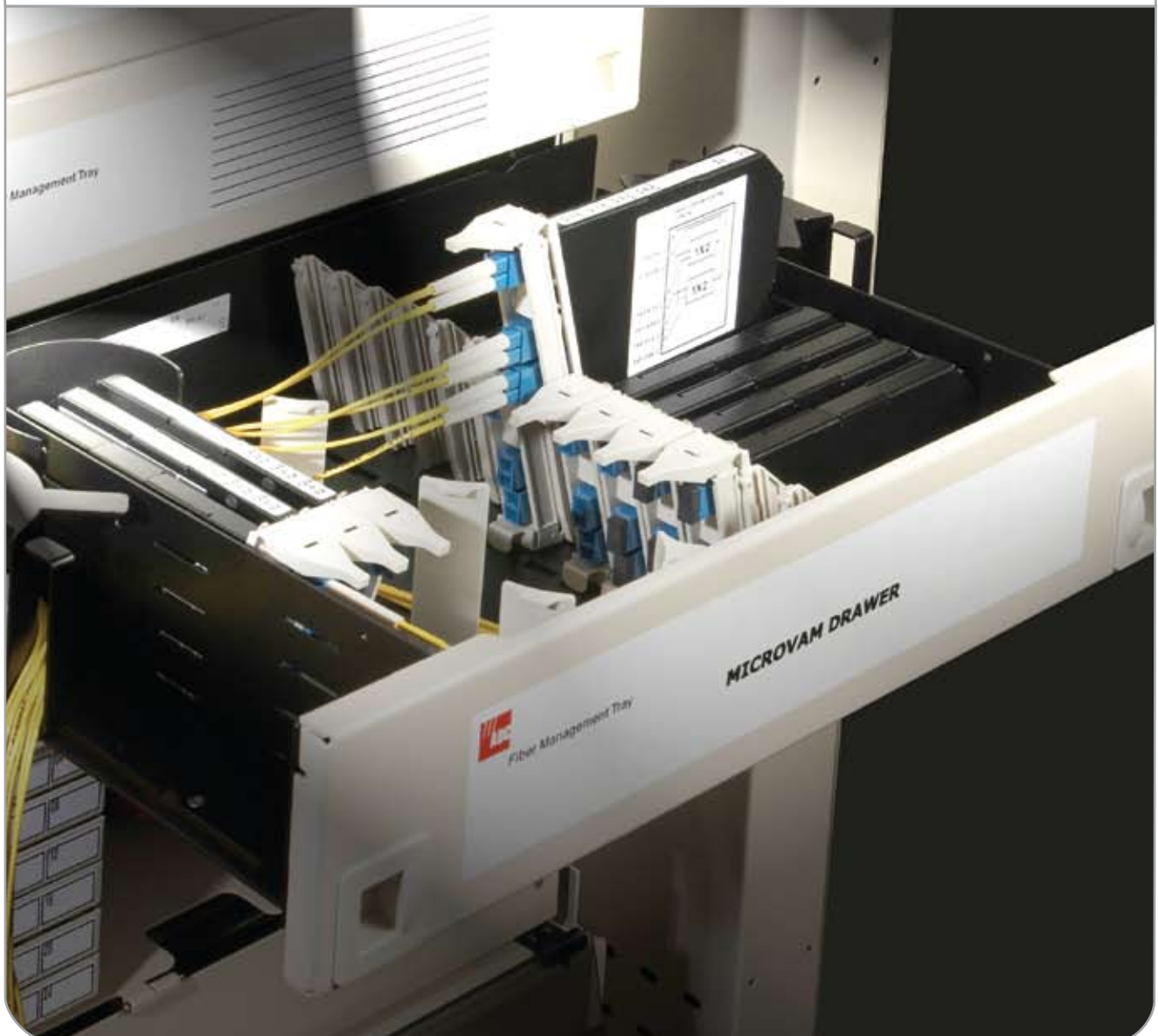




Value-Added Module (VAM) System

Monitor, Splitter, WDM, CWDM and DWDM Modules



6th Edition

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Value-Added Module (VAM) System

Introduction

TE's Value-Added Module (VAM) system adds flexibility and functionality to the optical transport system by enabling telecommunications service providers to easily incorporate optical components into the network. This versatile platform lays the foundation for the optical network of the future.

The VAM system consists of a variety of optical component modules and chassis that fit into all TE optical distribution frames and various other mounting environments.

Modules may include:

- Fused Biconic Taper (FBT) Couplers
- Planar Lightwave Circuit (PLC) Splitters
- Wavelength Division Multiplexers (WDMS)
- Coarse Wavelength Division Multiplexers (CWDMS)
- Dense Wavelength Division Multiplexers (DWDMS)

Features and Benefits

VAM Modules for Complete Optical Transport System Requirements:

Signal Splitting

Distribute signals to multiple subscribers

Monitor Testing

Troubleshoot networks or monitor traffic without forcing disruption of service

Wavelength Division Multiplexing

Increase capacity without deploying additional fiber

CWDM Applications

Increase bandwidth by transmitting multiple wavelengths simultaneously

DWDM Applications

Further increase bandwidth and capacity using closely spaced wavelengths in the ITU grid

TE's VAM Modules Feature:

Enclosed Plug-in Modules

Optical components are protected from physical and environmental damage

Angled Retainers

Maintains minimum bend radius of fiber patch cords

Pluggable Modules

Modules can be added or removed from the chassis interfering with existing terminated patch cords

Flexible Platform

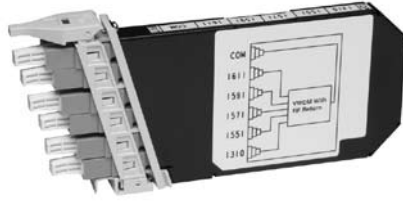
Modules can be created for new applications quickly and easily to meet customer requirements

Custom Configurations

Custom configurations are available upon request. Please contact TE's Technical Assistance Center.

VAM Module Types

Overview



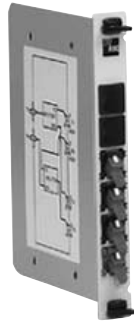
MicroVAM

Fits FMT, NGF and NG3 MicroVAM chassis



WideVAM®

Fits FCM WideVAM chassis



Standard VAM

Fits FCM and FL2000 optical distribution frames with standard VAM chassis



HD OMX VAM

Fits OMX600® high-density VAM chassis



LGX® Compatible VAM

Fits industry standard 7" LGX compatible VAM chassis



9" LGX Compatible VAM

Fits industry standard 9" LGX compatible VAM chassis

VAM Modules

Monitor Module

Monitor Module Types

6/11 • 101663AE Value-Added Module System

MicroVAM FMT-M Fits FMT, NGF and NG3® Micro-VAM chassis (pages 20-21) Available Ports: • 6 Front (8 LC) • 3 Rear (6 LC)	WideVAM® VMMW Fits FCM WideVAM chassis (page 25) Available Ports: • 18 Front (36 LC) • 12 Rear (24 LC)	Standard VAM VMM Fits FCM and FL2000 optical distribution frames with standard VAM chassis (pages 22-24) Available Ports: • 6 Front (12 LC) • 4 Rear (8 LC)
OMX600® VAM MXM-M Fits OMX600® high density VAM chassis (page 26) Available Ports: • 9 Front (10 LC) • 0 Rear	LGX® VAM VLM-M Fits industry standard 7" LGX compatible VAM chassis (page 27) Available Ports: • Up to 8 Front (16 LC) • 2 Rear (4 LC)	9" LGX VAM VLM9-M Fits industry standard 9" LGX compatible VAM chassis (page 28) Available Ports: • 6 Front (12 LC) • 12 Rear (24 LC)

Monitor Module Options

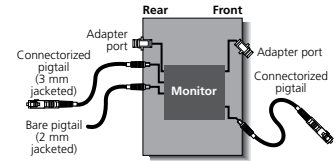
J DUAL MONITOR CROSS CONNECT	B CUSTOMER PREMISES MONITOR MODULE	D DUAL MONITOR CROSS CONNECT	G DUAL MONITOR CROSS CONNECT
P CUSTOMER PREMISES MONITOR MODULE	R SINGLE MONITOR CROSS CONNECT	C CUSTOMER PREMISES MONITOR MODULE	All styles shown are one circuit

