PACKAGES LINE-UP FOR RF AND MICROWAVE DEVICES

Common Information

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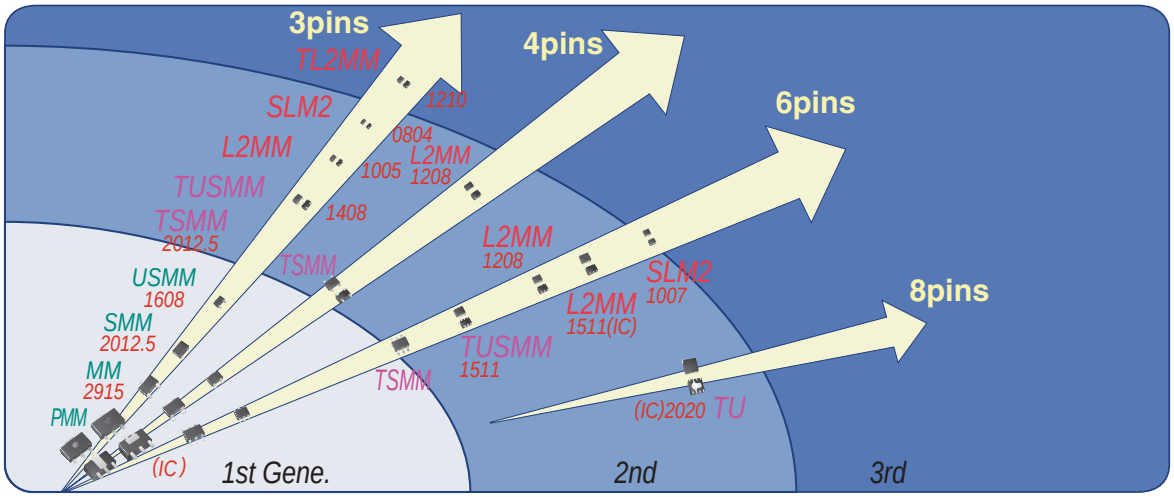
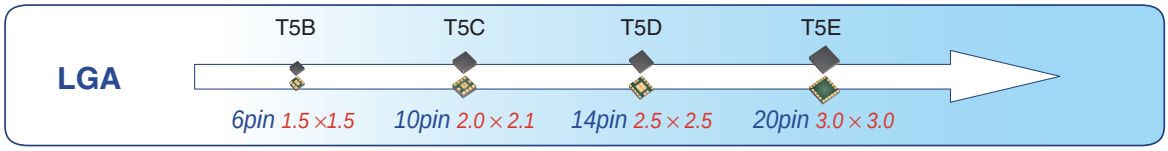
Surface Mount Type Package Line-up Actual Size Illustrations

(Unit : mm, Size not exact)

(1) Minimold

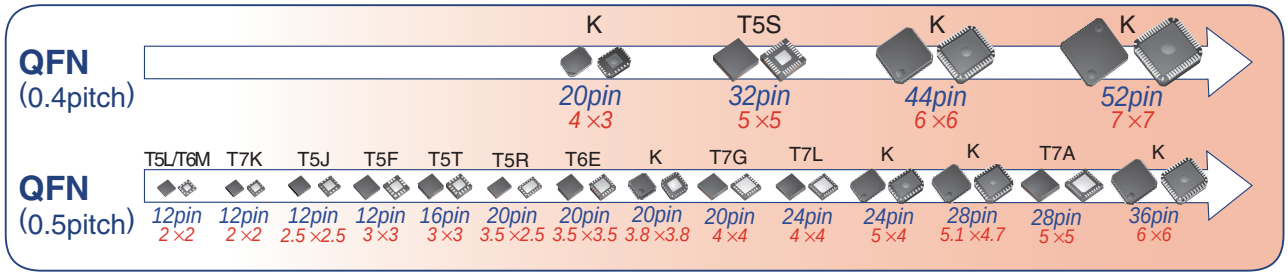


(2) LGA

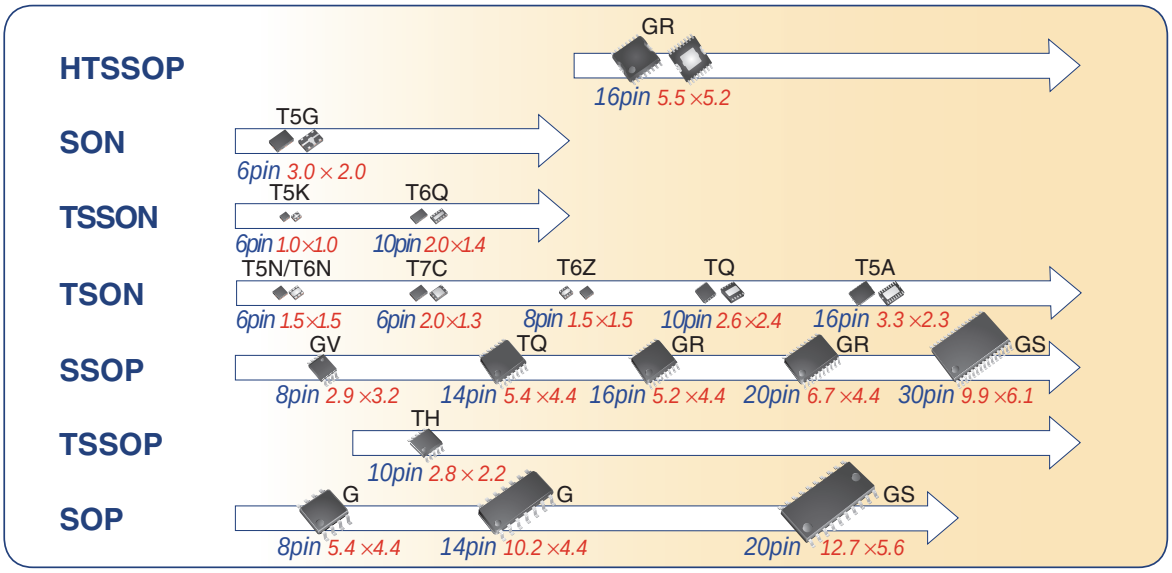


(3) QFN

<R>

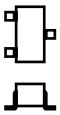
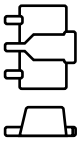
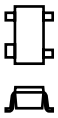
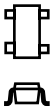
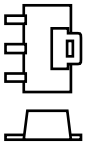
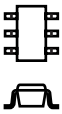
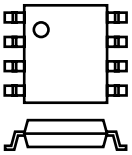
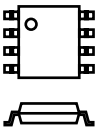


(4) SOP/SON and others



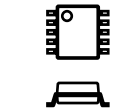
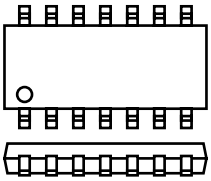
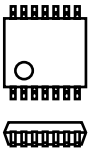
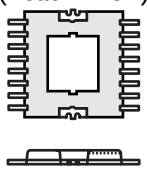
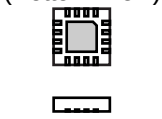
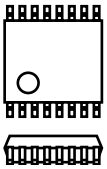
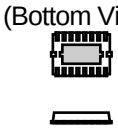
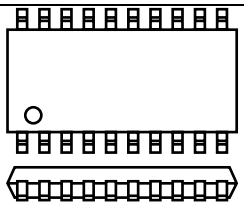
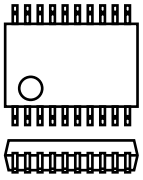
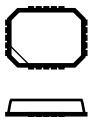
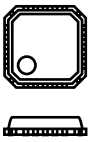
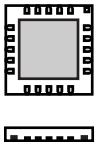
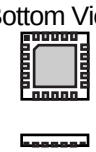
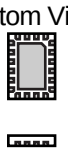
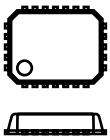
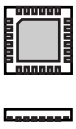
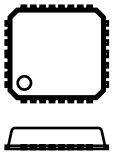
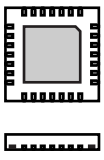
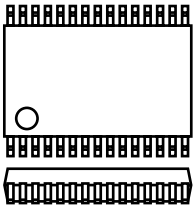
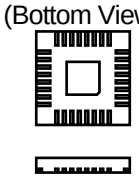
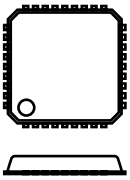
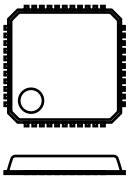
List of Surface Mount Type Package Drawings (1/2)

(Magnification of Dimensions × 2.5)

Abbreviation	3MM	3SMM	3USMM	F3TUSMM	3TL2MM	3L2MM
Outline Cliagram and Outline Dimensions L × W × H (mm)	 (2.9 × 1.5 × 1.1)	(2.0 × 1.3 × 0.9)	(1.6 × 0.8 × 0.8)	(1.4 × 0.8 × 0.6)	(1.2 × 1.0 × 0.3)	(1.0 × 0.7 × 0.5)
Abbreviation	**3SLM2**	**3PMM (34 PKG)**	**4MM**	**4SMM**	**F4TSMM**	**4L2MM**
Outline Cliagram and Outline Dimensions L × W × H (mm)	(0.8 × 0.4 × 0.4)	(Bottom View)  (4.5 × 2.5 × 1.5)	 (2.9 × 1.5 × 1.1)	 (2.0 × 1.3 × 0.9)	(2.0 × 1.3 × 0.6)	(1.2 × 0.8 × 0.5)
Abbreviation	**4PMM**	**6MM**	**6SMM**	**6TSMM**	**6L2MM (1511)**	**F6TUSMM**
Outline Cliagram and Outline Dimensions L × W × H (mm)	(Bottom View)  (4.5 × 2.5 × 1.5)	 (2.9 × 1.5 × 1.1)	(2.0 × 1.3 × 0.9)	(2.0 × 1.3 × 0.6)	(1.5 × 1.1 × 0.6)	(1.5 × 1.1 × 0.6)
Abbreviation	**6L2MM (1208)**	**6SLM2**	**6LGA**	**6SON**	**6RTSON**	**6TSON**
Outline Cliagram and Outline Dimensions L × W × H (mm)	(1.2 × 0.8 × 0.5)	(1.0 × 0.7 × 0.4)	(Bottom View) (1.5 × 1.5 × 0.6)	(Bottom View) (3.0 × 2.0 × 0.8)	(Bottom View) (2.0 × 1.3 × 0.4)	(Bottom View) (1.5 × 1.5 × 0.4)
Abbreviation	**6TSSON**	**8SOP**	**8SSOP**	**8L2MM**	**8TSON**	
Outline Cliagram and Outline Dimensions L × W × H (mm)	(Bottom View) (1.0 × 1.0 × 0.4)	 (5.2 × 4.4 × 1.6)	 (2.9 × 3.2 × 1.6)	(Bottom View) (2.0 × 2.0 × 0.5)	(Bottom View) (1.5 × 1.5 × 0.4)	

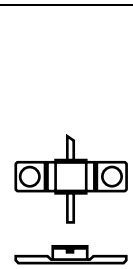
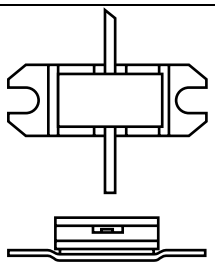
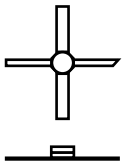
List of Surface Mount Type Package Drawings (2/2)

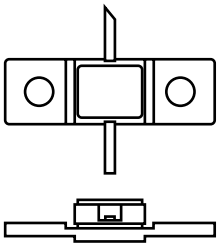
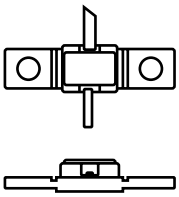
(Magnification of Dimensions × 2.5)

	Abbreviation	10TSSOP	10TSON	10TSSON	12QFN	12QFN(T7K)	12TQFN
<R>	Outline Cliagram and Outline Dimensions L × W × H (mm)			(Bottom View)	(Bottom View)	(Bottom View)	(Bottom View)
		(2.8 × 2.2 × 1.1)	(2.6 × 2.4 × 0.6)	(2.0 × 1.4 × 0.4)	(3.0 × 3.0 × 0.8)	(2.0 × 2.0 × 0.6)	(2.5 × 2.5 × 0.4)
	Abbreviation	**12TSQFN**	**14SOP**	**14SSOP**	**14LGA**	**16HTSSOP**	
	Outline Cliagram and Outline Dimensions L × W × H (mm)	(Bottom View)			(Bottom View)	 (Bottom View)	
		(2.0 × 2.0 × 0.4)	(10.2 × 4.4 × 1.6)	(5.4 × 4.4 × 1.6)	(2.5 × 2.5 × 0.6)	(5.5 × 5.2 × 0.9)	
	Abbreviation	**16QFN**	**16SSOP**	**16TSON**	**20SOP**	**20SSOP**	
	Outline Cliagram and Outline Dimensions L × W × H (mm)	 (Bottom View)		 (Bottom View)			
		(3.0 × 3.0 × 0.8)	(5.2 × 4.4 × 1.6)	(3.3 × 2.3 × 0.6)	(12.7 × 5.6 × 1.7)	(6.7 × 4.4 × 1.6)	
	Abbreviation	**20QFN (0.4)**	**20QFN (0.5)(K)**	**20QFN (0.5) (T7G)**	**20TQFN**	**20RQFN**	
	Outline Cliagram and Outline Dimensions L × W × H (mm)				 (Bottom View)	 (Bottom View)	
		(4.0 × 3.0 × 0.9)	(3.8 × 3.8 × 0.9)	(4 × 4 × 0.6)	(3.5 × 3.5 × 0.6)	(3.5 × 2.5 × 0.6)	
	Abbreviation	**20LGA**	**24QFN**	**24QFN(T7L)**	**28QFN (K)**	**28QFN (T7A)**	
<R>	Outline Cliagram and Outline Dimensions L × W × H (mm)	(Bottom View)		 (Bottom View)			
		(3.0 × 3.0 × 0.6)	(5.0 × 4.0 × 1.0)	(4 × 4 × 0.6)	(5.1 × 4.7 × 1.0)	(5.0 × 5.0 × 0.7)	
	Abbreviation	**30SSOP**	**32QFN**	**36QFN**	**44QFN**		
	Outline Cliagram and Outline Dimensions L × W × H (mm)		 (Bottom View)				
		(9.9 × 6.1 × 1.8)	(5.0 × 5.0 × 0.9)	(6.0 × 6.0 × 1.0)	(6.0 × 6.0 × 1.0)		

List of Special Type Package Drawings (1/2)

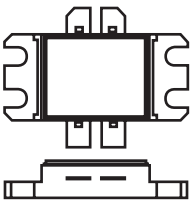
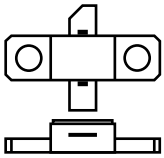
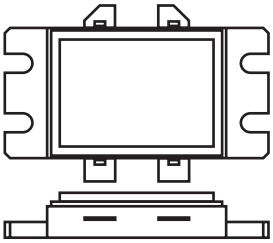
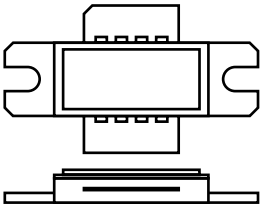
(Magnification of Dimensions × 1.5)

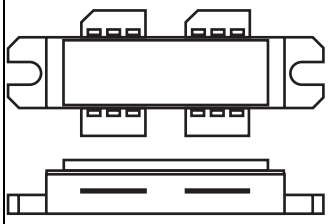
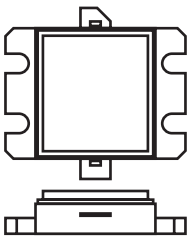
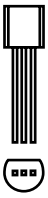
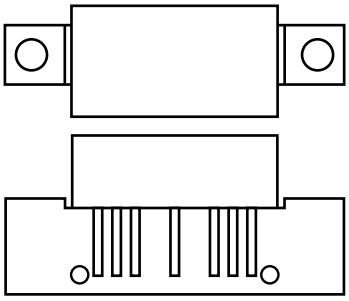
Abbreviation	75	77	79A	83A, 83B
Outline Cliagram and Outline Dimensions L × W × H (mm)	 (9.8 × 2.7 × 2.3)	 (17.5 × 6.4 × 3.8)	(4.4 × 4.2 × 0.9)	 (1.9 × 1.9 × 1.6)

Abbreviation	84, 84A, 84C	95	96/99	S01	S02, S03
Outline Cliagram and Outline Dimensions L × W × H (mm)	(1.8 × 1.8 × 1.8)	 (18.5 × 5.9 × 4.5)	 (15.0 × 4.3 × 5.0)	(2.0 × 2.0 × 1.5)	(2.6 × 2.6 × 1.5)

List of Special Type Package Drawings (2/2)

(Magnification of Dimensions × 1.0)

Abbreviation	T-86M	T-91M (3M)	T-92M	T-97M (3P)
Outline Cliagram and Outline Dimensions L × W × H (mm)	 (24.5 × 11.4 × 4.9)	 (20.3 × 5.8 × 4.2)	 (35.2 × 17.4 × 6.0)	 (34.0 × 9.9 × 4.4)

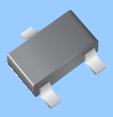
Abbreviation	T-101M (3S)	T-142M	TO-92	7-Pin Special
Outline Cliagram and Outline Dimensions L × W × H (mm)	 (41.2 × 10.2 × 5.0)	 (24.0 × 17.4 × 5.7)	 (5.5 × 5.2 × 4.2)	 (45.1 × 14.9 × 21.5)

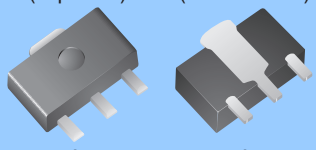
Package List

Package group general index

Type	Group	Abbreviation
Surface mount type	3-pin	3MM, 3SMM, 3USMM, F3TUSMM, 3L2MM, 3TL2MM, 3SLM2, 3PMM
	4-pin	4MM, 4SMM, F4TSMM, 4L2MM, 4PMM
	6-pin	6MM, 6SMM, 6TSMM, 6SLM2, 6L2MM, F6TUSMM, 6LGA, 6SON, 6TSON, 6RTSON, 6TSSON
	8-pin	8SOP, 8SSOP, 8L2MM, 8TSON
	10-pin	10TSSOP, 10TSON, 10TSSON, 10LGA
	12-pin	12QFN, 12TQFN, 12TSQFN
	14-pin	14SOP, 14SSOP, 14LGA
	16-pin	16HTSSOP, 16QFN, 16SSOP, 16TSON
	20-pin	20SOP, 20SSOP, 20QFN, 20TQFN, 20RQFN, 20LGA
	24 to 36-pin	24QFN, 28QFN, 30SSOP, 32QFN, 36QFN
	44, 52-pin	44QFN, 52QFN
Special type	Low Noise	83A, 83B, 84, 84A, 84C, S01, S02, S03
	Power 1/2	75, 77, 79A, 95, 96/99
	Power 2/2	T-86M, T-91M (3M), T-92M, T-97M (3P), T-101M (3S), T-142M
	MCM, other	TO-92, 7-Pin Special, Chip

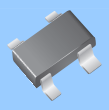
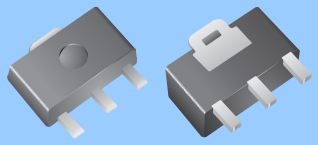
Surface mount type 3-pin package list

Abbreviation	3MM (33)	3SMM	3USMM	F3TUSMM	3L2MM
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.5	 (2.9 × 1.5 × 1.1)	(2.0 × 1.3 × 0.9)	(1.6 × 0.8 × 0.8)	(Top View) (Bottom View) (1.4 × 0.8 × 0.6)	(Top View) (Bottom View) (1.0 × 0.7 × 0.5)

Abbreviation	3TL2MM	3SLM2 (0804)	3PMM (34)
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.5	(Top View) (Bottom View) (1.2 × 1.0 × 0.3)	(Top View) (Bottom View) (0.8 × 0.4 × 0.4)	(Top View) (Bottom View)  (4.5 × 2.5 × 1.5)

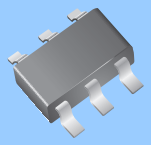
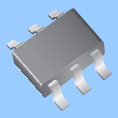
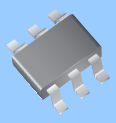
Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
3MM	33		3-Pin Minimold (33 PKG)	○	○
3SMM	30		3-Pin Super Minimold	○	○
3USMM	19		3-Pin Ultra Super Minimold (1608 PKG)	○	○
F3TUSMM	M03		Flat-Lead 3-Pin Thin-Type Ultra Super Minimold	○	○
3L2MM	M13		3-Pin Lead-Less Minimold	○	○
3TL2MM	M53	T6J	3-Pin Thin-Type Lead-Less Minimold	○	○
3SLM2	M33		3-Pin Super Lead-Less Minimold (0804 PKG)	○	○
3PMM	34		3-Pin Power Minimold (34 PKG)	○	○

Surface mount type 4-pin package list

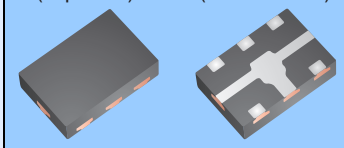
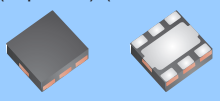
Abbreviation	4MM	4SMM	F4TSMM (2012)
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.5	 (2.9 × 1.5 × 1.1)	(2.0 × 1.3 × 0.9)	(Top View) (Bottom View) (2.0 × 1.3 × 0.6)
Abbreviation	**4L2MM (1208)**	**4PMM**	
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.5	(Top View) (Bottom View) (1.2 × 0.8 × 0.5)	(Top View) (Bottom View)  (4.5 × 2.5 × 1.5)	

Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
4MM	39		4-Pin Minimold (39)	○	○
4SMM	18		4-Pin Super Minimold (18)	○	○
F4TSMM	M04		Flat-Lead 4-Pin Thin-Type Super Minimold	○	○
F4TSMM	M05		Flat-Lead 4-Pin Thin-Type Super Minimold (2012 PKG)	○	○
4L2MM	M14		4-Pin Lead-Less Minimold (1208 PKG)	○	○
4PMM	M02		4-Pin Power Minimold	○	○

Surface mount type 6-pin package list

Abbreviation	6MM	6SMM	6TSMM	6L2MM (1511)	F6TUSMM
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 5.0	 (2.9 × 1.5 × 1.1)	 (2.0 × 1.3 × 0.9)	 (2.0 × 1.3 × 0.6)	(Top View) (Bottom View) (1.5 × 1.1 × 0.6)	(Top View) (Bottom View) (1.5 × 1.1 × 0.6)

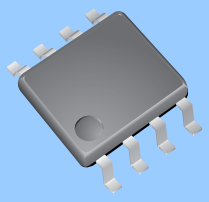
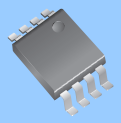
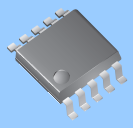
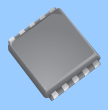
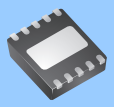
Abbreviation	6L2MM (1208)	6SLM2 (1007)	6LGA
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 5.0	(Top View) (Bottom View) (1.2 × 0.8 × 0.5)	(Top View) (Bottom View) (1.0 × 0.7 × 0.4)	(Top View) (Bottom View) (1.5 × 1.5 × 0.6)

Abbreviation	6SON	6TSON	6RTSON	6TSSON
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 5.0	(Top View) (Bottom View)  (3.0 × 2.0 × 0.8)	(Top View) (Bottom View)  (1.5 × 1.5 × 0.4)	(Top View) (Bottom View) (2.0 × 1.3 × 0.4)	(Top View) (Bottom View) (1.0 × 1.0 × 0.4)

Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
6MM		T	6-Pin Minimold	○	○
6MM		TA	6-Pin Minimold	○	○
6SMM	M01	T Note	6-Pin Super Minimold	○	○
6SMM		TB	6-Pin Super Minimold	○	○
6TSMM		TF Note	6-Pin Thin-Type Super Minimold	○	–
6SLM2		TS Note	6-Pin Super Lead-Less Minimold (1007 PKG)	○	○
6L2MM		TK	6-Pin Lead-Less Minimold (1511 PKG)	○	○
F6TUSMM		TC Note	Flat-Lead 6-Pin Thin-Type Ultra Super Minimold	○	○
6L2MM	M16	TD Note	6-Pin Lead-Less Minimold (1208 PKG)	○	○
6LGA		T5B	6-pin LGA (CSP Type)	○	–
6SON		T5G	6-Pin Plastic SON	○	–
6TSON		T5N	6-Pin Plastic TSON (T5N)	○	○
6TSON		T6N	6-Pin Plastic TSON (T6N)	○	○
6TSON		T6X	6-Pin Plastic TSON (T6X)	○	–
6RTSON		T7C	6-Pin Plastic RTSON (T7C)	○	–
6TSSON		T5K	6-Pin Plastic TSSON (T5K)	○	○
6TSSON		T6R	6-Pin Plastic TSSON (T6R)	○	○

Note: Twin Transistor

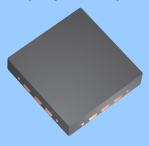
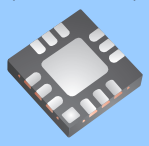
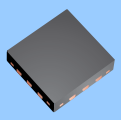
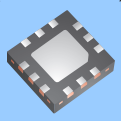
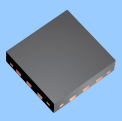
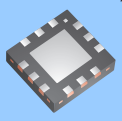
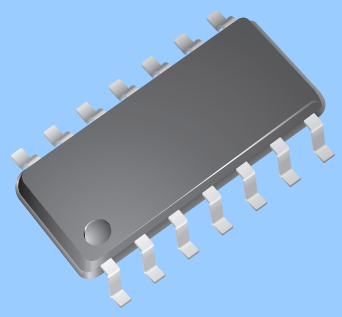
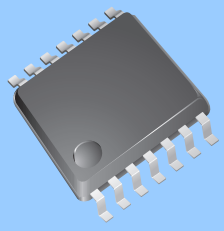
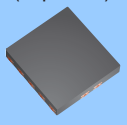
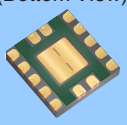
Surface mount type 8, 10-pin package list

Abbreviation	8SOP	8SSOP	8L2MM	8TSON
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.5	 (5.2 × 4.4 × 1.6)	 (2.9 × 3.2 × 1.6)	(Top View) (Bottom View) (2.0 × 2.0 × 0.5)	(Top View) (Bottom View) (1.5 × 1.5 × 0.4)
Abbreviation	**10TSSOP**	**10TSON**	**10TSSON**	**10LGA**
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.5	 (2.8 × 2.2 × 1.1)	(Top View)  (Bottom View)  (2.6 × 2.4 × 0.6)	(Top View) (Bottom View) (2.0 × 1.4 × 0.4)	(Top View) (Bottom View) (2.0 × 2.1 × 0.6)

Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
8SOP		G, GR	8-Pin Plastic SOP (5.72 mm (225))	○	–
8SSOP		GV	8-Pin Plastic SSOP (4.45 mm (175))	○	○
8L2MM		TU	8-Pin Lead-Less Minimold	○	○
8TSON		T6Z	8-Pin Plastic TSON	○	○
10TSSOP		TH	10-Pin Plastic TSSOP	○	–
10TSON		TQ	10-Pin Plastic TSON	○	○
10TSSON		T6Q	10-Pin Plastic TSSON	○	○
10LGA		T5C	10-Pin LGA	–	–

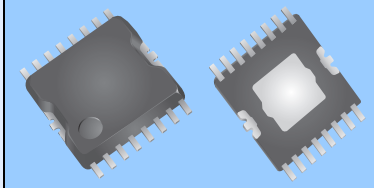
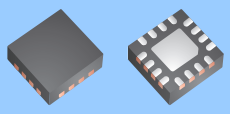
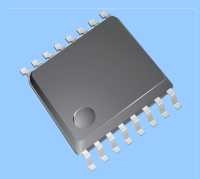
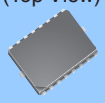
Surface mount type 12, 14-pin package list

<R>

Abbreviation	12QFN	12QFN(T7K)	12TQFN	12TSQFN
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 4.0	(Top View)  (Bottom View)  (3.0 × 3.0 × 0.8)	(Top View)  (Bottom View)  (2.0 × 2.0 × 0.6)	(Top View)  (Bottom View)  (2.5 × 2.5 × 0.4)	(Top View) (Bottom View) (2.0 × 2.0 × 0.4)
Abbreviation	**14SOP**		**14SSOP**	**14LGA**
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 4.0	 (10.2 × 4.4 × 1.6)		 (5.4 × 4.4 × 1.6)	(Top View)  (Bottom View)  (2.5 × 2.5 × 0.6)

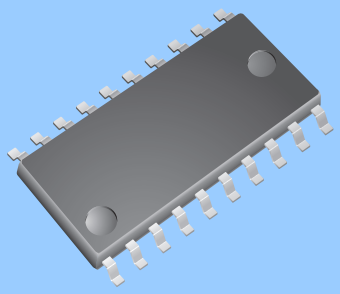
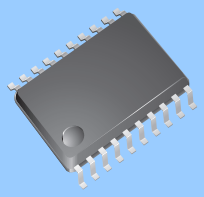
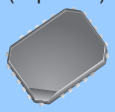
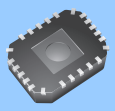
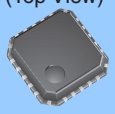
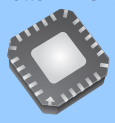
Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
12QFN		T5F	12-Pin Plastic QFN	○	○
<R> 12QFN		T7K	12-Pin Plastic QFN (T7K)	○	○
12TQFN		T5J	12-Pin Plastic TQFN	○	○
12TSQFN		T5L	12-Pin Plastic TSQFN (T5L)	○	○
12TSQFN		T6M	12-Pin Plastic TSQFN (T6M)	○	○
14SOP		G, GR	14-Pin Plastic SOP (5.72 mm (225))	○	–
14SSOP		GR	14-Pin Plastic SSOP (5.72 mm (225))	○	○
14LGA		T5D	14-Pin LGA (CSP Type)	○	○

