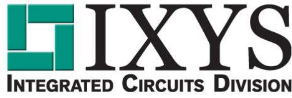

Reliability Report

Reliability Data for IXEP2300

Report Title: Reliability Data for IXEP2300

Report Number: 2013-008

Date: 3/20/13

Introduction:

This report summarizes the Reliability data of IXYS Integrated Circuits Division IXEP2300. The Reliability data presented here were collected during IXYS IC Division product qualification. The silicon dies used to build the IXEP2300 were manufactured at Vanguard wafer fabrication site in Taiwan using the VT 0.5µm 2P 3M Polycide 5V/40V process and assembled at ChipBond in TCP/COF packaging. Further reliability data for the Vanguard process is available in reliability reports on the IXYS website at www.ixysic.com and search IXD_602 Series, IXD_604SIA Series, IXD_609 Series, IXD_614 Series and IXD_630 Series reports.

Reliability Tests:

Table 1 below provides the qualification tests that were performed. The stress tests and sample size are chosen based on the IXYS internal specification and with the approval of the product development team and quality assurance.

Table 1: Product IXEP2300 Reliability Tests

Stress Test	Applicable Specs	Stress Conditions	Product/ Package	Number of Lots	Sample Size (SS)	Total SS
HTRB	Mil-Std-883	125°C, 80% 1000hrs	IXEP2300 COB-256	1	40	40
Latch-UP	JESD78	Ambient Temp/ Trigger Current (Inom + 100mA)	IXEP2300 COB-256	1	9	9
ESD HBM	JESD22, A114-E	1.5kΩ, 100pF	IXEP2300 COB-256	1	30	30

Reliability Test Results:

The stress tests and associated results for the product IXEP2300 qualification are summarized in Table 2. The devices chosen for the qualification were from standard material manufactured through normal production test flow and electrically tested to datasheet limits prior to stressing. Then reliability stresses were conducted and electrically tested to datasheet limit at each interval and final readpoints.

Table 2: Product IXEP2300 Reliability Test Results

Stress Test	Product/Kit Number	Readpoint / (Reject/ SS)	Comments
HTRB	IXEP2300 MXE123002	1000 hrs.	Qual Lot#1 Data
		0/40	
Latch-Up	IXEP2300 MXE123002	Class 1/Level A	Qual Lot#1 Data
		0/9	

ESD Testing Results:

As part of this qualification, the product IXEP2300 was subjected to Human Body Model (HBM) ESD Sensitivity Classification testing using a KeyTek Zapmaster system. The results are summarized in Table 3. All samples were electrically tested to data sheet limits before and after ESD stressing and they passed after +/-1000V testing.

Table3: Product IXEP2300 ESD Characterization Results

ESD Model	Product/Kit Number	Package	ESD Test Spec	RC Network	Highest Passed	Class
HBM	IXEP2300 MXE123002	COB-256	JESD22, A114-E	1.5kΩ, 100pF	1000V	1C

FIT (Failure in Time) Rate on the Product IXEP2300:
Table 4 summarizes the number of devices used for the product IXEP2300 reliability stress with associated failures. Using the HTRB data, FITs were calculated based on the Acceleration Factor (AF) and equivalent device hours at 0.7eV of activation energy for 125°C test temperature and 40°C use temperature. The calculated FITs from the reliability stress came out to be 90.05 for HTRB.

Table 4: Product IXEP2300 FIT Rate Summary

Qual#	Stress	Product/Kit Number	# of Devices	# of Fails	Hours Tested	Act. Energy	Acc. Factor	Equivalent Dev. Hours	FIT Rate @ 60% CL
1	HTRB	IXEP2300 MXE123002	40	0	1000	0.7	255.41	10,216,239	90.05

Conclusion:

The qualification of the product IXEP2300 has been successfully completed for the production release.

APPROVAL:

Prepared by: _Martha W. Brandt*_________________________________3/20/13__
Martha W. Brandt — Date
Quality Engineer

Approved by: _William Pao*_____________________________________3/20/13____
William Pao — Date
Product Engineer

Approved by: _Ronald P. Clark*_________________________________3/20/13____
Ronald P. Clark — Date
Director of Quality

Approved by: __James Archibald*_________________________________3/20/13____
James Archibald — Date
Director of Engineering

*Signature on File