

**Package Types**

The following are the package types and widths offered by Holtek.

**DIP (Dual In-line Package)**

Pin Count	Package Width
8, 14, 16, 18, 20	300mil
24, 28, 32, 40, 42	600mil
28, 32, 40 (Ceramic)	600mil

**SKDIP (Skinny Dual In-line Package)**

Pin Count	Package Width
22, 24, 28	300mil

**SDIP (Shrink Dual In-line Package)**

Pin Count	Package Width
42	600mil

**SOP (Small Outline Package)**

Pin Count	Package Width
8, 14	150mil
16, 18, 20, 24, 28	300mil
28	330mil
32	450mil

**NSOP (Narrow Small Outline Package)**

Pin Count	Package Width
16	150mil

**SSOP (Shrink Small Outline Package)**

Pin Count	Package Width
16, 20, 24, 28	150mil
20, 24, 28, 30	209mil
48, 56	300mil

**TSSOP (Thin Shrink Small Outline Package)**

Pin count: 8, 16, 20, 24

**MSOP**

Pin count: 8, 10

**Wing-type TSSOP**

**(Wing-type Thin Shrink Small Outline Package)**

Pin count: 16

**QFP (Quad Flat Package)**

Pin Count	Package Width
44	10mm × 10mm
52	14mm × 14mm
64	14mm × 14mm, 14mm × 20mm
80, 100, 128	14mm × 20mm
208	28mm × 28mm

**LQFP (Low profile Quad Flat Package)**

Pin Count	Package Width
32, 48	7mm × 7mm
44	10mm × 10mm
64	7mm × 7mm 10mm × 10mm
80	10mm × 10mm 12mm × 12mm
100	14mm × 14mm
144	20mm × 20mm

**TQFP (Thin Quad Flat Package)**

Pin Count	Package Width
100	14mm × 14mm

**Punched Type QFN (Quad Flat No-lead)**

Pin count: 48, 64

**SAW Type QFN (Quad Flat No-lead)**

Pin count: 16, 20, 32, 40, 40, 48, 56

**PLCC (Plastic Leaded Chip Carrier Package)**

Pin count: 32, 44

**SOT23, SOT223, SOT89**

Pin count: 3

**SOT23-5**

Pin count: 5

**SOT23-6**

Pin count: 6

**TO92**

Pin count: 3

**TO220, TO252, TO263**

Pin count: 3

**SIP**

Pin count: 4

**DIP for Optical Mouse Package**

Pin count: 8, 16

Packaging Diagrams and Parameters (for Reference Only)

Plastic DIP/SKDIP/SDIP Outline Dimensions

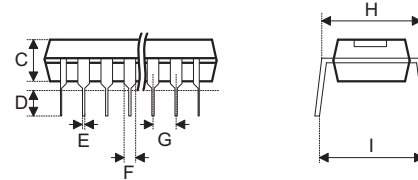
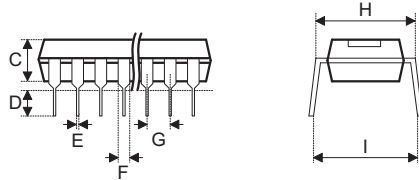
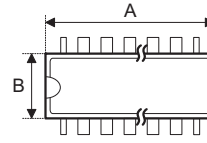
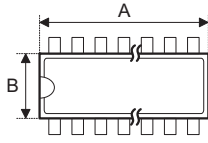


Fig1. Full Lead Packages

Fig2. 1/2 Lead Packages

300mil DIP

• unit: inch

Pin	Parameter									Remark
	A	B	C	D	E	F	G	H	I(max)	
8	0.355~0.375	0.240~0.260	0.125~0.135	0.125~0.145	0.016~0.020	0.050~0.070	0.100 typ.	0.295~0.315	0.375 typ.	
14	0.745~0.775	0.240~0.260	0.125~0.135	0.125~0.145	0.016~0.020	0.050~0.070	0.100 typ.	0.295~0.315	0.375 typ.	
16	0.745~0.785	0.275~0.295	0.120~0.150	0.110~0.150	0.014~0.022	0.045~0.060	0.100 typ.	0.300~0.325	0.430 typ.	MO-095A (Fig2)
16	0.735~0.775	0.240~0.280	0.115~0.195	0.115~0.150	0.014~0.022	0.045~0.070	0.100 typ.	0.300~0.325	0.430 typ.	MS-001D (Fig2)
16	0.780~0.880	0.240~0.280	0.115~0.195	0.115~0.150	0.014~0.022	0.045~0.070	0.100 typ.	0.300~0.325	0.430 typ.	MS-001D (Fig1)
18	0.845~0.885	0.275~0.295	0.120~0.150	0.110~0.150	0.014~0.022	0.045~0.060	0.100 typ.	0.300~0.325	0.430 typ.	MO-095A (Fig2)
18	0.845~0.880	0.240~0.280	0.115~0.195	0.115~0.150	0.014~0.022	0.045~0.070	0.100 typ.	0.300~0.325	0.430 typ.	MS-001D (Fig2)
18	0.880~0.920	0.240~0.280	0.115~0.195	0.115~0.150	0.014~0.022	0.045~0.070	0.100 typ.	0.300~0.325	0.430 typ.	MS-001D (Fig1)
20	0.945~0.985	0.275~0.295	0.120~0.150	0.110~0.150	0.014~0.022	0.045~0.060	0.100 typ.	0.300~0.325	0.430 typ.	MO-095A (Fig2)
20	0.980~1.060	0.240~0.280	0.115~0.195	0.115~0.150	0.014~0.022	0.045~0.070	0.100 typ.	0.300~0.325	0.430 typ.	MS-001D (Fig1)

• unit: mm

Pin	Parameter									Remark
	A	B	C	D	E	F	G	H	I(max)	
8	9.02~9.53	6.10~6.60	3.18~3.43	3.18~3.68	0.41~0.51	1.27~1.78	2.54 typ.	7.49~8.00	9.53 typ.	
14	18.92~19.69	6.10~6.60	3.18~3.43	3.18~3.68	0.41~0.51	1.27~1.78	2.54 typ.	7.49~8.00	9.53 typ.	
16	18.92~19.94	6.99~7.49	3.05~3.81	2.79~3.81	0.36~0.56	1.14~1.52	2.54 typ.	7.62~8.26	10.92 typ.	MO-095A (Fig2)
16	18.67~19.69	6.10~7.11	2.92~4.95	2.92~3.81	0.36~0.56	1.14~1.78	2.54 typ.	7.62~8.26	10.92 typ.	MS-001D (Fig2)
16	19.81~22.35	6.10~7.11	2.92~4.95	2.92~3.81	0.36~0.56	1.14~1.78	2.54 typ.	7.62~8.26	10.92 typ.	MS-001D (Fig1)
18	21.46~22.48	6.99~7.49	3.05~3.81	2.79~3.81	0.36~0.56	1.14~1.52	2.54 typ.	7.62~8.26	10.92 typ.	MO-095A (Fig2)
18	21.46~22.35	6.10~7.11	2.92~4.95	2.92~3.81	0.36~0.56	1.14~1.78	2.54 typ.	7.62~8.26	10.92 typ.	MS-001D (Fig2)
18	22.35~23.37	6.10~7.11	2.92~4.95	2.92~3.81	0.36~0.56	1.14~1.78	2.54 typ.	7.62~8.26	10.92 typ.	MS-001D (Fig1)
20	24.00~25.02	6.99~7.49	3.05~3.81	2.79~3.81	0.36~0.56	1.14~1.52	2.54 typ.	7.62~8.26	10.92 typ.	MO-095A (Fig2)
20	24.89~26.92	6.10~7.11	2.92~4.95	2.92~3.81	0.36~0.56	1.14~1.78	2.54 typ.	7.62~8.26	10.92 typ.	MS-001D (Fig1)

300mil SKDIP

• unit: inch

Pin	Parameter									Remark
	A	B	C	D	E	F	G	H	I(max)	
22	1.085~ 1.105	0.253~ 0.263	0.125~ 0.135	0.125~ 0.145	0.016~ 0.020	0.050~ 0.070	0.100 typ.	0.295~ 0.315	0.375 max.	
24	1.145~ 1.185	0.275~ 0.295	0.120~ 0.150	0.110~ 0.150	0.014~ 0.022	0.045~ 0.060	0.100 typ.	0.300~ 0.325	0.430 max.	MO-095A (Fig2)
24	1.160~ 1.195	0.240~ 0.280	0.115~ 0.195	0.115~ 0.150	0.014~ 0.022	0.045~ 0.070	0.100 typ.	0.300~ 0.325	0.430 max.	MS-001D (Fig2)
24	1.230~ 1.280	0.240~ 0.280	0.115~ 0.195	0.115~ 0.150	0.014~ 0.022	0.045~ 0.070	0.100 typ.	0.300~ 0.325	0.430 max.	MS-001D (Fig1)
28	1.375~ 1.395	0.278~ 0.298	0.125~ 0.135	0.125~ 0.145	0.016~ 0.020	0.050~ 0.070	0.100 typ.	0.295~ 0.315	0.375 max.	

• unit: mm

Pin	Parameter									Remark
	A	B	C	D	E	F	G	H	I(max)	
22	27.56~ 28.07	6.43~ 6.68	3.18~ 3.43	3.18~ 3.68	0.41~ 0.51	1.21~ 1.78	2.54 typ.	7.49~ 8.00	9.53 max.	
24	29.08~ 30.10	6.99~ 7.49	3.05~ 3.81	2.79~ 3.81	0.36~ 0.56	1.14~ 1.52	2.54 typ.	7.62~ 8.26	10.92 max.	MO-095A (Fig2)
24	29.46~ 30.35	6.10~ 7.11	2.92~ 4.95	2.92~ 3.81	0.36~ 0.56	1.14~ 1.78	2.54 typ.	7.62~ 8.26	10.92 max.	MS-001D (Fig2)
24	31.24~ 32.51	6.10~ 7.11	2.92~ 4.95	2.92~ 3.81	0.36~ 0.56	1.14~ 1.78	2.54 typ.	7.62~ 8.26	10.92 max.	MS-001D (Fig1)
28	34.93~ 35.43	7.06~ 7.57	3.18~ 3.43	3.18~ 3.68	0.41~ 0.51	1.27~ 1.78	2.54 typ.	7.49~ 8.00	9.53 max.	

600mil DIP

• unit: inch

Pin	Parameter									Remark
	A	B	C	D	E	F	G	H	I(max)	
24	1.240~ 1.260	0.535~ 0.555	0.145~ 0.155	0.125~ 0.145	0.016~ 0.020	0.050~ 0.070	0.100 typ.	0.595~ 0.615	0.670 max.	
28	1.445~ 1.465	0.535~ 0.555	0.145~ 0.155	0.125~ 0.145	0.016~ 0.020	0.050~ 0.070	0.100 typ.	0.595~ 0.615	0.670 max.	
32	1.635~ 1.665	0.535~ 0.555	0.145~ 0.155	0.125~ 0.145	0.016~ 0.020	0.050~ 0.070	0.100 typ.	0.595~ 0.615	0.670 max.	
40/42	2.045~ 2.065	0.535~ 0.555	0.145~ 0.155	0.125~ 0.145	0.016~ 0.020	0.050~ 0.070	0.100 typ.	0.595~ 0.615	0.670 max.	

• unit: mm

Pin	Parameter									Remark
	A	B	C	D	E	F	G	H	I(max)	
24	31.50~ 32.00	13.59~ 14.10	3.68~ 3.94	3.18~ 3.68	0.41~ 0.51	1.27~ 1.78	2.54 typ.	15.11~ 15.62	17.02 max.	
28	36.70~ 37.21	13.59~ 14.10	3.68~ 3.94	3.18~ 3.68	0.41~ 0.51	1.27~ 1.78	2.54 typ.	15.11~ 15.62	17.02 max.	
32	41.53~ 42.29	13.59~ 14.10	3.68~ 3.94	3.18~ 3.68	0.41~ 0.51	1.27~ 1.78	2.54 typ.	15.11~ 15.62	17.02 max.	
40/42	51.94~ 52.45	13.59~ 14.10	3.68~ 3.94	3.18~ 3.68	0.41~ 0.51	1.27~ 1.78	2.54 typ.	15.11~ 15.62	17.02 max.	

