



FCC Test Report

FCC Part 15.247 for DSSS systems/ CANADA RSS-210

FOR:

Notebook PC

MODEL #: PCG-4J1L

SONY CORPORATION
6-7-35, KITASHINAGAWA, SHINAGAWA-KU
TOKYO 141-0001
JAPAN

FCC ID: AK8PCG4J1L
IC ID: 409B-PCG4J1L

TEST REPORT #: SONYE_008_06002_15.247BGREV1
DATE: 08/25/2006



FCC listed#
101450

IC recognized #
3925

CETECOM Inc.

411 Dixon Landing Road • Milpitas, CA 95035 • U.S.A.

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CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686

Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

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TABLE OF CONTENTS

1	Assessment	3
2	Administrative Data	4
2.1	Identification of the Testing Laboratory Issuing the EMC Test Report	4
2.2	Identification of the Client	4
2.3	Identification of the Manufacturer	Error! Bookmark not defined.
3	Equipment under Test (EUT)	5
3.1	Identification of the Equipment under Test	5
3.2	Identification of Accessory equipment	5
4	Subject Of Investigation	6
5	Measurements	7
5.1	MAXIMUM PEAK OUTPUT POWER § 15.247 (RADIATED)	7
5.1.1	LIMIT SUB CLAUSE § 15.247 (b) (1) (2) (3) (4)	7
5.1.2	EIRP b MODE:	7
5.1.3	EIRP g MODE:	7
5.2	RESTRICTED BAND EDGE COMPLIANCE RADIATED §15.247/15.205	14
5.2.1	LIMITS	14
5.2.2	b MODE (2412MHz)	15
5.2.3	b MODE (2462MHz)	17
5.2.4	g MODE (2412MHz)	19
5.2.5	g MODE (2462MHz)	21
5.3	TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.247/15.205/15.209	23
5.3.1	LIMITS	23
5.3.2	RESULTS b MODE (worst case)	24
5.4	RECEIVER SPURIOUS RADIATION § 15.209/RSS210	32
5.4.1	LIMITS	32
5.4.2	RESULTS	33
5.5	AC POWER LINE CONDUCTED EMISSIONS § 15.107/207	37
5.5.1	LIMITS	37
5.5.2	RESULTS	38
5.6	TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS	39
5.7	BLOCK DIAGRAMS	40



1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Part 15.247 of the Code of Federal Regulations and in compliance with the applicable criteria specified in Industry Canada rules RSS210.

Company	Description	Model #
SONY CORPORATION	Notebook PC	PCG-4J1L

A handwritten signature in black ink that reads "Michael Grings". The signature is written in a cursive, flowing style.

Michael Grings
Deputy Test Lab Manager

The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.



2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	EMC
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Responsible Test Lab Manager:	Lothar Schmidt
Responsible Project Leader:	Michael Grings
Date of test:	6/21/2006 to 6/22/2006

2.2 Identification of the Client

Applicant's Name:	SONY Corporation
Street Address:	6-7-35, Kitashinagawa, Shinagawa-ku,
City/Zip Code	Tokyo 141-0001
Country	Japan
Contact Person:	Katsunori Tsusui
Phone No.	81-263-72-5696
Fax:	81-263-72-9755
e-mail:	Katsunori.tsusui@jp.sony.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	Sony EMCS Corporation
Manufacturers Address:	5432 Toyoshima, Toyoshima -machi, Minamiazumi-gun
City/Zip Code	Nagano 399-8282,
Country	Japan

3 Equipment under Test (EUT)

3.1 Identification of the Equipment under Test

Marketing Name:	VAIO-VGN-TX
Description:	Notebook PC
Model No:	PCG-4J1L
FCC ID:	AK8PCG4J1L
IC ID:	409B-PCG4J1L
Frequency Range:	2400-2483.5MHz
*Type(s) of Modulation:	CCK , OFDM
Number of Channels:	11
Antenna Type:	λ/monopole (Inverted F Antenna)
Output Power:	802.11 (b) mode: 0.044 W EIRP @ 2462 MHz 802.11 (g) mode: 0.077 W EIRP @ 2437 MHz

3.2 Identification of Accessory equipment

TYPE	MANF.	MODEL
AC ADAPTER	SONY	VGP-AC16V8



4 Subject Of Investigation

All testing was performed on the PCG-4J1L referred to as EUT. The EUT carries a pre-certified WLAN module with FCC ID# PD9WM3945ABG. This test report contains full radiated testing as per FCC15.247 on the EUT with the pre-certified WLAN module. All conducted measurements are covered under *test report# INTEL-050901F*

During the testing process the EUT was tested in b mode with 1Mbps data rate and in g mode with 6Mbps data rate which yielded the worst case results. All data in this report shows the worst case between horizontal and vertical polarization for above 1GHz.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations and Industry Canada rules RSS210.

5 Measurements

5.1 MAXIMUM PEAK OUTPUT POWER § 15.247 (RADIATED)

5.1.1 LIMIT SUB CLAUSE § 15.247 (b) (1) (2) (3) (4)

Frequency range	RF power output
2400-2483.5 MHz	36dBm EIRP

*limit is based upon antenna gain of less than or equal to 6dBi.

5.1.2 EIRP (802.11 b) MODE:

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2412	2437	2462
T _{nom} (23)°C	V _{nom} VDC	15.66	16.36	16.44
Measurement uncertainty		±0.5dBm		

5.1.3 EIRP (802.11 g) MODE:

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2412	2437	2462
T _{nom} (23)°C	V _{nom} VDC	17.93	18.84	17.35
Measurement uncertainty		±0.5dBm		



EIRP 802.11 b Mode (2412MHz)

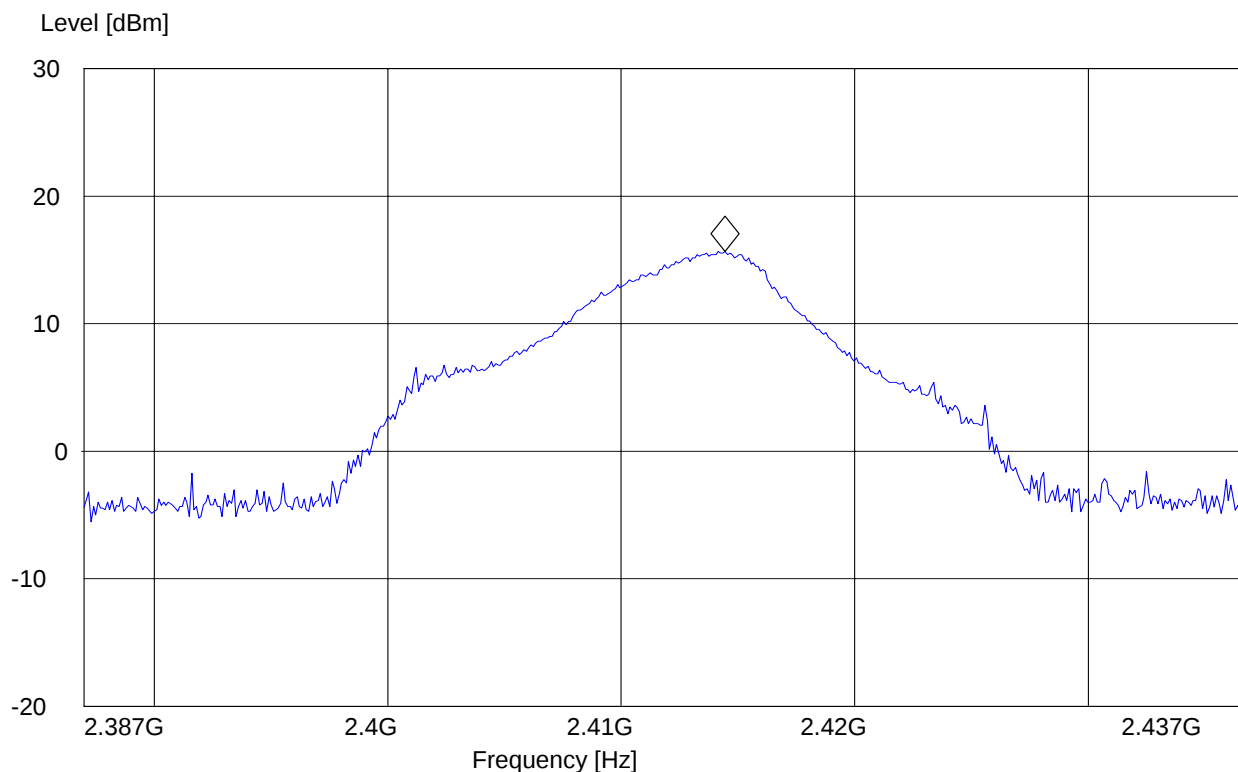
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2412MHz TABLE 185°
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC ADAPTOR
Sweep: EIRP RLAN CH1

SWEEP TABLE: "EIRP RLAN CH1"

Short Description:		EIRP RLAN channel-2412 MHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
2.4 GHz	2.4 GHz	MaxPeak	Coupled	10 MHz	DUMMY-DBM
		MaxPeak			

Marker: 2.41445491 GHz 15.66 dBm





EIRP 802.11 b Mode (2437MHz)

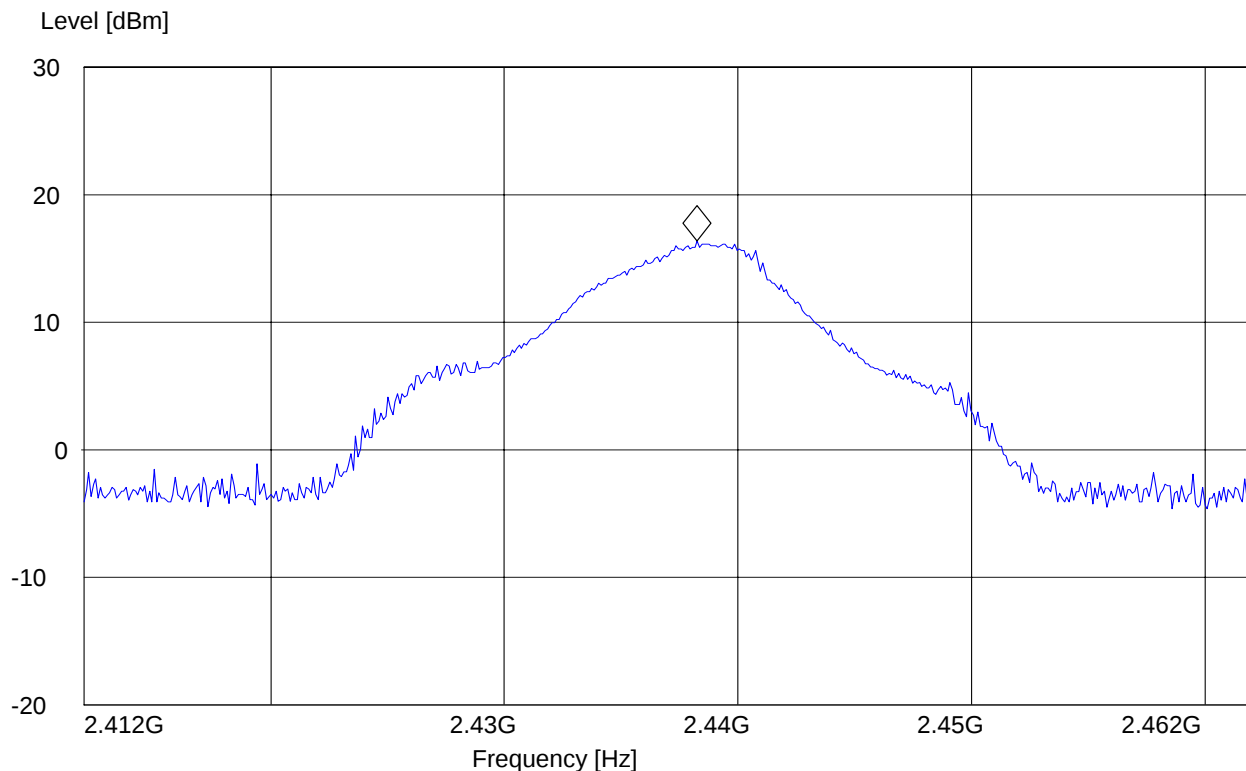
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2437MHz TABLE 185°
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC ADAPTOR
Sweep: EIRP RLAN CH6

SWEEP TABLE: "EIRP RLAN CH6"

Short Description:		EIRP RLAN channel-2437 MHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
2.4 GHz	2.5 GHz	MaxPeak	Coupled	10 MHz	DUMMY-DBM