VAM Modules

Monitor Module

Monitor Module Types

FMT-M	Module for FMT, NGF, NG3® MicroVAM chassis
VMMW-	Module for FCM optical distribution frames with WideVAM® chassis
VMM-	Module for FCM and FL2000 optical distribution frames with standard VAM chassis
MXM-M	Module for OMX600® high-density VAM chassis
VLM-M	Module for 7" LGX® compatible VAM chassis
VLM9-M	Module for 9" LGX compatible VAM chassis



Connectorized Example

Catalog Number

Input Connector/Adapter
Output Connector/Adapter
Monitor Connector/Adapter

Monitor Pigtail Length
Output Pigtail Length
Input Pigtail Length

Singlemode*

7U	SC ultra polish
7A	SC angled polish
KU	LC ultra polish
KA	LC angled polish
00	Fiber pigtail

Multimode*

9A	SC 50/125 µm
9B	SC 62.5/125 µm
KM	LC 62.5/125 µm
KN	LC 50/125 µm
00	Fiber pigtail

Example (in meters):
01 = 1 m
10 = 10 m
0 = Adapters only on input and output ports

Monitor Module Options¹ (see page 4)

J	Dual monitor cross-connect
B	Customer premises monitor module
D	Dual monitor cross-connect
G	Dual monitor cross-connect
P	Customer premise monitor module
R	Single monitor cross-connect
C	Customer premises monitor module

Split Ratio

K	99/1
B	95/5
A	90/10
E	80/20
H	70/30
J	60/40
C	50/50

Number of Circuits per VAM¹

1	1 Circuit
2	2 Circuit
3	3 Circuit

¹ See opposite page for compatibility.

Number of circuits and configuration option are dependent on module type.

*For specifications, see pages 8-9.

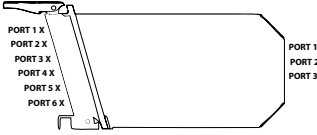
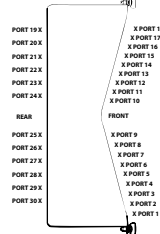
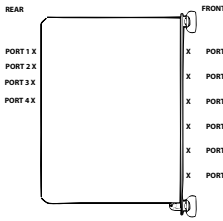
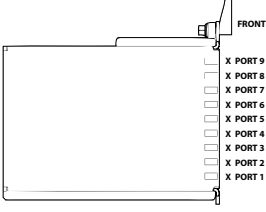
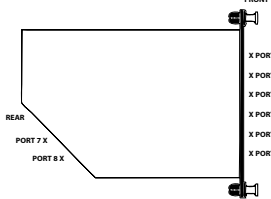
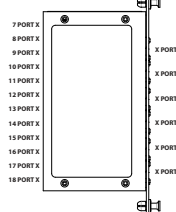
Ordering example: Standard VAM module, one circuit, SC ultra polish connector, 90/10 split ratio, dual monitor module, 5 m pigtails, order VMM-7U7U7U1AJ050505. Adapter only version, order VMM-7U7U7U1AJ000.

Other configurations and tap ratios are available upon request. Please contact TE's Technical Assistance Center.

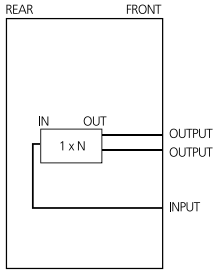
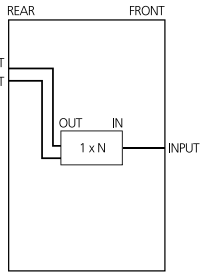
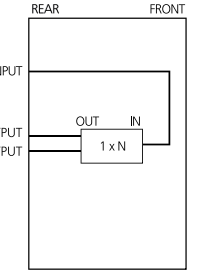
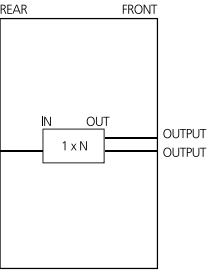
VAM Modules

Splitter Module

Splitter Module Types

 MicroVAM FMT-MS Fits FMT, NGF and NG3® MicroVAM chassis (pages 20-21) Available Ports: • 6 Front (8 LC) • 3 Rear (6 LC)	 WideVAM VSMW Fits FCM WideVAM chassis (page 25) Available Ports: • 18 Front (36 LC) • 12 Rear (24 LC)	 Standard VAM VSM Fits FCM and FL2000 optical distribution frames with standard VAM chassis (pages 22-24) Available Ports: • 6 Front (12 LC) • 4 Rear (8 LC)
 OMX600® High-Density MXM Fits OMX600® high density VAM chassis (page 26) Available Ports: • 9 Front (10 LC) • 0 Rear	 LGX® VAM VLM Fits industry standard 7" LGX compatible VAM chassis (page 27) Available Ports: • Up to 8 Front (16 LC) • 2 Rear (4 LC)	 9" LGX VAM VLM9 Fits industry standard 9" LGX compatible VAM chassis (page 28) Available Ports: • 6 Front (12 LC) • 12 Rear (24 LC)

Splitter Module Options

2 Input Front, Output Front 	3 Input Front, Output Rear 	4 Input Rear, Output Rear 	5 Input Rear, Output Front 
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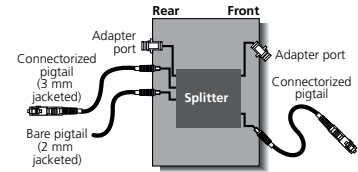
VAM Modules

Splitter Module

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Splitter Module Types

FMT-MS	Module for FMT, NGF and NG3® MicroVAM chassis
VSMW-	Module for FCM optical distribution frames with WideVAM® chassis
VSM-	Module for FCM and FL2000 optical distribution frames with standard VAM chassis
MXM-	Module for OMX600® high-density VAM chassis
VLM-	Module for 7" LGX® compatible VAM chassis
VLM9-	Module for 9" LGX compatible VAM chassis



Connectorized Example

Catalog Number

Splitter Module Options² (see page 18)

2	Input front, output front
3	Input front, output rear
4	Input rear, output rear
5	Input rear, output front

Output Pigtail Length Input Pigtail Length

Example: (in meters):
01 = 1 m
10 = 10 m
0 = Adapters only on input and output ports

Input Connector/Adapter

Output Connector/Adapter

Singlemode

7U	SC ultra polish
7A	SC angled polish
KU	LC ultra polish
KA	LC angled polish
00	Fiber Pigtail

Multimode

9A	SC 50/125 µm
9B	SC 62.5/125 µm
KM	LC 62.5/125 µm
KN	LC 50/125 µm
00	Fiber Pigtail

¹ Maximum number of splitters will vary by module type.

² Please verify against number of ports available on the opposite page before ordering.

*For specifications, see pages 8-9.

Number of Splitters Per Module ^{1,2}

A	Single (1) Splitter
B	Dual (2) Splitter
C	Triple (3) Splitter
D	Quad (4) Splitter
E	Five (5) Splitters
F	Six (6) Splitters
G	Seven (7) Splitters
H	Eight (8) Splitters

Split Ratio²

2000	1x2	50/50
2200	1x2	60/40
2400	1x2	70/30
2600	1x2	80/20
2800	1x2	90/10
2900	1x2	95/5
3900	1x3	33/33/33
4900	1x4	25/25/25/25
5300	1x5	20/20/20/20/20
6000	1x6	16.6/16.6/16.6/ 16.6/16.6/16.6
8000	1x8	12.5/12.5/12.5...12.5

Ordering Example: MicroVAM, front input and output, SC ultra polish, 90/10 split ratio, dual splitter, order FMT-MS27U7U2800B00.

Other split ratios and configurations are available upon request. Please contact TE's Technical Assistance Center.

Specifications

Splitter Specifications

Singlemode Wideband Optical Splitter*

Splitter Number	Splitter Type	Splitter Ratio	Maximum Insertion Loss	Typical Insertion Loss
2000	1x2	50/50	3.8/3.8	3.1/3.1
2200	1x2	60/40	2.7/4.7	2.3/4.1
2400	1x2	70/30	2.0/6.0	1.7/5.4
2600	1x2	80/20	1.3/7.8	1.1/7.1
2800	1x2	90/10	.8/11.2	.6/10.2
2900	1x2	95/5	.5/14.4	.4/13.2
3900	1x3	33/33/33	6.3/6.3/6.3	5.0/5.0/5.0
4900	1x4	25/25/25/25	7.5/7.5/7.5/7.5	6.3/6.3/6.3/6.3
5300	1x5	20/20/20/20/20	9.2/9.2/9.2/9.2/9.2	7.3/7.3/7.3/7.3/7.3
6000	1x6	16.6/16.6/... /16.6	10.3/10.3/... /10.3	8.1/8.1/8.1/... /8.1
8000	1x8	12.5/12.5/... /12.5	11.9/11.9/11.9/11.9	9.9/9.9/9.9/9.9 9.9/9.9/... /9.9

Maximum Insertion Loss

Maximum insertion loss is the upper limit of insertion loss for the coupler and applies over the entire wavelength range specified in the bandpass.

