40-785B
Microwave Multiplexer Module

- Single or Dual 6 Channel Panel Mounted Multiplexer
- Up To 3 Remote Multiplexers From Single Slot Version
- 18GHz, 26.5GHz 40GHz & 50GHz Versions
- 50Ω Terminated and Unterminated Versions
- 75Ω Version With 2.5GHz Bandwidth
- LED Indication
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- 3 Year Warranty

Pickering Interfaces PXI Microwave multiplexer modules are suitable for switching 50Ω signals up to 50GHz. The 40-785B is available as a single or dual 6 channel multiplexer with relays mounted on the front panel. The single slot version can support up to three remotely mounted multiplexers supplied with the module.

The single slot remote multiplexer versions occupy less PXI panel space and allow the microwave relays to be placed closer to the UUT and other RF test equipment. In some applications they can shorten the length of RF cable runs and improve system performance. The remote multiplexers are supplied complete with a 1.5m interface cable.

A 50Ω terminated version with panel mounted multiplexers is also available that occupies 4 or 6 (for the dual version) slots.

A 75Ω version is available with a bandwidth of 2.5GHz, using Siemens 1.6/5.6 style 75Ω connectors.

The 40-785B is suitable for constructing complex microwave switching networks and provides a range of switching configurations to suit most applications. Connection is by high performance SMA, SMA-2.9 and SMA-2.4 connectors for 50Ω versions.

Single slot version controls 1, 2 or 3 remotely mounted microwave multiplexers via interface cables

Model 40-785B-522 Features 2 Separate Non Terminated 6 Channel Microwave Multiplexers (model 40-785B-521 has 1 multiplexer bank) Default State Shown
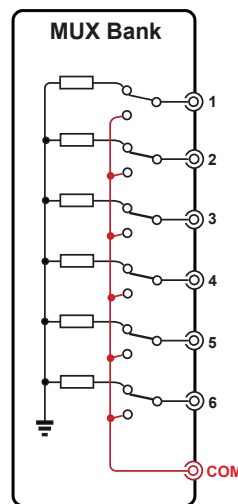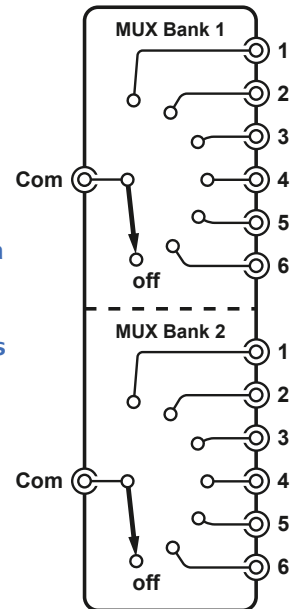
Model 40-785B-521-T Features a single Terminated 6 Channel Microwave Multiplexer (model 40-785B-522-T has 2 multiplexer banks) Default State Shown

These modules offer high RF & Microwave performance with applications mainly in the Microwave region, however there are many uses in the RF spectrum where extremely low insertion loss and ultra-high isolation are critical.

Specification

General Multiplexer Information

Relay Manufacturer:	Radiall
Configuration:	SP6T Microwave Multiplexer with 1, 2 or 3 independent banks.
LED Indicators:	Multiplexers have blue LEDs to indicate a closed RF path.
Operate Time:	Typically 15ms
Maximum Cold Switch Voltage:	100V
Maximum Carry Current:	1A

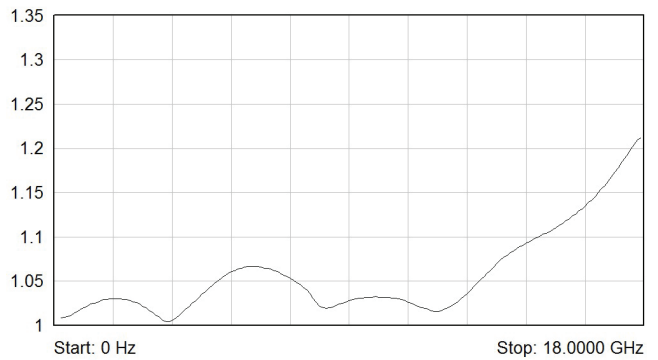## Multiplexer Specification - 18GHz Versions

