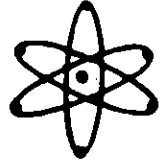


ICS RADIATION TECHNOLOGIES, INC.



8416 FLORENCE AVENUE • SUITE 207 • DOWNEY, CALIFORNIA 90240-3949 U.S.A.

ICS Radiation Test Results

IRHNJ57130 100V, N-CHANNEL POWER MOSFET

INTERNATIONAL RECTIFIER CORPORATION

=====

.....
.
.
DEVICE TYPE: IRHNJ57130 100V, N-CHANNEL POWER MOSFET (IRC).
RADIATION SOURCE: BREL FX-75, E-Beam mode
.
.
D/C CIRC 01 || PACKAGE TO-3 || LOT# ER12942
LOG# 975 || TEST DATE 07/10/01 || RTP# 389
.
.
Test Conductor: Armando R.V. Dantas
Test Administrator: Michael K. Gauthier
.....

ICS RADIATION TECHNOLOGIES, INC.
8416 Florence Ave, Suite 207
Downey, CA 90240-3949

TEL: 800-297-8688
TEL: 562-923-1837
FAX: 562-923-3609

INTERNET e-mail: support@icsrad.com
www.icsrad.com

I C S Radiation Test Results
IRHNJ57130 100V, N-CHANNEL POWER MOSFET (IRC)

Ipp A

AVG DOSE RATE	rad(Si)/sec	INITIAL	1.44E+11	1.15E+12
AVG PULSE WIDTH	seconds		3.68E-08	3.61E-08
----- S/N -----				

14	0.00E+00	1.59E+00	1.65E+01
23	0.00E+00	1.59E+00	1.67E+01
26	0.00E+00	1.61E+00	1.65E+01
32	0.00E+00	1.65E+00	1.65E+01
34	0.00E+00	1.59E+00	1.63E+01
37	0.00E+00	1.61E+00	1.65E+01
39	0.00E+00	1.57E+00	1.63E+01
41	0.00E+00	1.57E+00	1.67E+01
42	0.00E+00	1.57E+00	1.63E+01
46	0.00E+00	1.63E+00	1.65E+01
MINIMUM	0.00E+00	1.57E+00	1.63E+01
MEAN	0.00E+00	1.60E+00	1.65E+01
MAXIMUM	0.00E+00	1.65E+00	1.67E+01
+P 50/90	0.00E+00	1.61E+00	1.65E+01
-P 50/90	0.00E+00	1.59E+00	1.64E+01
+P 99/90	0.00E+00	1.69E+00	1.70E+01
-P 99/90	0.00E+00	1.50E+00	1.60E+01
SIGMA	0.00E+00	2.77E-02	1.52E-01

CIRCUIT INDUCTANCE (L1) 1uH 20uH

MAX VDSS Applied during pulse = 80 Volts

```

.....
.
.   DEVICE TYPE  IRHNJ57130 100V, PWR N-MOSFET (IRC).
.   RADIATION SOURCE  BREL FX-75, E-Beam mode
.
.   D/C  CIRC 01|| PACKAGE  TO-3    || LOT#  ER12942
.   LOG# 975  || TEST DATE 07/10/01|| RTP# 389
.
.....
I C S RADIATION TECHNOLOGIES, INC.

```

I C S Radiation Test Results
IRHNJ57130 100V, N-CHANNEL POWER MOSFET (IRC)

dI/dT A/usec
=====

AVG DOSE RATE rad(Si)/sec	INITIAL	1.44E+11	1.15E+12
AVG PULSE WIDTH seconds		3.68E-08	3.61E-08

----- S/N -----			
14	0.00E+00	3.40E+00	5.03E+01
23	0.00E+00	3.43E+00	4.97E+01
26	0.00E+00	3.47E+00	4.91E+01
32	0.00E+00	3.45E+00	4.91E+01
34	0.00E+00	3.46E+00	5.00E+01
37	0.00E+00	3.41E+00	5.03E+01
39	0.00E+00	3.35E+00	4.86E+01
41	0.00E+00	3.44E+00	4.97E+01
42	0.00E+00	3.38E+00	4.97E+01
46	0.00E+00	3.45E+00	4.91E+01
MINIMUM	0.00E+00	3.35E+00	4.86E+01
MEAN	0.00E+00	3.42E+00	4.96E+01
MAXIMUM	0.00E+00	3.47E+00	5.03E+01
+P 50/90	0.00E+00	3.44E+00	4.98E+01
-P 50/90	0.00E+00	3.41E+00	4.93E+01
+P 99/90	0.00E+00	3.56E+00	5.15E+01
-P 99/90	0.00E+00	3.29E+00	4.76E+01
SIGMA	0.00E+00	3.94E-02	5.90E-01

