

ELECTROSTATIC DISCHARGE TESTS

TEST-SET-UP FOR THE ELECTROSTATIC DISCHARGE SIMULATION TEST

The test was set up in accordance with the requirements as defined in IEC 1000-4-2.

The SART 3 was placed on a sheet of isolating material on a metal-top table positioned in the anechoic chamber. The subsystems of the EUT were interconnected as shown in Figure 6. The metal-top of the table which also acted as the horizontal coupling plane was connected to the metal ground plane placed in the chamber via two 470k Ω resistors.

The discharge simulator was placed on the metal top table and was powered from a filtered 220V mains supply. The ground strap from the electrostatic discharge simulator was connected to the ground plane

ELECTROSTATIC DISCHARGE TEST PROCEDURE

The EUT was tested in accordance with the procedures as defined in IEC-1000-4-2.

Contact and Air discharges were applied to the EUT at various points at the discharge voltages as indicated in Table 6.

Ten single discharges were applied to each location indicated in Table 6.

TEST RESULTS OBTAINED DURING THE ELECTROSTATIC DISCHARGE SIMULATION TEST

No indications of susceptibility were noted after application of the electrostatic discharge voltages.

The EUT remained functional after completion of all the electrostatic discharge tests.

ELECTROSTATIC DISCHARGE TEST CONCLUSION

The SART 3 complies with the requirements for immunity to electrostatic discharges when tested in accordance with the procedures and requirements as defined in IEC945 and IEC-1000-4-2

Discharge Application Area	Contact Discharge		Air Discharge	
	6KV (Pos.)	6KV (Neg.)	8KV (Pos.)	8KV
Radome			OK	OK
Battery housing	OK	OK	OK	OK
Switch Ring	OK	OK	OK	OK
Screw	OK	OK	OK	OK

Table 6: Results of Electrostatic Discharge Test with Positive Discharges

"OK" = No indications of susceptibility.

ANNEXURE A

**Emission levels vs Frequency
For
Radiated Emission Tests**

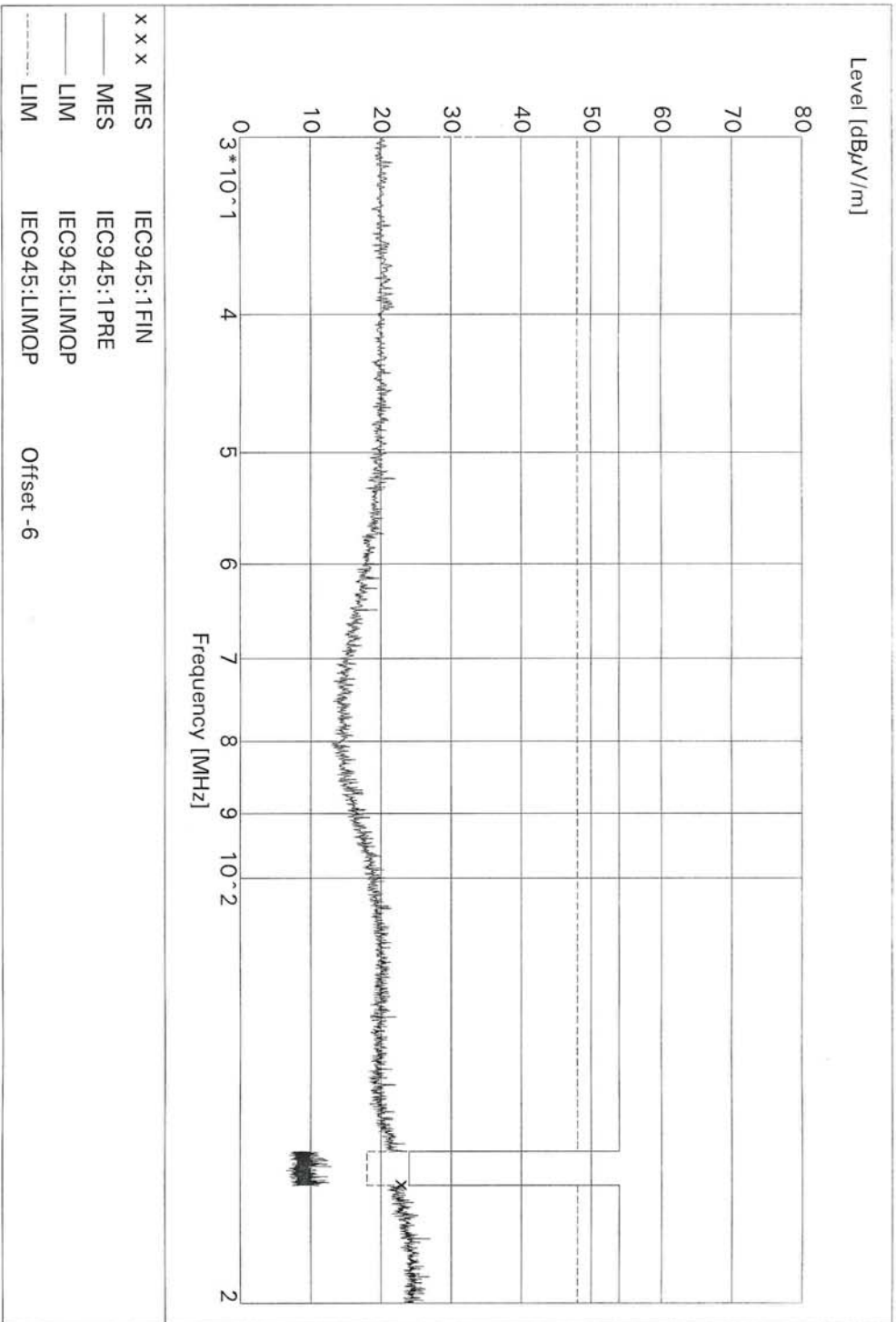
EMI TEST

RADIATED EMISSIONS

EUT: SART 3
Manufacturer: ACR SA
Operation condition: EUT ON; STANDBY MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: BI-CON ANTENNA HOR POLARIZATION
PK DET; HT = 1.54M; SEP = 3M

MEASUREMENT RESULT: "IEC945:1FIN"

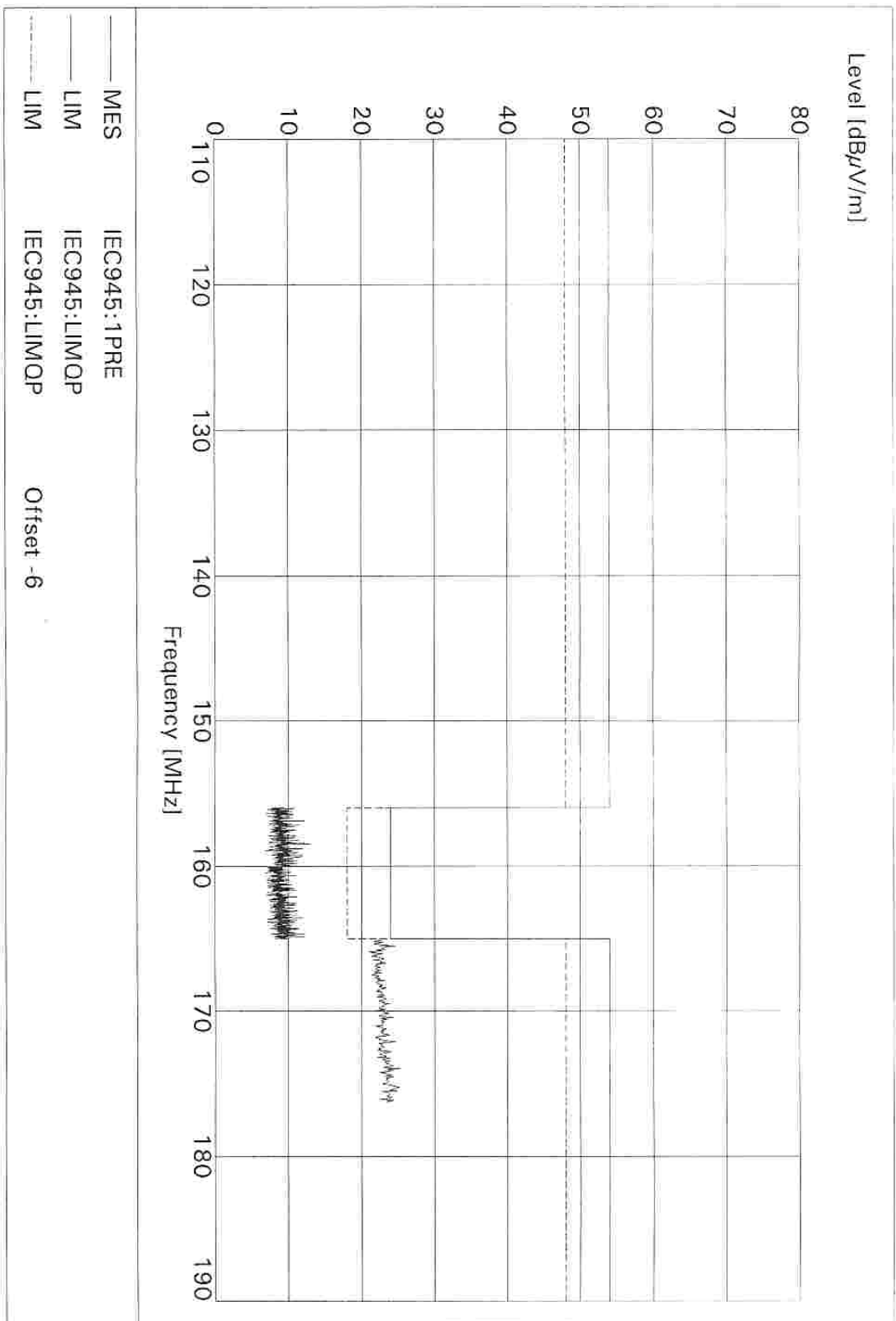
Frequency MHz	Level dB μ V/m	LIMIT dB μ V/m	EXCEEDING [dB]
165.00000	23.04	24.000	-0.960122



