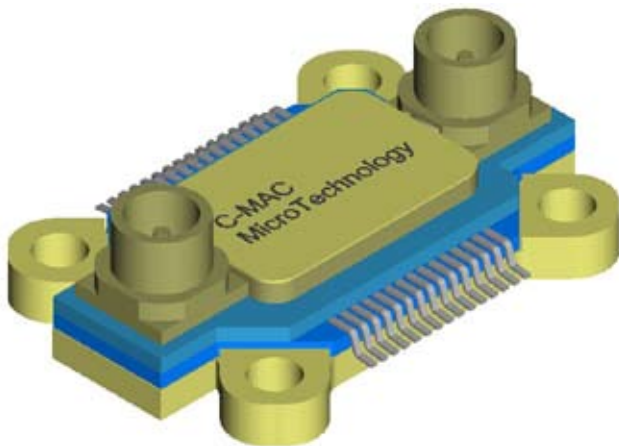


C-MAC MicroTechnology has over 10 years experience of low loss MMIC and MCM packaging solutions in both Low Temperature Co-fired Ceramic (LTCC) and High Temperature Co-fired Ceramic (HTCC) packages for single chip and Multi-Chip Modules (MCM). These optimised solutions are supplied into OEMs in defence, aerospace, automotive, communications, industrial and medical markets.

We auto pick and precision place die in Si, GaAs, InPh and SiGe technology. Our stepped depth cavities offer a shelf at the die surface level for wire bonding with short, controlled impedance wire bonds that are profiled for low loss characteristics.

Die junction temperatures are a critical factor in reliability and these are precisely modelled and accurately maintained by embedded thermal structures. These structures are realised by metal via stacks, embedded expansion matched cores and die pedestals.

Rapid prototyping and low tooling costs are achieved in-house with our LTCC development and production facility. We have a range of hermetic sealing techniques including solder (RoHS compliant), epoxy, laser welding and seam sealing. We provide a full service from the design and microwave simulation of the package, through to volume manufacture and full electrical and environmental testing.



- » Excellent RF performance
- » Excellent thermal performance
- » Low to high volume production services
- » Rapid prototyping and low tooling costs
- » RoHS compliant SMD packages
- » Range of options for electrical connections
- » Single chip and MCM packaging

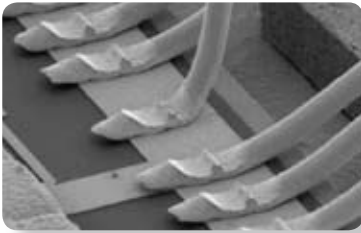
Typical Package Performance Data

Characteristic	Typical Value	Units
Insertion Loss (per port) @ 40GHz	0.25	dB
Return Loss @ 40 GHz	15	dB
Isolation (input to output) @ 40 GHz	40	dB
Power Dissipation (DC equiv.)	7	W
SMD reflow Temperature	250	°C
Substrate Material: HTCC and LTCC and Thick Film		



Our product integrity analysis includes:

- » Die shear
- » Wirebond pull and ball shear
- » Flip Chip mounting
- » Real time X-Ray analysis of die mounting and Flip Chip joint integrity
- » Temperature cycle – Power and signal applied and function monitored
- » Acceleration, vibration and shock
- » Climatic sequence. Salt Spray, Damp Heat
- » Lead bend and pull
- » Solderability
- » Hermeticity and Residual Gas Analysis (RGA)
- » Particle Impact Noise Detection (PIND)



SEM Wedgebonds

Our technologies include:

- » Thick film and LTCC
- » Hermetic Chip and Wire
- » Gold and Aluminium Wirebonding
- » PCB Assembly
- » System Assembly

Environmental Test House Facilities

- » Vibration – random, sine and gunfire (random on random)
- » Shock – saw-tooth, ½ sine, trapezoidal (to 30,000g)
- » Temperature shock – liquid/liquid & air/air
- » Centrifuge – to 40,000g
- » Salt Spray
- » Lift Test
- » Solderability – including steam ageing
- » Humidity – Cyclic and steady state



Electrical Test

Accreditation and Certification covers the Communications, Defence, Space, Medical, Industrial and Automotive markets and includes: ISO 9001:2000, MIL-PRF-38534, MIL-STD-883, BS9450 and ISO13485.

Contact us at:

C-MAC MicroTechnology
South Denes, Great Yarmouth
Norfolk, NR30 3PX, UK

Tel: +44 (0)1493 743100
Email: info@cmac.com

C-MAC
MicroTechnology
www.cmac.com

March 2008