Typical Insertion Loss

Typical insertion loss is the expected insertion loss value for the coupler measured at the specified center wavelength (i.e. 1310 nm and/or 1550 nm).

OPTICAL

Bandpass:	1260-1360 nm, and 1430-1580 nm
Directivity:	55 dB minimum
Reflectance:	< -55 dB

MECHANICAL AND ENVIRONMENTAL

Designed to meet the requirements of GR-1209-CORE and GR-1221-CORE

*Specifications reflect modally insensitive optical splitters and do not include connector loss.

Other split ratios and configurations are available upon request. Please contact TE's Technical Assistance Center.

Specifications

Splitter Specifications

Multimode Optical Splitter*

Splitter Number	Splitter Type	Splitter Ratio	Maximum Insertion Loss	Typical Insertion Loss
2000	1x2	50/50	4.0/4.0	3.5/3.5
2200	1x2	60/40	3.1/5.1	2.7/4.5
2400	1x2	70/30	2.2/6.2	2.0/4.7
2600	1x2	80/20	1.6/8.2	1.4/7.6
2800	1x2	90/10	1.1/12.0	0.9/10.9
2900	1x2	95/5	0.9/17.5	0.7/14.4
4900	1x4	25/25/25/25	8.1/8.1/8.1/8.1	7.1/7.1/7.1/7.1
8000	1x8	12.5/12.5/.../12.5	12.1/12.1/.../12.1	10.6/10.6/.../10.6

Maximum Insertion Loss

Maximum insertion loss is the upper limit of insertion loss for the coupler and applies over the entire wavelength range specified in the bandpass.

Typical Insertion Loss

Typical insertion loss is the expected insertion loss value for the coupler measured at the specified center wavelength (i.e. 850 μm and/or 1300 μm).

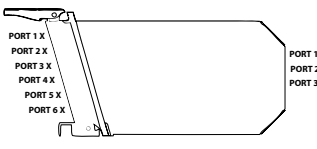
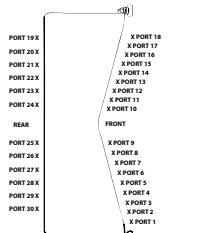
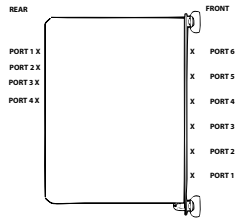
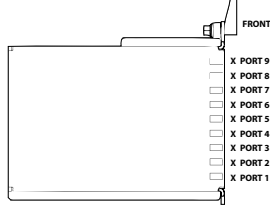
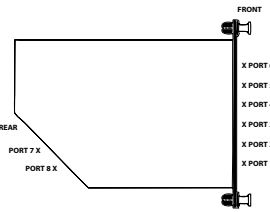
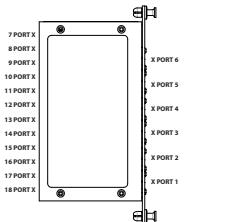
OPTICAL

Bandpass: 800-1600 nm
Directivity: 40 dB minimum

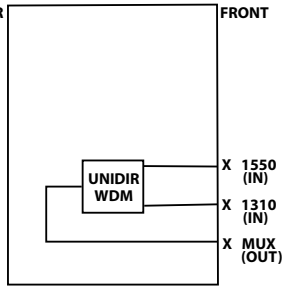
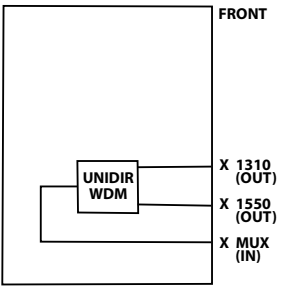
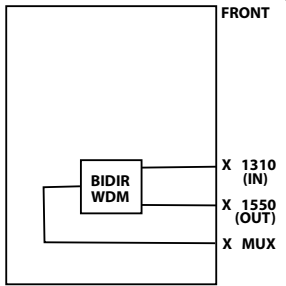
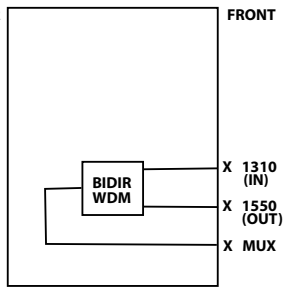
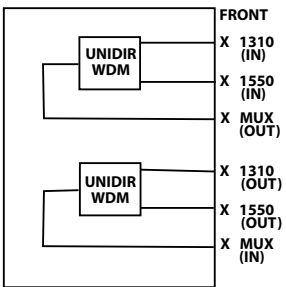
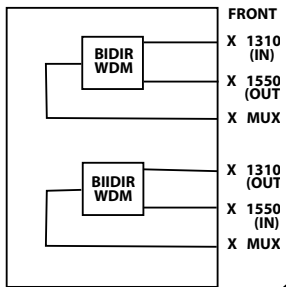
*Specifications reflect modally insensitive optical splitters and do not include connector loss.

Other split ratios and configurations are available upon request. Please contact TE's Technical Assistance Center.

WDM Module Types

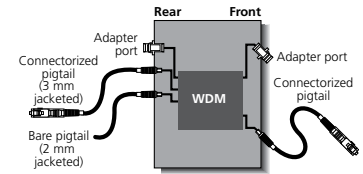
 MicroVAM FMT-MW Fits FMT, NGF and NG3® MicroVAM chassis (pages 20-21) Available Ports: • 6 Front (8 LC) • 3 Rear (6 LC)	 WideVAM® WDMW Fits FCM WideVAM chassis (page 25) Available Ports: • 18 Front (36 LC) • 12 Rear (24 LC)	 Standard VAM WDM Fits FCM and FL2000 optical distribution frames with standard VAM chassis (pages 22-24) Available Ports: • 6 Front (12 LC) • 4 Rear (8 LC)
 OMX600® VAM MXM-W Fits OMX600® high density VAM chassis (page 26) Available Ports: • 9 Front (10 LC) • 0 Rear	 LGX® VAM VLM-W Fits industry standard 7" LGX compatible VAM chassis (page 27) Available Ports: • Up to 8 Front (16 LC) • 2 Rear (4 LC)	 9" LGX VAM VLM9-W Fits industry standard 9" LGX compatible VAM chassis (page 28) Available Ports: • 6 Front (12 LC) • 12 Rear (24 LC)

WDM Component Types

A 	C 	E 
G 	L 	M 

WDM Module Types

FMT-MW	Module for FMT, NGF and NG3® MicroVam chassis
WDMW-	Module for FCM optical distribution frames with WideVAM® chassis
WDM-	Module for FCM and FL2000 optical distribution frames with standard VAM chassis
MXM-W	Module for OMX600® high-density VAM chassis
VLM-W	Module for 7" LGX® compatible chassis
VLM9-W	Module for 9" LGX compatible VAM chassis



Connectorized Example

Catalog Number

WDM Module Options² (see page 12)

2	Common front, λ front
3	Common front, λ rear
4	Common rear, λ rear
5	Common rear, λ front

Common Port Connector/Adapter

7U	SC ultra polish
7A	SC angled polish
KU	LC ultra polish
KA	LC angled polish
00	Bare fiber

λ Port Connector/Adapter

7U	SC ultra polish
7A	SC angled polish
KU	LC ultra polish
KA	LC angled polish
00	Bare fiber

Module Configuration^{1,2}

A	Single circuit
B	Dual circuit

λ Port Pigtail Length
Common Port Pigtail Length

Example (in meters):
01 = 1 m
10 = 10 m
0 = Adapters only on input and output ports

Wavelength

A	1310 (λ_1)/1550 (λ_2)
D	1550 (λ_1)/1625 (λ_2)
F	1310 (λ_1)/1625 (λ_2)

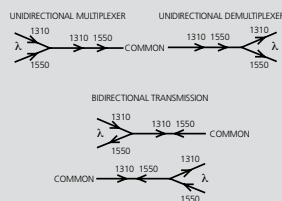
Isolation

1	Standard -15 dB
2	High -30 dB
3	Very High -45 dB

WDM Component Types (see page 10)

A	Unidirectional multiplexer
C	Unidirectional demultiplexer
E	Bidirectional λ_1 Tx/ λ_2 Rx
G	Bidirectional λ_2 Tx/ λ_1 Rx
L	(Dual only) unidirectional multiplexer, unidirectional demultiplexer ³
M	(Dual only) bidirectional λ_1 Tx/ λ_2 Rx, bidirectional λ_2 Tx/ λ_1 Rx

In the ordering charts, "common" references the multiplexed side of the WDM, the side where two optical signals co-exist on one fiber. " λ " references the demultiplexed side of the WDM, the side where each signal appears on its own fiber. Both unidirectional and bidirectional WDMs are available as shown below.