600mil SDIP

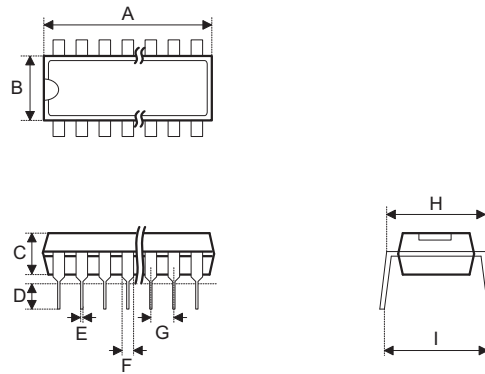
• unit: inch

Pin	Parameter									Remark
	A	B	C	D	E	F	G	H	I	
42	1.440~ 1.460	0.530~ 0.550	0.145~ 0.155	0.120~ 0.140	0.016~ 0.020	0.030~ 0.050	0.070 typ.	0.600~ 0.630	0.730 max.	

• unit: mm

Pin	Parameter									Remark
	A	B	C	D	E	F	G	H	I	
42	36.58~ 37.08	13.46~ 13.97	3.68~ 3.94	3.05~ 3.56	0.41~ 0.51	0.76~ 1.27	1.78 typ.	15.24~ 16.00	18.54 max.	

Ceramic DIP Outline Dimensions



600mil DIP

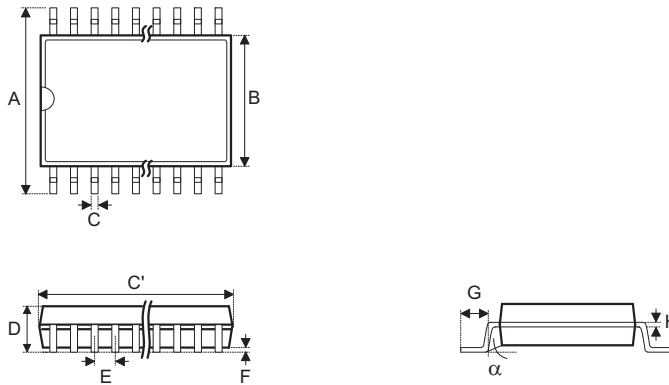
• unit: inch

Pin	Parameter									Remark
	A	B	C	D	E	F	G	H	I(max)	
28	1.445~ 1.465	0.505~ 0.535	0.155~ 0.165	0.130~ 0.140	0.016~ 0.020	0.050~ 0.070	0.100 typ.	0.608~ 0.618	0.670 max.	
32	1.635~ 1.665	0.505~ 0.535	0.155~ 0.165	0.130~ 0.140	0.016~ 0.020	0.050~ 0.070	0.100 typ.	0.608~ 0.618	0.670 max.	
40	2.045~ 2.065	0.572~ 0.582	0.155~ 0.165	0.130~ 0.140	0.016~ 0.020	0.050~ 0.070	0.100 typ.	0.605~ 0.615	0.670 max.	

• unit: mm

Pin	Parameter									Remark
	A	B	C	D	E	F	G	H	I(max)	
28	36.70~ 37.21	12.83~ 13.59	3.94~ 4.19	3.30~ 3.56	0.41~ 0.51	1.27~ 1.78	2.54 typ.	15.44~ 15.70	17.02 max.	
32	41.53~ 42.29	12.83~ 13.59	3.94~ 4.19	3.30~ 3.56	0.41~ 0.51	1.27~ 1.78	2.54 typ.	15.44~ 15.70	17.02 max.	
40	51.94~ 52.45	14.53~ 14.78	3.94~ 4.19	3.30~ 3.56	0.41~ 0.51	1.27~ 1.78	2.54 typ.	15.37~ 15.62	17.02 max.	

SOP/NSOP Outline Dimensions



150mil SOP

• unit: inch

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
8	0.228~ 0.244	0.150~ 0.157	0.012~ 0.020	0.188~ 0.197	0.069 max.	0.050 typ.	0.004~ 0.010	0.016~ 0.050	0.007~ 0.010	0°~8°	MS-012
14	0.228~ 0.244	0.150~ 0.157	0.012~ 0.020	0.337~ 0.344	0.069 max.	0.050 typ.	0.004~ 0.010	0.016~ 0.050	0.007~ 0.010	0°~8°	MS-012

• unit: mm

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
8	5.79~ 6.20	3.81~ 3.99	0.30~ 0.51	4.78~ 5.00	1.75 max.	1.27 typ.	0.10~ 0.25	0.41~ 1.27	0.18~ 0.25	0°~8°	MS-012
14	5.79~ 6.20	3.81~ 3.99	0.30~ 0.51	8.56~ 8.74	1.75 max.	1.27 typ.	0.10~ 0.25	0.41~ 1.27	0.18~ 0.25	0°~8°	MS-012

150mil NSOP

• unit: inch

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
16	0.228~ 0.244	0.150~ 0.157	0.012~ 0.020	0.386~ 0.394	0.069 max.	0.050 typ.	0.004~ 0.010	0.016~ 0.050	0.007~ 0.010	0°~8°	MS-012

• unit: mm

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
16	5.79~ 6.20	3.81~ 3.99	0.30~ 0.51	9.80~ 10.01	1.75 max.	1.27 typ.	0.10~ 0.25	0.41~ 1.27	0.18~ 0.25	0°~8°	MS-012

300mil SOP

• unit: inch

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
16	0.393~ 0.419	0.256~ 0.300	0.012~ 0.020	0.398~ 0.413	0.104 max.	0.050 typ.	0.004~ 0.012	0.016~ 0.050	0.008~ 0.013	0°~8°	MS-013
18	0.393~ 0.419	0.256~ 0.300	0.012~ 0.020	0.447~ 0.463	0.104 max.	0.050 typ.	0.004~ 0.012	0.016~ 0.050	0.008~ 0.013	0°~8°	MS-013
20	0.393~ 0.419	0.256~ 0.300	0.012~ 0.020	0.496~ 0.512	0.104 max.	0.050 typ.	0.004~ 0.012	0.016~ 0.050	0.008~ 0.013	0°~8°	MS-013
24	0.393~ 0.419	0.256~ 0.300	0.012~ 0.020	0.598~ 0.613	0.104 max.	0.050 typ.	0.004~ 0.012	0.016~ 0.050	0.008~ 0.013	0°~8°	MS-013
28	0.393~ 0.419	0.256~ 0.300	0.012~ 0.020	0.697~ 0.713	0.104 max.	0.050 typ.	0.004~ 0.012	0.016~ 0.050	0.008~ 0.013	0°~8°	MS-013

• unit: mm

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
16	9.98~ 10.64	6.50~ 7.62	0.30~ 0.51	10.11~ 10.49	2.64 max.	1.27 typ.	0.10~ 0.30	0.41~ 1.27	0.20~ 0.33	0°~8°	MS-013
18	9.98~ 10.64	6.50~ 7.62	0.30~ 0.51	11.35~ 11.76	2.64 max.	1.27 typ.	0.10~ 0.30	0.41~ 1.27	0.20~ 0.33	0°~8°	MS-013
20	9.98~ 10.64	6.50~ 7.62	0.30~ 0.51	12.60~ 13.00	2.64 max.	1.27 typ.	0.10~ 0.30	0.41~ 1.27	0.20~ 0.33	0°~8°	MS-013
24	9.98~ 10.64	6.50~ 7.62	0.30~ 0.51	15.19~ 15.57	2.64 max.	1.27 typ.	0.10~ 0.30	0.41~ 1.27	0.20~ 0.33	0°~8°	MS-013
28	9.98~ 10.64	6.50~ 7.62	0.30~ 0.51	17.70~ 18.11	2.64 max.	1.27 typ.	0.10~ 0.30	0.41~ 1.27	0.20~ 0.33	0°~8°	MS-013

330mil SOP

• unit: inch

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
28	0.453~ 0.500	0.324~ 0.350	0.014~ 0.020	0.697~ 0.728	0.100~ 0.120	0.050 typ.	0.002~ 0.014	0.016~ 0.050	0.006~ 0.013	0°~8°	MS-059

• unit: mm

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
28	11.51~ 12.70	8.23~ 8.89	0.36~ 0.51	17.70~ 18.49	2.54~ 3.05	1.27 typ.	0.05~ 0.36	0.41~ 1.27	0.15~ 0.32	0°~8°	MS-059

450mil SOP

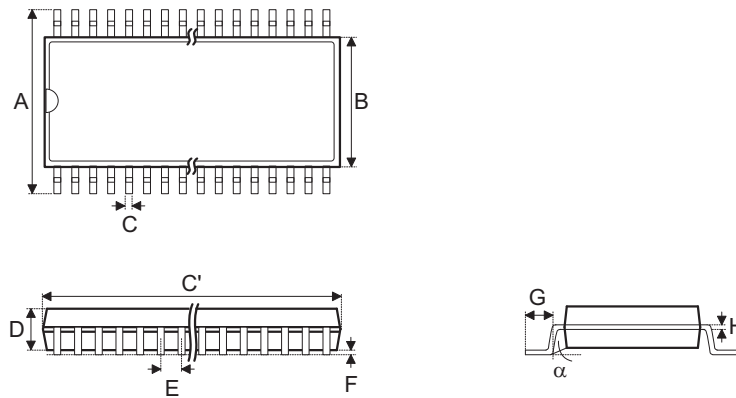
• unit: inch

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
32	0.530~ 0.580	0.437~ 0.445	0.014~ 0.020	0.799~ 0.815	0.100~ 0.120	0.050 typ.	0.004~ 0.014	0.016~ 0.050	0.006~ 0.013	0°~8°	MS-099

• unit: inch

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
32	13.46~ 14.73	11.10~ 11.30	0.36~ 0.51	20.29~ 20.70	2.54~ 3.05	1.27 typ.	0.10~ 0.36	0.41~ 1.27	0.15~ 0.32	0°~8°	MS-099

SSOP Outline Dimensions



- 150mil
- ♦ unit: inch

Pin	Parameter									
	A	B	C	C'	D	E	F	G	H	$\alpha$
16	0.228~0.244	0.150~0.157	0.008~0.012	0.189~0.197	0.054~0.060	0.025 typ.	0.004~0.010	0.022~0.028	0.007~0.010	0°~8°
20	0.228~0.244	0.150~0.158	0.008~0.012	0.335~0.347	0.049~0.065	0.025 typ.	0.004~0.010	0.015~0.050	0.007~0.010	0°~8°
24	0.228~0.244	0.150~0.157	0.008~0.012	0.335~0.346	0.054~0.060	0.025 typ.	0.004~0.010	0.022~0.028	0.007~0.010	0°~8°
28	0.228~0.244	0.150~0.157	0.008~0.012	0.386~0.394	0.054~0.060	0.025 typ.	0.004~0.010	0.022~0.028	0.007~0.010	0°~8°

- ♦ unit: mm

Pin	Parameter									
	A	B	C	C'	D	E	F	G	H	$\alpha$
16	5.79~6.20	3.81~3.99	0.20~0.30	4.80~5.00	1.37~1.52	0.64 typ.	0.10~0.25	0.56~0.71	0.18~0.25	0°~8°
20	5.79~6.20	3.81~4.01	0.20~0.30	8.51~8.81	1.24~1.65	0.64 typ.	0.10~0.25	0.38~1.27	0.18~0.25	0°~8°
24	5.79~6.20	3.81~3.99	0.20~0.30	8.51~8.79	1.37~1.52	0.64 typ.	0.10~0.25	0.56~0.71	0.18~0.25	0°~8°
28	5.79~6.20	3.81~3.99	0.20~0.30	9.80~10.01	1.37~1.52	0.64 typ.	0.10~0.25	0.56~0.71	0.18~0.25	0°~8°

