FCC 47 CFR PART 15 SUBPART C

Product Type	:	PDA phone
Applicant	:	ModeLabs manufacture
Address		11 Bis, RUE ROQUEPINE, 75008, PARIS, FRANCE
Trade Name	:	TAG Heuer
Model Number	:	TH02M
Test Specification	:	FCC 47 CFR PART 15 SUBPART C: Oct., 2009 Canada RSS-210 ISSUE 8: Dec., 2010 Canada RSS-Gen ISSUE 3: Dec., 2010 ANSI C63.4-2003
Issue Date	:	Mar. 21, 2011

Issue by

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade City,
Taoyuan County 334, Taiwan R.O.C.
Tel：+886-3-2710188 / Fax：+886-3-2710190

Taiwan Accreditation Foundation accreditation number: 1330

Revision History

Rev.	Issue Date	Revisions	Revised By
00	Mar. 21, 2011	Initial Issue	

Verification

Issued Date: 2011/03/21

Product Type	:	PDA phone
Applicant	:	ModeLabs manufacture
Address	:	11 Bis, RUE ROQUEPINE, 75008, PARIS, FRANCE
Trade Name	:	TAG Heuer
Model Number	:	TH02M
FCC ID	:	WCKTH02M
EUT Rated Voltage	:	DC 5.0V, 1.0A
Test Voltage	:	120 Vac / 60 Hz
Applicable Standard	:	FCC 47 CFR PART 15 SUBPART C: Oct., 2009 Canada RSS-210 ISSUE 8: Dec., 2010 Canada RSS-Gen ISSUE 3: Dec., 2010 ANSI C63.4-2003
Test Result	:	Complied
Performing Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade City, Taoyuan County 334, Taiwan R.O.C. Tel：+886-3-2710188 / Fax：+886-3-2710190 Taiwan Accreditation Foundation accreditation number: 1330 http://www.atl-lab.com.tw/e-index.htm

The above equipment was tested by A Test Lab Techno Corp. 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 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 identified in this report.

Approved By	:	Miller Lee	Reviewed By	:	Gary Wu
(Manager)		(Miller Lee)	(Testing Engineer)		(Gary Wu)

TABLE OF CONTENTS

1 General Information

1.1 Summary of Test Result

Standard		Item	Result	Remark
15.247	RSS-GEN			
15.207	7.2.2	AC Power Conducted Emission	PASS	-----
-----	6	Receiver Radiated Emissions	PASS	-----
Standard		Item	Result	Remark
15.247	RSS-210			
15.247(c)	A8.5	Transmitter Radiated Emissions	PASS	-----
15.247(b)(1)	A8.4 (2)	Max. Output Power	PASS	-----
15.247(a)(1)	A8.1 (1)	20dB RF Bandwidth	PASS	-----
15.247(a)(1)(iii)	A8.1 (2)	Carrier Frequency Separation	PASS	-----
15.247(a)(1)(iii)	A8.1 (4)	Number of Hopping	PASS	-----
15.247(a)(1)(iii)	A8.1 (4)	Time of Occupancy (Dwell Time)	PASS	-----
15.247(c)	A8.5	Out of Band Conducted Spurious Emission	PASS	-----
15.247(c)	A8.5	Band Edge Measurement	PASS	-----
15.203	-	Antenna Requirement	PASS	-----

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2 Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.24 dB.

Radiated Emission

The measurement uncertainty of 30 MHz - 1GHz is evaluated as ± 3.072dB.

2 EUT Description

Product	:	PDA phone				
Trade Name	:	TAG Heuer				
Model Number	:	TH02M				
Applicant	:	ModeLabs manufacture 11 Bis, RUE ROQUEPINE, 75008, PARIS, FRANCE				
Manufacturer	:	ModeLabs manufacture 11 Bis, RUE ROQUEPINE, 75008, PARIS, FRANCE				
FCC ID	:	WCKTH02M				
Frequency Range	:	2402 ~ 2480 MHz				
Modulation Type	:	GFSK for 1Mbps				
		π/4-DQPSK for 2Mbps				
		8DPSK for 3Mbps				
Antenna Type	:	Internal Type				
Antenna Gain	:	-4.9 dBi				
RF Output Power	:	GFSK for 1Mbps	1.15	dBm /	1.303	mW
(Conducted)		π/4-DQPSK for 2Mbps	2.77	dBm /	1.892	mW
		8DPSK for 3Mbps	3.11	dBm /	2.046	mW
Component						
Battery	:	TAG Heuer, TIGER-BAT1 DC 3.7V, 1400mAh				
Power Adapter	:	LG, STA-U15WS I/P: 100-240VAC, 50/60Hz, 0.3A O/P: 5VDC, 1A Cable out: Shielded, 1.1m, Detachable at Power Adaptor				

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: IDLE Mode
Mode 2: Normal Operation Mode
Mode 3: GFSK Link Mode
Mode 4: π/4-DQPSK Link Mode
Mode 5: 8DPSK Link Mode
Mode 6: Receiver Mode

Description of Test Modes

Preliminary tests were performed in different modulation to find the worst case. The modulation shown in the table below is the worst-case. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Modulation Type	Channel	Frequency (MHz)	Packet Type	Peak Conducted Power		Worst Case
				(dBm)	(W)	
GFSK	Low	2402	DH1	1.15	1.303	☐
	Low	2402	DH3	1.11	1.291	☐
	Low	2402	DH5	1.10	1.288	☐
	Middle	2441	DH1	-0.50	0.891	☐
	Middle	2441	DH3	-0.50	0.891	☐
	Middle	2441	DH5	-0.52	0.887	☐
	High	2480	DH1	0.15	1.035	☐
	High	2480	DH3	0.15	1.035	☐
	High	2480	DH5	0.14	1.033	☐
π/4-DQPSK	Low	2402	2DH1	2.77	1.892	☐
	Low	2402	2DH3	2.74	1.879	☐
	Low	2402	2DH5	2.72	1.871	☐
	Middle	2441	2DH1	2.50	1.778	☐
	Middle	2441	2DH3	2.43	1.750	☐
	Middle	2441	2DH5	2.45	1.758	☐
	High	2480	2DH1	1.54	1.426	☐
	High	2480	2DH3	1.55	1.429	☐
	High	2480	2DH5	1.56	1.432	☐
8DPSK	Low	2402	3DH1	3.11	2.046	■
	Low	2402	3DH3	3.09	2.037	☐
	Low	2402	3DH5	3.09	2.037	☐
	Middle	2441	3DH1	3.03	2.009	☐
	Middle	2441	3DH3	3.00	1.995	☐
	Middle	2441	3DH5	3.01	2.000	☐
	High	2480	3DH1	1.84	1.528	☐
	High	2480	3DH3	1.83	1.524	☐
	High	2480	3DH5	1.85	1.531	☐

Tested System Details

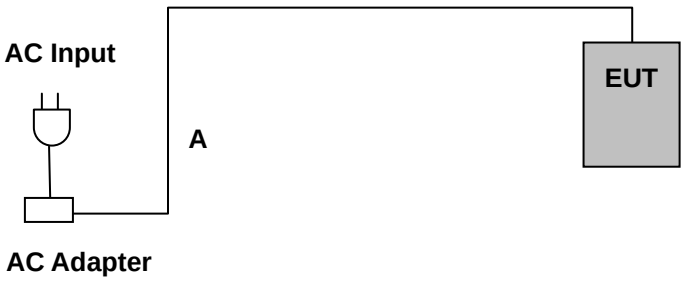
The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model Number	Serial Number	Power Cord
1.	Bluetooth Tester	R & S	CBT	100350	NA

3.2. EUT Exercise Software

1.	Setup the EUT and Bluetooth Tester (CBT) as shown on 3.3.
2.	Turn on the power of all equipment.
3.	EUT run test program.
4.	Open Bluetooth function link to CBT.

3.3. Configuration of Test System Details



	Signal Cable Type	Signal Cable Description
A	DC Power Cable	Shielded, 1.1 m

3.4. Test Site Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	25
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950

4 Conducted Emission Measurement

4.1. Limit

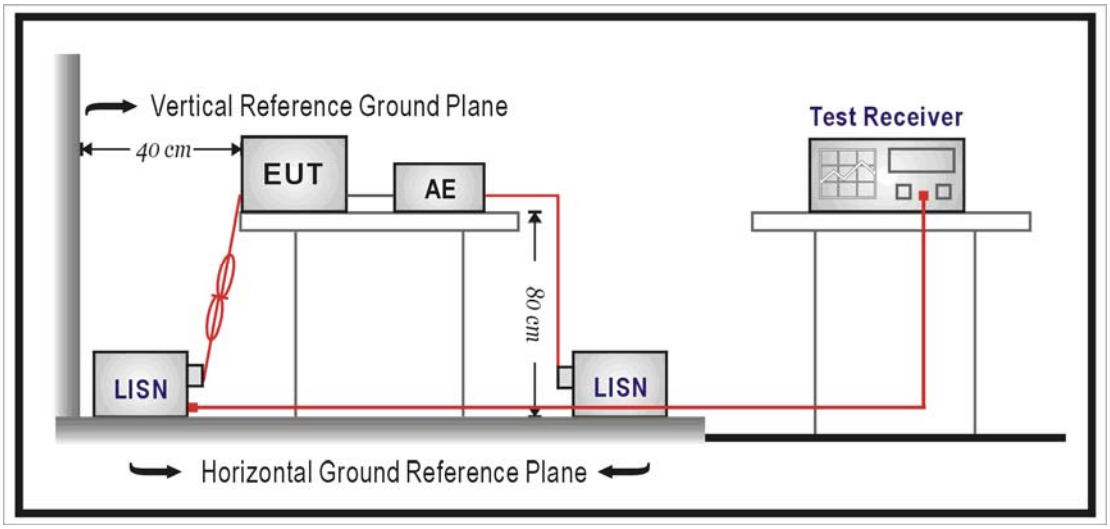
Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	07/01/2010	(1)
LISN	R&S	ENV216	101040	03/02/2010	(1)
LISN	R&S	ENV216	101041	03/02/2010	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

4.3. Test Setup



4.4. Test Procedure

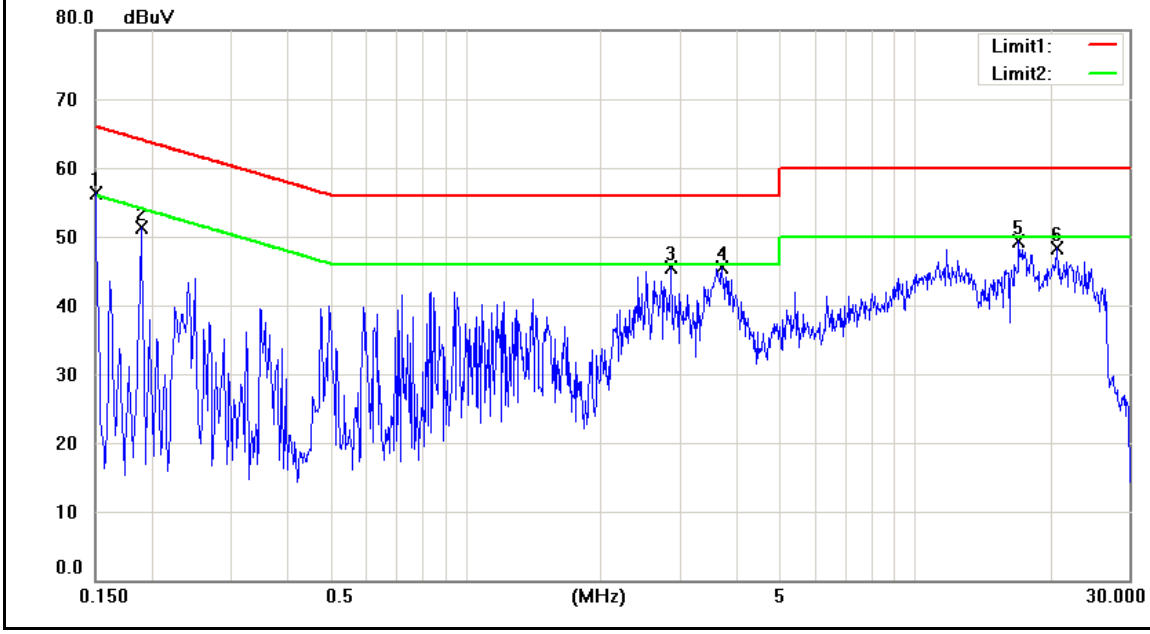
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

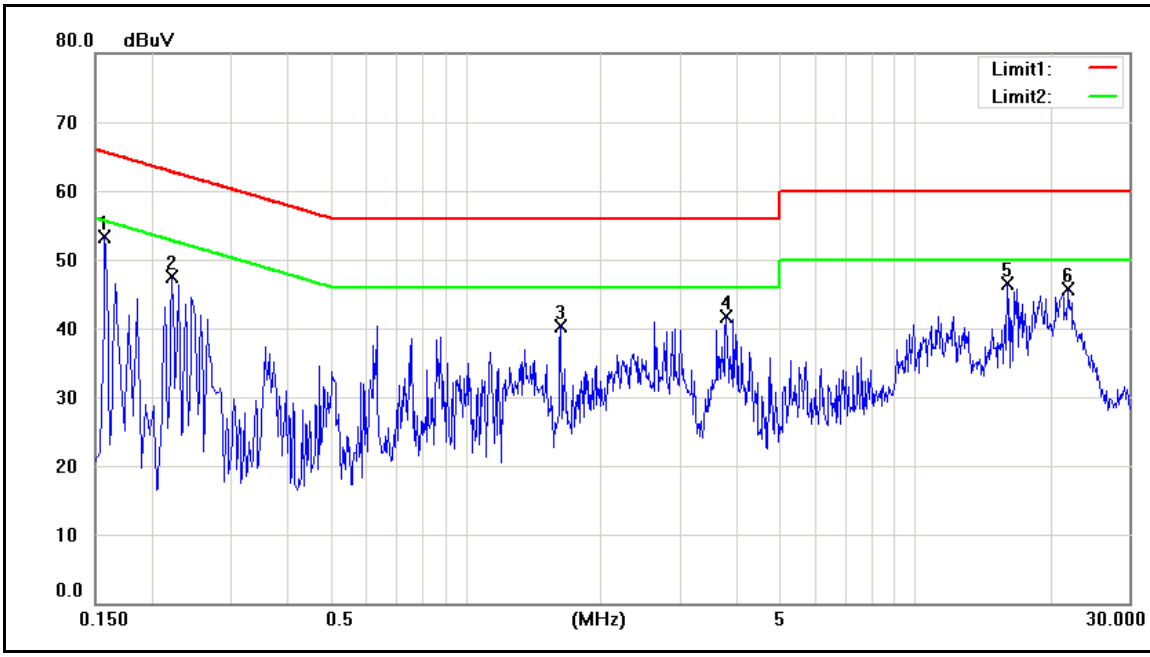
4.5. Test Result

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	2011/02/01
		Test By:	Gary Wu
Description:			