EMI TEST

RADIATED EMISSIONS

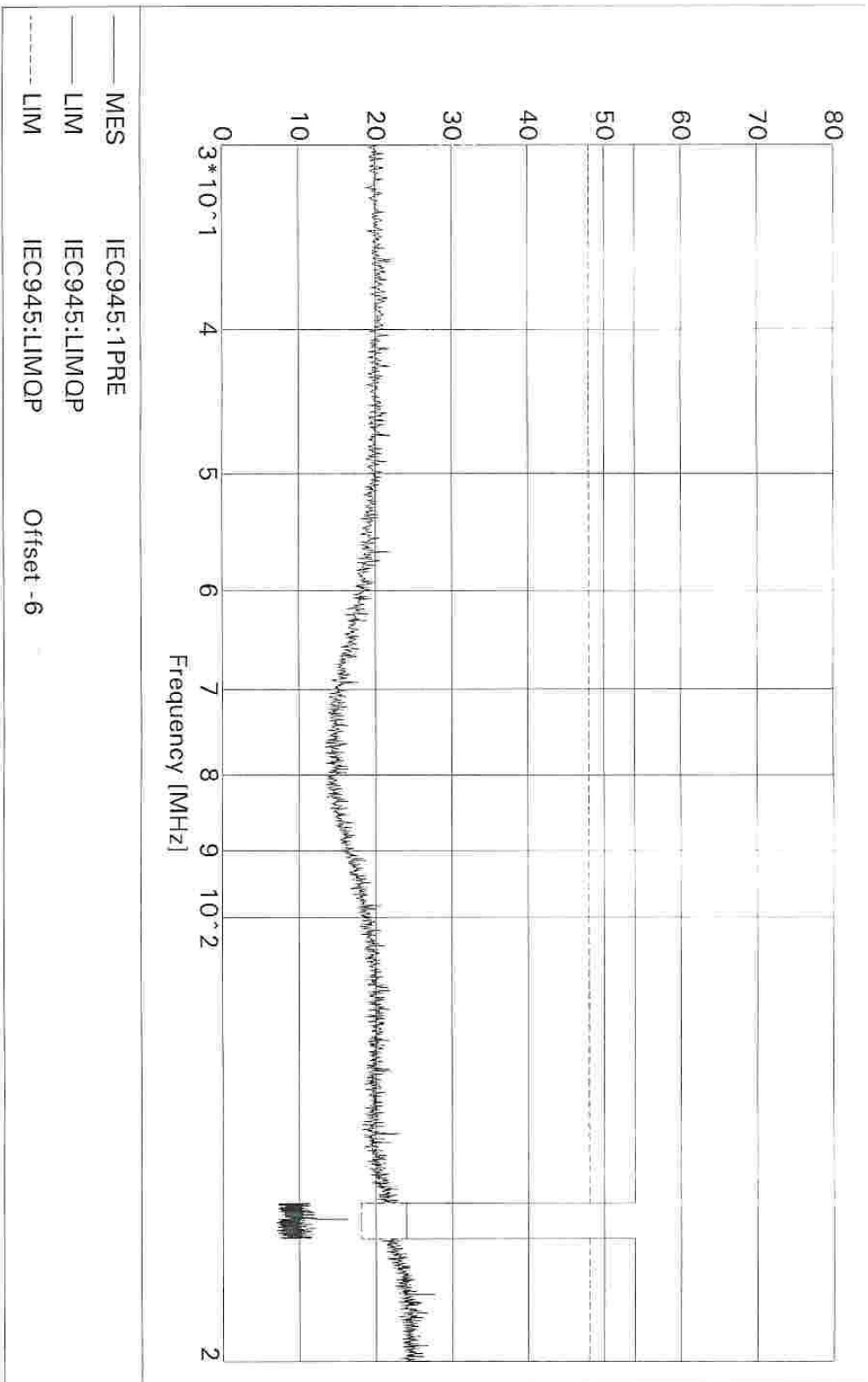
EUT: SART 3
Manufacturer: ACR SA
Operation condition: EUT ON; STANDBY MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: BI-CON ANTENNA HOR POLARIZATION
PK DET; HT = 1.54M; SEP = 3M



EMI TEST

RADIATED EMISSIONS

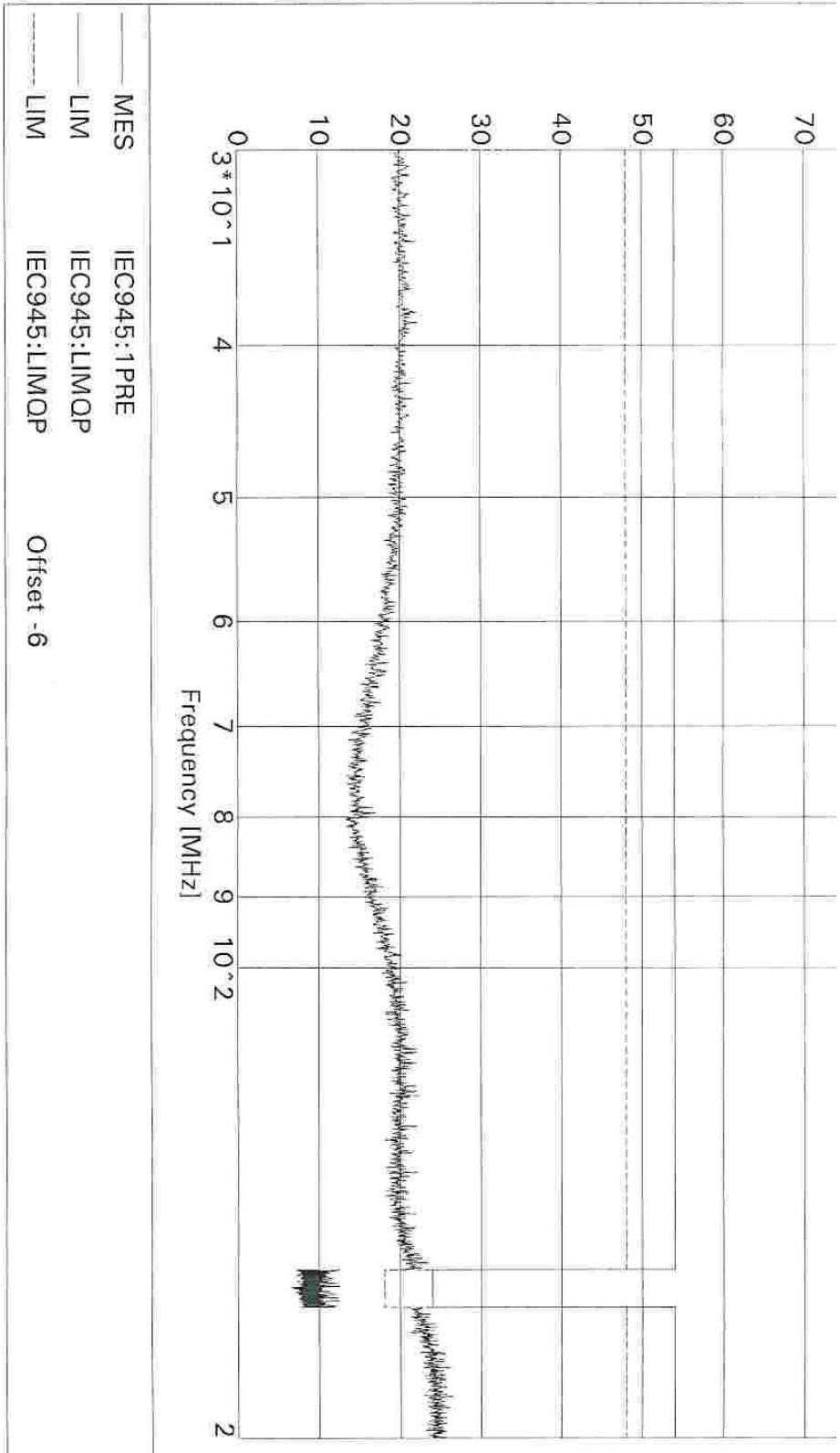
EUT: SART 3
Manufacturer: ACR SA
Operation condition: EUT ON; TRANSMIT MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: BI-CON ANTENNA HOR POLARIZATION
PK DET; HT = 1.54M; SEP = 3M



EMI TEST

RADIATED EMISSIONS

EUT: SART 3
Manufacturer: ACR SA
Operation condition: EUT ON; STANDBY MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: BI-CON ANTENNA VERT POLARIZATION
PK DET; HT = 1.54M; SEP = 3M

