

# **RL78 FAMILY**

Selection Guide







# **RL78 FAMILY LINEUP**

RL78/G10 (10	) to 16 pins)	R5F104AGASP — Top: Product name (16K/8K) — Bottom: (RAM/Data flash (bytes))
Group	RL78	3/G10
Pin count ROM (bytes)	10-pin	16-pin
512K		
384K		
256K		
192K		
128K		
96K		
64K		
48K		
32K		
24K		
16K		
8K		
4K	R5F10Y17ASP"1 (512/—)	R5F10Y47ASP'1 (512/—)
2К	R5F10Y16ASP*1 (256/—)	R5F10Y46ASP*1 (256/—)
1K	R5F10Y14ASP*1 (128/—)	R5F10Y44ASP'1 (128/—)
	10-pin LSSOP SP thickness: 1.45mm 4.4×3.6mm Pitch: 0.65mm	16-pin SSOP SP thickness: 1.725mm 4.4×5.0mm Pitch: 0.65mm
Package		

RL78/G11 (10	) to 25 pins)				— Top: Product name — Bottom: (RAM/Data flash (bytes)
Group			RL78/G11		
Pin count ROM (bytes)	10-pin	16-pin	20-pin	24-pin	25-pin
512K					
384K					
256K					
192K					
128K					
96K					
64K					
48K					
32K					
24K					
16K	R5F1051AASP <sup>-1</sup> (1.5K/2K)	R5F1054AASP*1 R5F1054AANA*1 (1.5K/2K)	R5F1056AASP"1 R5F1056AASM"1 (1.5K/2K)	R5F1057AANA*1 (1.5K/2K)	R5F1058AALA*1 (1.5K/2K)
8K					
4K					
2К					
1K					
Package	10-pin LSSOP SP thickness: 1.45mm 4.4×3.6mm Pitch: 0.65mm	16-pin SSOP SP thickness: 1.725mm 4.4×5.0mm Pitch: 0.65mm Line 16-pin HWQFN NA thickness: 0.80mm 3×3mm Pitch: 0.50mm	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm 20-pin TSSOP SM thickness: 1.20mm 4.4×6.5mm Pitch: 0.65mm	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm	25-pin WFLGA LA thickness: 0.76mm 3×3mm Pitch: 0.50mm



Group	RL78/G12									
Pin count HOM bytes)	20-pin				24-pin		30-pin			
512K										
384K										
256K										
192K										
128K										
96K										
64K										
48K										
32K										
16K	R5F1036AASP (1.5K/—)	R5F1036AASM (1.5K/—)	R5F1026AASP*1 (1.5K/2K)	R5F1026AASM*1 (1.5K/2K)	R5F1037AANA (1.5K/—)	R5F1027AANA*1 (1.5K/2K)	R5F103AAASP (2K/—)	R5F102AAASF (2K/2K)		
12K	R5F10369ASP (1K/—)	R5F10369ASP (1K/—)	R5F10269ASP*1 (1K/2K)	R5F10269ASM*1 (1K/2K)	R5F10379ANA (1K/—)	R5F10279ANA*1 (1K/2K)	R5F103A9ASP (1K/—)	R5F102A9ASF (1K/2K)		
8K	R5F10368ASP (768/—)	R5F10368ASM (768/—)	R5F10268ASP*1 (768/2K)	R5F10268ASM*1 (768/2K)	R5F10378ANA (768/—)	R5F10278ANA*1 (768/2K)	R5F103A8ASP (768/—)	R5F102A8ASF (768/2K)		
4K	R5F10367ASP (512/—)	R5F10367ASM (512/—)	R5F10267ASP*1 (512/2K)	R5F10267ASM*1 (512/2K)	R5F10377ANA (512/—)	R5F10277ANA*1 (512/2K)	R5F103A7ASP (512/—)	R5F102A7ASF (512/2K)		
2К	R5F10366ASP (256/—)	R5F10366ASM (256/—)	R5F10266ASP*1 (256/2K)	R5F10266ASM*1 (256/2K)	(312/ )	(312/21()	(312/ )	(JIZ/ZI()		
1K	(230/—)	(230/)	(200/210)	(230/2K)						
Package	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm 20-pin TSSOP SM thickness: 1.20mm 4.4×6.5mm Pitch: 0.65mm			24-pin HWQFN     30-pin LS       NA thickness: 0.80mm     SP thickness:       4×4mm     7.62mm (3)       Pitch: 0.50mm     Pitch: 0.63			ess: 1.40mm 1 (300mil) 0.65mm			

ΜΕΜΟ		



#### RL78/G13 (20 to 48 pins)

R5F104AGASP (16K/8K): Product name (RAM (bytes) / Data flash (bytes))

Group		RL78/G13								
Pin count ROM (bytes)	20-pin	24-pin	25-pin	30-pin	32-pin					
512K										
384K										
256K										
192K										
128K				R5F100AGASP (12K/8K) <sup>*2</sup> R5F101AGASP (12K/—)	R5F100BGANA (12K/8K)*2 R5F101BGANA (12K/—)					
96K				R5F100AFASP (8K/8K)*2 R5F101AFASP (8K/—)	R5F100BFANA (8K/8K) <sup>*2</sup> R5F101BFANA (8K/—)					
64K	R5F1006EASP (4K/4K) <sup>*2</sup> R5F1016EASP (4K/—) R5F1006EASM (4K/4K) <sup>*2</sup> R5F1016EASM (4K/—)	R5F1007EANA (4K/4K) <sup>-2</sup> R5F1017EANA (4K/—)	R5F1008EALA (4K/4K) <sup>*2</sup> R5F1018EALA (4K/—)	R5F100AEASP (4K/4K)*2 R5F101AEASP (4K/—)	R5F100BEANA (4K/4K)'² R5F101BEANA (4K/—)					
48K	R5F1006DASP (3K/4K)* <sup>2</sup> R5F1016DASP (3K/) R5F1006DASM (3K/4K)* <sup>2</sup> R5F1016DASM (3K/)	R5F1007DANA (3K/4K)*2 R5F1017DANA (3K/—)	R5F1008DALA (3K/4K) <sup>°2</sup> R5F1018DALA (3K/—)	R5F100ADASP (3K/4K)*2 R5F101ADASP (3K/—)	R5F100BDANA (3K/4K)" <sup>2</sup> R5F101BDANA (3K/—)					
32K	R5F1006CASP (2K/4K) <sup>*2</sup> R5F1016CASP (2K/—) R5F1006CASM (2K/4K) <sup>*2</sup> R5F1016CASM (2K/—)	R5F1007CANA (2K/4K) <sup>*2</sup> R5F1017CANA (2K/—)	R5F1008CALA (2K/4K) <sup>*2</sup> R5F1018CALA (2K/—)	R5F100ACASP (2K/4K)*2 R5F101ACASP (2K/—)	R5F100BCANA (2K/4K)'² R5F101BCANA (2K/—)					
16K	R5F1006AASP (2K/4K) <sup>*2</sup> R5F1016AASP (2K/—) R5F1006AASM (2K/4K) <sup>*2</sup> R5F1016AASM (2K/—)	R5F1007AANA (2K/4K)*² R5F1017AANA (2K/—)	R5F1008AALA (2K/4K) <sup>*2</sup> R5F1018AALA (2K/—)	R5F100AAASP (2K/4K)*² R5F101AAASP (2K/—)	R5F100BAANA (2K/4K)'² R5F101BAANA (2K/—)					
12K										
8K										
4K										
2К										
1K										
Package	20-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm 20-pin TSSOP SM thickness: 1.20mm 4.4×6.5mm Pitch: 0.65mm	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm	25-pin WFLGA LA thickness: 0.76mm 3×3mm Pitch: 0.50mm	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm					

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: -40 to +85°C) \*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

	RL78/G13								
36-pin	40-pin	44-pin	48-	48-pin					
		R5F100FLAFP (32K/8K)*1 R5F101FLAFP (32K/—)*1	R5F100GLAFB (32K/8K)*1 R5F101GLAFB (32K/—)*1	R5F100GLANA (32K/8K) R5F101GLANA (32K/—)					
		R5F100FKAFP (24K/8K)*1 R5F101FKAFP (24K/—)*1	R5F100GKAFB (24K/8K)*1 R5F101GKAFB (24K/—)*1	R5F100GKANA (24K/8K) R5F101GKANA (24K/—)					
		R5F100FJAFP (20K/8K)* <sup>2</sup> R5F101FJAFP (20K/—)	R5F100GJAFB (20K/8K) <sup>*2</sup> R5F101GJAFB (20K/—)	R5F100GJANA (20K/8K) R5F101GJANA (20K/—					
	R5F100EHANA (16K/8K) <sup>*2</sup>	R5F100FHAFP (16K/8K) <sup>*2</sup>	R5F100GHAFB (16K/8K) <sup>-2</sup>	R5F100GHANA (16K/8K)					
	R5F101EHANA (16K/—)	R5F101FHAFP (16K/—)	R5F101GHAFB (16K/—)	R5F101GHANA (16K/—					
R5F100CGALA (12K/8K) <sup>*2</sup>	R5F100EGANA (12K/8K) <sup>*2</sup>	R5F100FGAFP (12K/8K) <sup>*2</sup>	R5F100GGAFB (12K/8K) <sup>*2</sup>	R5F100GGANA (12K/8K)					
R5F101CGALA (12K/—)	R5F101EGANA (12K/—)	R5F101FGAFP (12K/—)	R5F101GGAFB (12K/—)	R5F101GGANA (12K/—					
R5F100CFALA (8K/8K) <sup>°2</sup>	R5F100EFANA (8K/8K) <sup>*2</sup>	R5F100FFAFP (8K/8K) <sup>°2</sup>	R5F100GFAFB (8K/8K) <sup>*2</sup>	R5F100GFANA (8K/8K)*					
R5F101CFALA (8K/—)	R5F101EFANA (8K/—)	R5F101FFAFP (8K/—)	R5F101GFAFB (8K/—)	R5F101GFANA (8K/—)					
R5F100CEALA (4K/4K) <sup>°2</sup>	R5F100EEANA (4K/4K)'²	R5F100FEAFP (4K/4K) <sup>*2</sup>	R5F100GEAFB (4K/4K)'²	R5F100GEANA (4K/4K)					
R5F101CEALA (4K/—)	R5F101EEANA (4K/—)	R5F101FEAFP (4K/—)	R5F101GEAFB (4K/—)	R5F101GEANA (4K/—)					
R5F100CDALA (3K/4K) <sup>-2</sup>	R5F100EDANA (3K/4K) <sup>32</sup>	R5F100FDAFP (3K/4K) <sup>32</sup>	R5F100GDAFB (3K/4K) <sup>32</sup>	R5F100GDANA (3K/4K)					
R5F101CDALA (3K/—)	R5F101EDANA (3K/—)	R5F101FDAFP (3K/—)	R5F101GDAFB (3K/—)	R5F101GDANA (3K/—)					
R5F100CCALA (2K/4K) <sup>*2</sup>	R5F100ECANA (2K/4K)*2	R5F100FCAFP (2K/4K) <sup>-2</sup>	R5F100GCAFB (2K/4K) <sup>+2</sup>	R5F100GCANA (2K/4K)					
R5F101CCALA (2K/—)	R5F101ECANA (2K/—)	R5F101FCAFP (2K/—)	R5F101GCAFB (2K/—)	R5F101GCANA (2K/—)					
R5F100CAALA (2K/4K) <sup>*2</sup>	R5F100EAANA (2K/4K) <sup>*2</sup>	R5F100FAAFP (2K/4K) <sup>*2</sup>	R5F100GAAFB (2K/4K) <sup>°2</sup>	R5F100GAANA (2K/4K)					
R5F101CAALA (2K/—)	R5F101EAANA (2K/—)	R5F101FAAFP (2K/—)	R5F101GAAFB (2K/—)	R5F101GAANA (2K/—)					
36-pin WFLGA	40-pin HWQFN	44-pin LQFP	48-pin LFQFP	48-pin HWQFN					
LA thickness: 0.76mm	NA thickness: 0.80mm	FP thickness: 1.60mm	FB thickness: 1.60mm	NA thickness: 0.80mm					
4×4mm	6×6mm	10×10mm	7×7mm	7×7mm					
Pitch: 0.50mm	Pitch: 0.50mm	Pitch: 0.80mm	Pitch: 0.50mm	Pitch: 0.50mm					
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#### RL78/G13 (52 to 128 pins)

R5F104AGASP (16K/8K): Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G13							
Pin count ROM (bytes)	52-pin		64-pin					
512K	R5F100JLAFA (32K/8K)*1 R5F101JLAFA (32K/—)*1	R5F100LLAFB (32K/8K)*1 R5F101LLAFB (32K/—)*1	R5F100LLAFA (32K/8K)*1 R5F101LLAFA (32K/—)*1					
384К	R5F100JKAFA (24K/8K)*1 R5F101JKAFA (24K/—)*1	R5F100LKAFB (24K/8K) <sup>*1</sup> R5F101LKAFB (24K/—) <sup>*1</sup>	R5F100LKAFA (24K/8K)*1 R5F101LKAFA (24K/—)*1					
256K	R5F100JJAFA (20K/8K) <sup>*2</sup> R5F101JJAFA (20K/—)	R5F100LJAFB (20K/8K) <sup>*2</sup> R5F101LJAFB (20K/—)	R5F100LJAFA (20K/8K)*² R5F101LJAFA (20K/—)	R5F100LJABG (20K/8K) <sup>*2</sup> R5F101LJABG (20K/—)				
192K	R5F100JHAFA (16K/8K) <sup>*2</sup> R5F101JHAFA (16K/—)	R5F100LHAFB (16K/8K) <sup>*2</sup> R5F101LHAFB (16K/—)	R5F100LHAFA (16K/8K) <sup>*2</sup> R5F101LHAFA (16K/—)	R5F100LHABG (16K/8K)*² R5F101LHABG (16K/—)				
128K	R5F100JGAFA (12K/8K) <sup>*2</sup> R5F101JGAFA (12K/—)	R5F100LGAFB (12K/8K) <sup>-2</sup> R5F101LGAFB (12K/—)	R5F100LGAFA (12K/8K) <sup>-2</sup> R5F101LGAFA (12K/—)	R5F100LGABG (12K/8K) <sup>-2</sup> R5F101LGABG (12K/—)				
96K	R5F100JFAFA (8K/8K)*² R5F101JFAFA (8K/—)	R5F100LFAFB (8K/8K)*² R5F101LFAFB (8K/—)	R5F100LFAFA (8K/8K) <sup>*2</sup> R5F101LFAFA (8K/—)	R5F100LFABG (8K/8K) <sup>*2</sup> R5F101LFABG (8K/—)				
64K	R5F100JEAFA (4K/4K)*2 R5F101JEAFA (4K/—)	R5F100LEAFB (4K/4K) <sup>+2</sup> R5F101LEAFB (4K/—)	R5F100LEAFA (4K/4K)*² R5F101LEAFA (4K/—)	R5F100LEABG (4K/4K) <sup>*2</sup> R5F101LEABG (4K/—)				
48K	R5F100JDAFA (3K/4K)*² R5F101JDAFA (3K/—)	R5F100LDAFB (3K/4K)*² R5F101LDAFB (3K/—)	R5F100LDAFA (3K/4K)*² R5F101LDAFA (3K/—)	R5F100LDABG (3K/4K) <sup>*2</sup> R5F101LDABG (3K/—)				
32K	R5F100JCAFA (2K/4K)*2 R5F101JCAFA (2K/—)	R5F100LCAFB (2K/4K) <sup>*2</sup> R5F101LCAFB (2K/—)	R5F100LCAFA (2K/4K)*² R5F101LCAFA (2K/—)	R5F100LCABG (2K/4K) <sup>*2</sup> R5F101LCABG (2K/—)				
16K								
12K								
8K								
4K								
2К								
1К								
Package	52-pin LQFP FA thickness: 1.70mm 10×10mm Pitch: 0.65mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	64-pin LQFP FA thickness: 1.60mm 12×12mm Pitch: 0.65mm	64-pin VFBGA BG thickness: 0.99mm 4×4mm Pitch: 0.40mm				

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: -40 to +85°C) \*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

		RL78/G13		
80-	pin	100	-pin	128-pin
R5F100MLAFB (32K/8K)*1 R5F101MLAFB (32K/—)*1	R5F100MLAFA (32K/8K) <sup>*1</sup> R5F101MLAFA (32K/—) <sup>*1</sup>	R5F100PLAFB (32K/8K)*1 R5F101PLAFB (32K/—)*1	R5F100PLAFA (32K/8K) <sup>*1</sup> R5F101PLAFA (32K/—) <sup>*1</sup>	R5F100SLAFB (32K/8K)*1 R5F101SLAFB (32K/—)*1
R5F100MKAFB (24K/8K)*1 R5F101MKAFB (24K/—)*1	R5F100MKAFA (24K/8K) <sup>*1</sup> R5F101MKAFA (24K/—) <sup>*1</sup>	R5F100PKAFB (24K/8K)*1 R5F101PKAFB (24K/—)*1	R5F100PKAFA (24K/8K) <sup>*1</sup> R5F101PKAFA (24K/—) <sup>*1</sup>	R5F100SKAFB (24K/8K)*1 R5F101SKAFB (24K/—)*1
R5F100MJAFB (20K/8K) <sup>*2</sup> R5F101MJAFB (20K/—)	R5F100MJAFA (20K/8K) <sup>*2</sup> R5F101MJAFA (20K/—)	R5F100PJAFB (20K/8K)*2 R5F101PJAFB (20K/—)	R5F100PJAFA (20K/8K) <sup>*2</sup> R5F101PJAFA (20K/—)	R5F100SJAFB (20K/8K)*1 R5F101SJAFB (20K/—)*1
R5F100MHAFB (16K/8K)*2 R5F101MHAFB (16K/—)	R5F100MHAFA (16K/8K) <sup>*2</sup> R5F101MHAFA (16K/—)	R5F100PHAFB (16K/8K) <sup>*2</sup> R5F101PHAFB (16K/—)	R5F100PHAFA (16K/8K) <sup>*2</sup> R5F101PHAFA (16K/—)	R5F100SHAFB (16K/8K)*1 R5F101SHAFB (16K/—)*1
R5F100MGAFB (12K/8K)*2 R5F101MGAFB (12K/—)	R5F100MGAFA (12K/8K) <sup>-2</sup> R5F101MGAFA (12K/—)	R5F100PGAFB (12K/8K) <sup>-2</sup> R5F101PGAFB (12K/—)	R5F100PGAFA (12K/8K) <sup>-2</sup> R5F101PGAFA (12K/—)	
R5F100MFAFB (8K/8K)*2 R5F101MFAFB (8K/—)	R5F100MFAFA (8K/8K)*2 R5F101MFAFA (8K/—)	R5F100PFAFB (8K/8K) <sup>*2</sup> R5F101PFAFB (8K/—)	R5F100PFAFA (8K/8K) <sup>°2</sup> R5F101PFAFA (8K/—)	
80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm	80-pin LQFP FA thickness: 1.70mm 14×14mm Pitch: 0.65mm	100-pin LFQFP FB thickness: 1.60mm 14×14mm Pitch: 0.50mm	100-pin LQFP FA thickness: 1.60mm 14×20mm Pitch: 0.65mm	128-pin LFQFP FB thickness: 1.60mm 14×20mm Pitch: 0.50mm



# RL78/G13A (44 to 100 pins)

R5F104AGASP (16K/8K): Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G13A							
Pin count ROM (bytes)	44-pin	48-pin	64-pin	100-pin				
768K								
512K	R5F140FLAFP (32K/8K) R5F140FLGFP (32K/8K)	R5F140GLAFB (32K/8K) R5F140GLGFB (32K/8K)	R5F140LLAFB (32K/8K) R5F140LLGFB (32K/8K)	R5F140PLAFB (32K/8K) R5F140PLGFB (32K/8K)				
384K	R5F140FKAFP (24K/8K) R5F140FKGFP (24K/8K)	R5F140GKAFB (24K/8K) R5F140GKGFB (24K/8K)	R5F140LKAFB (24K/8K) R5F140LKGFB (24K/8K)	R5F140PKAFB (24K/8K) R5F140PKGFB (24K/8K)				
256K								
192K								
128K								
96K								
64К								
48K								
32К								
16K								
12K								
8К								
4К								
2К								
1К								
Package	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm	48-pin LFQFP FB thickness: 1.70mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.70mm 10×10mm Pitch: 0.50mm	100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm				

MEMO		

# 10-11



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Group		RL78/G14								
Pin count ROM bytes)	30-pin	32-	pin	36-pin	40-pin	44-pin	48-pin			
512K							R5F104GLAFB*1 (48K/8K)	R5F104GLANA*1 (48K/8K)		
384K							R5F104GKAFB*1 (32K/8K)	R5F104GKANA*1 (32K/8K)		
256K						R5F104FJAFP*1 (24K/8K)	R5F104GJAFB <sup>*1</sup> (24K/8K)	R5F104GJANA*1 (24K/8K)		
192K					R5F104EHANA*1 (20K/8K)	R5F104FHAFP*1 (20K/8K)	R5F104GHAFB <sup>*1</sup> (20K/8K)	R5F104GHANA*1 (20K/8K)		
128K	R5F104AGASP*1 (16K/8K)	R5F104BGANA*1 (16K/8K)	R5F104BGAFP*1 (16K/8K)	R5F104CGALA*1 (16K/8K)	R5F104EGANA*1 (16K/8K)	R5F104FGAFP*1 (16K/8K)	R5F104GGAFB*1 (16K/8K)	R5F104GGANA*1 (16K/8K)		
96K	R5F104AFASP*1 (12K/8K)	R5F104BFANA*1 (12K/8K)	R5F104BFAFP*1 (12K/8K)	R5F104CFALA*1 (12K/8K)	R5F104EFANA*1 (12K/8K)	R5F104FFAFP*1 (12K/8K)	R5F104GFAFB*1 (12K/8K)	R5F104GFANA*1 (12K/8K)		
64K	R5F104AEASP*1 (5.5K/4K)	R5F104BEANA*1 (5.5K/4K)	R5F104BEAFP*1 (5.5K/4K)	R5F104CEALA*1 (5.5K/4K)	R5F104EEANA*1 (5.5K/4K)	R5F104FEAFP*1 (5.5K/4K)	R5F104GEAFB*1 (5.5K/4K)	R5F104GEANA*1 (5.5K/4K)		
48K	R5F104ADASP*1 (5.5K/4K)	R5F104BDANA*1 (5.5K/4K)	R5F104BDAFP*1 (5.5K/4K)	R5F104CDALA*1 (5.5K/4K)	R5F104EDANA*1 (5.5K/4K)	R5F104FDAFP*1 (5.5K/4K)	R5F104GDAFB*1 (5.5K/4K)	R5F104GDANA*1 (5.5K/4K)		
32K	R5F104ACASP*1 (4K/4K)	R5F104BCANA*1 (4K/4K)	R5F104BCAFP*1 (4K/4K)	R5F104CCALA*1 (4K/4K)	R5F104ECANA*1 (4K/4K)	R5F104FCAFP*1 (4K/4K)	R5F104GCAFB*1 (4K/4K)	R5F104GCANA*1 (4K/4K)		
16K	R5F104AAASP*1 (2.5K/4K)	R5F104BAANA*1 (2.5K/4K)	R5F104BAAFP*1 (2.5K/4K)	R5F104CAALA*1 (2.5K/4K)	R5F104EAANA*1 (2.5K/4K)	R5F104FAAFP <sup>*1</sup> (2.5K/4K)	R5F104GAAFB*1 (2.5K/4K)	R5F104GAANA*1 (2.5K/4K)		
12K										
8K										
4K										
2K										
1K										
Package	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HWQFN NA thickness: 0.80mm 5x5mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	36-pin WFLGA LA thickness: 0.76mm 4×4mm Pitch: 0.50mm	40-pin HWQFN NA thickness: 0.80mm 6×6mm Pitch: 0.50mm	44-pin LOFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm	48-pin LFQFP FB thickness: 1.60mm <sup>*2</sup> 7×7mm Pitch: 0.50mm	48-pin HWQFN NA thickness: 0.80mm 7×7mm Pitch: 0.50mm		

RL78/G14										
52-pin		64-	pin		80-pin		100-pin			
	R5F104LLAFB*1 (48K/8K)	R5F104LLAFA*1 (48K/8K)		R5F104LLALA*1 (48K/8K)	R5F104MLAFB <sup>*1</sup> (48K/8K)	R5F104MLAFA*1 (48K/8K)	R5F104PLAFB*1 (48K/8K)	R5F104PLAFA*1 (48K/8K)		
	R5F104LKAFB*1 (32K/8K)	R5F104LKAFA*1 (32K/8K)		R5F104LKALA*1 (32K/8K)	R5F104MKAFB*1 (32K/8K)	R5F104MKAFA*1 (32K/8K)	R5F104PKAFB <sup>*1</sup> (32K/8K)	R5F104PKAFA*1 (32K/8K)		
R5F104JJAFA*1 (24K/8K)	R5F104LJAFB*1 (24K/8K)	R5F104LJAFA*1 (24K/8K)	R5F104LJAFP*1 (24K/8K)	R5F104LJALA*1 (24K/8K)	R5F104MJAFB <sup>*1</sup> (24K/8K)	R5F104MJAFA*1 (24K/8K)	R5F104PJAFB*1 (24K/8K)	R5F104PJAFA*1 (24K/8K)		
R5F104JHAFA*1 (20K/8K)	R5F104LHAFB <sup>*1</sup> (20K/8K)	R5F104LHAFA*1 (20K/8K)	R5F104LHAFP*1 (20K/8K)	R5F104LHALA*1 (20K/8K)	R5F104MHAFB*1 (20K/8K)	R5F104MHAFA*1 (20K/8K)	R5F104PHAFB <sup>*1</sup> (20K/8K)	R5F104PHAFA*1 (20K/8K)		
R5F104JGAFA*1 (16K/8K)	R5F104LGAFB*1 (16K/8K)	R5F104LGAFA*1 (16K/8K)	R5F104LGAFP*1 (16K/8K)	R5F104LGALA*1 (16K/8K)	R5F104MGAFB*1 (16K/8K)	R5F104MGAFA*1 (16K/8K)	R5F104PGAFB*1 (16K/8K)	R5F104PGAFA*1 (16K/8K)		
R5F104JFAFA*1 (12K/8K)	R5F104LFAFB*1 (12K/8K)	R5F104LFAFA <sup>*1</sup> (12K/8K)	R5F104LFAFP*1 (12K/8K)	R5F104LFALA*1 (12K/8K)	R5F104MFAFB*1 (12K/8K)	R5F104MFAFA*1 (12K/8K)	R5F104PFAFB*1 (12K/8K)	R5F104PFAFA*1 (12K/8K)		
R5F104JEAFA*1 (5.5K/4K)	R5F104LEAFB*1 (5.5K/4K)	R5F104LEAFA <sup>*1</sup> (5.5K/4K)	R5F104LEAFP <sup>*1</sup> (5.5K/4K)	R5F104LEALA*1 (5.5K/4K)						
R5F104JDAFA*1 (5.5K/4K)	R5F104LDAFB*1 (5.5K/4K)	R5F104LDAFA*1 (5.5K/4K)	R5F104LDAFP <sup>*1</sup> (5.5K/4K)	R5F104LDALA <sup>*1</sup> (5.5K/4K)						
R5F104JCAFA*1 (4K/4K)	R5F104LCAFB*1 (4K/4K)	R5F104LCAFA*1 (4K/4K)	R5F104LCAFP*1 (4K/4K)	R5F104LCALA*1 (4K/4K)						
52-pin LQFP thickness: 1.70mm 10×10mm Pitch: 0.65mm	64-pin LFQFP FB thickness: 1.60mm <sup>*2</sup> 10×10mm Pitch: 0.50mm	64-pin LQFP FA thickness: 1.60mm 12×12mm Pitch: 0.65mm	64-pin LQFP FP thickness: 1.70mm 14×14mm Pitch: 0.80mm	64-pin WFLGA LA thickness: 0.76mm 5x5mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm <sup>*2</sup> 12×12mm Pitch: 0.50mm	80-pin LQFP FA thickness: 1.70mm 14×14mm Pitch: 0.65mm	100-pin LFQFP FB thickness: 1.60mm <sup>*2</sup> 14×14mm Pitch: 0.50mm	100-pin LQFP FA thickness: 1.60mr 14×20mm Pitch: 0.65mm		



#### RL78/G15 (8 to 20 pins)

R5F12007ANS (1K/1K): Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G15							
Pin count ROM (bytes)	8-pin	10-pin	16-pin	20-pin				
768K								
512K								
384K								
256K								
192K								
128K								
96K								
64К								
48K								
32К								
16K								
12K								
8K	R5F12008ANS (1K/1K)*1	R5F12018ASP (1K/1K)*1	R5F12048ASP (1K/1K)*1 R5F12048ANA (1K/1K)*1	R5F12068ASP (1K/1K)*1				
4К	R5F12007ANS (1K/1K)*1	R5F12017ASP (1K/1K)*1	R5F12047ASP (1K/1K)*1 R5F12047ANA (1K/1K)*1	R5F12067ASP (1K/1K)*1				
2К								
1К								
Package	8-pin WDFN NS thickness: 0.80mm 3×3mm Pitch: 0.65mm	10-pin LSSOP SP thickness: 1.45mm 4.4×3.6mm Pitch: 0.65mm	16-pin SSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm				
	nsumer grade products. (ambient operating temperature r		16-pin HWQFN NA thickness: 0.80mm 3×3mm Pitch: 0.50mm					

The above part numbers are consumer grade products. (ambient operating temperature range : -40-+85°C) \*1: Industrial grade products are also available. (part number:R5F120xxGxx, ambient operating temperature range: -40-+105°C, part number:R5F120xxMxx, ambient operating temperature range: -40-+125°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

Group	RL78/G16							
Pin count ROM (bytes)	10-pin	16-pin	20-pin	24-pin	32-pin			
768K								
512K								
384K								
256K								
192K								
128K								
96K								
64К								
48K								
32К	R5F1211CASP (2K/1K) <sup>-1</sup>	R5F1214CASP (2K/1K)*1 R5F1214CANA (2K/1K)*1	R5F1216CASP (2K/1K) <sup>*1</sup>	R5F1217CANA (2K/1K)*1	R5F121BCANA (2K/1K) <sup>*1</sup> R5F121BCAFP (2K/1K) <sup>*1</sup>			
16K	R5F1211AASP (2K/1K)*1	"R5F1214AASP (2K/1K)*1 R5F1214AANA (2K/1K)*1	R5F1216AASP (2K/1K)*1	R5F1217AANA (2K/1K)*1	R5F121BAANA (2K/1K) <sup>*1</sup> R5F121BAAFP (2K/1K) <sup>*1</sup>			
12K								
8К								
4К								
2К								
1К								
	10-pin LSSOP SP thickness: 1.45mm 4.4×3.6mm Pitch: 0.65mm	16-pin SSOP SP thickness: 1.725mm 4.4×5mm Pitch: 0.65mm	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.5mm	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.5mm			
Package		16-pin HWQFN NA thickness: 0.80mm 3×3mm Pitch: 0.5mm			32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.8mm			

#### RL78/G16 (10 to 32pins)

The above part numbers are consumer grade products. (ambient operating temperature range : -40-+85°C) \*1: Industrial grade products are also available. (part number:R5F121xxGxx, ambient operating temperature range: -40-+105°C, part number:R5F121xxMxx, ambient operating temperature range: -40-+125°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

R5F1211AASP (2K/1K): Product name (RAM((bytes) / Data flash (bytes))



#### RL78/G22 (16 to 48 pins)

R7F102G4E2DNP (4K/2K): Product name (RAM (bytes) / Data flash (bytes))

Group			RL78/G22		
Pin count ROM (bytes)	16-pin	20-pin	24-pin	25-pin	30-pin
768K					
512K					
384K					
256K					
192K					
128K					
96K					
64K	R7F102G4E2DNP (4K/2K)*1	R7F102G6E2DSP (4K/2K)*1	R7F102G7E2DNP (4K/2K)*1	R7F102G8E2DLA (4K/2K)*1	R7F102GAE2DSP (4K/2K)*1
48K					
32К	R7F102G4C2DNP (4K/2K)*1	R7F102G6C2DSP (4K/2K)*1	R7F102G7C2DNP (4K/2K)*1	R7F102G8C2DLA (4K/2K)*1	R7F102GAC2DSP (4K/2K)*1
16K					
12K					
8K					
4K					
2К					
1К					
Package	16-pin HWQFN NP thickness: 0.80mm 3×3mm Pitch: 0.50mm	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm	24-pin HWQFN NP thickness: 0.80mm 4×4mm Pitch: 0.50mm	25-pin WFLGA LA thickness: 0.76mm 3×3mm Pitch: 0.50mm	30-pin LSSOP SP thickness: 1.40mm 9.85mm (300mil) Pitch: 0.65mm

RL78/G22								
32-pin	36-pin	40-pin	44-pin	48-pin				
R7F102GBE2DNP (4K/2K) <sup>*1</sup> R7F102GBE2DFP (4K/2K) <sup>*1</sup>	R7F102GCE2DLA (4K/2K)''	R7F102GEE2DNP (4K/2K) <sup>*1</sup>	R7F102GFE2DFP (4K/2K)"	R7F102GGE2DNP (4K/2K) <sup>*1</sup> R7F102GGE2DFB (4K/2K) <sup>*1</sup>				
R7F102GBC2DNP (4K/2K)'1 R7F102GBC2DFP (4K/2K)'1	R7F102GCC2DLA (4K/2K)''	R7F102GEC2DNP (4K/2K)'1	R7F102GFC2DFP (4K/2K)"	R7F102GGC2DNP (4K/2K)'' R7F102GGC2DFB (4K/2K)''				
32-pin HWOFN NP thickness: 0.80mm 5×5mm Pitch: 0.50mm 32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	36-pin WFLGA LA thickness: 0.76mm 4×4mm Pitch: 0.50mm	40-pin HWQFN NP thickness: 0.80mm 6×6mm Pitch: 0.50mm	44-pin LOFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm	48-pin HWQFN NP thickness: 0.80mm 7×7mm Pitch: 0.50mm 48-pin LFQFP FB thickness: 1.70mm 7×7mm Pitch: 0.50mm				



#### RL78/G23 (30 to 128 pins)

R7F100GAJ2DSP(24K/8K): Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G23						
Pin count ROM (bytes)	30-pin	32-pin	36-pin	40-pin	44-pin		
768K					R7F100GFN2DFP(48K/8K)*1		
512K					R7F100GFL2DFP(48K/8K)*1		
384К					R7F100GFK2DFP(32K/8K)*1		
256K	R7F100GAJ2DSP(24K/8K)*1	R7F100GBJ2DNP(24K/8K) <sup>*1</sup> R7F100GBJ2DFP(24K/8K) <sup>*1</sup>	R7F100GCJ2DLA(24K/8K)*1	R7F100GEJ2DNP(24K/8K)*1	R7F100GFJ2DFP(24K/8K)*1		
192K	R7F100GAH2DSP(20K/8K)*1	R7F100GBH2DNP(20K/8K)*1 R7F100GBH2DFP(20K/8K)*1	R7F100GCH2DLA(20K/8K)*1	R7F100GEH2DNP(20K/8K)*1	R7F100GFH2DFP(20K/8K)*1		
128K	R7F100GAG2DSP(16K/8K)*1	R7F100GBG2DNP(16K/8K) <sup>*1</sup> R7F100GBG2DFP(16K/8K) <sup>*1</sup>	R7F100GCG2DLA(16K/8K)*1	R7F100GEG2DNP(16K/8K)*1	R7F100GFG2DFP(16K/8K)*1		
96K	R7F100GAF2DSP(12K/8K)*1	R7F100GBF2DNP(12K/8K) <sup>*1</sup> R7F100GBF2DFP(12K/8K) <sup>*1</sup>	R7F100GCF2DSLA(12K/8K)*1	R7F100GEF2DNP(12K/8K)*1	R7F100GFF2DFP(12K/8K)*1		
64K							
48K							
32K							
16K							
12K							
8K							
4K							
2К							
1К							
Package	30-pin LSSOP SM thickness: 1.30mm 9.85mm (300mil) Pitch: 0.65mm	32-pin HWQFN NP thickness: 0.80mm 5×5mm Pitch: 0.50mm 32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	36-pin WFLGA LA thickness: 0.76mm 4×4mm Pitch: 0.50mm	40-pin HWQFN NP thickness: 0.80mm 6×6mm Pitch: 0.50mm	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm		

	RL78/G23								
48-pin	52-pin	64-pin	80-pin	100-pin	128-pin				
R7F100GGN2DFB(48K/8K)*1 R7F100GGN2DNP(48K/8K)*1	R7F100GJN2DFA(48K/8K)*1	R7F100GLN2DFA(48K/8K) <sup>*1</sup> R7F100GLN2DFB(48K/8K) <sup>*1</sup> R7F100GLN2DFB(48K/8K) <sup>*1</sup>	R7F100GMN2DFA(48K/8K) <sup>*1</sup> R7F100GMN2DFB(48K/8K) <sup>*1</sup>	R7F100GPN2DFA(48K/8K)*1 R7F100GPN2DFB(48K/8K)*1	R7F100GSN2DFB(48K/8K)*1				
R7F100GGL2DFB(48K/8K)*1 R7F100GGL2DNP(48K/8K)*1	R7F100GJL2DFA(48K/8K) <sup>*1</sup>	R7F100GLL2DFA(48K/8K)*1 R7F100GLL2DFB(48K/8K)*1 R7F100GLL2DFB(48K/8K)*1 R7F100GLL2DLA(48K/8K)*1	R7F100GML2DFA(48K/8K) <sup>*1</sup> R7F100GML2DFB(48K/8K) <sup>*1</sup>	R7F100GPL2DFA(48K/8K)*1 R7F100GPL2DFB(48K/8K)*1	R7F100GSL2DFB(48K/8K) <sup>*1</sup>				
R7F100GGK2DFB(32K/8K)*1 R7F100GGK2DNP(32K/8K)*1	R7F100GJK2DFA(32K/8K)*1	R7F100GLK2DFA(32K/8K)*1 R7F100GLK2DFB(32K/8K)*1 R7F100GLK2DLA(32K/8K)*1	R7F100GMK2DFA(32K/8K)*1 R7F100GMK2DFB(32K/8K)*1	R7F100GPK2DFA(32K/8K)*1 R7F100GPK2DFB(32K/8K)*1	R7F100GSK2DFB(32K/8K) <sup>*1</sup>				
R7F100GGJ2DFB(24K/8K)*1 R7F100GGJ2DNP(24K/8K)*1	R7F100GJJ2DFA(24K/8K)*1	R7F100GLJ2DFA(24K/8K)*1 R7F100GLJ2DFB(24K/8K)*1 R7F100GLJ2DLA(24K/8K)*1	R7F100GMJ2DFA(24K/8K)*1 R7F100GMJ2DFB(24K/8K)*1	R7F100GPJ2DFA(24K/8K)*1 R7F100GPJ2DFB(24K/8K)*1	R7F100GSJ2DFB(24K/8K)*1				
R7F100GGH2DFB(20K/8K)*1 R7F100GGH2DNP(20K/8K)*1	R7F100GJH2DFA(20K/8K)*1	R7F100GLH2DFA(20K/8K)*1 R7F100GLH2DFB(20K/8K)*1 R7F100GLH2DLA(20K/8K)*1	R7F100GMH2DFA(20K/8K)*1 R7F100GMH2DFB(20K/8K)*1	R7F100GPH2DFA(20K/8K) <sup>*1</sup> R7F100GPH2DFB(20K/8K) <sup>*1</sup>					
R7F100GGG2DFB(16K/8K) <sup>*1</sup> R7F100GGG2DNP(16K/8K) <sup>*1</sup>	R7F100GJG2DFA(16K/8K)*1	R7F100GLG2DFA(16K/8K)*1 R7F100GLG2DFB(16K/8K)*1 R7F100GLG2DLA(16K/8K)*1	R7F100GMG2DFA(16K/8K)*1 R7F100GMG2DNB(16K/8K)*1	R7F100GPG2DFA(16K/8K)*1 R7F100GPG2DNB(16K/8K)*1					
R7F100GGF2DFB(12K/8K) <sup>*1</sup> R7F100GGF2DNP(12K/8K) <sup>*1</sup>	R7F100GJF2DFA(12K/8K)*1	R7F100GLF2DFA(12K/8K)*1 R7F100GLF2DFB(12K/8K)*1 R7F100GLF2DLA(12K/8K)*1							
48-pin LFQFP FB thickness: 0.70mm 7×7mm Pitch: 0.50mm 48-pin HWQFN NP thickness: 0.80mm 7×7mm Pitch: 0.50mm	52-pin LQFP FA thickness: 1.70mm 10×10mm Pitch: 0.50mm	64-pin LQFP FA thickness: 1.60mm 12×12mm Pitch: 0.65mm 64-pin LFQFP FB thickness: 1.70mm 10×10mm Pitch: 0.50mm 64-pin WFLGA LA thickness: 0.760mm 5×5mm Pitch: 0.50mm	80-pin LQFP FA thickness: 1.70mm 14×14mm Pitch: 0.65mm 80-pin LFQFP FB thickness: 1.70mm 12×12mm Pitch: 0.50mm	100-pin LQFP FA thickness: 1.60mm 14×20mm Pitch: 0.65mm 100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm	128-pin LFQFP FB thickness: 1.60mm 20×20mm Pitch: 0.50mm				



#### RL78/G24 (20 to 64pins)

R7F101G6E2DSP (12K/4K): Product name (RAM (bytes) / Data flash (bytes))

Group			RL78/G24		
Pin count ROM (bytes)	20-pin	24-pin	25-pin	30-pin	32-pin
768K					
512K					
384K					
256K					
192K					
128K	R7F101G6G2DSP (12K/4K)*1	R7F101G7G2DNP (12K/4K)*1	R7F101G8G2DLA (12K/4K)*2	R7F101GAG2DSP (12K/4K)*1	R7F101GBG2DNP (12K/4K) <sup>*1</sup> R7F101GBG2DFP (12K/4K) <sup>*2</sup>
96K					
64K	R7F101G6E2DSP (12K/4K)*1	R7F101G7E2DNP (12K/4K)*1	R7F101G8E2DLA (12K/4K)*2	R7F101GAE2DSP (12K/4K)*1	R7F101GBE2DNP (12K/4K) <sup>*1</sup> R7F101GBE2DFP (12K/4K) <sup>*2</sup>
48K					
32К					
16K					
12K					
8K					
4К					
2К					
1К					
Package	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm	24-pin HWQFN NP thickness: 0.80mm 4×4mm Pitch: 0.5mm	25-pin WFLGA LA thickness: 0.76mm 3×3mm Pitch: 0.5mm	30-pin LSSOP SP thickness: 1.40mm 9.85mm(300mil) Pitch: 0.65mm	32-pin HWQFN NP thickness: 0.80mm 5×5mm Pitch:0.5mm 32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.8mm

The above part numbers are consumer grade products. (ambient operating temperature range: -40--+85°C) \*1: Industrial grade products are also available. (part number: R7F101Gxx3Cxx, ambient operating temperature range: -40-+105°C, part number: R7F101Gxx4Cxx, ambient operating temperature range: -40-+125°C) \*2: Industrial grade products are also available. (part number: R7F101Gxx3Cxx, ambient operating temperature range: -40-+105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.

