PCN#:[MCO-AC-23-0032]

Product Change Notice (PCN)

Subject: Wafer-fabrication and chip-assembly factories addition for RL78/G23-128KB QFN and LQFP package products.
Publication Date: 10/3/2023
Effective Date: 6/30/2024
Description of Change:

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

[#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: 32/48/64pin 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 "MCO-AB-23-0082_G23-128KB_PCN_PSMC_fab-addition_differences")

Affected product list:

Product P/N	Package		Product P/N	Package
R7F100GGG3CNP#AA0	48pin QFN		R7F100GEG2DNP#AA0	40pin QFN
R7F100GGG3CNP#BA0	48pin QFN		R7F100GEG2DNP#BA0	40pin QFN
R7F100GGG3CNP#UA0	48pin QFN		R7F100GEG2DNP#UA0	40pin QFN
R7F100GGG3CNP#HA0	48pin QFN		R7F100GEG2DNP#HA0	40pin QFN
R7F100GGF3CNP#AA0	48pin QFN		R7F100GEF2DNP#AA0	40pin QFN
R7F100GGF3CNP#BA0	48pin QFN		R7F100GEF2DNP#BA0	40pin QFN
R7F100GGF3CNP#UA0	48pin QFN		R7F100GEF2DNP#UA0	40pin QFN
R7F100GGF3CNP#HA0	48pin QFN		R7F100GEF2DNP#HA0	40pin QFN
R7F100GGG2DNP#AA0	48pin QFN		R7F100GBG3CNP#AA0	32pin QFN
R7F100GGG2DNP#BA0	48pin QFN		R7F100GBG3CNP#BA0	32pin QFN
R7F100GGG2DNP#UA0	48pin QFN		R7F100GBG3CNP#UA0	32pin QFN
R7F100GGG2DNP#HA0	48pin QFN		R7F100GBG3CNP#HA0	32pin QFN
R7F100GGF2DNP#AA0	48pin QFN		R7F100GBF3CNP#AA0	32pin QFN
R7F100GGF2DNP#BA0	48pin QFN		R7F100GBF3CNP#BA0	32pin QFN
R7F100GGF2DNP#UA0	48pin QFN		R7F100GBF3CNP#UA0	32pin QFN

R7F100GGF2DNP#HA0	48pin QFN	R7F100GBF3CNP#HA0	32pin QFN
R7F100GEG3CNP#AA0	40pin QFN	R7F100GBG2DNP#AA0	32pin QFN
R7F100GEG3CNP#BA0	40pin QFN	R7F100GBG2DNP#BA0	32pin QFN
R7F100GEG3CNP#UA0	40pin QFN	R7F100GBG2DNP#UA0	32pin QFN
R7F100GEG3CNP#HA0	40pin QFN	R7F100GBG2DNP#HA0	32pin QFN
R7F100GEF3CNP#AA0	40pin QFN	R7F100GBF2DNP#AA0	32pin QFN
R7F100GEF3CNP#BA0	40pin QFN	R7F100GBF2DNP#BA0	32pin QFN
R7F100GEF3CNP#UA0	40pin QFN	R7F100GBF2DNP#UA0	32pin QFN
R7F100GEF3CNP#HA0	40pin QFN	R7F100GBF2DNP#HA0	32pin QFN

R7F100GLG3CFB#BA0	64pin LQFP	R7F100GFG3CFP#BA0	44pin LQFP
R7F100GLG3CFB#HA0	64pin LQFP	R7F100GFG3CFP#HA0	44pin LQFP
R7F100GLF3CFB#BA0	64pin LQFP	R7F100GFF3CFP#BA0	44pin LQFP
R7F100GLF3CFB#HA0	64pin LQFP	R7F100GFF3CFP#HA0	44pin LQFP
R7F100GLG2DFB#BA0	64pin LQFP	R7F100GFG2DFP#BA0	44pin LQFP
R7F100GLG2DFB#HA0	64pin LQFP	R7F100GFG2DFP#HA0	44pin LQFP
R7F100GLF2DFB#BA0	64pin LQFP	R7F100GFF2DFP#BA0	44pin LQFP
R7F100GLF2DFB#HA0	64pin LQFP	R7F100GFF2DFP#HA0	44pin LQFP
R7F100GGG3CFB#BA0	48pin LQFP	R7F100GBG3CFP#BA0	32pin LQFP
R7F100GGG3CFB#HA0	48pin LQFP	R7F100GBG3CFP#HA0	32pin LQFP
R7F100GGF3CFB#BA0	48pin LQFP	R7F100GBF3CFP#BA0	32pin LQFP
R7F100GGF3CFB#HA0	48pin LQFP	R7F100GBF3CFP#HA0	32pin LQFP
R7F100GGG2DFB#BA0	48pin LQFP	R7F100GBG2DFP#BA0	32pin LQFP
R7F100GGG2DFB#HA0	48pin LQFP	R7F100GBG2DFP#HA0	32pin LQFP
R7F100GGF2DFB#BA0	48pin LQFP	R7F100GBF2DFP#BA0	32pin LQFP
R7F100GGF2DFB#HA0	48pin LQFP	R7F100GBF2DFP#HA0	32pin LQFP

Reason for Change:
Stable production supply for RL78/G23-128KB 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 5/31/2024

Sample availability: 12/30/2023
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.

