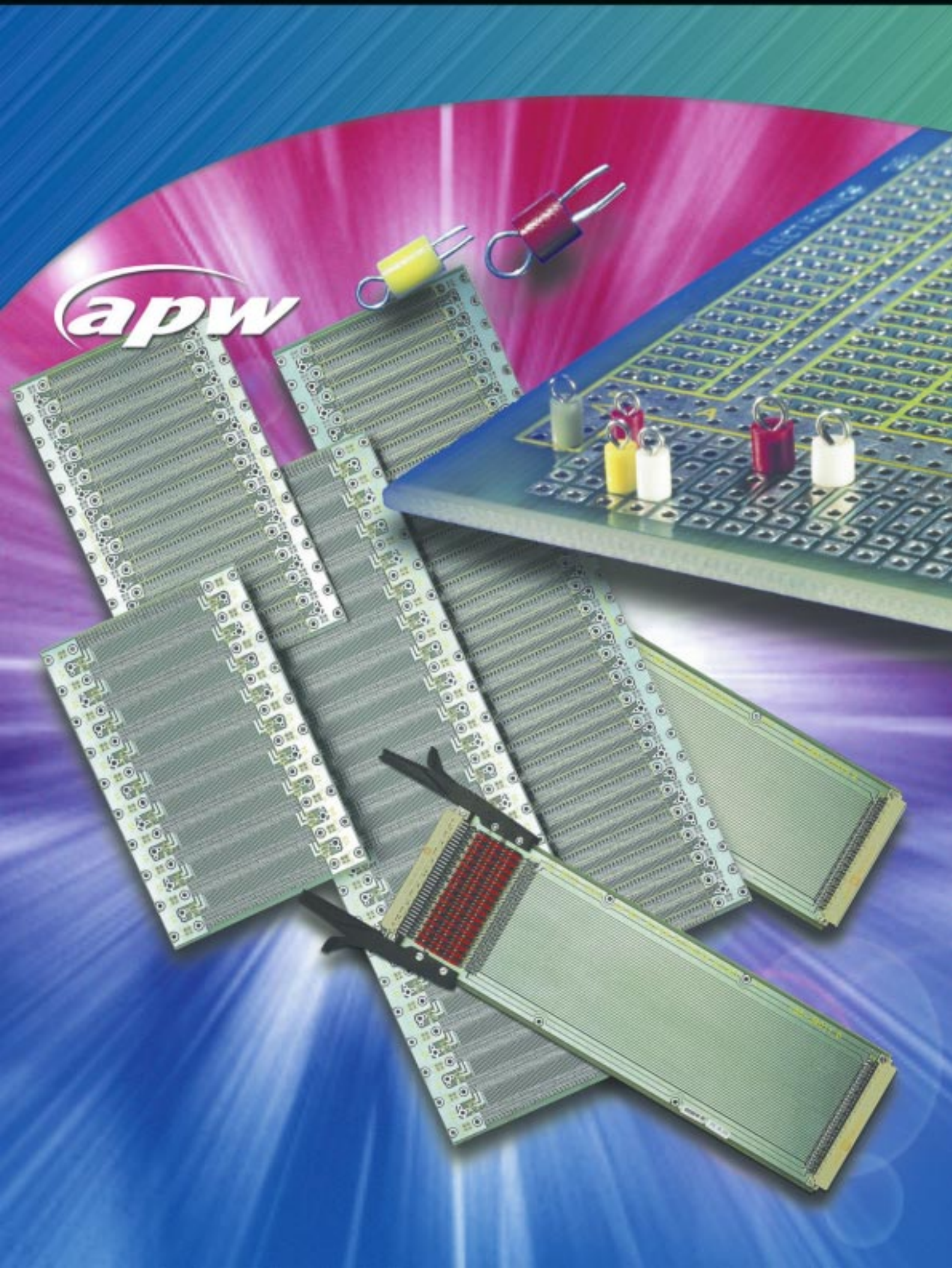
Prototyping products:
first issue



Introduction: APW Electronic Solutions

APW Electronic Solutions, which is responsible for the manufacture and marketing of the prototyping product range, is a focused business unit within APW, providing a global backplane, hardware and system integration capability, servicing multinational, high technology electronics businesses.

Major centres of excellence, located on both the east and west coasts of the United States, in northern Germany and the United Kingdom, provide a powerful combination of core competencies embracing engineering, design, assembly and test of backplanes and systems incorporating power supplies and thermal management functionality.

The backplane and systems facilities have long been at the forefront of technological development, and their commitment to the latest high technology boards is demonstrated by the fact that they currently manufacture some of the most advanced backplanes and systems available.

All APW Electronic Solutions facilities are fully equipped with some of the latest electronic design and manufacturing systems, enabling customers to access a "virtual" factory for the procurement of product.

The organisation is dedicated to being a leading provider of a comprehensive range of standard and custom product, borne from the integrated design, manufacturing and service capabilities, enabling it to provide OEMs with rapid deliveries at competitive prices.

At APW Electronic Soloutions every customer is a priority and contact is maintained by means of the organisation's own dedicated Sales and Applications Teams, which are able to draw upon the global resources of APW.

APW ELECTRONIC SOLUTIONS: LOCATIONS

Shown at right, from top to bottom, are the APW Electronic Solutions sites from which prototyping products can be ordered.

America: *Hudson, New Hampshire*
Britain: *Hedge End, Hampshire*
Denmark: *Værløse*
France: *Beauvais*
Germany: *Bremen*
Italy: *Turin*
Sweden: *Stockholm*

Full contact details for these locations can be found on the back cover of this publication.

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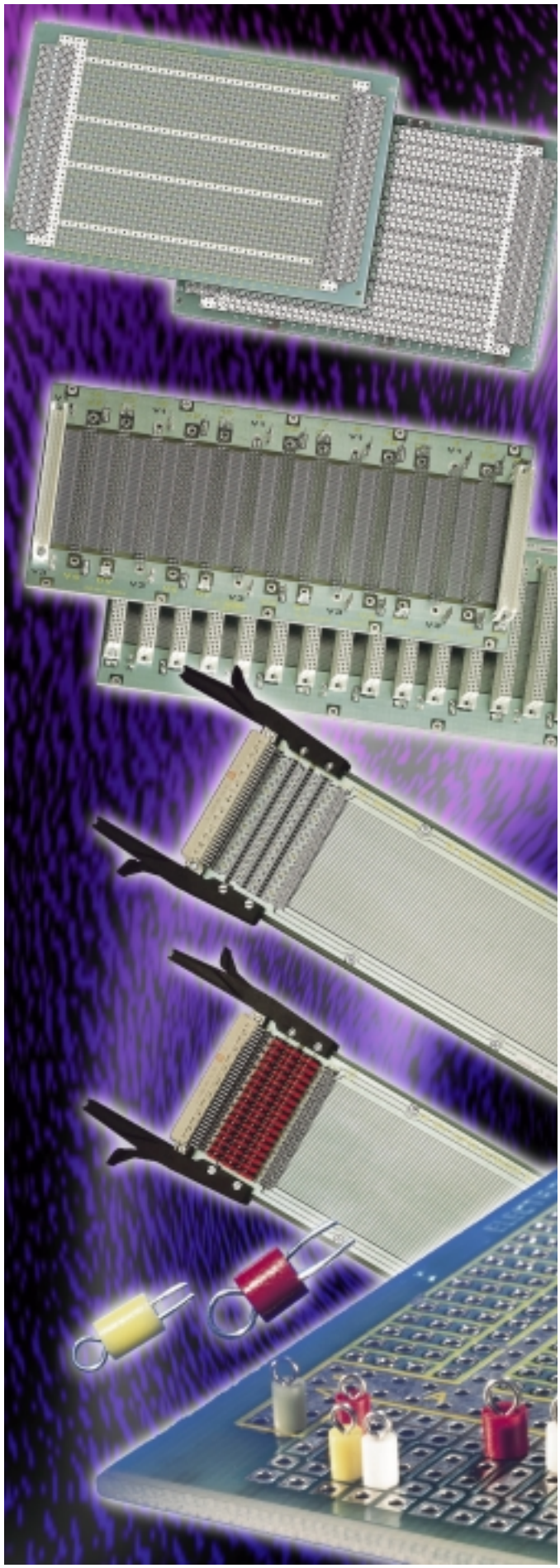


Critical Eurocard dimensions

CRITICAL EUROCARD DIMENSIONS

A 2,5mm wide border is necessary - top and bottom of printed circuit boards - to allow clearance for guides and for mounting into plug-in unit guide rails. On the double height Eurocard, owing to the overall size and position of the connectors, it is recommended that when fitting components to front panels the grid as laid out is adopted. This will allow consistency between 3U and 6U height front panels.

List of undrilled pads which appear on most Eurocards

E. DIN 41612 connector mounting

F. DIN 41617 connector mounting

G. Card ejectors

H. Card handle Type A - 45,72 centres

K. Card handle Type C

L. Card handle Type B - 30,48 centres

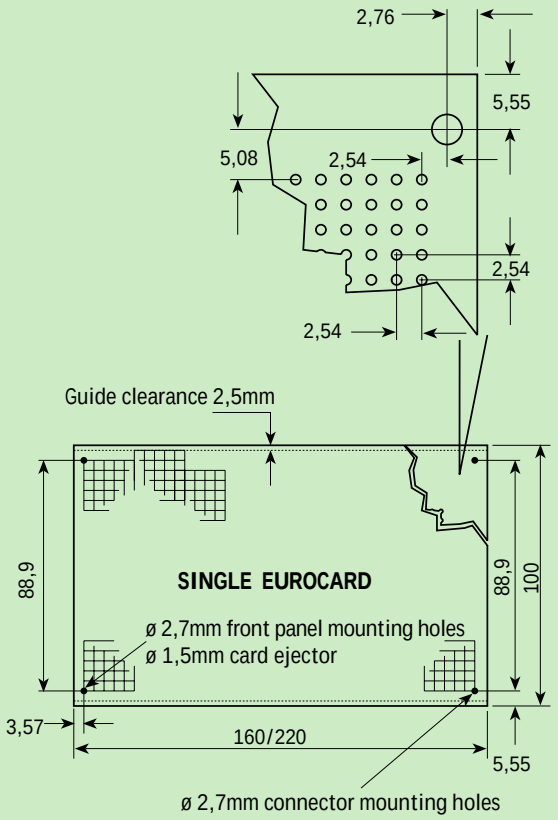
M. Module mounting

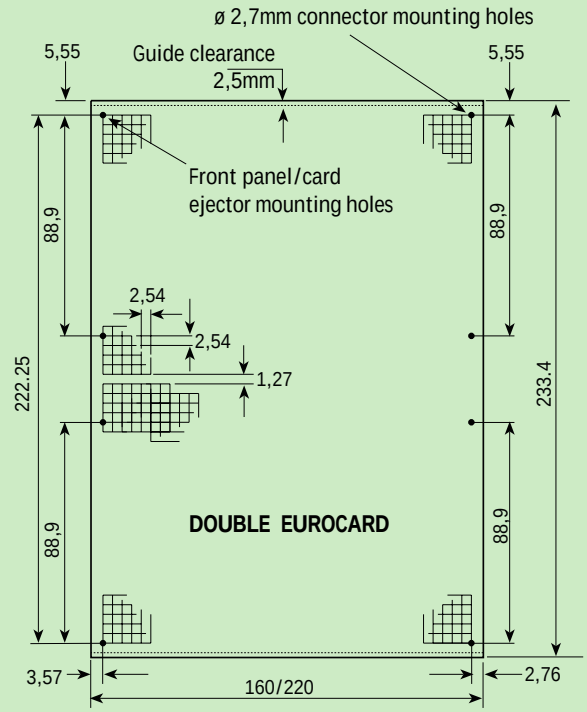
N. Card mounting brackets KM4 and KM6, card ejector KM6

O. KM4 module mounting extended with “M” holes

P. Module mounting 220 cards only

R. Flexible card handle Type E





Prototyping boards

PTH MICROBOARD

Features

- Reliability of plated through holes
- DIN 41494 (KM6-II) compatible
- Medium packing density
- DIN 41612 connector position, up to 96/96 ways, front and rear
- Solder resist protection to component side of board
- Two Vcc power rails and a 0V ground plane
- Grid print to aid component layout
- Microbus backplane compatible

Application

Specifically designed for microprocessor applications where high reliability, freedom from crosstalk and interface capability is a requirement. Fully compatible with DIN 41494 (KM6-II etc.) and equally suited to soldered or wirewrapped interconnections. When soldering a PTH board, capillary action draws the solder around the component leads forming extremely solid, reliable joints, particularly important in high vibration applications.

Screening

A maximum copper colander 0V ground plane is provided on the component side of the board. It is recommended that this side is used for interwiring with looms lying flat on the ground plane surface. This will reduce crosstalk from signal lines coupling directly to the ground plane.

Board specification

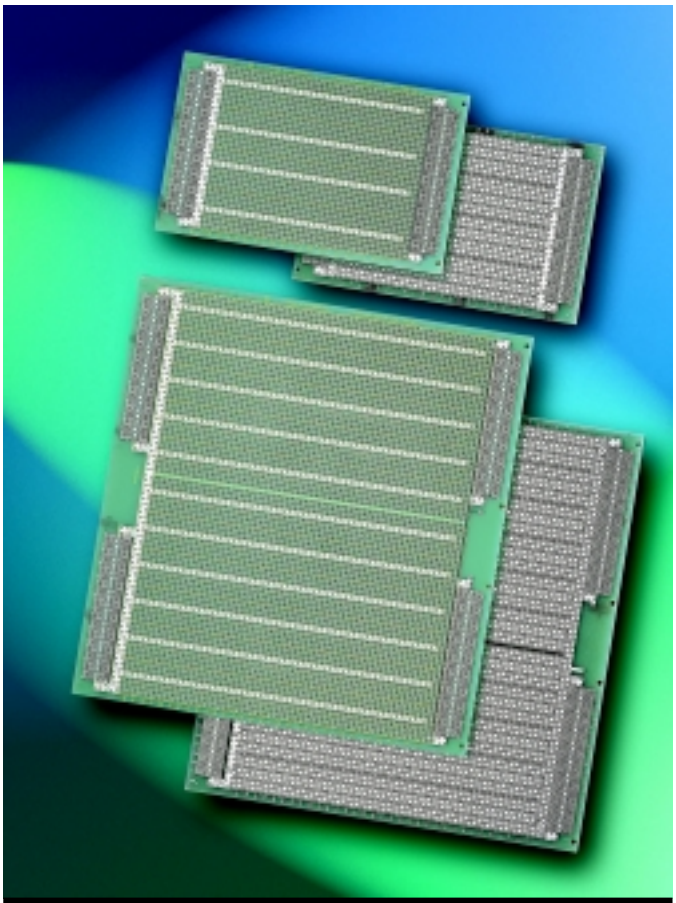
Board type	Epoxy glass
PTH	BS 4584 EP-GC-Cu 3 FR4
Max. working temp.	155°C
Nom. board thickness	1,6mm
Laminate copper thickness	35mm or 1oz/ft² or 305g/m²
Plated copper	25µm
Tin lead	10µm
Total	70µm

Note: bare boards are UL V-0 recognised components file number E116551. Bare boards are approved to BS 9762

Ordering information

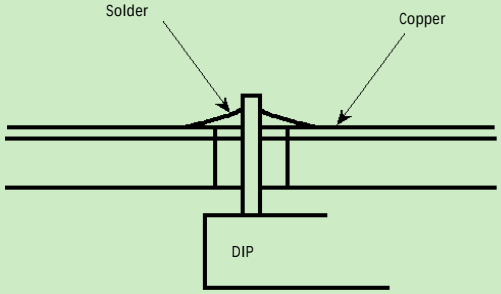
Description: PTH Microboard

Board dimensions	7,62 pitch IC DIP rows/pads	15,24 pitch IC DIP rows/pads	**Order code**
100 x160	4/44	4/44	**222-2991F**
100 x 220	4/67	4/67	**222-2992B**
233,4 x 160	11/44	17/44	**222-2993J**
233,4 x 220	11/67	17/67	**222-2994E**
366,8 x 220	17/67	10/67	**222-27561D**

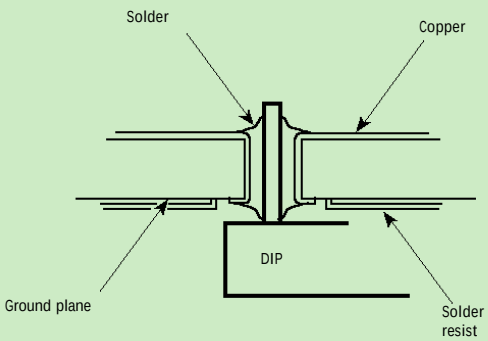


PTH microboard

Non-PTH Board



PTH Board



Prototyping boards

MICROBOARD DOUBLE SIDED

The forerunner of the PTH micrboard, this range of boards finds similar applications in all but high reliability of plated through holes and restricted use of DIN 41612 connectors up to 64/96 ways only.