RL78/G24									
40-pin	44-pin	48-pin	52-pin	64-pin					
R7F101GEG2DNP (12K/4K)*1	R7F101GFG2DFP (12K/4K)*2	R7F101GGG2DFB (12K/4K) <sup>*1</sup> R7F101GGG2DNP (12K/4K) <sup>*2</sup>	R7F101GJG2DFA (12K/4K)*1	R7F101GLG2DFA (12K/4K)*2 R7F101GLG2DFB (12K/4K)*2					
R7F101GEE2DNP (12K/4K)*1	R7F101GFE2DFP (12K/4K)*2	R7F101GGE2DFB (12K/4K)*1 R7F101GGE2DNP (12K/4K)*2	R7F101GJE2DFA (12K/4K)*1	R7F101GLE2DFA (12K/4K)*2 R7F101GLE2DFB (12K/4K)*2					
40-pin HWQFN NP thickness: 0.80mm 6×6mm Pitch: 0.5mm	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.8mm	48-pin LFQFP FB thickness: 1.70mm 7×7mm Pitch: 0.5mm	52-pin LQFP FA thickness:1.70mm 10×10mm Pitch:0.65mm	64-pin LQFP FA thickness:1.60mm 12×12mm Pitch:0.65mm					
		48-pin HWQFN NP thickness: 0.80mm 7×7mm Pitch: 0.5mm		64-pin LFQFP FB thickness:1.70mm 10×10mm Pitch:0.5mm					



Group			RL78	/G1A		
Pin count		00 min			C4	
OM oytes)	25-pin	32-pin	48-	pin	04-	pin
512K						
384K						
256K						
192K						
128K						
96K						
64K	R5F10E8EALA*1 (4K/4K)	R5F10EBEANA*1 (4K/4K)	R5F10EGEAFB <sup>*1</sup> (4K/4K)	R5F10EGEANA*1 (4K/4K)	R5F10ELEAFB <sup>*1</sup> (4K/4K)	R5F10ELEABG*1 (4K/4K)
48K	R5F10E8DALA*1 (3K/4K)	R5F10EBDANA <sup>*1</sup> (3K/4K)	R5F10EGDAFB <sup>*1</sup> (3K/4K)	R5F10EGDANA*1 (3K/4K)	R5F10ELDAFB <sup>*1</sup> (3K/4K)	R5F10ELDABG <sup>*1</sup> (3K/4K)
32K	R5F10E8CALA*1 (2K/4K)	R5F10EBCANA*1 (2K/4K)	R5F10EGCAFB <sup>*1</sup> (2K/4K)	R5F10EGCANA*1 (2K/4K)	R5F10ELCAFB <sup>*1</sup> (2K/4K)	R5F10ELCABG*1 (2K/4K)
16K	R5F10E8AALA*1 (2K/4K)	R5F10EBAANA <sup>*1</sup> (2K/4K)	R5F10EGAAFB <sup>*1</sup> (2K/4K)	R5F10EGAANA*1 (2K/4K)		
12K						
8K						
4K						
2К						
1K						
Package	25-pin WFLGA LA thickness: 0.76mm 3×3mm Pitch: 0.50mm	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HWQFN NA thickness: 0.80mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	64-pin VFBGA BG thickness: 0.99mn 4×4mm Pitch: 0.40mm

RL78/G1C (3	2 to 48 pins)					R5F104A0 (16K/8	GASP —— Top: Produ IK) —— Bottom: (F	uct name RAM/Data flash (bytes))	
Group		RL78/G1C							
Pin count ROM (bytes)		32-	pin			48	-pin		
512K									
384K									
256K									
192K									
128K									
96K									
64K									
48K									
32К	R5F10JBCANA*1 (5.5K/2K) Host/Function	R5F10JBCAFP*1 (5.5K/2K) Host/Function	R5F10KBCANA*1 (5.5K/2K) Function only	R5F10KBCAFP*1 (5.5K/2K) Function only	R5F10JGCANA*1 (5.5K/2K) Host/Function	R5F10JGCAFB <sup>*1</sup> (5.5K/2K) Host/Function	R5F10KGCANA*1 (5.5K/2K) Function only	R5F10KGCAFB*1 (5.5K/2K) Function only	
24K									
16K									
8K									
4K									
2К									
1K									
Package	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	48-pin HWQFN NA thickness: 0.80mm 7×7mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HWQFN NA thickness: 0.80mm 7×7mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mr 7×7mm Pitch: 0.50mm	



	78/G1D Module (42 pins)	R5F104AGASP — Top: Product name (16K/8K) — Bottom: (RAM/Data flash (b)
Group	RL78/G1D	RL78/G1D Module
Pin count A es)	48-pin	42-pin
512K		
384К		
256K	R5F11AGJANB"1 (20K/8K)	
192K	R5F11AGHANB" (16K/8K)	
128K	R5F11AGGANB" (12K/8K)	
96K		
64K		
48K		
32К		
16K		
12K		
8К		
4K		
2К		
1К		
	48-pin HWQFN NA thickness: 0.80mm 6×6mm Pitch: 0.40mm	42-pin LGA Thickness: 1.7mm 8.95×13.35mm Pitch: 0.85mm
Package		

RL78/G1F (24	to 64 pins)			R5F104AGASP — (16K/8K) —	— Top: Product name — Bottom: (RAM/Data flash (bytes))
Group			RL78/G1F		
Pin count ROM (bytes)	24-pin	32-pin	36-pin	48-pin	64-pin
512K					
384K					
256K					
192K					
128K					
96K					
64K	R5F11B7EANA*1 (5.5K/4K)	R5F11BBEAFP'' R5F11BBEANA'' (5.5K/4K)	R5F11BCEALA*1 (5.5K/4K)	R5F11BGEAFB*1 (5.5K/4K)	R5F11BLEAFB*1 (5.5K/4K)
48K					
32К	R5F11B7CANA*1 (5.5K/4K)	R5F11BBCAFP <sup>*1</sup> R5F11BBCANA <sup>*1</sup> (5.5K/4K)	R5F11BCCALA*1 (5.5K/4K)	R5F11BGCAFB*1 (5.5K/4K)	R5F11BLCAFB*1 (5.5K/4K)
16K					
12K					
8K					
4K					
2К					
1К					
Package	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm June 32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm	36-pin WFLGA LA thickness: 0.76mm 4×4mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.70mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.70mm 10×10mm Pitch: 0.50mm



RL78/G1G (30	) to 44 pins)		R5F104AGASP — Top: Product name (16K/8K) — Bottom: (RAM/Data flash (bytes))
Group		RL78/G1G	
Pin count ROM (bytes)	30-pin	32-pin	44-pin
512K			
384К			
256K			
192К			
128K			
96K			
64K			
48K			
32K			
16K	R5F11EAAASP (1.5K/—)	R5F11EBAAFP (1.5K/—)	R5F11EFAAFP (1.5K/—)
12K			
8K	R5F11EA8ASP (1.5K/—)	R5F11EB8AFP (1.5K/—)	R5F11EF8AFP (1.5K/—)
4K			
2К			
1K			
Package	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm

#### RL78/G1H

Group

512K

384K

256K

192K

128K

96K

64K

48K

32K

24K

16K

8K

4K

2K

1K

Package

ROM (bytes)

Pin co

(64	l pins)	R5F104AGASP (16K/8K)	<ul> <li>Top: Product name</li> <li>Bottom: (RAM/Data flash</li> </ul>	n (bytes))
		RL78	8/G1H	
unt		64	1-pin	
			FLLANA <sup>+1</sup> 3K/8K)	
			FLKANA*1 2K/8K)	
			FLJANA*1 IK/8K)	

RL78/G1M (2	(O pins) R5F104AGASP (16K/8K): Product name (RAM (bytes) / Data flash (bytes))
Group	RL78/G1M
Pin count ROM (bytes)	20-pin
768K	
512K	
384К	
256K	
192K	
128K	
96K	
64K	
48K	
32K	
16K	
12K	
8K	R5F11W68ASM (1K/—) R5F11W68DSM (1K/—)
4K	R5F11W67ASM (1K/—) R5F11W67DSM (1K/—)
2К	
1K	
Package	20-pin TSSOP SM thickness: 1.20mm 4.4×6.5mm Pitch: 0.65mm

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: -40 to +85°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

64-pin HVQFN NA thickness: 1.00mm 9×9mm Pitch: 0.50mm



RL78/G1N (20	D pins) Product name (RAM (bytes) / Data flash (bytes))
Group	RL78/G1N
Pin count ROM (bytes)	20-pin
768K	
512K	
384K	
256K	
192K	
128K	
96K	
64K	
48K	
32K	
16K	
12K	
8K	R5F11Y68ASM (1K/—) R5F11Y68DSM (1K/—)
4K	R5F11Y67ASM (1K/—) R5F11Y67DSM (1K/—)
2К	
1K	
Package	20-pin TSSOP SM thickness: 1.20mm 4.4×6.5mm Pitch: 0.65mm

# RL78/G1P (24 to 32 pins)

R5F104AGASP (16K/8K): Product name (RAM (bytes) / Data flash (bytes))

	11000	or name (in the bytes) / Data hash (bytes)			
Group	RL78/G1P				
Pin count ROM (bytes)	24-pin	32-pin			
768K					
512K					
384K					
256K					
192K					
128K					
96K					
64K					
48K					
32K					
16K	R5F11Z7AANA (1.5K/2K) R5F11Z7ADNA (1.5K/2K)	R5F11ZBAAFP (1.5K/2K) R5F11ZBADFP (1.5K/2K)			
12K					
8K					
4K					
2К					
1К					
Package	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm			

Group				RL78/L12			
Pin count IM /tes)	32-pin	44-pin	48-pin	52-pin		64-pin	
512K							
384K							
256K							
192K							
128K							
96K							
64K							
48K							
32K	R5F10RBCAFP*1 (1.5K/2K)	R5F10RFCAFP <sup>*1</sup> (1.5K/2K)	R5F10RGCAFB <sup>*1</sup> (1.5K/2K)	R5F10RJCAFA <sup>*1</sup> (1.5K/2K)	R5F10RLCAFB*1 (1.5K/2K)	R5F10RLCAFA <sup>*1</sup> (1.5K/2K)	R5F10RLCANI (1.5K/2K)
24K							
16K	R5F10RBAAFP*1 (1K/2K)	R5F10RFAAFP*1 (1K/2K)	R5F10RGAAFB*1 (1K/2K)	R5F10RJAAFA*1 (1K/2K)	R5F10RLAAFB <sup>*1</sup> (1K/2K)	R5F10RLAAFA <sup>*1</sup> (1K/2K)	R5F10RLAANI (1K/2K)
8K	R5F10RB8AFP*1 (1K/2K)	R5F10RF8AFP*1 (1K/2K)	R5F10RG8AFB*1 (1K/2K)	R5F10RJ8AFA*1 (1K/2K)			
4K							
2К							
1K							
Package	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	52-pin LQFP FA thickness: 1.70mm 10×10mm Pitch: 0.65mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	64-pin LQFP FA thickness: 1.60mm 12×12mm Pitch: 0.65mm	64-pin HWQF NB thickness 0.80mm 8×8mm Pitch: 0.40mn



: Product name tom: (RAM/Data flash (bytes))	GASP — Top: Pro BK) — Bottom	R5F104A( (16K/8		to 80 pins)	RL78/L13 (64
		8/L13	RL78		Group
	-pin	80	pin	64-	Pin count ROM (bytes)
					512K
					384K
					256K
					192K
5F10WMGAFA (8K/4K)		R5F10WMGAFB*1 (8K/4K)	R5F10WLGAFA (8K/4K)	R5F10WLGAFB*1 (8K/4K)	128K
5F10WMFAFA (6K/4K)		R5F10WMFAFB*1 (6K/4K)	R5F10WLFAFA (6K/4K)	R5F10WLFAFB <sup>-1</sup> (6K/4K)	96K
5F10WMEAFA (4K/4K)		R5F10WMEAFB*1 (4K/4K)	R5F10WLEAFA (4K/4K)	R5F10WLEAFB*1 (4K/4K)	64K
5F10WMDAFA (2K/4K)		R5F10WMDAFB*1 (2K/4K)	R5F10WLDAFA (2K/4K)	R5F10WLDAFB*1 (2K/4K)	48K
5F10WMCAFA (1.5K/4K)		R5F10WMCAFB*1 (1.5K/4K)	R5F10WLCAFA (1.5K/4K)	R5F10WLCAFB*1 (1.5K/4K)	32K
					24K
5F10WMAAFA (1K/4K)		R5F10WMAAFB*1 (1K/4K)	R5F10WLAAFA (1K/4K)	R5F10WLAAFB*1 (1K/4K)	16K
					8К
					4К
					2К
					1К
80-pin LQFP nickness: 1.70mm 14×14mm Pitch: 0.65mm	FA thick 14 Pitcl	80-pin LFQFP FB thickness: 1.70mm 12×12mm Pitch: 0.50mm	64-pin LQFP FA thickness: 1.60mm 12×12mm Pitch: 0.65mm	64-pin LFQFP FB thickness: 1.70mm 10×10mm Pitch: 0.50mm	Package
Pit	Pit	12×12mm Pitch: 0.50mm	12×12mm Pitch: 0.65mm	10×10mm	Package

RL78/L1A (80	) to 100 pins)	R5F104AGASP — Top: Product name (16K/8K) — Bottom: (RAM/Data flash (bytes))			
Group	RL78/L1A				
Pin count ROM (bytes)	80-pin	100-pin			
512K					
384K					
256K					
192K					
128K		R5F11MPGAFB (8KB/5.5KB)			
96K	R5F11MMFAFB (8KB/5.5KB)	R5F11MPFAFB (8KB/5.5KB)			
64K	R5F11MMEAFB (8KB/5.5KB)	R5F11MPEAFB (8KB/5.5KB)			
48K	R5F11MMDAFB (8KB/5.5KB)				
32K					
24К					
16K					
8K					
4K					
2К					
1K					
Package	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm	100-pin LFQFP FB thickness: 1.60mm 14×14mm Pitch: 0.50mm			



### RL78/L1C (80 to 100 pins)

Group		RL78/L1C (USB)	
Pin count ROM (bytes)	80-pin	85-pin	100-pin
512K			
384К			
256K	R5F110MJAFB*1 (16K/8K)	R5F110NJALA*1 (16K/8K)	R5F110PJAFB <sup>*1</sup> (16K/8K)
192K	R5F110MHAFB*1 (16K/8K)	R5F110NHALA*1 (16K/8K)	R5F110PHAFB <sup>*1</sup> (16K/8K)
128K	R5F110MGAFB*1 (12K/8K)	R5F110NGALA*1 (12K/8K)	R5F110PGAFB*1 (12K/8K)
96K	R5F110MFAFB*1 (10K/8K)	R5F110NFALA*1 (10K/8K)	R5F110PFAFB <sup>*1</sup> (10K/8K)
64K	R5F110MEAFB*1 (8K/8K)	R5F110NEALA*1 (8K/8K)	R5F110PEAFB <sup>*1</sup> (8K/8K)
48K			
32K			
24K			
16K			
8K			
4К			
2K			
1K			
Package	80-pin LFQFP FB thickness: 1.70mm 12×12mm Pitch: 0.50mm	85-pin VFLGA LA thickness: 1.00mm 7×7mm Pitch: 0.65mm	100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110. R5F104AGASP — Top: Product name (16K/8K) — Bottom: (RAM/Data flash (bytes))

	(16K/8K) — BC	ottom: (KAIVI/Data flash (bytes))
	RL78/L1C (no USB)	
80-pin	85-pin	100-pin
R5F111MJAFB*1 (16K/8K)	R5F111NJALA*1 (16K/8K)	R5F111PJAFB*1 (16K/8K)
R5F111MHAFB*1 (16K/8K)	R5F111NHALA*1 (16K/8K)	R5F111PHAFB*1 (16K/8K)
R5F111MGAFB*1 (12K/8K)	R5F111NGALA*1 (12K/8K)	R5F111PGAFB <sup>*1</sup> (12K/8K)
R5F111MFAFB <sup>*1</sup> (10K/8K)	R5F111NFALA*1 (10K/8K)	R5F111PFAFB*1 (10K/8K)
R5F111MEAFB <sup>*1</sup> (8K/8K)	R5F111NEALA*1 (8K/8K)	R5F111PEAFB*1 (8K/8K)
80-pin LFQFP FB thickness: 1.70mm 12×12mm Pitch: 0.50mm	85-pin VFLGA LA thickness: 1.00mm 7×7mm Pitch: 0.65mm	100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/H1D (44	8 to 80 pins)			R5F104AGASP — (16K/8K) —	— Top: Product name — Bottom: (RAM/Data flash (bytes))
Group			RL78/H1D		
Pin count ROM (bytes)	48-pin	64-	pin	80-	-pin
512K					
384К					
256K					
192K					
128K	R5F11NGGAFB (5.5KB/4KB)	R5F11PLGABG (5.5KB/4KB)	R5F11NLGAFB (5.5KB/4KB)	R5F11NMGAFB (5.5KB/4KB)	R5F11RMGDFB (8KB/4KB)
96K	R5F11NGFAFB (5.5KB/4KB)	R5F11PLFABG (5.5KB/4KB)	R5F11NLFAFB (5.5KB/4KB)	R5F11NMFAFB (5.5KB/4KB)	
64K				R5F11NMEAFB (5.5KB/4KB)	
48K					
32K					
24K					
16K					
8K					
4K					
2К					
1K					
Package	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	64-pin TFBGA BG thickness: 1.10mm 4×4mm Pitch: 0.40mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm	



RL78/I1A (20	to 38 pins)		R5F104AGASP — Top: Product name (16K/8K) — Bottom: (RAM/Data flash (bytes))
Group		RL78/I1A	
Pin count ROM (bytes)	20-pin	30-pin	38-pin
512K			
384K			
256K			
192K			
128K			
96K			
64K		R5F107AEGSP <sup>*1</sup> R5F107AEMSP <sup>*2</sup> (4K/4K)	R5F107DEGSP <sup>*1</sup> R5F107DEMSP <sup>*2</sup> (4K/4K)
48K			
32K	R5F1076CGSP'1 R5F1076CMSP'2 (2K/4K)	R5F107ACGSP'1 R5F107ACMSP'2 (2K/4K)	
16K			
12K			
8K			
4K			
2K			
1K			
Package	20-pin LSSOP SP thickness: 1.45mm 4.4x6.5mm Pitch: 0.65mm	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	38-pin SSOP SP thickness: 2.00mm 7.62mm (300mil) Pitch: 0.65mm

\*1: Operating temperature range: -40 to +105°C \*2: Operating temperature range: -40 to +125°C

34-3

100-pin

R5F10NPLDFB

(32K/2K)

R5F10NPJDFB

(16K/2K)

R5F10NPGDFB

(8K/2K)

#### **RL78/I1B** Group Pin count ROM (bytes) 80-pin 100-pin 64-pin R5F10NMLDFB 512K 384K R5F10NMJDFB 256K 192K R5F10NLGDFB R5F11TLGDFB (8K/2K) R5F10NMGDFB R5F10MMGDFB R5F10MPGDFB 128K (8K/—) (8K/—) 96K R5F10NLEDFB R5F10MMEDFB R5F10MPEDFB R5F10NMEDFB 64K R5F11TLEDFB (6K/—) (6K/—) (8K/2K) 48K 32K 24K 16K 8K 4K 2K 1K 80-pin LFQFP 100-pin LFQFP 64-pin LFQFP 80-pin LFQFP FB thickness: 1.70mm FB thickness: 1.70mm FB thickness: 1.70mm FB thickness: 1.70mm 14×14mm 12×12mm 10×10mm 12×12mm Pitch: 0.50mm Pitch: 0.50mm Pitch: 0.50mm Pitch: 0.50mm Package

RL78/I1B (80 to 100 pins), RL78/I1C (64 to 100 pins)

R5F104AGASP ----- Top: Product name (16K/8K) Bottom: (RAM/Data flash (bytes)) **RL78/I1C** 

80-pin

(32K/2K)

(16K/2K)

(8K/2K)

(6K/2K)

100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm





Group	RL78/I1D						
Pin count ROM (bytes)	20-pin	24-pin	30-pin	32-	pin	48-pin	
512K							
384K							
256K							
192K							
128K							
96K							
64K							
48K							
32K			R5F117ACGSP (3K/2K)	R5F117BCGNA (3K/2K)	R5F117BCGFP (3K/2K)	R5F117GCGFB (3K/2K)	
24K							
16K	R5F1176AGSP (2K/2K)	R5F1177AGNA (2K/2K)	R5F117AAGSP (2K/2K)	R5F117BAGNA (2K/2K)	R5F117BAGFP (2K/2K)	R5F117GAGFB (2K/2K)	
8K	R5F11768GSP (0.7K/2K)	R5F11778GNA (0.7K/2K)	R5F117A8GSP (0.7K/2K)				
4K							
2K							
1K							
Package	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HVQFN NA thickness: 0.90mm 5×5mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	48-pin LFQFP FB thickness: 1.70n 7×7mm Pitch: 0.50mm	
RL78/I1E (32	to 36 pins)	R5F104AGASP —— Top: Product name (16K/8K) —— Bottom: (RAM/Data flash (bytes))					
-----------------------------	--	--					
Group	RL78	B/I1E					
Pin count ROM (bytes)	32-pin	36-pin					
512K							
384K							
256K							
192K							
128K							
96K							
64K							
48K							
32К	R5F11CBCGNA*1 (8K/4K)	R5F11CCCGBG <sup>-1</sup> (8K/4K)					
24К							
16K							
8K							
4K							
2К							
1К							
Package	32-pin HVOFN NA thickness: 0.90mm 5x5mm Pitch: 0.50mm	36-pin TFBGA BG thickness: 1.10mm 4×4mm Pitch: 0.5mm					

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C)
\*1: Industrial grade products are also available. (part number: R5F1xxxxMxx, ambient operating temperature range: -40 to +125°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.



RL78/F23 (32	to 80pins)		R7F123FBG3/ (12K/8K	ANP-C Top: Product name ) Bottom: (RAM/Data flash (bytes))
Group		RL78	3/F23	
Pin count ROM (bytes)	32-pin	48-pin	64-pin	80-pin
768K				
512K				
384K				
256K				
192K				
128K	R7F123FBG3ANP-C (12K/8K)*1	R7F123FGG3AFB-C (12K/8K)*1	R7F123FLG3AFB-C (12K/8K)*1	R7F123FMG3AFB-C (12K/8K) <sup>*1</sup>
96K				
64K				
48K				
32K				
16K				
12K				
8K				
4K				
2К				
1К				
Package	32-pin HWQFN NP thickness: 0.80mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.6mm/1.7mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.6mm/1.7mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.6mm/1.7mm 12×12mm Pitch: 0.50mm

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R7F1xxxxx<sup>2</sup>C) or -40 to +150°C ambient operating temperature range (part number: R7F1xxxx<sup>2</sup>C) are also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.

#### RL78/F24 (32 to 100pins) R7F124FBJ3ANP-C ----- Top: Product name (24K/16K) Bottom: (RAM/Data flash (bytes)) **RL78/F24** Group Pin count ROM (bytes) 32-pin 48-pin 64-pin 80-pin 100-pin 768K 512K 384K R7F124FBJ3ANP-C R7F124FGJ3AFB-C R7F124FLJ3AFB-C R7F124FMJ3AFB-C R7F124FPJ3AFB-C 256K (24K/16K)\*1 (24K/16K)\*1 (24K/16K)\*1 (24K/16K)\*1 (24K/16K)\*1 192K 128K 96K 64K 48K 32K 16K 12K 8K 4K 2K 1K 32-pin HWQFN 48-pin LFQFP 64-pin LFQFP 80-pin LFQFP 100-pin LFQFP NP thickness: 0.80mm FB thickness:1.6mm/1.7mm FB thickness: 1.6mm/1.7mm FB thickness: 1.6mm/1.7mm FB thickness: 1.6mm/1.7mm 5×5mm 7×7mm 10×10mm 12×12mm 14×14mm Pitch: 0.50mm Pitch: 0.50mm Pitch: 0.50mm Pitch: 0.50mm Pitch: 0.50mm Package

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R7F1xxxxx4xxx-C) or -40 to +150°C ambient operating temperature range (part number: R7F1xxxx5xxx-C) are also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.



to 80 pins)				R5F104AGASP — T (16K/8K) — E	op: Product name Bottom: (RAM/Data flash (bytes))
		RL78/F13 (	CAN & LIN)		
30-pin	32-pin	48-	pin	64-pin	80-pin
R5F10BAGLSP*1 (8K/4K)	R5F10BBGLNA*1 (8K/4K)	R5F10BGGLFB*1 (8K/4K)	R5F10BGGLNA*1 (8K/4K)	R5F10BLGLFB*1 (8K/4K)	R5F10BMGLFB*1 (8K/4K)
R5F10BAFLSP*1 (6K/4K)	R5F10BBFLNA*1 (6K/4K)	R5F10BGFLFB*1 (6K/4K)	R5F10BGFLNA*1 (6K/4K)	R5F10BLFLFB <sup>*1</sup> (6K/4K)	R5F10BMFLFB*1 (6K/4K)
R5F10BAELSP*1 (4K/4K)	R5F10BBELNA*1 (4K/4K)	R5F10BGELFB*1 (4K/4K)	R5F10BGELNA*1 (4K/4K)	R5F10BLELFB <sup>*1</sup> (4K/4K)	R5F10BMELFB*1 (4K/4K)
R5F10BADLSP*1 (3K/4K)	R5F10BBDLNA*1 (3K/4K)	R5F10BGDLFB*1 (3K/4K)	R5F10BGDLNA*1 (3K/4K)	R5F10BLDLFB*1 (3K/4K)	
R5F10BACLSP*1 (2K/4K)	R5F10BBCLNA*1 (2K/4K)	R5F10BGCLFB*1 (2K/4K)	R5F10BGCLNA*1 (2K/4K)	R5F10BLCLFB*1 (2K/4K)	
30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HVQFN NA thickness: 0.90mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HVQFN NA thickness: 0.90mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm
	30-pin 30-pin 85F10BAGLSP <sup>-1</sup> (8K/4K) R5F10BAFLSP <sup>-1</sup> (8K/4K) R5F10BADLSP <sup>-1</sup> (4K/4K) R5F10BADLSP <sup>-1</sup> (3K/4K) R5F10BADLSP <sup>-1</sup> (2K/4K) 30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	30-pin       32-pin         30-pin       32-pin         Image: Signame of S	BLT8/F13 (           30-pin         32-pin         48           30-pin         32-pin         48           1         1         1	RL78/F13 (CAN & LIN)           30-pin         32-pin         48-pin           1         1         1         1           1         1         1         1         1           1         1         1         1         1         1           1         1         1         1         1         1         1           1	RL78/F13 (CAN & LIN)           30-pin         32-pin         43-pin         64-pin           30-pin         32-pin         Image: Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2"           30-pin         32-pin         Image: Colspan="2">Colspan="2"           30-pin         Image: Colspan="2">Colspan="2"           30-pin         S5-108.GL/M <sup>-1</sup> Image: Colspan="2">Colspan="2"           30-pin         RS-108.GL/M <sup>-1</sup> RS-108.GL/M <sup>-1</sup> RS-108.GL/M <sup>-1</sup> 1004.00         Image: Colspan="2"         RS-108.GL/M <sup>-1</sup> RS-108.GL/M <sup>-1</sup> 1004.01         RS-108.GL/M <sup>-1</sup> RS-108.GL/M <sup>-1</sup> RS-108.GL/M <sup>-1</sup> 1004.01         RS-108.G

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R5F1xxxXfxx) or -40 to +150°C ambient operating temperature range (part number: R5F1xxxXfxx) are also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

						F104AGASP — Top: Pr (16K/8K) — Botton	roduct name n: (RAM/Data flash (bytes))
Group				RL78/F13 (LIN)			
Pin count ROM (bytes)	20-pin	30-pin	32-pin	48-	pin	64-pin	80-pin
512K							
384K							
256K							
192K							
128K				R5F10AGGLFB <sup>*1</sup> (8K/4K)	R5F10AGGLNA*1 (8K/4K)	R5F10ALGLFB*1 (8K/4K)	R5F10AMGLFB <sup>*1</sup> (8K/4K)
96K				R5F10AGFLFB <sup>*1</sup> (6K/4K)	R5F10AGFLNA*1 (6K/4K)	R5F10ALFLFB <sup>*1</sup> (6K/4K)	R5F10AMFLFB <sup>*1</sup> (6K/4K)
64K	R5F10A6ELSP*1 (4K/4K)	R5F10AAELSP <sup>*1</sup> (4K/4K)	R5F10ABELNA*1 (4K/4K)	R5F10AGELFB <sup>*1</sup> (4K/4K)	R5F10AGELNA*1 (4K/4K)	R5F10ALELFB <sup>*1</sup> (4K/4K)	R5F10AMELFB <sup>*1</sup> (4K/4K)
48K	R5F10A6DLSP*1 (3K/4K)	R5F10AADLSP <sup>*1</sup> (3K/4K)	R5F10ABDLNA*1 (3K/4K)	R5F10AGDLFB <sup>*1</sup> (3K/4K)	R5F10AGDLNA*1 (3K/4K)	R5F10ALDLFB <sup>*1</sup> (3K/4K)	
32К	R5F10A6CLSP <sup>*1</sup> (2K/4K)	R5F10AACLSP <sup>*1</sup> (2K/4K)	R5F10ABCLNA*1 (2K/4K)	R5F10AGCLFB <sup>*1</sup> (2K/4K)	R5F10AGCLNA*1 (2K/4K)	R5F10ALCLFB <sup>*1</sup> (2K/4K)	
24К							
16K	R5F10A6ALSP*1 (1K/4K)	R5F10AAALSP <sup>*1</sup> (1K/4K)	R5F10ABALNA*1 (1K/4K)	R5F10AGALFB <sup>*1</sup> (1K/4K)	R5F10AGALNA*1 (1K/4K)		
8K							
4К							
2К							
1K							
Package	20-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HVQFN NA thickness: 0.90mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HVQFN NA thickness: 0.90mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R5F1xxxXxx) are also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.



RL78/F14 (30	) to 100 pins)					F104AGASP —— Top: Pr (16K/8K) —— Bottor	roduct name n: (RAM/Data flash (bytes))
Group				RL78/F14			
Pin count ROM (bytes)	30-pin	32-pin	48-	pin	64-pin	80-pin	100-pin
512K							
384K							
256K			R5F10PGJLFB <sup>*1</sup> (20K/8K)	R5F10PGJLNA*1 (20K/8K)	R5F10PLJLFB <sup>*1</sup> (20K/8K)	R5F10PMJLFB*1 (20K/8K)	R5F10PPJLFB*1 (20K/8K)
192K			R5F10PGHLFB*1 (16K/8K)	R5F10PGHLNA*1 (16K/8K)	R5F10PLHLFB <sup>*1</sup> (16K/8K)	R5F10PMHLFB*1 (16K/8K)	R5F10PPHLFB*1 (16K/8K)
128K			R5F10PGGLFB*1 (10K/8K)	R5F10PGGLNA*1 (10K/8K)	R5F10PLGLFB <sup>*1</sup> (10K/8K)	R5F10PMGLFB*1 (10K/8K)	R5F10PPGLFB*1 (10K/8K)
96K			R5F10PGFLFB*1 (8K/4K)	R5F10PGFLNA*1 (8K/4K)	R5F10PLFLFB*1 (8K/4K)	R5F10PMFLFB*1 (8K/4K)	R5F10PPFLFB*1 (8K/4K)
64К	R5F10PAELSP*1 (6K/4K)	R5F10PBELNA*1 (6K/4K)	R5F10PGELFB <sup>*1</sup> (6K/4K)	R5F10PGELNA*1 (6K/4K)	R5F10PLELFB <sup>*1</sup> (6K/4K)	R5F10PMELFB*1 (6K/4K)	R5F10PPELFB*1 (6K/4K)
48K	R5F10PADLSP*1 (4K/4K)	R5F10PBDLNA*1 (4K/4K)	R5F10PGDLFB*1 (4K/4K)	R5F10PGDLNA*1 (4K/4K)			
32К							
24К							
16K							
8K							
4К							
2К							
1K							
Package	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HVQFN NA thickness: 0.90mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HVQFN NA thickness: 0.90mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm	100-pin LFQFP FB thickness: 1.60mm 14×14mm Pitch: 0.50mm
					25 BECONDENSECOURS		

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R5F1xxxxfxx) or -40 to +150°C ambient operating temperature range (part number: R5F1xxxxfxx) are also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

Group			RL78	B/F15		
Pin count A es)	48-	-pin	64-pin	80-pin	100-pin	144-pin
512K	R5F113GLLFB <sup>*1</sup> (32K/16K)	R5F113GLLNA*1 (32K/16K)	R5F113LLLFB*1 (32K/16K)	R5F113MLLFB*1 (32K/16K)	R5F113PLLFB <sup>*1</sup> (32K/16K)	R5F113TLLFB*1 (32K/16K)
384K	R5F113GKLFB <sup>*1</sup> (26K/16K)	R5F113GKLNA*1 (26K/16K)	R5F113LKLFB*1 (26K/16K)	R5F113MKLFB*1 (26K/16K)	R5F113PKLFB*1 (26K/16K)	R5F113TKLFB <sup>*1</sup> (26K/16K)
256K					R5F113PJLFB <sup>*1</sup> (20K/8K)	R5F113TJLFB <sup>*1</sup> (20K/8K)
192K					R5F113PHLFB <sup>*1</sup> (16K/8K)	R5F113THLFB <sup>*1</sup> (16K/8K)
128K					R5F113PGLFB <sup>*1</sup> (10K/8K)	R5F113TGLFB <sup>*1</sup> (10K/8K)
96K						
64K						
48K						
32K						
24К						
16K						
8K						
4K						
2K						
1K						
Package	48-pin LFOFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HVQFN NA thickness: 0.90mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm	100-pin LFQFP FB thickness: 1.60mm 14×14mm Pitch: 0.50mm	144-pin LEQFP FB thickness: 1.60n 20×20mm Pitch: 0.50mm

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R5F1xxxxKxx) is also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.



