μPC 1944 GR - E2 - A
μPD 12 1 W 18 A T1F - E1 - AT

Renesas Device
μPC: Bipolar type
μPD: CMOS type

Series

12	Regulator (CMOS)
10	Shunt Regulator (Bipolar)
19	
29	Low-power Regulator
78	3 Terminal Regulator (Bipolar)

Optional function

0	w/o on/off pin
1	w/ on/off pin

Output voltage(V)

00	Variabel
05	5.0
10	1.0 or 10
15	1.5 or 15
18	1.8 or 18
25	2.5
33	3.3
78	7.8

Revision

Output current(A)

L	0.1
N	0.3
M	0.5
-	1
A	2
W	1.5
S	0.1

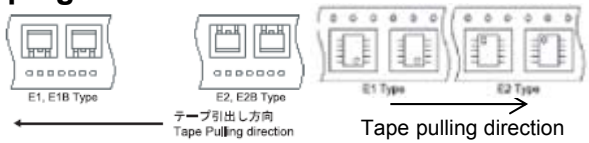
Lead-free code

A	Lead-free, Sn-Bi
AT	Lead-free, Sn
AZ	Lead-free*1, Sn
AY	Lead-free*1, Matte-Sn

*1: High-melting-point solder excepted in RoHS is contained internally.

Taping direction

E1	
E2	



Package

TA	T, T1B	T1F	T	T1D
SC-74A (5pin MM)	SC-62 (3pin PoMM)	5-pin TO-252 (MP-3ZK)	SC-63 (MP-3Z)	TO-252 (MP-3ZK)
2.9 x 2.8 (2.9 x 1.5)	4.5 x 4.0 (4.5 x 2.5)	6.5 x 10.4 (6.5 x 6.1)	6.5 x 9.5 (6.5 x 5.5)	6.5 x 10.4 (6.5 x 6.1)
G, GR	**T, HB**	**H***	**HF***	
8-pin SOP	SC-64(MP-3)	MP-5(TO-126)	TO-220(MP-45G)	
5.2 x 6.5 (5.2 x 4.4)	6.5 x 13.7 (6.5 x 5.5)	8.5 x 25.0 (8.5 x 12)	10.0 x 30.9(10.0 x 17.0)	

Renesas Shunt & Series Regulators

Ex: μPD121W18AT1F is Regulator with On/off pin in 5-pin TO-252 package(1.8V/1.5A).

Note:Codes shown in gray color are optional.

Mark*:Not recommend new design

HA 17431 G LP A EL - E

Renesas Device

Serial number

17431-2	2.5V Shunt Regulator
17L431-2	1.24VShunt Regulator
178L05, 08, 15	3 Terminal Regulator (5V,8V,15V)
179L05, 15	3 Terminal Regulator (-5V,-15V)

Output voltage accuracy

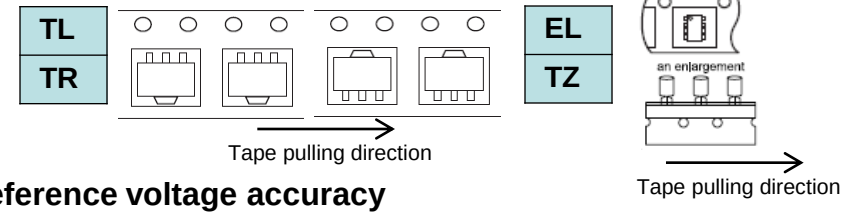
A	1%(HA17L431-2)
V	1%(HA17431-2)
-	4%(HA17431-2) 8%(HA178Lxx)

Lead-free code

E	Lead-free

Taping direction

TL	**EL**
TR	**TZ**



Reference voltage accuracy

A	2.2%(HA17431-2) 5%(HA178Lxx)
-	4%(HA17431-2)

Package

LTB	LP	U, UA, UP	FP	P, PN	
MPAKV	**MPAK-5 (SC-74A)**	**UPAK (SC-62)**	**FP-8DGV**	**TO-92V**	**TO-92MODV**
					
2.7 x 2.8 (2.7 x 1.5)	**2.95 x 2.8 (2.95 x 1.6)**	**4.5 x 4.25 (4.5 x 2.5)**	**4.85 x 6.5 (4.85 x 4.4)**	**4.8 x 17.7 (4.8 x 5.0)**	**4.8 x 18.1 (4.8 x 8.0)**

Renesas Shunt & Series Regulators

Ex: HA17431GPA is Shunt Regulator in MPAK-5V package.