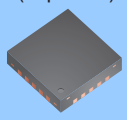
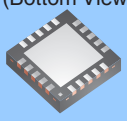
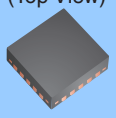
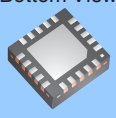
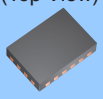
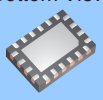
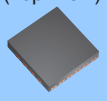
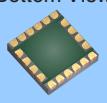
Surface mount type 16-pin package list

Abbreviation	16HTSSOP	16QFN	16SSOP	16TSON
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.0	(Top View) (Bottom View)  (5.5 × 5.2 × 0.9)	(Top View) (Bottom View)  (3.0 × 3.0 × 0.8)	 (5.2 × 4.4 × 1.6)	(Top View)  (Bottom View) (3.3 × 2.3 × 0.6)

Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
16HTSSOP	GR	GR	16-Pin Plastic HTSSOP	○	–
16QFN		T5T	16-Pin Plastic QFN (T5T)	○	○
16QFN		T6C	16-Pin Plastic QFN (T6C)	○	○
16QFN		T6S	16-Pin Plastic QFN (T6S)	○	○
16SSOP		GR	16-Pin Plastic SSOP (5.72 mm (225))	○	○
16TSON		T5A	16-Pin Plastic TSON	○	–

Surface mount type 20-pin package list

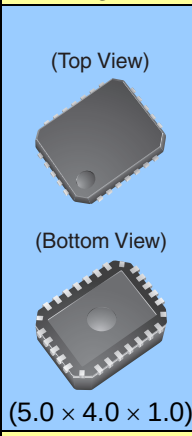
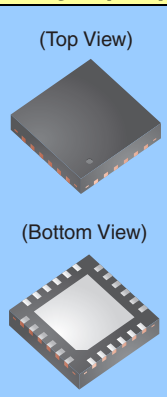
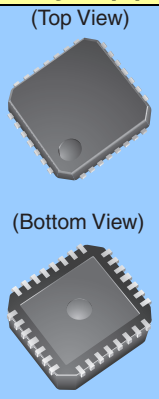
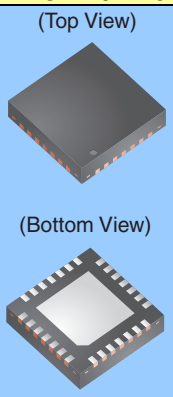
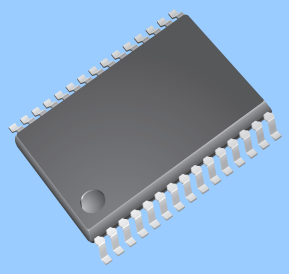
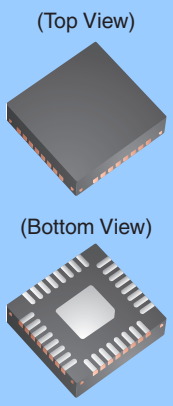
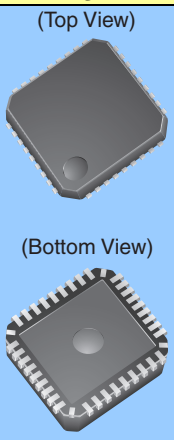
Abbreviation	20SOP	20SSOP	20QFN (0.4)	20QFN (0.5) (K)
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.0	 (12.7 × 5.6 × 1.7)	 (6.7 × 4.4 × 1.6)	(Top View)  (Bottom View)  (4.0 × 3.0 × 0.9)	(Top View)  (Bottom View)  (3.8 × 3.8 × 0.9)

Abbreviation	20QFN (0.5) (T7G)	20TQFN	20RQFN	20LGA
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.0	(Top View)  (Bottom View)  (4.0 × 4.0 × 0.6)	(Top View)  (Bottom View)  (3.5 × 3.5 × 0.6)	(Top View)  (Bottom View)  (3.5 × 2.5 × 0.6)	(Top View)  (Bottom View)  (3.0 × 3.0 × 0.6)

Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
20SOP		GS	20-Pin Plastic SOP (7.62 mm (300))	○	–
20SSOP		GR	20-Pin Plastic SSOP (5.72 mm (225))	○	○
20QFN (0.4)		K	20-Pin Plastic QFN (0.4 mm pitch)	○	○
20QFN (0.5)		K	20-Pin Plastic QFN (0.5 mm pitch)	○	–
20QFN (0.5)		T7G	20-Pin Plastic QFN (0.5 mm pitch)	○	○
20TQFN		T6E	20-Pin Plastic TQFN	○	–
20RQFN		T5R	20-Pin Plastic RQFN	○	○
20LGA		T5E	20-Pin LGA	○	–

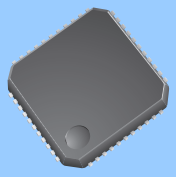
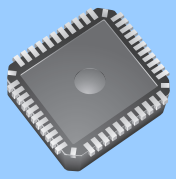
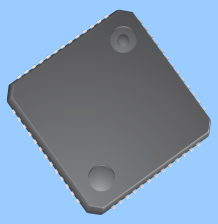
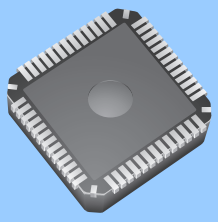
Surface mount type 24, 28, 30, 32, 36-pin package list

<R>

Abbreviation	24QFN	24QFN(T7L)	28QFN (K)	28QFN (T7A)
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.0	 (5.0 × 4.0 × 1.0)	 (4.0 × 4.0 × 0.6)	 (5.1 × 4.7 × 1.0)	 (5.0 × 5.0 × 0.7)
Abbreviation	**30SSOP**		**32QFN**	**36QFN**
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.0	 (9.9 × 6.1 × 1.8)		 (5.0 × 5.0 × 0.9)	 (6.0 × 6.0 × 1.0)

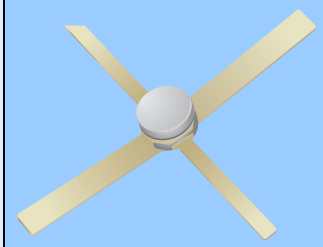
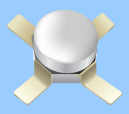
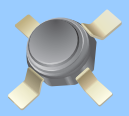
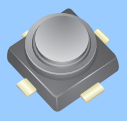
Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
24QFN		K	24-Pin Plastic QFN	○	○
<R> 24QFN		T7L	24-Pin Plastic QFN (T7L)	○	○
28QFN		K	28-Pin Plastic QFN (K)	○	○
28QFN		T7A	28-Pin Plastic QFN (T7A)	○	○
30SSOP		GS	30-Pin Plastic SSOP (7.62 mm (300))	○	–
32QFN		T5S	32-Pin Plastic QFN	○	–
36QFN		K	36-Pin Plastic QFN	○	–

Surface mount type 44, 52-pin package list

Abbreviation	44QFN	52QFN
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 3.0	(Top View)  (Bottom View)  (6.0 × 6.0 × 1.0)	(Top View)  (Bottom View)  (7.0 × 7.0 × 1.0)

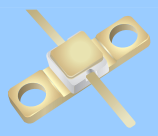
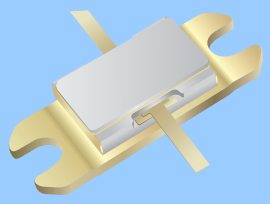
Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
44QFN		K	44-Pin Plastic QFN	○	–
52QFN		K	52-Pin Plastic QFN	–	–

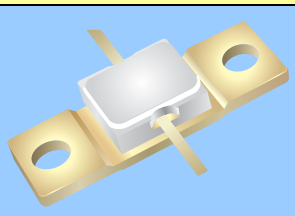
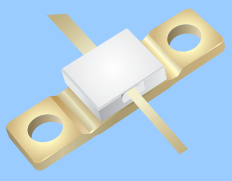
Special type (Low Noise) 83A/83B, 84/84A/84C, S01, S02/S03 package list

Abbreviation	83A, 83B	84, 84A, 84C	S01	S02, S03
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 4.0	 (1.9 × 1.9 × 1.6)	 (1.8 × 1.8 × 1.8)	 (2.0 × 2.0 × 1.5)	 (2.6 × 2.6 × 1.5)

Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
83A/83B	83A/83B		83A/83B Ceramic Package	○	–
84/84A/84C	84/84A/84C		84/84A/84C Ceramic Package	○	–
S01	S01		S01 Hollow Plastic Mold Package	○	○
S02/S03	S02/S03		S02/S03 Hollow Plastic Mold Package	○	–

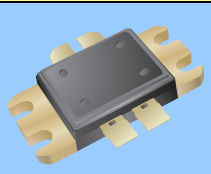
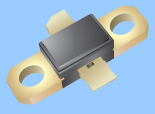
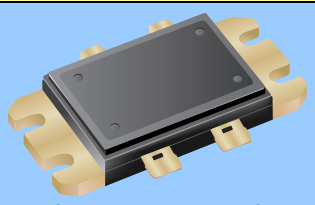
Special type (Power 1/2) 75, 77, 79A, 95, 96/99 package list

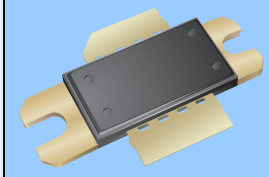
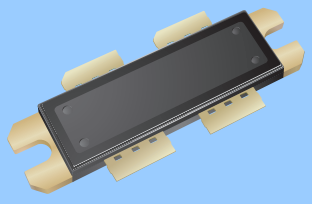
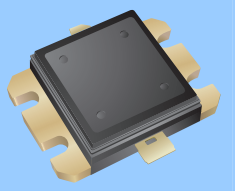
Abbreviation	75	77	79A
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 2.0	 (9.8 × 2.7 × 2.3)	 (17.5 × 6.4 × 3.8)	(4.4 × 4.2 × 0.9)

Abbreviation	95	96/99
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 2.0	 (18.5 × 5.9 × 4.5)	 (15.0 × 4.3 × 5.0)

Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
75	75		75 Ceramic Package	○	–
77	77		77 Ceramic Package	○	–
79A	79A		79A Plastic Mold Package	○	○
95	95		95 Ceramic Package	○	–
96/99	96/99		96/99 Ceramic Package	○	–

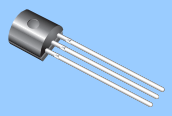
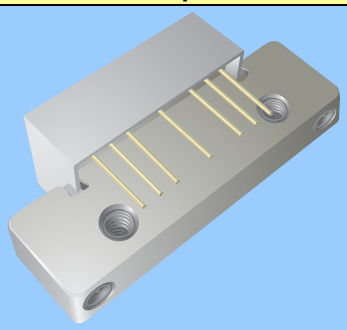
Special type (Power 2/2) T-86M, T-91M (3M), T-92M, T-97M (3P), T-101M (3S), T-142M package list

Abbreviation	T-86M	T-91M (3M)	T-92M
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 1.0	 (24.5 × 11.4 × 4.9)	 (20.3 × 5.8 × 4.2)	 (35.2 × 17.4 × 5.7)

Abbreviation	T-97M (3P)	T-101M (3S)	T-142M
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 1.0	 (34.0 × 9.9 × 4.4)	 (41.2 × 10.2 × 5.0)	 (24.0 × 17.4 × 5.7)

Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
T-86M			T-86M Hollow Plastic Mold Package	○	–
T-91M	3M		T-91M Hollow Plastic Mold Package	○	–
T-92M			T-92M Hollow Plastic Mold Package	○	–
T-97M	3P		T-97M Hollow Plastic Mold Package	○	–
T-101M	3S		T-101M Hollow Plastic Mold Package	○	–
T-142M			T-142M Hollow Plastic Mold Package	○	–

Special type (MCM, other) TO-92, 7-Pin Special, Chip package list

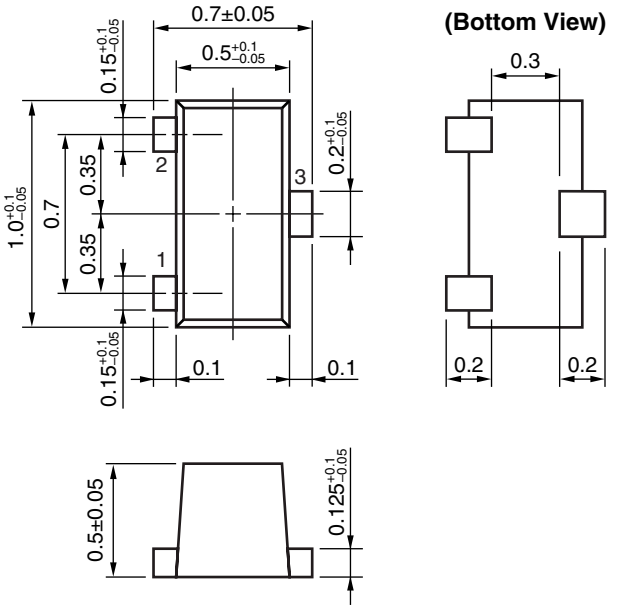
Abbreviation	TO-92	7-Pin Special	Chip
Outline Cliagram and Outline Dimensions L × W × H (mm) Magnification of Dimensions × 1.0	 (5.5 × 5.2 × 4.2)	 (45.1 × 14.9 × 21.5)	The Chip size drawing is carried to the data sheet.

Abbreviation	Package Code		Package Name	Drawings	
	NE	IC		Package	Land Pattern
TO-92	32		TO-92 Plastic Mold Package	○	–
7-Pin Special			7-Pin Special With Heatsink	○	–
Chip	00		Chip	–	–

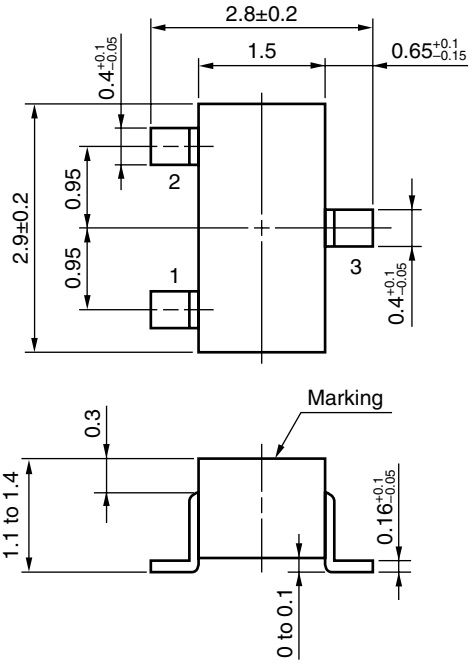
Package Dimensions (1/47)

(Unit : mm)

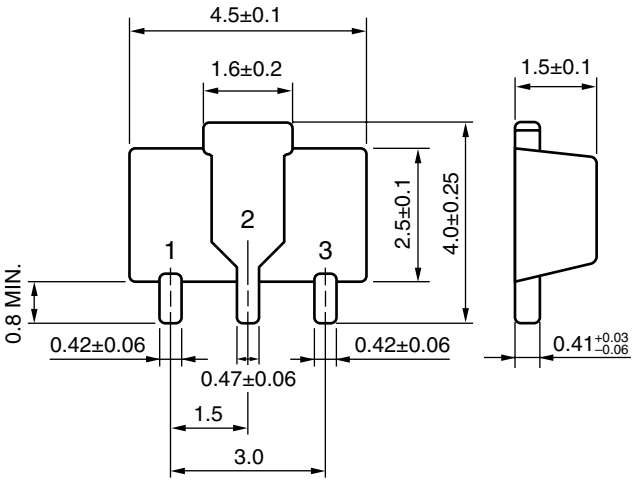
3-Pin Lead-Less Minimold



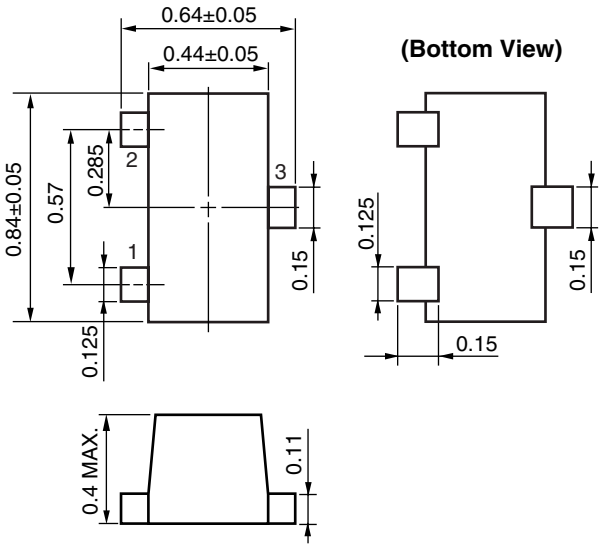
3-Pin Minimold (33 PKG)



3-Pin Power Minimold (34 PKG)



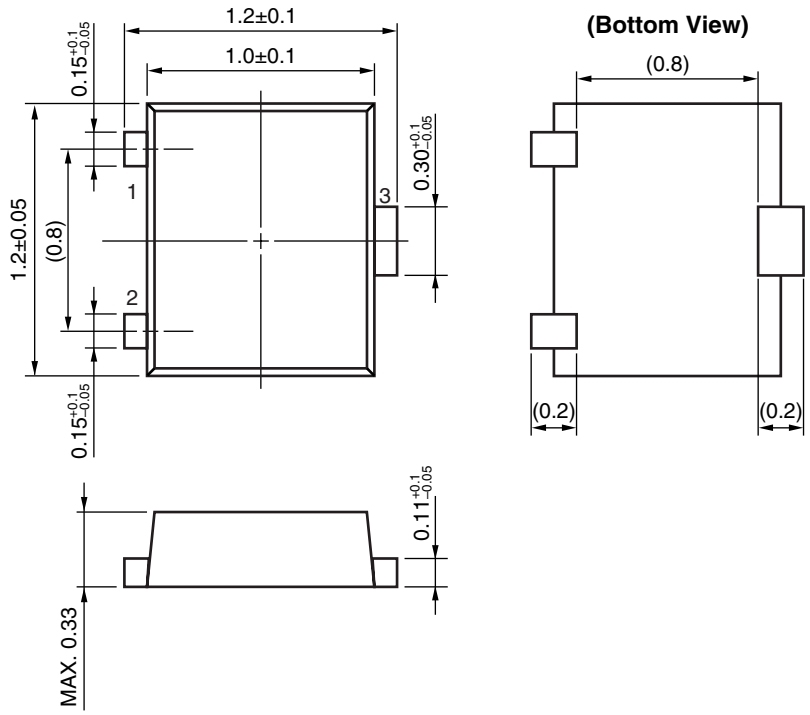
3-Pin Super Lead-Less Minimold (M33, 0804 PKG)



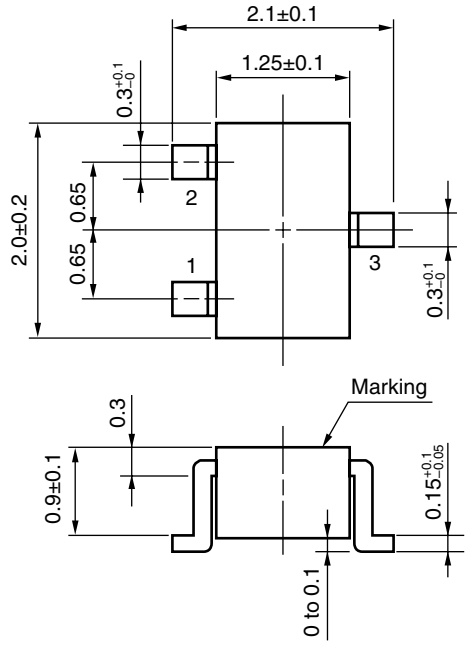
Package Dimensions (2/47)

(Unit : mm)

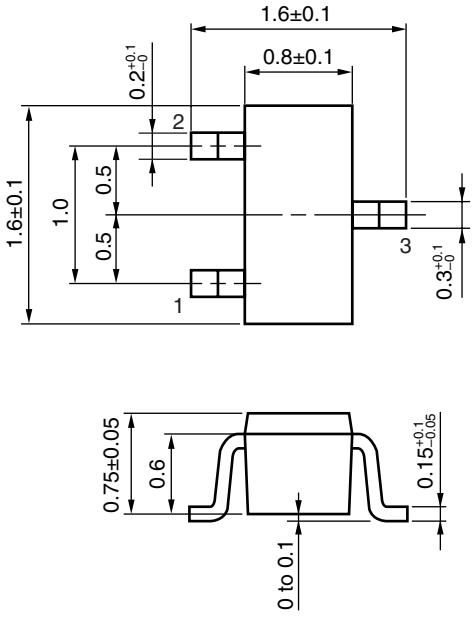
3-Pin Thin-Type Lead-Less Minimold (M53, T6J)



3-Pin Super Minimold



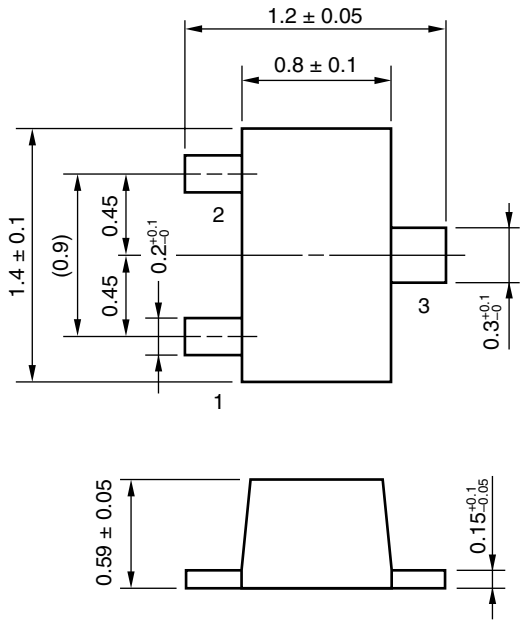
3-Pin Ultra Super Minimold (19, 1608 PKG)



Package Dimensions (3/47)

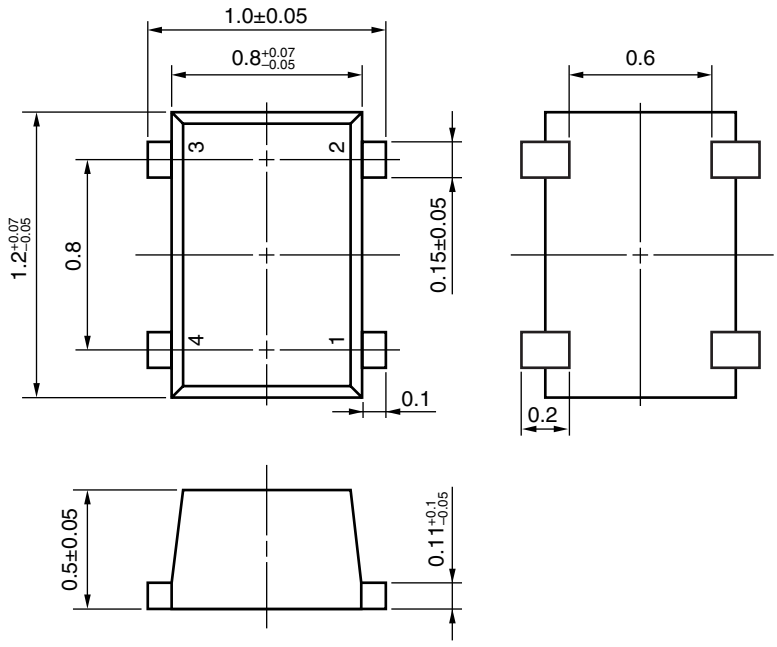
(Unit : mm)

Flat-Lead 3-Pin Thin-Type Ultra Super Minimold



4-Pin Lead-Less Minimold (M14, 1208 PKG)

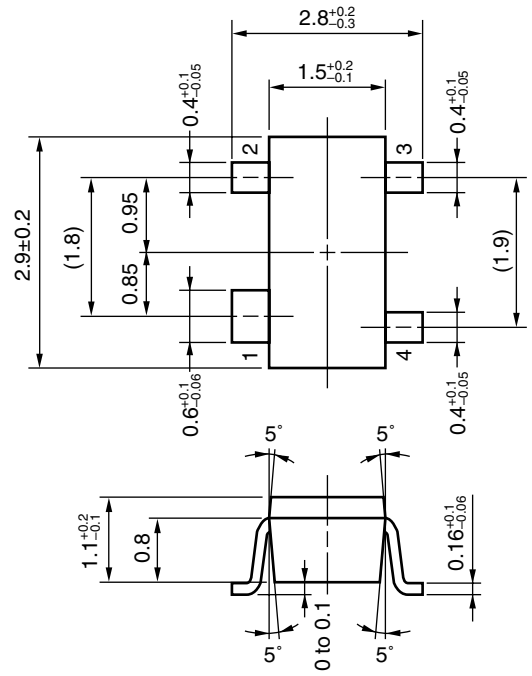
(Top View) **(Bottom View)**



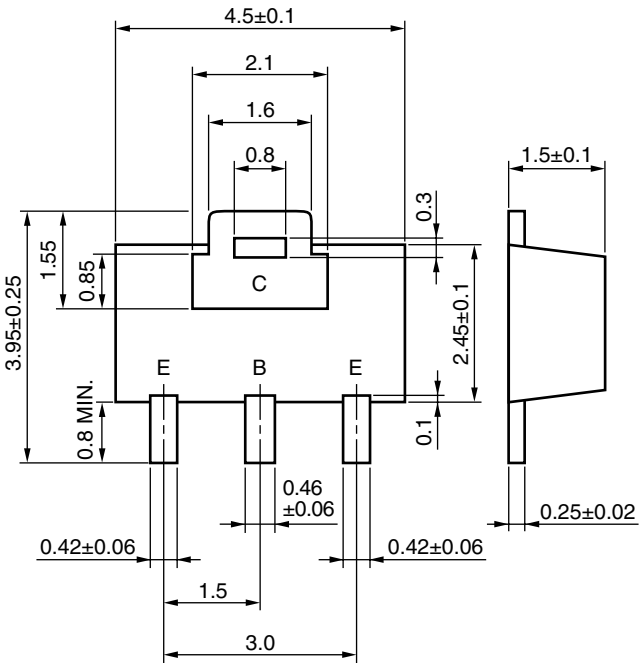
Package Dimensions (4/47)

(Unit : mm)

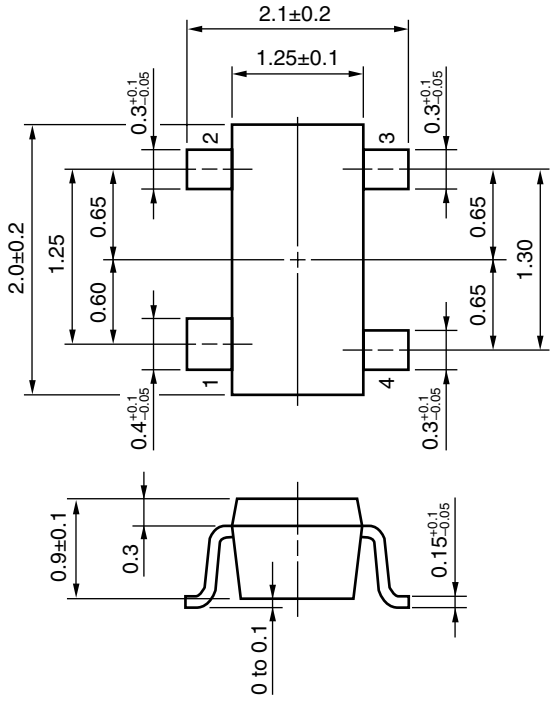
4-Pin Minimold (39)



4-Pin Power Minimold



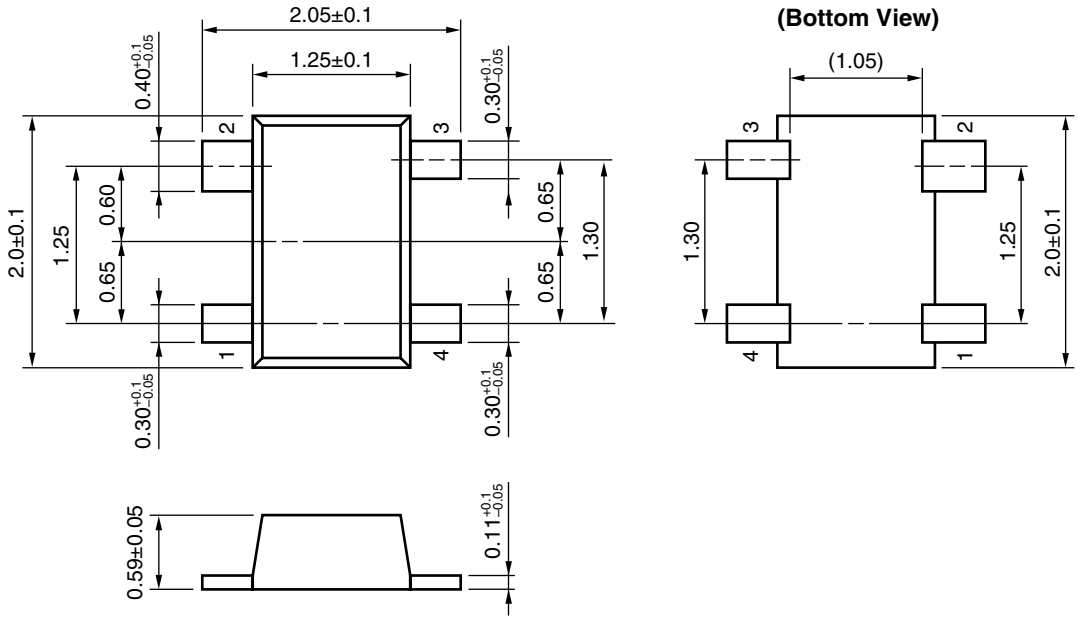
4-Pin Super Minimold (18)



