

Details of Change:

- 1) Factory:
 Before change: Amkor Technology Japan Kumamoto (ATJ Kumamoto)
 After change:
 Assembly factory: Powertech Technology Inc., Group_Greatek Electronics Inc., (PTI_Greatek)
 Final test factory: King Yuan Electronics Co., Ltd (KYEC)
- 2) Material: Change to standard material used in the factory.
 Bonding wire change from Gold (Au) to Copper (Cu).
 Lead frame, Die mount material and Mold resin material change
- 3) Package outline:
 3-1) Changes in some of the dimensions.
 3-2) The package surface becomes matte but does not affect the reliability.
- 4) Marking on package:
 4-1) Font Change
 4-2) Manufacturing lot number Change (from 9 digits to 7 digits)
 4-3) Delete Pb-Free Marking
- 5) Packaging material:
 5-1) Tray and the order of devices change
 5-2) Addition of bundling band color (Black)
 5-3) Emboss tape change
 5-4) Reel for emboss taping change
- 6) Storage condition after opening:
 Before change: Amkor Technology Japan: Within 30°C/ 70%RH/ 168h
 After change: Powertech Technology Inc., Group: Within 30°C/ 60%RH/ 168h
 (JEDEC compliant)
- 7) Ordering P/N:
 Please see the P/N reference table for details.
- 8) Add full carton P/N
 With regard to product shipped by tray package, we add Full carton P/N for the full state tray package and inner box. Full carton shipment will combine maximum 3 production lots at worst case.
 #U* changes to #2* or #0* for tray packed P/N and #W* changes to #4* for embossed taping P/N.

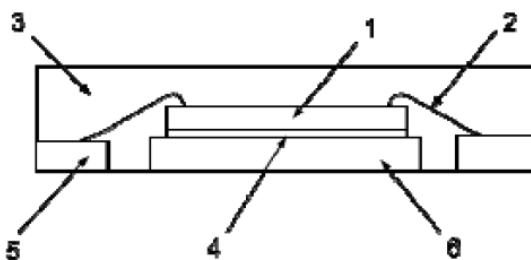
Difference of Specification's Outline:

Item		After change	Before change
Assembly factory		Powertech Technology Inc., Group_Greatek Electronics Inc.	Amkor Technology Japan Kumamoto
Sorting factory		King Yuan Electronics Co., Ltd	
Parts	Lead frame	Change to standard material used in new factory. The structure not changed.	-
	Die mount	Change to standard material used in new factory. The structure not changed.	-
	Mould resin	Change to standard material used in new factory. The structure not changed.	-
	Bonding wire	Cu (Pd coating)	Au
Package	Outline	There are changes in some of dimensions	-
Marking	Font	Font changed	-
	Country of origin indication	No indication	Indicated
	Manufacturing lot number	7 digits	9 digits
	Pb-Free Marking	No indication	Indicated

Item		After change	Before change
Packing	Bundling band color	Add black	-
	Tray	Tray and the order of devices change	-
	Emboss tape	Emboss tape, Reel for emboss taping and Desiccant change	-
Storage condition	After opening	Within 30°C/ 60%RH/ 168h	Within 30°C/ 70%RH/ 168h
Ordering P/N		R5F*****N*#2* / #0* / #4*	R5F*****N*#U* / #W*
The others		Add full carton P/N for tray package	-

Difference of Specification's Detail:
PACKAGE STRUCTURE IMAGE

* Package Section and die pad shape is a reference example.



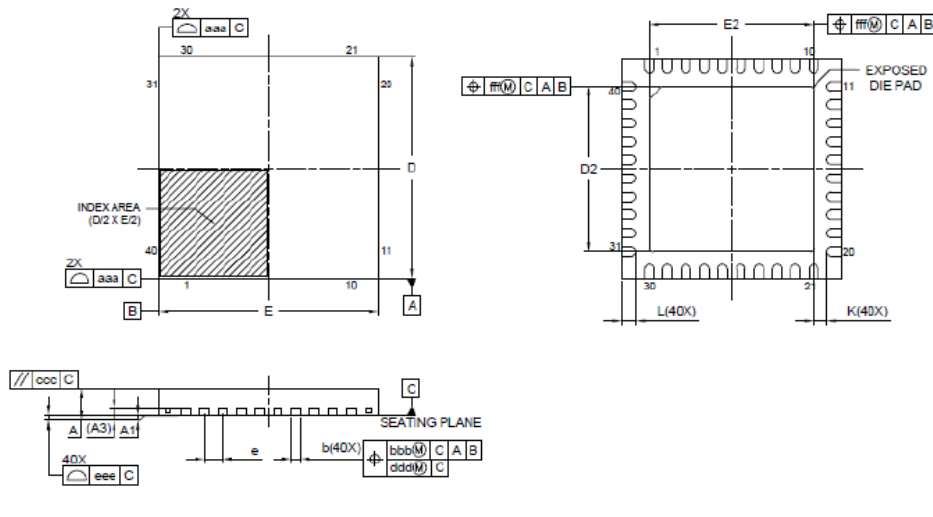
No.	部材 Part
1	チップ Die
2	ワイヤ Wire
3	封止材 Molding material
4	ダイアタッチ材 Die attach material
5	Cu リード: Ni/Pd/Au めっき Cu lead: Ni/Pd/Au plating
6	ダイパッド Die pad