CIRCUIT INDUCTANCE (L1)	1uH	20uH
-------------------------	-----	------

MAX VDSS Applied during pulse = 80 Volts

```

.....
.
.   DEVICE TYPE   IRHNJ57130 100V, PWR N-MOSFET (IRC).
.   RADIATION SOURCE  BREL FX-75, E-Beam mode
.
.   D/C CIRC 01 || PACKAGE   TO-3    || LOT#  ER12942
.   LOG# 975   || TEST DATE 07/10/01 || RTP# 389
.
.....

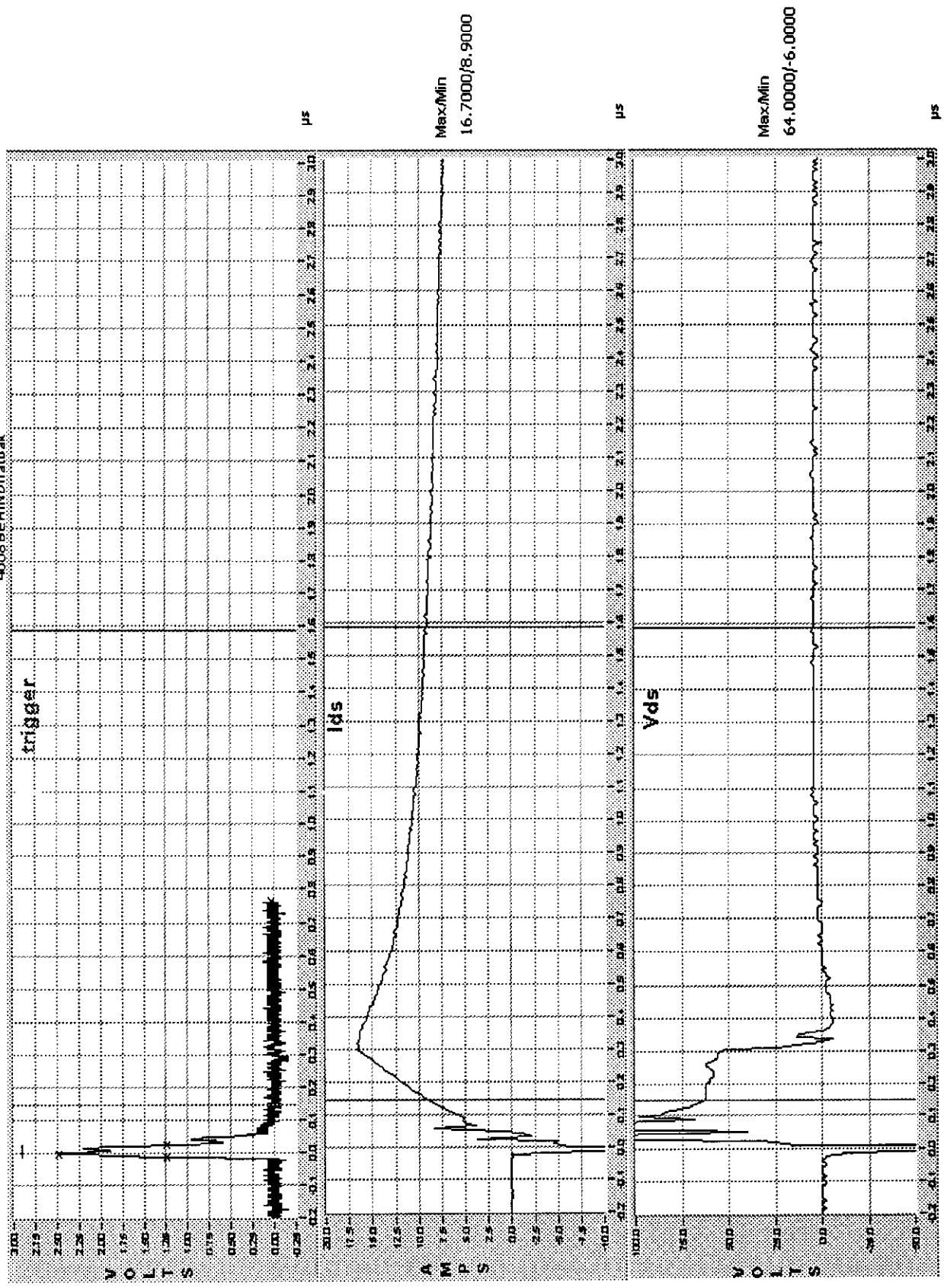
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I C S RADIATION TECHNOLOGIES, INC.

IRHNPJ57130 LOG# 975 RAW DATA

Date	Time	S/N	Shot	Pulse Width	Dose Rate	Temp	Ipp	dT	dI/dT	Vdss Pre	Vdss Post	L1
				rad(SI)/s			Amps	usec	A/usec	Volts	Volts	uH
07/10/01	15:00	14	19	3.62E-08	1.40E+11	25.0°C	1.59	0.468	3.40	80	80	1
07/10/01	14:20	23	13	3.67E-08	1.50E+11	25.0°C	1.59	0.464	3.43	80	80	1
07/10/01	14:36	26	15	3.68E-08	1.40E+11	25.0°C	1.61	0.464	3.47	80	80	1