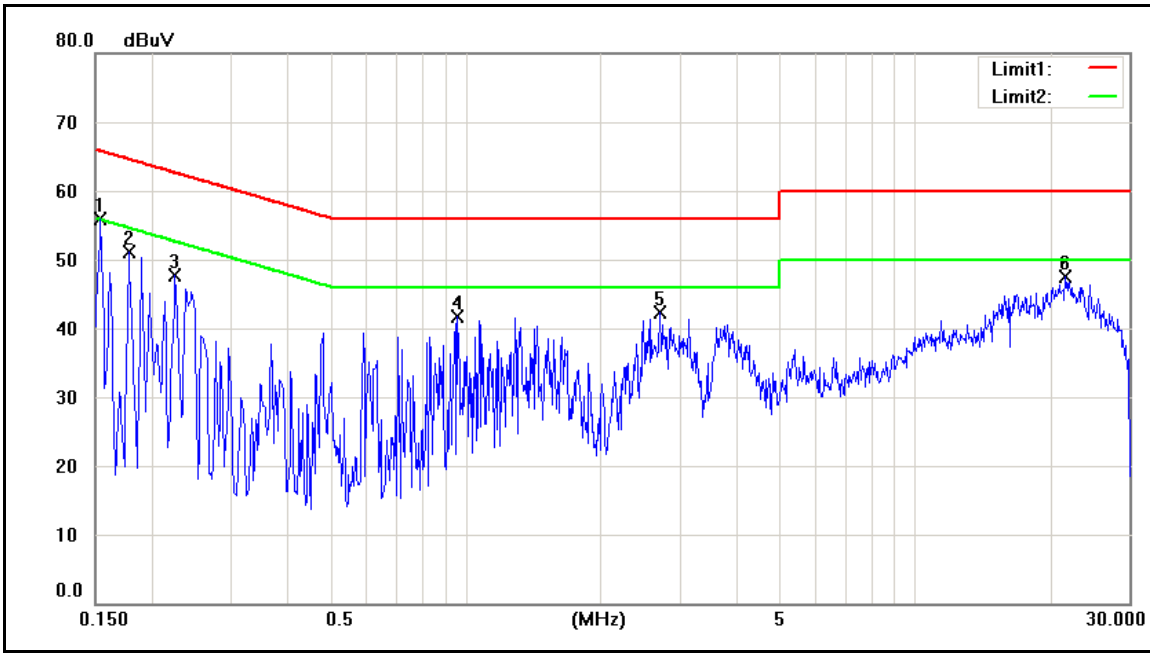
No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1500	38.93	13.15	10.11	49.04	23.26	66.00	56.00	-16.96	-32.74	Pass
2	0.1900	32.94	7.64	10.09	43.03	17.73	64.04	54.04	-21.01	-36.31	Pass
3	2.8740	26.15	15.79	9.82	35.97	25.61	56.00	46.00	-20.03	-20.39	Pass
4	3.7380	25.03	15.97	9.84	34.87	25.81	56.00	46.00	-21.13	-20.19	Pass
5	17.0900	31.79	20.52	10.29	42.08	30.81	60.00	50.00	-17.92	-19.19	Pass
6	20.7100	29.16	19.68	10.65	39.81	30.33	60.00	50.00	-20.19	-19.67	Pass

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	2011/02/01
		Test By:	Gary Wu
Description:			



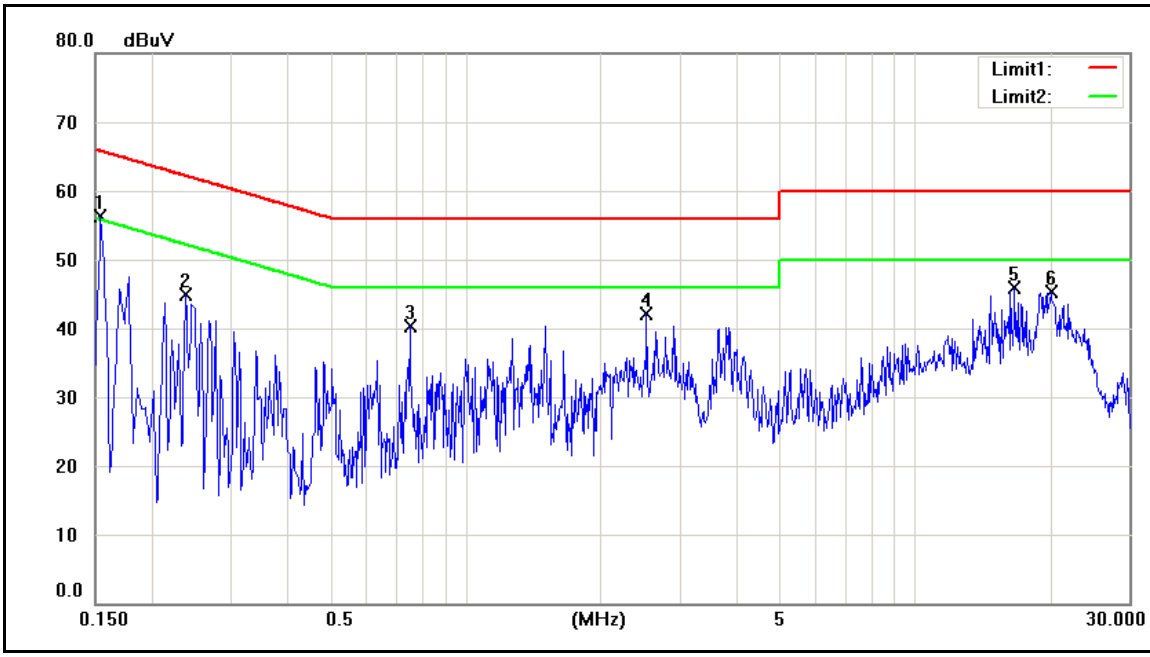
No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1580	35.80	10.89	10.10	45.90	20.99	65.57	55.57	-19.67	-34.58	Pass
2	0.2220	28.99	7.23	10.06	39.05	17.29	62.74	52.74	-23.69	-35.45	Pass
3	1.6340	19.13	10.24	9.71	28.84	19.95	56.00	46.00	-27.16	-26.05	Pass
4	3.8180	21.97	13.88	9.83	31.80	23.71	56.00	46.00	-24.20	-22.29	Pass
5	16.0860	27.77	21.85	10.29	38.06	32.14	60.00	50.00	-21.94	-17.86	Pass
6	21.9660	24.39	16.60	10.79	35.18	27.39	60.00	50.00	-24.82	-22.61	Pass

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	2011/02/01
		Test By:	Gary Wu
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1540	37.64	13.36	10.11	47.75	23.47	65.78	55.78	-18.03	-32.31	Pass
2	0.1780	32.47	7.27	10.09	42.56	17.36	64.58	54.58	-22.02	-37.22	Pass
3	0.2260	29.63	8.74	10.07	39.70	18.81	62.60	52.60	-22.90	-33.79	Pass
4	0.9620	27.55	12.01	9.78	37.33	21.79	56.00	46.00	-18.67	-24.21	Pass
5	2.7180	25.27	14.94	9.81	35.08	24.75	56.00	46.00	-20.92	-21.25	Pass
6	21.6500	29.70	20.19	10.68	40.38	30.87	60.00	50.00	-19.62	-19.13	Pass

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	2011/02/01
		Test By:	Gary Wu
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1540	38.41	13.59	10.10	48.51	23.69	65.78	55.78	-17.27	-32.09	Pass
2	0.2380	33.24	16.59	10.06	43.30	26.65	62.17	52.17	-18.87	-25.52	Pass
3	0.7540	23.78	13.97	9.85	33.63	23.82	56.00	46.00	-22.37	-22.18	Pass
4	2.5340	23.24	13.22	9.77	33.01	22.99	56.00	46.00	-22.99	-23.01	Pass
5	16.7180	27.92	18.06	10.32	38.24	28.38	60.00	50.00	-21.76	-21.62	Pass
6	20.0580	24.78	16.57	10.68	35.46	27.25	60.00	50.00	-24.54	-22.75	Pass

5 Radiated Interference Measurement

5.1. Limit

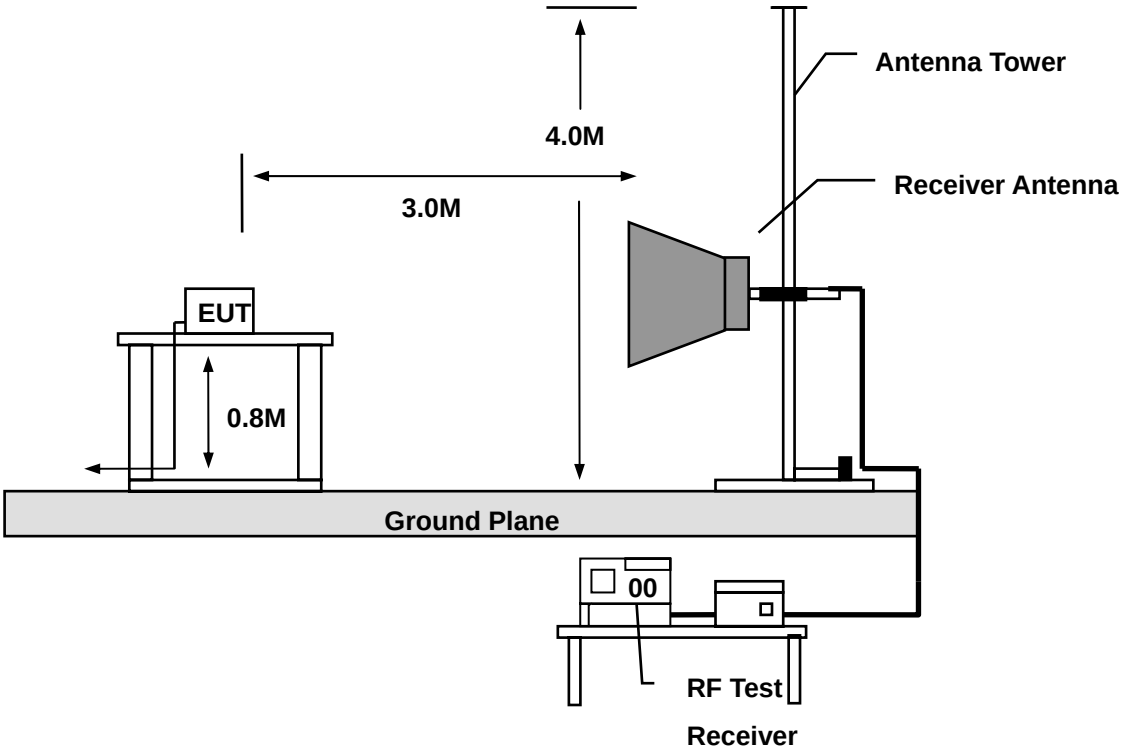
Frequency Range (MHz)	Peak (dBuV)
30 to 88	39
88 to 216	43.5
216 to 960	46.4
Above 960	49.5

5.2. Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/18/2011	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	02/24/2010	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/24/2010	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/24/2010	(1)
Bi-log Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	08/02/2010	(1)
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/29/2010	(1)
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/29/2010	(1)
Test Site	ATL	TE01	888001	07/30/2010	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

5.3. Setup



5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 30 MHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (mode VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

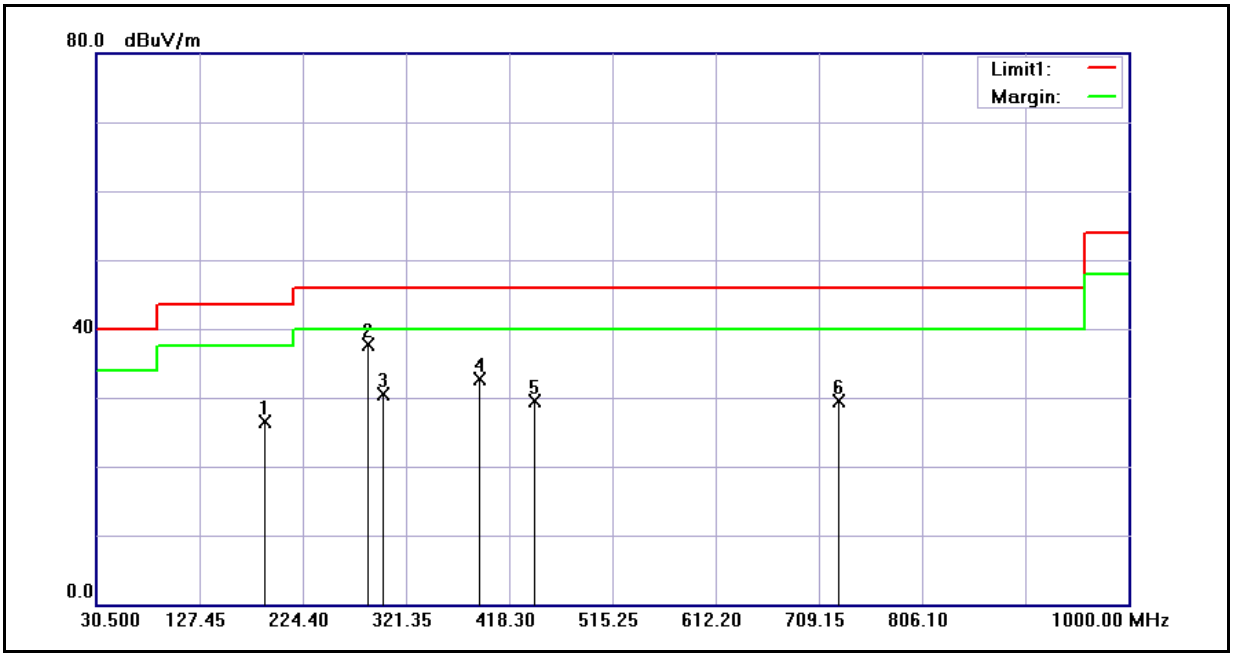
(1) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)
FI= Reading of the field intensity.
AF= Antenna factor.
CL= Cable loss.
P.S Amplitude is auto calculate in spectrum analyzer.

