

TOSHIBA

Discrete Device Package Lineups

Selection
Guide 2019

An abstract geometric design on the right side of the page. It features a large red triangle pointing downwards, which is partially covered by a textured red area. Below the red triangle is a teal triangle pointing upwards, and below that is a blue triangle pointing upwards. The overall shape formed by these triangles is a large, irregular polygon.

Contents

1. Small Signal Devices 4-17

- Package Lineups
- Dimensional Outline

2. Logic ICs 18-24

- Package Lineups
- Dimensional Outline

3. Power MOSFETs 26-33

- Package Lineups
- Dimensional Outline

4. Power Discrete Devices 34-39

- Package Lineups
- Dimensional Outline

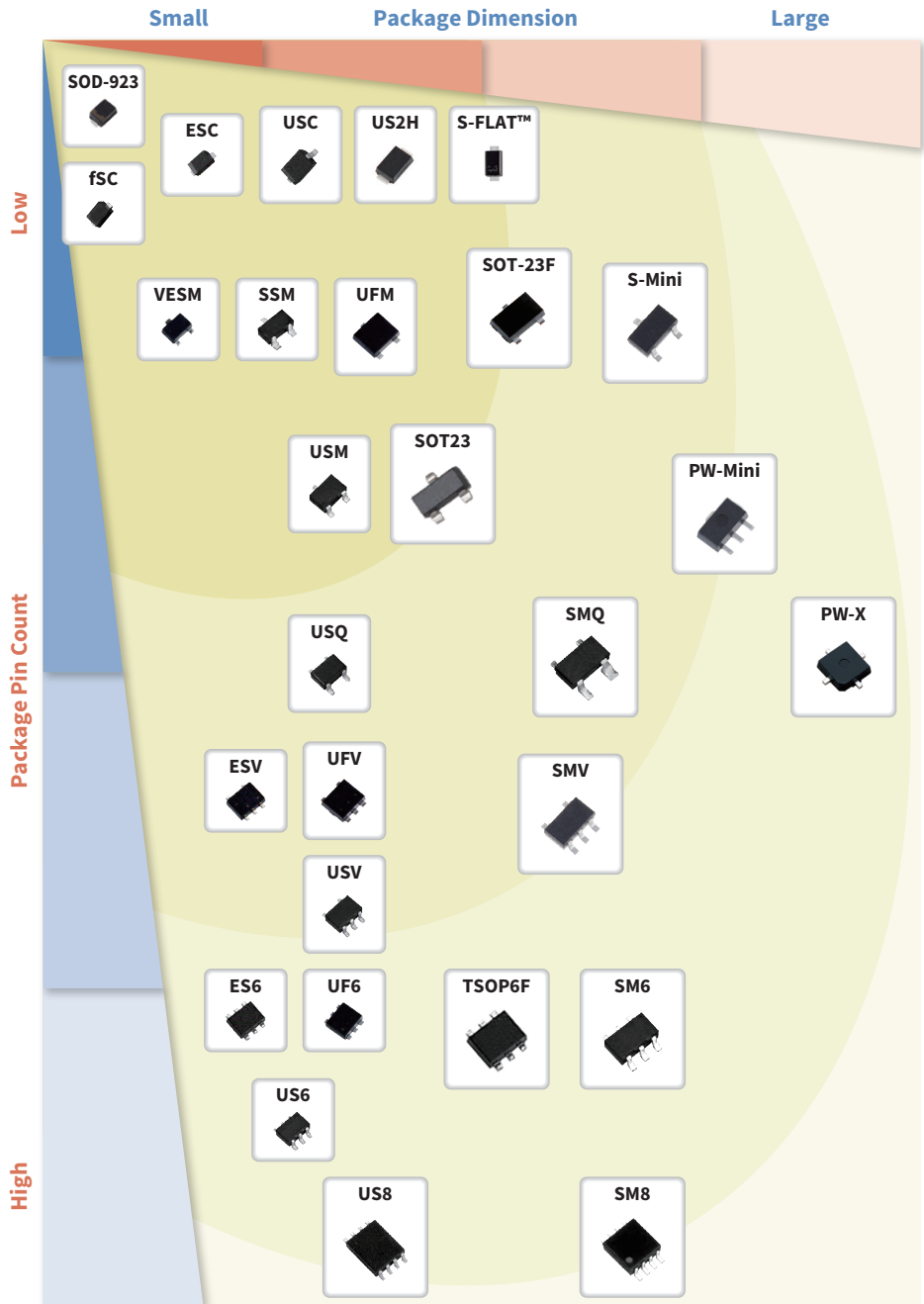
5. Photocouplers , Photorelays 40-51

- Package Lineups
- Dimensional Outline

1. Small Signal Devices

Package Lineups

Surface Mount Type (Lead Type)

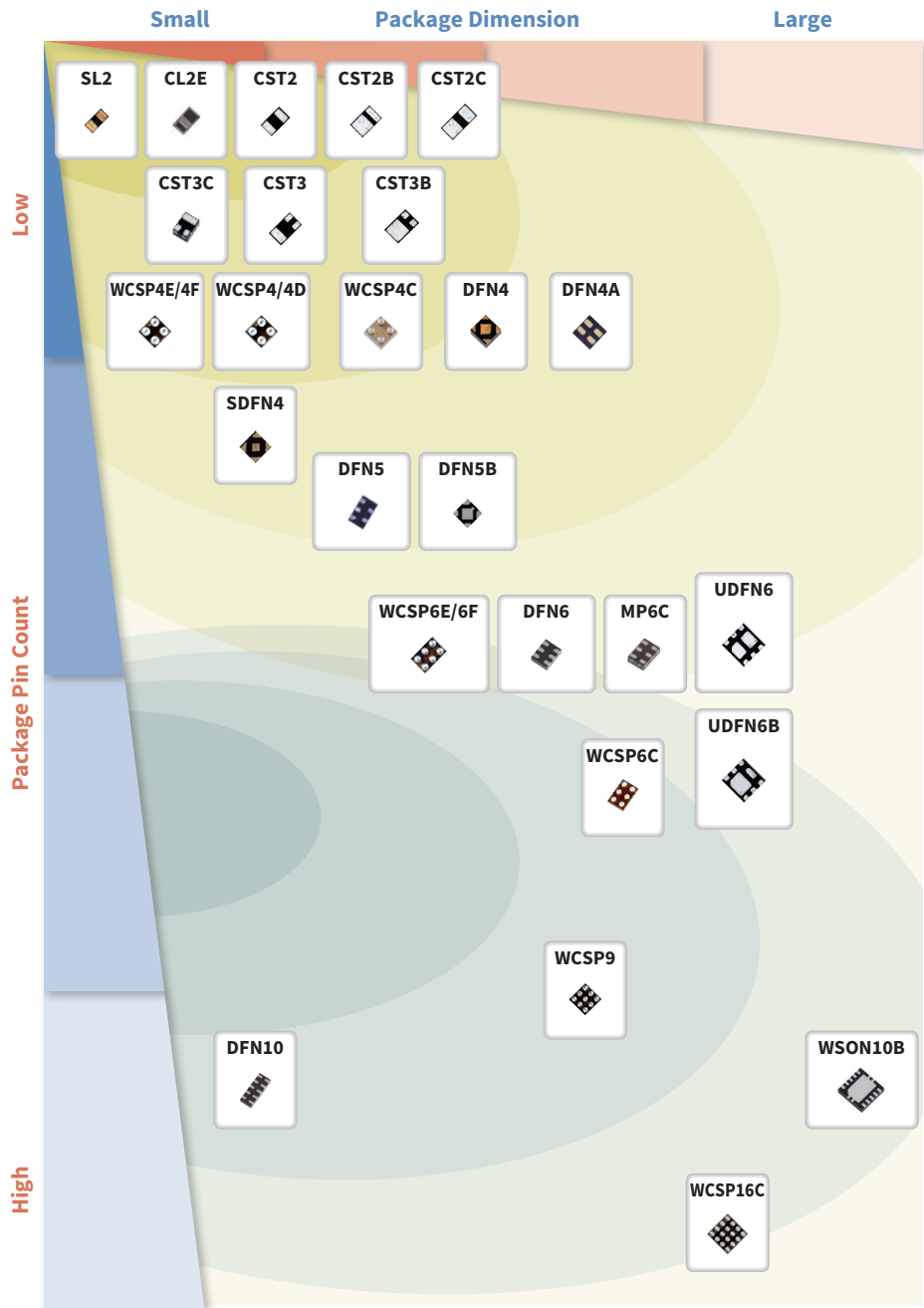


Surface Mount Type (Lead Type)

Package	Pin Count	Dimension W x L (mm)	Products						Page
			MOSFETs	Diodes	LDO Regulators	Linear ICs	Transistors	RF Devices (Radio-Frequency Devices)	
fSC (SOD-923)	2	1.0 x 0.6						✓	8
SOD-923	2	1.0 x 0.6		✓					8
ESC (SOD-523)	2	1.6 x 0.8		✓				✓	8
USC (SOD-323)	2	2.5 x 1.25		✓				✓	8
US2H (SOD-323HE)	2	2.5 x 1.4		✓					8
S-FLAT	2	1.6 x 3.5						✓	8
VESM (SOT-723)	3	1.2 x 1.2	✓	✓			✓	✓	9
SSM (SOT-416)	3	1.6 x 1.6	✓	✓			✓	✓	9
UFM (SOT-323F)	3	2.0 x 2.1	✓				✓	✓	9
USM (SOT-323)	3	2.0 x 2.1	✓	✓			✓	✓	9
SOT23	3	2.9 x 2.4	✓	✓			✓		9
SOT-23F	3	2.9 x 2.4	✓			✓		✓	9
S-Mini (SOT-346)	3	2.9 x 2.5	✓	✓			✓	✓	10
PW-Mini	3	4.6 x 4.2						✓	10
USQ (SOT-343)	4	2.0 x 2.1		✓				✓	10
SMQ (SOT-24)	4	2.9 x 2.9		✓				✓	10
PW-X	4	6.1 x 6.3						✓	10
ESV (SOT-553)	5	1.6 x 1.6	✓	✓	✓		✓		10
UFV (SOT-353F)	5	2.0 x 2.1	✓	✓	✓	✓			11
USV (SOT-353)	5	2.0 x 2.1	✓	✓		✓	✓		11
SMV (SOT-25)	5	2.9 x 2.8		✓	✓	✓	✓		11
ES6 (SOT-563)	6	1.6 x 1.6	✓	✓			✓		11
UF6 (SOT-363F)	6	2.0 x 2.1	✓						11
US6 (SOT-363)	6	2.0 x 2.1	✓	✓			✓		11
SM6 (SOT-26)	6	2.9 x 2.8		✓			✓		12
TSOP6F (SOT-26F)	6	2.9 x 2.8	✓						12
US8 (SOT-765)	8	2.0 x 3.1				✓			12
SM8 (SOT-505)	8	2.9 x 4.0				✓			12

Note
Linear ICs : Load Switch ICs , Power Multiplexer ICs , Operational Amplifier ICs , Comparator ICs , Magnetic Sensors

Surface Mount Type (Leadless Type)



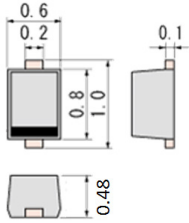
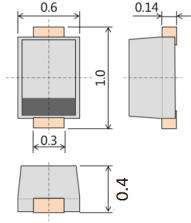
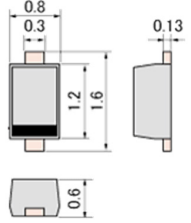
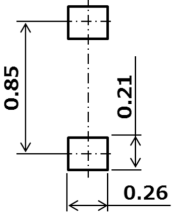
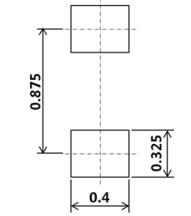
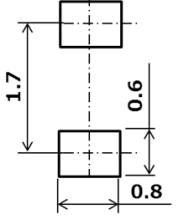
Surface Mount Type (Leadless Type)

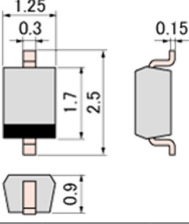
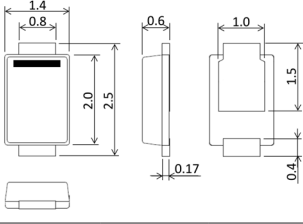
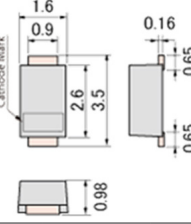
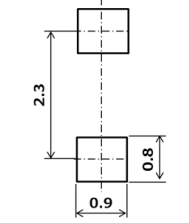
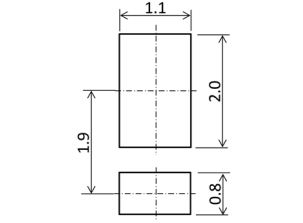
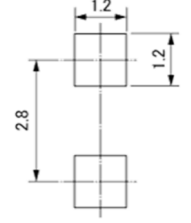
Package	Pin Count	Dimension W x L (mm)	Products						Page
			MOSFETs	Diodes	LDO Regulators	Linear ICs	Transistors	RF Devices (Radio-Frequency Devices)	
SL2 (SOD-962)	2	0.62 x 0.32		✓				✓	13
CL2E	2	1.0 x 0.6		✓					13
CST2 (SOD-882)	2	1.0 x 0.6		✓				✓	13
CST2B	2	1.2 x 0.8		✓					13
CST2C (SOD-963)	2	1.6 x 0.8		✓					13
CST3C	3	0.8 x 0.6	✓						13
CST3 (SOT-883)	3	1.0 x 0.6	✓	✓			✓		14
CST3B	3	1.2 x 0.8	✓						14
WCSP4E	4	0.645 x 0.645			✓				14
WCSP4F	4	0.645 x 0.645			✓				14
WCSP4	4	0.79 x 0.79			✓				14
WCSP4D	4	0.79 x 0.79				✓			14
SDFN4	4	0.8 x 0.8			✓				15
WCSP4C	4	0.9 x 0.9				✓			15
DFN4	4	1.0 x 1.0			✓				15
DFN4A	4	1.2 x 1.2				✓			15
DFN5B	5	1.2 x 1.2			✓				15
DFN5	5	1.3 x 0.8		✓					15
WCSP6E	6	1.2 x 0.8				✓			16
WCSP6F	6	1.2 x 0.8			✓				16
DFN6	6	1.25 x 1.0		✓					16
MP6C	6	1.45 x 1.0				✓			16
WCSP6C	6	1.5 x 1.0	✓			✓			16
UDFN6 (SOT-1118)	6	2.0 x 2.0	✓						16
UDFN6B (SOT-1220)	6	2.0 x 2.0	✓						17
WCSP9	9	1.5 x 1.5				✓			17
DFN10	10	2.5 x 1.0		✓					17
WSON10B	10	3.0 x 3.0				✓			17
WCSP16C	16	1.9 x 1.9				✓			17