07/10/01	14:42	32	16	3.60E-08	1.40E+11	25.0°C	1.65	0.478	3.45	80	80	1
07/10/01	14:48	34	17	3.74E-08	1.50E+11	25.0°C	1.59	0.460	3.46	80	80	1
07/10/01	15:25	37	23	3.75E-08	1.50E+11	25.0°C	1.61	0.472	3.41	80	80	1
07/10/01	15:06	39	20	3.74E-08	1.40E+11	25.0°C	1.57	0.468	3.35	80	80	1
07/10/01	15:13	41	21	3.59E-08	1.40E+11	25.0°C	1.57	0.456	3.44	80	80	1
07/10/01	15:19	42	22	3.79E-08	1.50E+11	25.0°C	1.57	0.464	3.38	80	80	1
07/10/01	14:54	46	18	3.59E-08	1.40E+11	25.0°C	1.63	0.472	3.45	80	80	1
			MEAN:	3.68E-08	1.44E+11	25.0°C	1.60	0.467	3.42	80	80	1
07/11/01	11:40	14	20	3.65E-08	1.20E+12	25.0°C	16.5	0.328	50.31	80	80	20
07/11/01	10:50	23	14	3.61E-08	1.20E+12	25.0°C	16.7	0.336	49.70	80	80	20
07/11/01	11:12	26	16	3.57E-08	1.10E+12	25.0°C	16.5	0.336	49.11	80	80	20
07/11/01	11:20	32	17	3.69E-08	1.10E+12	25.0°C	16.5	0.336	49.11	80	80	20
07/11/01	11:26	34	18	3.50E-08	1.20E+12	25.0°C	16.3	0.326	50.00	80	80	20