- 209mil
- ♦ unit: inch

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
20	0.291~ 0.323	0.197~ 0.220	0.009~ 0.013	0.272~ 0.295	0.079 max.	0.026 typ.	0.002 min.	0.022~ 0.037	0.004~ 0.008	0°~8°	MO-150
24	0.291~ 0.323	0.197~ 0.220	0.009~ 0.013	0.311~ 0.335	0.079 max.	0.026 typ.	0.002 min.	0.022~ 0.037	0.004~ 0.008	0°~8°	MO-150
28	0.291~ 0.323	0.197~ 0.220	0.009~ 0.013	0.390~ 0.413	0.079 max.	0.026 typ.	0.002 min.	0.022~ 0.037	0.004~ 0.008	0°~8°	MO-150
30	0.291~ 0.323	0.197~ 0.220	0.009~ 0.013	0.390~ 0.513	0.079 max.	0.026 typ.	0.002 min.	0.022~ 0.037	0.004~ 0.008	0°~8°	MO-150

- ♦ unit: mm

Pin	Parameter										Remark
	A	B	C	C'	D	E	F	G	H	$\alpha$	
20	7.40~ 8.20	5.00~ 5.60	0.22~ 0.33	6.90~ 7.50	2.00 max.	0.65 typ.	0.05 min.	0.55~ 0.95	0.09~ 0.21	0°~8°	MO-150
24	7.40~ 8.20	5.00~ 5.60	0.22~ 0.33	7.90~ 8.50	2.00 max.	0.65 typ.	0.05 min.	0.55~ 0.95	0.09~ 0.21	0°~8°	MO-150
28	7.40~ 8.20	5.00~ 5.60	0.22~ 0.33	9.90~ 10.50	2.00 max.	0.65 typ.	0.05 min.	0.55~ 0.95	0.09~ 0.21	0°~8°	MO-150
30	7.40~ 8.20	5.00~ 5.60	0.22~ 0.33	9.90~ 10.50	2.00 max.	0.65 typ.	0.05 min.	0.55~ 0.95	0.09~ 0.21	0°~8°	MO-150

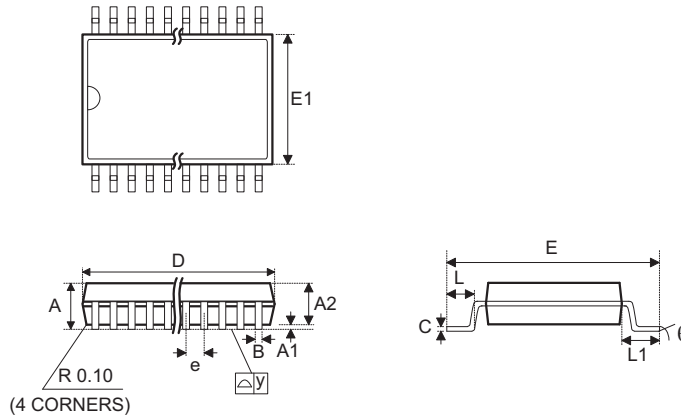
- 300mil
- ♦ unit: inch

Pin	Parameter										$\alpha$
	A	B	C	C'	D	E	F	G	H		
48	0.395~ 0.420	0.291~ 0.299	0.008~ 0.012	0.613~ 0.637	0.085~ 0.099	0.025 typ.	0.004~ 0.010	0.025~ 0.035	0.004~ 0.012	0°~8°	
56	0.395~ 0.420	0.291~ 0.299	0.008~ 0.012	0.720~ 0.730	0.089~ 0.099	0.025 typ.	0.004~ 0.010	0.025~ 0.035	0.004~ 0.012	0°~8°	

- ♦ unit: mm

Pin	Parameter										$\alpha$
	A	B	C	C'	D	E	F	G	H		
48	10.03~10.67	7.39~7.59	0.20~0.30	15.57~ 16.18	2.16~ 2.51	0.64 typ.	0.10~ 0.25	0.64~ 0.89	0.10~ 0.30	0°~8°	
56	10.03~10.67	7.39~7.59	0.20~0.30	18.29~ 18.54	2.26~ 2.51	0.64 typ.	0.10~ 0.25	0.64~ 0.89	0.10~ 0.30	0°~8°	

TSSOP Outline Dimensions



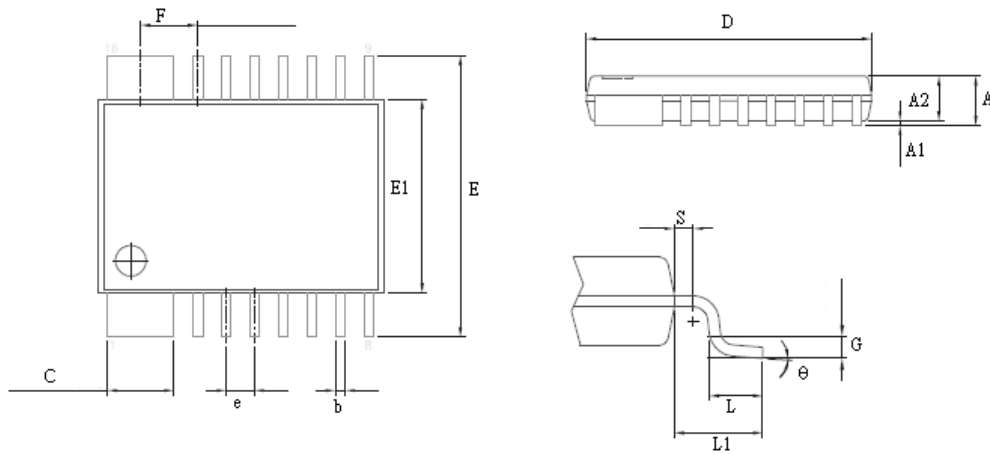
• Unit: inch

Pin	Parameter														Remark
	A	A1	A2	B	C	D	E	E1	e	L	L1	y	θ		
8	0.041~0.047	0.002~0.006	0.031~0.041	0.010 typ.	0.004~0.006	0.114~0.122	0.244~0.260	0.169~0.177	0.026 typ.	0.020~0.028	0.035~0.043	0.004 max.	0°~8°		
16	0.039~0.041	0.002~0.006	0.041~0.047	0.010 typ.	0.004~0.006	0.193~0.201	0.244~0.260	0.169~0.177	0.026 typ.typ.	0.020~0.028	—	0.003 max.	0°~8°		
20	0.041~0.047	0.002~0.006	0.037~0.041	0.009 typ.	0.005~0.007	0.252~0.260	0.248~0.256	0.169~0.177	0.026 typ.	0.018~0.030	—	0.004 max.	0°~8°		
24	0.047 max.	0.000~0.006	0.031~0.041	0.007~0.012	0.005~0.007	0.303~0.311	0.252 typ.	0.169~0.177	0.026 typ.	0.018~0.030	0.039 typ.	0.002 typ.	0°~8°		
8 MSOP	0.043 max.	0.000~0.006	0.030~0.037	0.009~0.013	0.003~0.009	0.012 typ.	0.193 typ.	0.118 typ.	0.026 typ.	0.016~0.031	0.037 typ.	0.004 max.	0°~8°	MO-187	
10 MSOP	0.043 max.	0.000~0.006	0.030~0.037	0.007~0.011	0.010 max.	0.012 typ.	0.193 typ.	0.118 typ.	0.020 typ.	0.016~0.031	0.037 typ.	—	0°~8°		

• Unit: mm

Pin	Parameter														Remark
	A	A1	A2	B	C	D	E	E1	e	L	L1	y	θ		
8	1.05~1.20	0.05~0.15	0.80~1.05	0.25 typ.	0.11~0.15	2.90~3.10	6.20~6.60	4.30~4.50	0.65 typ.	0.50~0.70	0.90~1.10	0.1 max.	0°~8°		
16	1.00~1.05	0.05~0.15	1.05~1.20	0.25 typ.	0.11~0.15	4.90~5.10	6.20~6.60	4.30~4.50	0.65 typ.	0.50~0.70	—	0.076 max.	0°~8°		
20	1.05~1.20	0.05~0.15	0.95~1.05	0.22 typ.	0.13~0.17	6.40~6.60	6.30~6.50	4.30~4.50	0.65 typ.	0.45~0.75	—	0.10 max.	0°~8°		
24	1.20 max.	0.00~0.15	0.80~1.05	0.19~0.30	0.13~0.17	7.70~7.90	6.40 typ.	4.30~4.50	0.65 typ.	0.45~0.75	1.00 typ.	0.05 typ.	0°~8°		
8 MSOP	1.10 max.	0.00~0.15	0.75~0.95	0.22~0.33	0.08~0.23	3.00 typ.	4.90 typ.	3.00 typ.	0.65 typ.	0.40~0.80	0.95 typ.	0.10 max.	0°~8°	MO-187	
10 MSOP	1.10 max.	0.00~0.15	0.75~0.95	0.17~0.27	0.25 max.	3.00 typ.	4.90 typ.	3.00 typ.	0.50 typ.	0.40~0.80	0.95 typ.	—	0°~8°		

Wing-type TSSOP Outline Dimensions



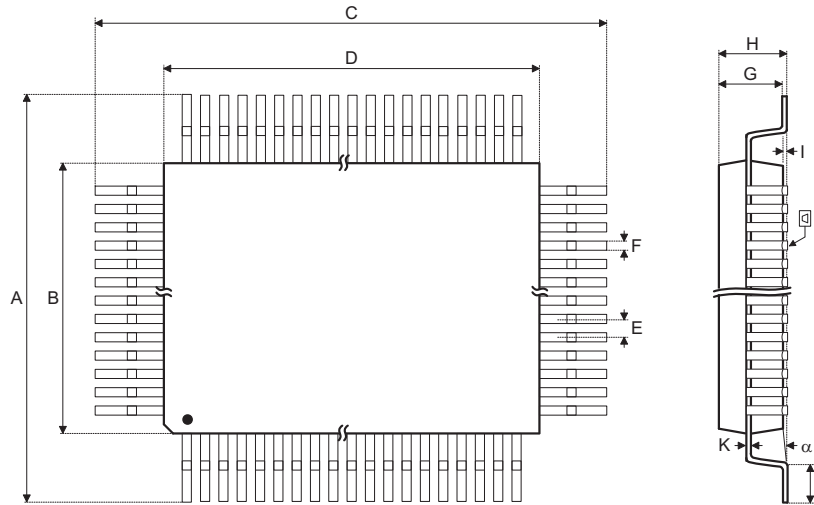
• Unit: inch

Pin	Parameter														
	A	A1	A2	b	C	D	E	E1	e	L	L1	F	G	S	θ
16	0.047 max.	0.002~ 0.006	0.031~ 0.041	0.007~ 0.012	0.060 typ.	0.252~ 0.260	0.252 typ.	0.169~ 0.177	0.026 typ.	0.020~ 0.030	0.039 typ.	0.051 typ.	0.098 typ.	0.008 min.	0°~8°

• Unit: mm

Pin	Parameter														
	A	A1	A2	b	C	D	E	E1	e	L	L1	F	G	S	θ
16	1.20 max.	0.05~ 0.15	0.80~ 1.05	0.19~ 0.30	1.52 typ.	6.40~ 6.60	6.40 typ.	4.30~ 4.50	0.65 typ.	0.50~ 0.75	1.00 typ.	1.30 typ.	0.25 typ.	0.20 min.	0°~8°

QFP/LQFP/TQFP Outline Dimensions (Unit: mm)



