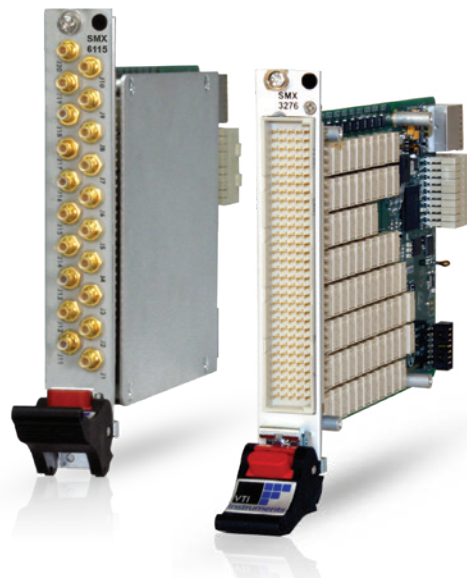


SentinelEX SWITCHING SERIES

PXI EXPRESS | TEST AND MEASUREMENT SUITE



FEATURES

- Software-configurable
- Embedded health monitoring
- Improved test reliability
- Exceptional noise immunity
- Efficient high-density packaging
- Interactive schematic control
- 3 Year warranty

ATE MARKETS & APPLICATIONS

- Avionics
- Electronics
- Oil and Gas
- Automotive
- Defense and Aerospace
- Energy / Power Generation

SentinelEX

Overview

AMETEK VTI Instruments modular instrumentation solutions are used in the world's most demanding electronic and functional test applications, helping customers meet the highest level of quality standards in the products they manufacture. Our ability to design precision instrumentation, in a modular form factor, has enabled engineers to develop test stations in a reduced footprint without compromising the integrity of test data.

SentinelEX continues to lead the way in modular PXI Express test solutions by delivering uncompromised measurement integrity to the core of every test station: the signal switching subsystem. The expanded PXIe Switching Series, built on 20 years of proven deployment in the most demanding aerospace, defense and automotive applications, delivers exceptional performance and reliability by implementing extensive signal path shielding providing reduced cross-talk and improved channel-to-channel isolation.

Test system performance is therefore improved and costs lowered by reducing false pass/fail errors and intermittent faults often associated with marginal signal levels. System level development and support costs are further reduced by combining software-configurable switch personalization with comprehensive, on-board health monitoring.



DESIGNING MODULES WITH THE SYSTEM IN MIND

A test system is more than just a collection of hardware modules, and the integrity of the signals passed between test instrumentation and the unit under test (UUT) is highly dependent on switching and the interconnection interfaces that are part of the signal transmission path.

AMETEK VTI Instruments PXIe switching modules are designed to maximize the integrity of the test signals by incorporating advanced circuit board layout techniques that minimize the effects of unwanted transmission stubs, shield against radiated signals in adjacent card slots and ultimately extend the usable bandwidth of the test system as a whole.

An innovative software driver approach, based on IVI industry standards, enables a single driver session to control multiple modules as a subsystem, providing an application



development environment that significantly reduces development time. Advanced triggering and module-to-module synchronization reduces test execution time, while chassis smart health-monitoring and relay odometers embody a predictive approach to maintenance.

AMETEK VTI Instruments core philosophy is to maintain focus on innovation and technology enabling our customers to optimize their test system capital investment through product longevity, unmatched measurement integrity and data reliability.

MULTIPLEXERS

Overview

The AMETEK VTI Instruments SMX-3000 Series of multiplexers deliver exceptional performance and reliability by implementing extensive signal path shielding and isolation. Available models with software configurable switch subsystems increase flexibility and help control costs by allowing a single module to be used for different testing requirements. Embedded virtual schematic control further simplifies setup and debugging, allowing all relays to be engaged independent of application software.

Ideally suited for medium-to-high density automated test systems (ATE), the SMX-3000 Series provides uncompromised measurement integrity ideal for the most demanding aerospace, defense and automotive applications.

