Product Change Notice

(PCN Tracking Number: EE-QR-221208-01)

Version: 2

Customer:	ALL Customers
Renesas Product Type:	RA2L1 series, QFN and LQFP package products (refer to last page for complete product list)
Description of Change:	Addition of wafer-fabrication and chip-assembly factories
Reason for Change:	To ensure stable production supply
Identification:	Identifiable via production history data from the packing label or trace code
Schedules:	Sample order deadline: e/o Mar. 2023 Sample delivery: b/o May 2023 (upon request) Reliability report: b/o Aug. 2023 (upon request) Requested approval e/o Aug. 2023 Change Implementation b/o Oct. 2023 onwards
Anticipated Impact:	Quality & Reliability: No impact Specification & Characteristic: No impact
Doc. No.:	EE-QC-PCN-CR-22-0230
Internal Reference:	MCP-AC-22-0050

In case of any question, please contact:

INITIATOR	TITLE	E-mail	PHONE No.
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Düsseldorf, 22.02.2023

Customer Response:

(please fill in and return by e-mail, fax or mail)

☐ acknowledge

☐ acceptable

☐ inacceptable (pls. comment)

☐ not applicable

Company: ______________________________

Name & Position: ______________________________

Phone / Fax No.: ______________________________

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

Comments:

______________________________ (Signature)

Details of Change:

	Current fab			Additional fabs (parallel production)		
	Wafer fab	Assembly	Sort	Wafer fab	Assembly	Sort
Case1	Kawashiri	Greatek	KYEC	Kawashiri **PSMC**	Greatek	KYEC
Case2	Kawashiri	RSB	RSB	Kawashiri **PSMC**	RSB **Greatek**	RSB **KYEC**

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

1) Case1: QFN package products
Wafer fab: Powerchip Semiconductor Manufacturing Corporation (PSMC) addition

2) Case2: LQFP package products
Wafer fab: Powerchip Semiconductor Manufacturing Corporation (PSMC) addition
Assembly: Greatek Electronics Inc.（Greatek）addition
Sort: King Yuan Electronics Corp. (KYEC) addition
(Remark for Case2: Greatek products to be shipped only via full-carton or T&R.)

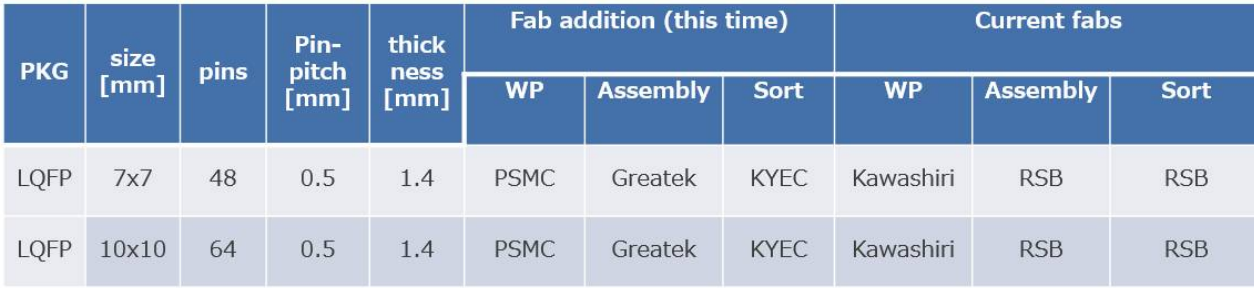
1) Wafer-fabrication: Renesas Semiconductor Manufacturing Co., Ltd., Kawashiri factory
Chip-assembly: Renesas Semiconductor (Beijing) Co., Ltd (RSB)
Package types: LQFP 7x7mm 48pin, 10x10mm 64pin

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.

