

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.

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