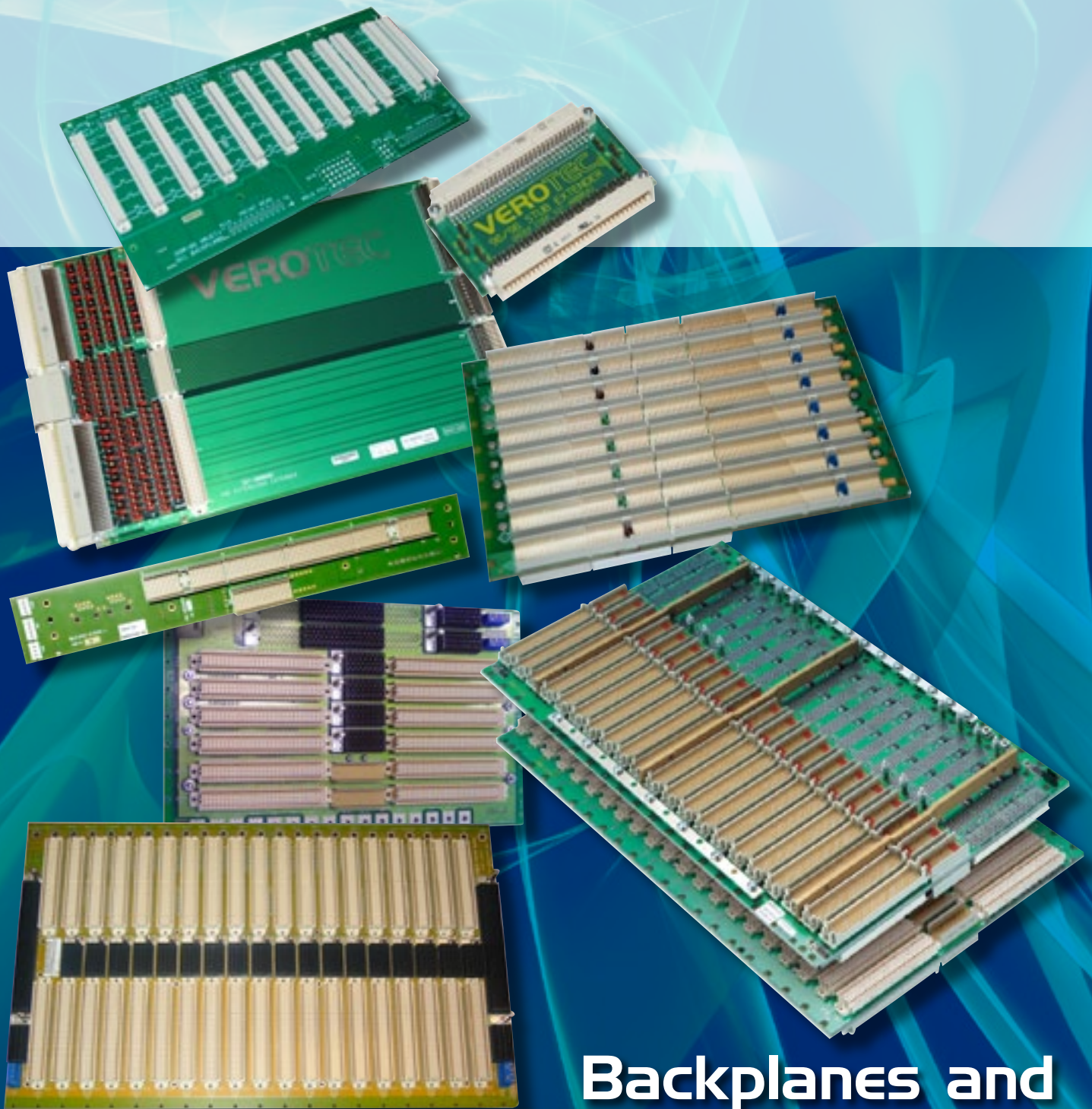
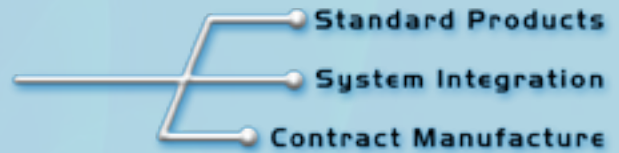


VEROTEC

Electronics Packaging



**Backplanes and
Extender boards**

INTRODUCTION

Verotec design, supply and integrate bus based products and systems. Our extensive standard range consists of open-architecture backplanes and extender boards for VME, VME64x, VXI, VPX, VXS, CompactPCI, PXI, AdvancedTCA and uTCA. Many years of design knowledge and expertise in backplane technology means that, in addition to standard product, we're able to offer modified to fully custom designs to your specifications. We are also happy to support a number of legacy backplane products including STEbus, Multibus and G64/96bus.



VME Industrial Trade Association



PCI Industrial Manufacturers Group

DESIGN

Our designers work with the above two standards organizations to bring to market the latest open-architecture products. Our knowledge and experience means we can meet the most demanding design specifications whilst rising to the challenges of modern day environmental issues.

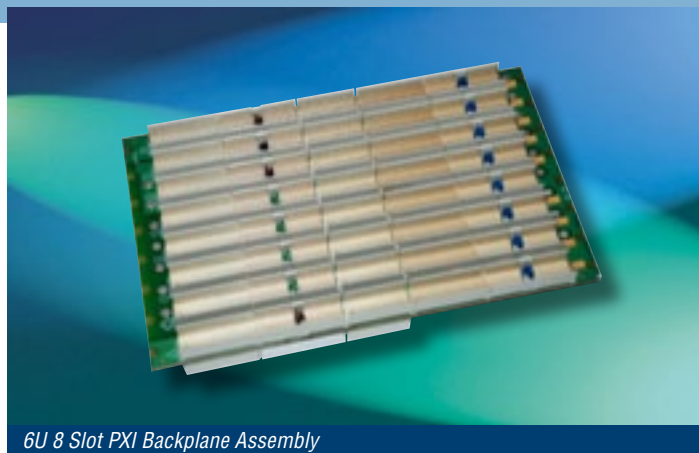
Verotec uses a number of software tools to aid backplane design, including Cadence Allegro, Mentor Graphics and Pads.

MANUFACTURING / QUALITY / TEST

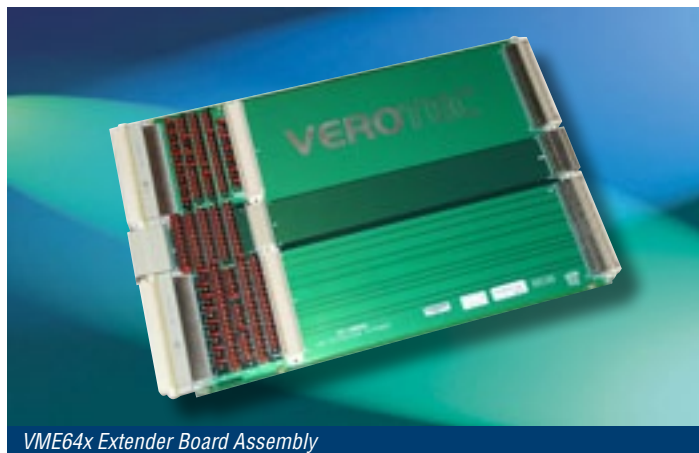
Our backplane manufacturing facility in the UK is at the forefront of technology and is equipped with some of the latest surface mount, soldering, press fit and testing machinery available. Assembly and test facilities are ESD protected with skilled technicians providing you with a high quality product every time.

Every backplane is tested and inspected before it leaves the factory with our standard of backplane workmanship meeting the requirements of IPC610 Class III.

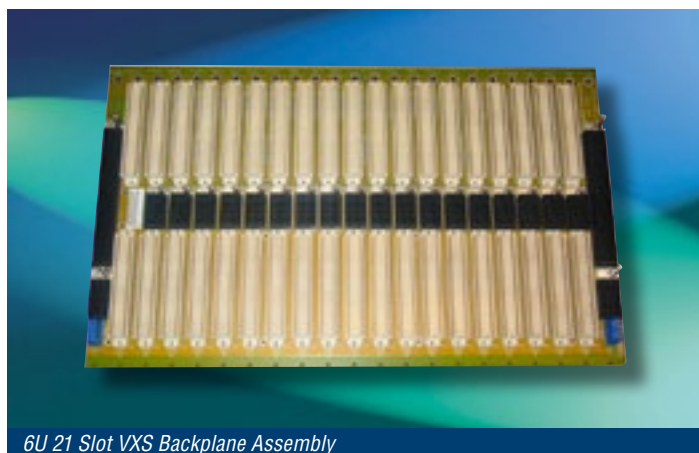
All Verotec backplanes are manufactured with systems approval in accordance with ISO 9001:2000 and meet the requirements of ROHS 2002/95EG.



6U 8 Slot PXI Backplane Assembly



VME64x Extender Board Assembly



6U 21 Slot VXS Backplane Assembly



Custom Backplane Assembly



Backplanes and Extender Boards – Introduction & Capability

INTEGRATION

Verotec has designed and manufactured backplanes for many years and continues to integrate them into our packaging products today. Our extensive range of subrack products coupled with our in-depth knowledge of standard bus architectures such as VME & CompactPCI provides an excellent foundation for our integration services.

Our engineering expertise in thermal management, EMC and power conversion means we can meet the most demanding design specifications whilst rising to the challenges of modern day environmental issues.

Our fully equipped integration and test facilities are ESD protected with skilled technicians to provide a high degree of workmanship and quality.

For full details, please refer to our “Systems” section.

CONTENTS:

Standard Backplanes

VMEbus	Page 4-5
VME64 Extensions	Page 6-7
VXI	Page 8
VPX	Page 9
VXS	Page 10
CompactPCI	Page 11-12
PXI	Page 13
ATCA	See systems brochure
uTCA	See systems brochure

Legacy Product

Multibus	Page 14
Multibus II	Page 14
STEBus	Page 15
G64bus	Page 15
G96bus	Page 15

Custom Backplanes

Capability	Page 16
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Verotec can integrate backplanes into chassis - for details please refer to section 13 “Integrated systems”



Backplanes and Extender Boards – VMEbus



INTRODUCTION

Verotec offer a comprehensive range of VME backplanes from 1 to 21 slots wide in J1, J2 (3U) and J1/J2 monolithic (6U) variants. They offer excellent performance characteristics in the areas of controlled impedance, power distribution and termination design.

