

Integra Optics Transceiver Testing

Testing Engineer:	<u>Herbert L. Santeliz</u>	Date:	<u>7/22/19</u>
Transceiver Part Number:	<u>1724CBA11</u>		
Transceiver Description:	<u>XFP, 1310nm, LR 8MF 10km 10G/2km</u> <u>OC-192 DDM</u>		

Physical Characteristics Testing

Step	Test Description	Use a Checkmark	Write Value
1.	Physical Resilience		
1.1.	Mechanical Shock Test		
1.1.1.	5 times/axis, 4900 m/s 2 (500G), 1.0ms	PASS ☒ FAIL ☐	NA
1.2.	Vibration		
1.2.1.	20 to 2000 Hz, 196 m/s 2 (20G), 4 min/cyc, 4 cyc/axis	PASS ☒ FAIL ☐	NA
1.3.	Thermal Shock - Ta = -40 to +85°C		
1.3.1.	Primary 100cyc	PASS ☒ FAIL ☐	NA
2.	Environmental Resilience		
2.1.	Hight Temperature Storage		
2.1.1.	Ta = +85°C, 2000h	PASS ☒ FAIL ☐	NA
2.2.	Temperature Cycling - Ta = -40 to +85°C		
2.2.1.	Primary 100cyc	PASS ☒ FAIL ☐	NA
2.3.	Low Temperature Storage		
2.3.1.	Ta = -40°C, 72h	PASS ☒ FAIL ☐	NA
2.4.	Damp Heat [Non-Operational]		
2.4.1.	Ta = +85°C, 85% RH, 1000h	PASS ☒ FAIL ☐	NA
2.5.	Hight Temp Operational Life (HTOL)		
2.5.1.	Tc = +75°C, operating, 2000h	PASS ☒ FAIL ☐	NA
2.6.	Damp Heat (Operational)		
2.6.1.	Tc = +75°C, 85% RH, Operating, 1000h	PASS ☒ FAIL ☐	NA
2.7.	Cyclic Moisture Resistance		
2.7.1.	20 cycles, 24 h/cycles, 80-100% RH, -10/+25/+65°C	PASS ☒ FAIL ☐	NA
2.8.	ESD Threshold, Human Body Model (HBM)		
2.8.1.	High speed pins +/-500V	PASS ☒ FAIL ☐	NA
2.8.2.	Other pins +/-2000V	PASS ☒ FAIL ☐	NA

3.	Module and Link Level Testing		
3.1.	24-hour traffic stability test		
3.1.1.	Zero errors taken during evaluation is required to pass	PASS ☒ FAIL ☐	NA
3.2.	Link restoration on hard/soft reboot		
3.2.1	Link recovery per expectation required to pass	PASS ☒ FAIL ☐	NA
3.3.	Link Restoration on fiber pull Tx, Rx, Recovery from a Tx and Rx interruption is required to pass		
3.3.1.	Tx interruption recovery	PASS ☒ FAIL ☐	NA
3.3.2.	Rx interruption recovery	PASS ☒ FAIL ☐	NA
3.4.	MSA compliant EEPROM memory map		
3.4.1.	Expected Write/Read of EEPROM is required to pass	PASS ☒ FAIL ☐	NA
3.5.	OEM interoperability testing		
3.5.1.	Proper expected identification and function compared to OEM is required to pass	PASS ☒ FAIL ☐	NA
3.6.	Digital Diagnostics Monitoring (DDM) validation		
3.6.1.	A proper programing board and reference platform reading of DDM values are required to pass	PASS ☒ FAIL ☐	NA
3.7.	Transmitter Optical Power		
3.7.1.	Transmit power congruent with specification data is required to pass	PASS ☒ FAIL ☐	Expected Value: <u>-6 to 0 dBm</u> Observed Value: <u>-3.6 dBm</u>
3.8.	Transmitter Wavelength		
3.8.1.	Transmitter power predominantly on the specified wavelength is required to pass	PASS ☒ FAIL ☐	NA
3.9.	Receiver Sensitivity and Bit Error Rate Testing (BERT)		
3.9.1	The minimum receive value must be validated 3 times with successful recovery in to pass	PASS ☒ FAIL ☐	Expected minimum Rx: <u>-14.5 dBm</u> Trial1, minimum Rx: <u>-19.0 dBm</u> Trial2, minimum Rx: <u>-18.8 dBm</u> Trial3, minimum Rx: <u>-18.6 dBm</u>

3.10.	Loop Length Dispersion Testing		
3.10.1.	<i>Error free traffic must exceed classification distance rating, triple verified, to pass</i>	PASS ☒ FAIL ☐	Launch distance used(km): <u>10Km</u>
			Trial 1, observed attenuation until error: <u>-13.8</u>
			Trial 2, observed attenuation until error: <u>-14.2</u>
			Trial 3, observed attenuation until error: <u>-14.0</u>
3.11.	Receiver Overload testing		
3.11.1.	<i>When subjected to unattenuated transmit (+1.0 dBm) The receiver still did not fail</i> <i>Observed maximum receive values must, triple verified, correlate to specification values to pass</i>	PASS ☒ FAIL ☐	Expected maximum Rx: <u>+0.5 dBm</u>
			Trial 1 observed overload level: _____
			Trial 2 observed overload level: _____
			Trial 3 observed overload level: _____
3.12.	Laser eye performance testing		
3.12.1.	<i>Eye diagram minimum definition and coherence at DUT specified distance must be observed to pass</i>	PASS ☒ FAIL ☐	NA
3.13.	Electrical eye performance testing		
3.13.1.	<i>Eye diagram minimum definition and coherence at DUT specified distance must be observed to pass</i>	PASS ☒ FAIL ☐	NA
3.14.	Spectral testing		
3.14.1.	<i>Spectral distribution must result in a properly narrow peak to pass</i>	PASS ☒ FAIL ☐	NA

The above testing was conducted in a controlled and uniform fashion and all values observed constitute validation of the Device Under Test (DUT).

Presiding Engineer Signature: Herbert L. Santeliz Date: 7/23/19

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