PCN#:[MCP-AC-22-0020]

Product Change Notice (PCN)

Subject: Wafer-fabrication and chip-assembly factories addition for RA2E1 QFN and LQFP package products.
Publication Date: 6/27/2022
Effective Date: 1/31/2023

Revision Description: Initial release

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
(Some other details shown in “MCP-AB-22-0069_RA2E1_LQFP_fab-addition_differences.pptx”)
(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
R7FA2E1A93CNE#HA0	48pin QFN		R7FA2E1A93CFL#HA0	48pin LQFP
R7FA2E1A93CNE#BA0	48pin QFN		R7FA2E1A93CFL#BA0	48pin LQFP
R7FA2E1A93CNE#AA0	48pin QFN		R7FA2E1A92DFL#HA0	48pin LQFP
R7FA2E1A92DNE#HA0	48pin QFN		R7FA2E1A92DFL#BA0	48pin LQFP
R7FA2E1A92DNE#BA0	48pin QFN		R7FA2E1A73CFL#HA0	48pin LQFP
R7FA2E1A92DNE#AA0	48pin QFN		R7FA2E1A73CFL#BA0	48pin LQFP
R7FA2E1A73CNE#HA0	48pin QFN		R7FA2E1A72DFL#HA0	48pin LQFP
R7FA2E1A73CNE#BA0	48pin QFN		R7FA2E1A72DFL#BA0	48pin LQFP
R7FA2E1A73CNE#AA0	48pin QFN		R7FA2E1A53CFL#HA0	48pin LQFP
R7FA2E1A72DNE#HA0	48pin QFN		R7FA2E1A53CFL#BA0	48pin LQFP
R7FA2E1A72DNE#BA0	48pin QFN		R7FA2E1A52DFL#HA0	48pin LQFP
R7FA2E1A72DNE#AA0	48pin QFN		R7FA2E1A52DFL#BA0	48pin LQFP

R7FA2E1A53CNE#HA0	48pin QFN		R7FA2E1A93CFM#HA0	64pin LQFP
R7FA2E1A53CNE#BA0	48pin QFN		R7FA2E1A93CFM#BA0	64pin LQFP
R7FA2E1A53CNE#AA0	48pin QFN		R7FA2E1A92DFM#HA0	64pin LQFP
R7FA2E1A52DNE#HA0	48pin QFN		R7FA2E1A92DFM#BA0	64pin LQFP
R7FA2E1A52DNE#BA0	48pin QFN		R7FA2E1A73CFM#HA0	64pin LQFP
R7FA2E1A52DNE#AA0	48pin QFN		R7FA2E1A73CFM#BA0	64pin LQFP
			R7FA2E1A72DFM#HA0	64pin LQFP
			R7FA2E1A72DFM#BA0	64pin LQFP

Reason for Change:

Stable production supply for RA2E1 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 1/31/2023

Sample availability: 9/30/2022

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:

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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.

RA2E1 QFN product fabrication factory addition: different points

Wafer-process factory addition: PSMC

Chip-assembly factory addition: Greatek

Jun/27/2022

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

Ver.1.0

MCP-AB-22-0069

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(Rev. 5.0-1 October 2020)

Outline of Changes

1) Object: RA2E1
   Wafer-fabrication: Renesas Semiconductor Manufacturing Co., Ltd., Kawashiri factory
   Chip-assembly: Renesas Semiconductor (Beijing) Co., Ltd (RSB)
   Package types: 7x7mm 48pin, 10x10mm 64pin, LFQFP

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]	thickness [mm]	Fab addition (this time)			Current fabs		
					WP	Assembly	Sort	WP	Assembly	Sort
LQFP	07x07	48	0.5	1.4	PSMC	Greatek	KYEC	Kawashiri	RSB	RSB
	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.

