

## Product Change Notice (PCN)

**Subject:** Wafer-fabrication and chip-assembly factories addition for RL78/G22 QFN and LQFP package products.

**Publication Date:** 1/31/2024

**Effective Date:** 11/30/2024

**Revision Description:** Initial release

### Description of Change:

	Current fab			Additional fabs (parallel production)		
	Wafer fab	Assembly	Sort	Wafer fab	Assembly	Sort
QFN Case1	Kawashiri	Greatek	KYEC	Kawashiri <b>PSMC</b>	Greatek	KYEC
LQFP Case2	Kawashiri	KL, BJ	KL, BJ	Kawashiri <b>PSMC</b>	KL, BJ <b>Greatek</b>	KL, BJ <b>KYEC</b>

[#1] Factory names indicated as **BOLD** letters, will be added on the parallel production path.

“KL” means Renesas Semiconductor KL Sdn. Bhd. “BJ” means Renesas Semiconductor (Beijing) Co., Ltd.

1)Case1: QFN package products

Wafer fab: Powerchip Semiconductor Manufacturing Corporation (PSMC) addition

2)Case2: LQFP package products

Case2a: 44pin LQFP (assembly in KL)

Case2b: 32/48 LQFP (assembly in BJ)

Wafer fab: Powerchip Semiconductor Manufacturing Corporation (PSMC) addition

Assembly: Greatek Electronics Inc. (Greatek) addition

Sort: King Yuan Electronics Corp. (KYEC) addition

(other details shown in “EP2O-AB-24-0008\_G22\_PCN\_PSMC\_fab-addition\_differences” )

### Affected product list:

Product P/N	Package	Product P/N	Package	Product P/N	Package
R7F102GGE3CFB#BA0	48pin LQFP	R7F102GBC3CNP#BA0	32pin QFN	R7F102GEE2DNP#AA0	40pin QFN
R7F102GGE3CFB#UA0	48pin LQFP	R7F102GBC3CNP#UA0	32pin QFN	R7F102GEE2DNP#BA0	40pin QFN
R7F102GGE3CFB#HA0	48pin LQFP	R7F102GBC3CNP#HA0	32pin QFN	R7F102GEE2DNP#UA0	40pin QFN
R7F102GGC3CFB#BA0	48pin LQFP	R7F102G7E3CNP#AA0	24pin QFN	R7F102GEE2DNP#HA0	40pin QFN
R7F102GGC3CFB#UA0	48pin LQFP	R7F102G7E3CNP#BA0	24pin QFN	R7F102GEC2DNP#AA0	40pin QFN
R7F102GGC3CFB#HA0	48pin LQFP	R7F102G7E3CNP#UA0	24pin QFN	R7F102GEC2DNP#BA0	40pin QFN
R7F102GGE3CNP#AA0	48pin QFN	R7F102G7E3CNP#HA0	24pin QFN	R7F102GEC2DNP#UA0	40pin QFN
R7F102GGE3CNP#BA0	48pin QFN	R7F102G7C3CNP#AA0	24pin QFN	R7F102GEC2DNP#HA0	40pin QFN
R7F102GGE3CNP#UA0	48pin QFN	R7F102G7C3CNP#BA0	24pin QFN	R7F102GBE2DFP#BA0	32pin LQFP
R7F102GGE3CNP#HA0	48pin QFN	R7F102G7C3CNP#UA0	24pin QFN	R7F102GBE2DFP#UA0	32pin LQFP
R7F102GGC3CNP#AA0	48pin QFN	R7F102G7C3CNP#HA0	24pin QFN	R7F102GBE2DFP#HA0	32pin LQFP
R7F102GGC3CNP#BA0	48pin QFN	R7F102G4E3CNP#AA0	16pin QFN	R7F102GBC2DFP#BA0	32pin LQFP
R7F102GGC3CNP#UA0	48pin QFN	R7F102G4E3CNP#BA0	16pin QFN	R7F102GBC2DFP#UA0	32pin LQFP

