

Part I

Package Outline Drawing

Part II

Carrier Tape Outline Drawing

Part III

Reel Outline Drawing

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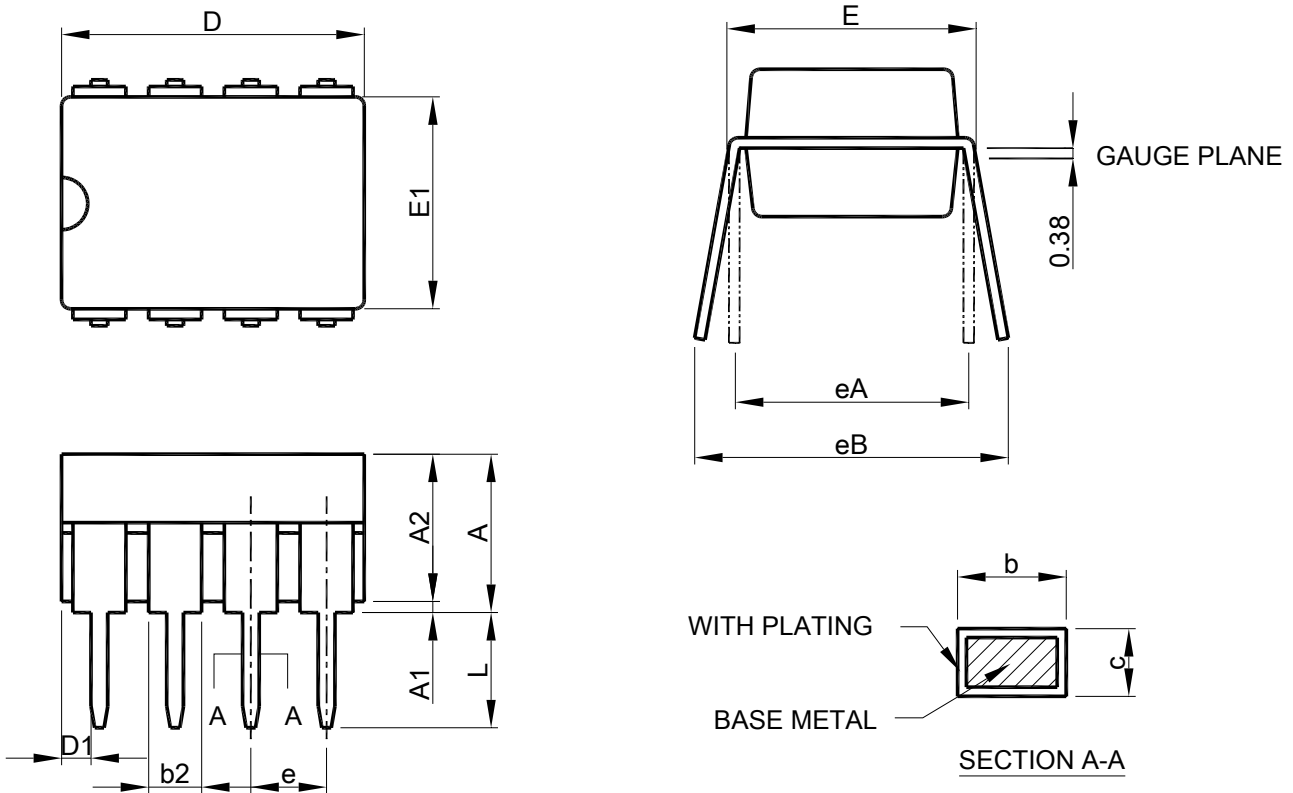
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Part I Package Outline Drawing

(unit : mm)

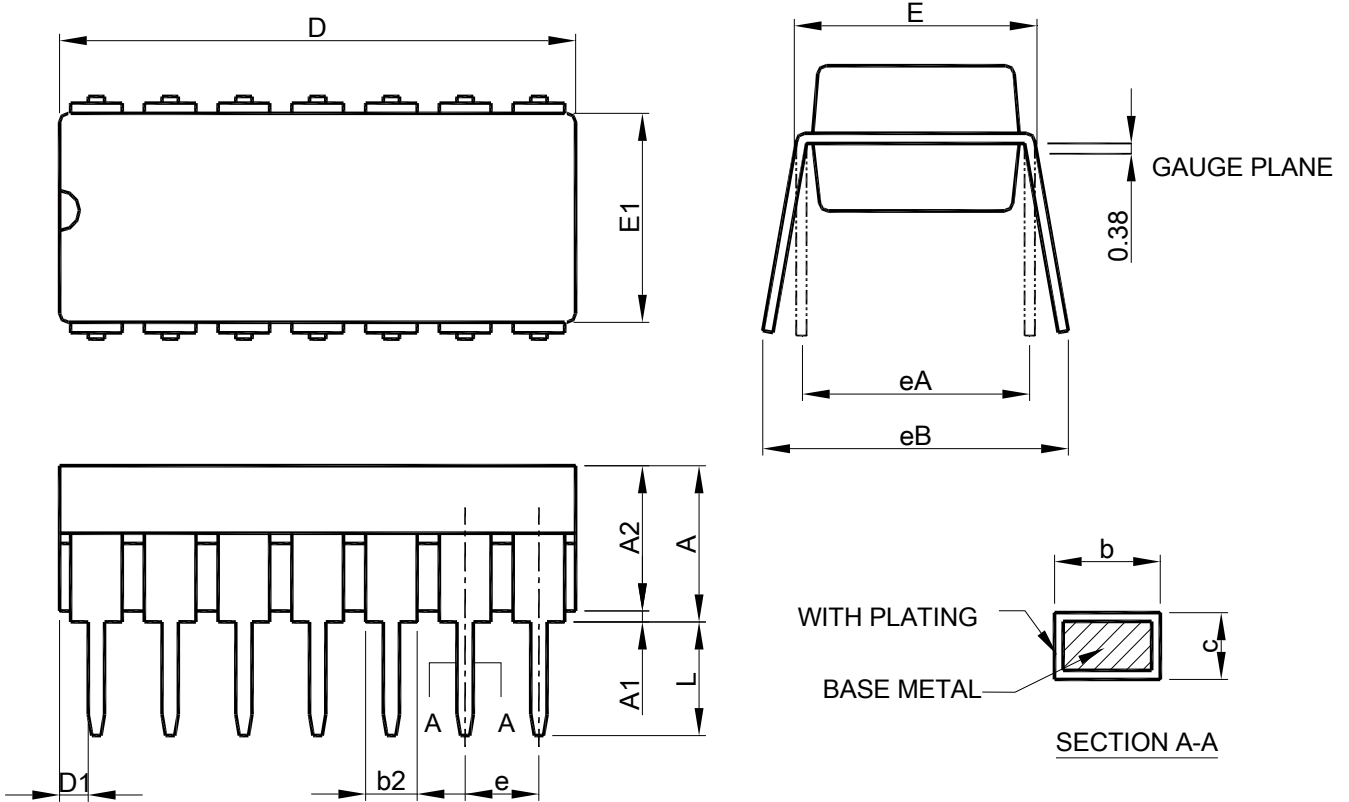
● DIP-8 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MS-001BA
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side .
 3. Dimension "D1" and "E1" do not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	DIP-8	
	MILLIMETERS	
	MIN.	MAX.
A		5.33
A1	0.38	
A2	2.92	4.95
b	0.36	0.56
b2	1.14	1.78
c	0.20	0.35
D	9.01	10.16
D1	0.13	
E	7.62	8.26
E1	6.10	7.11
e	2.54 BSC	
eA	7.62 BSC	
eB		10.92
L	2.92	3.81

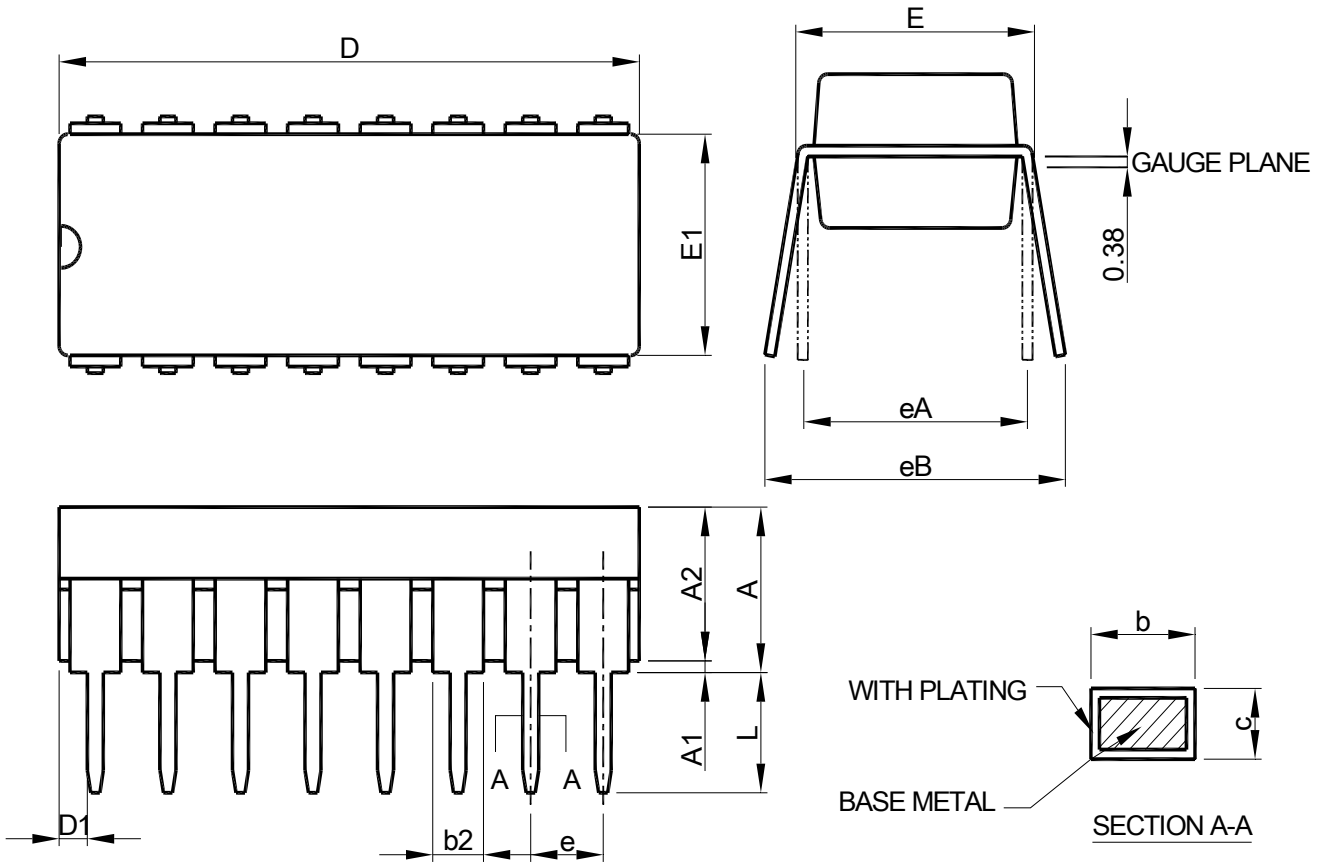
● DIP-14 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MS-001AA
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side .
 3. Dimension "D1"and "E1" do not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	DIP-14	
	MILLIMETERS	
	MIN.	MAX.
A		5.33
A1	0.38	
A2	2.92	4.95
b	0.36	0.56
b2	1.14	1.78
c	0.20	0.35
D	18.67	19.69
D1	0.13	
E	7.62	8.26
E1	6.10	7.11
e	2.54 BSC	
eA	7.62 BSC	
eB		10.92
L	2.92	3.81

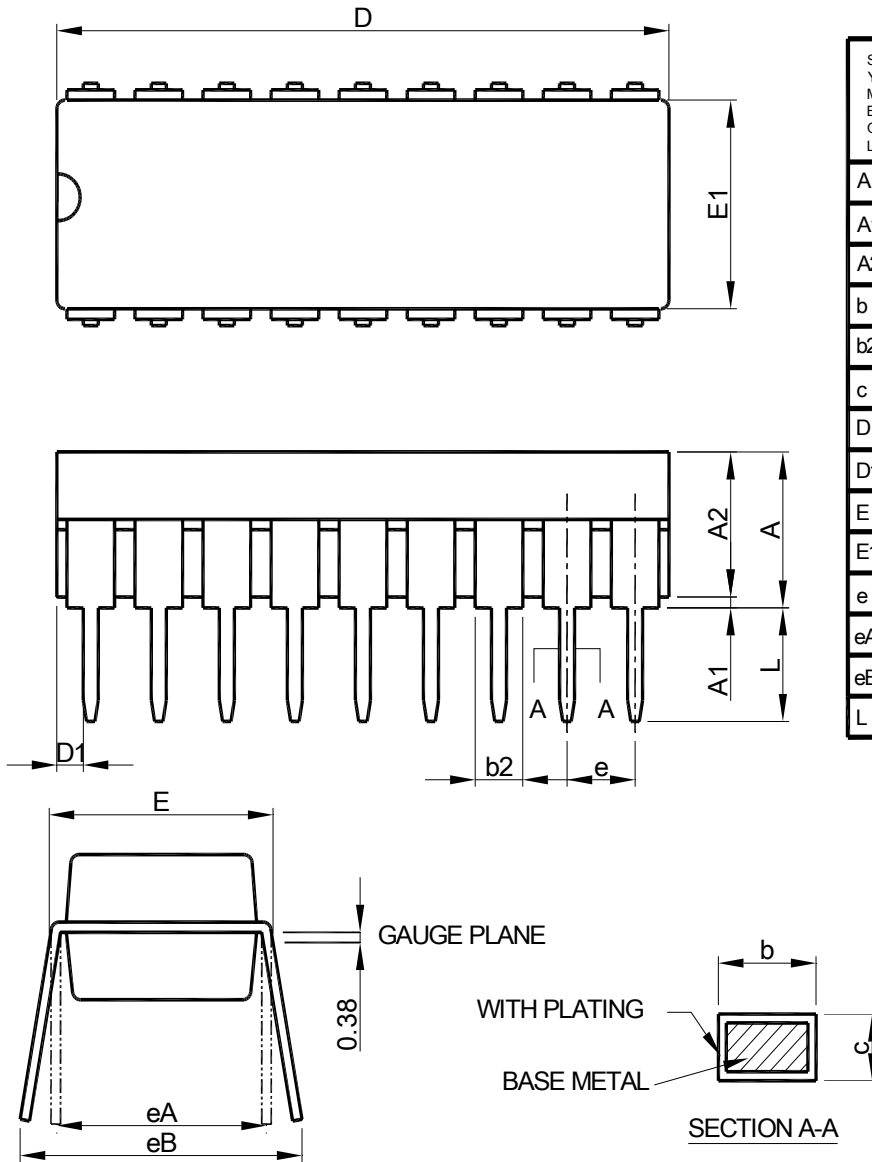
● DIP-16 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MS-001BB
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side .
 3. Dimension "D1" and "E1" do not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

S Y M B O L	DIP-16	
	MILLIMETERS	
	MIN.	MAX.
A		5.33
A1	0.38	
A2	2.92	4.95
b	0.36	0.56
b2	1.14	1.78
c	0.20	0.35
D	18.66	19.69
D1	0.13	
E	7.62	8.26
E1	6.10	7.11
e	2.54 BSC	
eA	7.62 BSC	
eB		10.92
L	2.92	3.81

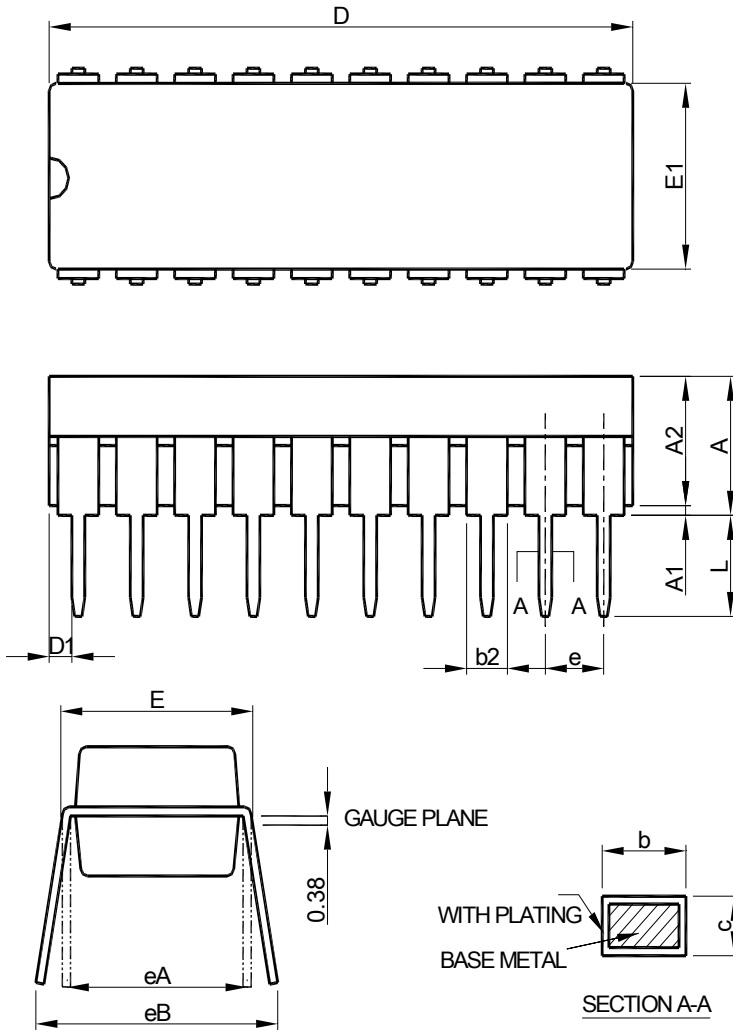
● DIP-18 PACKAGE OUTLINE DRAWING



SYMBOL	DIP-18	
	MILLIMETERS	
	MIN.	MAX.
A		5.33
A1	0.38	
A2	2.92	4.95
b	0.36	0.56
b2	1.14	1.78
c	0.20	0.35
D	22.35	23.37
D1	0.13	
E	7.62	8.26
E1	6.10	7.11
e	2.54 BSC	
eA	7.62 BSC	
eB		10.92
L	2.92	3.81

- Note: 1. Refer to JEDEC MS-001AC.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side .
 3. Dimension "D1" and "E1" do not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

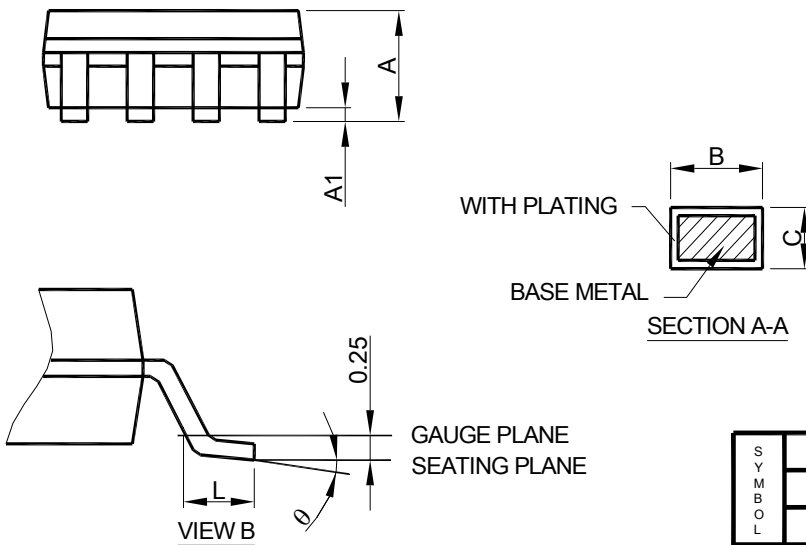
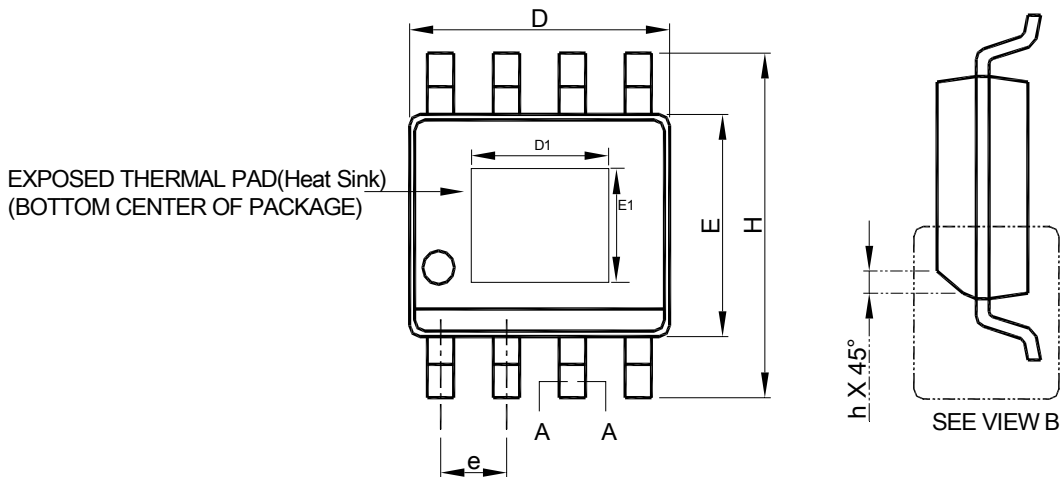
● DIP-20 PACKAGE OUTLINE DRAWING



SYMBOL	DIP-20	
	MILLIMETERS	
	MIN.	MAX.
A		5.33
A1	0.38	
A2	2.92	4.95
b	0.36	0.56
b2	1.14	1.78
c	0.20	0.35
D	24.89	26.92
D1	0.13	
E	7.62	8.26
E1	6.10	7.11
e	2.54 BSC	
eA	7.62 BSC	
eB		10.92
L	2.92	3.81

- Note: 1. Refer to JEDEC MS-001AD.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side .
 3. Dimension "D1" and "E1" do not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

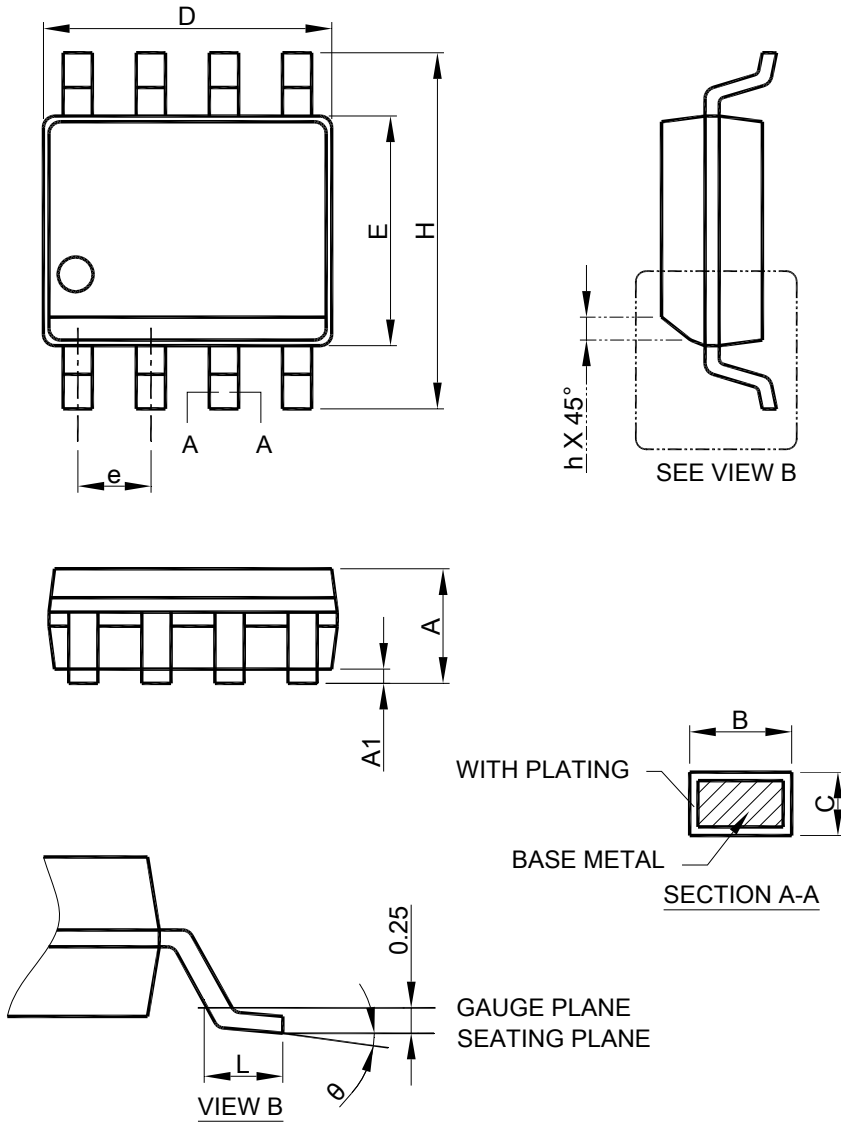
● SOP-8 Exposed Pad(Heat Sink)PACKAGE OUTLINE DRAWING



- Note :
1. Refer to JEDEC MS-012E.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
 3. Dimension "E" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOP-8 Exposed Pad(Heat Sink)	
	MILLIMETERS	
	MIN.	MAX.
A	1.35	1.75
A1	0.00	0.15
B	0.31	0.51
C	0.17	0.25
D	4.80	5.00
D1	1.50	3.50
E	3.80	4.00
E1	1.0	2.55
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.27
θ	0°	8°

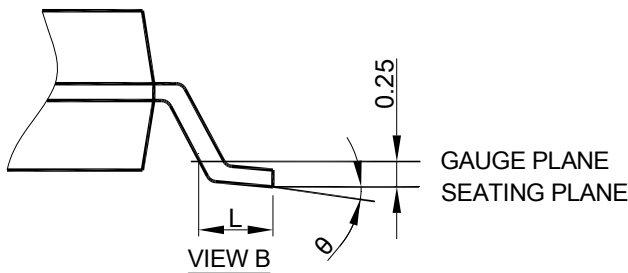
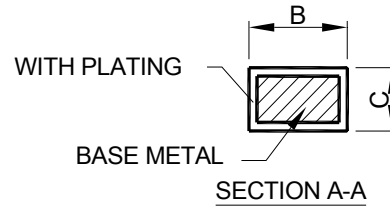
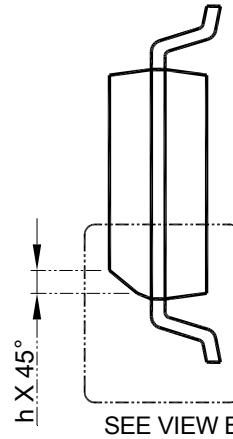
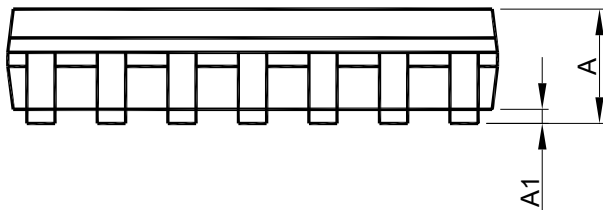
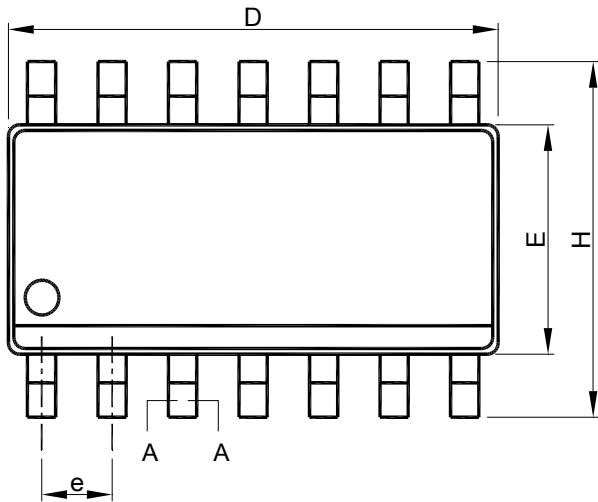
● SOP-8 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MS-012AA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
 3. Dimension "E" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOP-8	
	MILLIMETERS	
	MIN.	MAX.
A	1.35	1.75
A1	0.10	0.25
B	0.33	0.51
C	0.19	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.27
θ	0°	8°

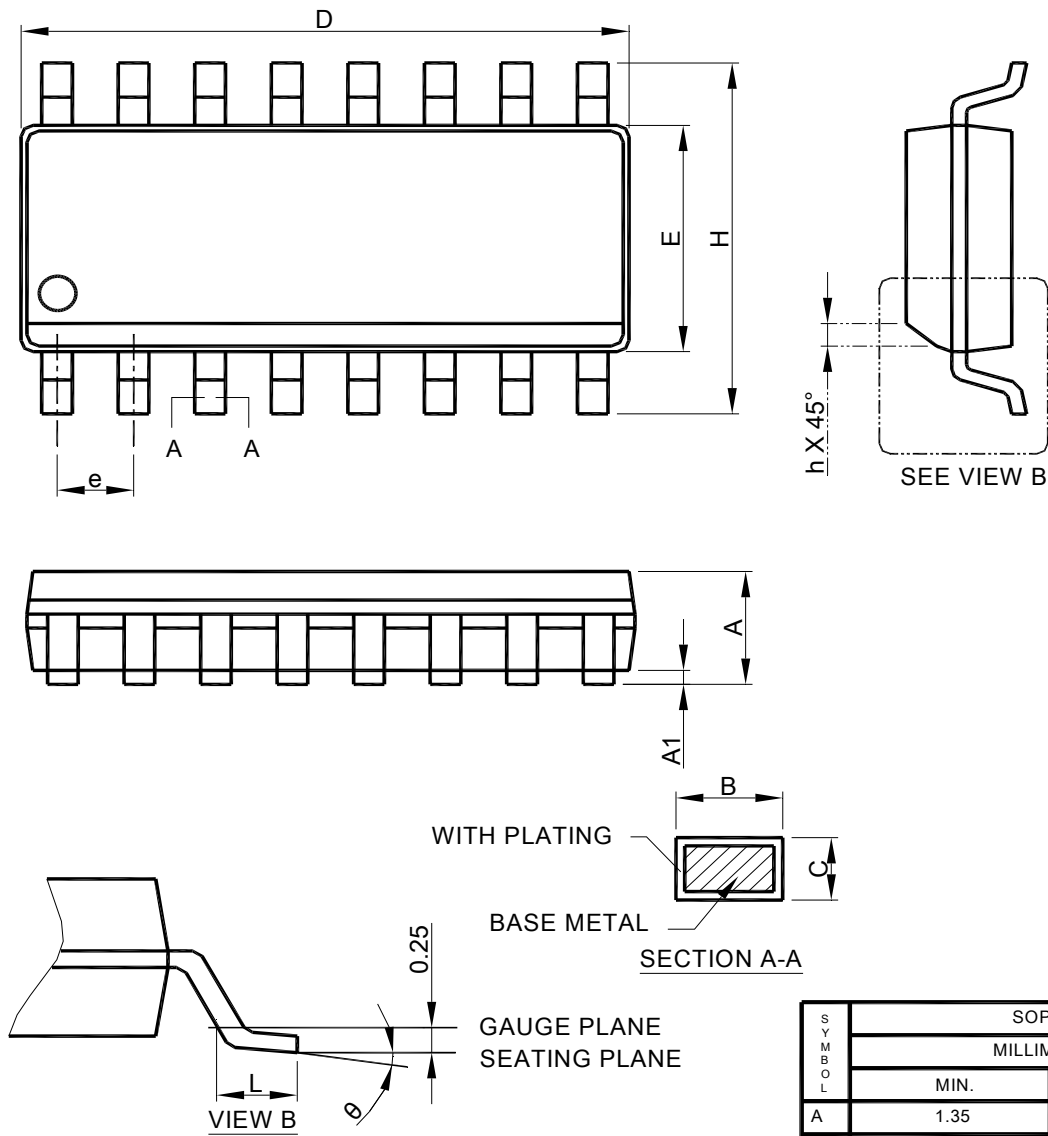
● SOP-14 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MS-012AB.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side on.
 3. Dimension "E" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOP-14	
	MILLIMETERS	
	MIN.	MAX.
A	1.35	1.75
A1	0.10	0.25
B	0.33	0.51
C	0.19	0.25
D	8.55	8.75
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.27
θ	0°	8°

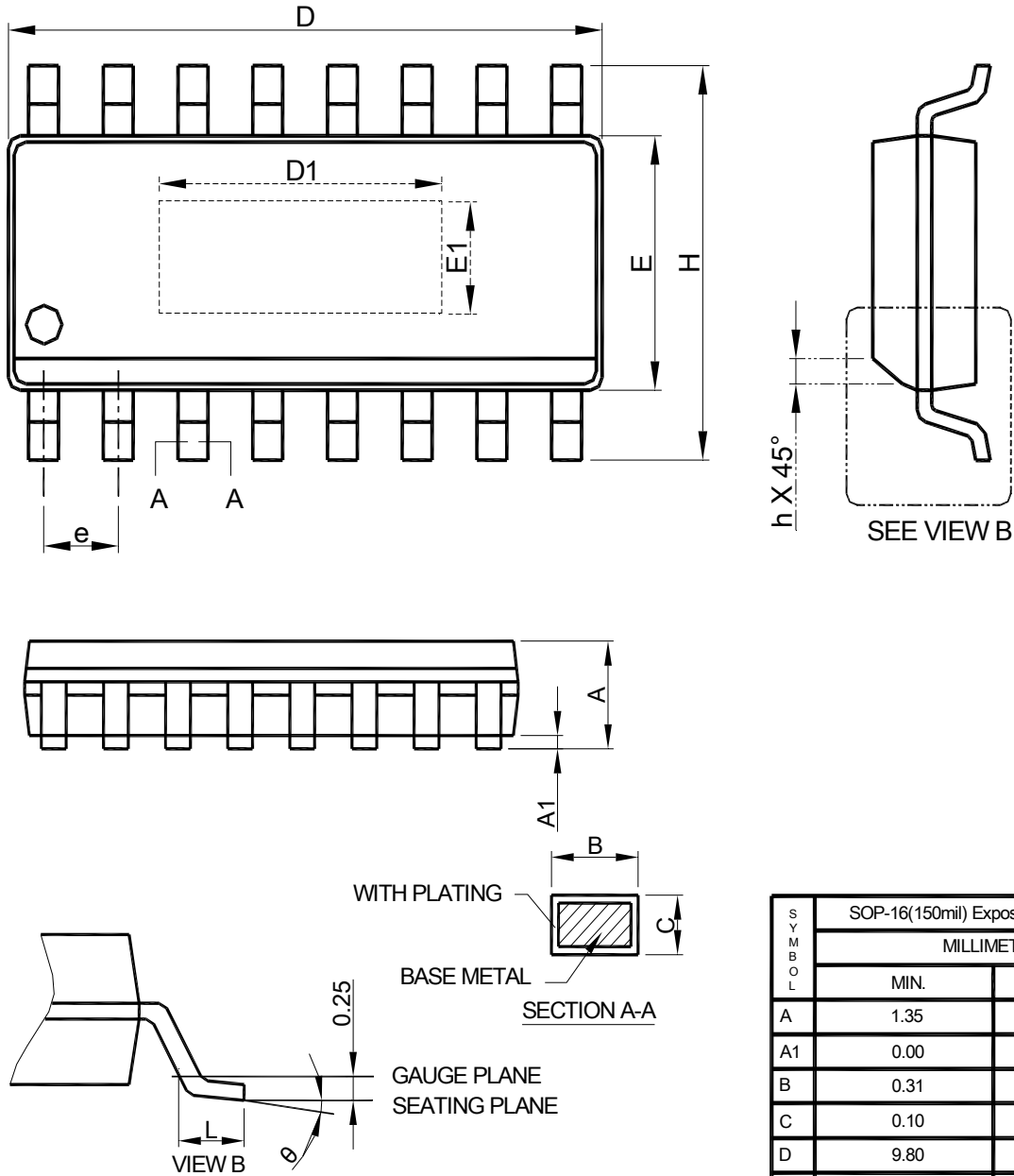
● SOP-16 (150 mil) PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MS-012AC.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side on.
 3. Dimension "E" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOP-16(150mil)	
	MILLIMETERS	
	MIN.	MAX.
A	1.35	1.75
A1	0.10	0.25
B	0.33	0.51
C	0.19	0.25
D	9.80	10.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.27
θ	0°	8°

SOP-16 (150 mil) Exposed Pad (Heat Sink) PACKAGE OUTLINE DRAWING

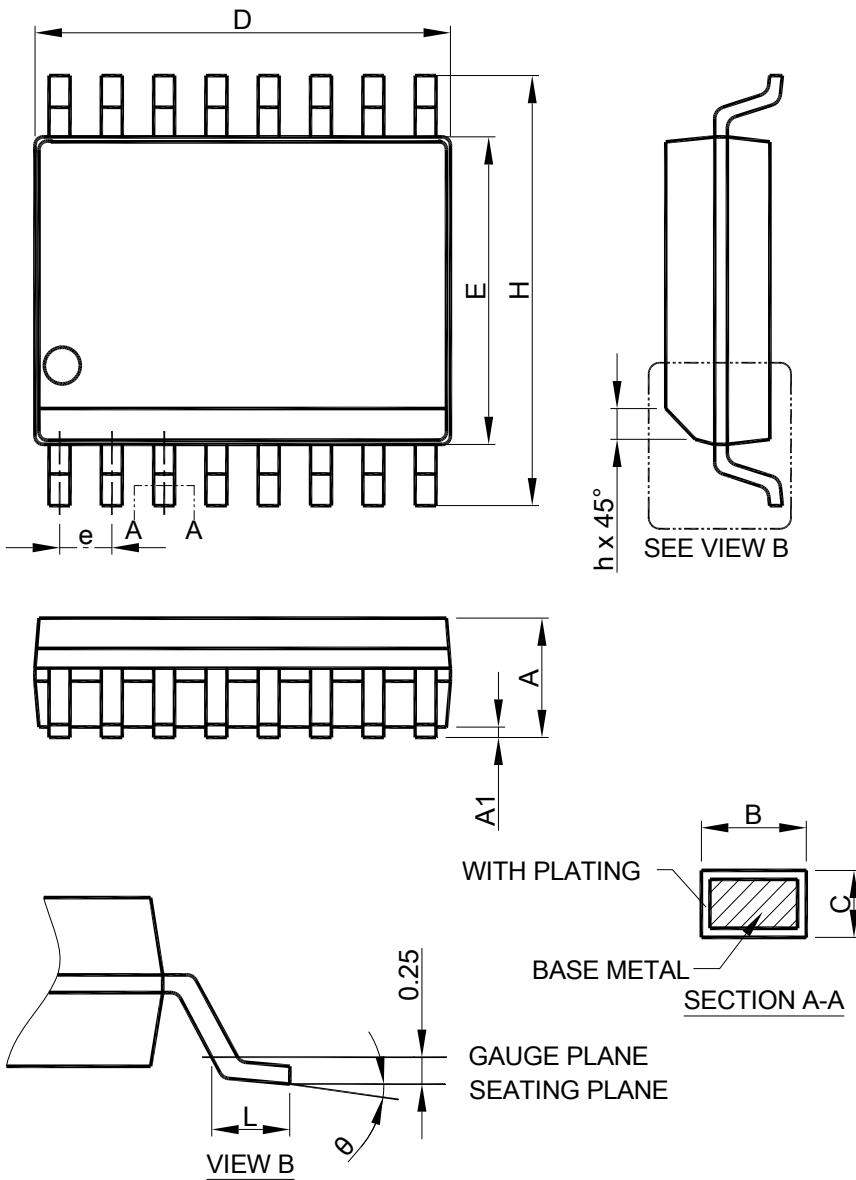


Note: 1. Refer to JEDEC MS-012AC.