Marker: 2.438252505 GHz 16.36 dBm





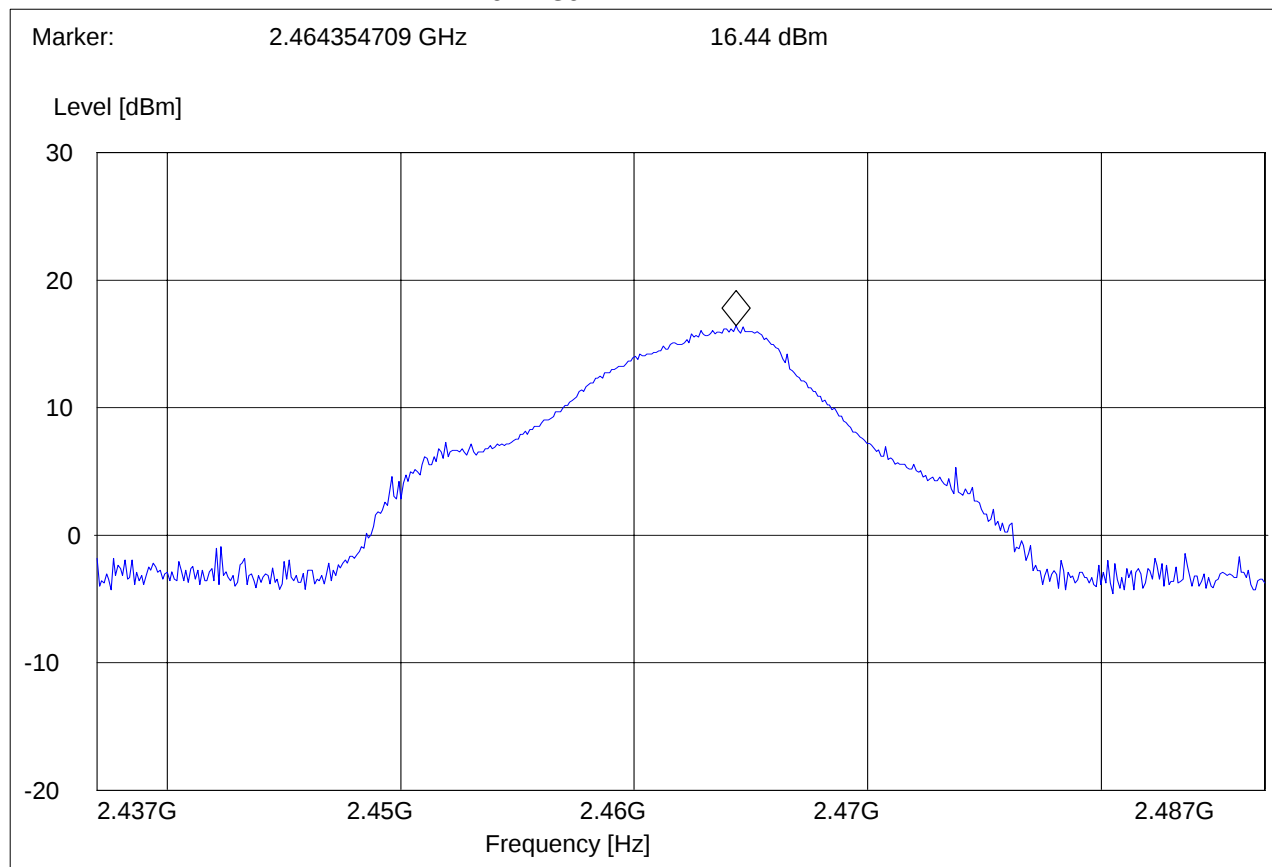
EIRP 802.11 b Mode (2462MHz)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2462MHz TABLE 185°
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC ADAPTOR
Sweep: EIRP RLAN CH11

SWEEP TABLE: "EIRP RLAN CH11"

Short Description:		EIRP RLAN channel-2462 MHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
2.4 GHz	2.5 GHz	MaxPeak	Coupled	10 MHz	DUMMY-DBM
		MaxPeak			





EIRP 802.11 g Mode (2412MHz)

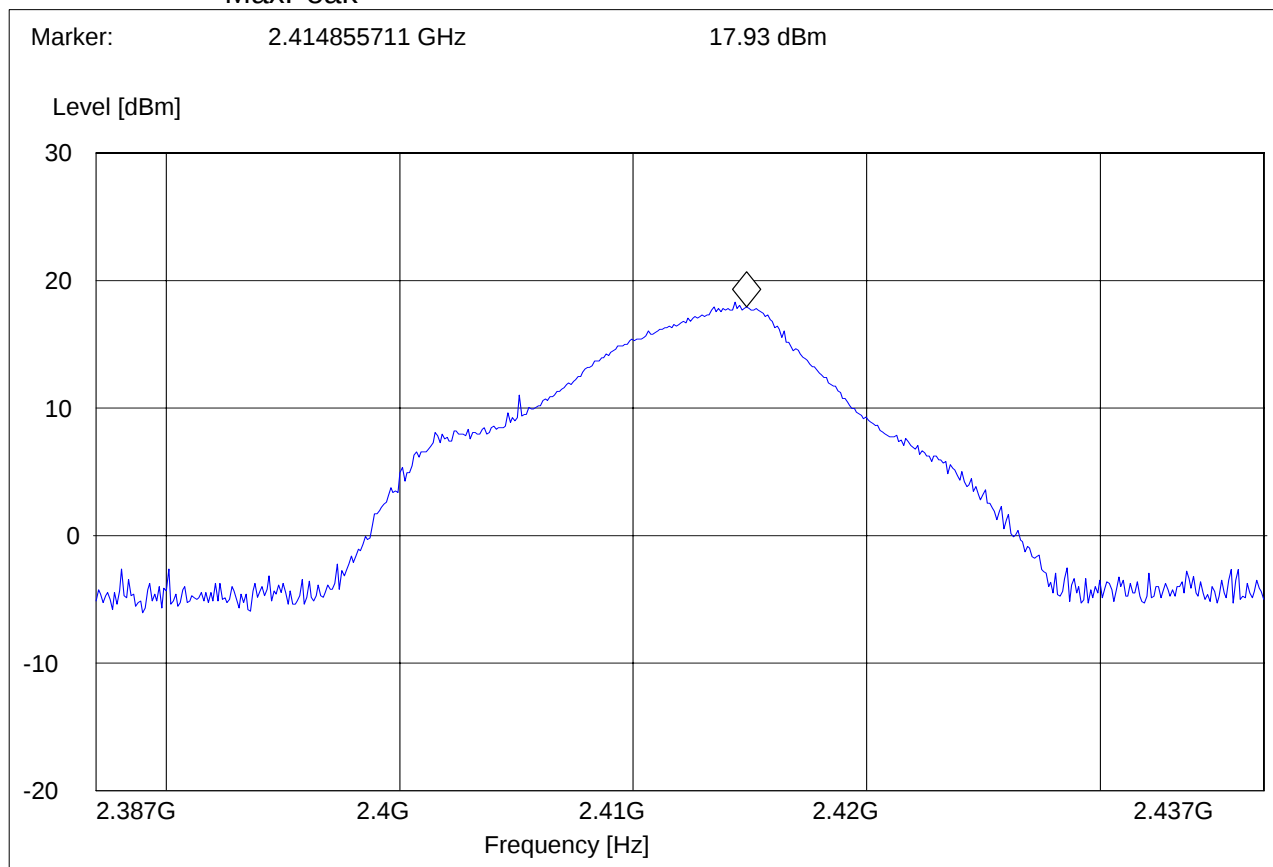
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2412MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: EIRP RLAN CH1

SWEEP TABLE: "EIRP RLAN CH1"

Short Description:		EIRP RLAN channel-2412 MHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
2.4 GHz	2.4 GHz	MaxPeak	Coupled	10 MHz	DUMMY-DBM

MaxPeak





EIRP 802.11 g Mode (2437MHz)

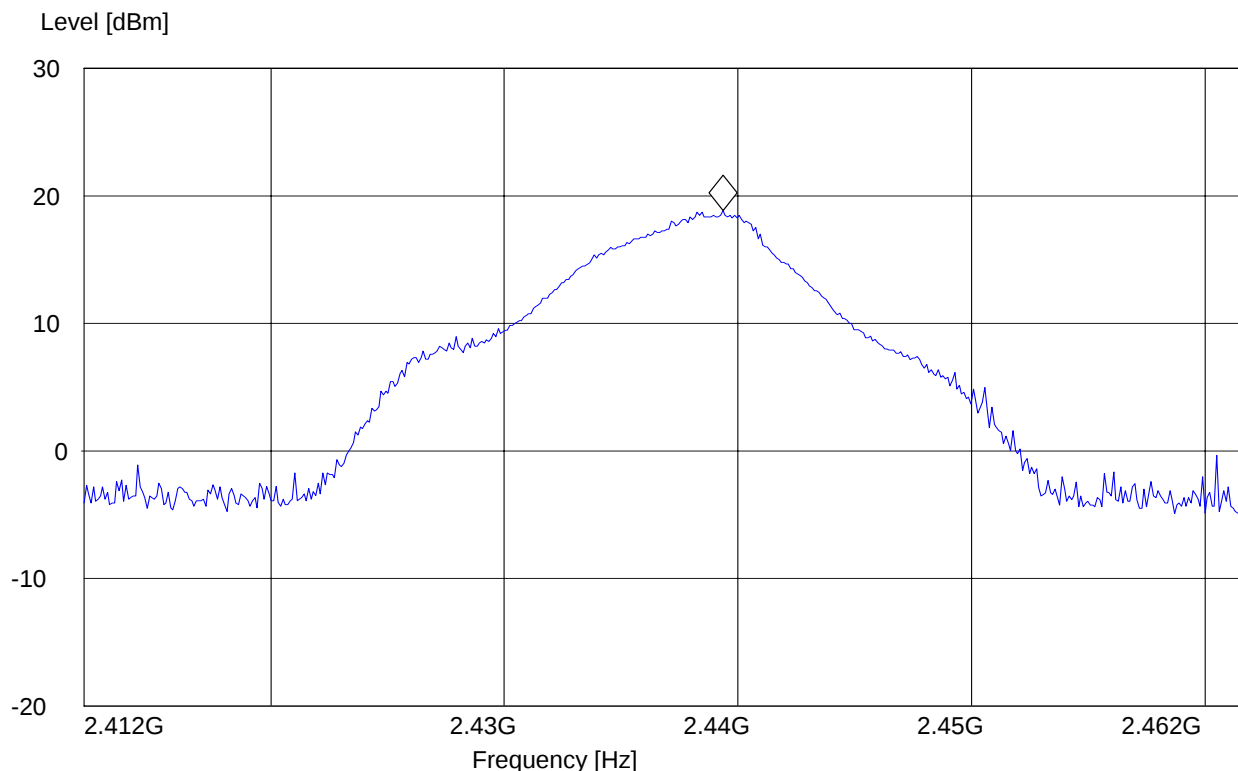
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2437MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: EIRP RLAN CH6

SWEEP TABLE: "EIRP RLAN CH6"

Short Description:		EIRP RLAN channel-2437 MHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
2.4 GHz	2.5 GHz	MaxPeak	Coupled	10 MHz	DUMMY-DBM

Marker: 2.439354709 GHz 18.84 dBm





EIRP 802.11 g Mode (2462MHz)