07/11/01	12:09	37	24	3.54E-08	1.10E+12	25.0°C	16.5	0.328	50.31	80	80	20
07/11/01	11:47	39	21	3.62E-08	1.20E+12	25.0°C	16.3	0.336	48.57	80	80	20
07/11/01	11:54	41	22	3.75E-08	1.20E+12	25.0°C	16.7	0.336	49.70	80	80	20
07/11/01	12:01	42	23	3.58E-08	1.10E+12	25.0°C	16.3	0.328	49.70	80	80	20
07/11/01	11:32	46	19	3.55E-08	1.10E+12	25.0°C	16.5	0.336	49.11	80	80	20
			MEAN:	3.61E-08	1.15E+12	25.0°C	16.5	0.333	49.56	80	80	20

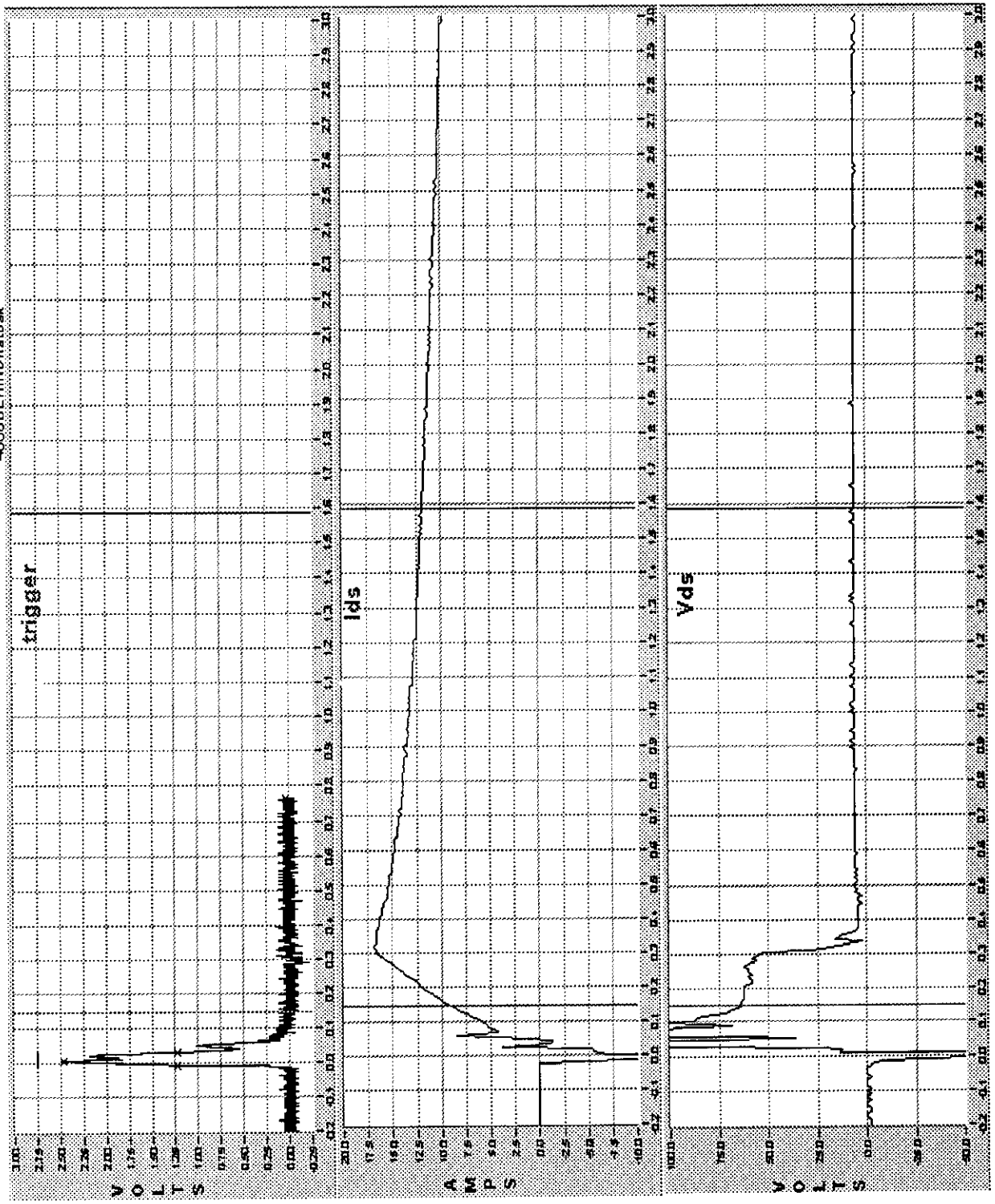
4608 BEHIND1toak



Part # IRHNJ57130
Vcc Pre 80.0
Vcc Post 80.0
Temperature 25.0°C
SN 14
Shot 20

FX-75 E-Beam mode
Boeing Radiation Effects Lab
Seattle, Washington
Date: 7/11/2001 11:40 AM

4608BEHINDflatbak



μs

Max/Min
16.9000/8.9000

μs

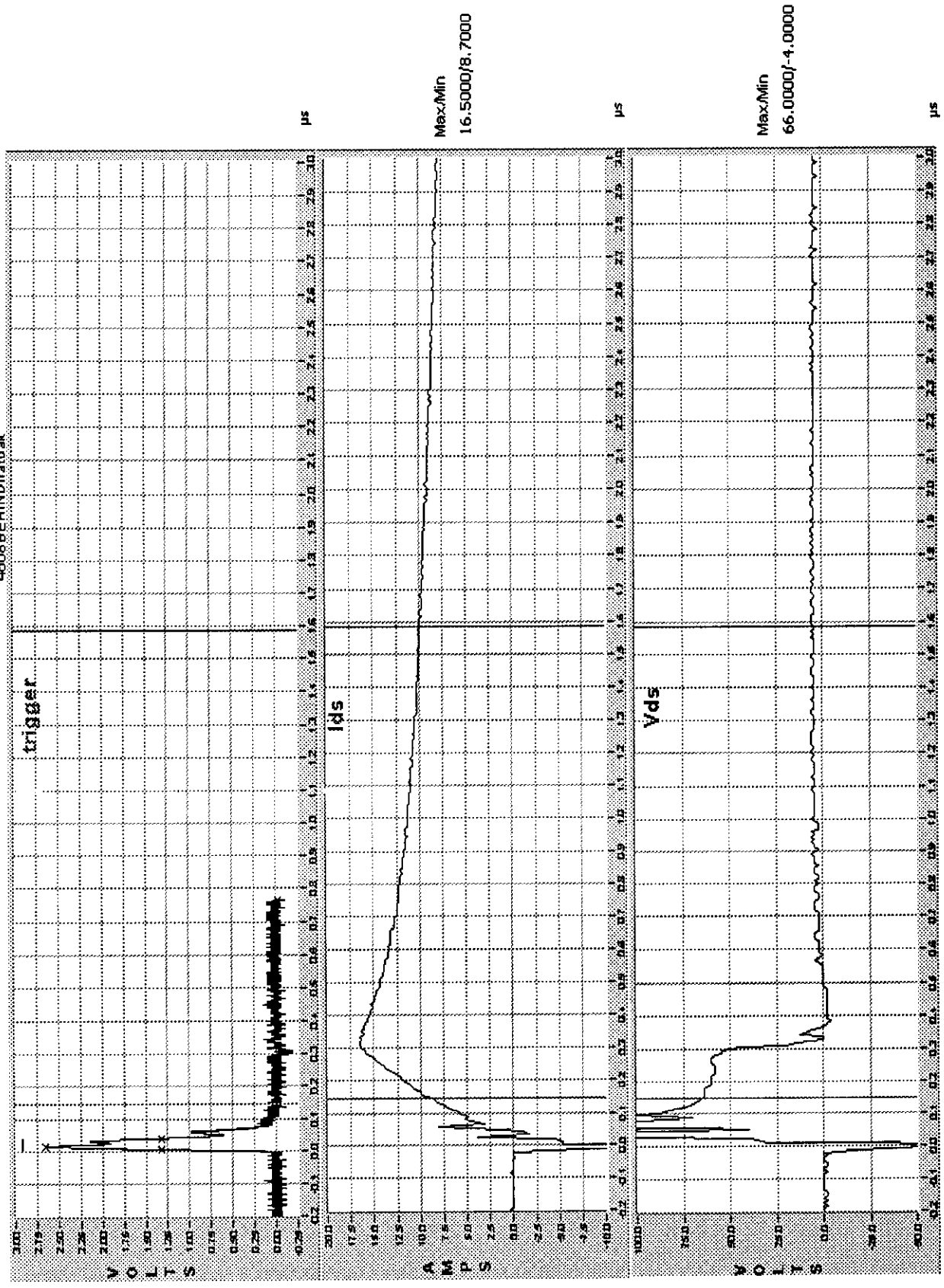
Max/Min
64.0000/2.0000

μs

Part # IRHNU57130
Vcc Pre 80.0
Vcc Post 80.0
Temperature 25.0°C
SIN 23
Shot 14
