

T-BERD®/MTS-8000

40/100 G Transport Module



Key Benefits

- Helps to accelerate the network with 40/100 GE and OTN
- Reduces OpEx by supporting both CFP and QSFP+ optics
- Provides battery support to fulfill field-mobility requirements
- Supports field expansion with customized modules and software options to sustain your investment
- Fully integrated T-BERD/MTS-8000V2 platform provides the best field 10 G scalability with support for four 10 G ports

Key Features

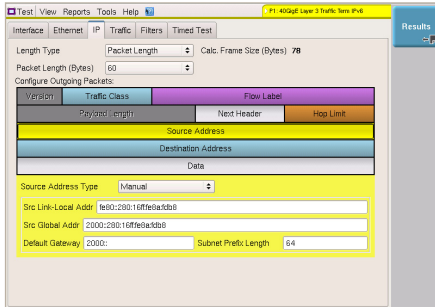
- Supports both 40 and 100 GE tests
- Provides OTU3 and OTU4 and a 100 GE client in OTU4
- Supports 10 concurrent Ethernet data streams for service testing
- Ready for 40/43 G SONET/SDH/OTN
- Measures high-accuracy round-trip latency (150 ns accuracy)
- Layer 3 test features include ping/ARP and traceroute for IPv4/IPv6

Applications

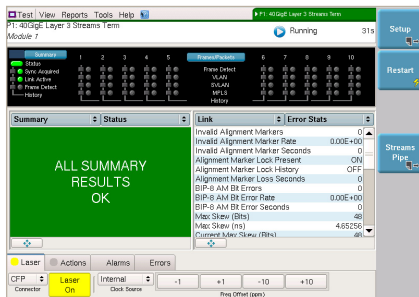
- Service activation and commissioning for Ethernet and OTN
- Network troubleshooting
- Application-driven service monitoring

The JDSU T-BERD/MTS-8000 40/100 G Transport Module is the most compact test solution on the market and is ideal for field-test applications. Its ruggedness and optional battery power and control connectivity can withstand the most diverse test conditions. With capabilities designed for carrier Ethernet/packet transport, long-haul, and metro-core networks, as well as government telecommunication centers, the module represents the latest innovation for the family of award-winning, industry-leading T-BERD/MTS test solutions. These elements combine to provide the right test tool for achieving quicker execution and easier mobility, especially during service activation and troubleshooting.

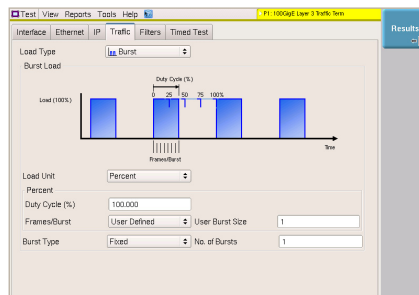
The module integrates native pluggable optics support for both the C form-factor pluggables (CFP) applicable to 40 and 100 G line rates and the quad small form-factor pluggables (QSFP+) applicable to 40 G line rates. It also provides clocking options for synchronous Ethernet and optical transport networks (OTNs) based on internal, recovered, and external clock SMA selections.



40 GE IPv6 setup



40 GE streaming



100 GE burst setup

Ethernet Testing

The 40/100 G Transport Module provides comprehensive Ethernet testing for 40 and 100 GE as well as 100 GE mapped into OTU4. It provides the right testing tools for service activation and troubleshooting. Test capabilities such as pause frame support and service disruption measurements are available on 40/100 GE. In addition, the right level of field test support is provided at Layer 1 with injections and monitoring, including skew measurements. The key strengths of the 40/100 G Transport Module are its application tests for real-world Layer 2 and Layer 3 applications.

Ethernet VLAN, Q-in-Q, and MPLS technologies

Ethernet tagging and encapsulation is commonly used to improve the scalability of Ethernet networks by isolating customer traffic. Regardless of the encapsulation and tagging used, the module tests class of service to confirm key performance indicators such as committed information rate (CIR), frame delay (FD), frame delay variation (FDV), and frame loss ratio. Support for virtual local area network tags (VLAN tags), Q-in-Q VLAN tags, and multiprotocol label switching (MPLS) enables the module to test any part of a metro or long-haul network.

RFC 2544 testing

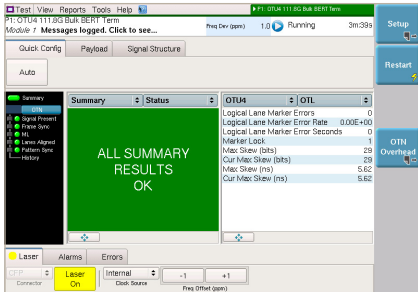
RFC 2544 is the de-facto industry standard for Ethernet service activation. In addition to supporting Ethernet throughput for CIR verification, FD/latency, frame loss, and back-to-back burst testing as specified in the RFC, the module also tests for FDV/packet jitter to ensure circuit readiness for transporting time-sensitive services such as IPTV and VoIP. It can measure FD/latency with high accuracy (150 ns) and also with lower accuracy for extremely long distances. The RFC 2544 test suite includes detailed customer-ready reports to complete the activation cycle. It also supports integrated loop-up/down capabilities to allow a local unit to control a far-end unit when providing latching logical loopback capability.