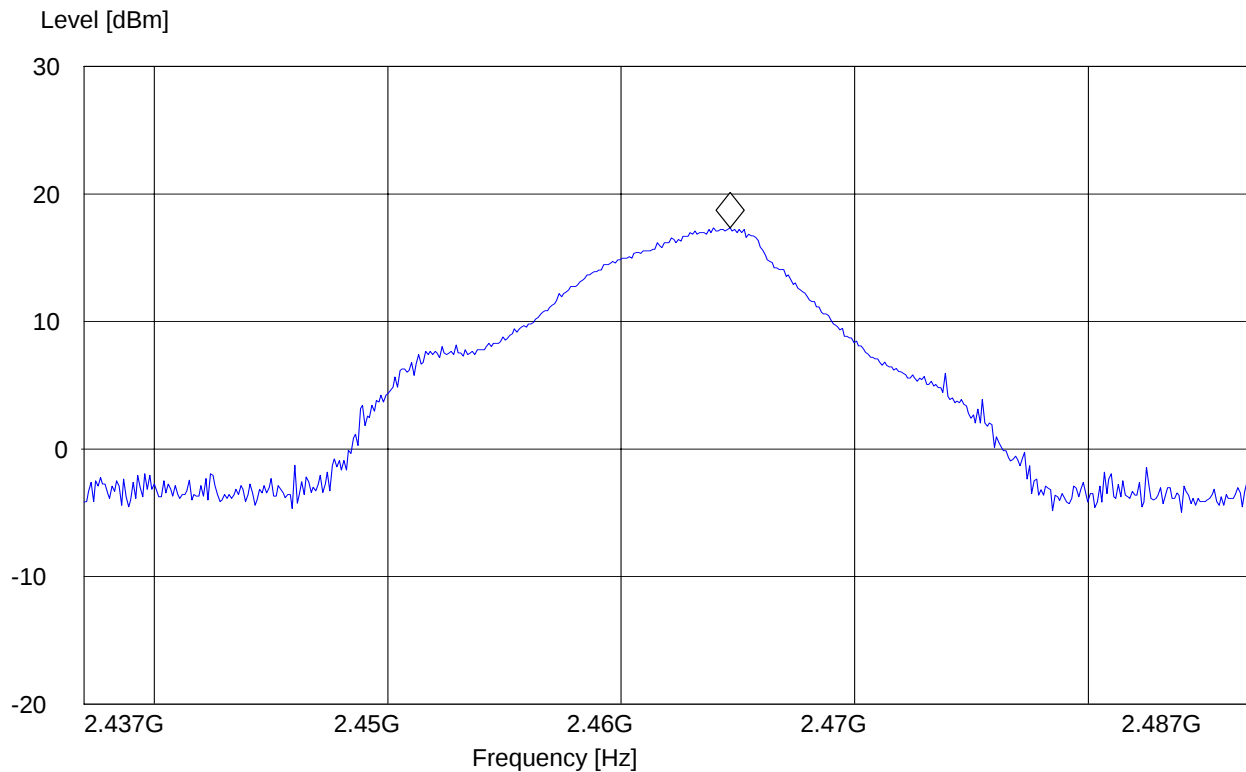
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2462MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: EIRP RLAN CH11

SWEEP TABLE: "EIRP RLAN CH11"

Short Description:		EIRP RLAN channel-2462 MHz			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
2.4 GHz	2.5 GHz	MaxPeak	Coupled	10 MHz	DUMMY-DBM
		MaxPeak			

Marker: 2.464655311 GHz 17.35 dBm



5.2 RESTRICTED BAND EDGE COMPLIANCE RADIATED §15.247/15.205

5.2.1 LIMITS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

*PEAK LIMIT= 74dBuV/m

*AVG. LIMIT= 54dBuV/m



5.2.2 802.11 b MODE (2412MHz) PEAK

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

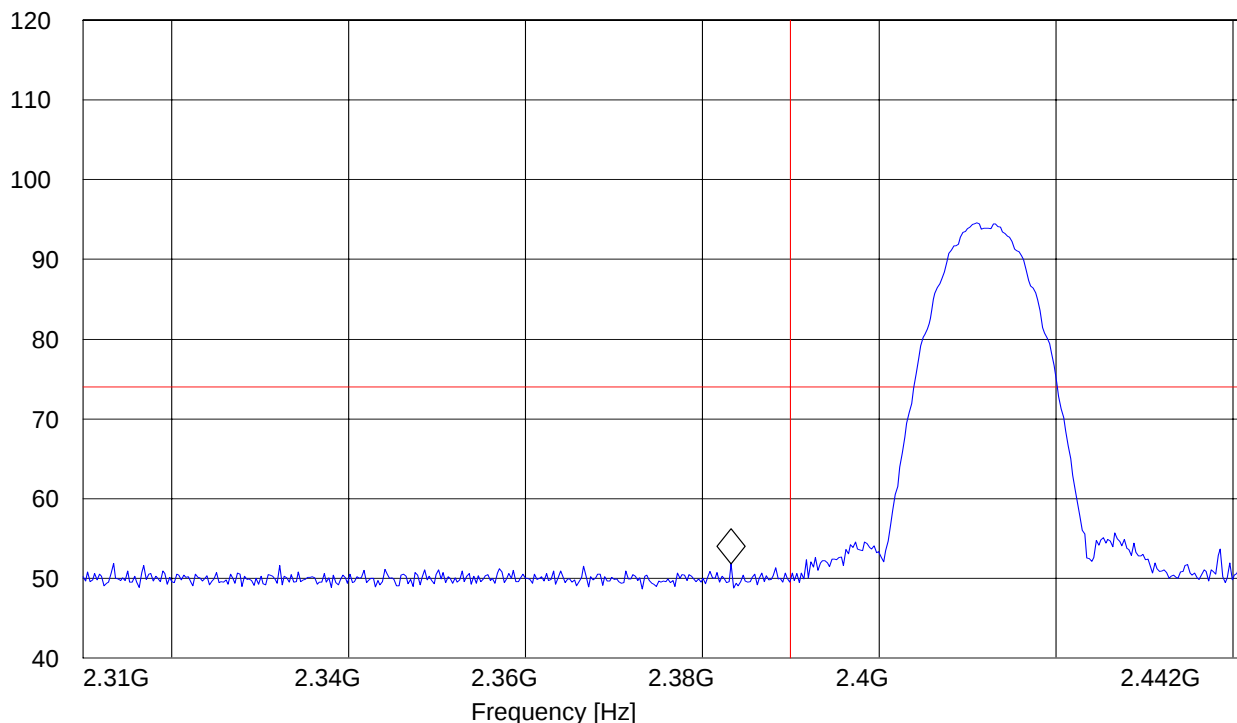
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2412MHz TABLE 280°
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC ADAPTOR
Sweep: FCC15.247 LBE_PK

SWEEP TABLE: "FCC15.247 LBE_PK"

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
2.3 GHz	2.4 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 2.383274549 GHz 51.78 dBμV/m

Level [dBμV/m]





AVG

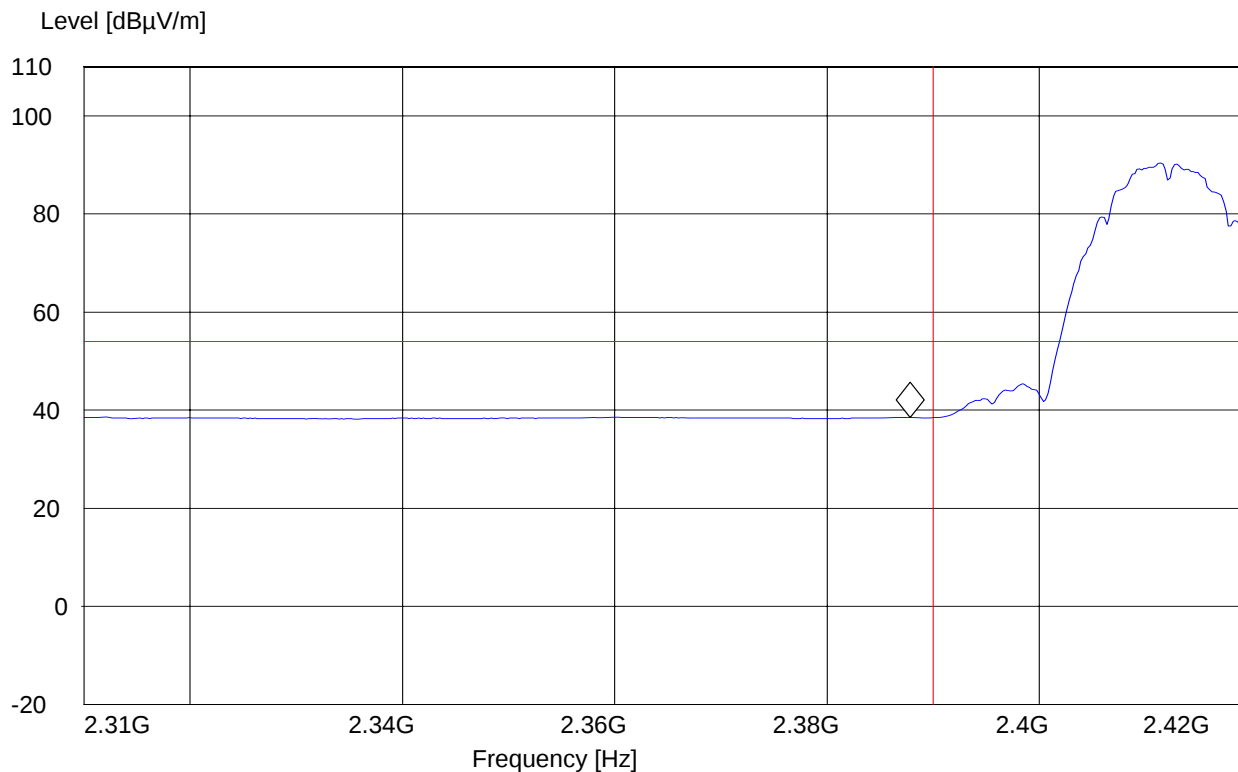
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2412MHz TABLE 280°
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC ADAPTOR
Sweep: FCC15.247 LBE_AVG

SWEEP TABLE: "FCC15.247 LBE_AVG"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.3 GHz	2.4 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 2.387815631 GHz 38.55 dBμV/m





5.2.3 802.11 b MODE (2462MHz) PEAK

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

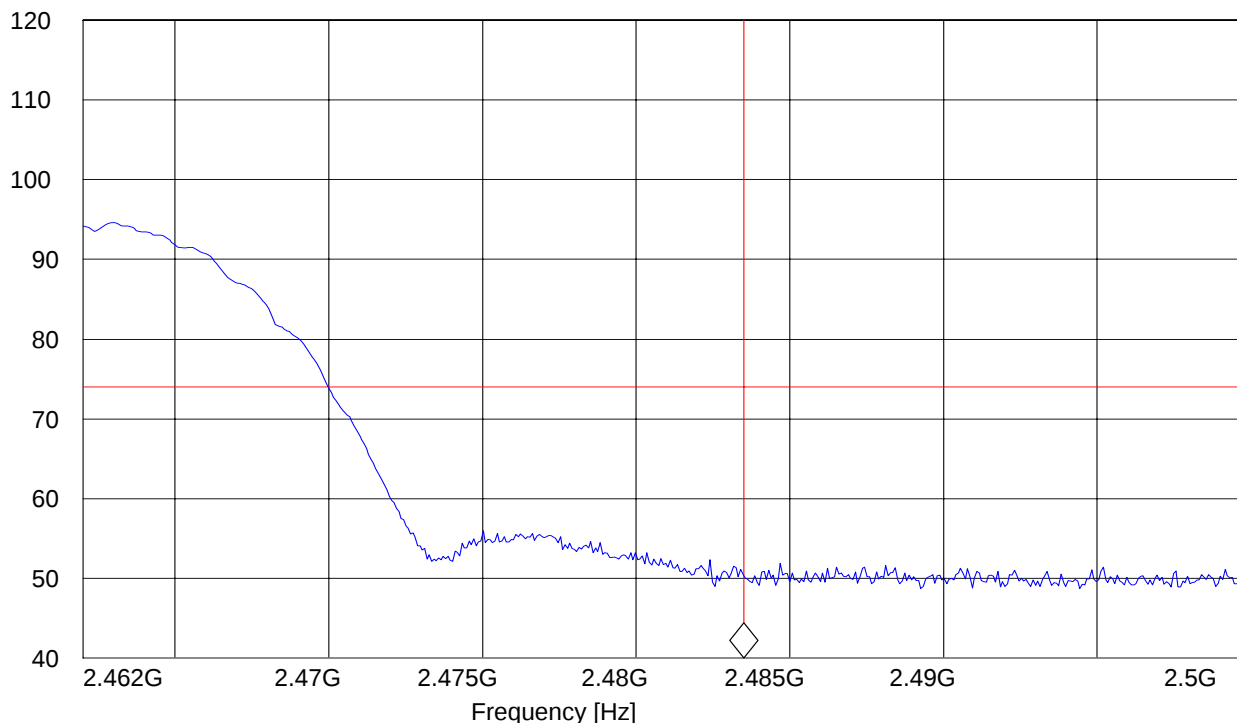
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2462MHz TABLE 280°
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC ADAPTOR
Sweep: FCC15.247 HBE_PK

SWEEP TABLE: "FCC15.247 HBE_PK"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.5 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 2.4835 GHz * -20 dBμV/m

Level [dBμV/m]





