

TOTAL DOSE RADIATION TEST REPORT

ESA study: "Survey of Critical Components for 150 kRad Power Systems"

ESTEC Contract N° 22831/09/NL/AF refers

Contract extension up to 400 kRad as per CCN: ATGSP-CN-0004 IS. 3

Final Report

Part Type : OLS449

Package : LCC-06

Description : Optocoupler with Radiation Tolerant Phototransistor

Manufacturer : Isolink Inc

Alter Technology Purchase Order N° ATGSP-TL-09-JC-CO-9 dated 11/27/2009

Alter Technology Project Manager: David NUNEZ

Hirex reference :	HRX/TID/1021	Issue : 01	Date :	January 20 th 2012
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Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

CHANGE RECORD

ISSUE	DATE	PAGE	DESCRIPTION OF CHANGES
01	January 20th 2012	All	Original Issue

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

TOTAL DOSE RADIATION TEST REPORT
on
Isolink Inc
OLS449
Optocoupler with Radiation Tolerant Phototransistor

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1 Introduction

In the scope of the ESA study: “Survey of Critical Components for 150 kRad Power Systems”, a total dose characterization test of the Isolink Inc OLS449, Optocoupler with Radiation Tolerant Phototransistor has been performed with an accumulated dose of about 416.7 Krad(Si) at different dose rates of 36, 100 & 300 rad(Si)/hour, in response to Alter Technology purchase order reference ATGSP-TL-09-JC-CO-9.

An Interim report, HRX/TID/0937 Issue 01, corresponding to the irradiation up to 155.7 Krad(Si) has been already provided.

The purpose of this test was to evaluate total dose withstanding of this component, to investigate its suitability for being used in space applications. This test was conducted on samples provided by Alter Technology.

Test has been performed in accordance with Hirex Engineering Radiation Test Plan HRX/SPE/0239 issue 3 dated 09/21/2010.

A complete set of electrical measurements together with graphical representation of measured parameters with respect to total dose received, are provided for all samples.

2 Applicable and Reference Documents

2.1 Applicable Documents

- Hirex Engineering Radiation Test Plan: HRX/SPE/0239 issue 3 dated 09/21/2010
- Alter Technology Group Proposal: ATGSP-OF-648/2009 Issue 1
- Minutes of Meeting: MM-SRP-ATG-0001 dated 29/10/2009
- Hirex specification: Total Ionizing dose test general procedure.

2.2 Reference Documents

- Isolink Inc datasheet

3 Test Samples

13 samples of the OLS449 device were tested (6 ON + 6 OFF + 1 control sample).

12 samples (including the 6 samples already submitted to protons test: see report HRX/TID/0882) have been biased according to the flow diagram given in Figure 1.

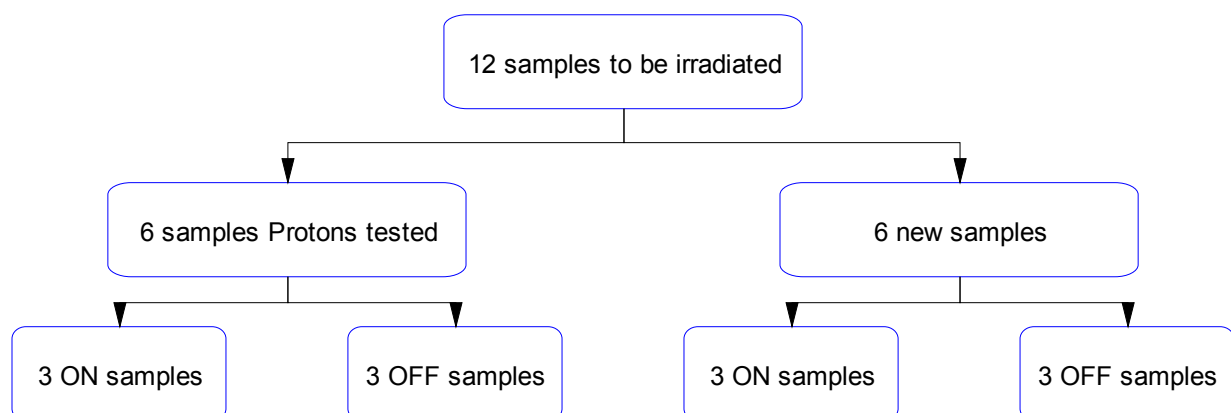


Figure 1 : Samples bias flow diagram

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Samples were allocated into the bias conditions during exposures and annealing as provided in the following table. The different samples groups are also identified for an easier plots reading.

SN attributed by Hirex	Samples Allocation	Samples Group Naming
1	Control sample	REF
2	Biased OFF	OFF_PROTON
3	Biased OFF	OFF_PROTON
4	Biased OFF	OFF_PROTON
5	Biased ON	ON_PROTON
6	Biased ON	ON_PROTON
7	Biased ON	ON_PROTON
8	Biased OFF	OFF_TID
9	Biased OFF	OFF_TID
10	Biased OFF	OFF_TID
11	Biased ON	ON_TID
12	Biased ON	ON_TID
13	Biased ON	ON_TID

Identification of the OLS449 is given below:

Part Number: OLS449

Top Marking: S OLS449 0949

Bottom Marking: -

Date Code: 0949

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4 Experimental Conditions

4.1 Radiation Source Dose Rate and Annealing

The dose exposures were performed at UCL in Louvain (Belgium). In this irradiation facility, a Cobalt 60 source is used with the possibility to vary the dose rate by simply adjusting the distance to the source. During the dose exposures, devices under test have been irradiated in an ambient temperature of 24°C ±6°C.

The dose received by the devices has been controlled by the measurement of one Alanine pellet dosimeter placed onto the bias board.

Resulting test conditions are provided below.

Irradiation Steps requested	Pellet dosimetry data	Dose rate	Annealing steps	Temperature
kRad	kRad	Rad/h	Hours	°C
0	0			
10	10.8	36		Room
20	20.7	36		Room
50	55.6	36		Room
100	102.6	36		Room
150	155.7	100 [1]		Room
200	212.4	300 [1]		Room
250	268.2	300 [1]		Room
300	322.2	300 [1]		Room
350	374.2	300 [1]		Room
400	416.7	300 [1]		Room
-	-	-	24	Room
-	-	-	168	100°C

Note [1]: Due to the maintenance period planned at UCL at the end of December and in order to perform subsequent requested exposures steps up to 400 Krad(Si), the dose rates of several steps have been changed, in agreement with ESA, from 36 rad(Si)/h to 100 rad(Si)/h and from 100 rad(Si)/h to 300 rad(Si)/h as indicated.

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4.2 Bias during Dose Exposures and Measurements conditions

4.2.1 Bias conditions

During exposures test board allowed to bias 6 samples in accordance with the electrical circuit provided in Figure 2.

6 other samples were biased OFF in accordance with the electrical circuit provided in Figure 3.

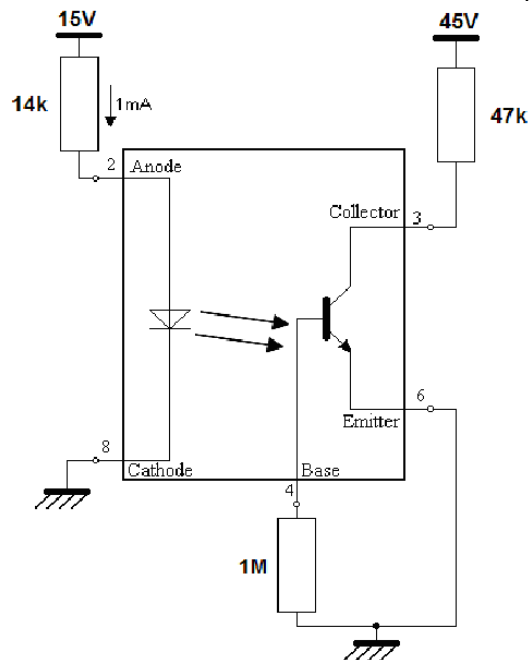


Figure 2 : Bias ON Conditions during Irradiation Exposures

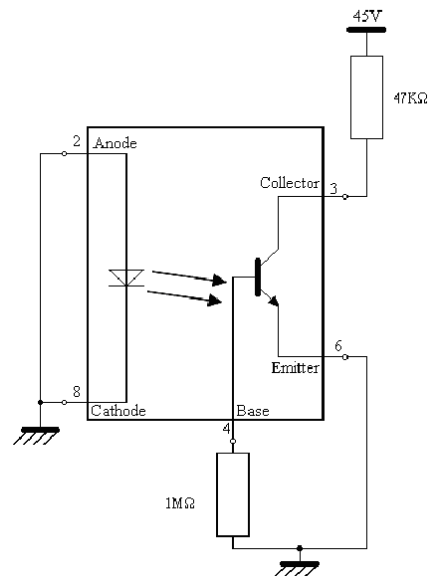


Figure 3 : Bias OFF Conditions during Irradiation Exposures

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4.2.2 Electrical Measurements

Electrical parameters test program principle for OLS449 is provided in Figure 4.

A HP4142 DC tester was used to perform required measurements

A dedicated test fixture was designed to ensure proper measurement conditions. In addition a faraday cage was used to ensure optimum conditions for low level measurements.

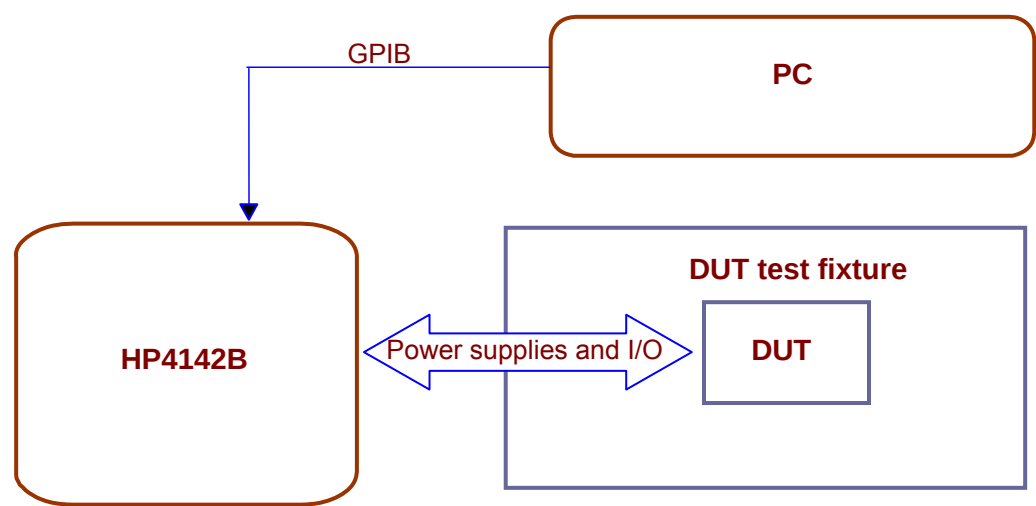


Figure 4 : OLS449 test program principle

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Electrical parameters test conditions and limits used for performing this test are given in Table 1.

Parameters	Description	Conditions	Spec		Unit	Temp
			Min	Max		
IC(ON) [1]	On-State Collector Current	IF = 1mA ; VCE = 5V	15	40	mA	Room
			7	-	mA	-35°C
			7	-	mA	100°C
ICB(ON)	On-State Collector-Base Current	IF = 10mA; VCB = 5V	300	-	µA	Room
VCE(SAT)	Saturation Voltage	IF = 1mA ; IC = 5mA	-	0.3	V	Room
BVCEO	Breakdown Voltage Collector to Emitter	ICE = 1 mA	65	-	V	Room
BVCBO	Breakdown Voltage Collector to Base	ICB = 100 µA	65	-	V	Room
BVEBO	Breakdown Voltage Emitter to Base	IEB = 100 µA	7	-	V	Room
ICE(OFF) [2]	Off-State Leakage Current Collector to Emitter	VCE = 5V	-	-	nA	Room
			-	-	µA	100°C
ICE(OFF) [2]	Off-State Leakage Current Collector to Emitter	VCE = 20V	-	100	nA	Room
			-	100	µA	100°C
ICE(OFF) [2]	Off-State Leakage Current Collector to Emitter	VCE = 40V	-	-	nA	Room
			-	-	µA	100°C
ICB(OFF)	Off-State Leakage Current Collector to Base	VCB = 20V	-	10	nA	Room
VF [1]	Input Forward Voltage	IF = 10mA	1.2	1.7	V	Room
			1.3	1.9	V	-35°C
			1.1	1.6	V	100°C
IR	Input Reverse Current	VR = 2V	-	100	µA	Room
CTR [1]	Current Transfert Ratio	IF = 1mA ; VCE = 5V	-	-		Room
		IF = 10mA ; VCE = 5V				-35°C
		IF = 1mA ; VCE = 40V				100°C
		IF = 10mA ; VCE = 40V				100°C

[1]: These parameters have been measured at Room temperature at all steps of testing, and also at -35°C and 110°C at initial step and after Annealing.

[2]: These parameters have been measured at Room temperature at all steps of testing, and also at 100°C at initial step and after Annealing.

Table 1 : Measured electrical parameters

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5 Conclusion

A Total Ionizing Dose verification test was carried out by Hirex Engineering under Alter Technology contract on the Isolink Inc OLS449 Optocoupler with Radiation Tolerant Phototransistor in LCC-06 package.

12 samples plus one control sample were used during testing. They were exposed to radiation using different dose rates of 36, 100 & 300 rad(Si)/hour at room temperature.

Electrical measurements on some parameters at Low (-35°C) and high (+100°C) temperatures are provided in appendix 1.

A summary of the failed parameters is provided in the following table. The behavior of each parameter is recorded for both biased On and biased Off samples of each group. Parameters not listed remained within specification limits all along testing or had no limits specified. Detail test results are presented in next section.

Parameters	Failure Level between :		Annealing Recovery [Note 1]					Comments
			NA	No	Partial	Complete	Rebound	
IC(ON)	ON_PROTON samples	-		X				[Note 2]
	ON_TID samples	No Failure	X					
	OFF_PROTON samples	-		X				[Note 2]
	OFF_TID samples	20.7 & 55.6 kRad(Si)				X		
VCE(SAT)	ON_PROTON samples	No Failure	X					
	ON_TID samples	No Failure	X					
	OFF_PROTON samples	10.8 & 20.7 kRad(Si)				X		
	OFF_TID samples	No Failure	X					
ICE(OFF)2	ON_PROTON samples	No Failure	X					
	ON_TID samples	No Failure	X					
	OFF_PROTON samples	322.2 & 374.2 kRad(Si)				X		
	OFF_TID samples	No Failure	X					
ICB(OFF)	ON_PROTON samples	No Failure	X					
	ON_TID samples	No Failure	X					
	OFF_PROTON samples	374.2 & 416.7 kRad(Si)				X		
	OFF_TID samples	No Failure	X					

[Note 1]: **NA** = Not applicable, **No**: means no sample has recovered, **Partial**: means at least one sample has recovered, **Complete**: means all samples have recovered, **Rebound**: means rebound has been observed on at least one sample.

[Note 2]: Samples failed after protons exposures were still failed at initial measurements of TID testing.

Table 2 : Summary of parameters failure levels

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6 Test Results

Test results including tables and graphics are provided in this section for each measured parameter.

Statistics are provided separately for biased ON & biased OFF samples of each group.

For each parameter, a drift calculation table is provided computing the drift between a given exposure step with respect to initial readings:

$$\Delta(\text{Parameter value}) = (\text{Parameter value}_{\text{POSTRAD}}) - (\text{Parameter value}_{\text{PRERAD}})$$

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Parameter : On-State Collector Current : IC(ON)

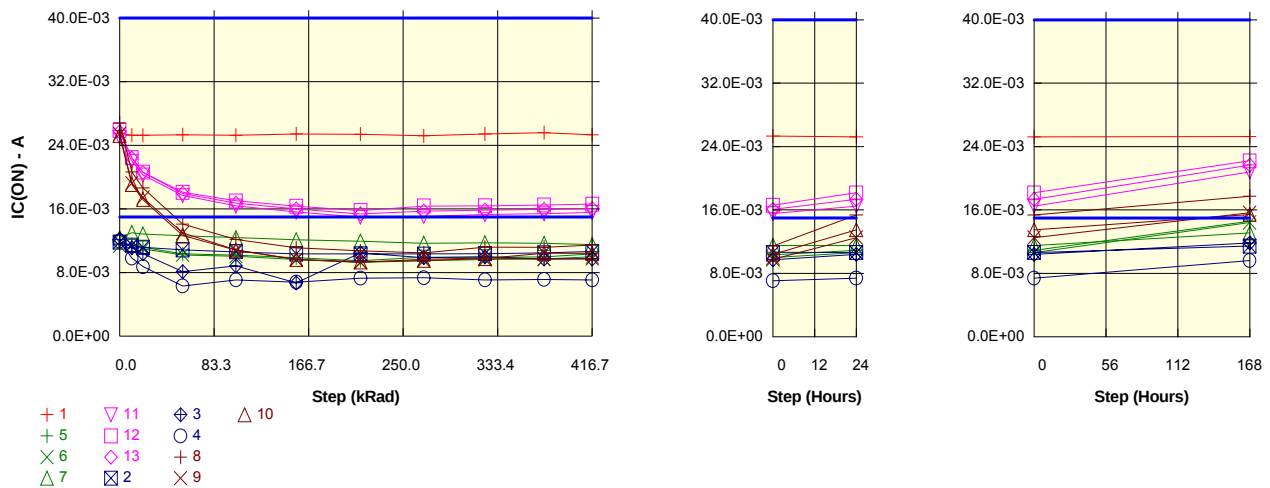
Test conditions : IF = 1mA ; VCE = 5V

Unit : A

Spec Limit Min : 15.0E-03

Spec Limit Max : 40.0E-03

Spec limits are represented in bold lines on the graphic.



Measurements

IC(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	25.5E-03	25.3E-03	25.3E-03	25.3E-03	25.3E-03	25.4E-03	25.4E-03	25.2E-03	25.4E-03	25.6E-03	25.3E-03	25.3E-03	25.3E-03
ON_PROTON samples													
5	11.6E-03	11.5E-03	11.2E-03	10.4E-03	10.2E-03	9.9E-03	9.5E-03	9.9E-03	9.9E-03	10.0E-03	10.3E-03	10.9E-03	14.6E-03
6	11.4E-03	11.5E-03	11.0E-03	10.2E-03	10.0E-03	9.7E-03	9.3E-03	9.5E-03	9.6E-03	9.7E-03	10.0E-03	10.6E-03	14.4E-03
7	12.4E-03	13.0E-03	12.9E-03	12.7E-03	12.4E-03	12.1E-03	12.0E-03	11.7E-03	11.8E-03	11.7E-03	11.5E-03	11.5E-03	13.1E-03
Statistics													
Min	11.4E-03	11.5E-03	11.0E-03	10.2E-03	10.0E-03	9.7E-03	9.3E-03	9.5E-03	9.6E-03	9.7E-03	10.0E-03	10.6E-03	13.1E-03
Max	12.4E-03	13.0E-03	12.9E-03	12.7E-03	12.4E-03	12.1E-03	12.0E-03	11.7E-03	11.8E-03	11.7E-03	11.5E-03	11.5E-03	14.6E-03
Average	11.8E-03	12.0E-03	11.7E-03	11.1E-03	10.9E-03	10.6E-03	10.3E-03	10.4E-03	10.4E-03	10.4E-03	10.6E-03	11.0E-03	14.0E-03
Sigma	442.6E-06	717.0E-06	836.3E-06	1.1E-03	1.1E-03	1.1E-03	1.2E-03	947.7E-06	933.0E-06	878.2E-06	665.8E-06	367.7E-06	660.6E-06

Drift Calculation

IC(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_PROTON samples													
5	-	-108.0E-06	-448.0E-06	-1.3E-03	-1.4E-03	-1.7E-03	-2.1E-03	-1.7E-03	-1.7E-03	-1.7E-03	-1.3E-03	-678.0E-06	3.0E-03
6	-	134.0E-06	-368.0E-06	-1.1E-03	-1.3E-03	-1.7E-03	-2.1E-03	-1.9E-03	-1.7E-03	-1.7E-03	-1.4E-03	-744.0E-06	3.1E-03
7	-	620.0E-06	446.0E-06	250.0E-06	-4.0E-06	-266.0E-06	-456.0E-06	-706.0E-06	-652.0E-06	-724.0E-06	-864.0E-06	-894.0E-06	700.0E-06
Average	-	215.3E-06	-123.3E-06	-716.0E-06	-919.3E-06	-1.2E-03	-1.5E-03	-1.4E-03	-1.4E-03	-1.3E-03	-1.2E-03	-772.0E-06	2.2E-03
Sigma	-	302.7E-06	403.9E-06	684.8E-06	648.9E-06	687.3E-06	770.6E-06	505.8E-06	494.9E-06	440.8E-06	223.4E-06	90.4E-06	1.1E-03

Measurements

IC(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	25.5E-03	25.3E-03	25.3E-03	25.3E-03	25.3E-03	25.4E-03	25.4E-03	25.2E-03	25.4E-03	25.6E-03	25.3E-03	25.3E-03	25.3E-03
ON_TID samples													
11	25.0E-03	22.0E-03	20.3E-03	17.7E-03	16.4E-03	15.6E-03	15.0E-03	15.1E-03	15.3E-03	15.4E-03	15.6E-03	16.5E-03	20.8E-03
12	25.9E-03	22.4E-03	20.6E-03	18.1E-03	17.0E-03	16.4E-03	15.8E-03	16.4E-03	16.4E-03	16.5E-03	16.6E-03	18.2E-03	22.2E-03
13	25.7E-03	22.4E-03	20.6E-03	18.0E-03	16.7E-03	16.0E-03	15.4E-03	15.7E-03	15.9E-03	16.0E-03	16.1E-03	17.4E-03	21.7E-03
Statistics													
Min	25.0E-03	22.0E-03	20.3E-03	17.7E-03	16.4E-03	15.6E-03	15.0E-03	15.1E-03	15.3E-03	15.4E-03	15.6E-03	16.5E-03	20.8E-03
Max	25.9E-03	22.4E-03	20.6E-03	18.1E-03	17.0E-03	16.4E-03	15.8E-03	16.4E-03	16.4E-03	16.5E-03	16.6E-03	18.2E-03	22.2E-03
Average	25.5E-03	22.3E-03	20.5E-03	17.9E-03	16.7E-03	16.0E-03	15.4E-03	15.7E-03	15.9E-03	15.9E-03	16.1E-03	17.3E-03	21.6E-03
Sigma	391.4E-06	194.3E-06	163.5E-06	167.0E-06	255.1E-06	299.7E-06	333.1E-06	533.2E-06	449.9E-06	449.1E-06	425.5E-06	682.7E-06	574.5E-06

Drift Calculation

IC(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_TID samples													
11	-	-3.0E-03	-4.7E-03	-7.3E-03	-8.6E-03	-9.4E-03	-10.0E-03	-9.9E-03	-9.7E-03	-9.6E-03	-9.4E-03	-8.5E-03	-4.2E-03
12	-	-3.4E-03	-5.3E-03	-7.8E-03	-8.9E-03	-9.5E-03	-10.1E-03	-9.5E-03	-9.5E-03	-9.4E-03	-9.3E-03	-7.7E-03	-3.7E-03
13	-	-3.3E-03	-5.2E-03	-7.8E-03	-9.0E-03	-9.7E-03	-10.4E-03	-10.0E-03	-9.9E-03	-9.8E-03	-9.7E-03	-8.4E-03	-4.0E-03
Average	-	-3.3E-03	-5.0E-03	-7.6E-03	-8.8E-03	-9.5E-03	-10.2E-03	-9.8E-03	-9.7E-03	-9.6E-03	-9.5E-03	-8.2E-03	-4.0E-03
Sigma	-	198.1E-06	228.1E-06	229.7E-06	165.1E-06	147.1E-06	141.9E-06	208.1E-06	154.4E-06	153.6E-06	153.3E-06	338.5E-06	209.3E-06

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Measurements

IC(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	25.5E-03	25.3E-03	25.3E-03	25.3E-03	25.3E-03	25.4E-03	25.4E-03	25.2E-03	25.4E-03	25.6E-03	25.3E-03	25.3E-03	25.3E-03
OFF PROTON samples													
2	11.8E-03	11.4E-03	11.2E-03	10.9E-03	10.6E-03	10.4E-03	10.4E-03	10.3E-03	10.4E-03	10.5E-03	10.7E-03	10.6E-03	11.5E-03
3	12.2E-03	11.1E-03	10.4E-03	8.1E-03	8.9E-03	6.7E-03	10.5E-03	9.9E-03	10.0E-03	9.7E-03	9.7E-03	10.4E-03	11.8E-03
4	12.0E-03	9.8E-03	8.8E-03	6.3E-03	7.1E-03	6.8E-03	7.3E-03	7.4E-03	7.1E-03	7.1E-03	7.1E-03	7.4E-03	9.6E-03
Statistics													
Min	11.8E-03	9.8E-03	8.8E-03	6.3E-03	7.1E-03	6.7E-03	7.3E-03	7.4E-03	7.1E-03	7.1E-03	7.1E-03	7.4E-03	9.6E-03
Max	12.2E-03	11.4E-03	11.2E-03	10.9E-03	10.6E-03	10.4E-03	10.5E-03	10.3E-03	10.4E-03	10.5E-03	10.7E-03	10.6E-03	11.8E-03
Average	12.0E-03	10.8E-03	10.1E-03	8.4E-03	8.8E-03	8.0E-03	9.4E-03	9.2E-03	9.2E-03	9.1E-03	9.2E-03	9.5E-03	11.0E-03
Sigma	153.4E-06	698.5E-06	1.0E-03	1.9E-03	1.4E-03	1.7E-03	1.5E-03	1.3E-03	1.5E-03	1.4E-03	1.5E-03	1.5E-03	962.4E-06

Drift Calculation

IC(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	-388.0E-06	-654.0E-06	-974.0E-06	-1.2E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.4E-03	-1.3E-03	-1.2E-03	-1.2E-03	-382.0E-06
3	-	-1.1E-03	-1.8E-03	-4.1E-03	-3.3E-03	-5.5E-03	-1.7E-03	-2.3E-03	-2.2E-03	-2.5E-03	-2.5E-03	-1.8E-03	-366.0E-06
4	-	-2.1E-03	-3.2E-03	-5.6E-03	-4.9E-03	-5.2E-03	-4.7E-03	-4.6E-03	-4.9E-03	-4.8E-03	-4.9E-03	-4.6E-03	-2.3E-03
Average	-	-1.2E-03	-1.9E-03	-3.6E-03	-3.1E-03	-4.0E-03	-2.6E-03	-2.8E-03	-2.8E-03	-2.9E-03	-2.8E-03	-2.5E-03	-1.0E-03
Sigma	-	712.6E-06	1.0E-03	1.9E-03	1.5E-03	1.8E-03	1.4E-03	1.3E-03	1.5E-03	1.4E-03	1.5E-03	1.5E-03	918.4E-06

Measurements

IC(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	25.5E-03	25.3E-03	25.3E-03	25.3E-03	25.3E-03	25.4E-03	25.4E-03	25.2E-03	25.4E-03	25.6E-03	25.3E-03	25.3E-03	25.3E-03
OFF TID samples													
8	26.8E-03	20.7E-03	18.6E-03	14.1E-03	12.2E-03	11.1E-03	10.7E-03	10.5E-03	11.2E-03	11.2E-03	11.5E-03	15.4E-03	17.7E-03
9	25.5E-03	19.2E-03	17.4E-03	13.0E-03	10.9E-03	9.6E-03	9.3E-03	9.7E-03	9.8E-03	9.7E-03	9.8E-03	12.5E-03	15.7E-03
10	25.2E-03	19.1E-03	17.2E-03	12.7E-03	10.8E-03	9.7E-03	9.3E-03	9.5E-03	9.8E-03	10.4E-03	10.4E-03	13.5E-03	15.5E-03
Statistics													
Min	25.2E-03	19.1E-03	17.2E-03	12.7E-03	10.8E-03	9.6E-03	9.3E-03	9.5E-03	9.8E-03	9.7E-03	9.8E-03	12.5E-03	15.5E-03
Max	26.8E-03	20.7E-03	18.6E-03	14.1E-03	12.2E-03	11.1E-03	10.7E-03	10.5E-03	11.2E-03	11.2E-03	11.5E-03	15.4E-03	17.7E-03
Average	25.8E-03	19.7E-03	17.8E-03	13.2E-03	11.3E-03	10.1E-03	9.8E-03	9.9E-03	10.3E-03	10.4E-03	10.6E-03	13.8E-03	16.3E-03
Sigma	704.5E-06	708.9E-06	634.8E-06	612.1E-06	633.3E-06	687.1E-06	657.6E-06	421.3E-06	660.2E-06	605.9E-06	697.3E-06	1.2E-03	1.0E-03

Drift Calculation

IC(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	-6.2E-03	-8.2E-03	-12.7E-03	-14.7E-03	-15.7E-03	-16.1E-03	-16.3E-03	-15.6E-03	-15.6E-03	-15.4E-03	-11.5E-03	-9.1E-03
9	-	-6.2E-03	-8.0E-03	-12.5E-03	-14.6E-03	-15.8E-03	-16.1E-03	-15.8E-03	-15.6E-03	-15.7E-03	-15.7E-03	-12.9E-03	-9.8E-03
10	-	-6.2E-03	-8.0E-03	-12.6E-03	-14.4E-03	-15.6E-03	-15.9E-03	-15.7E-03	-15.5E-03	-14.8E-03	-14.8E-03	-11.7E-03	-9.8E-03
Average	-	-6.2E-03	-8.1E-03	-12.6E-03	-14.6E-03	-15.7E-03	-16.0E-03	-15.9E-03	-15.6E-03	-15.4E-03	-15.3E-03	-12.0E-03	-9.6E-03
Sigma	-	20.7E-06	71.4E-06	108.1E-06	97.6E-06	93.4E-06	109.5E-06	283.2E-06	74.0E-06	419.0E-06	352.3E-06	640.8E-06	326.3E-06

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

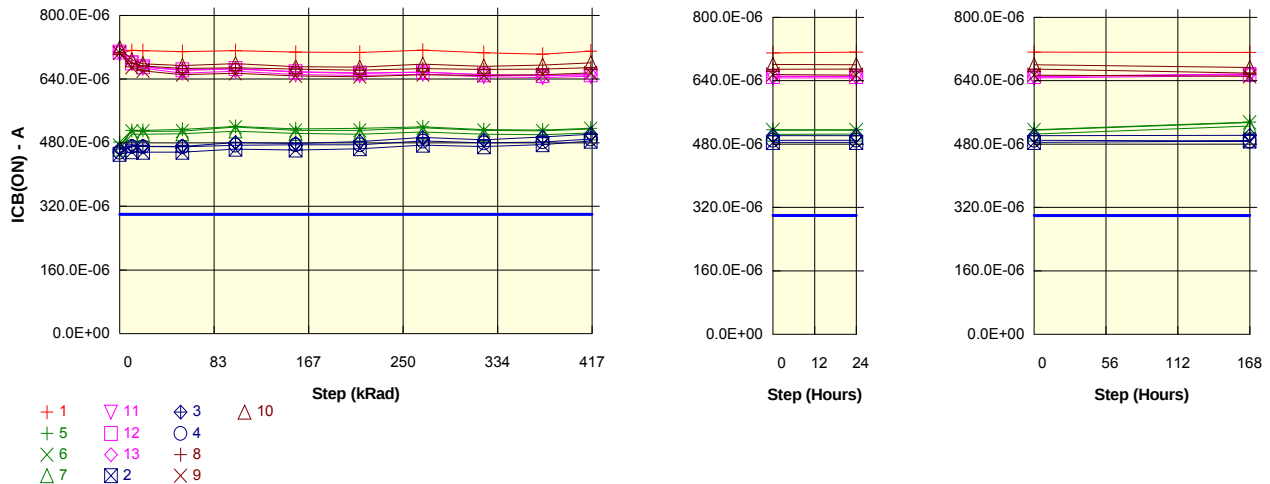
Parameter : On-State Collector-Base Current : ICB(ON)

Test conditions : IF = 10mA; VCB = 5V

Unit : A

Spec Limit Min : 300.0E-06

Spec limits are represented in bold lines on the graphic.



