TECHNICAL REPORT

卓時檢測 TIMEWAY TESTING LABORATORY

TESTING CNAS L2292

ISO/IEC17025Accredited Lab.

Report No: FCC 0704125
File reference No: 2007-06-13

Applicant: AMCOR Ltd.

Product: GPS

Model No: AMIGO-4300B

Trademark: AMCOR

Test Standards: FCC Part 15 Subpart C, Paragraph 15.247

Test result: It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 Subpart C, Paragraph 15.247 regulations for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Jack Chung
Manager

Dated: June 13,2007

Results appearing herein relate only to the sample tested
The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

Tel (755) 83448688 Fax (755) 83442996

Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.:899988.

IC- Registration No.: IC5205

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration No.: IC 5205.

Test Report Conclusion

Content

1.0 **General Details**

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

Telephone: (755) 83448688

Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: AMCOR Ltd.

Address: Suit 1010-1011, 10/F Ocean Centre, Harbour City, 5 Canton Road, Tsim Sha Tsui, kowloon, Hong Kong

Telephone: +852 2997 6865

Fax: +852 2997 6091

1.3 Description of EUT

Product:	GPS
Manufacturer:	WANLIDA GROUP CO., LTD
Brand Name:	AMCOR
Model Number:	AMIGO-4300B
Additional Model Name	AMCOR 4300B
Additional Trade Name	N/A
Rating:	Input: DC 5V; 2A
Power Supply1:	Model: E-AWB100-050A, Input: 100-240V~, 0.4A,50/60Hz; Output: DC5V, 2A
Power Supply2:	E-DWL100-050M, Input: 12-24V, DC1.75A, Output: DC5V, 2A
Type of Modulation	FHSS
Frequency range	2402-2480MHz
Number of Channel	79
Frequency Selection	By software
Antenna type	chip dielectric antenna, the antenna gain is 2.0dBi

1.4 Submitted Sample: 2 Sample

1.5 Test Duration

2007-05-20 to 2007-06-13

1.6 Test Uncertainty

Conducted Emissions Uncertainty =±2.4dB

Radiated Emissions Uncertainty =±4.2dB

1.7 Test Engineer

The sample tested by Terry Tang

Print Name: Terry Tang

2.0	Test Equipments				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2006-12-06	2007-12-05
Absorbing Clamp	ROHDE&SCHWARZ	MDS-21	100126	2006-12-06	2007-12-05
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2006-12-06	2007-12-05
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2006-12-06	2007-12-05
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2006-12-06	2007-12-05
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2007-03-30	2008-03-29
4-WIRE ISN	ROHDE&SCHWARZ	ENY 41	830663/044	2007-02-19	2008-02-18
GG ENY22 Double 2-Wire ISN	ROHDE&SCHWARZ	ENY22	83066/016	2007-02-19	2008-02-18
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2007-02-19	2008-02-18
System Controller	CT	SC100	-	2007-02-19	2008-02-18
Printer	EPSON	PHOTO EX3	CFNH234850	2007-02-19	2008-02-18
FM-AM Signal Generator	JUNGJIN	SG-150M	389911177	2007-02-19	2008-02-18
Color TV Pattern Generator	PHILIPS	PM5418	LO621747	2007-02-19	2008-02-18
Computer	IBM	8434	1S8434KCE99BLX LO*	-	-
Oscillator	KENWOOD	AG-203D	3070002	2007-02-23	2008-02-22

Spectrum Analyzer	HAMEG	HM5012	-	-	-
Power Supply	LW	APS1502	-	-	-
5K VA AC Power Source	California Instruments	5001iX	56060	2007-02-19	2008-02-18
CDN	EM TEST	CDN M2/M3	-	2007-02-19	2008-02-18
Attenuation	EM TEST	ATT6/75	-	2007-02-19	2008-02-18
Resistance	EM TEST	R100	-	2007-02-19	2008-02-18
Electromagnetic Injection Clamp	LITTHI	EM101	35708	2007-02-19	2008-02-18
Inductive Components	EM TEST	MC2630	-	2007-02-19	2008-02-18
Antenna	EM TEST	MS100	-	2007-02-19	2008-02-18
Signal Generator	ROHDE&SCHWARZ	SMT03	100029	2007-02-05	2008-02-04
Power Amplifier	AR	150W1000	300999	2007-02-05	2008-02-04
Field probe	Holaday	HI-6005	105152	2007-02-05	2008-02-04
Bilog Antenna	Chase	CBL6111C	2576	2007-02-05	2008-02-04
Loop Antenna	EMCO	6502	00042960	2007-02-05	2008-02-04
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2007-02-05	2008-02-04
3m OATS	--	--	N/A	2007-02-05	2008-02-04

3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Requirement	CFR 47 Section	Result	Notes
Antenna Requirement	15.203, 15.247(b)(4)	PASS	Complies
Maximum Peak Out Power	15.247 (b)(1), (4)	PASS	Complies
Carrier Frequency Separation	15.247(a)(1)	PASS	Complies
20dB Channel Bandwidth	15.247 (a)(1)	PASS	Complies
Number of Hopping Channels	15.247(a)(iii), 15.247(b)(1)	PASS	Complies
Time of Occupancy (Dwell Time)	15.247(a)(iii)	PASS	Complies
Spurious Emission, Band Edge, and Restricted bands	15.247(d),15.205(a), 15.209 (a)	PASS	Complies
Peak Power Spectral Density	15.247(e)	PASS	Complies
Conducted Emissions	15.207(a)	PASS	Complies
RF Exposure	15.247(i), 1.1307(b)(1)	PASS	Complies

3.2 Test Standards

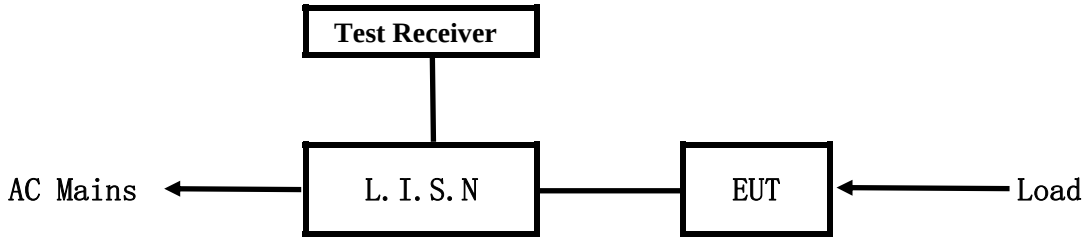
FCC Part 15 Subpart & Subpart C, Paragraph 15.247

4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co.,Ltd

5. Power Line Conducted Emission Test

5.1 Schematics of the test

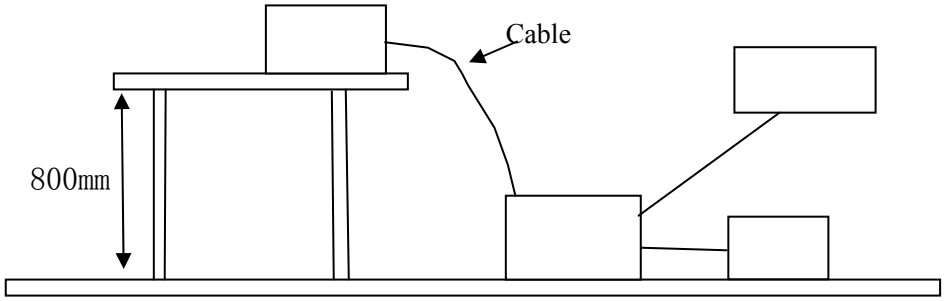


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2001.The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2001.

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2001. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

79 channels are provided to the EUT

A. EUT

Device	Manufacturer	Model	FCC ID
GPS	WANLIDA GROUP CO.,LTD	AMIGO-4300B	VFFAMIGO-4300B

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
N/A				

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2001.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency (MHz)	Class A Limits (dB μ V)		Class B Limits (dB μ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ～ 0.50	79.0	66.0	66.0～56.0*	56.0～46.0*
0.50 ～ 5.00	73.0	60.0	56.0	46.0
5.00 ～ 30.00	73.0	60.0	60.0	50.0

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

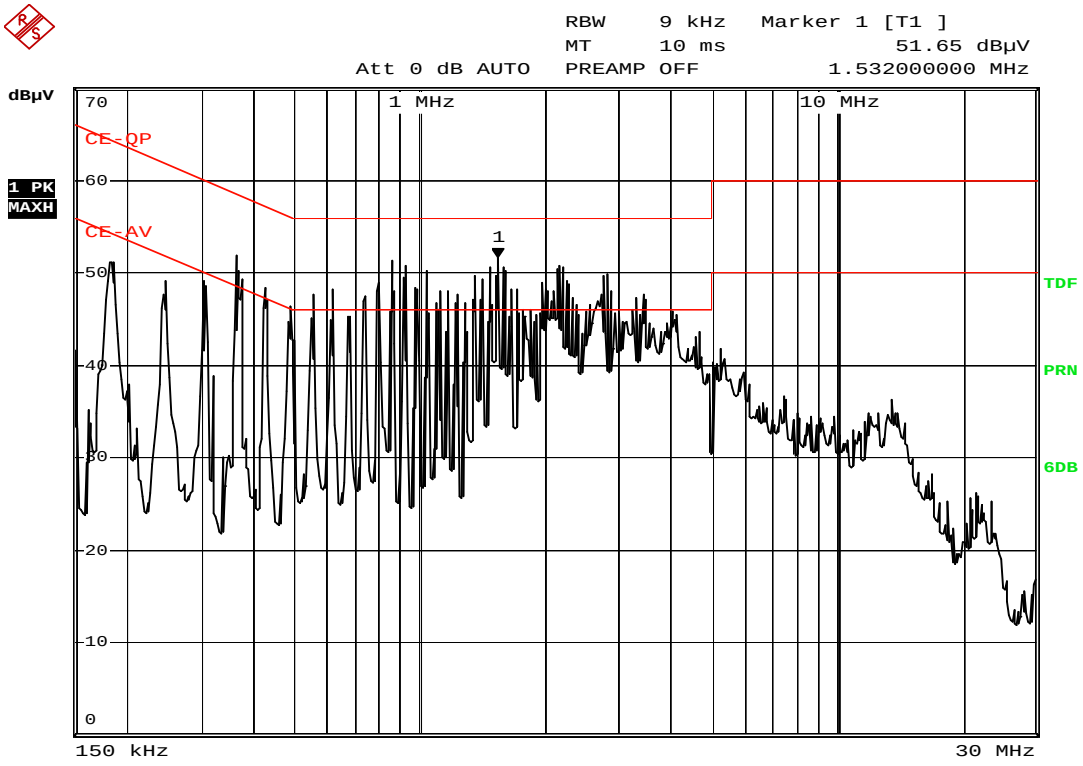
Note: the worse cases was selected to conducted the test

A Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Low Channel

Results: **Pass**

Please refer to following diagram for individual



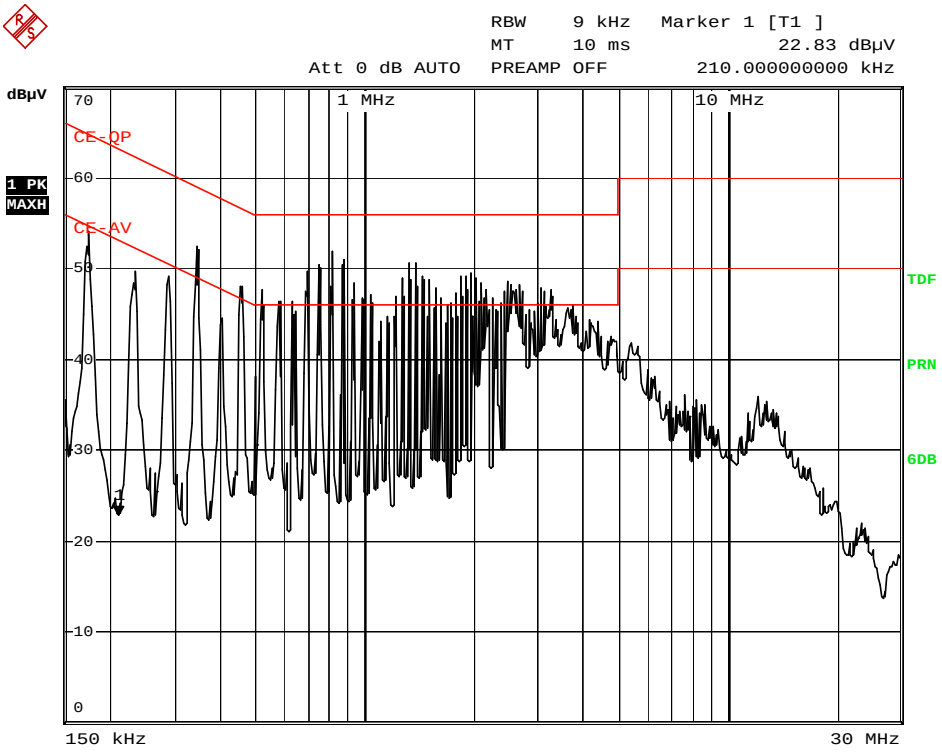
Frequency (MHz)	Reading(dB µ V)				Limit (dB µ V)	
	Line		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.182	49.70	40.80	--	--	64.40	54.40
0.246	46.00	36.80	--	--	61.90	51.90
0.306	44.50	34.52	--	--	60.10	50.10
0.366	48.51	39.98	--	--	58.60	48.60
0.430	39.89	26.92	--	--	57.30	47.30
0.856	42.65	21.60	--	--	56.00	46.00
2.152	43.06	27.06	--	--	56.00	46.00
2.764	34.98	20.53	--	--	56.00	46.00

B **Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)**

EUT set Condition: Low Channel

Results: **Pass**

Please refer to following diagram for individual



Frequency (MHz)	Reading(dB µ V)				Limit (dB µ V)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.174	--	--	52.30	47.10	65.80	55.80
0.234	--	--	43.98	39.52	62.30	52.30
0.290	--	--	45.51	40.23	60.50	50.50
0.346	--	--	50.03	45.05	59.10	49.10
0.462	--	--	48.62	43.08	56.70	46.70
0.748	--	--	44.15	32.53	56.00	46.00
0.812	--	--	35.91	16.20	56.00	46.00
0.872			36.80	16.20	56.00	46.00
1.388	--	--	39.30	20.00	56.00	46.00
1.968	--	--	44.70	33.20	56.00	46.00

6 Radiated Emission Test

6.1 Test Method and test Procedure:

(1) The EUT was tested according to ANSI C63.4 –2001. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988

(2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2001.

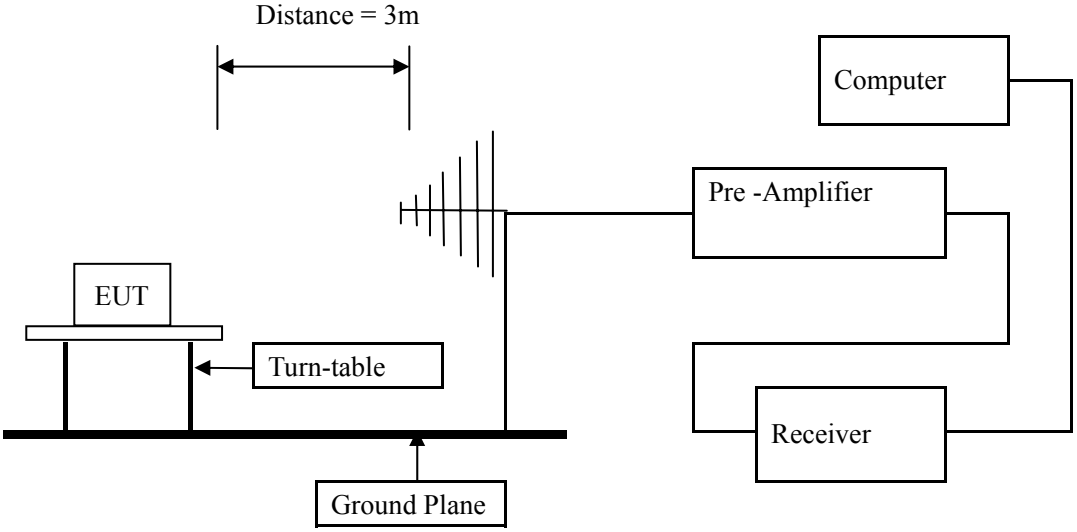
(3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.