# **RL78 FAMILY SPECIFICATIONS**

## RL78/G10 (10 to 16 pins)

Group					RL78	/G10					
Pin count				10-pin			16-pin				
Product name			R5F10Y14ASP 3	R5F10Y16ASP 3	R5F10Y17ASP 3	R5F10Y44ASP	R5F10Y46ASP	R5F10Y47ASP 3			
СРИ				<u> </u>	RL78 C		-	<u> </u>			
Memory	Flash ROM	/ [bytes]	1К	2К	4K	1K	2К	4K			
	Data flash	[bytes]			-	_	I				
	RAM [byt	es]	128	256	512	128	256	512			
Operating clocks	Maximum	On-chip oscillator clock			201	ЛНz	L				
	operating frequency [Hz]	External resonator		_			20MHz				
Clock generator		ramic oscillator [Hz]		_		1 to 20MHz ( $V_{DD} =$	2.7 to 5.5V), 1 to 5MHz (	V <sub>DD</sub> = 2.0 to 5.5V)*1			
circuit		d on-chip oscillator [Hz]		1.25 to 2	$OMHz (V_{DD} = 2.7 \text{ to } 5.5V),$	$1.25 \text{ to } 5\text{MHz} (\text{V}_{\text{DD}} = 2.0$	to 5.5V)*1				
	Low-spee	d on-chip oscillator [Hz]			15kHz (Vdd =	2.0 to 5.5V) <sup>*1</sup>					
	Subclock	(32.768 kHz)	_								
I/0	I/O ports			8		14					
	N-ch	annel open drain (6V tolerance)			-	_					
	N-ch	annel open drain (V <sub>DD</sub> tolerance)		2			4				
Timers	16-bit tim	er TAU [channels]		2, PWM output × 1			4, PWM output × 3				
	Real-time	clock (RTC) [channels]									
	Watchdog	) timer (WDT) [channels]	1								
	Interval ti	mer [channels]		—		12-bit × 1					
Serial interfaces	CSI×1, UA	ART×1, simplified I <sup>2</sup> C×1		1		-					
	CSI×2, UA	ART×1, simplified I <sup>2</sup> C×1		—	1						
	I <sup>2</sup> C×1			—			1				
DMA [channels]					-	-					
External interrupt	pins [count	]		8			10				
OCD	On-chip d	ebugging			Y	es					
Peripheral functions	8/10-bit A	/D converter [channels]		4			7				
Tunicuons	Comparat	or [channels]		_			1				
	Multiplier multiply-a	/divider/ ccumulator			Multiplier (8	8-bit × 8-bit)					
	Other fun	ctions		Sele	ctable power-on reset (S	POR), clock/buzzer outpu	t × 1				
Safety functions			Internal reset at illegal instruction execution*2								
Other	Power su	oply voltage [V]	V <sub>DD</sub> = 2.0 to 5.5V*1								
	Operating	ambient temperature [°C]	$T_A = -40$ to $+85^{\circ}$ C (A: Consumer applications, D: Industrial applications) <sup>*3</sup>								
	Package (	size [mm])		10-LSSOP (4.4×3.6mm)			16-SSOP (4.4×5.0mm)				

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Selectable power-on reset (SPOR) includes a detection voltage (VSPOR), which should be within the range of 2.25 to 5.5V. \*2: An internal reset is generated when the FFH instruction code is executed. No reset occurs when an illegal instruction is executed during emulation using OCD.

<sup>2</sup> A must fail device a set of the set o

## RL78/G11 (10 to 25 pins)

Group					RL78/G11									
Pin count			10-pin	16-pin	20-pin	24-pin	25-pin							
Product name			R5F1051AASP	©R5F1054AASP ©R5F1054AANA	©R5F1056AASP *1 ©R5F1056AASM *1	R5F1057AANA	R5F1058AALA							
CPU					RL78 CPU core	1	1							
Memory	Flash ROI	M [bytes]	16KB											
	Data flasl	h [bytes]	2КВ											
	RAM [byt	tes]			1.5KB									
Operating clocks	Maximum	On-chip oscillator clock			24MHz									
	operating frequency [Hz]	External resonator			20MHz									
Clock generator		eramic oscillator [Hz]	1 to 20MHz: V₀	D = 2.7 to 5.5V, 1 to 16MHz: V	/ <sub>DD</sub> = 2.4 to 5.5V, 1 to 8MHz: V	/ <sub>DD</sub> = 1.8 to 5.5V, 1 to 4MHz: V	<sub>DD</sub> = 1.6 to 5.5V							
circuit		ed on-chip oscillator [Hz]:												
	24MHz (m		1 to 9MUz /\/		i.5V): HS mode, 1 to 16MHz (V		EV/V I P mode							
	4 MHz (m	speed on-chip oscillator [Hz]: ax.)		$DD = 1.6 \ LO \ 5.5 \ V$ ): LS MOUE, 1	to $4MHz (V_{DD} = 1.6 \text{ to } 5.5V)$ : LV	v  mode,  mode,  v mode,  1.0  to 5.	SV): LP Mode							
	Low-spee	d on-chip oscillator [Hz]			15kHz (TYP.): V <sub>DD</sub> = 1.6 to 5.5V	1								
	Subclock	(32.768 kHz)			_									
I/0	I/O ports		7	13	17	2	1							
	N-cl	hannel open drain (6V tolerance)			_	1								
	N-cl	hannel open drain (V <sub>DD</sub> tolerance)	_	3	8	1	3							
Timers	16-bit tim	ner TAU [channels]	2, PWM output × 1	4, PWM output $\times$ 3		4, PWM output $\times$ 4								
	Real-time	clock (RTC) [channels]			_									
	Watchdog	timer (WDT) [channels]			1									
	Timer KB	[channels]			1, PWM output $\times$ 2									
	Interval ti	imer [channels]		8	$3$ -bit $\times$ 2 / 16-bit $\times$ 1, 12-bit $\times$	1								
Serial interfaces	CSI×2, U	ART×1, simplified I <sup>2</sup> C×2	_	_	1	2								
	CSI×2, U	ART×1, simplified I <sup>2</sup> C×1	_	1	_	-	_							
	CSI×1, U	ART×1, simplified I <sup>2</sup> C×1	-	_	1	-	_							
	CSI×1, U	ART×1	1	—	—	-	_							
	UART×1		_	1	_	-	_							
	I <sup>2</sup> C×1		_	1		2								
DMA/DTC			DTC × 13 sources	DTC × 22 sources	DTC × 23 sources	DTC × 24	4 sources							
ELC [channels]			11 inputs	16 inputs	17 inputs	18 ir	iputs							
External interrupt	pins [coun	t]	3	8	10	1	3							
OCD	On-chip o	debugging			Yes									
Peripheral	8/10-bit A	A/D converter [channels]	3	8	10	1	1							
functions	8-bit D/A	converter [channels]	1 (CMP0 reference voltage)		2 (External output × 1, CN	/IPO reference voltage $\times$ 1)								
	Comparat	tor [channels]	1		:	2								
	PGA [cha	nnels]			1									
	Multiplie				ed (included in CPU instruction									
	Other fun	accumulator	Divide: 32-bit + 32-bit = 32-bit (unsigned), Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned) Power-on reset (POR), low-voltage detection circuit (LVD), internal reference voltage (V <sub>BGR</sub> ), data operation circuit (DOC), clock/buzzer output × 2, Interrupt flag output (INTFO)											
Safety functions				culation function (high-speed guard function, illegal memor	), CRC calculation function (ge y access detection function, fr er output signal level detection	eneral-purpose), RAM parity energy detection function, A								
Other	Power su	pply voltage [V]	V <sub>DD</sub> = 1.6 to 5.5V											
	Operating	g ambient temperature [°C]	Та	= -40 to +85°C (A: Consume	r applications), $T_A = -40$ to +1	105°C (G: Industrial application	ns)							
	Package	(size [mm])	10-LSSOP (4.4×3.6mm)	16-SSOP (4.4×5.0mm) 16-HWQFN (3×3mm)	20-LSSOP (4.4×6.5mm) 20-TSSOP (4.4×6.5mm)	24-HWQFN (4×4mm)	25-WFLGA (3×3mm)							

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The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.



## RL78/G12 (20 to 30 pins)

Group							RL78	8/G12						
Pin count							20-	-pin						
Product name			©R5F10266ASP*1 @R5F10266ASM*1	©R5F10267ASP*1 @R5F10267ASM*1	©R5F10268ASP*1 ©R5F10268ASM*1	© R5F10269ASP⁺1 © R5F10269ASM⁺1	© R5F1026AASP*1 @R5F1026AASM*1	©R5F10366ASP ©R5F10366ASM	©R5F10367ASP ©R5F10367ASM	©R5F10368ASP ©R5F10368ASM	©R5F10369ASP ©R5F10369ASM	©R5F1036AASP ©R5F1036AASM		
CPU							RL78 C	PU core						
Memory	Flash RO	M [bytes]	2К	4K	8K	12K	16K	2К	4K	8K	12K	16K		
	Data flas	h [bytes]			2К					_				
	RAM [by1	tes]	256	256 512 768 1K 1.5K 256 512 768 1K 1.5K										
Operating clocks	Maximum operating	On-chip oscillator clock	24MHz											
	frequency [Hz]	External resonator					201	VIHz						
Clock generator	Crystal/co	eramic oscillator [Hz]				1 to 20MHz (Va	o = 2.7 to 5.5V	), 1 to 8MHz (V	od = 1.8 to 5.5V	/)				
circuit	High-spe	ed on-chip oscillator [Hz]		1	to 24MHz (Voc	= 2.7 to 5.5V),	1 to 16MHz (V	op = 2.4 to 5.5	/), 1 to 8MHz (\	/oo = 1.8 to 5.5	V)			
	Low-spee	ed on-chip oscillator [Hz]					15kHz (V <sub>DD</sub> =	= 1.8 to 5.5V)						
	Subclock	(32.768 kHz)					-							
1/0	I/O ports						1	8						
	N-cl	hannel open drain (6V tolerance)						2						
	N-cl	hannel open drain (V <sub>DD</sub> tolerance)		4										
Timers	16-bit tim	ner TAU [channels]					4, PWM (	output × 3						
	Real-time	e clock (RTC) [channels]												
	Watchdo	g timer (WDT) [channels]						1						
	Interval t	imer [channels]	12-bit × 1											
Serial interfaces	CSI×1, U	ART×1	- 1											
	CSI×2, U	ART×1, simplified I <sup>2</sup> C×2		1 –										
	CSI×1, U	ART×1, simplified I <sup>2</sup> C×1												
	I <sup>2</sup> C×1							1						
DMA [channels]					2					-				
External interrupt	pins [coun	it]					. 1	0						
OCD	On-chip o	debugging					Y	es						
Peripheral functions		A/D converter [channels]						1						
Tunctions	Multiplie multiply-a	r/divider/ accumulator		Libr		Multiply: 1 Divide	16-bit × 16-bit = e: 32-bit ÷ 32-b	= 32-bit (signed it = 32-bit (uns	· ·		unit)			
	Other fun	nctions			Power-on r	eset (POR), Iow	-voltage detect	tion circuit (LVI	)), clock/buzzer	output × 1				
Safety functions				ill	egal memory a		RAM parity err function, frequ		nction, n function, A/D	converter test	function			
				CRC calculatio		neral-purpose), ion,				_				
Other	Power su	ipply voltage [V]	V <sub>DD</sub> = 1.8 to 5.5V											
	Operating	g ambient temperature [°C]					0 to +85°C (A: to +105°C (G:							
	Package	(size [mm])	20-LSSOP (4.4×6.5mm), 20-TSSOP (4.4×6.5mm)											

\* A dedicated library (approx. 8.1 KB) is required to use the data flash. The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C)
\*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.
\*2: Figures in parentheses ( ) are when the PIOR function is used.

							RL78	3/G12							
			24-	pin							30-	-pin			
R5F10277ANA*1	R5F10278ANA*	R5F10279ANA*	R5F1027AANA"	R5F10377ANA	R5F10378ANA	R5F10379ANA	R5F1037AANA	R5F102A7ASP <sup>-1</sup> R5F102A8ASP <sup>-1</sup> R5F102A9ASP <sup>-1</sup> R5F103A7ASP R5F103A9ASP R5F103A9ASP					R5F103AAASP		
			<u></u>				RL78 C								
4K	8K	12K	16K	4K	8K	12K	16K	4K	8K	12K	16K	4K	8K	12K	16K
	21	K			-	_			2	2K			-	_	
512	768	1K	1.5K	512							1K	2К			
	24MHz														
	20MHz														
	1 to 20MHz (V <sub>DD</sub> = 2.7 to 5.5V), 1 to 8MHz (V <sub>DD</sub> = 1.8 to 5.5V)														
				1 to 24	VIHZ (Vod = 2	./ to 5.5V), 1			5V), 1 to 8IVII	Hz (Vdd = 1.8 1	:0 5.5V)				
							13KHZ (VDD =	= 1.8 to 5.5V)							
			2	2								26			
				-				2							
			ļ	5								9			
			4, PWM c	output × 3							8, PWM ou	tput × 3 (7)*2			
							-	_							
								1							
							12-b	it × 1							
	_	-				1			-	_				1	
	1								-	_					
			-	_				1		3			-	-	
	2	)			_	_				2				_	
			1	4						2		6			
							Y	es							
			1	1								8			
	Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)														
Po	wer-on reset	(POR), low-vo	oltage detect	ion circuit (L\						t (POR), low-v	oltage detect	tion circuit (L	VD), clock/bu	zzer output ×	2
				illerel	omoria			or detection f		A/D convert	toot fur at	2			
CRC calc	culation functi RAM guard	d function,	purpose),	niegai m	eniory acces	-	unction, freqt		ulation funct RAM guar	A/D converter tion (general- rd function,				_	
	SFR guard	I function					Ver - 1	8 to 5.5V	SFR guar	d function					
							to +85°C (A:	Consumer ap							
			2/1_1/000	(AxAmm)		$T_A = -40 \text{ to}$	) +105°C (G:	Industrial app	plications)*1	0	ח-ו ככום ויז מ	2mm (200mi			
	24-HWQFN (4×4mm) 30-LSSOP (7.62mm (300mil))									3	0.0001 (7.0	200111	11		



## RL78/G13 (20 to 32 pins)

Group								RL7	8/G13									
Pin count						20-	pin					_		24-	pin			
Product name			©R5F1006AASP*2 @R5F1006AASM*2	©R5F1006CASP*2 @R5F1006CASM*2	©R5F1006DASP*2 ©R5F1006DASM*2	©R5F1006EASP"2 @R5F1006EASM"2	©R5F1016AASP ©R5F1016AASM	©R5F1016CASP ©R5F1016CASM	©R5F1016DASP ©R5F1016DASM	©R5F1016EASP ©R5F1016EASM	R5F1007AANA*2	R5F1007CANA*2	R5F1007DANA*2	R5F1007EANA*2	R5F1017AANA	R5F1017CANA	R5F1017DANA	R5F1017EANA
CPU								RL78	CPU core		,						,	
Memory	Flash ROM	/I [bytes]	16K	32K	48K	64K	16K	32K	48K	64K	16K	32K	48K	64K	16K	32K	48K	64K
	Data flash	n [bytes]		4	K	·		-	_			4	1K			-		
	RAM [byte	es]	2K	2K 2K 3K 4K 2K 2K 3K 4K 2K 2K 3K 4K 3K 4K 3K 4K 3K 4K 3K 4K 3K 3K 3K 4K 3K 3K 3K 4K 3K 3K 4K 3K 3K 3K 4K 3K 3K 3K 3K 4K 3K 3K 4K 3K											4K			
Operating clocks	Maximum operating	On-chip oscillator clock	32MHz															
	frequency [Hz]	External resonator							OMHz				_					
Clock generator circuit		eramic oscillator [Hz]		1 to 20MHz (V <sub>DD</sub> = 2.7 to 5.5V), 1 to 16MHz (V <sub>DD</sub> = 2.4 to 5.5V), 1 to 8MHz (V <sub>DD</sub> = 1.8 to 5.5V), 1 to 4MHz (V <sub>DD</sub> = 1.6 to 5.5V)														
		ed on-chip oscillator [Hz]		1 to 32MHz	$(V_{DD} = 2.7 to$	o 5.5V), 1 to	16MHz (Vdd				to 5.5\	/), 1 to	4MHz	(Vdd =	1.6 to	5.5V)		
	· · ·	d on-chip oscillator [Hz]						15kHz (Vod	= 1.6 to 5.5	iV)	_	-		-				
	Subclock	(32.768 kHz)							-		1					-	_	
1/0	I/O ports					1	6								0			
		annel open drain (6V tolerance)				-	_								2			
		annel open drain (V <sub>DD</sub> tolerance)	5 6															
Timers		er TAU [channels]				8, PWM c	output × 2						8, F	PWM o	output	× 3		
	Real-time clock (RTC) [channels]			-	-				1*1		_							
	Watchdog timer (WDT) [channels]								1									
0.11.4		mer [channels]	12-bit × 1															
Serial interfaces		ART×1, simplified I <sup>2</sup> C×1	2															
		ART×1, simplified I <sup>2</sup> C×2																
	simplified	ART (LIN bus support)×1, I <sup>2</sup> C×1 ART (LIN bus support)×1,	—															
	simplified		-															
	I <sup>2</sup> C×1		- 1															
DMA [channels]									2		1							
External interrupt	pins [count	t]				:	3								5			
OCD	On-chip d								Yes									
Peripheral functions		/D converter [channels]			1.11			1.1.1	6					1				
	Multiplier multiply-a	/divider/ locumulator			Library su		Multiply: 16 Divide:	multiply-acc i-bit × 16-bit 32-bit ÷ 32- 16-bit × 16-l	: = 32-bit (si bit = 32-bit	gned/unsigr (unsigned)	ned)			ial unit	:)			
	Other functions Power-on re							on circuit (LVI		. 0		wer-or	n reset t (LVD)					on
Safety functions			1			on function ( function, ille												ion
Other	Power sup	oply voltage [V]		$V_{\text{DD}} = 1.6 \text{ to } 5.5 \text{V}$														
	Operating	ambient temperature [°C]	$T_A = -40 \text{ to } +85^\circ\text{C} \text{ (A: Consumer applications)}$ $T_A = -40 \text{ to } +105^\circ\text{C} \text{ (G: Industrial applications)}^{^\circ\text{T}}$															
	Package (	size [mm])	[mm]) 20-LSSOP (7.62mm (300mil)) 24-HWQFN (4×4mm) 20-TSSOP (4.4×6.5mm)															

\* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash\_libraries The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Products with pin counts from 20 to 32 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use. \*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

\*3: Figures in parentheses ( ) are when the PIOR function is used.

	RL78/G13								
25-pin	30-pin	32-pin							
R5F1008AALA <sup>22</sup> R5F1008CALA <sup>22</sup> R5F1008EALA <sup>22</sup> R5F1018AALA R5F1018AALA R5F1018CALA R5F1018CALA R5F1018EALA R5F1018EALA	R5F100AASP <sup>2</sup> R5F100ACASP <sup>2</sup> R5F100ADASP <sup>2</sup> R5F100AEASP <sup>2</sup> R5F100AGASP <sup>2</sup> R5F101AASP R5F101AASP R5F101AASP R5F101AASP R5F101AGASP R5F101AGASP R5F101AGASP	R5F100BAANA <sup>2</sup> R5F100BCANA <sup>2</sup> R5F100BCANA <sup>2</sup> R5F100BEANA <sup>2</sup> R5F100BEANA <sup>2</sup> R5F100BEANA <sup>2</sup> R5F101BAANA R5F101BEANA R5F101BEANA R5F101BEANA R5F101BEANA R5F101BEANA							
	RL78 CPU core								
16K         32K         48K         64K         16K         32K         48K         64K	16K         32K         48K         64K         96K         128K         16K         32K         48K         64K         96K         128K								
4K — 2K 2K 3K 4K 2K 2K 3K 4K	4K         8K            2K         2K         3K         4K         8K         12K         2K         3K         4K         8K         12K	4K         8K            2K         2K         3K         4K         8K         12K         2K         2K         4K         8K         12K							
ZK ZK JK 4K ZK ZK JK 4K	2K 2K 3K 4K 0K 12K 2K 2K 3K 4K 0K 12K 32MHz								
	20MHz								
1 to 20MF	$z$ (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 8MHz	5.5V), 1 to 4MHz (V <sub>DD</sub> = 1.6 to 5.5V)							
1 to 32MF	Iz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 8.5V (V_{DD} = 1.8 to 5.5V (V_{DD} = 1.8 to 5.5V), 1 to 8.5V (V_{DD} = 1.8 to 5.5V (V_{DD} = 1.8 to 5.5V), 1 to 8.5V (V_{DD} = 1.8 to 5.5V (V_{DD} = 1.8 to 5.	5.5V), 1 to 4MHz (V <sub>DD</sub> = 1.6 to 5.5V)							
	15kHz (V <sub>DD</sub> = 1.6 to 5.5V)								
21	26	28							
	2	3							
6		9							
8, PWM output × 3		tput × 3 (7)° <sup>3</sup>							
	1 <sup>''</sup>								
	12-bit × 1								
	2								
	-								
-		1							
	_								
	1								
	2								
5		6							
6	Yes	8							
U	6         8           Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit)         Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned)           Divide: 32-bit ÷ 32-bit ÷ 32-bit = 32-bit (unsigned)         Multiply-accumulate: 16-bit × 16-bit = 32-bit (signed/unsigned)           Multiply-accumulate: 16-bit × 16-bit = 32-bit (signed/unsigned)         Multiply-accumulate: 16-bit × 16-bit = 32-bit (signed/unsigned)								
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 1	$Power_{on reset}(PUR)$ low_voltage detection circuit (LVII) clock/butzer output $\propto 7$								
	CRC calculation function (high-speed), CRCcalculation function (general-purp on, SFR guard function, illegal memory accessdetection function, frequency de								
	$V_{\text{DD}} = 1.6 \text{ to } 5.5V$ $T_{\text{A}} = -40 \text{ to } +85^{\circ}\text{C} \text{ (A: Consumer applications)}$								
	$T_A = -40 \text{ to } +53 \text{ c} \text{ (A. consumer applications)}$ $T_A = -40 \text{ to } +105^{\circ}\text{C} \text{ (G. Industrial applications)}^2$								
25-WFLGA (3×3mm)	30-LSSOP (7.62mm (300mil))	32-HWQFN (5×5mm)							



## RL78/G13 (36 to 44 pins)

Group											R	L <b>78/G</b>	13								
Pin count								36-	-pin									40-pin			
Product name			R5F100CAALA*3	R5F100CCALA*3	R5F100CDALA*3	R5F100CEALA*3	R5F100CFALA*3	R5F100CGALA*3	R5F101CAALA	R5F101CCALA	R5F101CDALA	R5F101CEALA	R5F101CFALA	R5F101CGALA	R5F100EAANA*3	R5F100ECANA *3	R5F100EDANA*3	R5F100EEANA*3	R5F100EFANA*3	R5F100EGANA*3	R5F100EHANA*3
CPU												78 CPU (									
Memory	Flash R	OM [bytes]	16K	32K	48K	64K	96k	128k	16K	32K	48K	64K	96k	128k	16K	32K	48K	64K	96k	128k	192K
	Data fla	sh [bytes]		4	К		8	3K				_				4	K			8K	
	RAM [b	ytes]	2K	2K	3K	4K	8K	12K	2K	2K	3K	4K	8K	12K	2K	2K	3K	4K	8K	12K	16K
Operating clocks	Maximum	On-chip oscillator clock										32MHz									
	operating frequency (H	[] External resonator										20MHz									
Clock generator	Crystal/	ceramic oscillator [Hz]		1 to	20MHz	(Vdd =	2.7 to 5	.5V), 1 to	o 16MHz	: (Vdd =	2.4 to 5	.5V), 1 t	o 8MHz	(Vdd = 1	.8 to 5.	5V), 1 to	4MHz (	Vdd = 1.	.6 to 5.5	V)	
circuit	High-sp	eed on-chip oscillator [Hz]		1 to	32MHz	(Vdd =	2.7 to 5	.5V), 1 to	o 16MHz	: (Vdd =	2.4 to 5	.5V), 1 t	o 8MHz	(Vdd = 1	.8 to 5.	5V), 1 to	4MHz (	Vdd = 1.	.6 to 5.5	V)	
	Low-spe	eed on-chip oscillator [Hz]									15kHz (\	/dd = 1.6	6 to 5.5V	/)							
	Subcloc	k (32.768 kHz)						-	_							32	.768kHz	$(V_{DD} = $	1.6 to 5.	5V)	
I/O	I/O port	s						3	32			-						36			
	N-	channel open drain (6V tolerance)										3				-	-				
	N-	channel open drain (V <sub>DD</sub> tolerance)										10									
Timers	16-bit ti	mer TAU [channels]									8, PWN	1 output	× 3 (7)*	4							
	Real-tin	ne clock (RTC) [channels]						1	*1									1			
	Watchd	og timer (WDT) [channels]										1									
	Interval	timer [channels]										12-bit ×	1								
Serial interfaces	CSI×1,	UART×1, simplified I <sup>2</sup> C×1										2									
	CSI×2,	UART×1, simplified I <sup>2</sup> C×2										-									
	simplifie	UART (LIN bus support)×1, ed l <sup>2</sup> C×1		1								-	1							-	
	simplifie	UART (LIN bus support)×1, ed l²C×2										1									
DMA [abannala]	I <sup>2</sup> C×1											1									
DMA [channels] External interrupt	nine foou	int]			_			(	6			2						10			
OCD		debugging						(	0			Yes						10			
Peripheral		A/D converter [channels]						(	8			100						9		_	
functions		er/divider/				Lihrar	v sunno	ort for mu		ivide/m	ultiply-a	ccumul	ate oner	ations (e	auinne	d with f	unction				
		-accumulator				LIDIUI		Vultiply-	Multip D	oly: 16-b ivide: 3	oit × 16 2-bit ÷	·bit = 32 32-bit =	-bit (sig 32-bit (	ned/uns unsigne	igned) d)			a anty			
	Other fu	inctions					Power	r-on rese	et (POR),	low-vo	ltage de	etection	circuit (I	LVD), clo	ock/buzz	er outp	ut × 2				
Safety functions					,			function nction, il													
Other	Power s	upply voltage [V]									VDD	= 1.6 to	5.5V								
	Operati	ng ambient temperature [°C]										(A: Con (G: Indu									
								_			-										

A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash\_libraries
The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C)
 \*1: Products with a pin count of 36 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use.
 \*2: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: -40 to +85°C)
 \*3: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: -40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.
 \*4: Environ is expendenced.

\*4: Figures in parentheses ( ) are when the PIOR function is used.

												RL	.78/G	13												
	r		40-pin													44-	pin		·						·	
R5F101EAANA	R5F101ECANA	R5F101EDANA	R5F101EEANA	R5F101EFANA	R5F101EGANA	R5F101EHANA	R5F100FAAFP*3	R5F100FCAFP*3	R5F100FDAFP*3	R5F100FEAFP*3	R5F100FFAFP*3	R5F100FGAFP*3	R5F100FHAFP*3	R5F100FJAFP*3	R5F100FKAFP*2	R5F100FLAFP*2	R5F101FAAFP	R5F101FCAFP	R5F101FDAF*2	R5F101FEAFP	R5F101FFAFP	R5F101FGAFP	R5F101FHAFP	R5F101FJAFP	R5F101FKAFP	R5F101FLAFP
						,						RL7	8 CPU	core			,							,		
16K	32K	48K	64K	96k	128k	192K	16K	32K	48K	64K	96k	128k	192K	256K	384K	512K	16K	32K	48K	64K	96k	128k	192K	256K	384K	512K
	[		-					4					r	SK						I	-	_				
2K	2К	3K	4K	8K	12K	16K	2K	2K	3K	4K	8K	12K	16K 32MHz	20K	24K	32K	2K	2K	3K	4K	8K	12K	16K	20K	24K	32K
													20MHz			-						-				
					1 to 3	20MHz	(Vdd = 2	.7 to 5.5	V), 1 to	16MHz	(VDD = 3	-			(VDD = '	1.8 to 5.	5V), 1 to	o 4MHz	(Vdd = 1	.6 to 5.	5V)					
										16MHz					-									-	-	
											1	5kHz (\	/oo = 1.6	6 to 5.5\	/)											
											32.	768kHz	$(V_{DD} =$	1.6 to 5.	5V)											
			36													4	0									
			3														4									
	C		output		.4	-							10	-	0 01	MM out	inut v A	(7)*4	-	-	-	-		-	-	
	C	), P VVIVI	output	× 3 (7)*											0, F	WM out	iput × 4	• (7) •			-					
				-	-	-							1			-						-	-	-		
												1	2-bit ×	1												
													2													
													_									_				
													—													
													1													
													1													
													2													
													10													
													Yes													
			9				Library	suppor	for my	ltiply/di	vide/m	ultinky o	council	ata onor	ations		0 d with f	unction	al unit)							
							LIDIAIY			Multip	ly: 16-b ivide: 32	it × 16- 2-bit ÷ 3	bit = 32 32-bit =	-bit (sig 32-bit (	ned/uns unsigne	signed) d)			ai uintj							
										t (POR),						-										
								lation fu	Inction	(high-sp legal me	oeed), C	RCcalcı	lation f	unction	(genera	l-purpo:	se), RAM	/l parity								
												V <sub>DD</sub> :	= 1.6 to	5.5V												
								TA	=-40 1	to +85°( T <sub>A</sub> =				itions, D ustrial a			lications	5)*2								
		40-HW	/QFN (6	×6mm)											44	-LQFP (	10×10m	ım)								



## RL78/G13 (48 to 52 pins)

Group								R	L78/G1	3					
Pin count									48-pin						
Product name			<pre>①R5F100GAAFB*2 ②R5F100GAANA*2</pre>	@R5F100GCAF8 <sup>22</sup> @R5F100GCANA <sup>22</sup>	<pre>①R5F100GDAFB*2 ②R5F100GDANA*2</pre>	<pre>①R5F100GEAFB*2</pre> <pre>@R5F100GEANA*2</pre>	<pre>①R5F100GFAFB<sup>22</sup></pre> ②R5F100GFANA <sup>22</sup>	<pre>①R5F100GGAFB*2 ②R5F100GGANA*2</pre>	①R5F100GHAFB*2         0           ②R5F100GHANA*2         0	<pre>①R5F100GJAFB*2</pre> ②R5F100GJANA*2	<pre>①R5F100GKAFB*1 ②R5F100GKANA*1</pre>	<pre>①R5F100GLAFB*1 ②R5F100GLANA*1</pre>	<pre>①R5F101GAAFB ②R5F101GAANA</pre>	©R5F101GCAFB @R5F101GCANA	<pre>①R5F101GDAFB</pre> <pre>②R5F101GDANA</pre>
CPU									L78 CPU co	re					
Memory	Flash	ROM [bytes]	16K	32K	48K	64K	96K	128K	192K	256K	384K	512K	16K	32K	48K
	Data f	flash [bytes]		4	K				8	K				_	
	RAM	[bytes]	2K	2K	ЗK	4K	8K	12K	16K	20K	24K	32K	2K	2K	3K
Operating clocks	Maximun	on onp ocontator blook							32MHz						
	operating frequency								20MHz						
Clock generator	Crysta	al/ceramic oscillator [Hz]		1 to 20MHz	2 (VDD = 2.7	to 5.5V), 1 t	to 16MHz (\	/oo = 2.4 to	5.5V), 1 to 8	3MHz (Vdd =	= 1.8 to 5.5\	V), 1 to 4MH	Iz (Vod = 1.6	6 to 5.5V)	
circuit	High-	speed on-chip oscillator [Hz]		1 to 32MHz	2 (VDD = 2.7	to 5.5V), 1 t	to 16MHz (\	/oo = 2.4 to	5.5V), 1 to 8	3MHz (Vdd =	= 1.8 to 5.5\	V), 1 to 4MH	Hz (Vod = 1.6	6 to 5.5V)	
	Low-s	peed on-chip oscillator [Hz]						15kHz	(Vod = 1.6 t	o 5.5V)					
	Subcl	ock (32.768 kHz)						32.768kH	Hz (V <sub>DD</sub> = 1.6	6 to 5.5V)					
1/0	I/O po	orts							44						
		N-channel open drain (6V tolerance)							4						
		N-channel open drain (V <sub>DD</sub> tolerance)							11						
Timers	16-bit	timer TAU [channels]						8, PW	M output ×	4 (7)*3					
	Real-t	ime clock (RTC) [channels]							1						
	Watch	hdog timer (WDT) [channels]							1						
	Interv	al timer [channels]							12-bit × 1						
Serial interfaces	CSI×1	I, UART×1, simplified I <sup>2</sup> C×1							1						
	CSI×2	2, UART×1, simplified l <sup>2</sup> C×2							1						
	simpli	I, UART (LIN bus support)×1, ified I <sup>2</sup> C×1							_						
	simpli	?, UART (LIN bus support)×1, fied l <sup>2</sup> C×2							1						
DMA [channels]	l <sup>2</sup> C×1								2						
External interrupt	nino [o	ountl							13						
OCD	· -	ip debugging							Yes						
Peripheral		bit A/D converter [channels]							10						
functions	Multi	plier/divider/ Jly-accumulator			Library s		Multiply: Divi	: 16-bit × 11 de: 32-bit ÷	-accumulate 6-bit = 32-b - 32-bit = 32 16-bit + 32	it (signed/u 2-bit (unsigi	insigned) ned)		onal unit)		
	Other	functions			Р				detection cir				2		
Safety functions									culation fun detection fu				'		
Other	Powe	r supply voltage [V]						VD	<sub>D</sub> = 1.6 to 5.	5V					
	Opera	ting ambient temperature [°C]				$T_{A} = -40$			er applicatio °C (G: Indus			cations)*1			
	Packa	ge (size [mm])					①48-L	.FQFP (7×7)	mm) @48-	HWQFN (7>	<7mm)				
* A dodicated library is a	aquirad te	o overwrite the data flash. Refer to [Develo	nmant Enviro	montol [Floo	h Drogrommin	a Taolal (Colf	Drogramming	librond on the	Donooco woho			n/flach librariu			

\* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website, https://www.renesas.com/flash\_libraries The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxXXx, ambient operating temperature range: -40 to +85°C) \*2: Industrial grade products are also available. (part number: R5F1xxxXXx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110. \*3. Figures in parentheses ( ) are when the PIOR function is used.