Note:
Codes shown in gray color are optional.

µPC 1933 GR - E1 - A

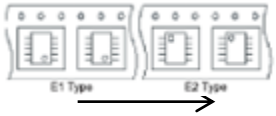
Renesas
Bipolar Device

Lead-free code

A	Lead-free, Sn-Bi

Taping direction

E1
E2



Tape pulling direction

Package

GR	G	GT	GS
8-pin SOP	**16-pin SOP**		
			
5.35 x 6.0 (5.35 x 4.4)	**10.0 x 10.3 (10.0 x 7.2)**	**10.2 x 10.3 (10.2 x 7.2)**	**10.2 x 7.7 (10.2 x 5.6)**

Serial number

Serail #	PKG	V_{IN}(V)max.	V_{OUT}(V)max.	I_{OUT}(mA)max.	f_{OSC}(KHz)min.	f_{OSC}(KHz)max.	P_T(mW)
1099	**GS**	24	24	1200(Peak)	50	500	694
1909	**GS**	24	24	1200(Peak)	50	500	694
494	**G, GS, GT**	40	40	250	1	300	650
1100	**GS**	40	40	25	1	500	694
1150	**GS**	20	41	25	1	500	694
1933	**GR**	20	20	20	20	800	480

Renesas SW regulators

Ex: µPC1933GR is SW regulator in 8pin-SOP package.

Note:
Codes shown in gray color are optional.

HA 16114 FP - EL - E

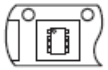
Renesas Device

Lead-free code

E	Lead-free

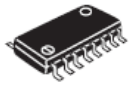
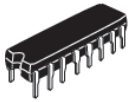
Taping direction

EL



Tape pulling direction

Package

FP		P
16-pin SOP	**20-pin SOP**	**16-pin DIP**
		
10.2 x 10.3 (10.2 x 7.2)	**12.6 x 7.8 (12.6 x 5.5)**	**19.20 x 7.62 (19.20 x 6.3)**

Serial number

Serail #	PKG		V_{IN}(V)max.	V_{OUT}(V)max.	I_{OUT}(mA)max.	f_{OSC}(KHz)min.	f_{OSC}(KHz)max.	P_T(mW)
16107	**FP, P**	16-pin	30	27.8	200	1	600	-
16108	**FP**	16-pin	30	27.8	200	1	600	-
16114	**FP, P**	16-pin	40	38.4	100	0.001	600	680
16116	**FP**	20-pin	40	38.4	100	0.001	600	680
16120	**FP**	16-pin	40	38.4	100	0.001	600	680
16121	**FP**	20-pin	40	38.4	100	0.001	600	680

Renesas SW regulators

Ex: HA16107FP is SW regulator in 16pin-SOP package.

Note:
Codes shown in gray color are optional.

HA 1630 S 01 CM EL – E H1P

Renesas Device

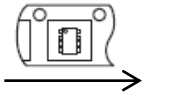
Serial Number 1

1630	Operational Amplifiers(CMOS)
1631	Voltage Comparators(CMOS)

Channel

S	Single
D	Dual
Q	Quad

Taping direction

EL	 Tape pulling direction

Lead-free code

E	Lead-free

Serial Number 2

Operational Amplifier(HA1630)

	V_{DD} (V)	V_{io}max. (mV)	I_{DD} typ. (mA)	SR typ. (V/ms)	I_S typ. (mA)	Type
01	1.8 -5.5	4	15	0.125	0.01	Standard
02			50	0.5	0.05	
03			100	1.0	0.1	
04	1.8 -5.5	4	200	2.0	0.2	Hi-Slew Rate
05			400	4.0	0.4	
06			800	8.0	0.8	
07	2.7 -5.5	6	60	1.5	15	Hi-Drive Current
08			170	1.5	30	

Voltage Comparator(HA1631)

	V_{DD} (V)	V_{io}max. (mV)	I_{DD} typ. (mA)	TPLH/HL typ.(ms)	I_S typ. (mA)	Type
01	1.8 -5.5	5	5	1.2/0.6	14	Push pull
02			50	0.3/0.2		
03	1.8 -5.5	5	5	-/0.6	14	Open drain
04			50	-/0.2		

Package

CM	**LP**	**MM**	**T**	
CMPAK-5	**MPAK-5**	**MMPAK-8**	**8pin-TSSOP**	**14pin-TSSOP**
				
2.0 x 2.1 (2.0 x 1.25)	**2.95 x 2.8 (2.95 x 1.6)**	**2.95 x 4.0 (2.95 x 2.8)**	**3.0 x 6.4 (3.0 x 4.40)**	**5.0 x 6.4 (5.0 x 4.40)**
Single		Dual		Quad

Renesas Operational Amplifiers & Voltage Comparators(CMOS Type)

Ex: HA1630S01CM is Operational Amplifier in CMPAK-5 package(Single type).

