TSOP

Thin Small Outline Package (TSOP):

Amkor offers a family of popular TSOP packages to serve the needs of IC designers, PCB/system engineers and component specifiers. Small and thin, these 1.0 mm thick packages were designed and introduced to operate reliably in a variety of environments. Particular attention was focused on material sets and assembly processes to address user issues such as flatness, coplanarity, wire sweep, delamination, solderability and more.

Applications:

The prime application for this technology is memory. SRAM, FLASH, FSRAM and E2PROM find this package symbiotic with end-use products. Amkor answers the needs required by telecom, cellular, memory modules, PC (PCMCIA) cards, wireless, netbooks and countless other product applications. These products demand more of IC packages and Amkor delivers.

Features:

Amkor's TSOP packages offer:

- 28 to 56 lead counts for TSOP 1
- 40 to 50 lead counts for TSOP 2
- 8 x 14 mm to 14 x 20 mm package sizes for TSOP 1
- 10.16 mm package body size for TSOP 2
- Hi-conductivity copper leadframes or Alloy 42 leadframes for low CTE
- JEDEC standard compliance
- Low stress die attach adhesive or optional non-conductive die attach film
- Stacked die up to 4X, including stair step and film-over wire (FOW) construction
- Precisely controlled wire loop height
- Enhanced design for memory applications
- Pb free, RoHS compliant and Green materials are standard

Thermal Resistance:

Forced Convection, Single-Layer PCB

Pkg	Body Size (mm)	Theta JA (°C/W) by Velocity (LFPM) 0	200	500
32 ld	8 x 14	85.2	66.6	58.5
40 ld	10 x 20	75.0	57.2	48.6
48 ld	12 x 20	80.1	62.4	54.2

Forced Convection, Multi-Layer PCB

Pkg	Body Size (mm)	Theta JA (°C/W) by Velocity (LFPM) 0	200	500
32 ld	8 x 14	53.2	46.4	43.0
40 ld	10 x 20	44.6	37.6	34.2
48 ld	12 x 20	50.8	43.7	40.0

JEDEC Standard Test Boards

Electrical:

Pkg	Body Size (mm)	Lead	Self Inductance (nH)	Self Capacitance (pF)	Self Resistance (mΩ)
48 ld	12 x 20	Longest	4.310	0.695	35.0
		Shortest	2.130	0.474	19.6

Simulated Results @ 100 MHz

Reliability:

TSOP packages are tested to assure reliable, long term operation for your devices.

- Temp cycle — -65/+150 °C, 500 cycles
- HAST — 130 °C/85% RH, 96 hours
- High temp storage — 150 °C, 1000 hours

TSOP

Process Highlights

Strip solder plating	Matte Sn standard
Strip marking	Laser
Pack/ship options	Bar code, dry pack, TnR
Wafer backgrinding	Available

Test Services

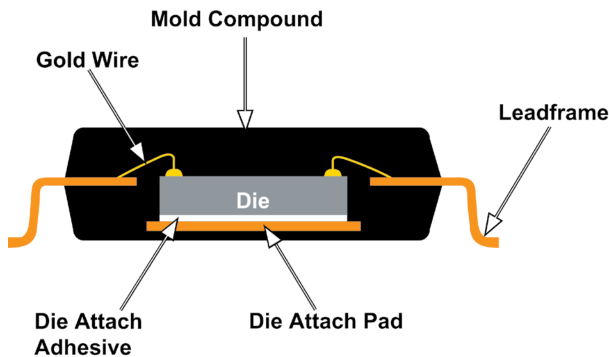
Contact Amkor Test Services for more details.

- Program generation/conversion
- Product engineering support
- Wafer sort
- Ambient to +165 °C test available
- Tape and reel services
- Burn-in available

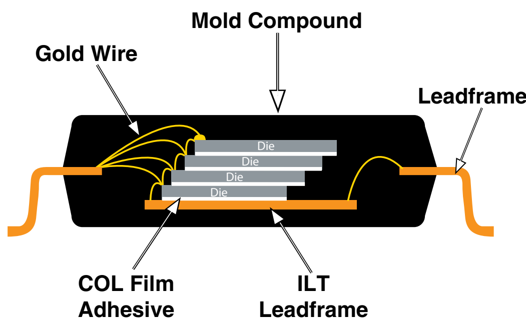
Shipping

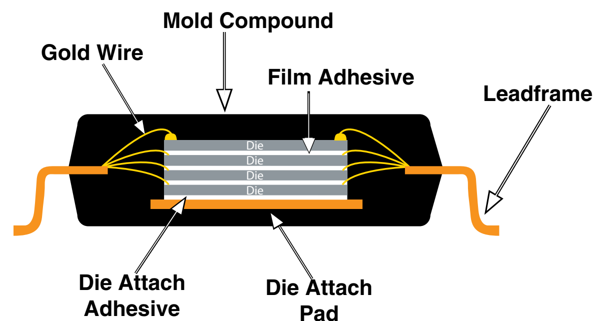
JEDEC outline CS-020 low profile tray

TSOP Cross Section



Stacked TSOP





Configuration Options:

TSOP 1 Nominal Package Dimensions (Units in mm)

Body Size	Lead Count	Body Length	Lead Length	Tip To Tip	Body Thck	Standoff	Overall Height	JEDEC	Tray Matrix	Units Per Tray
8 x 13.4	28	11.8	0.8	13.4	1.00	0.10	1.10	MO-183	13 x 18	234
8 x 13.4	32	11.8	0.8	13.4	1.00	0.10	1.10		13 x 18	234
8 x 14	32	12.4	0.80	14.0	1.00	0.10	1.10	MO-142	13 x 16	208
8 x 20	32	18.4	0.80	20.0	1.00	0.10	1.10	MO-142	13 x 12	156
10 x 14	40	12.4	0.80	14.0	1.00	0.10	1.10	MO-142	10 x 16	160
10 x 20	40	18.4	0.80	20.0	1.00	0.10	1.10	MO-142	10 x 12	120
12 x 20	48	18.4	0.80	20.0	1.00	0.10	1.10	MO-142	8 x 12	96
14 x 20	56	18.4	0.80	20.0	1.00	0.10	1.10	MO-142*	8 x 12	96

*56L currently tooled with non-standard lead width

TSOP 2 Nominal Package Dimensions (Units in mm)

Body Size	Lead Count	Body Length	Lead Length	Tip To Tip	Body Thck	Standoff	Overall Height	JEDEC	Tray Matrix	Units Per Tray
10.16	40	18.41	0.80	11.76	1.00	0.10	1.10	MS-024	9 x 15	135
10.16	44*	18.41	0.80	11.76	1.00	0.10	1.10	MS-024	9 x 15	135
10.16	44	20.95	0.80	11.76	1.00	0.10	1.10	MS-024	9 x 13	117
10.16	50	20.95	0.80	11.76	1.00	0.10	1.10	MS-024	9 x 13	117

*with LOC construction

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