



Spectrum Research & Testing Lab., Inc.
No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A13011801
Report No.: FCCA13011801
FCC ID : ZME-MLW221
Page: 1 of 119
Date: Feb. 06, 2013

Product Name: MobileLite Wireless
Model No.: MLW221
Applicant: Kingston Digital, Inc.
17600 Newhope Street Fountain Valley, CA 92708, U.S.A
Date of Receipt: Jan. 18, 2013
Finished date of Test: Feb. 04, 2013
Applicable Standards: 47 CFR Part 15, Subpart C
ANSI C63.4: 2003
KDB 558074-D01; Oct 2012” The FCC has made this KDB a requirement went testing DTS devices.

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Richard Lin , Date: 2/6/2013
(Richard Lin)

Approved By : JH , Date: 2/6/2013
(Johnson Ho, Director)



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Revisions History

Report No.	Issue Date	Revisions
FCCA13011801	Feb. 06, 2013	Initial issue



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1. DOCUMENT POLICY AND TEST STATEMENT

1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.

1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source, DC 3.7V of charge battery or Micro USB external power adapter, was used during the test.

1.3 EUT MODIFICATION

- No modification in SRT Lab.



2. DESCRIPTION OF EUT AND TEST MODE

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	MobileLite Wireless
MODEL NO.	MLW221
POWER SUPPLY	DC power source, DC 3.7V of charge battery Micro USB external power adapter DC:5V
CABLE	NA
FREQUENCY BAND	2.4 GHz ~ 2.4835 GHz
CARRIER FREQUENCY	2.412 GHz ~ 2.462 GHz
NUMBER OF CHANNEL	11 (802.11b/g/n – HT20) 7 (802.11n – HT40)
RATED RF OUTPUT POWER	2.4 GHz 802.11b : -4.51 dBm (0.354 mW) 802.11g : -2.94 dBm (0.508 mW) 802.11n – HT20 : -3.23 dBm (0.475 mW) 802.11n – HT40 : -5.76 dBm (0.265 mW)
MODULATION TYPE	IEEE802.11b/g/n – HT20/n – HT40 SISO-OFDM (BPSK/16QAM/64QAM)
MODE OF OPERATION	Duplex
BIT RATE OF TRANSMISSION	802.11b : 1, 2, 5.5, 11 Mbps; 802.11g : 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n - HT20 : MCS0 ~ MCS7 (Max. 72.2 Mbps) 802.11n - HT40 : MCS0 ~ MCS7 (Max. 150 Mbps)
ANTENNA TYPE	PIFA Antenna
ANTENNA GAIN	2.25 dBi
CHANNEL BANDWIDTH	20/40 MHz

NOTE:

For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

2.2 DESCRIPTION OF EUT INTERNAL DEVICE

DEVICE	BRAND / MAKER	MODEL #	FCC ID / DOC	REMARK
Micro USB Cable	N/A	N/A	N/A	0.5m unshielded power cord
Internal Battery	Sanyo	UF555148SX	N/A	DC : 3.7V, 1810 mAh



2.3 DESCRIPTION OF TEST MODE

11 channels are provided by EUT of wireless. The 3 channels of lower, medium and higher were chosen for test. There are test modes for each test configuration as below:

Mode		Modulation Type	Channel	Frequency (MHz)
1	802.11b	CCK	CH01	2412
2		QPSK	CH06	2437
3		BPSK	CH11	2462
4	802.11g	64QAM (OFDM)	CH01	2412
5			CH06	2437
6			CH11	2462
7	802.11n – HT20	64QAM (OFDM)	CH01	2412
8			CH06	2437
9			CH11	2462
10	802.11n – HT40	64QAM SISO-(OFDM)	CH05	2422
11			CH08	2437
12			CH11	2452

NOTE:

1. Below 1 GHz, the channel 1, 6 and 11 were pre-tested in chamber and chosen the worst case for conducted and radiated emission test.
2. Above 1 GHz, the channel 1, 6 and 11 were tested individually.
3. The axis X,Y and Z we evaluate in chamber, the X axis is worst case.

X axis:



Y axis:



Z axis:





2.4 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2003. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL #	FCC ID/DOC	CABLE
1	PC	ACER	Aspire SA85	DoC	1.5m unshielded power cable
2	CRT Monitor	SAMSUNG	PG17IS	DoC	1.8m unshielded power cord 1.5m shielded data cable. with one core.
3	Keyboard	WinTEK	WM530	DoC	1.8m unshielded data cable.
4	Mouse	WinTEK	WSS30	DoC	1.5m unshielded data cable.
5	Modem	ACEEX	DM-1414	DoC	1.5m unshielded power cord 1.5m shielded data cable.
6	Printer	EPSON	STYLUS C20SX	N/A	1.5m unshielded power cord 1.2m shielded data cable.
7	Dual Band USB Adapter	D-Link	DWA-160	CCA08LP1090 T3	N/A
8	Power Adapter	ANTHIN	APW305UB-03-06	DoC	Input:AC100-240V, 0.15A, 50/60Hz Output:DC 5V,1A

NOTE:

For the actual test configuration, please refer to the photos of testing.

2.5 EUT OPERATING CONDITION

1. Setup the EUT and all peripheral devices .
2. Turn on the power of all equipment and EUT.
3. We will use the following programs under Windows Home server system to test EUT.
4. Access IP "192.168.200.254" homepage and with download files, and set the EUT under continuous transmission mode



3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C

ANSI C63.4: 2003

KDB 558074-D01; Oct 2012” The FCC has made this KDB a requirement went testing DTS devices.

All tests have been performed and recorded as the above standards.

3.1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

STANDARD SECTION	TEST TYPE AND LIMIT RESULTS	RESULTS
15.203	Antenna requirement Limit : max. 6dBi	PASS
15.207	AC Power Conducted Emission	PASS
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit : min. 500kHz	PASS
15.247(b)	Maximum Peak Conducted Output Power Limit: max. 30dBm	PASS
15.247(d)	Transmitter Radiated Emissions Limit: Table 15.209	PASS
15.247(e)	Power Density Limit: max. 8dBm	PASS
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS



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4.1 CONDUCTED EMISSION TEST

4.1.1 LIMIT

Frequency (MHz)	Class A (dB μ V)		Class B (dB μ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.1.2 TEST EQUIPMENT

The following test equipment was used for the test:

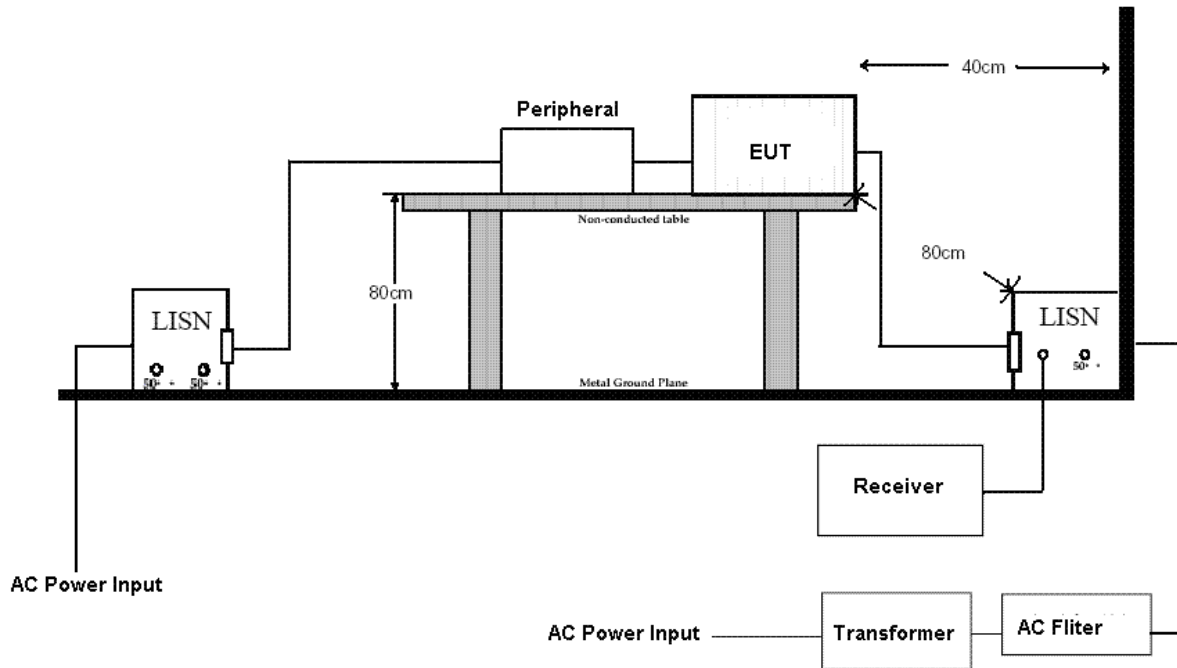
EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9 kHz ~ 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 100376	DEC. 16, 2013 ETC
EMI TEST RECEIVER	9 kHz ~ 30 MHz	ROHDE & SCHWARZ	ESHS30 / 826003/008	FEB. 14, 2013 ETC
LISN	50 μ H, 50 ohm	FCC	FCC-LISN-50-25-2 / 01017	JUN. 21, 2013 ETC
LISN	50 μ H, 50 ohm	SOLAR	9252-50-R-24-BNC/ 951315	OCT. 21, 2013 ETC
LISN	50 μ H, 50 ohm	EMCO	3825/2/ 9204-1952	JUN. 06, 2013 ETC
50 Ω BNC TYPE TERMINATOR	50 ohm	N/A	B00-CD-204/ L1TEQU008	JUN. 24, 2013 ETC
50 Ω BNC TYPE TERMINATOR	50 ohm	N/A	B00-CD-357/ L1TEQU009	JUN. 24, 2013 ETC
COAXIAL CABLE	5 M	HUBER+SUHNE R	RG214/U / #5M(L1TCAB013)	MAY. 29, 2013 ETC
FILTER	2 LINE, 30 A	FIL.COIL	FC-943 / 771	NCR
GROUND PLANE	2 M (H) x 3 M (W)	SRT	N/A	NCR
GROUND PLANE	2.5 M (H) x 3 M (W)	SRT	N/A	NCR
PULSE LIMITER	9 kHz ~ 30 MHz	ROHDE & SCHWARZ	ESH3Z2/ L1TTES009	MAR. 20, 2013 ETC

NOTE:

The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



4.1.3 TEST SETUP



NOTE :

1. The EUT was put on a wooden table with 0.8m heights above ground plane, and 0.4m away from reference ground plane (> 2mx2m).
2. For the actual test configuration, please refer to the photos of testing.

4.1.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR22:2003. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm/50 μ H as specified. All readings were quasi-peak and average values with 10 kHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. Both lines of the power mains of EUT were measured and the cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



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4.1.5 TEST RESULT

Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11b_CH01
Receiver Detector:	Q.P. and AV.	Modulation Type:	QPSK
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.416	0.00	47.40	35.40	47.40	35.40	57.54	47.54	-10.14	-12.14
0.920	-0.01	37.30	26.10	37.29	26.09	56.00	46.00	-18.71	-19.91
1.955	0.02	35.80	26.40	35.82	26.42	56.00	46.00	-20.18	-19.58
2.295	0.02	36.80	27.00	36.82	27.02	56.00	46.00	-19.18	-18.98
4.240	0.05	34.80	26.20	34.85	26.25	56.00	46.00	-21.15	-19.75
13.650	0.23	39.90	31.70	40.13	31.93	60.00	50.00	-19.87	-18.07

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.166	0.16	41.90	24.70	42.06	24.86	65.18	55.18	-23.12	-30.32
0.423	0.05	39.60	25.50	39.65	25.55	57.38	47.38	-17.73	-21.83
0.740	0.06	31.00	19.10	31.06	19.16	56.00	46.00	-24.94	-26.84
1.943	0.11	32.30	20.90	32.41	21.01	56.00	46.00	-23.59	-24.99
2.857	0.13	33.10	23.50	33.23	23.63	56.00	46.00	-22.77	-22.37
4.119	0.15	32.60	21.70	32.75	21.85	56.00	46.00	-23.25	-24.15

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



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Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11b_CH06
Receiver Detector:	Q.P. and AV.	Modulation Type:	QPSK
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.158	0.15	44.30	26.90	44.45	27.05	65.58	55.58	-21.13	-28.53
0.427	0.00	42.80	31.20	42.80	31.20	57.31	47.31	-14.51	-16.11
0.623	0.00	37.80	25.60	37.80	25.60	56.00	46.00	-18.20	-20.40
2.056	0.02	36.40	27.50	36.42	27.52	56.00	46.00	-19.58	-18.48
2.345	0.02	37.60	27.40	37.62	27.42	56.00	46.00	-18.38	-18.58
4.463	0.06	33.70	25.00	33.76	25.06	56.00	46.00	-22.24	-20.94

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.166	0.16	42.00	24.90	42.16	25.06	65.18	55.18	-23.02	-30.12
0.412	0.05	40.90	27.00	40.95	27.05	57.62	47.62	-16.67	-20.57
2.091	0.11	32.50	22.20	32.61	22.31	56.00	46.00	-23.39	-23.69
2.236	0.11	32.40	22.00	32.51	22.11	56.00	46.00	-23.49	-23.89
4.279	0.16	32.40	22.10	32.56	22.26	56.00	46.00	-23.44	-23.74
11.814	0.35	42.40	32.70	42.75	33.05	60.00	50.00	-17.25	-16.95

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



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Tested By:	Richard Lin	Tested Mode:	802.11b_CH11
Receiver Detector:	Q.P. and AV.	Modulation Type:	QPSK
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.193	0.15	38.90	23.60	39.05	23.75	63.91	53.91	-24.86	-30.16
0.412	0.00	45.10	31.00	45.10	31.00	57.62	47.62	-12.52	-16.62
0.591	0.00	36.20	21.70	36.20	21.70	56.00	46.00	-19.80	-24.30
2.002	0.02	31.50	23.30	31.52	23.32	56.00	46.00	-24.48	-22.68
2.240	0.02	33.70	24.20	33.72	24.22	56.00	46.00	-22.28	-21.78
13.670	0.23	36.30	29.90	36.53	30.13	60.00	50.00	-23.47	-19.87

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.170	0.16	41.60	25.30	41.76	25.46	64.98	54.98	-23.22	-29.52
0.427	0.05	37.40	24.10	37.45	24.15	57.31	47.31	-19.86	-23.16
0.697	0.06	29.50	17.80	29.56	17.86	56.00	46.00	-26.44	-28.14
4.302	0.16	28.40	18.90	28.56	19.06	56.00	46.00	-27.44	-26.94
14.275	0.41	38.70	32.70	39.11	33.11	60.00	50.00	-20.89	-16.89
15.966	0.45	33.40	26.90	33.85	27.35	60.00	50.00	-26.15	-22.65

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



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Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11g_CH01
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.162	0.15	43.40	28.10	43.55	28.25	65.38	55.38	-21.83	-27.13
0.423	0.00	43.90	32.90	43.90	32.90	57.38	47.38	-13.48	-14.48
0.869	0.00	36.90	25.40	36.90	25.40	56.00	46.00	-19.10	-20.60
2.064	0.02	36.00	27.30	36.02	27.32	56.00	46.00	-19.98	-18.68
2.443	0.03	36.70	25.50	36.73	25.53	56.00	46.00	-19.27	-20.47
4.404	0.06	34.40	25.10	34.46	25.16	56.00	46.00	-21.54	-20.84

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.154	0.16	43.50	27.00	43.66	27.16	65.79	55.79	-22.13	-28.63
0.396	0.07	38.60	26.00	38.67	26.07	57.94	47.94	-19.27	-21.87
0.673	0.06	31.50	20.20	31.56	20.26	56.00	46.00	-24.44	-25.74
2.084	0.11	32.10	22.40	32.21	22.51	56.00	46.00	-23.79	-23.49
2.209	0.11	32.20	22.10	32.31	22.21	56.00	46.00	-23.69	-23.79
4.228	0.16	32.70	22.60	32.86	22.76	56.00	46.00	-23.14	-23.24

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



Spectrum Research & Testing Lab., Inc.
 No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A13011801
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 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11g_CH06
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.400	0.00	45.30	35.20	45.30	35.20	57.86	47.86	-12.56	-12.66
0.670	0.00	37.90	28.40	37.90	28.40	56.00	46.00	-18.10	-17.60
2.099	0.02	38.30	30.70	38.32	30.72	56.00	46.00	-17.68	-15.28
3.279	0.04	36.40	27.80	36.44	27.84	56.00	46.00	-19.56	-18.16
4.130	0.05	35.80	28.70	35.85	28.75	56.00	46.00	-20.15	-17.25
15.466	0.26	36.70	20.70	36.96	20.96	60.00	50.00	-23.04	-29.04

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.173	0.16	41.20	26.00	41.36	26.16	64.80	54.80	-23.44	-28.64
0.420	0.05	41.40	28.20	41.45	28.25	57.46	47.46	-16.01	-19.21
0.673	0.06	32.50	20.50	32.56	20.56	56.00	46.00	-23.44	-25.44
2.088	0.11	33.40	23.50	33.51	23.61	56.00	46.00	-22.49	-22.39
4.072	0.15	33.80	23.30	33.95	23.45	56.00	46.00	-22.05	-22.55
13.650	0.40	37.90	32.50	38.30	32.90	60.00	50.00	-21.70	-17.10

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



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TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
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 Date: Feb. 06, 2013

Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11g_CH11
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.173	0.15	41.80	28.00	41.95	28.15	64.80	54.80	-22.85	-26.65
0.420	0.00	44.40	33.30	44.40	33.30	57.46	47.46	-13.06	-14.16
0.884	0.00	35.60	24.70	35.60	24.70	56.00	46.00	-20.40	-21.30
2.045	0.02	35.30	25.80	35.32	25.82	56.00	46.00	-20.68	-20.18
3.091	0.04	34.80	25.50	34.84	25.54	56.00	46.00	-21.16	-20.46
4.228	0.05	32.40	23.80	32.45	23.85	56.00	46.00	-23.55	-22.15

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.162	0.16	42.40	25.90	42.56	26.06	65.38	55.38	-22.82	-29.32
0.412	0.05	39.60	27.80	39.65	27.85	57.62	47.62	-17.97	-19.77
1.955	0.11	30.70	21.20	30.81	21.31	56.00	46.00	-25.19	-24.69
2.900	0.13	32.40	23.00	32.53	23.13	56.00	46.00	-23.47	-22.87
4.146	0.15	31.70	21.60	31.85	21.75	56.00	46.00	-24.15	-24.25
13.650	0.40	38.10	33.00	38.50	33.40	60.00	50.00	-21.50	-16.60

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



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TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
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 Date: Feb. 06, 2013

Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n – HT20_CH01
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.154	0.15	42.70	29.50	42.85	29.65	65.79	55.79	-22.94	-26.14
0.412	0.00	43.50	33.60	43.50	33.60	57.62	47.62	-14.12	-14.02
1.041	-0.01	39.00	27.70	38.99	27.69	56.00	46.00	-17.01	-18.31
1.287	0.00	37.40	26.80	37.40	26.80	56.00	46.00	-18.60	-19.20
2.361	0.02	39.80	30.30	39.82	30.32	56.00	46.00	-16.18	-15.68
4.693	0.06	37.00	27.80	37.06	27.86	56.00	46.00	-18.94	-18.14

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.404	0.05	41.30	29.10	41.35	29.15	57.78	47.78	-16.43	-18.63
0.900	0.07	33.70	22.60	33.77	22.67	56.00	46.00	-22.23	-23.33
2.048	0.11	34.20	24.60	34.31	24.71	56.00	46.00	-21.69	-21.29
2.232	0.11	36.10	26.20	36.21	26.31	56.00	46.00	-19.79	-19.69
4.822	0.17	36.50	25.90	36.67	26.07	56.00	46.00	-19.33	-19.93
10.427	0.31	36.40	28.40	36.71	28.71	60.00	50.00	-23.29	-21.29

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



Spectrum Research & Testing Lab., Inc.
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TEST REPORT

Reference No.: A13011801
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 Date: Feb. 06, 2013

Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n – HT20_CH06
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.197	0.15	42.50	26.30	42.65	26.45	63.74	53.74	-21.09	-27.29
0.474	0.00	41.40	27.30	41.40	27.30	56.44	46.44	-15.04	-19.14
1.048	-0.01	40.50	27.50	40.49	27.49	56.00	46.00	-15.51	-18.51
1.345	0.00	38.20	26.90	38.20	26.90	56.00	46.00	-17.80	-19.10
2.521	0.03	42.70	32.50	42.73	32.53	56.00	46.00	-13.27	-13.47
4.982	0.07	38.60	29.60	38.67	29.67	56.00	46.00	-17.33	-16.33

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.166	0.16	43.90	27.50	44.06	27.66	65.18	55.18	-21.12	-27.52
0.322	0.07	37.50	24.60	37.57	24.67	59.66	49.66	-22.09	-24.99
0.623	0.06	35.80	23.70	35.86	23.76	56.00	46.00	-20.14	-22.24
2.115	0.11	36.70	24.80	36.81	24.91	56.00	46.00	-19.19	-21.09
2.580	0.12	36.90	19.30	37.02	19.42	56.00	46.00	-18.98	-26.58
4.857	0.17	38.20	24.90	38.37	25.07	56.00	46.00	-17.63	-20.93

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



Spectrum Research & Testing Lab., Inc.
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TEST REPORT

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Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n – HT20_CH11
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.181	0.15	51.30	31.00	51.45	31.15	64.43	54.43	-12.98	-23.28
0.427	0.00	42.30	28.60	42.30	28.60	57.31	47.31	-15.01	-18.71
0.939	-0.01	35.70	25.50	35.69	25.49	56.00	46.00	-20.31	-20.51
1.220	0.00	37.10	26.30	37.10	26.30	56.00	46.00	-18.90	-19.70
2.759	0.03	41.40	31.40	41.43	31.43	56.00	46.00	-14.57	-14.57
4.951	0.07	37.00	29.50	37.07	29.57	56.00	46.00	-18.93	-16.43

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.16	51.20	30.00	51.36	30.16	66.00	56.00	-14.64	-25.84
0.537	0.05	38.30	21.20	38.35	21.25	56.00	46.00	-17.65	-24.75
0.607	0.06	38.20	23.80	38.26	23.86	56.00	46.00	-17.74	-22.14
2.115	0.11	35.70	26.70	35.81	26.81	56.00	46.00	-20.19	-19.19
2.173	0.11	36.50	27.90	36.61	28.01	56.00	46.00	-19.39	-17.99
4.806	0.17	38.70	28.10	38.87	28.27	56.00	46.00	-17.13	-17.73

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



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TEST REPORT

Reference No.: A13011801
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 Date: Feb. 06, 2013

Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n – HT40_CH05
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.560	0.00	41.40	28.90	41.40	28.90	56.00	46.00	-14.60	-17.10
1.060	-0.01	40.30	29.60	40.29	29.59	56.00	46.00	-15.71	-16.41
1.275	0.00	39.00	27.70	39.00	27.70	56.00	46.00	-17.00	-18.30
2.334	0.02	41.50	31.70	41.52	31.72	56.00	46.00	-14.48	-14.28
4.502	0.06	34.20	25.70	34.26	25.76	56.00	46.00	-21.74	-20.24
24.076	0.37	38.70	36.00	39.07	36.37	60.00	50.00	-20.93	-13.63

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.455	0.05	37.30	24.60	37.35	24.65	56.79	46.79	-19.44	-22.14
0.841	0.07	34.60	23.20	34.67	23.27	56.00	46.00	-21.33	-22.73
1.834	0.10	31.10	21.20	31.20	21.30	56.00	46.00	-24.80	-24.70
3.048	0.13	35.40	24.80	35.53	24.93	56.00	46.00	-20.47	-21.07
4.302	0.16	33.90	23.10	34.06	23.26	56.00	46.00	-21.94	-22.74
24.076	0.63	38.20	35.80	38.83	36.43	60.00	50.00	-21.17	-13.57

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



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TEST REPORT

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Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n – HT40_CH08
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.365	0.03	39.80	26.90	39.83	26.93	58.62	48.62	-18.79	-21.69
0.888	0.00	39.10	28.10	39.10	28.10	56.00	46.00	-16.90	-17.90
2.111	0.02	38.70	28.20	38.72	28.22	56.00	46.00	-17.28	-17.78
2.384	0.02	38.80	27.70	38.82	27.72	56.00	46.00	-17.18	-18.28
4.185	0.05	34.10	25.40	34.15	25.45	56.00	46.00	-21.85	-20.55
24.076	0.37	38.10	35.20	38.47	35.57	60.00	50.00	-21.53	-14.43

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.170	0.16	41.80	23.40	41.96	23.56	64.98	54.98	-23.02	-31.42
0.404	0.05	42.50	28.10	42.55	28.15	57.78	47.78	-15.23	-19.63
0.896	0.07	33.40	20.80	33.47	20.87	56.00	46.00	-22.53	-25.13
1.982	0.11	33.50	22.70	33.61	22.81	56.00	46.00	-22.39	-23.19
2.205	0.11	35.00	24.20	35.11	24.31	56.00	46.00	-20.89	-21.69
24.076	0.63	37.80	35.20	38.43	35.83	60.00	50.00	-21.57	-14.17

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



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TEST REPORT

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Temperature:	21 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n – HT40_CH11
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Frequency Range:	0.15 – 30 MHz	Tested Date:	Jan. 23, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.170	0.15	41.90	26.30	42.05	26.45	64.98	54.98	-22.93	-28.53
0.408	0.00	45.80	34.90	45.80	34.90	57.70	47.70	-11.90	-12.80
0.783	0.00	35.50	24.20	35.50	24.20	56.00	46.00	-20.50	-21.80
2.119	0.02	36.80	27.60	36.82	27.62	56.00	46.00	-19.18	-18.38
2.361	0.02	37.00	27.90	37.02	27.92	56.00	46.00	-18.98	-18.08
4.447	0.06	32.30	23.40	32.36	23.46	56.00	46.00	-23.64	-22.54

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.216	0.10	37.90	24.50	38.00	24.60	62.96	52.96	-24.96	-28.36
0.408	0.05	41.10	28.50	41.15	28.55	57.70	47.70	-16.55	-19.15
0.662	0.06	32.50	20.80	32.56	20.86	56.00	46.00	-23.44	-25.14
2.056	0.11	32.60	22.80	32.71	22.91	56.00	46.00	-23.29	-23.09
2.170	0.11	33.40	23.60	33.51	23.71	56.00	46.00	-22.49	-22.29
4.295	0.16	31.60	22.30	31.76	22.46	56.00	46.00	-24.24	-23.54

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



4.2 RADIATED EMISSION TEST

4.2.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dB μ V/m)
0.009 - 0.490	300	2400/F(KHz)
0.490 - 1.705	30	24000/F(KHz)
1.705 - 30	30	30
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

NOTE:

1. 30 dBuV (in 30m) = 70 dBuV (in 3m).
2. In the emission tables above , the tighter limit applies at the band edges.
3. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

FCC Part 15, Section15.35(b) limit of radiated emission for frequency above 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0



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4.2.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9 kHz ~ 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 100376	DEC. 16, 2013 ETC
EMI TEST RECEIVER	20 MHz ~ 1000 MHz	ROHDE & SCHWARZ	ESVS30 / 841977/003	DEC. 02, 2013 ETC
SPECTRUM ANALYZER	9 kHz ~ 7GHz	ROHDE & SCHWARZ	FSP7 / 100289	APR. 18, 2013 ETC
SPECTRUM ANALYZER	9 kHz ~ 40GHz	ROHDE & SCHWARZ	FSP40 / 100093	DEC 12, 2013 ETC
LOOP ANTENNA	9 kHz ~ 30 MHz	ROHDE & SCHWARZ	HFH2-Z2 / 860 605/002	MAR 06, 2013 ETC
BI-LOG ANTENNA	30 MHz ~ 2 GHz	SCHAFFNER	CBL6141A / 4181	JUN. 25, 2013 ETC
HORN ANTENNA	1 GHz ~ 18 GHz	EMCO	3115/ 9602-4681	DEC. 21, 2013 ETC
PRE-AMPLIFIER	1 GHz ~ 26.5 GHz	AGILENT	8449B/ 3008A01995	DEC. 18, 2013 ETC
OPEN AREA TEST SITE	3 – 10 M MEASUREMENT	SRT	A02 / SRT002	APR. 12, 2013 SRT
ANECHOIC CHAMBER	3 M MEASUREMENT	SRT	A01 / SRT001	MAY. 17, 2013 SRT
COAXIAL CABLE	30 M	TIMES	LMR-400 / #30M (L1TCAB014)	MAY. 30, 2013 ETC
FILTER	2 LINE, 30 A	FIL.COIL	FC-943 / 869	NCR
RF CABLE	UP TO 18 GHz 1.5 m	JYEBAO	A30A30-L 142 / EQF-0035(001)	DEC. 19, 2013 ETC
RF CABLE	UP TO 18 GHz 3.5 m	JYEBAO	A30A30-L 142 / EQF-0036(002)	DEC. 19, 2013 ETC

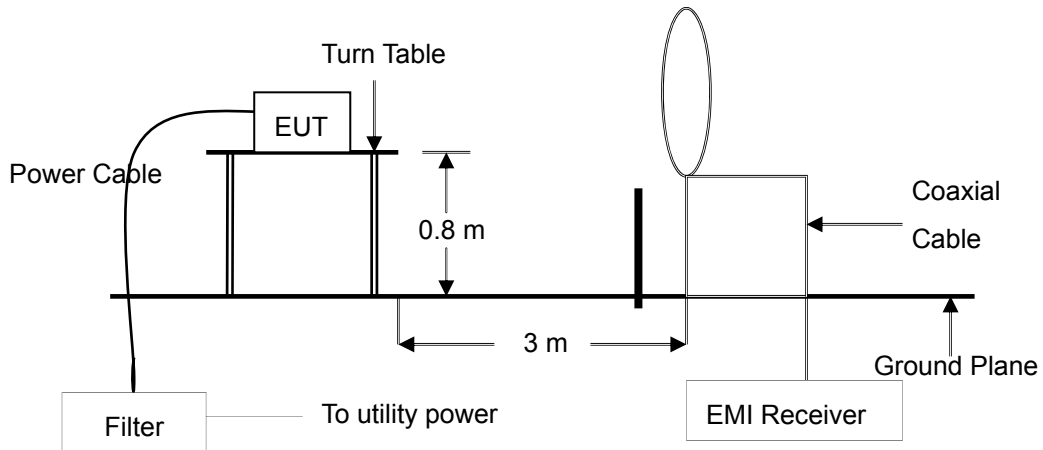
NOTE:

