EMISSIONS TEST REPORT FOR A LOW POWER TRANSMITTER

I. GENERAL INFORMATION

Requirement: Federal Communications Commissions

Test Requirements: 15.205, 15.207, 15.209, 15.247

Applicant: Carlson Wireless Inc.
1180-B Evergreen Rd
Redway, CA 95560 USA

Product ID: **FCC ID:** OPA-FT-512

This product is not sold directly to end users. Systems will be sold only to CWT's Authorized Resellers. Those authorized resellers are technically trained by CWT's Engineers periodically and must follow the rules set by CWT.

II. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

RF Specifications

RF Frequency Band	2.400 to 2.4835 GHz
RF Channels	Programmable in 1 MHz steps
RF Signal Bandwidth	12 MHz (6 non overlapping channels)
PN Code Rate	11 M chip/sec
PN Code Length	16
Spreading codes	4 programmable non orthogonal codes
Modulation Type	BPSK (256) or QPSK (512kbs) DSSS
Transmitter Output Power	+17dBm, set to allow CDMA operation
Antennas	Built-in (13.8 dBi gain) or External parabolic (24 dBi)

III. TEST LOCATION

All emissions tests were performed at:

Compliance Certification Services
571F Monterey Road
Morgan Hill, CA 95037

T.N. Cokenias 20 November 2002
EMC Consultant/Agent for Carlson Wireless

TEST PROCEDURES

Measurement Equipment Used:

TEST EQUIPMENTS LIST			
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**
Line Filter	**Lindgren 10k - 10GHz**	**LMF-3489**	**497**
LISN	**Fischer 9k - 100MHz**	**FCC-LISN-50/250-25-2**	**114**
EMI Test Receiver	**Rohde & Schwarz**	**ESHS 20**	**827129/006**
Quasi Peak Adapter	**HP9K - 1GHz**	**85650A**	**2811A01155**
Spectrum Display	**HP**	**85662A**	**2816A16696**
Spectrum Analyzer	**HP 0.1K - 1.5GHz**	**8568B**	**2732A03661**
RF Preselector	**HP20Hz-2GHz**	**85685A**	**2817A00756**
Pre-Amplifier,25 dB	**HP0.1 - 1300MHz**	**8447D (P8)**	**2944A06589**
Antenna, Bilog	**Schaffner-Chase30M-2GHz**	**CBL6112B**	**2586**
Pre-Amplifier	**MITEQ1-26GHz**	**NSP2600-44**	**646456**
Horn Antenna(1 - 18GHz)	**EMCO**	**3115**	**6717**
Spectrum Analyzer	**HP**	**8593EM**	**3710A00205**
Filter 4.5GHz	**FSY Microwave**	**FM-4570-9SS**	**3**
Power Meter	**Aglient**	**e441**	**gb41291160**

Radiated Emissions
Test Requirement: 15.109, 15.205, 15.209, 15.247

Test Procedures, 1- 26 GHz:

1. The EUT was placed on a wooden table resting on a turntable on the open air test site. The search antenna was placed 3m from the EUT. The EUT antenna was mounted vertically as per normal installation.

2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205.

3. Radiated emissions were investigated for a LOW channel, a MID channel, and HIGH channel. Emissions were investigated to the 10^{th} harmonic.

4. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

Radiated Test Set-up, 1-40 GHz

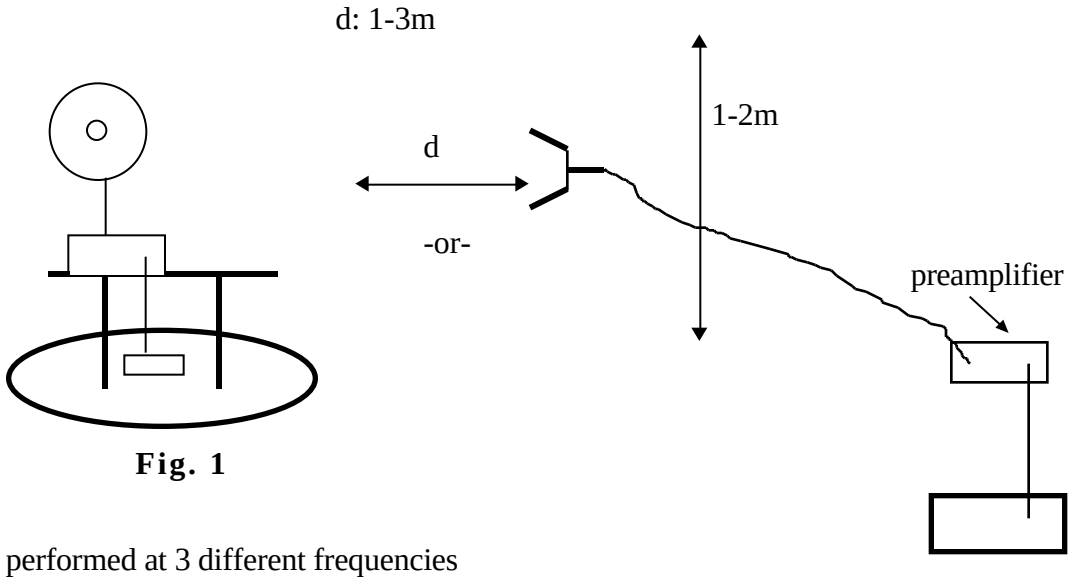

Fig. 1

Testing was performed at 3 different frequencies

Channel	**Frequency, MHz**
Low	2412
Mid	2448
High	2460

Radiated emissions were performed at each frequency for 2 different transmitter antennas.

Antennas tested:

Antenna Type	**Gain**	**Antenna Manufacturer**	**Model Number**
Integral	13.8 dBi	Carlton Wireless	n/a
external w/reflector	24 dBi	various	n/a

Test Results: Worst case results are presented. Refer to separate Excel spread sheet files.

NOTE: For radiated emissions that fall on restricted bands per 15.205, emissions limit is 54 dBuV/m at 3 m for emissions above 960 MHz. Data plots presented for internal antenna show corrected field strengths at band edges (REF OFFSET values are correction factors). The band edge field strengths for the external antenna were obtained with Marker Delta method.

Per 15.247(c) all other undesired emissions must be 20 dB below the highest in-band emission when measured in a 100 kHz bandwidth. Conducted measurements are presented for emissions up to 26.5 GHz.

11/07/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: NEELESH RAJ
Project #: 02U1641
Company: CARLSON WIRELESS
EUT Descrip.: 2.4GHZ SPREAD SPECTRUM W/LAN
EUT M/N: FT512
Test Target: FCC

Equipment for 1-22 GHz:
HP8593EM Analyzer
Miteq NSP2600-44 Preamp
EMCO 3115 Antenna
Cable: 15.0 feet

Equipment for 22 - 58 GHz:
HP8566B Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
HARMONICS															
4.824	3.3	59.8	45.5	33.9	5.7	-36.1	-9.5	1.0	54.9	40.5	74.0	54.0	-19.1	-13.5	V
7.236	3.3	69.5	46.3	37.0	7.2	-36.3	-9.5	1.0	68.9	45.7	74.0	54.0	-5.1	-8.3	V
9.647	3.3	55.2	42.0	38.5	8.5	-35.4	-9.5	1.0	58.3	45.1	74.0	54.0	-15.7	-8.9	V
12.050	3.3	53.1	43.4	39.3	9.5	-36.3	-9.5	1.0	57.1	47.4	74.0	54.0	-16.9	-6.6	V
4.824	3.3	63.5	41.7	33.9	5.7	-36.1	-9.5	1.0	58.5	36.7	74.0	54.0	-15.5	-17.3	H
7.236	3.3	61.9	45.1	37.0	7.2	-36.3	-9.5	1.0	61.3	44.6	74.0	54.0	-12.7	-9.4	H
9.647	3.3	54.7	41.2	38.5	8.5	-35.4	-9.5	1.0	57.8	44.3	74.0	54.0	-16.2	-9.7	H
12.050	3.3	52.4	42.3	39.3	9.5	-36.3	-9.5	1.0	56.4	46.3	74.0	54.0	-17.6	-7.7	H
SPURIOUS															
4.260	3.3	64.2	52.3	33.1	5.3	-36.1	-9.5	1.0	58.0	46.0	74.0	54.0	-16.0	-8.0	V
6.390	3.3	49.9	41.3	35.5	6.8	-36.3	-9.5	1.0	47.4	38.7	74.0	54.0	-26.6	-15.3	V
4.260	3.3	63.2	52.5	33.1	5.3	-36.1	-9.5	1.0	57.0	46.3	74.0	54.0	-17.0	-7.7	H
6.390	3.3	52.1	41.5	35.5	6.8	-36.3	-9.5	1.0	49.6	39.0	74.0	54.0	-24.4	-15.0	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

11/07/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: NEELESH RAJ
Project #: 02U1641
Company: CARLSON WIRELESS
EUT Descrip.: 2.4GHZ SPREAD SPECTRUM W/LAN
EUT M/N: FT512
Test Target: FCC

Equipment for 1-22 GHz:
HP8593EM Analyzer
Miteq NSP2600-44 Preamp
EMCO 3115 Antenna
Cable: 15.0 feet

Equipment for 22 - 58 GHz:
HP8566B Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
HARMONICS															
4.896	3.3	59.5	46.2	34.1	5.8	-36.1	-9.5	1.0	54.7	41.5	74.0	54.0	-19.3	-12.5	V
7.340	3.3	61.9	48.1	37.2	7.3	-36.3	-9.5	1.0	61.7	47.8	74.0	54.0	-12.3	-6.2	V
9.790	3.3	51.3	42.8	38.6	8.6	-35.5	-9.5	1.0	54.5	46.1	74.0	54.0	-19.5	-7.9	V
12.240	3.3	53.0	43.5	39.2	9.6	-36.4	-9.5	1.0	56.9	47.4	74.0	54.0	-17.1	-6.6	V
4.896	3.3	60.7	43.8	34.1	5.8	-36.1	-9.5	1.0	56.0	39.1	74.0	54.0	-18.0	-14.9	H
7.340	3.3	56.3	45.5	37.2	7.3	-36.3	-9.5	1.0	56.0	45.2	74.0	54.0	-18.0	-8.8	H
9.790	3.3	50.3	42.9	38.6	8.6	-35.5	-9.5	1.0	53.6	46.2	74.0	54.0	-20.4	-7.8	H
12.240	3.3	52.1	42.5	39.2	9.6	-36.4	-9.5	1.0	56.0	46.4	74.0	54.0	-18.0	-7.6	H
SPURIOUS															
4.330	3.3	61.3	52.9	33.0	5.3	-36.1	-9.5	1.0	55.1	46.7	74.0	54.0	-18.9	-7.3	V
6.500	3.3	62.4	51.6	35.5	6.9	-36.4	-9.5	1.0	59.9	49.1	74.0	54.0	-14.1	-4.9	V
4.330	3.3	60.2	51.8	33.0	5.3	-36.1	-9.5	1.0	54.0	45.6	74.0	54.0	-20.0	-8.4	H
6.500	3.3	63.2	52.1	35.5	6.9	-36.4	-9.5	1.0	60.7	49.6	74.0	54.0	-13.3	-4.4	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

11/07/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: NEELESH RAJ
Project #: 02U1641
Company: CARLSON WIRELESS
EUT Descrip.: 2.4GHZ SPREAD SPECTRUM W/LAN
EUT M/N: FT512 using internal 13 dBi antenna
Test Target: FCC

Equipment for 1-22 GHz:
HP8593EM Analyzer
Miteq NSP2600-44 Preamp
EMCO 3115 Antenna
Cable: 15.0 feet

Equipment for 22 - 58 GHz:
HP8566B Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
HARMONICS															
4.920	3.3	57.7	45.2	34.2	5.8	-36.1	-9.5	1.0	53.1	40.6	74.0	54.0	-20.9	-13.4	V
7.380	3.3	55.3	46.1	37.3	7.3	-36.2	-9.5	1.0	55.2	46.0	74.0	54.0	-18.8	-8.0	V
9.840	3.3	43.3	34.3	38.7	8.6	-35.5	-9.5	1.0	46.6	37.7	74.0	54.0	-27.4	-16.3	V
12.300	3.3	45.3	34.2	39.2	9.6	-36.4	-9.5	1.0	49.2	38.1	74.0	54.0	-24.8	-15.9	V
4.920	3.3	50.4	41.6	34.2	5.8	-36.1	-9.5	1.0	45.8	37.0	74.0	54.0	-28.2	-17.0	H
7.380	3.3	52.6	42.7	37.3	7.3	-36.2	-9.5	1.0	52.5	42.6	74.0	54.0	-21.5	-11.4	H
9.840	3.3	43.3	34.4	38.7	8.6	-35.5	-9.5	1.0	46.6	37.7	74.0	54.0	-27.4	-16.3	H
12.300	3.3	44.2	35.0	39.2	9.6	-36.4	-9.5	1.0	48.1	38.9	74.0	54.0	-25.9	-15.1	H
SPURIOUS															
4.359	3.3	62.5	53.1	33.0	5.4	-36.1	-9.5	1.0	56.3	46.9	74.0	54.0	-17.7	-7.1	V
6.539	3.3	63.7	52.9	35.6	6.9	-36.4	-9.5	1.0	61.3	50.5	74.0	54.0	-12.7	-3.5	V
4.359	3.3	61.3	52.9	33.0	5.4	-36.1	-9.5	1.0	55.1	46.7	74.0	54.0	-18.9	-7.3	H
6.539	3.3	62.8	51.0	35.6	6.9	-36.4	-9.5	1.0	60.4	48.6	74.0	54.0	-13.6	-5.4	H
BANDEDGE															
2.480	3.3	62.8	30.0	29.1	3.9	-36.3	-9.5	1.0	51.0	18.2	74.0	54.0	-23.0	-35.8	H
6.539	3.3	62.8	51.0	35.6	6.9	-36.4	-9.5	1.0	60.4	48.6	74.0	54.0	-13.6	-5.4	H
6.539	3.3	62.8	51.0	35.6	6.9	-36.4	-9.5	1.0	60.4	48.6	74.0	54.0	-13.6	-5.4	H
6.539	3.3	62.8	51.0	35.6	6.9	-36.4	-9.5	1.0	60.4	48.6	74.0	54.0	-13.6	-5.4	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

11/07/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: NEELESH RAJ
Project #: 02U1641
Company: CARLSON WIRELESS
EUT Descrip.: 2.4GHZ SPREAD SPECTRUM W/LAN
EUT M/N: FT512 with 24 dBi dish antenna
Test Target: FCC

Equipment for 1-22 GHz:
HP8593EM Analyzer
Miteq NSP2600-44 Preamp
EMCO 3115 Antenna
Cable: 15.0 feet

Equipment for 22 - 58 GHz:
HP8566B Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
HARMONICS															
4.870	9.8	57.6	41.3	34.0	5.8	-36.1	0.0	1.0	62.3	45.9	74.0	54.0	-11.7	-8.1	V
7.300	9.8	57.5	42.6	37.1	7.3	-36.3	0.0	1.0	66.5	51.7	74.0	54.0	-7.5	-2.3	V
9.740	9.8	46.6	34.2	38.6	8.6	-35.5	0.0	1.0	59.3	46.9	74.0	54.0	-14.7	-7.1	V
12.140	9.8	44.5	35.0	39.2	9.5	-36.3	0.0	1.0	57.9	48.4	74.0	54.0	-16.1	-5.6	V
4.870	9.8	49.2	37.1	34.0	5.8	-36.1	0.0	1.0	53.9	41.7	74.0	54.0	-20.1	-12.3	H
7.300	9.8	53.0	40.5	37.1	7.3	-36.3	0.0	1.0	62.1	49.5	74.0	54.0	-11.9	-4.5	H
9.740	9.8	46.2	34.0	38.6	8.6	-35.5	0.0	1.0	58.9	46.7	74.0	54.0	-15.1	-7.3	H
12.140	9.8	45.1	35.7	39.2	9.5	-36.3	0.0	1.0	58.5	49.1	74.0	54.0	-15.5	-4.9	H
SPURIOUS															
4.300	9.8	53.1	42.8	33.1	5.3	-36.1	0.0	1.0	56.3	46.1	74.0	54.0	-17.7	-7.9	V
6.460	9.8	49.8	40.2	35.5	6.8	-36.3	0.0	1.0	56.7	47.2	74.0	54.0	-17.3	-6.8	V
4.300	9.8	52.6	42.9	33.1	5.3	-36.1	0.0	1.0	55.8	46.1	74.0	54.0	-18.2	-7.9	H
6.460	9.8	48.3	40.9	35.5	6.8	-36.3	0.0	1.0	55.3	47.9	74.0	54.0	-18.7	-6.1	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
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EMCO 3115 Antenna
Cable: 15.0 feet

Equipment for 22 - 58 GHz:
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HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
HARMONICS															
4.890	9.8	54.0	38.8	34.1	5.8	-36.1	0.0	1.0	58.7	43.5	74.0	54.0	-15.3	-10.5	V
7.340	9.8	55.9	42.7	37.2	7.3	-36.3	0.0	1.0	65.1	51.9	74.0	54.0	-8.9	-2.1	V
9.780	9.8	45.8	34.1	38.6	8.6	-35.5	0.0	1.0	58.5	46.8	74.0	54.0	-15.5	-7.2	V
12.235	9.8	44.7	34.8	39.2	9.6	-36.4	0.0	1.0	58.0	48.1	74.0	54.0	-16.0	-5.9	V
4.890	9.8	49.5	37.7	34.1	5.8	-36.1	0.0	1.0	54.3	42.4	74.0	54.0	-19.7	-11.6	H
7.340	9.8	54.6	40.4	37.2	7.3	-36.3	0.0	1.0	63.8	49.6	74.0	54.0	-10.2	-4.4	H
9.780	9.8	45.8	34.2	38.6	8.6	-35.5	0.0	1.0	58.5	46.9	74.0	54.0	-15.5	-7.1	H
12.235	9.8	44.6	34.3	39.2	9.6	-36.4	0.0	1.0	57.9	47.6	74.0	54.0	-16.1	-6.4	H
SPURIOUS															
4.330	9.8	55.0	46.5	33.0	5.3	-36.1	0.0	1.0	58.3	49.7	74.0	54.0	-15.7	-4.3	V
6.500	9.8	52.7	42.5	35.5	6.9	-36.4	0.0	1.0	59.6	49.5	74.0	54.0	-14.4	-4.5	V
4.330	9.8	55.3	47.0	33.0	5.3	-36.1	0.0	1.0	58.5	50.2	74.0	54.0	-15.5	-3.8	H
6.500	9.8	51.3	42.6	35.5	6.9	-36.4	0.0	1.0	58.3	49.6	74.0	54.0	-15.7	-4.4	H