FEATURES

- Conforms to VME64 specification (ANSI/VITA 1-1994)
- Fits within a 3U/6U Eurocard
- 6 Layer stripline construction (J1 and Monolithic)
- 4 Layer stripline construction (J2)
- 57 Ohm characteristic impedance
- Excellent crosstalk performance
- Low ground shift
- Auto Bus Grant (ABG) connectors
- On-board, passive termination
- Latchable service header
- Various power options
- Extended tails with shrouds on all J2 connectors
- Extended tails with shrouds on first & last J1 connectors
- Optional decoupling capacitor positions in each slot

SPECIFICATIONS

Backplane Height (J1 and J2)	3U (128.5mm)
Backplane Height (Monolithic)	6U (262.0mm)
Board Thickness	2.7mm (0.11")
Connector Pitch	4HP (20.32mm/0.8")
Backplane Width	

The width of the backplane can be calculated using the following formula:

$$\text{Board width} = 0.752" + ([N-1] \times 0.8) \text{ inches } (\times 25.4 = \text{mm})$$

Where "N" = number of slots

Where 0.752" is the sum of the overhang at either end of the backplane

ENVIRONMENTAL

Temperature range (storage)	-40deg.C to +120deg.C
Temperature range (working)	-20deg.C to +85deg.C
Altitude	3000M
Humidity	90% R.H. non-condensing
Shock and vibration resistance	Commercial
MTBF to MIL-HBK-217E	>225,000 hours
Conditions:	Ground benign, temperature @ 25deg.C

VME SERVICE HEADER

A 5way latchable service header is fitted to the wiring side of the backplane which is supplied with the mating half on a 1M cable. The lines and the relevant colours are:

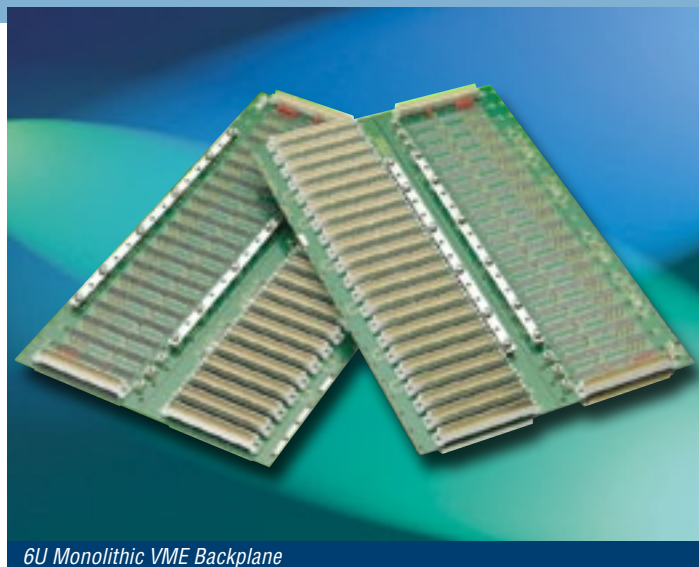
GND (Black), +5v (Red), ACFL (Blue), SYSFL (Grey), SYSRES (Orange).

TERMINATION OPTIONS

Termination networks are required at either end of the VMEbus backplane and can be supplied either "on-board" (where they are soldered directly into the backplane) or "off-board" (where they are mounted to pluggable modules that fit to the rear of the backplane).

J1 CONNECTOR OPTIONS

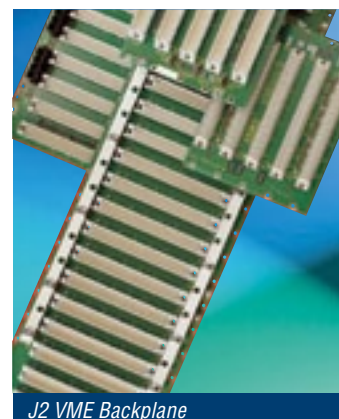
Bus Grant (BG) and Interrupt Acknowledge (IACK) lines of the VME bus need to be daisy-chained in vacant slots for the system to correctly function. The most common method of doing this is to use auto-bus granting (ABG) connectors; although a manual option (by positioning jumpers over pins between vacant slots) is also available.



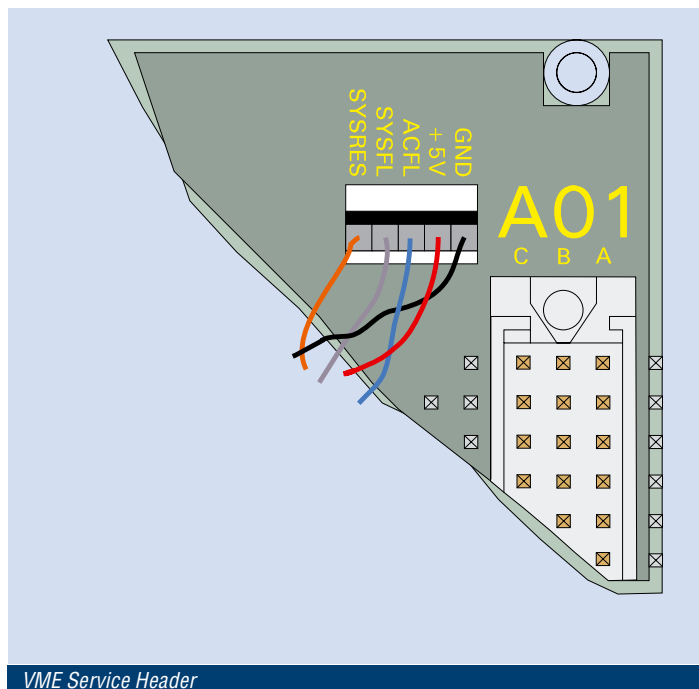
6U Monolithic VME Backplane



J1 VME Backplane



J2 VME Backplane



VME Service Header

Backplanes and Extender Boards – VMEbus

POWER OPTIONS

There are four options for introducing power onto the backplane:

MATE 'N' LOK A polarised, latchable connector with each contact rated at 10A.

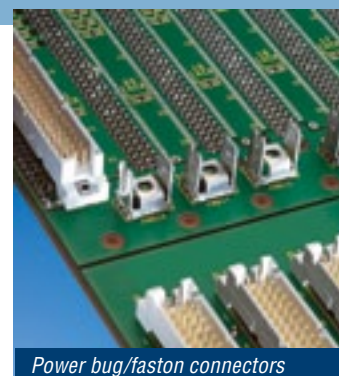
POWER BUG A combination connector providing both M4 screw terminal and 6.35mm tab, rated at 18A.

BUSBAR A combination of up to 6 x power bugs connected via a 2mm thick by 10mm wide plated copper busbar.

FASTON A single 6.35mm spade connector, rated at 12A



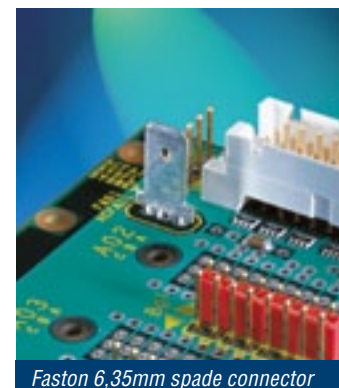
MATE 'N' LOK connectors



Power bug/faston connectors



Busbar



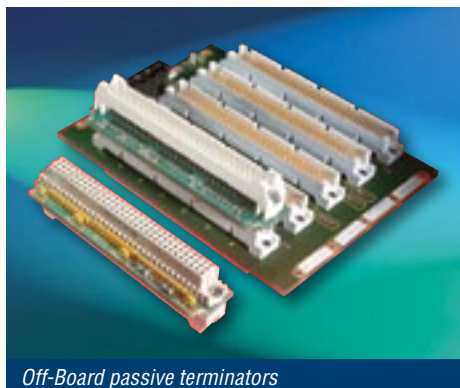
Faston 6,35mm spade connector

ORDERING INFORMATION

To configure your VMEbus backplane, use the chart below:

	Form Factor	Termination / Connector	Power Connection	Slot Size
927-54	X	X	X	XX
	1 = J1 2 = J2 3 = Monolithic	0 = Off-board / STD 1 = On-board / STD 2 = Off-board / ABG 3 = On-board / ABG	0 = Mate 'N' Lok 1 = Power Bug 2 = Busbar 3 = Faston	01-21

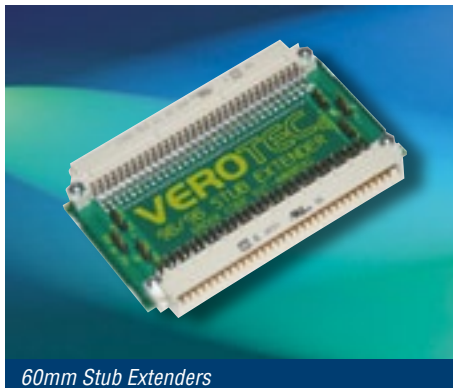
TERMINATION MODULES AND EXTENDER BOARDS



Off-Board passive terminators

OFF-BOARD PASSIVE TERMINATORS

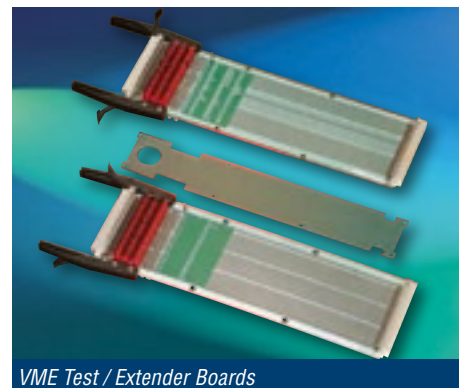
These VMEbus off-board, passive terminators are supplied as standard with the "off-board" terminated backplanes described above but are also available separately as spares / replacements.



60mm Stub Extenders

60MM STUB EXTENDERS

Multilayer stub extender boards are designed to allow a 160mm daughter card to fit into a 220mm subrack system. Available for VME or as a DIN 96/96 way un-committed version.



VME Test / Extender Boards

VME TEST / EXTENDER BOARDS

Designed to bring cards out of a system for fault diagnostic or development work, these multilayer extenders provide jumper links for signal line inter-rogation, ejector levers and termination facility.