2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side on.
3. Dimension "E" does not include inter-lead flash or protrusions.
4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOP-16(150mil) Exposed Pad (Heat Sink)	
	MILLIMETERS	
	MIN.	MAX.
A	1.35	1.70
A1	0.00	0.15
B	0.31	0.51
C	0.10	0.25
D	9.80	10.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.27
θ	0°	8°
D1	3.30	5.00
E1	1.30	2.80

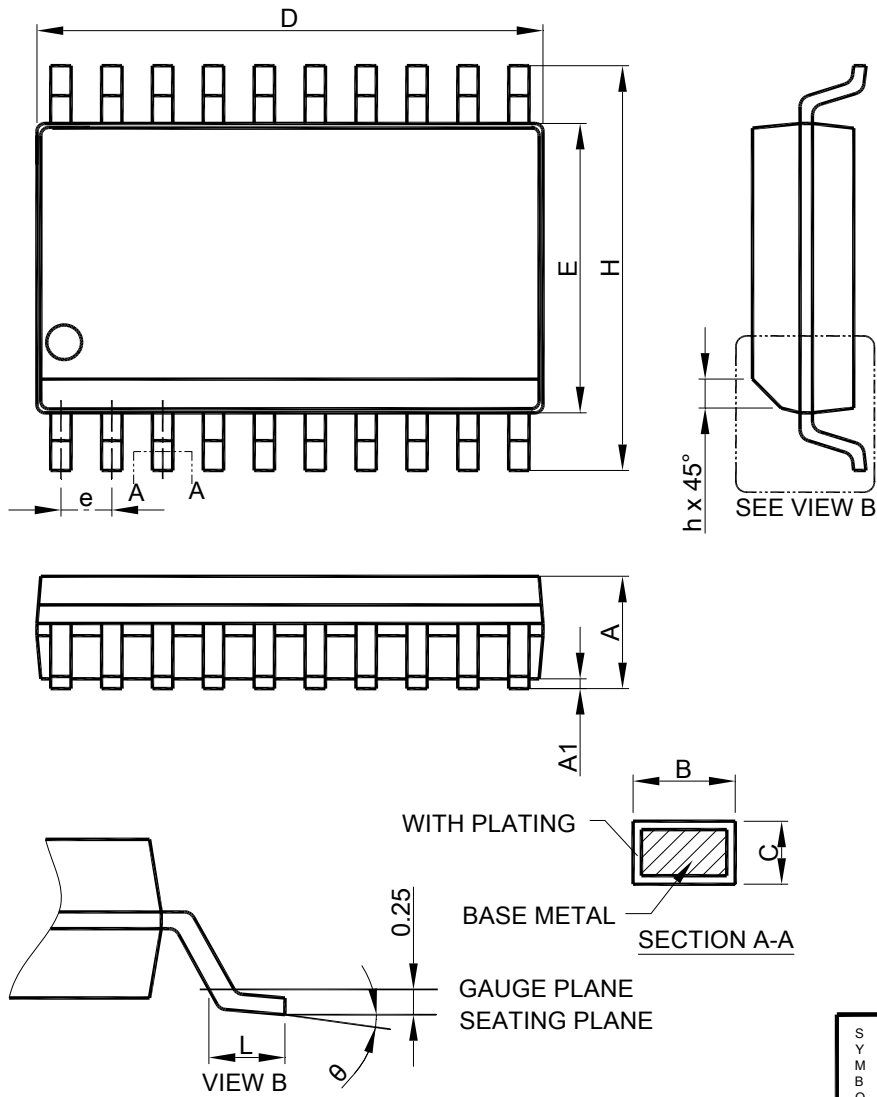
● SOP-16 (300 mil) PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MS-013AA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOP-16(300mil)	
	MILLIMETERS	
	MIN.	MAX.
A	2.35	2.65
A1	0.10	0.30
B	0.33	0.51
C	0.23	0.32
D	10.10	10.50
E	7.40	7.60
e	1.27 BSC	
H	10.00	10.65
h	0.25	0.50
L	0.40	1.27
θ	0°	8°

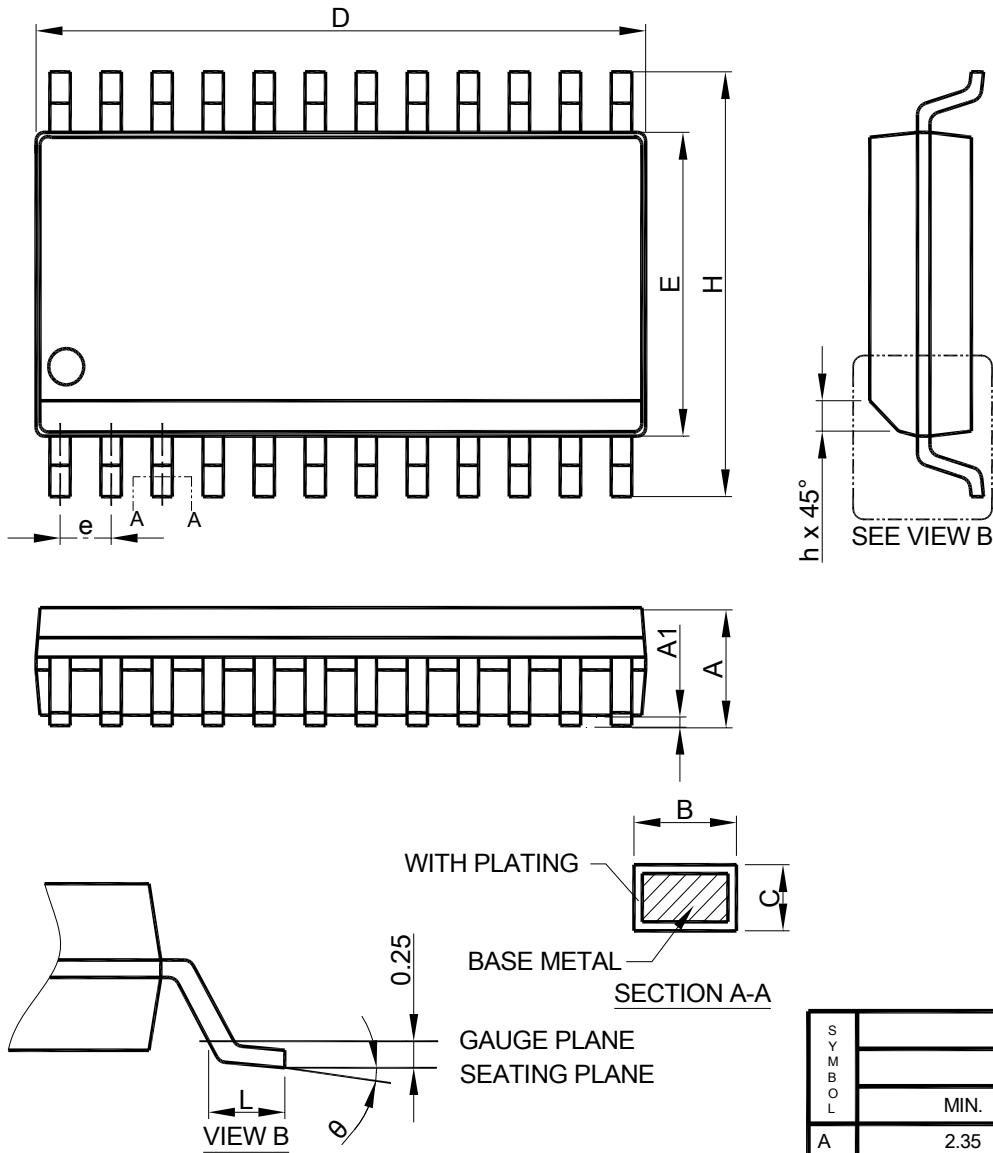
● SOP-20 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MS-013AC.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOP-20	
	MILLIMETERS	
	MIN.	MAX.
A	2.35	2.65
A1	0.10	0.30
B	0.33	0.51
C	0.23	0.32
D	12.60	13.00
E	7.40	7.60
e	1.27 BSC	
H	10.00	10.65
h	0.25	0.50
L	0.40	1.27
θ	0°	8°

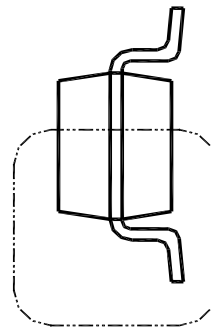
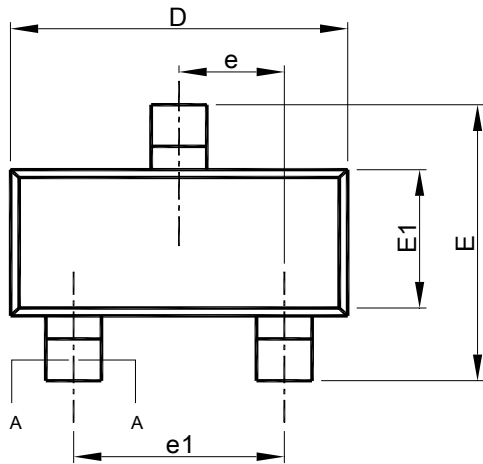
● SOP-24 PACKAGE OUTLINE DRAWING



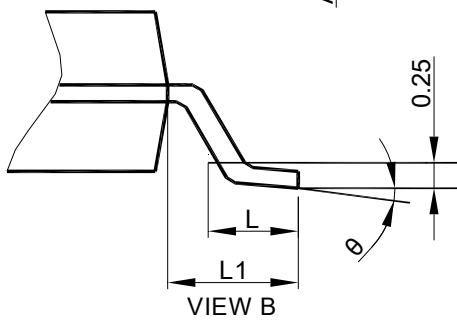
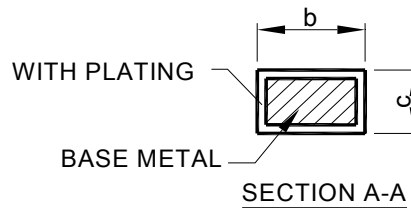
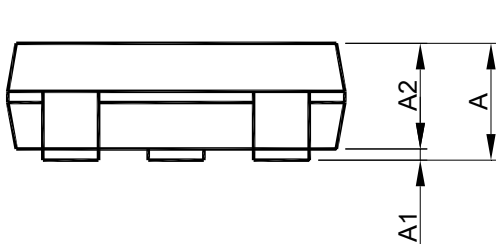
- Note: 1. Refer to JEDEC MS-013AD.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOP-24	
	MILLIMETERS	
	MIN.	MAX.
A	2.35	2.65
A1	0.10	0.30
B	0.33	0.51
C	0.23	0.32
D	15.20	15.60
E	7.40	7.60
e	1.27 BSC	
H	10.00	10.65
h	0.25	0.50
L	0.40	1.27
theta	0°	8°

● SOT-23 PACKAGE OUTLINE DRAWING



SEE VIEW B



GAUGE PLANE
SEATING PLANE

SYMBOL	SOT-23	
	MILLIMETERS	
	MIN.	MAX.
A	0.95	1.45
A1	0.00	0.15
A2	0.90	1.30
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
θ	0°	8°

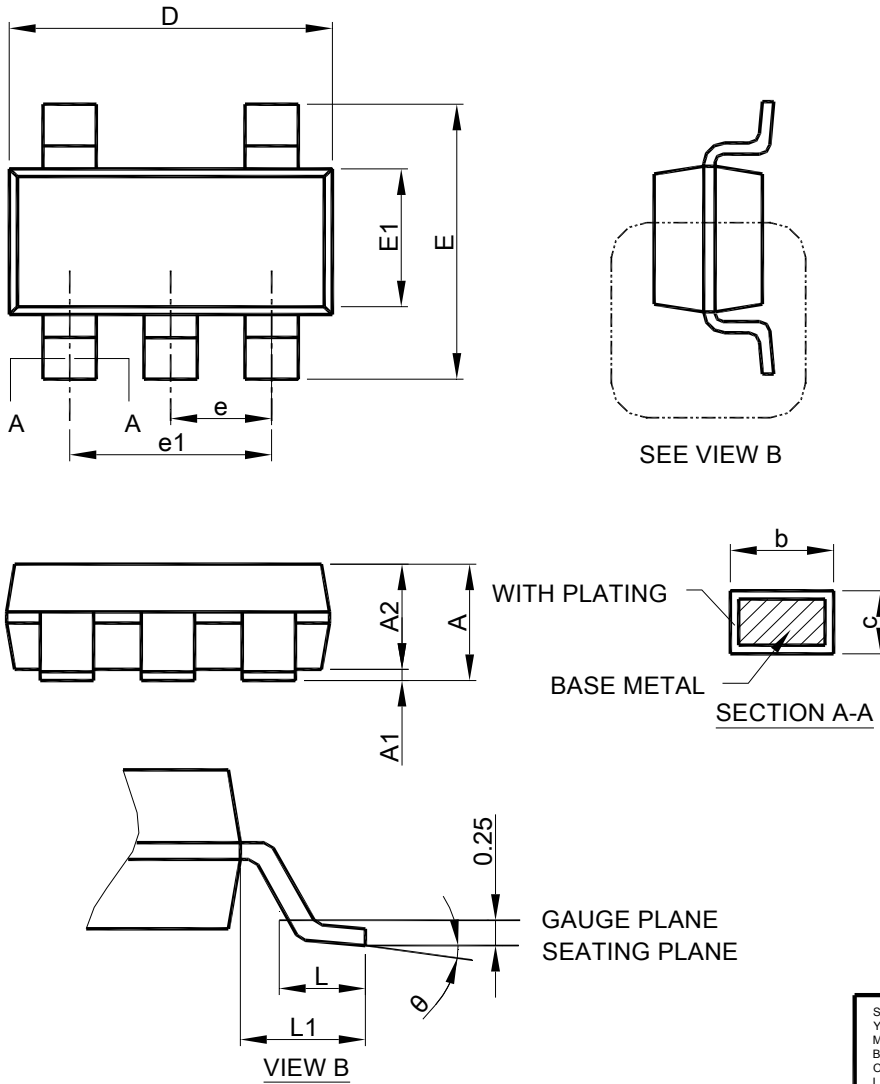
Note: 1. Refer to JEDEC MO-178.

2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side.

3. Dimension "E1" does not include inter-lead flash or protrusions.

4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

● SOT-23-5 PACKAGE OUTLINE DRAWING

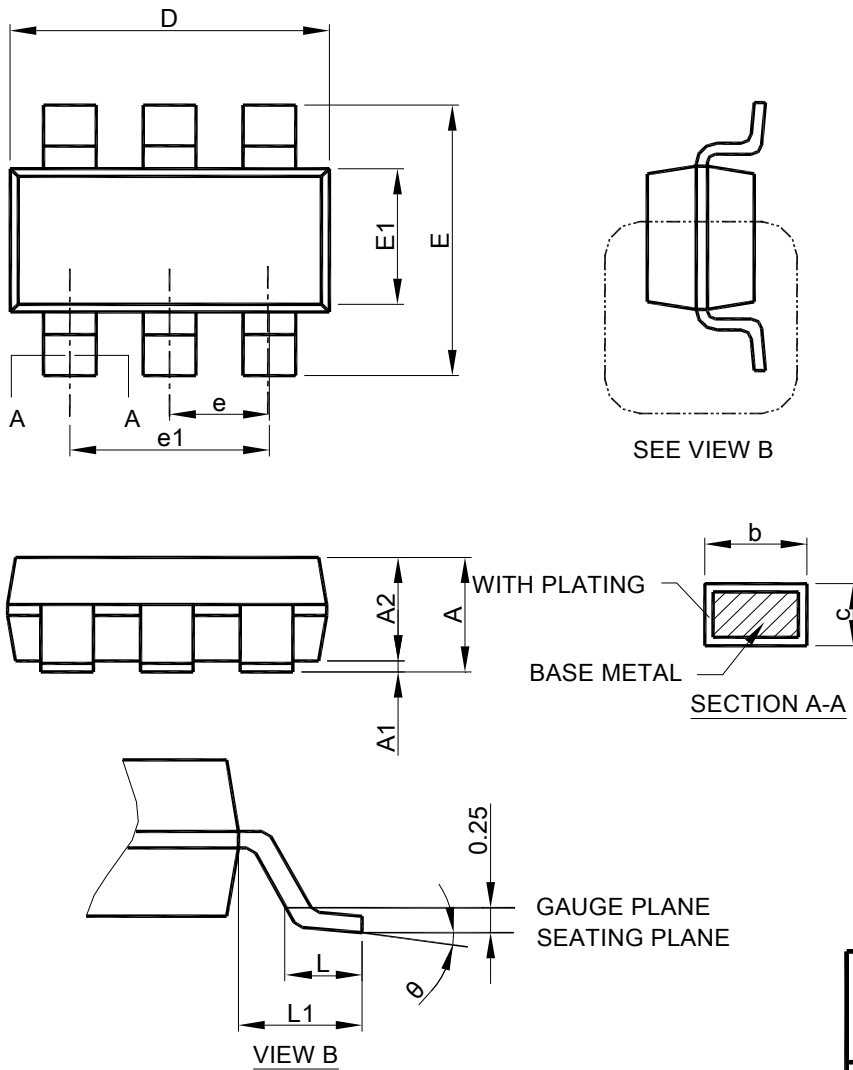


Note : 1. Refer to JEDEC MO-178AA.

2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side.
3. Dimension "E1" does not include inter-lead flash or protrusions.
4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOT-23-5	
	MILLIMETERS	
	MIN.	MAX.
A	0.95	1.45
A1	0.00	0.15
A2	0.90	1.30
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
θ	0°	8°

● SOT-23-6 PACKAGE OUTLINE DRAWING

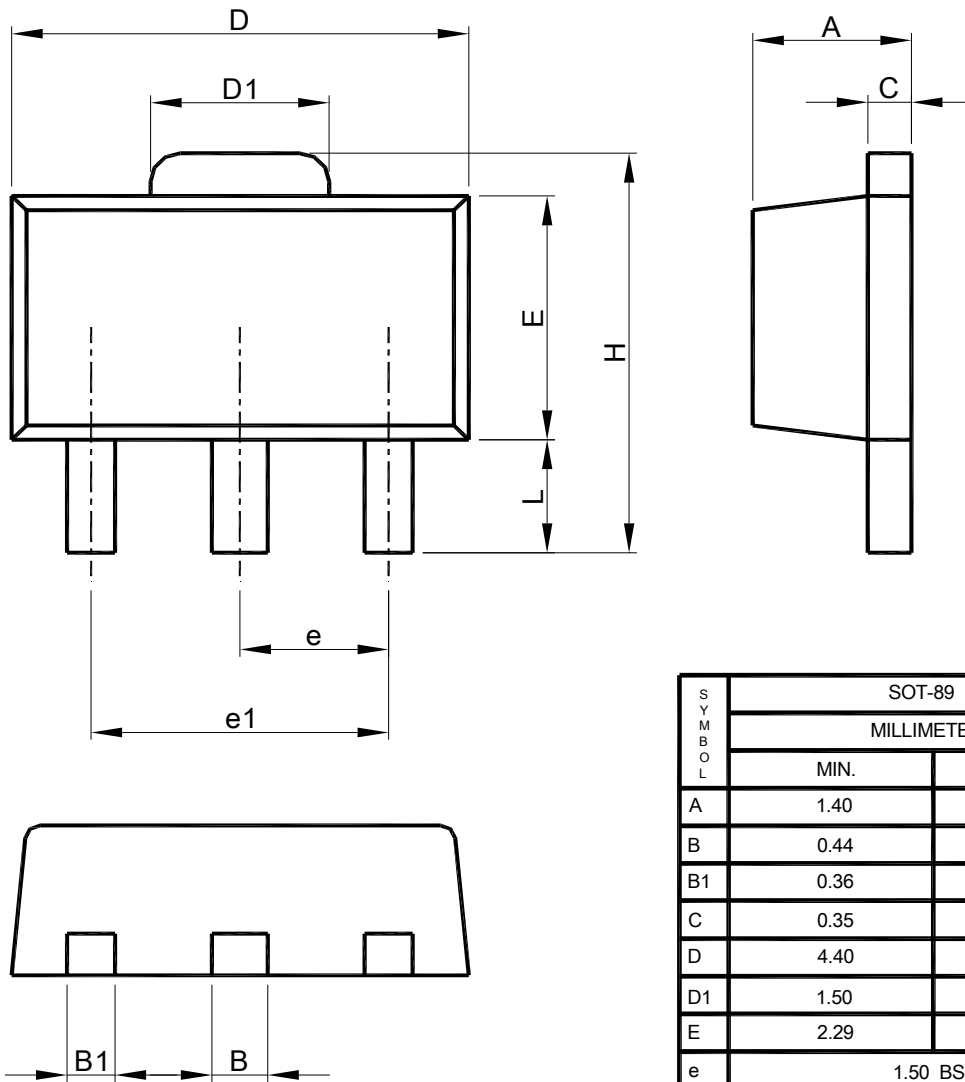


Note : 1. Refer to JEDEC MO-178AB.

2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side.
3. Dimension "E1" does not include inter-lead flash or protrusions.
4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOT-23-6	
	MILLIMETERS	
	MIN.	MAX.
A	0.95	1.45
A1	0.00	0.15
A2	0.90	1.30
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
θ	0°	8°

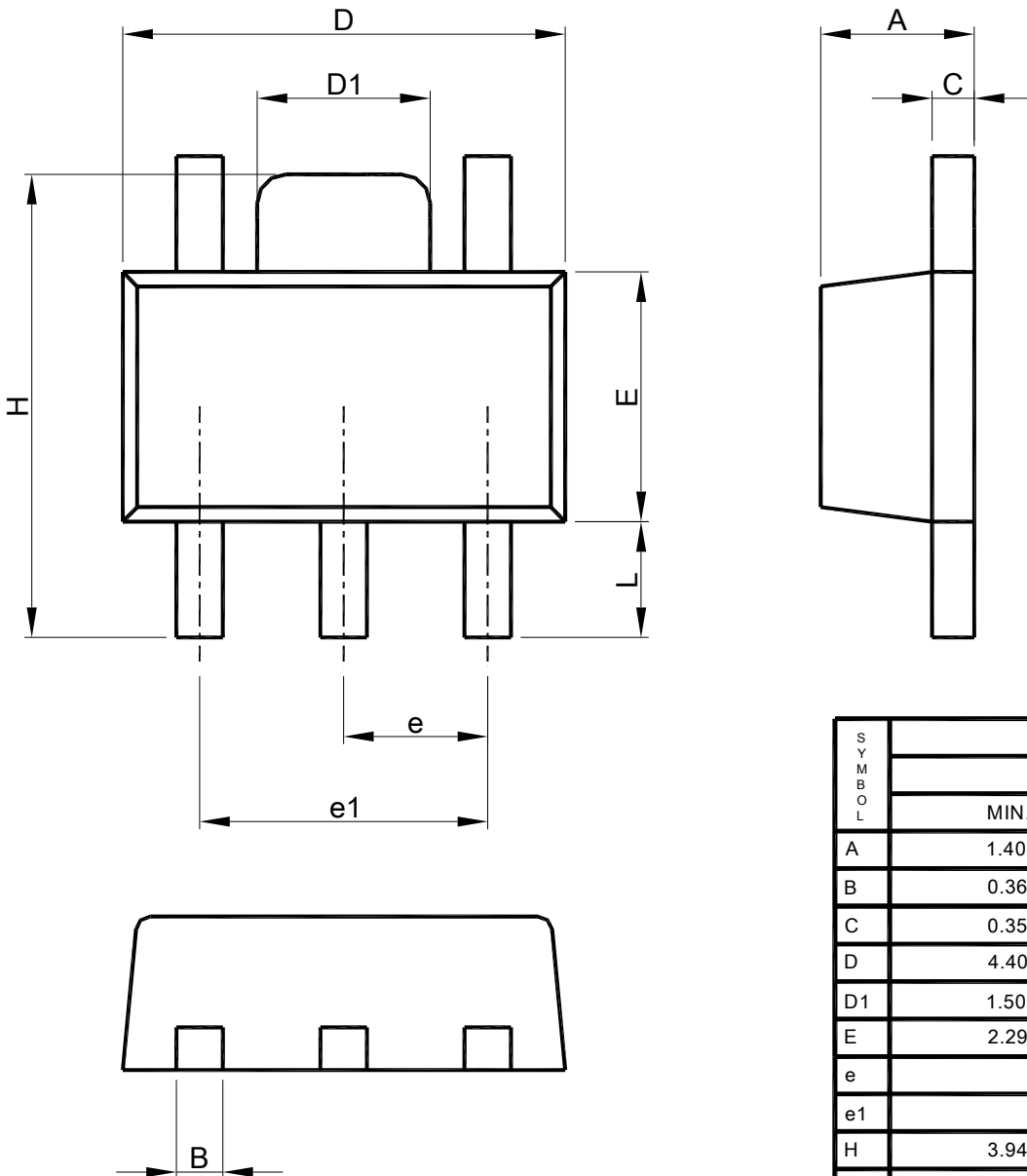
● SOT-89 PACKAGE OUTLINE DRAWING



SYMBOL	SOT-89	
	MILLIMETERS	
	MIN.	MAX.
A	1.40	1.60
B	0.44	0.56
B1	0.36	0.48
C	0.35	0.44
D	4.40	4.60
D1	1.50	1.83
E	2.29	2.60
e	1.50 BSC	
e1	3.00 BSC	
H	3.94	4.25
L	0.89	1.20

- Note: 1. Refer to JEDEC TO-243AA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

● SOT-89 5PIN PACKAGE OUTLINE DRAWIN



SYMBOL	SOT-89-5	
	MILLIMETERS	
	MIN.	MAX.
A	1.40	1.60
B	0.36	0.56
C	0.35	0.44
D	4.40	4.60
D1	1.50	1.83
E	2.29	2.60
e	1.50 BSC	
e1	3.00 BSC	
H	3.94	4.25
L	0.80	1.20

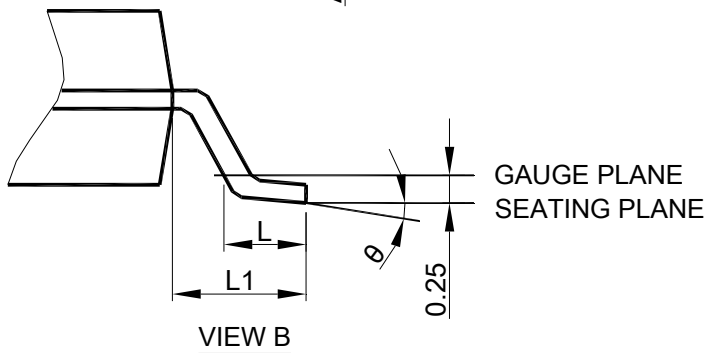
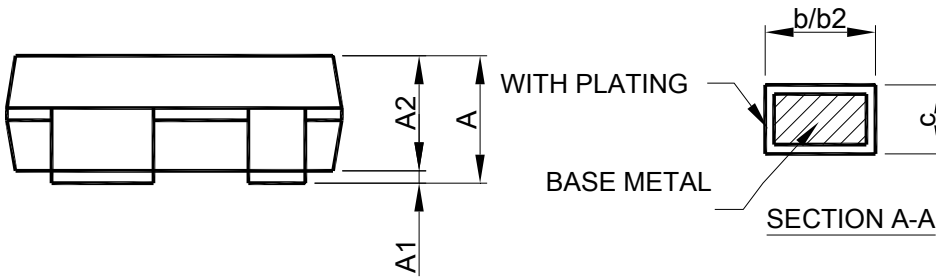
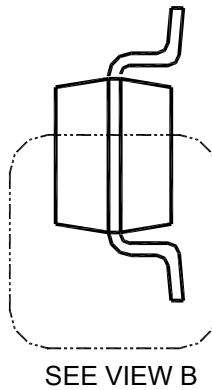
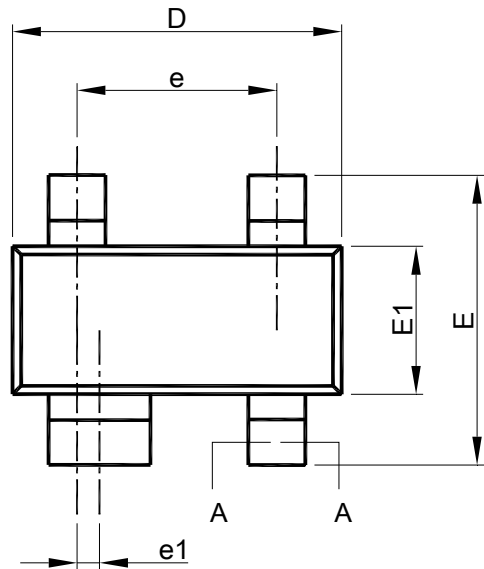
Note: 1. Refer to JEDEC TO-243AA.

2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.

