

VIAVI

ONT Multiport Test Module (MTM)

ONT-601 MTM stand-alone configuration and MTM plug-in module for ONT-600 and ONT-800

Our network equipment manufacturing (NEM) customers tell us that they are building higher port density into their network elements to meet the need for ever-increasing bandwidth demand, and, therefore, need more test equipment ports at a lower cost. The revolutionary VIAVI Solutions ONT Multiport Test Module (MTM) design provides unparalleled value with support for multiple Layers 1 to 3 protocols at 155 Mbps to 11.3 Gbps rate port rates. These unique benefits reduce CapEx and OpEx because our customers no longer have to purchase, manage, and maintain multiple test sets to perform these functions.

The MTM supports multiport testing with four SFP/SFP+/XFP port banks. Each port bank supports one test, enabling up to four concurrent test sessions. This flexibility enables each user to generate/analyze traffic over a broad range of protocols and line rates.

The MTM also provides unparalleled value with comprehensive protocol coverage that includes the optical transport network (OTN), Gigabit Ethernet (GE)/10GE local area network (LAN), Generic Framing



Key Benefits

- All-in-one solution tests Layers 1 to 3 at 155 Mbps to 11.3 Gbps rates
- Reduces CapEx with high port density and a comprehensive feature set
- Maximizes efficiency and minimizes test time with multiuser, multiport capability
- Maximizes value with broad Ethernet, OTN, GFP, Fibre Channel, CPRI and SONET/SDH protocol coverage
- Complex traffic generation, deep analysis, and advanced error/alarm insertion ensures optimal system performance
- For OTN, it supports both Enhanced (ITU-T G.975 I.4 and I.7) and Generic (ITU-T G.709) FEC for complete FEC test coverage
- Unframed 600 Mbps and 1.2, 2.4, 3, 4.9, 6.1, 9.8, and 10 Gbps CPRI rates, infiniband 2.5, 5, and 10 Gbps rates and 1.485, 1.484, 2.970, and 2.967 Gbps SDI rates

Applications

- Validate Carrier Ethernet
- Perform system verification testing
- Generate clients to fully load/analyze 40/100 G systems
- Conduct production testing on network elements
- Load 155 Mbps – 11.3 Gbps traffic

Compliance

- CE Mark
- OTN ITU-T G.709
- LAN/WAN IEEE 802.3
- SONET Telcordia GR-253-Core
- SDH ITU-T G.707
- Safety CSA Certificate of Compliance

Procedure (GFP), Fibre Channel (FC), CPRI (Common Public Radio Interface) and synchronous optical/synchronous digital hierarchy (SONET/SDH Single and Multi Channel) technologies. It enables generating, analyzing, and selectively erroring protocol-based and unframed test traffic. For OTN testing, users can configure OTN framed clients as LAN, GFP, SONET/SDH, ODU0, ODUflex, or bulk payloads. Full client signal features are maintained when wrapped in OTN. Standard connectivity options supported while connected to a device under test are Terminal, Intrusive Through, and Nonintrusive Through modes.

The MTM is available as a stand-alone configuration or as a hot-swappable plug-in module. The stand-alone configuration is a compact, stackable 1-RU form factor known as the ONT-601 MTM-B. The plug-in MTM is for use in the ONT-800 and ONT-600 chassis series and enables scalability of up to 48 SFP/SFP+/XFP test ports within an ONT-812 chassis.

Capabilities

Optical Interfaces

The optical interfaces are based on XFP, tunable XFP, and SFP/SFP+ pluggable optics. I2C debug control of pluggable optics.

Unframed Testing

All available rates are offered with unframed pattern and BERT capabilities.

- Unframed BERT at 28 different rates: 155.52, 614.40, and 622.08 Mbps and 1.063, 1.229, 1.25, 1.484, 1.485, 2.125, 2.488, 2.5, 2.666, 2.967, 2.970, 3.072, 4.25, 4.915, 5.0, 6.144, 6.250, 8.5, 9.83, 9.953, 10.0, 10.138, 10.313, 10.519, 10.709, 11.049, 11.095, 11.270, and 11.318 Gbps
- Unframed patterns: PRBS31, PRBS23, PRBS15, PRBS11, PRBS7 and inverted, PRBS31-IEEE, DW 32 bits, square wave (Tx only), repeating ones/zeros editable 4 to 11 bits

OTN OTU2/OTU1 Testing

OTN OTU2/OTU1 testing supports OTU2/OTU1 applications including overclocked OTU2 rates for signal generation and analysis with deep signal manipulation (alarm, error, overhead), generic FEC (GFEC) and enhanced FEC (EFEC) generation and analysis. Also supports comprehensive ODU multiplexing (ODU0, ODUflex, ODU1, and ODU2) with multistage multiplexing as well as ODU multichannel capability.