¹ Maximum number of circuits will vary by module type.

² Please verify against number of ports available on the opposite page before ordering.

For specifications, see page 16.

Ordering Example: Standard VAM, Common front, λ Front, SC ultra polish, single circuit, 1310/1550 standard isolation, bidirectional, adapter only, order WDM-27U7UAE1A0000.

For MicroVAM, FMT-MW27U7UAE1A00

Other WDM configurations are available upon request. Please contact TE's Technical Assistance Center.

CWDM Module Types

MicroVAM CWFMT Fits FMT, NGF and NG3® MicroVAM chassis (pages 20-21) Available Ports: • 6 Front (8 LC) • 3 Rear (6 LC)	WideVAM® CWVMW Fits FCM WideVAM chassis (page 25) Available Ports: • 18 Front (36 LC) • 12 Rear (24 LC)	Standard VAM CWVSM Fits FCM and FL2000 optical distribution frames with standard VAM chassis (pages 22-24) Available Ports: • 6 Front (12 LC) • 4 Rear (8 LC)
OMX600® VAM CWMXM Fits OMX600® high density VAM chassis (page 26) Available Ports: • 9 Front (10 LC) • 0 Rear	LGX® VAM CWVLM Fits industry standard 7" LGX compatible VAM chassis (page 27) Available Ports: • Up to 8 Front (16 LC) • 2 Rear (4 LC)	9" LGX VAM CWVLM9 Fits industry standard 9" LGX compatible VAM chassis (page 28) Available Ports: • 6 Front (12 LC) • 12 Rear (24 LC)

Module Options (WDM and CWDM)

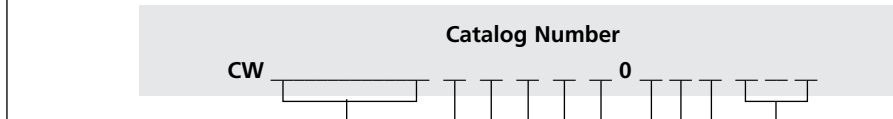
2 Common Front, λ Front	3 Common Front, λ Rear	4 Common Rear, λ Rear	5 Common Rear, λ Front
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VAM Modules

CWDM Module

CWDM Module Types

FMT-	Module for FMT, NGF and NG3® MicroVAM chassis
VMW-	Module for FCM optical distribution frames with WideVAM® chassis
VSM-	Module for FCM and FL2000 optical distribution frames with standard VAM chassis
MXM-	Module for OMX600® high-density VAM chassis
VLM-	Module for 7" LGX® compatible VAM chassis
VLM9-	Module for 9" LGX compatible VAM chassis



CWDM Module Options² (see page 12)

2	Common front, λ front
3	Common front, λ rear
4	Common rear, λ rear
5	Common rear, λ front

Common Port Connector/Adapter

7	SC ultra polish
L	SC angled polish
K	LC ultra polish
S	LC angled polish

λ Port Connector/Adapter

7	SC ultra polish
L	SC angled polish
K	LC ultra polish
S	LC angled polish

Number of Channels per Circuit²

A	8
B	4
C	10
D	2
E	1

Highest Channel Wavelength

A	1611 nm
B	1591 nm
C	1571 nm
D	1551 nm
E	1531 nm
F	1511 nm
G	1491 nm
H	1471 nm
J	1451 nm
K	1431 nm
L	1411 nm
M	1391 nm
N	1371 nm
P	1351 nm
Q	1331 nm
R	1311 nm
S	1291 nm
T	1271 nm

Custom Configurations

000	Standard module
-----	-----------------

Number of Circuits^{1,2}

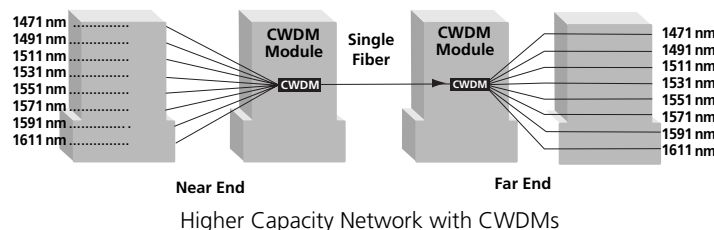
1	1
2	2
3	3
4	4

1310 nm Upgrade Port

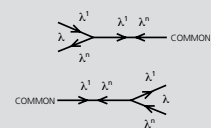
Y	Yes
N	No

MUX or DEMUX

A	MUX (5 channels and greater)
B	DEMUX (5 channels and greater)
C	MUX/DEMUX (4 channels and less)
D	1 MUX and 1 DEMUX (5 channels and greater, WideVAM only)



In the ordering charts, "common" references the multiplexed side of the CWDM, the side where multiple optical signals co-exist on one fiber. " λ " references the demultiplexed side of the CWDM, the side where each signal appears on its own fiber.



For specifications, see page 17.

¹Maximum number of circuits will vary by module type.

²Please verify against the number of ports available before ordering.

Other configurations of CWDM are available upon request. Please contact TE's Technical Assistance Center.

VAM Modules

DWDM Module

DWDM Module Types

MicroVAM DWFMT Fits FMT, NGF and NG3® MicroVAM chassis (pages 20-21) Available Ports: • 6 Front (8 LC) • 3 Rear (6 LC)	WideVAM® DWVMW Fits FCM WideVAM chassis (page 25) Available Ports: • 18 Front (36 LC) • 12 Rear (24 LC)	Standard VAM DWVSM Fits FCM and FL2000 optical distribution frames with standard VAM chassis (pages 22-24) Available Ports: • 6 Front (12 LC) • 4 Rear (8 LC)
OMX600® VAM DWMXM Fits OMX600® high density VAM chassis (page 26) Available Ports: • 9 Front (10 LC) • 0 Rear	LGX® VAM DWVLM Fits industry standard 7" LGX compatible VAM chassis (page 27) Available Ports: • Up to 8 Front (16 LC) • 2 Rear (4 LC)	9" LGX VAM DWVLM9 Fits industry standard 9" LGX compatible VAM chassis (page 28) Available Ports: • 6 Front (12 LC) • 12 Rear (24 LC)