The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

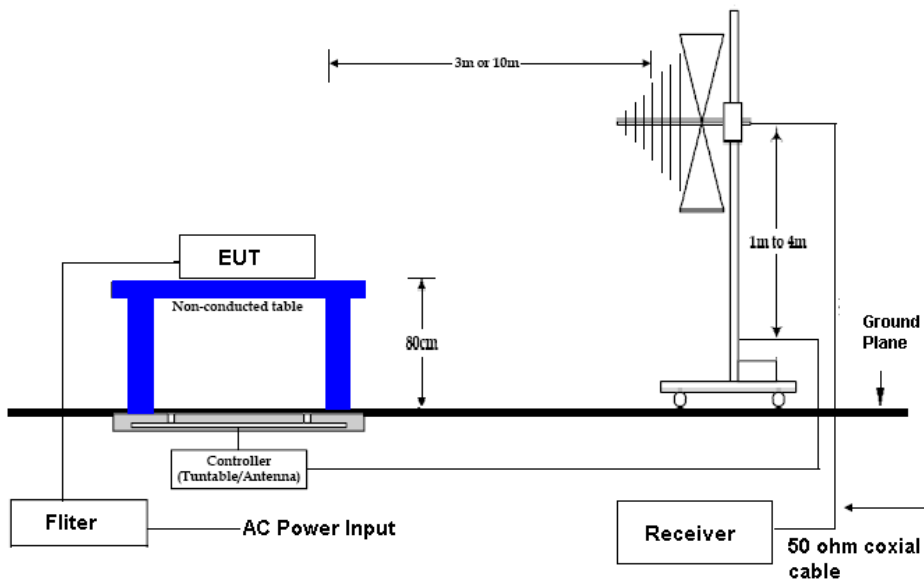


4.2.3 TEST SET-UP

9 kHz ~ 30 MHz

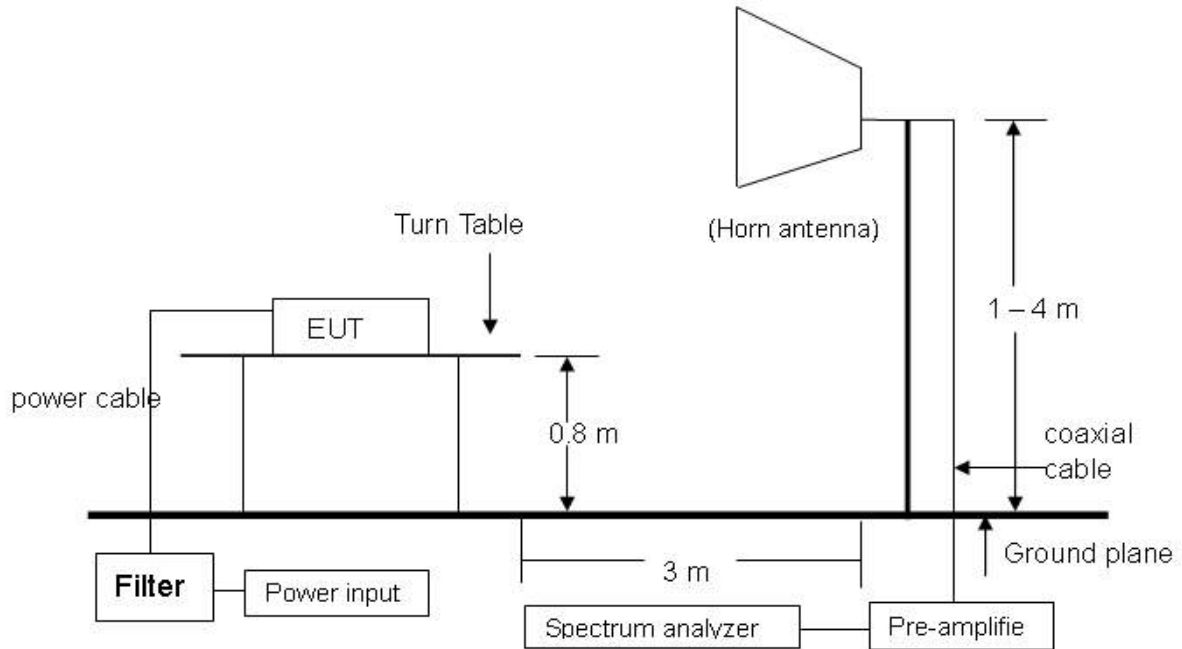


30 MHz ~ 1 GHz





Above 1 GHz



NOTE:

The EUT system was put on a wooden table with 0.8m heights above a ground plane.
For the actual test configuration, please refer to the photos of testing.



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4.2.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR 22:2003.

The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz.

The frequency spectrum measured started from 9kHz to 30MHz and 30 MHz to 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver.

Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver.

The EUT system was operated in all typical methods by users.

The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data.

The procedure is referred on the test procedure of SRT LAB.



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4.2.5 TEST RESULT

Temperature:	22 °C	Humidity:	57 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	Q.P.	Tested Mode:	802.11b_CH01
Tested By:	Richard Lin	Tested Date:	Feb. 04, 2013

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3.39	0.33	20.22	9.98	30.53	70.00	-39.47
7.28	0.48	20.39	9.45	30.32	70.00	-39.68
20.73	0.77	21.04	8.73	30.54	70.00	-39.46
22.46	0.80	21.12	8.87	30.79	70.00	-39.21
23.05	0.81	21.15	14.25	36.21	70.00	-33.79
27.64	0.88	21.38	12.39	34.65	70.00	-35.35

Temperature:	22 °C	Humidity:	57 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	Q.P.	Tested Mode:	802.11b_CH06
Tested By:	Richard Lin	Tested Date:	Feb. 04, 2013

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
21.05	0.78	21.05	9.21	31.04	70.00	-38.96
22.73	0.80	21.14	10.29	32.23	70.00	-37.77
23.46	0.82	21.17	14.84	36.83	70.00	-33.17
23.72	0.82	21.19	9.03	31.03	70.00	-38.97
27.19	0.87	21.36	14.09	36.32	70.00	-33.68
28.24	0.89	21.41	8.89	31.19	70.00	-38.81



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Temperature:	<u>22 °C</u>	Humidity:	<u>57 %RH</u>
Frequency Range:	<u>9 kHz – 30 MHz</u>	Measured Distance:	<u>3 m</u>
Receiver Detector:	<u>Q.P.</u>	Tested Mode:	<u>802.11b_CH11</u>
Tested By:	<u>Richard Lin</u>	Tested Date:	<u>Feb. 04, 2013</u>

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5.52	0.43	20.32	10.11	30.86	70.00	-39.14
13.80	0.64	20.69	8.88	30.21	70.00	-39.79
20.98	0.78	21.05	8.55	30.37	70.00	-39.63
22.42	0.80	21.12	8.90	30.82	70.00	-39.18
23.73	0.82	21.19	14.43	36.44	70.00	-33.56
27.55	0.88	21.38	9.57	31.82	70.00	-38.18

Temperature:	<u>22 °C</u>	Humidity:	<u>57 %RH</u>
Frequency Range:	<u>9 kHz – 30 MHz</u>	Measured Distance:	<u>3 m</u>
Receiver Detector:	<u>Q.P.</u>	Tested Mode:	<u>802.11g_CH01</u>
Tested By:	<u>Richard Lin</u>	Tested Date:	<u>Feb. 04, 2013</u>

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10.61	0.57	20.53	9.27	30.37	70.00	-39.63
12.74	0.62	20.64	9.16	30.42	70.00	-39.58
21.84	0.79	21.09	10.11	31.99	70.00	-38.01
22.32	0.80	21.12	9.75	31.66	70.00	-38.34
23.67	0.82	21.18	14.10	36.10	70.00	-33.90
27.55	0.88	21.38	9.71	31.96	70.00	-38.04



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Temperature:	22 °C	Humidity:	57 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	Q.P.	Tested Mode:	802.11g_CH06
Tested By:	Richard Lin	Tested Date:	Feb. 04, 2013

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5.28	0.42	20.31	9.89	30.62	70.00	-39.38
15.63	0.68	20.78	8.91	30.37	70.00	-39.63
21.77	0.79	21.09	9.53	31.41	70.00	-38.59
23.95	0.82	21.20	14.28	36.30	70.00	-33.70
26.73	0.86	21.34	7.96	30.16	70.00	-39.84
27.45	0.87	21.37	9.88	32.13	70.00	-37.87

Temperature:	22 °C	Humidity:	57 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	Q.P.	Tested Mode:	802.11g_CH11
Tested By:	Richard Lin	Tested Date:	Feb. 04, 2013

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
9.34	0.54	20.47	9.35	30.36	70.00	-39.64
16.70	0.70	20.83	9.44	30.97	70.00	-39.03
22.51	0.80	21.13	8.95	30.88	70.00	-39.12
23.48	0.82	21.17	14.58	36.57	70.00	-33.43
23.68	0.82	21.18	10.19	32.19	70.00	-37.81
27.54	0.88	21.38	11.48	33.73	70.00	-36.27



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Temperature:	<u>22 °C</u>	Humidity:	<u>57 %RH</u>
Frequency Range:	<u>9 kHz – 30 MHz</u>	Measured Distance:	<u>3 m</u>
Receiver Detector:	<u>Q.P.</u>	Tested Mode:	<u>802.11n – HT20_CH01</u>
Tested By:	<u>Richard Lin</u>	Tested Date:	<u>Feb. 04, 2013</u>

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4.07	0.36	20.25	10.21	30.83	70.00	-39.17
13.76	0.64	20.69	9.09	30.42	70.00	-39.58
21.33	0.78	21.07	8.50	30.35	70.00	-39.65
22.84	0.81	21.14	8.65	30.60	70.00	-39.40
23.58	0.82	21.18	14.05	36.05	70.00	-33.95
27.12	0.87	21.36	10.17	32.40	70.00	-37.60

Temperature:	<u>22 °C</u>	Humidity:	<u>57 %RH</u>
Frequency Range:	<u>9 kHz – 30 MHz</u>	Measured Distance:	<u>3 m</u>
Receiver Detector:	<u>Q.P.</u>	Tested Mode:	<u>802.11n – HT20_CH06</u>
Tested By:	<u>Richard Lin</u>	Tested Date:	<u>Feb. 04, 2013</u>

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4.63	0.39	20.28	9.77	30.44	70.00	-39.56
17.33	0.71	20.86	9.26	30.84	70.00	-39.16
21.86	0.79	21.09	8.79	30.67	70.00	-39.33
22.47	0.80	21.12	9.39	31.31	70.00	-38.69
23.04	0.81	21.15	14.17	36.13	70.00	-33.87
27.20	0.87	21.36	13.44	35.67	70.00	-34.33



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Temperature:	<u>22 °C</u>	Humidity:	<u>57 %RH</u>
Frequency Range:	<u>9 kHz – 30 MHz</u>	Measured Distance:	<u>3 m</u>
Receiver Detector:	<u>Q.P.</u>	Tested Mode:	<u>802.11n – HT20_CH11</u>
Tested By:	<u>Richard Lin</u>	Tested Date:	<u>Feb. 04, 2013</u>

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
15.91	0.69	20.79	8.83	30.31	70.00	-39.69
20.74	0.77	21.04	8.69	30.50	70.00	-39.50
21.55	0.78	21.08	9.01	30.87	70.00	-39.13
22.44	0.80	21.12	9.48	31.40	70.00	-38.60
23.17	0.81	21.16	14.25	36.22	70.00	-33.78
27.90	0.88	21.39	12.85	35.12	70.00	-34.88

Temperature:	<u>22 °C</u>	Humidity:	<u>57 %RH</u>
Frequency Range:	<u>9 kHz – 30 MHz</u>	Measured Distance:	<u>3 m</u>
Receiver Detector:	<u>Q.P.</u>	Tested Mode:	<u>802.11n – HT40_CH05</u>
Tested By:	<u>Richard Lin</u>	Tested Date:	<u>Feb. 04, 2013</u>

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4.75	0.40	20.29	9.53	30.21	70.00	-39.79
8.63	0.52	20.45	9.44	30.40	70.00	-39.60
11.29	0.59	20.56	8.98	30.13	70.00	-39.87
22.45	0.80	21.12	8.95	30.87	70.00	-39.13
23.33	0.81	21.17	14.51	36.49	70.00	-33.51
27.08	0.87	21.35	13.28	35.50	70.00	-34.50



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Temperature:	<u>22 °C</u>	Humidity:	<u>57 %RH</u>
Frequency Range:	<u>9 kHz – 30 MHz</u>	Measured Distance:	<u>3 m</u>
Receiver Detector:	<u>Q.P.</u>	Tested Mode:	<u>802.11n – HT40_CH08</u>
Tested By:	<u>Richard Lin</u>	Tested Date:	<u>Feb. 04, 2013</u>

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4.19	0.37	20.26	9.56	30.19	70.00	-39.81
11.80	0.60	20.59	8.63	29.82	70.00	-40.18
22.41	0.80	21.12	9.65	31.57	70.00	-38.43
23.84	0.82	21.19	13.87	35.88	70.00	-34.12
26.13	0.86	21.31	8.03	30.19	70.00	-39.81
27.52	0.88	21.38	10.67	32.92	70.00	-37.08

Temperature:	<u>22 °C</u>	Humidity:	<u>57 %RH</u>
Frequency Range:	<u>9 kHz – 30 MHz</u>	Measured Distance:	<u>3 m</u>
Receiver Detector:	<u>Q.P.</u>	Tested Mode:	<u>802.11n – HT40_CH11</u>
Tested By:	<u>Richard Lin</u>	Tested Date:	<u>Feb. 04, 2013</u>

Frequency (MHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3.06	0.31	20.20	9.92	30.44	70.00	-39.56
18.38	0.73	20.92	9.53	31.18	70.00	-38.82
20.63	0.77	21.03	8.71	30.51	70.00	-39.49
23.42	0.81	21.17	14.17	36.16	70.00	-33.84
24.89	0.84	21.24	8.54	30.62	70.00	-39.38
27.78	0.88	21.39	9.40	31.67	70.00	-38.33



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Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11b_CH01
Receiver Detector:	Q.P.	Modulation Type:	QPSK
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
67.41	1.28	8.64	22.91	32.83	40.0	-7.17	129	3.62
191.38	2.09	10.99	22.52	35.60	43.5	-7.91	45	3.44
479.92	3.61	17.82	15.95	37.38	46.0	-8.62	168	2.83
709.58	4.59	21.00	10.24	35.83	46.0	-10.17	283	2.07
814.05	5.04	22.55	6.59	34.19	46.0	-11.81	77	1.64
960.77	5.56	24.48	10.08	40.12	54.0	-13.88	115	1.21

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
79.31	1.36	8.28	19.28	28.92	40.0	-11.08	68	1.19
191.32	2.09	10.99	17.42	30.50	43.5	-13.01	312	1.63
479.96	3.61	17.82	12.04	33.47	46.0	-12.53	253	1.98
579.49	4.06	19.42	6.97	30.45	46.0	-15.55	294	2.25
709.52	4.59	21.00	5.14	30.73	46.0	-15.27	199	2.97
857.07	5.20	23.21	3.60	32.02	46.0	-13.99	103	3.35

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "**": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11b_CH06
Receiver Detector:	Q.P.	Modulation Type:	QPSK
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
67.48	1.28	8.64	23.37	33.29	40.0	-6.71	231	3.62
191.04	2.09	10.99	22.45	35.53	43.5	-7.98	146	3.43
479.22	3.61	17.82	12.48	33.91	46.0	-12.09	265	2.78
711.84	4.60	21.04	9.42	35.06	46.0	-10.94	183	1.92
793.63	4.96	22.24	7.11	34.31	46.0	-11.69	90	1.57
960.12	5.56	24.48	12.04	42.08	54.0	-11.92	79	1.22

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
79.25	1.36	8.28	19.18	28.82	40.0	-11.18	158	1.19
191.08	2.09	10.99	16.14	29.22	43.5	-14.29	277	1.54
405.37	3.25	16.58	9.65	29.48	46.0	-16.53	78	2.07
479.29	3.61	17.82	11.18	32.61	46.0	-13.39	300	2.16
713.56	4.61	21.09	4.97	30.67	46.0	-15.33	217	2.99
960.16	5.56	24.48	7.66	37.70	54.0	-16.30	84	3.45

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



Spectrum Research & Testing Lab., Inc.
 No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11b_CH11
Receiver Detector:	Q.P.	Modulation Type:	QPSK
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
67.27	1.28	8.64	22.63	32.55	40.0	-7.45	109	3.65
191.42	2.09	10.99	23.07	36.15	43.5	-7.36	243	3.38
479.73	3.61	17.82	18.05	39.48	46.0	-6.52	168	2.67
579.84	4.06	19.42	11.72	35.20	46.0	-10.80	326	2.31
805.47	5.01	22.39	7.48	34.88	46.0	-11.12	99	1.89
816.96	5.05	22.59	6.98	34.62	46.0	-11.38	124	1.54

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
79.04	1.36	8.28	19.47	29.11	40.0	-10.89	305	1.17
191.45	2.09	10.99	16.63	29.71	43.5	-13.80	147	1.53
407.30	3.26	16.61	9.85	29.72	46.0	-16.28	239	2.18
579.82	4.06	19.42	5.79	29.27	46.0	-16.73	74	2.69
713.63	4.61	21.09	5.68	31.38	46.0	-14.62	95	3.05
960.79	5.56	24.48	8.14	38.18	54.0	-15.82	151	3.54

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11g_CH01
Receiver Detector:	Q.P.	Modulation Type:	OFDM
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
67.18	1.28	8.64	22.64	32.56	40.0	-7.44	303	3.66
191.50	2.09	10.99	23.17	36.25	43.5	-7.26	147	3.42
479.66	3.61	17.82	18.38	39.81	46.0	-6.19	169	2.65
579.82	4.06	19.42	13.65	37.13	46.0	-8.87	252	2.38
676.21	4.46	20.61	11.41	36.48	46.0	-9.52	98	2.09
719.55	4.64	21.22	11.29	37.15	46.0	-8.85	189	1.85

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
56.37	1.18	11.70	17.06	29.94	40.0	-10.06	234	1.12
191.57	2.09	10.99	16.72	29.80	43.5	-13.71	129	1.57
479.62	3.61	17.82	13.48	34.91	46.0	-11.09	282	2.35
579.88	4.06	19.42	8.74	32.22	46.0	-13.78	311	2.74
719.59	4.64	21.22	7.58	33.44	46.0	-12.56	57	3.08
960.18	5.56	24.48	9.15	39.19	54.0	-14.81	74	3.57

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11g_CH06
Receiver Detector:	Q.P.	Modulation Type:	OFDM
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
67.40	1.28	8.64	22.24	32.16	40.0	-7.84	88	3.61
191.76	2.09	10.99	25.08	38.16	43.5	-5.35	143	3.47
479.34	3.61	17.82	18.92	40.35	46.0	-5.65	267	2.59
579.16	4.06	19.42	14.81	38.29	46.0	-7.71	335	2.34
713.08	4.61	21.09	11.22	36.92	46.0	-9.08	120	1.83
805.23	5.01	22.39	8.54	35.94	46.0	-10.06	79	1.57

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
56.34	1.18	11.70	16.53	29.41	40.0	-10.59	133	1.15
79.74	1.36	8.28	19.12	28.76	40.0	-11.24	285	1.31
191.71	2.09	10.99	17.01	30.09	43.5	-13.42	92	1.79
479.38	3.61	17.82	14.08	35.51	46.0	-10.49	175	2.28
579.12	4.06	19.42	9.56	33.04	46.0	-12.96	43	2.77
709.78	4.59	21.00	5.93	31.52	46.0	-14.48	299	3.14

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11g_CH11
Receiver Detector:	Q.P.	Modulation Type:	OFDM
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
67.49	1.28	8.64	23.61	33.53	40.0	-6.47	312	3.67
191.07	2.09	10.99	25.08	38.16	43.5	-5.35	157	3.52
479.81	3.61	17.82	16.57	38.00	46.0	-8.00	193	2.64
579.16	4.06	19.42	15.73	39.21	46.0	-6.79	271	2.35
719.34	4.64	21.22	12.49	38.35	46.0	-7.65	225	1.89
803.72	5.00	22.35	9.74	37.10	46.0	-8.90	303	1.62

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
56.38	1.18	11.70	17.85	30.73	40.0	-9.27	108	1.07
191.02	2.09	10.99	16.02	29.10	43.5	-14.41	165	1.54
479.82	3.61	17.82	13.63	35.06	46.0	-10.94	291	2.38
579.20	4.06	19.42	9.26	32.74	46.0	-13.26	88	2.71
715.57	4.62	21.13	5.48	31.23	46.0	-14.77	75	3.16
960.47	5.56	24.48	9.65	39.69	54.0	-14.31	266	3.53

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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TEST REPORT

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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n – HT20_CH01
Receiver Detector:	Q.P.	Modulation Type:	OFDM
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
67.09	1.28	8.64	23.74	33.66	40.0	-6.34	132	3.54
137.63	1.76	12.87	19.32	33.95	43.5	-9.55	291	3.47
191.47	2.09	10.99	21.21	34.29	43.5	-9.22	338	3.38
479.34	3.61	17.82	15.90	37.33	46.0	-8.67	69	2.62
721.59	4.65	21.26	9.36	35.27	46.0	-10.73	185	1.87
803.71	5.00	22.35	9.08	36.44	46.0	-9.56	87	1.65

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
56.42	1.18	11.70	19.47	32.35	40.0	-7.65	167	1.18
79.85	1.36	8.28	23.18	32.82	40.0	-7.18	224	1.24
191.43	2.09	10.99	18.34	31.42	43.5	-12.09	171	1.53
479.37	3.61	17.82	12.83	34.26	46.0	-11.74	256	2.38
579.68	4.06	19.42	7.51	30.99	46.0	-15.01	98	2.71
709.94	4.59	21.00	5.76	31.35	46.0	-14.65	137	3.26

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "**": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



Spectrum Research & Testing Lab., Inc.
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TEST REPORT

Reference No.: A13011801
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n – HT20_CH06
Receiver Detector:	Q.P.	Modulation Type:	OFDM
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
69.33	1.29	8.28	25.73	35.30	40.0	-4.70	315	3.61
141.78	1.79	12.88	19.31	33.98	43.5	-9.52	46	3.53
191.85	2.09	10.99	23.24	36.32	43.5	-7.19	148	3.37
479.07	3.61	17.82	17.43	38.86	46.0	-7.14	165	2.64
713.44	4.61	21.09	10.69	36.39	46.0	-9.61	283	1.87
812.72	5.04	22.52	8.48	36.03	46.0	-9.97	97	1.59

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
69.38	1.29	8.28	21.41	30.98	40.0	-9.02	102	1.15
139.06	1.77	12.89	15.37	30.03	43.5	-13.47	247	1.36
191.84	2.09	10.99	18.49	31.57	43.5	-11.94	198	1.51
479.03	3.61	17.82	13.52	34.95	46.0	-11.05	263	2.48
719.32	4.64	21.22	6.37	32.23	46.0	-13.77	305	3.14
801.77	4.99	22.32	4.18	31.49	46.0	-14.51	66	3.39

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "**": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n – HT20_CH11
Receiver Detector:	Q.P.	Modulation Type:	OFDM
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
69.44	1.29	8.28	24.42	33.99	40.0	-6.01	261	3.57
191.81	2.09	10.99	21.75	34.83	43.5	-8.68	48	3.42
479.31	3.61	17.82	17.59	39.02	46.0	-6.98	115	2.67
721.62	4.65	21.26	11.96	37.87	46.0	-8.13	193	1.85
805.49	5.01	22.39	9.55	36.95	46.0	-9.05	227	1.62
869.16	5.24	23.24	8.01	36.49	46.0	-9.52	65	1.43

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
69.47	1.29	8.28	20.02	29.59	40.0	-10.41	99	1.17
137.02	1.76	12.87	16.79	31.42	43.5	-12.08	134	1.35
191.84	2.09	10.99	16.68	29.76	43.5	-13.75	208	1.56
479.38	3.61	17.82	13.43	34.86	46.0	-11.14	172	2.38
719.44	4.64	21.22	7.15	33.01	46.0	-12.99	93	3.11
960.17	5.56	24.48	10.03	40.07	54.0	-13.93	54	3.55

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "**": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n - HT40_CH05
Receiver Detector:	Q.P.	Modulation Type:	OFDM
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
67.19	1.28	8.64	23.02	32.94	40.0	-7.06	198	3.64
191.35	2.09	10.99	20.13	33.21	43.5	-10.30	223	3.48
479.73	3.61	17.82	18.05	39.48	46.0	-6.52	107	2.67
579.56	4.06	19.42	14.72	38.20	46.0	-7.80	65	2.20
673.12	4.45	20.58	10.53	35.56	46.0	-10.44	193	1.81
721.91	4.65	21.26	11.29	37.20	46.0	-8.80	214	1.72

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
56.31	1.18	11.70	20.58	33.46	40.0	-6.54	138	1.17
191.38	2.09	10.99	16.28	29.36	43.5	-14.15	97	1.53
479.76	3.61	17.82	14.51	35.94	46.0	-10.06	271	2.36
579.50	4.06	19.42	8.25	31.73	46.0	-14.27	62	2.71
628.91	4.26	20.14	7.58	31.97	46.0	-14.03	189	2.87
711.69	4.60	21.04	6.74	32.38	46.0	-13.62	273	3.13

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "**": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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TEST REPORT

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Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n - HT40_CH08
Receiver Detector:	Q.P.	Modulation Type:	OFDM
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
69.58	1.29	8.28	24.14	33.71	40.0	-6.29	131	3.64
479.37	3.61	17.82	16.02	37.45	46.0	-8.55	227	2.58
496.12	3.69	18.13	16.74	38.56	46.0	-7.44	168	2.53
579.28	4.06	19.42	15.26	38.74	46.0	-7.26	193	2.31
719.06	4.64	21.22	10.52	36.38	46.0	-9.62	251	1.86
810.59	5.03	22.48	9.77	37.28	46.0	-8.72	334	1.57

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
79.15	1.36	8.28	22.53	32.17	40.0	-7.83	48	1.17
191.33	2.09	10.99	17.81	30.89	43.5	-12.62	145	1.53
479.33	3.61	17.82	14.29	35.72	46.0	-10.28	93	2.38
579.23	4.06	19.42	10.18	33.66	46.0	-12.34	102	2.72
713.66	4.61	21.09	6.92	32.62	46.0	-13.38	279	3.11
880.17	5.27	23.26	4.29	32.82	46.0	-13.18	42	3.57

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "**": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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TEST REPORT

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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Tested By:	Richard Lin	Tested Mode:	802.11n - HT40_CH11
Receiver Detector:	Q.P.	Modulation Type:	OFDM
Frequency Range:	30 M – 1 GHz	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
67.40	1.28	8.64	22.98	32.90	40.0	-7.10	192	3.68
191.35	2.09	10.99	19.83	32.91	43.5	-10.60	105	3.52
479.06	3.61	17.82	17.24	38.67	46.0	-7.33	236	2.64
579.83	4.06	19.42	13.07	36.55	46.0	-9.45	307	2.35
719.96	4.64	21.22	11.24	37.10	46.0	-8.90	58	1.87
810.39	5.03	22.48	9.66	37.17	46.0	-8.83	112	1.58

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
56.58	1.18	11.70	18.91	31.79	40.0	-8.21	83	1.09
191.38	2.09	10.99	16.49	29.57	43.5	-13.94	159	1.52
479.04	3.61	17.82	13.87	35.30	46.0	-10.70	207	2.37
719.92	4.64	21.22	9.06	34.92	46.0	-11.08	288	3.14
880.46	5.27	23.26	4.94	33.47	46.0	-12.53	69	3.45
960.72	5.56	24.48	9.43	39.47	54.0	-14.53	313	3.66

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "**": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



Spectrum Research & Testing Lab., Inc.
 No.167,Ln. 780, Shan-Tong Rd.,Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11b_CH01
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	QPSK
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1438.03	-32.61	25.30	55.36	44.83	48.05	37.52	74.00	54.00	-25.95	-16.48	305	2.38
3079.46	-30.54	30.76	43.63	33.07	43.84	33.28	74.00	54.00	-30.16	-20.72	217	1.86
3213.88	-30.29	31.03	44.78	34.26	45.51	34.99	74.00	54.00	-28.49	-19.01	262	1.82
3694.51	-29.58	32.07	41.91	31.35	44.39	33.83	74.00	54.00	-29.61	-20.17	185	1.67
5118.74	-27.96	34.17	39.19	28.67	45.39	34.87	74.00	54.00	-28.61	-19.13	72	1.28
5769.12	-27.40	34.65	38.27	27.73	45.52	34.98	74.00	54.00	-28.48	-19.02	94	1.07

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
3013.17	-30.67	30.63	44.92	34.41	44.88	34.37	74.00	54.00	-29.12	-19.63	134	1.62
3074.34	-30.55	30.75	44.11	33.65	44.31	33.85	74.00	54.00	-29.69	-20.15	254	1.69
3213.84	-30.29	31.03	43.53	33.04	44.26	33.77	74.00	54.00	-29.74	-20.23	168	1.78
4627.38	-28.62	33.10	40.25	29.75	44.74	34.24	74.00	54.00	-29.26	-19.76	193	2.08
4894.53	-28.40	33.75	39.24	28.73	44.58	34.07	74.00	54.00	-29.42	-19.93	271	2.14
5332.27	-27.32	34.46	38.15	27.61	45.30	34.76	74.00	54.00	-28.70	-19.24	309	2.32