R7F102GGC3CNP#HA0	48pin QFN	R7F102G4E3CNP#UA0	16pin QFN	R7F102GBC2DFP#HA0	32pin LQFP
R7F102GFE3CFP#BA0	44pin LQFP	R7F102G4E3CNP#HA0	16pin QFN	R7F102GBE2DNP#AA0	32pin QFN
R7F102GFE3CFP#UA0	44pin LQFP	R7F102G4C3CNP#AA0	16pin QFN	R7F102GBE2DNP#BA0	32pin QFN
R7F102GFE3CFP#HA0	44pin LQFP	R7F102G4C3CNP#BA0	16pin QFN	R7F102GBE2DNP#UA0	32pin QFN
R7F102GFC3CFP#BA0	44pin LQFP	R7F102G4C3CNP#UA0	16pin QFN	R7F102GBE2DNP#HA0	32pin QFN
R7F102GFC3CFP#UA0	44pin LQFP	R7F102G4C3CNP#HA0	16pin QFN	R7F102GBC2DNP#AA0	32pin QFN
R7F102GFC3CFP#HA0	44pin LQFP	R7F102GGE2DFB#BA0	48pin LQFP	R7F102GBC2DNP#BA0	32pin QFN
R7F102GEE3CNP#AA0	40pin QFN	R7F102GGE2DFB#UA0	48pin LQFP	R7F102GBC2DNP#UA0	32pin QFN
R7F102GEE3CNP#BA0	40pin QFN	R7F102GGE2DFB#HA0	48pin LQFP	R7F102GBC2DNP#HA0	32pin QFN
R7F102GEE3CNP#UA0	40pin QFN	R7F102GGC2DFB#BA0	48pin LQFP	R7F102G7E2DNP#AA0	24pin QFN
R7F102GEE3CNP#HA0	40pin QFN	R7F102GGC2DFB#UA0	48pin LQFP	R7F102G7E2DNP#BA0	24pin QFN
R7F102GEC3CNP#AA0	40pin QFN	R7F102GGC2DFB#HA0	48pin LQFP	R7F102G7E2DNP#UA0	24pin QFN
R7F102GEC3CNP#BA0	40pin QFN	R7F102GGE2DNP#AA0	48pin QFN	R7F102G7E2DNP#HA0	24pin QFN
R7F102GEC3CNP#UA0	40pin QFN	R7F102GGE2DNP#BA0	48pin QFN	R7F102G7C2DNP#AA0	24pin QFN
R7F102GEC3CNP#HA0	40pin QFN	R7F102GGE2DNP#UA0	48pin QFN	R7F102G7C2DNP#BA0	24pin QFN
R7F102GBE3CFP#BA0	32pin LQFP	R7F102GGE2DNP#HA0	48pin QFN	R7F102G7C2DNP#UA0	24pin QFN
R7F102GBE3CFP#UA0	32pin LQFP	R7F102GGC2DNP#AA0	48pin QFN	R7F102G7C2DNP#HA0	24pin QFN
R7F102GBE3CFP#HA0	32pin LQFP	R7F102GGC2DNP#BA0	48pin QFN	R7F102G4E2DNP#AA0	16pin QFN
R7F102GBC3CFP#BA0	32pin LQFP	R7F102GGC2DNP#UA0	48pin QFN	R7F102G4E2DNP#BA0	16pin QFN
R7F102GBC3CFP#UA0	32pin LQFP	R7F102GGC2DNP#HA0	48pin QFN	R7F102G4E2DNP#UA0	16pin QFN
R7F102GBC3CFP#HA0	32pin LQFP	R7F102GFE2DFP#BA0	44pin LQFP	R7F102G4E2DNP#HA0	16pin QFN
R7F102GBE3CNP#AA0	32pin QFN	R7F102GFE2DFP#UA0	44pin LQFP	R7F102G4C2DNP#AA0	16pin QFN
R7F102GBE3CNP#BA0	32pin QFN	R7F102GFE2DFP#HA0	44pin LQFP	R7F102G4C2DNP#BA0	16pin QFN
R7F102GBE3CNP#UA0	32pin QFN	R7F102GFC2DFP#BA0	44pin LQFP	R7F102G4C2DNP#UA0	16pin QFN
R7F102GBE3CNP#HA0	32pin QFN	R7F102GFC2DFP#UA0	44pin LQFP	R7F102G4C2DNP#HA0	16pin QFN
R7F102GBC3CNP#AA0	32pin QFN	R7F102GFC2DFP#HA0	44pin LQFP		

**Reason for Change:**

Stable production supply for RL78/G22 QFN/LQFP products.

**Impact on specifications, characteristics, quality & reliability:**

No impact.

**Product Identification:**

Enable via the production history data on the packing label or of the trace code.  
Please contact our sales staff.

**Qualification Status:** to be provided by 9/30/2024

**Sample availability:** 5/31/2024

ES samples will be provided for functionality check where there is no functionality difference between ES sample and MP version.

**Device Material Declaration:** Contact Renesas sales, distributor, or agency.

Note:

1. Acknowledgement must be received by Renesas within 30 days or Renesas will consider the change as approved.
2. If timely acknowledgement is provided by Customer, then Customer shall have 90 days from the date of receipt of this PCN to make any objections to this PCN. If Customer fails to make objections to this PCN within 90 days of the receipt of the PCN then Renesas will consider the PCN changes as approved.
3. If customer cannot accept the PCN then customer must provide Renesas with a last time buy demand and purchase order.

**For additional information regarding this notice, please contact your Renesas sales representative.**

# RL78/G22 LQFP品 (32pin,44pin,48pin) product fabrication factory addition: differences

Wafer-process factory addition: PSMC

Chip-assembly factory addition: Greatek

January/31/2024

EP2 Operations Strategy Department  
EP 2<sup>nd</sup> Business Division, Embedded Processing Product Group  
Renesas Electronics Corporation

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EP2O-AB-24-0008

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(Rev. 5.0-1 October 2020)

# Outline of Changes

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1) Object: RL78/G22

Wafer-fabrication: Renesas Semiconductor Manufacturing Co., Ltd., Kawashiri factory

Chip-assembly: Renesas Semiconductor (Beijing) Co., Ltd (BJ)

Renesas Semiconductor KL Sdn. Bhd. (KL)

Package types: LQFP 7x7mm 32pin, 10x10mm 44pin, LFQFP 7x7mm 48pin

2) Wafer fabrication factory addition: Powerchip Semiconductor Manufacturing Corporation (PSMC)

Assembly factory addition: Greatek Electronics Inc. (Greatek)

3) Specification differences:

Wafer process: sufficiently equivalent process was ported from Kawashiri factory.