DWDM Module Options

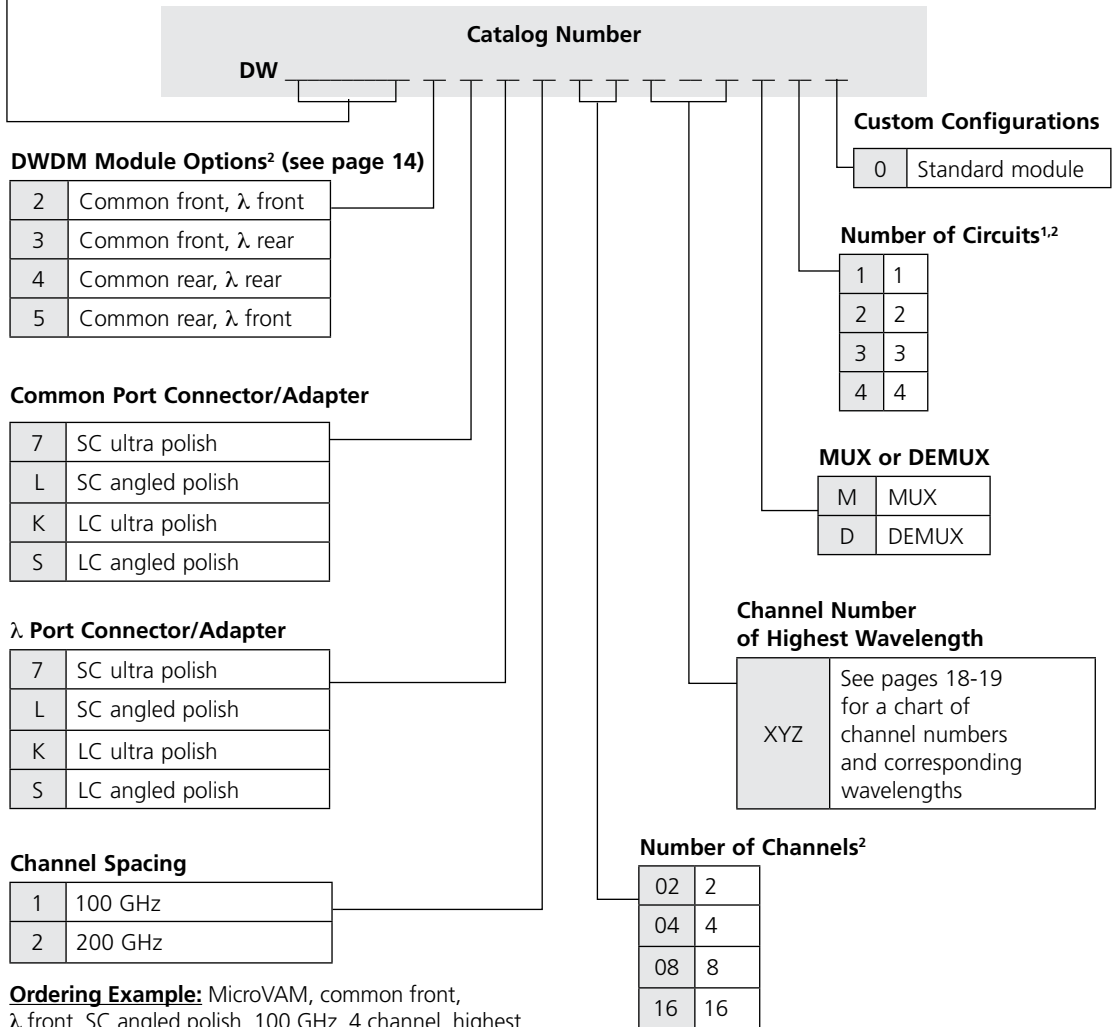
2 Common Front, λ Front	3 Common Front, λ Rear	4 Common Rear, λ Rear	5 Common Rear, λ Front
--	---	--	---

VAM Modules

DWDM Module

DWDM Module Types

FMT-	Module for FMT, NGF and NG3® MicroVAM chassis
VMW-	Module for FCM optical distribution frames with WideVAM® chassis
VSM-	Module for FCM and FL2000 optical distribution frames with standard VAM chassis
MXM-	Module for OMX600® high-density VAM chassis
VLM-	Module for 7" LGX® compatible VAM chassis
VLM9-	Module for 9" LGX compatible VAM chassis



Ordering Example: MicroVAM, common front, λ front, SC angled polish, 100 GHz, 4 channel, highest λ = 1531.12, MUX, single circuit, standard module: DWFMT-2LL104C58M10.

For specifications, see page 18.

¹ Maximum number of circuits will vary by module type.

² Please verify against the number of ports available before ordering.

Other configurations of DWDM are available upon request. Please contact TE's Technical Assistance Center.

Specifications

WDM Specifications

Singlemode WDM

OPTICAL

Bandpass: 1310 ± 20 nm and 1550 ± 20 nm
Insertion Loss*: See table below
Reflectance: < -55 dB

ISOLATION

Near End: 55 dB
Far End: See table below

MECHANICAL/ ENVIRONMENTAL

Designed to meet the mechanical and environmental requirements of GR-1209-CORE and GR-1221-CORE.

1310/1550 nm

	Bandpass (nm)	Maximum Insertion Loss * (dB)	Minimum Far End Isolation (dB)
Multiplexer/Demultiplexer:	1310 ± 20 nm and 1550 ± 20 nm	0.3	15
High Isolation Demultiplexer:	1310 ± 20 nm and 1550 ± 20 nm	0.6	30
Very High Isolation Demultiplexer:	1310 ± 20 nm and 1550 ± 20 nm	0.9	45

* Does not include connector loss.

Specifications

CWDM Specifications

PARAMETERS	4 CHANNEL	8 CHANNEL
Operating Temperature:	-40° to +85° C	-40° to +85° C
Channel Spacing:	20 nm	20 nm
Maximum Optical Power:	250 mW	250 mW
MUX and DEMUX without 1310 upgrade port		
CWDM Channel Passband:	±6.5 nm	±6.5 nm
Insertion Loss*:	<2.0 dB	<2.5 dB
Adjacent Channel Isolation:	>30 dB	>30 dB
Non-Adjacent Channel Isolation:	>40 dB	>40 dB
Directivity:	>50 dB	>50 dB
Return Loss:	>45 dB	>45 dB
Polarization Dependent Loss:	<0.2 dB	<0.2 dB
MUX and DEMUX with 1310 upgrade port		
CWDM Channel Passband:	±6.5 nm	±6.5 nm
1310 Upgrade Channel Passband:	1260-1360 nm	1260-1360 nm
Insertion Loss CWDM Ports*:	<2.2 dB	<2.9 dB
Insertion Loss 1310 Upgrade Port*:	<2.2 dB	<2.9 dB
CWDM Adjacent Channel Isolation:	>30 dB	>30 dB
CWDM Non-Adjacent Channel Isolation:	>40 dB	>40 dB
1310 Upgrade Adjacent Channel Isolation:	>40 dB	>40 dB
1310 Upgrade Non-Adjacent Channel Isolation:	>40 dB	>40 dB
Directivity:	>50 dB	>50 dB
Return Loss:	>45 dB	>45 dB
Polarization Dependent Loss:	<0.2 dB	<0.25 dB

*Specification does not include connector loss

DWDM Specifications

200 GHz Channel Spacing

PARAMETERS	4 CHANNEL	8 CHANNEL	16 CHANNEL
Operating Temperature:	0 to +75° C	0 to +75° C	0 to +75° C
Channel Spacing:	200 GHz	200 GHz	200 GHz
Maximum Optical Power:	500 mW	500 mW	500 mW
Channel Passband:	+ 0.25 nm	+ 0.25 nm	+ 0.25 nm
Insertion Loss*:	< 2.6 dB	< 3.6 dB	< 5.8 dB
Adjacent Channel Isolation:	> 25 dB	> 25 dB	> 25 dB
Non-Adjacent Channel Isolation:	> 45 dB	> 45 dB	> 45 dB
Directivity:	> 50 dB	> 50 dB	> 50 dB
Return Loss:	> 45 dB	> 45 dB	> 45 dB
Polarization Dependent Loss:	< 0.2 dB	< 0.2 dB	< 0.2 dB
Polarization Mode Dispersion:	< 0.2 ps	< 0.2 ps	< 0.2 ps

100 GHz Channel Spacing

PARAMETERS	4 CHANNEL	8 CHANNEL	16 CHANNEL
Operating Temperature:	0 to +75° C	0 to +75° C	0 to +75° C
Channel Spacing:	200 GHz	200 GHz	200 GHz
Maximum Optical Power:	500 mW	500 mW	500 mW
Channel Passband:	+ 12.5 GHz	+ 12.5 GHz	+ 12.5 GHz
Insertion Loss*:	< 2.6 dB	< 3.6 dB	< 5.8 dB
Adjacent Channel Isolation:	> 25 dB	> 25 dB	> 25 dB
Non-Adjacent Channel Isolation:	> 45 dB	> 45 dB	> 45 dB
Directivity:	> 50 dB	> 50 dB	> 50 dB
Return Loss:	> 45 dB	> 45 dB	> 45 dB
Polarization Dependent Loss:	< 0.2 dB	< 0.2 dB	< 0.2 dB
Polarization Mode Dispersion:	< 0.2 ps	< 0.2 ps	< 0.2 ps

* Specification does not include connector loss

DWDM Channel Number Chart – 200 GHz Channel Spacing

Channel Number	Frequency (GHz)	Wavelength (nm)	Channel Number	Frequency (GHz)	Wavelength (nm)	Channel Number	Frequency (GHz)	Wavelength (nm)
C01	190100	1577.03	C23	192300	1558.98	C45	194500	1541.35
C03	190300	1575.37	C25	192500	1557.36	C47	194700	1539.77
C05	190500	1573.71	C27	192700	1555.75	C49	194900	1538.19
C07	190700	1572.06	C29	192900	1554.13	C51	195100	1536.61
C09	190900	1570.42	C31	193100	1552.52	C53	195300	1535.04
C11	191100	1568.77	C33	193300	1550.92	C55	195500	1533.47
C13	191300	1567.13	C35	193500	1549.32	C57	195700	1531.9
C15	191500	1565.5	C37	193700	1547.72	C59	195900	1530.33
C17	191700	1563.86	C39	193900	1546.12	C61	196100	1528.77
C19	191900	1562.23	C41	194100	1544.53			
C21	192100	1560.61	C43	194300	1542.94			