- Standard and overclocked OTU2 rates
- GFEC and EFEC I.4 and I.7
- Bulk and fully structured clients; LAN, WAN, and SDH/SONET
- ODU multichannel with parallel generation and analysis of ODU0/1/flex mixed mappings
- Supports all TCM layers
- Overhead- and payload-based transfer delay
- Service disruption tests with high-level detail
- Client offset stuffing control at each layer
- ODU0 with GE and SDH/SONET clients
- Capture and analyze HDLC frames on GCC bytes

GFP Testing

The GFP functionality encapsulates Ethernet MAC into ODU0/1/flex or OTU2 with implementation in accordance with ITU-T G.7041, G.707, and ANSI T1.105.02. GFP-F and GFP-T are supported. Also GFP-transparent mapping in accordance with ITU-T G.7041 Par.17.4.1 encapsulates both PCS and Ethernet MAC into OTU2.

- Generation and analysis of GFP frame types
- Core header processing
- Payload-type header processing
- Error and alarm processing
- PCS and LAN Layer 2/3 traffic with full feature set
- GFP-F with extension header and full OAM support

GE and 10 GE LAN Testing

Testing covers the generation and analysis of PCS and MAC/IP Layer traffic. Testing on GE and 10 GE can be a native line interface or a client signal mapped into OTN.

- Layer 1 BERT and Layer 2/3 traffic
- PCS-layer testing with dynamic block errors and coding statistics
- VPLS and MAC-in-MAC Ethernet frame formats
- Up to 256 traffic flows and independent receiver filters, 16 independent traffic profiles
- Real-time QoS, service disruption, and packet jitter analysis per flow
- IPv4, IPv6, VLAN/Q-in-Q, MPLS, TCP, UDP frame structures
- RFC 2544 suite

1/2/4/8/10 G FC Testing

Testing covers the generation and analysis of PCS- and FC-2-layer traffic.

- Full-featured PCS-layer testing at 10 G PCS
- Single stream with constant traffic, bursty traffic, and full bandwidth support
- Implicit flow control login
- Credit buffer support

SDH/SONET Testing

The SDH/SONET functionality includes mappings down to VC-11/12 and VT-1.5/2 and can be a native interface or a client signal for ODU0/1/2.

- Full SDH/SONET testing for STM-1/STM-4/STM-16/STM-64 and OC-3/OC-12/OC-48/OC-192 with mappings down to VC-11/12 and VT-1.5/2
- Dynamic error/alarm insertion including bursts
- Full access to overhead bytes with byte capture
- Pointer sequence generation and analysis
- Service disruption tests with high-level detail
- Performance monitoring ITU-T G.826/828/829

SDH/SONET Multichannel Testing

The SDH/SONET MC application allows to generate and test HO Multi-Channel structures with up to 192 STS-1 or 64 VC-3/VC-4 channels, as well as LO MC structures with up to 1344 VT1.5 channels over 48 STS-1, or up to 1008 VC-12 over 16 STM-1.

- Mixed mapping structures
- Alarm/Error Analysis
- Service Disruption Test
- Connectivity Test
- Overhead Access
- Pointer Analysis