|	
Characteristic Impedance:	50Ω
Connectors:	SMA
Bandwidth	DC to 18GHz
Isolation:	80dB (0-3GHz) 70dB (3-8GHz) 60dB (8-12.4GHz) 60dB (12.4-18GHz)
Insertion Loss:	0.2dB (0-3GHz) 0.3dB (3-8GHz) 0.4dB (8-12.4GHz) 0.5dB (12.4-18GHz)
VSWR:	1.2:1 (0-3GHz) 1.3:1 (3-8GHz) 1.4:1 (8-12.4GHz) 1.5:1 (12.4-18GHz)
Maximum RF Carry Power:	240W (0-3GHz) 150W (3-8GHz) 120W (8-12.4GHz) 100W (12.4-18GHz)
Termination Power Rating:	1W per termination, 3W total per 6 channel multiplexer.
Expected Life (Low Power)	18GHz option >5 million operations
	18GHz terminated option >2 million operations
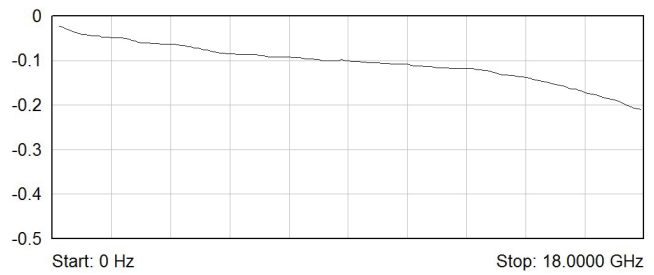
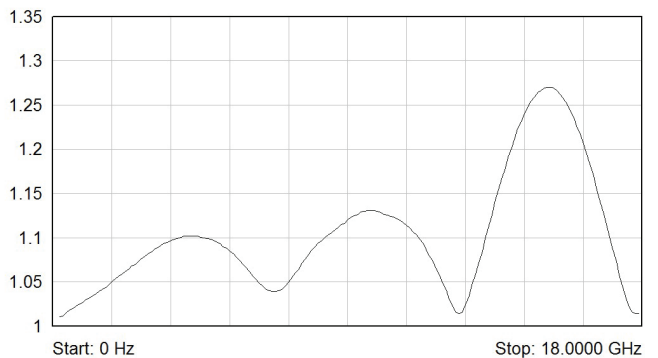**Typical Insertion Loss (dB) Plot for 18GHz Versions**
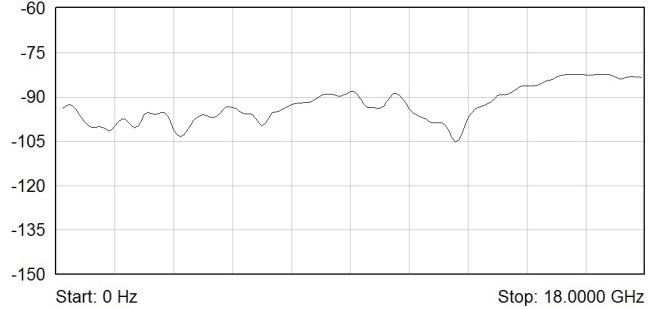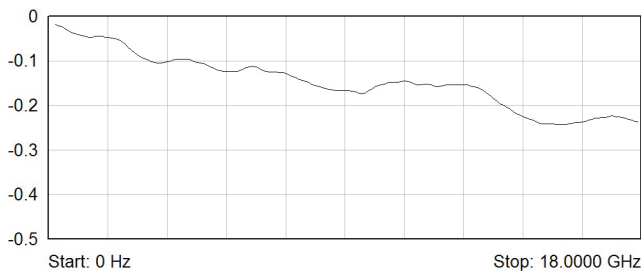

Typical Isolation (dB) Plot for 18GHz Versions

Typical VSWR Plot for 18GHz Versions
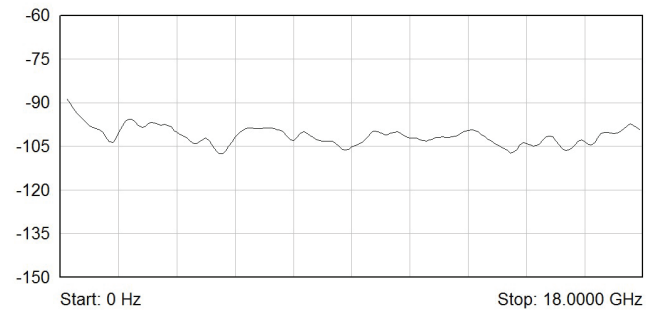
Typical Isolation (dB) Plot for Terminated 18GHz Versions

Typical Insertion Loss (dB) Plot for Terminated 18GHz Versions

Typical VSWR Plot for Terminated 18GHz Versions

Multiplexer Specification - 26.5GHz Terminated Versions

Characteristic Impedance:	50Ω
Connectors:	SMA
Bandwidth	DC to 26.5GHz
Isolation:	80dB (0-3GHz)
	70dB (3-8GHz)
	60dB (8-12.4GHz)
	60dB (12.4-18GHz)
	55dB (18-26.5GHz)
Insertion Loss:	0.2dB (0-3GHz)
	0.3dB (3-8GHz)
	0.4dB (8-12.4GHz)
	0.5dB (12.4-18GHz)
	0.7dB (18-26.5GHz
VSWR:	1.2:1 (0-3GHz)
	1.3:1 (3-8GHz)
	1.4:1 (8-12.4GHz)
	1.5:1 (12.4-18GHz)
	1.7:1(18-26.5GHz)
Maximum RF Carry Power:	240W (0-3GHz)
	150W (3-8GHz)
	120W (8-12.4GHz)
	100W (12.4-18GHz)
	40W (18-26.5GHz)
Termination power rating:	1W per termination,
	3W total per 6 channel multiplexer
Expected Life (low power):	>2 million ops per position