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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TEST REPORT

Reference No.: A13011801
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 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11b_CH01 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	QPSK
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2412.00	-31.14	28.35	98.62	86.95	95.84	84.17	114	94	-18.16	-9.83	61	1.52
4824.00	-28.46	33.58	44.42	33.86	49.54	38.98	74.00	54.00	-24.46	-15.02	193	1.39
7236.00	-27.03	36.67	35.74	25.17	45.37	34.80	74.00	54.00	-28.63	-19.20	58	1.44
9648.00	-25.60	38.25	36.58	26.08	49.23	38.73	74.00	54.00	-24.77	-15.27	226	1.51
12060.00	-23.76	39.30	34.37	23.84	49.91	39.38	74.00	54.00	-24.09	-14.62	171	1.34
14472.00	-21.15	40.77	32.91	22.37	52.52	41.98	74.00	54.00	-21.48	-12.02	315	1.69

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2412.00	-31.14	28.35	96.83	85.38	94.05	82.60	114	94	-19.95	-11.40	333	1.75
4824.00	-28.46	33.58	41.33	30.89	46.45	36.01	74.00	54.00	-27.55	-17.99	287	1.46
7236.00	-27.03	36.67	35.61	25.03	45.24	34.66	74.00	54.00	-28.76	-19.34	152	1.57
9648.00	-25.60	38.25	36.48	26.04	49.13	38.69	74.00	54.00	-24.87	-15.31	93	1.49
12060.00	-23.76	39.30	34.45	23.86	49.99	39.40	74.00	54.00	-24.01	-14.60	246	1.32
14472.00	-21.15	40.77	32.57	22.08	52.18	41.69	74.00	54.00	-21.82	-12.31	298	1.72

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



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Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11b_CH06
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	QPSK
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1924.06	-31.75	26.93	54.12	43.67	49.30	38.85	74.00	54.00	-24.70	-15.15	135	2.23
3247.26	-30.23	31.09	44.16	33.71	45.02	34.57	74.00	54.00	-28.98	-19.43	312	1.84
3483.72	-29.79	31.57	42.97	32.53	44.74	34.30	74.00	54.00	-29.26	-19.70	208	1.76
3644.19	-29.63	31.95	42.25	31.78	44.57	34.10	74.00	54.00	-29.43	-19.90	176	1.72
4638.57	-28.61	33.13	40.28	29.75	44.80	34.27	74.00	54.00	-29.20	-19.73	84	1.43
5753.29	-27.36	34.65	38.36	27.89	45.65	35.18	74.00	54.00	-28.35	-18.82	96	1.08

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
3138.79	-30.43	30.88	42.84	32.46	43.28	32.90	74.00	54.00	-30.72	-21.10	151	1.63
3287.43	-30.16	31.17	42.51	31.98	43.53	33.00	74.00	54.00	-30.47	-21.00	212	1.69
3639.21	-29.63	31.93	42.08	31.55	44.38	33.85	74.00	54.00	-29.62	-20.15	136	1.78
4507.89	-28.71	32.82	40.92	30.48	45.02	34.58	74.00	54.00	-28.98	-19.42	194	2.03
5432.16	-27.02	34.60	38.26	27.82	45.85	35.41	74.00	54.00	-28.15	-18.59	282	2.34
5814.67	-27.49	34.64	37.96	27.57	45.10	34.71	74.00	54.00	-28.90	-19.29	275	2.43

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11b_CH06 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	QPSK
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-31.11	28.42	97.58	86.02	94.90	83.34	114	94	-19.10	-10.66	199	1.55
4874.00	-28.42	33.70	44.96	34.45	50.24	39.73	74.00	54.00	-23.76	-14.27	253	1.42
7311.00	-26.98	36.85	35.98	25.47	45.84	35.33	74.00	54.00	-28.16	-18.67	174	1.39
9748.00	-25.45	38.35	36.03	25.52	48.93	38.42	74.00	54.00	-25.07	-15.58	67	1.46
12185.00	-23.43	39.30	34.42	23.83	50.29	39.70	74.00	54.00	-23.71	-14.30	99	1.57
14622.00	-21.25	40.41	30.95	20.46	50.11	39.62	74.00	54.00	-23.89	-14.38	324	1.62

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-31.11	28.42	96.21	85.73	93.53	83.05	114	94	-20.47	-10.95	183	1.63
4874.00	-28.42	33.70	42.04	31.56	47.32	36.84	74.00	54.00	-26.68	-17.16	95	1.48
7311.00	-26.98	36.85	36.13	25.58	45.99	35.44	74.00	54.00	-28.01	-18.56	279	1.75
9748.00	-25.45	38.35	35.91	25.47	48.81	38.37	74.00	54.00	-25.19	-15.63	203	1.34
12185.00	-23.43	39.30	32.89	22.46	48.76	38.33	74.00	54.00	-25.24	-15.67	306	1.56
14622.00	-21.25	40.41	30.76	20.23	49.92	39.39	74.00	54.00	-24.08	-14.61	48	1.41

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



TEST REPORT

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11b_CH11
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	QPSK
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
3073.38	-30.55	30.75	42.93	32.38	43.12	32.57	74.00	54.00	-30.88	-21.43	312	1.91
3284.54	-30.16	31.17	43.56	33.02	44.57	34.03	74.00	54.00	-29.43	-19.97	151	1.83
3712.74	-29.56	32.11	41.71	31.17	44.25	33.71	74.00	54.00	-29.75	-20.29	64	1.67
4708.23	-28.55	33.30	40.75	30.22	45.50	34.97	74.00	54.00	-28.50	-19.03	138	1.38
5279.11	-27.48	34.39	38.86	28.45	45.77	35.36	74.00	54.00	-28.23	-18.64	142	1.24
5648.56	-27.13	34.67	37.83	27.36	45.37	34.90	74.00	54.00	-28.63	-19.10	95	1.13

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1438.09	-32.61	25.30	52.87	42.39	45.56	35.08	74.00	54.00	-28.44	-18.92	308	1.16
3684.76	-29.59	32.04	42.28	31.76	44.73	34.21	74.00	54.00	-29.27	-19.79	106	1.82
3758.89	-29.52	32.22	42.06	31.54	44.76	34.24	74.00	54.00	-29.24	-19.76	215	1.91
3903.47	-29.39	32.57	41.15	30.68	44.33	33.86	74.00	54.00	-29.67	-20.14	264	1.97
4817.16	-28.47	33.56	40.24	29.75	45.33	34.84	74.00	54.00	-28.67	-19.16	199	2.16
5349.37	-27.27	34.49	38.81	28.26	46.03	35.48	74.00	54.00	-27.97	-18.52	273	2.32

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11b_CH11 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	QPSK
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2462.00	-31.08	28.49	92.57	81.84	89.99	79.26	114	94	-24.01	-14.74	312	1.37
4924.00	-28.38	33.82	39.73	29.36	45.17	34.80	74.00	54.00	-28.83	-19.20	107	1.62
7386.00	-26.94	37.03	37.15	26.64	47.24	36.73	74.00	54.00	-26.76	-17.27	67	1.59
9848.00	-25.29	38.45	36.07	25.58	49.22	38.73	74.00	54.00	-24.78	-15.27	224	1.43
12310.00	-23.10	39.30	34.96	24.47	51.16	40.67	74.00	54.00	-22.84	-13.33	309	1.47
14772.00	-21.37	40.05	30.91	20.35	49.59	39.03	74.00	54.00	-24.41	-14.97	268	1.53

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2462.00	-31.08	28.49	93.87	82.39	91.29	79.81	114	94	-22.71	-14.19	152	1.49
4924.00	-28.38	33.82	39.56	29.04	45.00	34.48	74.00	54.00	-29.00	-19.52	192	1.51
7386.00	-26.94	37.03	37.03	26.52	47.12	36.61	74.00	54.00	-26.88	-17.39	235	1.64
9848.00	-25.29	38.45	35.97	25.44	49.12	38.59	74.00	54.00	-24.88	-15.41	76	1.73
12310.00	-23.10	39.30	34.88	24.41	51.08	40.61	74.00	54.00	-22.92	-13.39	295	1.39
14772.00	-21.37	40.05	30.82	20.26	49.50	38.94	74.00	54.00	-24.50	-15.06	83	1.44

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



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TEST REPORT

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Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11g_CH01
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1928.93	-31.74	26.94	50.81	40.27	46.01	35.47	74.00	54.00	-27.99	-18.53	153	2.24
3049.38	-30.60	30.70	43.91	33.56	44.01	33.66	74.00	54.00	-29.99	-20.34	216	1.87
3213.01	-30.29	31.03	44.75	34.24	45.48	34.97	74.00	54.00	-28.52	-19.03	192	1.82
3634.43	-29.64	31.92	42.68	32.14	44.96	34.42	74.00	54.00	-29.04	-19.58	186	1.73
4517.68	-28.71	32.84	41.42	30.97	45.55	35.10	74.00	54.00	-28.45	-18.90	102	1.43
5759.11	-27.37	34.65	38.77	28.36	46.04	35.63	74.00	54.00	-27.96	-18.37	89	1.09

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
3213.07	-30.29	31.03	45.23	34.76	45.96	35.49	74.00	54.00	-28.04	-18.51	71	1.67
3694.38	-29.58	32.07	42.08	31.54	44.56	34.02	74.00	54.00	-29.44	-19.98	253	1.83
4499.62	-28.72	32.80	41.16	30.73	45.24	34.81	74.00	54.00	-28.76	-19.19	277	2.06
5198.70	-27.72	34.28	38.83	28.49	45.39	35.05	74.00	54.00	-28.61	-18.95	315	2.27
5332.74	-27.32	34.46	38.57	28.06	45.72	35.21	74.00	54.00	-28.28	-18.79	46	2.31
5698.15	-27.24	34.66	38.39	27.87	45.81	35.29	74.00	54.00	-28.19	-18.71	88	2.38

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



Spectrum Research & Testing Lab., Inc.
 No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11g_CH01 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2412.00	-31.14	28.35	97.85	86.42	95.07	83.64	114	94	-18.93	-10.36	217	1.35
4824.00	-28.46	33.58	41.74	31.26	46.86	36.38	74.00	54.00	-27.14	-17.62	153	1.66
7236.00	-27.03	36.67	35.93	25.37	45.56	35.00	74.00	54.00	-28.44	-19.00	112	1.39
9648.00	-25.60	38.25	37.15	26.64	49.80	39.29	74.00	54.00	-24.20	-14.71	97	1.47
12060.00	-23.76	39.30	34.87	24.45	50.41	39.99	74.00	54.00	-23.59	-14.01	68	1.52
14472.00	-21.15	40.77	32.89	22.32	52.50	41.93	74.00	54.00	-21.50	-12.07	246	1.59

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2412.00	-31.14	28.35	94.48	83.01	91.70	80.23	114	94	-22.30	-13.77	293	1.44
4824.00	-28.46	33.58	38.76	28.34	43.88	33.46	74.00	54.00	-30.12	-20.54	175	1.39
7236.00	-27.03	36.67	35.98	25.52	45.61	35.15	74.00	54.00	-28.39	-18.85	136	1.36
9648.00	-25.60	38.25	37.34	26.83	49.99	39.48	74.00	54.00	-24.01	-14.52	199	1.57
12060.00	-23.76	39.30	34.81	24.27	50.35	39.81	74.00	54.00	-23.65	-14.19	78	1.76
14472.00	-21.15	40.77	32.73	22.17	52.34	41.78	74.00	54.00	-21.66	-12.22	317	1.64

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



TEST REPORT

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11g_CH06
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1923.11	-31.75	26.92	50.02	39.53	45.20	34.71	74.00	54.00	-28.80	-19.29	254	2.14
3249.27	-30.23	31.10	43.27	32.76	44.14	33.63	74.00	54.00	-29.86	-20.37	189	1.85
3578.03	-29.69	31.79	41.93	31.48	44.03	33.58	74.00	54.00	-29.97	-20.42	107	1.73
3684.57	-29.59	32.04	42.08	31.56	44.53	34.01	74.00	54.00	-29.47	-19.99	226	1.67
4437.63	-28.79	32.80	40.38	29.94	44.39	33.95	74.00	54.00	-29.61	-20.05	58	1.46
5872.68	-27.62	34.63	38.42	27.89	45.42	34.89	74.00	54.00	-28.58	-19.11	89	1.05

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
3159.60	-30.39	30.92	43.44	32.97	43.96	33.49	74.00	54.00	-30.04	-20.51	132	1.67
3249.22	-30.23	31.10	43.75	33.26	44.62	34.13	74.00	54.00	-29.38	-19.87	197	1.72
3632.79	-29.64	31.92	42.81	32.37	45.09	34.65	74.00	54.00	-28.91	-19.35	246	1.83
4628.51	-28.62	33.11	40.57	30.08	45.06	34.57	74.00	54.00	-28.94	-19.43	331	2.14
5277.65	-27.48	34.39	38.95	28.51	45.85	35.41	74.00	54.00	-28.15	-18.59	295	2.25
5658.09	-27.15	34.67	37.96	27.49	45.47	35.00	74.00	54.00	-28.53	-19.00	98	2.37

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11g_CH06 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBµV)		Emission Level (dBµV/m)		Limit (dBµV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-31.11	28.42	98.55	87.06	95.87	84.38	114	94	-18.13	-9.62	159	1.58
4874.00	-28.42	33.70	43.49	32.98	48.77	38.26	74.00	54.00	-25.23	-15.74	117	1.42
7311.00	-26.98	36.85	36.27	25.73	46.13	35.59	74.00	54.00	-27.87	-18.41	234	1.55
9748.00	-25.45	38.35	36.03	25.56	48.93	38.46	74.00	54.00	-25.07	-15.54	100	1.39
12185.00	-23.43	39.30	34.18	23.63	50.05	39.50	74.00	54.00	-23.95	-14.50	95	1.47
14622.00	-21.25	40.41	30.89	20.38	50.05	39.54	74.00	54.00	-23.95	-14.46	317	1.36

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBµV)		Emission Level (dBµV/m)		Limit (dBµV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-31.11	28.42	94.85	83.22	92.17	80.54	114	94	-21.83	-13.46	48	1.47
4874.00	-28.42	33.70	39.30	28.75	44.58	34.03	74.00	54.00	-29.42	-19.97	97	1.59
7311.00	-26.98	36.85	36.13	25.68	45.99	35.54	74.00	54.00	-28.01	-18.46	136	1.73
9748.00	-25.45	38.35	36.02	25.51	48.92	38.41	74.00	54.00	-25.08	-15.59	271	1.79
12185.00	-23.43	39.30	34.25	23.62	50.12	39.49	74.00	54.00	-23.88	-14.51	255	1.36
14622.00	-21.25	40.41	30.96	20.37	50.12	39.53	74.00	54.00	-23.88	-14.47	79	1.49

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



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TEST REPORT

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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11g_CH11
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
3022.71	-30.65	30.64	43.51	33.02	43.50	33.01	74.00	54.00	-30.50	-20.99	118	1.87
3658.43	-29.61	31.98	41.75	31.37	44.11	33.73	74.00	54.00	-29.89	-20.27	305	1.72
4073.69	-29.22	32.80	40.28	29.76	43.86	33.34	74.00	54.00	-30.14	-20.66	219	1.59
4427.34	-28.80	32.80	39.94	29.48	43.94	33.48	74.00	54.00	-30.06	-20.52	67	1.46
5329.09	-27.33	34.46	38.56	28.13	45.69	35.26	74.00	54.00	-28.31	-18.74	316	1.22
5628.53	-27.09	34.67	38.06	27.56	45.65	35.15	74.00	54.00	-28.35	-18.85	258	1.13

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1438.33	-32.61	25.30	52.12	41.79	44.81	34.48	74.00	54.00	-29.19	-19.52	194	1.17
3632.54	-29.64	31.92	42.13	31.68	44.41	33.96	74.00	54.00	-29.59	-20.04	172	1.78
3764.81	-29.52	32.23	41.94	31.44	44.66	34.16	74.00	54.00	-29.34	-19.84	229	1.85
4438.25	-28.79	32.80	40.37	29.89	44.38	33.90	74.00	54.00	-29.62	-20.10	334	2.02
4783.73	-28.49	33.48	39.85	29.45	44.84	34.44	74.00	54.00	-29.16	-19.56	193	2.16
5184.08	-27.76	34.26	39.19	28.61	45.68	35.10	74.00	54.00	-28.32	-18.90	295	2.23

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



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TEST REPORT

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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11g_CH11 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBµV)		Emission Level (dBµV/m)		Limit (dBµV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2462.00	-31.08	28.49	96.62	85.03	94.04	82.45	114	94	-19.96	-11.55	119	1.44
4924.00	-28.38	33.82	41.53	31.12	46.97	36.56	74.00	54.00	-27.03	-17.44	259	1.68
7386.00	-26.94	37.03	37.35	26.84	47.44	36.93	74.00	54.00	-26.56	-17.07	335	1.61
9848.00	-25.29	38.45	36.57	26.03	49.72	39.18	74.00	54.00	-24.28	-14.82	137	1.53
12310.00	-23.10	39.30	34.96	24.47	51.16	40.67	74.00	54.00	-22.84	-13.33	216	1.57
14772.00	-21.37	40.05	31.15	20.62	49.83	39.30	74.00	54.00	-24.17	-14.70	281	1.48

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBµV)		Emission Level (dBµV/m)		Limit (dBµV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2462.00	-31.08	28.49	93.57	81.95	90.99	79.37	114	94	-23.01	-14.63	300	1.32
4924.00	-28.38	33.82	37.96	27.44	43.40	32.88	74.00	54.00	-30.60	-21.12	176	1.49
7386.00	-26.94	37.03	37.37	26.84	47.46	36.93	74.00	54.00	-26.54	-17.07	57	1.37
9848.00	-25.29	38.45	36.49	25.96	49.64	39.11	74.00	54.00	-24.36	-14.89	44	1.65
12310.00	-23.10	39.30	34.85	24.43	51.05	40.63	74.00	54.00	-22.95	-13.37	182	1.74
14772.00	-21.37	40.05	30.87	20.44	49.55	39.12	74.00	54.00	-24.45	-14.88	236	1.71

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



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TEST REPORT

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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT20_CH01
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1439.64	-32.61	25.30	56.03	45.31	48.73	38.01	74.00	54.00	-25.27	-15.99	242	2.24
3227.83	-30.27	31.05	43.72	33.24	44.51	34.03	74.00	54.00	-29.49	-19.97	311	1.85
3424.28	-29.90	31.45	42.07	31.67	43.62	33.22	74.00	54.00	-30.38	-20.78	128	1.76
3648.70	-29.62	31.96	42.08	31.45	44.41	33.78	74.00	54.00	-29.59	-20.22	106	1.63
5328.41	-27.33	34.46	38.85	28.39	45.98	35.52	74.00	54.00	-28.02	-18.48	79	1.24
5767.17	-27.39	34.65	38.07	27.53	45.32	34.78	74.00	54.00	-28.68	-19.22	229	1.09

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1439.67	-32.61	25.30	52.31	41.83	45.01	34.53	74.00	54.00	-28.99	-19.47	148	1.12
3099.36	-30.51	30.80	43.41	32.95	43.70	33.24	74.00	54.00	-30.30	-20.76	197	1.65
3227.87	-30.27	31.05	44.75	34.26	45.54	35.05	74.00	54.00	-28.46	-18.95	213	1.69
3634.18	-29.64	31.92	41.98	31.47	44.26	33.75	74.00	54.00	-29.74	-20.25	286	1.74
4648.04	-28.60	33.16	40.06	29.54	44.61	34.09	74.00	54.00	-29.39	-19.91	192	2.03
5203.69	-27.71	34.28	38.95	28.48	45.53	35.06	74.00	54.00	-28.47	-18.94	281	2.27

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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TEST REPORT

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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT20_CH01 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2412.00	-31.14	28.35	94.32	82.67	91.54	79.89	114	94	-22.46	-14.11	175	1.53
4824.00	-28.46	33.58	39.35	28.84	44.47	33.96	74.00	54.00	-29.53	-20.04	209	1.68
7236.00	-27.03	36.67	35.57	25.04	45.20	34.67	74.00	54.00	-28.80	-19.33	61	1.61
9648.00	-25.60	38.25	36.51	26.03	49.16	38.68	74.00	54.00	-24.84	-15.32	84	1.57
12060.00	-23.76	39.30	34.24	23.76	49.78	39.30	74.00	54.00	-24.22	-14.70	312	1.44
14472.00	-21.15	40.77	32.71	22.17	52.32	41.78	74.00	54.00	-21.68	-12.22	195	1.69

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2412.00	-31.14	28.35	92.85	81.29	90.07	78.51	114	94	-23.93	-15.49	247	1.55
4824.00	-28.46	33.58	38.34	27.94	43.46	33.06	74.00	54.00	-30.54	-20.94	218	1.48
7236.00	-27.03	36.67	35.53	25.07	45.16	34.70	74.00	54.00	-28.84	-19.30	96	1.59
9648.00	-25.60	38.25	36.67	26.18	49.32	38.83	74.00	54.00	-24.68	-15.17	314	1.54
12060.00	-23.76	39.30	34.28	23.75	49.82	39.29	74.00	54.00	-24.18	-14.71	266	1.40
14472.00	-21.15	40.77	32.41	21.93	52.02	41.54	74.00	54.00	-21.98	-12.46	298	1.38

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



Spectrum Research & Testing Lab., Inc.
 No.167,Ln. 780, Shan-Tong Rd.,Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT20_CH06
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1438.16	-32.61	25.30	54.37	43.75	47.06	36.44	74.00	54.00	-26.94	-17.56	140	2.35
1924.33	-31.75	26.93	53.82	43.38	49.00	38.56	74.00	54.00	-25.00	-15.44	334	2.21
3017.64	-30.66	30.63	43.84	33.46	43.82	33.44	74.00	54.00	-30.18	-20.56	216	1.87
3763.79	-29.52	32.23	42.11	31.72	44.82	34.43	74.00	54.00	-29.18	-19.57	108	1.68
3914.27	-29.38	32.59	42.22	31.78	45.43	34.99	74.00	54.00	-28.57	-19.01	157	1.64
4702.90	-28.56	33.28	40.16	29.63	44.89	34.36	74.00	54.00	-29.11	-19.64	62	1.38

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1433.65	-32.63	25.29	52.54	42.02	45.20	34.68	74.00	54.00	-28.80	-19.32	98	1.15
1924.37	-31.75	26.93	53.17	42.68	48.35	37.86	74.00	54.00	-25.65	-16.14	244	1.24
3579.43	-29.69	31.79	42.29	31.76	44.39	33.86	74.00	54.00	-29.61	-20.14	307	1.75
3927.16	-29.37	32.62	40.85	30.37	44.11	33.63	74.00	54.00	-29.89	-20.37	208	1.83
4508.78	-28.71	32.82	40.23	29.78	44.34	33.89	74.00	54.00	-29.66	-20.11	192	2.04
5278.32	-27.48	34.39	39.07	28.55	45.98	35.46	74.00	54.00	-28.02	-18.54	71	2.29

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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TEST REPORT

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Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT20_CH06 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-31.11	28.42	94.29	82.71	91.61	80.03	114	94	-22.39	-13.97	285	1.55
4874.00	-28.42	33.70	39.08	28.54	44.36	33.82	74.00	54.00	-29.64	-20.18	192	1.34
7311.00	-26.98	36.85	36.13	25.59	45.99	35.45	74.00	54.00	-28.01	-18.55	57	1.69
9748.00	-25.45	38.35	35.94	25.36	48.84	38.26	74.00	54.00	-25.16	-15.74	163	1.58
12185.00	-23.43	39.30	34.67	24.13	50.54	40.00	74.00	54.00	-23.46	-14.00	248	1.46
14622.00	-21.25	40.41	31.16	20.55	50.32	39.71	74.00	54.00	-23.68	-14.29	209	1.53

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-31.11	28.42	94.05	82.46	91.37	79.78	114	94	-22.63	-14.22	148	1.72
4874.00	-28.42	33.70	39.02	28.51	44.30	33.79	74.00	54.00	-29.70	-20.21	105	1.68
7311.00	-26.98	36.85	36.02	25.57	45.88	35.43	74.00	54.00	-28.12	-18.57	85	1.62
9748.00	-25.45	38.35	35.97	25.36	48.87	38.26	74.00	54.00	-25.13	-15.74	113	1.51
12185.00	-23.43	39.30	34.26	23.71	50.13	39.58	74.00	54.00	-23.87	-14.42	94	1.49
14622.00	-21.25	40.41	30.98	20.53	50.14	39.69	74.00	54.00	-23.86	-14.31	316	1.37

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



TEST REPORT

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT20_CH11
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1439.22	-32.61	25.30	54.26	43.68	46.96	36.38	74.00	54.00	-27.04	-17.62	246	2.35
1923.43	-31.75	26.92	55.61	45.12	50.79	40.30	74.00	54.00	-23.21	-13.70	339	2.24
3244.83	-30.24	31.09	43.76	33.27	44.61	34.12	74.00	54.00	-29.39	-19.88	157	1.86
3697.34	-29.58	32.07	42.27	31.78	44.76	34.27	74.00	54.00	-29.24	-19.73	201	1.67
4698.73	-28.56	33.28	41.13	30.67	45.84	35.38	74.00	54.00	-28.16	-18.62	54	1.35
5333.90	-27.31	34.47	38.44	27.95	45.59	35.10	74.00	54.00	-28.41	-18.90	59	1.22

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1439.26	-32.61	25.30	52.05	41.56	44.75	34.26	74.00	54.00	-29.25	-19.74	109	1.14
1923.47	-31.75	26.92	53.81	43.39	48.99	38.57	74.00	54.00	-25.01	-15.43	302	1.29
3038.88	-30.62	30.68	44.03	33.56	44.09	33.62	74.00	54.00	-29.91	-20.38	198	1.67
3884.62	-29.41	32.52	41.54	31.07	44.65	34.18	74.00	54.00	-29.35	-19.82	242	1.89
4579.35	-28.66	32.99	40.37	29.84	44.70	34.17	74.00	54.00	-29.30	-19.83	278	2.06
5188.43	-27.75	34.26	39.53	29.04	46.04	35.55	74.00	54.00	-27.96	-18.45	191	2.28

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



Spectrum Research & Testing Lab., Inc.
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TEST REPORT

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 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT20_CH11 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2462.00	-31.08	28.49	94.73	83.16	92.15	80.58	114	94	-21.85	-13.42	226	1.41
4924.00	-28.38	33.82	41.42	30.97	46.86	36.41	74.00	54.00	-27.14	-17.59	187	1.62
7386.00	-26.94	37.03	37.03	26.54	47.12	36.63	74.00	54.00	-26.88	-17.37	39	1.38
9848.00	-25.29	38.45	35.94	25.46	49.09	38.61	74.00	54.00	-24.91	-15.39	64	1.55
12310.00	-23.10	39.30	34.37	23.87	50.57	40.07	74.00	54.00	-23.43	-13.93	251	1.49
14773.00	-21.37	40.04	30.86	20.29	49.54	38.97	74.00	54.00	-24.46	-15.03	309	1.33

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2462.00	-31.08	28.49	95.02	83.58	92.44	81.00	114	94	-21.56	-13.00	102	1.45
4924.00	-28.38	33.82	39.24	28.75	44.68	34.19	74.00	54.00	-29.32	-19.81	91	1.57
7386.00	-26.94	37.03	37.12	26.68	47.21	36.77	74.00	54.00	-26.79	-17.23	155	1.73
9848.00	-25.29	38.45	35.98	25.51	49.13	38.66	74.00	54.00	-24.87	-15.34	238	1.72
12310.00	-23.10	39.30	34.46	23.94	50.66	40.14	74.00	54.00	-23.34	-13.86	317	1.56
14773.00	-21.37	40.04	31.03	20.58	49.71	39.26	74.00	54.00	-24.29	-14.74	244	1.64

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



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Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT40_CH05
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1438.02	-32.61	25.30	52.07	41.56	44.76	34.25	74.00	54.00	-29.24	-19.75	291	2.34
1924.74	-31.75	26.93	53.41	42.93	48.59	38.11	74.00	54.00	-25.41	-15.89	315	2.21
3227.45	-30.27	31.05	43.79	33.18	44.58	33.97	74.00	54.00	-29.42	-20.03	216	1.84
3752.86	-29.53	32.20	41.36	30.84	44.04	33.52	74.00	54.00	-29.96	-20.48	124	1.68
4373.94	-28.87	32.80	41.59	31.07	45.52	35.00	74.00	54.00	-28.48	-19.00	97	1.47
5339.68	-27.30	34.47	38.72	28.23	45.90	35.41	74.00	54.00	-28.10	-18.59	105	1.23

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1438.07	-32.61	25.30	51.89	41.34	44.58	34.03	74.00	54.00	-29.42	-19.97	248	1.14
1924.78	-31.75	26.93	51.82	41.31	47.00	36.49	74.00	54.00	-27.00	-17.51	342	1.29
3138.28	-30.43	30.88	44.53	34.02	44.97	34.46	74.00	54.00	-29.03	-19.54	117	1.61
3227.49	-30.27	31.05	44.54	33.97	45.33	34.76	74.00	54.00	-28.67	-19.24	275	1.68
4412.71	-28.82	32.80	42.26	31.75	46.24	35.73	74.00	54.00	-27.76	-18.27	196	2.03
5199.69	-27.72	34.28	38.73	28.16	45.29	34.72	74.00	54.00	-28.71	-19.28	283	2.27