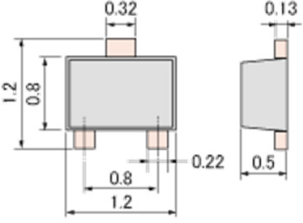
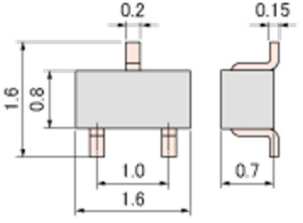
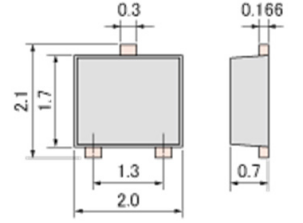
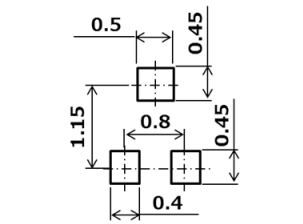
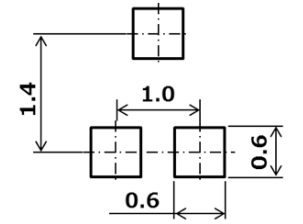
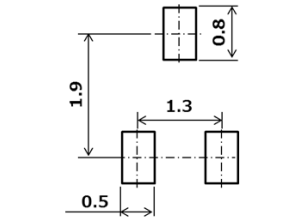
Note
 Linear ICs : Load Switch ICs , Power Multiplexer ICs , eFuse ICs , Operational Amplifier ICs , Comparator ICs , Magnetic Sensors

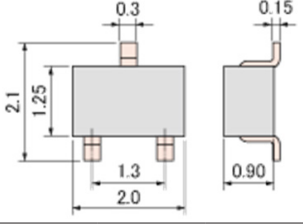
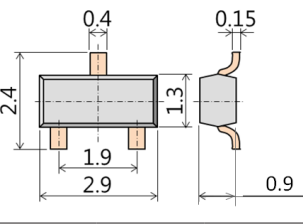
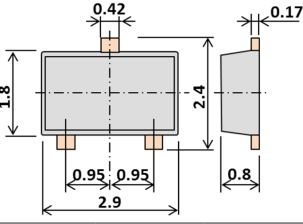
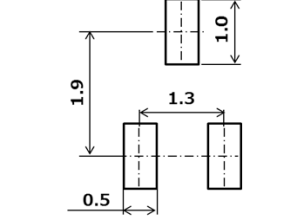
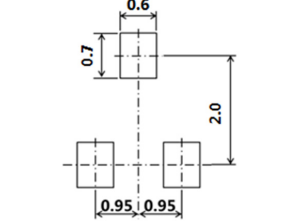
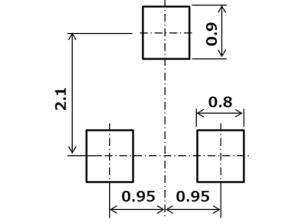
■ Dimensional Outline

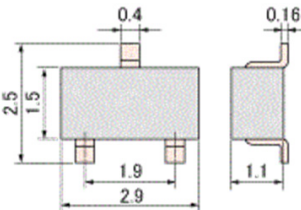
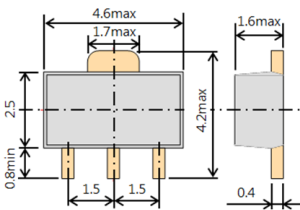
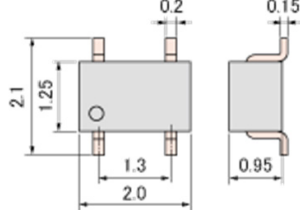
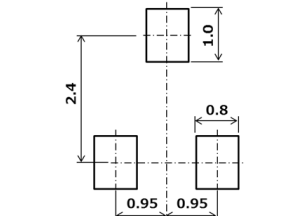
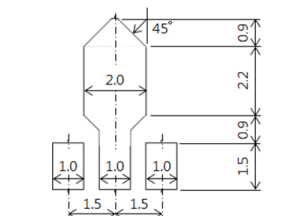
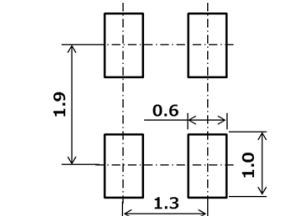
Surface Mount Type (Lead Type)

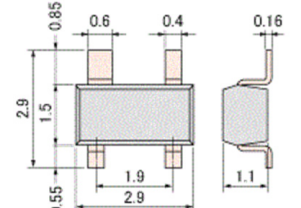
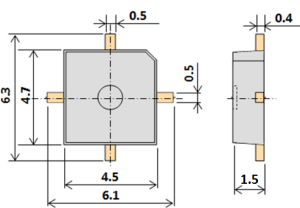
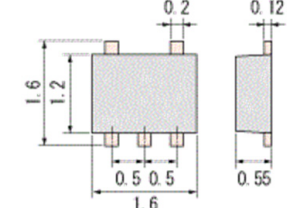
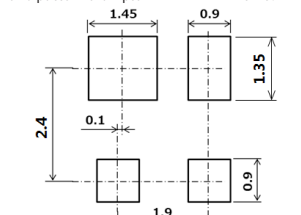
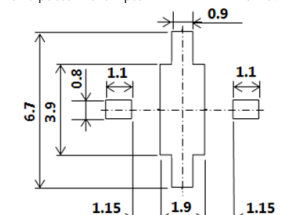
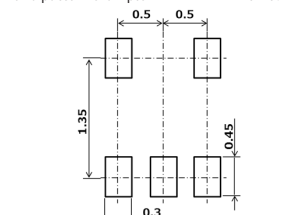
fSC (SOD-923) (1.0x0.6)			SOD-923 (1.0x0.6)			ESC (SOD-523) (1.6x0.8)		
Package dimension unit : mm			Package dimension unit : mm			Package dimension unit : mm		
								
Land pattern example unit : mm			Land pattern example unit : mm			Land pattern example unit : mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
2	0.6 mg	10,000 p/reel	2	0.55 mg	10,000 p/reel	2	1.4 mg	8,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

USC (SOD-323) (2.5x1.25)			US2H (SOD-323HE) (2.5x1.4)			S-FLAT™ (1.6x3.5)		
Package dimension unit : mm			Package dimension unit : mm			Package dimension unit : mm		
								
Land pattern example unit : mm			Land pattern example unit : mm			Land pattern example unit : mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
2	4.5 mg	3,000 p/reel	2	5.4 mg	3,000 p/reel	2	13 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

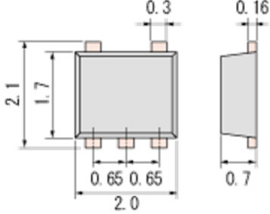
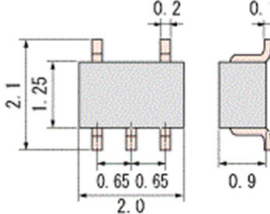
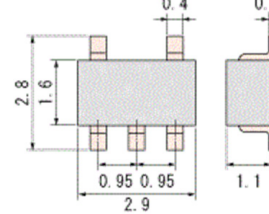
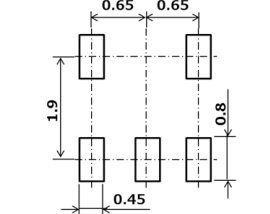
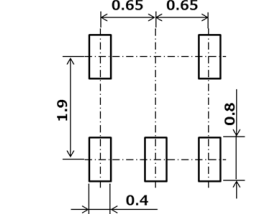
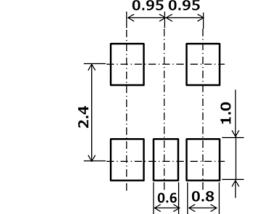
VESM (SOT-723) (1.2x1.2)			SSM (SOT-416) (1.6x1.6)			UFM (SOT-323F) (2.0x2.1)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
3	1.5 mg	8,000 p/reel	3	2.4 mg	3,000 p/reel	3	6.6 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

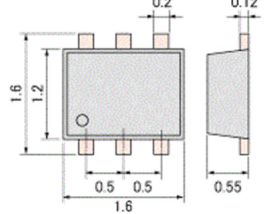
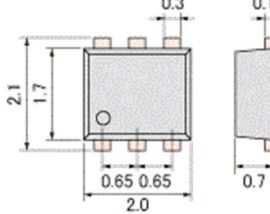
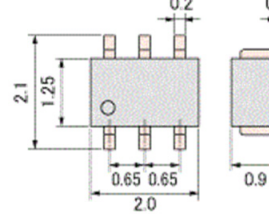
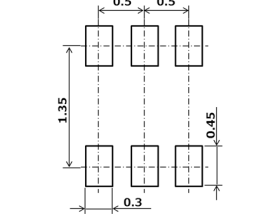
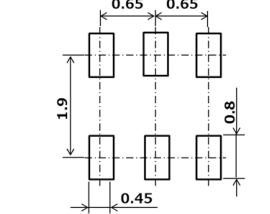
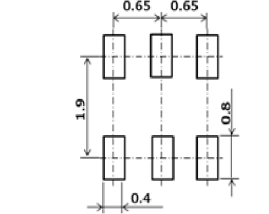
USM (SOT-323) (2.0x2.1)			SOT23 (SOT-23) (2.9x2.4)			SOT-23F (2.9x2.4)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
3	6 mg	3,000 p/reel	3	9 mg	3,000 p/reel	3	11 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

S-Mini (SOT-346) (2.9x2.5)			PW-Mini (4.6x4.2)			USQ (SOT-343) (2.0x2.1)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
3	12 mg	3,000 p/reel	3	50 mg	1,000 p/reel	4	6 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	13 mm	12 mm	180 mmΦ	9 mm	8 mm

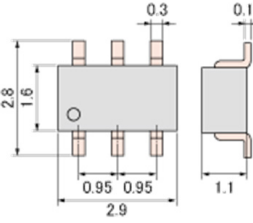
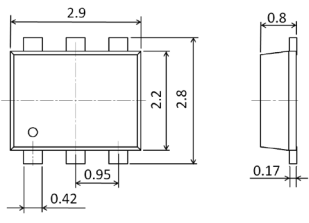
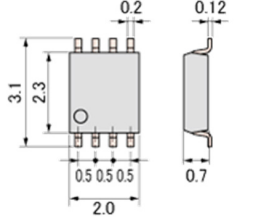
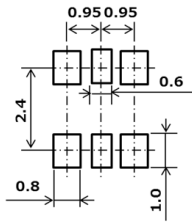
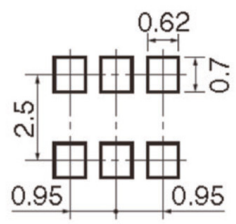
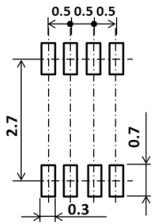
SMQ (SOT-24) (2.9x2.9)			PW-X (6.1x6.3)			ESV (SOT-553) (1.6x1.6)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
4	13 mg	3,000 p/reel	4	80 mg	1,000 p/reel	5	3 mg	- *
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	13 mm	12 mm	180 mmΦ	9 mm	8 mm

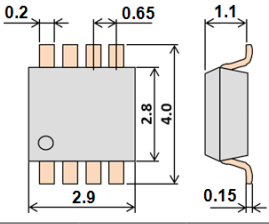
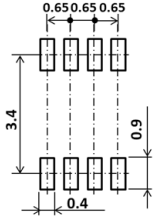
* TPL3 8,000p/reel, TE85L 4,000p/reel

UFV (SOT-353F) (2.0x2.1)			USV (SOT-353) (2.0x2.1)			SMV (SOT-25) (2.9x2.8)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
5	7 mg	3,000 p/reel	5	6 mg	3,000 p/reel	5	14 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

ES6 (SOT-563) (1.6x1.6)			UF6 (SOT-363F) (2.0x2.1)			US6 (SOT-363) (2.0x2.1)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
6	3 mg	- *	6	7 mg	3,000 p/reel	6	6.8 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

* TPL3 8,000p/reel, TE85L 4,000p/reel

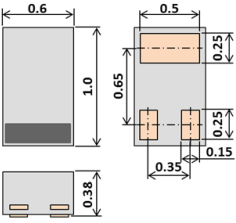
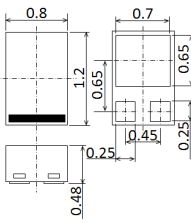
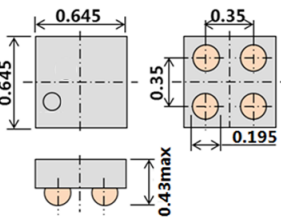
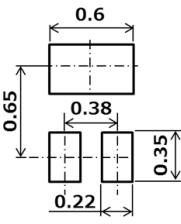
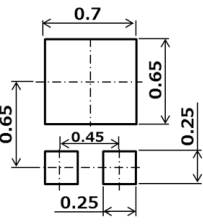
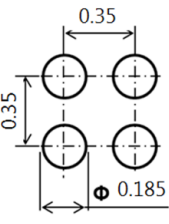
SM6 (SOT-26) (2.9x2.8)			TSOP6F (SOT-26F) (2.9x2.8)			US8 (SOT-765) (2.0x3.1)		
Package dimension 			Package dimension 			Package dimension 		
Land pattern example 			Land pattern example 			Land pattern example 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
6	15 mg	3,000 p/reel	6	16 mg	3,000 p/reel	8	8.8 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

