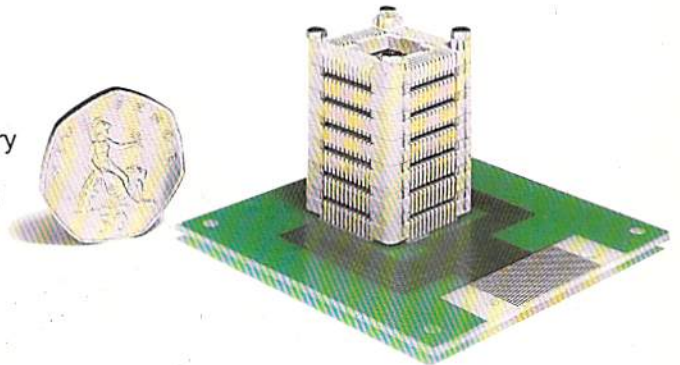## Dowty Interconnect

The System

CHIPRACK is an interconnection system for Very Large Scale Integrated circuitry (VLSI), Application Specific Integrated circuitry (ASIC's) and high density surface mounted components. The System permits both simple and complex three dimensional interconnection between the circuit 'blocks'.

There are two types of structure in CHIPRACK systems: –

A) **CHIPRACK*** COMPONENT CARRIERS

CHIPRACK component carriers are designed to hold one or more large scale integrated circuits in die (silicon) form, or surface mount package form. The carriers are double sided and have contact pads on both upper and lower surfaces.

B) **CHIPRACK*** CONNECTORS

The connectors have been designed to rack or stack the component carriers. The upper surface of one carrier is directly connected to the lower surface of the adjacent carrier by means of the CHIPRACK connectors. The connectors also present all signals at the outside of the stack where they are easily accessed for test and interconnection. Connectors may be manufactured in a range of shapes and sizes to suit applications.
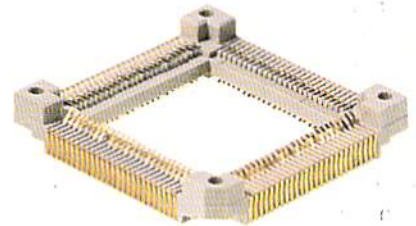
ASSEMBLY

Construction of a product is simply a matter of placing carriers into connectors and clamping or fixing the resulting assembly. Vapour phase soldering may be employed if required. Prototype systems can be constructed using the torque bolts, whilst production units can take advantage of quick assembly latching connectors.
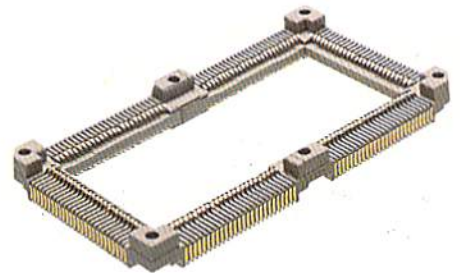
THE FINAL PRODUCT
A) VLSI/ASIC

A product designed for CHIPRACK will typically consist of a number of industry standard VLSI (e.g. processors, memory) tailored into the product by the addition of an ASIC. The role of the ASIC is to absorb any small or medium scale logic in the design (glue logic) and to pattern the signals for the particular product. The complex interconnections traditionally implemented by the PCB are moved onto silicon. The remaining interconnection requirements are implemented by simple regular identical structures in the form of CHIPRACK connectors.
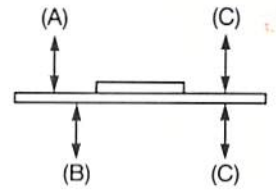
B) SURFACE MOUNT

Product designs are partitioned into a number of surface mount sub assemblies which are then interconnected by means of the CHIPRACK connectors.
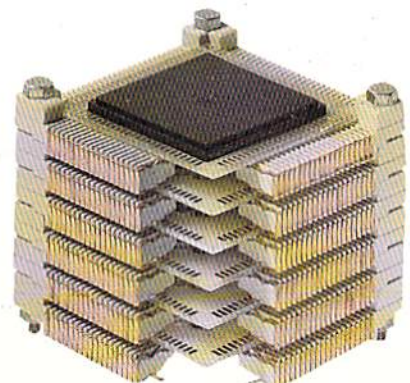
Signal Routing Possibilities

1) AT THE INTERCONNECTION OF ANY CARRIER

Signals may pass to and from one face of the carrier (A), to and from the other face (B) or may affect both faces (C).

2) IN A SINGLE STACK

The intersection of each carrier in the system permits signals to be re-routed at that point. Complex signal tracking may therefore be implemented. CHIPRACK assemblies do not rely on a through bus.
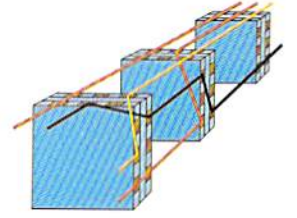
3) IN MULTIPLE STACK ARRAYS

CHIPRACK systems may be built into arrays. The availability of signals at the outside of a stack permits interconnection between stacks by optical or mechanical links. A carrier may be directly connected to 14 adjacent carriers.

Features

- **Costs**

  The system employs mass-produced connectors and carriers which may be assembled very rapidly into extremely cost-effective systems.

- **Modular Design for Assembly**

  Simplified assembly features make inexpensive hard-tooled automated assembly possible, compared with software controlled pick and place assembly. Simultaneous placement of carriers permits high mechanised assembly rates.

- **Modular Design for Test**

  Systems are partitioned for test at the level of the individual component. Testing is simplified because of the constant 'footprint' of the carriers. Faulty systems are easily taken apart for re-test and re-assembly. There is open access to all signals.

- **Modular Design for Alteration**

  Non-soldered stacks may be dismantled for alteration. Stacks may be enhanced by the addition of carrier layers and/or the re-organisation of existing carriers.

- **Shape Density**

  Form factor suits particular applications. Volume reductions of 80% on equivalent DIL/PCB assembly have been achieved.

- **Permits 3D Systems**

  Three dimensional freedom enables complex communications in three dimensional arrays. Point to point optic fibre channels may be incorporated.

Application Examples

- Hand held data loggers • Portable test equipment • Control systems
- Multi processor systems • Security & alarms • Image processing
- Memory systems • Hand held communications • Display controllers

Availability

A range of CHIPRACK connectors and carriers comprising 8, 16 or 32 bit processors, static rams, eproms, ASIC and I/O are available. They are supplied as separate components or as complete designer kits for evaluation and new product development. Contact Dowty Interconnect for applications data or further information.

The company reserves the right to depart from specifications in the light of continuing development.

*CHIPRACK is a trademark of Dowty Electronic Components Ltd.   CHIPRACK is protected by British and foreign patents.

DOWTY

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