



# Single-Event-Effects Summary Report

## IR RAD-Hard Gen-5 250V N-channel

### *SEE Qualifications of:*

JANTXVR, F, G, H AND JANSR, F, G, H 2N7474U2 MIL-PRF-19500/684

JANTXVR, F, G, H AND JANSR, F, G, H 2N7477T1 MIL-PRF-19500/685

JANTXVR, F, G, H AND JANSR, F, G, H 2N7487U3 MIL-PRF-19500/704

JANTXVR, F, G, H AND JANSR, F, G, H 2N7490T3 MIL-PRF-19500/705

JANTXVR, F, G, H AND JANSR, F, G, H 2N7499T2 MIL-PRF-19500/706

JANTXVR, F, G, H AND JANSR, F, G, H 2N7502U5 MIL-PRF-19500/707

IRHNA57264SE, IRHNA53264SE, IRHNA56264SE, IRHNA58264SE SCV AND SCS

IRHMS57264SE, IRHMS53264SE, IRHMS56264SE, IRHMS58264SE SCV AND SCS

IRHNJ57234SE, IRHNJ53234SE, IRHNJ56234SE, IRHNJ58234SE SCV AND SCS

IRHY57234CMSE, IRHY53234CMSE, IRHY56234CMSE, IRHY58234CMSE SCV AND SCS

IRHF57234SE, IRHF53234SE, IRHF56234SE, IRHF58234SE SCV AND SCS

IRHE57234SE, IRHE53234SE, IRHE56234SE, IRHES58234SE SCV AND SCS

# SEE Summary Report - RH, G5, N, SE, 250V



Fab-2 Wafer Lot: Q781006 Split C  
SEE Test Date: April 7th 2009  
SEE Test Facility: Brookhaven Accelerator

	Br	I	Au
Ion			
LET	36.93	59.72	81.43
Energy	298	320	332.9
Range	38.2	31	27.5
Run Numbers	192,193&203	162-167	101-115

## IR Fab-5 Specs

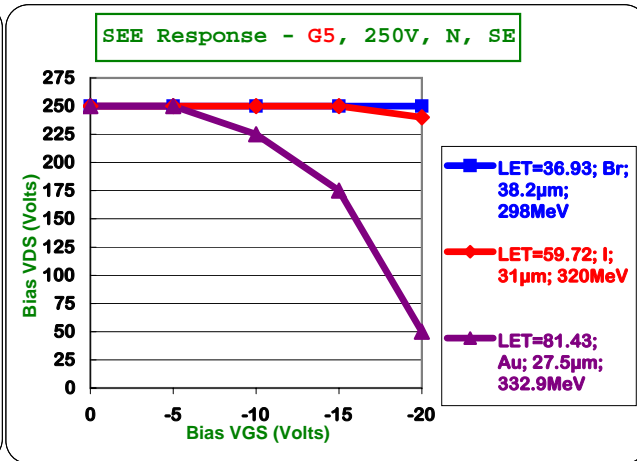
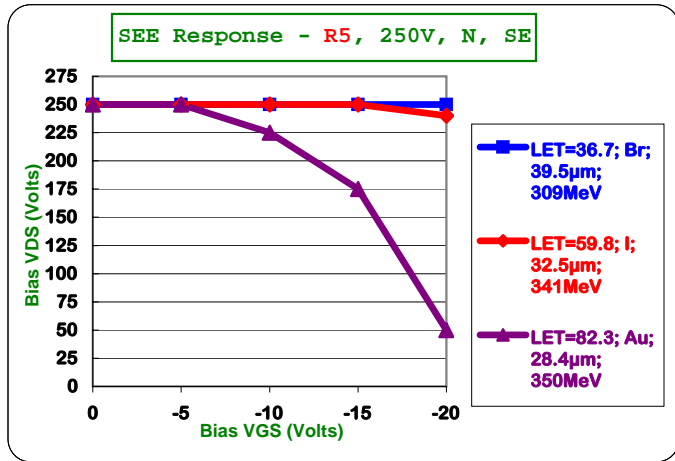
VDS Bias (Volts)

VGS Bias	LET=36.7; Br; 39.5µm; 309MeV	LET=59.8; I; 32.5µm; 341MeV	LET=82.3; Au; 28.4µm; 350MeV
0	250	250	250
-5	250	250	250
-10	250	250	225
-15	250	250	175
-20	250	240	50

## IR Fab-2 Qual to Specs

VDS Bias (Volts)