Description	Ordercode
J1 VME terminator (pair)	927-4001358
J2 VME terminator (pair)	927-4001359

Description	Ordercode
J1 60mm stub extender	927-4000581
J2 60mm stub extender	927-4001360
96/96 60mm stub extender	927-4000582

Description	Ordercode
J1 VME test / extender	927-4001361
J2 VME test / extender	927-4001362
3U-6U Conversion Kit	927-4001363

INTRODUCTION

VME64 Extensions backplanes from Verotec are available in a 6U formfactor, from 1 to 21 slots wide, and in 4 standard configurations: with or without P0 connectors and with or without a 3.3V busbar / stiffener. VME64x incorporates a 5 row, 160way DIN connector which provides extra I/O and signal lines but also backward compatibility with traditional VMEbus systems that use the 96way DIN interconnect. Additional features include:

- An optional P0/J0 metric connector giving 95 extra user definable pins (note: these are not bussed)
- +3.3v power and 4 x auxiliary power planes
- Test and maintenance bus
- Geographic addressing (slot identification)
- 35 more ground returns for improved signal integrity

FEATURES

- Conforms to VME64x specification (ANSI/VITA 1.1-1997)
- Fits within a 6U Eurocard
- Available in 01-21 slot widths
- 12 Layer stripline construction
- Surface mount / pressfit technology
- Tightly controlled 57 ohm characteristic impedance
- Surface mount active termination
- Electronic on-board automatic bus grant
- Power connections via busbars and power studs
- Decoupling capacitors in every slot
- All connector long tails gold-plated
- Optional 3.3v busbar / stiffener available

ENVIRONMENTAL

Temperature range (storage)	-40deg.C to +120deg.C
Temperature range (working)	-20deg.C to +85deg.C
Altitude	3000M
Humidity	90% R.H. non-condensing
Shock and vibration resistance	Exceeds ETS 300-019-2-5 (Table 2a T5.2)
MTBF to MIL-HBK-217E	>225,000 hours
Conditions:	Ground benign, temperature @ 25deg.C
Rapid decompression:	Exceeds DEF STAN 00-35 test CL9 class F(4)
Safety assessment (3rd party)	EN60950

SPECIFICATIONS

Backplane Height	6U (262.0mm)
Board Thickness	5.1mm (0.2")
Connector Pitch	4HP (20.32mm/0.8")

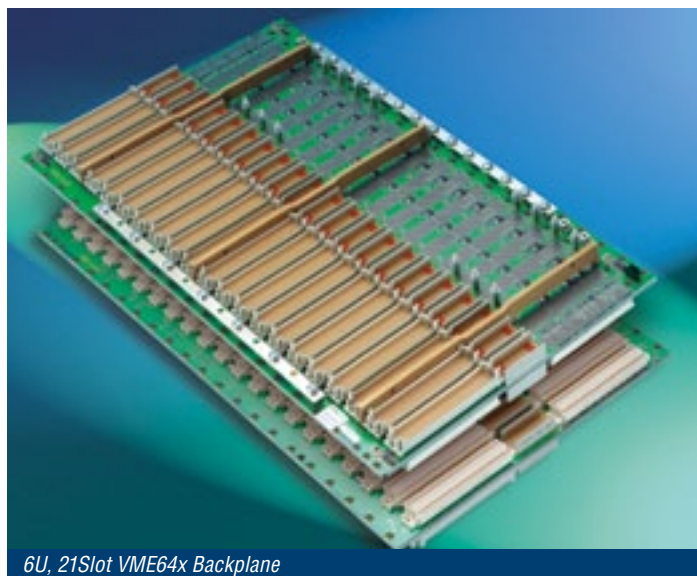
Backplane Width

Due to the width of the 160mm connector and real estate required for the termination networks, it is necessary to increase the width of the 2, 3 & 4 slot backplanes by 1 slot. They are therefore mechanically 3, 4 & 5 slots wide respectively, the extra slot being to the right of slot "n" when viewed from the connector side. 5-21 slot backplanes are true widths.

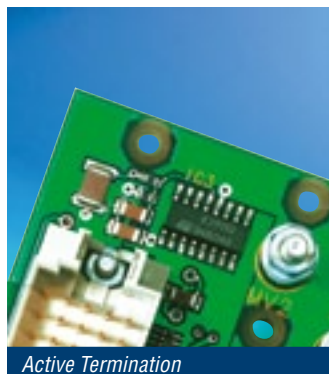
ORDERING INFORMATION

To configure your VME64 Extensions backplane, use the chart below:

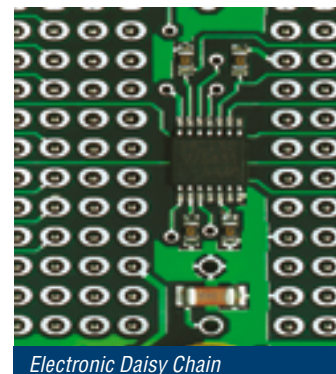
	P0 Connector option	3.3v Busbar / stiffener option	Slot Size
927-547	X	X	X X
	9 = Without P0 connector 0 = With P0 connector	2 = Without 3.3v busbar 6 = With 3.3v busbar	01-21



6U, 21Slot VME64x Backplane



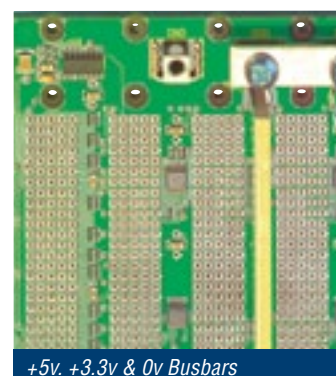
Active Termination



Electronic Daisy Chain



Auxiliary Power Studs



+5v, +3.3v & 0v Busbars

Backplanes and Extender Boards – VME64 Extensions

VME SERVICE HEADER

A 5way latchable service header is fitted to the wiring side of the backplane which is supplied with the mating half on a 1M cable. The lines and the relevant colours are: GND (Black), +5v (Red), ACFL (Blue), SYSFL (Grey), SYSRES (Orange).

6U VME64 EXTENSIONS EXTENDER BOARDS

Available with or without the centre P0 connectors, these 6U multilayer extenders are for use in VME64x applications and are designed to bring cards out of a system for fault diagnostic or development work. Jumper links are provided on all signal lines for interrogation and an additional connector is fitted for connection to a logic analyser or termination module. Available separately is a metal frame to support the card and provide extraction functionality by two ejector levers.

FEATURES

- 10 Layer stripline construction
- Individual signal track screening
- Jumper links on all signal tracks
- Connector position for logic analyser / terminator
- Optional card support frame with ejector mechanism
- Available with or without P0 connector

ENVIRONMENTAL

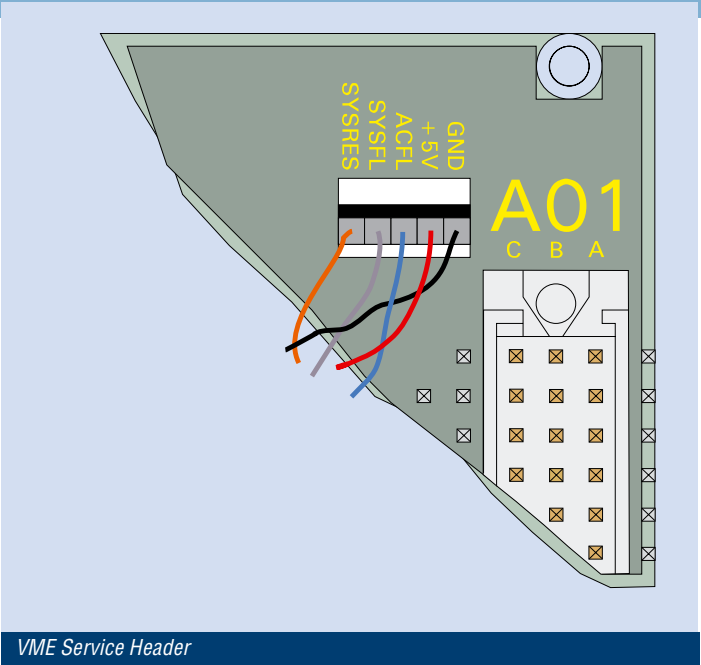
Temperature range (storage)	-55deg.C to +125deg.C
Temperature range (working)	-25deg.C to +85deg.C
Altitude	3000M
Humidity	90% R.H. non-condensing
Shock and vibration resistance	Exceeds ETS 300-019-2-5 (Table 2a T5.2)
MTBF to MIL-HBK-217E	>225,000 hours
Conditions:	Ground benign, temperature @ 25deg.C
Rapid decompression:	Exceeds DEF STAN 00-35 test CL9 class F(4)
Safety assessment (3rd party)	EN60950

SPECIFICATIONS

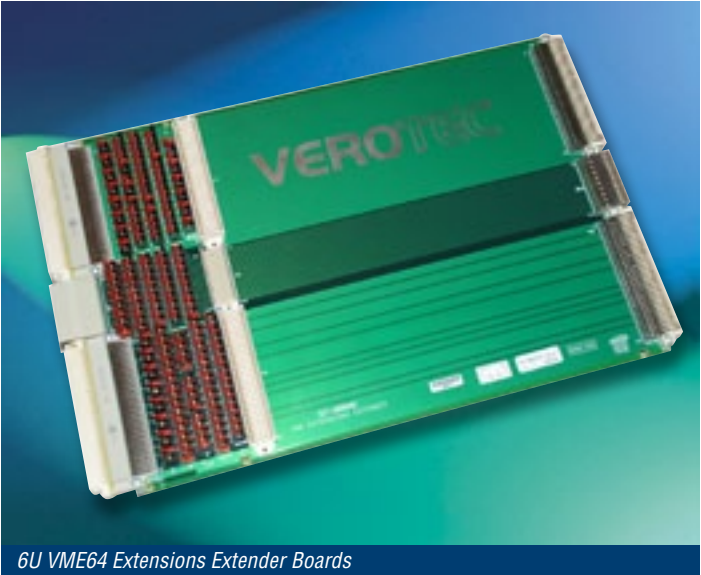
Board Height	6U (262.0mm)
Board Thickness	2.1mm (0.08")
Board Length	330.0mm (13")

ORDERING INFORMATION

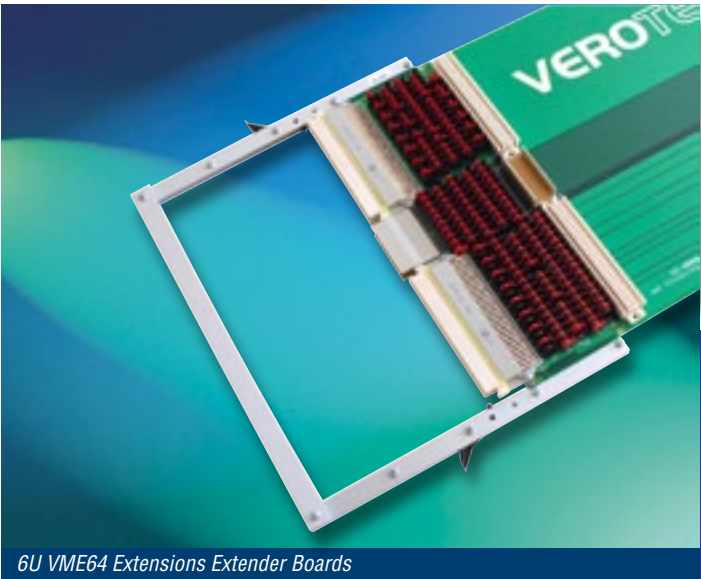
Description	Ordercode
6U VME64x Extender with P0 connector	927-4000603
6U VME64x Extender without P0 connector	927-4000604
6U VME64x Extender with P0 connector and support frame	927-4000783
6U VME64x Extender without P0 connector, with support frame	927-4000784



VME Service Header



6U VME64 Extensions Extender Boards



6U VME64 Extensions Extender Boards

INTRODUCTION

The specification governing VXIbus – an acronym for VMEbus eXtension for Instrumentation – defines the use of 4 x bus module sizes (fig.1), with the “A” and “B” modules being the same as 3U & 6U VMEbus cards. Although the VXI specification, broadly speaking, follows the VME standards, it includes defined functions on the P2 connector and a further set of functions on the P3 connector. The most important variation in the two standards arises from the fact that any VXIbus instruments incorporated in a system must be capable of being physically screened against EMC on all sides with a provision for additional chassis screening between instruments.

