FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Notebook Computer

Model: VED8900

Trade Name: iDOT

Issued to

iDOT COMPUTERS INC.
8F, No 529, Chung-Cheng Rd., Hsin-Tien City,
Taipei County 23148, Taiwan (R.O.C.)

Issued by

Compliance Certification Services Inc.
No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,
Taoyuan Hsien, (338) Taiwan, R.O.C.
TEL: 886-3-324-0332
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Testing Laboratory
0363

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1. TEST RESULT CERTIFICATION

Applicant: iDOT COMPUTERS INC.
8F, No 529, Chung-Cheng Rd., Hsin-Tien City,
Taipei County 23148, Taiwan (R.O.C.)

Equipment Under Test: Notebook Computer

Trade Name: iDOT

Model: VED8900

Date of Test: August 4 ~ 7, 2008

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Robert Huang
Section Manager
Compliance Certification Services Inc.

Reviewed by:

Julia Wei
Senior Specialist
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	Notebook Computer
Trade Name	IDOT
Model Number	VED8900
Model Name Discrepancy	N/A
Power Supply	Li Shin / 0335A1965 I/P: 100-240VAC, 50-60Hz, 1.7A O/P: 19VDC, 3.42A
Frequency Range	2400 MHz ~ 2483.5 MHz
Transmit Power	Bluetooth: 6.47 dBm (4.436mW)
Modulation Technique	FHSS, GFSK, π/4-DQPSK, 8DPSK
Number of Channels	79 Channels
Antenna Specification	1.68dBi
Antenna Designation	PIFA Antenna

Remark:

1. *The sample selected for test was production product and was provided by manufacturer.*
2. *This submittal(s) (test report) is intended for FCC ID: **WPQ-VED8900A** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.*

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 - 13.41	322 - 335.4		

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.5 DESCRIPTION OF TEST MODES

The EUT (model: VED8900) had been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting mode was programmed.

During the preliminary test, GFSK, π/4-QPSK & 8DPSK with DH1 were pre-tested and found that 8DPSK emits the highest output power. Then the tests were carried on with DH1 compare to DH3 & DH5 and found that 8DPSK with DH5 emit the highest output power, and therefore had been tested under operating condition.

Following channels were selected for the for radiated emission testing only as listed below:

Tested Channel	Modulation Type	Packet Type	Date Rate
Low, Mid, High	GFSK	DH 5	1
Low, Mid, High	8DPSK	DH 5	3

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☐ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☒ No. 81-1, Lane 210, Pa-De 2nd Rd., Luchu Hsiang, Taoyuan Shien, (338) Taiwan, R.O.C.
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200600-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (Registration no: 93105 and 90471).

5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001	ACCREDITED No. 0824-01
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	93105, 90471
Japan	VCCI	3/10 meter Open Area Test Sites and conducted test sites to perform radiated/conducted measurements	R-2541/2798/725/1868 C-402/747/912
Taiwan	TAF	EN 300 328-1, EN 300 328-2, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3	Testing Laboratory 0363
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	SL2-IS-E-0014 / IN-E-0014 /A1-E-0014 /R1-E-0014 /R2-E-0014 /L1-E-0014
Canada	Industry Canada	RSS212, Issue 1	IC 2324C-3 IC 2324C-5

Note: *No part of this report may be used to claim or imply product endorsement by A2LA, TAF or other government agency.*

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
	N/A						

****No any support equipment during the test.**

For Powerline Measurement

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Monitor	SAMSUNG	959NF	AQ19H2RT706121B	FCC DoC	Shielded, 1.8m with two cores	Unshielded, 1.8m
2.	USB Mouse	HP	MO19UCA	020440953	FCC DoC	Shielded, 1.8m	N/A
3.	USB 2.0 External HDD	TeraSys	F12-U	A0100214-43b0005	FCC DoC	Shielded, 1.8m	N/A
4.	USB 2.0 External HDD	TeraSys	F12-U	A0100214-43b0007	FCC DoC	Shielded, 1.8m	N/A
5.	Multimedia Headset	CJC	CJC-5258MV	0507106322	FCC DoC	Unshielded, 1.8m	N/A
6.	Notebook PC (Remote)	IBM	1706-A78	LV-L1870 06/09	FCC DoC	LAN Cable: Unshielded, 10m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m

Remark: *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

7. FCC PART 15.247 REQUIREMENTS

7.1 PEAK POWER

LIMIT

According to §15.247, the maximum peak output power of the intentional radiator shall not exceed the following:

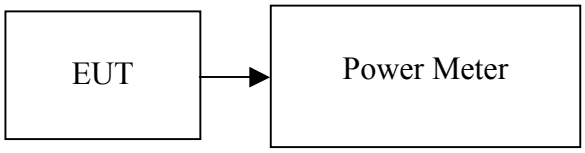
1. According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping 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.
2. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt.
3. 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.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Agilent	E4416A	GB41291611	04/06/2009
Power Sensor	Agilent	E9327A	US40441097	06/19/2009

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the peak power detection.

TEST RESULTS

No non-compliance noted

TEST DATA

GFSK

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Test Result
Low	2402	5.16	0.003281	1	PASS
Mid	2441	5.66	0.003681		PASS
High	2480	4.78	0.003006		PASS

8DPSK

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Test Result
Low	2402	4.81	0.003027	1	PASS
Mid	2441	6.47	0.004436		PASS
High	2480	4.28	0.002679		PASS

7.2AVERAGE POWER

LIMIT

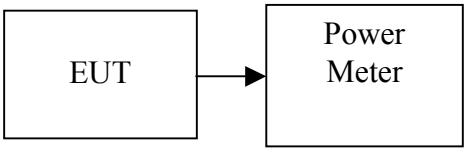
None; for reporting purposes only.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Agilent	E4416A	GB41291611	04/06/2009
Power Sensor	Agilent	E9327A	US40441097	06/19/2009

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the peak power detection.

TEST RESULTS

No non-compliance noted

TEST DATA

GFSK

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2402	4.76	0.002992
Mid	2441	5.15	0.003273
High	2480	4.30	0.002692

8DPSK

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2402	4.40	0.002754
Mid	2441	4.01	0.002518
High	2480	3.14	0.002061

7.3 BAND EDGES MEASUREMENT

LIMIT

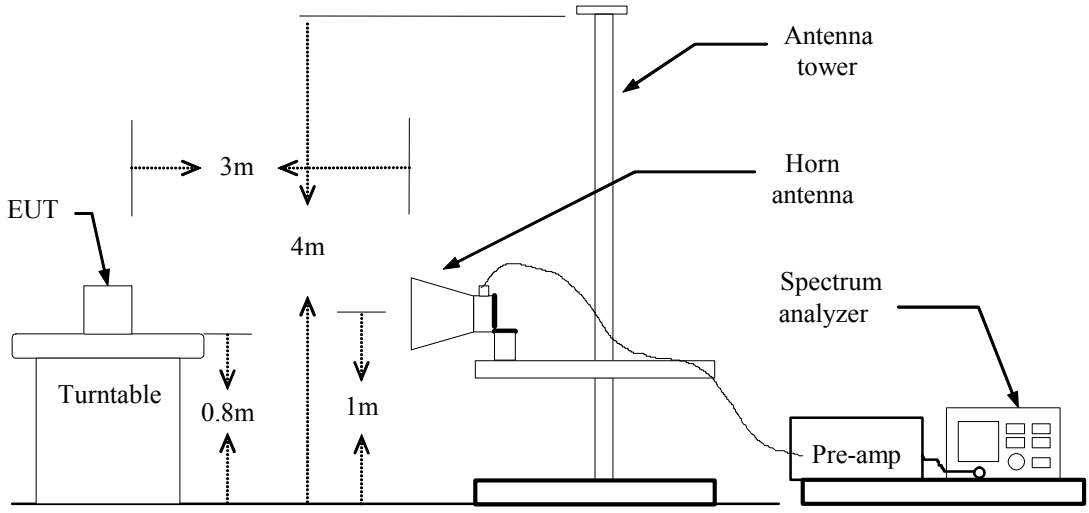
According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSP30	100112	10/14/2008
Horn Antenna	EMCO	3115	00022250	05/08/2009
Turn Table	Chance Most	CM-T003-1	T807-6	N.C.R
Antenna Tower	Chance Most	CM-A003-1	A807-6	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=auto.
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep= auto.
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

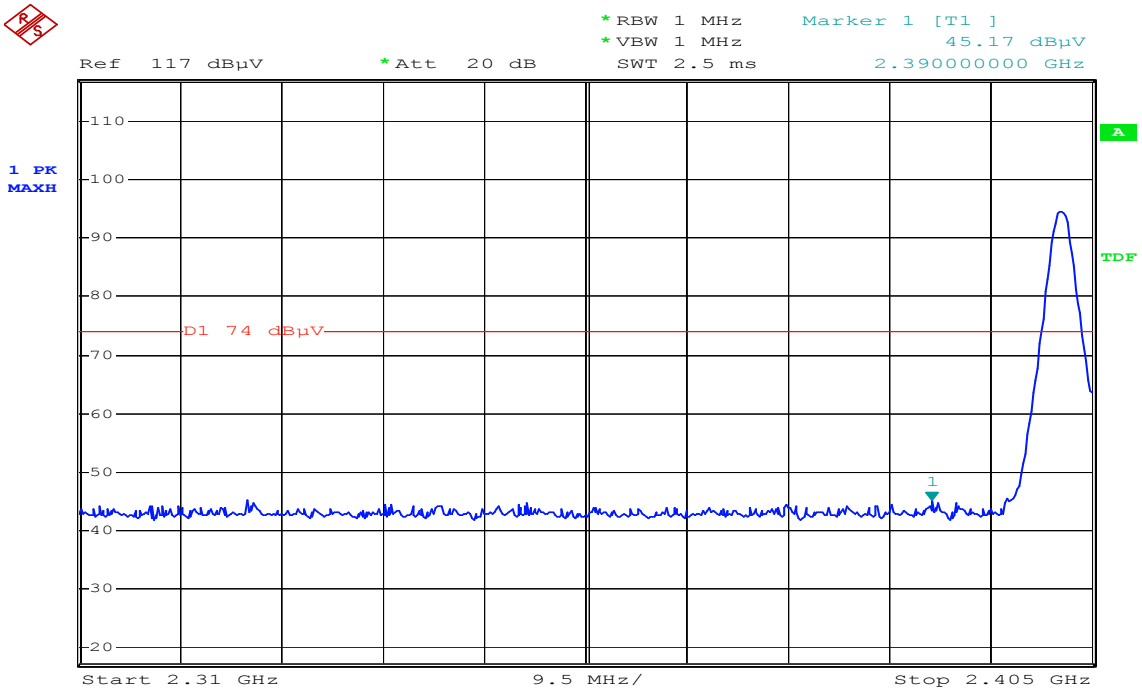
No non-compliance noted

TEST DATA

Refer to attach spectrum analyzer data chart.

Band Edges (Bluetooth GFSK / CH Low)

Detector mode: Peak Polarity: Vertical



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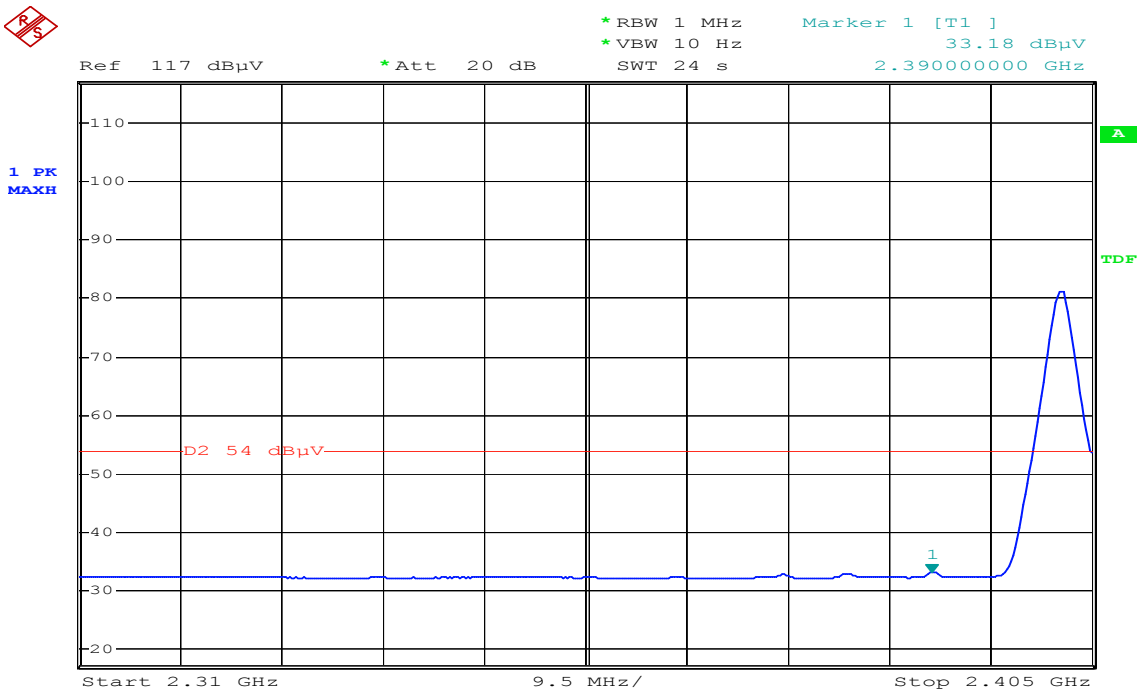
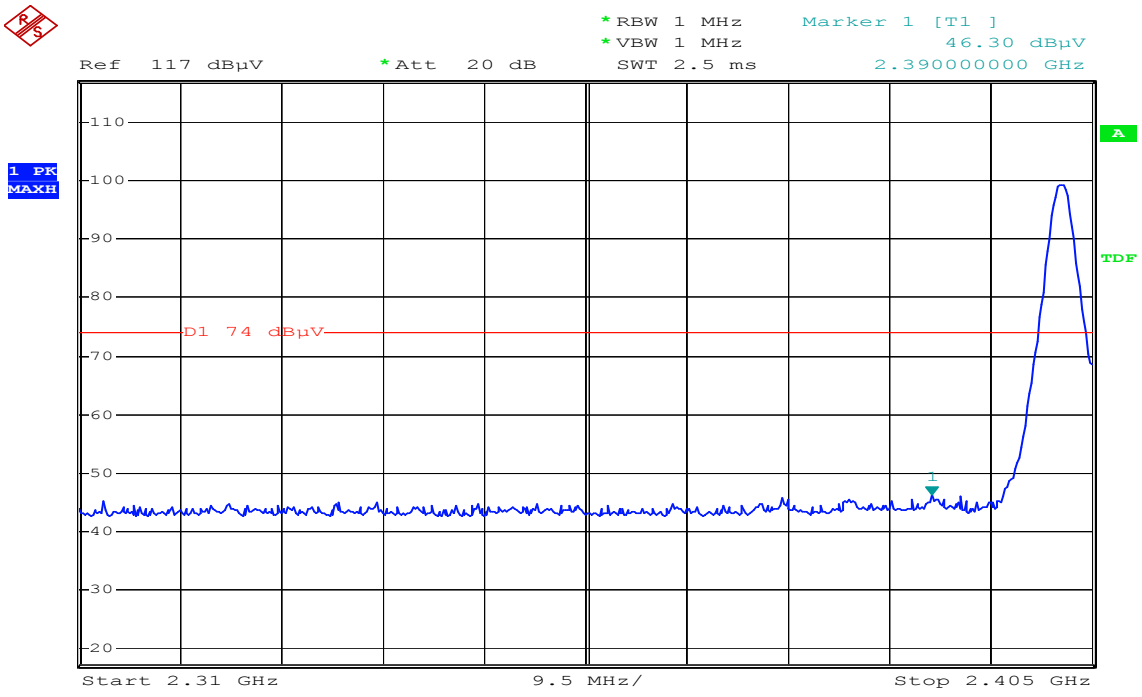
Detector mode: Average Polarity: Vertical



Date: 7.AUG.2008 08:56:31

Detector mode: Peak **Polarity: Horizontal**



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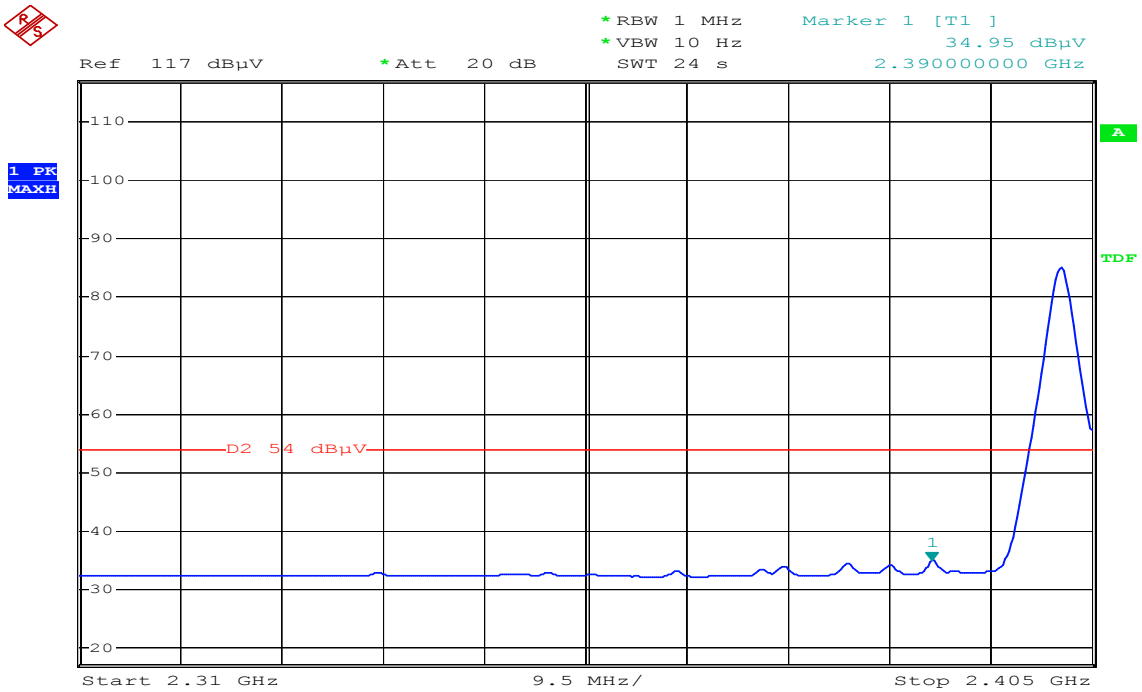
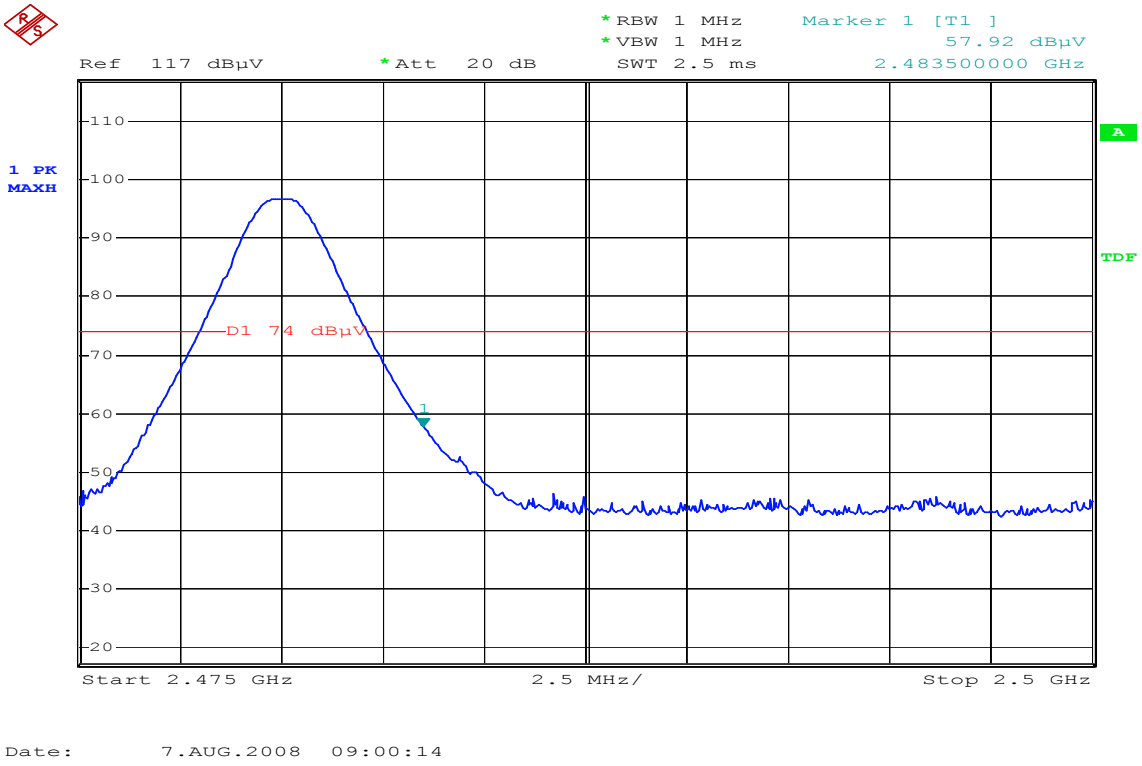
Detector mode: Average **Polarity: Horizontal**