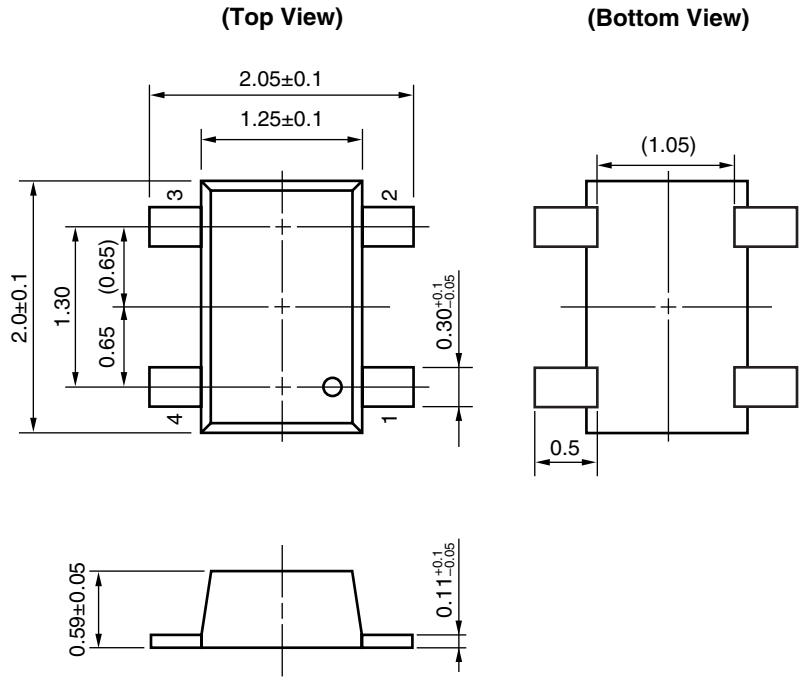
Package Dimensions (5/47)

(Unit : mm)

Flat-Lead 4-Pin Thin-Type Super Minimold (M04)



Flat-Lead 4-Pin Thin-Type Super Minimold (M05, 2012 PKG)

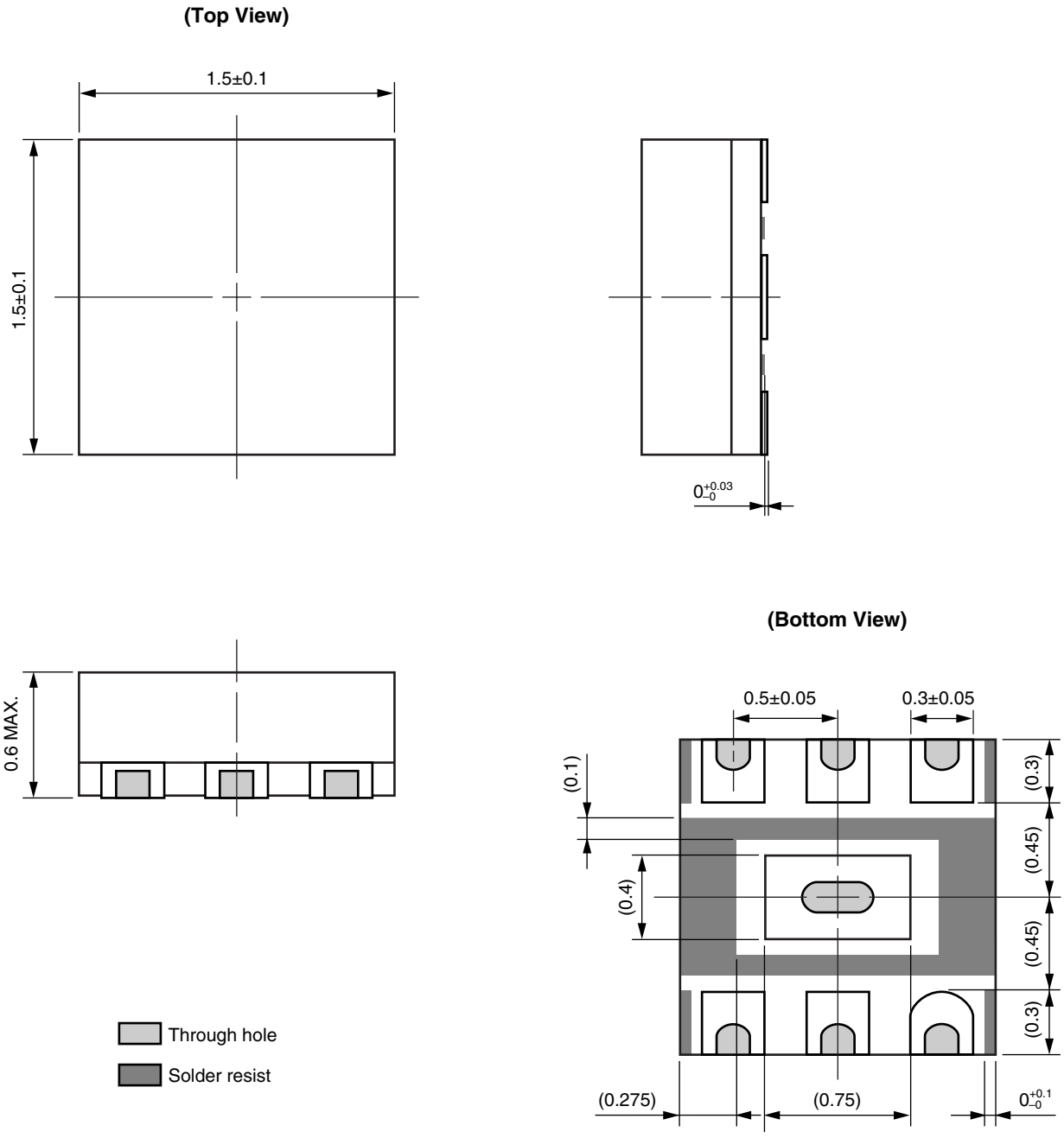


Remark ( ) : Reference value

Package Dimensions (6/47)

(Unit : mm)

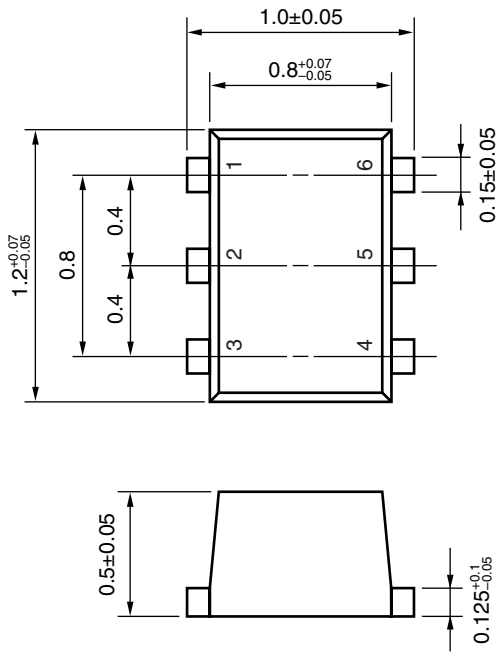
6-Pin LGA (CSP Type)



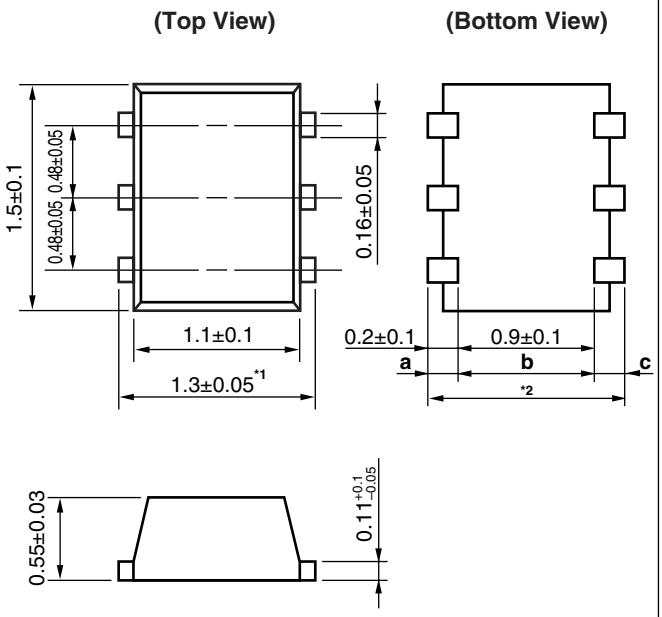
Package Dimensions (7/47)

(Unit : mm)

6-Pin Lead-Less Minimold (M16, 1208 PKG)

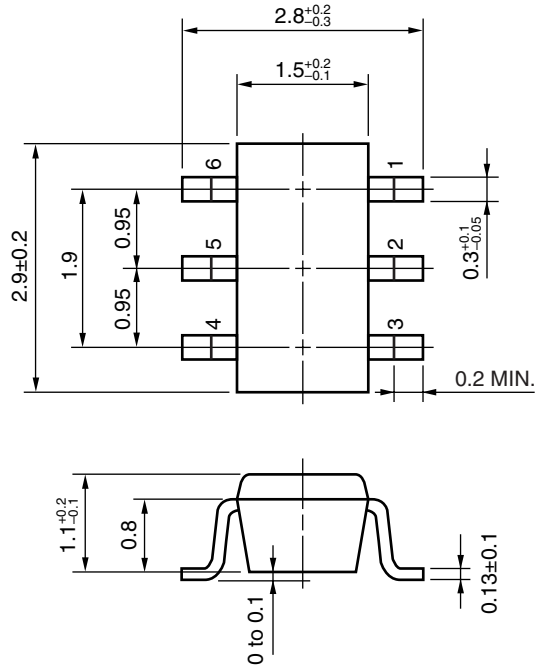


6-Pin Lead-Less Minimold (1511 PKG)

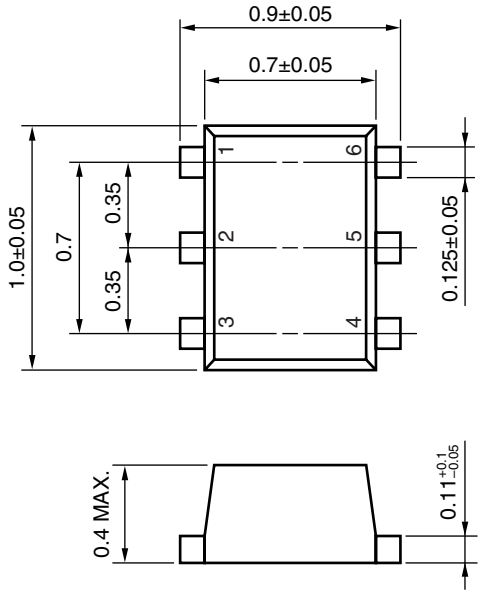


Remark Dimension*1 is bigger than dimension*2 (dimension*2 = **a** + **b** + **c**).

6-Pin Minimold



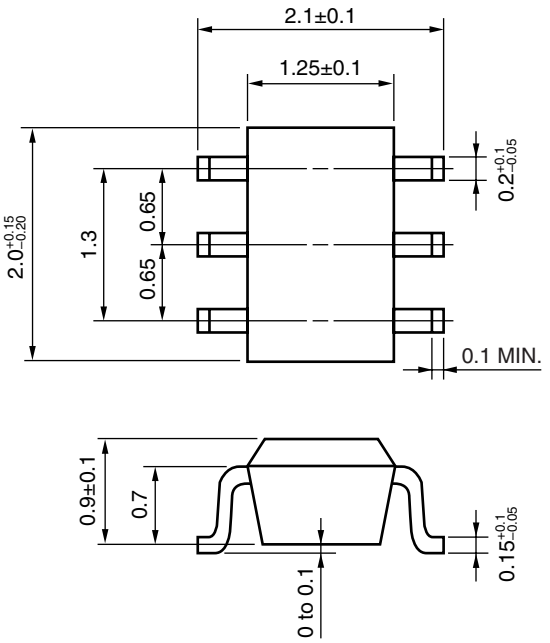
6-Pin Super Lead-Less Minimold (1007 PKG)



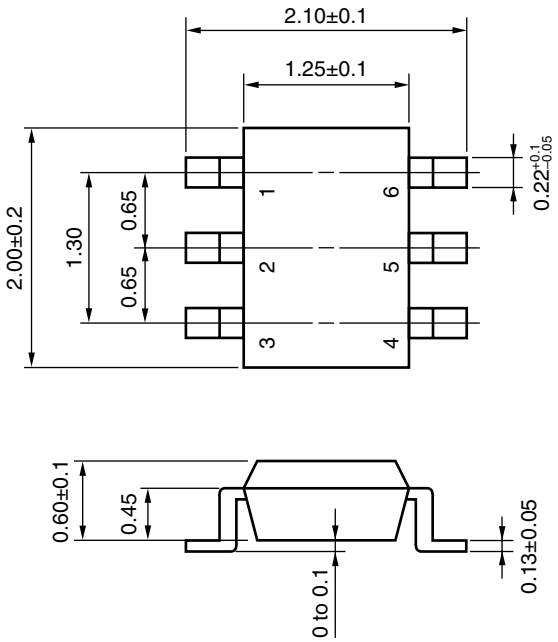
Package Dimensions (8/47)

(Unit : mm)

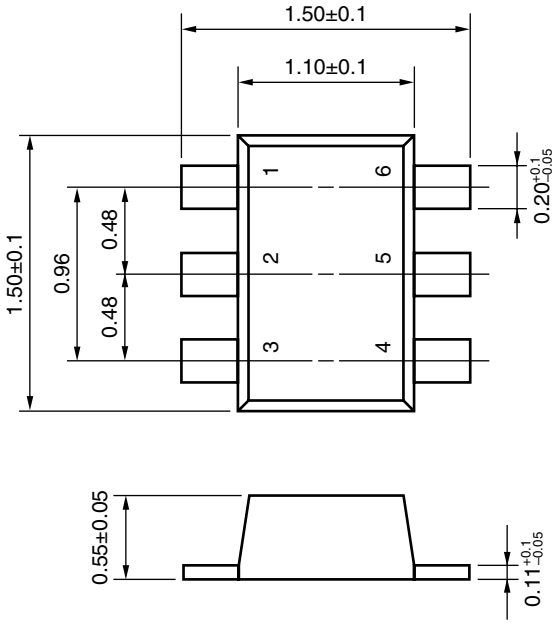
6-Pin Super Minimold (M01, TB)



6-Pin Thin-Type Super Minimold



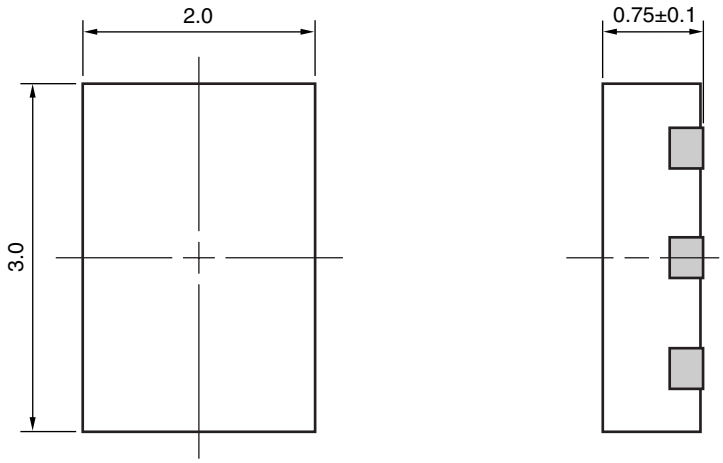
Flat-Lead 6-Pin Thin-Type Ultra Super Minimold



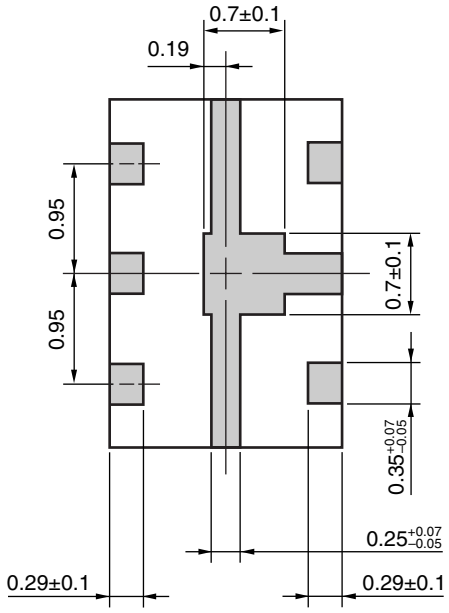
Package Dimensions (9/47)

(Unit : mm)

6-Pin Plastic SON



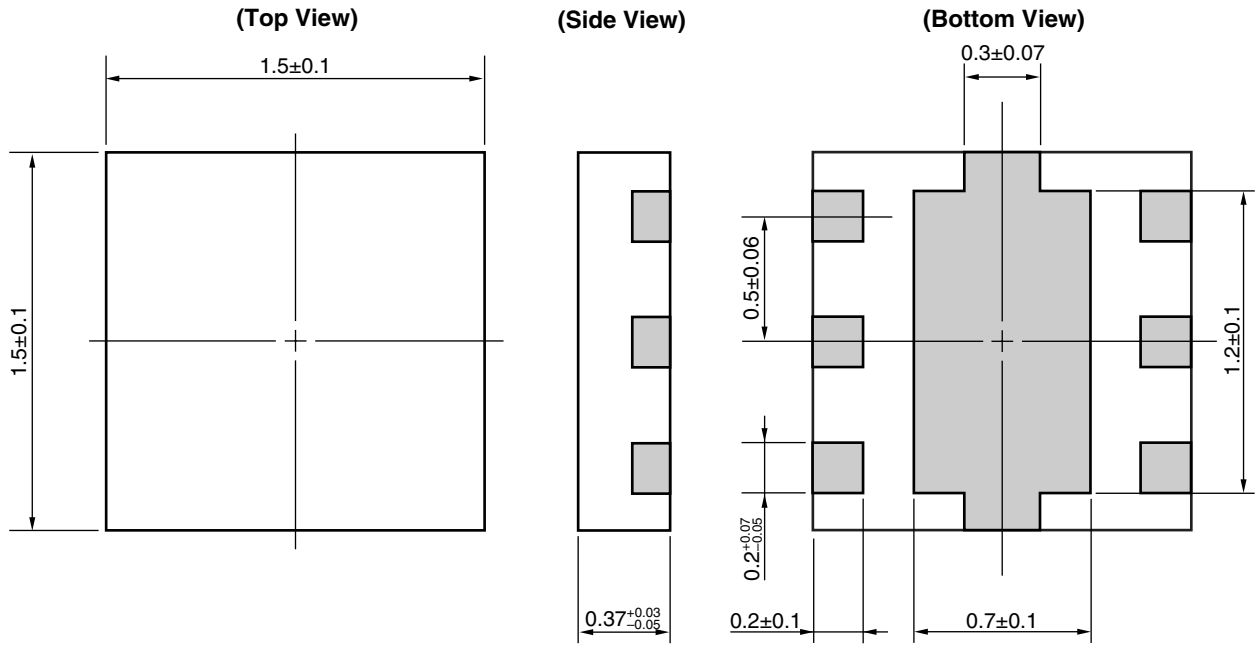
(Bottom View)



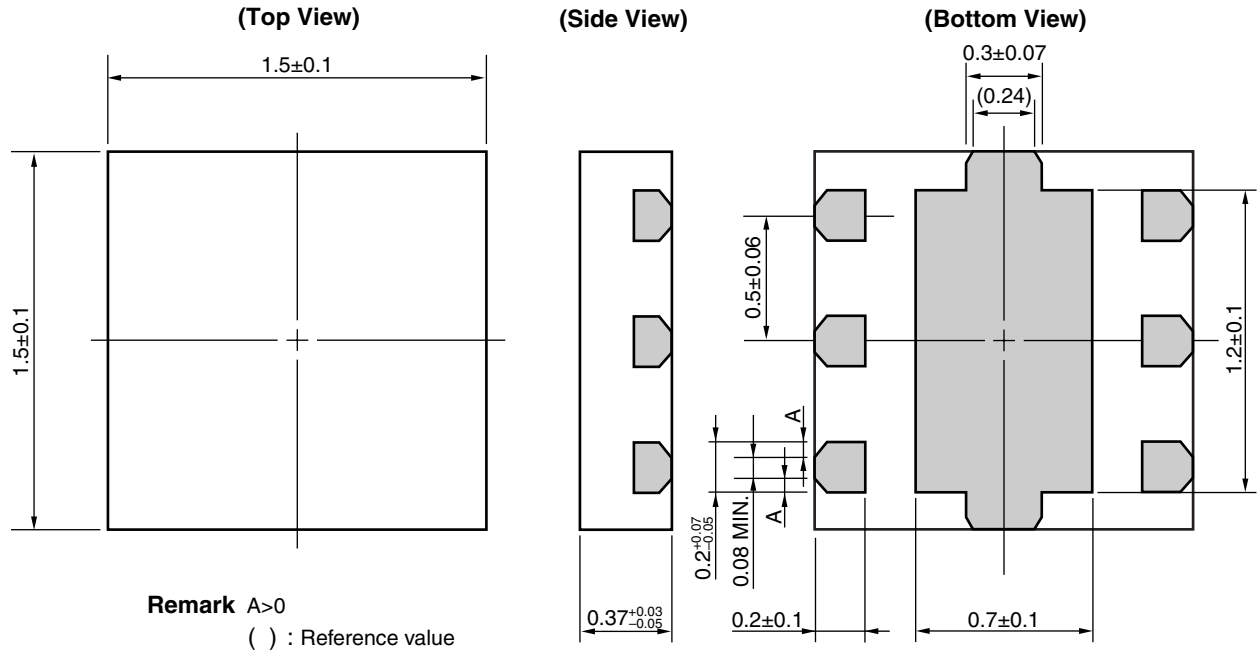
Package Dimensions (10/47)

(Unit : mm)

6-Pin Plastic TSON (T5N)



6-Pin Plastic TSON (T6N)



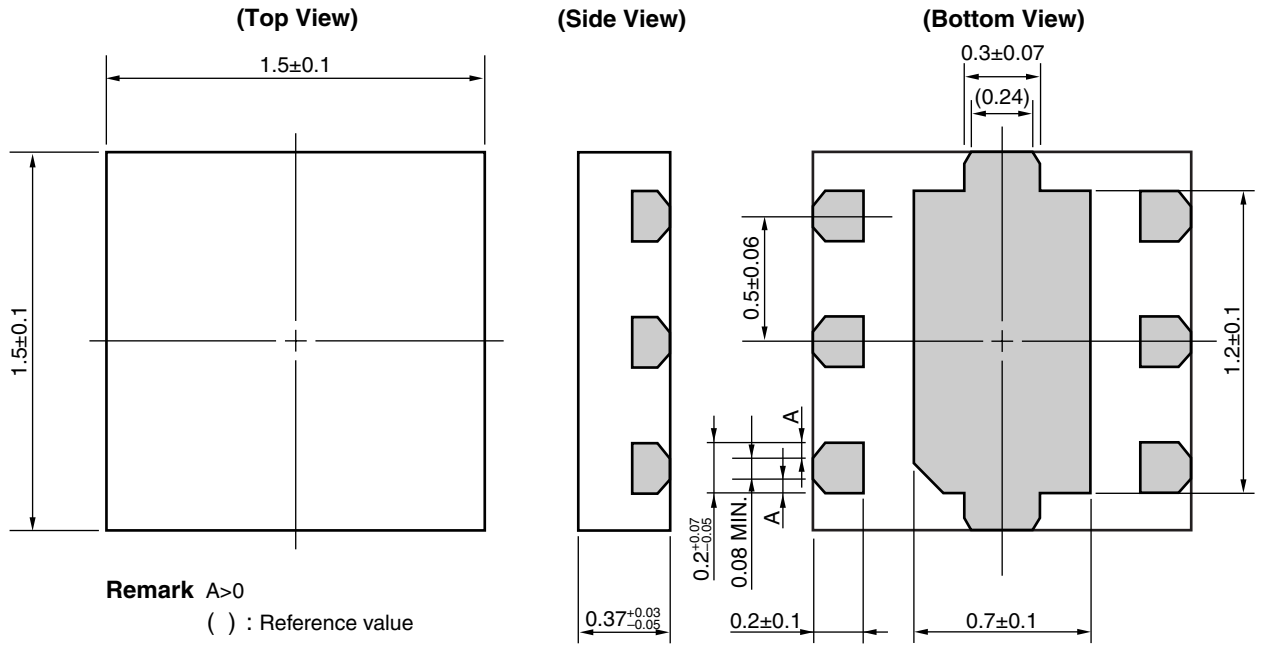
Remark A>0

( ) : Reference value

Package Dimensions (11/47)

(Unit : mm)

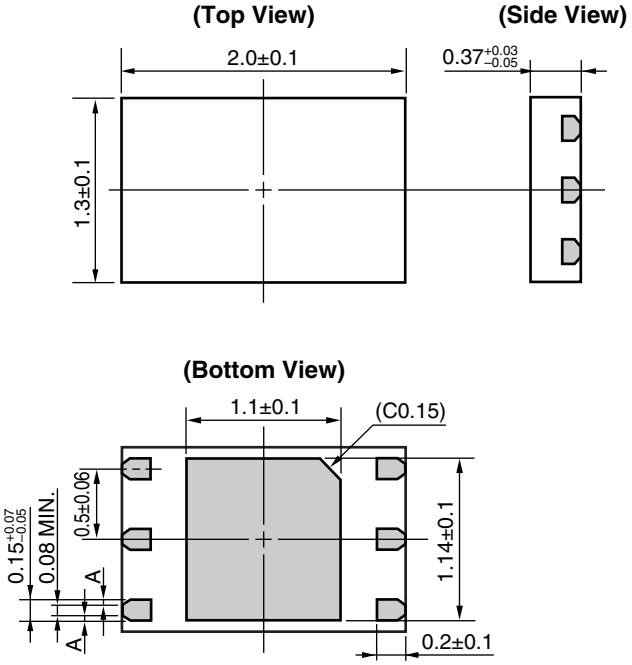
6-Pin Plastic TSON (T6X)



Remark A>0

( ) : Reference value

6-Pin Plastic RTSON (T7C)



Remark A>0

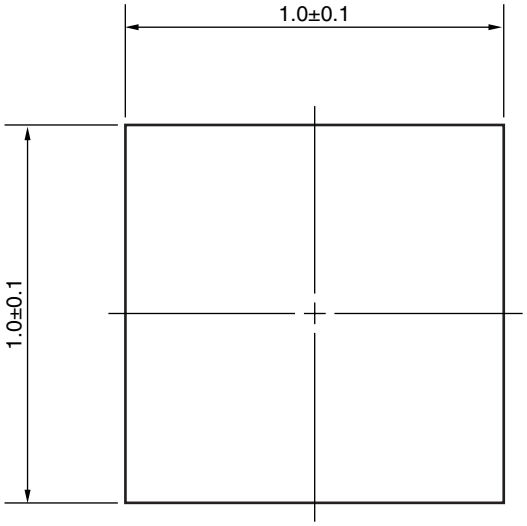
( ) : Reference value

Package Dimensions (12/47)

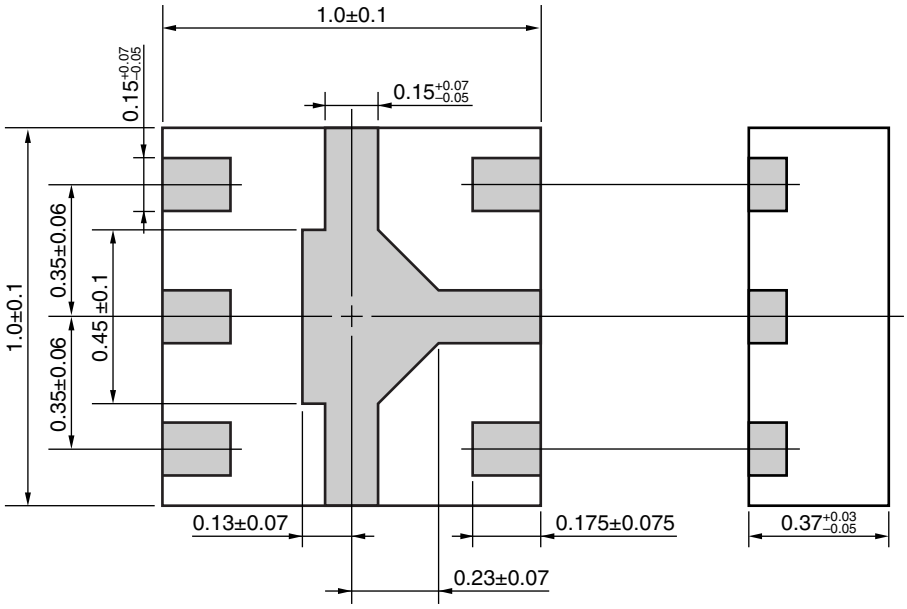
(Unit : mm)

6-Pin Plastic TSSON (T5K)

(Top View)



(Bottom View)

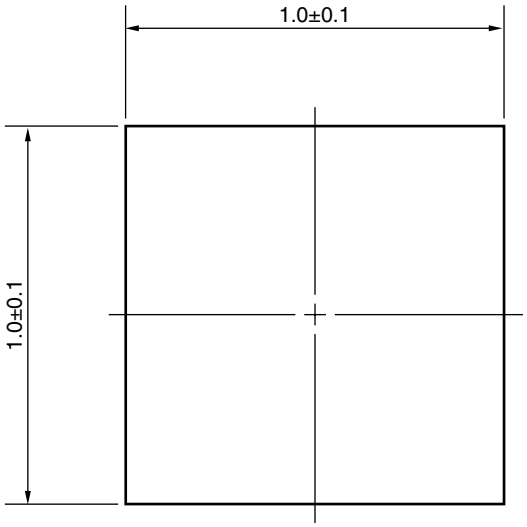


Package Dimensions (13/47)