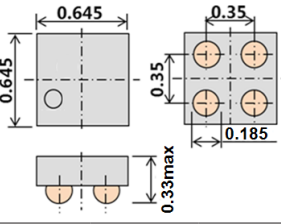
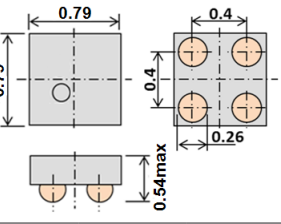
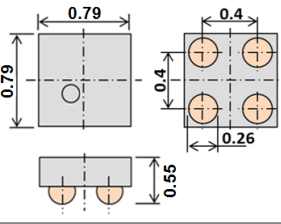
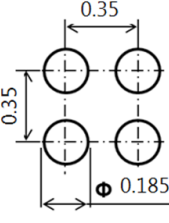
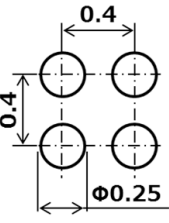
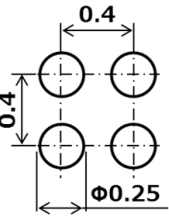
SM8 (SOT-505) (2.9x4.0)		
Package dimension 		
Land pattern example 		
Pin count	Weight	MOQ
8	21 mg	3,000 p/reel
Reel dimension		Tape width
Diameter	Width	
180 mmΦ	13 mm	12 mm

Surface Mount Type (Leadless Type)

SL2 (SOD-962) (0.62x0.32)			CL2E (1.0x0.6)			CST2 (SOD-882) (1.0x0.6)		
Package dimension unit : mm			Package dimension unit : mm			Package dimension unit : mm		
Land pattern example unit : mm			Land pattern example unit : mm			Land pattern example unit : mm		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
2	0.2 mg	10,000 p/reel	2	0.39 mg	10,000 p/reel	2	0.7 mg	10,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

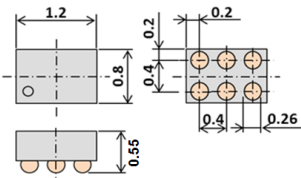
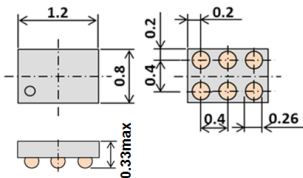
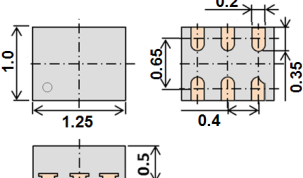
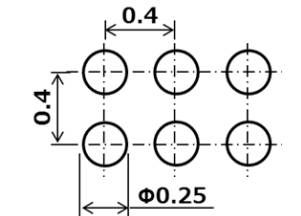
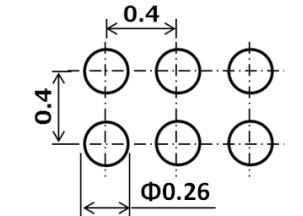
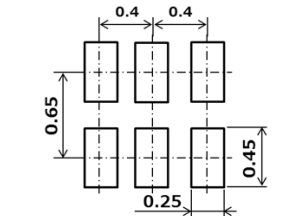
CST2B (1.2x0.8)			CST2C (SOD-963) (1.6x0.8)			CST3C (0.8x0.6)		
Package dimension unit : mm			Package dimension unit : mm			Package dimension unit : mm		
Land pattern example unit : mm			Land pattern example unit : mm			Land pattern example unit : mm		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
2	0.7 mg	10,000 p/reel	2	1.5 mg	10,000 p/reel	3	0.63 mg	10,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

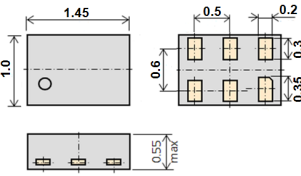
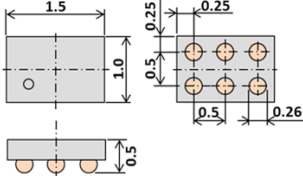
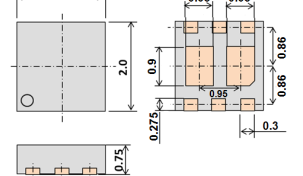
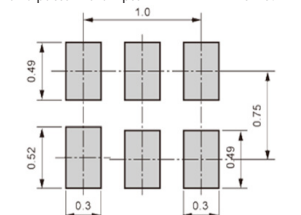
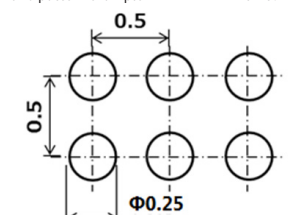
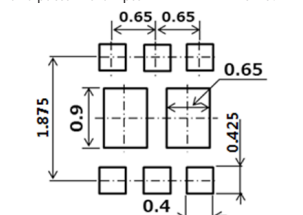
CST3 (SOT-883) (1.0x0.6)			CST3B (1.2x0.8)			WCSP4E (0.645x0.645)		
Package dimension unit: mm			Package dimension unit: mm			Package dimension unit: mm		
								
Land pattern example unit: mm			Land pattern example unit: mm			Land pattern example unit: mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
3	0.75 mg	10,000 p/reel	3	1.5 mg	10,000 p/reel	4	0.34 mg	5,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

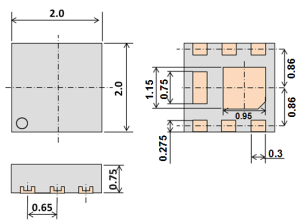
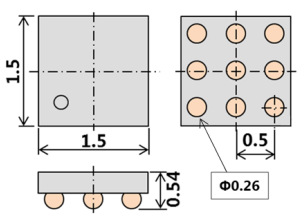
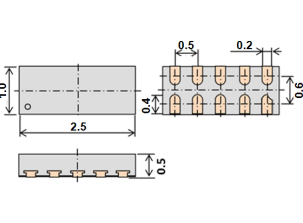
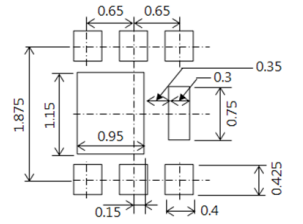
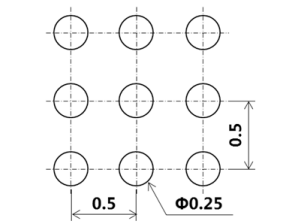
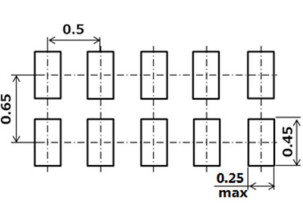
WCSP4F (0.645x0.645)			WCSP4 (0.79x0.79)			WCSP4D (0.79x0.79)		
Package dimension unit: mm			Package dimension unit: mm			Package dimension unit: mm		
								
Land pattern example unit: mm			Land pattern example unit: mm			Land pattern example unit: mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
4	0.26 mg	5,000 p/reel	4	0.7 mg	3,000 p/reel	4	0.79 mg	5,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

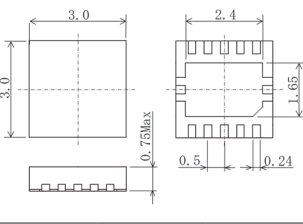
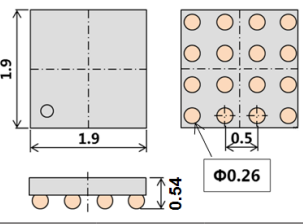
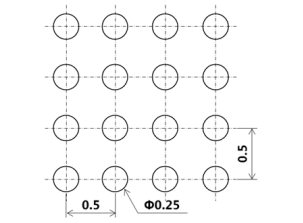
SDFN4 (0.8x0.8)			WCSP4C (0.9x0.9)			DFN4 (1.0x1.0)		
Package dimension unit: mm 			Package dimension unit: mm 			Package dimension unit: mm 		
Land pattern example unit: mm 			Land pattern example unit: mm 			Land pattern example unit: mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
4	0.6 mg	10,000 p/reel	4	0.9 mg	3,000 p/reel	4	1.3 mg	10,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

DFN4A (1.2x1.2)			DFN5B (1.2x1.2)			DFN5 (1.3x0.8)		
Package dimension unit: mm 			Package dimension unit: mm 			Package dimension unit: mm 		
Land pattern example unit: mm 			Land pattern example unit: mm 			Land pattern example unit: mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
4	1.45 mg	5,000 p/reel	5	1.4 mg	5,000 p/reel	5	1 mg	5,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

WCSP6E (1.2x0.8)			WCSP6F (1.2x0.8)			DFN6 (1.25x1.0)		
Package dimension unit: mm			Package dimension unit: mm			Package dimension unit: mm		
								
Land pattern example unit: mm			Land pattern example unit: mm			Land pattern example unit: mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
6	1 mg	5,000 p/reel	6	0.61 mg	5,000 p/reel	6	0.7 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

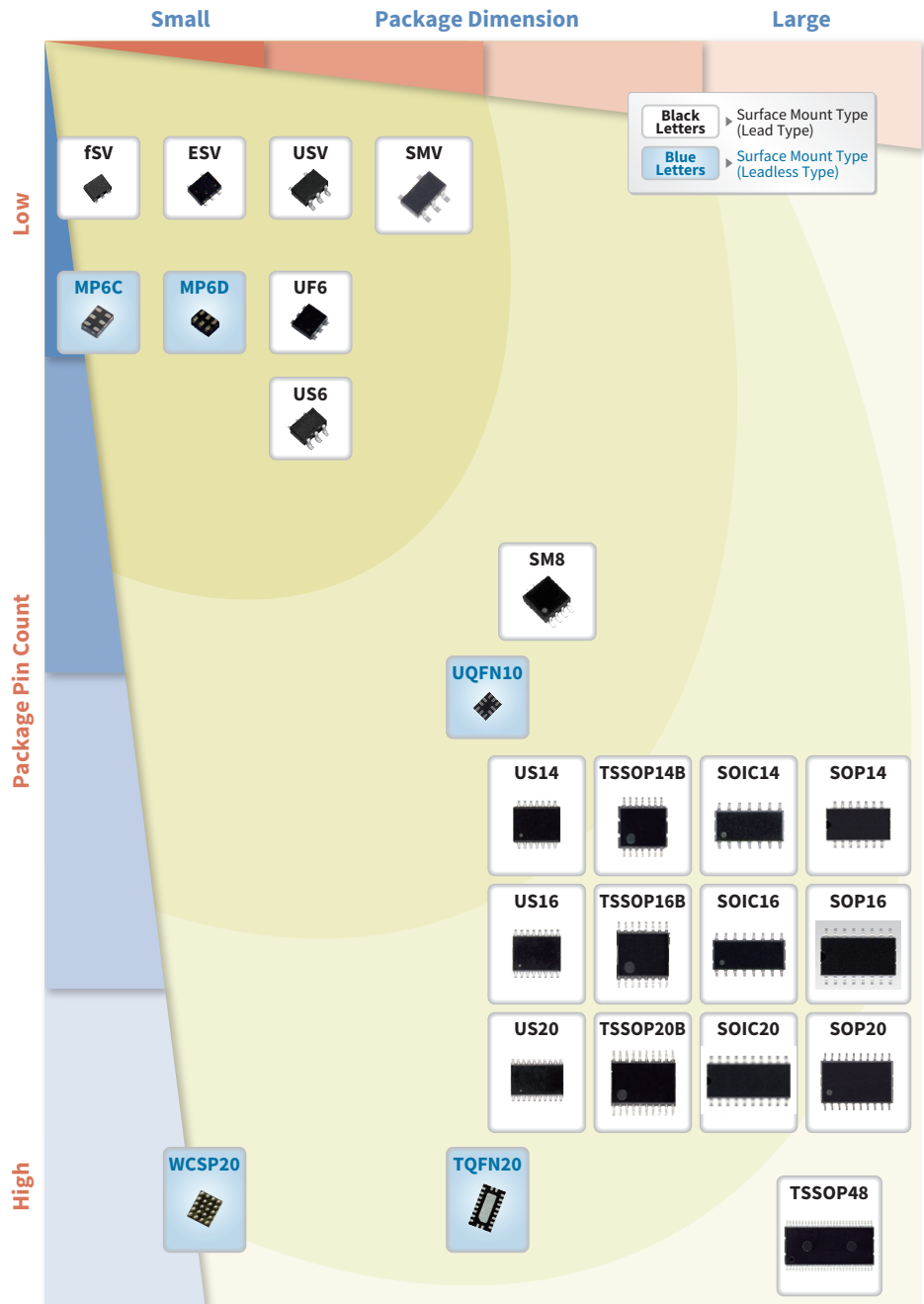
MP6C (1.45x1.0)			WCSP6C (1.5x1.0)			UDFN6 (SOT-1118) (2.0x2.0)		
Package dimension unit: mm			Package dimension unit: mm			Package dimension unit: mm		
								
Land pattern example unit: mm			Land pattern example unit: mm			Land pattern example unit: mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
6	2.4 mg	5,000 p/reel	6	1.4 mg	3,000 p/reel	6	8.5 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

UDFN6B (SOT-1220) (2.0x2.0)			WCSP9 (1.5x1.5)			DFN10 (2.5x1.0)		
Package dimension unit: mm 			Package dimension unit: mm 			Package dimension unit: mm 		
Land pattern example unit: mm 			Land pattern example unit: mm 			Land pattern example unit: mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
6	8.5 mg	3,000 p/reel	9	3.5 mg	5,000 p/reel	10	3.2 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

