Single-Event-Effects Summary Report

IR RAD-Hard Gen-6 150V N-channel

SEE Qualifications of:

JANTXVR, F, G, H AND JANSR, F, G, H 2N7589U3 MIL-PRF-19500/746

JANTXVR, F, G, H AND JANSR, F, G, H 2N7590T3 MIL-PRF-19500/755

JANTXVR, F, G, H AND JANSR, F, G, H 2N7581U2 MIL-PRF-19500/760

JANTXVR, F, G, H AND JANSR, F, G, H 2N7582T1 MIL-PRF-19500/753

IRHNJ67134, IRHNJ63134, IRHNJ66134, IRHNJ68134 SCV AND SCS

IRHYS67134CM, IRHYS63134CM, IRHYS66134CM, IRHYS68134CM SCV AND SCS

IRHNA67164, IRHNA63164, IRHNA66164, IRHNA68164 SCV AND SCS

IRHMS67164, IRHMS63164, IRHMS66164, IRHMS68164 SCV AND SCS

International IOR Rectifier

SEE Summary Report - RH, G6, N, MR, 150V

Fab-2 Wafer Lot: Q770854D
SEE Test Date: April 18th-20th 2009
SEE Test Facility: Texas A&M Cyclotron

Ion	Kr	Xe	Au
LET	37.1	59	90.1
Energy	411	825	1472
Range	49.9	65.9	80
Run Numbers	153-156	279-287	486-493

IR Fab-5 Specs

VDS Bias (Volts)

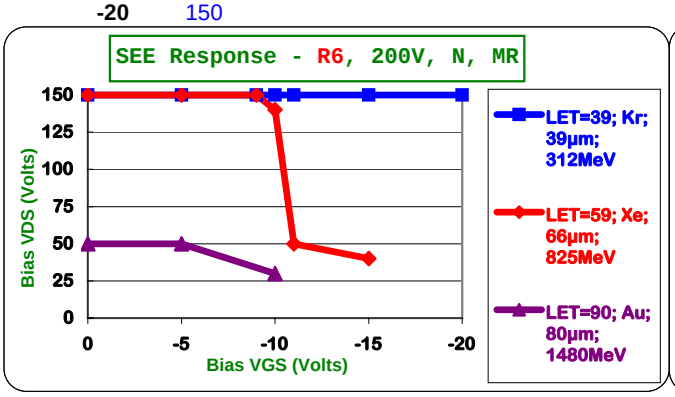
VGS Bias	LET=39; Kr; 39µm; 312MeV	LET=59; Xe; 66µm; 825MeV
0	150	150
-5	150	150
-9	150	150
-10	150	140
-11	150	50
-15	150	40
-20	150	

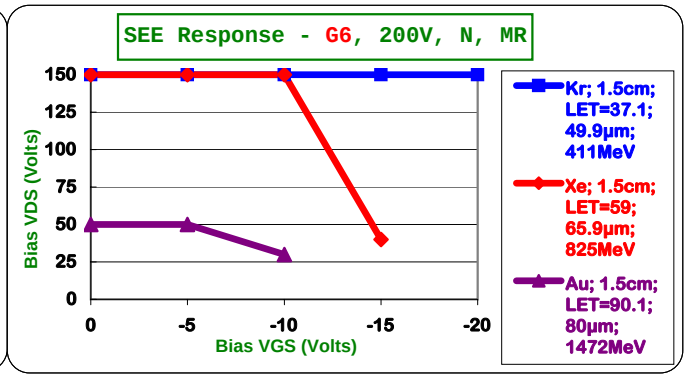
VGS Bias	LET=90; Au; 80µm; 1480MeV
0	50
-5	50
-10	30
-15	
-20	

IR Fab-2 Qual to Simplified Specs

VDS Bias (Volts)

VGS Bias	Kr; 1.5cm; LET=37.1; 49.9µm; 411MeV	Xe; 1.5cm; LET=59; 65.9µm; 825MeV	Au; 1.5cm; LET=90.1; 80µm; 1472MeV
0	150	150	50
-5	150	150	**50**
-10	150	**150**	**30**
-15	150	**40**	
-20	**150**		