3. Dimension "E" does not include inter-lead flash or protrusions.

4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

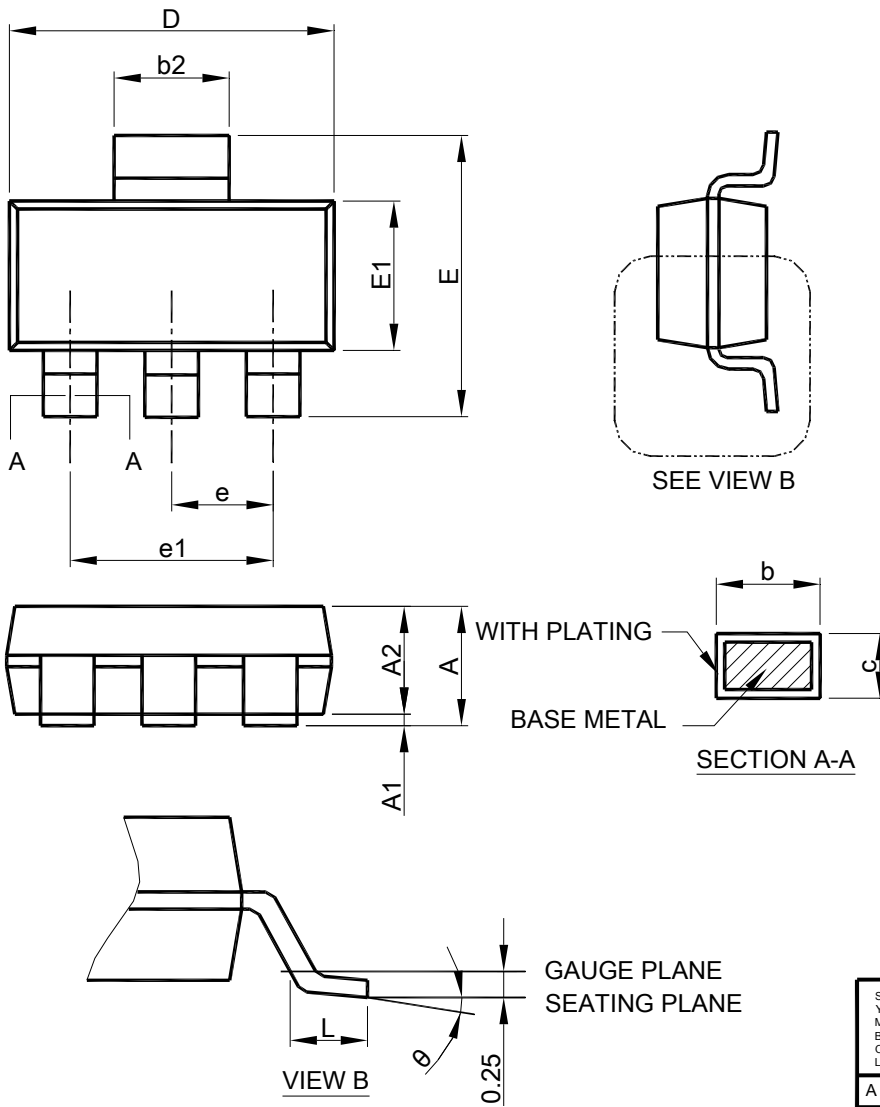
● SOT-143 PACKAGE OUTLINE DRAWING



SYMBOL	SOT-143	
	MILLIMETERS	
	MIN.	MAX.
A	0.80	1.22
A1	0.05	0.15
A2	0.75	1.07
b	0.30	0.50
b2	0.76	0.89
c	0.08	0.20
D	2.80	3.04
E	2.10	2.64
E1	1.20	1.40
e	1.92 BSC	
e1	0.20 BSC	
L	0.40	0.60
L1	0.54 REF	
θ	0°	8°

- Note: 1. Refer to JEDEC TO-253AA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

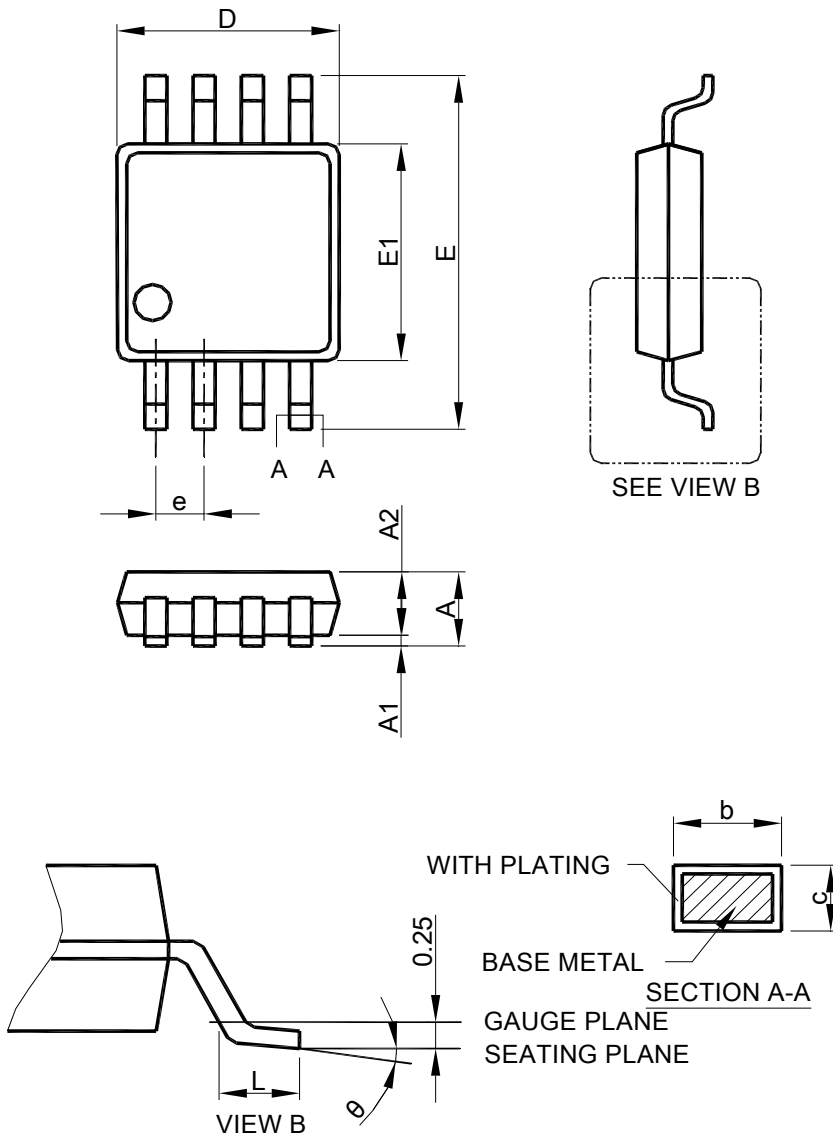
● SOT-223 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC TO-261AA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SOT-223	
	MILLIMETERS	
	MIN.	MAX.
A		1.80
A1	0.02	0.10
A2	1.55	1.65
b	0.66	0.84
b2	2.90	3.10
c	0.23	0.33
D	6.30	6.70
E	6.70	7.30
E1	3.30	3.70
e	2.30 BSC	
e1	4.60 BSC	
L	0.90	
θ	0°	8°

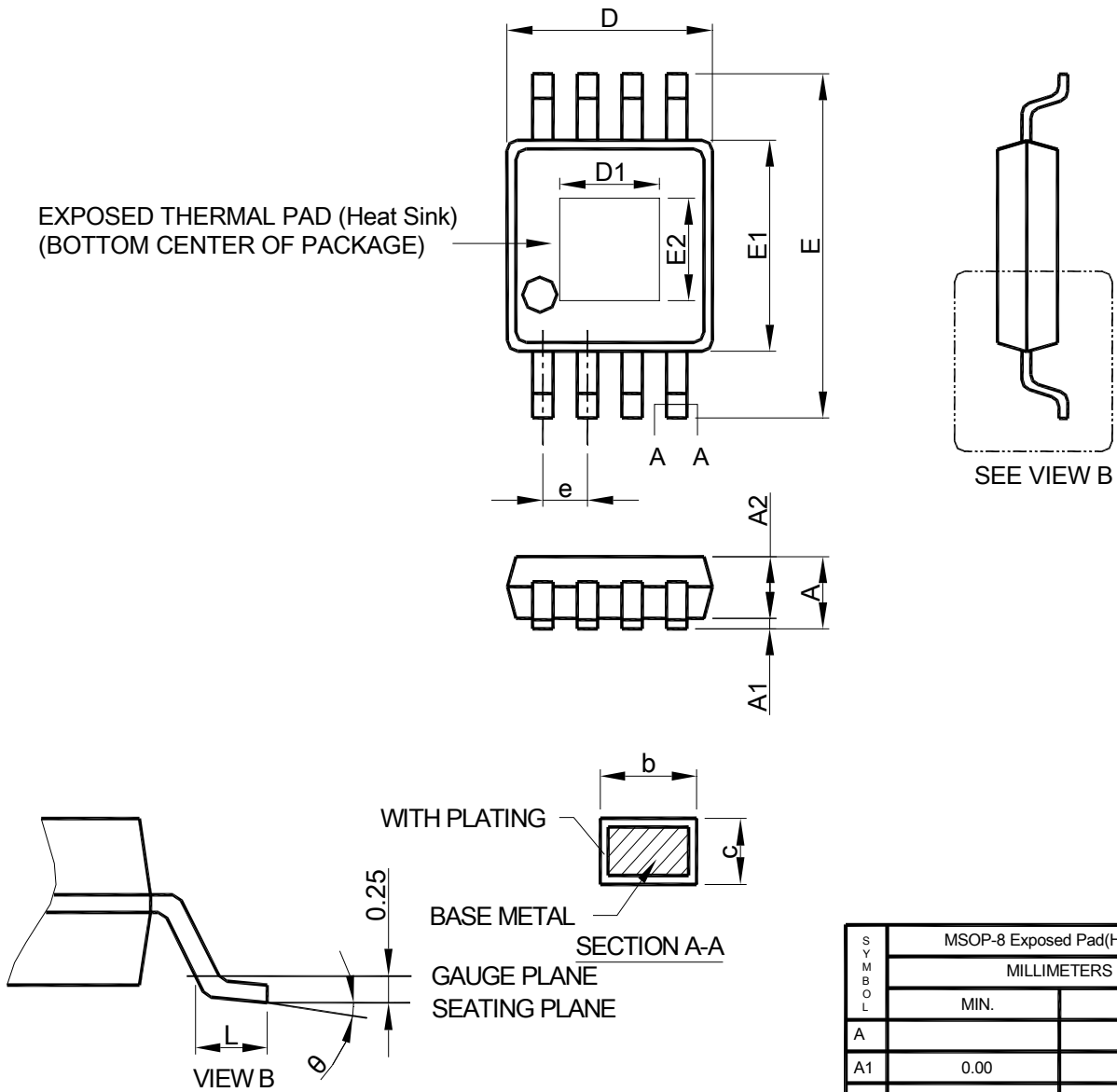
● MSOP-8 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MO-187AA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	MSOP-8	
	MILLIMETERS	
	MIN.	MAX.
A		1.10
A1	0.00	0.15
A2	0.75	0.95
b	0.25	0.40
c	0.13	0.23
D	2.90	3.10
E	4.90 BSC	
E1	2.90	3.10
e	0.65 BSC	
L	0.40	0.70
θ	0°	8°

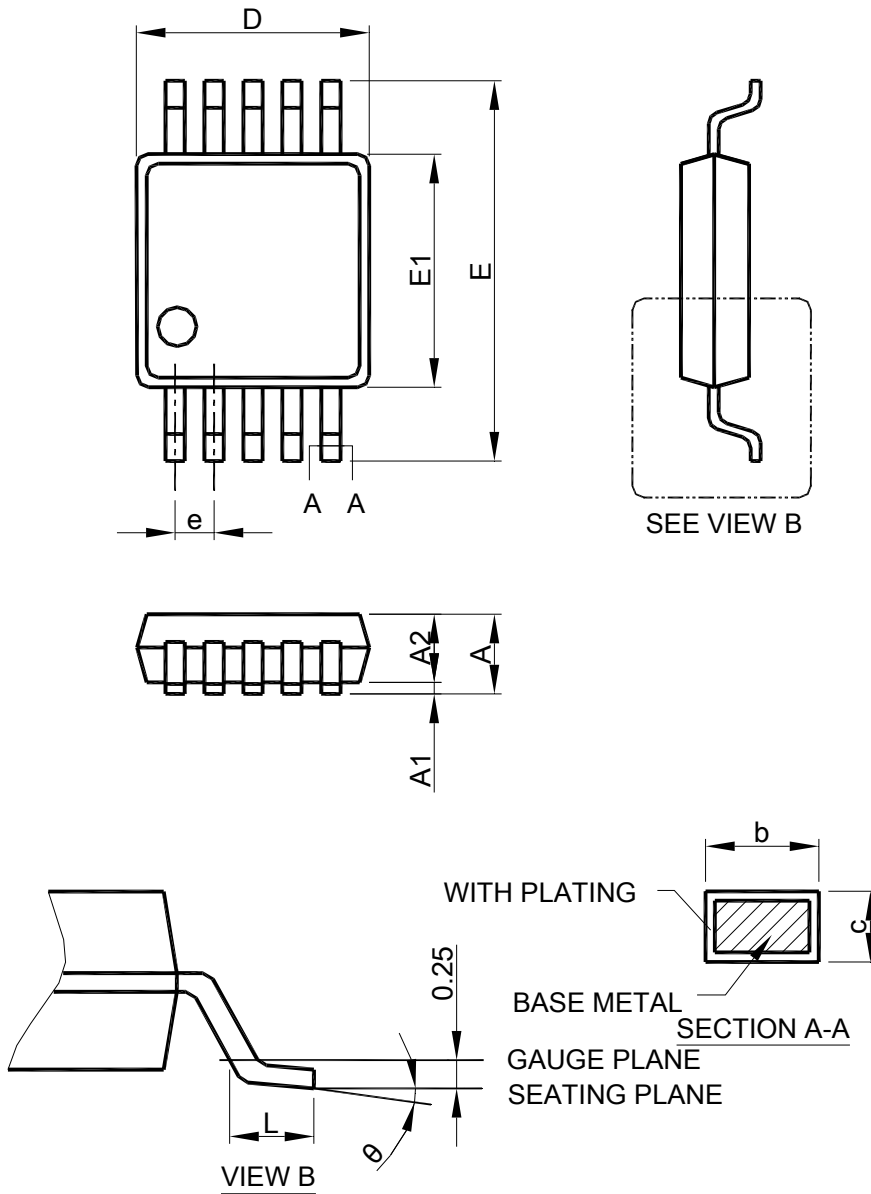
● MSOP-8 Exposed Pad (Heat Sink) PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MO-187AA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	MSOP-8 Exposed Pad(Heat Sink)	
	MILLIMETERS	
	MIN.	MAX.
A		1.10
A1	0.00	0.15
A2	0.75	0.95
b	0.22	0.38
c	0.08	0.23
D	3.00 BSC	
E	4.90 BSC	
E1	3.00 BSC	
e	0.65 BSC	
L	0.40	0.80
θ	0°	8°
D1	0.75	2.50
E2	0.75	2.50

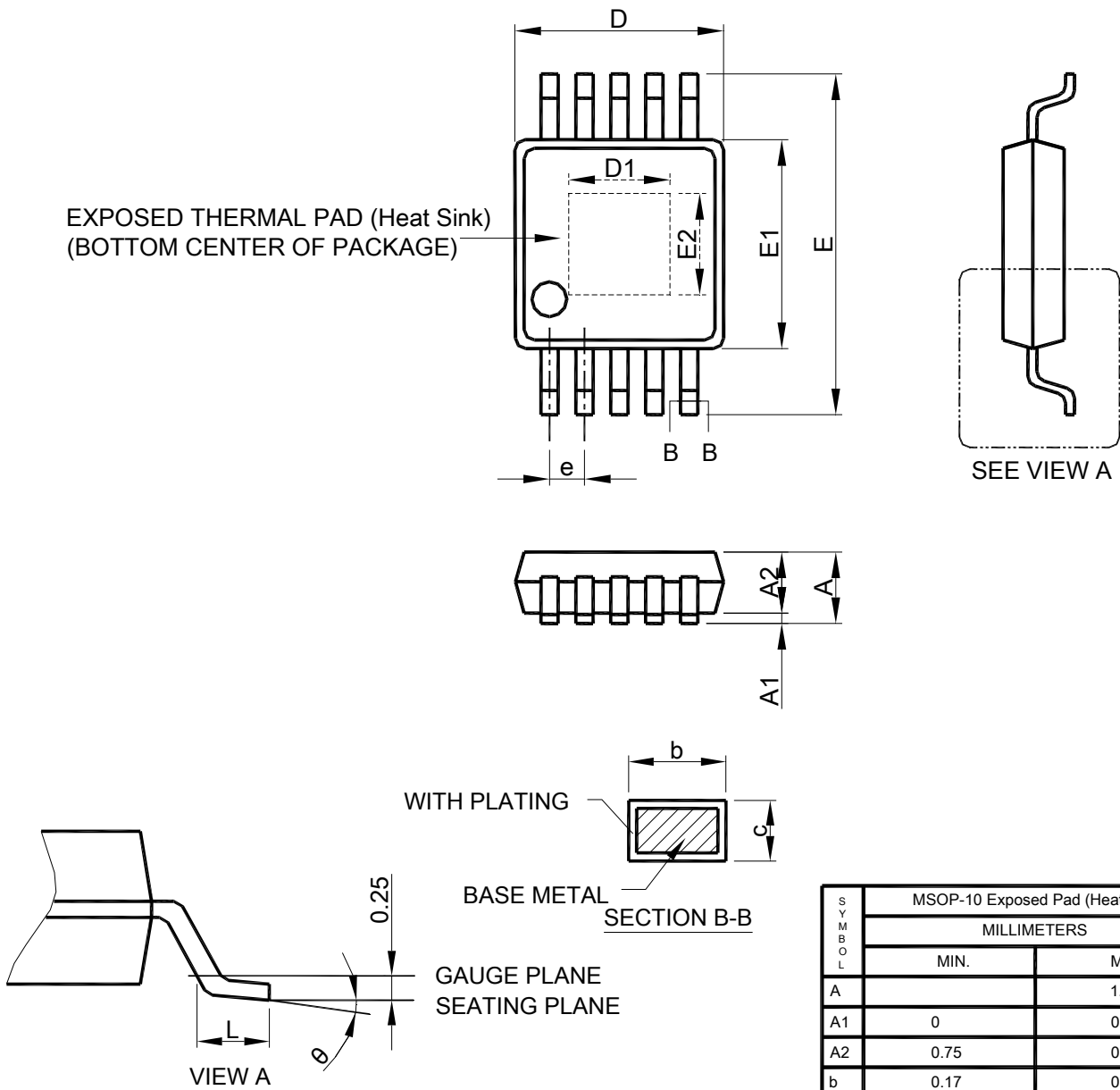
● MSOP-10 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MO-187BA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

MSOP-10		
MILLIMETERS		
SYMBOL	MIN.	MAX.
A		1.10
A1	0.00	0.15
A2	0.75	0.95
b	0.15	0.30
c	0.13	0.23
D	2.90	3.10
E	4.90 BSC	
E1	2.90	3.10
e	0.50 BSC	
L	0.40	0.70
θ	0°	8°

● MSOP-10 Exposed Pad (Heat Sink) PACKAGE OUTLINE DRAWING

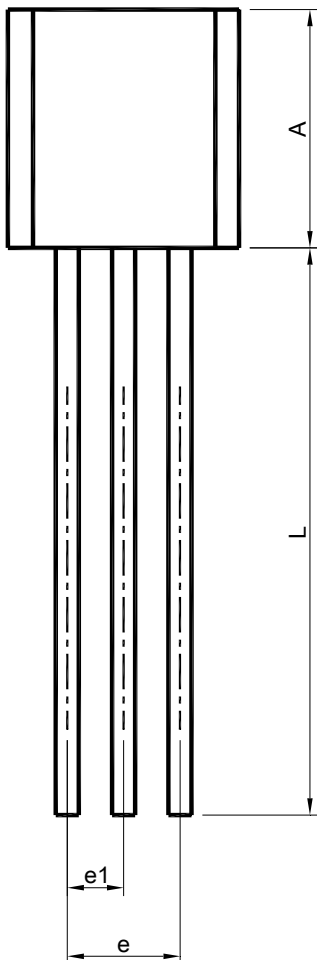
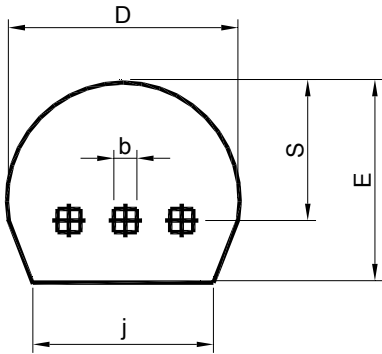


Note: 1. Refer to JEDEC MO-187E

2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
3. Dimension "E1" does not include inter-lead flash or protrusions.
4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	MSOP-10 Exposed Pad (Heat Sink)	
	MILLIMETERS	
	MIN.	MAX.
A		1.10
A1	0	0.15
A2	0.75	0.95
b	0.17	0.33
c	0.08	0.23
D	3.00 BSC	
D1	0.75	2.50
E	4.90 BSC	
E1	3.00 BSC	
E2	0.75	2.50
e	0.50 BSC	
L	0.40	0.80
θ	0°	8°

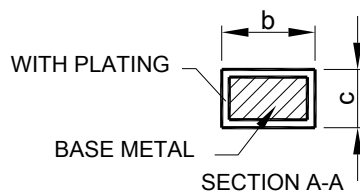
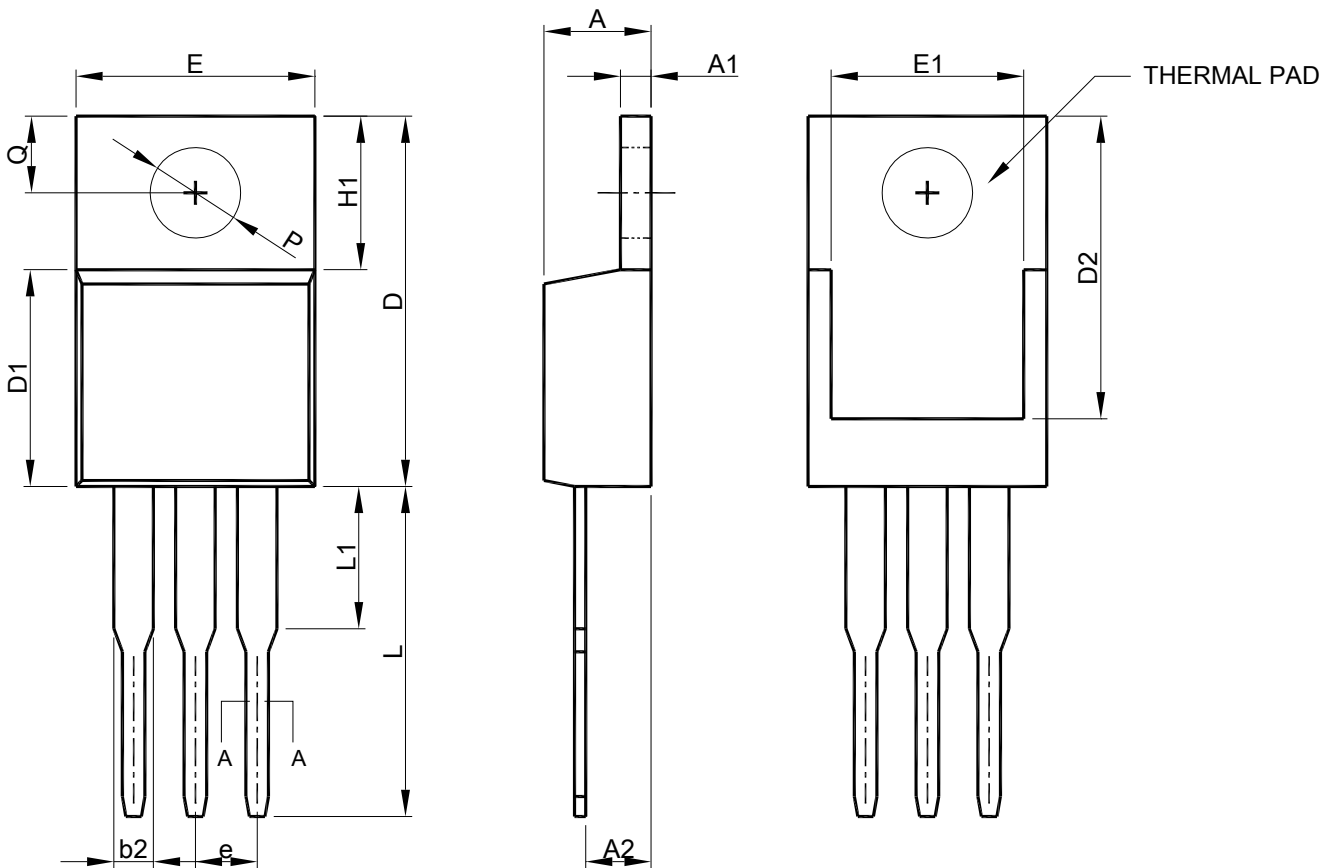
● TO-92 PACKAGE OUTLINE DRAWING



SYMBOL	TO-92	
	MILLIMETERS	
	MIN.	MAX.
A	4.32	5.33
b	0.36	0.47
D	4.45	5.20
E	3.18	4.19
e	2.42	2.66
e1	1.15	1.39
j	3.43	
L	12.70	
S	2.03	2.66

- Note: 1. Refer to JEDEC TO-226.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
 3. Dimension "A" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

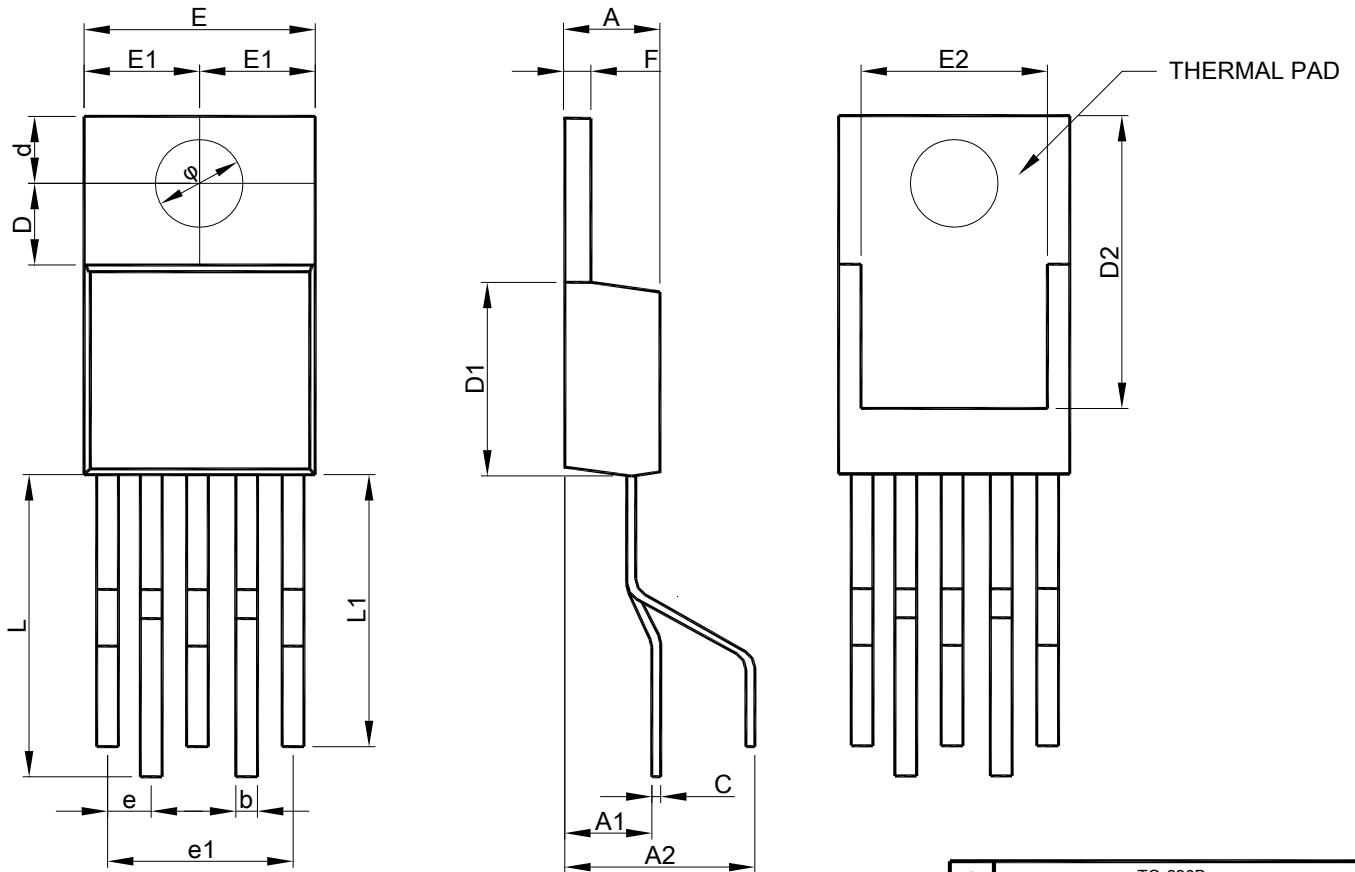
● TO-220 PACKAGE OUTLINE DRAWING



SYMBOL	TO-220	
	MILLIMETERS	
	MIN.	MAX.
A	3.56	4.82
A1	0.51	1.39
A2	2.04	2.92
b	0.38	1.01
b2	1.15	1.77
c	0.35	0.61
D	14.23	16.51
D1	8.38	9.02
D2	11.75	12.88
E	9.66	10.66
E1	6.86	8.90
e	2.54 BSC	
H1	5.85	6.85
L	12.70	14.73
L1	--	6.35
P	3.54	4.08
Q	2.54	3.42

- Note: 1. Refer to JEDEC TO-220AB.
 2. Dimension "E" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
 3. Dimension "D1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

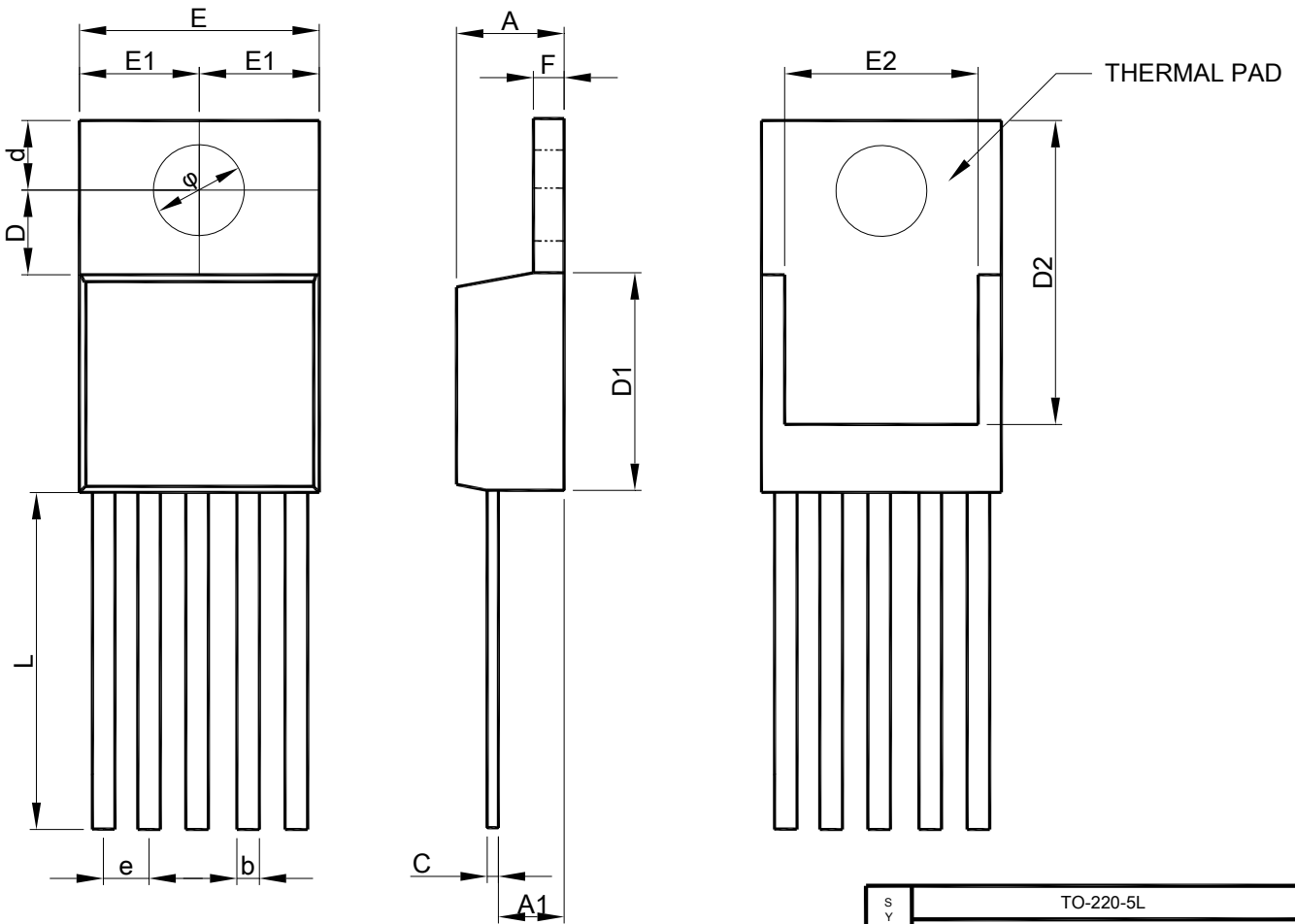
● TO-220B PACKAGE OUTLINE DRAWING



Note : Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	TO-220B	
	MILLIMETERS	
	MIN.	MAX.
A	4.318	4.826
A1	4.250	4.550
A2	8.250	8.550
b	0.690	0.940
C	0.304	0.530
D	3.556(REF)	
D1	8.480	9.300
D2	11.75	12.88
d	2.743(REF)	
E	9.906	10.44
E1	4.953	5.220
E2	6.86	8.90
⌀	3.708	3.962
e	1.524	2.032
e1	6.604	7.112
F	1.143	1.397
L	9.880	10.64
L1	9.090	9.850

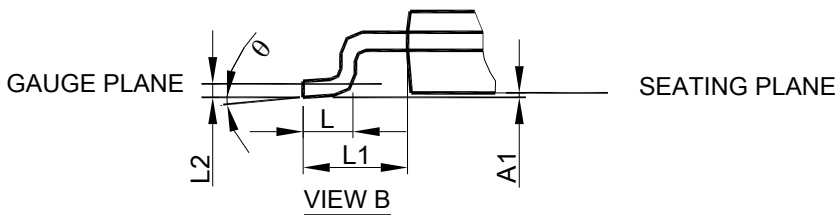
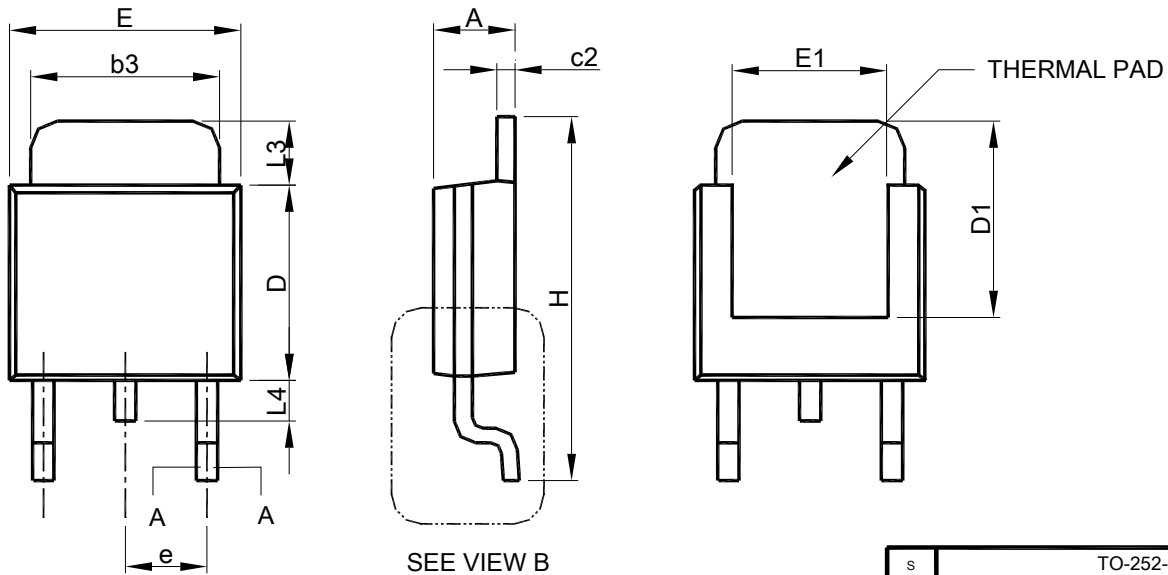
● TO-220-5L PACKAGE OUTLINE DRAWING



Note : Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	TO-220-5L	
	MILLIMETERS	
	MIN.	MAX.
A	4.064	4.826
A1	2.032	2.921
b	0.635	1.016
C	0.304	0.460
D	3.429	3.683
D1	7.620	9.398
D2	11.75	12.88
d	2.620	2.870
E	9.779	10.668
E1	4.953	5.220
E2	6.86	8.90
Φ	3.708	3.962
e	1.524	2.032
F	1.143	1.397
L	13.589	14.351

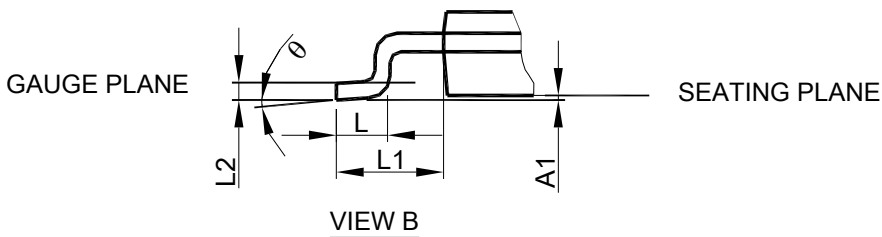
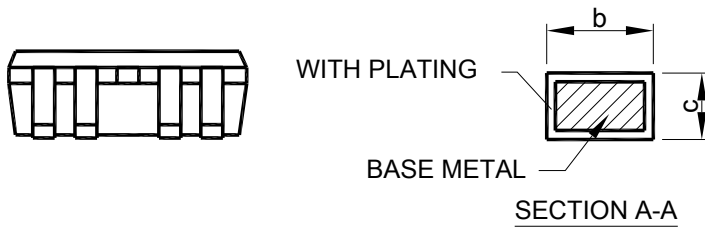
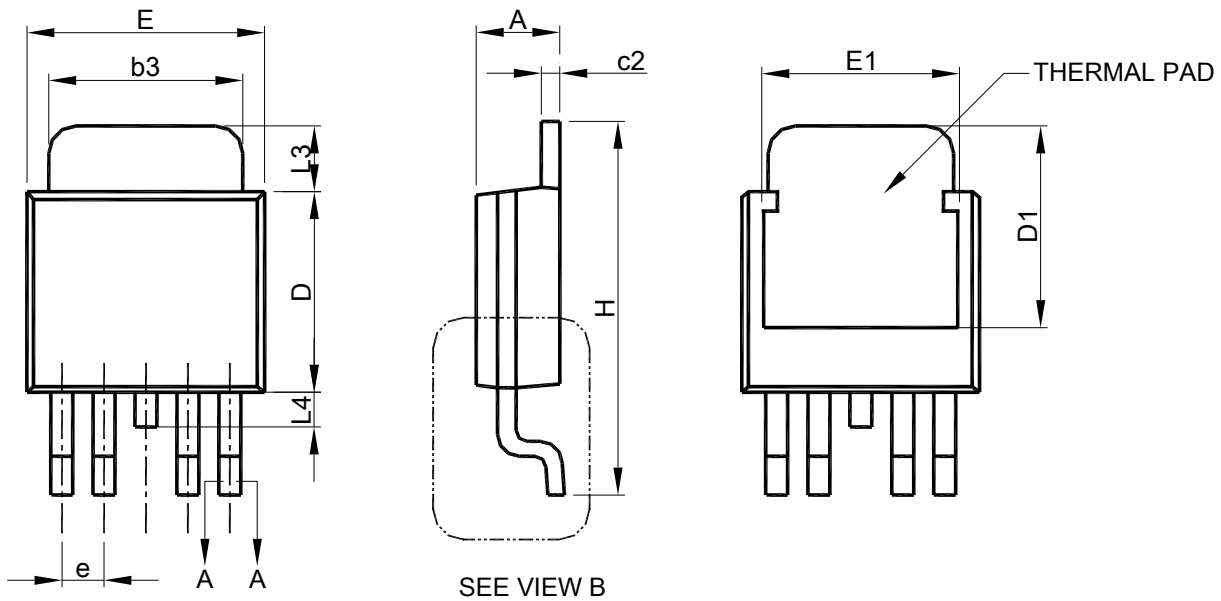
● TO-252-3L PACKAGE OUTLINE DRAWING