(4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**QP**" in the data table.

(6) The antenna polarization : Vertical polarization and Horizontal polarization.

Block diagram of Test setup



6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the higher limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal (30MHz----1000MHz)

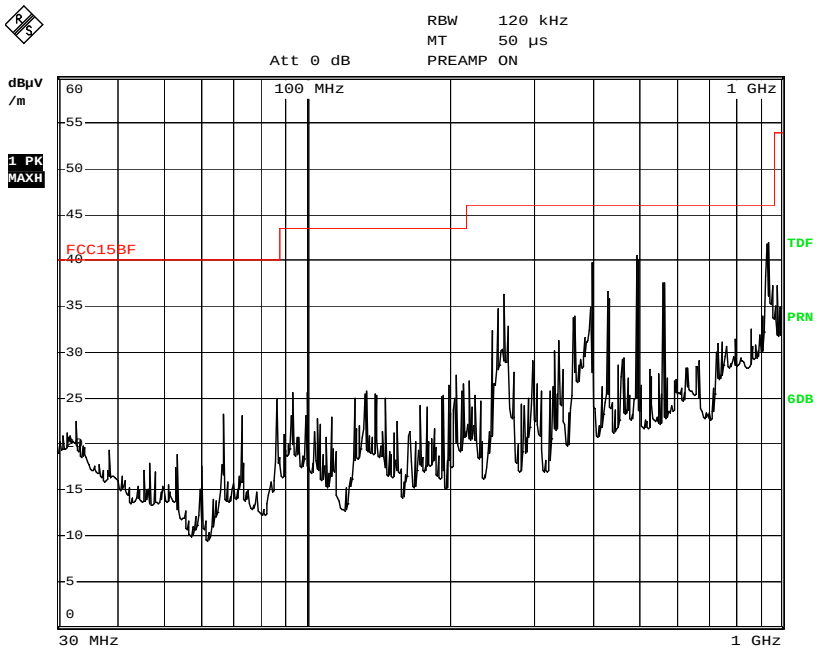
EUT set Condition: Low Channel

Results: **Pass**

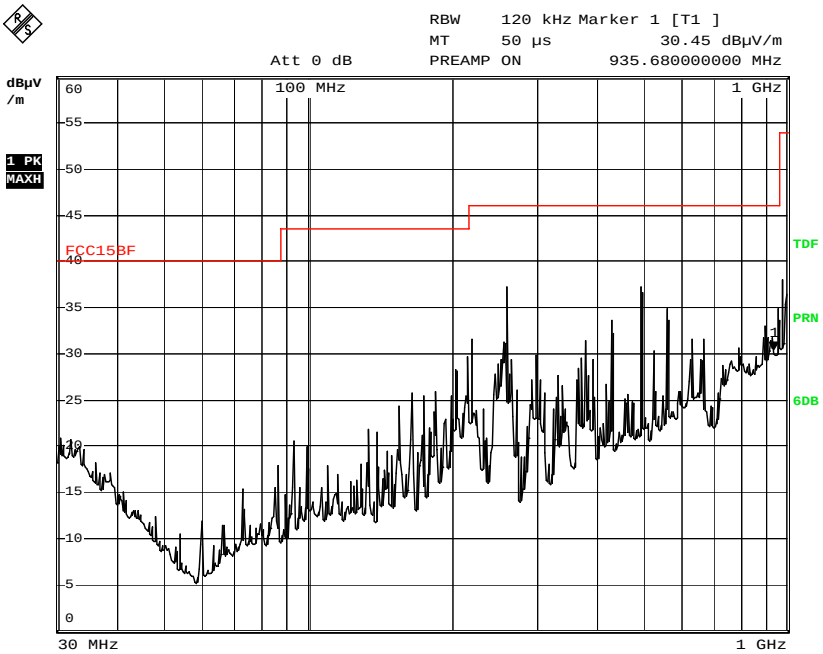
Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
259.60	37.12	V	46.00
397.76	39.70	V	46.00
497.00	40.60	V	46.00
566.44	37.50	V	46.00
935.84	36.19	V	46.00
259.64	37.92	H	46.00
497.08	36.18	H	46.00

Test Figure: Low Channel

V



H



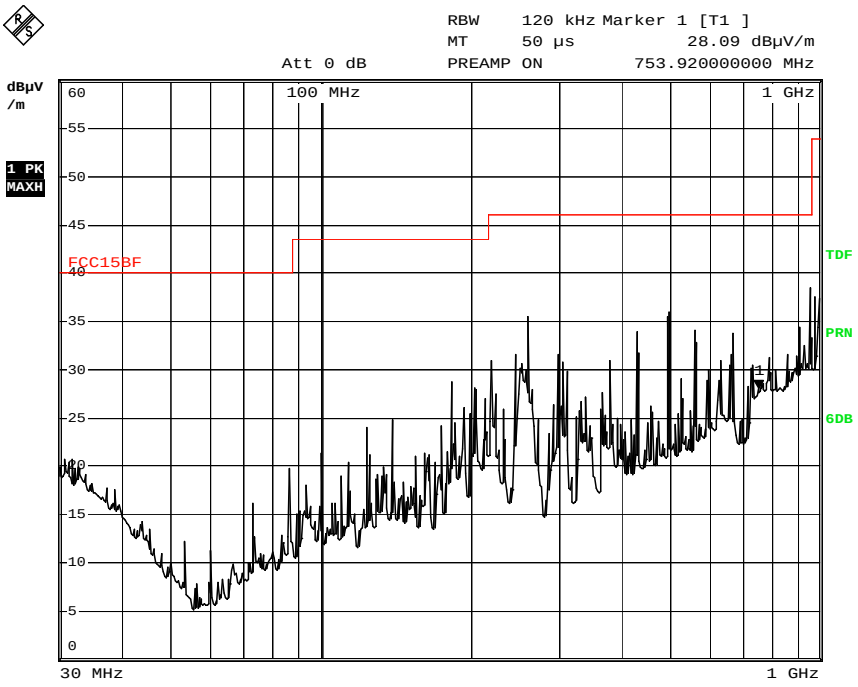
EUT set Condition: **Middle Channel**

Results: **Pass**

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
259.56	36.18	H	46.00
432.08	35.69	H	46.00
499.84	34.86	H	46.00
960.20	42.43	H	46.00
259.60	38.46	V	46.00
496.96	36.89	V	46.00
928.36	32.58	V	46.00

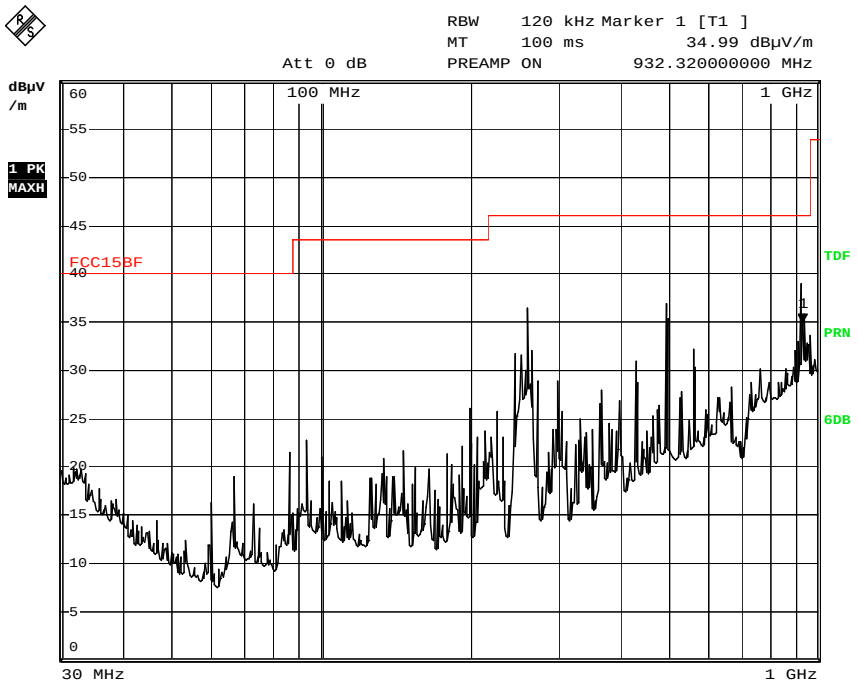
Test Figure: Middle Channel

H



Date: 16.JUN.2007 00:41:02

V



Date: 16.JUN.2007 00:44:38

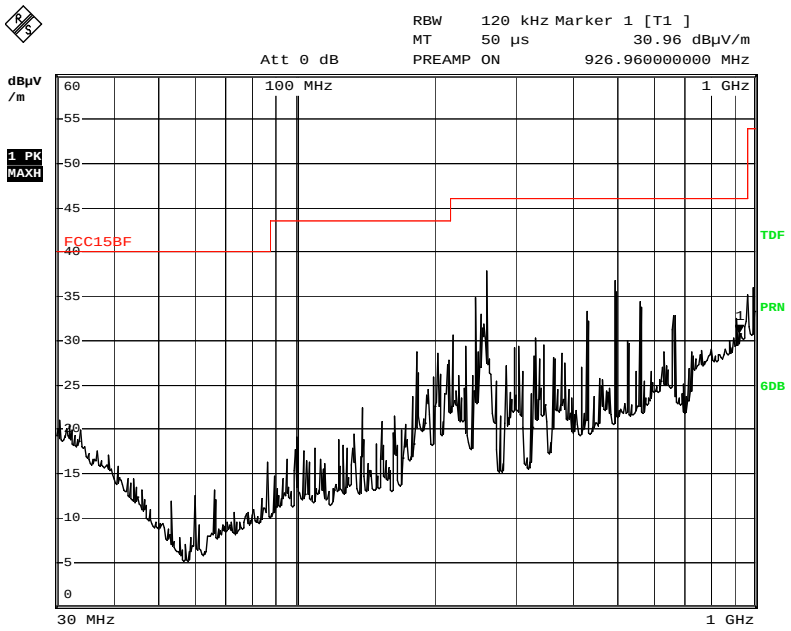
EUT set Condition: **High Channel**

Results: **Pass**

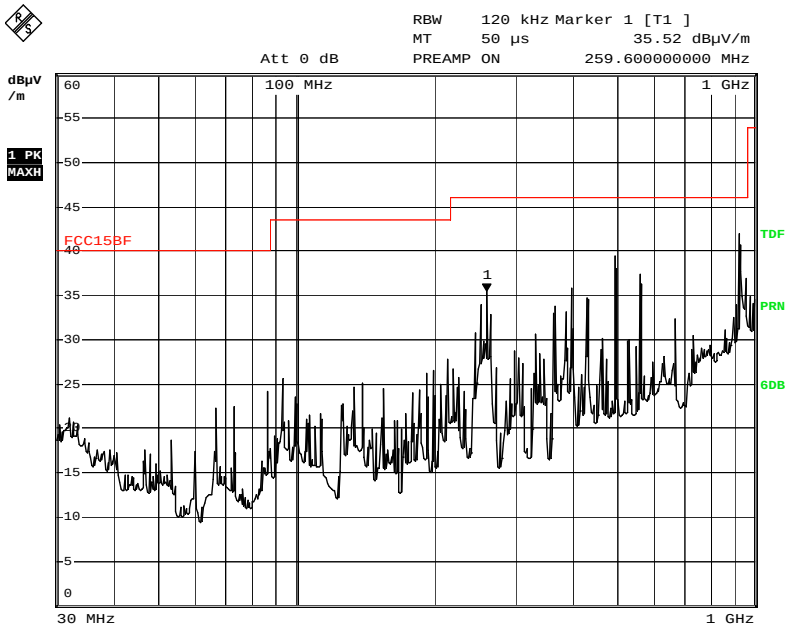
Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
259.60	38.69	H	46.00
496.96	37.13	H	46.00
563.20	35.36	H	46.00
259.60	37.28	V	46.00
397.60	35.86	V	46.00
497.04	39.94	V	46.00
563.28	38.03	V	46.00
928.12	41.05	V	46.00

Test Figure: High Channel

H



V



Note: 1. Emission level (dBµV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBµV).

Operation Mode: Transmitting under Low Channel (2402MHz)

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2402.029	77.4（PK）/77.2（AV）	V	Fundamental Frequency
2402.039	75.1（PK）/74.8（AV）	H	
4804	--	H/V	74(Peak)/ 54(AV)
7206	--	H/V	74(Peak)/ 54(AV)
9608	--	H/V	74(Peak)/ 54(AV)
12010	--	H/V	74(Peak)/ 54(AV)
14412	--	H/V	74(Peak)/ 54(AV)
16814	--	H/V	74(Peak)/ 54(AV)
19216	--	H/V	74(Peak)/ 54(AV)
21618	--	H/V	74(Peak)/ 54(AV)
24020	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

Operation Mode: Transmitting g under Middle Channel (2441MHz)

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2441.029	73.5（PK）/73.3（AV）	H	Fundamental Frequency
2441.039	77.3（PK）77.0（AV）	V	
4881.039	46.9（PK）/37.9（AV）	H	74(Peak)/ 54(AV)
4882.049	49.8（PK）/43.7（AV）	V	74(Peak)/ 54(AV)
7323	--	H/V	74(Peak)/ 54(AV)
9764	--	H/V	74(Peak)/ 54(AV)
12205	--	H/V	74(Peak)/ 54(AV)
14646	--	H/V	74(Peak)/ 54(AV)
17087	--	H/V	74(Peak)/ 54(AV)
19528	--	H/V	74(Peak)/ 54(AV)
21969	--	H/V	74(Peak)/ 54(AV)
24410	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

Operation Mode: Transmitting under High Channel

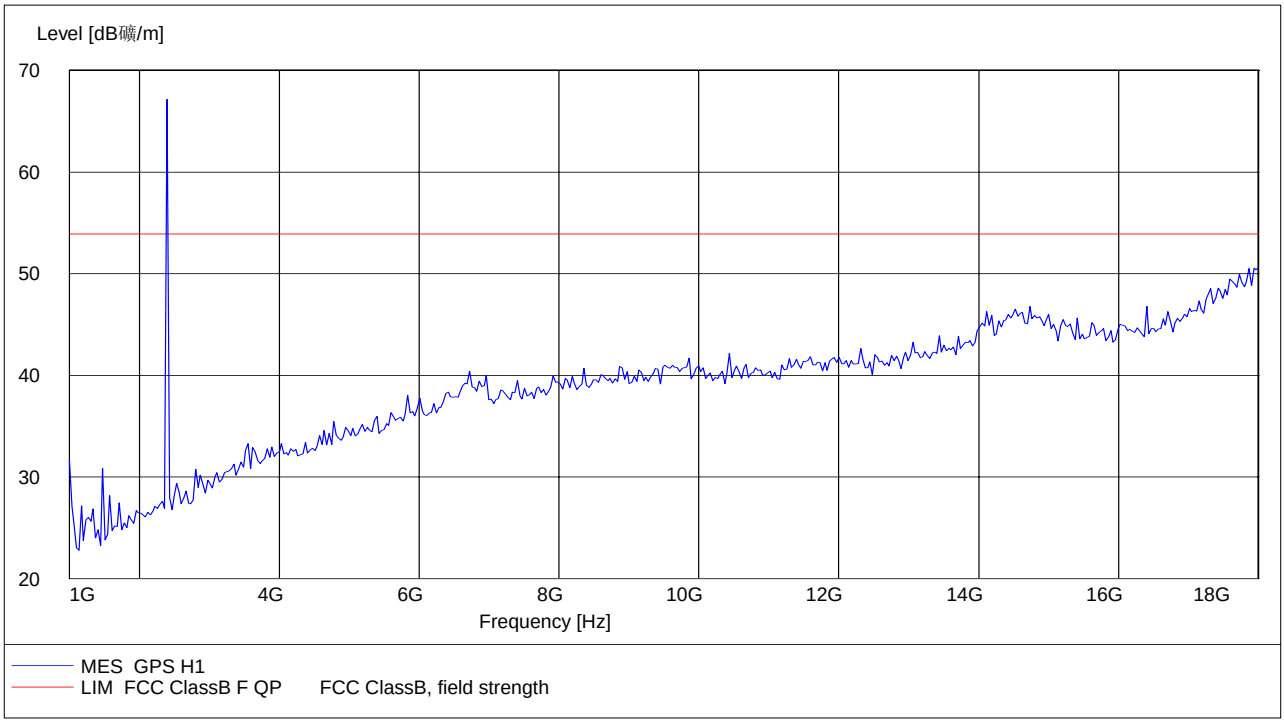
Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2479.879	65.5（PK）/54.5（AV）	H	Fundamental Frequency
2479.946	67.2（PK）/56.9（AV）	V	
4960.049	48.9（PK）/36.6（AV）	V	74(Peak)/ 54(AV)
4960.049	--	H	74(Peak)/ 54(AV)
7440	--	H/V	74(Peak)/ 54(AV)
9920	--	H/V	74(Peak)/ 54(AV)
12400	--	H/V	74(Peak)/ 54(AV)
14880	--	H/V	74(Peak)/ 54(AV)
17360	--	H/V	74(Peak)/ 54(AV)
19840	--	H/V	74(Peak)/ 54(AV)
22320	--	H/V	74(Peak)/ 54(AV)
24800	--	H/V	74(Peak)/ 54(AV)
1653.343	38.2（PK）/25.9（AV）	H	74(Peak)/ 54(AV)
1654.009	40.7（PK）/34.6（AV）	V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