(2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)
The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:
(a) For fundamental frequency : Transmitter Output < +30dBm
(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

5.5. Test Result

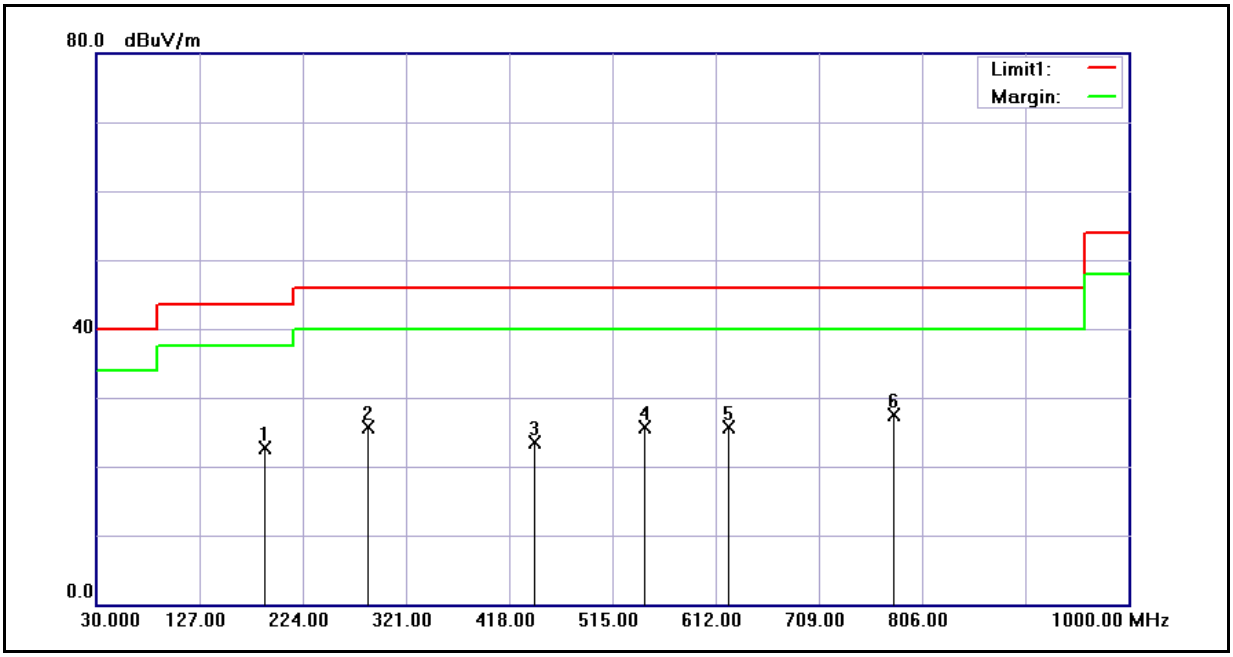
Below 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	2011/02/09
Ant.Polar.:	Horizontal	Test By:	Gary Wu



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	189.0000	40.52	-13.98	26.54	43.50	-16.96	QP
2	286.0000	48.59	-10.90	37.69	46.00	-8.31	QP
3	300.0000	40.94	-10.53	30.41	46.00	-15.59	QP
4	390.0000	41.16	-8.48	32.68	46.00	-13.32	QP
5	442.0000	37.59	-8.02	29.57	46.00	-16.43	QP
6	728.0000	32.27	-2.73	29.54	46.00	-16.46	QP

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	2011/02/09
Ant.Polar.:	Vertical	Test By:	Gary Wu



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	189.0000	36.62	-13.98	22.64	43.50	-20.86	QP
2	286.0000	36.51	-10.90	25.61	46.00	-20.39	QP
3	442.0000	31.53	-8.02	23.51	46.00	-22.49	QP
4	546.0000	32.03	-6.29	25.74	46.00	-20.26	QP
5	624.0000	30.08	-4.45	25.63	46.00	-20.37	QP
6	780.0000	29.29	-1.71	27.58	46.00	-18.42	QP

Above 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	2011/02/08
Frequency:	2402 MHz	Test By:	Gary Wu

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3716.000	38.86	4.24	43.10	74.00	-30.90	peak	H
4801.000	62.25	7.84	70.09	74.00	-3.91	peak	H
4801.000	36.50	7.84	44.34	54.00	-9.66	AVG	H
7104.000	36.85	14.68	51.53	74.00	-22.47	peak	H
3681.000	39.34	4.11	43.45	74.00	-30.55	peak	V
4801.000	57.48	7.84	65.32	74.00	-8.68	peak	V
4801.000	35.00	7.84	42.84	54.00	-11.16	AVG	V
7209.000	36.86	14.96	51.82	74.00	-22.18	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	2011/02/08
Frequency:	2441 MHz	Test By:	Gary Wu

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3863.000	38.88	4.81	43.69	74.00	-30.31	peak	H
4885.000	53.73	8.12	61.85	74.00	-12.15	peak	H
4885.000	35.61	8.12	43.73	54.00	-10.27	AVG	H
7363.000	36.63	15.37	52.00	74.00	-22.00	peak	H
3898.000	38.25	4.94	43.19	74.00	-30.81	peak	V
4885.000	46.66	8.12	54.78	74.00	-19.22	peak	V
4885.000	34.51	8.12	42.63	54.00	-11.37	AVG	V
7391.000	36.41	15.44	51.85	74.00	-22.15	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	2011/02/08
Frequency:	2480 MHz	Test By:	Gary Wu

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3695.000	38.45	4.16	42.61	74.00	-31.39	peak	H
4962.000	59.02	8.37	67.39	74.00	-6.61	peak	H
4962.000	36.25	8.37	44.62	54.00	-9.38	AVG	H
6859.000	37.86	13.99	51.85	74.00	-22.15	peak	H
3772.000	38.56	4.45	43.01	74.00	-30.99	peak	V
4962.000	51.87	8.37	60.24	74.00	-13.76	peak	V
4962.000	35.11	8.37	43.48	54.00	-10.52	AVG	V
7139.000	37.21	14.78	51.99	74.00	-22.01	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	2011/02/08
Frequency:	2402 MHz	Test By:	Gary Wu

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3975.000	38.08	5.23	43.31	74.00	-30.69	peak	H
4808.000	61.36	7.87	69.23	74.00	-4.77	peak	H
4808.000	35.44	7.87	43.31	54.00	-10.69	AVG	H
7272.000	36.12	15.13	51.25	74.00	-22.75	peak	H
4248.000	38.80	6.08	44.88	74.00	-29.12	peak	V
4801.000	57.77	7.84	65.61	74.00	-8.39	peak	V
4801.000	33.88	7.84	41.72	54.00	-12.28	AVG	V
7181.000	36.25	14.89	51.14	74.00	-22.86	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	2011/02/08
Frequency:	2441 MHz	Test By:	Gary Wu

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2988.000	40.34	2.25	42.59	74.00	-31.41	peak	H
4885.000	56.69	8.12	64.81	74.00	-9.19	peak	H
4885.000	34.59	8.12	42.71	54.00	-11.29	AVG	H
7440.000	35.61	15.57	51.18	74.00	-22.82	peak	H
3905.000	38.58	4.97	43.55	74.00	-30.45	peak	V
4885.000	49.63	8.12	57.75	74.00	-16.25	peak	V
4885.000	32.65	8.12	40.77	54.00	-13.23	AVG	V
7433.000	35.92	15.55	51.47	74.00	-22.53	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	2011/02/08
Frequency:	2480 MHz	Test By:	Gary Wu

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4325.000	37.95	6.32	44.27	74.00	-29.73	peak	H
4962.000	63.76	8.37	72.13	74.00	-1.87	peak	H
4962.000	34.98	8.37	43.35	54.00	-10.65	AVG	H
6999.000	37.31	14.41	51.72	74.00	-22.28	peak	H
4178.000	38.40	5.87	44.27	74.00	-29.73	peak	V
4962.000	54.31	8.37	62.68	74.00	-11.32	peak	V
4962.000	33.29	8.37	41.66	54.00	-12.34	AVG	V
7202.000	36.18	14.94	51.12	74.00	-22.88	peak	V

Standard:	FCC Part 15B	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 6	Date:	2011/02/08
Frequency:	2441 MHz	Test By:	Gary Wu

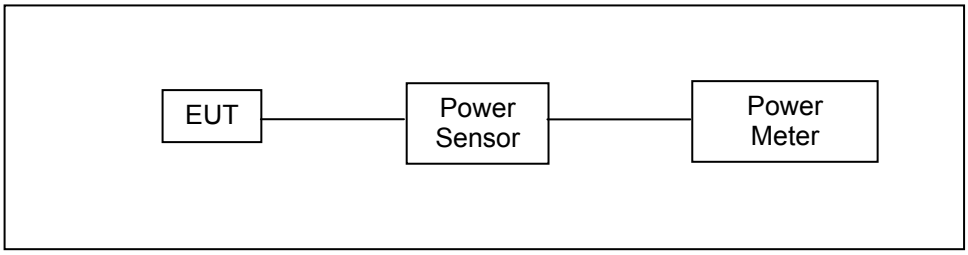
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Peak Limit (dBuV/m)	AVG. Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4745.000	38.27	7.66	45.93	74.00	54.00	-28.07	peak	H
5522.000	37.32	10.02	47.34	74.00	54.00	-26.66	peak	H
7041.000	36.37	14.52	50.89	74.00	54.00	-23.11	peak	H
4724.000	38.01	7.60	45.61	74.00	54.00	-28.39	peak	V
6705.000	35.98	13.51	49.49	74.00	54.00	-24.51	peak	V
7447.000	36.06	15.59	51.65	74.00	54.00	-22.35	peak	V

6 Maximum Conducted Output Power Measurement

6.1. Limit

For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels < 1 watt.

6.2. Test Setup



6.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Single Channel PK Power Sensor	Agilent	N1911A	MY45101619	07/19/2010	(1)
Wideband Power Meter	Agilent	N1921A	MY45241957	07/19/2010	(1)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

6.4. Test Procedure

The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

6.5. Test Result

Model Number	TH02M					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 3: GFSK Link Mode					
Date of Test	02/08/2011			Test Site	TE06	
Frequency (MHz)	Packet Type	Average Power		Peak Power		Limit (W)
		(dBm)	(W)	(dBm)	(W)	
2402	DH1	-4.090	0.390	**1.150**	**1.303**	< 1
	DH3	-0.860	0.820	1.110	1.291	< 1
	DH5	-0.170	0.962	1.100	1.288	< 1
2441	DH1	-5.750	0.266	-0.500	0.891	< 1
	DH3	-2.520	0.560	-0.500	0.891	< 1
	DH5	-1.830	0.656	-0.520	0.887	< 1
2480	DH1	-5.080	0.310	0.150	1.035	< 1
	DH3	-1.850	0.653	0.150	1.035	< 1
	DH5	-1.170	0.764	0.140	1.033	< 1

Model Number	TH02M					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 4: π/4-DQPSK Mode					
Date of Test	02/08/2011			Test Site	TE06	
Frequency (MHz)	Packet Type	Average Power		Peak Power		Limit (W)
		(dBm)	(W)	(dBm)	(W)	
2402	DH1	-4.230	0.378	**2.770**	**1.892**	< 1
	DH3	-1.120	0.773	2.740	1.879	< 1
	DH5	-0.440	0.904	2.720	1.871	< 1
2441	DH1	-5.510	0.281	2.500	1.778	< 1
	DH3	-2.360	0.581	2.430	1.750	< 1
	DH5	-1.670	0.681	2.450	1.758	< 1
2480	DH1	-5.320	0.294	1.540	1.426	< 1
	DH3	-2.230	0.598	1.550	1.429	< 1
	DH5	-1.550	0.700	1.560	1.432	< 1

Model Number	TH02M				
Test Item	Maximum Conducted Output Power				
Test Mode	Mode 5: 8DPSK Link Mode				
Date of Test	02/08/2011		Test Site	TE06	

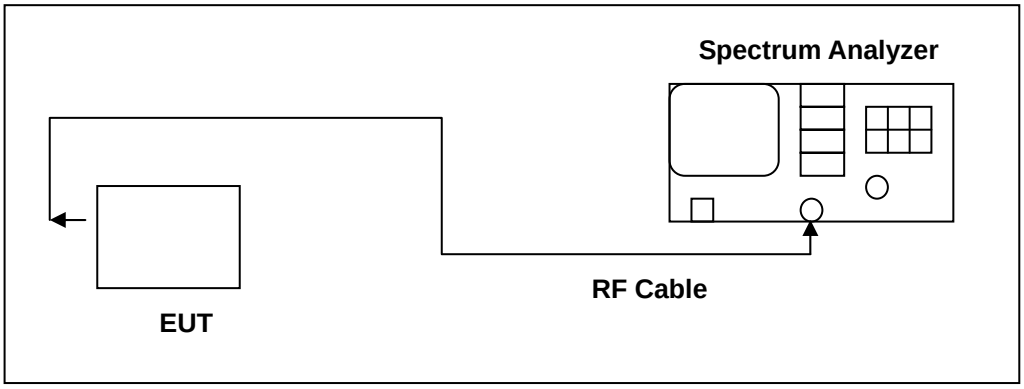
Frequency (MHz)	Packet Type	Average Power		Peak Power		Limit (W)
		(dBm)	(W)	(dBm)	(W)	
2402	DH1	-4.230	0.378	**3.110**	**2.046**	< 1
	DH3	-1.120	0.773	3.090	2.037	< 1
	DH5	-0.440	0.904	3.090	2.037	< 1
2441	DH1	-5.510	0.281	3.030	2.009	< 1
	DH3	-2.360	0.581	3.000	1.995	< 1
	DH5	-1.680	0.679	3.010	2.000	< 1
2480	DH1	-5.330	0.293	1.840	1.528	< 1
	DH3	-2.230	0.598	1.830	1.524	< 1
	DH5	-1.550	0.700	1.850	1.531	< 1

7 Minimum 20dB RF Bandwidth Measurement

7.1. Limit

N/A

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

7.4. Test Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = approx. 2 to 3 times the 20dB bandwidth, centered on a hopping frequency
2. RBW ≥ 1% of the 20dB span
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

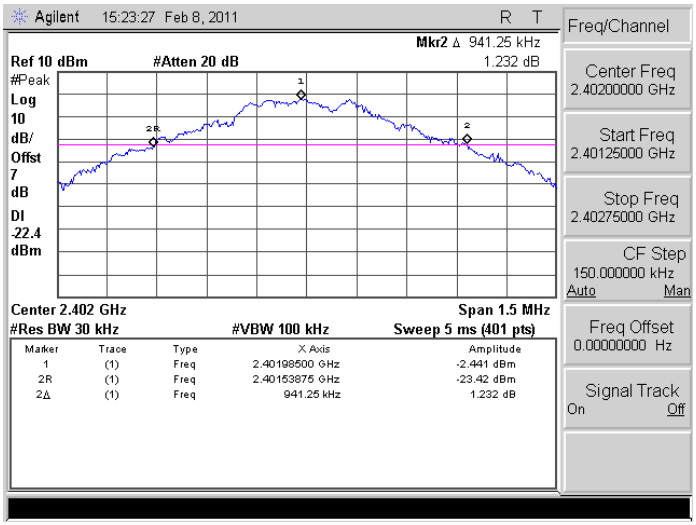
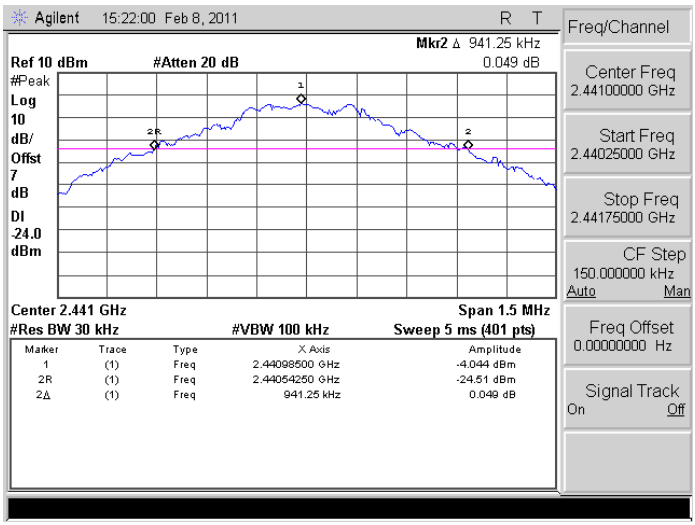
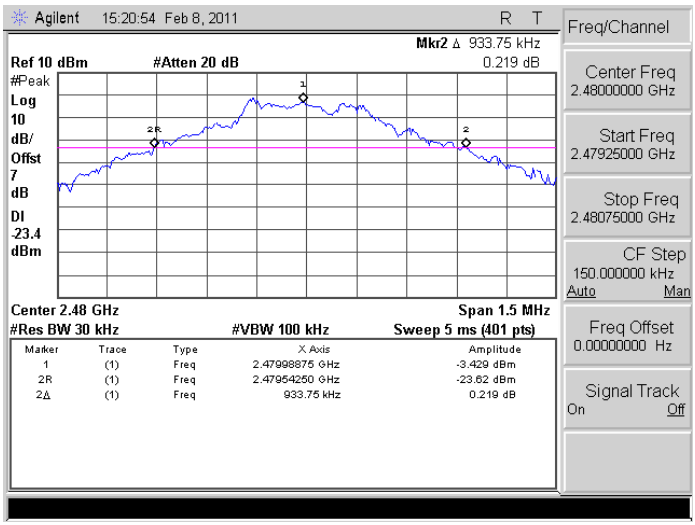
The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The marker-to-peak function was used to set the marker to the peak of the emission. The marker-delta function was used to measure 20dB down one side of the emission. The marker-delta function and marker was moved to the other side of the emission until it was even with the reference marker. The marker-delta reading at this point was the 20dB bandwidth of the emission.