The Verotec range of VXI backplanes include “C” size (6U) and “D” size (9U) formfactors in a variety of slot widths which fully conform with the latest revision (rev.1.4) to the VXIbus specification. As with all our backplanes, we are able to offer semi or fully customised versions to suit unique applications

FEATURES

- Fully conforms to VXIbus specification (revision 1.4)
- 12 Layer stripline construction
- Tightly controlled characteristic impedance
- On-board passive termination
- Auto bus grant connectors fitted as standard
- Differential tracking and line length equalization techniques utilized to minimise signal skew on all high speed lines
- On-board socketed ECL buffers for CLK10 & CLK100 distribution.
- High speed decoupling capacitors positioned between termination networks.
- Exposed ground plane area to facilitate RFI grounding of plug-in modules.
- Additional decoupling capacitor positions provided between each connector slot to facilitate fine tuning of the system.
- High power versions available

ORDERING INFORMATION - STANDARD

Description	Dimensions	Ordercode
“C” Size, 5 slot	262.0 x 152.4cm	927-4001364
“C” Size, 6 slot	262.0 x 182.88cm	927-4001365
“C” Size, 13 slot	262.0 x 395.0cm	927-4001366
“D” Size, 5 slot	395.0 x 152.4cm	927-4001367
“D” Size, 13 slot	395.0 x 395.0cm	927-4001368

ORDERING INFORMATION – HIGH POWER

“C” Size, 13 slot	1.9KW	927-4001369
“D” Size, 13 slot	3.0KW	927-4001370

VXI HIGH POWER BACKPLANES

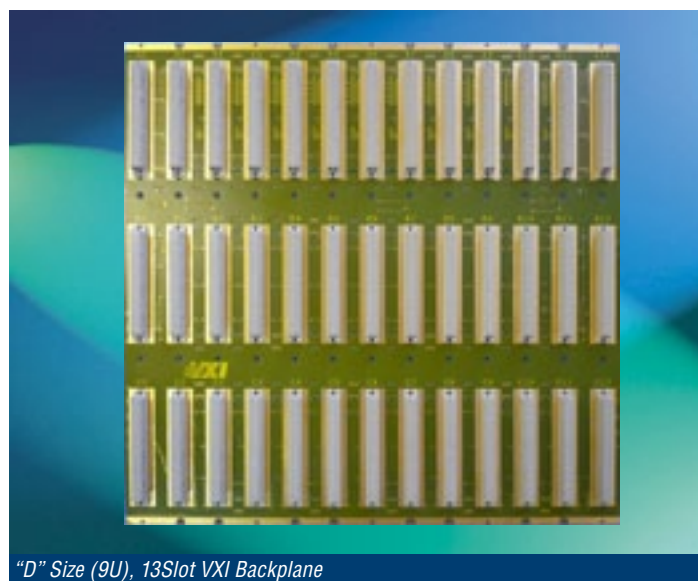
A high power option is available on 13 slot “C” and “D” size backplanes. Extra power positions are added to the backplane to ensure that every voltage can have the maximum current drawn as specified by the VXI specifications. To introduce the power on to the backplanes, special laminated busbars are used.

SPECIFICATIONS

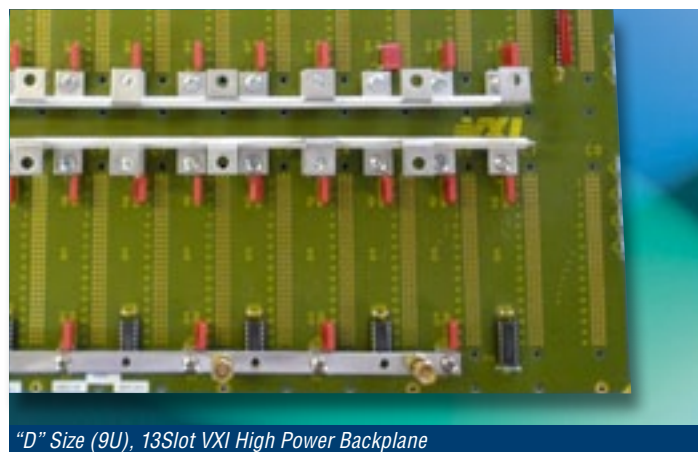
Board Thickness	5.35mm (0.21")
Connector Pitch	6HP (30.48mm/1.2")

ENVIRONMENTAL

Temperature range (storage)	-40deg.C to +120deg.C
Temperature range (working)	-20deg.C to +85deg.C
Altitude	3000M
Humidity	90% R.H. non-condensing
Shock and vibration resistance	Exceeds ETS 300-019-2-5 (Table 2a T5.2)
MTBF to MIL-HBK-217E	>225,000 hours
Conditions:	Ground benign, temperature @ 25deg.C
Rapid decompression:	Exceeds DEF STAN 00-35 test CL9 class F(4)
Safety assessment (3rd party)	EN60950

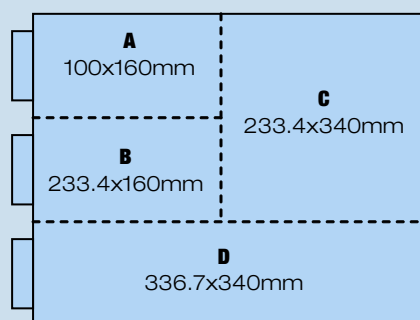


“D” Size (9U), 13Slot VXI Backplane

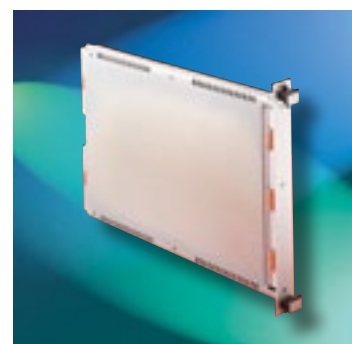


“D” Size (9U), 13Slot VXI High Power Backplane

Figure 1



For information on VXI duty modules & accessories, please refer to page 2.26 of the “Front Panels & Plug-in Units” section.



INTRODUCTION

Defense and aerospace system designers are looking to serial switch fabric architectures to provide an interconnect able to deliver cost-effective systems with bandwidth and performance levels unreachable by traditional VME-based systems. While VME continues to provide an excellent solution for a great number of applications, it is unable to provide the bandwidth and performance required to address new specialized multiprocessing tasks.

VPX (VITA 46) is one of two new standards recently developed to address demanding applications that require throughput greater than 320 Mbytes/s and to provide multiprocessing and streaming I/O beyond the capability of VME's parallel bus architecture

The new, rugged, conduction-cooled board architecture is targeted at switched fabric signaling rates of up to 6.25 Gbits/s, exceeding VME's limit of about 1 Gbits/s. VPX uses the high-speed multi-gig connector in a mesh topology, vastly increasing the potential bandwidth of the system, while maintaining backward compatibility with legacy VME technology via preservation of the VMEbus 6U mechanical form factor and through-mapping of the current VMEbus signals to the VITA 46 connectors.

VPX combines best-in-class technologies to assure a very long technology cycle similar to that of the original VMEbus solutions. Traditional parallel VMEbus will continue to be supported by VPX through bridging schemes that assure a solid migration pathway.

Verotec's expertise in Backplane technology and its resources in the latest, sophisticated design tools have been applied to produce a unique range of VPX Backplanes, including hybrid versions that incorporate the standard 160mm DIN connector, allowing backward compatibility with VME64x. The VPX Backplanes match performance and cost-effectiveness by realising a fully optimised signal and power distribution environment. Design techniques ensure uniform impedance controlled signaling environment and ground guarding minimises line-to-line crosstalk.

FEATURES

- Compliant to the latest VITA 46 Standards
- Various slot widths
- 3U or 6U standard Eurocard formfactor
- Hybrid versions available
- High speed, multi-gig connector
- High performance, low noise

ORDERING INFORMATION

Due to the custom nature of VPX applications, we normally design and manufacture your backplane product to order. We do however hold a number of standard configurations in stock which are ideal for development work and prototyping. Please contact us for further details.

Far Right: VPX adopts the standard 3U/6U Euro-card formfactor with rear plug-up.

Right: Diagram showing 6U connector arrangement.

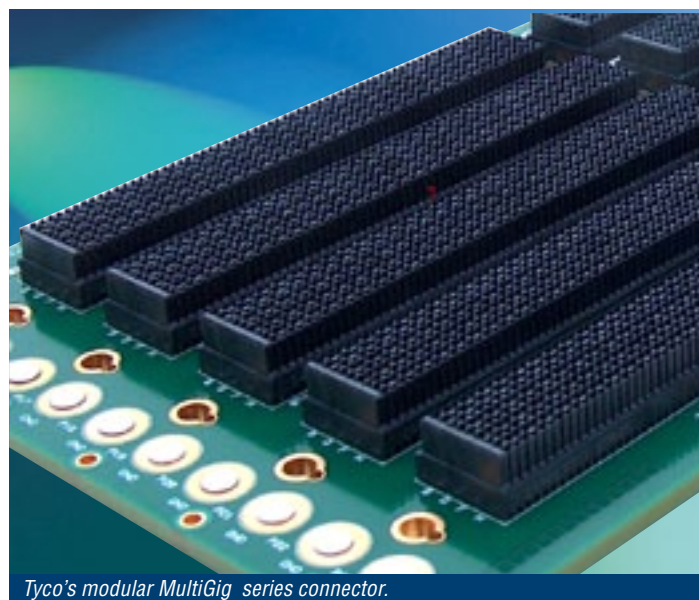
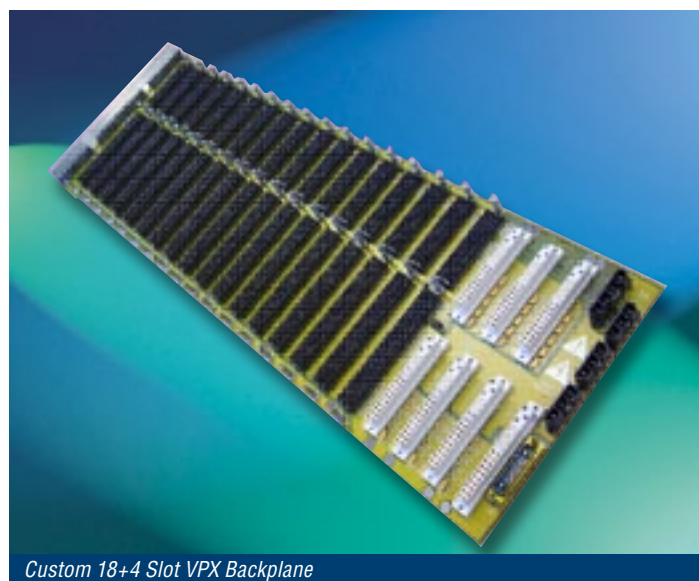


FIGURE 1

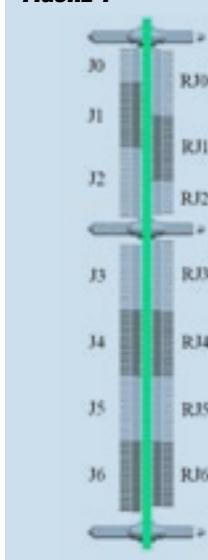
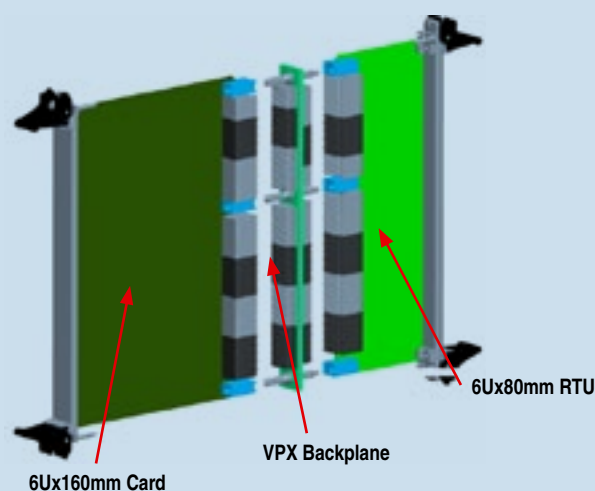


FIGURE 2



Backplanes and Extender Boards – VX5 (VITA 41)

INTRODUCTION

Defense and aerospace system designers are looking to serial switch fabric architectures to provide an interconnect able to deliver cost-effective systems with bandwidth and performance levels unreachable by traditional VME-based systems. While VME continues to provide an excellent solution for a great number of applications, it is unable to provide the bandwidth and performance required to address new specialized multiprocessing tasks.