QFP

Pin	Parameter												
	A	B	C	D	E	F	G	H	I	J	K	L	$\alpha$
44 (10×10)	13~ 13.4	9.9~ 10.1	13~ 13.4	9.9~ 10.1	0.80 typ.	0.30 typ.	1.9~ 2.2	2.7 max.	0.25~ 0.50	0.73~ 0.93	0.1~ 0.2	0.1	0°~7°
52 (14×14)	17.3~ 17.5	13.9~ 14.1	17.3~ 17.5	13.9~ 14.1	1.00 typ.	0.40 typ.	2.5~ 3.1	3.4 max.	0.10 typ.	0.73~ 1.03	0.1~ 0.2	—	0°~7°
64 (14×14)	17.2	14.0	17.2	14.0	0.80 typ.	0.35 typ.	1.8~ 2.2	2.7 max.	0.25~ 0.50	0.73~ 0.93	0.1~ 0.2	—	0°~7°
64 (14×20)	18.8~ 19.2	13.9~ 14.1	24.8~ 25.2	19.9~ 20.1	1.00 typ.	0.40 typ.	2.5~ 3.1	3.4 max.	0.1 typ.	1.15~ 1.45	0.1~ 0.2	—	0°~7°
80 (14×20)	17.7~ 18.2	13.9~ 14.1	23.7~ 24.1	19.9~ 20.1	0.80 typ.	0.40 typ.	2.5~ 3.1	3.4 max.	0.1 typ.	0.73~ 1.03	0.1~ 0.2	—	0°~7°
100 (14×20)	18.5~ 19.2	13.9~ 14.1	24.5~ 25.2	19.9~ 20.1	0.65 typ.	0.30 typ.	2.5~ 3.1	3.4 max.	0.1 typ.	1~ 1.4	0.1~ 0.2	—	0°~7°
128 (14×20)	17.0~ 17.5	13.9~ 14.1	23.0~ 23.5	19.9~ 20.1	0.50 typ.	0.20 typ.	2.5~ 3.1	3.4 max.	0.1 typ.	0.65~ 0.95	0.1~ 0.2	—	0°~7°
208 (28×28)	31~ 31.4	27.9~ 28.1	31~ 31.4	27.9~ 28.1	0.50 typ.	0.20 typ.	3.1~ 3.4	3.7 max.	0.1 typ.	0.35~ 0.65	0.1~ 0.2	—	0°~7°

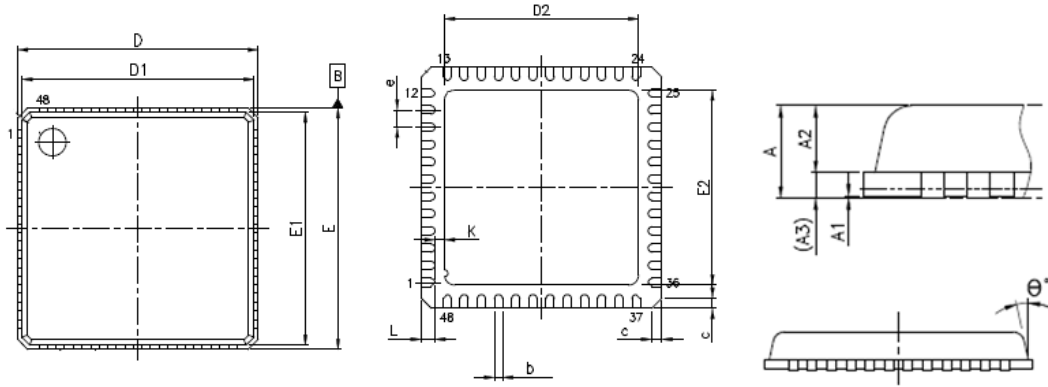
LQFP

Pin	Parameter												
	A	B	C	D	E	F	G	H	I	J	K	$\alpha$	
32 (7×7)	8.9~ 9.1	6.9~ 7.1	8.9~ 9.1	6.9~ 7.1	0.8 typ.	0.35 typ.	1.35~ 1.45	1.6 max.	0.1 typ.	0.45~ 0.75	0.1~ 0.2	—	0°~7°
44 (10×10)	11.9~ 12.1	9.9~ 10.1	11.9~ 12.1	9.9~ 10.1	0.8 typ.	0.3 typ.	1.35~ 1.45	1.6 max.	0.1 typ.	0.45~ 0.75	0.1~ 0.2	—	0°~7°
48 (7×7)	8.9~ 9.1	6.9~ 7.1	8.9~ 9.1	6.9~ 7.1	0.5 typ.	0.2 typ.	1.35~ 1.45	1.6 max.	0.1 typ.	0.45~ 0.75	0.1~ 0.2	—	0°~7°
64 (7×7)	8.9~ 9.1	6.9~ 7.1	8.9~ 9.1	6.9~ 7.1	0.4 typ.	0.13~ 0.23	1.35~ 1.45	1.6 max.	0.05~ 0.15	0.45~ 0.75	0.09~ 0.20	—	0°~7°
64 (10×10)	11.9~ 12.1	9.9~ 10.1	11.9~ 12.1	9.9~ 10.1	0.5 typ.	0.2 typ.	1.35~ 1.45	1.6 max.	0.1 typ.	0.45~ 0.75	0.1~ 0.2	—	0°~7°
80 (10×10)	11.9~ 12.1	9.9~ 10.1	11.9~ 12.1	9.9~ 10.1	0.4 typ.	0.16 typ.	1.35~ 1.45	1.6 max.	0.1 typ.	0.45~ 0.75	0.1~ 0.2	—	0°~7°
80 (12×12)	13.9~ 14.1	11.9~ 12.1	13.9~ 14.1	11.9~ 12.1	0.5 typ.	0.2 typ.	1.35~ 1.45	1.6 max.	0.1 typ.	0.45~ 0.75	0.1~ 0.2	—	0°~7°
100 (14×14)	15.9~ 16.1	13.9~ 14.1	15.9~ 16.1	13.9~ 14.1	0.5 typ.	0.2 typ.	1.35~ 1.45	1.6 max.	0.1 typ.	0.45~ 0.75	0.1~ 0.2	—	0°~7°
144 (20×20)	21.9~ 22.1	19.9~ 20.1	21.9~ 22.1	19.9~ 20.1	0.5 typ.	0.2 typ.	1.35~ 1.45	1.6 max.	0.1 typ.	0.45~ 0.75	0.1~ 0.2	—	0°~7°

TQFP

Pin	Parameter											
	A	B	C	D	E	F	G	H	I	J	K	$\alpha$
100 (14×14)	15.9~ 16.1	13.9~ 14.1	15.9~ 16.1	13.9~ 14.1	0.5 typ.	0.2 typ.	0.95~ 1.05	1.2 max.	0.1 typ.	0.45~ 0.75	0.1~ 0.2	0°~7°

Punched Type QFN Outline Dimensions



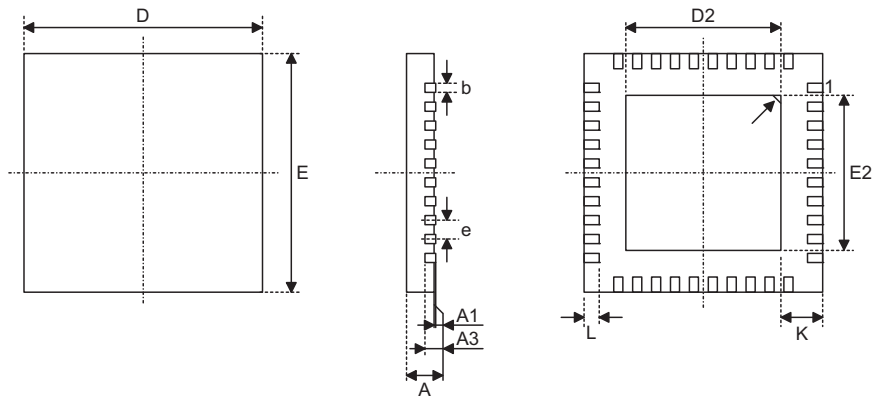
• unit: inch

Pin	Parameter															
	A	A1	A2	A3	b	c	D	E	D1	E1	D2	E2	e	L	$\theta$	Remark
48 (7×7mm)	0.031~ 0.039	0.000~ 0.002	0.026 typ.	0.008 typ.	0.007~ 0.012	0.009~ 0.024	0.354 typ.	0.354 typ.	0.262~ 0.270	0.262~ 0.270	0.197~ 0.213	0.197~ 0.213	0.020 typ.	0.012~ 0.020	0°~ 12°	GTK
64 (9×9mm)	0.031~ 0.039	0.000~ 0.002	0.026 typ.	0.008 typ.	0.007~ 0.012	0.009~ 0.024	0.354 typ.	0.354 typ.	0.344 typ.	0.344 typ.	0.236~ 0.295	0.236~ 0.295	0.020 typ.	0.012~ 0.020	0°~ 12°	GTK

• unit: mm

Pin	Parameter															
	A	A1	A2	A3	b	c	D	E	D1	E1	D2	E2	e	L	$\theta$	Remark
48 (7×7mm)	0.8~ 1.0	0.00~ 0.05	0.65 typ.	0.203 typ.	0.18~ 0.30	0.24~ 0.60	9 typ.	9 typ.	6.65~ 6.85	6.65~ 8.85	5.00~ 5.40	5.00~ 5.40	0.5 typ.	0.3~ 0.5	0°~ 12°	GTK
64 (9×9mm)	0.8~ 1.0	0.00~ 0.05	0.65 typ.	0.200 typ.	0.18~ 0.30	0.24~ 0.60	9 typ.	9 typ.	8.75 typ.	8.75 typ.	6.00 7.50~	6.00~ 7.50	0.5 typ.	0.3~ 0.5	0°~ 12°	GTK

SAW Type QFN Outline Dimensions



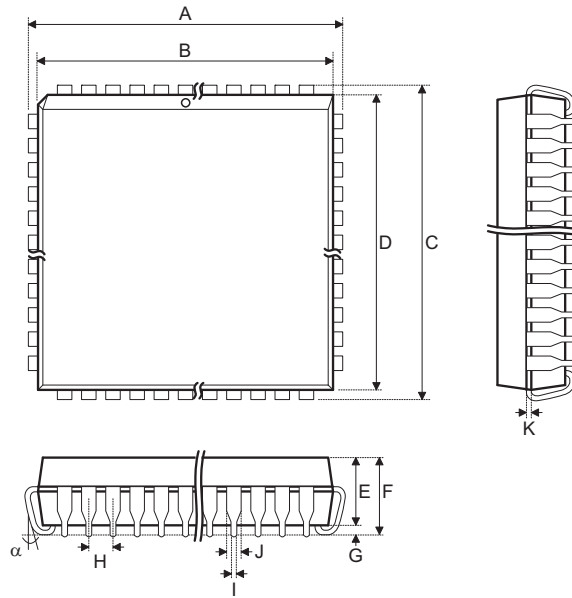
• Unit: inch

Pin	Parameter											Remark
	A	A1	A3	b	D	E	e	D2	E2	L	K	
16 (3×3mm)	0.028~0.031	0.000~0.002	0.008 typ.	0.007~0.012	0.118 typ.	0.118 typ.	0.020 typ.	0.063~0.069	0.063~0.069	0.012~0.016	—	GTK
16 (4×4mm)	0.028~0.031	0.000~0.002	0.008 typ.	0.010~0.014	0.157 typ.	0.157 typ.	0.026 typ.	0.079~0.085	0.079~0.085	0.014~0.018	—	GTK
20 (5×5mm)	0.028~0.031	0.000~0.002	0.008 typ.	0.010~0.014	0.197 typ.	0.197 typ.	0.026 typ.	0.118~0.124	0.118~0.126	0.018~0.026	0.008 min.	GTK
32 (5×5mm)	0.028~0.031	0.000~0.002	0.008 typ.	0.007~0.012	0.197 typ.	0.197 typ.	0.020 typ.	0.122~0.130	0.122~0.130	0.014~0.018	0.008 min.	ASECL
40 (5×5mm)	0.028~0.031	0.000~0.002	0.008 typ.	0.006~0.010	0.197 typ.	0.197 typ.	0.016 typ.	0.126~0.134	0.126~0.134	0.014~0.018	—	TICP
40 (6×6mm)	0.028~0.031	0.000~0.002	0.008 typ.	0.007~0.012	0.236 typ.	0.236 typ.	0.020 typ.	0.173~0.179	0.173~0.179	0.014~0.018	0.008 min.	GTK
48 (7×7mm)	0.031~0.035	0.000~0.002	0.008 typ.	0.007~0.012	0.276 typ.	0.276 typ.	0.020 typ.	0.219~0.226	0.219~0.226	0.014~0.018	—	ASECL
56 (8×8mm)	0.031~0.035	0.000~0.002	0.008 typ.	0.008~0.012	0.315 typ.	0.315 typ.	0.020 typ.	0.234~0.242	0.234~0.242	0.014~0.018	—	ASECL

