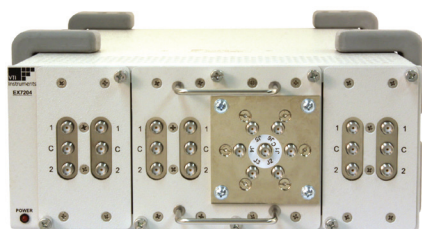




DATA SHEET



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

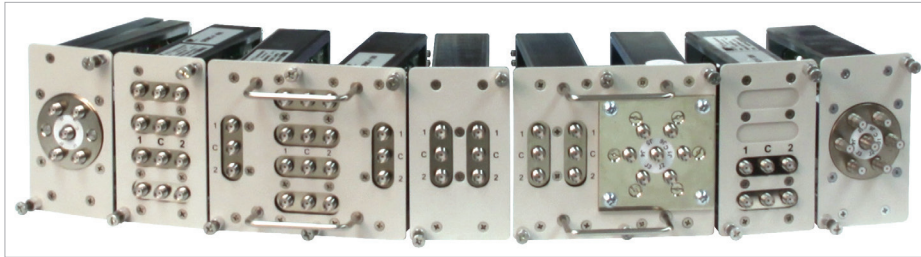
Specifications contained within this document are subject to change without notice



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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 commonly used 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.

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:

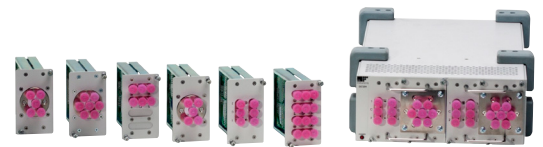
- Embedded web based GUI capable of closing/opening configured end-to-end paths
- Path Level Programming in LabVIEW or Visual Studio simplifies application development
- Load different configurations as test topologies change for instant re-configuration

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.



