

Package Miniaturization

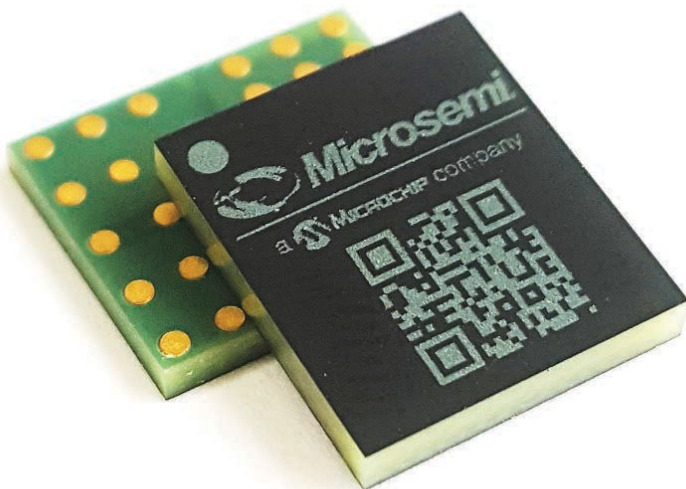
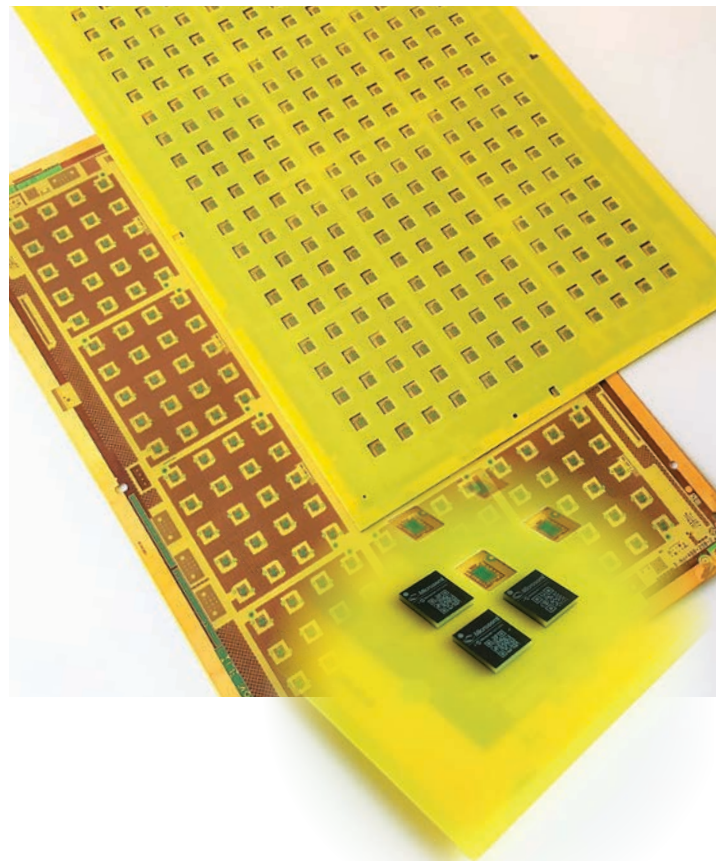
Large Area Panel Molding

Microsemi's Large Area Panel Molding provides a low cost of entry, fast turnaround, flexible package size design alternative to standard Injection Molding. Adapted from Microsemi's embedded die technology, the LAPM process is based on 18" x 12" printed circuit board laminates, offering a scalable manufacturing process across all production volumes.

Customers looking to develop packaged parts often face tough decisions on justification of package tooling and the risk of having to make costly adjustments prior to moving in to volume production. The LAPM process requires minimal tooling, thus lowering development costs and providing a faster time to samples.

The technology provides additional packaging benefits of using thermally matched materials by allowing the same material to be used for the substrate and over-molding, minimising stress throughout the package during thermal cycling.

Microsemi's Large Area Panels allow customers limitless possibilities in package shape and size, which would normally be uneconomical by standard methods.



Features

- Low cost of entry – no expensive tooling
- Fast turnaround time – standard PCB process
- Flexible size and shape – large panels allow for economic and scalable production at any package size
- Thermally matched package materials
- Internal interconnect – Bare die (flip chip or wire bond), BGA, SMT components

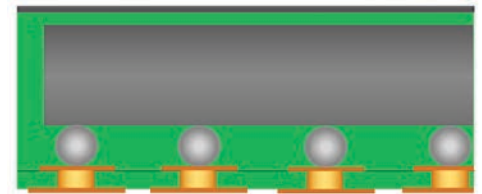
Applications

- Medical Implants
- Wearables
- Military
- Security
- Industrial

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Large Area Panel Molding

Module Parameters	
Minimum substrate thickness	100µm core
Minimum feature size	75µm
Minimum module XY size	Flip chip die XY dimensions + 1 mm Wire bond pad + 200µm
Minimum module height	Flip chip = Core + (die height + 10%) Wire bond = Core + wire bond height + 10%
Die interconnect	Flip chip and wire bond
Components	Bare die, packaged parts and SMT components
Marking	Laser and label
Traceability	Yes
Packaging	JEDEC tray or tape and reel
Footprint	Land Grid Array (LGA)



LAPM Flip Chip Module – Single Core



LAPM Wire-bond Module – Single Core

Test Group	Test Standard	Result
Moisture sensitivity preconditioning:	JESD22-A113F, IPC/JEDEC J-STD-020 Level 3	✓
Temperature cycling	-40 °C to 60 °C, 5 cycles	
Bake	125 °C for 24 h	
Moisture soak	40 hrs, 60 °C/60%RH	
3X reflow	JESD22-A113F, 260 °C	
Thermal stress:		✓
Low temperature storage	-40 °C, 72 h	
High temperature storage	125 °C, 72 h	
Temperature cycling	MIL-STD-883 Method 1010, Condition B, -55 °C to 125 °C, 20 cycles	✓
Mechanical stress:		
Mechanical shock	MIL-STD-883 Method 2002, Condition B, 5 shocks, 1500 g	
Mechanical vibration	MIL-STD-883 Method 2007, Condition A, 20–2000 Hz, 20 G	
Constant acceleration	MIL-STD-883 Method 2001, 10,000 G	✓
Exposure:		
Resistance to solvents	MIL-STD-883 Method 2016	
ESD	MIL-883 Method 3015, 1000V HBM	✓
Assembly:		
Component shear	MIL-STD-883 Method 2019/2011	
External physical dimensions	MIL-883 Method 2016	
Solderability	MIL-STD-883 Method 2003.8/2022.2	
Ionic cleanliness	IPC-TM-650	

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