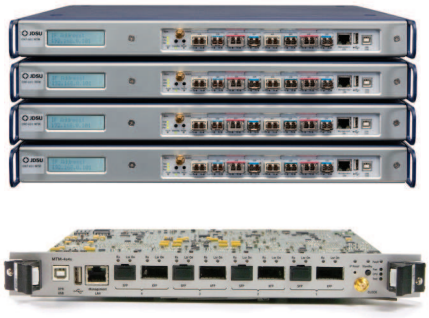
ONT-600 Multiport Test Module (MTM)

ONT-601 MTM Stand-Alone Configuration and MTM Plug-in Module for ONT-603/606/612



Key Benefits

- **All-in-one solution tests L1 to L3 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**
- **Supports both enhanced and generic FEC for complete FEC test coverage**

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

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 JDSU ONT-600 Multiport Test Module (MTM) design provides unparalleled value with support for multiple Layers 1 to 3 protocols and unmatched 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 small-form pluggable port banks consisting of an SFP for lower rates and an XFP for 10 G rates. 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 standalone configuration is a compact, stackable 1-RU form factor known as the ONT-601 MTM-4s4x. The plug-in MTM is for use in the ONT-603/606/612 chassis series and enables scalability of up to 48 XFP/SFP test ports within an ONT-612 chassis.

Capabilities

Optical Interfaces

The optical interfaces are based on XFP, tunable XFP, and 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 17 different rates: 155.52 and 622.08 Mbps, and 1.063, 1.25, 2.125, 2.488, 2.666, 4.25, 8.5, 9.953, 10.313, 10.519, 10.709, 11.049, 11.095, 11.270, and 11.318 G
- Unframed patterns: PRBS $2^{31}-1$, $2^{23}-1$, $2^{15}-1$, $2^{11}-1$, $2^{7}-1$ and inverted, PRBS $2^{31}-1$ 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.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

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.

- Features at the 10 G PCS layer are the same as 10 GE LAN
- Single stream with constant traffic, bursty traffic, and full bandwidth support
- Implicit flow control login
- Credit buffer support