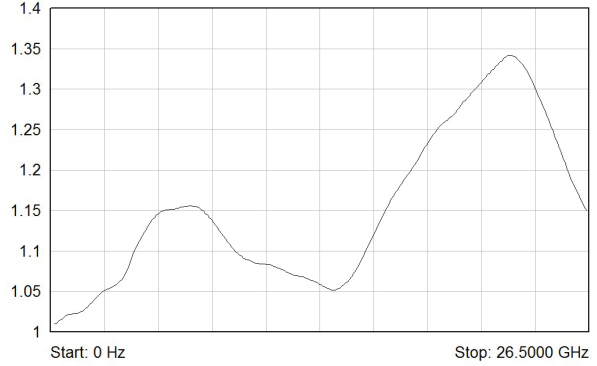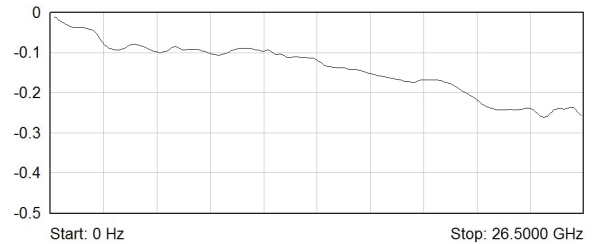## Multiplexer Specification - 26.5GHz Unterminated Versions

|	
Characteristic Impedance:	50Ω
Connectors:	SMA-2.9
Bandwidth	DC to 26.5GHz
Isolation:	70dB (0-6GHz)
	60dB (6-12.4GHz)
	60dB (12.4-18GHz)
	55dB (18-26.5GHz)
Insertion Loss:	0.2dB (0-6GHz)
	0.4dB (6-12.4GHz)
	0.5dB (12.4-18GHz)
	0.7dB (18-26.5GHz
VSWR:	1.2:1 (0-6GHz)
	1.4:1 (6-12.4GHz)
	1.5:1 (12.4-18GHz)
	1.7:1(18-26.5GHz)
Maximum RF Carry Power:	40W (0-6GHz)
	30W (6-12.4GHz)
	25W (12.4-18GHz)
	15W (18-26.5GHz)
Expected Life (low power):	>2 million ops per position
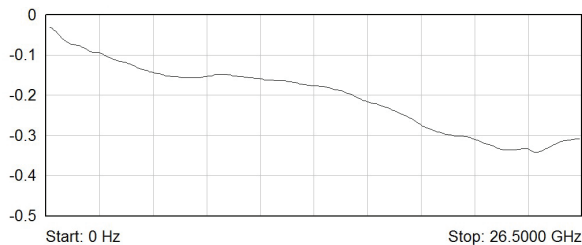
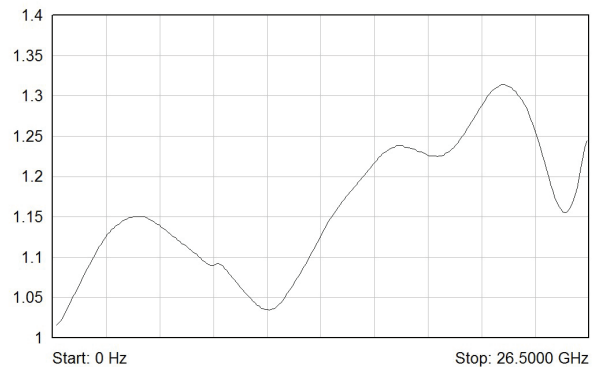**Typical Isolation (dB) Plot for 26.5GHz Versions**
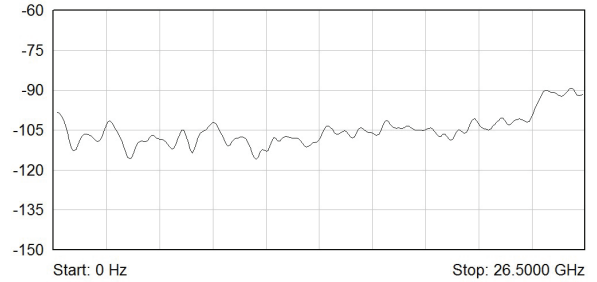
Typical VSWR Plot for 26.5GHz Versions

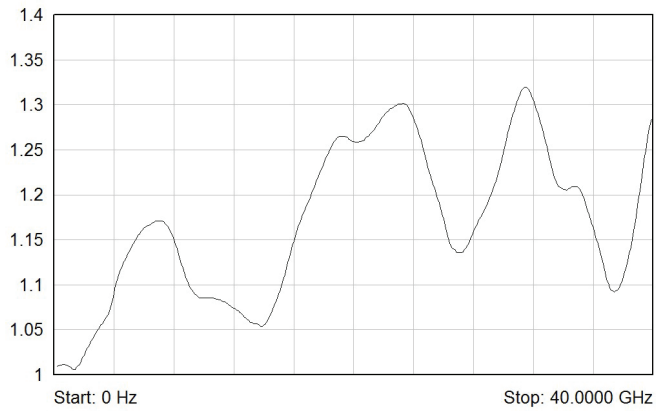**Typical Insertion (dB) Loss Plot for 26.5GHz Terminated Versions**