WSON10B (3.0x3.0)			WCSP16C (1.9x1.9)		
Package dimension unit: mm 			Package dimension unit: mm 		
Land pattern example unit: mm 			Land pattern example unit: mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ
10			16	3.9 mg	5,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width	
			180 mmΦ	9 mm	8 mm

2. Logic ICs

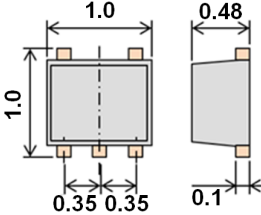
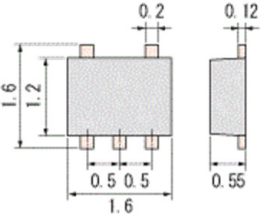
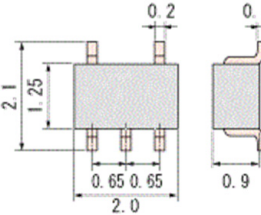
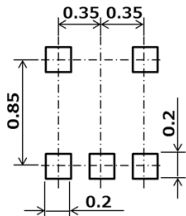
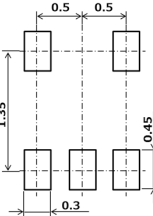
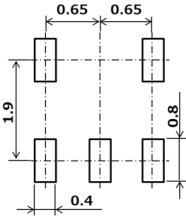
■ Package Lineups



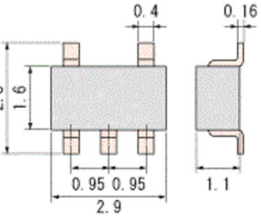
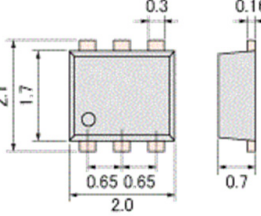
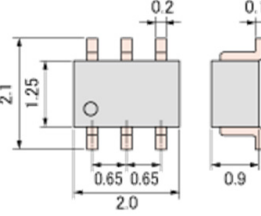
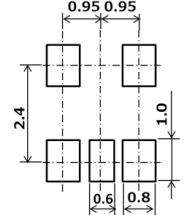
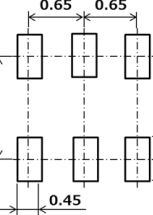
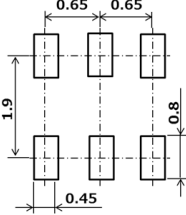
Package		Pin Count	Dimension W x L (mm)	Products				Page
				One-Gate Logic	CMOS Logic ICs	Bus Switches	Dual-Supply Level Shifters	
Surface Mount Type (Lead Type)	fSV (SOT-953)	5	1.0 x 1.0	✓				20
	ESV (SOT-553)	5	1.6 x 1.6	✓				20
	USV (SOT-353)	5	2.0 x 2.1	✓		✓		20
	SMV (SOT-25)	5	2.9 x 2.8	✓				20
	UF6 (SOT-363F)	6	2.0 x 2.1			✓	✓	20
	US6 (SOT-363)	6	2.0 x 2.1	✓		✓		20
	US8 (SOT-765)	8	2.0 x 3.1	✓		✓		21
	SM8 (SOT-505)	8	2.9 x 4.0	✓				21
	US14	14	4.0 x 4.0		✓	✓		21
	TSSOP14B	14	5.0 x 6.4		✓			21
	SOIC14	14	8.65 x 6.0		✓			21
	SOP14	14	10.3 x 7.8		✓			21
	US16	16	4.0 x 4.0		✓	✓	✓	22
	TSSOP16B	16	5.0 x 6.4		✓		✓	22
	SOIC16	16	9.9 x 6.0		✓			22
	SOP16	16	10.3 x 7.8		✓			22
	US20	20	5.0 x 4.0		✓	✓		22
	TSSOP20B	20	6.5 x 6.4		✓			22
	SOP20	20	12.8 x 7.8		✓			23
	SOIC20	20	12.8 x 10.3		✓			23
	TSSOP48	48	12.5 x 8.1		✓		✓	23
Surface Mount Type (Leadless Type)	MP6C	6	1.45 x 1.0				✓	24
	MP6D	6	1.45 x 1.0			✓		24
	UQFN10	10	1.8 X 1.4			✓		24
	TQFN20	20	4.5 x 2.5			✓		24
	WCSP20	20	1.6 x 2.0			✓		24

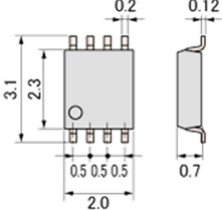
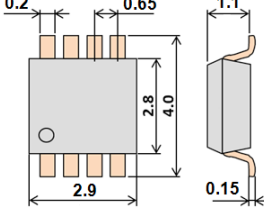
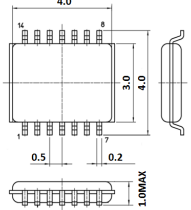
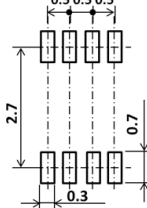
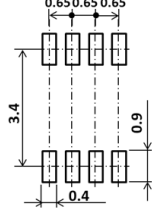
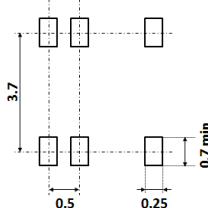
■ Dimensional Outline

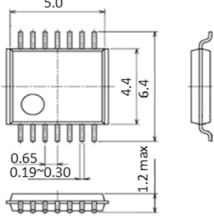
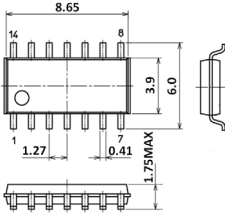
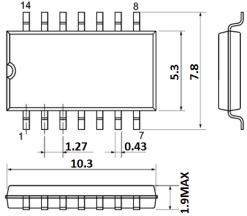
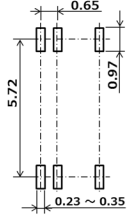
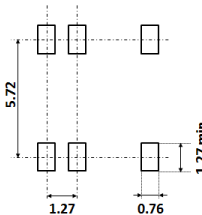
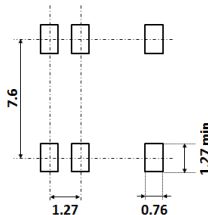
Surface Mount Type (Lead Type)

fSV (SOT-953) (1.0x1.0)			ESV (SOT-553) (1.6x1.6)			USV (SOT-353) (2.0x2.1)		
Package dimension unit: mm			Package dimension unit: mm			Package dimension unit: mm		
								
Land pattern example unit: mm			Land pattern example unit: mm			Land pattern example unit: mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
5	1 mg	10,000 p/reel	5	3 mg	- *	5	6 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

* TPL3 8,000p/reel, TE85L 4,000p/reel

SMV (SOT-25) (2.9x2.8)			UF6 (SOT-363F) (2.0x2.1)			US6 (SOT-363) (2.0x2.1)		
Package dimension unit: mm			Package dimension unit: mm			Package dimension unit: mm		
								
Land pattern example unit: mm			Land pattern example unit: mm			Land pattern example unit: mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
5	14 mg	3,000 p/reel	6	7 mg	3,000 p/reel	6	6.8 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

US8 (SOT-765) (2.0x3.1)			SM8 (SOT-505) (2.9x4.0)			US14 (4.0x4.0)		
Package dimension unit : mm 			Package dimension unit : mm 			Package dimension unit : mm 		
Land pattern example unit : mm 			Land pattern example unit : mm 			Land pattern example unit : mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
8	8.8 mg	3,000 p/reel	8	21 mg	3,000 p/reel	14	20 mg	2,500 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	13 mm	12 mm	254 mmΦ	13 mm	12 mm

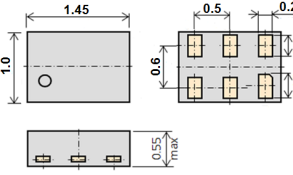
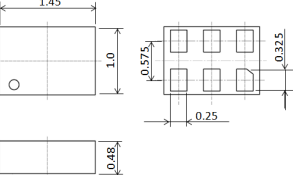
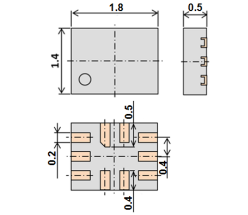
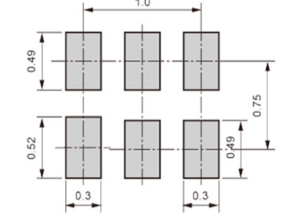
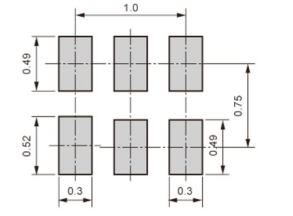
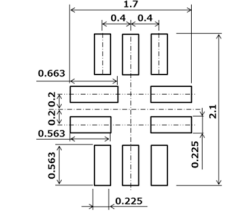
TSSOP14B (5.0x6.4)			SOIC14 (8.65x6.0)			SOP14 (10.3x7.8)		
Package dimension unit : mm 			Package dimension unit : mm 			Package dimension unit : mm 		
Land pattern example unit : mm 			Land pattern example unit : mm 			Land pattern example unit : mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
14	54 mg	2,500 p/reel	14	130 mg	2,500 p/reel	14	180 mg	2,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	12.4 mm	12 mm	330 mmΦ	17.4 mm	16 mm	330 mmΦ	17.5 mm	16 mm

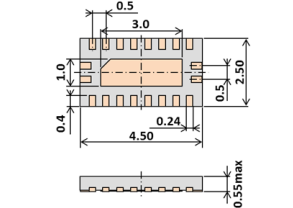
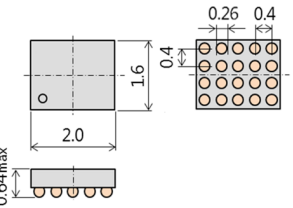
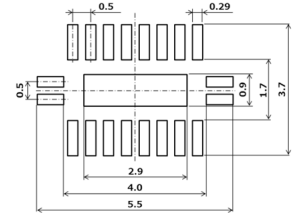
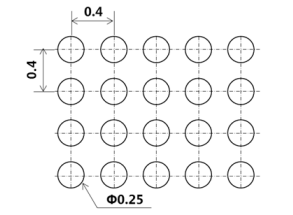
US16 (4.0x4.0)			TSSOP16B (5.0x6.4)			SOIC16 (9.9x6.0)		
Package dimension unit : mm 			Package dimension unit : mm 			Package dimension unit : mm 		
Land pattern example unit : mm 			Land pattern example unit : mm 			Land pattern example unit : mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
16	20 mg	2,500 p/reel	16	55 mg	2,500 p/reel	16	150 mg	2,500 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
254 mmΦ	12 mm	12 mm	330 mmΦ	12.4 mm	12 mm	330 mmΦ	17.4 mm	16 mm

SOP16 (10.3x7.8)			US20 (5.0x4.0)			TSSOP20B (6.5x6.4)		
Package dimension unit : mm 			Package dimension unit : mm 			Package dimension unit : mm 		
Land pattern example unit : mm 			Land pattern example unit : mm 			Land pattern example unit : mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
16	180 mg	2,000 p/reel	20	30 mg	2,500 p/reel	20	71 mg	2,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	17.5 mm	16 mm	254 mmΦ	13 mm	12 mm	330 mmΦ	17.5 mm	16 mm

SOIC20 (12.8x10.3)			SOP20 (12.8x7.8)			TSSOP48 (12.5x8.1)		
Package dimension unit : mm 			Package dimension unit : mm 			Package dimension unit : mm 		
Land pattern example unit : mm 			Land pattern example unit : mm 			Land pattern example unit : mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
20	510 mg	2,000 p/reel	20	220 mg	2,000 p/reel	48	250 mg	1,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	25.4 mm	24 mm	330 mmΦ	25.5 mm	24 mm	330 mmΦ	25.5 mm	24 mm

Surface Mount Type (Leadless Type)

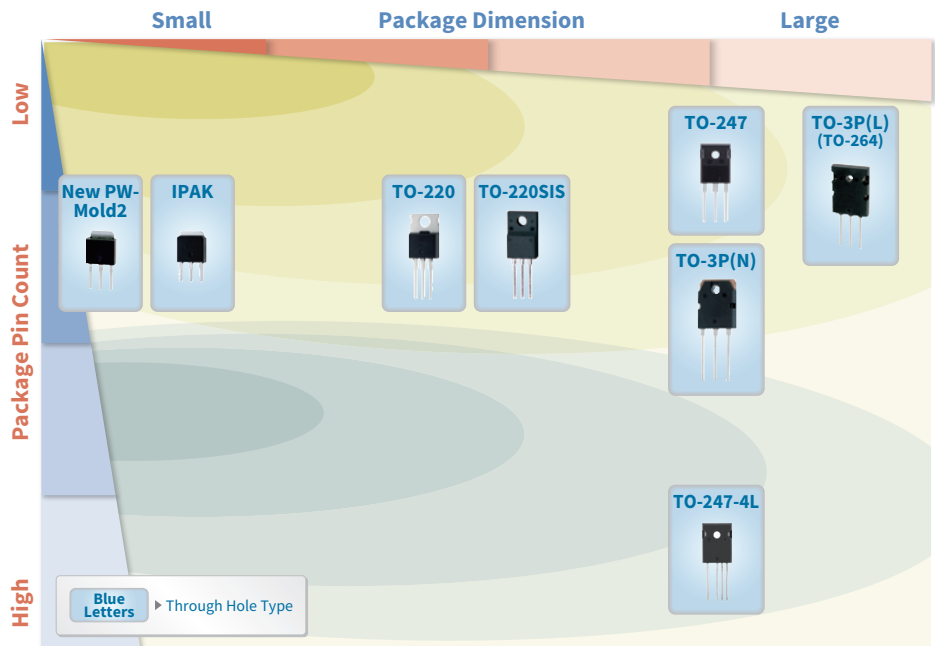
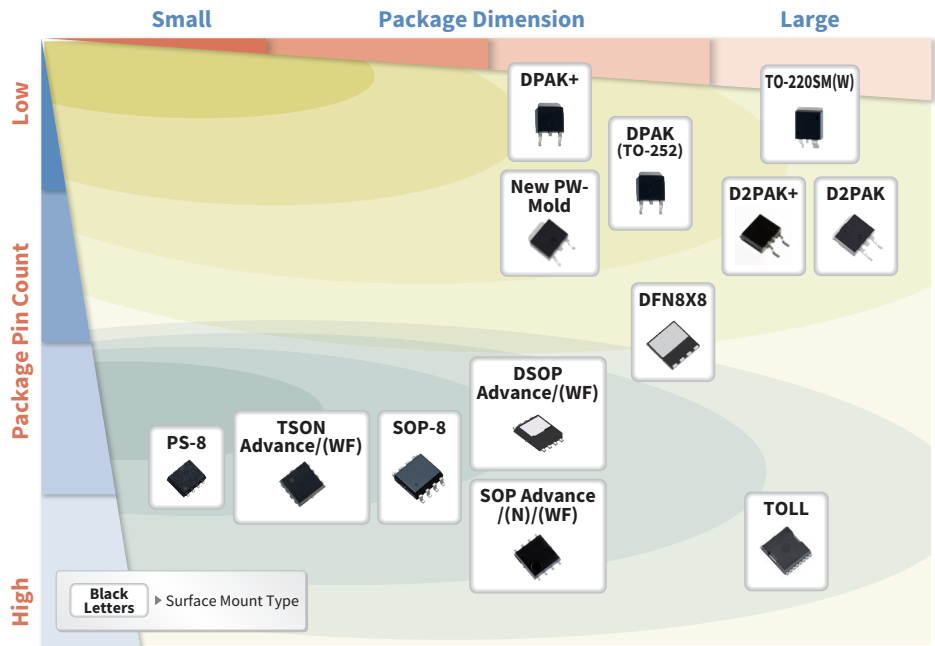
MP6C (1.45x1.0)			MP6D (1.45x1.0)			UQFN10 (1.8x1.4)		
Package dimension unit : mm			Package dimension unit : mm			Package dimension unit : mm		
								
