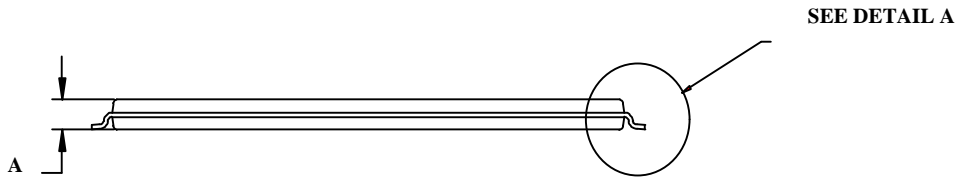
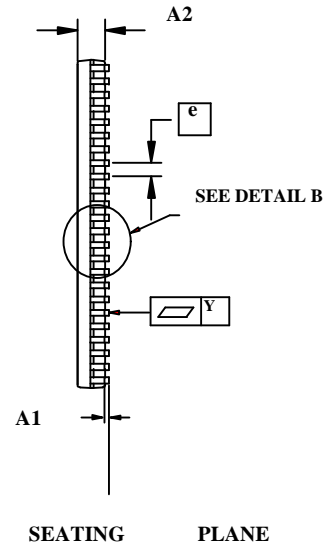
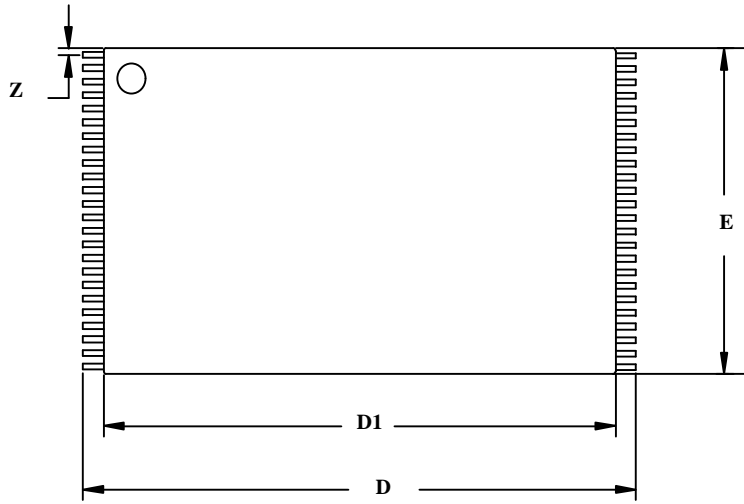
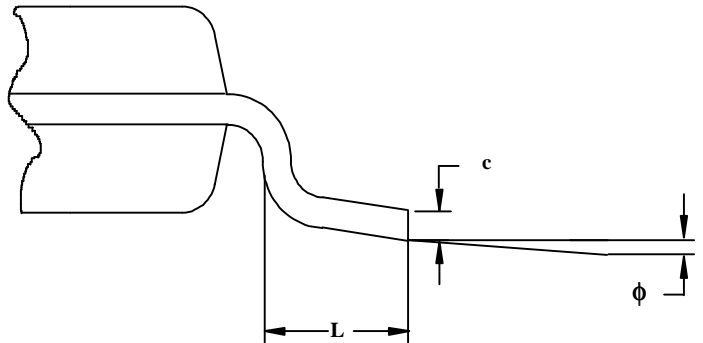
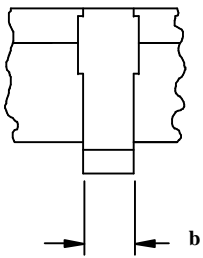


# TSOP: THIN SMALL OUTLINE PACKAGE DRAWING



DETAIL B

DETAIL A





## Thin Small Outline Package (TSOP)

Packaging Family Attributes	
Category	Thin Small Outline Package
Acronym	TSOP
Lead Configuration	Type 1
Lead Counts	32, 40, 48, 56
Lead Finish	Solder Plate
Lead Pitch	0.5 mm
Board Assembly Type	Surface Mount
Standard Registration	JEDEC and EIAJ

Notes: For 32L, 40L, 48L and 56L TSOP specifications

1. 32-, 40-, 56-Lead TSOP: Alloy- 42 leads, 48-Lead TSOP: Copper Alloy C7025 leads
2. Novalac Body
3. Offered in Reverse Pin-Out for special circuitry layout. (32L, 40L only)
4. Profile Tolerances zones for D1 and E do not include mold protrusion. (Allowable mold protrusion on D1 is 0.25 mm per side and on E is .15 mm per side.)
5. Lead Plating Thickness is 0.007 mm-0.015 mm. (Not part of b or c dimensions)