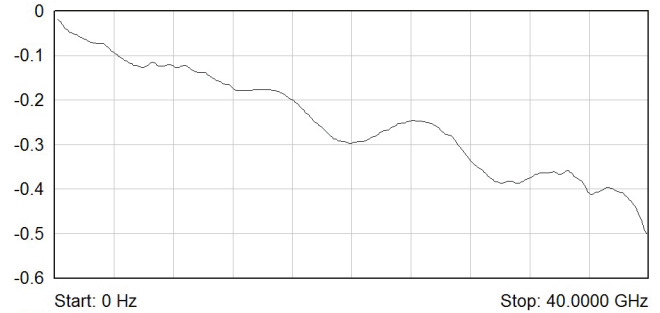**Typical Isolation (dB) Plot for 26.5GHz Terminated Versions**
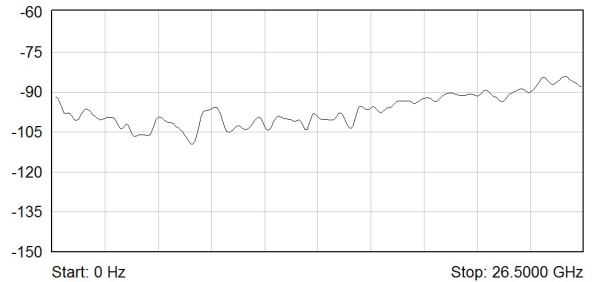
Typical Insertion Loss (dB) Plot for 26.5GHz Versions

Typical VSWR Plot for 26.5GHz Terminated Versions
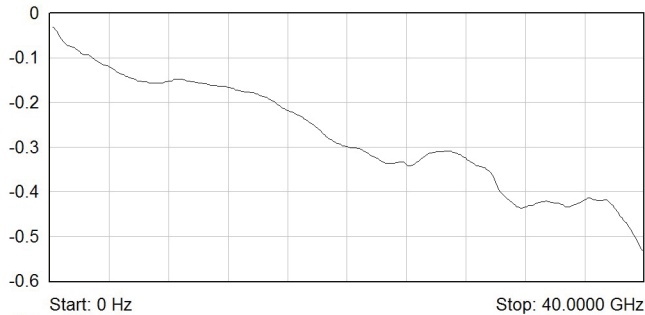
Multiplexer Specification - 40GHz Versions

|	
Characteristic Impedance:	50Ω
Connectors:	SMA-2.9
Bandwidth	DC to 40GHz
Isolation:	70dB (0-6GHz) 60dB (6-12.4GHz) 60dB (12.4-18GHz) 55dB (18-26.5GHz) 50dB (26.5-40GHz)
Insertion Loss:	0.2dB (0-6GHz) 0.4dB (6-12.4GHz) 0.5dB (12.4-18GHz) 0.7dB (18-26.5GHz) 1.1dB (26.5-40GHz)
VSWR:	1.3:1 (0-6GHz) 1.4:1 (6-12.4GHz) 1.5:1 (12.4-18GHz) 1.7:1 (18-26.5GHz) 2.2:1 (26.5-40GHz
Maximum RF Carry Power:	40W (0-6GHz) 30W (6-12.4GHz) 25W (12.4-18GHz) 15W (18-26.5GHz) 5W (26.5-40GHz)
Termination power rating:	1W per termination, 3W total per 6 channel multiplexer
Expected Life (Low Power):	>2 million operations per position

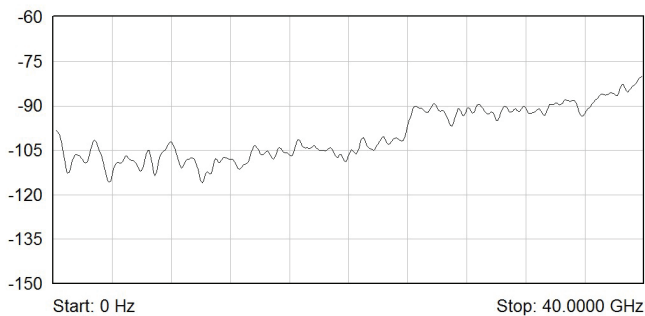**Typical VSWR Plot for 40GHz Versions**

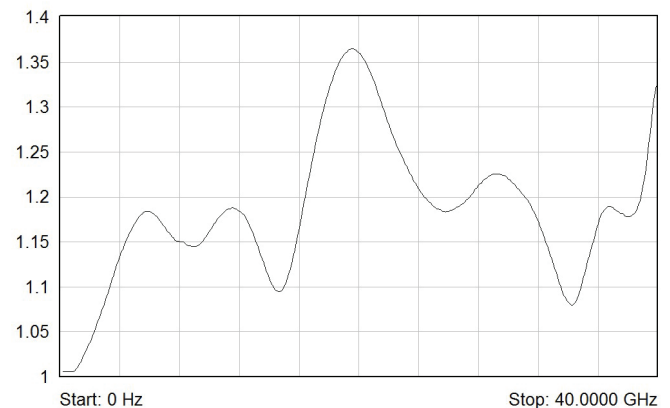**Typical Insertion (dB) Loss Plot for 40GHz Terminated Versions**