* The materials are different because they use materials certified at the site, but the structure is equivalent.

* Refer to the package drawing because some sizes are different depending on the package.

6x6mm 40pin HWQFN package drawing (After change)

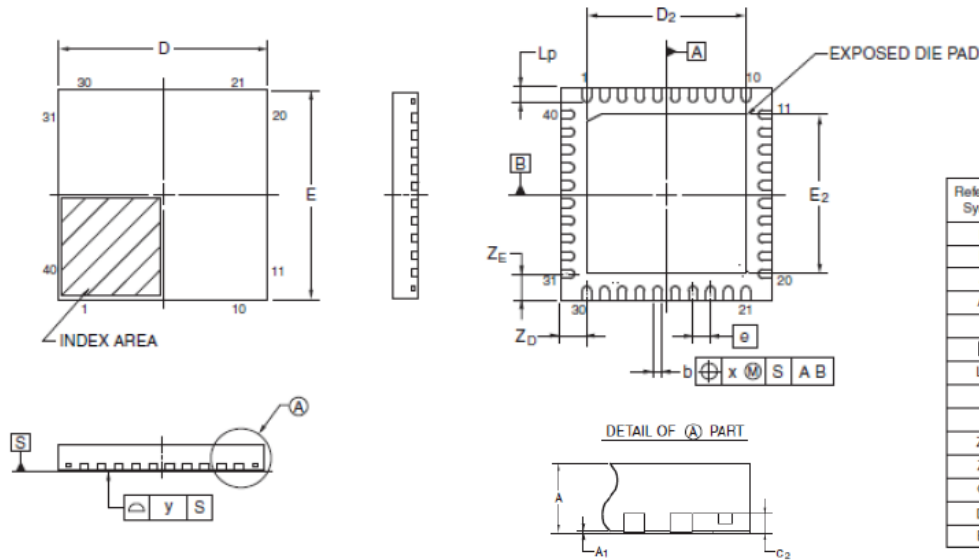
JEITA Package code	RENESAS code	MASS(TYP.)(g)
P-HWQFN040-6x6-0.50	PWQN0040KD-A	0.08



Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	—	—	0.80
A ₁	0.00	0.02	0.05
A ₂	0.203 REF.		
b	0.18	0.25	0.30
D	6.00 BSC		
E	6.00 BSC		
e	0.50 BSC		
L	0.30	0.40	0.50
K	0.20	—	—
D ₁	4.45	4.50	4.65
E ₁	4.45	4.50	4.65
aaa	0.15		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		
fff	0.10		

6x6mm 40pin HWQFN package drawing (Before change)

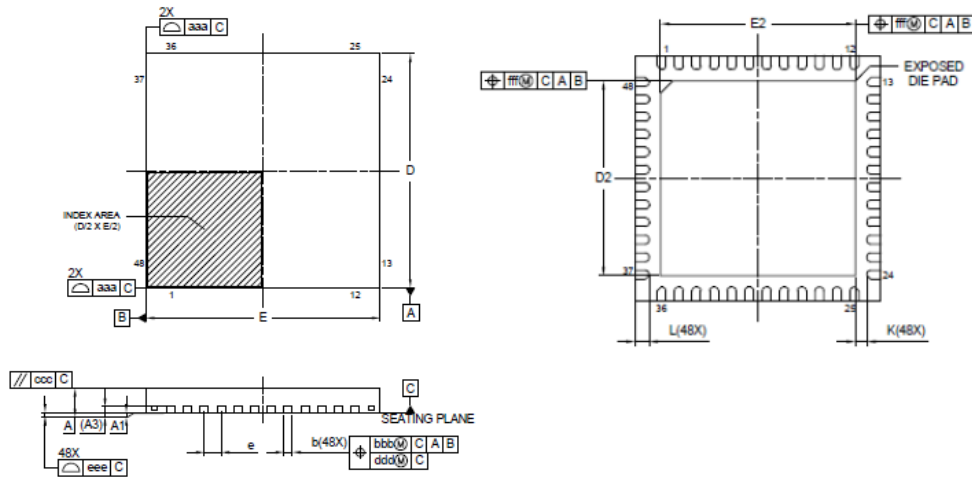
JEITA Package code	RENESAS code	Previous code	MASS(TYP.)(g)
P-HWQFN040-6x6-0.50	PWQN0040KC-A	P40K8-50-4B4-5	0.09



Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
D	5.95	6.00	6.05
E	5.95	6.00	6.05
A	—	—	0.80
A ₁	0.00	—	—
b	0.18	0.25	0.30
ⓐ	—	0.50	—
Lp	0.30	0.40	0.50
x	—	—	0.05
y	—	—	0.05
Z _D	—	0.75	—
Z _E	—	0.75	—
c ₂	0.15	0.20	0.25
D ₂	—	4.50	—
E ₂	—	4.50	—

7x7mm 48pin HWQFN package drawing (After change)

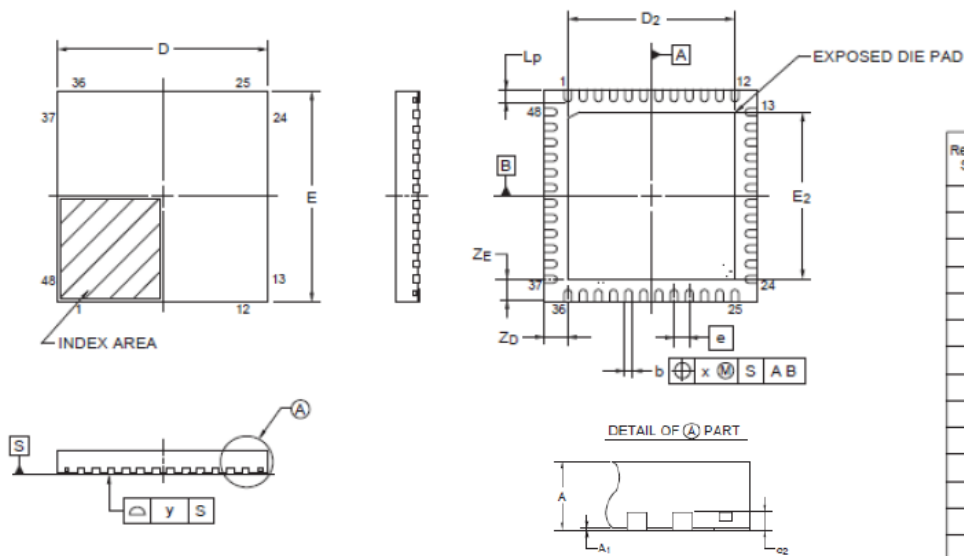
JEITA Package code	RENESAS code	MASS(TYP.)[g]
P-HWQFN048-7x7-0.50	PWQNG048KE-A	0.13



Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	—	—	0.80
A ₁	0.00	0.02	0.05
A _v	0.203 REF.		
b	0.20	0.25	0.30
D	7.00 BSC		
E	7.00 BSC		
e	0.50 BSC		
L	0.30	0.40	0.50
K	0.20	—	—
D ₂	5.50	5.55	5.60
E ₂	5.50	5.55	5.60
aaa	0.15		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		
fff	0.10		

7x7mm 48pin HWQFN package drawing (Before change)

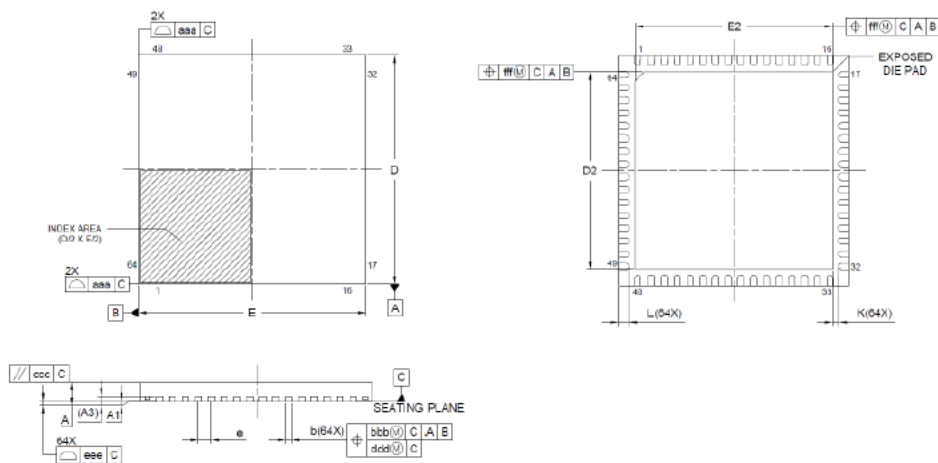
JEITA Package Code	RENESAS Code	Previous Code	MASS (Typ) [g]
P-HWQFN48-7x7-0.50	PWQNG048KB-A	48PJN.A P48K8-50-5B4.7	0.13