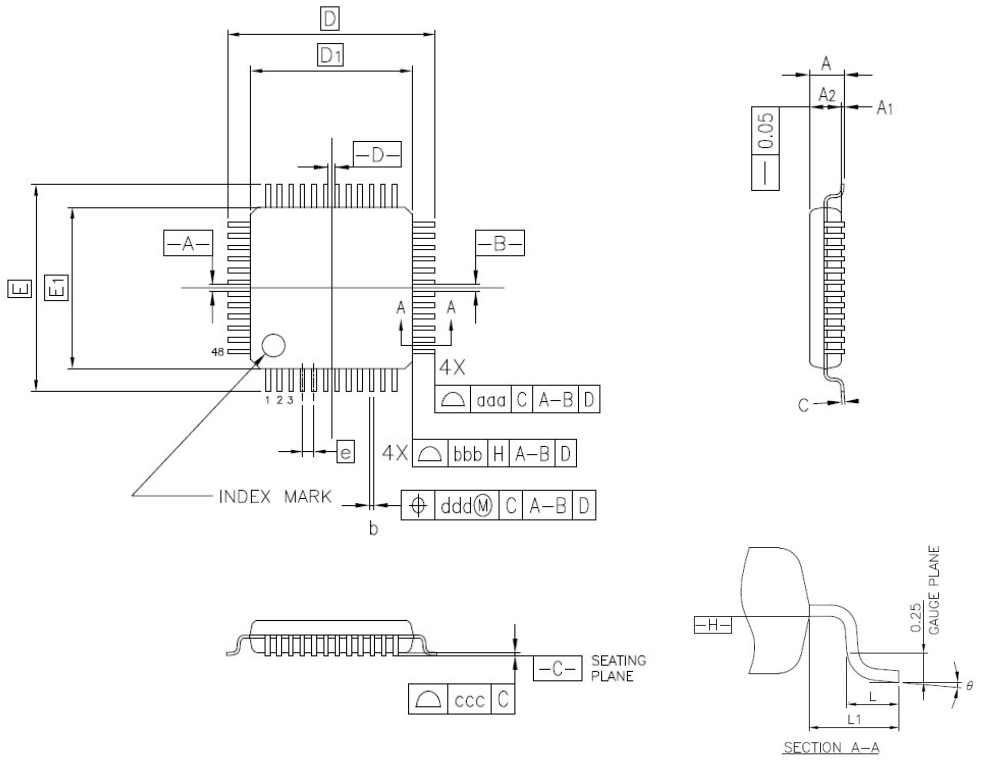
Differences

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)

