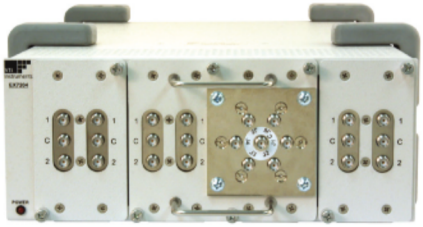
VTI Instruments

DATA SHEET



EX7204

MODULAR MICROWAVE/OPTICAL SWITCHING & SIGNAL CONDITIONING PLATFORM

APPLICATIONS

Wireless Communication

GPS

Radar

RFID

FEATURES

Combine wide variety of RF/Microwave switches and optical switches in a compact 2U mainframe

Embedded web interface provides interactive utility to monitor and control relays from anywhere in the world

Web interface automatically updates as modules are swapped out or moved

Programmable RF/Microwave attenuators capable of 0-110 dB in 1 dB steps

Universal RF/Microwave filter module holds up to 5 low-pass, band-pass, or high-pass filters

Flexible IVI based instrument drivers integrate easily into LabVIEW, Visual Studio, and VEE Pro

Direct Word Serial Communication (SCPI Control)

LXI trigger event implementation provides seamless test synchronization with external devices

Store up to 128 relay configurations for quick recall, including automatic power up state

Define exclude lists to avoid setting an undesirable configuration

Relay odometers tracks closures to facilitate preventative maintenance

Dual LXI/USB communication control

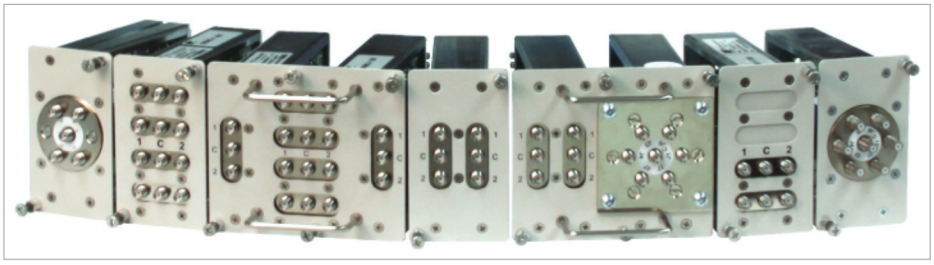
AMETEK® ADVANCED MEASUREMENT TECHNOLOGY

www.vtiinstruments.com

Specifications contained within this document are subject to change without notice

RELIABLE DATA FIRST TIME EVERY TIME

OVERVIEW



The EX7204 is the industry's first solution which modularizes both switching and signal conditioning into one flexible family of COTS products.

A wide variety of switch building blocks can be combined with commonlyused microwave signal conditioning modules to provide for a complete solution from signal source to measurement. The re-configurability of the platform makes it ideal for environments where test topologies and requirements need to be changed frequently and with minimal down time. With a wide variety of switch architectures, operating ranges, and signal conditioning options, the EX7204 is well suited to address the following applications spaces:

- Wireless Communication
- GPS
- Radar
- RFID

Excellent Switch Performance in Flexible and Compact Footprints

The EX7204 offers a wide variety of switch modules that maximize density and provide exceptional performance. Any combination of up to 16 switch modules can be integrated into 2U of rack space. Microwave switch configurations include SPDT, SP4T, and SP6T with flexible operating ranges up to 26.5 GHz. Optical switch configurations include 1xN, 2xN, 1x2, 2x2, MxN (blocking) and on/off switches, with options to support multimode, singlemode, bare fiber, loose tube and tight buffer optic fibers. The EX7204 switches are rated for a minimum of 5,000,000 cycles and have built in health monitoring through relay odometers which can be proactively monitored as a preventative maintenance.

Combine Signal Switching with Conditioning Modules for a Complete Solution

The EX7204 offers a variety of modules that allow for quick design of re-configurable systems that include both signal conditioning as well as signal distribution. Programmable RF/Microwave attenuators allow users to precisely modulate input signals. With a wide dynamic range users can select attenuation levels from 0-110 dB in 1 dB steps. Taking advantage of the EX7204's ability to save and load configurations either programmatically or at power up, calibration settings through the programmable attenuators are easily re-called.

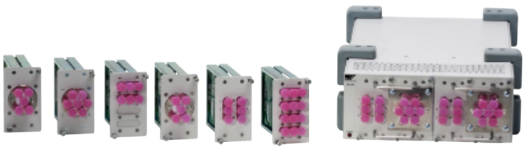
A universal RF/Microwave filter module allows users to define up to 5 low pass, band pass, or high pass filters to be included in a single plug-in module. Used in combination with the dual SP6T switch module, a switchable 5 stage filter can be quickly configured.