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT40_CH05 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2422.00	-31.12	28.38	95.81	84.16	93.07	81.42	114	94	-20.93	-12.58	135	1.58
4844.00	-28.44	33.63	40.93	30.35	46.11	35.53	74.00	54.00	-27.89	-18.47	176	1.69
7266.00	-27.01	36.74	36.75	26.19	46.47	35.91	74.00	54.00	-27.53	-18.09	239	1.44
9688.00	-25.54	38.29	36.71	26.17	49.46	38.92	74.00	54.00	-24.54	-15.08	92	1.53
12110.00	-23.63	39.30	34.58	23.97	50.25	39.64	74.00	54.00	-23.75	-14.36	324	1.64
14532.00	-21.18	40.62	32.07	21.54	51.52	40.99	74.00	54.00	-22.48	-13.01	187	1.62

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2422.00	-31.12	28.38	95.24	83.67	92.50	80.93	114	94	-21.50	-13.07	250	1.59
4844.00	-28.44	33.63	38.97	28.46	44.15	33.64	74.00	54.00	-29.85	-20.36	45	1.35
7266.00	-27.01	36.74	36.57	26.06	46.29	35.78	74.00	54.00	-27.71	-18.22	193	1.37
9688.00	-25.54	38.29	36.78	26.25	49.53	39.00	74.00	54.00	-24.47	-15.00	276	1.56
12110.00	-23.63	39.30	34.49	23.93	50.16	39.60	74.00	54.00	-23.84	-14.40	299	1.67
14532.00	-21.18	40.62	31.82	21.29	51.27	40.74	74.00	54.00	-22.73	-13.26	301	1.43

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



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Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT40_CH08
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1438.53	-32.61	25.30	54.66	44.13	47.35	36.82	74.00	54.00	-26.65	-17.18	140	2.31
1734.68	-32.03	26.24	51.37	40.87	45.58	35.08	74.00	54.00	-28.42	-18.92	236	2.26
3247.14	-30.23	31.09	44.45	34.02	45.31	34.88	74.00	54.00	-28.69	-19.12	218	1.85
3748.77	-29.53	32.20	42.34	31.85	45.00	34.51	74.00	54.00	-29.00	-19.49	85	1.69
5264.01	-27.52	34.37	39.01	28.53	45.86	35.38	74.00	54.00	-28.14	-18.62	131	1.24
5447.33	-26.97	34.63	38.26	27.79	45.92	35.45	74.00	54.00	-28.08	-18.55	167	1.18

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1438.57	-32.61	25.30	51.68	41.13	44.37	33.82	74.00	54.00	-29.63	-20.18	241	1.12
3739.21	-29.54	32.17	43.15	32.67	45.78	35.30	74.00	54.00	-28.22	-18.70	259	1.83
4067.51	-29.22	32.80	40.42	29.96	44.00	33.54	74.00	54.00	-30.00	-20.46	300	1.92
4423.18	-28.81	32.80	40.38	29.85	44.37	33.84	74.00	54.00	-29.63	-20.16	315	2.04
5124.69	-27.95	34.17	39.28	28.76	45.51	34.99	74.00	54.00	-28.49	-19.01	76	2.25
5329.07	-27.33	34.46	38.76	28.23	45.89	35.36	74.00	54.00	-28.11	-18.64	103	2.29

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT40_CH08 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBµV)		Emission Level (dBµV/m)		Limit (dBµV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-31.11	28.42	96.64	85.07	93.96	82.39	114	94	-20.04	-11.61	316	1.62
4874.00	-28.42	33.70	39.35	28.82	44.63	34.10	74.00	54.00	-29.37	-19.90	127	1.73
7311.00	-26.98	36.85	36.14	25.64	46.00	35.50	74.00	54.00	-28.00	-18.50	168	1.44
9748.00	-25.45	38.35	35.99	25.49	48.89	38.39	74.00	54.00	-25.11	-15.61	241	1.66
12185.00	-23.43	39.30	34.27	23.77	50.14	39.64	74.00	54.00	-23.86	-14.36	239	1.57
14622.00	-21.25	40.41	31.08	20.59	50.24	39.75	74.00	54.00	-23.76	-14.25	157	1.39

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBµV)		Emission Level (dBµV/m)		Limit (dBµV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-31.11	28.42	95.16	83.45	92.48	80.77	114	94	-21.52	-13.23	106	1.48
4874.00	-28.42	33.70	39.28	28.73	44.56	34.01	74.00	54.00	-29.44	-19.99	138	1.35
7311.00	-26.98	36.85	36.07	25.53	45.93	35.39	74.00	54.00	-28.07	-18.61	76	1.77
9748.00	-25.45	38.35	36.96	25.47	49.86	38.37	74.00	54.00	-24.14	-15.63	99	1.58
12185.00	-23.43	39.30	34.11	23.59	49.98	39.46	74.00	54.00	-24.02	-14.54	301	1.49
14622.00	-21.25	40.41	30.98	20.38	50.14	39.54	74.00	54.00	-23.86	-14.46	55	1.69

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



TEST REPORT

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT40_CH11
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1437.67	-32.61	25.30	53.26	42.78	45.94	35.46	74.00	54.00	-28.06	-18.54	39	2.34
1929.43	-31.74	26.94	53.57	43.03	48.78	38.24	74.00	54.00	-25.22	-15.76	257	2.26
3154.29	-30.40	30.91	44.12	33.76	44.62	34.26	74.00	54.00	-29.38	-19.74	326	1.87
4332.73	-28.91	32.80	43.19	32.73	47.08	36.62	74.00	54.00	-26.92	-17.38	101	1.53
4578.37	-28.66	32.99	43.83	33.37	48.16	37.70	74.00	54.00	-25.84	-16.30	93	1.46
5262.11	-27.53	34.37	40.03	29.54	46.87	36.38	74.00	54.00	-27.13	-17.62	67	1.21

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1437.69	-32.61	25.30	52.38	41.93	45.06	34.61	74.00	54.00	-28.94	-19.39	275	1.17
1923.70	-31.75	26.92	52.09	41.59	47.27	36.77	74.00	54.00	-26.73	-17.23	162	1.29
3108.92	-30.49	30.82	45.02	34.52	45.35	34.85	74.00	54.00	-28.65	-19.15	112	1.63
4132.52	-29.15	32.80	41.85	31.29	45.50	34.94	74.00	54.00	-28.50	-19.06	184	1.95
4639.84	-28.61	33.13	42.33	31.76	46.85	36.28	74.00	54.00	-27.15	-17.72	195	2.08
5267.48	-27.51	34.37	39.28	28.85	46.14	35.71	74.00	54.00	-27.86	-18.29	287	2.24

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	20 °C	Humidity:	63 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	802.11n – HT40_CH11 (Fundamental)
Frequency Range:	1 GHz – 25 GHz	Modulation Type:	OFDM
Tested By:	Richard Lin	Tested Date:	Jan. 24, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBµV)		Emission Level (dBµV/m)		Limit (dBµV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2452.00	-31.09	28.47	95.45	83.82	92.83	81.20	114	94	-21.17	-12.80	265	1.56
4904.00	-28.40	33.77	39.37	28.85	44.74	34.22	74.00	54.00	-29.26	-19.78	133	1.48
7356.00	-26.96	36.95	37.58	27.06	47.58	37.06	74.00	54.00	-26.42	-16.94	59	1.35
9808.00	-25.36	38.41	36.49	26.03	49.54	39.08	74.00	54.00	-24.46	-14.92	102	1.38
12260.00	-23.23	39.30	36.03	25.57	52.10	41.64	74.00	54.00	-21.90	-12.36	341	1.49
14712.00	-21.32	40.19	30.81	20.28	49.68	39.15	74.00	54.00	-24.32	-14.85	98	1.73

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBµV)		Emission Level (dBµV/m)		Limit (dBµV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2452.00	-31.09	28.47	94.46	82.87	91.84	80.25	114	94	-22.16	-13.75	109	1.67
4904.00	-28.40	33.77	39.25	28.73	44.62	34.10	74.00	54.00	-29.38	-19.90	258	1.65
7356.00	-26.96	36.95	37.44	26.92	47.44	36.92	74.00	54.00	-26.56	-17.08	174	1.44
9808.00	-25.36	38.41	36.51	26.05	49.56	39.10	74.00	54.00	-24.44	-14.90	195	1.53
12260.00	-23.23	39.30	36.13	25.63	52.20	41.70	74.00	54.00	-21.80	-12.30	283	1.69
14712.00	-21.32	40.19	31.25	20.68	50.12	39.55	74.00	54.00	-23.88	-14.45	211	1.36

NOTE:

1. Measurement uncertainty is +/- 4.73dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



4.3 BANDWIDTH TEST

4.3.1 LIMIT

FCC Part15, Subpart C Section 15.247 (a)(2). The minimum 6dB bandwidth shall be at least 500 kHz.

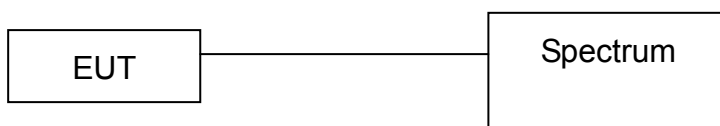
4.3.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM ANALYZER	9 kHz ~ 40 GHz	ROHDE & SCHWARZ	FSP40 / 100093	DEC. 12, 2013 ETC
EMI TEST RECEIVER	9 kHz ~ 6 GHz	ROHDE & SCHWARZ	ESL6/ 100176	APR. 04, 2013 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.3.4 TEST PROCEDURE

The EUT was operated in continuous transmission mode or any specific channel. Printed out the test result from the spectrum by hard copy function.

4.3.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.

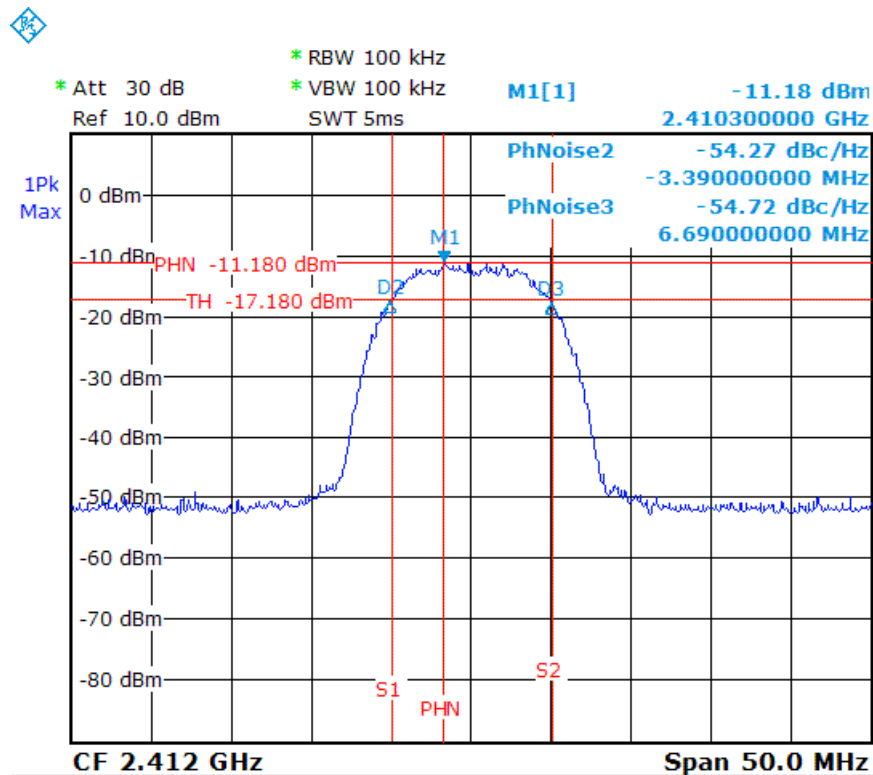


4.3.6 TEST RESULT

Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Test Mode:	802.11b
Tested By:	Richard	Modulation Type:	QPSK
Test Result:	PASS	Tested Date:	Jan. 28, 2013

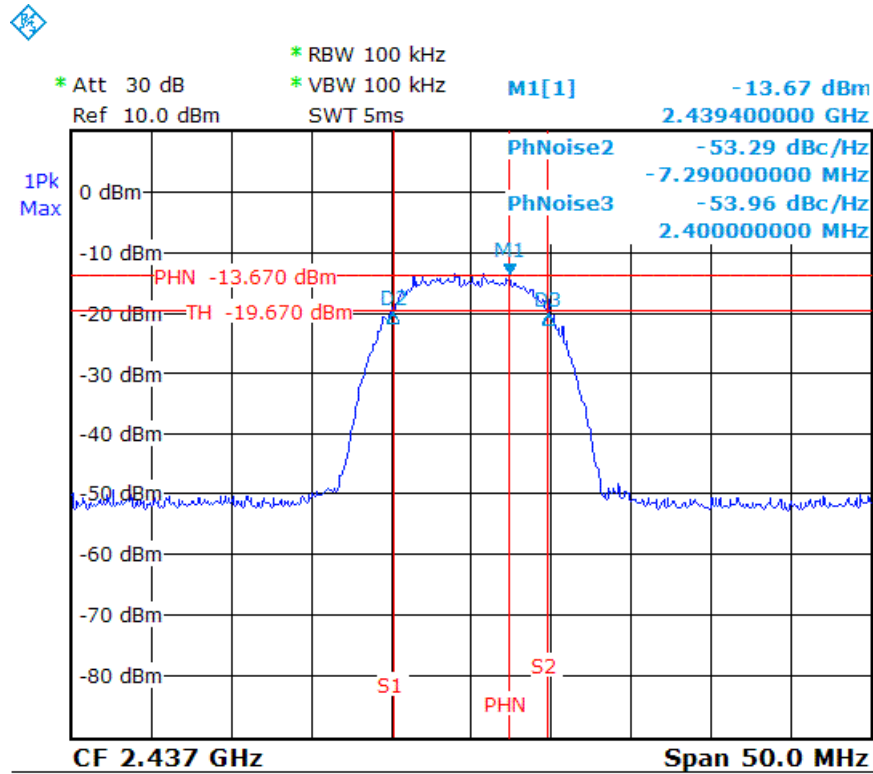
Channel Number	Channel Frequency (MHz)	6dB Down BW (MHz)	Minimum Limit (MHz)
CH01	2412	10.08	0.5
CH06	2437	9.69	0.5
CH11	2462	9.98	0.5

CH01 : (3.39 + 6.69 = **10.08**)

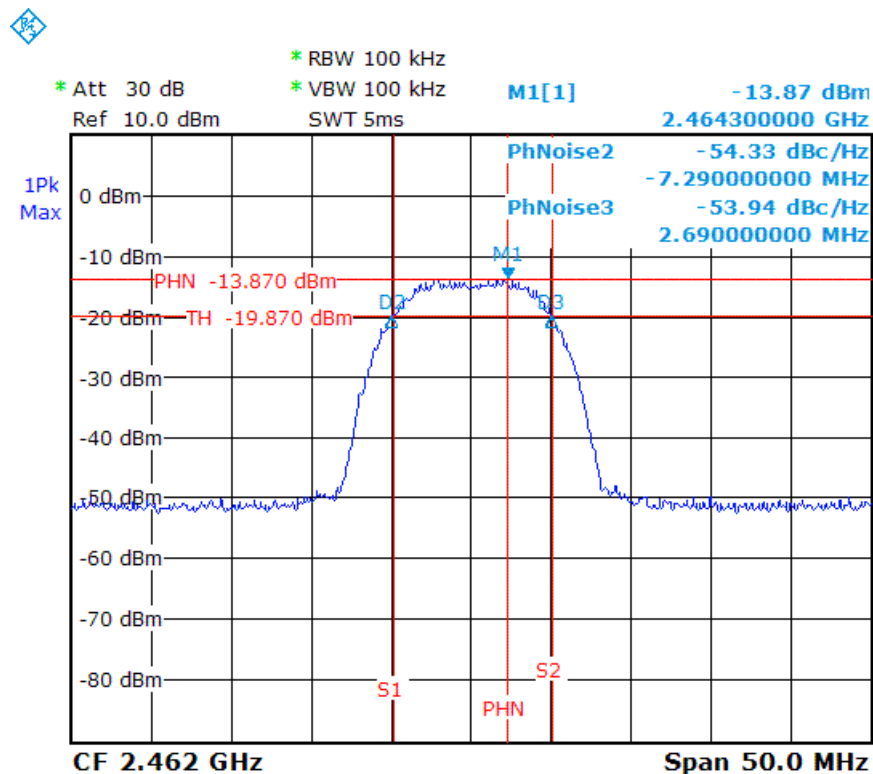




CH06 : (7.29 + 2.4 = 9.69)



CH11 : (7.29 + 2.69 = 9.98)





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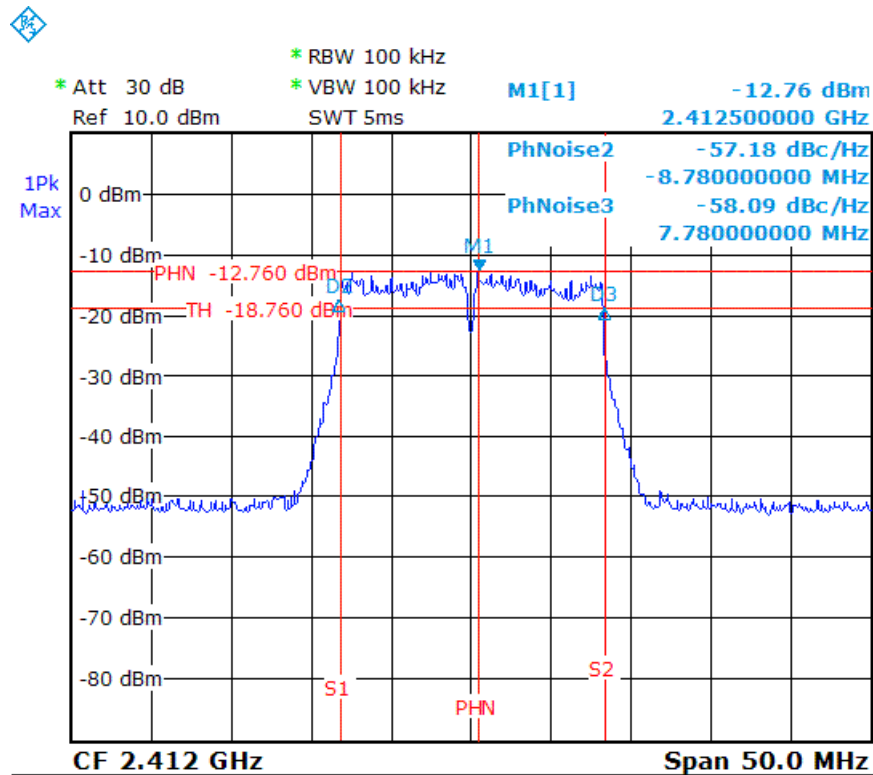
TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Test Mode:	802.11g
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

Channel Number	Channel Frequency (MHz)	6dB Down BW (MHz)	Minimum Limit (MHz)
CH01	2412	16.56	0.5
CH06	2437	16.31	0.5
CH11	2462	15.97	0.5

CH01 : (8.78 + 7.78 = 16.56)





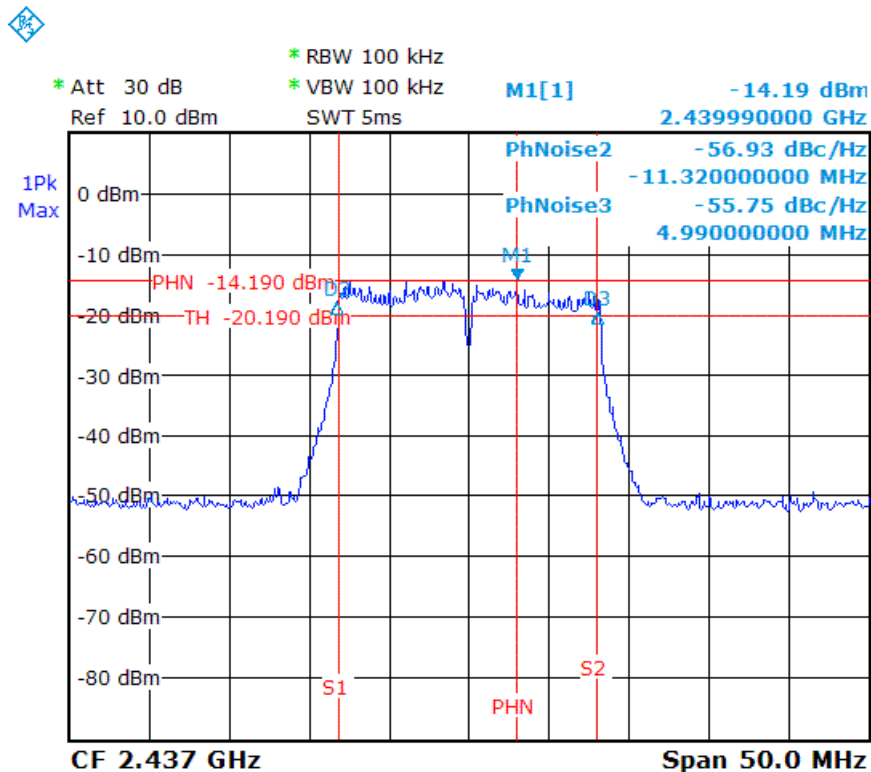
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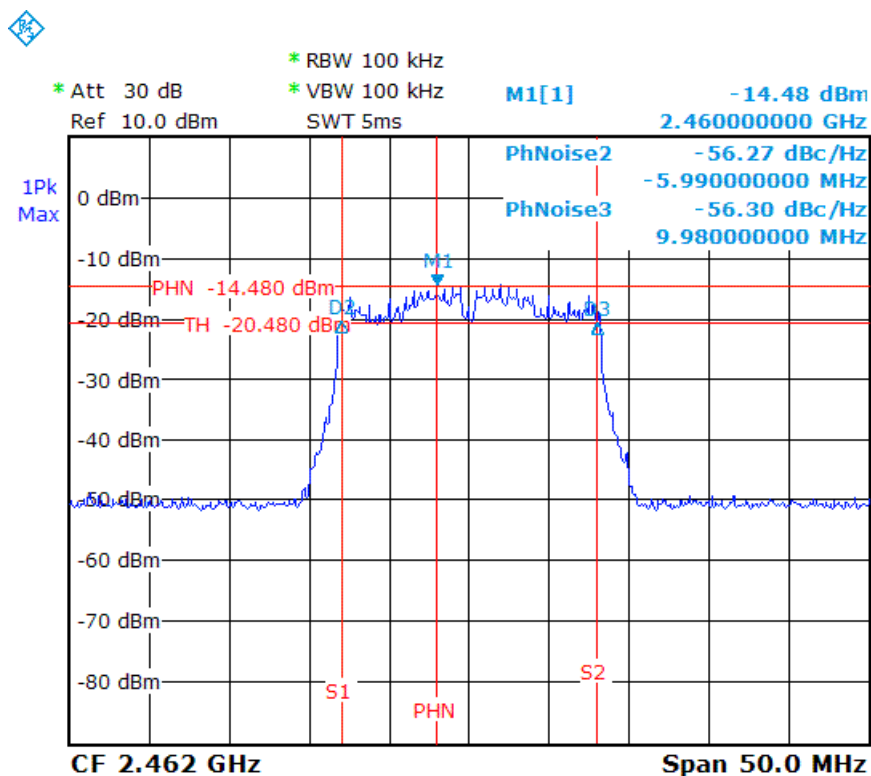
TEST REPORT

Reference No.: A13011801
Report No.: FCCA13011801
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CH06 : (11.32 + 4.99 = 16.31)



CH11 : (5.99 + 9.98 = 15.97)





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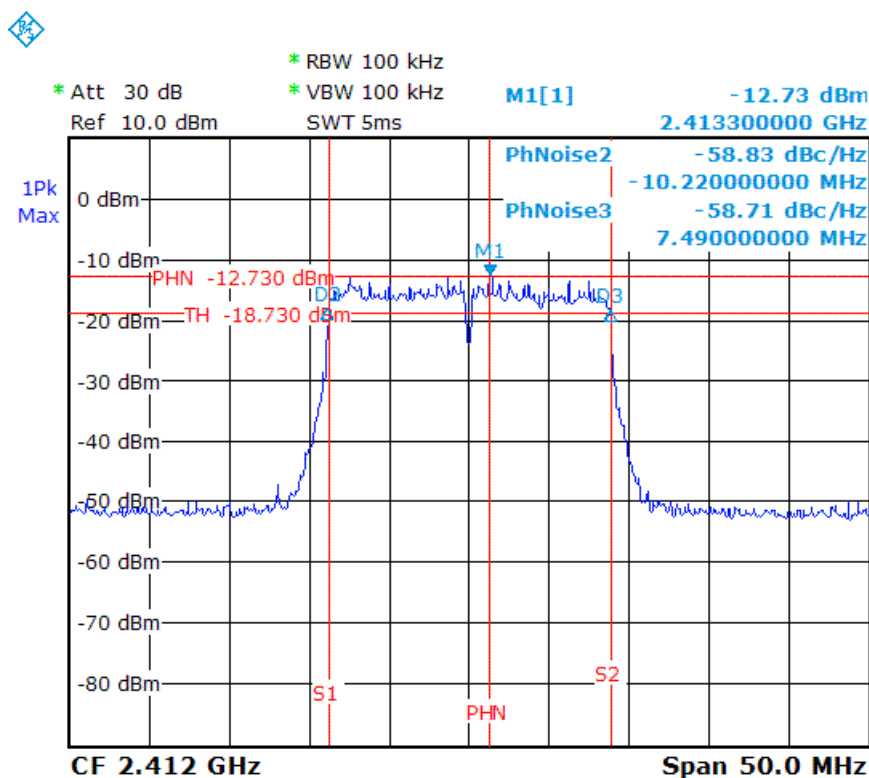
TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Test Mode:	802.11n – HT20
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

Channel Number	Channel Frequency (MHz)	6dB Down BW (MHz)	Minimum Limit (MHz)
CH01	2412	17.71	0.5
CH06	2437	17.46	0.5
CH11	2462	17.47	0.5

CH01 : (10.22 + 7.49 = 17.71)



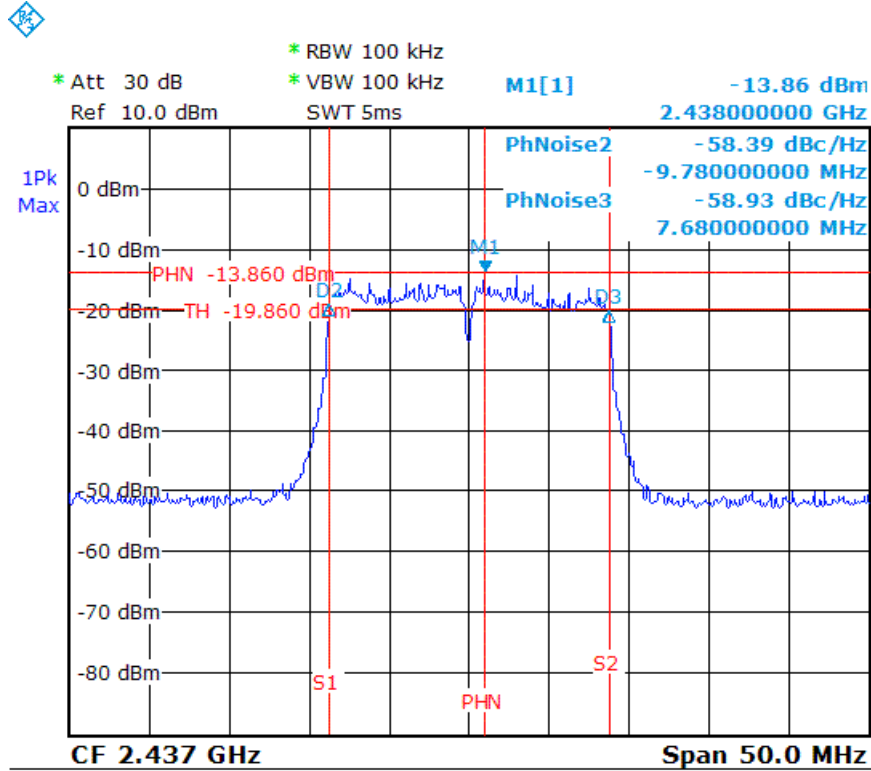


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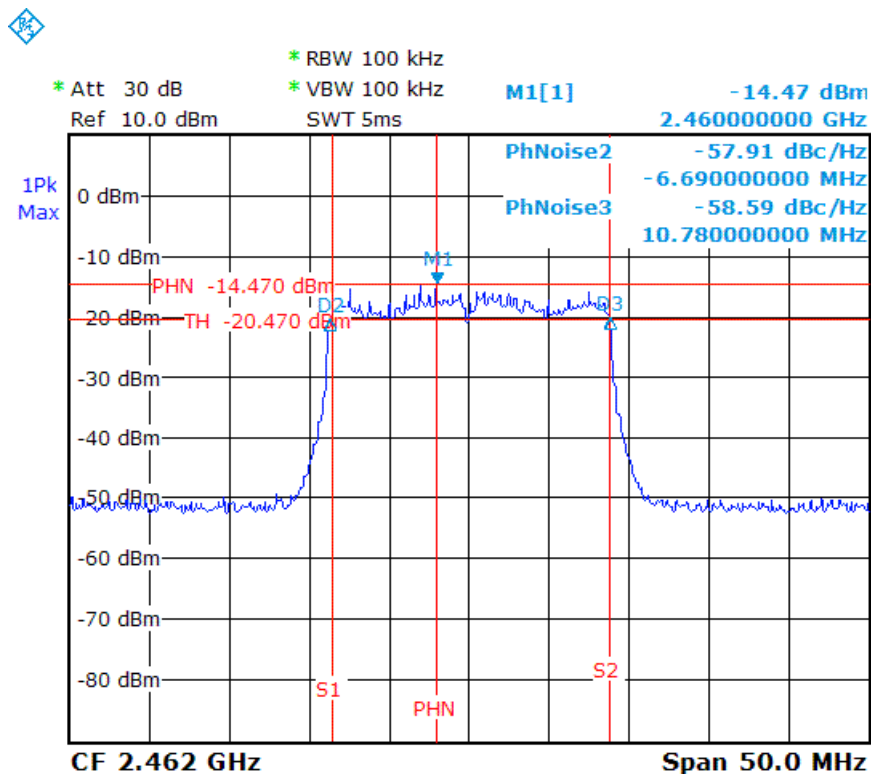
TEST REPORT