									RL	78/G	13					-		-					-	
			48-pin	_		_									52-	pin								
©R5F101GEAFB ©R5F101GEANA	©R5F101GFAFB ©R5F101GFANA	©R5F101GGAFB ©R5F101GGANA	©R5F101GHAFB ©R5F101GHANA	©R5F101GJAFB ©R5F101GJANA	©R5F101GKAFB*1 ©R5F101GKANA*1	① R5F101GLAFB*1 ② R5F101GLANA*1	R5F100JCAFA*2	R5F100JDAFA*2	R5F100JEAFA*2	R5F100JFAFA*2	R5F100JGAFA*2	R5F100JHAFA*2	R5F100JJAFA*2	R5F100JKAFA*1	R5F100JLAFA*1	R5F101JCAFA	R5F101JDAFA	R5F101JEAFA	R5F101JFAFA	R5F101JGAFA	R5F101JHAFA	R5F101JJAFA	R5F101JKAFA	R5F101JLAFA
									RL78	B CPU c	ore											,		
64K	96K	128K	192K	256K	384K	512K	32K	48K	64K	96K	128K	192K	256K	384K	512K	32K	48K	64K	96K	128K	192K	256K	384K	512K
414	01/	401/	_	001/	0.414	0.01/	01/	4K	414	01/	101/	8		0.414	0.01/	01/	01/		01/		4.01/	0.01/	0.414	0.01/
4K	8K	12K	16K	20K	24K	32K	2K	3K	4K	8K 32MHz	12K	16K	20K	24K	32K	2K	3К	4K	8K	12K	16K	20K	24K	32K
										20MHz											-			
			1 to	20MHz (Vo	o = 2.7 to 5.	5V), 1 to 16	6MHz (V	/dd = 2.4		-		(Vdd =	1.8 to 5	5.5V), 1	to 4MF	Iz (Vod :	= 1.6 to	o 5.5V)		_				
			1 to	32MHz (Vo	o = 2.7 to 5.	5V), 1 to 16	6MHz (V	/dd = 2.4	4 to 5.5	iV), 1 to	8MHz	(Vdd = '	1.8 to 5	5.5V), 1	to 4MF	Iz (Vod :	= 1.6 to	o 5.5V)						
								15	kHz (V□	o = 1.6	to 5.5V	)												
							1	32.76	68kHz (	V <sub>DD</sub> = 1	.6 to 5.	ōV)												
			44												4	8								
			11							4					1	2								
							<u> </u>	8.	PWM	output	× 4 (7)*											-		
								-,		1														
										1														
									12	2-bit ×	1													
										1														
										1														
										_														
										1														
										1														
										2														
			13												1	5								
			10							Yes					1	2								
			10	Li	brary suppo		lultiply: Divi	: 16-bit de: 32-l	× 16-b bit ÷ 32	it = 32- 2-bit =	∙bit (sigı 32-bit (ı	ned/un: Insigne	signed) ed)	)	I functi		it)							
					Power	-on reset (F	POR), lo	w-volta	ige det	ection o	circuit (l	VD), cl	ock/bu	zzer ou	tput × 2	2								
		F			calculation f FR guard fur							-								ion				
										1.6 to														
					Τ,	<sub>A</sub> = -40 to -		(A: Cons 40 to +1						plicatio	ns)*1									
	①48-L	.FQFP (7×7r	mm) @48-	HWQFN (7>	<7mm)									52-	LQFP (	10×10n	nm)							



## RL78/G13 (64 pins)

Group						RL78/G13			
Pin count						64-pin			
Product name			©R5F100LCAFA <sup>-2</sup> ©R5F100LCAFB <sup>-2</sup> ©R5F100LCABG <sup>-2</sup>	<ul> <li>①R5F100LDAFA*2</li> <li>②R5F100LDAFB*2</li> <li>③R5F100LDABG*2</li> </ul>	©R5F100LEAFA* <sup>2</sup> ©R5F100LEAFB* <sup>2</sup> ©R5F100LEABG* <sup>2</sup>	©R5F100LFAFA*2 ©R5F100LFAFB*2 ©R5F100LFAB6*2	<ul> <li>①R5F100LGAFA*2</li> <li>②R5F100LGAFB*2</li> <li>③R5F100LGABG*2</li> </ul>	<ul> <li>①R5F100LHAFA'2</li> <li>②R5F100LHAFB'2</li> <li>③R5F100LHABG'2</li> </ul>	①R5F100LJAFA*2 ②R5F100LJAFB*2 ③R5F100LJABG*2
CPU						RL78 CPU core			
Memory	Flash ROM	[bytes]	32K	48K	64K	96K	128K	192K	256K
	Data flash	[bytes]		4K			8	IK	
	RAM [byte	s]	2К	3K	4K	8K	12K	16K	20K
Operating clocks	Maximum operating	On-chip oscillator clock				32MHz			
	frequency [Hz]	External resonator				20MHz			
Clock generator circuit		amic oscillator [Hz]		· · ·		2.4 to 5.5V), 1 to 8MH	· · ·		
		d on-chip oscillator [Hz]	1 to 32M	Hz (VDD = 2.7 to 5.5V)		2.4 to 5.5V), 1 to 8MH		1 to 4MHz (V <sub>DD</sub> = 1.6	to 5.5V)
	· · ·	l on-chip oscillator [Hz]				5kHz (VDD = 1.6 to 5.5			
1/0		32.768 kHz)			32.	768kHz (V <sub>DD</sub> = 1.6 to 5	.5V)		
70	I/O ports	nnel open drain (6V tolerance)							
		nnel open drain ( $V_{nn}$ tolerance)							
Timers		r TAU [channels]				8, PWM output × 7			
		clock (RTC) [channels]				1			
		timer (WDT) [channels]				1			
		ner [channels]				12-bit × 1			
Serial interfaces	CSI×1, UA	RT×1, simplified l <sup>2</sup> C×1				_			
	CSI×2, UA	RT×1, simplified l <sup>2</sup> C×2				2			
	CSI×1, UA simplified	RT (LIN bus support)×1, <sup>2</sup> C×1				-			
	simplified	RT (LIN bus support)×1, <sup>2</sup> C×2				1			
	I <sup>2</sup> C×1					2			
DMA [channels]	nine [count]					16 (18)*3			
OCD	On-chip de					Yes			
Peripheral		D converter [channels]				12		-	
functions	Multiplier/ multiply-ad	divider/			Multiply: 16-bi Divide: 32	ltiply-accumulate ope t × 16-bit = 32-bit (sig -bit ÷ 32-bit = 32-bit bit × 16-bit + 32-bit =	gned/unsigned) (unsigned)		
	Other func	tions		Power-on	reset (POR), low-volt	age detection circuit	(LVD), clock/buzzer o	utput × 2	
Safety functions			,			RCcalculation function		, ,	
Other	Power sup	ply voltage [V]				$V_{\text{DD}}=1.6 \text{ to } 5.5 V$			
	Operating	ambient temperature [°C]				+85°C (A: Consumer -105°C (G: Industrial a			
	Package (s	ize [mm])		164	I-LQFP (12×12mm)	©64-LFQFP (10×10mr	n) ③64-VFBGA (4×4	lmm)	

					RL78/G13					
					64-pin					
<ul><li>①R5F100LKAFA<sup>+1</sup></li><li>②R5F100LKAFB<sup>+1</sup></li></ul>	©R5F100LLAFA" ©R5F100LLAFB"	<ul> <li>①R5F101LCAFA*2</li> <li>②R5F101LCAFB*2</li> <li>③R5F101LCABG</li> </ul>	<ul> <li>①R5F101LDAFA<sup>2</sup></li> <li>②R5F101LDAFB<sup>2</sup></li> <li>③R5F101LDABG</li> </ul>	<ul> <li>①R5F101LEAFA*2</li> <li>②R5F101LEAFB*2</li> <li>③R5F101LEABG</li> </ul>	<ul> <li>①R5F101LFAFA*2</li> <li>②R5F101LFAFB*2</li> <li>③R5F101LFAFB</li> </ul>	<ul> <li>①R5F101LGAFA<sup>-2</sup></li> <li>②R5F101LGAFB<sup>-2</sup></li> <li>③R5F101LGABG</li> </ul>	<ul> <li>①R5F101LHAFA<sup>-2</sup></li> <li>②R5F101LHAFB<sup>-2</sup></li> <li>③R5F101LHABG</li> </ul>	<ul> <li>①R5F101LJAFA*2</li> <li>②R5F101LJAFB*2</li> <li>③R5F101LJABG</li> </ul>	①R5F101LKAFA <sup>*1</sup> ②R5F101LKAFB*1	©R5F101LLAFA" ©R5F100LLAFB"
					RL78 CPU core					
384K	512K	32K	48K	64K	96K	128K	192K	256K	384K	512K
5	3K					_				
24K	32K	2K	3К	4K	8K	12K	16K	20K	24K	32K
					32MHz					
					20MHz					
		1 to 20MHz (Vo	D = 2.7 to 5.5V), 1 t	o 16MHz (V <sub>DD</sub> = $2.4$	4 to 5.5V), 1 to 8MH	$z (V_{DD} = 1.8 \text{ to } 5.5)$	V), 1 to 4MHz (Vod :	= 1.6 to 5.5V)		
		1 to 32MHz (Vo	o = 2.7 to 5.5V), 1 t	o 16MHz (VDD = 2.4	4 to 5.5V), 1 to 8MH	Hz (VDD = 1.8 to 5.5)	V), 1 to 4MHz (Vdd =	= 1.6 to 5.5V)		
				15	kHz (VDD = 1.6 to 5.	5V)				
				32.76	58kHz (V <sub>DD</sub> = 1.6 to	5.5V)				
					58					
					4					
					15					
					8, PWM output × 7	1				
					1					
					1					
					12-bit × 1					
					_					
					2					
					_					
					1					
					1					
					2					
					16 (18)* <sup>3</sup>					
					Yes					
					12					
		Li		Multiply: 16-bit Divide: 32-b	iply-accumulate op × 16-bit = 32-bit (s bit ÷ 32-bit = 32-bit it × 16-bit + 32-bit	igned/unsigned) t (unsigned)	with functional un nsigned)	it)		
			Power-on res	et (POR), low-volta	ge detection circuit	t (LVD), clock/buzze	er output × 2			
		Flash memory CRC A guard function, S								
					$V_{\text{DD}} = 1.6 \text{ to } 5.5 V$					
			$T_A = -40$		sumer applications, 105°C (G: Industrial		cations)*1			
			①64-LQ	FP (12×12mm) ②	64-LFQFP (10×10m	nm) ③64-VFBGA (	4×4mm)			



## RL78/G13 (80 to 128 pins)

Group								RL78	/G13					
Pin count								-08	pin					
Product name			©R5F100MFAFB*2 @R5F100MFAFA*2	<pre>@R5F100MGAFB*2 @R5F100MGAFA*2</pre>	©R5F100MHAFB*2 ©R5F100MHAFA*2	©R5F100MJAFB*2 @R5F100MJAFA*2	<pre>①R5F100MKAFB*1 ②R5F100MKAFA*1</pre>	©R5F100MLAFB*1 @R5F100MLAFA*1	©R5F101MFAFB @R5F101MFAFA	<pre>①R5F101MGAFB ②R5F101MGAFA</pre>	©R5F101MHAFB @R5F101MHAFA	©R5F101MJAFB @R5F101MJAFA	©R5F101 MKAFB*1 ©R5F101 MKAFA*1	©R5F101MLAFB*1 ©R5F101MLAFA*1
CPU								RL78 C	PU core					
Memory	Flash I	ROM [bytes]	96K	128K	192K	256K	384K	512K	96K	128K	192K	256K	384K	512K
	Data fl	ash [bytes]			. 8	K					-	_		
	RAM [	bytes]	8K	12K	16K	20K	24K	32K	8K	12K	16K	20K	24K	32K
Operating clocks	Maximum operating	On-chip oscillator clock						321	ЛHz					
	frequency	[Hz] External resonator						201	ЛHz					
Clock generator circuit	Crysta	l/ceramic oscillator [Hz]		1 to 20MHz	(Vod = 2.7 to	o 5.5V), 1 to	16MHz (Vdd	= 2.4 to 5.5V	), 1 to 8MHz	(Vod = 1.8 to	o 5.5V), 1 to	4MHz (Vod =	1.6 to 5.5V)	
circuit	High-s	peed on-chip oscillator [Hz]		1 to 32MHz	(Vod = 2.7 to	o 5.5V), 1 to	16MHz (Vdd :	= 2.4 to 5.5V	), 1 to 8MHz	(Vod = 1.8 to	o 5.5V), 1 to	4MHz (Vod =	1.6 to 5.5V)	
	Low-s	peed on-chip oscillator [Hz]						15kHz (Vdd =	= 1.6 to 5.5V)					
	Subclo	ock (32.768 kHz)					32	2.768kHz (V <sub>DE</sub>	o = 1.6 to 5.5	iV)				
I/O	1/0 po	rts						7	4					
	١	N-channel open drain (6V tolerance)							1					
	1	N-channel open drain (V <sub>DD</sub> tolerance)						2	1					
Timers	16-bit	timer TAU [channels]						12, PWM c	output × 10					
	Real-ti	me clock (RTC) [channels]							1					
	Watch	dog timer (WDT) [channels]							1					
	Interva	al timer [channels]						12-bi	t×1	-				
Serial interfaces		, UART×1, simplified I <sup>2</sup> C×1						-	_					
		, UART×1, simplified I <sup>2</sup> C×2							3					
	simplif	, UART (LIN bus support)×1, ied I <sup>2</sup> C×1						-	_					
	simplif	. UART (LIN bus support)×1, iied I²C×2									-			
DMA [shappala]	l <sup>2</sup> C×1													
DMA [channels] External interrupt	nine [co	untl							+ 18)* <sup>3</sup>					
OCD	· -	p debugging							es					
Peripheral		it A/D converter [channels]							7					
functions	Multip	lier/divider/ ly-accumulator			Library supp	Ν	/ultiply: 16- Divide: 3	nultiply-accur bit × 16-bit = 32-bit ÷ 32-b 6-bit × 16-bit	mulate opera = 32-bit (sigr it = 32-bit (u	ied/unsigned insigned)	1)	ctional unit)		
	Other	functions			Pow			oltage detect				× 2		
Safety functions				'	IC calculation	n function (h	igh-speed),	CRCcalculatio accessdetect	on function (	general-purp	ose), RAM p	parity error d		
Other	Power	supply voltage [V]						$V_{DD} = 1.0$	6 to 5.5V					
	Operat	ing ambient temperature [°C]				$T_A = -40$ to		onsumer app +105°C (G:			oplications)*1			
	Packa	ge (size [mm])					180-LFQFP	(12×12mm)	280-LQFP	(14×14mm)				
* A dedicated library is a	oquirad to	overwrite the data flash. Refer to [Devel	onmont Environ	montol [Elooh]	Drogramming To	olal [Colf Drog	romming Libror	ul on the Benner	a wahaita		(flaats 10b			

\* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website, https://www.renesas.com/flash\_libraries The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxXXx, ambient operating temperature range: -40 to +85°C) \*2: Industrial grade products are also available. (part number: R5F1xxxXXx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110. \*3. Figures in parentheses ( ) are when the PIOR function is used.

							R	L78/G1	3			-		-			-		
					100	-pin							_		128	-pin			
①R5F100PFAF8*2 ②R5F100PFAFA*2	①R5F100PGAFB*2 ②R5F100PGAFA*2	①R5F100PHAFB*2 ②R5F100PHAFA*2	<pre>①R5F100PJAFB*2 ②R5F100PJAFA*2</pre>	①R5F100PKAFB*1 ②R5F100PKAFA*1	<pre>①R5F100PLAFB*1 ②R5F100PLAFA*1</pre>	①R5F101PFAFB ②R5F101PFAFA	<ul><li>①R5F101PGAFB</li><li>②R5F101PGAFA</li></ul>	<ul><li>①R5F101PHAFB</li><li>②R5F101PHAFA</li></ul>	<pre>①R5F101PJAFB ②R5F101PJAFA</pre>	<pre>①R5F101PKAFB*1 ②R5F101PKAFA*1</pre>	<pre>①R5F101PLAFB*1 ②R5F101PLAFA*1</pre>	R5F100SHAFB*1	R5F100SJAFB*1	R5F100SKAFB*1	R5F100SLAFB*1	R5F101SHAFB*1	R5F101SJAFB*1	R5F101SKAFB*1	R5F101SLAFB*1
	,						R	L78 CPU cor	е										
96K	128K	192K	256K	384K	512K	96K	128K	192K	256K	384K	512K	192K	256K	384K	512K	192K	256K	384K	512K
		81	K					-	-				8	K			-	-	
8K	12K	16K	20K	24K	32K	8K	12K	16K	20K	24K	32K	16K	20K	24K	32K	16K	20K	24K	32K
								32MHz				-					-		
			4 + 00		0.7.6.510	4	/// 0.4.i	20MHz	0.000	4.0 + 5.510	4	01	101 5	510					
						1 to 16MHz 1 to 16MHz													
			1 to 32		2.7 10 3.3 V],			$(V_{DD} = 1.6 \text{ to})$		· 1.0 t0 J.JV)	, 1 10 411112	(vuu -	1.0 10 J.						
								$I_{Z}(V_{DD} = 1.6)$											
					9	2													
								4					120						
					2	4									2	5			
					12, PWM o	output × 10								16,	PWM o	utput ×	: 14		
								1											
								1											
								12-bit × 1											
								3											
								_		-									
								1					_						
								2											
								4											
								16 (20)* <sup>3</sup>											
								Yes				,							
					2										2	6			
				Library			v: 16-bit × 16 ide: 32-bit ÷	6-bit = 32-bi 32-bit = 32	t (signed/un: -bit (unsigne	signed) ed)		ıl unit)							
						eset (POR), lo					-								
				,		ion (high-spe n, illegal mer													
								e = 1.6 to 5.5											
					$T_A = -i$	40 to +85°C T <sub>A</sub> = -			ns, D: Indust rial applicati		ions)*1								
			đ	D100-LFQFP	(14×14mm)	@100-LQFI	P (14×20mm	)						128	-LFQFP	(14×20	mm)		



## RL78/G13A (44 to 100 pins)

Group						RL78/	/G13A			
Pin count			44-	pin	48-	pin	64-	pin	100	-pin
Product name			R5F140FKAFP R5F140FKGFP	R5F140FLAFP R5F140FLGFP	R5F140GKAFB R5F140GKGFB	R5F140GLAFB R5F140GLGFB	R5F140LKAFB R5F140LKGFB	R5F140LLAFB R5F140LLGFB	R5F140PKAFB R5F140PKGFB	R5F140PLAFB R5F140PLGFB
CPU										
Memory	Flas	h ROM [bytes]	384K	512K	384K	512K	384K	512K	384K	512K
	Data	a flash [bytes]				8	K			
	RAN	/I [bytes]	24K	32K	24K	32K	24K	32K	24K	32K
Operating clocks	Maxim	UII-GIIIP USGIIIALUI GIUGK				32N	ЛНz			
	operati frequei	ncy [Hz] External resonator				201	ЛНz			
Clock generator	Crys	stal/ceramic oscillator [Hz]	1 to 2	0MHz (Vod = 2.7 to	o 5.5V), 1 to 16MH;	z (Vod = 2.4 to 5.5V	), 1 to 8MHz (Vod =	= 1.8 to 5.5V), 1 to -	4MHz (Vod = 1.6 to	5.5V)
circuit	High	n-speed on-chip oscillator [Hz]	1 to 3	$2MHz (V_{DD} = 2.7 to$	o 5.5V), 1 to 16MH	$V_{DD} = 2.4 \text{ to } 5.5 \text{V}$	), 1 to 8MHz (V <sub>DD</sub> =	1.8 to 5.5V), 1 to	$4MHz (V_{DD} = 1.6 to$	5.5V)
	Low	-speed on-chip oscillator [Hz]				15kHz (TYP.) (Va	oo = 1.6 to 5.5V)			
	Sub	clock				32.768kHz (Voc	o = 1.6 to 5.5V)			
1/0	1/0 p	ports	4	0	4	4	5	8	g	2
		N-channel open drain (6V tolerance)				L	1			
		N-channel open drain (Voo tolerance)	1	0	1	1	1	5	2	4
Timers	16-b	oit timer TAU [channels]			8, PWM c	utput × 7			12, PWM o	utput × 10
	Real	l-time clock (RTC) [channels]				1	1			
	Wat	chdog timer (WDT) [channels]				1	1			
	Inte	rval timer [channels]				12-bi	it × 1			
Serial interfaces	CSI>	<1, UART×1, simplified I <sup>2</sup> C×1	2	2		1		-	_	
	CSI>	×2, UART×1, simplified I <sup>2</sup> C×2	-	_			2	2		3
		×2, UART (LIN bus support)×1, plified I²C×2				1	1			
	l²C b	DUS				1	1			
DMA [channels]						2				1
Interrupt	Inte	rnal			2	7			3	7
sources	Exte		-	7	1	0		1	3	
OCD	<u> </u>	chip debugging				Ye				
Peripheral	8/10	)-bit A/D converter [channels]			0			2		0
functions		tiplier/divider/ tiply-accumulator		Library supp	Multipl Di	y: 16-bit × 16-bit = vide: 32-bit ÷ 32-bi	nulate operations ( = 32-bit (signed/un: it = 32-bit (unsigne : + 32-bit = 32-bit (	signed) ed)	ctional unit)	
	Othe	er functions		Pov	ver-on reset (POR),	low-voltage detect	ion circuit (LVD), cl	lock/buzzer output	× 2	
Safety function					n, SFR guard funct	ion, illegal memory	on function (genera accessdetection f nction, Trap functio	unction, frequency		
Other	Pow	er supply voltage [V]		V	$T_{DD} = 1.6 \text{ to } 5.5 \text{V} \text{ (T}_{e}$	$= -40 \text{ to } +85^{\circ}\text{C}$ ),	$V_{DD} = 2.4 \text{ to } 5.5 \text{V}$ (1	$\Gamma_{\rm A} = -40 \text{ to } + 105^{\circ}$	C)	
	Ope	rating ambient temperature [°C]		$T_A = -40$	to +85°C (A: Consu	imer applications),	$T_A = -40 \text{ to } +105^\circ$	C (G: Industrial ap	plications)	
	Pack	kage (size [mm])	44-LQFP (*	10×10mm)	48-LFQFP	(7×7mm)	64-LFQFP (	10×10mm)	100-LFQFP	(14×14mm)

МЕМО		

#### 58-59



## RL78/G14 (30 to 48 pins)

Group											RL7	8/G14								
Pin count					30-	pin					32-	pin					36-	pin		
Product name			R5F104AASP*2	R5F104ACASP*2	R5F104ADASP*2	R5F104AEASP*2	R5F104AFASP*2	R5F104AGASP*2	①R5F104BAANA*2 ②R5F104BAAFP*2	<pre>①R5F104BCANA*2 ②R5F104BCAFP*2</pre>	①R5F104BDANA*2 ②R5F104BDAFP*2	<pre>①R5F104BEANA*2 ②R5F104BEAFP*2</pre>	©R5F104BFANA*2 ©R5F104BFAFP*2	<pre>①R5F104BGANA*2</pre> ②R5F104BGAFP*2	R5F104CAALA*2	R5F104CCALA*2	R5F104CDALA*2	R5F104CEALA*2	R5F104CFALA*2	R5F104CGALA*2
CPU									~ ~			CPU core		~ ~						
Memory	Flash ROM	/I [bytes]	16K	32K	48K	64K	96K	128K	16K	32K	48K	64K	96K	128K	16K	32K	48K	64K	96K	128K
	Data flash	[bytes]		4	K		8	К		4	К		8	К		4	К		8	8K
	RAM [byt	-	2.5K	4K	5.	5K	12K	16K	2.5K	4K		5K	12K	16K	2.5K	4K	5.	5K	12K	16K
Operating clocks	Maximum	On-chip oscillator clock										2MHz								
	operating frequency [Hz]	External resonator										MHz	51.0							
01 1		Timer RD clock			1 . 0	01.411	0.1	071		400.411 /0/	· · · ·	ab = 2.7  to  5.00  to  5.000  to  5.0000  to  5.00000  to  5.00000000000000000000000000000000000					1.0.	E EV/		
Clock generator circuit	Crystal/ce	ramic oscillator [Hz]										V), 1 to 8M		-						
	High-spee	d on-chip oscillator [Hz]			1 10 0	4IVITIZ	(VDD =	Z.7 LO				V), 1 to 8MH n at 48 or 64			10 4111	mz (vdd	= 1.0 1	0 0.00	)	
	Low-spee	d on-chip oscillator [Hz]									, .	= 1.6 to 5.5								
		(32.768 kHz)										_	,							
1/0	I/O ports				2	6					2	8					3	2		
	N-ch	annel open drain (6V tolerance)			:	2							3							
	N-ch	annel open drain (V <sub>DD</sub> tolerance)										10								
Timers	16-bit tim	er TAU [channels]									4, PWM	$output \times 3$								
	16-bit tim	er RJ [channels]										1								
		er RD [channels]										$output \times 6$								
		er RG [channels]										output × 1								
		clock (RTC) [channels]										1*1								
	`	j timer (WDT) [channels]									12	bit × 1								
Serial interfaces		mer [channels] ART×1, simplified I²C×1								2	12-				1			1		
Sendi milendues		$ART \times 1$ , simplified I <sup>2</sup> C×2																		
		ART (LIN bus support)×1,										1		-	1					
	simplified	I <sup>2</sup> C×1 ART (LIN bus support)×1,																		
	simplified											_								
	l <sup>2</sup> C×1											1								
DTC (sources)				2	-			0			8			0		2	-			30
ELC (inputs/trigge				19	/7		21	/8		19	)/7	-	21	/9		19	/7		21	1/9
External interrupt	<u> </u>	-										6								
OCD	On-chip d	ebugging /D converter [channels]										Yes 8								
Peripheral functions		converter [channels]			_			1				0		2		_	_			2
	Multiplier								divide/multi	nlv-accumu	 late instruct	ions support			structio	n set)			2	-
		ccumulator								. ,		= 32-bit (sig			ondone					
												bit = 32-bit								
									Multiply-ac	cumulate: 1	6-bit × 16-b	oit + 32-bit =	= 32-bit (sig	ned/unsign	ed)					
	Comparat			_	-		4	2		-	-		(1)(D)	//		-	-		2	2
Cafata f	Other fun	ctions		Eloch	omer	CDC -	Joulat			· ·		ction circuit			·		n DAMA	auged f	unotion	
Safety functions												on (general-pu function, A/D								
Othor	Power su	oply voltage [V]				5	1					.6 to 5.5V								
Other							Τ	_40 to	+85°C (A:	Concumor	nnligational	T /0.44	. 10590 /0	Industrial	applier	tional"	2			
ottiel	Operating	ambient temperature [°C]					14 -	10 10	0 100 0 (A.	consumer a	ipplications)	, IA = -40 ll	) + 105 C (G	. muusunai	applica	illons) -				

\* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash\_libraries The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Products with pin counts from 30 to 36 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use. \*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

		RL78/G14	
40-pin	44-pin	48-pin	
R5F104EAANA <sup>22</sup> R5F104ECANA <sup>22</sup> R5F104EEANA <sup>22</sup> R5F104EFANA <sup>22</sup> R5F104EFANA <sup>22</sup> R5F104EFANA <sup>22</sup> R5F104EHANA <sup>22</sup>	R5F104FCAFP <sup>2</sup> R5F104FCAFP <sup>2</sup> R5F104FDAFP <sup>2</sup> R5F104FEAFP <sup>2</sup> R5F104FAFP <sup>2</sup> R5F104FAFP <sup>2</sup> R5F104FHAFP <sup>2</sup> R5F104FLAFP <sup>2</sup>	<ul> <li>① R5F104GAARB<sup>2</sup></li> <li>② R5F104GAANA<sup>2</sup></li> <li>⑦ R5F104GCARB<sup>2</sup></li> <li>⑦ R5F104GCANA<sup>2</sup></li> <li>⑦ R5F104GCANA<sup>2</sup></li> <li>⑦ R5F104GEAFB<sup>2</sup></li> <li>⑧ R5F104GEAFB<sup>2</sup></li> <li>⑧ R5F104GEAFB<sup>2</sup></li> <li>⑧ R5F104GEAFB<sup>2</sup></li> <li>⑧ R5F104GGARB<sup>2</sup></li> <li>⑧ R5F104GAAB<sup>2</sup></li> <li>◎ R5F104GAAB<sup>2</sup></li> <li>◎ R5F104GAAB<sup>2</sup></li> <li>◎ R5F104GAAB<sup>2</sup></li> <li>◎ R5F104GAAB<sup>2</sup></li> <li>◎ R5F104GAAB<sup>2</sup></li> </ul>	©R5F104GKANA*2 ©R5F104GLAFB*2 ©R5F104GLANA*2
16K 22K 40K 64K 06K 120K 100K		RL78 CPU core	DAK 512K
16K         32K         48K         64K         96K         128K         192K           4K         8K         8K	16K         32K         48K         64K         96K         128K         192K         256K           4K         8K         8K	16K         32K         48K         64K         96K         128K         192K         256K         3           4K         4K         8K	84K 512K
	2.5K 4K 5.5K 12K 16K 20K 24K		32K 48K
		32MHz	·
		20MHz	
1		MHz (Voo = 2.7 to 5.5V) .4 to 5.5V), 1 to 8MHz (Voo = 1.8 to 5.5V), 1 to 4MHz (Voo = 1.6 to 5.5V)	
· · · · · · · · · · · · · · · · · · ·		.4 to 5.5V), 1 to 6MHz (Vob = 1.6 to 5.5V), 1 to 4MHz (Vob = 1.6 to 5.5V) .4 to 5.5V), 1 to 8MHz (Vob = 1.8 to 5.5V), 1 to 4MHz (Vob = 1.6 to 5.5V)	
		operation at 48 or 64MHz supported	
		ikHz (Vpp = 1.6 to 5.5V)	
00		68kHz (Vod = 1.6 to 5.5V)	
36	40	44	
<u>_</u>	11	12	
		4, PWM output × 3	
		1	
		2, PWM output × 6	
		1, PWM output × 1	
		1	
		12-bit × 1	
		1	
		1	
	1		
	_	1	
		1	
29 31	29 31	30 32	
20/7 22/9	20/7 22/9 10	20/7 22/9	
		13 Yes	
9		10	
- 2	- 2	- 2	
	Multiply: 16-bit Divide: 32-	instructions supported (included in CPU instruction set) × 16-bit = 32-bit (signed/unsigned) bit ÷ 32-bit = 32-bit (unsigned) it × 16-bit + 32-bit = 32-bit (signed/unsigned)	
- 2	- 2	- 2	
L	Power-on reset (POB) low-volt	age detection circuit (LVD), clock/buzzer output × 2	
Flash memory CR0	C calculation function (high-speed), CRC calculatio	n function (general-purpose), RAM parity error detection function, RAM guard function,	
Flash memory CR0	C calculation function (high-speed), CRC calculatio	etection function, A/D converter test function, I/O power output signal level detection function	
Flash memory CR0	C calculation function (high-speed), CRC calculatio gal memory access detection function, frequency d		



## RL78/G14 (52 to 100 pins)

Group											RL78/G14			
Pin count					5	i2-pir	1					64-pin		
Product name			R5F104JCAFA*1	R5F104JDAFA*1	R5F104JEAFA*1	R5F104JFAFA*1	R5F104JGAFA*1	R5F104JHAFA*1	R5F104JJAFA*1	©R5F104LCAFB <sup>*1</sup> ©R5F104LCAFA <sup>*1</sup> @R5F104LCAFP <sup>*1</sup> @R5F104LCAFP <sup>*1</sup>	©R5F104LDAFB*1 ©R5F104LDAFA*1 ©R5F104LDAFP*1 ©R5F104LDAFP*1 @R5F104LDALA*1	0.85F104LEAFB" 2.85F104LEAFA" 3.85F104LEAFA" 3.85F104LEAFP" 4.85F104LEALA"	©R5F104LFAFB <sup>-1</sup> ©R5F104LFAFA <sup>-1</sup> @R5F104LFAFA <sup>-1</sup> @R5F104LFAFP <sup>-1</sup> @R5F104LFALA <sup>-1</sup>	0.R5F104LGAFB'' @R5F104LGAFA'' @R5F104LGAFP'' @R5F104LGAFP'' @R5F104LGALA''
CPU											RL78 CPU core			
Memory	Flash RO	VI [bytes]	32K	48K	64K	96K	128K	192K	256K	32K	48K	64K	96K	128K
	Data flas	n [bytes]		4K			81				4K		8	K
	RAM [by1	es]	4K	5.5	ōΚ	12K	16K	20K	24K	4K	5.	5K	12K	16K
Operating clocks	Maximum	On-chip oscillator clock									32MHz			
	operating frequency [Hz]	External resonator									20MHz			
		Timer RD clock									$4MHz (V_{DD} = 2.7 \text{ to } 5.10 \text{ s})$			
Clock generator circuit		eramic oscillator [Hz] ed on-chip oscillator [Hz]								5V), 1 to 16MHz (Vod =	= 2.4 to 5.5V), 1 to 8M	/Hz (Vod = 1.8 to 5.5)	1 to $4MHz (V_{DD} = 1.6)$ /), 1 to $4MHz (V_{DD} = 1.6)$	
		d an abin and llater (Ua)									ly, operation at 48 or			
	· · ·	d on-chip oscillator [Hz]									5kHz (V <sub>DD</sub> = 1.6 to 5.9	,		
1/0	I/O ports	(32.768 kHz)				48				32.	768kHz (V <sub>DD</sub> = 1.6 to	5.57)		
1/0	· · · · · · · · · · · · · · · · · · ·	nannel open drain (6V tolerance)				40					4	50		
		nannel open drain (V <sub>DD</sub> tolerance)				14					4	16		
Timers		er TAU [channels]									4, PWM output × 3			
TIMOTO		ier RJ [channels]									1			
		er RD [channels]									2, PWM output × 6	1		
	16-bit tim	er RG [channels]									1, PWM output × 1			
	Real-time	clock (RTC) [channels]									1			
	Watchdo	g timer (WDT) [channels]									1			
	Interval t	mer [channels]									12-bit × 1			
Serial interfaces		ART×1, simplified $I^2C \times 1$				1						-		
		ART×1, simplified I <sup>2</sup> C×2 ART (LIN bus support)×1,				1						2		
	simplified CSI×2, U	LI <sup>2</sup> C×1 ART (LIN bus support)×1,									- 1			
	simplified I²C×1	1 1²C×2									1			
DTC (sources)	1-0×1			30			32	2			31			3
ELC (inputs/trigge	r outnuts)			20/7	_		22		_		20/7			2/9
External interrupt		t]		20/1		15	22)		_		2017	15 (19)*2		
OCD	· · · · · · · · · · · · · · · · · · ·	-j lebugging								<u> </u>	Yes			
Peripheral		VD converter [channels]									12			
functions	8-bit D/A	converter [channels]		_			2				_		:	2
	Multiplie multiply-a	r/divider/ accumulator					M	lultiply			it × 16-bit = 32-bit (s 2-bit ÷ 32-bit = 32-bit	igned/unsigned) (unsigned)		
	Compara	tor		_			2				_		1	2
	Other fun								wer-o	n reset (POR), low-vol	Itage detection circui	t (LVD), clock/buzzer d	1	
Safety functions			SFR g			·					10 1	1 1 1 1	or detection function, RAI , I/O power output signal	
Other	Power su	pply voltage [V]									$V_{DD} = 1.6 \text{ to } 5.5 \text{V}$			
	Operating	ambient temperature [°C]					Ta =	= -40	to +8	5°C (A: Consumer ap	plications), $T_A = -40$ t	o +105°C (G: Industr	ial applications)*1	
	Package	(size [mm])		52	2-LQFI	P (10×	10mm	1)				10×10mm) @64-LQF 4×14mm) @64-WF		

A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash\_libraries
The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C)
\*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.
\*2. Figures in parentheses ( ) are when the PIOR function is used.