Measurements

ICB(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1 REF	704.8E-06	712.1E-06	711.7E-06	709.3E-06	711.8E-06	707.7E-06	707.4E-06	712.6E-06	706.6E-06	702.4E-06	710.4E-06	711.9E-06	711.4E-06
ON PROTON samples													
5	481.9E-06	510.9E-06	510.9E-06	513.9E-06	521.2E-06	515.0E-06	516.3E-06	520.1E-06	512.8E-06	511.8E-06	516.3E-06	516.5E-06	535.9E-06
6	473.3E-06	509.2E-06	508.8E-06	509.5E-06	519.1E-06	511.1E-06	511.2E-06	517.4E-06	510.9E-06	509.8E-06	515.0E-06	515.3E-06	534.9E-06
7	464.5E-06	501.5E-06	501.5E-06	502.6E-06	509.5E-06	503.8E-06	501.8E-06	507.3E-06	501.5E-06	500.3E-06	504.8E-06	505.4E-06	525.8E-06
Statistics													
Min	464.5E-06	501.5E-06	501.5E-06	502.6E-06	509.5E-06	503.8E-06	501.8E-06	507.3E-06	501.5E-06	500.3E-06	504.8E-06	505.4E-06	525.8E-06
Max	481.9E-06	510.9E-06	510.9E-06	513.9E-06	521.2E-06	515.0E-06	516.3E-06	520.1E-06	512.8E-06	511.8E-06	516.3E-06	516.5E-06	535.9E-06
Average	473.2E-06	507.2E-06	507.1E-06	508.7E-06	516.6E-06	510.0E-06	509.8E-06	514.9E-06	508.4E-06	507.3E-06	512.0E-06	512.4E-06	532.2E-06
Sigma	7.1E-06	4.1E-06	4.0E-06	4.7E-06	5.1E-06	4.7E-06	6.0E-06	5.5E-06	4.9E-06	5.0E-06	5.2E-06	5.0E-06	4.5E-06

Drift Calculation

ICB(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON PROTON samples													
5	-	29.0E-06	29.0E-06	32.0E-06	39.3E-06	33.1E-06	34.4E-06	38.2E-06	30.9E-06	30.0E-06	34.5E-06	34.7E-06	54.0E-06
6	-	35.9E-06	35.5E-06	36.2E-06	45.8E-06	37.8E-06	37.9E-06	44.1E-06	37.6E-06	36.5E-06	41.7E-06	42.0E-06	61.6E-06
7	-	37.0E-06	37.0E-06	38.1E-06	45.0E-06	39.3E-06	37.3E-06	42.8E-06	37.0E-06	35.8E-06	40.3E-06	40.9E-06	61.3E-06
Average	-	34.0E-06	33.8E-06	35.4E-06	43.4E-06	36.7E-06	36.5E-06	41.7E-06	35.2E-06	34.1E-06	38.8E-06	39.2E-06	59.0E-06
Sigma	-	3.5E-06	3.5E-06	2.5E-06	2.9E-06	2.6E-06	1.5E-06	2.5E-06	3.0E-06	2.9E-06	3.1E-06	3.2E-06	3.5E-06

Measurements

ICB(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1 REF	704.8E-06	712.1E-06	711.7E-06	709.3E-06	711.8E-06	707.7E-06	707.4E-06	712.6E-06	706.6E-06	702.4E-06	710.4E-06	711.9E-06	711.4E-06
ON TID samples													
11	704.2E-06	680.9E-06	667.9E-06	655.1E-06	660.1E-06	651.4E-06	649.1E-06	652.5E-06	646.3E-06	644.0E-06	647.0E-06	647.1E-06	652.8E-06
12	707.8E-06	680.6E-06	671.1E-06	663.3E-06	666.4E-06	658.5E-06	655.4E-06	657.8E-06	651.0E-06	648.8E-06	651.0E-06	650.5E-06	656.2E-06
13	708.7E-06	682.7E-06	671.1E-06	661.9E-06	665.5E-06	657.2E-06	654.6E-06	657.6E-06	650.9E-06	649.2E-06	651.0E-06	651.4E-06	657.3E-06
Statistics													
Min	704.2E-06	680.6E-06	667.9E-06	655.1E-06	660.1E-06	651.4E-06	649.1E-06	652.5E-06	646.3E-06	644.0E-06	647.0E-06	647.1E-06	652.8E-06
Max	708.7E-06	682.7E-06	671.1E-06	663.3E-06	666.4E-06	658.5E-06	655.4E-06	657.8E-06	651.0E-06	648.8E-06	651.0E-06	651.4E-06	657.3E-06
Average	706.9E-06	681.4E-06	670.1E-06	660.1E-06	664.0E-06	655.7E-06	653.0E-06	656.0E-06	649.4E-06	647.3E-06	649.7E-06	649.7E-06	655.4E-06
Sigma	1.9E-06	917.0E-09	1.5E-06	3.6E-06	2.8E-06	3.1E-06	2.8E-06	2.4E-06	2.2E-06	2.3E-06	1.9E-06	1.9E-06	1.9E-06

Drift Calculation

ICB(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON TID samples													
11	-	-23.3E-06	-36.3E-06	-49.1E-06	-44.1E-06	-52.8E-06	-55.1E-06	-51.7E-06	-57.9E-06	-60.2E-06	-57.2E-06	-57.1E-06	-51.4E-06
12	-	-27.2E-06	-36.7E-06	-44.5E-06	-41.4E-06	-49.3E-06	-52.4E-06	-50.0E-06	-56.8E-06	-59.0E-06	-56.8E-06	-57.3E-06	-51.6E-06
13	-	-26.0E-06	-37.6E-06	-46.8E-06	-43.2E-06	-51.5E-06	-54.1E-06	-51.0E-06	-57.7E-06	-59.5E-06	-57.7E-06	-57.2E-06	-51.3E-06
Average	-	-25.5E-06	-36.8E-06	-46.8E-06	-42.9E-06	-51.2E-06	-53.9E-06	-50.9E-06	-57.5E-06	-59.6E-06	-57.2E-06	-57.2E-06	-51.5E-06
Sigma	-	1.7E-06	541.7E-09	1.9E-06	1.1E-06	1.4E-06	1.1E-06	676.1E-09	512.4E-09	483.6E-09	335.6E-09	80.6E-09	126.8E-09

Hirex Engineering	Total Dose Radiation Test Report									Ref.:	HRX/TID/1021		
	OLS449					Isolink Inc				Issue:	01		

Measurements

ICB(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	704.8E-06	712.1E-06	711.7E-06	709.3E-06	711.8E-06	707.7E-06	707.4E-06	712.6E-06	706.6E-06	702.4E-06	710.4E-06	711.9E-06	711.4E-06
OFF PROTON samples													
2	451.1E-06	457.3E-06	456.3E-06	456.4E-06	464.0E-06	461.7E-06	465.0E-06	474.0E-06	470.3E-06	475.5E-06	484.3E-06	484.3E-06	487.9E-06
3	464.2E-06	471.5E-06	471.0E-06	471.3E-06	480.7E-06	478.3E-06	483.3E-06	493.0E-06	487.5E-06	494.5E-06	501.6E-06	501.8E-06	502.0E-06
4	455.9E-06	470.7E-06	470.2E-06	469.6E-06	473.6E-06	474.8E-06	474.7E-06	484.1E-06	479.9E-06	482.2E-06	489.7E-06	489.5E-06	487.9E-06
Statistics													
Min	451.1E-06	457.3E-06	456.3E-06	456.4E-06	464.0E-06	461.7E-06	465.0E-06	474.0E-06	470.3E-06	475.5E-06	484.3E-06	484.3E-06	487.9E-06
Max	464.2E-06	471.5E-06	471.0E-06	471.3E-06	480.7E-06	478.3E-06	483.3E-06	493.0E-06	487.5E-06	494.5E-06	501.6E-06	501.8E-06	502.0E-06
Average	457.1E-06	466.5E-06	465.8E-06	465.7E-06	472.8E-06	471.6E-06	474.3E-06	483.7E-06	479.3E-06	484.0E-06	491.9E-06	491.9E-06	492.6E-06
Sigma	5.4E-06	6.5E-06	6.7E-06	6.7E-06	6.9E-06	7.2E-06	7.5E-06	7.8E-06	7.0E-06	7.9E-06	7.2E-06	7.4E-06	6.7E-06

Drift Calculation

ICB(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	6.2E-06	5.2E-06	5.3E-06	12.9E-06	10.6E-06	13.9E-06	22.9E-06	19.2E-06	24.4E-06	33.3E-06	33.2E-06	36.8E-06
3	-	7.3E-06	6.7E-06	7.0E-06	16.5E-06	14.1E-06	19.0E-06	28.8E-06	23.3E-06	30.2E-06	37.4E-06	37.6E-06	37.8E-06
4	-	14.9E-06	14.4E-06	13.7E-06	17.8E-06	19.0E-06	18.8E-06	28.2E-06	24.1E-06	26.3E-06	33.8E-06	33.7E-06	32.1E-06
Average	-	9.4E-06	8.8E-06	8.7E-06	15.7E-06	14.6E-06	17.3E-06	26.6E-06	22.2E-06	27.0E-06	34.8E-06	34.8E-06	35.6E-06
Sigma	-	3.9E-06	4.0E-06	3.6E-06	2.1E-06	3.4E-06	2.4E-06	2.7E-06	2.1E-06	2.4E-06	1.8E-06	2.0E-06	2.5E-06

Measurements

ICB(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	704.8E-06	712.1E-06	711.7E-06	709.3E-06	711.8E-06	707.7E-06	707.4E-06	712.6E-06	706.6E-06	702.4E-06	710.4E-06	711.9E-06	711.4E-06
OFF TID samples													
8	707.1E-06	680.0E-06	673.2E-06	666.8E-06	668.1E-06	665.1E-06	662.3E-06	666.1E-06	664.3E-06	665.0E-06	669.0E-06	669.4E-06	659.3E-06
9	706.1E-06	669.9E-06	660.9E-06	651.3E-06	654.6E-06	648.1E-06	646.2E-06	651.3E-06	648.9E-06	651.4E-06	655.7E-06	654.5E-06	651.4E-06
10	718.6E-06	688.6E-06	678.7E-06	674.1E-06	679.0E-06	671.2E-06	670.1E-06	677.6E-06	672.3E-06	675.0E-06	681.2E-06	680.4E-06	673.6E-06
Statistics													
Min	706.1E-06	669.9E-06	660.9E-06	651.3E-06	654.6E-06	648.1E-06	646.2E-06	651.3E-06	648.9E-06	651.4E-06	655.7E-06	654.5E-06	651.4E-06
Max	718.6E-06	688.6E-06	678.7E-06	674.1E-06	679.0E-06	671.2E-06	670.1E-06	677.6E-06	672.3E-06	675.0E-06	681.2E-06	680.4E-06	673.6E-06
Average	710.6E-06	679.5E-06	670.9E-06	664.1E-06	667.2E-06	661.5E-06	659.5E-06	665.0E-06	661.8E-06	663.8E-06	668.6E-06	668.1E-06	661.4E-06
Sigma	5.7E-06	7.6E-06	7.4E-06	9.5E-06	10.0E-06	9.8E-06	10.0E-06	10.7E-06	9.7E-06	9.7E-06	10.4E-06	10.6E-06	9.2E-06

Drift Calculation

ICB(ON)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	-27.2E-06	-33.9E-06	-40.4E-06	-39.0E-06	-42.0E-06	-44.8E-06	-41.0E-06	-42.9E-06	-42.1E-06	-38.1E-06	-37.7E-06	-47.9E-06
9	-	-36.2E-06	-45.2E-06	-54.8E-06	-51.5E-06	-58.0E-06	-59.9E-06	-54.8E-06	-57.2E-06	-54.7E-06	-50.4E-06	-51.6E-06	-54.7E-06
10	-	-30.0E-06	-39.9E-06	-44.5E-06	-39.6E-06	-47.4E-06	-48.4E-06	-41.0E-06	-46.3E-06	-43.6E-06	-37.4E-06	-38.2E-06	-44.9E-06
Average	-	-31.1E-06	-39.7E-06	-46.6E-06	-43.4E-06	-49.1E-06	-51.1E-06	-45.6E-06	-48.8E-06	-46.8E-06	-42.0E-06	-42.5E-06	-49.2E-06
Sigma	-	3.8E-06	4.6E-06	6.1E-06	5.7E-06	6.6E-06	6.4E-06	6.5E-06	6.1E-06	5.6E-06	6.0E-06	6.4E-06	4.1E-06

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

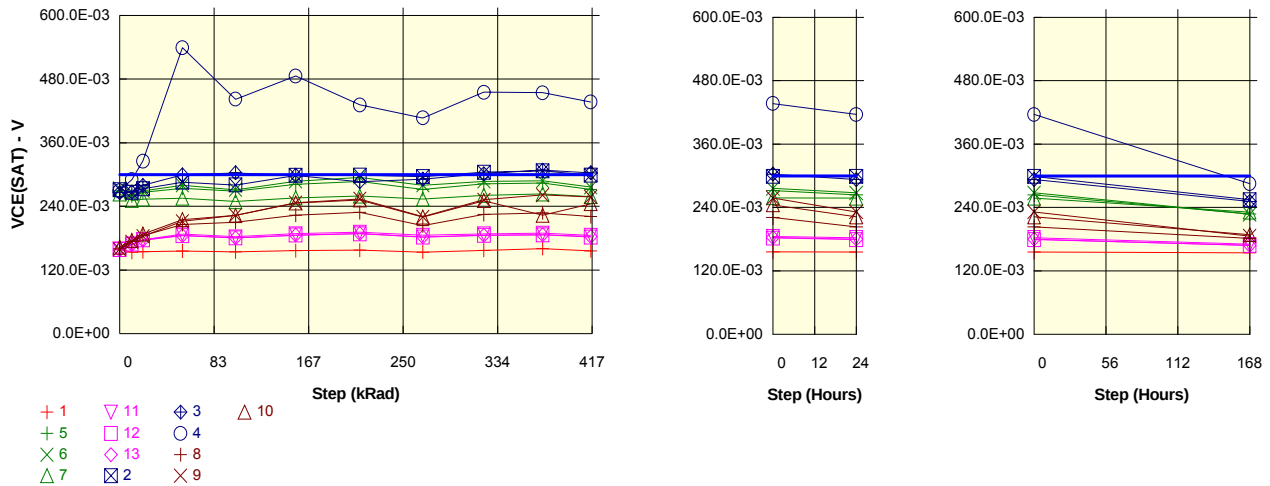
Parameter : Saturation Voltage : VCE(SAT)

Test conditions : IF = 1mA ; IC = 5mA

Unit : V

Spec Limit Max : 300.0E-03

Spec limits are represented in bold lines on the graphic.



Measurements

VCE(SAT)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	158.9E-03	153.6E-03	154.7E-03	155.9E-03	154.2E-03	156.5E-03	157.5E-03	154.0E-03	157.2E-03	160.6E-03	156.4E-03	155.7E-03	154.3E-03
ON_PROTON samples													
5	269.1E-03	260.2E-03	266.4E-03	274.3E-03	269.0E-03	281.6E-03	286.8E-03	272.1E-03	282.4E-03	283.9E-03	272.4E-03	264.1E-03	227.8E-03
6	273.9E-03	263.4E-03	269.5E-03	279.9E-03	271.3E-03	287.4E-03	294.7E-03	279.8E-03	287.1E-03	288.2E-03	276.4E-03	267.7E-03	227.1E-03
7	263.3E-03	251.4E-03	253.6E-03	255.6E-03	249.0E-03	256.0E-03	259.6E-03	253.8E-03	260.8E-03	263.5E-03	258.5E-03	257.8E-03	231.3E-03
Statistics													
Min	263.3E-03	251.4E-03	253.6E-03	255.6E-03	249.0E-03	256.0E-03	259.6E-03	253.8E-03	260.8E-03	263.5E-03	258.5E-03	257.8E-03	227.1E-03
Max	273.9E-03	263.4E-03	269.5E-03	279.9E-03	271.3E-03	287.4E-03	294.7E-03	279.8E-03	287.1E-03	288.2E-03	276.4E-03	267.7E-03	231.3E-03
Average	268.8E-03	258.3E-03	263.2E-03	269.9E-03	263.1E-03	275.0E-03	280.4E-03	268.6E-03	276.8E-03	278.6E-03	269.1E-03	263.2E-03	228.7E-03
Sigma	4.3E-03	5.1E-03	6.9E-03	10.4E-03	10.0E-03	13.6E-03	15.0E-03	10.9E-03	11.4E-03	10.8E-03	7.7E-03	4.1E-03	1.8E-03

Drift Calculation

VCE(SAT)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_PROTON samples													
5	-	-8.9E-03	-2.7E-03	5.2E-03	-80.0E-06	12.6E-03	17.7E-03	3.0E-03	13.4E-03	14.8E-03	3.3E-03	-5.0E-03	-41.3E-03
6	-	-10.5E-03	-4.4E-03	6.0E-03	-2.6E-03	13.5E-03	20.8E-03	6.0E-03	13.2E-03	14.4E-03	2.6E-03	-6.2E-03	-46.8E-03
7	-	-12.0E-03	-9.7E-03	-7.8E-03	-14.3E-03	-7.3E-03	-3.7E-03	-9.5E-03	-2.5E-03	200.0E-06	-4.8E-03	-5.5E-03	-32.0E-03
Average	-	-10.5E-03	-5.6E-03	1.2E-03	-5.6E-03	6.3E-03	11.6E-03	-186.7E-06	8.0E-03	9.8E-03	360.0E-06	-5.5E-03	-40.0E-03
Sigma	-	1.2E-03	3.0E-03	6.3E-03	6.2E-03	9.6E-03	10.9E-03	6.7E-03	7.4E-03	6.8E-03	3.7E-03	490.3E-06	6.1E-03

Measurements

VCE(SAT)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	158.9E-03	153.6E-03	154.7E-03	155.9E-03	154.2E-03	156.5E-03	157.5E-03	154.0E-03	157.2E-03	160.6E-03	156.4E-03	155.7E-03	154.3E-03
ON_TID samples													
11	159.7E-03	168.8E-03	177.3E-03	187.9E-03	182.7E-03	188.6E-03	191.5E-03	185.7E-03	188.4E-03	189.5E-03	185.3E-03	183.0E-03	170.5E-03
12	158.8E-03	168.8E-03	176.8E-03	185.2E-03	180.6E-03	185.8E-03	188.6E-03	182.0E-03	185.5E-03	186.4E-03	182.4E-03	179.5E-03	168.6E-03
13	157.8E-03	168.0E-03	176.3E-03	185.0E-03	180.6E-03	186.0E-03	188.7E-03	182.6E-03	185.8E-03	186.5E-03	183.3E-03	180.2E-03	168.4E-03
Statistics													
Min	157.8E-03	168.0E-03	176.3E-03	185.0E-03	180.6E-03	185.8E-03	188.6E-03	182.0E-03	185.5E-03	186.4E-03	182.4E-03	179.5E-03	168.4E-03
Max	159.7E-03	168.8E-03	177.3E-03	187.9E-03	182.7E-03	188.6E-03	191.5E-03	185.7E-03	188.4E-03	189.5E-03	185.3E-03	183.0E-03	170.5E-03
Average	158.8E-03	168.5E-03	176.8E-03	186.0E-03	181.3E-03	186.8E-03	189.6E-03	183.4E-03	186.5E-03	187.5E-03	183.7E-03	180.9E-03	169.1E-03
Sigma	751.4E-06	386.9E-06	409.2E-06	1.3E-03	990.1E-06	1.3E-03	1.3E-03	1.6E-03	1.3E-03	1.4E-03	1.2E-03	1.5E-03	947.9E-06

Drift Calculation

VCE(SAT)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_TID samples													
11	-	9.1E-03	17.6E-03	28.2E-03	23.0E-03	28.9E-03	31.8E-03	26.0E-03	28.7E-03	29.8E-03	25.6E-03	23.3E-03	10.8E-03
12	-	10.0E-03	18.0E-03	26.4E-03	21.8E-03	27.0E-03	29.8E-03	23.2E-03	26.7E-03	27.6E-03	23.6E-03	20.7E-03	9.8E-03
13	-	10.2E-03	18.5E-03	27.2E-03	22.8E-03	28.2E-03	30.9E-03	24.8E-03	27.9E-03	28.7E-03	25.5E-03	22.4E-03	10.5E-03
Average	-	9.8E-03	18.0E-03	27.3E-03	22.5E-03	28.0E-03	30.8E-03	24.7E-03	27.8E-03	28.7E-03	24.9E-03	22.1E-03	10.4E-03
Sigma	-	464.6E-06	346.2E-06	770.3E-06	537.0E-06	789.5E-06	817.4E-06	1.1E-03	824.3E-06	914.5E-06	926.3E-06	1.1E-03	421.2E-06

Hirex Engineering	Total Dose Radiation Test Report									Ref.:	HRX/TID/1021		
	OLS449					Isolink Inc				Issue:	01		

Measurements

VCE(SAT)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	158.9E-03	153.6E-03	154.7E-03	155.9E-03	154.2E-03	156.5E-03	157.5E-03	154.0E-03	157.2E-03	160.6E-03	156.4E-03	155.7E-03	154.3E-03
OFF PROTON samples													
2	271.6E-03	266.6E-03	273.2E-03	285.6E-03	280.3E-03	298.4E-03	299.0E-03	296.1E-03	304.6E-03	307.2E-03	299.1E-03	299.0E-03	254.9E-03
3	265.8E-03	267.1E-03	279.6E-03	299.4E-03	303.3E-03	298.5E-03	286.6E-03	291.5E-03	301.7E-03	308.4E-03	303.4E-03	293.0E-03	251.5E-03
4	269.8E-03	290.3E-03	325.4E-03	539.2E-03	442.1E-03	485.8E-03	431.4E-03	406.9E-03	455.2E-03	454.3E-03	436.9E-03	416.2E-03	285.2E-03
Statistics													
Min	265.8E-03	266.6E-03	273.2E-03	285.6E-03	280.3E-03	298.4E-03	286.6E-03	291.5E-03	301.7E-03	307.2E-03	299.1E-03	293.0E-03	251.5E-03
Max	271.6E-03	290.3E-03	325.4E-03	539.2E-03	442.1E-03	485.8E-03	431.4E-03	406.9E-03	455.2E-03	454.3E-03	436.9E-03	416.2E-03	285.2E-03
Average	269.1E-03	274.7E-03	292.8E-03	374.7E-03	341.9E-03	360.9E-03	339.0E-03	331.5E-03	353.9E-03	356.6E-03	346.5E-03	336.1E-03	263.9E-03
Sigma	2.4E-03	11.1E-03	23.3E-03	116.5E-03	71.5E-03	88.3E-03	65.6E-03	53.4E-03	71.7E-03	69.1E-03	64.0E-03	56.7E-03	15.2E-03

Drift Calculation

VCE(SAT)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	-5.1E-03	1.6E-03	14.0E-03	8.6E-03	26.8E-03	27.4E-03	24.4E-03	33.0E-03	35.5E-03	27.4E-03	27.4E-03	-16.7E-03
3	-	1.3E-03	13.8E-03	33.6E-03	37.5E-03	32.7E-03	20.8E-03	25.7E-03	35.9E-03	42.6E-03	37.6E-03	27.2E-03	-14.3E-03
4	-	20.6E-03	55.7E-03	269.5E-03	172.3E-03	216.1E-03	161.7E-03	137.2E-03	185.5E-03	184.5E-03	167.2E-03	146.5E-03	15.5E-03
Average	-	5.6E-03	23.7E-03	105.7E-03	72.8E-03	91.8E-03	69.9E-03	62.4E-03	84.8E-03	87.5E-03	77.4E-03	67.0E-03	-5.2E-03
Sigma	-	10.9E-03	23.2E-03	116.1E-03	71.3E-03	87.9E-03	64.9E-03	52.8E-03	71.2E-03	68.6E-03	63.6E-03	56.2E-03	14.6E-03

Measurements

VCE(SAT)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	158.9E-03	153.6E-03	154.7E-03	155.9E-03	154.2E-03	156.5E-03	157.5E-03	154.0E-03	157.2E-03	160.6E-03	156.4E-03	155.7E-03	154.3E-03
OFF TID samples													
8	160.2E-03	173.8E-03	184.8E-03	206.0E-03	210.2E-03	223.7E-03	228.6E-03	203.9E-03	224.7E-03	227.8E-03	220.9E-03	203.6E-03	181.5E-03
9	159.2E-03	173.0E-03	183.8E-03	211.9E-03	223.2E-03	246.9E-03	254.1E-03	220.6E-03	252.4E-03	261.5E-03	257.9E-03	231.7E-03	185.9E-03
10	163.2E-03	175.9E-03	187.9E-03	215.0E-03	222.9E-03	246.4E-03	252.2E-03	219.8E-03	250.8E-03	223.3E-03	245.0E-03	222.3E-03	188.8E-03
Statistics													
Min	159.2E-03	173.0E-03	183.8E-03	206.0E-03	210.2E-03	223.7E-03	228.6E-03	203.9E-03	224.7E-03	223.3E-03	220.9E-03	203.6E-03	181.5E-03
Max	163.2E-03	175.9E-03	187.9E-03	215.0E-03	223.2E-03	246.9E-03	254.1E-03	220.6E-03	252.4E-03	261.5E-03	257.9E-03	231.7E-03	188.8E-03
Average	160.9E-03	174.2E-03	185.5E-03	210.9E-03	218.8E-03	239.0E-03	245.0E-03	214.8E-03	242.7E-03	237.5E-03	241.3E-03	219.2E-03	185.4E-03
Sigma	1.7E-03	1.2E-03	1.7E-03	3.7E-03	6.1E-03	10.8E-03	11.6E-03	7.7E-03	12.7E-03	17.0E-03	15.3E-03	11.7E-03	3.0E-03

Drift Calculation

VCE(SAT)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	13.6E-03	24.6E-03	45.8E-03	50.0E-03	63.5E-03	68.4E-03	43.7E-03	64.5E-03	67.6E-03	60.7E-03	43.4E-03	21.3E-03
9	-	13.8E-03	24.6E-03	52.7E-03	64.1E-03	87.7E-03	94.9E-03	61.4E-03	93.3E-03	102.3E-03	98.8E-03	72.5E-03	26.7E-03
10	-	12.7E-03	24.7E-03	51.8E-03	59.7E-03	83.2E-03	89.0E-03	56.6E-03	87.6E-03	60.1E-03	81.8E-03	59.1E-03	25.6E-03
Average	-	13.4E-03	24.6E-03	50.1E-03	57.9E-03	78.1E-03	84.1E-03	53.9E-03	81.8E-03	76.7E-03	80.4E-03	58.3E-03	24.5E-03
Sigma	-	494.2E-06	32.7E-06	3.1E-03	5.9E-03	10.5E-03	11.4E-03	7.5E-03	12.4E-03	18.4E-03	15.6E-03	11.9E-03	2.3E-03

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

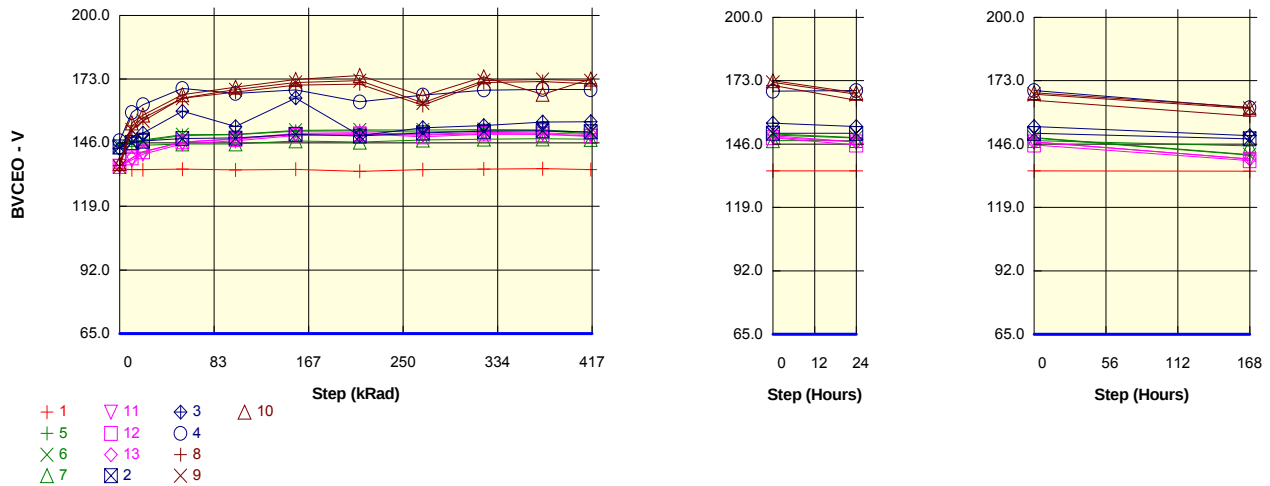
Parameter : Breakdown Voltage Collector To Emitter : BVCEO

Test conditions : I CE = 1 mA

Unit : V

Spec Limit Min : 65.0

Spec limits are represented in bold lines on the graphic.