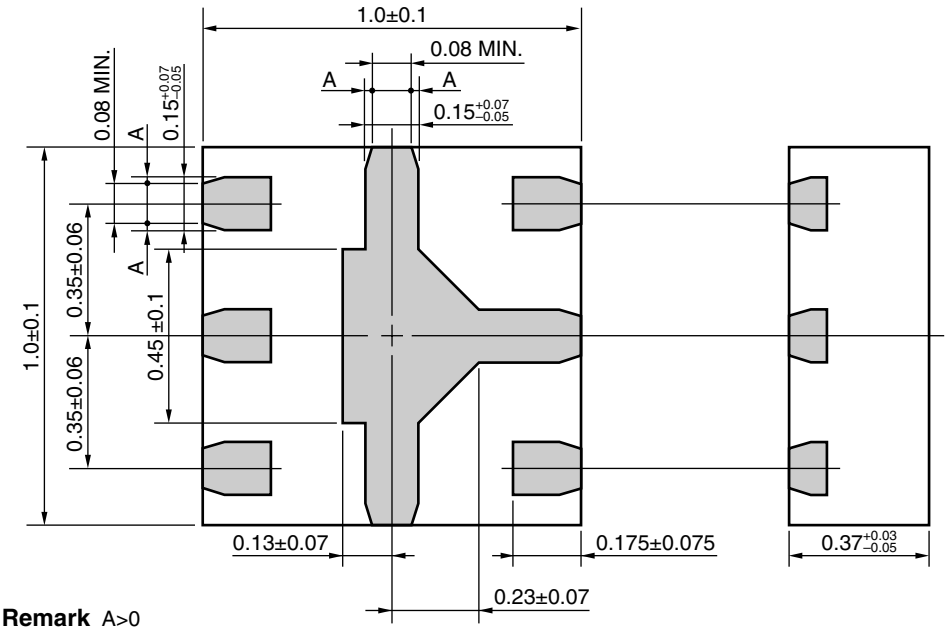
(Unit : mm)

6-Pin Plastic TSSON (T6R)

(Top View)



(Bottom View)

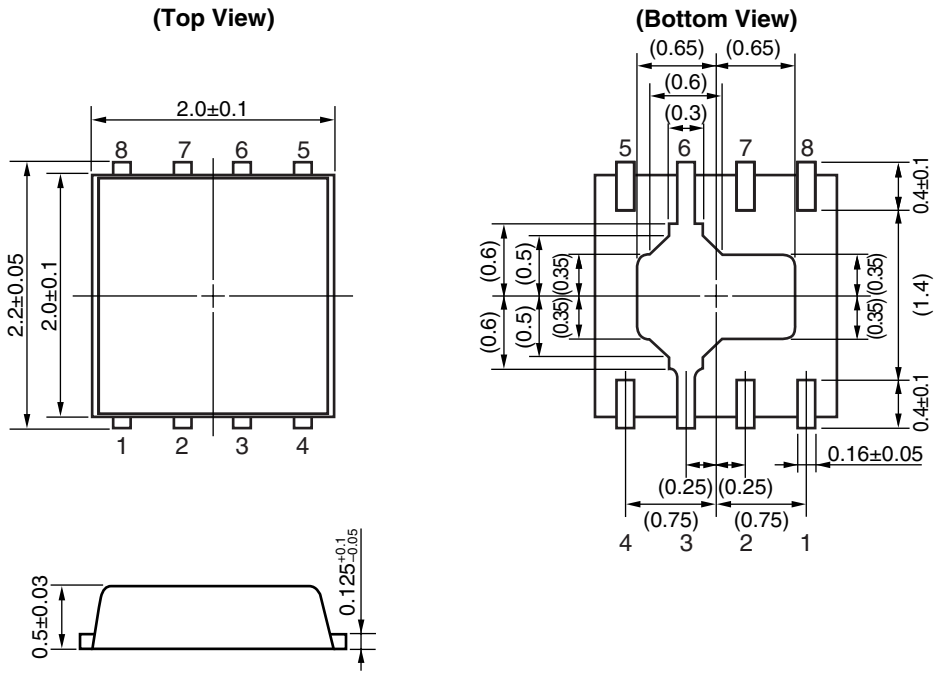


Remark A>0

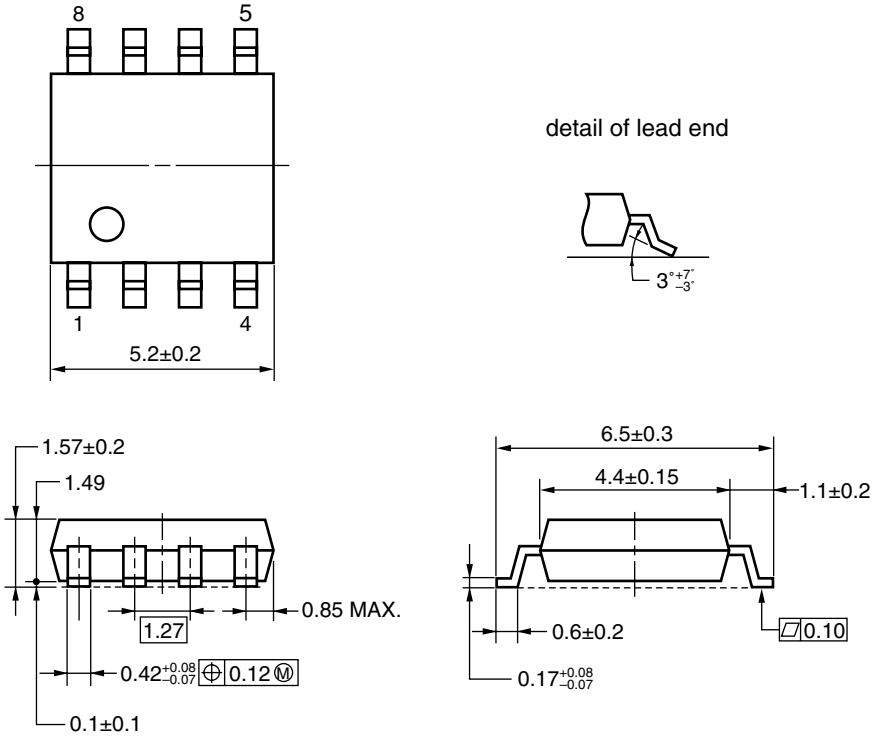
Package Dimensions (14/47)

(Unit : mm)

8-Pin Lead-Less Minimold



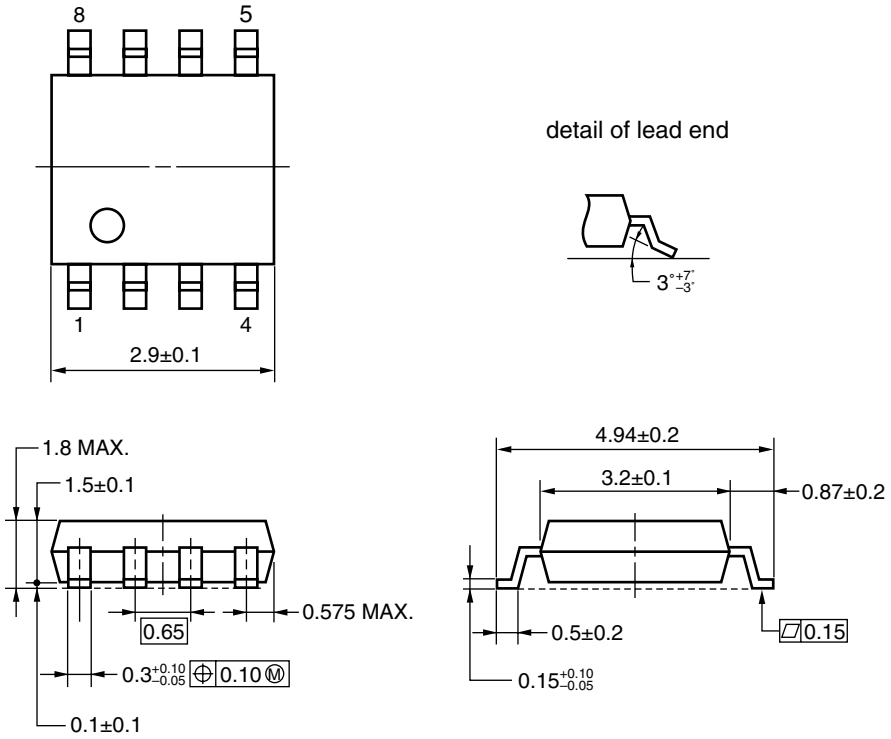
8-Pin Plastic SOP (5.72 mm (225))



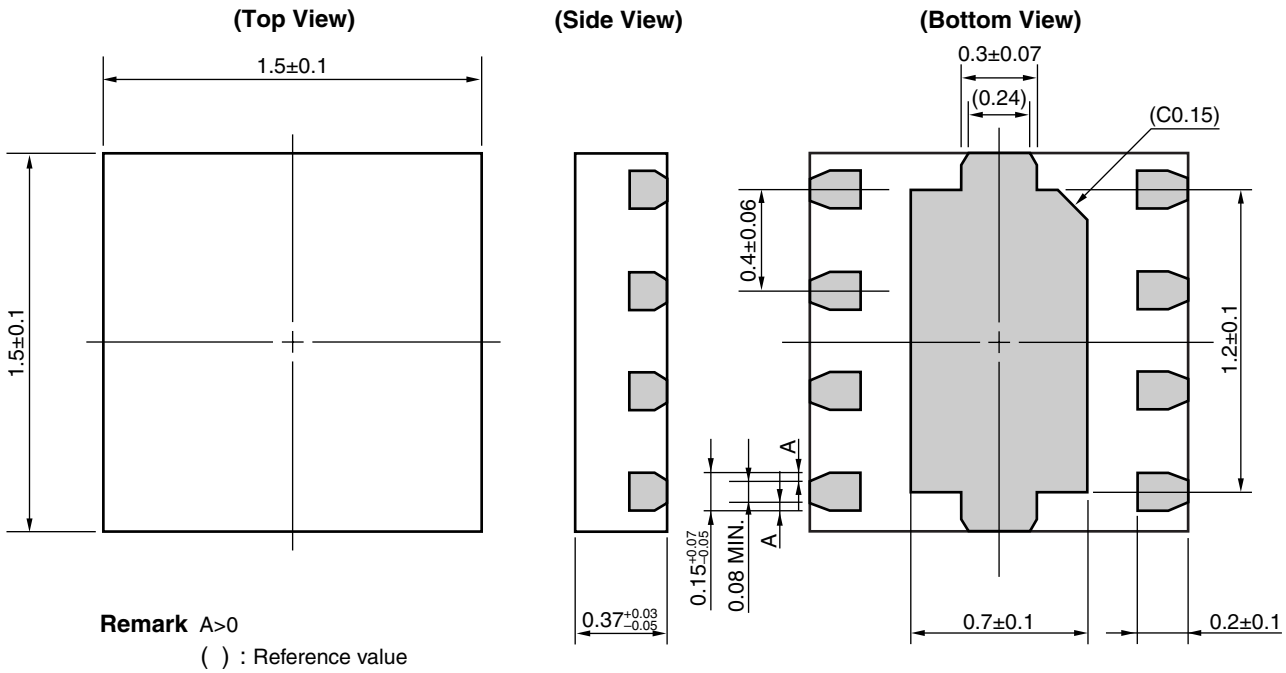
Package Dimensions (15/47)

(Unit : mm)

8-Pin Plastic SSOP (4.45 mm (175))



8-Pin Plastic TSON



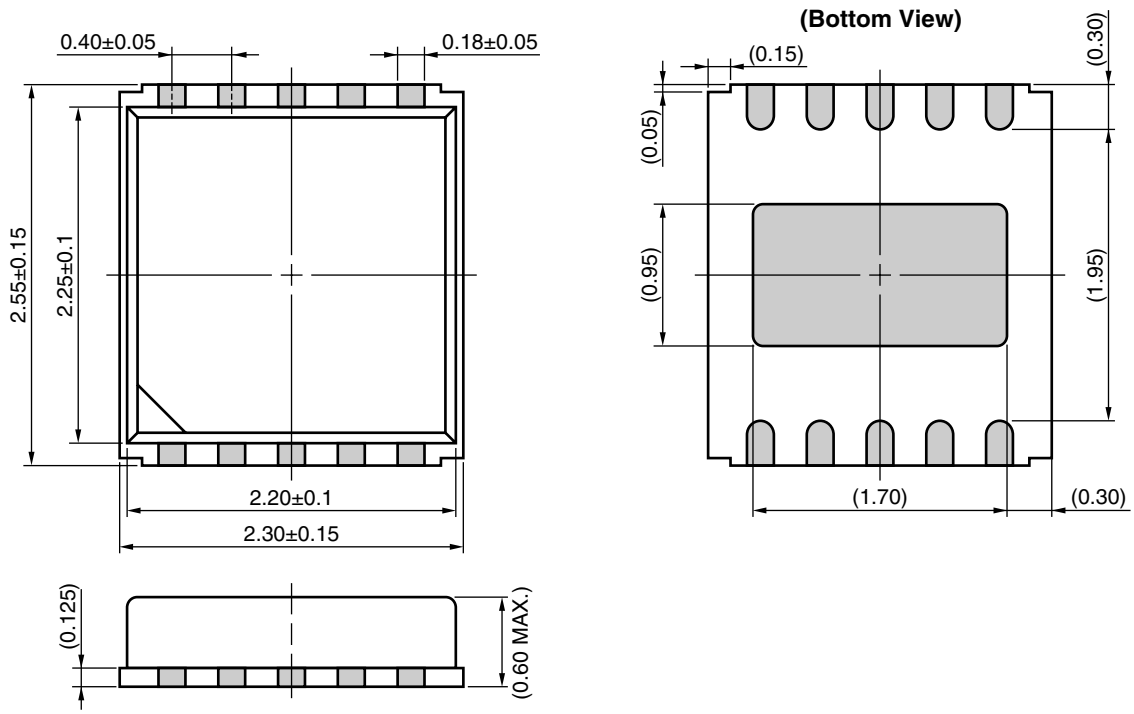
Remark A>0

( ) : Reference value

Package Dimensions (16/47)

(Unit : mm)

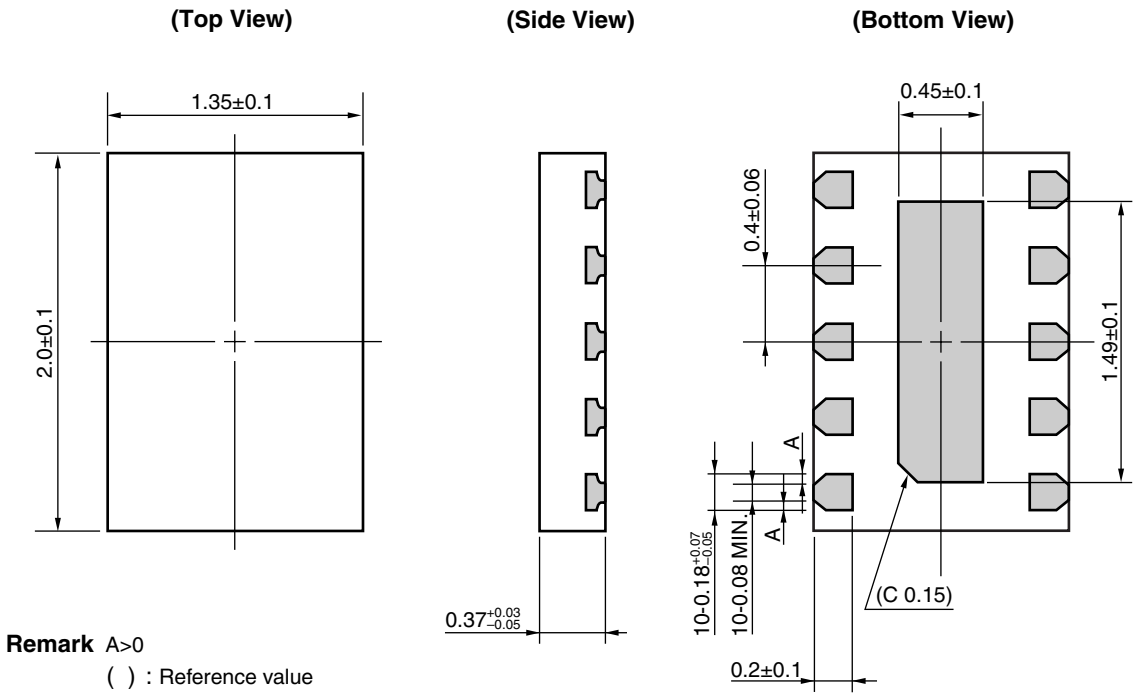
10-Pin Plastic TSON (TQ)



Package Dimensions (17/47)

(Unit : mm)

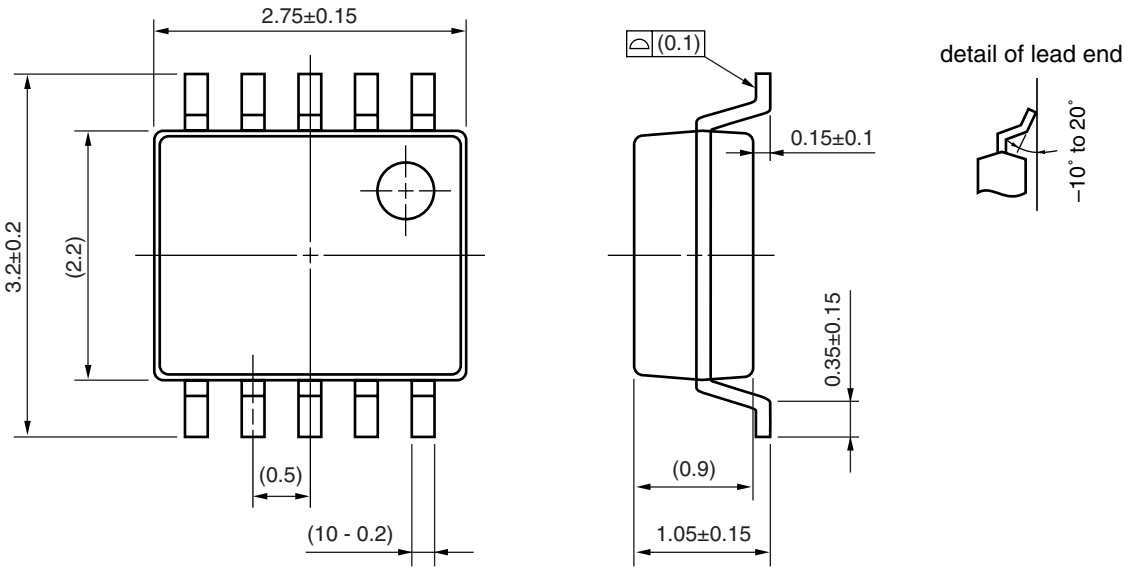
10-Pin Plastic TSSON (T6Q)



Remark A>0

( ) : Reference value

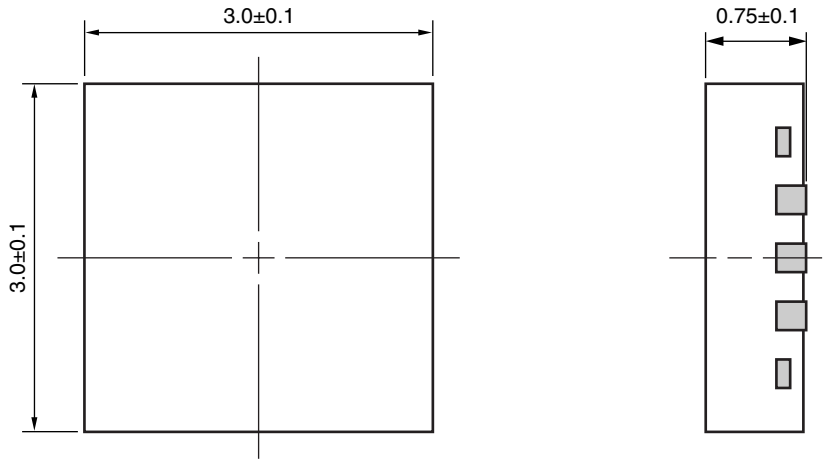
10-Pin Plastic TSSOP



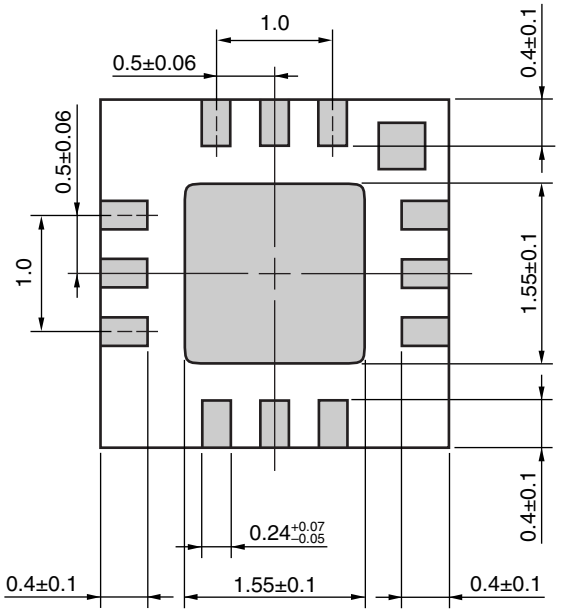
Package Dimensions (18/47)

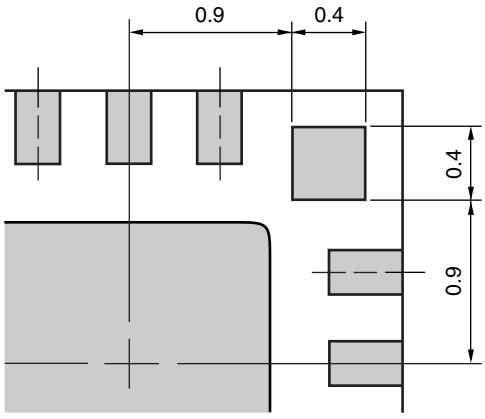
(Unit : mm)

12-Pin Plastic QFN (T5F)



(Bottom View)





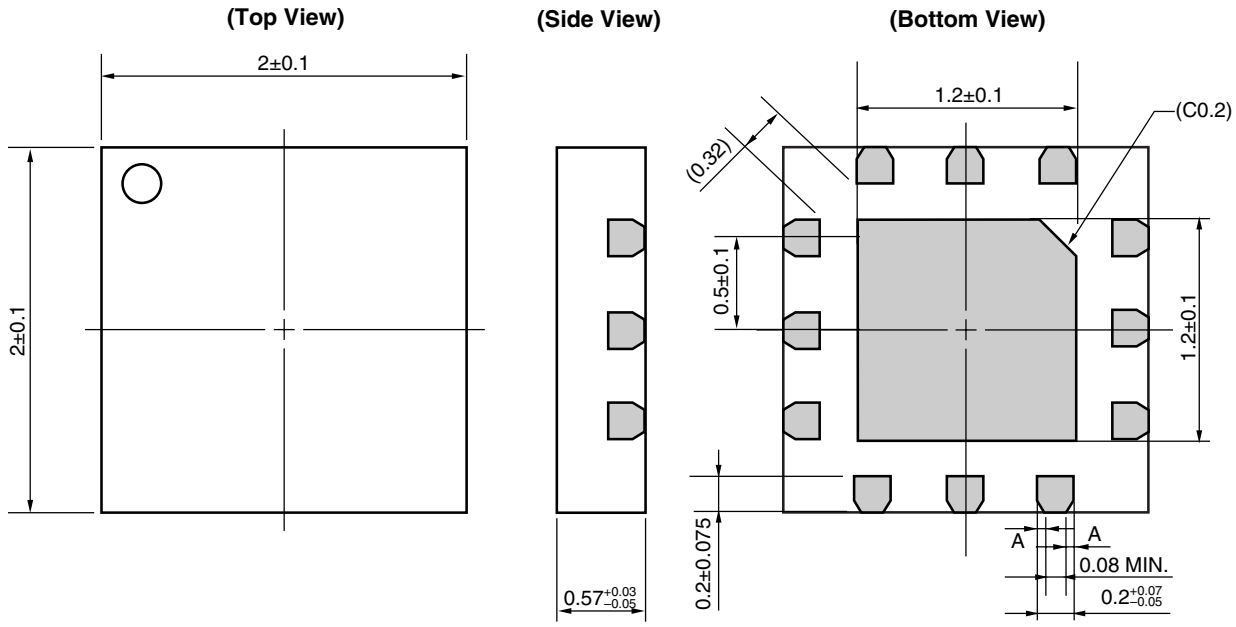
Dimensions of pin No.1 indication

Package Dimensions (19/47)

(Unit : mm)

<R>

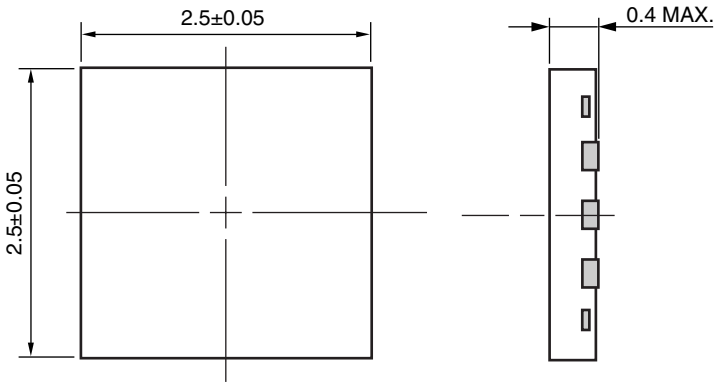
12-Pin Plastic QFN (T7K)



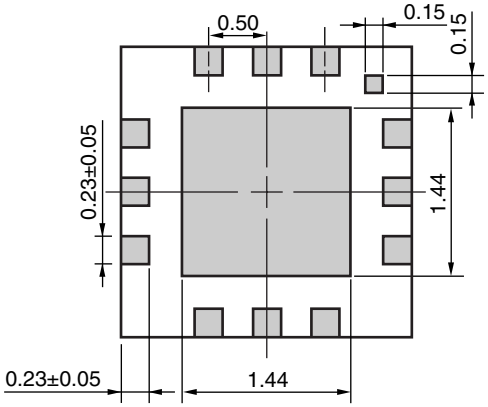
Package Dimensions (20/47)

(Unit : mm)

12-Pin Plastic TQFN



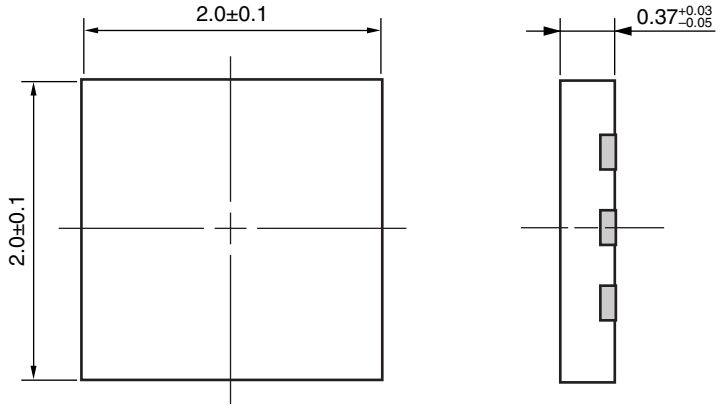
(Bottom View)



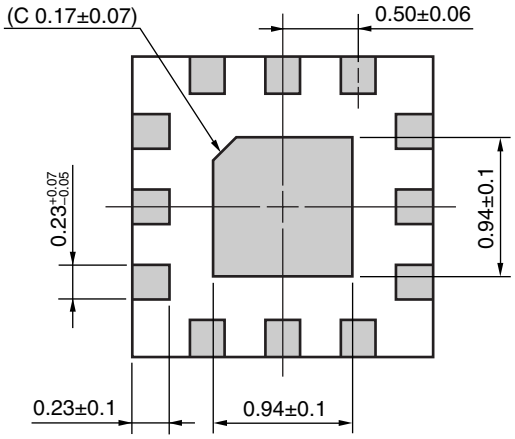
Package Dimensions (21/47)

(Unit : mm)

12-Pin Plastic TSQFN (T5L)



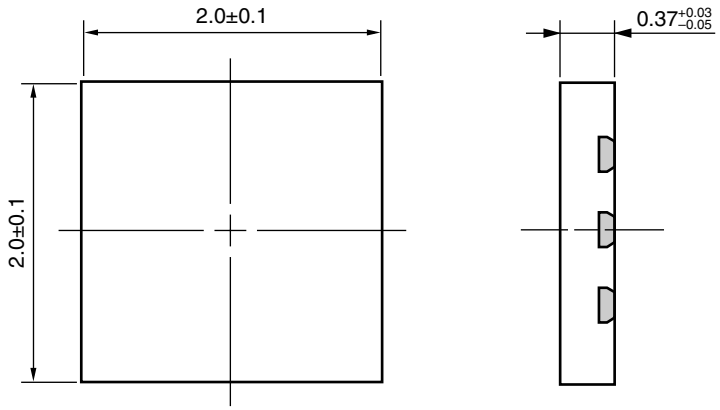
(Bottom View)



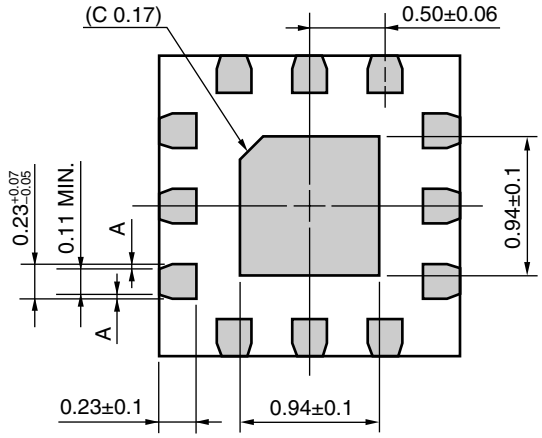
Package Dimensions (22/47)