SIDE VIEW

Configuration Software for System Level Programming & Control

VTI offers patented configuration SW with all microwave switching & signal conditioning products. The "Broadband Integration Wizard" provides a Java based utility that allows users to specify how measurement paths are wired together in a test system. The result is a platform that user's control from a system perspective:

- Embedded web based GUI capable of closing/opening configured end-to-end paths
- Path Level Programming in LabVIEW or Visual Studio simplifies application development
- Load different configurations as test topologies change for instant re-configuration



FRONT VIEW

Intuitive Command & Control

The EX7204's software and hardware architecture allow easy integration with other GPIB, PXI, LXI, or USB instruments. Designed with LXI Extended Functions, the EX7204 delivers ease of use through an embedded web based GUI, and guarantees interoperability by definition of the LXI standard. Instrument drivers are based on the IVI industry standard and can be used with virtually any of the most commonly used development environments.

MAINFRAMES

Model	Description
EX7204A	Half-Rack 2U, LXI, Including Extended Functions
EX7204L	Half-Rack 2U, LXI, Including Extended Functions

RELAY MODULE SPECIFICATIONS

Model Name	Module Size	Relay	Qty	Frequency Range	Life Expentancy	Connectors	Internal Termination		Insertion Loss	Isolation	VSWR	Repeatability
EX7204A-2121S	Single Slot	SPDT Failsafe	2	DC - 18 GHz	5 Million Cycles	SMA	No Termination	DC - 6 GHz 6 - 12 GHz 12 - 18 GHz	0.20 dB 0.40 dB 0.50 dB	70.0 dB 60.0 dB 60.0 dB	1.25:1 1.40:1 1.50:1	0.05 dB 0.10 dB 0.10 dB
EX7204A-3121S	Single Slot	SPDT Failsafe	3	DC - 18 GHz	5 Million Cycles	SMA	No Termination	DC - 6 GHz 6 - 12 GHz 12 - 18 GHz	0.20 dB 0.40 dB 0.50 dB	70.0 dB 60.0 dB 60.0 dB	1.25:1 1.40:1 1.50:1	0.05 dB 0.10 dB 0.10 dB
EX7204A-4121S	Single Slot	SPDT Failsafe	4	DC - 18 GHz	5 Million Cycles	SMA	No Termination	DC - 6 GHz 6 - 12 GHz 12 - 18 GHz	0.20 dB 0.40 dB 0.50 dB	70.0 dB 60.0 dB 60.0 dB	1.25:1 1.40:1 1.50:1	0.05 dB 0.10 dB 0.10 dB
EX7204L-0202T	Single Slot	SPDT Latching	2	DC - 18 GHz	5 Million Cycles	SMA	Terminated (50 ohm)	DC - 6 GHz 6 - 12 GHz 12 - 18 GHz	0.20 dB 0.40 dB 0.50 dB	70.0 dB 60.0 dB 60.0 dB	1.25:1 1.40:1 1.50:1	0.05 dB 0.10 dB 0.10 dB
EX7204L-0402T	Single Slot	SPDT Latching	4	DC - 18 GHz	5 Million Cycles	SMA	Terminated (50 ohm)	DC - 6 GHz 6 - 12 GHz 12 - 18 GHz	0.20 dB 0.40 dB 0.50 dB	70.0 dB 60.0 dB 60.0 dB	1.25:1 1.40:1 1.50:1	0.05 dB 0.10 dB 0.10 dB
EX7204L-0602T	Double slot	SPDT Latching	6	DC - 18 GHz	5 Million Cycles	SMA	Terminated (50 ohm)	DC - 6 GHz 6 - 12 GHz 12 - 18 GHz	0.20 dB 0.40 dB 0.50 dB	70.0 dB 60.0 dB 60.0 dB	1.25:1 1.40:1 1.50:1	0.05 dB 0.10 dB 0.10 dB
EX7204A-1141S	Single Slot	SP4T Normally Open	1	DC - 18 GHz	5 Million Cycles	SMA	No Termination	DC - 6 GHz 6 - 12 GHz 12 - 18 GHz	0.20 dB 0.40 dB 0.50 dB	70.0 dB 60.0 dB 60.0 dB	1.25:1 1.40:1 1.50:1	0.05 dB 0.10 dB 0.10 dB
EX7204A-2142S	Single Slot	SP4T Normally Open	2	DC - 26.5 GHz	10 Million Cycles	SMA	No Termination	DC - 3 GHz 3 - 8 GHz 8-12.4 GHz 12.4 - 18 GHz 18 - 26.5 GHz	0.20 dB 0.30 dB 0.40 dB 0.50 dB 0.60 dB	80.0 dB 70.0 dB 60.0 dB 60.0 dB 55.0 dB	1.20:1 1.30:1 1.40:1 1.50:1 1.60:1	
EX7204A-1161S	Single Slot	SP4T Normally Open	1	DC - 18 GHz	5 Million Cycles	SMA	No Termination	DC - 6 GHz 6 - 12 GHz 12 - 18 GHz	0.20 dB 0.40 dB 0.50 dB	70.0 dB 60.0 dB 60.0 dB	1.25:1 1.40:1 1.50:1	0.05 dB 0.10 dB 0.10 dB
EX7204A-2162S	Single Slot	SP6T Normally Open	2	DC - 26.5 GHz	10 Million Cycles	SMA	No Termination	DC - 3 GHz 3 - 8 GHz 8-12.4 GHz 12.4 - 18 GHz 18 - 26.5 GHz	0.20 dB 0.30 dB 0.40 dB 0.50 dB 0.60 dB	80.0 dB 70.0 dB 60.0 dB 60.0 dB 55.0 dB	1.20:1 1.30:1 1.40:1 1.50:1 1.60:1	
EX7204L-0202T/0106T	Double Slot	SPDT Latching	2	DC - 18 GHz	5 Million Cycles	SMA	Terminated (50 ohm)	DC - 6 GHz 6 - 12 GHz 12 - 18 GHz	0.20 dB 0.40 dB 0.50 dB	70.0 dB 60.0 dB 60.0 dB	1.25:1 1.40:1 1.50:1	0.05 dB 0.10 dB 0.10 dB
		SP6T Latching	1	DC - 18 GHz	5 Million Cycles	SMA	Terminated (50 ohm)	DC - 6 GHz 6 - 12 GHz 12 - 18 GHz	0.20 dB 0.40 dB 0.50 dB	70.0 dB 60.0 dB 60.0 dB	1.25:1 1.40:1 1.50:1	0.05 dB 0.10 dB 0.10 dB