Date: 7.AUG.2008 08:45:01

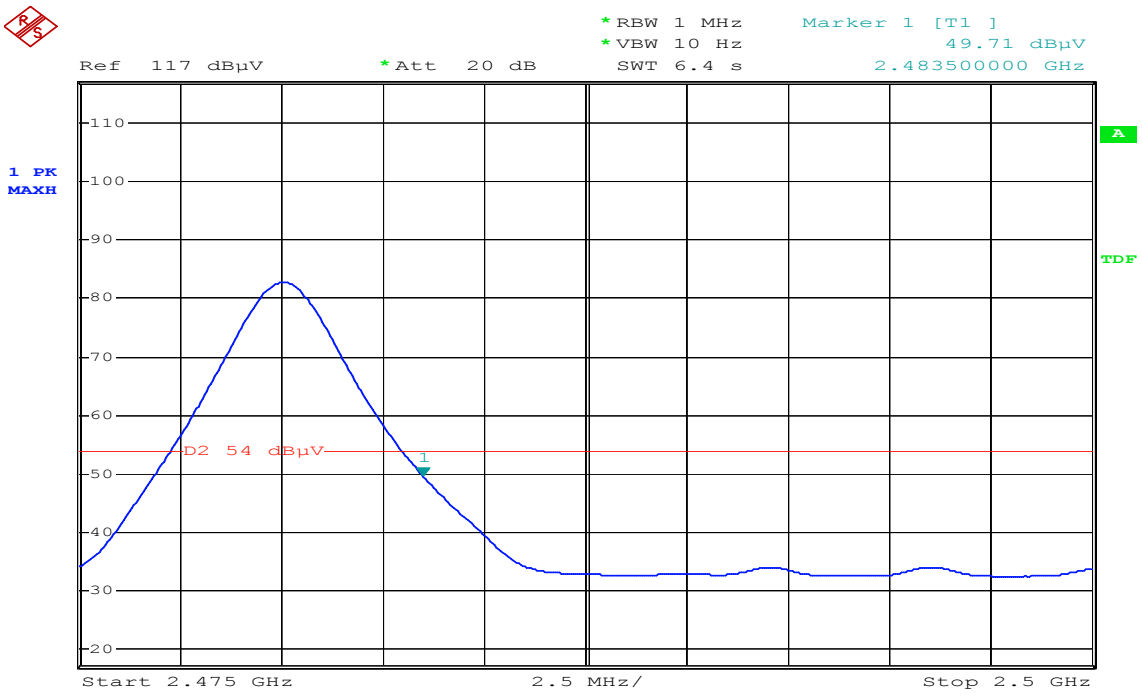
Band Edges (Bluetooth GFSK / CH High)

Detector mode: Peak Polarity: Vertical



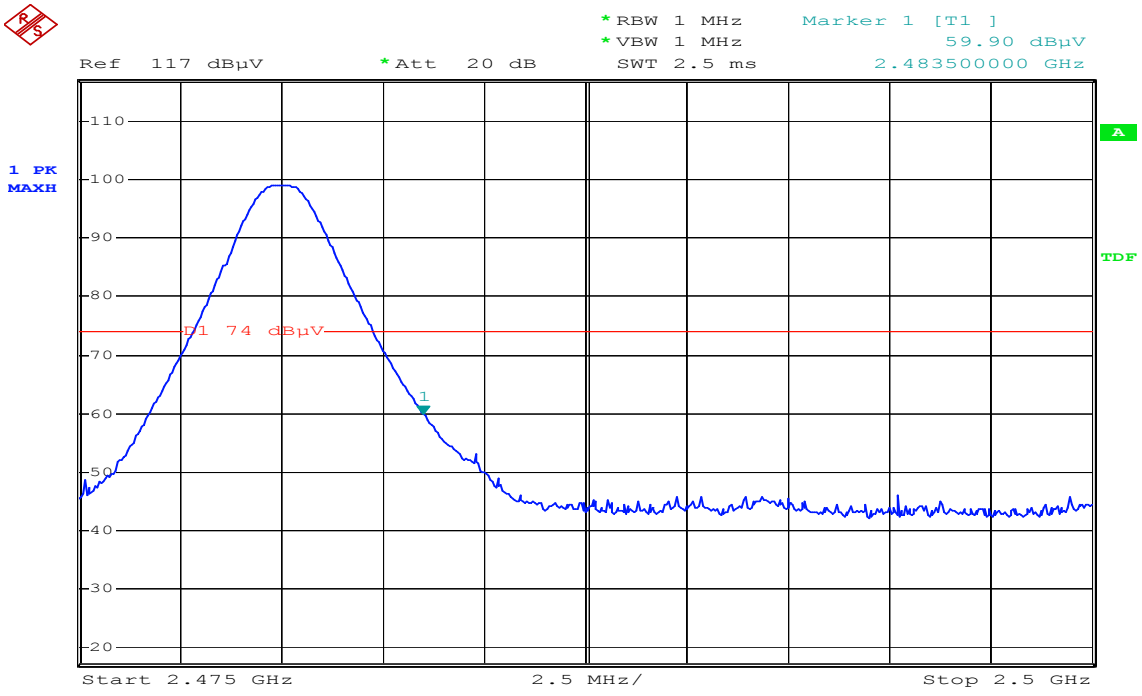
Date: 7.AUG.2008 09:00:14

Detector mode: Average Polarity: Vertical



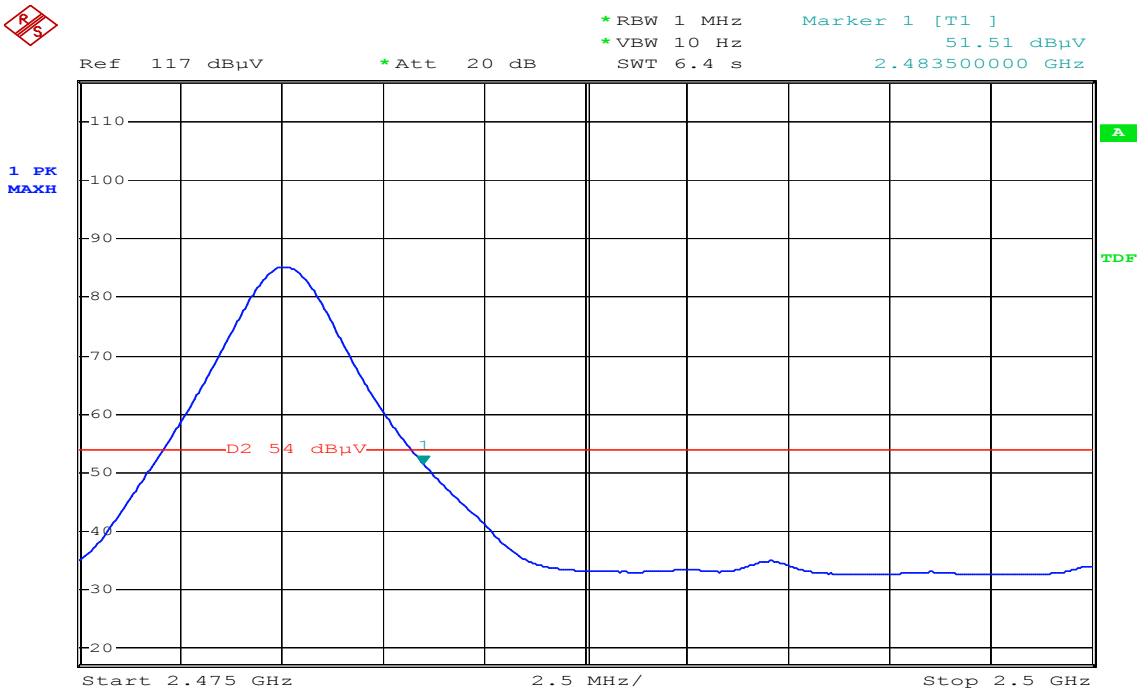
Date: 7.AUG.2008 09:00:43

Detector mode: Peak **Polarity: Horizontal**



Date: 7.AUG.2008 09:08:30

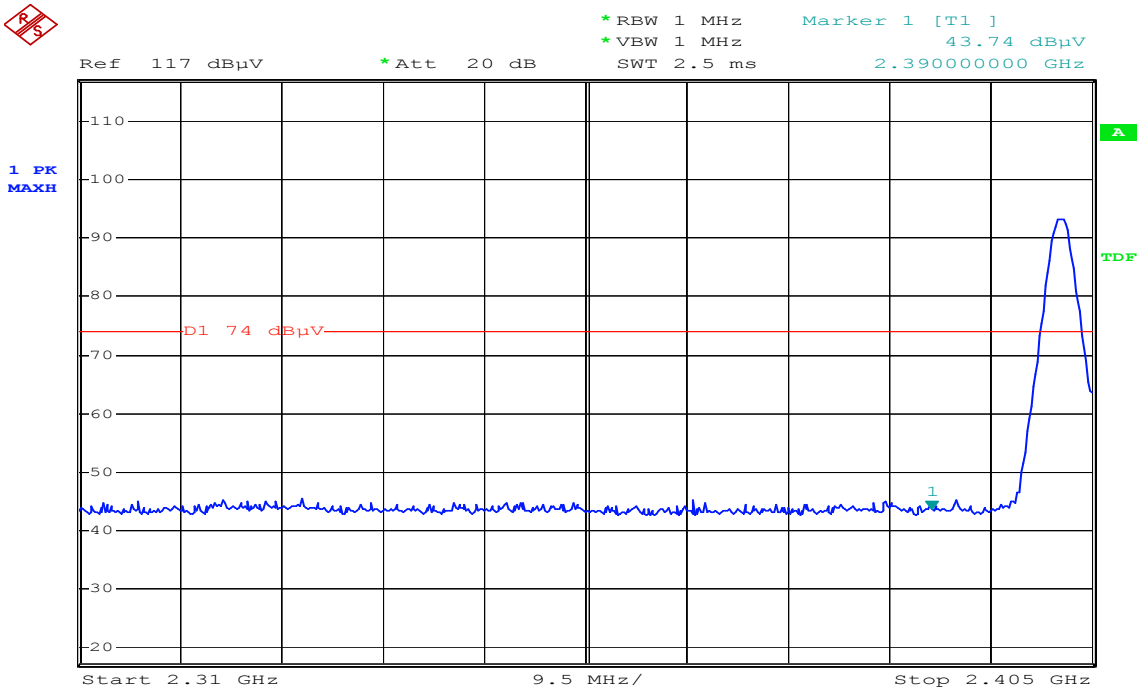
Detector mode: Average **Polarity: Horizontal**



Date: 7.AUG.2008 09:08:59

Band Edges (Bluetooth 8DPSK / CH Low)

Detector mode: Peak Polarity: Vertical



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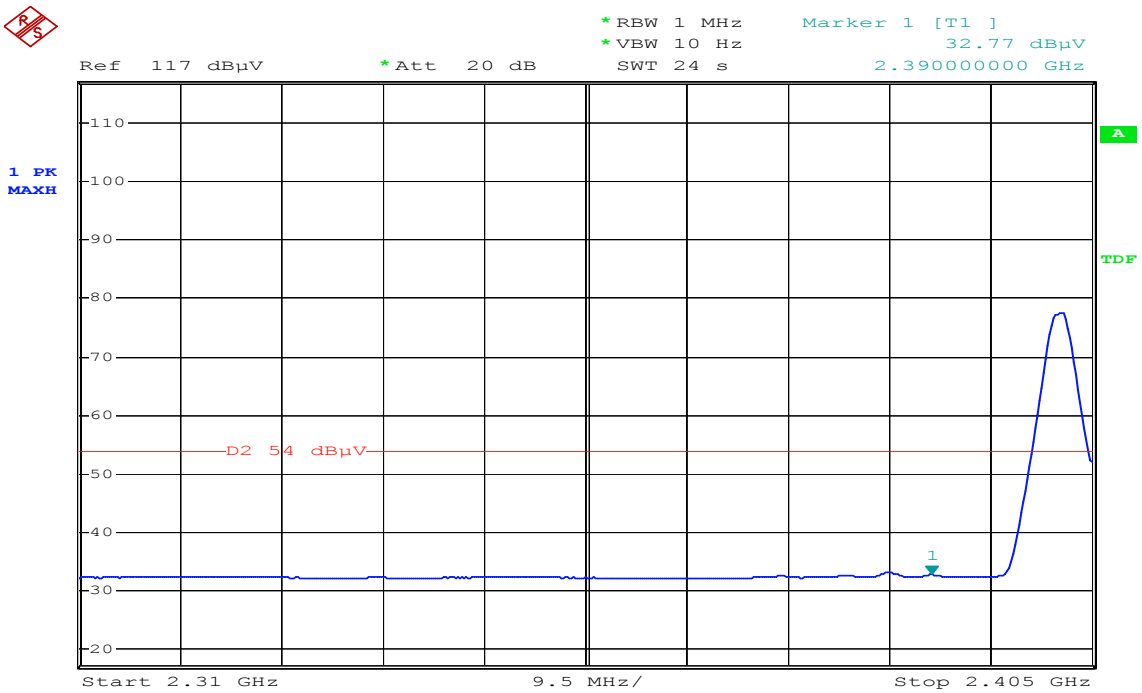
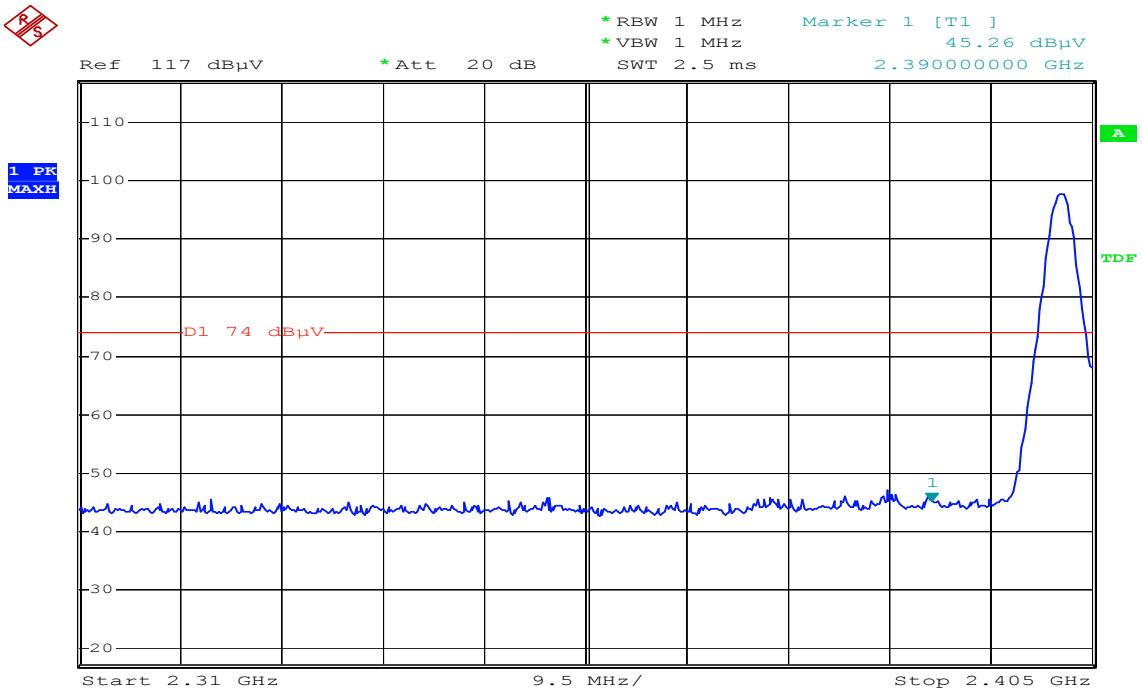
Detector mode: Average Polarity: Vertical



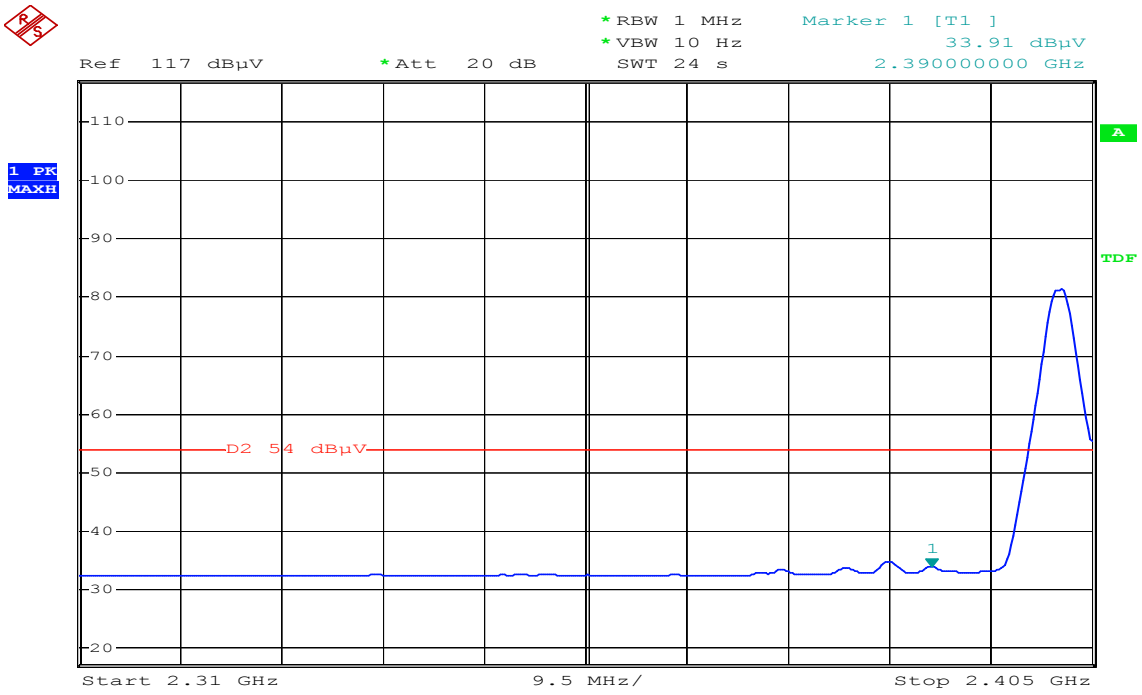
Date: 7.AUG.2008 08:53:07

Detector mode: Peak **Polarity: Horizontal**



Date: 7.AUG.2008 08:49:01

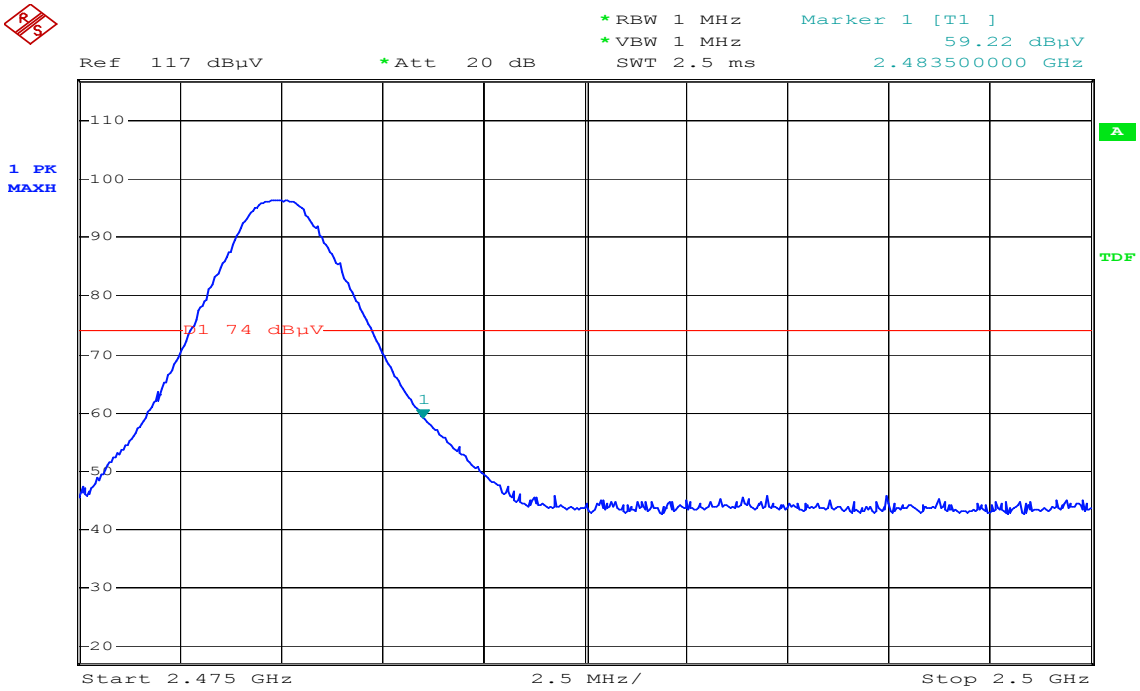
Detector mode: Average **Polarity: Horizontal**



Date: 7.AUG.2008 08:50:00

Band Edges (Bluetooth 8DPSK / CH High)