Features

- DIN 41494 (KM6-II) compatible
- Medium packing density
- DIN 41612 connector up to 64/96 ways, front and rear
- Solder resist protection to component side of board
- Grid print to aid component layout
- Microbus backplane compatible
- 0V ground plane screen

Ordering information

Description: Double-sided Microboard

Board dimensions	7,62 pitch IC DIP rows/pads	15,24 pitch IC DIP rows/pads	**Order code**
100 x 160	4/46	4/46	**10-2845B**
233,4 x 220	11/69	7/69	**10-2858C**

MICROBOARD SINGLE SIDED

This low cost Eurocard has no 0V ground plane on the component side, but is otherwise identical to the double sided microboards.

Features

- Medium packing density
- DIN 41612 connector pattern, up to 64/96 ways, front and rear
- Grid print to aid component layout
- Microbus backplane compatible

***Note**: DIN 41494 (KM6-II) compatible*

Ordering Information

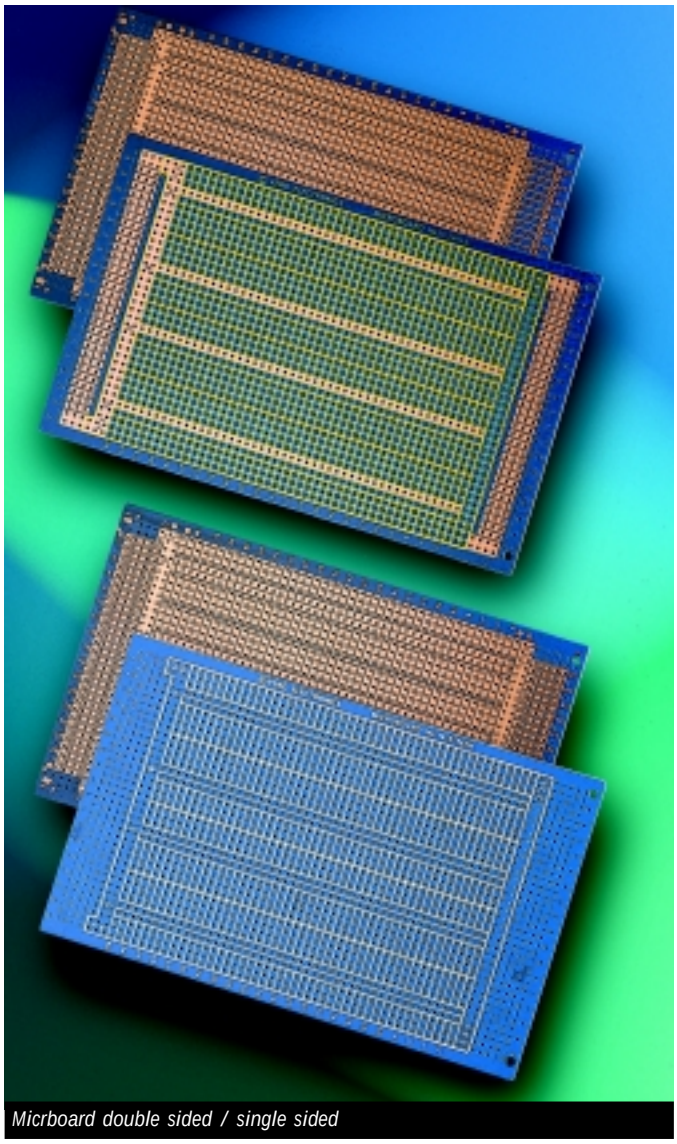
Description: Single-sided Microboard

Board dimensions	7,62 pitch IC DIP rows/pads	15,24 pitch IC DIP rows/pads	**Order code**
100 x 160	4/46	4/46	**10-27563H**

***Note:** Hole grid 2,54 x 2,54mm Hole dia. 1,02mm*
N.B. 3,81mm centre gap on double height boards

Board specification

Board type	Epoxy glass
Double/single sided copper	BS 4584 part 16
Max. working temp.	155°C
Nom. board thickness (inc. copper)	1,6mm
Copper thickness	35µm or 1oz/ft²or 305g/m²



Micrboard double sided / single sided

Prototyping boards

3 PLANE HIGH DENSITY DIP BOARD

Features

- High packing density
- Two Vcc and one 0V power rail options
- DIN 41494 (KM6-II) compatible
- DIN 41612 connector pattern, up to 64/96 ways
- Microbus backplane compatible

Ideal for high density circuitry using wirewrapping, hardwiring or Verowire interconnection rechniques. The board features two power rail options, either as two 0V or one Vcc and a ground plane on the component side. Power rails run between rows of 7,62 pitch integrated circuits allowing end-to-end stacking for increased packing density.

Backplane compatible

By utilising a simple track break facility to isolate Vcc from pin 32, high density DIP boards are fully compatible with the APW Microbus range of backplanes.

Ordering information

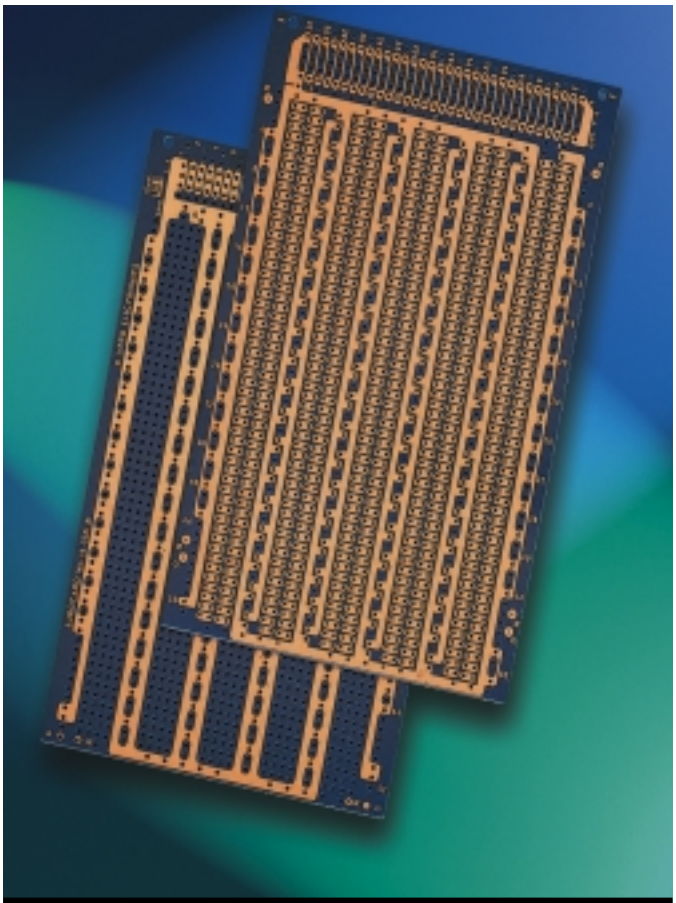
Description: 3 Plane high density DIP board

Board dimensions	7,61 pitch IC DIP rows/pads	15,24 pitch IC DIP rows/pads	**Order code**
100 x 160	5/53	4/53	**10-0581B**

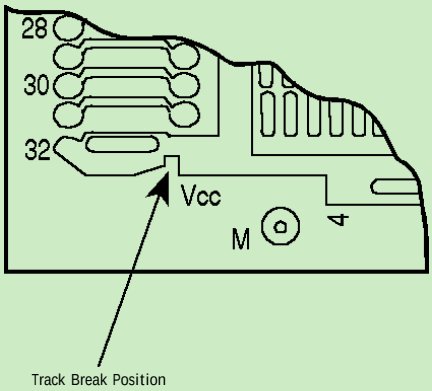
Note: *hole grid 2,54 x 2,54mm Hole dia. 1,02mm*
Note*: 3,81mm gap on double height boards*

Board specifications

Board type	Epoxy glass
Double/single sided copper	BS 4584 part 16
Max. working temp.	155°C
Nom. board thickness (inc. copper)	1,6mm
Copper thickness	35µm or 1oz/ft² or 305g/m²



3 plane high density dip board



Track Break Position

Prototyping boards

KM6 DIP BOARD

A low density board designed for hard wiring of integrated circuits. 0V and Vcc rail patterns are duplicated on the component side of the board giving increased power distribution. Connector pattern at rear edge of board allows input/output via ribbon cable headers.

Features

- DIN 41494 (KM6-II) compatible
- DIN 41612 connector position, up to 64/96 ways
- Rear end input/output facility
- Grid print to aid component layout
- Microbus backplane compatible
- Ample room for wiring looms and/or discrete components

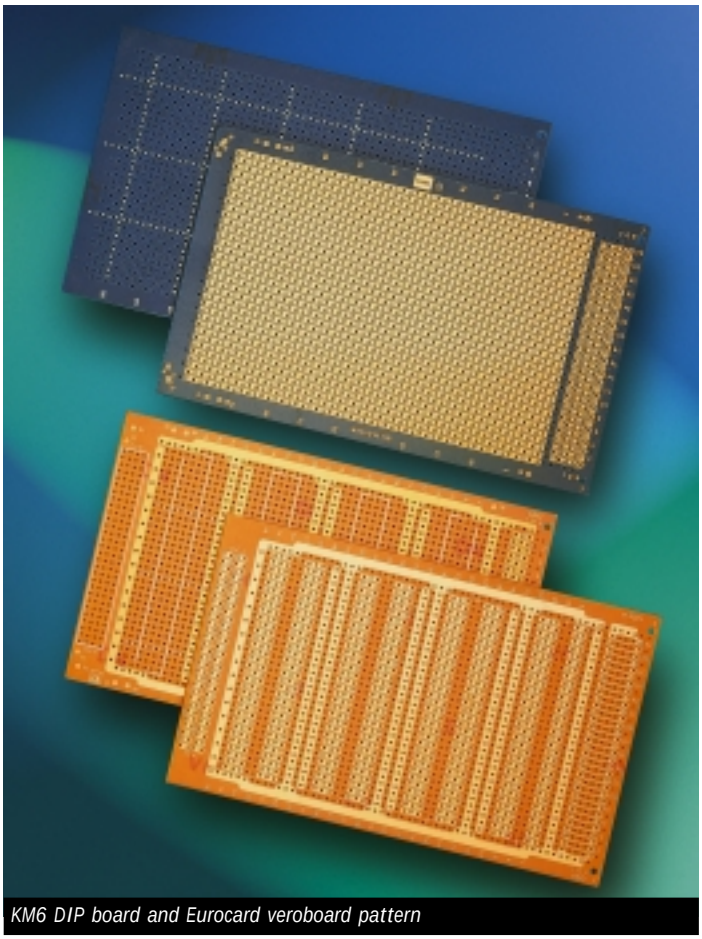
Note: *The board pattern is turned through 90° on double height Eurocard versions in order to maximise packing density.*

Ordering information

Description: KM6 DIP Board

Board dims	7,62 pitch IC DIP rows/pads	15,24 pitch IC DIP rows/pads	Base material	**Order code**
100 x 160	4/32	3/32	Epoxy	**10-2446C**

Note*: hole grid 2,54 x 2,54mm Hole dia. 1,02mm*



KM6 DIP board and Eurocard veroboard pattern

KM6 EUROCARD VEROBOARD PATTERN

A unique board giving the advantages of Veroboard with the flexibility of Eurocard and DIN 41612 connectors. Primarily used for hard wiring of discrete components, typically in analogue circuits, it is equally useful where a number of common bus or signal lines are required. For wirewrapping applications a 3,81mm gap on the double height boards maintains board patterns on grid with adjacent connectors.

Features

- DIN 41494 (KM6-II) compatible
- Ideal for hard wiring of discrete components
- Grid pattern to aid component layout
- Microbus backplane compatible
- Eurocard sizes

Ordering information

Description: KM6 Eurocard, Veroboard Pattern

Board dims	Tracks	Holes per track	Base material	**Order code**
100 x 160	34	52	Epoxy	**10-2449K**
100 x 220	34	77	Epoxy	**10-27558D**

*N**ote:** Hole grid 2,54 x 2,54mm Hole dia. 1,02mm*
Note: *3,81mm gap on double height versions*

Board specification

Board type	Epoxy	SRBP
Single/double sided copper	BS4584 part 16	BS 4584 part 5
Max. working temp.	155°C	97°C
Nom. board thickness	1,6mm (inc.copper)	
Copper thickness	35μm or 1oz/ft² or 305g/m²	

Prototyping boards

VEROBOARD PATTERN WITH COLANDER GROUND PLANE

Similar in use to the standard Veroboard pattern but offering the advantages of full 0V colander ground plane to provide maximum screening on the component side of the board.

Features

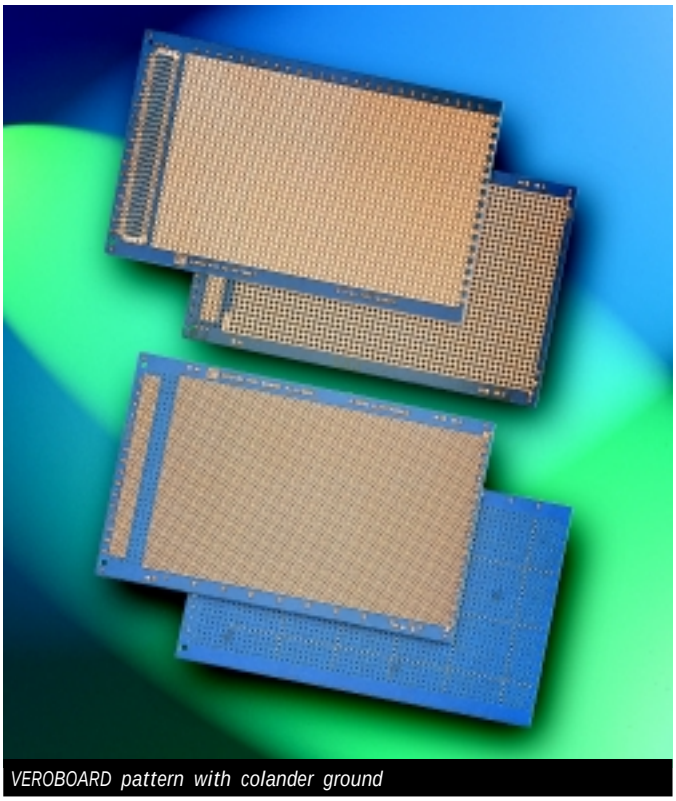
- DIN 41494 (KM6-II) compatible
- Ideal for hard wiring of discrete components
- Colander ground plane for maximum screening
- DIN 41612 connector up to 64/96 ways
- Microbus backplane compatible

Ordering information

Description: Veroboard pattern, with colander gound plane

Board dimension	Tracks	Holes/ tracks	Base material	**Order code**
100 x 160	34	54	Epoxy glass	**03-2990F**

Note: *Hole grid 2,54 x 2,54mm, hole dia. 1,02mm and 3,81mm gap on double height boards*



VEROBOARD pattern with colander ground

SQUARE PAD BOARD

A range of boards offering total flexibility and maximum density of wirewrapped circuitry. Any size of wirewrapping DIP socket or terminal pin can be accepted in either X or Y planes. Vcc and 0V rails may be daisy chained from post to post around the board eliminating the need to stake pins in power rails as on other types of board.