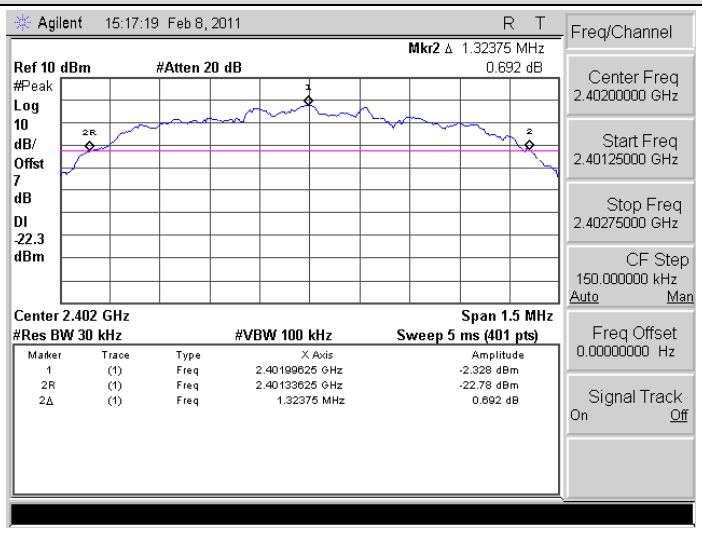
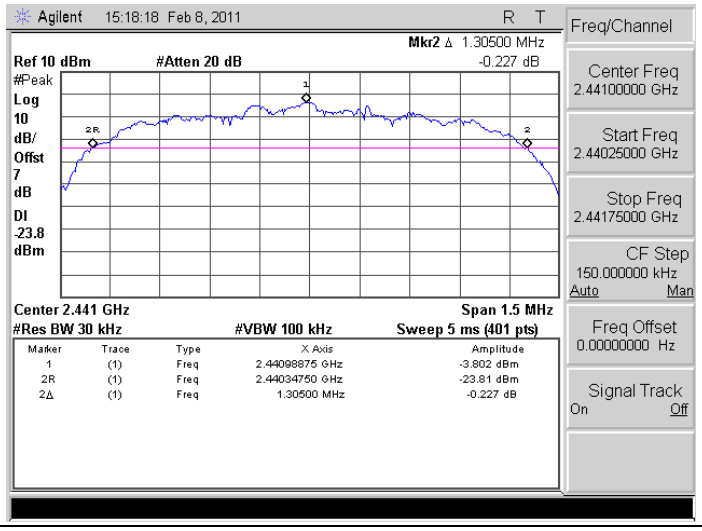
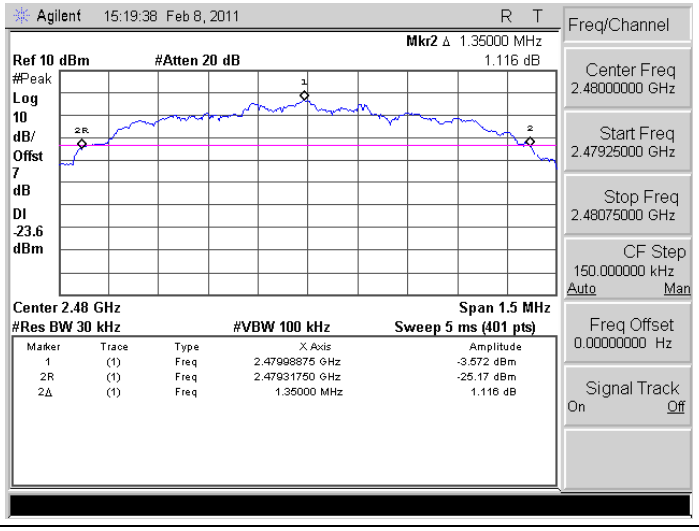
7.5. Test Result

Model Number	TH02M		
Test Item	Minimum 20dB RF Bandwidth		
Test Mode	Mode 3: GFSK Link Mode		
Date of Test	02/08/2011	Test Site	TE06
Frequency (MHz)	Measurement (MHz)		Limit (MHz)
2402	0.94125		-----
2441	0.94125		-----
2480	0.93375		-----

Model Number	TH02M		
Test Item	Minimum 20dB RF Bandwidth		
Test Mode	Mode 5: 8DPSK Link Mode		
Date of Test	02/08/2011	Test Site	TE06
Frequency (MHz)	20dB Bandwidth (MHz)		Limit (MHz)
2402	1.32375		-----
2441	1.30500		-----
2480	1.35000		-----

7.6. Test Graphs

Mode 3: GFSK Link Mode	
2402	
2441	
2480	

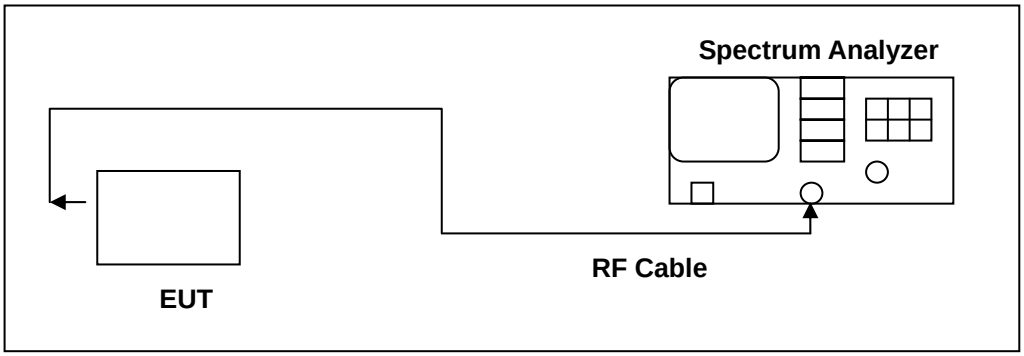
Mode 5: 8DPSK Link Mode	
2402	
2441	
2480	

8 Carrier Frequency Separation Measurement

8.1. Limit

Title 47 of the CFR, Part 15 Subpart (c) 15.247(a)(1)(i) requires the measurement of the bandwidth of the transmission between the -20 dB points on the transmitted spectrum. The results of this test determine the limits for channel spacing. The channel spacing shall be a minimum of 25 kHz or the 20 dB bandwidth.

8.2. Test Setup



8.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

8.4. Test Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth transmitter of the V6 had its hopping function enabled. The following spectrum analyzer settings were used:

1. Span = wide enough to capture the peaks of two adjacent channels
2. Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
3. Video (or Average) Bandwidth (VBW) ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels.

8.5. Test Result

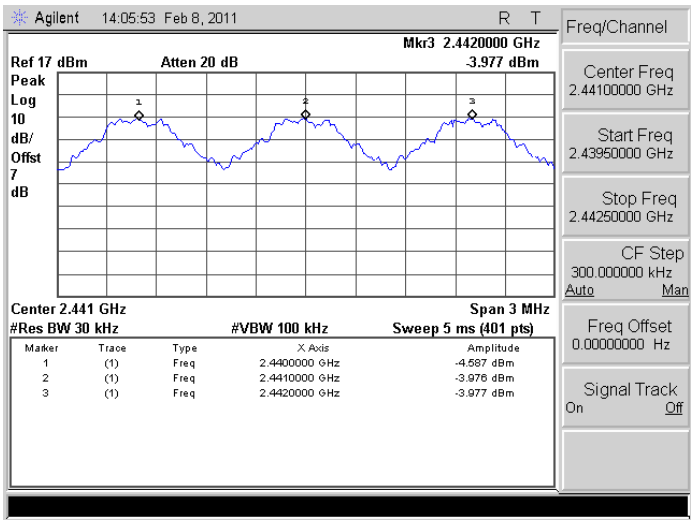
Model Number	TH02M		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 3: GFSK Link Mode		
Date of Test	02/08/2011	Test Site	TE06

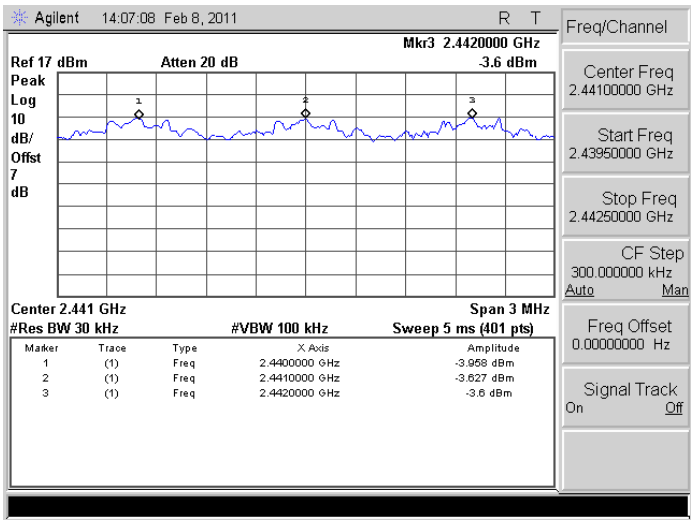
Frequency (MHz)	Measurement (MHz)	Limit (MHz)
2441	1	minimum of 25 kHz or the 20 dB bandwidth

Model Number	TH02M		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 5: 8DPSK Link Mode		
Date of Test	02/08/2011	Test Site	TE06

Frequency (MHz)	Measurement (MHz)	Limit (MHz)
2441	1	minimum of 25 kHz or the 20 dB bandwidth

8.6. Test Graphs

Mode 3: GFSK Link Mode	
2441	

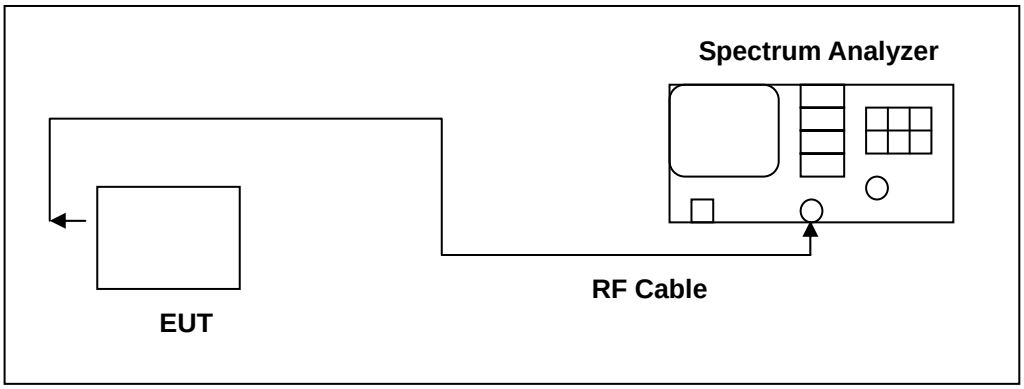
Mode 5: 8DPSK Link Mode	
2441	

9 Number of Hopping Measurement

9.1. Limit

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

9.2. Test Setup



9.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

9.4. Test Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = the frequency band of operation
2. RBW ≥ 1% of the span
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

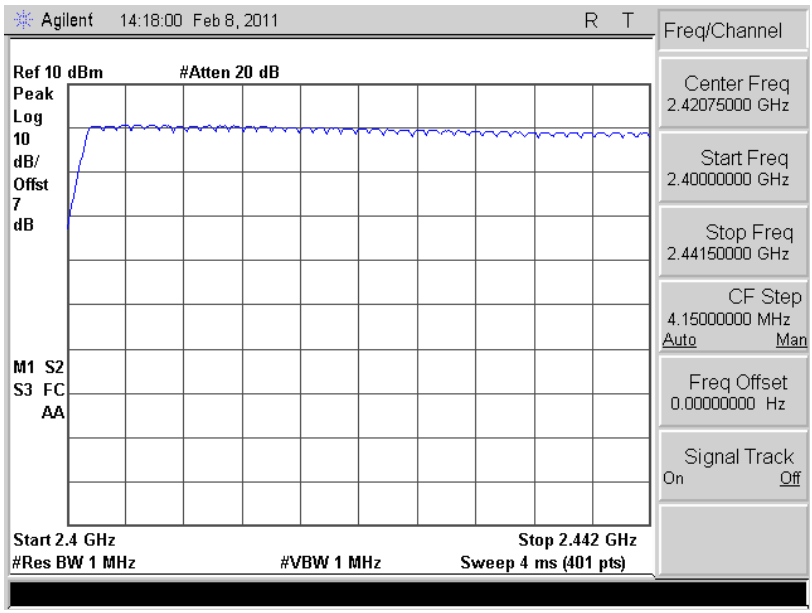
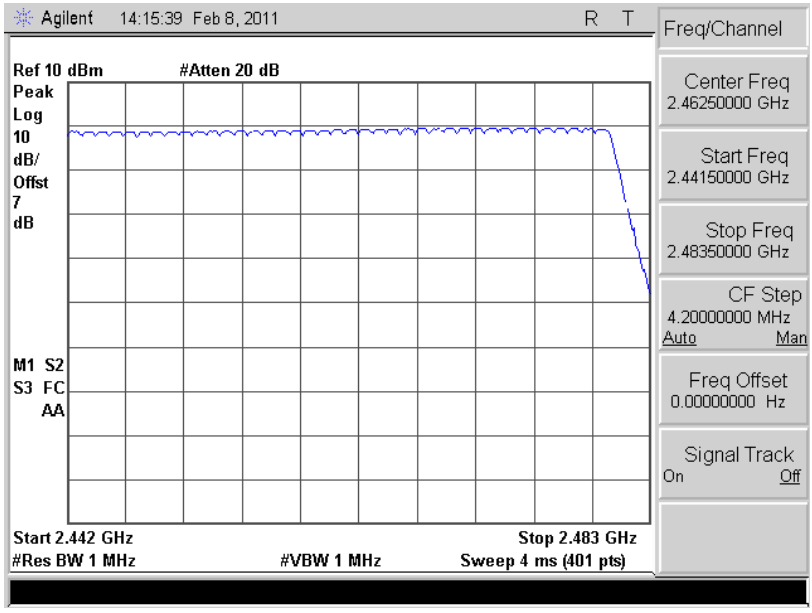
The trace was allowed to stabilize.

