

13. October 2008

VS1000D QUALIFICATION REPORT SUMMARY

1.1 Package qualification

Package type: LQFP 48 RoHS

Dimensions: 7 x 7 x 1.4 (mm)

LQFP48 RoHS (Green) package has passed qualification tests, MSL3 at 260°C, MSL test and reliability test results are presented below.

Moisture Sensitivity Level Test (MSL3 at 260°C) for 22 devices (J-STD 020)

1. Electrical test and SAM.
2. Oven bake at +125°C for 24 hours.
3. Moisture soak at: MSL 3 condition at +30°C / 60% RH for 192 hours.
4. 3x IR Reflow at peak temperature +260°C -0/+5 °C.
5. Electrical test and SAM.

Results: PASSED, SAM analysis didn't show any internal/external crack after Preconditioning MSL3 at 260°C.

Reliability Test	Sample size	Conditions	Result Passed / Failed
Preconditioning JESD22-A113, RA 1008	50	MSL 3 at +260°C	50 / 0
Unbiased HAST JESD22-A118, RA1021	25	+130°C/85%, 18 psig	25 / 0
		48 hours	25 / 0
Temperature Cycle JESD22-A104 cond. C, RA 1004	25	-65°C / +150°C, air to air	25 / 0
		300 cycles	25 / 0
High Temperature Storage test JESD22-A103, RA 1025	25	+150°C	25 / 0
		168 hours	25 / 0
		1000 hours	25 / 0

1.2 Device qualification

The qualification was done for devices fabricated with the production masks and encapsulated with the qualified production package. Each device has passed pre-test by using the production test program (+25 °C), that is also called as "Final Test". The qualification tests are summarized below.

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Test	Sample size	Conditions	Result Failed/passed
Electrical temperature characterization, Lot ID: 8055240, nominal wafers.	19	-30, +25, +85 °C in 7 different voltage set-up.	0 / 19
Latch-up immunity: I-Test AVDD = IOVDD = 3.6 V, CVDD = 2.65 V, Vhigh = 5.25 V Lot ID: 8055240	6	+ / - 200 mA JEDEC JESD78	0 / 6
Latch-up immunity: Voltage test. Lot ID: 8055240	6	1.5*Vmax trigger pulses JEDEC JESD78	0 / 6
ESD susceptibility, Human Body Model. MIL-STD-883 3015 Lot ID: 8055240, nominal wafer.	3	1000 V	0 / 3
	3	2000 V	0 / 3
	3	3000 V	0 / 3*
	3	4000 V	3 / 0
Life-test, Lot ID: 8055240, nominal wafer	34	125 °C, 1000h, Vhigh = 5.5 V MIL-STD-883 1005	0 / 34

*) All devices passed with relaxed limits.

1.3 Conclusion

VS1000D device passed the qualification tests. ESD susceptibility is 2000V for USB pins and 3000V for other pins.

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1.4 Electrical temperature characterization set-up

	Voltage set-up	-40 °C	+25 °C	+85 °C
VDD = #1	AVDD =2.75V CVDD = 2.20 V IOVDD = 1.80 V VHIGH = 4.00 V USB = 3.28 V	19	19	19
VDD = #2	AVDD =2.80 V CVDD = 2.40 V IOVDD = 2.80 V VHIGH = 4.00 V USB = 3.30 V	19	19	19
VDD = #3	AVDD = 3.17 V CVDD = 2.42 V IOVDD = 2.70 V VHIGH = 4.62 V USB = 3.44 V	19	19	19
VDD= #4	AVDD =2.80V CVDD = 2.20 V IOVDD = 2.80 V VHIGH = 4.00 V USB = 3.30 V	19	19	19
VDD = #5	AVDD =2.75V CVDD = 2.40 V IOVDD = 2.80 V VHIGH = 4.0 V USB = 3.30 V	19	19	19
VDD = #6	AVDD =2.80 V CVDD = 2.40 V IOVDD = 1.80 V VHIGH = 4.00 V USB = 3.30 V	19	19	19
VDD = #7	AVDD =3.60 V CVDD = 2.65 V IOVDD = 3.60 V VHIGH = 5.25 V USB = 3.60 V	19	19	19