Features

- Maximum packing density
- Total flexibility using hard wire or wirewrapping techniques
- DIN 41494 (KM6-II) compatible
- DIN 41612 connector pattern up to 96/ 96 ways
- Grid references to both sides of board to aid component layout and to assist wiring
- Microbus backplane compatible

Note*: Component grids compatible with connectors.* ***Board 03-0111L*** *has a full board pattern aligned with the lower connector giving a 1,27mm offset between the top and bottom connector patterns.*

Ordering information

Description: Square pad board

Board dimensions	No. of Pads width	length	Base material	**Order code**
100 x160	34	54	Epoxy glass	**03-0026J**
100 x 220	34	77	Epoxy glass	**03-27555K**
233,4 x 160	85	52	Epoxy glass	**03-0111L**
233,4 x 160	86	52	Epoxy glass	**03-27556F***
233,4 x 220	86	75	Epoxy glass	**03-27557B***

Note: *Hole grid 2,54 x 2,54mm Hole dia. 1,02mm* *******3,81mm gap on these boards*

Board specifications

Board type	Epoxy glass
Double sided copper	BS 4584 part 16
Max. working temp.	155°C
Nom. board thickness (inc. copper)	1,6mm
Copper thickness	35µm or 1oz/ft^2 or 305g/m^2

Prototyping boards

SQUARE PAD BOARD WITH COLANDER GROUND PLANE

A single height Eurocard similar to the standard square pad board but offering the additional advantage of 0V colander ground plane.

Features

- Maximum packing density
- Total flexibility using hard wire or wire wrapping techniques
- Colander ground plane for maximum screening
- DIN 41494 (KM6-II) compatible
- DIN 41612 connector pattern up to 96/96 ways
- Grid references to both sides of board to aid component layout and to assist wiring
- Microbus backplane compatible

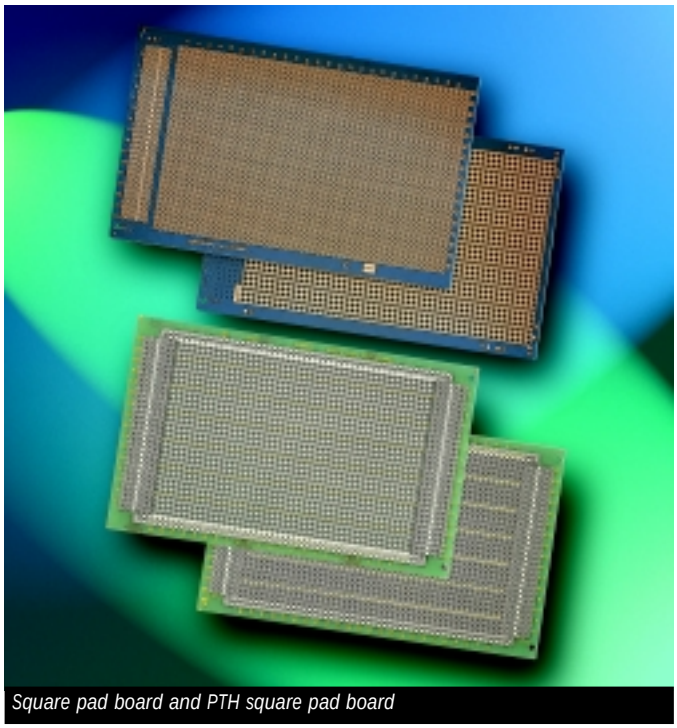
Board specification

Board type	Epoxy glass
Double sided copper	BS 5484 part16
Max. working temp.	155°C
Nom. board thickness	1,6mm(inc. copper)
Copper thickness	35µm or 1oz/ft² 305g/m²

Ordering information

Description: Square pad board with colander ground plane

Board dimensions	No. of Pads width	No. of Pads length	Base material	Order code
100 x 160	34	54	Epoxy glass	**03-2989L**



Square pad board and PTH square pad board

PTH SQUARE PAD BOARDS

By having plated through holes, these boards are able to offer the same high density and flexibility as the square pad Eurocards but for hard wiring applications. A high level of interfacing may be achieved with boards able to accept 96/96 way DIN 41612 connectors.
Power rails are provided along the length of the board and a colander ground plane affords maximum screening to the component side of the board.

Features

- Maximum packing density
- Total flexibility using hard wire or wirewrapping techniques
- DIN 41494 (KM6-II) compatible
- DIN 41612 connector pattern up to 96/96 ways, front and rear
- Solder resist protection to component side of board

Board specification

Board type	Epoxy glass
Plated through hole	BS 4584 Ep-GC-Cu-FR4
Max. working temp.	155°C
Nom. board thickness	1,6mm
Laminate copper thickness	35µm or 1oz/ft² or 305g/m²
Plated copper	25µm
Tin lead	10µm
Total	70µm

Ordering information

Description: PTH Square pad boards

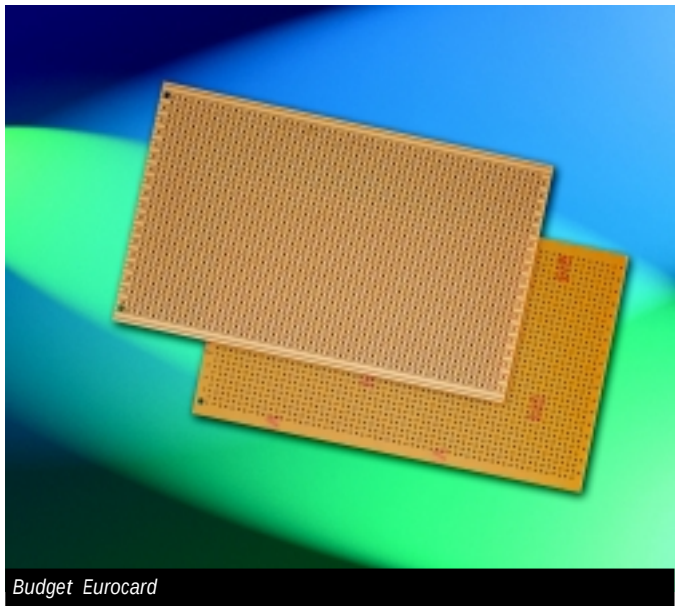
Board dimensions	No. of Pads width	No. of Pads length	Base material	Order code
100 x 160	32	48	Epoxy glass	**222-26492L**
100 x 220	32	71	Epoxy glass	**222-53134H**
233,4 x 160	70	48	Epoxy glass	**222-53135E**
233,4 x 220	70	71	Epoxy glass	**222-53136B**

Note: *Hole grid 2,54 x 2,54mm hole dia. 1,02mm*

Prototyping boards

BUDGET EUROCARD

A range of low cost prototyping boards primarily for hard wiring of general discrete components, as used in analogue and general circuitry, but equally useful where a number of common bus or signal lines are required.


Budget Eurocard

Features

- Ideal for low cost prototyping
- DIN 41494 (KM6-II) compatible
- Fixing holes provided for DIN 41612 connector
- Microbus backplane compatible

Board specification

Board type	SRBP
Double sided copper	BS 4584 part 5
Max. working temp.	97°C
Nom. board thickness (inc. copper)	1,6mm
Copper thickness	35µm or 1oz/ft² or 305g/m²

Ordering information

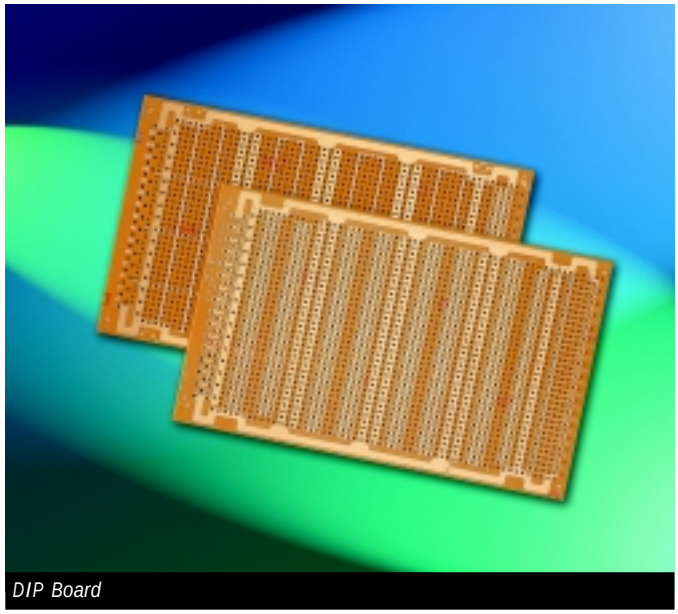
Description: Budget Eurocard

Board dims.	No. of tracks	Hole per track	**Order code**
100 x 160	36	60	**09-2196L**
100 x 220	36	83	**09-27562G**

Note:*hole grid 2,54 x 2,54mm Hole dia. 1,02mm*

DIP BOARD

A low density board designed for hard wiring of integrated circuits. Ample room is provided between rows for wiring looms and discrete components. 0V and Vcc rail patterns duplicated on component side of board give increased power distribution.


DIP Board

Features

- Ideal for hard wiring applications
- DIN 41612 or DIN 41617 connector patterns
- Grid print to aid component layout
- Microbus backplane compatible

Note: *The board pattern is turned through 90° on double Eurocard versions in order to maximise packaging density.*

Board specifications

Board type	Epoxy glass	SRBP
Double sided copper	BS4584 part 16	BS4584 part 5
Max. working temp.	155°C	97°C
Nom. board thickness (inc copper)	1,6mm	
Copper thickness	35µm or 1oz/ft² or 305g/m²	

Ordering information

Description: DIP Board

Board Dimensions	7,62 pitch IC DIP rows/pads	15,24 pitch IC DIP rows/pads	Base material	**Order code**
100 x 160	4/32	3/32	SRBP	**10-1041J**
100 x 160	4/32	3/32	Epoxy	**10-1042D**
233,4 x 160	7/47	6/47	Epoxy	**10-3183G**

Prototyping boards

PLUG-IN VEROBOARD

This board combines the unique Veroboard pattern with the 37 way 2,54mm pitch direct edge connector. Intended primarily for hard wiring of discrete components it is equally useful where a number of common bus or signal lines are required.

Features

- Ideal for hard wired applications
- 37 way 2,54mm pitch gold plated tongue

Board specification

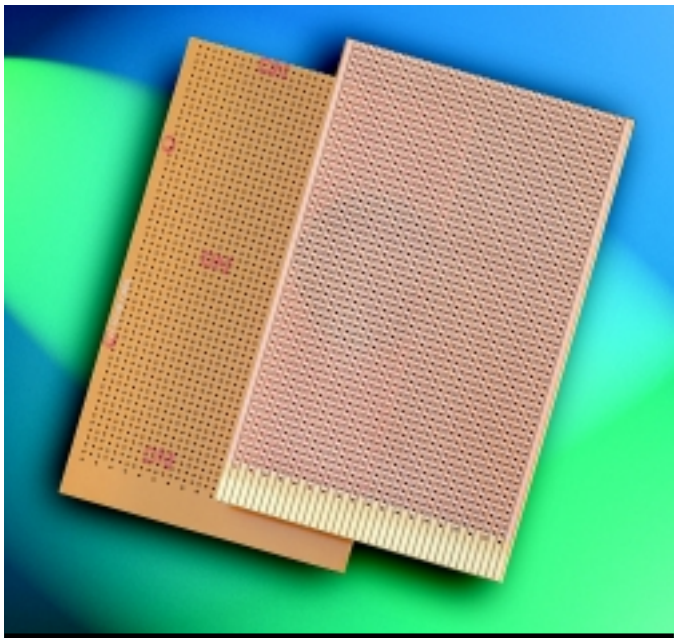
Board type	Epoxy glass
Base material	SRBP
Single sided copper	BS4584 part 16
Max. working temp.	155°C
Nom. board thickness (inc. copper)	1,6mm
Copper thickness	35µm or 1oz/ft² or 305g/m²

Ordering information

Description: plug-in Veroboard

Dimensions	Tracks	Holes per track	Base material	**Order code**
100 x 160	37	57	SRBP	**09-1036G**

Note: *hole grid 2,54 x 2,54mm Hole dia. 1,02mm Contact pitch 2,54mm*



Plug-in VEROBOARD

Prototyping boards

VEROBOARD METRIC PITCH

A range of general purpose Eurocards primarily for hard wiring of discrete components, typically in analogue circuits, they are equally useful where a number of common bus or signal lines are required. The boards feature a metric pitch of 2,50 x 2,50mm or 5,0 x 2,50mm which is not DIN 41612 compatible, but can be used inside modules.

Features

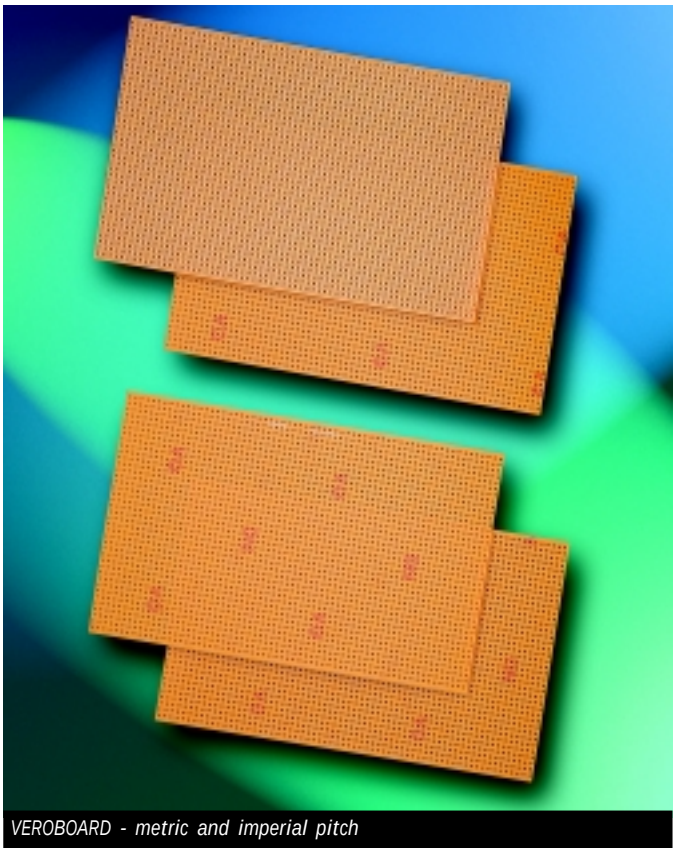
- Metric pitch
- Ideal for hard wiring of discrete components

Ordering information

Description: Veroboard, metric pitch

Board dimensions	Tracks	Holes/ track	Board pitch	Base material	**Order code**
100 x 160	39	64	2,5 x 2,5	SRBP	**09-1034F**
100 x 160	39	64	2,5 x 2,5	Epoxy	**09-1461H**

Note: *hole dia. 1,02mm*



VEROBOARD - metric and imperial pitch

PLAIN BOARDS, METRIC AND IMPERIAL PITCH

These boards offer total flexibility for the hard wiring of discrete components or the mounting of wirewrap sockets and pins and for the prototyping of analogue circuitry.