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CH06 : (9.78 + 7.68 = 17.46)



CH11 : (6.69 + 10.78 = 17.47)





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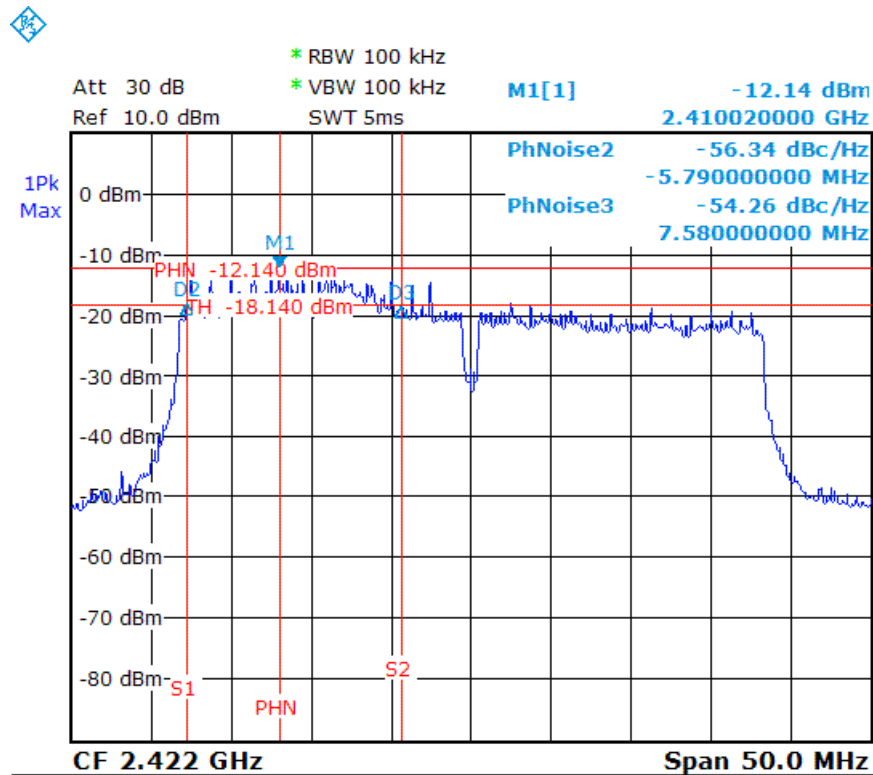
TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
 Page: 78 of 119
 Date: Feb. 06, 2013

Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Test Mode:	802.11n – HT40
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

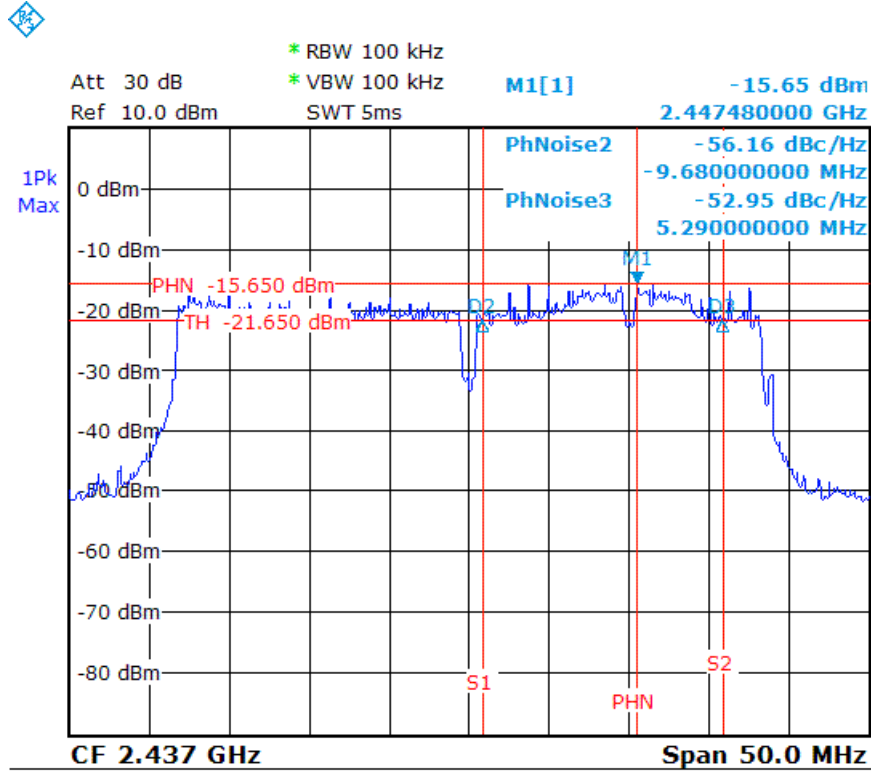
Channel Number	Channel Frequency (MHz)	6dB Down BW (MHz)	Minimum Limit (MHz)
CH05	2422	13.37	0.5
CH08	2437	14.97	0.5
CH11	2452	16.07	0.5

CH05 : (5.79 + 7.58 = 13.37)

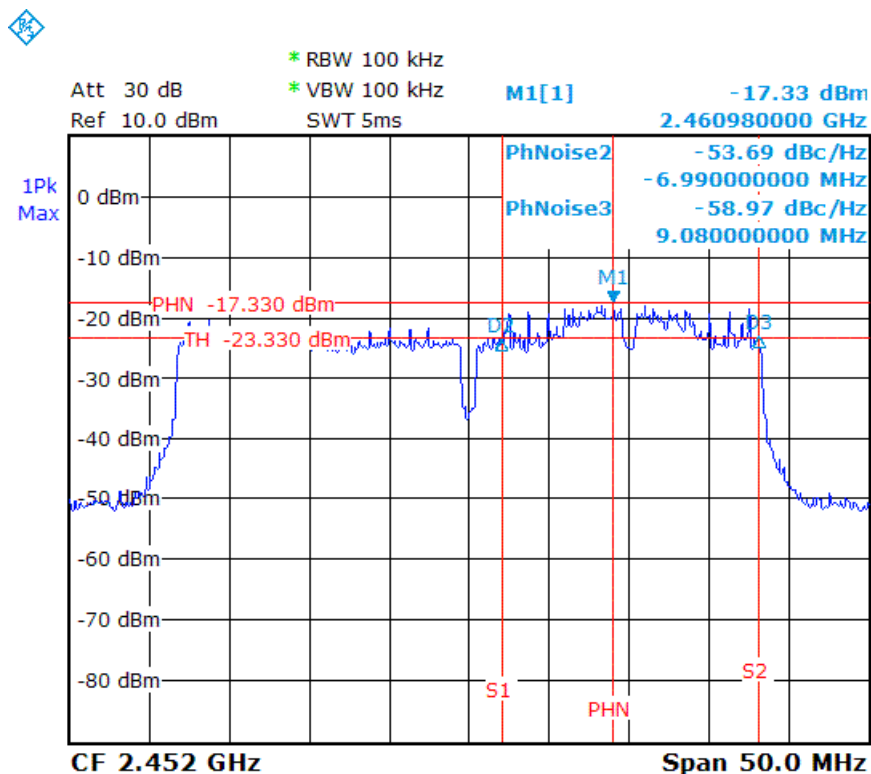




CH08 : (9.68 + 5.29 = 14.97)



CH11 : (6.99 + 9.08 = 16.07)





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TEST REPORT

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4.4 PEAK POWER TEST

4.4.1 LIMIT

FCC Part15, Subpart C Section 15.247(b).

Frequency Range (MHz)	The maximum (peak) conducted output power Limit(w)				
	Quantity of Hopping Channel	50	25	15	75
902-928		1(30dBm)	0.125(21dBm)	NA	NA
2400-2483.5		NA	NA	0.125(21dBm)	1(30dBm)
5725-5850		NA	NA	NA	1(30dBm)

4.4.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM ANALYZER	9 kHz ~ 40 GHz	ROHDE & SCHWARZ	FSP40 / 100093	DEC. 12, 2013 ETC
EMI TEST RECEIVER	9 kHz ~ 6 GHz	ROHDE & SCHWARZ	ESL6/ 100176	APR. 04, 2013 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.4.4 TEST PROCEDURE

The EUT was operating in continuous transmission mode or could control its channel. Printed out the test result from the spectrum by hard copy function.



4.4.5 EUT OPERATING CONDITION

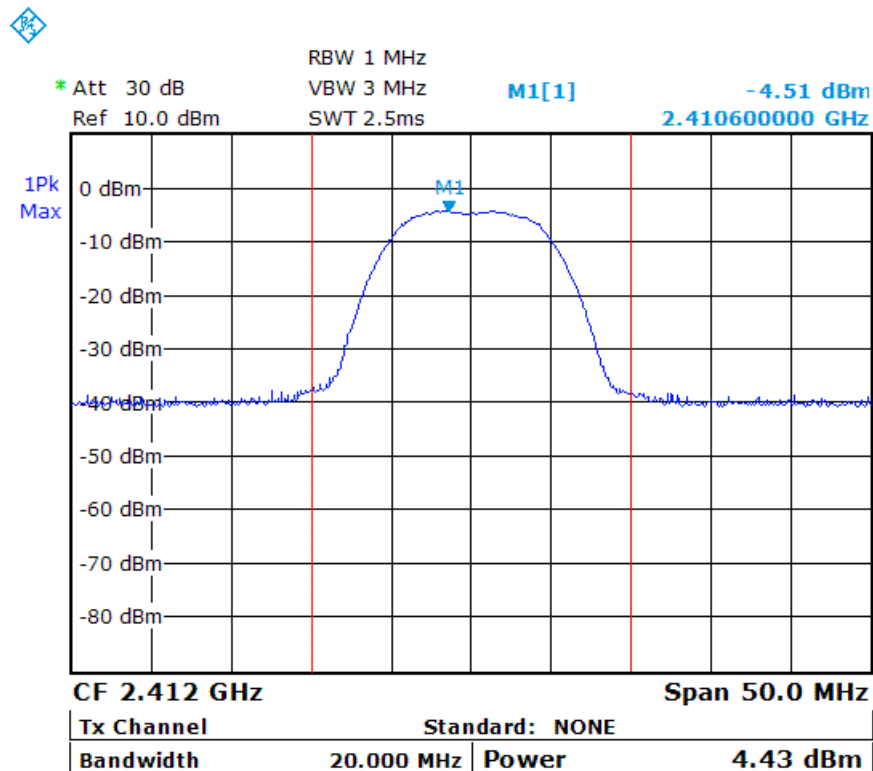
1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.

4.4.6 TEST RESULT

Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Tesr Mode:	802.11b
Tested By:	Richard	Modulation Type:	QPSK
Test Result:	PASS	Tested Date:	Jan. 28, 2013

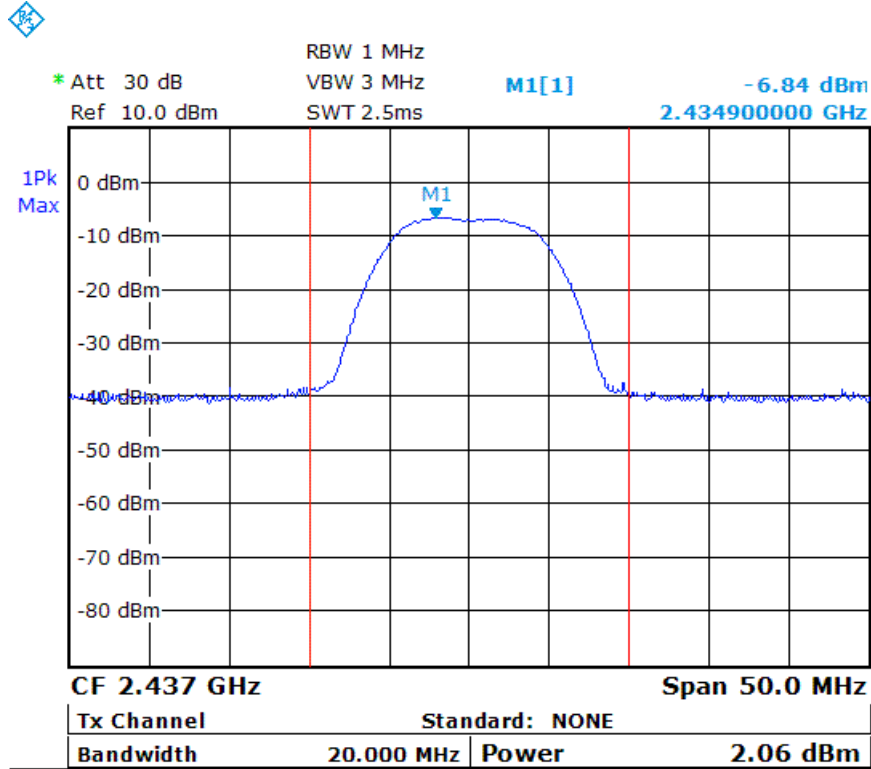
Channel Number	Channel Frequency (MHz)	Peak Power Output		Limit (dBm)
		(dBm)	(mW)	
CH01	2412	-4.51	0.354	30
CH06	2437	-6.84	0.207	30
CH11	2462	-7.22	0.190	30

CH01 :

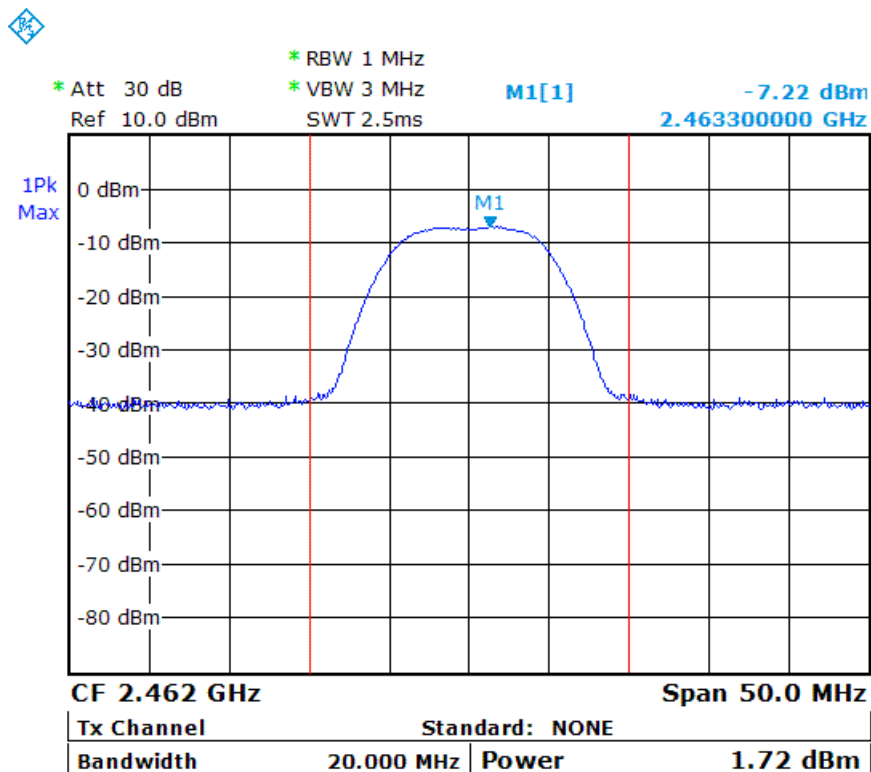




CH06 :



CH11 :





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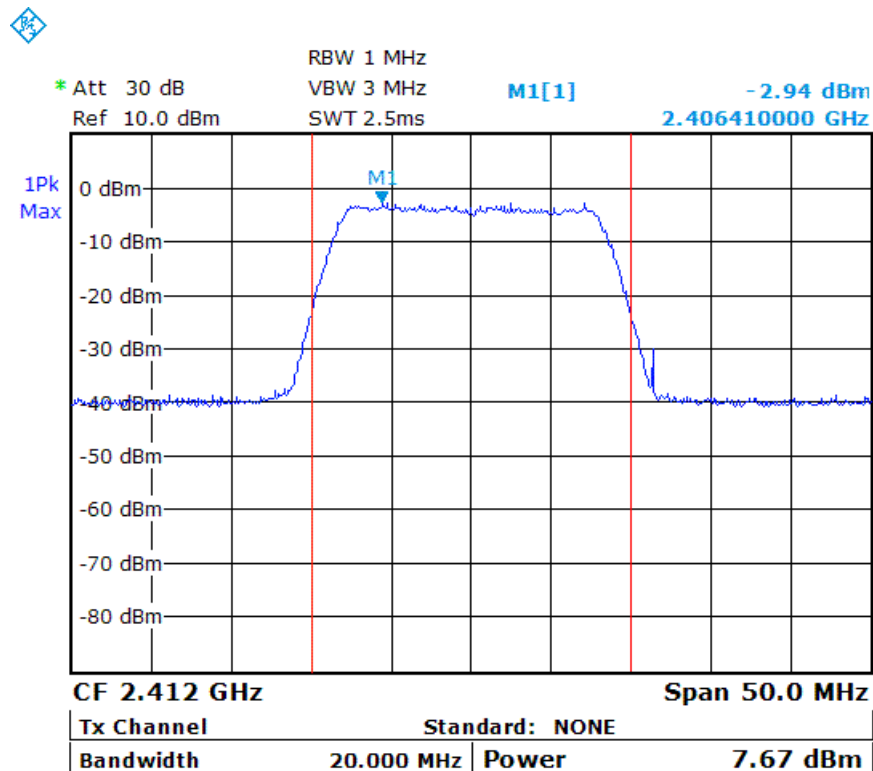
TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Tesr Mode:	802.11g
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

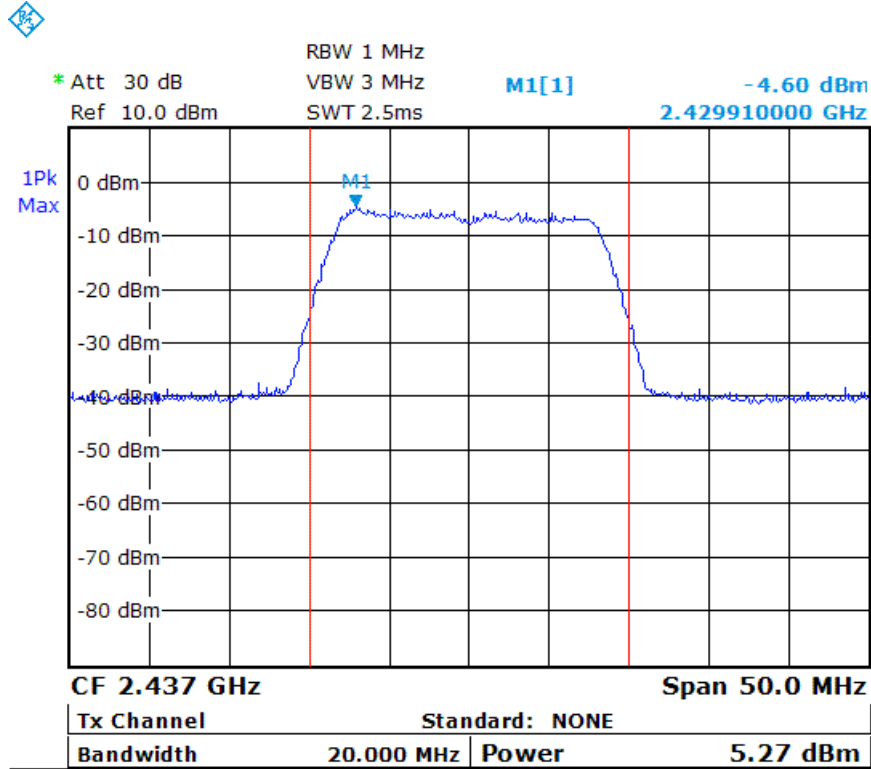
Channel Number	Channel Frequency (MHz)	Peak Power Output		Limit (dBm)
		(dBm)	(mW)	
CH01	2412	-2.94	0.508	30
CH06	2437	-4.60	0.347	30
CH11	2462	-6.60	0.219	30

CH01 :

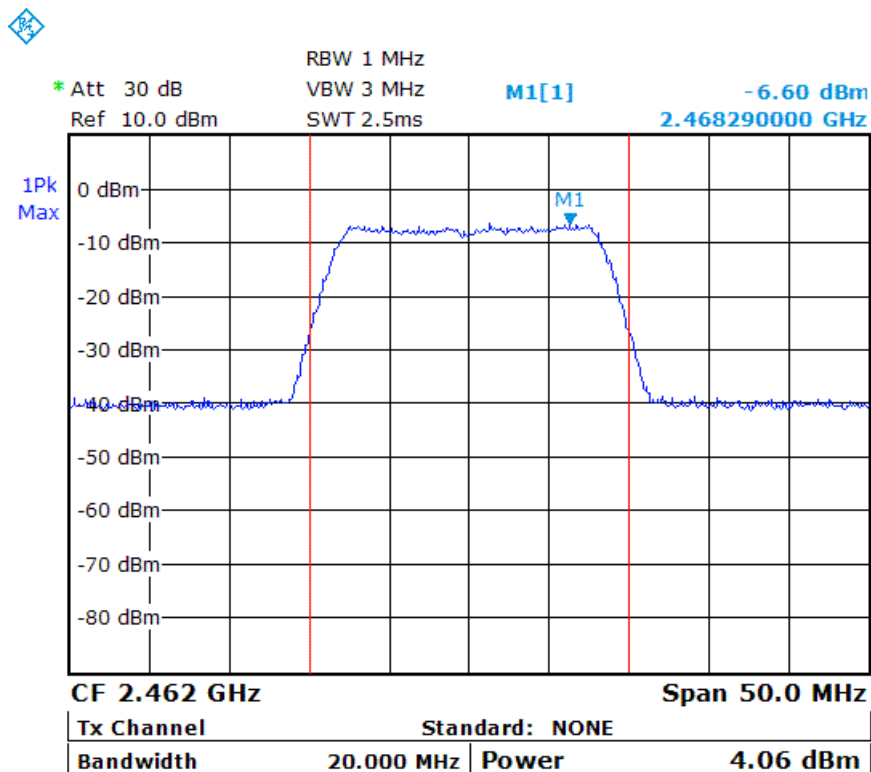




CH06 :



CH11 :





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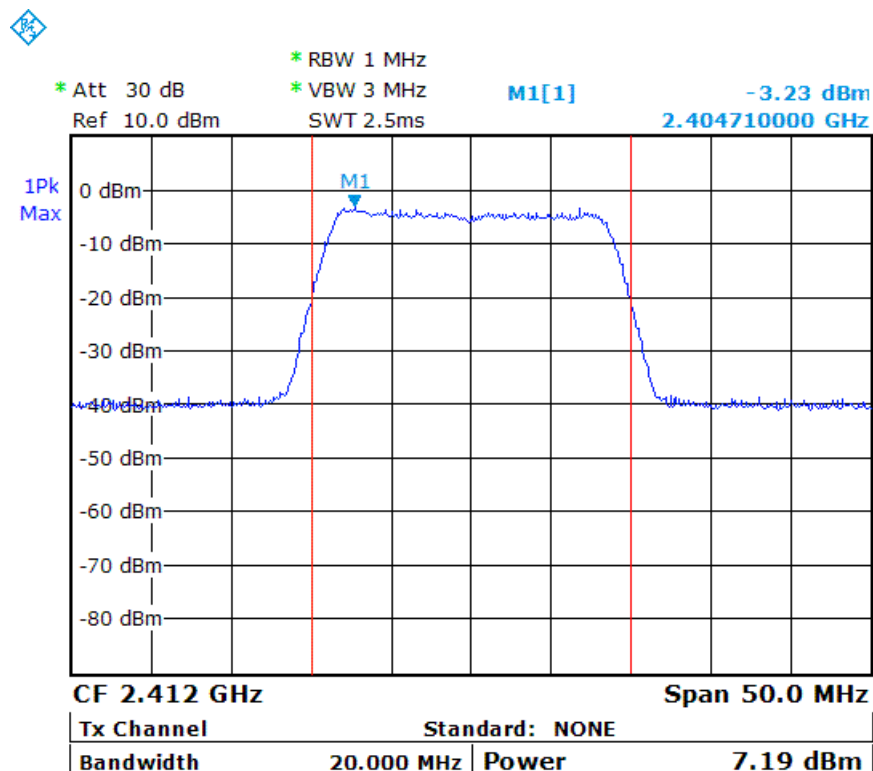
TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
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Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Tesr Mode:	802.11n – HT20
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

Channel Number	Channel Frequency (MHz)	Peak Power Output		Limit (dBm)
		(dBm)	(mW)	
CH01	2412	-3.23	0.475	30
CH06	2437	-5.40	0.288	30
CH11	2462	-6.75	0.211	30

CH01 :



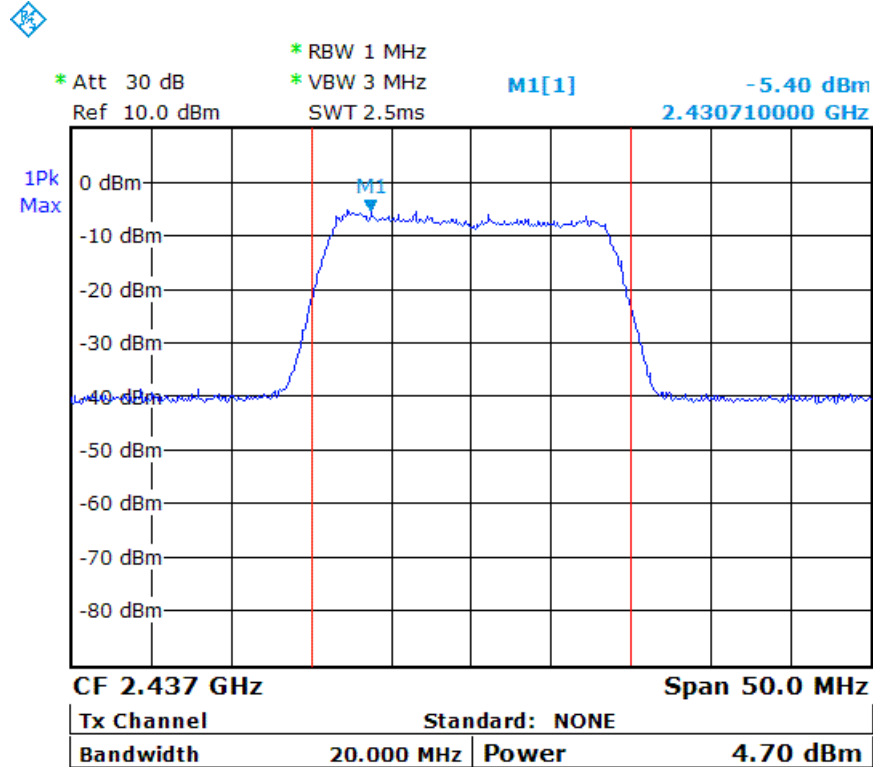


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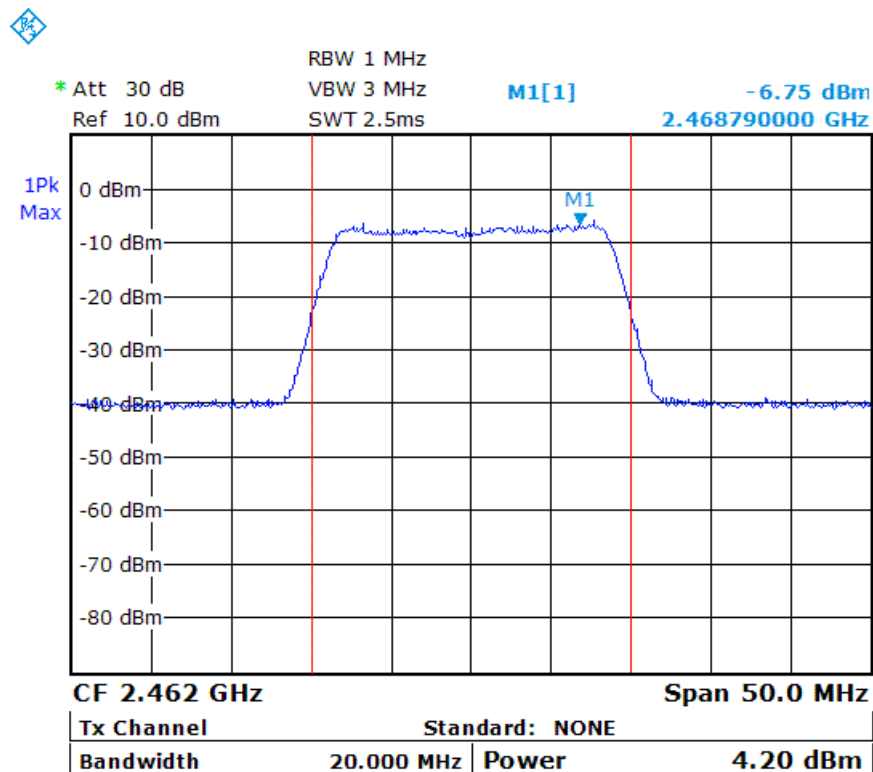
TEST REPORT

Reference No.: A13011801
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CH06 :



CH11 :