Land pattern example unit : mm			Land pattern example unit : mm			Land pattern example unit : mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
6	2.4 mg	5,000 p/reel	6	2.4 mg	10,000 p/reel	10	3.5 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	179 mmΦ	8.4 mm	8 mm

TQFN20 (4.5x2.5)			WCSP20 (1.6x2.0)		
Package dimension unit : mm			Package dimension unit : mm		
					
Land pattern example unit : mm			Land pattern example unit : mm		
					
Pin count	Weight	MOQ	Pin count	Weight	MOQ
20	17 mg	- *	20	5 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width	
179 mmΦ	13 mm	12 mm	180 mmΦ	9 mm	8 mm

* 3,000 or 5,000pcs/reel

3. Power MOSFETs

■ Package Lineups



Package		Pin Count	Dimension W x L (mm)	Page
Surface Mount Type	DPAK+	3	6.5 x 9.5	28
	New PW-Mold	3	6.5 x 9.5	28
	DPAK	3	6.6 x 10.0	28
	TO-220SM(W)	3	10.0 x 13.0	28
	D2PAK+	3	10.0 x 15.0	28
	D2PAK	3	10.35 x 15.3	29
	DFN8x8	5	8.0 x 8.0	29
	PS-8	8	2.9 x 2.8	29
	TSOP Advance	8	3.1 x 3.3	29
	SOP-8	8	4.9 x 6.0	29
	DSOP Advance	8	5.0 x 6.0	30
	SOP Advance	8	5.0 x 6.0	30
	SOP Advance(N)	8	4.9 x 6.1	30
	TOLL	9	9.9 x 11.68	30
	Wettable Flank Lead	TSOP Advance (WF)	3.1 x 3.6	31
		DSOP Advance (WF)L	5.0 x 6.0	31
		DSOP Advance (WF)M	5.0 x 6.0	31
		SOP Advance (WF)	5.0 x 6.0	31
Through Hole Type	New PW-Mold2	3	6.5 x 5.5	32
	IPAK	3	6.65 x 6.1	32
	TO-220	3	10.16 x 8.59	32
	TO-220SIS	3	10.0 x 15.0	32
	TO-3P(N)	3	15.5 x 20.0	32
	TO-247	3	15.94 x 20.95	32
	TO-3P(L)	3	20.0 x 26.0	33
	TO-247-4L	4	15.94 x 20.95	33

■ Dimensional Outline

Surface Mount Type

DPAK+ (6.5x9.5)			New PW-Mold (6.5x9.5)			DPAK 2-7K1S (TO-252) (6.6x10.0)		
Package dimension unit: mm			Package dimension unit: mm			Package dimension unit: mm		
Land pattern example unit: mm			Land pattern example unit: mm			Land pattern example unit: mm		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
3	360 mg	2,000 p/reel	3	360 mg	2,000 p/reel	3	360 mg	2,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	17.5 mm	16 mm	330 mmΦ	17.5 mm	16 mm	332 mmΦ	16.4 mm	16 mm

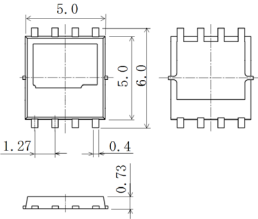
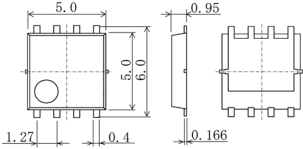
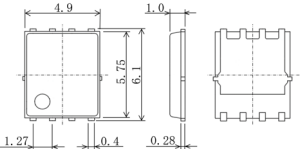
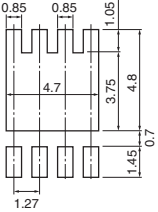
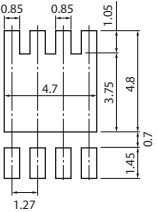
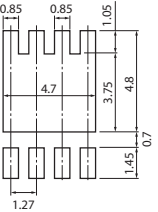
DPAK 2-7N1S (TO-252)			TO-220SM(W) (10.0x13.0)			D2PAK+ (10.0x15.0)		
Package dimension unit: mm			Package dimension unit: mm			Package dimension unit: mm		
Land pattern example unit: mm			Land pattern example unit: mm			Land pattern example unit: mm		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
3	389 mg	2,500 p/reel	3	1070 mg	1,000 p/reel	3	992 mg mg	1,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	17.2 mm	16 mm	330 mmΦ	25.5 mm	24 mm	330 mmΦ	25.5 mm	24 mm

D2PAK (10.35x15.3)			DFN8X8 (8.0x8.0)			PS-8 (2.9x2.8)		
Package dimension unit : mm			Package dimension unit: mm			Package dimension unit: mm		
Land pattern example unit: mm			Land pattern example unit: mm			Land pattern example unit: mm		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
3	1590 mg	1,000 p/reel	5	175 mg	2,500 p/reel	8	17 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	25.5 mm	24 mm	332 mmΦ	17.2 mm	16.2 mm	180 mmΦ	9 mm	8 mm

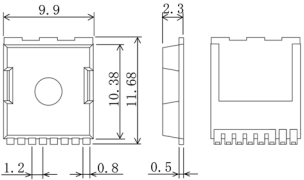
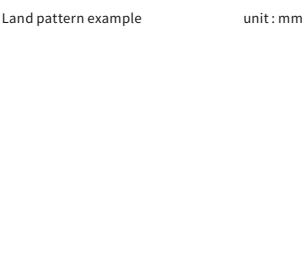
TSOP Advance (3.1x3.3)			SOP-8 2-5R1S (4.9x6.0)			SOP-8 2-6J1S		
Package dimension unit: mm			Package dimension unit: mm			Package dimension unit: mm		
Land pattern example unit: mm			Land pattern example unit: mm			Land pattern example unit: mm		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
8	20 mg	- *	8	85 mg	2,500 p/reel	8	85 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	13.5 mm	12 mm	330 mmΦ	13.5 mm	12 mm	330 mmΦ	13.5 mm	12 mm

* 3,000 or 5,000pcs/reel

Surface Mount Type

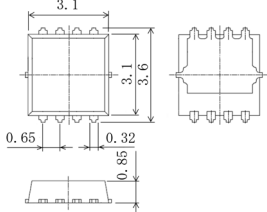
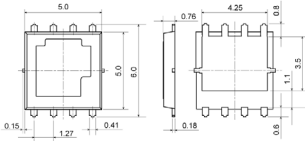
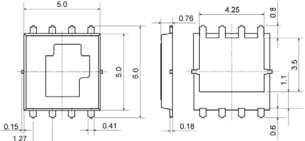
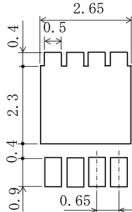
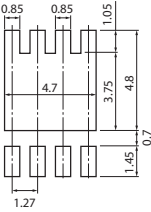
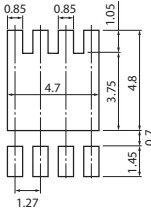
DSOP Advance (5.0x6.0)			SOP Advance (5.0x6.0)			SOP Advance(N) (4.9x6.1)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
8	98 mg	5,000 p/reel	8	69 mg	- *	8	110 mg	5,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	13.5 mm	12 mm	330 mmΦ	13.5 mm	12 mm	330 mmΦ	13.5 mm	12 mm

* 3,000 or 5,000pcs/reel

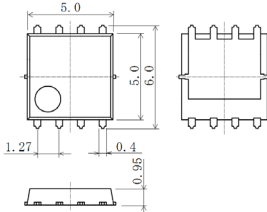
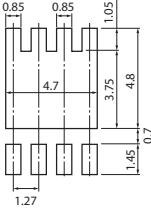
TOLL (9.9x11.68) *		
Package dimension		unit : mm
		
Land pattern example		unit : mm
		
Pin count	Weight	MOQ
9		
Reel dimension		Tape width
Diameter	Width	

* Under Development
(The specification is subject to change without notice.)

Surface Mount Type (Wettable Flank Lead Terminal)

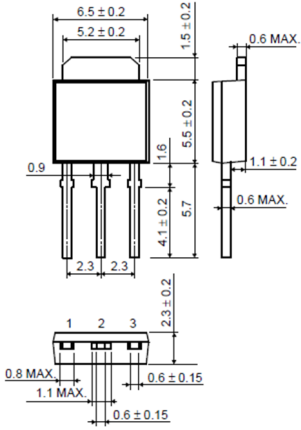
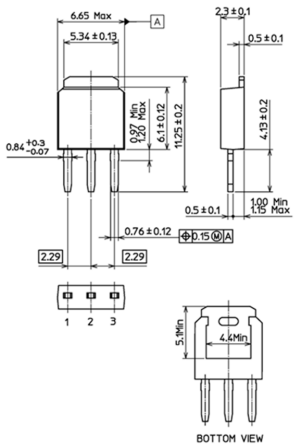
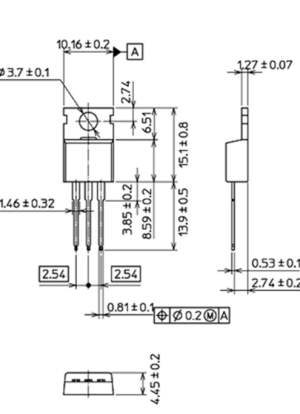
TSON Advance (WF) (3.1x3.6)			DSOP Advance (WF)L (5.0x6.0)			DSOP Advance (WF)M (5.0x6.0)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
8	20 mg	- *	8	98 mg	5,000 p/reel	8	98 mg	5,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	13.5 mm	12 mm	330 mmΦ	13.5 mm	12 mm	330 mmΦ	13.5 mm	12 mm

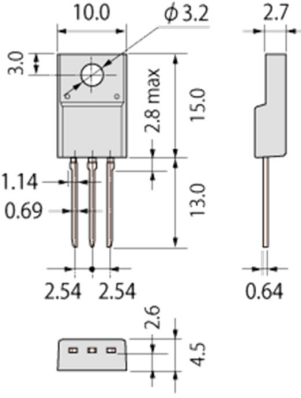
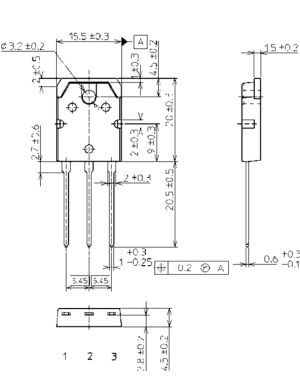
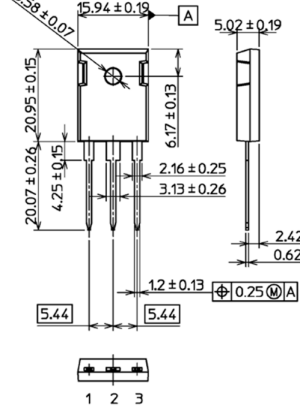
* 3,000 or 5,000pcs/reel

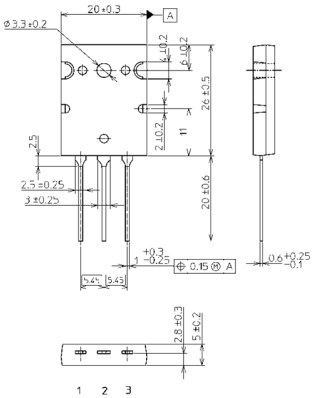
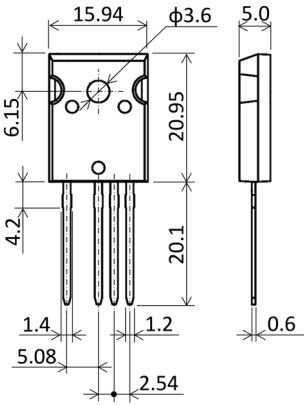
SOP Advance (WF) (5.0x6.0)		
Package dimension		unit : mm
		
Land pattern example		unit : mm
		
Pin count	Weight	MOQ
8	69 mg	- *
Reel dimension		Tape width
Diameter	Width	
330 mmΦ	13.5 mm	12 mm

