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 (GFN), Serial Interface (SI), CPRI, SONET/SDH, and other protocols.

**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
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

Legend

3076/63.    Required part number

Port loading mode and deep mode

Deep-mode substructure

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

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

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

11.049 Gbps
11.095 Gbps

11.27 Gbps
11.31 Gbps
Signal Structures

OTU1 Structures

Legend

- 3076: Required part number
- 3076/63: Port loading mode and deep mode

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

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

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

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

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

1 G FC

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

Legend

- Required part number
- Port loading mode and deep mode
- Deep mode substructure

- 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

Legend:

- 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. For example: full structure supported count (standard possible count)
### Ordering Information

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*Deep Mode software supports up to 2 ports simultaneously.