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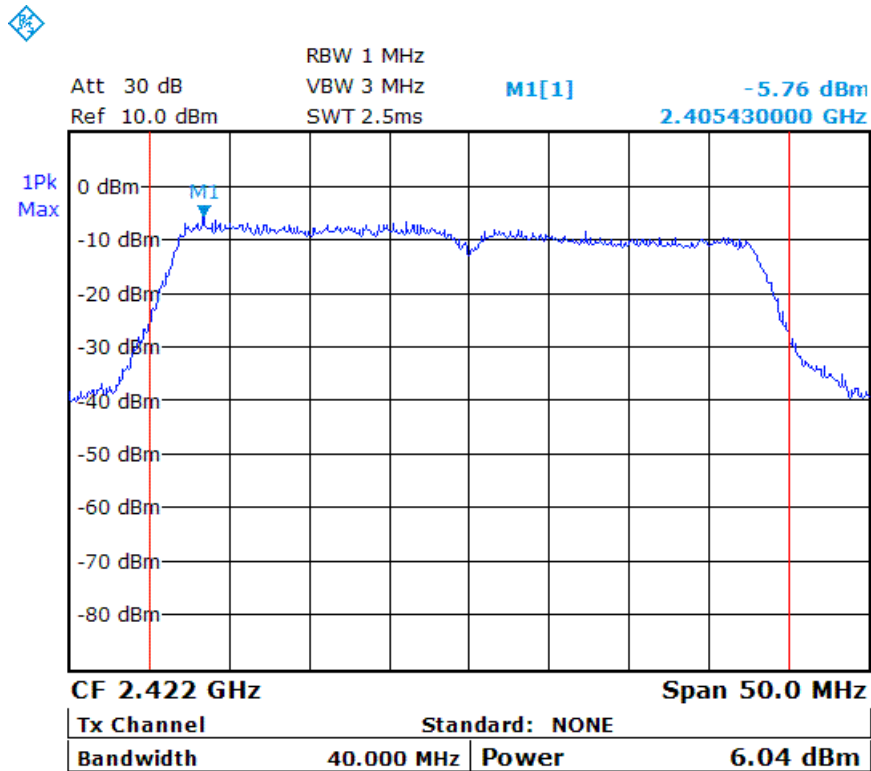
TEST REPORT

Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Test Mode:	802.11n – HT40
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

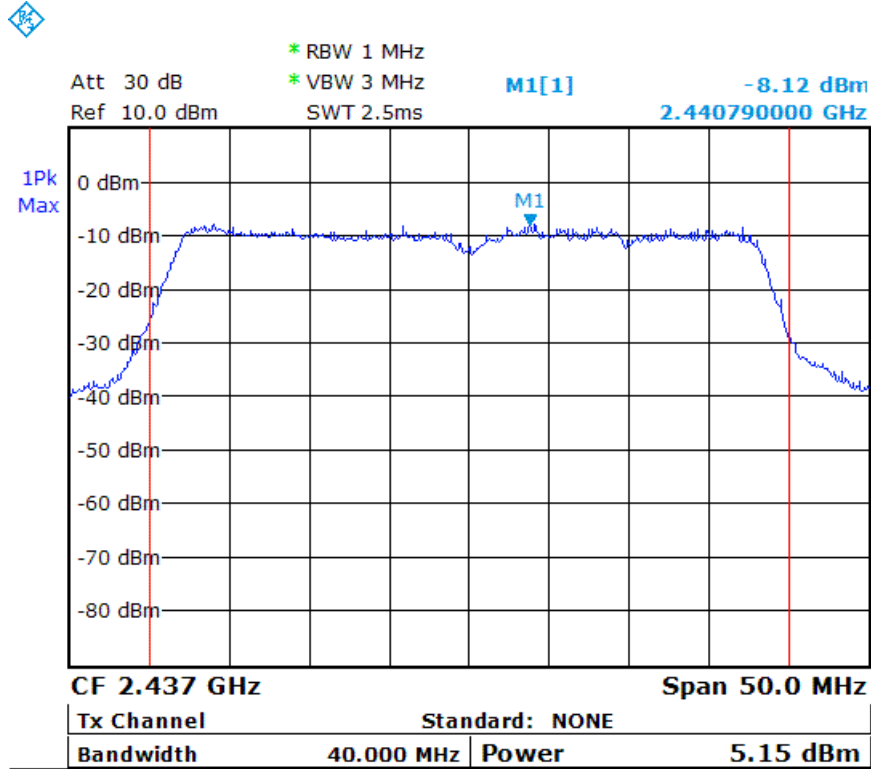
Channel Number	Channel Frequency (MHz)	Peak Power Output		Limit (dBm)
		(dBm)	(mW)	
CH05	2422	-5.76	0.265	30
CH08	2437	-8.12	0.154	30
CH11	2452	-9.88	0.103	30

CH05 :

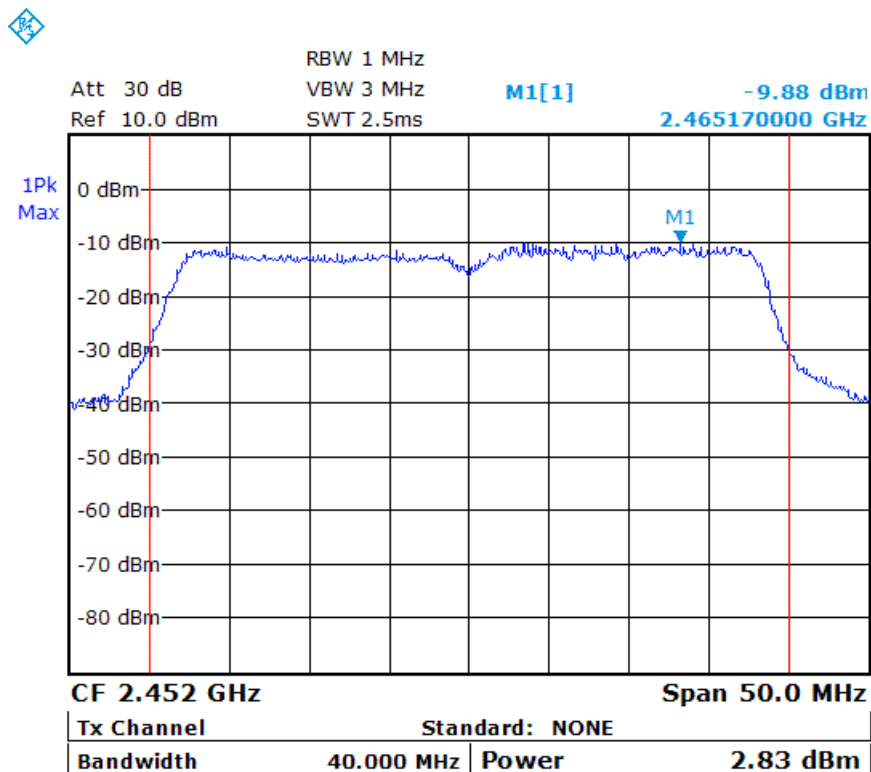




CH08 :



CH11 :





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TEST REPORT

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4.5 BAND EDGE TEST

4.5.1 LIMIT

FCC Part15, Subpart C Section 15.247. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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)).

OPERATING FREQUENCY RANGE (MHz)	SPURIOUS EMISSION FREQUENCY (MHz)	LIMIT	
		Peak power ration to emission(dBc)	Emission level(dBuV/m)
902 - 928	<902	>20	NA
	>928	>20	NA
	960-1240	NA	54
2400 - 2483.5	<2400	>20	NA
	>2483.5-2500	NA	54
5725 - 5850	<5350-5460	NA	54
	<5725	>20	NA
	>5850	>20	NA



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4.5.2 TEST EQUIPMENT

The following test equipment was used during the test:

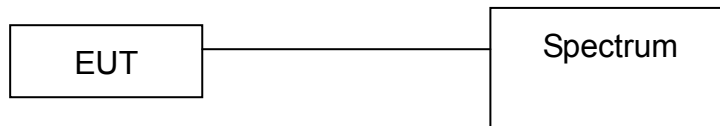
EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM ANALYZER	9 kHz ~ 40 GHz	ROHDE & SCHWARZ	FSP40 / 100093	DEC. 12, 2013 ETC
EMI TEST RECEIVER	9 kHz ~ 6 GHz	ROHDE & SCHWARZ	ESL6/ 100176	APR. 04, 2013 ETC
HORN ANTENNA	1 GHz ~ 18 GHz	EMCO	3115/ 9602-4681	DEC. 21, 2013 ETC
PRE-AMPLIFIER	1 GHz ~ 26.5 GHz	AGILENT	8449B/ 3008A01995	DEC. 18, 2013 ETC
OPEN AREA TEST SITE	3 – 10 M MEASUREMENT	SRT	A02 / SRT002	APR. 12, 2013 SRT
ANECHOIC CHAMBER	3 M MEASUREMENT	SRT	A01 / SRT001	MAY. 17, 2013 SRT
RF CABLE	UP TO 18 GHz 1.5 m	JYEBAO	A30A30-L 142 / EQF-0035(001)	DEC. 19, 2013 ETC
RF CABLE	UP TO 18 GHz 3.5 m	JYEBAO	A30A30-L 142 / EQF-0036(002)	DEC. 19, 2013 ETC
K-TYPE CABLE	UP TO 40 GHz SK-252/1M	HUBER+SUHNER	SF 102-40/2*11/ 23934/2	OCT. 24, 2013 ETC
FILTER	2 LINE, 30 A	FIL.COIL	FC-943/ 869	NCR

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



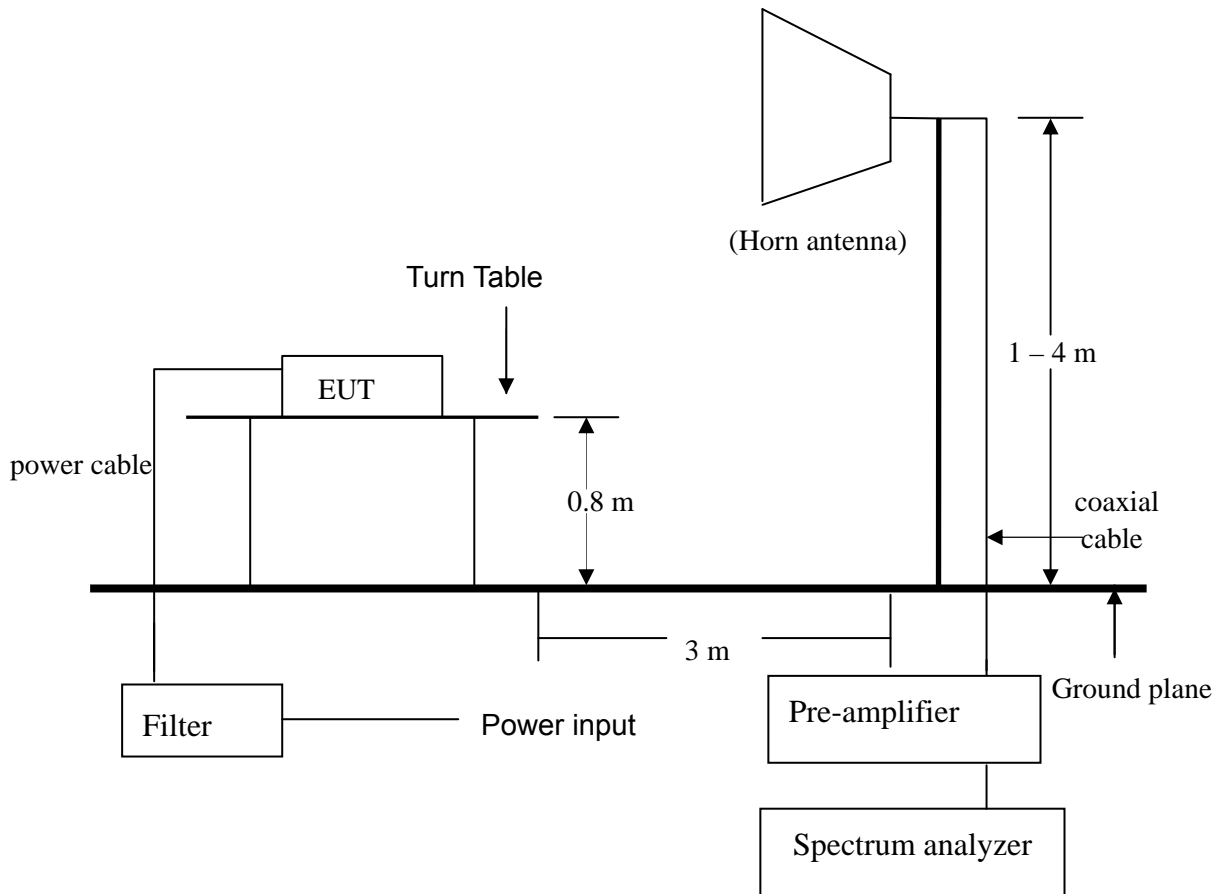
4.5.3 TEST SET-UP

FOR RF CONDUCTED TEST (dBc)



The EUT was connected to a spectrum through a 50Ω RF cable.

FOR RADIATED EMISSION TEST



NOTE:

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
2. For the actual test configuration, please refer to the photos of testing.



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4.5.4 TEST PROCEDURE

1. The EUT was operating in continuous transmission mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.
2. The EUT was tested according to the requirement of ANSI C63.4 and CISPR 22. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz. All readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak and average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

4.5.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



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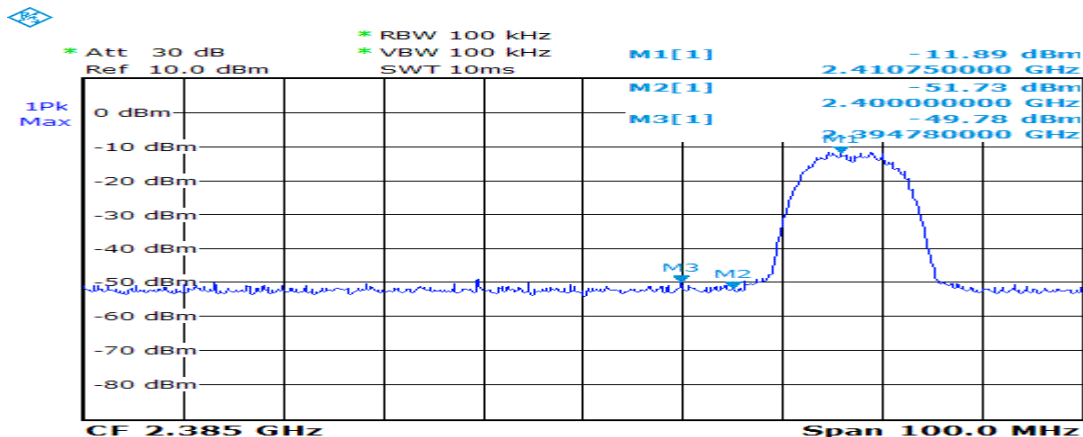
4.5.6 TEST RESULT

Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK. or AV.	Test Mode:	802.11b
Tested By:	Richard	Modulation Type:	QPSK
Test Result:	PASS	Tested Date:	Jan. 28, 2013

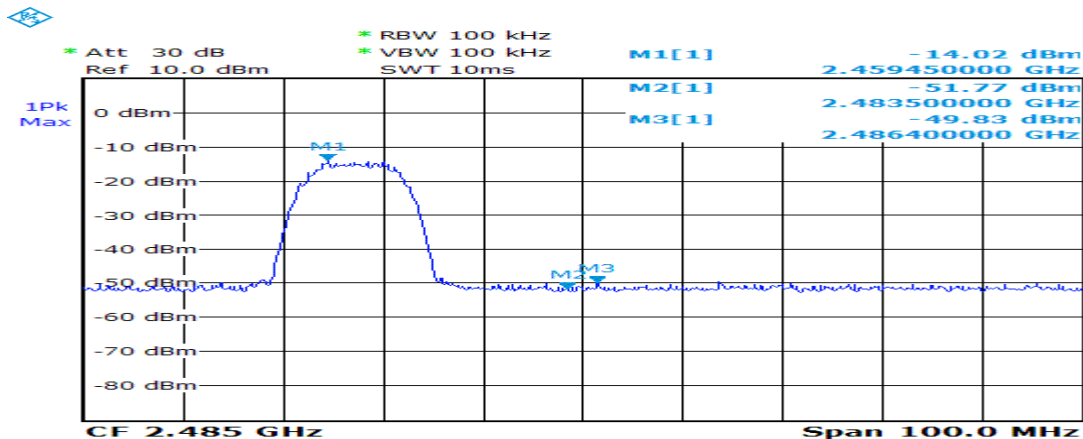
1. Conducted test

Frequency (MHz)	Peak Power Output (dBm)	Emission Read Value (dBm)	Result Of Band Edge (dBc)	Band Edge Limit (dBc)
< 2400	-11.89	-49.78	37.89	> 20 dBc
> 2483.5	-14.02	-49.83	35.81	> 20 dBc

Below 2400 MHz (CH01) :



Above 2483.5 MHz (CH11) :

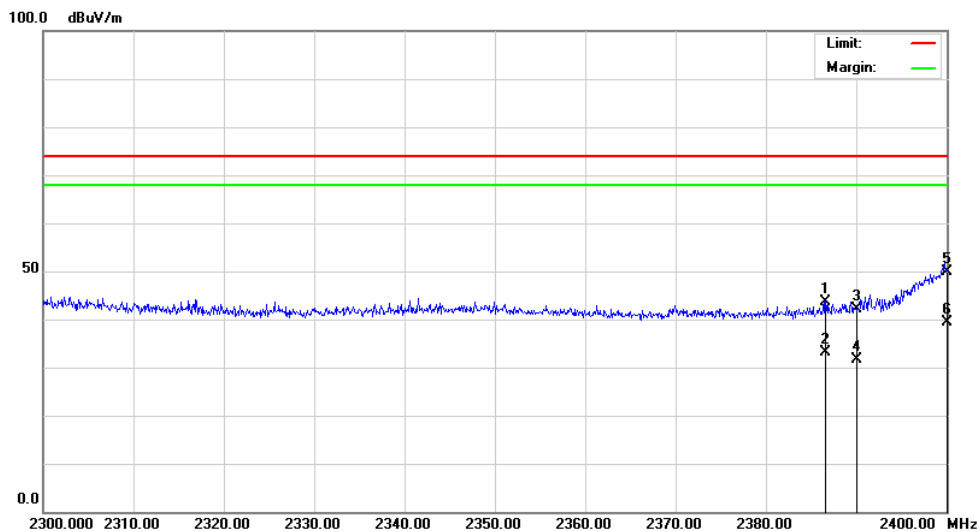




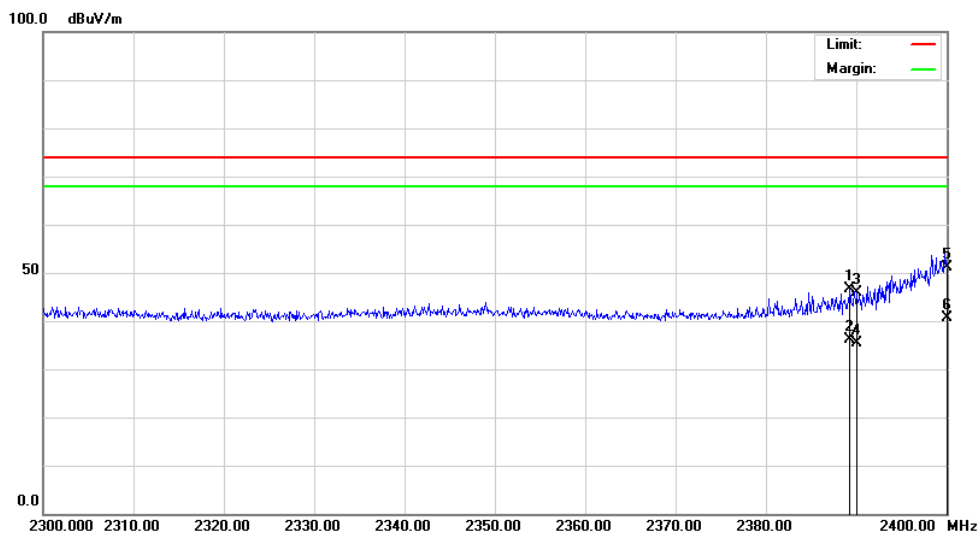
2. Radiated emission test
 Below 2400 MHz (CH01) :

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2412.00	-31.14	28.35	H	98.62	86.95	95.84	84.17	114.00	94.00	-18.16	-9.83
2412.00	-31.14	28.35	V	96.83	85.38	94.05	82.60	114.00	94.00	-19.95	-11.40
2400.00	-31.15	28.32	H	50.82	40.19	47.99	37.36	74.00	54.00	-26.01	-16.64
2400.00	-31.15	28.32	V	51.94	41.37	49.11	38.54	74.00	54.00	-24.89	-15.46
2386.61	-31.17	28.28	H	44.56	34.05	41.67	31.16	74.00	54.00	-32.33	-22.84
2389.35	-31.16	28.29	V	47.41	36.87	44.54	34.00	74.00	54.00	-29.46	-20.00

Horizontal:



Vertical:



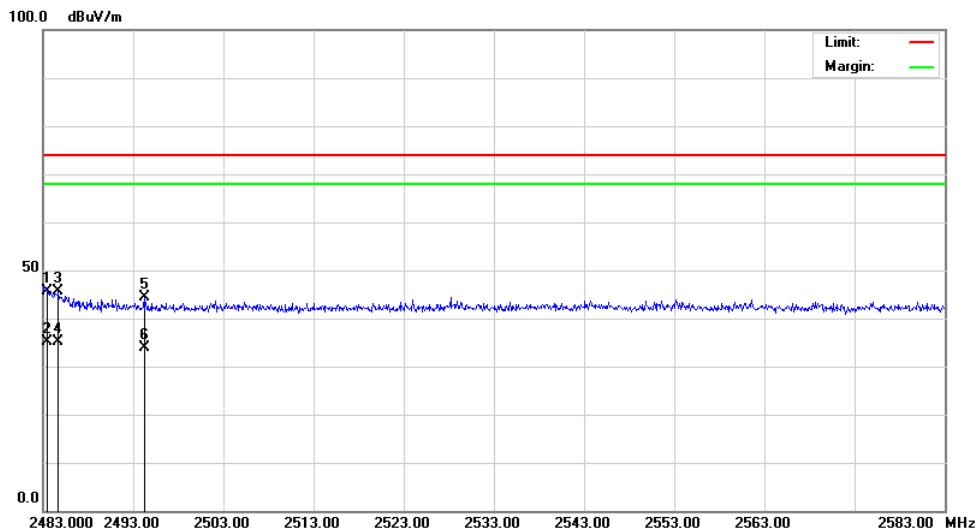


TEST REPORT

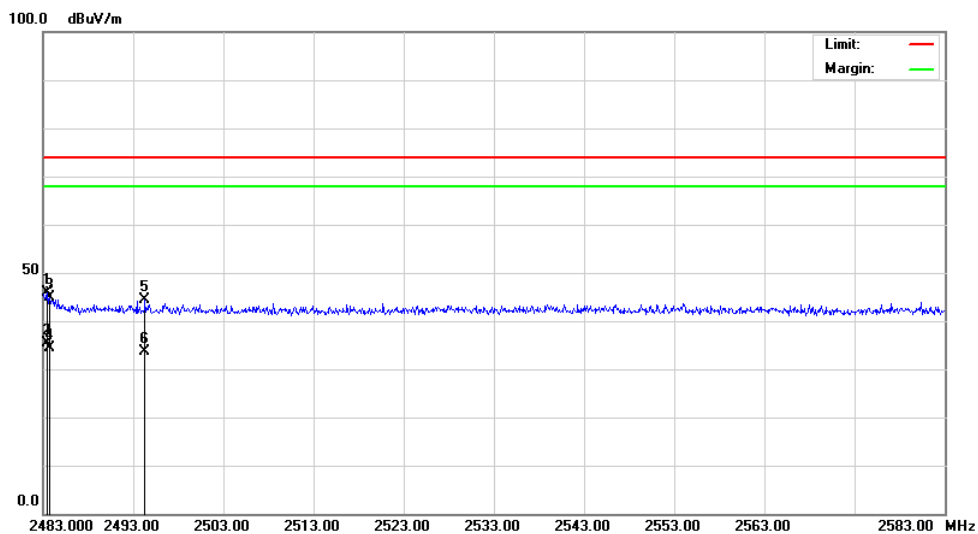
Above 2483.5 MHz (CH11) :

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2462.00	-31.08	28.49	H	92.57	81.84	89.99	79.26	114.00	94.00	-24.01	-14.74
2462.00	-31.08	28.49	V	93.87	82.39	91.29	79.81	114.00	94.00	-22.71	-14.19
2483.50	-31.05	28.55	H	46.13	35.61	43.63	33.11	74.00	54.00	-30.37	-20.89
2483.50	-31.05	28.55	V	46.35	35.74	43.85	33.24	74.00	54.00	-30.15	-20.76
2484.02	-31.05	28.56	H	46.01	35.56	43.52	33.07	74.00	54.00	-30.48	-20.93
2484.13	-31.05	28.56	V	45.28	34.91	42.79	32.42	74.00	54.00	-31.21	-21.58

Horizontal:



Vertical:





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TEST REPORT

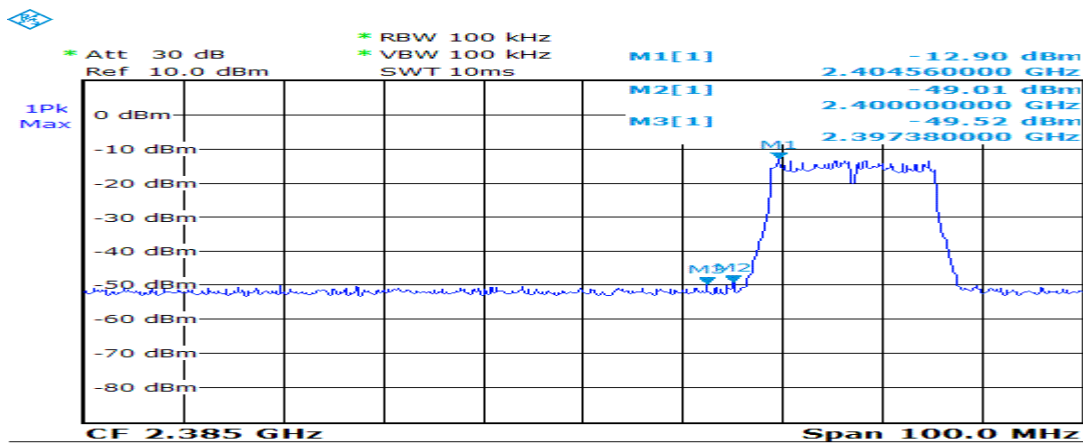
Reference No.: A13011801
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Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK. or AV.	Test Mode:	802.11g
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

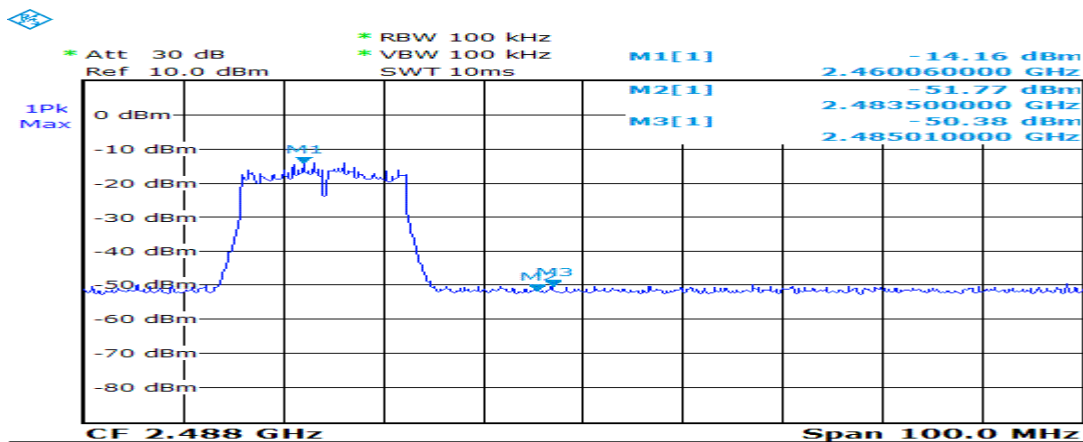
1. Conducted test

Frequency (MHz)	Peak Power Output (dBm)	Emission Read Value (dBm)	Result Of Band Edge (dBc)	Band Edge Limit (dBc)
< 2400	-12.90	-49.52	36.62	> 20 dBc
> 2483.5	-14.16	-50.38	36.22	> 20 dBc

Below 2400 MHz (CH01) :



Above 2483.5 MHz (CH11) :