Date: 7/11/2001 10:50 AM

FX-75 E-Beam mode
Boeing Radiation Effects Lab
Seattle, Washington

46088EHIND1a.to.ak



μs

Max/Min
16.5000/8.7000

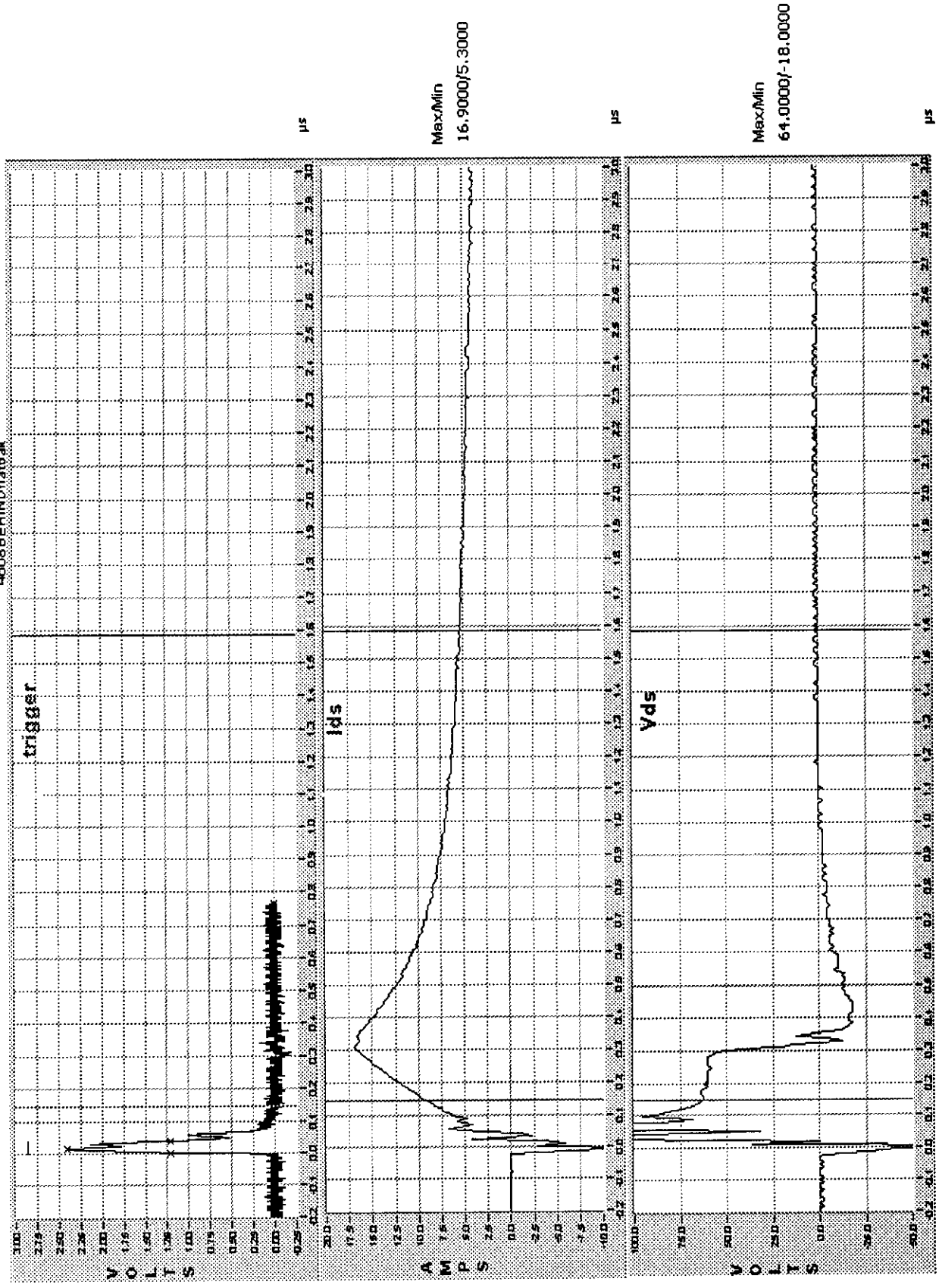
μs

Max/Min
66.0000/-4.0000

μs

Part # IRHNJ57130
Vcc Pre 80.0 Vcc Post -0.00000
Y (A) 80.0 0.00000
Temperature 25.0°C
SIN 26 Shot 16
FX-75 E-Beam mode
Boeing Radiation Effects Lab
Seattle, Washington
Date: 7/11/2001 11:12 AM

4608BEHINDflatok



Max/Min
16.9000/5.3000

Max/Min
64.0000/-18.0000

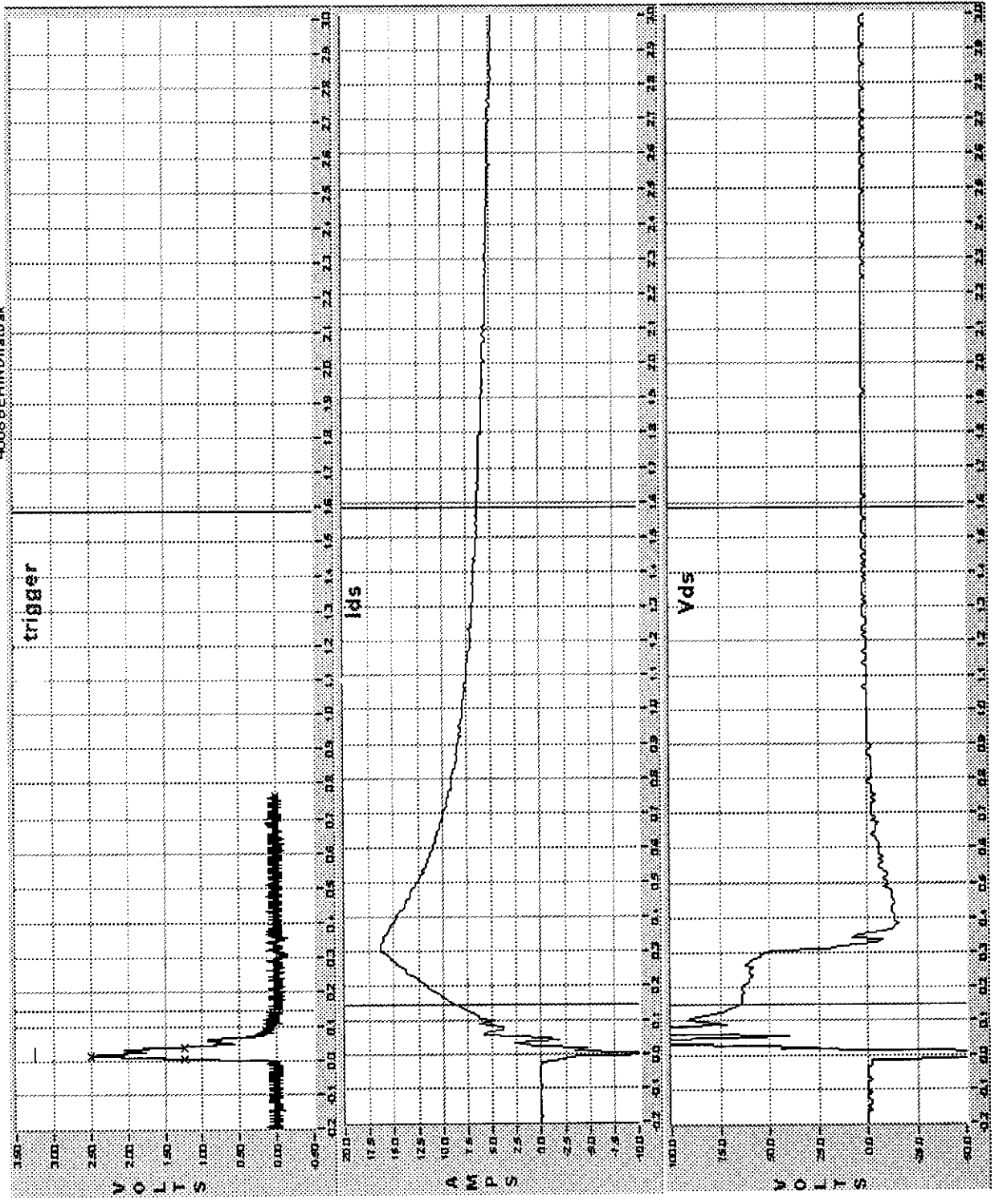
FX-75 E-Beam mode
Boeing Radiation Effects Lab
Seattle, Washington
Date: 7/11/2001 11:20 AM

Temperature 25.0°C
SN 32 Shot 17

V (A)
Vcc Pre 80.0 0.00001
Vcc Post 80.0 0.00255

Part # IR4NU57130

4608EHIND11a0ak



μs

Max/Min
16.3000/6.3000

μs

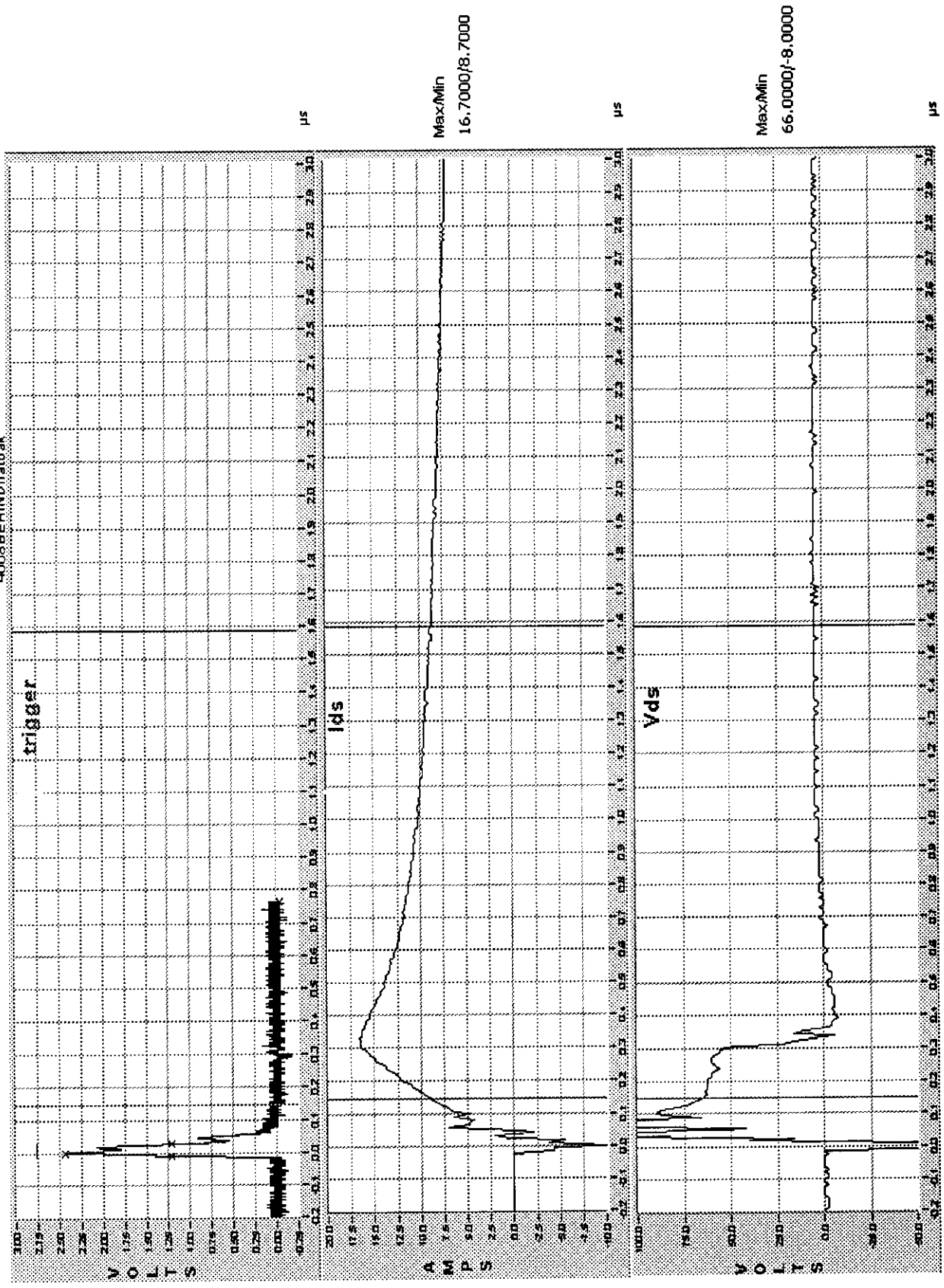
Max/Min
66.0000/-16.0000

μs

Part # IRHNU57130
Temperature 25.0°C