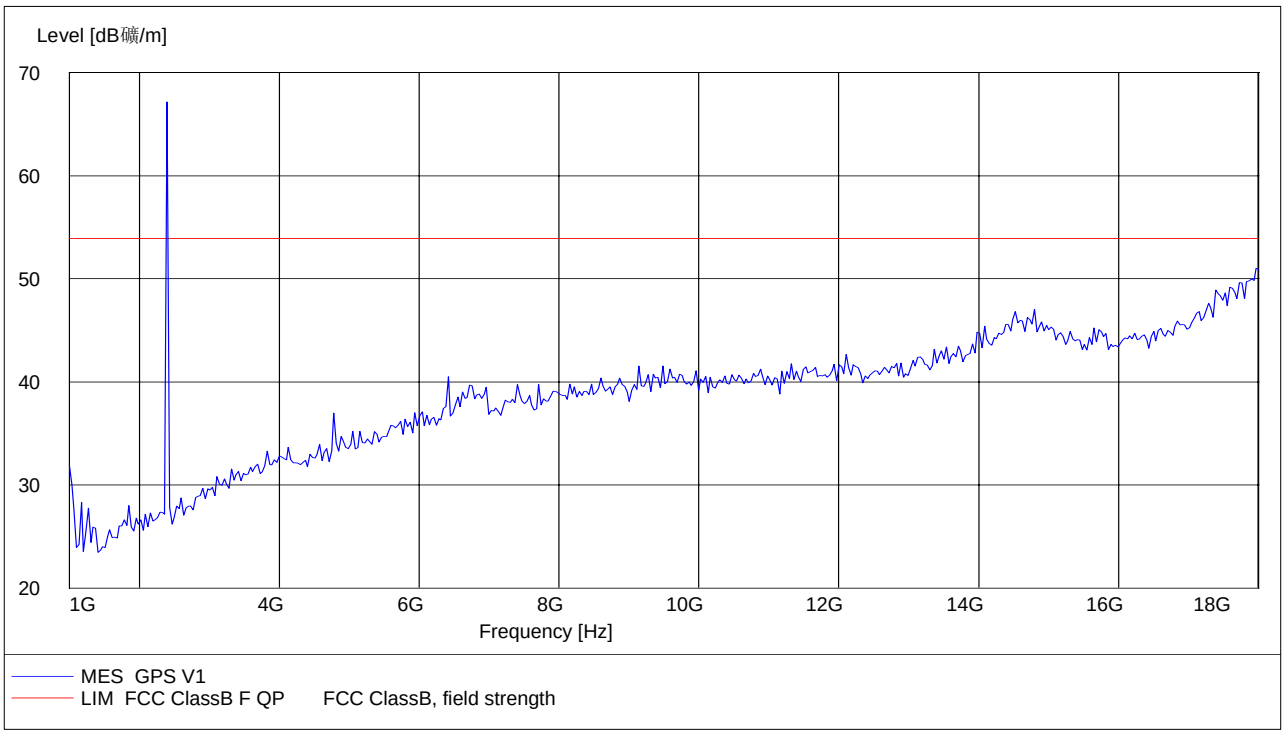
2. Remark “---” means that the emissions level is too low to be measured

Please refer to the following test plots for details:

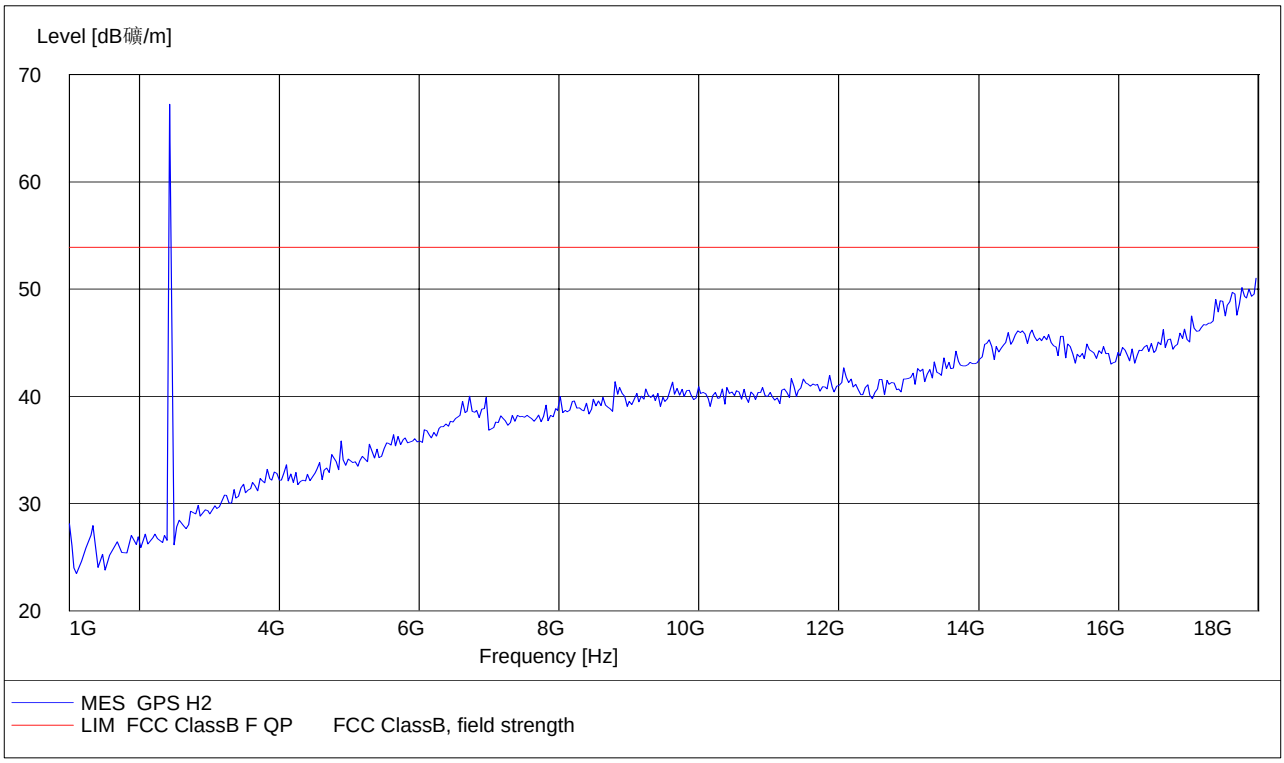
Low Channel: Horizontal



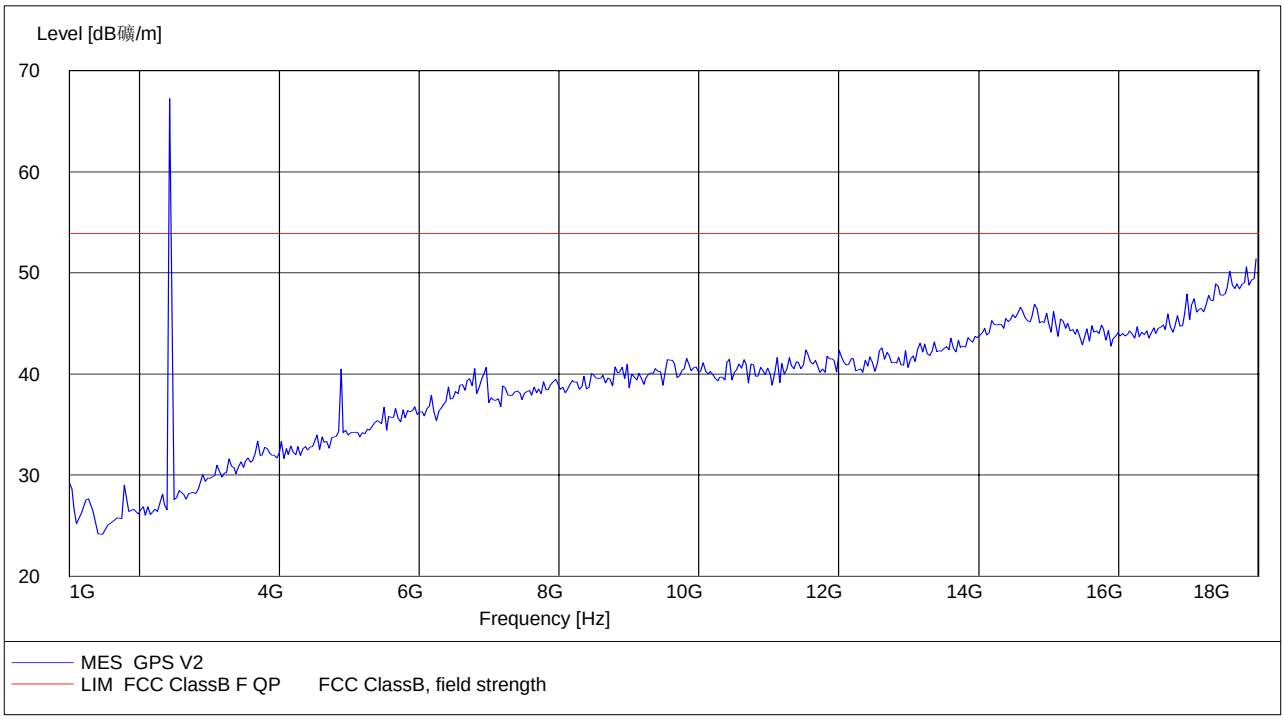
Low Channel : Vertical



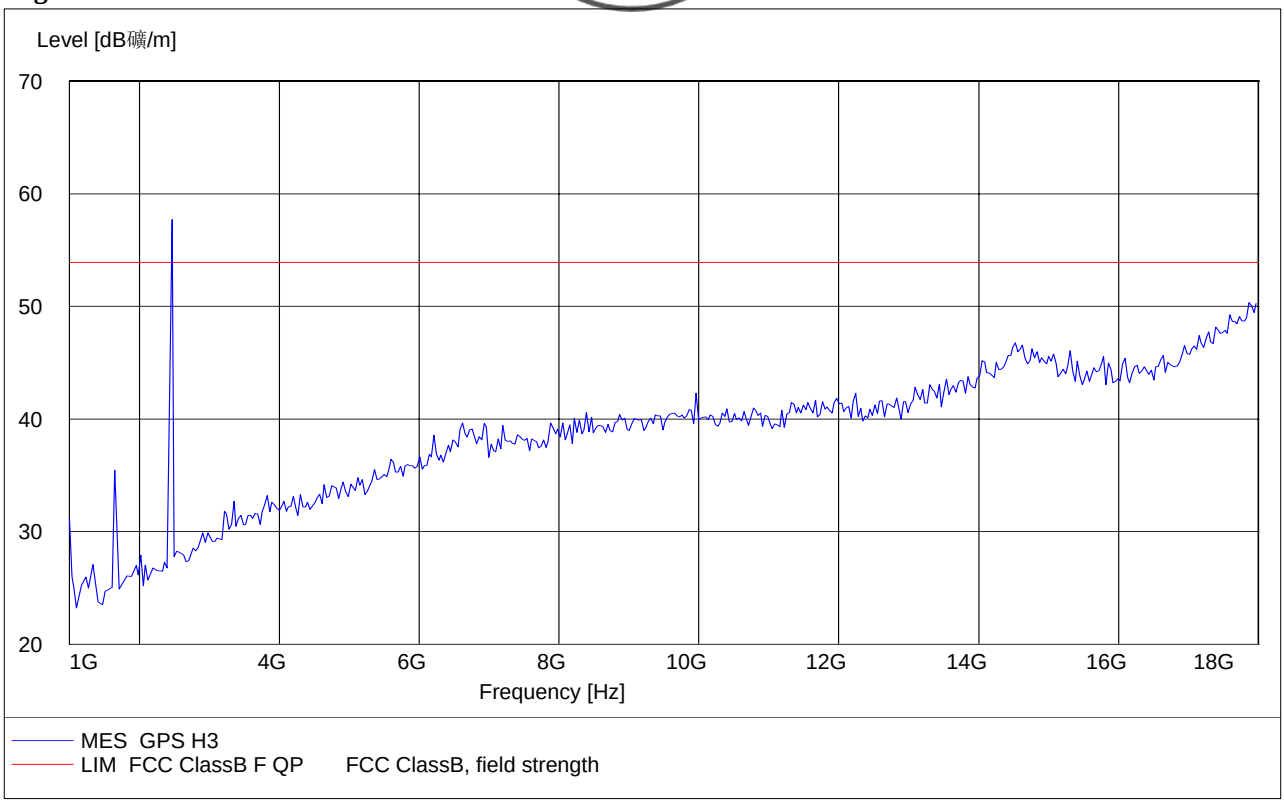
Middle Channel : Horizontal



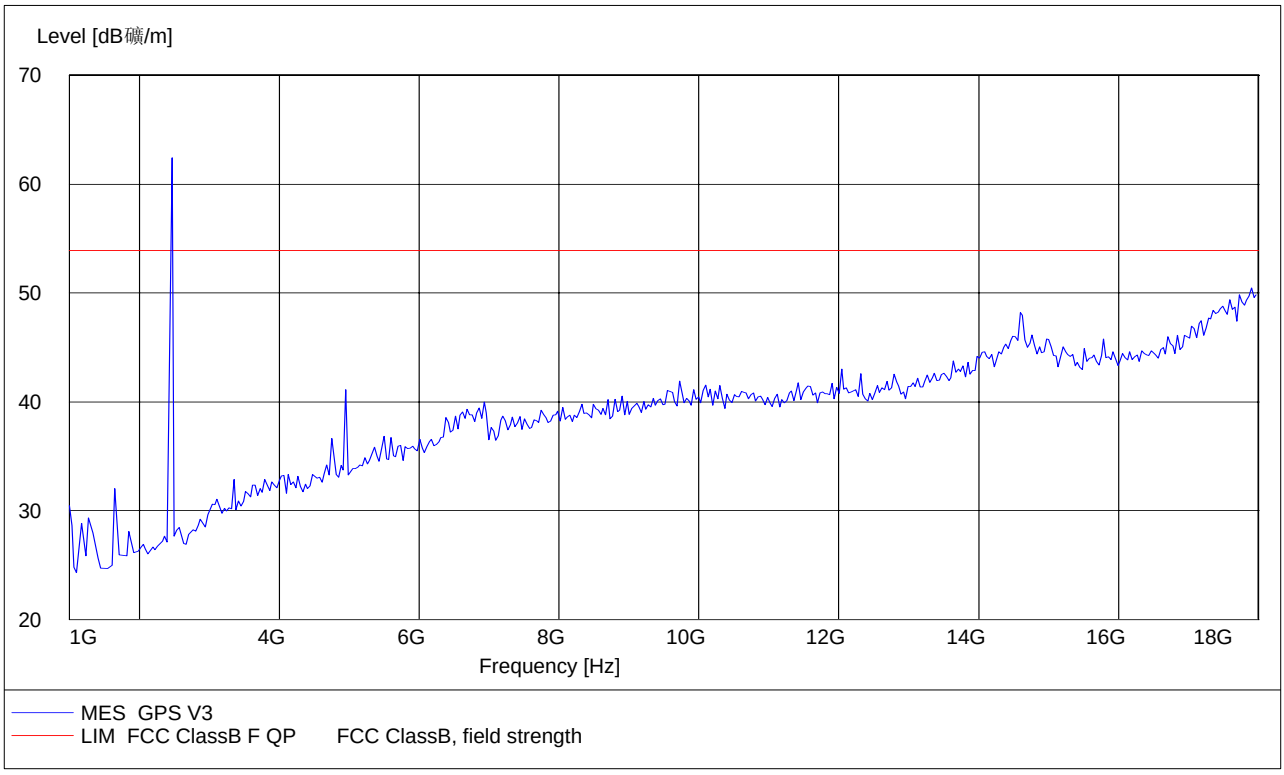
Middle Channel :: Vertical



High Channel : Horizontal



High Channel : Vertical



7.0 20dB Bandwidth Measurement

7.1 Regulation

According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.2 Limits of 20dB Bandwidth Measurement

The minimum of 20dB Bandwidth Measurement is <1MHz

7.3 Test Procedure.

1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.

