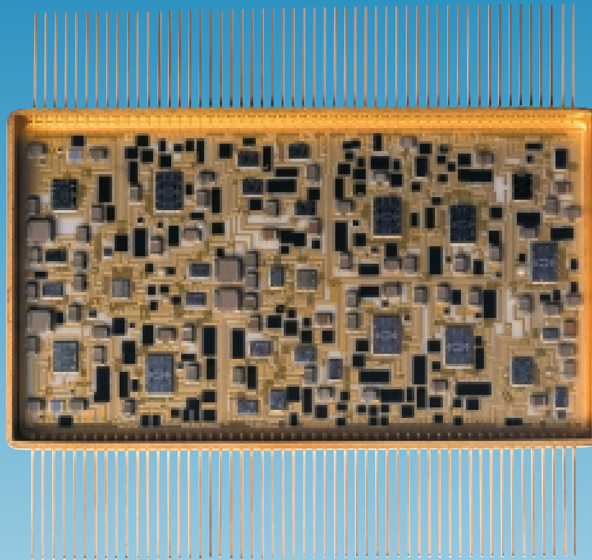
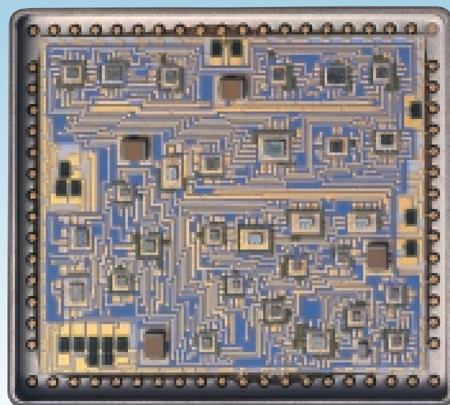
Microelectronic Assemblies





TECHNOGRAPH

Thick Film Hybrids

Chip and Wire

PCB Assembly

System Build
including
Procurement and
Logistics

DFM / DFT
Product Layout

Electronic
Packaging

Test

Solutions

Prototypes
and Volume

Microelectronic Assemblies

A leading supplier of microelectronic solutions for aerospace, military, telecommunications and high end industrial & professional market applications, the Technograph Portsmouth facility has established itself as a centre of excellence for product development and realisation, providing microelectronic assemblies to an advanced level of integration often within the smallest possible footprint.

With a long established track record in the "Chip & Wire" field, Technograph expertise and flexibility in the fields of microelectronic design and manufacturing allows them to offer the widest possible scope of product supply in terms of surface mount assemblies and hybrid & multichip modules. This has enabled them to supply technically compliant complex solutions such as :

- *Multichip wirebonded thick film hybrids and modules*
- *Surface mount thick and thin film hybrids*
- *PCB assemblies and onward integration*
- *Specialist assembly – complex PCB, copper invar composite boards*
- *Space qualified hybrids and assemblies*
- *Microwave, fibre optic & power modules*
- *Specialist test – ASIC, subsystem integration and test*

Technograph works closely with a diverse and demanding OEM customer base, anticipating and responding to market advancements, and helping to ensure that new generation system structures are both functional and available to the market within required timescales.

Design & Development Engineering

At the core of the Technograph microelectronics capability is an experienced and highly proficient team of engineers. These technical specialists undertake the physical and electronic design of thick film, thin film and PCB/composite substrates and hybrid assemblies.

The success of the design and development function is dependant upon two key factors – innovation and collaboration.

The innovative techniques employed by our designers consistently results in technically compliant, manufacturable and cost effective product solutions. However this optimum level of product performance is only achieved through close co-operation with customers from the earliest possible stage of their product development process.

Layouts for customers circuit designs are produced on industry popular CAD and CAE systems using proven in-house packages (e.g Calma GDS2 and Intergraph) in conjunction with external design systems and tools.

Where existing design processes and standards do not meet a specific requirement, Technograph can rapidly introduce new technologies into its design and development activities. Technograph is also able to develop build-to-print solutions for second source requirements or to support older, obsolescent product configurations.

Microelectronic Assembly

Shop floor lay-out has been designed to ensure total flexibility of manufacturing, and to facilitate any rapid ramp-ups in production volume. Flexibility is also maximised through the existence of multi-fuctional employees and the ability to handle various manufacturing methods – including batch manufacture, process manufacture and flow manufacture with feeder cells.