Assembly materials:

Lead-frame, Die-mount paste, and Mold-resin are certificated at each facility.

4) Package outline:

No change on the foot-print geometry

Please refer the package outline drawings and the geometry comparison tables.

# Outline of Changes

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## 5) Marking:

Marking characters appears slightly different for the font type and digit number.

## 6) Product specification/characteristics

No change

## 7) Product qualification/reliability

No impact

# PKG LIST

PKG	size [mm]	pins	Pin- pitch [mm]	thickne ss [mm]	Fab addition (this time)			Current fabs		
					WP	Assembly	Sort	WP	Assembly	Sort
LQFP	7x7	32	0.8	1.4	PSMC	Greatek	KYEC	川尻	BJ	BJ
LQFP	10x10	44	0.8	1.4	PSMC	Greatek	KYEC	川尻	KL	KL
LFQFP	7x7	48	0.5	1.4	PSMC	Greatek	KYEC	川尻	BJ	BJ

Kawashiri : Renesas Semiconductor Manufacturing Company Co., Ltd. Kawashiri Factory  
PSMC: Powerchip Semiconductor Manufacturing Corporation  
BJ: Renesas Semiconductor (Beijing) Co. Ltd  
KL: Renesas Semiconductor KL Sdn. Bhd.  
KYEC: King Yuan Electronics Co., Ltd  
Greatek: Greatek Electronics Inc.



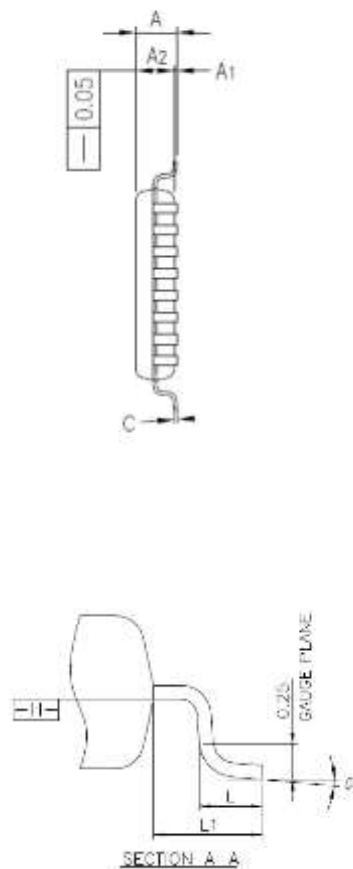
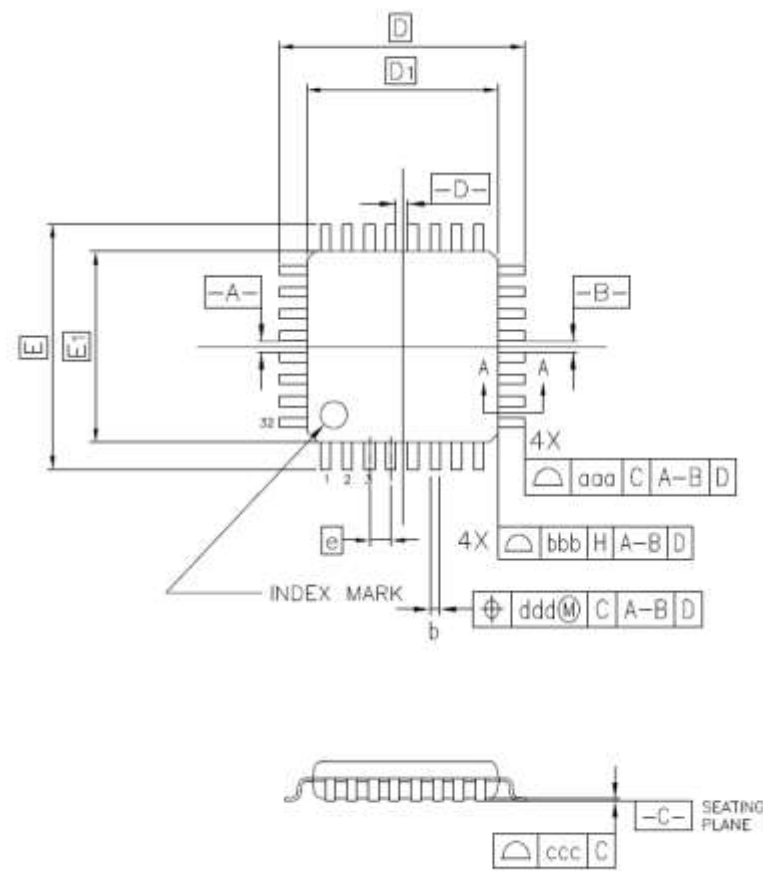
# Differences

Items		Additional factory	Current
Wafer process		PSMC	Kawashiri
Assembly		Greatek	BJ, KL
Sort		KYEC	BJ, KL
Package	Outline	Slight differences (see p.7~p.15)	
Lead frame	Material	No difference	
	Inner lead shape	Shape difference (see p.16)	
Die mount	Material	Ag epoxy paste D *	Ag epoxy paste A *
Bonding wire	Material	No difference: Cu (Pd coating)	
Mold resin	Material	Epoxy resin D * (halogen-free)	Epoxy resin A * (halogen-free)
Plating	Material	No difference	
Marking	Font	Font type difference (see p.17)	
	Digit number	Slight difference (see p.18)	
Packing	Tray / T&R	No difference	
Storage conditions	after opening	No difference	

\* Factory certified materials, there are differences however no impact on reliability or characteristics.