Detector mode: Peak Polarity: Vertical



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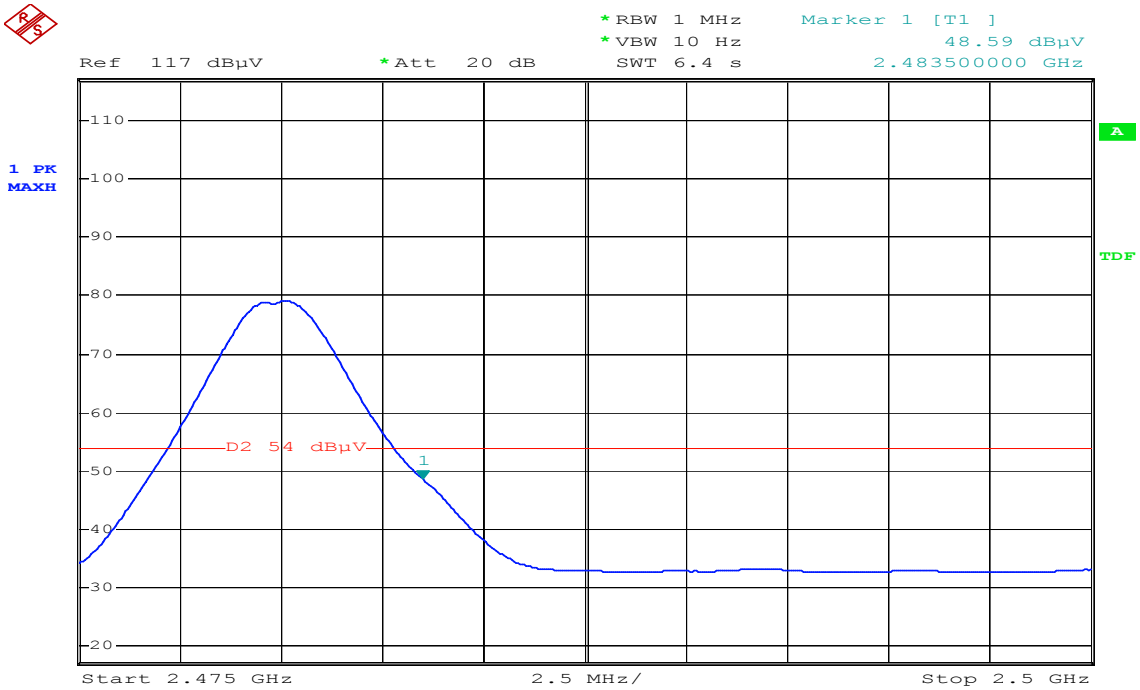
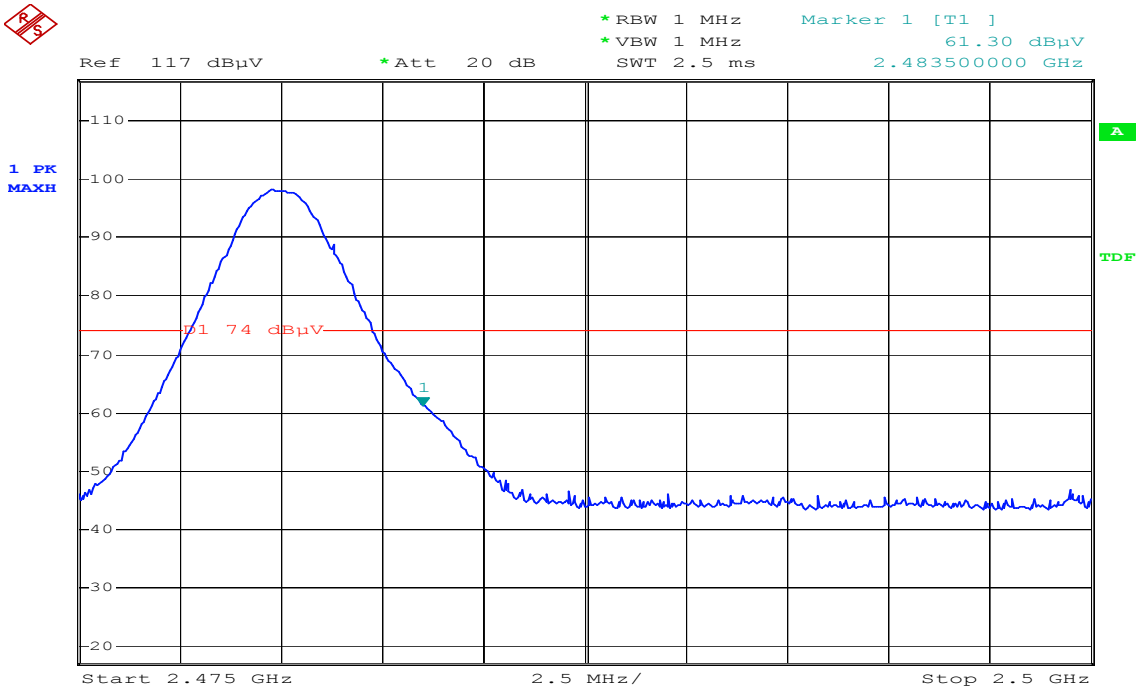


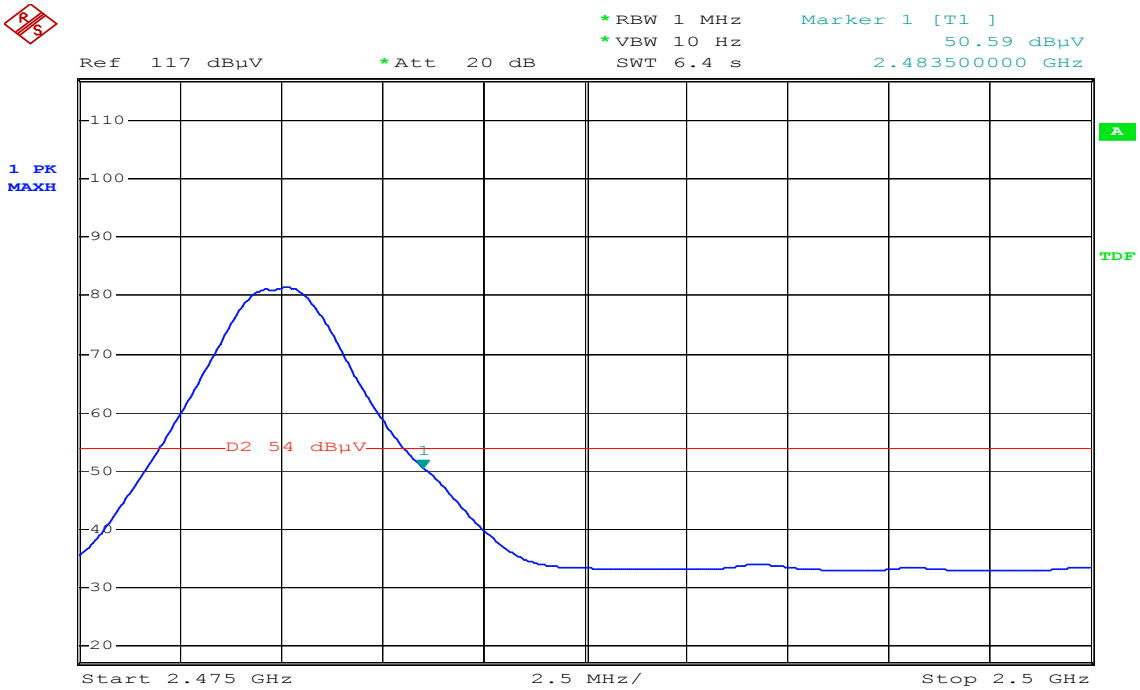
Date: 7.AUG.2008 09:02:49

Detector mode: Peak **Polarity: Horizontal**



Date: 7.AUG.2008 09:06:48

Detector mode: Average **Polarity: Horizontal**



Date: 7.AUG.2008 09:07:12

7.4 FREQUENCY SEPARATION

LIMIT

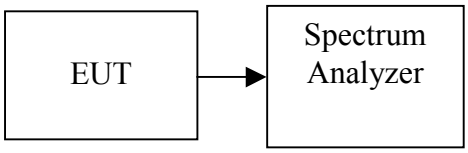
1. According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping 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.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSP30	100112	10/14/2008

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST CONFIGURATION



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = middle of hopping channel.
4. Set the spectrum analyzer as RBW = 30kHz, VBW = 100kHz, Span = 3MHz, Sweep = auto.
5. Max hold, mark 3 peaks of hopping channel and record the 3 peaks frequency.

TEST RESULTS

No non-compliance noted

TEST DATA

GFSK

Channel Separation (MHz)	20dB Bandwith (kHz)	Limit (kHz)	Result
1.00	941	>25	Pass

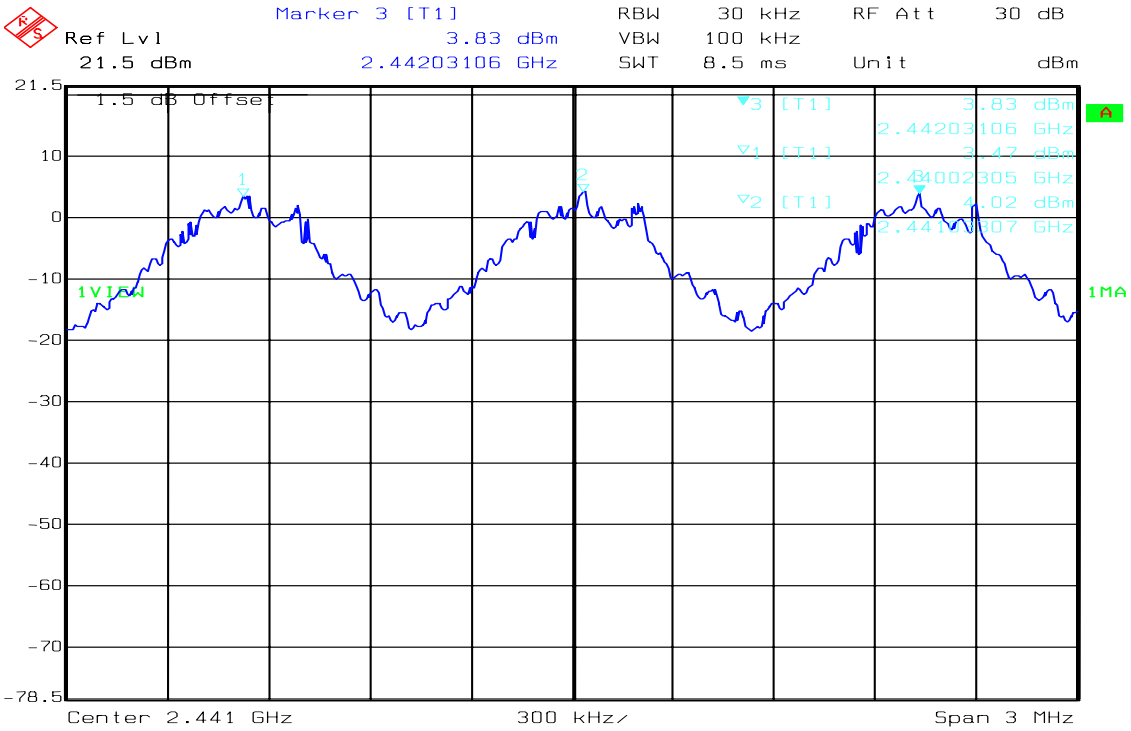
8DPSK

Channel Separation (MHz)	20dB Bandwith (kHz)	Limit (kHz)	Result
1.00	1292.5	>25	Pass