SYMBOL	TO-252-3L	
	MILLIMETERS	
	MIN.	MAX.
A	2.19	2.38
A1	0.00	0.13
b	0.64	0.89
b3	4.95	5.46
c	0.46	0.61
c2	0.46	0.89
D	5.33	6.22
D1	4.60	6.00
E	6.35	6.73
E1	3.90	5.46
e	2.28 BSC	
H	9.40	10.41
L	1.40	1.78
L1	2.67 REF	
L2	0.51 BSC	
L3	0.89	2.03
L4	--	1.02
θ	0°	8°

- Note: 1. Refer to JEDEC TO-252AA and AB.
 2. Dimension "E" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
 3. Dimension "D" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

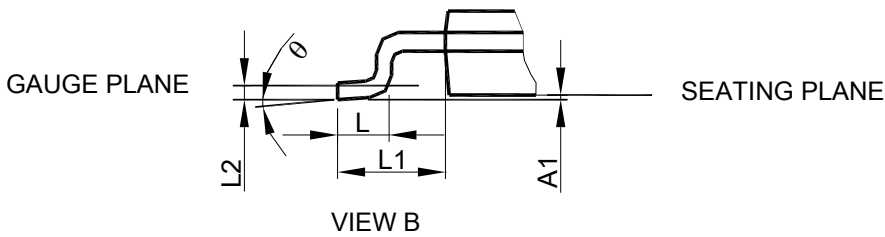
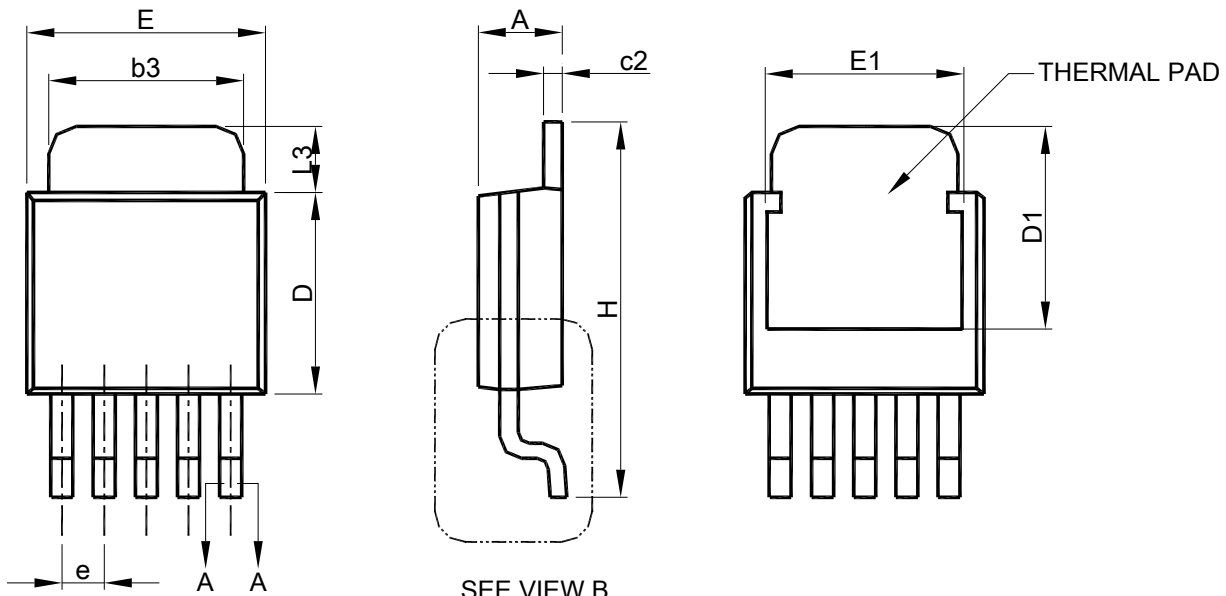
● TO-252-4L PACKAGE OUTLINE DRAWING



SYMBOL	TO-252-4L	
	MILLIMETERS	
	MIN.	MAX.
A	2.19	2.38
A1	0.00	0.13
b	0.51	0.71
b3	4.32	5.46
c	0.46	0.61
c2	0.46	0.89
D	5.33	6.22
D1	4.90	6.00
E	6.35	6.73
E1	4.32	5.33
e	1.27 BSC	
H	9.40	10.41
L	1.40	1.78
L1	2.67 REF	
L2	0.51 BSC	
L3	0.89	2.03
L4	0.6	1.0
θ	0°	8°

- Note: 1. Refer to JEDEC TO-252AD and AB.
 2. Dimension "E" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "D" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

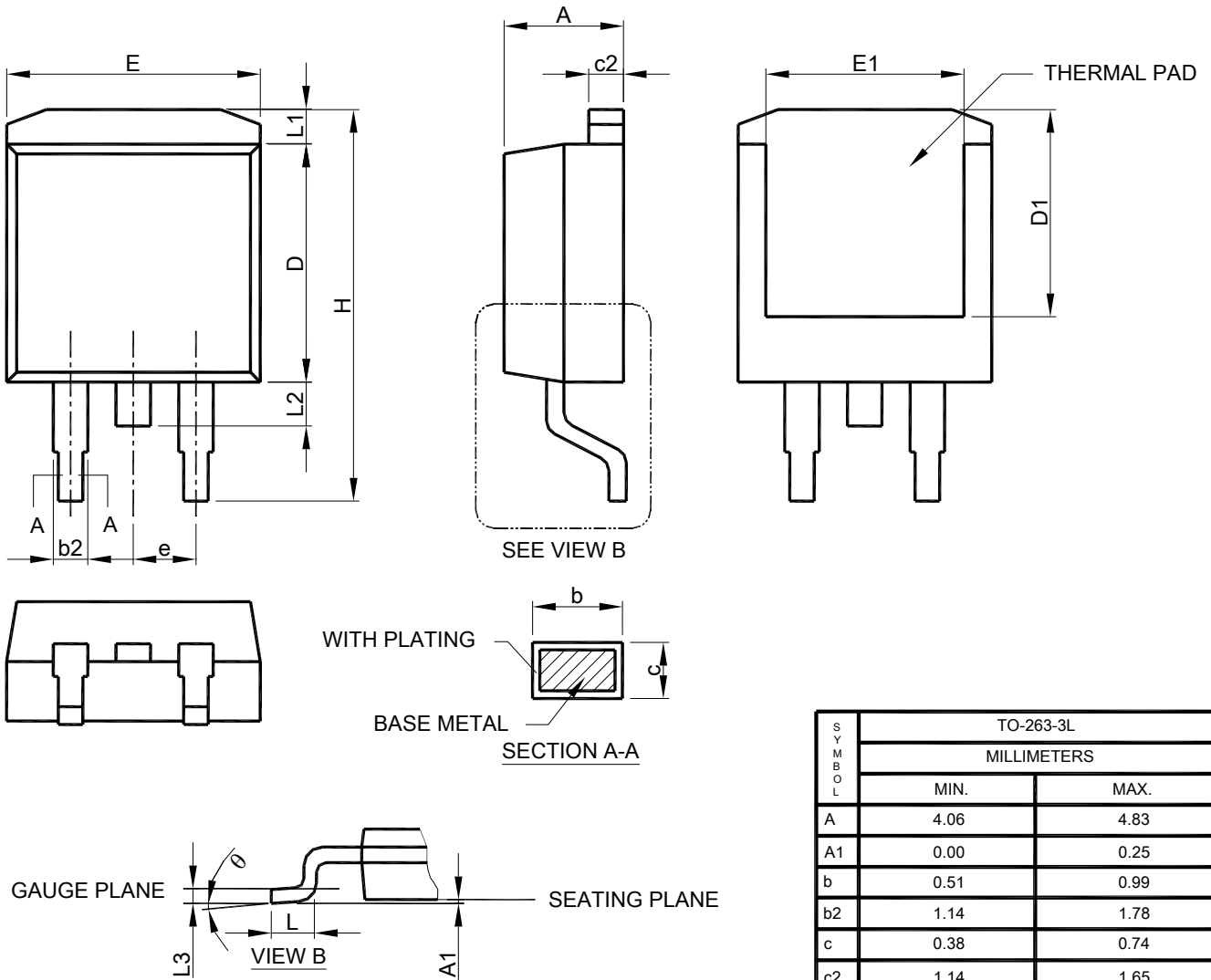
● TO-252-5L PACKAGE OUTLINE DRAWING



SYMBOL	TO-252-5L	
	MILLIMETERS	
	MIN.	MAX.
A	2.19	2.38
A1	0.00	0.13
b	0.51	0.71
b3	4.32	5.46
c	0.46	0.61
c2	0.46	0.89
D	5.33	6.22
D1	4.90	6.00
E	6.35	6.73
E1	4.32	5.33
e	1.27 BSC	
H	9.40	10.41
L	1.40	1.78
L1	2.67 REF	
L2	0.51 BSC	
L3	0.89	2.03
θ	0°	8°

- Note: 1. Refer to JEDEC TO-252AD and AB.
 2. Dimension "E" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .
 3. Dimension "D" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

● TO-263-3L PACKAGE OUTLINE DRAWING

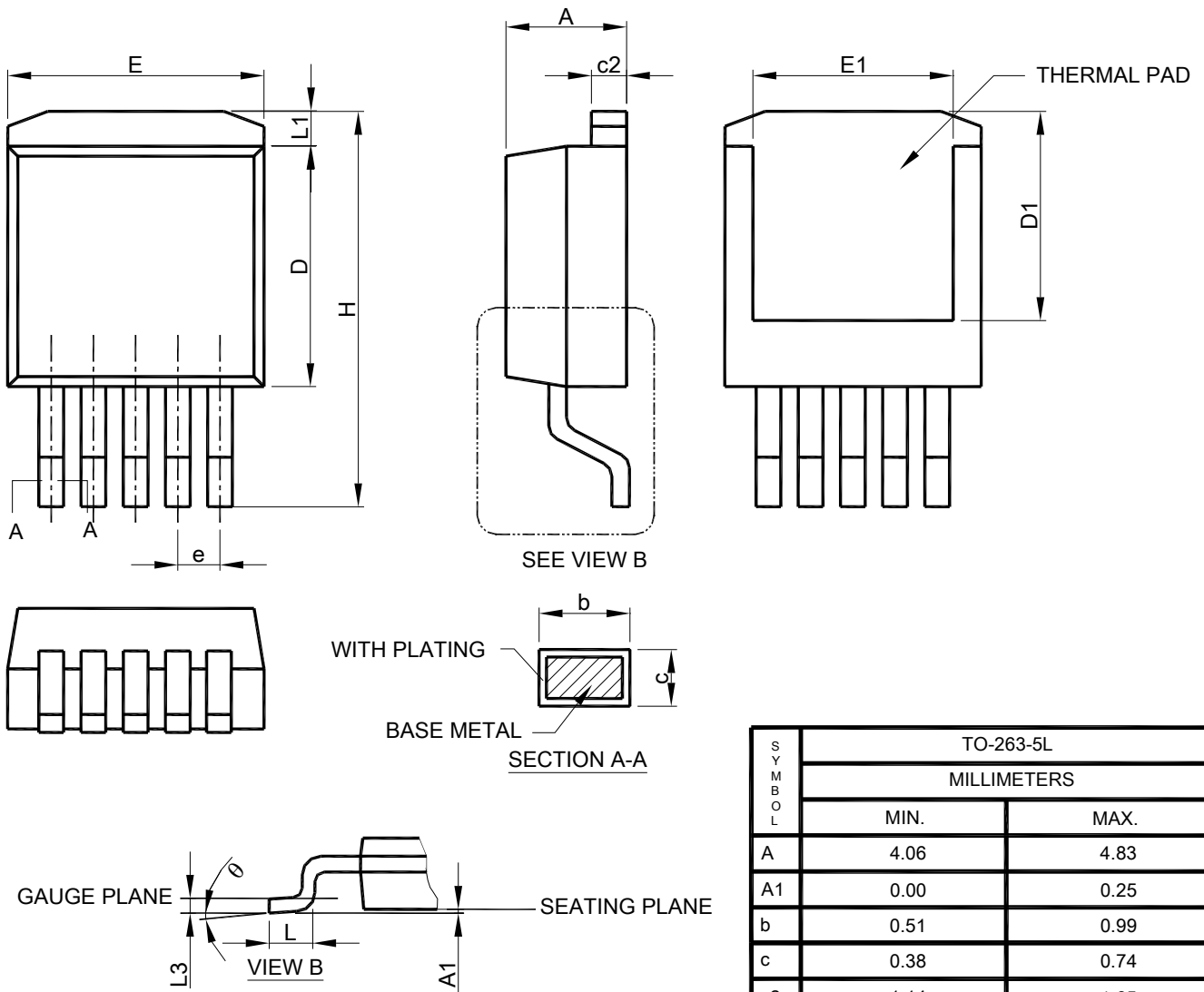


Note: 1. Refer to JEDEC TO-263AB.

2. Dimension "E" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
3. Dimension "D" does not include inter-lead flash or protrusions.
4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	TO-263-3L	
	MILLIMETERS	
	MIN.	MAX.
A	4.06	4.83
A1	0.00	0.25
b	0.51	0.99
b2	1.14	1.78
c	0.38	0.74
c2	1.14	1.65
D	8.38	9.65
D1	6.86	--
E	9.65	10.67
E1	6.23	--
e	2.54 BSC	
H	14.61	15.88
L	1.78	2.79
L1	--	1.68
L2	--	1.78
L3	0.25 BSC	
θ	0°	8°

● TO-263-5L PACKAGE OUTLINE DRAWING



SYMBOL	TO-263-5L	
	MILLIMETERS	
	MIN.	MAX.
A	4.06	4.83
A1	0.00	0.25
b	0.51	0.99
c	0.38	0.74
c2	1.14	1.65
D	8.38	9.65
D1	6.86	--
E	9.65	10.67
E1	6.23	--
e	1.70 BSC	
H	14.61	15.88
L	1.78	2.79
L1	--	1.68
L3	0.25 BSC	
θ	0°	8°

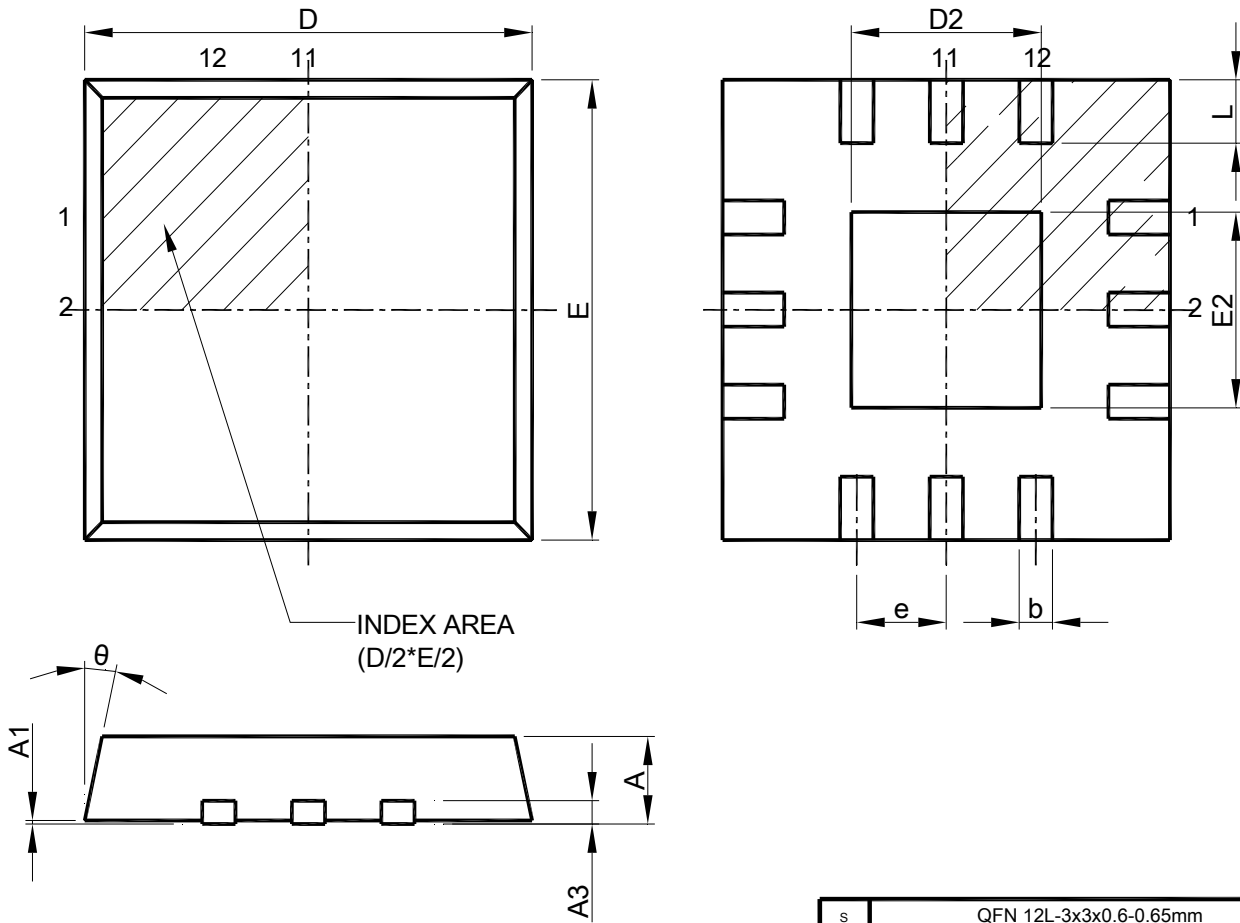
Note: 1. Refer to JEDEC TO-263BA.

2. Dimension "E" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side .

3. Dimension "D" does not include inter-lead flash or protrusions.

4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

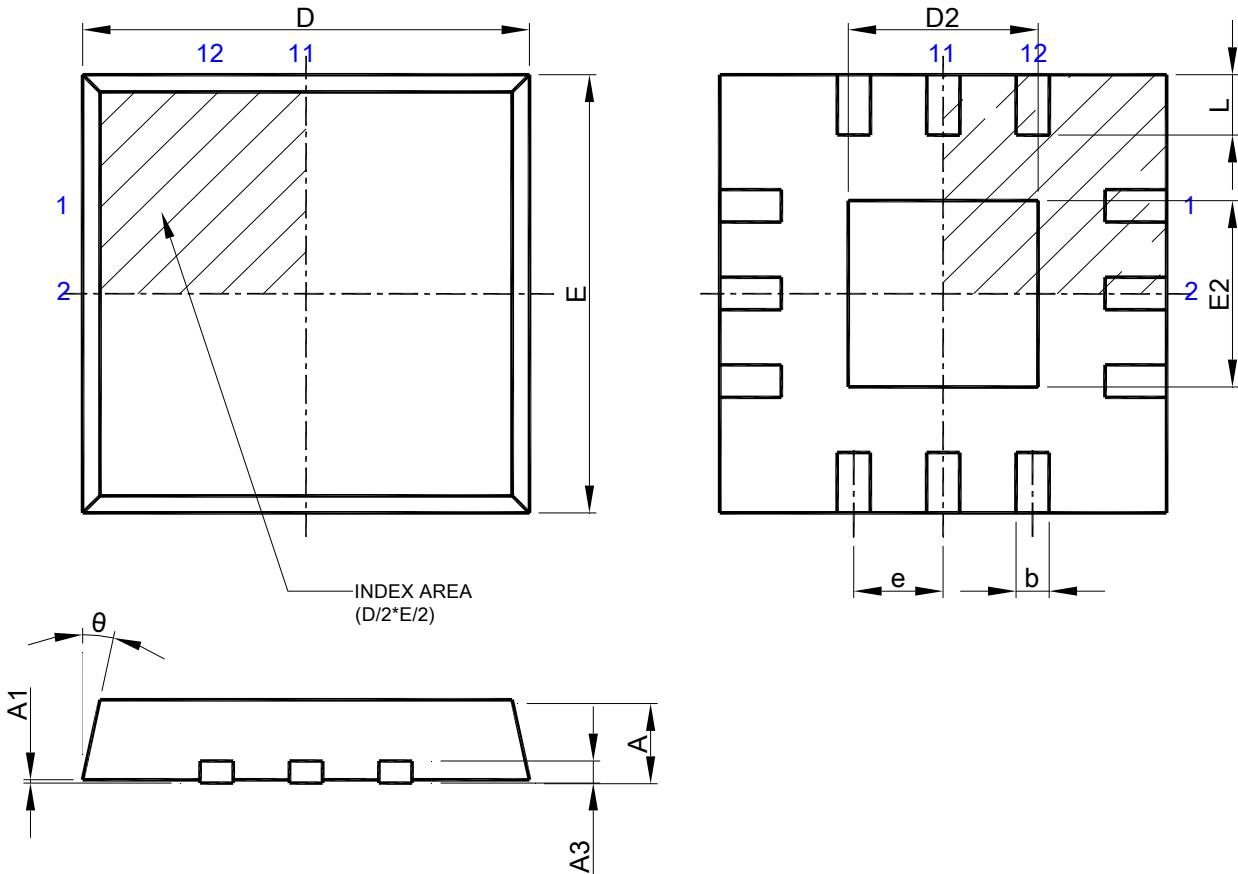
● QFN 12L-3x3x0.6-0.65mm PACKAGE OUTLINE DRAWING



Note : 1. Refer to JEDEC MO-220 VEEC-1.
2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 12L-3x3x0.6-0.65mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.55	0.65
A1	0.00	0.05
A3	0.20 REF	
b	0.25	0.35
D	2.90	3.10
D2	1.50	1.80
E	2.90	3.10
E2	1.50	1.80
e	0.60	0.70
L	0.35	0.45
θ	0	12

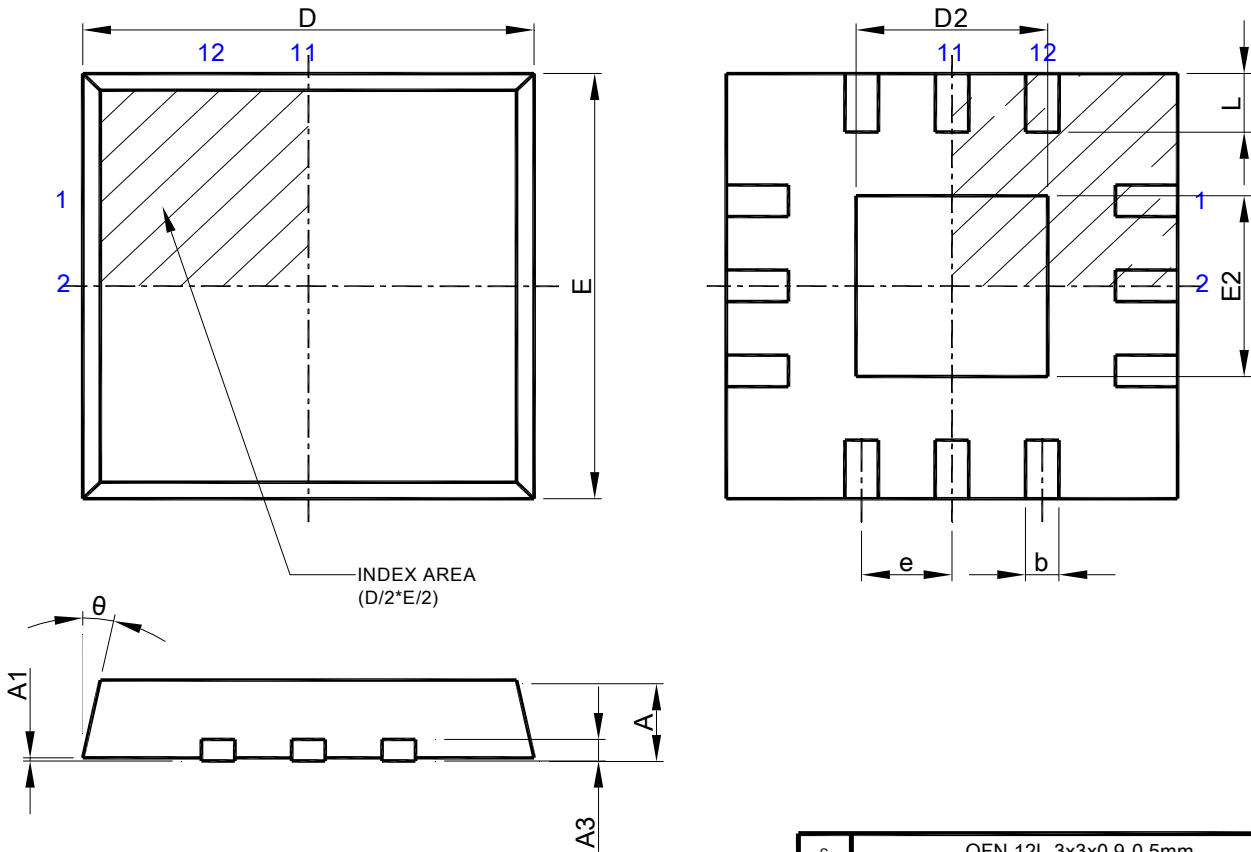
● QFN 12L-3x3x0.75-0.5mm PACKAGE OUTLINE DRAWING



Note : 1. Refer to JEDEC MO-220 WEED-3, 5
2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 12L-3x3x0.75-0.5mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A1	0.00	0.05
A3	0.20 REF	
b	0.18	0.30
D	2.90	3.10
D2	1.25	1.80
E	2.90	3.10
E2	1.25	1.80
e	0.50 BSC	
L	0.35	0.45
θ	0	14

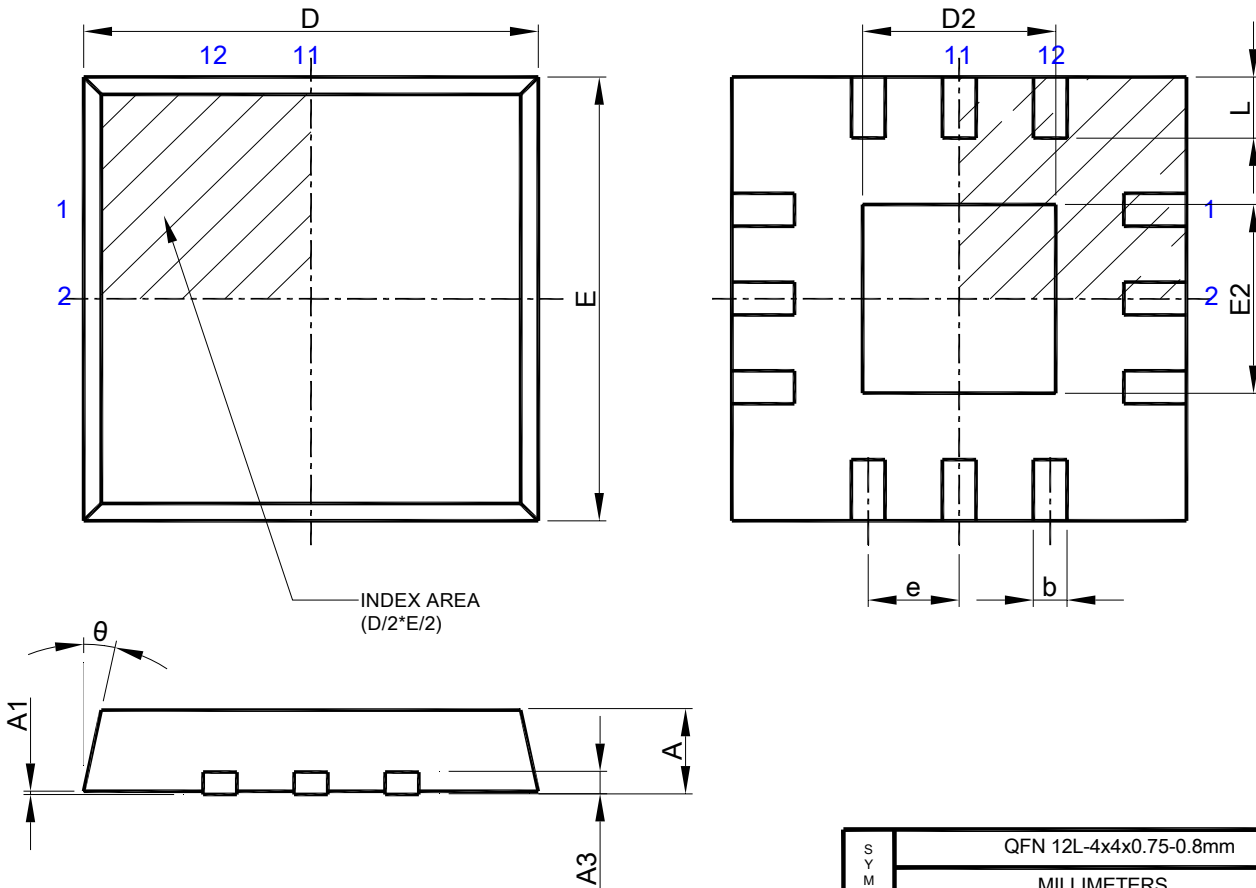
● QFN 12L-3x3x0.9-0.5mm PACKAGE OUTLINE DRAWING



Note : 1. Refer to JEDEC MO-220 VEED-3.
2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 12L-3x3x0.9-0.5mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.80	1.00
A1	0.00	0.05
A3	0.20 REF	
b	0.18	0.30
D	2.90	3.10
D2	1.50	1.80
E	2.90	3.10
E2	1.50	1.80
e	0.45	0.55
L	0.35	0.45
θ	0	12

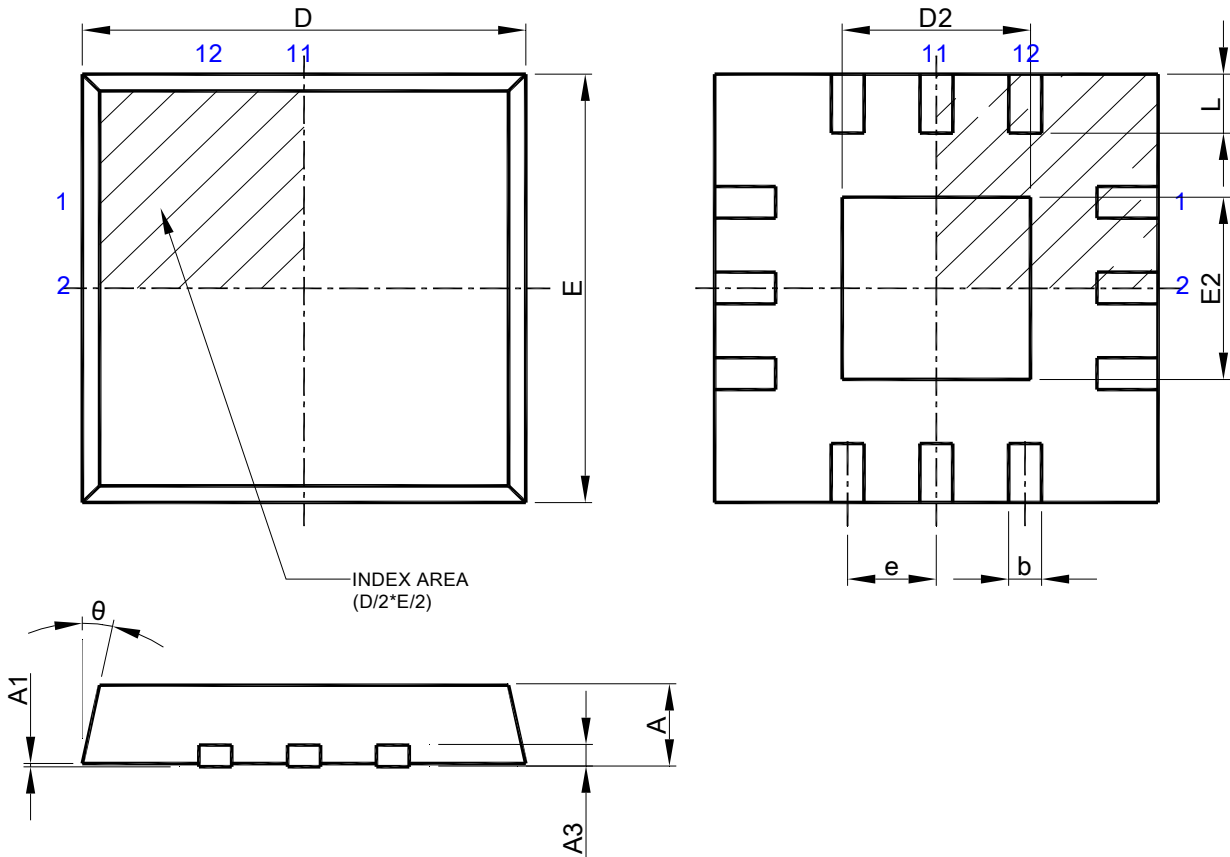
● QFN 12L-4x4x0.75 -0.8mm PACKAGE OUTLINE DRAWING



Note: 1. Refer to JEDEC MO-220 WGGB.
2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 12L-4x4x0.75-0.8mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A1	0.00	0.05
A3	0.20 REF	
b	0.25	0.35
D	3.90	4.10
D2	0.75	2.35
E	3.90	4.10
E2	0.75	2.35
e	0.80BSC	
L	0.47	0.63
θ	0	14

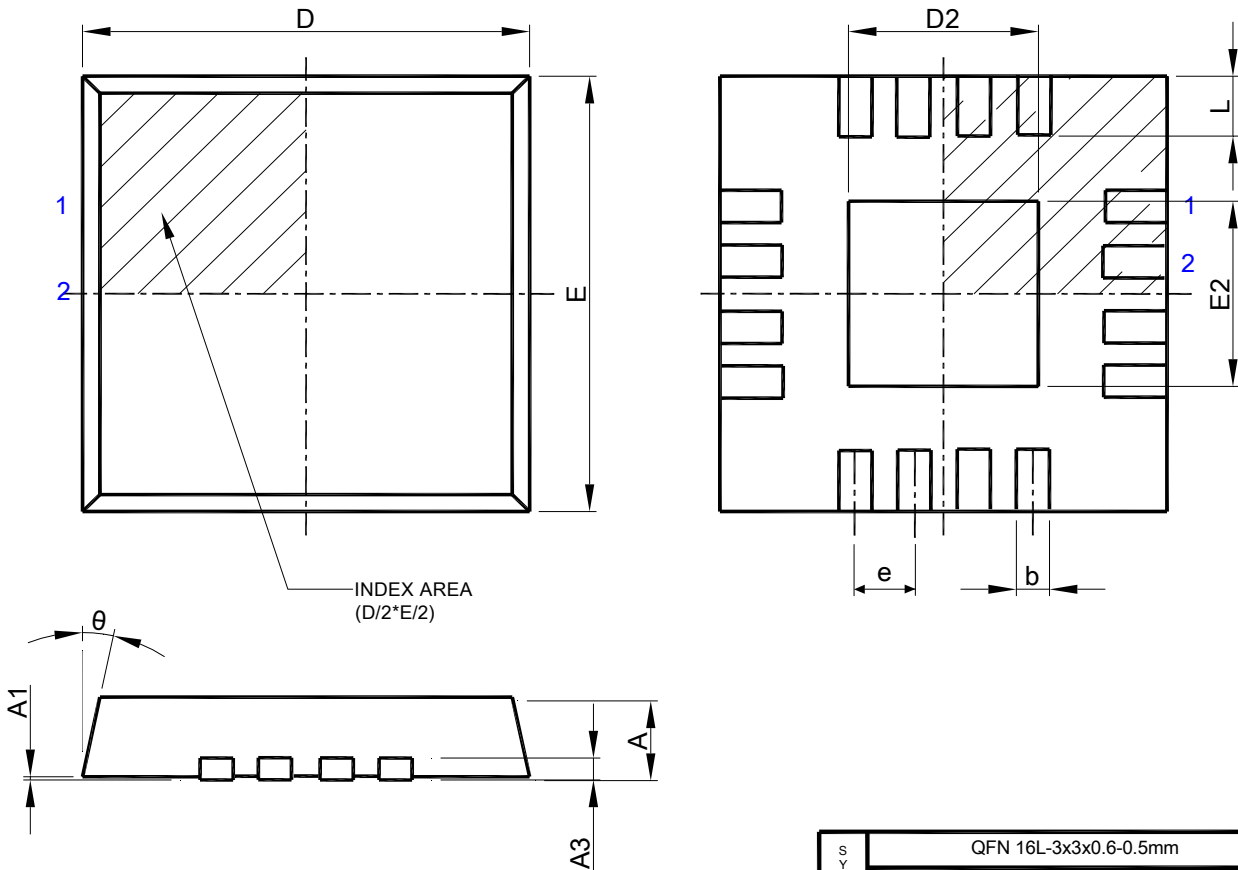
● QFN 12L-4x4x0.9-0.8mm PACKAGE OUTLINE DRAWING



