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-600 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 tests 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)/10 GE local area network (LAN), Generic Framing Procedure (GFP), Fibre Channel (FC), and synchronous optical/synchronous digital hierarchy (SONET/SDH) 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-603/606/612 chassis series and enables scalability of up to 48 SFP/SFP+/XFP test ports within an ONT-612 chassis.

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, 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
- Performs 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
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: PRBS 231–1, 223–1, 215–1, 211–1, 27–1 and inverted, PRBS 231–1 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
- ODU 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 T1105.02. GFP-F and GFP-T are supported. Also GFP-transparent mapping in accordance with ITU-T G.7041 Part1741 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 ODU4/1/2.
- 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/G.828/G.829
Signal Structures

OTU2 Standard Structures

Legend

3076/63. Required part number

Port loading mode and deep mode

Deep-mode substructure

AMP: Asynchronous mapping procedure
GMP: Generic mapping procedure
BMP: Bit-synchronous mapping procedure
PT: Payload type
TS: Timeslot
1x: payload type supported count (standard possible count)x

Port loading mode

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

AMP

GMP

BMP

OTU2

ODU/OPU2

OTU1f/2f

ODUFlex

10.7 Gbps

11.049 Gbps

11.095 Gbps

11.27 Gbps

11.31 Gbps

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

OTU1 Structures

Ethernet Structures

Legend

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
N: Single structure count (standard possible count)
Signal Structures

SDH/SONET Structures

9.9 Gbps
- OC-192c/STM-64c
  - 10 G Single-Channel
  - SDH / ONET
    - 10 G WAN Interface
  - PCS
    - 64B/66B
- MAC/IP
  - Up to 10 G

155 Mbps

622 Mbps
- OC-48c/STM-16c
  - 2.5 Gbps Single-Channel

2.5 Gbps

Fibre Channel Structures

10 G FC
- PCS
  - 64B/66B
- Fibre Channel
  - 10 G

8 G FC
- PCS
  - 8B/10B
- Fibre Channel
  - 8 G

4 G FC
- PCS
  - 8B/10B
- Fibre Channel
  - 1/2/4 G

2 G FC

1 G FC

Legend
- Required part number
- Single-port part number
- Dual-port part number
- Port loading part number

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

11 Gbps AMP
2.5 Gbps TS (PT=20)
Bulk
ODU/OPU1
2.5 Gbps Single-Channel AMP
1(4)x
Multi-stage muxing
ODU/OPU0 MAC/IP
Up to 1 G
PCS 8B/10B
155/622 Mbps Single-Channel GMP
1(8)x
MuxGMP
1.25 Gbps TS (PT=21)
1(2)x
ODUFlex
Bulk
BMP
NxTS
GFP-T
Mux AMP
1.25 Gbps TS (PT=21)
Mux AMP
1.25 Gbps TS (PT=20)
AMP
1x
331,222,823
431,372
701,612
26
27
29
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691,602
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111,032
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# Ordering Information

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<td>3076/12</td>
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<tr>
<td>MTM-B module for ONT-603/606/612</td>
<td>3076/6012</td>
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<td>*<em>Deep Mode Software</em></td>
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<td>EFEC I.7 for MTM</td>
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<td>155 Mbps to 2.5 Gbps SONET/SDH for MTM — single port</td>
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<td>ONT-601 MTM hard carrying case</td>
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*Deep Mode software supports up to 2 ports simultaneously.*
## Ordering Information

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<tr>
<th>Description</th>
<th>SONET/SDH</th>
<th>OTN</th>
<th>Ethernet</th>
<th>FC</th>
<th>CPRI</th>
<th>Infiniband</th>
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