# 7mm×7mm 0.8mm pitch 32pin LQFP Package Outline (Greatek)

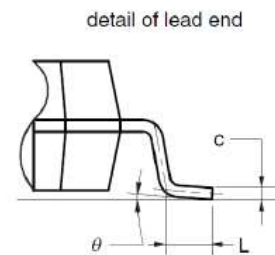
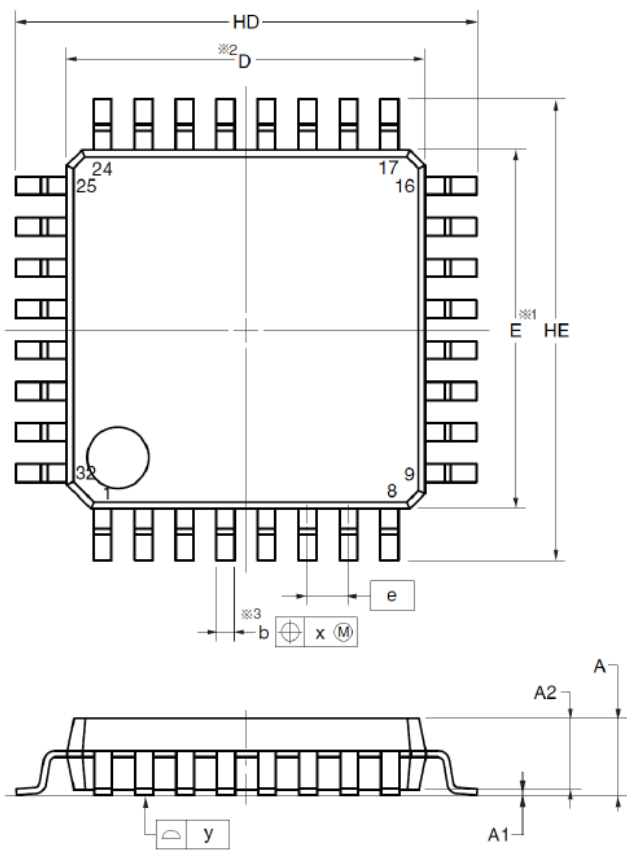
RENESAS Code : PLQP0032GE-A



Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	—	—	1.60
A <sub>1</sub>	0.05	—	0.15
A <sub>2</sub>	1.35	1.40	1.45
D	—	9.00	—
D1	—	7.00	—
E	—	9.00	—
E <sub>1</sub>	—	7.00	—
N	—	32	—
e	—	0.80	—
b	0.30	0.37	0.45
c	0.09	—	0.20
θ	0°	3.5°	7°
L	0.45	0.60	0.75
L <sub>1</sub>	—	1.00	—
aaa	—	—	0.20
bbb	—	—	0.20
ccc	—	—	0.10
ddd	—	—	0.20

# 7mm×7mm 0.8mm pitch 32pin LQFP Package Outline (BJ)

RENESAS Code : PLQP0032GB-A



(UNIT:mm)

ITEM	DIMENSIONS
D	7.00±0.10
E	7.00±0.10
HD	9.00±0.20
HE	9.00±0.20
A	1.70 MAX.
A1	0.10±0.10
A2	1.40
b	0.37±0.05
c	0.145±0.055
L	0.50±0.20
$\theta$	0° to 8°
e	0.80
x	0.20
y	0.10

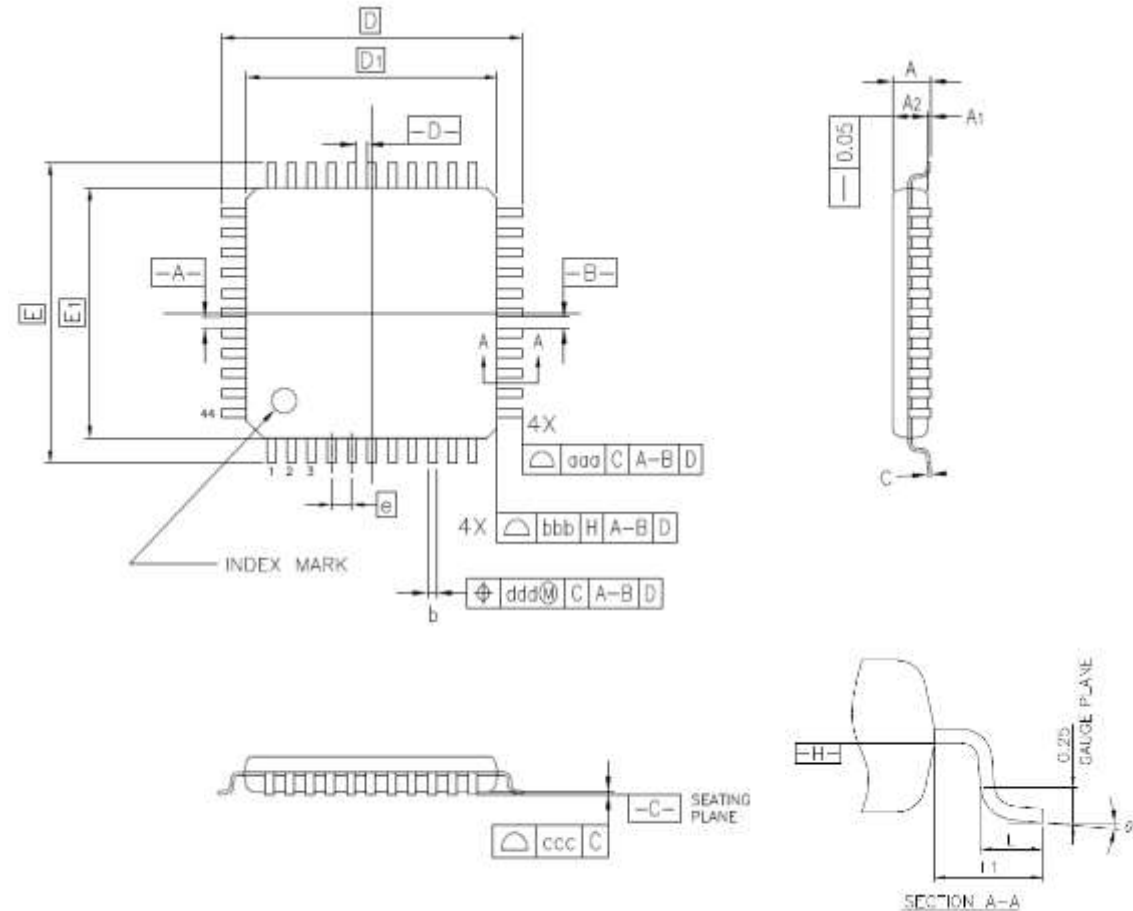
# Comparison: 7mm×7mm 0.8mm pitch 32pin LQFP Package