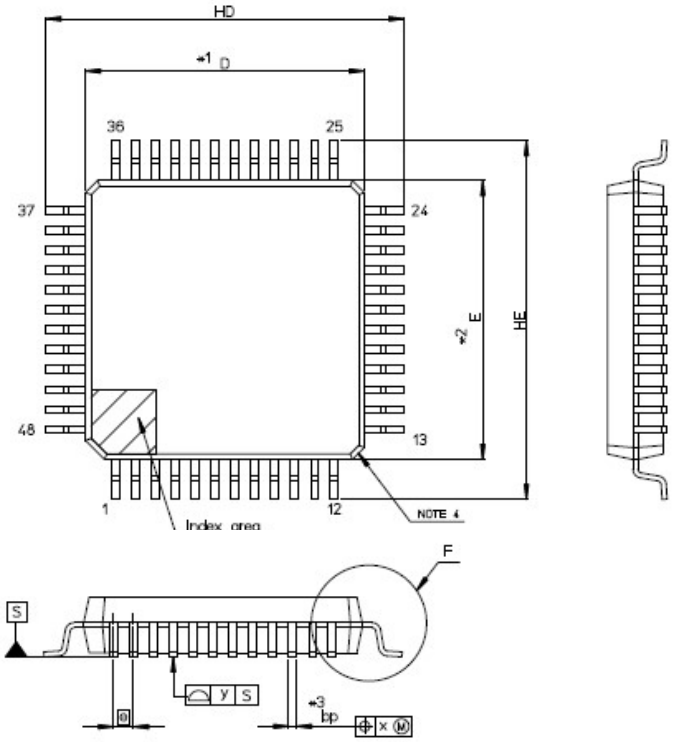
RENESAS Code : PLQP0048KL-A

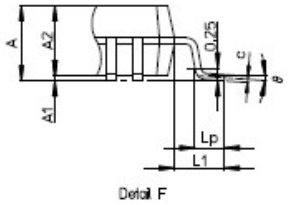


Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	–	–	1.60
A_1	0.05	–	0.15
A_2	1.35	1.40	1.45
D	–	9.00	–
D1	–	7.00	–
E	–	9.00	–
E_1	–	7.00	–
N	–	48	–
e	–	0.50	–
b	0.17	0.22	0.27
c	0.09	–	0.20
θ	0°	3.5°	7°
L	0.45	0.60	0.75
L_1	–	1.00	–
aaa	–	–	0.20
bbb	–	–	0.20
ccc	–	–	0.08
ddd	–	–	0.08

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	—

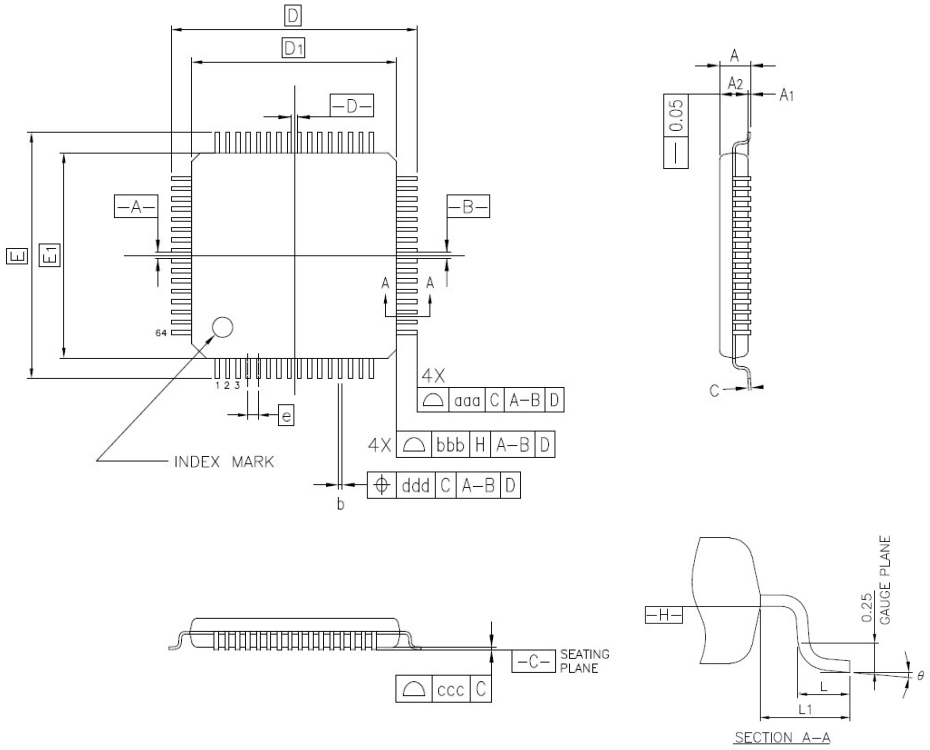
Comparison: 7mm×7mm 0.5mm pitch 48pin LFQFP package

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)