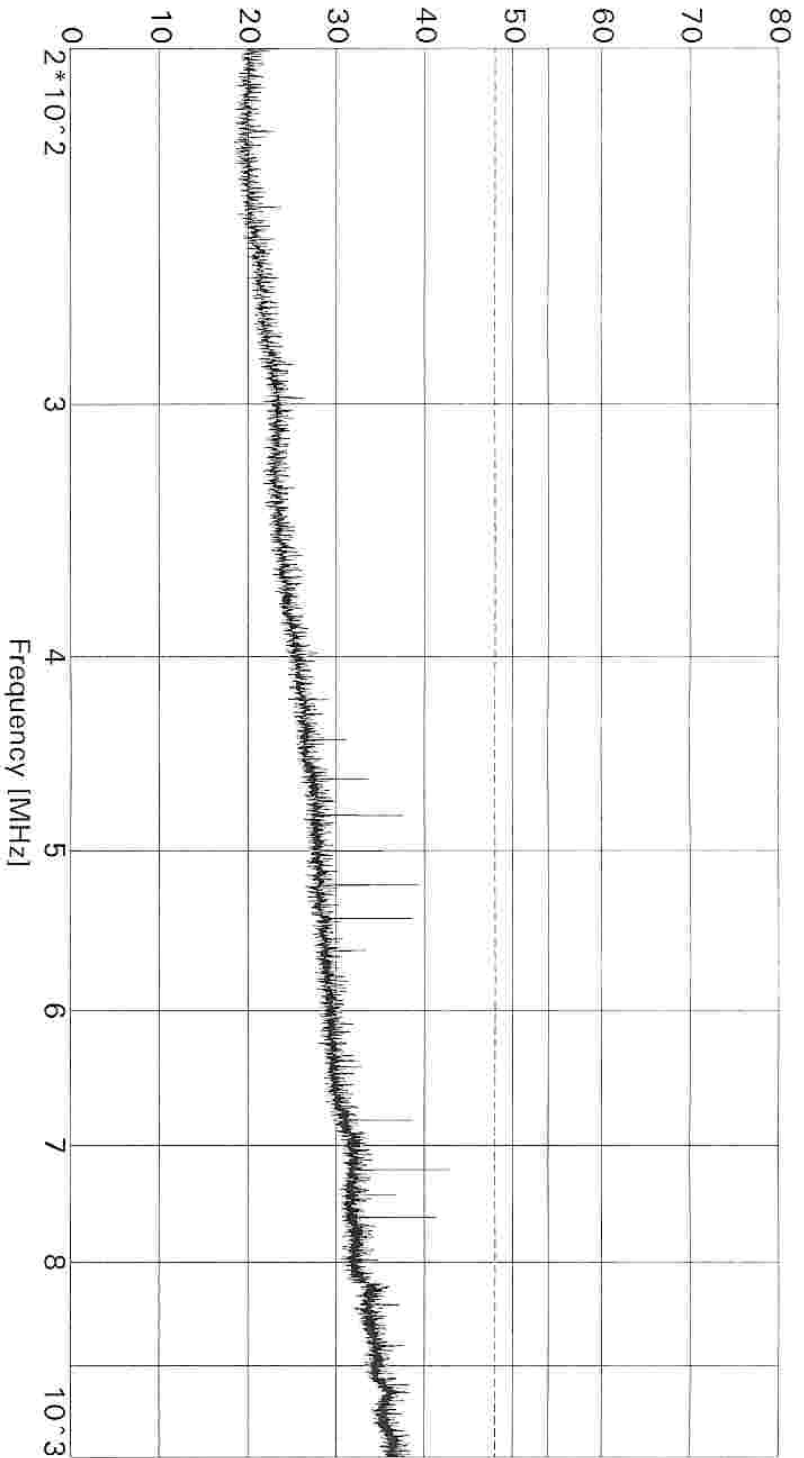


EMI TEST

RADIATED EMISSIONS

EUT: SART 3
Manufacturer: ACR SA
Operation condition: EUT ON; STANDBY MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: *LA Key-0* ~~BI-CON~~ ANTENNA HOR POLARIZATION
PK DET; HT = 1.54M; SEP = 3M

Level [dBµV/m]

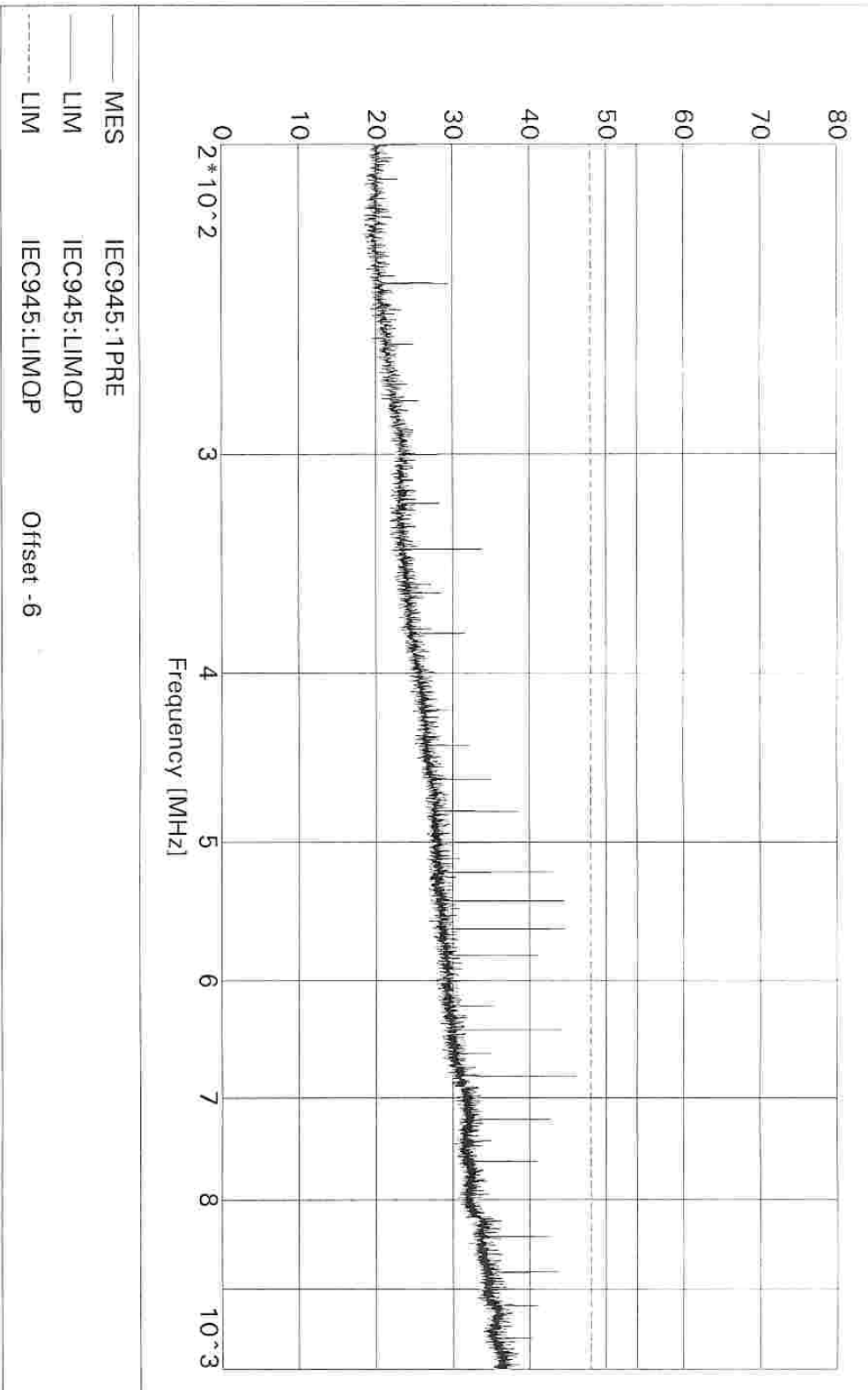


—	MES	IEC945:1PRE
—	LIM	IEC945:LIMQP
---	LIM	IEC945:LIMQP
		Offset -6

EMI TEST

RADIATED EMISSIONS

EUT: SART 3
Manufacturer: ACR SA
Operation condition: EUT ON; STANDBY MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: BI-CON ANTENNA VERT POLARIZATION
PK DET; HT = 1.54M; SEP = 3M



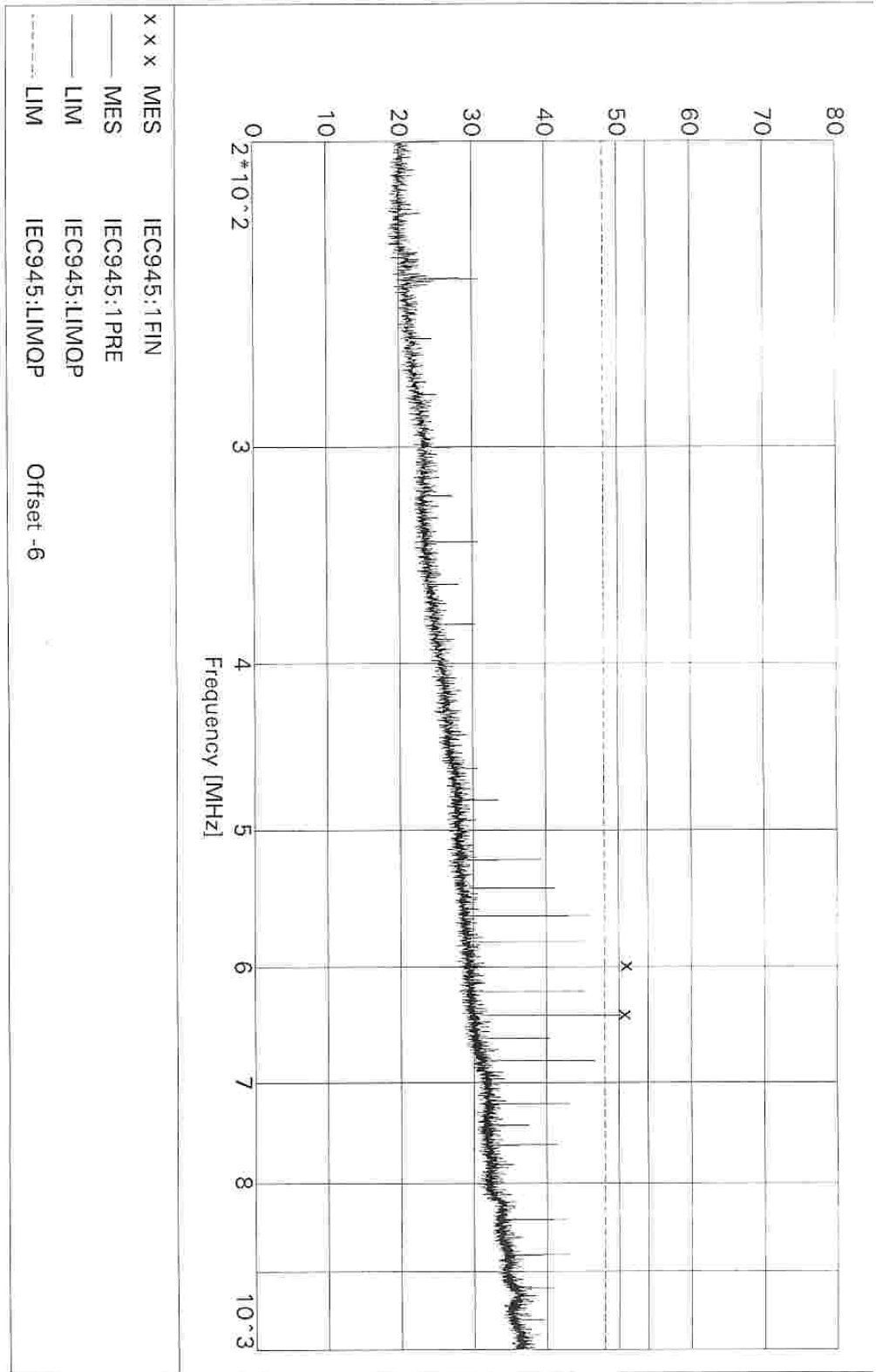
EMI TEST

RADIATED EMISSIONS

EUT: SART 3
Manufacturer: ACR SA
Operation condition: EUT ON; TRANSMIT MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: *Alky-p* ~~BI-CON~~ ANTENNA VERT POLARIZATION
PK DET; HT = 1.54M; SEP = 3M