VXS (VITA 41) is one of two new standards recently developed to address demanding applications that require throughput greater than 320 Mbytes/s and to provide multiprocessing and streaming I/O beyond the capability of VME's parallel bus architecture.

VXS stands for VMEbus Switched Serial Standard. The standard is VITA 41. VXS has the same form factor as standard VME boards, but uses a different type of P0 connector and a different electrical interface.

The VXS specification defines 2 types of boards: Payload cards and Switch cards. Payload cards are standard VME64x boards with a new P0 connector for serial links. Switch cards are not backward compatible with the legacy VMEbus standard via P1 and P2 connectors.

VXS Backplanes may operate in a number of configurations; Star, Dual-Star, Mesh, or Daisy-Chain. VXS supports InfiniBand bus, Serial RapidIO, Gigabit Ethernet, and PCI Express Bus.

FEATURES

- Compliant to the latest VITA 41 Standards
- Various slot widths
- 6U standard Eurocard formfactor
- Hybrid versions available
- High speed, multi-gig connector
- High performance, low noise

ORDERING INFORMATION

Due to the countless possible VXS configurations, we design and manufacture your backplane product to order. We do however have two hybrid VME64x and VXS standard product designs available as shown.

Bus Structure

8 Slot Hybrid Version

Dual VITA 41 Switches (7-8)
4 x VXS Payload slots (3-6)
2 x VME64x slots (1+2)

21 Slot Hybrid Version

Dual VITA 41 Switches (1 & 21)
18 x VXS Payload slots (3-20)
1 x VME64x slot (2)

Electrical

Termination
Impedance

Passive, on-board, 330/470ohm
50 Ohms (VME), 100 Ohms (Differential, VXS)

Decoupling

High frequency decoupling at each slot, distributed Low frequency bulk decoupling.

Control

System header for SYSRESET, SYSFAIL, ACFAIL, +5v, GND

Power Distribution

35A Screw terminals for +5v, +3.3v & GND 15A Spade terminals for +/-12v, V1/V2

Environmental

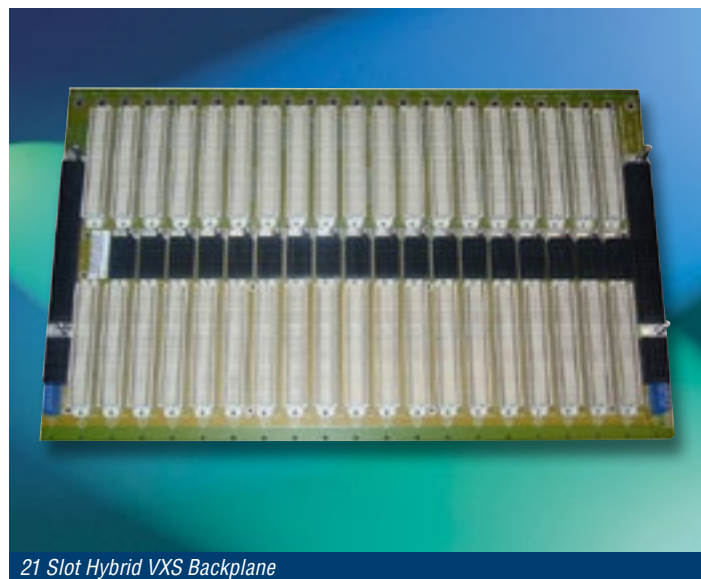
Temperature range (storage)
Temperature range (working)
Flammability Rating

-40deg.C to +125deg.C
-20deg.C to +75deg.C
UL94-V0

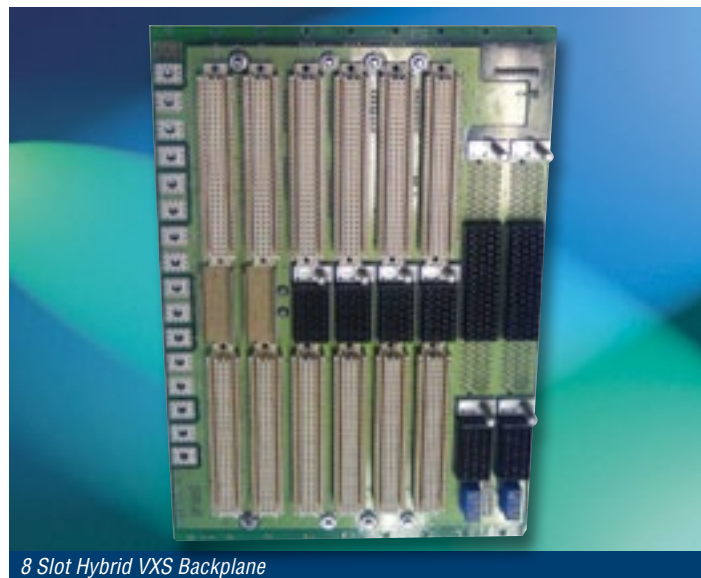
Compliance

Regulatory

ANSI/VITA 41.0, 1.1-1997
Designed to meet UL, CSA, CE requirements



21 Slot Hybrid VXS Backplane



8 Slot Hybrid VXS Backplane

VXS Formfactor

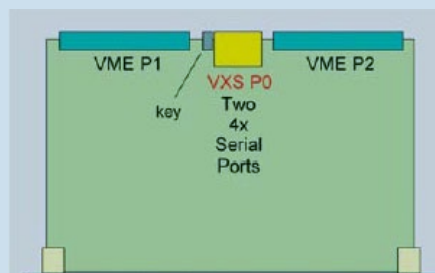


Figure 1. VXS Payload Card

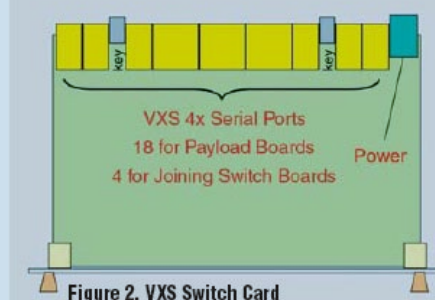


Figure 2. VXS Switch Card

Introduction

CompactPCI is an adaptation of the Peripheral Component Interconnect (PCI) Specification, revision 3, for industrial and/or embedded applications that require a more robust mechanical form-factor than the normal desktop PCI.

CompactPCI uses industry standard mechanical components, such as Verotec's KM6-RF subrack, high-performance connector technologies and cost-effective PCI components to provide an optimised system solution which is electrically compatible with the PCI specification but ideal for applications in a more rugged environment.

Supported, and controlled, by PICMG (PCI Industrial Computer Manufacturers Group), CompactPCI is an open specification. PICMG is a consortium of companies involved in utilizing PCI for embedded applications.

STANDARD 3U & 6U HOT SWAP CompactPCI BACKPLANE

Our standard range of high performance, hot swap CPCI backplanes are available in 3U and 6U form factors and from 2 to 16 slots wide*. The generic base design allows many different product configurations to be realised, making them suitable for a wide range of end user applications. Other variations can be designed on a custom basis, giving customers the ability to specify a backplane to their exact requirements. To configure a backplane, please use the table on the following page.

* Note: A rear pallet bridge is required for backplanes above 8 slots wide.

Features

- Compliant to PICMG 2.0 Revision 3
- Compliant to PICMG 2.1 Revision 2
- 2-16 slot widths in 3U or 6U formfactors
- PCI-PCI bridging technology available for 9+ slot backplanes
- User selectable 32-bit or 64-bit PCI transfer bandwidth
- User selectable 33 or 66MHz clock speed (33MHz factory set)
- User definable I/O areas – P3, P4, P5
- Service header for access to controller slot signals and PSU
- User selectable coded 5v or 3.3v signalling environment
- 10 layer construction
- Tri-length pin staging on P1/P2 (eg. make first / break last)
- Matched trace lengths for clock signal to each slot
- Controlled characteristic impedance (Z0) 65ohms
- Flexible power connection options
- Right or Left hand system slot
- High reliability; MTBF >200,000 hours

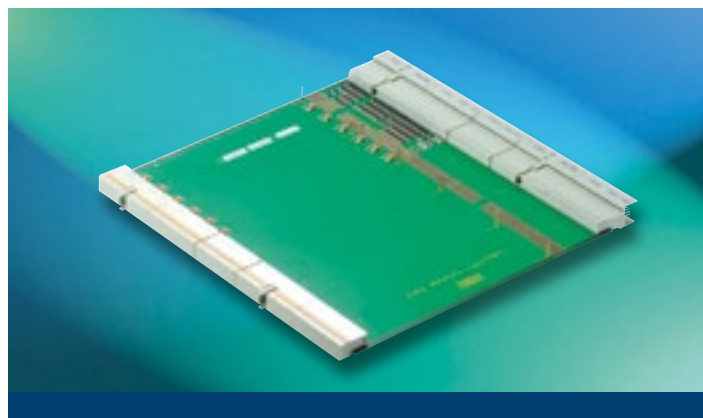
CompactPCI EXTENDER BOARD

Features

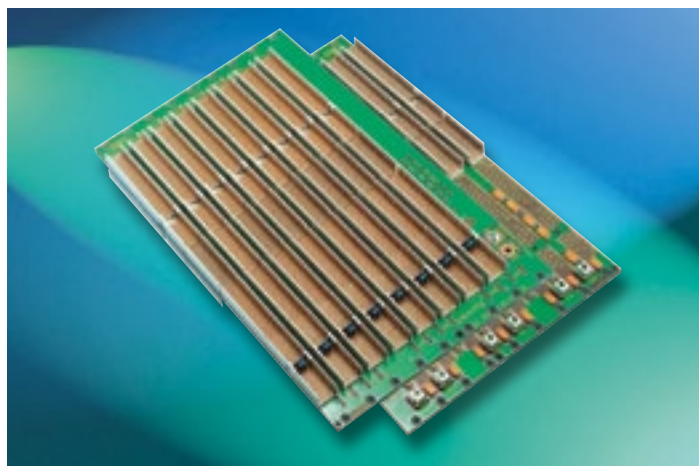
- 3U or 6U x 1.6mm thick x 180mm long
- Tracks all CompactPCI and user defined signal lines
- Test point array with reference designation on all signal tracks
- Integrated power decoupling
- 65ohm controlled characteristic impedance
- Silicon Schottky diode termination

