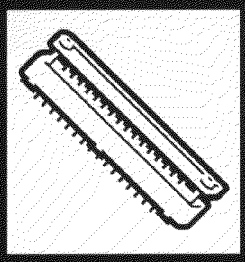
HIT

Hierarchical Interconnection Technology



FEATURES

- Enables phased introduction of Surface Mount Technology - SMT.
- Permits use of mixed technology-plated through hole (PTH) + SMT.
- Simplifies handling and test.
- Increases space utilisation of available component area.
- Provides a modular approach to design and manufacture.
- Reduces equipment downtime by simplifying fault location.

McMurdo

Rodney Road, Portsmouth, Hampshire, PO4 8SG, UK. Tel: +44 (0) 1705 735361 Fax: +44 (0) 1705 821777

AN INTRODUCTION TO H.I.T.

Advances in Surface Mount Technology (SMT), Very Large Scale Integration (VLSI), Tape Automated Bonding (TAB) and other comparable technologies has led to significant increases in packaging densities over recent years. With SMT for example, three fold increases in packing density can now be expected compared to conventional p.c.b. methods.

Whatever the merits of these advances, they can nevertheless present formidable difficulties not only in terms of assembly and diagnostic testing, but also reworking. Complexities aside, costs can be considerable.

Effects of these technologies in introducing sizeable increases in complexity, cost and test problems can often discourage any policy of standardising on large p.c.b's. This can conflict with well established equipment practices such as those affecting equipment for which Double Eurocards are extensively used as an example. Moreover, in many industry sectors, adoption of total surface mount p.c.b's. can lead to unacceptably high levels of initial capital investment and engineering effort.

A controlled and phased introduction of SMT in parallel with conventional thru-hole solder technology therefore presents a more viable approach to these difficulties. As such it has led to the development of an entirely new interconnection system and equipment practice; Hierarchical Interconnection Technology or HIT.

The H.I.T. Concept

In effect, HIT produces a framework for circuit board partitioning and modularisation as well as solderless assembly of sub-units. At the same time, it also enables engineers to continue to base their designs on large boards and established equipment practices.

The system is based on circuit units that are intermediate in size between a conventional p.c.b. (Daughter Board) and a chipcarrier. Units assume the form of small boards (Child Boards) that are 'socketed' into the HIT connector which is then parallel mounted onto the Daughter Board. The connector is also designed to be capable of using a variety of substrate materials. Thus single-sided, double sided and multilayer boards using glass-epoxy, metal clad laminates or ceramic substrates can all be accommodated.

This therefore permits the use of mixed technologies enabling the phased introduction of SMT into conventional technology. Similarly if redesign or updating is required, this can be confined to the module rather than involving the entire board.

The H.I.T. Contact

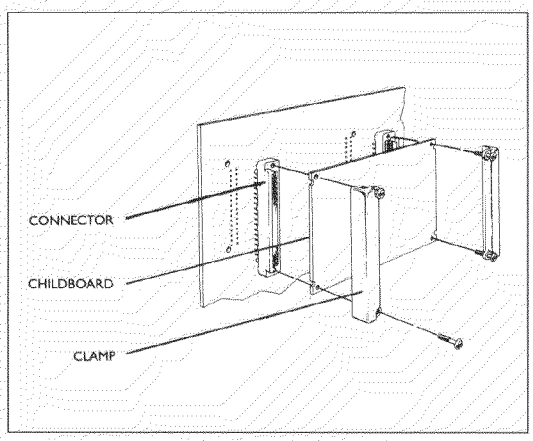
Two essential requirements which had to be met were (a) High reliability and (b) Low installation costs.

HIT uses two basic elements; a connector and a clamp. The connector consists of an insulator fitted with cantilever contacts with straight p.c. terminations. The clamp provides the contact pressure being secured by screws engaging captive threaded inserts in the insulator.