Vcc Pre 80.0 0.00000
Vcc Post 80.0 0.00001
Y (A)
Shot 18
Date: 7/11/2001 11:28 AM

FX-75 E-Beam mode
Boeing Radiation Effects Lab
Seattle, Washington

4608BEHINDItoak



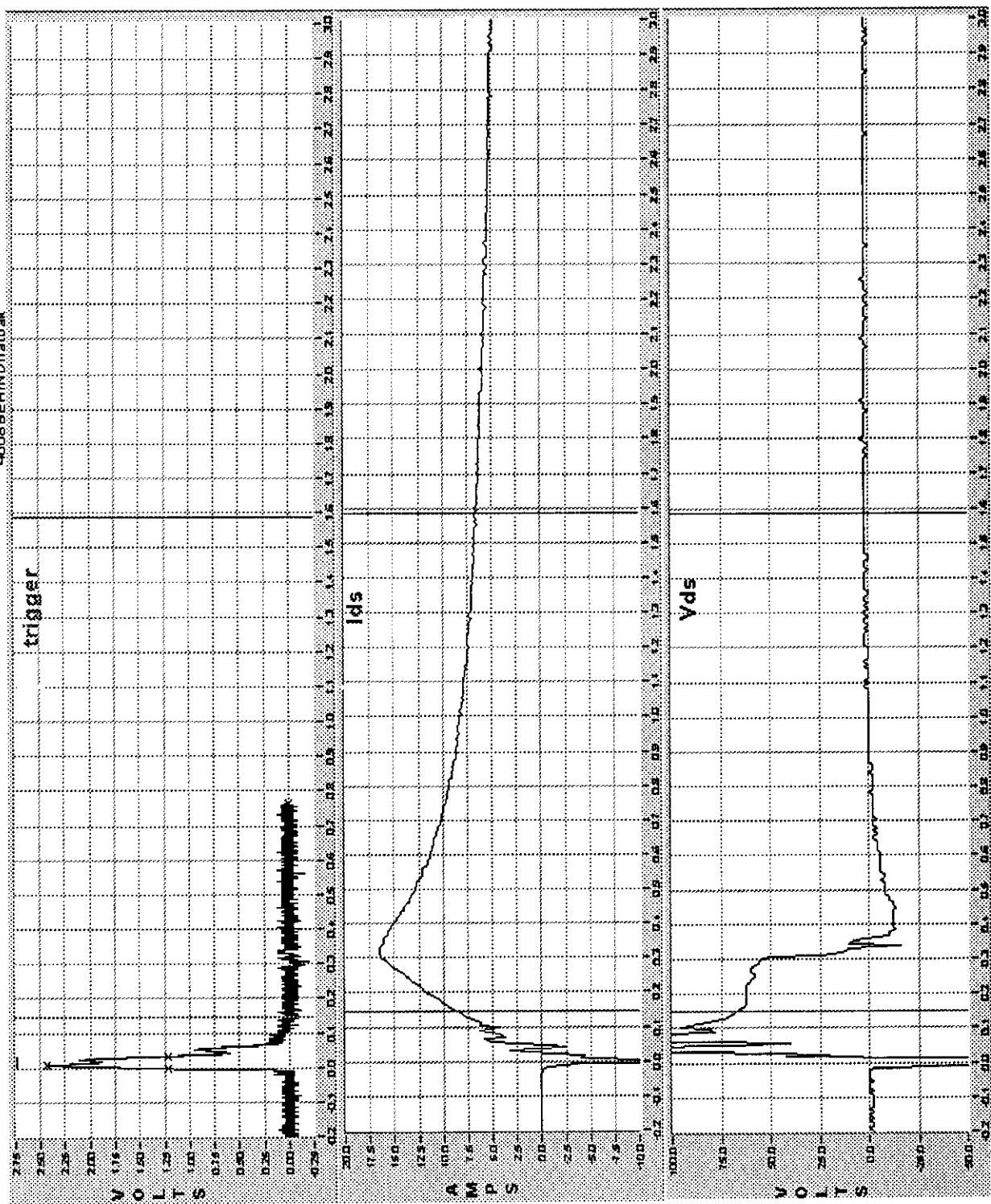
Part # IR-HUJ57130

Vcc Pre 80.0 Vcc Post 80.0 I(A) 0.00001

SIN 37 Shot 24 Temperature 25.0°C

FX-75 E-Beam mode
Boeing Radiation Effects Lab
Seattle, Washington
Date: 7/11/2001 12:09 PM

4608BEHIND1a1o.ak



μs

Max/Min
16.5000/6.5000

μs

Max/Min
68.0000/-16.0000

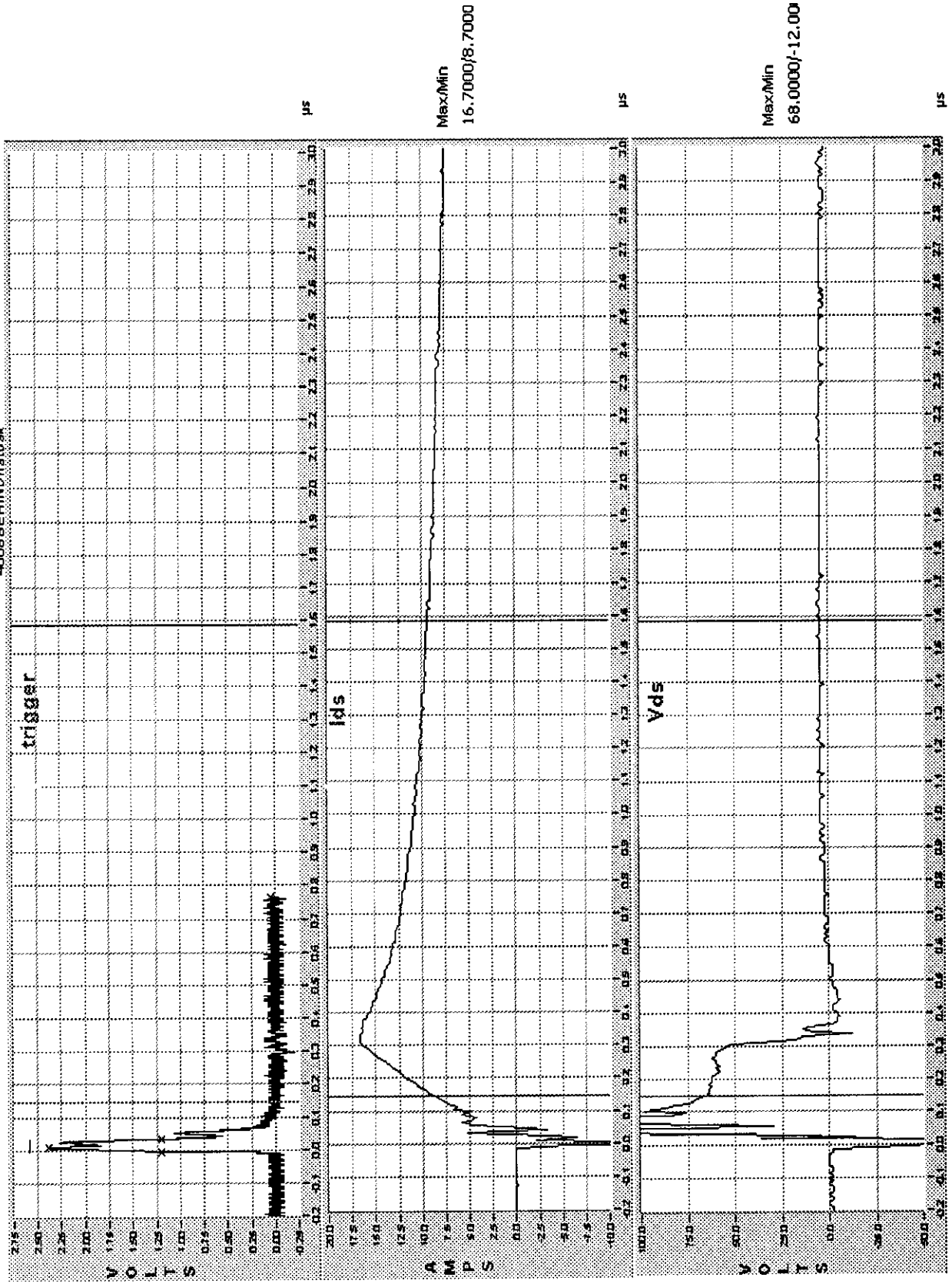
μs

Part # IRHNU57130
Vcc Pre 80.0
Vcc Post 80.0
Temperature 25.0°C
SN 39
Shot 21
Date: 7/11/2001 11:47 AM

V (K A)
0.00000
0.00323

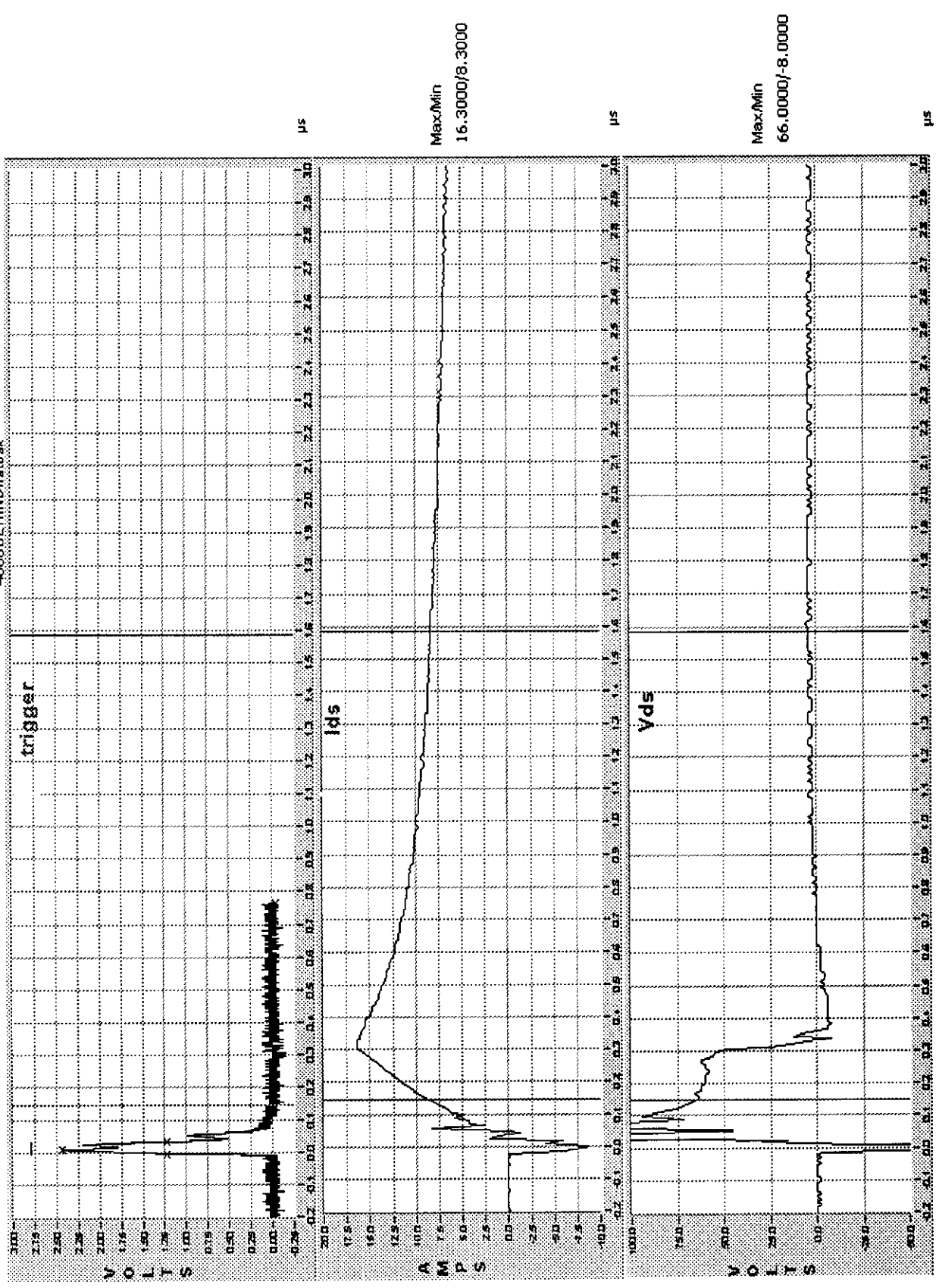
FX-75 E-Beam mode
Boeing Radiation Effects Lab
Seattle, Washington
Date: 7/11/2001 11:47 AM

4608BEHIND11afo.ak



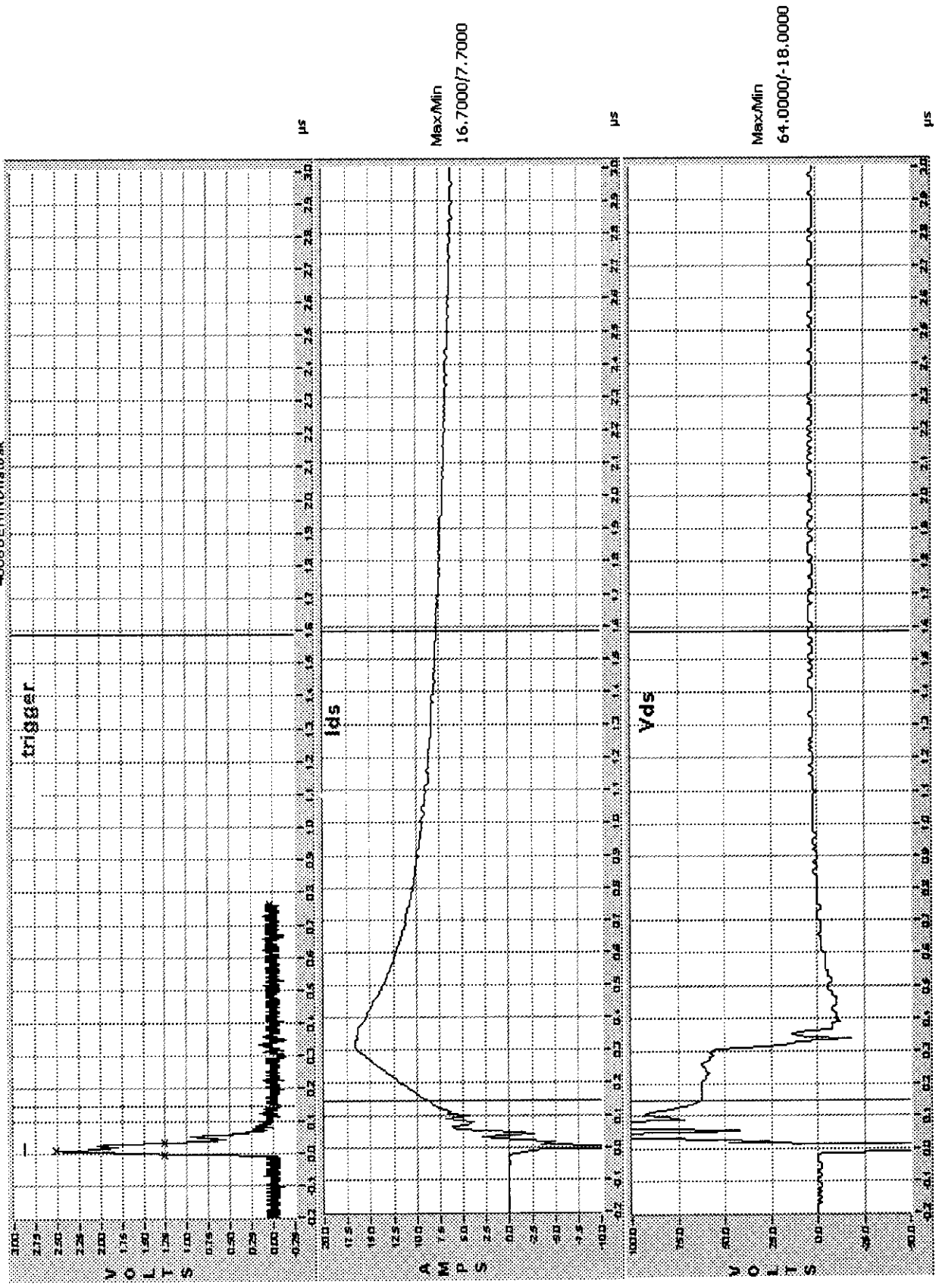
Part # IRHJ57130