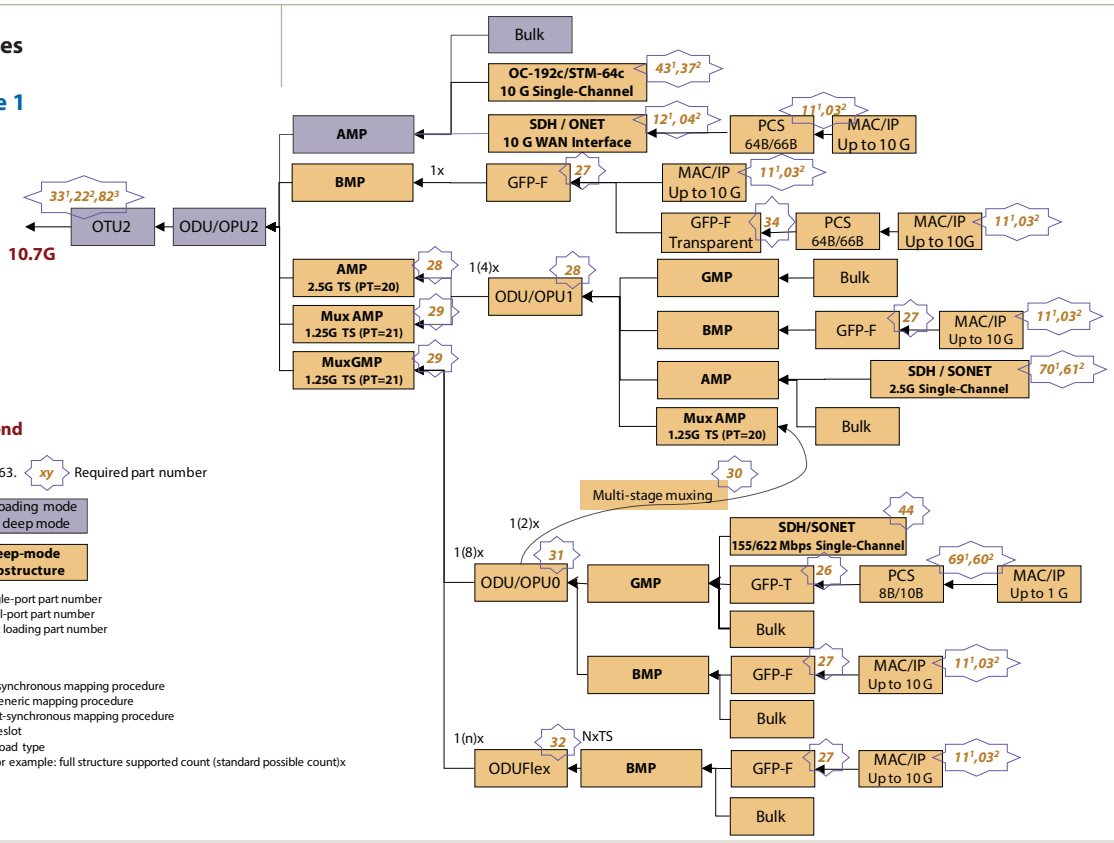
SDH/SONET Testing

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

Signal Structures

OTU2 Structure 1



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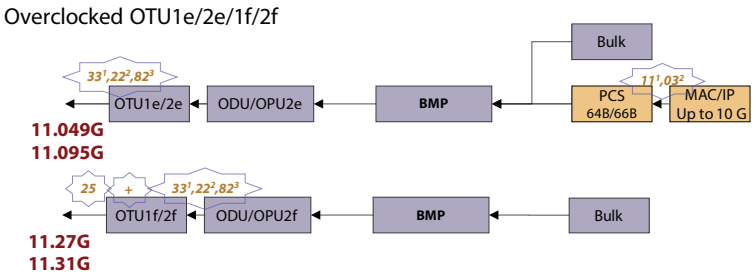
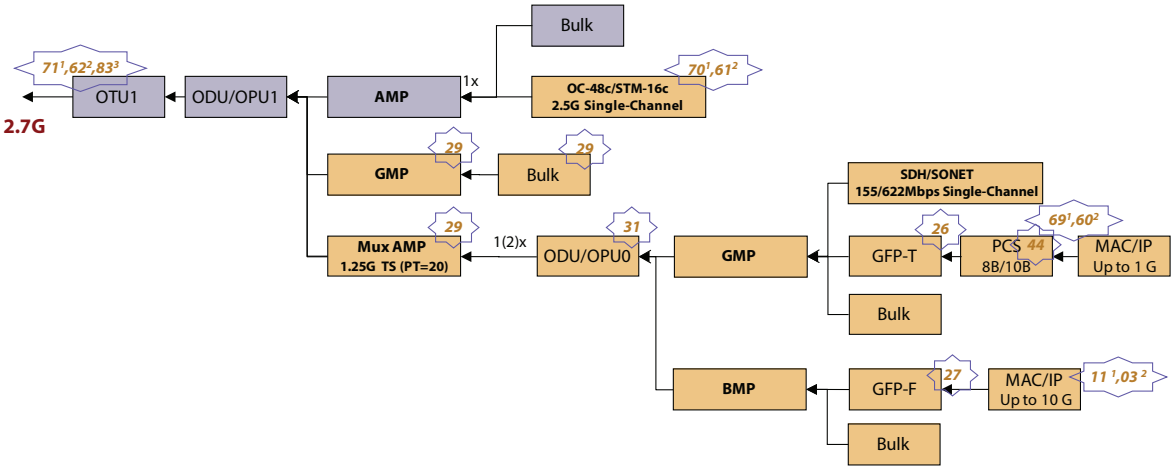
Signal Structures