Measurements

BVCEO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	134.9	134.6	134.6	134.8	134.5	134.8	133.9	134.6	134.9	135.0	134.6	134.6	134.6
ON PROTON samples													
5	145.0	146.1	146.8	149.1	149.4	150.9	151.1	150.5	151.2	151.2	149.8	148.5	141.3
6	145.1	146.1	147.2	149.4	149.6	151.3	151.4	151.4	151.6	151.5	150.4	148.8	141.4
7	144.3	144.5	144.9	145.5	145.5	146.8	146.3	147.1	147.5	147.7	147.5	147.5	145.2
Statistics													
Min	144.3	144.5	144.9	145.5	145.5	146.8	146.3	147.1	147.5	147.7	147.5	147.5	141.3
Max	145.1	146.1	147.2	149.4	149.6	151.3	151.4	151.4	151.6	151.5	150.4	148.8	145.2
Average	144.8	145.5	146.3	148.0	148.2	149.7	149.6	149.7	150.1	150.1	149.2	148.3	142.7
Sigma	0.3	0.7	1.0	1.8	1.9	2.0	2.3	1.8	1.8	1.7	1.3	0.5	1.8

Drift Calculation

BVCEO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON PROTON samples													
5	-	1.1E+00	1.8E+00	4.1E+00	4.5E+00	5.9E+00	6.1E+00	5.5E+00	6.2E+00	6.2E+00	4.9E+00	3.6E+00	-3.7E+00
6	-	940.0E-03	2.1E+00	4.3E+00	4.5E+00	6.2E+00	6.3E+00	6.3E+00	6.5E+00	6.4E+00	5.2E+00	3.7E+00	-3.7E+00
7	-	188.0E-03	604.0E-03	1.2E+00	1.2E+00	2.5E+00	2.0E+00	2.8E+00	3.2E+00	3.4E+00	3.1E+00	3.2E+00	888.0E-03
Average	-	741.3E-03	1.5E+00	3.2E+00	3.4E+00	4.9E+00	4.8E+00	4.9E+00	5.3E+00	5.3E+00	4.4E+00	3.5E+00	-2.2E+00
Sigma	-	396.4E-03	636.5E-03	1.4E+00	1.5E+00	1.7E+00	2.0E+00	1.5E+00	1.5E+00	1.4E+00	914.9E-03	195.3E-03	2.1E+00

Measurements

BVCEO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	134.9	134.6	134.6	134.8	134.5	134.8	133.9	134.6	134.9	135.0	134.6	134.6	134.6
ON TID samples													
11	136.1	138.7	141.2	145.6	146.9	149.2	149.5	149.3	149.9	149.8	148.9	146.9	139.6
12	136.0	139.6	142.2	146.4	147.5	149.5	149.8	148.6	149.7	149.5	148.7	145.7	139.0
13	136.3	139.5	142.1	146.4	147.7	149.9	150.3	149.5	150.4	150.2	149.6	146.9	139.6
Statistics													
Min	136.0	138.7	141.2	145.6	146.9	149.2	149.5	148.6	149.7	149.5	148.7	145.7	139.0
Max	136.3	139.6	142.2	146.4	147.7	149.9	150.3	149.5	150.4	150.2	149.6	146.9	139.6
Average	136.1	139.2	141.8	146.1	147.4	149.5	149.9	149.1	150.0	149.8	149.0	146.5	139.4
Sigma	0.1	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.6	0.3

Drift Calculation

BVCEO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON TID samples													
11	-	2.6E+00	5.1E+00	9.5E+00	10.8E+00	13.1E+00	13.4E+00	13.2E+00	13.8E+00	13.7E+00	12.8E+00	10.9E+00	3.5E+00
12	-	3.6E+00	6.2E+00	10.4E+00	11.5E+00	13.6E+00	13.8E+00	12.6E+00	13.7E+00	13.5E+00	12.7E+00	9.7E+00	3.0E+00
13	-	3.2E+00	5.8E+00	10.1E+00	11.4E+00	13.7E+00	14.0E+00	13.2E+00	14.1E+00	13.9E+00	13.3E+00	10.6E+00	3.3E+00
Average	-	3.1E+00	5.7E+00	10.0E+00	11.2E+00	13.4E+00	13.8E+00	13.0E+00	13.9E+00	13.7E+00	12.9E+00	10.4E+00	3.3E+00
Sigma	-	394.3E-03	461.6E-03	381.0E-03	322.2E-03	255.7E-03	233.0E-03	284.7E-03	169.7E-03	154.9E-03	241.3E-03	500.0E-03	218.7E-03

Hirex Engineering	Total Dose Radiation Test Report									Ref.:	HRX/TID/1021		
	OLS449					Isolink Inc				Issue:	01		

Measurements

BVCEO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	134.9	134.6	134.6	134.8	134.5	134.8	133.9	134.6	134.9	135.0	134.6	134.6	134.6
OFF PROTON samples													
2	144.2	146.0	146.7	147.8	148.0	149.6	148.9	150.2	150.9	151.1	150.7	150.6	148.3
3	143.6	148.4	150.1	159.4	152.8	165.0	149.1	152.3	153.3	154.8	154.9	153.5	149.6
4	146.9	158.9	162.1	169.0	166.9	168.5	163.4	166.2	168.3	168.6	168.5	168.8	161.5
Statistics													
Min	143.6	146.0	146.7	147.8	148.0	149.6	148.9	150.2	150.9	151.1	150.7	150.6	148.3
Max	146.9	158.9	162.1	169.0	166.9	168.5	163.4	166.2	168.3	168.6	168.5	168.8	161.5
Average	144.9	151.1	153.0	158.7	155.9	161.0	153.8	156.2	157.5	158.2	158.0	157.6	153.1
Sigma	1.4	5.6	6.6	8.7	8.0	8.2	6.8	7.1	7.7	7.5	7.6	8.0	5.9

Drift Calculation

BVCEO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	1.8E+00	2.5E+00	3.6E+00	3.8E+00	5.4E+00	4.7E+00	6.0E+00	6.7E+00	6.9E+00	6.4E+00	6.4E+00	4.1E+00
3	-	4.8E+00	6.5E+00	15.8E+00	9.3E+00	21.5E+00	5.6E+00	8.8E+00	9.7E+00	11.3E+00	11.4E+00	9.9E+00	6.0E+00
4	-	12.0E+00	15.2E+00	22.1E+00	20.0E+00	21.6E+00	16.5E+00	19.3E+00	21.4E+00	21.7E+00	21.6E+00	21.9E+00	14.6E+00
Average	-	6.2E+00	8.1E+00	13.8E+00	11.0E+00	16.1E+00	8.9E+00	11.4E+00	12.6E+00	13.3E+00	13.2E+00	12.7E+00	8.2E+00
Sigma	-	4.3E+00	5.3E+00	7.7E+00	6.7E+00	7.6E+00	5.4E+00	5.7E+00	6.4E+00	6.2E+00	6.3E+00	6.7E+00	4.6E+00

Measurements

BVCEO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	134.9	134.6	134.6	134.8	134.5	134.8	133.9	134.6	134.9	135.0	134.6	134.6	134.6
OFF TID samples													
8	136.4	153.2	156.5	164.9	167.5	170.4	170.9	161.9	171.6	172.0	171.0	164.7	158.0
9	135.8	151.4	155.2	165.0	168.5	171.6	172.4	162.9	172.4	172.8	172.3	167.2	161.2
10	137.2	154.4	157.7	166.4	169.6	172.8	174.5	165.8	174.0	166.5	173.0	167.9	161.6
Statistics													
Min	135.8	151.4	155.2	164.9	167.5	170.4	170.9	161.9	171.6	166.5	171.0	164.7	158.0
Max	137.2	154.4	157.7	166.4	169.6	172.8	174.5	165.8	174.0	172.8	173.0	167.9	161.6
Average	136.5	153.0	156.5	165.4	168.5	171.6	172.6	163.5	172.6	170.4	172.1	166.6	160.3
Sigma	0.6	1.2	1.0	0.7	0.9	1.0	1.5	1.7	1.0	2.8	0.8	1.4	1.6

Drift Calculation

BVCEO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	16.8E+00	20.1E+00	28.6E+00	31.1E+00	34.1E+00	34.6E+00	25.5E+00	35.2E+00	35.6E+00	34.7E+00	28.3E+00	21.6E+00
9	-	15.5E+00	19.4E+00	29.1E+00	32.7E+00	35.7E+00	36.5E+00	27.1E+00	36.5E+00	36.9E+00	36.4E+00	31.4E+00	25.3E+00
10	-	17.2E+00	20.5E+00	29.2E+00	32.4E+00	35.6E+00	37.4E+00	28.6E+00	36.8E+00	29.4E+00	35.8E+00	30.8E+00	24.4E+00
Average	-	16.5E+00	20.0E+00	28.9E+00	32.1E+00	35.1E+00	36.2E+00	27.1E+00	36.2E+00	34.0E+00	35.6E+00	30.1E+00	23.8E+00
Sigma	-	708.0E-03	470.4E-03	282.8E-03	674.0E-03	764.6E-03	1.2E+00	1.3E+00	675.2E-03	3.3E+00	730.7E-03	1.3E+00	1.6E+00

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

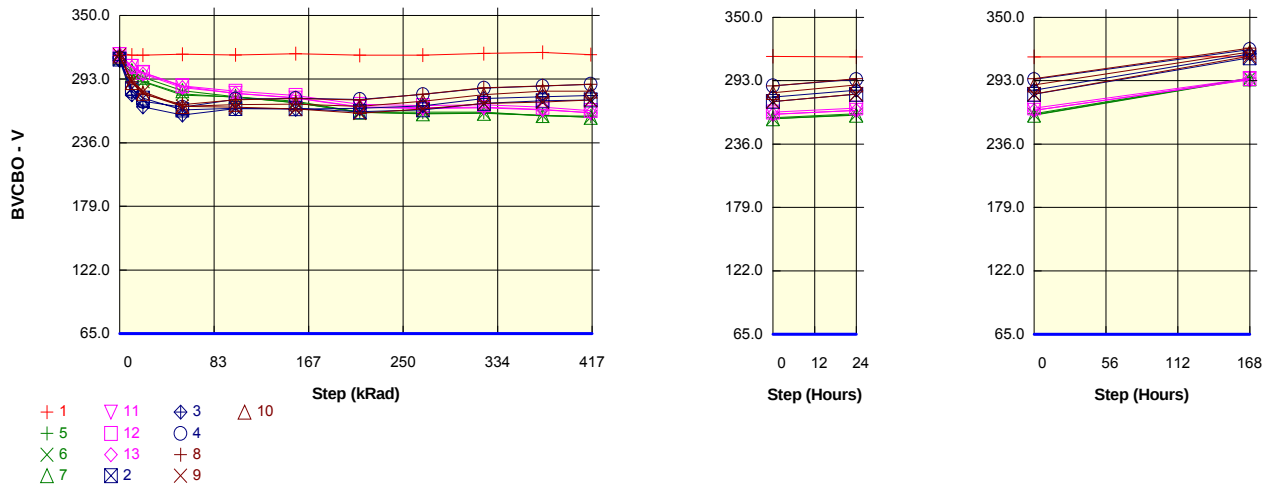
Parameter : Breakdown Voltage Collector To Base : BVCBO

Test conditions : I CB = 100 µA

Unit : V

Spec Limit Min : 65.0

Spec limits are represented in bold lines on the graphic.



Measurements

BVCBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	316.4	314.5	314.4	315.3	314.7	315.8	314.4	314.5	315.9	317.0	314.9	314.5	314.7
ON_PROTON samples													
5	309.7	296.9	290.7	278.7	277.0	273.0	263.4	263.4	263.4	260.3	259.8	263.5	295.5
6	311.0	297.7	291.1	279.8	276.7	272.1	263.2	262.3	262.7	260.4	258.9	262.4	295.1
7	312.0	300.6	294.7	282.6	277.3	271.8	263.4	261.9	262.4	260.4	258.9	262.0	294.6
Statistics													
Min	309.7	296.9	290.7	278.7	276.7	271.8	263.2	261.9	262.4	260.3	258.9	262.0	294.6
Max	312.0	300.6	294.7	282.6	277.3	273.0	263.4	263.4	263.4	260.4	259.8	263.5	295.5
Average	310.9	298.4	292.2	280.4	277.0	272.3	263.4	262.5	262.8	260.4	259.2	262.6	295.1
Sigma	1.0	1.6	1.8	1.6	0.2	0.5	0.1	0.6	0.4	0.1	0.5	0.6	0.3

Drift Calculation

BVCBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_PROTON samples													
5	-	-12.8E+00	-19.0E+00	-31.0E+00	-32.7E+00	-36.7E+00	-46.3E+00	-46.4E+00	-46.3E+00	-49.4E+00	-49.9E+00	-46.2E+00	-14.2E+00
6	-	-13.3E+00	-19.9E+00	-31.3E+00	-34.3E+00	-38.9E+00	-47.8E+00	-48.7E+00	-48.3E+00	-50.6E+00	-52.1E+00	-48.6E+00	-15.9E+00
7	-	-11.5E+00	-17.4E+00	-29.4E+00	-34.7E+00	-40.2E+00	-48.6E+00	-50.1E+00	-49.7E+00	-51.6E+00	-53.2E+00	-50.0E+00	-17.4E+00
Average	-	-12.5E+00	-18.8E+00	-30.6E+00	-33.9E+00	-38.6E+00	-47.6E+00	-48.4E+00	-48.1E+00	-50.6E+00	-51.7E+00	-48.3E+00	-15.8E+00
Sigma	-	772.9E-03	1.0E+00	805.6E-03	885.7E-03	1.5E+00	977.0E-03	1.5E+00	1.4E+00	888.6E-03	1.4E+00	1.6E+00	1.3E+00

Measurements

BVCBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	316.4	314.5	314.4	315.3	314.7	315.8	314.4	314.5	315.9	317.0	314.9	314.5	314.7
ON_TID samples													
11	315.0	304.3	298.7	286.6	280.2	276.0	267.7	266.7	267.3	265.5	263.0	266.4	294.4
12	315.0	304.5	299.1	287.0	282.2	278.5	270.4	269.4	270.1	267.9	264.9	268.4	295.1
13	314.8	303.3	297.6	285.4	280.4	276.4	268.1	267.6	268.0	265.8	262.6	266.3	293.8
Statistics													
Min	314.8	303.3	297.6	285.4	280.2	276.0	267.7	266.7	267.3	265.5	262.6	266.3	293.8
Max	315.0	304.5	299.1	287.0	282.2	278.5	270.4	269.4	270.1	267.9	264.9	268.4	295.1
Average	314.9	304.0	298.5	286.4	280.9	277.0	268.7	267.9	268.5	266.4	263.5	267.0	294.4
Sigma	0.1	0.5	0.6	0.7	0.9	1.1	1.2	1.1	1.2	1.1	1.0	1.0	0.6

Drift Calculation

BVCBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_TID samples													
11	-	-10.7E+00	-16.3E+00	-28.3E+00	-34.7E+00	-39.0E+00	-47.3E+00	-48.3E+00	-47.6E+00	-49.5E+00	-52.0E+00	-48.6E+00	-20.6E+00
12	-	-10.6E+00	-16.0E+00	-28.0E+00	-32.8E+00	-36.6E+00	-44.6E+00	-45.7E+00	-45.0E+00	-47.1E+00	-50.2E+00	-46.6E+00	-19.9E+00
13	-	-11.4E+00	-17.2E+00	-29.4E+00	-34.4E+00	-38.3E+00	-46.7E+00	-47.2E+00	-46.8E+00	-48.9E+00	-52.1E+00	-48.5E+00	-21.0E+00
Average	-	-10.9E+00	-16.5E+00	-28.6E+00	-34.0E+00	-38.0E+00	-46.2E+00	-47.0E+00	-46.5E+00	-48.5E+00	-51.4E+00	-47.9E+00	-20.5E+00
Sigma	-	387.9E-03	506.5E-03	580.4E-03	810.5E-03	1.0E+00	1.1E+00	1.1E+00	1.1E+00	1.0E+00	889.2E-03	921.0E-03	448.0E-03

Hirex Engineering	Total Dose Radiation Test Report									Ref.:	HRX/TID/1021		
	OLS449					Isolink Inc				Issue:	01		

Measurements

BVCBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	316.4	314.5	314.4	315.3	314.7	315.8	314.4	314.5	315.9	317.0	314.9	314.5	314.7
OFF PROTON samples													
2	311.0	284.5	276.0	265.5	266.7	266.5	263.8	265.5	271.3	273.6	274.4	280.8	313.7
3	309.8	278.9	268.1	260.8	266.5	266.1	266.8	269.1	275.7	277.3	278.3	284.5	317.2
4	312.0	282.1	273.1	267.9	275.1	275.8	274.8	279.2	284.8	286.7	288.4	294.1	321.1
Statistics													
Min	309.8	278.9	268.1	260.8	266.5	266.1	263.8	265.5	271.3	273.6	274.4	280.8	313.7
Max	312.0	284.5	276.0	267.9	275.1	275.8	274.8	279.2	284.8	286.7	288.4	294.1	321.1
Average	310.9	281.8	272.4	264.7	269.4	269.5	268.5	271.3	277.3	279.2	280.3	286.5	317.3
Sigma	0.9	2.3	3.3	2.9	4.0	4.5	4.6	5.8	5.6	5.5	5.9	5.6	3.0

Drift Calculation

BVCBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	-26.5E+00	-35.0E+00	-45.5E+00	-44.3E+00	-44.4E+00	-47.1E+00	-45.5E+00	-39.6E+00	-37.4E+00	-36.6E+00	-30.2E+00	2.7E+00
3	-	-30.8E+00	-41.6E+00	-48.9E+00	-43.2E+00	-43.7E+00	-43.0E+00	-40.6E+00	-34.0E+00	-32.4E+00	-31.5E+00	-25.3E+00	7.5E+00
4	-	-29.8E+00	-38.8E+00	-44.0E+00	-36.9E+00	-36.1E+00	-37.1E+00	-32.8E+00	-27.1E+00	-25.3E+00	-23.6E+00	-17.8E+00	9.1E+00
Average	-	-29.1E+00	-38.5E+00	-46.2E+00	-41.5E+00	-41.4E+00	-42.4E+00	-39.6E+00	-33.6E+00	-31.7E+00	-30.6E+00	-24.4E+00	6.4E+00
Sigma	-	1.9E+00	2.7E+00	2.0E+00	3.3E+00	3.8E+00	4.1E+00	5.2E+00	5.1E+00	5.0E+00	5.3E+00	5.1E+00	2.7E+00

Measurements

BVCBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	316.4	314.5	314.4	315.3	314.7	315.8	314.4	314.5	315.9	317.0	314.9	314.5	314.7
OFF TID samples													
8	314.2	290.4	279.7	270.2	274.4	275.6	274.4	279.5	285.2	287.0	288.3	294.8	322.2
9	314.4	291.0	281.8	268.6	267.8	266.3	262.6	266.3	271.2	272.5	274.3	281.1	315.1
10	313.6	289.7	280.2	268.6	270.3	270.7	268.5	273.2	279.0	282.3	282.2	289.2	318.9
Statistics													
Min	313.6	289.7	279.7	268.6	267.8	266.3	262.6	266.3	271.2	272.5	274.3	281.1	315.1
Max	314.4	291.0	281.8	270.2	274.4	275.6	274.4	279.5	285.2	287.0	288.3	294.8	322.2
Average	314.1	290.4	280.6	269.1	270.9	270.9	268.5	273.0	278.5	280.6	281.6	288.4	318.8
Sigma	0.3	0.5	0.9	0.8	2.7	3.8	4.8	5.4	5.7	6.1	5.7	5.6	2.9

Drift Calculation

BVCBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	-23.8E+00	-34.5E+00	-44.0E+00	-39.8E+00	-38.6E+00	-39.8E+00	-34.8E+00	-29.0E+00	-27.2E+00	-25.9E+00	-19.4E+00	8.0E+00
9	-	-23.5E+00	-32.7E+00	-45.8E+00	-46.6E+00	-48.2E+00	-51.9E+00	-48.2E+00	-43.2E+00	-41.9E+00	-40.2E+00	-33.3E+00	696.0E-03
10	-	-23.9E+00	-33.4E+00	-45.0E+00	-43.3E+00	-42.9E+00	-45.1E+00	-40.4E+00	-34.6E+00	-31.3E+00	-31.4E+00	-24.4E+00	5.3E+00
Average	-	-23.7E+00	-33.5E+00	-44.9E+00	-43.2E+00	-43.2E+00	-45.6E+00	-41.1E+00	-35.6E+00	-33.5E+00	-32.5E+00	-25.7E+00	4.7E+00
Sigma	-	179.7E-03	759.0E-03	753.7E-03	2.8E+00	3.9E+00	4.9E+00	5.5E+00	5.8E+00	6.2E+00	5.9E+00	5.8E+00	3.0E+00

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

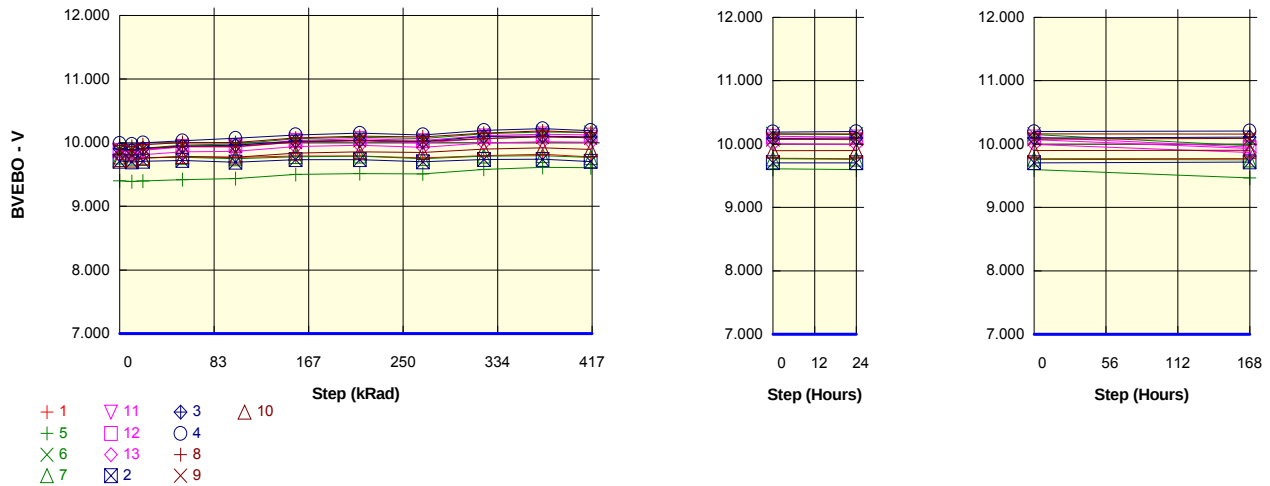
Parameter : Breakdown Voltage Emitter To Base : BVEBO

Test conditions : I EB = 100 µA

Unit : V

Spec Limit Min : 7.000

Spec limits are represented in bold lines on the graphic.