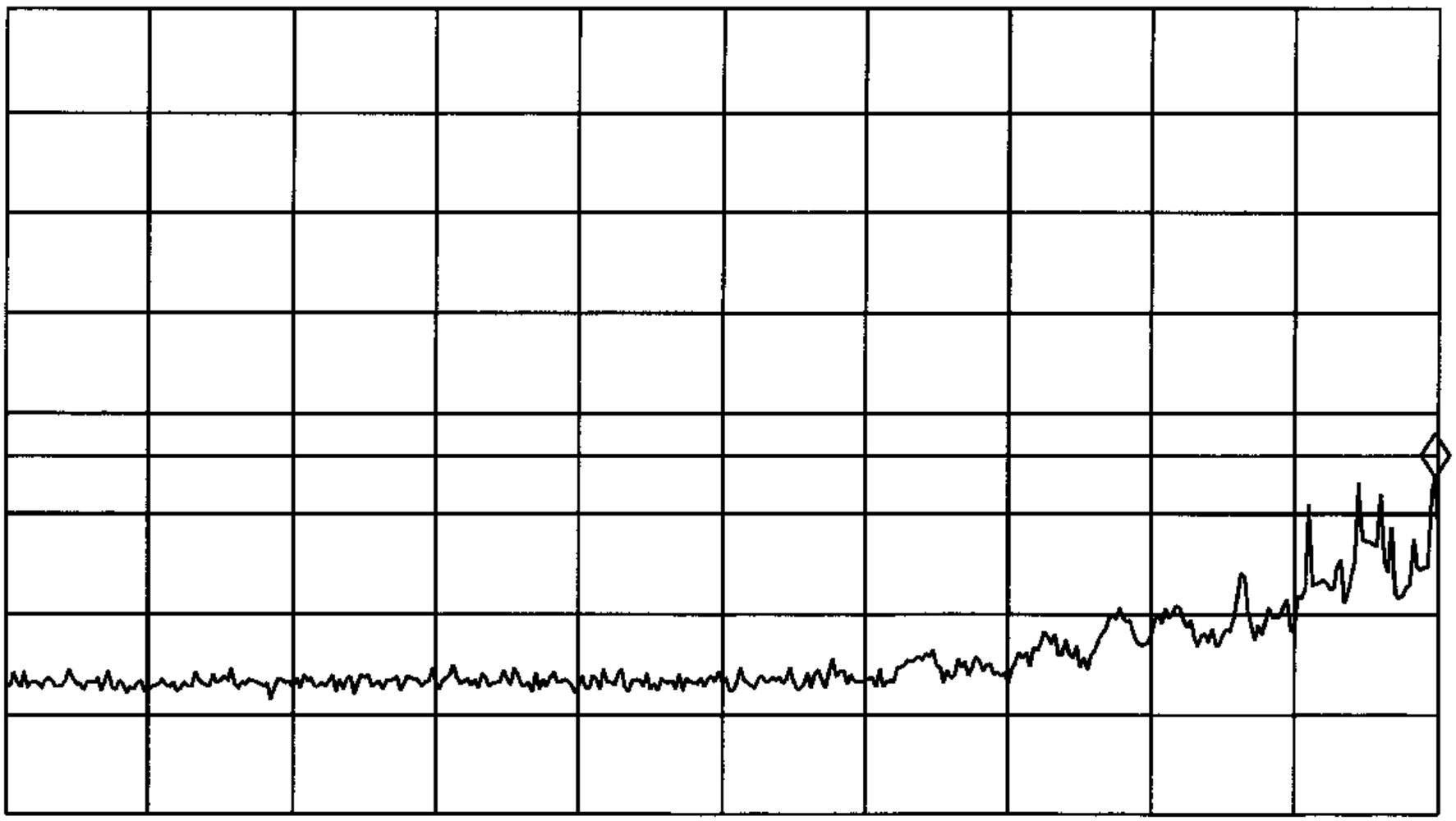
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

11:Ø7:11 NOV 18, 2ØØ2
CARLSON WIRELESS RES.BAND CH.1 RAD VERT

DISPLAY LINE
74.Ø dBµV

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.3898Ø GHz
71.88 dBµV

REF OFFST 22.5 dB
LOG REF 118.5 dBµV
1Ø dB/
#ATN Ø dB



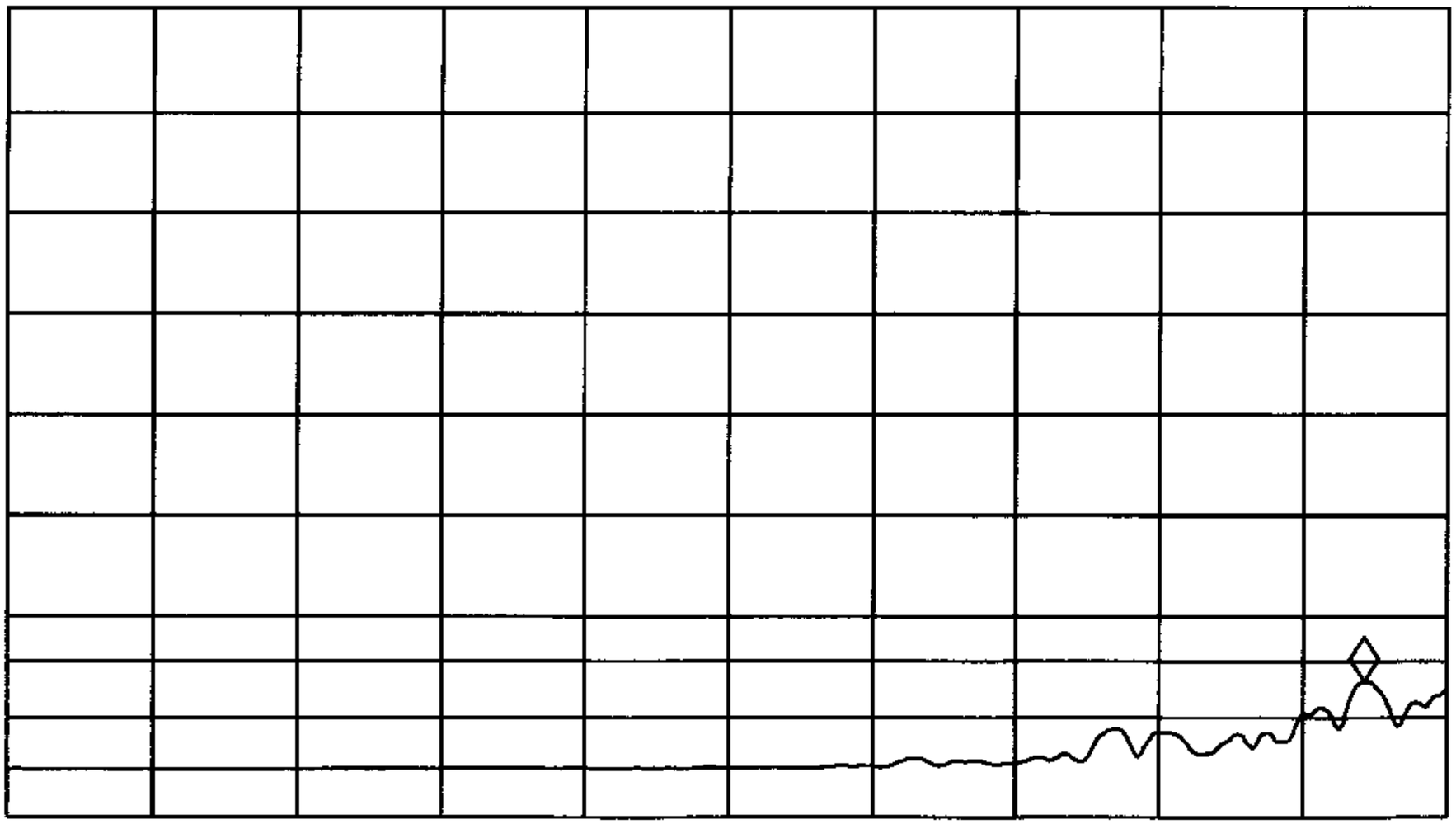
START 2.31ØØØ GHz
#IF BW 1.Ø MHz
#AVG BW 1 MHz
STOP 2.39ØØØ GHz
SWP 2Ø.Ø msec

11:Ø8:21 NOV 18, 2ØØ2
CARLSON WIRELESS RES.BAND CH.1 RAD VERT

DISPLAY LINE
54.Ø dBµV

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.3854Ø GHz
52.ØØ dBµV

REF OFFST 22.5 dB
LOG REF 118.5 dBµV
1Ø dB/
#ATN Ø dB



DL
54.Ø
dBµV
VA SB
SC FC
CORR

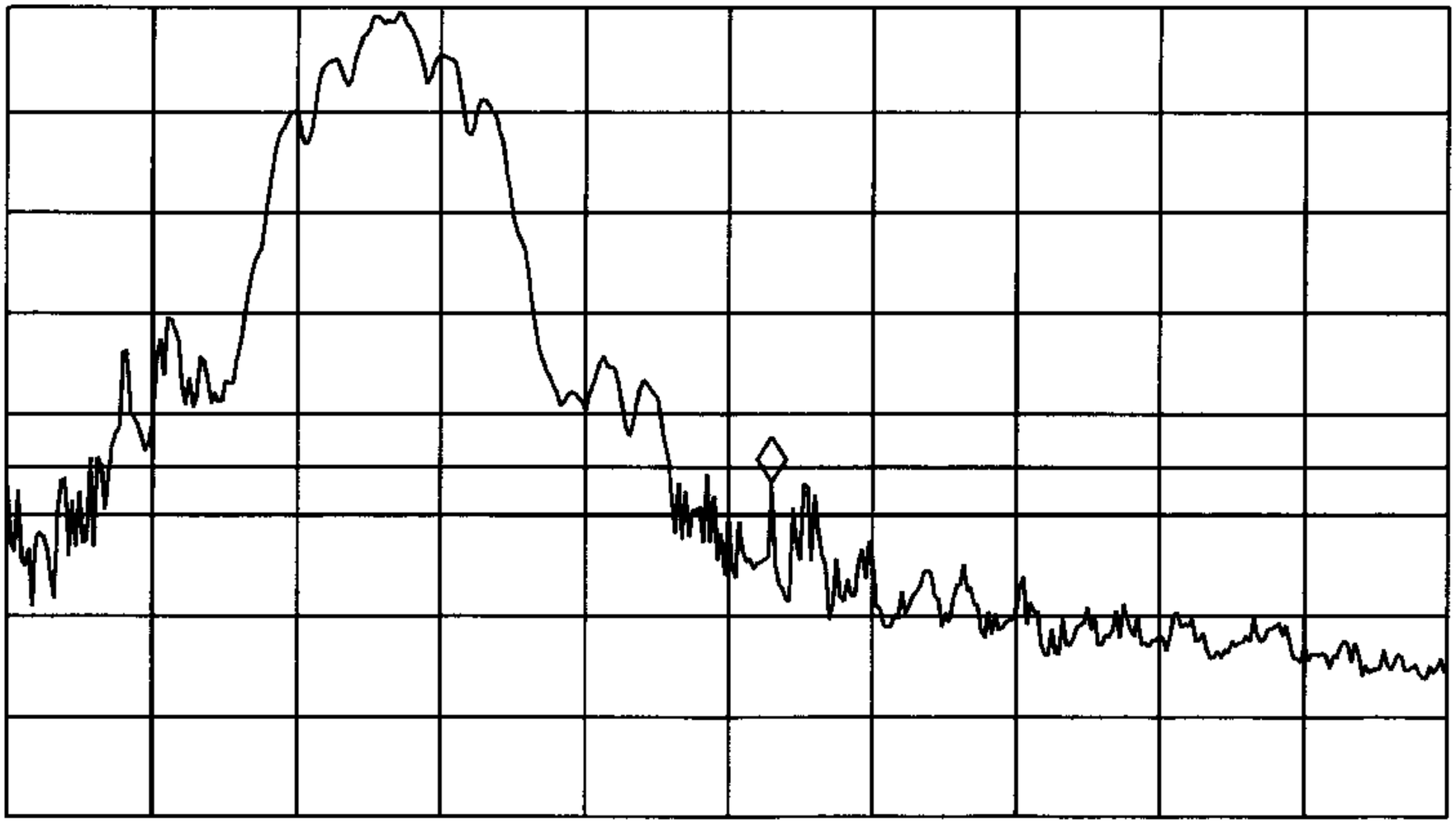
START 2.31ØØØ GHz
STOP 2.39ØØØ GHz
#IF BW 1.Ø MHz
#AVG BW 1Ø Hz
SWP 24.Ø sec

10: 40: 58 NOV 18, 2002
CARLSON WIRELESS BANDEDGE CH.5 RAD VERT

MARKER
2.4865 GHz
72.53 dBµV

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4865 GHz
72.53 dBµV

REF OFFST 22.5 dB
LOG REF 119.5 dBµV
10 dB/
#ATN Ø dB



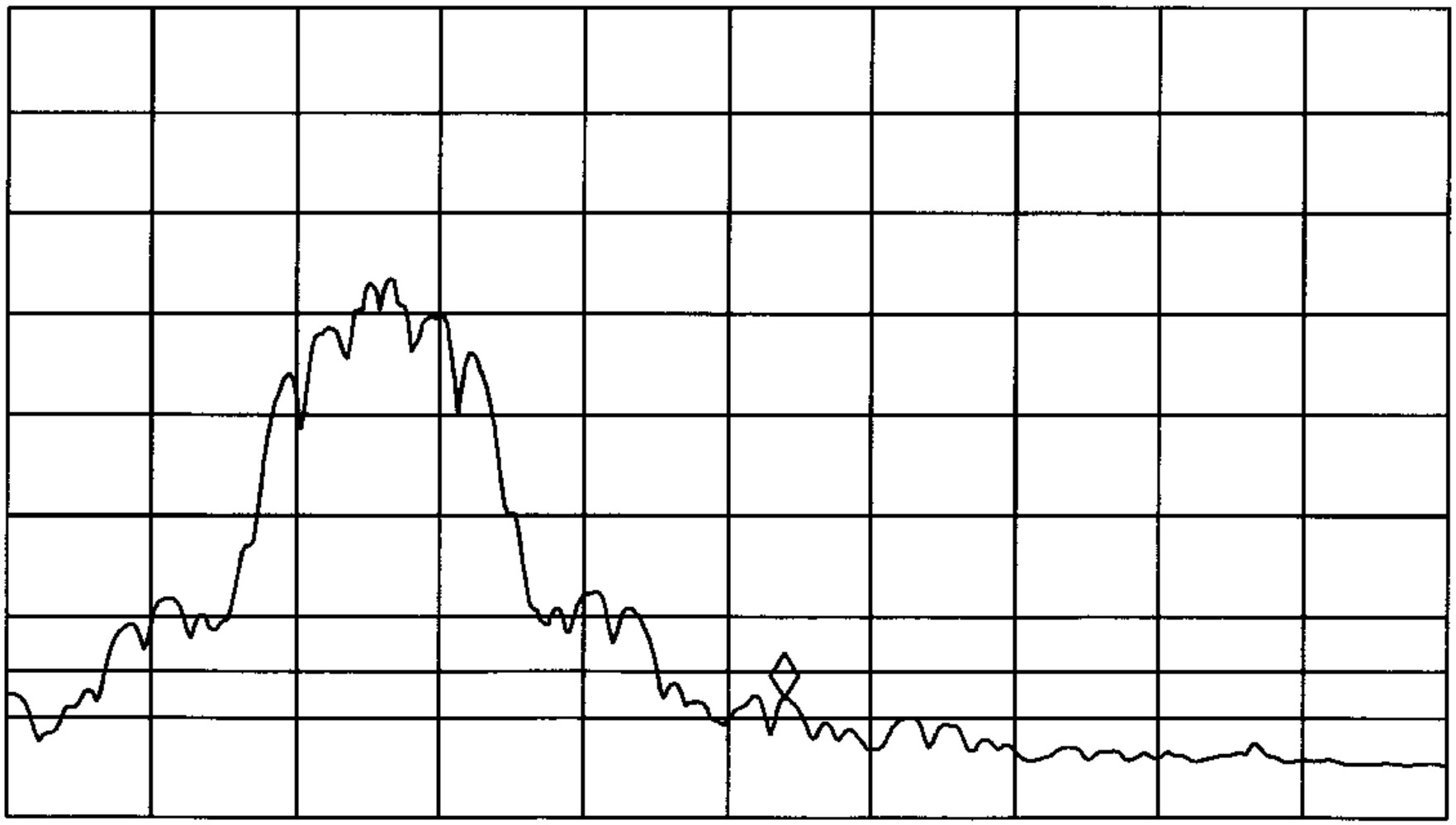
START 2.4335 GHz
#IF BW 1.Ø MHz
#AVG BW 1 MHz
STOP 2.5335 GHz
SWP 2Ø.Ø msec

10: 40: 11 NOV 18, 2002
CARLSON WIRELESS BANDEDGE CH.5 RAD VERT

MARKER
2.4875 GHz
51.39 dBµV

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4875 GHz
51.39 dBµV

REF OFFST 22.5 dB
LOG REF 119.5 dBµV
10 dB/
#ATN Ø dB



DL
54.Ø
dBµV
VA SB
SC FC
CORR

START 2.4335 GHz
STOP 2.5335 GHz
#IF BW 1.Ø MHz
#AVG BW 1Ø Hz
SWP 3Ø.Ø sec

11/07/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Neelesh Raj
Project #:
Company: Carlson Wireless
EUT Descrip.: 2.4 GHZ DTS
EUT M/N: FT512 with 24 dBi external Antenna
Test Target: 15.205, 15.209 bandedge

Equipment for 1-22 GHz:
HP8566B Analyzer
Miteq NSP2600-44 Preamp
EMCO 3115 Antenna
Cable: 13.5 feet

Equipment for 22 - 58 GHz:
HP8566B Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

NOTE: Peak and Average readings were derived from data using the Marker Delta method. Refer to spectrum analyzer plots

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
2.385	3.3	44.7	21.1	28.8	3.4	0.0	-9.5	0.0	67.5	43.9	74.0	54.0	-6.5	-10.1	CH2
2.485	3.3	41.0	15.3	29.1	3.5	0.0	-9.5	0.0	64.1	38.3	74.0	54.0	-9.9	-15.7	CH4