Test Plot

GFSK

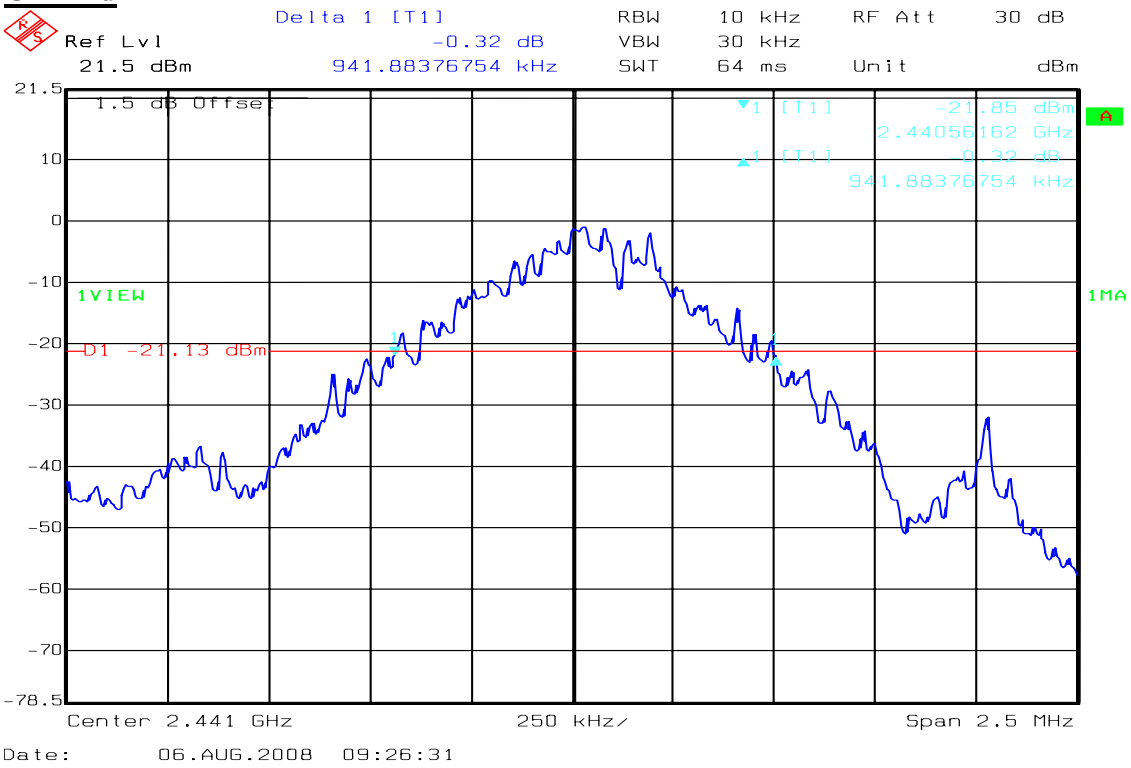
Measurement of Channel Separation



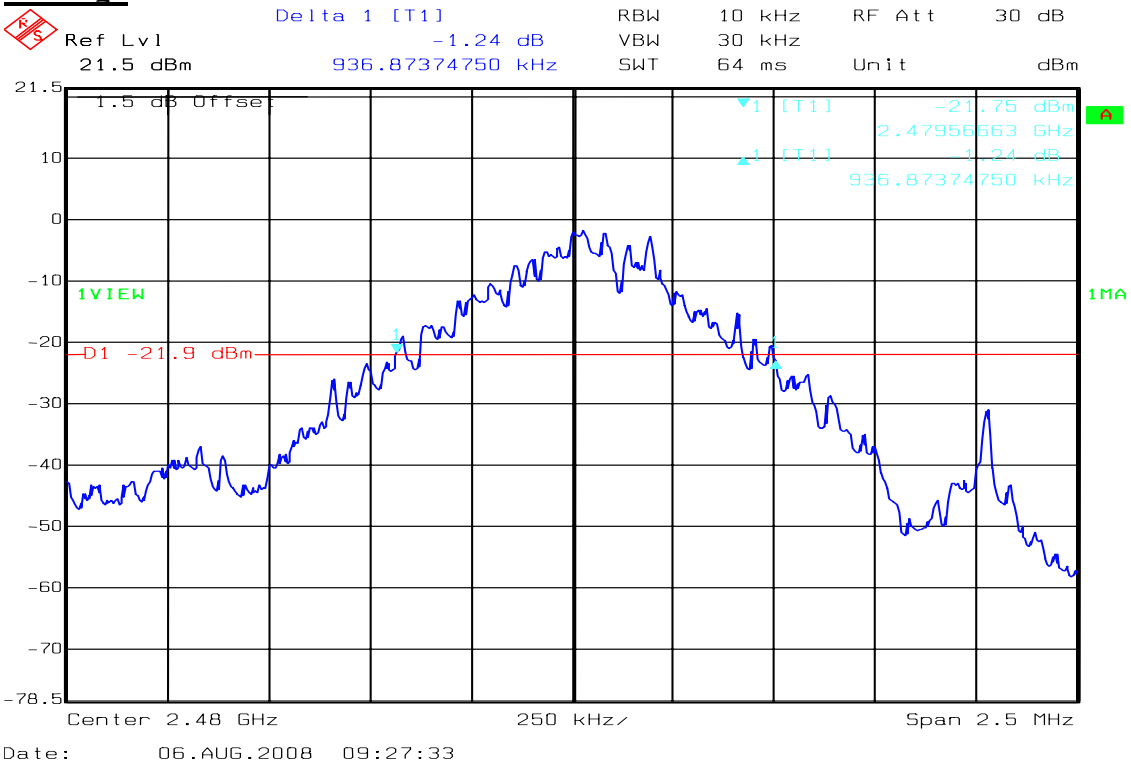
Measurement of 20dB Bandwidth

CH Low

CH Mid

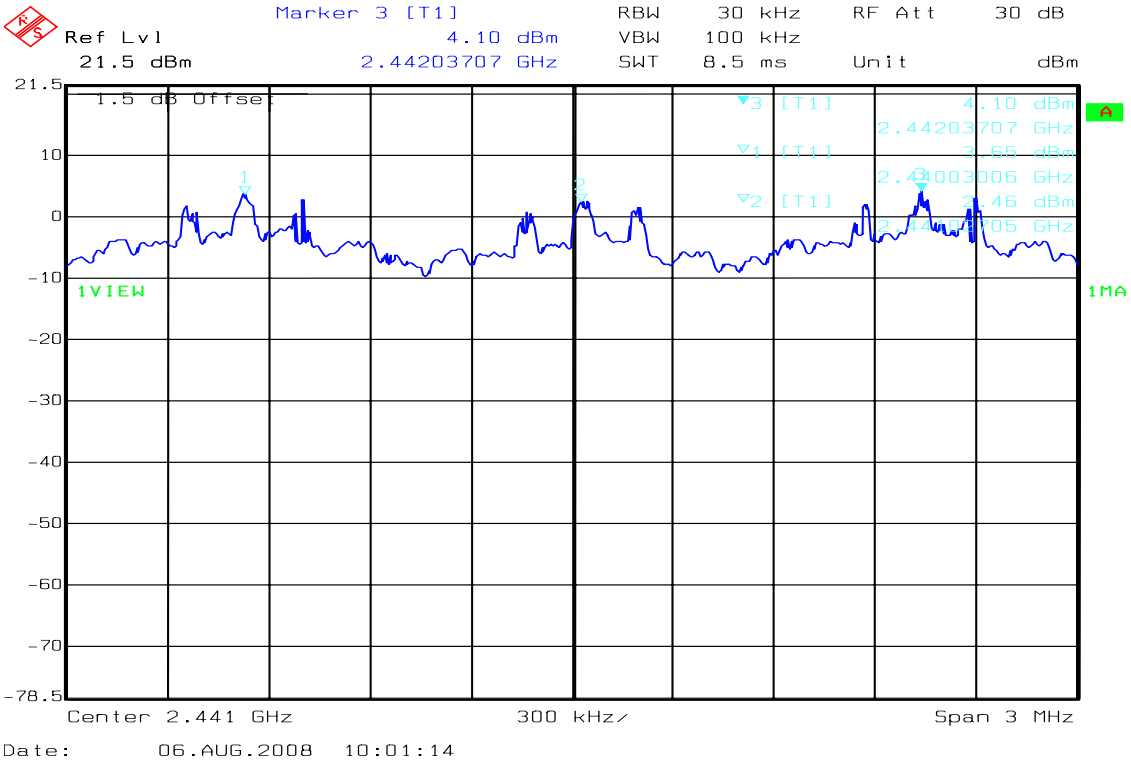


CH High



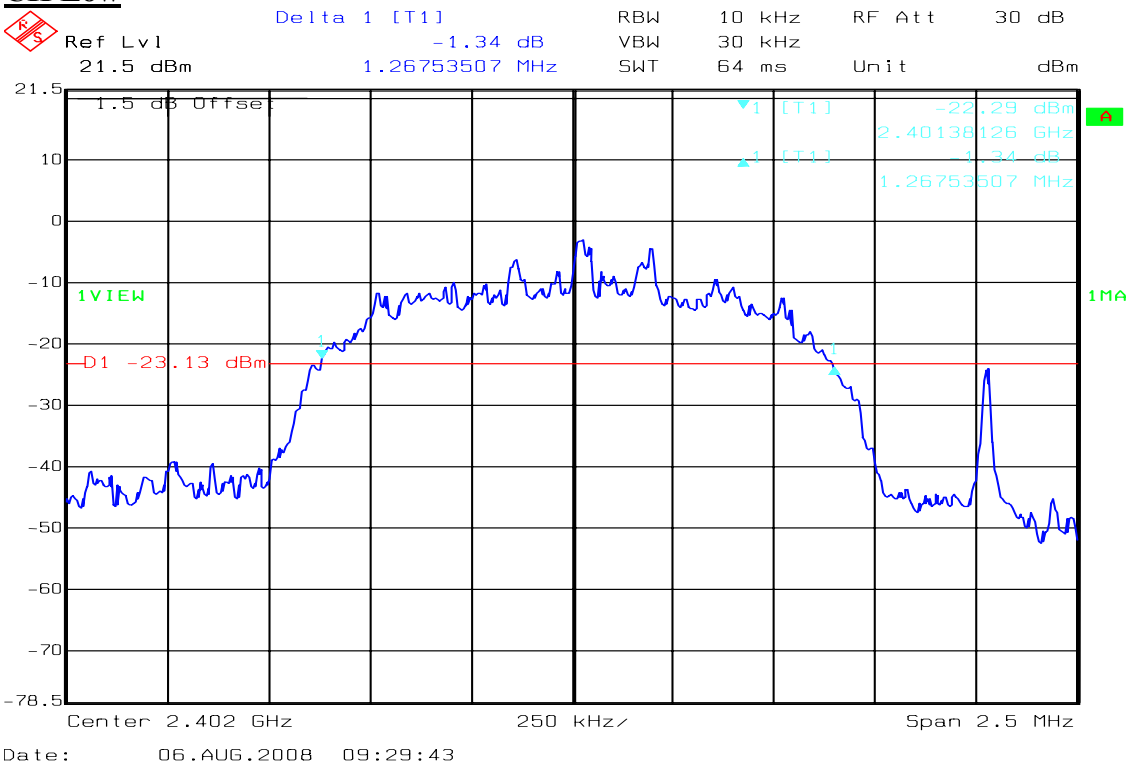
8DPSK

Measurement of Channel Separation

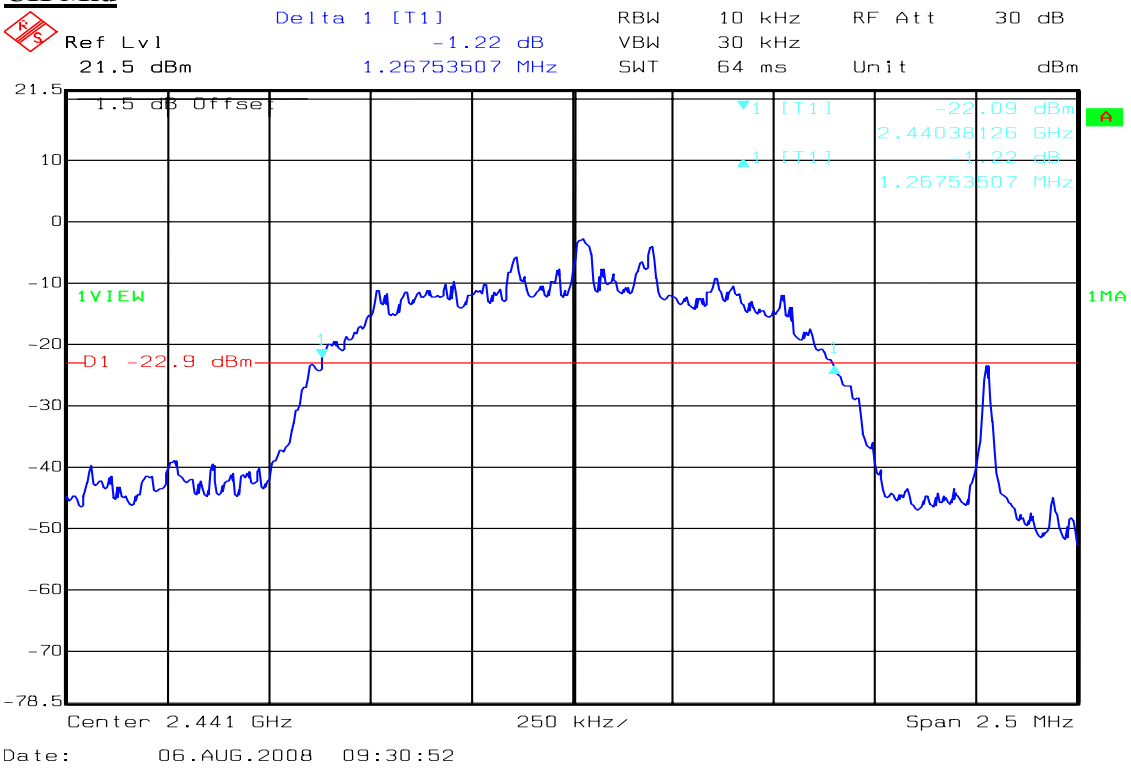


Measurement of 20dB Bandwidth

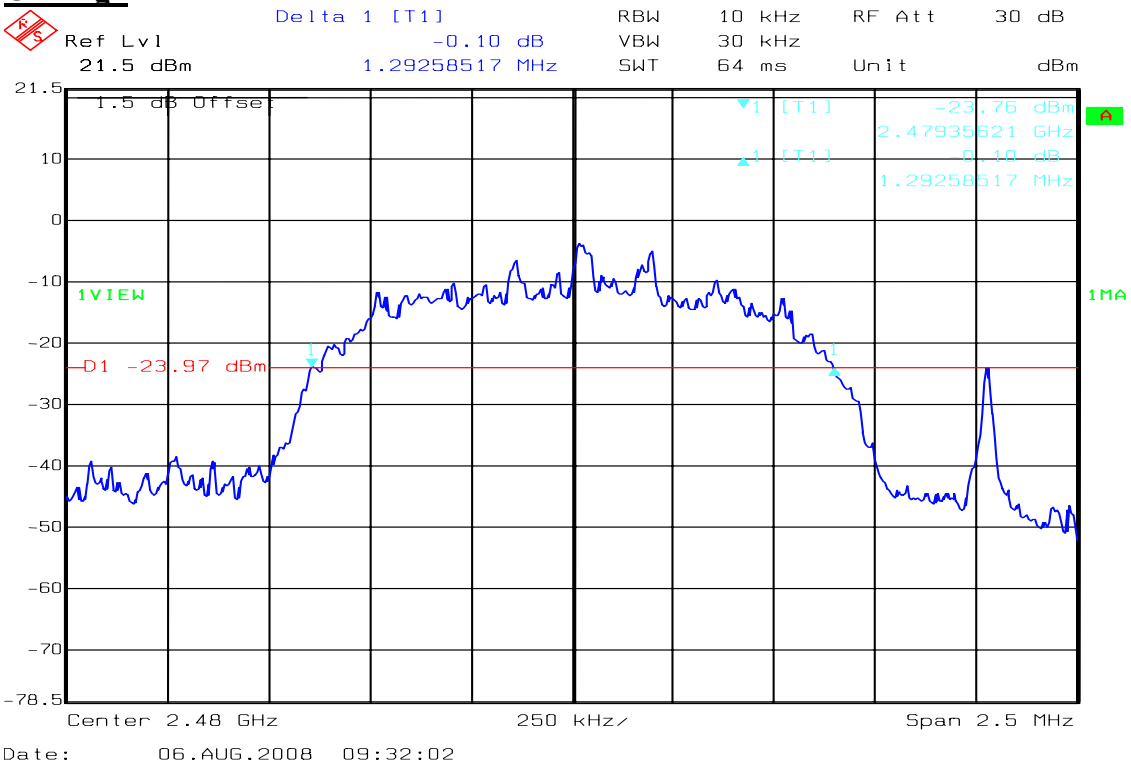
CH Low



CH Mid



CH High



7.5 NUMBER OF HOPPING FREQUENCY

LIMIT

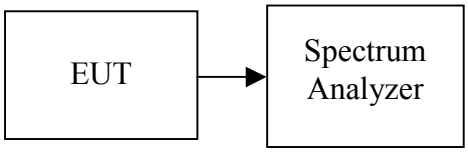
According to §15.247 (a)(1)(iii), Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSP30	100112	10/14/2008

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST CONFIGURATION



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set spectrum analyzer Start=2400MHz, Stop = 2441.5MHz, Sweep = auto and Start=2441.5MHz, Stop = 2483.5MHz, Sweep = auto.
4. Set the spectrum analyzer as RBW, VBW=500kHz.
5. Max hold, view and count how many channel in the band.

TEST RESULTS

No non-compliance noted

TEST DATA

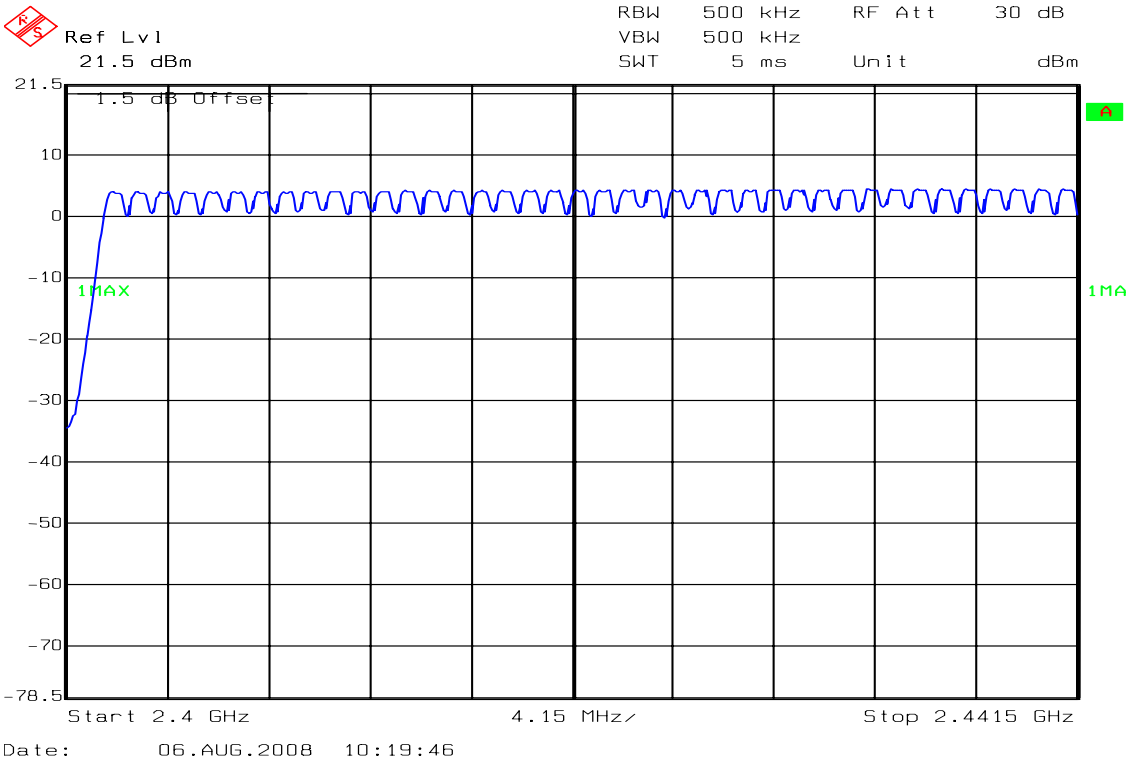
Result (No. of CH)	Limit (No. of CH)	Result
79	>75	PASS

Test Plot

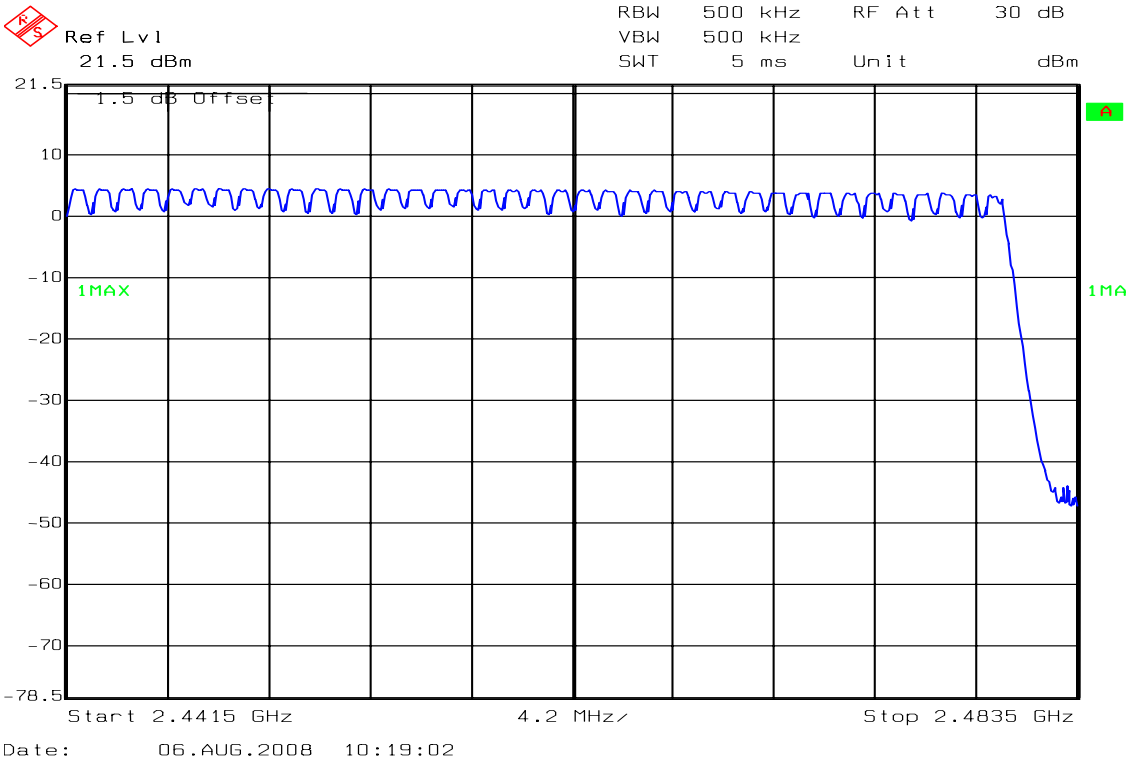
GFSK

Channel Number

2.4 GHz – 2.4415 GHz



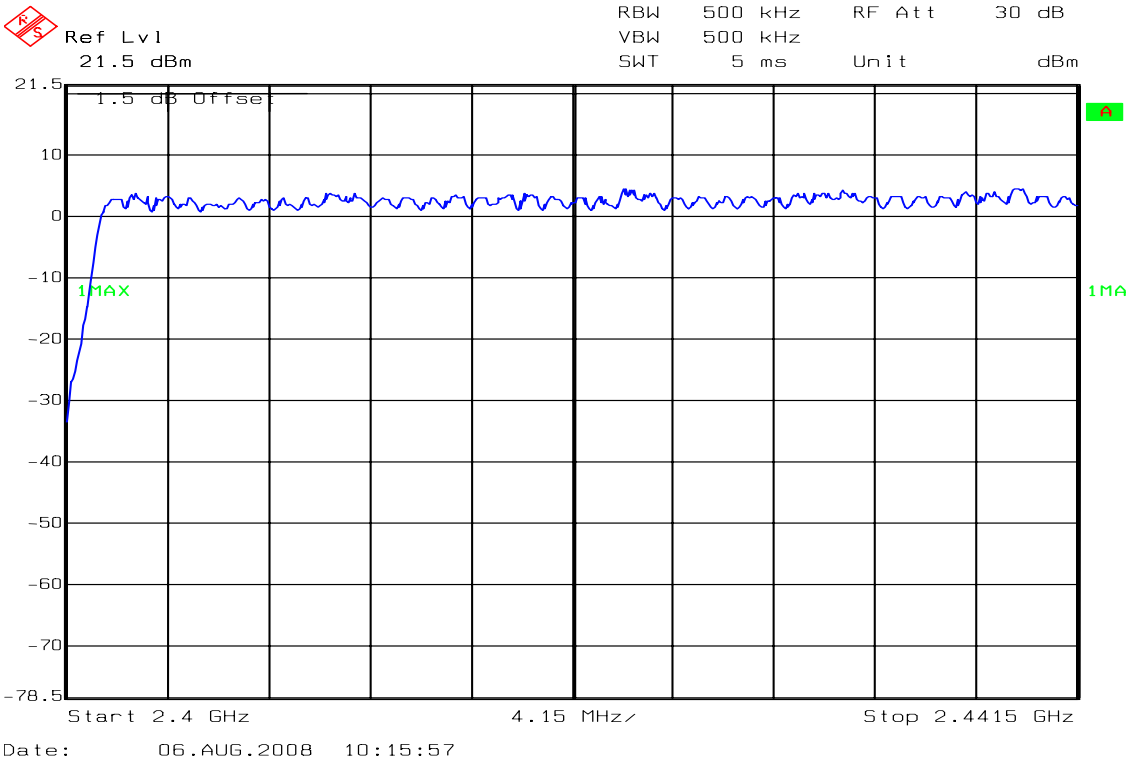
2.4415 GHz – 2.4835 GHz



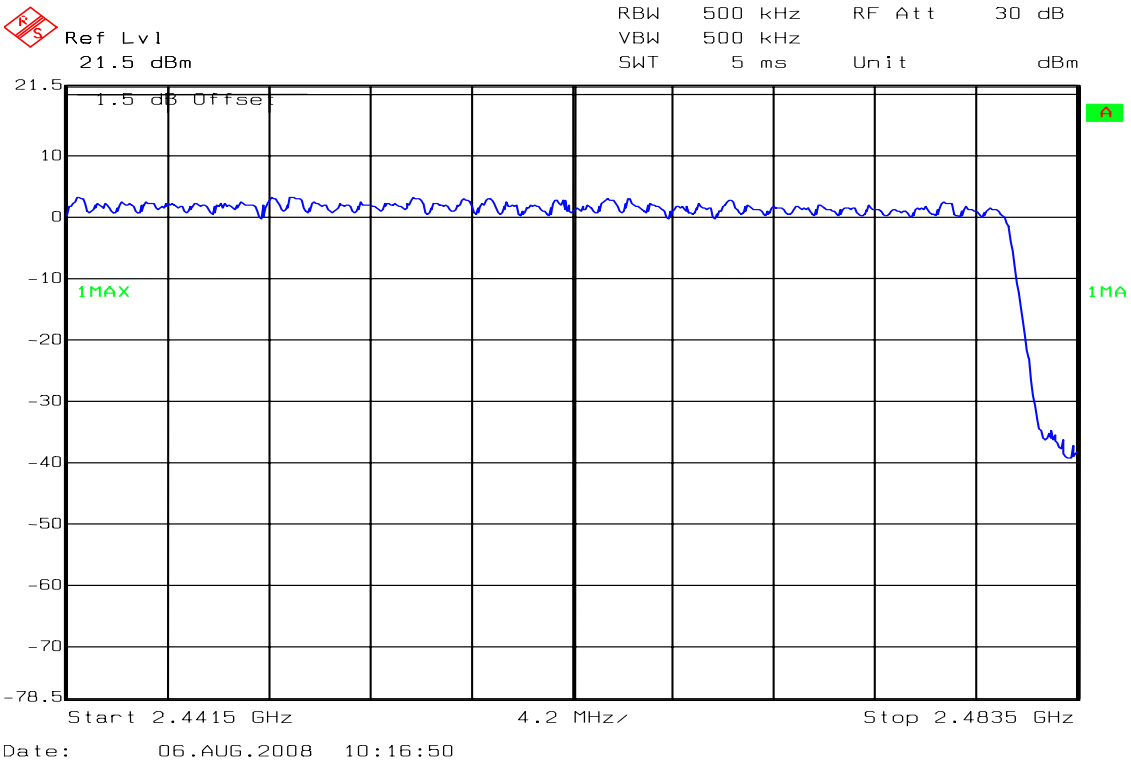
8DPSK

Channel Number

2.4 GHz – 2.4415 GHz



2.4415 GHz – 2.4835 GHz



7.6 TIME OF OCCUPANCY (DWELL TIME)

LIMIT

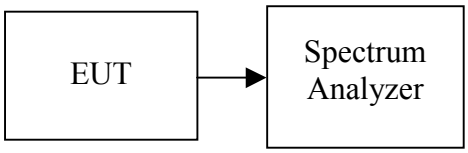
According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSP30	100112	10/14/2008

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST CONFIGURATION



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.
5. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

No non-compliance noted

TEST DATA

GFSK

DH 1

CH Low: 0.4008 * (1600/2)/79 * 31.60 = 128.256 (ms)
CH Mid: 0.4008 * (1600/2)/79 * 31.60 = 128.256 (ms)
CH High: 0.4008 * (1600/2)/79 * 31.60 = 128.256 (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	0.4008	128.256	31.60	400.00	PASS
Mid	0.4008	128.256	31.60		PASS
High	0.4008	128.256	31.60		PASS

DH 3

CH Low: 1.663 * (1600/4)/79 * 31.60 = 266.080 (ms)
CH Mid: 1.663 * (1600/4)/79 * 31.60 = 266.080 (ms)
CH High: 1.663 * (1600/4)/79 * 31.60 = 266.080 (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	1.663	266.080	31.60	400.00	PASS
Mid	1.663	266.080	31.60		PASS
High	1.663	266.080	31.60		PASS

DH 5

CH Low: 2.905 * (1600/6)/79 * 31.60 = 309.8667 (ms)
CH Mid: 2.905 * (1600/6)/79 * 31.60 = 309.8667 (ms)
CH High: 2.905 * (1600/6)/79 * 31.60 = 309.8667 (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	2.905	309.8667	31.60	400.00	PASS
Mid	2.905	309.8667	31.60		PASS
High	2.905	309.8667	31.60		PASS

8DPSK

DH 1

CH Low: 0.4108 * (1600/2)/79 * 31.60 = 131.456 (ms)
CH Mid: 0.4108 * (1600/2)/79 * 31.60 = 131.456 (ms)
CH High: 0.4108 * (1600/2)/79 * 31.60 = 131.456 (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	0.4108	131.456	31.60	400.00	PASS
Mid	0.4108	131.456	31.60		PASS
High	0.4108	131.456	31.60		PASS