Measurements

BVEBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	9.803	9.768	9.766	9.779	9.767	9.793	9.793	9.762	9.797	9.822	9.778	9.770	9.772
ON PROTON samples													
5	9.403	9.390	9.398	9.420	9.437	9.501	9.515	9.512	9.582	9.612	9.609	9.597	9.465
6	9.906	9.896	9.914	9.965	9.979	10.064	10.089	10.066	10.142	10.172	10.162	10.153	9.974
7	9.775	9.758	9.764	9.773	9.748	9.782	9.789	9.750	9.790	9.798	9.767	9.762	9.752
Statistics													
Min	9.403	9.390	9.398	9.420	9.437	9.501	9.515	9.512	9.582	9.612	9.609	9.597	9.465
Max	9.906	9.896	9.914	9.965	9.979	10.064	10.089	10.066	10.142	10.172	10.162	10.153	9.974
Average	9.695	9.681	9.692	9.719	9.722	9.783	9.798	9.776	9.838	9.861	9.846	9.837	9.730
Sigma	0.213	0.214	0.216	0.226	0.222	0.230	0.234	0.227	0.231	0.233	0.232	0.233	0.208

Drift Calculation

BVEBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON PROTON samples													
5	-	-13.6E-03	-4.8E-03	16.4E-03	34.0E-03	98.0E-03	112.0E-03	108.4E-03	179.2E-03	209.2E-03	206.0E-03	193.6E-03	62.0E-03
6	-	-10.0E-03	8.0E-03	59.2E-03	73.2E-03	158.0E-03	183.2E-03	160.4E-03	236.0E-03	266.4E-03	255.6E-03	246.8E-03	68.4E-03
7	-	-17.6E-03	-11.6E-03	-2.4E-03	-26.8E-03	7.2E-03	14.0E-03	-25.2E-03	14.4E-03	22.8E-03	-8.0E-03	-13.6E-03	-23.6E-03
Average	-	-13.7E-03	-2.8E-03	24.4E-03	26.8E-03	87.7E-03	103.1E-03	81.2E-03	143.2E-03	166.1E-03	151.2E-03	142.3E-03	35.6E-03
Sigma	-	3.1E-03	8.1E-03	25.8E-03	41.1E-03	62.0E-03	69.4E-03	78.2E-03	94.0E-03	104.0E-03	114.4E-03	112.3E-03	41.9E-03

Measurements

BVEBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	9.803	9.768	9.766	9.779	9.767	9.793	9.793	9.762	9.797	9.822	9.778	9.770	9.772
ON TID samples													
11	9.878	9.862	9.879	9.935	9.934	10.010	10.031	10.000	10.068	10.096	10.081	10.071	9.931
12	9.876	9.867	9.887	9.941	9.957	10.037	10.064	10.034	10.109	10.137	10.122	10.112	9.953
13	9.807	9.794	9.811	9.855	9.864	9.938	9.958	9.927	9.996	10.017	10.008	9.998	9.867
Statistics													
Min	9.807	9.794	9.811	9.855	9.864	9.938	9.958	9.927	9.996	10.017	10.008	9.998	9.867
Max	9.878	9.867	9.887	9.941	9.957	10.037	10.064	10.034	10.109	10.137	10.122	10.112	9.953
Average	9.853	9.841	9.859	9.910	9.918	9.995	10.018	9.987	10.058	10.083	10.070	10.060	9.917
Sigma	0.033	0.033	0.034	0.039	0.039	0.042	0.044	0.045	0.047	0.050	0.047	0.047	0.036

Drift Calculation

BVEBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON TID samples													
11	-	-15.6E-03	1.2E-03	57.6E-03	56.0E-03	132.4E-03	153.2E-03	122.8E-03	190.0E-03	218.8E-03	203.6E-03	193.2E-03	53.2E-03
12	-	-8.8E-03	11.6E-03	65.2E-03	81.2E-03	161.6E-03	188.8E-03	158.4E-03	233.6E-03	261.2E-03	246.4E-03	236.8E-03	77.2E-03
13	-	-13.2E-03	4.0E-03	47.6E-03	57.2E-03	131.2E-03	150.8E-03	120.0E-03	188.8E-03	210.0E-03	200.4E-03	190.4E-03	60.0E-03
Average	-	-12.5E-03	5.6E-03	56.8E-03	64.8E-03	141.7E-03	164.3E-03	133.7E-03	204.1E-03	230.0E-03	216.8E-03	206.8E-03	63.5E-03
Sigma	-	2.8E-03	4.4E-03	7.2E-03	11.6E-03	14.1E-03	17.4E-03	17.5E-03	20.8E-03	22.4E-03	21.0E-03	21.2E-03	10.1E-03

Hirex Engineering	Total Dose Radiation Test Report									Ref.:	HRX/TID/1021		
	OLS449					Isolink Inc				Issue:	01		

Measurements

BVEBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	9.803	9.768	9.766	9.779	9.767	9.793	9.793	9.762	9.797	9.822	9.778	9.770	9.772
OFF PROTON samples													
2	9.712	9.698	9.711	9.723	9.694	9.735	9.735	9.701	9.739	9.741	9.707	9.706	9.718
3	9.902	9.889	9.912	9.946	9.962	10.025	10.037	10.022	10.097	10.105	10.092	10.094	10.113
4	9.990	9.974	9.999	10.030	10.071	10.124	10.150	10.125	10.194	10.221	10.192	10.197	10.208
Statistics													
Min	9.712	9.698	9.711	9.723	9.694	9.735	9.735	9.701	9.739	9.741	9.707	9.706	9.718
Max	9.990	9.974	9.999	10.030	10.071	10.124	10.150	10.125	10.194	10.221	10.192	10.197	10.208
Average	9.868	9.854	9.874	9.900	9.909	9.961	9.974	9.949	10.010	10.022	9.997	9.999	10.013
Sigma	0.116	0.115	0.121	0.129	0.159	0.165	0.175	0.180	0.196	0.204	0.209	0.212	0.212

Drift Calculation

BVEBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	-13.6E-03	-1.2E-03	11.2E-03	-18.4E-03	22.8E-03	22.8E-03	-10.8E-03	27.2E-03	29.2E-03	-5.2E-03	-6.0E-03	6.4E-03
3	-	-13.2E-03	9.6E-03	43.6E-03	60.0E-03	122.4E-03	134.8E-03	119.2E-03	194.8E-03	202.4E-03	189.6E-03	192.0E-03	210.4E-03
4	-	-15.2E-03	9.2E-03	40.0E-03	81.2E-03	134.0E-03	160.4E-03	135.2E-03	204.4E-03	231.2E-03	202.8E-03	207.6E-03	218.8E-03
Average	-	-14.0E-03	5.9E-03	31.6E-03	40.9E-03	93.1E-03	106.0E-03	81.2E-03	142.1E-03	154.3E-03	129.1E-03	131.2E-03	145.2E-03
Sigma	-	864.4E-06	5.0E-03	14.5E-03	42.8E-03	49.9E-03	59.8E-03	65.4E-03	81.4E-03	89.2E-03	95.1E-03	97.2E-03	98.2E-03

Measurements

BVEBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	9.803	9.768	9.766	9.779	9.767	9.793	9.793	9.762	9.797	9.822	9.778	9.770	9.772
OFF TID samples													
8	9.956	9.941	9.968	10.004	10.002	10.074	10.102	10.091	10.150	10.185	10.158	10.161	10.158
9	9.888	9.878	9.904	9.952	9.944	10.011	10.039	10.021	10.069	10.094	10.078	10.081	10.090
10	9.735	9.726	9.755	9.784	9.774	9.838	9.858	9.847	9.899	9.918	9.895	9.902	9.905
Statistics													
Min	9.735	9.726	9.755	9.784	9.774	9.838	9.858	9.847	9.899	9.918	9.895	9.902	9.905
Max	9.956	9.941	9.968	10.004	10.002	10.074	10.102	10.091	10.150	10.185	10.158	10.161	10.158
Average	9.860	9.848	9.876	9.913	9.907	9.974	10.000	9.986	10.039	10.066	10.044	10.048	10.051
Sigma	0.092	0.090	0.089	0.094	0.097	0.099	0.103	0.103	0.105	0.111	0.110	0.108	0.107

Drift Calculation

BVEBO	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	-14.8E-03	12.0E-03	48.4E-03	46.4E-03	118.0E-03	146.0E-03	135.6E-03	194.0E-03	229.2E-03	202.4E-03	205.2E-03	202.0E-03
9	-	-10.4E-03	16.0E-03	63.2E-03	56.0E-03	122.8E-03	150.8E-03	132.4E-03	180.8E-03	206.0E-03	189.6E-03	192.4E-03	201.2E-03
10	-	-9.2E-03	20.4E-03	48.8E-03	38.8E-03	103.6E-03	123.2E-03	112.4E-03	164.0E-03	183.6E-03	160.4E-03	167.2E-03	170.0E-03
Average	-	-11.5E-03	16.1E-03	53.5E-03	47.1E-03	114.8E-03	140.0E-03	126.8E-03	179.6E-03	206.3E-03	184.1E-03	188.3E-03	191.1E-03
Sigma	-	2.4E-03	3.4E-03	6.9E-03	7.0E-03	8.2E-03	12.0E-03	10.3E-03	12.3E-03	18.6E-03	17.6E-03	15.8E-03	14.9E-03

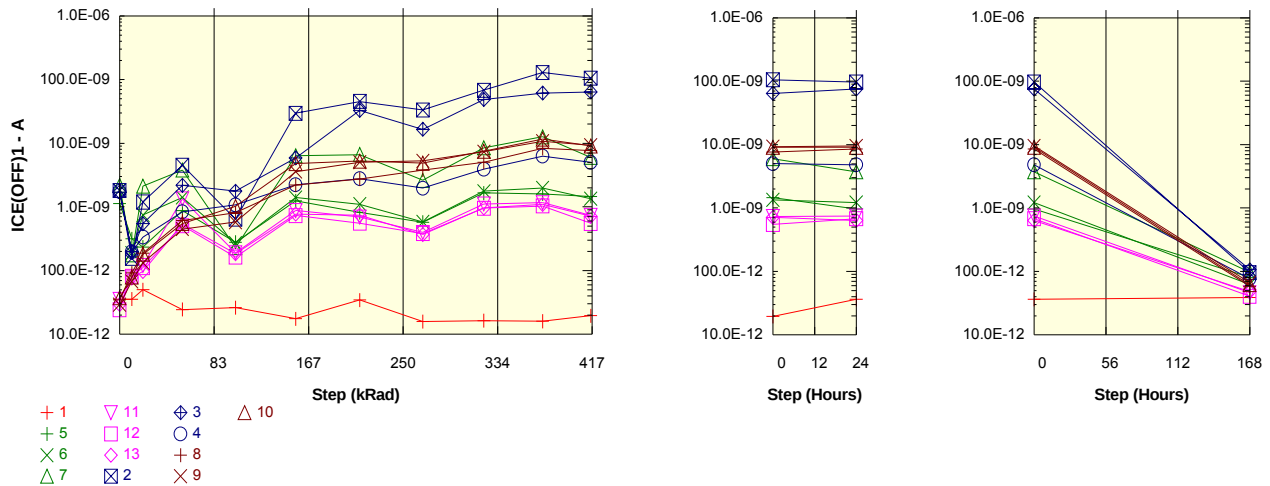
Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

Parameter : Off-State Leakage Current Collector To Emitter : ICE(OFF)1

Test conditions : VCE=5V

Unit : A

No spec limit specified.



Measurements

ICE(OFF)1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	35.6E-12	35.6E-12	50.1E-12	24.5E-12	26.2E-12	17.5E-12	34.4E-12	15.8E-12	16.3E-12	16.0E-12	19.5E-12	36.5E-12	38.7E-12
ON_PROTON samples													
5	1.1E-09	315.6E-12	234.0E-12	872.6E-12	279.1E-12	1.2E-09	819.0E-12	574.9E-12	1.7E-09	1.6E-09	1.5E-09	968.8E-12	81.1E-12
6	1.8E-09	188.1E-12	747.8E-12	1.4E-09	268.7E-12	1.4E-09	1.1E-09	580.7E-12	1.8E-09	2.0E-09	1.3E-09	1.2E-09	62.2E-12
7	2.2E-09	176.7E-12	2.1E-09	3.8E-09	229.4E-12	6.4E-09	6.6E-09	2.6E-09	8.5E-09	12.7E-09	6.0E-09	3.7E-09	97.1E-12
Statistics													
Min	1.1E-09	176.7E-12	234.0E-12	872.6E-12	229.4E-12	1.2E-09	819.0E-12	574.9E-12	1.7E-09	1.6E-09	1.3E-09	968.8E-12	62.2E-12
Max	2.2E-09	315.6E-12	2.1E-09	3.8E-09	279.1E-12	6.4E-09	6.6E-09	2.6E-09	8.5E-09	12.7E-09	6.0E-09	3.7E-09	97.1E-12
Average	1.7E-09	226.8E-12	1.0E-09	2.0E-09	259.1E-12	3.0E-09	2.9E-09	1.3E-09	4.0E-09	5.4E-09	2.9E-09	2.0E-09	80.1E-12
Sigma	438.5E-12	63.0E-12	796.9E-12	1.3E-09	21.4E-12	2.4E-09	2.7E-09	960.8E-12	3.2E-09	5.1E-09	2.2E-09	1.2E-09	14.3E-12

Drift Calculation

ICE(OFF)1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_PROTON samples													
5	-	-814.2E-12	-895.8E-12	-257.2E-12	-850.7E-12	119.4E-12	-310.8E-12	-554.9E-12	529.4E-12	474.4E-12	331.4E-12	-161.0E-12	-1.0E-09
6	-	-1.6E-09	-1.1E-09	-418.4E-12	-1.6E-09	-428.0E-12	-730.2E-12	-1.3E-09	-62.8E-12	144.8E-12	-486.2E-12	-612.8E-12	-1.8E-09
7	-	-2.0E-09	-62.8E-12	1.6E-09	-2.0E-09	4.2E-09	4.4E-09	431.4E-12	6.3E-09	10.5E-09	3.8E-09	1.5E-09	-2.1E-09
Average	-	-1.5E-09	-681.3E-12	310.5E-12	-1.5E-09	1.3E-09	1.1E-09	-458.7E-12	2.3E-09	3.7E-09	1.2E-09	253.9E-12	-1.6E-09
Sigma	-	499.7E-12	444.2E-12	919.1E-12	457.3E-12	2.1E-09	2.3E-09	690.8E-12	2.9E-09	4.8E-09	1.9E-09	924.8E-12	434.8E-12

Measurements

ICE(OFF)1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	35.6E-12	35.6E-12	50.1E-12	24.5E-12	26.2E-12	17.5E-12	34.4E-12	15.8E-12	16.3E-12	16.0E-12	19.5E-12	36.5E-12	38.7E-12
ON_TID samples													
11	35.4E-12	77.1E-12	120.8E-12	1.3E-09	189.7E-12	879.6E-12	693.8E-12	397.2E-12	1.1E-09	1.2E-09	736.4E-12	751.2E-12	46.1E-12
12	24.2E-12	81.5E-12	111.2E-12	508.7E-12	162.4E-12	732.8E-12	554.0E-12	380.6E-12	956.2E-12	1.0E-09	551.6E-12	678.0E-12	40.7E-12
13	29.3E-12	77.5E-12	97.0E-12	540.7E-12	183.7E-12	772.4E-12	742.8E-12	369.4E-12	967.4E-12	1.1E-09	714.4E-12	635.2E-12	47.9E-12
Statistics													
Min	24.2E-12	77.1E-12	97.0E-12	508.7E-12	162.4E-12	732.8E-12	554.0E-12	369.4E-12	956.2E-12	1.0E-09	551.6E-12	635.2E-12	40.7E-12
Max	35.4E-12	81.5E-12	120.8E-12	1.3E-09	189.7E-12	879.6E-12	742.8E-12	397.2E-12	1.1E-09	1.2E-09	736.4E-12	751.2E-12	47.9E-12
Average	29.7E-12	78.7E-12	109.7E-12	794.5E-12	178.6E-12	794.9E-12	663.5E-12	382.4E-12	1.0E-09	1.1E-09	667.5E-12	688.1E-12	44.9E-12
Sigma	4.6E-12	2.0E-12	9.8E-12	381.7E-12	11.7E-12	62.0E-12	80.0E-12	11.4E-12	72.2E-12	56.0E-12	82.4E-12	47.9E-12	3.1E-12

Drift Calculation

ICE(OFF)1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_TID samples													
11	-	41.7E-12	85.4E-12	1.3E-09	154.2E-12	844.2E-12	658.4E-12	361.7E-12	1.1E-09	1.1E-09	701.0E-12	715.8E-12	10.7E-12
12	-	57.3E-12	87.0E-12	484.5E-12	138.2E-12	708.6E-12	529.8E-12	356.4E-12	932.0E-12	1.0E-09	527.4E-12	653.8E-12	16.4E-12
13	-	48.2E-12	67.7E-12	511.3E-12	154.4E-12	743.1E-12	713.5E-12	340.1E-12	938.1E-12	1.1E-09	685.1E-12	605.9E-12	18.6E-12
Average	-	49.0E-12	80.0E-12	764.8E-12	148.9E-12	765.3E-12	633.9E-12	352.7E-12	983.1E-12	1.1E-09	637.8E-12	658.5E-12	15.2E-12
Sigma	-	6.4E-12	8.8E-12	377.6E-12	7.6E-12	57.5E-12	77.0E-12	9.2E-12	68.0E-12	51.4E-12	78.4E-12	45.0E-12	3.3E-12

Measurements

Hirex Engineering	Total Dose Radiation Test Report										Ref.:	HRX/TID/1021	
	OLS449					Isolink Inc					Issue:	01	

ICE(OFF)1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1 REF	35.6E-12	35.6E-12	50.1E-12	24.5E-12	26.2E-12	17.5E-12	34.4E-12	15.8E-12	16.3E-12	16.0E-12	19.5E-12	36.5E-12	38.7E-12
OFF PROTON samples													
2	1.8E-09	156.3E-12	1.2E-09	4.5E-09	640.9E-12	29.7E-09	45.4E-09	33.4E-09	68.2E-09	129.2E-09	105.2E-09	96.9E-09	95.9E-12
3	1.7E-09	195.8E-12	546.1E-12	2.2E-09	1.8E-09	5.9E-09	32.9E-09	16.6E-09	48.9E-09	61.4E-09	64.2E-09	75.3E-09	106.4E-12
4	1.8E-09	197.1E-12	335.5E-12	836.9E-12	1.1E-09	2.2E-09	2.8E-09	2.0E-09	3.9E-09	6.3E-09	5.0E-09	4.8E-09	76.4E-12
Statistics													
Min	1.7E-09	156.3E-12	335.5E-12	836.9E-12	640.9E-12	2.2E-09	2.8E-09	2.0E-09	3.9E-09	6.3E-09	5.0E-09	4.8E-09	76.4E-12
Max	1.8E-09	197.1E-12	1.2E-09	4.5E-09	1.8E-09	29.7E-09	45.4E-09	33.4E-09	68.2E-09	129.2E-09	105.2E-09	96.9E-09	106.4E-12
Average	1.8E-09	183.1E-12	692.0E-12	2.5E-09	1.2E-09	12.6E-09	27.0E-09	17.3E-09	40.4E-09	65.7E-09	58.1E-09	59.0E-09	92.9E-12
Sigma	39.9E-12	18.9E-12	365.5E-12	1.5E-09	462.9E-12	12.2E-09	17.9E-09	12.9E-09	26.9E-09	50.3E-09	41.1E-09	39.3E-09	12.4E-12

Drift Calculation

ICE(OFF)1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	-1.7E-09	-614.0E-12	2.7E-09	-1.2E-09	27.9E-09	43.6E-09	31.6E-09	66.4E-09	127.4E-09	103.4E-09	95.1E-09	-1.7E-09
3	-	-1.5E-09	-1.2E-09	467.0E-12	54.6E-12	4.2E-09	31.2E-09	14.9E-09	47.2E-09	59.7E-09	62.5E-09	73.6E-09	-1.6E-09
4	-	-1.6E-09	-1.4E-09	-916.9E-12	-677.0E-12	473.6E-12	1.0E-09	213.8E-12	2.2E-09	4.5E-09	3.3E-09	3.1E-09	-1.7E-09
Average	-	-1.6E-09	-1.1E-09	754.6E-12	-596.6E-12	10.8E-09	25.3E-09	15.6E-09	38.6E-09	63.9E-09	56.4E-09	57.2E-09	-1.7E-09
Sigma	-	57.4E-12	335.7E-12	1.5E-09	502.2E-12	12.1E-09	17.9E-09	12.8E-09	26.9E-09	50.3E-09	41.1E-09	39.3E-09	45.0E-12

Measurements

ICE(OFF)1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1 REF	35.6E-12	35.6E-12	50.1E-12	24.5E-12	26.2E-12	17.5E-12	34.4E-12	15.8E-12	16.3E-12	16.0E-12	19.5E-12	36.5E-12	38.7E-12
OFF TID samples													
8	34.5E-12	92.0E-12	188.0E-12	610.0E-12	812.8E-12	2.2E-09	2.7E-09	3.8E-09	5.0E-09	8.3E-09	7.7E-09	8.6E-09	58.1E-12
9	29.3E-12	67.9E-12	132.5E-12	450.4E-12	576.8E-12	3.6E-09	5.0E-09	5.3E-09	7.4E-09	10.8E-09	9.3E-09	9.5E-09	66.2E-12
10	37.3E-12	79.0E-12	180.0E-12	550.3E-12	1.0E-09	4.8E-09	5.3E-09	4.9E-09	7.5E-09	11.7E-09	9.1E-09	9.1E-09	61.5E-12
Statistics													
Min	29.3E-12	67.9E-12	132.5E-12	450.4E-12	576.8E-12	2.2E-09	2.7E-09	3.8E-09	5.0E-09	8.3E-09	7.7E-09	8.6E-09	58.1E-12
Max	37.3E-12	92.0E-12	188.0E-12	610.0E-12	1.0E-09	4.8E-09	5.3E-09	5.3E-09	7.5E-09	11.7E-09	9.3E-09	9.5E-09	66.2E-12
Average	33.7E-12	79.6E-12	166.8E-12	536.9E-12	803.1E-12	3.5E-09	4.3E-09	4.7E-09	6.6E-09	10.2E-09	8.7E-09	9.1E-09	61.9E-12
Sigma	3.3E-12	9.8E-12	24.5E-12	65.9E-12	180.9E-12	1.1E-09	1.1E-09	638.9E-12	1.1E-09	1.4E-09	730.9E-12	384.8E-12	3.3E-12

Drift Calculation

ICE(OFF)1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	57.5E-12	153.5E-12	575.6E-12	778.3E-12	2.2E-09	2.7E-09	3.8E-09	5.0E-09	8.3E-09	7.6E-09	8.5E-09	23.7E-12
9	-	38.7E-12	103.2E-12	421.1E-12	547.6E-12	3.6E-09	5.0E-09	5.3E-09	7.4E-09	10.8E-09	9.3E-09	9.5E-09	36.9E-12
10	-	41.7E-12	142.7E-12	513.0E-12	982.3E-12	4.8E-09	5.2E-09	4.9E-09	7.5E-09	11.6E-09	9.1E-09	9.1E-09	24.2E-12
Average	-	45.9E-12	133.1E-12	503.2E-12	769.4E-12	3.5E-09	4.3E-09	4.6E-09	6.6E-09	10.2E-09	8.6E-09	9.0E-09	28.2E-12
Sigma	-	8.3E-12	21.6E-12	63.4E-12	177.6E-12	1.1E-09	1.1E-09	640.3E-12	1.1E-09	1.4E-09	731.8E-12	386.7E-12	6.1E-12

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

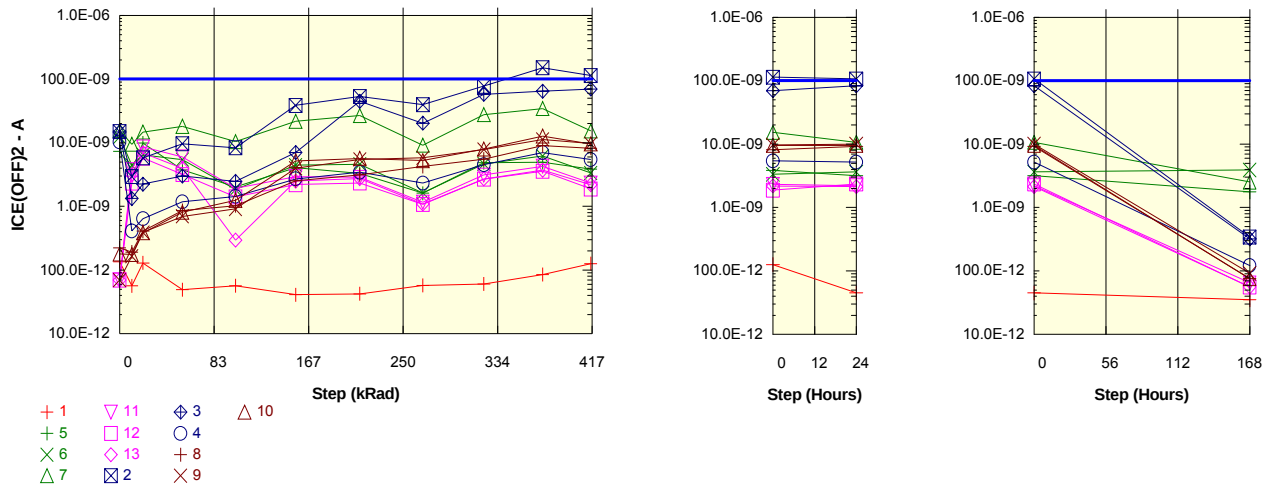
Parameter : Off-State Leakage Current Collector To Emitter : ICE(OFF)2

Test conditions : VCE=20V

Unit : A

Spec Limit Max : 100.0E-09

Spec limits are represented in bold lines on the graphic.