2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW > the 20 dB bandwidth of the emission being measured VBW ≥ RBW Sweep = auto Detector function = peak Trace = max hold

3. Measure the highest amplitude appearing on spectral display and record the level to calculate results. 6. Repeat above procedures until all frequencies measured were complete.

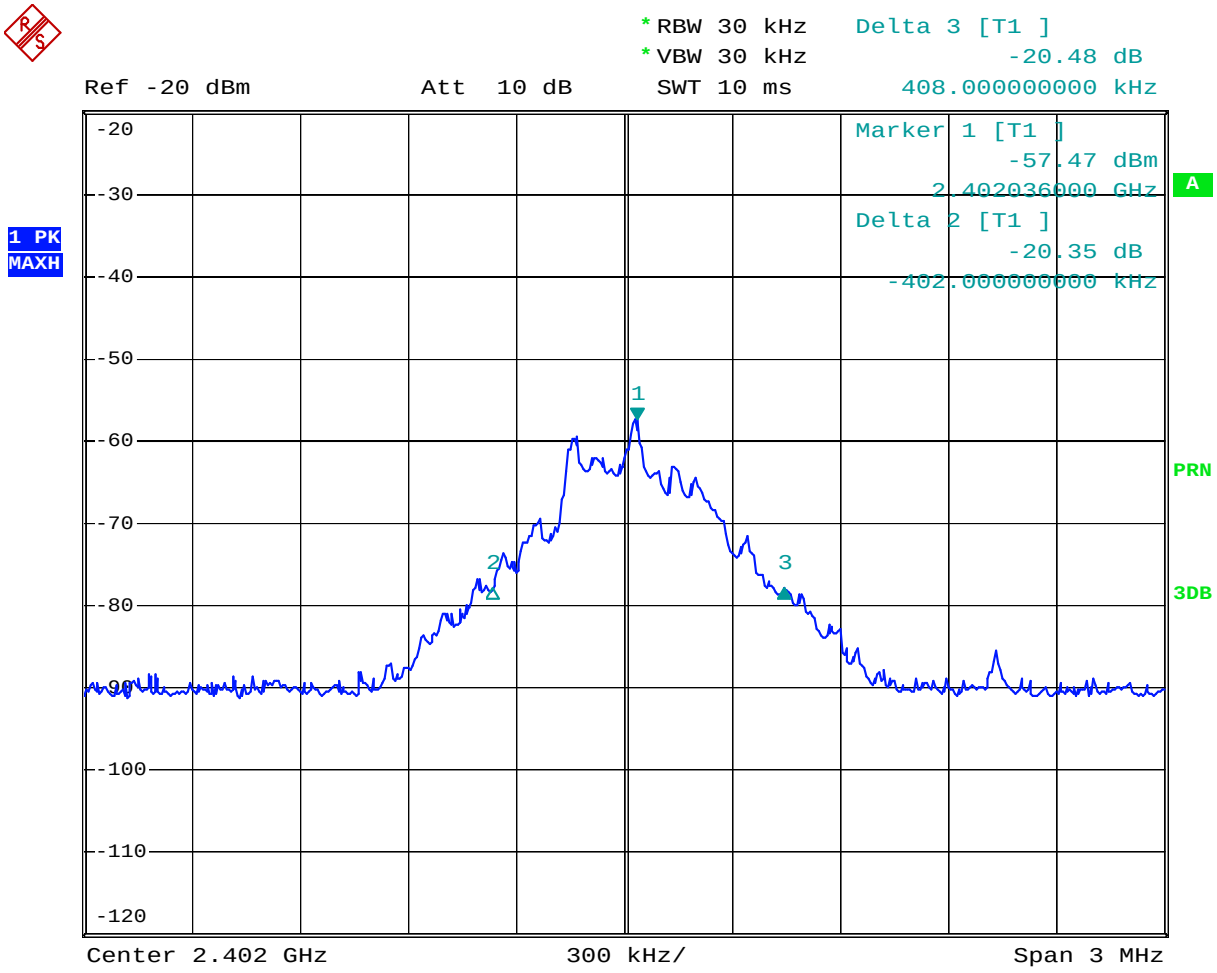
7.4 Test Result

EUT	GPS	Model	AMIGO-4300B
Mode	Keep Transmitting	Input Voltage	DC 5V
Temperature	24 deg. C,	Humidity	56% RH

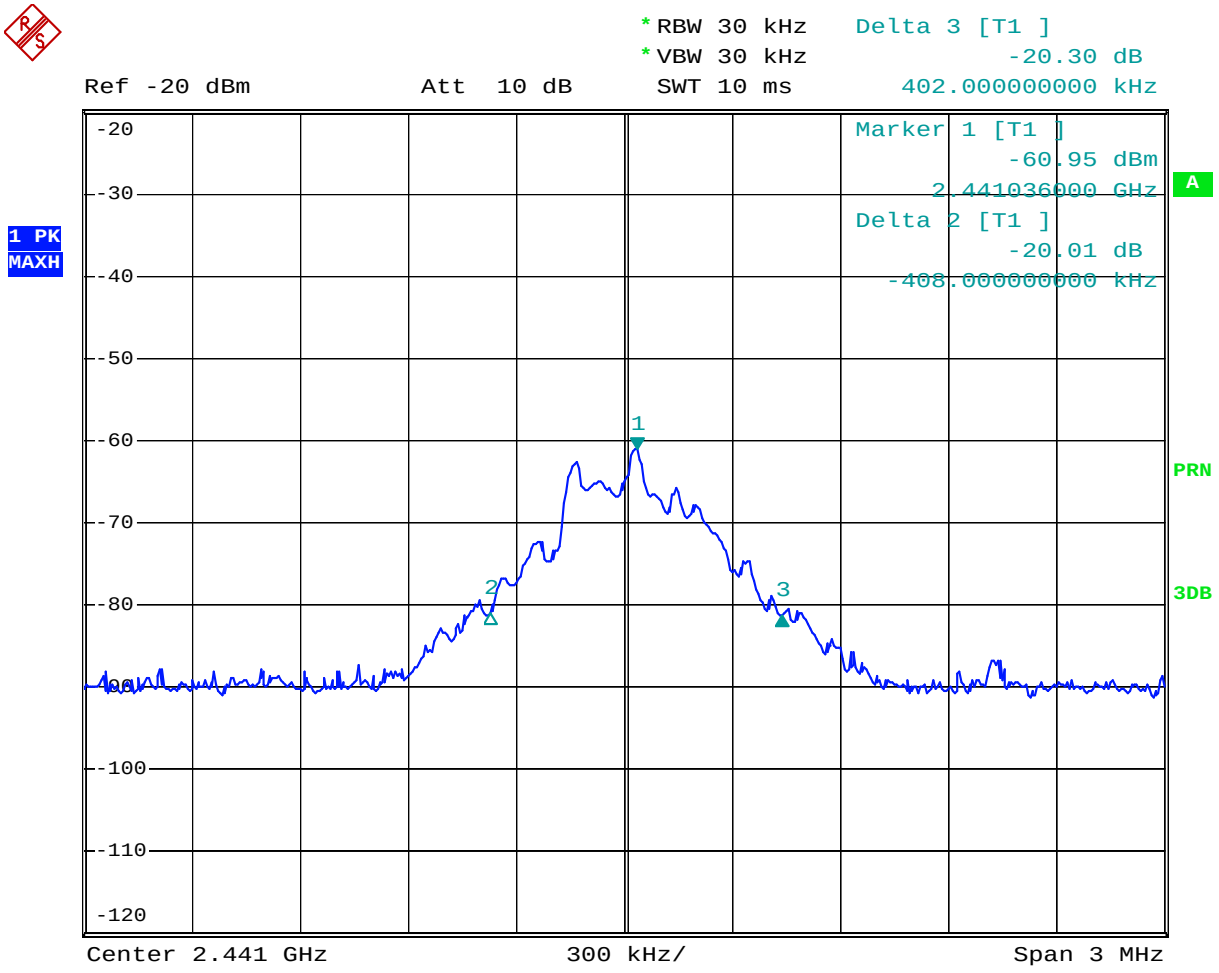
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/ Fail
Low	2402	810	<1000	Pass
Middle	2441	810	<1000	Pass
High	2480	882	<1000	Pass

Test Figure:

1. Condition: Low Channel

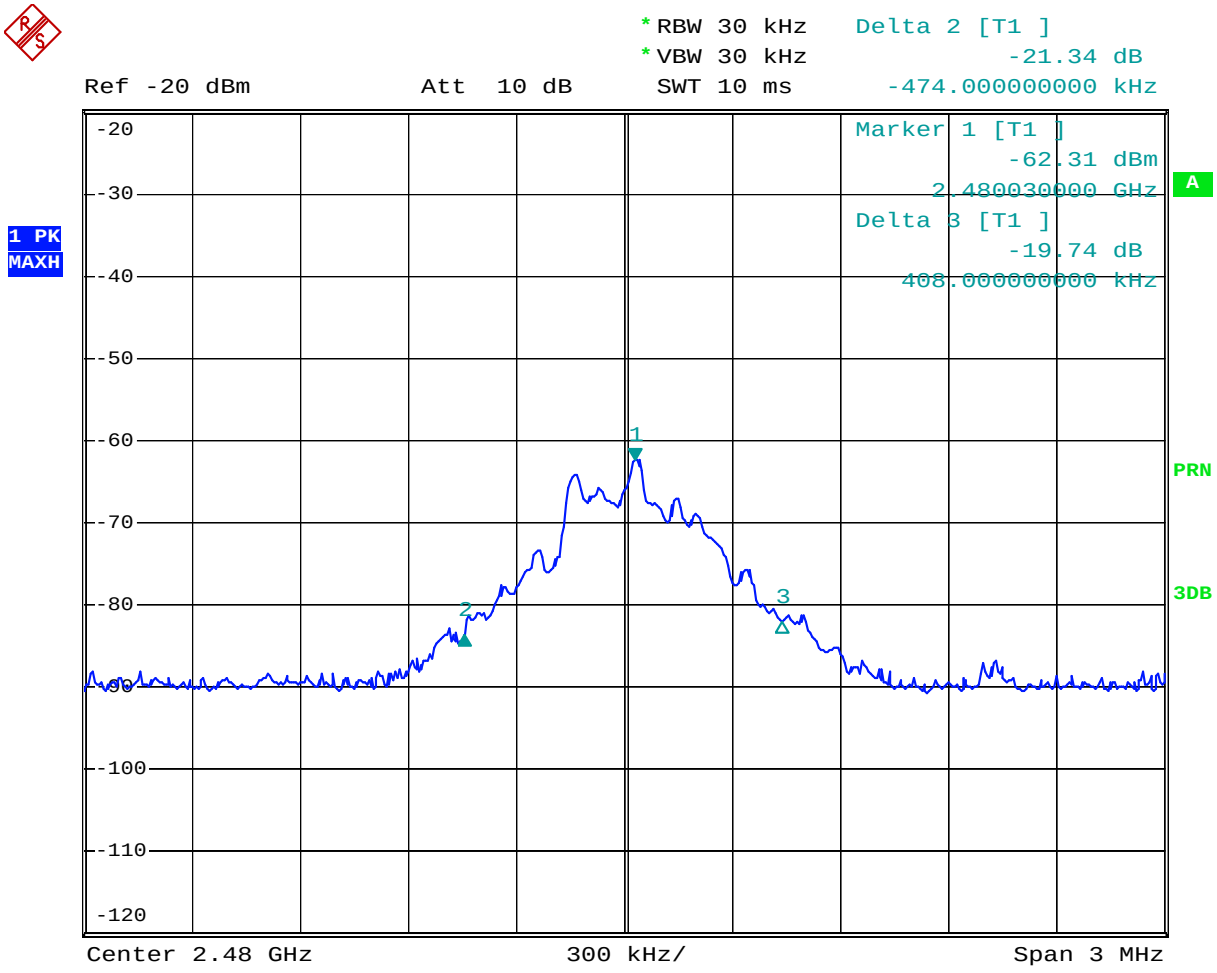


2. Condition: Middle Channel



Date: 22.MAY.2007 02:27:37

3. High Channel



Date: 22.MAY.2007 02:25:03

8. Maximum Peak Output Power

8.1 Regulation

According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5MHz band:0.125 watts. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

8.3 Test Procedure

1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel； RBW > the 20 dB bandwidth of the emission being measured； VBW ≥ RBW； Sweep = auto； Detector function = peak； Trace = max hold
3. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
4. Repeat above procedures until all frequencies measured were complete.

8.4Test Results

EUT	GPS	Model	AMIGO-4300B
Mode	Keeping Transmitting	Input Voltage	DC5V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Low	2402	-21.03	30	Pass
Middle	2441	-21.71	30	Pass
High	2480	-33.79	30	Pass

Note: 1. the result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

9. Power Spectral Density Measurement

9.1 Regulation

According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

9.2 Limits of Power Spectral Density Measurement

The Maximum Power Spectral Density Measurement is 8dBm.

9.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer to MAX HOLD mode with RBW = 3 kHz.
3. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
4. Repeat above procedures until all frequencies measured were complete.