### 32 Lead TSOP Specifications

	Symbol	Millimeters			Notes	Inches		
		Min	Nom	Max		Min	Nom	Max
Package Height	A			1.200				0.047
Standoff	A1	0.050				0.002		
Package Body Thickness	A2	0.965	0.995	1.025		0.038	0.039	0.040
Lead Width	b	0.150	0.200	0.300		0.006	0.008	0.012
Lead Thickness	c	0.115	0.125	0.135		0.004	0.0049	0.0053
Package Body Length	D1	18.200	18.400	18.600	4	0.717	0.724	0.732
Package Body Width	E	7.800	8.000	8.200	4	0.307	0.315	0.323
Pitch	e		0.500				0.0197	
Terminal Dimension	D	19.800	20.000	20.200		0.780	0.787	0.795
Lead Tip Length	L	0.500	0.600	0.700		0.020	0.024	0.028
Lead Count	N		32				32	
Lead Tip Angle	$\phi$	0°	3°	5°		0°	3°	5°
Seating Plane Coplanarity	Y			0.100				0.004
Lead to Package Offset	Z	0.150	0.250	0.350		0.006	0.010	0.014



### 40 Lead TSOP Specifications

	Symbol	Millimeters			Notes	Inches		
		Min	Nom	Max		Min	Nom	Max
Package Height	A			1.200				0.047
Standoff	A1	0.050				0.002		
Package Body Thickness	A2	0.965	0.995	1.025		0.038	0.039	0.040
Lead Width	b	0.150	0.200	0.300		0.006	0.008	0.012
Lead Thickness	c	0.115	0.125	0.135		0.0045	0.0049	0.0053
Package Body Length	D1	18.200	18.400	18.600	4	0.717	0.724	0.732
Package Body Width	E	9.800	10.000	10.200	4	0.386	0.394	0.402
Pitch	e		0.500				0.0197	
Terminal Dimension	D	19.800	20.000	20.200		0.780	0.787	0.795
Lead Tip Length	L	0.500	0.600	0.700		0.020	0.024	0.028
Lead Count	N		40				40	
Lead Tip Angle	$\phi$	0°	3°	5°		0°	3°	5°
Seating Plane Coplanarity	Y			0.100				0.004
Lead to Package Offset	Z	0.150	0.250	0.350		0.006	0.010	0.014

#### 48 Lead TSOP Specifications

	Symbol	Millimeters			Notes	Inches		
		Min	Nom	Max		Min	Nom	Max
Package Height	A			1.200				0.047
Standoff	A1	0.050				0.002		
Package Body Thickness	A2	0.950	1.000	1.050		0.037	0.039	0.041
Lead Width	b	0.150	0.200	0.300		0.006	0.008	0.012
Lead Thickness	c	0.100	0.150	0.200		0.004	0.006	0.008
Package Body Length	D1	18.200	18.400	18.600	4	0.717	0.724	0.732
Package Body Width	E	11.800	12.000	12.200	4	0.465	0.472	0.480
Pitch	e		0.500				0.0197	
Terminal Dimension	D	19.800	20.000	20.200		0.780	0.787	0.795
Lead Tip Length	L	0.500	0.600	0.700		0.020	0.024	0.028
Lead Count	N		48				48	
Lead Tip Angle	$\phi$	0°	3°	5°		0°	3°	5°
Seating Plane Coplanarity	Y			0.100				0.004
Lead to Package Offset	Z	0.150	0.250	0.350		0.006	0.010	0.014

