Data Sheet

Thin Shrink Small Outline Package, Micro Small Outline Package (TSSOP/MSOP)

TSSOP and MSOP are leadframe based, plastic encapsulated packages that are well suited for applications requiring less than 1 mm mounted height. These industry standard packages run in very high volume and provide a value added, low cost solution for a wide range of applications.

Features

- Cu wire interconnect for lowest cost
- Standard JEDEC package outlines
- Multi-die production capability
- Turnkey test services, including strip test options
- Available in ExposedPad configuration (Ref: DS571)
- Green materials are standard – Pb-free and RoHS compliant
- Stealth dicing (narrow saw streets)
- Larger/higher density leadframe strips
- Leadframe roughening for improved MSL capability

New Developments

Stealth dicing (narrow saw streets)
Larger/higher density leadframe strips
Leadframe roughening for improved MSL capability

Services and Support

Amkor has a broad base of resources available to help customers bring quality new products to market quickly and at the lowest possible cost.

- Full package characterization
- Thermal, mechanical stress and electrical performance modeling
- Turnkey assembly, test and drop ship
- World class reliability testing and failure analysis

TSSOP/MSOP

Thermal Performance

Forced Convection, Single-layer PCB

Pkg	Body Size (mm)	ΘJA (°C/W) by Velocity (LFPM)		
		0	200	500
16 ld	4.4 x 5.0	137.1	118.2	106.8
20 ld	4.4 x 6.5	114.5	98.0	88.0

Forced Convection, Multi-layer PCB

Pkg	Body Size (mm)	ΘJA (°C/W) by Velocity (LFPM)		
		0	200	500
16 ld	4.4 x 5.0	89.0	81.8	78.1
20 ld	4.4 x 6.5	73.2	66.6	63.5

JEDEC Standard Test Boards

Electrical Performance

Pkg	Body Size (mm)	Lead	Inductance (nH)	Capacitance (pF)	Resistance (mΩ)
8 ld	4.4 x 3.0	Longest Shortest	1.470 0.725	0.224 0.177	13.7 7.5
28 ld	4.4 x 9.7	Longest Shortest	2.100 0.713	0.368 0.180	16.1 6.8

Simulated Results @ 100 MHz

Reliability Qualification

Amkor package qualification uses three independent production lots and a minimum of 77 units per test group. All testing includes JSTD-020 moisture preconditioning.

- Moisture Sensitivity Characterization — JEDEC Level 1, 85°C/85% RH, 168 hrs; JEDEC Level 3, 30°C/60% RH, 192 hrs
- uHAST — 130°C/85% RH, No Bias, 96 hrs
- Temp Cycle — -65°C/+150°C, 500 cycles
- High Temp Storage — 150°C, 1000 hours

Process Highlights

- Au plated PCC wire is standard, Au and Ag wire available
- Wafer backgrinding services available
- Multiple die and die stacking capability
- NiPdAu (PPF) lead finish is standard, Matte Sn is optional
- Laser mark on package body

Visit Amkor Technology online for locations and to view the most current product information.

TSSOP/MSOP

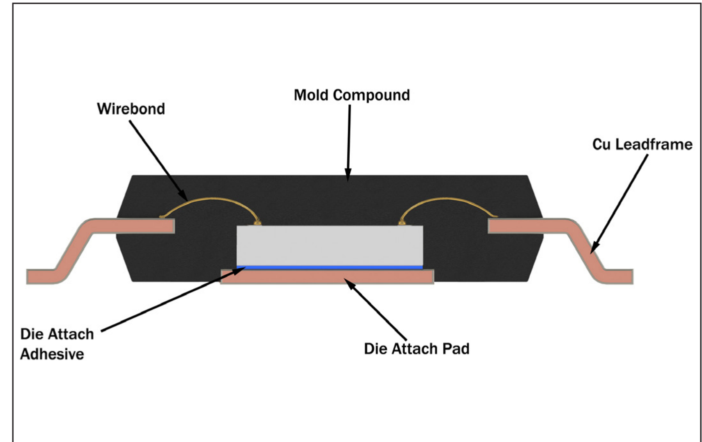
Test Services

- Program generation/conversion
- Wafer probe
- Burn-in capabilities
- -55°C to +165°C test available
- Strip test available

Shipping

- Clear anti-static tube, 20 inch
- Tape and reel
- Dry pack
- Drop ship

Cross-section TSSOP/MSOP



Configuration Options

TSSOP/MSOP Nominal Package Dimensions (mm)

Package Type	Lead Count	Body Width	Body Length	Body Thickness	Standoff	Overall Height	Lead Pitch	Tip-to-Tip	JEDEC
TSSOP	8	4.4	3.0	0.90	0.10	1.00	0.65	6.4	MO-153
	14	4.4	5.0	0.90	0.10	1.00	0.65	6.4	MO-153
	16	4.4	5.0	0.90	0.10	1.00	0.65	6.4	MO-153
	20	4.4	6.5	0.90	0.10	1.00	0.65	6.4	MO-153
	24	4.4	7.8	0.90	0.10	1.00	0.65	6.4	MO-153
	28	4.4	9.7	0.90	0.10	1.00	0.65	6.4	MO-153
	38	4.4	9.7	0.90	0.10	1.00	0.50	6.4	MO-153
MSOP	8	3.0	3.0	0.85	0.10	0.95	0.65	5.0	MO-187
	10	3.0	3.0	0.85	0.10	0.95	0.50	5.0	MO-187

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