Specifications

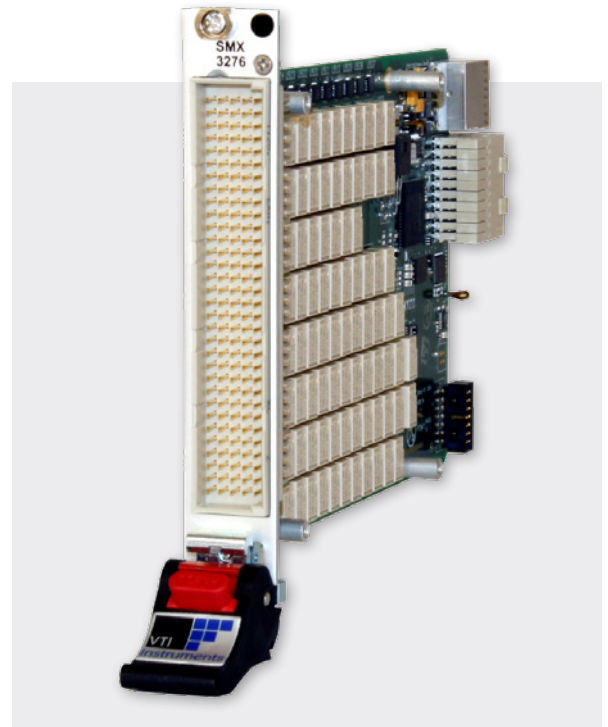
Maximum Switching Voltage	300 VDC / 300 VAC
Maximum Switching Current	2 A
Maximum Switching Power	60 W DC, 62.5 VA
Bandwidth	> 100 MHz (typical)
Operate Time	< 3 ms
Path Resistance	< 500 mΩ
Insulation Resistance	> 1 X 10 ⁹ Ω
Rated Switch Operations	
Mechanical	1 X 10 ⁸
Electrical	1 X 10 ⁵
Capacitive Discharge Relays	Internal
Configurable Bussing Relays	Internal
End-to-End Signal Path Shielding	Yes

Specifications subject to change without notice.

Ordering Information

Model	Configuration
SMX-3001	(8) 1x8, 2-wire multiplexer, fully configurable
SMX-3002	(8) 1x8, 2-wire multiplexer, fixed
SMX-3003	(4) 1x16, 2-wire multiplexer, fixed
SMX-3004	(2) 1x32, 2-wire multiplexer, fixed
SMX-3005	(1) 1x64, 2-wire multiplexer, fixed
SMX-3006	(1) 1x128, 1-wire multiplexer, fixed
SMX-3007	(2) 1x64, 1-wire multiplexer, fixed
SMX-3276	(2) 1x38, 2-wire multiplexer, fully configurable
SMX-3277	(2) 1x76, 1-wire multiplexer, fixed
SMX-3278	(2) 1x38, 2-wire multiplexer, fixed
SMX-3279	(1) 1x76, 2-wire multiplexer, fixed
SMX-3280	(1) 1x152, 1-wire multiplexer, fixed

Option with Discharge Relays will have suffix "DS" in above model names.



FEATURES

- SMX-30xx: 1x128 1-wire, 1x64 2-wire, or 1x32 4-wire Configurations
- SMX-32xx: 1x152 1-wire, 1x76 2-wire, 1x38 4-wire
- 300 VAC / 300 VDC
- 2 A Switching / Carrying
- Embedded Virtual Schematic
- Capacitive Discharge Relays
- Configurable Internal Bussing Relays
- Relay Cycle Count Odometer
- Extensive End-to-End Signal Path Shielding

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MATRICES With Built In SELF-TEST (BIST)

Overview

The VTI SMX-4xxx Series of matrix cards deliver exceptional performance and reliability by implementing extensive signal path shielding, isolation and built-in health monitoring. Built In Self-Test (BIST) capability can be used to determine relay health and provide confidence. Available models with software configurable switch subsystems increase flexibility and help control costs by allowing a single module to be used for different testing requirements. Embedded virtual schematic control further simplifies setup and debugging, allowing all relays to be engaged independent of application software.

Ideally suited for medium-to-high density automated test equipment (ATE) requiring multiple connection point flexibility, the SMX-4000 Series provides uncompromised measurement integrity ideal for the most demanding aerospace, defense and automotive applications.