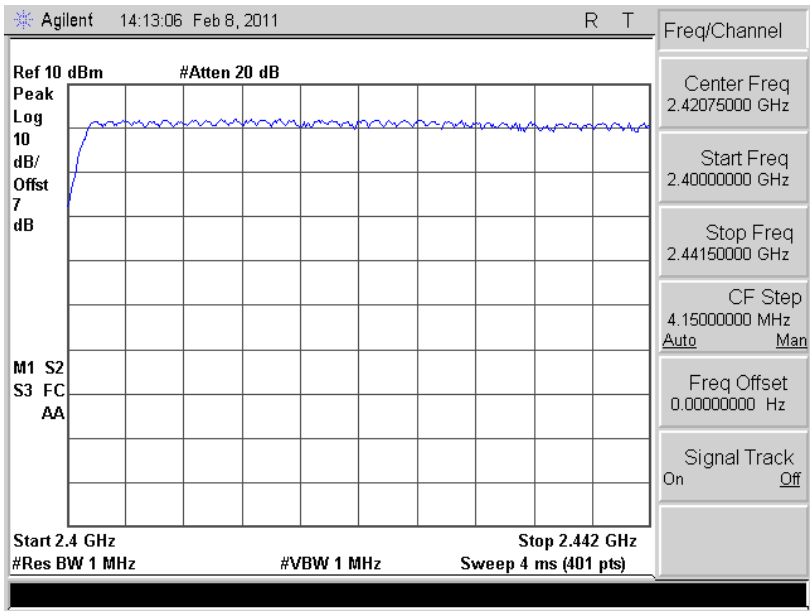
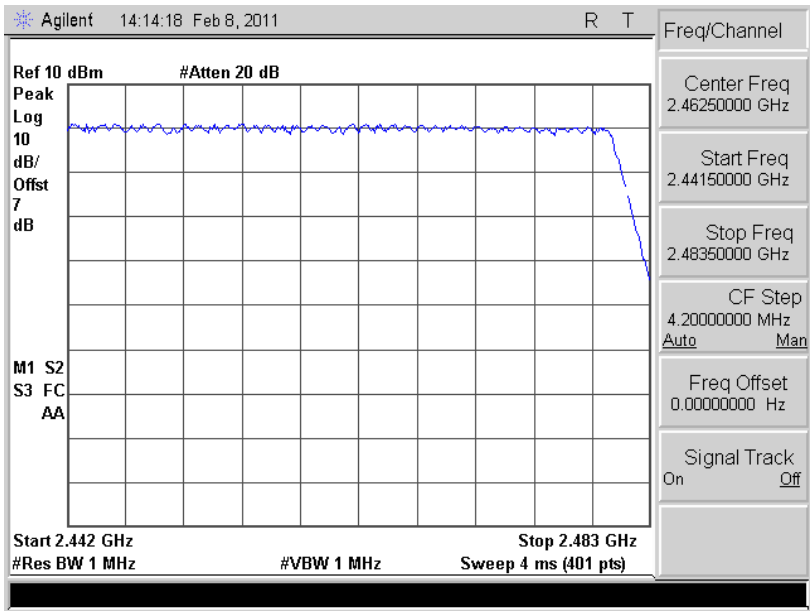
9.5. Test Result

Model Number	TH02M		
Test Item	Number of Hopping		
Test Mode	Mode 3: GFSK Link Mode		
Date of Test	02/08/2011	Test Site	TE06
Frequency Range (MHz)	Measurement (ch)	Limit (ch)	
2402 - 2480	79	> 15	

Model Number	TH02M		
Test Item	Number of Hopping		
Test Mode	Mode 5: 8DPSK Link Mode		
Date of Test	02/08/2011	Test Site	TE06
Frequency Range (MHz)	Measurement (ch)	Limit (ch)	
2402 - 2480	79	> 15	

9.6. Test Graphs

Mode 3: GFSK Link Mode	
CH0~CH39	
CH40~CH78	

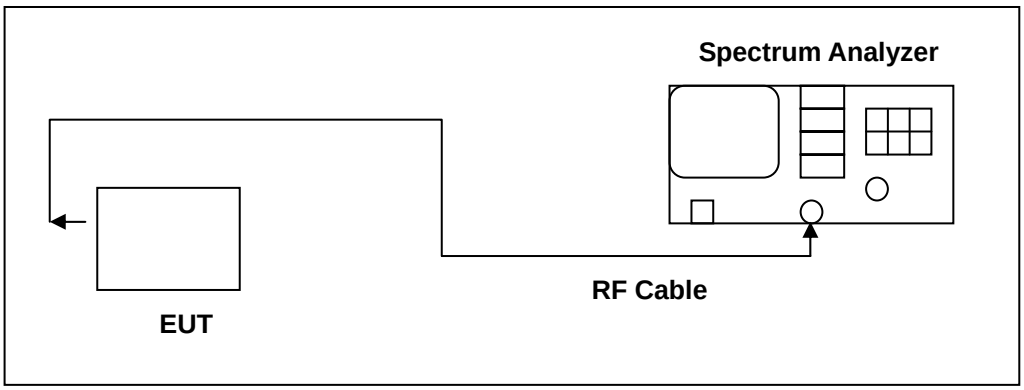
Mode 5: 8DPSK Link Mode	
CH0~CH39	
CH40~CH78	

10 Time of Occupancy (Dwell Time) Measurement

10.1. Limit

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.

10.2. Test Setup



10.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

10.4. Test Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

1. Span = zero span, centered on a hopping channel
2. RBW = 1 MHz
3. VBW ≥ RBW
4. Sweep = as necessary to capture the entire dwell time per hopping channel
5. Detector function = peak
6. Trace = max hold

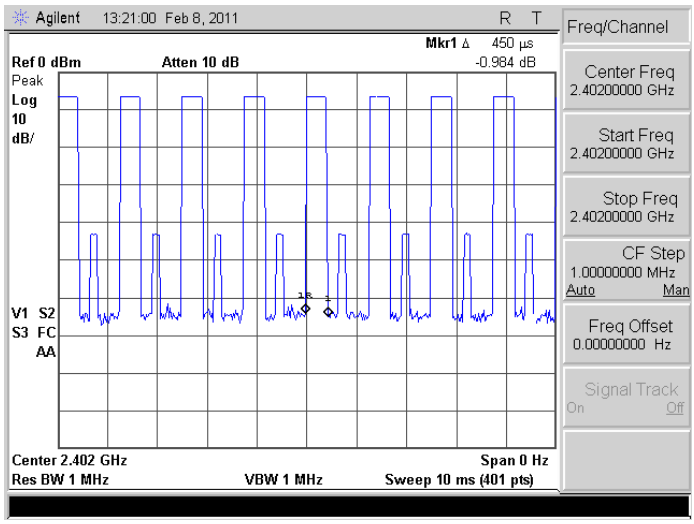
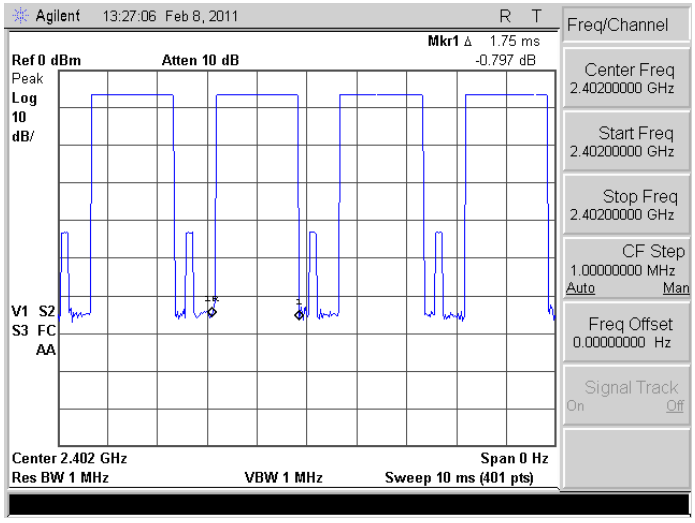
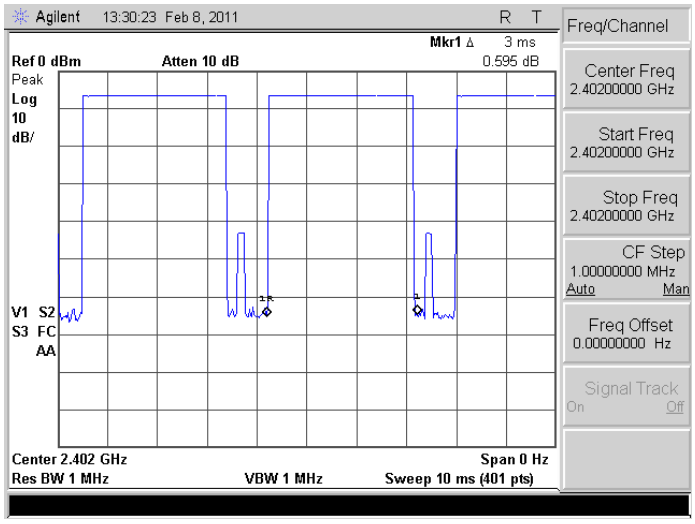
The marker-delta function was used to determine the dwell time.

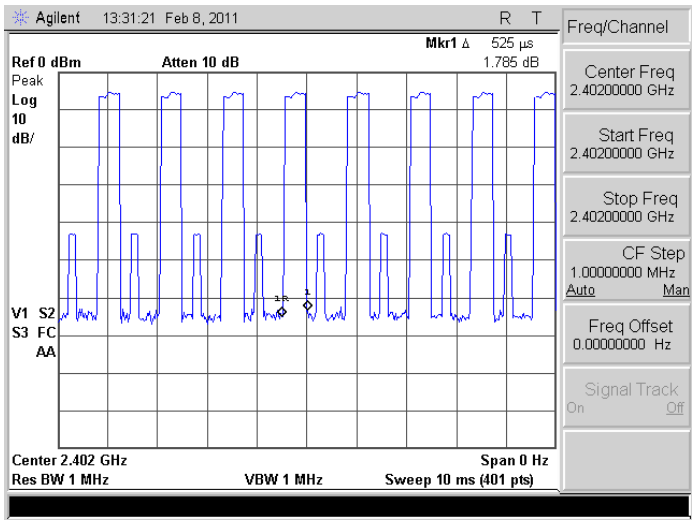
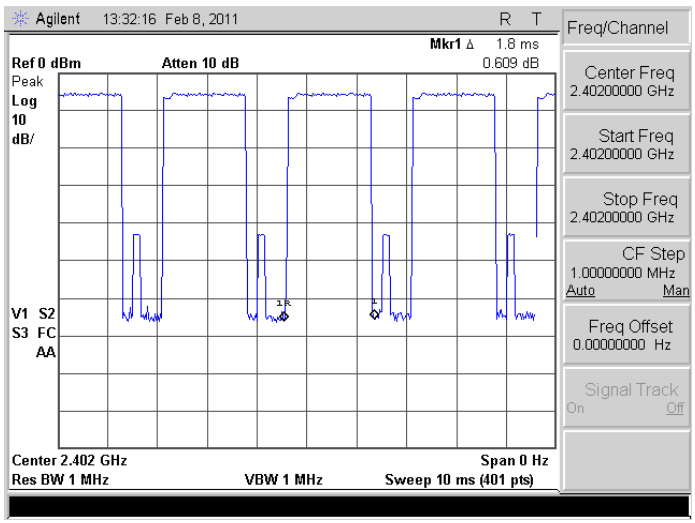
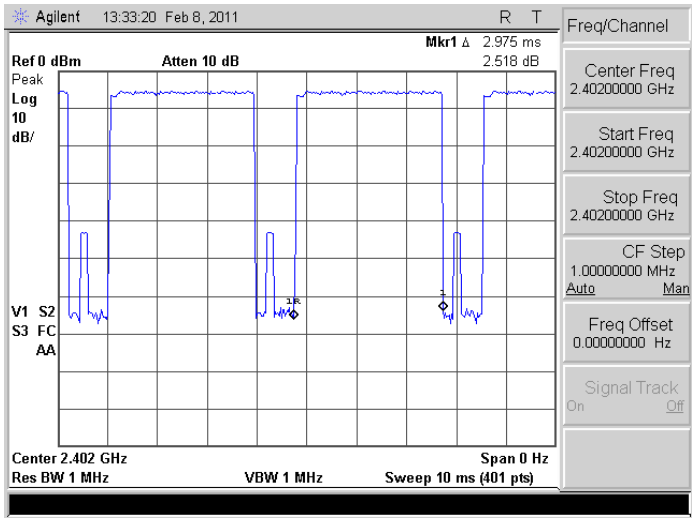
10.5.Test Result

Model Number	TH02M		
Test Item	Time of Occupancy (Dwell Time)		
Test Mode	Mode 3: GFSK Link Mode		
Date of Test	02/08/2011	Test Site	TE06
DH1			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	800/79CH = 10.13(times/sec)		
Each Channel Dwell Times (1)	0.450 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 10.13 = 320.108(times)		
Dwell Times on Cycle (1) * (2)	144.0486 ms (sec)		
LIMIT(msec)	< = 400		
DH3			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	400/79CH = 5.1(times/sec)		
Each Channel Dwell Times (1)	1.750 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 5.1 = 161.16(times)		
Dwell Times on Cycle (1) * (2)	282.03 ms (sec)		
LIMIT(msec)	< = 400		
DH5			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	266.7/79CH = 3.37(times/sec)		
Each Channel Dwell Times (1)	3.000 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 3.37 = 106.492(times)		
Dwell Times on Cycle (1) * (2)	319.476 ms (sec)		
LIMIT(msec)	< = 400		

