

HyperBGA®

HyperBGA® fluoropolymer-based coreless semiconductor package allows your die to run at extremely high speeds. The combination of the low loss, low dielectric constant material and strip line cross sections enable signal speeds surpassing 25GHz. And much higher over shorter distances (>70GHz)

The PTFE material compliance combines with the dimensional stability of a copper-invar-copper center plane enabling HyperBGA® to provide long field life without the BGA wearout, die cracking, delamination or flip chip bump fatigue of other packages.

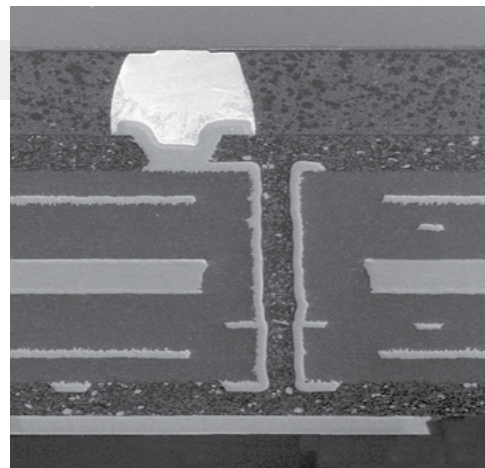
It's the solution for networking, high-end server, telecommunications, military and medical markets — anyplace where speed, reliability and increased signal I/O must combine with reduced size, weight and power (SWaP).

This low stress flip chip laminate package is also ideally suited to multi-layer, RF, chip-on-flex or any application requiring a system-in-package (SiP) approach.

DESCRIPTION

5, 7, 9, 11 and 13 layer HyperBGA® PTFE Substrate

- Great solution for RF/High speed digital
- Perfect for conversion of inorganic to an organic product set
- 50 micron UV laser drilled vias
- 25 micron trace/33 micron space
- Low loss / Low Dk
- High Reliability
- Rad tolerant
- Rogers 2800 and 2808 material sets



Attribute	HDI: Hyper® (PTFE)
PCB Attach	BGA, Custom Pin Array
Die attach	Wirebondable, Flip Chip up to 20mm, SMT
Radiation Level	Rad Tolerant
Embedded Passives	Yes
FC Component level reliability (-55 to 125C)	250 cycles
FC Board level reliability (0 to 100°C)	10,000 cycles
Composite CTE	12ppm
Er	2.7
Loss Tan	.003

Inspiring Innovation

www.ttm.com

follow us on [in](#) [f](#)