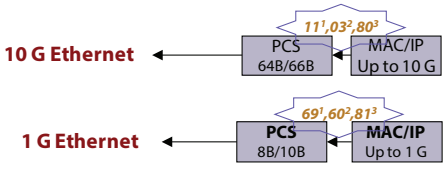
OTU2 Structure 2



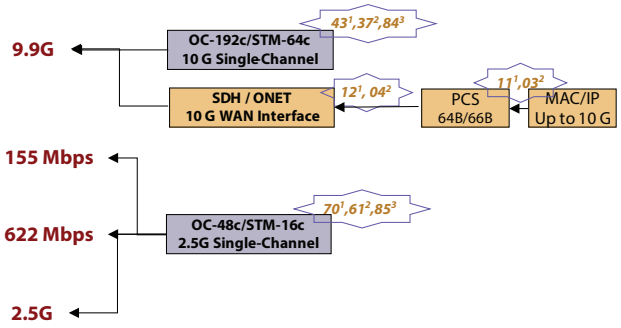
OTU1 Structure



Ethernet Structure



SDH/SONET Structure



Legend

3076/63. xy Required part number

Port loading mode and deep mode

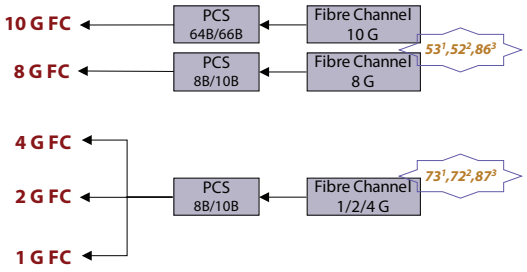
Deep-mode substructure

[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

Signal Structures

Fibre Channel Structure



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
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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

Main Product and Module

Part Number	Description
BN 3076/11	ONT-601 MTM
BN 3076/60.11	MTM-4s4x module for ONT-603/606/612

Deep Mode Software

Part Number	Description
BN 3076/63.26	GFP-T for MTM
BN 3076/63.29	OTN multiplexing — enhanced for MTM
BN 3076/63.31	ODU0 for MTM
BN 3076/63.28	OTN multiplexing OTU2 for MTM
BN 3076/63.30	OTN multistage multiplexing for MTM
BN 3076/63.32	OTN ODUflex for MTM
BN 3076/63.44	SDH/SONET client in ODU0 for MTM
BN 3076/63.27	10 G GFP-F for MTM
BN 3076/63.35	OTN ODU multichannel for MTM
BN 3076/63.34	OTN Transparent GFP-F for MTM
BN 3076/63.24	EFEC I.7 for MTM

SFP Port Software

Part Number	Description
BN 3076/63.70	155 Mbps to 2.5 G SONET/SDH for MTM — single port
BN 3076/63.61	155 Mbps to 2.5 G SONET/SDH for MTM — dual port
BN 3076/63.85	155 Mbps to 2.5 G SONET/SDH for MTM — 4-port loading
BN 3076/63.71	OTU1 for MTM — single port
BN 3076/63.62	OTU1 for MTM — dual port
BN 3076/63.83	OTU1 for MTM — 4-port loading
BN 3076/63.69	1 GE for MTM — single port
BN 3076/63.60	1 GE for MTM — dual port
BN 3076/63.81	1 GE for MTM — 4-port loading
BN 3076/63.73	1/2/4 G FC for MTM — single port
BN 3076/63.72	1/2/4 G FC for MTM — dual port
BN 3076/63.87	1/2/4 G FC for MTM — 4-port loading

XFP Port Software

Part Number	Description
BN 3076/63.11	10 GE LAN for MTM — single port
BN 3076/63.03	10 GE LAN for MTM — dual port
BN 3076/63.80	10 GE LAN for MTM — 4-port loading
BN 3076/63.12	10 GE WAN for MTM — single port
BN 3076/63.04	10 GE WAN for MTM — dual port
BN 3076/63.33	OTN 10.7/11.05/11.1 G for MTM — single port
BN 3076/63.22	OTN 10.7/11.05/11.1 G for MTM — dual port
BN 3076/63.82	OTN 10.7/11.05/11.1 G for MTM — 4-port loading
BN 3076/63.43	OC192/STM-64 BERT for MTM — single port
BN 3076/63.37	OC192/STM-64 BERT for MTM — dual port
BN 3076/63.84	OC192/STM-64 BERT for MTM — 4-port loading
BN 3076/63.53	8/10 G FC for MTM — single port
BN 3076/63.52	8/10 G FC for MTM — dual port
BN 3076/63.86	8/10 G FC for MTM — 4-port loading
BN 3076/63.25	OTN 11.27/11.32 G for MTM

XFP Optics

Part Number	Description
BN 3076/96.20	XFP optics 850 nm for MTM
BN 3076/96.21	XFP optics 1310 nm for MTM
BN 3076/96.22	XFP optics 1550 nm for MTM

SFP Optics

Part Number	Description
BN 3076/96.25	SFP optics 850 nm for MTM
BN 3076/96.26	SFP optics 1310 nm for MTM
BN 3076/96.27	SFP optics 1550 nm for MTM

Accessories

Part Number	Description
BN 3076/96.03	ONT-601 MTM hard carrying case

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