Typical Insertion Loss (dB) Plot for 40GHz Versions
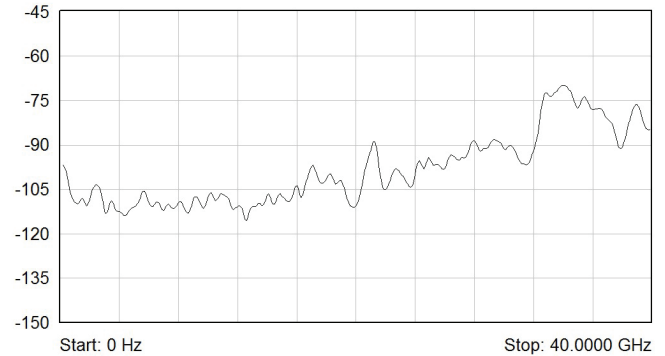
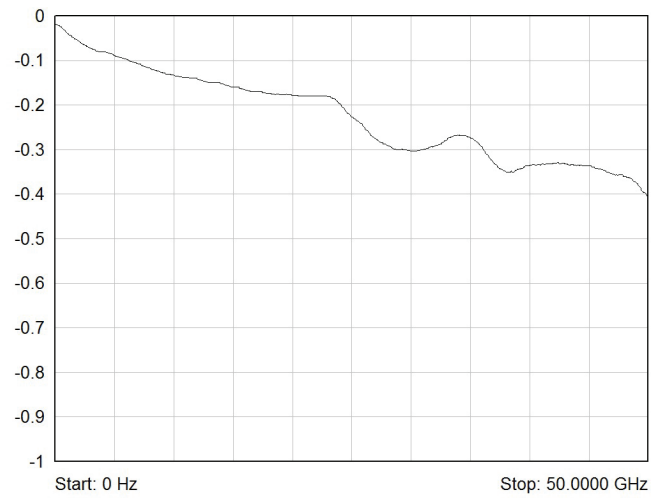**Typical Isolation (dB) Plot for 40GHz Terminated Versions**

Typical Isolation (dB) Plot for 40GHz Versions

Typical VSWR Plot for 40GHz Terminated Versions

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Multiplexer Specification - 50GHz Versions

Characteristic Impedance:	50Ω
Connectors:	SMA-2.4
Bandwidth	DC to 50GHz
Isolation:	70dB (0-6GHz) 60dB (6-12.4GHz) 60dB (12.4-18GHz) 55dB (18-26.5GHz) 50dB (26.5-40GHz) 50dB (40-50GHz)
Insertion Loss:	0.2dB (0-6GHz) 0.4dB (6-12.4GHz) 0.5dB (12.4-18GHz) 0.7dB (18-26.5GHz) 0.9dB (26.5-40GHz) 1.2dB (40-50GHz)
VSWR:	1.3:1 (0-6GHz) 1.4:1 (6-12.4GHz) 1.5:1 (12.4-18GHz) 1.7:1(18-26.5GHz) 1.9:1 (26.5-40GHz) 2.2:1 (40-50GHz)
Maximum RF Carry Power:	40W (0-6GHz) 30W (6-12.4GHz) 25W (12.4-18GHz) 15W (18-26.5GHz) 5W (26.5-40GHz) 3W (40-50GHz)
Expected Life (Low Power):	>2 million operations per position

Typical Insertion Loss (dB) Plot for 50GHz Versions
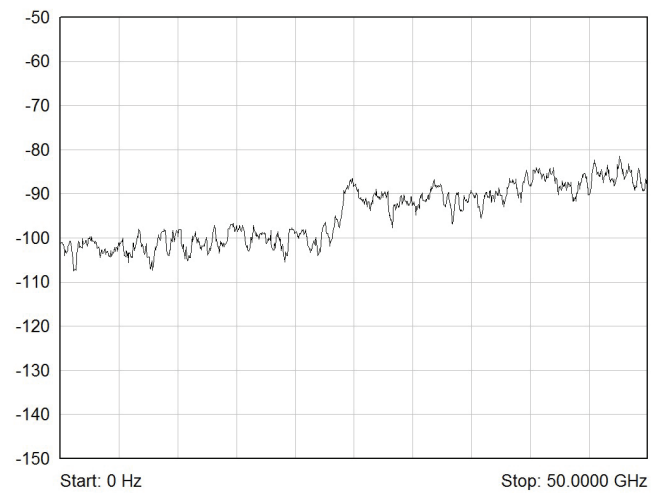
Typical Isolation (dB) Plot for 50GHz Versions
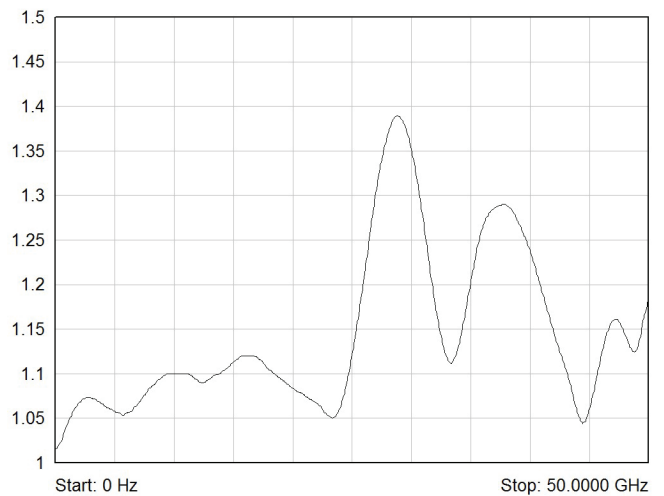
Typical VSWR Plot for 50GHz Versions