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

RL78/G23-128KB LQFP品 (32pin,44pin,48pin,64pin) product fabrication factory addition: differences

Wafer-process factory addition: PSMC

Chip-assembly factory addition: Greatek

October/3/2023

MCU product marketing department
MCU Device Solution Division
Embedded Processing, Digital Power and Signal Chain Solutions Group
Renesas Electronics Corporation

MCO-AB-23-0082

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(Rev. 5.0-1 October 2020)

Outline of Changes

1) Object: RL78/G23-128KB
   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, 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]	thickness [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
LQFP	7x7	48	0.5	1.4	PSMC	Greatek	KYEC	川尻	BJ	BJ
LQFP	10x10	64	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.

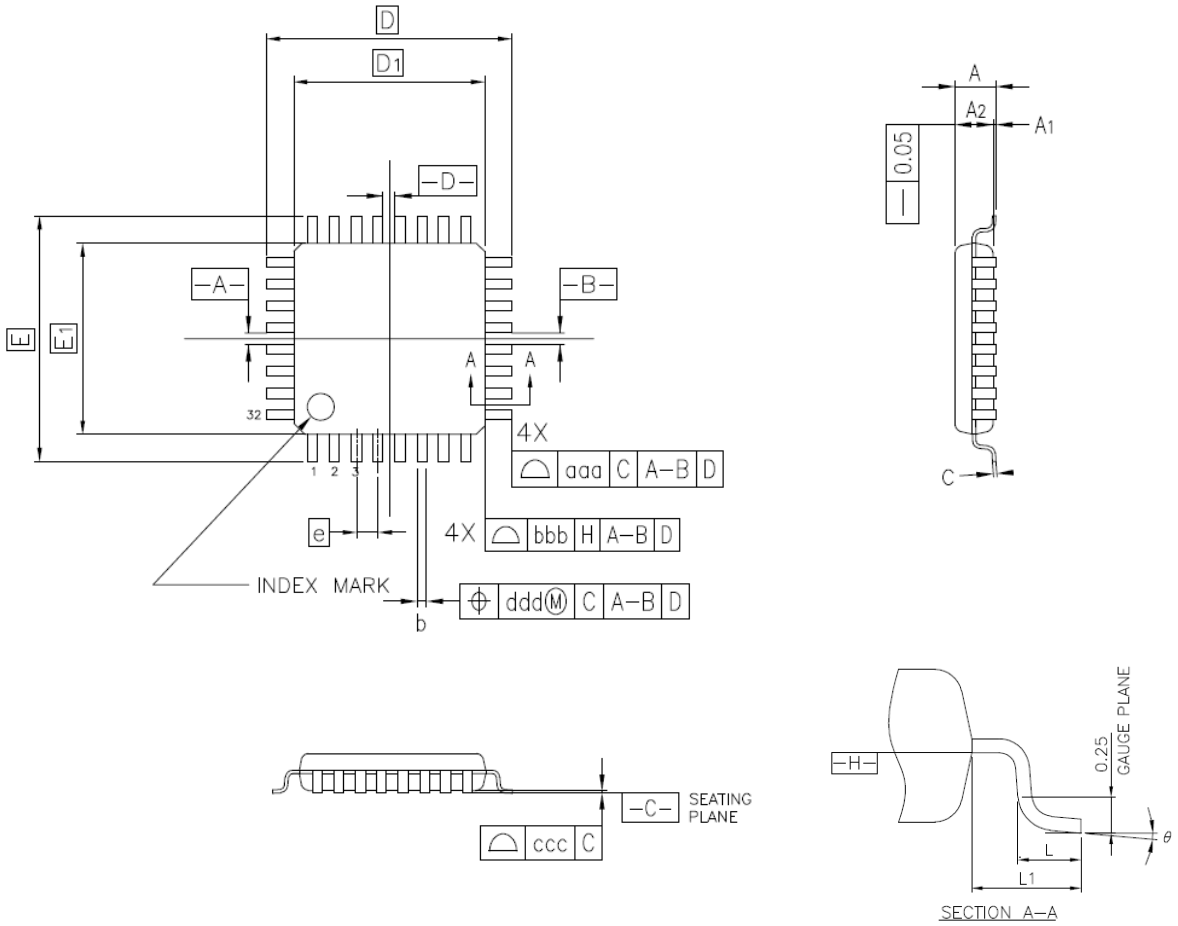
Differences

Items		Additional factory	Current
Wafer process		PSMC	Kawashiri
Assembly		Greatek	BJ, KL
Sort		KYEC	BJ, KL
Package	Outline	Slight differences (see p.7~p.18)	
Lead frame	Material	No difference	
	Inner lead shape	Shape difference (see p.19)	
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.20)	
	Digit number	Slight difference (see p.21)	
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)

