New Agilent Internal Post Amplifier IC for operation at 2.5 Gbit/s for use with HFCT-594x

Reliability Data Sheet

Summary

The internal Agilent post amplifier IC for operation at 2.5 Gbps, has been successfully qualified in accordance with the requirements of Agilent Quality and Reliability Engineering.

This report summarizes the qualification testing performed on the post amplifier over a range of environmental and mechanical extremes.

Introduction

The LC transceivers are high performance, cost effective modules for serial optical data communications applications specified for a signal rate from 155 Mb/s to 2.5 Gb/s.

These modules are designed for single mode fiber and operate at a nominal wavelength of 1300 nm.

Currently the Maxim MAX3269 post amplifier is used in the 2.5 Gbps transceiver. This external chip is to be replaced by an internal design.

The internal Post Amplifier IC has been designed on the ST BiCMOS6G process for which we have extensive qualification data. Further to this, laser drivers built on this process have been fully qualified in the original LC qualification programs.

The move to the internal design is seen as a low risk change.

Results

Appendix A gives a top-level summary of the qualification test legs, test reference, condition and sample size.

Appendix B contains a full set of results summarizing the changes in receiver parameters over the test legs performed.

Conclusions

The design change to move to an internally designed post amplifier has successfully passed the qualification as defined by Agilent Quality and Reliability Department.

Sub Contract Testing

Where the facilities to test in house do not exist for the tests detailed below, the work was subcontracted as shown below:-

ESD (HBM/MM)

ISE Labs
San Jose
California
USA

ESD (CDM)

Amkor Test Services
San Jose
California
USA

Appendix A. Internal Post Amplifier IC Qualification Status

Leg	Test	Reference	Condition	Status	No. Tested	No. Passed
D1	HTOL	Section 5.18 (GR-468-CORE)	+85 °C, 2000 hours	Pass	25 HFCT-5942AL	25
D2	ESD Threshold	MIL-STD-883 Method 3015	2000 V	Pass	6 HFCT-5942AL	6
D3	Charged Device Model ESD	JESD22-C101	500 V all pins	Pass	3 HFCT-5942AL	3
D4	Contact Discharge ESD	IEC61000-4-2	8 kV to nose	Pass	3 HFCT-5942AL	3
D5	Machine Model ESD	JESD22-A115-A	200 V	Pass	3 HFCT-5942AL	3

Appendix B. Internal Post Amplifier IC Detailed Qualification Results
All values shown represent changes over the environmental leg.

HTOL
Section 5.18 (GR-468-CORE), 2000 hours

Device	Rx Current (mA)	Sensitivity (dBm)	SD Assert (dBm)	Hysteresis (dBm)	Pass/Fail
2	0	0.8	0.3	0.1	Pass
3	-1.0	0.8	0.4	0.2	Pass
4	-1.0	0.5	0.2	0	Pass
5	-2.0	0.7	0.3	0	Pass
6	-1.0	0.6	0.5	0.1	Pass
7	-1.0	0.5	0.4	0.1	Pass
8	-2.0	0.8	0.3	0	Pass
9	-1.0	0.9	0.4	0.1	Pass
10	-2.0	0.5	0.3	0.2	Pass
11	-1.0	1.0	0.5	0.1	Pass
13	-2.0	1.0	1.2	0	Pass
16	0	1.1	0.3	-0.1	Pass
17	-1.0	0.7	0.4	0.1	Pass
18	0	1.2	0.5	0.1	Pass
19	-1.0	1.0	0.5	0	Pass
20	0	0.7	0.5	0	Pass
21	-1.0	0.6	0.6	-0.6	Pass
22	-1.0	-0.4	-0.1	-0.1	Pass
23	-1.0	1.1	0.2	-0.1	Pass
24	-2.0	0.6	0.4	0.1	Pass
26	0	0.2	0.4	-0.2	Pass
27	0	0.9	0.4	-0.1	Pass
28	0	0.3	0.3	-0.2	Pass
29	-1.0	1.1	0.7	0	Pass
35	-2.0	0	0.6	0	Pass

Human Body Model ESD
MIL-STD-883, Method 3015, 2000 V

Device	Rx Current (mA)	Sensitivity (dBm)	SD Assert (dBm)	Hysteresis (dBm)	Pass/Fail
1	-5.0	0	-0.1	0.1	Pass
2	1.0	0	-0.2	0	Pass
3	-1.0	0.3	0.4	-0.1	Pass
4	1.0	0.1	-0.4	0	Pass
5	0	0	-0.1	0	Pass
6	-2.0	0	-0.3	-0.1	Pass

Charged Device Model ESD
JESD22-C101, 500 V all pins

Device	Rx Current (mA)	Sensitivity (dBm)	SD Assert (dBm)	Hysteresis (dBm)	Pass/Fail
2	-1.0	0.2	0.4	-0.1	Pass
3	-1.0	0.5	0.3	0.1	Pass
4	1.0	0.3	0.2	-0.1	Pass

Contact Discharge ESD
IEC61000-4-2, 8 kV to nose

Device	Rx Current (mA)	Sensitivity (dBm)	SD Assert (dBm)	Hysteresis (dBm)	Pass/Fail
31	1.0	0.2	-0.1	0	Pass
39	2.0	-0.1	0.2	-1.4	Pass
42	0	0.1	0	0.1	Pass

Machine Model ESD
JESD22-A115-A, 200 V

Device	Rx Current (mA)	Sensitivity (dBm)	SD Assert (dBm)	Hysteresis (dBm)	Pass/Fail
1	1.0	0	-0.4	-0.1	Pass
2	3.0	0	-0.4	0	Pass
3	1.0	0	0.7	0.8	Pass

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Data subject to change.

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