Automatic component placement and wirebonding capabilities are provided to an advanced level. Un-encapsulated semiconductor component placement is to 30 um, as is placement of passive components. Various wire diameters can be bonded, and tape bonding is also a key in-house capability. To support advanced telecommunications specifications, consistent placement and bonding accuracy is maintained for RF applications.

With more than 15,000 square feet of class 10,000 clean room capacity constantly available, with further capacity and cleaner areas available if required, Technograph can readily cope with the full spectrum of production volumes.

Electrical Test & Screening

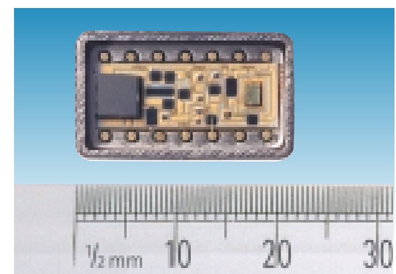
Technograph's high performance electrical testing facilities utilise an extensive range of test equipment together with a comprehensive breadth of test engineering experience, both in the development phase and during high volume production.

Technograph design and build complex test interfaces, with an ability to perform test activity in climatic conditions below –55°C and in excess of 125°C.

Typical test applications include :

- *Manual & ATE controlled test, IEEE, HP, Teradyne and networked PC controlled bus options*
- *Automated active laser trimming*
- *Temperature testing using forced air or dedicated chambers*
- *Passive and active burn-in at elevated temperatures*
- *Test system development*
- *Screening fine and gross leak, centrifuge, temperature cycling, thermal shock, vibration, mechanical shock, PIND testing.*

A number of proprietary test bays have been developed for DC to RF applications, in addition to dedicated environmental test areas, fixed and mobile ATE test sites, manual bench testing facilities, in-house calibration of test fixtures and fast turnaround of sub-contracted calibration and repair.



TECHNOGRAPH

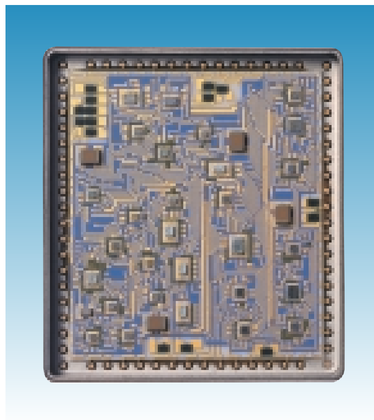
Approvals & Continuous Improvement

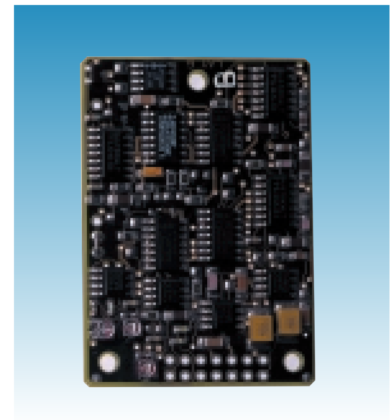
The nature of the products supplied and the markets within which Technograph operate demands an effective, well-defined quality assurance policy, and this has also resulted in the award a number of approvals and standards. These include :

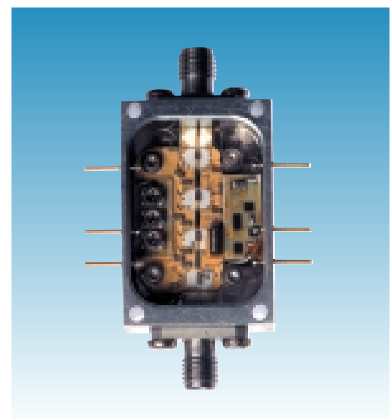
- *I.S.O. 14001 environmental certification*
- *I.S.O. certification to BS EN ISO 9001 : 1994*
- *Capability approval to BS 9000 : 9450*
- *Product screening to MIL standards*
- *Customer specific approvals to UK & overseas Military, Bell Corp., Boeing, ESA (space standards)*
- *List X Secure Site status*

Manufacturing processes are subject to full Statistical Process Controls (SPC), and continuous improvement teams drive business and process efficiency gains throughout the organisation. Individual operator training and certification is of paramount importance, and skills and training matrices form an integral part of the development of this.