Test Date	Run No.	Ion	DUT Id	Socket	Wafer	Serial	Batch	VGS Volts	VDS Volts	
4/18/2009	153	Kr	R1	13	20	1	8	-20	150	CurvePoint
4/18/2009	154	Kr	R2	14	20	2	8	-20	150	CurvePoint
4/18/2009	155	Kr	R3	15	20	3	8	-20	150	CurvePoint
4/18/2009	156	Kr	R7	16	20	7	8	-20	150	CurvePoint
4/18/2009	279	Xe	R9	10	20	9	16	-10	140	
4/18/2009	280	Xe	R9	10	20	9	16	-10	150	CurvePoint-1
4/18/2009	281	Xe	R10	11	20	10	16	-10	150	CurvePoint-1
4/18/2009	282	Xe	R11	12	21	11	16	-10	150	CurvePoint-1
4/18/2009	283	Xe	R12	13	21	12	16	-10	150	CurvePoint-1
4/18/2009	284	Xe	R13	14	21	13	16	-15	40	CurvePoint-2
4/18/2009	285	Xe	R14	15	21	14	16	-15	40	CurvePoint-2
4/18/2009	286	Xe	R15	16	21	15	16	-15	40	CurvePoint-2
4/18/2009	287	Xe	R16	17	21	16	16	-15	40	CurvePoint-2
4/20/2009	486	Au	R19	10	21	19	28	-5	50	CurvePoint-1
4/20/2009	487	Au	R20	11	22	21	28	-5	50	CurvePoint-1
4/20/2009	488	Au	R21	12	21	17	28	-5	50	CurvePoint-1
4/20/2009	489	Au	R22	13	22	22	28	-5	50	CurvePoint-1
4/20/2009	490	Au	R23	14	22	23	28	-10	30	CurvePoint-2
4/20/2009	491	Au	R24	15	22	24	28	-10	30	CurvePoint-2
4/20/2009	492	Au	R25	16	22	25	28	-10	30	CurvePoint-2
4/20/2009	493	Au	R26	17	22	26	28	-10	30	CurvePoint-2

International IOR Rectifier

SEE Summary Report - RH, G6, N, MR, 150V

RadHard MOSFET - G6, Size 6, 150V, N-channel

	BATCH8	TAMU	IRHC67164	PRE	4/18/2009	4:41 PM	Kr	
			(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)		
	SOCKET	BIN	-20.00E+0V	20.00E+0V	120.00E+0V	1.00E-3A	DATE	TIME
	13	PASS	5.53E-09	7.52E-09	3.59E-07	166.21	4/18/2009	4:42:21 PM
	14	PASS	7.19E-09	9.73E-09	3.31E-07	166.21	4/18/2009	4:42:26 PM
	15	PASS	1.324E-08	1.735E-08	4.11E-07	166.24	4/18/2009	4:42:32 PM
	16	FAIL	1.267E-08	1.929E-08	0.005	48.44	4/18/2009	4:42:37 PM
	17	FAIL	1.897E-08	3.169E-08	0.000147	150.68	4/18/2009	4:42:43 PM
	18	PASS	1.808E-08	2.845E-08	4.47E-07	166.35	4/18/2009	4:42:49 PM

	BATCH8	TAMU	IRHC67164	PRE	4/18/2009	4:51 PM	Kr	
			(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)		
	SOCKET	BIN	-20.00E+0V	20.00E+0V	120.00E+0V	1.00E-3A	DATE	TIME
Re-Test	13	PASS	6.27E-09	8.91E-09	3.41E-07	166.14	4/18/2009	4:53:06 PM
Re-Test	14	PASS	9.19E-09	1.178E-08	3.26E-07	166.15	4/18/2009	4:53:11 PM
Re-Test	15	PASS	1.617E-08	2.071E-08	4.41E-07	166.18	4/18/2009	4:53:16 PM
Re-Test New*	16	PASS	1.435E-08	2.05E-08	3.26E-07	166.59	4/18/2009	4:53:21 PM
Re-Test New*	17	PASS	1.932E-08	3.281E-08	4.71E-07	166.54	4/18/2009	4:53:26 PM
Re-Test	18	PASS	1.967E-08	3.103E-08	4.75E-07	166.28	4/18/2009	4:53:32 PM