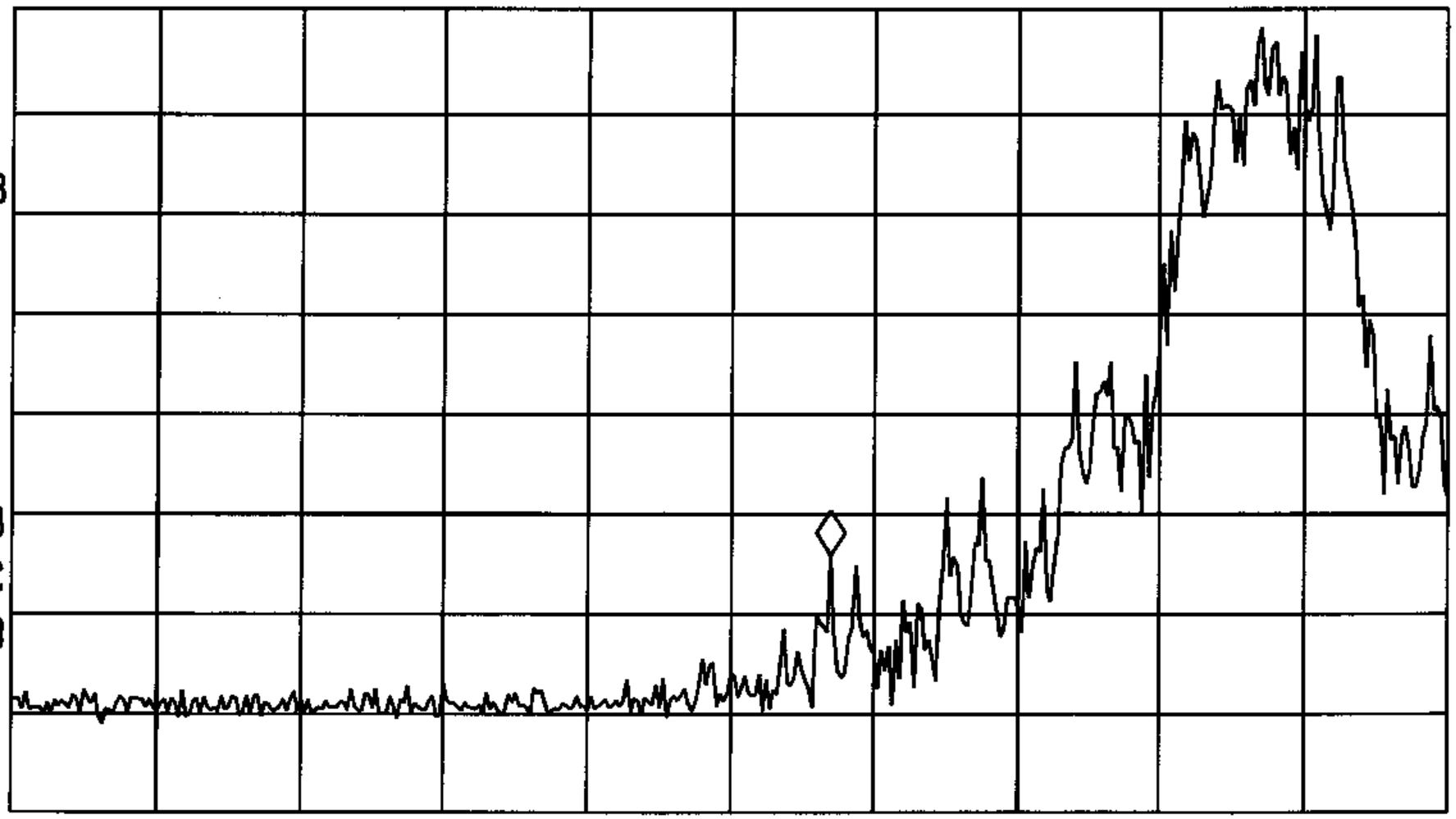
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

13: 44: 1Ø NOV Ø7, 2ØØ2
CARLSON-OPAFT512 DISH ANTENNA BANDEDGE CH.2 MARKER DE

MARKER
2.3845 GHz
37.74 dBµV

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.3845 GHz
37.74 dBµV

LOG REF 92.Ø dBµV
1Ø
dB/
ATN
1Ø dB



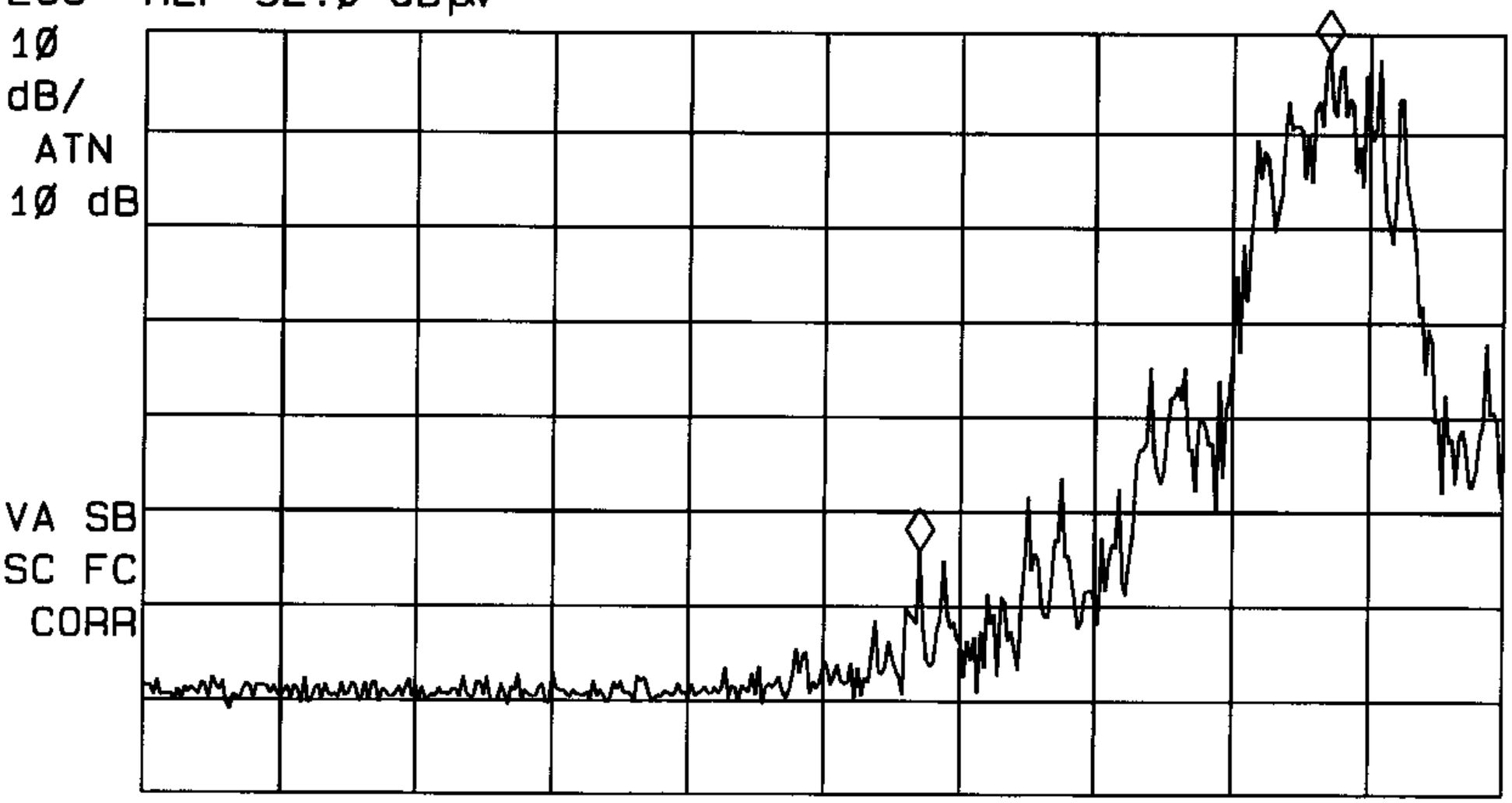
VA SB
SC FC
CORR

START 2.31ØØ GHz
#IF BW 3Ø kHz
#AVG BW 3Ø kHz
STOP 2.44Ø8 GHz
SWP 436 msec

13: 43: 4Ø NOV Ø7, 2ØØ2
CARLSON-OPAFT512 DISH ANTENNA BANDEDGE CH.2 MARKER DE

MARKER Δ
39.2 MHz
52.39 dB

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 39.2 MHz
52.39 dB

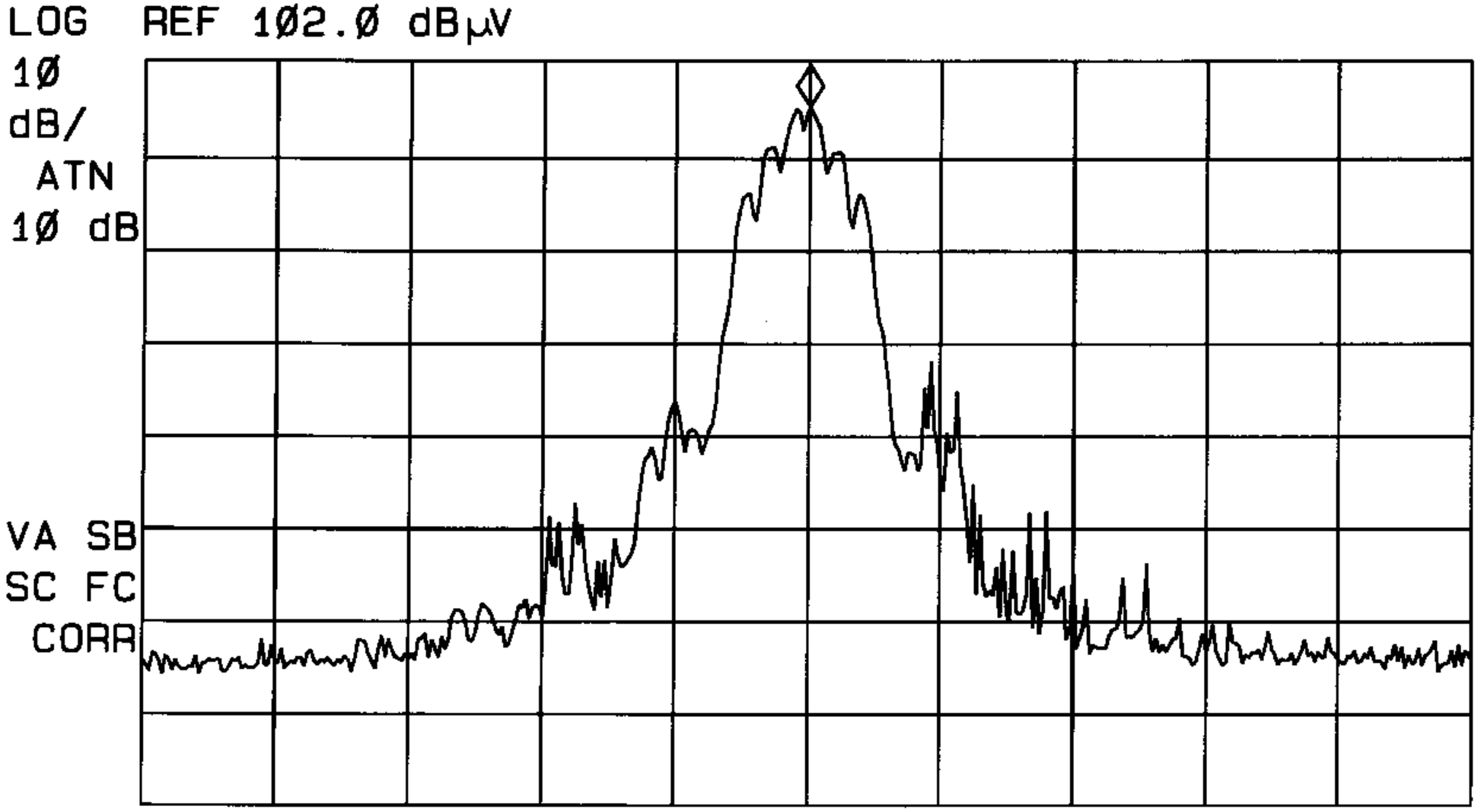


START 2.31ØØ GHz
#IF BW 3Ø kHz
#AVG BW 3Ø kHz
STOP 2.44Ø8 GHz
SWP 436 msec

13: 37: 38 NOV Ø7, 2ØØ2
CARLSON-OPAFT512 DISH ANTENNA BANDEDGE CH.2 MARKER DE

AVERAGE BANDWIDTH
1 MHz

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4246 GHz
97.13 dBµV



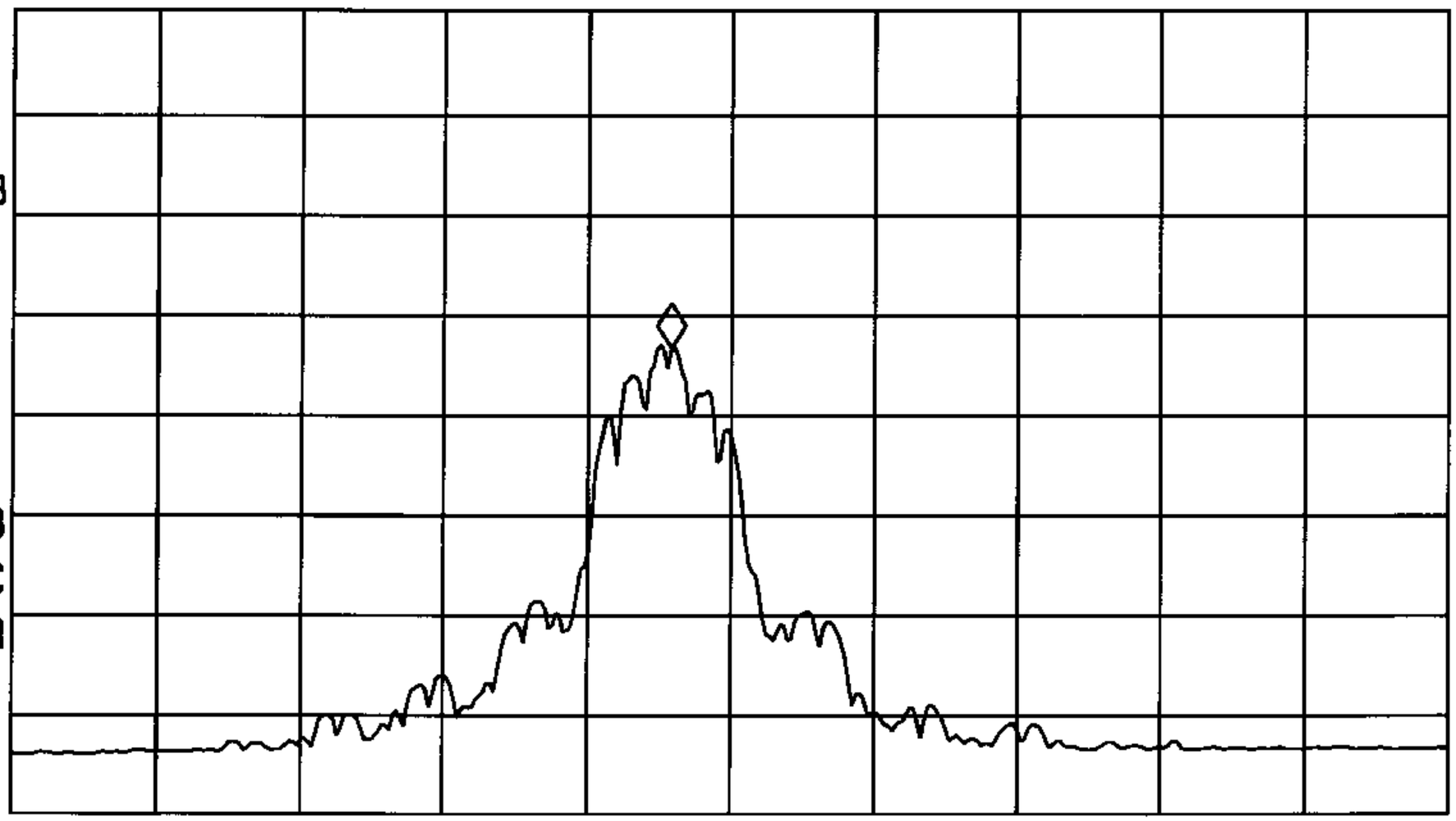
START 2.3466 GHz
#IF BW 1.Ø MHz
#AVG BW 1 MHz
STOP 2.5Ø25 GHz
SWP 2Ø.Ø msec