Vcc Pre 80.0 Vcc Post 80.0
I(A) 0.00001 0.00400
Temperature 25.0°C
SN 41 Shot 22
Date: 7/11/2001 11:54 AM
FX-75 E-Beam mode
Boeing Radiation Effects Lab
Seattle, Washington

4608BEHIND1a to ak



Part # IRHJ57130
Vcc Pre 80.0 Vcc Post 80.0
Temperature 25.0°C
S/N 42 Shct 23
FX-75 E-Beam mode
Boeing Radiation Effects Lab
Seattle, Washington
Date: 7/11/2001 12:01 PM

4608BEHINDflato.ak



Max/Min
16.7000/7.7000

Max/Min
64.0000/-18.0000

FX-75 E-Beam mode
Boeing Radiation Effects Lab
Seattle, Washington
Date: 7/11/2001 11:32 AM

Temperature 25.0°C
SN 46 Shot 19

V (A)
Vcc Pre 80.0 0.00001
Vcc Post 80.0 0.00001

Part # IRHU57130

RADIATION TEST PROCEDURE

Device Type: IRH1N57130 100V, N-CHANNEL POWER MOSFET
 Manufacturer: IRC
 Lot No: ER12942 Wafer# Date Code:
 Package Type: TO-3
 No. of Devices Supplied: 10
 No. of Devices to be tested: 10

RADIATION CONDITIONS: MIL STD 883E, Method 1020/1021