ORDERING INFORMATION

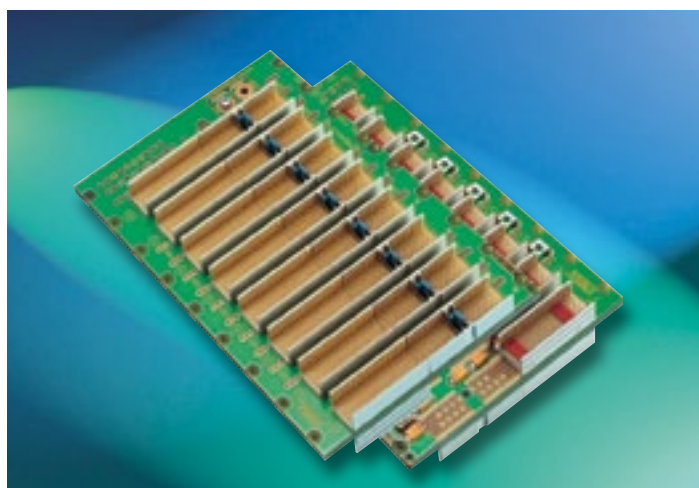
Description	Ordercode
3U CPCI extender board	927-4001371
6U CPCI extender board	927-4001372



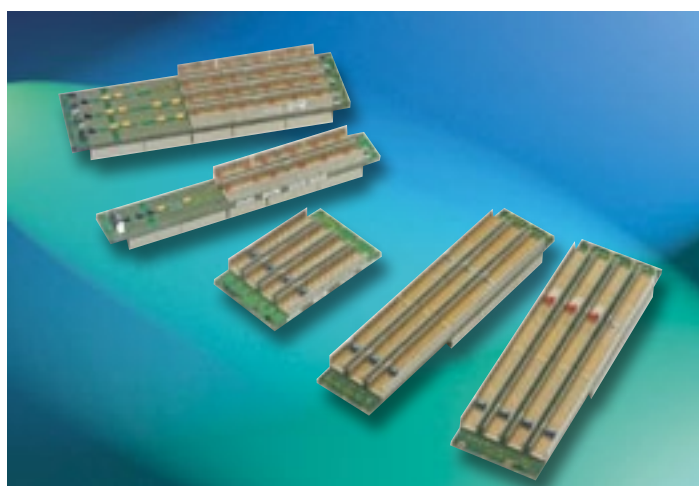
CompactPCI®



6U, 8 Slot Hot Swap CompactPCI Backplane



3U, 8 Slot Hot Swap CompactPCI Backplane



3U & 6U Hot Swap CompactPCI Backplanes

CompactPCI COMPUTER TELEPHONY / H.110 BACKPLANES

The primary objective of Computer Telephony (CT) is to extend the capabilities of the 6U CompactPCI form factor to support the application needs of the telecommunications industry.

The PICMG Computer Telephony and ECTF (Enterprise Computer Telephony Forum) H.110 requirements define the industry standards for CompactPCI and CT system vendors products, ensuring multi-vendor interoperability based on an open architecture. These computer telephony specifications define the use of IEEE 1101.10/11 for mechanics and hardware.

On CT/H.110 backplanes, the P4 connector is used for implementing the H.110 TDM bus signals as well as the telecom power rails and control signals. It has 3 different mating length pins and is selectively loaded in order to meet the hazardous voltage safety requirements. The P5 connector is used for telephony I/O with 3 mating levels provided according to the pin assignments.

Features

The features described below are in addition to those described on the previous page for standard hot swap CompactPCI backplanes.

- Compliant to PICMG CT specification
- Provision for Intra-system isochronous (TDM) media transport
- Common telephony I/O definition
- Reliable hot-swap of CT and peripheral boards
- Conformance with world wide safety regulations
- Compliant to ECTF H.110 specification
- P4/J4 implementation
- Interleaved grounds
- CT Bus lengths minimised from connector to I/O cell
- Maximum slot support – 16 slots
- 6U form factor
- P3 user definable I/O
- Telecoms power connectors

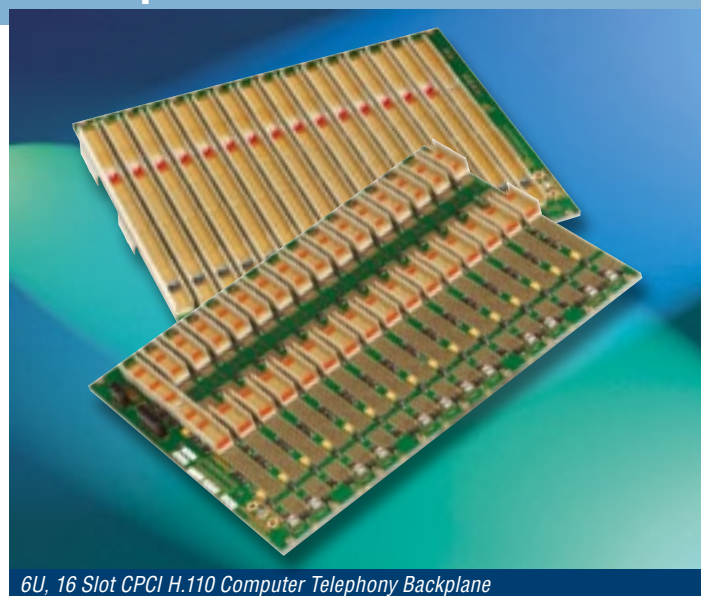
ORDERING INFORMATION

To configure a standard backplane, use the table below:

	927-5	X	X	X	X	XX
Bandwidth / I/O Voltage						
32-Bit, 3.3v	5					
64-Bit, 3.3v	6					
32-Bit, 5.0v	7					
64-Bit, 5.0v	8					
Form factor / Hand						
3U, left hand		1				
6U, left hand		2				
3U, right hand		3				
6U, right hand		4				
Backplane Type						
Standard Hot Swap (No rear I/O)			0			
Standard Hot Swap (with rear I/O)			1			
CT/H.110			3			
Power-on Option						
Powerbug				1		
6.3mm Faston				2		
Busbar				3		
ATX Header				4		
P47 Positronic				5		
Slot Width						
02-16						02-16

CompactPCI PICMG 2.16 BACKPLANES

PICMG 2.16 supplements the robust, reliable and hot-swap capable CompactPCI architecture with the easily integrated, low-cost, high-performance, and extensible Ethernet. The 2.16 specification extends rather than replaces CompactPCI because it over-lays, on the P3 connector, up to two embedded switched Ethernet networks in a star-topology. Slots can be routed either as "Fabric" or "Node" slots with a separate system / controller slot if required.



6U, 16 Slot CPCI H.110 Computer Telephony Backplane

SPECIFICATIONS (FOR STANDARD HOT SWAP AND CT/H.110 BACKPLANES)

Physical

Nominal thickness	5.6mm
3U height	128.70mm
6U height	262.05mm

Electrical

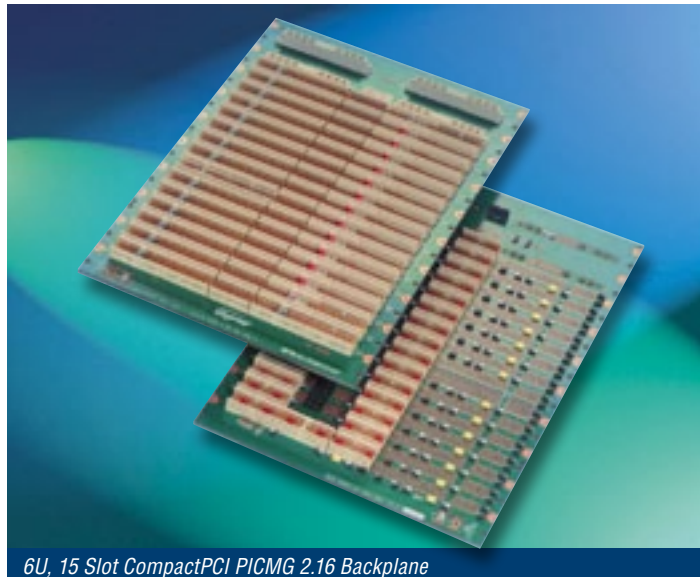
Crosstalk	94.0mV
Impedance	65ohms +/-10%
Ground bounce	50mV

Environmental

Temperature range (storage)	-40deg.C to +120deg.C
Temperature range (working)	-20deg.C to +85deg.C
Altitude (operating)	12,100M (40,000ft)
Humidity	95% R.H. non-condensing
Shock & Vibration	Exceeds ETS 300-019-2-5 Table 2a T5.2
MTBF	To MIL-HDBK-217F (>200,000 hours)
Rapid decompression	Exceeds DEF STAN 00-35 test CL9 class F(4)

Regulatory

Designed to meet UL, CSA, CE requirements



6U, 15 Slot CompactPCI PICMG 2.16 Backplane

Features

The features described below are in addition to standard hot swap CompactPCI backplanes.

- Compliant to PICMG 2.16 specification
- 6U formfactor, 4-16 slot widths
- Single or Dual fabric with optional system / controller slot

ORDERING INFORMATION

Please contact Verotec for further details



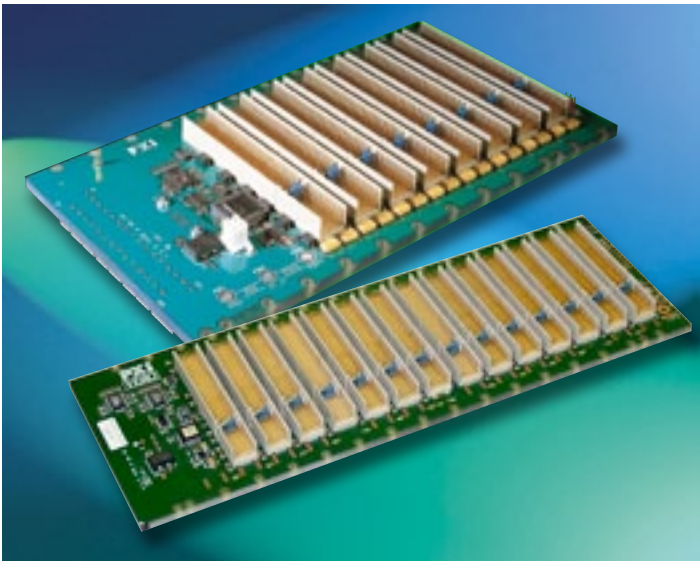
INTRODUCTION

PXI (CompactPCI eXtensions for Instrumentation) was developed to fulfil the requirements of users, primarily of instrumentation and automation systems, who needed increased performance, reliability and functionality from compact, PC based systems. In order to allow users to benefit from existing software and component availability, PXI maintains compatibility with industry standard PCs.