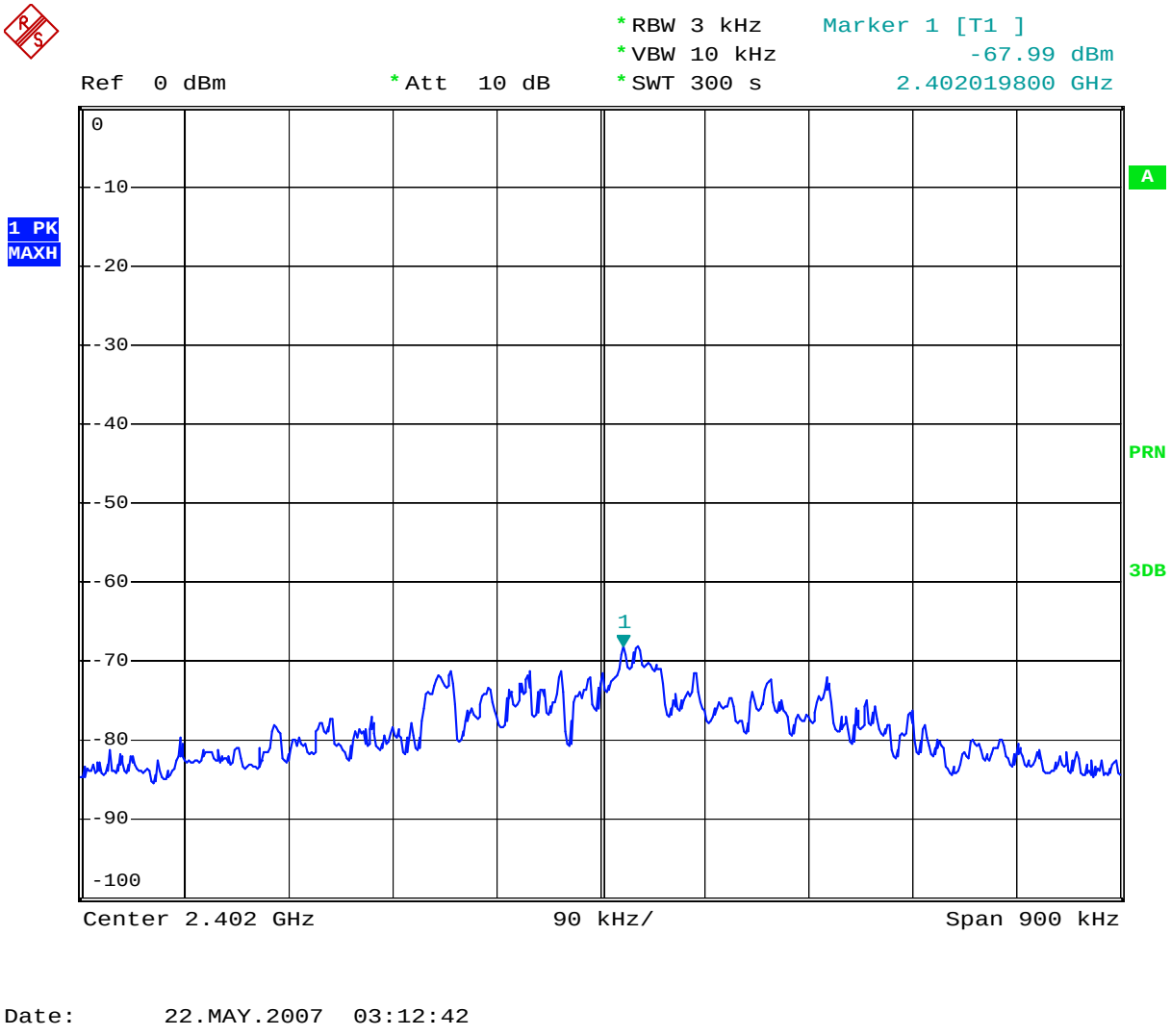
9.4Test Result

EUT	GPS	Model	AMIGO-4300B
Mode	Keeping Transmitting	Input Voltage	DC5V
Temperature	24 deg. C,	Humidity	56% RH

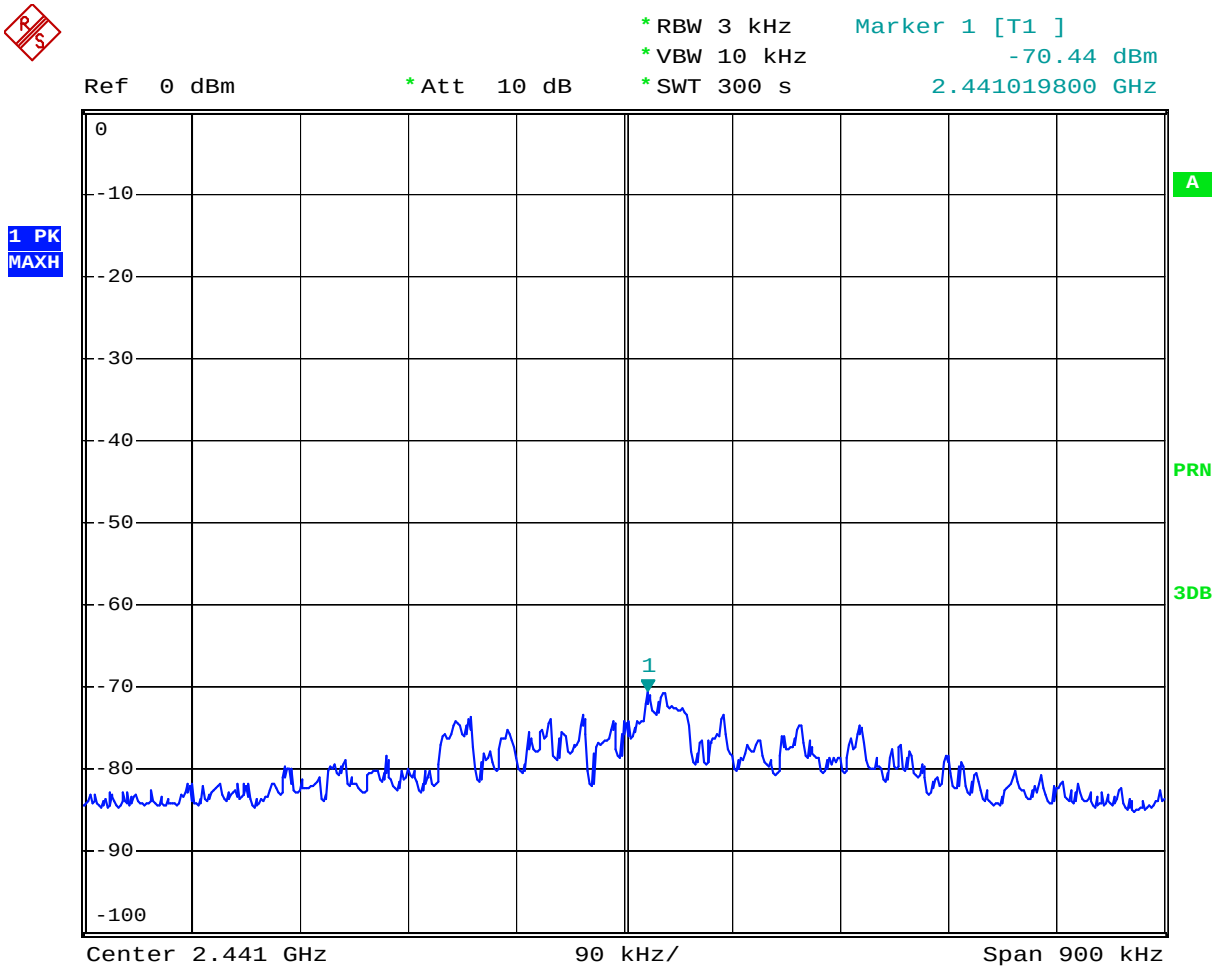
Channel	Channel Frequency (MHz)	Final RF Power Level in 3kHz BW (dBm)	Maximum Limit (dBm)	Pass/ Fail
Low	2402	-67.99	8	Pass
Middle	2441	-70.44	8	Pass
High	2480	-69.16	8	Pass

9.5Photo of Power Spectral Density Measurement

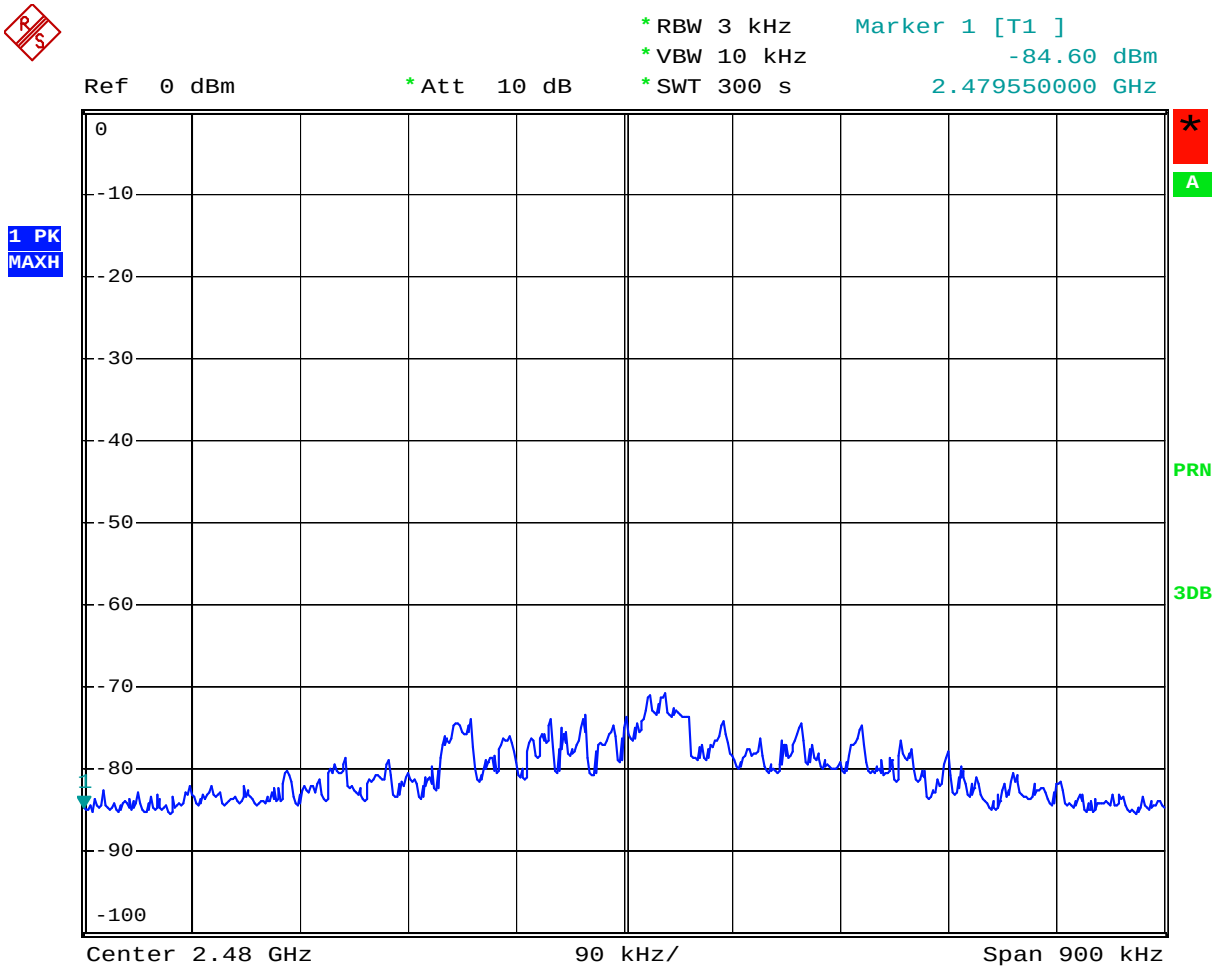
1.Low Channel



2. Middle Channel



3. High Channel



10. Carrier Frequency Separation

10.1 Regulation

According to §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

10.2 Limits of Carrier Frequency Separation

The Maximum Power Spectral Density Measurement is 25kHz or two-thirds of the 20dB bandwidth of the hopping Channel which is great.

10.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = wide enough to capture the peaks of two adjacent channels: Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span; Video (or Average) Bandwidth (VBW) ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold
3. Measure the separation between the peaks of the adjacent channels using the marker-delta function.
4. Repeat above procedures until all frequencies measured were complete.

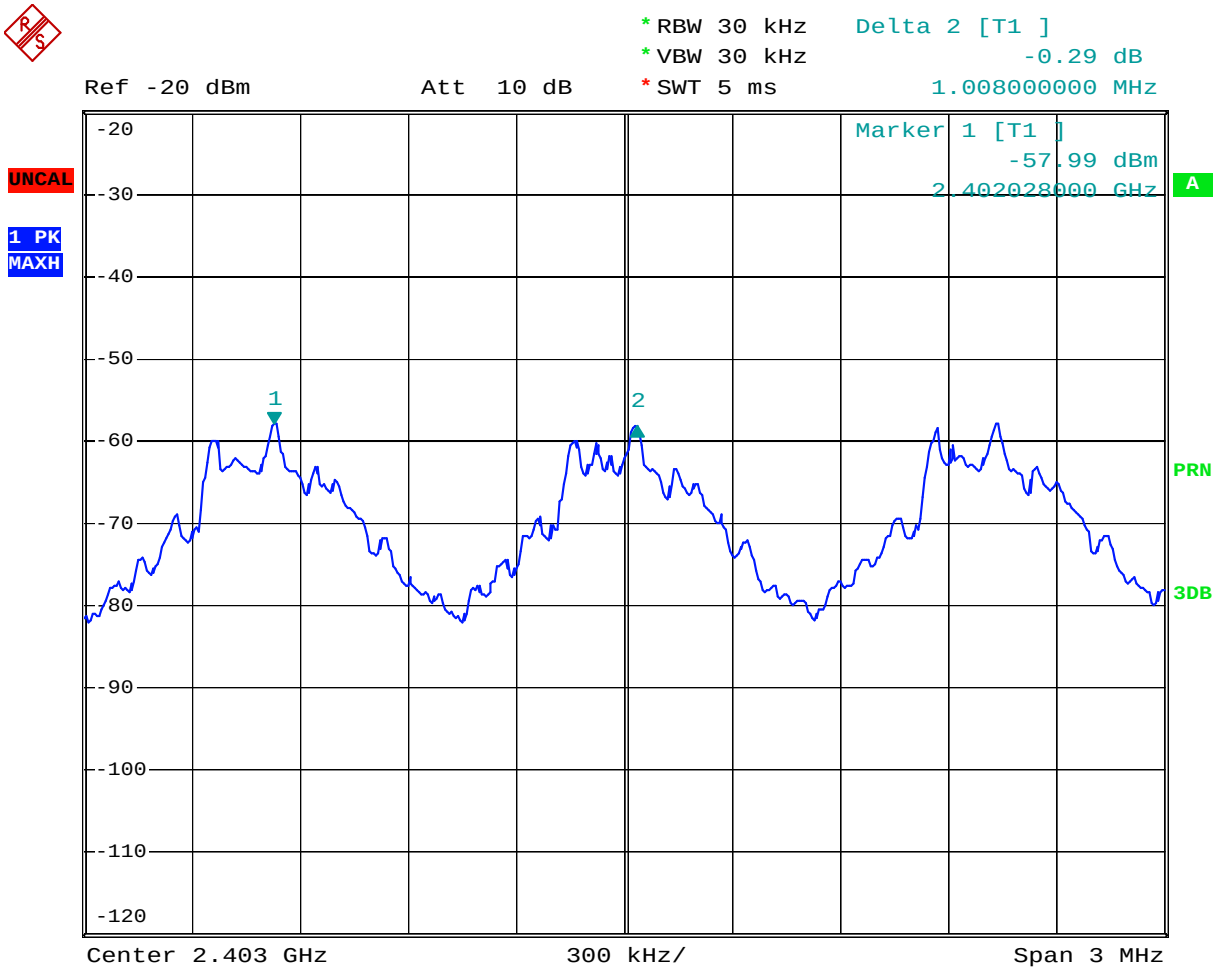
10.4Test Result

EUT	GPS	Model	AMIGO-4300B
Mode	Keeping Transmitting	Input Voltage	DC5V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Carrier Frequency Separation	Limit	Pass/ Fail
Low	2402	1.008MHz	≥ 25 kHz or 20 dB bandwidth	Pass
Middle	2441	0.996MHz	≥ 25 kHz or 20 dB bandwidth	Pass
High	2408	1.002MHz	≥ 25 kHz or 20 dB bandwidth	Pass

Test Plots

Low Channel



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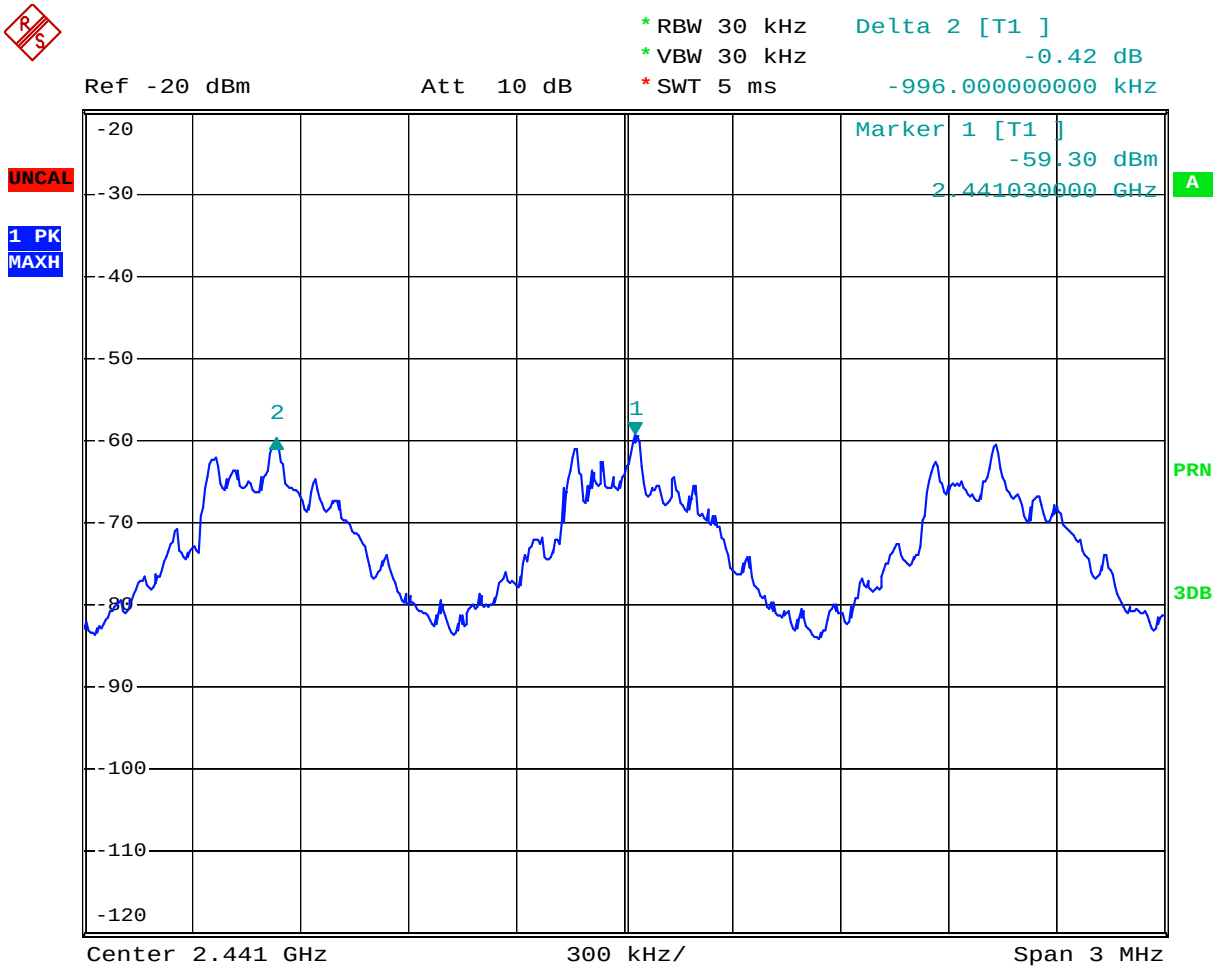
Middle Channel