Note : 1. Refer to JEDEC MO-220 VGG B.
 2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 12L-4x4x0.9-0.8mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.80	1.00
A1	0.00	0.05
A3	0.20 REF	
b	0.25	0.35
D	3.90	4.10
D2	0.75	2.25
E	3.90	4.10
E2	0.75	2.25
e	0.75	0.85
L	0.35	0.75
θ	0	12

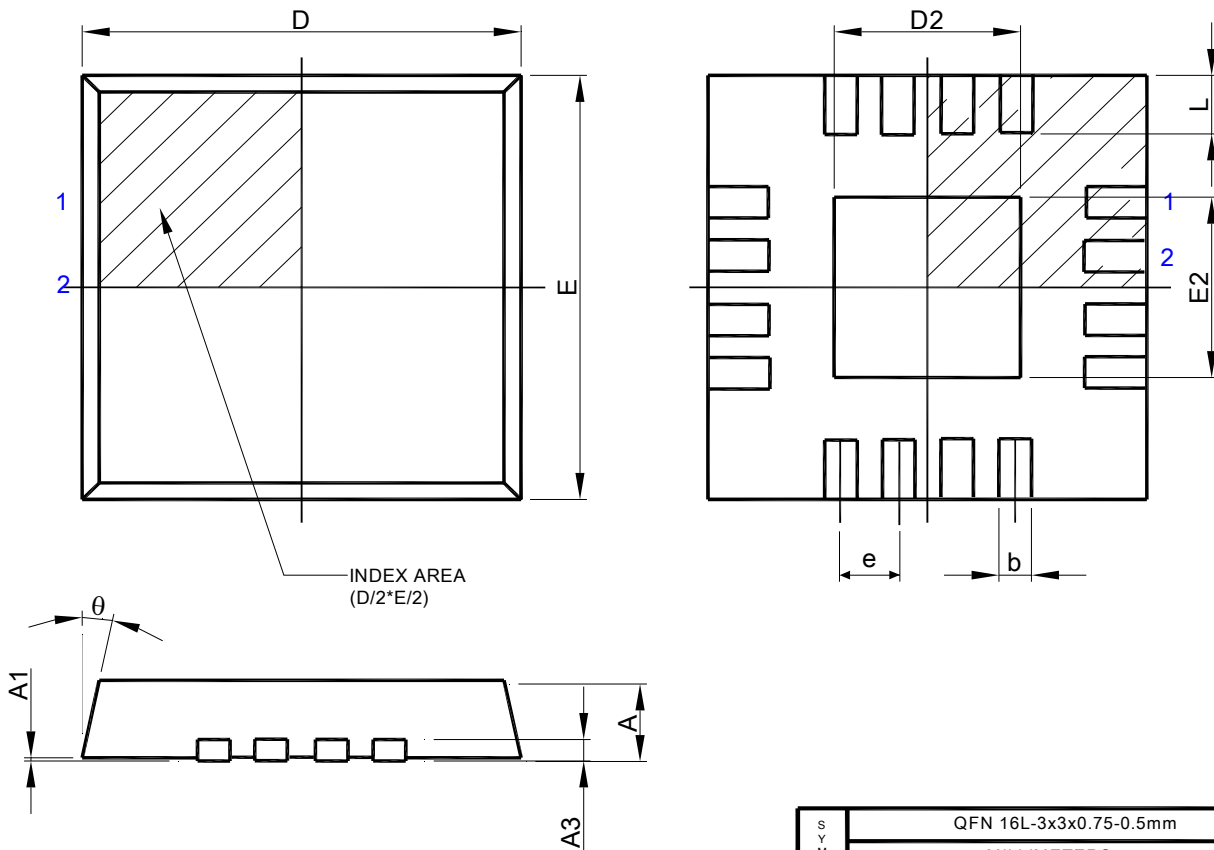
● QFN 16L-3x3x0.6-0.5mm PACKAGE OUTLINE DRAWING



Note: 1. Refer to JEDEC MO-220 WEED-4,6,7
2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 16L-3x3x0.6-0.5mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.55	0.65
A1	0.00	0.05
A3	0.20 REF	
b	0.18	0.30
D	2.90	3.10
D2	1.05	1.80
E	2.90	3.10
E2	1.05	1.80
e	0.50 BSC	
L	0.30	0.55
θ	0	14

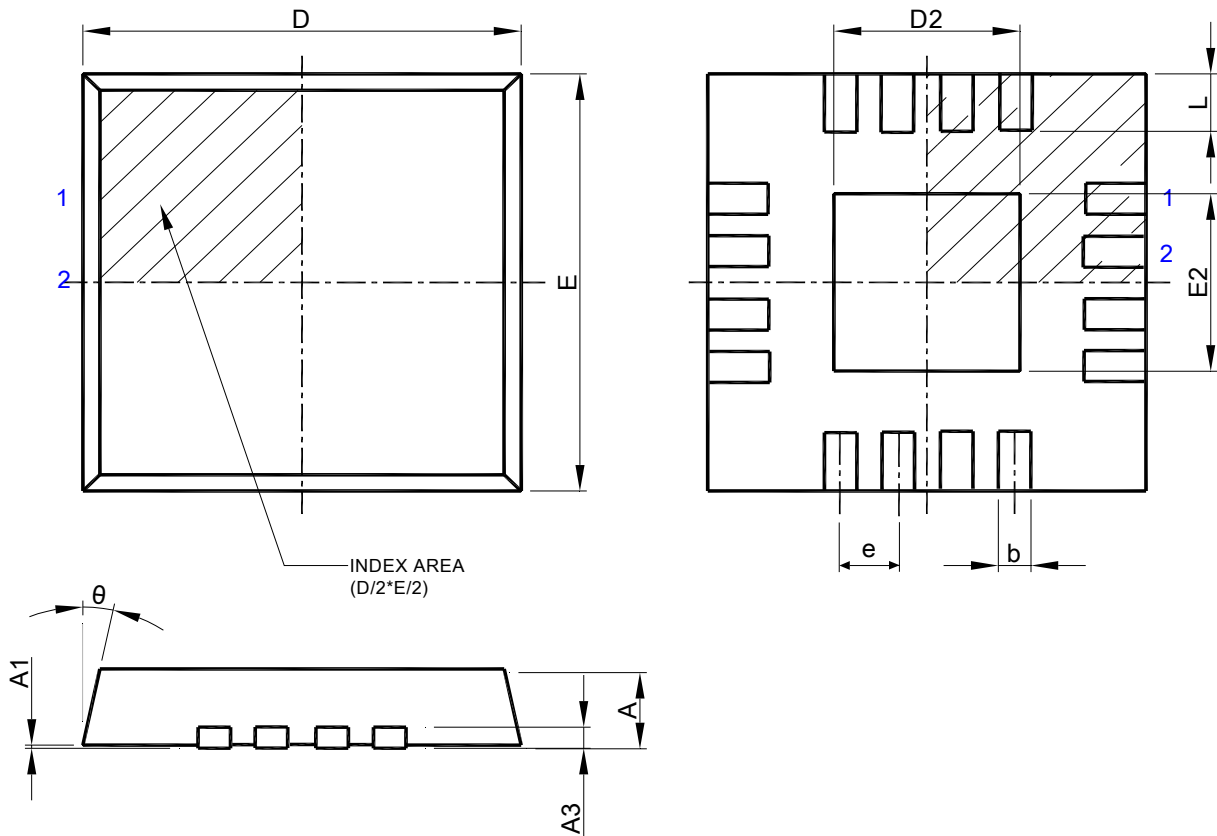
● QFN 16L-3x3x0.75 -0.5mm PACKAGE OUTLINE DRAWING



Note: 1. Refer to JEDEC MO-220 WEED-4,6,7
 2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 16L-3x3x0.75-0.5mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A1	0.00	0.05
A3	0.20 REF	
b	0.18	0.30
D	2.90	3.10
D2	1.05	1.80
E	2.90	3.10
E2	1.05	1.80
e	0.50 BSC	
L	0.30	0.55
θ	0	14

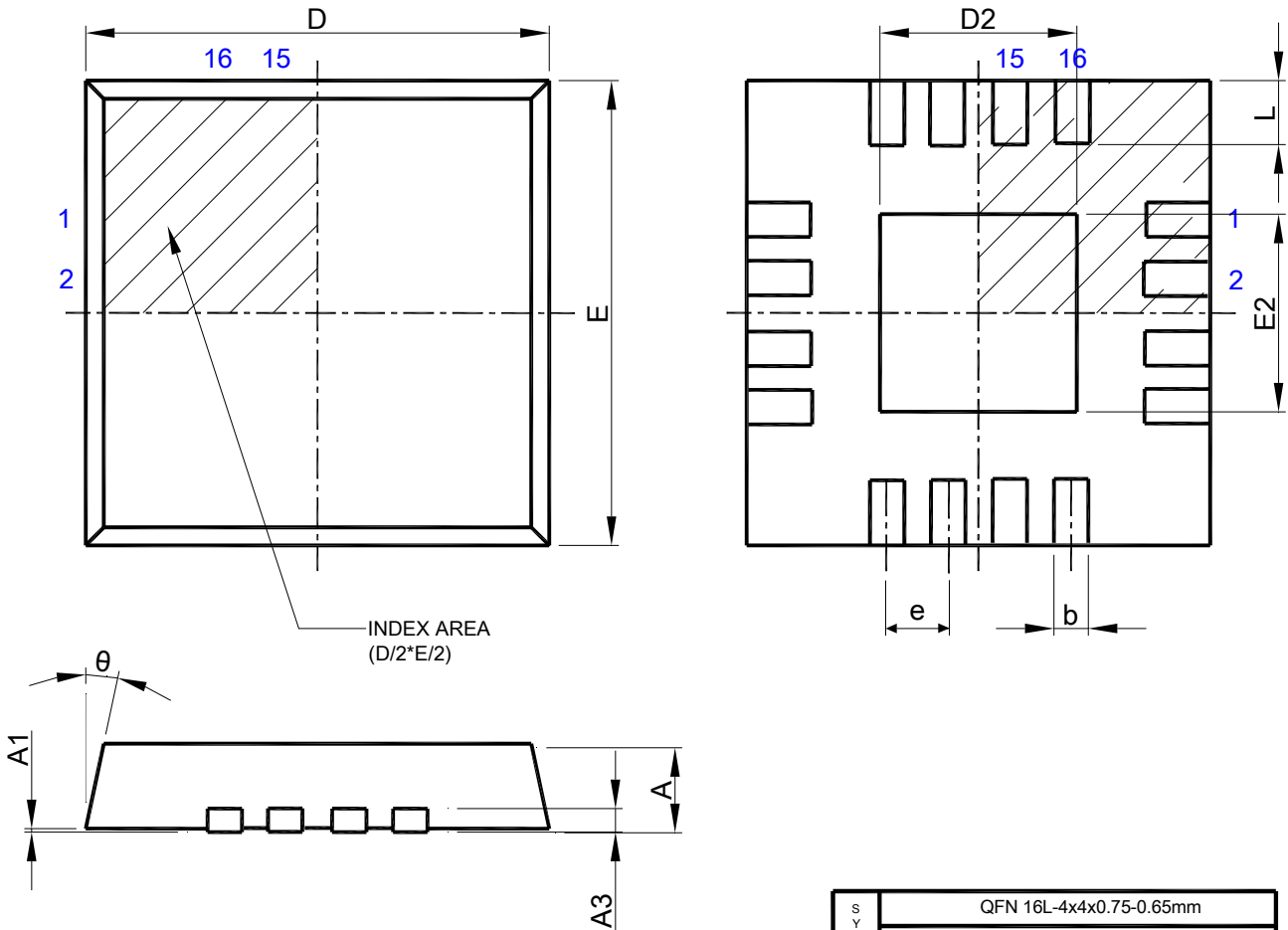
● QFN 16L-3x3x0.9-0.5mm PACKAGE OUTLINE DRAWING



Note: 1. Refer to JEDEC MO-220 VEED-4,6,7
2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 16L-3x3x0.9-0.5mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.80	1.00
A1	0.00	0.05
A3	0.20 REF	
b	0.18	0.30
D	2.90	3.10
D2	1.05	1.80
E	2.90	3.10
E2	1.05	1.80
e	0.50 BSC	
L	0.30	0.55
θ	0	14

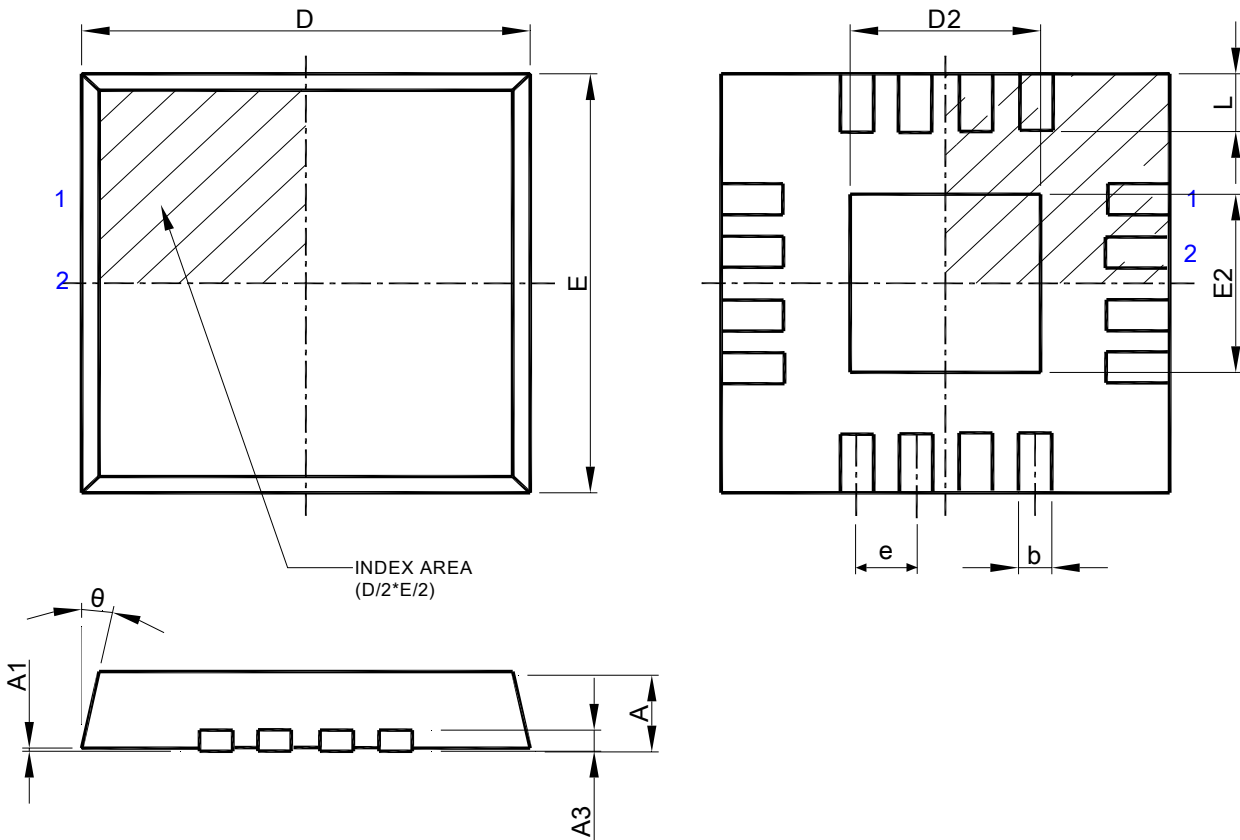
● QFN 16L-4x4x0.75-0.65mm PACKAGE OUTLINE DRAWING



Note : 1. Refer to JEDEC MO-220 WGGC-4
 2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 16L-4x4x0.75-0.65mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A1	0.00	0.05
A3	0.20 REF	
b	0.25	0.35
D	3.90	4.10
D2	2.00	2.80
E	3.90	4.10
E2	2.00	2.80
e	0.65 BSC	
L	0.30	0.65
θ	0	14

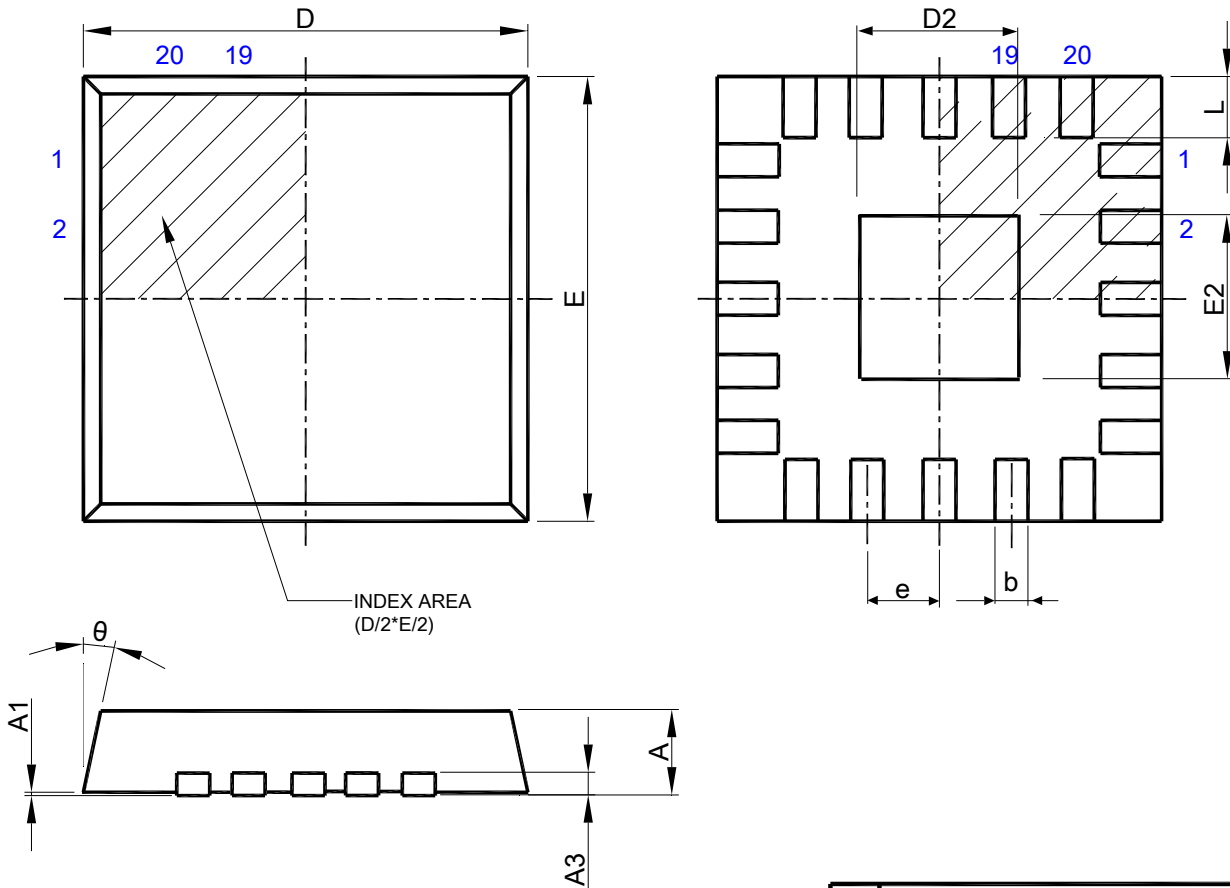
● QFN 16L-4x4x0.9-0.65mm PACKAGE OUTLINE DRAWING



Note: 1. Refer to JEDEC MO-220 VGGC-2,3,4
2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 16L-4x4x0.9-0.65mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.80	1.00
A1	0.00	0.05
A3	0.20 REF	
b	0.25	0.35
D	3.90	4.10
D2	2.20	2.80
E	3.90	4.10
E2	2.20	2.80
e	0.65 BSC	
L	0.30	0.65
θ	0	14

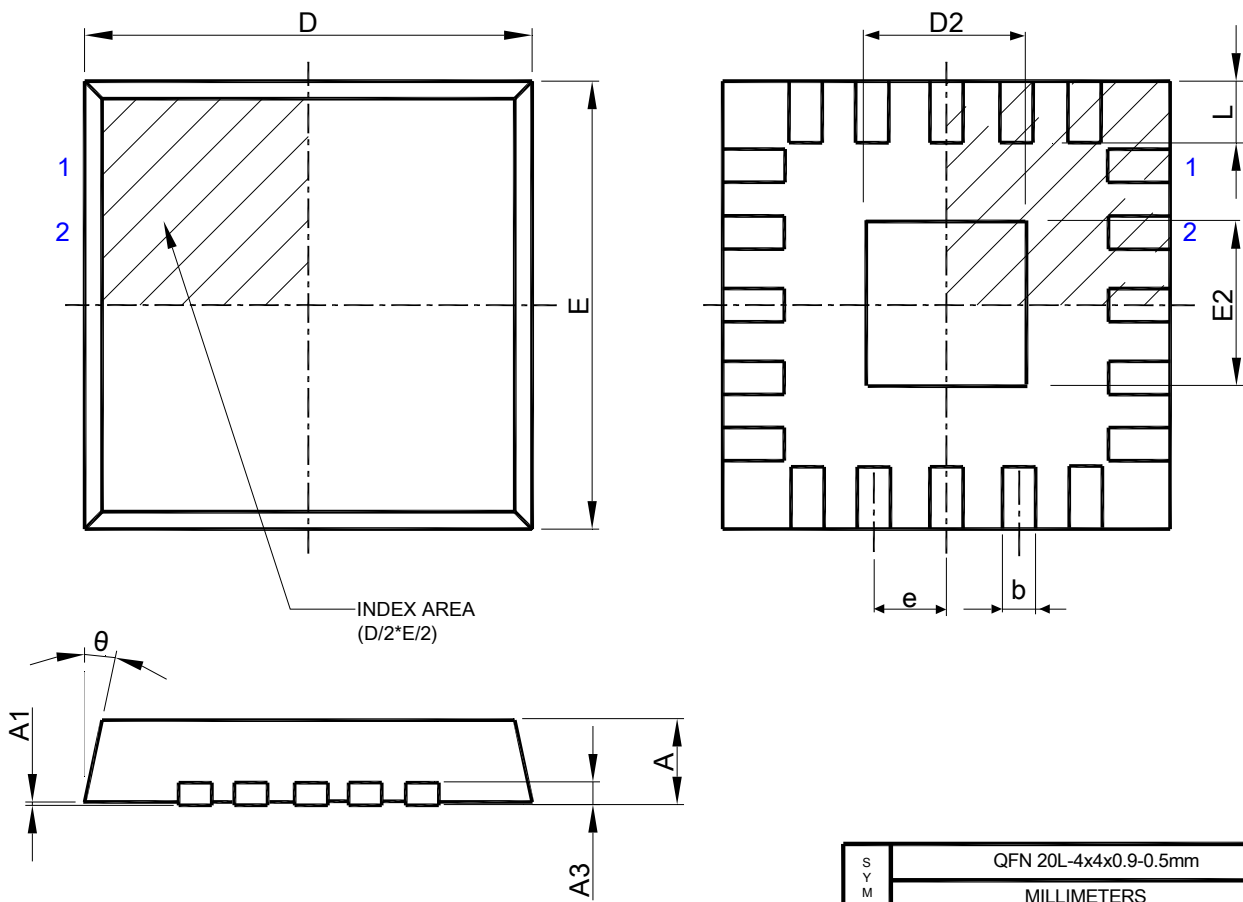
● QFN 20L-4x4x0.75-0.5 mm PACKAGE OUTLINE DRAWING



Note : 1. Refer to JEDEC MO-220 WGGD-1, 5
2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 20L-4x4x0.75-0.5mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A1	0.00	0.05
A3	0.20 REF	
b	0.18	0.30
D	3.90	4.10
D2	2.25	2.80
E	3.90	4.10
E2	2.25	2.80
e	0.50 BSC	
L	0.35	0.45
θ	0	14

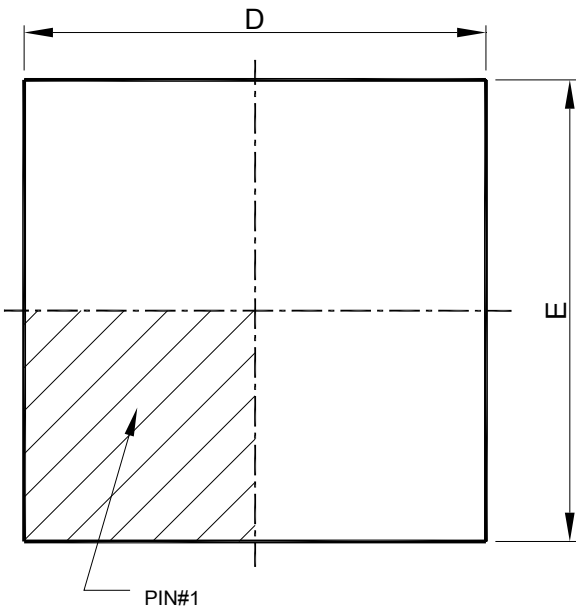
● QFN 20L-4x4x0.9-0.5 mm PACKAGE OUTLINE DRAWING



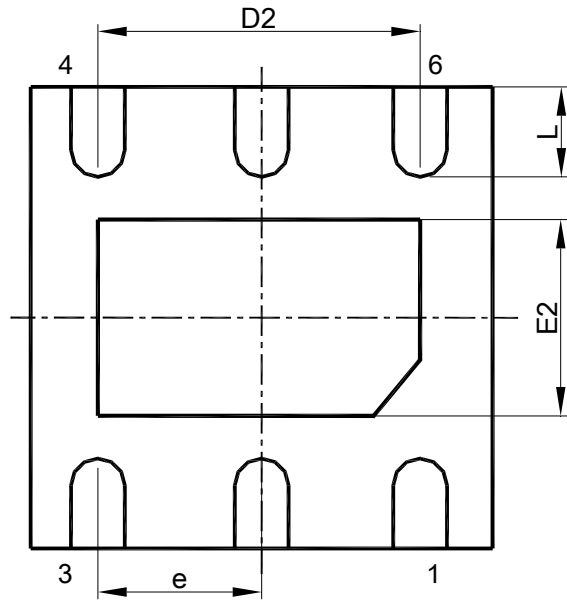
Note: 1. Refer to JEDEC MO-220 VGGD-5
2. All dimensions are in millimeters, θ is in degrees.

SYMBOL	QFN 20L-4x4x0.9-0.5mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.80	1.00
A1	0.00	0.05
A3	0.20 REF	
b	0.18	0.30
D	3.90	4.10
D2	2.25	2.80
E	3.90	4.10
E2	2.25	2.80
e	0.50 BSC	
L	0.35	0.50
θ	0	14

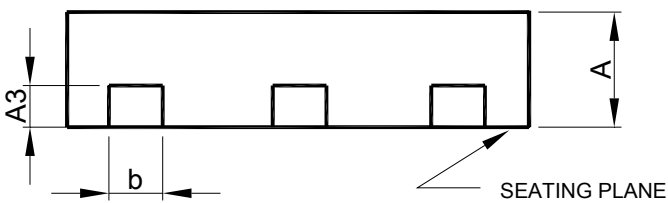
● DFN 6L-2x2x0.75-0.65mm PACKAGE OUTLINE DRAWING



TOP VIEW



BOTTOM VIEW

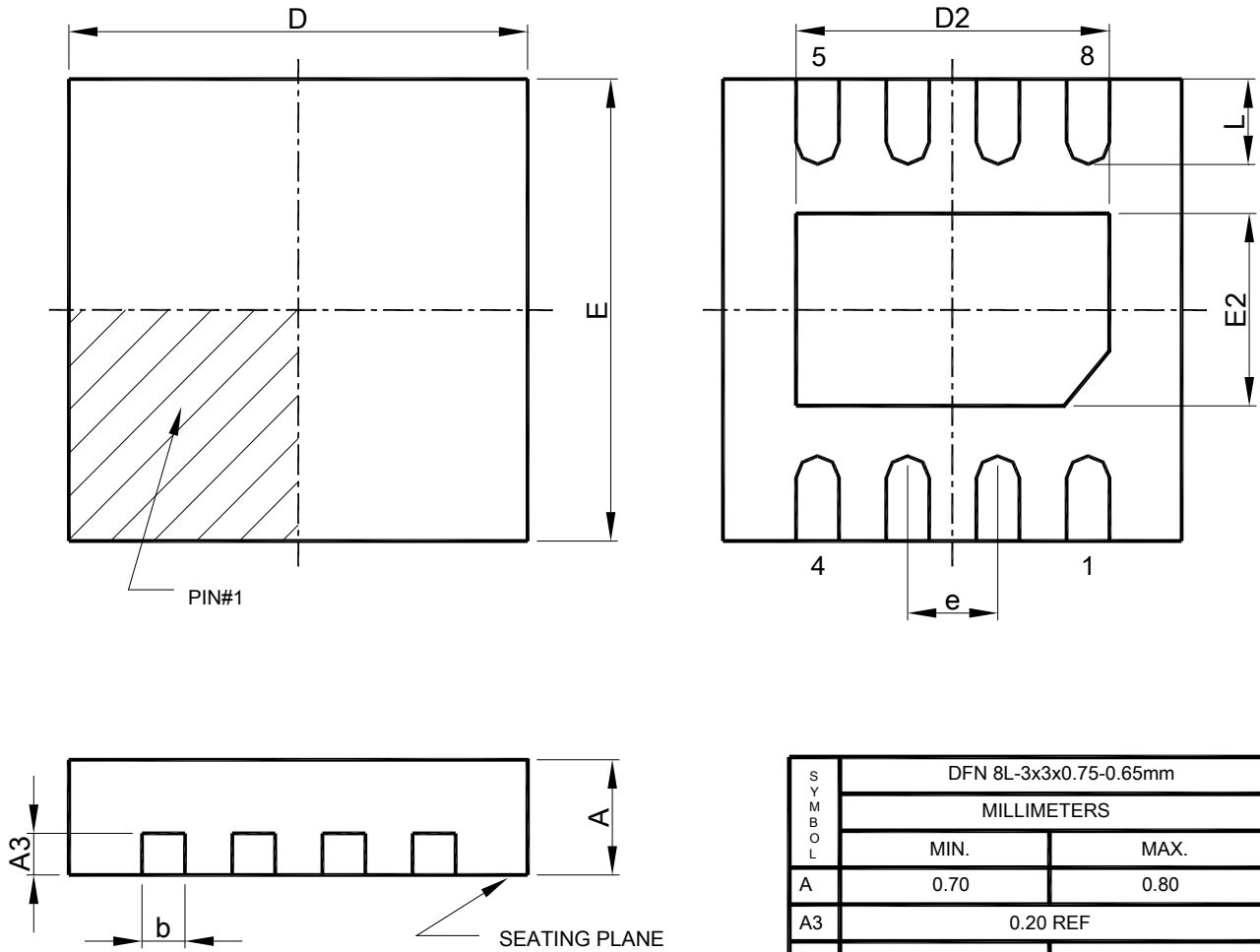


SIDE VIEW

SYMBOL	DFN 6L-2x2x0.75-0.65mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A3	0.20 BSC	
b	0.20	0.35
D	2.00 BSC	
D2	1.10	1.60
E	2.00 BSC	
E2	0.55	0.85
e	0.65 BSC	
L	0.25	0.45

- Note :
1. DIMENSION AND TOLERANCING CONFORM TO ASME Y14.5M-1994.
 2. CONTROLLING DIMENSIONS : MILLIMETER , CONVERTED INCH DIMENSION ARE NOT NECESSARILY EXACT.
 3. DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.10 AND 0.25 mm FROM TERMINAL TIP.

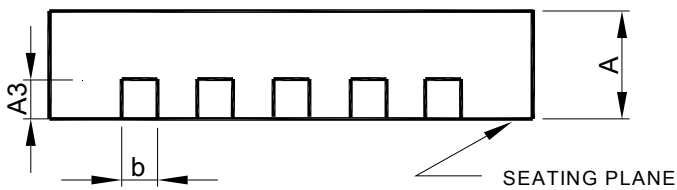
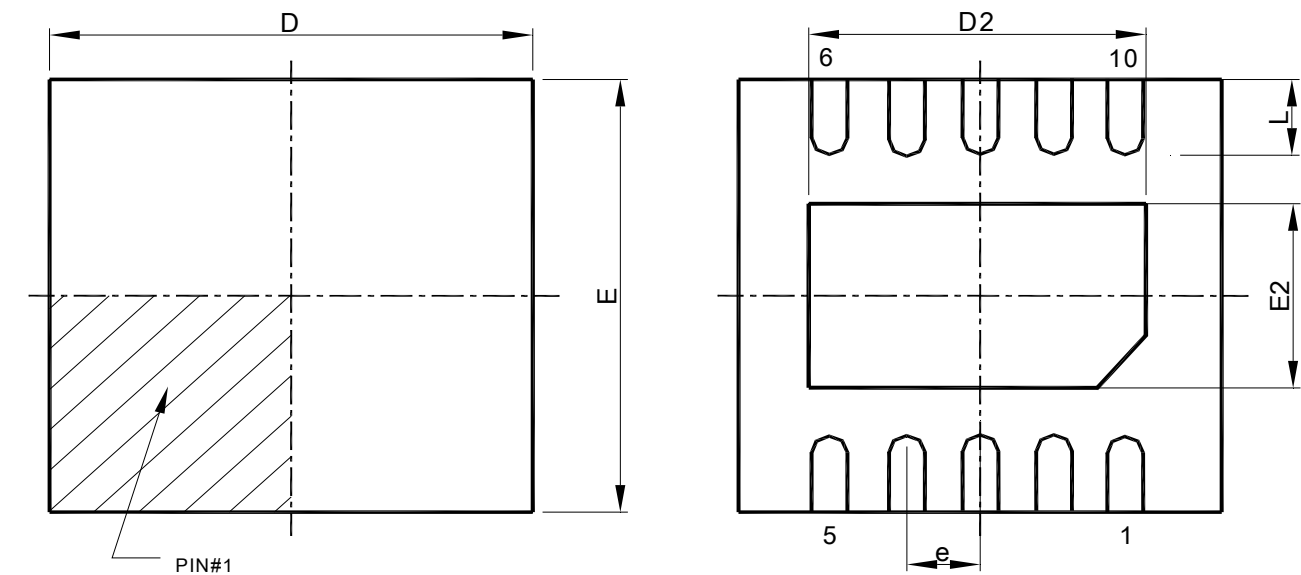
DFN 8L-3x3x0.75-0.65mm PACKAGE OUTLINE DRAWING



SYMBOL	DFN 8L-3x3x0.75-0.65mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A3	0.20 REF	
b	0.25	0.35
D	2.90	3.10
D2	2.20	2.40
E	2.90	3.10
E2	1.40	1.60
e	0.65 BSC	
L	0.25	0.45

Note : 1. Refer to JEDEC MO-220K.
 2. CONTROLLING DIMENSIONS : MILLIMETER , CONVERTED INCH DIMENSION ARE NOT NECESSARILY EXACT.