Greatek package symbols comply JEDEC standard.

Greatek Symbol	7x7mm 32pin LQFP PLQP0032GE-A			BJ Symbol	7x7mm 32pin LQFP PLQP0032GB-A		
	Dimension in Millimeters				Dimension in Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	-	-	1.60	A	-	-	1.70
A1	0.05	-	0.15	A1	0.00	0.10	0.20
A2	1.35	1.40	1.45	A2	-	1.40	-
D	-	9.00	-	HD	8.80	9.00	9.20
D1	-	7.00	-	D	6.90	7.00	7.10
E	-	9.00	-	HE	8.80	9.00	9.20
E1	-	7.00	-	E	6.90	7.00	7.10
N	-	32	-	-	-	-	-
e	-	0.80	-	e	-	0.80	-
b	0.30	0.37	0.45	b	0.32	0.37	0.42
c	0.09	-	0.20	c	0.09	0.145	0.20
θ	0°	3.5°	7°	θ	0°	-	8°
L	0.45	0.60	0.75	L	0.30	0.50	0.70
L1	-	1.00	-	-	-	-	-
aaa	-	-	0.20	-	-	-	-
bbb	-	-	0.20	-	-	-	-
ccc	-	-	0.10	y	-	0.10	-
ddd	-	-	0.20	x	-	0.20	-