Reference Symbol	Dimensions in millimeters		
	Min	Nom	Max
D	6.95	7.00	7.05
E	6.95	7.00	7.05
A	—	—	0.80
A ₁	0.00	—	—
b	0.18	0.25	0.30
e	—	0.50	—
Lp	0.30	0.40	0.50
x	—	—	0.05
y	—	—	0.05
Z _D	—	0.75	—
Z _E	—	0.75	—
c ₂	0.15	0.20	0.25
D ₂	—	5.50	—
E ₂	—	5.50	—

9x9mm 64pin HWQFN package drawing (After change)

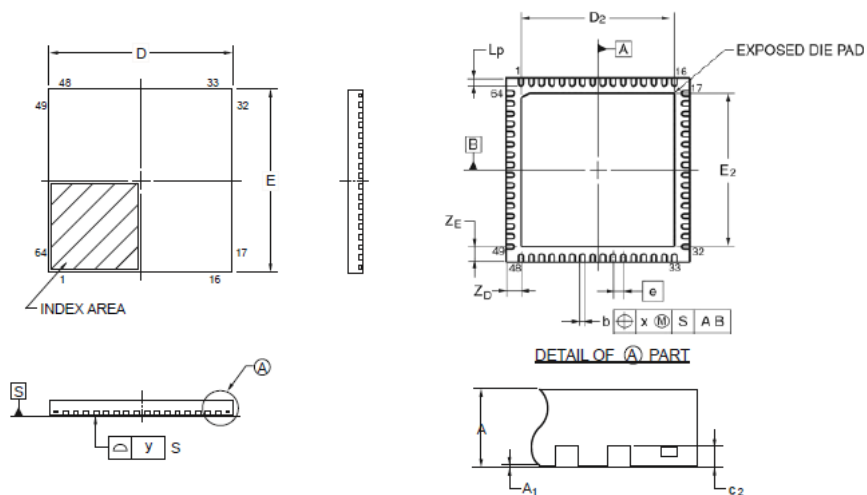
JEITA Package code	RENESAS code	MASS(TYP.)(g)
P-HWQFN064-9x9-0.50	PWQN0064KD-A	0.17



Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	—	—	0.80
A ₁	0.00	0.02	0.05
A ₂	0.203 REF.		
b	0.18	0.25	0.30
D	9.00 BSC		
E	9.00 BSC		
e	0.50 BSC		
L	0.30	0.40	0.50
K	0.20	—	—
D ₂	7.65	7.70	7.75
E ₂	7.65	7.70	7.75
aaa	0.15		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		
fff	0.10		

9x9mm 64pin HWQFN package drawing (Before change)

JEITA Package code	RENESAS code	Previous code	MASS(TYP.)(g)
P-HWQFN64-9x9-0.50	PWQN0064KC-A	P64K8-50-6B4-4	0.21



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	8.95	9.00	9.05
E	8.95	9.00	9.05
A			0.80
A ₁	0.00		
b	0.18	0.25	0.30
e	0.50		
Lp	0.30	0.40	0.50
x			0.05
y			0.05
ZD		0.75	
ZE		0.75	
c2	0.15	0.20	0.25
D ₂	7.50		
E ₂	7.50		

Dimension comparison: 6x6mm 40pin HWQFN package

JEDEC notation will be used instead of the conventional notation.

Symbol (After change)	6x6mm 40pin HWQFN PWQN0040KD-A			Symbol (Before change)	6x6mm 40pin HWQFN PWQN0040KC-A		
	Dimension in Millimeters				Dimension in Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	-	-	0.80	A	-	-	0.80
A1	0.00	0.02	0.05	A1	0.00	-	-
A3	0.203 REF.			C2	0.15	0.20	0.25
b	0.18	0.25	0.30	b	0.18	0.25	0.30
D	6.00 BSC			E	5.95	6.00	6.05
E	6.00 BSC			D	5.95	6.00	6.05
e	0.50 BSC			e	-	0.50	-
L	0.30	0.40	0.50	Lp	0.30	0.40	0.50
K	0.20	-	-	-	-	-	-
D2	4.45	4.50	4.55	E2	-	4.50	-
E2	4.45	4.50	4.55	D2	-	4.50	-
-	-	-	-	ZD	-	0.75	-
-	-	-	-	ZE	-	0.75	-
aaa	0.15			-	-	-	-
bbb	0.10			x	-	-	0.05
ccc	0.10			-	-	-	-
ddd	0.05			-	-	-	-
eee	0.08			y	-	-	0.05
fff	0.10			-	-	-	-

Dimension comparison: 7x7mm 48pin HWQFN package

JEDEC notation will be used instead of the conventional notation.