Measurements

ICE(OFF)2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1. REF	135.3E-12	56.4E-12	129.1E-12	49.2E-12	56.8E-12	40.9E-12	42.2E-12	57.2E-12	60.5E-12	84.8E-12	125.8E-12	44.8E-12	35.0E-12
ON PROTON samples													
5	7.3E-09	3.8E-09	9.9E-09	3.8E-09	2.0E-09	4.1E-09	3.3E-09	1.6E-09	4.9E-09	4.9E-09	3.9E-09	3.2E-09	1.8E-09
6	12.2E-09	4.4E-09	6.4E-09	5.4E-09	1.8E-09	4.4E-09	4.6E-09	1.6E-09	4.6E-09	6.2E-09	3.3E-09	3.6E-09	3.9E-09
7	15.6E-09	9.5E-09	14.7E-09	18.1E-09	10.5E-09	21.8E-09	26.8E-09	9.2E-09	27.7E-09	34.4E-09	15.4E-09	10.7E-09	2.5E-09
Statistics													
Min	7.3E-09	3.8E-09	6.4E-09	3.8E-09	1.8E-09	4.1E-09	3.3E-09	1.6E-09	4.6E-09	4.9E-09	3.3E-09	3.2E-09	1.8E-09
Max	15.6E-09	9.5E-09	14.7E-09	18.1E-09	10.5E-09	21.8E-09	26.8E-09	9.2E-09	27.7E-09	34.4E-09	15.4E-09	10.7E-09	3.9E-09
Average	11.7E-09	5.9E-09	10.4E-09	9.1E-09	4.8E-09	10.1E-09	11.6E-09	4.1E-09	12.4E-09	15.2E-09	7.5E-09	5.8E-09	2.7E-09
Sigma	3.4E-09	2.6E-09	3.4E-09	6.4E-09	4.0E-09	8.2E-09	10.8E-09	3.5E-09	10.8E-09	13.6E-09	5.5E-09	3.4E-09	892.6E-12

Drift Calculation

ICE(OFF)2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON PROTON samples													
5	-	-3.6E-09	2.6E-09	-3.6E-09	-5.3E-09	-3.3E-09	-4.0E-09	-5.7E-09	-2.5E-09	-2.4E-09	-3.5E-09	-4.2E-09	-5.6E-09
6	-	-7.8E-09	-5.8E-09	-6.8E-09	-10.4E-09	-7.8E-09	-7.6E-09	-10.6E-09	-7.6E-09	-6.1E-09	-8.9E-09	-8.6E-09	-8.3E-09
7	-	-6.2E-09	-922.0E-12	2.5E-09	-5.2E-09	6.1E-09	11.1E-09	-6.5E-09	12.1E-09	18.8E-09	-274.0E-12	-4.9E-09	-13.1E-09
Average	-	-5.9E-09	-1.4E-09	-2.6E-09	-7.0E-09	-1.6E-09	-185.3E-12	-7.6E-09	657.3E-12	3.4E-09	-4.2E-09	-5.9E-09	-9.0E-09
Sigma	-	1.7E-09	3.4E-09	3.9E-09	2.4E-09	5.8E-09	8.1E-09	2.1E-09	8.3E-09	11.0E-09	3.6E-09	1.9E-09	3.1E-09

Measurements

ICE(OFF)2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1. REF	135.3E-12	56.4E-12	129.1E-12	49.2E-12	56.8E-12	40.9E-12	42.2E-12	57.2E-12	60.5E-12	84.8E-12	125.8E-12	44.8E-12	35.0E-12
ON TID samples													
11	70.3E-12	3.8E-09	8.6E-09	6.0E-09	1.9E-09	2.9E-09	2.9E-09	1.2E-09	3.1E-09	4.3E-09	2.3E-09	2.2E-09	64.7E-12
12	69.3E-12	2.3E-09	5.8E-09	3.2E-09	1.4E-09	2.2E-09	2.3E-09	1.1E-09	2.7E-09	3.6E-09	1.9E-09	2.4E-09	55.7E-12
13	69.8E-12	3.2E-09	7.0E-09	4.0E-09	295.3E-12	2.5E-09	2.7E-09	1.1E-09	2.7E-09	3.7E-09	2.2E-09	2.1E-09	56.0E-12
Statistics													
Min	69.3E-12	2.3E-09	5.8E-09	3.2E-09	295.3E-12	2.2E-09	2.3E-09	1.1E-09	2.7E-09	3.6E-09	1.9E-09	2.1E-09	55.7E-12
Max	70.3E-12	3.8E-09	8.6E-09	6.0E-09	1.9E-09	2.9E-09	2.9E-09	1.2E-09	3.1E-09	4.3E-09	2.3E-09	2.4E-09	64.7E-12
Average	69.8E-12	3.1E-09	7.1E-09	4.4E-09	1.2E-09	2.5E-09	2.6E-09	1.1E-09	2.8E-09	3.9E-09	2.1E-09	2.2E-09	58.8E-12
Sigma	408.2E-15	590.4E-12	1.2E-09	1.2E-09	681.3E-12	299.8E-12	230.5E-12	38.2E-12	200.1E-12	304.3E-12	186.2E-12	88.3E-12	4.2E-12

Drift Calculation

ICE(OFF)2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON TID samples													
11	-	3.7E-09	8.5E-09	5.9E-09	1.9E-09	2.9E-09	2.8E-09	1.1E-09	3.0E-09	4.2E-09	2.3E-09	2.1E-09	-5.6E-12
12	-	2.3E-09	5.7E-09	3.1E-09	1.3E-09	2.1E-09	2.3E-09	1.0E-09	2.6E-09	3.5E-09	1.8E-09	2.3E-09	-13.6E-12
13	-	3.1E-09	6.9E-09	3.9E-09	225.5E-12	2.4E-09	2.7E-09	1.0E-09	2.6E-09	3.6E-09	2.1E-09	2.1E-09	-13.8E-12
Average	-	3.0E-09	7.0E-09	4.3E-09	1.1E-09	2.5E-09	2.6E-09	1.0E-09	2.8E-09	3.8E-09	2.1E-09	2.2E-09	-11.0E-12
Sigma	-	590.0E-12	1.2E-09	1.2E-09	681.2E-12	299.4E-12	230.1E-12	37.8E-12	199.7E-12	303.9E-12	185.8E-12	88.6E-12	3.8E-12

Hirex Engineering	Total Dose Radiation Test Report									Ref.:	HRX/TID/1021		
	OLS449					Isolink Inc				Issue:	01		

Measurements

ICE(OFF)2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	135.3E-12	56.4E-12	129.1E-12	49.2E-12	56.8E-12	40.9E-12	42.2E-12	57.2E-12	60.5E-12	84.8E-12	125.8E-12	44.8E-12	35.0E-12
OFF PROTON samples													
2	15.0E-09	2.9E-09	5.8E-09	9.6E-09	8.3E-09	38.7E-09	53.2E-09	39.8E-09	77.6E-09	150.9E-09	114.1E-09	106.7E-09	341.6E-12
3	14.8E-09	1.3E-09	2.2E-09	3.0E-09	2.5E-09	7.0E-09	44.7E-09	20.2E-09	57.6E-09	64.6E-09	69.9E-09	83.3E-09	320.1E-12
4	10.3E-09	411.6E-12	642.5E-12	1.2E-09	1.4E-09	2.7E-09	3.5E-09	2.3E-09	4.5E-09	7.0E-09	5.4E-09	5.2E-09	121.1E-12
Statistics													
Min	10.3E-09	411.6E-12	642.5E-12	1.2E-09	1.4E-09	2.7E-09	3.5E-09	2.3E-09	4.5E-09	7.0E-09	5.4E-09	5.2E-09	121.1E-12
Max	15.0E-09	2.9E-09	5.8E-09	9.6E-09	8.3E-09	38.7E-09	53.2E-09	39.8E-09	77.6E-09	150.9E-09	114.1E-09	106.7E-09	341.6E-12
Average	13.4E-09	1.6E-09	2.9E-09	4.6E-09	4.1E-09	16.1E-09	33.8E-09	20.8E-09	46.6E-09	74.2E-09	63.1E-09	65.1E-09	260.9E-12
Sigma	2.2E-09	1.0E-09	2.1E-09	3.6E-09	3.0E-09	16.0E-09	21.7E-09	15.3E-09	30.8E-09	59.1E-09	44.6E-09	43.4E-09	99.3E-12

Drift Calculation

ICE(OFF)2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	-12.1E-09	-9.3E-09	-5.4E-09	-6.7E-09	23.7E-09	38.1E-09	24.7E-09	62.5E-09	135.9E-09	99.1E-09	91.7E-09	-14.7E-09
3	-	-13.4E-09	-12.5E-09	-11.8E-09	-12.3E-09	-7.7E-09	29.9E-09	5.5E-09	42.8E-09	49.8E-09	55.1E-09	68.5E-09	-14.4E-09
4	-	-9.9E-09	-9.7E-09	-9.2E-09	-8.9E-09	-7.6E-09	-6.9E-09	-8.0E-09	-5.8E-09	-3.3E-09	-4.9E-09	-5.1E-09	-10.2E-09
Average	-	-11.8E-09	-10.5E-09	-8.8E-09	-9.3E-09	2.8E-09	20.4E-09	7.4E-09	33.2E-09	60.8E-09	49.8E-09	51.7E-09	-13.1E-09
Sigma	-	1.4E-09	1.4E-09	2.6E-09	2.3E-09	14.8E-09	19.6E-09	13.4E-09	28.7E-09	57.4E-09	42.6E-09	41.3E-09	2.1E-09

Measurements

ICE(OFF)2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	135.3E-12	56.4E-12	129.1E-12	49.2E-12	56.8E-12	40.9E-12	42.2E-12	57.2E-12	60.5E-12	84.8E-12	125.8E-12	44.8E-12	35.0E-12
OFF TID samples													
8	223.0E-12	192.0E-12	408.2E-12	862.2E-12	1.0E-09	2.5E-09	3.1E-09	4.3E-09	5.5E-09	9.0E-09	8.2E-09	9.2E-09	75.8E-12
9	69.8E-12	165.3E-12	390.3E-12	696.6E-12	913.2E-12	4.0E-09	5.5E-09	5.8E-09	7.8E-09	11.3E-09	9.7E-09	10.0E-09	91.6E-12
10	178.9E-12	175.4E-12	385.2E-12	811.8E-12	1.2E-09	5.2E-09	5.7E-09	5.2E-09	8.0E-09	12.7E-09	9.6E-09	9.6E-09	75.2E-12
Statistics													
Min	69.8E-12	165.3E-12	385.2E-12	696.6E-12	913.2E-12	2.5E-09	3.1E-09	4.3E-09	5.5E-09	9.0E-09	8.2E-09	9.2E-09	75.2E-12
Max	223.0E-12	192.0E-12	408.2E-12	862.2E-12	1.2E-09	5.2E-09	5.7E-09	5.8E-09	8.0E-09	12.7E-09	9.7E-09	10.0E-09	91.6E-12
Average	157.2E-12	177.6E-12	394.6E-12	790.2E-12	1.1E-09	3.9E-09	4.8E-09	5.1E-09	7.1E-09	11.0E-09	9.2E-09	9.6E-09	80.9E-12
Sigma	64.4E-12	11.0E-12	9.9E-12	69.3E-12	139.0E-12	1.1E-09	1.2E-09	636.7E-12	1.1E-09	1.5E-09	679.2E-12	317.0E-12	7.6E-12

Drift Calculation

ICE(OFF)2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	-31.0E-12	185.2E-12	639.2E-12	802.6E-12	2.3E-09	2.9E-09	4.0E-09	5.3E-09	8.8E-09	8.0E-09	9.0E-09	-147.2E-12
9	-	95.4E-12	320.5E-12	626.8E-12	843.4E-12	3.9E-09	5.4E-09	5.7E-09	7.8E-09	11.2E-09	9.6E-09	9.9E-09	21.8E-12
10	-	-3.5E-12	206.3E-12	632.9E-12	1.1E-09	5.0E-09	5.5E-09	5.1E-09	7.8E-09	12.5E-09	9.4E-09	9.4E-09	-103.6E-12
Average	-	20.3E-12	237.3E-12	633.0E-12	905.0E-12	3.7E-09	4.6E-09	4.9E-09	6.9E-09	10.8E-09	9.0E-09	9.4E-09	-76.3E-12
Sigma	-	54.3E-12	59.4E-12	5.1E-12	117.1E-12	1.1E-09	1.2E-09	696.4E-12	1.2E-09	1.5E-09	729.5E-12	380.9E-12	71.6E-12

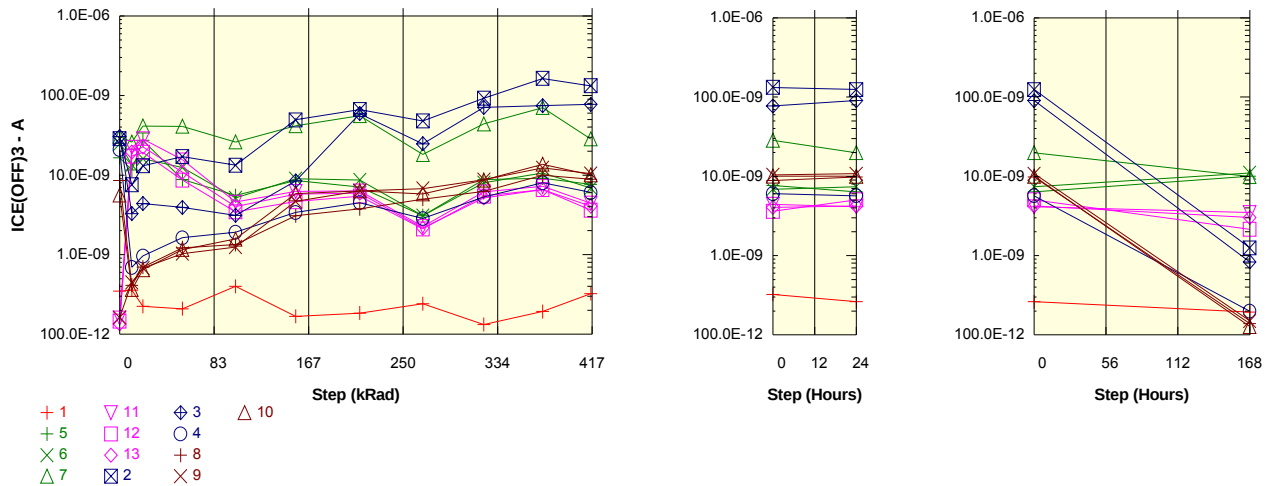
Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

Parameter : Off-State Leakage Current Collector To Emitter : ICE(OFF)3

Test conditions : VCE=40V

Unit : A

No spec limit specified.



Measurements

ICE(OFF)3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	347.6E-12	358.8E-12	223.9E-12	208.7E-12	399.3E-12	167.7E-12	184.2E-12	242.0E-12	132.5E-12	193.1E-12	324.2E-12	261.6E-12	193.7E-12
ON_PROTON samples													
5	16.6E-09	11.6E-09	27.4E-09	8.8E-09	5.5E-09	8.5E-09	7.1E-09	3.1E-09	8.8E-09	9.2E-09	7.7E-09	6.4E-09	10.1E-09
6	24.6E-09	13.4E-09	16.0E-09	12.5E-09	5.2E-09	9.0E-09	8.7E-09	3.1E-09	8.0E-09	10.6E-09	6.9E-09	7.4E-09	11.1E-09
7	30.6E-09	26.0E-09	41.4E-09	41.1E-09	26.1E-09	41.6E-09	55.9E-09	18.1E-09	44.0E-09	70.7E-09	28.5E-09	19.9E-09	10.0E-09
Statistics													
Min	16.6E-09	11.6E-09	16.0E-09	8.8E-09	5.2E-09	8.5E-09	7.1E-09	3.1E-09	8.0E-09	9.2E-09	6.9E-09	6.4E-09	10.0E-09
Max	30.6E-09	26.0E-09	41.4E-09	41.1E-09	26.1E-09	41.6E-09	55.9E-09	18.1E-09	44.0E-09	70.7E-09	28.5E-09	19.9E-09	11.1E-09
Average	23.9E-09	17.0E-09	28.3E-09	20.8E-09	12.3E-09	19.7E-09	23.9E-09	8.1E-09	20.3E-09	30.2E-09	14.4E-09	11.2E-09	10.4E-09
Sigma	5.8E-09	6.4E-09	10.4E-09	14.5E-09	9.8E-09	15.5E-09	22.7E-09	7.1E-09	16.8E-09	28.7E-09	10.0E-09	6.1E-09	499.1E-12

Drift Calculation

ICE(OFF)3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_PROTON samples													
5	-	-4.9E-09	10.9E-09	-7.8E-09	-11.0E-09	-8.0E-09	-9.5E-09	-13.5E-09	-7.8E-09	-7.4E-09	-8.9E-09	-10.2E-09	-6.5E-09
6	-	-11.2E-09	-8.6E-09	-12.1E-09	-19.4E-09	-15.6E-09	-15.9E-09	-21.5E-09	-16.6E-09	-14.0E-09	-17.7E-09	-17.2E-09	-13.5E-09
7	-	-4.6E-09	10.8E-09	10.5E-09	-4.5E-09	11.0E-09	25.3E-09	-12.5E-09	13.4E-09	40.1E-09	-2.1E-09	-10.7E-09	-20.6E-09
Average	-	-6.9E-09	4.4E-09	-3.1E-09	-11.7E-09	-4.2E-09	-20.7E-12	-15.8E-09	-3.6E-09	6.3E-09	-9.6E-09	-12.7E-09	-13.5E-09
Sigma	-	3.0E-09	9.2E-09	9.8E-09	6.1E-09	11.2E-09	18.1E-09	4.0E-09	12.6E-09	24.1E-09	6.4E-09	3.2E-09	5.8E-09

Measurements

ICE(OFF)3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	347.6E-12	358.8E-12	223.9E-12	208.7E-12	399.3E-12	167.7E-12	184.2E-12	242.0E-12	132.5E-12	193.1E-12	324.2E-12	261.6E-12	193.7E-12
ON_TID samples													
11	160.0E-12	22.4E-09	28.5E-09	15.6E-09	4.6E-09	6.2E-09	6.3E-09	2.3E-09	6.1E-09	7.2E-09	4.4E-09	4.1E-09	3.5E-09
12	145.8E-12	17.4E-09	19.3E-09	8.7E-09	3.5E-09	4.6E-09	5.4E-09	2.1E-09	5.5E-09	6.6E-09	3.6E-09	5.1E-09	2.1E-09
13	135.2E-12	19.6E-09	22.6E-09	10.9E-09	4.0E-09	5.8E-09	5.9E-09	2.2E-09	5.2E-09	6.6E-09	4.1E-09	4.2E-09	3.0E-09
Statistics													
Min	135.2E-12	17.4E-09	19.3E-09	8.7E-09	3.5E-09	4.6E-09	5.4E-09	2.1E-09	5.2E-09	6.6E-09	3.6E-09	4.1E-09	2.1E-09
Max	160.0E-12	22.4E-09	28.5E-09	15.6E-09	4.6E-09	6.2E-09	6.3E-09	2.3E-09	6.1E-09	7.2E-09	4.4E-09	5.1E-09	3.5E-09
Average	147.0E-12	19.8E-09	23.5E-09	11.7E-09	4.0E-09	5.6E-09	5.9E-09	2.2E-09	5.6E-09	6.8E-09	4.0E-09	4.5E-09	2.9E-09
Sigma	10.1E-12	2.1E-09	3.8E-09	2.9E-09	454.9E-12	662.6E-12	357.1E-12	62.2E-12	407.2E-12	302.2E-12	331.1E-12	415.4E-12	555.8E-12

Drift Calculation

ICE(OFF)3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_TID samples													
11	-	22.2E-09	28.4E-09	15.4E-09	4.4E-09	6.1E-09	6.2E-09	2.1E-09	6.0E-09	7.1E-09	4.3E-09	4.0E-09	3.3E-09
12	-	17.2E-09	19.2E-09	8.5E-09	3.3E-09	4.5E-09	5.3E-09	2.0E-09	5.3E-09	6.4E-09	3.5E-09	4.9E-09	2.0E-09
13	-	19.4E-09	22.4E-09	10.7E-09	3.9E-09	5.6E-09	5.8E-09	2.0E-09	5.0E-09	6.4E-09	3.9E-09	4.1E-09	2.9E-09
Average	-	19.6E-09	23.3E-09	11.6E-09	3.9E-09	5.4E-09	5.8E-09	2.0E-09	5.4E-09	6.6E-09	3.9E-09	4.3E-09	2.7E-09
Sigma	-	2.0E-09	3.8E-09	2.9E-09	449.4E-12	659.1E-12	352.1E-12	55.1E-12	397.2E-12	293.0E-12	325.8E-12	417.3E-12	551.6E-12

Measurements

Hirex Engineering	Total Dose Radiation Test Report										Ref.:	HRX/TID/1021	
	OLS449					Isolink Inc					Issue:	01	

ICE(OFF)3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1 REF	347.6E-12	358.8E-12	223.9E-12	208.7E-12	399.3E-12	167.7E-12	184.2E-12	242.0E-12	132.5E-12	193.1E-12	324.2E-12	261.6E-12	193.7E-12
OFF PROTON samples													
2	28.9E-09	7.6E-09	13.1E-09	17.1E-09	13.3E-09	49.5E-09	66.7E-09	47.9E-09	92.7E-09	164.3E-09	132.8E-09	124.8E-09	1.3E-09
3	30.6E-09	3.3E-09	4.4E-09	3.9E-09	3.1E-09	8.4E-09	59.2E-09	24.8E-09	70.9E-09	74.7E-09	77.4E-09	90.4E-09	834.2E-12
4	20.9E-09	692.2E-12	962.6E-12	1.6E-09	1.9E-09	3.4E-09	4.5E-09	2.8E-09	5.3E-09	8.0E-09	6.0E-09	5.7E-09	198.6E-12
Statistics													
Min	20.9E-09	692.2E-12	962.6E-12	1.6E-09	1.9E-09	3.4E-09	4.5E-09	2.8E-09	5.3E-09	8.0E-09	6.0E-09	5.7E-09	198.6E-12
Max	30.6E-09	7.6E-09	13.1E-09	17.1E-09	13.3E-09	49.5E-09	66.7E-09	47.9E-09	92.7E-09	164.3E-09	132.8E-09	124.8E-09	1.3E-09
Average	26.8E-09	3.8E-09	6.2E-09	7.5E-09	6.1E-09	20.4E-09	43.4E-09	25.2E-09	56.3E-09	82.3E-09	72.1E-09	73.6E-09	761.4E-12
Sigma	4.2E-09	2.8E-09	5.1E-09	6.8E-09	5.1E-09	20.6E-09	27.7E-09	18.4E-09	37.1E-09	64.0E-09	51.9E-09	50.0E-09	432.9E-12

Drift Calculation

ICE(OFF)3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	-21.3E-09	-15.7E-09	-11.8E-09	-15.5E-09	20.6E-09	37.8E-09	19.0E-09	63.8E-09	135.4E-09	104.0E-09	95.9E-09	-27.6E-09
3	-	-27.4E-09	-26.2E-09	-26.7E-09	-27.5E-09	-22.2E-09	28.5E-09	-5.8E-09	40.3E-09	44.1E-09	46.7E-09	59.7E-09	-29.8E-09
4	-	-20.2E-09	-20.0E-09	-19.3E-09	-19.0E-09	-17.5E-09	-16.4E-09	-18.1E-09	-15.6E-09	-12.9E-09	-14.9E-09	-15.2E-09	-20.7E-09
Average	-	-23.0E-09	-20.7E-09	-19.3E-09	-20.7E-09	-6.4E-09	16.6E-09	-1.6E-09	29.5E-09	55.5E-09	45.3E-09	46.8E-09	-26.0E-09
Sigma	-	3.1E-09	4.3E-09	6.1E-09	5.0E-09	19.2E-09	23.7E-09	15.4E-09	33.3E-09	61.1E-09	48.5E-09	46.3E-09	3.9E-09

Measurements

ICE(OFF)3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1 REF	347.6E-12	358.8E-12	223.9E-12	208.7E-12	399.3E-12	167.7E-12	184.2E-12	242.0E-12	132.5E-12	193.1E-12	324.2E-12	261.6E-12	193.7E-12
OFF TID samples													
8	8.5E-09	413.3E-12	697.2E-12	1.2E-09	1.3E-09	3.1E-09	3.8E-09	5.0E-09	6.2E-09	9.9E-09	8.9E-09	9.8E-09	138.0E-12
9	162.1E-12	447.8E-12	676.4E-12	1.0E-09	1.2E-09	4.7E-09	6.3E-09	6.8E-09	8.8E-09	12.3E-09	10.5E-09	10.8E-09	149.9E-12
10	5.6E-09	363.9E-12	646.9E-12	1.2E-09	1.6E-09	5.8E-09	6.4E-09	5.8E-09	8.7E-09	13.7E-09	10.1E-09	10.0E-09	127.5E-12
Statistics													
Min	162.1E-12	363.9E-12	646.9E-12	1.0E-09	1.2E-09	3.1E-09	3.8E-09	5.0E-09	6.2E-09	9.9E-09	8.9E-09	9.8E-09	127.5E-12
Max	8.5E-09	447.8E-12	697.2E-12	1.2E-09	1.6E-09	5.8E-09	6.4E-09	6.8E-09	8.8E-09	13.7E-09	10.5E-09	10.8E-09	149.9E-12
Average	4.8E-09	408.3E-12	673.5E-12	1.1E-09	1.4E-09	4.5E-09	5.5E-09	5.9E-09	7.9E-09	12.0E-09	9.8E-09	10.2E-09	138.5E-12
Sigma	3.5E-09	34.4E-12	20.6E-12	79.1E-12	137.0E-12	1.1E-09	1.2E-09	735.9E-12	1.2E-09	1.5E-09	676.5E-12	407.8E-12	9.1E-12

Drift Calculation

ICE(OFF)3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	-8.1E-09	-7.9E-09	-7.3E-09	-7.2E-09	-5.5E-09	-4.8E-09	-3.6E-09	-2.3E-09	1.4E-09	315.8E-12	1.3E-09	-8.4E-09
9	-	285.7E-12	514.4E-12	868.7E-12	1.1E-09	4.5E-09	6.2E-09	6.6E-09	8.6E-09	12.2E-09	10.3E-09	10.6E-09	-12.2E-12
10	-	-5.2E-09	-5.0E-09	-4.5E-09	-4.0E-09	212.2E-12	738.2E-12	195.2E-12	3.1E-09	8.1E-09	4.5E-09	4.4E-09	-5.5E-09
Average	-	-4.4E-09	-4.1E-09	-3.6E-09	-3.4E-09	-245.6E-12	710.2E-12	1.1E-09	3.1E-09	7.2E-09	5.0E-09	5.4E-09	-4.6E-09
Sigma	-	3.5E-09	3.5E-09	3.4E-09	3.4E-09	4.1E-09	4.5E-09	4.2E-09	4.5E-09	4.4E-09	4.1E-09	3.9E-09	3.5E-09

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

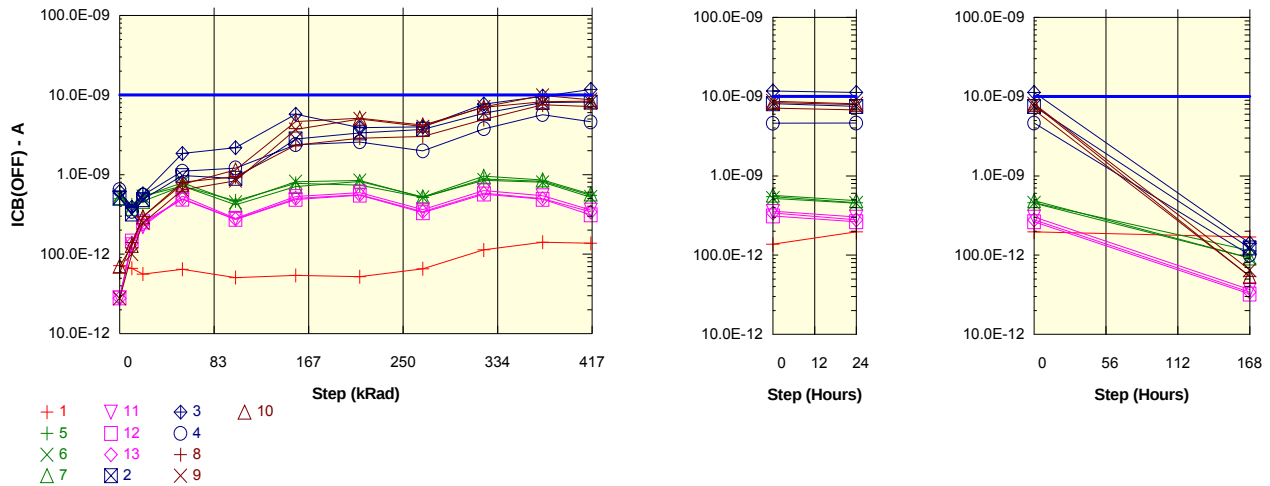
Parameter : Off-State Leakage Current Collector To Base : ICB(OFF)

Test conditions : VCB=20V

Unit : A

Spec Limit Max : 10.0E-09

Spec limits are represented in bold lines on the graphic.