# 10mm×10mm 0.8mm pitch 44pin LQFP Package Outline (Greatek)

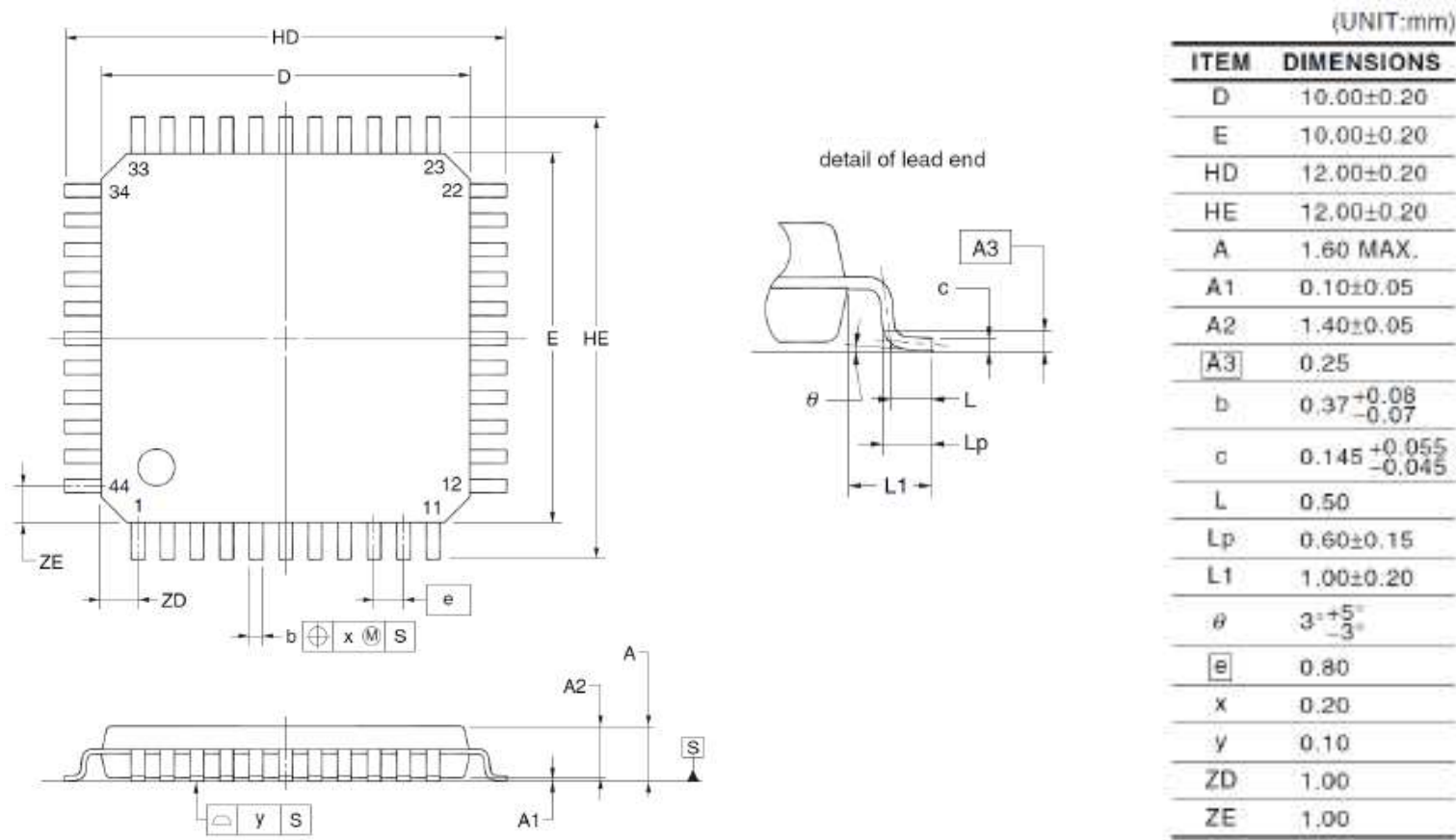
RENESAS Code : PLQP0044GE-A



Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	—	—	1.60
A <sub>1</sub>	0.05	—	0.15
A <sub>2</sub>	1.35	1.40	1.45
D	—	12.00	—
D1	—	10.00	—
E	—	12.00	—
E <sub>1</sub>	—	10.00	—
N	—	44	—
e	—	0.80	—
b	0.30	0.37	0.45
c	0.09	—	0.20
ø	0°	3.5°	7°
L	0.45	0.60	0.75
L <sub>1</sub>	—	1.00	—
aaa	—	—	0.20
bbb	—	—	0.20
ccc	—	—	0.10
ddd	—	—	0.20

# 10mm×10mm 0.8mm pitch 44pin LQFP Package Outline (KL)

RENESAS Code : PLQP0044GC-A



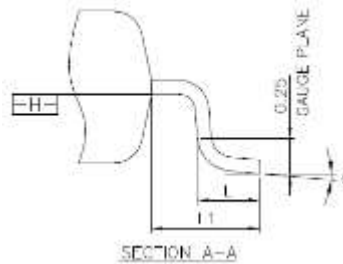
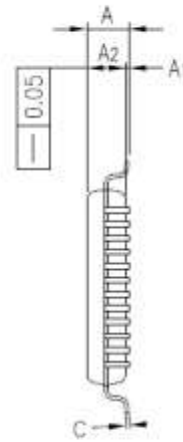
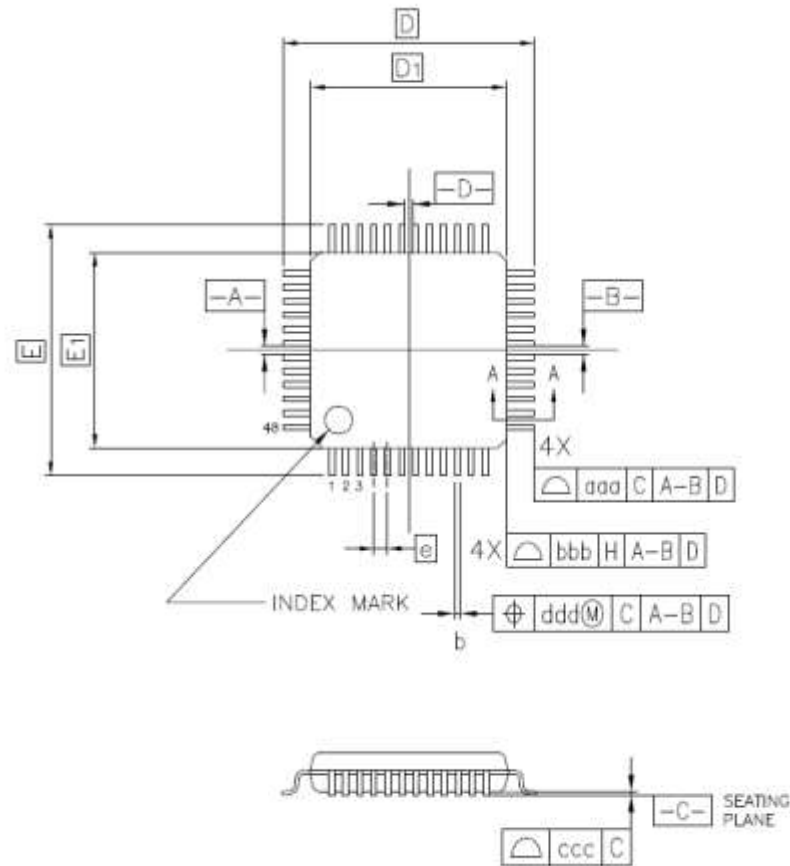
# Comparison: 10mm×10mm 0.8mm pitch 44pin LQFP Package

Greatek package symbols comply JEDEC standard.