* 3,000 or 5,000pcs/reel

Through Hole Type

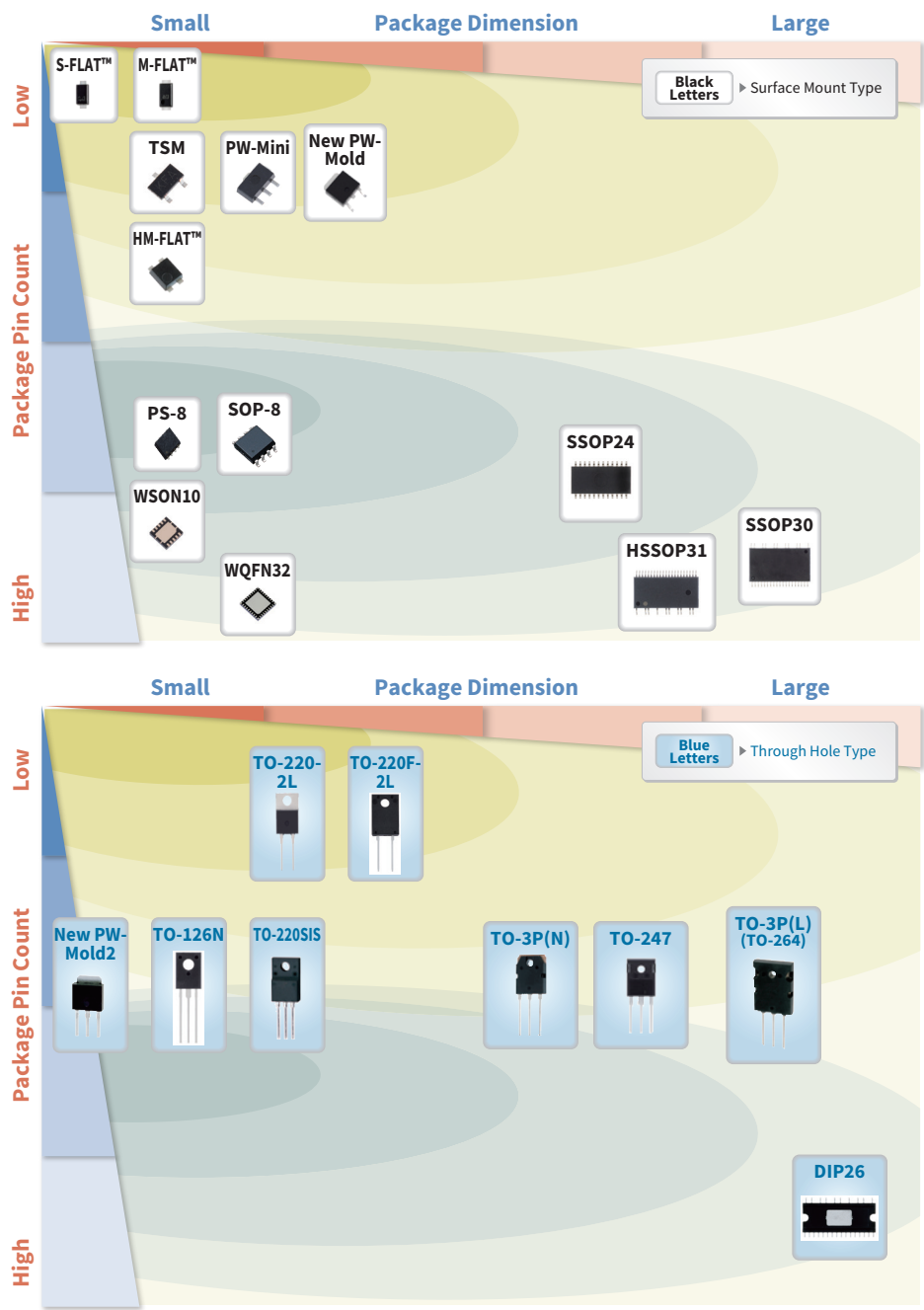
New PW-Mold2 (6.5x5.5)			IPAK (6.65x6.1)			TO-220 (10.16x15.1)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Pin count	Weight	Q'ty	Pin count	Weight	Q'ty	Pin count	Weight	Q'ty
3	360 mg	200 p/bag	3	337 mg	75 p/tube	3	1930 mg	50 p/tube
Carton dimension		Bag Q'ty / Carton	Tube dimension		Tube Q'ty / Carton	Tube dimension		Tube Q'ty / Carton
178 x 80 x 90 mm		15 bag	20 x 4.4 x 508 mm		90 tube	33 x 7.0 x 534.5 mm		20 tube

TO-220SIS (SC-67) (10.0x15.0)			TO-3P(N) (SC-65) (15.5x20.0)			TO-247 (15.94x20.95)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Pin count	Weight	Q'ty	Pin count	Weight	Q'ty	Pin count	Weight	Q'ty
3	1700 mg	50 p/tube	3	4600 mg	25 p/tube	3	6150 mg	30 p/tube
Tube dimension		Tube Q'ty / Carton	Tube dimension		Tube Q'ty / Carton	Tube dimension		Tube Q'ty / Carton
32.4 x 7.11 x 528.5 mm		30 tube	45 x 7.6 x 433 mm		40 tube	46 x 7.7 x 533.5 mm		8 tube

TO-3P(L) (20.0x26.0)			TO-247-4L (15.94x20.95)		
Package dimension		unit : mm	Package dimension		unit : mm
 Technical drawing of TO-3P(L) package showing top, side, and pin detail views with dimensions.			 Technical drawing of TO-247-4L package showing top, side, and pin detail views with dimensions.		
Pin count	Weight	Q'ty	Pin count	Weight	Q'ty
3	9750 mg	100 p/tray	4	6360 mg	30 p/tube
Tray dimension		Tray Q'ty / Carton	Tube dimension		Tube Q'ty / Carton
184 x 24 x 290 mm		5 tray	45.5 x 7.6 x 533 mm		15 tube

4. Power Discrete Devices

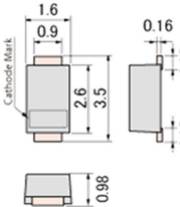
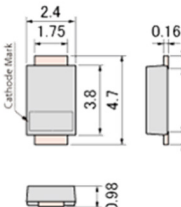
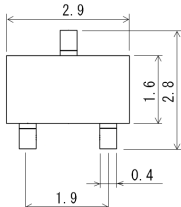
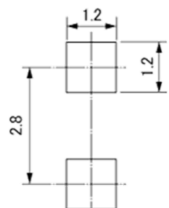
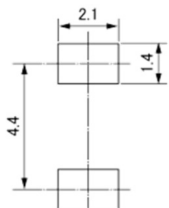
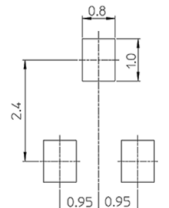
■ Package Lineups

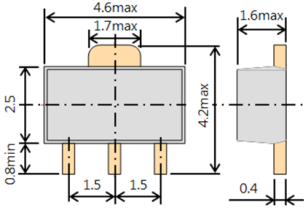
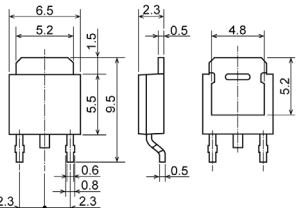
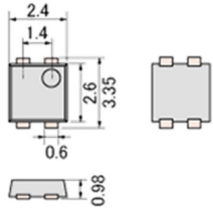
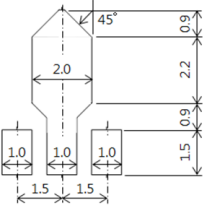
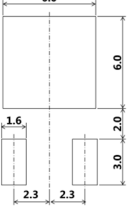
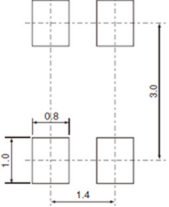


Package		Pin Count	Dimension W x L (mm)	Products					Page
				Three-Phase Brushless DC Motor Driver ICs (with Built-in Power Device)	Automotive IPDs (Intelligent Power Devices)	Diodes	IGBTs	Bipolar Transistors	
Surface Mount Type	S-FLAT	2	1.6 x 3.5			✓			36
	M-FLAT	2	2.4 x 4.7			✓			36
	TSM	3	2.9 x 2.8					✓	36
	PW-Mini	3	4.6 x 4.2					✓	36
	New PW-Mold	3	6.5 x 9.5					✓	36
	HM-FLAT	4	2.4 x 3.35			✓			36
	PS-8	8	2.9 x 2.8		✓			✓	37
	SOP-8	8	4.9 x 6.0		✓				37
	WSON10	10	3.0 x 3.0		✓				37
	SSOP24	24	13.0 x 8.0		✓				37
	SSOP30	30	20.0 x 14.2	✓					37
	HSSOP31	31	17.5 x 11.93	✓					37
Through Hole Type	WQFN32	32	5.0 x 5.0		✓				38
	TO-220-2L	2	10.05 x 15.3			✓			38
	TO-220F-2L	2	10.0 x 15.0			✓			38
	New PW-Mold2	3	6.5 x 5.5					✓	38
	TO-126N	3	8.0 x 11.0					✓	39
	TO-220SIS	3	10.0 x 15.0				✓	✓	39
	TO-3P(N)	3	15.5 x 20.0				✓	✓	39
	TO-247	3	15.94 x 20.95			✓	✓		39
	TO-3P(L)	3	20.0 x 26.0					✓	39
	DIP26	26	32.0 x 16.6	✓					39

■ Dimensional Outline

Surface Mount Type

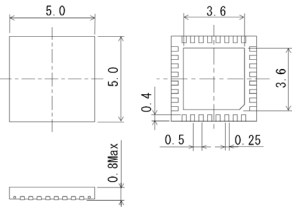
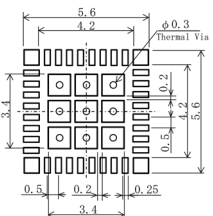
S-FLAT™ (1.6x3.5)			M-FLAT™ (2.4x4.7)			TSM (2.9x2.8)		
Package dimension unit : mm			Package dimension unit : mm			Package dimension unit : mm		
								
Land pattern example unit : mm			Land pattern example unit : mm			Land pattern example unit : mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
2	13 mg	3,000 p/reel	2	23 mg	3,000 p/reel	3	10 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	13 mm	12 mm	180 mmΦ	9 mm	6 mm

PW-Mini (4.6x4.2)			New PW-Mold (6.5x9.5)			HM-FLAT™ (2.4x3.35)		
Package dimension unit : mm			Package dimension unit : mm			Package dimension unit : mm		
								
Land pattern example unit : mm			Land pattern example unit : mm			Land pattern example unit : mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
3	50 mg	1,000 p/reel	3	360 mg	2,000 p/reel	4	16 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	13 mm	12 mm	330 mmΦ	17.5 mm	16 mm	180 mmΦ	9 mm	16 mm

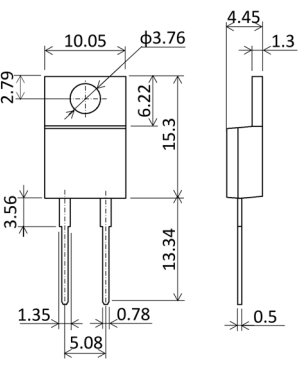
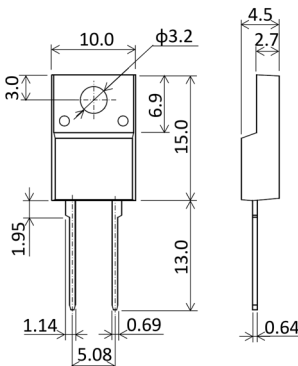
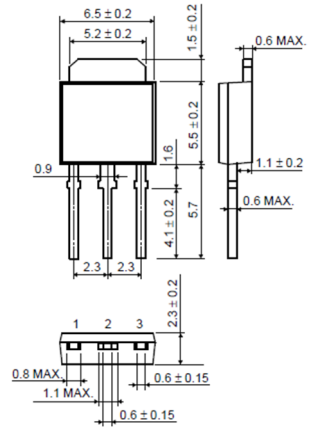
PS-8 (2.9x2.8)			SOP-8 P-1.27A (5.0x6.0)			WSO10 (3.0x3.0)		
Package dimension unit: mm 			Package dimension unit: mm 			Package dimension unit: mm 		
Land pattern example unit: mm 			Land pattern example unit: mm 			Land pattern example unit: mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
8	17 mg	3,000 p/reel	8	85 mg	3,000 p/reel	10	20 mg	1,500 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	330 mmΦ	13.5 mm	12 mm	330 mmΦ	9 mm	8 mm

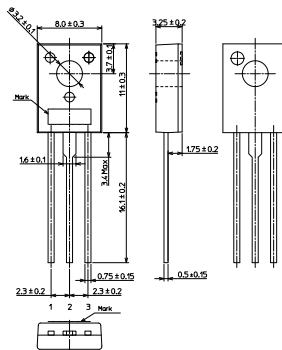
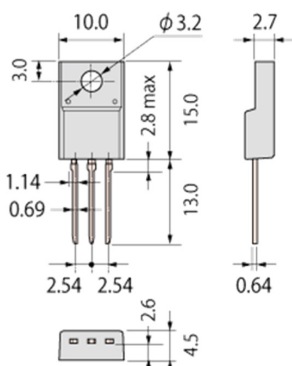
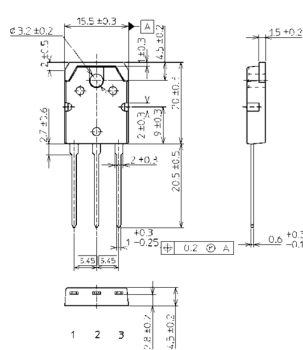
SSOP24 (13.0x8.0)			SSOP30 (20.0x14.2)			HSSOP31 (17.5x11.93)		
Package dimension unit: mm 			Package dimension unit: mm 			Package dimension unit: mm 		
Land pattern example unit: mm 			Land pattern example unit: mm 			Land pattern example unit: mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
24	290 mg	2,000 p/reel	30	1,200 mg		31	700 mg	1,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	25.5 mm	24 mm				330 mmΦ	25.4 mm	24 mm