Measurements

ICB(OFF)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	71.9E-12	66.5E-12	56.2E-12	64.6E-12	50.7E-12	53.9E-12	52.0E-12	65.6E-12	113.1E-12	141.6E-12	136.6E-12	196.0E-12	169.0E-12
ON PROTON samples													
5	496.4E-12	414.8E-12	535.1E-12	717.5E-12	467.7E-12	774.9E-12	737.2E-12	514.1E-12	881.8E-12	826.9E-12	547.9E-12	459.8E-12	114.4E-12
6	553.2E-12	406.1E-12	529.1E-12	787.6E-12	447.6E-12	813.9E-12	841.5E-12	519.1E-12	852.0E-12	800.6E-12	520.3E-12	453.1E-12	91.9E-12
7	501.4E-12	375.9E-12	461.6E-12	715.7E-12	418.0E-12	708.6E-12	818.5E-12	525.0E-12	953.8E-12	857.5E-12	569.1E-12	485.6E-12	92.1E-12
Statistics													
Min	496.4E-12	375.9E-12	461.6E-12	715.7E-12	418.0E-12	708.6E-12	737.2E-12	514.1E-12	852.0E-12	800.6E-12	520.3E-12	453.1E-12	91.9E-12
Max	553.2E-12	414.8E-12	535.1E-12	787.6E-12	467.7E-12	813.9E-12	841.5E-12	525.0E-12	953.8E-12	857.5E-12	569.1E-12	485.6E-12	114.4E-12
Average	517.0E-12	398.9E-12	508.6E-12	740.3E-12	444.4E-12	765.8E-12	799.1E-12	519.4E-12	895.9E-12	828.4E-12	545.8E-12	466.2E-12	99.5E-12
Sigma	25.7E-12	16.6E-12	33.3E-12	33.5E-12	20.4E-12	43.5E-12	44.8E-12	4.5E-12	42.7E-12	23.3E-12	20.0E-12	14.0E-12	10.5E-12

Drift Calculation

ICB(OFF)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON PROTON samples													
5	-	-81.6E-12	38.7E-12	221.1E-12	-28.6E-12	278.6E-12	240.8E-12	17.7E-12	385.4E-12	330.6E-12	51.5E-12	-36.6E-12	-382.0E-12
6	-	-147.1E-12	-24.1E-12	234.4E-12	-105.6E-12	260.7E-12	288.3E-12	-34.1E-12	298.8E-12	247.4E-12	-32.9E-12	-100.1E-12	-461.3E-12
7	-	-125.4E-12	-39.7E-12	214.3E-12	-83.4E-12	207.2E-12	317.1E-12	23.6E-12	452.4E-12	356.2E-12	67.8E-12	-15.8E-12	-409.2E-12
Average	-	-118.1E-12	-8.4E-12	223.3E-12	-72.6E-12	248.8E-12	282.1E-12	2.4E-12	378.9E-12	311.4E-12	28.8E-12	-50.8E-12	-417.5E-12
Sigma	-	27.3E-12	33.9E-12	8.4E-12	32.4E-12	30.3E-12	31.5E-12	25.9E-12	62.9E-12	46.4E-12	44.1E-12	35.9E-12	32.9E-12

Measurements

ICB(OFF)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	71.9E-12	66.5E-12	56.2E-12	64.6E-12	50.7E-12	53.9E-12	52.0E-12	65.6E-12	113.1E-12	141.6E-12	136.6E-12	196.0E-12	169.0E-12
ON TID samples													
11	28.1E-12	132.0E-12	222.8E-12	536.5E-12	281.0E-12	530.4E-12	593.9E-12	362.4E-12	626.7E-12	542.3E-12	356.8E-12	301.7E-12	36.6E-12
12	28.2E-12	145.5E-12	254.0E-12	491.8E-12	273.2E-12	486.8E-12	551.8E-12	331.9E-12	568.7E-12	489.4E-12	311.5E-12	263.4E-12	32.3E-12
13	28.0E-12	136.7E-12	239.0E-12	496.6E-12	275.8E-12	501.1E-12	560.2E-12	343.0E-12	583.6E-12	495.6E-12	339.8E-12	278.3E-12	34.1E-12
Statistics													
Min	28.0E-12	132.0E-12	222.8E-12	491.8E-12	273.2E-12	486.8E-12	551.8E-12	331.9E-12	568.7E-12	489.4E-12	311.5E-12	263.4E-12	32.3E-12
Max	28.2E-12	145.5E-12	254.0E-12	536.5E-12	281.0E-12	530.4E-12	593.9E-12	362.4E-12	626.7E-12	542.3E-12	356.8E-12	301.7E-12	36.6E-12
Average	28.1E-12	138.1E-12	238.6E-12	508.3E-12	276.7E-12	506.1E-12	568.6E-12	345.8E-12	593.0E-12	509.1E-12	336.0E-12	281.1E-12	34.3E-12
Sigma	89.9E-15	5.6E-12	12.7E-12	20.0E-12	3.2E-12	18.1E-12	18.2E-12	12.6E-12	24.6E-12	23.6E-12	18.7E-12	15.8E-12	1.8E-12

Drift Calculation

ICB(OFF)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON TID samples													
11	-	103.9E-12	194.7E-12	508.4E-12	252.9E-12	502.3E-12	565.8E-12	334.3E-12	598.6E-12	514.2E-12	328.7E-12	273.6E-12	8.5E-12
12	-	117.3E-12	225.8E-12	463.5E-12	245.0E-12	458.6E-12	523.6E-12	303.7E-12	540.4E-12	461.2E-12	283.3E-12	235.2E-12	4.1E-12
13	-	108.7E-12	211.0E-12	468.6E-12	247.8E-12	473.1E-12	532.2E-12	315.0E-12	555.6E-12	467.6E-12	311.8E-12	250.3E-12	6.1E-12
Average	-	110.0E-12	210.5E-12	480.2E-12	248.6E-12	478.0E-12	540.5E-12	317.7E-12	564.9E-12	481.0E-12	307.9E-12	253.0E-12	6.2E-12
Sigma	-	5.5E-12	12.7E-12	20.0E-12	3.3E-12	18.2E-12	18.2E-12	12.7E-12	24.6E-12	23.6E-12	18.7E-12	15.8E-12	1.8E-12

Hirex Engineering	Total Dose Radiation Test Report									Ref.:	HRX/TID/1021		
	OLS449					Isolink Inc				Issue:	01		

Measurements

ICB(OFF)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	71.9E-12	66.5E-12	56.2E-12	64.6E-12	50.7E-12	53.9E-12	52.0E-12	65.6E-12	113.1E-12	141.6E-12	136.6E-12	196.0E-12	169.0E-12
OFF PROTON samples													
2	510.8E-12	320.1E-12	485.5E-12	972.9E-12	896.4E-12	2.8E-09	3.3E-09	3.7E-09	5.9E-09	8.1E-09	8.1E-09	7.5E-09	122.8E-12
3	612.4E-12	390.2E-12	572.0E-12	1.8E-09	2.2E-09	5.7E-09	3.9E-09	4.0E-09	7.7E-09	9.7E-09	11.8E-09	11.3E-09	141.1E-12
4	643.1E-12	343.5E-12	551.6E-12	1.1E-09	1.2E-09	2.4E-09	2.6E-09	2.0E-09	3.8E-09	5.7E-09	4.6E-09	4.6E-09	99.9E-12
Statistics													
Min	510.8E-12	320.1E-12	485.5E-12	972.9E-12	896.4E-12	2.4E-09	2.6E-09	2.0E-09	3.8E-09	5.7E-09	4.6E-09	4.6E-09	99.9E-12
Max	643.1E-12	390.2E-12	572.0E-12	1.8E-09	2.2E-09	5.7E-09	3.9E-09	4.0E-09	7.7E-09	9.7E-09	11.8E-09	11.3E-09	141.1E-12
Average	588.8E-12	351.3E-12	536.3E-12	1.3E-09	1.4E-09	3.6E-09	3.3E-09	3.2E-09	5.8E-09	7.8E-09	8.2E-09	7.8E-09	121.3E-12
Sigma	56.5E-12	29.1E-12	36.9E-12	383.7E-12	547.9E-12	1.5E-09	540.3E-12	881.7E-12	1.6E-09	1.6E-09	2.9E-09	2.7E-09	16.8E-12

Drift Calculation

ICB(OFF)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	-190.7E-12	-25.4E-12	462.1E-12	385.5E-12	2.3E-09	2.8E-09	3.2E-09	5.4E-09	7.5E-09	7.6E-09	7.0E-09	-388.0E-12
3	-	-222.3E-12	-40.5E-12	1.2E-09	1.6E-09	5.1E-09	3.3E-09	3.4E-09	7.1E-09	9.1E-09	11.2E-09	10.7E-09	-471.3E-12
4	-	-299.6E-12	-91.5E-12	458.9E-12	563.9E-12	1.7E-09	1.9E-09	1.3E-09	3.1E-09	5.0E-09	4.0E-09	4.0E-09	-543.2E-12
Average	-	-237.5E-12	-52.5E-12	717.4E-12	839.8E-12	3.0E-09	2.7E-09	2.6E-09	5.2E-09	7.2E-09	7.6E-09	7.2E-09	-467.5E-12
Sigma	-	45.8E-12	28.3E-12	363.3E-12	521.4E-12	1.5E-09	560.6E-12	916.0E-12	1.6E-09	1.7E-09	2.9E-09	2.7E-09	63.4E-12

Measurements

ICB(OFF)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	71.9E-12	66.5E-12	56.2E-12	64.6E-12	50.7E-12	53.9E-12	52.0E-12	65.6E-12	113.1E-12	141.6E-12	136.6E-12	196.0E-12	169.0E-12
OFF TID samples													
8	58.5E-12	139.9E-12	294.7E-12	803.3E-12	939.8E-12	2.4E-09	2.9E-09	3.0E-09	4.9E-09	7.5E-09	7.2E-09	6.8E-09	54.0E-12
9	27.8E-12	100.3E-12	247.0E-12	642.9E-12	838.0E-12	3.7E-09	5.0E-09	4.0E-09	7.1E-09	9.9E-09	8.8E-09	8.1E-09	64.9E-12
10	70.5E-12	128.3E-12	295.3E-12	756.0E-12	1.1E-09	4.6E-09	5.1E-09	4.2E-09	7.0E-09	8.2E-09	8.4E-09	7.9E-09	53.6E-12
Statistics													
Min	27.8E-12	100.3E-12	247.0E-12	642.9E-12	838.0E-12	2.4E-09	2.9E-09	3.0E-09	4.9E-09	7.5E-09	7.2E-09	6.8E-09	53.6E-12
Max	70.5E-12	139.9E-12	295.3E-12	803.3E-12	1.1E-09	4.6E-09	5.1E-09	4.2E-09	7.1E-09	9.9E-09	8.8E-09	8.1E-09	64.9E-12
Average	52.3E-12	122.8E-12	279.0E-12	734.1E-12	973.5E-12	3.6E-09	4.3E-09	3.7E-09	6.3E-09	8.5E-09	8.1E-09	7.6E-09	57.5E-12
Sigma	18.0E-12	16.6E-12	22.7E-12	67.3E-12	126.7E-12	940.3E-12	1.0E-09	523.4E-12	1.0E-09	999.0E-12	678.0E-12	581.4E-12	5.2E-12

Drift Calculation

ICB(OFF)	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	81.3E-12	236.2E-12	744.8E-12	881.2E-12	2.3E-09	2.8E-09	2.9E-09	4.9E-09	7.5E-09	7.1E-09	6.7E-09	-4.5E-12
9	-	72.5E-12	219.2E-12	615.1E-12	810.2E-12	3.7E-09	5.0E-09	4.0E-09	7.1E-09	9.9E-09	8.7E-09	8.1E-09	37.1E-12
10	-	57.8E-12	224.8E-12	685.5E-12	1.1E-09	4.6E-09	5.1E-09	4.1E-09	6.9E-09	8.1E-09	8.3E-09	7.8E-09	-16.9E-12
Average	-	70.5E-12	226.7E-12	681.8E-12	921.3E-12	3.5E-09	4.3E-09	3.7E-09	6.3E-09	8.5E-09	8.1E-09	7.5E-09	5.2E-12
Sigma	-	9.7E-12	7.1E-12	53.0E-12	110.7E-12	937.3E-12	1.0E-09	525.4E-12	1.0E-09	1.0E-09	686.2E-12	588.4E-12	23.1E-12

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

Parameter : Input Forward Voltage : VF

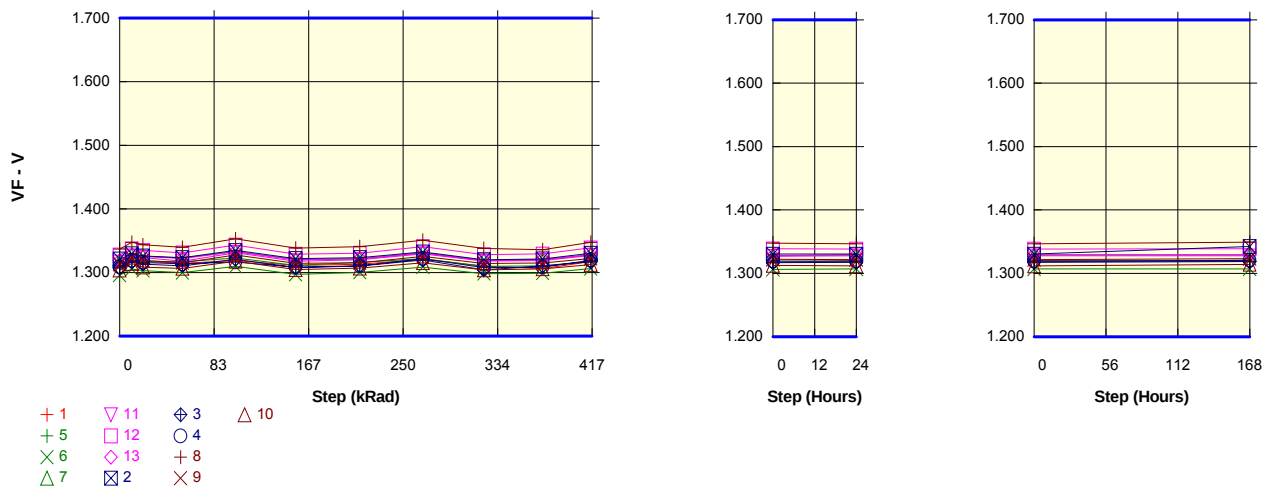
Test conditions : IF=10mA

Unit : V

Spec Limit Min : 1.200

Spec Limit Max : 1.700

Spec limits are represented in bold lines on the graphic.



Measurements

VF	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	1.308	1.319	1.318	1.315	1.319	1.312	1.313	1.321	1.310	1.306	1.318	1.320	1.319
ON_PROTON samples													
5	1.310	1.319	1.318	1.317	1.323	1.312	1.316	1.322	1.310	1.311	1.318	1.318	1.321
6	1.296	1.306	1.303	1.300	1.310	1.297	1.300	1.309	1.298	1.299	1.306	1.307	1.307
7	1.318	1.327	1.326	1.323	1.333	1.321	1.322	1.331	1.319	1.320	1.328	1.329	1.329
Statistics													
Min	1.296	1.306	1.303	1.300	1.310	1.297	1.300	1.309	1.298	1.299	1.306	1.307	1.307
Max	1.318	1.327	1.326	1.323	1.333	1.321	1.322	1.331	1.319	1.320	1.328	1.329	1.329
Average	1.308	1.317	1.315	1.313	1.322	1.310	1.313	1.321	1.309	1.310	1.317	1.318	1.319
Sigma	0.009	0.009	0.009	0.010	0.009	0.010	0.009	0.009	0.009	0.009	0.009	0.009	0.009

Drift Calculation

VF	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_PROTON samples													
5	-	8.8E-03	7.2E-03	6.8E-03	12.8E-03	1.2E-03	6.0E-03	11.6E-03	-400.1E-06	399.9E-06	7.6E-03	8.0E-03	10.8E-03
6	-	9.6E-03	7.2E-03	4.0E-03	14.0E-03	1.2E-03	4.4E-03	12.8E-03	2.4E-03	3.2E-03	10.4E-03	11.2E-03	11.2E-03
7	-	8.8E-03	7.2E-03	4.8E-03	14.4E-03	2.4E-03	3.2E-03	12.8E-03	800.0E-06	1.6E-03	9.6E-03	10.8E-03	10.8E-03
Average	-	9.1E-03	7.2E-03	5.2E-03	13.7E-03	1.6E-03	4.5E-03	12.4E-03	933.3E-06	1.7E-03	9.2E-03	10.0E-03	10.9E-03
Sigma	-	377.1E-06	0.0E+00	1.2E-03	679.9E-06	565.7E-06	1.1E-03	565.7E-06	1.1E-03	1.1E-03	1.2E-03	1.4E-03	188.5E-06

Measurements

VF	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	1.308	1.319	1.318	1.315	1.319	1.312	1.313	1.321	1.310	1.306	1.318	1.320	1.319
ON_TID samples													
11	1.316	1.326	1.324	1.318	1.331	1.318	1.320	1.329	1.318	1.319	1.327	1.328	1.328
12	1.328	1.337	1.335	1.331	1.343	1.329	1.330	1.341	1.328	1.329	1.339	1.338	1.339
13	1.319	1.328	1.326	1.322	1.333	1.320	1.322	1.330	1.319	1.321	1.328	1.329	1.329
Statistics													
Min	1.316	1.326	1.324	1.318	1.331	1.318	1.320	1.329	1.318	1.319	1.327	1.328	1.328
Max	1.328	1.337	1.335	1.331	1.343	1.329	1.330	1.341	1.328	1.329	1.339	1.338	1.339
Average	1.321	1.330	1.328	1.324	1.336	1.322	1.324	1.333	1.322	1.323	1.331	1.332	1.332
Sigma	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.005	0.004	0.004	0.005	0.005	0.005

Drift Calculation

VF	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_TID samples													
11	-	9.6E-03	7.6E-03	1.6E-03	14.8E-03	1.6E-03	4.0E-03	12.8E-03	2.0E-03	2.8E-03	10.4E-03	11.2E-03	11.2E-03
12	-	9.6E-03	7.2E-03	3.2E-03	15.6E-03	1.2E-03	2.8E-03	13.2E-03	399.9E-06	1.6E-03	11.2E-03	10.8E-03	11.2E-03
13	-	9.2E-03	6.8E-03	3.6E-03	14.0E-03	1.2E-03	3.2E-03	11.6E-03	400.1E-06	2.4E-03	8.8E-03	10.0E-03	10.4E-03
Average	-	9.5E-03	7.2E-03	2.8E-03	14.8E-03	1.3E-03	3.3E-03	12.5E-03	933.3E-06	2.3E-03	10.1E-03	10.7E-03	10.9E-03
Sigma	-	188.6E-06	326.6E-06	864.2E-06	653.2E-06	188.5E-06	498.9E-06	679.9E-06	754.2E-06	498.9E-06	997.7E-06	498.9E-06	377.1E-06

Hirex Engineering	Total Dose Radiation Test Report										Ref.:	HRX/TID/1021
	OLS449					Isolink Inc					Issue:	01

Measurements

VF	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	1.308	1.319	1.318	1.315	1.319	1.312	1.313	1.321	1.310	1.306	1.318	1.320	1.319
OFF PROTON samples													
2	1.321	1.330	1.326	1.324	1.335	1.322	1.324	1.332	1.320	1.322	1.330	1.330	1.342
3	1.308	1.317	1.314	1.311	1.321	1.308	1.310	1.320	1.304	1.310	1.317	1.318	1.319
4	1.309	1.319	1.316	1.314	1.317	1.309	1.311	1.322	1.308	1.309	1.320	1.320	1.321
Statistics													
Min	1.308	1.317	1.314	1.311	1.317	1.308	1.310	1.320	1.304	1.309	1.317	1.318	1.319
Max	1.321	1.330	1.326	1.324	1.335	1.322	1.324	1.332	1.320	1.322	1.330	1.330	1.342
Average	1.313	1.322	1.319	1.316	1.324	1.313	1.315	1.325	1.311	1.314	1.322	1.323	1.327
Sigma	0.006	0.006	0.005	0.005	0.008	0.006	0.006	0.005	0.007	0.006	0.006	0.006	0.011

Drift Calculation

VF	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	8.4E-03	4.8E-03	2.4E-03	13.6E-03	800.0E-06	2.4E-03	11.2E-03	-800.0E-06	399.9E-06	9.2E-03	9.2E-03	21.2E-03
3	-	9.2E-03	6.0E-03	3.2E-03	13.6E-03	399.9E-06	2.8E-03	12.4E-03	-3.2E-03	2.8E-03	9.6E-03	10.0E-03	11.2E-03
4	-	10.0E-03	6.8E-03	4.8E-03	7.6E-03	-400.1E-06	1.6E-03	12.8E-03	-1.2E-03	-400.1E-06	10.4E-03	10.4E-03	11.6E-03
Average	-	9.2E-03	5.9E-03	3.5E-03	11.6E-03	266.6E-06	2.3E-03	12.1E-03	-1.7E-03	933.3E-06	9.7E-03	9.9E-03	14.7E-03
Sigma	-	653.2E-06	821.9E-06	997.7E-06	2.8E-03	498.9E-06	498.9E-06	679.9E-06	1.0E-03	1.4E-03	498.9E-06	498.9E-06	4.6E-03

Measurements

VF	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	1.308	1.319	1.318	1.315	1.319	1.312	1.313	1.321	1.310	1.306	1.318	1.320	1.319
OFF TID samples													
8	1.337	1.348	1.344	1.340	1.353	1.338	1.341	1.351	1.338	1.336	1.348	1.347	1.349
9	1.313	1.323	1.320	1.316	1.328	1.315	1.316	1.325	1.314	1.315	1.322	1.322	1.324
10	1.304	1.314	1.309	1.307	1.318	1.305	1.307	1.316	1.304	1.306	1.313	1.312	1.314
Statistics													
Min	1.304	1.314	1.309	1.307	1.318	1.305	1.307	1.316	1.304	1.306	1.313	1.312	1.314
Max	1.337	1.348	1.344	1.340	1.353	1.338	1.341	1.351	1.338	1.336	1.348	1.347	1.349
Average	1.318	1.328	1.324	1.321	1.333	1.319	1.321	1.331	1.319	1.319	1.328	1.327	1.329
Sigma	0.014	0.014	0.015	0.014	0.015	0.014	0.014	0.015	0.014	0.013	0.015	0.015	0.015

Drift Calculation

VF	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	10.8E-03	6.8E-03	2.8E-03	16.4E-03	1.6E-03	4.0E-03	14.0E-03	1.2E-03	-800.0E-06	10.8E-03	10.0E-03	12.4E-03
9	-	10.0E-03	6.4E-03	2.4E-03	14.4E-03	1.6E-03	2.4E-03	12.0E-03	1.2E-03	2.0E-03	9.2E-03	8.8E-03	10.4E-03
10	-	10.4E-03	4.8E-03	2.8E-03	14.0E-03	800.0E-06	3.2E-03	11.6E-03	399.9E-06	2.0E-03	8.8E-03	8.0E-03	10.4E-03
Average	-	10.4E-03	6.0E-03	2.7E-03	14.9E-03	1.3E-03	3.2E-03	12.5E-03	933.3E-06	1.1E-03	9.6E-03	8.9E-03	11.1E-03
Sigma	-	326.6E-06	864.1E-06	188.5E-06	1.0E-03	377.1E-06	653.2E-06	1.0E-03	377.2E-06	1.3E-03	864.1E-06	821.9E-06	942.8E-06

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

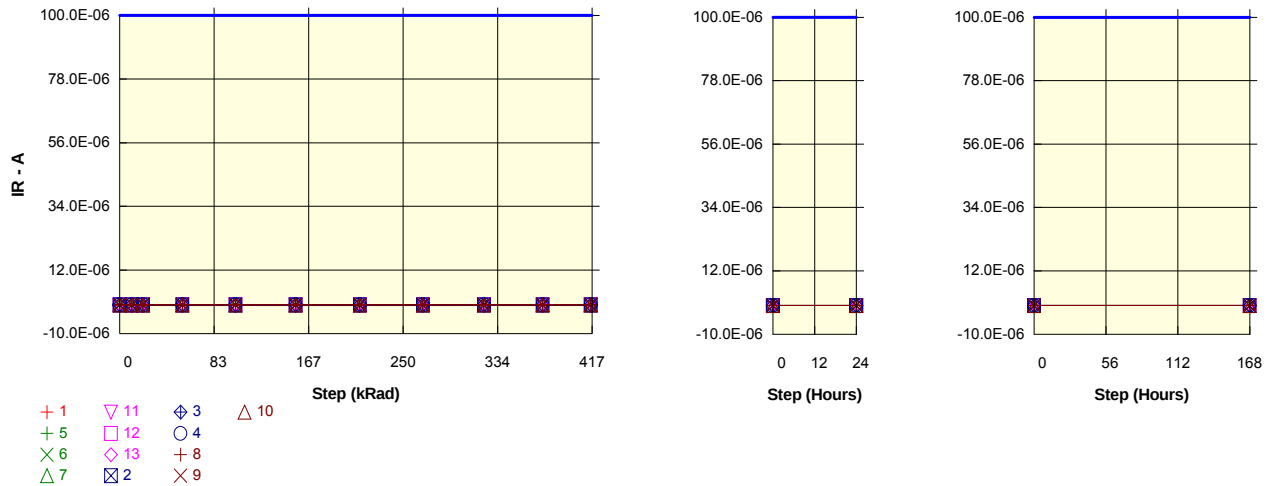
Parameter : Input Reverse Current : IR

Test conditions : VR=2V

Unit : A

Spec Limit Max : 100.0E-06

Spec limits are represented in bold lines on the graphic.



Measurements

IR	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	-29.3E-12	-26.1E-12	-30.8E-12	-23.5E-12	-14.4E-12	-31.1E-12	-19.8E-12	-21.0E-12	-23.4E-12	-22.4E-12	-16.9E-12	-13.4E-12	-18.5E-12
ON PROTON samples													
5	-10.6E-12	-10.6E-12	-18.0E-12	-10.5E-12	-8.8E-12	-11.1E-12	-12.1E-12	-7.8E-12	-13.3E-12	-13.5E-12	-11.7E-12	-11.0E-12	-10.0E-12
6	-8.1E-12	-4.9E-12	-14.1E-12	-7.0E-12	-5.3E-12	-7.0E-12	-6.9E-12	-4.6E-12	-6.6E-12	-12.7E-12	-6.9E-12	-6.7E-12	-6.2E-12
7	-8.0E-12	-11.4E-12	-15.2E-12	-7.0E-12	-5.3E-12	-6.1E-12	-7.4E-12	-3.3E-12	-9.6E-12	380.0E-15	-7.3E-12	-5.4E-12	-6.9E-12
Statistics													
Min	-10.6E-12	-11.4E-12	-18.0E-12	-10.5E-12	-8.8E-12	-11.1E-12	-12.1E-12	-7.8E-12	-13.3E-12	-13.5E-12	-11.7E-12	-11.0E-12	-10.0E-12
Max	-8.0E-12	-4.9E-12	-14.1E-12	-7.0E-12	-5.3E-12	-6.1E-12	-6.9E-12	-3.3E-12	-6.6E-12	380.0E-15	-6.9E-12	-5.4E-12	-6.2E-12
Average	-8.9E-12	-8.9E-12	-15.8E-12	-8.2E-12	-6.5E-12	-8.1E-12	-8.8E-12	-5.2E-12	-9.8E-12	-8.6E-12	-8.6E-12	-7.7E-12	-7.7E-12
Sigma	1.2E-12	2.9E-12	1.6E-12	1.6E-12	1.7E-12	2.2E-12	2.4E-12	1.9E-12	2.7E-12	6.4E-12	2.2E-12	2.4E-12	1.7E-12

Drift Calculation

IR	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON PROTON samples													
5	-	0.0E+00	-7.4E-12	80.0E-15	1.7E-12	-560.0E-15	-1.5E-12	2.8E-12	-2.7E-12	-2.9E-12	-1.1E-12	-440.0E-15	600.0E-15
6	-	3.3E-12	-6.0E-12	1.1E-12	2.8E-12	1.1E-12	1.2E-12	3.6E-12	1.5E-12	-4.6E-12	1.2E-12	1.4E-12	2.0E-12
7	-	-3.3E-12	-7.2E-12	1.0E-12	2.8E-12	1.9E-12	660.0E-15	4.7E-12	-1.5E-12	8.4E-12	700.0E-15	2.7E-12	1.2E-12
Average	-	-26.7E-15	-6.9E-12	733.3E-15	2.5E-12	833.3E-15	106.7E-15	3.7E-12	-900.0E-15	313.3E-15	273.3E-15	1.2E-12	1.2E-12
Sigma	-	2.7E-12	618.2E-15	463.1E-15	505.0E-15	1.0E-12	1.2E-12	780.8E-15	1.8E-12	5.8E-12	994.0E-15	1.3E-12	558.1E-15

Measurements

IR	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	-29.3E-12	-26.1E-12	-30.8E-12	-23.5E-12	-14.4E-12	-31.1E-12	-19.8E-12	-21.0E-12	-23.4E-12	-22.4E-12	-16.9E-12	-13.4E-12	-18.5E-12
ON TID samples													
11	-9.8E-12	-6.5E-12	-12.7E-12	-8.2E-12	-4.6E-12	-8.2E-12	-8.3E-12	-4.3E-12	-8.4E-12	-8.7E-12	-6.6E-12	-7.5E-12	-6.4E-12
12	-7.9E-12	-8.9E-12	-14.7E-12	-10.6E-12	-8.0E-12	-10.7E-12	-10.5E-12	-5.7E-12	-8.8E-12	-15.5E-12	-8.0E-12	-8.2E-12	-4.4E-12
13	-30.5E-12	-23.7E-12	-48.0E-12	-123.2E-12	-46.1E-12	-55.0E-12	-137.1E-12	-49.1E-12	-126.5E-12	-124.6E-12	-109.0E-12	-125.5E-12	-32.7E-12
Statistics													
Min	-30.5E-12	-23.7E-12	-48.0E-12	-123.2E-12	-46.1E-12	-55.0E-12	-137.1E-12	-49.1E-12	-126.5E-12	-124.6E-12	-109.0E-12	-125.5E-12	-32.7E-12
Max	-7.9E-12	-6.5E-12	-12.7E-12	-8.2E-12	-4.6E-12	-8.2E-12	-8.3E-12	-4.3E-12	-8.4E-12	-8.7E-12	-6.6E-12	-7.5E-12	-4.4E-12
Average	-16.1E-12	-13.0E-12	-25.1E-12	-47.3E-12	-19.6E-12	-24.7E-12	-52.0E-12	-19.7E-12	-47.9E-12	-49.6E-12	-41.2E-12	-47.1E-12	-14.5E-12
Sigma	10.2E-12	7.6E-12	16.2E-12	53.7E-12	18.8E-12	21.5E-12	60.2E-12	20.8E-12	55.6E-12	53.1E-12	48.0E-12	55.5E-12	12.9E-12

Drift Calculation

IR	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON TID samples													
11	-	3.3E-12	-2.8E-12	1.7E-12	5.3E-12	1.6E-12	1.5E-12	5.5E-12	1.4E-12	1.1E-12	3.2E-12	2.3E-12	3.4E-12
12	-	-960.0E-15	-6.8E-12	-2.7E-12	-120.0E-15	-2.8E-12	-2.6E-12	2.2E-12	-860.0E-15	-7.6E-12	-60.0E-15	-240.0E-15	3.5E-12
13	-	6.9E-12	-17.5E-12	-92.7E-12	-15.6E-12	-24.5E-12	-106.5E-12	-18.6E-12	-95.9E-12	-94.1E-12	-78.5E-12	-95.0E-12	-2.1E-12
Average	-	3.1E-12	-9.1E-12	-31.2E-12	-3.5E-12	-8.6E-12	-35.9E-12	-3.6E-12	-31.8E-12	-33.5E-12	-25.1E-12	-31.0E-12	1.6E-12
Sigma	-	3.2E-12	6.2E-12	43.5E-12	8.8E-12	11.4E-12	50.0E-12	10.6E-12	45.3E-12	43.0E-12	37.8E-12	45.3E-12	2.6E-12