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Mux Specification – 2.5GHz 75Ω unterminated version

Characteristic Impedance:	75Ω
Connectors:	1.6/5.6
Bandwidth	DC to 2.5GHz
Isolation:	80dB (0-1GHz)
	70dB (1-2.5GHz)
Insertion Loss:	0.2dB (0-1GHz)
	0.3dB (1-2.5GHz)
VSWR:	1.2:1 (0-1GHz)
	1.3:1 (1-2.5GHz)
Maximum RF Carry Power:	400W (0-1GHz)
	240W (1-2.5GHz)
Expected Life (Low Power):	>2 million operations per position
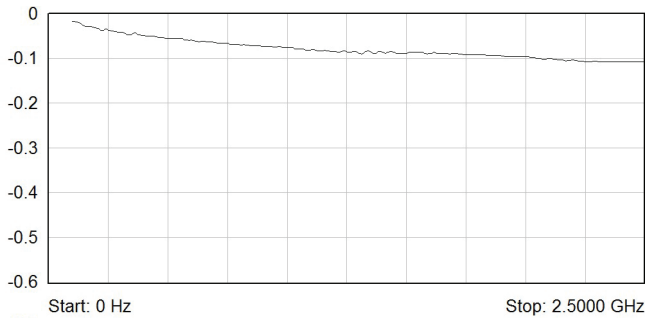
Typical Insertion Loss (dB) Plot for 2.5GHz 75Ω Versions
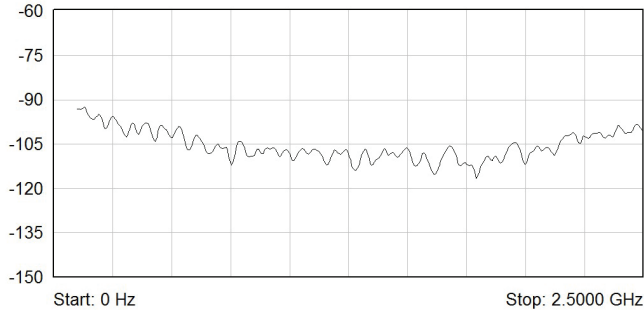
Typical Isolation (dB) Plot for 2.5GHz 75Ω Versions
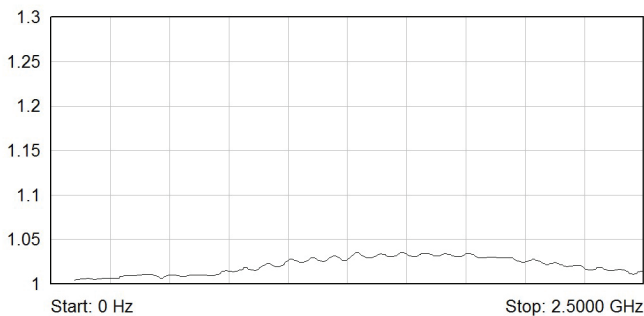
Typical VSWR Plot for 2.5GHz 75Ω Versions

Interconnection between the 40-785B single slot version and the remotely mounted microwave multiplexers

40-785B Single Slot Version

3 off Interface Cables 1.5m Length

Remotely Mounted Microwave Multiplexers
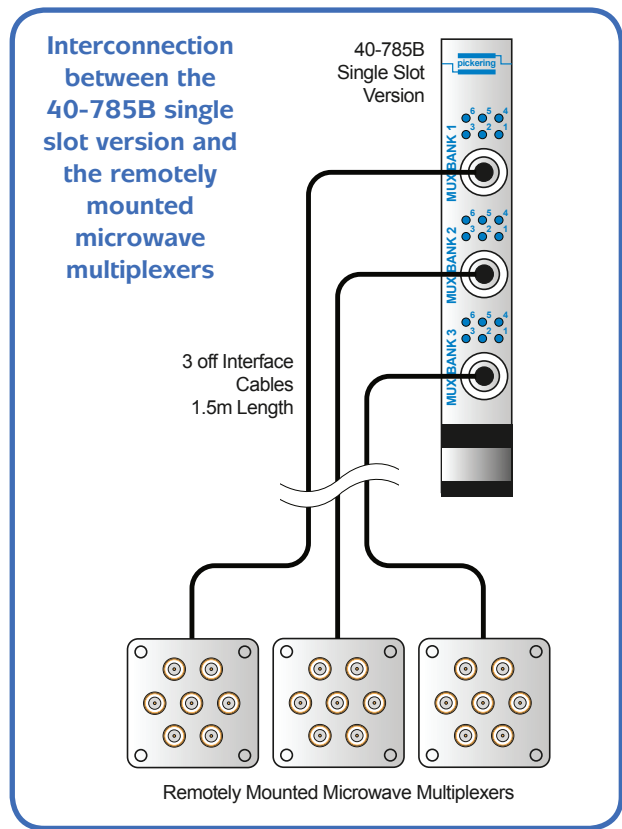
Remote Mount Microwave Multiplexer 40-785B-541-E