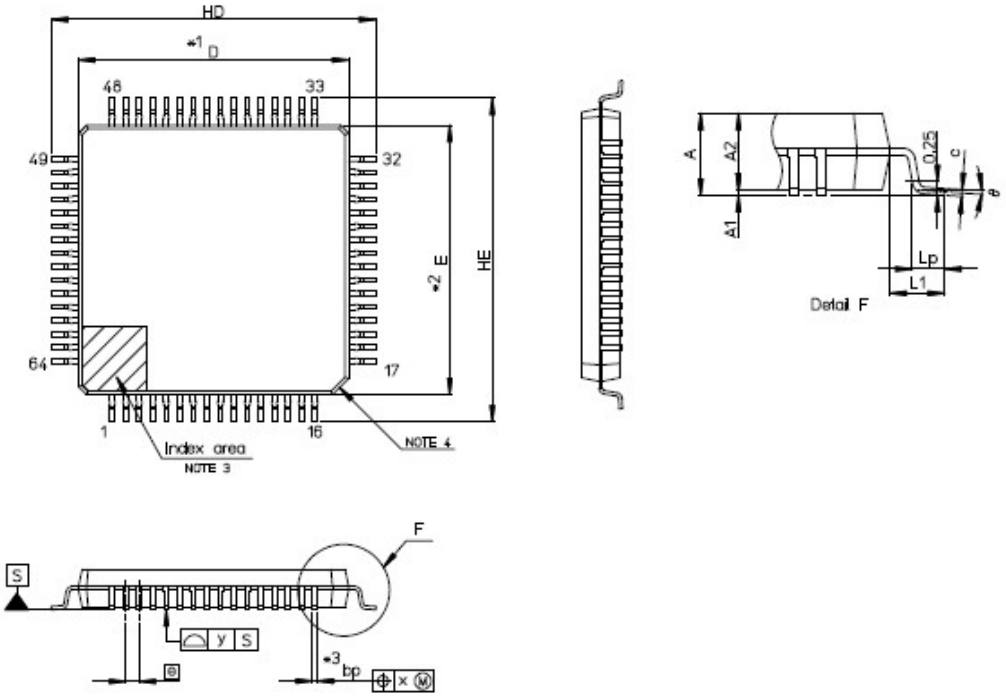
RENESAS Code : PLQP0064KL-A



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	—

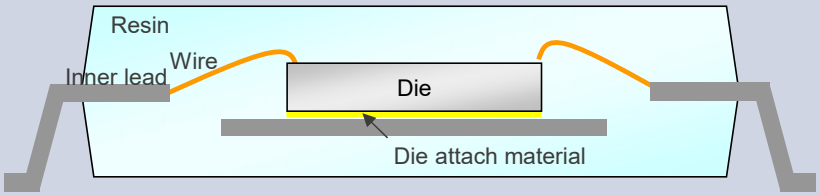
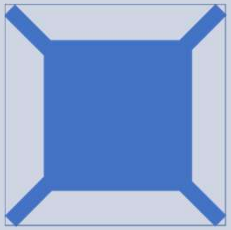
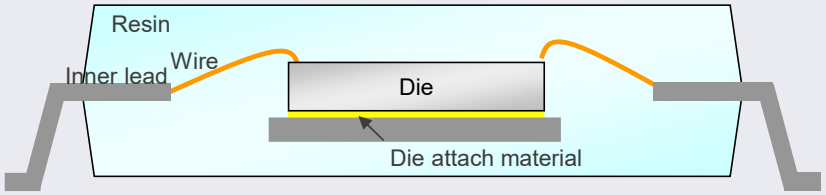
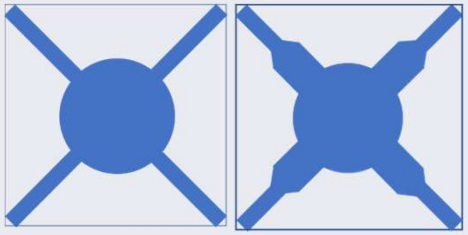
Comparison: 10mm×10mm 0.5mm pitch 64pin LFQFP package

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

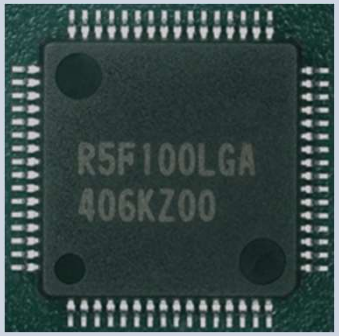
* Package cross-section and die pad shape are reference example.

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**

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