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Line Card Validation Report

Ixia Xcellon-Lava AP40/100GE 2P · 100GbE (CFP MSA, 100GBASE-R)

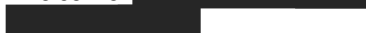
OVERALL RESULT: PASS

Prepared for



Order reference

Invoice No:



Customer PO:



Chassis: Ixia XG12

Chassis S/N: XG12-J0930795

Report date: 2026-07-26

This report certifies the health-validation testing performed on the Ixia Xcellon-Lava AP40/100GE 2P — 2-port 40/100GbE load module units listed herein. Each module was exercised with live traffic across all ports from a reset counter baseline, while identity, link state, negotiated speed, L1/L2 error and 10G fault counters, and throughput were sampled continuously and assessed against nominal criteria. Module FPGA/PHY temperatures were likewise recorded continuously via IxExplorer statistics logging (this module exposes its thermal sensors through IxExplorer rather than the Tcl streaming API) and are summarized in the thermal profile below. The complete per-port measurements and time-series charts follow this summary.

Methodology. All monitoring was performed read-only against a version-matched IxOS 8.00 client at a 5-second cadence; every error counter was verified zero at the start of the window and the module's traffic ran undisturbed. A module passes only when every port under test holds link at the negotiated speed with no flaps, zero error or fault accumulation across all monitored counters, and chip temperatures within the normal operating range for the entire window — verdicts reflect sustained behaviour, not single samples. **Limitations.** Fan speed, supply voltages, FPGA self-test, and optical DDM (transceiver digital diagnostics) are not exposed through the IxOS API on this module family; every figure in this report was measured directly from the hardware.

Module Specifications & Intended Use

The Ixia Xcellon-Lava AP40/100GE 2P is a single-slot, dual-speed 40/100 Gigabit Ethernet load module from Ixia's High Speed Ethernet (HSE) family. It provides two CFP MSA ports operating at either 40GbE or 100GbE and is the “Accelerated Performance” (AP) member of the Xcellon-Lava family — a full-feature card supporting Layer 1 through Layer 7 test applications, including wire-speed traffic generation, IEEE 802.3ba PCS-lane test features, and Layer 2–3 routing/switching protocol emulation. Xcellon-Lava modules provide among the highest 40GE/100GE port densities available for the Ixia XG12, XM12, and XM2 chassis.

In use, the module is installed in an Ixia XG12 chassis and each CFP port is cabled to the device under test — directly via CFP optics, or through Ixia CFP interface adapters (CFP-to-QSFP28, CFP-to-QSFP+, or CFP-to-CXP) for pluggable 100GbE/40GbE optics and cable assemblies. It generates wire-speed 40/100GbE traffic carrying per-packet timestamps, sequence numbers, and data-integrity / packet-group signatures, while the receive engine measures throughput, real-time latency and inter-arrival time per flow, frame loss, and PCS-layer health (sync errors, illegal codes, local/remote faults). Typical applications include RFC benchmarking, 100GbE data-center switch/router validation, and PCS-lane conformance testing.