Power Requirements

Power consumption from the backplane supply is as follows:

+3.3V	+5V	+12V	–12V
0	0.2A	0.75A	0

Mechanical Characteristics

Front panel mounted versions occupy 3 slots, terminated front panel mounted versions occupy 4 (single) or 6 (dual versions) slots.

Remote multiplexer versions occupy one slot and are supplied with a 1.5m interface cable for each of the supplied microwave relays.

3D models for all versions in a variety of popular file formats are available on request.

Connectors

PXI bus via 32-bit P1/J1 backplane connector.

Connectors on microwave switches are coaxial as follows:
18GHz, 50Ω versions - SMA
26.5GHz, 50Ω versions - SMA or SMA-2.9
40GHz, 50Ω versions - SMA-2.9
50GHz, 50Ω versions - SMA-2.4
2.5GHz, 75Ω versions - Siemens 1.6/5.6 75Ω connectors

Product Order Codes

18GHz Multiplexer Versions - 50Ω

† Single 6 Chan, Panel mount, 50Ω SMA	**40-785B-521**
† Dual 6 Chan, Panel mount, 50Ω SMA	**40-785B-522**
Single 6 Chan, Panel mt, 50Ω SMA, Term.	**40-785B-521-T**
Dual 6 Chan, Panel mt, 50Ω SMA, Term.	**40-785B-522-T**
Single 6 Chan, Remote mount, 50Ω SMA	**40-785B-521-E**
Dual 6 Chan, Remote mount, 50Ω SMA	**40-785B-522-E**
Triple 6 Chan, Remote mount, 50Ω SMA	**40-785B-523-E**
Single 6 Chan, Remote, 50Ω SMA, Term.	**40-785B-521-TE**
Dual 6 Chan, Remote, 50Ω SMA, Term.	**40-785B-522-TE**
Triple 6 Chan, Remote, 50Ω SMA, Term.	**40-785B-523-TE**

26.5GHz Multiplexer Versions - 50Ω

‡ Single 6 Chan, Panel mount, 50Ω SMA-2.9	**40-785B-531**
‡ Dual 6 Chan, Panel mount, 50Ω SMA-2.9	**40-785B-532**
Single 6 Chan, Panel mt, 50Ω SMA, Term.	**40-785B-531-T**
Dual 6 Chan, Panel mt, 50Ω SMA, Term.	**40-785B-532-T**
Single 6 Chan, Remote mount, 50Ω SMA-2.9	**40-785B-531-E**
Dual 6 Chan, Remote mount, 50Ω SMA-2.9	**40-785B-532-E**
Triple 6 Chan, Remote mount, 50Ω SMA-2.9	**40-785B-533-E**
Single 6 Chan, Remote, 50Ω SMA, Term.	**40-785B-531-TE**
Dual 6 Chan, Remote, 50Ω SMA, Term.	**40-785B-532-TE**
Triple 6 Chan, Remote, 50Ω SMA, Term.	**40-785B-533-TE**

40GHz Multiplexer Versions - 50Ω

‡ Single 6 Chan, Panel mount, 50Ω SMA-2.9	**40-785B-541**
‡ Dual 6 Chan, Panel mount, 50Ω SMA-2.9	**40-785B-542**
Single 6 Chan, Panel mt, 50Ω SMA-2.9, Term.	**40-785B-541-T**
Dual 6 Chan, Panel mt, 50Ω SMA-2.9, Term.	**40-785B-542-T**
Single 6 Chan, Remote mount, 50Ω SMA-2.9	**40-785B-541-E**
Dual 6 Chan, Remote mount, 50Ω SMA-2.9	**40-785B-542-E**
Triple 6 Chan, Remote mount, 50Ω SMA-2.9	**40-785B-543-E**
Single 6 Chan, Remote, 50Ω SMA-2.9, Term.	**40-785B-541-TE**
Dual 6 Chan, Remote, 50Ω SMA-2.9, Term.	**40-785B-542-TE**
Triple 6 Chan, Remote, 50Ω SMA-2.9, Term.	**40-785B-543-TE**