13: 41: 45 NOV Ø7, 2ØØ2
CARLSON-OPAFT512 DISH ANTENNA BANDEDGE CH.2 MARKER DE

SWEEPTIME
1ØØ sec

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.418Ø GHz
68.5Ø dBµV

LOG REF 1Ø2.Ø dBµV
1Ø
dB/
ATN
1Ø dB



WA SB
SC FC
CORR

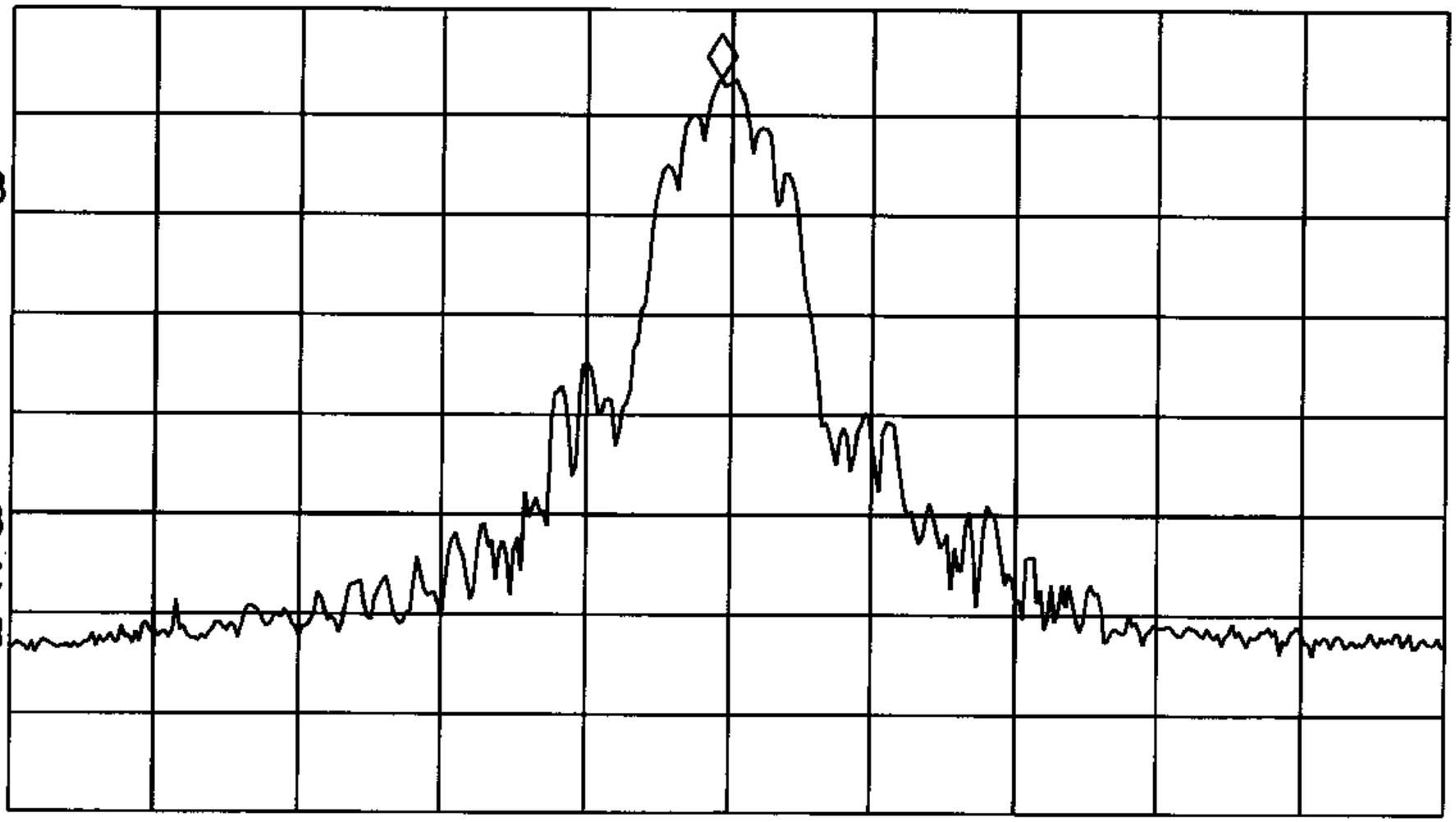
START 2.3466 GHz
#IF BW 1.Ø MHz
#AVG BW 1Ø Hz
STOP 2.5Ø25 GHz
#SWP 1ØØ sec

13: 21: 44 NOV Ø7, 2ØØ2
CARLSON-OPAFT512 DISH ANTENNA BANDEDGE CH.4 MARKER DE

REF LEVEL
1Ø2.Ø dBµV

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4472 GHz
95.17 dBµV

LOG REF 1Ø2.Ø dBµV
1Ø
dB/
ATN
1Ø dB



MA SB
SC FC
CORR

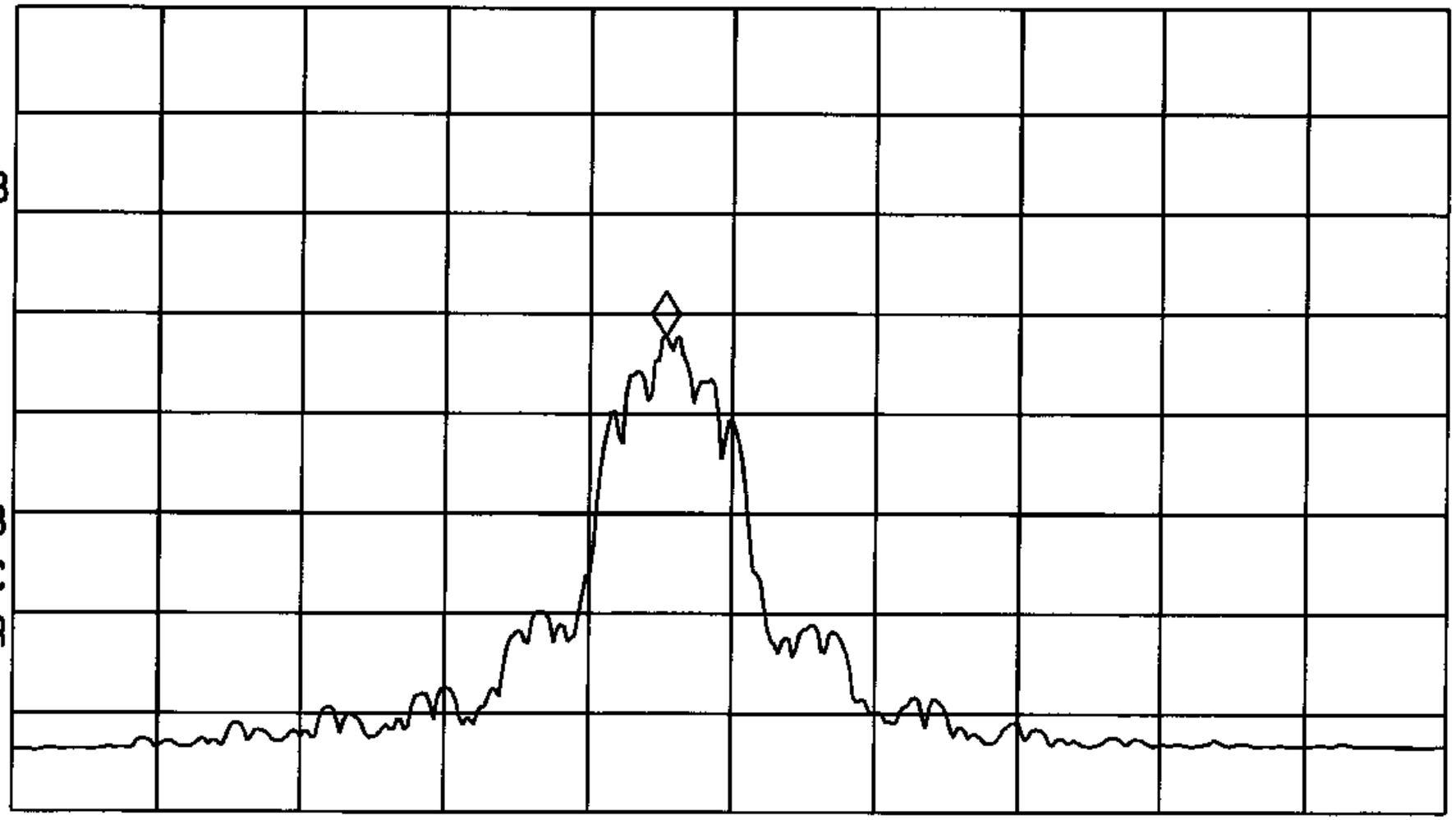
START 2.37Ø4 GHz
#IF BW 1.Ø MHz
#AVG BW 1 MHz
STOP 2.5263 GHz
SWP 2Ø.Ø msec

13: 25: 48 NOV Ø7, 2ØØ2
CARLSON-OPAFT512 DISH ANTENNA BANDEDGE CH.4 MARKER DE

SWEEPTIME
1ØØ sec

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.441Ø GHz
69.45 dBµV

LOG REF 1Ø2.Ø dBµV
1Ø
dB/
ATN
1Ø dB



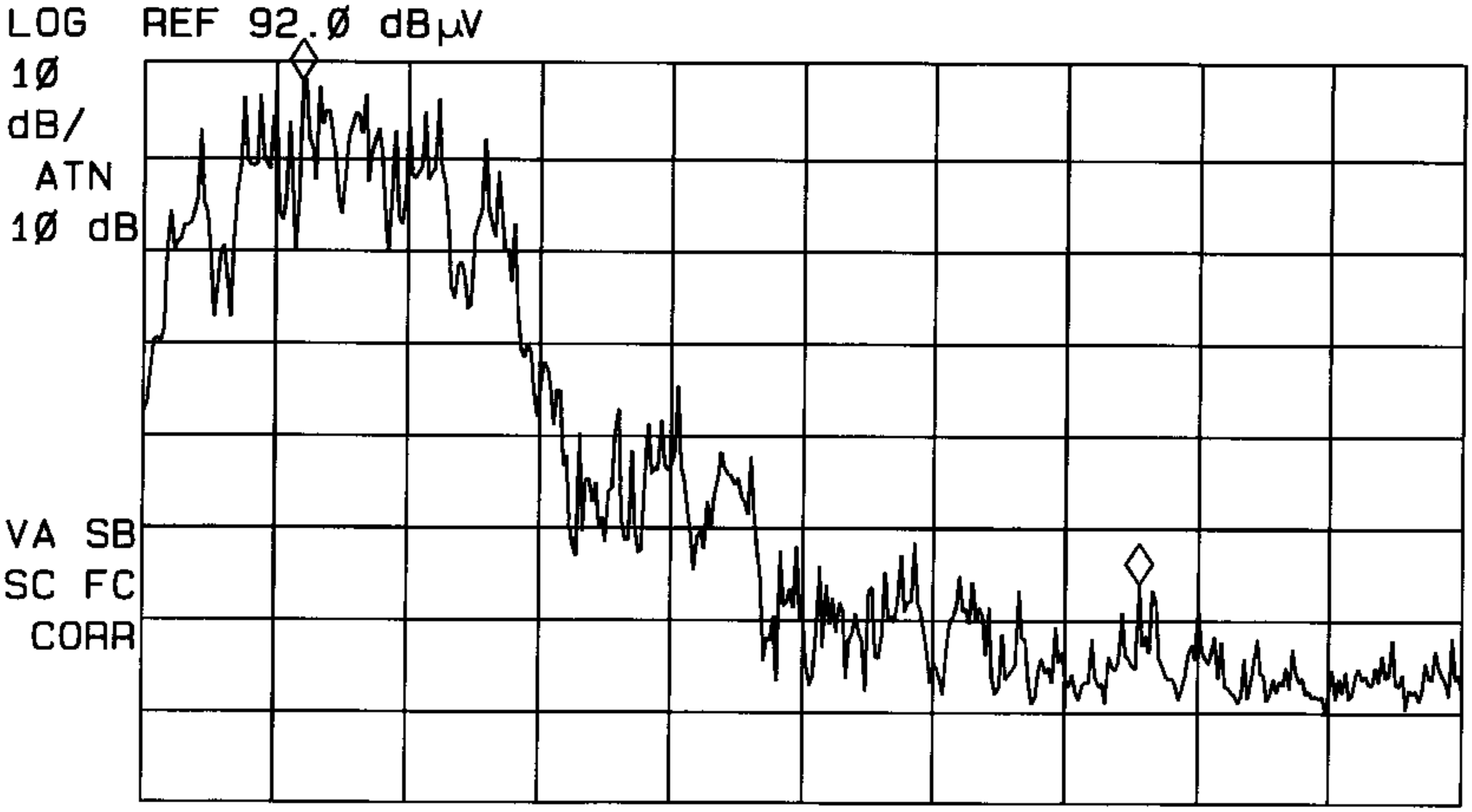
VA SB
SC FC
CORR

START 2.37Ø4 GHz
STOP 2.5263 GHz
#IF BW 1.Ø MHz
#AVG BW 1Ø Hz
#SWP 1ØØ sec

14: 16: Ø7 NOV Ø7, 2ØØ2
CARLSON-OPAFT512 DISH ANTENNA BANDEDGE CH.4 MARKER DE

MARKER Δ
-38.83 MHz
54.2Ø dB

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR -38.83 MHz
54.2Ø dB

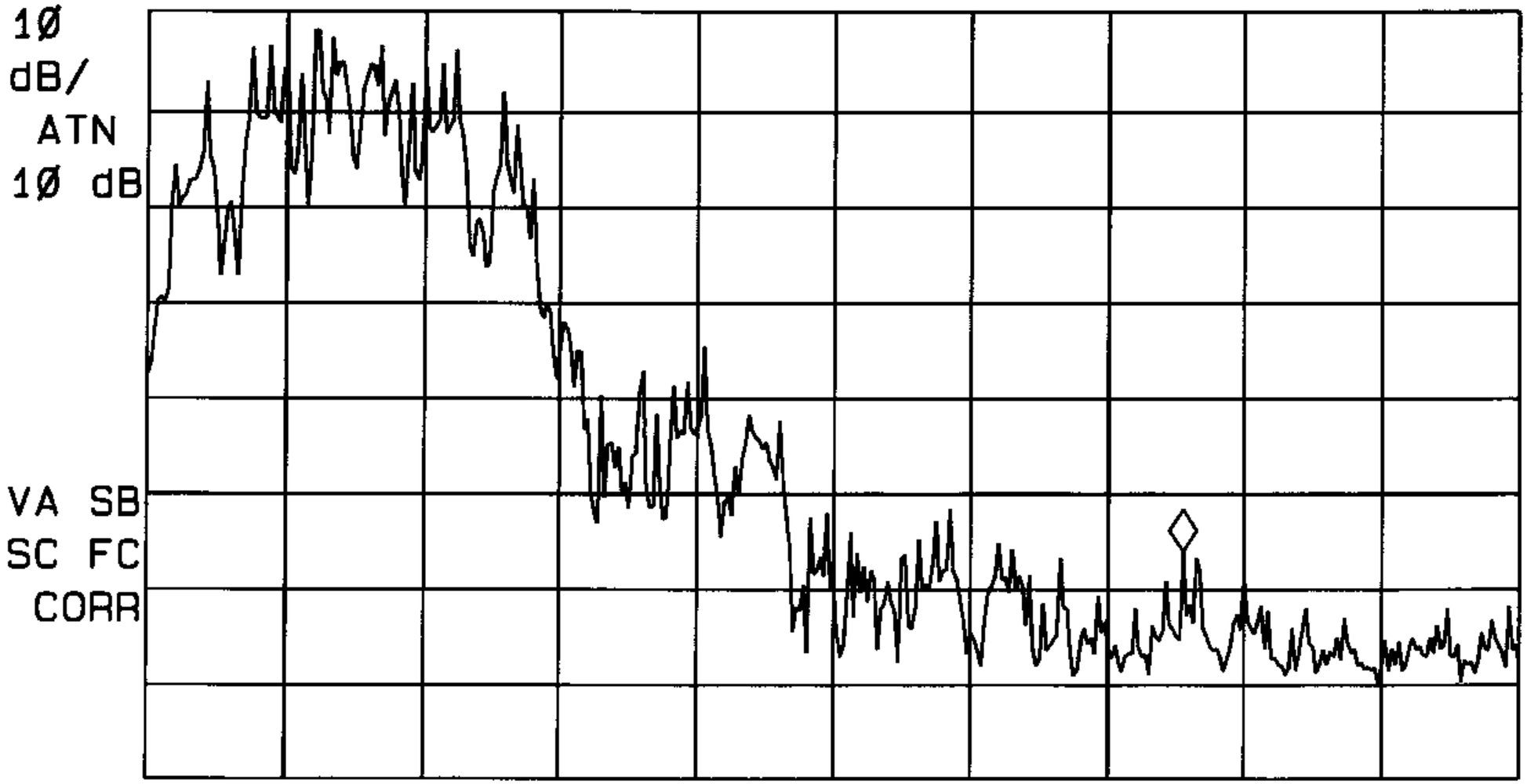


START 2.43885 GHz
#IF BW 3Ø kHz
#AVG BW 3Ø kHz
STOP 2.5ØØØØ GHz
SWP 2Ø4 msec

14: 15: 5Ø NOV Ø7, 2ØØ2
CARLSON-OPAFT512 DISH ANTENNA BANDEDGE CH.4 MARKER DE

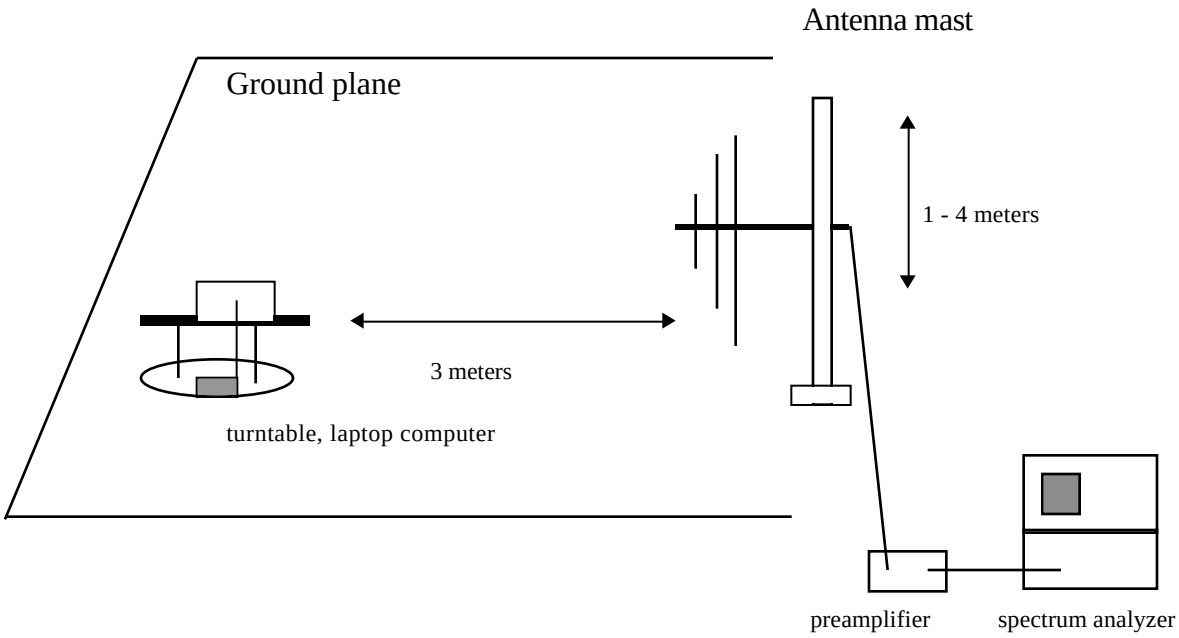
MARKER
2.485Ø2 GHz
35.82 dBµV

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.485Ø2 GHz
35.82 dBµV



#IF BW 3Ø kHz #AVG BW 3Ø kHz SWP 2Ø4 msec

Radiated Test Set-up, 30 - 1000 MHz



Test Procedures, 30 -1000 MHz

The EUT was set to RECEIVE/TRANSMIT mode. Radiation emissions from the digital portion of the EUT were measured according to the dictates of ANSI C63.4.