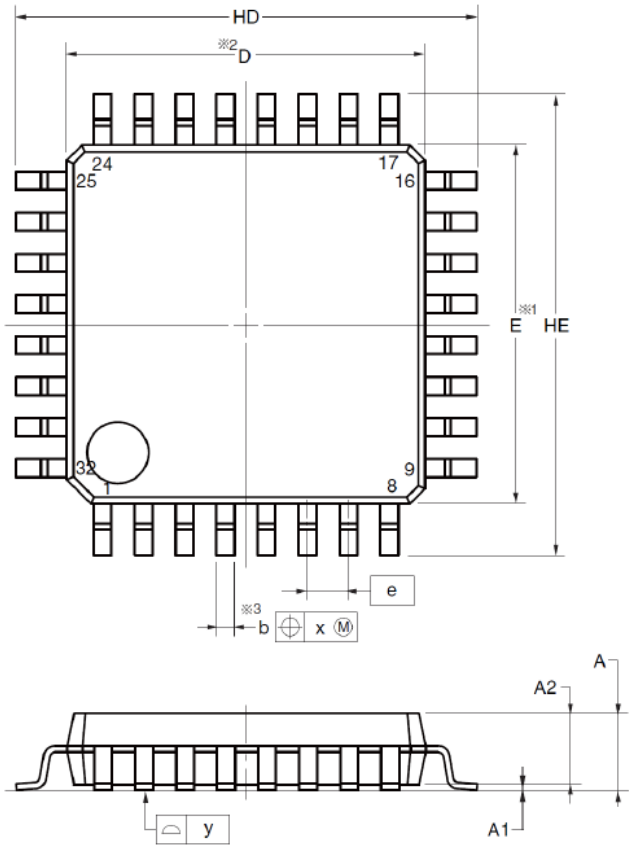
RENESAS Code : PLQP0032GE-A

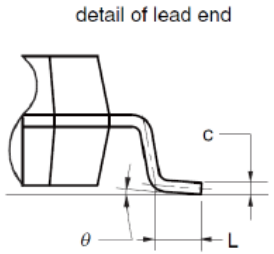


Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	–	–	1.60
A_1	0.05	–	0.15
A_2	1.35	1.40	1.45
D	–	9.00	–
D1	–	7.00	–
E	–	9.00	–
E_1	–	7.00	–
N	–	32	–
e	–	0.80	–
b	0.30	0.37	0.45
c	0.09	–	0.20
θ	0°	3.5°	7°
L	0.45	0.60	0.75
L_1	–	1.00	–
aaa	–	–	0.20
bbb	–	–	0.20
ccc	–	–	0.10
ddd	–	–	0.20

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
θ	0° to 8°
e	0.80
x	0.20
y	0.10

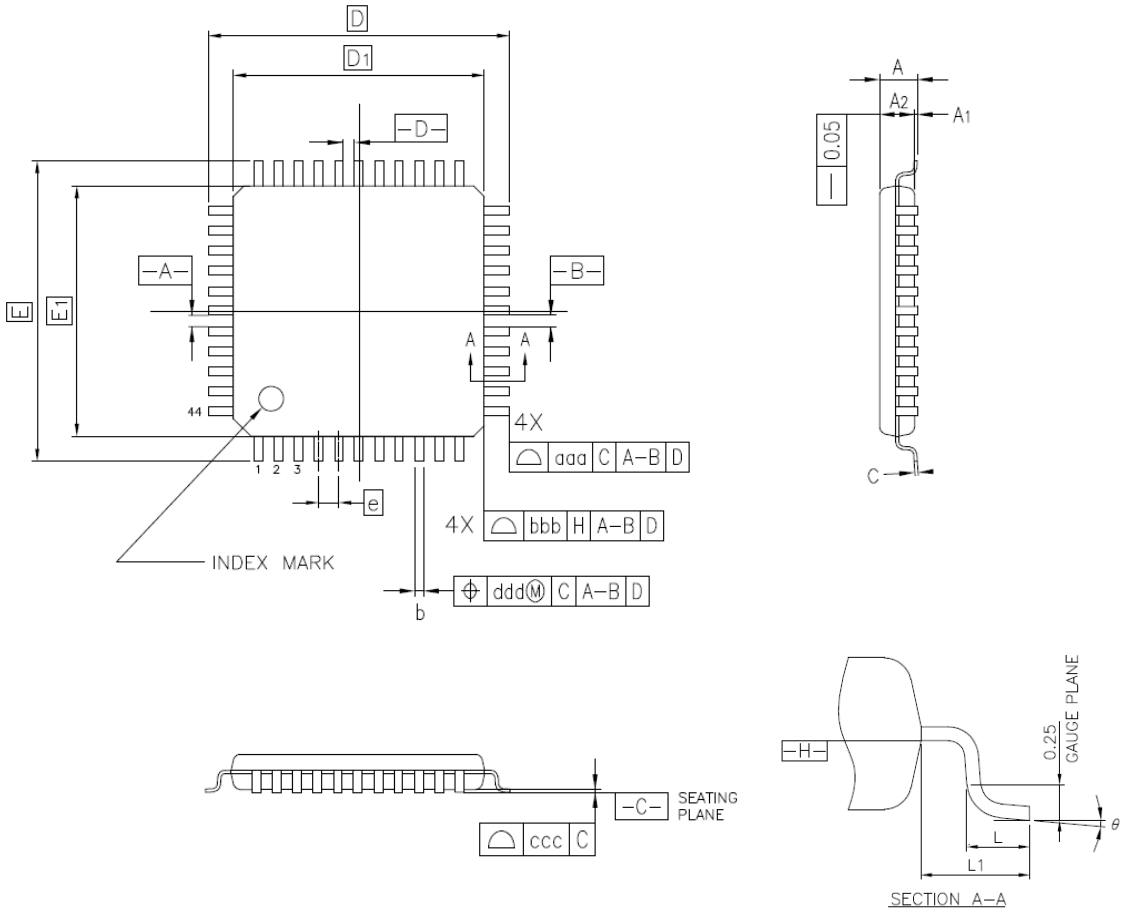
Comparison: 7mm×7mm 0.8mm pitch 32pin LQFP Package