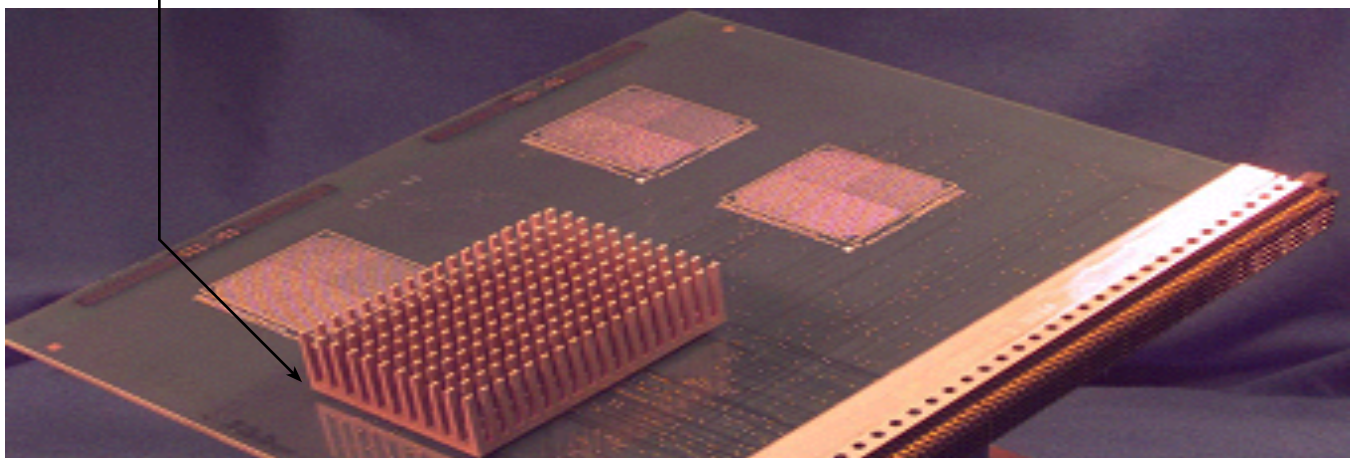
TTM Technologies

HYPERBGA® MODULE RELIABILITY PERFORMANCE

Test	Format	Test Duration	Status
Board Level Thermal Cycle (0 / 100°C)	On board w/heat sink*	3600 cycles	Pass
Board Level Thermal Cycle (0 / 100°C)	On board w/lid	3600 cycles	10K Pass
Power Cycling (25 / 125°C)	On board	3600 cycles	Pass
Deep Thermal Cycling (-40 / +125°C)	Component	250 cycles	Pass
Wet Thermal Shock (-40 / +125°C)	Component	100 cycles	Pass
TH & B (85°C / 85%RH / 3.7V)	On board	1000 hours	Pass
HAST (110°C / 85%RH / 3.7V)	On board	264 hours	Pass
Pressure Pot (121°C / 100%RH / 2atm)	Component	96 hours	Pass
High Temp. Storage (150°C)	Component	1000 hours	Pass
Low Temp. Storage (-65°C)	Component	1000 hours	Pass
Shock/Vibration JEDEC	Component	various	Pass

No field returns on any HyperBGA products shipped (Millions shipped)
Compatible with Lead-Free MSL4

*Component w/ adhesively attached
200 gm Heat Sink on 9x10 inch card



HyperBGA[®] SPECIFICATIONS

LAMINATE

Line width 25 µm minimum in die area

Line space 30 µm minimum in die area

Via diameter 50 µm minimum (UV laser drilled)

Layers Up to 13+

MATERIALS

Outer Dielectric Low-loss thermoset dielectric

Ground Plane Copper-invar-copper

Flip chip Pad Surface Finish Eutectic on ENIG, ENIG, lead free compatible on ENIG

Wirebond Compatible ENEPIG

BGA metallurgy ENIG on copper, OSP on copper

ENEPIG Available for wirebond

BGA Metallurgy ENIG on Copper, OSP on Copper, lead free compatible on ENIG

PHYSICAL

Body sizes JEDEC, 17.0 mm–55.0 mm

SiP body sizes Custom

Number of BGA I/Os Up to 2916 at 1.0 mm pitch, smaller pitch possible

Die size >18.3 mm

BGA pitch 0.5 mm–1.27 mm

Decoupling capacitors Flip chip and SMT

RELIABILITY

Moisture sensitivity JEDEC Level 3

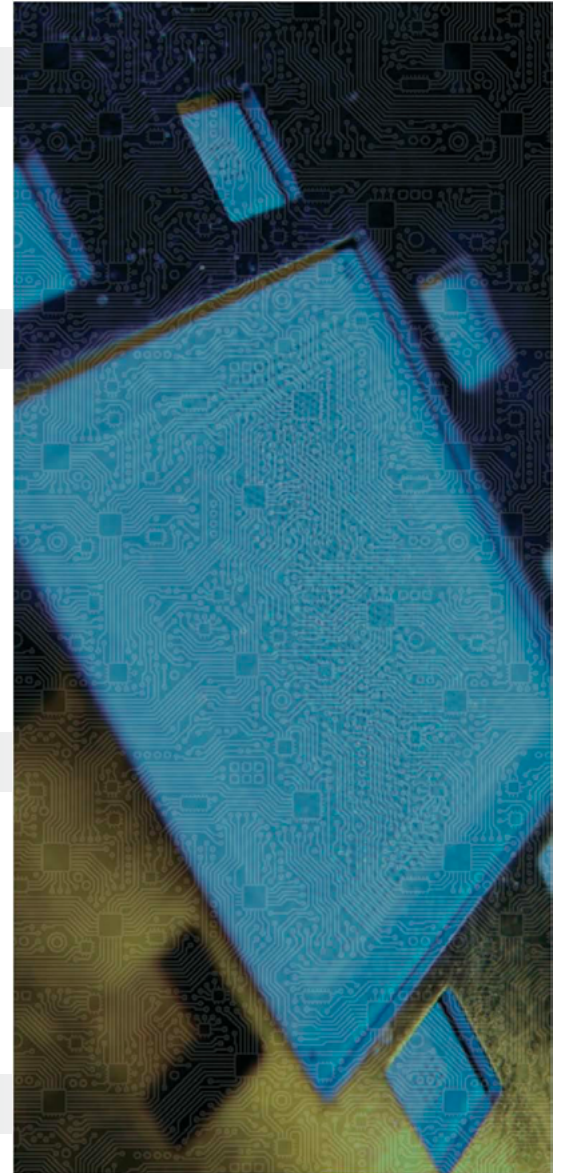
Board level thermal cycles 10,000 cycles of 0° to 100°C

High-temperature storage 1,000 hours at 150°C

Component level thermal cycles 250 cycles of -55° to 125°C, HAST 264 hours of 110°C/85% RH/3.7V

Pressure pot 96 hours at 121°C/100% RH/2 ATM

Temperature, humidity, bias 1,000 hours at 85°C/85%RH/3.7V



Results may vary with different die, assembly processing or design attributes.

Inspiring Innovation

www.ttm.com

follow us on [in](#) [f](#)

TTM Technologies