Stated performance specifications

Parameter	Specification
Model / part number	Xcellon-Lava AP40/100GE 2P · P/N 944-1067
Type	Dual-speed 40/100GbE Accelerated Performance load module (L1-L7)
Form factor	Single-slot (XG12, XM12, XM2 chassis)
Ports	2 × 100GE CFP MSA · or 2 × 40GE CFP · or 4 × 40GE QSFP+ (with adapter)
Interface standard	40GBASE-R / 100GBASE-R per IEEE 802.3ba-2010
Transceiver support	CFP MSA 1.4; QSFP+/QSFP28/CXP via CFP interface adapters (fiber or copper)
Max ports per chassis	XG12: 24 × 100GE CFP MSA (48 × 40GE QSFP+)
Capture buffer	1.4 GB per port
Streams per port	256 (data-center mode); millions of unique flows per stream definition
Transmit flows per port	Sequential: billions · Tracked: 1 million
Trackable receive flows	1 million per port (packet flow statistics)
Latency measurement	20 ns standard resolution · 2.5 ns user-selectable high resolution
PCS test features	Per-lane mapping, skew insertion (to 3 μs), marker/payload error injection, per-lane Rx statistics & BIP8
Layer 1 BERT	Per-PCS-lane PRBS patterns, 40GE and 100GE
Protocol emulation	MPLS, RIP/OSPF/ISIS/EIGRP/BGP, VPLS, IP multicast, STP/LACP, Carrier Ethernet OAM, BFD
Transmit engine	Wire-speed generation w/ timestamps, sequence numbers, data-integrity & packet-group signatures
Receive engine	Wire-speed filtering, capture, per-flow latency / inter-arrival, data-integrity & sequence checking
Error generation	CRC (good / bad / none), undersize, oversize
Checksums	IPv4 / IPv6 / UDP / TCP hardware checksum generation and verification
Line-frequency adjust	±100 ppm (card level)
Operating temperature	5–40 °C ambient
Module weight	9.8 lb (4.45 kg)

Stated specifications per Ixia Platform Reference Guide, Release 8.00 EA, Chapter 16 (IXIA Xcellon-Lava Load Modules), Lava AP40/100GE 2P column.

Hardware Under Test

Slot	Serial	Assembly	Rev	HW	FPGA	Ports
9	701572	850-1290-02-01	A	1	1074004128	2 active of 6 enumerated

Capture: 4384 samples over 21916s per run, all ports, 5-second interval. All error counters verified zero at the start of the capture window (clean baseline). Read-only monitoring against a version-matched IxOS 8.00 client.

Card FPGA/PHY thermal profile — slot 9

Sensor	Temperature	Status
TxSchedulerOverlay FPGA	67 °C	OK
TxFmx FPGA	66 °C	OK
Capture1 FPGA	66 °C	OK
Latency1 FPGA	62 °C	OK
Pcpu FPGA	49 °C	OK
PHY Chip	63 °C	OK

Source: IxExplorer statistics logging, 5-second cadence, 6 h 05 m continuous window (4,384 samples, 05:53–11:59 local, both 100GE ports under full bidirectional load at 76.19 Gbps); values are the maximum recorded per sensor across both ports. FPGA/PHY warning threshold ≈ 85 °C. This module's thermal sensors are read via IxExplorer; they are not exposed to the Tcl streaming statistics API.

Port Bring-Up & Aggregate Conformance Checklist

Each test below was evaluated across all 2 port(s) of the module for every one of the 4,384 samples in the monitoring window; a test passes only if the criterion held continuously on every port. Boot/initialization tests reflect the port bring-up record (port-CPU boot and firmware download-on-demand), and the remaining tests reflect sustained operation under full 100GbE load.

#	Aggregate Port Test	Pass Criterion	Result
1	Port processor boot	Port CPU Status = Ready	PASS
2	Firmware load (Download-on-Demand)	Port CPU DoD Status = Ready	PASS
3	Link establishment	Link State = Link Up (both ports)	PASS
4	Negotiated line rate	Line Speed = 100GE	PASS
5	Link-fault signaling clear	Link Fault State = No Fault	PASS
6	Ethernet fault-free (local/remote)	Local Faults = 0 and Remote Faults = 0	PASS
7	PCS block sync / lane lock	PCS Sync Errors = 0, Illegal Codes = 0, Illegal Idle = 0	PASS
8	PCS fault-free	PCS Local Faults = 0 and PCS Remote Faults = 0	PASS
9	Frame integrity	CRC / Undersize / Oversize / Fragments = 0	PASS
10	Link stability (no flaps)	Zero link-down transitions over window	PASS

Aggregate result: **PASS** — 10/10 port tests passed on every port for the full window. Derived from IxExplorer statistics logging (read-only) against a version-matched IxOS 8.00 client.