VGS Bias	LET=36.93; Br; 38.2µm; 298MeV	LET=59.72 ; I; 31µm; 320MeV	LET=81.43; Au; 27.5µm; 332.9MeV
0	250	250	250
-5	250	250	250
-10	250	250	225
-15	250	250	175
-20	250	240	50



Run No.	Ion	DUT Id	Socket	Wafer	Serial	Batch	VGS Volts	VDS Volts	Pass/Fail Blank=Pass
192	Br-81	I40	8	11	40	13	-20	250	Curve-Point
193	Br-81	I41	9	18	41	13	-20	250	Curve-Point
203	Br-81	I37	5	17	37	14	-20	250	Curve-Point
162	I-127	I42	1	18	42	11	-20	240	Curve-Point 1
163	I-127	I43	2	20	43	11	-20	240	Curve-Point 1
164	I-127	I44	3	20	44	11	-20	240	Curve-Point 1
165	I-127	I45	4	20	45	11	-15	250	Curve-Point 2
166	I-127	I46	5	20	46	11	-15	250	Curve-Point 2
167	I-127	I47	6	20	47	11	-15	250	Curve-Point 2
101	Au-197	I11	1	14	1	7	-20	50	Curve-Point 1
102	Au-197	I2	2	14	2	7	-20	50	Curve-Point 1
103	Au-197	I3	3	14	3	7	-20	50	Curve-Point 1
104	Au-197	I4	4	14	4	7	-15	175	Curve-Point 2
105	Au-197	I5	5	14	5	7	-15	175	Curve-Point 2
106	Au-197	I6	6	14	6	7	-15	175	Curve-Point 2
107	Au-197	I7	7	14	7	7	-10	225	Curve-Point 3
108	Au-197	I8	8	14	8	7	-10	225	Curve-Point 3
109	Au-197	I9	9	14	9	7	-10	225	Curve-Point 3
110	Au-197	I10	10	14	10	7	-5	250	Curve-Point 4
111	Au-197	I11	11	15	11	7	-5	250	Curve-Point 4
112	Au-197	I13	13	15	12	7	-5	250	Curve-Point 4
113	Au-197	I14	14	15	13	7	0	250	Curve-Point 5
114	Au-197	I15	15	15	14	7	0	250	Curve-Point 5
115	Au-197	I16	16	15	15	7	0	250	Curve-Point 5



## RadHard MOSFET - G5, Hex 3, 250V, N-channel, SE

BATCH7		BNL	IRHC57234	PRE	4/7/2009	1:20:35 PM	Au		
SOCKET	BIN	(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)	DATE	TIME		
	1	PASS	4.94E-09	1.632E-08	5.05E-07	282.71	4/7/2009	1:20:42 PM	
	2	PASS	6.04E-09	1.691E-08	2.13E-07	282.83	4/7/2009	1:21:05 PM	
	3	PASS	6.3E-09	1.885E-08	2.23E-07	282.9	4/7/2009	1:21:10 PM	
	4	PASS	6.43E-09	1.92E-08	1.91E-07	282.67	4/7/2009	1:21:16 PM	
	5	PASS	6.43E-09	1.877E-08	2.33E-07	281.74	4/7/2009	1:21:21 PM	
	6	PASS	5.67E-09	1.903E-08	2.11E-07	282.58	4/7/2009	1:21:26 PM	
	7	PASS	3.74E-09	1.811E-08	1.97E-07	282.77	4/7/2009	1:21:31 PM	
	8	PASS	6.81E-09	1.849E-08	2.22E-07	282.6	4/7/2009	1:21:37 PM	
	9	PASS	6.63E-09	1.756E-08	2.05E-07	282.67	4/7/2009	1:21:43 PM	
	10	PASS	5.61E-09	1.706E-08	2.18E-07	282.43	4/7/2009	1:21:49 PM	
	11	PASS	5.21E-09	1.608E-08	1.94E-07	286.15	4/7/2009	1:21:57 PM	
	12	PASS	8.12E-09	1.93E-08	2.01E-07	285.97	4/7/2009	1:22:02 PM	
	13	PASS	5.92E-09	1.566E-08	1.95E-07	286.49	4/7/2009	1:22:08 PM	
	14	PASS	6.17E-09	1.625E-08	1.89E-07	287	4/7/2009	1:22:14 PM	
	15	PASS	6.68E-09	1.681E-08	2.22E-07	286.61	4/7/2009	1:22:21 PM	
	16	PASS	8.54E-09	1.84E-08	2.13E-07	287.12	4/7/2009	1:22:27 PM	
	17	FAIL	8.65E-09	1.928E-08	0.005	1.15	4/7/2009	1:22:32 PM	
	18	PASS	7.12E-09	1.693E-08	2.25E-07	288.7	4/7/2009	1:22:40 PM	
	17	FAIL	9.7E-09	2.067E-08	0.005	3.61	4/7/2009	1:22:51 PM	

