

Product Change Notice (PCN)

Subject: Wafer-fabrication and chip-assembly factories addition for RA2L1 QFN and LQFP package products.

Publication Date: 2/22/2023

Effective Date: 10/1/2023

Revision Description: Revision 1 Effective date is changed to 10/1/2023

Description 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

(other details shown in “MCP-AB-22-0114_RA2L1_PSMC_fab-addition_differences”)

(Remark for Case2: Greatek products to be shipped only via full-carton or T&R.)

Affected product list:

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

Reason for Change:

Stable production supply for RA2L1 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 7/31/2023

Sample availability: 4/30/2023

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.

RA2L1 LQFP(48pin,64pin) product fabrication factory addition: different points

Wafer-process factory addition: PSMC

Chip-assembly factory addition: Greatek

December/1/2022

MCU product marketing department
MCU device solution business division
IoT and infrastructure business unit
Renesas Electronics Corporation

Ver.3.1

Do not disclose this document to others without our permission

MCP-AB-22-0114

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. Renesas Electronics disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.
 2. Renesas Electronics hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.
 3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
 4. You shall be responsible for determining what licenses are required from any third parties, and obtaining such licenses for the lawful import, export, manufacture, sales, utilization, distribution or other disposal of any products incorporating Renesas Electronics products, if required.
 5. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.
 6. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The intended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.
 - "Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.
 - "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.

Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implantations; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user's manual or other Renesas Electronics document.
 7. No semiconductor product is absolutely secure. Notwithstanding any security measures or features that may be implemented in Renesas Electronics hardware or software products, Renesas Electronics shall have absolutely no liability arising out of any vulnerability or security breach, including but not limited to any unauthorized access to or use of a Renesas Electronics product or a system that uses a Renesas Electronics product. RENESAS ELECTRONICS DOES NOT WARRANT OR GUARANTEE THAT RENESAS ELECTRONICS PRODUCTS, OR ANY SYSTEMS CREATED USING RENESAS ELECTRONICS PRODUCTS WILL BE INVULNERABLE OR FREE FROM CORRUPTION, ATTACK, VIRUSES, INTERFERENCE, HACKING, DATA LOSS OR THEFT, OR OTHER SECURITY INTRUSION ("Vulnerability Issues"). RENESAS ELECTRONICS DISCLAIMS ANY AND ALL RESPONSIBILITY OR LIABILITY ARISING FROM OR RELATED TO ANY VULNERABILITY ISSUES. FURTHERMORE, TO THE EXTENT PERMITTED BY APPLICABLE LAW, RENESAS ELECTRONICS DISCLAIMS ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS DOCUMENT AND ANY RELATED OR ACCOMPANYING SOFTWARE OR HARDWARE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.
 8. When using Renesas Electronics products, refer to the latest product information (data sheets, user's manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.
 9. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of Renesas Electronics products, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.
 10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
 11. Renesas Electronics products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.
 12. It is the responsibility of the buyer or distributor of Renesas Electronics products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.
 13. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
 14. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.
- (Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries.
 (Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

(Rev. 5.0-1 October 2020)

Outline of Changes

1) Object: RA2L1

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.

Outline of Changes

5) Marking:

Marking characters appears slightly different in the font type.

- Product specification/characteristics

No change

- Product qualification/reliability

No impact

PKG LIST

PKG	size [mm]	pins	Pin- pitch [mm]	thick ness [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.