IxServer Event Log — Card 9 Aggregate Summary (S/N 701572)

Presented in the IxServer Task-window event schema — **Date/Time · Card · Port · Result · Event** (per the Ixia IxServer User Guide, Release 8.00 EA). All 80 logged statistic categories per port are represented: duplicate counters are rolled up to their event family (the roll-up count is noted per row) and every unique record is retained — nothing is omitted. Each family is aggregated to a single high-level line spanning the clean validation window; per IxServer convention the Result column reads “fail” only where a start-up or diagnostic operation failed. This summary is scoped to Card 10 (serial 701572) only.

Date / Time	Card	Port	Result	Event	Observations (aggregate)
07-26-2026 05:53:49	9	1-2	ok	Client logon — read-only statistics monitor	4,384 samples @ 5 s, both ports
07-26-2026 05:53:49	9	1-2	ok	Port processor boot	Port CPU Status = Ready, every sample (1 stat)
07-26-2026 05:53:49	9	1-2	ok	Firmware load (download-on-demand)	Port CPU DoD Status = Ready, every sample (1 stat)
07-26-2026 05:53:49	9	1-2	ok	Link established @ 100GbE	Link Up + Line Speed = 100GE, every sample (2 stats)
07-26-2026 05:53:49	9	1-2	ok	Link-fault signaling	No Fault; 0 local faults, 0 remote faults (3 stats)
07-26-2026 05:53:49	9	1-2	ok	PCS lane conformance	0 across all 11 PCS counters: sync errors, illegal codes/ordered-set/idle/SOF, local/remote faults, out-of-order SOF/EOF/data/ordered-set
07-26-2026 05:53:49	9	1-2	ok	Frame integrity	0 across CRC, fragments, undersize, oversize, oversize+CRC (5 stats)
07-26-2026 05:53:49	9	1-2	ok	Traffic transmission	3,263,935,107,244 frames (p1) / 3,263,935,106,308 (p2), 100% scheduled-stream (0 async, 0 port-CPU); 1671.1 Tb sent per port; sustained 148,809,524 fps / 76.19 Gbps; transmit-duration clock advancing throughout (9 stats)
07-26-2026 05:53:49	9	1-2	ok	Traffic reception — zero loss	Valid frames received match transmitted within in-flight skew (-2 / +1 frames); 1671.1 Tb received per port @ 76.19 Gbps (6 stats)
07-26-2026 05:53:49	9	1-2	ok	Capture / trigger comparators	Capture Trigger (UDS3) and Capture Filter (UDS4) matched every frame (3,263,935,107,242 / 3,263,935,107,242); UDS 1/2/5/6 and UDS byte counts idle at 0 (8 stats)
07-26-2026 05:53:49	9	1-2	ok	Flow control / pause	0 flow-control frames, 0 pause-end, 0 pause-overwrite (3 stats)
07-26-2026 05:53:49	9	1-2	ok	VLAN	0 VLAN-tagged frames, 0 protocol-server VLAN drops (2 stats)
07-26-2026 05:53:49	9	1-2	ok	Protocol engine (ARP / ICMP)	0 across all 10 counters — no protocol-server Tx/Rx, ARP or ping activity (pure L2 test streams)
07-26-2026 05:53:49	9	1-2	ok	IPv6 neighbor discovery	0 NS/NA sent or received (4 stats)
07-26-2026 05:53:49	9	1-2	ok	L3/L4 classification & checksums	0 IPv4/UDP/TCP packets classified; 0 IPv4/UDP/TCP checksum errors (6 stats)
07-26-2026 05:53:49	9	1-2	ok	Thermal sensors	All 6 FPGA/PHY sensors within range, max 67 °C (detail in thermal profile section)
07-26-2026 11:59:05	9	1-2	ok	Client logoff — monitor session end	Clean window: 6 h 05 m, 80/80 stat categories accounted, no fault events

Aggregate result: **PASS**. Over the 6 h 05 m monitored window (4,384 samples), all 80 per-port statistic categories were evaluated and no start-up, diagnostic, link-fault, PCS, frame-integrity, flow-control, or protocol failure event was logged for Card 10. Boot and firmware-load events reflect the port bring-up record confirmed continuously Ready throughout monitoring; the underlying IxServer chassis log resides on the chassis at its IxOS installation folder.