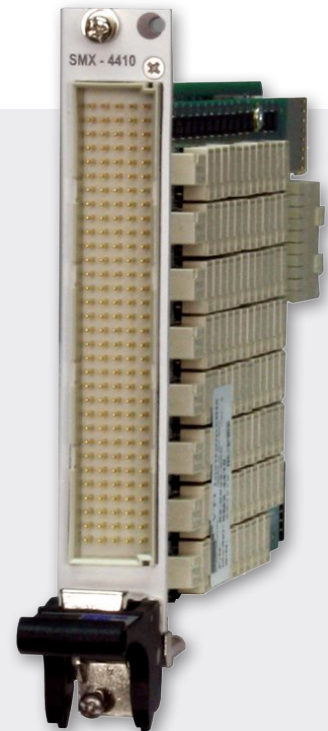
Specifications

Maximum Switching Voltage	300 VDC / 300 VAC
Maximum Switching Current	2 A
Maximum Switching Power	60 W DC, 62.5 VA
Bandwidth	> 82 MHz (typical)
Operate Time	< 3 ms
Path Resistance	< 500 mΩ
Insulation Resistance	> 1 X 10 ⁹ Ω
Rated Switch Operations	
Mechanical	1 X 10 ⁸
Electrical	1 X 10 ⁵
Capacitive Discharge Relays	Internal
Configurable Bussing Relays	Internal
End-to-End Signal Path Shielding	Yes

Specifications subject to change without notice.

Ordering Information

Model	Configuration
SMX-4410	(4) 4x10, 2-wire, fully configurable
SMX-4411	(4) 4x10 2-wire Matrix, fixed
SMX-4412	(2) 4x20 2-wire Matrix, fixed
SMX-4413	(1) 4x40 2-wire Matrix, fixed
SMX-4414	(2) 8x10 2-wire Matrix, fixed
SMX-4415	(1) 8x20 2-wire Matrix



FEATURES

- (4) 4x10 2-wire Fully Configurable
- (4) 4x10 2-wire, (2) 4x20 2-wire, (1) 4x40 2-wire, (2) 8x10 2-wire Configurations
- 300 VAC / 300 VDC
- 2 A Switching / Carrying
- Embedded Virtual Schematic
- Configurable Internal Bussing Relays
- Relay Cycle Count Odometer
- Extensive End-to-End Signal Path Shielding
- Self-Test to Determine Relay Health

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GENERAL PURPOSE SWITCHING

Overview

The AMETEK VTI Instruments SMX-5000 Series of general purpose switches deliver exceptional performance and reliability by implementing extensive signal path shielding, isolation and built-in health monitoring. Embedded virtual schematic control simplifies setup and debugging, allowing all relays to be engaged independent of application software and device drivers.

Ideally suited for a wide range of discrete signal switching, the SMX-5000 Series provides uncompromised measurement integrity ideal for the most demanding aerospace, defense and automotive automated test equipment (ATE) applications.

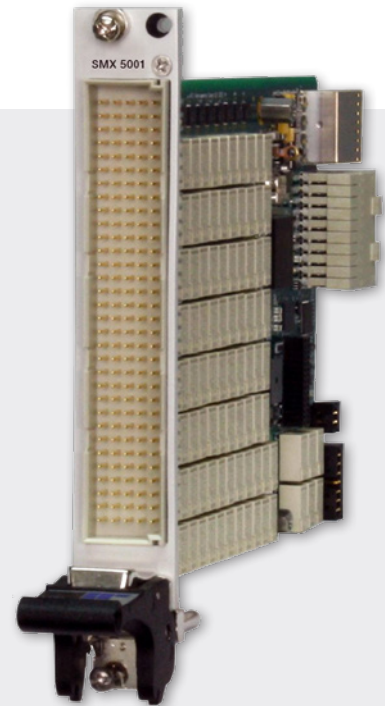
Specifications

Maximum Switching Voltage	300 VDC / 300 VAC
Maximum Switching Current	2 A
Maximum Switching Power	60 W DC, 62.5 VA Breaking Capacity
Bandwidth	> 64 MHz (typical)
Operate Time	< 3 ms
Path Resistance	< 400 mΩ
Insulation Resistance	> 1 X 10 ⁹ Ω
Rated Switch Operations	
Mechanical	1 X 10 ⁸
Electrical	1 X 10 ⁵
End-to-End Signal Path Shielding	Yes

Specifications subject to change without notice.