		· · · · · · · · · · · · · · · · · · ·				RL78/0	G14								
	64-pin		_			-08	pin					100	-pin		
©R5F104LHAFB"1 ©R5F104LHAFA"1 ©R5F104LHAFA"1 @R5F104LHAFP"1	①R5F104LJAFB*1 ②R5F104LJAFA*1 ③R5F104LJAFP*1 ④R5F104LJALA*1	<ul> <li>① R5F104LKAFB*1</li> <li>② R5F104LKAFA*1</li> <li>④ R5F104LKALA*1</li> </ul>	①R5F104LLAFB <sup>+1</sup> ②R5F104LLAFA <sup>+1</sup> ④R5F104LLALA <sup>+1</sup>	<pre>①R5F104MFAFB*1 ②R5F104MFAFA*1</pre>	<pre>①R5F104MGAFB*1 ②R5F104MGAFA*1</pre>	①R5F104MHAFB <sup>*1</sup> ②R5F104MHAFA <sup>*1</sup>	<pre></pre>	<pre>①R5F104MKAFB*1 ②R5F104MKAFA*1</pre>	<pre>①R5F104MLAFB*1 ②R5F104MLAFA*1</pre>	①R5F104PFAFB*1 ②R5F104PFAFA*1	①R5F104PGAFB*1 ②R5F104PGAFA*1	①R5F104PHAFB <sup>*1</sup> ②R5F104PHAFA <sup>*1</sup>	①R5F104PJAFB*1 ②R5F104PJAFA*1	<pre>①R5F104PKAFB*1 ②R5F104PKAFA*1</pre>	①R5F104PLAFB*1 ②R5F104PLAFA*1
192K	256K	384K	512K	96K	128K	RL78 CPU 192K	core 256K	384K	512K	96K	128K	192K	256K	384K	512K
2014				1011	1011	8K	0.414			1.01/	101/				1011
20K	24K	32K	48K	12K	16K	20K 32MH	24K z	32K	48K	12K	16K	20K	24K	32K	48K
						20MH									
					64N	1Hz (Vod = 2	.7 to 5.5V)								
		1 to 20MHz (VDD	= 2.7 to 5.5V),	1 to 16MH	z (Vdd = 2.4	to 5.5V), 1	to 8MHz (V	oo = 1.8 to	5.5V), 1 to 4	4MHz (Vdd =	= 1.6 to 5.5\	V)			
		1 to 64MHz (Vi	od = 2.7 to 5.5\				1 to 8MHz t 48 or 64M			o 4MHz (Voi	o = 1.6 to 5	.5V)			
						$Hz (V_{DD} = 1)$									
	32.768kHz (Vpp = 1.6 to 5.5V)       58     74     92       4     4														
	4														
	4 16 25 28														
	4, PWM output × 3         8, PWM output × 6           1         1														
						2, PWM out									
					1	, PWM out	put × 1					-	-		
						1									
						12-bit >	(1								
						-									
	2								;	3					
						—									
						1									
	33									2 9					
	22/9									5/9					
	15 (19)*2					15 (	19)*2					16 (2	20)*2		
						Yes									
	12					1	7					2	0		
		1	Multiply/divide Mult	Multi	ply: 16-bit > Divide: 32-b	< 16-bit = 3 it ÷ 32-bit =	2-bit (signe = 32-bit (un	d/unsigned signed)							
						2									
							·		uzzer outpu			A. A			
SI	Flash memory C FR guard function, ill	RC calculation fu			equency de	tection fund	ction, A/D c							tion	
		-	40 - 05	0. ( 0		$V_{DD} = 1.6 to$		0500 (0.1	a dura ta ta d	-1:					
	0FP (10×10mm) @64 FP (14×14mm) @64	4-LQFP (12×12m					= -40 to +1 @80-LQFF					14×14mm)	@100-L0	IFP (14×20n	nm)



## RL78/G15 (8 to 20 pins)

Group						RL78	/G15				
Pin count		8-	pin	10	-pin		16-	·pin		20-	·pin
Product name		R5F12007ANS R5F12007GNS R5F12007MNS	R5F12008ANS R5F12008GNS R5F12008MNS	R5F12017ASP R5F12017GSP R5F12017MSP	R5F12018ASP R5F12018GSP R5F12018MSP	R5F12047ASP R5F12047GSP R5F12047MSP	R5F12048ASP R5F12048GSP R5F12048MSP	R5F12047ANA R5F12047GNA R5F12047MNA	R5F12048ANA R5F12048GNA R5F12048MNA	R5F12067ASP R5F12067GSP R5F12067MSP	R5F12068ASP R5F12068GSP R5F12068MSP
CPU						RL78 C					
Memory	Flash ROM [bytes]	4	8	4	8	4	8	4	8	4	8
	Data flash [bytes]						1				
	RAM [bytes]						1				
Operating clocks	Maximum On-chip oscillator clock					161	ЛНz				
	operating frequency [Hz] External resonator		_	_				121	VIHz		
Clock generator	Crystal/ceramic oscillator [Hz]		_	_				1 to 1	2MHz		
circuit	High-speed on-chip oscillator [Hz]				1 M	Hz, 2 MHz, 4 M	IHz, 8 MHz, 16	MHz			
	Low-speed on-chip oscillator [Hz]					15 kHz	z (TYP.)				
1/0	I/O ports	(	5		8		1	4		1	8
Timers	16-bit timer TAU [channels]					1	В				
	Watchdog timer (WDT) [channels]						1				
	Interval timer [channels]						1				
Serial interfaces	CSI×1, UART×1, simplified I <sup>2</sup> C×1			1				-	_		
	CSI×2, UART×1, simplified I <sup>2</sup> C×2		-	_					1		
	I <sup>2</sup> C bus						1				
Interrupt	Internal		3	1	0		1	6		1	9
sources	External	1	6				1	8			
OCD	On-chip debugging					Y	es				
Peripheral	8/10-bit A/D converter [channels]	1	6		8		1	4		1	8
functions	Other functions				Power-o	n reset (POR),	clock/buzzer ou	itput × 1			
Other	Power supply voltage [V]					$V_{DD} = 2.4$	1 to 5.5 V				
	Operating ambient temperature [°C]	$T_A = -40$ to	+85°C (A: Con	sumer applicat	ions), $T_A = -40$	to +105°C (G:	Industrial appli	ications), $T_A = -$	–40 to +125°C	(M: Industrial a	applications)
	Package (size [mm])	8-pin WDF	N (3×3mm)	10-pin LSSOF	P (4.4×3.6mm)	16-pin SSOP	(4.4×6.5mm)	16-pin HWO	IFN (3×3mm)	20-pin LSSOF	9 (4.4×6.5mm)

MEMO		



## RL78/G16 (10 to 32pins)

Group					RL78	/G16		
Pin count			10-	nin			pin	
			10-	рш		10-	pin	
Product name			R5F1211AASP R5F1211AASP R5F1211AGSP R5F1211AMSP	R5F1211CASP R5F1211CGSP R5F1211CMSP	R5F1214AASP R5F1214AGSP R5F1214AGSP R5F1214AMSP	R5F1214CASP R5F1214CGSP R5F1214CMSP	R5F1214AANA R5F1214AGNA R5F1214AGNA R5F1214AMNA	R5F1214CANA R5F1214CGNA R5F1214CGNA R5F1214CMNA
CPU					RL78 CI	PU core		
Memory	Flash RON	/I [bytes]	16	32	16	32	16	32
	Data flash	[bytes]			1			
	RAM [byte	es]			2			
Operating clocks	Maximum operating	On-chip oscillator clock			16N	1Hz		
	frequency [Hz]	External resonator	-	-		121	ЛНz	
Clock generator	Crystal/ce	ramic oscillator [Hz]	-	-		1 to 1	2MHz	
circuit	High-speed	d on-chip oscillator [Hz]			1 MHz, 2 MHz, 4 M	Hz, 8 MHz, 16 MHz		
	Low-speed	l on-chip oscillator [Hz]			15 kHz	(TYP.)		
1/0	I/O ports		8	}		1	4	
Timers	16-bit tim	er [channels]			8	}		
	Watchdog t	imer (WDT) [channels]			1			
	Interval tir	mer [channels]			1			
Serial interfaces	CSI×1, UA	ART×1, Simplified I <sup>2</sup> C×1	1	l		-	_	
	CSI×2, UA	ART×2, Simplified I <sup>2</sup> C×2	-	-			1	
	CSI×3, UA	ART×3, Simplified I <sup>2</sup> C×3				-		
	I <sup>2</sup> C bus				1			
Interrupt	Internal		2	3		2	6	
sources	External					}		
OCD	On-chip d	ebugging			Ye	?S		
Peripheral	8/10-bit A	/D converter [channels]	4	ļ			7	
functions	Other fund	ctions			Power-on reset (POR), o	lock/buzzer output $\times$ 1		
Other	Power sup	oply voltage [V]			VDD = 2.4	to 5.5 V		
	Operating	ambient temperature [°C]	$T_A = -40$ to $+85^{\circ}C$ (A:	Consumer applications)	, $T_A = -40$ to $+105^{\circ}C$ (G:	ndustrial applications), 1	$T_A = -40 \text{ to } + 125^{\circ}\text{C} \text{ (M: I)}$	ndustrial applications)
	Package (s	size [mm])	10-pin LSSOP	(4.4×3.6mm)	16-pin SSOP	(4.4×5mm)	16-pin HWQ	FN (3×3mm)

			RL78	/616			
		0.4		/010			
20-	pin	24-	pin		32-	pin	
R5F1216AASP R5F1216AASP R5F1216AMSP R5F1216AMSP	R5F1216CASP R5F1216CGSP R5F1216CGSP R5F1216CMSP	R5F1217AANA R5F1217AGNA R5F1217AMNA R5F1217AMNA	R5F1217CANA R5F1217CGNA R5F1217CMNA R5F1217CMNA	R5F121BAANA R5F121BAGNA R5F121BAGNA R5F121BAMNA	R5F121BCANA R5F121BCGNA R5F121BCMNA R5F121BCMNA	R5F121BAAFP R5F121BAGFP R5F121BAMFP	R5F121BCAFP R5F121BCGFP R5F121BCGFP R5F121BCMFP
			RL78 CF	PU core			
16	32	16	32	16	32	16	32
			1				
			2	1			
			16N	1Hz			
			12N	1Hz			
			1 to 12	2MHz			
			1 MHz, 2 MHz, 4 M	Hz, 8 MHz, 16 MHz			
			15 kHz	(TYP.)			
1	8	2	2		3	0	
			8				
			1				
			1				
				-			
				-			
			1				
			1				
			31				
			8				
			Ye				
			1				
			Power-on reset (POR), c				
	T 40 to 0500	(A. C	VDD = 2.4		40 to 10500 /F4 L L		
		(A: Consumer applications					D (7, 7mm)
20-pin SSOP	(4.4×5mm)	20-pin HWO	FIN (4×4mm)	32-pin HWQ	FN (5×5mm)	32-pin LQF	P (7×7mm)



## RL78/G22 (16 to 48 pins)

Group							RL78	3/G22				
Pin count			16-	pin	20	-pin	24-	·pin	25-	·pin	30-	pin
Product name			R7F102G4C3CNP R7F102G4C2DNP	R7F102G4E3CNP R7F102G4E2DNP	R7F102G6C3CSP R7F102G6C2DSP	R7F102G6E3CSP R7F102G6E2DSP	R7F102G7C3CNP R7F102G7C2DNP	R7F102G7E3CNP R7F102G7E2DNP	R7F102G8C3CLA R7F102G8C2DLA	R7F102G8E3CLA R7F102G8E2DLA	R7F102GAC3CSP R7F102GAC2DSP	R7F102GAE3CSP R7F102GAE2DSP
CPU								PU core				
Memory	Flash RON	I [bytes]	32	64	32	64	32	64	32	64	32	64
	Data flash	[bytes]						2				
	RAM [byte	es]						4				
Operating clocks	Maximum operating	On-chip oscillator clock					321	VIHz				
	frequency [Hz]	External resonator					201	VIHz				
Clock generator		ramic oscillator [Hz]					1 to 2	0 MHz				
circuit	High-spee	d on-chip oscillator [Hz]			1 MHz, 2 I	VHz, 3 MHz, 4	MHz, 6 MHz, 8	MHz, 12 MHz,	16 MHz, 24 MI	Hz, 32 MHz		
	Middle-sp	eed on-chip oscillator [Hz]					1 MHz, 2 N	/IHz, 4 MHz				
	Low-speed	d on-chip oscillator [Hz]					32.768 k	:Hz (TYP.)				
	Subclock						32.768 kHz (Vo	o = 1.6 to 5.5 V	()			
1/0	I/O ports		1	2		16	2	20	2	!1	2	6
	N-ch	annel open drain (6V tolerance)		-					:	2		
Timers	16-bit tim	er TAU [channels]						8				
	Real-time	clock (RTC) [channels]						1				
	Watchdog	timer (WDT) [channels]						1				
	Interval tir	mer [channels]						1				
Serial interfaces	CSI×1, UA	NRT×1, simplified I <sup>2</sup> C×1	1	1		-			2			
		NRT×1, simplified I <sup>2</sup> C×2					-	_				
	simplified	NRT (LIN bus support)×1, l <sup>2</sup> C×1 NRT (LIN bus support)×1,					_				ſ	
	simplified	l <sup>2</sup> C×2			1			_				
	Simplified	l'C×1	1					-	_			
	UARTA							_			1	
	I <sup>2</sup> C bus				1		-				1	
Interrupt	Internal		2	3		25			26		2	
sources	External					3			5		6	j
Key interrupt			-				-	_				2
Data transfer con			2	1	4	23			25		2	В
Event link control	· · ·	10)						1				
SNOOZE mode se						-		1	-			
OCD	On-chip d				1		_	es				
Peripheral functions		/D converter [channels]	3	}		(202)		6			{	}
Safety functions	Other fund	ctions	Flash m		lculation funct function, SFR	ion (high-speed guard function	l), CRCcalculati , illegal memory	on function (ge / accessdetecti	D), clock/buzzer eneral-purpose), ion function, fre tection function	, RAM parity e equency detect	rror detection fu ion function,	nction,
Other	Power sup	ply voltage [V]					VDD=1.6	to 5.5 V				
	Operating	ambient temperature [°C]		TA	= -40 to +85°0	C (2D: Consume	er applications),	$T_A = -40 \text{ to } +$	105°C (3C: Indu	istrial applicati	ions)	
	Package (s	size [mm])	16-pin I (3×3	HWQFN	20-pin	LSSOP 6.5mm)	24-pin	HWQFN Imm)	25-pin	WFLGA 3mm)	30-pin (9.85mm	

						RL78	/G22						
	32-	pin		36-	pin	40-	pin	44-	pin		48	-pin	
R7F102GBC3CNP R7F102GBC2DNP	R7F102GBE3CNP R7F102GBE2DNP	R7F102GBC3CFP R7F102GBC2DFP	R7F102GBE3CFP R7F102GBE2DFP	R7F102GCC3CLA R7F102GCC3CLA	R7F102GCE3CLA R7F102GCE2DLA	R7F102GEC3CNP R7F102GEC2DNP	R7F102GEE3CNP R7F102GEE2DNP	R7F102GFC3CFP R7F102GFC2DFP	R7F102GFE3CFP R7F102GFE2DFP	R7F102GGC3CFB R7F102GGC2DFB	R7F102GGE3CFB R7F102GGE2DFB	R7F102GGC3CNP R7F102GGC2DNP	R7F102GGE3CNP R7F102GGE2DNP
						RL78 CF							
32	64	32	64	32	64	32	64	32	64	32	64	32	64
						32N							
						20N	ЛНz						
						1 to 20	) MHz						
				1 MHz, 2 N	/Hz, 3 MHz, 4	MHz, 6 MHz, 8		16 MHz, 24 MH	Hz, 32 MHz				
						1 MHz, 2 N							
						32.768 kl 32.768 kHz (Vod		1					
	2	8		3		32.700 KHZ (VDD		4	0		L	14	
				3	-					1			
						8	}	<u> </u>					
						1							
						1							
						1						1	
					2							1	
	1							_	_				
								1					
							_	1	1				
				<u> </u>		1		1	1				
	2	9						3	2				
		6	3					7			1	10	
			-					4				6	
	2	8		3	0			1			3	32	
						1							
						Ye							
			3			g				1	0		
		Flash m		lculation functi function, SFR g	on (high-speed guard function,	/-voltage detect I), CRCcalculatio , illegal memory test function, O	on function (ge accessdetecti utput level det	neral-purpose), on function, fre	RAM parity er quency detect		unction,		
					100.0	VDD=1.6							
32-pin H	IWQFN nm)	32-pin (7×7	LQFP	= -40 to +85°C 36-pin (4×4	WFLGA	er applications), 40-pin H (6×6	HWQFN	105°C (3C: Indu 44-pin (10×1	LQFP	ons) 48-pin (7×7		48-pin H (7×7	



## RL78/G23 (30 to 52 pins)

Group										-	RL78	/G23	}								
Pin count			30-	pin					32-	pin					36-	pin			40-	pin	
Product name		R7F100GAF3CSP R7F100GAF2DSP	R7F100GAG3CSP R7F100GAG2DSP	R7F100GAH3CSP R7F100GAH2DSP	R7F100GAJ3CSP R7F100GAJ2DSP	R7F100GBF3CNP R7F100GBF2DNP	R7F100GBG3CNP R7F100GBG2DNP	R7F100GBH3CNP R7F100GBH2DNP	R7F100GBJ3CNP R7F100GBJ2DNP	R7F100GBF3CFP R7F100GBF2DFP	R7F100GBG3CFP R7F100GBG2DFP	R7F100GBH3CFP R7F100GBH2DFP	R7F100GBJ3CFP R7F100GBJ2DFP	R7F100GCF3CLA R7F100GCF2DLA	R7F100GCG3CLA R7F100GCG2DLA	R7F100GCH3CLA R7F100GCH2DLA	R7F100GCJ3CLA R7F100GCJ2DLA	R7F100GEF3CNP R7F100GEF2DNP	R7F100GEG3CNP R7F100GEG2DNP	R7F100GEH3CNP R7F100GEH2DNP	R7F100GEJ3CNP R7F100GEJ2DNP
CPU											RL78 C										
Memory	Flash ROM [bytes]	96K	128K	192K	256K	96K	128K	192K	256K	96K	128K	192K	256K	96K	128K	192K	256K	96K	128K	192K	256K
	Data flash [bytes]										8	K									
	RAM [bytes]	12K	16K	20K	24K	12K	16K	20K	24K	12K	16K	20K	24K	12K	16K	20K	24K	12K	16K	20K	24K
Operating clocks	Maximum operating frequency [Hz] External resonator										32N 20N										
Clock generator	Crystal/ceramic oscillator [Hz]										1 to 2	OMHz									
circuit	High-speed on-chip oscillator [Hz]						1MHz, 3	2MHz, 3	3MHz, 4	MHz, 6	MHz, 81	MHz, 12	2MHz, 1	6MHz,	24MHz,	32MHz	7				
	Middle-speed on-chip oscillator [Hz]									1N	1Hz, 2N	Hz, 4M	Hz								
	Low-speed on-chip oscillator [Hz]									3	32.768k	Hz (TYP	.)								
	Subclock							32.768	kHz (Voc	0 = 2.4 1	to 5.5V)							32.768	kHz (Vot	0 = 1.6	to 5.5V)
1/0	I/O ports		2	20					2	8					3	2			3	6	
	N-channel open drain (6V tolerance)			2										3							
Timers	16-bit timer TAU [channels]										{	}									
	Real-time clock (RTC) [channels]																				
	Watchdog timer (WDT) [channels]																				
	Interval timer [channels]					1	channe	l in 32-	bit mod	e, 2 cha			mode,	4 chann	els in 8	-bit moo	de		-		
Serial interfaces	CSI×1, UART×1, simplified I <sup>2</sup> C×1		-								1	-									-
	CSI×2, UART×1, simplified I <sup>2</sup> C×2 CSI×1, UART (LIN bus support)×1,											-									
	simplified I <sup>2</sup> C×1 CSI×2, UART (LIN bus support)×1,							1									-				
	simplified I <sup>2</sup> C×2 UARTA						-			-											
	l <sup>2</sup> C bus											1						1			
				1			-			2							2	15	-		
Interrupt sources	Internal External							-									J			7	
Key interrupt	LAtemai			-			_	_					-			1					-
	nk controller (ELCL)											1									
SNOOZE mode se																					
OCD	On-chip debugging										Ye	es									
Peripheral	8/10/12-bit A/D converter [channels]								{	3									(	9	
functions	D/A converter [channels]											2						1			
	Other functions					Pov	ver-on r	eset (P(	OR), Iow	-voltag	e detect	ion circ	uit (LVD	), clock	/buzzer	output	×2				
Safety functions			Flash n			functio	n, SFR	guard fi	h-speed unction, test fun	illegal	memory	access	detecti	on func	tion, fre	quency	detecti			inction,	
Other	Power supply voltage [V]				V	/DD = 1.6	6 to 5.5	/ (2D: C	Consume	er applio	cations)	$V_{\text{DD}} =$	1.8 to 5	.5V (3C:	Indust	rial app	lication	s)			
	Operating ambient temperature [°C]				Ta =	=40 to	) +85°C	(2D: C	onsume	r applic	ations),	$T_A = -4$	10 to +1	105°C (3	BC: Indu	strial a	pplicati	ons)			
	Package (size [mm])	30-LSS	SOP (9.8	5mm (3	(00mil)	32-	HWQFI	V (5×5r	nm)	3	2-LQFP	(7×7mr	n)	36	-WFLGA	A (4×4m	nm)	40-	HWQF	V (6×6r	nm)

		-		-	-						-	-	RL78	3/G23	}		-		-	-			-	-		-	
			44-pin										48-	pin										52-pir	1		
R7F100GFF3CFP R7F100GFF2DFP	R7F100GFG3CFP R7F100GFG2DFP	R7F100GFH3CFP R7F100GFH2DFP	R7F100GFJ3CFP R7F100GFJ2DFP	R7F100GFK3CFP R7F100GFK2DFP	R7F100GFL3CFP R7F100GFL2DFP	R7F100GFN3CFP R7F100GFN2DFP	R7F100GGF3CFB R7F100GGF2DFB	R7F100GGG3CFB R7F100GGG2DFB	R7F100GGH3CFB R7F100GGH2DFB	R7F100GGJ3CFB R7F100GGJ2DFB	R7F100GGK3CFB R7F100GGK2DFB	R7F100GGL3CFB R7F100GGL2DFB	R7F100GGN3CFB R7F100GGN3CFB R7F100GGN2DFB	R7F100GGF3CNP R7F100GGF2DNP	R7F100GGG3CNP R7F100GGG2DNP	R7F100GGH3CNP R7F100GGH2DNP	R7F100GGJ3CNP R7F100GGJ2DNP	R7F100GGK3CNP R7F100GGK2DNP	R7F100GGL3CNP R7F100GGL2DNP	R7F100GGN3CNP R7F100GGN2DNP	R7F100GJF3CFA R7F100GJF2DFA	R7F100GJG3CFA R7F100GJG2DFA	R7F100GJH3CFA R7F100GJH2DFA	R7F100GJJ3CFA R7F100GJJ2DFA	R7F100GJK3CFA R7F100GJK2DFA	R7F100GJL3CFA R7F100GJL2DFA	R7F100GJN3CFA R7F100GJN2DFA
96K	128K	192K	256K	384K	512K	768K	96K	128K	192K	256K	384K	512K			128K	192K	256K	384K	512K	768K	96K	128K	192K	256K	384K	512K	768K
									-			-		K													
12K	16K	20K	24K	32K	48	3K	12K	16K	20K	24K	32K	4	8K	12K	16K	20K	24K	32K	48	BK	12K	16K	20K	24K	32K	4	8K
														//Hz							-						
														MHz OMHz											_		
									1MHz, 2	2MHz, 3	3MHz, 4	MHz, 6			2MHz, 1	6MHz,	24MHz,	32MH	7								
												11	ЛНz, 2N	1Hz, 4M	Hz												
													32.768k	Hz (TYP	.)												
												32.768	kHz (Vo		to 5.5V)						1	-					
			40											4										48			
														+ B													
														1													
														1													
								1	channe	l in 32-k	pit mode	e, 2 cha	innels ir	n 16-bit	mode, 4	1 chann		-bit mo	de								
			2														1										
													-											-		-	
														1													
														2							_				_	_	
														9													
			7										1	0										12			
			4											6										8			
														1													
														1 es													
										10			1	60										12			
													:	2													
												-			uit (LVD												
					Flash m			functio	n, SFR g	juard fu	inction,	illegal	memory	/ access	tion (ge detectio utput le	on func	tion, fre	quency	detecti			unction					
							V								1.8 to 5.					s)							
							Ta =	=40 to	+85°C	(2D: Co	onsume	r applic	ations),	$T_A = -4$	10 to +1	05°C (3	BC: Indu	strial a	pplicati	ons)							
		44-LQI	FP (10×	10mm)					48-LF(	QFP (7×	7mm)					48-HW	QFN (7	×7mm)					52-LQ	FP (10×	:10mm)		



## RL78/G23 (64 to 128 pins)

Group											RI	78/G	23			-										
Pin count												64-pir	<u>,                                     </u>			,	r	,		r	,					
Product name		R7F100GLF3CFA R7F100GLF2DFA	R7F100GLG3CFA R7F100GLG2DFA	R7F100GLH3CFA R7F100GLH2DFA	R7F100GLJ3CFA R7F100GLJ2DFA	R7F100GLK3CFA R7F100GLK2DFA	R7F100GLL3CFA R7F100GLL2DFA	R7F100GLN3CFA R7F100GLN2DFA	R7F100GLF3CFB R7F100GLF2DFB	R7F100GLG3CFB R7F100GLG2DFB	R7F100GLH3CFB R7F100GLH2DFB	R7F100GLJ3CFB R7F100GLJ2DFB	R7F100GLK3CFB R7F100GLK2DFB	R7F100GLL3CFB R7F100GLL2DFB	R7F100GLN3CFB R7F100GLN2DFB	R7F100GLF3CLA R7F100GLF2DLA	R7F100GLG3CLA R7F100GLG2DLA	R7F100GLH3CLA R7F100GLH2DLA	R7F100GLJ3CLA R7F100GLJ2DLA	R7F100GLK3CLA R7F100GLK2DLA	R7F100GLL3CLA R7F100GLL2DLA	R7F100GLN3CLA R7F100GLN2DLA				
CPU												8 CPU														
Memory	Flash ROM [bytes]	96K	128K	192K	256K	384K	512K	768K	96K	128K	192K	256K	384K	512K	768K	96K	128K	192K	256K	384K	512K	768K				
	Data flash [bytes]		<u></u>									8K														
	RAM [bytes]	12K	16K	20K	24K	32K	4	3K	12K	16K	20K	24K	32K	48	3K	12K	16K	20K	24K	32K	4	BK				
Operating clocks	Maximum operating On-chip oscillator clock											32MHz														
	frequency [Hz] External resonator											20MHz														
Clock generator	Crystal/ceramic oscillator [Hz]										11	to 20M	Hz													
circuit	High-speed on-chip oscillator [Hz]						1MH	z, 2MH	z, 3MH:	2, 4MHz	z, 6MHz	z, 8MH:	z, 12M	Hz, 16N	1Hz, 24	MHz, 3	2MHz									
	Middle-speed on-chip oscillator [Hz]										1MHz,	2MHz,	4MHz													
	Low-speed on-chip oscillator [Hz]										32.7	68kHz (	TYP.)													
	Subclock									32.7	68kHz	(Vdd =	1.6 to 5	5.5V)												
I/O	I/O ports											58				-			-							
	N-channel open drain (6V tolerance)											4														
Timers	16-bit timer TAU [channels]											8														
	Real-time clock (RTC) [channels]											1														
	Watchdog timer (WDT) [channels]		-						-			1		-		-	-	-		_						
	Interval timer [channels]						1 chan	nel in 3	2-bit m	ode, 2 (	channe	ls in 16	i-bit mo	ode, 4 c	hannels	s in 8-b	it mode	;		-						
Serial interfaces	CSI×1, UART×1, simplified I <sup>2</sup> C×1											—														
	CSI×2, UART×1, simplified I <sup>2</sup> C×2											2														
	CSI×1, UART (LIN bus support)×1, Simplified I <sup>2</sup> C×1 CSI×2, UART (LIN bus support)×1,																									
	Simplified I <sup>2</sup> C×2											1														
	UARTA											2										_				
	l <sup>2</sup> C bus											2														
Interrupt sources	Internal		-									39				-		-								
	External											13														
Key interrupt	nk controllor (ELCL)											0										_				
SNOOZE mode se	nk controller (ELCL)											1														
OCD	On-chip debugging											Yes														
	8/10/12-bit A/D converter [channels]											12														
Peripheral functions	D/A converter [channels]											2														
	Other functions					Pr	wer-or	n reset	(POR) I	ow-volt	tane de		circuit	(LVD), (	clock/h		utnut v	2								
Safety functions			Flash			alculati	on fun ion, SF	ction (h R guarc	iigh-spe d functi	ed), CF on, illeg	Ccalcu gal men	lation f nory ac	unction cessde	n (gener tection out leve	ral-purp functio	oose), R n, frequ	AM pa	rity erro			nction,					
Other	Power supply voltage [V]					$V_{DD} = 1$	.6 to 5	.5V (2D	: Consu	mer ap	plicatio	ons), V <sub>D</sub>	<sub>D</sub> = 1.8	to 5.5V	(3C: In	ndustria	al applic	cations)								
	Operating ambient temperature [°C]				Ta	= -40	to +85	°C (2D:	Consu	ner app	plicatio	ns), Ta	= -40 1	to +105	°C (3C:	Indust	rial app	licatior	ns)							
	Package (size [mm])			64-LQF	P (12×	12mm)					64-LFQ	FP (10>	<10mm	)				64-WF	LGA (5	×5mm)						
												RL78	3/G23	}									_			
--	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	---------------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------
				-08	pin											100	-pin							128	-pin	
IFA IFA IFA	FA	FA	FA		<u>.</u>	FB	EB	田田	88	EB	FA	FA	A A	A A A	A A		· · · · · · · · · · · · · · · · · · ·	88		88		田田		1	-	88
R7F100GMG3CFA R7F100GMG2DFA R7F100GMH3CFA R7F100GMH3CFA	R7F100GMJ3CFA R7F100GMJ2DFA	R7F100GMK3CFA R7F100GMK2DFA	R7F100GML3CFA R7F100GML2DFA	R7F100GMN3CFA R7F100GMN2DFA	R7F100GMG3CFB R7F100GMG2DFB	R7F100GMH3CFB R7F100GMH2DFB	R7F100GMJ3CFB R7F100GMJ2DFB	R7F100GMK3CFB R7F100GMK2DFB	R7F100GML3CFB R7F100GML2DFB	R7F100GMN3CFB R7F100GMN2DFB	R7F100GPG3CFA R7F100GPG2DFA	R7F100GPH3CFA R7F100GPH2DFA	R7F100GPJ3CFA R7F100GPJ2DFA	R7F100GPK3CFA R7F100GPK2DFA	R7F100GPL3CFA R7F100GPL2DFA	R7F100GPN3CFA R7F100GPN2DFA	R7F100GPG3CFB R7F100GPG2DFB	R7F100GPH3CFB R7F100GPH2DFB	R7F100GPJ3CFB R7F100GPJ2DFB	R7F100GPK3CFB R7F100GPK2DFB	R7F100GPL3CFB R7F100GPL2DFB	R7F100GPN3CFB R7F100GPN2DFB	R7F100GSJ3CFB R7F100GSJ2DFB	R7F100GSK3CFB R7F100GSK2DFB	R7F100GSL3CFB R7F100GSL2DFB	R7F100GSN3CFB R7F100GSN2DFB
100G 100G 100G 100G	100G	100G	100G	100G	100G	100G	100G	100G	100G	100G																
R7F R7F R7F R7F R7F	R7F R7F				R7F R7F	R7F R7F	R7F R7F	R7F R7F	R7F R7F	R7F R7F	R7F R7F	R7F R7F	R7F R7F	R7F R7F	R7F R7F	R7F R7F										
4001/ 4001/	0501/	00414	54014	7001/	4001/	40.01/	0501/	00414	5401/	7001/	4001/		PU core		5401/	7001/	4001/	4001/	0501/	00.41/	5401/	7001/	0501/	00414	5401/	7001/
128K 192K	256K	384K	512K	768K	128K	192K	256K	384K	512K	768K	128K	192K 8	256K	384K	512K	768K	128K	192K	256K	384K	512K	768K	256K	384K	512K	768K
16K 20K	24K	32K	48	3K	16K	20K	24K	32K	48	3K	16K	20K	24K	32K	48	3K	16K	20K	24K	32K	48	BK	24K	32K	48	3K
													ЛНz													
												201	ЛНz													
												1 to 2	OMHz													
								1MHz, 2	2MHz, 3	MHz, 4				2MHz, 1	6MHz, 2	24MHz,	32MH	2								
			-	-		-							1Hz, 4M							-	-					-
													Hz (TYP) = 1.61													
				7	4						52.700		) = 1.01	.0 0.0 0 /		9	2							12	20	
				-	-								4				_									
						-				1	2									-				1	6	
													1													
						-						-	1							-	-			_		
							1	channe	in 32-b	oit mod	e, 2 cha	nnels ir	n 16-bit	mode, 4	4 chann	els in 8	-bit mo	de								
	_												3													
					-								J													
													1													
													2													
			_	_						4	4		2											4	8	_
										4	•	1	3											4	•	
													B													
													1													
										_			1													
												Y	es													
				1	7								2			2	0							2	6	
							Pou	/er-on r	eset (PO	IR) Jow	-voltage		2 tion circ	uit (LVD		huzzer	output	× 2								
				Flash m	'		culation	n functi	on (high	i-speed	), CRCc	alculati	on func	tion (ge	neral-pu	urpose),	, RAM p	parity er		ection f	unction,					
					пАIV	i yuard		-			-			detectio utput le					ion runa	cuon,						
						V								1.8 to 5.					s)							
						Ta =	=40 to	+85°C	(2D: Co	onsume	r applic	ations),	$T_A = -4$	10 to +1	05°C (3	BC: Indu	istrial a	pplicati	ons)							
80	)-LQFP (1	14×14m	nm)			80-	LFQFP (	12×12n	nm)			100	)-LQFP (	14×20n	nm)			100	-LFQFP	(14×14	mm)		128	-LFQFP	(20×20	mm)



#### RL78/G24 (20 to 64pins)

Group								RL78	8/G24						
Pin count			20-	nin	24-	nin	25	-pin		pin		32	-pin	_	
Product name			7F101G6E4CSP R7F101G6E3CSP R7F101G6E2DSP	R7F101G6G4CSP R7F101G6G3CSP R7F101G6G2DSP	R7F101G7E4CNP R7F101G7E3CNP R7F101G7E2DNP	R7F101G7G4CNP R7F101G7G3CNP R7F101G7G2DNP	R7F101G8E3CLA R7F101G8E2DLA	R7F101G8G3CLA R7F101G8G2DLA	R7F101GAE4CSP R7F101GAE3CSP R7F101GAE2DSP	R7F101GAG4CSP R7F101GAG3CSP R7F101GAG2DSP	R7F101GBE4CNP R7F101GBE3CNP R7F101GBE2DNP	R7F101GBG4CNP R7F101GBG3CNP R7F101GBG2DNP	R7F101GBE3CFP R7F101GBE3CFP	R7F101GBG3CFP R7F101GBG2DFP	
CPU									PU core						
Memory	Flash RO	M [bytes]	64	128	64	128	64	128	64	128	64	128	64	128	
	Data flas	h [bytes]							4						
	RAM [by1	tes]							2						
Operating clocks	Maximum	On-chip oscillator clock	48 MHz												
	operating frequency [Hz]	External resonator	20 MHz												
Clock generator	Crystal/co	eramic oscillator [Hz]		1 to 20 MHz											
circuit	High-speed on-chip oscillator [Hz]			1 MHz, 2 MHz, 3 MHz, 4 MHz, 6 MHz, 8 MHz, 12 MHz, 16 MHz, 24 MHz, 32 MHz, 48MHz, 64MHz											
	Middle-s	peed on-chip oscillator [Hz]						1 MHz, 2 I	ЛНz, 4 MHz						
	Low-spee	ed on-chip oscillator [Hz]						32.768 I	(Hz (TYP.)						
	Subclock						32	2.768 kHz (V₀	p = 1.6 to 5.5	5 V)					
1/0	I/O ports		1	6	2	0		21	2	26	2	8	2	8	
	N-cl	hannel open drain (6V tolerance)			_	_						2			
Timers	16-bit time	r (TAU,RJ,RD2,RX,RG2) [channels]							9						
	16-bit tim	ner (KB3) [channels]	2	2 3											
	Real-time	clock (RTC) [channels]		1											
	Watchdog	timer (WDT) [channels]							1						
	Interval t	imer [channels]							1						
Serial interfaces	CSI×1, U	ART×1, simplified I <sup>2</sup> C×1							2						
		ART×1, simplified l <sup>2</sup> C×2						-	_	-					
	CSI×1, L Simplifie	JART (LIN bus support)×1, $d l^2 C \times 1$		- 1 1											
	CSI×2, L Simplifie	JART (LIN bus support)×1,		_											
	I <sup>2</sup> C bus					_						1			
	I <sup>2</sup> C (SM/F	PM) bus				_						1			
	DALI	,			_	_						1			
Interrupt	Internal		4	6					5	5					
sources	External		6				3				1	2			
Key interrupt					L				_						
Data transfer con	troller (DTC	:)	4	2		4	7				5	2			
Event link control	ler (ELC)								1						
Programmable ga	in amplifie	r (PGA)							1						
Comparator modu	lle		3	}						4					
OCD	On-chip o	lebugging						Y	es						
Peripheral					1	3				1	6				
functions	8/10-bit [	D/A converter [channels]						2	:0 3						
			Pow	ver-on reset (	POR), low-v	oltage detec	tion circuit (L	.VD), clock/b	uzzer output	× 2					
Safety functions		Flash			n, SFR guard	l function, il	CRCcalculati legal memor st function, (	y accessdete	ction functio	n, frequency		etection fund unction,	ction,		
Other	Power su	pply voltage [V]	V <sub>DD</sub> = 1.6 to 5.5 V (2D: Consumer applications, 3C: Industrial applications), V <sub>DD</sub> = 2.7 to 5.5 V (4C: Industrial applications)												
	Operating	g ambient temperature [°C]										oplications)			
	Package	(size [mm])	20-pin (4.4×6		24-pin ł (4×4			WFLGA 3mm)	30-pin (7.62mm	LSSOP (300mil))	32-pin l (5×5	HWQFN imm)	32-pir (7×7		

						RL78	3/G24						
40-p		44-	pin		48-	-pin		52-	pin		64-	pin	
R7F101GEE4CNP R7F101GEE3CNP R7F101GEE2DNP	R7F101GEG4CNP R7F101GEG3CNP R7F101GEG2DNP	R7F101GFE3CFP R7F101GFE2DFP	R7F101GFG3CFP R7F101GFG2DFP	R7F101GGE4CFB R7F101GGE3CFB R7F101GGE2DFB	R7F101GGG4CFB R7F101GGG3CFB R7F101GGG2DFB	R7F101GGE3CNP R7F101GGE2DNP	R7F101GGG3CNP R7F101GGG2DNP	R7F101GJE4CFA R7F101GJE4CFA R7F101GJE2DFA R7F101GJE2DFA	R7F101GJG4CFA R7F101GJG3CFA R7F101GJG2DFA	R7F101GLE3CFA R7F101GLE2DFA	R7F101GLG3CFA R7F101GLG2DFA	R7F101GLE3CFB R7F101GLE2DFB	R7F101GLG3CFB R7F101GLG2DFB
							PU core						
64	128	64	128	64	128	64	128	64	128	64	128	64	128
						1							
							VHz						
							MHz 0 MHz						
			1 M	Hz. 2 MHz. 3 N	IHz. 4 MHz. 6 N			, 24 MHz, 32 M	Hz. 48MHz. 64	IMHz			-
			. 101	,	,		лнг, 4 MHz		,				
						32.768 k							
						32.768 kHz (V <sub>DE</sub>	o = 1.6 to 5.5 V	')					
36		4	0		4	14		4	8		5	8	
						2	2						
						ę	9						
							3						
							1						
							1						
					1		1					_	
					1						-	2	
		1							_			-	
									1				-
							1						
							1						
				-			-						
						5	5						
	1	13						1	5				
		4				6				1	8		
						5	i3						
							1						
							4						
19				2	1	Y	es				23		
19				2	1	2 t	0.3			2	.0		
				Power-on n	eset (POR), Iow			D), clock/buzzer	output $\times 2$				
		Flash m		lculation functi function, SFR (	on (high-speed guard function,	l), CRCcalculati , illegal memory	on function (ge / accessdetecti	eneral-purpose), on function, fre	, RAM parity e equency detect		unction,		
		V	/oo = 1.6 to 5.5	V (2D: Consum	ner applications	s, 3C: Industrial	l applications),	$V_{DD} = 2.7$ to 5.5	5 V (4C: Indust	rial applications	5)		
		$T_A = -40 \text{ to } +8$	85°C (2D: Con	sumer applicati	ons), T <sub>A</sub> = -40	to +105°C (3C:	Industrial app	lications)), $T_A =$	-40 to +125°	C (4C: Industria	l applications)		
40-pin H' (6×6n		44-pin (10×1		48-pin (7×7	LFQFP 'mm)	48-pin   (7×7	HWQFN 'mm)	52-pin (10×1			n LQFP I2mm)	64-pin (10×1	LFQFP Omm)