MEASUREMENT RESULT: "IEC945:1FIN"

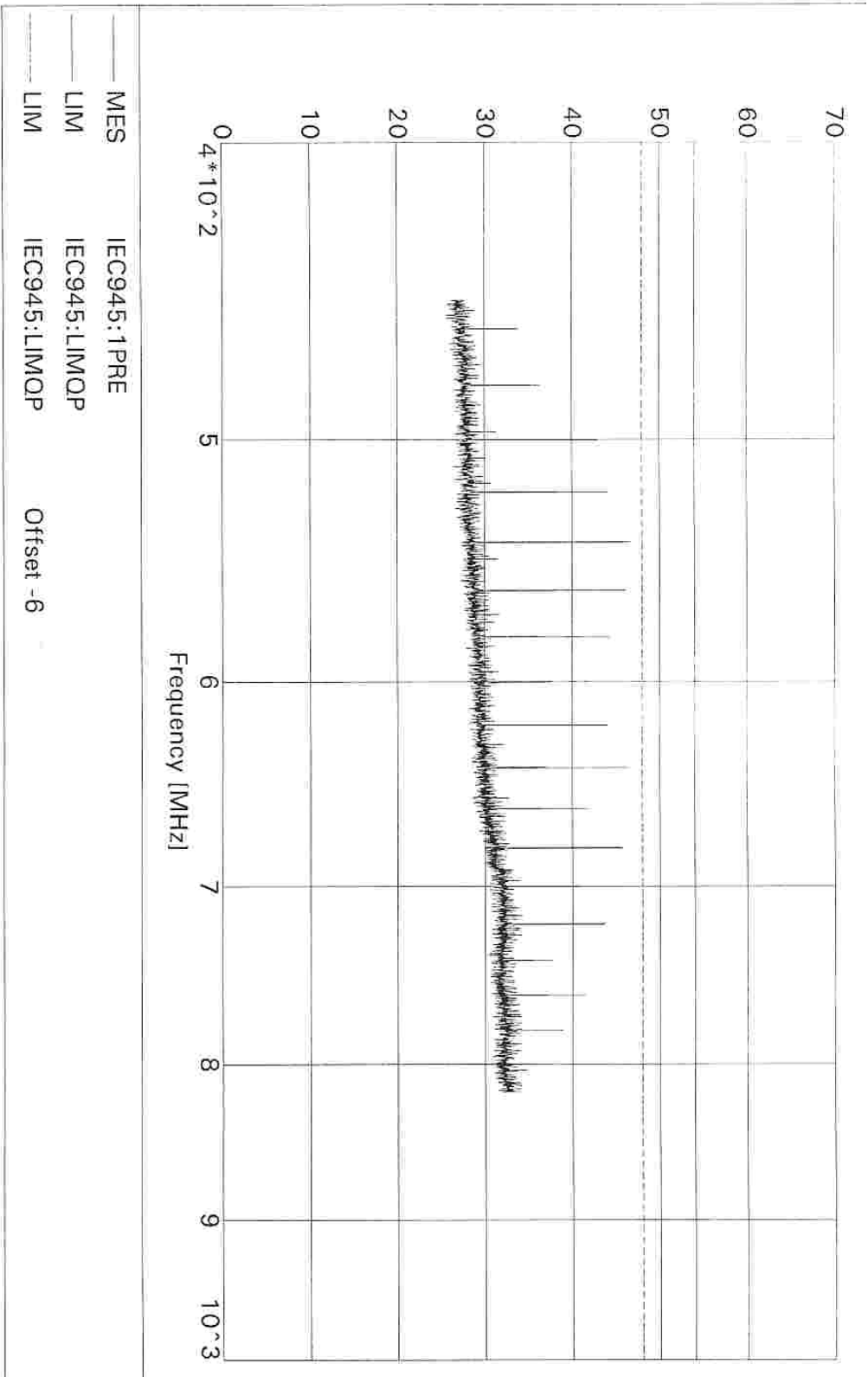
Frequency MHz	Level dB μ V/m	LIMIT dB μ V/m	EXCEEDING [dB]
600.08000	51.16	54.000	-2.838960
640.04000	50.89	54.000	-3.107521



EMI TEST

RADIATED EMISSIONS

EUT: SART 3B
Manufacturer: ACR SA
Operation condition: EUT ON; TRANSMIT MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: *Log-P* ~~BI CON~~ ANTENNA VERT POLARIZATION
PK DET; HT = 1.54M; SEP = 3M

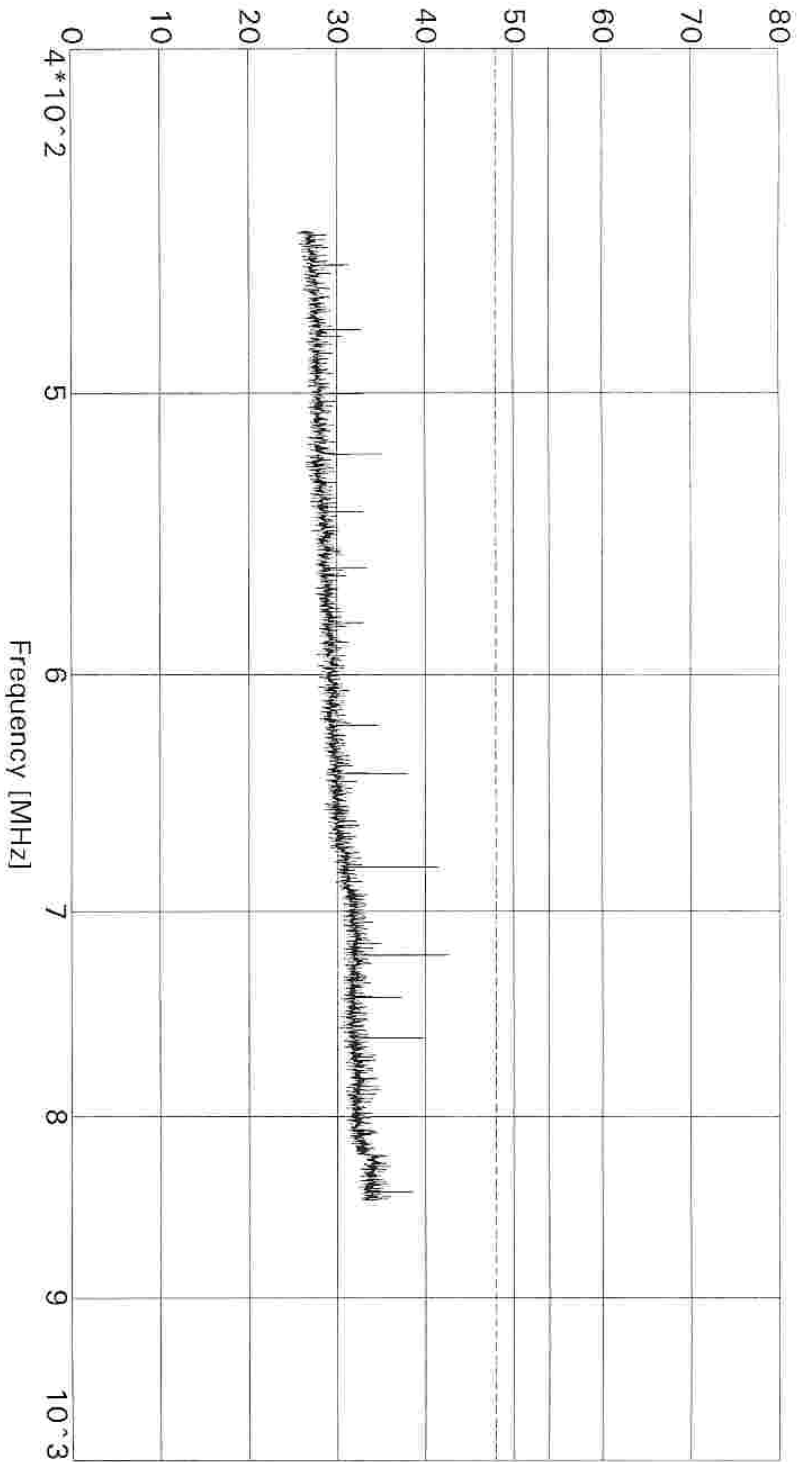


EMI TEST

RADIATED EMISSIONS

EUT: SART 3
Manufacturer: ACR SA
Operation condition: EUT ON; TRANSMIT MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: *log-p* *AD* ~~BI-CON~~ ANTENNA HOR POLARIZATION
PK DET; HT = 1.54M; SEP = 3M

Level [dB μ V/ml]