AVG

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

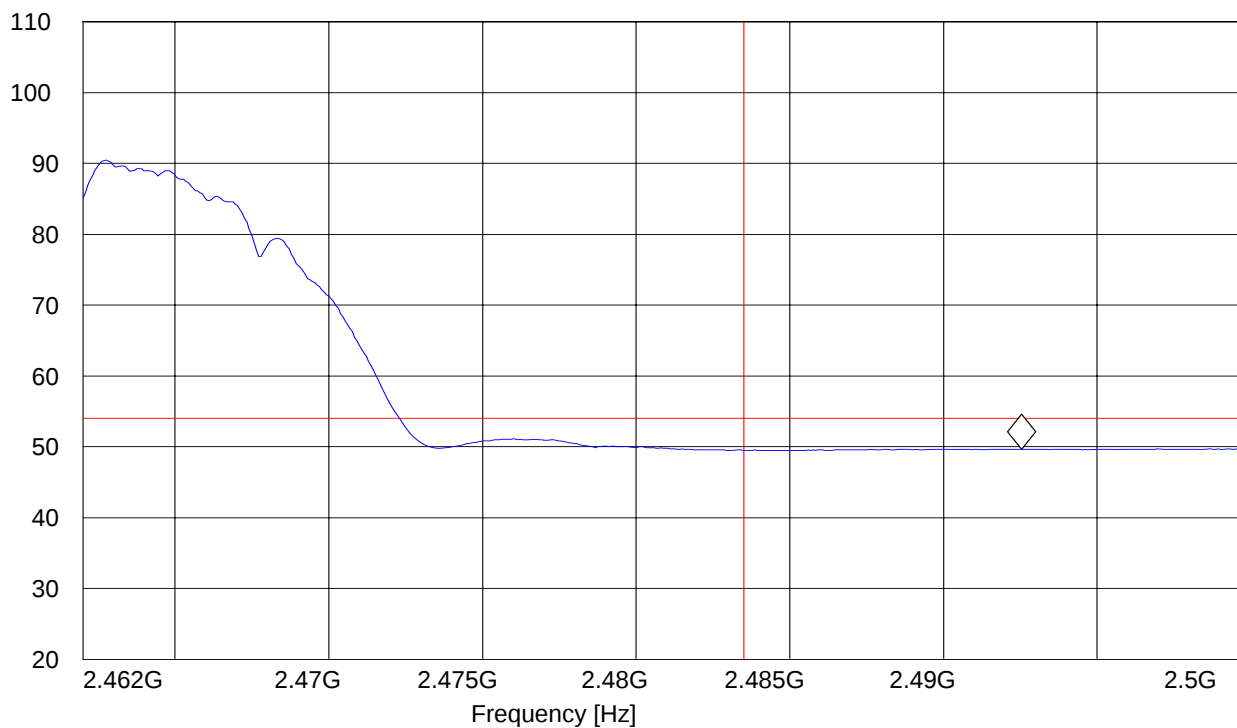
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2462MHz TABLE 280°
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC ADAPTOR
Sweep: FCC15.247 HBE_AVG

SWEEP TABLE: "FCC15.247 HBE_AVG"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.5 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_horz

Marker: 2.492537074 GHz 49.65 dBμV/m

Level [dBμV/m]





5.2.4 802.11 g MODE (2412MHz) PEAK

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

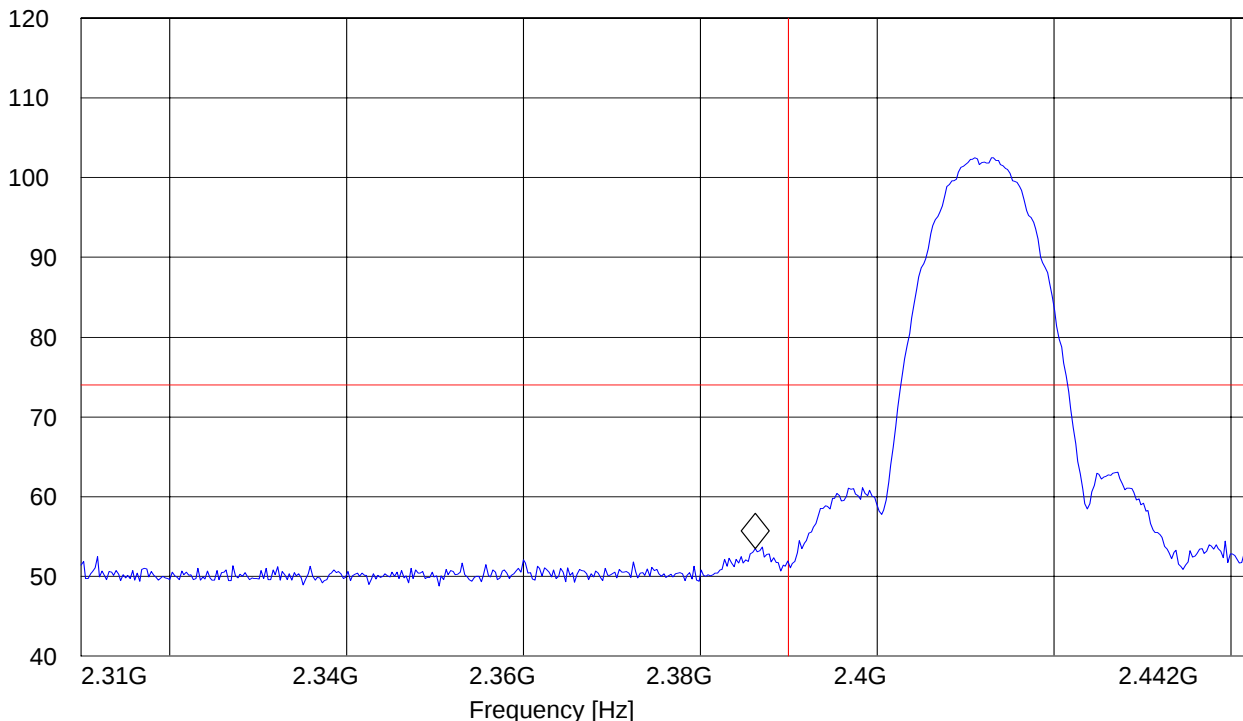
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2412MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: FCC15.247 LBE_PK

SWEEP TABLE: "FCC15.247 LBE_PK"

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
2.3 GHz	2.4 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 2.386184369 GHz 53.47 dBμV/m

Level [dBμV/m]





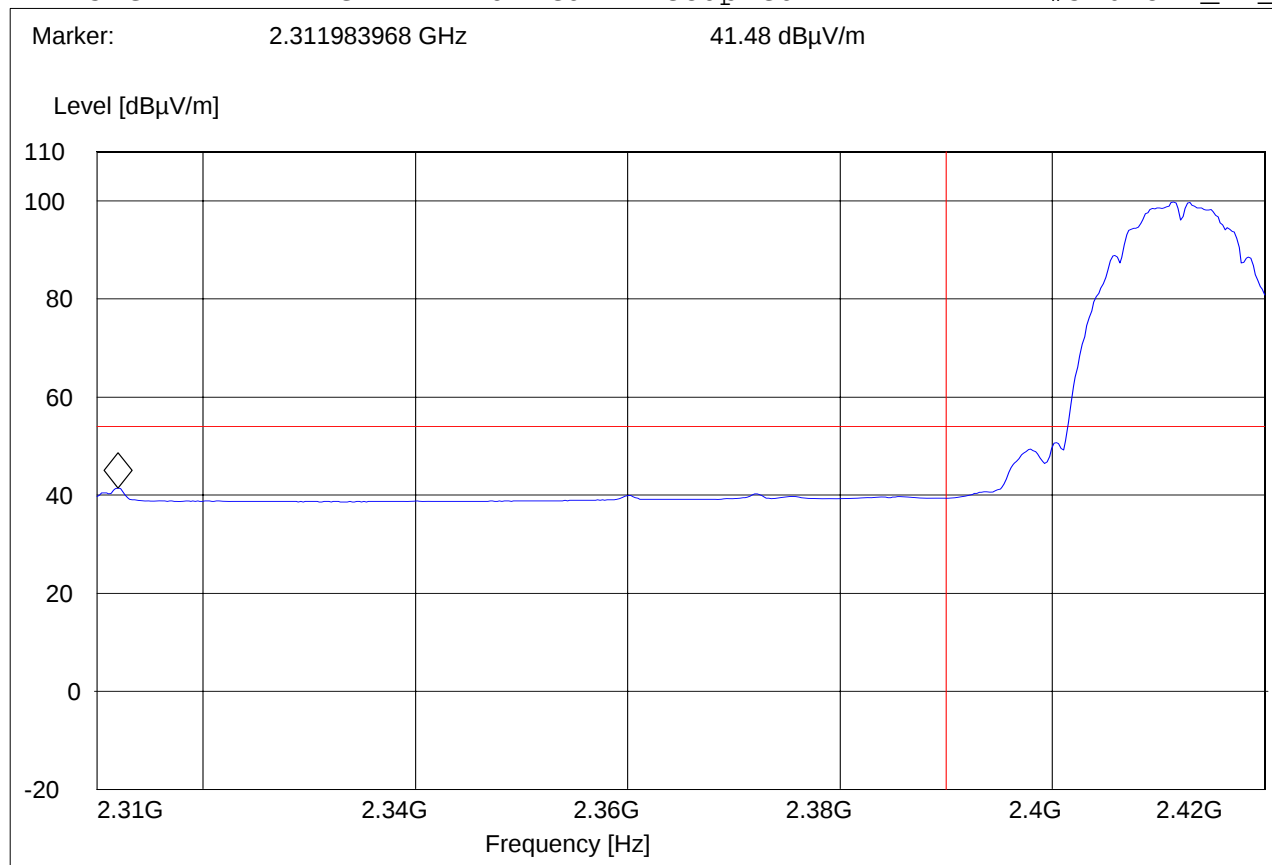
AVG

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2412MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: FCC15.247 LBE_AVG

SWEEP TABLE: "FCC15.247 LBE_AVG"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.3 GHz	2.4 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





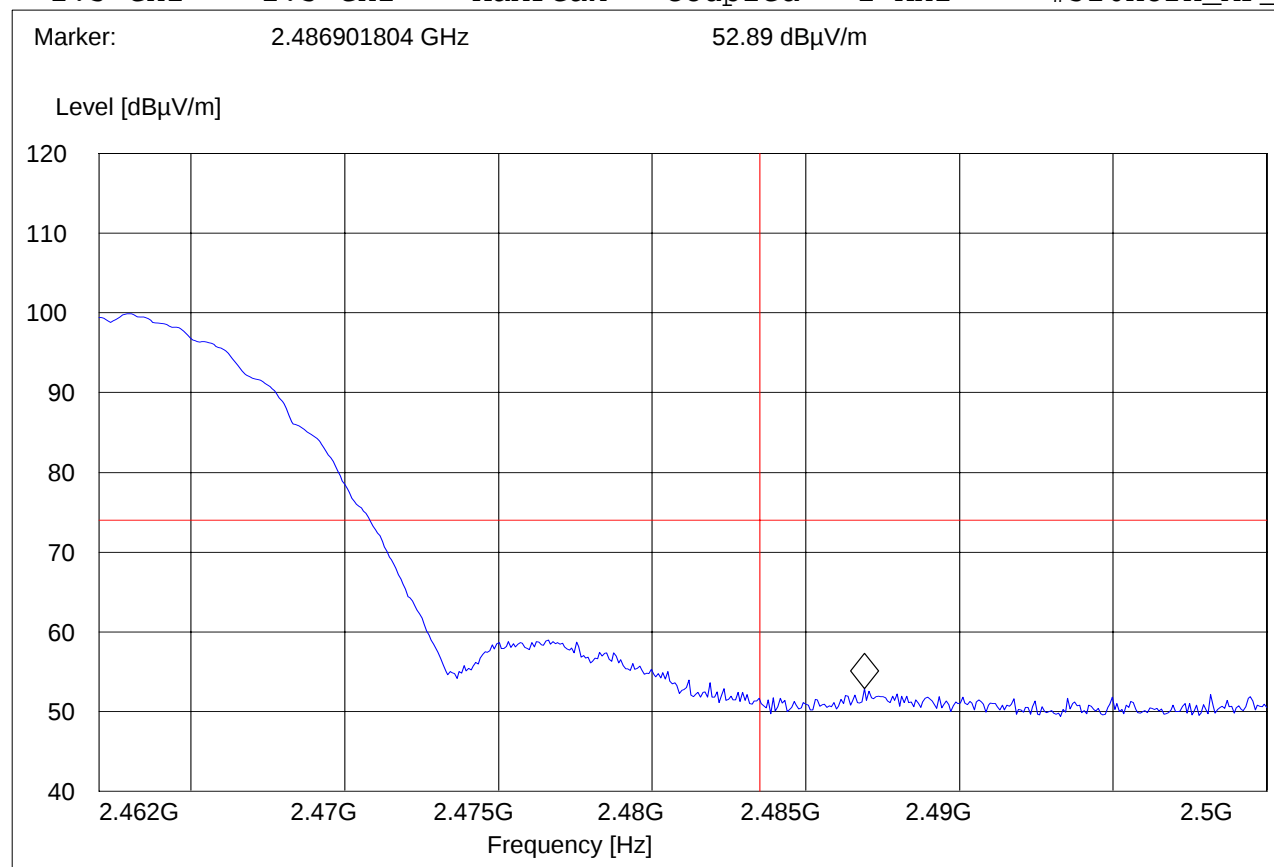
**5.2.5 802.11 g MODE (2462MHz)
PEAK**

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2462MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: FCC15.247 HBE_PK