5) Marking:
Marking characters appears slightly different in the font type



PKG	size [mm]	pins	Pin-pitch [mm]	thickness [mm]	Fab addition (this time)			Current fabs		
					WP	Assembly	Sort	WP	Assembly	Sort
LQFP	7x7	48	0.5	1.4	PSMC	Greatek	KYEC	Kawashiri	RSB	RSB
LQFP	10x10	64	0.5	1.4	PSMC	Greatek	KYEC	Kawashiri	RSB	RSB

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

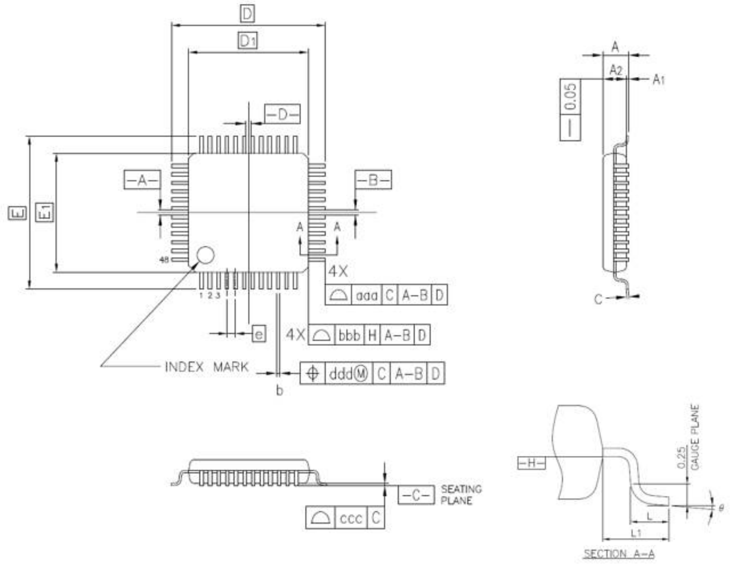
Change Overview:

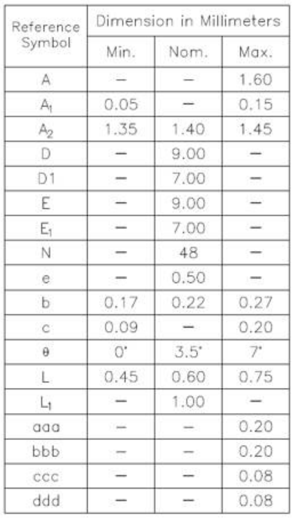
Items		This time	Current
Wafer process		Kawashiri, PSMC	Kawashiri
Assembly		Greatek	RSB
Sort		KYEC	RSB
Package	Outline	Slight differences (see p.3~p.6)	
Lead frame	Material	No difference	
	Inner lead shape	Shape difference (see p.7)	
Die mount	Material	Ag epoxy paste D *	Ag epoxy paste A *
Bonding wire	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.7)	
	Digit number	No difference	
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 0.5mm pitch 48pin LFQFP package outline(Greatek)

RENESAS Code : PLQP0048KL-A

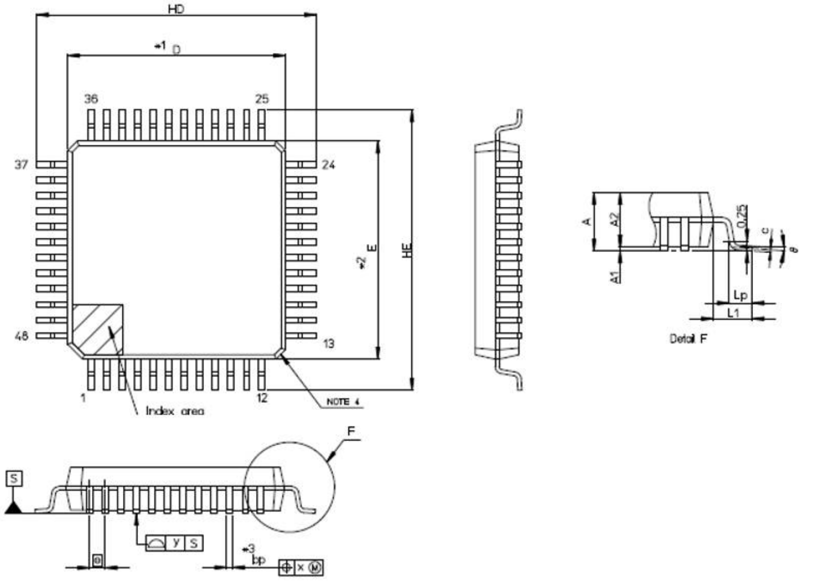




Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	–	–	1.60
A_1	0.05	–	0.15
A_2	1.35	1.40	1.45
D	–	9.00	–
D1	–	7.00	–
E	–	9.00	–
E_1	–	7.00	–
N	–	48	–
e	–	0.50	–
b	0.17	0.22	0.27
c	0.09	–	0.20
θ	0°	3.5°	7°
L	0.45	0.60	0.75
L_1	–	1.00	–
aaa	–	–	0.20
bbb	–	–	0.20
ccc	–	–	0.08
ddd	–	–	0.08