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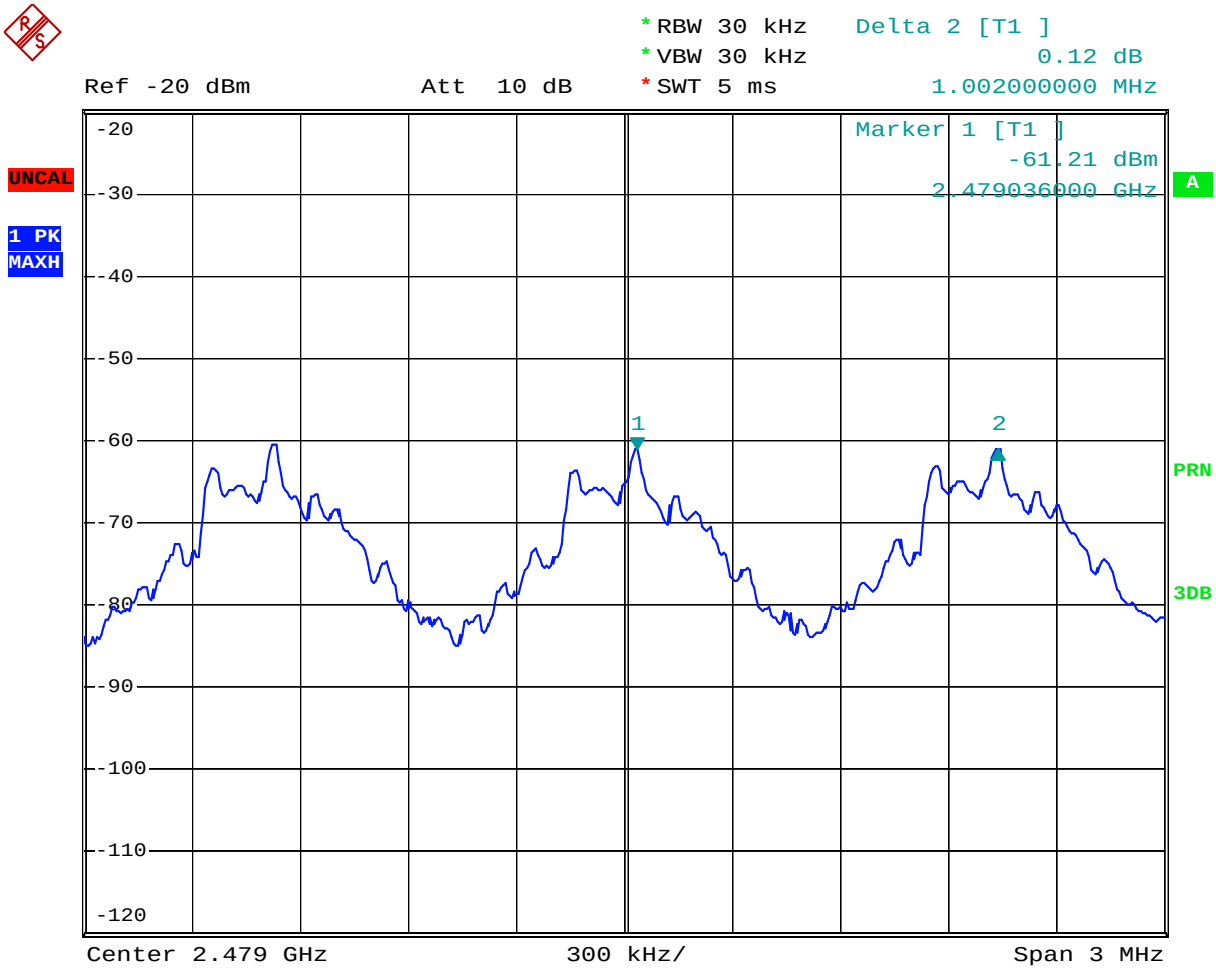
High Channel:



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11. Number of Hopping Channels

11.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

11.2 Limits of Number of Hopping Channels

The frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

11.3 Test Procedure

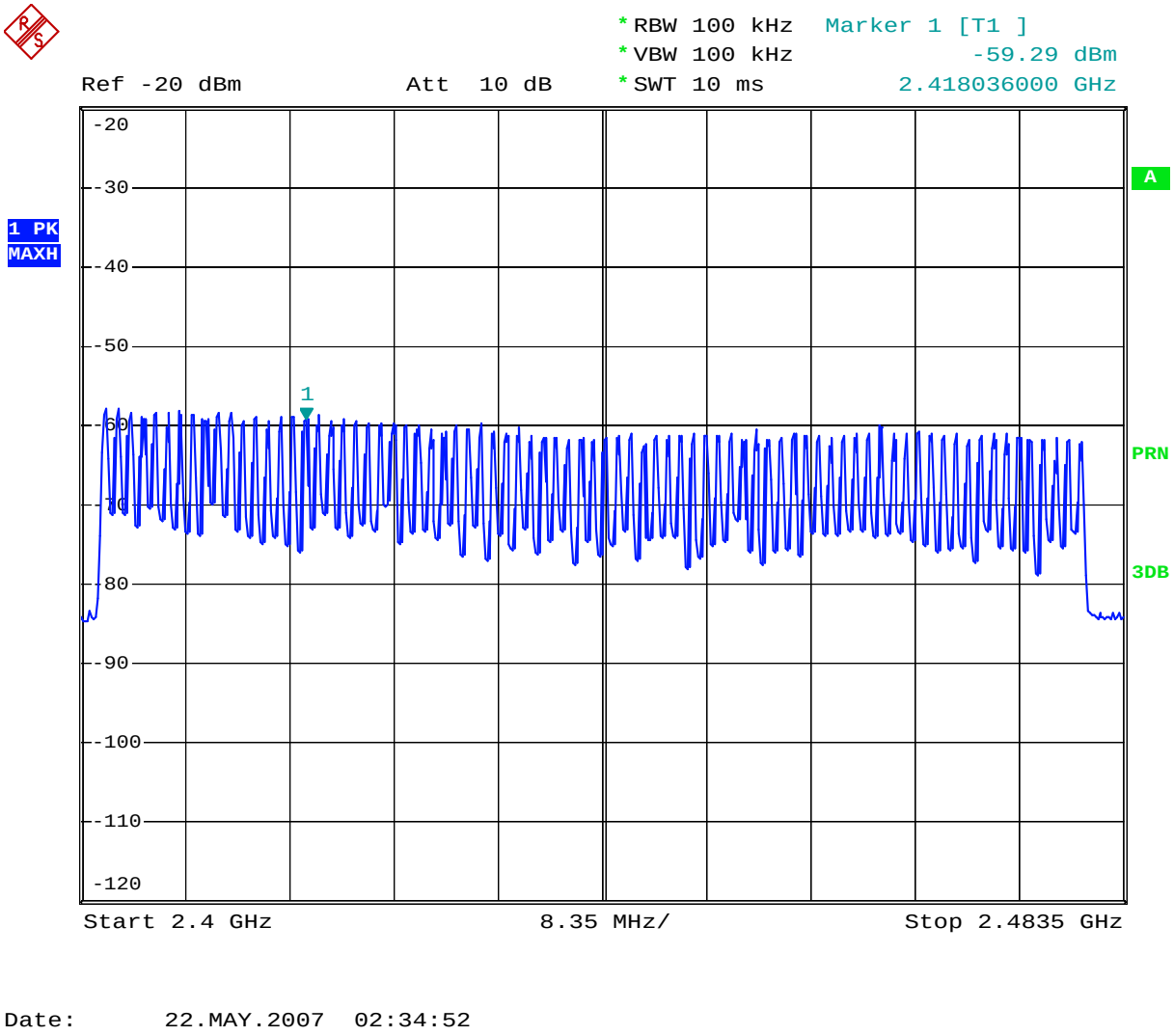
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = the frequency band of operation; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold
3. Record the number of hopping channels.

11.4Test Result

EUT	GPS	Model	AMIGO-4300B
Mode	Keeping Transmitting	Input Voltage	DC5V
Temperature	24 deg. C,	Humidity	56% RH

Operating Frequency	Number of hopping channels	Limit	Pass/ Fail
2402-2480MHz	79	≥ 15	Pass

Test Plot



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12. Time of Occupancy (Dewell Time)

12.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

12.2 Limits of Carrier Frequency Separation

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed

12.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold
3. Measure the dwell time using the marker-delta function.
4. Repeat above procedures until all frequencies measured were complete.
5. Repeat this test for different modes of operation (e.g., data rate, modulation format, etc.), if applicable.

12.4Test Result

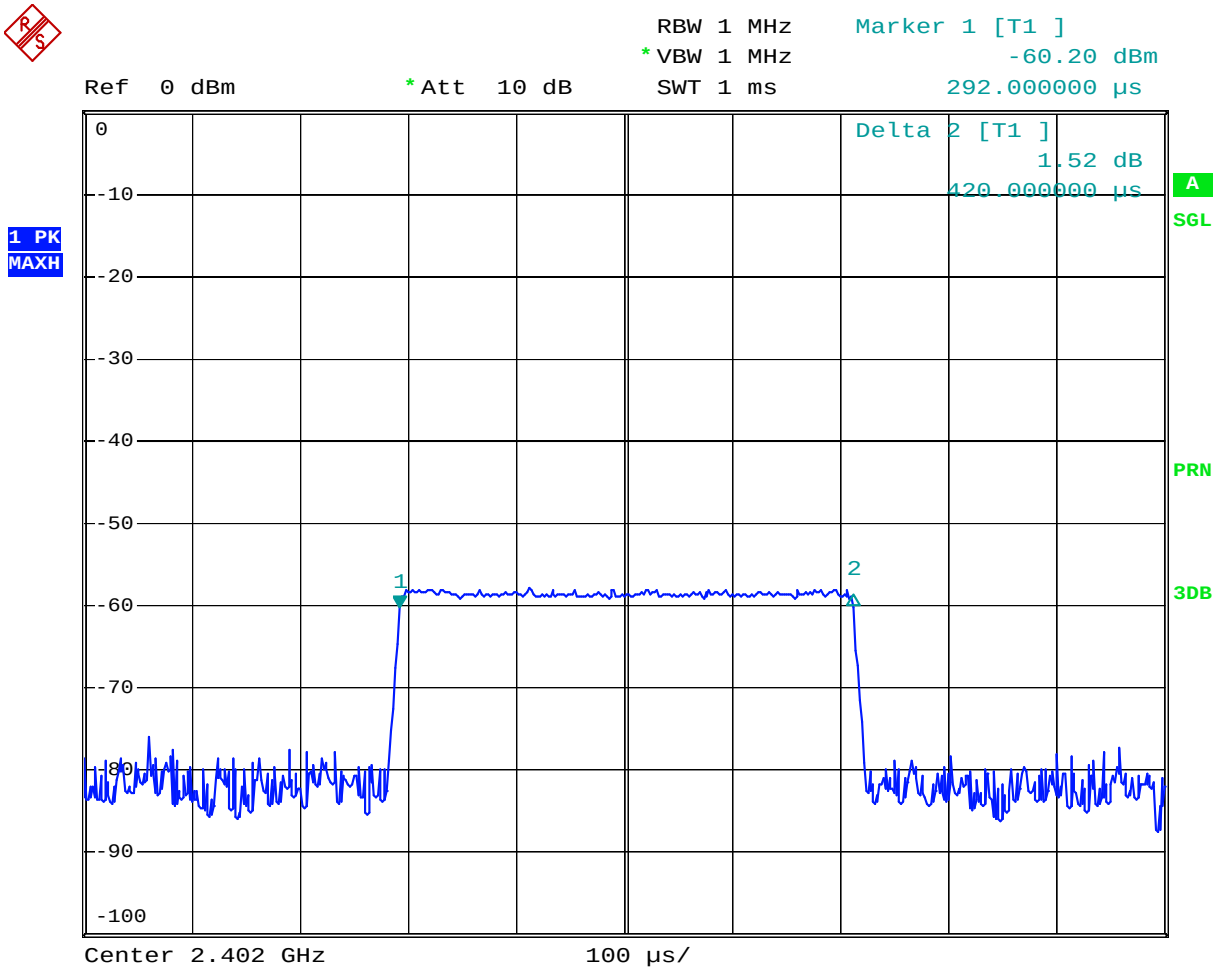
EUT	GPS	Model	AMIGO-4300B
Mode	Keeping Transmitting	Input Voltage	DC5V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Reading	Hoping Rate	Actual	Limit
Low	0.420	800 hop/s	0.1344	0.4s
Middle	0.422	800 hop/s	0.1350	0.4s
High	0.416	800 hop/s	0.1331	0.4s

Actual = Reading × (Hopping rate / Number of channels) × Test period Test period = 0.4 [seconds / channel] × 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625μs with 79 channels. A DH1 Packet needs 1 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 800 hops per second with 79 channels.