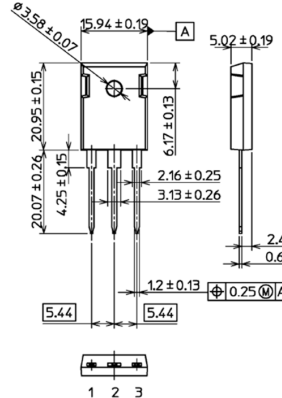
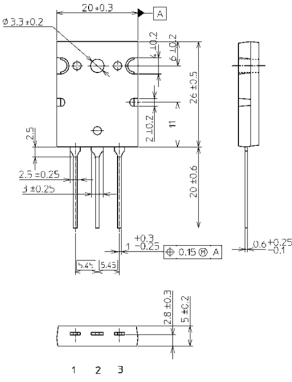
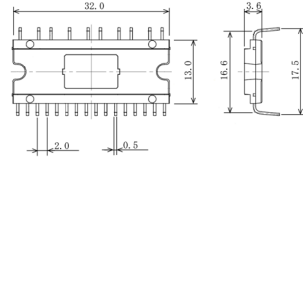
Surface Mount Type

WQFN32 (5.0x5.0)		
Package dimension unit: mm		
		
Land pattern example unit: mm		
		
Pin count	Weight	MOQ
32	60 mg	
Reel dimension		Tape width
Diameter	Width	

Through Hole Type

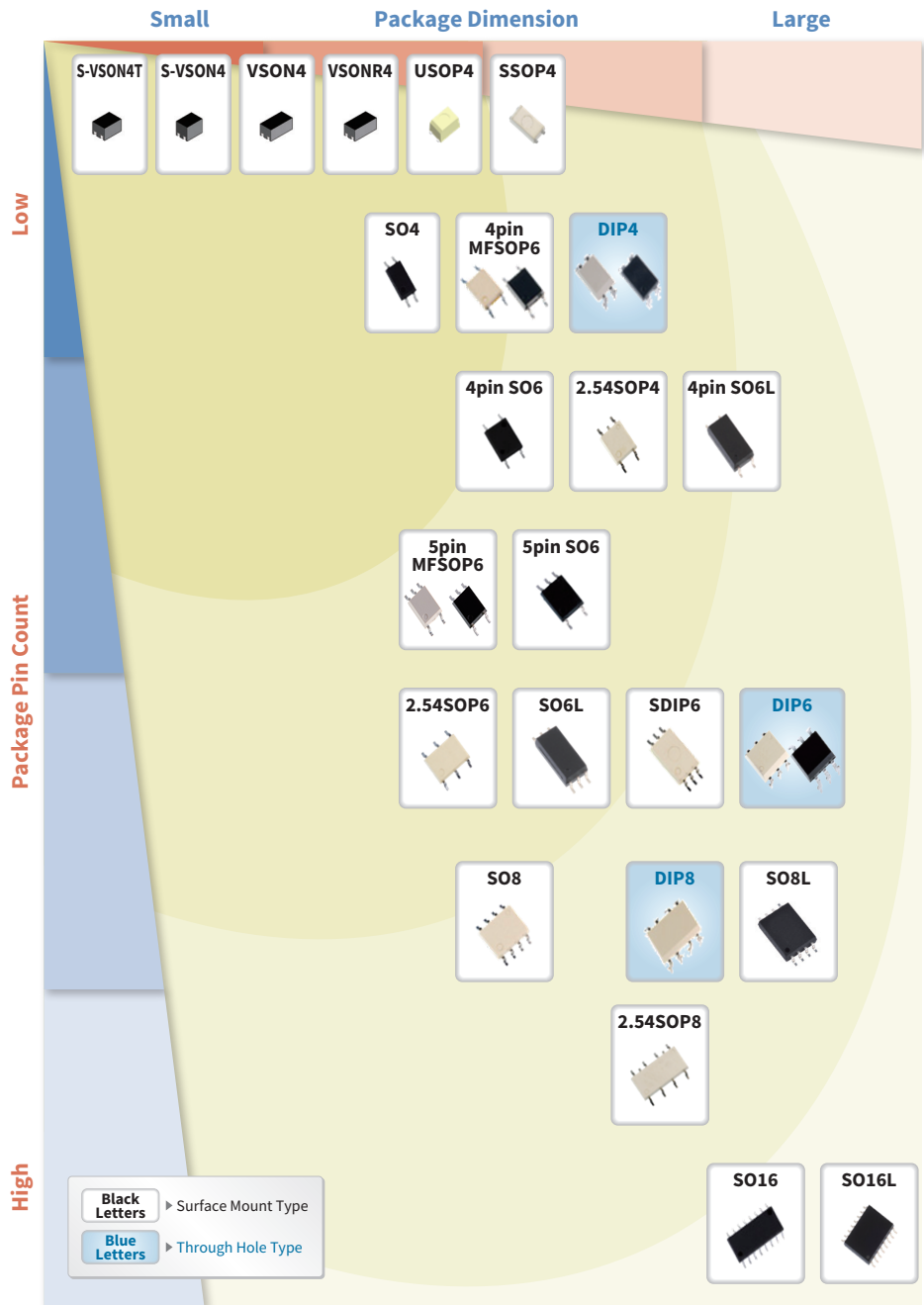
TO-220-2L (10.05x15.3)			TO-220F-2L (10.0x15.0)			New PW-Mold2 (6.5x5.5)		
Package dimension unit: mm			Package dimension unit: mm			Package dimension unit: mm		
								
Pin count	Weight	Q'ty	Pin count	Weight	Q'ty	Pin count	Weight	Q'ty
2	1,900 mg	50 p/tube	2	1,830 mg	50 p/tube	3	360 mg	200 p/bag
Tube dimension		Tube Q'ty / Carton	Tube dimension		Tube Q'ty / Carton	Carton Dimension		Bag Q'ty / Carton
32.8/33.0 x 7.0 x 533/534.5 mm		20 tube	33.0 x 7.0 x 532.5 mm		20 tube	178 x 80 x 90 mm		15 bag

TO-126N (8.0x11.0)			TO-220SIS (SC-67) (10.0x15.0)			TO-3P(N) (SC-65) (15.5x20.0)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Pin count	Weight	Q'ty	Pin count	Weight	Q'ty	Pin count	Weight	Q'ty
3	840 mg	250 p/bag	3	1,700 mg	50 p/tube	3	4,600 mg	25 p/tube
Carton dimension		Tube Q'ty / Carton	Tube dimension		Tube Q'ty / Carton	Tube dimension		Tube Q'ty / Carton
245 x 175 x 100 mm		8 bag	32.4 x 7.11 x 528.5 mm		30 tube	45 x 7.6 x 433 mm		40 tube

TO-247 (15.94x20.95)			TO-3P(L) (20.0x26.0)			DIP26 (32.0x16.6)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Pin count	Weight	Q'ty	Pin count	Weight	Q'ty	Pin count	Weight	Q'ty
3	6,150 mg	30 p/tube	3	9,750 mg	100 p/tray	26	3,800 mg	20 p/tube
Tube dimension		Tube Q'ty / Carton	Tray dimension		Tray Q'ty / Carton	Tube dimension		Tube Q'ty / Carton
46 x 7.7 x 533.5 mm		8 tube	184 x 24 x 290 mm		5 tray	22 x 11 x 665 mm		25 tube

5. Photocouplers , Photorelays

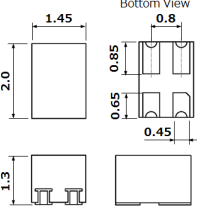
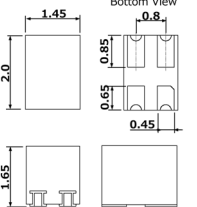
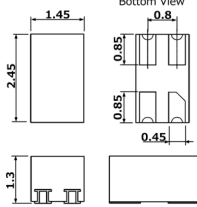
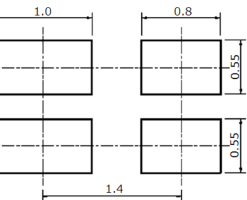
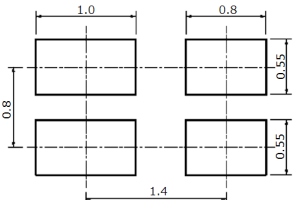
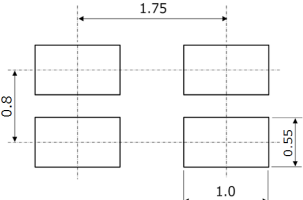
■ Package Lineups

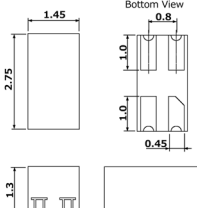
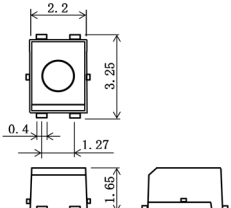
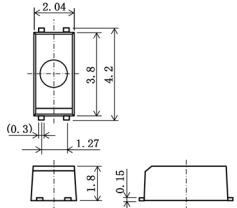
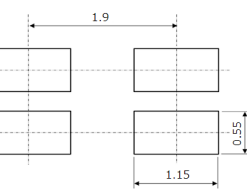
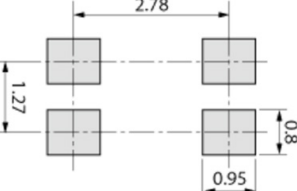
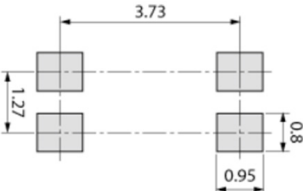


Package		Pin Count	Dimension W x L (mm)	Products						Page
				Photocouplers					Photorelays	
				IC Output	Transistor Output	Triac Output	Photovoltaic Output	Thyristor Output		
Surface Mount Type	S-VSON4T	4	1.45 x 2.0						✓	42
	S-VSON4	4	1.45 x 2.0						✓	42
	VSON4	4	1.45 x 2.45						✓	42
	VSONR4	4	1.45 x 2.75						✓	42
	USOP4	4	2.2 x 3.25						✓	42
	SSOP4	4	2.04 x 4.2				✓		✓	42
	SO4	4	2.6 x 7.0		✓					43
	4pin MFSOP6	4	3.6 x 7.0			✓	✓			43
	4pin SO6	4	3.7 x 7.0	✓	✓	✓	✓		✓	43
	2.54 SOP4	4	3.9 x 7.0						✓	43
	4pin SO6L	4	3.84 x 10.0	✓	✓					43
	5pin MFSOP6	5	3.6 x 7.0	✓		✓		✓		43
	5pin SO6	5	3.7 x 7.0	✓						44
	2.54 SOP6	6	6.3 x 7.0						✓	44
	SO6L	6	3.84 x 10	✓						44
	SDIP6	6	4.58 x 9.7	✓						44
	SO8	8	5.1 x 6.0	✓						44
	SO8L	8	5.85 x 10.0	✓						44
	2.54 SOP8	8	9.4 x 7.0						✓	45
	SO16	16	10.3 x 7.0		✓					45
	SO16L	16	10.3 x 10.0	✓						45
Through Hole Type	DIP4	4	4.58 x 7.62		✓	✓			✓	46
	DIP4(TLP785)	4	4.6 x 7.62		✓					46
	DIP6	6	7.12 x 7.62		✓	✓	✓	✓	✓	46
	DIP8	8	9.66 x 7.62	✓	✓	✓		✓	✓	46

■ Dimensional Outline

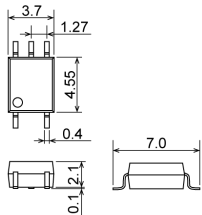
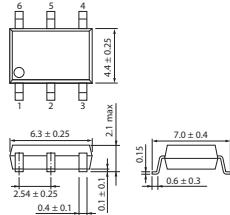
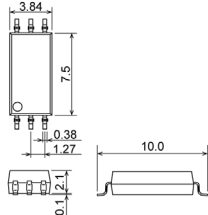
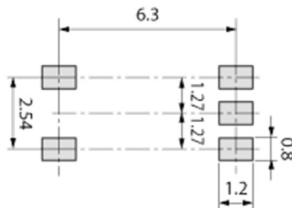
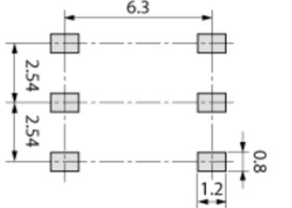
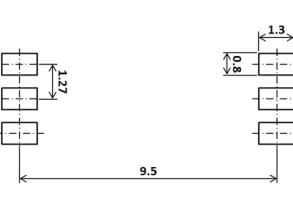
Surface Mount Type

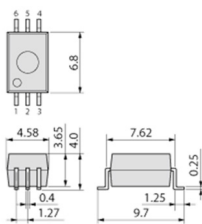
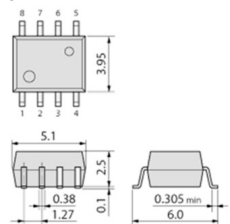
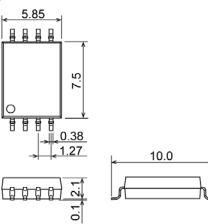
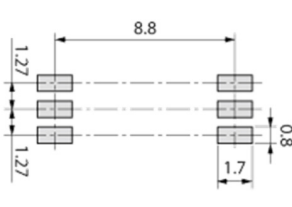
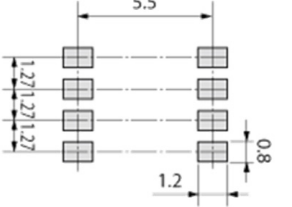
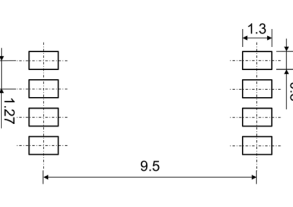
S-VSON4T (1.45x2.0)			S-VSON4 (1.45x2.0)			VSON4 (1.45x2.45)		
Package dimension unit : mm			Package dimension unit : mm			Package dimension unit : mm		
								