Model Number	TH02M		
Test Item	Time of Occupancy (Dwell Time)		
Test Mode	Mode 5: 8DPSK Link Mode		
Date of Test	02/08/2011	Test Site	TE06
3DH1			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	800/79CH = 10.13(times/sec)		
Each Channel Dwell Times (1)	0.525 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 10.13 = 320.108(times)		
Dwell Times on Cycle (1) * (2)	168.0567 ms (sec)		
LIMIT(msec)	< = 400		
3DH3			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	400/79CH = 5.1(times/sec)		
Each Channel Dwell Times (1)	1.800 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 5.1 = 161.16(times)		
Dwell Times on Cycle (1) * (2)	290.088 ms (sec)		
LIMIT(msec)	< = 400		
3DH5			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	266.7/79CH = 3.37(times/sec)		
Each Channel Dwell Times (1)	2.975 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 3.37 = 106.492(times)		
Dwell Times on Cycle (1) * (2)	316.8137 ms (sec)		
LIMIT(msec)	< = 400		

10.6.Test Graphs

Mode 3: GFSK Link Mode	
DH1	
DH3	
DH5	

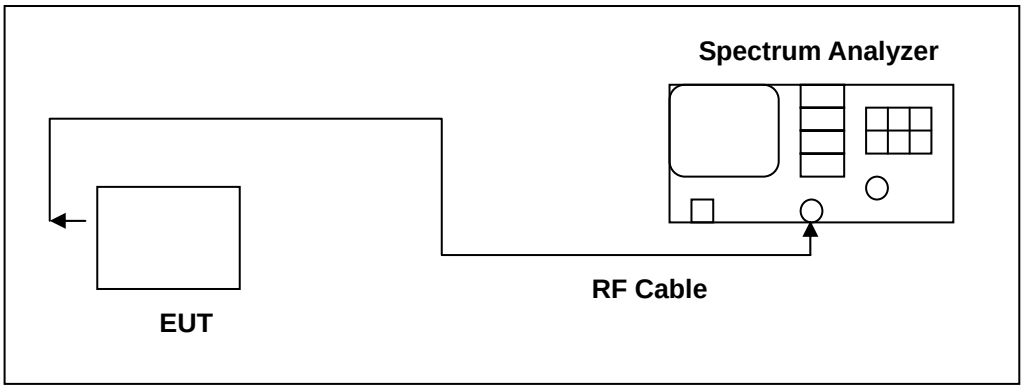
Mode 5: 8DPSK Link Mode	
2DH1	
2DH3	
2DH5	

11 Out of Band Conducted Emissions Measurement

11.1.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

11.2.Test Setup



11.3.Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

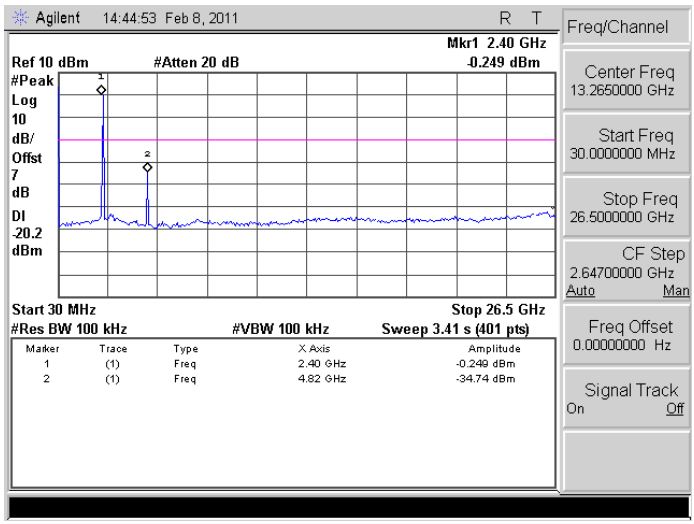
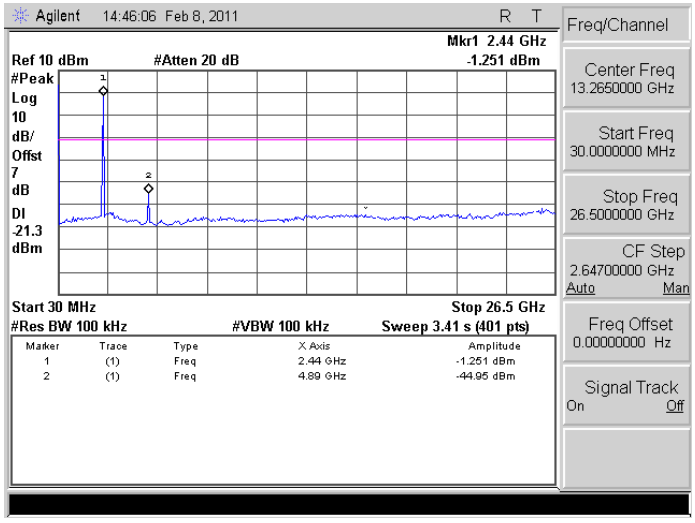
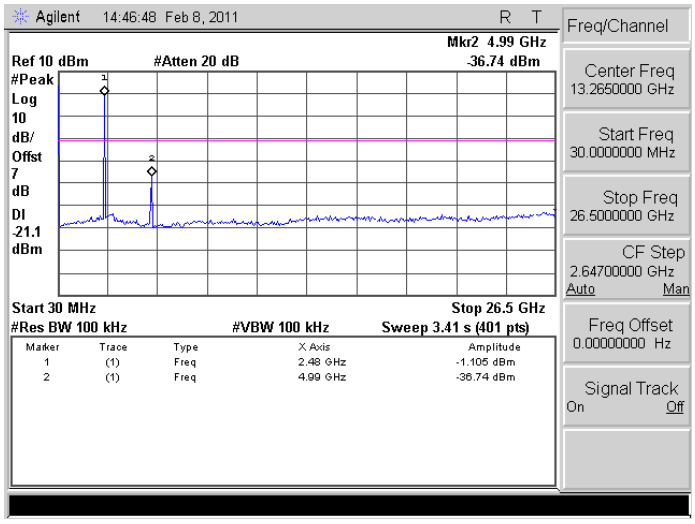
Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

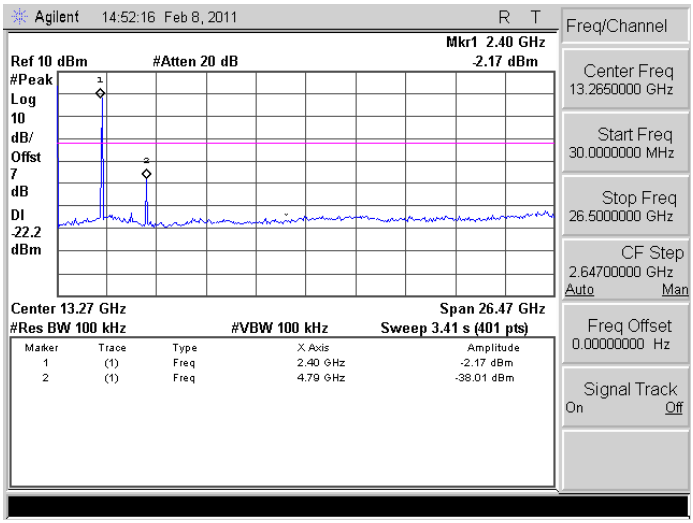
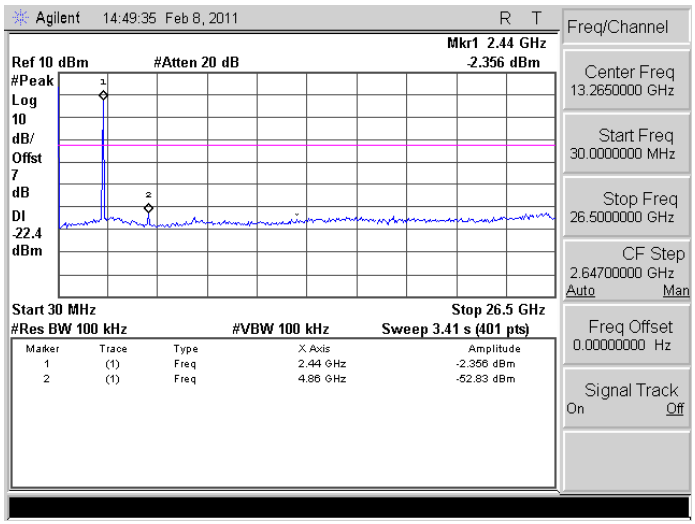
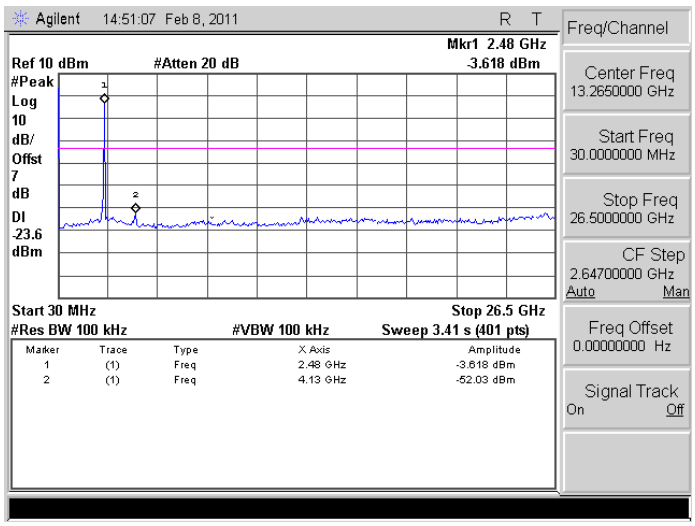
11.4.Test Procedure

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels (Channel 0, 39, 78)

11.5.Test Graphs

Mode 3: GFSK Link Mode	
2402	
2441	
2480	

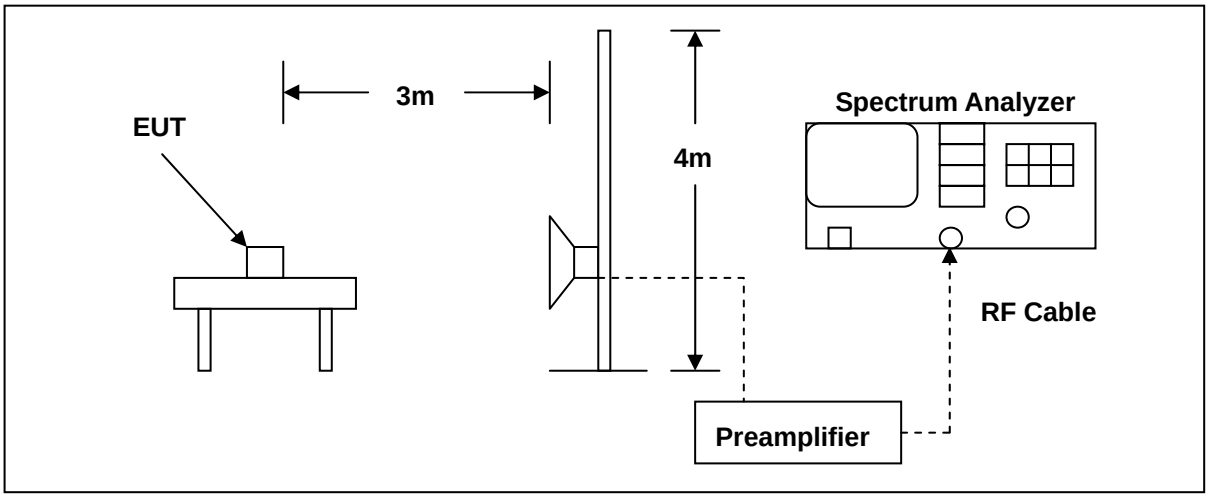
Mode 5: 8DPSK Link Mode	
2402	
2441	
2480	

12 Band Edges Measurement

12.1.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

12.2.Test Setup



12.3.Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4408B	MY45107753	06/24/2010	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/24/2010	(1)
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	9120D	9120D-550	06/29/2010	(1)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

12.4.Test Procedure

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

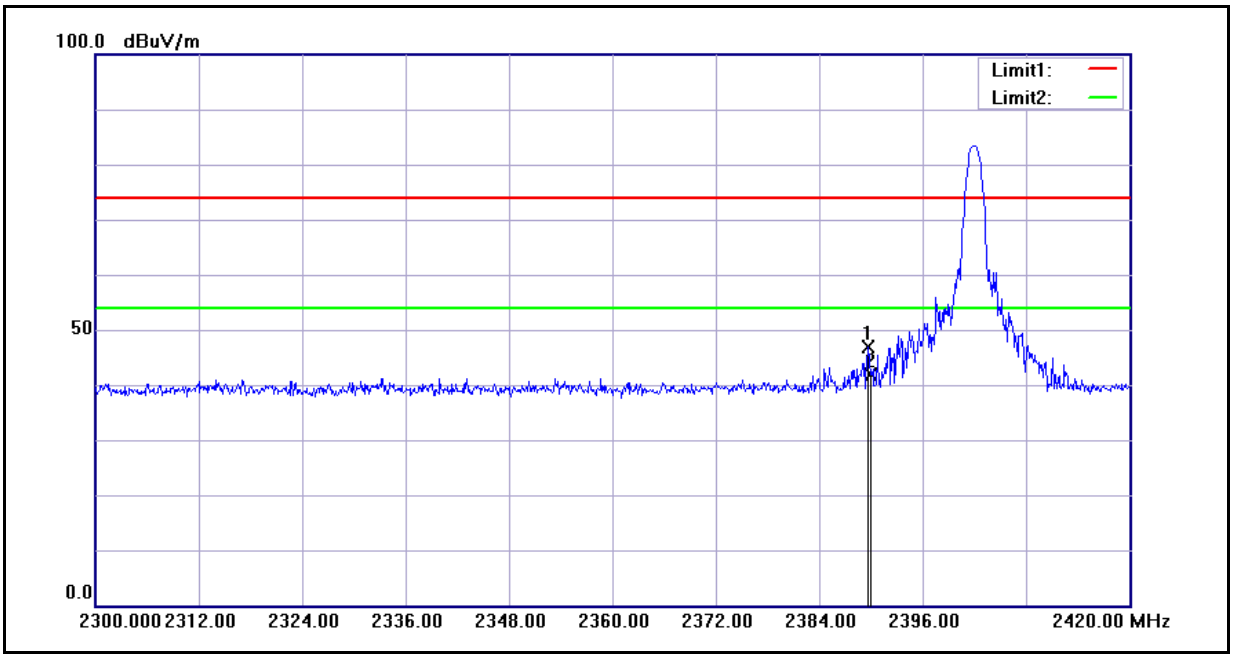
The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