Ordering Information

Model	Configuration
SMX-5001	(80) SPST/Form A
SMX-5002	(50)SPDT/Form C



FEATURES

- Form A and Form C Configurations
- 300 VAC / 300 VDC
- 2 A Switching / Carrying
- Embedded Virtual Schematic
- Relay Cycle Count Odometer
- Extensive End-to-End Signal Path Shielding

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POWER SWITCHING

Overview

The AMETEK VTI Instruments SMX-2000 Series of power switches deliver exceptional performance and reliability in a compact, high-density form factor. Embedded virtual schematic control simplifies setup and debugging, allowing all relays to be engaged independent of application software and device drivers.

Ideally suited for medium-to-high density automated test equipment (ATE), the SMX-2xxx Series provides uncompromised measurement integrity ideal for the most demanding aerospace, defense and automotive automated test system (ATE) applications.

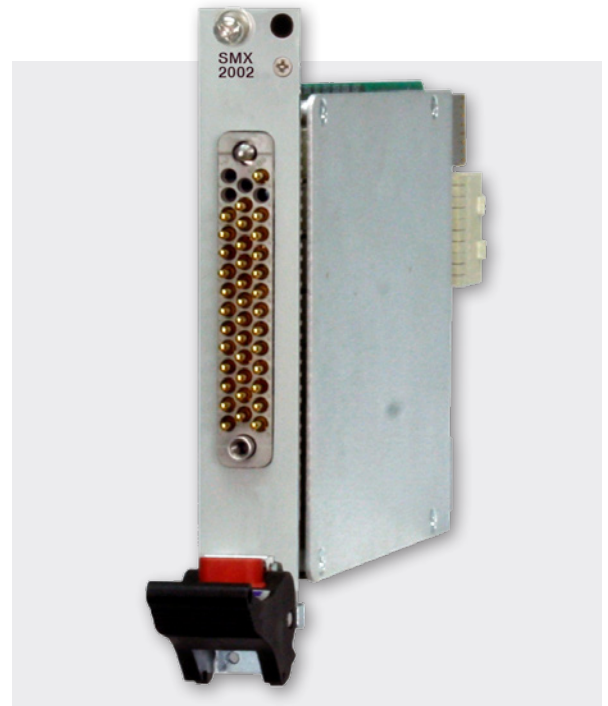
Specifications

Maximum Switching Voltage	250 AC / 300 VDC
Maximum Switching Current	16 A
Maximum Switching Power	480 W DC, 4000 VA Breaking Capacity
Operate Time	< 8 ms
Path Resistance	< 100 mΩ
Insulation Resistance	> 1 X 10 ⁹ Ω
Rated Switch Operations	
Mechanical	> 30 x 10 ⁶
Electrical	1 x 10 ⁵ (full load)

Specifications subject to change without notice.

Ordering Information

Model	Configuration
SMX-2002	(10) SPDT



FEATURES

- (10) SPDT
- 250 AC / 300 VDC
- 16 A Switching / Carrying
- Embedded Virtual Schematic
- Relay Cycle Count Odometer
- Fail-safe Interrupt Input on Front Panels for Emergency Safety Conditions

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RF MULTIPLEXER – 50 OHM

Overview

The AMETEK VTI Instruments SMX-6000 Series of high density non-blocking RF multiplexers deliver exceptional performance and reliability in a compact configuration. Front panel connectivity is available in both SMB (single / double slot) and PkZ (single slot) formats to integrate seamlessly into new or existing test systems. Embedded virtual schematic control further simplifies setup and debugging allowing all relays to be engaged independent of application software and device drivers.

The SMX-6000 Series delivers unmatched bandwidth and isolation performance resulting in exceptional measurement integrity that is ideal for the most demanding aerospace, defense and automotive automated test equipment (ATE) applications.

Specifications

Maximum Switching Voltage	250 VAC / 220 VDC
Maximum Switching Current	1.5 A
Maximum Switching Power	50 W DC, 62.5 VA
Rated Switch Operations	
Mechanical	1 X 10 ⁷
Electrical	1 X 10 ⁵
Operate Time	< 5 ms
RF Impedance	50Ω
Connector	SMB or PkZ

Specifications subject to change without notice.

RF Specifications

	SMX-6101/6111 (1x4)	SMX-6105/6115 (1x8)	SMX-6106/6116 (1x16)	SMX-6103 (1x32)
Characteristic Impedance	50 Ω	50 Ω	50 Ω	50 Ω
Bandwidth (-3dB)	3.4 GHz	2.7 GHz	2.5 GHz	1.5 GHz
Insertion Loss @ 3.5 GHz	-3.3 dB	-4.4 dB	-4.7 dB	-5.5 dB
Isolation & Cross-talk @ 1.5 GHz	-60 dB	-60 dB	-60 dB	-60 dB
VSWR DC-3.5 GHz	2:1	2:1	2:1	2:1
Propagation Delay (Typical)	2.35 ns	3.50 ns	3.50 ns	4.50 ns

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FEATURES

- Non-Blocking Configuration
- Bandwidth > 3.5 GHz (configuration specific)
- 250 VAC / 220 VDC
- 1.5A Switching Current
- Embedded Virtual Schematic
- Relay Cycle Count Odometer
- High Density Single-Slot Implementations

Ordering Information

Model	Configuration
SMX-6101	(10) 1X4 COAX MUXES
SMX-6101-SMB	(10) 1X4 COAX MUXES
SMX-6111	(5) 1X4 COAX MUXES
SMX-6111-SMB	(5) 1X4 COAX MUXES
SMX-6106	(2) 1X16 COAX MUXES
SMX-6106-SMB	(2) 1X16 COAX MUXES
SMX-6116	(1) 1X16 COAX MUXES
SMX-6116-SMB	(1) 1X16 COAX MUXES
SMX-6105	(4) 1X8 COAX MUXES
SMX-6105-SMB	(4) 1X8 COAX MUXES
SMX-6115	(2) 1X8 COAX MUXES
SMX-6115-SMB	(2) 1X8 COAX MUXES
SMX-6103	(1) 1X32 COAX MUX
SMX-6103-SMB	(1) 1X32 COAX MUX

RF MATRIX – 50 OHM

Overview

The AMETEK VTI Instruments SMX-6000 Series of high density non-blocking RF matrix cards deliver exceptional performance and reliability in a compact configuration. Front panel connectivity is available in both SMB and PkZ formats to integrate seamlessly into new or existing test systems. Embedded virtual schematic control further simplifies setup and debugging allowing all relays to be engaged independent of application software and device drivers.

The SMX-6000 Series delivers unmatched bandwidth and isolation performance for multi-point connectivity, resulting in exceptional measurement integrity that is ideal for the most demanding aerospace, defense and automotive automated test equipment (ATE) applications.

Specifications

Maximum Switching Voltage	250 VAC / 220 VDC
Maximum Switching Current	1.5 A
Maximum Switching Power	50 W DC, 62.5 VA
Rated Switch Operations	
Mechanical	1 X 10 ⁷
Electrical	1 X 10 ⁵
Operate Time	< 5 ms
RF Impedance	50Ω
Connector	SMB or PkZ

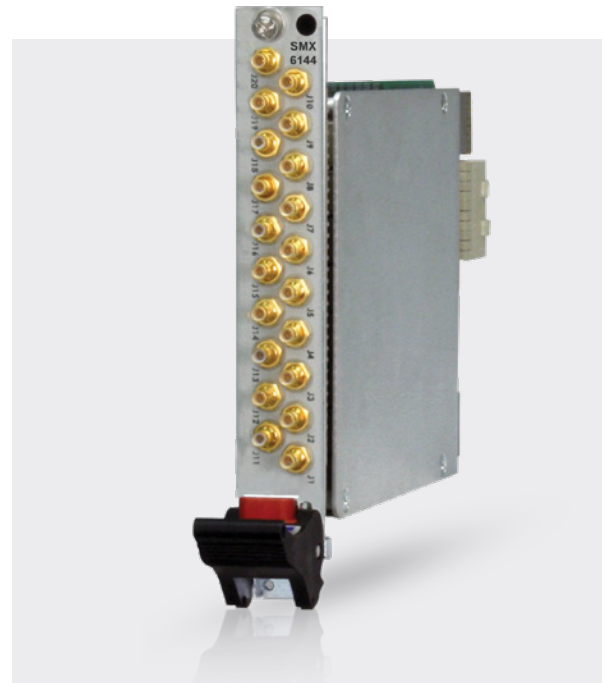
Specifications subject to change without notice.

