

VSC7158HT/XHT First Level Product Qualification Report

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Manufacturer: Vitesse
Device Type: VSC7158HT/XHT
Fab: TSMC
Assembler: ASE, KS
Test Location: Camarillo, CA
Process: 0.13 μ m LV-OD
Package Type: HSBGA

1.0 Package

1.1 Package Type	HSBGA
1.2 Body Size	23x23x2.03 mm
1.3 Ball Pitch	1.00 mm
1.4 Pin/Ball Count	448
1.5 Cavity Up / Down	Up
1.6 Substrate P/N	DCDHCL35564-V003-100RA for XYS A06900A for YS
1.7 Heat Spreader Description	NA
1.6 Die Attach Epoxy	Ablestik 2100A, Conductive
1.7 Bond Wire Material	Au
1.8 Bond Wire Diameter	0.9 mil
1.9 Fill Material	Sumitomo G770J
1.10 Solder Ball Material	Sn3Ag0.5Cu for XHT, 63Sn/37Pb for HT
1.11 Diameter	0.64 \pm 0.10 mm
1.12 Moisture Sensitivity Level	MSL4 for XHT and MSL3 for HT

2.0 Wafer/Die

2.1 Technology	0.13 μ m LV-OD CMOS
2.2 Die Dimensions	9619x8897 μ m
2.3 Metallization Material	Cu
2.4 Metallization Layers	8+RDL
2.5 Dielectric Material	FSG
2.6 Passivation Material	Dual Passivation Si ₃ N ₄

3.0 Qualification Results

Table 1: Summary of Device Qualification Results

<u>Test</u>	<u>Conditions</u>	<u>Quantity</u>	<u>Results</u>	<u>Notes</u>
3.1 High Temperature Operating Life (HTOL)	MS883, Method 1005, T _j =140°C, 1008 hours, nominal supplies	48 + 48 +48	2 Fails	A, B, C
3.2 Temperature Humidity with Bias (THB)	JESD22-A101, 85°C/85% R.H., 1008 hours	45	All Pass	D



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3.3 Temperature Cycle (TC)	JESD22-A104, Condition B (-55°C ~125 °C), 1000 cycles	45	All Pass	D
3.4 High Temperature Storage Life (HTSL)	JESD22-A103, 1008 hours, 150°C	45	All Pass	D
3.5 ESD HBM	JESD22-A114, +/-1500V	3	All Pass	C
3.6 ESD CDM	JESD22-C101, +/-200V	3	All Pass	C
3.7 Latch Up	JESD78, Class II	6	All Pass	C

Notes:

A: For the first group of 48 devices, there are two failures at 168 hrs. They are related to MEMBIST. The rest of devices passed 1008 hrs without failure. The 2nd group of 48 parts passed 168 hrs HTOL with no failure. The 3rd group of 48 parts also passed 168 hrs HTOL with no failure. The 3rd group was continued to 1008 hrs and all passed.

B: FA on this failure can't be performed. However, the two MEMBIST failures were identified at 168 hrs readpoint and the exact time to failure is unknown. They are likely to be random early failures. The failure can't be reproduced on 2nd and 3rd groups.

C: By similarity to VSC7157-03 with the same die design

D: By similarity to VSC7250HL/XHL with the same process and package

4.0 Reliability Data

The reliability results are documented in "*TSMC 0.13 μm LVOD PROCESS RELIABILITY REPORT*", report number: VQUR-00242



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