

Reliability Report: Reliability Data for Multi-Function Relay/Opto Products 16L SOIC Package
(Output Voltage Rating 200V– 450V)
Qualification Report No.: 2010-010



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Date: 8/17/12

Introduction:

This is to summarize the Reliability (Life-test & Environmental) data for IAA110P that were collected on various family products. These data were collected as part of the qualification or IXYS IC Division monthly Reliability Monitor program. The IAA110P HTRB data presented here are applicable to all Form A Relay and Multifunction Relay/Opto Products with 200V – 450V rating in 16L SOIC style packaging.

Reliability Tests:

Table 1 below outlined Reliability stresses performed on various products that are transferable to the IAA110P Product Family.

Table 1: IAA110P Product Family Reliability Tests

Product/ Package	Stress	Applicable Specs	Stress Conditions	# of Kits	Sample Size (SS)	Total SS
IAA110P/ 16L SOIC	HTRB	JESD22-A108	125C, 80% WVDC, 1000 hrs	2	120	240
				1	129	129
ITC117P/ 16L SOIC	HTRB	JESD22-A108	125C, 80% WVDC, 1000 hrs	1	129	129
IAA110P/ 16L SOIC	Thermal Shock (T/S)	Mil-Std-883, M1011	0 to 100°C, 10/10 dwells 15 cycles	3	55	165
ITC117P/ 16L SOIC	Thermal Shock (T/S)	Mil-Std-883, M1011	0 to 100°C, 10/10 dwells 15 cycles	1	55	55
IAA110P/ 16L SOIC	Temp Cycle (T/C)	Mil-Std-883 M1010, “B”	-55 to 125°C, 10/10 dwells, 300 cycles	3	55	165
ITC117P/ 16L SOIC	Temp Cycle (T/C)	Mil-Std-883 M1010, “B”	-55 to 125°C, 10/10 dwells, 300 cycles	1	55	55
IAA110P/ 16L SOIC	MSL	J-STD-020D.1	IR Reflow, Level 1	3	50	150
ITC117P 16L SOIC	MSL	J-STD-020D.1	IR Reflow, Level 1	1	50	50
IAA110P/ 16L SOIC	High Temp Storage	JESD22-A103C	125°C, 1000hrs	1	50	50
IAA110P/ 16L SOIC	ESD HBM	JESD22, A114-E	1.5kΩ, 100pF	1	5	5
				1	3	3

Reliability Tests Results:

The stress tests data and associated results for the family of IAA110P products are summarized in Table 2.

Table 2: IAA110P Product Family Reliability Test Results

Product/ Package	Stress Test/ Conditions	Kits (lots) Number	Readpoints / (Reject/ SS)	Comments
IAA110P/ 16L SOIC	HTRB 125C, 80% WVDC	T22717	1000 hrs.	Reliability Monitor Data
			0/120	
IAA110P/ 16L SOIC	HTRB 125C, 80% WVDC	T37682	1000 hrs.	Reliability Monitor Data
			0/129	
IAA110P/ 16L SOIC	HTRB 125C, 80% WVDC	T52174	1000 hrs	Reliability Monitor Data
			0/120	
ITC117P/ 16L SOIC	HTRB 125C, 80% WVDC	T48998	1000 hrs	Reliability Monitor Data
			0/129	
IAA110P/ 16L SOIC	Thermal Shock 0 to 100°C, 10/10 dwell	T22717	10 cycles	Reliability Monitor Data
			0/55	
IAA110P/ 16L SOIC	Thermal Shock 0 to 100°C, 10/10 dwell	T37682	10 cycles	Reliability Monitor Data
			0/55	
IAA110P/ 16L SOIC	Thermal Shock 0 to 100°C, 10/10 dwell	T52174	10 cycles	Reliability Monitor Data
			0/55	
ITC117P/ 16L SOIC	Thermal Shock 0 to 100°C, 10/10 dwell	T48998	10 cycles	Reliability Monitor Data
			0/55	
IAA110P/ 16L SOIC	Temp Cycles -55 to 125°C, 10/10 dwell	T22717	300 cycles	Reliability Monitor Data
			0/55	
IAA110P/ 16L SOIC	Temp Cycles -55 to 125°C, 10/10 dwell	T37682	300 cycles	Reliability Monitor Data
			0/55	
IAA110P/ 16L SOIC	Temp Cycles -55 to 125°C, 10/10 dwell	T52174	300 cycles	Reliability Monitor Data
			0/55	
ITC117P/ 16L SOIC	Temp Cycles -55 to 125°C, 10/10 dwell	T48998	300 cycles	Reliability Monitor Data
			0/55	
IAA110P/ 16L SOIC	MSL, IR Reflow J-STD-020D.1	T22717	Level 1	Reliability Monitor Data
			0/55	
IAA110P/ 16L SOIC	MSL, IR Reflow J-STD-020D.1	T37682	Level 1	Reliability Monitor Data
			0/55	
IAA110P/ 16L SOIC	MSL, IR Reflow J-STD-020D.1	T52174	Level 1	Reliability Monitor Data
			0/55	
ITC117P/ 16L SOIC	MSL, IR Reflow J-STD-020D.1	T48998	Level 1	Reliability Monitor Data
			0/55	
IAA110P/ 16L SOIC	High Temp Storage JESD22-A103C	T52174	1000 hrs.	Reliability Monitor Data
			0/50	

FIT (Failure in Time) Rate of IAA110P Product Family:

Table 3 below summarizes the FIT rate from the HTRB data. Using the Reliability HTRB data, FIT rate was calculated based on the equivalent device hours at use condition of 40°C and stressed condition of 125°C. To calculate equivalent device hours, Acceleration Factor (AF) was calculated at 0.7eV of activation energy. The FIT rate came out to be 7.23 FITs.

Table 3: IAA110P Product Family FIT Rate Summary

Product/ Stress	# of Devices	# of Fails.	Hours Tested	Test Temp (°C)	Eq. Dev. Hours	FITs @ 60% CL
IAA110P/ ITC117P/ HTRB	498	0	1000	125	127,192,171	7.23

ESD Testing Results:

As part of this qualification, the IAA110P Family Product was subjected to Human Body Model (HBM) ESD Sensitivity Classification testing using a KeyTek Zapmaster system. The results are summarized in Table 4. All samples were electrically tested to data sheet limits before and after ESD stressing and they passed after +/- 8000V zapping.

Table4: Product IAA110P Family ESD Characterization Results

ESD Model	Product Number	Package	ESD Test Spec	RC Network	Highest Passed	Class
HBM	IAA110P	16L SOIC	JESD22, A114-E	1.5kΩ, 100pF	8000V	3A