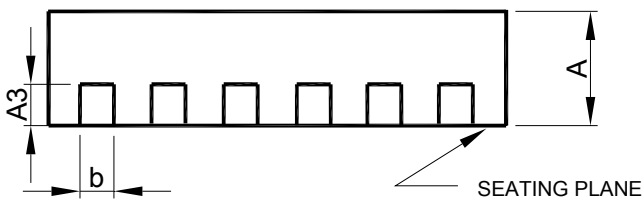
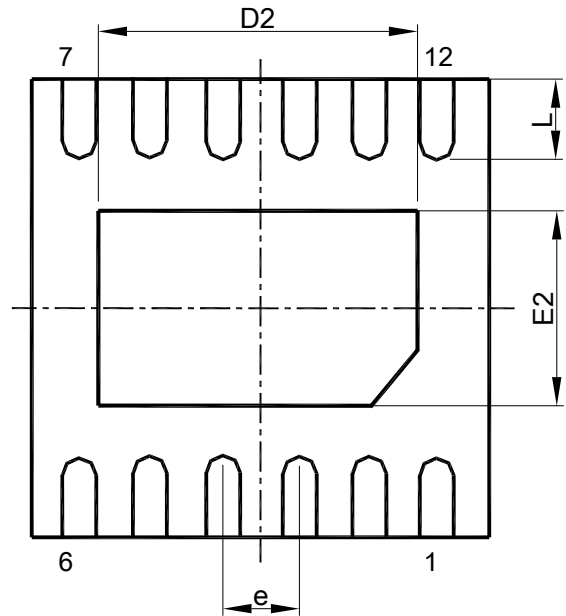
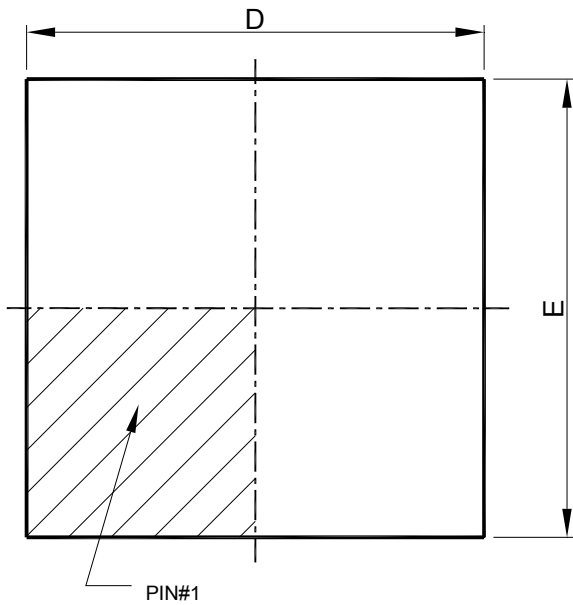
DFN 10L-3x3x0.75-0.5mm PACKAGE OUTLINE DRAWING



SYMBOL	DFN 10L-3x3x0.75-0.5mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A3	0.20 BSC	
b	0.18	0.30
D	2.90	3.10
D2	2.20	2.70
E	2.90	3.10
E2	1.40	1.80
e	0.5 BSC	
L	0.30	0.50

Note : 1. DIMENSION AND TOLERANCING CONFORM TO ASME Y14.5M-1994.
 2. CONTROLLING DIMENSIONS : MILLIMETER , CONVERTED INCH DIMENSION ARE NOT NECESSARILY EXACT.

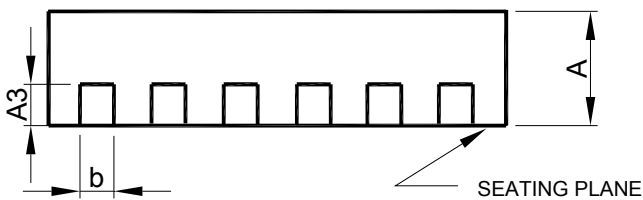
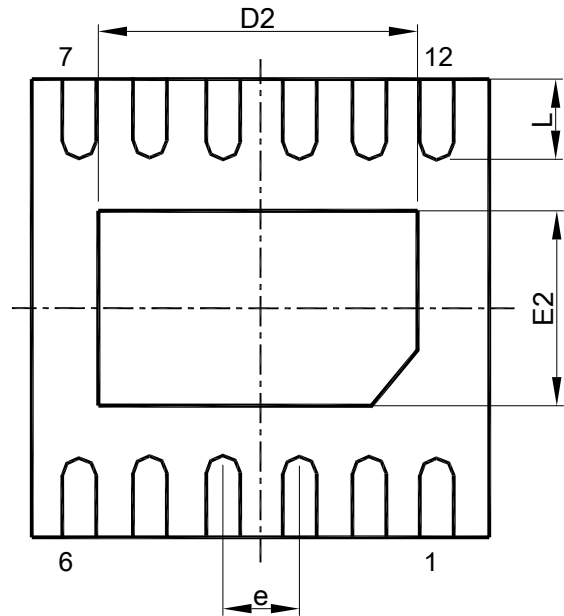
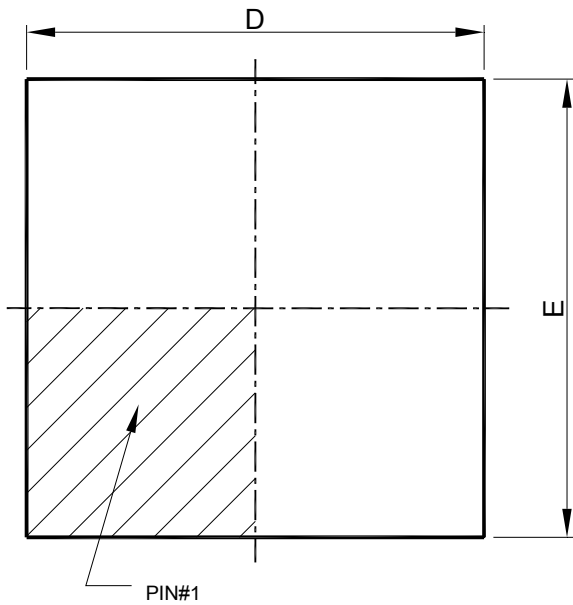
● DFN 12L-3x3x0.75-0.45mm PACKAGE OUTLINE DRAWING



SYMBOL	DFN 12L-3x3x0.75-0.45mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A3	0.20 BSC	
b	0.18	0.30
D	2.90	3.10
D2	2.20	2.70
E	2.90	3.10
E2	1.40	1.80
e	0.45 BSC	
L	0.30	0.50

Note : 1. DIMENSION AND TOLERANCING CONFORM TO ASME Y14.5M-1994.
 2. CONTROLLING DIMENSIONS : MILLIMETER , CONVERTED INCH DIMENSION ARE NOT NECESSARILY EXACT.

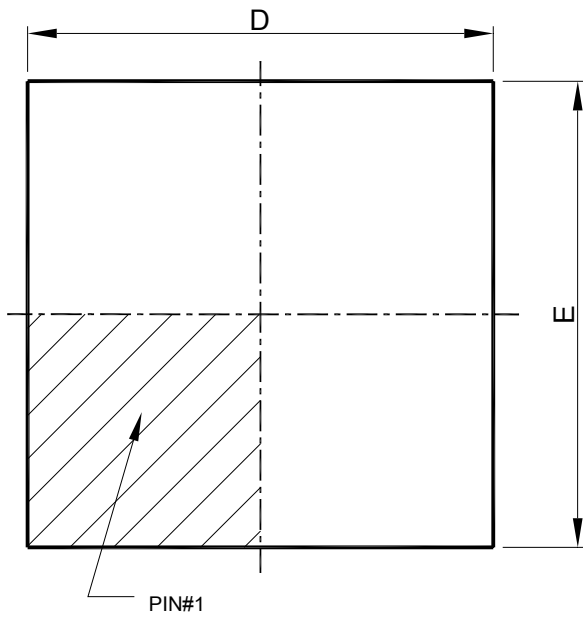
● DFN 12L-3x3x0.75-0.5mm PACKAGE OUTLINE DRAWING



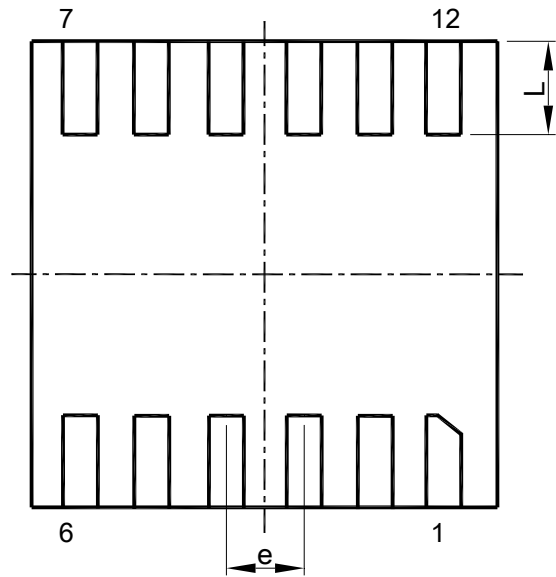
SYMBOL	DFN 12L-3x3x0.75-0.5mm	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A3	0.20 BSC	
b	0.18	0.30
D	2.90	3.10
D2	2.20	2.40
E	2.90	3.10
E2	1.60	1.80
e	0.50 BSC	
L	0.35	0.45

Note : 1. DIMENSION AND TOLERANCING CONFORM TO ASME Y14.5M-1994.
 2. CONTROLLING DIMENSIONS : MILLIMETER , CONVERTED INCH DIMENSION ARE NOT NECESSARILY EXACT.

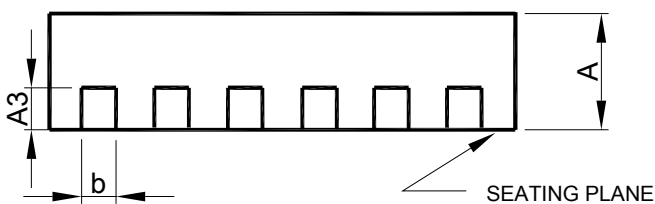
● DFN 12L-3x3x0.75-0.5mm (Without Heat Sink) PACKAGE OUTLINE DRAWING



TOP VIEW



BOTTOM VIEW

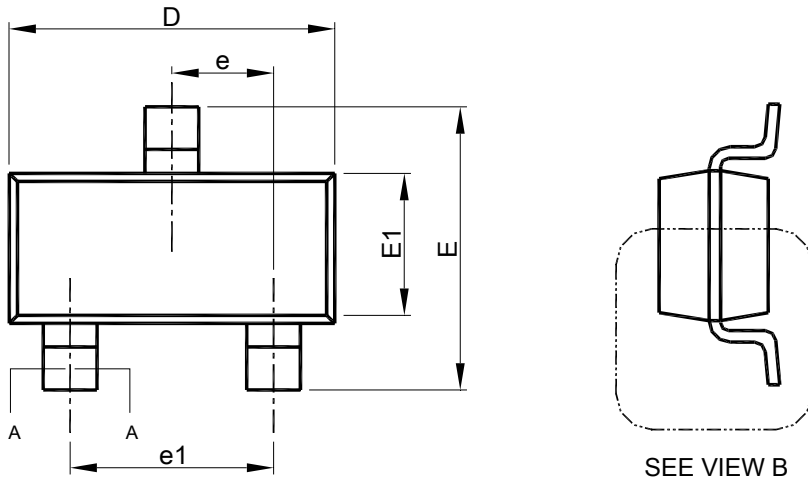


SIDE VIEW

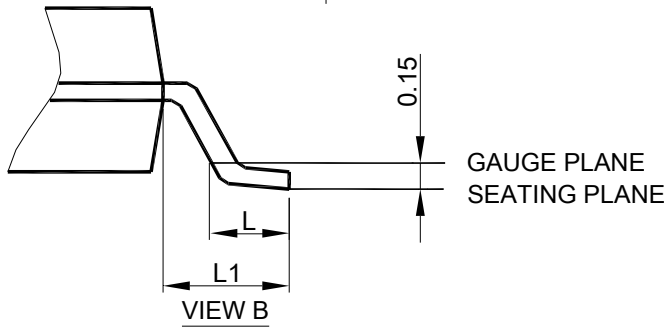
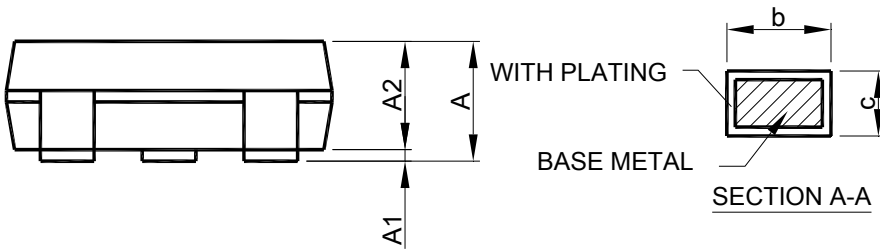
SYMBOL	DFN 12L-3x3x0.75-0.5mm (Without Heat Sink)	
	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A3	0.203 BSC	
b	0.20	0.30
D	2.90	3.10
E	2.90	3.10
e	0.500 BSC	
L	0.60	0.70

Note : 1. DIMENSION AND TOLERANCING CONFORM TO ASME Y14.5M-1994.
 2. CONTROLLING DIMENSIONS : MILLIMETER , CONVERTED INCH DIMENSION ARE NOT NECESSARILY EXACT.

● SC70-3L PACKAGE OUTLINE DRAWING



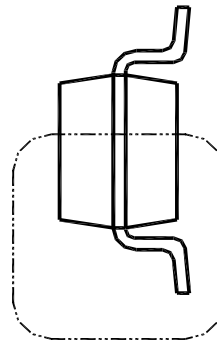
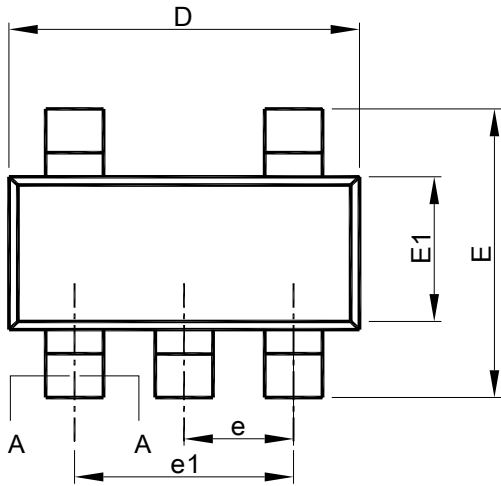
SEE VIEW B



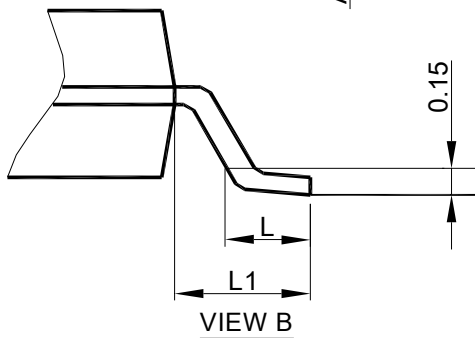
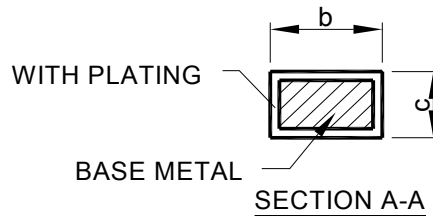
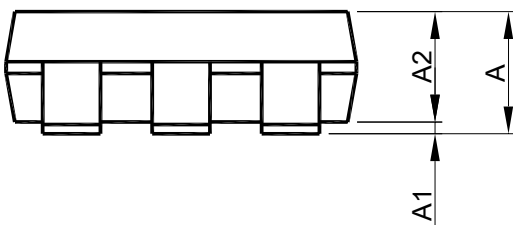
SYMBOL	SC70-3L	
	MILLIMETERS	
	MIN.	MAX.
A	-	1.10
A1	0	0.10
A2	0.70	1.00
b	0.15	0.40
c	0.08	0.25
D	1.85	2.15
E	1.80	2.40
E1	1.10	1.40
e	0.65 BSC	
e1	1.30 BSC	
L	0.26	0.46
L1	0.42 REF	

- Note: 1. Refer to JEDEC MO-203.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

● SC70-5L PACKAGE OUTLINE DRAWING



SEE VIEW B

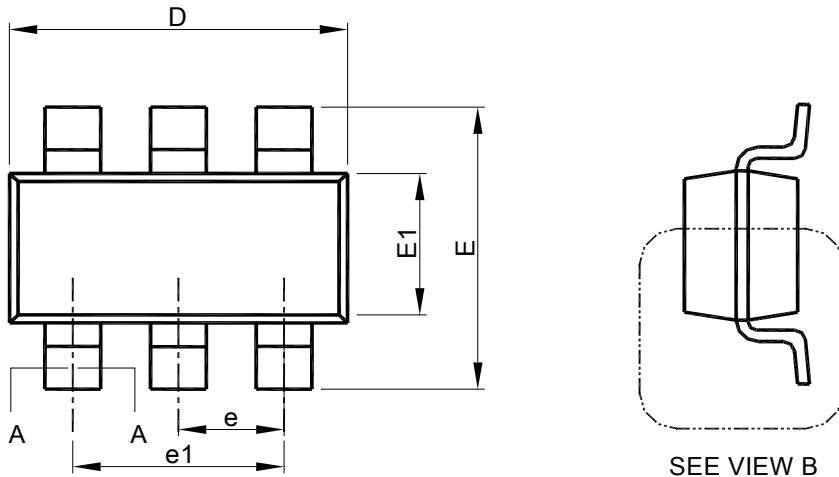


GAUGE PLANE
SEATING PLANE

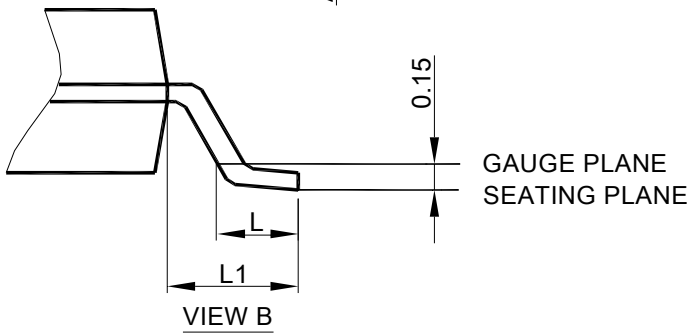
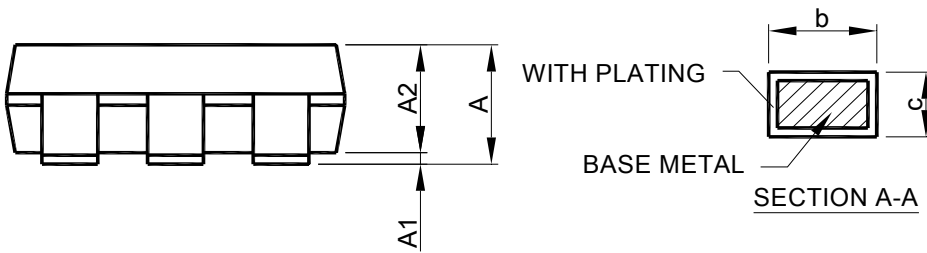
SYMBOL	SC70-5L	
	MILLIMETERS	
	MIN.	MAX.
A	-	1.10
A1	0	0.10
A2	0.70	1.00
b	0.15	0.30
c	0.08	0.25
D	1.85	2.15
E	1.80	2.40
E1	1.10	1.40
e	0.65 BSC	
e1	1.30 BSC	
L	0.26	0.46
L1	0.42 REF	

- Note: 1. Refer to JEDEC MO-203AA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

● SC70-6L PACKAGE OUTLINE DRAWING



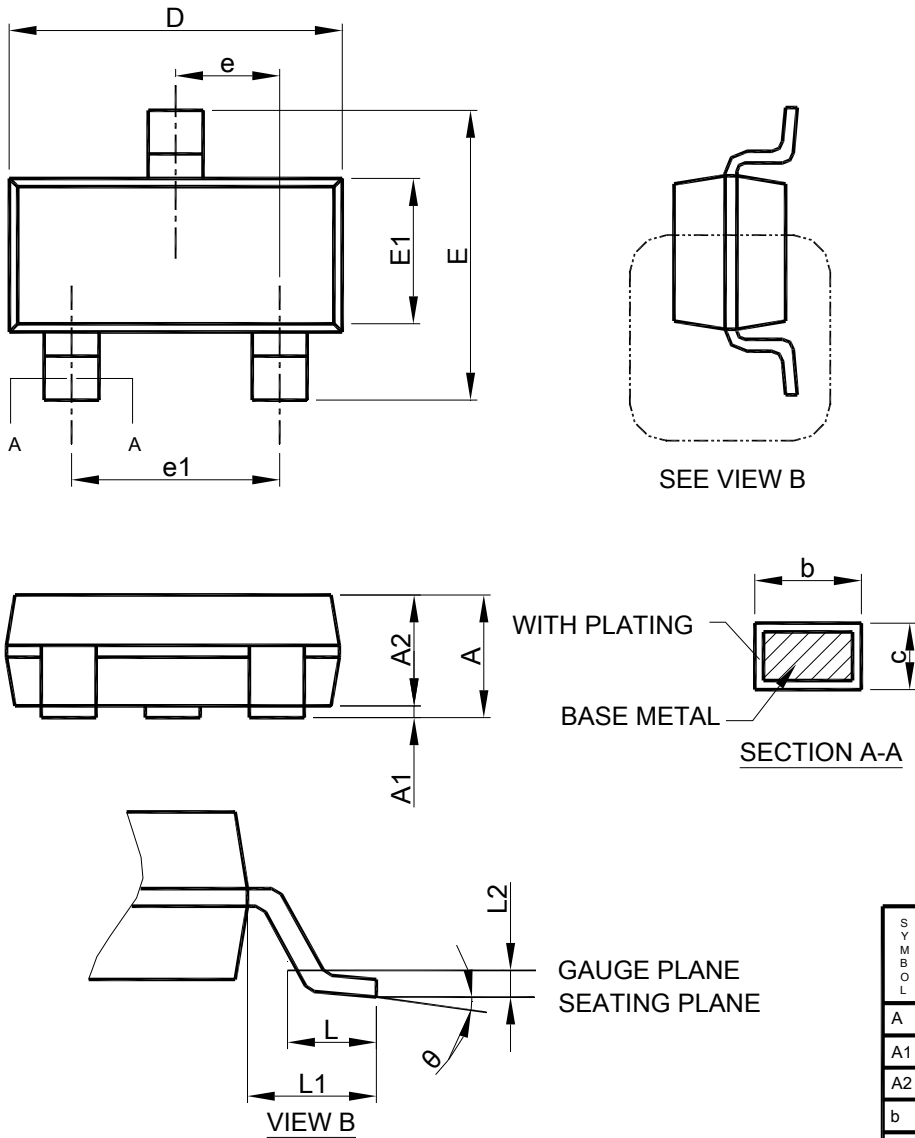
SEE VIEW B



- Note: 1. Refer to JEDEC MO-203AB.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	SC70-6L	
	MILLIMETERS	
	MIN.	MAX.
A	-	1.10
A1	0	0.10
A2	0.70	1.00
b	0.15	0.30
c	0.08	0.25
D	1.85	2.15
E	1.80	2.40
E1	1.10	1.40
e	0.65 BSC	
e1	1.30 BSC	
L	0.26	0.46
L1	0.42 REF	

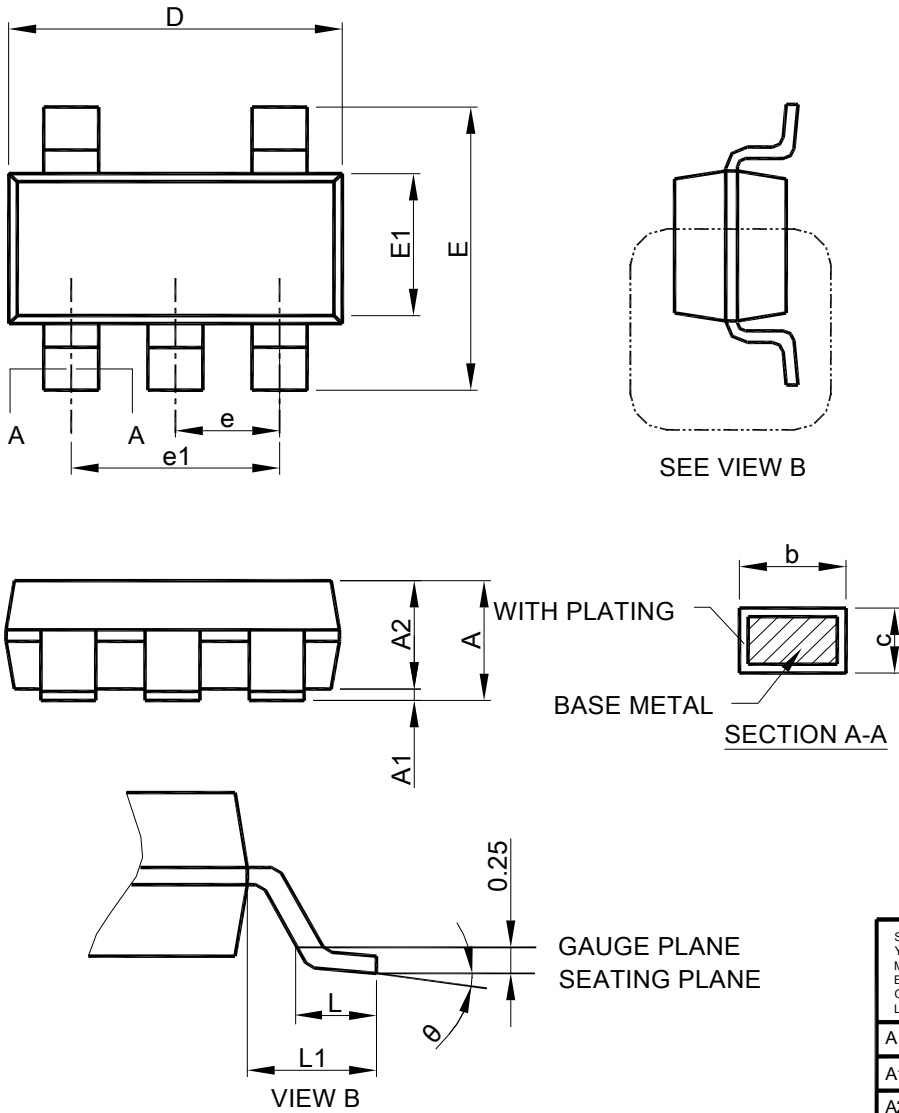
● TSOT-23 PACKAGE OUTLINE DRAWING



- Note : 1. Refer to JEDEC MO-193C.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	TSOT-23	
	MILLIMETERS	
	MIN.	MAX.
A	-	1.00
A1	0	0.10
A2	0.70	0.90
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
L2	0.25 BSC	
θ	0°	8°

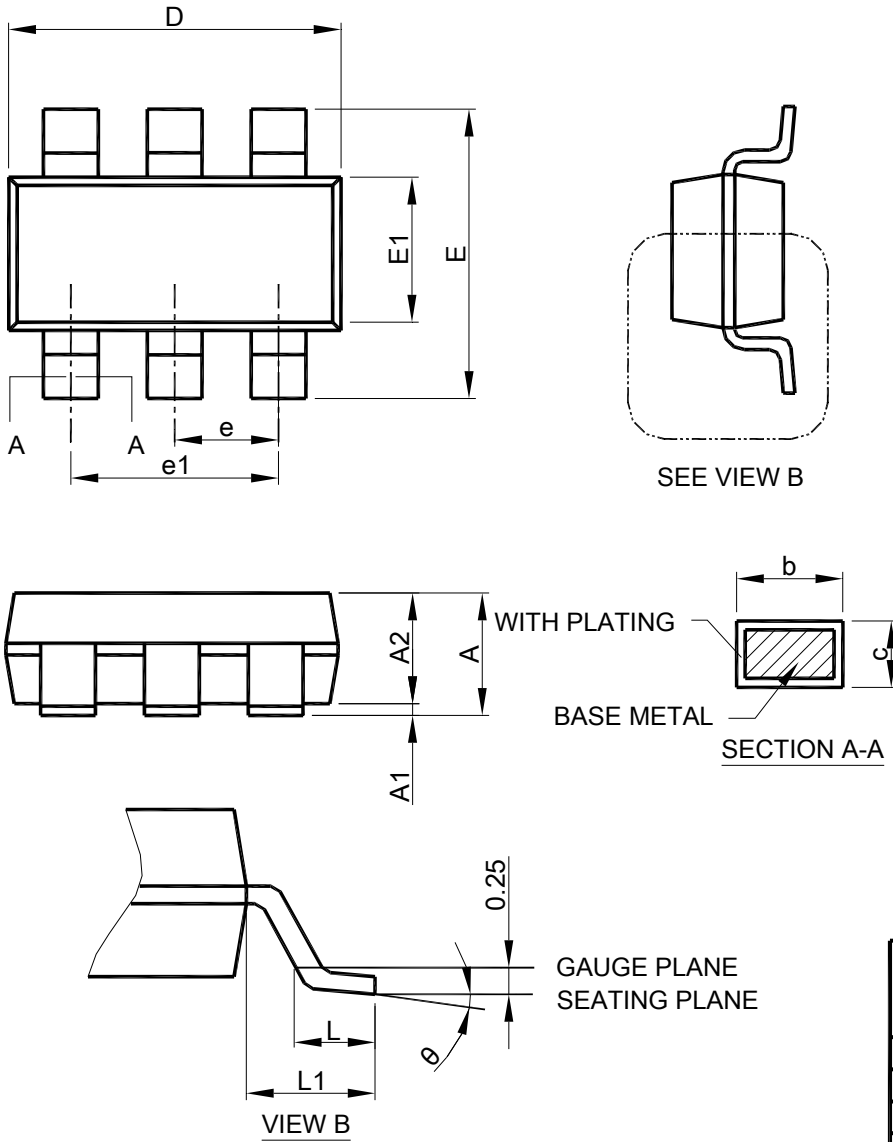
● TSOT-23-5 PACKAGE OUTLINE DRAWING



- Note :
1. Refer to JEDEC MO-193AB.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	TSOT-23-5	
	MILLIMETERS	
	MIN.	MAX.
A	-	1.00
A1	0	0.10
A2	0.70	0.90
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
θ	0°	8°

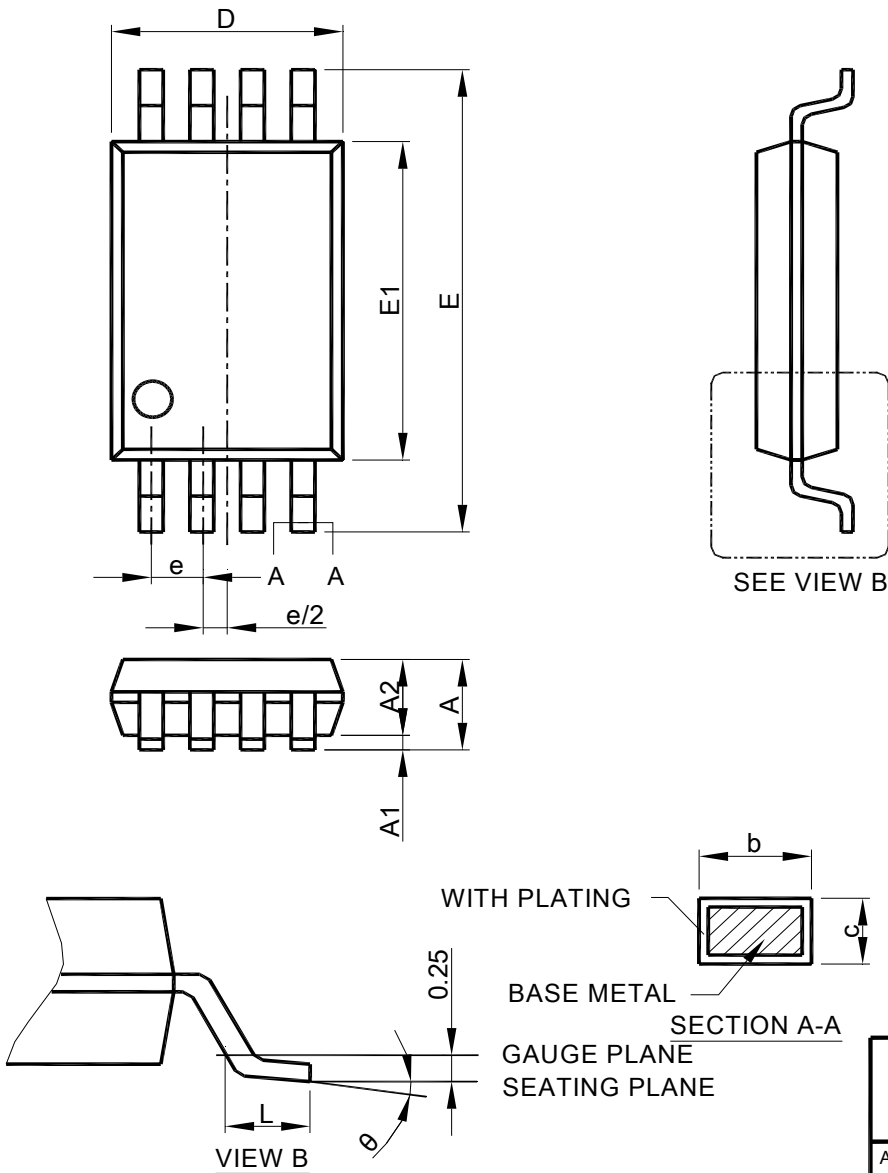
● TSOT-23-6 PACKAGE OUTLINE DRAWING



- Note :
1. Refer to JEDEC MO-193AA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	TSOT-23-6	
	MILLIMETERS	
	MIN.	MAX.
A	-	1.00
A1	0	0.10
A2	0.70	0.90
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
θ	0°	8°

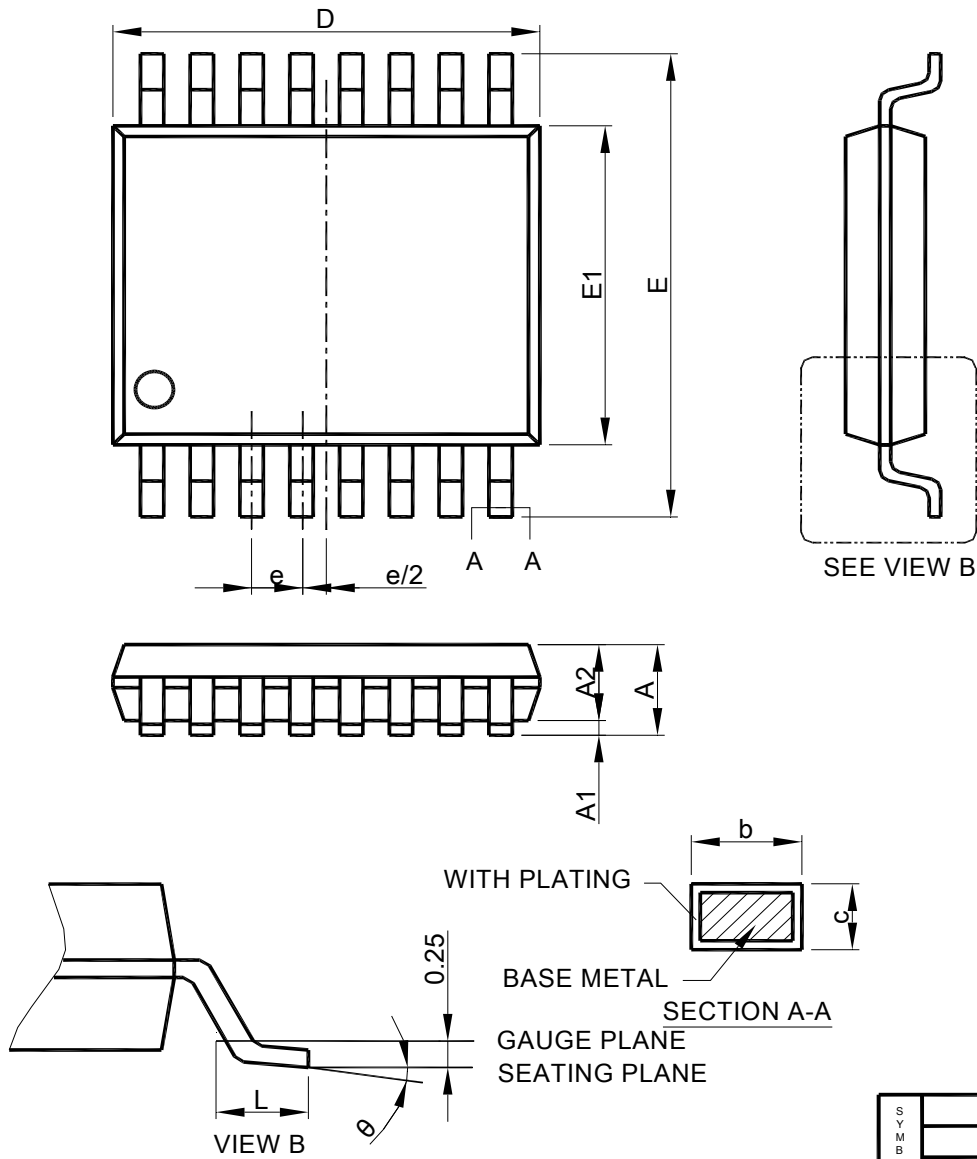
● TSSOP-8 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MO-153AA.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	TSSOP-8	
	MILLIMETERS	
	MIN.	MAX.
A		1.20
A1	0.05	0.15
A2	0.80	1.05
b	0.19	0.30
c	0.09	0.20
D	2.90	3.10
E	6.40 BSC	
E1	4.30	4.50
e	0.65 BSC	
L	0.45	0.75
θ	0°	8°

