

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: 32pin QFN package products

Wafer fab: Powerchip Semiconductor Manufacturing Corporation (PSMC) addition

2)Case2: 32pin LQFP package products

Wafer fab: Powerchip Semiconductor Manufacturing Corporation (PSMC) addition

Assembly: Greatek Electronics Inc. (Greatek) addition

Sorting: King Yuan Electronics Corp. (KYEC) addition

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

PKG	size [mm]	pins	Pin-pitch [mm]	thickness [mm]	Fab addition (this time)			Current fabs		
					WP	Assembly	Sort	WP	Assembly	Sort
LQFP	07x07	32	0.8	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

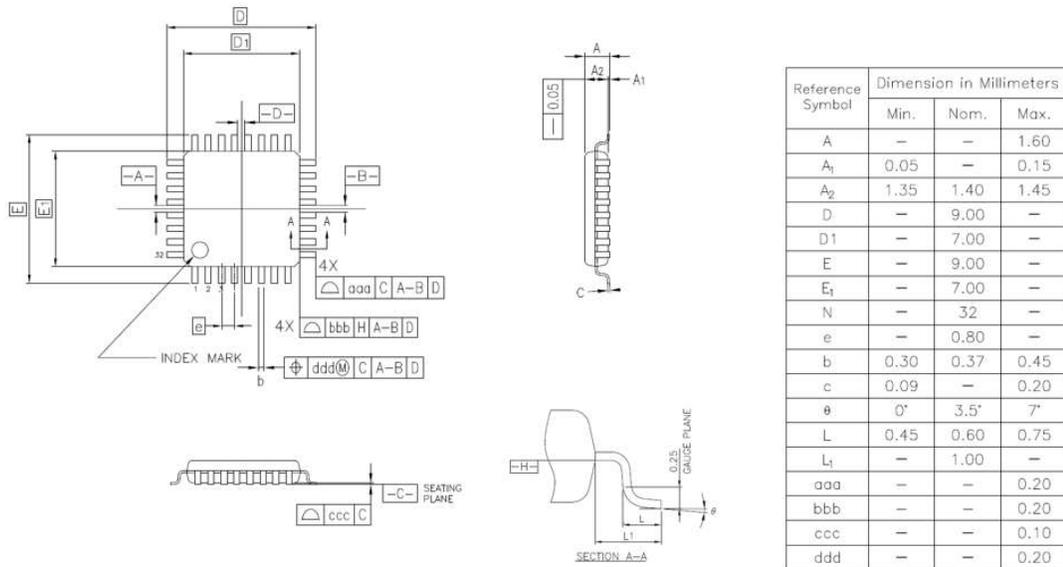
Greatek: Greatek Electronics Inc.

Items		This time	Current
Wafer process		Kawashiri, PSMC	Kawashiri
Assembly		Greatek	RSB
Sort		KYEC	RSB
Package	Outline	Slight differences (see p.3~p.4)	
Lead frame	Material	No difference	
	Inner lead shape	Shape difference (see p.4)	
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.4)	
	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.