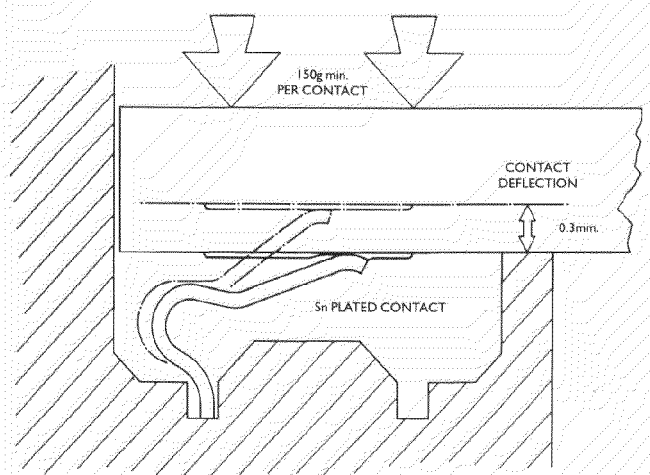
The contact system provides a small wiping action between the contact and the child board pad as the clamp is secured. The clamp is secured to a datum on the insulator such that a minimum contact force of 1.5N is achieved. Thus it is possible to avoid precious metal plating and use tin-lead. As a result, a reliable gas-tight joint is achieved. Extensive testing has proved this to be so even after the child board and connector have been subjected to 100 operations. A detailed Equipment Practice which includes data on thermal management, EMC etc is available on request.

Linear HIT

LINEAR HIT provides the opportunity for the child boards to be of variable lengths and widths and is available in three sizes, 16, 32 and 64 way. The standard clearance between child board and daughter board is increased to 6.35mm permitting thru board or surface mount components to also be mounted on the daughter board. In addition, the 32 and 64 way sizes can also be supplied with a 10mm clearance to cater for larger size components, along the surface of the p.c.b. The Linear HIT may be edge or inboard mounted.



The HIT contact



TECHNICAL DATA

Materials

Insulator	Thermoplastic rated UL94V-0
Contact	Copper alloy plated tin/lead
Termination	Tin/lead
Clamps	Zinc alloy
Clamp screws	Steel/zinc plated

Environmental

Climatic category	55/125/56
Vibration severity	10-2000Hz. 0.75m/98m/s² ($10g_n$) duration 6h
Shock severity	490 m/s² ($50g_n$) for 11ms
Bump severity	390 m/s² ($40g_n$), 4000 ± 10 bumps

Electrical

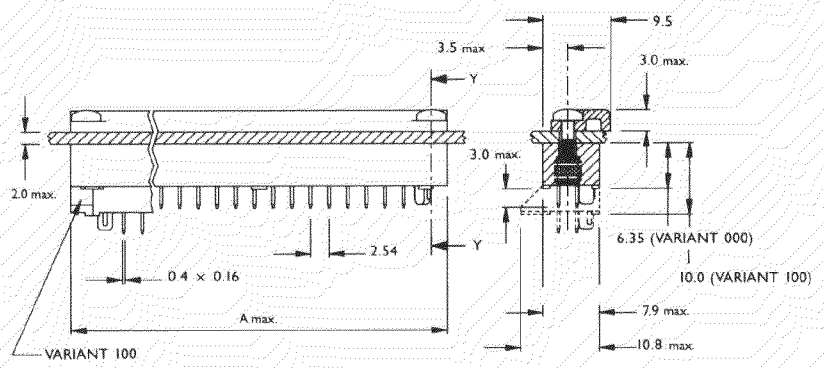
Current	
Individual contact (in isolation)	at 85°C Tamb. 2A max.
All contacts (simultaneously)	at 85°C Tamb. 1.4A max.
Working Voltage	350V d.c. or a.c. peak
Proof Voltage	1000V d.c. or a.c. peak
Contact Resistance (initially)	15mΩ max.
Contact Resistance (after conditioning)	20mΩ max.
Insulation Resistance (initially)	1000MΩ min.
Insulation Resistance (after conditioning)	100MΩ min.

Mechanical

Mechanical operations	100
Child Boards	Accommodates laminate p.c.b's. between 0.95mm and 2.0mm thickness.