SWEEP TABLE: "FCC15.247 HBE_PK"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.5 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





AVG

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

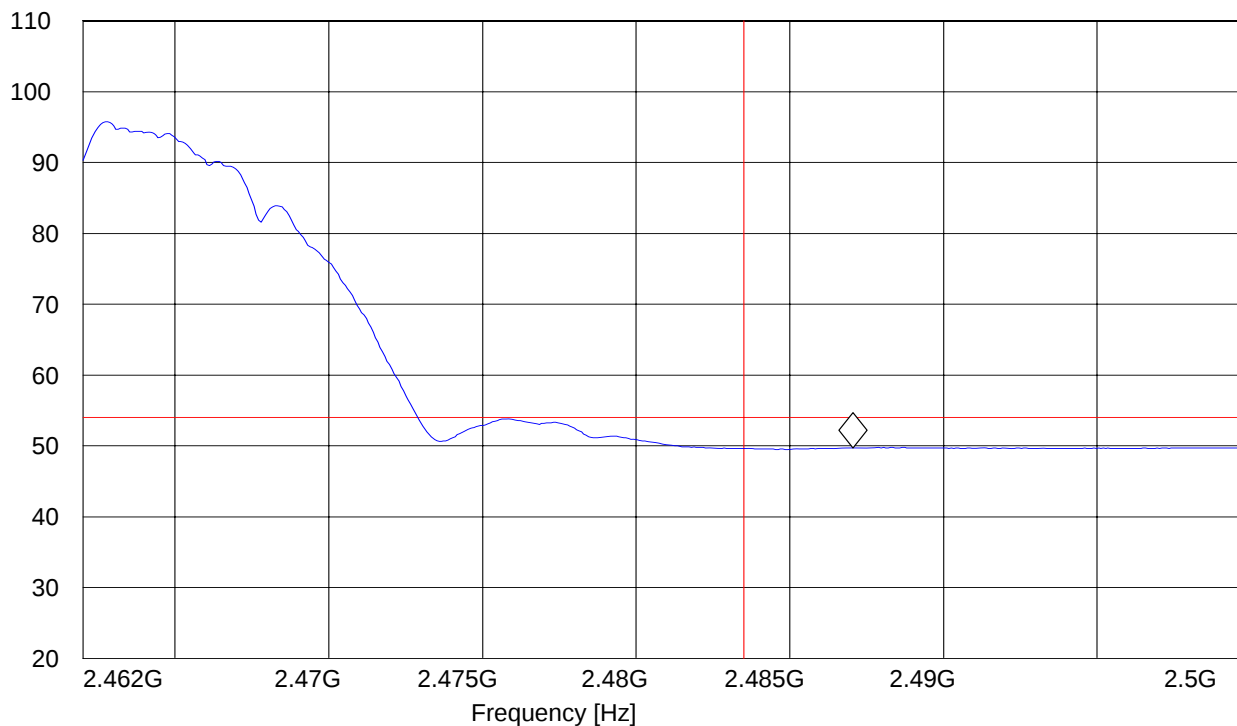
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2462MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: FCC15.247 HBE_AV

SWEEP TABLE: "FCC15.247 HBE_AVG"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.5 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_horz

Marker: 2.487054108 GHz 49.72 dB μ V/m

Level [dB μ V/m]



5.3 TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.247/15.205/15.209

5.3.1 LIMITS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

*PEAK LIMIT= 74dBuV/m

*AVG. LIMIT= 54dBuV/m

NOTE:

1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.

2. All measurements are done in peak mode using an average limit , unless specified with the plots.

Results for the radiated measurements below 30MHz according § 15.33

Frequency	Measured values	Remarks
9KHz – 30MHz	No emissions found, caused by the EUT	This is valid for all the tested channels



5.3.2 RESULTS 802.11 g MODE (worst case)

30MHz – 1GHz

Antenna: vertical

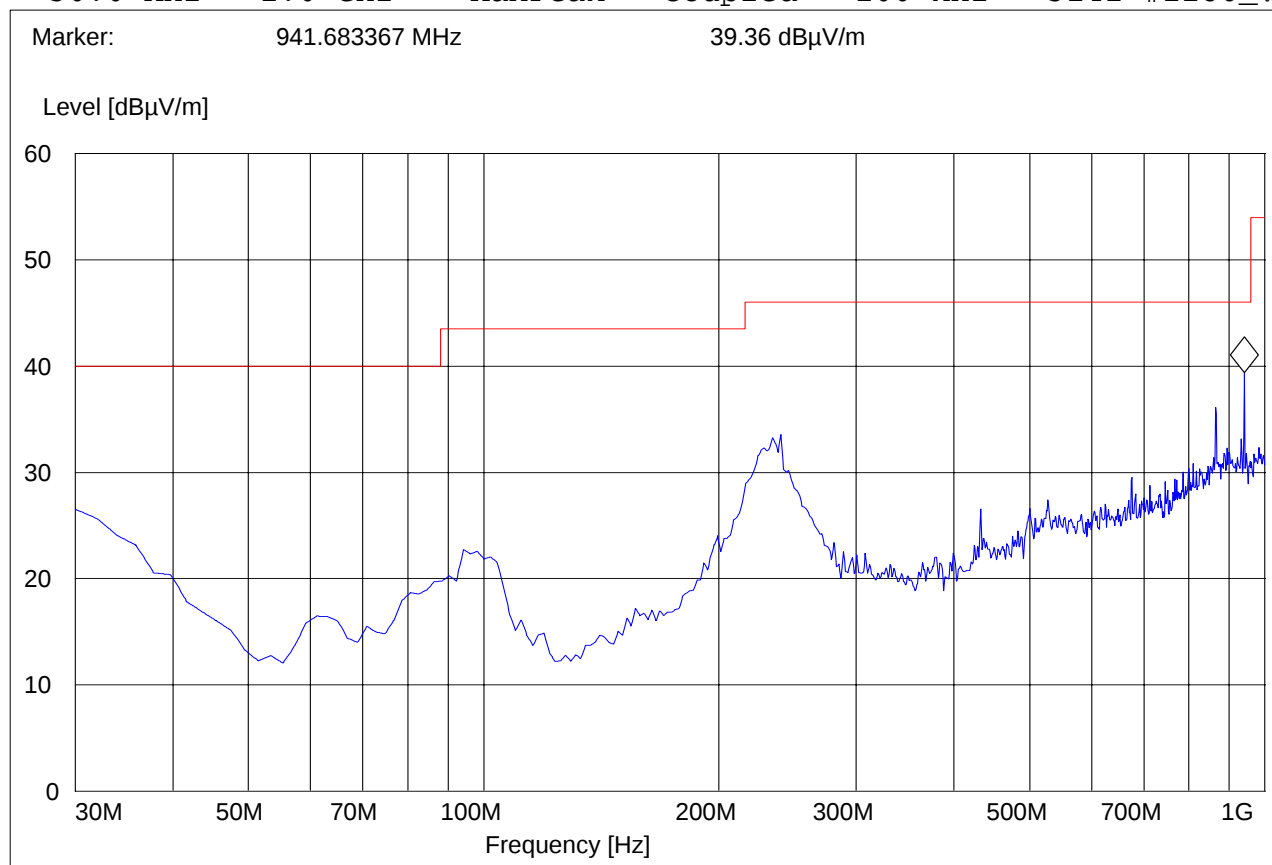
Note: This plot is valid for low, mid, high channels and both polarizations (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2437MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: FCC15.247_30M-1G_VER

SWEEP TABLE: "FCC15.247_30M-1G_Ver"

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Vert





1-3GHz (2412MHz)

Note: The peaks above the limit line is the carrier freq.

Note: Peak Reading vs. Average limit

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

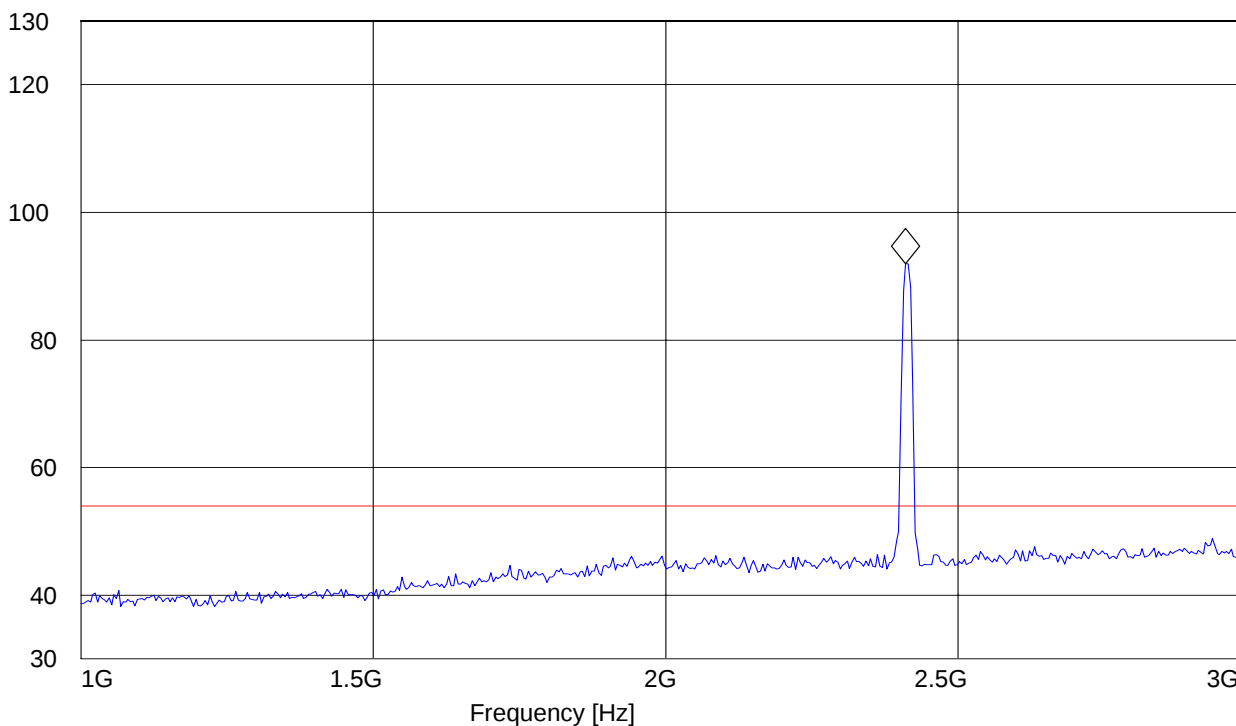
EUT / Description: Vaio laptop "F" series unit #1 ESN: 5B101B06
Customer: Sony Electronics
Operating Mode: WLAN, TX 2412MHz
Antenna: V
EUT: V
Test Engineer: Peter
Voltage: AC
Sweep: FCC15.247.1-3G

SWEEP TABLE: "FCC15.247_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 2.410821643 GHz 91.98 dBμV/m

Level [dBμV/m]





1-3GHz (2437MHz)

Note: The peaks above the limit line is the carrier freq.

