Agilent N2X

OC-192/STM-64 XM Test Card

J7241A and J7242A

Technical Data Sheet

Simultaneous multi-port and multi-channel SONET/SDH testing for OC-192/STM-64 interfaces throughout development and deployment.

Agilent Technologies

Key Features

- **OC-192/STM-64**
- **Multi-channel BER, APS, and J1 connectivity measurements**
- **Generation/measurement of mixed mapping structures**
- **SONET/SDH Overhead access**
- **Error & alarm generation & measurements**
- **Transparent & intrusive thru mode testing for both SONET/SDH and 10G Ethernet WAN-Phy**
- **Simultaneous measurement results for all channels**

Product Overview

Agilent N2X is the industry's most comprehensive test solution for testing the development and deployment of network services for converging network infrastructures. Service providers, network equipment manufacturers (NEMs), and component manufacturers can verify service attributes of entire networks end-to-end, while also isolating problems down to individual networking devices and subsystems. Agilent N2X delivers unparalleled test realism to verify the ultimate performance, scalability and resilience of carrier grade services and infrastructure.

The Agilent N2X OC-192/ STM-64 Multi-channel Test Card, in conjunction with the N2X Multi-Services Transport Application provides simultaneous multi-port and multi-channel SONET/SDH test capability to realistically characterize next generation SONET equipment.

The J7241A and J7242A OC-192/ STM-64 Multi-channel Test Cards are dual SONET/SDH, providing 10 Gb/s optical interfaces. SONET support is for OC-192. SDH support is for STM-64. The J7241A has a 1550nm transmitter and the J7242A has a 1310nm transmitter. Both test cards have wideband receivers covering both 1550nm and 1310nm.

Each test card provides multi-channel payload granularity down to STS-1/ AU-3. Key functionality includes multi-channel STS/High Order Path BER, STS/High Order Path APS switching times and (J1 byte based) path connectivity testing. This functionality enables both tributary and line side testing of MSSPs (Multi-Service Switching Platforms) plus line side testing of MSPPs (Multi-Service Provisioning Platforms).

Product Features

Comprehensive Ethernet Services Testing

Along with the N2X XM Test card range, N2X provides a portfolio of packet and routing test cards for comprehensive testing of Ethernet Services across SONET/SDH networks and infrastructure. Key capabilities include:

- Patented Ethernet Service Disruption measurements to verify services are "carrier class" and meets 50ms outage times or SLAs
- Real-time multi-stream measurements including Ethernet Packet BER, throughput, loss and latency to verify Ethernet service QOS
- VLAN tag stacking (IEEE 802.ad) measurements to verify class of Service and service prioritization
- Layer 2 VPN emulation software for testing latest technologies like VPLS (Virtual Private LAN Service)
- GMPLS control plane software to verify interaction of control and data planes of ASON (Automatically switched Optical Network

For information on the J7244A and J7245A OC-48/STM-16 (and below) multi-rate test cards, see URL: http://cp.literature.agilent.com/litweb/pdf/5988-6785EN.pdf

Technical Specifications

Functional Specifications

Multi-channel BER Generates & measures BER simultaneously on all STS/High Order Path channels.

Multi-channel APS times Measures service disruption times simultaneously on all or selected STS/High Order Path channels.

Multi-channel J1 auto-connectivity Generates unique preset or user definable J1trace message for each High Order Path (64 byte or 16 byte including CRC7) with user initiated automatic measurement of J1 connectivity on all STS/ High Order Path channels.

Overhead Access Set/monitor all defined/undefined overhead incl. the following: SOH/RSOH: A1A2, J0, Z0, E1, F1, D1-D3LOH/MSOH: H1-H3, K1K2, D4-D12, S1, M0, M1, E2, Z1, Z2POH: J1, C2, G1, F2, H4, F3, K3, N1(STS/ HP POH can be set uniquely for each channel)

Overhead Sequence Generation

(Up to 9 bytes can be selected Simultaneously)

SOH/TOH J0, E1, F1, S1, D1-D3, K1, K2, K1-2, K2-2, D4-D12, M0, M1, E2 plus all undefined overhead bytes.

POH J1, C2, G1, F2, H4, Z3/F3, Z4/K3, Z5/N1 in a single selected POH channel.

Available in Terminal Mode and Intrusive Thru-mode. Sequences can contain up to 255 elements. No of frames transmitted 1-6553**5.**

J0 Section Trace Preset or user definable trace message (64 byte or 16 byte including CRC7)

K1K2 Messages Set/monitor K1K2 messages. Byte encode/ decodes for both linear & ring topology messages are supported.

K1K2 Capture Capture K1K2 pair or K1K2K2-2 triplets. Up to 256 different states with up to 65535 frames per value.

S1 Sync Status Set/monitor S1 sync status byte. S1 byte encode/ decodes are supported.

Mixed Payloads (SONET) Full multi-channel mixed payloads generation & measurement STS-1, STS-3c, STS-6c, STS-9c, STS-12c, STS-24c & STS-48c.

