

# PowerCSP™

PowerCSP™ is an innovative chip scale power transistor package. It has a simple structure, excellent electrical and thermal properties and high-density form factor that suits the challenges of discrete or integrated packaging.

## Applications

PowerCSP™ is suitable for power applications designed for low on-resistance and high-speed-switching MOSFETs such as:

- ▶ Telecom/Data centers
- ▶ Electric and hybrid electric vehicles
- ▶ DC/DC conversion

## Reliability Qualification

- ▶ Under development in 5 x 6 mm package body

## Test Services

Amkor offers full turnkey business for all power discrete products with the capability to test various types of power devices including MOSFETs, bipolar transistors, IGBTs, diodes and regulator ICs/intelligent power devices.

- ▶ Amkor power discrete test capability
  - ▷ Static test (DC)
  - ▷ Dynamic test (AC, switching/Trr, capacitance/Rg)
  - ▷ Destruction test (inductive load/VSUS, latch up test, surge, isolation/VIL)
  - ▷ Thermal resistance ( $\Delta VDS$ ,  $\Delta mV$ , etc.)
- ▶ Program generation/conversion
- ▶ Failure analysis
- ▶ Available test/handling technology
- ▶ Integrated marking, vision inspection and tape & reel services

## Standard Materials

- ▶ Leadframe: Bare copper (C19210)
- ▶ Die attach: Ag adhesive, Ag sintering, solder or hybrid sintering material
- ▶ Mold compound: Halogen free

## Shipping

- ▶ Tape and reel packing
  - ▷ 3000 pcs per reel
  - ▷ Tape width 12 mm
  - ▷ Reel  $\Phi$  = 330 mm
- ▶ Barcode packing label



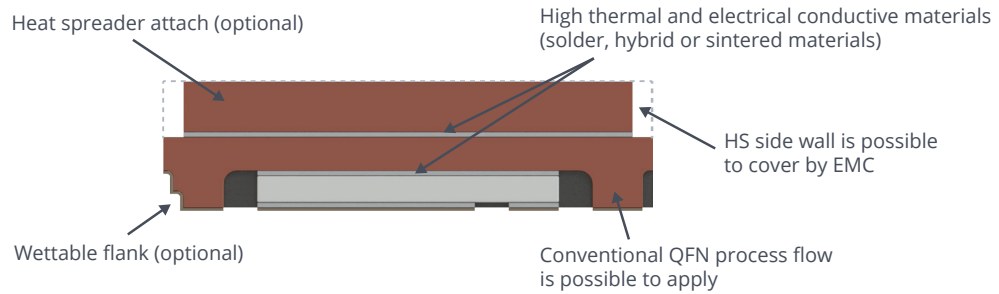
## FEATURES

- ▶ Low resistance/inductance packaging
- ▶ Reduced form factor, Chip Scale Package (CSP)
- ▶ CMOS, GaN and SiC compatible
- ▶ Integrated power building block
- ▶ Reduced thermal and electrical interfaces
- ▶ Direct connection of the source or drain to the PCB
- ▶ High percent of conductive material within the volume of the package of 30-70%
- ▶ Low resistance (Rds), low inductance (Lds) and good capacitive (Ciss) performance compared to other discrete packages
- ▶ Custom and standard pin layouts in a dual-sided power package

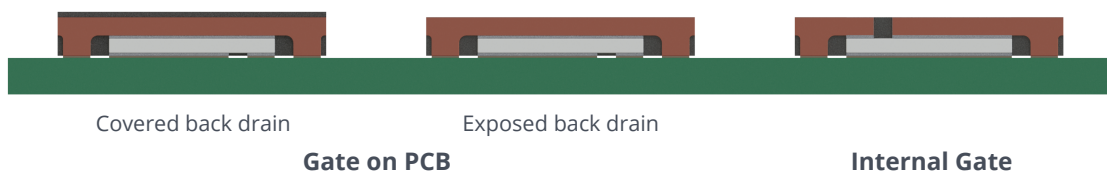
## NEW DEVELOPMENTS

- ▶ Simple package structure eliminates clip and wire for a direct source/drain/gate connection
- ▶ Eliminates lossy interfaces compared to traditional discrete packaging
- ▶ Maximized source and drain connectivity area

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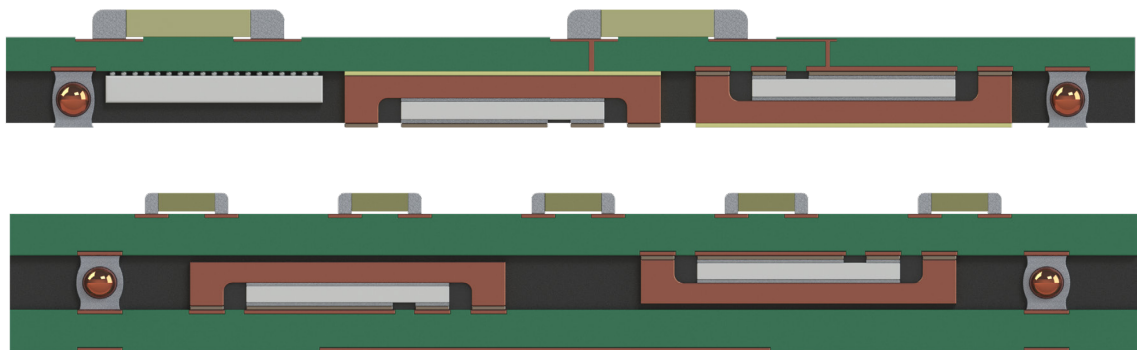
The first implementation of PowerCSP™ technology shows its flexibility and many construction options.



The PowerCSP™ design provides many connectivity options for chip scale power.



Packaging variations for chip scale power based on the flexibility of the PowerCSP™ design.



Example of embedded technology.



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