PROGRAMMABLE ATTENUATOR SPECIFICATIONS

Model Name	Module Size	Step Size	Frequency Range	Life Expentancy	Connectors	Attenuation Range		Insertion Loss	VSWR
EX7204-ATT-06103	Double Slot	1	DC - 6.0 GHz	5 Million Cycles	SMA	0 - 103 dB	DC - 3 GHz 3 - 6 GHz	3.4 dB 5.0 dB	1.30:1 1.45:1
EX204A-ATT-18011	Double Slot	1	DC - 18 GHz	5 Million Cycles	SMA	0 - 11 dB	DC - 4 GHz 4 - 18 GHz	0.90 dB 2.20 dB	1.50:1 1.90:1
EX7204-ATT-18110	Double Slot	10	DC - 18 GHz	5 Million Cycles	SMA	0 - 110 dB	DC - 4 GHz 4 - 18 GHz	0.90 dB 2.20 dB	1.50:1 1.90:1

UNIVERSAL FILTER MODULE

Model Name	Description
EX7204-FILT	Single slot module capable of accommodating 5 low-pass, band-pass, or high-pass filters. Please refer to website or call your local VTI representative for details on specifying and ordering filter modules.

OPTICAL RELAY SPECIFICATIONS[1]

INSERTION LOSS[2]	$2 \leq N \leq 4$ $5 \leq N \leq 8$ $N > 8$	< 1.0 dB < 1.2 dB < 1.6 dB
CROSSTALK	50 µm 62.5 µm	< -25 dB < -20 dB max
BACK REFLECTION	<-20 dB	
REPEATABILITY[4]	0.04 dB	
TDL	0.4 dB max.	
SWITCHING TIME	< 30 ms	
DURABILITY	$>10^9$ cycles	
OPTICAL POWER	500 mW max.	

ELECTRICAL

POWER REQUIREMENTS	AC/DC power adapter included, AC Input 100 - 240 VAC
MAX DC POWER CAPACITY	7204A - 24V 50W 7204L - 12V 60W
INPUT FREQUENCY	50-60HZ

Note: 1. All specifications referenced without a connector
2. For single-band. For dual-band, add 0.4 dB.
3. Same as power-off isolation
4. 100 cycles measured at constant temperature after warmup

Optical Switch Module Ordering Information

EX7204 - [ ] - [ ] - [ ] - [ ]

SWITCH CONFIGURATION

1xN
2xN
M/1xN (M + MxN Single Slot: <=5 Double Slot: <=10)

FIBER TYPE

50/BF
62/BF
50/TB
62/TB
50/LT
62/LT

WAVELENGTH RANGE

7	680-850 nm
8	850 nm
9	980 nm
8/13	850 &1310 nm
X	Specify

CONNECTOR TYPE

FC	SPC, APC, UPC
SC	SPC, APC, UPC
ST	APC, UPC
LC	