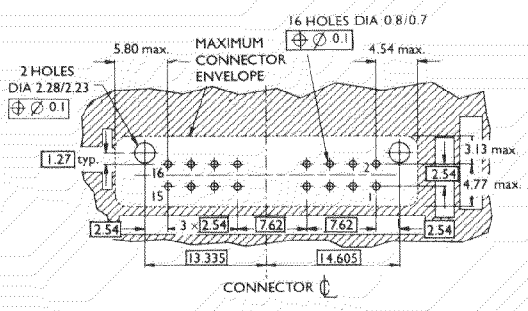
Outline Dimentions

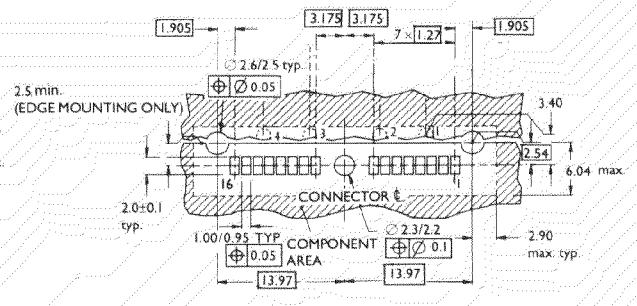
No of Contacts	Dimension "A"
16	33.20
32	53.30
64	97.75



Board Details (viewed from below)

16 Contacts **Daughter Board** **Child Board**





TECHNICAL DATA

Materials

Insulator	Thermoplastic rated UL94V-0
Contact	Copper alloy plated tin/lead
Termination	Tin/lead
Clamps	Zinc alloy
Clamp screws	Steel/zinc plated

Environmental

Climatic category	55/125/56
Vibration severity	10-2000Hz. 0.75m/98m/s² ($10g_n$) duration 6h
Shock severity	490 m/s² ($50g_n$) for 11ms
Bump severity	390 m/s² ($40g_n$), 4000 ± 10 bumps

Electrical

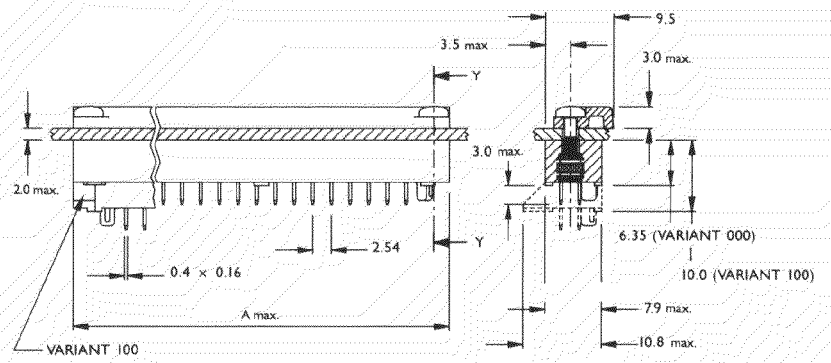
Current	
Individual contact (in isolation)	at 85°C Tamb. 2A max.
All contacts (simultaneously)	at 85°C Tamb. 1.4A max.
Working Voltage	350V d.c. or a.c. peak
Proof Voltage	1000V d.c. or a.c. peak
Contact Resistance (initially)	15mΩ max.
Contact Resistance (after conditioning)	20mΩ max.
Insulation Resistance (initially)	1000MΩ min.
Insulation Resistance (after conditioning)	100MΩ min.

Mechanical

Mechanical operations	100
Child Boards	Accommodates laminate p.c.b's. between 0.95mm and 2.0mm thickness.

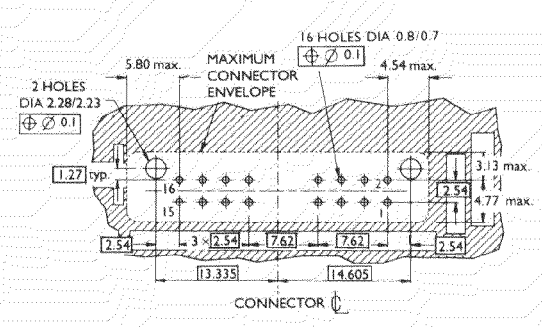
Outline Dimentions

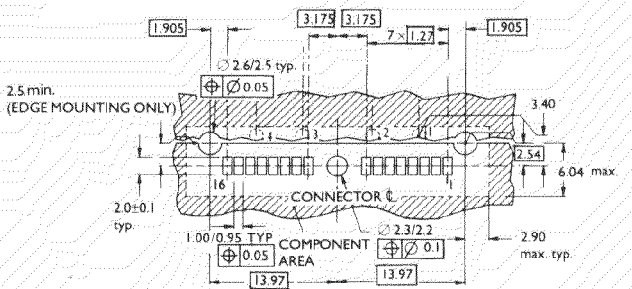
No of Contacts	Dimension "A"
16	33.20
32	53.30
64	97. 75