#### RL78/G1A (25 to 64 pins)

Group		RL78/G1A																
Pin count			25	-pin			32	pin				48-	-pin		64-pin			
Product name		R5F10E8AALA	R5F10E8CALA	R5F10E8DALA	R5F10E8EALA	R5F10EBAANA	R5F10EBCANA	R5F10EBDANA	R5F10EBEANA	①R5F10EGAAFB *2 ②R5F10EGAANA	*2	<ul> <li>①R5F10EGCAFB</li> <li>*2</li> <li>②R5F10EGCANA</li> <li>*2</li> </ul>	©R5F10EGDAFB *2 ©R5F10EGDANA *2	<ul> <li>①R5F10EGEAFB</li> <li>*2</li> <li>②R5F10EGEANA</li> <li>*2</li> </ul>	<ul> <li>①R5F10ELCAFB</li> <li>2</li> <li>②R5F10ELCABG</li> <li>2</li> </ul>	<ul> <li>①R5F10ELDAFB</li> <li>2</li> <li>2</li> <li>8</li> <li>8</li> <li>5</li> <li>10</li> <li>10</li></ul>	<ul> <li>①R5F10ELEAFB</li> <li>2</li> <li>②R5F10ELEABG</li> <li>2</li> </ul>	
CPU					,	,					F	RL78 CPU cor	e			•		
Memory	Flash ROM [bytes]	16K	32K	48K	64K	16K	32K	48K	64K	16K		32K	48K	64K	32K	48K	64K	
	Data flash [bytes]											4K						
	RAM [bytes]	ź	2K	3K	4K	2	2K	3K	4K		2	К	3К	4K	2К	ЗK	4K	
Operating clocks	Maximum operating											32MHz						
	frequency [Hz] External resonator		20MHz															
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (Vob = 2.7 to 3.6V), 1 to 16MHz (Vob = 2.4 to 3.6V), 1 to 8MHz (Vob = 1.8 to 3.6V), 1 to 4MHz (Vob = 1.6 to 3.6V)												()			
circuit	High-speed on-chip oscillator [Hz]		1 to 32MHz (VDD = 2.7 to 3.6V), 1 to 16MHz (VDD = 2.4 to 3.6V), 1 to 8MHz (VDD = 1.8 to 3.6V), 1 to 4MHz (VDD = 1.6 to 3.6V)												()			
	Low-speed on-chip oscillator [Hz]									15	ōkHz	z (VDD = 1.6 to	3.6V)				_	
	Subclock (32.768 kHz)				-	_			_				32.768k	Hz (VDD = 1.6	to 3.6V)		-	
I/0	I/O ports		1	9			2	26				4	12			56		
	N-channel open drain (6V tolerance)			2				3						4				
	N-channel open drain (V <sub>DD</sub> tolerance)	6			9			11			12							
Timers	16-bit timer TAU [channels]		8, PWM output × 1         8, PWM output × 3         8, P									PWM output	× 6					
	Real-time clock (RTC) [channels]		1 <sup>*1</sup>															
	Watchdog timer (WDT) [channels]											1						
	Interval timer [channels]		12-bit × 1															
Serial interfaces	CSI×1, UART×1, simplified l <sup>2</sup> C×1	2					1					—						
	CSI×2, UART×1, simplified l <sup>2</sup> C×2								1					2				
	CSI×1, UART (LIN bus support)×1, simplified l <sup>2</sup> C×1		-	_				1						-				
	CSI×2, UART (LIN bus support)×1, simplified I <sup>2</sup> C×2				-	_								1				
	l²C×1				-	_						1						
DMA [channels]											_	2						
External interrupt	pins [count]			5				6					13			18		
OCD	On-chip debugging											Yes						
Peripheral functions	8/12-bit A/D converter [channels]		. 1	3				8	1.1.1.7		1.1		24			28		
	Multiplier/divider/ multiply-accumulator				Li	brary s	upport	tor mu	Multi	ply: 16-bit	× 1	6-bit = 32-bi	operations (e t (signed/unsi -bit (unsigned	gned)	functional un	iit)		
						M						bit = 32-bit (s	<u> </u>	ed)				
	Other functions				-	leek -							detection circ		n aval n			
Safety functions		Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function																
Other	Power supply voltage [V]											$_{\rm DD} = 1.6 \text{ to } 3.6$						
	Operating ambient temperature [°C]					$T_A = -4$	10 to +	85°C (/	A: Cons	umer app	licat	tions), $T_A = -4$	40 to +105°C	(G: Industrial	applications)'	2		
	Package (size [mm])	25-WFLGA (3×3mm)         32-HWQFN (5×5mm)         ①48-LFQFP (7×7mm)         ①64-LFQFP (10×10mm)           ②48-HWQFN (7×7mm)         ③64-VFBGA (4×4mm)         ③64-VFBGA (4×4mm)         ③64-VFBGA (4×4mm)							mm)									

\* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash\_libraries The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Products with pin counts from 25 or 32 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15 kHz) is available for use. \*2: Industrial grade products are also available. (part number: RSF150xx65xx, ambient operating temperature range: -40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

### RL78/G1C (32 to 48 pins)

Group	· · ·			RL78	/G1C								
Pin count			32	-pin	48	-pin							
Product name			©R5F10JBCANA	©R5F10KBCANA	ORFTOJGCANA	©R5F10K6CANA							
CPU				RL78 C	PU core								
Memory	Flash ROI	VI [bytes]		32	2K								
	Data flas	n [bytes]	2K										
	RAM [byt	es]	5.5K										
Operating clocks	Maximum	On-chip oscillator clock		24N	ЛНz								
	operating frequency [Hz]	External resonator		201	ЛНz								
		USB clock		481	ЛНz								
Clock generator circuit	Crystal/ce	eramic oscillator [Hz]		1 to 20MHz (VDD = 2.7 to 5.5V),	1 to $16MHz (V_{DD} = 2.4 \text{ to } 5.5V)$								
onour		ed on-chip oscillator [Hz]		1 to 48MHz (V <sub>D</sub>	<sub>D</sub> = 2.7 to 5.5V)								
	Low-spee	d on-chip oscillator [Hz]		15kHz (Vdd =	= 2.4 to 5.5V)								
		(32.768 kHz)		32.768kHz (Voc									
1/0		oorts and dedicated USB pins	28*2	26*3	44*2	42*3							
	1/0	ports		22	:	38							
		N-channel open drain (6V tolerance)	3 4										
Timers		er TAU [channels]			1								
		clock (RTC) [channels]		1	1								
		g timer (WDT) [channels]		1	1								
		mer [channels]	12-bit × 1										
Serial interfaces		ART×1, simplified I <sup>2</sup> C×2	1										
1100	I <sup>2</sup> C×1			1	<u> </u>	I							
USB	Host [cha	-	2	-	2	-							
	Function	[channels]											
DMA [channels]					2								
External interrupt				8		10							
OCD Peripheral		ebugging		Y		0							
functions	Multiplie	VD converter [channels] /divider/ accumulator	8 9 Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)										
	Other fun	ctions	Po	wer-on reset (POR), low-voltage detect									
			- RTC output (1Hz) × 1										
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function										
Other	Power su	pply voltage [V]	V <sub>DD</sub> = 2.4 to 5.5V										
	Operating	ambient temperature [°C]	] $T_A = -40$ to $+85^{\circ}$ C (A: Consumer applications), $T_A = -40$ to $+105^{\circ}$ C (G: Industrial applications) <sup>*1</sup>										
	Package	size [mm])	132-HWQFN (5×5mm	) @32-LFQFP (7×7mm)	⊙48-HWQFN (7×7mm	) @48-LFQFP (7×7mm)							

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110. \*2: USB uses pins UVBUS, UVDD, UDP0, UDP0, UDP1, and UDM1. \*3: USB uses pins UVBUS, UVDD, UDP0, and UDM0.



### RL78/G1D (48 pins)

Group		RL78/G1D										
Pin count			48-pin									
Product name		R5F11AGGANB	RSF11AGHANB	R5F11AGJANB								
CPU			RL78 CPU core									
Memory	Flash ROM [bytes]	128K	192K	256K								
	Data flash [bytes]		8К	l								
	RAM [bytes]	12K	16K	20K								
Operating clocks	Maximum On-chip oscillator clock	32MHz										
	operating frequency [Hz] External resonator		20MHz									
Clock generator	Crystal/ceramic oscillator [Hz]	1 to 20MHz (V <sub>DD</sub> = 2.7 to 3.6V), 1 to	16MHz (V <sub>DD</sub> = 2.4 to 3.6V), 1 to 8MHz (V <sub>DD</sub> = 1.8 to	o 3.6V), 1 to 4MHz (VDD = 1.6 to 3.6V)								
circuit	High-speed on-chip oscillator [Hz]	1 to 32MHz (V <sub>DD</sub> = 2.7 to 3.6V), 1 to	16MHz (V <sub>DD</sub> = 2.4 to 3.6V), 1 to 8MHz (V <sub>DD</sub> = 1.8 to	o 3.6V), 1 to 4MHz (VDD = 1.6 to 3.6V)								
	Low-speed on-chip oscillator [Hz]		$15 \text{kHz} (V_{DD} = 1.6 \text{ to } 3.6 \text{V})$									
	Subclock (32.768 kHz)		$32.768 \text{kHz} (V_{\text{DD}} = 1.6 \text{ to } 3.6 \text{V})$									
	Crystal resonator for RF [Hz]		32MHz									
	Low-speed on-chip oscillator for RF [Hz]		32.768kHz (with calibration)									
I/0	I/O ports		32									
	N-channel open drain (6V tolerance)		2									
	N-channel open drain (V <sub>DD</sub> tolerance)		9									
Timers	16-bit timer TAU [channels]		8, PWM output $\times$ 7									
	Real-time clock (RTC) [channels]		1									
	Watchdog timer (WDT) [channels]		1									
	12-bit Interval timer [channels]	12-bit × 1										
8/10-bit resolution	n A/D converter [channels]	8										
Serial interfaces	CSI, simplified I <sup>2</sup> C, UART	1										
	CSI, simplified I <sup>2</sup> C		1									
	UART		1									
	I <sup>2</sup> C bus		1									
DMA [channels]	<u> </u>		4									
External interrupt	s [channels]	4 (When using RF, this includes connections b	etween the MCU and the RF transceiver via pins of	externally connected on the board by the user.)								
OCD	On-chip debugging		Yes									
Peripheral	8/10-bit A/D converter [channels]		8									
functions	Multiplier/divider/ multiply-accumulator		iply/divide/multiply-accumulate operations (equip) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) ccumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed)	1)								
	2.4 GHz RF transceiver	2.4GHz ISM band, GFSK i	Bluetooth v4.2 specification (low energy) supporte modulation, TDMA/TDD frequency hopping (on-ch adapter function (during slave operation only)	ip AES encryption circuit),								
Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 1										
Safety functions		WDT, TRAP instruction, flash memory CRC calculation, RAM parity error detection, illegal memory access detection function, frequency detection function, RAM guard function, SFR guard function, A/D test										
Other	Power supply voltage [V]	1.6 to 3.6V (V <sub>DD</sub> = 1.8 to 3.6V: using DC-DC converter)										
	Operating ambient temperature [°C]	$T_A = -40 \text{ to } +85^{\circ}\text{C}$										
	Package (size [mm])	48-HWQFN (6×6mm)										

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: -40 to +85°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

# RL78/G1D Module (42 pins)

Group		RL78/G1D Module				
Pin count		42-pin				
Product name		A7011A0000D200				
CPU		RL78 CPU core				
Memory	Flash ROM [bytes]	256К				
	Data flash [bytes]	8K				
	RAM [bytes]	20К				
Operating clocks	Maximum On-chip oscillator clock	32MHz				
	operating frequency [Hz] External resonator	20MHz				
Clock generator	Crystal/ceramic oscillator [Hz]	1 to 20MHz (VDD = 2.7 to 3.6V), 1 to 16MHz (VDD = 2.4 to 3.6V), 1 to 8MHz (VDD = 1.8 to 3.6V), 1 to 4Hz (VDD = 1.6 to 3.6V)				
circuit	High-speed on-chip oscillator [Hz]	1 to 32MHz (VDD = 2.7 to 3.6V), 1 to 16MHz (VDD = 2.4 to 3.6V), 1 to 8MHz (VDD = 1.8 to 3.6V), 1 to 4Hz (VDD = 1.6 to 3.6V)				
	Low-speed on-chip oscillator [Hz]	15kHz (V <sub>DD</sub> = 1.6 to 3.6V)				
	Subclock (32.768 kHz)	32.768kHz (V <sub>DD</sub> = 1.6 to 3.6V)				
	Crystal resonator for RF [Hz]	32MHz				
	Low-speed on-chip oscillator for RF [Hz]	32.768kHz (with calibration)				
I/0	I/O ports	24				
	N-channel open drain (6V tolerance)	2				
	N-channel open drain (V <sub>DD</sub> tolerance)	9				
Timers	16-bit timer TAU [channels]	8, PWM output × 7				
	Real-time clock (RTC) [channels]	1				
	Watchdog timer (WDT) [channels]	1				
	12-bit Interval timer [channels]	12-bit × 1				
Serial interfaces	CSI, UART, simplified I <sup>2</sup> C	1				
	CSI, simplified I <sup>2</sup> C	1				
	UART	1				
	I <sup>2</sup> C	1				
DMA [channels]	<u> </u>	4				
External interrupt	pins [count]	3				
OCD	On-chip debugging	Yes				
Peripheral	8/10-bit A/D converter [channels]	8				
functions	Multiplier/divider/ multiply-accumulator	Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)				
	2.4 GHz RF transceiver	Bluetooth v4.2 specification (low energy) supported 2.4GHz ISM band, GFSK modulation, TDMA/TDD frequency hopping (on-chip AES encryption circuit), adapter function (during slave operation only), transmission output: 0dBm, reception sensitivity: –90dBm				
	Other functions	Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 1				
Safety functions		Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function				
Other	Power supply voltage [V]	$V_{DD} = 1.6$ to $3.6V$ ( $V_{DD} = 1.8$ to $3.6V$ : using DC-DC converter)				
	Receive/transmit peak current	Receive: 3.5mA, transmit: 4.3mA (voltage: 3.0V)				
	Operating ambient temperature [°C]	$T_A = -25 \text{ to } +75^{\circ}\text{C}$				
	Radio law compliance	Japan (MIC), Europe (CE), U.S.A. (FCC), Canada (IC)				
	Product order number	RY7011A0000DZ00#001: 2500 pcs (1 reel), RY7011A0000DZ00#002: 100 pcs (1 reel)				
	Package (size [mm])	42-LGA (8.95×13.35mm)				
Default software	Supplied software	Software for checking operation of modem configuration for control by host microcontroller via UART				
	Supplied profiles Proximity profile, find me profile, heart rate profile, time profile, alert notification profile, running speed and cadence profile, health thermometer profile, blood pressure profile, glucose profile, phone alert status profile, general-purpose bidirectional communication, firmware update					

 $\ensuremath{^*\!\!:}\xspace A$  dedicated library is required to use the data flash.



### RL78/G1F (24 to 64 pins)

Group							RL78	8/G1F							
Pin count			24-	·pin	32	-pin	36-	pin	48-	pin	64-	pin			
Product name			R5F11B7CANA *2	R5F11B7EANA *2	<pre>①R5F11BBCAFP *2 ③R5F11BBCANA *2</pre>	©R5F11BBEAFP *2 ©R5F11BBEANA *2	R5F11BCCALA *2	R5F11BCEALA 22	R5F11BGCAFB *2	R5F11BGEAFB *2	R5F11BLCAFB	R5F11BLEAFB			
CPU				l			RL78 C	PU core		ļ	1				
Memory	Flash ROI	VI [bytes]	32K	64K	32K	64K	32K	64K	32K	64K	32K	64K			
	Data flasi	n [bytes]					4	K							
	RAM [byt	es]					5.	5K	-						
Operating clocks	Maximum	On-chip oscillator clock					321	ЛНz							
	operating	External resonator	20MHz												
	frequency [Hz]	Clock for timer RD/RX		64MHz (V <sub>DD</sub> = 2.7 to 5.5V)											
Clock generator	Crystal/ce	eramic oscillator [Hz]		l to 20MHz (Vo	= 2.7 to 5.5V	), 1 to 16MHz (\	/oo = 2.4 to 5.5	V), 1 to 8MHz (	Vod = 1.8 to 5.5	5V), 1 to 4Hz (V	/oo = 1.6 to 5.5V	)			
circuit	High-spee	ed on-chip oscillator [Hz]		$\frac{1 \text{ to } 20\text{ MHz} (V_{DD} = 2.7 \text{ to } 5.5\text{V}), 1 \text{ to } 16\text{ MHz} (V_{DD} = 2.4 \text{ to } 5.5\text{V}), 1 \text{ to } 8\text{ MHz} (V_{DD} = 1.8 \text{ to } 5.5\text{V}), 1 \text{ to } 4\text{Hz} (V_{DD} = 1.6 \text{ to } 5.5\text{V})}{1 \text{ to } 64\text{ MHz} (V_{DD} = 2.7 \text{ to } 5.5\text{V}), 1 \text{ to } 16\text{ MHz} (V_{DD} = 2.4 \text{ to } 5.5\text{V}), 1 \text{ to } 8\text{ MHz} (V_{DD} = 1.8 \text{ to } 5.5\text{V}), 1 \text{ to } 4\text{ Hz} (V_{DD} = 1.6 \text{ to } 5.5\text{V})}{1 \text{ to } 64\text{ MHz} (V_{DD} = 2.7 \text{ to } 5.5\text{V}), 1 \text{ to } 16\text{ MHz} (V_{DD} = 2.4 \text{ to } 5.5\text{V}), 1 \text{ to } 8\text{ MHz} (V_{DD} = 1.8 \text{ to } 5.5\text{V}), 1 \text{ to } 4\text{ Hz} (V_{DD} = 1.6 \text{ to } 5.5\text{V})}{1 \text{ to } 7000 \text{ to } 1.6 \text{ to } 5.5\text{V}}$											
	Low-spee	d on-chip oscillator [Hz]					15kHz (Vdd =	= 1.6 to 5.5V)							
	Subclock	(32.768 kHz)		-					32.768kHz (VDE	p = 1.6 to $5.5V$	)				
I/O	I/O ports		2	0		28	3	1	4	4	5	8			
	N-ch	annel open drain (6V tolerance)	-			_	:	2	4	1	4				
	N-ch	annel open drain ( $V_{DD}$ tolerance)	1	0		12	1	0	1	2	1	6			
Timers	16-bit tim	er TAU [channels]					4, PWM c	output × 3							
	16-bit tim	er RJ [channels]	1												
	16-bit tim	er RD [channels]					2, PWM o	output × 6							
	16-bit tim	er RG [channels]					1, PWM o	output × 1							
	16-bit tim	er RX [channels]						1							
	Real-time	clock (RTC) [channels]					1	*1							
	Watchdo	g timer (WDT) [channels]						1							
	Interval ti	mer [channels]					12-b	it × 1							
Serial interfaces	CSI×1, U	ART×1, simplified I <sup>2</sup> C×1		2 (including 1 UART with IrDA support) 1											
	CSI×2, U	ART×1, simplified I <sup>2</sup> C×2				_			1 (including 1 UART with IrDA support) 2 (including 1 UART with Ir			with IrDA support)			
	simplified					1			-	_	_	-			
	simplified	ART (LIN bus support)×1, I I²C×2						1			1				
	I <sup>2</sup> C×1			0		10	1	1	2	2	2	n			
DTC (sources)			C			21	J 3		3		3	3			
ELC (inputs/trigge		+1		9		11	1	0	1	6	22 2	0			
External interrupt OCD				J 				es		0	Ζ	U			
Peripheral	On-chip d	VD converter [channels]		8		13	1	5	1	7	1	7			
functions		converter [channels]		1		15	1	5	2	1	1	1			
				I.	l Jultinlv/divide/	multinly-accum	ulate instructio	ons sunnorted (	z (included in CPL	Linstruction s	et)				
	Multiplier multiply-a	r/divider/ accumulator				Multiply: 1 Divide	6-bit × 16-bit = e: 32-bit ÷ 32-b	= 32-bit (signed it = 32-bit (uns	d/unsigned) signed)						
	Composed				Multi		reference volta		-bit (signed/uns	signed)					
	Comparat					Z (WILII	reference volta	ige generator i 1							
	Other fun	nable-gain amplifier		Power on room	at (POB) low	oltana dotoctio	n circuit (LVD)	clock/buzzor.or	utput (48-pin: 1	channel 64 n	in: 2 channole)				
Safety functions		ctions		mory CRC calcula	tion function (hi	gh-speed), CRC ca	alculation function	n (general-purpos	se), RAM parity er	ror detection fun	ction, RAM guard				
Other	Power su	pply voltage [V]	SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function           V <sub>DD</sub> = 1.6 to 5.5V         V <sub>DD</sub> = 1.6 to 5.5V         V <sub>DD</sub> = 1.6 to 5.5V         V <sub>DD</sub> = 1.6 to 5.5V												
other		pply voltage [v]   ambient temperature [°C]										(Exm subboll)			
		·	32-1 OFP (7×7mm)												
		size [mm])	24-HWQFI	N (4×4mm)		N (5×5mm)	36-WFLGA	A (4×4mm)	48-LFQFP	(7×7mm)	64-LFQFP (	10×10mm)			

\* A dedicated library is required to use the data flash.

A declared indiary is required to use the data instit. The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Products with pin counts from 24 or 32 priss are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use. \*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

# RL78/G1G (30 to 44 pins)

Group					RL78	/G1G									
Pin count			30-	pin	32-	pin	44-	pin							
Product name			R5F11EA8ASP	R5F11EAASP	R5F11EB8AFP	R5F11EBAAFP	R5F11EF8AFP	R5F11EFAAFP							
CPU					RL78 C	PU core									
Memory	Flash RON	1 [bytes]	8K	16K	8K	16K	8K 16K								
	Data flash	[bytes]													
	RAM [byte	28]			1.	ōΚ									
Operating clocks	Maximum	On-chip oscillator clock	24MHz												
	operating frequency [Hz]	External resonator	20MHz												
Clock generator	Crystal/ce	ramic oscillator [Hz]		1 to 20MHz (Voo = 2.7 to 5.5V)											
circuit	High-spee	d on-chip oscillator [Hz]		1 to 48MHz (V	op = 2.7 to 5.5V) *Timer	RD only, operation at 48	MHz supported								
	Low-spee	d on-chip oscillator [Hz]			15kHz (Vod =	2.7 to 5.5V)									
	Subclock	32.768 kHz)			-	-									
I/0	I/O ports		2	6	2	8	4	0							
	N-cha	annel open drain (6V tolerance)			-	-									
	N-cha	nnel open drain (V <sub>DD</sub> tolerance)		7											
Timers	16-bit tim	er TAU [channels]		•	4, PWM o	utput × 3									
	16-bit tim	er RJ [channels]				l									
	16-bit tim	er RD [channels]			2, PWM o	utput × 6	·								
	Real-time	clock (RTC) [channels]				_									
	Watchdog	timer (WDT) [channels]	1												
	Interval ti	ner [channels]	12-bit × 1												
Serial interfaces	CSI×1, UA	\RT×1, simplified I <sup>2</sup> C×1	1												
	UART×1					l									
ELC (inputs/trigge	r outputs)			18	3/6		19	/6							
External interrupt	pins [count	]			6		1	0							
OCD	On-chip o	lebugging			Y	28	1								
Peripheral	8/10-bit /	VD converter [channels]			8		1	2							
functions	Multiplie multiply-	r/divider/ accumulator		1	ply-accumulate instructio Multiply: 16-bit × 16-bit = Divide: 32-bit ÷ 32-b cumulate: 16-bit × 16-bit	= 32-bit (signed/unsigned t = 32-bit (unsigned)	d)								
	Compara	tor [channels]			2 (with reference volta	ge generator function)									
	Program	nable-gain amplifier				l									
	Other fur	ctions		Power-on rese	et (POR), low-voltage dete	ction circuit (LVD), clock	/buzzer output								
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, 1/0 power output signal level detection function												
Other	Power su	pply voltage [V]	V <sub>DD</sub> = 2.7 to 5.5V												
	Operating	g ambient temperature [°C]			$T_A = -40 \text{ to } +85^{\circ}\text{C}$ (A: (	Consumer applications)									
	Package	(size [mm])	30-LSSOP (7.62mm) 32-LQFP (7×7mm) 44-LQFP (10×10mm)												



### RL78/G1H (64 pins)

Group		RL78/G1H								
Pin count			64-pin							
Product name		R5F11FLJANA	R5F11FLKANA	R5F1FLLANA						
СРИ			RL78 CPU core							
Memory	Flash ROM [bytes]	256KB	384KB	512KB						
	Data flash [bytes]		8KB	1						
	RAM [bytes]	24KB	32KB	48KB						
Main system clock	High-speed system clock	X1 (crystal/ceramic) oscillator, external main system clock input (EXCLK), HS (high-speed main) mode: 1 to 20MHz (V <sub>00</sub> = 2.7 to 3.6V), HS (high-speed main) mode: 1 to 16MHz (V <sub>00</sub> = 2.4 to 3.6V), LS (low-speed main) mode: 1 to 8MHz (V <sub>00</sub> = 1.8 to 3.6V)								
	High-speed on-chip oscillator clock		1 to 32MHz ( $V_{DD}$ = 2.7 to 3.6V), HS (high-speed main) mode: 1 LS (low-speed main) mode: 1 to 8MHz ( $V_{DD}$ = 1.8 to 3.6V)							
Subclock (32.768 kHz)		,	KT1 (crystal) oscillator, external subsystem clock input (EXCLK: 32.768kHz (TYP.)	S)						
Low-speed on-chip os	cillator [Hz]		15kHz (TYP.)							
RF reference clock			48MHz (TYP.)							
General-purpose regist	ter		8 bits $\times$ 32 registers (8 bits $\times$ 8 registers $\times$ 4 banks)							
Minimum instruction e	execution time	0.03	125 $\mu s$ (High-speed on-chip oscillator clock: $f_{\rm IH}=32MHz$ operation	ation)						
			$0.05 \mu s$ (High-speed system clock: $f_{\mbox{\scriptsize MX}} = 20 MHz$ operation)							
			30.5 $\mu s$ (Subsystem clock: $f_{_{SUB}}=$ 32.768kHz operation)							
Instruction set			ical operation (8/16bits), Multiplication (8bits × 8bits, 16bits × × 16bits + 32bits), Rotate, barrel shift, and bit manipulation (s							
I/O ports	Total		41							
	CMOS I/O		26							
	CMOS input		5							
	CMOS output		1							
	N-ch open-drain I/O (6V tolerance)		4							
	GPIO (RF unit)		5							
SubGHz	Operating frequency band		863MHz to 928MHz							
RF transceiver	Modulation scheme / Data rate (kbps)	2	FSK/GFSK: 10/20/40/50/100/150/200/300 4FSK/GFSK: 200/4	00						
	Quiescent current (RF portion)	V	/cc=3.3V, typ. RX: 6.3mA, RX wait: 5.8mA / TX: 20mA (+10dB	m)						
	Receiving sensitivity	-114dB	m (GFSK 10Kbps, BER<0.1%) –104dBm (GFSK 100Kbps, BEF	3 < 0.1%)						
	Support IEEE802.15.4e/g	Dual Sub-GHz Communication filtering, Transmission fran	ne auto-generation function, *Preamble length: 4 $-$ 1000 Byte	s can be set, Auto ACK Reply / Reception function support						
Timers	16-bit timer [channels]		9							
	Watchdog timer (WDT) [channels]		1	·						
	Real-time clock (RTC) [channels]		1							
	12-bit interval timer		1							
	Timer output		1							
Serial interfaces	-	CSI/UART: 2 channels, CSI: 2 channels	s (1 channel of 2 channels is used for the internal communica	tion between MCU and RF transceiver.)						
	I <sup>2</sup> C Bus		2							
DTC (sources)			21							
Vectored interrupt	Internal		26							
sources	External		7							
OCD	On-chip debugging		Yes							
Peripheral functions	10-bit resolution A/D converter		6							
	Multiplier/divider/multiply-accumulator	Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned), Divide: 32-bit ÷ 32-bit (unsigned), Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned) Reset by RESET# pin, Internal reset by watchdog timer, Internal reset by power-on-reset, Internal reset by voltage detector,								
	Reset		reset by watchdog timer, Internal reset by power-on-reset, Int uction execution, Internal reset by RAM parity error, Internal n							
	Power-on-reset circuit		Power-on-reset: 1.51 (TYP.), Power-down-reset: 1.50 (TYP.)							
	Voltage detector	Rising ed	dge: 1.88V to 3.13V (10 stages), Falling edge: 1.84V to 3.06V (	10 stages)						
	Clock output/buzzer output		2							
		2.44kHz, 4.88kHz, 9.76kHz, 1.25MHz, 2.5MHz, 5MHz, 10MHz (Main system clock: f <sub>MANN</sub> = 20MHz operation), 256Hz, 512Hz, 1.024kHz, 2.048kHz, 4.096kHz, 8.192kHz, 1.084kHz, 32.768kHz (Subsystem clock: f <sub>SUB</sub> = 32.768kHz operation)								
Other	Power supply voltage [V]		VDD = 1.8 to 3.6V							
	Operating ambient temperature [°C]	T <sub>A</sub> =	-40 to +85°C (A: Consumer applications, D: Industrial applica	tions)						
	Package (size [mm])		64-HVQFN (9×9mm)							

The above part numbers are consumer grade products, (ambient operating temperature range : -40 to +85°C) \*1: Industrial grade products are also available. (part number: R5F1xxxxDxx, ambient operating temperature range: -40 to +85°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

Group		RL78/G1M							
Pin count		20-	pin						
Product name		R5F11W67ASM R5F11W67DSM	R5F11W68ASM R5F11W68DSM						
CPU		RL78 CI	PU core						
Memory	Flash ROM [bytes]	4К	8К						
	RAM [bytes]	0.5K 1K							
Operating clocks	Maximum operating On-chip oscillator frequency [Hz] clock	201	ЛНz						
Clock generator circuit	High-speed on-chip oscillator [Hz]	1.25 to 20MHz (V 1.25 to 5MHz (Vo							
	Low-speed on-chip oscillator [Hz]	15kHz	(TYP.)						
1/0	I/O ports	18							
	N-channel open drain (VDD tolerance)	1	4						
Timers	16-bit timer TAU [channels]		L						
	Watchdog timer (WDT) [channels]	1							
	Interval timer [channels]	12-bit × 1							
Serial interfaces		CSI: 1 channel, U	JART: 1 channel						
Interrupt sources	Internal	1	2						
	External	7	,						
OCD	On-chip debugging	Ye	28						
Peripheral	8/10-bit A/D converter [channels]	8	3						
Unctions Other functions		Power-on reset (POR), Clock/buzze	r output × 1, Real time output × 8						
Safety function		Trap fu	nction						
Other Power supply voltage [V]		V <sub>DD</sub> = 2.0 to 5.5V <sup>*1</sup>							
	Operating ambient temperature [°C]	$T_{A} = -40 \text{ to } +85^{\circ}\text{C}$							
	Package (size [mm])	20-TSSOP (4×4mm)							

\*1: Use this product within the voltage range from 2.25 to 5.5V because the detection voltage (VSPOR) of the selectable power-on-reset (SPOR) circuit should also be considered.



### RL78/G1N (20 pins)

Group		RL78/G1N								
Pin count		20-	pin							
Product name		R5F11Y67ASM R5F11Y67DSM	R5F11Y68ASM R5F11Y68DSM							
CPU		RL78 CI	PU core							
Memory	Flash ROM [bytes]	4К	8К							
	RAM [bytes]	0.5K	1К							
Operating clocks	Maximum operating On-chip oscillator frequency [Hz] clock	201	IHz							
Clock generator circuit	High-speed on-chip oscillator [Hz]	1.25 to 20MHz (V 1.25 to 5MHz (V₀								
	Low-speed on-chip oscillator [Hz]	15kHz	(TYP.)							
I/0	I/O ports	1	3							
	N-channel open drain (Vod tolerance)	14								
	P-ch open-drain output (high current pin)	6								
Timers	16-bit timer TAU [channels]	4								
	Watchdog timer (WDT) [channels]	1								
	Interval timer [channels]	12-bi	t×1							
Serial interfaces		CSI: 1 channel, U	JART: 1 channel							
Interrupt sources	Internal	1	2							
	External	7								
OCD	On-chip debugging	Ye	S							
Peripheral functions	8/10-bit A/D converter [channels]	8								
TGATOLIO II O	Other functions	Power-on reset (POR), C	lock/buzzer output × 1							
Safety function		Trap fu	nction							
Other	Power supply voltage [V]	V <sub>00</sub> = 2.0 to 5.5V <sup>-1</sup>								
	Operating ambient temperature [°C]	] T <sub>A</sub> = −40 to +85°C								
	Package (size [mm])	20-TSSOP (4×4mm)								

\*1: Use this product within the voltage range from 2.25 to 5.5V because the detection voltage (VSPOR) of the selectable power-on-reset (SPOR) circuit should also be considered.

# RL78/G1P (24 to 32 pins)

Group			RL78	/G1P
Pin count			24-pin	32-pin
Product name			R5F11Z7AANA R5F11Z7ADNA	R5F11ZBAAFP R5F11ZBADFP
CPU			RL78 C	PU core
Memory	Flash ROM [	[bytes]	16	šκ
	Data flash [k	bytes]	2	K
	RAM [bytes]	]	1.	5К
Operating clocks	Maximum operating	On-chip oscillator clock	321	ЛНz
	frequency [Hz]	External resonator	201	ЛНz
Clock generator circuit	Crystal/cera	mic oscillator [Hz]	1 to 20MHz (Vo	D = 2.7 to 3.6V)
circuit	High-speed	on-chip oscillator [Hz]	1 to 32MHz (Vo	D = 2.7 to 3.6V)
	Low-speed of	on-chip oscillator [Hz]	15kHz (TYP.) (Va	10 = 2.7 to 3.6V)
I/O	I/O ports		20	28
	N-chan (6V tole	nnel open drain erance)	2	2
Timers	16-bit timer	TAU [channels]		1
	Watchdog ti	imer (WDT) [channels]		1
Serial interfaces			CSI: 1 channel, 1 channel (2 sl	
DMA [channels]			:	2
Interrupt sources	Internal		1	2
	External		(	3
OCD	On-chip de	bugging	Ye	35
Peripheral	8/10-bit A/	D converter [channels]	6	8
functions	10-bit D/A	CONVERTER [ch]	2	2
	EVENT LIN	K CONTROLLER (ELC)	Event input: 10, Eve	ent trigger output: 3
	Other funct	tions	Power-on reset (POR), low-voltage detect	ion circuit (LVD), clock/buzzer output $\times$ 2
Safety functions				on function (general-purpose), RAM parity error detection function, accessdetection function, frequency detection function, nction, Trap function
Other	Power supp	oly voltage [V]	VDD = 2.	7 to 3.6V
	Operating a	ambient temperature [°C]	$T_{\text{A}}=-40$	to +85°C
	Package (si	ize [mm])	24-HWQFN (4×4mm)	32-LQFP (7×7mm)



#### RL78/L12 (32 to 64 pins)

Group												RL78	B/L12			
Pin count				32-pir			44-pir			48-p			52-pin			1-pin
Product name			R5F10RB8AFP	R5F10RBAAFP	R5F10RBCAFP	R5F10RF8AFP	R5F10RFAAFP	R5F10RFCAFP	R5F10RG8AFB	R5F10RGAAFB	R5F10RGCAFB	R5F10RJ8AFA	R5F10RJAAFA	R5F10RJCAFA	ŪR5F10RLAAFB <sup>4</sup> ©R5F10RLAAFA <sup>4</sup> ©R5F10RLAAFA <sup>4</sup>	©R5F10RLCAFB -4 ©R5F10RLCAFA -4 @R5F10RLCANB -4
CPU												RL78 C	PU core			
Memory	Flash RC	OM [bytes]	8K	16K	32K	8K	16K	32K	8K	16K	32K	8K	16K	32K	16K	32K
	Data flas	sh [bytes]										2	К			
	RAM [by	/tes]*1	1K	1K	1.5K	1K	1K	1.5K	1K	1K	1.5K	1K	1K	1.5K	1K	1.5K
Operating clocks	Maximum	On-chip oscillator clock										241	ЛНz			
	operating frequency [Hz	] External resonator										201	ЛНz			
Clock generator	Crystal/o	ceramic oscillator [Hz]		1	to 20M	Hz (Vdd	= 2.7 t	o 5.5V),	1 to 16	MHz (Vi	od = 2.4	to 5.5V	'), 1 to 8ľ	VIHz (V	/op = 1.8 to 5.5V), 1 to 4MHz	(VDD = 1.6 to 5.5V)
circuit	High-spe	eed on-chip oscillator [Hz]		1	to 24M	Hz (Vdd	= 2.7 t	o 5.5V),	1 to 16	MHz (Va	dd = 2.4	to 5.5V	'), 1 to 8ľ	VIHz (V	/op = 1.8 to 5.5V), 1 to 4MHz	(VDD = 1.6 to 5.5V)
	Low-spe	ed on-chip oscillator [Hz]		15kHz (Vnp = 1.6 to 5.5V)												
	Subcloc	k (32.768 kHz)	— 32.768kHz (V <sub>DD</sub> =			1.6 to 5.5V)										
1/0	Total I/O p	ports and LCD pins (SEG and COM)		28			40			44			48			58
		) ports		20			29			33			37			47
		N-channel open drain (EV <sub>DD</sub> tolerance)											2			
LCD controller/Driver				Selectable among internal voltage boost, capacitor split, and external resistance division												
		13			22 (18)		-	26 (22)*		1	30 (26)*²		39 (35)*2			
	Segment signal outputs Common signal outputs			4						. ,		1	. ,	4 (8)*2		
Timers			4. PV	/M outp	out × 3	5. PW	/M outp	out × 4	6. PW	/M outp	out × 5			(-7	8, PWM output × 7	,
	Real-time clock (RTC) [channels]											1	*3			
	Watchdog timer (WDT) [channels]															
		timer [channels]	1													
Serial interfaces		IART (LIN bus support)×1											1			
	I <sup>2</sup> C×1												1			
DMA [channels]													2			
External interrupt:	s [channe	s]		4			6					7				9
OCD	- -	debugging				1						Y	es			
Peripheral		A/D converter [channels]		4			7			9					10	
functions	Multiplie	er/divider/ -accumulator				Libr			Mu	y/divide Iltiply: 1 Divide	6-bit × e: 32-bit	16-bit = ÷ 32-b	= 32-bit ( it = 32-b	signed it (uns	ons (equipped with functiona I/unsigned)	l unit)
	Other fu	nctions			Power-	on rese	t (POR),	, low-vo	ltage de	etection	circuit	(LVD), c	lock/buz	zer out	tput, Remote control carrier	wave output $\times$ 1
Safety functions			Flash m	nemory	CRC cal			functio	n, SFR (	guard fu	inction,	illegal n	nemory	eneral-purpose), RAM parity / access detection function, r test function	error detection function,	
Other	Power si	upply voltage [V]									١	/dd = 1.	6 to 5.5V	1		
Operating ambient temperature [°C]															ications) ications) <sup>*4</sup>	
	Package	(size [mm])		32-LQFI 7×7mm			44-LQFI 0×10m			18-LFQF 7×7mm			52-LQFP 0×10mn		1)64-LFQFP (10×10mm) 2)64-LQFP (12×12mm) 3)64-HWQFN (8×8mm)	①64-LFQFP (10×10mm) ②64-LQFP (12×12mm) ③64-HWQFN (8×8mm)