Features: Metric pitch

- Ideal for hard wiring of discrete components
- For use with solder pins
- Total flexibility
- Compatible with KM6 cardframes

Features: Imperial pitch

- Compatible with KM6 cardframes
- Fibreglass material
- For use with solder pins or wirewrap DIP sockets
- DIN 41612 connector compatible
- Grid printed for component reference

Ordering information

Description: Plain boards - metric and imperial pitch

Board dimensions	Rows of holes	Hole matrix	Base material	**Order code**
100 x 160	34 x 64	2,5 x 2,5	SRBP	**09-1040J**
100 x 160	39 x 60	2,54 x 2,54	Epoxy	**09-19082K**

Note: *hole dia. 1,02mm*

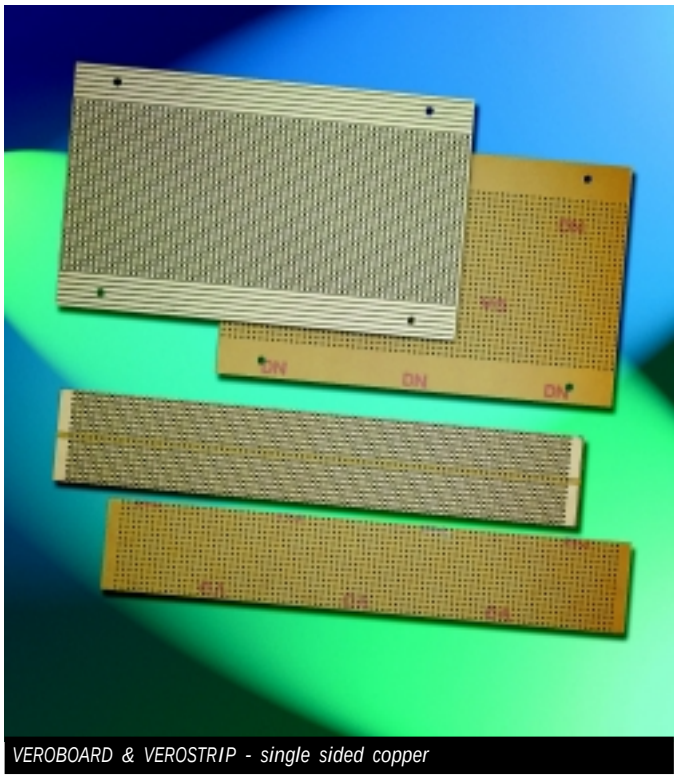
Boards specifications

Board type	Epoxy glass	SRBP
Single sided copper	BS4584 part 16	BS4584 par t5
Max. working temp.	155°C	97°C
Nom. board thickness (inc. copper)	1,6mm	
Copper thickness	35µm or 1oz/ft^2 or 305g/m^2	

Non-Eurocard Prototyping Boards

VEROBOARD - SINGLE SIDED COPPER

Ideal for development and prototyping work, Veroboard is designed primarily for hard wiring of discrete components, typically in analogue circuits, but is equally useful where a number of common bus or signal lines are required.
Veroboard is manufactured from copper clad laminated board which has been pierced with a grid of holes and machined to provide parallel tracks.



VEROBOARD & VEROSTRIP - single sided copper

Features

- Ideal for hard wiring or discrete components
- Range of standard sizes
- Choice of hole sizes and grid pitch

Ordering information

Description: Veroboard, single sided copper

Board dimensions	No. of pierced copper tracks	Holes/ track	Base material	**Order code**
121,92 x 101,60	41	44	SRBP	**01-0021H**
100,84 x 162,56	28	64	SRBP	**07-0008H**
111,76 x 176,53	40	61	SRBP	**01-0014K**
204,75 x 393,70	78	155	SRBP	**67-1902F**
95,10 x 454,66	34	179	Epoxy	**01-0112B**
95,10 x 454,66	34	179	SRBP	**01-0040A**
119,38 x 454,66	36	179	SRBP	**01-0041G**
119,38 x 454,66	38	179	SRBP	**01-0043H**
179,07 x 454,66	60	179	SRBP	**01-0042B**
100,00 x 500,00	36	197	SRBP	**01-27567D**
100,00 x 500,00	36	197	Epoxy	**01-27568L**

Note: *hole grid 2,54 x 2,54mm Hole dia. 1,02mm*

VEROSTRIP - SINGLE SIDED COPPER

A variant of Veroboard designed to provide a simple and inexpensive mounting board for discrete components or integrated circuits. The board is suitable for all applications where a conventional tag strip or group board might be used.

Features

- Ideal for hard wiring of discrete components
- Central track break already provided

Ordering information

Description: Verostrip, single sided copper

Board dimensions	No. of pierced copper tracks	Holes/ track	Base material	**Order code**
38,1 x 214,6	81	15	SRBP	**01-0171D**

Note*: Hole grid 2,54 x 2,54mm Hole dia. 1,02mm*

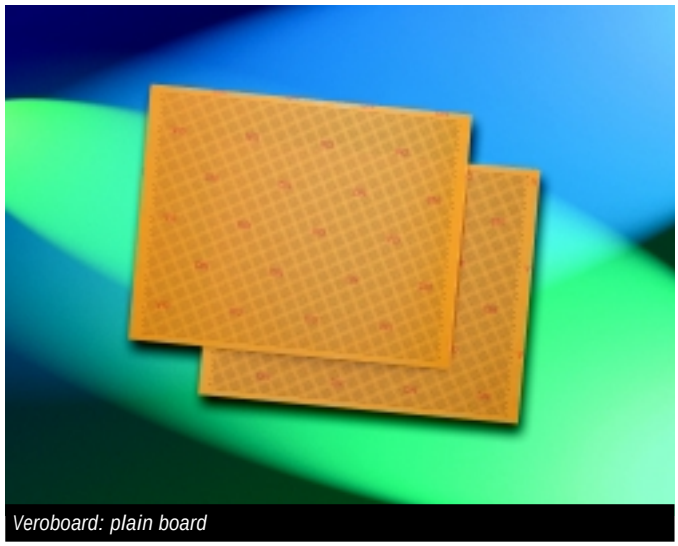
Board specifications

Board type	Epoxy glass	SRBP
Single sided copper	BS4584 part 16	BS4584 part 5
Max. working temp.	155°C	97°C
Nom. board thickness (inc copper)	1,6mm	
Copper thickness	35µm or 1oz/ft² or 305g/m²	

Non-Eurocard Prototyping Boards

PLAIN BOARD

A fully pierced board designed for prototyping analogue circuitry. Utilising APW terminal pins, this board offers total flexibility for hard wiring of discrete components or wirewrapping sockets or pins.


Veroboard: plain board

Features

- Ideal for hard wiring of discrete components
- Total flexibility
- May also be used for wirewrapping

Board specifications

Board type	SRBP
Double/single sided copper	BS4584 part 5
Max. working temp.	97°C
Nom. board thickness (inc. copper)	1,6mm
Copper thickness	35µm or 1oz/ft² or 305g/m²

Ordering information

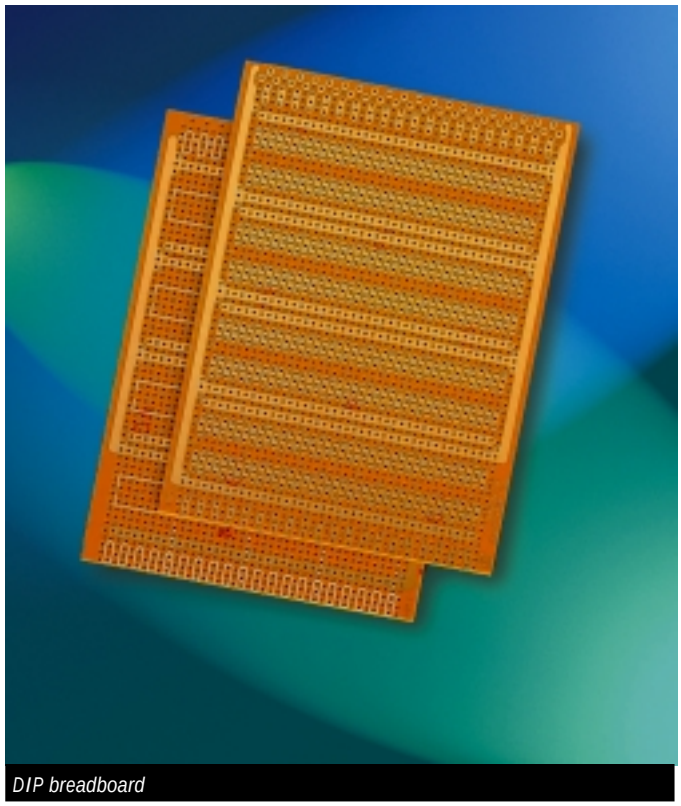
Description: Plain board

Board dimensions	No. of holes width	Length	Base material	**Order code**
95,10 x 454,66	34	179	SRBP	**02-0134D**

Note: *hole grid 2,54 x 2,54mm Hole dia. 1,02mm*

DIP BREADBOARD

A range of low density boards for hard wiring of integrated circuits, particularly useful in R & D applications. 0V and Vcc rail patterns are duplicated on the component side of the board giving increased power capacity. These boards do not have gold plated contacts, therefore offering a cost saving over plug-in boards. In place of contacts, individual mounting pads for terminal pins are provided.


DIP breadboard

Features

- Ideal for hard wired applications
- Grid print to aid component layout
- Full range of terminal pins available for interfacing

Ordering information

Description: DIP Breadboard

Board dimensions	Rows/ Pads	Rows/ Pads	Base material	**Order code**
114,30 x 156,21	4/39	4/39	SRBP	**06-0166F**
203,30 x 194,31	5/76	5/76	SRBP	**06-0168G**

Note: *7,62 pitch IC DIP 15,24 pitch IC DIP*
Note: *hole grid 2,54 x 2,54mm hole dia. 1,02mm*

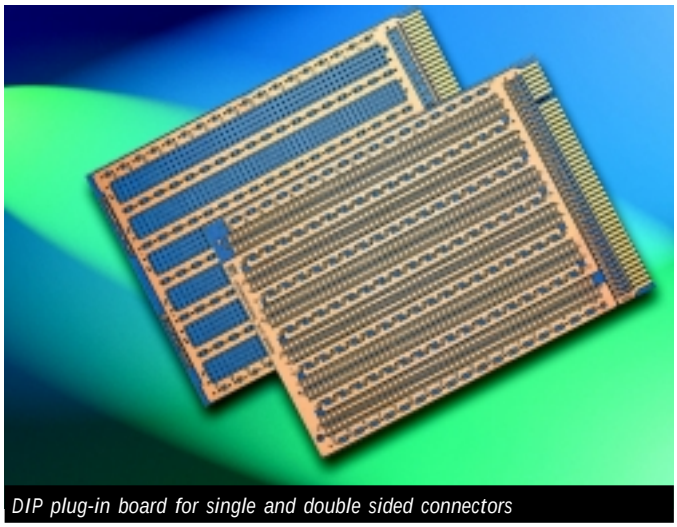
Board specifications

Board type	SRBP
Double/single sided copper	BS4584 part 5
Max. working temp.	97°C
Nom. board thickness (inc. copper)	1,6mm
Copper thickness	35µm or 1oz/ft² or 305g/m²

Non-Eurocard Protopying Boards

DIP PLUG-IN BOARD: FOR SINGLE AND DOUBLE SIDED CONNECTORS

This range of DIP boards is provided with either single or double sided contacts for interfacing via direct, edge card connectors. Primarily low density, they have been designed for hard wiring of integrated circuits. A test point facility is given by copper pads situated at the front end of each board.



DIP plug-in board for single and double sided connectors

Features

- Ideal for hard wiring applications
- Single or double sided contacts
- Profiled or full width gold plated tongue
- Choice of contact pitch and number of ways
- Grid pattern to aid component layout
- Test point facility

Board specification

Board type	Epoxy glass
Double sided copper	BS4584 part 16
Max. working temp.	155°C
Nom. board thickness (inc. copper)	1,6mm
Copper thickness	35µm or 1oz/ft² or 305g/m²

Ordering information

Description: DIP Plug-in board for single and double sided connectors

Board dimensions	7,62/15,24 pitch ICs rows/pads	Tongue no.of ways	Base material	**Order code**
114,3 x 165,1	4/39	22/22	Epoxy	**06-0147B**

Note: *Hole grid 2,54 x 2,54mm Hole dia. 1,02mm*

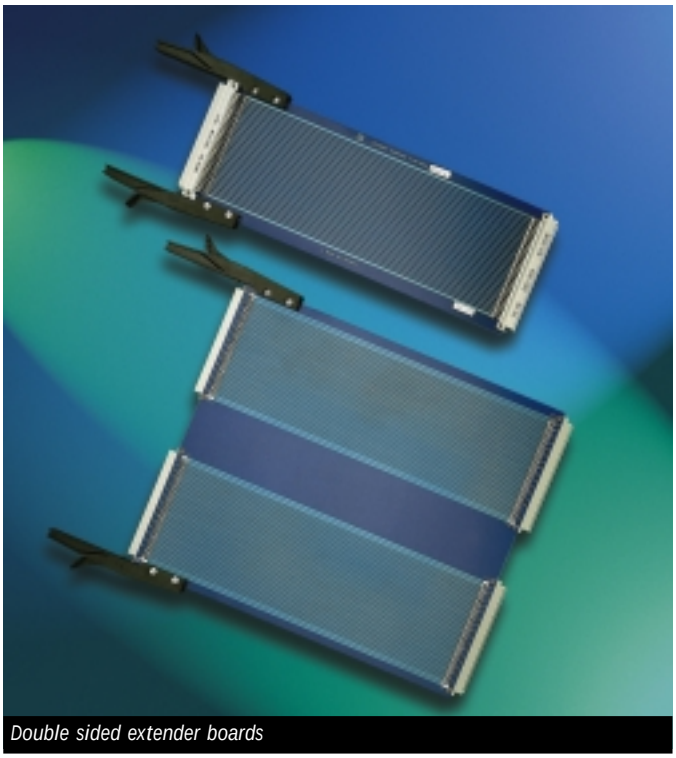
Eurocard extender boards

DOUBLE SIDED EXTENDER BOARDS

A range of double sided extender boards to enable testing of single and double height Eurocards, suitable for both 160 and 220mm deep frames, using DIN 41612 type B and C connectors. The extender board plugs directly into a subrack connector with the unique support/ejector mechanism at the front supporting the board under test.

Terminal assemblies (supplied with the boards), may be fitted to the board to allow easy attachment of scope probes typically for measuring voltage levels.

