



## Power Small Outline Package, PowerSOP® (PSOP3)

PSOP3 is a leadframe based, plastic encapsulated package that is well suited for applications requiring optimum performance in IC packaging. This industry standard package utilizes a thick copper heat slug to accommodate the needs of higher power devices. 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
- Green materials are standard – Pb-free and RoHS compliant
- Theta JC of under 1°C/W can be achieved with optimal heatsinking
- Highly conductive copper heat-slug and leadframes
- PSOP3 package has optional soft solder die attach for enhanced power capability

### New Developments

- Stealth dicing (narrow saw streets)
- 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 for locations and to view the most current product information.

## PowerSOP® 3

### Thermal Performance

Forced Convection, Single-layer PCB

| Pkg   | Die Size (mm) | S/NS | ΘJA (°C/W) by Velocity (LFPM) |      |      |
|-------|---------------|------|-------------------------------|------|------|
|       |               |      | 0                             | 200  | 500  |
| 20 ld | 5.1 x 5.1     | S    | 50.8                          | 35.7 | 27.8 |
|       |               | NS   | 52.4                          | 37.6 | 28.8 |

Forced Convection, Multi-layer PCB

| Pkg   | Die Size (mm) | S/NS | ΘJA (°C/W) by Velocity (LFPM) |      |      |
|-------|---------------|------|-------------------------------|------|------|
|       |               |      | 0                             | 200  | 500  |
| 20 ld | 5.1 x 5.1     | S    | 19.2                          | 14.2 | 12.2 |
|       |               | NS   | 25.7                          | 20.4 | 17.8 |

S = Slug soldered to test board  
 NS = Slug not soldered to test board  
 JEDEC Standard Test Boards

### Electrical Performance

| Pkg   | Body Size (mm) | Pad Size (mm) | Lead     | Inductance (nH) | Capacitance (pF) | Resistance (mF) |
|-------|----------------|---------------|----------|-----------------|------------------|-----------------|
| 20 ld | 11 x 15.9      | 7.5 x 7.9     | Longest  | 3.130           | 1.990            | 30.6            |
|       |                |               | Shortest | 1.540           | 0.604            | 9.42            |

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 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



DS320K  
 Rev Date: 3/15

## PowerSOP® 3

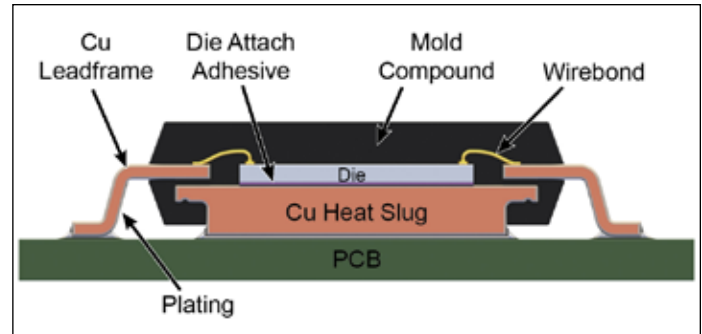
### Test Services

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

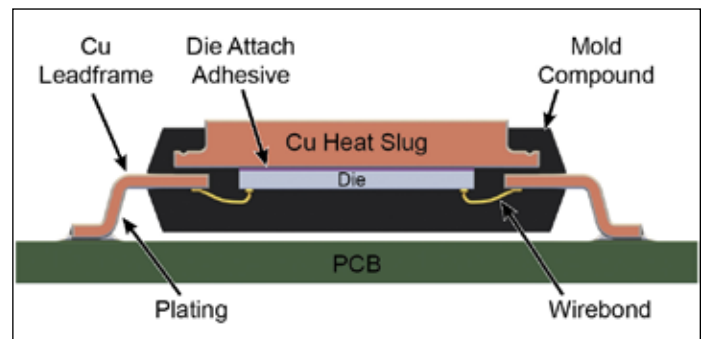
### Shipping

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

### Cross-section PowerSOP® 3 (Bottom Slug)



### Cross-section PowerSOP® 3 (Top Slug)



### Configuration Options

#### PowerSOP (PSOP3) Nominal Package Dimensions (mm)

| Lead Count | Body Width      | Body Length | Body Thickness | Standoff | Overall Height | Lead Pitch | Tip-to-Tip | JEDEC  |
|------------|-----------------|-------------|----------------|----------|----------------|------------|------------|--------|
| 20         | 11.0 mm (.433") | 15.9        | 3.15           | 0.20     | 3.35           | 1.27       | 14.2       | MO-166 |
| 24         | 11.0 mm (.433") | 15.9        | 3.15           | 0.20     | 3.35           | 1.00       | 14.2       | MO-166 |
| 30         | 11.0 mm (.433") | 15.9        | 3.15           | 0.20     | 3.35           | 0.80       | 14.2       | MO-166 |
| 36         | 11.0 mm (.433") | 15.9        | 3.15           | 0.20     | 3.35           | 0.65       | 14.2       | MO-166 |
| 44         | 11.0 mm (.433") | 15.9        | 3.15           | 0.20     | 3.35           | 0.65       | 14.2       | MO-166 |

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