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

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
θ	0°	3.5°	8°
e	—	0.5	—
x	—	—	0.08
y	—	—	0.08
Lp	0.45	0.6	0.75
L1	—	1.0	—

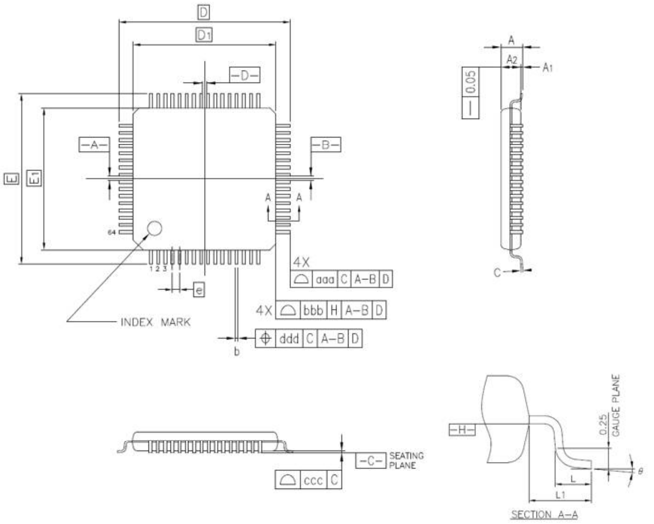
Comparison: 7mm×7mm 0.5mm pitch 48pin LFQFP package

Greatek package symbols comply JEDEC standard.

Greatek Symbol	7x7mm 48pin LQFP PLQP0048KL-A			RSB Symbol	7x7mm 48pin LQFP 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

10mm×10mm 0.5mm pitch 64pin LFQFP package outline(Greatek)

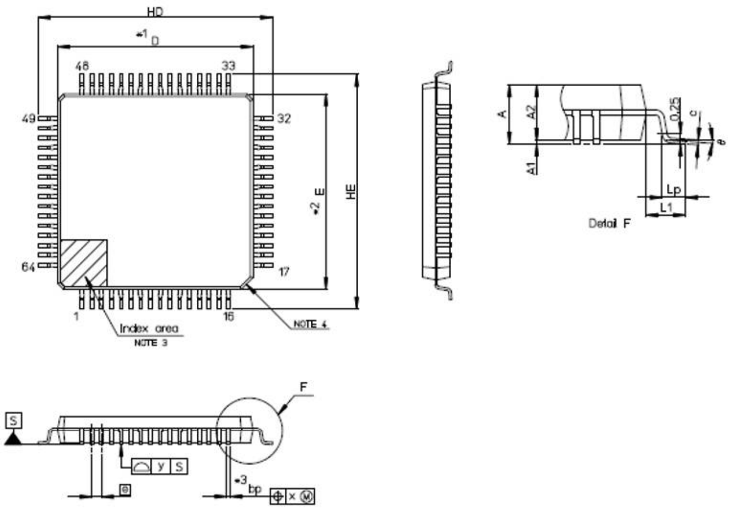
RENESAS Code : PLQP0064KL-A



Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	–	–	1.60
A_1	0.05	–	0.15
A_2	1.35	1.40	1.45
D	–	12.00	–
D1	–	10.00	–
E	–	12.00	–
E_1	–	10.00	–
N	–	64	–
e	–	0.50	–
b	0.17	0.22	0.27
c	0.09	–	0.20
θ	0°	3.5°	7°
L	0.45	0.60	0.75
L_1	–	1.00	–
aaa	–	–	0.20
bbb	–	–	0.20
ccc	–	–	0.08
ddd	–	–	0.08

10mm×10mm 0.5mm pitch 64pin LFQFP package outline(RSB)