Symbol (After change)	7x7mm 48pin HWQFN PWQN0048KE-A			Symbol (Before change)	7x7mm 48pin HWQFN PWQN0048KB-A		
	Dimension in Millimeters				Dimension in Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	-	-	0.80	A	-	-	0.80
A1	0.00	0.02	0.05	A1	0.00	-	-
A3	0.203 REF.			C2	0.15	0.20	0.25
b	0.20	0.25	0.30	b	0.18	0.25	0.30
D	7.00 BSC			E	6.95	7.00	7.05
E	7.00 BSC			D	6.95	7.00	7.05
e	0.50 BSC			e	-	0.50	-
L	0.30	0.40	0.50	Lp	0.30	0.40	0.50
K	0.20	-	-	-	-	-	-
D2	5.50	5.55	5.60	E2	-	5.50	-
E2	5.50	5.55	5.60	D2	-	5.50	-
-	-	-	-	ZD	-	0.75	-
-	-	-	-	ZE	-	0.75	-
aaa	0.15			-	-	-	-
bbb	0.10			x	-	-	0.05
ccc	0.10			-	-	-	-
ddd	0.05			-	-	-	-
eee	0.08			y	-	-	0.05
fff	0.10			-	-	-	-

Dimension comparison: 9x9mm 64pin HWQFN package

JEDEC notation will be used instead of the conventional notation.

Symbol (After change)	9x9mm 64pin HWQFN PWQN0064??-A			Symbol (Before change)	9x9mm 64pin HWQFN PWQN0064LA-A		
	Dimension in Millimeters				Dimension in Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	0.70	0.75	0.80	A	0.70	0.75	0.80
A1	0.00	0.02	0.05	A1	-	-	0.05
C2	0.203 REF.			C2	0.15	0.20	0.25
b	0.18	0.25	0.30	b	0.18	0.25	0.30
D	9.00 BSC			E	8.95	9.00	9.05
E	9.00 BSC			D	8.95	9.00	9.05
e	0.50 BSC			e	0.47	0.50	0.53
L	0.30	0.40	0.50	Lp	0.30	0.40	0.50
K	0.20	-	-	-	-	-	-
D2	7.65	7.70	7.75	E2	7.45	7.50	7.55
E2	7.65	7.70	7.75	D2	7.45	7.50	7.55
-	-	-	-	ZD	-	0.75	-
-	-	-	-	ZE	-	0.75	-
aaa	0.15			-	-	-	-
bbb	0.10			x	-	-	0.05
ccc	0.10			-	-	-	-
ddd	0.05			-	-	-	-
eee	0.08			y	-	-	0.05
fff	0.10			-	-	-	-

APPEARANCE

Comparison with ATJ Kumamoto

※Example of 7x7mm 48pin
Character is reference example

	Package surface	Package back	Package side
After change			
Before change			

LASER VISIBILITY

Comparison with ATJ Kumamoto

※Character is reference example

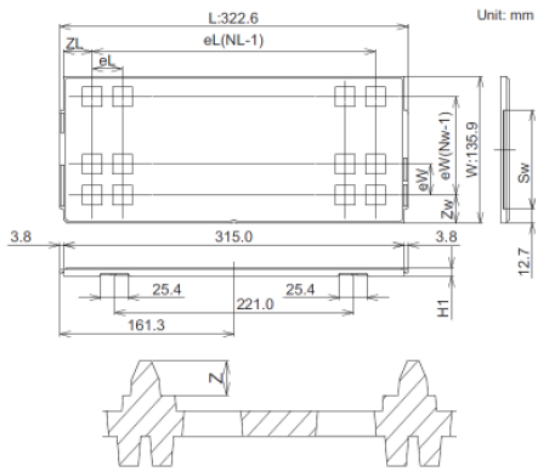
Assembly site	After change	Before change
Whole Photo		
Detail Photo		