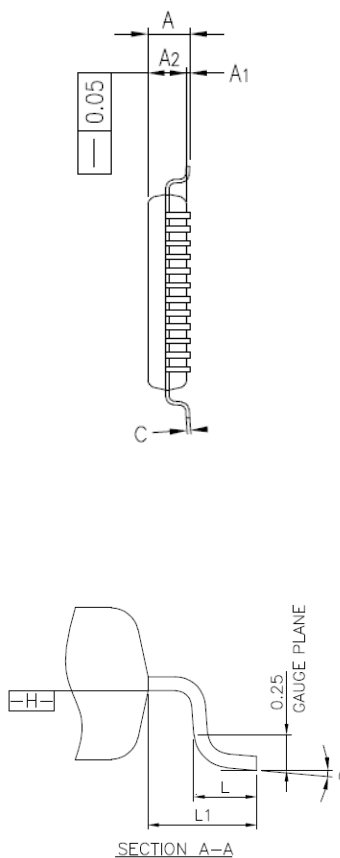
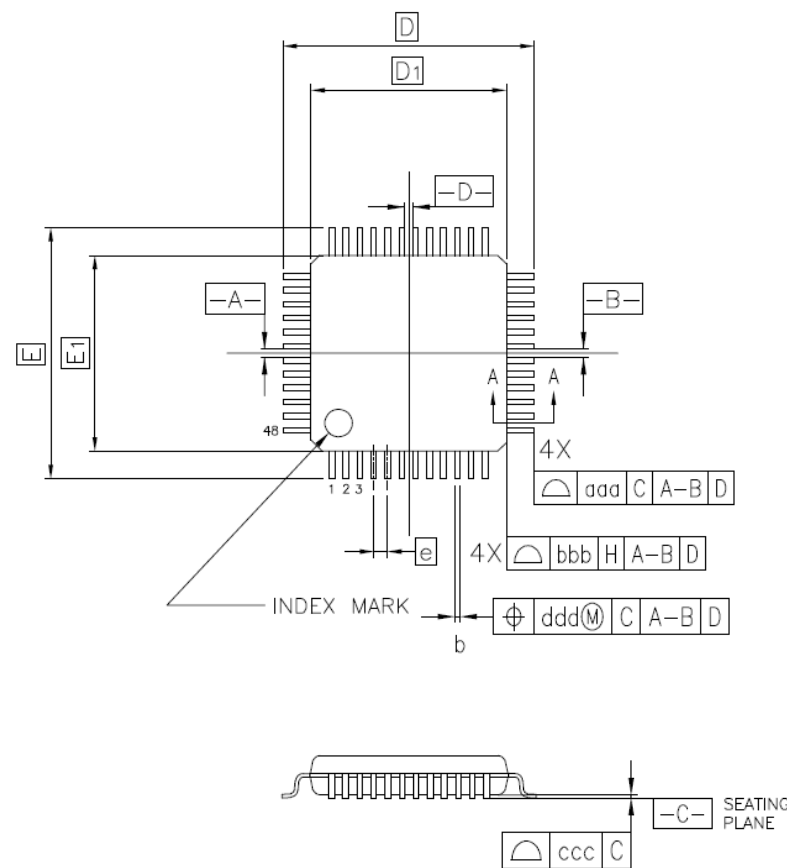
Differences

Items		This time	Current
Wafer process		Kawashiri, PSMC	Kawashiri
Assembly		Greatek	RSB
Sort		KYEC	RSB
Package	Outline	Slight differences (see p.7~p.12)	
Lead frame	Material	No difference	
	Inner lead shape	Shape difference (see p.13)	
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.14)	
	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)

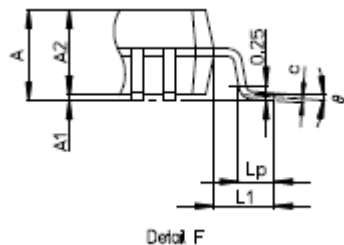
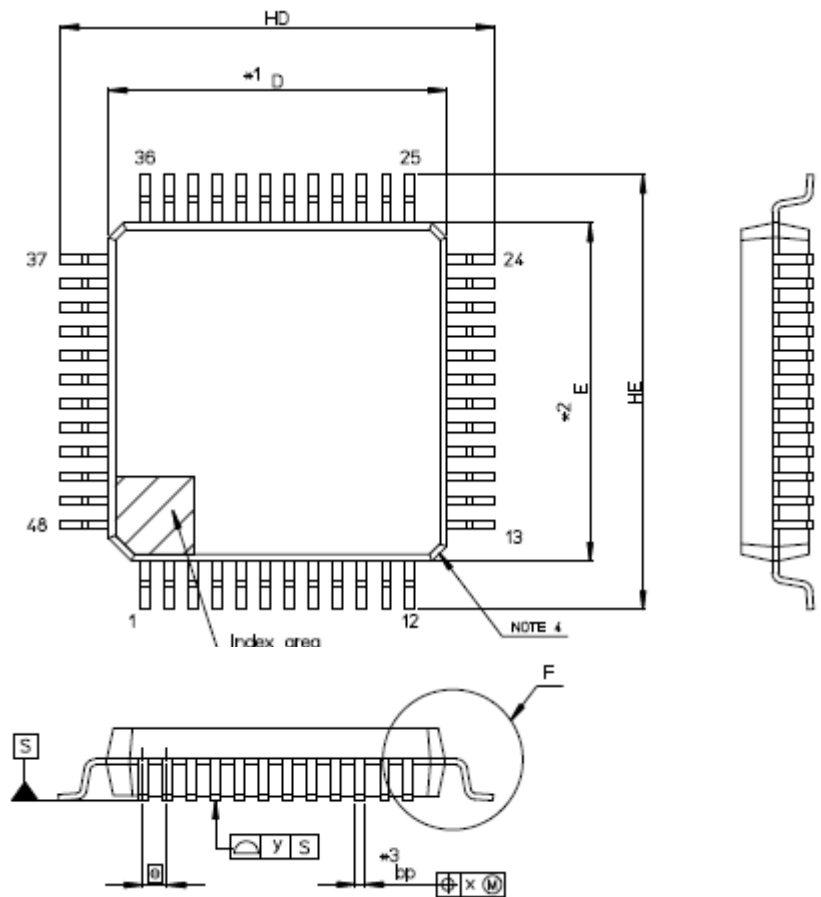
RENESAS Code : PLQP0048KL-A