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)

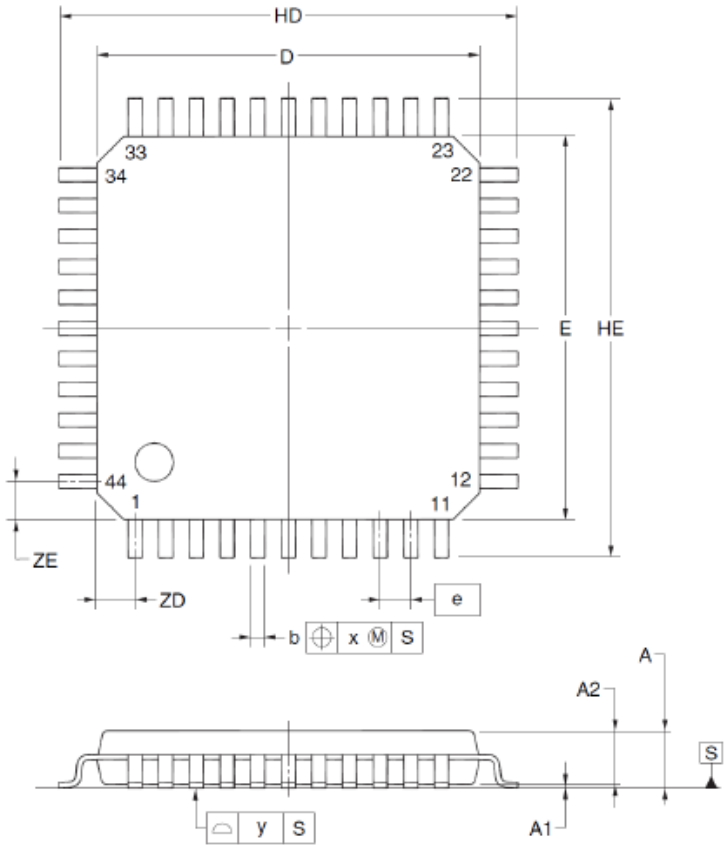
RENESAS Code : PLQP0044GE-A

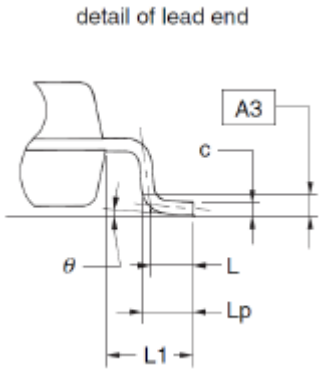


Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	–	–	1.60
A_1	0.05	–	0.15
A_2	1.35	1.40	1.45
D	–	12.00	–
D1	–	10.00	–
E	–	12.00	–
E_1	–	10.00	–
N	–	44	–
e	–	0.80	–
b	0.30	0.37	0.45
c	0.09	–	0.20
θ	0°	3.5°	7°
L	0.45	0.60	0.75
L_1	–	1.00	–
aaa	–	–	0.20
bbb	–	–	0.20
ccc	–	–	0.10
ddd	–	–	0.20

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

RENESAS Code : PLQP0044GC-A





(UNIT:mm)