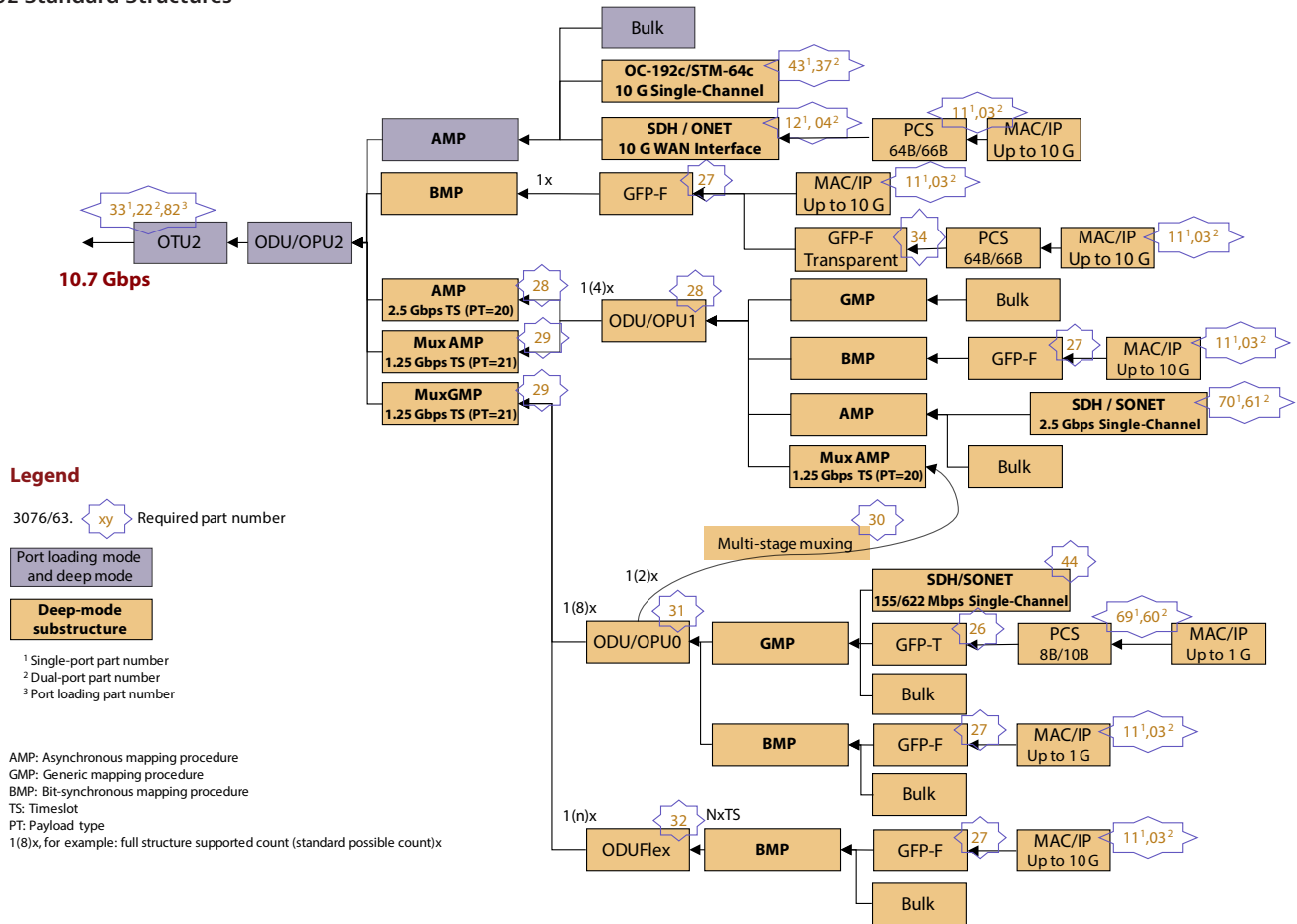
CPRI Testing

The CPRI applications support CPRI options 1 ... 9 (0.6144 - 12.165 Gbps)

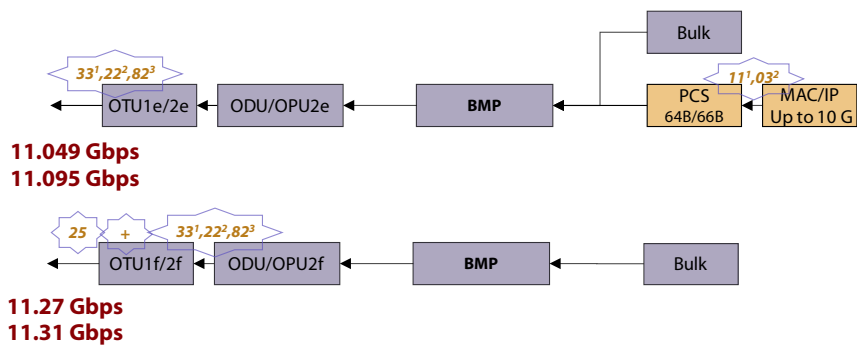
- PCS error/alarm LOBL, HiBER
- CPRI error/alarm LOF, RLOS, RLOF, RAI, SDI
- PCS Statistics and Capture
- Delay and Service Disruption Test