Board Details (viewed from below)

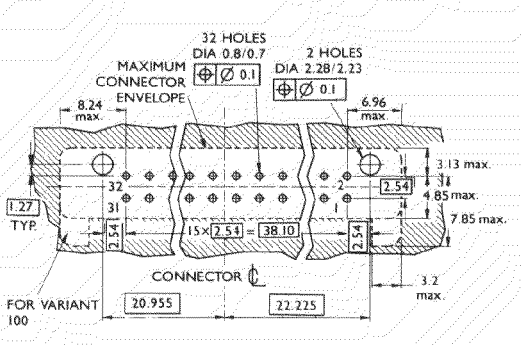
16 Contacts **Daughter Board** **Child Board**

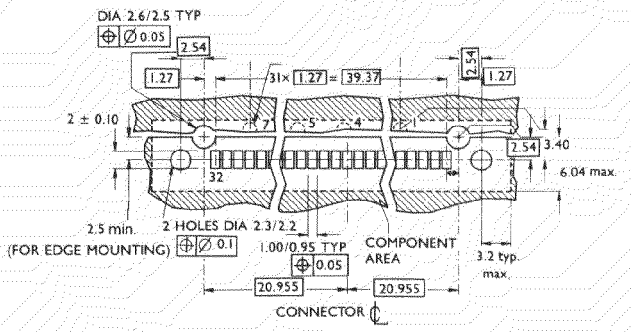




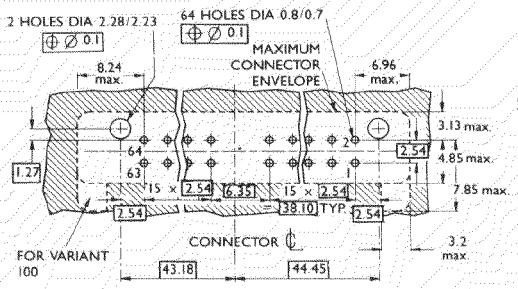
Board Details Cont'd (viewed from below)

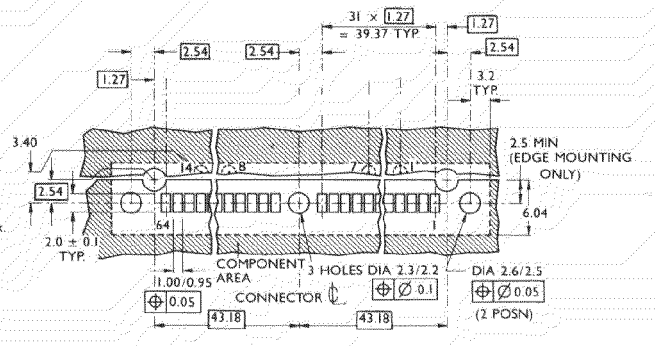
32 Contacts **Daughter Board** **Child Board**





64 Contacts **Daughter Board** **Child Board**





ORDERING INFORMATION

X 032 T1 T 000

SERIES
CONTACT ARRANGEMENT
TERMINATION STYLE
CONTACT FINISH
VARIANT

Series

X - Linear H.I.T.

Contact Arrangement

016, 032 and 064

Termination Style

T1 - Through board for 1.6mm p.c.b.

Contact Finish

T - Tin/lead contact/termination finish

Variant

000 - Standard spacing (6.35mm)
100 - 10mm spacing (32 and 64 way only)

McMurdo

Rodney Road, Portsmouth, Hampshire, PO4 8SG, UK. Tel: +44 (0) 1705 735361 Fax: +44 (0) 1705 821777