Note:
Codes shown in gray color are optional.

µPC4574 GR-9LG E1 - A

Renesas Device

Serial Number

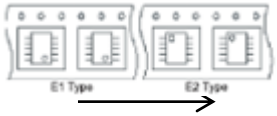
Serial Number	Packages	Feature	Type
151,741	G2	Standard	Single
802, 4250		Micro power	
4081		J-FET input	
831, 4061		J-FET input, Micro power	
821, 4071		J-FET input, Low noise	
811, 813, 4091, 4093		J-FET input, Hi-accuracy	
251,1458	G2	Standard	Dual
258,4556, 4558,4560	G2,MF	Low noise	
4570,4572	G2,GR,MF	Super low noise	
358,842,1251,4742	G2,GR,MF, MP	Single supply voltage	
803,4082	G2	J-FET input	
832,4062	G2	J-FET input, Micro power	
822,4072	G2,MF	J-FET input, Low noise	
812,814,835,4092,4094	G2,MN	J-FET input, Hi-accuracy	
324,451,452,844,3403, 4744	G2,GR	Single supply voltage	Quad
458,4741	G2	Low noise	
4574	G2,GR	Super low noise	
834,4064	G2	J-FET input, Micro power	
824,4074	G2	J-FET input, Low noise	

Lead-free code

A	Lead-free

Taping direction

E1
E2



Tape pulling direction

Package

	G2	MF-DAA	MP-KAA	GR-9LG	MN-KAA
Single, Dual	8pin-SOP(Single, Dual)		8pin-TSSOP (Dual)	8pin-TSSOP(Dual)	
					
	5.0 x 6.5 (5.0 x 4.4)	4.9 x 6.0 (4.9 x 3.9)	3.0 x 4.0 (3.0 x 2.8)	3.15 x 6.4 (5.0 x 4.40)	3.3 x 4.9 (3.3 x 3.3)
	G2			GR-9LG	
Quad	14pin-SOP(Quad)			14pin-TSSOP(Quad)	
					
	10.02 x 6.5 (10.02 x 4.4)			5.15 x 6.4 (5.0 x 4.40)	

Renesas Operational Amplifiers (Bipolar Type)

Ex: µPC4574 GR-9LG is Bipolar Type Operational Amplifier in 14pin-TSSOP package(Quad type).

Note:
Codes shown in gray color are optional.

µPC177 GR-9LG E1 - A

Renesas Device

Serial Number

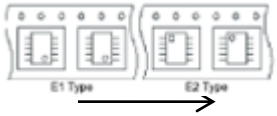
Serial Number	Packages	Feature	Type
271,311	G2	High speed	Single
272,277,393,	G2,GR,MP,MF	Single supply voltage, Low power	Dual
319	G2(14pin-SOP)	High speed	
177,339	G2,GR	Single supply voltage, Low power	Quad

Lead-free code

A	Lead-free

Taping direction

E1
E2



Tape pulling direction

Package

	G2	MF-DAA	MP-KAA	GR-9LG
Single, Dual	8pin-SOP  5.0 x 6.5 (5.0 x 4.4)	4.9 x 6.0 (4.9 x 3.9)	8pin-TSSOP  3.0 x 4.0 (3.0 x 2.8)	8pin-TSSOP  3.15 x 6.4 (5.0 x 4.40)
	G2			GR-9LG
Dual, Quad	14pin-SOP  10.02 x 6.5 (10.02 x 4.4)			14pin-TSSOP  5.15 x 6.4 (5.0 x 4.40)

Renesas Voltage Comparators (Bipolar Type)

Ex: µPC177 GR-9LG is Bipolar Type Voltage Comparator in 14pin-TSSOP package(Quad type).

Note:
Codes shown in gray color are optional.