Test Results

Refer to tabulated data sheet.

COMPLIANCE Certification Services

FCC, VCCI, CISPR, CE, AUSTEL, NZ
UL, CSA, TUV, BSMI, DHHS, NVLAP

561F MONTEREY ROAD, SAN JOSE, CA 95037-9001
PHONE: (408) 463-0885 FAX: (408) 463-0888

Project #:	02U1641
Report #:	110802B1
Date& Time:	11/08/02 1:46 PM
Test Engr:	NEELESH RAJ

Company:	CARLSON WIRELESS
EUT Description:	FT512 (2.4GHz SPREAD SPECTRUM W/LAN)
Test Configuration :	EUT/AC ADAPTER
Type of Test:	EN55022-B
Mode of Operation:	TRANSMITTING

<< Main Sheet

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)
220.00	59.45	10.11	3.62	28.03	45.14	46.00	-0.86	3mV	90.00	1.00
242.00	56.10	11.61	3.79	27.98	43.51	46.00	-2.49	3mH	90.00	1.50
220.00	56.80	10.11	3.62	28.03	42.49	46.00	-3.51	3mH	180.00	2.50
32.00	47.17	16.13	1.55	28.53	36.32	40.00	-3.68	3mV	45.00	1.00
131.00	51.63	11.45	2.79	28.35	37.52	43.50	-5.98	3mV	180.00	1.00
264.00	51.50	12.38	3.95	27.94	39.88	46.00	-6.12	3mV	180.00	2.00
6 Worst Data										

Mark (P/Q/A)
QP
P
QP
P
QP
P

AC Line Conducted Emissions
Test Requirement: 15.107, 15.207

Measurement Equipment Used:

Rohde & Schwarz EMI Receiver ESHS-20
Fischer Custom Communication LISN, FCC-LISN-50/250-25-2

Test Procedure

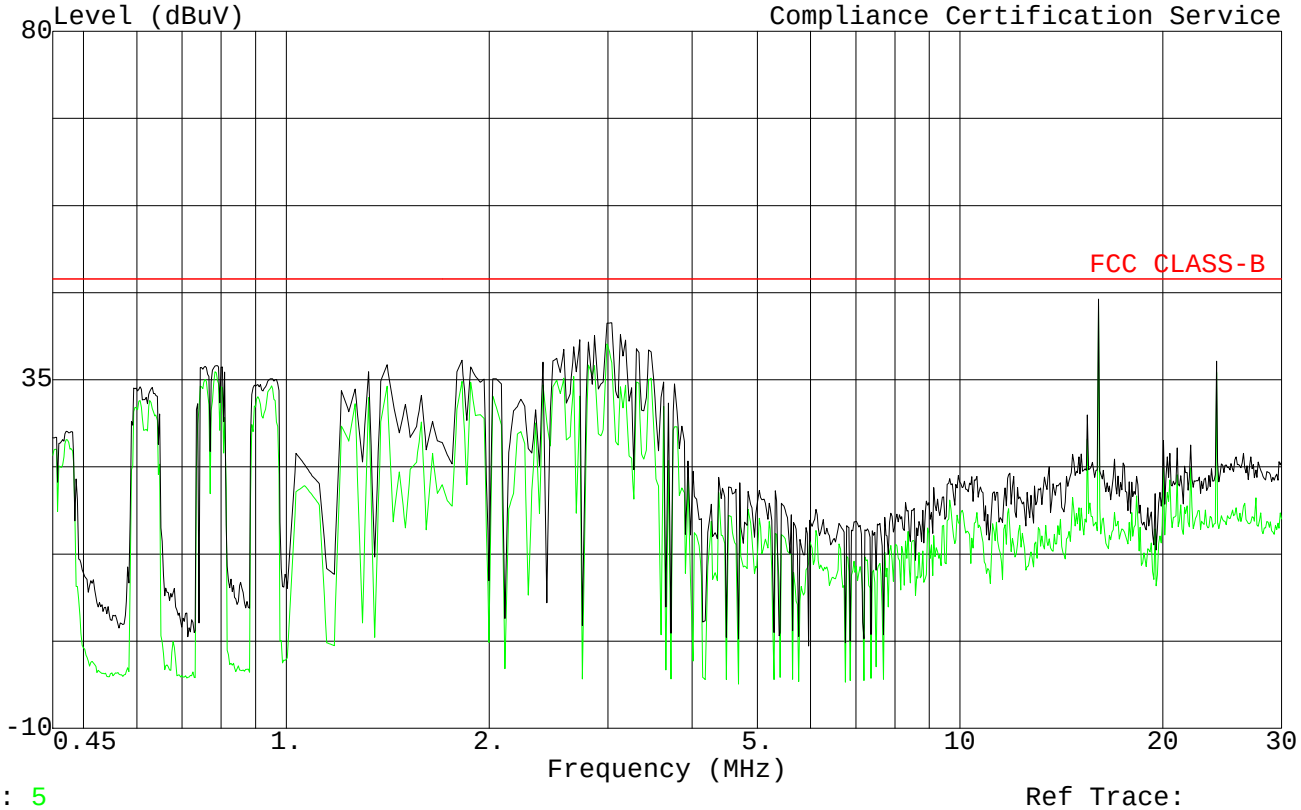
1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in normally.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.

Test Results

PASS. Refer to data sheets below. Data is presented for 120 VAC and 240 VAC models.

561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 7 File#: 02U1641D.EMI Date: 11-08-2002 Time: 16:24:03



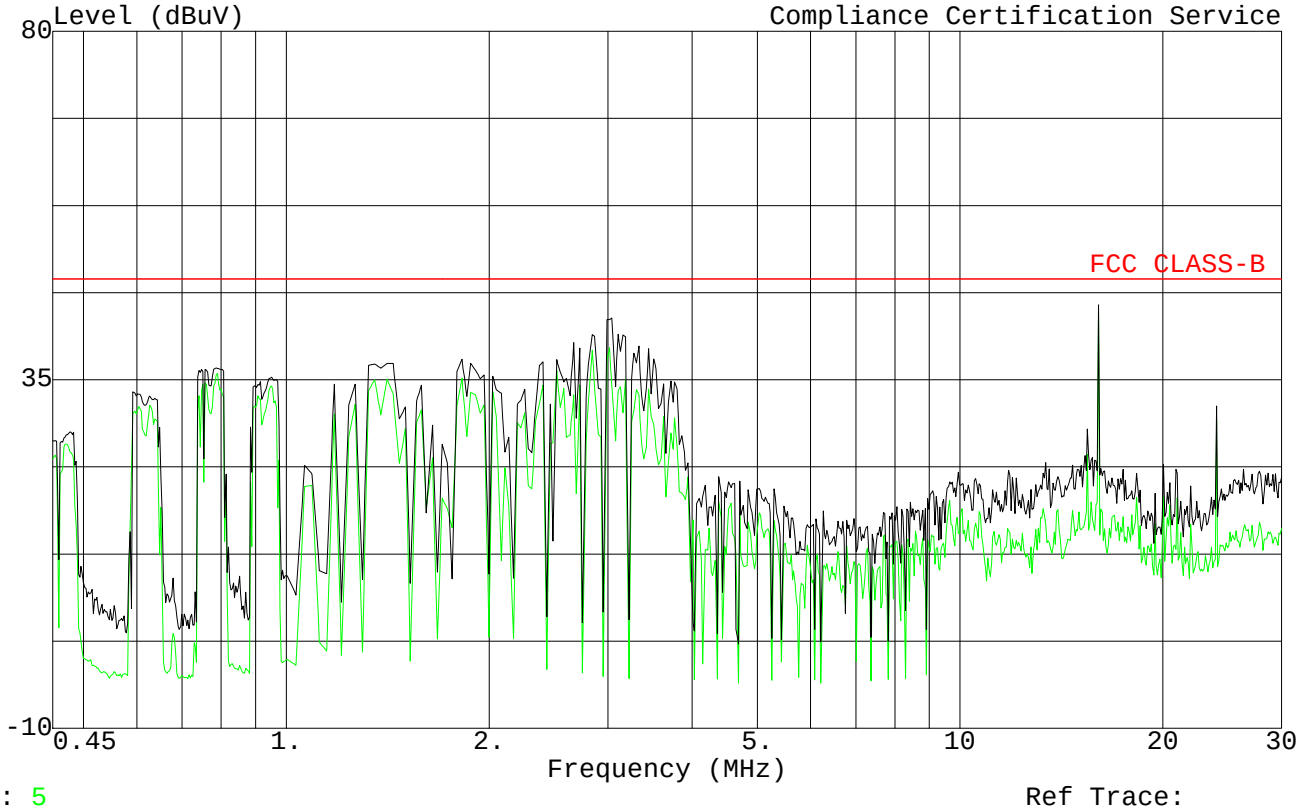
Trace: 5 Ref Trace:

Project # : 02u1641
Test Engineer : NEELESH RAJ
Company : CARLSON WIRELESS
EUT : 2.4GHz SPREAD SPECTRUM W/LAN
Model Name : FT512
Test Config. : EUT/AC ADAPTER
Test of Target: EN55022 Class B
Mode of Op. : TRANSMITTING
: 115VAC@60Hz
: L1 (peak; black quasipeak; green)

COMPLIANCE Engineering Service, Inc.
FCC,VCCI,CISPR,CE
UL,CSA,TUV

561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 7 File#: 02U1641C.EMI Date: 11-08-2002 Time: 15:59:20



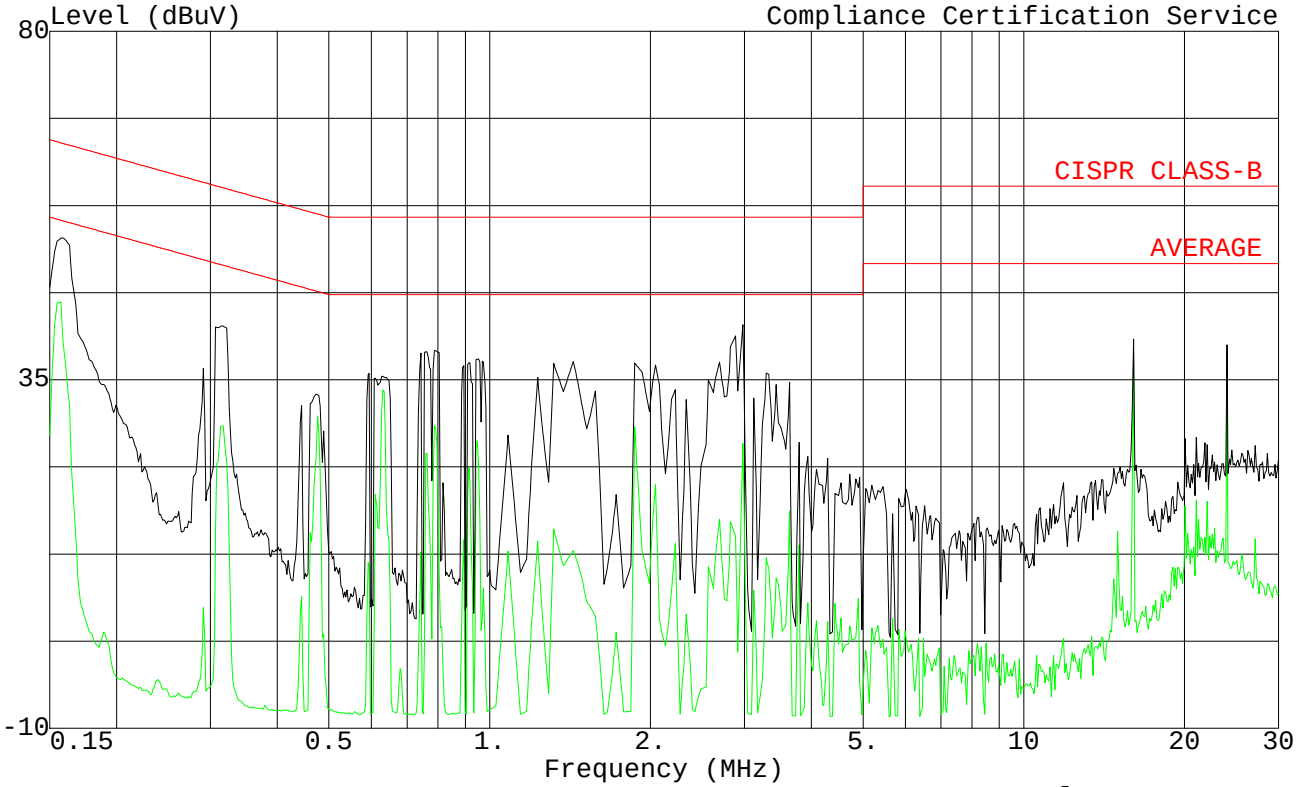
Trace: 5 Ref Trace:

Project # : 02u1641
Test Engineer : NEELESH RAJ
Company : CARLSON WIRELESS
EUT : 2.4GHz SPREAD SPECTRUM W/LAN
Model Name : FT512
Test Config. : EUT/AC ADAPTER
Test of Target: EN55022 Class B
Mode of Op. : TRANSMITTING
: 115VAC@60Hz
: L2 (peak; black quasipeak; green)

COMPLIANCE Engineering Service, Inc.
FCC,VCCI,CISPR,CE
UL,CSA,TUV

561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 7 File#: 02U1641A.EMI Date: 11-08-2002 Time: 15:31:40

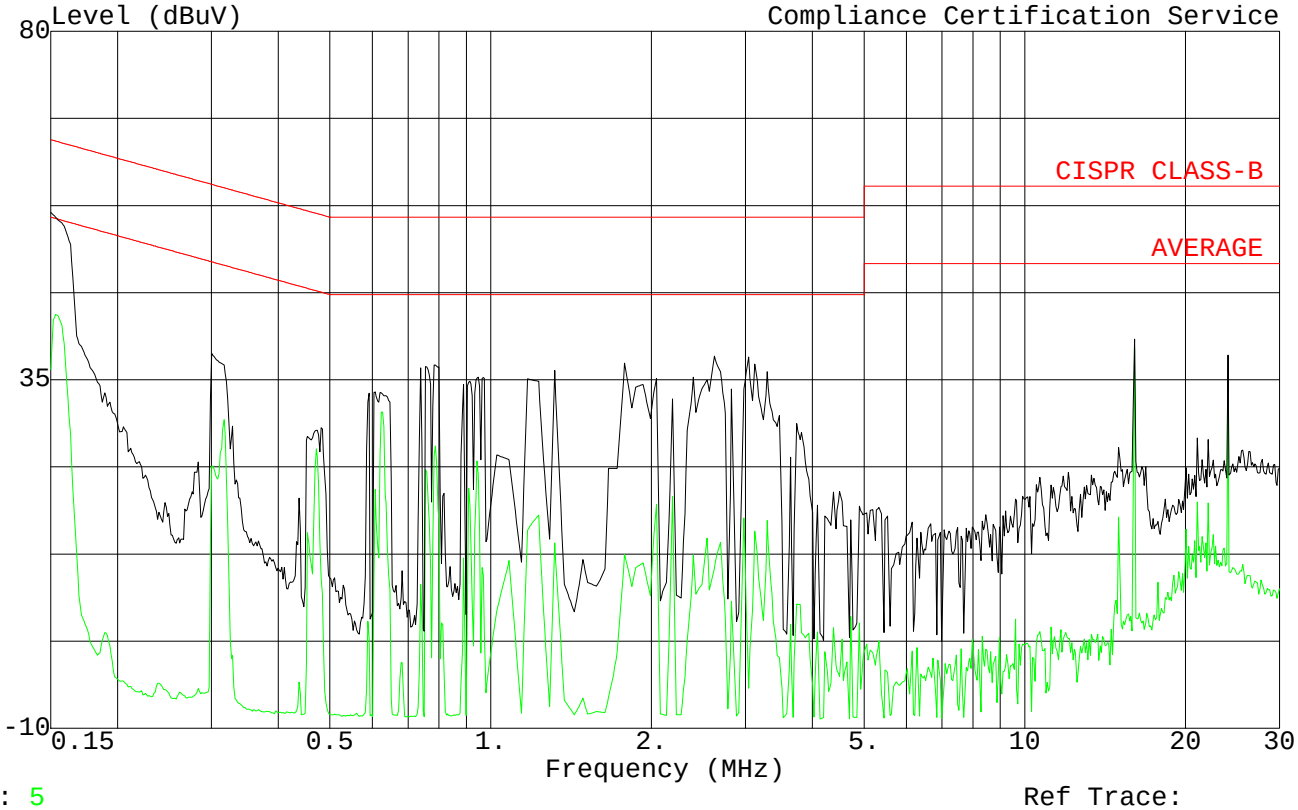


Trace: 5 Ref Trace:

Project # : 02u1641
Test Engineer : NEELESH RAJ
Company : CARLSON WIRELESS
EUT : 2.4GHz SPREAD SPECTRUM W/LAN
Model Name : FT512
Test Config. : EUT/AC ADAPTER
Test of Target: EN55022 Class B
Mode of Op. : TRANSMITTING
: 115VAC@60Hz
: L1 (peak; black avg; green)

561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 7 File#: 02U1641B.EMI Date: 11-08-2002 Time: 15:48:50



Trace: 5 Ref Trace:

Project # : 02u1641
Test Engineer : NEELESH RAJ
Company : CARLSON WIRELESS
EUT : 2.4GHz SPREAD SPECTRUM W/LAN
Model Name : FT512
Test Config. : EUT/AC ADAPTER
Test of Target: EN55022 Class B
Mode of Op. : TRANSMITTING
: 115VAC@60Hz
: L2 (peak; black avg; green)

*CISPR DATA

CONDUCTED EMISSIONS DATA (115VAC 60Hz)								
Freq.	Reading			Closs	Limit	EN_B	Margin	
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)
0.16	53.30	--	45.02	0.00	65.74	55.74	-12.44	-10.72
2.98	42.12	--	26.79	0.00	56.00	46.00	-13.88	-19.21
0.32	41.93	--	29.02	0.00	61.29	51.29	-19.36	-22.27
0.15	56.64	--	43.45	0.00	66.00	56.00	-9.36	-12.55
3.04	37.94	--	17.13	0.00	56.00	46.00	-18.06	-28.87
1.78	37.16	--	12.50	0.00	56.00	46.00	-18.84	-33.50
6 Worst Data								

*FCC DATA

CONDUCTED EMISSIONS DATA (115VAC 60Hz)								
Freq.	Reading			Closs	Limit	FCC_B	Margin	
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)
16.05	45.42	44.56	--	0.00	48.00	--	-3.44	--
3.02	42.32	39.64	--	0.00	48.00	--	-8.36	--
3.13	40.82	34.10	--	0.00	48.00	--	-13.90	--
16.05	44.66	43.92	--	0.00	48.00	--	-4.08	--
3.03	42.87	39.16	--	0.00	48.00	--	-8.84	--
3.16	40.80	35.10	--	0.00	48.00	--	-12.90	--
6 Worst Data								

Remark L1 / L2
L1
L1
L1
L2
L2
L2

Remark L1 / L2
L1
L1
L1
L2
L2
L2

Minimum 6 dB Bandwidth
Test Requirement: 15.247(a)2

Measurement Equipment Used:

HP 8593EM Spectrum Analyzer
20 dB attenuator
3ft length low loss coaxial cable

Test Procedures

The EUT was configured on a test bench. The EUT was set for continuous operation . Frequency was set to LOW channel. While the transmitter broadcast a steady stream of digital data, the analyzer MAX HOLD function was used to capture the envelope of the transmission occupied bandwidth.