Note: Peak Reading vs. Average limit

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

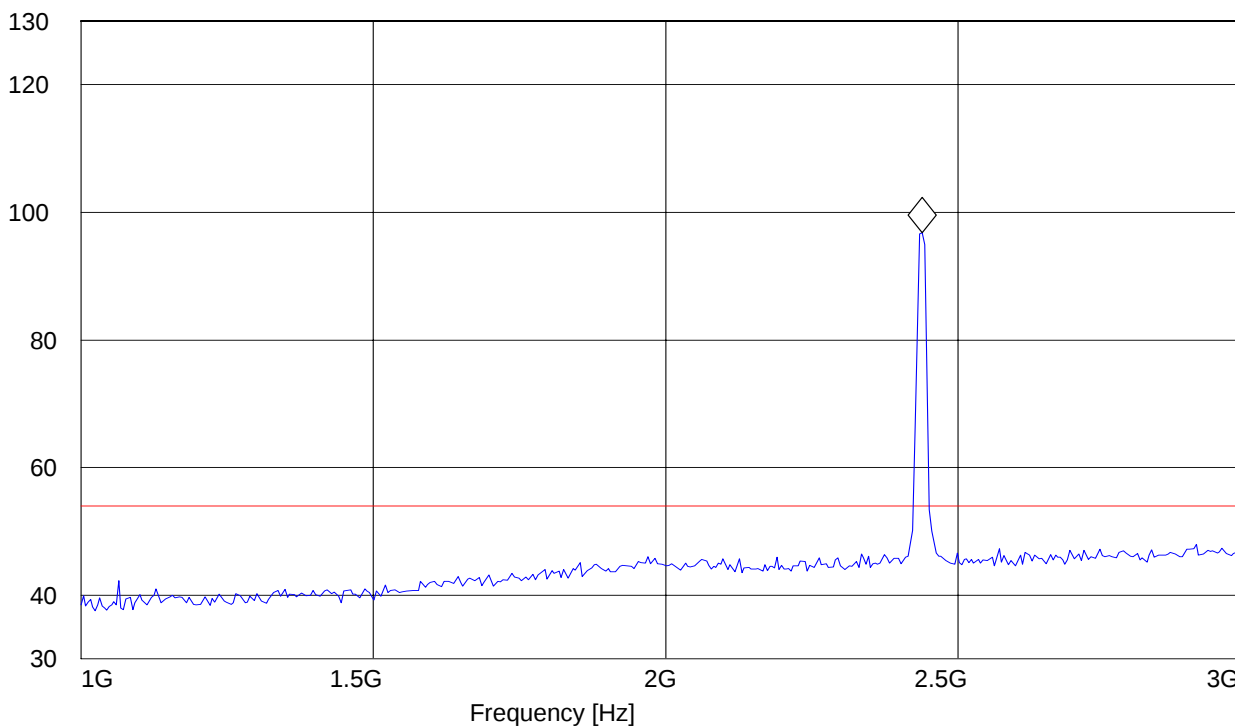
EUT / Description: Vaio laptop "F" series unit #1 ESN: 5B101B06
Customer: Sony Electronics
Operating Mode: WLAN, TX 2437MHz
Antenna: V
EUT: V
Test Engineer: Peter
Voltage: AC
Sweep: FCC15.247.1-3G

SWEEP TABLE: "FCC15.247_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 2.438877756 GHz 96.79 dBμV/m

Level [dBμV/m]





1-3GHz (2462MHz)

Note: The peaks above the limit line is the carrier freq.

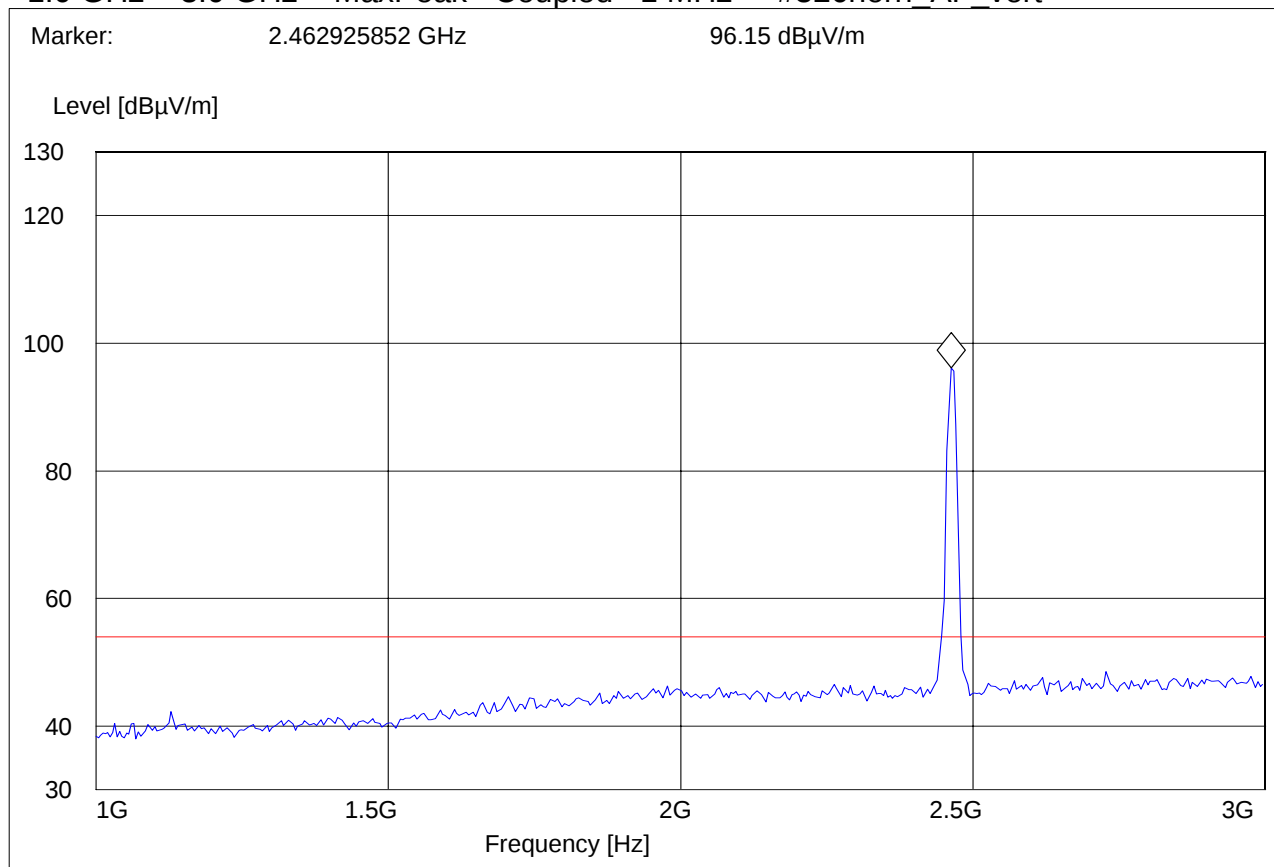
Note: Peak Reading vs. Average limit

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #1 ESN: 5B101B06
Customer: Sony Electronics
Operating Mode: WLAN, TX 2462MHz
Antenna: V
EUT: V
Test Engineer: Peter
Voltage: AC
Sweep: FCC15.247.1-3G

SWEEP TABLE: "FCC15.247_1-3G"

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert





3-18GHz (2412MHz)

Note: Peak Reading vs. Average limit

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

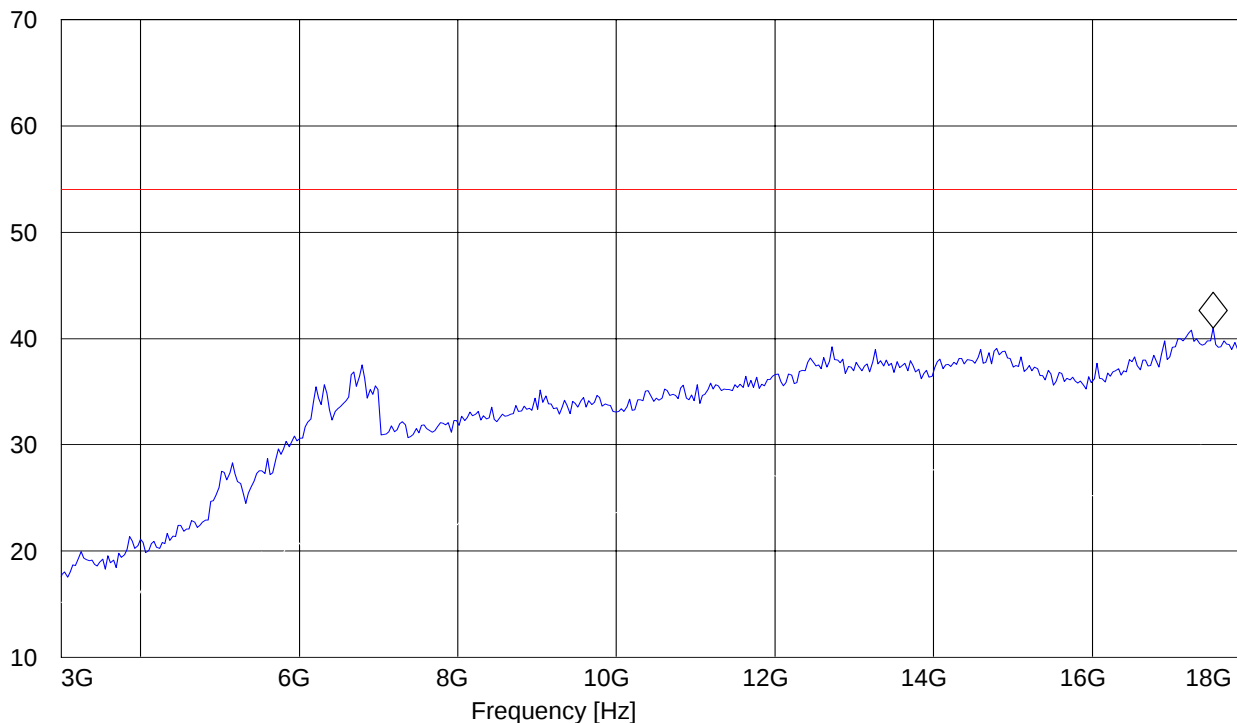
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2412MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: FCC15.247.3-18G

SWEEP TABLE: "FCC15.247_3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 17.523046092 GHz 40.97 dB μ V/m

Level [dB μ V/m]





3-18GHz (2437MHz)

Note: Peak Reading vs. Average limit

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

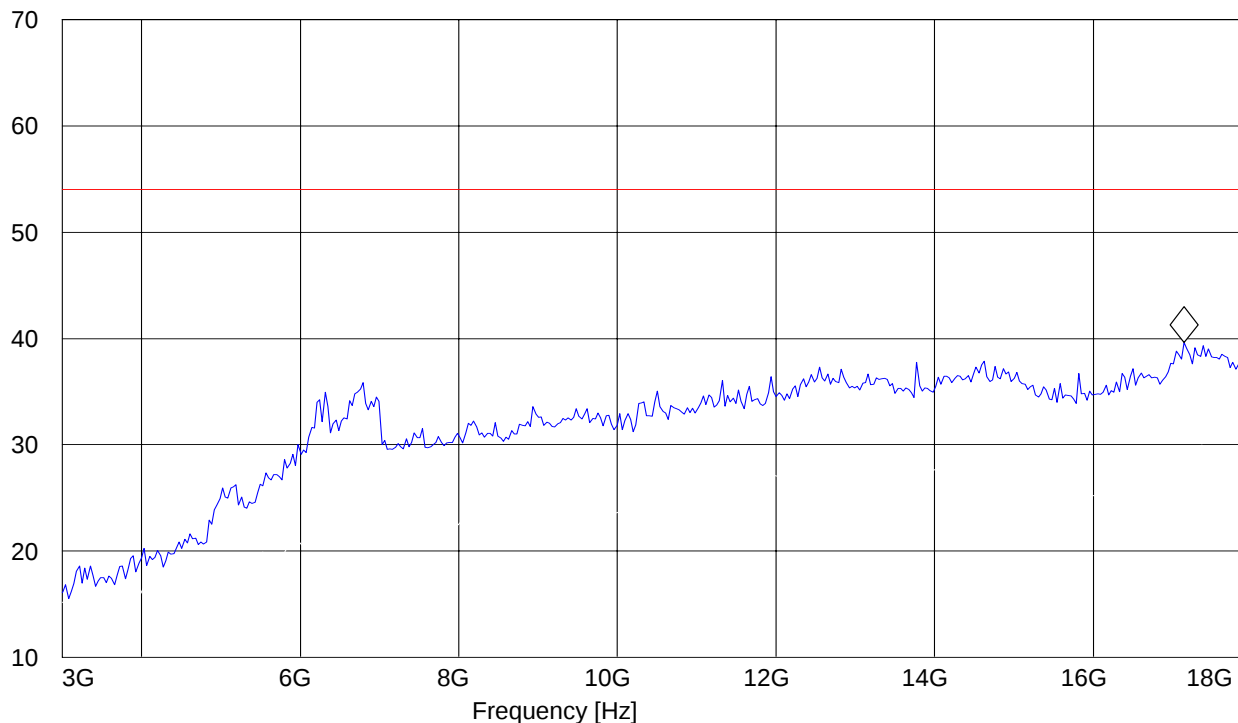
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2437MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: FCC15.247_3-18G