ITEM	DIMENSIONS
D	10.00±0.20
E	10.00±0.20
HD	12.00±0.20
HE	12.00±0.20
A	1.60 MAX.
A1	0.10±0.05
A2	1.40±0.05
A3	0.25
b	$0.37^{+0.08}_{-0.07}$
c	$0.145^{+0.055}_{-0.045}$
L	0.50
Lp	0.60±0.15
L1	1.00±0.20
θ	$3^{\circ}{}^{+5^{\circ}}_{-3^{\circ}}$
e	0.80
x	0.20
y	0.10
ZD	1.00
ZE	1.00

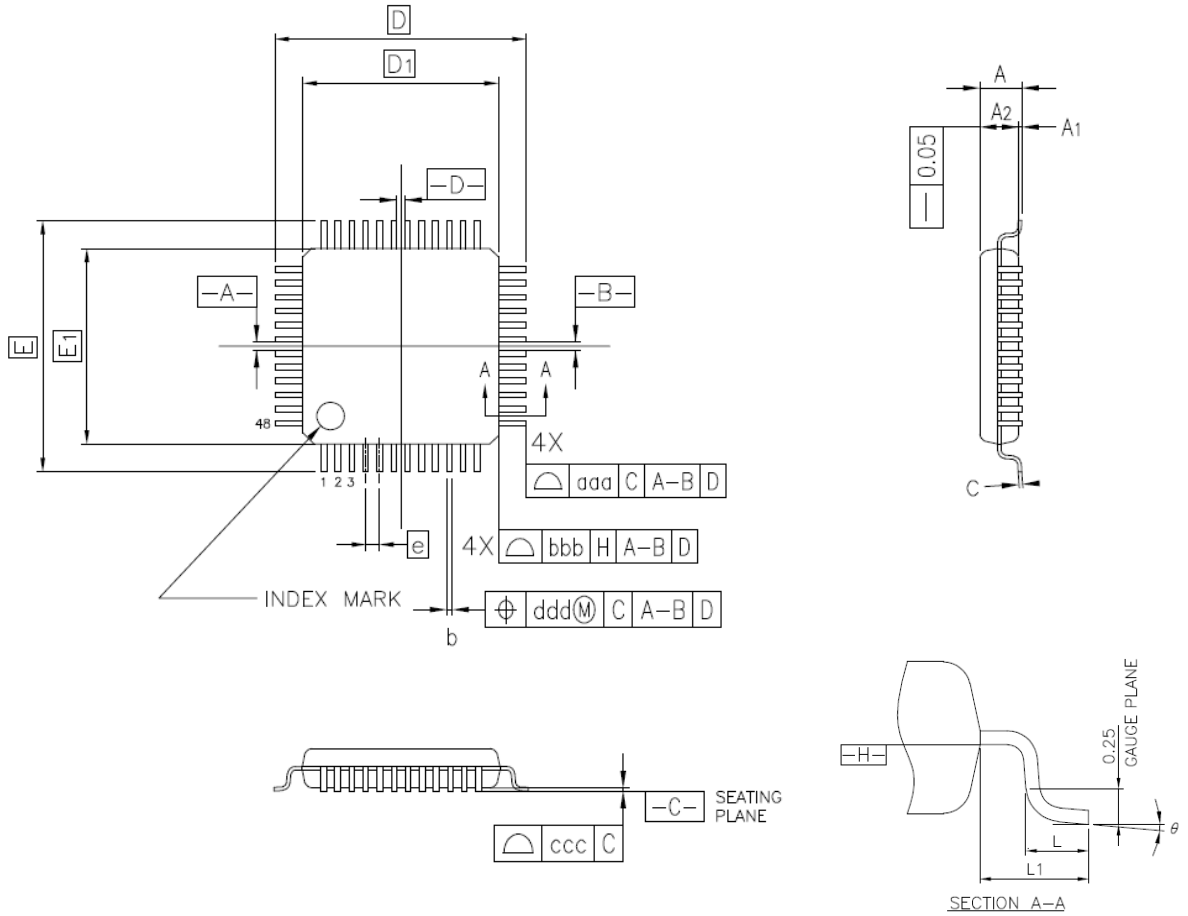
Comparison: 10mm×10mm 0.8mm pitch 44pin LQFP Package

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)