The test was repeated at MID channel and at HIGH channel.

Test Results: Refer to attached spectrum analyzer charts. Data taken with RES BW of 100 kHz shows minimum 6 dB BW of 9.2 MHz. Minimum requirement: 500 kHz

Channel	**Frequency, MHz**
Low	2412
Mid	2448
High	2460

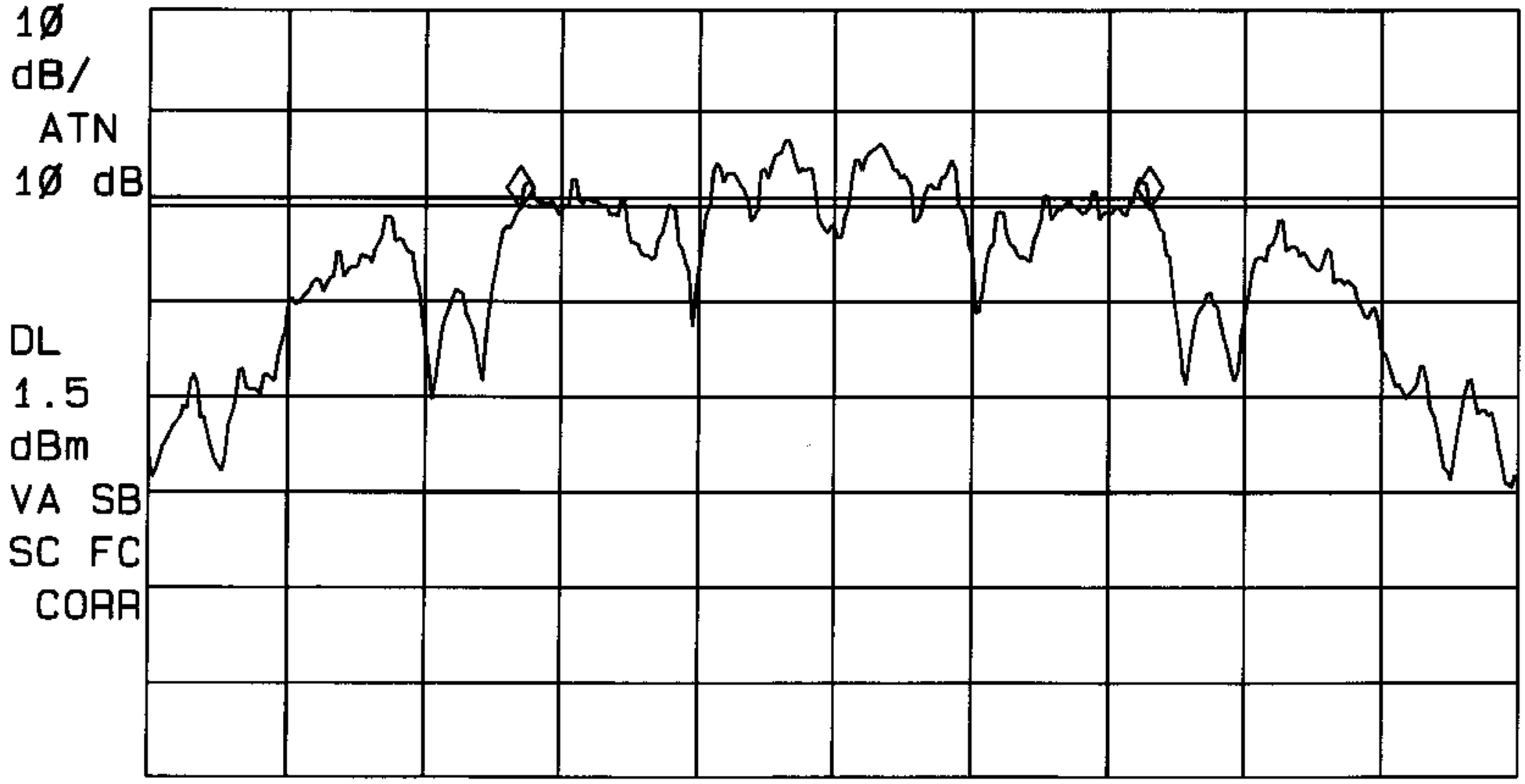
NOTE: 6 dB bandwidth was measured at each modulation, with essentially the same bandwidth resulting. Data is presented for the 512 kbps modulation setting.

15.247(a)2: Minimum 6 dB Bandwidth

12: 42: 59 NOV Ø6, 2ØØ2
CARLSON-OPAFT512 6dB BW LOW

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 9.2Ø MHz
-.Ø1 dB

REF OFFST 21.Ø dB
LOG REF 21.Ø dBm



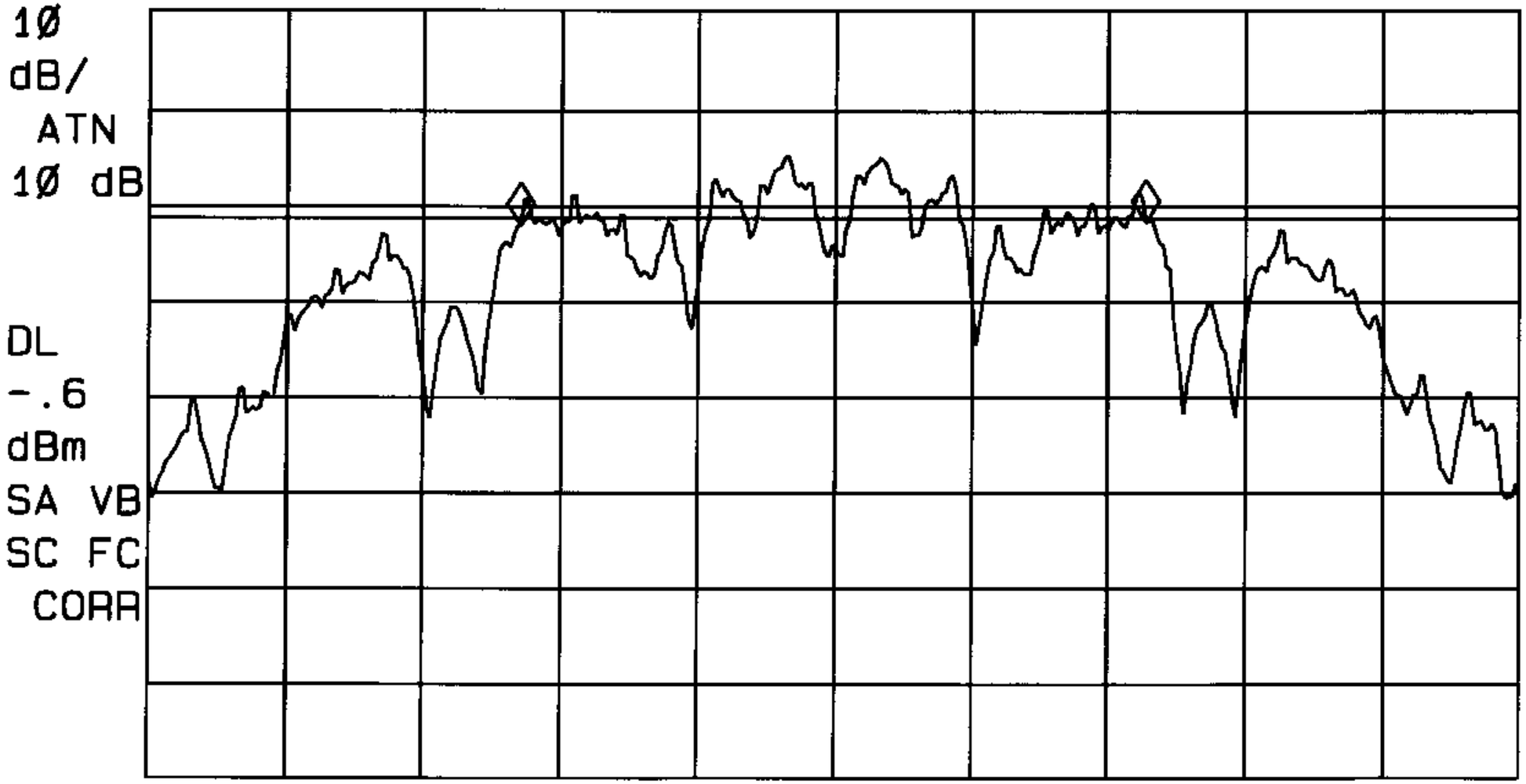
CENTER 2.412ØØ GHz
SPAN 2Ø.ØØ MHz
#IF BW 1ØØ kHz
#AVG BW 1ØØ kHz
SWP 2Ø.Ø msec

Ch 1

12: 13: 26 NOV Ø6, 2ØØ2
CARLSON-OPAFT512 6dB BW MID

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 9.15 MHz
.34 dB

REF OFFST 21.Ø dB
LOG REF 21.Ø dBm



CENTER 2.448ØØ GHz
SPAN 2Ø.ØØ MHz
#IF BW 1ØØ kHz
#AVG BW 1ØØ kHz
SWP 2Ø.Ø msec

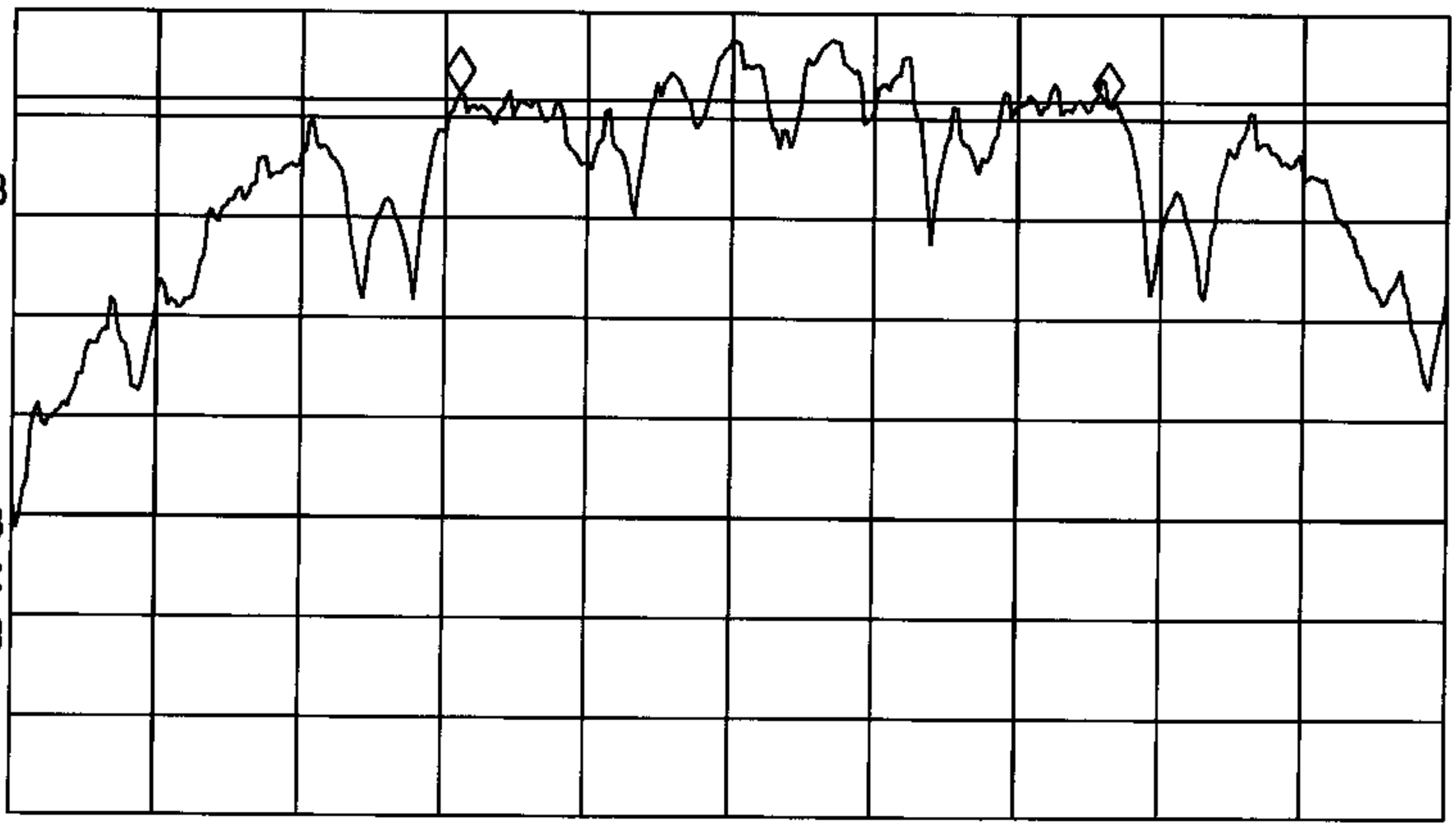
Ch 4

09:38:38 NOV 08, 2002
CARLSON-OPAFT512 6dB BW CH.5

MARKER Δ
-9.05 MHz
1.17 dB

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR -9.05 MHz
1.17 dB

REF OFFST 11.0 dB
LOG REF 10.0 dBm
10 dB/
ATN 10 dB
DL 1.3 dBm
VA SB
SC FC
CORR



CENTER 2.45928 GHz
SPAN 20.00 MHz
#IF BW 100 kHz
#AVG BW 100 kHz
SWP 20.0 msec

RF Power Output
Test Requirement: 15.247(b)

Measurement Equipment Used:

Agilent E4416A power meter
Agilent E9327A RF sensor
20 dB attenuator

Test Procedures

1. The EUT was configured on a test bench. The power meter was zeroed and calibrated. The control software was activated and power was set to produce highest output level.
2. The 20 dB attenuator was connected to the antenna port of the EUT. The power meter head was connected to the other end of the attenuator. Peak power was read directly off the meter, accounting for the 20 dB attenuator.

3. The process in (1) and (2) was repeated for MID channel and HIGH channel.

Test Results

Power level readings converted to dBm are shown below. Refer also to spectrum analyzer graphs. Reference level offset corrects for external attenuation and cable loss.

Channel	Frequency, MHz	Output Power, dBm
1 LOW	2412	17.6
3 MID	2436	17.5
5 HIGH	2460	17.4

Maximum output power output variation within 0.6 dBm of design maximum 18 dBm output.

NOTE: Data is presented for the 512 kbps modulation setting. Maximum power output is independent of modulation type

Spurious Emissions, Conducted
Test Requirement: 15.247(c)

Measurement Equipment Used:

HP 8593EM Spectrum Analyzer
20 dB attenuator
3 ft length low loss A coaxial RF cable

Test Procedure

1. The EUT was configured on a test bench. The cable was connected between the EUT antenna port and the spectrum analyzer input port.

Spectrum analyzer RES BW was set to 100 kHz. While the transmitter broadcast a steady stream of digital data, the analyzer MAX HOLD function was used to capture the envelope of the transmission.

Readings were taken out to 10fo.

2. The process in (1) was repeated for MID channel and HIGH channel.

Test Results

Refer to attached data sheets. Data shows out of band emissions are suppressed well below the -20 dBc minimum required by the Rules.

Channel	**Frequency, MHz**
1 LOW	2412
4 MID	2448
5 HIGH	2460

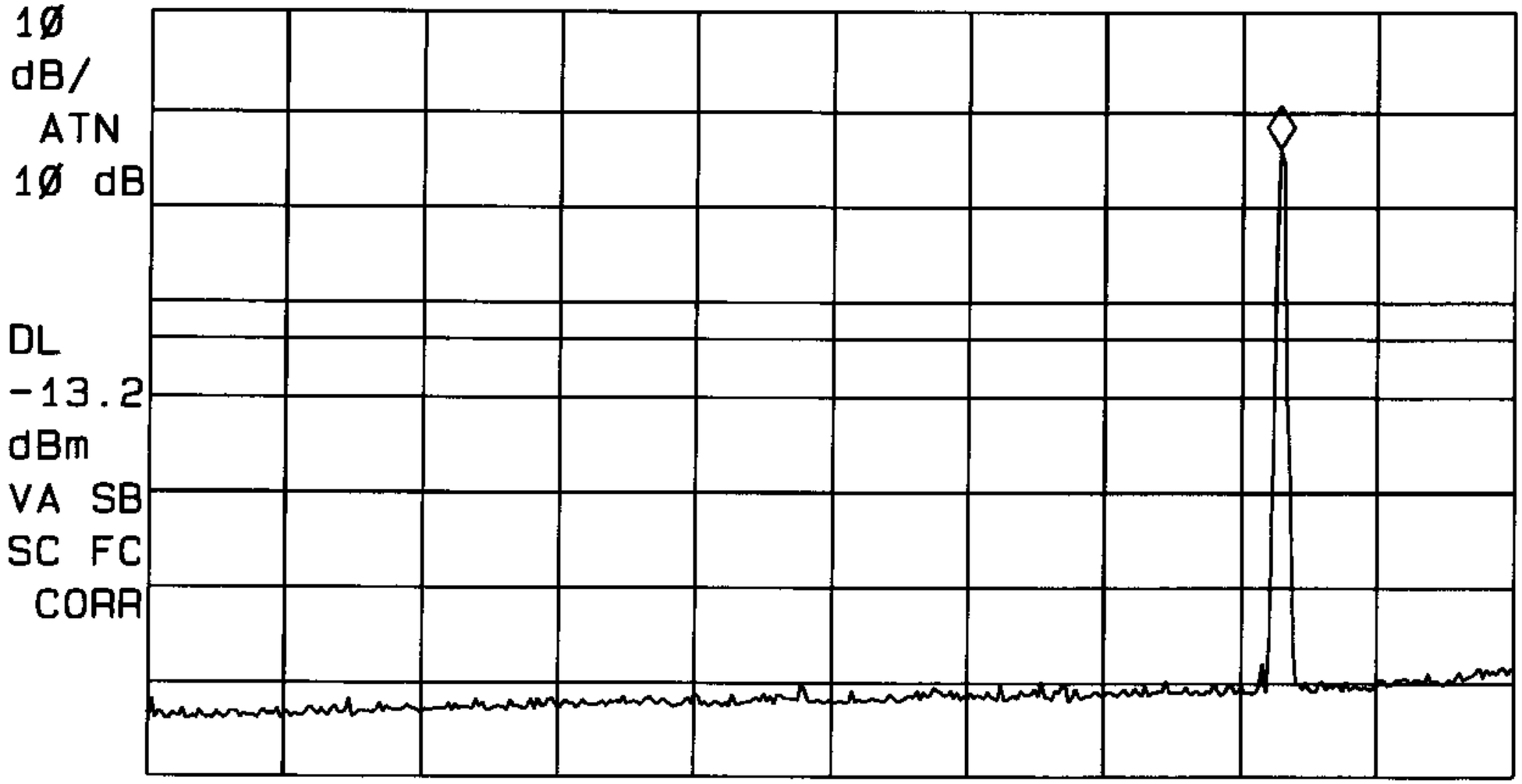
NOTE: Data is presented for the 512 kbps modulation setting.