SWEEP TABLE: "FCC15.247_3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 17.148296593 GHz 39.62 dB μ V/m

Level [dB μ V/m]





3-18GHz (2462MHz)

Note: Peak Reading vs. Average limit

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

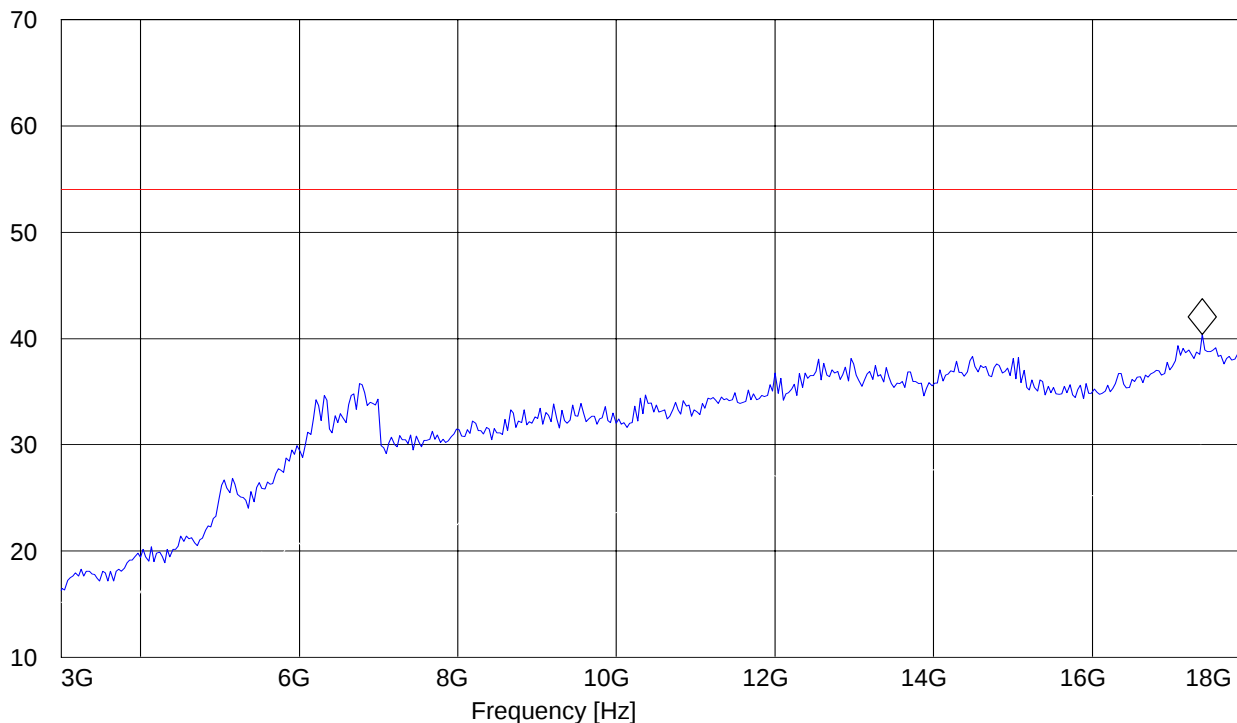
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2462MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: FCC15.247_3-18G

SWEEP TABLE: "FCC15.247_3-18G"

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 17.386773547 GHz 40.37 dB μ V/m

Level [dB μ V/m]





18-25GHz

Note: This plot is valid for low, mid, high channels (worst-case plot)

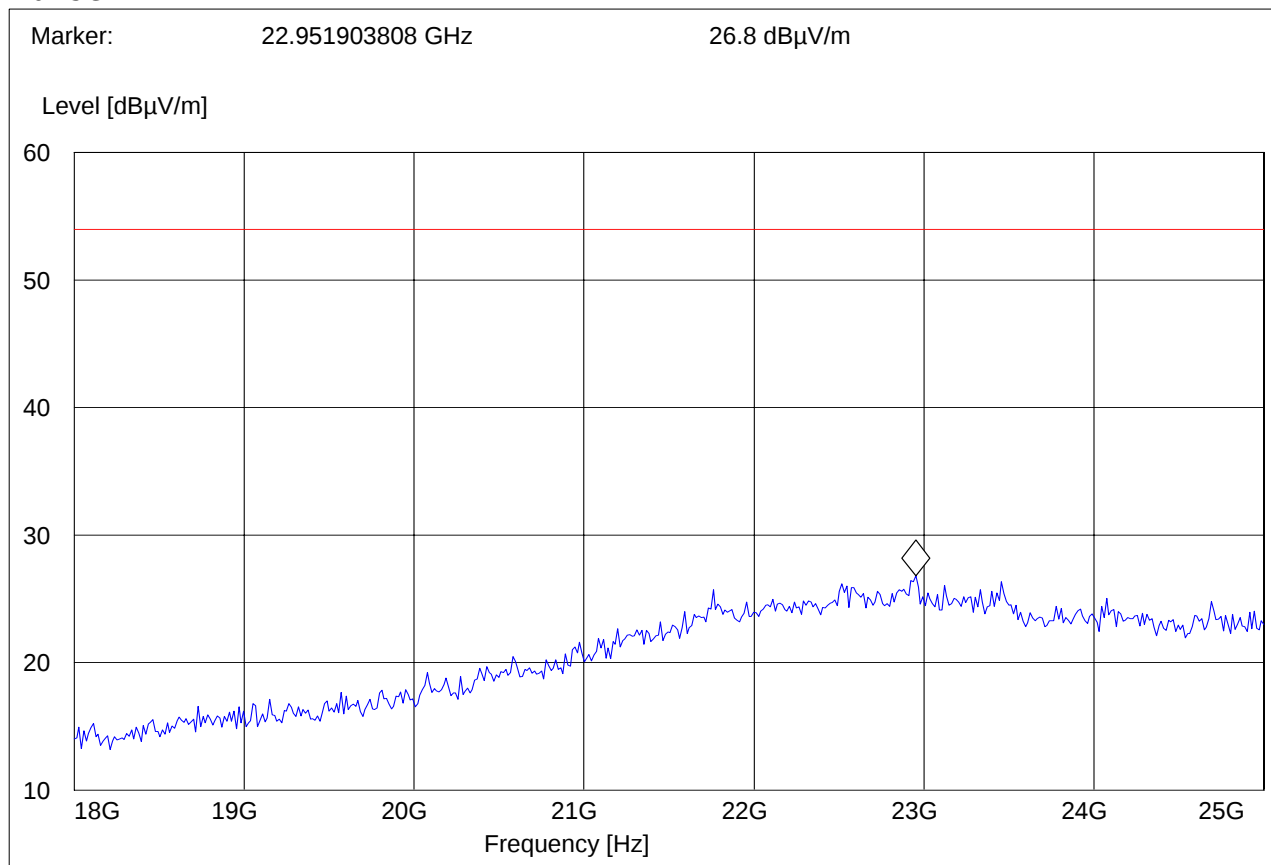
Note: Peak Reading vs. Average limit

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, TX 2412MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: FCC15.247_18-26.5G

SWEEP TABLE: "FCC15.247_18-26.5G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
18.0 GHz	25.0 GHz	MaxPeak	Coupled	1 MHz	3160 Horn 18- 26.5G



5.4 RECEIVER SPURIOUS RADIATION § 15.209/RSS210

5.4.1 LIMITS

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Measurement distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

NOTE:

1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.

2. All measurements are done in peak mode using an average limit , unless specified with the plots.



5.4.2 RESULTS

30MHz – 1GHz

Antenna: vertical (worst case)

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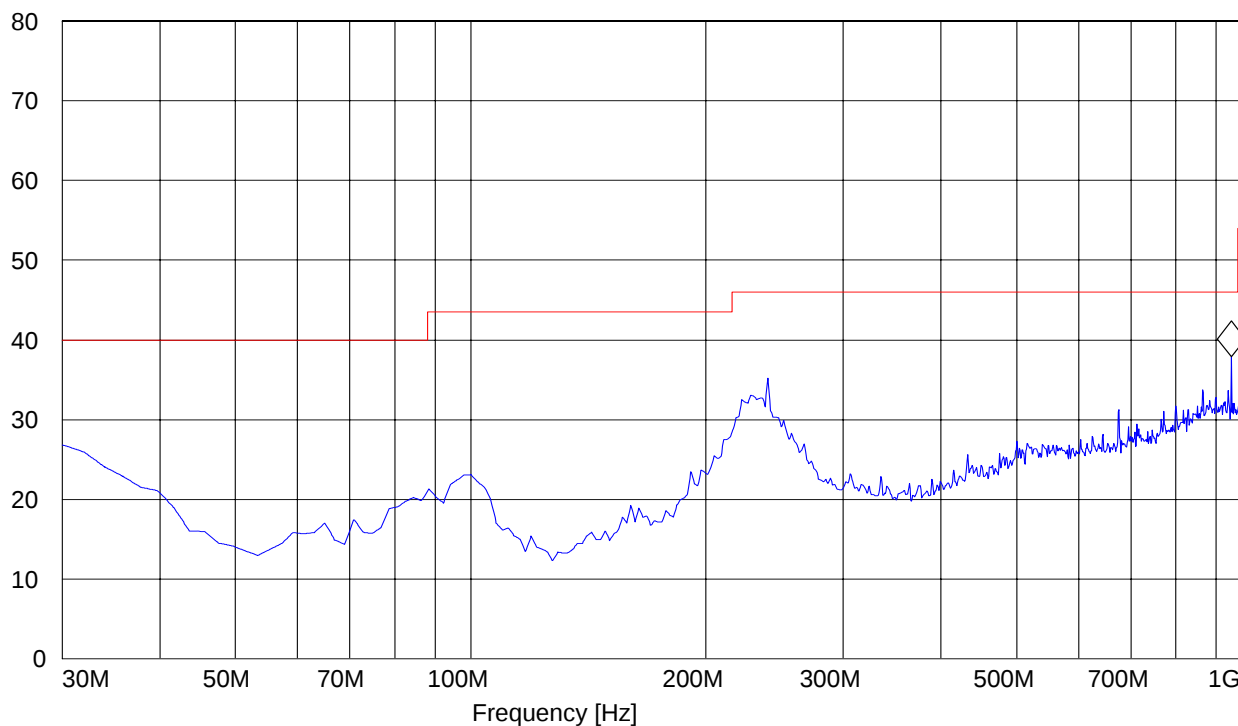
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, RX 2412MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: CANADA RE_30M-1G_VER

SWEEP TABLE: "CANDA RE_30M-1G_Hor"

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Horz

Marker: 941.683367 MHz 37.87 dB μ V/m

Level [dB μ V/m]





1-3GHz

Note: Peak Reading vs. Average limit

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

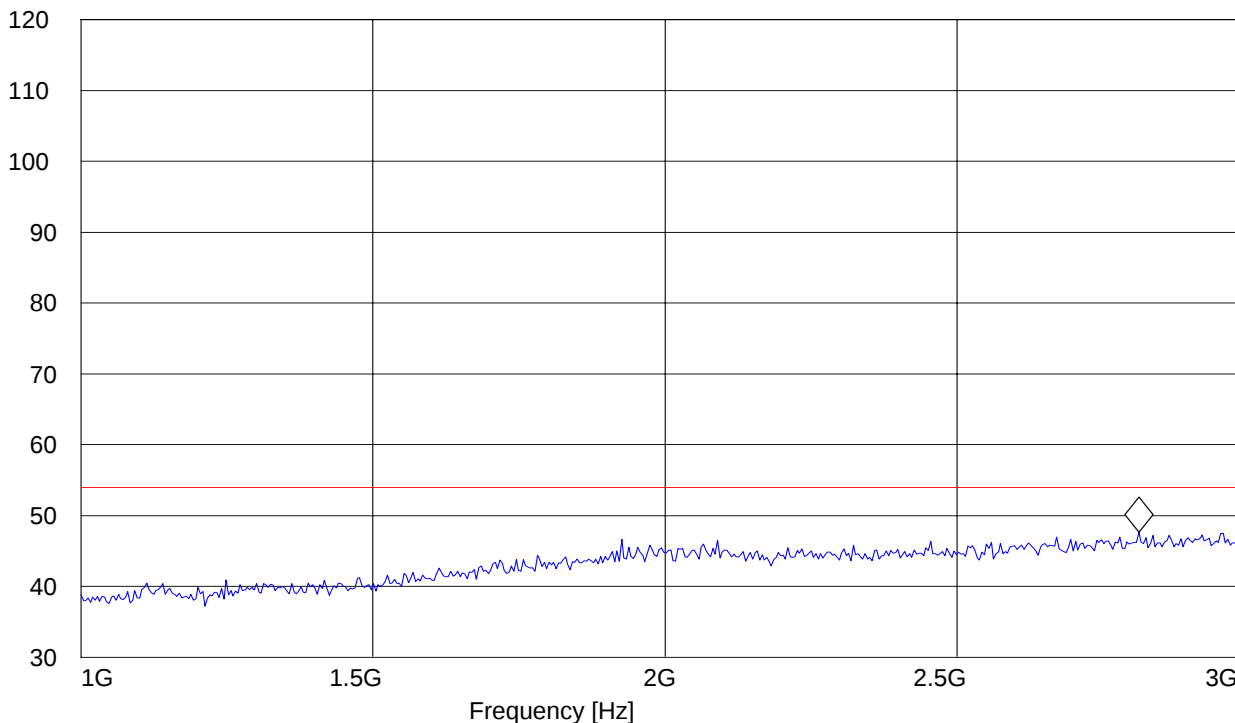
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, RX 2412MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: CANADA RE_1-3G