MEMO		

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#### RL78/L13 (64 to 80 pins)

Group				RL78/L13							
Pin count	·			64-pin		·					
Product name		©R5F10WLAAFB '2 ©R5F10WLAAFA '2	©R5F10WLCAFB -2 ©R5F10WLCAFA	©R5F10WLDAFB 22 ©R5F10WLDAFA	OBF10WLEAFB <sup>22</sup> 2865F10WLEAFA	©R5F10WLFAFB '2 ©R5F10WLFAFA '2					
CPU	· · · · · · · · · · · · · · · · · · ·		00	RL78 CPU core							
Memory	Flash ROM [bytes] Data flash [bytes] RAM [bytes]	16K	32K	48K 4K 2K	64K 4K	96K 6K					
Operating clocks	Maximum operating frequency[Hz] Timer KB20 clock		I.JA	24MHz 20MHz 48MHz (Vop = 2.7 to 5.5V)	711	UK					
Clock generator circuit	Crystal/ceramic oscillator [Hz] High-speed on-chip oscillator [Hz] Low-speed on-chip oscillator [Hz] Subclock (32.768 kHz)		= 2.7 to 5.5V), 1 to 16MHz (Va	<ul> <li>a) = 2.4 to 5.5V), 1 to 8MHz (Va</li> <li>b) = 2.4 to 5.5V), 1 to 8MHz (Va</li> <li>b) = 1.6 to 5.5V)</li> <li>c) = 1.6 to 5.5V)</li> <li>c) = 1.6 to 5.5V)</li> </ul>							
1/0	Total I/O ports and LCD pins (SEG and COM) I/O ports N-channel open drain (6V tolerance)			57 49 2							
LCD controller	LCD drive voltage generation method Segment signal outputs Common signal outputs		Selectable among internal voltage boost, capacitor split, and external resistance division 36 (32)*1 4 (8)*1								
Timers	16-bit timer TAU [channels] 16-bit timer KB20 [channels] Real-time clock2 (RTC2) [channels] Watchdog timer (WDT) [channels] Interval timer [channels]		8 , PWM output × 7 1, PWM output × 2 1 (0.96 ppm minimum resolution) 1 12-bit × 1								
Serial interfaces	CSI×1, UART (LIN bus support)×1, simplified I <sup>2</sup> C×1 CSI×1, UART×1, simplified I2C×1 UART×1 I <sup>2</sup> C×1			1 1 1 1							
DMA [channels]	I			4							
External interrupt	s [channels]			9							
OCD Peripheral	On-chip debugging 8/10-bit A/D converter [channels]			Yes 9							
functions	Comparator [channels] Multiplier/divider/ multiply-accumulator		Multiply: 1 Divide Multiply-accumulate:	2 /multiply-accumulate operation 6-bit × 16-bit = 32-bit (signed. : 32-bit ÷ 32-bit = 32-bit (unsi 16-bit × 16-bit + 32-bit = 32-1 DEC actual (111)	′unsigned) gned) pit (signed/unsigned)						
Safety functions	Other functions	Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1 Hz) × 1, clock/buzzer output × 2, remote control carrier wave output × 1 Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function									
Other	Power supply voltage [V] Operating ambient temperature [°C]	$V_{DD} = 1.6 \text{ to } 5.5 \text{V}$ $T_A = -40 \text{ to } +85^{\circ}\text{C} \text{ (A: Consumer applications)}$									
	Package (size [mm])	$T_{A} = -40 \text{ to } +105^{\circ}\text{C (G: Industrial applications)^{v_{2}}}$									
<b>T</b> I I I I I I											

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Figure in parentheses ( ) is number of signal lines when using & COM. \*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

			RL78/L13			
64-pin			80-	nin		
* •	۲۷ *	۲*	-00 *	» «	°*	*
©R5F10WLGAFB ©R5F10WLGAFA	©R5F1 0WMAAFB ©R5F1 0WMAAFA	©R5F10WMCAFB ©R5F10WMCAFA	©R5F10WMDAFB ©R5F10WMDAFA	©R5F10WMEAFB ©R5F10WMEAFA	©R5F10V/MFAFB ©R5F10V/MFAFA	©R5F10WMGAFB ©R5F10WMGAFA
			RL78 CPU core			
128K	16K	32K	48K	64K	96K	128K
			4K			
8K	1К	1.5K	2К	4K	6K	8K
			24MHz			
			20MHz			
			48MHz (VDD = 2.7 to 5.5V)			
			<sub>DD</sub> = 2.4 to 5.5V), 1 to 8MHz (V			
	1 to 24MHz (VDD :	= 2.7 to 5.5V), 1 to 16MHz (V	<sub>DD</sub> = 2.4 to 5.5V), 1 to 8MHz (V	od = 1.8 to 5.5V), 1 to 4MHz (V	/oo = 1.6 to 5.5V)	
			$15 \text{kHz} (\text{V}_{\text{DD}} = 1.6 \text{ to } 5.5 \text{V})$			
			32.768kHz (VDD = 1.6 to 5.5V)			
57			7	3		
49			6	5		
			2			
		Selectable among internal vo	oltage boost, capacitor split, ar			
36 (32)*1			51 (	47)* <sup>1</sup>		
			4 (8)*1			
			8 , PWM output $\times$ 7			
			1, PWM output × 2			
			1 (0.96 ppm minimum resoluti	on)		
			1			
			12-bit × 1			
			1			
	1		1			
1				2		
			1			
			4			
			9			
			Yes			
9				2		
		and the second	2	na (anning a still for still for		
	Libra		e/multiply-accumulate operation 16-bit × 16-bit = 32-bit (signed		unit)	
			e: 32-bit $\div$ 32-bit = 32-bit (uns	· ·		
			$: 16-bit \times 16-bit + 32-bit = 32-bit =$			
			, RTC output (1 Hz) × 1, clock/			
		guard function, illegal memor	I), CRCcalculation function (ge y access detection function, fr	equency detection function, A		
		1/U powe	er output signal level detection $V_{DD} = 1.6$ to 5.5V	Tunction		
		$T_A = -41$	0 to +85°C (A: Consumer appl	ications)		
			) to +105°C (G: Industrial appli			
①64-LFQFP (10×10mm) ②64-LQFP (12×12mm)			①80-LFQFP ②80-LQFP	(12×12mm)		



### RL78/L1A (80 to 100 pins)

Group					RL7	8/L1A		
Pin count				80-pin			100-pin	
Product name			R5F11MMDAFB	R5F11MMEAFB	R5F11MMFAFB	R5F11MPEAFB	R5F11MPFAFB	R5F11MPGAFB
СРИ			E	Æ		CPU core	Œ.	<u> </u>
Memory	Flash RON	/ [bytes]	48K	64K	96K	64K	96K	128K
	Data flash	[bytes]				8K		
	RAM [byte	es]			5	.5K		
Operating clocks	Maximum operating	On-chip oscillator clock			24	MHz		
	frequency [Hz]	External resonator				MHz		
Clock generator	Crystal/ce	ramic oscillator [Hz]		1 to	20MHz: $V_{DD} = 2.7$ to 3.6	V, 1 to 8MHz: $V_{DD} = 1.8$ to	2.7V	
circuit	High-spee	d on-chip oscillator [Hz]		1 to $24MHz (V_{DD} = 2.$	7 to 3.6V), 1 to 16MHz (\	$J_{DD} = 2.4$ to 3.6V), 1 to 8N	$Hz (V_{DD} = 1.8 \text{ to } 3.6 \text{V})$	
		d on-chip oscillator [Hz]				= 1.8V to 3.6V)		
		32.768 kHz)			32.768kHz (Vr	and the second s		
1/0		orts and LCD pins		59			79	
LCD controller		voltage generation method			internal voltage boost, ca	apacitor split, and externa		
	-	signal outputs		32 (28)*1	4	(8)*1	45 (41)*1	
Timoro		signal outputs er TAU [channels]				8, PWM output × 7)		
Timers		iterval timer [channels]				/1 (16-bit)		
		clock2 (RTC2) [channels]				1		
		timer (WDT) [channels]				1		
		rval timer [channels]				1		
Serial interfaces	CSI×1, UA simplified	\RT (LIN bus support)×1, I²C×1				1		
	CSI×1, UA	ART×1, simplified I <sup>2</sup> C×1				3		
	I <sup>2</sup> C×1					1		
DTC (sources)						30		
ELC (inputs/trigge						2, event outputs: 8		
External interrupts		·				8		
OCD	On-chip d			10	١	/es	14	
Peripheral functions		/D converter[ch]		10		3		
	Op-amp [c		2 (of whic	h, 2 channels have 2 I/O		-	ch, 2 channels have 4 I/O	switchoc)
	Reference		5 (01 WINC		,	8/1.8/1.5V		
		pr [channels]			2.0/2.04	1		
	Multiplier				Multiply: 16-bit × 16-bit Divide: 32-bit ÷ 32-b	ons supported (included i = 32-bit (signed/unsigned bit = 32-bit (unsigned) it + 32-bit = 32-bit (signe	1)	
	Other fund	ctions	Po			(LVD), RTC output (1 Hz)	-	× 2
Safety functions				uard function, SFR guard	I function, illegal memor	tion function (general-pur y access detection function er output signal level dete	on, frequency detection f	
Other	Power sup	pply voltage [V]			VDD = 1	.8 to 3.6V		
	Operating	ambient temperature [°C]			$T_A = -40$ to $+85^{\circ}C$ (A:	Consumer applications)		
	Package (s	size [mm])		80-LQFP (12×12mm)			100-LQFP (14×14mm)	

\*1: Figure in parentheses ( ) is number of signal lines when using 8 COM.

MEMO		



### RL78/L1C (80 to 100 pins)

Group									RL78	B/L1C	(USB)						
Pin count					80-pin					85-pin					100-pin	1	
Product name			R5F110MEAFB *2	R5F110MFAFB *2	R5F110MGAFB	R5F110MHAFB	R5F110MJAFB	R5F110NEALA *2	R5F110NFALA	R5F110NGALA *2	R5F110NHALA *2	R5F110NJALA *2	R5F110PEAFB	R5F110PFAFB	R5F110PGAFB *2	R5F110PHAFB	R5F110PJAFB *2
CPU									RI	.78 CPU c	ore		,				
Memory		DM [bytes] sh [bytes] /tes]	64K 8K	96K 10K	128K 12K	192K 16K	256K 16K	64K 8K	96K 10K	128K 8K 12K	192K	256K	64K 8K	96K 10K	128K	192K	256K
Operating clocks	Maximum operating frequency [Hz	On-chip oscillator clock External resonator		24MHz 20MHz 48MHz (V <sub>DD</sub> = 2.7 to 3.6V)													
Clock generator circuit	High-spe Low-spe	ceramic oscillator [Hz] eed on-chip oscillator [Hz] ed on-chip oscillator [Hz]			-			16MHz (V	oo = 2.4 to 15kHz	3.6V), 1 (Vdd = 1.6	to 8MHz (\ to 3.6V)	/oo = 1.8 to					
1/0	Total I/O p	k (32.768 kHz) orts and LCD pins (SEG and COM)*3 ) ports N-channel open drain (6V tolerance)						71 59	32.708KH	$12 (V_{DD} = 1)$	1.6 to 3.6V				89 77		
LCD controller	Segmen	e voltage generation method t signal outputs n signal outputs		Selectable among internal voltage boost, capacitor split, and externa 44 (40)*1 4 (8)*1						l resistance division 56 (52)*1							
Timers	16-bit tir Real-tim Watchdo	mer TAU [channels] mer KB20 [channels] e clock2 (RTC2) [channels] og timer (WDT) [channels] timer [channels]		8 (PWM output × 7) 3 (PWM output × 6) 1 (0.96 ppm accuracy correction) 1													
Serial interfaces	CSI×1, L simplifie	JART (LIN bus support)×1,								12-bit × 1 3 1							
USB		ı [channels]								1				-			
DTC (sources)							3	32							33		
ELC (inputs/trigge External interrupt							3	30		9					31		
OCD Peripheral functions	8/12-bit	debugging A/D converter [channels] A converter [channels]						9		Yes 2					13		
	Compara	ator [channels]				A I /!		1				(in a local a d i	e CDUL in a		2		
	Multiplier/divider/ multiply-accumulator				I		I	Nultiply: 1 Divide	6-bit × 16 :: 32-bit ÷	6-bit = 32 32-bit =	-bit (signed 32-bit (uns	(included i d/unsignec signed) -bit (signe	1)		et)		
Safety functions	Other functions afety functions			ash memo	ry CRC ca	culation f function,	unction (h SFR guard	igh-speed I function,	), CRC cal illegal me	culation f emory acc	unction (g ess detect	buzzer outp eneral-purj ion functio level deteo	pose), RAI on, freque	VI parity e ncy detec	error detec	tion funct	
Other	Power si	Power supply voltage [V]		$V_{DD} = 1.6$ to $3.6V$ °C] $T_A = -40$ to $+85^{\circ}$ °C (A: Consumer applications), $T_A = -40$ to $+105^{\circ}$ °C (G: Industrial applications)* <sup>2</sup>													
	Operatin	g ambient temperature [°C]			80-LFQFP (12×12mm) 85-VFLGA (7×7mm) 100-LFQFP (14×14mm)							,					

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Figure in parentheses ( ) is number of signal lines when using 8 COM. \*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110. \*3: LCD uses SEG pins and COM pins. USB uses UVBUS, UREGC, UDP, and UDM pins.

### RL78/L1C (80 to 100 pins)

Group									RL78/	L1C (n	o USB	)					
Pin count					80-pin				_	85-pin		_			100-pin	1	
Product name			R5F111MEAFB	R5F111MFAFB	R5F111MGAFB	R5F111MHAFB *2	R5F111MJAFB	R5F111NEALA *2	R5F111NFALA *2	R5F111NGALA *2	R5F111NHALA *2	R5F111NJALA *2	R5F111PEAFB	R5F111PFAFB	R5F111PGAFB	R5F111PHAFB	R5F111PJAFB
CPU									R	L78 CPU c	ore						
Memory	Flash RO Data flas	M [bytes] h [bytes]	64K	96K	128K	192K	256K	64K	96K	128K 8K	192K	256K	64K	96K	128K	192K	256K
	RAM [by1	-	8K	10K	12K	16K	16K	8K	10K	12K	16K	16K	8K	10K	12K	16K	16K
Operating clocks	Maximum	On-chip oscillator clock								24MHz							
	operating frequency [Hz]	External resonator								20MHz							
		Timer KB2 clock, USB clock								(VDD = 2.7							
Clock generator circuit	Crystal/c	eramic oscillator [Hz]		1 to 20	MHz (Vod	= 2.7 to 3	.6V), 1 to	16MHz (V	oo = 2.4 to	o 3.6V), 1 t	:o 8MHz (\	/oo = 1.8 to	o 3.6V), 1	to 4MHz (	VDD = 1.6	to 3.6V)	
circuit		ed on-chip oscillator [Hz]		1 to 48MHz ( $V_{DD} = 2.7$ to 3.6V), 1 to 16MHz ( $V_{DD} = 2.4$ to 3.6V), 1 to 8MHz ( $V_{DD} = 1.8$ to 3.6V), 1 to 4MHz ( $V_{DD} = 1.6$ to 3.6V								to 3.6V)					
	Low-spee	d on-chip oscillator [Hz]		15kHz (TYP.): V <sub>DD</sub> = 1.6 to 3.6V						V					_		
		(32.768 kHz)							32.768kH	Iz (Vdd = 1	.6 to 3.6V	)					
1/0		orts and LCD pins (SEG and COM)*3						'1							89		
	1/0	ports		-			6	3							81		
		N-channel open drain (6V tolerance)	2														
LCD controller		e voltage generation method		Selectable among internal voltage boost, capacitor split, and external resistance division           44 (40)*1         56 (52)*1													
		signal outputs		-			44 (	40)*1						_	56 (52)*1		
		signal outputs								4 (8)*1							
Timers		ner TAU [channels]								NM outpu							
		ner KB20 [channels]								NM outpu							
		e clock2 (RTC2) [channels]	1 (0.96 ppm accuracy correction)														
		g timer (WDT) [channels]	1														
Carial interfaces		imer [channels]	12-bit × 1														
Serial interfaces	simplified						-			1				-			
	$l^2C \times 1$	ART×1, simplified I <sup>2</sup> C×1		-						3							
	I-UXI			-				0		1				-	31	-	
DTC (sources) ELC (inputs/trigge	r Outpute)							0							31		
External interrupt		s]								9					51		
OCD		Jebugging								Yes						_	
Peripheral	· · · ·	A/D converter [channels]					1	1							13		
functions		converter [channels]								2			1				
		tor [channels]						1							2		
	Multiplie	r/divider/ accumulator	I     Z       Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set)       Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned)       Divide: 32-bit ÷ 32-bit (signed/unsigned)       Multiply-accumulate: 16-bit × 16-bit + 32-bit (signed/unsigned)														
	Other functions			Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1 Hz) × 1, clock/buzzer output × 2, remote control carrier wave output × 1										ut × 1			
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function									ion,					
Other	Power su	pply voltage [V]	V <sub>DD</sub> = 1.6 to 3.6V														
	Operating	g ambient temperature [°C]			Ta	= -40 to -	⊦85°C (A:	Consumer	application	ons), TA =	-40 to +1	05°C (G: Ir	ndustrial a	pplicatior	IS)*2		
	Package	(size [mm])		80-LF	QFP (12×	12mm)			85-V	/FLGA (7×	7mm)			100-L	FQFP (14×	:14mm)	

The above part numbers are consumer grade products. (ambient operating temperature range : -40 to +85°C) \*1: Figure in parentheses ( ) is number of signal lines when using 8 COM. \*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: -40 to +105°C) For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.



# RL78/H1D (48 to 80 pins)

Group									RL78/	′H1D				
Pin count				48	-pin		64	-pin				-08	pin	
Product name					<u>.</u>		1	r –		ピ	8	· · · · · · · · · · · · · · · · · · ·	1	
Toduct name				R5F11NGGAFB	R5F11NGFAFB	R5F11PLGABG	R5F11PLFABG	R5F11NLGAFB	R5F11NLFAFB	R5F11NMGAFB	R5F11NMFAFB	R5F11NMEAFB	R5F11RMGDFB	
CPU									RL78 CP	U core				
Memory	Flash ROM	[bytes]		128KB	96KB	128KB	96KB	128KB	96KB	128KB	96KB	64KB	128KB	
	Data flash [	bytes]							4K	В				
	RAM [bytes	5]						5.5KB					8KB	
Operating clocks	Maximum operating	On-chip o	scillator clock						24M	Hz				
	frequency [Hz]	External r	esonator					_	20M	Hz				
Clock generator	Crystal/cera	amic oscilla	tor [Hz]				11	to 20MHz: Vod :	= 2.7 to 5.5V,	1 to 16MHz: V	bb = 2.4  to  2.7	V		
circuit		· · ·	cillator [Hz]				1	to 24MHz (Vod			$p_{D} = 2.4 \text{ to } 2.7 \text{V}$	)		
	Low-speed		illator [Hz]						15kHz (Vod = 2					
	Subclock (3					-		1	2.768kHz (VDD	= 2.4 to 5.5V)				
1/0	Total I/O po					29 Calaata			36	14 114	53		63	
LCD controller			eration method		Selectable among internal voltage boost, capacitor split, and external resistance division     - 27 (23)*1 36 (32)*1									
	Segment si Common si							27 (	231	]	4 (8)			
Timers	16-bit timer							8 (Ti	mer output: 8,	PWM output				
	8/16-bit int							2 (8-bit)/1 (16-k			,		6 (8-bit)/3 (16-bit)	
	Real-time c	lock2 (RTC2	?) [channels]						1					
	Watchdog 1	imer (WDT	[channels]						1					
	12-bit inter	val timer [cl	hannels]						1					
	16-bit timer	r RJ (chann	els]					_					2, Timer output: 2	
			r [channels]						-				1	
	Sampling o [channels]	utput timer	detector (SMOTD)		— Input: 6, Output: 3									
Serial interfaces	CSI×1, UAF simplified I		support)×1,											
	CSI×1, UAF		ified I <sup>2</sup> C×1	2										
	I <sup>2</sup> C×1			1										
	Serial interf	ace UARTM	G					_					1	
DTC (sources)					2	24		2	25		26		35	
ELC (inputs/trigg	jer outputs)		_			nput: 19 er output: 10			Event input: 18 Event input: 20 Event trigger output: 10 Event trigger output: 7				Event input: 26 Event trigger output: 5	
External interrup						7			6				}	
OCD	On-chip del						-		Ye	s			1	
Peripheral functions	24-bit ∆∑ A programma amplifier 0	ble gain ins	er with strumentation	2 cha	nnels (differen	g input: itial or single- single-ended)		1 channel ( single-	g input: differential or ended), single-ended)	1 channel (d	Analog input differential or s		_	
	8/10-bit res A/D conver		External [channels]						3					
			Internal [channels]		-			· ·		out voltage (or	nly selectable	in HS (high-sp	oeed main) mode)]	
	D/A conve	rter	12-bit [channels]		1 (with an ou			nal output pin)		(		-	-	
	Programmab	le gain instru	8-bit [channels] mentation amplifier 1			I (with	out an output	amplifier and	iio external ou	(put pin)			-	
	(PGA1) [chan	nels]					1						-	
			annels] (AMPO) np [channels]					1		1			-	
	(AMP1, AN	IP2)					2					-	-	
	Multiplier/divider/multiply-accumulator			Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set), Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned), Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)										
	Other funct	ions					Power-on re	eset (POR), low	-voltage detec	tion circuit (L\	/D), RTC outpu	ıt (1Hz) × 1		
				Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1Hz) × 1           Clock/buzzer output × 2         Clock/buzzer output × 1         Clock/buzzer output × 2										
Safety functions							ction, SFR gu		legal memory	access detect	ion function, f	requency dete	error detection function, action function,	
Other	Power supp	ly voltage [						VDD = 1.8 to 5.5V						
								5°C (A: Consur	-	-			$T_A = -40$ to $+85^{\circ}$ C (D: Industrial applicatio	
	Operating a	inipient ten												

 $^{*1:}$  The number in parentheses indicates the number of signal outputs when 8 coms are used.

### RL78/I1A (20 to 38 pins)

Group			RL78	B/I1A		
Pin count		20-pin	30-	pin	38-pin	
Product name		©R5F1076CGSP ©R5F1076CMSP	©R5F107ACGSP ©R5F107ACMSP	©R5F107AEGSP ©R5F107AEMSP	©R5F107DEGSP ©R5F107DEMSP	
CPU			RL78 C	PU core	•	
Memory	Flash ROM [bytes]	3:	2К	6	4К	
	Data flash [bytes]		4	К		
	RAM [bytes]	2	K	4	IK	
Operating clocks	Maximum operating On-chip oscillator clock		$32MHz (T_A = -40 \text{ to } +105^{\circ}C)$	), 16MHz (T <sub>A</sub> = 105 to 125°C)		
	frequency [Hz] External resonator		201	ИНz		
Clock generator	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V <sub>D</sub>	<sub>D</sub> = 2.7 to 5.5V)		
circuit	High-speed on-chip oscillator [Hz]		1 to 32MHz ( $V_{DD} = 2.7$ to 5.5V)	, 1 to 8MHz ( $V_{DD} = 2.7$ to 5.5V)		
	Low-speed on-chip oscillator [Hz]		15kHz (V <sub>DD</sub> =	= 2.7 to 5.5V)		
	Subclock (32.768 kHz)		-		32.768kHz (V <sub>DD</sub> = 2.7 to 5.5V)	
I/0	I/O ports	16	2	6	34	
	N-channel open drain (6V tolerance)		-	_	•	
	N-channel open drain (Voo tolerance)	6	1	0	11	
Timers	16-bit timer TAU [channels]	8	8, PWM a	output × 1	8, PWM output × 3	
	16-bit timer KB [channels]	2, PWM output × 4	3, PWM a	output × 6	3, PWM output × 6	
	16-bit timer KC [channels]	1, PWM output × 3	1, PWM a	output × 6	1, PWM output × 6	
	Real-time clock (RTC) [channels]		1	*1		
	Watchdog timer (WDT) [channels]		1	1		
	Interval timer [channels]		12-bi	it × 1		
Serial interfaces	UART×1	_		1		
	CSI×1, UART (LIN bus and DMX512 support)×1		_		1	
	UART (LIN bus and DMX512 support)×1*2		1		—	
	UART (DALI communication support)×1*2		1	1		
	I <sup>2</sup> C×1		1	1		
DMA [channels]			2	2		
External interrupt	s [channels]	7	1	0	11	
OCD	On-chip debugging		Ye	es		
Peripheral	8/10-bit A/D converter [channels]	6		11		
functions	Comparator [channels]	4		6		
	PGA [channels]			1		
	Multiplier/divider/ multiply-accumulator         Library support for multiply/divide/multiply-accumulate operations (equipped with fu Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)					
	Other functions		Power-on reset (POR), low-vo			
Safety functions		R	ory CRC calculation function (high-spo AM parity error detection function, RA ory access detection function, frequen	AM guard function, SFR guard function	on,	
Other	Power supply voltage [V]		$V_{DD} = 2.7$	7 to 5.5V		
	Operating ambient temperature [°C]	$ ()T_A = -40 t $	o +105°C (G: Industrial applications),	$@T_{\text{A}} = -40$ to $+125^{\circ}\text{C}$ (M: Industrial	applications)	
	Package (size [mm])	20-LSSOP (4.4×6.5mm)	30-LSSOP (7.6	2mm (300mil))	38-SSOP (7.62mm (300mil))	
				1 1 1 <i>11</i>		

\* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash\_libraries \*1: Products with pin counts from 20 or 30 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use. \*2: The same pin is used for both functions on 20-pin products, so only one function may be used at any given time.



### RL78/I1B (80 to 100 pins)

Group			RL78	B/I1B								
Pin count		80-	-pin	100	-pin							
Product name		R5F10MMEDFB	RSF10MMGDFB	RSF10MPEDFB	RSF10MPGDFB							
CPU			RL78 C	PU core	I							
Memory	Flash ROM [bytes]	64K	128K	64K	128K							
	Data flash [bytes]		-	_								
	RAM [bytes]	6K	8K	6К	8K							
Operating clocks	Maximum On-chip oscillator clock		241	ЛНz								
	operating frequency [Hz] External resonator		20MHz									
Clock generator	Crystal/ceramic oscillator [Hz]	1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 8MHz (V_{DD} = 1.9 to 5.5V)										
circuit	High-speed on-chip oscillator [Hz]	24/12/6/	24/12/6/3MHz (V_{DD} = 2.7 to 5.5V), 12/6/3MHz (V_{DD} = 2.4 to 5.5V), 6/3MHz (V_{DD} = 1.9 to 5.5V)									
	Low-speed on-chip oscillator [Hz]		15kHz (V <sub>DD</sub> = 1.9 to 5.5V)									
	Subclock (32.768 kHz)		32.768kHz (Voc	= 1.9 to 5.5V)								
I/O	Total I/O ports and LCD pins (SEG and COM)	6	51	7	7							
	I/O ports	Ę	53	6	9							
	N-channel open drain (6V tolerance)		3	}								
Timers	16-bit timer TAU [channels]	8, PWM output × 7										
	Real-time clock (RTC) [channels]		1 (high-precision, 0.96 p	pm minimum resolution)								
	Watchdog timer (WDT) [channels]		1									
	Interval timer [channels]		12-bit × 1	, 8-bit × 4								
Serial interfaces	CSI×1, UART×1, simplified l <sup>2</sup> C×1		1									
	UART×1, simplified I <sup>2</sup> C×1		11									
	UART×1, IrDA×1		1									
	I <sup>2</sup> C×1	1										
LCD controller	LCD drive voltage generation method	Selectable among internal voltage boost, capacitor split, and external resistance division										
	Segment signal outputs	34 (	30)*1		38)*1							
	Common signal outputs		4 (8									
DTC (sources)			3									
External interrupt				0								
OCD	On-chip debugging		Ye									
Peripheral functions	8/10-bit A/D converter [channels]		4		6							
	24-bit $\Delta \sum$ A/D converter [channels]		3		4							
	Comparator [channels]			-								
	PGA	Multiply	×1, ×2, ×4, ×		ation act)							
	Multiplier/divider/         Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set)           multiply-accumulator         Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned)           Divide: 32-bit ÷ 32-bit = 32-bit (unsigned)											
	Other functions	Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)           Power-on reset (POR), low-voltage detection circuit (LVD), battery backup function, RTC output (1 Hz) × 1										
Safety functions		Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function										
Other	Power supply voltage [V]	V <sub>DD</sub> = 1.9 to 5.5V										
		T <sub>A</sub> = $-40$ to $+85^{\circ}$ C (D: Industrial applications)										
	Operating ambient temperature [°C]	C]         IA = -40 to +85°C (D: Industrial applications)           80-LFQFP (12×12mm)         100-LFQFP (14×14mm)										

\*1: The number in parentheses indicates the number of signal outputs when 8 coms are used.

Group			RL78	3/I1C	
Pin count		64-pin	80-	pin	100-pin
Product name		R5F10NLE/G	R5F10NME/G	RSF10NMJ	R5F10NPJ/G
Code flash [bytes]	]	64K to 128K	64K to 128K	256K	128K to 256K
Data flash [bytes]			2	K	
RAM [bytes]		6K to 8K	6K to 8K	16K	8K to 16K
System clocks	External		High-speed clock 1 to 20MHz	, Low-speed clock 32.768kHz	
	On-chip oscillator clock		High-speed 1.5 to 24MHz, Middle-s	speed 1 to 4MHz, Low-speed 15kHz	
	PLL clock	-	_	32	MHz
High-speed on-chip	oscillator clock frequency correction function		Ye	28	_
24-bit ∆∑ A/D	Input channels	4ch	3ch	3ch	4ch
converter	SNDR		to 80dB (	gain × 1)	
	Sampling frequency		3.906kHz/	/1.953kHz	
	PGA		×1, ×2, ×4, ×	8, ×16, (×32)	
	Internal reference voltage (temperature coefficient)		0.8V (10	ppm/°C)	
	Zero-cross detection		HW Zero-cro	ss detection	
8/10-bit A/D conv	erter		4ch		6ch
32-bit multiply-an	d accumulate circuit		Ye	25	
LCD controller	Segment/common signal combinations	15/8, 19/4	30/8, 34/4	30/8, 34/4	38/8, 42/4
	Drive voltage generation method	Select	able among internal voltage boost, ca	pacitor split, and external resistance	division
Timers			16-bit timer a	rray unit: 8ch	
			12-bit Interv	al timer: 1ch	
			8-bit Interva	ıl timer: 4ch	
RTC with indepen	dent power supply		10	ch	
Serial interfaces	CSIO, UARTO, simplified I <sup>2</sup> CO		10	ch	
	CSI1, UART1, simplified I <sup>2</sup> C1		10	ch	
	UART2, IrDA		10	ch	1
	CSI3, UART3, simplified I <sup>2</sup> C3		_		1ch
	MultiMaster I <sup>2</sup> C		10	ch	1
DTC (sources)			36		38
ELC			22 event generation sources, 5 se		
Battery backup functions	CPU		VDD/		
lanotiono	24-bit $\Delta \sum A/D$ converter		VDD/		
1 1. 1.	RTC		VRTC (independe		
Low-voltage deter	ction circuit (LVD)		Internal VDD, VDD pin, VBA		
AES HW		F-1	Encryption mode: GCM/ECB/CBC, en		
Key interrupts	unations	5pins	Motobele - times	8pins	
Other peripheral f			Watchdog timer, power-on		
Power supply volt			1.7V t		
	t temperature [°C]	64 LEOED (10, 40mm)		to 85°C	100   FOED /14, -14
Package (size [mn	1])	64-LFQFP (10×10mm)	80-LFQFP (	12×1211111)	100-LFQFP (14×14mm)



### RL78/I1C (512KB) (80 to 100 pins)

Group		RL78/I1C	; (512KB)
Pin count		80-pin	100-pin
Product name		R5F10N/MLDFB	R5F10NPLDFB
CPU		RL78 C	PU core
Memory	Flash ROM [bytes]	512K (256KE	3 × 2 banks)
	Data flash [bytes]	2	К
	RAM [bytes]	32	K''1
Operating clocks	Maximum operating On-chip oscillator clock	32N	ЛНz
	frequency [Hz] External resonator	201	ЛНг
Clock generator	Crystal/ceramic oscillator [Hz]	High-speed clock 1 to 20MHz	r, Low-speed clock 32.768kHz
circuit	On-chip oscillator [Hz]	High-speed 1.5 to 24MHz, Middle-s	speed 1 to 4MHz, Low-speed 15kHz
	PLL [Hz]	32N	
	oscillator clock frequency correction function	Ye	
24-bit $\Delta \sum A/D$ converter	Input channels [ch]	3	4
CONVENCE	SNDR	to 80dB (	
	Sampling frequency	3.906kHz/	
	PGA Internal reference voltage	×1, ×2, ×4, ×	
	(temperature coefficient)	0.8V (10	
	Zero-cross detection	HW Zero-cro	
12-bit A/D conver		4	6
	d accumulate circuit	Ye	
LCD controller	Segment/common signal combinations	30/8, 34/4	38/8, 42/4
	Drive voltage generation method	Selectable among internal voltage boost, ca	
Timers		16-bit timer a 12-bit Interv	
		8-bit Interva	
RTC with indepen	dent power supply [ch]		
Serial interfaces	CSI0/UART/simplified I <sup>2</sup> C [ch]	2	3
oonar menaeco	UART/IrDA [ch]		
	UART [ch]	_	1
	l <sup>2</sup> C bus [ch]		l
	UARTMG [ch]	2	2
Data transfer cont	roller (DTC) (sources)	46	50
Event link	Event input		7
controller (ELC)	Event trigger input	3	0
Battery backup	CPU	V <sub>DD</sub> /V	/BAT
functions	24-bit $\Delta \sum A/D$ converter	Vod/V	
	RTC	VRTC (independe	
Low-voltage detec	ction circuit (LVD)	Internal Voo, Voo pin, VBAT	
AES HW		Encryption mode: GCM/ECB/CBC, en	
Key interrupts		8p	
Other peripheral f		Watchdog timer, power-on	
Power supply volt		1.6V t	
	t temperature [°C]	-40°C 1	
Package (size [mm		80-LFQFP (12×12mm)	100-LFQFP (14×14mm)

\*1: This is about 31 KB when the self-programming function is used.

MEMO		

#### 98-99



### RL78/I1D (20 to 48 pins)

Group								F	RL78/I1	D					
Pin count			20-	-pin	24	-pin		30-pin			32	-pin		48	-pin
Product name			R5F11768GSP	R5F1176AGSP	R5F11778GNA	R5F1177AGNA	R5F117A8GSP	R5F117AAGSP	R5F117ACGSP	R5F117BAGNA	R5F117BCGNA	R5F117BAGFP	R5F117BCGFP	R5F117GAGFB	R5F117GCGFB
CPU								R	L78 CPU co	re	,				
Memory	Flash ROM	/I [bytes]	8K	16K	8K	16K	8K	16K	32K	16K	32K	16K	32K	16K	32K
	Data flash	n [bytes]							2K				1		
	RAM [byt	es]	0.7K										3K	2K	3K
Operating clocks	Maximum operating	On-chip oscillator clock							24MHz						
	frequency [Hz]	External resonator	20MHz												
Clock generator	Crystal/ce	eramic oscillator [Hz]			1 to 2	20MHz (Vod	= 2.7 to 3.6	6V), 1 to 8M	IHz (Vdd = 1.	.8 to 2.7V),	1 to 4MHz (	Vod = 1.6 to	o 1.8V)		
circuit	High-spee	ed on-chip oscillator [Hz]				1	:o 24MHz (\	/ <sub>DD</sub> = 2.7 to	3.6V), 1 to	16MHz (V <sub>DD</sub>	= 2.4 to 3.6	6V),			
	Middle-sp	peed on-chip oscillator [Hz]			11	to 8MHz (Vi	o = 1.8 to 3	.6V), 1 to 4	MHz (Vdd =	1.6 to 3.6V)	, 1MHz (Voc	o = 1.8 to 3	.6V)		
	Low-spee	d on-chip oscillator [Hz]						15kHz	$(V_{DD} = 1.6 t)$	:o 3.6V)					
	Subclock	(32.768 kHz)			_					32.768kl	Hz (Vdd = 1.	6 to 3.6V)			
I/O	I/O ports		1	4	1	18		24			2	26			42
	N-ch	annel open drain (6V tolerance)	-	_		_		_			-				4
	N-ch	annel open drain (VDD tolerance)							_						
Timers	16-bit tim	er TAU [channels]							4						
	Real-time	clock (RTC) [channels]							1*1						
	Watchdog	g timer (WDT) [channels]							1						
	Interval ti	mer [channels]						8-bit × 4 (c	or 16-bit × 2	), <b>12-</b> bit × 1					
Serial interfaces	CSI×1, U/	ART×1, simplified I <sup>2</sup> C×1		1		_		1			-	_			_
	CSI×2, U/	ART×1, simplified I <sup>2</sup> C×2	-	_		1		_				1			1
DTC (sources)			1	6	2	20		19			2	20			23
ELC (inputs/trigge	er outputs)		13	3/5	1	7/5		16/7			1	7/7		2	0/7
External interrupt	pins [coun	t]		3					5						8
OCD	On-chip d	ebugging							Yes						
Peripheral	12-bit A/[	) converter [channels]			6					12					17
TUNCTIONS	Multiplier multiply-a	/divider/ iccumulator			Multi		Multiply Div	r: 16-bit × 1 ide: 32-bit -	tructions su 6-bit = 32-t ÷ 32-bit = 3 16-bit + 32	oit (signed/u 2-bit (unsig	ınsigned) ned)		ion set)		
	Op-amp [	channels]			2						4				
	Comparat	or [channels]							2						
	Other fun	ctions		P	ower-on res	et (POR), lo	w-voltage o	letection cir	rcuit (LVD), d	clock/buzzei	r output, da	ta operatio	n circuit (DC	IC)	
Safety functions			Flas	'		tion, SFR g	uard function	on, illegal m		ss detectior	n function, f	frequency d	rity error de letection fur		ction,
Other	Power su	oply voltage [V]						V	oo = 1.6 to 3	3.6					
	Operating	ambient temperature [°C]					-40	) to +105°C	; (G: Industr	ial applicati	ons)				
	Package (	size [mm])		SSOP 6.5mm)	24-HWQF	N (4×4mm)	(7.	30-LSSOP 62mm (300)			VQFN 5mm)		LQFP 7mm)		LFQFP 7mm)

\* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash\_libraries \*1: Products with pin counts from 20 or 24 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use.