Mixed Payloads (SDH) Full multi-channel mixed payloads generation & measurement AU-3, AU-4, AU-4-2c, AU-4-3c, AU-4-4c, AU-4-8c, AU-4-16c, AU-4-64c

Error Tx/Rx B1, B2, REI-L/MS-REI B3, REI-P and Payload Bit (path error generation can be added to all or selected paths simultaneously, error rates can be different for each channel size, measurement is on all channels simultaneously)

Error Rates Single or w.xy E-z (w.xy can be 1.00 to 9.99, z is 3 to 10)

Alarm Tx/Rx LOS, LOF, SEF/OOF, AIS-L/MS-AIS, RDI-L/MS-RDI LOP, AIS-P/AU-AIS, RDI-P/HP-RDI, UNEQ-P, Pattern Sync Loss, PDI-P (Path alarms can be added to all or selected paths simultaneously) Errors & Alarms can be added simultaneously.

Error/Alarm Timed Bursting Bursts of ON for x seconds and OFF for y seconds, REPEAT z times (x, z =1 to 10,000; y =0 to 10,000)

Alarm Pulse Bursting Off then burst ON for x frames then off (where x=1 to 64). Pulse bursting does not include support for LOS alarm.

Test Payload Independent selection per channel of PRBS, inverted PRBS or user-defined 16bit word.

Pointer Adjustment Inc, Dec, New Pointer Value (with/without NDF)

Pointer Measurements Pointer Activity, Inc count, Dec Count (measurement is on all channels simultaneously)

Performance Analysis ITU-T G.826 & G.828 (block based) and GR-253 (bit based) performance analysis.

Thru-mode Transparent or Intrusive modes.

- **10G Ethernet WAN-Phy:** add line, section and hi-order path errors and alarms to 10G Ethernet WAN-Phy signals in thru-mode between DUTs or using N2X XR/XS cards as a source
- **Error Tx/Rx:** B1, B2, REI-L/MS-REI, B3, REI-P/HP-REI
- **Alarm Tx/Rx:** LOS, LOF, LOP, AIS-L/MS-AIS, RDI-L/MS-RDI, AIS-P/AU-AIS, RDI-P/HP-RDI, UNEQ-P/HP-UNEQ
- Overhead Delay (up to 9 bytes can be selected simultaneously)
- Available in Intrusive Thru-mode only.
- **SOH/TOH:** J0, E1, F1, S1, D1-D3, K1, K2, K1-2, K2-2, D4-D12, M0, M1, E2 plus all undefined overhead bytes.
- The selected overhead channel is delayed by N frames where N can be between 1 and 512 (0.125ms to 64ms)

Error Tx/Rx B1, B2, REI-L/MS-REI, B3, REI-P/HP-REI

Alarm Tx/Rx LOS, LOF,LOP, AIS-L/MS-AIS, RDI-L/MS-RDI, AIS-P/AU-AIS, RDI-P/HP-RDI, UNEQ-P/HP-UNEQ

Overhead Delay

- (Up to 9 bytes can be selected simultaneously) Available in Intrusive Thru-mode only.
- SOH/TOH: J0, E1, F1, S1, D1-D3, K1, K2, K1-2, K2-2, D4-D12, M0, M1, E2 plus all undefined overhead bytes.
- The selected overhead channel is delayed by N frames where N can be between 1 and 512 (0.125ms to 64ms)

Signal auto-discovery	Receiver detects the signal structure and configures receiver channel settings appropriately.
Transmit Frequency offset	Up to +/- 100ppm

Parametric Specifications

Fiber power output:	1310nm: Min -6dBm, max -1dBm (single mode) 1550nm: Min -5dBm, max -1dBm (single mode)
Tx spectral width	<3nm
Extinction Ratio (min)	6db at 1310nm, 8.2dB at 1550nm
Min sensitivity	-11dbm at 1310nm, -14dBm at 1550nm
Max input power	-1dBm
Max input power damage level	+3 dBm
Optical pulse mask	• SDH: S-64.2,S64.3 (ITU-T G.691) • SONET: OC-192 (reach to VSR-1)
Tx clock sync	Tx clock can be synchronized to BITS, MTS or internal 10M through the XM chassis, or to recovered clock.
Tx clock performance	• Frequency: +/- 0.2ppm • Stability: +/-1.0ppm/year max
Eye clock o/p	Line rate/16

Mechanical

Size	287mm L x 187mm W x 29mm H
Weight	1.7kg

Environmental

Operating temperature range:	+5C to +40C

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Agilent N2X

Agilent's N2X multi-service tester combines leading-edge services with carrier grade infrastructure testing and emulation. The N2X solution set allows network equipment manufacturers and service providers to more comprehensively test new services end-to-end, resulting in higher quality of service and lower network operating costs.

Warranty and Support

Hardware Warranty

All N2X hardware is warranted against defects in materials and workmanship for a period of 1 year from the date of shipment.

Software Warranty

All N2X software is warranted for a period of 90 days. The applications are warranted to execute and install properly from the media provided.
This warranty only covers physical defects in the media, whereby the media is replaced at no charge during the warranty period.

Software Updates

With the purchase of any new system controller Agilent will provide 1 year of complimentary software updates. At the end of the first year you can enroll into the Software and Suport Agreement (SSA) contract for continuing software product enhancements.

Support

Technical support is available throughout the support life of the product. Support is available to verify that the equipment works properly, to help with product operation, and to provide basic measurement assistance for the use of the specified capabilities, at no extra cost, upon request.

Ordering Information

To order and configure the test system consult your local Agilent field engineer.

Sales, Service and Support

United States:
Agilent Technologies
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