



ExposedPad Thin Shrink Small Outline Package, Micro Small Outline Package, Small Outline IC Package, Shrink Small Outline Package (ePad TSSOP/MSOP/SOIC/SSOP)

ExposedPad (ePad) TSSOP, MSOP, SOIC and SSOP are leadframe based, plastic encapsulated packages that are well suited for applications requiring optimum thermal performance, compressed body size and tightened lead pitch. These industry standard IC packages offer a substantial increase in heat dissipation, yield a significant reduction in size and provide value-added, low-cost solutions for a wide range of applications. A green BOM is standard, allowing devices to meet applicable Pb-free and RoHS standards.

Features

- Cu wire interconnect for low cost
- Standard JEDEC package outlines
- Multi-die production capability
- Turnkey test services, including strip test options
- ExposedPad configuration for increased thermal efficiency
- Up to 60% improvement in Theta JA (compared to standard TSSOP or SOIC)
- Green materials are standard – Pb-free and RoHS compliant

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

Visit [Amkor Technology online](http://www.amkor.com) for locations and to view the most current product information.

ExposedPad TSSOP/MSOP/SOIC/SSOP

Thermal Performance

Forced Convection, Single-layer PCB

Pkg	Body Size (mm)	Pad Size (mm)	ΘJA (°C/W) by Velocity (LFPM)		
			0	200	500
TSSOP 16 Id*	4.4 x 5.0	3.0 x 3.0	37.6	32.3	30.2
TSSOP 20 Id	4.4 x 6.5	3.0 x 4.2	37.6	32.3	29.9
TSSOP 28 Id*	4.4 x 9.7	3.0 x 5.5	37.0	32.0	29.0
TSSOP 56 Id*	6.1 x 14	4.7 x 5.5	33.5	30.0	28.0
MSOP 8 Id*	3.0 x 3.0	1.73 x 2.39	38.0	33.0	31.0
SOIC 8 Id	3.9 x 4.9	2.3 x 2.3	58.6	52.1	49.4

* = Estimated
JEDEC Standard Test Boards

Electrical Performance

Pkg	Body Size (mm)	Pad Size (mm)	Center Inductance (nH)	Corner Inductance (nH)
TSSOP 16 Id*	4.4 x 5.0	3.0 x 3.0	1.58	2.28
TSSOP 20 Id	4.4 x 6.5	3.0 x 4.2	1.68	2.45
TSSOP 28 Id*	4.4 x 9.7	3.0 x 5.5	1.70	2.65
TSSOP 56 Id*	6.1 x 14	4.7 x 5.5	1.90	2.85
MSOP 8 Id*	3.0 x 3.0	1.73 x 2.39	1.50	2.20

* = Estimated
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

- Pcc wire bonding standard, Ag wire available
- Wafer backgrinding services available
- Multiple die and die stacking capability
- NiPdAu (PPF) or Matte Sn lead finish options
- Laser mark on package body



ExposedPad TSSOP/MSOP/SOIC/SSOP

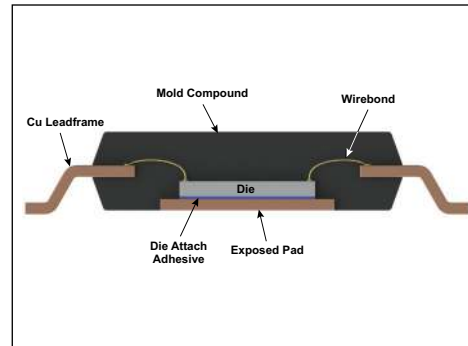
Test Services

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

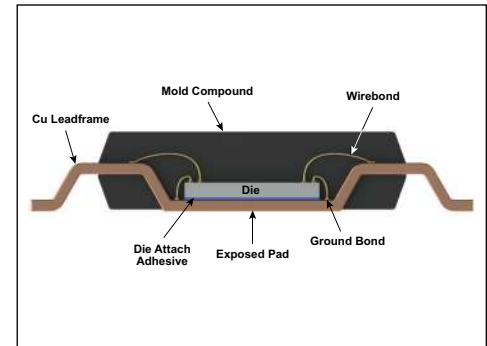
Shipping

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

Cross-section ePad SOIC



Cross-section ePad TSSOP



Configuration Options

ePad TSSOP, ePad MSOP, ePad SOIC, ePad SSOP Nominal Package Dimensions (mm)

Package Type	Lead Count	Body Width	Body Length	Body Thickness	Standoff	Overall Height	Lead Pitch	Tip-to-Tip	JEDEC
ePad TSSOP	8	4.4	3.0	0.90	0.10	1.00	0.65	6.40	MO-153
	14	4.4	5.0	0.90	0.10	1.00	0.65	6.40	MO-153
	16	4.4	5.0	0.90	0.10	1.00	0.65	6.40	MO-153
	20	4.4	6.5	0.90	0.10	1.00	0.65	6.40	MO-153
	24	4.4	7.8	0.90	0.10	1.00	0.65	6.40	MO-153
	28	4.4	9.7	0.90	0.10	1.00	0.65	6.40	MO-153
	38	4.4	9.7	0.90	0.10	1.00	0.50	6.40	MO-153
	48	6.1	12.5	0.90	0.10	1.00	0.50	8.10	MO-153
ePad MSOP	8	3.0	3.0	0.85	0.10	0.95	0.65	5.00	MO-187
	10	3.0	3.0	0.85	0.10	0.95	0.50	5.00	MO-187
ePad SOIC	8	3.9	4.9	1.47	0.05	1.52	1.27	6.00	MS-012
	16	3.9	9.9	1.47	0.05	1.52	1.27	6.00	MS-012
ePad SSOP	36	7.6	10.3	2.28	0.05	2.45	0.50	10.40	MO-271

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