— MES IEC945:1PRE
— LIM IEC945:LIMOP
— LIM IEC945:LIMOP

Offset -6

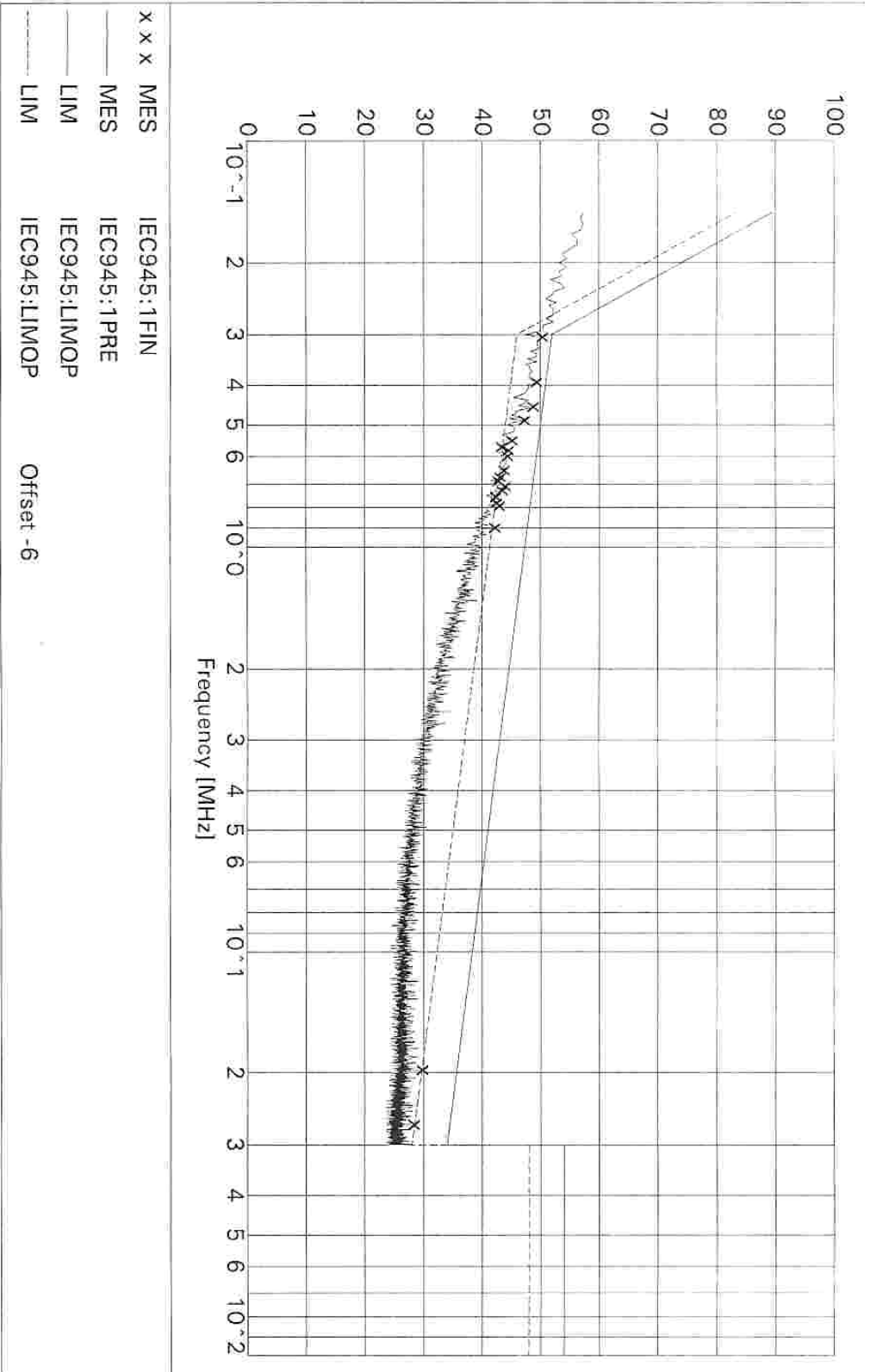
EMI TEST

RADIATED EMISSIONS

EUT: SART 3
Manufacturer: ACR SA
Operation condition: EUT ON; STANDBY MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: MAGNETIC LOOP ANTENNA
PK DET; HT = 1.0M; SEP = 3M

MEASUREMENT RESULT: "IEC945:1FIN"

Frequency MHz	Level dB μ V/m	LIMIT dB μ V/m	EXCEEDING [dB]
0.30500	50.53	51.935	-1.401503
0.39500	49.54	50.924	-1.388414
0.45500	48.94	50.371	-1.434365
0.49000	47.44	50.082	-2.644011
0.55000	45.24	49.630	-4.391433
0.57000	43.54	49.491	-5.951490
0.58000	44.64	49.423	-4.783350
0.60000	44.54	49.290	-4.750524
0.65000	43.94	48.977	-5.036918
0.67500	43.24	48.830	-5.589051
0.69000	42.94	48.744	-5.802938
0.71000	44.04	48.632	-4.590988
0.73000	43.64	48.524	-4.882148
0.75500	42.54	48.392	-5.857146
0.78000	42.70	48.265	-5.563484
0.79500	43.08	48.190	-5.108718
0.90000	42.35	47.705	-5.352045
19.70000	29.96	35.643	-5.683753
26.82500	28.52	34.437	-5.916076



x x x	MES	IEC945:1FIN
---	MES	IEC945:1PRE
---	LIM	IEC945:LIMOP
---	LIM	IEC945:LIMOP
		Offset -6

EMI TEST

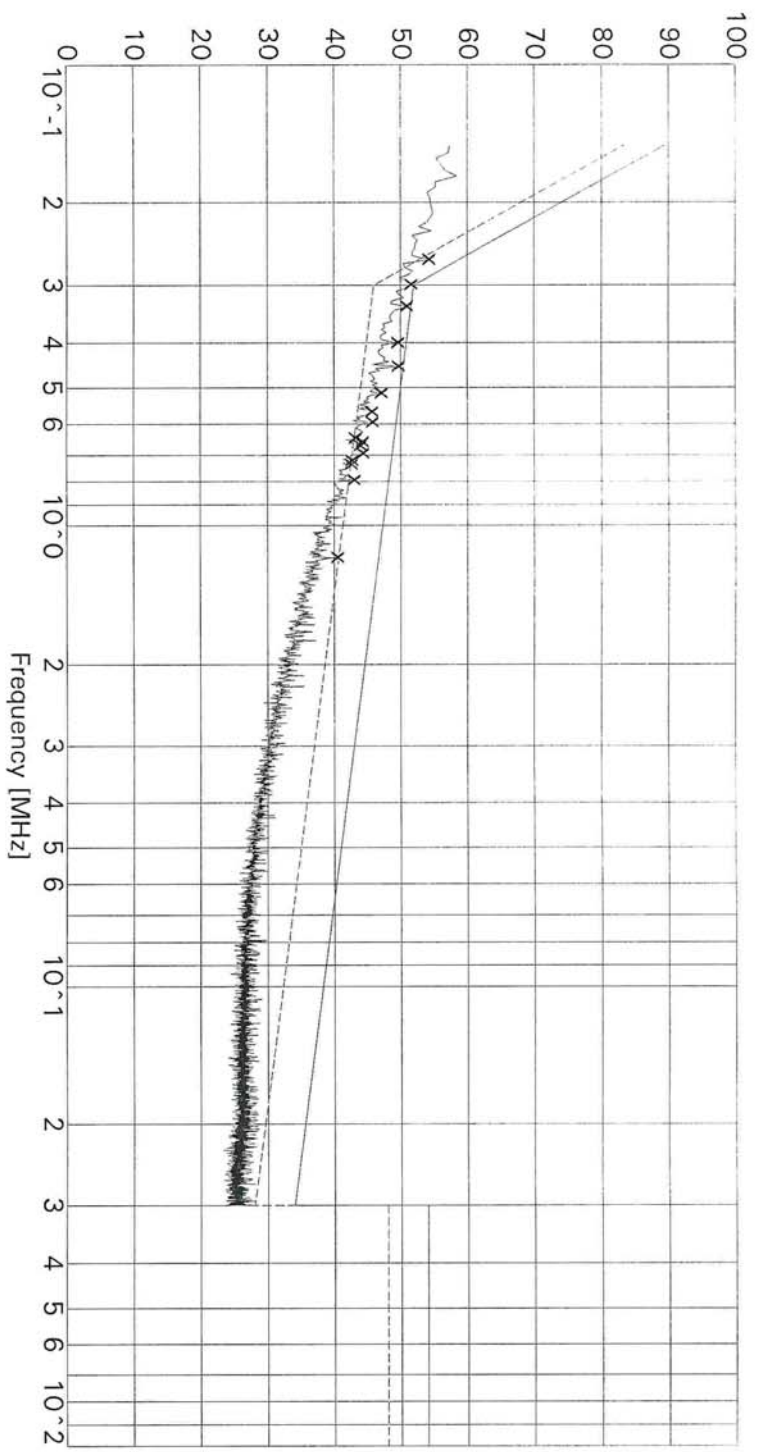
RADIATED EMISSIONS

EUT: SART 3
Manufacturer: ACR SA
Operation condition: EUT ON; TRANSMIT MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: MAGNETIC LOOP ANTENNA
PK DET; HT = 1.0M; SEP = 3M

MEASUREMENT RESULT: "IEC945:1FIN"

Frequency MHz	Level dB μ V/m	LIMIT dB μ V/m	EXCEEDING [dB]
0.26500	54.43	58.711	-4.278803
0.30000	51.73	52.000	-0.266265
0.33500	51.03	51.568	-0.533922
0.40000	49.74	50.875	-1.139130
0.45000	49.84	50.415	-0.577658
0.51500	47.24	49.887	-2.649046
0.56500	45.84	49.525	-3.686010
0.59500	45.94	49.323	-3.383310
0.64500	43.34	49.008	-5.667172
0.65500	44.44	48.947	-4.506895
0.67000	44.04	48.859	-4.818182
0.69500	44.54	48.716	-4.174650
0.72000	42.84	48.578	-5.736190
0.73500	42.74	48.497	-5.755404
0.79500	43.18	48.190	-5.008718
1.17500	40.69	46.663	-5.977673