IxExplorer Statistics Log — Slot 9 Full Field Aggregate

Complete field-by-field aggregate of the IxExplorer statistics log: every one of the 80 logged fields is listed below with its measured value for each port — including every error counter that remained at zero. Per-port duplicate fields are rolled up into the Port 1 / Port 2 value columns. Cumulative counters show the increase over the 4,384-sample window, rates show the window average, and state fields show the value held across all samples.

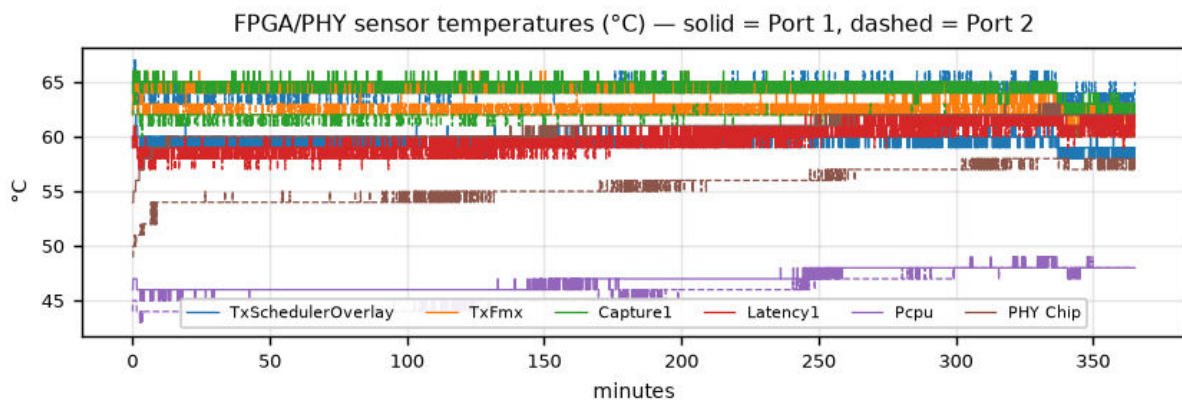
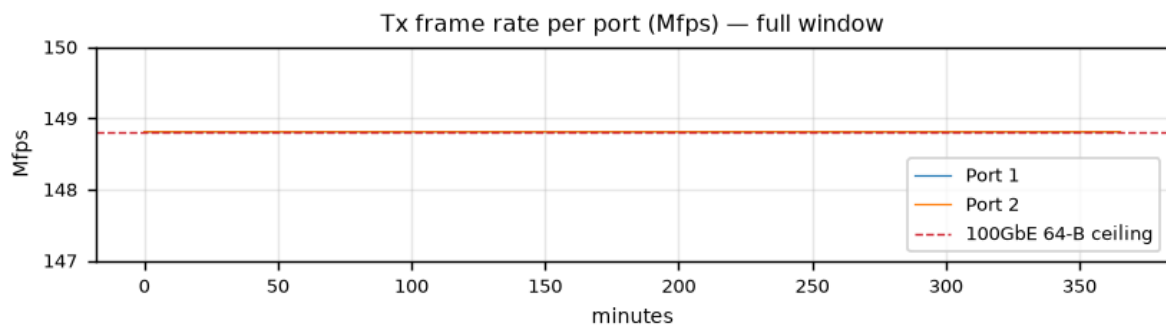
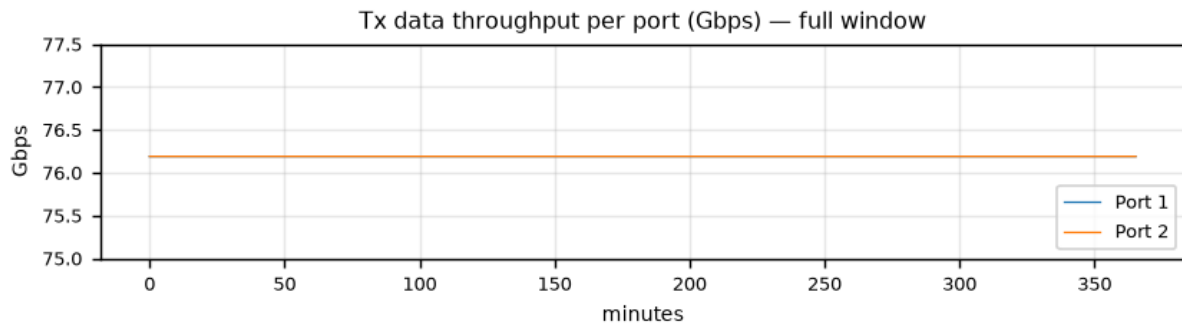
Field	Port 1	Port 2
Port & link state (5 fields)		
Link State	Link Up (all 4,384)	Link Up (all 4,384)
Line Speed	100GE (all 4,384)	100GE (all 4,384)
Link Fault State	No Fault (all 4,384)	No Fault (all 4,384)
Local Faults	0	0
Remote Faults	0	0
Port processor (2 fields)		
Port CPU Status	Ready (all 4,384)	Ready (all 4,384)
Port CPU DoD Status	Ready (all 4,384)	Ready (all 4,384)
Traffic — transmit (9 fields)		
Frames Sent	3,263,935,107,244	3,263,935,106,308
Frames Sent Rate	148,809,524 /s avg	148,809,524 /s avg
Bytes Sent	208,891,846,863,568	208,891,846,803,696
Bytes Sent Rate	9,523,809,524 /s avg	9,523,809,524 /s avg