15.247(c): Spurious Emissions, Conducted

12: 36: 27 NOV Ø6, 2ØØ2
CARLSON-OPAFT512 SPURIOUS LOW

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4Ø5 GHz
6.83 dBm

REF OFFST 21.Ø dB
LOG REF 21.Ø dBm



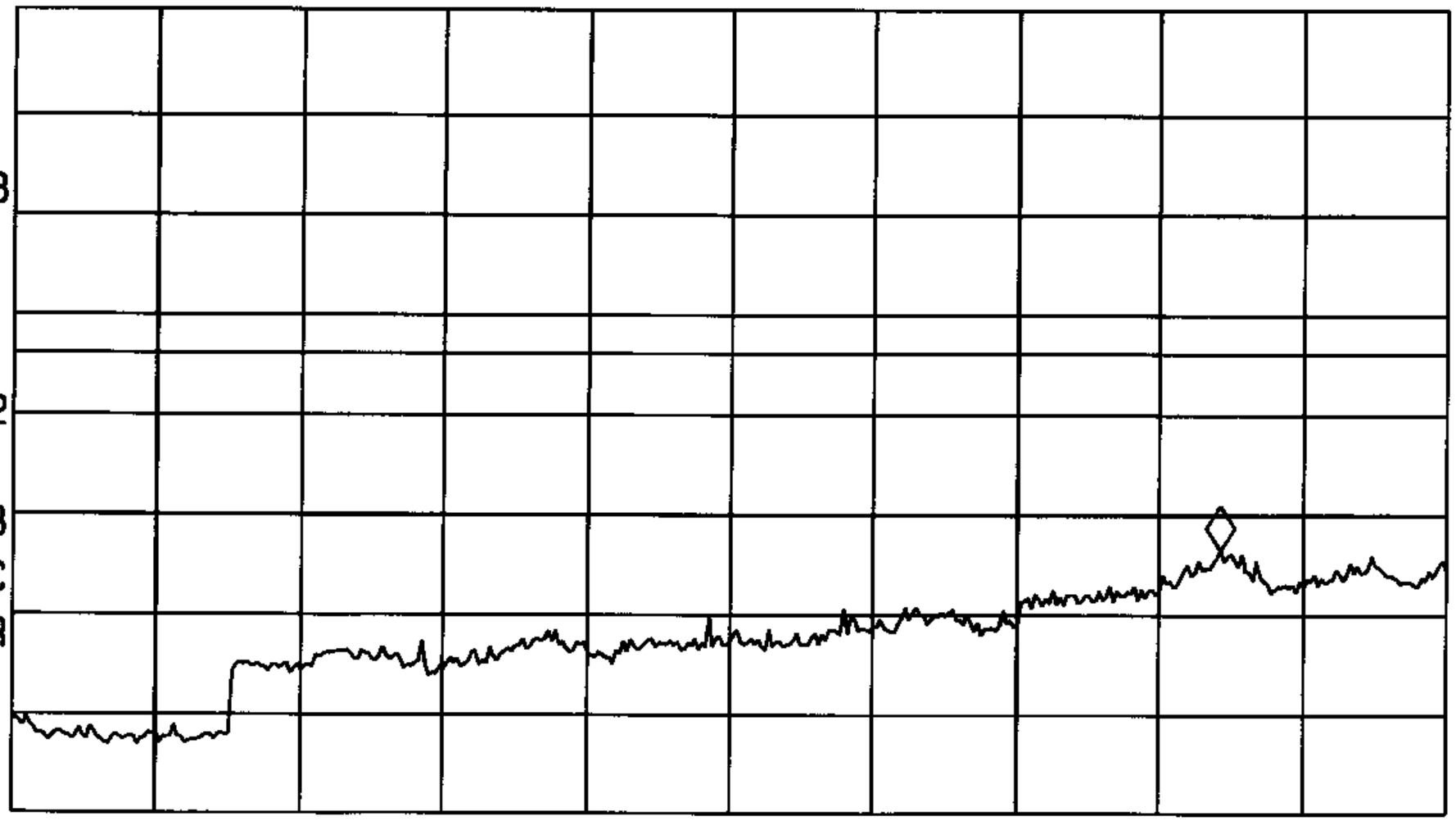
START 3Ø MHz
STOP 2.9ØØ GHz
#IF BW 1ØØ kHz
#AVG BW 1ØØ kHz
SWP 861 msec