RENESAS Code : PLQP0064KB-C



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	9.9	10.0	10.1
E	9.9	10.0	10.1
A2	——	1.4	——
HD	11.8	12.0	12.2
HE	11.8	12.0	12.2
A	——	——	1.7
A1	0.05	——	0.15
bp	0.15	0.20	0.27
c	0.09	——	0.20
θ	0°	3.5°	8°
e	——	0.5	——
x	——	——	0.08
y	——	——	0.08
Lp	0.45	0.6	0.75
L1	——	1.0	——

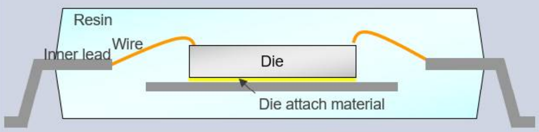
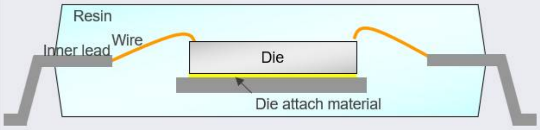
Comparison: 10mm×10mm 0.5mm pitch 64pin LFQFP package

Greatek package symbols comply JEDEC standard.

Greatek Symbol	10x10mm 64pin LQFP PLQP0064KL-A			RSB Symbol	10x10mm 64pin LQFP PLQP0064KB-C		
	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	-	12.00	-	HD	11.80	12.00	12.20
D1	-	10.00	-	D	9.90	10.00	10.10
E	-	12.00	-	HE	11.80	12.00	12.20
E1	-	10.00	-	E	9.90	10.00	10.10
N	-	64	-	-	-	-	-
e	-	0.50	-	e	-	0.50	-
b	0.17	0.22	0.27	bp	0.15	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	-	1.000	-
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		 RSB  RSB

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

Marking visibility

※Characters are reference example

Assembly Line	Greatek (Additional factory)	RSB (Existing factory)
Overall photo		
Enlarged photo		

4M changing points (Wafer process facility addition)

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)

Item	Check Result	Judgement
Machine	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.	**No risk**
Method	The same as the existing products.	**No risk**
Operator	Adopting operator certification system, only certificated operators are allowed for performing the production work.	**No risk**
Material	Only certificated materials are used. The products were certificated by specific reliability test as well as the existing products, no risk to be seen.	**No risk**

Affected Products:

Product P/N	Package		Product P/N	Package
R7FA2L1A93CNE#HA0	48pin QFN		R7FA2L1A92DFL#HA0	48pin LQFP
R7FA2L1A93CNE#BA0	48pin QFN		R7FA2L1A92DFL#BA0	48pin LQFP
R7FA2L1A93CNE#AA0	48pin QFN		R7FA2L1AB3CFL#HA0	48pin LQFP
R7FA2L1A92DNE#HA0	48pin QFN		R7FA2L1AB3CFL#BA0	48pin LQFP
R7FA2L1A92DNE#BA0	48pin QFN		R7FA2L1AB2DFL#HA0	48pin LQFP
R7FA2L1A92DNE#AA0	48pin QFN		R7FA2L1AB2DFL#BA0	48pin LQFP
R7FA2L1AB3CNE#HA0	48pin QFN		R7FA2L1A93CFM#HA0	64pin LQFP
R7FA2L1AB3CNE#BA0	48pin QFN		R7FA2L1A93CFM#BA0	64pin LQFP
R7FA2L1AB3CNE#AA0	48pin QFN		R7FA2L1A92DFM#HA0	64pin LQFP
R7FA2L1AB2DNE#HA0	48pin QFN		R7FA2L1A92DFM#BA0	64pin LQFP
R7FA2L1AB2DNE#BA0	48pin QFN		R7FA2L1AB3CFM#HA0	64pin LQFP
R7FA2L1AB2DNE#AA0	48pin QFN		R7FA2L1AB3CFM#BA0	64pin LQFP
R7FA2L1A93CFL#HA0	48pin LQFP		R7FA2L1AB2DFM#HA0	64pin LQFP
R7FA2L1A93CFL#BA0	48pin LQFP		R7FA2L1AB2DFM#BA0	64pin LQFP