(Unit : mm)

12-Pin Plastic TSQFN (T6M)



(Bottom View)



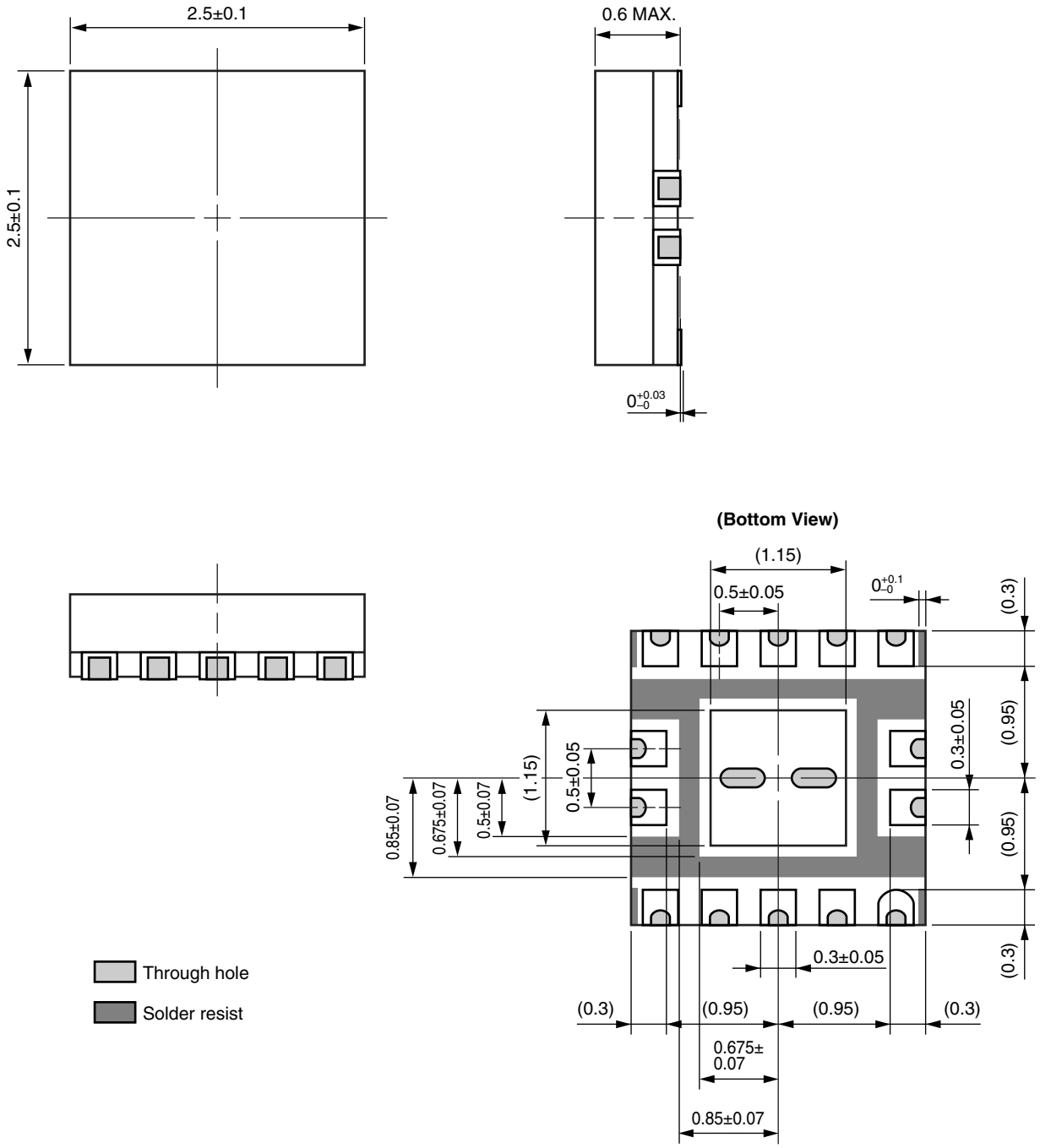
Remark A>0

( ) : Reference value

Package Dimensions (23/47)

(Unit : mm)

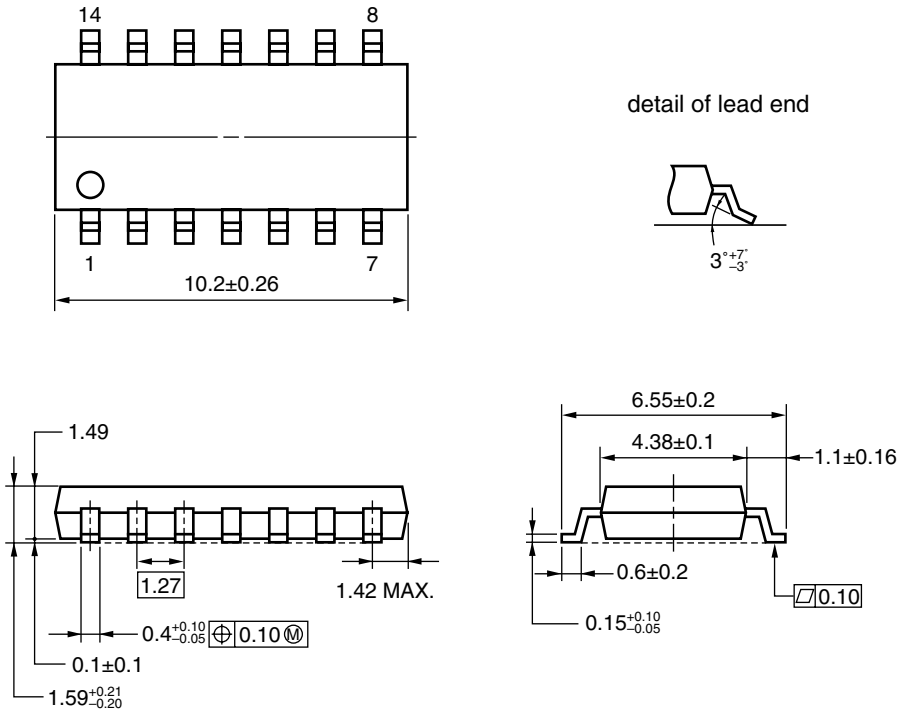
14-Pin LGA (CSP Type)



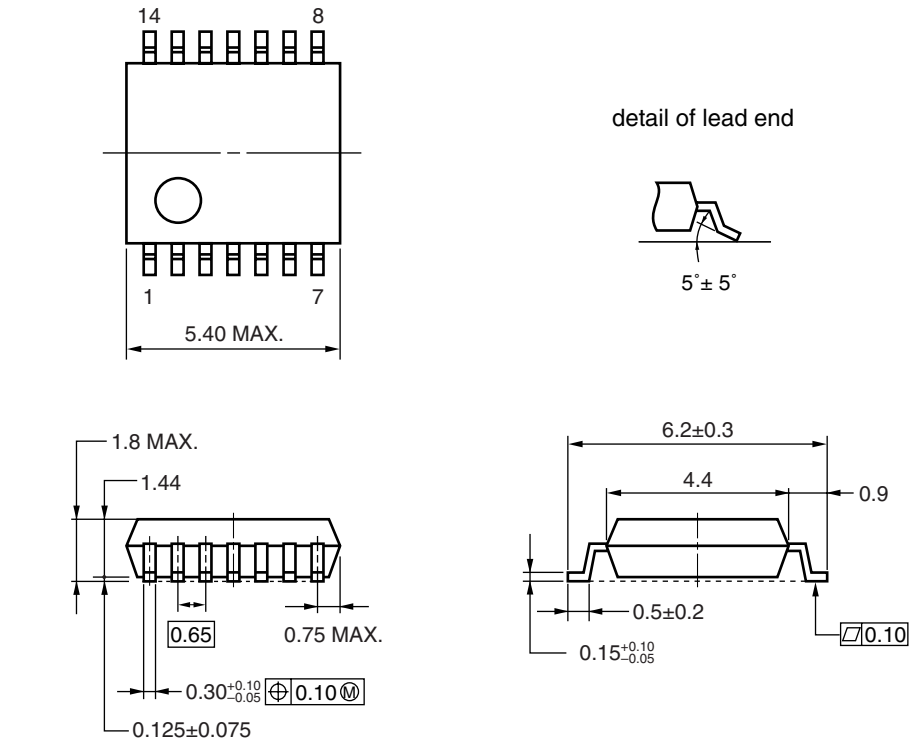
Package Dimensions (24/47)

(Unit : mm)

14-Pin Plastic SOP (5.72 mm (225))



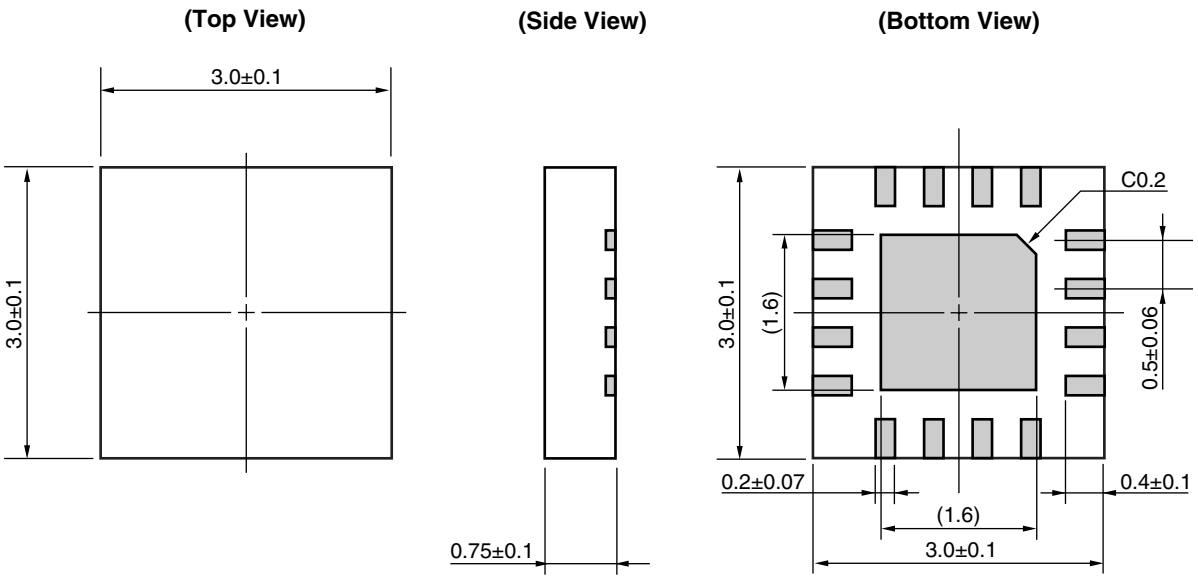
14-Pin Plastic SSOP (5.72 mm (225))



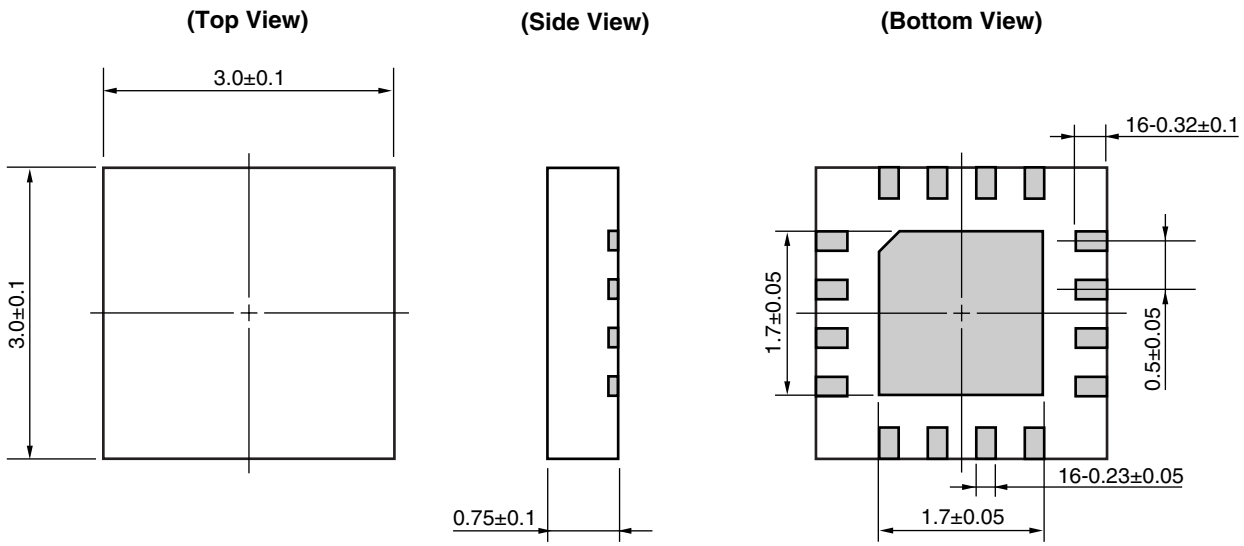
Package Dimensions (25/47)

(Unit : mm)

16-Pin Plastic QFN (T5T)



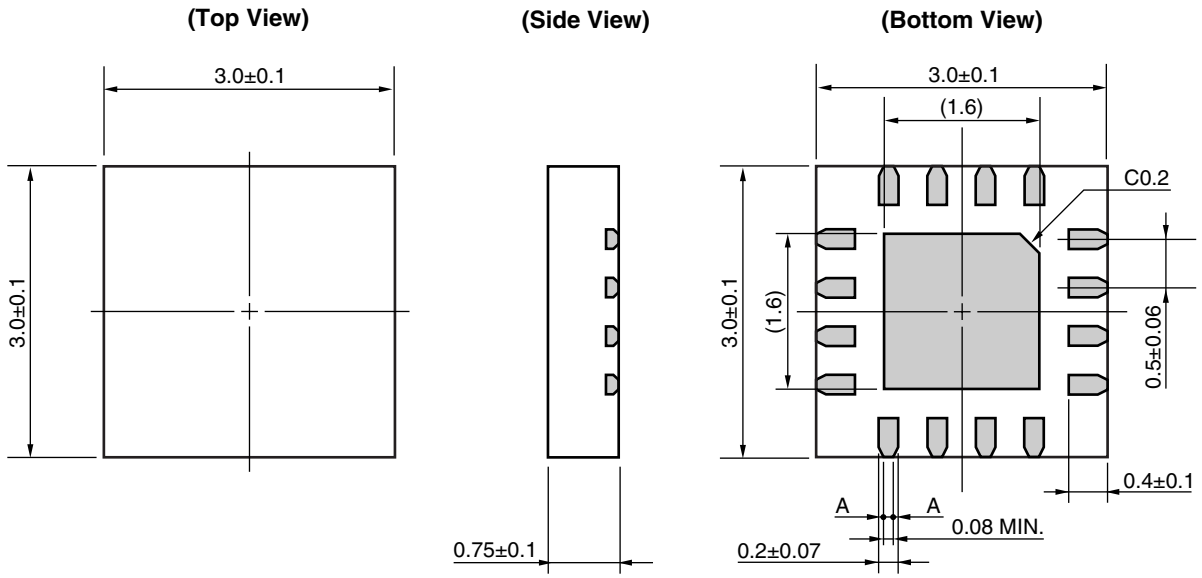
16-Pin Plastic QFN (T6C)



Package Dimensions (26/47)

(Unit : mm)

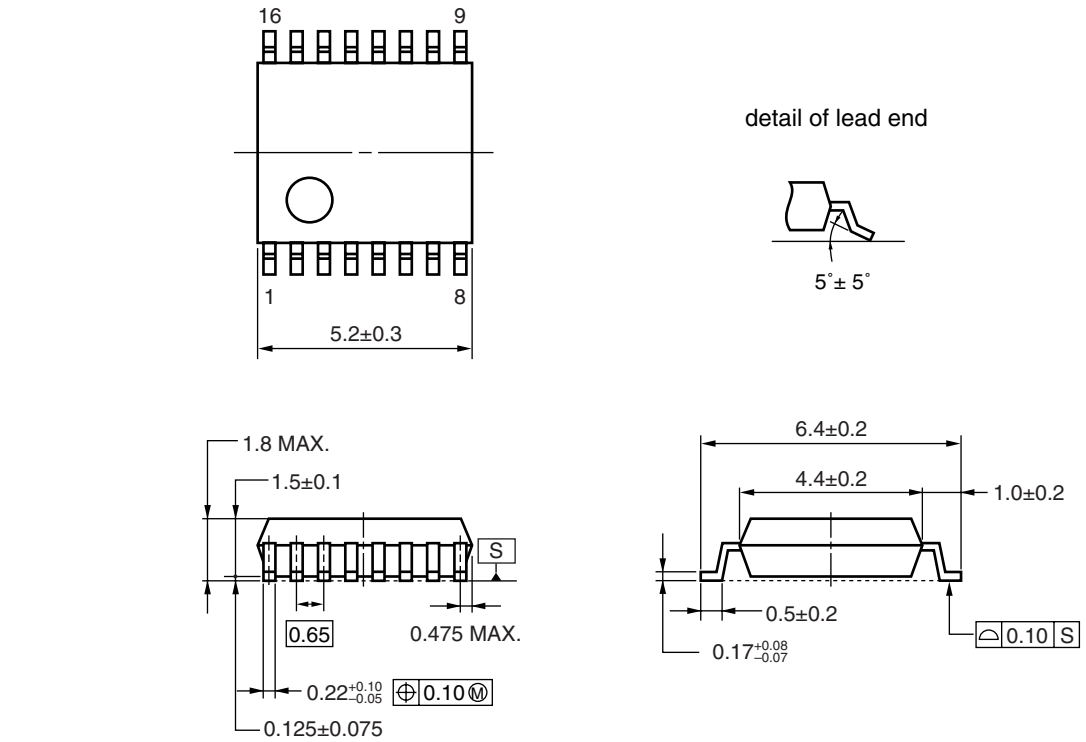
16-Pin Plastic QFN (T6S)



Remark A>0

( ) : Reference value

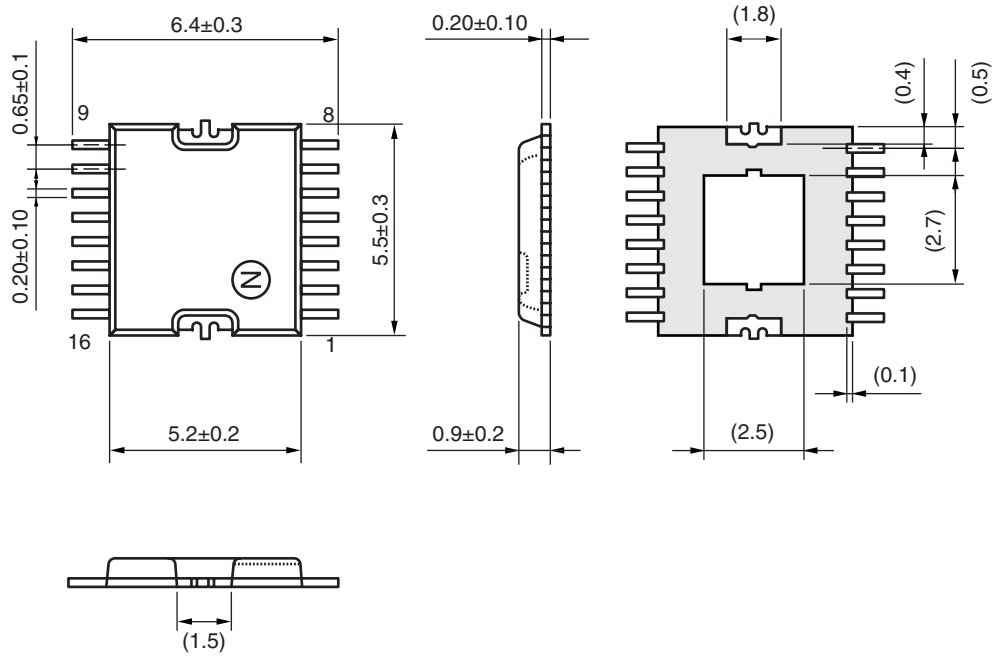
16-Pin Plastic SSOP (5.72 mm (225))



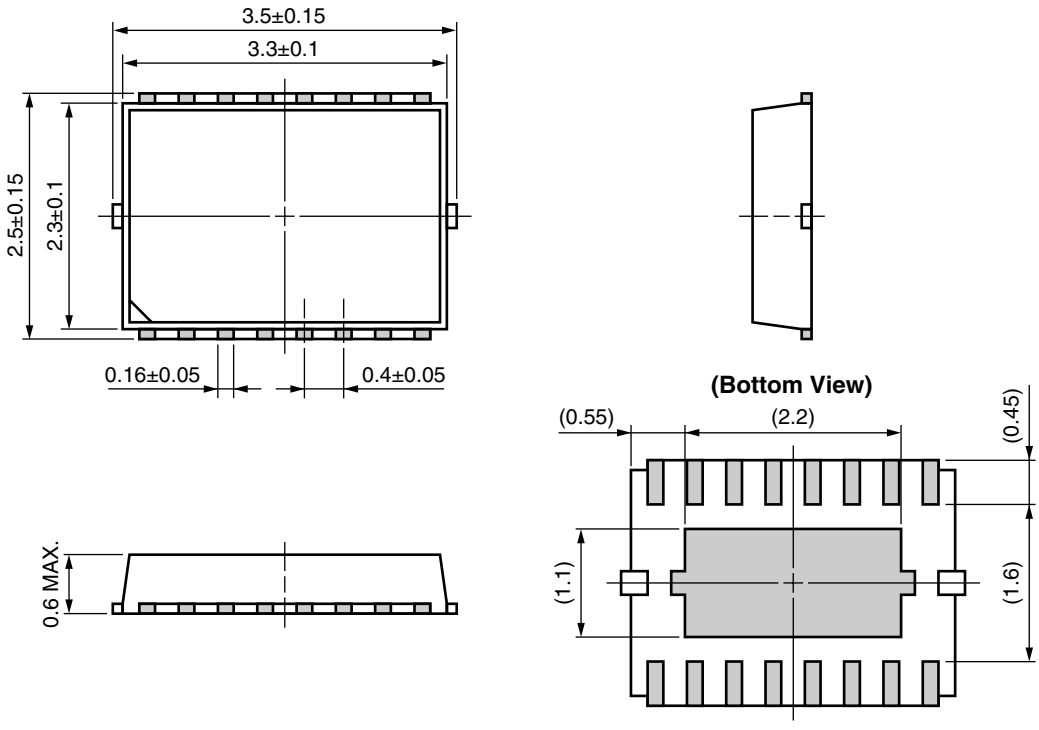
Package Dimensions (27/47)

(Unit : mm)

16-Pin Plastic HTSSOP



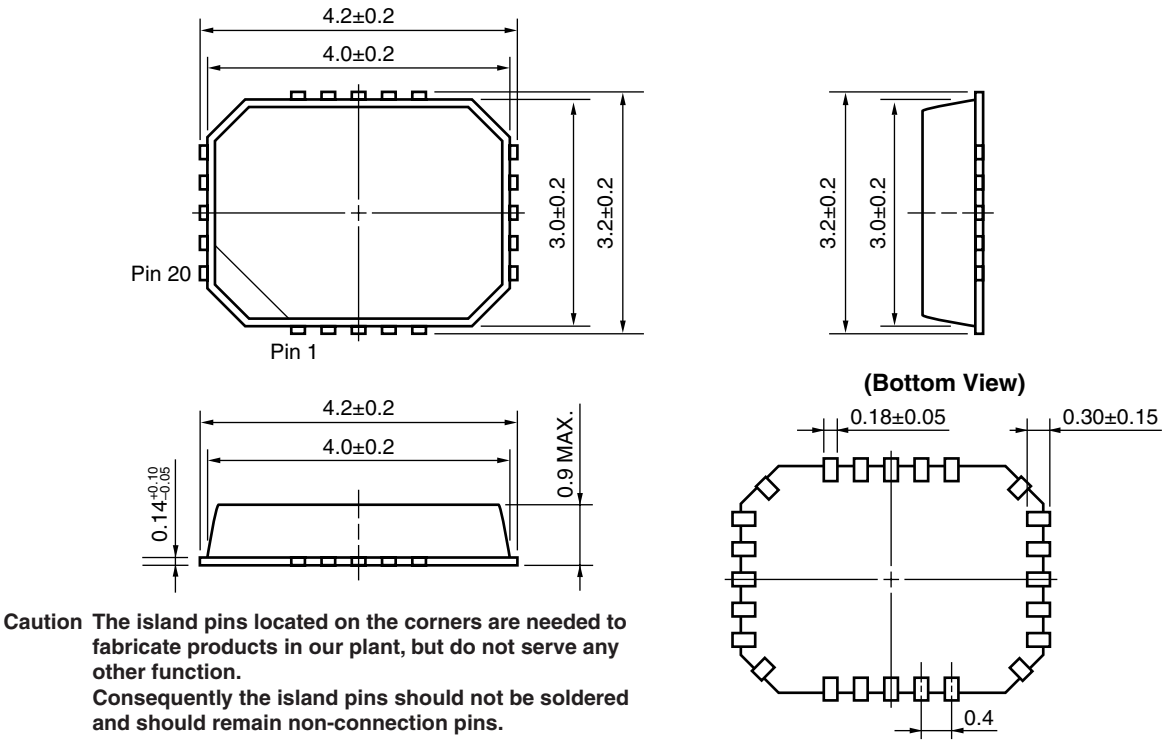
16-Pin Plastic TSON



Package Dimensions (28/47)

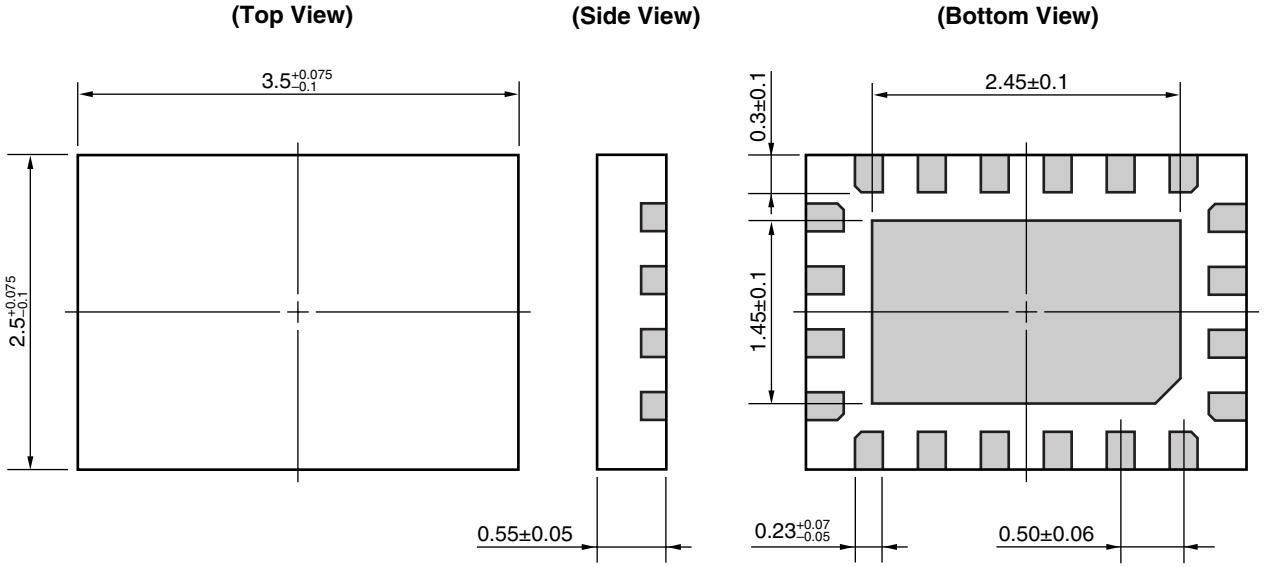
(Unit : mm)

20-Pin Plastic QFN (0.4 mm pitch)



Caution The island pins located on the corners are needed to fabricate products in our plant, but do not serve any other function.
Consequently the island pins should not be soldered and should remain non-connection pins.