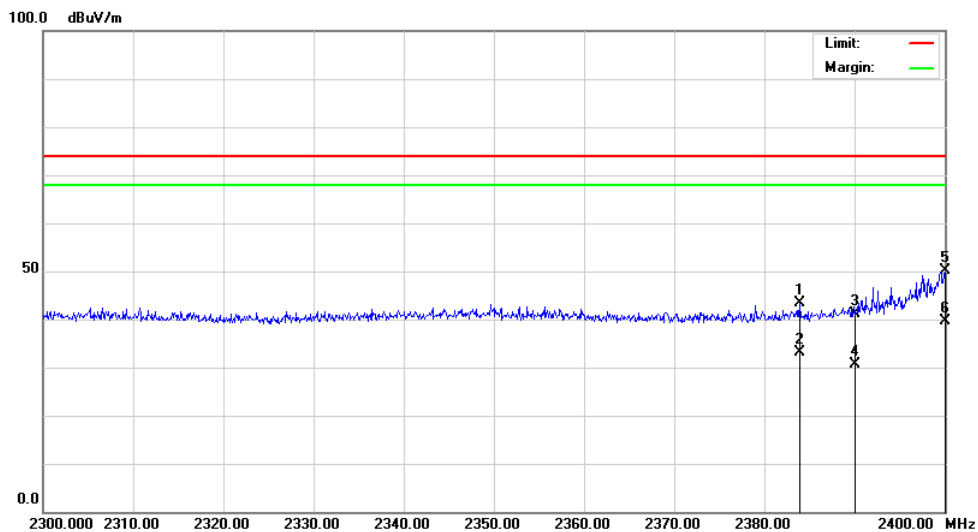


TEST REPORT

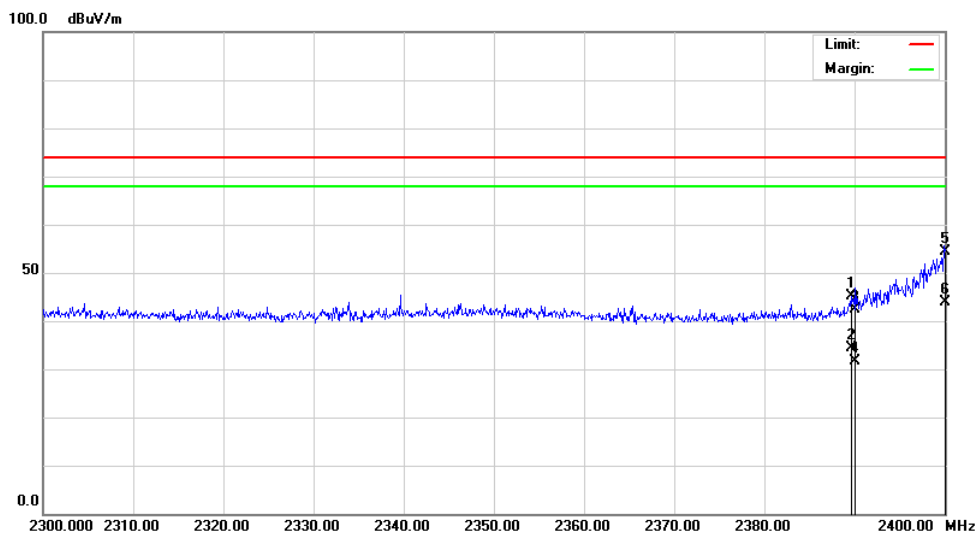
2. Radiated emission test
 Below 2400 MHz (CH01) :

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2412.00	-31.14	28.35	H	97.85	86.42	95.07	83.64	114.00	94.00	-18.93	-10.36
2412.00	-31.14	28.35	V	94.48	83.01	91.70	80.23	114.00	94.00	-22.30	-13.77
2400.00	-31.15	28.32	H	51.06	40.59	48.23	37.76	74.00	54.00	-25.77	-16.24
2400.00	-31.15	28.32	V	55.22	44.63	52.39	41.80	74.00	54.00	-21.61	-12.20
2383.96	-31.17	28.27	H	44.27	33.93	41.37	31.03	74.00	54.00	-32.63	-22.97
2389.65	-31.16	28.29	V	45.94	35.38	43.07	32.51	74.00	54.00	-30.93	-21.49

Horizontal:



Vertical:





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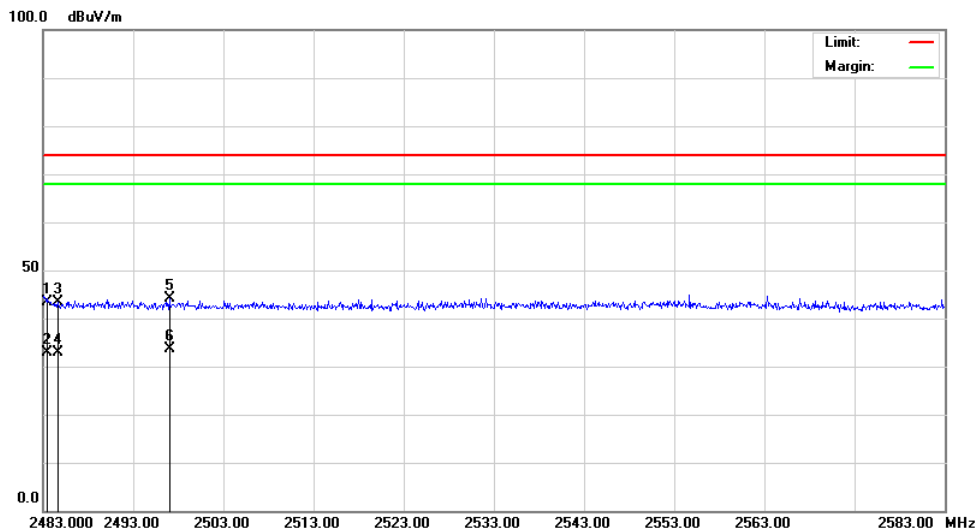
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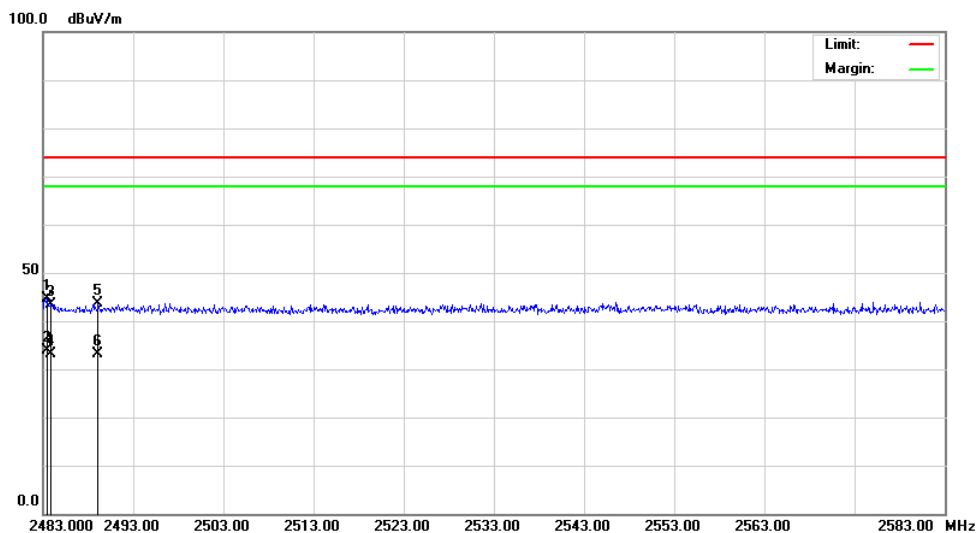
Above 2483.5 MHz (CH11) :

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2462.00	-31.08	28.49	H	96.62	85.03	94.04	82.45	114.00	94.00	-19.96	-11.55
2462.00	-31.08	28.49	V	93.57	81.95	90.99	79.37	114.00	94.00	-23.01	-14.63
2483.50	-31.05	28.55	H	43.99	33.42	41.49	30.92	74.00	54.00	-32.51	-23.08
2483.50	-31.05	28.55	V	45.06	34.37	42.56	31.87	74.00	54.00	-31.44	-22.13
2484.06	-31.05	28.56	H	43.92	33.38	41.43	30.89	74.00	54.00	-32.57	-23.11
2483.83	-31.05	28.55	V	43.85	33.51	41.35	31.01	74.00	54.00	-32.65	-22.99

Horizontal:



Vertical:





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TEST REPORT

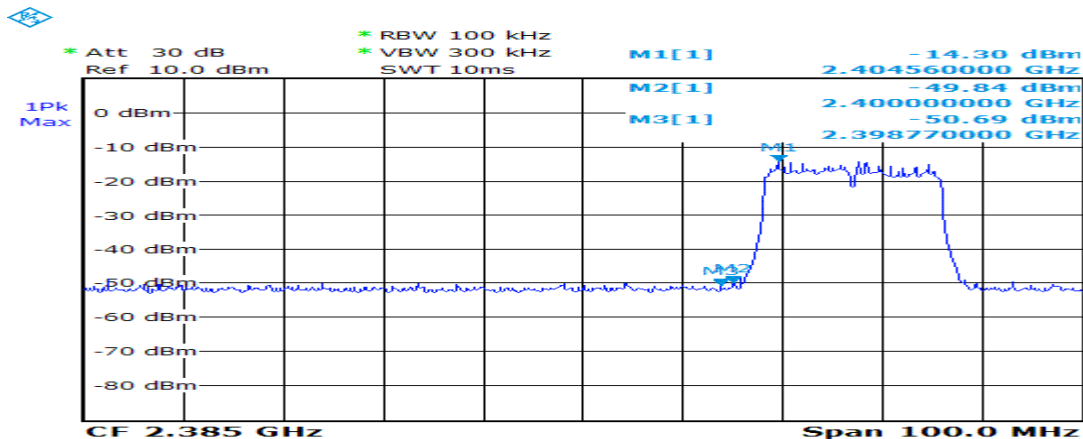
Reference No.: A13011801
 Report No.: FCCA13011801
 FCC ID : ZME-MLW221
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 Date: Feb. 06, 2013

Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK. or AV.	Test Mode:	802.11n – HT20
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

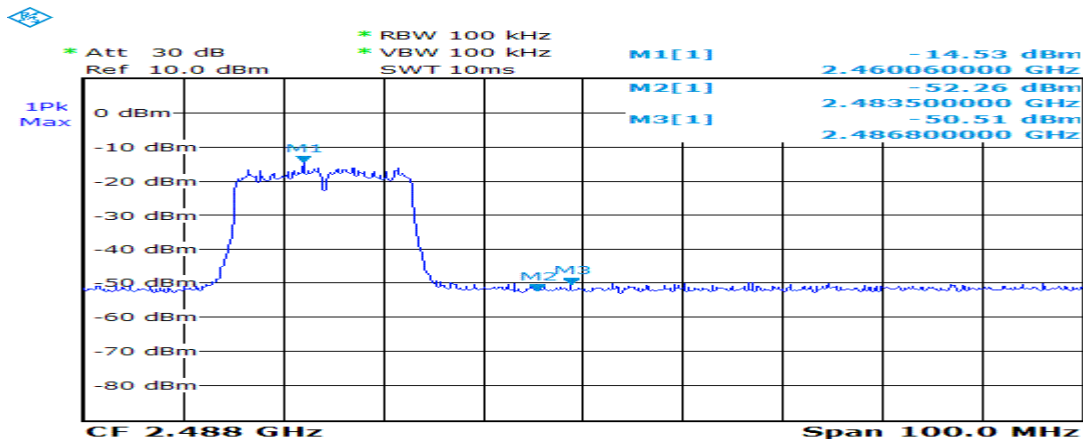
1. Conducted test

Frequency (MHz)	Peak Power Output (dBm)	Emission Read Value (dBm)	Result Of Band Edge (dBc)	Band Edge Limit (dBc)
< 2400	-14.30	-50.69	36.39	> 20 dBc
> 2483.5	-14.53	-50.51	35.98	> 20 dBc

Below 2400 MHz (CH01) :



Above 2483.5 MHz (CH11) :

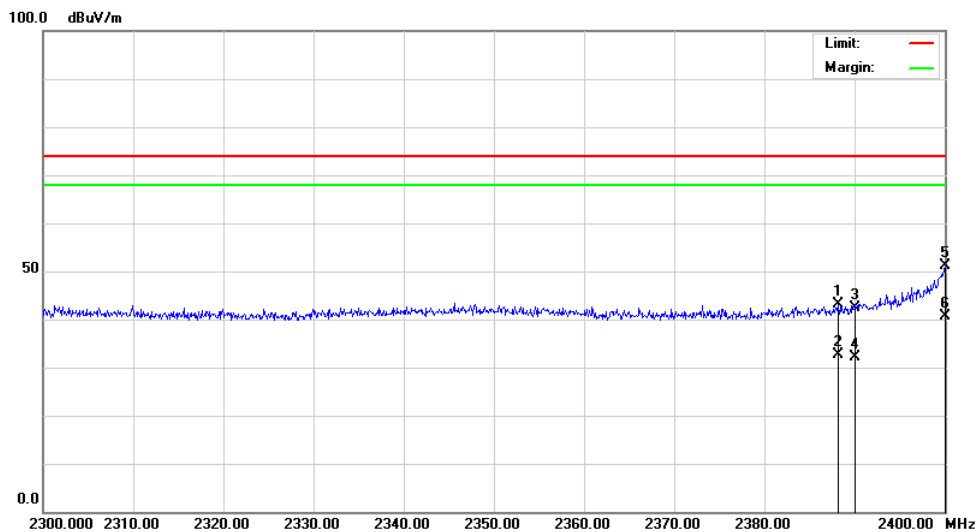




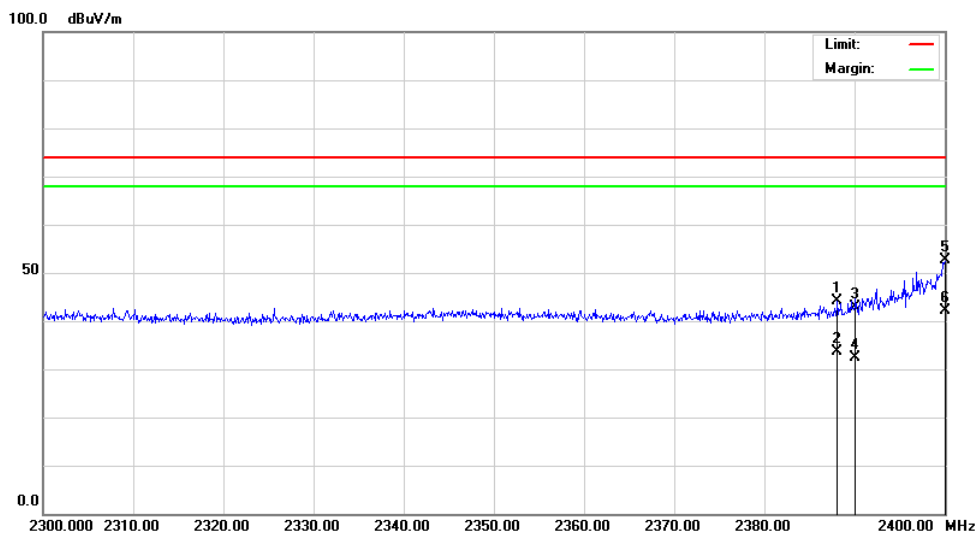
2. Radiated emission test
 Below 2400 MHz (CH01) :

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2412.00	-31.14	28.35	H	94.32	82.67	91.54	79.89	114.00	94.00	-22.46	-14.11
2412.00	-31.14	28.35	V	92.85	81.29	90.07	78.51	114.00	94.00	-23.93	-15.49
2400.00	-31.15	28.32	H	51.95	41.52	49.12	38.69	74.00	54.00	-24.88	-15.31
2400.00	-31.15	28.32	V	53.34	42.86	50.51	40.03	74.00	54.00	-23.49	-13.97
2388.22	-31.16	28.29	H	43.87	33.41	40.99	30.53	74.00	54.00	-33.01	-23.47
2388.18	-31.16	28.29	V	44.98	34.43	42.10	31.55	74.00	54.00	-31.90	-22.45

Horizontal:



Vertical:





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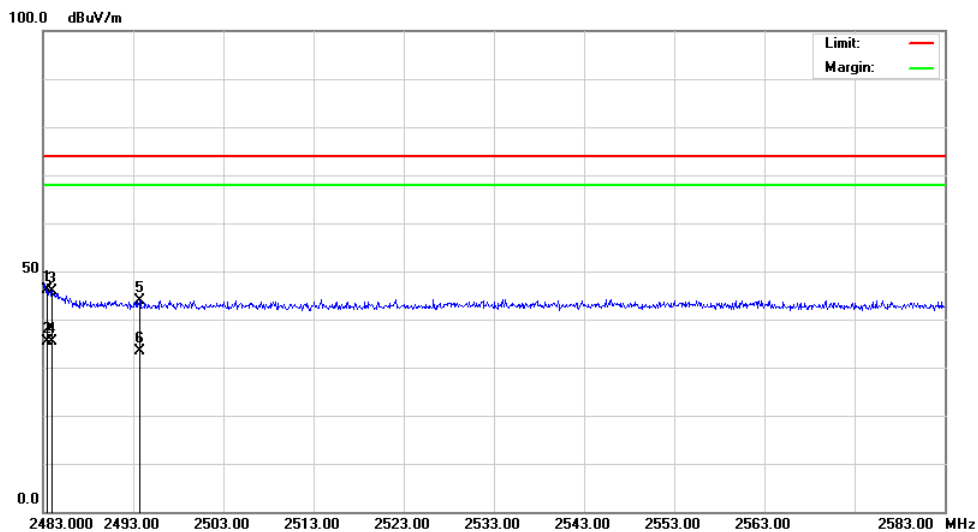
TEST REPORT

Reference No.: A13011801
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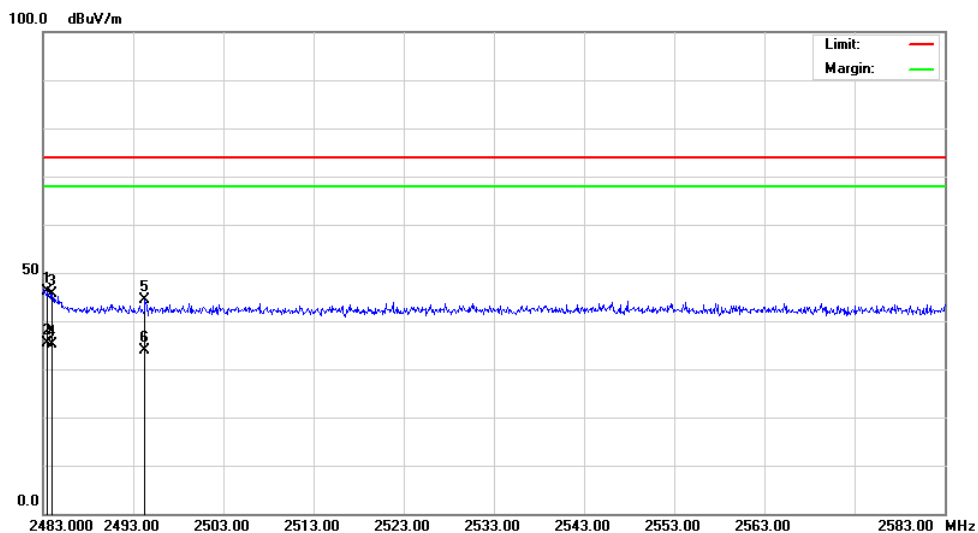
Above 2483.5 MHz (CH11) :

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2462.00	-31.08	28.49	H	94.73	83.16	92.15	80.58	114.00	94.00	-21.85	-13.42
2462.00	-31.08	28.49	V	95.02	83.58	92.44	81.00	114.00	94.00	-21.56	-13.00
2483.50	-31.05	28.55	H	46.59	36.01	44.09	33.51	74.00	54.00	-29.91	-20.49
2483.50	-31.05	28.55	V	46.53	35.94	44.03	33.44	74.00	54.00	-29.97	-20.56
2483.95	-31.05	28.55	H	46.41	35.96	43.91	33.46	74.00	54.00	-30.09	-20.54
2484.07	-31.05	28.56	V	46.18	35.62	43.69	33.13	74.00	54.00	-30.31	-20.87

Horizontal:



Vertical:





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TEST REPORT

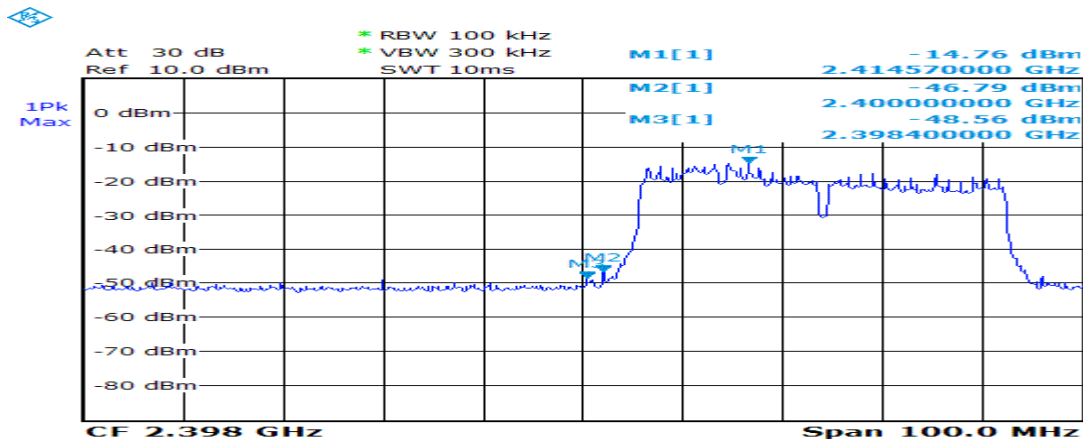
Reference No.: A13011801
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Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK. or AV.	Test Mode:	802.11n – HT40
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

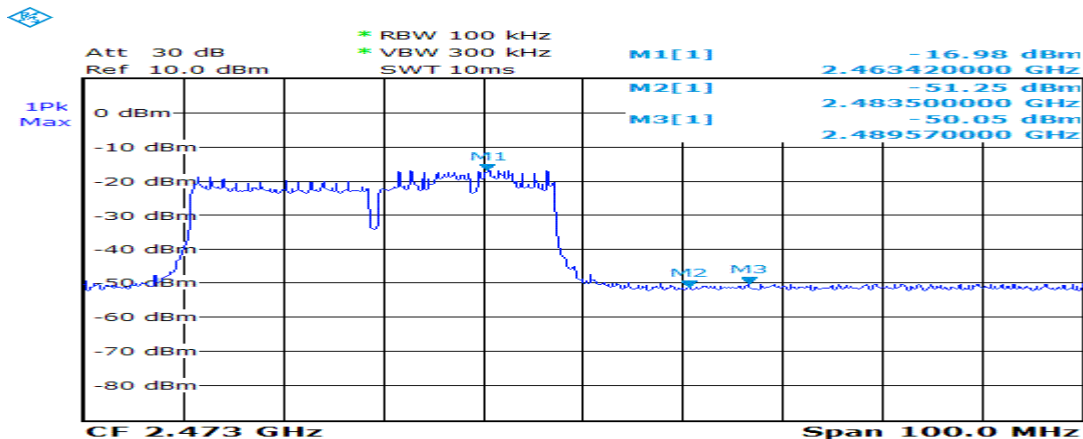
1. Conducted test

Frequency (MHz)	Peak Power Output (dBm)	Emission Read Value (dBm)	Result Of Band Edge (dBc)	Band Edge Limit (dBc)
< 2400	-14.76	-48.56	30.08	> 20 dBc
> 2483.5	-16.98	-50.05	33.07	> 20 dBc

Below 2400 MHz (CH05) :



Above 2483.5 MHz (CH11) :



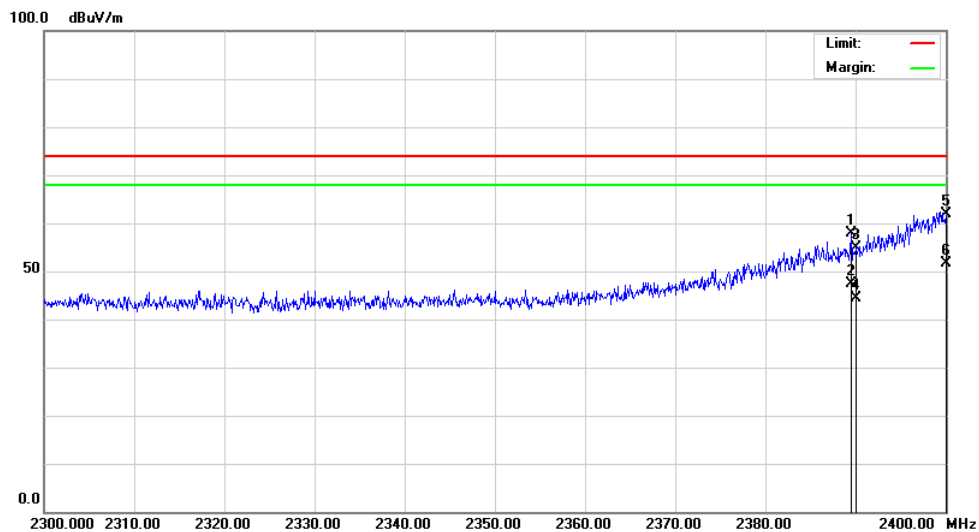


TEST REPORT

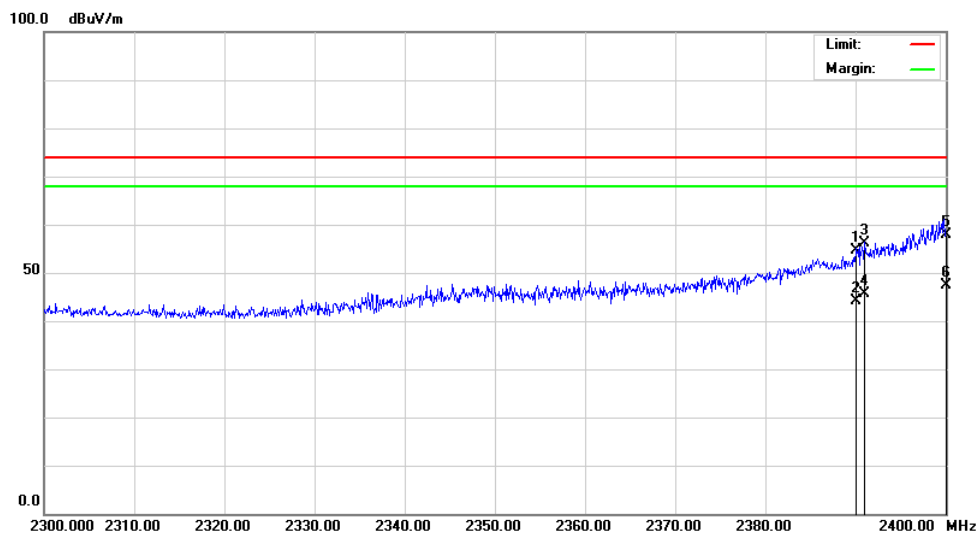
2. Radiated emission test
 Below 2400 MHz (CH05) :

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2422.00	-31.12	28.38	H	95.81	84.16	93.07	81.42	114.00	94.00	-20.93	-12.58
2422.00	-31.12	28.38	V	95.24	83.67	92.50	80.93	114.00	94.00	-21.50	-13.07
2400.00	-31.15	28.32	H	62.85	52.42	60.02	49.59	74.00	54.00	-13.98	-4.41
2400.00	-31.15	28.32	V	58.77	48.24	55.94	45.41	74.00	54.00	-18.06	-8.59
2389.54	-31.16	28.29	H	58.71	48.20	55.84	45.33	74.00	54.00	-18.16	-8.67
2389.21	-31.16	28.29	V	55.51	44.93	52.64	42.06	74.00	54.00	-21.36	-11.94

Horizontal:



Vertical:

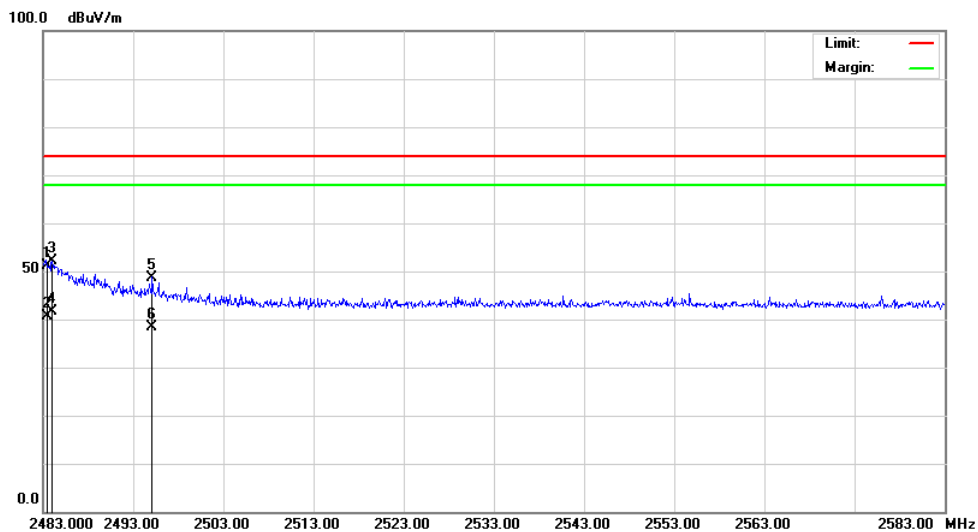




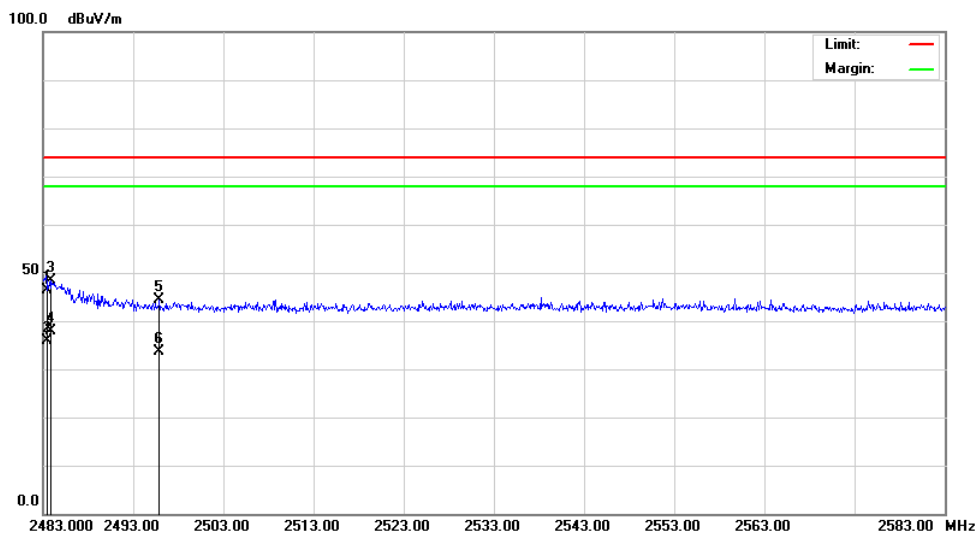
Above 2483.5 MHz (CH11) :