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	—
D ₁	—	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
e	0°	3.5°	8°
e	—	0.5	—
x	—	—	0.08
y	—	—	0.08
Lp	0.45	0.6	0.75
L1	—	1.0	—

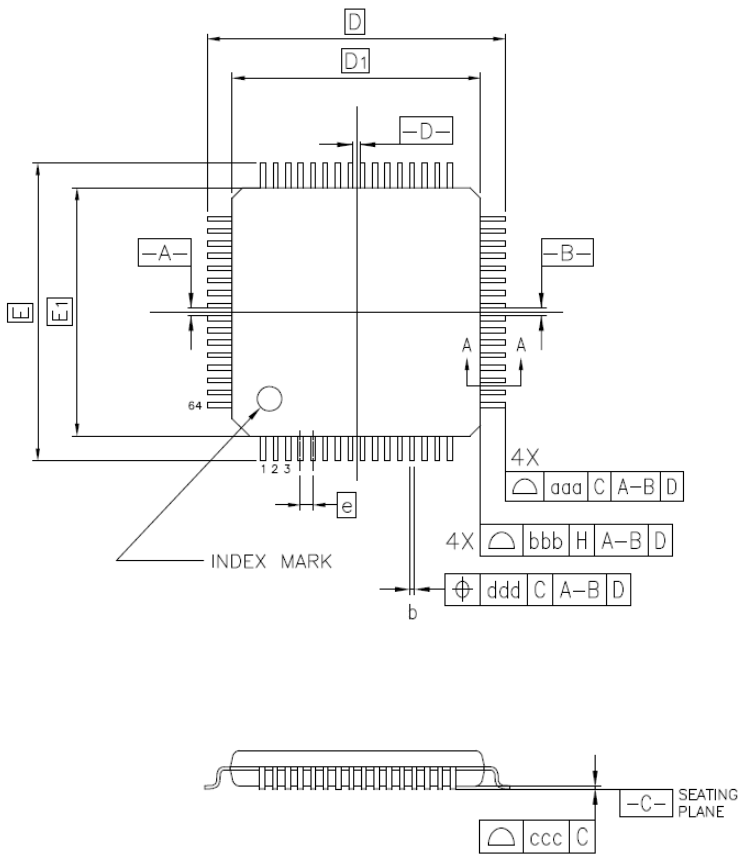
Comparison: 7mm×7mm 0.5mm pitch 48pin LFQFP package

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)