Greatek Symbol	10x10mm 44pin LQFP PLQP0044GE-A			KL Symbol	10x10mm 44pin LQFP PLQP0044GC-A		
	Dimension in Millimeters				Dimension in Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	-	-	1.60	A	-	-	1.60
A1	0.05	-	0.15	A1	0.05	0.10	0.15
A2	1.35	1.40	1.45	A2	1.35	1.40	1.45
D	-	12.00	-	HD	11.80	12.00	12.20
D1	-	10.00	-	D	9.80	10.00	10.20
E	-	12.00	-	HE	11.80	12.00	12.20
E1	-	10.00	-	E	9.80	10.00	10.20
N	-	44	-	-	-	-	-
e	-	0.80	-	e	-	0.80	-
b	0.30	0.37	0.45	b	0.30	0.37	0.45
c	0.09	-	0.20	c	0.10	0.145	0.20
θ	0°	3.5°	7°	θ	0°	3°	8°
L	0.45	0.60	0.75	Lp	0.45	0.60	0.75
L1	-	1.00	-	L1	0.80	1.00	1.20
aaa	-	-	0.20	-	-	-	-
bbb	-	-	0.20	-	-	-	-
ccc	-	-	0.10	y	-	0.10	-
ddd	-	-	0.20	x	-	0.20	-

## 7mm×7mm 0.5mm pitch 48pin LFQFP package outline(Greatek)

RENESAS Code : PLQP0048KL-A

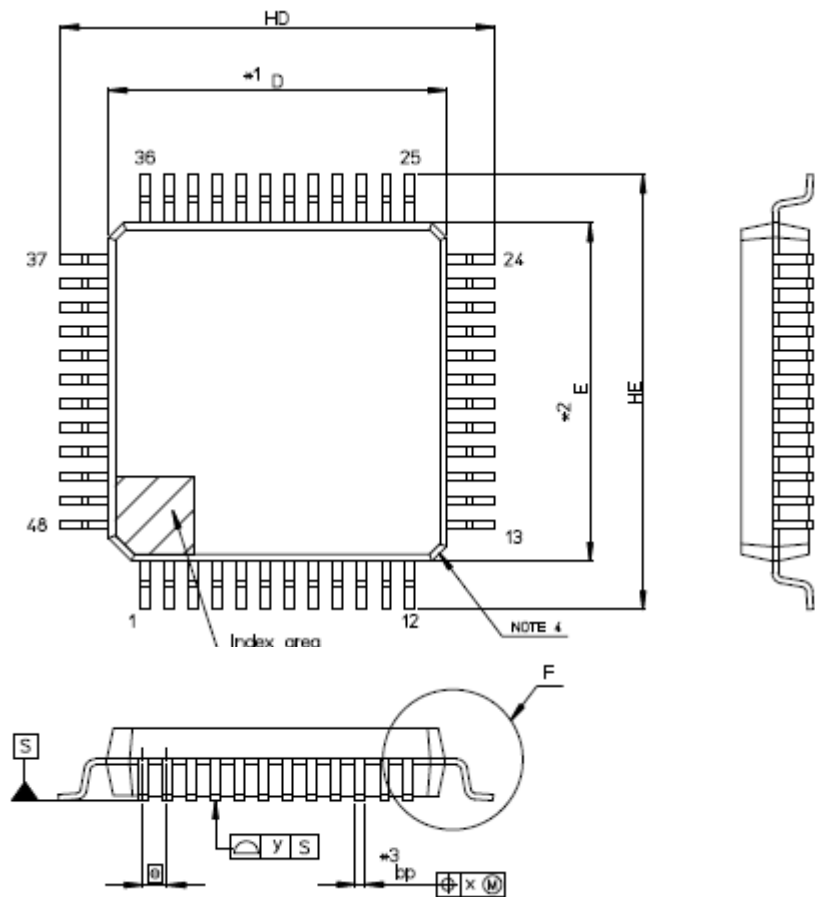


Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	—	—	1.60
A <sub>1</sub>	0.05	—	0.15
A <sub>2</sub>	1.35	1.40	1.45
D	—	9.00	—
D <sub>1</sub>	—	7.00	—
E	—	9.00	—
E <sub>1</sub>	—	7.00	—
N	—	48	—
e	—	0.50	—
b	0.17	0.22	0.27
c	0.09	—	0.20
ø	0°	3.5°	7°
L	0.45	0.60	0.75
L <sub>1</sub>	—	1.00	—
aaa	—	—	0.20
bbb	—	—	0.20
ccc	—	—	0.08
ddd	—	—	0.08



# 7mm×7mm 0.5mm pitch 48pin LFQFP package outline(BJ)

RENESAS Code : PLQP0048KB-B



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	6.9	7.0	7.1
E	6.9	7.0	7.1
A2	—	1.4	—
HD	8.8	9.0	9.2
HE	8.8	9.0	9.2
A	—	—	1.7
A1	0.05	—	0.15
bp	0.17	0.20	0.27
c	0.09	—	0.20
e	0 <sup>□</sup>	3.5 <sup>□</sup>	8 <sup>■</sup>
e	—	0.5	—
x	—	—	0.08
y	—	—	0.08
Lp	0.45	0.6	0.75
L1	—	1.0	—