Signal Structures

OTU2 Standard Structures

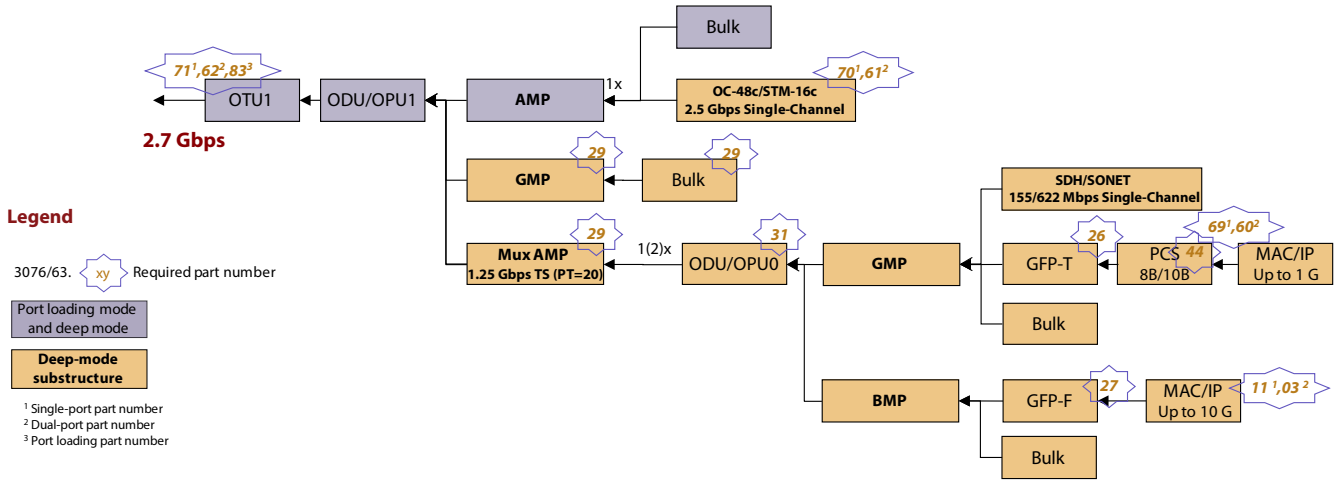


OTU2 Overclocked OTU1e/2e/1f/2f Structures



Signal Structures

OTU1 Structures



Legend

3076/63. xy Required part number

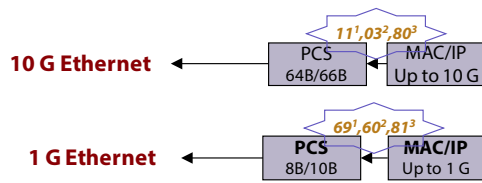
Port loading mode and deep mode

Deep-mode substructure

¹ Single-port part number
² Dual-port part number
³ Port loading part number

AMP: Asynchronous mapping procedure
 GMP: Generic mapping procedure
 BMP: Bit-synchronous mapping procedure
 TS: Timeslot
 PT: Payload type
 1(8)x, for example: full structure supported count (standard possible count)x

Ethernet Structures



CPRI Signals

PCS [8B/10B] CPRI BERT (74, 75, 88)

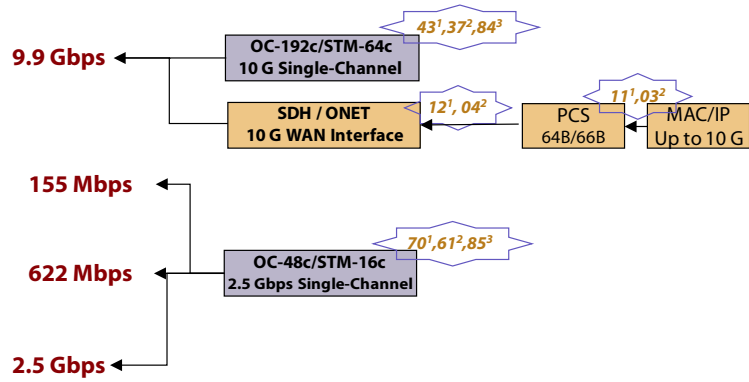
- 614.40 Mb/s [CPRI Option 1]
- 1.229 Gb/s [CPRI Option 2]
- 2.458 Gb/s [CPRI Option 3]
- 3.072 Gb/s [CPRI Option 4]
- 4.915 Gb/s [CPRI Option 5]
- 6.144 Gb/s [CPRI Option 6]
- 9.830 Gb/s [CPRI Option 7]

PCS [64B/66B] CPRI BERT (54, 55, 89)

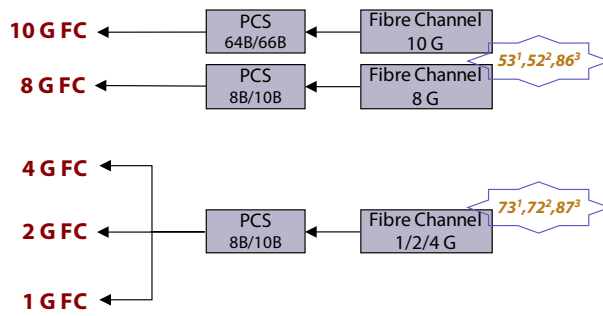
- 10.138 Gb/s [CPRI Option 8]
- 12.165 Gb/s [CPRI Option 9]