20-Pin Plastic RQFN (T5R)

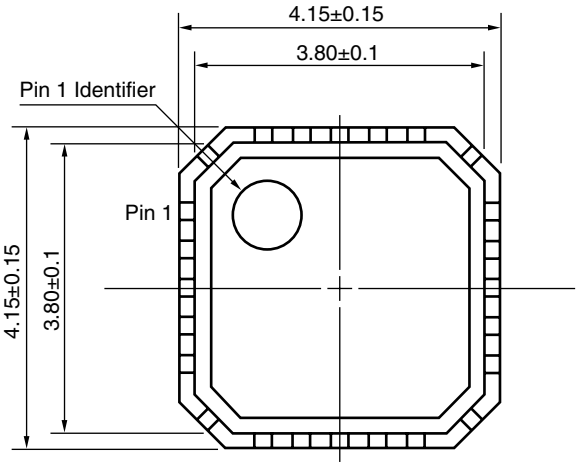


Package Dimensions (29/47)

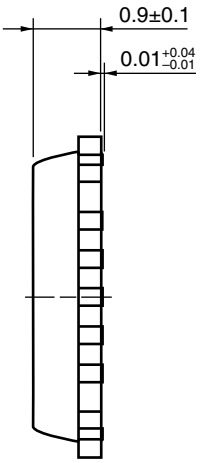
(Unit : mm)

20-Pin Plastic QFN (0.5 mm pitch) (K)

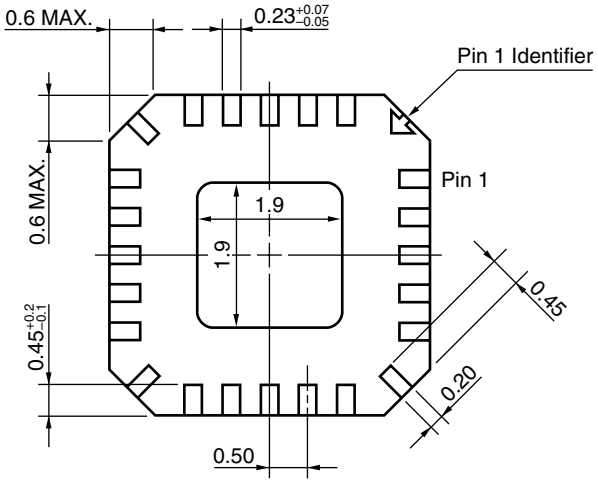
(Top View)



(Side View)



(Bottom View)

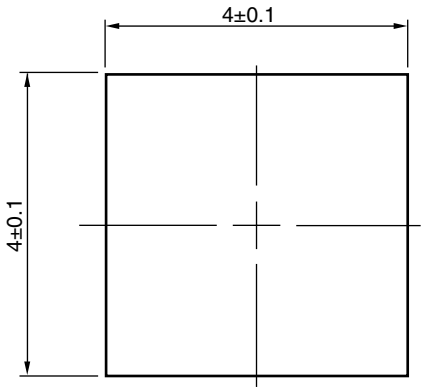


Package Dimensions (30/47)

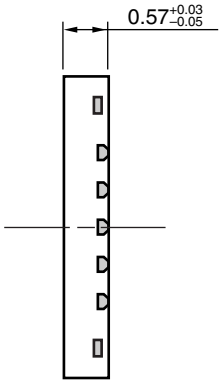
(Unit : mm)

20-Pin Plastic QFN (0.5 mm pitch) (T7G)

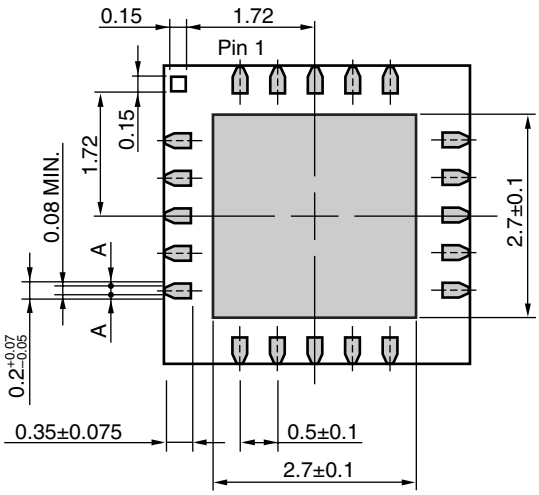
(Top View)



(Side View)



(Bottom View)

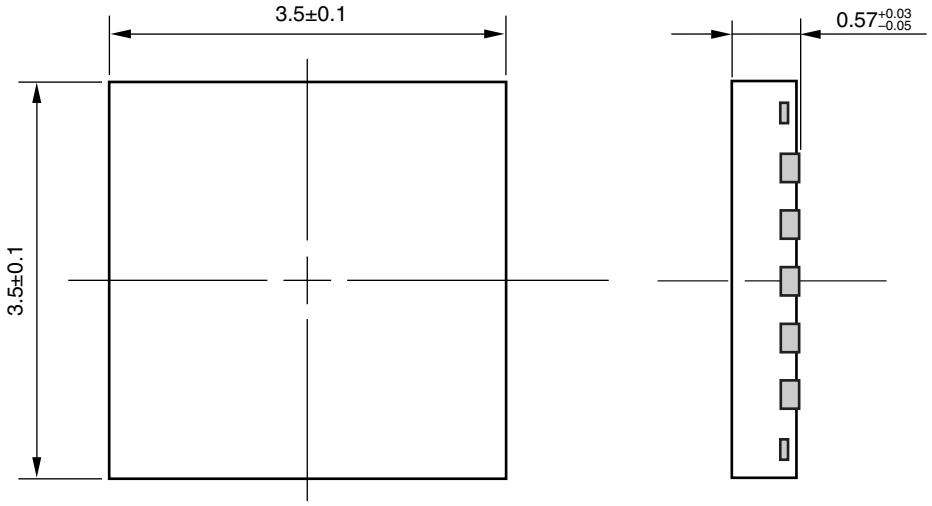


Remark A>0

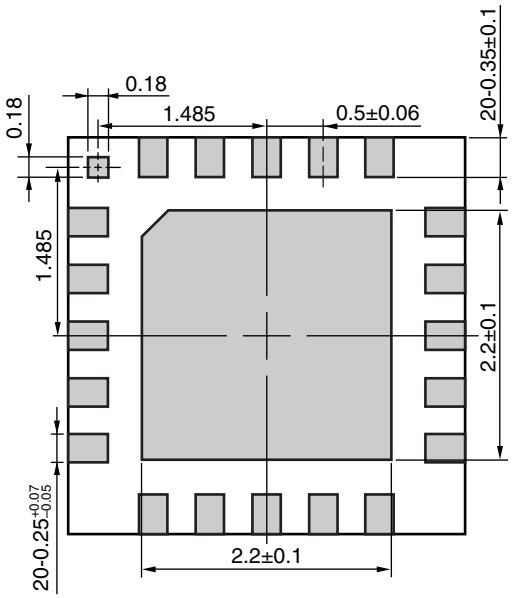
Package Dimensions (31/47)

(Unit : mm)

20-Pin Plastic TQFN (T6E)



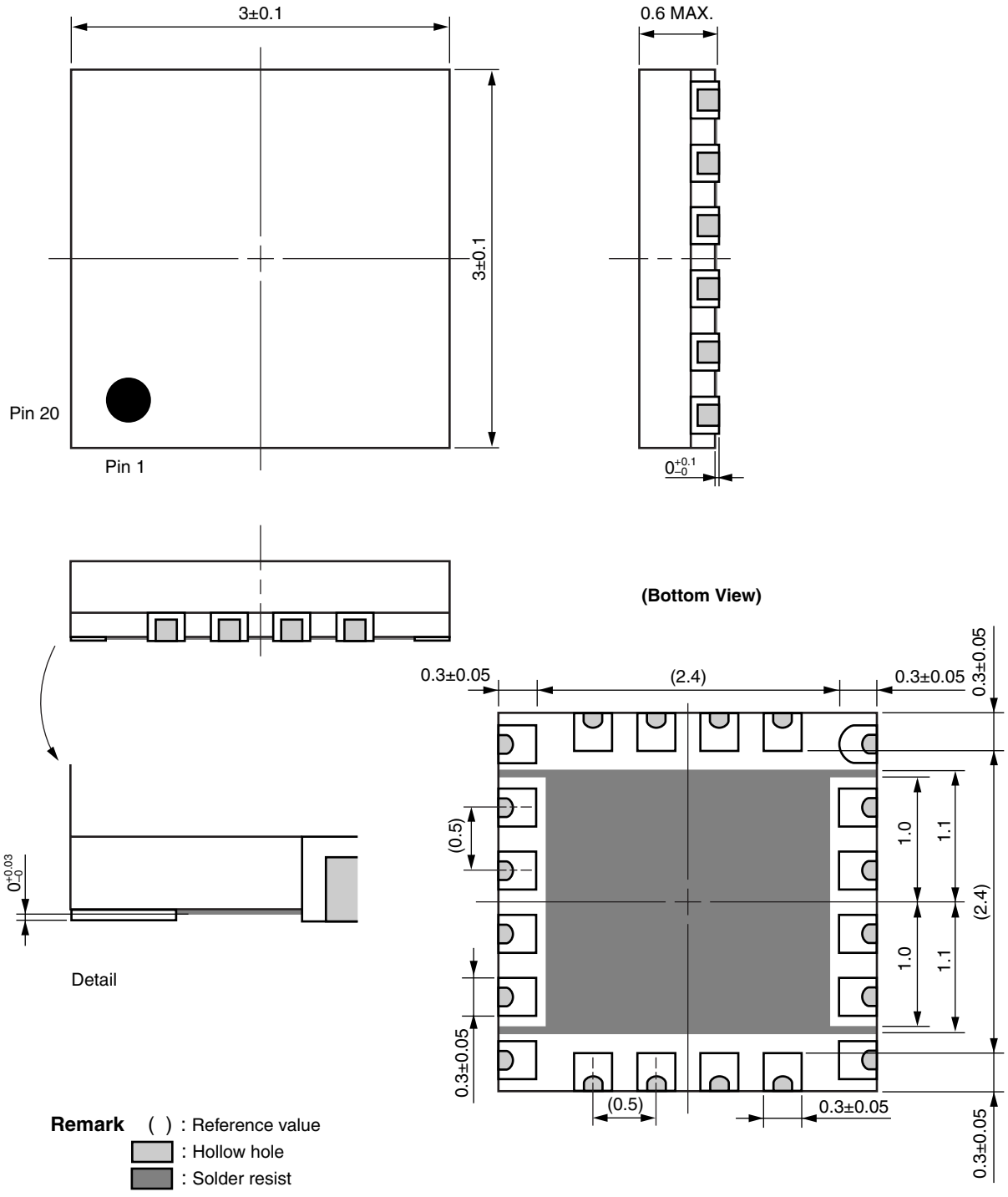
(Bottom View)



Package Dimensions (32/47)

(Unit : mm)

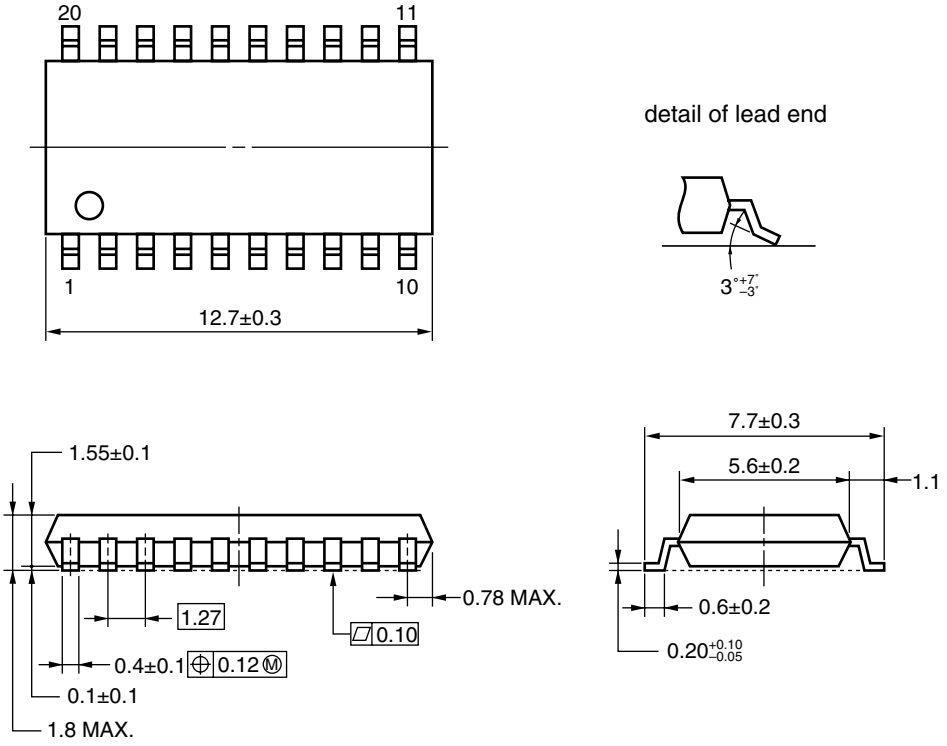
20-Pin LGA (CSP Type)



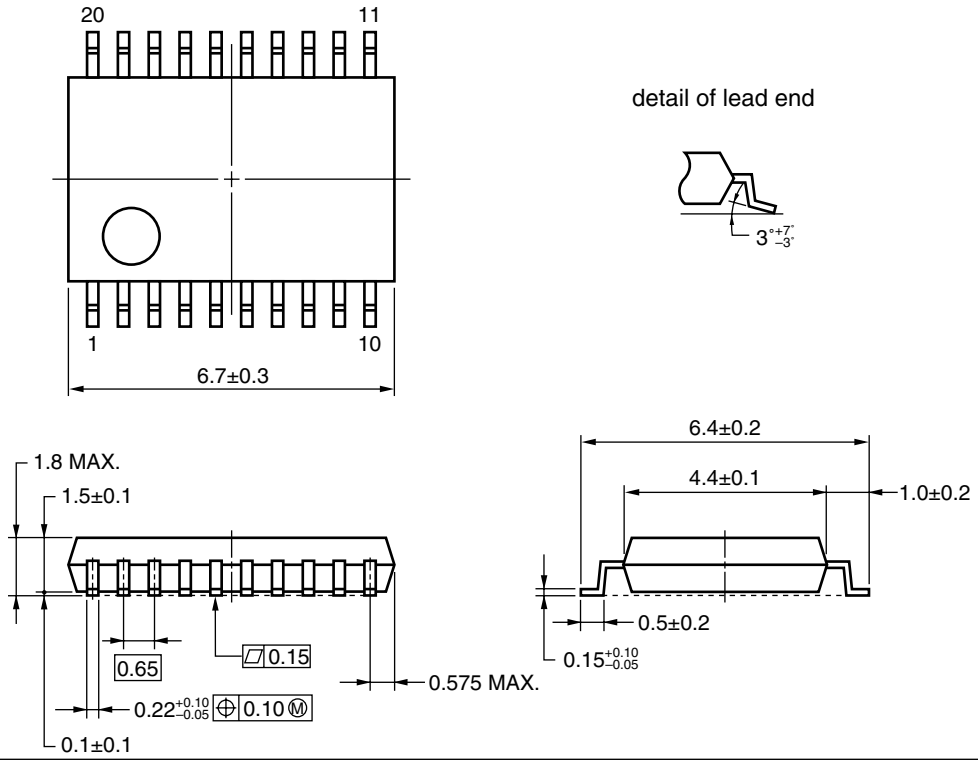
Package Dimensions (33/47)

(Unit : mm)

20-Pin Plastic SOP (7.62 mm (300))



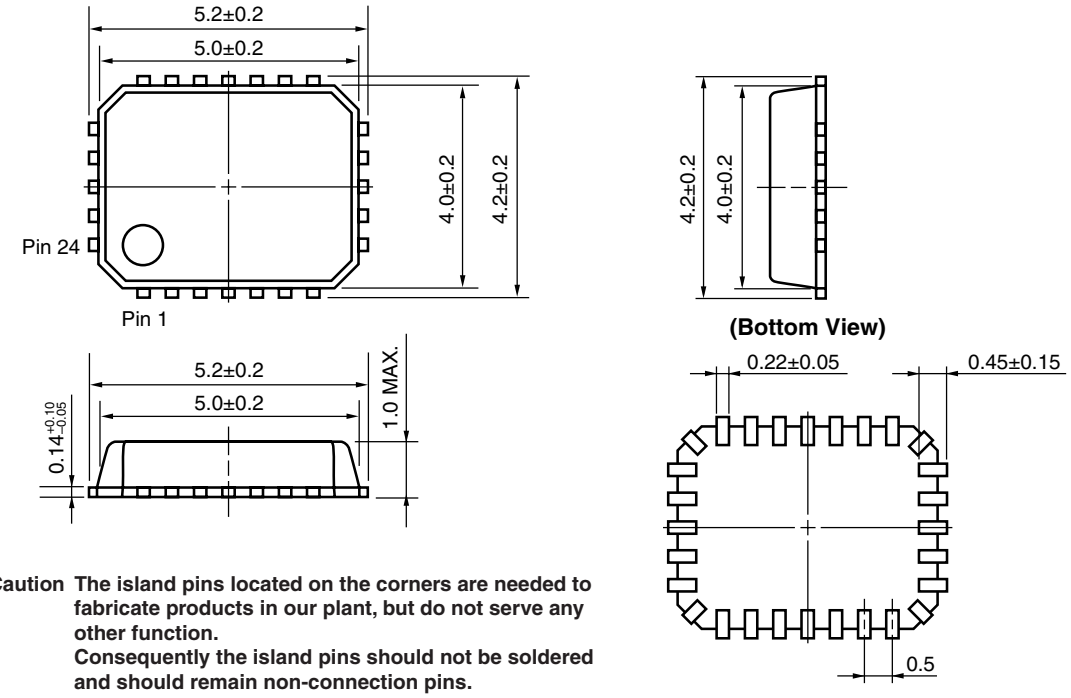
20-Pin Plastic SSOP (5.72 mm (225))



Package Dimensions (34/47)

(Unit : mm)

24-Pin Plastic QFN



Caution The island pins located on the corners are needed to fabricate products in our plant, but do not serve any other function.
Consequently the island pins should not be soldered and should remain non-connection pins.

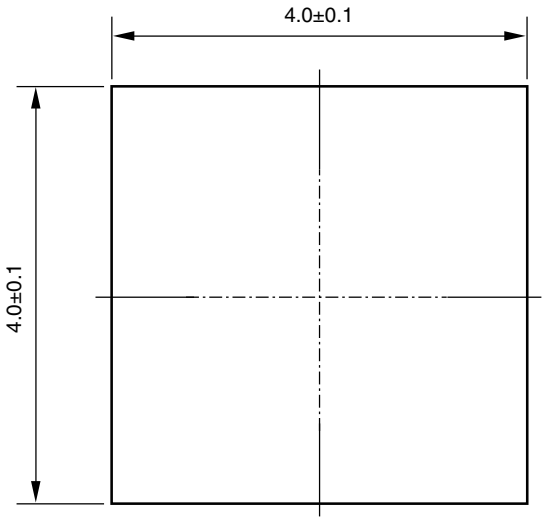
Package Dimensions (35/47)

(Unit : mm)

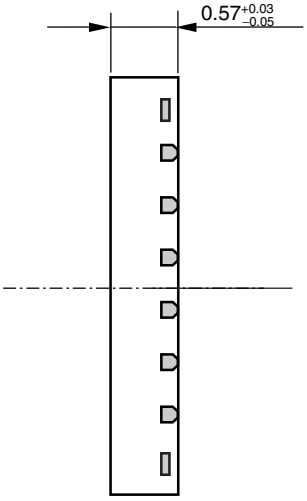
<R>

24-Pin Plastic QFN (T7L)

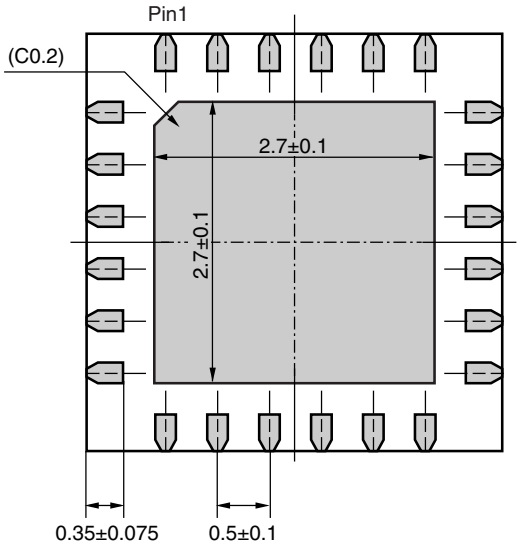
(Top View)



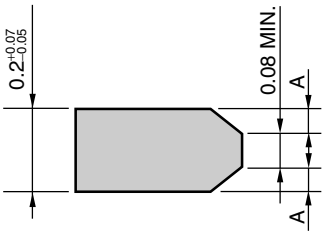
(Side View)



(Bottom View)



(Dimensions of Each Pin Part)

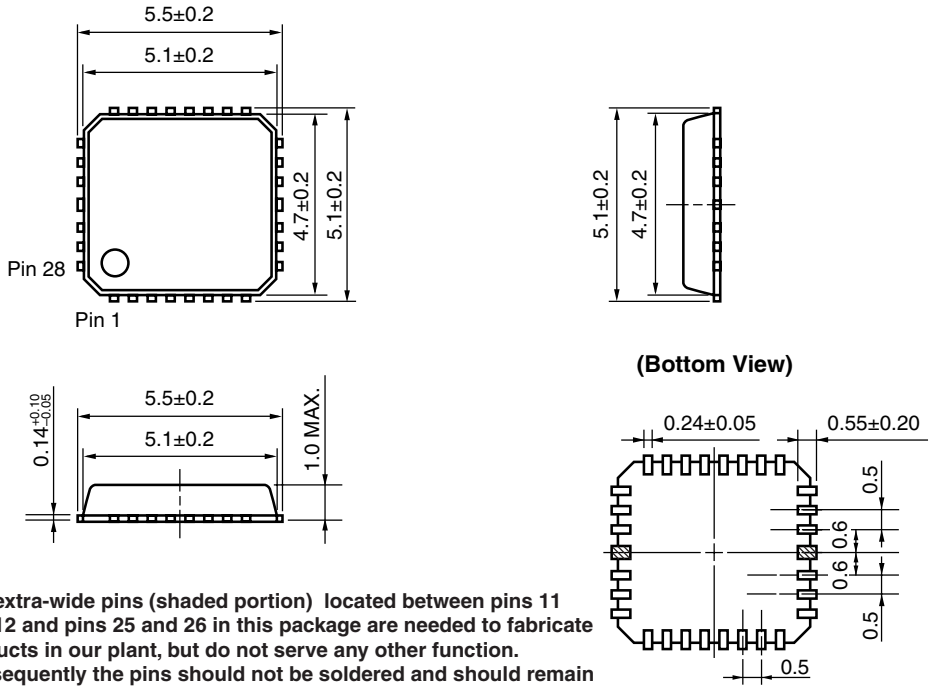


Remark A > 0

Package Dimensions (36/47)

(Unit : mm)

28-Pin Plastic QFN (K)

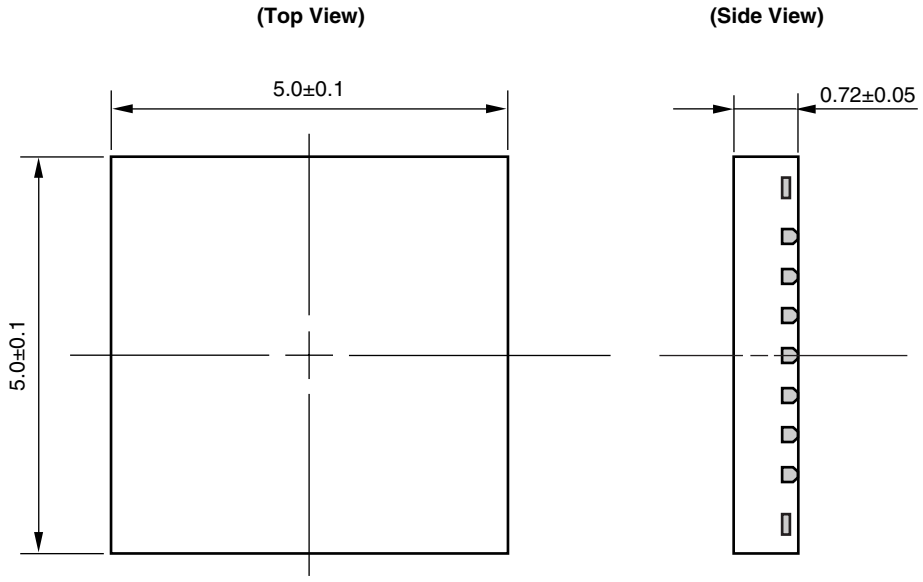


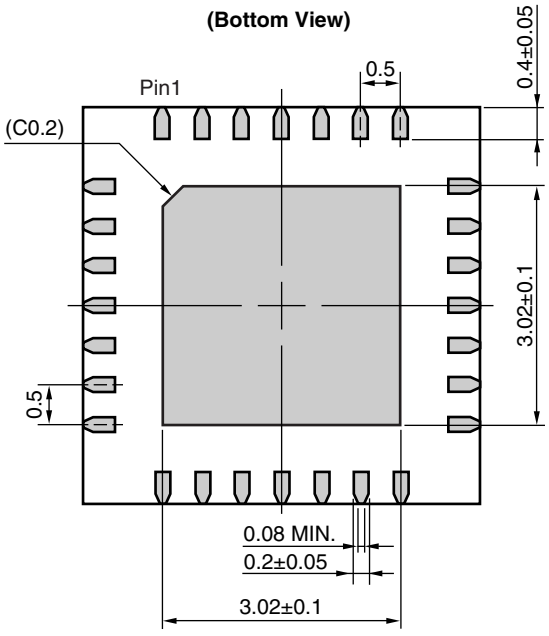
Caution The extra-wide pins (shaded portion) located between pins 11 and 12 and pins 25 and 26 in this package are needed to fabricate products in our plant, but do not serve any other function. Consequently the pins should not be soldered and should remain non-connection pins.

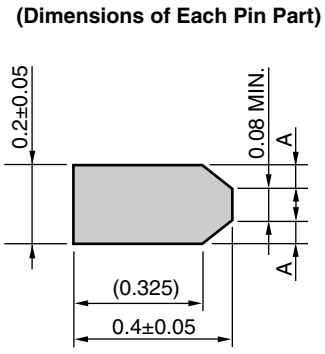
Package Dimensions (37/47)

(Unit : mm)

28-Pin Plastic QFN (T7A)







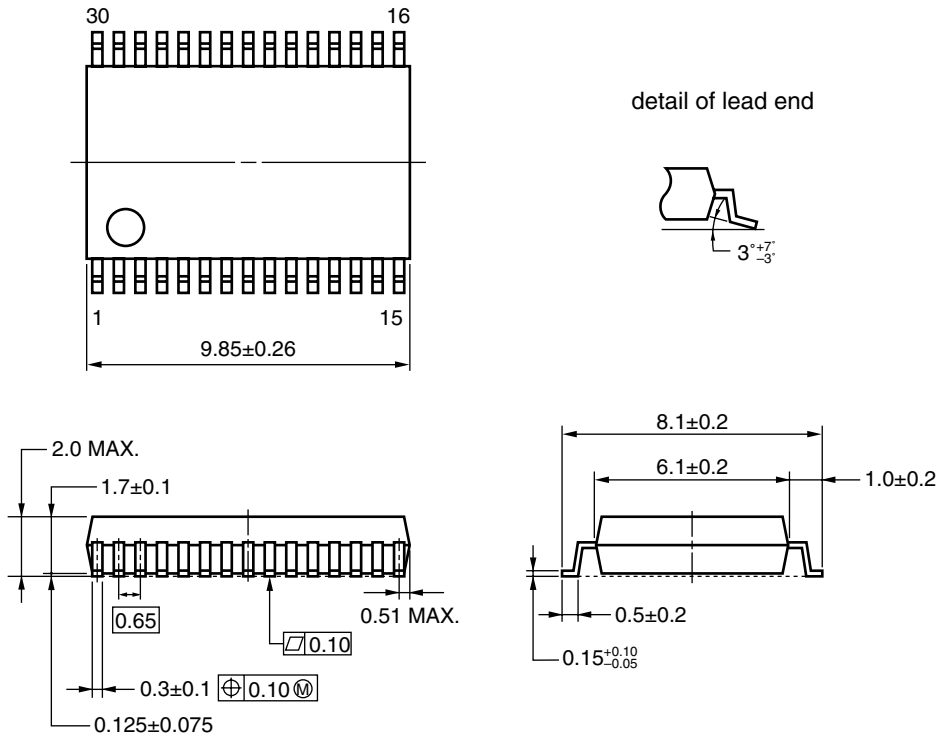
Remark A>0

( ) : Reference value

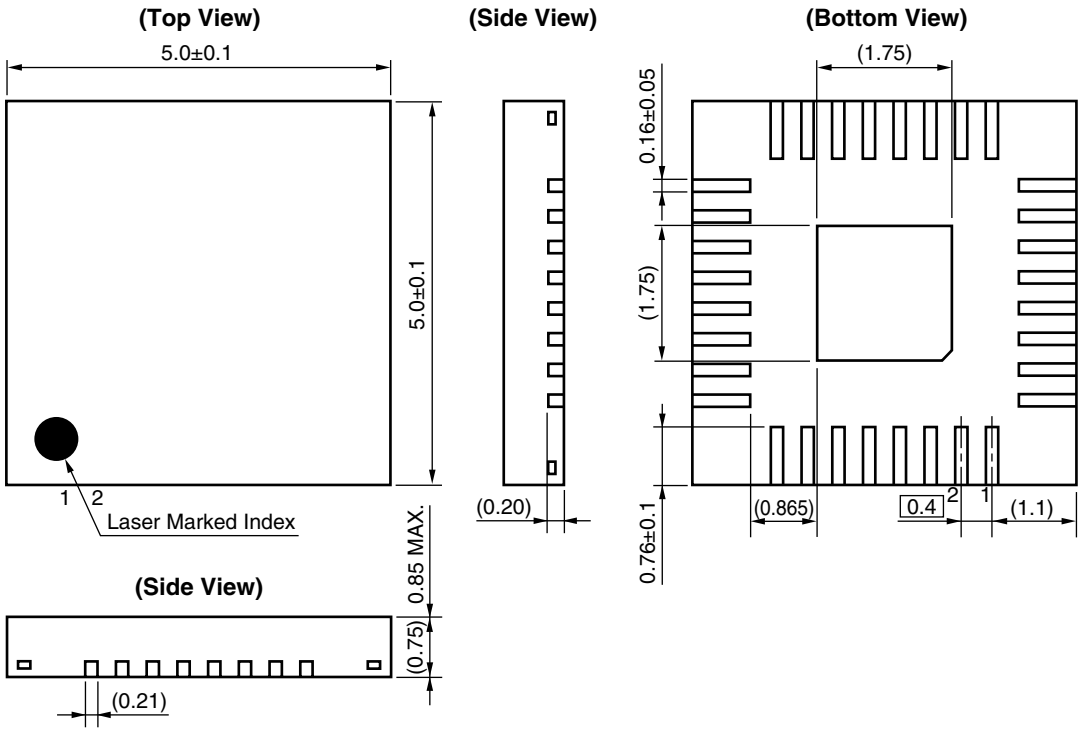
Package Dimensions (38/47)

(Unit : mm)