Technograph commitment is to full product life cycle support, continually seeking process improvements and supporting ongoing cost reduction exercises. Yield and root cause analysis is also a key feature of the continuous improvement effort.







product **specification**

SURFACE MOUNT ASSEMBLIES

Semiconductors of all types, bare die or packaged in LCC, SO, QFP to 20 thou pitch, TAB, BGA, Glob Top

Resistors, Capacitors, Inductors, Relays, Crystals

Sensors & optical components / displays

Connectors and flexible cable attachment

Laminating to metal & composite cores for strength and thermal management

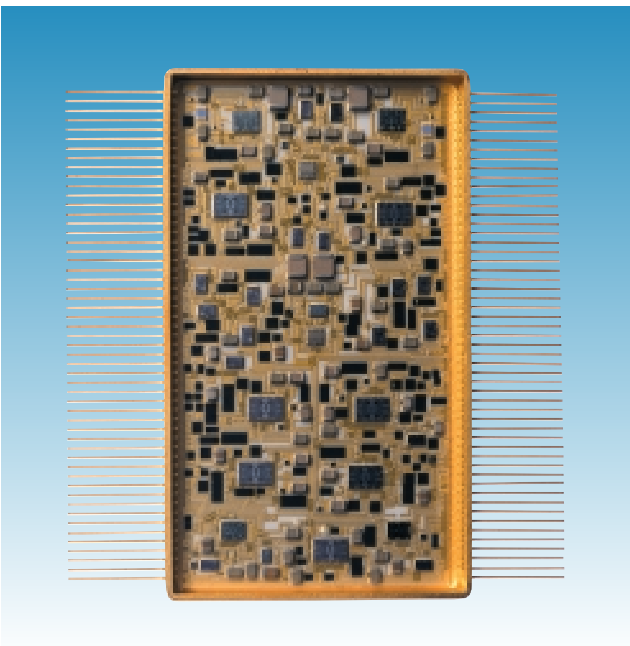
Double sided and stacked substrate assemblies including ceramic & PCB

Complex SMT Assembly

Assemblies including double sided with composite cores (Cu Invar) and thermal vias

Multilayer Thick Film SMT

High reliability & packing density



HYBRIDS & MULTICHIP MODULES

Thick Film Substrates

Substrate material 96% to 99% Alumina up to 180mm x 120mm

Multilayer conductors & solid vias in gold, platinum gold, silver, palladium silver, copper

Double sided printing & through holes

Laser trimmed resistors – values milliohms to Gigohms.
Tolerance <0.2%   Stability 0.25%
Power rating as required to >5W

Fine lines for high density to 0.05mm tracks/spacing

High current & high voltage capability

Suitable for solder assembly & wire bonding

MCM/Chip & Wire Add-on Devices & Interconnection

Chip scale integration for bare die semiconductors of all types

Resistors, Capacitors, Inductors, Quartz Crystals, Fibre Optic Components, Sensors

Stacked substrates including silicon on silicon

Eutectic diebond, epoxy attach & soldering

Gold & aluminium automatic & manual wirebond,
17 to 200 micron ultrasonic, thermosonic & wedge

Gold tape bonding to 500 micron

Specialist assembly skills for microwave and opto-electronic manufacturing

MCM, Microwave & Hybrid Packaging

Hermetic metal bathtub & flatpack packages
Sizes up to 75mm square
including deep packages for large components

Custom packages with optical input/output

Custom power package with mounting flanges

Kovar, Moly, steel, copper & aluminium silicon carbide composite options

Ceramic co-fired packages

Ceramic epoxy sealed integrated substrate packages

Laser & parallel gap package welding

Power Hybrids

Extensive experience in thermal design for power semiconductors

Special techniques for semiconductor mounting, interconnection & packaging

Thick film copper substrates for high conductivity

Demonstrated capability to 300V, 30A, 100W peak, 30W continuous dissipation in flanged packages

Applications include SMPS, actuator drivers, motor controllers, avionics & military

Technograph is continually upgrading its capability, so please call for latest information

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The Technograph Philosophy

Technograph offers its microelectronics capability with one clear aim – helping its customers to realise their products. From its early involvement at conceptual development phase through design modelling and prototyping to volume production and test, Technograph applies best-in-class techniques across the board.

Technograph continues to have a strategic relationship with Viasystems so can offer scalability and further levels of integration.

As part of an international electronic manufacturing services organisation, the Viasystems capability stretches far beyond the microelectronic module. Other parts of the organisation specialise in the design and manufacture of traditional printed circuit board products, backplane assemblies, enclosure innovation, interconnect solutions, through to complete system assembly and configuration.

TECHNOGRAPH

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The company reserve the right to amend the specifications, method of manufacture, without notice and cannot be held responsible for any effect of such changes.
Dimensions stated are nominal measures only.

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