***Note**: This feature is not available on the 96/96 way extenders.*



Double sided extender boards

Features

- Eurocard compatible
- Suitable for 160 and 220mm deep boards
- DIN 41612 type B and C connectors
- Support/ejector mechanism
- Terminal assemblies for ease of testing (except 96/96 way versions)
- Solder resist coating to prevent solder bridging and prevent finger staining

Contents of kit

Item/decription
Board (assembled with connectors)
2 Support/eject mechanisms
Terminal assemblies (where applicable)

Ordering information

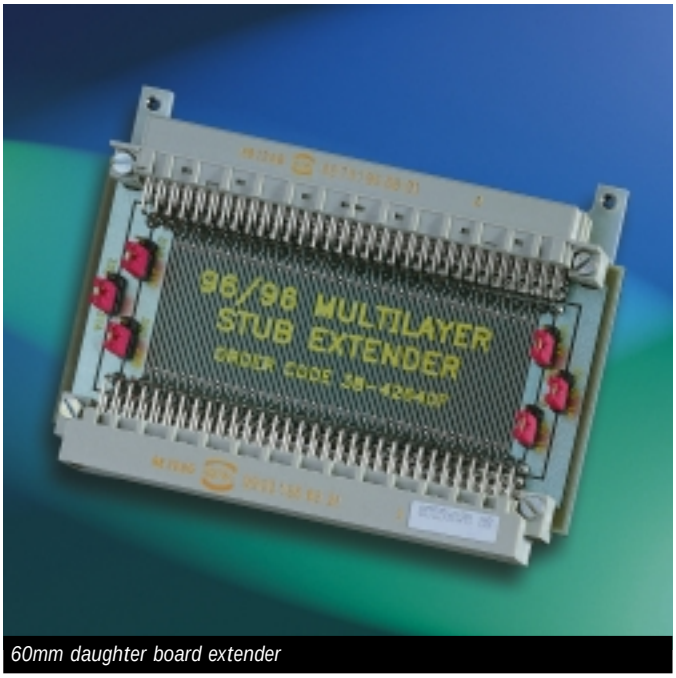
Description: Double sided extender boards

For frame height	Connectors fitted plug	socket	type	Order code
3U	1 off	1 off	64/64	**09-3817H**
6U	2 off	2 off	64/64	**09-0106D**
3U	1 off	1 off	64/96	**09-3865K**
6U	2 off	2 off	64/96	**09-0108E**
3U	1 off	1 off	96/96	**09-2459K**
6U	2 off	2 off	96/96	**09-2460E**

***Note:** hole grid 2,54 x 2,54mm hole dia. 0,9mm*
***Note:** 3,81mm gap on double height boards*

60mm DAUGHTER BOARD EXTENDER

A multilayer extender fitted with 96/96 way plug and 96/96 way socket suitable for adapting a 160mm deep daughter board to fit into a 220mm deep card slot or a 220 deep daughter board to fit into a 280mm deep card slot. The extender is 60mm deep so that front panels are positioned correctly.



60mm daughter board extender

Ordering information

Description: 60mm daughter board

Size	Order code
60 x 100	**38-42640F**

Board specification

Board type	Epoxy glass
Plated through hole	BS4584 part 16
Copper thickness to outer layers	38µm
Plated copper	37µm
Tin lead	5µm
Total	80µm
Copper thickness inner layers	38µm

***Note**: Bare boards are UL 94 V-0 recognised components file number E116551. Bare boards are approved to BS9762.*

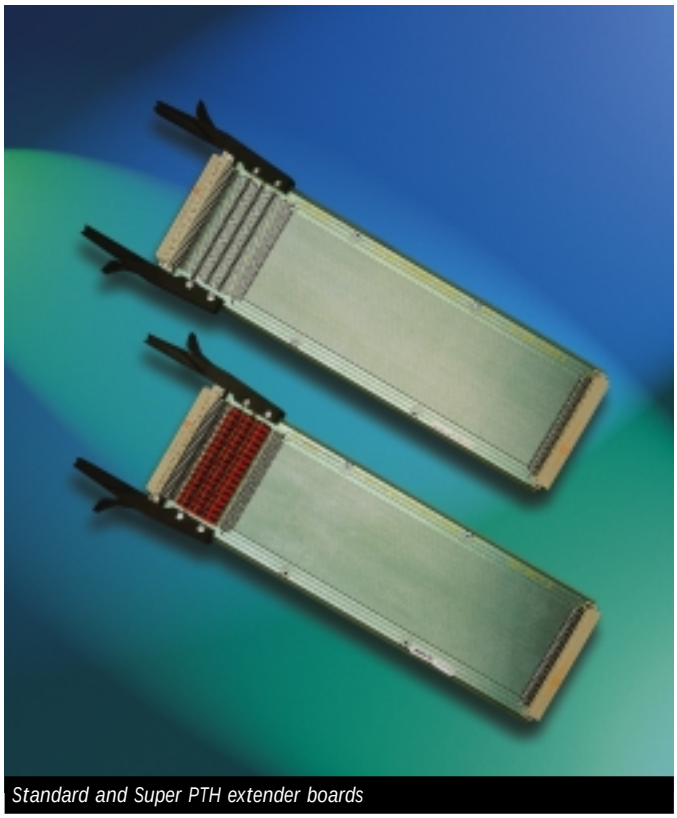
Eurocard extender boards

STANDARD AND SUPER PTH EXTENDER BOARDS

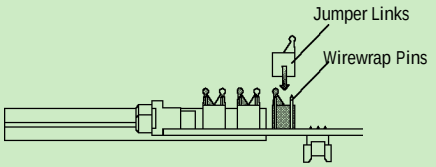
A range of PTH extender board assemblies available in two combinations of standard and super. The standard range, in either 64/64 or 96/96, is assembled with front and rear DIN connectors and supplied complete with ejector arms. The super version, in 96/96 format only, is supplied as per the standard format but also including gold plated wirewrapping pins, jumper links and logic analyser reverse DIN connector. The boards provide a high degree of mechanical flexibility and have many electrical advantages over their double sided predecessors.

Features

- Expandable height in multiples of 3U, i.e. 3U, 6U, 9U etc. is achieved by simply adding a standard divider plate assembly as required
- The ability to mix different types of extenders on 3U upwards to suit a particular bus system
- Suitable 160 and 220mm deep systems
- Maximum track widths with a copper plating thickness of 70µm in order to minimise voltage drop
- DIN connector outer rows 1abc, 2abc, 31abc and 32abc have extra wide tracks to match power rails on most standard bus systems, i.e. APW Microbus range
- Voltage and current measuring facilities available by either simply breaking tracks and pinning for the addition of jumper links (see illustration) or using the fully assembled super version
- Standard versions provide the facility for mounting a backplane stub terminator or logic analyser to the side of the board as required. This is supplied complete with the super version.
- Provides support/eject mechanism to ensure the daughter board remains captive within the guides when ejecting and that the correct connector breaks when dismantling
- Solder resist coated to prevent solder bridging of joints and finger staining



Standard and Super PTH extender boards



Ordering information

Description: PTH Extender boards	Order code
64/64 Standard PTH extender board	**188-29937F**
96/96 Standard PTH extender board	**188-27573A**
96/96 Super PTH extender board	**188-39011D**
Extender board conversion kit	**188-27542E**

Board specification

Board type	Epoxy glass
Plated through hole	BS4584, EP-GC-Cu FR4
Max. working temp.	155°C
Nom. board thickness	1,6mm
Laminated copper thickness	35µm or 1oz/ft^2 or 305g/m^2
Plated copper	25µm
Tin lead	10µm
Total	70µm

Note: *Bare boards are UL 94 V-0 recognised components file number E116551. Bare boards are approved to BS9762*

Accessories

Jumper links, wirewrapping pins, reverse DIN connector.

Ordering information

Description: Accessories	Order code
Jumper links Red/10	**188-29988E**
Jumper links Black/10	**188-29989B**
Wirewrapping pins/100	**188-29990C**

Eurocard extender boards

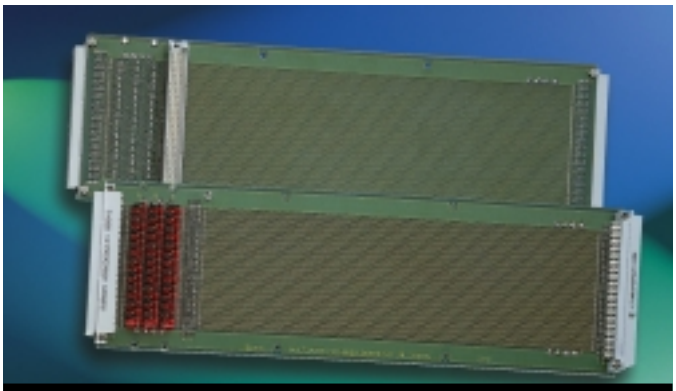
MULTILAYER EXTENDERS

This multilayer extender board offers the engineer the best possible guarantee against crosstalk due to the 0V guarding being positioned on three sides of each individual signal line.

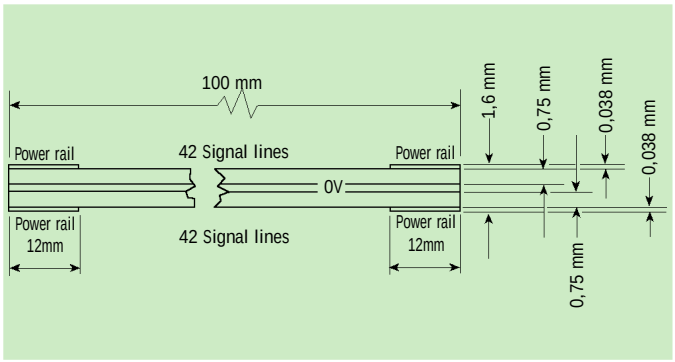
The multilayer construction features a control 0V ground plane inner layer with a latticed trace around all jumper pin positions for maximum shielding. The extender board features 42 signal lines on both sides of the board which are protected by an 0V guard track between each pair of signal lines. The guard track is connected to the 0V inner layer plane at both ends by the use of via holes.

The power rails on the outer edges of the board feature a cross patching facility which uses jumper links in order to give the user complete flexibility when trying to match a particular backplane system. The board is supplied completely assembled with connectors at both ends.

Power rails are committed to pins 1abc, 2abc, 31abc and 32abc. If necessary any of these power rails may be connected to the 0V inner plane by use of cross patching jumper links.



Multilayer extenders



Features

- 3 layer bonded multilayer construction with a 0V ground plane sandwich between layers
- Patented 0V guard tracking between all signal lines
- Flexible power rail construction with up to four separate Vcc rails and a 0V return plane
- Voltage and current measuring facilities are available by use of wirewrapping pins and jumper links which are fully assembled to the board
- Logic analyser or backplane stub terminator position on board
- Expandable to 3U, 6U, 9U etc. in many combinations using the compatible range of PTH and super PTH extender boards
- Suitable for 160 and 220mm deep systems
- Compatible with multilayer Microbus backplanes and PTH backplanes
- Support/eject mechanism to ensure that the daughter board remains captive within the guides when ejecting and that the correct connector breaks when dismantling

Ordering information

Description: Multilayer extender board	**Order code**
96/96 multilayer extender board	**38-39084J**
Extender board conversion kit	**188-27542E**

Board specification

Board type	Epoxy glass
Plated through hole	BS4584 part 16
Copper thickness to outer layers	38µm
Plated copper	37µm
Tin lead	5µm
Total	80µm
Copper thickness inner layers	38µm

Note: *Bare boards are UL 94 V-0 recognised components file number E116551. Bare boards are approved to BS9762.*

Characteristics impedance

The separation of signal layers to the 0V ground plane is 0,74mm and the signal track width is 0,3mm which gives a theoretical characteristic impedance of 94Ω with a Zo tolerance of ±5%.

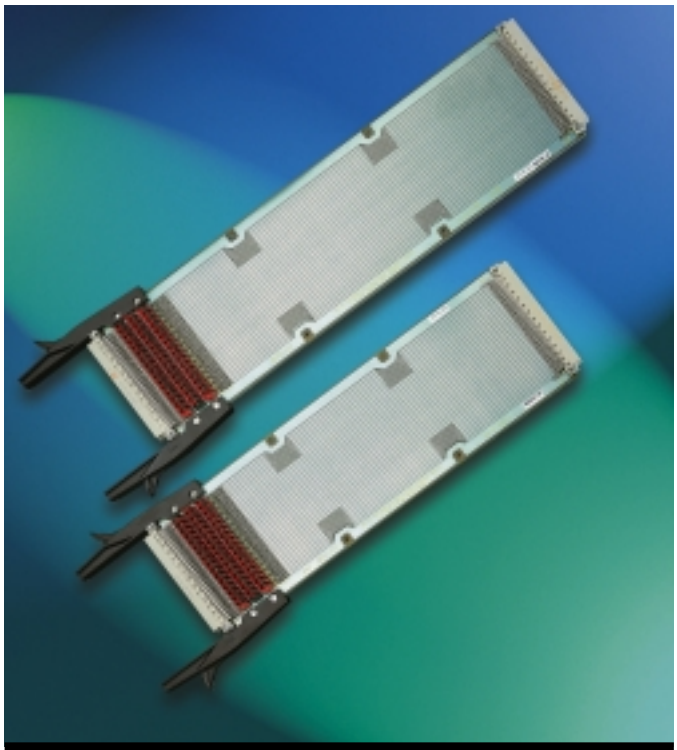
Note: *Zo = 94Ω ±5% excluding all holes in the boards*
Zo = approximately 80Ω including connector and jumper pin holes
Zo = approximately 65Ω when active daughter board is in position.

Note: *The guard tracking arrangement is manufactured under licence from University College, London.*

Eurocard extender boards

MULTILAYER UNCOMMITTED EXTENDER BOARDS

These extender boards have been designed to offer the greatest flexibility in the arrangement of power, ground and signal lines, yet afford the engineer the best possible protection against crosstalk by the use of a patented method of 0V guard tracking. The 96 signal lines are positioned over three layers with the facility to commit any line to any voltage. The remaining layers are committed to 0V and Vcc planes, thus minimising voltage drop over the length of the extender. These extenders are supplied completely assembled with connectors at each end plus wirewrap pins, jumpers and a reverse DIN connector for the fitment of a "stub" terminator or a logic analyser.
Signal lines can be committed to either 0V or Vcc by using the Commitment strap shown below. By fitting the tag into the holes in the guard track (round pads) adjacent, the connector pattern will commit the required pins to 0V. Conversely, rotating the strap 180° and fitting the tag to the square padded holes will commit to Vcc. This process is to be repeated at both ends of the extender.



Multilayer uncommitted extender boards

Features

- 6 layer construction providing full voltage and ground planes
- Patented 0V guard tracking between all signal lines
- Full 0V and Vcc planes plus two auxiliary Vcc rails
- Suitable for 220 and 280mm deep subracks
- Total flexibility of voltage and ground committment
- Signal line interrupt facilities by means of wirewrap pins and jumper links which are pre-fitted to the board
- Reverse 96/96 DIN connector to accept stub terminator or logic analyser
- Support/eject mechanism to ensure that the correct connector breaks when dismantling and that the daughter board remains captive within the guides when ejecting
- Expandable in height by multiples of 3U. This is acheived by means of an extender board conversion kit

Board specification

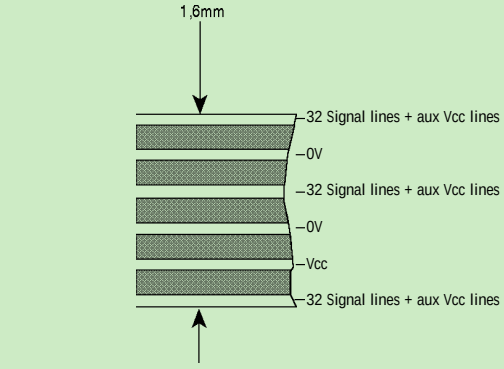
Dielectric	Epoxy glass BS4584 EP-GC-Cu3 FR4
Nom. thickness	1,6mm
Base copper thickness	35µm
Finish	
Plated copper	25µm average
Tin lead	5µm nominal
Total	68µm outer layers only

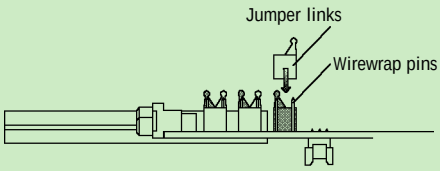
Note: bare boards are UL 94 V-0 recognised components file number E116551. Bare boards are approved to BS9762.
The guard tracking arrangement is manufactured under licence from University College, London.

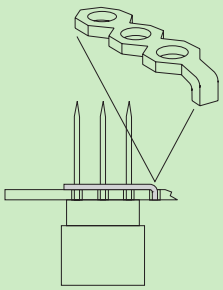
Ordering information

Description: Uncommitted extender boards

Size	Order code
220mm deep Un-committed extender	**38-63623C**
280mm deep Un-committed extender	**38-61486J**
Extender board conversion kit 220mm	**188-27542E**
Extender board conversion kit 280mm	**188-39120J**







Commitment Strap

COMMITMENT STRAP

These commitment straps drop over the tails of a DIN connector, committing a row of pins to a common voltage. The tag on the end of the strap fits into the PTH hole which is assigned to the voltage or ground plane on the un-committed backplane or un-committed extender. The straps can be cut to size, ensuring only the required pins are committed. Commitment straps are supplied in packs of 100.

Ordering information

Description: Commitment straps	Order code
Pkt. 100	**22-301331B**

Eurocard development backplanes

MICROBUS BACKPLANES

Features

- PTH backplanes designed for use with microprocessors
- Reliability of plated through holes
- Minimal crosstalk
- DIN 41612 connectors
- DIN 41494 (KM6-II) compatible
- Choice of connector styles and pitches:
  15,24mm for PCB's for hard wired daughter boards
  20,32mm for two level wirewrap daughter boards

96/96 Version

Ideal for high speed applications using 96/96 way connectors, screening is provided on row b between each signal track on the backplane and, via the connector, through onto the individual cards. Alternatively, for slower applications the 96/96 way connector allows the use of a maximum of 84 separate signal lines by simply breaking the 0V commoning line in the end position. Using either of these methods input/output connections are generally made at the front end of the individual plug-in boards. If a 64/96 way connector is used on the system, the 0V screen is still a feature of the Microbus, with the added advantage of input/output connections being possible from the rear of the system.

When using 0V and two power rails, pin 1 and 32 on rows a, b and c are fully committed to 0V and commoned together at one end. Two separate Vcc planes are provided for dual voltage systems and are committed to pins 2 and 31 on rows a, b and c. If 0V and three power rails are required the same situation exists as for two power rails except that it is now necessary to convert 0V on pins 32 a, b and c to Vcc by simply cutting the 0V link on the extreme edge of the connector side of the backplane. Power onto the 0V and Vcc planes is made via plated through holes positioned beneath the connector fixing screws.

64/96 Way version

A low cost version of the Microbus backplane still with the reliability of plated through holes but restricted in use to only 64/96 way connectors. The basic design is very simple, with pin 1 and 32 on rows a and c committed to 0V with a complete 0V screen over one side of the board. Pin 2 and 31 on rows a and c are committed to Vcc. This leaves 56 separate signal lines from pin 3 a and c to pin 29 a and c inclusive.

Crosstalk

Tests have been carried out on the 84HP version by feeding a 1MHz square wave signal (5ns rise and fall times), through a DIN 41612 connector and measuring the adjacent tracks at the opposite end.

Note: *The Microbus motherboard was not terminated, which would have reduced the amplitude to the crosstalk and changed its shape considerably.*

Results: 96/96 way Microbus

Worst case in row c (square wave fed on row a) amplitude of crosstalk was 15% with only 8% on adjacent tracks in the same row.

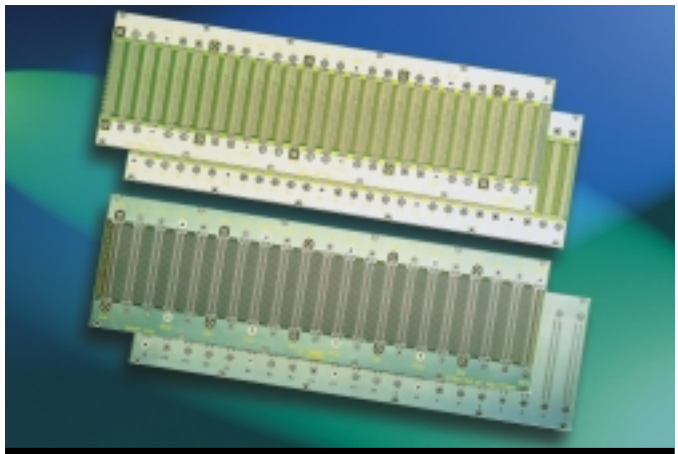
Results: 64/96 way Microbus

Worst case in row c (square wave fed on row a) amplitude of crosstalk was 35% of main signal reducing further away from the main signal line. Adjacent tracks on the same row were 25-30% amplitude.

Ordering information

Description: Microbus backplanes

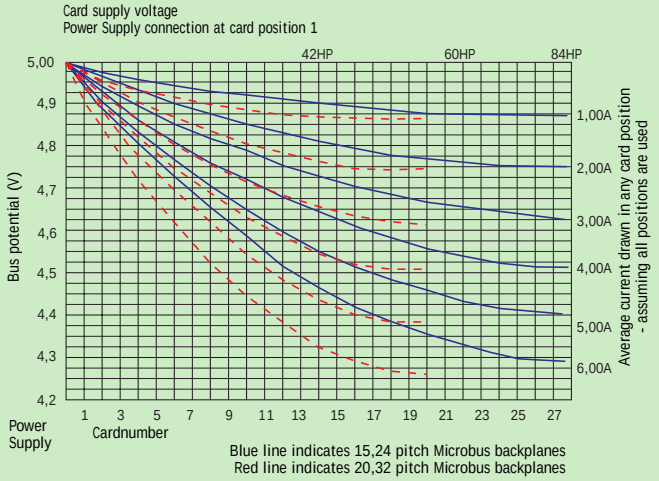
Conn. type	Conn. pitch (HP)	Size/Slots	Length	Order code
96/96	15,24 (3 HP)	84HP/28	426,3	**222-2470F**
96/96	20,32 (4 HP)	84HP/21	426,3	**222-22847J**
64/96	15,24 (3 HP)	84HP/28	426,3	**222-26025F**
64/96	20,32 (4 HP)	84HP/21	426,3	**222-27569B**



Microbus backplanes

Graph Test Data

- Temperature: 25ºC
- Busbar width: 20mm
- Copper thickness width: 70µm
- Microbus typical impedance:200Ω measured @1MHz
- DIN 41612 connector types B and C
- Power track resistance: less than 25mΩ/m, typically 19mΩ/m
- Signal track resistance: less than 1,2mΩ/m, typically 0,97mΩ/m
- Calculations based on both Vcc and 0V rails being used with single voltage



By connecting 0V and Vcc to the centre of the power rails rather than the end position as shown on the graph, the voltage drop will be halved. Similarly, if the intermediate positions are used, the voltage drop will be reduced proportionally.

Board specification

Dielectric Epoxy glass		BS4584 , EP-GC-Cu3 FR4
Nominal thickness		1,6mm
Base copper thickness		35µm
Finish:	Plated copper	25µm average
	Tin lead	8µm maximum
	Total	68µm

Note: *Bare boards are UL 94 V-0 recognised components file number E116551. Bare boards are approved to BS9762*

Eurocard development backplanes

DOUBLE SIDED UNCOMMITTED BACKPLANE

This range of backplanes has been designed to be totally flexible, allowing the engineer to configure the backplane to exactly match the requirements of his system. Each pin is bussed across the board, with the added facility of using row b as 0V guard rails thus minimising crosstalk on rows a and c. Power connection to the backplane is by means of M3 studs or 6,3mm Faston tabs.
To identify voltages a combination of studs and Fastons may be used. Power committment to pins 1, 2, 31 and 32 is by a 2,54mm pitch link, other pins can be committed by either wirewrapping or hard wiring. Rows a, b and c can be linked together by the Committment Strap.

Features

- Total flexibility on positioning of Vcc or 0V
- Four voltage rails available
- M3 stud or 6,3mm Faston power connection facilities
- Choice of backplane widths and pitches
- High quality PTH boards with resist coating to prevent solder bridging

Ordering information

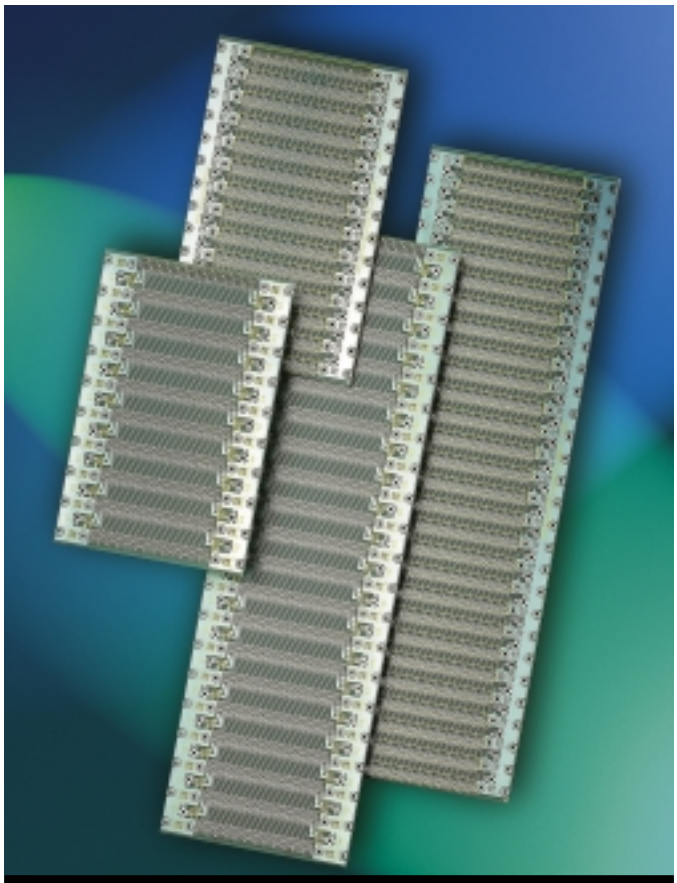
Description: Uncommitted backplanes

Conn. type	Conn. pitch (HP)	Slots	Width x Length	**Order code**
96/96	20,32 (4 HP)	21	128,6 x 420,8	**222-63630K**
96/96	20,32 (4 HP)	10	128,6 x 197,3	**222-63631G**
96/96	20,32 (4 HP)	5	128,6 x 95,7	**222-63632D**
96/96	15,24 (3 HP)	28	128,6 x 425,9	**222-63633A**
96/96	15,24 (3 HP)	14	128,6 x 212,5	**222-63634J**

Board specification

Dielectric Epoxy glass	BS4584, EP-GC-Cu3 FR4
Nom. thickness	1,6mm
Base copper thickness	35µm
FinishPlated copper	25µm average
Tin lead	8µm nominal
Total	68µm

Note: *Bare boards are UL 94 V-0 recognised components file number E 116551. Bare boards are approved to BS9762.*



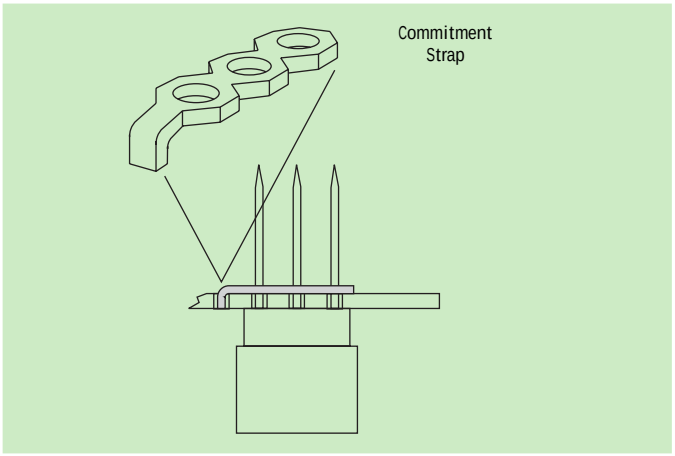
Uncommitted backplanes

COMMITMENT STRAP

These commitment straps drop over the tails of a DIN connector, committing a row of pins to a common voltage. The tag on the end of the strap fits into the PTH hole which is assigned to the voltage or ground plane on the un-committed backplane or un-committed extender. The straps can be cut to size, ensuring only the required pins are committed. Commitment straps are supplied in packs of 100.

Ordering information

Description: Commitment straps	**Order code**
Pkt. 100	**22-301331B**



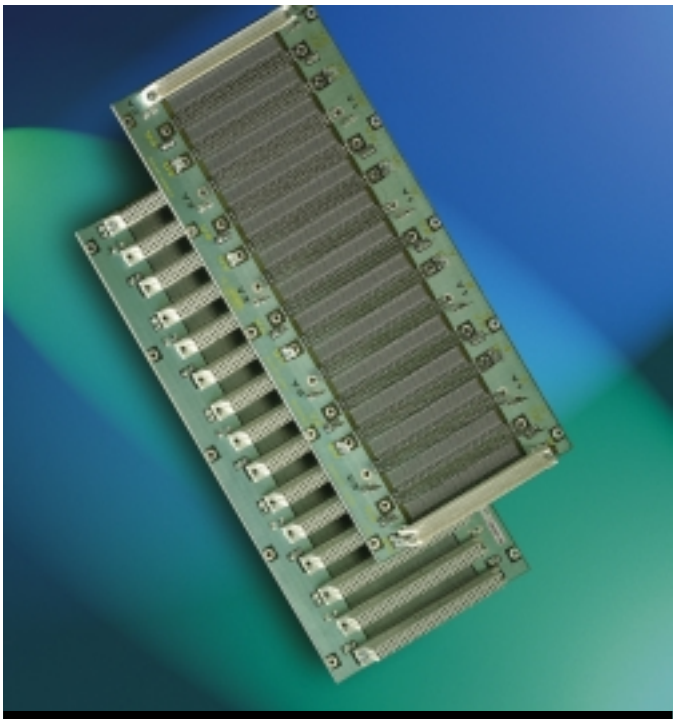
Eurocard development backplanes

MULTILAYER MICROBUS BACKPLANES

This range of multilayer Microbus backplanes is available in 0,8" (20,32mm) pitch and in widths of 5, 10 and 15 slots. All widths coincide with either 42HP, 60HP or 84HP KM6-II cardframes. All multilayer Microbus backplanes feature a patented tracking arrangement which includes 42 signal lines on each side of the board with a 0V guard track between each signal line. Power distribution is designed for use with a maximum of four power rails each capable of handling the total current rating of all connector pins, providing several feeders are used on order to distribute the load evenly.

Features

- 3 layer bonded multilayer construction with 0V ground plane sandwiched between signal layers
- Patented 0V guard tracking between all signal lines
- Theoretical characteristic impedance Zo = 100Ω ± 5%
- Flexible power rail construction with up to four separate Vcc rails
- Fully assembled with 96/96 standard DIN 41612 compliant pin press-fit connectors and ample spade style power pick-up points
- 0,8 inch (20,32mm) pitch
- Compatible with KM6-II cardframes, multilayer extender boards and stub terminators



Multilayer microbus backplanes

Ordering information

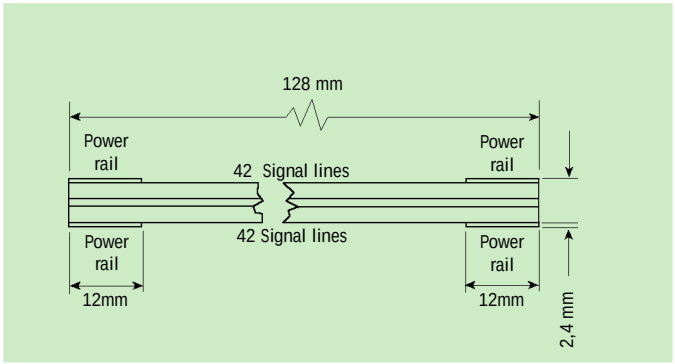
Description: Multilayer microbus backplanes

Slot pitch (HP)	No. of slots	Length x width	Cardframe width	**Order code**
20,32 (4 HP)	5	96 x 128	21HP	**38-39104K**
20,32 (4 HP)	10	212 x 128	42HP	**38-39105F**
20,32 (4 HP)	15	303 x 128	60HP	**38-39106B**

Board specification

Copper clad Epoxy glass board	BS4584
Nominal thickness	2,4mm
Copper thickness outer layers	38µm
Plated copper	37µm
Tin lead	5µm
Total	80µm
Copper thickness inner layers	38µm

Note: *Bare boards are UL 94 V-0 recognised components file number E 116551. Bare boards are approved to BS9762.*



Characteristic impedance

The impedance of signal layers to the 0V ground plane is 1mm and the signal track width is 0,38mm which gives a theorectical impedance of 100Ω with a Zo tolerance of ± 5%.

Note: *Zo = 100Ω ± 5% theoretical impedance excluding holes in the board*
Zo = approximately 80Ω including connector holes in backplane
Zo = approximately 20Ω fully loaded with boards

Note:*Manufactured under licence from University College, London*

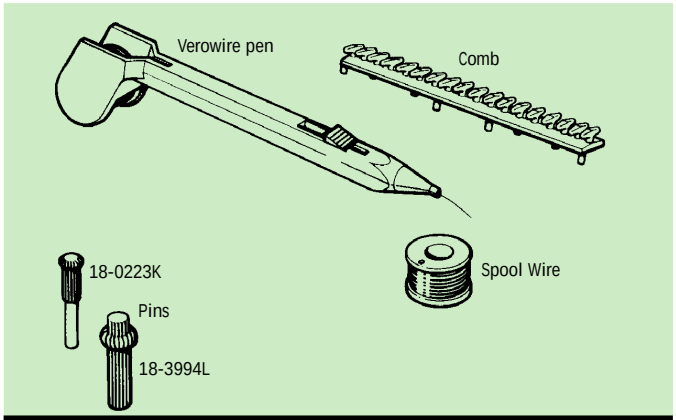
VEROWIRE and prototyping board accessories

VEROWIRE

The Verowire wiring system is ideal for prototypes, breadboards and limited production runs. Finished results are of a high standard with a neat orderly appearance achieved in significantly less time than more conventional methods.

Features

- Low profile
- High speed applications
- Suitable for high-density wiring
- No headers required
- Low cost



VEROWIRE accessories

Wire specification

Diameter of wire:	0,15 mm (34 AWG)
Insulation:	Self-fluxing polyurethane*
Insulation Thickness:	0,005 mm
Proof Voltage:	600V d.c.
Current Rating:	0,100 A
Resistance @ 20ºC:	0,857 W/m
Length of wire/spool:	40 m
Colours:	Pink, Gold

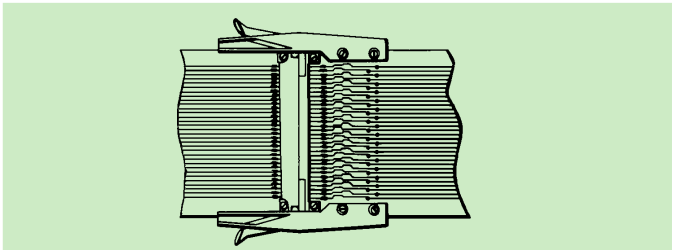
***WARNING!** When soldering through polyurethane enamelled wire a small quantity of TDI gas is produced. Use in a well ventilated room.*

Ordering information

Description	Unit of Sale	**Order code**
Wiring pen	1	**79-1732G**
Spools wire; 2 gold, 2 pink	4	**79-19038G**
Spool wire, Pink	4	**79-1737D**
Spool wire, Gold	4	**79-1739E**
Wiring combs	100	**79-1735C**
Half pin	1000	**18-0223K**

CARD SUPPORT - EJECTOR MECHANISM

Supplied as an accessory for any extender board, this device attaches to the plug end and guides/supports the circuit board under test. Supplied as a kit comprising 2 support-ejector assemblies, 4 M3 x 8 long screws and 4 M3 nuts.

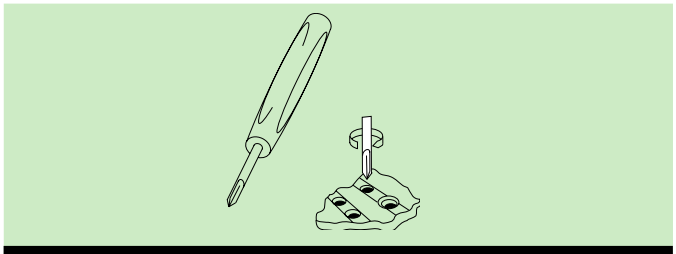

Card support

Ordering information

Description	**Order code**
Card support/ejector	**22-2427D**

SPOT FACE CUTTER

Used to break copper tracks on a PCB.
Can be used by hand or, with the handle removed, fitted into a bench drill.


Spot face cutter

Ordering information

Description	**Order code**
Spot face cutter	**22-0239G**

Prototyping board accessories

TERMINAL ASSEMBLY

This assembly is designed to act as a terminal on PC boards for attachment of scope probe etc. The spring design allows the terminal to be inserted into a plated through hole board without damaging the hole plating. The terminal will remain in place when the board is reversed for soldering. The sintered glass bead has a recommended maximum working temperature of 475ºC. Assemblies are available for two different hole diameters. The terminal assemblies are available in five standard colours; black, yellow, red, white or green.

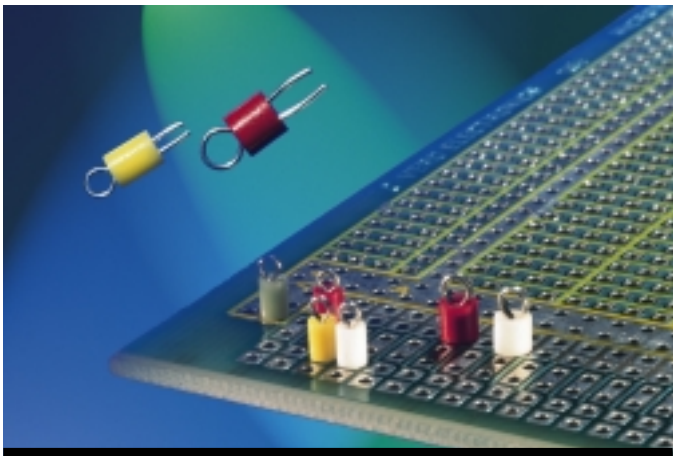
Note: Finish electroplated tin 5µm (nominal)

Nominal hole Ø	Dim. A (mm)	Dim. B (mm)	Dim. C (mm)
1,0 ±0,1 mm	1,1 - 1,3	3,1 - 3,3	2,3 - 2,5
1,4 ±0,2 mm	2,0 - 2,2	2,9 - 3,1	3,2 - 3,4

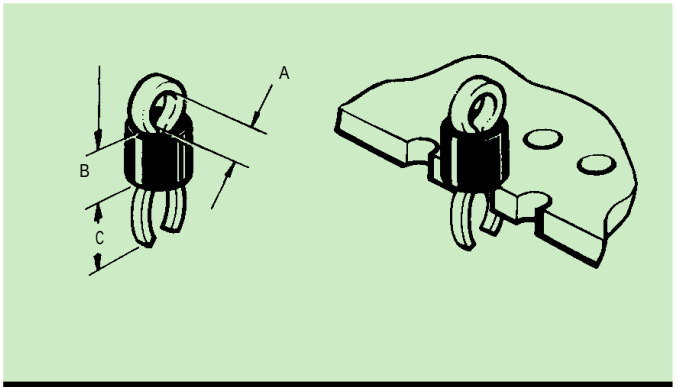
Ordering information

Bead	Nominal hole Ø	Nominal hole Ø
Colour	1,0mm ±0,1	1,4mm ±0,2
Red	**20-313137D**	**20-313141G**
Green	**20-313138A**	**20-313142D**
White	**20-313139J**	**20-313143A**
Yellow	**20-313140K**	**20-313144J**
Black	**20-002137D**	**20-002136J**

Supplied in packets of 100



Terminal Assembly



Terminal Assembly

Prototyping board accessories: Card handles

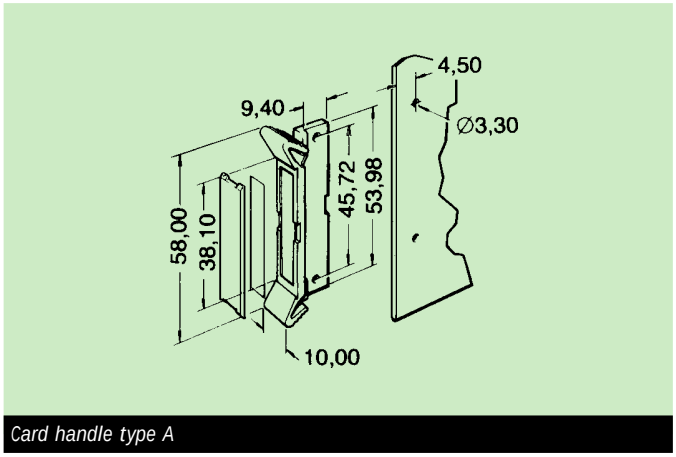
CARD HANDLE TYPE A

These card handles have provision for card identification, by means of a recess which may be covered by a clip-in window (supplied separately).

Ordering information

Colour	Material	Order code
Black	Noryl	**21-0246C**
Grey	Noryl	**21-0247J**
Red	Noryl	**21-0248D**
Blue	Noryl	**21-0249K**
Green	Noryl	**21-0250E**
Yellow	Noryl	**21-0251L**

Supplied in packets of 10



Card handle type A

TYPE A ACCESSORIES

Ordering information

Item	Unit of Sale	Order code
Window & label	Kit	**22-0318F**

Kits include 10 windows and labels

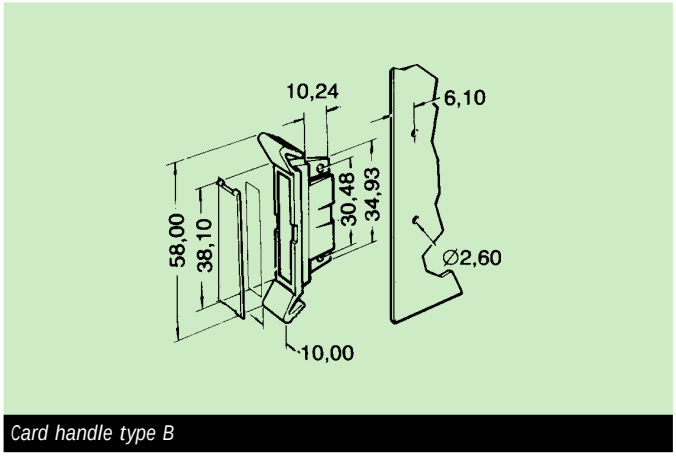
CARD HANDLE TYPE B

Differs from type A only in the means of attachment to the board. This handle has a clip-on feature which enables it to be assembled onto a PCB 1,6 mm thick which is pre-drilled with 2,6 mm dia. holes.

Ordering information

Colour	Material	Order code
Black	Noryl	**21-0252C**
Grey	Noryl	**21-0253A**
Red	Noryl	**21-0254G**
Blue	Noryl	**21-0255B**
Green	Noryl	**21-0256H**
Yellow	Noryl	**21-0257C**

Supplied in packets of 10



Card handle type B

TYPE B ACCESSORIES

Ordering information

Description	Order code
Window & label kit	**22-0318F**

Kits include 10 windows and labels

Prototyping board accessories: Card handles

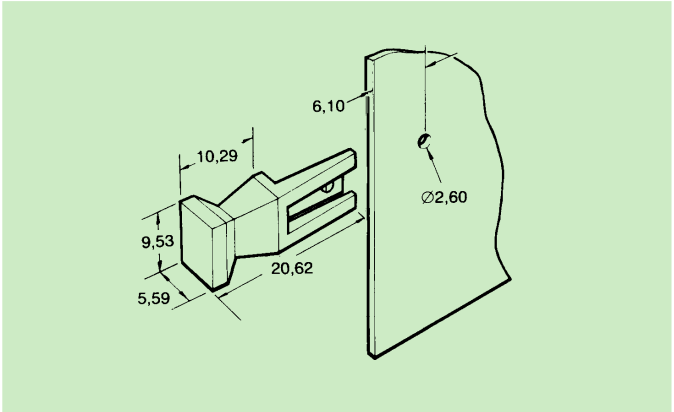
CARD HANDLE TYPE C

This handle has a clip-on feature, and is used for applications where a minimum of space is available on a PCB. Fixing hole dia. 2,6 mm.

Ordering information

Colour	Material	Order code
Black	Noryl	**21-0240L**
Grey	Noryl	**21-0241F**
Red	Noryl	**21-0242A**
Blue	Noryl	**21-0243G**
Green	Noryl	**21-0244B**
Yellow	Noryl	**21-0245H**

Supplied in packets on 10



Card handle type C

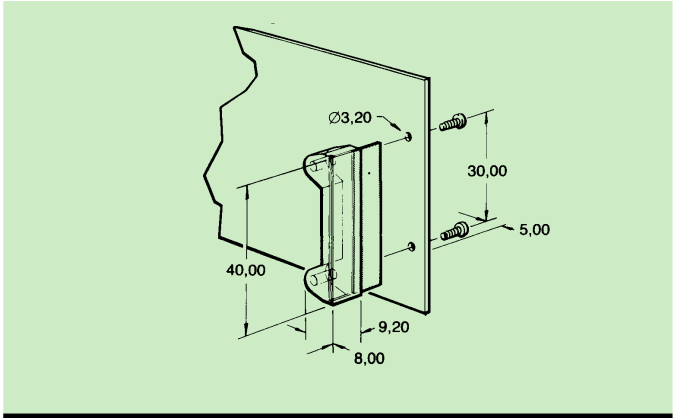
CARD HANDLE TYPE D

These handles are made in a transparent makrolon material, so that the ident strip is readily visible from the front of the PCB. Supplied with 2 no. 4 self-tapping screws, this screw-on type handle also incorporates an identification strip.