DWDM Channel Number Chart – 100 GHz Channel Spacing

6/11 • 101663AE Value-Added Module System

Channel Number	Frequency (GHz)	Wavelength (nm)
L66	186600	1606.6
L67	186700	1605.74
L68	186800	1604.88
L69	186900	1604.03
L70	187000	1603.17
L71	187100	1602.31
L72	187200	1601.46
L73	187300	1600.6
L74	187400	1599.75
L75	187500	1598.89
L76	187600	1598.04
L77	187700	1597.19
L78	187800	1596.34
L79	187900	1595.49
L80	188000	1594.64
L81	188100	1593.79
L82	188200	1592.95
L83	188300	1592.1
L84	188400	1591.26
L85	188500	1590.41
L86	188600	1589.57
L87	188700	1588.73
L88	188800	1587.88
L89	188900	1587.04
L90	189000	1586.2
L91	189100	1585.36
L92	189200	1584.53
L93	189300	1583.69
L94	189400	1582.85
L95	189500	1582.02
L96	189600	1581.18
L97	189700	1580.35

Channel Number	Frequency (GHz)	Wavelength (nm)
L98	189800	1579.52
L99	189900	1578.69
L00	190000	1577.86
C01	190100	1577.03
C02	190200	1576.2
C03	190300	1575.37
C04	190400	1574.54
C05	190500	1573.71
C06	190600	1572.89
C07	190700	1572.06
C08	190800	1571.24
C09	190900	1570.42
C10	191000	1569.59
C11	191100	1568.77
C12	191200	1567.95
C13	191300	1567.13
C14	191400	1566.31
C15	191500	1565.5
C16	191600	1564.68
C17	191700	1563.86
C18	191800	1563.05
C19	191900	1562.23
C20	192000	1561.42
C21	192100	1560.61
C22	192200	1559.79
C23	192300	1558.98
C24	192400	1558.17
C25	192500	1557.36
C26	192600	1556.55
C27	192700	1555.75
C28	192800	1554.94
C29	192900	1554.13

Channel Number	Frequency (GHz)	Wavelength (nm)
C30	193000	1553.33
C31	193100	1552.52
C32	193200	1551.72
C33	193300	1550.92
C34	193400	1550.12
C35	193500	1549.32
C36	193600	1548.51
C37	193700	1547.72
C38	193800	1546.92
C39	193900	1546.12
C40	194000	1545.32
C41	194100	1544.53
C42	194200	1543.73
C43	194300	1542.94
C44	194400	1542.14
C45	194500	1541.35
C46	194600	1540.56
C47	194700	1539.77
C48	194800	1538.98
C49	194900	1538.19
C50	195000	1537.4
C51	195100	1536.61
C52	195200	1535.82
C53	195300	1535.04
C54	195400	1534.25
C55	195500	1533.47
C56	195600	1532.68
C57	195700	1531.9
C58	195800	1531.12
C59	195900	1530.33
C60	196000	1529.55
C61	196100	1528.77

VAM Chassis

NGF MicroVAM Chassis

The NGF MicroVAM Chassis is designed to mount on all standard NGF frames. Each chassis accommodates up to 12 front and rear port MicroVAM modules.



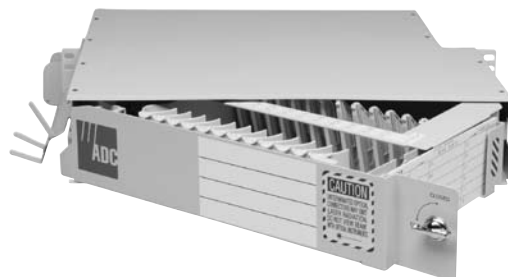
NGF MicroVAM Chassis - Right Orientation

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
NGF MicroVAM chassis, unloaded - left orientation; accommodates 12 MicroVAM modules, left side mounting	300 mm x 455 mm x 132 mm (11.8" x 17.9" x 5.2")	NGF-VSPM-7000L
NGF MicroVAM chassis, unloaded - right orientation; accommodates 12 MicroVAM modules, right side mounting	300 mm x 455 mm x 132 mm (11.8" x 17.9" x 5.2")	NGF-VSPM-7000R

NG3® MicroVAM Chassis

The NG3® MicroVAM chassis houses up to 13 MicroVAM modules. These MicroVAM modules are TE's highest density and most versatile VAM module.



NG3 MicroVAM Chassis

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
NG3 MicroVAM chassis; Accommodates up to 13 single MicroVAMs, front port only	89 mm x 483 mm x 381 mm (3.5" x 19" x 15")	NG3-VPB0000
NG3 Chassis for Rear Port MicroVAMs; Accommodates up to 12 single MicroVAMs, front and rear ports	89 mm x 483 mm x 381 mm (3.5" x 19" x 15")	NG3-VPC0000
Rear Entry NG3 MicroVAM chassis; Accommodates up to 10 single MicroVAMs, front port only	89 mm x 483 mm x 381 mm (3.5" x 19" x 15")	PPF-000000-V-PTY

See the following pages for module ordering information: Monitor Modules 4-5 • Splitter Modules 6-7 • WDM Modules 10-11 • CWDM Modules 12-13 • DWDM Modules 14-15

VAM Chassis

FMT MicroVAM Chassis

The FMT MicroVAM Chassis comes in various 1 RU and 2 RU configurations and can accommodate up to 24 MicroVAM modules. The MicroVAM module is TE's highest density and most versatile VAM module.



4-Position FMT Drawer
(FMT-DVS000000-E00B)



8-Position FMT Drawer
(FMX-ATT-BARVM00)



12-Position FMT Drawer
(FMT-GVM000000-A72P)



16-Position FMT Drawer
(FMT-GVS000000-E96P)



12-Position, Rear Port, FMT Drawer
(FMX-ATT-BARVM00-12)



20-Position FMT Drawer
(FMX-ATT-BARVM00-20)



24-Position FMT Drawer
(FMX-ATT-BARVM00-24)

Ordering Information

Description	Catalog Number
12" Depth (front port MicroVAMs only)	
4 Position FMT drawer, 19"/23" mount, 12" deep, 1 RU	FMT-DVS000000-E00B
8 Position FMT drawer, 19"/23" mount, 12" deep, 2 RU	FMX-ATT-BARVM00
12 Position FMT drawer, 19"/23" mount, 12" deep, 2 RU	FMT-GVM000000-A72P
16 Position FMT drawer, 19"/23" mount, 12" deep, 2 RU	FMT-GVS000000-E96P
15" Depth (front port MicroVAMs only)	
20 Position FMT drawer, 19"/23" mount, 15" deep, 2 RU	FMX-ATT-BARVM00-20
20 Position FMT drawer, 19"/23" mount, 15" deep, 2 RU, Rear drawer entry	FMX-ATT-BARVM00-20R
24 Position FMT drawer, 23" mount, 15" deep, 2 RU	FMX-ATT-BARVM00-24
15" Depth (front and rear port MicroVAMs)	
12 Position FMT drawer, 19"/23" mount, 15" deep, 2 RU, Rear port MicroVAMs	FMX-ATT-BARVM00-12

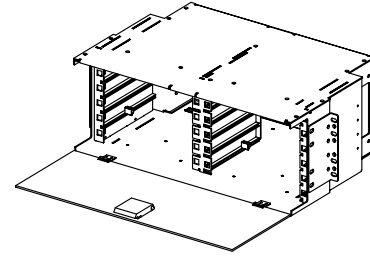
See the following pages for module ordering information: Monitor Modules 4-5 • Splitter Modules 6-7 • WDM Modules 10-11 • CWDM Modules 12-13 • DWDM Modules 14-15

VAM Chassis

Standard VAM Chassis

7-inch Standard VAM Chassis – 12 Single Plug-In Modules

The 7-inch standard VAM chassis fits into any open chassis location within an existing TE 7-inch panel system or in an LGX® compatible frame. It accommodates a maximum of 12 single plug-in modules, 12 bulkhead plates, 12 blank panels or any combination thereof. Adjustable mounting brackets are provided for 19- or 23-inch rack mounting environments. The 7-inch chassis mounts in EIA or WECCO racks. **Not for use in TE's 8-inch FCM frame.**