DH 3

CH Low: 1.663 * (1600/4)/79 * 31.60 = 266.080 (ms)
CH Mid: 1.663 * (1600/4)/79 * 31.60 = 266.080 (ms)
CH High: 1.663 * (1600/4)/79 * 31.60 = 266.080 (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	1.663	266.080	31.60	400.00	PASS
Mid	1.663	266.080	31.60		PASS
High	1.663	266.080	31.60		PASS

DH 5

CH Low: 2.915 * (1600/6)/79 * 31.60 = 310.933 (ms)
CH Mid: 2.925 * (1600/6)/79 * 31.60 = 312.000 (ms)
CH High: 2.915 * (1600/6)/79 * 31.60 = 310.933 (ms)

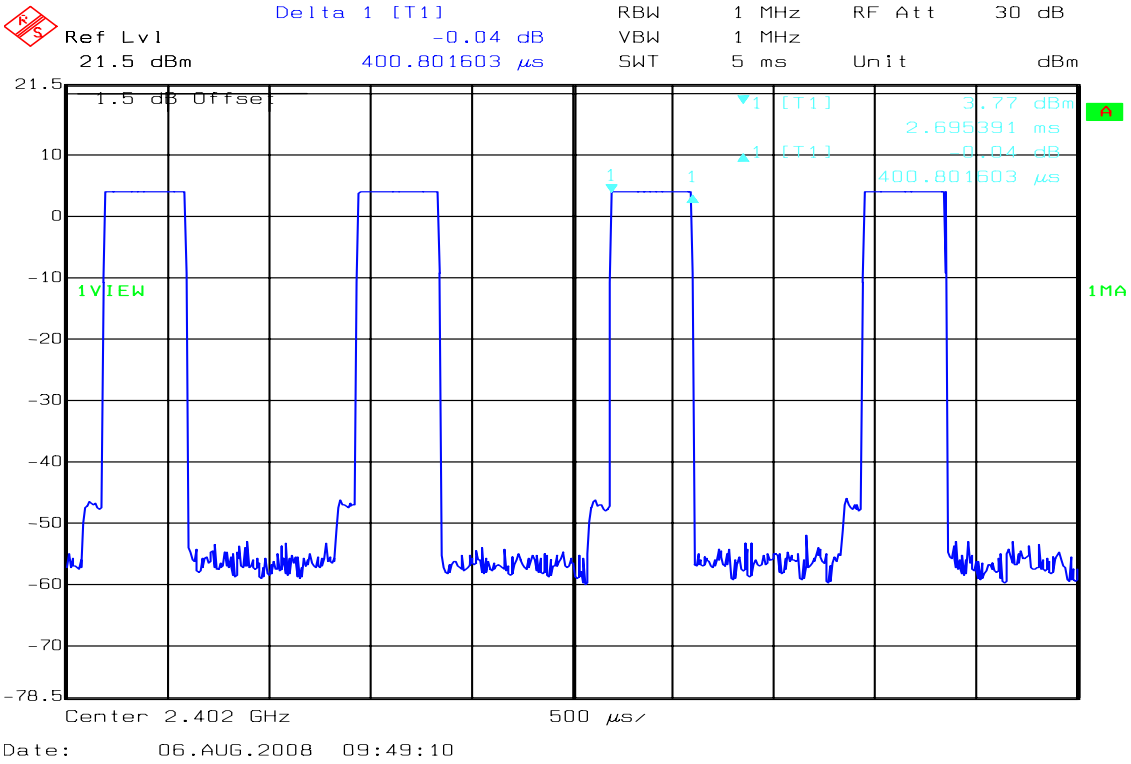
CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	2.915	310.933	31.60	400.00	PASS
Mid	2.925	312.000	31.60		PASS
High	2.915	310.933	31.60		PASS

Test Plot

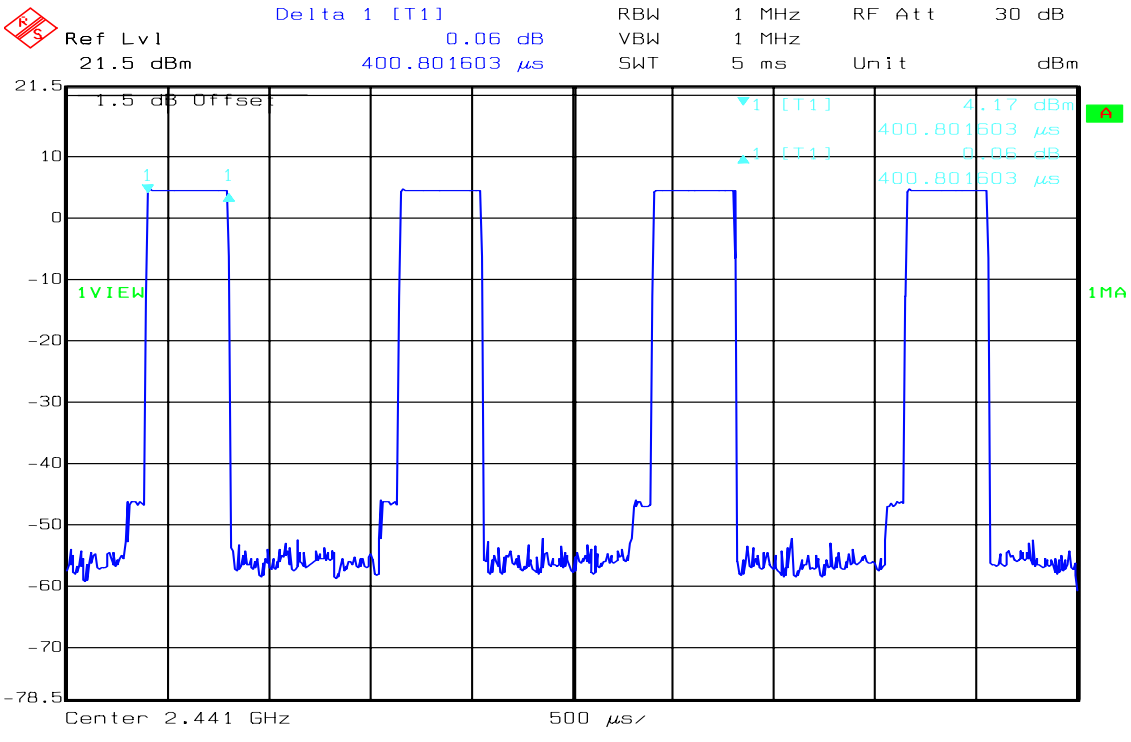
GFSK

DH 1

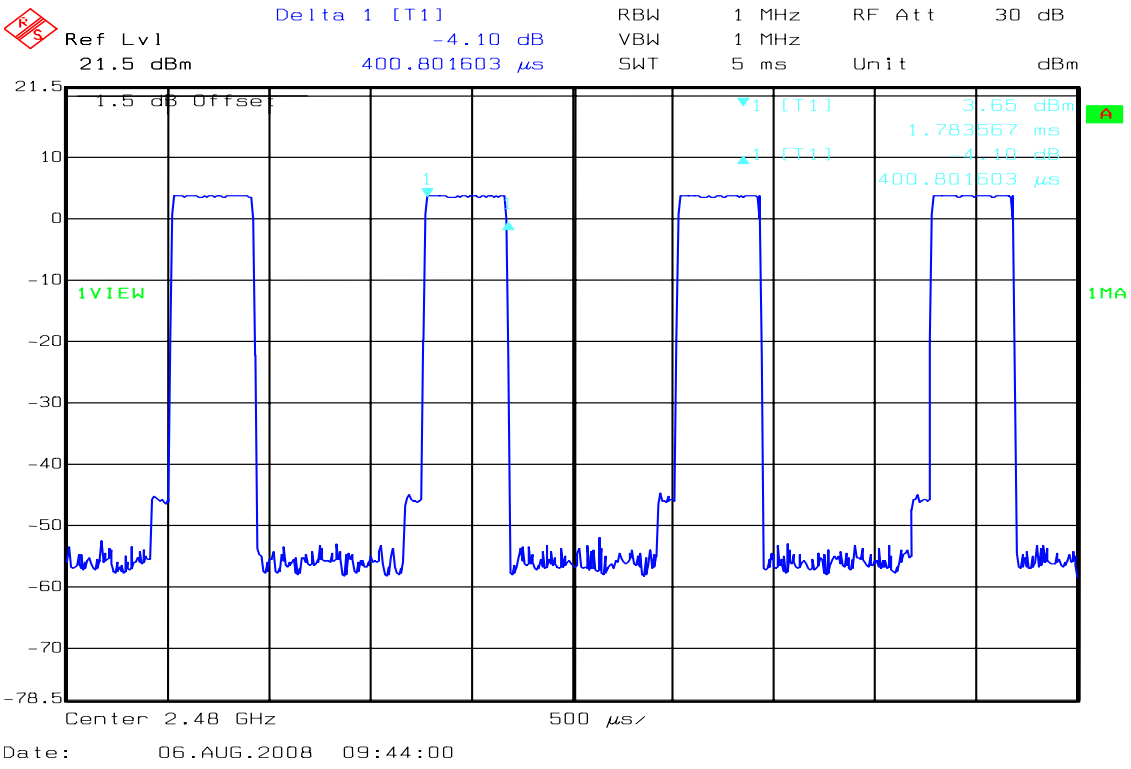
(CH Low)



(CH Mid)

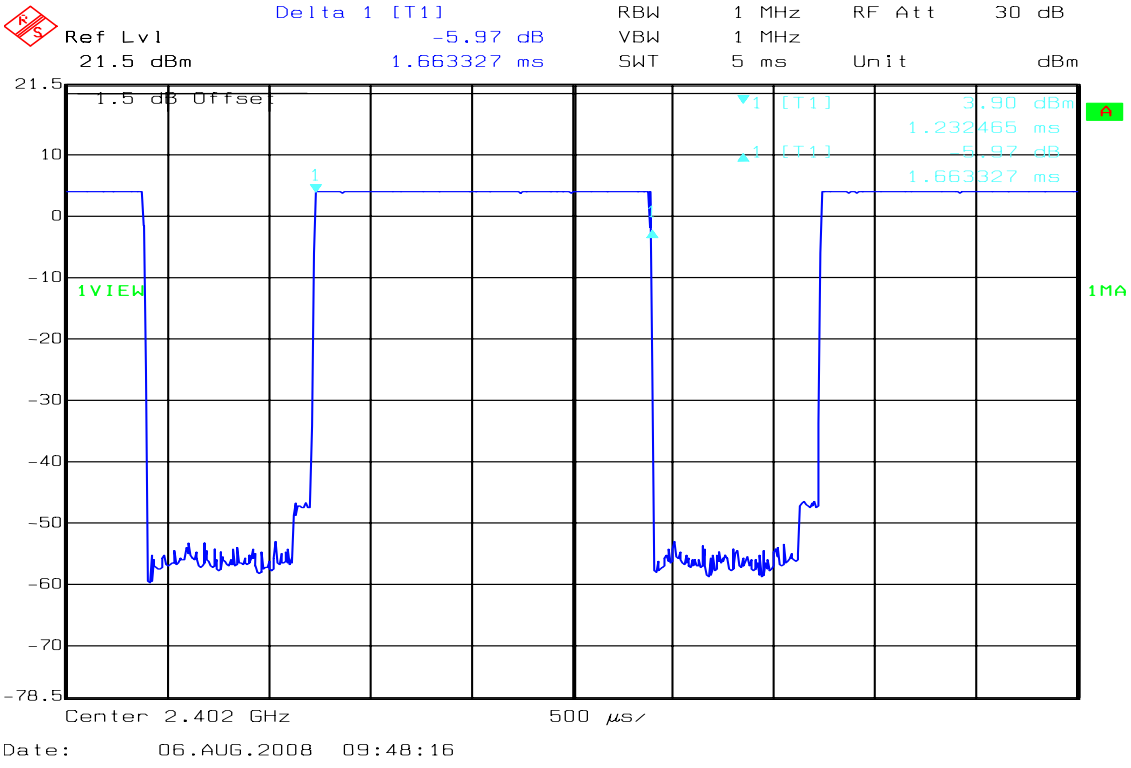


(CH High)

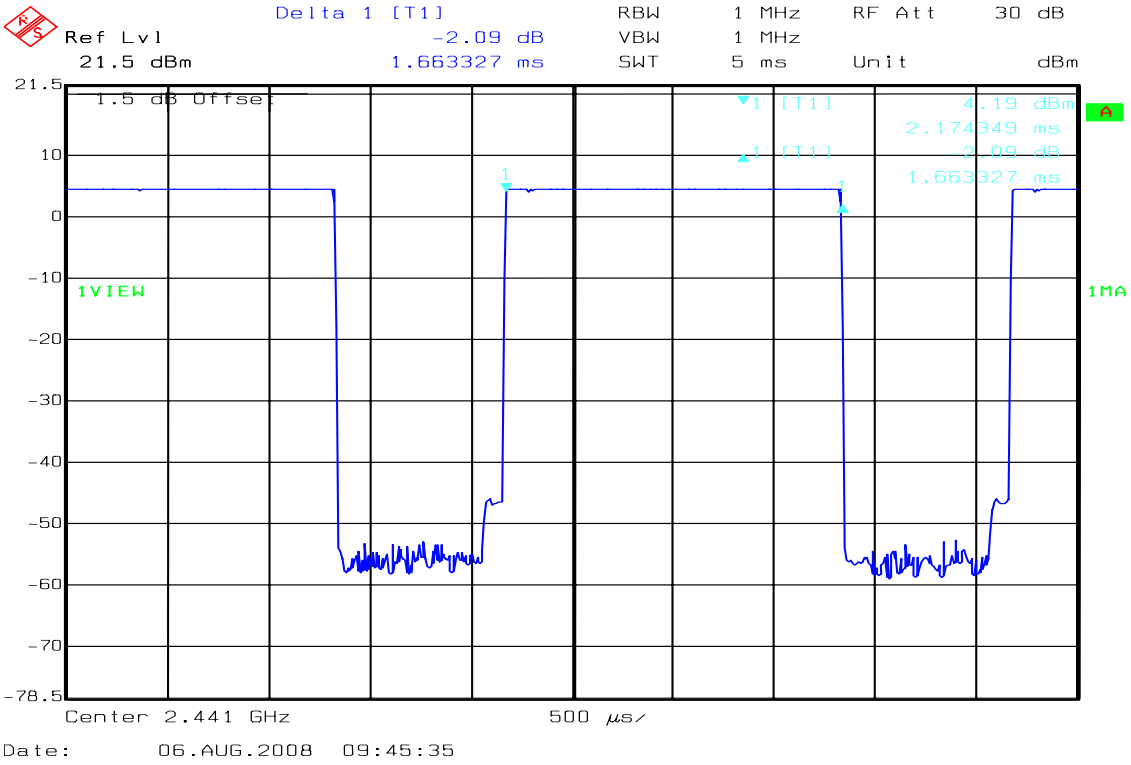


DH 3

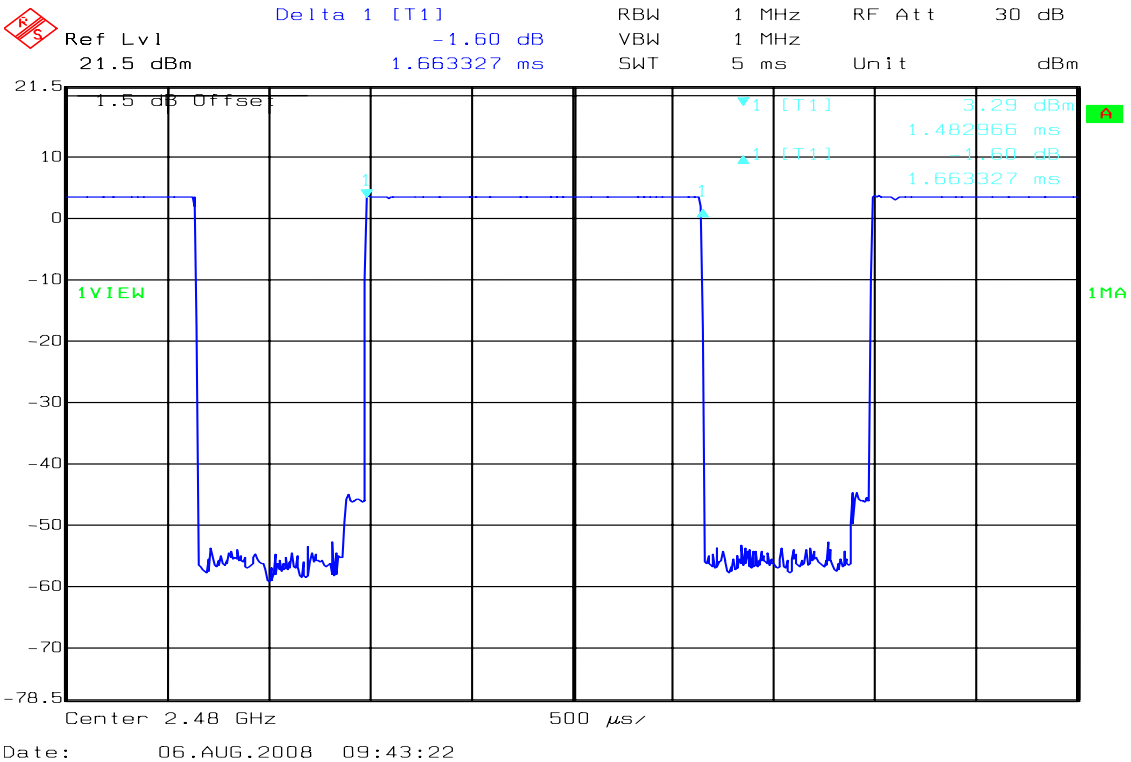
(CH Low)



(CH Mid)

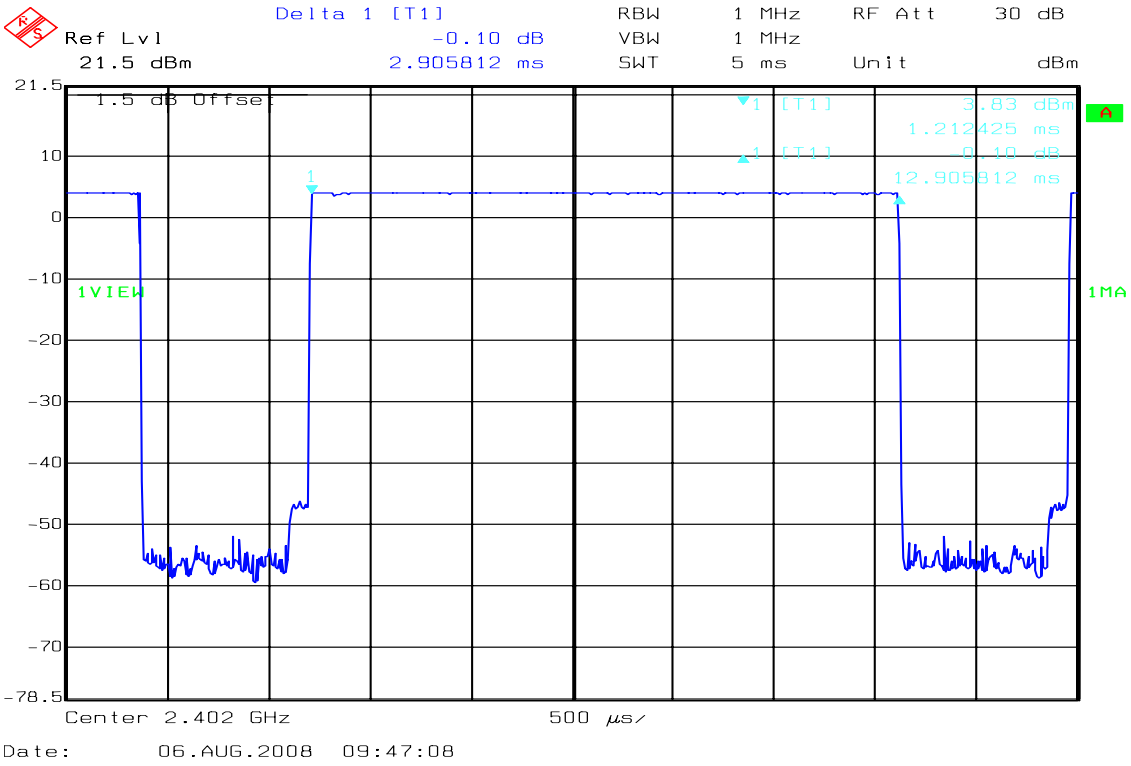


(CH High)