• Unit: mm

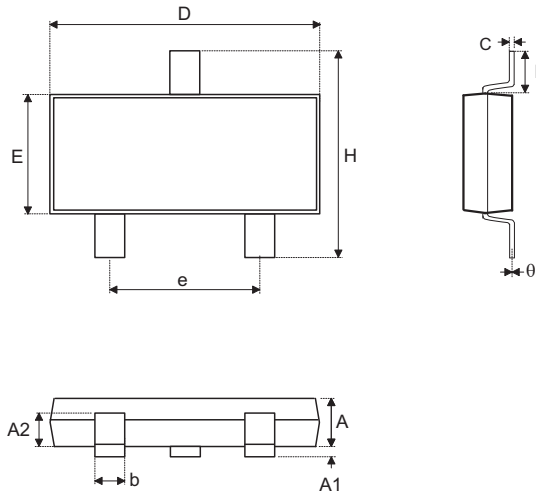
Pin	Parameter											Remark
	A	A1	A3	b	D	E	e	D2	E2	L	K	
16 (3×3mm)	0.70~0.80	0.00~0.05	0.200 typ.	0.18~0.30	3.0 typ.	3.0 typ.	0.50 typ.	1.60~1.75	1.60~1.75	0.30~0.40	—	GTK
16 (4×4mm)	0.70~0.80	0.00~0.05	0.200 typ.	0.25~0.35	4.0 typ.	4.0 typ.	0.65 typ.	2.00~2.15	2.00~2.15	0.35~0.45	—	GTK
20 (5×5mm)	0.70~0.80	0.00~0.05	0.200 typ.	0.25~0.35	5.0 typ.	5.0 typ.	0.65 typ.	3.00~3.15	3.00~3.15	0.45~0.65	0.2 min.	GTK
32 (5×5mm)	0.70~0.80	0.00~0.05	0.200 typ.	0.18~0.30	5.0 typ.	5.0 typ.	0.5 typ.	3.10~3.30	3.10~3.30	0.35~0.45	0.2 min.	ASECL
40 (5×5mm)	0.70~0.80	0.00~0.05	0.203 typ.	0.15~0.25	5.0 typ.	5.0 typ.	0.4 typ.	3.20~3.40	3.20~3.40	0.35~0.45	—	TICP
40 (6×6mm)	0.70~0.80	0.00~0.05	0.200 typ.	0.18~0.30	6.0 typ.	6.0 typ.	0.5 typ.	4.40~4.55	4.40~4.55	0.35~0.45	0.2 min.	GTK
48 (7×7mm)	0.80~0.90	0.00~0.05	0.203 typ.	0.18~0.30	7.0 typ.	7.0 typ.	0.5 typ.	5.55~5.75	5.55~5.75	0.35~0.45	—	ASECL
56 (8×8mm)	0.80~0.90	0.00~0.05	0.203 typ.	0.20~0.30	8.0 typ.	8.0 typ.	0.5 typ.	5.95~6.15	5.95~6.15	0.35~0.45	—	ASECL

PLCC Outline Dimensions (Unit: mil)



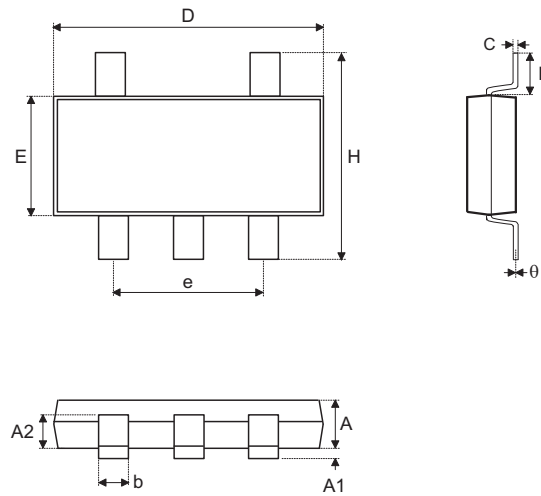
Pin	Parameter											
	A	B	C	D	E	F	G	H	I	J	K	α
32	485~495	445~455	585~595	545~555	105~115	140 max.	15 min.	50 typ.	16~22	24~32	8~12	0°~10°
44	680~700	648~658	680~700	648~658	145~155	190 max.	20 min.	50 typ.	16~22	24~32	8~12	0°~10°

**SOT23 Outline Dimensions (Unit: mm)**



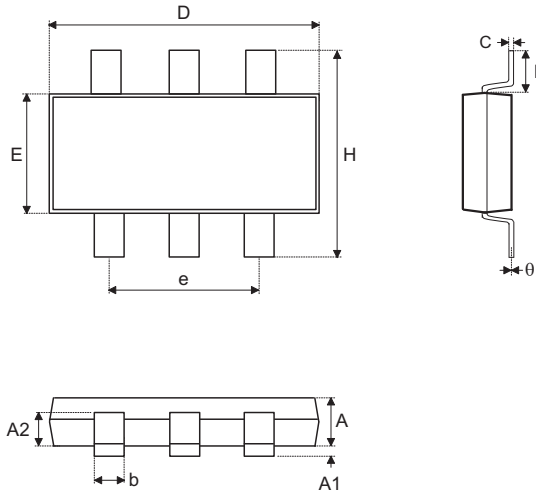
Pin	Parameter										
	A	A1	A2	b	C	D	E	e	H	L	$\theta$
3	1~1.3	0.1 max.	0.7~0.9	0.35~0.5	0.1~0.25	2.7~3.1	1.4~1.8	1.9 typ.	2.6~3	0.37 min.	1°~9°

**SOT23-5 Outline Dimensions (Unit: mm)**



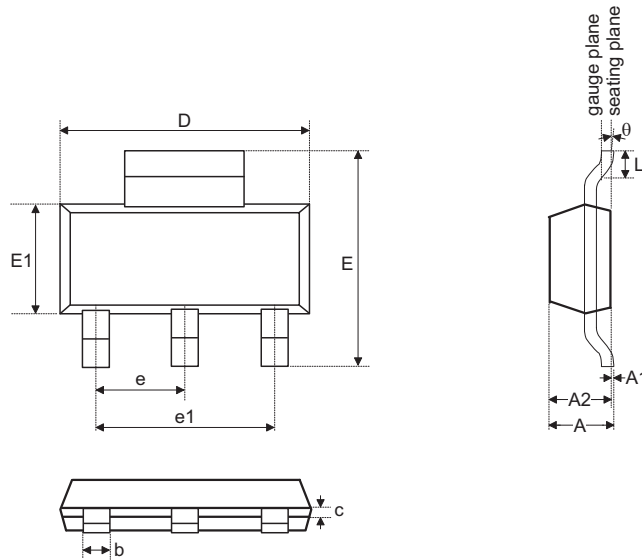
Pin	Parameter										
	A	A1	A2	b	C	D	E	e	H	L	$\theta$
5	1~1.3	0.1 max.	0.7~0.9	0.35~0.5	0.1~0.25	2.7~3.1	1.4~1.8	1.9 typ.	2.6~3	0.37 min.	1°~9°

**SOT23-6 Outline Dimensions (Unit: mm)**



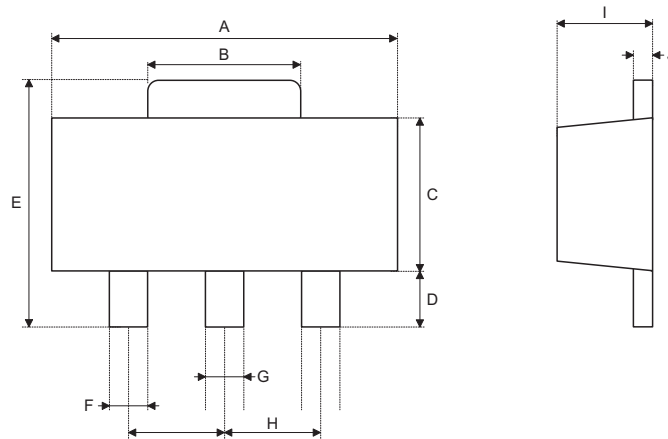
Pin	Parameter										
	A	A1	A2	b	C	D	E	e	H	L	$\theta$
6	1~1.3	0.1 max.	0.7~0.9	0.35~0.5	0.1~0.25	2.7~3.1	1.4~1.8	1.9 typ.	2.6~3	0.37 min.	1°~9°

**SOT223 Outline Dimensions (Unit: mm)**



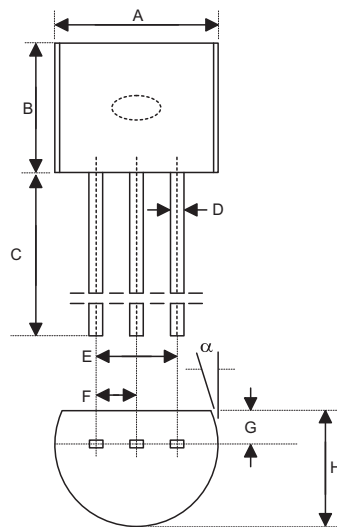
Pin	Parameter											
	A	A1	A2	b	C	D	E	E1	e	e1	L	$\theta$
4	1.8 max.	0.02~0.1	1.5~1.7	0.66~0.84	0.23~0.35	6.3~6.7	6.7~7.3	3.3~3.7	2.3 basic	4.6 basic	0.75 min.	0°~10°

**SOT89 Outline Dimensions (Unit: mil)**



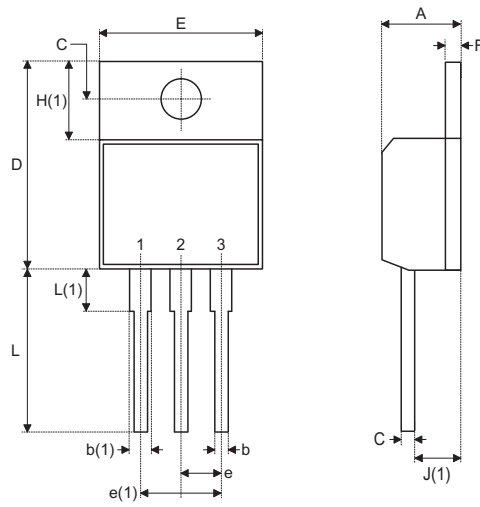
Pin	Parameter									
	A	B	C	D	E	F	G	H	I	J
3	173~181	59~72	90~102	35~47	155~167	14~19	17~22	59 typ.	55~63	14~17

**TO92 Outline Dimensions (Unit: mil)**



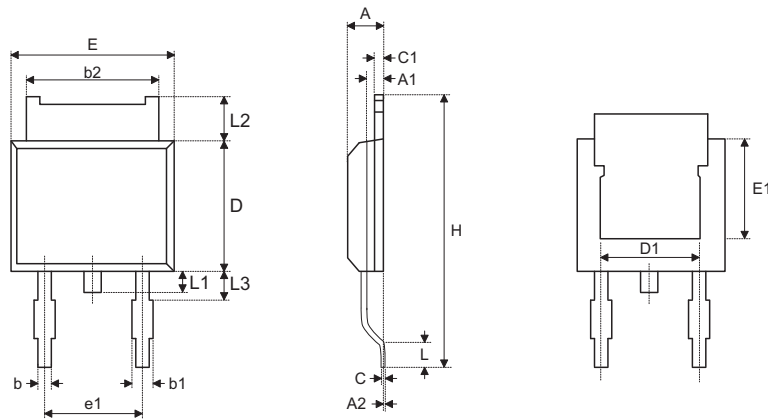
Pin	Parameter									
	A	B	C	D	E	F	G	H	I	$\alpha$
3	170~200	170~200	500 min.	11~20	90~110	45~55	45~65	130~160	8~18	4°~6°