Hirex Engineering	Total Dose Radiation Test Report									Ref.:	HRX/TID/1021		
	OLS449					Isolink Inc				Issue:	01		

Measurements

IR	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	-29.3E-12	-26.1E-12	-30.8E-12	-23.5E-12	-14.4E-12	-31.1E-12	-19.8E-12	-21.0E-12	-23.4E-12	-22.4E-12	-16.9E-12	-13.4E-12	-18.5E-12
OFF PROTON samples													
2	-3.3E-09	-2.9E-09	-3.0E-09	-3.1E-09	-2.9E-09	-3.4E-09	-2.2E-09	-2.8E-09	-3.3E-09	-2.7E-09	-2.9E-09	-2.6E-09	-3.1E-09
3	-7.9E-12	-6.2E-12	-12.8E-12	-6.4E-12	-4.2E-12	-5.6E-12	60.0E-15	-3.3E-12	2.1E-12	-12.5E-12	-3.3E-12	-880.0E-15	-2.1E-12
4	-1.7E-09	-2.1E-09	-1.8E-09	-2.1E-09	-2.0E-09	-2.3E-09	-1.2E-09	-2.1E-09	-2.4E-09	-2.6E-09	-2.4E-09	-2.2E-09	-2.2E-09
Statistics													
Min	-3.3E-09	-2.9E-09	-3.0E-09	-3.1E-09	-2.9E-09	-3.4E-09	-2.2E-09	-2.8E-09	-3.3E-09	-2.7E-09	-2.9E-09	-2.6E-09	-3.1E-09
Max	-7.9E-12	-6.2E-12	-12.8E-12	-6.4E-12	-4.2E-12	-5.6E-12	60.0E-15	-3.3E-12	2.1E-12	-12.5E-12	-3.3E-12	-880.0E-15	-2.1E-12
Average	-1.7E-09	-1.6E-09	-1.6E-09	-1.7E-09	-1.6E-09	-1.9E-09	-1.1E-09	-1.6E-09	-1.9E-09	-1.8E-09	-1.8E-09	-1.6E-09	-1.8E-09
Sigma	1.4E-09	1.2E-09	1.2E-09	1.3E-09	1.2E-09	1.4E-09	905.5E-12	1.2E-09	1.4E-09	1.2E-09	1.3E-09	1.1E-09	1.3E-09

Drift Calculation

IR	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	469.6E-12	366.2E-12	257.2E-12	498.0E-12	-62.4E-12	1.1E-09	572.8E-12	85.2E-12	653.4E-12	444.8E-12	756.0E-12	296.2E-12
3	-	1.7E-12	-4.9E-12	1.5E-12	3.7E-12	2.3E-12	7.9E-12	4.6E-12	10.0E-12	-4.6E-12	4.6E-12	7.0E-12	5.8E-12
4	-	-346.0E-12	-66.6E-12	-396.0E-12	-323.2E-12	-605.2E-12	523.8E-12	-425.6E-12	-674.4E-12	-875.4E-12	-643.8E-12	-498.0E-12	-515.2E-12
Average	-	41.8E-12	98.2E-12	-45.8E-12	59.5E-12	-221.8E-12	554.6E-12	50.6E-12	-193.1E-12	-75.5E-12	-64.8E-12	88.3E-12	-71.1E-12
Sigma	-	334.2E-12	191.1E-12	268.8E-12	337.6E-12	272.4E-12	459.4E-12	408.9E-12	341.7E-12	626.1E-12	447.1E-12	515.2E-12	335.7E-12

Measurements

IR	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	-29.3E-12	-26.1E-12	-30.8E-12	-23.5E-12	-14.4E-12	-31.1E-12	-19.8E-12	-21.0E-12	-23.4E-12	-22.4E-12	-16.9E-12	-13.4E-12	-18.5E-12
OFF TID samples													
8	-5.4E-12	-5.1E-12	-10.1E-12	-4.4E-12	-10.9E-12	-5.0E-12	-4.7E-12	-3.1E-12	-3.9E-12	-5.7E-12	-5.9E-12	-5.8E-12	-3.6E-12
9	-76.8E-12	-66.2E-12	-105.4E-12	-106.3E-12	-73.7E-12	-81.5E-12	-91.2E-12	-110.8E-12	-108.5E-12	-61.0E-12	-76.8E-12	-68.9E-12	-88.9E-12
10	-6.8E-12	-5.6E-12	-10.5E-12	-4.2E-12	-10.4E-12	-420.0E-15	-200.0E-15	-16.9E-12	-5.2E-12	5.3E-12	-4.5E-12	-5.2E-12	-2.3E-12
Statistics													
Min	-76.8E-12	-66.2E-12	-105.4E-12	-106.3E-12	-73.7E-12	-81.5E-12	-91.2E-12	-110.8E-12	-108.5E-12	-61.0E-12	-76.8E-12	-68.9E-12	-88.9E-12
Max	-5.4E-12	-5.1E-12	-10.1E-12	-4.2E-12	-10.4E-12	-420.0E-15	-200.0E-15	-3.1E-12	-3.9E-12	5.3E-12	-4.5E-12	-5.2E-12	-2.3E-12
Average	-29.6E-12	-25.6E-12	-42.0E-12	-38.3E-12	-31.7E-12	-29.0E-12	-32.0E-12	-43.6E-12	-39.2E-12	-20.5E-12	-29.1E-12	-26.6E-12	-31.6E-12
Sigma	33.3E-12	28.7E-12	44.8E-12	48.1E-12	29.7E-12	37.2E-12	41.9E-12	47.9E-12	49.0E-12	29.0E-12	33.8E-12	29.9E-12	40.5E-12

Drift Calculation

IR	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	280.0E-15	-4.7E-12	980.0E-15	-5.5E-12	400.0E-15	700.0E-15	2.3E-12	1.5E-12	-280.0E-15	-520.0E-15	-420.0E-15	1.8E-12
9	-	10.5E-12	-28.6E-12	-29.5E-12	3.1E-12	-4.8E-12	-14.5E-12	-34.1E-12	-31.7E-12	15.7E-12	-80.0E-15	7.9E-12	-12.2E-12
10	-	1.2E-12	-3.7E-12	2.6E-12	-3.7E-12	6.3E-12	6.6E-12	-10.2E-12	1.5E-12	12.0E-12	2.2E-12	1.6E-12	4.4E-12
Average	-	4.0E-12	-12.3E-12	-8.6E-12	-2.0E-12	660.0E-15	-2.4E-12	-14.0E-12	-9.6E-12	9.2E-12	546.7E-15	3.0E-12	-2.0E-12
Sigma	-	4.6E-12	11.5E-12	14.8E-12	3.7E-12	4.5E-12	8.9E-12	15.1E-12	15.7E-12	6.8E-12	1.2E-12	3.5E-12	7.3E-12

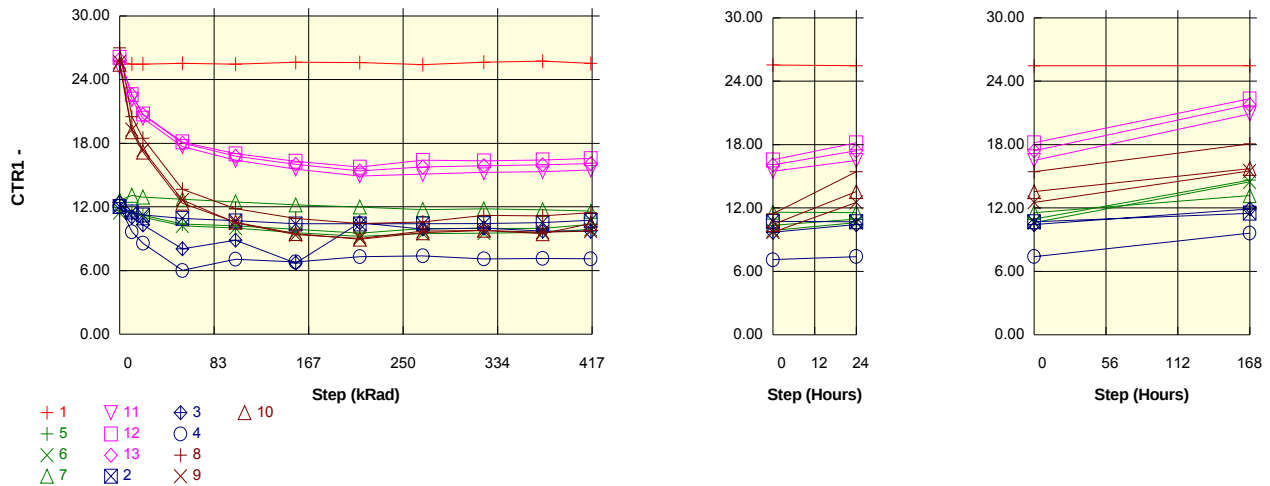
Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

Parameter : Current Transfert Ratio : CTR1

Test conditions : IF=1mA. VCE=5V

Unit :

No spec limit specified.



Measurements

CTR1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	25.70	25.48	25.47	25.54	25.46	25.63	25.60	25.41	25.64	25.75	25.53	25.47	25.48
ON PROTON samples													
5	11.69	11.56	11.22	10.40	10.22	9.90	9.53	9.96	9.96	9.99	10.37	10.97	14.65
6	11.48	11.54	11.02	10.22	10.02	9.59	9.21	9.49	9.54	9.60	9.89	10.61	14.48
7	12.61	13.09	12.92	12.72	12.47	12.20	11.99	11.76	11.81	11.73	11.60	11.57	13.17
Statistics													
Min	11.48	11.54	11.02	10.22	10.02	9.59	9.21	9.49	9.54	9.60	9.89	10.61	13.17
Max	12.61	13.09	12.92	12.72	12.47	12.20	11.99	11.76	11.81	11.73	11.60	11.57	14.65
Average	11.93	12.06	11.72	11.11	10.90	10.56	10.24	10.40	10.43	10.44	10.62	11.05	14.10
Sigma	0.49	0.73	0.85	1.14	1.11	1.16	1.24	0.98	0.99	0.92	0.72	0.39	0.66

Drift Calculation

CTR1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON PROTON samples													
5	-	977.0E-06	3.6E-03	10.6E-03	12.3E-03	15.5E-03	19.4E-03	14.8E-03	14.9E-03	14.6E-03	10.9E-03	5.6E-03	-17.3E-03
6	-	-392.5E-06	3.6E-03	10.8E-03	12.8E-03	17.2E-03	21.5E-03	18.3E-03	17.8E-03	17.1E-03	14.1E-03	7.1E-03	-18.0E-03
7	-	-2.9E-03	-1.9E-03	-660.6E-06	902.6E-06	2.7E-03	4.1E-03	5.8E-03	5.4E-03	6.0E-03	6.9E-03	7.2E-03	-3.3E-03
Average	-	-773.9E-06	1.8E-03	6.9E-03	8.7E-03	11.8E-03	15.0E-03	13.0E-03	12.7E-03	12.6E-03	10.6E-03	6.6E-03	-12.9E-03
Sigma	-	1.6E-03	2.6E-03	5.4E-03	5.5E-03	6.5E-03	7.8E-03	5.3E-03	5.3E-03	4.8E-03	2.9E-03	717.5E-06	6.8E-03

Measurements

CTR1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	25.70	25.48	25.47	25.54	25.46	25.63	25.60	25.41	25.64	25.75	25.53	25.47	25.48
ON TID samples													
11	25.18	22.15	20.37	17.70	16.39	15.58	14.93	15.08	15.25	15.33	15.49	16.51	20.91
12	26.11	22.60	20.75	18.13	17.01	16.31	15.75	16.39	16.34	16.42	16.56	18.18	22.33
13	25.92	22.56	20.70	18.01	16.78	16.02	15.40	15.78	15.88	15.98	16.09	17.41	21.79
Statistics													
Min	25.18	22.15	20.37	17.70	16.39	15.58	14.93	15.08	15.25	15.33	15.49	16.51	20.91
Max	26.11	22.60	20.75	18.13	17.01	16.31	15.75	16.39	16.34	16.42	16.56	18.18	22.33
Average	25.74	22.44	20.61	17.95	16.73	15.97	15.36	15.75	15.82	15.91	16.05	17.37	21.68
Sigma	0.40	0.20	0.17	0.18	0.26	0.30	0.34	0.54	0.45	0.45	0.44	0.69	0.58

Drift Calculation

CTR1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON TID samples													
11	-	5.4E-03	9.4E-03	16.8E-03	21.3E-03	24.5E-03	27.3E-03	26.6E-03	25.9E-03	25.5E-03	24.8E-03	20.9E-03	8.1E-03
12	-	5.9E-03	9.9E-03	16.9E-03	20.5E-03	23.0E-03	25.2E-03	22.7E-03	22.9E-03	22.6E-03	22.1E-03	16.7E-03	6.5E-03
13	-	5.7E-03	9.7E-03	16.9E-03	21.0E-03	23.8E-03	26.4E-03	24.8E-03	24.4E-03	24.0E-03	23.6E-03	18.8E-03	7.3E-03
Average	-	5.7E-03	9.7E-03	16.9E-03	20.9E-03	23.8E-03	26.3E-03	24.7E-03	24.4E-03	24.0E-03	23.5E-03	18.8E-03	7.3E-03
Sigma	-	211.1E-06	212.6E-06	63.3E-06	336.7E-06	597.1E-06	849.0E-06	1.6E-03	1.2E-03	1.2E-03	1.1E-03	1.7E-03	662.3E-06

Measurements

Hirex Engineering	Total Dose Radiation Test Report										Ref.:	HRX/TID/1021	
	OLS449					Isolink Inc					Issue:	01	

CTR1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1 REF	25.70	25.48	25.47	25.54	25.46	25.63	25.60	25.41	25.64	25.75	25.53	25.47	25.48
OFF PROTON samples													
2	12.04	11.52	11.24	10.92	10.69	10.41	10.40	10.40	10.43	10.54	10.74	10.70	11.51
3	12.41	11.04	10.31	8.05	8.86	6.72	10.51	9.91	10.01	9.72	9.72	10.43	11.92
4	12.06	9.66	8.58	6.02	7.08	6.81	7.32	7.38	7.10	7.15	7.11	7.41	9.63
Statistics													
Min	12.04	9.66	8.58	6.02	7.08	6.72	7.32	7.38	7.10	7.15	7.11	7.41	9.63
Max	12.41	11.52	11.24	10.92	10.69	10.41	10.51	10.40	10.43	10.54	10.74	10.70	11.92
Average	12.17	10.74	10.05	8.33	8.88	7.98	9.41	9.23	9.18	9.13	9.19	9.51	11.02
Sigma	0.17	0.79	1.10	2.01	1.47	1.72	1.48	1.32	1.48	1.44	1.53	1.49	1.00

Drift Calculation

CTR1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	3.7E-03	5.9E-03	8.5E-03	10.5E-03	13.0E-03	13.0E-03	13.1E-03	12.8E-03	11.8E-03	10.0E-03	10.4E-03	3.8E-03
3	-	9.9E-03	16.4E-03	43.5E-03	32.2E-03	68.3E-03	14.5E-03	20.3E-03	19.3E-03	22.3E-03	22.3E-03	15.3E-03	3.3E-03
4	-	20.6E-03	33.6E-03	83.3E-03	58.3E-03	64.0E-03	53.8E-03	52.6E-03	57.9E-03	56.9E-03	57.8E-03	52.1E-03	21.0E-03
Average	-	11.4E-03	18.6E-03	45.1E-03	33.7E-03	48.4E-03	27.1E-03	28.6E-03	30.0E-03	30.4E-03	30.0E-03	25.9E-03	9.4E-03
Sigma	-	6.9E-03	11.4E-03	30.6E-03	19.5E-03	25.1E-03	18.9E-03	17.2E-03	19.9E-03	19.3E-03	20.2E-03	18.6E-03	8.2E-03

Measurements

CTR1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1 REF	25.70	25.48	25.47	25.54	25.46	25.63	25.60	25.41	25.64	25.75	25.53	25.47	25.48
OFF TID samples													
8	26.99	20.50	18.48	13.66	11.85	10.91	10.43	10.58	11.20	11.16	11.46	15.43	18.07
9	25.65	19.31	17.40	12.65	10.51	9.38	9.04	9.72	9.79	9.63	9.72	12.54	15.51
10	25.45	19.09	17.18	12.35	10.56	9.49	8.96	9.57	9.79	9.48	10.45	13.56	15.74
Statistics													
Min	25.45	19.09	17.18	12.35	10.51	9.38	8.96	9.57	9.79	9.48	9.72	12.54	15.51
Max	26.99	20.50	18.48	13.66	11.85	10.91	10.43	10.58	11.20	11.16	11.46	15.43	18.07
Average	26.03	19.63	17.68	12.89	10.98	9.92	9.48	9.96	10.26	10.09	10.54	13.84	16.44
Sigma	0.68	0.62	0.57	0.56	0.62	0.70	0.68	0.45	0.66	0.76	0.71	1.20	1.16

Drift Calculation

CTR1	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	11.7E-03	17.1E-03	36.1E-03	47.3E-03	54.6E-03	58.8E-03	57.4E-03	52.2E-03	52.5E-03	50.2E-03	27.7E-03	18.3E-03
9	-	12.8E-03	18.5E-03	40.1E-03	56.2E-03	67.6E-03	71.7E-03	63.9E-03	63.2E-03	64.9E-03	63.8E-03	40.8E-03	25.5E-03
10	-	13.1E-03	18.9E-03	41.7E-03	55.4E-03	66.1E-03	72.3E-03	65.2E-03	62.8E-03	66.2E-03	56.4E-03	34.5E-03	24.2E-03
Average	-	12.5E-03	18.2E-03	39.3E-03	52.9E-03	62.8E-03	67.6E-03	62.2E-03	59.4E-03	61.2E-03	56.8E-03	34.3E-03	22.7E-03
Sigma	-	584.9E-06	796.6E-06	2.3E-03	4.0E-03	5.8E-03	6.2E-03	3.4E-03	5.1E-03	6.2E-03	5.6E-03	5.3E-03	3.1E-03

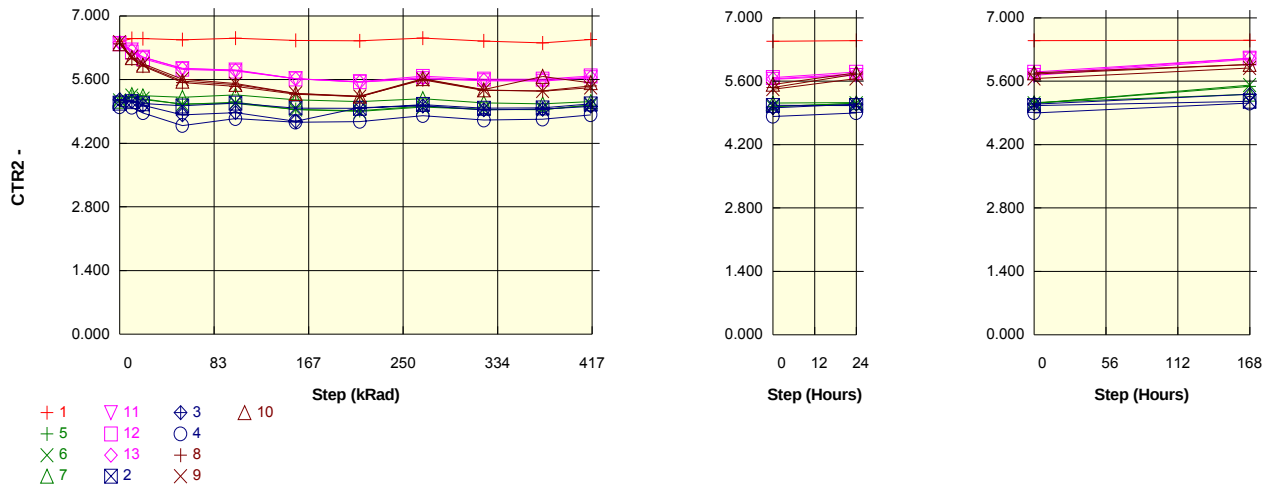
Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

Parameter : Current Transfert Ratio : CTR2

Test conditions : IF=10mA. VCE=5V

Unit :

No spec limit specified.



Measurements

CTR2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	6.431	6.506	6.504	6.478	6.511	6.460	6.453	6.515	6.451	6.409	6.482	6.501	6.503
ON_PROTON samples													
5	5.143	5.215	5.165	5.064	5.075	4.943	4.918	5.016	4.946	4.940	5.038	5.112	5.485
6	5.146	5.250	5.180	5.059	5.100	4.941	4.899	4.994	4.946	4.942	5.038	5.114	5.514
7	5.128	5.271	5.246	5.211	5.264	5.155	5.120	5.181	5.092	5.066	5.117	5.129	5.315
Statistics													
Min	5.128	5.215	5.165	5.059	5.075	4.941	4.899	4.994	4.946	4.940	5.038	5.112	5.315
Max	5.146	5.271	5.246	5.211	5.264	5.155	5.120	5.181	5.092	5.066	5.117	5.129	5.514
Average	5.139	5.245	5.197	5.111	5.146	5.013	4.979	5.064	4.995	4.983	5.064	5.118	5.438
Sigma	0.008	0.023	0.035	0.071	0.084	0.100	0.100	0.083	0.069	0.059	0.037	0.007	0.088

Drift Calculation

CTR2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_PROTON samples													
5	-	-2.7E-03	-835.7E-06	3.0E-03	2.6E-03	7.9E-03	8.9E-03	4.9E-03	7.8E-03	8.0E-03	4.1E-03	1.2E-03	-12.1E-03
6	-	-3.9E-03	-1.3E-03	3.3E-03	1.7E-03	8.0E-03	9.8E-03	5.9E-03	7.8E-03	8.0E-03	4.1E-03	1.2E-03	-13.0E-03
7	-	-5.3E-03	-4.4E-03	-3.1E-03	-5.0E-03	-991.1E-06	319.9E-06	-2.0E-03	1.4E-03	2.4E-03	442.1E-06	-7.6E-06	-6.8E-03
Average	-	-3.9E-03	-2.2E-03	1.1E-03	-219.3E-06	5.0E-03	6.3E-03	3.0E-03	5.7E-03	6.1E-03	2.9E-03	790.8E-06	-10.6E-03
Sigma	-	1.1E-03	1.6E-03	3.0E-03	3.4E-03	4.2E-03	4.3E-03	3.5E-03	3.0E-03	2.6E-03	1.7E-03	565.0E-06	2.7E-03

Measurements

CTR2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	6.431	6.506	6.504	6.478	6.511	6.460	6.453	6.515	6.451	6.409	6.482	6.501	6.503
ON_TID samples													
11	6.397	6.249	6.098	5.841	5.812	5.620	5.546	5.621	5.575	5.567	5.644	5.730	6.089
12	6.392	6.206	6.060	5.826	5.790	5.619	5.556	5.674	5.610	5.609	5.683	5.802	6.112
13	6.414	6.240	6.088	5.847	5.802	5.617	5.548	5.643	5.587	5.589	5.653	5.763	6.111
Statistics													
Min	6.392	6.206	6.060	5.826	5.790	5.617	5.546	5.621	5.575	5.567	5.644	5.730	6.089
Max	6.414	6.249	6.098	5.847	5.812	5.620	5.556	5.674	5.610	5.609	5.683	5.802	6.112
Average	6.401	6.232	6.082	5.838	5.801	5.618	5.550	5.646	5.591	5.588	5.660	5.765	6.104
Sigma	0.009	0.018	0.016	0.009	0.009	0.001	0.004	0.022	0.014	0.017	0.017	0.030	0.011

Drift Calculation

CTR2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_TID samples													
11	-	3.7E-03	7.7E-03	14.9E-03	15.7E-03	21.6E-03	24.0E-03	21.6E-03	23.0E-03	23.3E-03	20.9E-03	18.2E-03	7.9E-03
12	-	4.7E-03	8.6E-03	15.2E-03	16.3E-03	21.5E-03	23.5E-03	19.8E-03	21.8E-03	21.8E-03	19.5E-03	15.9E-03	7.2E-03
13	-	4.3E-03	8.3E-03	15.1E-03	16.4E-03	22.1E-03	24.3E-03	21.3E-03	23.1E-03	23.0E-03	21.0E-03	17.6E-03	7.7E-03
Average	-	4.2E-03	8.2E-03	15.1E-03	16.1E-03	21.8E-03	23.9E-03	20.9E-03	22.6E-03	22.7E-03	20.4E-03	17.2E-03	7.6E-03
Sigma	-	404.3E-06	393.0E-06	141.9E-06	297.5E-06	255.4E-06	332.0E-06	780.0E-06	578.5E-06	631.6E-06	665.1E-06	972.7E-06	308.5E-06

Measurements

Hirex Engineering	Total Dose Radiation Test Report										Ref.:	HRX/TID/1021
	OLS449					Isolink Inc					Issue:	01

CTR2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	6.431	6.506	6.504	6.478	6.511	6.460	6.453	6.515	6.451	6.409	6.482	6.501	6.503
OFF PROTON samples													
2	5.084	5.115	5.073	5.022	5.082	4.974	4.970	5.052	4.973	4.977	5.066	5.064	5.158
3	5.159	5.122	5.036	4.825	4.875	4.682	4.984	5.023	4.935	4.952	5.015	5.097	5.313
4	5.006	4.991	4.870	4.590	4.743	4.663	4.680	4.807	4.711	4.729	4.825	4.903	5.116
Statistics													
Min	5.006	4.991	4.870	4.590	4.743	4.663	4.680	4.807	4.711	4.729	4.825	4.903	5.116
Max	5.159	5.122	5.073	5.022	5.082	4.974	4.984	5.052	4.973	4.977	5.066	5.097	5.313
Average	5.083	5.076	4.993	4.813	4.900	4.773	4.878	4.961	4.873	4.886	4.969	5.021	5.196
Sigma	0.062	0.060	0.088	0.177	0.140	0.142	0.140	0.109	0.115	0.111	0.103	0.085	0.085

Drift Calculation

CTR2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF PROTON samples													
2	-	-1.2E-03	434.2E-06	2.4E-03	85.1E-06	4.4E-03	4.5E-03	1.3E-03	4.4E-03	4.3E-03	722.1E-06	807.9E-06	-2.8E-03
3	-	1.4E-03	4.7E-03	13.4E-03	11.3E-03	19.7E-03	6.8E-03	5.2E-03	8.8E-03	8.1E-03	5.6E-03	2.3E-03	-5.6E-03
4	-	616.4E-06	5.6E-03	18.1E-03	11.1E-03	14.7E-03	13.9E-03	8.3E-03	12.5E-03	11.7E-03	7.5E-03	4.2E-03	-4.3E-03
Average	-	287.6E-06	3.6E-03	11.3E-03	7.5E-03	12.9E-03	8.4E-03	4.9E-03	8.6E-03	8.0E-03	4.6E-03	2.5E-03	-4.2E-03
Sigma	-	1.1E-03	2.3E-03	6.6E-03	5.2E-03	6.4E-03	4.0E-03	2.9E-03	3.3E-03	3.0E-03	2.8E-03	1.4E-03	1.1E-03

Measurements

CTR2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	6.431	6.506	6.504	6.478	6.511	6.460	6.453	6.515	6.451	6.409	6.482	6.501	6.503
OFF TID samples													
8	6.386	6.059	5.898	5.536	5.453	5.281	5.231	5.600	5.362	5.349	5.463	5.758	5.968
9	6.422	6.102	5.946	5.609	5.513	5.299	5.226	5.606	5.374	5.349	5.425	5.661	5.892
10	6.392	6.082	5.915	5.568	5.494	5.294	5.236	5.620	5.377	5.672	5.531	5.786	5.972
Statistics													
Min	6.386	6.059	5.898	5.536	5.453	5.281	5.226	5.600	5.362	5.349	5.425	5.661	5.892
Max	6.422	6.102	5.946	5.609	5.513	5.299	5.236	5.620	5.377	5.672	5.531	5.786	5.972
Average	6.400	6.081	5.919	5.571	5.486	5.291	5.231	5.609	5.371	5.457	5.473	5.735	5.944
Sigma	0.016	0.018	0.020	0.030	0.025	0.008	0.004	0.009	0.007	0.152	0.044	0.053	0.037

Drift Calculation

CTR2	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF TID samples													
8	-	8.5E-03	13.0E-03	24.1E-03	26.8E-03	32.8E-03	34.6E-03	22.0E-03	29.9E-03	30.3E-03	26.4E-03	17.1E-03	11.0E-03
9	-	8.2E-03	12.5E-03	22.6E-03	25.7E-03	33.0E-03	35.6E-03	22.7E-03	30.4E-03	31.2E-03	28.6E-03	20.9E-03	14.0E-03
10	-	8.0E-03	12.6E-03	23.1E-03	25.6E-03	32.4E-03	34.5E-03	21.5E-03	29.5E-03	19.9E-03	24.3E-03	16.4E-03	11.0E-03
Average	-	8.2E-03	12.7E-03	23.3E-03	26.0E-03	32.7E-03	34.9E-03	22.0E-03	29.9E-03	27.1E-03	26.5E-03	18.1E-03	12.0E-03
Sigma	-	204.0E-06	205.6E-06	615.1E-06	557.1E-06	233.8E-06	506.9E-06	490.6E-06	347.8E-06	5.2E-03	1.7E-03	2.0E-03	1.4E-03

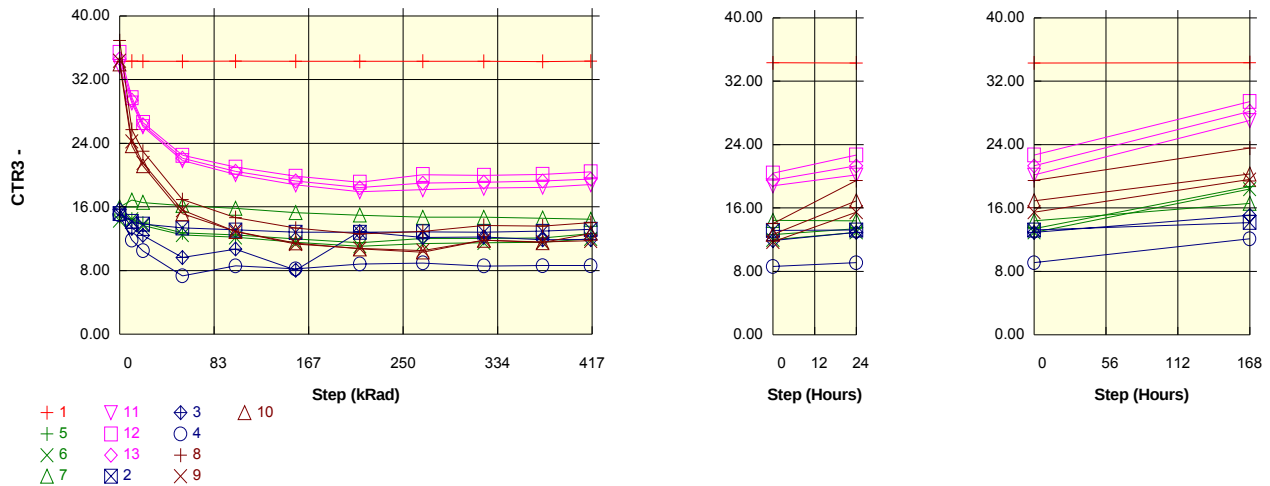
Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

Parameter : Current Transfert Ratio : CTR3

Test conditions : IF=1mA. VCE=40V

Unit :

No spec limit specified.