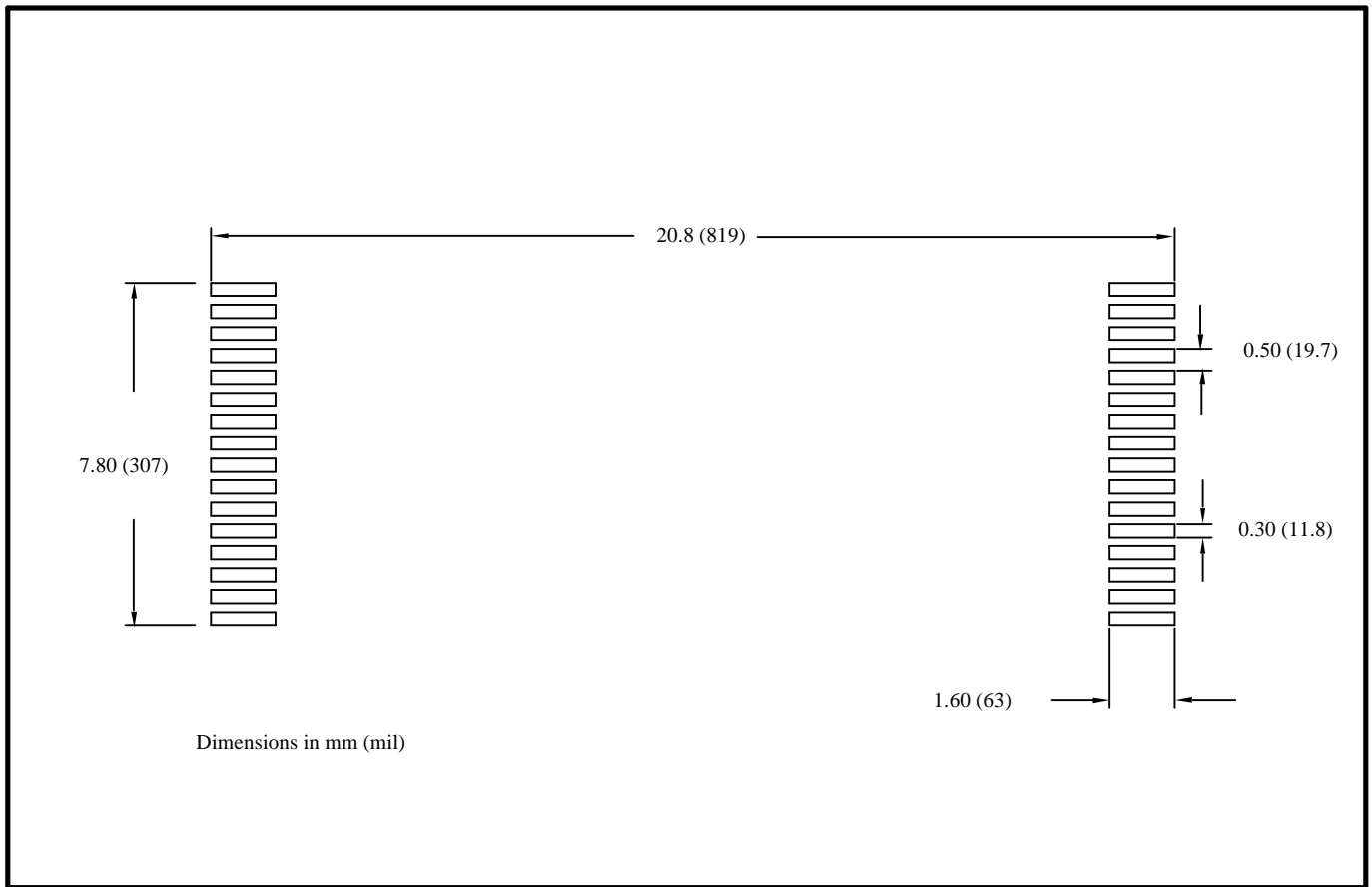
#### 56 Lead TSOP Specifications

	Symbol	Millimeters			Notes	Inches		
		Min	Nom	Max		Min	Nom	Max
Package Height	A			1.200				0.047
Standoff	A1	0.050				0.002		
Package Body Thickness	A2	0.965	0.995	1.025		0.038	0.039	0.040
Lead Width	b	0.100	0.150	0.200		0.004	0.006	0.008
Lead Thickness	c	0.115	0.125	0.135		0.0045	0.0049	0.0053
Package Body Length	D1	18.200	18.400	18.600	4	0.717	0.724	0.732
Package Body Width	E	13.800	14.000	14.200	4	0.543	0.551	0.559
Pitch	e		0.500				0.0197	
Terminal Dimension	D	19.800	20.000	20.200		0.780	0.787	0.795
Lead Tip Length	L	0.500	0.600	0.700		0.020	0.024	0.028
Lead Count	N		56				56	
Lead Tip Angle	$\phi$	0°	3°	5°		0°	3°	5°
Seating Plane Coplanarity	Y			0.100				0.004
Lead to Package Offset	Z	0.150	0.250	0.350		0.006	0.010	0.014



### TSOP Board Footprints

A typical land pad diagram for the 32 lead TSOP package is shown.



### Typical TSOP Land Pad Diagram

Similar land pad diagrams can be constructed for the 40-lead, 48-lead and the 56-lead TSOP packages. The 40-lead land pad diagram can be constructed by adding four leads to both sides of the 32-lead land pad diagram, while maintaining the spacing between the lead footprints. The total footprint width becomes 9.80mm instead of 7.80mm used with the 32-lead package. With the 48-lead package 8 leads are added to both sides of the 32-lead package. The total footprint width becomes 11.80 instead of 7.80mm used with the 32 lead package. With the 56-lead package, 12 leads are added to both sides between the lead footprints. The total footprint width becomes 13.80 instead of the 7.80mm used with the 32-lead package. The DDT SOP uses the same land pad diagram as the 56-lead TSOP package.