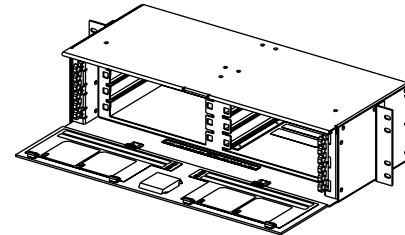
FVM-19X700

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
7" Standard VAM chassis; putty white 23" vertical cable guide (VCG) included	178 mm x 483 mm/584 mm x 305 mm (7" x 19" or 23" x 12")	FVM-19X700
7" LGX compatible VAM chassis; putty white, with rear doors, 23" VCG included	178 mm x 483 mm/584 mm x 280 mm (7" x 19" or 23" x 11")	FVM-19X700X11
Front vertical cable guide (VCG); putty white, for 19" mounting environments	51 mm x 127 mm (2" x 5")	VCG-25
Front vertical cable guide (VCG); putty white, for 23" mounting environments	102 mm x 127 mm (4" x 5")	VCG-45

5.25-Inch Standard VAM Chassis – 8 Single Plug-In Modules

The 5.25-inch standard VAM chassis fits into any 23-inch rack mounting environment. It accommodates a maximum of 8 plug-in modules, 8 bulkhead plates, 8 blank panels, or any combination thereof. **Not for use in TE's 8-inch FCM frame.**



FDM24-VAM525

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
5.25" Standard VAM chassis; putty white, for 23" mounting environments	133 mm x 584 mm x 305 mm (5.25" x 23" x 12")	FDM24-VAM525

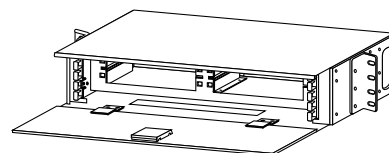
See the following pages for module ordering information: Monitor Modules 4-5 • Splitter Modules 6-7 • WDM Modules 10-11 • CWDM Modules 12-13 • DWDM Modules 14-15

VAM Chassis

Standard VAM Chassis

4-Inch Standard VAM Chassis – 6 Single Plug-In Modules

The 4-inch standard VAM chassis fits into any 19-inch or 23-inch rack mounting environment. It accommodates a maximum of 6 plug-in modules, 6 bulkhead plates, 6 blank panels or any combination thereof. **Not for use in TE's 8-inch FCM frame.**



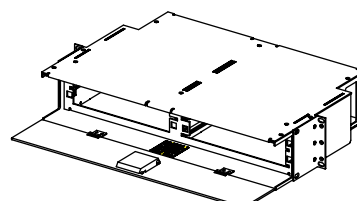
FVM-23X400

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
4" Standard VAM chassis; for 19" mounting environments	228.6 mm x 482.6 mm x 305 mm (9" x 19" x 12")	FVM-19X400
4" Standard VAM chassis; for 23" mounting environments	102 mm x 584 mm x 305 mm (4" x 23" x 12")	FVM-23X400

3.5-Inch Standard VAM Chassis – 4 Single Plug-In Modules

The 3.5-inch standard VAM chassis fits into any 19-inch rack mounting environment. It accommodates a maximum of 4 plug-in modules, 4 bulkhead plates, 4 blank panels or any combination thereof. Adjustable mounting brackets are provided for 23-inch rack mounting environments. **Not for use in TE's 8-inch FCM frame.**



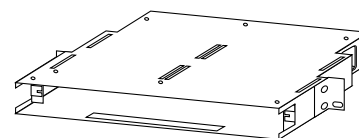
FVM-19X350

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
3.5" Standard chassis; for 19" or 23" mounting environments	89 mm x 483 mm/582 mm x 305 mm (3.5" x 19" or 23" x 12")	FVM-19X350

1.75-Inch Standard VAM Chassis – 2 Single Plug-In Modules

The 1.75-inch standard VAM chassis fits into any 19-inch rack mounting environment. It accommodates a maximum of 2 plug-in modules, 2 bulkhead plates, 2 blank panels or any combination thereof. Adjustable mounting brackets are provided for 23-inch rack mounting environments. **Not for use in TE's 8-inch FCM frame.**



FVM-19X175

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
1.75" Standard VAM chassis, unloaded; for 19" or 23" mounting environments	44.5 mm x 483 mm/583 mm x 305 mm (1.75" x 19" or 23" x 12")	FVM-19X175
Door Kit for 1.75" Standard VAM chassis; removable polycarbonate cover to protect cables	43.2 mm x 513 mm x 3.2 mm (1.7" x 20.2" or 23" x 0.125")	FVM-19X175-DRKT

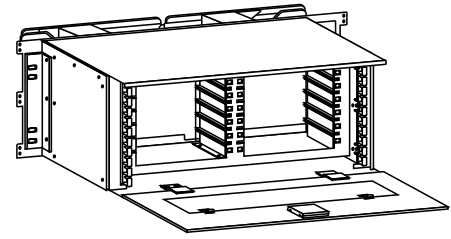
See the following pages for module ordering information: Monitor Modules 4-5 • Splitter Modules 6-7 • WDM Modules 10-11 • CWDM Modules 12-13 • DWDM Modules 14-15

VAM Chassis

8-Inch FCM Standard VAM Chassis

8-Inch FCM Standard VAM Chassis – 12 Single Plug-In Modules

The 8-inch FCM standard VAM chassis fits into any open chassis location and ships with appropriate rear cable management. It accommodates a maximum of either 12 plug-in modules, 12 bulkhead plates, 12 blank panels or any combination thereof. The 8-inch rear load chassis mounts in EIA or WECCO racks.



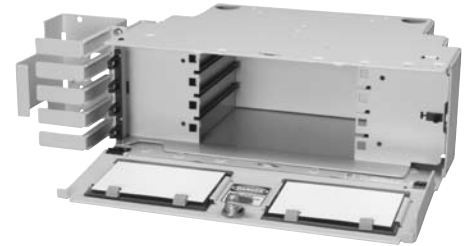
FDF-FCMVAM

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
8" FCM standard VAM chassis (rear load); rear cable management and doors attached to module	203 mm x 620 mm x 307 mm (8.0" x 24.4" x 12.1")	FDF-FCMVAM
8" FCM standard VAM chassis (front load); rear cable management and doors attached to module	203 mm x 549 mm x 226 mm (8.0" x 24.1.6" x 8.9")	FDF-STDVAM

FL2000 VAM Chassis

The FL2000 VAM chassis can be mounted in 5-inch recess, 19- or 23-inch rack mount, frame and cabinet environments. Vertical cable guides match the vertical cable management features of existing FL2000 system. The chassis accommodates 4, 6, or 9 plug-in modules.



FL2000 VAM Chassis

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
10.5" FL2000 VAM chassis; accommodates 9 single plug-in modules	267 mm x 483 mm x 258 mm (10.5" x 19" x 10.1")	FL2-9VAM105
7" FL2000 VAM chassis; accommodates 6 single plug-in modules	152 mm x 483 mm x 258 mm (7" x 19" x 10.1")	FL2-6VAM700
5.25" FL2000 VAM chassis; accommodates 4 single plug-in modules	133 mm x 483 mm x 258 mm (5.25" x 19" x 10.1")	FL2-4VAM525

Note: The FL2000 VAM system is designed to accept only front access modules. All input and output adapters, pigtails and/or bare fibers must be located on the front of the plug-in modules.

For complete information on TE's FL2000 product family, please contact TE's Technical Assistance Center.

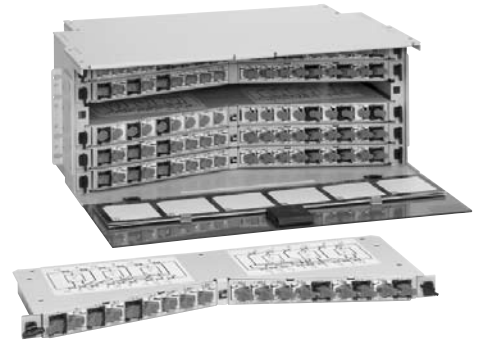
See the following pages for module ordering information: Monitor Modules 4-5 • Splitter Modules 6-7 • WDM Modules 10-11 • CWDM Modules 12-13 • DWDM Modules 14-15

VAM Chassis

WideVAM® Chassis

TE's 8-Inch FCM WideVAM Chassis family of products allows for an even more efficient integration of optical components into the optical distribution frame. WideVAM chassis are available for both industry-standard 19- or 23-inch optical distribution frames and TE's 8-inch FCM family. The WideVAM chassis continues to provide high density along with the utmost protection, modularity and flexibility for all optical component needs.