Packing specifications (tray)_Tray order

Assembly site	Order of Devices
After change	
Before change	

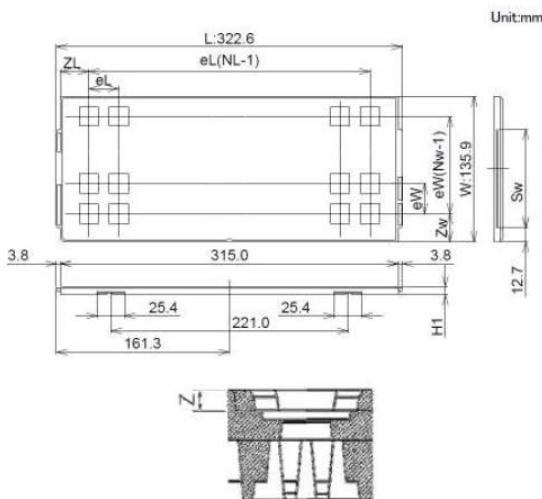
PACKING SPECIFICATION (TRAY)_6mm×6mm 40pin HWQFN

No change from current product



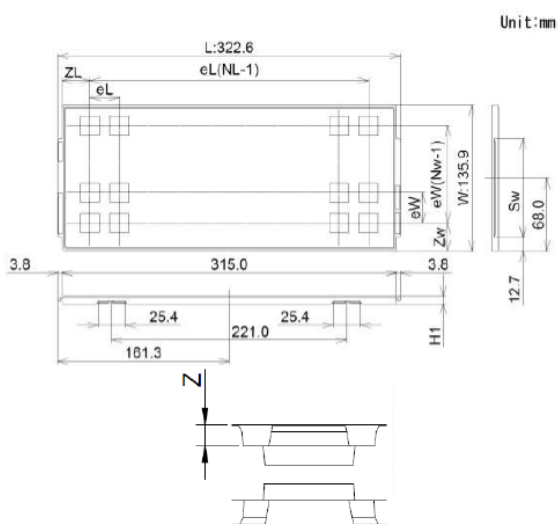
Tray Code		After change / Before change
Position dimension of cells	Z	1.35
	Zw	8.15
	ZL	7.90
	eW	9.20
	eL	8.80
	Sw	92.10
Thickness (mm)	H1	7.62
Number of cells	Nw	14
	NL	35
Maximum storage pcs IC/Tray		490
Maximum storage pcs IC/Inner box		3,920
Material		Carbon PPE
Heat resistant temperature		135°C MAX
JEDECorCustom		JEDEC
Surface resistance		Less than 1x10 ¹¹ Ω/□

PACKING SPECIFICATION (TRAY)_7mm×7mm 48pin HWQFN



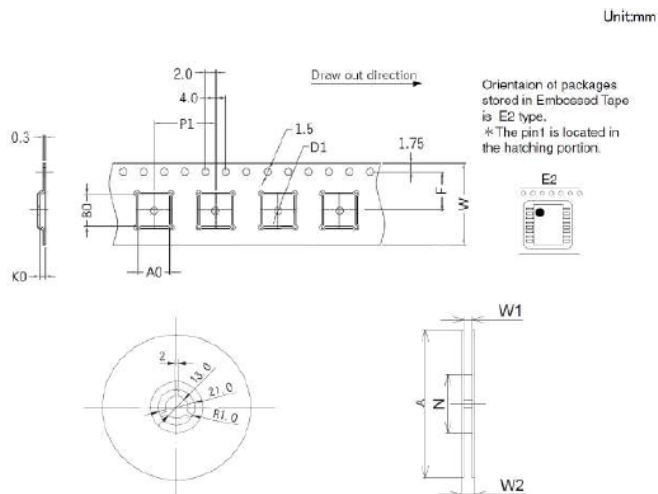
Tray Code		After change	Before change
Position dimension of cells	Z	1.40	1.55
	Zw	11.55	10.35
	ZL	11.80	10.00
	eW	9.40	12.80
	eL	9.40	11.80
	Sw	92.10	92.10
Thickness (mm)	H1	7.62	7.62
Number of cells	Nw	13	10
	NL	32	26
Maximum storage pcs IC/Tray		416	260
Maximum storage pcs IC/Inner box		3,328	2,080
Material		Carbon PPE	Carbon PPE
Heat resistant temperature		135°C MAX	135°C MAX
JEDECorCustom		JEDEC	JEDEC
Surface resistance		Less than 1x10 ¹¹ Ω/□	Less than 1x10 ¹¹ Ω/□

