Avago Technologies AFBR-703SMZ

10 GBASE- SR SFP+ Transceiver

Qualification Report

Summary

The AFBR-703SMZ Multi-mode Optical Transceivers are qualified in accordance to the requirement of Telcordia Document GR-468-CORE under the supervision of Avago Technologies Quality & Reliability Department.

This report summarizes the qualification tests over a range of environmental and mechanical extremes.

Introduction

The AFBR-703SMZ is in full compliance to IEEE 802.3ae requirements for 10 GBASE-SR performance. The transceiver includes a transmitter that employs a Vertical Cavity Surface Emitting Laser (VCSEL) at 850 nm. The receiver includes a highly reliable PIN photodiode and conventional limiting output postamplifier. The transceiver is compliant with the requirements of Cisco's SFP+ specifications and the SFF Committee documents 8431, 8432 and 8472.

Testing

In order to demonstrate mechanical integrity, ruggedness and endurance, AFBR-703SMZ modules were subjected to Accelerated Stress Tests as shown in Table 1. The devices were tested for all key parameters before and after each test leg. Receiver sensitivity and transmitter output power were used to confirm correct functionality of the module.

This program was conducted under the supervision of Avago Technologies Quality and Reliability Department, using in-house test facilities for most of the test legs. The stress tests are in line with Telcordia Document GR-468-CORE.

Results

Table 1 summarizes the qualification test legs, test references, conditions, sample size and results.

Conclusion

AFBR-703SMZ has completed the qualification read points as indicated in Table 1, and is passing.

Qualification Test Summary

Table 1. AFBR-703SMZQualification Results

Leg	Test	Reference	Stress Condition	S/S	Result
1	High Temperature Operating Life	GR-468-CORE Section 5.18	Tc = 85° C, Vcc = 3.3 V	11	0 Failures @ 2000 Hrs
2	Biased Damp Heat (B70/85)	MIL-STD-202 Method 103	Tc = 85° C, RH = 85% Vcc = 3.3 V	11	0 Failures @ 2000 Hrs
3	Un-Biased Damp Heat (85/85)	MIL-STD-202 Method 103	Ta = 85° C, RH = 85%	11	0 Failures @ 2000 Hrs
4	Temperature Cycling	MIL-STD-883 Method 1010	Ta = -40° C to +100° C, 15 min dwell, 10 min transfer, O/E connectors mated	11	0 Failures @ 1000 Cyc
5a	Optical Mate/ Demate Test	GR-326-CORE Section 4.4.3.8	200 fiber insertion/extractions	11	0 Failures @ 200 Cyc
5b	Electrical Mate/ Demate Test (hot plug)	SFP MSA	300 powered insertion/extractions	11	0 Failures @ 300 Insertions
6	Low Temperature Storage	GR-468-CORE	Ta = -40° C	11	0 Failures @ 500 Hrs
7	High Temperature Storage	GR-468-CORE	Ta = 85° C	11	0 Failures @ 2000 Hrs
8a	Mechanical Vibration	MIL-STD-883 Method 2007A	20 – 2000 Hz, 20 G 4 min/cycle, 4 cycle/axis, 3 axis, unmated	11	0 Failures
8b	Mechanical Shock	MIL-STD-883 Method 2002B	1500 g (peak), 0.5 ms, 5 pulses/surface, 6 surfaces, unmated	11	0 Failures
9	Biased Cyclic Moisture Resistance	MIL-STD-883 Method 1004	Ta = -10° C to 65° C, biased Power on/off @ 30 min RH = 95%	11	0 Failures @ 50 Cyc
10	Contact Discharge	IEC 61000-4-2	2 KV, 4 KV & 8 KV 10 zaps on electrical faceplate on panel Live traffic	3	Pass
11	Air Discharge	IEC 61000-4-2	15000 V Live Traffic	3	Pass
12	ESD – HBM	MIL-STD-883 Method 3015 JESD22-A114-B	2000 V for all pins HBM	6	0 Failures @ 2000 V
13	ESD – CDM	JESD22-C101	500 V	3	0 Failures at 500 V
14	Straight Pull (Proof Test)	GR-326-CORE Section 4.4.3.4	4.5 kgf 5 sec load, 6.8 kgf for info only	11	Pass
15	Dust Test	TP-91	6 Functional & 6 Mechanical samples	6	0 Failures for Functional Test
16	Mixed Flowing Gas	GR-63-CORE Section 5.5.2	30° C, 70%RH, 20 ppb Cl2, 100 ppb H2S, 200 ppb NO2, 200 ppb SO2, Balance – Air	3	0 Failures
17	Thermal Shock	MIL-STD-883 Method 1011	Ta = -40° C to 100° C, 15 min dwell, approx. 10 sec transfer, O/E connectors mated	11	0 Failures @ 20 Cyc

Comments:

1. Stress Legs 8a & 8b are using the same set of qualification samples, with Mechanical Shock after Mechanical Vibration.
2. Stress Legs 12a & 12b are using the same set of qualification samples, with High Temperature Operating Life (Post ESD) performed for information only.
3. Failure will mean any qualification sample failing the module test plan test limits or Tx LOP/Rx OMA center-of-the-eye sensitivity (OMA Csens) drift of greater than ± 1.0 dB.
4. Fibers used in all optical testing (both for reliability and production testing): 3M, LC/FC, Multimode 62.5/125 μm, simplex.
5. Electrical socket used for testing: Molex -0744410010.

For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**

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