Level [dBµV/m]



x x x	MES	IEC945:1FIN
—	MES	IEC945:1PRE
—	LIM	IEC945:LIMQP
---	LIM	IEC945:LIMQP
		Offset -6

EMI TEST

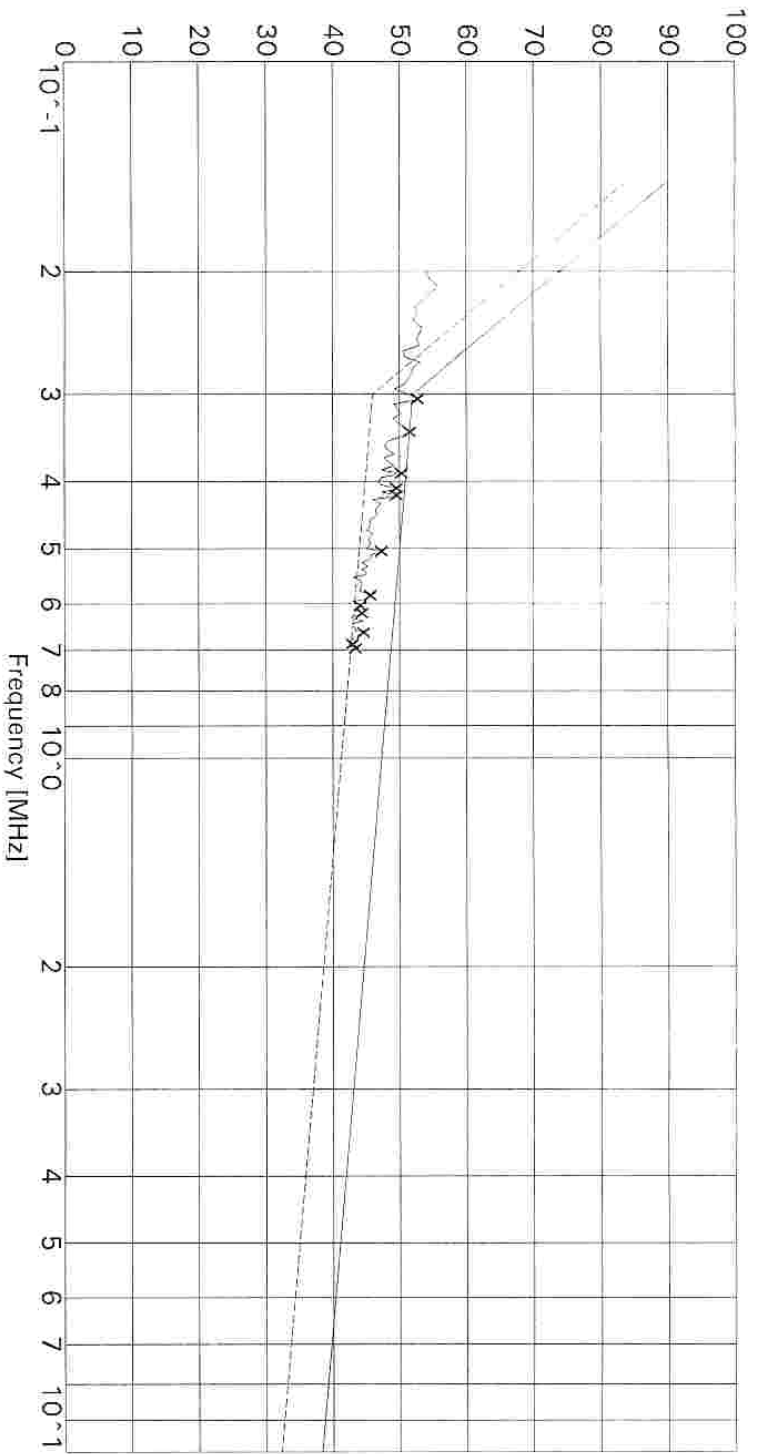
RADIATED EMISSIONS

EUT: SART 3B
Manufacturer: ACR SA
Operation condition: EUT ON; TRANSMIT MODE
Test site: ISSA
Operator:
Test specification: IEC945
Comment: MAGNETIC LOOP ANTENNA
PK DET; HT = 1.0M; SEP = 3M

MEASUREMENT RESULT: "IEC945:1FIN"

Frequency MHz	Level dB μ V/m	LIMIT dB μ V/m	EXCEEDING [dB]
0.30500	52.83	51.935	0.898497
0.34000	51.63	51.510	0.124123
0.39000	50.44	50.974	-0.538325
0.41000	49.64	50.779	-1.142385
0.42000	49.64	50.684	-1.047971
0.50500	47.44	49.964	-2.525872
0.58500	45.74	49.389	-3.649719
0.60500	44.24	49.258	-5.018009
0.62000	44.54	49.162	-4.622054
0.66000	44.74	48.918	-4.177100
0.68500	43.04	48.772	-5.731433
0.69500	43.54	48.716	-5.174650

Level [dB μ V/m]



x x x	MES	IEC945:1FIN	
—	MES	IEC945:1PRE	
—	LIM	IEC945:LIMOP	
—	LIM	IEC945:LIMOP	Offset -6

APENDIX F
TEST SETUP BLOCK DIAGRAM

4

3

2

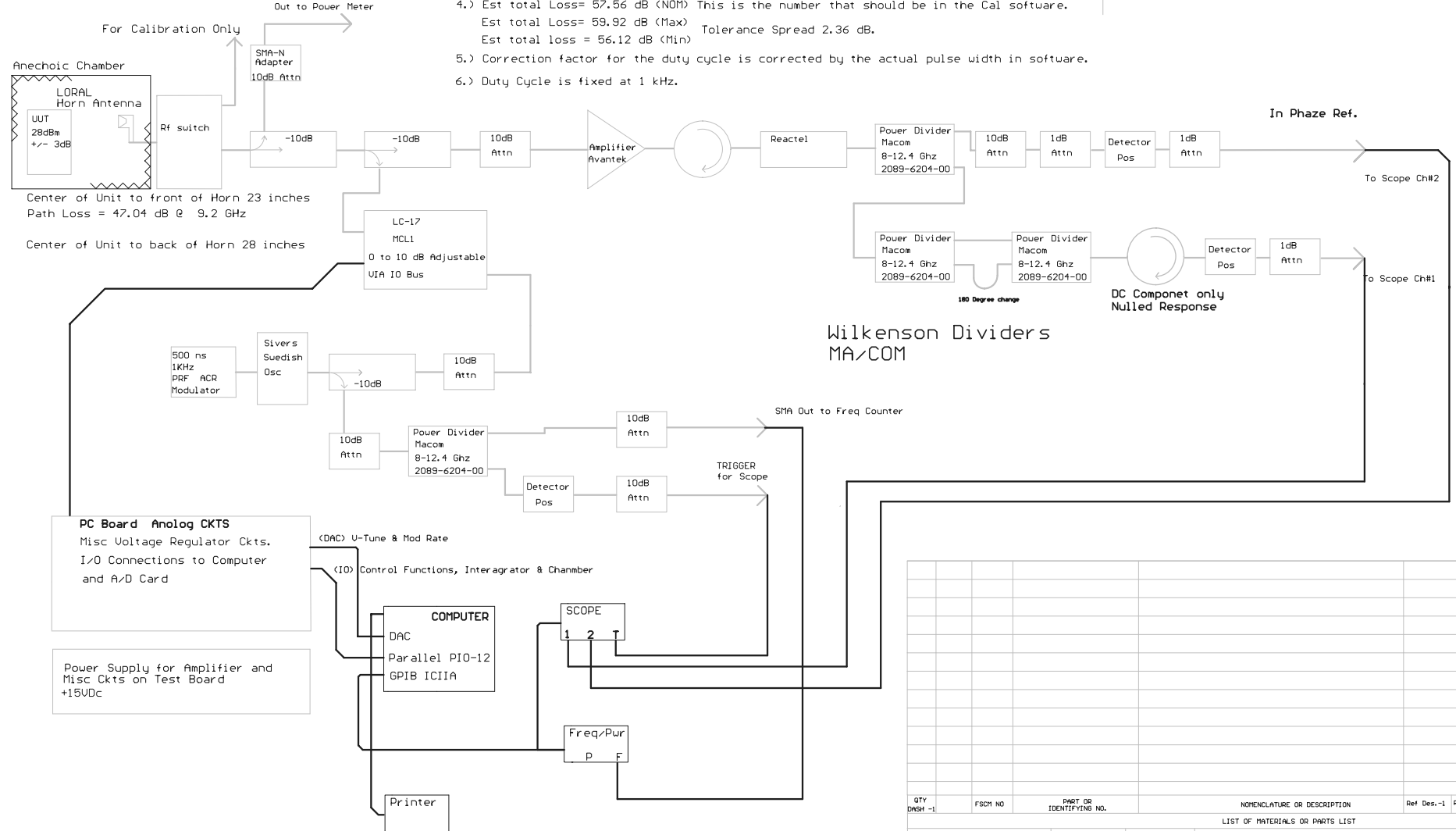
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REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	RELEASED PER ECO	10/23/97	B. Cox

NOTES:
 COAX LENGTH 7 FEET.
 FROM HORN TO TEST FIXTURE.
 APPROX ATTENUATION 3.52 dB.

- Transmit Calibration factor**
- 1.) Path Loss=47.04 dB
 - 2.) cable Loss / couplers to the power meter =27.02 dB
 (COAX - 3.52 dB, Switch- 1.5 dB, Attn 1 +/- .3, Attn 2 +/- .5dB, 10 dB Coupler +/- .1 dB)
 - 3.) Antenna Gain =16.5 dB
 - 4.) Est total Loss= 57.56 dB (NOM) This is the number that should be in the Cal software.
 Est total Loss= 59.92 dB (Max) Tolerance Spread 2.36 dB.
 Est total loss = 56.12 dB (Min)
 - 5.) Correction factor for the duty cycle is corrected by the actual pulse width in software.
 - 6.) Duty Cycle is fixed at 1 kHz.



Wilkinson Dividers
 MA/COM

QTY	FRSH NO	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	Ref Des.-1	Ref Des.-2

UNLESS OTHERWISE SPECIFIED:
 ALL ANGLES ARE 90°
 DIMENSIONS ARE IN INCHES
 TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
±1/64	.X ± .030	*1/2°
	.XX ± .010	
	.XXX ± .005	

ANSI-B PROTEL

DRAWN: Bill Cox 1/12/98
 CHECKED: Bill Cox 5/3/2002
 ENG: Bill Cox
 APUD:

ACR ELECTRONICS, INC
 5757 RAMENSWOOD RD. FT. LAUDERDALE FL 33312

SART TEST FIXTURE Block Diagram

SIZE	CODE IDENT. NO.	DRAWING NO.	REV
C	18560	Test Fixture	A

SCALE: NONE SHEET 1 OF 1

18560
 DATE: NOV
 Test Fixture
 SW 1
 REV A

4

3

2

1

PR55

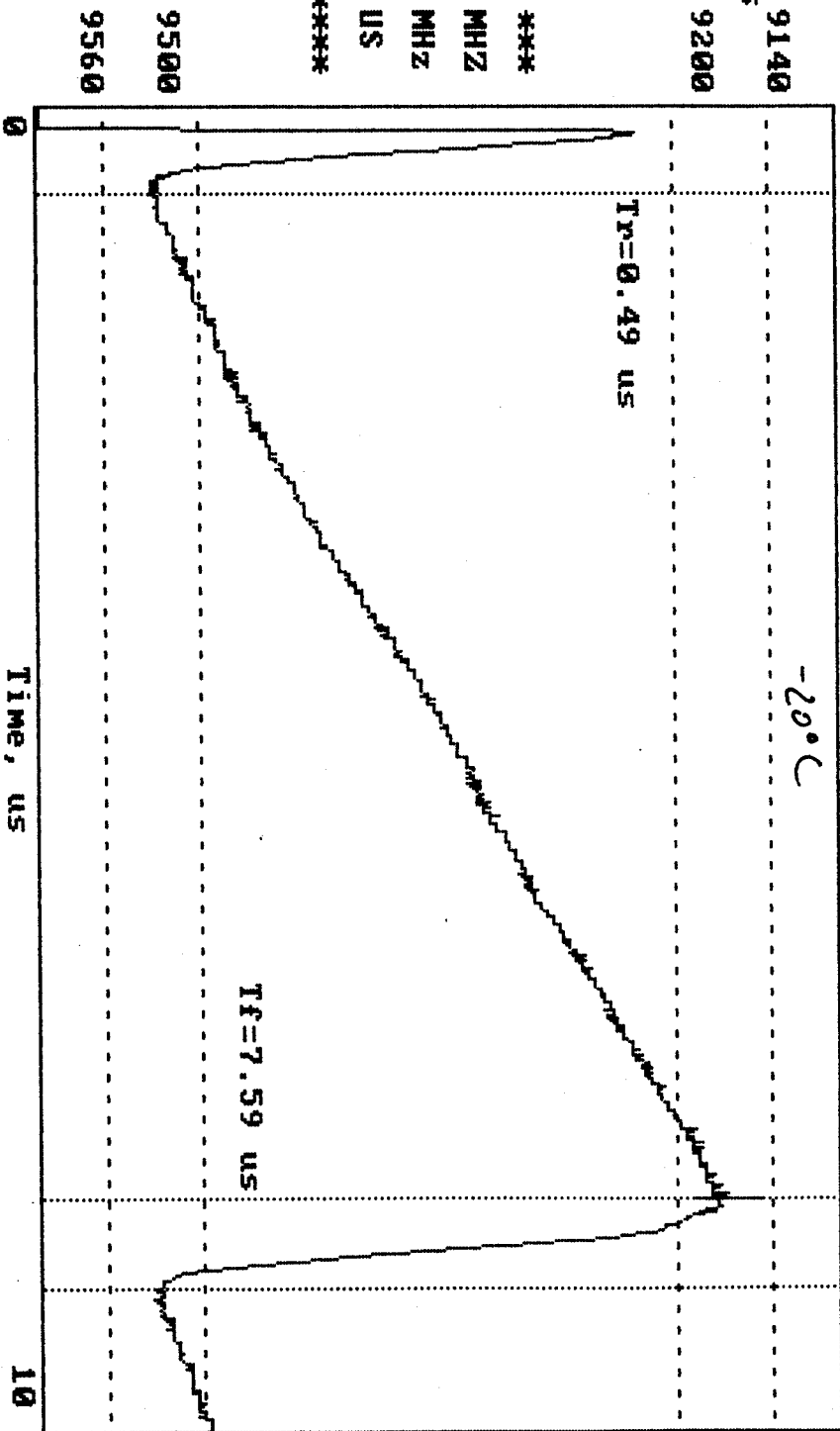
SART Serial #
Protocol

»»»»» SART FREQUENCY SWEEP ANALYSIS «««««

BURST LOW FREQUENCY	BURST HIGH FREQUENCY	FWD SWEEP LINEARITY	RTN SWEEP LINEARITY
9169 MHZ	9532 MHZ	-9.19 MHZ	-15.00 MHZ

9140
of Sweeps
12
9200

*** CURSOR ***
FREQ: 9169 MHZ
LIN: MHZ
TIME: 8.3 US



13:28:37
06-10-2003

Press Spacebar to Continue

PR55

SART Serial #
 protocol

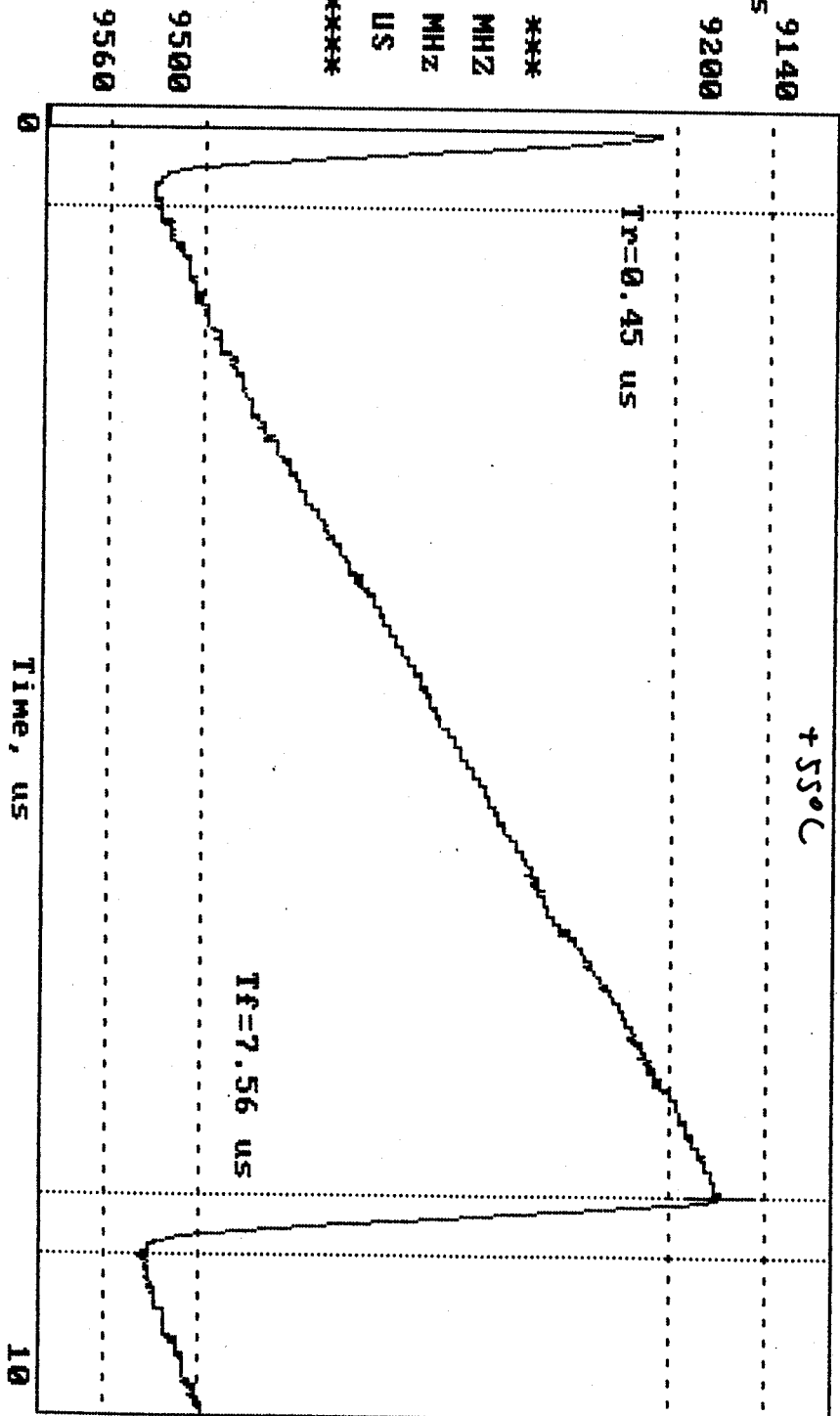
***** SART FREQUENCY SWEEP ANALYSIS *****

of Sweeps 9140
 12 9200

BURST LOW	BURST HIGH	FWD SWEEP	RIN SWEEP
FREQUENCY	FREQUENCY	LINEARITY	LINEARITY
9169	9538	-6.62	-6.00
MHz	MHz	MHz	MHz

+55°C

*** CURSOR ***
 FREQ: 9169 MHz
 LIN: MHz
 TIME: 8.3 US



15:58:58
 06-06-2003

Press Spacebar to Continue

PR55

SART Serial #

BURST LOW
FREQUENCY

9178

BURST HIGH
FREQUENCY

9531

BURST
WIDTH

101.0

MHz

MHz

us

SPUR
PULSE

NO

?