BATCH7		BNL	IRHC57234	POST	4/7/2009	1:42:51 PM	Au		
SOCKET	BIN	(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)	DATE	TIME		
I1	1	PASS	5.98E-09	2.343E-08	5.96E-07	285.83	4/7/2009	1:42:58 PM	Au Pass -20V / 50V
I2	2	PASS	6.13E-09	1.766E-08	2.41E-07	285.83	4/7/2009	1:43:04 PM	Au Pass -20V / 50V
I3	3	PASS	6.46E-09	1.836E-08	2.47E-07	285.42	4/7/2009	1:43:09 PM	Au Pass -20V / 50V
I4	4	PASS	8.47E-09	1.759E-08	2.49E-07	285.49	4/7/2009	1:43:16 PM	Au Pass -15V / 175V
I5	5	PASS	8.48E-09	1.799E-08	2.66E-07	284.37	4/7/2009	1:43:21 PM	Au Pass -15V / 175V
I6	6	PASS	7.11E-09	1.763E-08	2.45E-07	285.88	4/7/2009	1:43:26 PM	Au Pass -15V / 175V
I7	7	PASS	5.84E-09	1.796E-08	2.42E-07	286.64	4/7/2009	1:43:31 PM	Au Pass -10V / 225V
I8	8	PASS	6.36E-09	1.919E-08	2.53E-07	285.36	4/7/2009	1:43:37 PM	Au Pass -10V / 225V
I9	9	PASS	6.33E-09	1.892E-08	2.53E-07	284.65	4/7/2009	1:43:42 PM	Au Pass -10V / 225V
I10	10	PASS	6.82E-09	1.562E-08	2.66E-07	284.52	4/7/2009	1:43:49 PM	Au Pass -5V / 250V
I11	11	PASS	6.12E-09	1.495E-08	2.46E-07	289.29	4/7/2009	1:43:59 PM	Au Pass -5V / 250V
	12	PASS	6.27E-09	1.483E-08	3.05E-07	290.05	4/7/2009	1:44:05 PM	Au INVALID
I13	13	PASS	5.15E-09	1.484E-08	2.33E-07	295.32	4/7/2009	1:44:12 PM	Au Pass -5V / 250V
I14	14	PASS	5.26E-09	1.503E-08	2.39E-07	295	4/7/2009	1:44:18 PM	Au Pass 0V / 250V
I15	15	PASS	6.26E-09	1.61E-08	2.39E-07	292.97	4/7/2009	1:44:25 PM	Au Pass 0V / 250V
I16	16	PASS	6.14E-09	1.762E-08	1.92E-07	291.49	4/7/2009	1:44:30 PM	Au Pass 0V / 250V
	17	FAIL	1.097E-08	1.847E-08	0.005	18.71	4/7/2009	1:44:35 PM	Au UN-USED
	18	PASS	5.44E-09	1.739E-08	2.19E-07	293.31	4/7/2009	1:44:41 PM	Au UN-USED

BATCH11		BNL	IRHC57234	PRE	4/7/2009	3:43:15 PM	I		
SOCKET	BIN	(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)	DATE	TIME		
	1	PASS	4.53E-09	9.38E-09	2.69E-07	284.94	4/7/2009	3:43:24 PM	
	2	PASS	4.69E-09	9.66E-09	6.56E-08	285.03	4/7/2009	3:43:31 PM	
	3	PASS	5.02E-09	1.084E-08	6.83E-08	283.51	4/7/2009	3:43:38 PM	
	4	PASS	5.29E-09	1.045E-08	7.92E-08	283.29	4/7/2009	3:43:44 PM	
	5	PASS	4.62E-09	1.087E-08	5.94E-08	284.06	4/7/2009	3:43:50 PM	
	6	PASS	4.81E-09	1.045E-08	8.71E-08	284.18	4/7/2009	3:43:56 PM	
	7	PASS	4.28E-09	9.83E-09	7.98E-08	284.75	4/7/2009	3:44:03 PM	
	8	PASS	4.55E-09	1.066E-08	7.68E-08	284.12	4/7/2009	3:44:09 PM	
	9	PASS	4.7E-09	1.059E-08	7.31E-08	284.31	4/7/2009	3:44:15 PM	