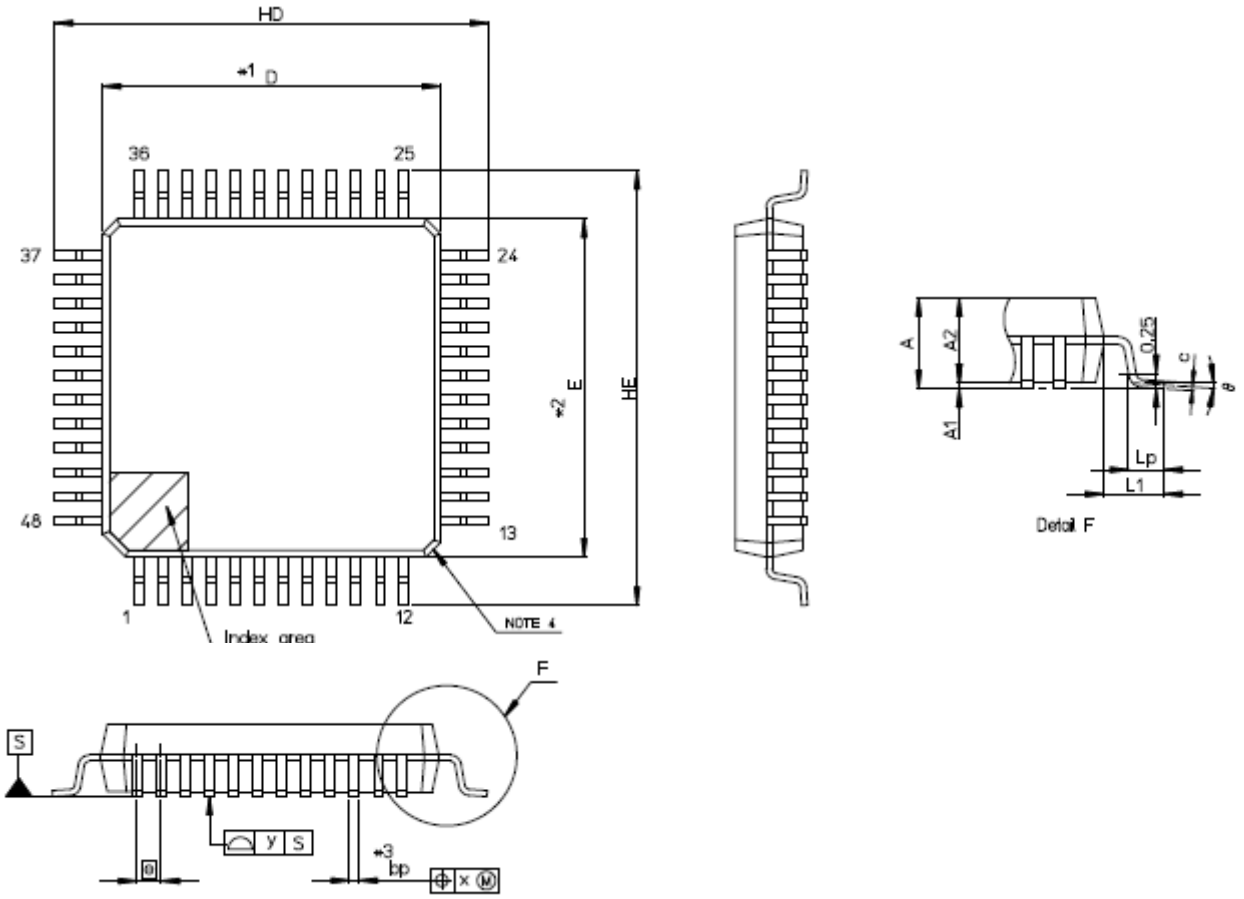
RENESAS Code : PLQP0048KL-A



Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	–	–	1.60
A_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(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
θ	0°	3.5°	8°
e	—	0.5	—
x	—	—	0.08
y	—	—	0.08
Lp	0.45	0.6	0.75
L1	—	1.0	—