Signal Structures

SDH/SONET Structures



Fibre Channel Structures



Legend

3076/63. xy Required part number

Port loading mode and deep mode

Deep-mode substructure

- ¹ Single-port part number
- ² Dual-port part number
- ³ Port loading part number

AMP: Asynchronous mapping procedure
 GMP: Generic mapping procedure
 BMP: Bit-synchronous mapping procedure
 TS: Timeslot
 PT: Payload type
 1(8)x, for example: full structure supported count (standard possible count)x

Ordering Information

Description	Part Number
Main Product and Module	
ONT-601 MTM-B	3076/12
MTM-B module for ONT-600 and ONT-800	3076/60.12
Deep Mode Software*	
GFP-T for MTM	3076/63.26
OTN multiplexing — enhanced for MTM	3076/63.29
ODU0 for MTM	3076/63.31
OTN multiplexing OTU2 for MTM	3076/63.28
OTN multistage multiplexing for MTM	3076/63.30
OTN ODUflex for MTM	3076/63.32
SDH/SONET client in ODU0 for MTM	3076/63.44
10 G GFP-F for MTM	3076/63.27
OTN ODU multichannel for MTM	3076/63.35
OTN transparent GFP-F for MTM	3076/63.34
OTN Enhanced Overhead Manipulation for MTM	3076/63.39
OTN OSMC Analysis for MTM	3076/63.40
EFEC I.4 for MTM	3076/63.23
EFEC I.7 for MTM	3076/63.24
ESMC G.8264	3076/63.13
IEEE 1588 V2 PTP Master/Slave Evaluation for 10GE	3076/63.14
OTN control plane enhancements for MTM	3076/63.38
Lower-Rate Software	
155 Mbps to 2.5 Gbps SONET/SDH for MTM — single port	3076/63.70
155 Mbps to 2.5 Gbps SONET/SDH for MTM — dual port	3076/63.61
155 Mbps to 2.5 Gbps SONET/SDH for MTM — 4-port loading	3076/63.85
OTU1 for MTM — single port	3076/63.71
OTU1 for MTM — dual port	3076/63.62
OTU1 for MTM — 4-port loading	3076/63.83
1 GE for MTM — single port	3076/63.69
1 GE for MTM — dual port	3076/63.60
1 GE for MTM — 4-port loading	3076/63.81
1/2/4 G FC for MTM — single port	3076/63.73
1/2/4 G FC for MTM — dual port	3076/63.72

1/2/4 G FC for MTM — 4-port loading	3076/63.87
2.5GigE — Dual Port	3076/63.76
2.5GigE — Single Port	3076/63.77
CPRI Lower Rates — Dual Port	3076/63.74
CPRI Lower Rates — Single Port	3076/63.75
CPRI Lower Rates — 4 Port Loading	3076/63.88

Description	Part Number
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Higher-Rate Software	
10 GE LAN for MTM — single port	3076/63.11
10 GE LAN for MTM — dual port	3076/63.03
10 GE LAN for MTM — 4-port loading	3076/63.80
10 GE WAN for MTM — single port	3076/63.12
10 GE WAN for MTM — dual port	3076/63.04
OTN 10.7/11.05/11.1 Gbps for MTM — single port	3076/63.33
OTN 10.7/11.05/11.1 Gbps for MTM — dual port	3076/63.22
OTN 10.7/11.05/11.1 Gbps for MTM — 4-port loading	3076/63.82
OC192/STM-64 BERT for MTM — single port	3076/63.43
OC192/STM-64 BERT for MTM — dual port	3076/63.37
OC192/STM-64 BERT for MTM — 4-port loading	3076/63.84
SDH/SONET MultiChannel for MTM - Dual Port	3076/63.46
8/10 G FC for MTM — single port	3076/63.53
8/10 G FC for MTM — dual port	3076/63.52
8/10 G FC for MTM — 4-port loading	3076/63.86
OTN 11.27/11.32 Gbps for MTM	3076/63.25
CPRI Higher Rates — Dual Port	3076/63.54
CPRI Higher Rates — Single Port	3076/63.55
CPRI Higher Rates — 4 Port Loading	3076/63.89

*Deep Mode software supports up to 2 ports simultaneously.



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