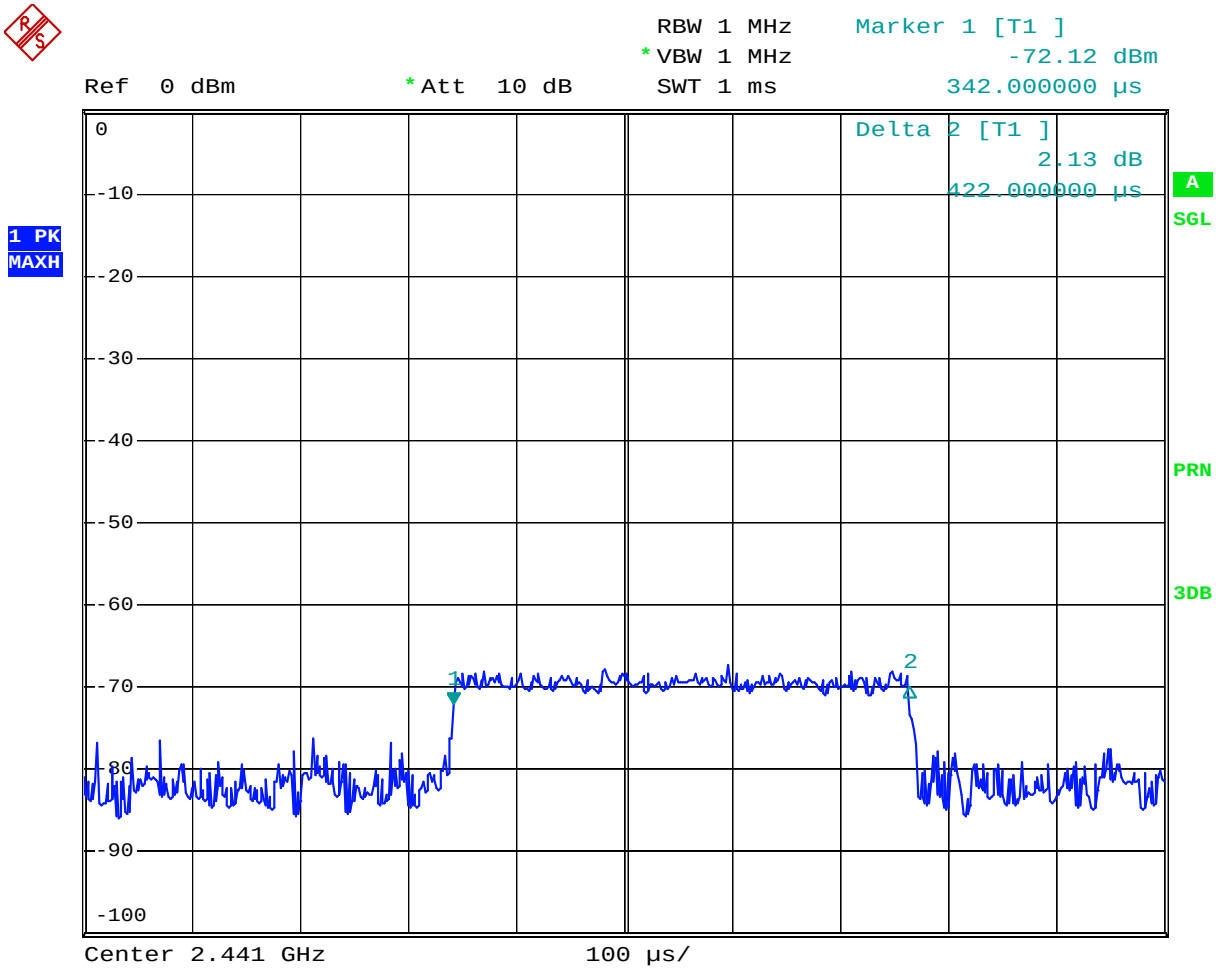
Test Plots:

Low Channel:



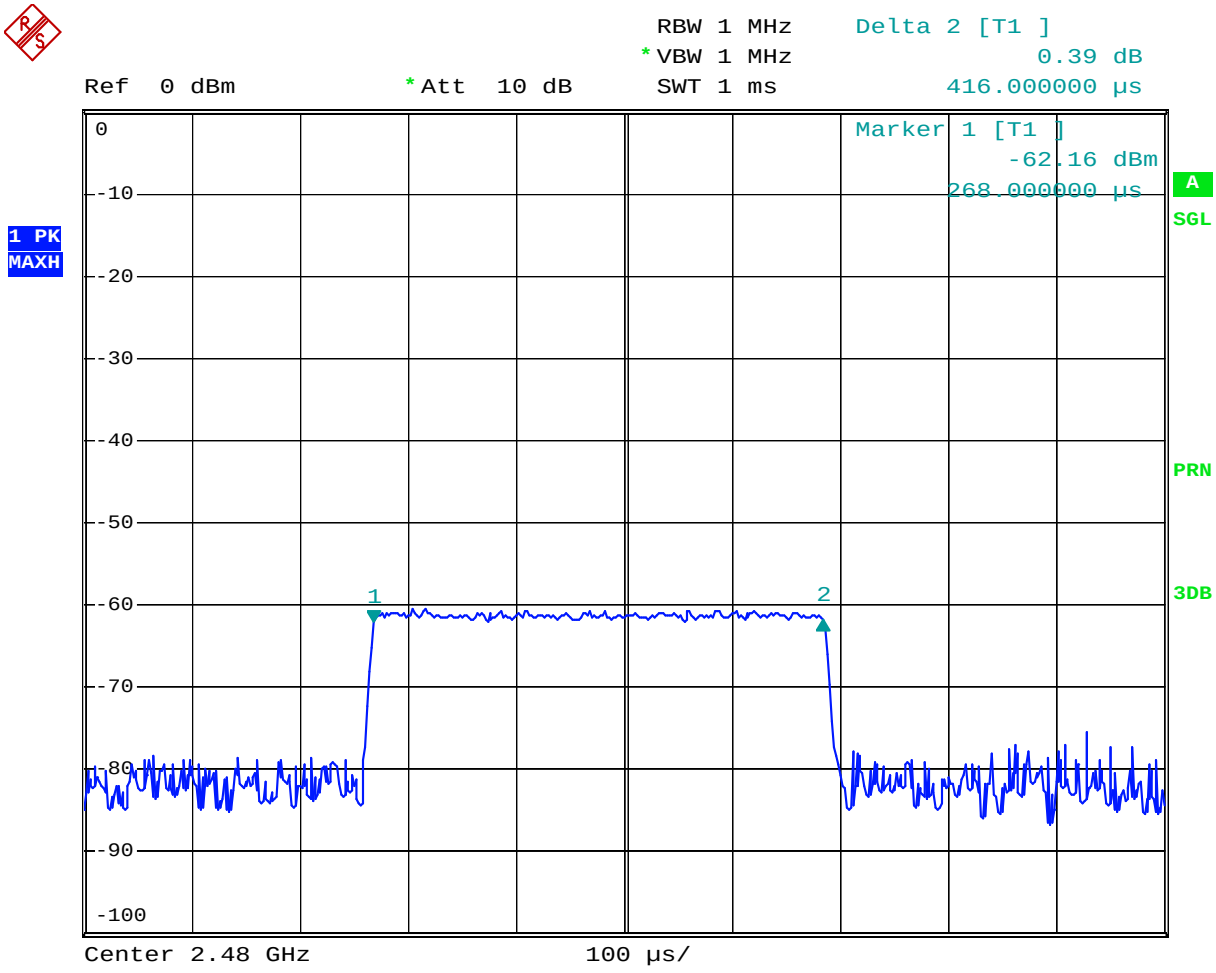
Date: 22.MAY.2007 03:48:12

Middle Channel:



Date: 7.JUN.2007 20:52:07

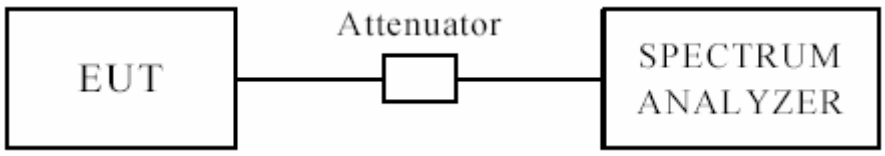
High Channel



Date: 22.MAY.2007 03:46:41

13 Out of Band Measurement

10.1 Test Setup



13.2 Limits of Out of Band Emissions Measurement

1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

13.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak filed strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Peak RBW=VBW=1MHz; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

13.4Test Result

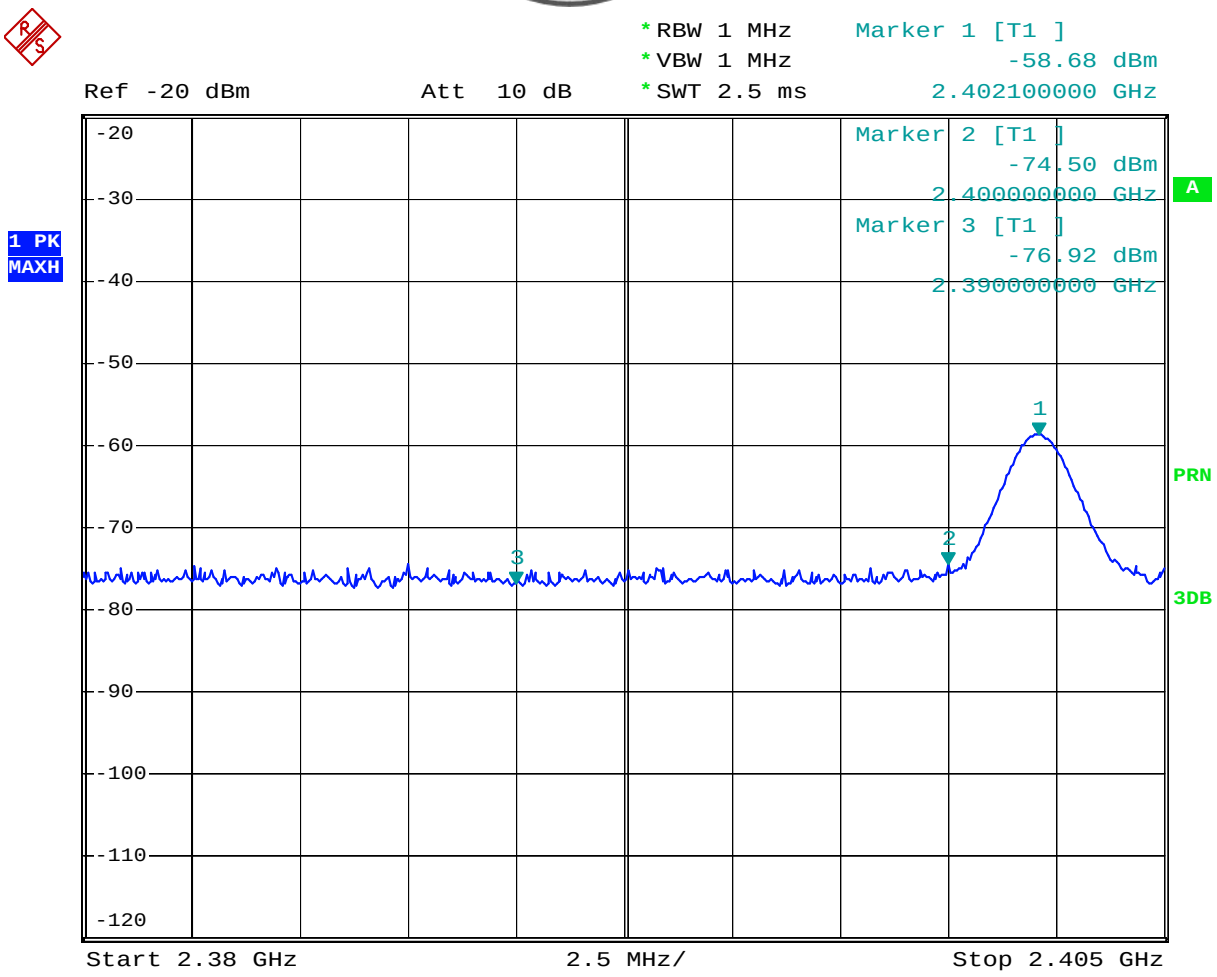
Low Channel

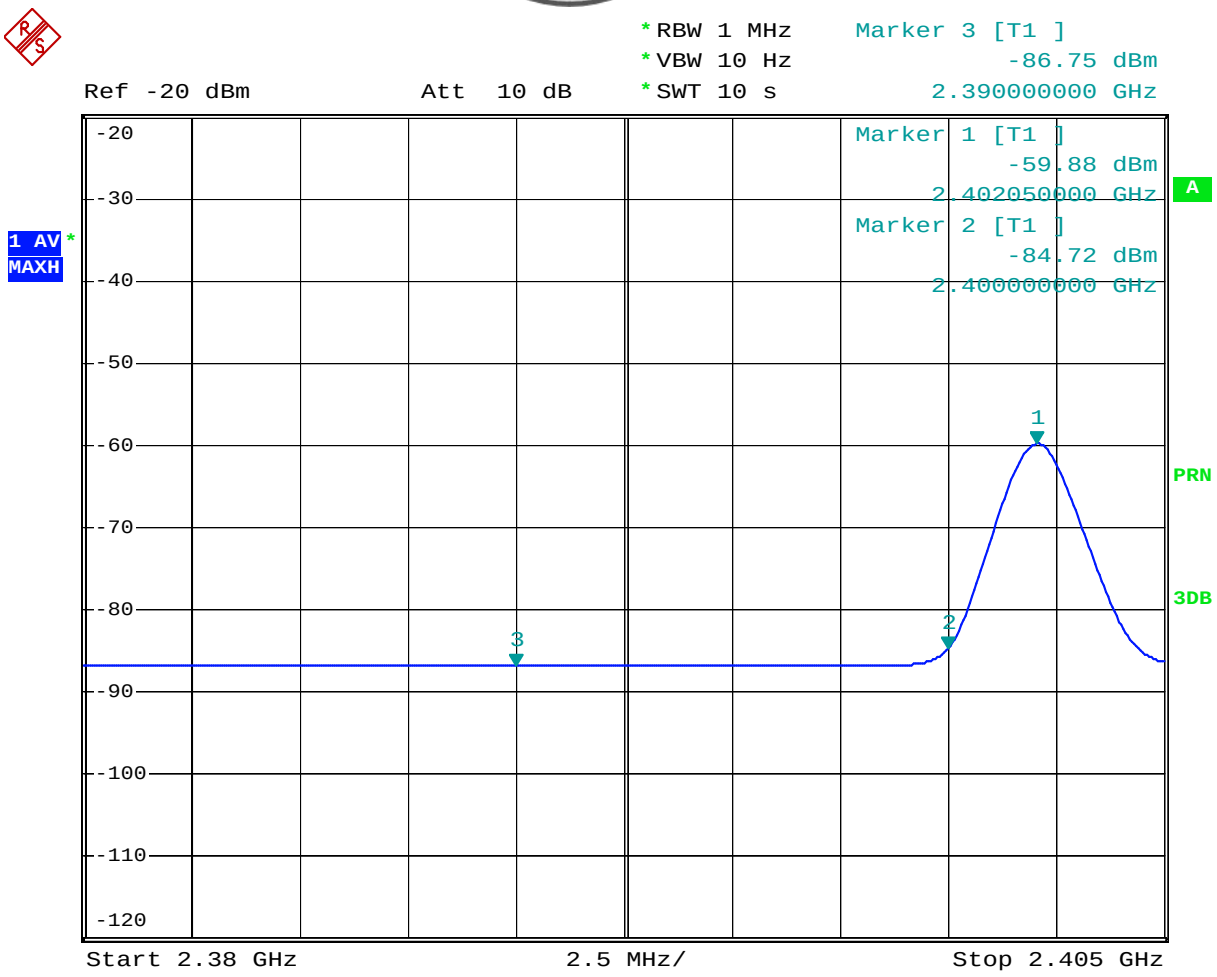
Note (Peak)

The band edge emission plot on the following first page shows 18.24dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of low channel is 77.4dBuV/m (Peak), so the maximum field strength in restrict band is 77.4-18.24=59.16dBuV/m which is under 74dBuV/m limit.

Note (Average):

The band edge emission plot on the following second page shows 26.87.dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 77.2dBuV/m (Average), so the maximum field strength in restrict band is 77.2-26.87=50.33dBuV/m which is under 54dBuV/m limit.