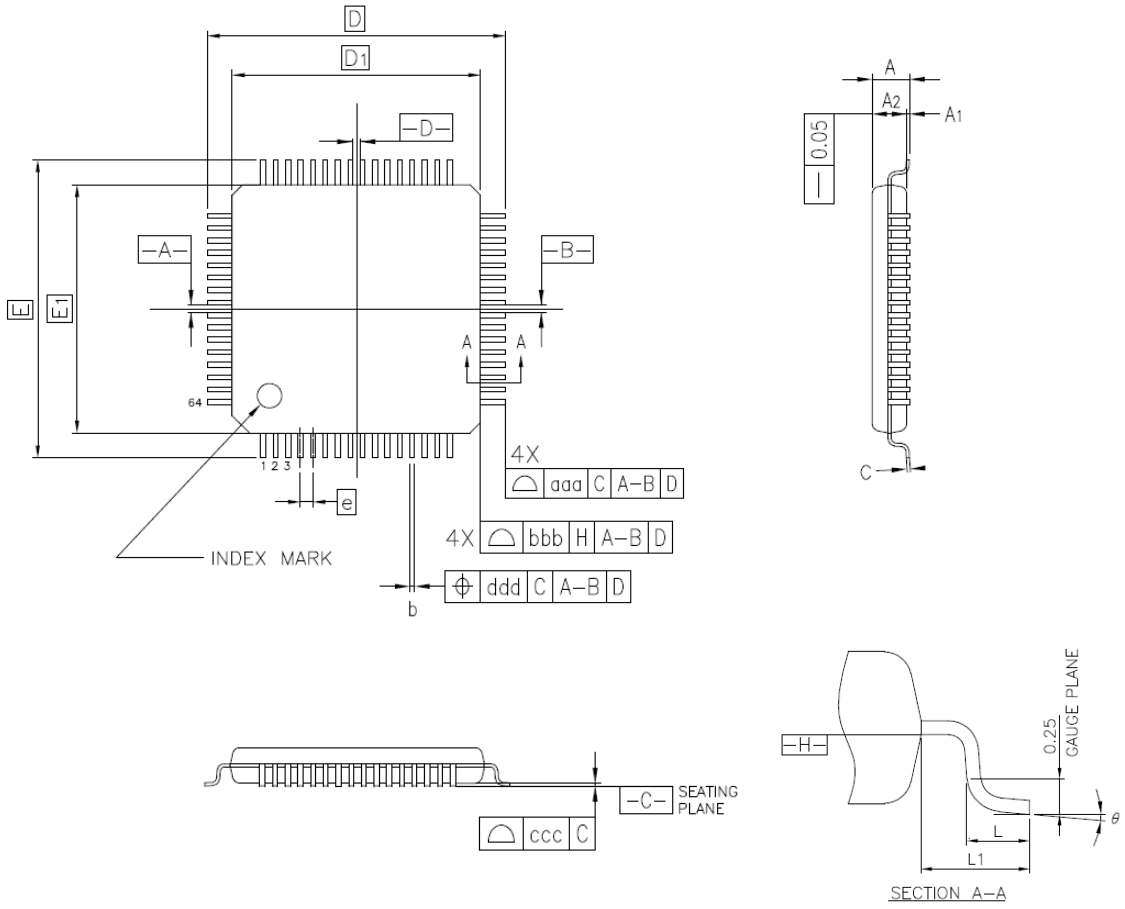
Comparison: 7mm×7mm 0.5mm pitch 48pin LFQFP package

Greatek package symbols comply JEDEC standard.

Greatek Symbol	7x7mm 48pin LQFP PLQP0048KL-A			BJ 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)

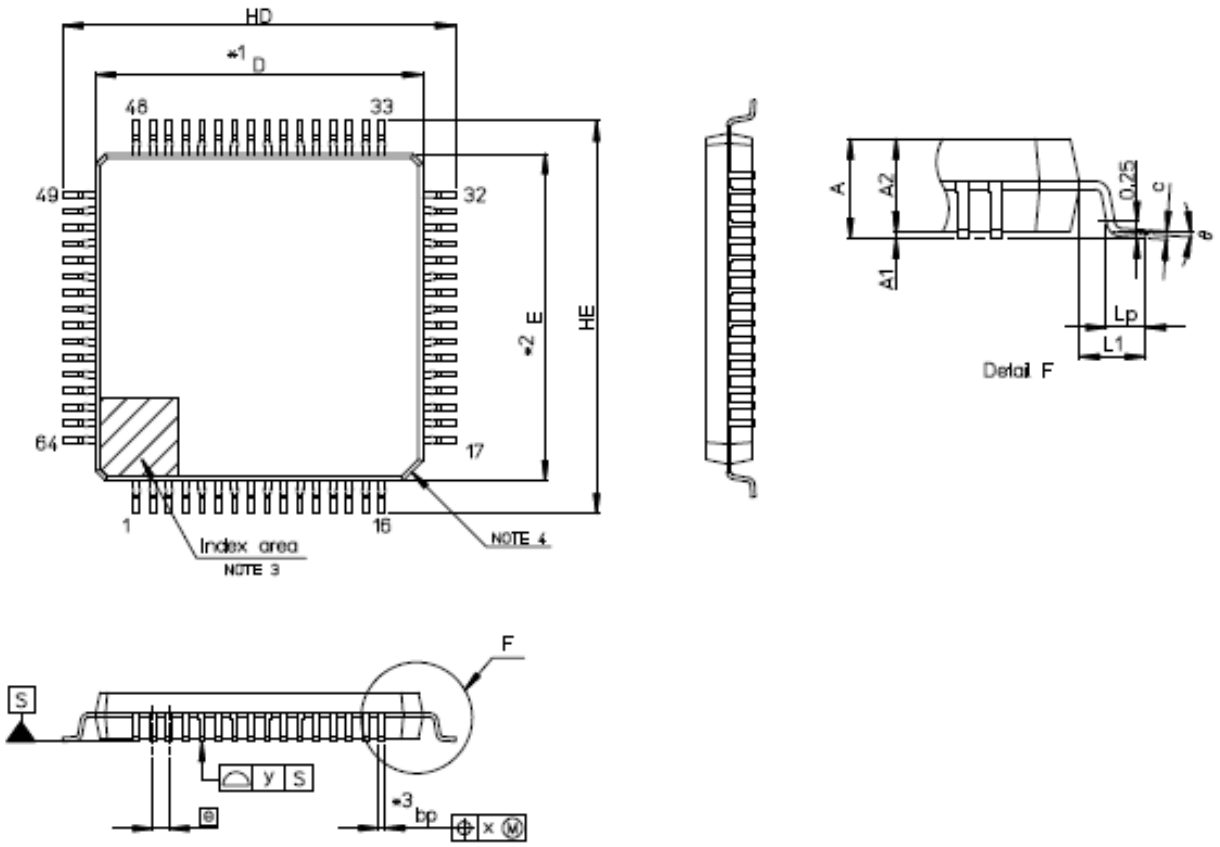
RENESAS Code : PLQP0064KL-A



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(BJ)

RENESAS Code : PLQP0064KB-C



Reference Symbol	Dimension in Milimeters		
	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	—

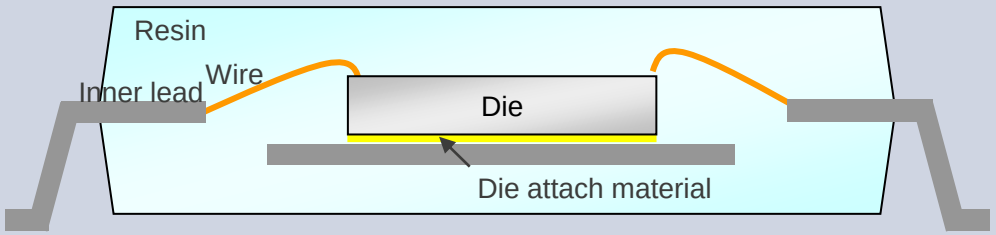
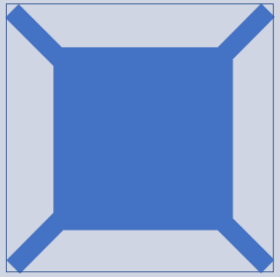
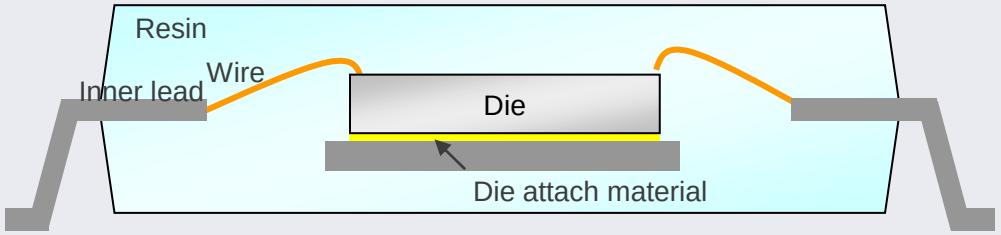
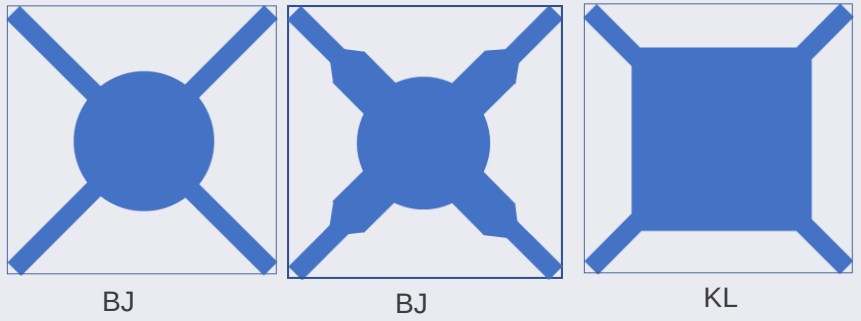
Comparison: 10mm×10mm 0.5mm pitch 64pin LFQFP package

Greatek package symbols comply JEDEC standard.

Greatek Symbol	10x10mm 64pin LQFP PLQP0064KL-A			BJ 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		
Current factory		

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

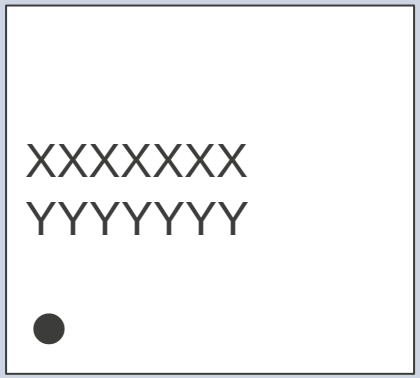
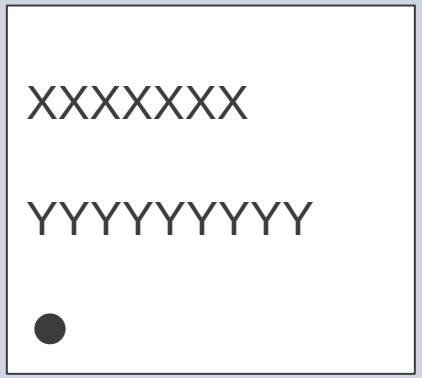
Marking visibility

※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		
	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)

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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