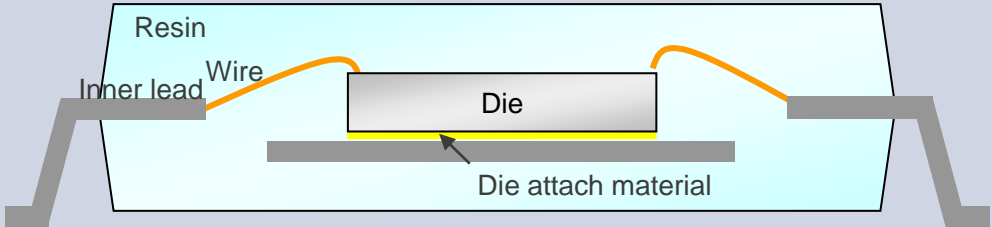

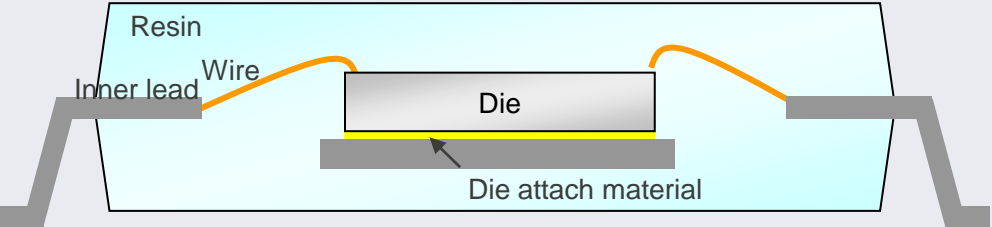

# Comparison: 7mm×7mm 0.5mm pitch 48pin LFQFP package

Greatek package symbols comply JEDEC standard.

Greatek Symbol	7x7mm 48pin LFQFP PLQP0048KL-A			BJ Symbol	7x7mm 48pin LFQFP PLQP0048KB-B		
	Dimension in Millimeters				Dimension in Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	-	-	1.60	A	-	-	1.70
A1	0.05	-	0.15	A1	0.05	-	0.15
A2	1.35	1.40	1.45	A2	-	1.40	-
D	-	9.00	-	HD	8.80	9.00	9.20
D1	-	7.00	-	D	6.90	7.00	7.10
E	-	9.00	-	HE	8.80	9.00	9.20
E1	-	7.00	-	E	6.90	7.00	7.10
N	-	48	-	-	-	-	-
e	-	0.50	-	e	-	0.50	-
b	0.17	0.22	0.27	bp	0.17	0.20	0.27
c	0.09	-	0.20	c	0.09	-	0.20
θ	0°	3.5°	7°	θ	0°	3.5°	8°
L	0.45	0.60	0.75	Lp	0.45	0.60	0.75
L1	-	1.00	-	L1	-	1.00	-
aaa	-	-	0.20	-	-	-	-
bbb	-	-	0.20	-	-	-	-
ccc	-	-	0.08	y	-	-	0.08
ddd	-	-	0.08	x	-	-	0.08

# Package structure image







\* Package cross-section and die pad shape are reference example.

Assembly Line	PKG cross section	Die pad shape
Additional factory		 Greatek
Current factory		 BJ      BJ      KL

※ There is no impact on the reliability with these die pad shapes

# Marking visibility

※Characters are reference example

Assembly Line	Greatek (Additional factory)	BJ (Existing factory)	KL (Existing factory)
Overall photo			
Enlarged photo			

# 10x10mm 0.8mm pitch 44pin LQFP Marking specification

※ Difference for 10x10mm 0.8mm pitch 44pin LQFP package only.

Product	Greatek (Addition)	KL (Existing)
Blank ROM	<div><div>XXXXXXXX YYYYYYYY</div><div></div></div>	<div><div>XXXXXXXX YYYYYYYYYYY</div><div></div></div>
	1st row - 2nd row 7-digit product name 3rd row 7-digit Lot No.	1st row 7-digit product name 2nd row - 3rd row 9-digit Lot No.

# 4M changing points (Wafer process facility addition)

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Full chip-design compatible wafer-fabrication-process was ported from Kawashiri factory.

Item	Check Result	Judgement
Machine	Sufficiently compatible to produce the equivalent wafer-level structure and electrical characteristics	No risk
Method	Sufficiently compatible to produce the equivalent wafer-level structure and electrical characteristics	No risk
Man	Using operator certification system. Only certificated operator can work for the production.	No risk
Material	Sufficiently compatible to produce the equivalent wafer-level structure and electrical characteristics	No risk

## 4M changing points (Additional assembly factory)

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Item	Check Result	Judgement
<b>Machine</b>	Despite some differences, the machines are equivalent to current fabrication machines. As well as similar existing products which show sufficient MP records, no problem found for the additional products.	<b>No risk</b>
<b>Method</b>	The same as the existing products.	<b>No risk</b>
<b>Operator</b>	Adopting operator certification system, only certificated operators are allowed for performing the production work.	<b>No risk</b>
<b>Material</b>	Only certificated materials are used. The products were certificated by specific reliability test as well as the existing products, no risk to be seen.	<b>No risk</b>

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