Date: 16.JUN.2007 00:20:17

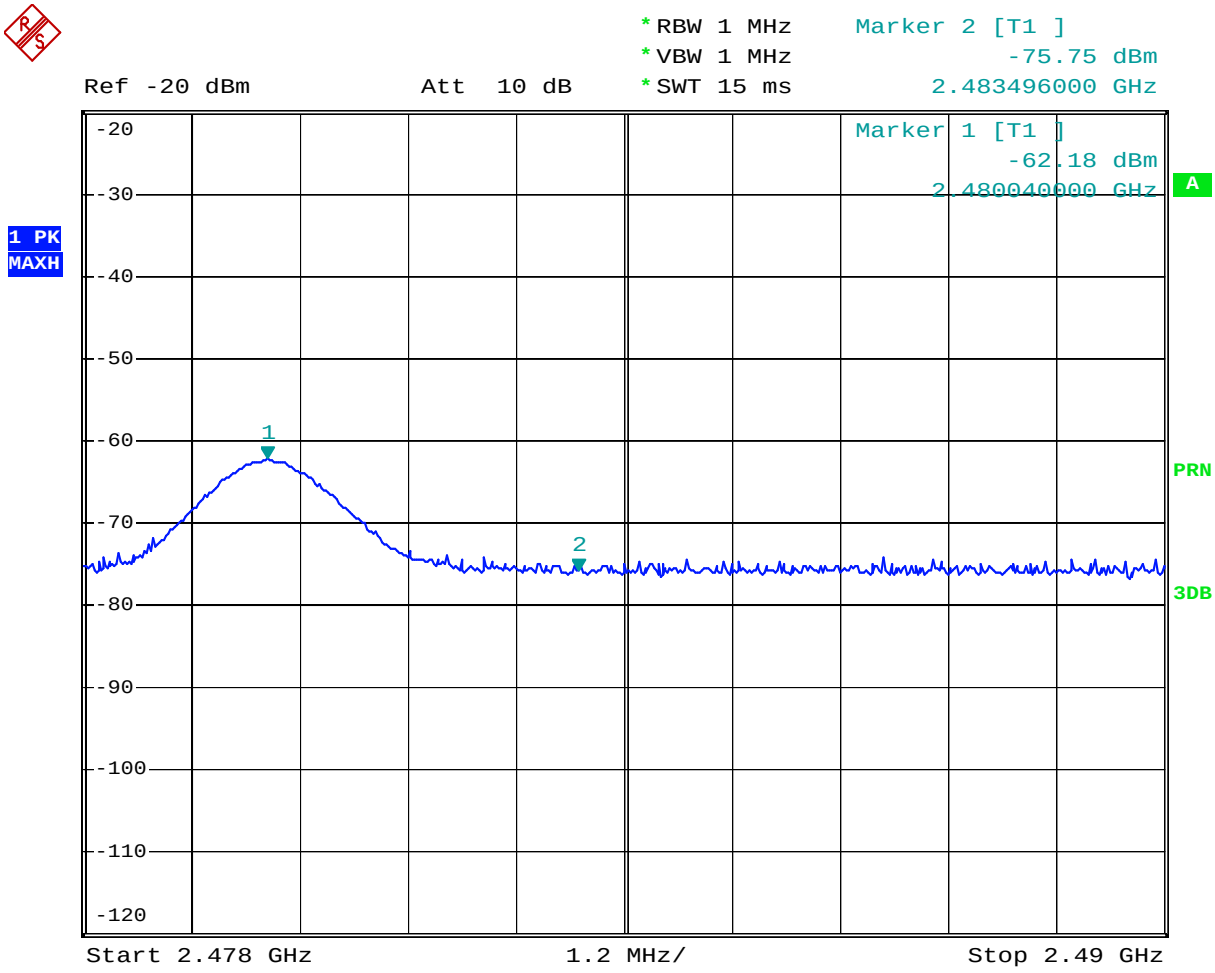
High Channel

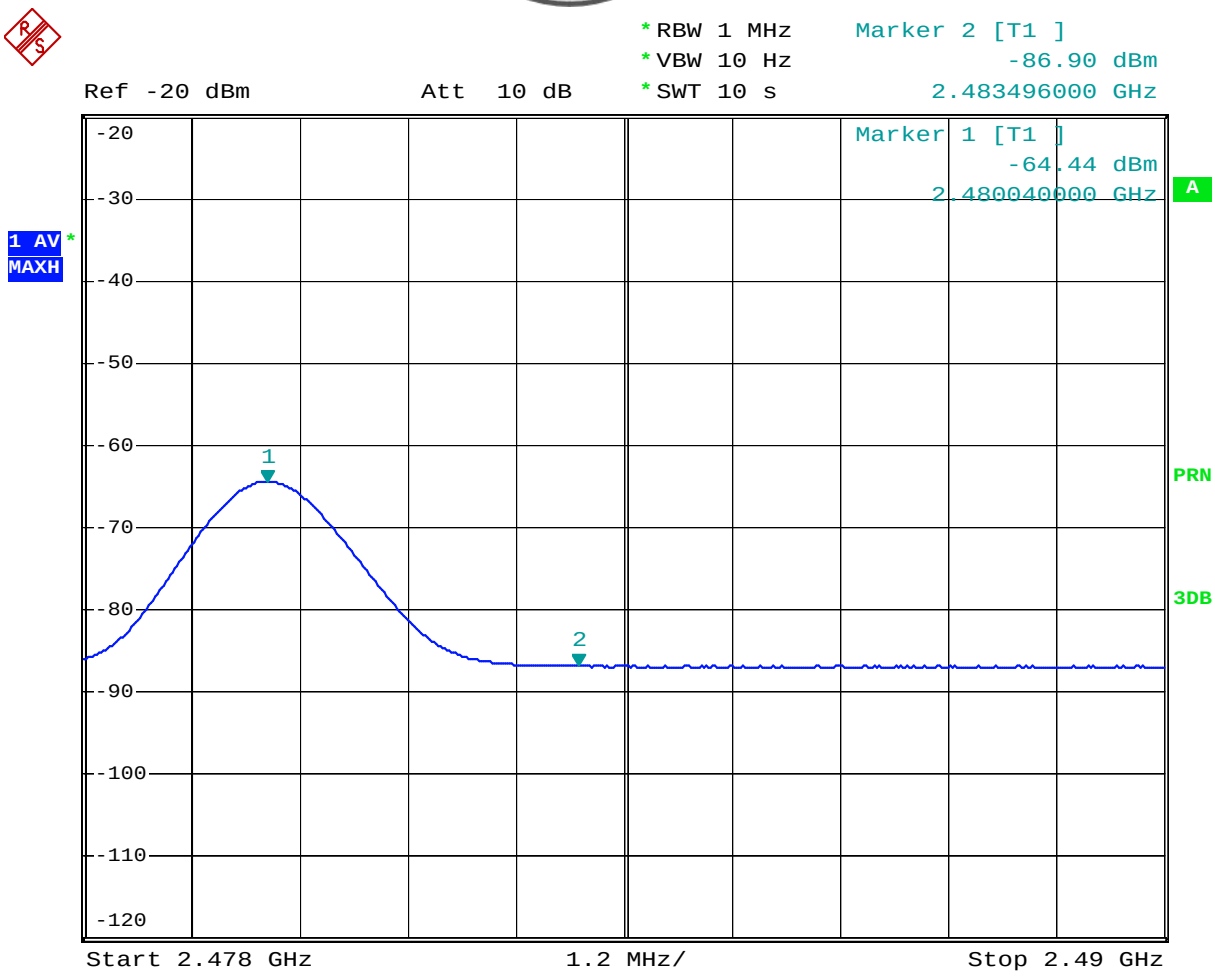
Note (Peak)

The band edge emission plot on the following first page shows 13.57dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 11 is 67.2dBuV/m (Peak), so the maximum field strength in restrict band is67.2-13.57=53.63dBuV/m which is under 74dBuV/m limit.

Note (Average):

The band edge emission plot on the following second page shows 22.46dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of High channel is 56.9dBuV/m (Average), so the maximum field strength in restrict band is 56.9-22.46=34.44dBuV/m which is under 54dBuV/m limit.





14.0 Antenna Requirement

14.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

14.2 Antenna Connected construction

The antenna is chip dielectric antenna. The maximum Gain of this antenna is 2.0dBi

15.0 Maximum Permissible Exposure

Applicable Standard

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

(a) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100000			1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

MPE Calculation Method

E (V/m) = $(30*P*G)^{0.5}/d$ Power Density: Pd (W/m^2) = $E^2/377$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $(30*P*G) / (377*d^2)$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

Calculated Result and Limit

Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
1.585	-21.03	0.0078886	$2.48742*10^{-6}$	1	Compiles

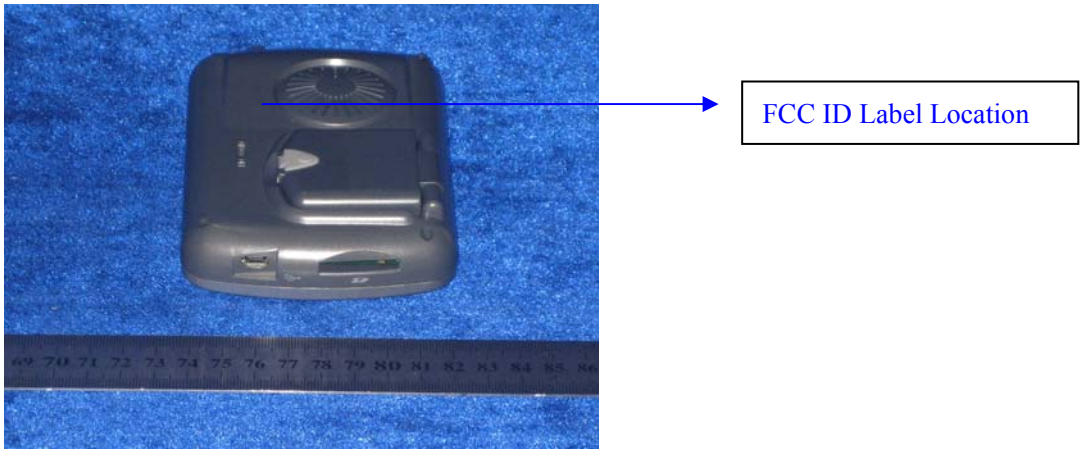
16.0 FCC ID Label

FCC ID: VFFAMIGO-4300B

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



17.0 Photo of testing

17.1 Conducted test View—N/A

17.2 Emission Radiated test View--

17.3 Photo for the EUT

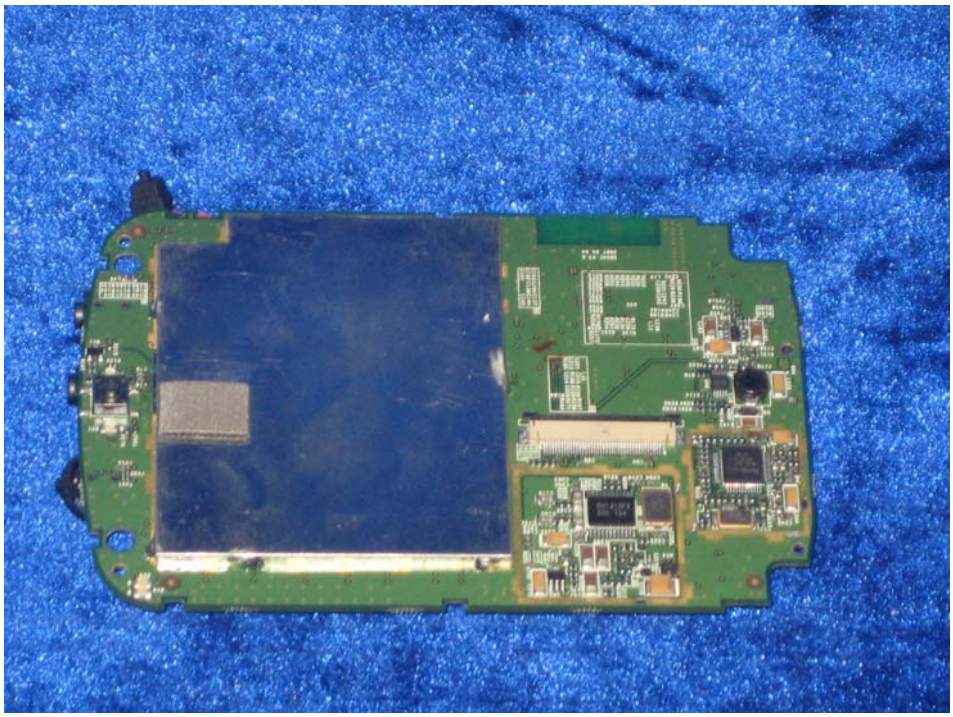
Outside View

17.4 Photo for the EUT

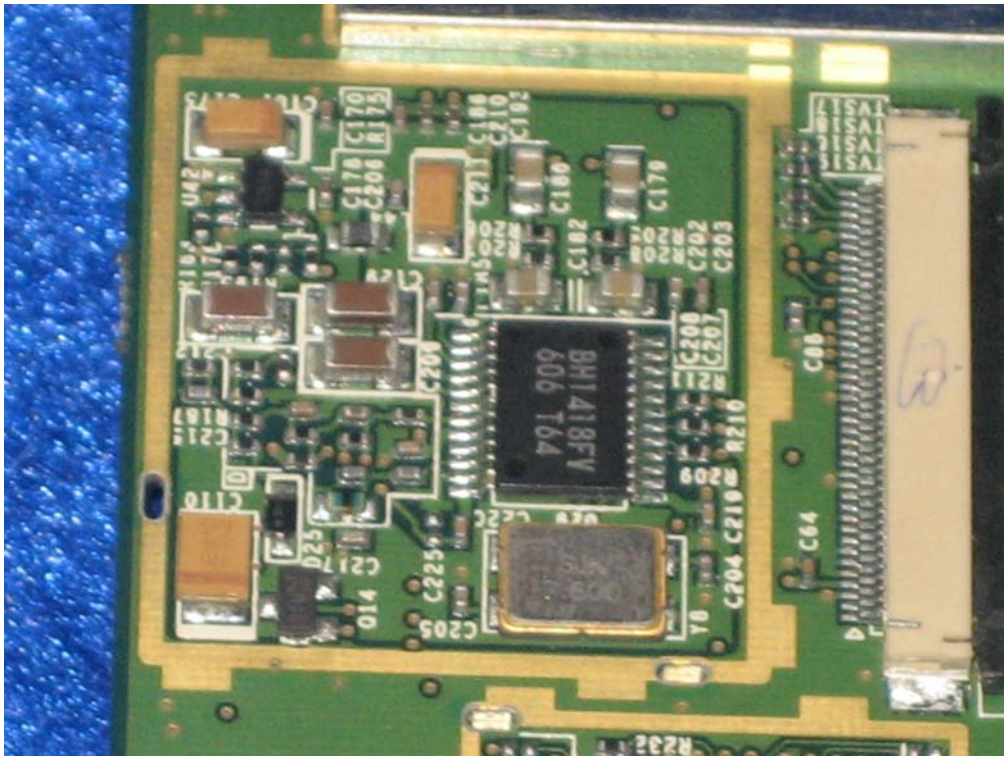
Inside View

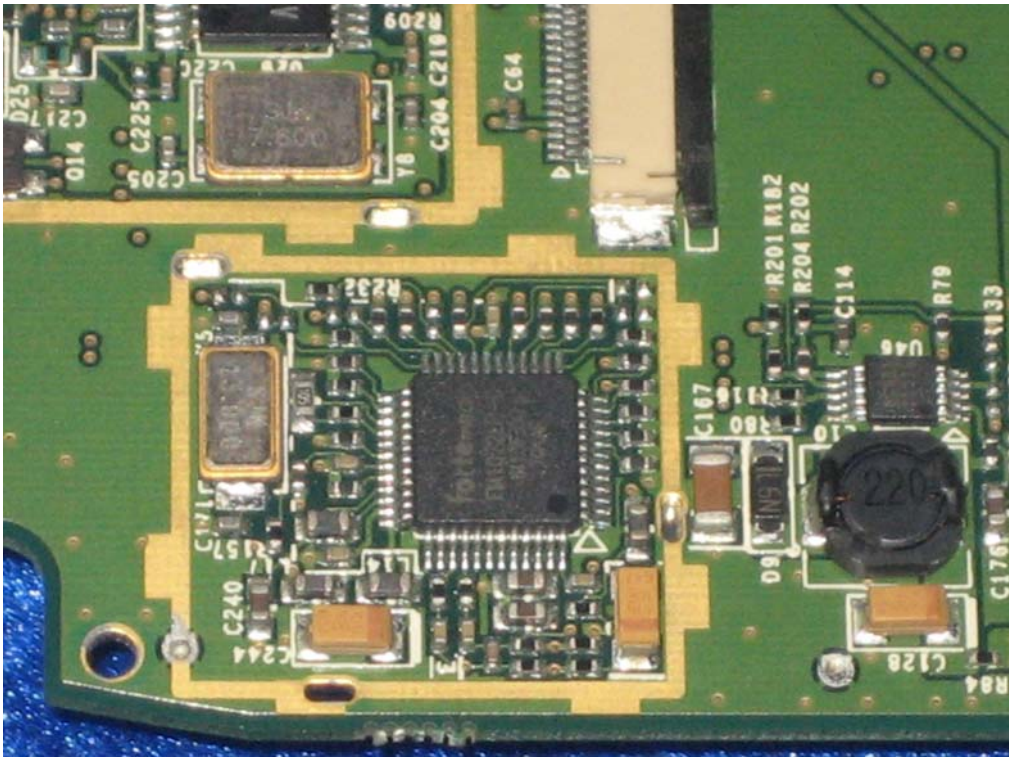
Inside View

Inside View



Inside View





Appendix

End of the report