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2452.00	-31.09	28.47	H	95.45	83.82	92.83	81.20	114.00	94.00	-21.17	-12.80
2452.00	-31.09	28.47	V	94.46	82.87	91.84	80.25	114.00	94.00	-22.16	-13.75
2483.50	-31.05	28.55	H	51.56	41.02	49.06	38.52	74.00	54.00	-24.94	-15.48
2483.50	-31.05	28.55	V	46.95	36.48	44.45	33.98	74.00	54.00	-29.55	-20.02
2483.98	-31.05	28.55	H	52.67	42.17	50.17	39.67	74.00	54.00	-23.83	-14.33
2483.83	-31.05	28.55	V	48.84	38.29	46.34	35.79	74.00	54.00	-27.66	-18.21

Horizontal:



Vertical:





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4.6 POWER DENSITY TEST

4.6.1 LIMIT

FCC Part15, Subpart C Section 15.247

FREQUENCY RANGE (MHz)	Limit (dBm / kHz)
902-928	8 dBm / 3 kHz
2400-2483.5	
5725-5850	

4.6.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM ANALYZER	9 kHz ~ 40 GHz	ROHDE & SCHWARZ	FSP40 / 100093	DEC. 12, 2013 ETC
EMI TEST RECEIVER	9 kHz ~ 6 GHz	ROHDE & SCHWARZ	ESL6/ 100176	APR. 04, 2013 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.6.4 TEST PROCEDURE

The EUT was operating in transmitter mode and could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

4.6.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



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TEST REPORT

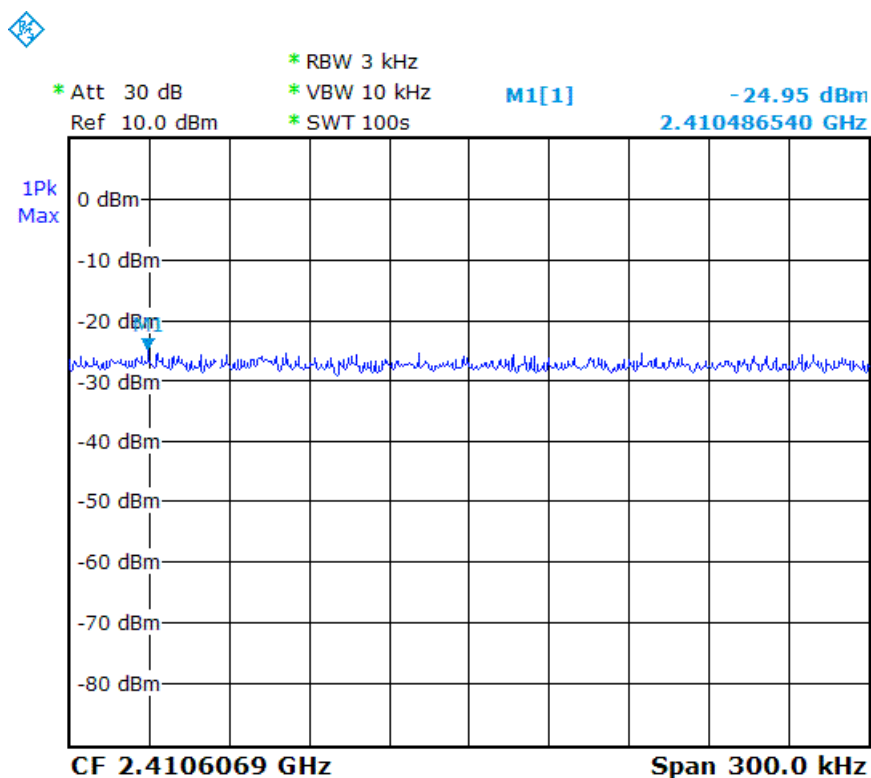
Reference No.: A13011801
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4.6.6 TEST RESULT

Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Test Mode:	802.11b
Tested By:	Richard	Modulation Type:	QPSK
Test Result:	PASS	Tested Date:	Jan. 28, 2013

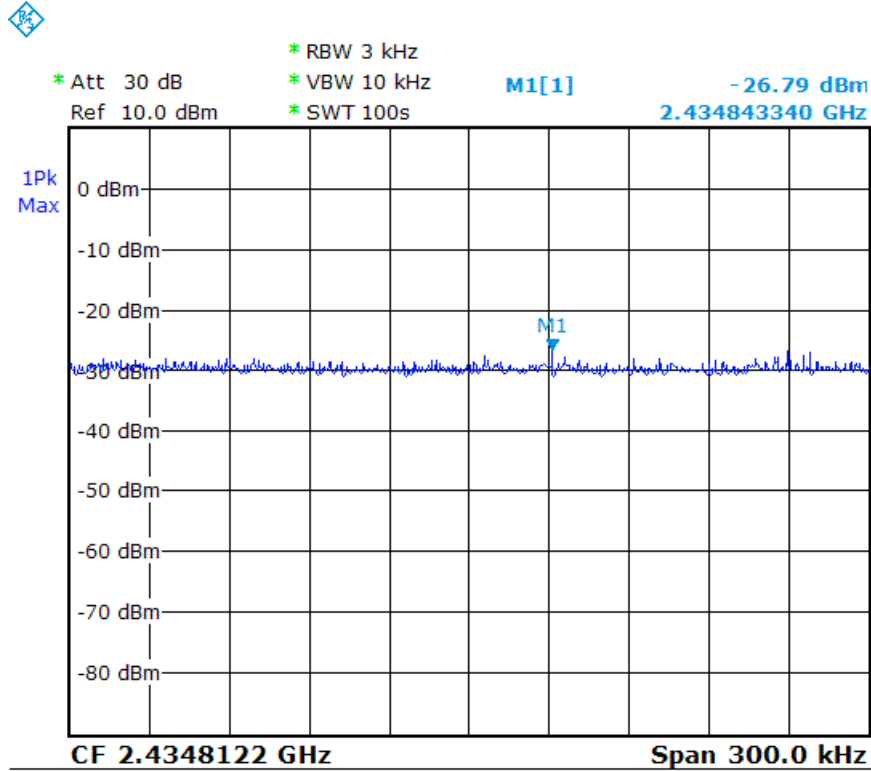
Channel Number	Channel Frequency (MHz)	RF Power Level in 3 KHz BW (dBm/3kHz)	Maximum Limit (dBm/3kHz)
CH01	2412	-24.95	8
CH06	2437	-26.79	8
CH11	2462	-28.53	8

CH01 :

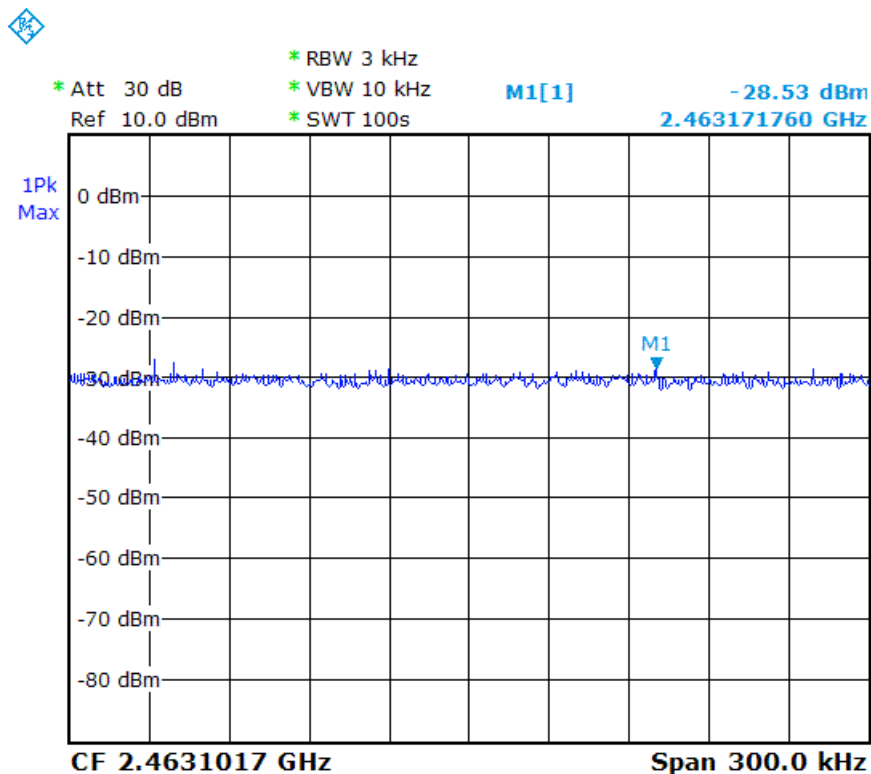




CH06 :



CH11 :





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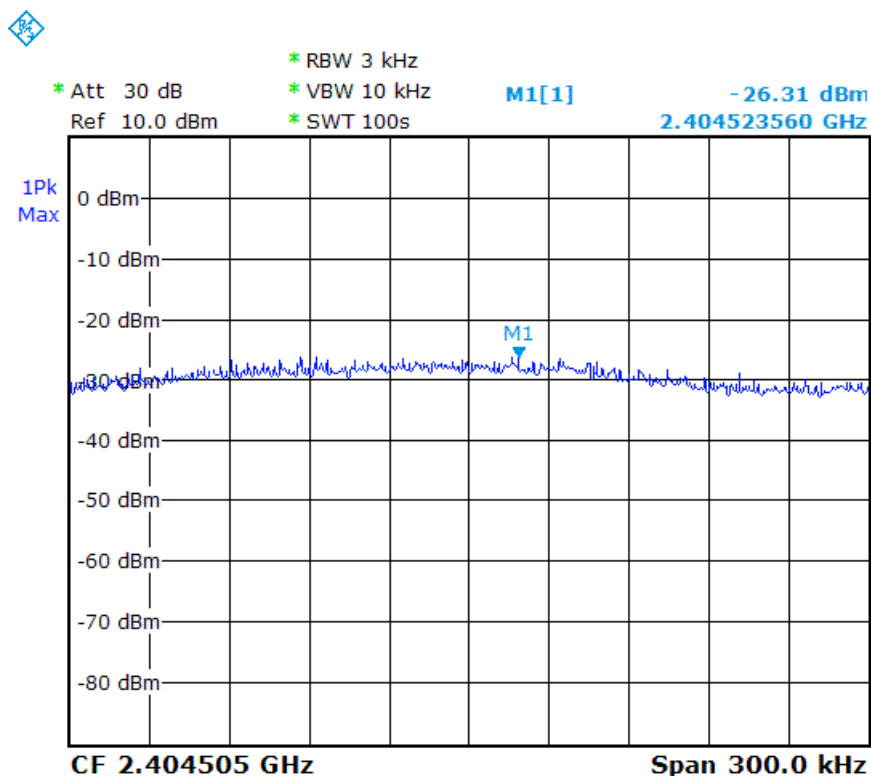
TEST REPORT

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Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Tesr Mode:	802.11g
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

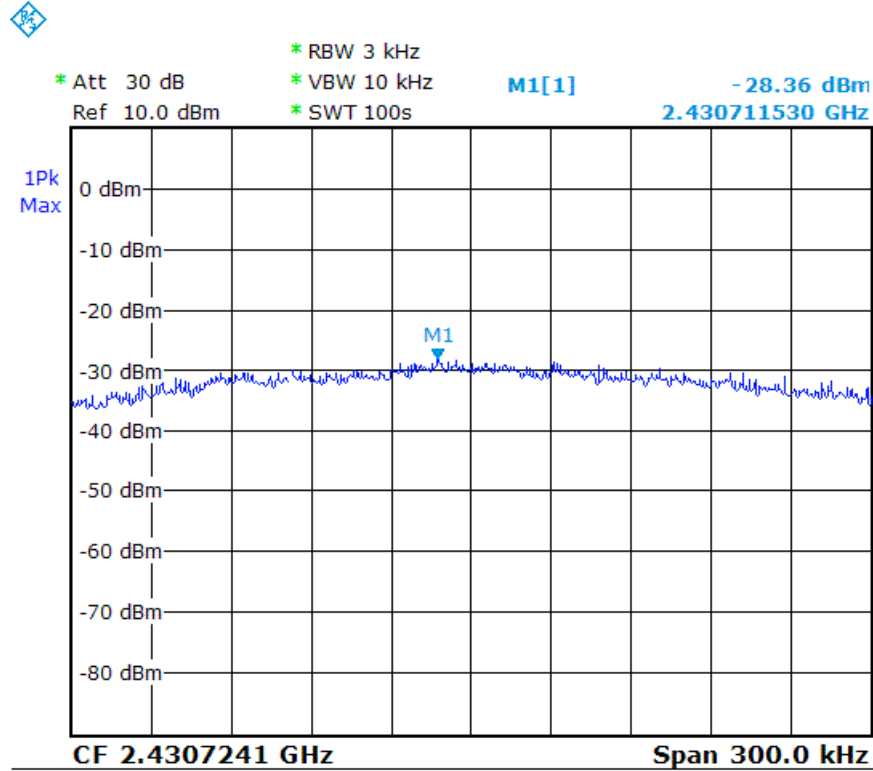
Channel Number	Channel Frequency (MHz)	RF Power Level in 3 KHz BW (dBm/3kHz)	Maximum Limit (dBm/3kHz)
CH01	2412	-26.31	8
CH06	2437	-28.36	8
CH11	2462	-28.29	8

CH01 :

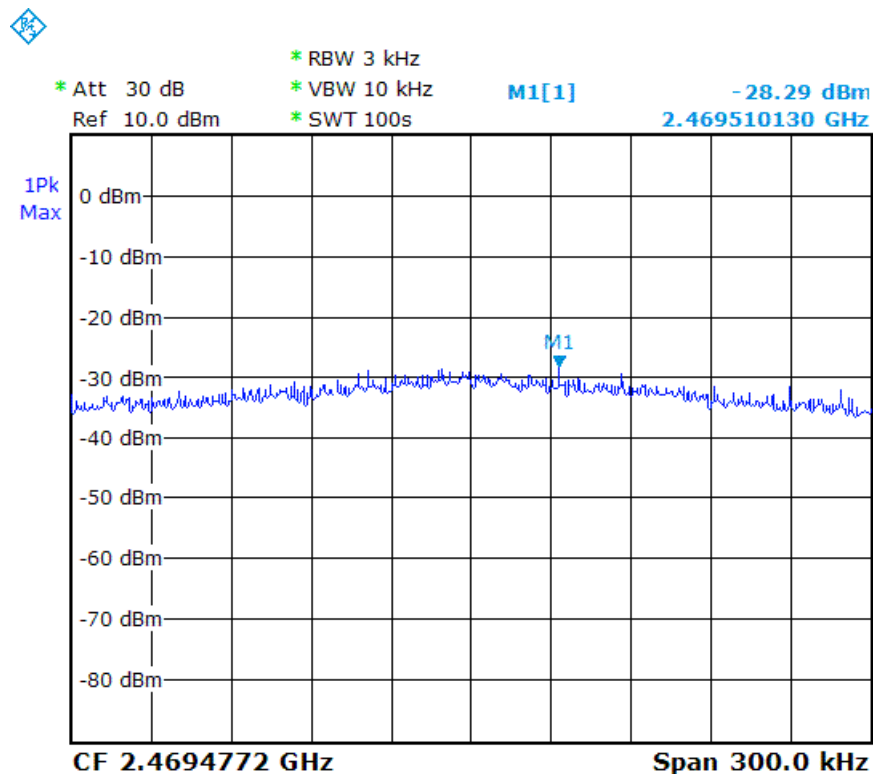




CH06 :



CH11 :





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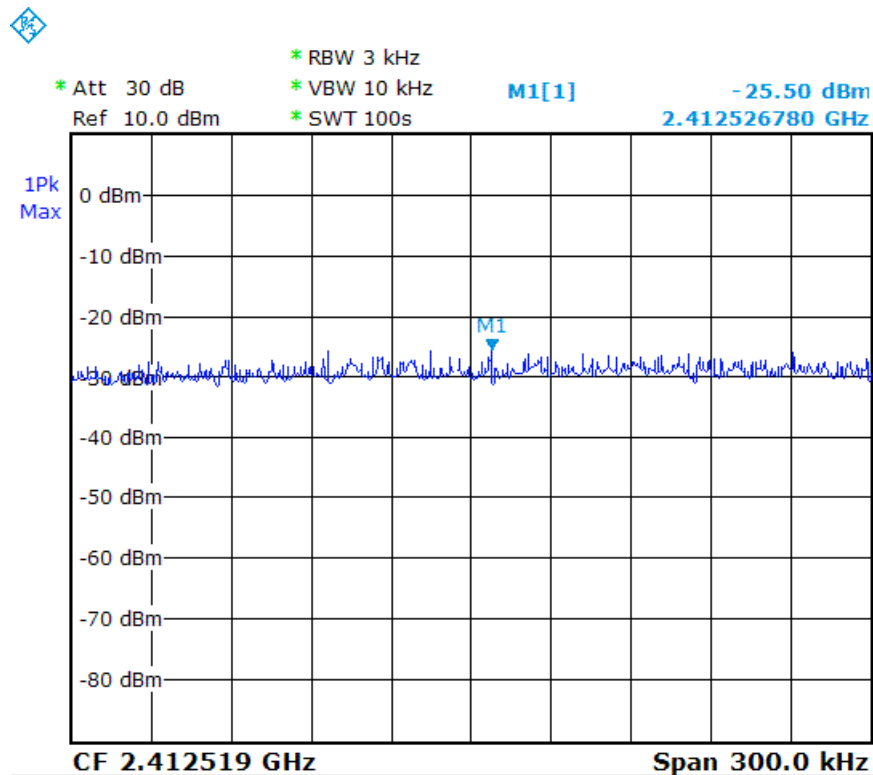
TEST REPORT

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Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Test Mode:	802.11n – HT20
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

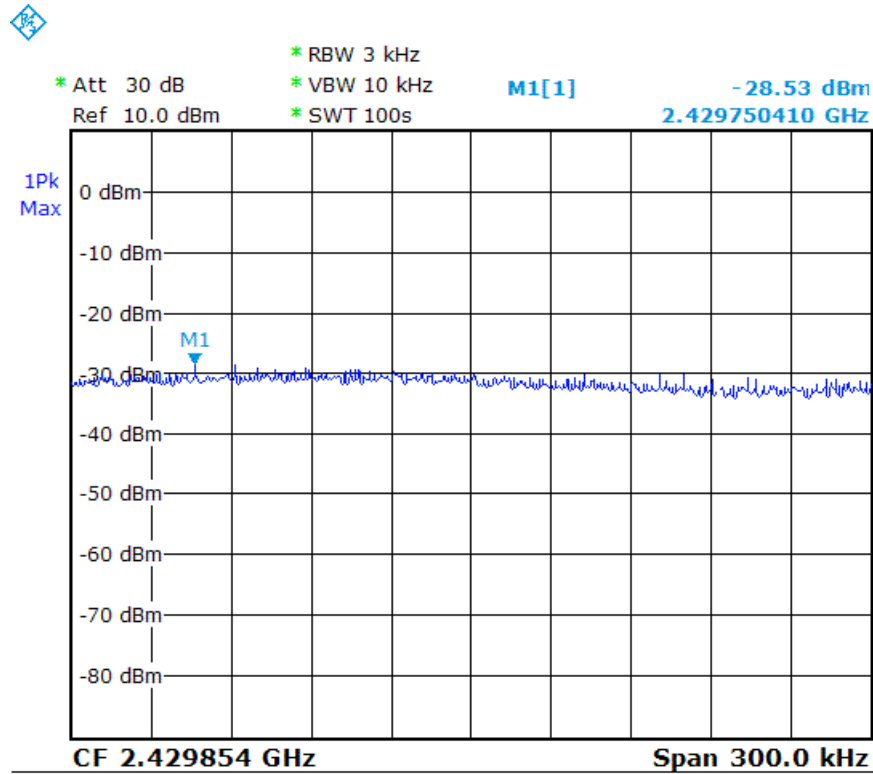
Channel Number	Channel Frequency (MHz)	RF Power Level in 3 KHz BW (dBm/3kHz)	Maximum Limit (dBm/3kHz)
CH01	2412	-25.50	8
CH06	2437	-28.53	8
CH11	2462	-28.58	8

CH01 :

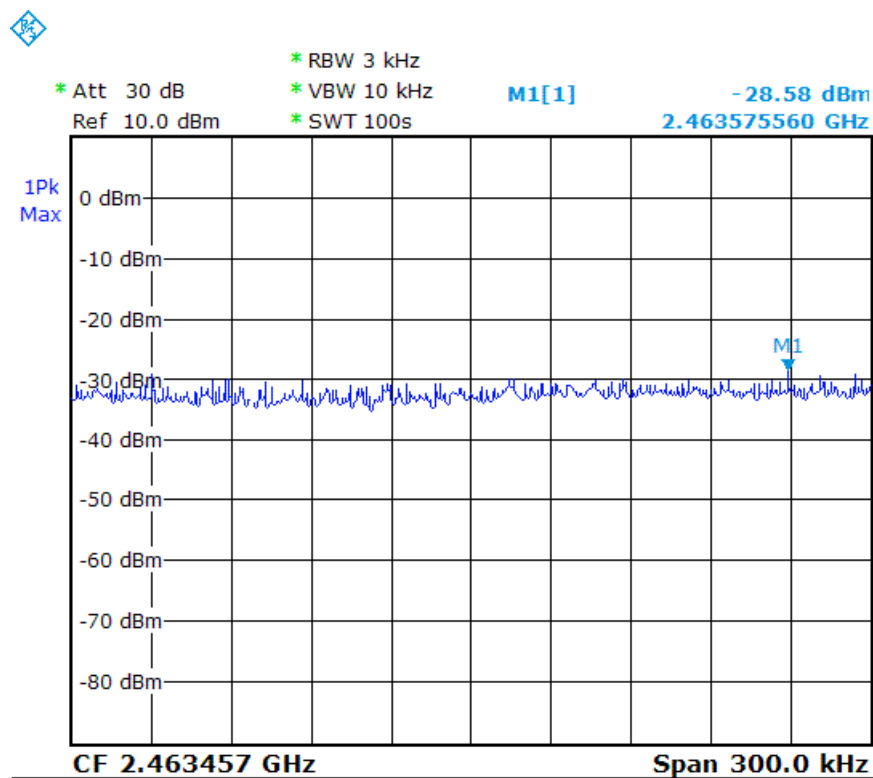




CH06 :



CH11 :





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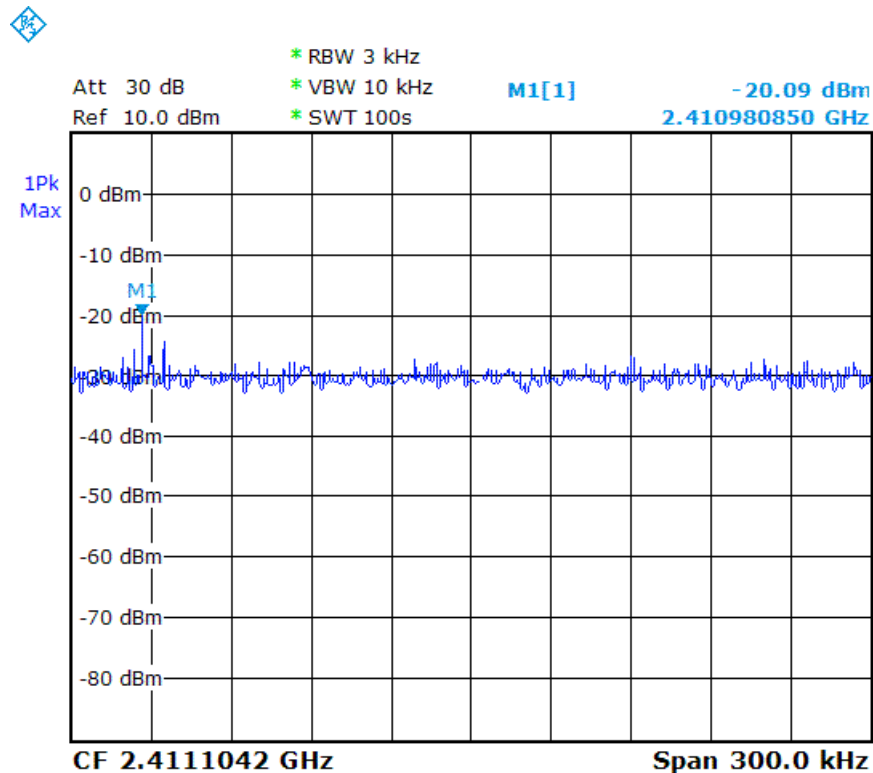
TEST REPORT

Reference No.: A13011801
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Temperature:	21°C	Humidity:	58%RH
Spectrum Detector:	PK.	Test Mode:	802.11n – HT40
Tested By:	Richard	Modulation Type:	OFDM
Test Result:	PASS	Tested Date:	Jan. 28, 2013

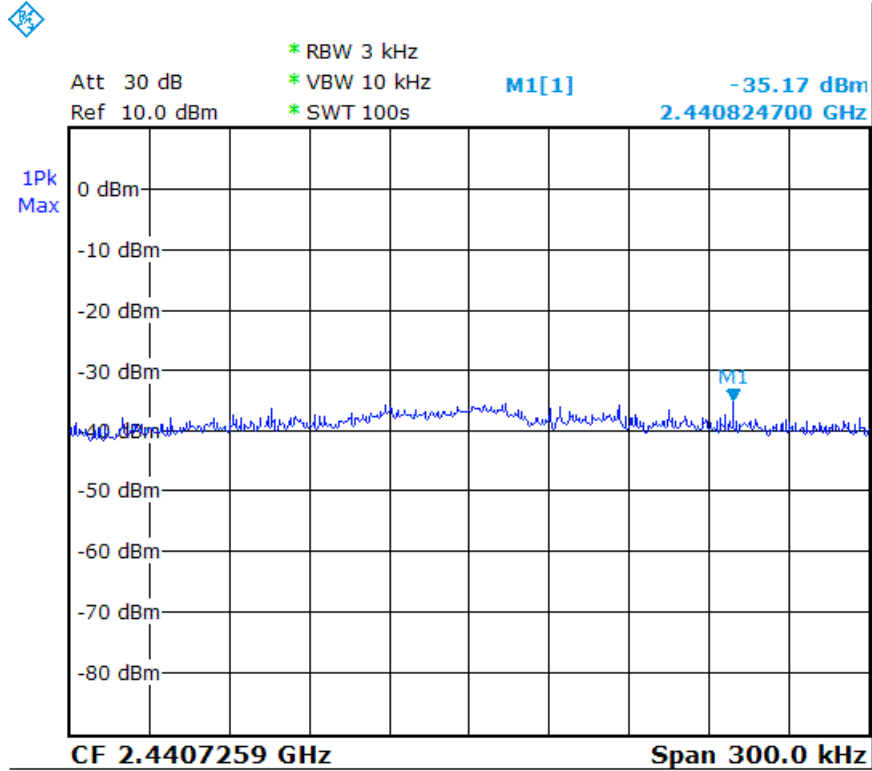
Channel Number	Channel Frequency (MHz)	RF Power Level in 3 KHz BW (dBm/3kHz)	Maximum Limit (dBm/3kHz)
CH05	2422	-20.09	8
CH08	2437	-35.17	8
CH11	2452	-23.46	8

CH05 :

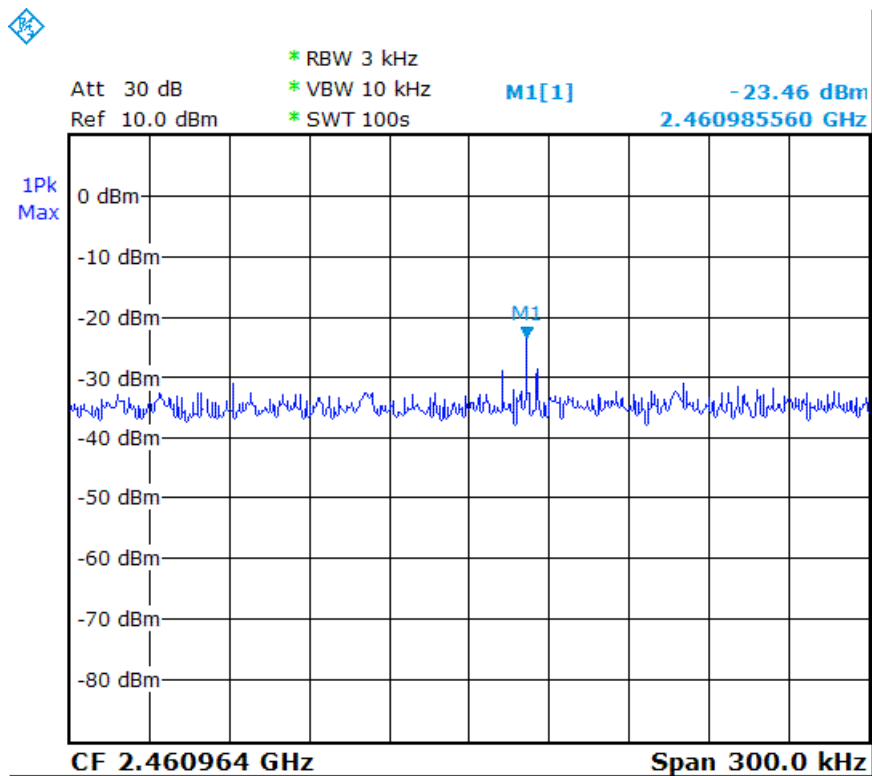




CH08 :



CH11 :





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5. Antenna application

5.1 Antenna requirement

The EUT's antenna is met the requirement of FCC Part 15C section 15.203 and 15.204.

FCC Part 15C section 15.247 requirement:

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

5.2 Result

The EUT's antenna used a PIFA antenna. Gain of antenna types is 2.25 dBi that meet the requirement.



6. PHOTOS OF TESTING

- Conducted test





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- Radiated test (below 30M)





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- Radiated test (below 1G)





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- Radiated test (above 1G)





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7. TERMS OF ABBREVIATION

AV.	Average detection
AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction