15.247 Certification
FCC ID : IMKRL26330M

EMI TEST REPORT

On

RangeLAN2 - 6330
Micro ISA Design-in Card
Centurion CXR-2.4 GHz-TNSP 1.0 dBi antenna
Intermec 248X SMB 1.0 dBi Antenna
Intermec 2.4 GHz SMB 1.5 dBi antenna
Intermec 2.4 GHz TNC 1.0 dBi antenna
Intermec 2.4 GHz SMC1.0 dBi Antenna
Norand F – Style 1.0 dBi Antenna

Prepared for

Proxim, Inc.
295 N. Bernardo Ave
Mountain View, CA 94043
Tel: (650)960-1630
Fax: (650)960-1984

Prepared by

Electronic Compliance Laboratories Inc.
1249 Birchwood Dr.
Sunnyvale, CA 94089
Tel: (408) 747-1490
Fax: (408) 747-1495

Test Report Number: A812005
Date of Test: December 9 and 11, 1998

Table of Contents

1.0 TEST FACILITY

Name:	Electronic Compliance Laboratories
Location:	1249 Birchwood Dr. Sunnyvale, CA 94089
Site Filing:	A site description is on file at the Federal Communications Commission P.O. Box 429 Columbia, MD 21045
NVLAP LAB CODE:	200089
Types of Sites:	Open Field Radiated and Indoor Screen Room (Line Conducted). All sites are constructed and calibrated to meet ANSI C63.4-1994 requirements.

2.0 TEST EQUIPMENT

Description	Manufacturer	Model	SN
EMI Receiver	HP	8546A	3325A00137
Spectrum Analyzer	HP	8563A	3137A01183
Preamp	HP	8447F	3113A05849
Preamp	HP	8449B	3008A00527
LISN	EM	ANS-25/2	2532
Biconical Antenna	EM	EM 6912	414
Log Periodic Ant	EM	EM 6950	311
Double Ridge Horn	EM	EM 6961	6231
Filter BP 1.2-45 GHz	FSY	HM 1160-1155	001
Filter BP 4-10 GHz	FSY	HM 2950-1565	001
Filter BP 10-18 GHz	FSY	HP 8601- 7SS	001

3.0 EUT

RangeLAN2 – 6330-05

Model Number	- 6330
Serial Number	- 0005
FCC ID:	- IMKRL26330M

4.0 SUPPORT EQUIPMENT

Dell Computer	- M/N 466LN	S/N 5Q8D4
Logitech Mouse	- M/N M-S34-6MD	S/N LZA54637080
Packard Bell Keyboard	- M/N 7939	S/N 841180007
KFC Monitor	- M/N CA1511	S/N A4KKU4931207

Centurion CXR-2.4 GHz-TNSP 1.0 dBi Antenna	P/N CAF28771
Intermec 248X SMB 1.0 dBi Antenna	P/N 066147
Intermec 2.4 GHz SMB 1.5 dBi Antenna	P/N 063825
Intermec 2.4 GHz TNC 1.0 dBi Antenna	P/N 060751
Intermec 2.4 GHz SMC1.0 dBi Antenna	P/N 060750
Norand F – Style 1.0 dBi Antenna	P/N 650-277

5.0 EQUIPMENT CONFIGURATION

The RangeLAN2 6307-05 Mini ISA Design-in card was designed to be a drop-in spread spectrum device that has already been FCC certified so that customers purchasing the product would not have to apply for an intentional radiator certification.

In order to prove the module will pass all requirements in a stand alone configuration a desktop PC was used to provide DC power and to allow test commands to be sent and data received. The card was placed outside of the PC shell.

All of the equipment and cables were placed in worst case positions to maximize emissions.

Interconnecting cables were of the type and length specified in the individual equipment requirements.

Grounding was in accordance with the manufacturer requirements and conditions for intended use.

6.0 SUMMARY OF TESTS

The RangeLAN2 6330-05 is a mcroi ISA card with a low power frequency hopping spread spectrum (FHSS) radio system operating in the 2400-2483.5 MHz band. Tests were performed with one antenna. Test firmware resident in the EUT and RL2DIAG.exe were used to do the test.

6.1 15.247(a)(1) FREQUENCY HOPPING SYSTEMS

RangeLAN2 - 6330 uses 79 channels, each 1 MHz wide. The system hops over one of 15 pseudorandom sequences. On average, each channel is used equally. Please refer to " RangeLAN2 – Frequency Hopping Theory of Operation" attached to this submission for more details.

6.1.1 15.247(a)(1)(ii) CHANNEL UTILIZATION

A spectrum analyzer plots labeled "Channel Utilization". The total number of channels is 79. The channels used have nominal center frequencies of 2402 through 2480 MHz. Three spectrum analyzer MAX HOLD plots labeled "20 dB Bandwidth" show the 20 dB bandwidth of the hopping channel to be < 1 MHz (1.0 / .90 / .99 MHz) at the low/midband/high frequencies of 2.402 / 2.440 / 2.480 GHz. **Test Plots are shown in Appendix A.**

Zero span spectrum analyzer plot labeled "Dwell Time" shows
Worst case transmission time in a given slot: 18 mS elapsed time, <100 % duty
Maximum allowed: 400 msec.

Test Data in Appendix A.

6.1.2 15.247(b) MAXIMUM PEAK OUTPUT POWER

The three spectrum analyzer plots labeled " Output Power" show the maximum power of the hopping channel to be 19.97 dBm or 99.3 mW. The EUT was made to transmit uninterrupted random data on each of the low/mid/high channels. **Test Plots are shown in Appendix A.**

The output was taken from an MCX connector, through 6 in. cable to the spectrum analyzer set on Max Hold with no additional attenuation.

Power = 19.67 dBm (peak reading) +0.3 dB cable loss = +19.97 dBm / 99.3 mW EIRP
Limit: +30 dBm / 1 W maximum power

Intermec 2.4 GHz SMB 1.5 dBi Antenna
EIRP = +19.97 (peak power) +1.5 (peak gain, dBi) = +21.47 dBm / 140 mW EIRP
Limit: +36 dBm / 4 W maximum EIRP

6.1.3 **15.247(c) OUT OF BAND EMISSIONS**

The spectrum analyzer plots titled "Out of Band - Band Edges" shows the output spectrum of the EUT while hopping one of the pseudorandom sequences and continuously transmitting packetized data. The analyzer was placed in MAX HOLD mode, and individual sweeps were recorded continually for 10 minutes with the same spectrum analyzer connection as was used for peak output power. The resultant plot shows that the EUT emissions remain inside the 2400 - 2483.5 MHz band when measured in >= 100 kHz bandwidth during operation.

The spectrum analyzer plots labeled "Out of Band 30 to 1000 MHz", " Out of Band 1 to 2.75 GHz", and "Out of Band 2.75 to 26.5 GHz" show that emissions measured in >= 100 kHz bandwidth are more than 20 dB below the highest level of the desired power outside of the 2400 - 2483.5 MHz band. **Test Plots are shown in Appendix A.**

6.1.4 **15.203 ANTENNA REQUIREMENT**

This product has uses an MMCX type antenna connector to provide a unique coupling to the intentional radiator. The Manufacture's control drawings, and the antenna drawings are in **Appendix B.**

6.1.5 **15.205 RESTRICTED BAND RADIATION LIMITS**

The EUT was placed on a wooden table resting on a turntable. The wooden table was approximately 1 meter above the groundplane of the 3 meter test site. The search antenna was moved in to 1 meter when necessary to improve the noise floor, and the appropriate range factor was applied. While the EUT was transmitting uninterrupted random data on each of the low/mid/high channels and with the spectrum analyzer on MAX HOLD, the turntable was rotated, and the search antenna raised and lowered in an attempt to maximize the received radiated emission level. **Test results are attached in Appendix C** in tabular form showing that no spurious signals were detected above the 74 dBuV/m peak/54dBuV/m average limits. Peak measurements were made with a RBW and VBW = 1 MHz. Average measurements were made with a RBW = 1 MHz and a VBW = 10 Hz.

6.1.6 **15.207 AC LINE CONDUCTED EMISSIONS**

The RF line conducted levels for emissions in the 0.45 - 30 MHz band must not exceed 250 μV when measured with a LISN. Attached graphs and tabular data show that emissions are below the 250 μV (48 dBμV) maximum allowed level. **Test Data is in Appendix D**.

6.1.7 **15.209 RADIATED EMISSIONS**

The attached table shows that the Class B radiated limits from 30 - 1000 MHz are not exceeded by the EUT. The EUT was operating normally with a combination of transmission and reception and hopping one of the fifteen pseudorandom sequences during this test. The EUT was placed near one edge of a wooden table resting on a turntable. The wooden table was approximately 1 meter above the groundplane of the 3 meter test site. The search antennas were located at 3 meters. Measurements were made in accordance with ANSI C63.4-1994. **Test Data is in Appendix E.**