Land pattern example unit : mm			Land pattern example unit : mm			Land pattern example unit : mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
4	10 mg	2,500 p/reel	4	10 mg	2,500 p/reel	4	10 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm	180 mmΦ	9 mm	8 mm

VSONR4 (1.45x2.75)			USOP4 (2.2x3.25)			SSOP4 (2.04x4.2)		
Package dimension unit : mm			Package dimension unit : mm			Package dimension unit : mm		
								
Land pattern example unit : mm			Land pattern example unit : mm			Land pattern example unit : mm		
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
4	10 mg	3,000 p/reel	4	30 mg	1,500 p/reel	4	30 mg	1,500 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
180 mmΦ	9 mm	8 mm	180 mmΦ	13 mm	12 mm	180 mmΦ	13 mm	12 mm

SO4 (2.6x7.0)			4pin MFSOP6 (3.6x7.0)			4pin SO6 (3.7x7.0)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
4	50 mg	2,500 p/reel	4	90 mg	3,000 p/reel	4	80 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	13.5 mm	12 mm	380 mmΦ	13.5 mm	12 mm	380 mmΦ	13.5 mm	12 mm

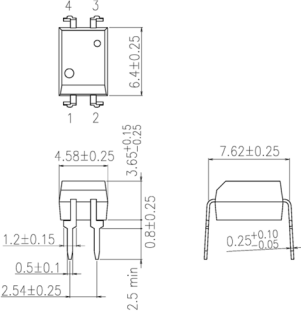
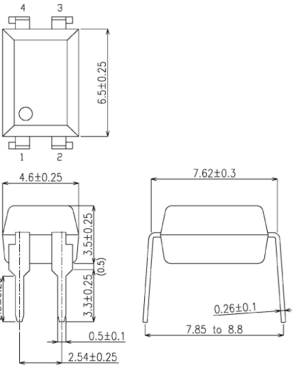
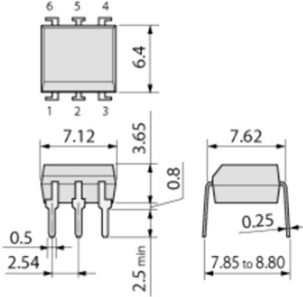
2.54SOP4 (3.9x7.0)			4pin SO6L (3.84x10.0)			5pin MFSOP6 (3.6x7.0)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
4	100 mg	2,500 p/reel	4	128 mg	3,000 p/reel	5	90 mg	3,000 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	13.5 mm	12 mm	330 mmΦ	17.4 mm	16 mm	380 mmΦ	13.5 mm	12 mm

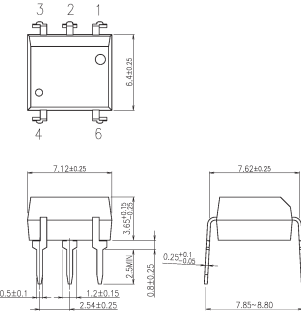
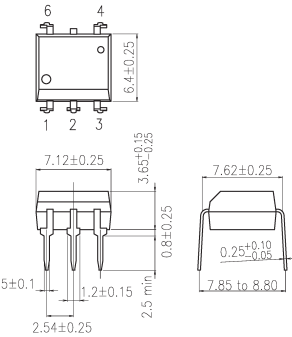
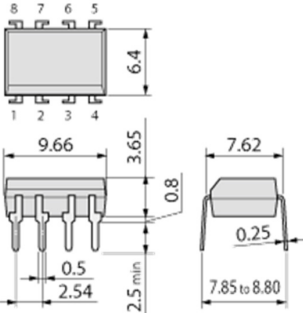
5pin SO6 (3.7x7.0)			2.54SOP6 (6.3x7.0)			SO6L (3.84x10.0)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
5	80 mg	3,000 p/reel	6	130 mg	2,500 p/reel	6	126 mg	1,500 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
380 mmΦ	13.5 mm	12 mm	330 mmΦ	17.5 mm	16 mm	330 mmΦ	17.4 mm	16 mm

SDIP6 (4.58x9.7)			SO8 (5.1x6.0)			SO8L (5.85x10.0)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Land pattern example		unit : mm	Land pattern example		unit : mm	Land pattern example		unit : mm
								
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
6	260 mg	1,500 p/reel	8	110 mg	2,500 p/reel	8	205 mg	1,500 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
380 mmΦ	17.5 mm	16 mm	330 mmΦ	13.5 mm	12 mm	330 mmΦ	17.4 mm	16 mm

2.54SOP8 (9.4x7.0)			SO16 (10.3x7.0)			SO16L (10.3x10.0)		
Package dimension unit : mm 			Package dimension unit : mm 			Package dimension unit : mm 		
Land pattern example unit : mm 			Land pattern example unit : mm 			Land pattern example unit : mm 		
Pin count	Weight	MOQ	Pin count	Weight	MOQ	Pin count	Weight	MOQ
8	200 mg	2,500 p/reel	16	190 mg	2,000 p/reel	16	370 mg	1,500 p/reel
Reel dimension		Tape width	Reel dimension		Tape width	Reel dimension		Tape width
Diameter	Width		Diameter	Width		Diameter	Width	
330 mmΦ	17.5 mm	16 mm	330 mmΦ	17.5 mm	16 mm	330 mmΦ	17.4 mm	16 mm

Through Hole Type

DIP4 (4.58x7.62)			DIP4(TLP785) (4.6x7.62)			DIP6 (7.12x7.62)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Pin count	Weight	Q'ty	Pin count	Weight	Q'ty	Pin count	Weight	Q'ty
4	260 mg	100 p/tube	4	260 mg	100 p/tube	6	400 mg	50 p/tube
Tube dimension		Tube Q'ty / Carton	Tube dimension		Tube Q'ty / Carton	Tube dimension		Tube Q'ty / Carton
11.3 x 10.3 x 525 mm		4 tube	11.3 x 10.3 x 525 mm		4 tube	11.3 x 10.3 x 525 mm		20 tube

5pin DIP6 (7.12x7.62)			5pin DIP6 (cut) (7.12x7.62)			DIP8 (9.66x7.62)		
Package dimension		unit : mm	Package dimension		unit : mm	Package dimension		unit : mm
								
Pin count	Weight	Q'ty	Pin count	Weight	Q'ty	Pin count	Weight	Q'ty
5	400 mg	50 p/tube	5	400 mg	50 p/tube	8	540 mg	50 p/tube
Tube dimension		Tube Q'ty / Carton	Tube dimension		Tube Q'ty / Carton	Tube dimension		Tube Q'ty / Carton
11.3 x 10.3 x 525 mm		20 tube	11.3 x 10.3 x 525 mm		20 tube	11.3 x 10.3 x 525 mm		60 tube

DIP4(LF1) / (TP1)		DIP4(LF5) / (TP5)		DIP4(LF2)	
Package dimension unit : mm 		Package dimension unit : mm 		Package dimension (DIP4 FType) unit : mm 	
Land pattern example unit : mm 		Land pattern example unit : mm 		Land pattern example unit : mm 	
DIP4(LF4) / (TP4)		TLP785 DIP4(LF6) / (TP6)		TLP785 DIP4(LF7) / (TP7)	
Package dimension unit : mm 		Package dimension unit : mm 		Package dimension unit : mm 	
Land pattern example unit : mm 		Land pattern example unit : mm 		Land pattern example unit : mm 	

DIP6(LF1) / (TP1)	DIP6(LF5) / (TP5)	DIP6(LF2)
Package dimension unit : mm 	Package dimension unit : mm 	Package dimension unit : mm (DIP6 Ftype)

Land pattern example	Land pattern example
unit : mm 	unit : mm

DIP6(LF4) / (TP4)	5pin DIP6 (LF1) / (TP1)	5pin DIP6 (LF5) / (TP5)
Package dimension unit : mm 	Package dimension unit : mm 	Package dimension unit : mm

Land pattern example	Land pattern example	Land pattern example
unit : mm 	unit : mm 	unit : mm

5pin DIP6 (LF2)	5pin DIP6 (LF4) / (TP4)	5pin DIP6 (cut) (LF1) / (TP1)
Package dimension (5pin DIP6 Ftype)	Package dimension	Package dimension
	Land pattern example	Land pattern example

5pin DIP6 (cut) (LF5) / (TP5)	5pin DIP6 (cut) (LF2)	5pin DIP6 (cut) (LF4) / (TP4)
Package dimension	Package dimension (5pin DIP6 (cut) Ftype)	Package dimension
Land pattern example		Land pattern example

DIP8(LF1) / (TP1)	DIP8(LF5) / (TP5)	DIP8(LF2)
Package dimension unit : mm 	Package dimension unit : mm 	Package dimension unit : mm (DIP8 Ftype)

Land pattern example unit : mm 	Land pattern example unit : mm
---	---

DIP8(LF4) / (TP4)	SO8L(LF4)
Package dimension unit : mm 	Package dimension unit : mm
Land pattern example unit : mm 	Land pattern example unit : mm

RESTRICTIONS ON PRODUCT USE

Toshiba Corporation and its subsidiaries and affiliates are collectively referred to as "TOSHIBA". Hardware, software and systems described in this document are collectively referred to as "Product".

- The drawings shown may not accurately represent the actual shape or dimensions.
- All linear dimensions are given in millimeters unless otherwise specified.
- TOSHIBA reserves the right to make changes to the information in this document and related Product without notice.
- This document and any information herein may not be reproduced without prior written permission from TOSHIBA. Even with TOSHIBA's written permission, reproduction is permissible only if reproduction is without alteration/omission.
- Though TOSHIBA works continually to improve Product's quality and reliability, Product can malfunction or fail. Customers are responsible for complying with safety standards and for providing adequate designs and safeguards for their hardware, software and systems which minimize risk and avoid situations in which a malfunction or failure of Product could cause loss of human life, bodily injury or damage to property, including data loss or corruption. Before customers use the Product, create designs including the Product, or incorporate the Product into their own applications, customers must also refer to and comply with (a) the latest versions of all relevant TOSHIBA information, including without limitation, this document, the specifications, the data sheets and application notes for Product and the precautions and conditions set forth in the "TOSHIBA Semiconductor Reliability Handbook" and (b) the instructions for the application with which the Product will be used with or for. Customers are solely responsible for all aspects of their own product design or applications, including but not limited to (a) determining the appropriateness of the use of this Product in such design or applications; (b) evaluating and determining the applicability of any information contained in this document, or in charts, diagrams, programs, algorithms, sample application circuits, or any other referenced documents; and (c) validating all operating parameters for such designs and applications. **TOSHIBA ASSUMES NO LIABILITY FOR CUSTOMERS' PRODUCT DESIGN OR APPLICATIONS.**
- **PRODUCT IS NEITHER INTENDED NOR WARRANTED FOR USE IN EQUIPMENTS OR SYSTEMS THAT REQUIRE EXTRAORDINARILY HIGH LEVELS OF QUALITY AND/OR RELIABILITY, AND/OR A MALFUNCTION OR FAILURE OF WHICH MAY CAUSE LOSS OF HUMAN LIFE, BODILY INJURY, SERIOUS PROPERTY DAMAGE AND/OR SERIOUS PUBLIC IMPACT ("UNINTENDED USE").** Except for specific applications as expressly stated in this document, Unintended Use includes, without limitation, equipment used in nuclear facilities, equipment used in the aerospace industry, lifesaving and/or life supporting medical equipment, equipment used for automobiles, trains, ships and other transportation, traffic signaling equipment, equipment used to control combustions or explosions, safety devices, elevators and escalators, and devices related to power plant. **IF YOU USE PRODUCT FOR UNINTENDED USE, TOSHIBA ASSUMES NO LIABILITY FOR PRODUCT.** For details, please contact your TOSHIBA sales representative or contact us via our website.
- Do not disassemble, analyze, reverse-engineer, alter, modify, translate or copy Product, whether in whole or in part.
- Product shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable laws or regulations.
- The information contained herein is presented only as guidance for Product use. No responsibility is assumed by TOSHIBA for any infringement of patents or any other intellectual property rights of third parties that may result from the use of Product. No license to any intellectual property right is granted by this document, whether express or implied, by estoppel or otherwise.
- **ABSENT A WRITTEN SIGNED AGREEMENT, EXCEPT AS PROVIDED IN THE RELEVANT TERMS AND CONDITIONS OF SALE FOR PRODUCT, AND TO THE MAXIMUM EXTENT ALLOWABLE BY LAW, TOSHIBA (1) ASSUMES NO LIABILITY WHATSOEVER, INCLUDING WITHOUT LIMITATION, INDIRECT, CONSEQUENTIAL, SPECIAL, OR INCIDENTAL DAMAGES OR LOSS, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF OPPORTUNITIES, BUSINESS INTERRUPTION AND LOSS OF DATA, AND (2) DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES AND CONDITIONS RELATED TO SALE, USE OF PRODUCT, OR INFORMATION, INCLUDING WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY OF INFORMATION, OR NONINFRINGEMENT.**
- Do not use or otherwise make available Product or related software or technology for any military purposes, including without limitation, for the design, development, use, stockpiling or manufacturing of nuclear, chemical, or biological weapons or missile technology products (mass destruction weapons). Product and related software and technology may be controlled under the applicable export laws and regulations including, without limitation, the Japanese Foreign Exchange and Foreign Trade Law and the U.S. Export Administration Regulations. Export and re-export of Product or related software or technology are strictly prohibited except in compliance with all applicable export laws and regulations.
- Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. Please use Product in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. **TOSHIBA ASSUMES NO LIABILITY FOR DAMAGES OR LOSSES OCCURRING AS A RESULT OF NONCOMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS.**

TOSHIBA

Toshiba Electronic Devices & Storage Corporation

<https://toshiba.semicon-storage.com/>