PACKING SPECIFICATION (TRAY)_ 9mm×9mm 64pin HWQFN



Tray Code		After change	Before change
Position dimension of cells	Z	1.55	1.50
	Zw	10.35	10.75
	ZL	10.00	11.90
	eW	12.80	10.40
	eL	11.80	10.40
	Sw	92.10	92.10
Thickness (mm)	H1	7.62	7.62
Number of cells	Nw	10	12
	NL	26	29
Maximum storage pcs IC/Tray		260	348
Maximum storage pcs IC/Inner box		2,080	2,784
Material		Carbon PPE	Carbon PPE
Heat resistant temperature		135°C MAX	135°C MAX
JEDECorCustom		JEDEC	JEDEC
Surface resistance		Less than 1x10 ¹¹ Ω/□	Less than 1x10 ¹¹ Ω/□

PACKING SPECIFICATIONS (EMBOSS TAPING)_6mm×6mm 40pin HWQFN



Tape Code	After change	Before change	
Tape Dimensions (mm)	W	16.0	16.0
	P1	12.0	12.0
	A0	6.3	6.3
	B0	6.3	6.3
	K0	1.1	1.0
	F	7.5	7.5
	D1	1.5	1.5
Reel Dimensions (mm)	A	330	330
	N	96.5	100
	W1	16.8	17.5
	W2	22.2	21.5
Maximum storage Pcs. IC/ Reel	2,500	2,500	
Material	Carbon PS	Carbon PS	
Surface resistance	Less than 1x10 ¹¹ Ω/□	Less than 1x10 ¹¹ Ω/□	

* Desiccant change
Desiccant is changed, but there is no change in the storage period. Shape or the like might be changed.

	After change	Before change
Desiccant		

TARGET P/N: RX HWQFN PACKAGE PRODUCTS

Please refer to attached list about the ordering part number.

Due to the change to Cu wire, #U* changes to #2* or #0* for tray packed P/N and #W* changes to #4* for embossed taping P/N.

Examples of the P/N are shown below. Please see the P/N reference table for details.

RX111 (Example of 64kB Code flash)

Package type	P/N before change	P/N after change		
			Full carton P/N	Full carton quantity
Tray	R5F1113AGNF#UA	R5F1113AGNF#2A	R5F1113AGNF#0A	3,920
Embossed taping	R5F1113AGNF#WA	R5F1113AGNF#4A	-	-

ADD FULL CARTON P/N

For the target P/N product shipped by tray package, we add full carton P/N for the full state tray package and inner box. Full carton shipment will combine maximum 3 production lots at worst case.

Details of Changes: The following are the details

Item	Normal package (Fraction)	Full carton package
① Packing form	Any vacancy in the tray and any free space in the carton	Tray and Carton is packed with every product
② Label	No printed at upper left area on the label	Combined Lots are printed at upper left area on the label
③ Lot combine	1 lot in 1 carton	Combined maximum 3 lots for fulfill a Carton at worst case
④ Booking Part Number	The right next to "#" character of Booking Part Number : #2*	The right next to "#" character of Booking Part Number : #0*
⑤ Order Quantity	One product unit (fraction quantity)	Full Carton quantity unit

Example of current (fraction packing) Label

Not Printed at upper left area on the label



Example of Full Carton (3 combined lots) Label after change

The production lot's information are printed at upper left area on the label : 3 combined lots lot's information such as serial number code, week code and quantity

4M changing points

Change of material (Au to Cu) assembly and sorting factory

Item	Check result	Judgement
Machine	Changing at assembly and sorting. The machines are equivalent to present machines. To prevent copper wire oxidization, inert gas is used to wire bonding process. There are production results of copper wire products in new site and we have already checked there is no risk at the start of this product's production.	No risk
Method	Bonding method (thermosonic bonding) and process flow for the Cu wiring are same as the Au wiring.	No risk
Man	Using operator certification system. Only certificated operator can work for the production.	No risk
Material	Using only certificated copper wire. And applying certificated lead frame, die attach epoxy and mold compound for copper wire products. The products has been certificated by reliability test same as gold wire products and have no risk.	No risk

Product List:

P/N before change	P/N after change		
		Full carton P/N	Full carton quantity
R5F51101ADNE#U0	R5F51101ADNE#20	R5F51101ADNE#00	3,328
R5F51101ADNF#U0	R5F51101ADNF#20	R5F51101ADNF#00	3,920
R5F51101AGNE#U0	R5F51101AGNE#20	R5F51101AGNE#00	3,328
R5F51101AGNF#U0	R5F51101AGNF#20	R5F51101AGNF#00	3,920
R5F51103ADNE#U0	R5F51103ADNE#20	R5F51103ADNE#00	3,328
R5F51103ADNF#U0	R5F51103ADNF#20	R5F51103ADNF#00	3,920
R5F51105ADNE#U0	R5F51105ADNE#20	R5F51105ADNE#00	3,328
R5F5110HADNF#U0	R5F5110HADNF#20	R5F5110HADNF#00	3,920
R5F5110JADNE#U0	R5F5110JADNE#20	R5F5110JADNE#00	3,328
R5F5110JADNF#U0	R5F5110JADNF#20	R5F5110JADNF#00	3,920
R5F51111ADNE#UA	R5F51111ADNE#2A	R5F51111ADNE#0A	3,328
R5F51111ADNF#UA	R5F51111ADNF#2A	R5F51111ADNF#0A	3,920
R5F51111AGNF#UA	R5F51111AGNF#2A	R5F51111AGNF#0A	3,920
R5F51113ADNE#UA	R5F51113ADNE#2A	R5F51113ADNE#0A	3,328
R5F51113ADNF#UA	R5F51113ADNF#2A	R5F51113ADNF#0A	3,920
R5F51113AGNF#UA	R5F51113AGNF#2A	R5F51113AGNF#0A	3,920
R5F51113AGNF#WA	R5F51113AGNF#4A	-	
R5F51114ADNE#UA	R5F51114ADNE#2A	R5F51114ADNE#0A	3,328
R5F51115ADNE#UA	R5F51115ADNE#2A	R5F51115ADNE#0A	3,328
R5F51115AGNE#UA	R5F51115AGNE#2A	R5F51115AGNE#0A	3,328
R5F51116ADNE#UA	R5F51116ADNE#2A	R5F51116ADNE#0A	3,328
R5F51118ADNE#UA	R5F51118ADNE#2A	R5F51118ADNE#0A	3,328
R5F5111JADNE#UA	R5F5111JADNE#2A	R5F5111JADNE#0A	3,328
R5F5111JADNF#UA	R5F5111JADNF#2A	R5F5111JADNF#0A	3,920
R5F51303ADNE#U0	R5F51303ADNE#20	R5F51303ADNE#00	3,328
R5F51305ADNE#U0	R5F51305ADNE#20	R5F51305ADNE#00	3,328
R5F52305ADND#U0	R5F52305ADND#20	R5F52305ADND#00	2,080
R5F52305ADNE#U0	R5F52305ADNE#20	R5F52305ADNE#00	3,328
R5F52305AGND#U0	R5F52305AGND#20	R5F52305AGND#00	2,080
R5F52306ADND#U0	R5F52306ADND#20	R5F52306ADND#00	2,080
R5F52306ADNE#U0	R5F52306ADNE#20	R5F52306ADNE#00	3,328
R5F52315ADND#U0	R5F52315ADND#20	R5F52315ADND#00	2,080
R5F52315ADNE#U0	R5F52315ADNE#20	R5F52315ADNE#00	3,328
R5F52315CDND#U0	R5F52315CDND#20	R5F52315CDND#00	2,080
R5F52315CDNE#U0	R5F52315CDNE#20	R5F52315CDNE#00	3,328
R5F52316ADND#U0	R5F52316ADND#20	R5F52316ADND#00	2,080
R5F52316ADNE#U0	R5F52316ADNE#20	R5F52316ADNE#00	3,328
R5F52316CDND#U0	R5F52316CDND#20	R5F52316CDND#00	2,080
R5F52316CDNE#U0	R5F52316CDNE#20	R5F52316CDNE#00	3,328

R5F52316CGND#U0	R5F52316CGND#20	R5F52316CGND#00	2,080
R5F52317ADND#U0	R5F52317ADND#20	R5F52317ADND#00	2,080
R5F52317ADNE#U0	R5F52317ADNE#20	R5F52317ADNE#00	3,328
R5F52317BDNE#U0	R5F52317BDNE#20	R5F52317BDNE#00	3,328
R5F52318ADND#U0	R5F52318ADND#20	R5F52318ADND#00	2,080
R5F52318ADNE#U0	R5F52318ADNE#20	R5F52318ADNE#00	3,328
R5F52318AGND#U0	R5F52318AGND#20	R5F52318AGND#00	2,080
R5F52318BDND#U0	R5F52318BDND#20	R5F52318BDND#00	2,080
R5F52318BDNE#U0	R5F52318BDNE#20	R5F52318BDNE#00	3,328
R5F523E5ADNF#U0	R5F523E5ADNF#20	R5F523E5ADNF#00	3,920
R5F523E6ADNF#U0	R5F523E6ADNF#20	R5F523E6ADNF#00	3,920
R5F523E6AGNF#U0	R5F523E6AGNF#20	R5F523E6AGNF#00	3,920