	BATCH8	TAMU	IRHC67164	POST	4/18/2009	5:14 PM	Kr			
			(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)				
	SOCKET	BIN	-20.00E+0V	20.00E+0V	120.00E+0V	1.00E-3A	DATE	TIME	Ion, Insitu & SEE Results	
R1	13	**PASS**	7.83E-09	1.051E-08	3.37E-07	166.1	4/18/2009	5:15:50 PM	**Kr**	**Pass -20V / 150V**
R2	14	**PASS**	1.179E-08	1.447E-08	2.93E-07	166.11	4/18/2009	5:15:56 PM	**Kr**	**Pass -20V / 150V**
R3	15	**PASS**	1.935E-08	1.335E-08	3.12E-07	166.14	4/18/2009	5:16:02 PM	**Kr**	**Pass -20V / 150V**
R7*	16	**PASS**	1.281E-08	2.283E-08	2.16E-07	166.46	4/18/2009	5:16:07 PM	**Kr**	**Pass -20V / 150V**
R8*	17	PASS	1.927E-08	3.454E-08	4.59E-07	166.42	4/18/2009	5:16:12 PM	**Kr**	**Un-Tested**
R6	18	PASS	2.047E-08	3.345E-08	4.46E-07	166.26	4/18/2009	5:16:18 PM	**Kr**	**Un-Tested**

	BATCH16	TAMU	IRHC67164	PRE	4/18/2009	11:17 PM	Xe	
			(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)		
	SOCKET	BIN	-20.00E+0V	20.00E+0V	120.00E+0V	1.00E-3A	DATE	TIME
	10	PASS	5.78E-09	3.78E-09	2E-07	166.84	4/18/2009	11:19:13 PM
	11	PASS	4.48E-09	3E-09	3.34E-07	167.01	4/18/2009	11:19:21 PM
	12	PASS	4.75E-09	2.64E-09	1.89E-07	166.39	4/18/2009	11:19:29 PM
	13	PASS	3.885E-08	5.6E-09	1.54E-07	166.86	4/18/2009	11:19:39 PM
	14	PASS	7.54E-09	5.5E-09	1.77E-07	166.5	4/18/2009	11:19:47 PM
	15	PASS	1.312E-08	9.9E-09	2.19E-07	166.28	4/18/2009	11:19:57 PM
	16	PASS	1.368E-08	8.16E-09	2.25E-07	166.07	4/18/2009	11:20:06 PM
	17	PASS	4.04E-08	3.124E-08	3.12E-07	167.11	4/18/2009	11:20:14 PM
Re-Test New*	18	PASS	1.969E-08	1.272E-08	2.3E-07	166.56	4/18/2009	11:20:23 PM

	BATCH16	TAMU	IRHC67164	POST	4/18/2009	11:47 PM	Xe			
			(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)				
	SOCKET	BIN	-20.00E+0V	20.00E+0V	120.00E+0V	1.00E-3A	DATE	TIME	Ion, Insitu & SEE Results	
R9	10	**PASS**	6.65E-09	4.51E-09	2.19E-07	166.73	4/18/2009	11:49:45 PM	**Xe**	**Pass -10V / 150V**
R10	11	**PASS**	5.93E-09	4.1E-09	2.51E-07	166.82	4/18/2009	11:49:54 PM	**Xe**	**Pass -10V / 150V**
R11	12	**PASS**	5.03E-09	2.39E-09	2.51E-07	166.23	4/18/2009	11:50:03 PM	**Xe**	**Pass -10V / 150V**
R12	13	**PASS**	7.28E-09	5.95E-09	1.66E-07	166.72	4/18/2009	11:50:11 PM	**Xe**	**Pass -10V / 150V**
R13	14	**PASS**	9.42E-09	7.51E-09	1.62E-07	166.35	4/18/2009	11:50:20 PM	**Xe**	**Pass -15V / 40V**
R14	15	**PASS**	1.546E-08	1.189E-08	2.01E-07	166.14	4/18/2009	11:50:30 PM	**Xe**	**Pass -15V / 40V**
R15	16	**PASS**	1.418E-08	8.74E-09	1.82E-07	165.87	4/18/2009	11:50:38 PM	**Xe**	**Pass -15V / 40V**
R16	17	**PASS**	3.736E-08	3.156E-08	1.71E-07	166.98	4/18/2009	11:50:47 PM	**Xe**	**Pass -15V / 40V**
R18*	18	PASS	2.055E-08	1.353E-08	2.38E-07	166.45	4/18/2009	11:50:56 PM	**Xe**	**Un-Tested**