**TO220 Outline Dimensions (Unit: mil)**



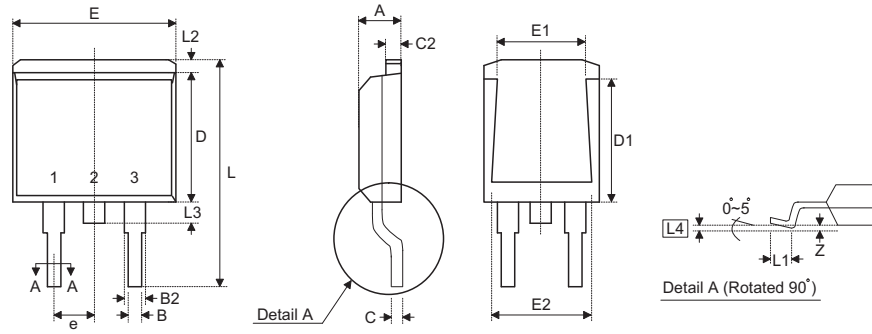
Pin	Parameter												
	A	b	b(1)	C	D	E	e	e(1)	F	H(1)	J(1)	L	L(1)
3	170~185	15~40	50~65	14~20	575~610	395~410	95~105	195~210	45~55	235~265	95~110	515~560	145~155

**TO252 Outline Dimensions (Unit: mil)**



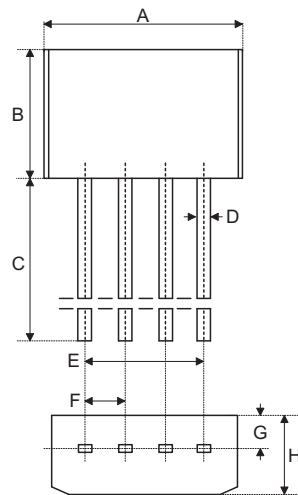
Pin	Parameter																	
	A	A1	A2	B	b1	b2	C	C1	D	D1	E	E1	e1	H	L	L1	L2	L3
3	87~94	35~45	1~9	25~35	30~45	206~215	18~23	18~23	235~245	177~197	255~265	165~175	175~185	380~410	20 min.	25~40	35~50	40~60

TO263 (DD2-PAK) Outline Dimensions (Unit: mil)



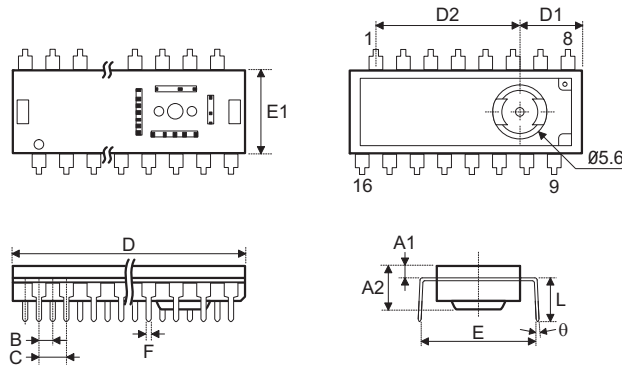
Pin	Parameter															
	A	B	B2	C	C2	D	D1	E	E1	E2	e	L	L1	L2	L3	L4
3	170~185	28~40	50~65	13~20	45~55	340~380	220~240	395~410	310~340	355~375	95~105	575~625	90~110	40~55	50~70	6~14

SIP Outline Dimensions (Unit: mil)



Pin	Parameter							
	A	B	C	D	E	F	G	H
4	203~208	141~146	543~583	13~17	148~152	48~52	27~30	59~63

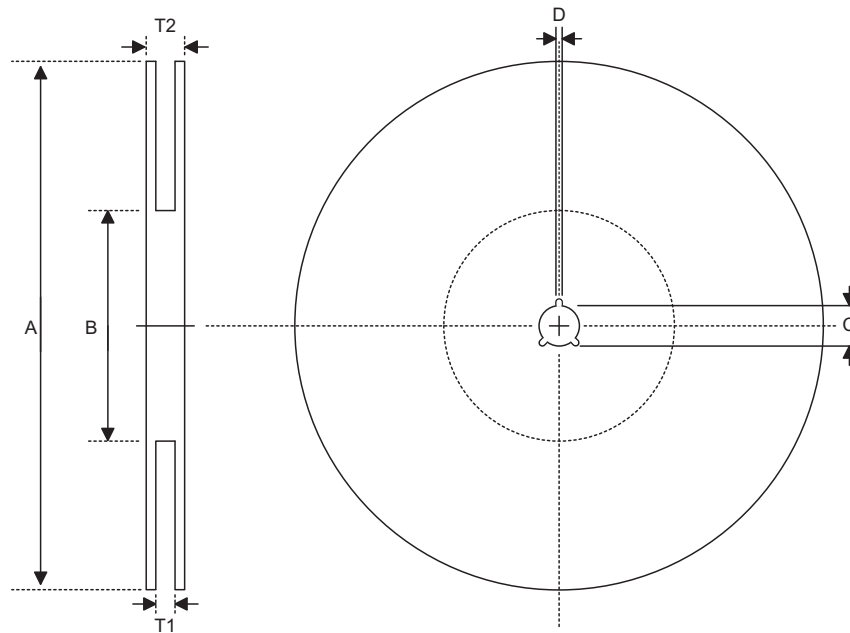
**DIP for Optical Mouse Package**



Pin	Parameter											
	A1	A2	B	C	D	D1	D2	E	E1	F	L	$\theta$
8	0.9~ 1.1	3.08~ 3.28	N.A	2.0 typ.	9.8~ 10.0	4.35~ 4.55	N.A	12.65~ 13.05	9.0~ 9.2	0.5 typ.	5.05~ 5.25	$\theta$
16	0.9~ 1.1	4.4~ 4.6	1.27 typ.	2.54 typ.	22.2~ 22.4	5.93~ 6.13	13.28~ 13.48	12.15~ 12.55	9.0~ 9.2	0.5 typ.	5.05~ 5.25	-3°~ +3°

Product Tape and Reel Specifications

Reel Dimensions (Unit: mm)



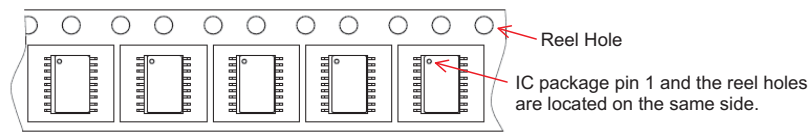
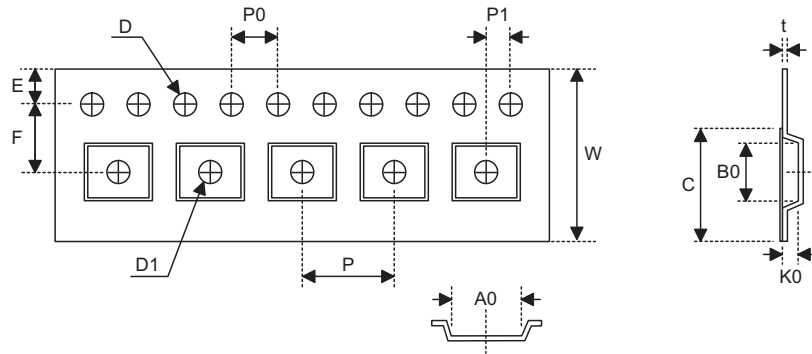
Application	A	B	C	D	T1	T2
SOP 8N	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	12.8 <sup>+0.3/-0.2</sup>	18.2±0.2
SOP 14N	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	16.8 <sup>+0.3/-0.2</sup>	22.2±0.2
SOP 16N (150mil)	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	16.8 <sup>+0.3/-0.2</sup>	22.2±0.2
SOP 16W (300mil)	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	16.8 <sup>+0.3/-0.2</sup>	22.2±0.2
SOP 18W	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	24.8 <sup>+0.3/-0.2</sup>	30.2±0.2
SOP 20W	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	24.8 <sup>+0.3/-0.2</sup>	30.2±0.2
SOP 24W	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	24.8 <sup>+0.3/-0.2</sup>	30.2±0.2
SOP 28W (300mil)	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	24.8 <sup>+0.3/-0.2</sup>	30.2±0.2
SOP 28E (330mil)	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	24.8 <sup>+0.3/-0.2</sup>	30.2±0.2
SOP 32W	330.0±1.0	100.0±0.1	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	32.8 <sup>+0.3/-0.2</sup>	38.2±0.2
SOP 44W	330.0±1.0	100.0±0.1	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	44.8 <sup>+0.3/-0.2</sup>	50.2±0.2
SSOP16S	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	12.8 <sup>+0.3/-0.2</sup>	18.2±0.2
SSOP20S (150mil)	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	16.8 <sup>+0.3/-0.2</sup>	22.2±0.2
SSOP20N (209mil)	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	16.8 <sup>+0.3/-0.2</sup>	22.2±0.2
SSOP24S (150mil)	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	16.8 <sup>+0.3/-0.2</sup>	22.2±0.2
SSOP28S (150mil)	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	16.8 <sup>+0.3/-0.2</sup>	22.2±0.2
SSOP28S (209mil)	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	28.4 <sup>+0.3/-0.2</sup>	31.1 max.
SSOP48W	330.0±1.0	100.0±0.1	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	32.2 <sup>+0.3/-0.2</sup>	38.2±0.2
TSSOP 8L	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	12.8 <sup>+0.3/-0.2</sup>	18.2±0.2
TSSOP 16L	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	16.8 <sup>+0.3/-0.2</sup>	22.2±0.2
TSSOP 20L	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	16.4 <sup>+0.3/-0.2</sup>	19.1 max.

Application	A	B	C	D	T1	T2
TSSOP 48L	330.0±1.0	100.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	16.8 <sup>+0.3/-0.2</sup>	22.2±0.2
SOJ 28	330.0±1.0	62.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	24.8 <sup>+0.3/-0.2</sup>	30.2±0.2
PLCC 32	330.0±1.0	62.0±1.5	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	24.8 <sup>+0.3/-0.2</sup>	30.2±0.2
PLCC 44	330.0±1.0	100.0±0.1	13.0 <sup>+0.5/-0.2</sup>	2.0±0.5	32.8 <sup>+0.3/-0.2</sup>	38.2±0.2
SOT223	330.0±1.0	62.0±1.5	12.75±0.15	2.0 <sup>+0.6/-0.0</sup>	12.4 <sup>+0.2/-0.0</sup>	16.4 <sup>+0.0/-0.4</sup>
SOT23	178.0±1.0	62.0±1.0	13.0±0.2	2.50±0.25	8.4 <sup>+1.5/-0.0</sup>	11.4 <sup>+1.5/-0.0</sup>
SOT23-5	178.0±1.0	62.0±1.0	13.0±0.2	2.50±0.25	8.4 <sup>+1.5/-0.0</sup>	11.4 <sup>+1.5/-0.0</sup>
SOT23-6	178.0±1.0	62.0±1.0	13.0±0.2	2.50±0.25	8.4 <sup>+1.5/-0.0</sup>	11.4 <sup>+1.5/-0.0</sup>
SOT89	180.0±1.0	62.0±1.5	12.75 <sup>+0.15/-0.00</sup>	1.90±0.15	12.4 <sup>+0.2/-0.0</sup>	17.0 <sup>+0.0/-0.4</sup>
TO252	330.0±3.0	100.0±2.0	13.0±0.5	2.0±0.5	16.4 <sup>+0.3/-0.2</sup>	21.4 <sup>+0.4/-0.0</sup>
TO263	380.0±3.0	80.0±2.0	13.0±0.5	2.0±0.5	24.0±0.4	28.4 <sup>+0.4/-0.0</sup>

Note: The cover tape is adhered to the carrier by hot meet process.