SWEEP TABLE: "CANADA RE_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 2.811623246 GHz 47.67 dBμV/m

Level [dBμV/m]





3-18GHz

Note: Peak Reading vs. Average limit

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

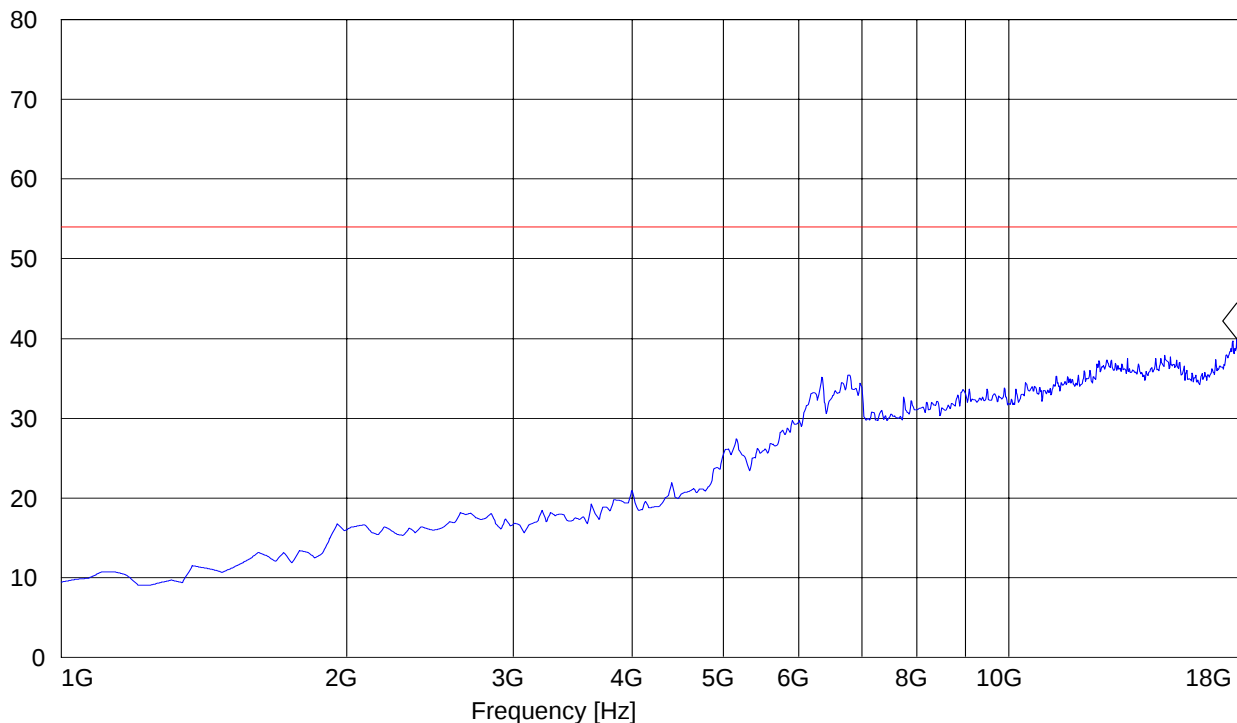
EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, RX 2412MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: CANADA RE_3-18G

SWEEP TABLE: "CANADA RE_3-18G"

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

Marker: 17.386773547 GHz 39.96 dB μ V/m

Level [dB μ V/m]





18-25GHz

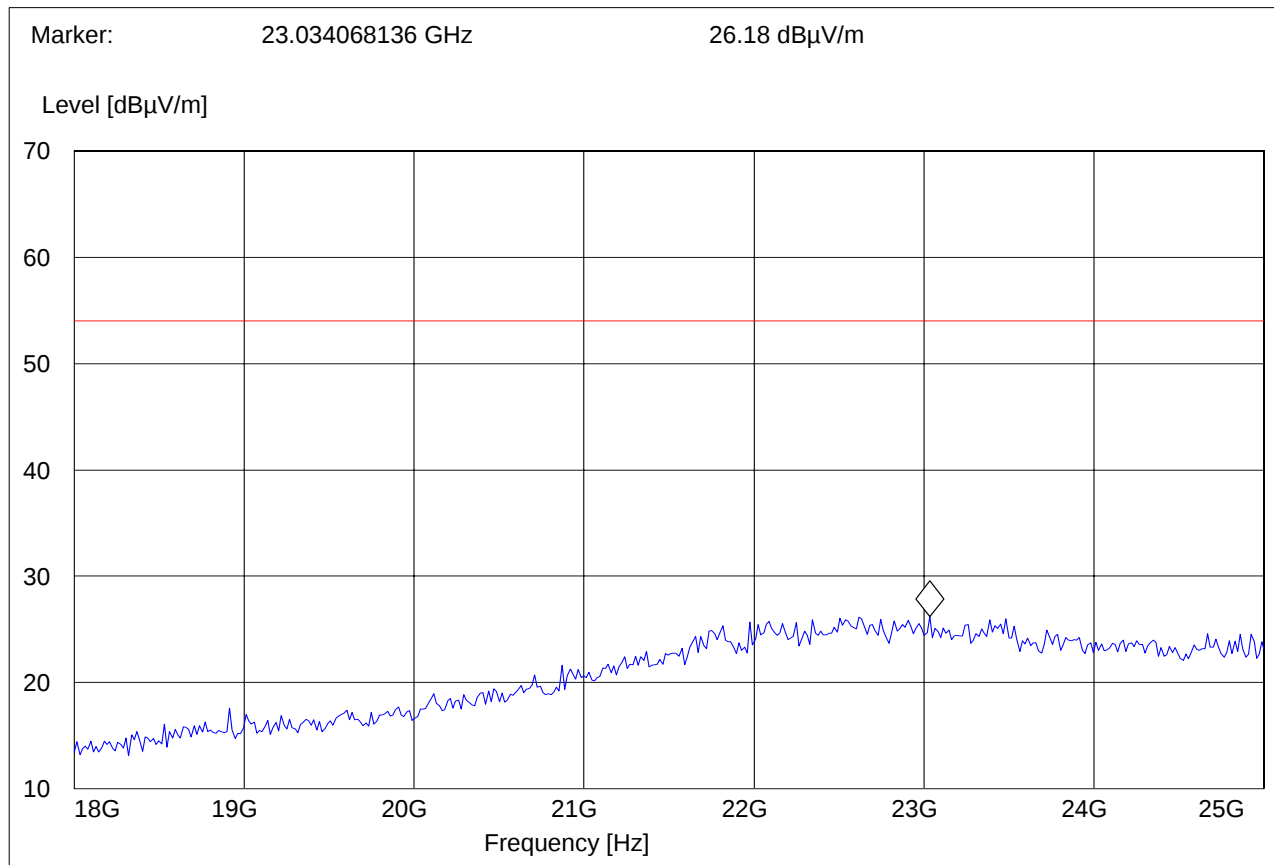
Note: Peak Reading vs. Average limit

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #2 ESN: 5B101BC3
Customer: Sony Electronics
Operating Mode: WLAN, RX 2412MHz
Antenna: V
EUT: V
Test Engineer: ED
Voltage: AC
Sweep: CANADA RE_18-26.5G

SWEEP TABLE: "CANADA RE_18-26.5G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
18.0 GHz	26.0 GHz	MaxPeak	Coupled	1 MHz	3160 Horn 18- 26.5G





5.5 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

5.5.1 LIMITS

Technical specification: 15.107 / 15.207 (Revised as of August 20, 2002)

Limit

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50
* Decreases with logarithm of the frequency		

ANALYZER SETTINGS: RBW = 10KHz

VBW = 10KHz



5.5.2 RESULTS

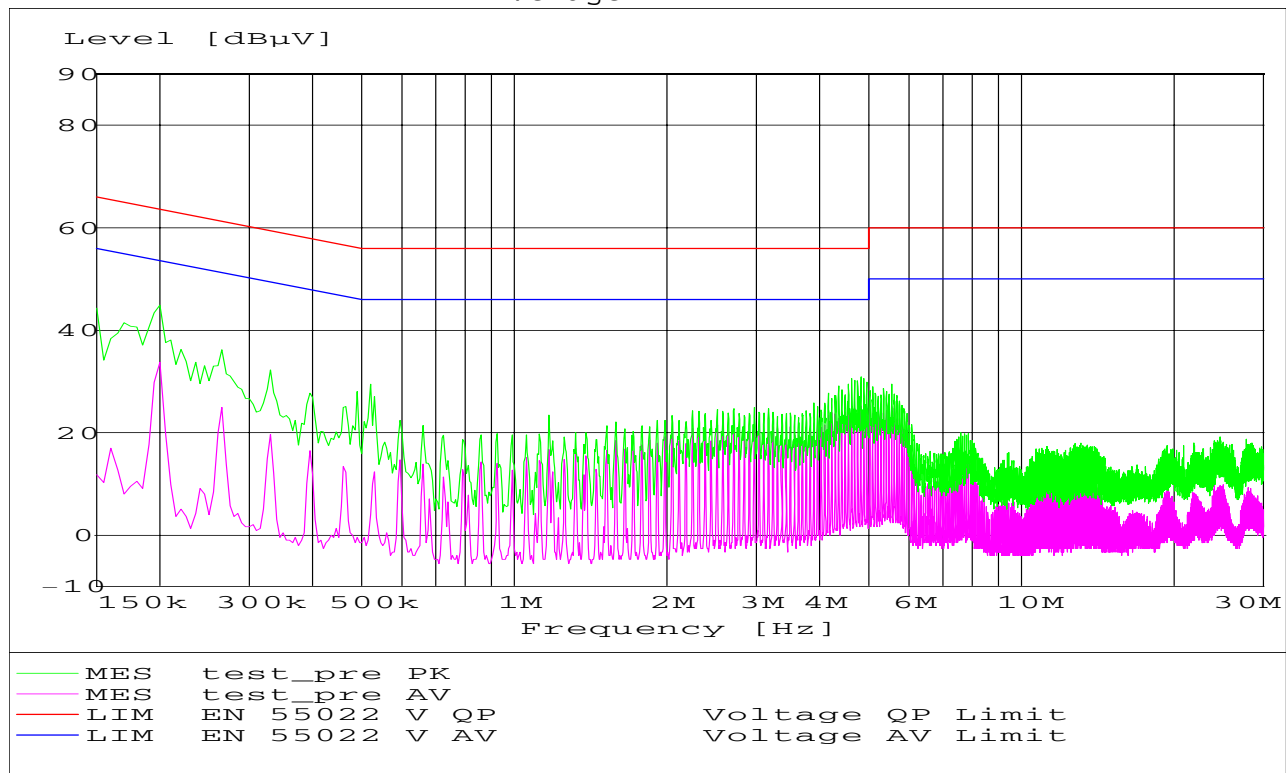
LISN

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Vaio laptop "F" series unit #1 ESN: 5B101BA6
Manufacturer: Sony Electronics
Test Engineer: Ed
Phase: L & N
Comment: EN55022
AC/DC adapter at 110V

SWEEP TABLE: "EN 55022 Voltage"

Short Description:		EN 55022 Voltage			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
150.0 kHz	30.0 MHz	MaxPeak	Coupled	9 kHz	None
Average					





5.6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2007	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2007	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2007	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2007	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2007	1 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2007	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2007	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2007	1 year
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
12	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2007	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2007	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2007	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2007	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2007	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2007	2 years

5.7 BLOCK DIAGRAMS

Radiated Testing