# SEE Summary Report - RH, G5, N, SE, 250V



BATCH11		BNL	IRHC57234	POST	4/7/2009	3:56:57 PM	I		
SOCKET		BIN	(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)	DATE	TIME	
I42	1	PASS	4.09E-09	9.18E-09	3.23E-07	291.03	4/7/2009	3:57:06 PM	I Pass -20V / 240V
I43	2	PASS	4.62E-09	9.93E-09	9.84E-08	288.84	4/7/2009	3:57:12 PM	I Pass -20V / 240V
I44	3	PASS	4.72E-09	1.07E-08	8.55E-08	285.56	4/7/2009	3:57:18 PM	I Pass -20V / 240V
I45	4	PASS	4.81E-09	1.088E-08	7.85E-08	285.62	4/7/2009	3:57:24 PM	I Pass -15V / 250V
I46	5	PASS	4.62E-09	1.09E-08	8.33E-08	286.34	4/7/2009	3:57:31 PM	I Pass -15V / 250V
I47	6	PASS	3.98E-09	1.115E-08	9.23E-08	287.15	4/7/2009	3:57:37 PM	I Pass -15V / 250V
I48	7	PASS	4.51E-09	1.033E-08	8.69E-08	291.24	4/7/2009	3:57:43 PM	I UN-USED
I49	8	PASS	4.98E-09	1.023E-08	5.34E-08	289.15	4/7/2009	3:57:49 PM	I UN-USED
I50	9	PASS	5.25E-09	1.022E-08	7.45E-08	287.19	4/7/2009	3:57:55 PM	I UN-USED
BATCH13		BNL	IRHC57234	PRE	4/7/2009	4:42:53 PM	Br		
SOCKET		BIN	(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)	DATE	TIME	
	7	FAIL	4.39E-09	7.86E-09	0.005	3.81	4/7/2009	4:43:02 PM	
	8	PASS	4.77E-09	8.24E-09	3.56E-08	284.99	4/7/2009	4:43:11 PM	
	9	PASS	4.91E-09	8.42E-09	2.85E-08	287.56	4/7/2009	4:43:19 PM	
BATCH13		BNL	IRHC57234	PRE	4/7/2009	4:46:46 PM	Br		
SOCKET		BIN	(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)	DATE	TIME	
	7	FAIL	4.23E-09	7.7E-09	0.005	3.87	4/7/2009	4:46:54 PM	
BATCH13		BNL	IRHC57234	POST	4/7/2009	5:24:44 PM	Br		
SOCKET		BIN	(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)	DATE	TIME	
I39	7	FAIL	3.81E-09	6.93E-09	0.005	4.1	4/7/2009	5:24:52 PM	Br UN-USED
I40	8	PASS	4.58E-09	7.58E-09	5.5E-08	287.85	4/7/2009	5:25:00 PM	Br Pass -20V / 250V
I41	9	PASS	3.98E-09	7.67E-09	5.13E-08	289.87	4/7/2009	5:25:07 PM	Br Pass -20V / 250V
BATCH14		BNL	IRHC57234	PRE	4/7/2009	5:35:14 PM	Br		
SOCKET		BIN	(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)	DATE	TIME	
	5	PASS	4.91E-09	8.24E-09	4.86E-08	287.53	4/7/2009	5:35:30 PM	
	6	PASS	5.04E-09	9.21E-09	6.72E-08	284.19	4/7/2009	5:35:37 PM	
BATCH14		BNL	IRHC57234	POST	4/7/2009	6:12:37 PM	Br		
SOCKET		BIN	(-)IGSS (A)	(+)IGSS (A)	IDSS (A)	BVR (V)	DATE	TIME	
I37	5	PASS	6.75E-09	5.18E-09	4.15E-08	289.75	4/7/2009	6:12:47 PM	Br Pass -20V / 250V
I38	6	PASS	4.13E-09	7.1E-09	3.25E-07	284.14	4/7/2009	6:12:55 PM	Br UN-USED



## Final QPL Specs

for **2N7502U5/707** (IRHF57234SE) and **2N7499T2/706** (IRHE57234SE)  
 for **2N7487U3/704** (IRHNJ57234SE) and **2N7490T3/705** (IRHY57234CMSE)  
 for **2N7474U2/684** (IRHNA57264SE) and **2N7477T1/685** (IRHMS57264SE)

VGS (Volts)	LET=38±5%; 38µm±7.5%; 300MeV±7.5%	LET=61±5%; 31µm±10%; 330MeV±7.5%	LET=84±5%; 28µm±7.5%; 350MeV±10%
0	250	250	250
-5	250	250	250
-10	250	250	225
-15	250	250	175
-20	250	240	50