Carrier Tape Dimensions (Unit: mm)

- SSOP, SOP, NSOP, SOJ, TSSOP



SOP

Application	C	W	P	E	F	D	D1
SOP 8N	9.3±0.1	12.0 <sup>+0.3/-0.1</sup>	8.0±0.1	1.75±0.10	5.5±0.1	1.55±0.10	1.50 <sup>+0.25/-0.00</sup>
SOP 14N	13.3±0.1	16.0 <sup>+0.3/-0.1</sup>	8.0±0.1	1.75±0.10	7.5±0.1	1.50 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>
SOP 16N (150mil)	13.3±0.1	16.0±0.3	8.0±0.1	1.75±0.10	7.5±0.1	1.55 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>
SOP 16W (300mil)	13.3±0.1	16.0±0.2	12.0±0.1	1.75±0.10	7.5±0.1	1.50 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>
SOP 18W	21.3±0.1	24.0 <sup>+0.3/-0.1</sup>	16.0±0.1	1.75±0.10	11.5±0.1	1.50±0.10	1.50 <sup>+0.25/-0.00</sup>
SOP 20W	21.3±0.1	24.0 <sup>+0.3/-0.1</sup>	12.0±0.1	1.75±0.10	11.5±0.1	1.50 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>
SOP 24W	21.3±0.1	24.0±0.3	12.0±0.1	1.75±0.10	11.5±0.1	1.55 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>
SOP 28W (300mil)	21.3±0.1	24.0±0.3	12.0±0.1	1.75±0.10	11.5±0.1	1.50 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>
SOP 28E (330mil)	21.3±0.1	24.0 <sup>+0.3/-0.1</sup>	16.0±0.1	1.75±0.10	11.5±0.1	1.55 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>

Application	P0	P1	A0	B0	K0	t
SOP 8N	4.0±0.1	2.0±0.1	6.40±0.10	5.20±0.10	2.10±0.10	0.30±0.05
SOP 14N	4.0±0.1	2.0±0.1	6.50±0.10	9.50±0.10	2.10±0.10	0.30±0.05
SOP 16N (150mil)	4.0±0.1	2.0±0.1	6.50±0.10	10.30±0.10	2.10±0.10	0.30±0.05
SOP 16W (300mil)	4.0±0.1	2.0±0.1	10.90±0.10	10.80±0.10	3.00±0.10	0.30±0.05
SOP 18W	4.0±0.1	2.0±0.1	10.90±0.10	12.00±0.10	2.80±0.10	0.30±0.05
SOP 20W	4.0±0.1	2.0±0.1	10.80±0.10	13.30±0.10	3.20±0.10	0.30±0.05
SOP 24W	4.0±0.1	2.0±0.1	10.90±0.10	15.90±0.10	3.10±0.10	0.35±0.05
SOP 28W (300mil)	4.0±0.1	2.0±0.1	10.85±0.10	18.34±0.10	2.97±0.10	0.35±0.01
SOP 28E (330mil)	4.0±0.1	2.0±0.1	12.32±0.10	18.80±0.10	3.00±0.10	0.30±0.05

**SSOP**

Application	C	W	P	E	F	D	D1
SSOP16S	9.3±0.1	12.0 <sup>+0.3/-0.1</sup>	8.0±0.1	1.75±0.10	5.5±0.1	1.55±0.10	1.50 <sup>+0.25/-0.00</sup>
SSOP20S (150mil)	13.3±0.1	16.0 <sup>+0.3/-0.1</sup>	8.0±0.1	1.75±0.10	7.5±0.1	1.50 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>
SSOP20N (209mil)	13.3±0.1	16.0 <sup>+0.3/-0.1</sup>	12.0±0.1	1.75±0.10	7.5±0.1	1.50 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>
SSOP24S (150mil)	13.3±0.1	16.0 <sup>+0.3/-0.1</sup>	8.0±0.1	1.75±0.10	7.5±0.1	1.50 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>
SSOP28S (150mil)	13.3±0.1	16.0±0.3	8.0±0.1	1.75±0.10	7.5±0.1	1.55 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>
SSOP28S (209mil)	21.3±0.1	24.0±0.3	12.0±0.1	1.75±0.10	11.5±0.1	1.50 <sup>+0.10/-0.00</sup>	1.50 <sup>+0.25/-0.00</sup>

Application	P0	P1	A0	B0	K0	t
SSOP16S	4.0±0.1	2.0±0.1	6.4±0.1	5.20±0.1	2.1±0.1	0.30±0.05
SSOP20S (150mil)	4.0±0.1	2.0±0.1	6.5±0.1	9.00±0.1	2.3±0.1	0.30±0.05
SSOP20N (209mil)	4.0±0.1	2.0±0.1	7.1±0.1	7.20±0.1	2.0±0.1	0.30±0.05
SSOP24S (150mil)	4.0±0.1	2.0±0.1	6.5±0.1	9.50±0.1	2.1±0.1	0.30±0.05
SSOP28S (150mil)	4.0±0.1	2.0±0.1	6.5±0.1	10.30±0.1	2.1±0.1	0.30±0.05
SSOP28S (209mil)	4.0±0.2	2.0±0.1	8.4±0.1	10.65±0.10	2.4±0.1	0.30±0.05

**TSSOP**

Application	C	W	P	E	F	D	D1
TSSOP8L	9.3±0.1	12.0 <sup>+0.3/-0.1</sup>	8.0±0.1	1.75±0.10	5.5±0.5	1.50 <sup>+0.1/-0.0</sup>	1.50 <sup>+0.1/-0.0</sup>
TSSOP16L	13.3±0.1	16.0 <sup>+0.3/-0.1</sup>	8.0±0.1	1.75±0.10	7.5±0.5	1.50 <sup>+0.1/-0.0</sup>	1.50 <sup>+0.1/-0.0</sup>
TSSOP20L	13.3±0.1	16.0±0.3	8.0±0.1	1.75±0.10	7.5±0.1	1.50 <sup>+0.1/-0.0</sup>	1.50 <sup>+0.1/-0.0</sup>
TSSOP 48L	13.3±0.1	16.0±0.3	8.0±0.1	1.75±0.10	7.5±0.1	1.55 <sup>+0.1/-0.0</sup>	1.50 <sup>+0.25/-0.00</sup>

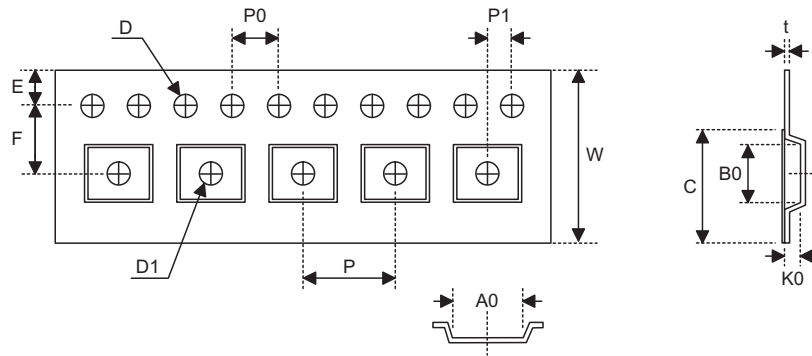
Application	P0	P1	A0	B0	K0	t
TSSOP8L	4.0±0.1	2.0±0.1	7.0±0.1	3.6±0.1	1.6±0.1	0.300±0.013
TSSOP16L	4.0±0.1	2.0±0.1	6.8±0.1	5.4±0.1	1.6±0.1	0.300±0.013
TSSOP20L	4.0±0.1	2.0±0.1	6.8±0.1	6.9±0.1	1.6±0.1	0.300±0.050
TSSOP48L	4.0±0.1	2.0±0.1	6.5±0.1	10.3±0.1	2.1±0.1	0.300±0.050

**SOJ**

Application	C	W	P	E	F	D	D1
SOJ28	9.3±0.1	24.0 <sup>+0.3/-0.1</sup>	12.0±0.1	1.75±0.10	11.5±0.1	1.5 <sup>+0.1/-0.0</sup>	1.50 <sup>+0.25/-0.00</sup>

Application	P0	P1	A0	B0	K0	t
SOJ28	4.0±0.1	2.0±0.1	9.3±0.1	18.8±0.1	4.0±0.1	0.30±0.05

- PLCC

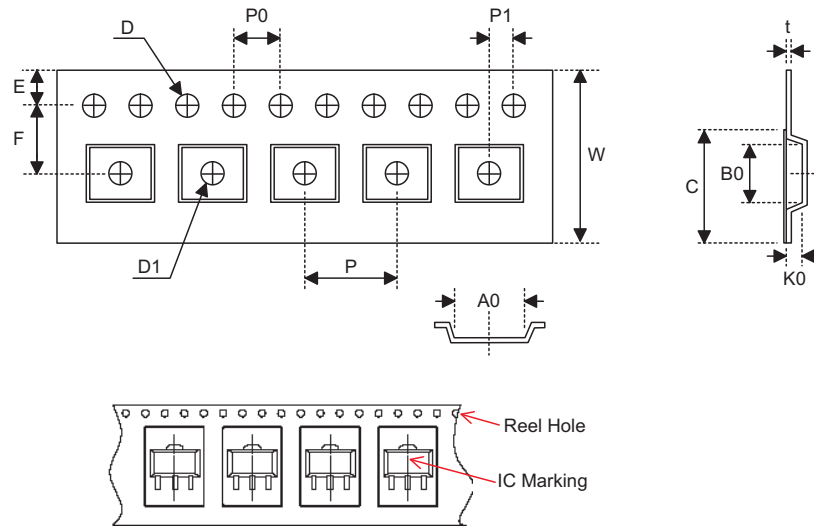


PLCC

Application	C	W	P	E	F	D	D1
PLCC32	21.3±0.1	24.0±0.3	16.0±0.1	1.75±0.10	11.5±0.1	1.5 <sup>+0.1/-0.0</sup>	1.55 <sup>+1.00/0.05</sup>

Application	P0	P1	A0	B0	K0	t
PLCC32	4.0±0.1	2.0±0.1	13.1±0.1	15.5±0.1	3.9±0.1	0.30±0.05

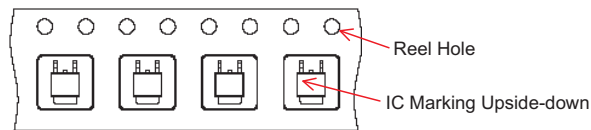
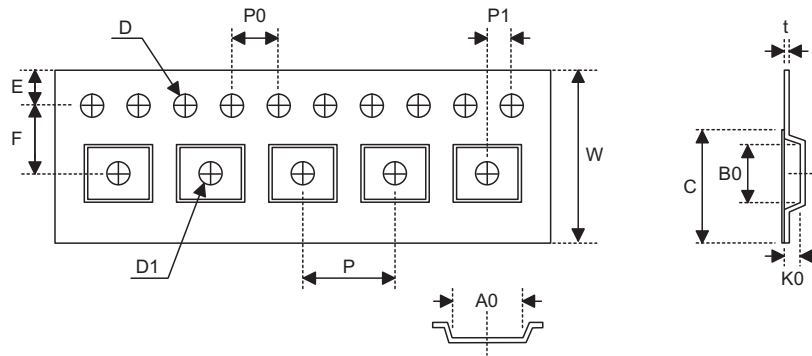
- SOT223, SOT23, SOT23-5, SOT23-6, SOT89



Application	C	W	P	E	F	D	D1
SOT23	5.3±0.1	8.0±0.3	4.0±0.1	1.75±0.10	3.50±0.05	1.5 <sup>+0.1/-0.0</sup>	1.5 <sup>+0.1/-0.0</sup>
SOT23-5	5.3±0.1	8.0±0.3	4.0±0.1	1.75±0.10	3.50±0.05	1.5 <sup>+0.1/-0.0</sup>	1.5 <sup>+0.1/-0.0</sup>
SOT23-6	5.3±0.1	8.0±0.3	4.0±0.1	1.75±0.10	3.50±0.05	1.5 <sup>+0.1/-0.0</sup>	1.5 <sup>+0.1/-0.0</sup>
SOT223	9.3±0.1	12.0±0.3	8.0±0.1	1.75±0.10	5.50±0.05	1.5 <sup>+0.1/-0.0</sup>	1.5 <sup>+0.1/-0.0</sup>
SOT89	9.3±0.1	12 <sup>+0.3/-0.1</sup>	8.0±0.1	1.75±0.10	5.50±0.05	1.5 <sup>+0.1/-0.0</sup>	1.5 <sup>+0.1/-0.0</sup>