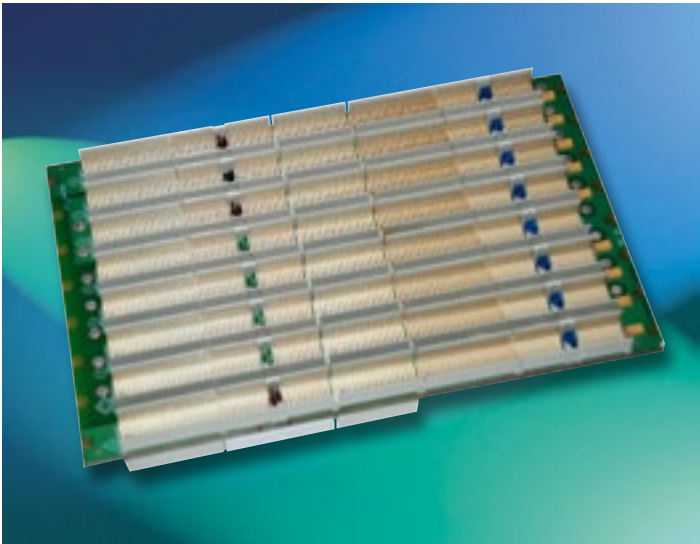
PXI adopts the electrical specification of the Peripheral Component Interface (PCI) and the physical specification and high performance connectors and rugged packaging systems of CompactPCI. This permits both PXI and CompactPCI to implement up to seven peripheral slots as opposed to four in a conventional PCI system. By employing PCI-PCI bridges systems can be configured which accommodate a higher number of slot positions.

The PXI specification introduces electrical features such as triggering and system clock capabilities to satisfy the requirements of high performance instrumentation applications, as well as offering two-way interoperability with CompactPCI products. In common with CompactPCI, PXI can draw on a large, standing base of industry-standard software, ranging from a low-level device driver via operating systems to complete, high-level graphical Application Programming Interfaces.

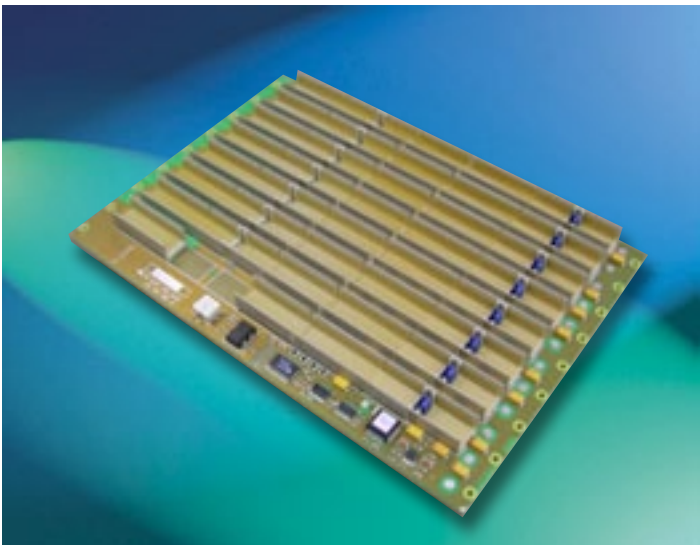
PXI also implements VISA (Virtual Instrumentation Software Architecture), used to locate - and communicate with - serial, VXI and GPIB interface modules. The capabilities of VISA is extended by PXI beyond the limits of these interfaces, allowing for the locaion and control of PXI modules. The instrumentation software model adopted by the instrumentation community is preserved by PXI.



3U, 8 Slot & 14 slot PXI Backplane



6U, 8 Slot PXI Backplane



Custom 6U, 8 Slot PXI Backplane

FEATURES

- Compliant to PXI Revision 2.2
- Compliant to PICMG 2.0 Revision 3.0
- Hot Swap compliant to PICMG 2.1 Revision 2.0
- 3U & 6U versions, 4-18 slots wide
- 8-14 Layer PCB
- 32/64Bit, 33/66MHz clock
- 10MHz clock driver on backplane
- Standard and custom versions available
- Rear pallet PXI bridge for higher slot counts (straight CPCI female connectors for bridge, plugged on the extended pins of the front CPCI P1 & P2 connectors)
- High performance, low noise
- Controlled characteristic impedance @ 65/75ohms
- Matched trace length for PXI_CLK10 and PXI_STAR signals
- 24-Way latchable service header for DEG, FAL, PRST signals & remote voltage sense for +5v, +3.3v, +/-12v

SPECIFICATIONS

Bus Structure

PXI 64 Bit, system slot left

Bridge

Rear mounted PXI 64Bit pallet bridges with user selectable trigger detection; factory setting is right to left.

Environmental

Temperature range (storage)	-40deg.C to +125deg.C
Temperature range (working)	-20deg.C to +75deg.C
Flammability Rating	UL94-V0
Humidity	95%
Regulatory	Designed to meet UL, CSA, CE requirements

ORDERING INFORMATION

Description	Ordercode
3U, 8 slot PXI Backplane	927-4001724
6U, 8 slot PXI Backplane	927-4001724
3U, 14 slot PXI Backplane	927-4001724

Legacy Backplanes – STEbus, G-64bus & G-96bus

INTRODUCTION – LEGACY BACKPLANES

To provide continued support for legacy bussed systems, Verotec offer a range of backplanes including Multibus, Multibus II, STEbus, G64 & G96.

Multibus iPSB Backplanes

- Fully conforms to the Intel Multibus specification revision 04 – June 1982, IEEE 796
- Multilayer construction
- 6.3mm spade terminals for power
- Interlocking fingers allow positive location of iLBX

Multibus iLBX Backplanes

- Fully conforms to the Multibus specification revision 04 – June 1982, IEEE 796
- Double sided construction
- Earth guard tracking
- 6.3mm spade terminals for power
- Interlocking fingers allow positive location of iLBX

Multibus II iPSB Backplanes

- Fully conforms to the Multibus II specification – IEEE 1296
- 6 layer construction
- On-Board or Off-Board passive termination (2 x terminator modules supplied with off-board versions)
- High speed decoupling capacitors

Multibus II iLBX Backplanes

- Fully conforms to the Multibus II specification – Revision C, 1984 – IEEE 1296
- Multilayer construction
- Off-Board passive termination (Supplied with 1 x terminator)
- High speed decoupling capacitors

ORDERING INFORMATION - BACKPLANES

Description	Number of slots	Ordercode
Multibus iPSB	6	927-4001373
Multibus iPSB	12	927-4001374
Multibus iLBX	6	927-4001375
Multibus II iPSB – Off board termination	5	927-4001376
Multibus II iPSB – Off board termination	7	927-4001377
Multibus II iPSB – Off board termination	10	927-4001378
Multibus II iPSB – Off board termination	15	927-4001379
Multibus II iPSB – Off board termination	20	927-4001380
Multibus II iPSB – On board termination	8	927-4001381
Multibus II iPSB – On board termination	10	927-4001382
Multibus II iPSB – On board termination	20	927-4001383
Multibus II iLBX - Off board termination	2	927-4001384
Multibus II iLBX - Off board termination	3	927-4001385
Multibus II iLBX - Off board termination	4	927-4001386
Multibus II iLBX - Off board termination	6	927-4001387

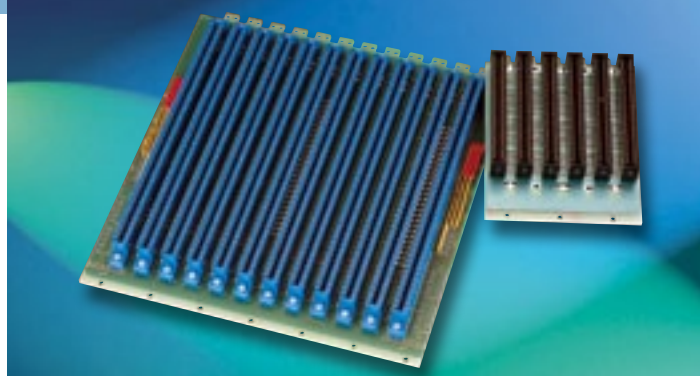
MULTIBUS ACCESSORIES

Terminator modules are available separately for off-board terminated backplanes. iPSB types are supplied in pairs where as iLBX are supplied singly. Both are rear mounted at right angles to the backplane.

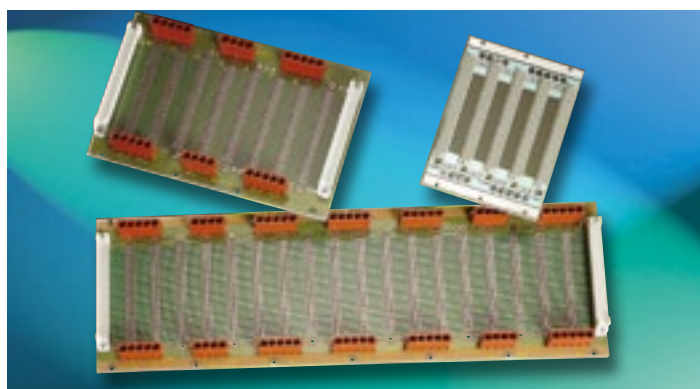
Extender boards are multilayer in design with earth guard tracking for improved signal integrity. Included are jumper links for signal line interrogation and an addition connector into which a terminator or logic analyzer can be connected.