For measurements the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

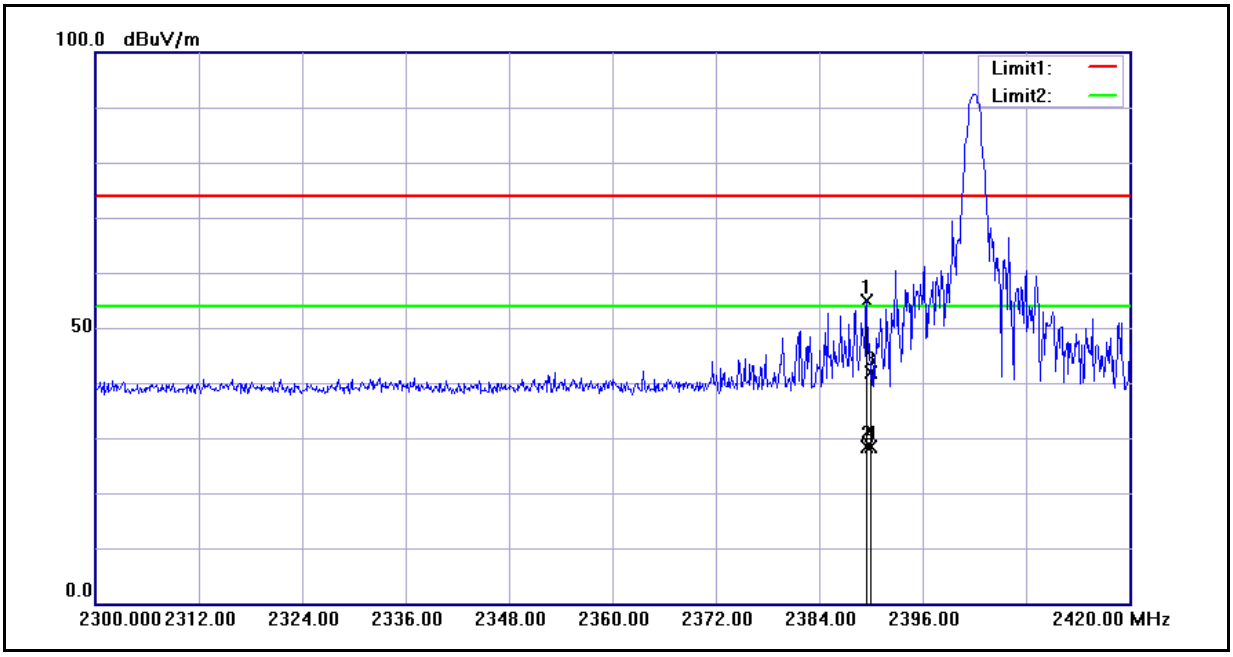
12.5.Test Result

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	2011/02/08
Frequency:	2402 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



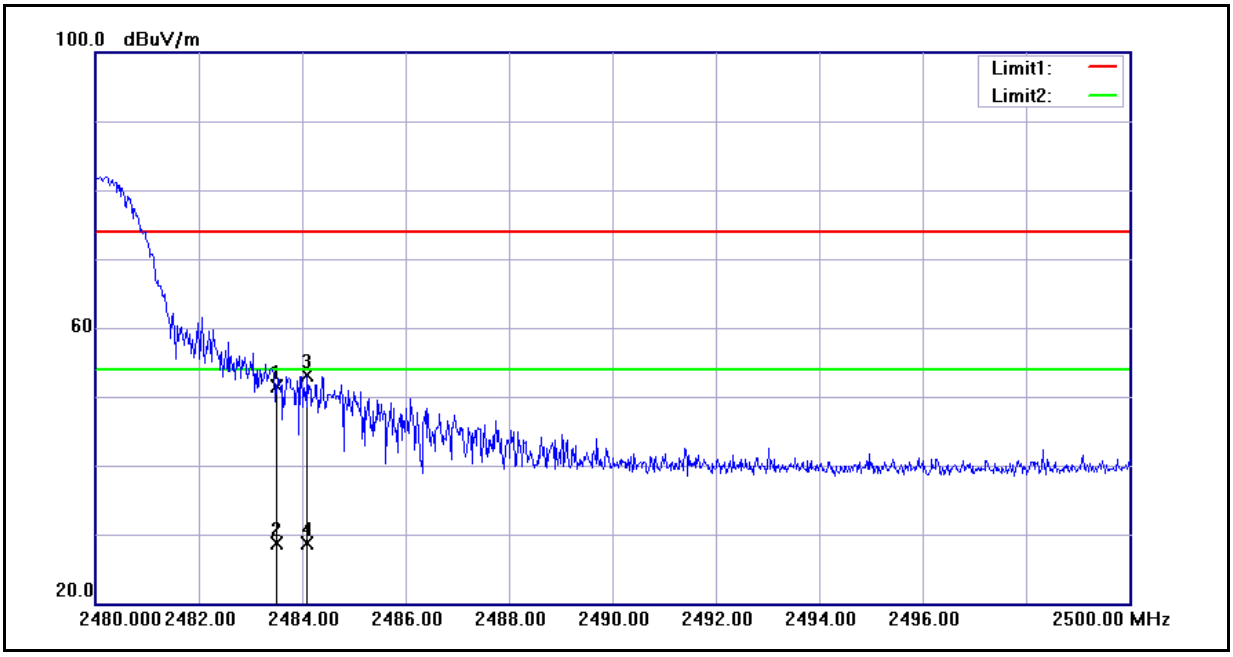
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.640	47.09	-0.22	46.87	74.00	-27.13	peak
2	2390.000	42.00	-0.22	41.78	74.00	-32.22	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	2011/02/08
Frequency:	2402 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



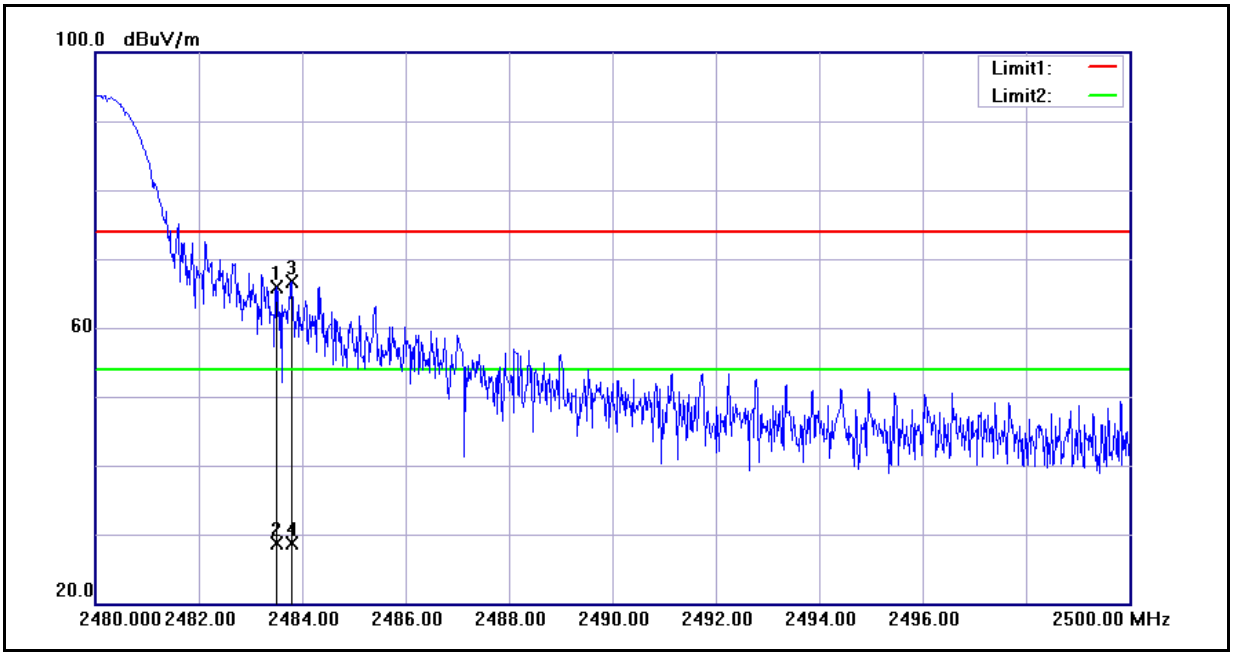
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.520	55.08	-0.22	54.86	74.00	-19.14	peak
2	2389.520	28.62	-0.22	28.40	54.00	-25.60	AVG
3	2390.000	42.00	-0.22	41.78	74.00	-32.22	peak
4	2390.000	28.68	-0.22	28.46	54.00	-25.54	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	2011/02/08
Frequency:	2480 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



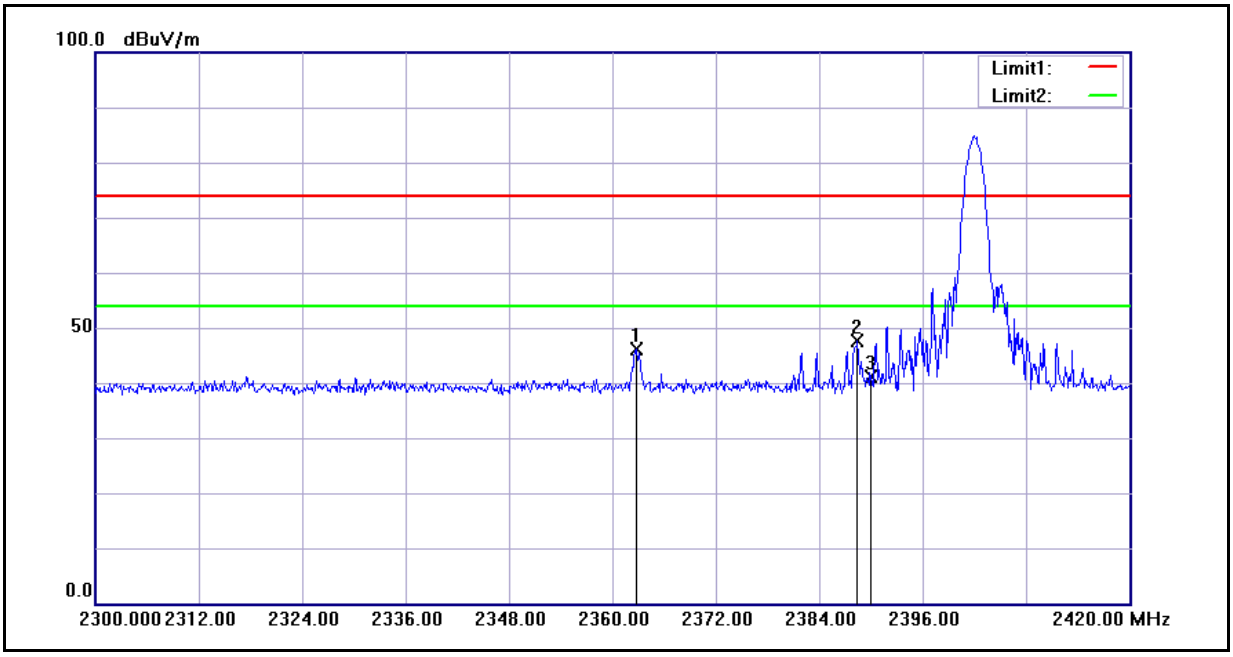
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	51.32	0.16	51.48	74.00	-22.52	peak
2	2483.500	28.50	0.16	28.66	54.00	-25.34	AVG
3	2484.100	52.89	0.16	53.05	74.00	-20.95	peak
4	2484.100	28.47	0.16	28.63	54.00	-25.37	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	2011/02/08
Frequency:	2480 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



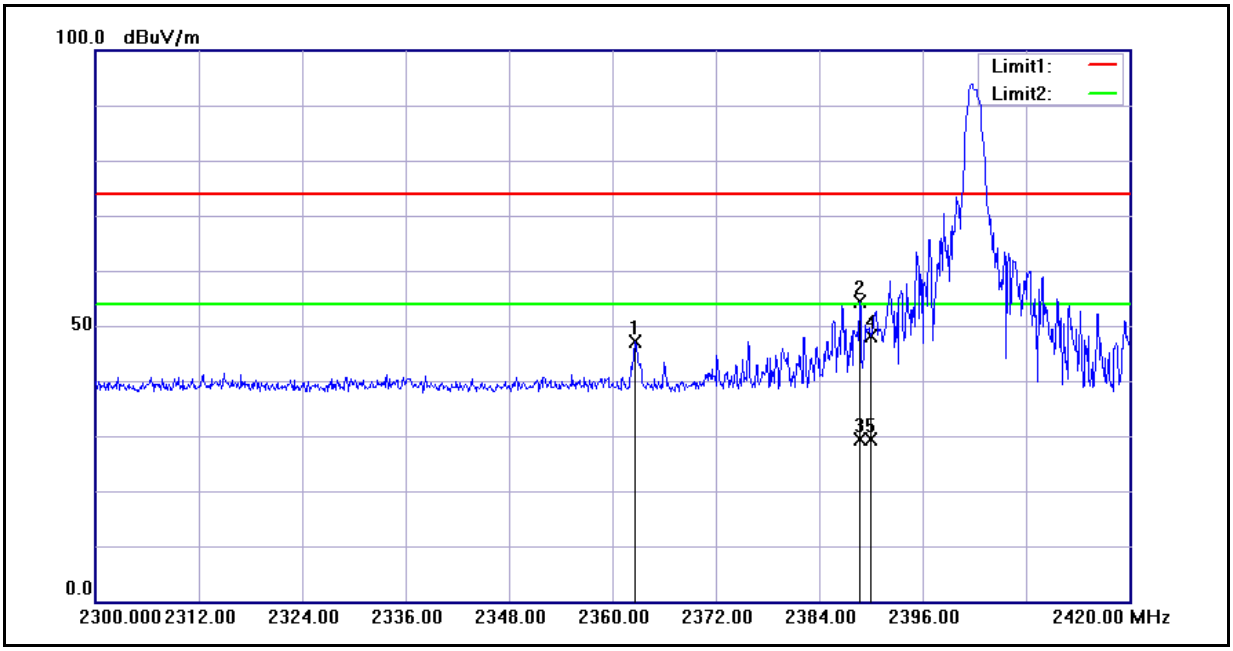
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	65.76	0.16	65.92	74.00	-8.08	peak
2	2483.500	28.61	0.16	28.77	54.00	-25.23	AVG
3	2483.800	66.51	0.16	66.67	74.00	-7.33	peak
4	2483.800	28.53	0.16	28.69	54.00	-25.31	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	2011/02/08
Frequency:	2402 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