Ordering information

Colour	Material	Order code
Clear	Makrolon	**21-3170J**
Amber	Makrolon	**21-3171D**
Red	Makrolon	**21-3172K**
Green	Makrolon	**21-3173E**
Blue	Makrolon	**21-3174L**

Supplied as a kit comprising 10 handles plus fixing



Card handle type D

CARD HANDLE TYPE E (FLEXIBLE HANDLE)

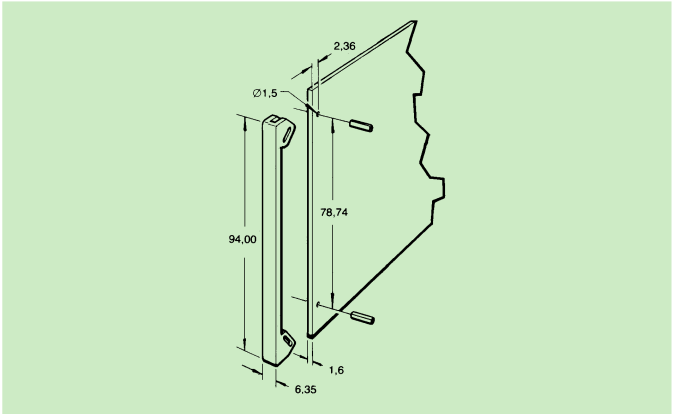
By bowing out from the board, when pulled, this handle enables a positive grip for card extraction. When not in use handle projects forward from the board edge less than 2,5 mm, making these handles fully compatible with the requirements of DIN 41494 (KM6-II).

The front surface of the handle is flat and provides ample space for card identification.

Ordering information

Colour	Material	Order code
Natural	Nylon 66	**21-1884E**
Red	Nylon 66	**21-1885L**
Green	Nylon 66	**21-1886F**
Yellow	Nylon 66	**21-1887A**
Black	Nylon 66	**21-1888G**
Blue	Nylon 66	**21-1889B**

Supplied as a kit of 10 handles and 20 fixing pins



Card handle type E flexible handle

Prototyping board accessories: Headers and socket pins

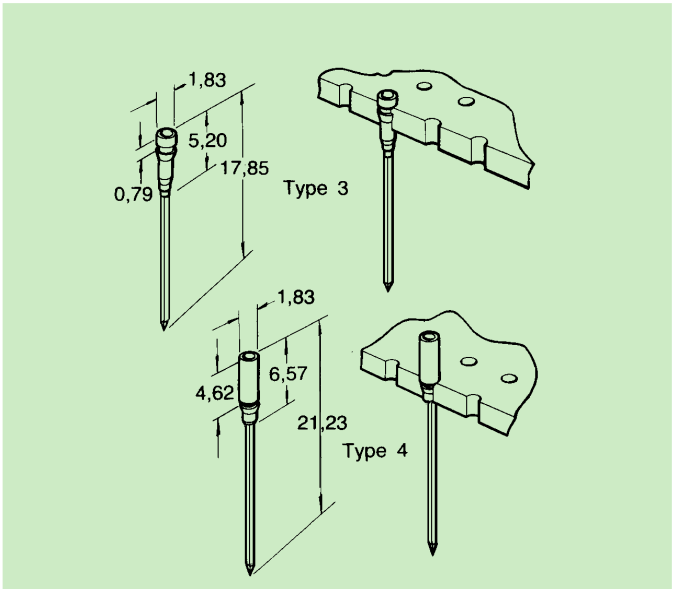
MINIWRAP SOCKET PINS (TYPES 3, 4 & 5)

These pins have 4-leaf spring beryllium copper inserts enabling components to be plugged directly into sockets.

Type 3 is a low-profile pin allowing components to be mounted close to the board surface

Type 4 has a higher profile allowing heat to be dissipated by convection between the components and the board

Material: All wire wrapping pins are manufactured from brass to BS249 and gold plated over a copper and nickel finish (unless otherwise stated)
Post size: 0,61 mm square, 0,86 mm diagonal.



Miniwrap socket pins (types 3, 4 & 5)

Socket pins - typical test data
(test data shown applies to 66-3472C and 66-3505A only)

Test	Result
Terminal retention	5,4 kgf
Contact resistance	Initial 5,3 mΩ average After 1000 insertions /withdrawals 6,4 mΩ av.
Low voltage	0,1 mA measured with open-circuit voltage of 10 μV
Salt spray (48 Hours)	Contact resistance <15 mΩ No evidence of galvanic corrosion
Humidity	No evidence of damage
Exposure to atmospheric pollution	5mΩ maximum

Ordering information

Type	Compatible hole dia.		**Order code**
	pierced	drilled	
3	-	1,45	**66-3472C**
4	1,02	1,05	**66-3505A**

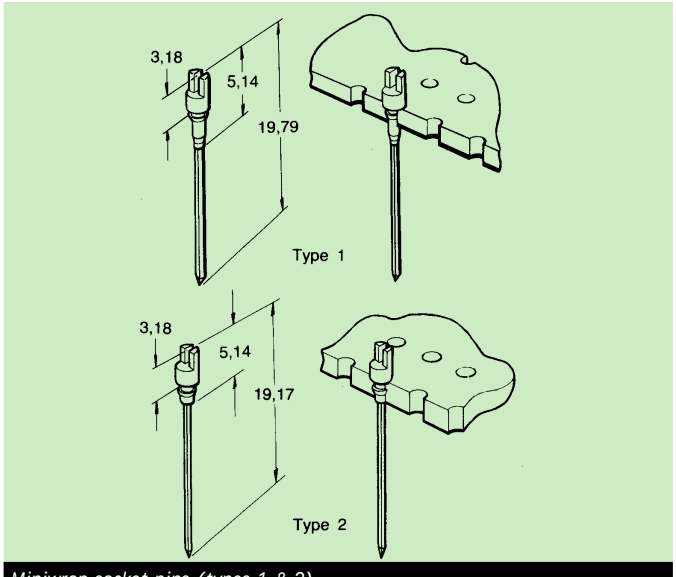
MINIWRAP HEADED PINS (TYPES 1 & 2)

For mounting discrete components.
These pins feature a 0,89 mm cross-cut slot on the component side to locate component leads for assembly.

Ordering information

Type	Compatible hole dia.		**Order code**
	pierced	drilled	
1	1,32	1,40	**66-3478F**
2	1,02	1,05	**66-3523K**

Supplied in packets of 100



Miniwrap socket pins (types 1 & 2)

Prototyping board accessories: Headers and socket pins

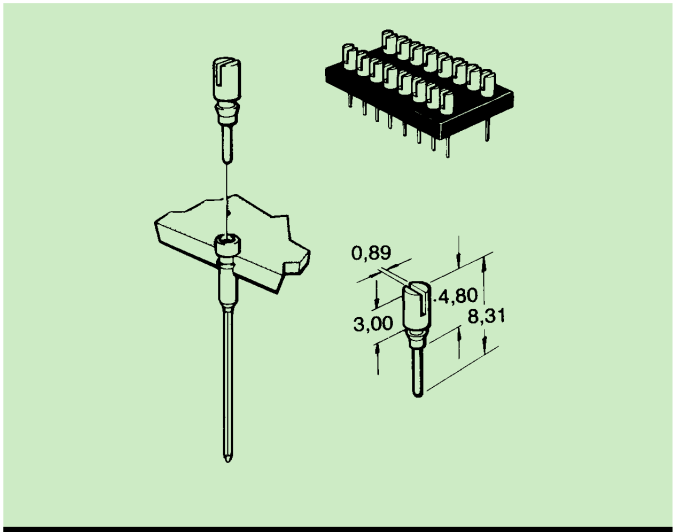
TERMINAL HEADER PIN (TYPE 7)

May be mounted directly into header board or alternatively plugged into socket pins (66-3472C - type 3) or (66-3505A - type 4).

Ordering information

Type	Compatible hole dia.		Order code
	pierced	drilled	
7	1,32	1,40	**66-3469G**

Supplied in packets of 100



Terminal header pin (Type 7)

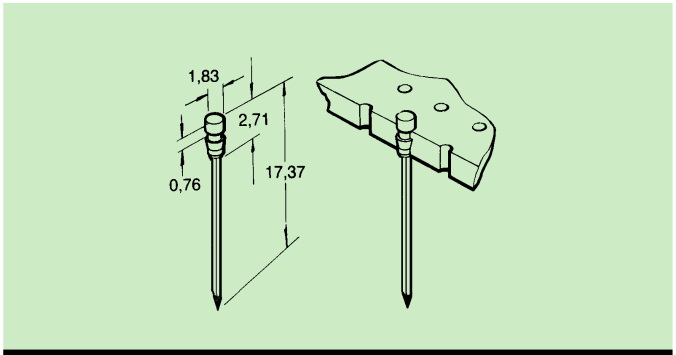
MINIWRAP TERMINALS (TYPE 9)

Suitable for use with all types of boards. This pin may be soldered to a copper track or pad to ensure electrical continuity.

Ordering information

Type	Compatible hole dia.		Order code
	pierced	drilled	
9	1,02	1,05	**66-3514L**

Supplied in packets of 100



Miniwrap terminals (Type 9)

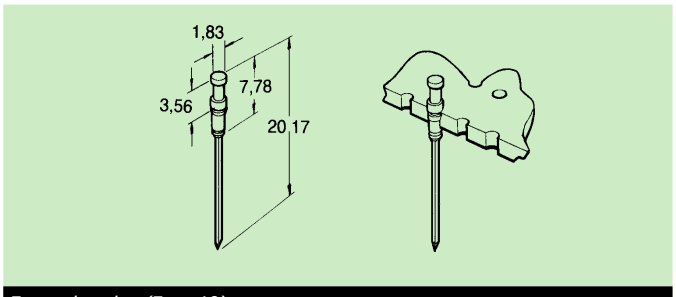
TEST POINT PINS (TYPE 12)

These pins feature a turreted lug on the component side, guaranteeing a firm connection using a clip-on style test probe.

Ordering information

Type	Compatible hole dia.		Order code
	pierced	drilled	
12	1,32	1,40	**66-3532J**

Supplied in packets of 100



Test point pins (Type 12)

Prototyping board accessories: Wirewrapping pins

SINGLE SIDED PIN (TYPE 10)

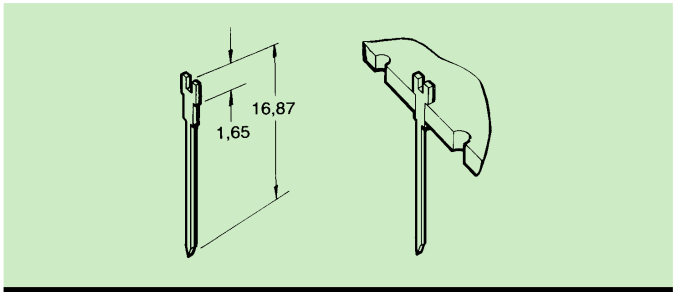
For use with plain or copper-clad boards. These pins have the facility for soldering discrete components on one side and wire wrapping on the other.

Material: Manufactured from phosphor bronze to BS 2870 PB 102 with tin finish over copper flash.
Post size: 0,68 mm x 0,64 mm, diagonal 0,94 mm

Ordering information

Type	Compatible hole dia.		Order code
	pierced	drilled	
10	1,00	1,05	**18-0226F**

Supplied in packets of 500



Single sided pin (Type 10)

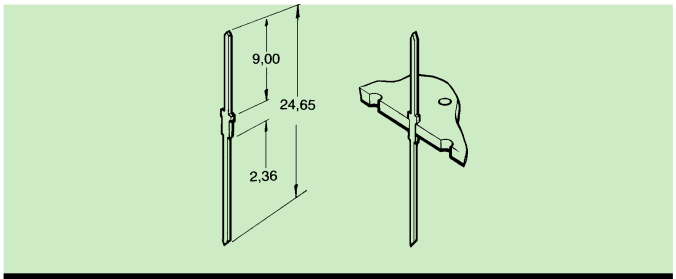
DOUBLE SIDED PIN (TYPE 11)

For use when wire wrapping is required both sides of board.

Ordering information

Type	Compatible hole dia.		Order code
	pierced	drilled	
11	1,00	1,05	**18-1657B**

Supplied in packets of 500

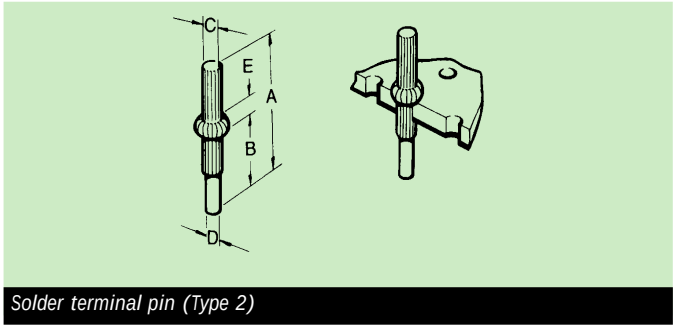


Double sided pin (Type 11)

Prototyping board accessories: Terminal pins

SOLDER TERMINAL PIN (TYPE 2)

By inserting pin up to its shoulder these pins stand at a fixed height above the board surface. The separated profile offers good mechanical retention while electrical contact is made by soldering shoulder to copper track. Available in two sizes for hole size 1,02 and 1,32 mm.



Solder terminal pin (Type 2)

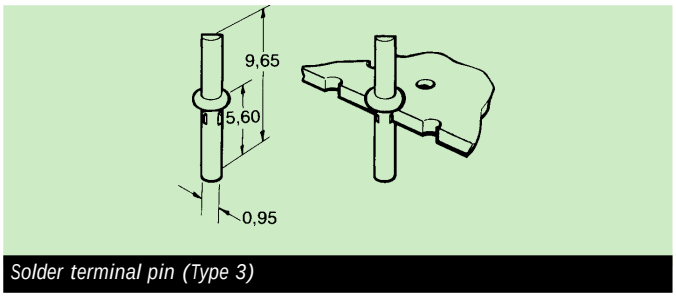
Ordering information

Hole	Dimensions					Order
dia.	A	B	C	D	E	code
1,00	9,7	5,6	1,1	1,0	0,4	**18-0222D**
1,32	11,9	6,7	1,4	1,2	0,5	**18-0219H**

Supplied in packets of 1000

SOLDER TERMINAL PIN (TYPE 3)

Similar to 18-0222D but manufactured from phosphor bronze to BS 2873 PB 102, tin finish over copper flash.



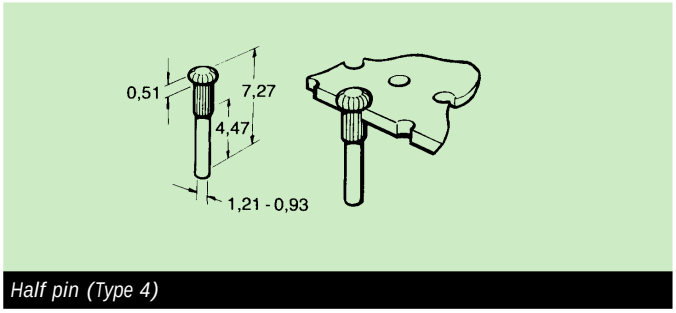
Solder terminal pin (Type 3)

Ordering information

Type	Qty	Hole dia.	Order code
3	1000	1,00	**18-0218B**

SOLDER TERMINAL HALF PIN (TYPE 4)

These pins are ideally suited to take off points or flying leads from a PCB. The shoulder is soldered to the copper track with the pin protruding on the component side of the board. Two sizes are available for 1,02 and 1,32 mm diameter holes.



Half pin (Type 4)

Ordering information

Type	Qty	Hole dia.	Dim.A	Order code
4	1000	1,32	1,21	**18-0217G**
4	1000	1,00	0,93	**18-0223K**

Order Code Index

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