ORDERING INFORMATION – ACCESSORIES

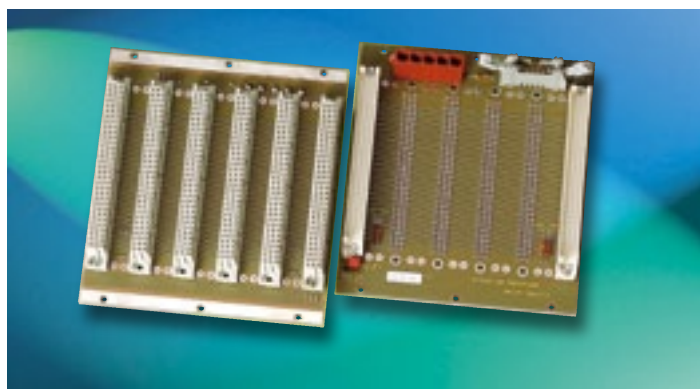
Description	Ordercode
Multibus II iPSB Terminator module	927-4001388
Multibus II iLBX Terminator module	927-4001389
Multibus II iPSB Extender board	927-4001390
Multibus II iLBX Extender board	927-4001391



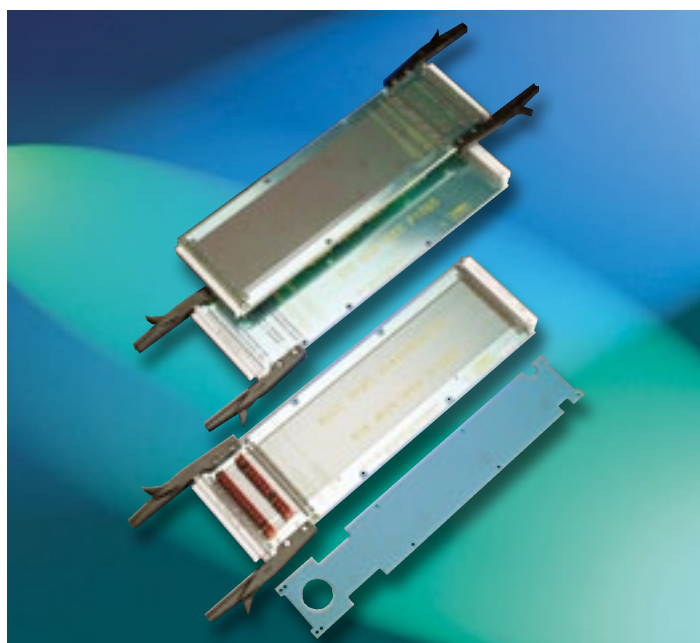
Multibus II iLBX Backplanes



Multibus II iPSB Backplanes



Multibus iPSB & iLBX Backplanes



Multibus II Extender Boards

Legacy Backplanes – STEbus, G-64bus & G-96bus

STEBUS BACKPLANES

- Fully conforms to the STEbus specification – IEEE 1000
- Available in a wide range of slot widths
- Pick-up positions provided by a pin header for SYSRST, ATNRQ0, TFRERR,

0V AND +5V

- Connector rows “a” and “c” fully bussed and terminated
- Controlled characteristic impedance
- Off board termination
- 3-10 slot widths: double sided construction
- 14-21 slot widths: multilayer construction
- Earth guard tracking on multilayer versions
- Additional rear plug-up connector for remote diagnostics

G-64BUS BACKPLANES

- Fully conforms to the G-64 bus specification, revision 02, 1984
- Double sided PTH board
- 5 standard slot widths
- Controlled characteristic impedance
- Full ground plane screen
- 6.3mm spade terminals for power

G-96BUS BACKPLANES

- Fully conforms to the G-64 bus specification, revision 02, 1984
- Double sided PTH board
- 5 standard slot widths
- Controlled characteristic impedance
- On-board passive termination
- Full ground plane screen
- 6.3mm spade terminals for power

ORDERING INFORMATION – BACKPLANES

Description	Number of slots	Ordercode
STEBus Backplane (Double sided)	3	927-4001392
STEBus Backplane (Double sided)	4	927-4001393
STEBus Backplane (Double sided)	5	927-4001394
STEBus Backplane (Double sided)	7	927-4001395
STEBus Backplane (Double sided)	10	927-4001396
STEBus Backplane (Multilayer)	14	927-4001397
STEBus Backplane (Multilayer)	21	927-4001398
G-64bus	4	927-4001399
G-64bus	8	927-4001400
G-64bus	12	927-4001401
G-64bus	16	927-4001402
G-64bus	20	927-4001403
G-96bus	4	927-4001404
G-96bus	8	927-4001405
G-96bus	12	927-4001406
G-96bus	16	927-4001407
G-96bus	20	927-4001408

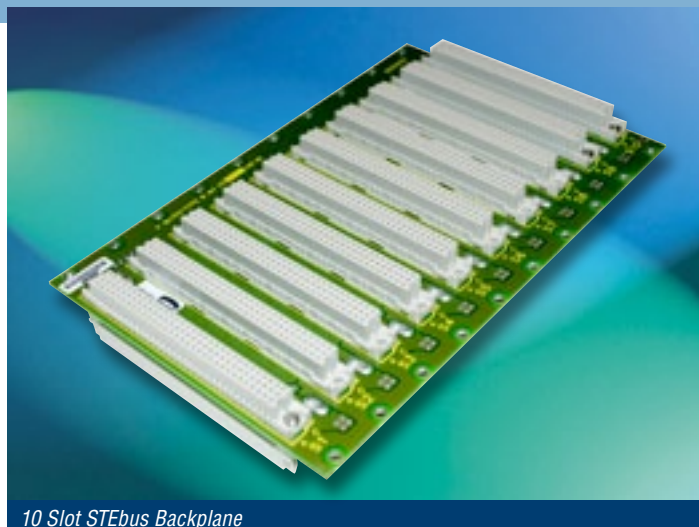
STEBUS ACCESSORIES

Terminator modules are available separately for STE backplanes and simply plug in to the rear of the backplane in the first and last slots. They are a 3 layer construction incorporating an active design with all 49 signal lines terminated via a 270 ohm series resistor.

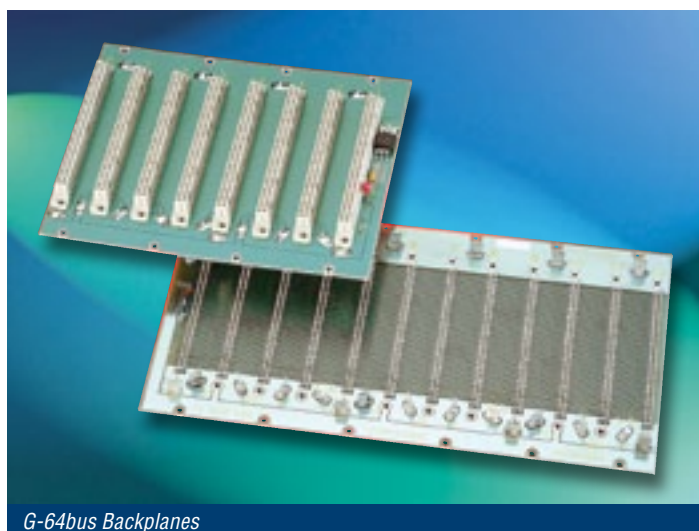
Extender boards are available in two versions; “Standard” extender boards are double sided and suited to basic applications whereas “Enhanced” incorporate a multilayer design for high performance applications. Both provide jumper links for signal line interrogation and an addition connector into which a terminator or logic analyzer can be connected.

ORDERING INFORMATION – ACCESSORIES

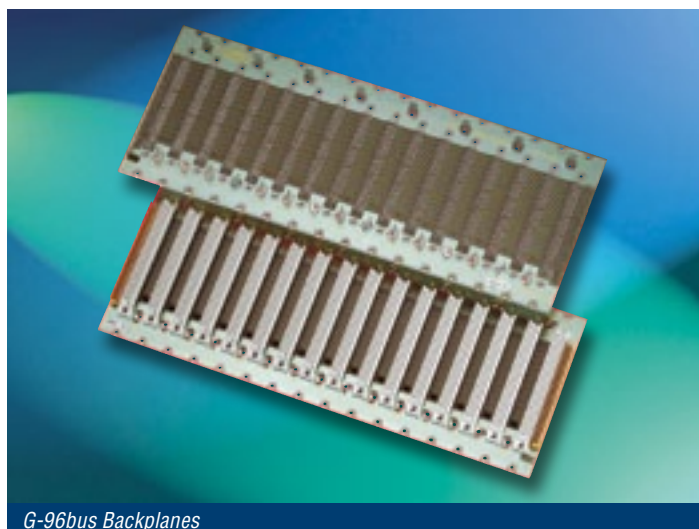
Description	Ordercode
STEBus Terminator module (supplied singly)	927-4001409
Standard (double sided) STEbus Extender board	927-4001410
Enhanced (multilayer) STEbus Extender board	927-4001411



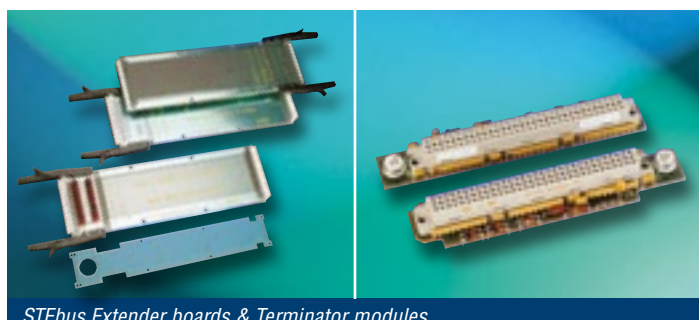
10 Slot STEbus Backplane



G-64bus Backplanes



G-96bus Backplanes



STEbus Extender boards & Terminator modules

Backplanes and Extender Boards – Custom Backplanes

INTRODUCTION

Many years of design knowledge and expertise in backplane technology means that, in addition to our standard products, we're able to offer modified standard or fully custom designs to your specifications.

DESIGN

Our designers work with leading standards organizations to bring to market the latest open-architecture products. Our knowledge and experience means we can meet the most demanding design specifications whilst rising to the challenges of modern day environmental issues.

Verotec uses a number of software tools to aid backplane design, including Cadence Allegro, Mentor Graphics and Pads.

DESIGN CAPABILITIES / EXPERIENCE

- Large library of standard parts
- Extensive knowledge of connector technologies
- Experience in high speed signal transmission
- Controlled differential / characteristic impedances
- Large format & high layer count designs
- Power distribution and decoupling
- Crosstalk reduction and termination techniques
- Environmental issues (EMC, Shock & Vibration etc.)
- Regulatory compliance (CE, RoHS, UL etc.)
- Standards compliance (PICMG, VITA etc.)



Backplane Design

MANUFACTURING / QUALITY / TEST

The backplane manufacturing facility we use in the UK is at the forefront of technology and is equipped with some of the latest surface mount, wave solder, press fit and testing machinery available. Assembly and test facilities are ESD protected whilst fully trained and skilled operators ensure products meet the highest quality standards.

Every backplane is tested and inspected before it leaves the factory with our standard of backplane workmanship meeting the requirements of IPC610 Class III.

All Verotec backplanes are manufactured with systems approval in accordance with ISO 9001:2000 and meet the requirements of ROHS 2002/95EG.

MANUFACTURING CAPABILITIES

Surface Mount

- PCB's up to 1,500mm x 800mm
- Rapid change-over times
- In-line inspection
- Process compatibility with PIHIR (pin-in-hole-intrusive-reflow) assembly techniques

Pressfit

- Semi and Fully-Automatic Presses
- Computer controlled insertion
- Manual presses 12Kn to 40Kn

Soldering

- Lead-free flow soldering
- Computer controlled wave forms
- Adjustable width for speedy changeovers
- Vapour phase reflow oven, ideal for large, thick backplanes and heavy power planes, with uniform heat dissipation and no 'hot-spots'

Test

- Terotest LINX backplane Intelligent Module, backplane Testers ~ 65,550 node count
- Robot tester for testing high complexity, large pin field backplanes
- Optical inspection for pin alignment to 0.25mm



ROBAT Backplane test



Automatic connector press