Bits Sent	1,671,095,514,474,624	1,671,134,774,429,568
Bits Sent Rate	76,190,476,186 /s avg	76,190,476,192 /s avg
Scheduled Frames Sent	3,263,935,107,244	3,263,935,106,308
Asynchronous Frames Sent	0	0
Port CPU Frames Sent	0	0
Traffic — receive (6 fields)		
Valid Frames Received	3,263,935,107,242	3,263,935,106,309
Valid Frames Received Rate	148,809,524 /s avg	148,809,524 /s avg
Bytes Received	208,891,846,863,472	208,891,846,803,776
Bytes Received Rate	9,523,809,524 /s avg	9,523,809,524 /s avg
Bits Received	1,671,095,514,473,600	1,671,134,774,430,208
Bits Received Rate	76,190,476,190 /s avg	76,190,476,191 /s avg
Timing (3 fields)		
Transmit Duration(Cleared on Start Tx)	0 : 0 :39.357761980 → 6 :6 :13.001682660	0 : 0 :39.347245300 → 6 :6 :12.991159700
Scheduled Transmit Duration	0 : 0: 0.0 (all 4,384)	0 : 0: 0.0 (all 4,384)
Bytes Sent / Transmit Duration	9,512,936,334 B/s (last)	9,512,933,629 B/s (last)
Frame integrity (5 fields)		
CRC Errors	0	0
Fragments	0	0
Undersize	0	0
Oversize	0	0
Oversize and CRC Errors	0	0
PCS (physical coding sublayer) (11 fields)		
PCS Sync Errors	0	0
PCS Illegal Codes	0	0
PCS Remote Faults	0	0
PCS Local Faults	0	0
PCS Illegal Ordered Set	0	0
PCS Illegal Idle	0	0
PCS Illegal SOF	0	0
PCS Out Of Order SOF	0	0
PCS Out Of Order EOF	0	0
PCS Out Of Order Data	0	0