50GHz Multiplexer Versions - 50Ω

Single 6 Chan, Panel mount, 50Ω SMA-2.4	**40-785B-551**
Dual 6 Chan, Panel mount, 50Ω SMA-2.4	**40-785B-552**
Single 6 Chan, Remote mount, 50Ω SMA-2.4	**40-785B-551-E**
Dual 6 Chan, Remote mount, 50Ω SMA-2.4	**40-785B-552-E**
Triple 6 Chan, Remote mount, 50Ω SMA-2.4	**40-785B-553-E**

2.5GHz Multiplexer Versions - 75Ω

Single 6 Chan, Panel mount, 75Ω 1.6/5.6	**40-785B-751**
Dual 6 Chan, Panel mount, 75Ω 1.6/5.6	**40-785B-752**
Single 6 Chan, Remote mount, 75Ω 1.6/5.6	**40-785B-751-E**
Dual 6 Chan, Remote mount, 75Ω 1.6/5.6	**40-785B-752-E**
Triple 6 Chan, Remote mount, 75Ω 1.6/5.6	**40-785B-753-E**

Accessories:

Microwave relay bracket for remote mounting
- Contact Pickering Interfaces for information.

† These models have equivalents in the 40-784A range that occupy only two PXI slots.

‡ These models have been superceded with more competitive options from model 40-784A, however remain available for legacy requirements.

Mating Connectors & Cabling

For connection accessories for the 40-785B range please refer to the **90-011D** RF Cable Assemblies data sheets where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Programming

Pickering provide kernel, IVI and VISA (NI & Keysight) drivers which are compatible with all Microsoft supported versions of Windows and popular older versions. For a list of all supporting operating systems, please see: www.pickeringtest.com/os

The VISA driver is also compatible with Real-Time Operating Systems such as LabVIEW RT. For other RTOS support contact Pickering. These drivers may be used with a variety of programming environments and applications including:

- **Pickering Interfaces Switch Path Manager**
- **MTQ Testsolutions** Tecap Test & Measurement Suite
- **National Instruments** products (LabVIEW, LabWindows/ CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Keysight** VEE   • **Mathworks** Matlab   • **Marvin** ATEasy

Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries.

Operating/Storage Conditions

Operating Conditions

Operating Temperature:	0°C to +55°C
Humidity:	Up to 90% non-condensing
Altitude:	5000m

Storage and Transport Conditions

Storage Temperature:	–20°C to +75°C
Humidity:	Up to 90% non-condensing
Altitude:	15000m

PXI & CompactPCI Compliance

The module is compliant with the PXI Specification 2.2. Local Bus, Trigger Bus and Star Trigger are not implemented. Uses a 33MHz 32-bit backplane interface.

Safety & CE Compliance

All modules are fully CE compliant and meet applicable EU directives: Low-voltage safety EN61010-1:2001, EMC Immunity EN61000-6-1:2001, Emissions EN55011:1998.

PXI & LXI Chassis Compatibility

Compatible with all chassis conforming to the 3U PXI and 3U cPCI specification. Compatible with Legacy and Hybrid peripheral slots in a 3U PXI Express chassis.

Compatible with Pickering Interfaces LXI Modular Chassis. For information on driving your switching solution in an LXI environment refer to the LXI Product Guide.

Please refer to the 200 page Pickering Interfaces "**Connection Solutions**" catalog for the full list of connector/cabling options, including drawings, photos and specifications. Available in either print or as a download. Alternatively our web site has dynamically linked connector/ cabling options, including pricing, for all Pickering PXI modules.

"**The Big PXI Catalog**" gives full details of Pickering's entire range of PXI switch modules, instrument modules and support products. At over 500 pages, the Big PXI Catalog is available on request or can be downloaded from the Pickering website.
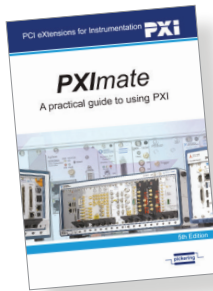
Ever wondered what PXI is all about? Pickering Interfaces' "**PXImate**" explains the basics of PXI and provides useful data for engineers working on switch based test systems. The PXImate is available free on request from the Pickering website.
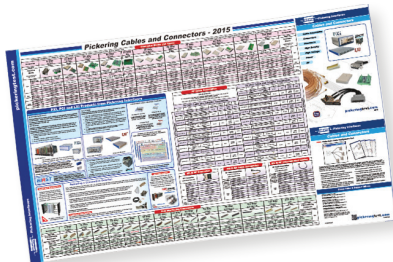
The "**Cables & Connectors Map**" – outlines the cable and connector options available for all PXI Modules.
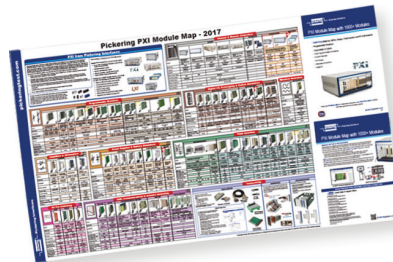
The "**PXI Module Map**" – a simple fold-out selection guide to all Pickering's 1000+ PXI Modules.

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