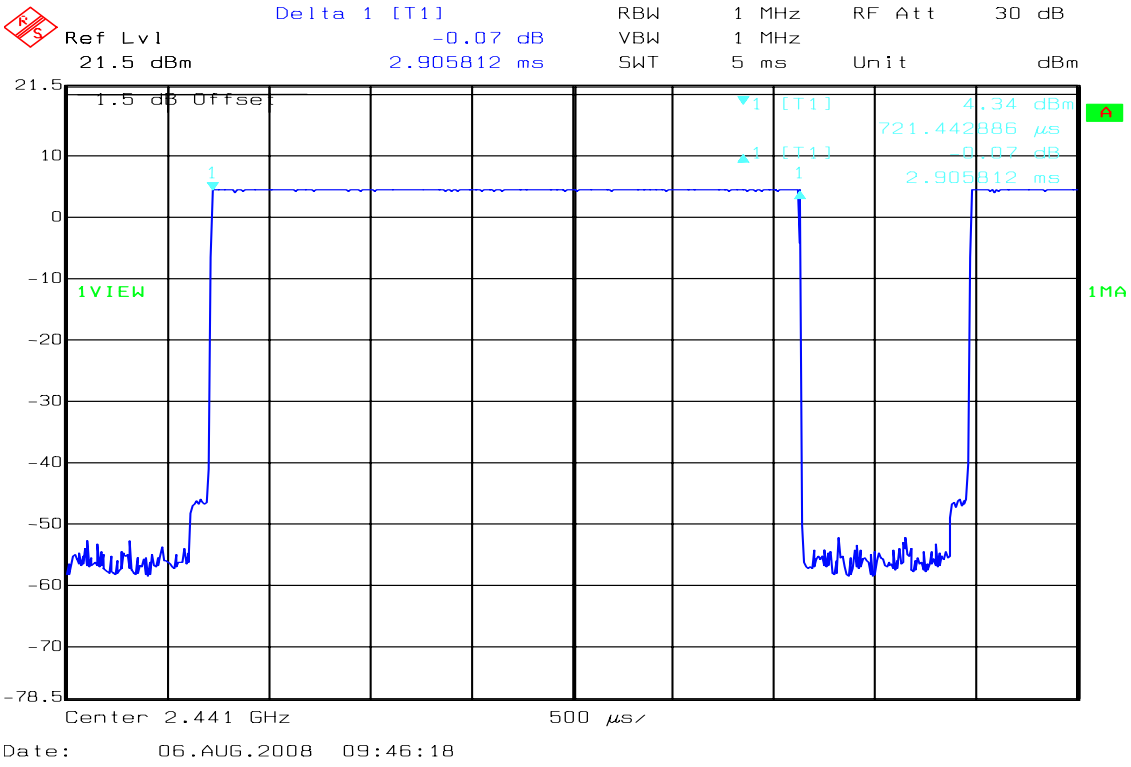


DH 5

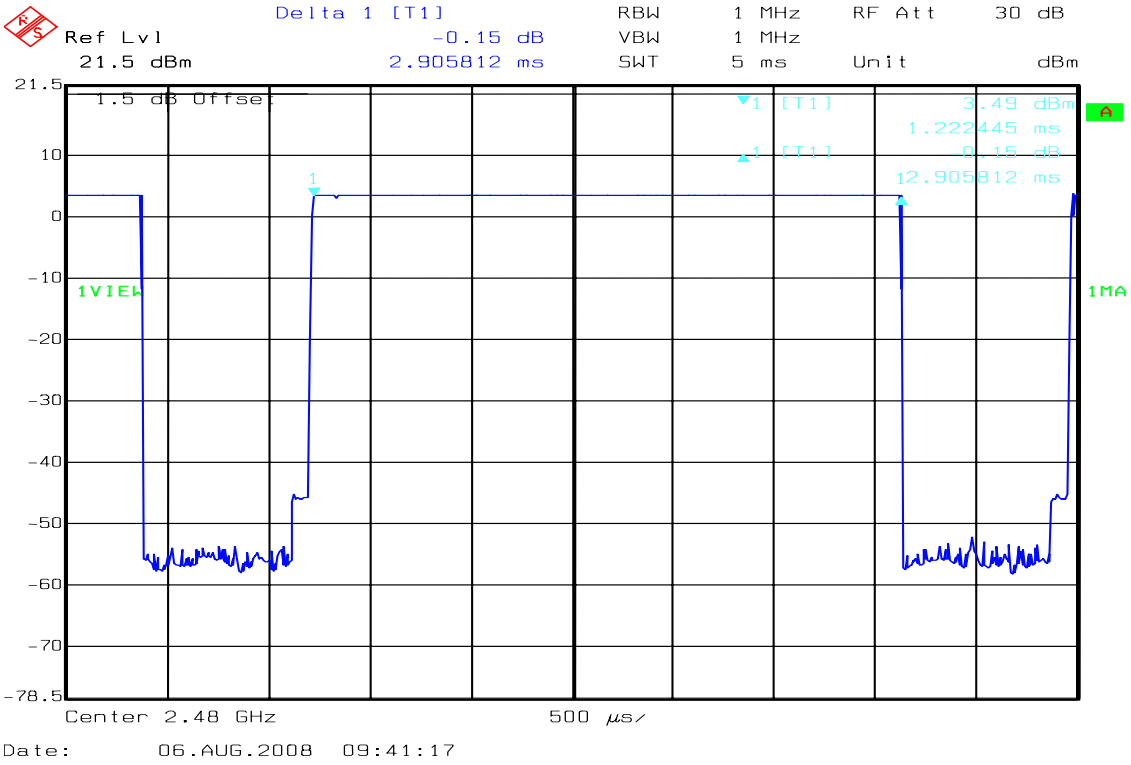
(CH Low)



(CH Mid)



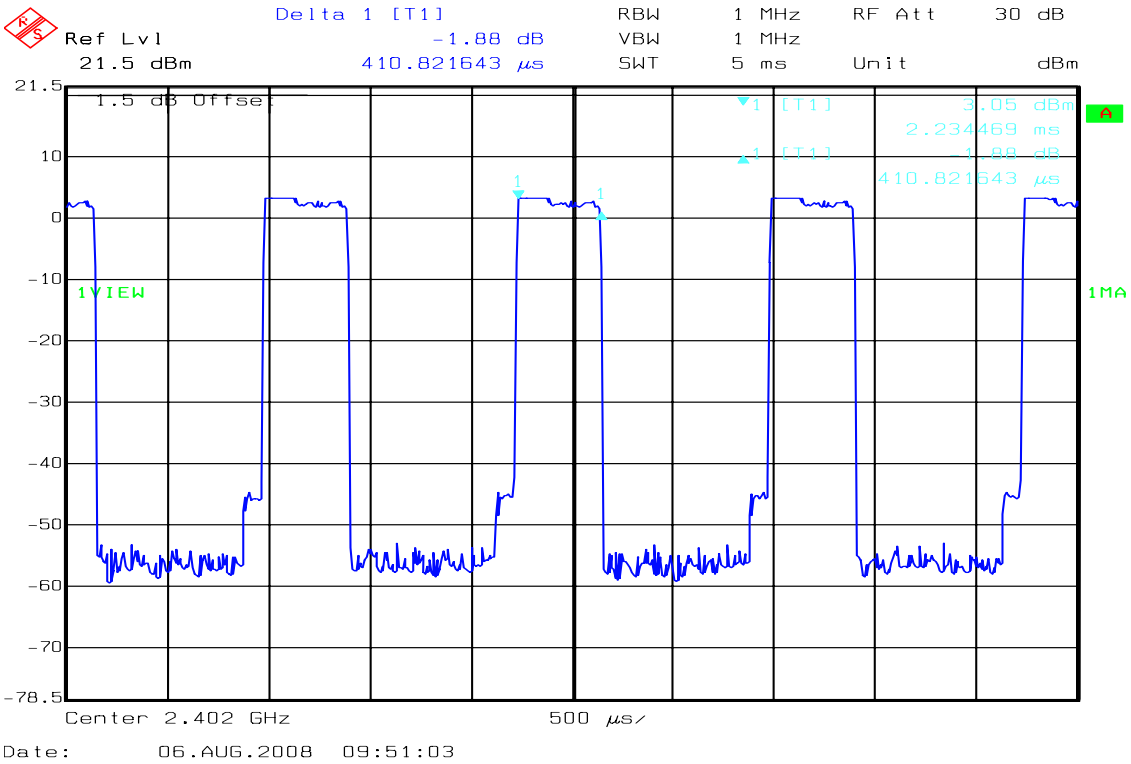
(CH High)



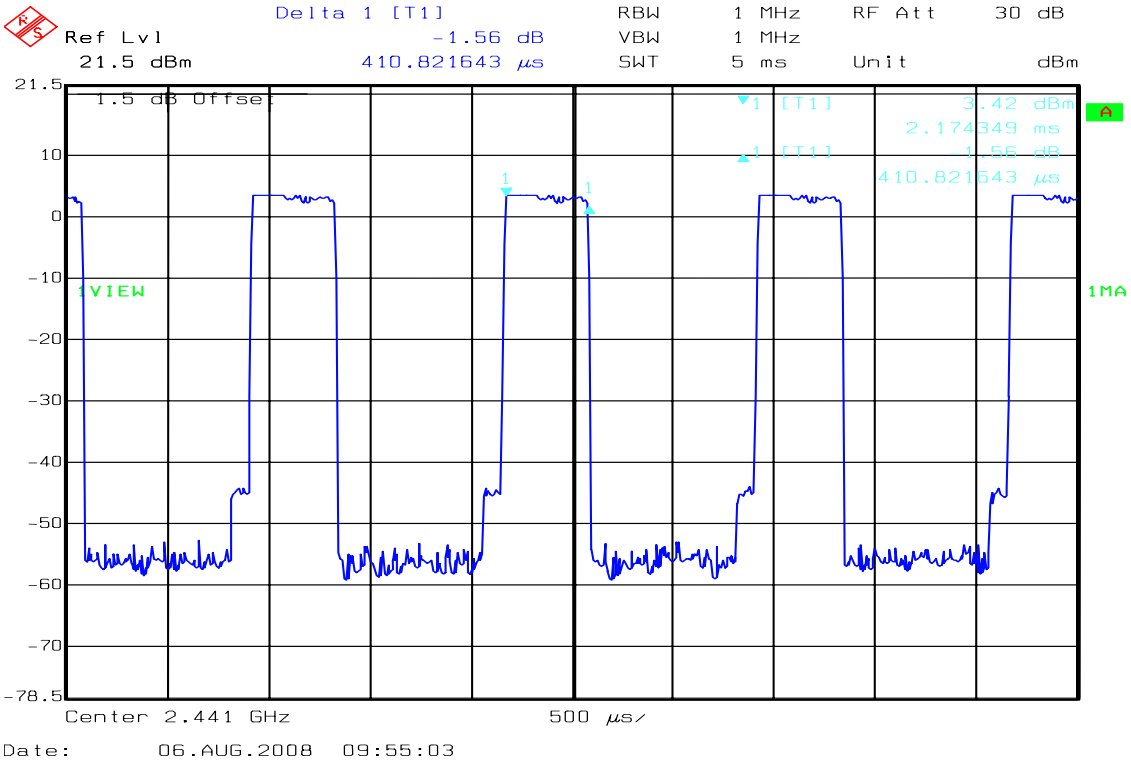
8DPSK

DH 1

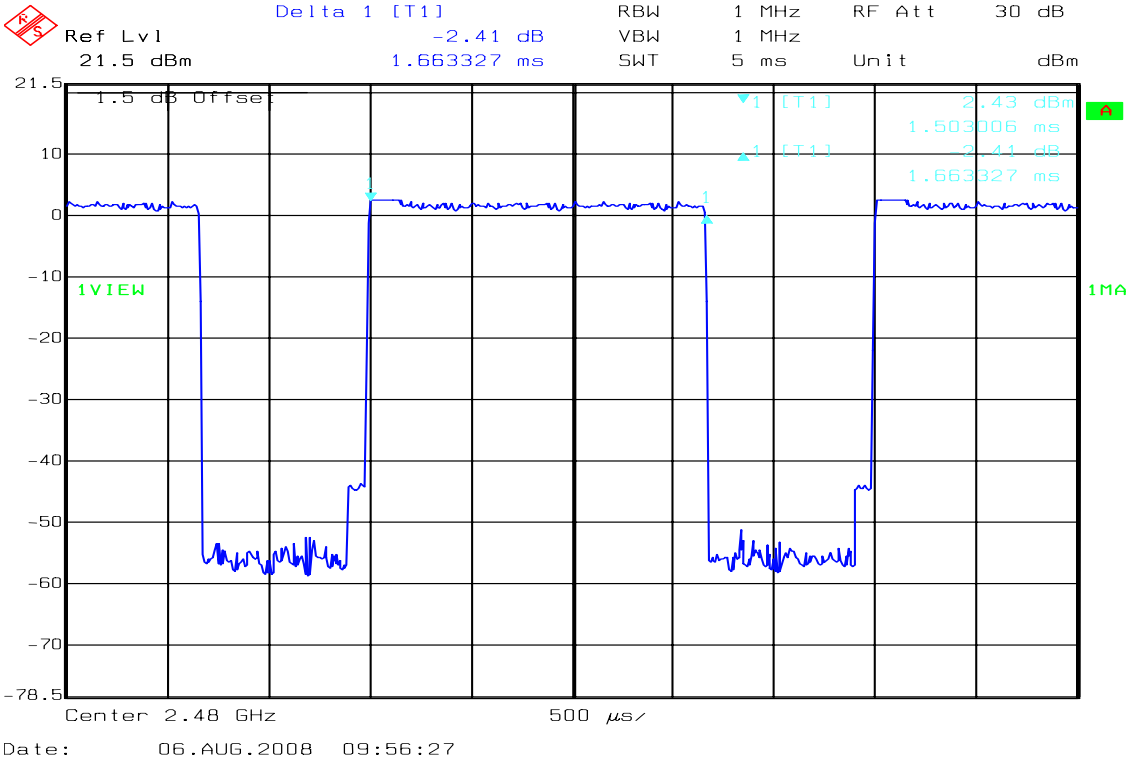
(CH Low)



(CH Mid)

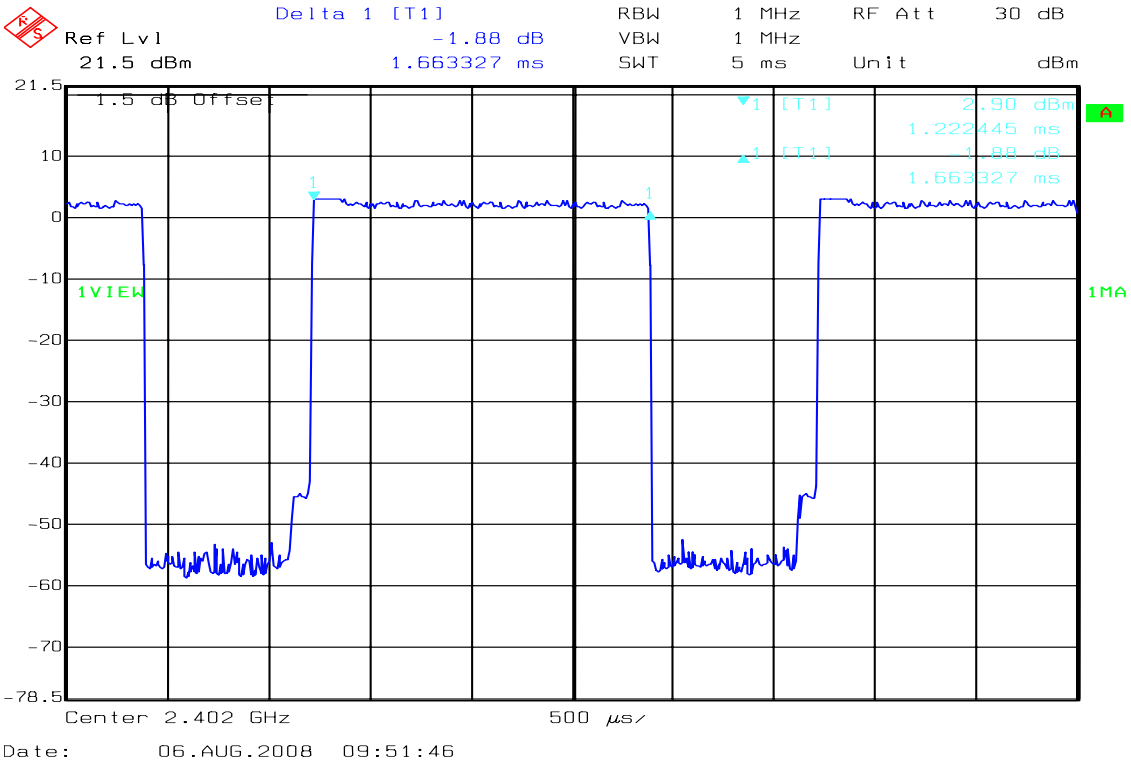


(CH High)

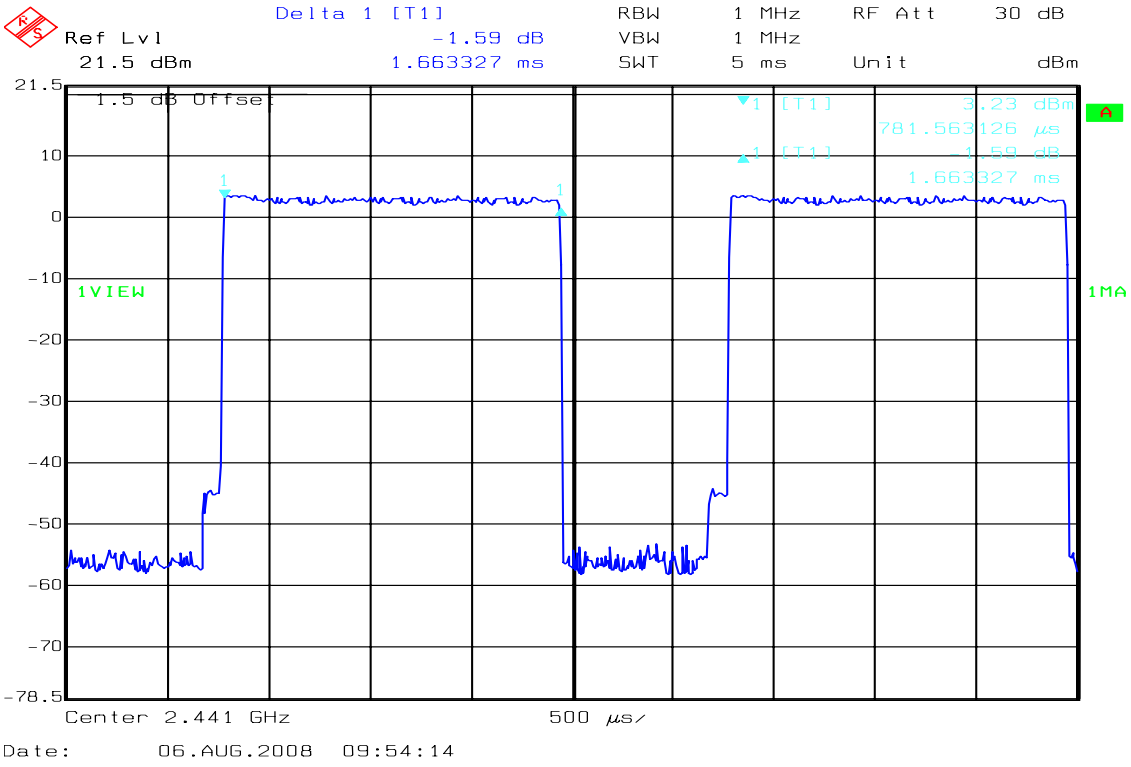


DH 3

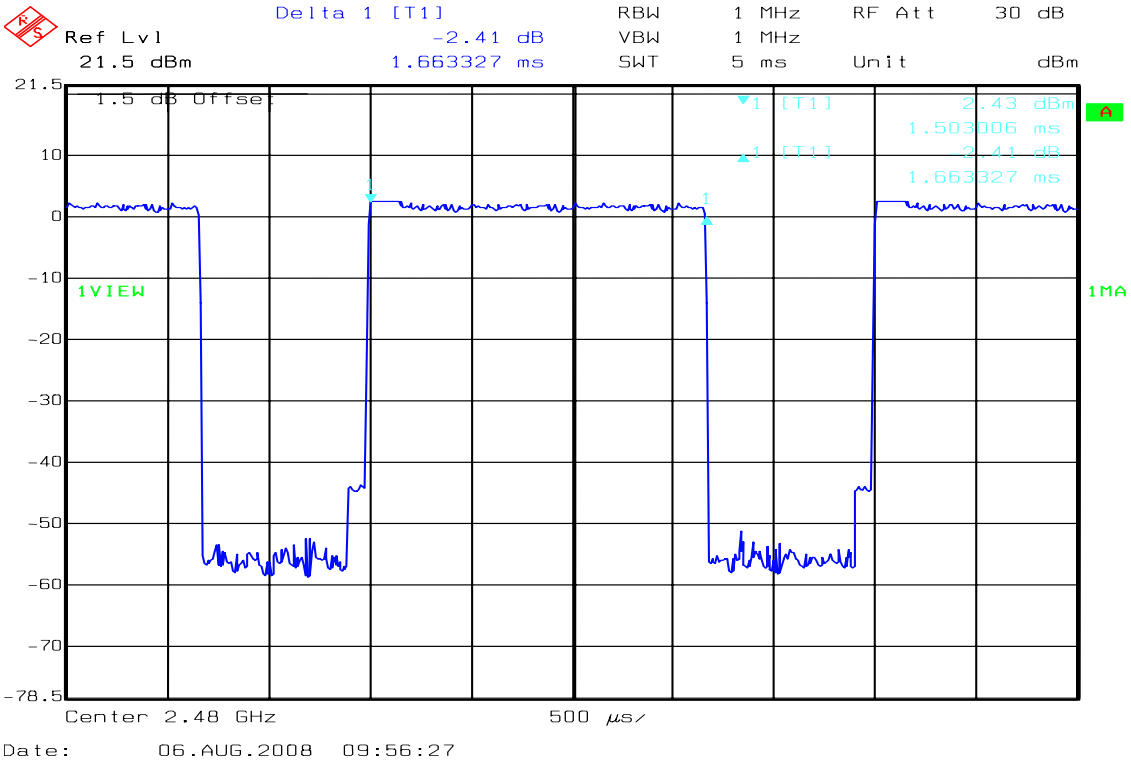
(CH Low)