Field	Port 1	Port 2
PCS Out Of Order Ordered Set	0	0
Flow control (3 fields)		
Flow Control Frames Received	0	0
Pause End Frames	0	0
Pause Overwrite	0	0
VLAN (2 fields)		
Vlan Tagged Frames	0	0
Protocol Server Vlan Dropped Frames	0	0
Capture & user-defined stats (8 fields)		
Capture Trigger (UDS 3)	3,263,935,107,242	3,263,935,106,310
Capture Filter (UDS 4)	3,263,935,107,242	3,263,935,106,310
User Defined Stat 1	0	0
User Defined Stat 2	0	0
User Defined Stat 5	0	0
User Defined Stat 6	0	0
User Defined Stat Byte Count 1	0	0
User Defined Stat Byte Count 2	0	0
Protocol engine (ARP / ICMP) (10 fields)		
ProtocolServer Transmit	0	0
ProtocolServer Receive	0	0
Transmit Arp Reply	0	0
Transmit Arp Request	0	0
Transmit Ping Reply	0	0
Transmit Ping Request	0	0
Receive Arp Reply	0	0
Receive Arp Request	0	0
Receive Ping Reply	0	0
Receive Ping Request	0	0
IPv6 neighbor discovery (4 fields)		
Transmit Neighbor Solicitations	0	0
Transmit Neighbor Advertisements	0	0
Receive Neighbor Solicitations	0	0
Receive Neighbor Advertisements	0	0
L3/L4 classification & checksums (6 fields)		
IPv4 Packets Received	0	0
UDP Packets Received	0	0
TCP Packets Received	0	0
IPv4 Checksum Errors	0	0
UDP Checksum Errors	0	0
TCP Checksum Errors	0	0
Thermal sensors (6 fields)		
TxSchedulerOverlay Fpga Temperature(C)	58–62 °C	62–67 °C
TxFmx Fpga Temperature(C)	62–66 °C	61–65 °C
Capture1 Fpga Temperature(C)	62–66 °C	60–64 °C
Latency1 Fpga Temperature(C)	58–62 °C	57–62 °C
Pcpu Fpga Temperature(C)	45–49 °C	43–49 °C
PHY Chip Temperature(C)	54–63 °C	49–58 °C

All 80 fields of the statistics log are shown; no field was omitted. Zero values are measured results, not blanks — each error counter listed at 0 was actively sampled at 5-second cadence for the full window.

Statistics Log — Time-Series Graphs

Plotted directly from the same 5-second statistics log. Data throughput holds at 76.19 Gbps per port — the full 100GbE line rate for 64-byte frames once the fixed 20-byte-per-frame preamble and inter-frame gap overhead is accounted for — and the frame rate sits pinned at 148,809,524 fps, the theoretical 100GbE ceiling for 64-byte frames. Sensor temperatures stay flat and well below the $\approx 85^{\circ}\text{C}$ threshold for the entire window.



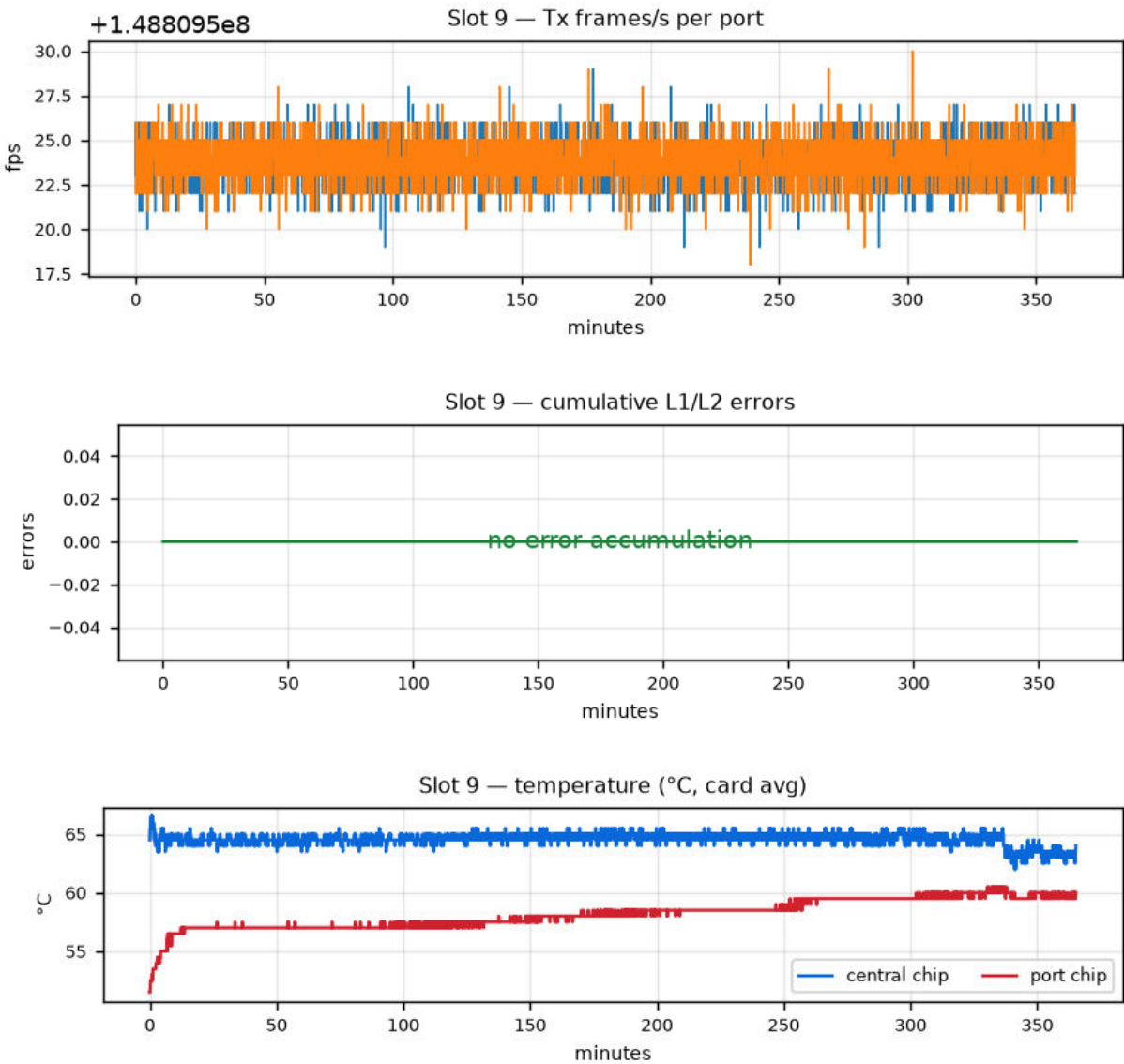
Per-Module Detail

Slot 9 — Lava AP40/100GE 2P · S/N 701572 · fiber

PASS

Port	Link	Speed	Tx frames	Rx frames	Loss	Avg fps	Throughput	Errors	Result
1	100%	100000	3,263,935,107,244	3,263,935,107,242	—	148,809,524	76.2 Gbps	0	PASS
2	100%	100000	3,263,935,106,308	3,263,935,106,309	—	148,809,524	76.2 Gbps	0	PASS

Thermal: central chip avg 65°C (max 67°C) · port chip avg 58°C (max 63°C) · drift +8°C over run — stable, within normal range.



Transceivers (CFP MSA): 2 × 40GE/100GE LAN.



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Validation Sign-Off

Zombie Components LLC certifies that the health-validation testing described in this report was performed on the line-card modules and chassis identified below, and that the recorded results are accurate and complete to the best of the tester's knowledge.

Customer	[REDACTED]
Order / Invoice	[REDACTED] / [REDACTED]
Customer PO	[REDACTED]
Chassis	Ixia XG12 · S/N XG12-J0930795
Modules tested	1 × Ixia Xcellon-Lava AP40/100GE 2P — 2-port 40/100GbE load module
Overall result	PASS

Tested by: Allen E. Hall

Title: President

Signature: 

Date: July 26, 2026