Ch 1

12: 39: Ø5 NOV Ø6, 2ØØ2
CARLSON-OPAFT512 SPURIOUS LOW

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 22.78 GHz
-32.66 dBm

REF OFFST 21.Ø dB
LOG REF 21.Ø dBm
1Ø dB/
ATN 1Ø dB
DL -13.2 dBm
VA SB
SC FC
CORR



START 2.9Ø GHz
#IF BW 1ØØ kHz
#AVG BW 1ØØ kHz
STOP 26.5Ø GHz
SWP 7.Ø8 sec

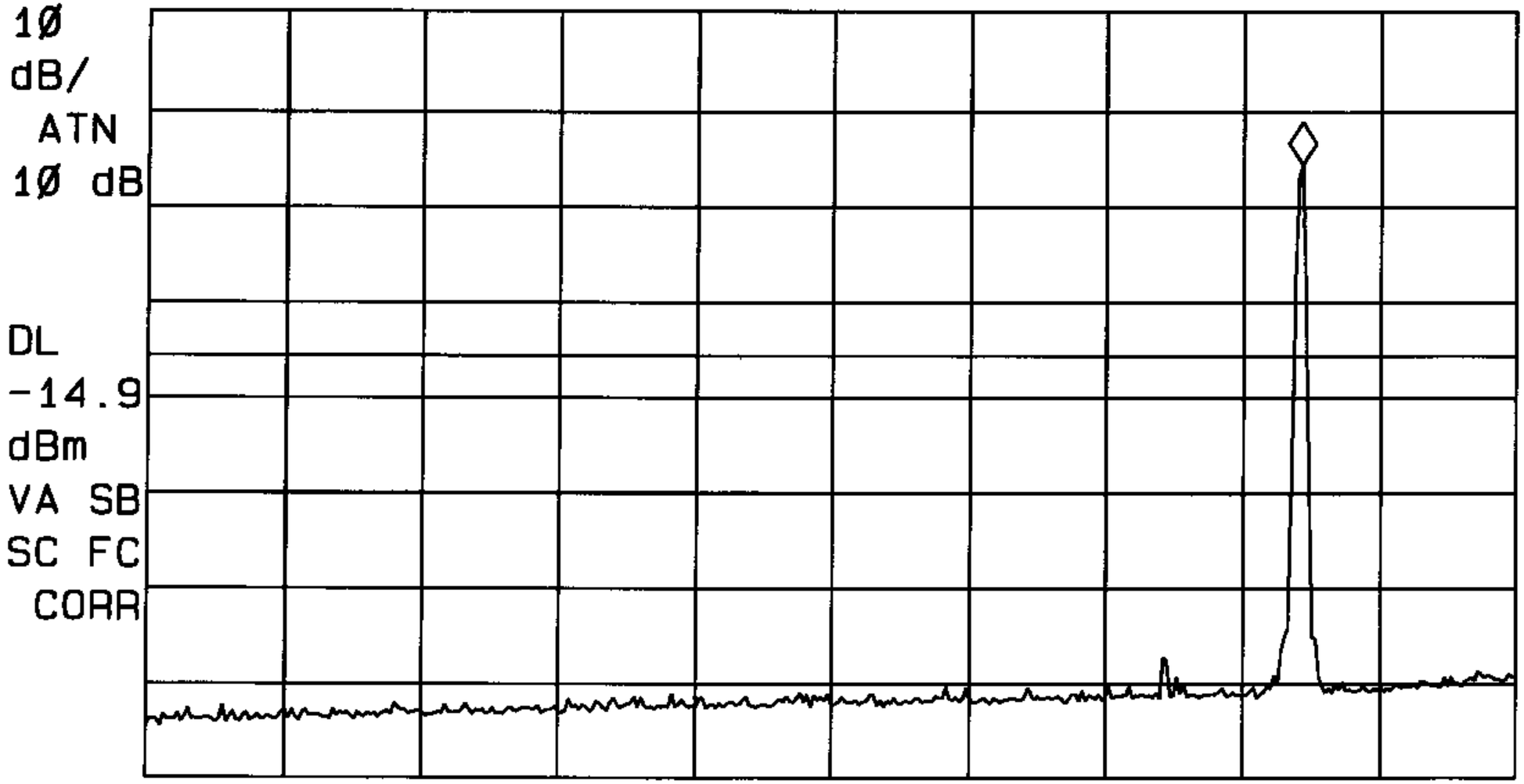
Ch1

12: 24: 37 NOV Ø6, 2ØØ2
CARLSON-OPAFT512 SPURIOUS MID

DISPLAY LINE
-14.9 dBm

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.448 GHz
5.Ø7 dBm

REF OFFST 21.Ø dB
LOG REF 21.Ø dBm



START 3Ø MHz
#IF BW 1ØØ kHz
#AVG BW 1ØØ kHz
STOP 2.9ØØ GHz
SWP 861 msec

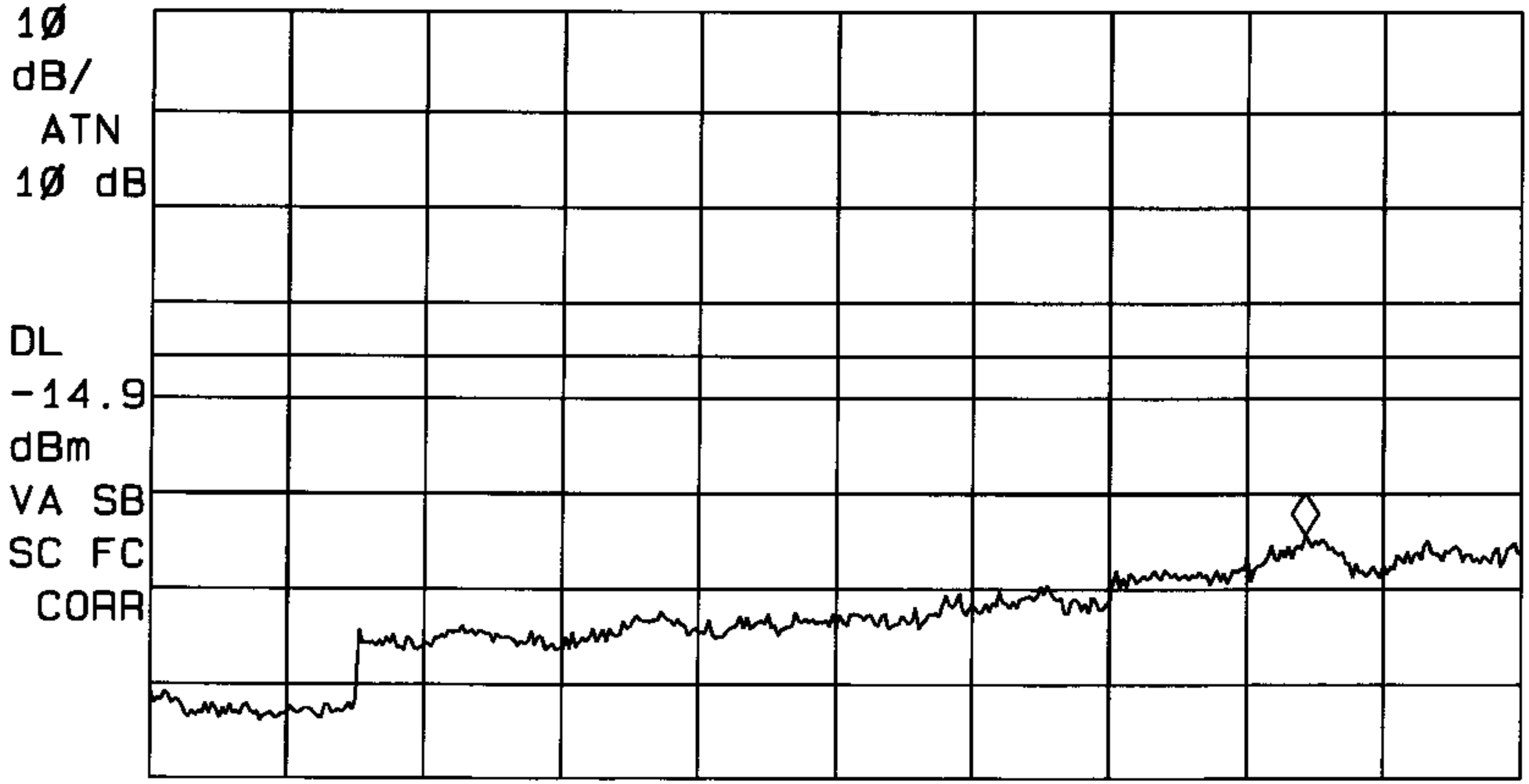
64

12: 26: 43 NOV Ø6, 2ØØ2
CARLSON-OPAFT512 SPURIOUS MID

STOP
26.5Ø GHz

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 22.78 GHz
-33.45 dBm

REF OFFST 21.Ø dB
LOG REF 21.Ø dBm



START 2.9Ø GHz
#IF BW 1ØØ kHz
#AVG BW 1ØØ kHz
STOP 26.5Ø GHz
SWP 7.Ø8 sec

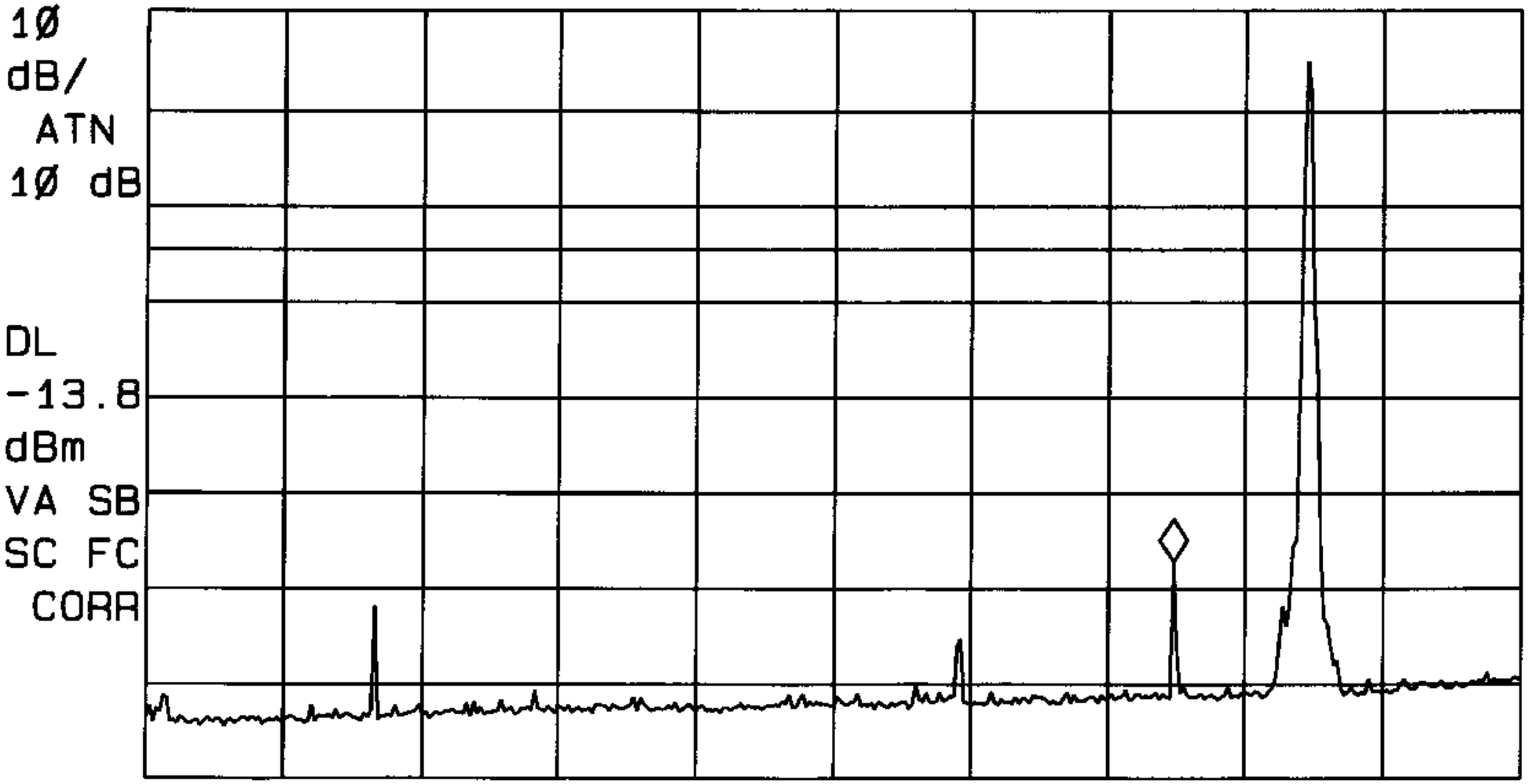
ch4

17:51:13 NOV 08, 2002
CARLSON-OPAFT512 CH.5 SPURIOUS

MARKER
2.175 GHz
-46.29 dBm

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.175 GHz
-46.29 dBm

REF OFFST 11.0 dB
LOG REF 11.0 dBm



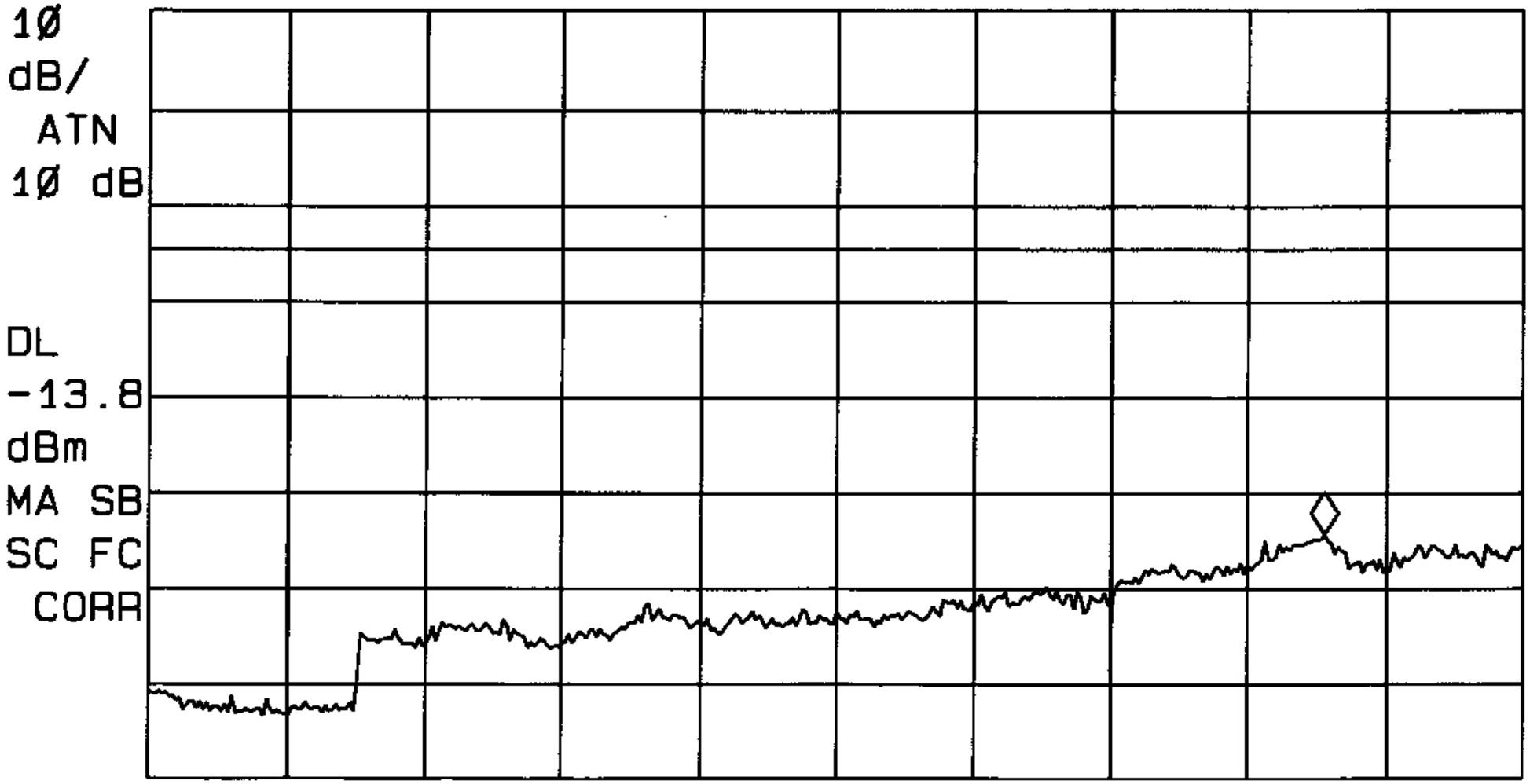
START 30 MHz
#IF BW 100 kHz
#AVG BW 100 kHz
STOP 2.900 GHz
SWP 861 msec

17: 52: ØØ NOV Ø8, 2ØØ2
CARLSON-OPAFT512 CH.5 SPURIOUS

STOP
26.5Ø GHz

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 23.Ø8 GHz
-43.45 dBm

REF OFFST 11.Ø dB
LOG REF 11.Ø dBm



START 2.9Ø GHz
STOP 26.5Ø GHz
#IF BW 1ØØ kHz
#AVG BW 1ØØ kHz
SWP 7.Ø8 sec

Power Spectral Density
Test Requirement: 15.247(d)

Measurement Equipment Used:

HP 8593EM Spectrum Analyzer
2 ft length low loss A coaxial RF cable

Test Procedure

For the LOW channel, the emission peak was set to the center of the display. The SPAN was set to 300 kHz, the RES BW and VID BW were set to 3 kHz, and SWEEP TIME was set to 100 seconds. The maximum trace was recorded and compared to the 8 dBm limit.

The test was repeated for MID and HIGH channel.

Test Results

Maximum measured PSD was approximately -4.5 dBm. Refer to attached spectrum analyzer charts.

Channel	**Frequency, MHz**
1 (Low)	2412
4 (Mid)	2448
5 (High)	2460

NOTE: Data is presented for the 512 kbps modulation setting. Readings essentially identical for all modulation types, 512 kbps appearing to be worst case.

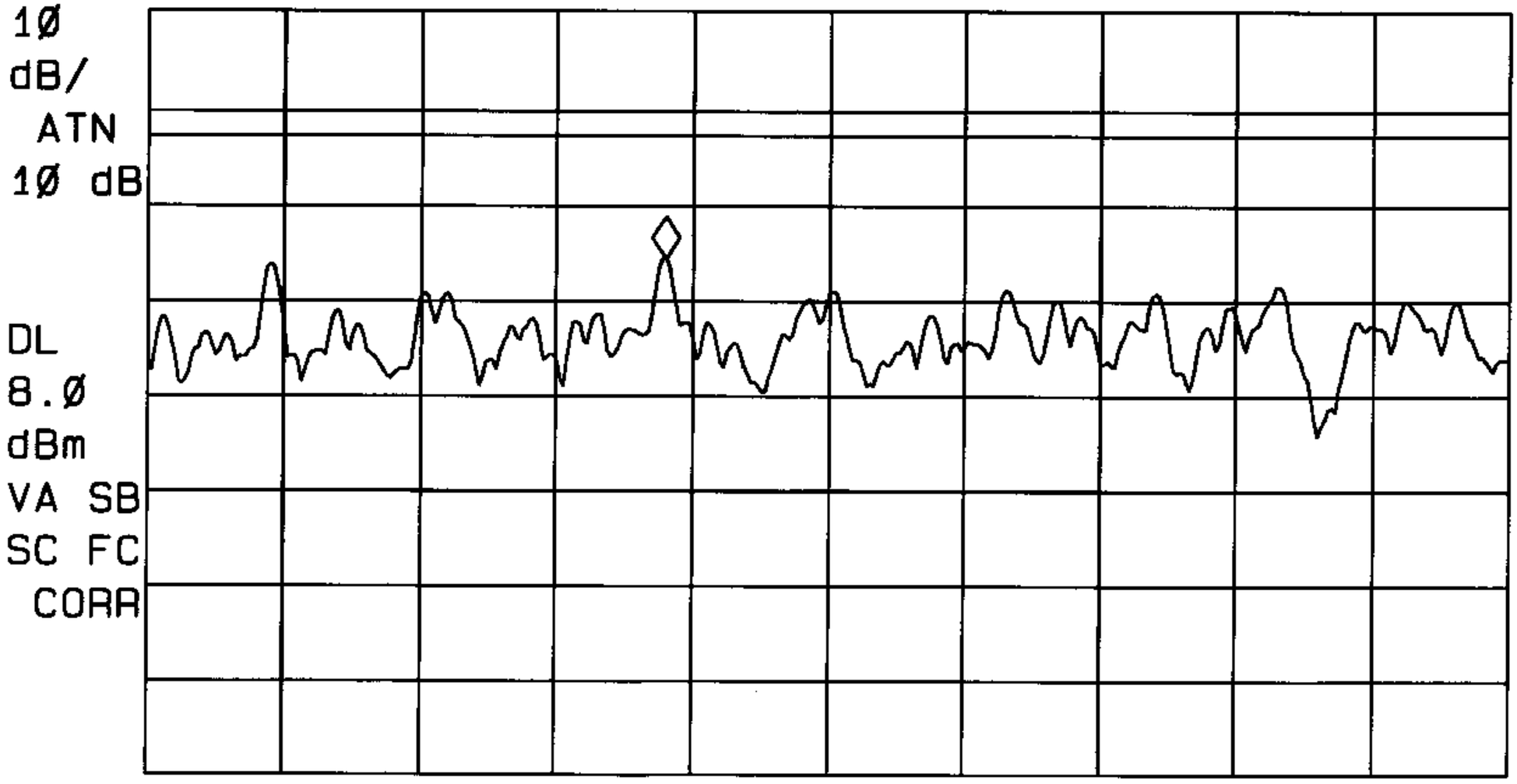
15.247(d): Power Spectral Density

13: 41: 41 NOV Ø6, 2ØØ2
CARLSON-OPAFT512 PPSD LOW

SWEEPTIME
1ØØ sec

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4112140 GHz
-4.87 dBm

REF OFFST 21.Ø dB
LOG REF 21.Ø dBm



CENTER 2.4112500 GHz
SPAN 3ØØ.Ø kHz
#IF BW 3.Ø kHz
#AVG BW 3 kHz
#SWP 1ØØ sec

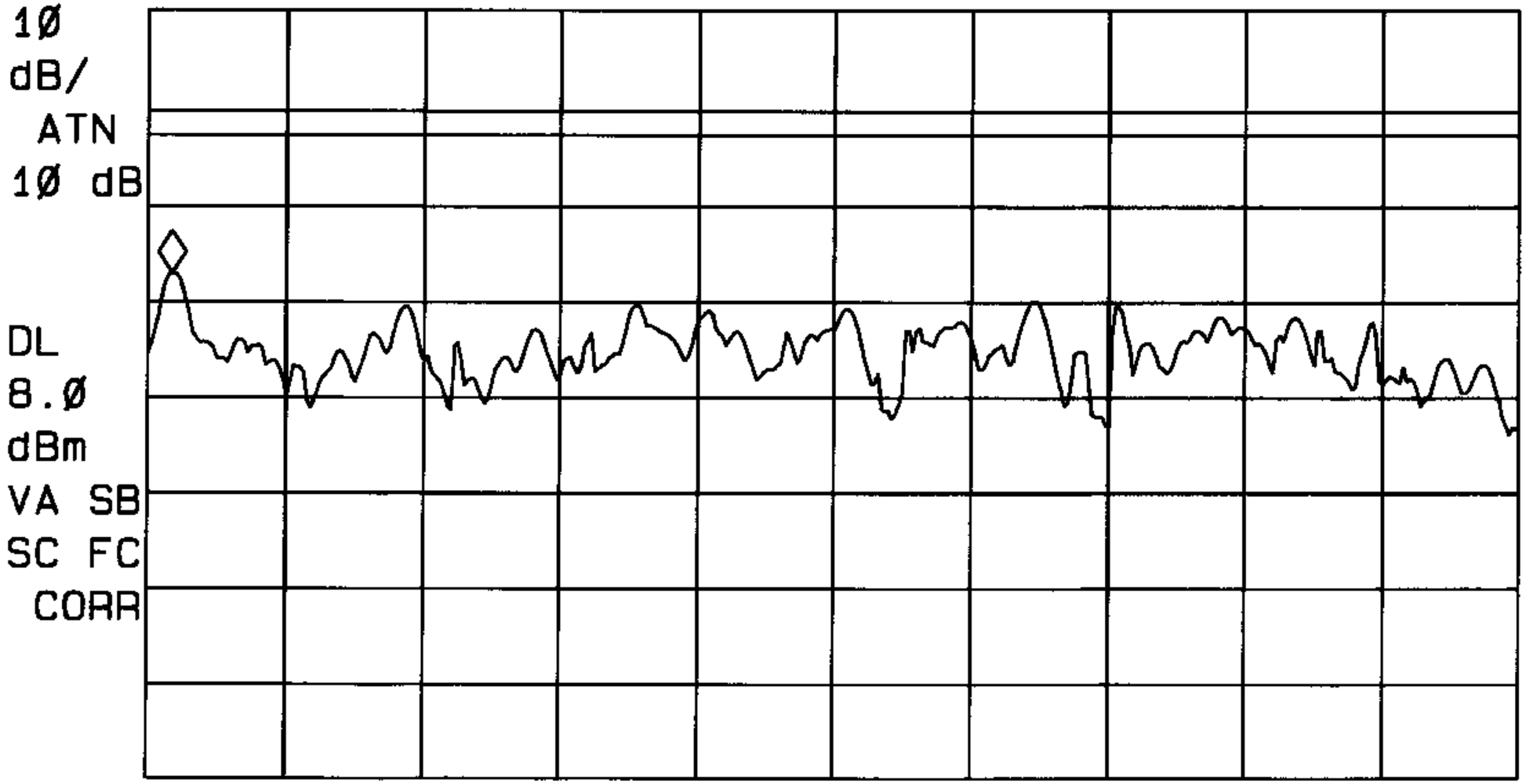
Ch1

12: 19: 17 NOV Ø6, 2ØØ2
CARLSON-OPAFT512 PPSD MID

DISPLAY LINE
8.Ø dBm

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4486Ø35 GHz
-6.34 dBm

REF OFFST 21.Ø dB
LOG REF 21.Ø dBm



CENTER 2.4487ØØØ GHz
SPAN 2ØØ.Ø kHz
#IF BW 3.Ø kHz
#AVG BW 3 kHz
#SWP 1ØØ sec

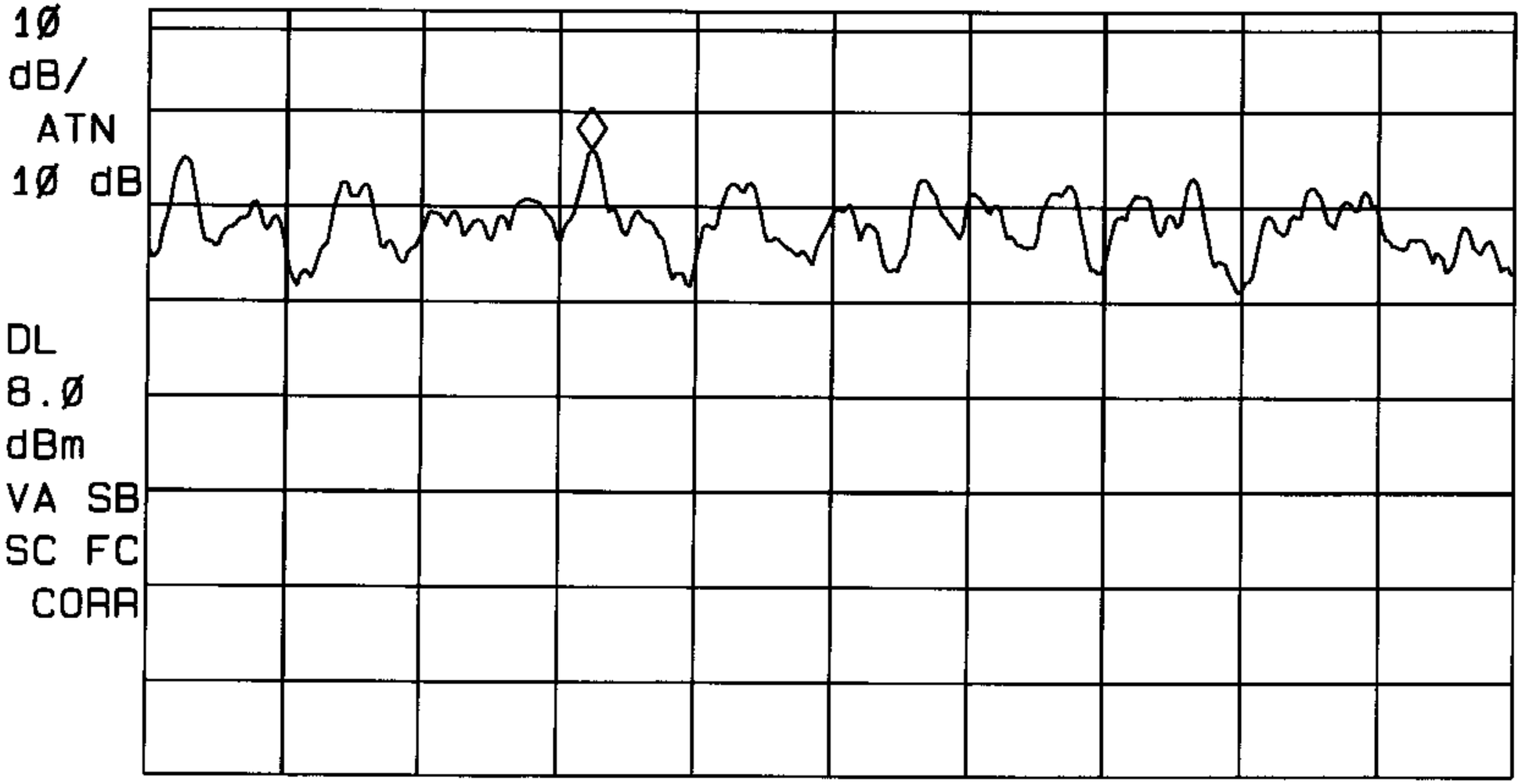
Ch 4

09:43:32 NOV 08, 2002
CARLSON-OPAFT512 6dB BW CH.5

SWEEPTIME
100 sec

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4592218 GHz
-4.45 dBm

REF OFFST 11.0 dB
LOG REF 10.0 dBm



CENTER 2.4592750 GHz
SPAN 300.0 kHz
#IF BW 3.0 kHz
#AVG BW 3 MHz
#SWP 100 sec