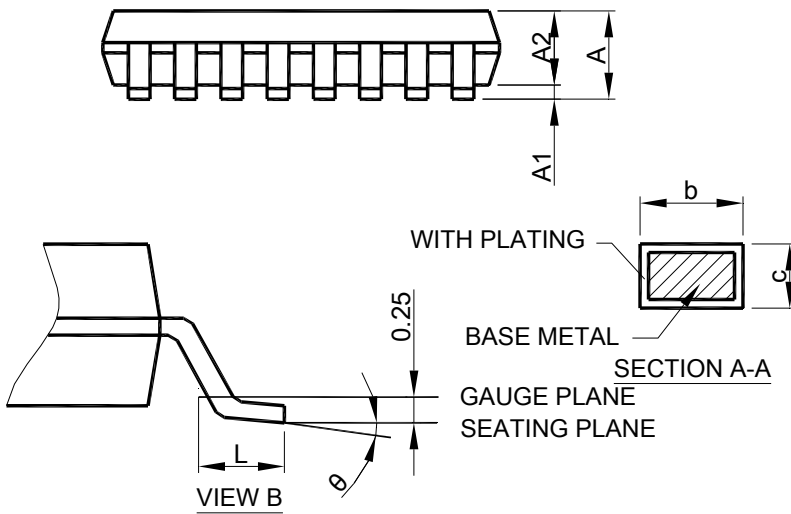
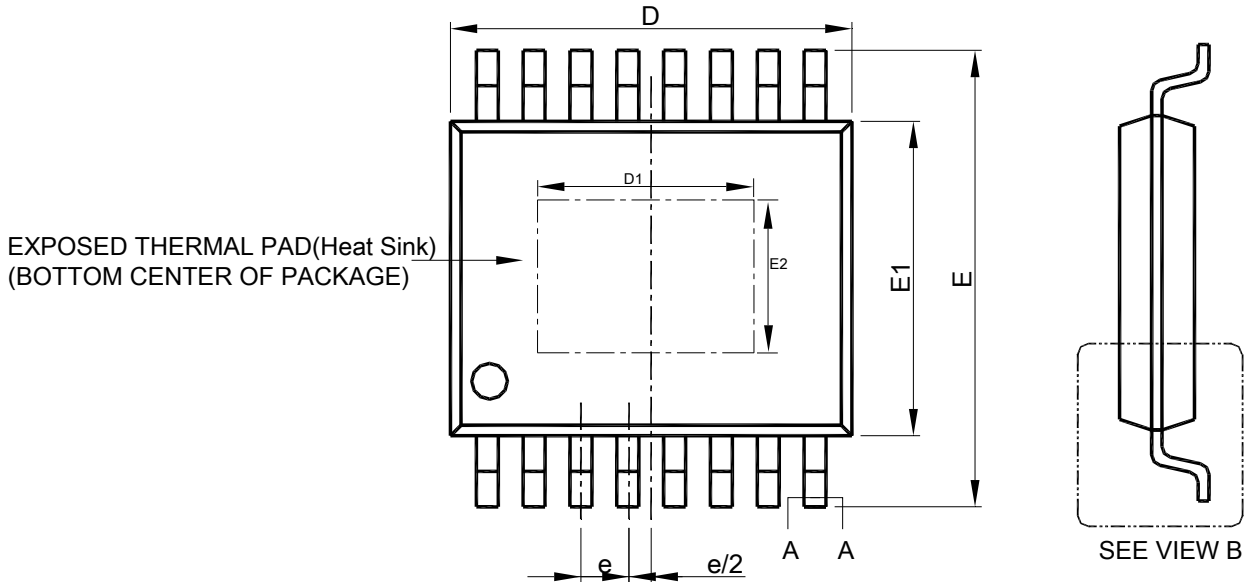
● TSSOP-16 PACKAGE OUTLINE DRAWING



- Note: 1. Refer to JEDEC MO-153AB.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	TSSOP-16	
	MILLIMETERS	
	MIN.	MAX.
A		1.20
A1	0.05	0.15
A2	0.80	1.05
b	0.19	0.30
c	0.09	0.20
D	4.90	5.10
E	6.40 BSC	
E1	4.30	4.50
e	0.65 BSC	
L	0.45	0.75
θ	0°	8°

● TSSOP-16 Exposed Pad(Heat Sink) PACKAGE OUTLINE DRAWIN



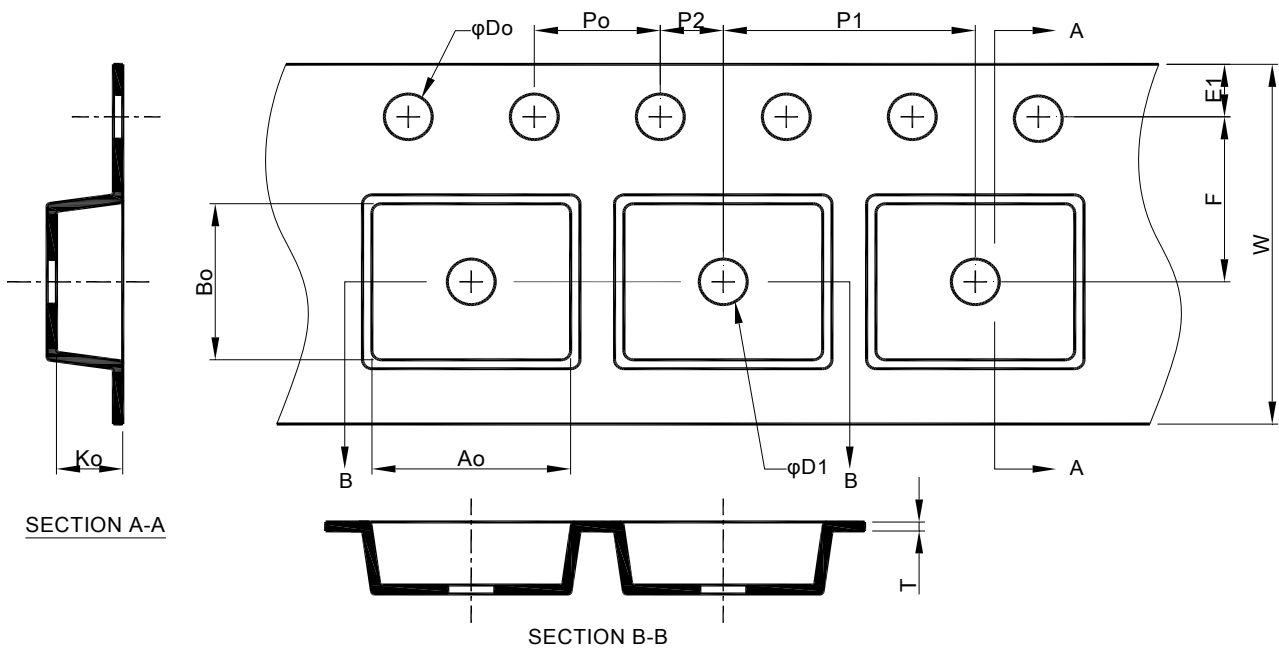
- Note: 1. Refer to JEDEC MO-153AB.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
 3. Dimension "E1" does not include inter-lead flash or protrusions.
 4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

SYMBOL	TSSOP-16 Exposed Pad (Heat Sink)	
	MILLIMETERS	
	MIN.	MAX.
A		1.20
A1	0.00	0.15
A2	0.80	1.05
b	0.19	0.30
c	0.09	0.20
D	4.90	5.10
E	6.40 BSC	
E1	4.30	4.50
e	0.65 BSC	
L	0.45	0.75
θ	0°	8°
D1	2.00	4.00
E2	1.80	3.40

Part II Carrier Tape Outline Drawing

(unit: mm)

● SOP-8 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	6.30 ± 0.20	5.20 ± 0.20	2.10 ± 0.20	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	1.75 ± 0.10	5.50 ± 0.05	12.00 ± 0.30

Note: 1. Refer to EIA-481-B

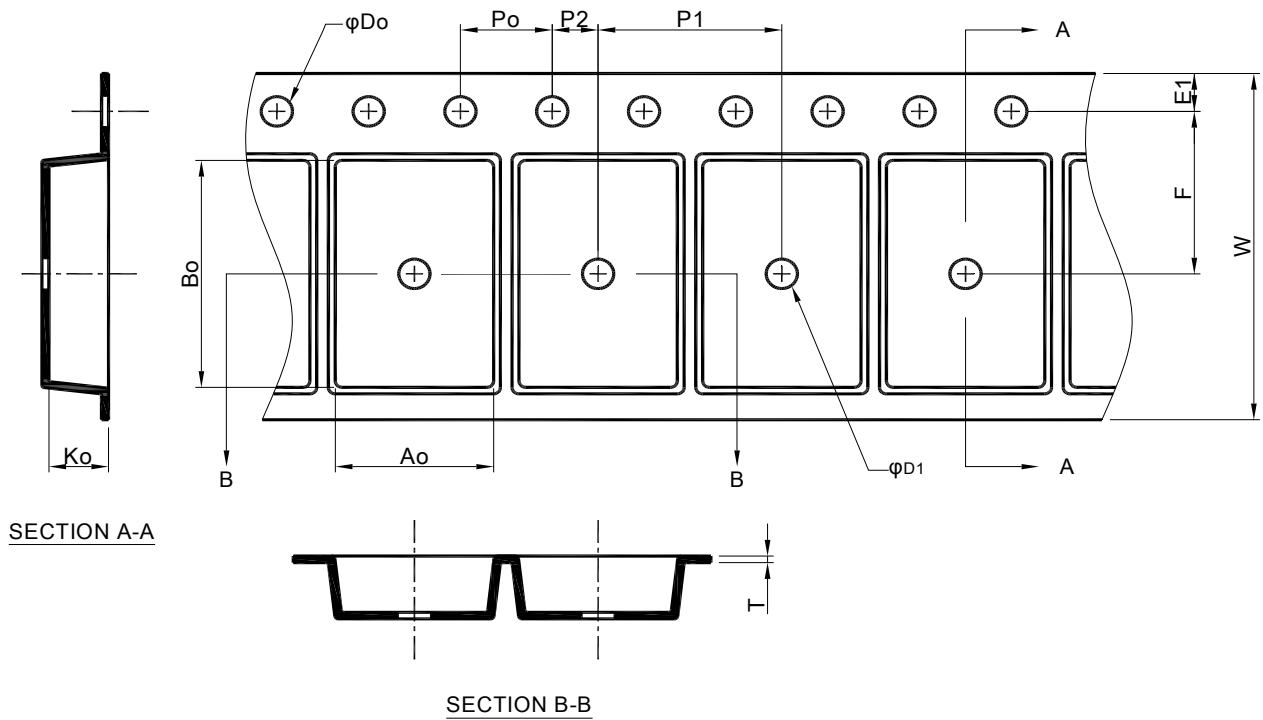
2. 10 sprocket hole pitch cumulative tolerance ± 0.2

3. Material: conductive polystyrene

4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket

5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

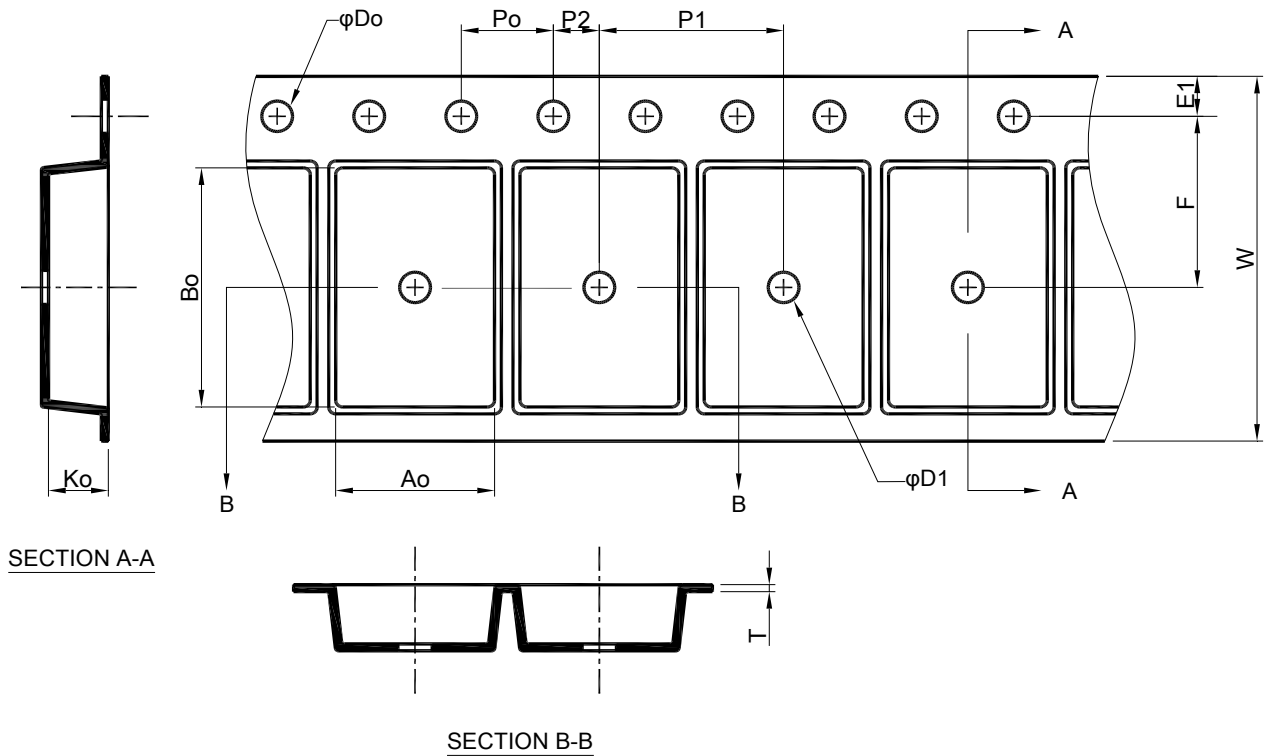
● SOP-14 CARRIER TAPE OUTLINE DRAWING



SYMBOL	Ao	Bo	Ko	T	Do	$D1$
SPEC.	6.5 ± 0.2	9.2 ± 0.35	2.1 ± 0.2	0.30 ± 0.05	$1.5^{+0.1}_{-0.0}$	1.50 min.
SYMBOL	Po	$P1$	$P2$	$E1$	F	W
SPEC.	4.0 ± 0.1	8.0 ± 0.1	2.0 ± 0.1	1.75 ± 0.1	7.5 ± 0.1	16.0 ± 0.3

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket
 5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier

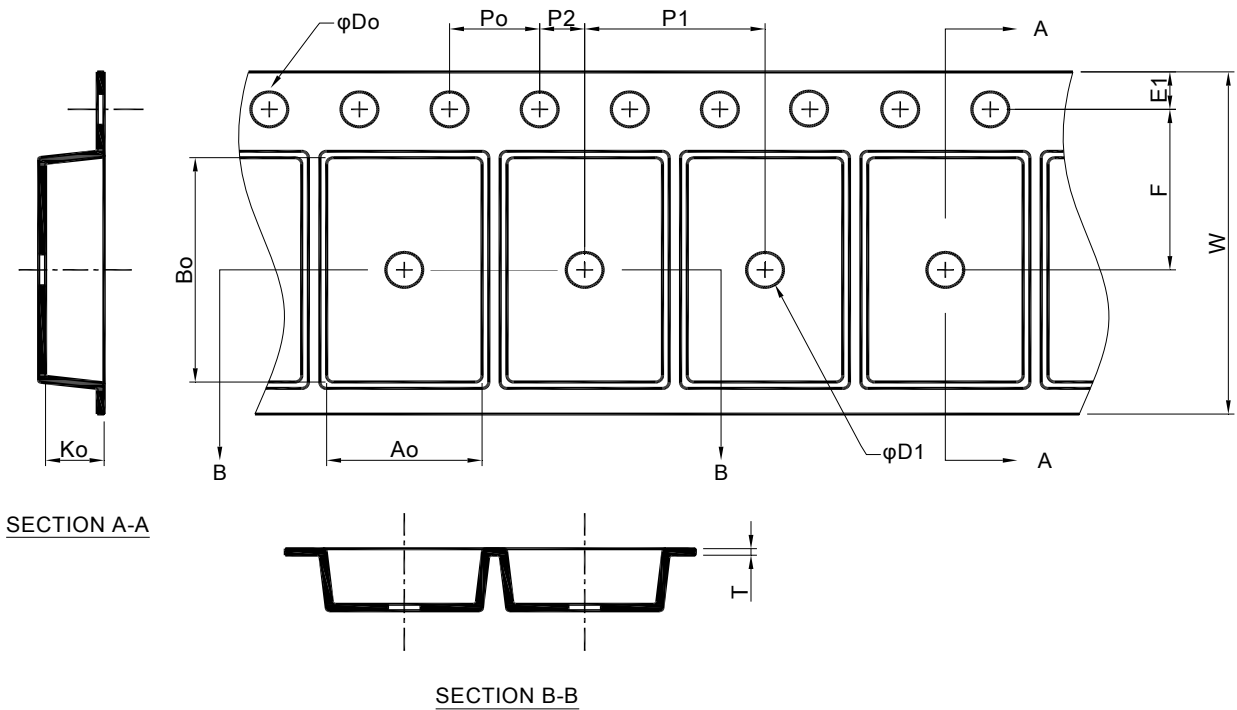
● SOP-16 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	6.5 ± 0.2	10.3 ± 0.2	2.1 ± 0.2	0.30 ± 0.05	$1.5^{+0.1}_{-0.0}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.0 ± 0.1	8.0 ± 0.1	2.0 ± 0.1	1.75 ± 0.1	7.5 ± 0.1	16.0 ± 0.3

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

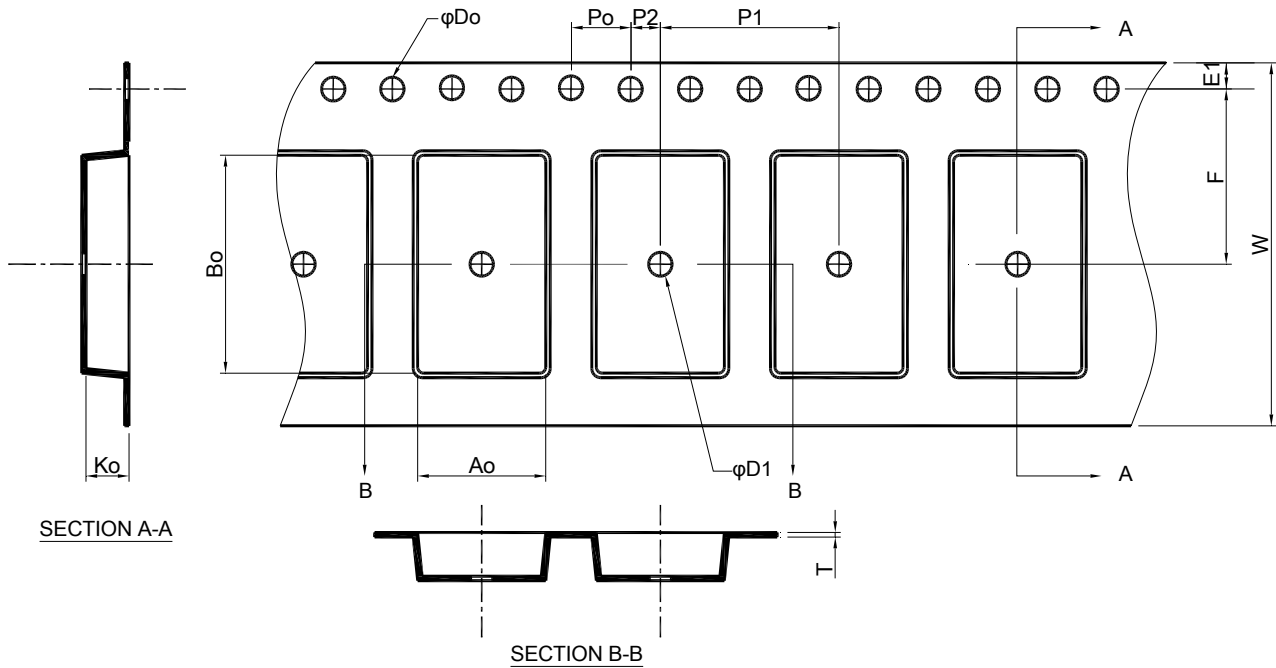
● SOP-16W CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	10.9 ± 0.2	10.7 ± 0.2	3.2 ± 0.2	0.30 ± 0.05	$1.5^{+0.1}_{-0.0}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.0 ± 0.1	12.0 ± 0.1	2.0 ± 0.1	1.75 ± 0.1	7.5 ± 0.1	16.0 ± 0.3

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

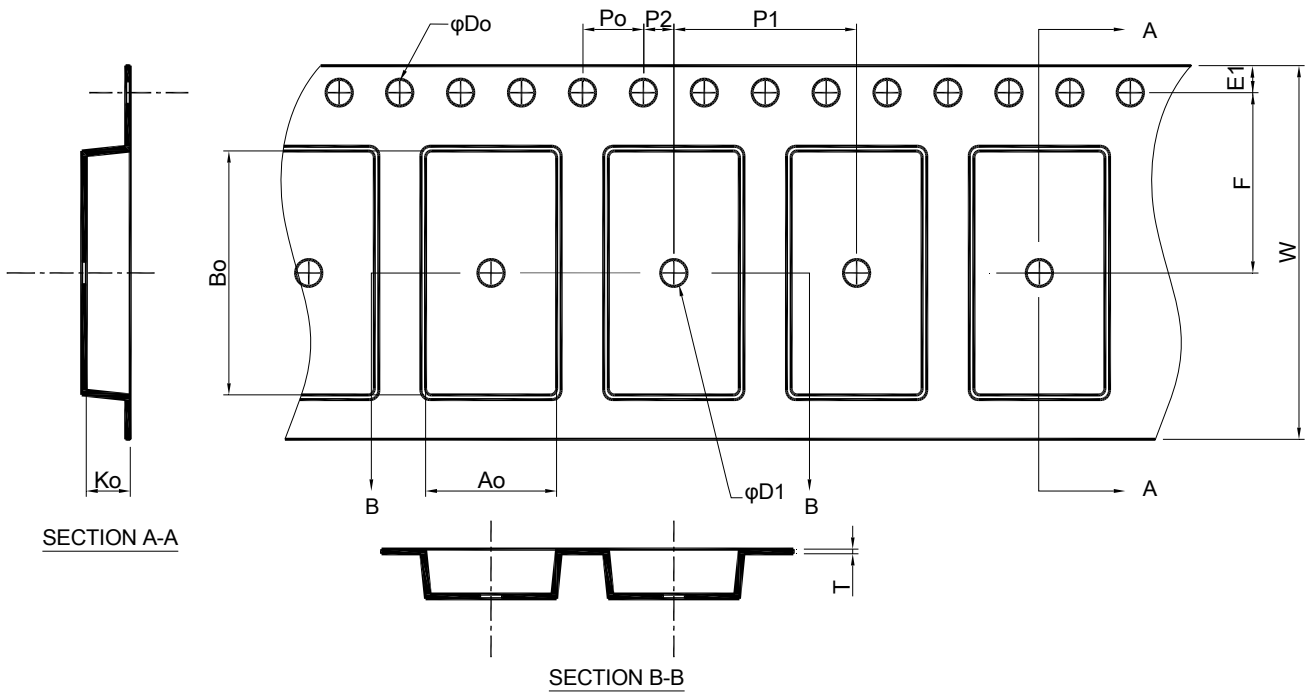
● SOP-20 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	10.90 ± 0.20	13.30 ± 0.20	3.10 ± 0.20	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	12.00 ± 0.10	2.00 ± 0.10	1.75 ± 0.10	11.50 ± 0.10	24.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

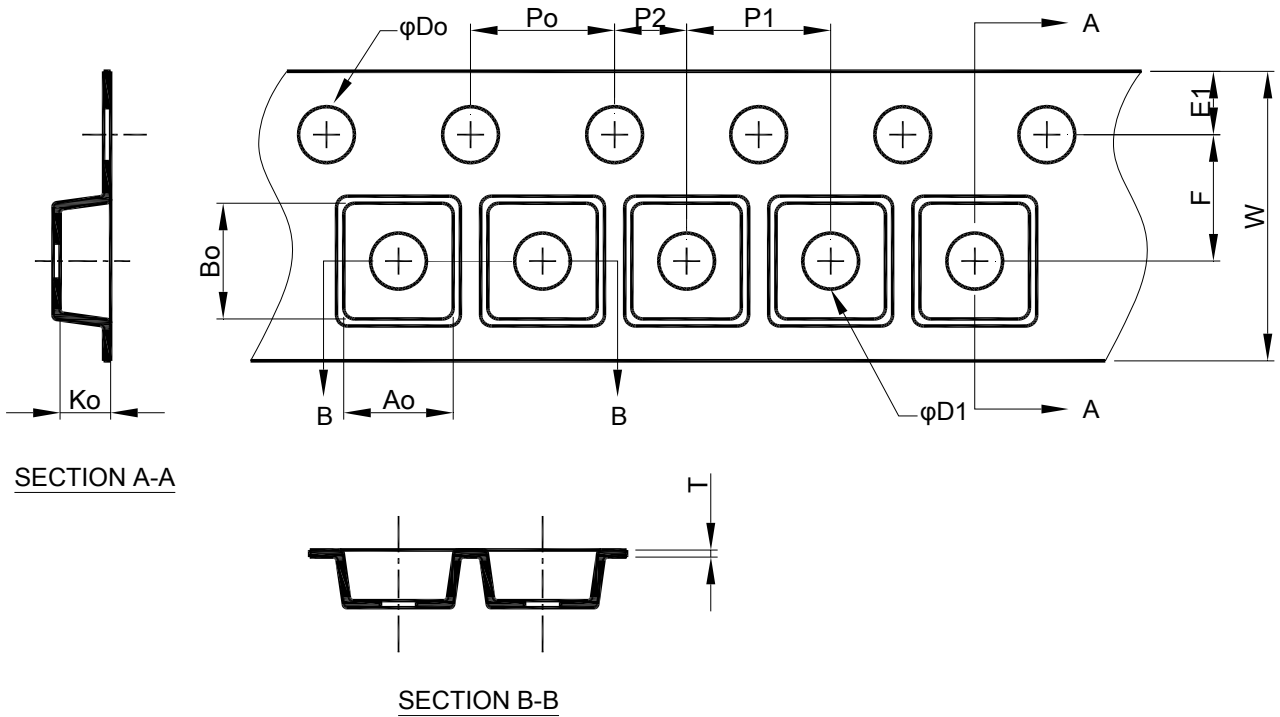
● SOP-24 CARRIER TAPE OUTLINE DRAWIN



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	10.90 ± 0.20	15.90 ± 0.20	3.10 ± 0.20	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	12.00 ± 0.10	2.00 ± 0.10	1.75 ± 0.10	11.50 ± 0.10	24.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

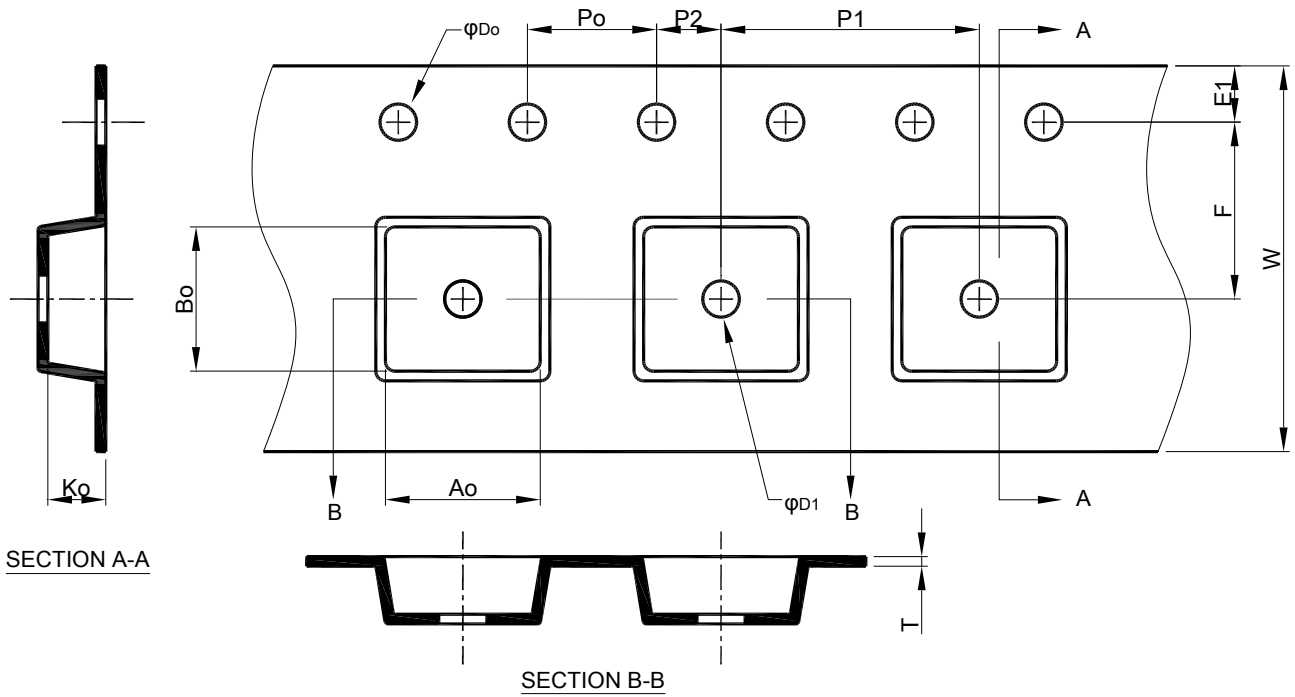
● SOT-23/SOT-23-5/SOT-23-6 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	3.15 ± 0.20	3.20 ± 0.20	1.45 ± 0.25	0.22 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.00 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

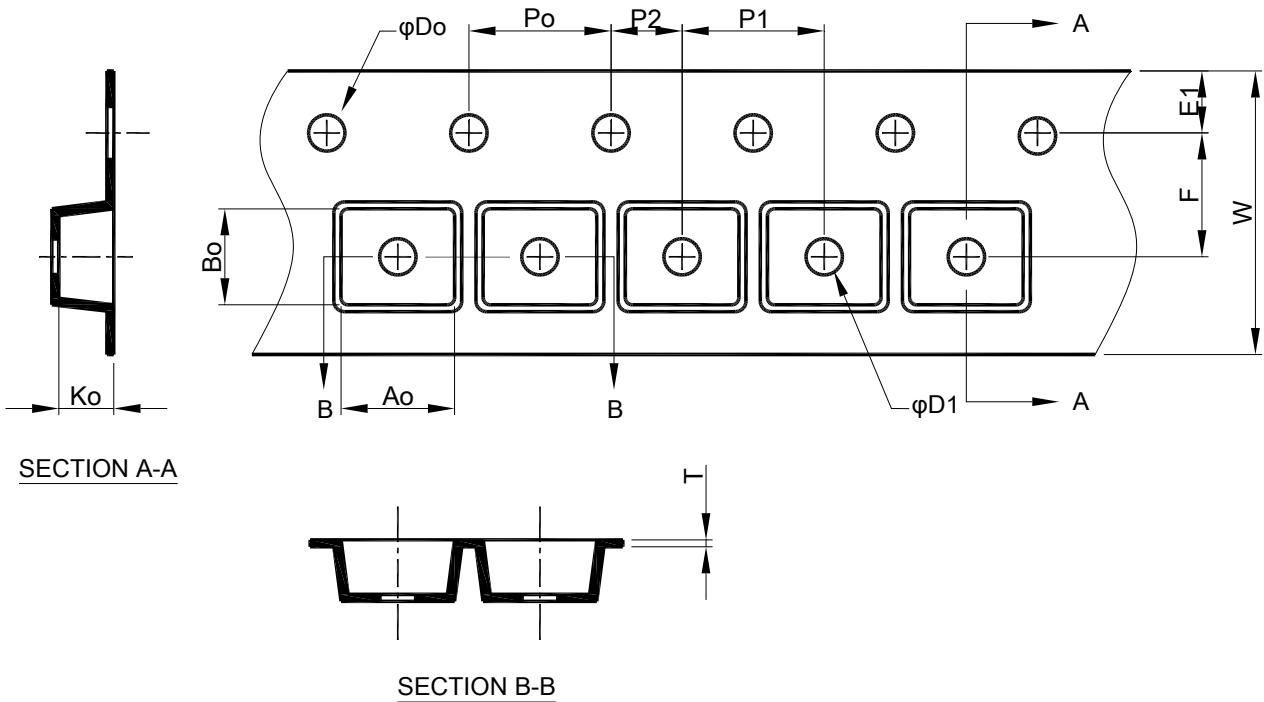
● SOT-89 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_0	B_0	K_0	T	D_0	D_1
SPEC.	4.80 ± 0.20	4.50 ± 0.20	1.80 ± 0.20	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_0	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	1.75 ± 0.10	5.50 ± 0.05	12.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_0 and B_0 measured on a plane 0.3mm above the bottom of the pocket
 5. K_0 measured from a plane on the inside bottom of the pocket to the top surface of the carrier

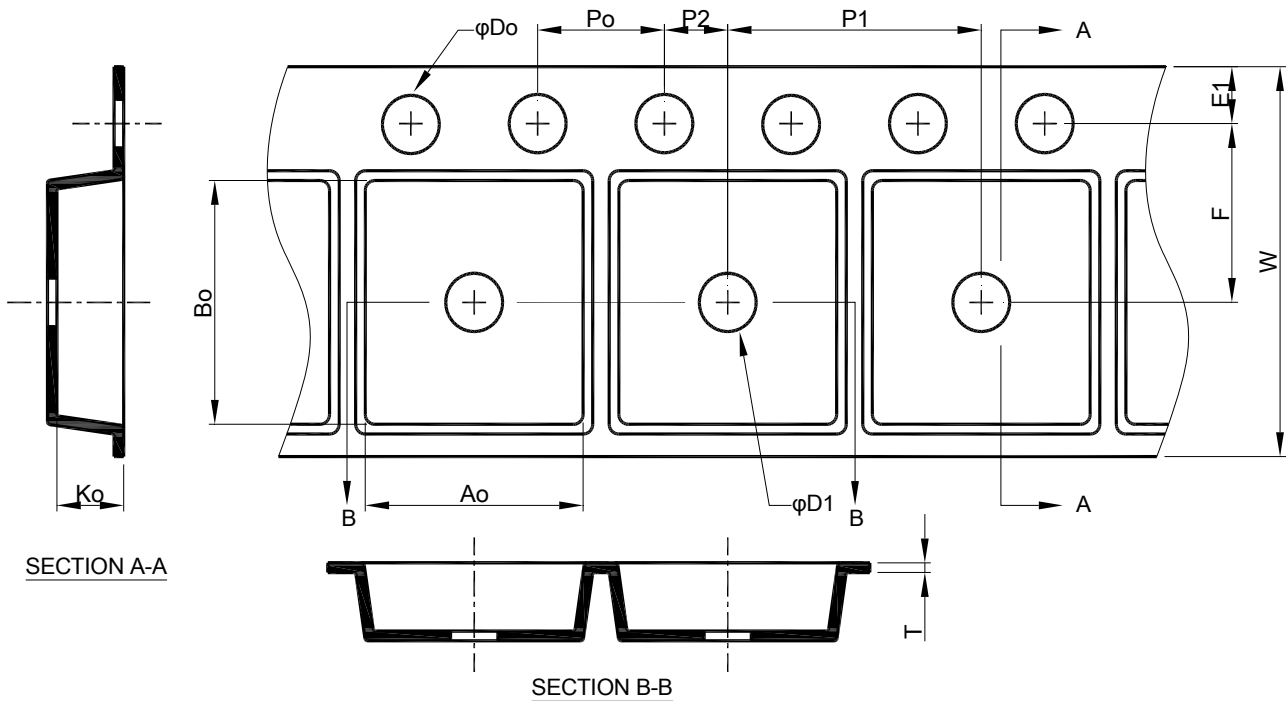
● SOT-143 CARRIER TAPE OUTLINE DRAWING



SYMBOL	Ao	Bo	Ko	T	Do	D1
SPEC.	3.20±0.20	2.70±0.20	1.35±0.20	0.20±0.03	1.50 ^{+0.10} _{-0.00}	1.00 min.
SYMBOL	Po	P1	P2	E1	F	W
SPEC.	4.00±0.10	4.00±0.10	2.00±0.05	1.75±0.10	3.50±0.05	8.00±0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket
 5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier

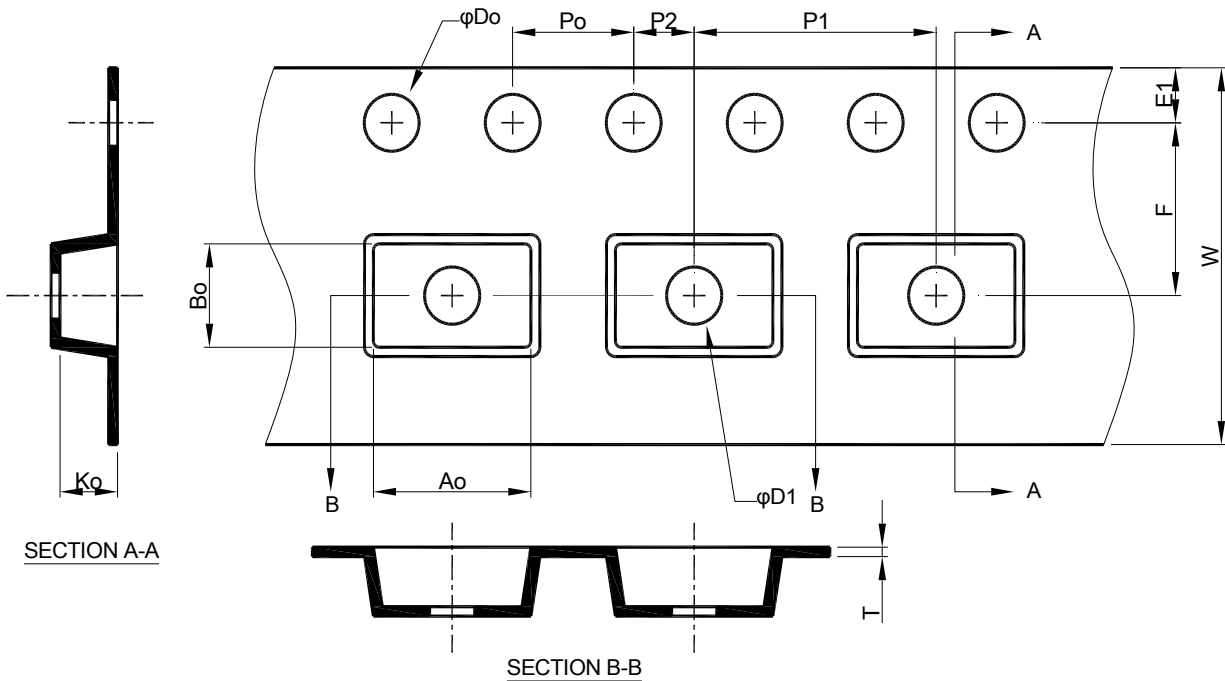
● SOT-223 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	6.90 ± 0.20	7.50 ± 0.20	2.10 ± 0.20	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	1.75 ± 0.10	5.50 ± 0.05	12.00 ± 0.30

- Note:
1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

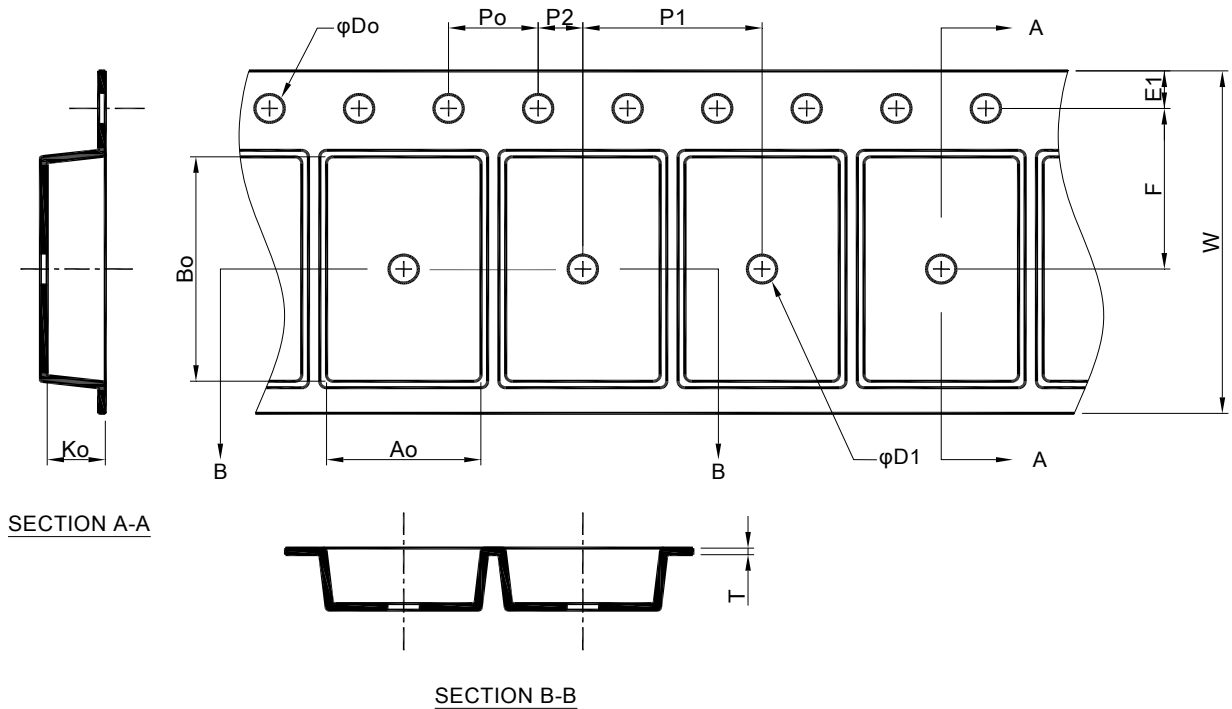
● MSOP-8/10 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	5.20 ± 0.20	3.30 ± 0.20	1.60 ± 0.20	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	1.75 ± 0.10	5.50 ± 0.05	12.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

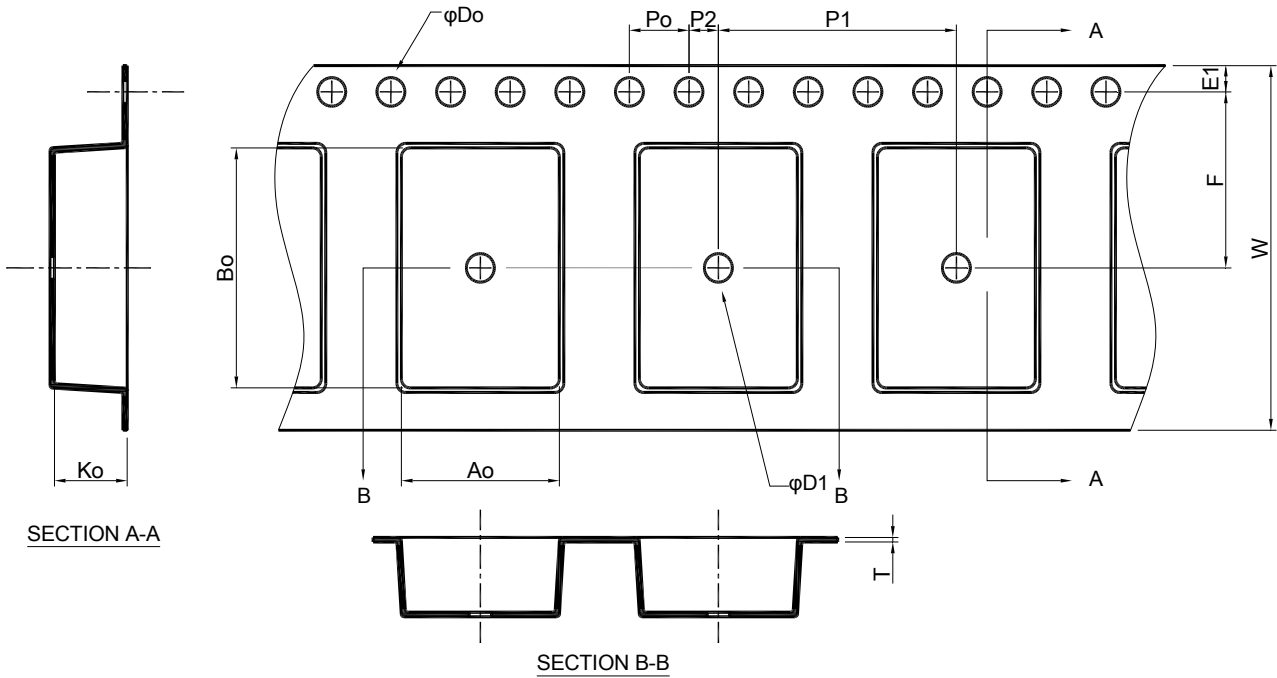
● TO-252 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	6.90 ± 0.20	10.50 ± 0.20	2.60 ± 0.20	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.10	1.75 ± 0.10	7.50 ± 0.10	16.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

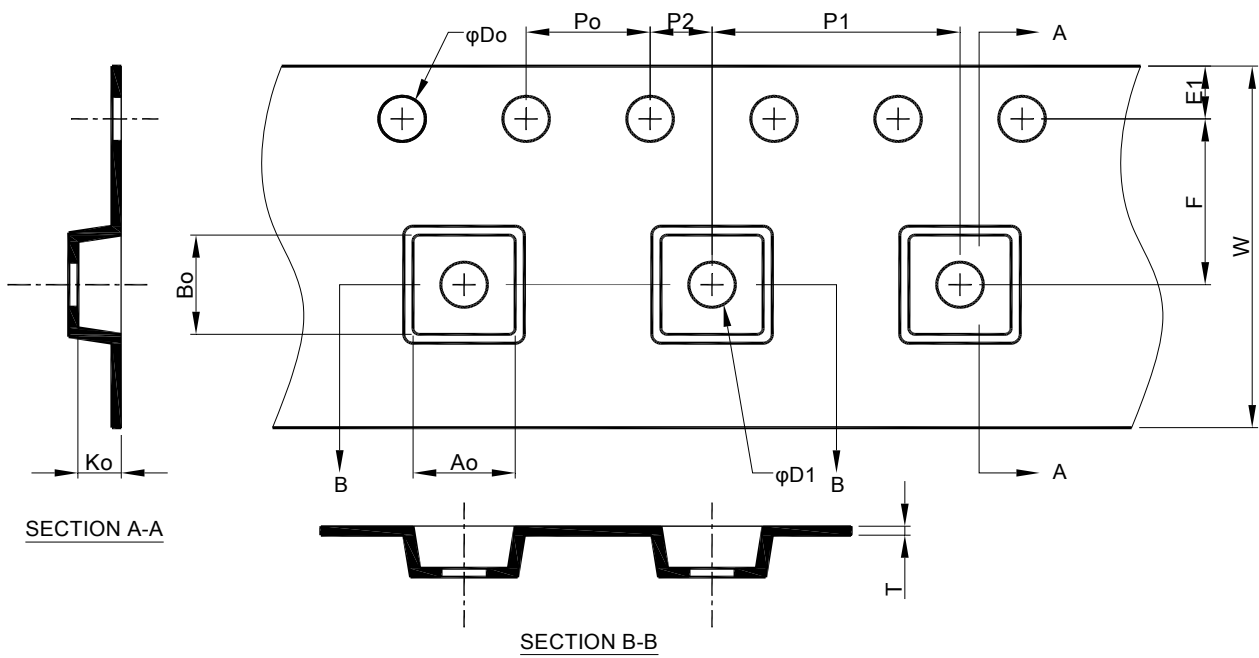
● TO-263 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	10.60 ± 0.20	16.10 ± 0.50 *Note 6	4.90 ± 0.20	0.35 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	16.00 ± 0.10	2.00 ± 0.10	1.75 ± 0.10	11.50 ± 0.10	24.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier
 6. A_o and B_o must keep the lateral movement of the component within 1.0 mm in the pocket

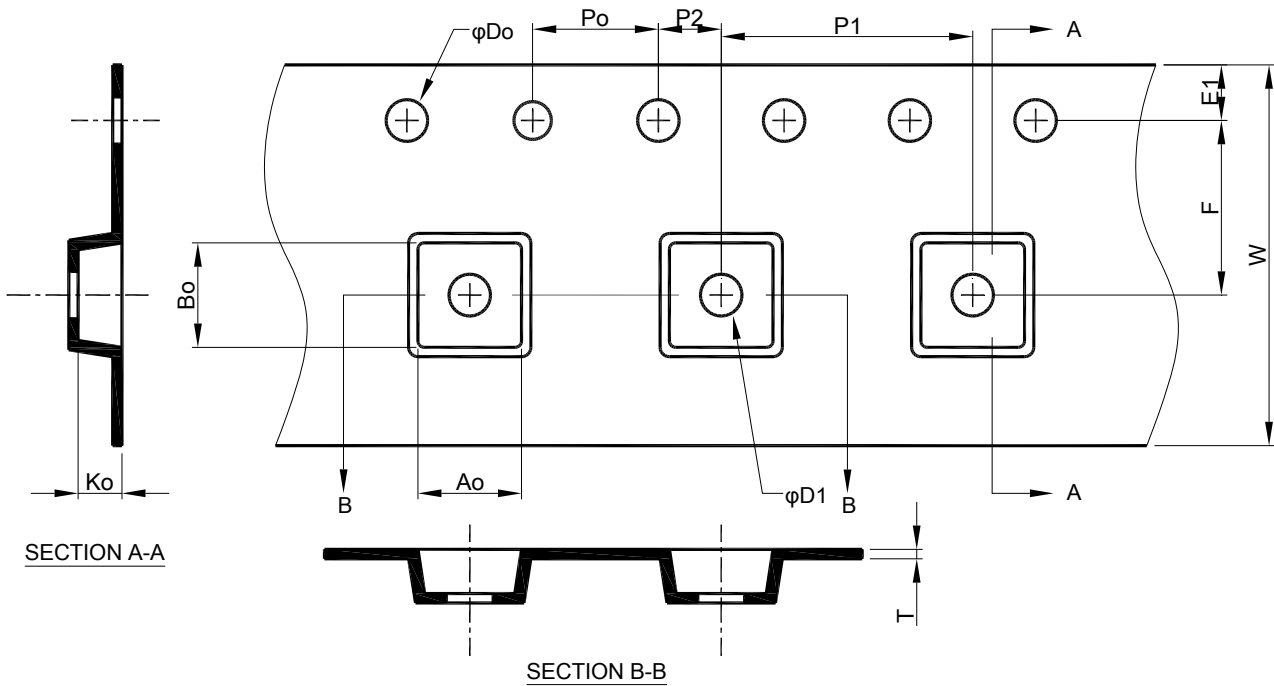
● QFN 3x3x0.6 CARRIER TAPE OUTLINE DRAWING



SYMBOL	Ao	Bo	Ko	T	Do	D1
SPEC.	3.30±0.20	3.30±0.20	0.90±0.20	0.30±0.05	1.50 ^{+0.10} _{-0.00}	1.50 min.
SYMBOL	Po	P1	P2	E1	F	W
SPEC.	4.00±0.10	8.00±0.10	2.00±0.05	1.75±0.10	5.50±0.05	12.00±0.30

- Note :
1. 10 sprocket hole pitch cumulative tolerance ± 0.2
 2. Material: conductive polystyrene
 3. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket
 - 4 Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier

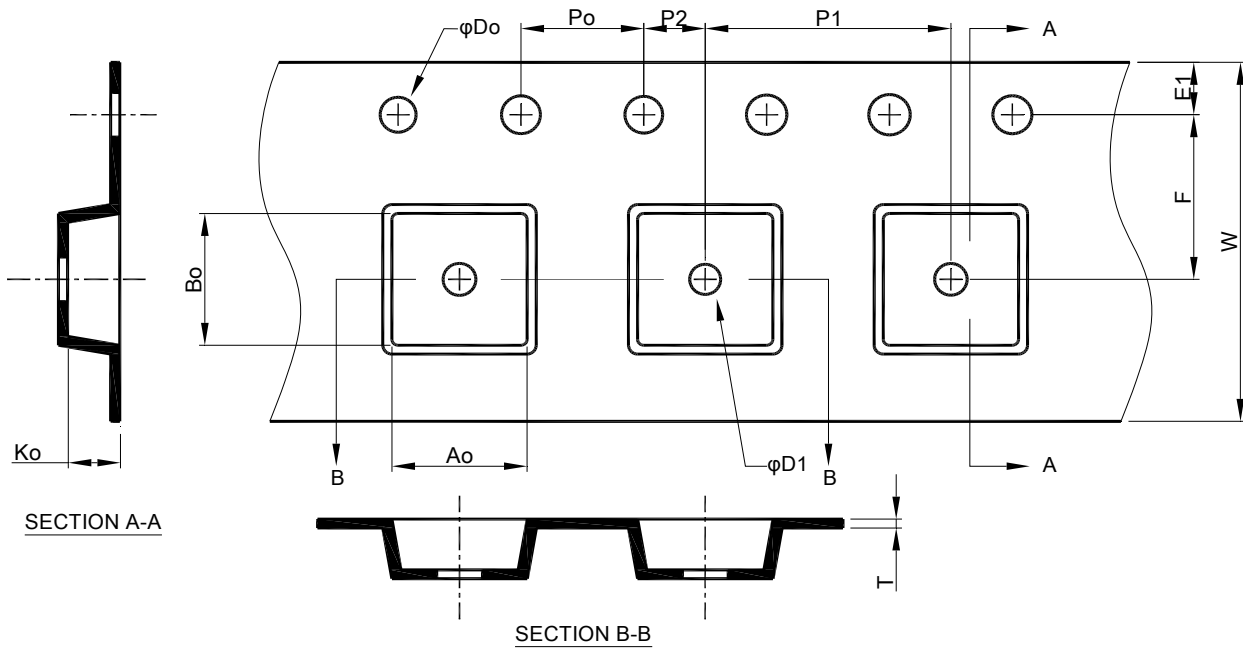
● QFN 3x3x0.9 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	3.30 ± 0.20	3.30 ± 0.20	1.20 ± 0.20	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	1.75 ± 0.10	5.50 ± 0.05	12.00 ± 0.30

- Note:
1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

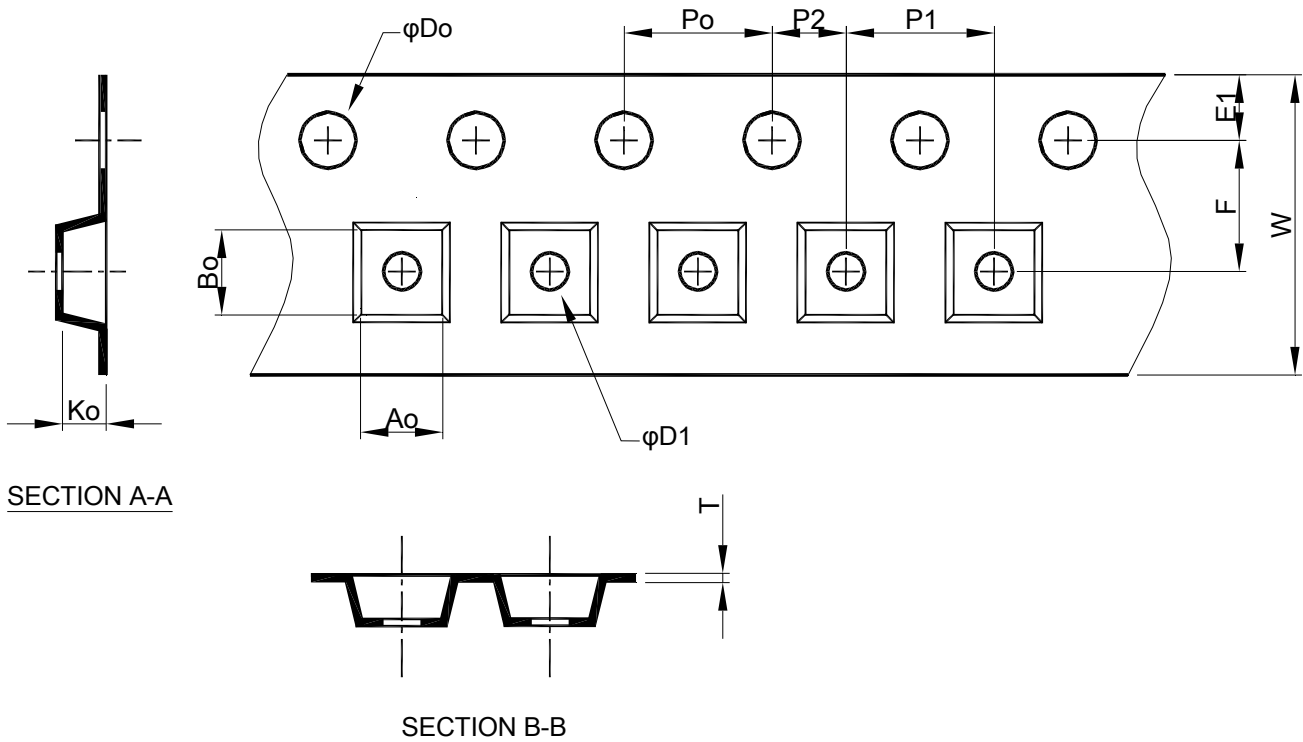
● QFN 4x4x0.9 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	$D1$
SPEC.	4.40 ± 0.20	4.40 ± 0.20	1.20 ± 0.20	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	$P1$	$P2$	$E1$	F	W
SPEC.	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	1.75 ± 0.10	5.50 ± 0.05	12.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

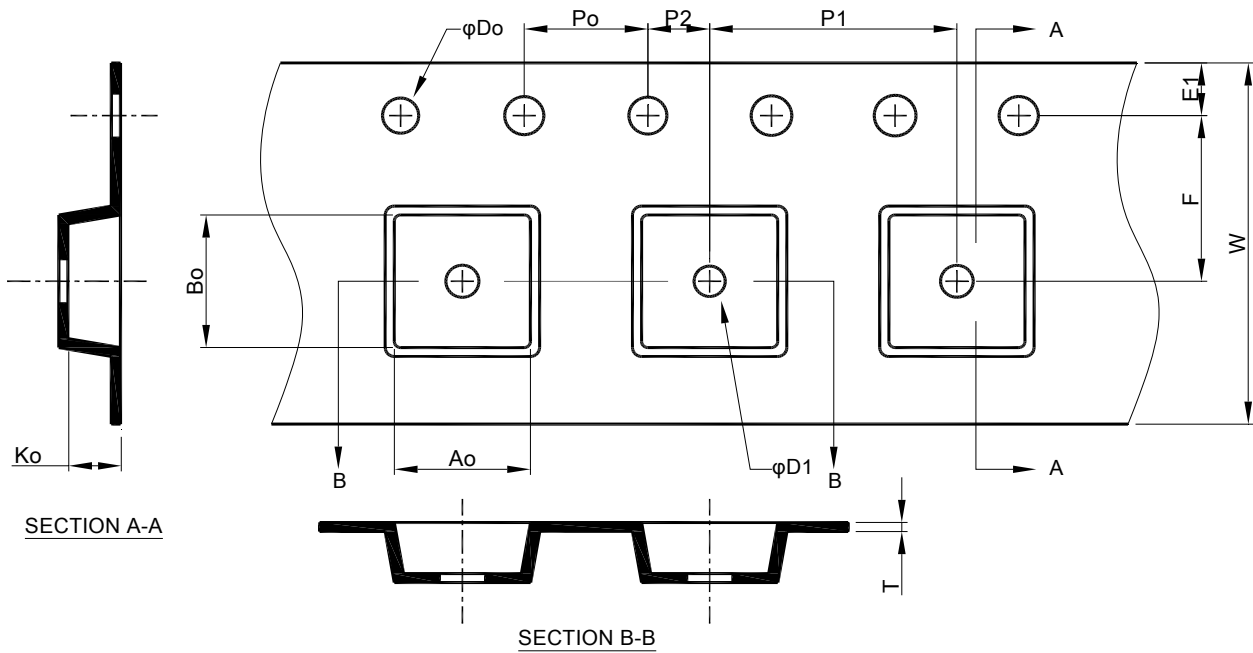
● DFN 2x2x0.75 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	ϕD_o	ϕD_1
SPEC.	2.30 ± 0.10	2.30 ± 0.10	1.15 ± 0.10	0.26 ± 0.04	$1.50^{+0.10}_{-0.00}$	$1.00^{+0.25}_{-0.00}$
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

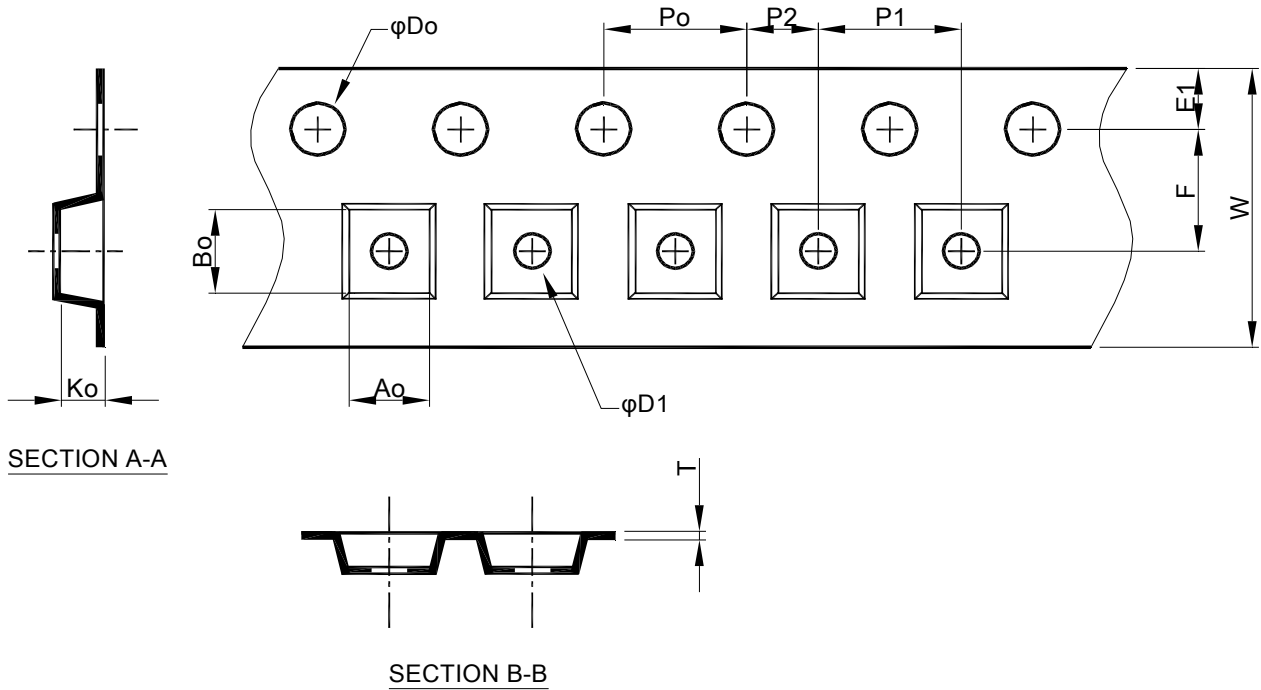
● DFN 3x3x0.75 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	3.30 ± 0.20	3.30 ± 0.20	1.15 ± 0.25	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.10	1.75 ± 0.10	5.50 ± 0.10	12.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

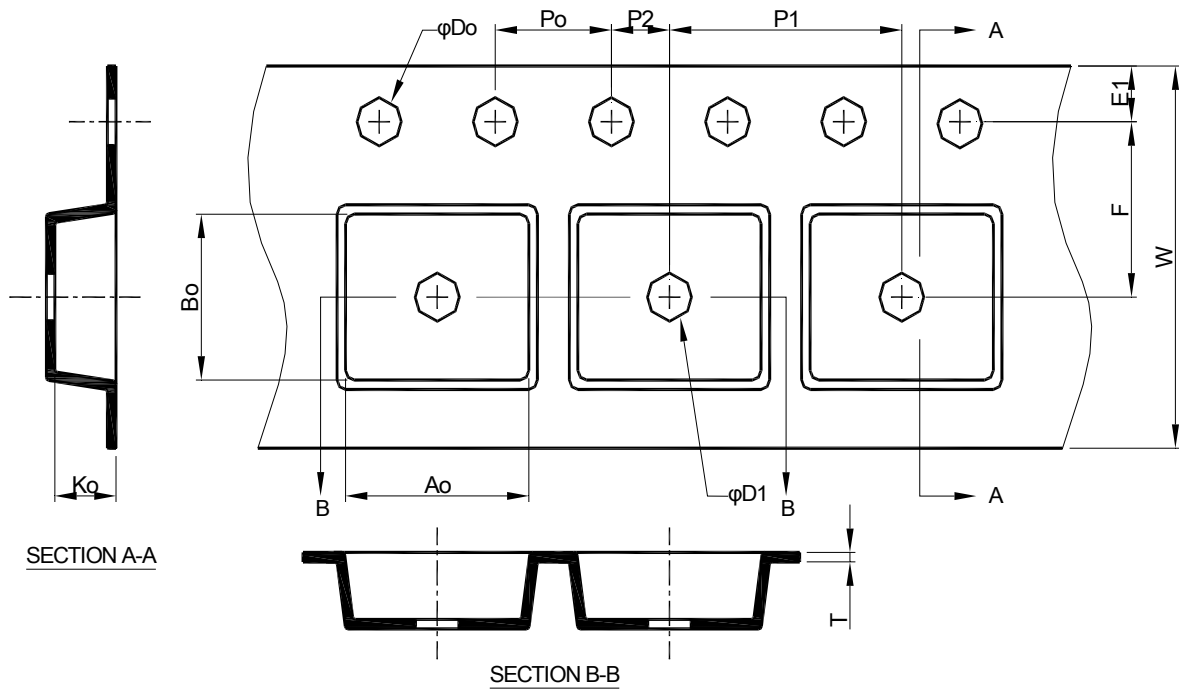
● SC-70/SC-82 CARRIER TAPE OUTLINE DRAWING



SYMBOL	A_o	B_o	K_o	T	ϕD_o	ϕD_1
SPEC.	2.25 ± 0.10	2.40 ± 0.10	1.22 ± 0.10	0.254 ± 0.02	$1.50 \begin{matrix} +0.10 \\ -0.00 \end{matrix}$	$1.00 \begin{matrix} +0.25 \\ -0.00 \end{matrix}$
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.75 ± 0.10	3.50 ± 0.05	$8.00 \begin{matrix} +0.30 \\ -0.10 \end{matrix}$

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

● TSSOP-16 CARRIER TAPE OUTLINE DRAWING



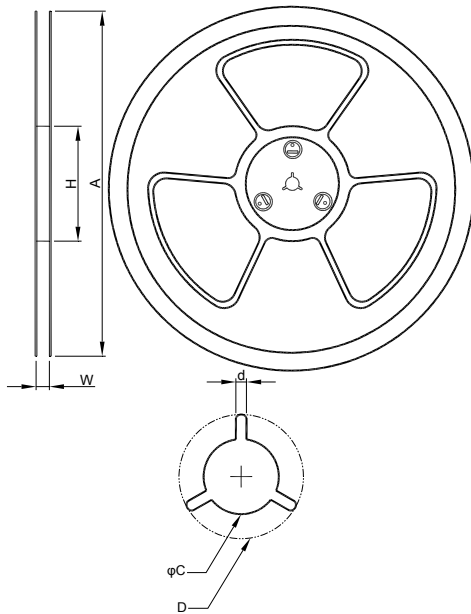
SYMBOL	A_o	B_o	K_o	T	D_o	D_1
SPEC.	6.80 ± 0.20	5.40 ± 0.20	1.60 ± 0.20	0.30 ± 0.05	$1.50^{+0.10}_{-0.00}$	1.50 min.
SYMBOL	P_o	P_1	P_2	E_1	F	W
SPEC.	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	1.75 ± 0.10	5.50 ± 0.05	12.00 ± 0.30

- Note: 1. Refer to EIA-481-B
 2. 10 sprocket hole pitch cumulative tolerance ± 0.2
 3. Material: conductive polystyrene
 4. A_o and B_o measured on a plane 0.3mm above the bottom of the pocket
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier

Part III Reel Outline Drawing

(unit : mm)

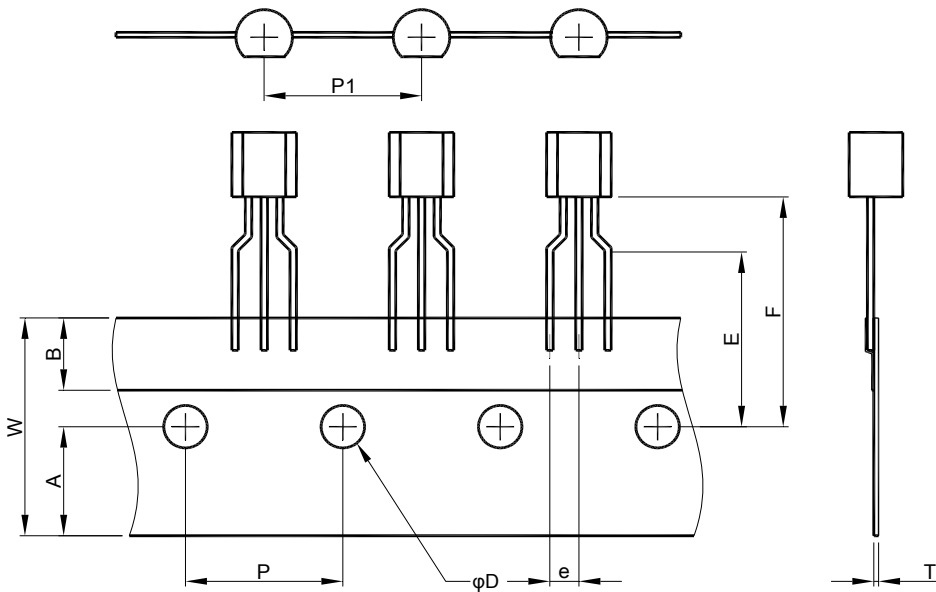
● REEL OUTLINE DRAWING



Package Type	A	H	W	C	d	D
TO-263-3L TO-263-5L	330±2	60 MIN.	24.4 ^{+2.0} _{-0.0}	13.0 ^{+0.5} _{-0.2}	1.5 MIN.	20.2 MIN.
TO-252-3L TO-252-5L SOP-14(150mil) SOP-16(150mil) SOP-16W(300mil)	330±2	50 MIN.	16.4 ^{+2.0} _{-0.0}	13.0 ^{+0.5} _{-0.2}	1.5 MIN.	20.2 MIN.
SOP-8 TSSOP-16 MSOP-8 MSOP-10 SOT-223 QFN 3x4 QFN 4x4 DFN 3x3	330±2	50 MIN.	12.4 ^{+2.0} _{-0.0}	13.0 ^{+0.5} _{-0.2}	1.5 MIN.	20.2 MIN.
SOT-89-3L SOT-89-5L	178±2	50 MIN.	12.4 ^{+2.0} _{-0.0}	13.0 ^{+0.5} _{-0.2}	1.5 MIN.	20.2 MIN.
SOT-143 SOT-23-x TSOT-23-x SC-70 SC-82 DFN 2x2	178±2	50 MIN.	8.4 ^{+2.0} _{-0.0}	13.0 ^{+0.5} _{-0.2}	1.5 MIN.	20.2 MIN.

Note: Refer to EIA-481-B

● TO-92 TAPING SPEC. DRAWING



SYMBOL	W	A	B	E	F
SPEC.	18.0±0.2	9.0±0.2	6.0±0.20	16.0±0.5	19.0±0.5
SYMBOL	P	P1	D	e	T
SPEC.	12.7 BSC	12.7 BSC	4.0±0.2	2.5 BSC	0.6±0.1