

**Reliability Report-Reliability Data for IXYS Low Voltage Trench 6 Pin/8 Pin DIP
(Low Voltage 60V – 150V)
Qualification No: 2013-002**



Reliability Report

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**Report Title: Reliability Data for IXYS Low Voltage Trench 6 Pin/8 Pin
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Report Number: 2013-002

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Introduction:

This report summarizes the Reliability data of IXYS Integrated Circuits Division. The Reliability data presented here were collected during IXYS IC Division product qualification. The purpose of this qualification was to verify the IXYS IC Division Quality and Reliability requirements as outlined in IXYS IC Division internal specifications. The 100V Trench Gate MOSFET is manufactured by IXYS of Milipitas, CA and sample devices LCA701/LCA710/LCA715/CPC1906Y were assembled at ATEC in the Philippines and CPC1709J was assembled at PSI Technologies.

Reliability Tests:

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

Table 1: Product IXYS Low Voltage Trench Reliability Tests

Stress Test	Applicable Specs	Stress Conditions	Product/ Package	Number of Lots	Sample Size (SS)	Total SS
HTRB	JESD22-A108	125°C, 80%	LCA701/ 6-Pin DIP	1	181	181
HTRB	JESD22-A108	125°C, 80%	LCA710X/ 6-Pin DIP	1	105	105
HTRB	JESD22-A108	125°C, 80%	CPC1906Y/ Power SIP	1	105	105
HTRB	JESD22-A108	125°C, 80%	CPC1706Y/ Power SIP	1	10	10
HTRB	JESD22-A108	125°C, 80%	CPC1709J/ ISOPLUS-264	1	25	25
Cold Storage Test	JESD22-A119	-55C, 1000hrs	CPC1909J/ ISOPLUS-264	1	55	55

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Reliability Test Results:

The stress tests and associated results for the product IXYS Low Voltage Trench 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 IXYS Low Voltage Trench Reliability Test Results

Stress Test	Product/Kit Number	Readpoint / (Reject/ SS)	Comments
HTRB	LCA701 TE2973	1000 hrs.	Qual Lot#1 Data
		0/181	
HTRB	LCA710X TE2587	1000 hrs	Qual Lot#1 Data
		0/105	
HTRB	CPC1906Y TE2889	1000 hrs	Qual Lot#1 Data
		0/105	
HTRB	CPC1706Y N/A	1000 hrs.	Qual Lot#1 Data
		0/10	
HTRB	CPC1709J PE0009	1000 hrs	Qual Lot#1 Data
		0/25	
Cold Storage Test	CPC1909J P00160	1000 hrs	Qual Lot#1 Data
		0/55	

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FIT (Failure in Time) Rate on the Product IXYS Low Voltage Trench:

Table 3 summarizes the number of devices used for the product IXYS Low Voltage Trench 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 temperatures. The calculated FITs from the reliability stress came out to be 7.66 for HTRB.

Table 3: Product IXYS Low Voltage Trench 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	LCA701/ TE2973 LCA710X/ TE2587 CPC1906Y/ TE2889 CPC1706Y/ N/A CPC1709J/ PE0009	426	0	1000	0.7	255.41	120,118,448	7.66

Conclusion:

The qualification of the product IXYS Low Voltage Trench has been successfully completed for the production release.