of Sweeps
12

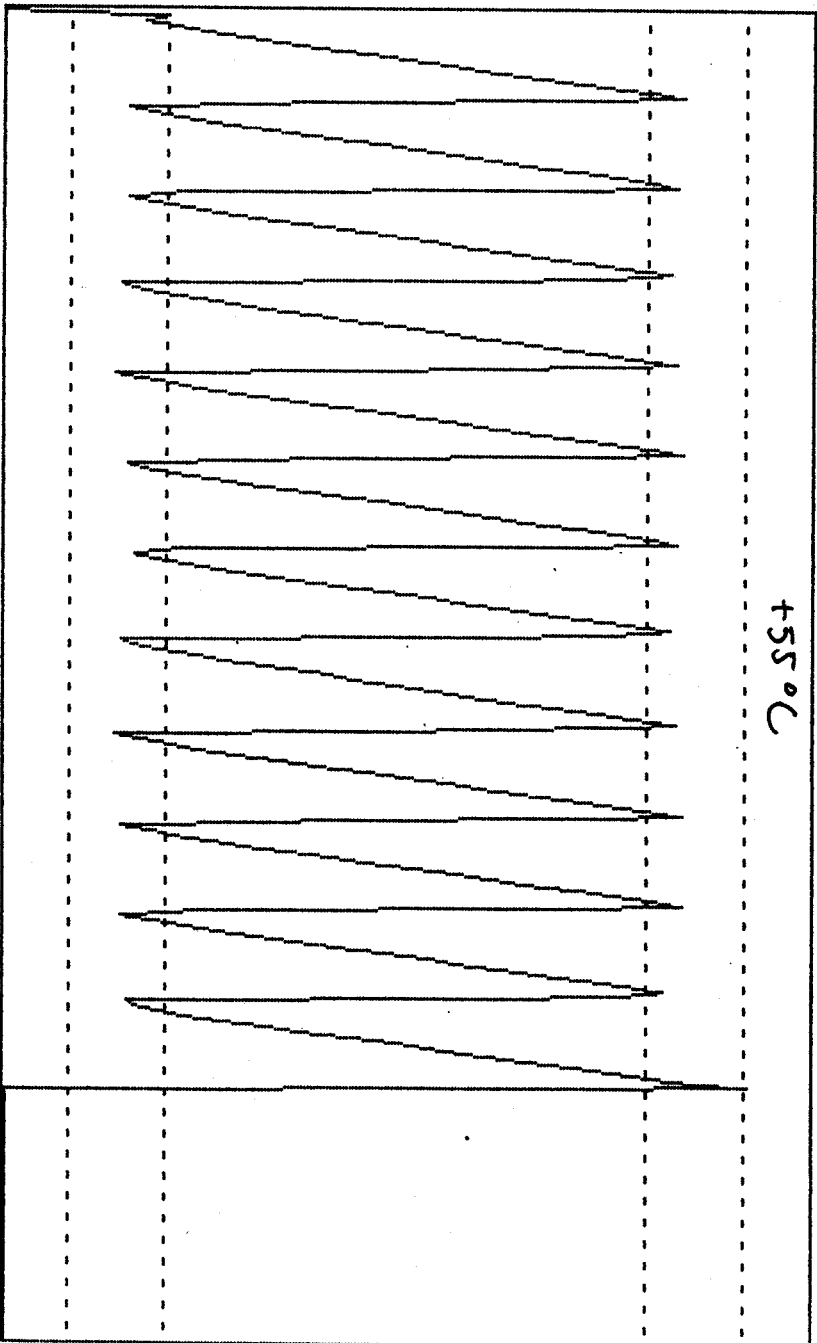
9140

9200

15:56:51
06-06-2003

9500

9560



Press Spacebar to Continue

PR55

SART Serial # 0001

=====
SART FREQUENCY SWEEP ANALYSIS
=====

of Sweeps
12

9140
9200

BURST LOW FREQUENCY	BURST HIGH FREQUENCY	FWD SWEEP LINEARITY	RTN SWEEP LINEARITY
9158	9533	-3.23	-10.00
MHZ	MHZ	MHZ	MHZ

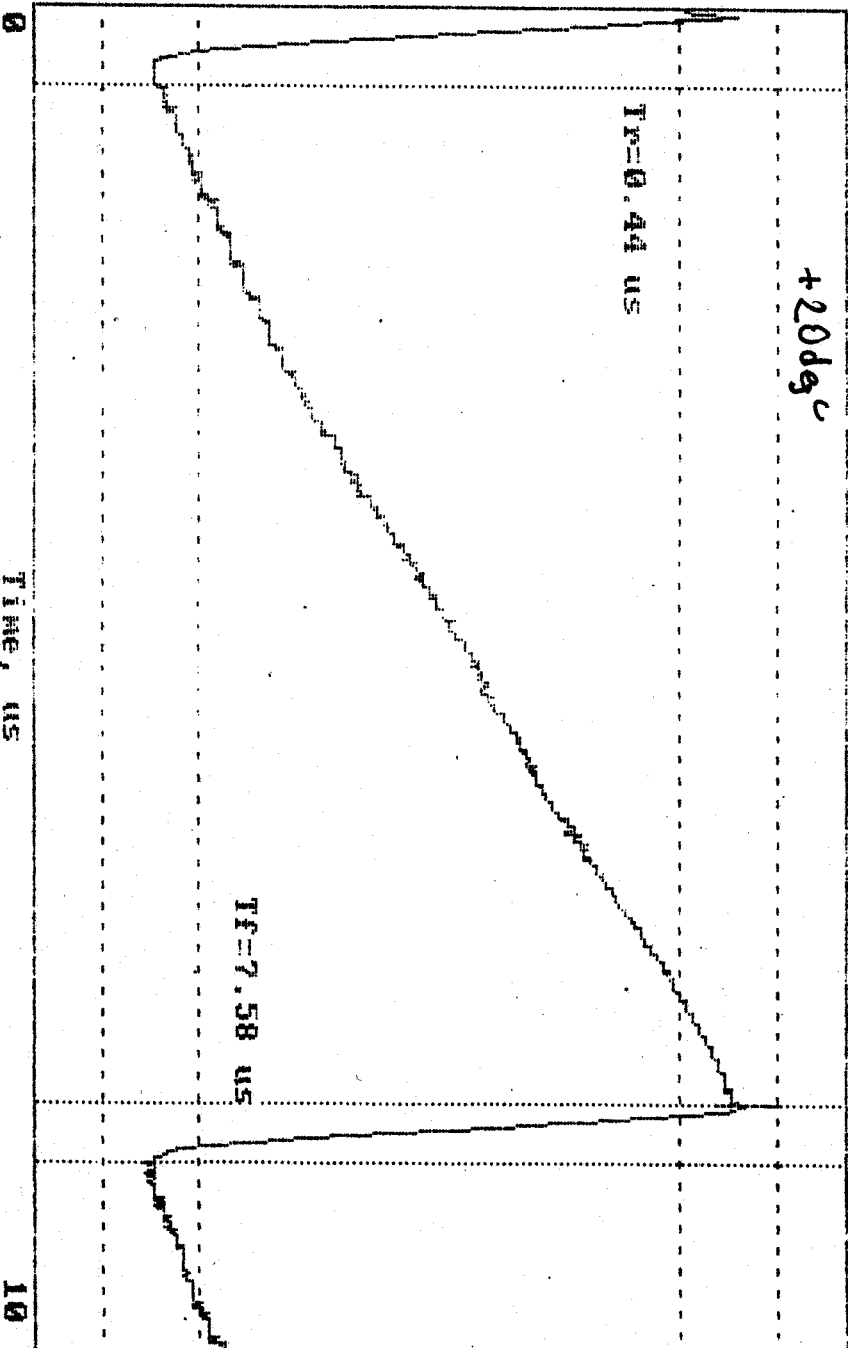
+20dg^c

Tf=0.44 us

Tf=7.58 us

*** CURSOR ***
FREQ: 9158 MHZ
LIN: MHZ
TIME: 8.2 US

9506
9560



13:18:07
04-28-2003

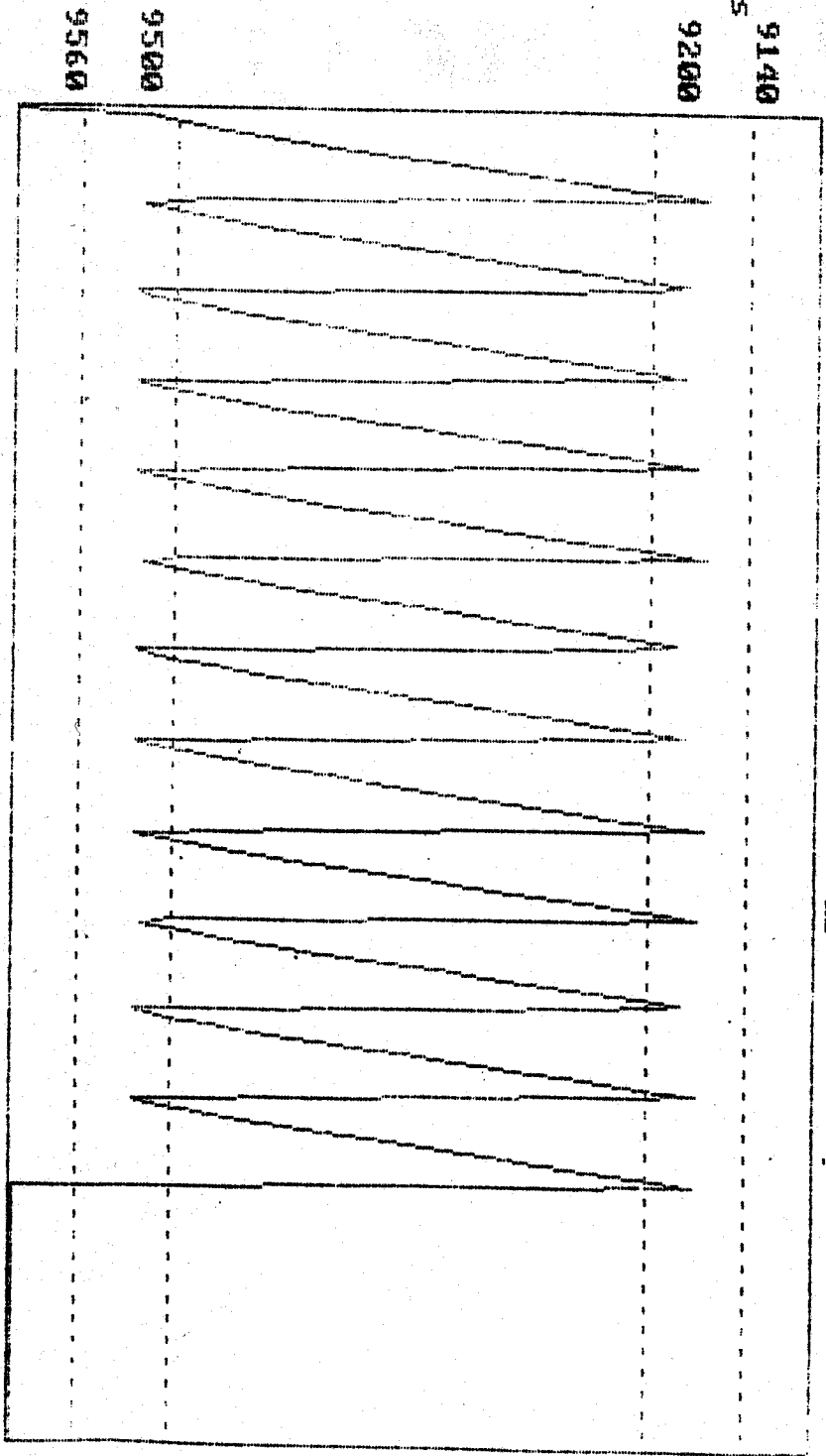
Press Spacebar to Continue

SAHRT BURST ANALYSIS

PR55
SAHRT Serial #
0001

BURST LOW FREQUENCY	BURST HIGH FREQUENCY	BURST WIDTH	SPUR PULSE
9167 MHz	9524 MHz	100.5 us	NO

of Sweeps
12



13:16:02
04-28-2003

Press Spacebar to Continue