(CH Mid)

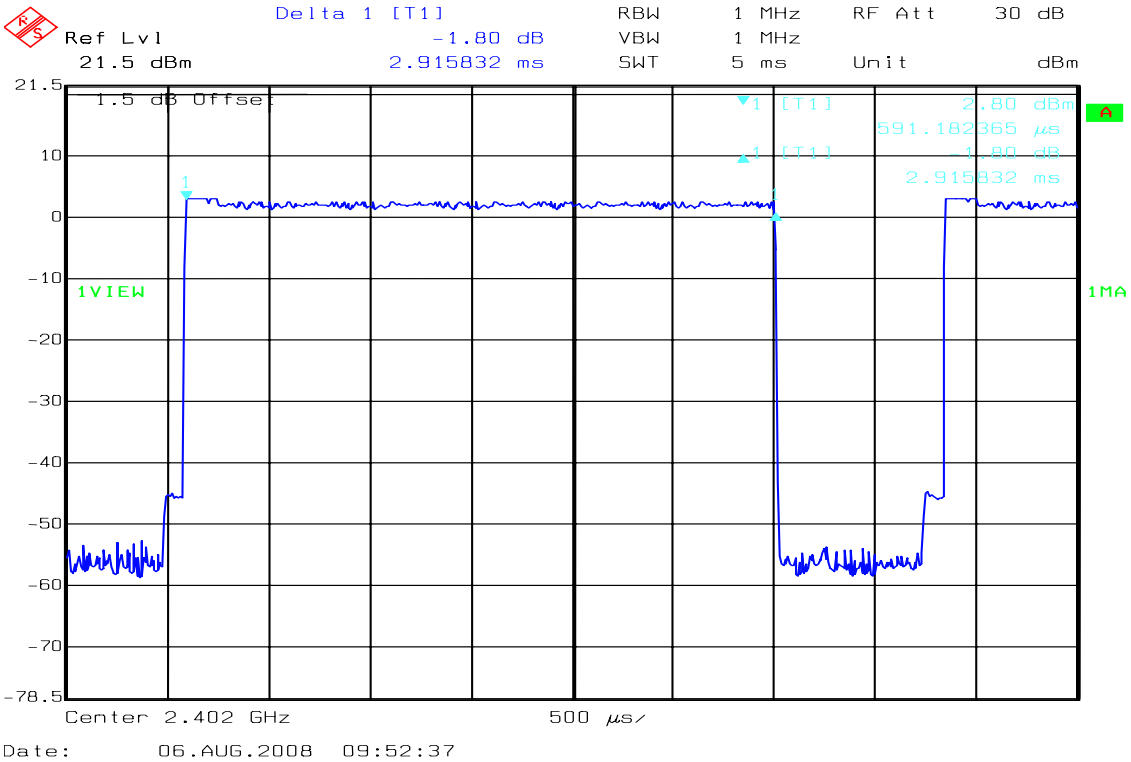


(CH High)

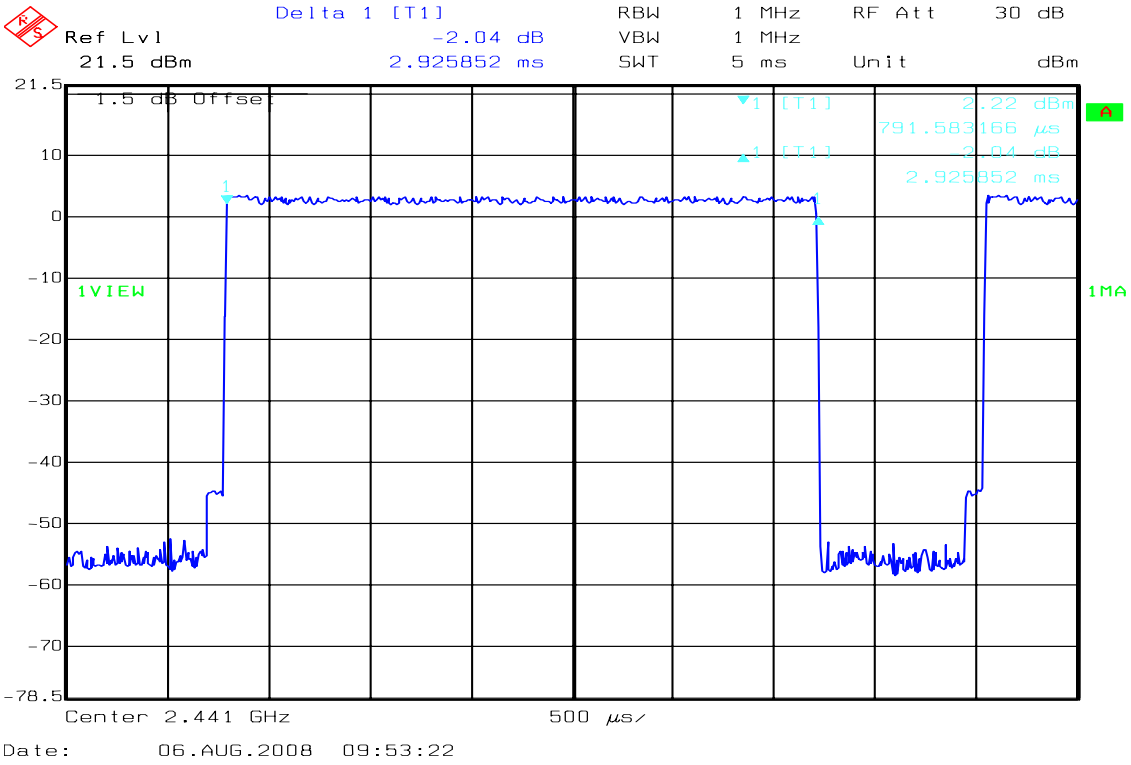


DH 5

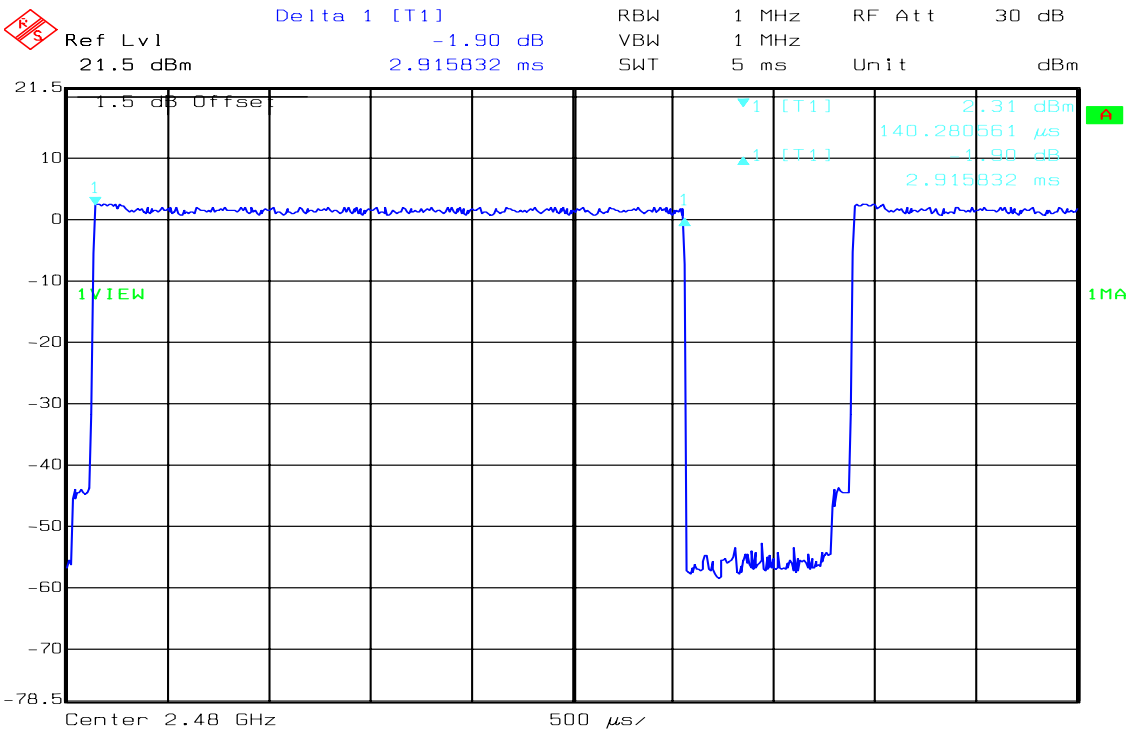
(CH Low)



(CH Mid)



(CH High)



7.7 RADIO FREQUENCY EXPOSURE

LIMIT

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 levels in excess of the Commission's guidelines. See §15.247(i) and §1.1307(b)(1) of this chapter.

EUT SPECIFICATION

EUT	Notebook Computer
Frequency band (Operating)	☐ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☒ Others Bluetooth: 2.402GHz ~ 2.480GHz
Device category	☒ Portable (<20cm separation) ☐ Mobile (>20cm separation) ☐ Others _____
Exposure classification	☐ Occupational/Controlled exposure *(S = 5mW/cm^2)* ☒ General Population/Uncontrolled exposure *(S=1mW/cm^2)*
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Max. output power	6.47 dBm (4.436mW)
Antenna gain (Max)	1.68 dBi (Numeric gain: 1.47)
Evaluation applied	☐ MPE Evaluation ☐ SAR Evaluation ☒ N/A
Remark: *1. The maximum output power is 6.47dBm (4.436mW) at 2441MHz (with 1.47 numeric antenna gain.)* *2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.* *3. For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.*	

TEST RESULTS

No non-compliance noted.
(SAR evaluation is not required for the PORTABLE device while its maximum output power is lower than the general population low threshold: 60/f (GHz)=60 / 2.441GHz = 24.58mW)

7.8 SPURIOUS EMISSIONS

7.8.1 Conducted Measurement

LIMIT

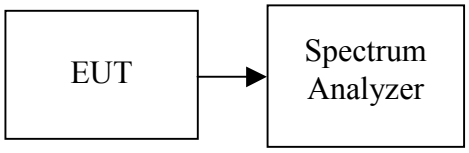
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSP30	100112	10/10/2007

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST CONFIGURATION



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

Measurements are made over the 30MHz to 26.5GHz range with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

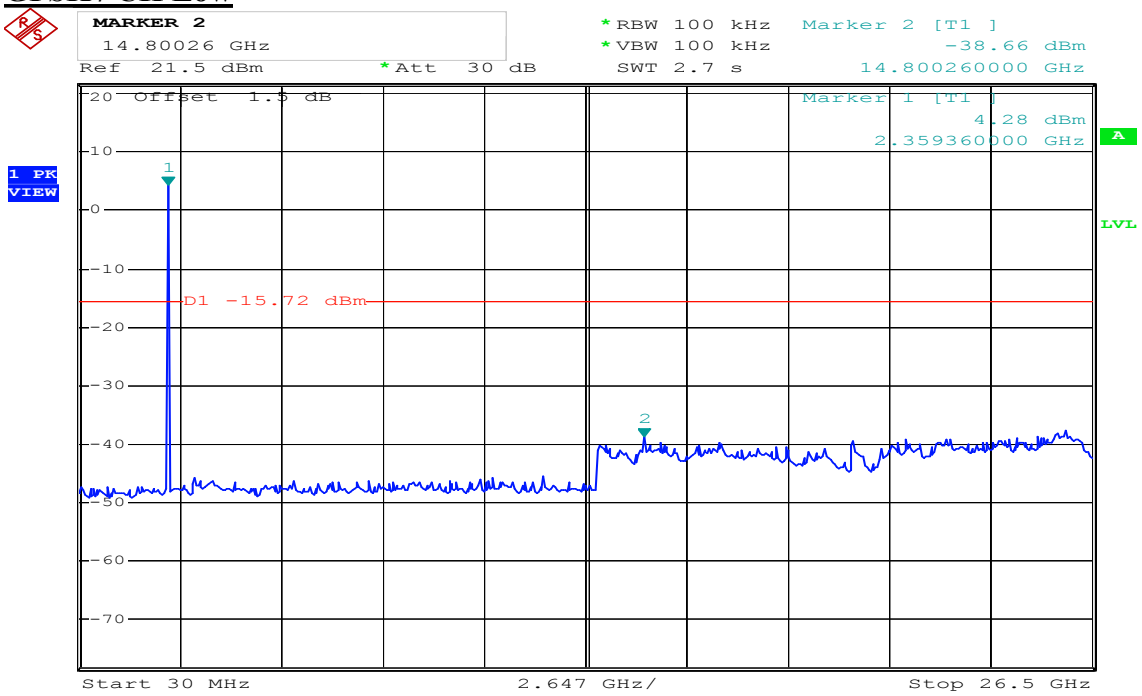
No non-compliance noted

TEST DATA

Refer to attach spectrum analyzer data chart.