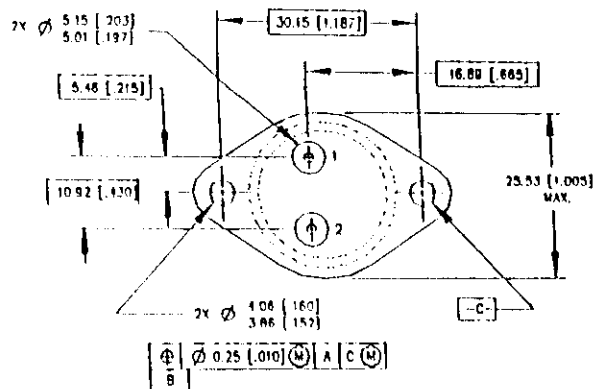
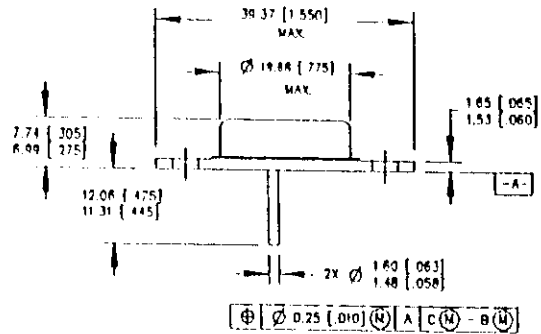
Facility: FX-75 Flash X-Ray (BREL) Energy: E-Beam Mode

AVG DOSE RATE [rad(Si)/sec]	1.54E+11	1.17E+12
--------------------------------	----------	----------

AVG PULSE WIDTH [Seconds]	3.64E-08	3.62E-08
------------------------------	----------	----------

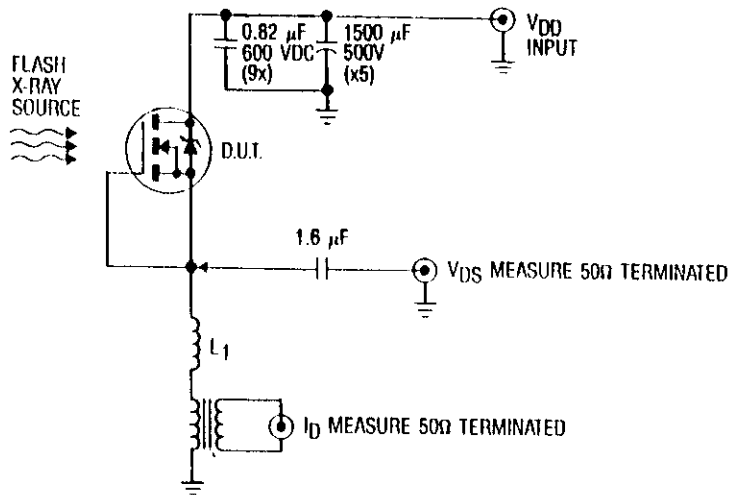
BIAS CONDITIONS DURING IRRADIATION:

- 1 SOURCE
- 2 GATE
- 3 DRAIN (Case)



RADIATION TEST PROCEDURE

Device Type: IRIINJ57130 100V, N-CHANNEL POWER MOSFET



High Dose Rate (Gamma Dot)
Test Circuit

July 6, 2001

RADIATION TEST PROCEDURE

No. 389

Device Type: **IRIHNJ57130 100V, N-CHANNEL POWER MOSFET**

TEST NUMBER	TEST DESCRIPTION	DELTA LIMIT	TEST LIMITS	
			<u>MIN</u>	<u>MAX</u>
1	Ipp			
2	dI/dT			

Measurements shall be made at room (ambient) temperature.