### RL78/I1E (32 to 36 pins)

Group			RL78	B/I1E	
Pin count		32	-pin	36	-pin
Product name		RSF11CBCGNA	R5F 11CBCMNA	R5F 11CCCGBG	R5F11CCCMBG
CPU			RL78 C	PU core	
Memory	Flash ROM [bytes]		32	2K	
	Data flash [bytes]		4	К	
	RAM [bytes]		8	К	
Operating clocks	Maximum operating		321	ЛНz	
	frequency [Hz] External resonator		201	ЛНz	
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (2.7 to 5.5V),	1 to 16MHz (2.4 to 2.7V)	,
circuit	High-speed on-chip oscillator [Hz]	1 to 32MHz (2.7 to 5.5V)	1 to 24MHz (2.7 to 5.5V) 1 to 16MHz	1 to 32MHz (2.7 to 5.5V) (2.4 to 2.7V)	1 to 24MHz (2.7 to 5.5V)
	Low-speed on-chip oscillator [Hz]		151	kHz	
	Subclock (32.768 kHz)		-	_	
I/O	I/O ports	1	10		14
	N-channel open drain (6V tolerance)		-	-	
	N-channel open drain (Voo tolerance)		(	6	
Timers	16-bit timer TAU [channels]		(	6	
	16-bit timer RJ [channels]			1	
	16-bit timer RG [channels]			1	
	Real-time clock (RTC) [channels]			1	
	Watchdog timer (WDT) [channels]		·	1	
	Interval timer [channels]		15-bi	it × 1	
Serial interfaces	CSIx2, UART×1, simplified I <sup>2</sup> C×2			1	
	UART×1			•	
DTC (sources)				3	
ELC (inputs/trigge				\$/7 	
External interrupt			7		8
OCD Peripheral	On-chip debugging Instrumentation amplifier + 24-bit $\Delta \Sigma$ A/D converter [channels]		3	es	4
functions	8/10-bit A/D converter [channels]		8		10
	12-bit D/A converter [channels]			1	
	Configurable amplifier [channels]			3	
	Multiplier/divider/ multiply-accumulator	Library sup		= 32-bit (signed/unsigned) it = 32-bit (unsigned)	nctional unit)
	Other functions	Power-on reset (PO	R), low-voltage detection circuit (LVD)	, temperature sensor, reference volta	ge generation circuit
Safety functions		RAM guard functio	n function (high-speed), CRC calculati n, SFR guard function, illegal memory A/D converter test function, I/O power	access detection function, frequenc	y detection function,
Other	Power supply voltage [V]		Vcc = 2.	4 to 5.5V	
	Operating ambient temperature [°C]	Ta = -40 to +105°C (G: Industrial applications)	Ta = -40 to +125°C (M: Industrial applications)	Ta = -40 to +105°C (G: Industrial applications)	Ta = -40 to +125°C (M: Industrial applications)
	Package (size [mm])	32-HVQFI	N (5×5mm)	36-TFBGA	A (4×4mm)



#### RL78/F23 (32 to 80pins)

Group				RL78	3/F23	
Pin count			32-pin	48-pin	64-pin	80-pin
Product name			R7F123FBG3ANP-C"	R7F123FGG3AFB-C*1	R7F123FLG3AFB-C*1	R7F123FMG3AFB-C"1
CPU				RL78 C	PU core	·
Memory	Flash ROM	/I [bytes]		1:	28	
	Data flash	[bytes]		1	В	
	RAM [byt	es]		1	2	
Operating clocks	Maximum	On-chip oscillator clock		40	MHz	
	operating frequency [Hz]	External resonator		20	VIHz	
		Timer RD clock		80 1	VIHz	
Clock generator	Crystal/ce	ramic oscillator [Hz]		1 to 2	OMHz	
circuit	High-spee	ed on-chip oscillator [Hz]		MAX. 80N	/IHz (±2%)	
	Low-spee	d on-chip oscillator [Hz]		15 kHz	z (TYP.)	
	Subclock			32.768 kHz (VD	D = 2.7 to 5.5 V)	
	PLL			Multiplication factors: >	<3, ×4, ×5, ×6, ×8, ×10	
I/O	I/O ports		25	38	52	68
	N-ch	annel open drain (6V tolerance)		-	-	-
	N-cha	annel open drain (EV <sub>DD</sub> tolerance)			30	45
Timers	16-bit tim	er (TAU) [channels]		1	2	
	16-bit tim	er (RJ) [channels]			1	
	16-bit tim	er (RDe) [channels]			2	
	Real-time	clock (RTC) [channels]			1	
	Watchdog	timer (WDT) [channels]			1	
Serial interfaces	CSI×4, UA	ART×2, Simplified I <sup>2</sup> C×4	_		1	
	CSI×3, UA	ART×2, Simplified I <sup>2</sup> C×3	1		_	
	UART×1,	LIN (RLIN3)×1			1	
	CAN (RS-	CANFD lite)×1		-	_	
	Multi-mas	ster I <sup>2</sup> C×1			1	
		(activation sources)	35		36	
Event link control	er (ELC) (in	puts/trigger outputs)		-	_	1
Interrupt sources	External		8	12	14	15
OCD	On-chip d	ebugging		Yes (Hot plugin	, On-chip trace)	
Peripheral	8/10-bit A	/D converter [channels]	8	13		16
functions	8-bit D/A	converter [channels]		-	_	
	Comparat	or [channels]		-	-	
	Clock/buz	zer output	-		1	
	Multiplier/	divider/ multiply-accumulator	Application Accelerator Unit (	AAU, the dedicated arithmetic assist I	hardware to reduce the software loa	ad for FOC algorithm processing)
	Other fun	ctions		ower-on reset (POR), low-voltage dete		
Safety functions	ASIL-B (IS	026262)	Code flash memory 1-bit error	•	ry 2-bit error detection function, RA n function, Frequency detection fun- tion, A/D converter test function	M 1-bit error correction function,
Security functions	Evita light	(ISO/SAE21434)		Random number		
Other	Power sup	oply voltage [V]		V <sub>DD</sub> = 2.7		
	Operating	ambient temperature [°C]		applications), $T_A = -40$ to $+125$ °C (4: A		
	Package (	size [mm])	32-pin HWQFN (5x5mm)	48-pin LFQFP (7×7mm)	64-pin LFQFP (10×10mm)	80-pin LFQFP (12×12mm)

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R7F1xxxxx4xxx-C) or -40 to +150°C ambient operating temperature range (part number: R7F1xxxxx5xxx-C) are also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.

### RL78/F24 (32 to 100pins)

Group					RL78/F24		
Pin count			32-pin	48-pin	64-pin	80-pin	100-pin
Product name			R7F124FBJ3ANP-C*1	R7F124FGJ3AEB-C**	R7F124FLJ3AFB-C"	R7F124FMJ3AFB-C"	R7F124FPJ3AFB-C"
CPU			_	_	RL78 CPU core	_	_
Memory	Flash ROM	/I [bytes]			256		
,	Data flash	n [bytes]			16		
	RAM [byte	es]			24		
Operating clocks	Maximum	On-chip oscillator clock			40 MHz		
	operating	External resonator			20 MHz		
	frequency [Hz]	Timer RD clock			80 MHz		
Clock generator	Crystal/ce	eramic oscillator [Hz]			1 to 20MHz		
circuit	High-spee	ed on-chip oscillator [Hz]			MAX. 80MHz (±2%)		
	Low-spee	d on-chip oscillator [Hz]			15 kHz (TYP.)		
	Subclock				32.768 kHz (VDD = 2.7 to 5.5 V	)	
	PLL			Multiplie	cation factors: ×3, ×4, ×5, ×6,	×8, ×10	
I/0	I/O ports		25	38	52	68	86
	N-ch	annel open drain (6V tolerance)			_		
	N-cha	annel open drain (EVDD tolerance)	-	-	30	45	57
Timers	16-bit tim	er (TAU) [channels]			16		
	16-bit tim	er (RJ) [channels]			1		
	16-bit tim	er (RDe) [channels]			2		
	Real-time	clock (RTC) [channels]			1		
	Watchdog	g timer (WDT) [channels]			1		
Serial interfaces	CSI×4, UA	ART×2, Simplified I <sup>2</sup> C×4	—			1	
	CSI×3, UA	ART×2, Simplified I <sup>2</sup> C×3	1		-	-	
	UART×1,	LIN (RLIN3)×1			2		
	CAN (RS-	CANFD lite)×1			1		
	Multi-mas	ster I <sup>2</sup> C×1			1		
Data transfer con	troller (DTC)	) (activation sources)	43		4	4	
Event link control	ler (ELC) (in	puts/trigger outputs)			26/10		
Interrupt sources	External		10	14	15	1	6
OCD	On-chip d	ebugging			Yes (Hot plugin, On-chip trace	)	
Peripheral	8/10-bit A	/D converter [channels]	8	13		16	
functions	8-bit D/A	converter [channels]			1		
	Comparat	or [channels]			1unit (4ch)		
	Clock/buz	zer output	-			1	
	Multiplier/	divider/ multiply-accumulator	Application Accelerato	r Unit (AAU, the dedicated ari	thmetic assist hardware to rec	luce the software load for FO	C algorithm processing)
	Other fun	ctions			w-voltage detection circuit (LV	·	
Safety functions	ASIL-B (IS	:026262)	Code flash memory 1-bi	t error correction function, Co on function, Invalid memory a	a memory fast CRC operation for ode flash memory 2-bit error data access detection function, Free er monitor function, A/D conve	etection function, RAM 1-bit e quency detection function, Clo	error correction function,
Security functions	Evita light	t (ISO/SAE21434)			CBC mode and CMAC (AES-12 andom number generator (TRN		
Other	Power sup	oply voltage [V]			$V_{\text{DD}}=2.7 \text{ to } 5.5 \text{ V}$		
	Operating	ambient temperature [°C]	$T_A = -40 \text{ to } +105^{\circ}\text{C}$ (3: Auton	notive applications), $T_A = -40$	to +125°C (4: Automotive appli	$(a = -40 \text{ to } +150^{\circ}\text{C})^{*1}$ , $T_A = -40 \text{ to } +150^{\circ}\text{C}$	(5: Automotive applications)"
	Package (	size [mm])	32-pin HWQFN (5x5mm)	48-pin LFQFP (7×7mm)	64-pin LFQFP (10×10mm)	80-pin LFQFP (12×12mm)	100-pin LFQFP (14×14mm)

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R7F1xxxxx4xxx-C) or -40 to +150°C ambient operating temperature range (part number: R7F1xxxx5xxx-C) are also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.



### RL78/F13 (30 to 80 pins)

Group													RL78/	F13 (C	an a	LIN)									
Pin count				3	80-pir	ı	_			32-pii	n				48-pin					64-pi	n		8	0-pin	
Product name			R5F10BACLSP <sup>*1</sup>	R5F10BADLSP*1	R5F10BAELSP <sup>*1</sup>	R5F10BAFLSP*1	R5F10BAGLSP <sup>+1</sup>	R5F10BBCLNA*1	R5F10BBDLNA"	R5F10BBELNA*1	R5F10BBFLNA*1	R5F10BBGLNA*1	@R5F10BGCLFB*1 @R5F10BGCLAA*1	<pre>①R5F10BGDLFB'1 ②R5F10BGDLNA'1</pre>	©R5F10BGELFB*1 ©R5F10BGELNA*1	<pre>@R5F10BGFLFB*1 @R5F10BGFLNA*1</pre>	①R5F10BGGLFB*1 ②R5F10BGGLAB*1	R5F10BLCLFB*1	R5F10BLDLFB <sup>+1</sup>	R5F10BLELFB*1	R5F10BLFLFB <sup>*1</sup>	R5F10BLGLFB*1	R5F10BMELFB <sup>+1</sup>	R5F10BMFLFB*1	R5F10BMGLFB*1
CPU														RL78 CP											_
Memory	Flash ROM	/I [bytes]	32K	48K	64K	96K	128K	32K	48K	64K	96K	128K	32K	48K	64K	96K	128K	32K	48K	64K	961	K 128K	64K	96K 1	28K
	Data flash	n [bytes]			4K					4K					4K					4K				4K	
	RAM [byt	es]	2K	3K	4K	6K	8K	2K	3K	4K	6K	8K	2K	3K	4K	6K	8K	2K	3K	4K	6K	8K	4K	6K	8K
Operating clocks	Maximum	On-chip oscillator clock		32	MHz	(auto	motive	e appl	icatior	ns, T <sub>A</sub> =	= -40	to +1	05°C), 2	4MHz (au	tomotive	applicati	ions, T <sub>A</sub> =	-40 to	+12	25°C, 1	$T_A = \cdot$	-40 to -	+150°	C)	
	operating	External resonator												20M	Hz										
	frequency [Hz]	Timer RD clock												64M	Hz										
Clock generator	Crystal/ce	eramic oscillator [Hz]												1 to 20	MHz										
circuit	High-spee	ed on-chip oscillator [Hz]	64MI	Hz (±2%	): autor	notive	applica	tions/	$\Gamma_{A} = -40$	) to +1(	05°C, 48	BMHz (:	±3%): auto	omotive app	lications/T <sub>#</sub>	= -40 to +	+125°C, 481	MHz (±5	%): aı	utomoti	ive app	plications	/T <sub>A</sub> =	40 to +1!	50°C
	Low-spee	d on-chip oscillator [Hz]												15k	Ηz										
	Subclock	(32.768 kHz)					-	_									32.7	68kHz							
	PLL											Μ	ultiplicat	tion facto	rs: ×3, ×4	4, ×6, ×8	}								
I/O	I/O ports				23					25					38					52				68	
	N-cha	annel open drain (6V tolerance)		_																					
	N-cha	annel open drain (EV10 tolerance)		9 13 16																					
Timers	16-bit tim	er TAU [channels]												16											
	Timer RJ													1											
	Timer RD													2											
	Real-time	clock (RTC) [channels]												1							-				
	Watchdog	g timer (WDT) [channels]												1											
Serial interfaces	CSI×2, UA	ART×1, simplified l <sup>2</sup> C×2						1										_							
	CSI×4, UA	ART×2, simplified I <sup>2</sup> C×4					-	_										1							
	UART×1,	LIN (RLIN3)×1												1											
	CAN (RS-	CAN lite)×1						-				_		1											
	Multi-mas	ster I²C×1			_											1									
DTC (sources)							3	16										37							
External interrupt	s [channels	]					(	9							13						_	14			
OCD	On-chip d	ebugging											Ye	s (hot plu	gin, trace	:)									
Peripheral	8/10-bit A	/D converter [channels]			12					10					15					19				20	
functions	8-bit D/A	converter [channels]												_											
	Comparat	or [channels]												_											
	Multiplier multiply-a	/divider/ locumulator	Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																						
	Other fun	ctions							Powe	r-on re	eset (I	POR),	low-volta	age detec	tion circu	it (LVD),	RTC outp	ut (1Hz	) × 1						
							-	_								CI	lock/buzz	er outp	ut ×	1					
Safety functions	fety functions				Fla	ash m	CPU	stack	pointe	er mor	nitor fi s dete	unctio ction f	n, clock function,	d), CRC ci monitor f frequenc ut signal	unction, l y detecti	RAM gua on functi	rd functio on, A/D c	on, SFF	gua	rd fun	nctior	٦,	in,		
Other	Power sup	oply voltage [V]												VDD = 2.7											
		ambient temperature [°C]	Ta =	—40 to	+105	°C (L:	autor	notive	e appli	cation	s), Ta	= -40	to +125	°C (K: aut	omotive a	applicatio	ns)*1, TA	= -40	0 +1	50°C	(Y: ai	utomoti	ve app	lication	s)*
	Package (	size [mm])		-LSSOI					2-HV0					148-	.FQFP (7> IVQFN (7	<7mm)				FP (10			80	-LFQFP ×12mm	)

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R5F1xxxXxx) or -40 to +150°C ambient operating temperature range (part number: R5F1xxxXxx) are also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

# RL78/F13 (20 to 80 pins)

Group														RL7	8/F1	3 (LIN	)									
Pin count				20-р	in		3	0-pi	in		32	2-pin				48	-pin				6	4-pin			80	)-pin
Product name			R5F10A6ALSP*1	R5F10A6CLSP*1	H5F10A6DLSP	R5F10A6ELSP"	R5F10AALSP		R5F10AADLSP*1 R5F10AAFLSP*1		R5F10ABALNA* <sup>1</sup> R5F10ARCI NA* <sup>1</sup>	R5F10ABDLNA <sup>+1</sup>	R5F10ABELNA*1	③R5F10AGALFB*1 ③R5F10AGALNA*1	③R5F10AGCLFB <sup>+1</sup> ③R5F10AGCLNA <sup>+1</sup>	@R5F10AGDLFB*1 @R5F10AGDLNA*1	<pre>①R5F10AGELFB<sup>*1</sup></pre> <pre>②R5F10AGELNA<sup>*1</sup></pre>	③R5F10AGFLFB <sup>+1</sup> ②R5F10AGFLNA <sup>+1</sup>	③R5F10AGGLFB <sup>*1</sup> ③R5F10AGGLNA <sup>*1</sup>	R5F10ALCLFB*1	R5F10ALDLFB*1	R5F10ALELFB*1	R5F10ALFLFB*1	R5F10ALGLFB*1	K5F IUAMELFB	R5F10AMFLFB*1
CPU							_					_		R	L78 CPI		. ~ ~									
Memory	Flash RON	/ [bytes]	16K	32K 4	8K 6	i4K 1	6K 32	K 4	8K 64	K 1	6K 32	K 48K	64K	16K	32K	48K	64K	96K	128K	32K	48K	64K	96K <sup>-</sup>	128K 6	4K 9	96K 12
	Data flash	[bytes]		4K				4K		T		4K					łK						4K			
	RAM [byte	es]	1K	2K 3	3K 4	4K 1	K 21	K 3	3K 4F	( -	1K 2F	K 3K	4K	1K	2K	3K	4K	6K	8K	2K	3K	4K	6K	8K 4	ΙK	6K 8
Operating clocks	Maximum	On-chip oscillator clock		32	MHz	(auto	motive	e ap	plicatio	ons,	$T_A = -$	40 to	+105°	°C), 24N	IHz (aut	omotive	applica	tions, T <sub>A</sub>	=-40 1	to +1:	25°C,	$T_A = -$	-40 to	o +150	)°C)	
	operating	External resonator													20MI	lz										
	frequency [Hz]	Timer RD clock													64MI	lz										
Clock generator	Crystal/ce	ramic oscillator [Hz]													1 to 201	ЛНz										
circuit	High-spee	d on-chip oscillator [Hz]	64M	Hz (±2%)	: auto	motive	applica	ations	s/T <sub>A</sub> =	40 to	o +105°C	, 48MH	lz (±3%	): automo	tive appl	cations/T	$_{A} = -40$ to	+125°C, 4	18MHz (±	5%): a	utomo	tive app	licatio	ins/T <sub>A</sub> =	-40	to +150
	Low-spee	d on-chip oscillator [Hz]													15kH	z										
	Subclock	(32.768 kHz)						-										:	32.768k	Hz						
	PLL												Multi	plicatio	n factor	s: ×3, ×	4, ×6, ×	8								
I/O	I/O ports			13				23				25				1	38					52				68
	N-cha	annel open drain (6V tolerance)													_											
	N-cha	nnel open drain ( $EV_{DD}$ tolerance)			6 10											16	/13					16/13				16
Timers	16-bit tim	er TAU [channels]									8							1	2		8				2	
	Timer RJ														1											
	Timer RD														2											
	Real-time	clock (RTC) [channels]													1											
	Watchdog	timer (WDT) [channels]													1											
Serial interfaces	CSI×2, UA	ART×1, simplified l <sup>2</sup> C×2									1							-	_				1			
	CSI×4, UA	ART×2, simplified l <sup>2</sup> C×4									_											1				
	UART×1,	LIN (RLIN3)×1													1											
	CAN (RS-0	CAN lite)×1													_											
	Multi-mas	ster I <sup>2</sup> C×1									_								1		_				1	
DTC (sources)				28						29					3	80		3	6		30			3	36	
External interrupts	s [channels	]		7						8						0		1	2		10				3	
OCD	On-chip d													Yes (I	not plug	in, trac	e)									
Peripheral	8/10-bit A	/D converter [channels]		4				10				8				2		1	5		12		19			20
functions	8-bit D/A	converter [channels]													_											
	Comparat	or [channels]																								
	Multiplier multiply-a	/divider/ ccumulator	Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																							
	Other fund	ctions							Pow	er-c	on rese	t (POF	l), low	-voltage	detect	on circı	iit (LVD),	RTC ou	tput (1F	lz) × '	1					
							_										Clock/b	uzzer o	utput	× 1						
Safety functions	afety functions					Flash	CPI	J sta	ack poi	nter	r monit	or fund etectio	ction, on fun	clock mo ction, fro	onitor fu equency	nction, l detecti	function RAM gua on functi ction fur	ard function, A/D	tion, SFF	R guar	rd fun	ction,	unctio	on,		
Other	Power sup	oply voltage [V]												VDI	o = 2.7 f	o 5.5V										
	Operating	ambient temperature [°C]	Ta =	-40 to	+105	5°C (L	: autor	noti	ve app	lica	tions),	Ta = -	40 to	+125°C	(K: auto	motive	applicati	ons)* <sup>1</sup> , T	A = −40	to +1	150°C	; (Y: au	itomo	otive a	oplic	ations)
	Package (	size [mm])		20-LSS 6.1×6.6				LSS	SOP 5mm)			HVQFI <5mm					P (7×7n N (7×7r					-LFQF ×10m				LFQFP 12mm

Ambient operating temperature range of the above part numbers is –40 to +105°C. \*1: Products with –40 to +125°C ambient operating temperature range (part number: R5F1xxxXfxx) or –40 to +150°C ambient operating temperature range (part number: R5F1xxxXfxx) are also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.



# RL78/F14 (30 to 100 pins)

Group							RL78	B/F14				
Pin count			30-	·pin	32-	pin			48	-pin		
Product name			R5F10PADLSP*1	R5F10PAELSP"	R5F10PBDLNA"	R5F10PBELNA*	©R5F10PGDLFB *1 ©R5F10PGDLNA *1	©R5F10PGELFB *1 @R5F10PGELNA *1	©R5F10PGFLFB *1 ©R5F10PGFLNA *1	©R5F10PGGLFB *1 ©R5F10PGGLNA *1	©R5F10PGHLFB *1 ©R5F10PGHLNA *1	©R5F10PGJLFB 11
CPU					1		RL78 C	PU core				•
Memory	Flash RO	M [bytes]	48K	64K	48K	64K	48K	64K	96K	128K	192K	256K
	Data flas	h [bytes]		K		K		4K	1		8K	1
	RAM [by	1	4K	6K	4K	6K	4K	6K	8K	10K	16K	20K
Operating clocks	Maximum operating	On-chip oscillator clock	32MHz (automo	tive applications	$T_{A} = -40 \text{ to } +10$	)5°C), 24MHz (a	utomotive applic	ations, $T_A = -40$	to +125°C), 24N	IHz (automotive	applications, T <sub>A</sub> =	= -40 to +150°C)
	frequency [Hz]	External resonator					201	MHz				
		Timer RD clock					641	VIHz				
Clock generator	Crystal/c	eramic oscillator [Hz]					1 to 2	20MHz				
circuit		ed on-chip oscillator [Hz]	64MHz (±2%): a	utomotive applicat	tions/ $T_A = -40$ to +	105°C, 48MHz (±3	3%): automotive ap	oplications/ $T_A = -4$	40 to +125°C, 48M	Hz (±5%): automo	tive applications/T	$A_{A} = -40 \text{ to } +150^{\circ}\text{C}$
	Low-spee	ed on-chip oscillator [Hz]					15	kHz				
	Subclock	: (32.768 kHz)		-	_				32.7	68kHz		
	PLL					Mu	Itiplication fact	ors: ×3, ×4, ×6	6, ×8			
I/0	I/O ports		2	3	2	5			3	38		
	N-c	hannel open drain (6V tolerance)					-	_				
	N-c	hannel open drain (EVID tolerance)		9	1	3			1	16		
Timers	16-bit tin	ner TAU [channels]		1	12				16 (	or 12		
	16-bit tin	ner RJ [channels]						1				
	16-bit tin	ner RD [channels]						2				
	Real-time	e clock (RTC) [channels]						1				
	Watchdo	g timer (WDT) [channels]						1				
Serial interfaces	CSI×3, U	ART×2, simplified l <sup>2</sup> C×3			1					_		
	CSI×4, U	ART×2, simplified I <sup>2</sup> C×4		-	—					1		
	UART×1,	, LIN (RLIN3)×1			1				2 (	or 1		
	CAN (RS-	-CAN lite)×1						1				
	Multi-ma	aster I²C×1	-	_					1			
DTC (sources)				3	37				44	/38		
ELC (inputs/trigge	er outputs)			20	)/7				26 (20	0)/9 (7)		
External interrupt					9				14 (	or 13		
OCD	On-chip (	debugging					Yes (hot pl	ugin, trace)				
Peripheral	8/10-bit	A/D converter [channels]	1	0	1	8			1	13		
functions	8-bit D/A	converter [channels]						1				
	Compara	tor [channels]						1				
		r/divider/ accumulator		Ν	/lultiply/divide/ Multip	Multiply: 1 Divide	16-bit × 16-bit : e: 32-bit ÷ 32-b	= 32-bit (signed it = 32-bit (uns	d/unsigned)		et)	
	Other fur	nctions		Power-	on reset (POR),	low-voltage de	tection circuit	(LVD), RTC outp	put (1 Hz) $ imes$ 1, o	clock/buzzer ou	tput × 2	
Safety functions			CPU stack p	, ointer monitor	CRC calculatio function, clock cy detection fur	monitor functi	on, RAM guard	function, SFR ction, I/O powe	guard function	, illegal memor	y access detec	
Other	Power su	ipply voltage [V]						7 to 5.5V				
	Operating	g ambient temperature [°C]			motive applicati		to +125°C (K: au	utomotive applic			Y: automotive a	pplications)*1
	Package	(size [mm])		SSOP .85mm)	32-H (5×5	VQFN imm)				P (7×7mm) N (7×7mm)		

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R5F1xxxXfxx) or -40 to +150°C ambient operating temperature range (part number: R5F1xxxXfxx) are also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

		RL78/F14	1												
64-pin		80-pin					100-pin		_						
R5F10PLELFB" R5F10PLFLFB" R5F10PLGLFB" R5F10PLJLFB"	R5F10PMELFB <sup>-1</sup>	R5F10PMGLFB"	R5F10PMHLFB*1	R5F10PMJLF8*	R5F10PPELFB*1	R5F10PPFLFB <sup>*1</sup>	R5F10PPGLFB*1	R5F10PPHLFB*1	R5F10PPJLFB*1						
	Letter I	RL78 CPU cor			,										
64K 96K 128K 192K 256K	64K 9	6K 128K	192K	256K	64K	96K	128K	192K	256K						
4К 8К	4K		8K	1	4	K		8K							
6K 8K 10K 16K 20K		3K 10K	16K	20K	6K	8K	10K	16K	20K						
32MHz (automotive applications, $T_A = -40$ to +	105°C), 24MHz (auto		$T_{A} = -40 \text{ to } + 7$	125°C), 24MH	z (automotive	applications,	$T_{A} = -40 \text{ to } + 7$	150°C)							
		20MHz 64MHz													
	1 to 20MHz														
$1 \text{ to 20VHz}$ $64\text{MHz} (\pm 2\%): \text{ automotive applications/T}_{A} = -40 \text{ to } +105^{\circ}\text{C}, 48\text{MHz} (\pm 3\%): \text{ automotive applications/T}_{A} = -40 \text{ to } +125^{\circ}\text{C}, 48\text{MHz} (\pm 5\%): \text{ automotive applications/T}_{A} = -40 \text{ to } +150^{\circ}\text{C}$ $15\text{kHz}$															
15kHz															
32.768kHz															
Multiplication factors: ×3, ×4, ×6, ×8															
Multiplication factors: x3, x4, x6, x8           52         68         86															
52 68 86 —															
52         68         86           —         —         —           16         —         —															
	1 2														
		1													
		1													
		1													
2 0	r 1	1					2								
		1	-	-											
		1													
44,	/38						44								
26 (20	)/9 (7)						26/9								
15 or 14		16 or 14					16								
		Yes (hot plugin, t	race)												
17 or 16		18 or 16					24								
		1													
NA. Isinh. / Ji	ido/multiplu o oumu	1 ulate instructions sur	norted (includ	lad in CDI Ling	truction cot)										
N	Multiply: 16 Divide: Lultiply-accumulate:	6-bit × 16-bit = 32-bi 32-bit ÷ 32-bit = 32 16-bit × 16-bit + 32- ection circuit (LVD), I	t (signed/unsi -bit (unsigned bit = 32-bit (si	gned) ) igned/unsigne	d)	× 2									
Flash memory CRC calcu CPU stack pointer monitor function, c	lation function (high lock monitor functio	n-speed), CRC calcula	tion function( on, SFR guard	general-purpo function, illeg	se), SRAM EC al memory ac	C function, cess detection	n function,								
	,	$V_{DD} = 2.7 \text{ to } 5.5$													
$T_{\text{A}}=-40 \text{ to }+105^{\circ}\text{C}$ (L: automotive app	lications), $T_A = -40$ to	) +125°C (K: automoti	ve applications	$()^{*1}, T_A = -40 \text{ to}$	) +150°C (Y: a)	utomotive appl	lications)*1								
64-LFQFP (10×10mm)		80-LFQFP (12×12	mm)			100	-LFQFP (14×14	4mm)							



# RL78/F15 (48 to 144 pins)

Group											RL78	8/F15								
Pin count				48-	-pin		64	-pin	80	-pin			100-pir	1				144-pir	1	
Product name			R5F113GKLFB"	R5F113GLLFB"1	R5F113GKLNA*1	R5F113GLLNA*1	R5F113LKLFB*1	R5F113LLLFB*1	R5F113MKLFB*1	R5F113MLLFB*1	R5F113PGLFB*1	R5F113PHLFB*1	R5F113PJLFB°1	R5F113PKLFB*1	R5F113PLLFB*1	R5F113TGLFB*1	R5F113THLFB*1	R5F113TJLFB*1	R5F113TKLFB*1	R5F113TLLFB*1
СРИ												PU core								
Memory	Flash RC	OM [bytes]	384K	512K	384K	512K	384K	512K	384K	512K	128K	192K	256K	384K	512K	128K	192K	256K	384K	512k
	Data flas	sh [bytes]				1	6K					8K		1	6K	8	K		1	6K
	RAM [by	/tes]	26K	32K	26K	32K	26K	32K	26K	32K	10K	16K	20K	26K	32K	10K	16K	20K	26K	32K
Operating clocks	Maximum	On-chip oscillator clock			32M	Hz (auto	motive a	applicatio	ons, T <sub>A</sub> =	–40 to -	+105°C)	24MHz	(automo	tive app	lications	$T_A = -4$	40 to +12	25°C)		
	operating	External resonator									201	ЛНz								
	frequency (Hz	Timer RD clock									641	ЛНz								
Clock generator	Crystal/o	ceramic oscillator [Hz]									1 to 2	OMHz								
circuit	High-spe	eed on-chip oscillator [Hz]		6	4MHz (±	:2%): au	tomotive	e applica	tions/T <sub>A</sub>	= -40 to	+105°C	48MHz	(±3%): a	automot	ive appli	cations/	$\Gamma_{A} = -40$	to +125	°C	
	Low-spe	ed on-chip oscillator [Hz]				_					15	kHz								
	Subcloc	k (32.768 kHz)									32.70	68kHz								
	PLL								M	ultiplica	tion fact	ors: ×3,	×4, ×6,	×8						
I/O	I/O ports	3		3	38			52	6	68			86					130		
	N-0	channel open drain (6V tolerance)									-	_								
	N-c	channel open drain (EV <sub>ID</sub> tolerance)										6								
Timers	16-bit tiı	mer TAU [channels]							16									24		
	16-bit tir	mer RJ [channels]										1								
	16-bit tir	mer RD [channels]										2								
	Real-tim	e clock (RTC) [channels]										1								
		og timer (WDT) [channels]										1								
Serial interfaces		JART×3, simplified I <sup>2</sup> C×4										1								
		JART×2, simplified I <sup>2</sup> C×3				-	_									1				
	CSI×4, l	JART×2, simplified l <sup>2</sup> C×4					1								-					
	UART×1	, LIN (RLIN3)×1					2									3				
	CAN (RS	S-CAN lite)×1										2								
	IEBus co	ontroller										1								
	Multi-m	aster I²C×1										1								
DTC (sources)						L	16						50					52		
ELC (inputs/trigge	r outputs)	)									26	5/9				1				
External interrupt				- 1	15	-		18	1	9			20					22		
OCD	On-chip	debugging								Ye	s (hot pl	ugin, tra	ce)							
Peripheral		A/D converter [channels]		1	3			17	1	8			. <u>.</u>		2	24				
functions	8-bit D/A	A converter [channels]																		
	Compara	ator [channels]										1								
		er/divider/ -accumulator				Mult	. ,	ide/multi I ultiply-ac	Multiply: Divi	16-bit × de: 32-bi	: 16-bit = it ÷ 32-b	= 32-bit it = 32-b	signed/ it (unsig	unsigne ned)	d)		n set)			
	Other fu	nctions			Po	wer-on		DR), Iow-									output >	< 2		
Safety functions			SI		RAM EC	, CC functi	CRC calc ion, CPU memory	stack po access	inter mo detectio	nitor fur	nction, cl n, frequ	ock mor ency det	iitor fun ection fi	ction, RA unction,	AM guar	d functio		on,		
Other	Power si	upply voltage [V]									$V_{DD} = 2.$	7 to 5.5V	1							
	Operatin	g ambient temperature [°C]				$T_A = -4$	0 to +10	15°C (L: a			ations),	$T_A = -40$	to +12	5°C (K: a	utomoti	ve applic	ations)*1			
	Package	(size [mm])		FQFP 7mm)		VQFN 7mm)		.FQFP 10mm)		FQFP I 2mm)		100-LF	2FP (14>	(14mm)			144-LF(	2FP (20>	<20mm)	

Ambient operating temperature range of the above part numbers is -40 to +105°C. \*1: Products with -40 to +125°C ambient operating temperature range (part number: R5F1xxxxKxx) is also available. For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

### **RL78 FAMILY PACKAGE LINEUP**



Note: \*1. G14 (384, 512 KB)



# **EXPLANATION OF ORDERABLE PART NUMBERS** (For part numbers start with R5F)

R5 F 1	00 6 E C A SP #Vx
Renesas ROM Type RL74 MCU F: Flash Fam	
	Packaging, Material (Pb-free)
Product group	#G, #O Full Carton
00 G13 Data Flash	(HWQFN,HVQFN,WFLGA) #H, #1 Full Carton
01 No Data Flash	(SSOP,LSSOP,LGFP,LFQFP,TSSOP,WDFN)
02 G12 Data Flash 03 No Data Flash	#U, #2 Tray (HWQFN,HVQFN.VFBGA,VFLGA,WFLGA,FLGA,TFBG
04 G14	#V, #3 Tray, Tube*1
05 G11	(SSOP,LSSOP,LGFP,TSSOP,WDFN)
07 I1A 09 F12	#W, #4 Embossed Tape (HWQFN,HVQFN,VFBGA,VFLGA,WFLGA,FLGA,TFBG
OA F13 LIN	Pin count #X, #5 Embossed Tape
0B LIN & CAN	(SSOP,LSSOP,LQFP,LFQFP,TSSOP,WDFN)
OE G1A OF G1E	
0J G1C USB Host & Function	
OK USB Function	Package, Pin Pitch
OM I1B ON I1C On-chip AES	7         24         6         2
0P F14	8 25 7 A
OR L12	A 30 8 8 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
0W L13 0Y G10	A         SU         6         6         0           B         32         9         12         INA         HWQFN 0.5 mm         TFBGA 0.5 mm
10 L1C LCD & USB Function	B         32         9         12           C         36         A         16         HVQFN 0.5 mm         FA         LQFP 0.65 mm           NB         HWQFN 0.65 mm         FB         LFQFP 0.5 mm
11 LCD	D         38         B         24           NB         HWQFN 0.65 mm         FB         LFQFP 0.5 mm           HWQFN 0.4 mm         FP         LQFP 0.8 mm
13 F15 17 I1D	E 40 C 32
1A G1D	F 44 D 48 Temperature & Quality Grade
1B G1F	G 48 E 64 A -40°C to 85°C Consumer
1C  1E 1E G1G	J 52 F 96 D -40°C to 85°C Industrial
1F G1H	L 64 G 128 G -40°C to 105°C Industrial
1M L1A	M 80 H 192 M -40°C to 125°C Industrial
1N         H1D         AFE, LFQFP package           1P         AFE, TFBGA package	P 100 J 256 J -40°C to 85°C Automotive
1R Meter, Timer	S 128 K 384 L -40°C to 105°C Automotive
1T I1C No On-chip AES	T         144         L         512         K         -40°C to 125°C         Automotive
1W G1M 1Y G1N	Y -40°C to 150°C Automotive
1Z G1P	Bonding wire (Only part of RL78/F1x)*2
20 G15	C Cu (Copper)
21 G16 40 G13A	
	15 PL 70/C16 PL 70/110 and PL 70/110 L SCOP products only the package specification is tube

Notes: 1. For 20-pin RL78/G11, RL78/G12, RL78/G15, RL78/G16 RL78/I1A and RL78/I1D LSSOP products only the package specification is tube. 2. Please contact Renesas sales or agent for details.

### **EXPLANATION OF ORDERABLE PART NUMBERS** (For part numbers start with R7F)



D Consumer



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