Measurements

CTR3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	34.29	34.33	34.32	34.30	34.33	34.32	34.30	34.31	34.29	34.27	34.33	34.32	34.34
ON_PROTON samples													
5	14.75	14.47	13.97	12.75	12.47	11.97	11.49	12.05	12.05	12.09	12.64	13.39	18.72
6	14.28	14.44	13.67	12.47	12.19	11.55	11.06	11.40	11.48	11.56	11.99	12.93	18.39
7	15.98	16.86	16.56	16.19	15.84	15.29	14.98	14.70	14.70	14.58	14.45	14.41	16.59
Statistics													
Min	14.28	14.44	13.67	12.47	12.19	11.55	11.06	11.40	11.48	11.56	11.99	12.93	16.59
Max	15.98	16.86	16.56	16.19	15.84	15.29	14.98	14.70	14.70	14.58	14.45	14.41	18.72
Average	15.00	15.26	14.73	13.80	13.50	12.94	12.51	12.71	12.74	12.74	13.03	13.58	17.90
Sigma	0.72	1.13	1.30	1.69	1.66	1.67	1.75	1.43	1.40	1.32	1.04	0.62	0.94

Drift Calculation

CTR3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_PROTON samples													
5	-	1.3E-03	3.8E-03	10.7E-03	12.4E-03	15.7E-03	19.2E-03	15.2E-03	15.2E-03	14.9E-03	11.3E-03	6.9E-03	-14.4E-03
6	-	-785.7E-06	3.1E-03	10.2E-03	12.0E-03	16.5E-03	20.3E-03	17.7E-03	17.1E-03	16.4E-03	13.4E-03	7.3E-03	-15.7E-03
7	-	-3.3E-03	-2.2E-03	-788.6E-06	576.9E-06	2.8E-03	4.2E-03	5.5E-03	5.4E-03	6.0E-03	6.6E-03	6.8E-03	-2.3E-03
Average	-	-913.8E-06	1.6E-03	6.7E-03	8.3E-03	11.7E-03	14.6E-03	12.8E-03	12.6E-03	12.5E-03	10.4E-03	7.0E-03	-10.8E-03
Sigma	-	1.9E-03	2.7E-03	5.3E-03	5.5E-03	6.3E-03	7.4E-03	5.3E-03	5.1E-03	4.6E-03	2.8E-03	204.9E-06	6.0E-03

Measurements

CTR3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	34.29	34.33	34.32	34.30	34.33	34.32	34.30	34.31	34.29	34.27	34.33	34.32	34.34
ON_TID samples													
11	33.66	29.07	26.09	21.82	20.07	18.78	17.91	18.16	18.36	18.47	18.81	20.17	27.04
12	35.45	29.75	26.61	22.49	21.01	19.86	19.11	20.06	19.97	20.09	20.42	22.70	29.45
13	34.64	29.42	26.34	22.12	20.47	19.26	18.43	19.00	19.10	19.25	19.50	21.32	28.21
Statistics													
Min	33.66	29.07	26.09	21.82	20.07	18.78	17.91	18.16	18.36	18.47	18.81	20.17	27.04
Max	35.45	29.75	26.61	22.49	21.01	19.86	19.11	20.06	19.97	20.09	20.42	22.70	29.45
Average	34.58	29.41	26.35	22.15	20.51	19.30	18.48	19.07	19.14	19.27	19.58	21.40	28.23
Sigma	0.73	0.28	0.21	0.27	0.38	0.44	0.49	0.77	0.66	0.66	0.66	1.03	0.98

Drift Calculation

CTR3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_TID samples													
11	-	4.7E-03	8.6E-03	16.1E-03	20.1E-03	23.6E-03	26.1E-03	25.3E-03	24.8E-03	24.4E-03	23.5E-03	19.9E-03	7.3E-03
12	-	5.4E-03	9.4E-03	16.3E-03	19.4E-03	22.1E-03	24.1E-03	21.7E-03	21.9E-03	21.6E-03	20.8E-03	15.8E-03	5.7E-03
13	-	5.1E-03	9.1E-03	16.3E-03	20.0E-03	23.0E-03	25.4E-03	23.8E-03	23.5E-03	23.1E-03	22.4E-03	18.0E-03	6.6E-03
Average	-	5.1E-03	9.0E-03	16.2E-03	19.8E-03	22.9E-03	25.2E-03	23.6E-03	23.4E-03	23.0E-03	22.2E-03	17.9E-03	6.5E-03
Sigma	-	294.2E-06	309.0E-06	86.7E-06	315.1E-06	586.2E-06	832.8E-06	1.5E-03	1.2E-03	1.2E-03	1.1E-03	1.6E-03	626.1E-06

Measurements

Hirex Engineering	Total Dose Radiation Test Report										Ref.:	HRX/TID/1021	
	OLS449					Isolink Inc					Issue:	01	

CTR3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	34.29	34.33	34.32	34.30	34.33	34.32	34.30	34.31	34.29	34.27	34.33	34.32	34.34
OFF_PROTON samples													
2	15.17	14.18	13.84	13.37	13.11	12.83	12.82	12.87	12.84	12.95	13.20	13.24	14.17
3	15.67	13.34	12.43	9.63	10.71	8.05	12.89	12.16	12.21	11.86	11.90	12.91	15.09
4	15.00	11.84	10.48	7.34	8.59	8.21	8.83	8.96	8.57	8.63	8.62	9.09	12.12
Statistics													
Min	15.00	11.84	10.48	7.34	8.59	8.05	8.83	8.96	8.57	8.63	8.62	9.09	12.12
Max	15.67	14.18	13.84	13.37	13.11	12.83	12.89	12.87	12.84	12.95	13.20	13.24	15.09
Average	15.28	13.12	12.25	10.11	10.80	9.70	11.51	11.33	11.21	11.15	11.24	11.75	13.79
Sigma	0.28	0.97	1.38	2.49	1.85	2.21	1.90	1.70	1.88	1.83	1.93	1.88	1.24

Drift Calculation

CTR3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF_PROTON samples													
2	-	4.6E-03	6.4E-03	8.9E-03	10.4E-03	12.1E-03	12.1E-03	11.8E-03	12.0E-03	11.3E-03	9.9E-03	9.6E-03	4.6E-03
3	-	11.1E-03	16.6E-03	40.0E-03	29.5E-03	60.4E-03	13.8E-03	18.4E-03	18.0E-03	20.5E-03	20.2E-03	13.6E-03	2.5E-03
4	-	17.8E-03	28.7E-03	69.6E-03	49.8E-03	55.1E-03	46.6E-03	44.9E-03	50.0E-03	49.2E-03	49.4E-03	43.3E-03	15.8E-03
Average	-	11.2E-03	17.2E-03	39.5E-03	29.9E-03	42.5E-03	24.2E-03	25.0E-03	26.7E-03	27.0E-03	26.5E-03	22.2E-03	7.6E-03
Sigma	-	5.4E-03	9.1E-03	24.8E-03	16.1E-03	21.6E-03	15.9E-03	14.3E-03	16.7E-03	16.1E-03	16.7E-03	15.0E-03	5.9E-03

Measurements

CTR3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	34.29	34.33	34.32	34.30	34.33	34.32	34.30	34.31	34.29	34.27	34.33	34.32	34.34
OFF_TID samples													
8	36.91	25.72	23.00	16.93	14.65	13.33	12.60	12.93	13.67	13.60	14.03	19.47	23.58
9	34.38	24.22	21.53	15.60	12.89	11.34	10.79	10.52	11.81	11.58	11.74	15.47	19.60
10	33.98	23.71	21.17	15.15	12.93	11.47	10.72	10.33	11.80	11.52	12.68	16.92	20.31
Statistics													
Min	33.98	23.71	21.17	15.15	12.89	11.34	10.72	10.33	11.80	11.52	11.74	15.47	19.60
Max	36.91	25.72	23.00	16.93	14.65	13.33	12.60	12.93	13.67	13.60	14.03	19.47	23.58
Average	35.09	24.55	21.90	15.89	13.49	12.04	11.37	11.26	12.43	12.23	12.82	17.29	21.16
Sigma	1.30	0.85	0.79	0.76	0.82	0.91	0.87	1.18	0.88	0.97	0.94	1.65	1.74

Drift Calculation

CTR3	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF_TID samples													
8	-	11.8E-03	16.4E-03	32.0E-03	41.2E-03	47.9E-03	52.3E-03	50.3E-03	46.1E-03	46.4E-03	44.2E-03	24.3E-03	15.3E-03
9	-	12.2E-03	17.4E-03	35.0E-03	48.5E-03	59.1E-03	63.6E-03	66.0E-03	55.6E-03	57.3E-03	56.1E-03	35.5E-03	21.9E-03
10	-	12.8E-03	17.8E-03	36.6E-03	47.9E-03	57.8E-03	63.8E-03	67.4E-03	55.3E-03	57.4E-03	49.4E-03	29.7E-03	19.8E-03
Average	-	12.2E-03	17.2E-03	34.5E-03	45.9E-03	54.9E-03	59.9E-03	61.2E-03	52.3E-03	53.7E-03	49.9E-03	29.8E-03	19.0E-03
Sigma	-	394.0E-06	596.3E-06	1.9E-03	3.3E-03	5.0E-03	5.4E-03	7.8E-03	4.4E-03	5.1E-03	4.9E-03	4.6E-03	2.8E-03

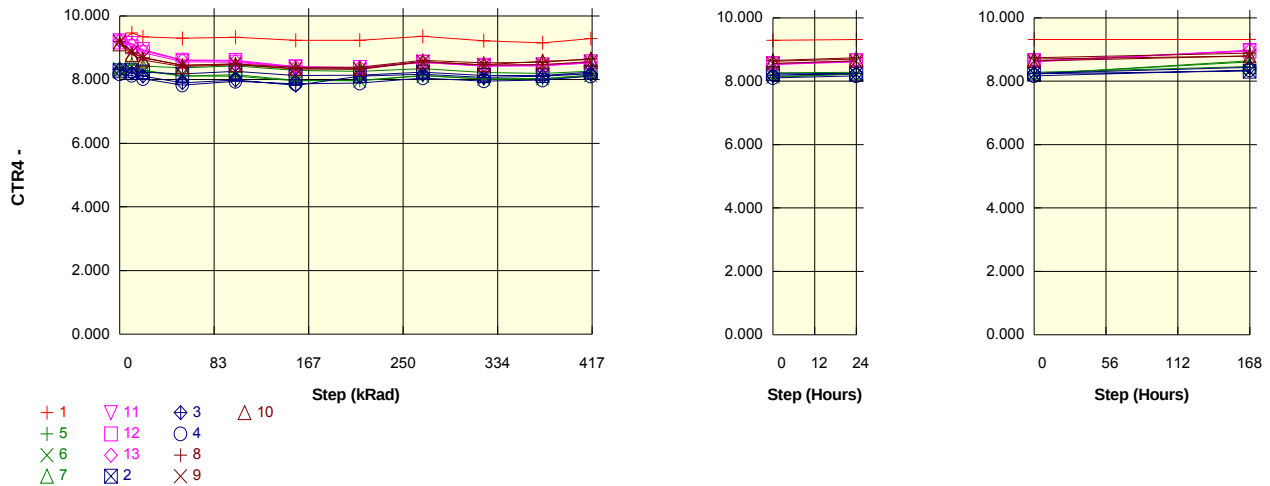
Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

Parameter : Current Transfert Ratio : CTR4

Test conditions : IF=10mA. VCE=40V

Unit :

No spec limit specified.



Measurements

CTR4	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	9.190	9.467	9.346	9.298	9.328	9.236	9.238	9.363	9.223	9.159	9.289	9.319	9.313
ON_PROTON samples													
5	8.315	8.365	8.279	8.112	8.110	7.965	7.976	8.127	8.013	8.022	8.123	8.235	8.605
6	8.333	8.396	8.301	8.114	8.153	7.977	7.968	8.122	8.028	8.038	8.143	8.225	8.649
7	8.335	8.462	8.425	8.369	8.434	8.293	8.261	8.344	8.223	8.198	8.269	8.283	8.467
Statistics													
Min	8.315	8.365	8.279	8.112	8.110	7.965	7.968	8.122	8.013	8.022	8.123	8.225	8.467
Max	8.335	8.462	8.425	8.369	8.434	8.293	8.261	8.344	8.223	8.198	8.269	8.283	8.649
Average	8.328	8.408	8.335	8.198	8.232	8.078	8.068	8.198	8.088	8.086	8.178	8.248	8.574
Sigma	0.009	0.041	0.064	0.121	0.144	0.152	0.136	0.103	0.096	0.080	0.065	0.025	0.077

Drift Calculation

CTR4	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_PROTON samples													
5	-	-715.9E-06	531.7E-06	3.0E-03	3.1E-03	5.3E-03	5.1E-03	2.8E-03	4.5E-03	4.4E-03	2.9E-03	1.2E-03	-4.0E-03
6	-	-894.8E-06	462.6E-06	3.2E-03	2.7E-03	5.4E-03	5.5E-03	3.1E-03	4.6E-03	4.4E-03	2.8E-03	1.6E-03	-4.4E-03
7	-	-1.8E-03	-1.3E-03	-490.3E-06	-1.4E-03	607.6E-06	1.1E-03	-135.2E-06	1.6E-03	2.0E-03	957.6E-06	747.4E-06	-1.9E-03
Average	-	-1.1E-03	-94.9E-06	1.9E-03	1.4E-03	3.8E-03	3.9E-03	1.9E-03	3.6E-03	3.6E-03	2.2E-03	1.2E-03	-3.4E-03
Sigma	-	477.5E-06	837.7E-06	1.7E-03	2.0E-03	2.2E-03	2.0E-03	1.5E-03	1.4E-03	1.1E-03	880.2E-06	335.8E-06	1.1E-03

Measurements

CTR4	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	9.190	9.467	9.346	9.298	9.328	9.236	9.238	9.363	9.223	9.159	9.289	9.319	9.313
ON_TID samples													
11	9.221	9.137	8.946	8.615	8.607	8.408	8.381	8.539	8.425	8.433	8.526	8.611	8.971
12	9.186	9.035	8.845	8.561	8.548	8.386	8.380	8.560	8.449	8.469	8.562	8.649	8.951
13	9.221	9.101	8.908	8.606	8.582	8.395	8.379	8.547	8.433	8.453	8.535	8.629	8.977
Statistics													
Min	9.186	9.035	8.845	8.561	8.548	8.386	8.379	8.539	8.425	8.433	8.526	8.611	8.951
Max	9.221	9.137	8.946	8.615	8.607	8.408	8.381	8.560	8.449	8.469	8.562	8.649	8.977
Average	9.209	9.091	8.900	8.594	8.579	8.396	8.380	8.549	8.436	8.452	8.541	8.630	8.966
Sigma	0.017	0.042	0.041	0.024	0.024	0.009	0.001	0.009	0.010	0.015	0.015	0.016	0.011

Drift Calculation

CTR4	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
ON_TID samples													
11	-	997.0E-06	3.3E-03	7.6E-03	7.7E-03	10.5E-03	10.9E-03	8.7E-03	10.2E-03	10.1E-03	8.8E-03	7.7E-03	3.0E-03
12	-	1.8E-03	4.2E-03	7.9E-03	8.1E-03	10.4E-03	10.5E-03	8.0E-03	9.5E-03	9.2E-03	7.9E-03	6.8E-03	2.9E-03
13	-	1.4E-03	3.8E-03	7.7E-03	8.1E-03	10.7E-03	10.9E-03	8.6E-03	10.1E-03	9.9E-03	8.7E-03	7.4E-03	3.0E-03
Average	-	1.4E-03	3.8E-03	7.8E-03	8.0E-03	10.5E-03	10.7E-03	8.4E-03	10.0E-03	9.7E-03	8.5E-03	7.3E-03	2.9E-03
Sigma	-	333.2E-06	349.5E-06	132.7E-06	170.4E-06	119.2E-06	198.5E-06	310.0E-06	333.6E-06	389.7E-06	401.7E-06	392.8E-06	68.7E-06

Measurements

Hirex Engineering	Total Dose Radiation Test Report										Ref.:	HRX/TID/1021	
	OLS449					Isolink Inc					Issue:	01	

CTR4	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	9.190	9.467	9.346	9.298	9.328	9.236	9.238	9.363	9.223	9.159	9.289	9.319	9.313
OFF_PROTON samples													
2	8.282	8.280	8.237	8.175	8.259	8.133	8.135	8.237	8.128	8.130	8.235	8.234	8.321
3	8.321	8.209	8.113	7.902	7.990	7.824	8.106	8.170	8.064	8.105	8.184	8.250	8.438
4	8.184	8.133	8.028	7.829	7.948	7.871	7.891	8.055	7.956	7.985	8.110	8.173	8.354
Statistics													
Min	8.184	8.133	8.028	7.829	7.948	7.824	7.891	8.055	7.956	7.985	8.110	8.173	8.321
Max	8.321	8.280	8.237	8.175	8.259	8.133	8.135	8.237	8.128	8.130	8.235	8.250	8.438
Average	8.262	8.208	8.126	7.969	8.066	7.943	8.044	8.154	8.050	8.073	8.176	8.219	8.371
Sigma	0.058	0.060	0.086	0.149	0.138	0.136	0.109	0.075	0.071	0.063	0.052	0.033	0.049

Drift Calculation

CTR4	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF_PROTON samples													
2	-	23.3E-06	662.6E-06	1.6E-03	333.3E-06	2.2E-03	2.2E-03	656.7E-06	2.3E-03	2.3E-03	686.2E-06	709.8E-06	-563.0E-06
3	-	1.6E-03	3.1E-03	6.4E-03	5.0E-03	7.6E-03	3.2E-03	2.2E-03	3.8E-03	3.2E-03	2.0E-03	1.0E-03	-1.7E-03
4	-	760.2E-06	2.4E-03	5.5E-03	3.6E-03	4.9E-03	4.5E-03	2.0E-03	3.5E-03	3.0E-03	1.1E-03	155.5E-06	-2.5E-03
Average	-	805.8E-06	2.0E-03	4.5E-03	3.0E-03	4.9E-03	3.3E-03	1.6E-03	3.2E-03	2.8E-03	1.3E-03	631.2E-06	-1.6E-03
Sigma	-	658.3E-06	1.0E-03	2.1E-03	2.0E-03	2.2E-03	963.7E-06	682.1E-06	659.2E-06	414.2E-06	548.1E-06	360.7E-06	790.6E-06

Measurements

CTR4	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
1_REF	9.190	9.467	9.346	9.298	9.328	9.236	9.238	9.363	9.223	9.159	9.289	9.319	9.313
OFF_TID samples													
8	9.208	8.850	8.688	8.452	8.493	8.387	8.395	8.609	8.526	8.545	8.659	8.745	8.887
9	9.193	8.861	8.693	8.451	8.491	8.345	8.319	8.568	8.456	8.471	8.560	8.637	8.796
10	9.125	8.790	8.617	8.413	8.468	8.340	8.346	8.562	8.468	8.579	8.633	8.700	8.802
Statistics													
Min	9.125	8.790	8.617	8.413	8.468	8.340	8.319	8.562	8.456	8.471	8.560	8.637	8.796
Max	9.208	8.861	8.693	8.452	8.493	8.387	8.395	8.609	8.526	8.579	8.659	8.745	8.887
Average	9.175	8.834	8.666	8.439	8.484	8.357	8.354	8.580	8.483	8.531	8.617	8.694	8.828
Sigma	0.036	0.031	0.035	0.018	0.012	0.021	0.031	0.021	0.031	0.045	0.042	0.044	0.042

Drift Calculation

CTR4	0 kRad	10.8 kRad	20.7 kRad	55.6 kRad	102.6 kRad	155.7 kRad	212.4 kRad	268.2 kRad	322.2 kRad	374.2 kRad	416.7 kRad	24 Hours	168 Hours
OFF_TID samples													
8	-	4.4E-03	6.5E-03	9.7E-03	9.1E-03	10.6E-03	10.5E-03	7.6E-03	8.7E-03	8.4E-03	6.9E-03	5.7E-03	3.9E-03
9	-	4.1E-03	6.3E-03	9.5E-03	9.0E-03	11.1E-03	11.4E-03	7.9E-03	9.5E-03	9.3E-03	8.1E-03	7.0E-03	4.9E-03
10	-	4.2E-03	6.5E-03	9.3E-03	8.5E-03	10.3E-03	10.2E-03	7.2E-03	8.5E-03	7.0E-03	6.2E-03	5.3E-03	4.0E-03
Average	-	4.2E-03	6.4E-03	9.5E-03	8.9E-03	10.7E-03	10.7E-03	7.6E-03	8.9E-03	8.2E-03	7.1E-03	6.0E-03	4.3E-03
Sigma	-	130.2E-06	101.8E-06	183.0E-06	273.4E-06	310.1E-06	514.9E-06	301.5E-06	430.2E-06	953.4E-06	751.5E-06	707.4E-06	450.8E-06

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

Appendix 1: Electrical measurements at Low and High temperatures

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

SN	Temp [°C]	IC(ON) [A]	VF [V]	CTR1	CTR2	CTR3	CTR4
spec min	-	7.00E-3	1.300				
spec max	-		1.900				
8	-35	20.17E-3	1.481	20.444	6.835	30.408	9.999
9	-35	19.14E-3	1.446	19.390	6.969	28.718	9.999
10	-35	20.16E-3	1.423	20.438	6.962	30.272	9.999
11	-35	19.82E-3	1.430	20.046	6.903	29.262	9.999
12	-35	21.23E-3	1.450	21.484	6.856	31.748	10.000
13	-35	20.25E-3	1.433	20.500	6.914	29.882	10.000

min	19.14E-3	1.423	19.390	6.835	28.718	9.999
max	21.23E-3	1.481	21.484	6.969	31.748	10.000
mean	20.13E-3	1.444	20.384	6.907	30.048	9.999

Table 3 : Initial measurements at Low temperature on TID Samples

SN	Temp [°C]	IC(ON) [A]	ICE(OFF)1 [A]	ICE(OFF)2 [A]	ICE(OFF)3 [A]	VF [V]	CTR1	CTR2	CTR3	CTR4
spec min	-	7.00E-3				1.10				
spec max	-			100.00E-6		1.60				
8	100	22.16E-3	2.61E-6	7.73E-6	14.40E-6	1.207	22.070	5.390	31.690	7.802
9	100	21.66E-3	523.40E-9	724.40E-9	957.60E-9	1.201	21.558	5.331	28.124	7.749
10	100	21.40E-3	1.39E-6	5.33E-6	10.56E-6	1.200	21.308	5.325	27.362	7.765
11	100	22.73E-3	115.80E-9	209.60E-9	353.60E-9	1.220	22.596	5.517	29.322	7.996
12	100	22.95E-3	165.12E-9	314.00E-9	440.20E-9	1.218	22.794	5.505	30.590	7.956
13	100	23.04E-3	154.76E-9	245.40E-9	320.00E-9	1.218	22.906	5.505	30.194	7.963

min	21.40E-3	115.80E-9	209.60E-9	320.00E-9	1.200	21.308	5.325	27.362	7.749
max	23.04E-3	2.61E-6	7.73E-6	14.40E-6	1.220	22.906	5.517	31.690	7.996
mean	22.33E-3	825.11E-9	2.43E-6	4.51E-6	1.211	22.205	5.429	29.547	7.872

Table 4 : Initial measurements at High temperature on TID Samples

Hirex Engineering	Total Dose Radiation Test Report		Ref.:	HRX/TID/1021
	OLS449	Isolink Inc	Issue:	01

SN	Temp [°C]	IC(ON) [A]	VF [V]	CTR1	CTR2	CTR3	CTR4
spec min	-35	7.00E-3	1.30				
spec max	-35		1.90				
8	-35	13.67E-3	1.476	13.98	6.34	19.16	9.85
9	-35	13.37E-3	1.422	13.43	6.32	17.47	9.62
10	-35	13.96E-3	1.391	14.24	6.34	19.15	9.53
11	-35	16.29E-3	1.429	16.44	6.55	22.24	10.03
12	-35	18.34E-3	1.471	18.55	6.70	26.88	9.48
13	-35	16.80E-3	1.441	16.96	6.61	23.29	9.60

min	8.09E-3	1.358	8.14	5.52	10.56	8.78
max	18.34E-3	1.476	18.55	6.70	26.88	10.03
moy	13.19E-3	1.425	13.31	6.14	17.83	9.49

Table 5 : Final measurements at Low temperature on TID Samples

SN	Temp [°C]	IC(ON) [A]	ICE(OFF)1 [A]	ICE(OFF)2 [A]	ICE(OFF)3 [A]	VF [V]	CTR1	CTR2	CTR3	CTR4
spec min	100	7.00E-3				1.10				
spec max	100			100.00E-6		1.60				
8	100	16.74E-3	261.74E-9	445.84E-9	740.78E-9	1.212	16.79	4.84	20.02	7.45
9	100	14.07E-3	279.30E-9	534.82E-9	946.74E-9	1.202	14.07	4.66	16.50	7.36
10	100	14.02E-3	73.54E-9	146.34E-9	272.94E-9	1.208	13.91	4.82	16.18	7.42
11	100	18.08E-3	778.06E-9	1.51E-6	2.87E-6	1.207	18.08	4.93	21.42	7.50
12	100	20.88E-3	1.41E-6	2.57E-6	4.52E-6	1.205	20.80	5.13	26.49	7.60
13	100	18.98E-3	757.38E-9	1.44E-6	2.67E-6	1.206	18.96	4.96	22.50	7.22

min	8.89E-3	73.54E-9	146.34E-9	272.94E-9	1.192	8.86	3.93	10.45	6.87
max	20.88E-3	3.10E-6	5.74E-6	9.04E-6	1.218	20.80	5.13	26.49	7.60
moy	14.06E-3	1.30E-6	2.48E-6	4.10E-6	1.206	14.05	4.53	16.80	7.26

Table 6 : Final measurements at High temperature on TID Samples