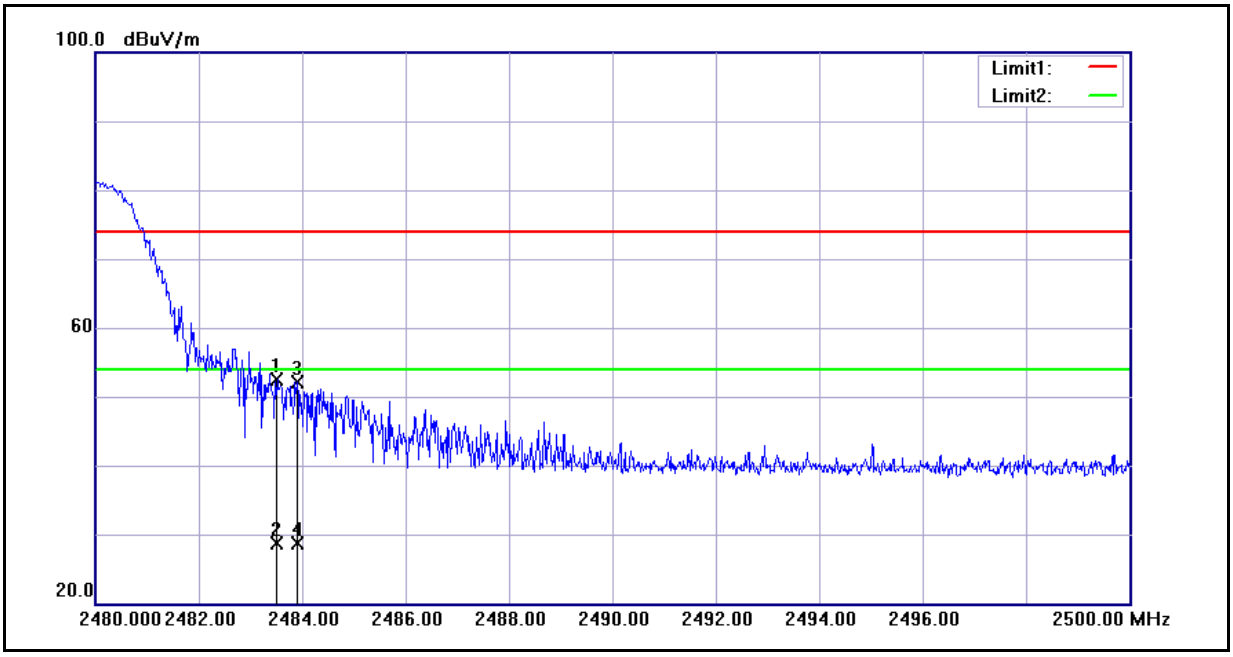
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2362.760	46.49	-0.33	46.16	74.00	-27.84	peak
2	2388.440	47.91	-0.22	47.69	74.00	-26.31	peak
3	2390.000	41.25	-0.22	41.03	74.00	-32.97	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	2011/02/08
Frequency:	2402 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



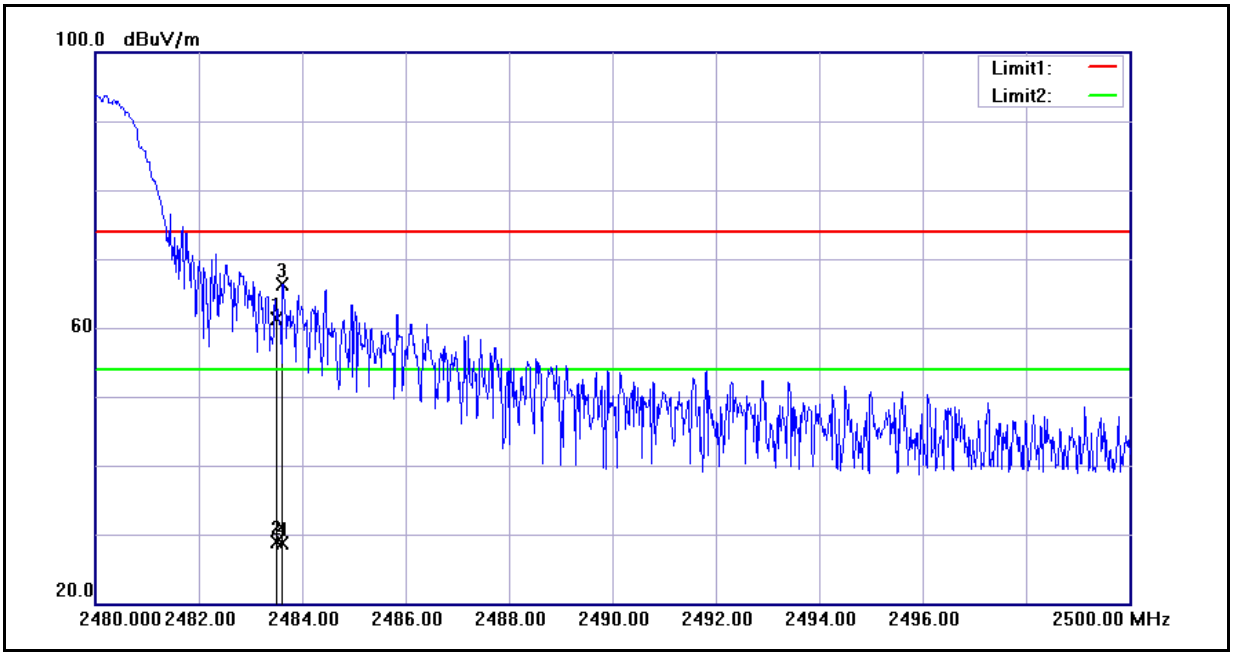
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2362.640	47.36	-0.33	47.03	74.00	-26.97	peak
2	2388.680	54.68	-0.22	54.46	74.00	-19.54	peak
3	2388.680	29.61	-0.22	29.39	54.00	-24.61	AVG
4	2390.000	48.31	-0.22	48.09	74.00	-25.91	peak
5	2390.000	29.68	-0.22	29.46	54.00	-24.54	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	2011/02/08
Frequency:	2480 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	52.28	0.16	52.44	74.00	-21.56	peak
2	2483.500	28.55	0.16	28.71	54.00	-25.29	AVG
3	2483.900	51.94	0.16	52.10	74.00	-21.90	peak
4	2483.900	28.48	0.16	28.64	54.00	-25.36	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH02M	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	2011/02/08
Frequency:	2480 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



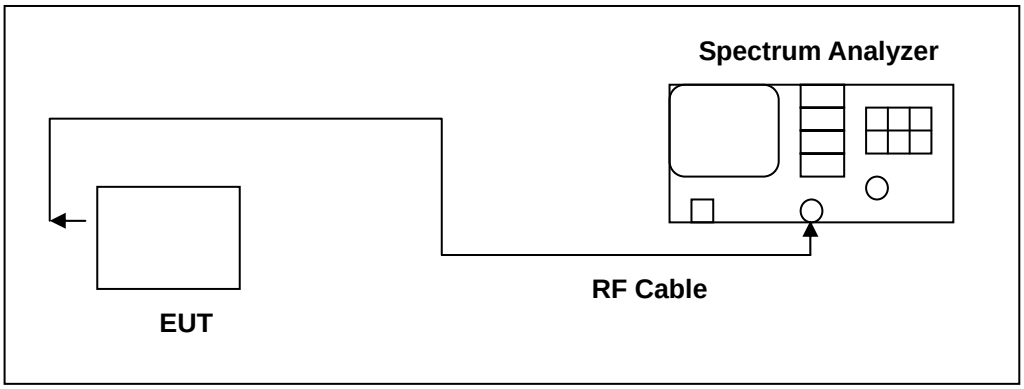
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	61.17	0.16	61.33	74.00	-12.67	peak
2	2483.500	28.67	0.16	28.83	54.00	-25.17	AVG
3	2483.620	66.21	0.16	66.37	74.00	-7.63	peak
4	2483.620	28.61	0.16	28.77	54.00	-25.23	AVG

13 99 % Occupied Bandwidth Measurement

13.1.Limit

N/A

13.2.Test Setup



13.3.Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

13.4.Test Procedure

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

13.5.Test Result

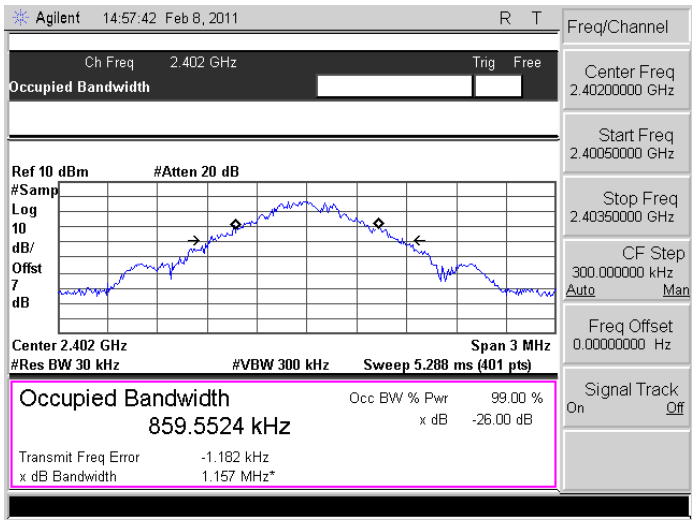
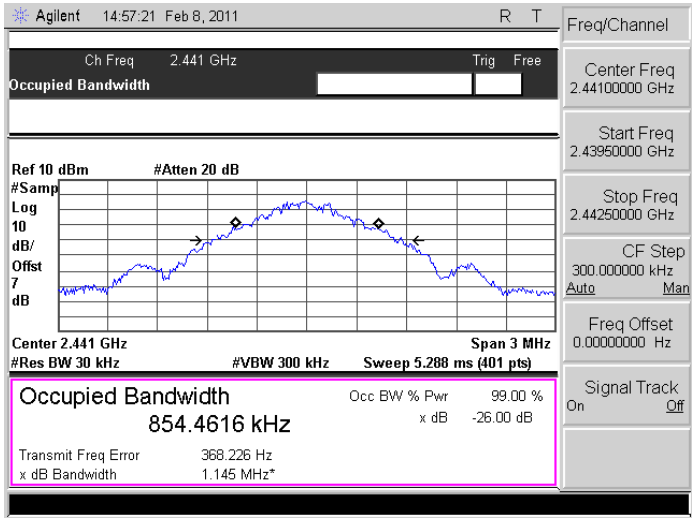
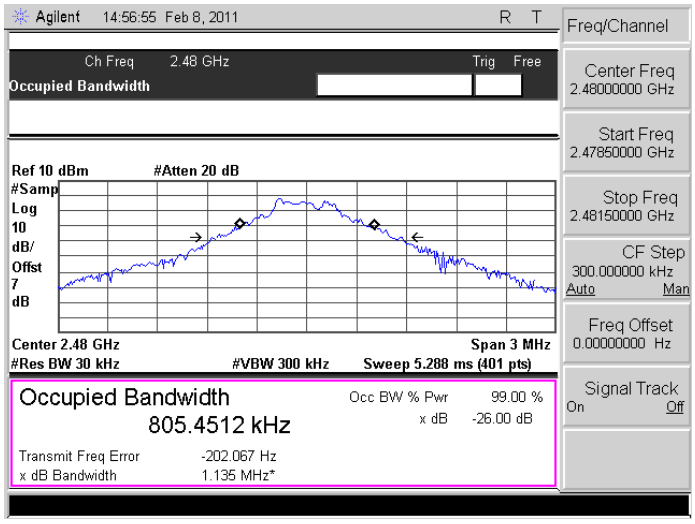
Model Number	TH02M		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 3: GFSK Link Mode		
Date of Test	02/08/2011	Test Site	TE06

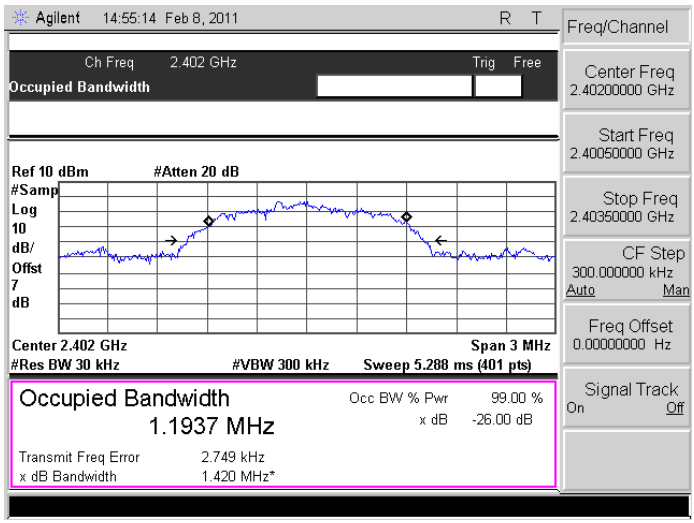
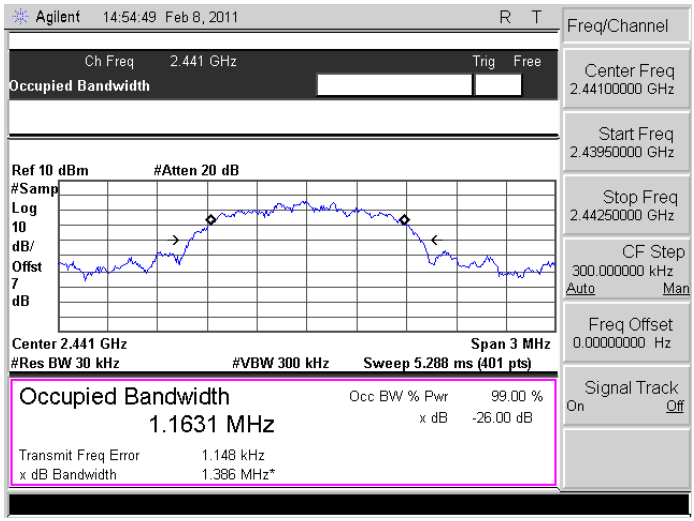
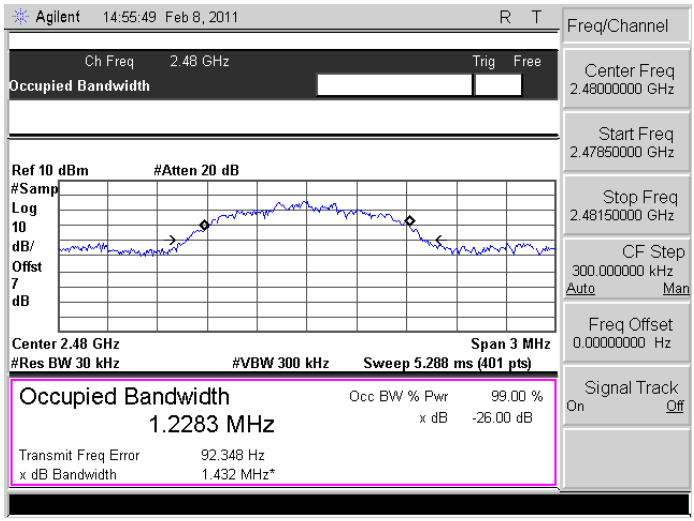
Frequency (MHz)	Measurement (MHz)	Limit (MHz)
2402	0.8595524	-----
2441	0.8544616	-----
2480	0.8054512	-----

Model Number	TH02M		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 5: 8DPSK Link Mode		
Date of Test	02/08/2011	Test Site	TE06

Frequency (MHz)	Measurement (MHz)	Limit (MHz)
2402	1.1937	-----
2441	1.1631	-----
2480	1.2283	-----

13.6.Test Graphs

Mode 3: GFSK Link Mode	
2402	
2441	
2480	

Mode 5: 8DPSK Link Mode	
2402	
2441	
2480	

14 Antenna Measurement

14.1. Limit

For intentional device, according to 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 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

14.2. Antenna Connector Construction

The antenna used in this product is **Internal antenna**. And the maximum Gain of this antenna is only **-4.9 dBi**.