RF Specifications

	SMX-6144 (4x4)
Characteristic Impedance	50 Ω
Bandwidth (-3dB)	2 GHz
Insertion Loss @ 3.5 GHz	-4.3 dB
Isolation & Crosstalk @ 1.5 GHz	-60 dB
VSWR DC-3.5 GHz	2:1
Propagation Delay (Typical)	3.50 ns

Ordering Information

Model	Configuration
SMX-6144	(1) 4X4 COAX MATRIX
SMX-6144-SMB	(1) 4X4 COAX MATRIX



FEATURES

- Non-blocking Configuration
- Bandwidth > 2 GHz (configuration specific)
- 250 VAC / 220 VDC
- 1.5A Switching Current
- Embedded Virtual Schematic
- Relay Cycle Count Odometer

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MICROWAVE SWITCHING

Overview

The AMETEK VTI Instruments SMX-7000 Series of microwave switch cards extends functionality typically reserved for dedicated stand-alone systems into the PXIe form-factor. Single and dual slot configurations provide the ability to mix and match multiple switch configurations including SPDT, SP4T, SP6T and Transfer. The pass through adapter extends functionality even further with programmable drive line ideal for attenuators and other devices. Embedded virtual schematic control further simplifies setup and debugging allowing all relays to be engaged independent of application software and device drivers.

Ideally suited for medium-to-high density automated test equipment (ATE), the SMX-7000 Series deliver uncompromised measurement integrity ideal for the most demanding aerospace, defense and communication applications.

Specifications

Bandwidth	6 - 40 GHz
Average Power Per Channel	40 W
RF Impedance	50 Ω
Switching Time	< 10 ms
Connector Type	SMA

Specifications subject to change without notice.

FEATURES

- 6 - 40 GHz
- Single and Dual Slot Carriers
- Embedded Virtual Schematic Control



Ordering Information

Model	Configuration
SMX-7241-06	Dual Slot MW SW Carrier with (1) SP4T 6 GHz switch
SMX-7242-06	Dual Slot MW SW Carrier with (2) SP4T 6 GHz switch
SMX-7243-06	Dual Slot MW SW Carrier with (3) SP4T 6 GHz switch
SMX-7261-06	Dual Slot MW SW Carrier with (1) SP6T 6 GHz switch
SMX-7262-06	Dual Slot MW SW Carrier with (2) SP6T 6 GHz switch
SMX-7263-06	Dual Slot MW SW Carrier with (3) SP6T 6 GHz switch
SMX-7121-18	Single Slot MW SW Carrier with (1) SPDT 18 GHz switch
SMX-7122-18	Single Slot MW SW Carrier with (2) SPDT 18 GHz switch
SMX-7121-26	Single Slot MW SW Carrier with (1) SPDT 26.5 GHz switch
SMX-7122-26	Single Slot MW SW Carrier with (2) SPDT 26.5 GHz switch
SMX-7241-26	Dual Slot MW SW Carrier with (1) SP4T 26.5 GHz switch
SMX-7242-26	Dual Slot MW SW Carrier with (2) SP4T 26.5 GHz switch
SMX-7243-26	Dual Slot MW SW Carrier with (3) SP4T 26.5 GHz switch
SMX-7261-26	Dual Slot MW SW Carrier with (1) SP6T 26.5 GHz switch
SMX-7262-26	Dual Slot MW SW Carrier with (2) SP6T 26.5 GHz switch

Model	Configuration (continued)
SMX-7263-26	Dual Slot MW SW Carrier with (3) SP6T 26.5 GHz switch
SMX-7121-40	Single Slot MW SW Carrier with (1) SPDT 40 GHz switch
SMX-7122-40	Single Slot MW SW Carrier with (2) SPDT 40 GHz switch
SMX-7241-40	Dual Slot MW SW Carrier with (1) SP4T 40 GHz switch
SMX-7242-40	Dual Slot MW SW Carrier with (2) SP4T 40 GHz switch
SMX-7243-40	Dual Slot MW SW Carrier with (3) SP4T 40 GHz switch
SMX-7261-40	Dual Slot MW SW Carrier with (1) SP6T 40 GHz switch
SMX-7262-40	Dual Slot MW SW Carrier with (2) SP6T 40 GHz switch
SMX-7263-40	Dual Slot MW SW Carrier with (3) SP6T 40 GHz switch

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