Electronic Compliance Laboratories

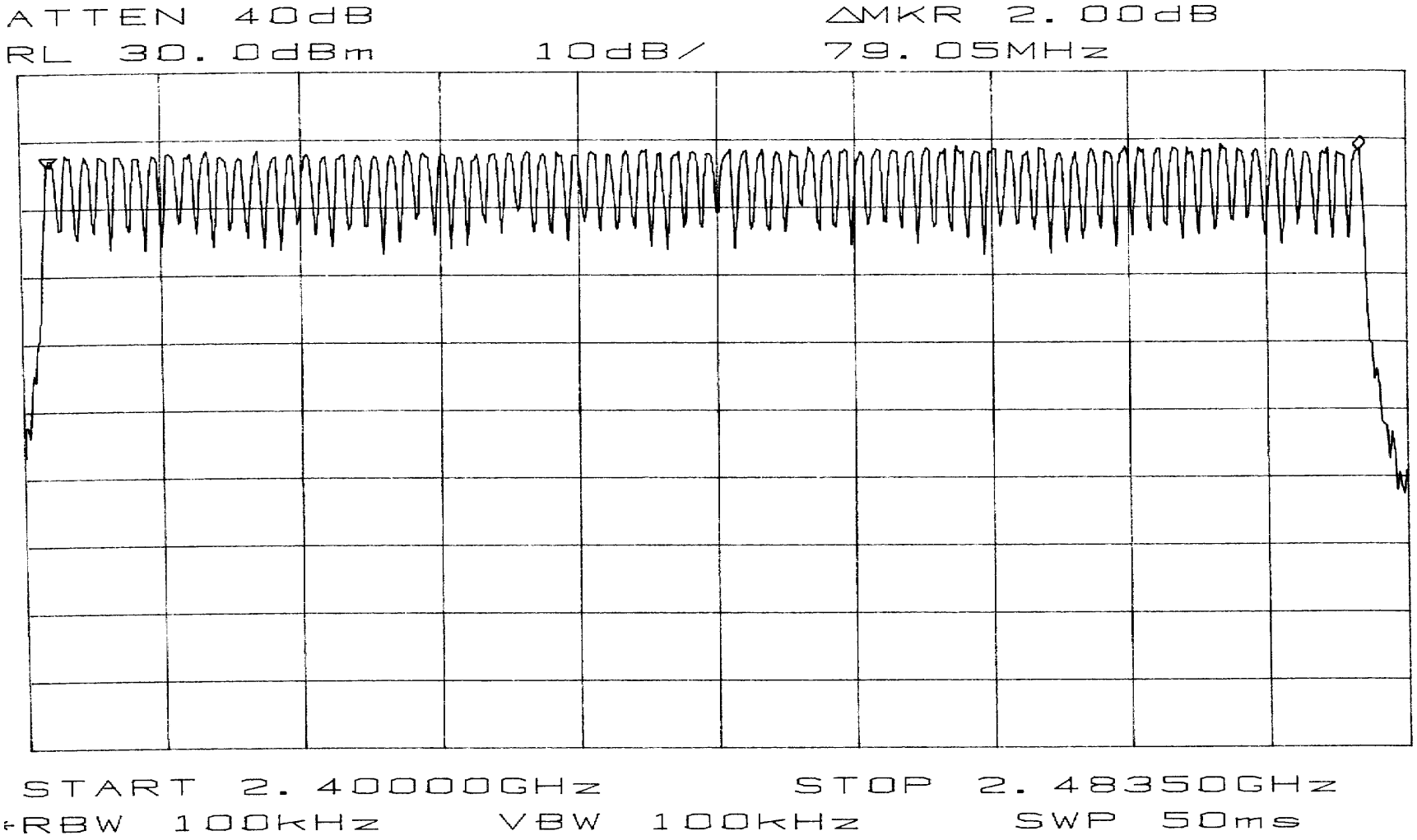
_____ _____

Chris Byleckie Date
Technical Director

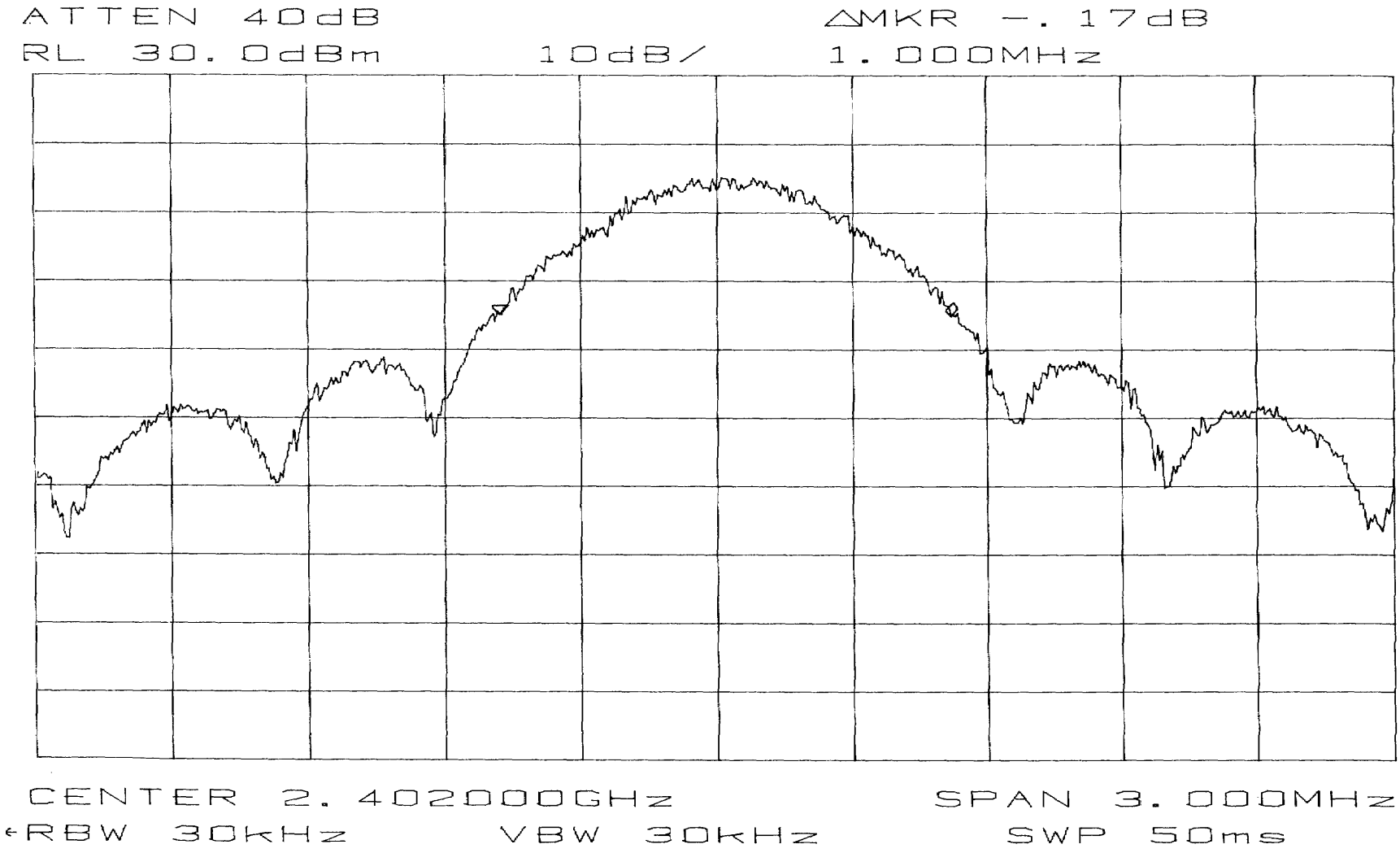
APPENDIX A

SPREAD SPECTRUM PLOTS

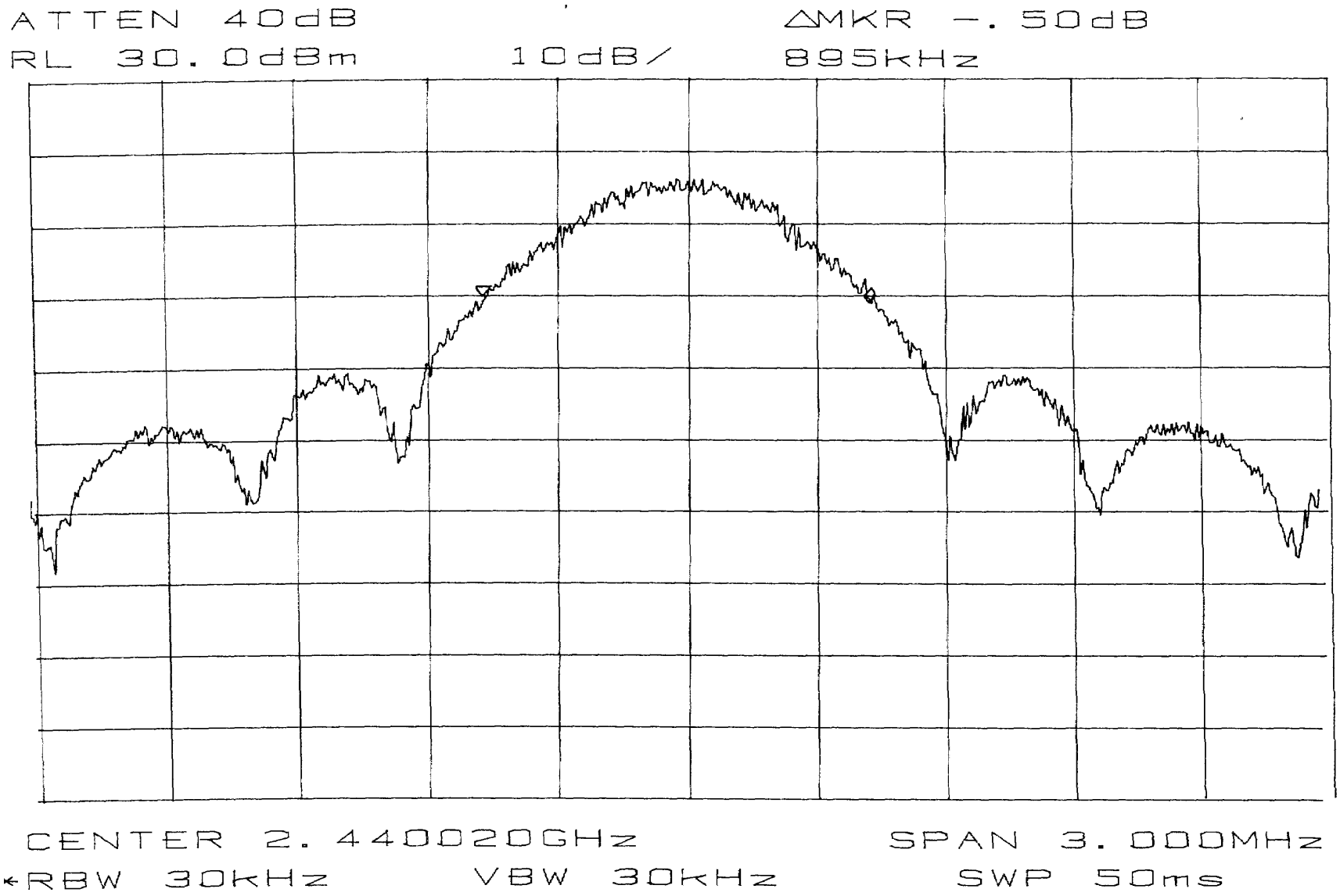
Channel Utilization



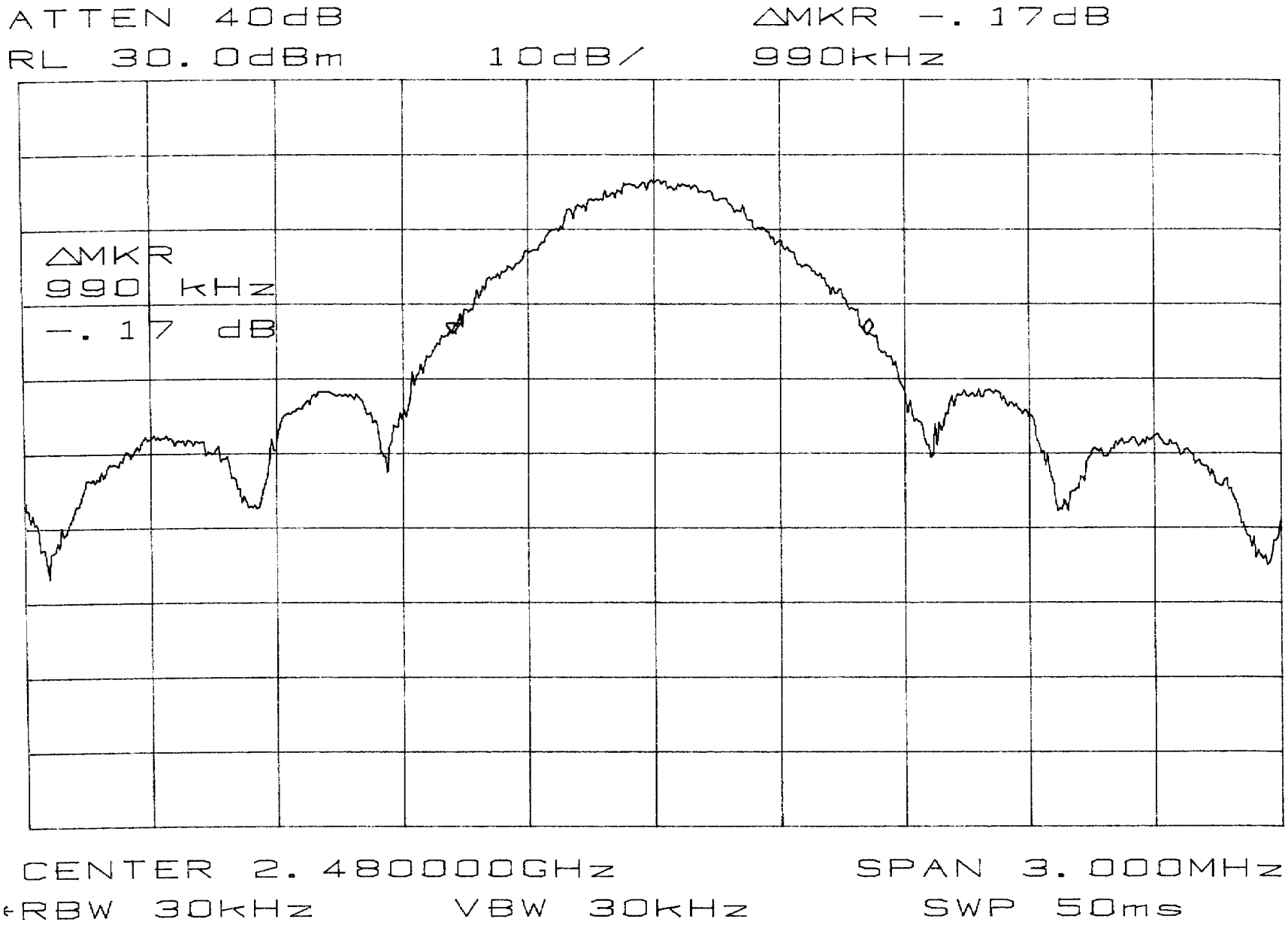
20 dB Bandwidth



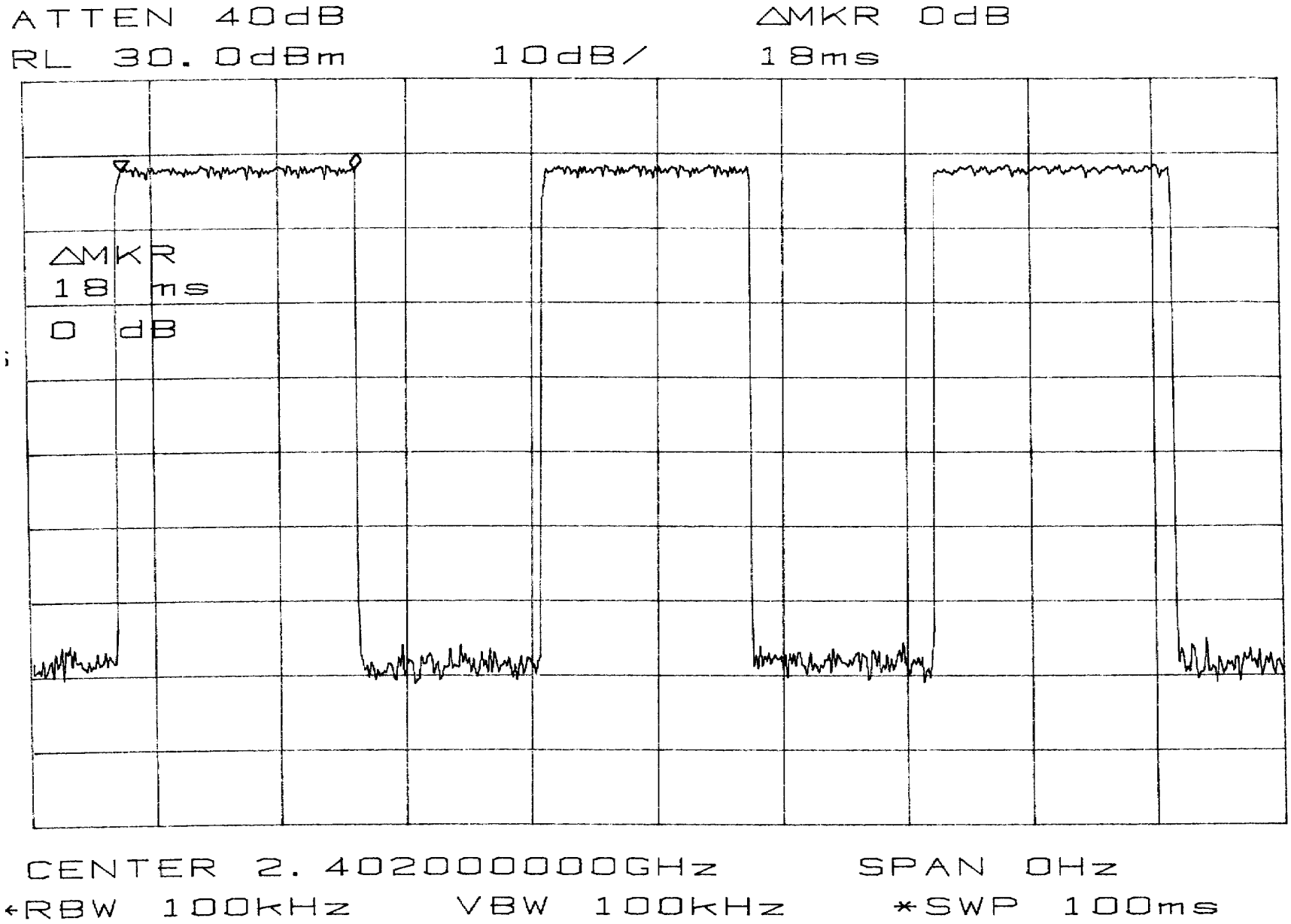
20 dB Bandwidth



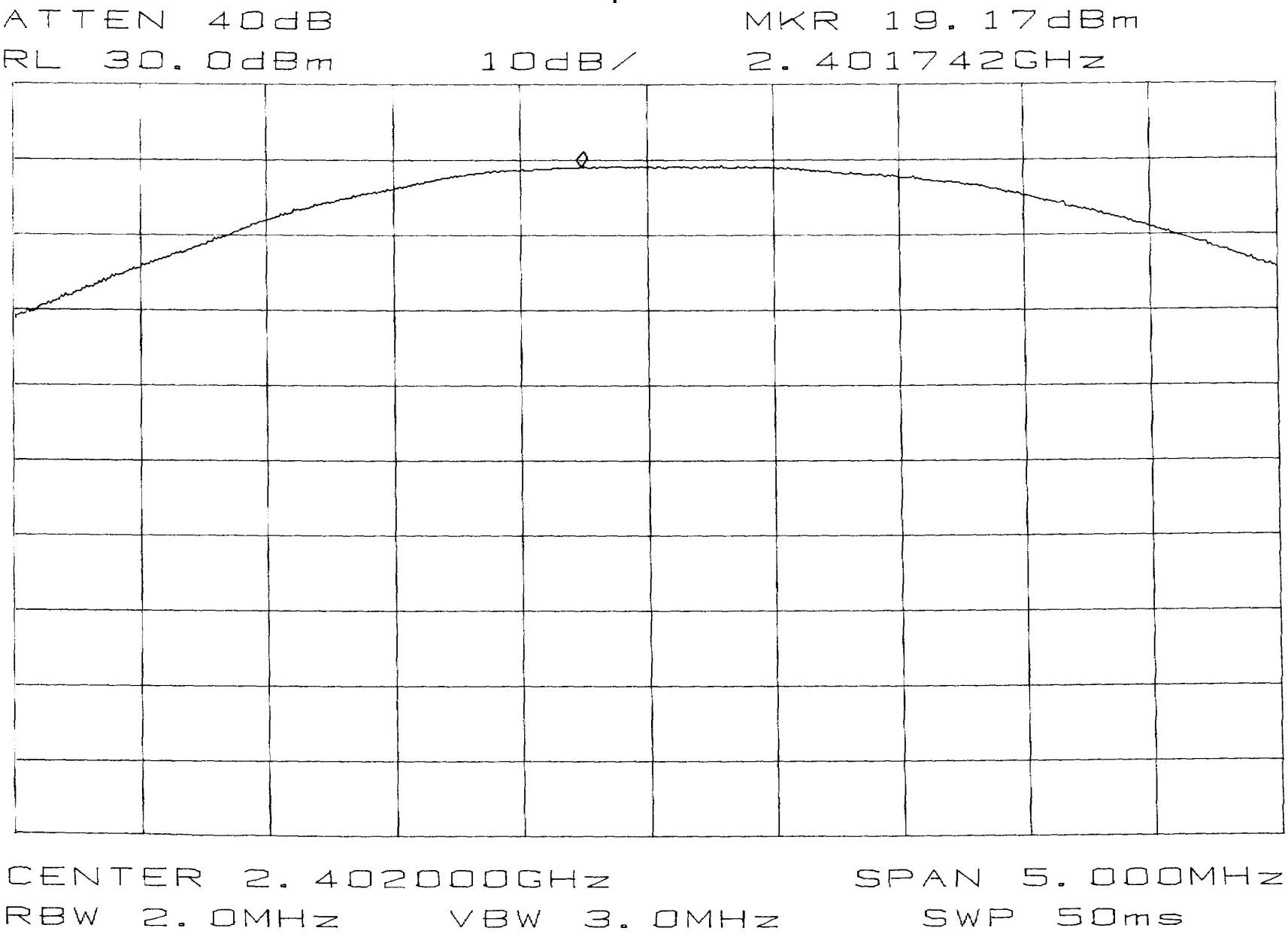
20 dB Bandwidth



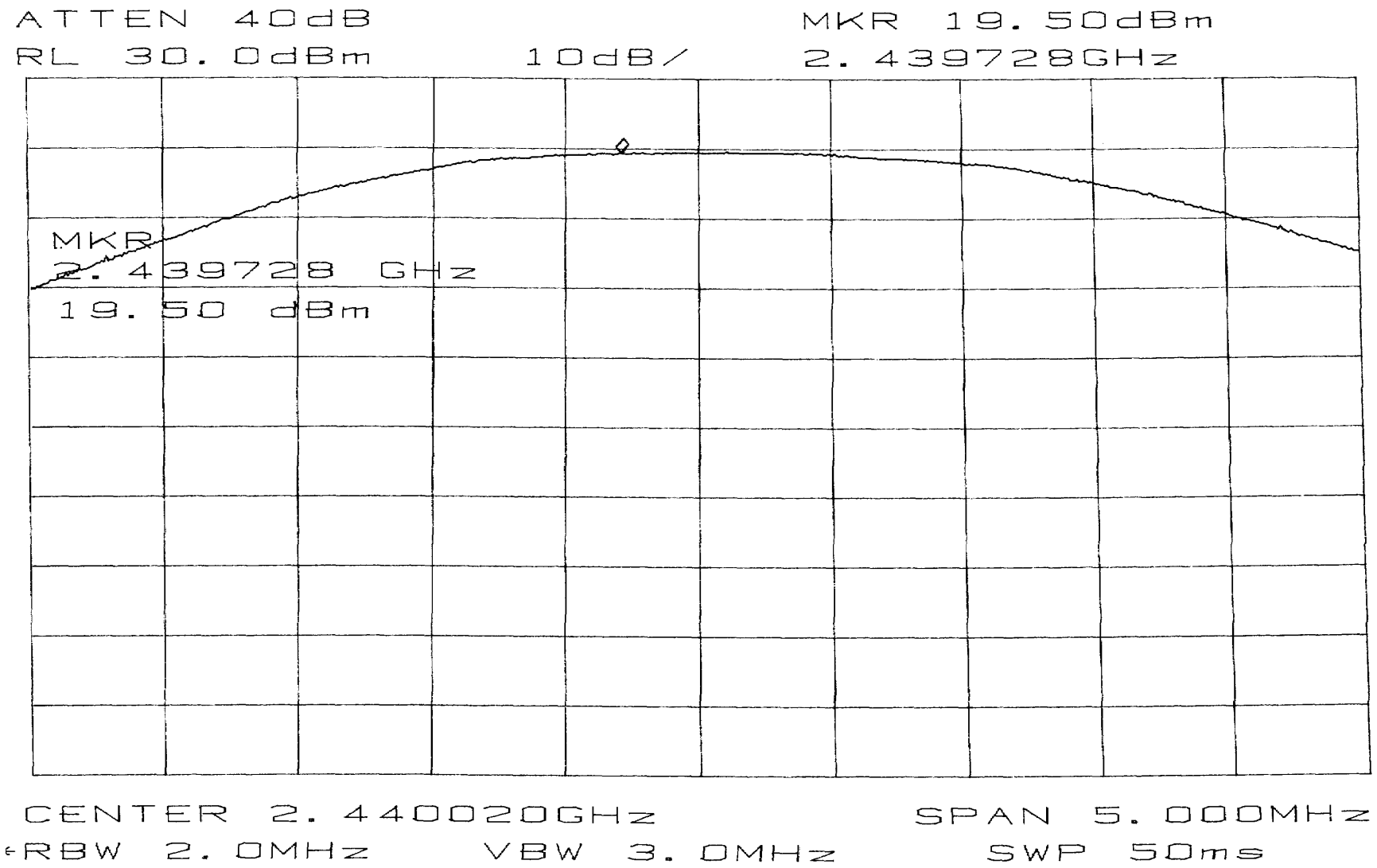
Dwell Time


ATTEN 40dB
ΔMKR 0dB
RL 30.0dBm
10dB/
18ms
ΔMKR
18 ms
0 dB
CENTER 2.402000000GHz
SPAN 0Hz
←RBW 100kHz
VBW 100kHz
*SWP 100ms

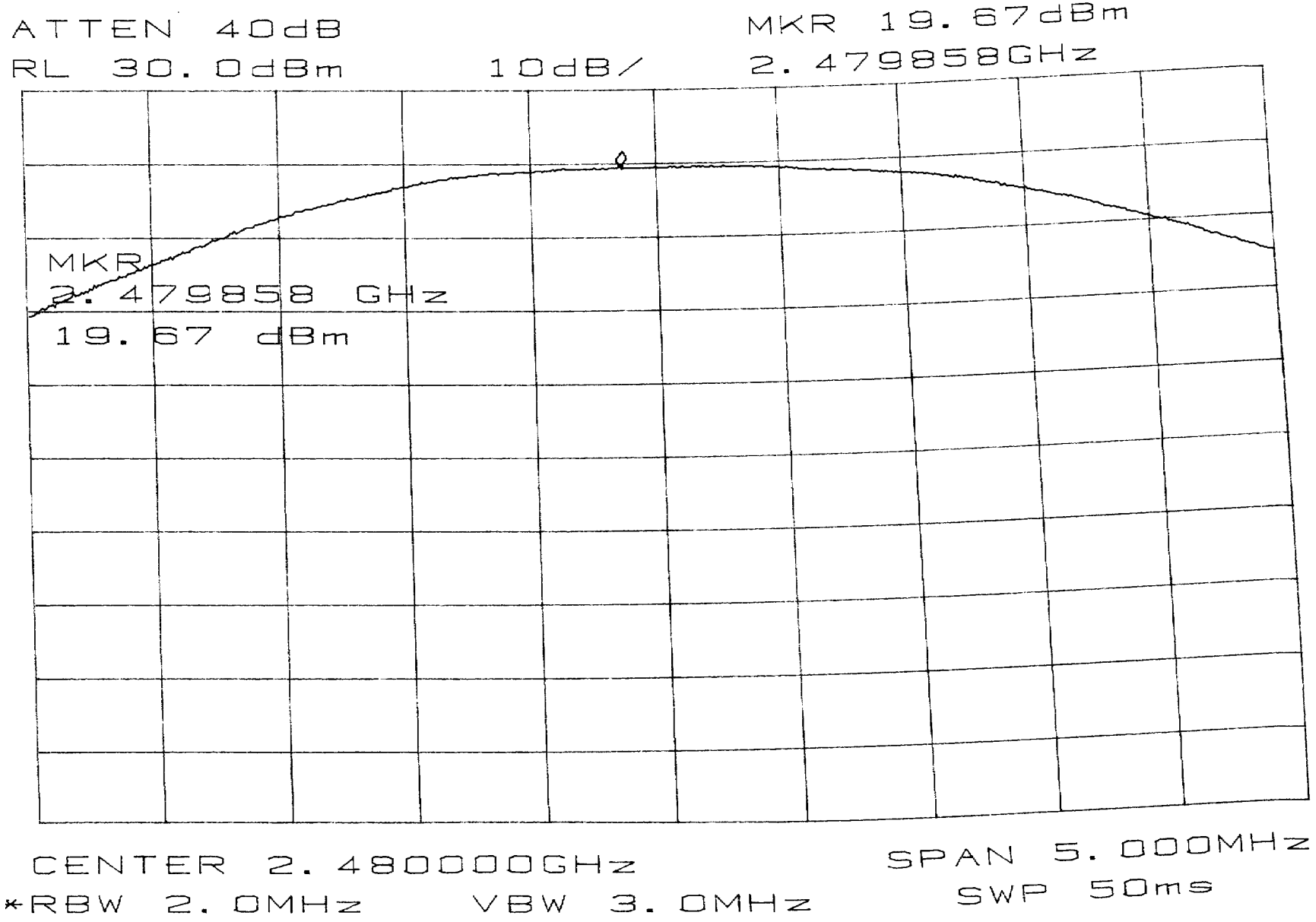
Output Power



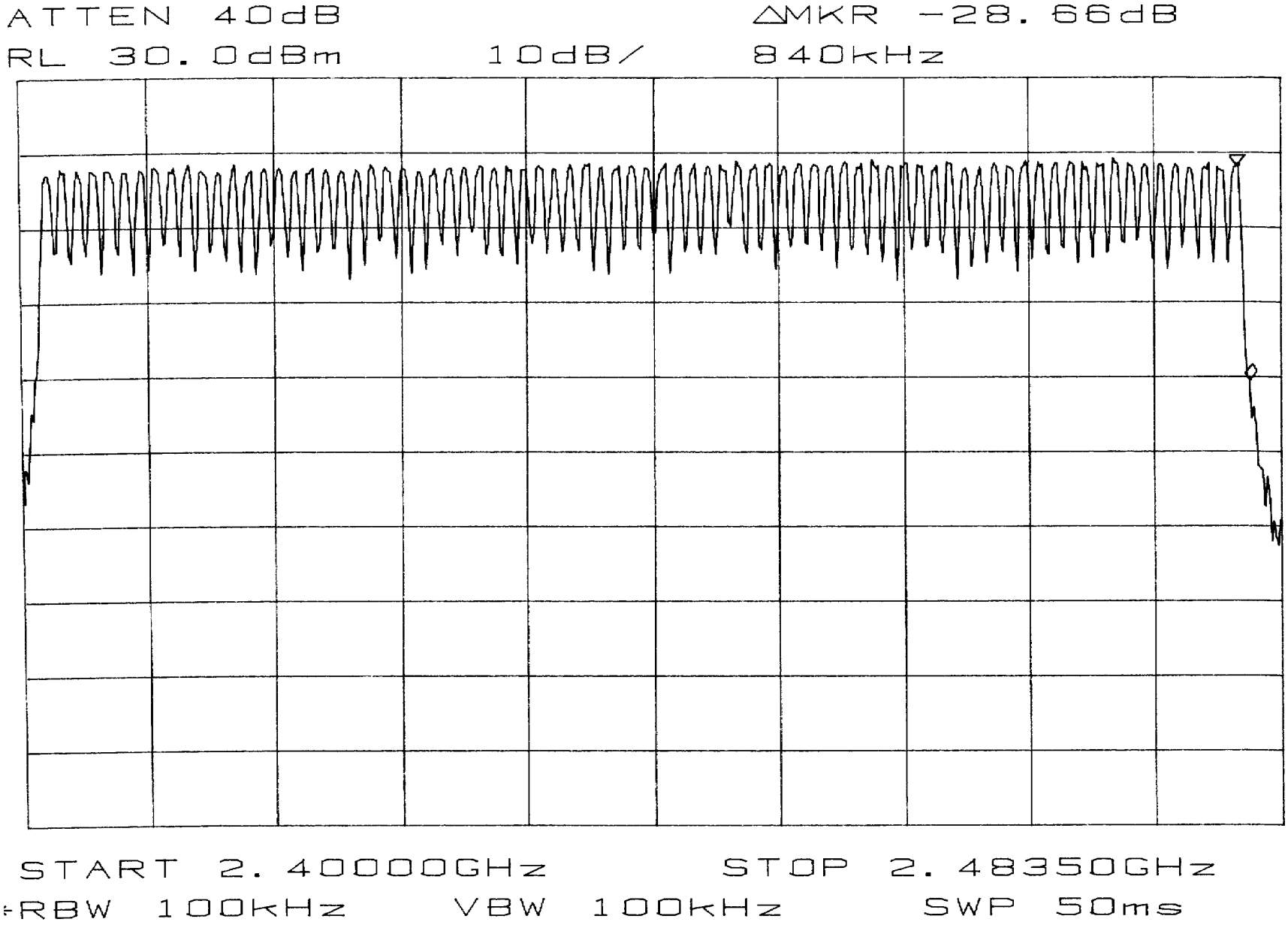
Output Power



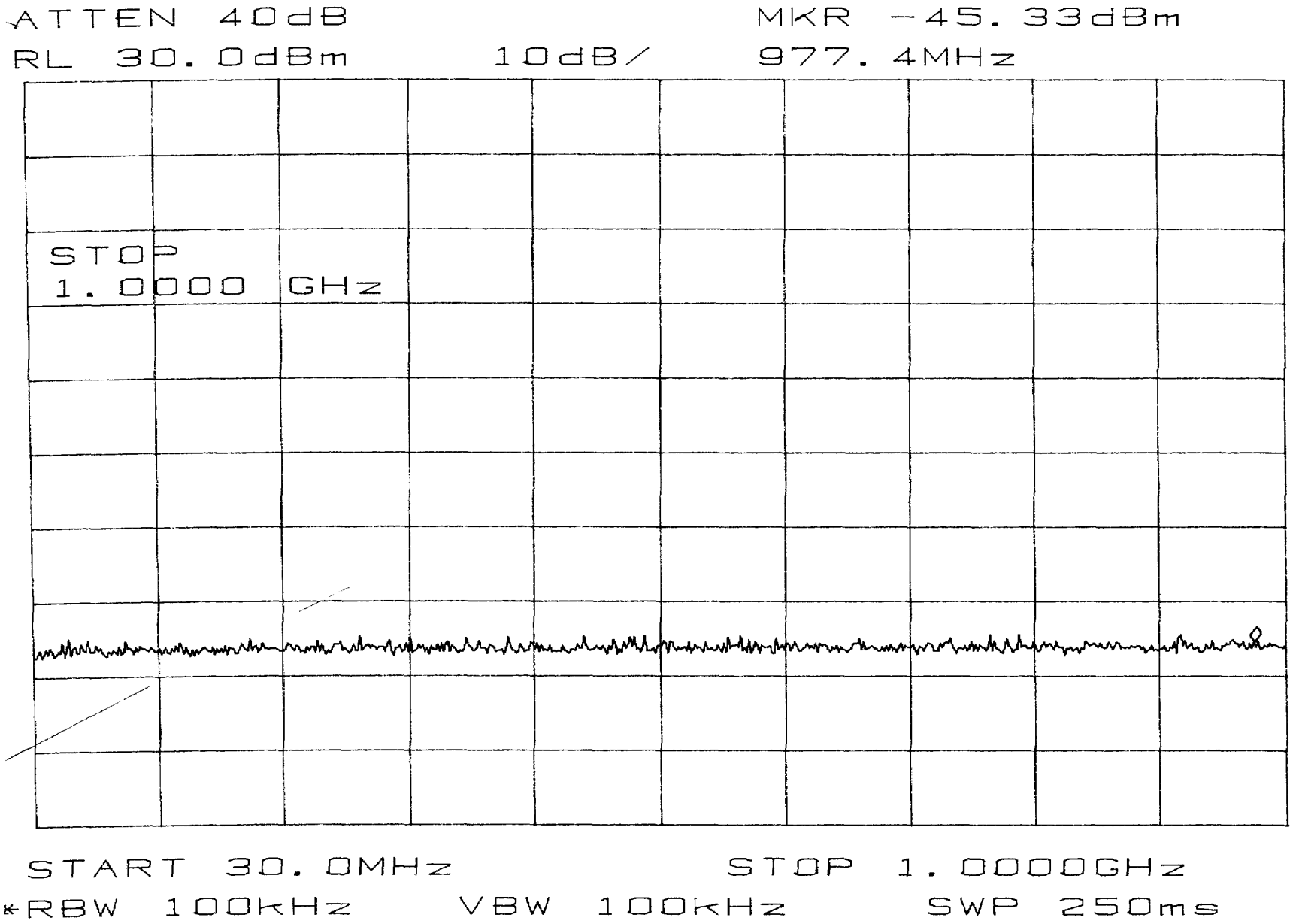
Output Power



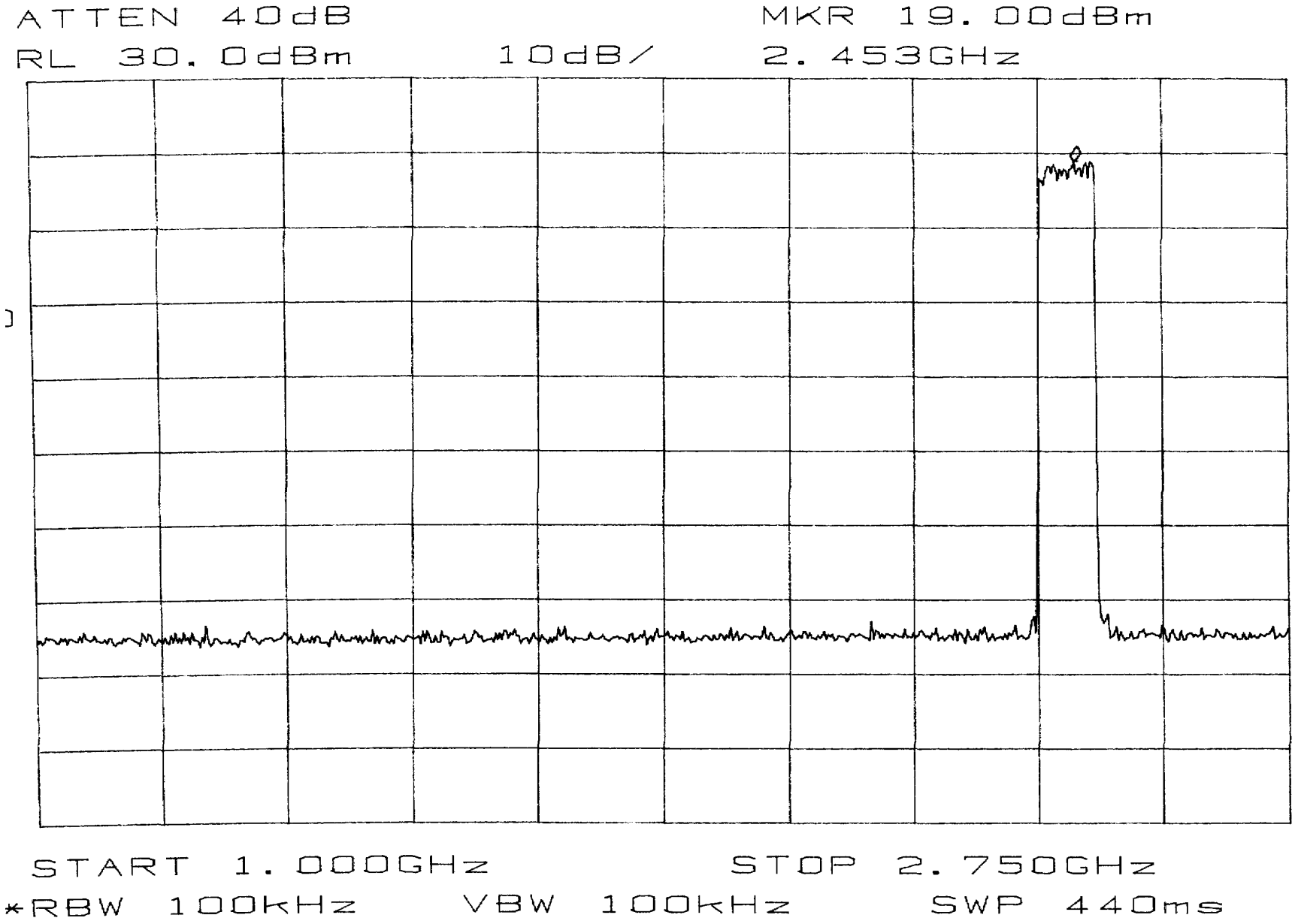
Out Of Band - Band Edges



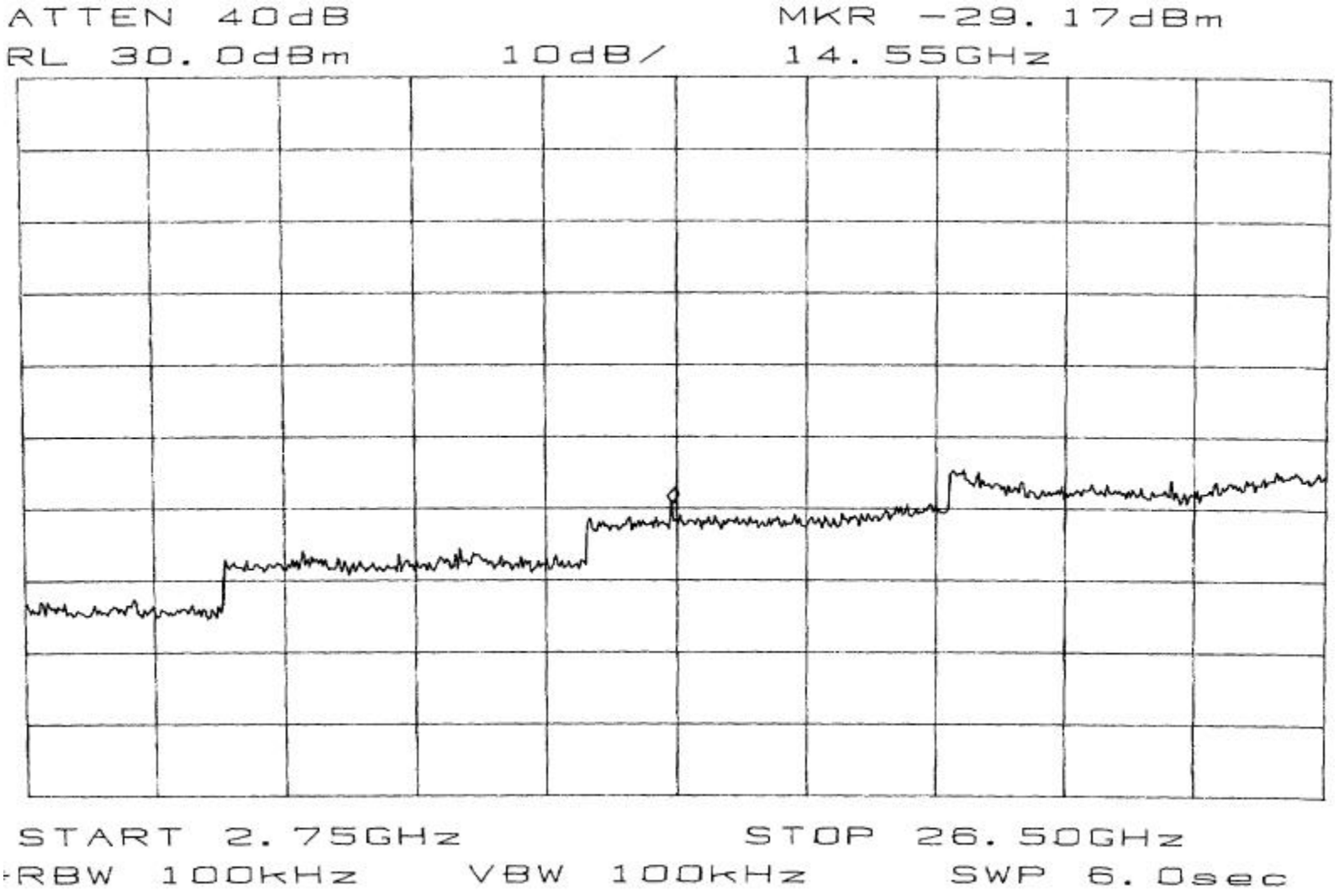
Out Of Band 30 to 1000 MHz



Out Of Band 1 to 2.75 GHz



Out of Band 2.75 to 26.5 GHz



APPENDIX B

RESTRICTED BAND DATA

FCC RADIATED DATA SHEET

				DATE:	DEC. 9, 1998
EUT:	DESIGN-IN MOD. 6330			**CUSTOMER NAME:**	PROXIM
S/N:	S/N 0005			**WORK ORDER:**	8120901
RULE PART:	15.247			**FILE:**	8120901B.xls
ANTENNA:	HORN	**OTHER CAL FACTORS:**		**ATTN dB:**	0
MODULATION TYPE:				**DUTY dB:**	0
TESTED BY:	SHAWN			**HP IL dB:**	0
COMMENTS:				**DIST dB:**	0

FREQ.	READING	Pk, QP,	A.F.	Cable loss	AMP	O.C.F.	TOTAL,	LIMIT	DELTA
MHz	dB(uV)	or Av	dB	dB	dB	dB	dB(uV/m)	dB(uV/m)	dB
Fund =	**2402.0**								
4804	44.3	Pk	34.2	11.0	35.0	0.0	54.5	74.0	-19.5
4804	34.2	Avg	34.2	11.0	35.0	0.0	44.4	54.0	-9.6
12010	35.2	Pk	42.6	23.5	35.0	0.0	66.3	74.0	-7.7
12010	19.0	Avg	42.6	23.5	35.0	0.0	50.1	54.0	-3.9
14412	34.5	Pk	40.9	26.9	35.0	0.0	67.3	74.0	-6.7
14412	17.4	Avg	40.9	26.9	35.0	0.0	50.2	54.0	-3.8
Fund =	**2440.0**								
4880	43.3	Pk	34.2	11.2	35.0	0.0	53.7	74.0	-20.3
4880	34.3	Avg	34.2	11.2	35.0	0.0	44.7	54.0	-9.3
7320	45.2	Pk	36.8	16.0	35.0	0.0	63.0	74.0	-11.0
7320	30.0	Avg	36.8	16.0	35.0	0.0	47.8	54.0	-6.2
12200	33.9	Pk	42.6	24.0	35.0	0.0	65.5	74.0	-8.5
12200	18.0	Avg	42.6	24.0	35.0	0.0	49.6	54.0	-4.4
Fund =	**2480.0**								
4960	45.5	Pk	34.2	11.0	35.0	0.0	55.7	74.0	-18.3
4960	37.0	Avg	34.2	11.0	35.0	0.0	47.2	54.0	-6.8
7440	46.5	Pk	36.8	15.9	35.0	0.0	64.2	74.0	-9.8
7440	32.2	Avg	36.8	15.9	35.0	0.0	49.9	54.0	-4.1
12400	34.4	Pk	42.6	24.5	35.0	0.0	66.5	74.0	-7.5
12400	17.4	Avg	42.6	24.5	35.0	0.0	49.5	54.0	-4.5

APPENDIX C
15.207 CONDUCTED EMISSIONS

Electronic Compliance Laboratories, Inc.
1249 Birchwood Ave.
Sunnyvale, CA

Conducted Emissions
Frequency range: 450KHz-30MHz

Government Agency and Limit: FCC Class B

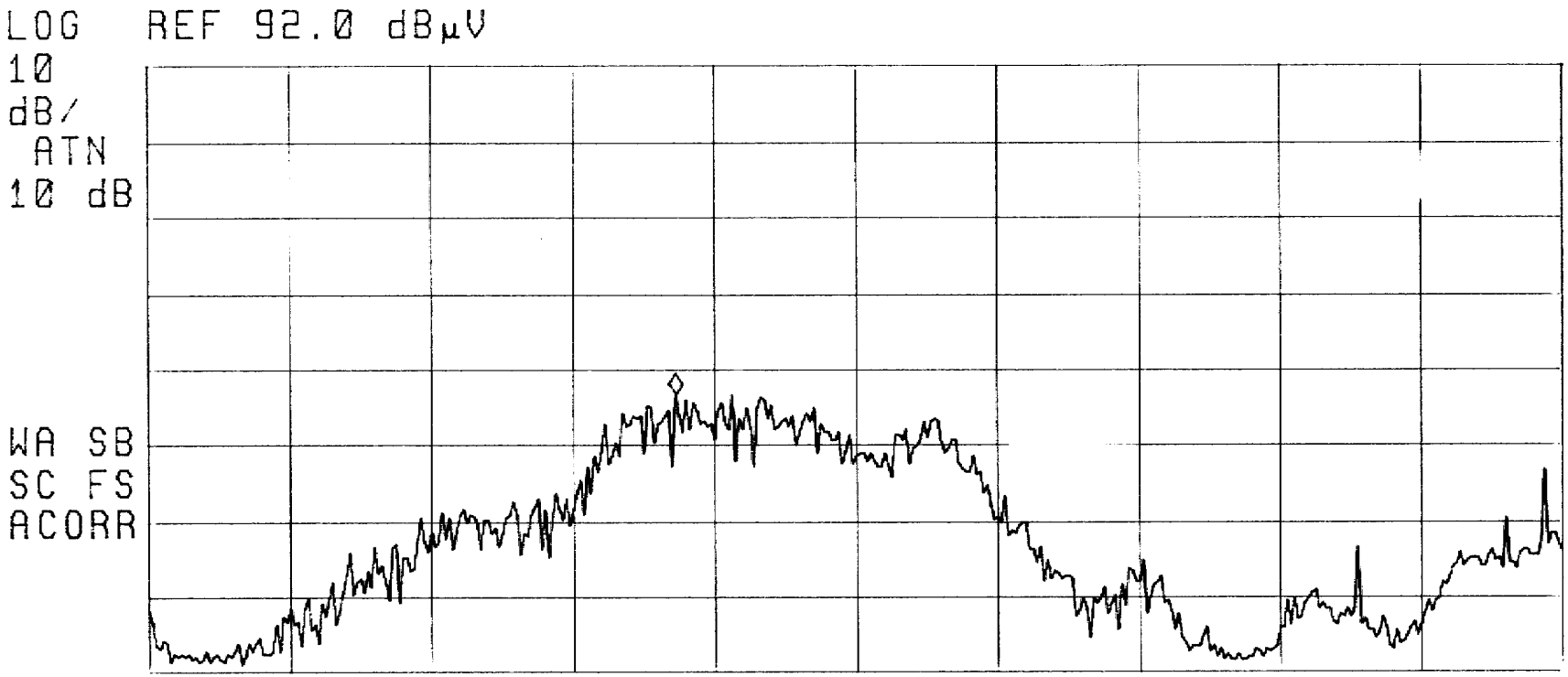
QP = Quasi-Peak Note: Ignore peak readings when Quasi-Peak reading exists
PK = Peak

Customer:	PROXIM	Operator:	SHAWN
Date:	12-09-1998	Time:	15:04:40
Temperature Range:	72 Deg F	Percent Humidity:	45
E.U.T.:	DESIGN-IN MOD. 6330		
Serial Number:	0005		
Support Devices:	DELL CPU, MONITOR, KEYBOARD, MOUSE		
Exercise Program:	rl2diag.exe		
Modifications:	None		
Report File Name:	F:\TESTDATA\8120901B.F		

TEST FREQ	TEST dBuV	CLASS B LIMIT	VERSUS B LIMIT	CONDUCTOR	TYPE
0.890	13.4	48.0	-34.6	LINE	PK
7.990	32.8	48.0	-15.2	LINE	PK
11.460	48.6	48.0	0.6	LINE	PK
16.850	45.5	48.0	-2.5	LINE	PK
25.720	28.6	48.0	-19.4	LINE	PK
29.630	38.7	48.0	-9.3	LINE	PK
11.460	32.5	48.0	-15.5	LINE	QP
16.850	34.0	48.0	-14.0	LINE	QP
1.040	15.1	48.0	-32.9	NEUTRAL	PK
6.430	32.8	48.0	-15.2	NEUTRAL	PK
11.530	49.2	48.0	1.2	NEUTRAL	PK
16.780	45.5	48.0	-2.5	NEUTRAL	PK
24.160	24.6	48.0	-23.4	NEUTRAL	PK
28.890	36.6	48.0	-11.4	NEUTRAL	PK
11.530	34.6	48.0	-13.4	NEUTRAL	QP
16.780	33.9	48.0	-14.1	NEUTRAL	QP

15:13:41 DEC 09, 1998
8120901B LINE

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 11.46 MHz
48.58 dBµV




15:17:28 DEC 09, 1998
8120901B NEUTRAL
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 11.53 MHz
49.21 dBµV
LOG REF 92.0 dBµV
10
dB/
ATN
10 dB
WA SB
SC FS
ACORR
START 450 kHz
STOP 30.00 MHz
IF BW 9.0 kHz
AVG BW 30 kHz
SWP 2.46 sec

APPENDIX D
15.209 RADIATED EMISSIONS

Electronic Compliance Laboratories, Inc.
1249 Birchwood Ave.
Sunnyvale, CA

Radiated Emissions
Frequency range: 30MHz-1000MHz
3 Meter Open Site
Site Calibrated: June 1997

Government Agency and Limit: FCC Class B

QP = Quasi-Peak Note: Ignore peak readings when Quasi-Peak reading exists
PK = Peak

Customer: PROXIM Operator: SHAWN
Date: 12-09-1998 Time: 12:30:35
Temperature Range: 52 Deg F Percent Humidity: 48
E.U.T.: DESIGN-IN MOD. 6330
Serial Number: 0005
Support Devices: DELL CPU, MONITOR, KEYBOARD, MOUSE
Exercise Program: rl2diag.exe
Modifications: None
Report File Name: F:\TESTDATA\8120901B.RF

Antenna Type: BICONICAL

TEST FREQ	TEST dBuV	ACTUAL dBuV/m	CLASS B LIMIT	VERSUS B LIMIT	TABLE DEGREES	ANTENNA HEIGHT	POLAR-IZATION	DETECTOR Type
64.000	50.2	33.3	40.0	-6.7	0	2.0	V	PK
80.000	47.2	30.6	40.0	-9.4	90	2.0	V	PK
182.300	45.2	36.5	43.5	-7.0	180	2.0	V	PK
144.000	44.0	34.4	43.5	-9.1	120	2.0	V	PK
176.000	43.0	34.1	43.5	-9.4	0	1.5	V	PK
192.000	45.0	36.6	43.5	-6.9	270	1.5	V	PK
240.000	38.5	31.0	46.0	-15.0	220	1.5	V	PK
272.000	35.3	29.1	46.0	-16.9	220	1.5	V	PK
288.000	36.2	32.1	46.0	-13.9	250	1.5	H	PK
272.000	33.0	26.8	46.0	-19.2	270	1.5	H	PK
256.800	44.8	37.5	46.0	-8.5	250	2.0	H	PK
240.000	49.6	42.1	46.0	-3.9	270	1.5	H	PK
240.000	47.2	39.7	46.0	-6.3	270	1.5	H	QP
224.000	42.3	34.6	46.0	-11.4	270	2.0	H	PK
208.000	43.1	35.2	43.5	-8.3	270	2.0	H	PK
176.000	44.2	35.3	43.5	-8.2	270	2.0	H	PK
144.000	44.3	34.7	43.5	-8.8	270	2.0	H	PK
128.000	45.2	35.0	43.5	-8.5	250	1.5	H	PK
112.000	39.5	27.6	43.5	-15.9	250	2.0	H	PK
64.000	47.2	30.3	40.0	-9.7	300	2.0	H	PK

CHANGED ANTENNA TO LOG PERIODIC

304.000	34.2	25.4	46.0	-20.6	0	1.5	V	PK
320.000	38.0	28.8	46.0	-17.2	0	1.5	V	PK
336.000	41.0	32.0	46.0	-14.0	270	1.5	V	PK
352.000	32.0	23.3	46.0	-22.7	270	1.5	V	PK
384.000	41.7	33.8	46.0	-12.2	270	1.5	V	PK
400.000	32.3	24.8	46.0	-21.2	250	1.5	V	PK

416.000	31.0	23.7	46.0	-22.3	270	1.5	V	PK

Date: 12-09-1998
E.U.T.: DESIGN-IN MOD. 6330
Serial Number: 0005
Antenna Type: LOG PERIODIC

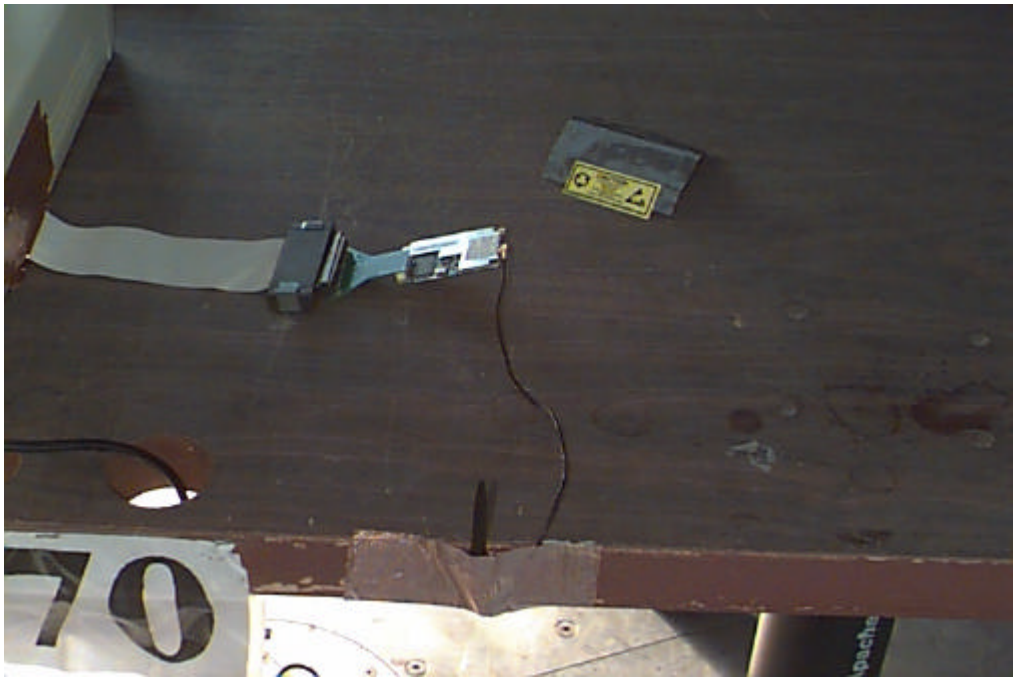
TEST FREQ	TEST dBuV	ACTUAL dBuV/m	CLASS B LIMIT	VERSUS B LIMIT	TABLE DEGREES	ANTENNA HEIGHT	POLAR-IZATION	DETECTOR Type
320.000	43.3	34.1	46.0	-11.9	300	2.0	H	PK
304.000	41.3	32.5	46.0	-13.5	300	2.0	H	PK
480.000	30.0	24.3	46.0	-21.7	250	2.0	H	PK
416.000	30.0	22.7	46.0	-23.3	270	2.0	H	PK
400.000	41.2	33.7	46.0	-12.3	270	2.0	H	PK
384.000	42.2	34.3	46.0	-11.7	340	2.0	H	PK
368.000	43.0	34.7	46.0	-11.3	300	1.5	H	PK
352.000	43.3	34.6	46.0	-11.4	300	1.5	H	PK
336.000	39.9	30.9	46.0	-15.1	300	1.5	H	PK

APPENDIX E

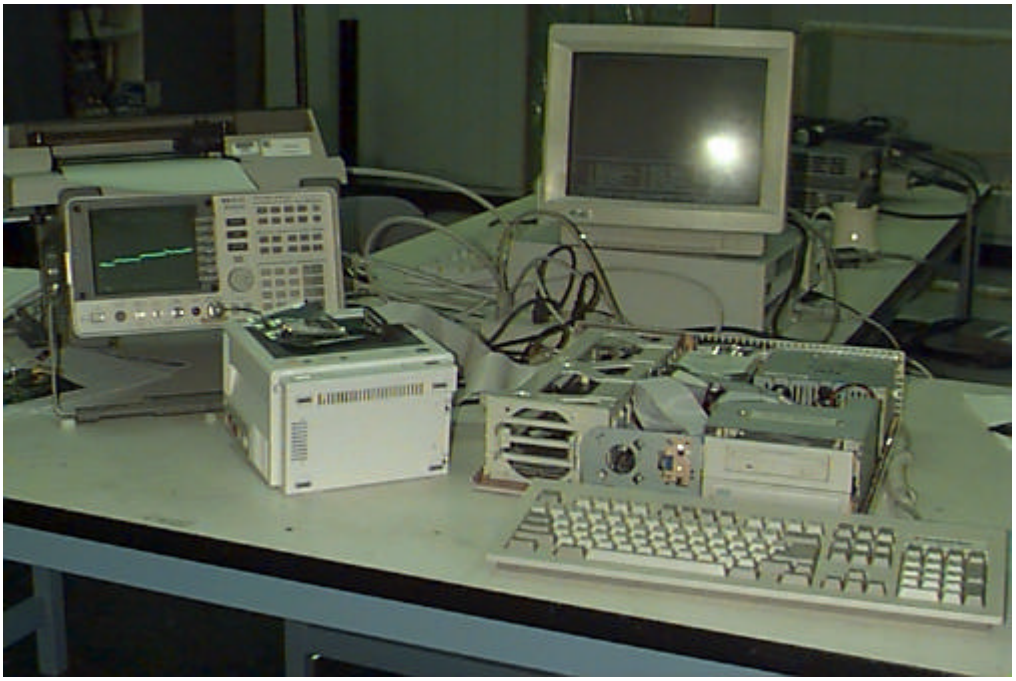
SET-UP PHOTOS

FCC 15.209 Class B
Radiated Emissions

FCC 15.207 Class B
Conducted Emissions



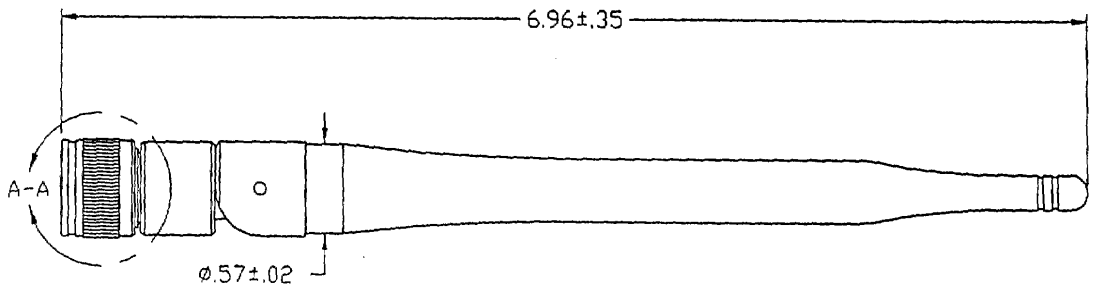
FCC 15.247 Restricted Band

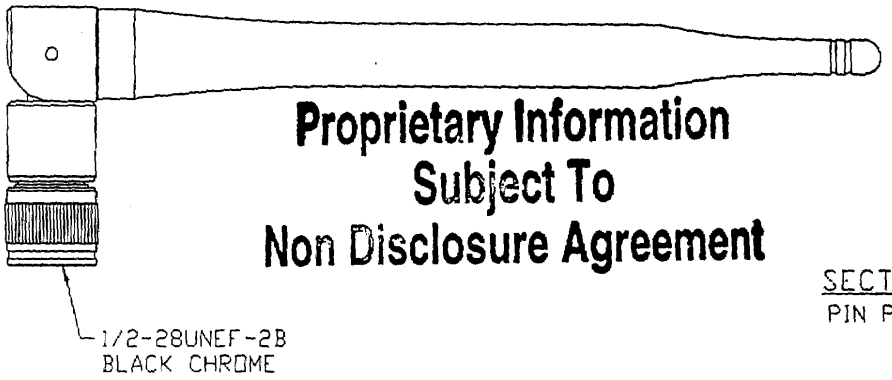


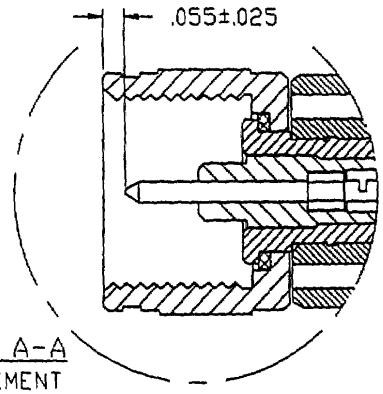
FCC 15.247 Conducted RF

APPENDIX F

ANTENNA DRAWINGS







SECTION A-A
PIN PLACEMENT

ALL DIMENSIONS ARE IN INCHES

NOTES:

1 SPECIFICATIONS:
- GAIN: 1.0 dBi
- OPERATING TEMPERATURE:-40°C TO +85°C
- FLEX TEST: PER QEA0014
- PULL TEST: 20 lbs. LINEAR PULL
- TORQUE TEST: 20 in-lbs.
- POWER RATING: 50 WATTS
- VSWR 1.5:1 MAX. AT RESONANCE

2

CENTURION PART NO.	CUSTOMER MODEL NO.	FREQUENCY CODE	FREQUENCY RANGE
CAF28771	805-486-001	2.4 GHZ	2.4-2.5GHZ

LET	REVISION	DATE	CK	APP
X1	PROT6032	10/95		
A	ECO951263	10/95		
B	ECO9653	01/96		

SCALE: 1:1 | DR: JB | CK:

TOL. UNLESS NOTED:
.XX = ± .010
.XXX = ± .005
ANGULAR ± 30'

CENTURION INT. INC.
PH. 402-467-4491
FAX. 402-467-4528
P.O. BOX 82846
LINCOLN, NE 68501

ANT,CXR-2.4GHZ-TNSP

MATERIAL: N/A

DATE:	DWG NO.:	PG:	REV
10/13/95	CAF28771	1/6	B

ATTACHMENT 1

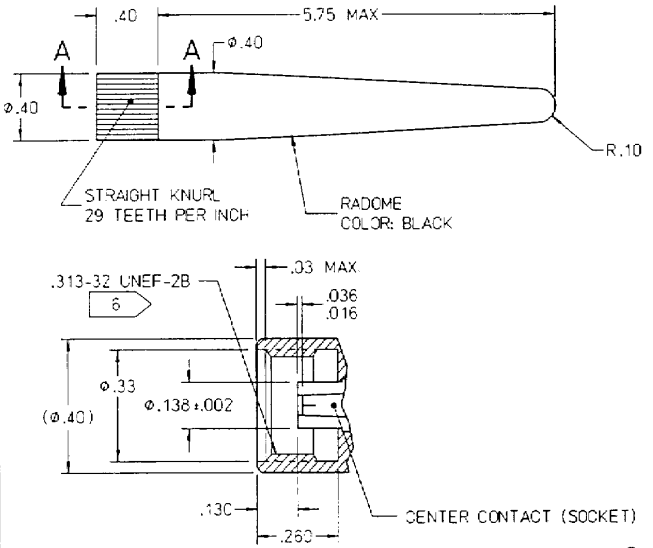
APPROVED SOURCE(S) OF SUPPLY

SUPPLIER	PART NUMBER
1. CENTURION	CAF28776
2.	
3.	
4.	

5	4	3	2	1	REVISION
					SHEET

REV STATUS OF SHEETS

REVISIONS			
REV	DESCRIPTION	DATE	DRAWN & APPROVED
C	-001 RELEASED AT REV C		
D	-002 PER ECN 023493	12-15-94	G.RAVEN RCH
E	-003 PER ECN 024930	12-21-95	J.FOTI RCH



SECTION A-A
SCALE 4/1

NOTES: UNLESS OTHERWISE SPECIFIED

1. BAG PART AND MARK BAG WITH 060750 AND DASH NUMBER TO WHICH MANUFACTURED PER SPECIFICATION 606427.

2. SPECIFICATIONS:
   FREQUENCY RANGE: 2.4-2.4835 GHZ
   GAIN: 1.0 dB PEAK MINUMUM
   IMPEDANCE: 50 OHMS.
   VSWR MAX: 1.5:1 ACROSS 2.4-2.4835 GHZ.
   POWER RATING: 1 WATT.
   OPERATING TEMPERATURE: -40° TO +85° C @95% RH

3. CONNECTOR REQUIREMENTS:
   MATERIAL: CONNECTOR BODY: BRASS ALLOY 360, PER QQ-B-626.
   CENTER CONTACT: BERYLLIUM COPPER PER ASTM-B196.
   INSULATOR: PTFE FLUOROCARBON PER ASTM-D1710, TYPE 1, GRADE 1.

   FINISH: CENTER CONTACT: GOLD PER MIL-G-45204, TYPE 1, GRADE C, OVER GOLD PER MIL-G-45204, TYPE 1, GRADE A OVER NICKEL PER QQ-N-290, GRADE C (.001)

   CONNECTOR BODY: BLACK CHROME PER MIL-C-14538C (.00001) WITH NICKEL UNDERPLATE PER QQ-N-290A, GRADE G (.0001-.0002)

4. MECHANICAL REQUIREMENTS:
   90° FLEXURE PERFORMANCE: 500 CYCLES.
   PULL TEST: 30 LB LINEAR PULL.
   TORQUE TEST: 15 IN-LB.

5. PLUG MATES WITH INTERMEC DRAWING NUMBER 582223, ITT SEALECTRO PART NUMBER C50-827-0019-910.

6. CONNECTOR PLUG WITH STANDARD 75 OHM SCREW ON INTERFACE AND 50 OHM LINE IMPEDANCE.

7. CHANGES REQUIRE SAC APPROVAL.

-003

SOURCE CONTROL DRAWING

CAD DBREF-/cadserv/ecn/060750.1.e
SYSTEM - HP

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.
.XX ± .02
.XXX ± .010
ANGLES ± 1°

APPROVALS		DATE
DRAWN	G.RAVEN	4-9-94
CHECKED	R.HOAGLUND	8-2-94
RESP ENG	M.SHAVER	8-5-94
QA	K.CANTRELL	8-11-94
MFG ENG	M.SALATINO	8-4-94
SAC	P.HELTON	8-3-94

Intermec
6001 36TH AVENUE WEST
EVERETT, WA 98203-9280

TITLE: ANTENNA, SMC, 2.4 GHZ DIPOLE

SIZE	CAGE CODE	DRAWING NUMBER	REV
C	33825	060750	E

SCALE NONE | SHEET 1 OF 1

APPROVED SOURCE(S) OF SUPPLY

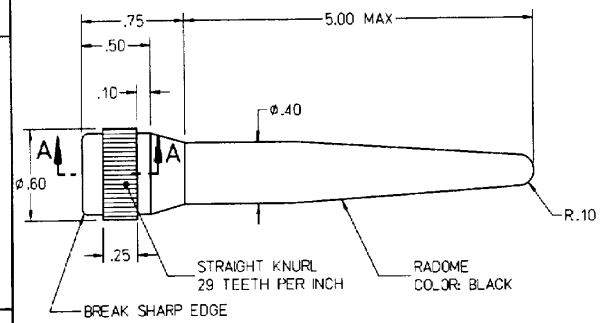
SUPPLIER	PART NUMBER
1. CENTURION	CAF28775
2.	
3.	
4.	

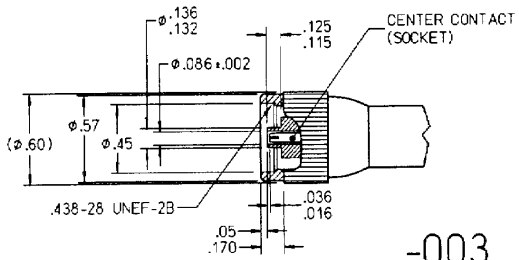
					REVISION
5	4	3	2	1	SHEET

REV STATUS OF SHEETS

REVISIONS

REV	DESCRIPTION	DATE	DRAWN & APPROVED
C	-001 RELEASED AT REV C		
D	-002 PER ECN 023493	12-16-94	G.RAVEN RCH
E	-003 PER ECN 024930	12-22-95	J.FOTI RCH





SECTION A-A

-003

NOTES: UNLESS OTHERWISE SPECIFIED

1. PLUG MATES WITH INTERMEC DRAWING NUMBER 058905. KINGS PART NUMBER 372-6-9.

2. CONNECTOR REQUIREMENTS:
   MATERIAL: CONNECTOR BODY: BRASS ALLOY 360, PER QQ-B-626.
   CENTER CONTACT: BERYLLIUM COPPER PER ASTM-B-196.
   INSULATOR: PTFE FLUOROCARBON PER ASTM-D1710, TYPE 1, GRADE 1.

   FINISH: CENTER CONTACT: GOLD PER MIL-G-45204, TYPE 1, GRADE C, OVER GOLD PER MIL-G-45204, TYPE 1, GRADE A OVER NICKEL PER QQ-N-290, GRADE C (.001)

   CONNECTOR BODY: BLACK CHROME PER MIL-C-14538C (.00001) WITH NICKEL UNDERPLATE PER QQ-N-290A, GRADE G (.0001-.0002)

3. MECHANICAL REQUIREMENTS:
   90° FLEXURE PERFORMANCE: 500 CYCLES.
   PULL TEST: 30 LB LINEAR PULL.
   TORQUE TEST: 15 IN-LB.

4. SPECIFICATIONS: FREQUENCY RANGE 2.4-2.4835 GHZ
   IMPEDANCE: 50 OHMS
   VSWR: 1.5:1 ACROSS 2.4-2.4835 GHZ
   POWER RATING: 1 WATT
   OPERATING TEMPERATURE: -40° TO +65°C @95% RH
   GAIN: 1.0 dBi PEAK MINIMUM

5. BAG PART AND MARK BAG WITH 060751 AND DASH NUMBER TO WHICH MANUFACTURED PER SPECIFICATION 606427.

6. INTERFACE PER MIL-C-39012 OR MIL-STD-348 AS APPLICABLE.

7. CHANGES REQUIRE SAC APPROVAL.

SOURCE CONTROL DRAWING

CAD DBREF - /cadserv/rel/060751.1.e
SYSTEM - HP

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.
.XX ± .02
.XXX ± .010
ANGLES ± 1°

APPROVALS		DATE
DRAWN	G.RAVEN	4-9-94
CHECKED	R.HOAGLUND	8-2-94
RESP ENG	M.SHAVER	8-5-94
QA	K.CANTRELL	8-11-94
MFG ENG	M.SALATINO	8-4-94
SAC	P.HELTON	8-3-94

Intermec
6001 36TH AVENUE WEST
EVERETT, WA 98203-9280

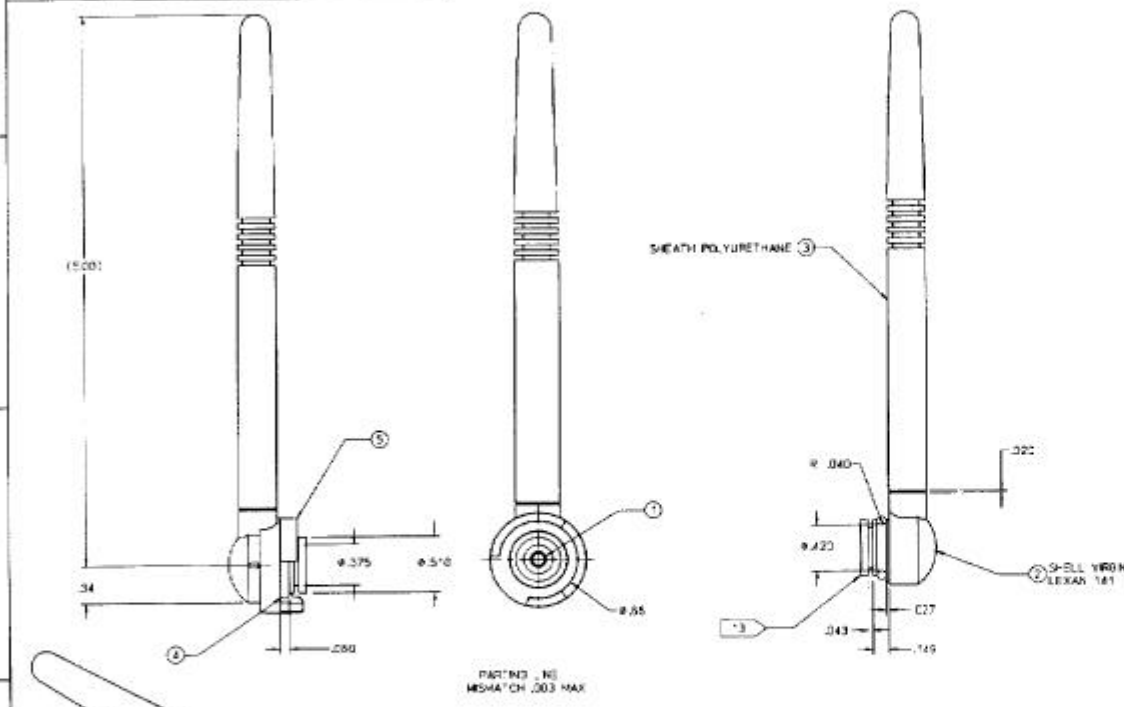
TITLE ANTENNA, TNC, 2.4 GHZ DIPOLE

SIZE	CAGE CODE	DRAWING NUMBER	REV
C	33825	060751	E

SCALE 2/1 SHEET 1 OF 1

APPROVED SOURCE(S) OF SUPPLY	
SUPPLIER	PART NUMBER
1. CENTURION	CAF28792
2.	
3.	
4.	
5.	
6.	

REVISIONS			
REV	DESCRIPTION	DATE	DRAWN & APPROVED
D	-004 PER ECN 025910 SEE SEPARATE PARTS LIST	8-12-96	G.RAVEN RCH
E	-005 PER ECN 025912 SEE SEPARATE PARTS LIST	10-18-96	G.RAVEN RCH
F	-005 PER ECN 025919 SEE SEPARATE PARTS LIST	10-18-96	G.RAVEN RCH
G	-005 PER ECN 027429	1-16-98	G.OPSTAD RSH



NOTES: UNLESS OTHERWISE SPECIFIED

1. FILLETS AND EDGE RADII TO BE R .010 MAXIMUM.
2. DIMENSIONS APPLY AT MAXIMUM DRAFT.
3. SPECIFICATIONS:
   FREQUENCY RANGE: 2.4-2.4835 GHz
   GAIN: +1.5 DB PEAK.
   IMPEDANCE: 50 OHMS.
   VSWR ACROSS THE BAND: 2.5:1.
   POWER RATING: 1 WATT MAX.
   OPERATING TEMPERATURE: -40° C TO 60° C @95% RH.
4. MECHANICAL REQUIREMENTS:
   FLEX PERFORMANCE: 500 CYCLES AT 90° IN TWO DIRECTIONS PERPENDICULAR TO THE CENTERLINE AXIS OF THE CONNECTOR.

   PULL TEST: 30 LB.
   TORQUE TEST: 15 IN-LB.

   CORROSION TEST: 24 HOURS WITH 5% NaCl @35° C
   SINUSOIDAL VIBRATION WITH THE FOLLOWING CHARACTERISTICS:
   SWEEP RATE: CONSTANT, 1 OCTAVE PER MINUTE
   1 Hz TO 3 Hz: CONSTANT DISPLACEMENT OF ONE INCH PEAK TO PEAK
   3 Hz TO 100 Hz: CONSTANT ACCELERATION OF 1.5 Gs
5. COSMETIC REQUIREMENTS PER SPECIFICATION 044656 APPENDIX A, CATEGORY II, CLASS A (EXTERNAL SURFACES ONLY).
6. EXTERIOR SURFACE PER MOLD TECH #1010 OR EQUIVALENT.
7. BULK PACKAGE PARTS (MAXIMUM 100 PARTS PER CONTAINER) TO PROVIDE ADEQUATE PROTECTION AGAINST SHIPPING DAMAGE AND MARK PACKAGE WITH 063825 AND DASH NUMBER TO WHICH MANUFACTURED PER SPECIFICATION 606427.
8. PARTING LINE FLASH .005 MAXIMUM.
9. GATE PENNANT .020 MAXIMUM.
10. PART TO BE FREE OF MOLD RELEASE.
11. CHANGES REQUIRE SAC APPROVAL.
12. SEE CAD GENERATED WIRE FRAME AND DRAFTING MODEL, PART NUMBER 063825-005 FOR ADDITIONAL FEATURE DETAILS. ALL FEATURES NOT OTHERWISE DEFINED ARE TO BE ±.005 THE NOMINAL FEATURE POSITION AS DEFINED BY THE MODEL. THIS PART REQUIRES AN IGES FILE.

(13) CLIP, ITEM 5 NOT SHOWN IN VIEW FOR DIMENSION CLARITY.

SOURCE CONTROL DRAWING
SEE SEPARATE PARTS LIST FOR 063825-005

-005

CAD DRAWING: 063825.1.ig
SYSTEM: -W

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
XX ± .01
XXX ± .005
ANGLES ±

APPROVALS		DATE
DRAWN	G.RAVEN	2-9-96
CHECKED	R.GRADLUND	3-8-96
RESP ENG	R.ZOLLER	3-11-96
QA	R.SLOWEY	3-12-96
MFG ENG	V.LORD	3-12-96
SAC	P.HELTON	3-12-96

Intermec
6001 36TH AVENUE WEST
EVERETT, WA 98203-1264

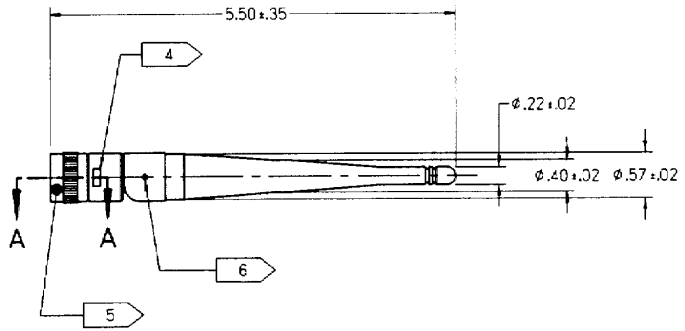
TITLE: ANTENNA, SMB, 2.4 GHz, DIPOLE

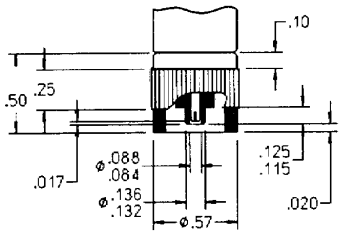
SIZE	CAGE CODE	DRAWING NUMBER	REV
D	33628	063825	G

SCALE: NONE SHEET 1 OF 1

APPROVED SOURCE(S) OF SUPPLY	
SUPPLIER	PART NUMBER
1. CENTURION	066147-001
2.	
3.	
4.	
5.	
6.	

REVISIONS			
REV	DESCRIPTION	DATE	DRAWN & APPROVED
B	-001 RELEASED AT REV B		
C	-001 PER ECN 027276	03-07-98	JLEE RCH





SECTION A-A

SCALE 2/1

NOTES: UNLESS OTHERWISE SPECIFIED

1. BAG PARTS (25 MAX PER BAG) AND MARK BAG WITH 066147 AND DASH NUMBER TO WHICH MANUFACTURED PER SPECIFICATION 606427.
2. SPECIFICATIONS: FREQUENCY RANGE 2.4-2.5 GHZ
   GAIN: 1.0 dBi
   OPERATING TEMPERATURE: -40°C TO +85°C
   FLEX TEST: PER QEA0014
   PULL TEST: 20 LB LINEAR PULL
   TORQUE TEST: 20 IN-LB
   POWER RATING: 50 WATTS
   VSWR 1.5:1 MAX AT RESONANCE
3. CHANGES REQUIRE SAC APPROVAL.

4 > PART MARKED WITH A01.

5 > THIS PIECE IS FREE TO ROTATE 360°.

6 > FREE TO ROTATE 90° (DOWNWARD) ABOUT THIS PIVOT. LOCKS IN 0° AND 90° POSITION.

7. ALL PARTS OF ASSEMBLY ARE TO BE MOLDED BLACK OR BLACK CHROME.

SOURCE CONTROL DRAWING

-001

CAD DB.REF- 066147.1.c
SYSTEM - HP/ME30

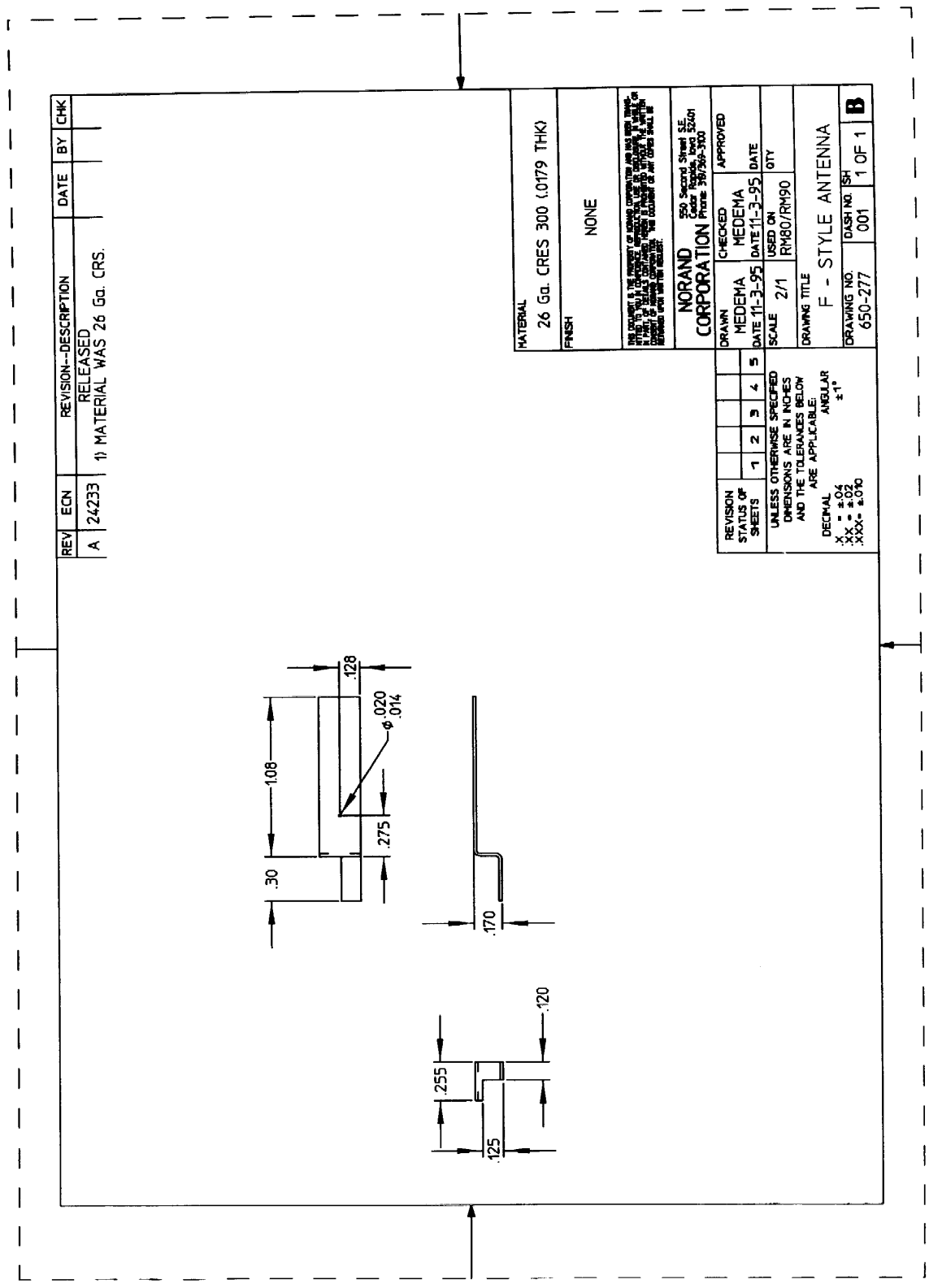
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. .XX ± .03 .XXX ± .010 ANGLES ±	APPROVALS	DATE
	DRAWN G.RAVEN	7-11-97
	CHECKED R.HOAGLUND	10-29-97
	RESP ENG T.BENSON	10-30-97
	QA T.ANDERSON	11-10-97
	MFG ENG V.LORD	11-6-97
	SAC O.DREW	10-30-97
	CMPNT ENG R.KELLY	11-4-97

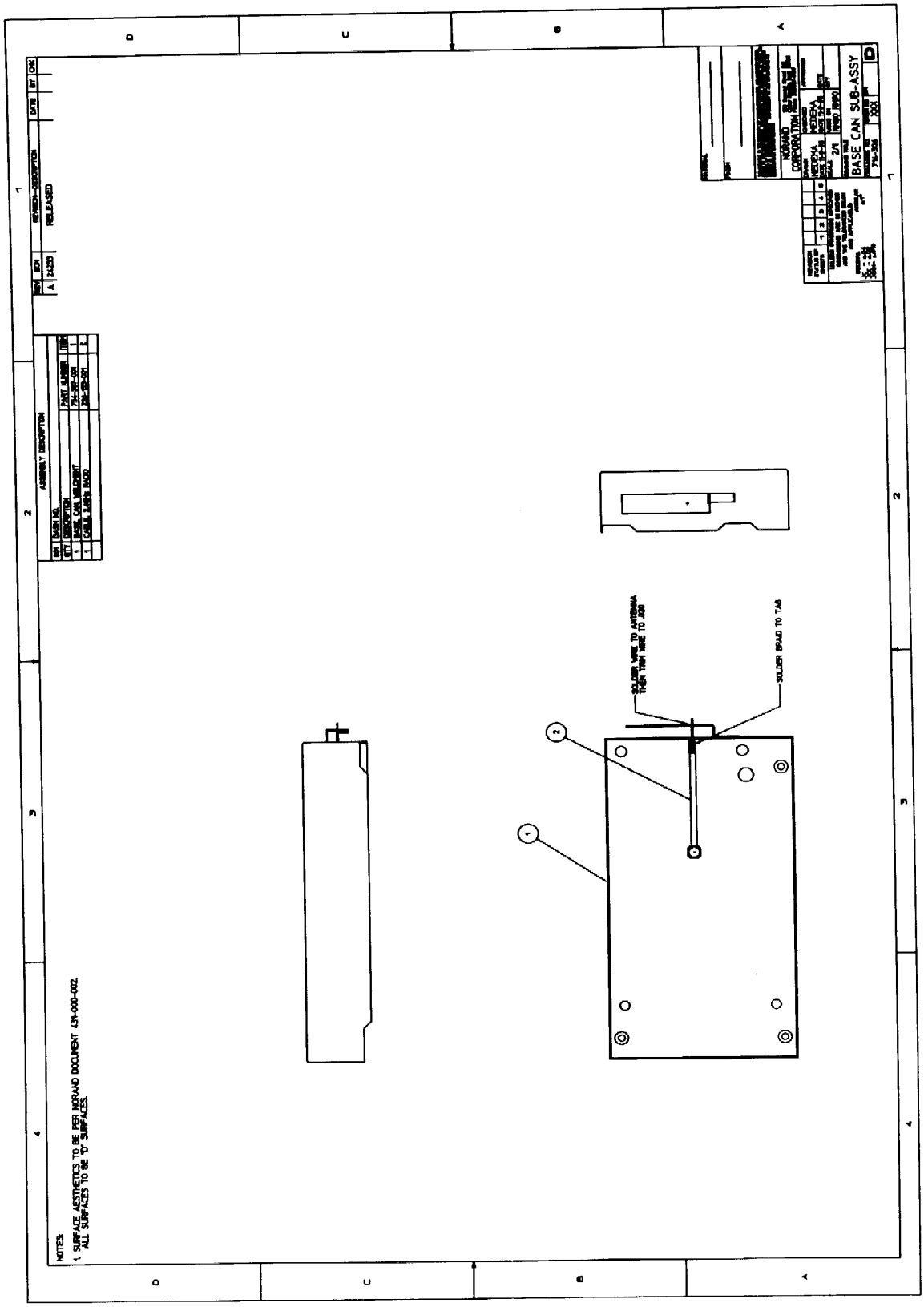
Intermec
6001 36TH AVENUE WEST
EVERETT, WA 98203-9280

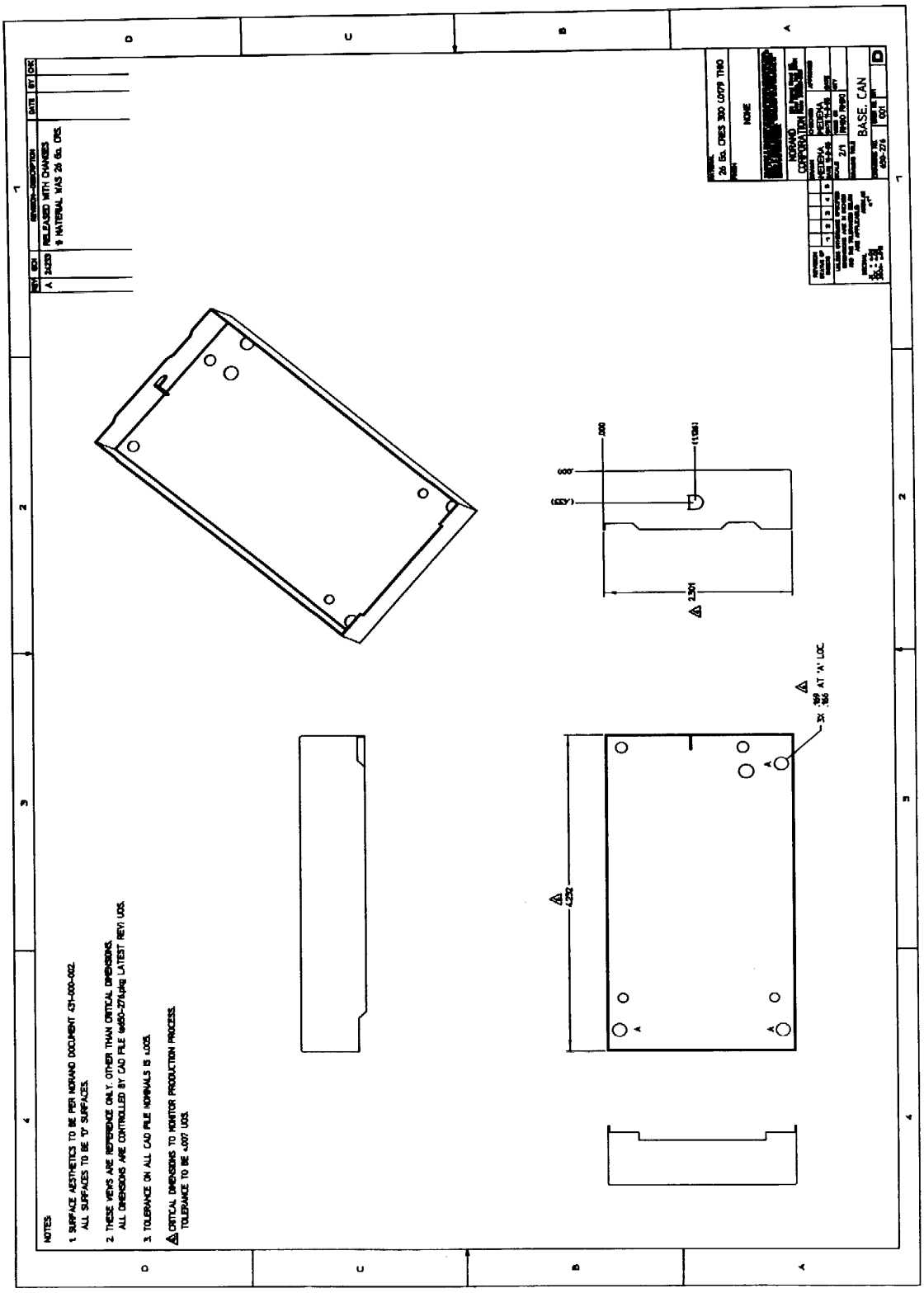
TITLE: ANTENNA, SMB, 2.4 GHZ, DIPOLE, 248X

SIZE	CAGE CODE	DRAWING NUMBER	REV
C	33825	066147	C

SCALE 1/1 SHEET 1 OF 1


REV
ECN
REVISION--DESCRIPTION
DATE
BY
CHK
A
24233
RELEASED
1\ MATERIAL WAS 26 Ga. CRS.
MATERIAL
26 Ga. CRES 300 (.0179 THK)
FINISH
NONE
NORAND
CORPORATION
250 Second Street S.E.
Cedar Rapids, Iowa 52401
Phone 319/369-3100
DRAWN
MEDEMA
DATE 11-3-95
CHECKED
MEDEMA
DATE 11-3-95
APPROVED
DATE
SCALE 2/1
USED ON
RM80/RM90
QTY
DRAWING TITLE
F - STYLE ANTENNA
DRAWING NO.
650-277
DASH NO.
001
SH
1 OF 1
B
REVISION STATUS OF SHEETS
1 2 3 4 5
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND THE TOLERANCES BELOW ARE APPLICABLE:
DECIMAL
.X = ±.04
.XX = ±.02
.XXX= ±.010
ANGULAR
±1°
.128
.020
.014
1.08
.275
.30
.170
.120
.255
.125


BASE CAN SUB-ASSY
NOTES:
1. SURFACE AESTHETICS TO BE PER NORAD DOCUMENT 474-000-002.
ALL SURFACES TO BE "D" SURFACES.
SOLDER WIRE TO ANTENNA TRACE THAT WIRE TO GND
SOLDER BRAID TO TAB


NOTES:
1. SURFACE AESTHETICS TO BE PER NORAND DOCUMENT 431-000-002.
ALL SURFACES TO BE 'D' SURFACES.
2. THESE VIEWS ARE REFERENCE ONLY. OTHER THAN CRITICAL DIMENSIONS,
ALL DIMENSIONS ARE CONTROLLED BY CAD FILE 6460-274.dwg LATEST REV. UOS.
3. TOLERANCE ON ALL CAD FILE NOMINALS IS ±.005.
⚠ CRITICAL DIMENSIONS TO MONITOR PRODUCTION PROCESS.
TOLERANCE TO BE ±.007 UOS.
REVISION DESCRIPTION
RELEASED WITH CHANGES
MATERIAL WAS 26 GA. CRS.
NORAND CORPORATION
BASE CAN
26 GA. CRES 300 (.0079 THK)
NONE
6460-274
001
D