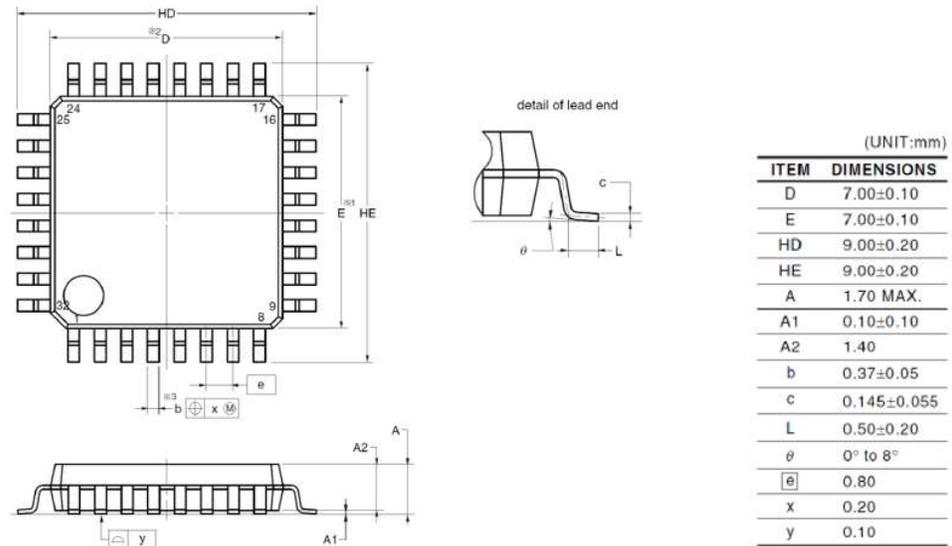
7mm×7mm 0.8mm pitch 32pin LQFP package outline (Greatek)

RENESAS Code : PLQP0032GE-A



7mm×7mm 0.8mm pitch 32pin LQFP package outline (RSB)

RENESAS Code : PLQP0032GB-A



Comparison: 7mm×7mm 0.8mm pitch 32pin LQFP package outline

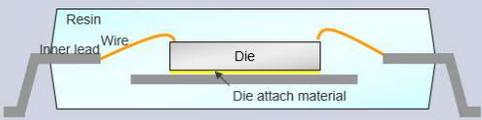
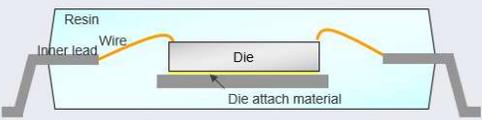
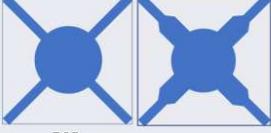
Greatek package symbols comply JEDEC standard.

Greatek Symbol	7x7mm 32pin LQFP PLQP0032GE-A			RSB 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	-

←different measurement points

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

Product List:

Product P/N	Package	Product P/N	Package
R7FA2E1A93CNH#HA0	32pin QFN	R7FA2E1A93CFJ#HA0	32pin LQFP
R7FA2E1A93CNH#BA0	32pin QFN	R7FA2E1A93CFJ#BA0	32pin LQFP
R7FA2E1A93CNH#AA0	32pin QFN	R7FA2E1A92DFJ#HA0	32pin LQFP
R7FA2E1A92DNH#HA0	32pin QFN	R7FA2E1A92DFJ#BA0	32pin LQFP
R7FA2E1A92DNH#BA0	32pin QFN	R7FA2E1A73CFJ#HA0	32pin LQFP
R7FA2E1A92DNH#AA0	32pin QFN	R7FA2E1A73CFJ#BA0	32pin LQFP
R7FA2E1A73CNH#HA0	32pin QFN	R7FA2E1A72DFJ#HA0	32pin LQFP
R7FA2E1A73CNH#BA0	32pin QFN	R7FA2E1A72DFJ#BA0	32pin LQFP
R7FA2E1A73CNH#AA0	32pin QFN	R7FA2E1A53CFJ#HA0	32pin LQFP
R7FA2E1A72DNH#HA0	32pin QFN	R7FA2E1A53CFJ#BA0	32pin LQFP
R7FA2E1A72DNH#BA0	32pin QFN	R7FA2E1A52DFJ#HA0	32pin LQFP
R7FA2E1A72DNH#AA0	32pin QFN	R7FA2E1A52DFJ#BA0	32pin LQFP
R7FA2E1A53CNH#HA0	32pin QFN		
R7FA2E1A53CNH#BA0	32pin QFN		
R7FA2E1A53CNH#AA0	32pin QFN		
R7FA2E1A52DNH#HA0	32pin QFN		
R7FA2E1A52DNH#BA0	32pin QFN		
R7FA2E1A52DNH#AA0	32pin QFN		