IPv4 and IPv6 testing

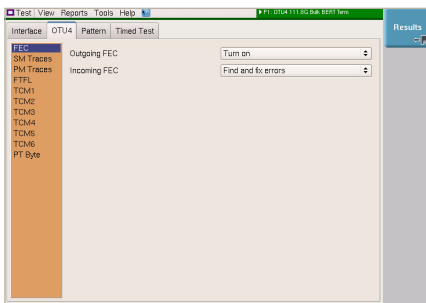
Layer 3 test features incorporate traffic generation and analysis for both IPv4 and IPv6. Router connectivity is enabled via support of the ARP protocol to dynamically determine destination MAC addresses. In addition, the T-BERD/MTS supports ping and traceroute testing. Specific to IPv6, the neighbor discovery protocol provides support for IPv6 address resolution.

CoS verification with multiple streams

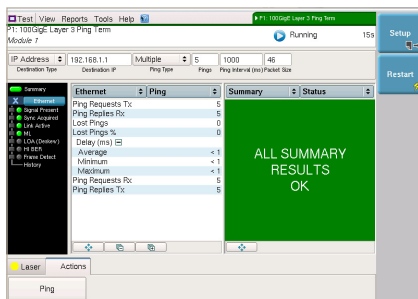
Multistream testing delivers traffic generation and analysis at the Ethernet and IP layers so technicians can emulate various types of traffic with CoS mappings letting them assess the impact of traffic prioritization on the overall network architecture and to confirm proper queuing, policing, and shaping. Users can generate and analyze up to 10 individually configured streams because of key per-stream parameters such as VLAN ID and priority, type of service/differentiated services code point (TOS/DSCP) marking, packet size, stream bandwidth, and source/destination MAC and IP addresses. Configuring constant, burst, or ramp traffic enables near real-world traffic simulation before actually delivering a service. This level of testing can confirm network design and drastically reduce post-installation troubleshooting by measuring high-accuracy round-trip latency (150 ns accuracy).



OTU4 OTL



OTU4 Overhead settings



100 GE ping

OTN Testing

OTN testing is provided on both OTU3 and OTU4 interfaces, which includes the ability to run service-activation testing and troubleshooting on native OTN interfaces. An OTN primarily transports Ethernet or SONET/SDH client signals over a backbone using DWDM. The OTN wraps the client signal, provides alarm and error support in its overhead, and offers signal robustness using forward error correction (FEC). In addition, Optical Channel Transport Lane (OTL) layer support provides error/alarm injection and monitoring in support of OTU3/OTU4 implementations.

Alarms, errors, and FEC testing

High-speed OTN interfaces require the standard G.709 FEC. The 40/100 G Transport Module enables monitoring and correcting the FEC on incoming signals; conversely, it can inject correctable or uncorrectable errors in the transmit direction. Furthermore, it can verify OTN alarms and errors with injection capabilities at both the OTN line and client level. Connectivity to nonstandard FECs is also possible via the use of an all-zero algorithm. It can also monitor OTN signals while connected in-line on a circuit. An overhead editor provides full manipulation of OTN overhead bytes; additional capabilities provide for editing and monitoring of trace messages (TTI), payload type (PT), and fault signaling (FTFL).

Support for TTI and six TCM sets

The T-BERD/MTS supports all six tandem connection monitoring (TCM) sets, including testing of associated alarms and trail trace identifiers (TTI), which includes concurrently checking expected trace messages on all TCMs and SM/PM.

Mappings

The 40/100 G Transport Module supports multiple PRBS patterns as bulk OTN payload, including PRBS 9, 23, 31, and inverts. A full-featured 100 GE client can also be mapped into OTU4 using generic mapping procedures (GMP) for dual-layer service activation and troubleshooting.

Optics Support

The 40/100 G Transport Module provides native support for both CFP and QSFP+ optics. For example, a user who needs to switch between 100 GE and 40 GE testing does not need to swap optics using the CFP and QSFP+ slots. This solution can test using the vast majority of available CFP or QSFP+ solutions on the market. JDSU sources optics from multiple vendors for use in the 40/100 G Transport Module. A CFP/QSFP+ information menu displays the type of optics used and an expert mode lets the user tweak the CFP parameters as needed.

Additional Features and Applications

The full-featured 40/100 G Transport Module also features:

- comprehensive QoS testing: FD, FDV, frame loss, and out-of-sequence per stream
- integrated RFC 2544 test suite and reporting
- IPv4, IPv6, ARP, ping, and traceroute testing for router applications
- support for CFP and native QSFP+ pluggable optics.

Applications include low-latency measurement support, far-end Ethernet logical loopback via address swapping, and connectivity verification.

- Layer 1 OTL BERT capability for OTN interfaces and Ethernet scrambled idle patterns
- High-level scalability can be combined with DMC/MSAM to add one or multiple ports at 10 G and below. It can also be combined with optical modules such as an optical spectrum analyzer.

Ordering Information

Part Number	Description
CH040103	40/100 G Transport Module - One-level applications
CH043112	40/100 G Transport Module - One- and two-level applications
CH40GE	40 GigE Test Option
CH100GE	100 GigE Test Option
CHOTU3	OTN - OTU3 Bulk 43 G Test Option
CHOTU4	OTN - OTU4 Bulk 112 G Test Option
CHCOS	Multiple Streams/COS Test Option
CHIPV6	IPv6 Test Option
CHMPLS	MPLS Test Option
CH100GEINOTU4	100 GE in OTU4 test application (on CH043112)
CCFP-112G-3-4	CFP 100 GE and OTU4, 1310 nm, 4λ, LC
CCFP-112G-5-10	CFP 100 GE and OTU4, 1550 nm, 10λ, LC
CCFP-43G-3-4	CFP, 40 GE and OTU3, 1310 nm, 4λ, LC
CCFP-112G-8-10	CFP 100 GE and OTU4 and 40 GE and OTU3, 850 nm, 10 fibers, MPO connector

Test & Measurement Regional Sales

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