30-Pin Plastic SSOP (7.62 mm (300))



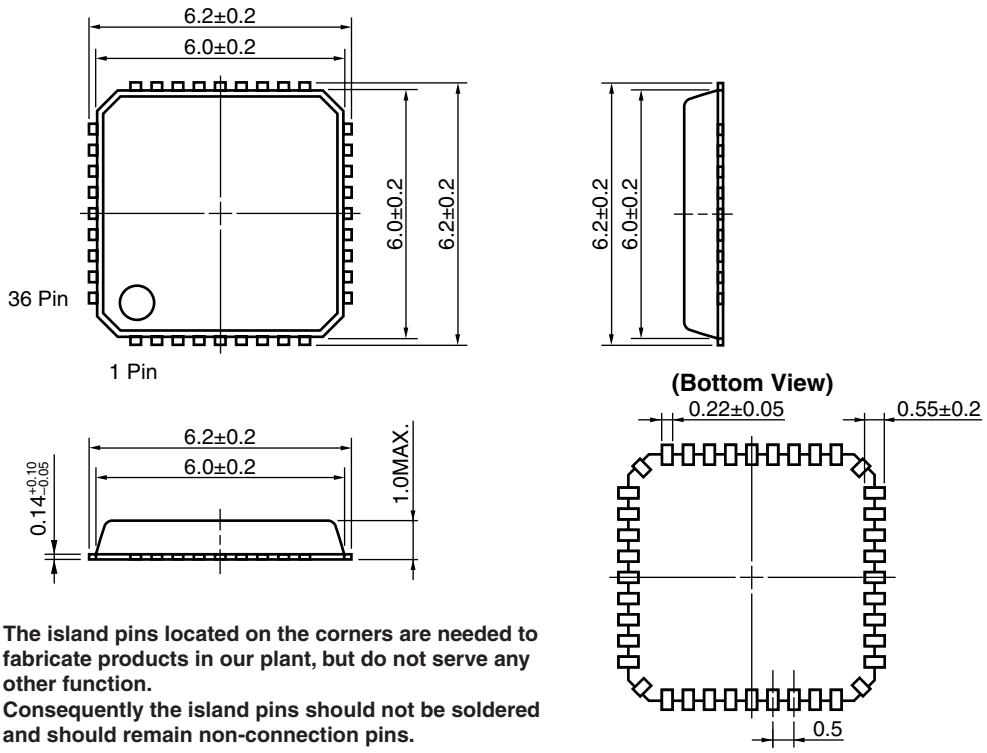
32-Pin Plastic QFN (T5S)



Package Dimensions (39/47)

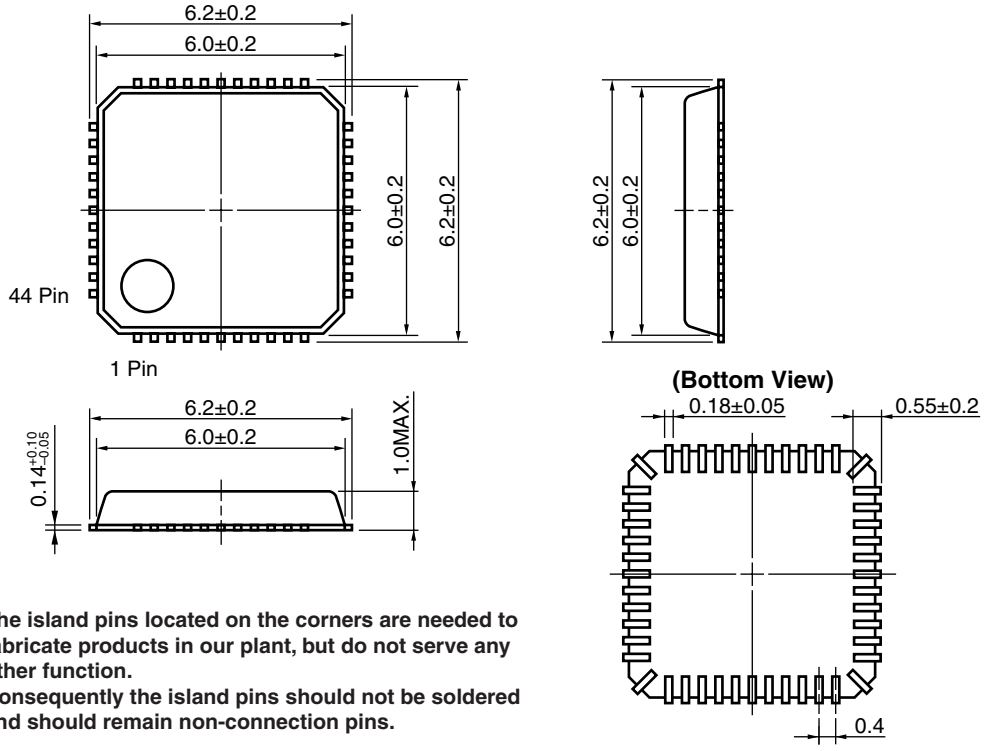
(Unit : mm)

36-Pin Plastic QFN



Caution The island pins located on the corners are needed to fabricate products in our plant, but do not serve any other function.
Consequently the island pins should not be soldered and should remain non-connection pins.

44-Pin Plastic QFN

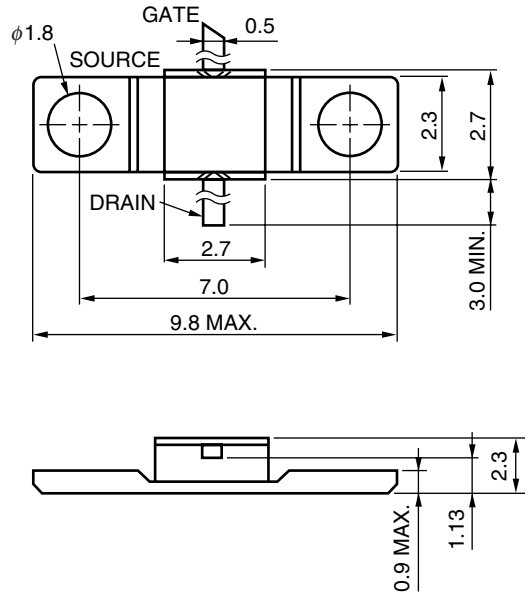


Caution The island pins located on the corners are needed to fabricate products in our plant, but do not serve any other function.
Consequently the island pins should not be soldered and should remain non-connection pins.

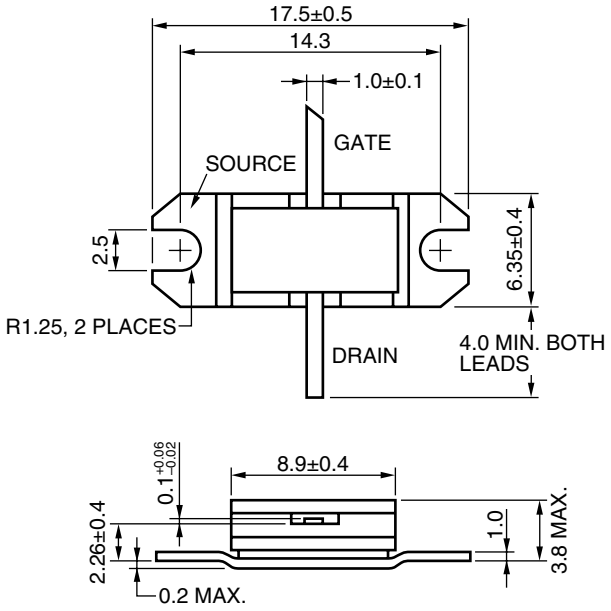
Package Dimensions (40/47)

(Unit : mm)

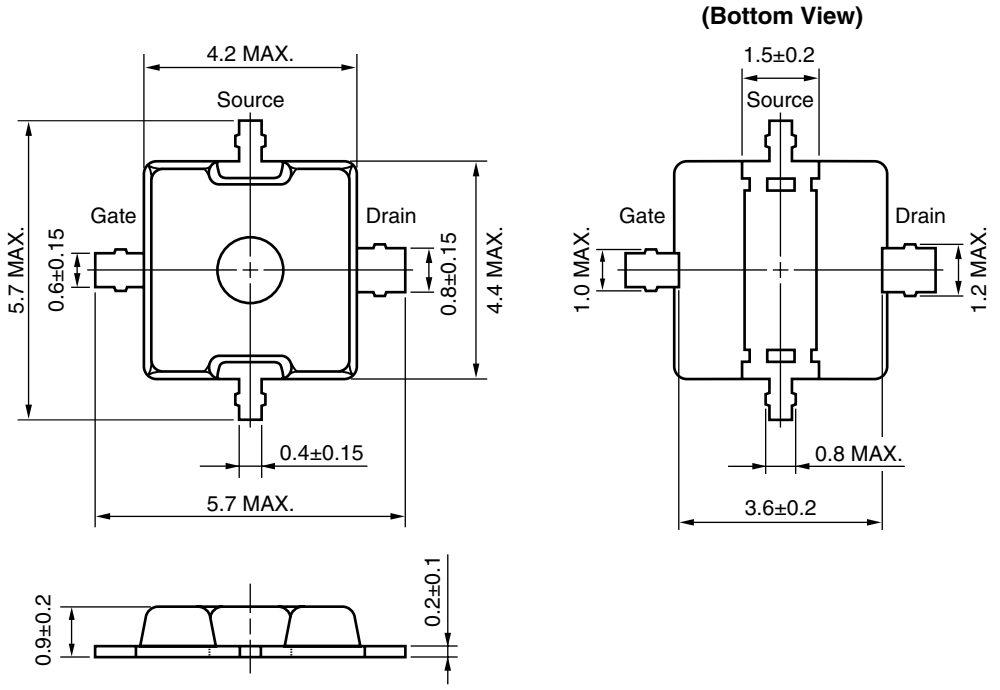
75



77

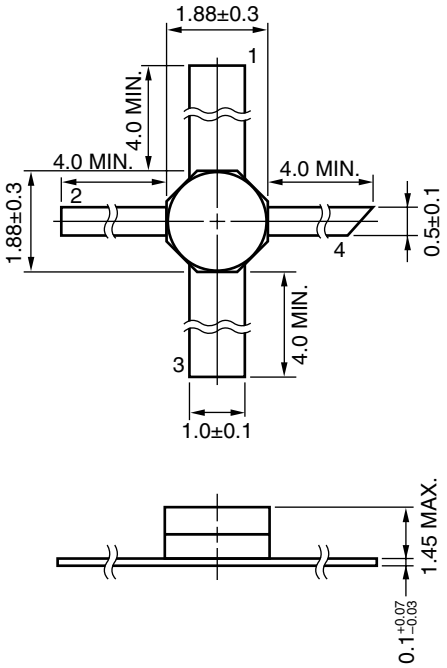
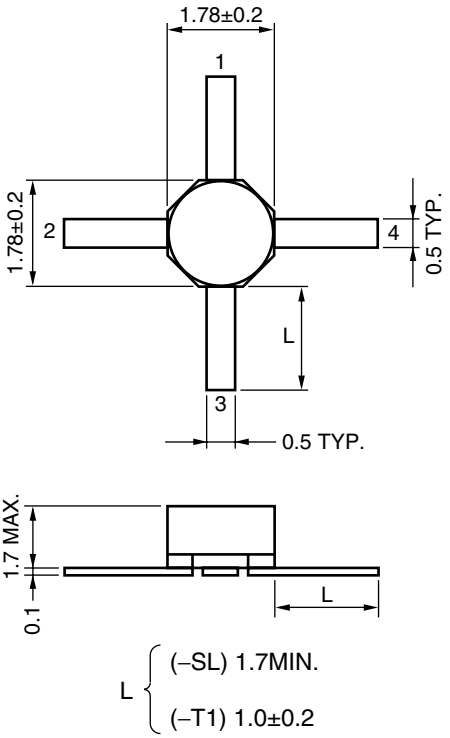
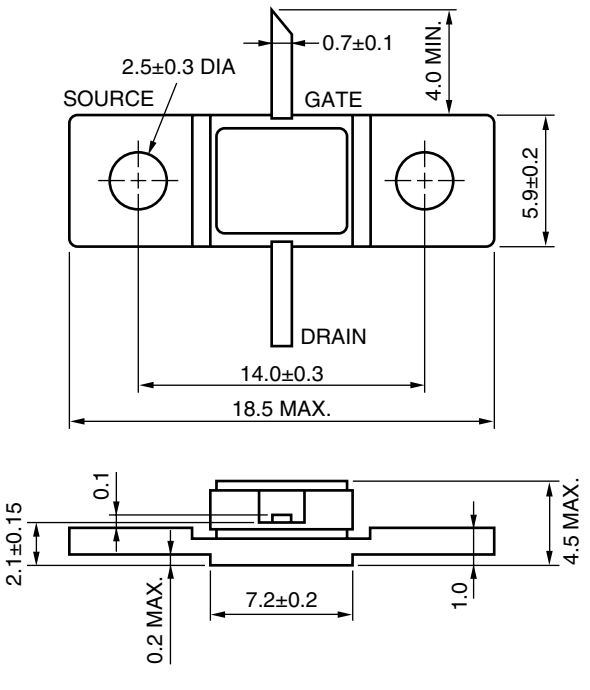
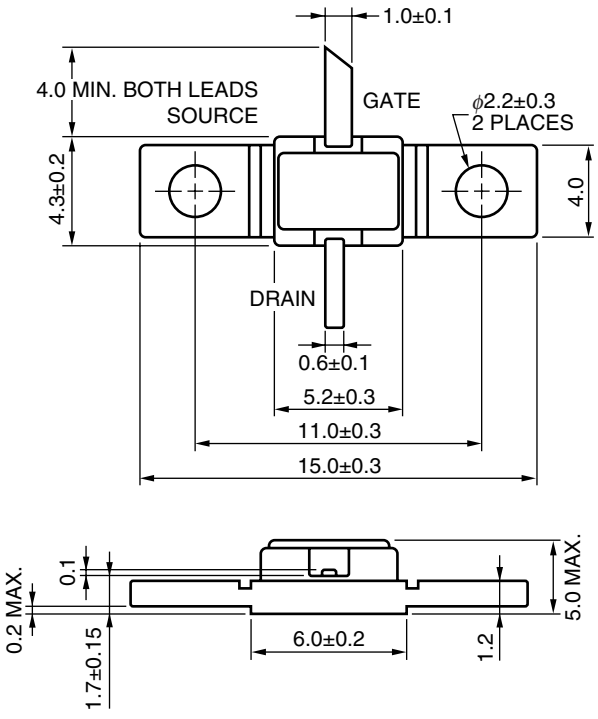


79A



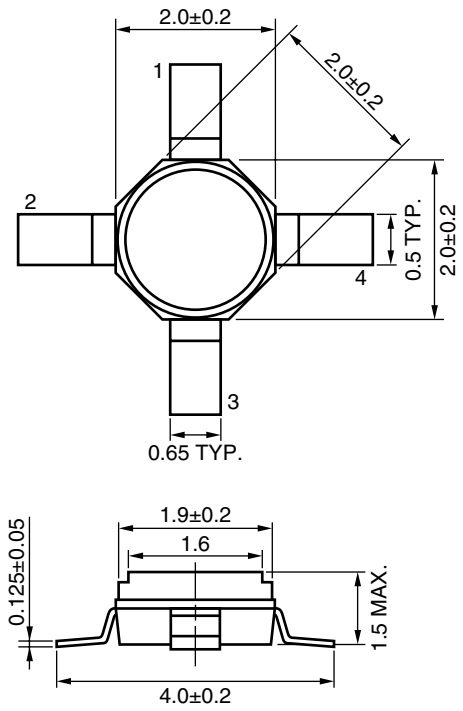
Package Dimensions (41/47)

(Unit : mm)

83A, 83B	84, 84A, 84C
	
95	**96/99**
	

Package Dimensions (42/47)

(Unit : mm)

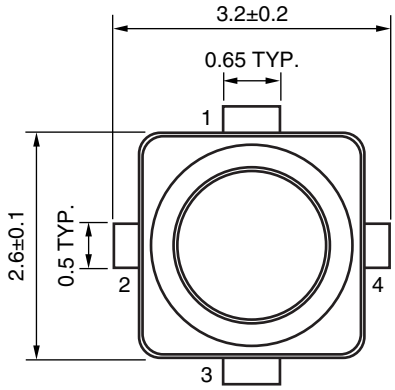
S01	
	

Package Dimensions (43/47)

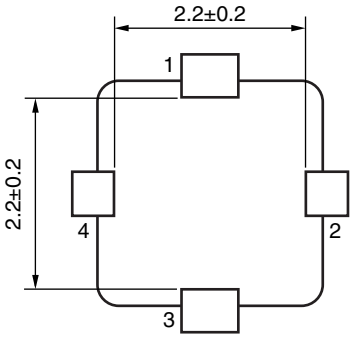
(Unit : mm)

S02, S03

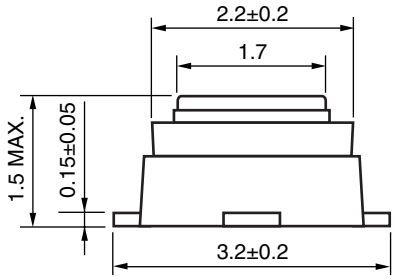
(Top View)



(Bottom View)



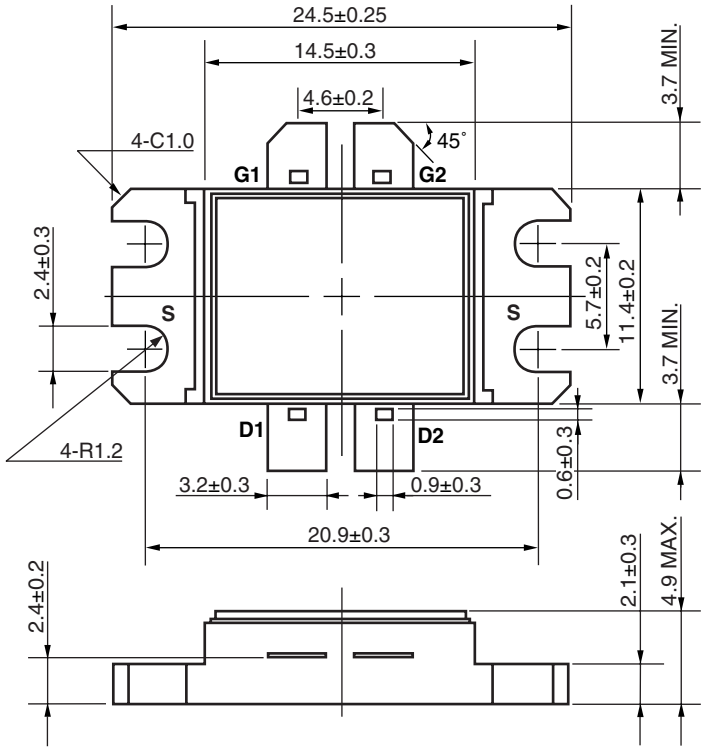
(Side View)



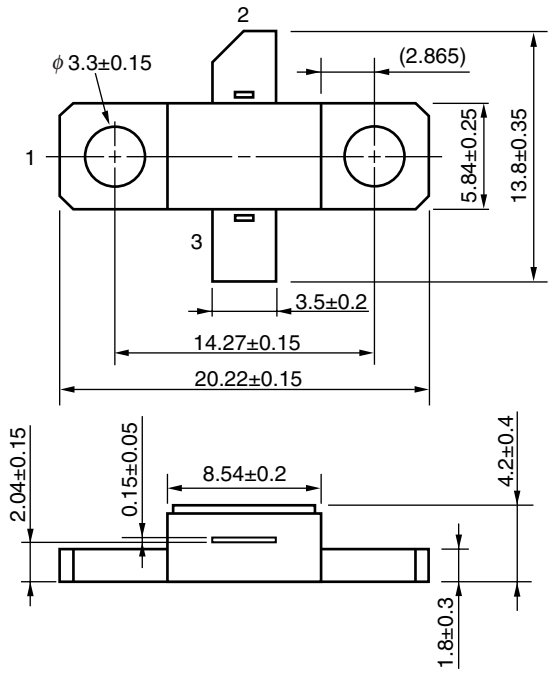
Package Dimensions (44/47)

(Unit : mm)

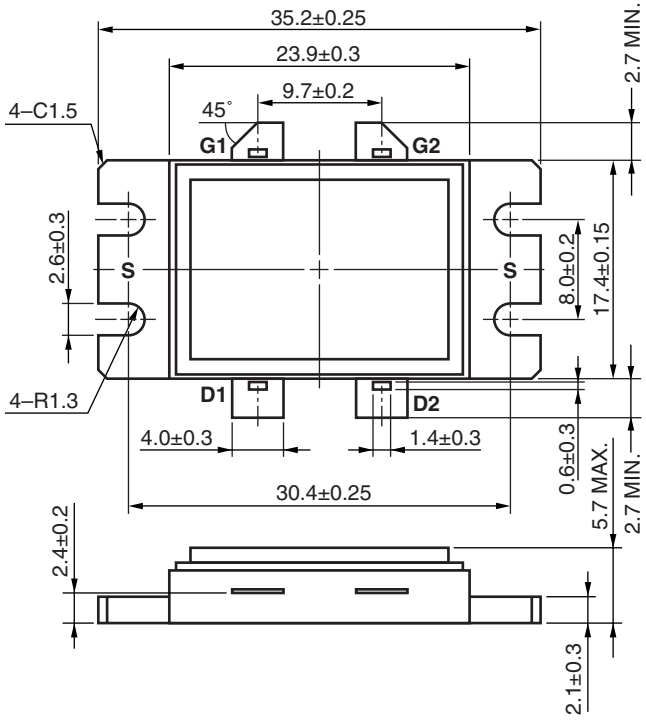
T-86M



T-91M (3M)



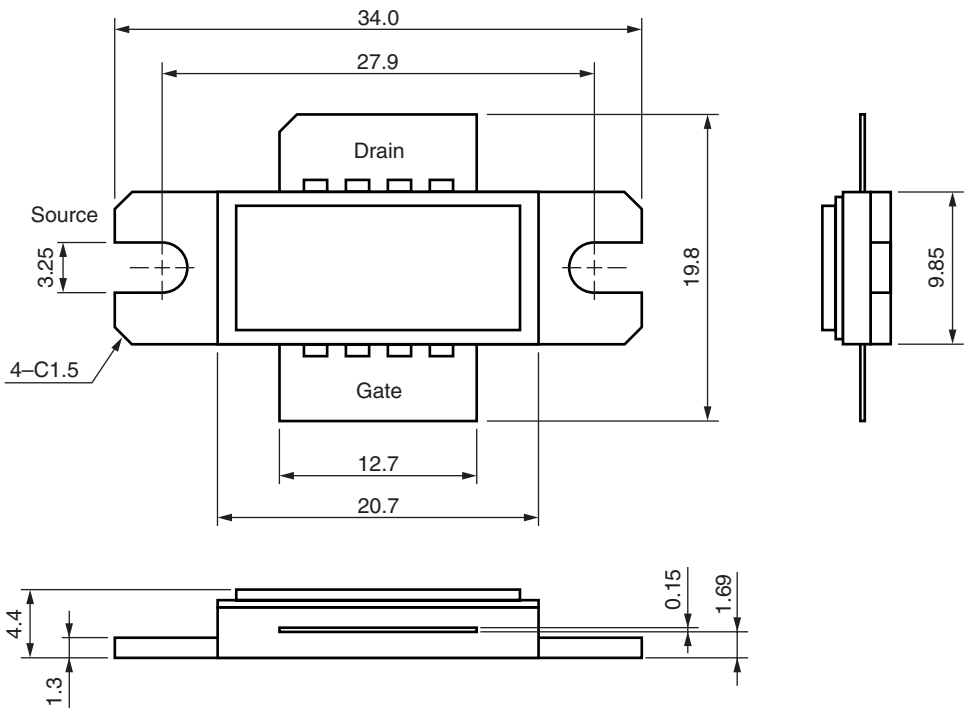
T-92M



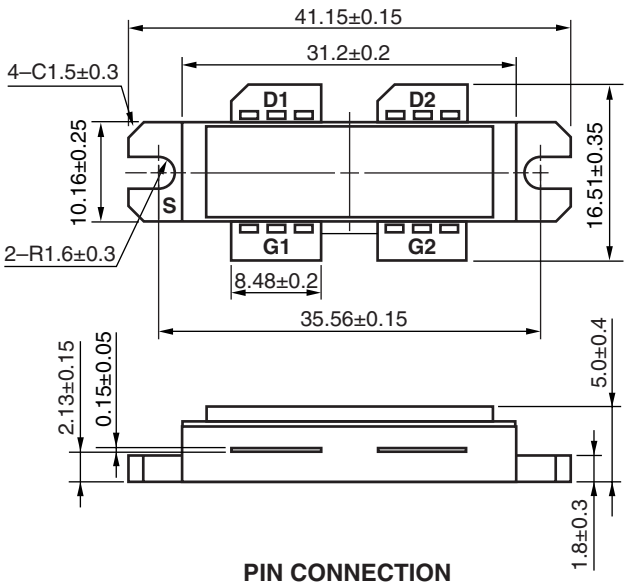
Package Dimensions (45/47)

(Unit : mm)

T-97M (3P)



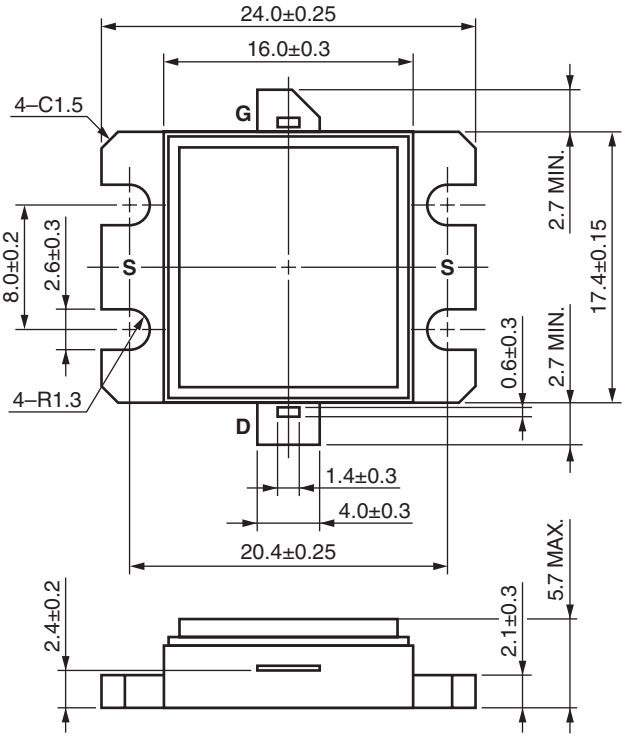
T-101M (3S)



PIN CONNECTION

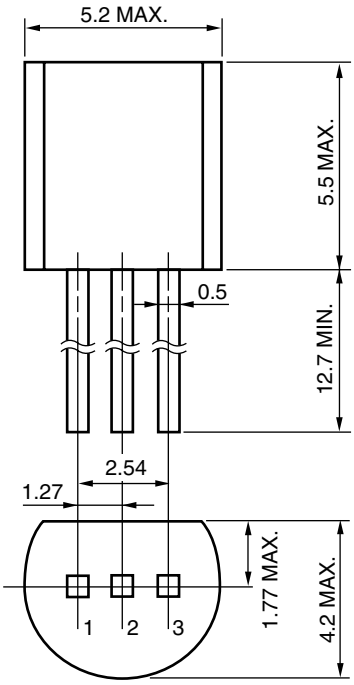
S : Source
D1, D2 : Drain
G1, G2 : Gate

T-142M



Package Dimensions (46/47)

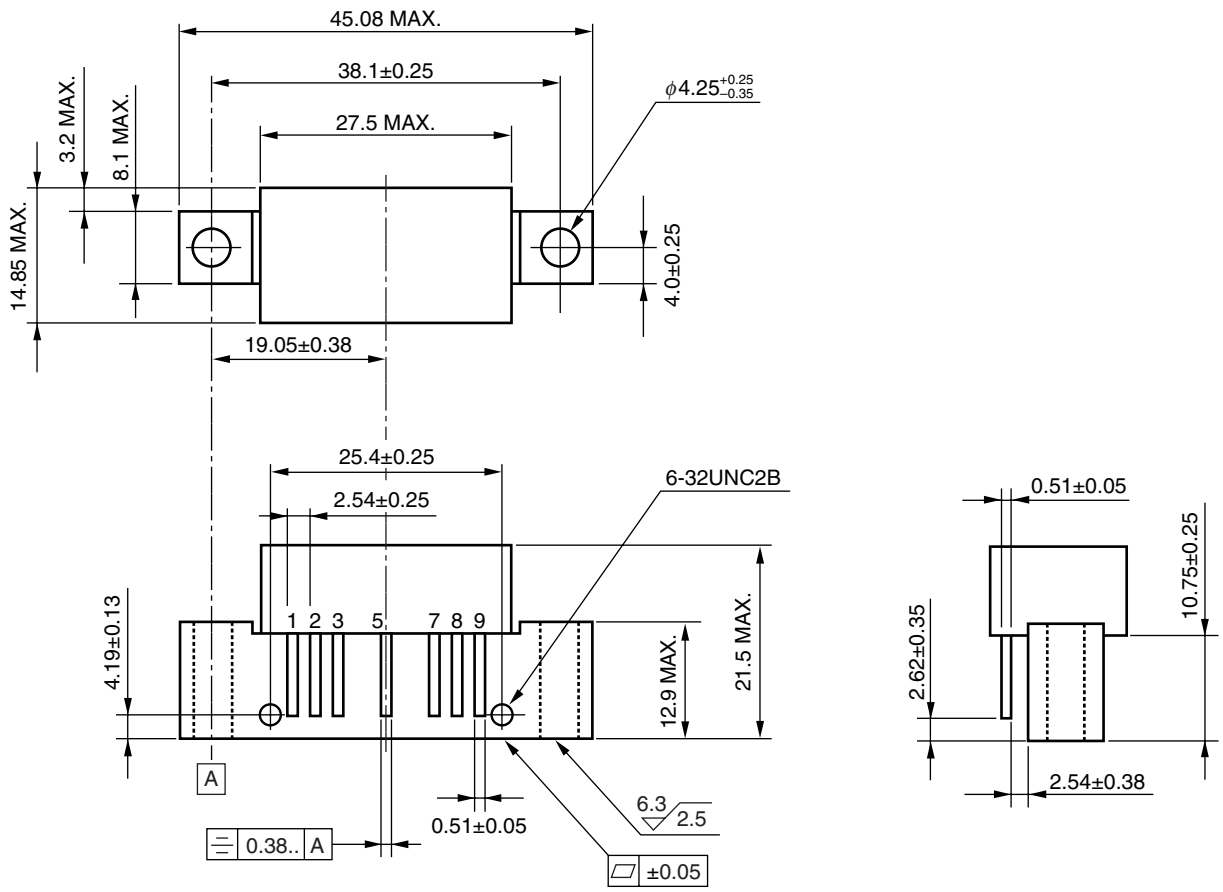
(Unit : mm)