International IOR Rectifier

SEE Summary Report - RH, G6, N, MR, 150V

	BATCH28	TAMU	IRHC67164	PRE	4/20/2009	2:03 AM	Au			
			(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)				
	SOCKET	BIN	-2.00E+01V	2.00E+01V	1.20E+02V	1.00E-03A	DATE	TIME		
	10	PASS	3.88E-09	1.92E-09	1.88E-07	167.06	4/20/2009	2:05:05 AM		
	11	PASS	3.55E-09	1.73E-09	2.03E-07	166.38	4/20/2009	2:05:13 AM		
	12	PASS	3.56E-09	1.84E-09	1.85E-07	166.21	4/20/2009	2:05:22 AM		
	13	PASS	3.23E-09	2.06E-09	1.63E-07	166.39	4/20/2009	2:05:30 AM		
	14	PASS	2.19E-09	1.77E-09	1.87E-07	166.59	4/20/2009	2:05:39 AM		
	15	PASS	4.67E-09	2.67E-09	2.17E-07	166.39	4/20/2009	2:05:48 AM		
	16	PASS	5.7E-09	3.61E-09	2.28E-07	166.39	4/20/2009	2:05:56 AM		
	17	PASS	7.2E-09	4.89E-09	2E-07	166.47	4/20/2009	2:06:05 AM		
	18	PASS	6.6E-09	3.84E-09	2.06E-07	166.13	4/20/2009	2:06:13 AM		

	BATCH28	TAMU	IRHC67164	POST	4/20/2009	2:25 AM	Au			
			(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)				
	SOCKET	BIN	-2.00E+01V	2.00E+01V	1.20E+02V	1.00E-03A	DATE	TIME	Ion, Insitu & SEE Results	
R19	10	PASS	3.45E-09	1.93E-09	2.23E-07	166.95	4/20/2009	2:26:39 AM	Au	Pass -5V/50V
R20	11	PASS	4.31E-09	1.26E-09	2.58E-07	166.27	4/20/2009	2:26:47 AM	Au	Pass -5V/50V
R21	12	PASS	5.45E-09	1.66E-09	2.61E-07	166.1	4/20/2009	2:26:55 AM	Au	Pass -5V/50V
R22	13	PASS	3.11E-09	1.91E-09	2.02E-07	166.25	4/20/2009	2:27:04 AM	Au	Pass -5V/50V
R23	14	PASS	3.89E-09	1.93E-09	1.82E-07	166.43	4/20/2009	2:27:12 AM	Au	Pass -10V/30V
R24	15	PASS	4.89E-09	2.9E-09	2.38E-07	166.26	4/20/2009	2:27:26 AM	Au	Pass -10V/30V
R25	16	PASS	5.63E-09	3.78E-09	1.88E-07	166.27	4/20/2009	2:27:35 AM	Au	Pass -10V/30V
R26	17	PASS	9.39E-09	5.14E-09	8.82E-08	166.36	4/20/2009	2:27:44 AM	Au	Pass -10V/30V
R27	18	PASS	6.86E-09	4.04E-09	1.88E-07	166.03	4/20/2009	2:27:52 AM	Au	Un-Tested

VGS Bias	LET=39±5%; 50µm±5%; 410MeV±5%	LET=61±5%; 66µm±7.5%; 825MeV±5%	LET=90±5%; 80µm±5%; 1470MeV±5%
0	150	150	50
-5	150	150	50
-10	150	150	30
-15	150	40	
-20	150		

Final QPL Specs

for 2N7589U3/746 (IRHNJ67134)
for 2N7590T3/755 (IRHYS67134CM)
for 2N7581U2/760 (IRHNA67164)
for 2N7582T1/753 (IRHMS67164)