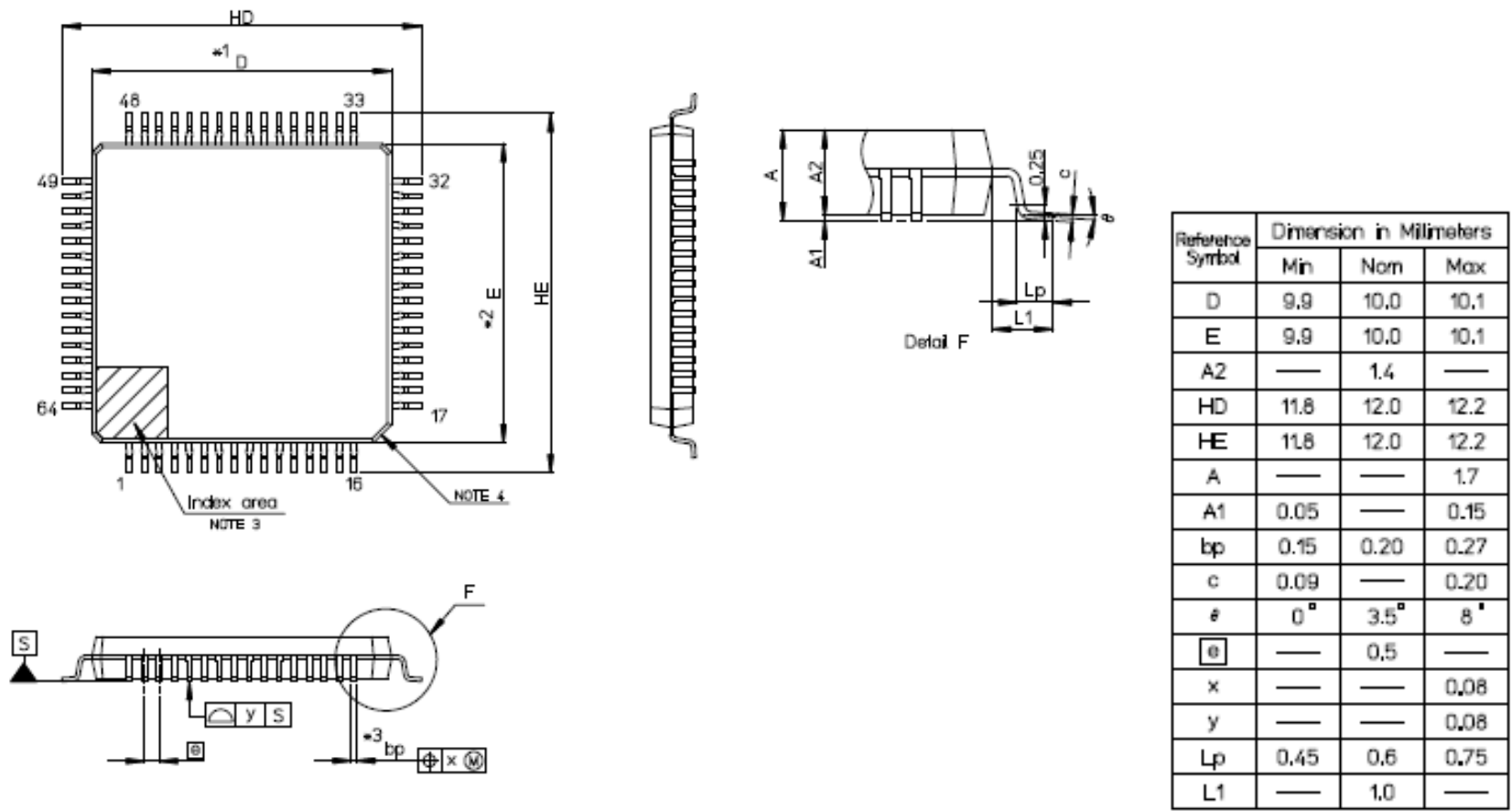
RENESAS Code : PLQP0064KL-A



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



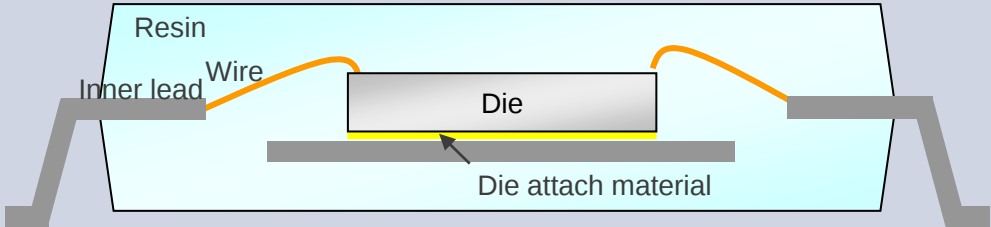
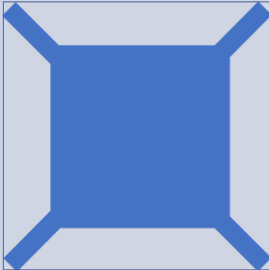
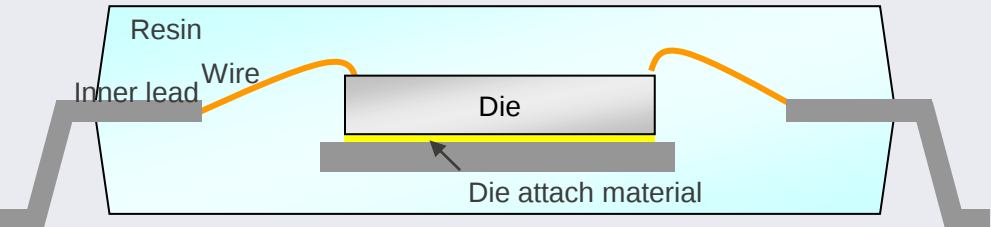
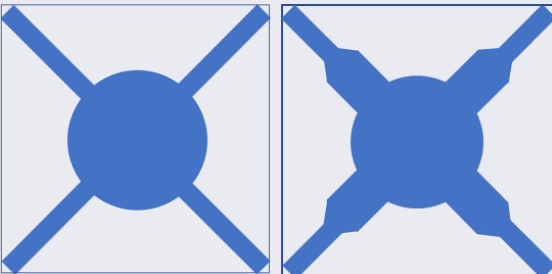
Comparison: 10mm×10mm 0.5mm pitch 64pin LFQFP package

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

Renesas.com