TO-92	
	

Package Dimensions (47/47)

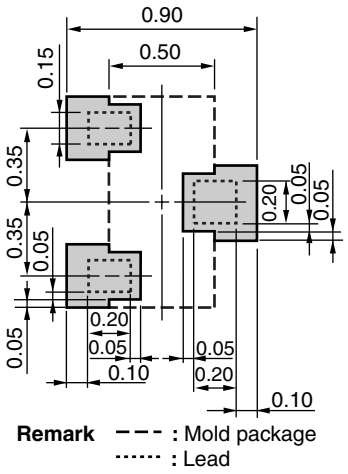
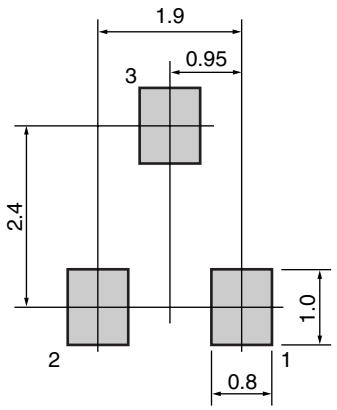
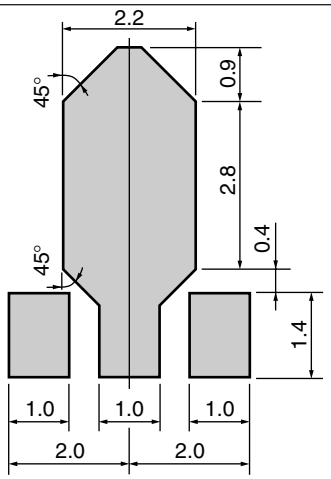
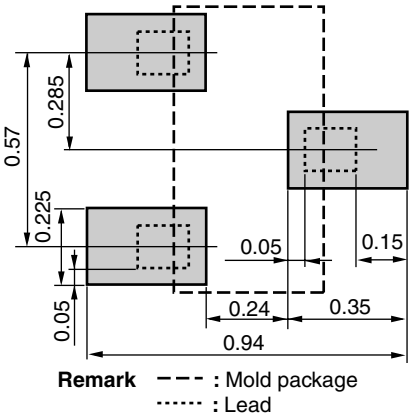
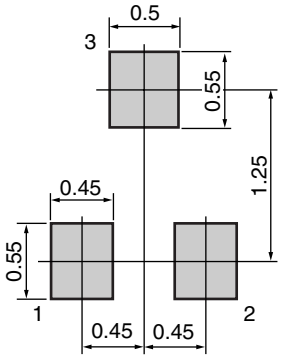
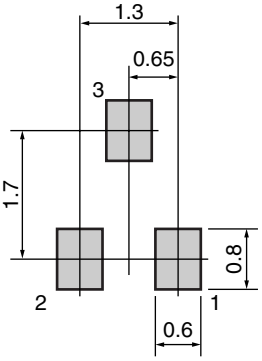
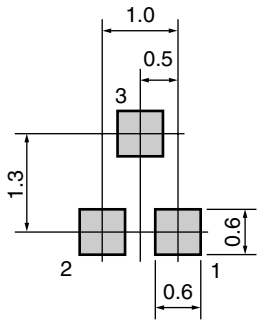
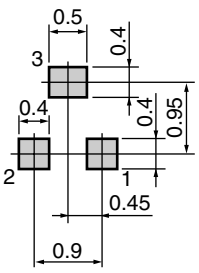
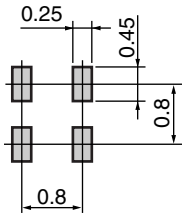
(Unit : mm)

7-Pin Special With Heatsink



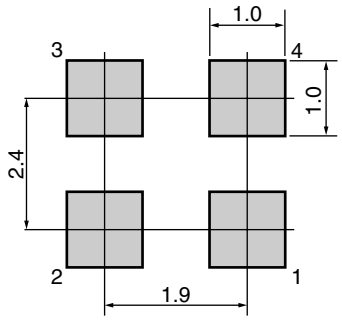
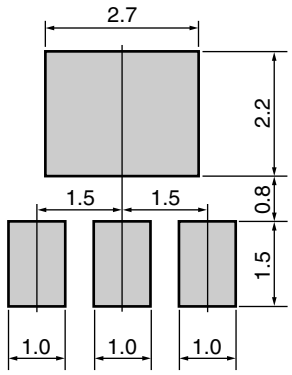
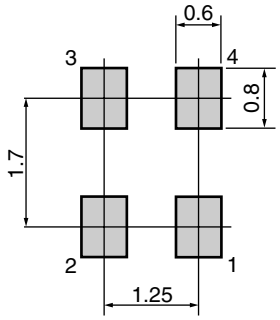
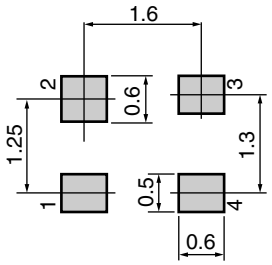
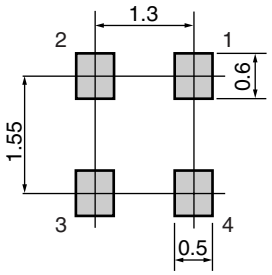
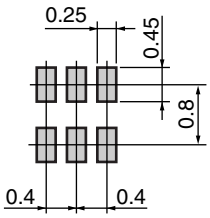
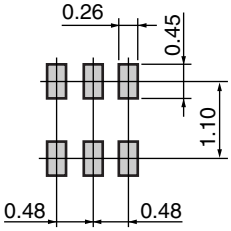
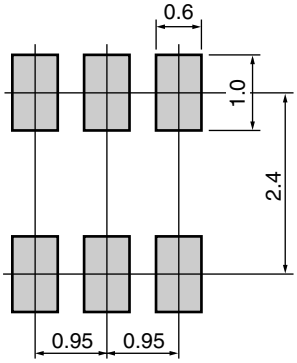
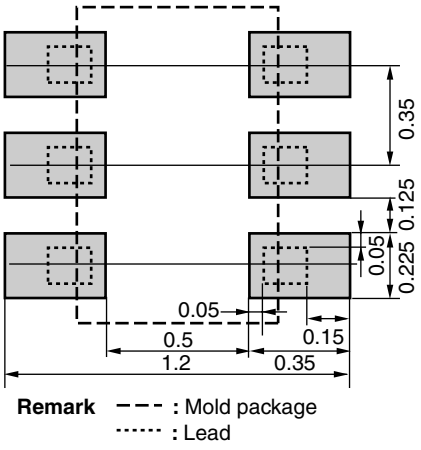
Mounting Pad Layout (1/6)

(Unit : mm)

3-Pin Lead-Less Minimold	3-Pin Minimold (33 PKG)	3-Pin Power Minimold (34 PKG)
		
3-Pin Super Lead-Less Minimold (M33, 0804 PKG)	**3-Pin Thin-Type Lead-Less Minimold (M53, T6J)**	**3-Pin Super Minimold**
		
3-Pin Ultra Super Minimold (19, 1608 PKG)	**Flat-Lead 3-Pin Thin-Type Ultra Super Minimold**	**4-Pin Lead-Less Minimold (M14, 1208 PKG)**
		

Mounting Pad Layout (2/6)

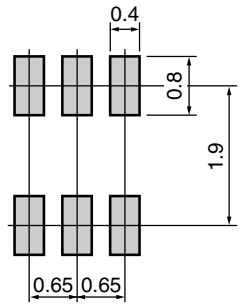
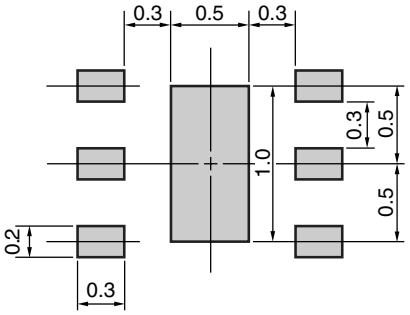
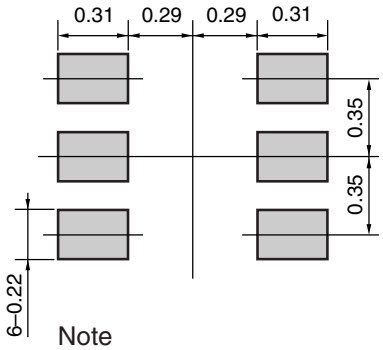
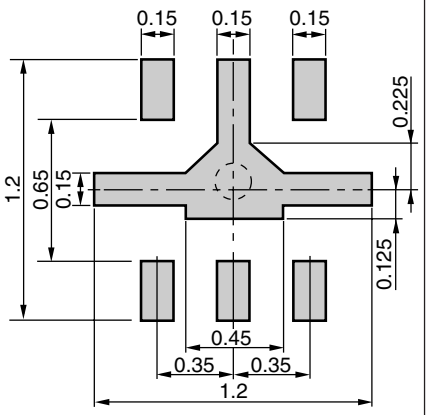
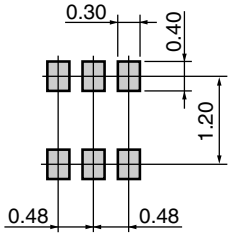
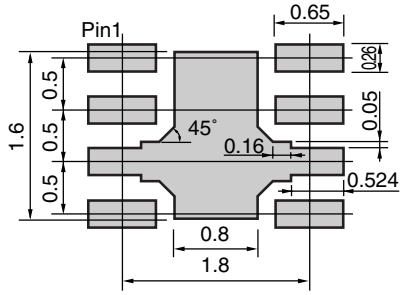
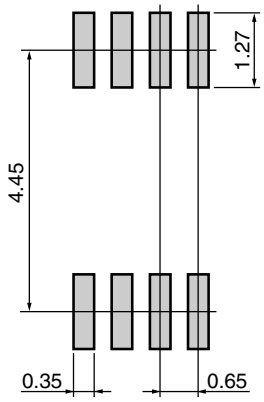
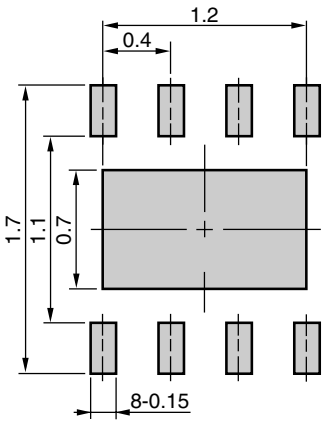
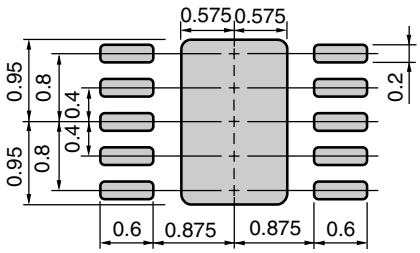
(Unit : mm)

4-Pin Minimold (39)	4-Pin Power Minimold	4-Pin Super Minimold (18)
		
Flat-Lead 4-Pin Thin-Type Super Minimold (M04)	**Flat-Lead 4-Pin Thin-Type Super Minimold (M05, 2012 PKG)**	**6-Pin Lead-Less Minimold (M16, 1208 PKG)**
		
6-Pin Lead-Less Minimold (1511 PKG) for Silicon MMIC/GaAs MMIC	**6-Pin Minimold**	**6-Pin Super Lead-Less Minimold (1007 PKG)**
		

Mounting Pad Layout (3/6)

(Unit : mm)

<R>

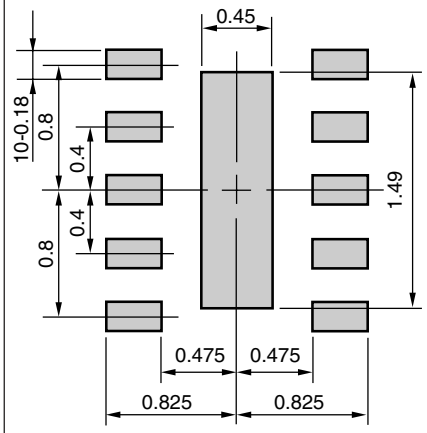
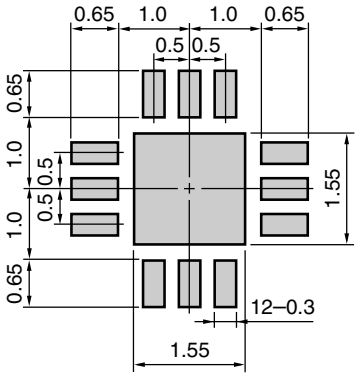
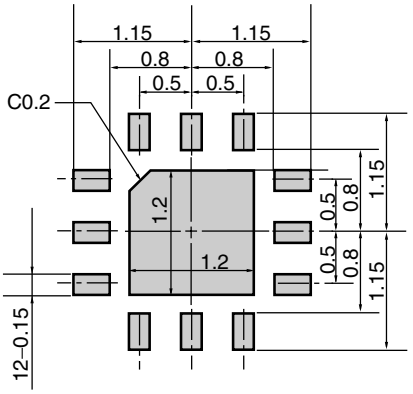
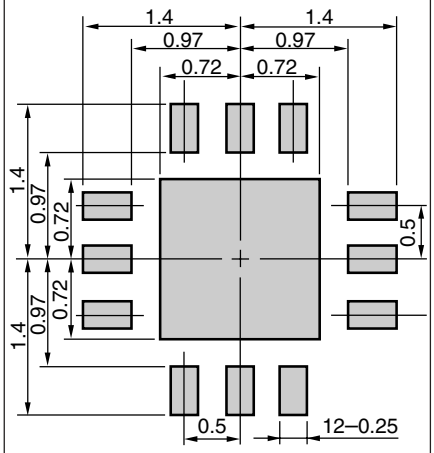
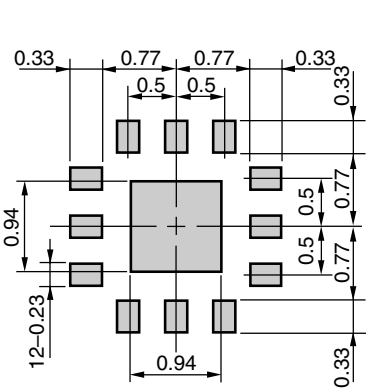
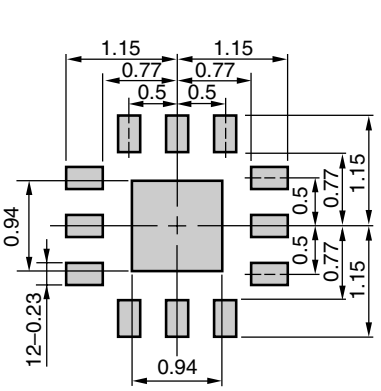
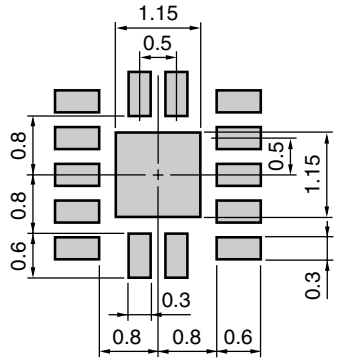
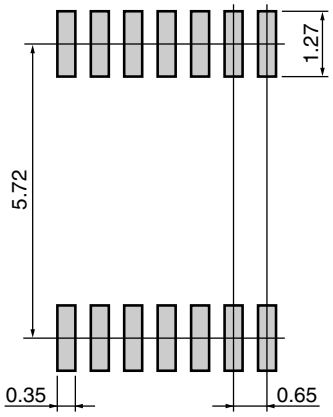
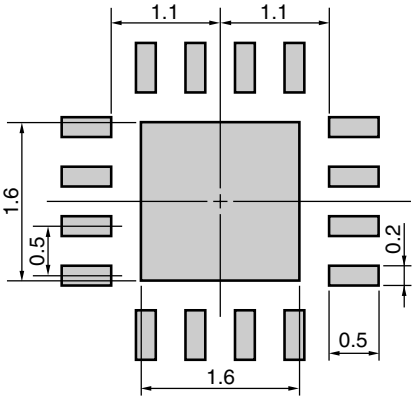
6-Pin Super Minimold (M01, TB)	6-Pin Plastic TSON	6-Pin Plastic TSSON (T5K)
		
6-Pin Plastic TSSON (T6R)	**Flat-Lead 6-Pin Thin-Type Ultra Super Minimold**	**8-Pin Lead-Less Minimold**
		
8-Pin Plastic SSOP (4.45 mm (175))	**8-Pin Plastic TSON**	**10-Pin Plastic TSON**
		

<R> Note: This layout can also be adopted to some of the products in T6R package.
Please refer to the data sheet of each product.

Mounting Pad Layout (4/6)

(Unit : mm)

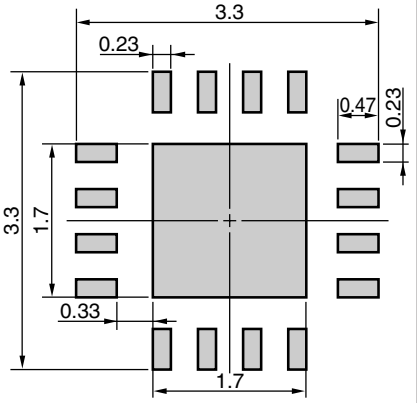
<R>

10-Pin Plastic TSSON	12-Pin Plastic QFN	12-Pin Plastic QFN (T7K)
		
12-Pin Plastic TQFN	**12-Pin Plastic TSQFN (T5L)**	**12-Pin Plastic TSQFN (T6M)**
		
14-pin LGA (CSP Type)	**14-Pin Plastic SSOP (5.72 mm (225))**	**16-Pin Plastic QFN (T5T/T6S)**
		

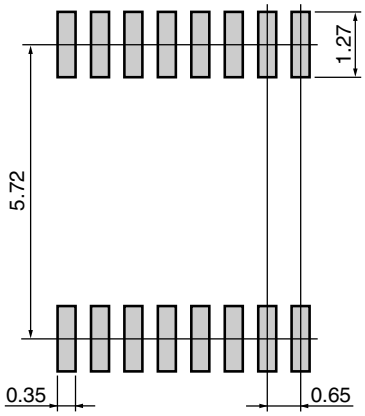
Mounting Pad Layout (5/6)

(Unit : mm)

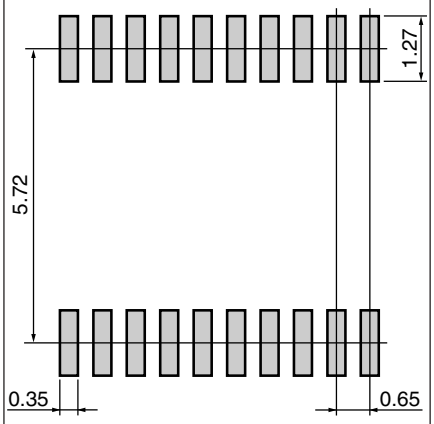
16-Pin Plastic QFN (T6C)



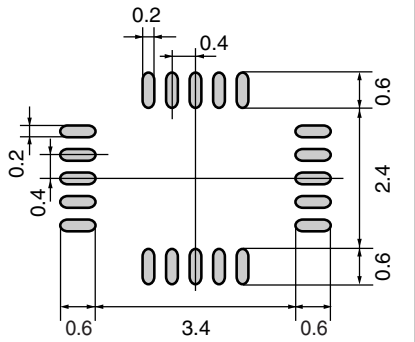
16-Pin Plastic SSOP (5.72 mm (225))



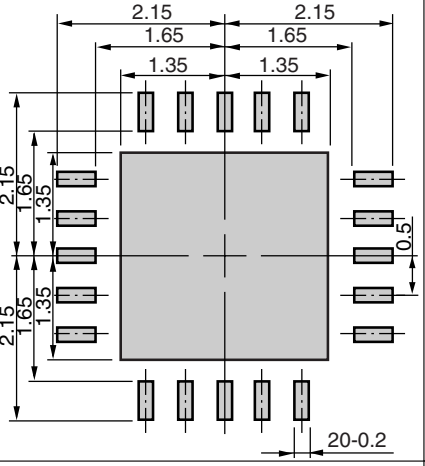
20-Pin Plastic SSOP (5.72 mm (225))



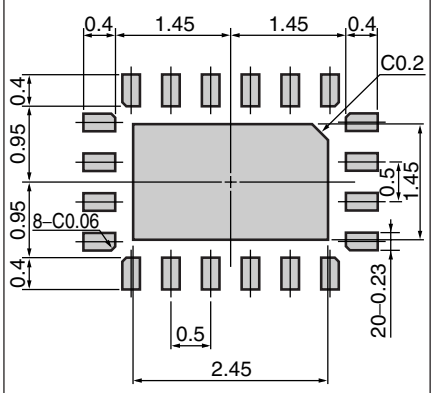
20-Pin Plastic QFN (0.4 mm pitch)



20-Pin Plastic QFN (0.5 mm pitch) (T7G)



20-Pin Plastic RQFN



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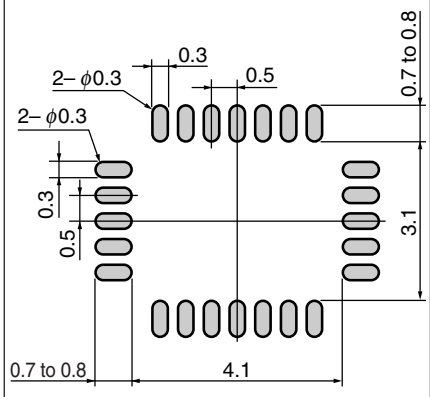
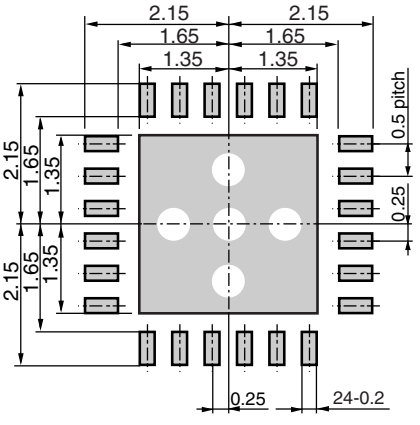
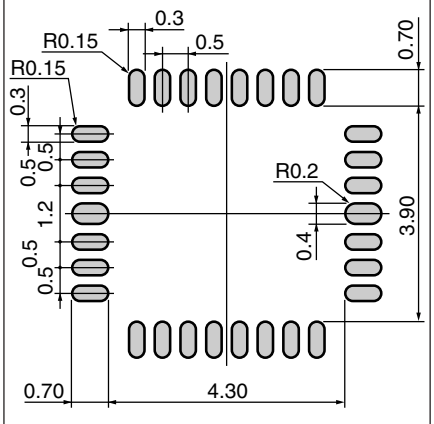
24-Pin Plastic QFN



24-Pin Plastic QFN (T7L)

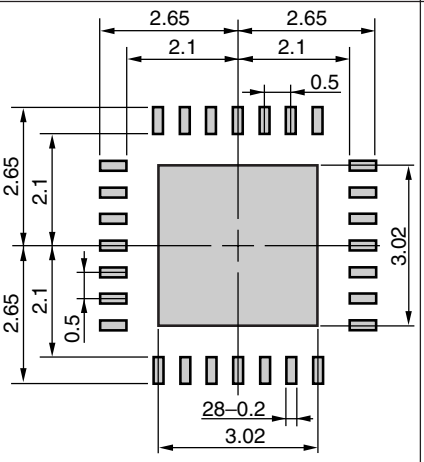
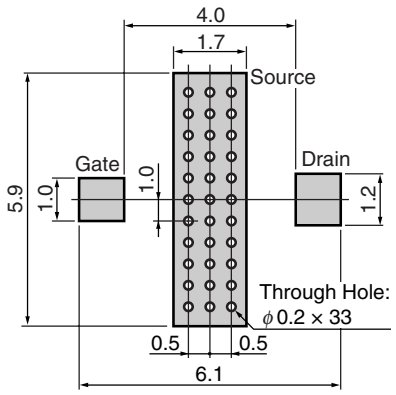
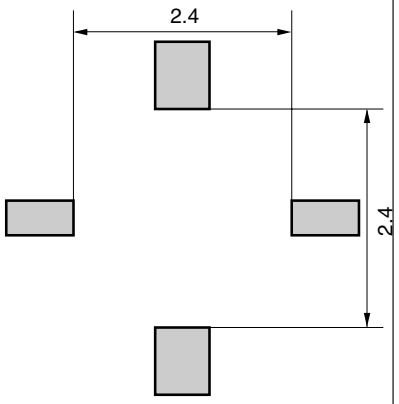


28-Pin Plastic QFN (K)



Mounting Pad Layout (6/6)

(Unit : mm)

28-Pin Plastic QFN (T7A)	79A	S01
	 Stop up the hole with a rosin or something to avoid solder flow.	

REVISION HISTORY	PACKAGES LINE-UP FOR RF AND MICROWAVE DEVICES Common Information

Rev.	Date	Description	
		Page	Summary
1.00	Jul 22, 2010	—	Previous Number:PX10051EJ35V0TN
		p.5	<Surface Mount Type Package Line-up Actual Size Illustrations> Addition of 20-Pin Plastic TQFN (T6E)
		p.6	<List of Surface Mount Type Package Drawings (1/2)> Addition of 6-Pin Plastic RTSON (T7C) Addition of 8-Pin Plastic TSON
		pp.9, 10,12, 13, 16	<Package List> Addition of package code for 3-Pin Thin-Type Lead-Less Minimold (M53, T6J) Addition of 6-Pin Plastic RTSON (T7C) Addition of 8-Pin Plastic TSON Addition of 20-Pin Plastic TQFN
		pp.21, 30, 34	<Package Dimensions> Addition of package code for 3-Pin Thin-Type Lead-Less Minimold (M53, T6J) Addition of 6-Pin Plastic RTSON (T7C) Addition of 8-Pin Plastic TSON
		pp.62, 64	<Mounting Pad Layout> Addition of package code for 3-Pin Thin-Type Lead-Less Minimold (M53, T6J) Addition of 8-Pin Plastic TSON
2.00	Oct 13, 2010	p.5	<Surface Mount Type Package Line-up Actual Size Illustrations> Addition of 6-Pin Plastic RTSON (T7C) Addition of 8-Pin Plastic TSON
		p.7	<List of Surface Mount Type Package Drawings (2/2)> Addition of 28-Pin Plastic QFN (T7A)
		pp.12, 13, 17	<Package List> Addition of the illustration of 6-Pin Plastic RTSON (T7C) Addition of the illustration of 8-Pin Plastic TSON Addition of 28-Pin Plastic QFN (T7A)
		p.53	<Package Dimensions> Addition of 28-Pin Plastic QFN (T7A)
		p.68	<Mounting Pad Layout> Addition of 28-Pin Plastic QFN (T7A)
3.00	Apr 27, 2011	p.6	<Surface Mount Type Package Line-up Actual Size Illustrations> Addition of 20-Pin Plastic QFN (0.5) (T7G) Addition of 28-Pin Plastic QFN (T7A)
		p.8	<List of Surface Mount Type Package Drawings (2/2)> Addition of 20-Pin Plastic QFN (0.5) (T7G)
		pp.17, 18	<Package List> Addition of the illustration of 20-Pin Plastic QFN (0.5) (T7G) Addition of the illustration of 28-Pin Plastic QFN (T7A) Addition of 20-Pin Plastic QFN (0.5) (T7G)
		p.50	<Package Dimensions> Addition of 20-Pin Plastic QFN (0.5) (T7G)
		p.70	<Mounting Pad Layout> Addition of 20-Pin Plastic QFN (0.5) (T7G)

Rev.	Date	Description	
		Page	Summary
4.00	Dec 11, 2012	p.6	<Surface Mount Type Package Line-up Actual Size Illustrations> Addition of 12-Pin Plastic QFN (T7K) Addition of 24-Pin Plastic QFN (T7L)
		p8	<List of Surface Mount Type Package Drawings> Addition of 12-Pin Plastic QFN (T7K) Addition of 24-Pin Plastic QFN (T7L)
		p15	<Surface mount type 12, 14-pin package list> Addition of 12-Pin Plastic QFN (T7K)
		p18	< Surface mount type 24, 28, 30, 32, 36-pin package list> Addition of 24-Pin Plastic QFN (T7L)
		pp.40, 56	<Package List> Addition of 12-Pin Plastic QFN (T7K) Addition of 24-Pin Plastic QFN (T7L)
		P71	< Mounting Pad Layout > The note is added in Mounting Pad Layout of 6-Pin Plastic TSSON (T5K).
		pp.72, 73	< Mounting Pad Layout > Addition of 12-Pin Plastic QFN (T7K) Addition of 24-Pin Plastic QFN (T7L)

PACKAGES LINE-UP FOR RF AND MICROWAVE DEVICES
Common Information

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