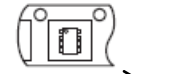
HA 17904 A F - EL - E - Q

- **Renesas Device**
- **Serial Number**
- **Product revision**
- **Fixed**
- **Lead-free code**

E	Lead-free

- **Taping direction**

EL



Tape pulling direction

- **Package**

Operational Amplifier(Bipolar)

Serial #	package	V_{CC} max.(V)	V_{io} max. (mV)	I_{IB} max. (nA)	I_{CC} typ. (mA)	SR typ. (V/μs)	Type	T_A(℃)
17324A	**-, F, RP**	32	7	500	0.8	0.19	Quad	-40 - +85
17902A	**P, FP, RP, T**							
17358A	**-, F, RP, T**	32	7	250	0.8	0.2	Dual	-40 - +85
17904A	**FP, T**							
17458	**-, F, PS, FP**	±18	6	500	-	0.6		-20 - +85

Voltage Comparator((Bipolar)

Serial #	package	V_{CC} max.(V)	V_{io} max. (mV)	I_{IB} max. (nA)	I_{CC} typ. (mA)	$T_{respons}$ typ.(μs)	Type	T_A(℃)
17339A	**-, F, RP, T**	36	7	250	0.8	1.3	Quad	-40 - +85
17901A	**FP, T**							
17393A	**-, F, RP, T**		5				Dual	
17903A	**FP, T**							

	-, P, PS	F, FP	RP	T
Dual	**8pin-DIP**  **9.6 x 7.62 (19.2 x 6.3)**	**8pin-SOP**  **4.85 x 6.5 (4.85 x 4.4)**	**4.90 x 6.1 (4.90 x 3.95)**	**8pin-TSSOP**  **3.0 x 6.4 (3.0 x 4.40)**
Quad	**14pin-DIP**  **19.2 x 7.62 (19.2 x 6.3)**	**14pin-SOP**  **10.06 x 7.8 (10.06 x 5.5)**	**8.65 x 6.1 (8.65 x 3.95)**	**14pin-TSSOP**  **5.0 x 6.4 (5.0 x 4.40)**

Renesas Operational Amplifiers & Voltage Comparators (Bipolar Type)

Ex: HA16324AF is Operational Amplifier in 14pin-SOP package(Quad type).

Note:
Codes shown in gray color are optional.

R2A 20 152 SP # W5

Renesas
General-Purpose IC

Serial number

	Package	Ch	Bus	Function
152	NS,SP	2	I²C	R-2R
154	NS,SP	4	I²C	R-2R
158	NP	8	I²C	R-2R
162	NS,SA,SP	2	3-line	R-2R
164	NP,SA	4	3-line	R-2R
166	NP,SA	6	3-line	R-2R
168	NP,SA,SP	8	3-line	R-2R
169	NP,SA,SP	12	3-line	R-2R
178	NP	8	3-line	R-2R, Multiplying

Package

NP	QFN
SP	SOP
NS	SON
SA	TSSOP

Packaging, Material (Pb-free)

#W0	T&R	Pb-free, Halogen-Free
#W5	T&R	Pb-free, Halogen-Free

Renesas DA Converters

Ex: R2A20152SP is R-2R type 2 channel D/A Convert in 8pin-SOP.

Note:
Codes shown in gray color are optional.

RNA5 0C27 A US EL E

Renesas Reset ICs

Product Number

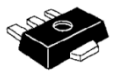
0C27	**US,MM**	Dual Power Supply control & Detection (3.3V/1.8V)
2A10	**MM**	CMOS Dual
194x	**UP**	Single(w/o delay circuit)
195x	**FP,UP,P**	Single
1Axx	**LP**	CMOS Single Open drain
1Bxx	**LP**	CMOS Single

Output /function*

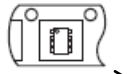
A	w/ fixed current load
B	Open collector
F	w/ base voltage output function

*A/B: RNA5195x
F: RNA51A/B

Package

LP	US	MM
MPAK-5  **2.0 x 2.1 (2.0 x 1.25)**	**8pin SSOP**  **2.0 x 3.1 (2.0 x 2.3)**	**MMPAK-8**  **2.95 x 4.0 (2.95 x 2.8)**
UP	**FP**	**P**
UPAK  **4.5 x 4.25 (4.5 x 2.5)**	**8-pin SOP**  **4.85 x 6.2 (4.85 x 4.4)**	**8pin-DIP**  **9.6 x 7.62 (9.6 x 6.3)**

Taping direction or Packing

EL	 Tape pulling direction	**#H** Emboss taping (Left)
		#T Tube

Lead-free code

E	Lead-free

0	Lead-free w/o Bi
1	Lead-free w/ Bi

Renesas Reset ICs (Voltage Detectors)

Ex: RNA51951AFP is 8-pin SOP package Reset IC(Detection Voltage = 4.25V).

Note:
Codes shown in gray color are optional.