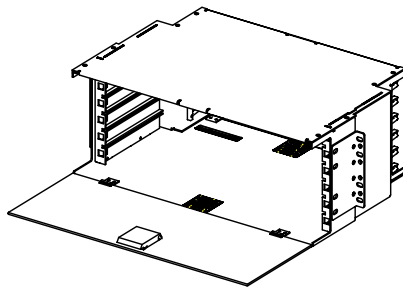
The WideVAM incorporates 18 front and 10 rear ports to provide 50 percent more density than the standard VAM. 7- and 3.5-inch industry-standard WideVAM chassis are also available, ensuring consistent, superior cable management within the frame.



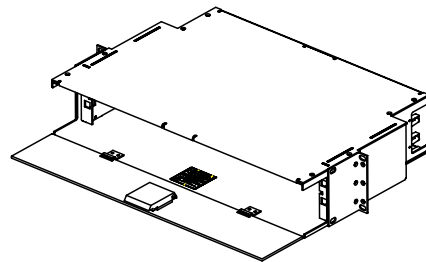
FCM WideVAM Chassis and Single Module

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
8" FCM WideVAM chassis (rear load); accommodates 6 single WideVAM modules	203 mm x 518 mm x 308 mm (8" x 20.4" x 12.1")	FDF-FCMWWAM
8" FCM WideVAM chassis (front load); accommodates 6 single WideVAM modules; and 3.5" and 7" Standard WideVAM chassis		FDF-STDWWAM



FVM-19X700W



FVM-19X350W-M6

Ordering Information

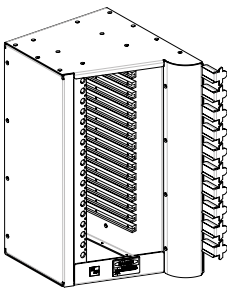
Description	Dimensions (HxWxD)	Catalog Number
7" WideVAM chassis; accommodates 6 single WideVAM modules	178 mm x 483 mm x 303 mm (7" x 19" x 11.9")	FVM-19X700W
3.5" WideVAM chassis; accommodates 2 single WideVAM modules	89 mm x 483 mm x 304 mm (3.5" x 19" x 12")	FVM-19X350W-M6

See the following pages for module ordering information: Monitor Modules 4-5 • Splitter Modules 6-7 • WDM Modules 10-11 • CWDM Modules 12-13 • DWDM Modules 14-15

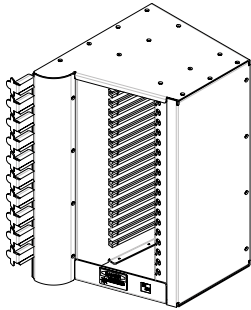
VAM Chassis

OMX600® VAM Chassis

The HD OMX VAM chassis is designed to fit into any open chassis location within new or existing OMX600 fiber distribution frames. Each chassis can accommodate a maximum of 18 high-density VAM plug-in modules, 18 bulkhead plates, 18 blank plates or any combination thereof.



MX6-HDVAMCHAS-R
(Right Orientation)



MX6-HDVAMCHAS-L
(Left Orientation)

Ordering Information

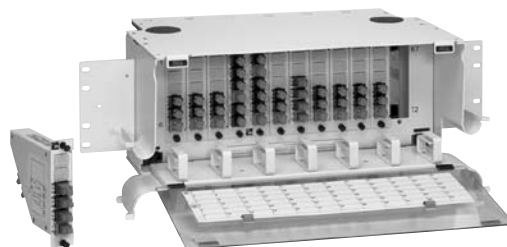
Description	Dimensions (HxWxD)	Catalog Number
OMX600 high-density VAM chassis, left orientation; accommodates up to 18 single OMX600 high-density modules	373 mm x 227 mm x 286 mm (14.7" x 8.9" x 11.3")	MX6-HDVAMCHAS-L
OMX600 high-density VAM chassis, right orientation; accommodates up to 18 single OMX600 high-density modules	373 mm x 227 mm x 286 mm (14.7" x 8.9" x 11.3")	MX6-HDVAMCHAS-R

See the following pages for module ordering information: Monitor Modules 4-5 • Splitter Modules 6-7 • WDM Modules 10-11 • CWDM Modules 12-13 • DWDM Modules 14-15

VAM Chassis

LGX® Compatible VAM Chassis

The 7-Inch LGX VAM chassis is designed to fit into any open chassis location within new or existing LGX compatible fiber frames. It can accommodate a maximum of 12 plug-in modules, 12 bulkhead plates, 12 blank plates, or any combination thereof. The mounting slots are oriented vertically.

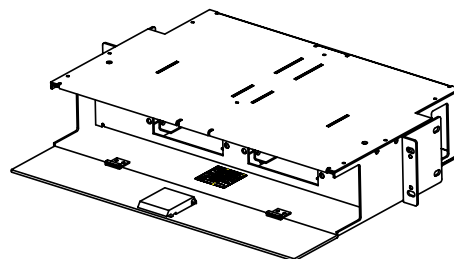


7" LGX® Compatible VAM Chassis

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
7" LGX compatible VAM chassis , white; VAMs mount vertically; accommodates up to 12 single modules	178 x 483 mm/584 mm x 280 mm (7" x 19"/23" x 11")	FVM-VLM19X700-W

The 3.5-Inch LGX VAM chassis is designed to fit into any 19- or 23-inch environment. It can accommodate a maximum of 4 plug-in modules, 4 bulkhead plates, 4 blank plates or any combination thereof. The mounting slots are oriented horizontally to allow standard 7" LGX compatible plug-in modules to be used while maximizing density and minimizing rack space allotment.



FVM-LGX19X350-W

Ordering Information

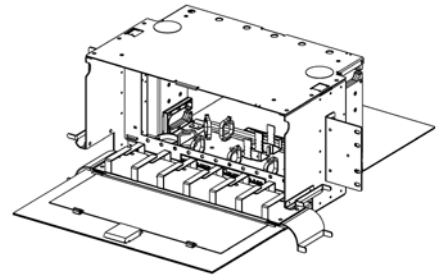
Description	Dimensions (HxWxD)	Catalog Number
3.5" LGX compatible VAM chassis ; white, VAMs mount horizontally; accommodates up to 4 single modules	89 mm x 483/584 mm x 280 mm (3.5" x 19"/23" x 11")	FVM-LGX19X350-W

See the following pages for module ordering information: Monitor Modules 4-5 • Splitter Modules 6-7 • WDM Modules 10-11 • CWDM Modules 12-13 • DWDM Modules 14-15

VAM Chassis

LGX® Compatible VAM Chassis

The 9-Inch LGX VAM chassis is designed to fit into any open chassis location within new or existing 19" or 22" fiber frames. It can accommodate a maximum of 12 plug-in modules, 12 bulkhead plates, 12 blank plates, or any combination thereof. The mounting slots are oriented vertically.

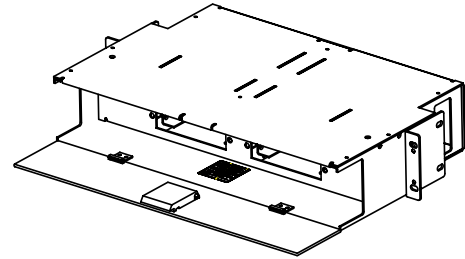


FVM-VLM19X900-W

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
9" LGX compatible VAM chassis	226 mm x 463/504 mm x 280 mm (8.9" x 19/23" x 11")	FVM-VLM19X900-W

The 3.5-Inch LGX VAM chassis is designed to fit into any 19- or 23-inch environment. It can accommodate a maximum of 4 plug-in modules, 4 bulkhead plates, 4 blank plates or any combination thereof. The mounting slots are oriented horizontally to allow standard 9" LGX compatible plug-in modules to be used while maximizing density and minimizing rack space allotment.



FVM-LGX19X350-W

Ordering Information

Description	Dimensions (HxWxD)	Catalog Number
3.5" LGX compatible VAM chassis; VAMs mount horizontally; accommodates up to 4 single modules	89 mm x 483/584 mm x 280 mm (3.5" x 19/23" x 11")	FVM-VLM919X350-W

See the following pages for module ordering information: Monitor Modules 4-5 • Splitter Modules 6-7 • WDM Modules 10-11 • CWDM Modules 12-13 • DWDM Modules 14-15

VALUE-ADDED MODULE (VAM) SYSTEM

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