Application	P0	P1	A0	B0	K0	t
SOT23	4.0±0.1	2.00±0.05	3.15±0.1	3.2±0.1	1.4±0.1	0.20±0.03
SOT23-5	4.0±0.1	2.00±0.05	3.15±0.1	3.2±0.1	1.4±0.1	0.20±0.03
SOT23-6	4.0±0.1	2.00±0.05	3.15±0.1	3.2±0.1	1.4±0.1	0.20±0.03
SOT223	4.0±0.1	2.00±0.05	6.9±0.1	7.5±0.1	2.1±0.1	0.30±0.05
SOT89	4.0±0.1	2.00±0.10	4.8±0.1	4.5±0.1	1.8±0.1	0.300±0.013

- TO252, TO263

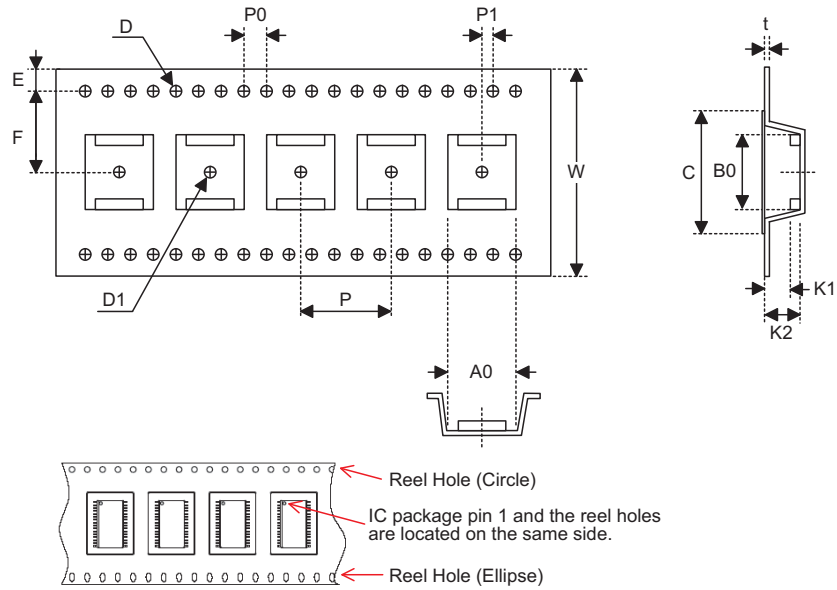


Application	C	W	P	E	F	D	D1
TO252	13.3±0.1	16.0 <sup>+0.3/-0.1</sup>	8.0±0.1	1.75±0.1	7.5±0.1	1.5±0.1	1.50 <sup>+0.25/-0.00</sup>
TO263	21.3±0.1	24.0 <sup>+0.3/-0.1</sup>	16.0±0.1	1.75±0.1	11.5±0.1	1.5 <sup>+0.1/-0.0</sup>	1.5 <sup>+0.25/-0.00</sup>

Application	P0	P1	A0	B0	K0	t
TO252	4.0±0.1	2.0±0.1	6.8±0.1	10.4±0.1	2.5±0.1	0.300±0.050
TO263	4.0±0.1	2.0±0.1	10.8±0.1	16.1±0.1	5.2±0.1	0.350±0.013

Carrier Tape Dimensions (Unit: mm)

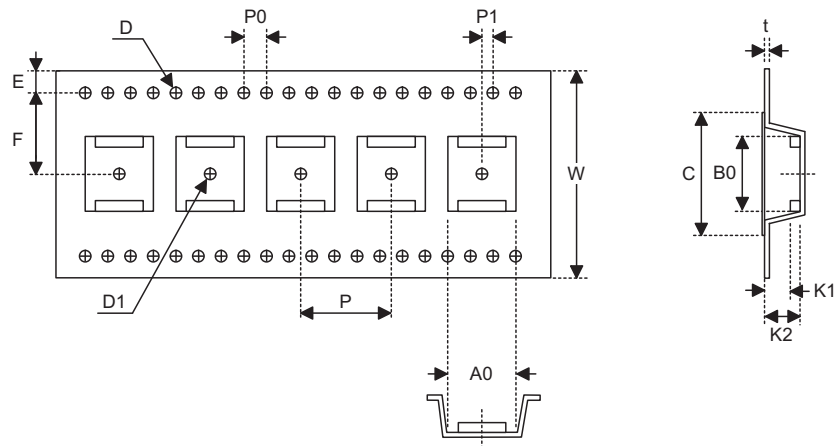
- SSOP, SOP, NSOP, SOJ, TSSOP



Application	C	W	P	E	F	D	D1
SOP 32W	25.5±0.1	32 <sup>+0.3/-0.1</sup>	16.0±0.1	1.75±0.1	14.2±0.1	1.55 <sup>+0.10/-0.00</sup>	2.00 <sup>+0.25/-0.00</sup>
SOP 44W	25.5±0.1	32 <sup>+0.3/-0.1</sup>	240.±0.1	1.75±0.1	20.2±0.1	1.55 <sup>+0.10/-0.00</sup>	2.00 <sup>+0.25/-0.00</sup>
SSOP 48W	25.5±0.1	32.0±0.3	16.0±0.1	1.75±0.1	14.2±0.1	1.5 <sup>+0.1/-0.0</sup>	1.50 <sup>+0.25/-0.00</sup>

Application	P0	P1	A0	B0	K1	K2	t
SOP 32W	4.0±0.1	2.0±0.1	14.7±0.1	20.9±0.1	3.0±0.1	3.4±0.1	0.35±0.05
SOP 44W	4.0±0.1	2.0±0.1	16.6±0.1	28.9±0.1	2.7±0.1	3.5±0.1	0.35±0.05
SSOP 48W	4.0±0.1	2.0±0.1	12.0±0.1	16.2±0.1	2.4±0.1	3.2±0.1	0.35±0.05

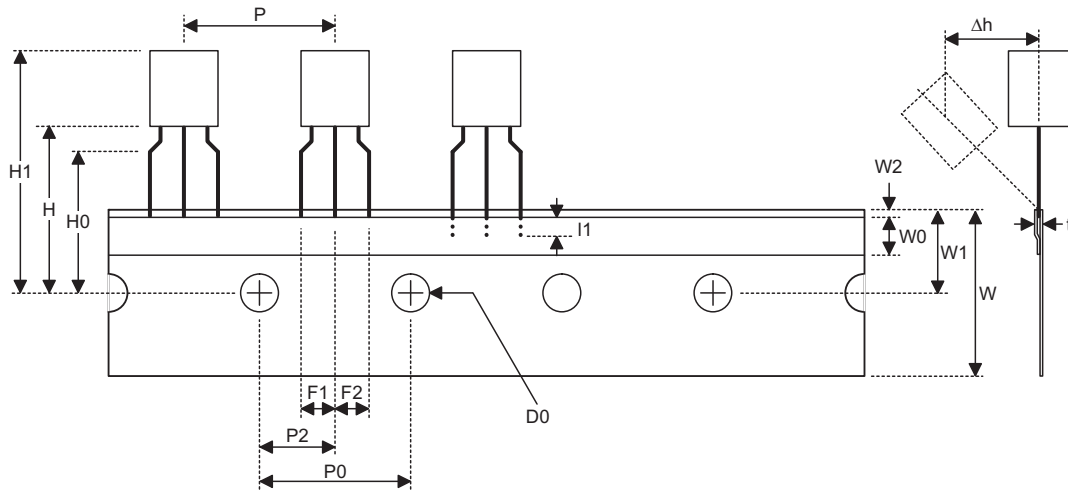
- PLCC



Application	C	W	P	E	F	D	D1
PLCC44	25.5±0.1	32.0±0.3	24.0±0.1	1.75±0.1	14.2±0.1	1.5 <sup>+0.1/-0.0</sup>	2.00 Min.

Application	P0	P1	A0	B0	K1	K2	t
PLCC44	4.0±0.1	2.0±0.1	18.0±0.1	18.0±0.1	NA	4.9±0.1	0.33±0.05

TO92 Carrier Tape Dimensions (Unit: mm)



Application	(I1)	P	P0	P2	F1	F2	Δh	W
TO92	(2.5)	12.7±1.0	12.7±0.3	6.35±0.40	2.5 <sup>+0.4/-0.1</sup>	2.5 <sup>+0.4/-0.1</sup>	0.0±0.1	18.0 <sup>+1.0/-0.5</sup>

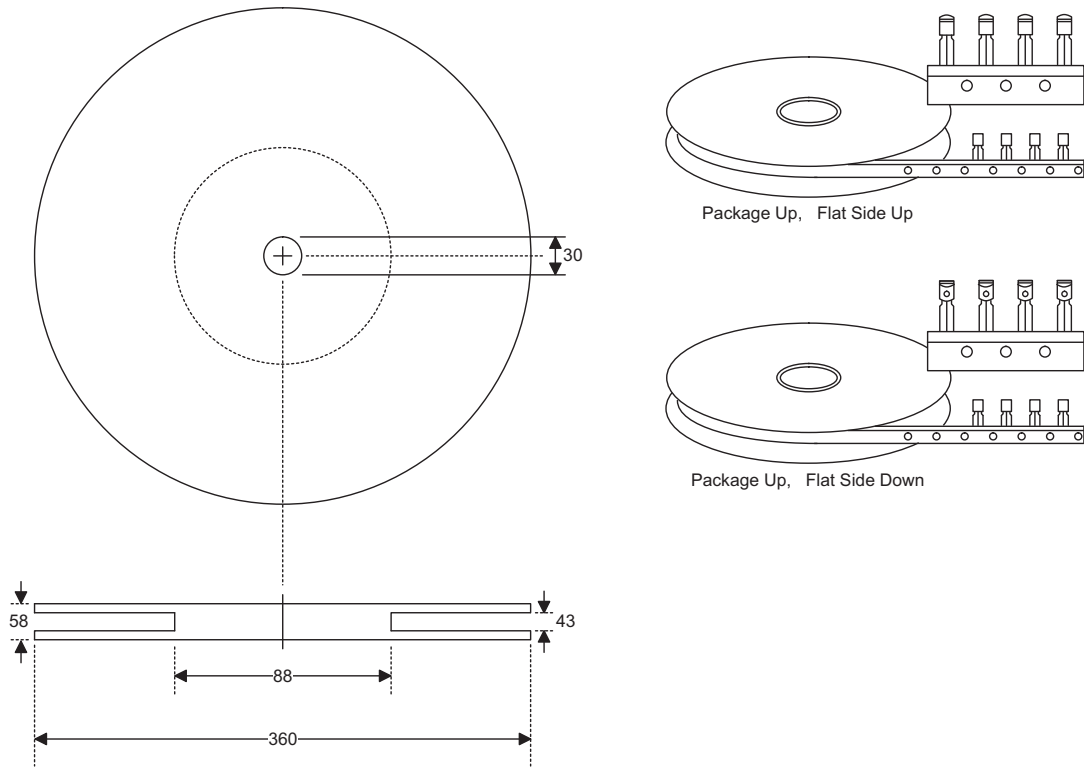
Application	W0	W1	(W2)	H0	H1	D0	t	H
TO92	6.0±0.5	9.0±0.5	(0.5)	16.0±0.5	Less than 24.7	4.0±0.2	0.7±0.2	19.0±0.5

Note: Thickness less than 0.38±0.05mm~0.50mm

P0 Accumulated pitch tolerance: ±1mm/20pitches.

( ) Bracketed figures are for consultation only

**TO92 Reel Dimensions (Unit: mm)**



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