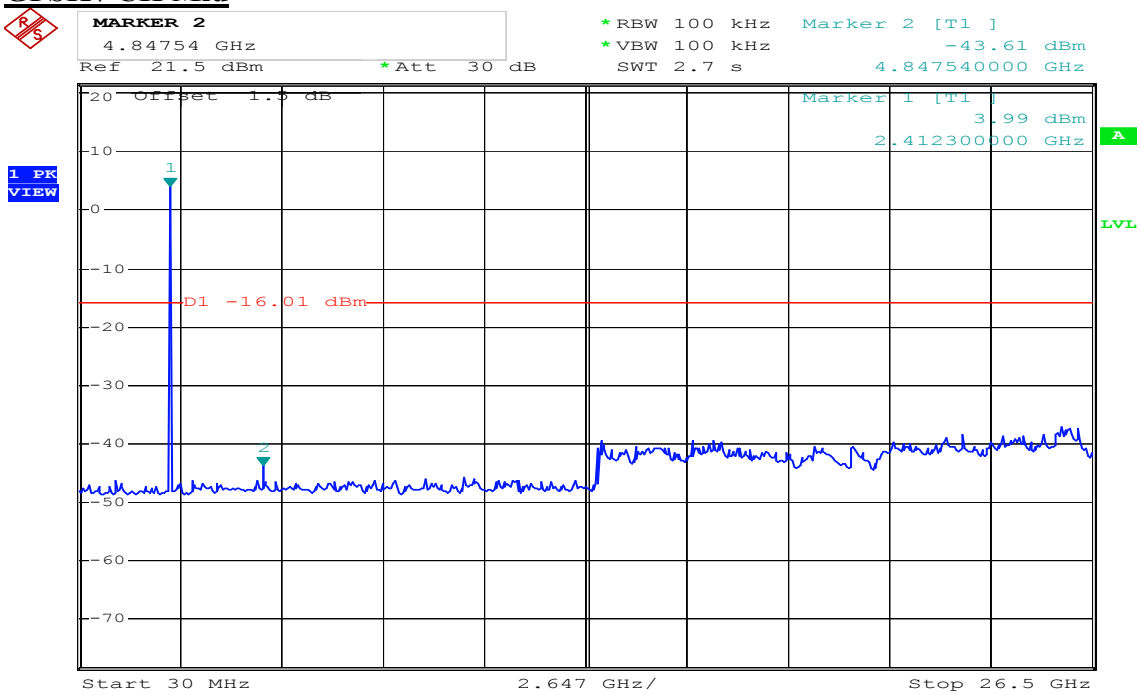
Test Plot

GFSK / CH Low



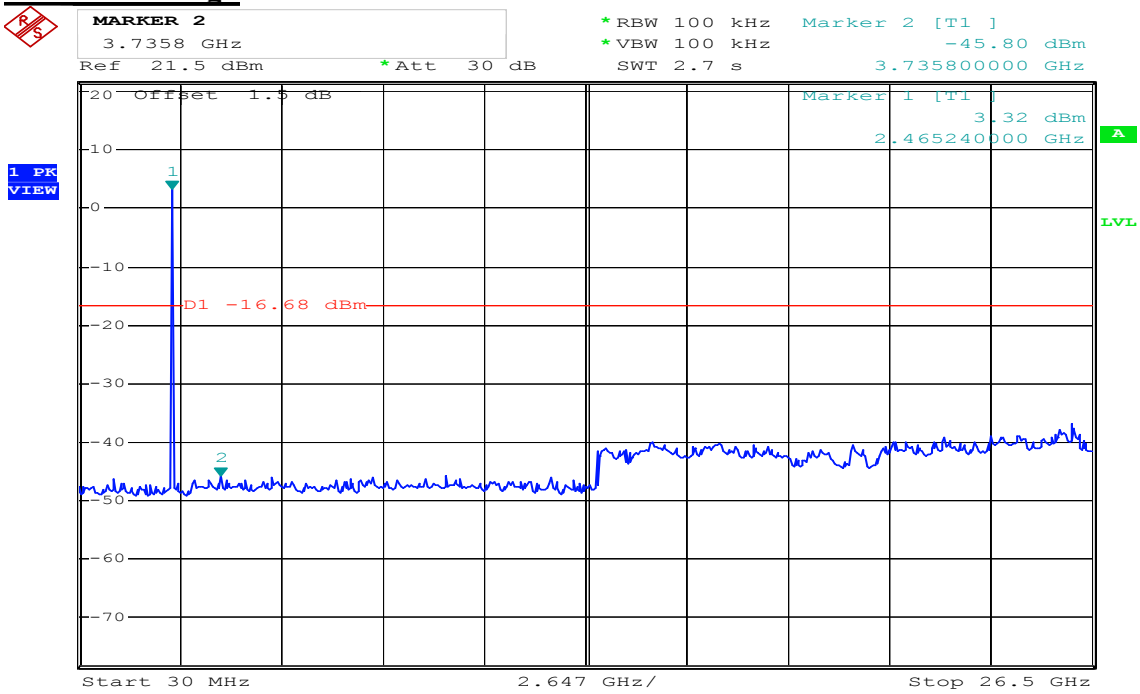
Date: 7.AUG.2008 12:36:40

GFSK / CH Mid



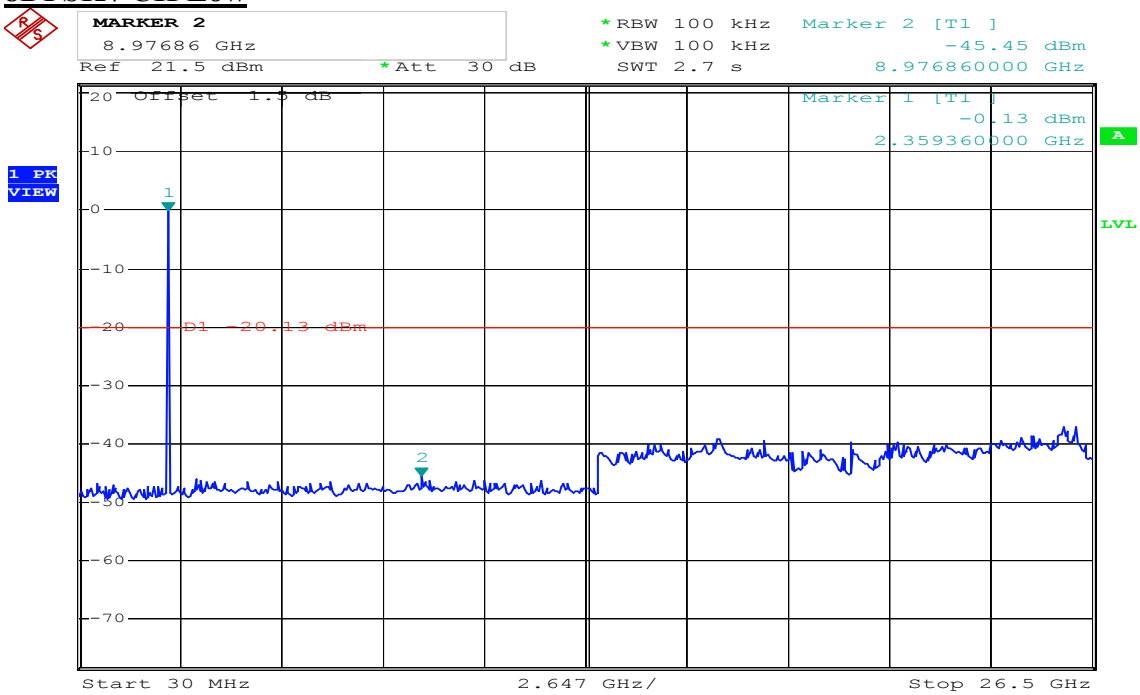
Date: 7.AUG.2008 12:37:38

GFSK / CH High



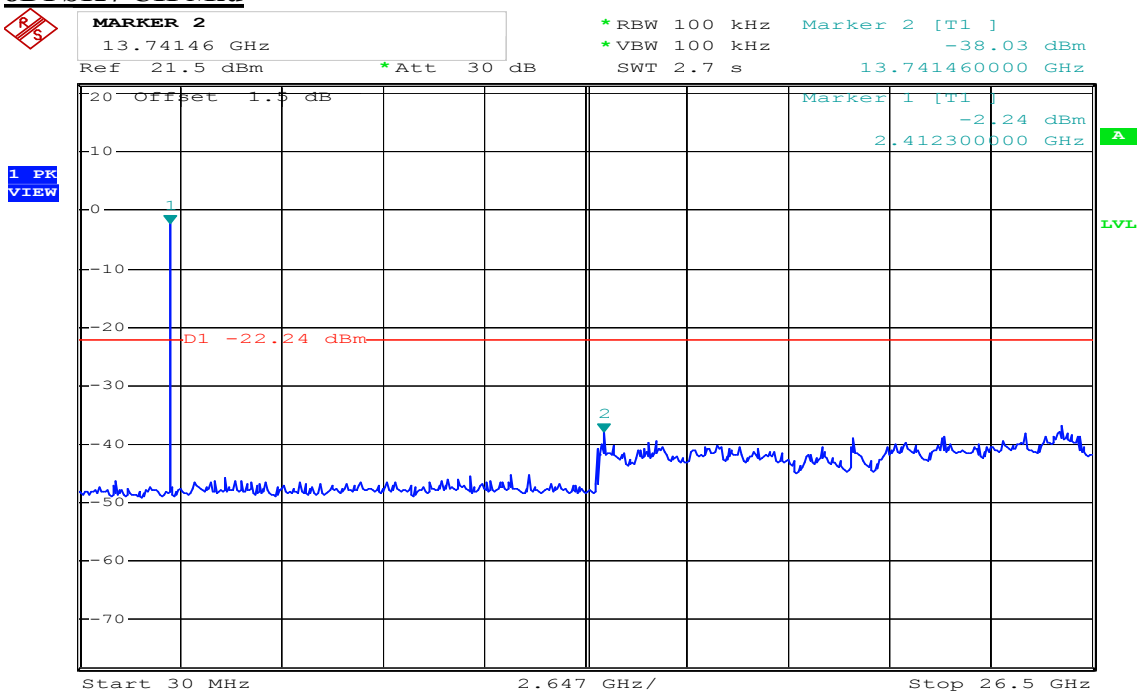
Date: 7.AUG.2008 12:39:11

8DPSK / CH Low



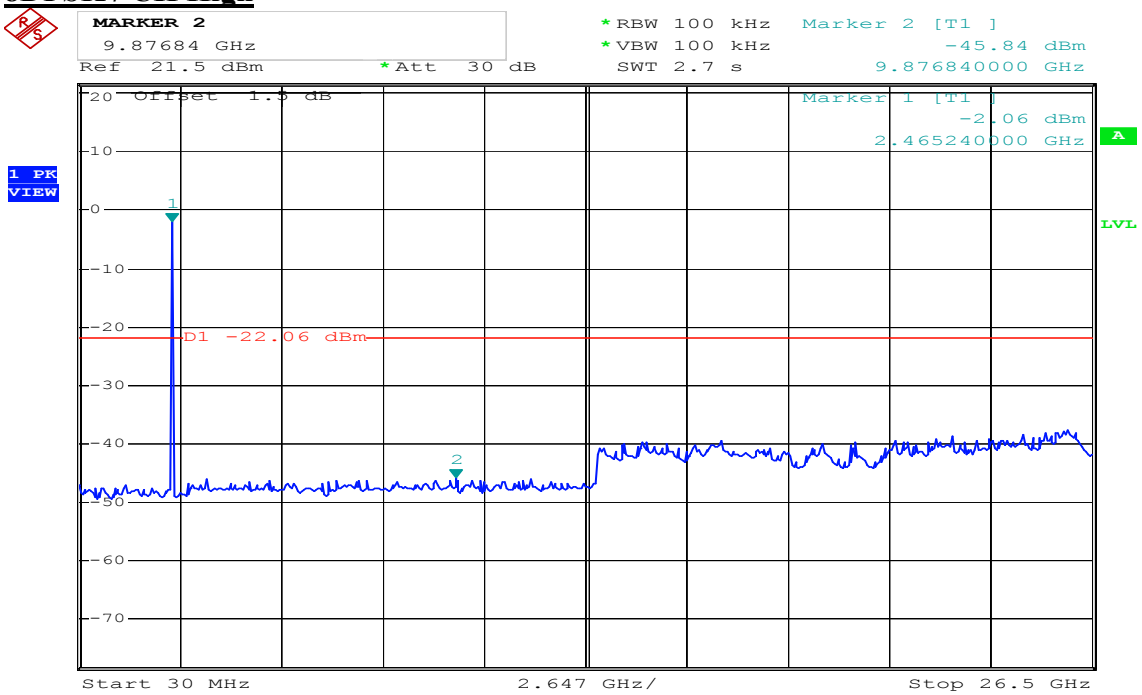
Date: 7.AUG.2008 12:40:37

8DPSK / CH Mid



Date: 7.AUG.2008 12:41:25

8DPSK / CH High



Date: 7.AUG.2008 12:42:13

7.8.2 RADIATED EMISSIONS

LIMIT

1. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

2. In the above emission table, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

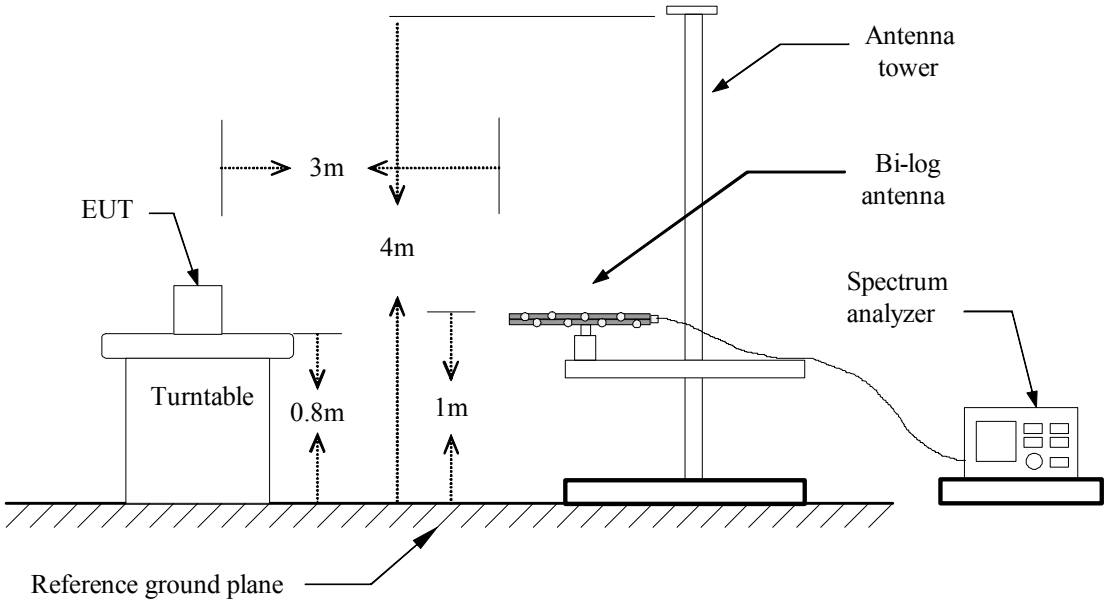
MEASUREMENT EQUIPMENT USED

Open Area Test Site # 3				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilnet	E4411B	MY41440314	N.C.R
Spectrum Analyzer	R&S	FSP30	100112	10/14/2008
EMI Test Receiver	R&S	ESVS30	828488/004	03/20/2009
Pre-Amplifier	Mini-Circuits	ZKL-2R5	83153007374	04/02/2009
Pre-Amplifier	Agilent	8449B	3008A01738	03/28/2009
Bilog Antenna	Sunol Sciences	JB1	A031605	04/03/2009
Horn Antenna	EMCO	3115	00022250	05/08/2009
Loop Antenna	EMCO	6502	2356	05/28/2010
Turn Table	Chance Most	CM-T003-1	T807-6	N.C.R
Antenna Tower	Chance Most	CM-A003-1	A807-6	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R
Site NSA	CCS	N/A	N/A	05/09/2009
Test S/W	LabVIEW 6.1 (CCS OATS EMI SW V2.7)			

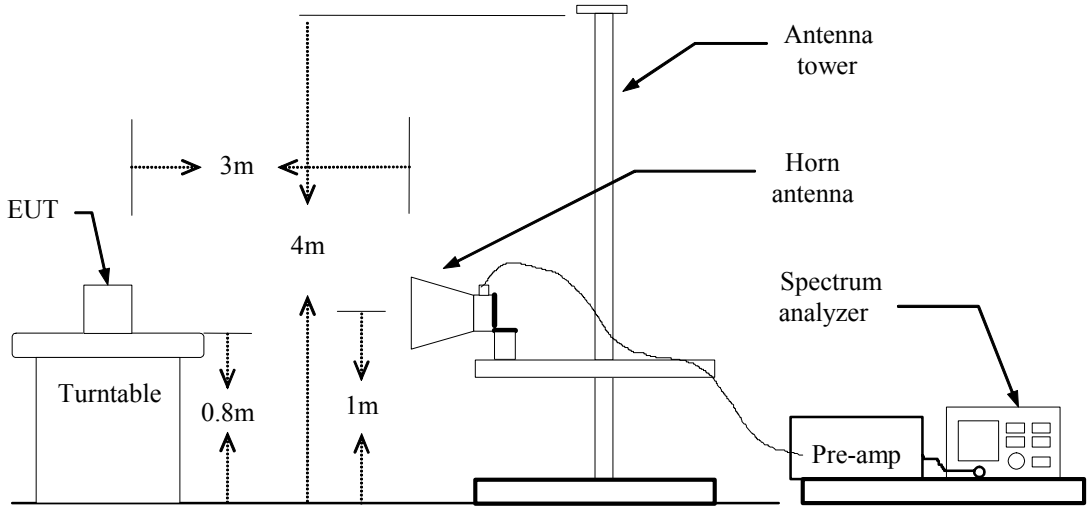
Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST CONFIGURATION

Below 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

   RBW=100kHz / VBW=300kHz / Sweep=AUTO

   Above 1GHz:

   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

No non-compliance noted

TEST DATA

Below 1 GHz

Operation Mode: Normal Link **Test Date:** Aug. 4, 2008

Temperature: 22°C **Tested by:** Alonso Lu

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
281.03	V	Peak	8.98	16.88	25.86	46.00	-20.14
317.23	V	Peak	11.62	16.84	28.46	46.00	-17.54
350.00	V	Peak	12.78	17.67	30.45	46.00	-15.55
515.30	V	Peak	6.23	22.82	29.05	46.00	-16.95
666.30	V	Peak	9.75	24.14	33.89	46.00	-12.11
730.03	V	Peak	9.20	25.59	34.79	46.00	-11.21
252.83	H	Peak	14.20	14.71	28.91	46.00	-17.09
282.60	H	Peak	15.91	16.84	32.75	46.00	-13.25
315.88	H	Peak	15.39	16.81	32.20	46.00	-13.80
349.80	H	Peak	15.54	17.66	33.21	46.00	-12.79
663.68	H	Peak	11.08	24.14	35.21	46.00	-10.79
730.15	H	Peak	7.38	25.59	32.97	46.00	-13.03

Remark:

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*

Above 1 GHz

GFSK

Operation Mode: TX / CH Low **Test Date:** August 6, 2008

Temperature: 25°C **Tested by:** Alonso Lu

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1060.00	V	50.49	---	-10.42	40.07	---	74.00	54.00	-13.93	Peak
2000.00	V	49.47	---	-5.53	43.94	---	74.00	54.00	-10.06	Peak
N/A										
N/A										

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

Operation Mode: TX / CH Mid **Test Date:** August 6, 2008

Temperature: 25°C **Tested by:** Alonso Lu

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1060.00	V	51.79	---	-10.42	41.37	---	74.00	54.00	-12.63	Peak
2000.00	V	49.84	---	-5.53	44.31	---	74.00	54.00	-9.69	Peak
4880.00	V	44.08	---	2.05	46.13	---	74.00	54.00	-7.87	Peak
N/A										
1060.00	H	51.22	---	-10.42	40.80	---	74.00	54.00	-13.20	Peak
1332.00	H	49.72	---	-9.17	40.55	---	74.00	54.00	-13.45	Peak
2760.00	H	49.01	---	-3.20	45.80	---	74.00	54.00	-8.20	Peak
7460.00	H	42.38	---	7.02	49.40	---	74.00	54.00	-4.60	Peak
N/A										

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

Operation Mode: TX / CH High **Test Date:** August 6, 2008

Temperature: 25°C **Tested by:** Alonso Lu

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1060.00	V	50.40	---	-10.42	39.98	---	74.00	54.00	-14.02	Peak
1332.00	V	50.25	---	-9.17	41.09	---	74.00	54.00	-12.91	Peak
1996.00	V	49.33	---	-5.55	43.78	---	74.00	54.00	-10.22	Peak
6740.00	V	42.40	---	5.05	47.44	---	74.00	54.00	-6.56	Peak
N/A										
1060.00	H	49.51	---	-10.42	39.09	---	74.00	54.00	-14.91	Peak
1328.00	H	50.13	---	-9.18	40.94	---	74.00	54.00	-13.06	Peak
N/A										

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

Operation Mode: RX / CH Mid **Test Date:** August 6, 2008

Temperature: 25°C **Tested by:** Alonso Lu

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1322.00	V	49.19	---	-9.21	39.98	---	74.00	54.00	-14.02	Peak
1994.00	V	48.88	---	-5.56	43.31	---	74.00	54.00	-10.69	Peak
3002.00	V	44.79	---	-2.09	42.70	---	74.00	54.00	-11.30	Peak
N/A										
1322.00	H	48.52	---	-9.21	39.30	---	74.00	54.00	-14.70	Peak
3044.00	H	44.25	---	-1.97	42.28	---	74.00	54.00	-11.72	Peak
N/A										

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

8DPSK

Operation Mode: TX / CH Low **Test Date:** August 6, 2008

Temperature: 25°C **Tested by:** Alonso Lu

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1060.00	V	51.73	---	-10.42	41.30	---	74.00	54.00	-12.70	Peak
1328.00	V	50.79	---	-9.18	41.61	---	74.00	54.00	-12.39	Peak
1996.00	V	50.75	---	-5.55	45.20	---	74.00	54.00	-8.80	Peak
N/A										
1060.00	H	51.94	---	-10.42	41.51	---	74.00	54.00	-12.49	Peak
1332.00	H	49.17	---	-9.17	40.01	---	74.00	54.00	-13.99	Peak
N/A										

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

Operation Mode: TX / CH Mid **Test Date:** August 6, 2008

Temperature: 25°C **Tested by:** Alonso Lu

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1060.00	V	51.41	---	-10.42	40.98	---	74.00	54.00	-13.02	Peak
1160.00	V	51.05	---	-9.96	41.09	---	74.00	54.00	-12.91	Peak
1332.00	V	51.17	---	-9.17	42.00	---	74.00	54.00	-12.00	Peak
2000.00	V	49.59	---	-5.53	44.06	---	74.00	54.00	-9.94	Peak
N/A										
1060.00	H	49.67	---	-10.42	39.25	---	74.00	54.00	-14.75	Peak
1328.00	H	49.67	---	-9.18	40.49	---	74.00	54.00	-13.51	Peak
N/A										

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

Operation Mode: TX / CH High **Test Date:** August 6, 2008

Temperature: 25°C **Tested by:** Alonso Lu

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1060.00	V	51.73	---	-10.42	41.30	---	74.00	54.00	-12.70	Peak
1332.00	V	50.46	---	-9.17	41.29	---	74.00	54.00	-12.71	Peak
2000.00	V	50.06	---	-5.53	44.53	---	74.00	54.00	-9.47	Peak
N/A										
1060.00	H	50.25	---	-10.42	39.83	---	74.00	54.00	-14.17	Peak
1328.00	H	50.21	---	-9.18	41.02	---	74.00	54.00	-12.98	Peak
N/A										

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

Operation Mode: RX / CH Mid **Test Date:** August 6, 2008

Temperature: 25°C **Tested by:** Alonso Lu

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1322.00	V	49.09	---	-9.21	39.88	---	74.00	54.00	-14.12	Peak
1980.00	V	48.94	---	-5.64	43.30	---	74.00	54.00	-10.70	Peak
N/A										
1056.00	H	48.67	---	-10.44	38.23	---	74.00	54.00	-15.77	Peak
1322.00	H	48.55	---	-9.21	39.34	---	74.00	54.00	-14.66	Peak
N/A										

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

7.9 POWERLINE CONDUCTED EMISSIONS

LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCS30	845552/030	04/08/2009
LISN	R&S	ENV216	100074	12/03/2008
LISN	FCC	FCC-LISN-50/ 250-16-2-07	06013	10/16/2008
Test S/W	LabVIEW 6.1 (CCS Conduction Test SW Version_01)			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

TEST DATA

Operation Mode:	Normal Link	**Test Date:**	August 5, 2008
Temperature:	22°C	**Tested by:**	Alonso Lu
Humidity:	52% RH		

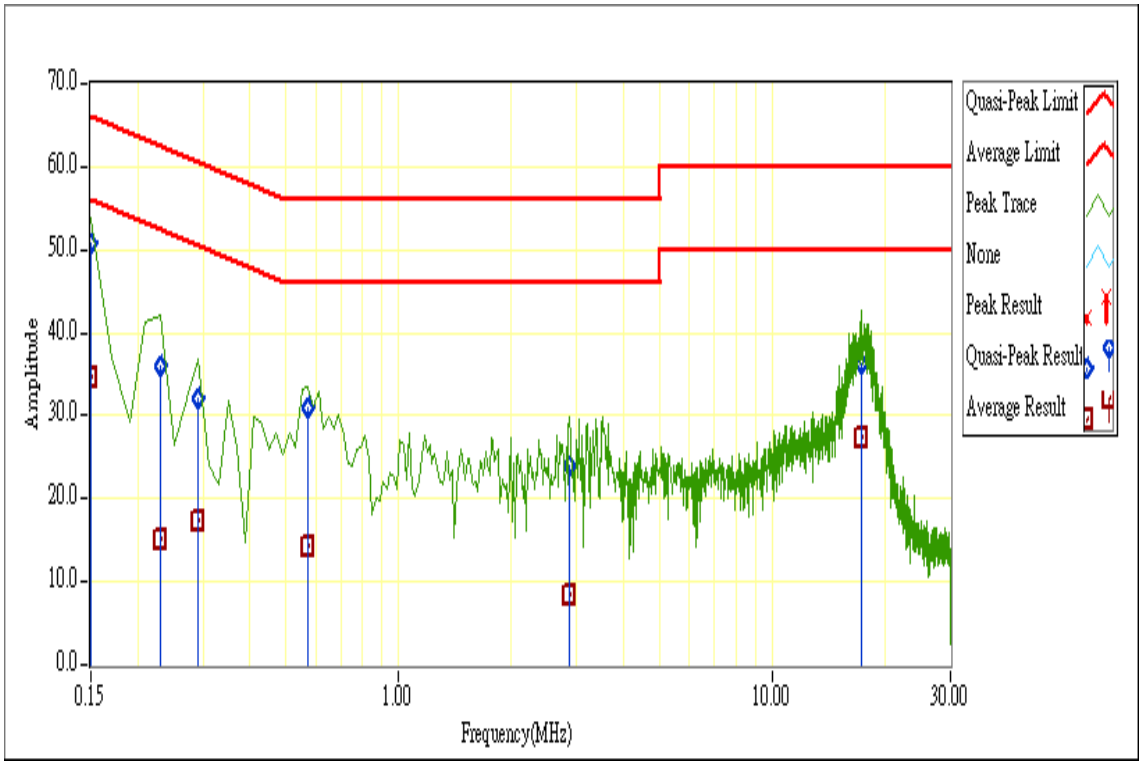
Freq. (MHz)	QP Reading	AV Reading	Corr. factor	QP Result	AV Result	QP Limit	AV Limit	QP Margin	AV Margin	Note
0.15	50.53	34.45	0.20	50.73	34.65	66.00	56.00	-15.27	-21.35	L1
0.23	35.64	14.79	0.20	35.84	14.99	62.45	52.45	-26.61	-37.46	L1
0.29	31.78	17.20	0.20	31.98	17.40	60.52	50.52	-28.54	-33.12	L1
0.57	30.95	14.17	0.10	31.05	14.27	56.00	46.00	-24.95	-31.73	L1
2.87	23.71	8.23	0.24	23.95	8.47	56.00	46.00	-32.05	-37.53	L1
17.35	34.88	25.81	1.39	36.27	27.20	60.00	50.00	-23.73	-22.80	L1
0.21	39.27	24.81	0.20	39.47	25.01	63.21	53.21	-23.74	-28.20	L2
0.29	32.01	17.21	0.20	32.21	17.41	60.52	50.52	-28.31	-33.11	L2
0.55	33.11	16.78	0.10	33.21	16.88	56.00	46.00	-22.79	-29.12	L2
1.21	29.02	14.62	0.12	29.14	14.74	56.00	46.00	-26.86	-31.26	L2
3.21	29.01	14.51	0.20	29.21	14.71	56.00	46.00	-26.79	-31.29	L2
17.03	35.53	26.41	1.18	36.71	27.59	60.00	50.00	-23.29	-22.41	L2

Remark:

1. *Measuring frequencies from 0.15 MHz to 30MHz.*
2. *The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.*
3. *"---" denotes the emission level was or more than 2dB below the Average limit*
4. *The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;*
5. *L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*

Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)