SIDE VIEW



FRONT VIEW

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 | 0.20 dB | 70.0 dB | 1.25:1 | 0.05 dB |
| | | | | | | | | 6 - 12 GHz | 0.40 dB | 60.0 dB | 1.40:1 | 0.10 dB |
| | | | | | | | | 12 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | 0.10 dB |
| EX7204A-3121S | Single Slot | SPDT Failsafe | 3 | DC - 18 GHz | 5 Million Cycles | SMA | No Termination | DC - 6 GHz | 0.20 dB | 70.0 dB | 1.25:1 | 0.05 dB |
| | | | | | | | | 6 - 12 GHz | 0.40 dB | 60.0 dB | 1.40:1 | 0.10 dB |
| | | | | | | | | 12 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | 0.10 dB |
| EX7204A-4121S | Single Slot | SPDT Failsafe | 4 | DC - 18 GHz | 5 Million Cycles | SMA | No Termination | DC - 6 GHz | 0.20 dB | 70.0 dB | 1.25:1 | 0.05 dB |
| | | | | | | | | 6 - 12 GHz | 0.40 dB | 60.0 dB | 1.40:1 | 0.10 dB |
| | | | | | | | | 12 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | 0.10 dB |
| EX7204L-0202T | Single Slot | SPDT Latching | 2 | DC - 18 GHz | 5 Million Cycles | SMA | Terminated (50 ohm) | DC - 6 GHz | 0.20 dB | 70.0 dB | 1.25:1 | 0.05 dB |
| | | | | | | | | 6 - 12 GHz | 0.40 dB | 60.0 dB | 1.40:1 | 0.10 dB |
| | | | | | | | | 12 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | 0.10 dB |
| EX7204L-0402T | Single Slot | SPDT Latching | 4 | DC - 18 GHz | 5 Million Cycles | SMA | Terminated (50 ohm) | DC - 6 GHz | 0.20 dB | 70.0 dB | 1.25:1 | 0.05 dB |
| | | | | | | | | 6 - 12 GHz | 0.40 dB | 60.0 dB | 1.40:1 | 0.10 dB |
| | | | | | | | | 12 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | 0.10 dB |
| EX7204L-0602T | Double slot | SPDT Latching | 6 | DC - 18 GHz | 5 Million Cycles | SMA | Terminated (50 ohm) | DC - 6 GHz | 0.20 dB | 70.0 dB | 1.25:1 | 0.05 dB |
| | | | | | | | | 6 - 12 GHz | 0.40 dB | 60.0 dB | 1.40:1 | 0.10 dB |
| | | | | | | | | 12 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | 0.10 dB |
| EX7204A-1141S | Single Slot | SP4T Normally Open | 1 | DC - 18 GHz | 5 Million Cycles | SMA | No Termination | DC - 6 GHz | 0.20 dB | 70.0 dB | 1.25:1 | 0.05 dB |
| | | | | | | | | 6 - 12 GHz | 0.40 dB | 60.0 dB | 1.40:1 | 0.10 dB |
| | | | | | | | | 12 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | 0.10 dB |
| EX7204A-2142S | Single Slot | SP4T Normally Open | 2 | DC - 26.5 GHz | 10 Million Cycles | SMA | No Termination | DC - 3 GHz | 0.20 dB | 80.0 dB | 1.20:1 | |
| | | | | | | | | 3 - 8 GHz | 0.30 dB | 70.0 dB | 1.30:1 | |
| | | | | | | | | 8-12.4 GHz | 0.40 dB | 60.0 dB | 1.40:1 | |
| | | | | | | | | 12.4 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | |
| | | | | | | | | 18 - 26.5 GHz | 0.60 dB | 55.0 dB | 1.60:1 | |
| EX7204A-1161S | Single Slot | SP4T Normally Open | 1 | DC - 18 GHz | 5 Million Cycles | SMA | No Termination | DC - 6 GHz | 0.20 dB | 70.0 dB | 1.25:1 | 0.05 dB |
| | | | | | | | | 6 - 12 GHz | 0.40 dB | 60.0 dB | 1.40:1 | 0.10 dB |
| | | | | | | | | 12 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | 0.10 dB |
| EX7204A-2162S | Single Slot | SP6T Normally Open | 2 | DC - 26.5 GHz | 10 Million Cycles | SMA | No Termination | DC - 3 GHz | 0.20 dB | 80.0 dB | 1.20:1 | |
| | | | | | | | | 3 - 8 GHz | 0.30 dB | 70.0 dB | 1.30:1 | |
| | | | | | | | | 8-12.4 GHz | 0.40 dB | 60.0 dB | 1.40:1 | |
| | | | | | | | | 12.4 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | |
| | | | | | | | | 18 - 26.5 GHz | 0.60 dB | 55.0 dB | 1.60:1 | |
| EX7204L-0202T/0106T | Double Slot | SPDT Latching | 2 | DC - 18 GHz | 5 Million Cycles | SMA | Terminated (50 ohm) | DC - 6 GHz | 0.20 dB | 70.0 dB | 1.25:1 | 0.05 dB |
| | | | | | | | | 6 - 12 GHz | 0.40 dB | 60.0 dB | 1.40:1 | 0.10 dB |
| | | SP6T Latching | 1 | DC - 18 GHz | 5 Million Cycles | SMA | Terminated (50 ohm) | DC - 6 GHz | 0.20 dB | 70.0 dB | 1.25:1 | 0.05 dB |
| | | | | | | | | 6 - 12 GHz | 0.40 dB | 60.0 dB | 1.40:1 | 0.10 dB |
| | | | | | | | 12 - 18 GHz | 0.50 dB | 60.0 dB | 1.50:1 | 0.10 dB | |

PROGRAMMABLE ATTENUATOR SPECIFICATIONS

| Model Name | Module Size | Step Size | Frequency Range | Life Exptency | 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 SPECIFICATIONS¹

| | |
|-----------------------------|--|
| INSERTION LOSS ² | $2 \leq N \leq 4$ < 1.0 dB $5 \leq N \leq 8$ < 1.2 dB $N > 8$ < 1.6 dB |
| CROSSTALK | 50 μ m < -25 dB 62.5 μ m < -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

