

FCC RF Test Report

APPLICANT : Partner Tech Corp
EQUIPMENT : E-Menu
BRAND NAME : PARTNER
MODEL NAME : EM-70B
FCC ID : NDPEM-70B
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Jun. 06, 2012 and completely tested on Jul. 26, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : NDPEM-70B

Page Number : 1 of 83

Report Issued Date : Aug. 20, 2012

Report Version : Rev. 01



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR260602B	Rev. 01	Initial issue of report	Aug. 20, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	A8.4	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	A8.5	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	-
			Radiated Spurious Emission		Pass	Under limit 3.52 dB at 2484.160 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 14.50 dB at 21.150 MHz and 20.454 MHz
3.7	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Partner Tech Corp

10FL, 233-2, Baoqiao Road, Xindian, New Taipei City, Taiwan.

1.2 Manufacturer

Partner Tech Corp

10FL, 233-2, Baoqiao Road, Xindian, New Taipei City, Taiwan.

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	E-Menu
Brand Name	PARTNER
Model Name	EM-70B
FCC ID	NDPEM-70B
Sample 1	EUT with White color
Sample 2	EUT with Black color
EUT supports Radios application	WLAN 11bgn / Bluetooth / NFC
HW Version	V1.5
SW Version	F2.04
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2412 MHz ~ 2462 MHz
Number of Channels	11
Carrier Frequency of Each Channel	$2412 + (n-1) \times 5$ MHz; $n=1 \sim 11$
Maximum Output Power to Antenna	802.11b : 19.40 dBm (0.0871 W) 802.11g : 16.47 dBm (0.0444 W) 802.11n HT-20 : 14.48 dBm (0.0281 W) 802.11n HT-40 : 14.52 dBm (0.0283 W)
Antenna Type	PIFA Antenna with gain 3.70 dBi
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.			
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH02-HY	CO05-HY	03CH05-HY	722060/4086B-1

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01
- FCC TCB Workshop 2012, April
- ANSI C63.4-2003 and ANSI C63.10-2009
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	LCD Monitor	Dell	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	USB HD	WD	WDBAAR3200ABK-PESN	FCC DoC	Unshielded, 0.5 m	N/A
5.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
6.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate as below table and the highest power data rates (11b, 11g, 11n HT-20, 11n HT-40 modes) were chosen for full test in the following sections to demonstrate compliance to the FCC limit line. .

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	19.40	18.83	18.72	18.80

2.4GHz 802.11g mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	16.47	15.97	16.18	15.82	16.44	16.25	16.10	16.26

2.4GHz 802.11n HT-20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	14.48	14.32	14.40	14.45	14.24	14.32	14.23	14.19

2.4GHz 802.11n HT-40 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	14.52	14.30	14.15	14.47	14.48	14.50	14.48	14.24

2.3 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and ANSI C63.10-2009 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 KHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

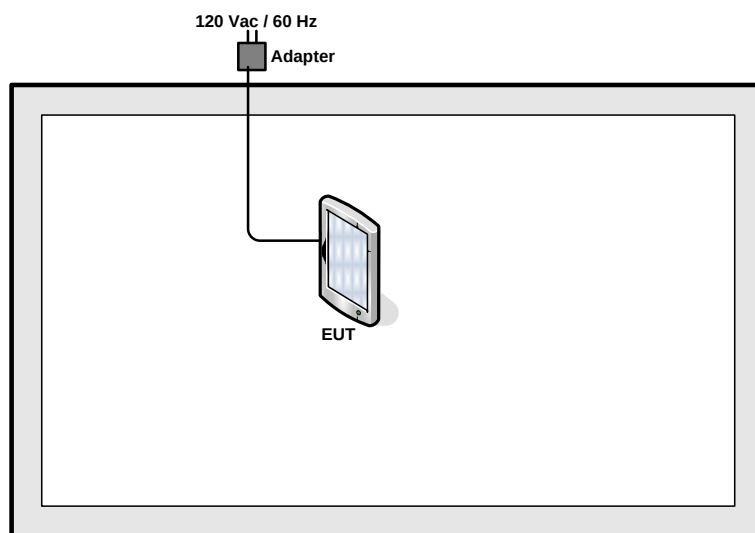
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

The following tables are showing the test modes as the worst cases (Zplane) and recorded in this report.

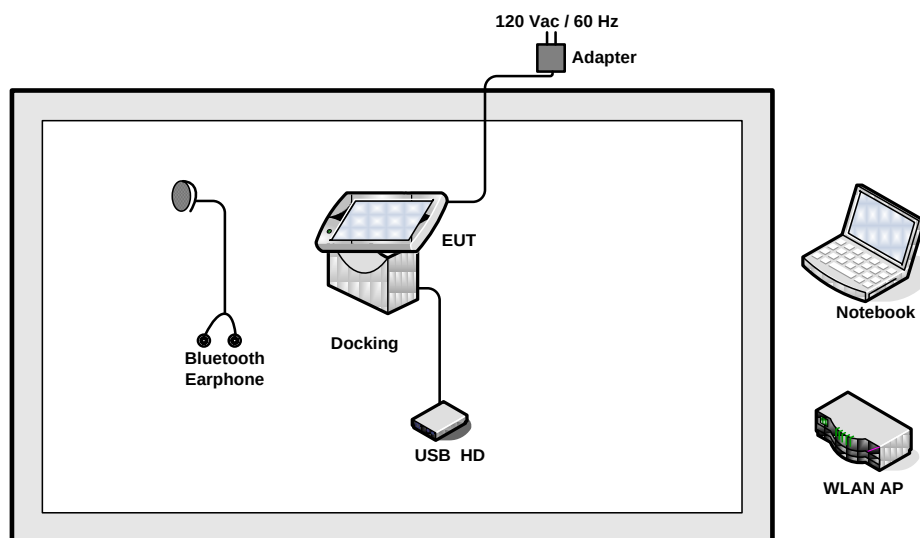
Test Cases					
Test Item	802.11b (Modulation : DSSS) 802.11g/n (Modulation : OFDM)				
Conducted TCs	Test Mode	802.11b	802.11g	802.11n HT-20	
	CH01	1	4	7	
	CH06	2	5	8	
	CH11	3	6	9	
	Test Mode	802.11n HT-40			
	CH03	10			
	CH06	11			
	CH09	12			
	Radiated TCs	Test Mode	802.11b	802.11g	802.11n HT-20
		CH01	1	4	7
CH06		2	5	8	
CH11		3	6	9	
Test Mode		802.11n HT-40			
CH03		10			
CH06		11			
CH09		12			
AC Conducted Emission		Mode 1 : WLAN Link + Bluetooth Link + H-Pattern + USB Cable (Data Link with Notebook) + Adapter + SD Card + NFC On			
		Mode 2 : WLAN Link + Bluetooth Link + MPEG4 + Docking + NFC On + Adapter			
Remark:					
1. The worst case of conducted emission is mode 2; only the test data of it was reported.					
2. All test items were performance with Sample 2.					

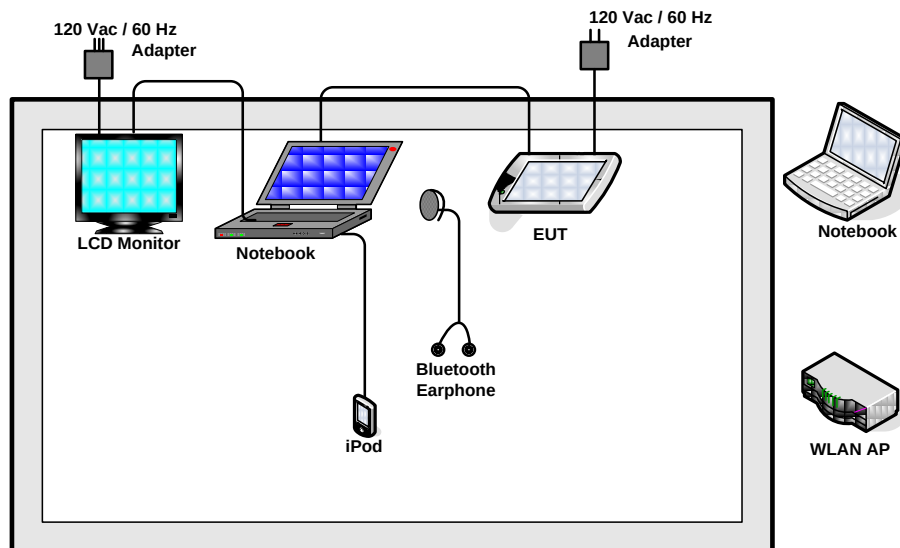
2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<EUT with Docking Mode>



<EUT with USB Cable (Link with Notebook) Mode>


2.5 RF Utility

For WLAN function, programmed RF utility, "CMD" installed in the notebook make the EUT provides functions like channel selection and power level for continuous transmitting and receiving signals.

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 KHz.

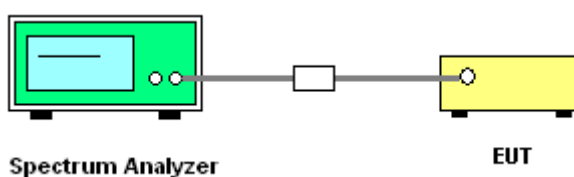
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1-5% of the emission bandwidth (EBW). Set the Video bandwidth (VBW) $\geq 3 * RBW$. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

3.1.4 Test Setup





Test Mode :	802.11b	Temperature :	24~26℃	
Test Engineer :	Book Lin	Relative Humidity :	50~53%	

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	10.16	0.5	Pass
06	2437	10.16	0.5	Pass
11	2462	10.12	0.5	Pass

• RBW 300 kHz Delta 2 [T1]
 • VBW 1 MHz -0.53 dB
 Ref 20 dBm • Att 20 dB
 SWT 5 ms 10.16000000 MHz

20 Offset 23 7 dB

Marker 1 [T1] -0.22 dBm
 2 40692000 GHz

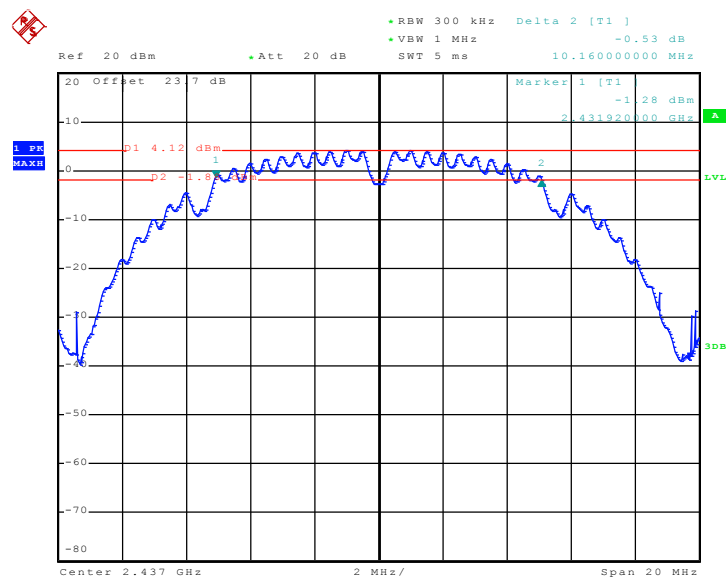
1. 5.22 dBm
 2. 20.53 dBm

Center 2.412 GHz 2 MHz/ Span 20 MHz

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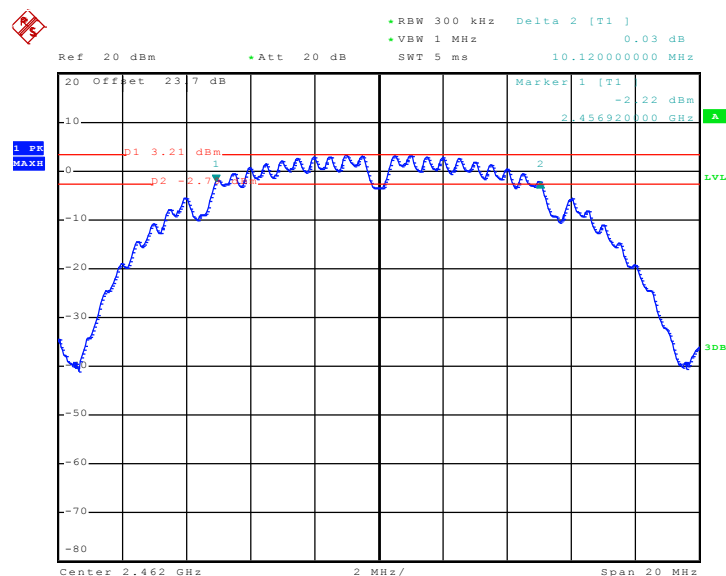


6 dB Bandwidth Plot on 802.11b Channel 06



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6 dB Bandwidth Plot on 802.11b Channel 11



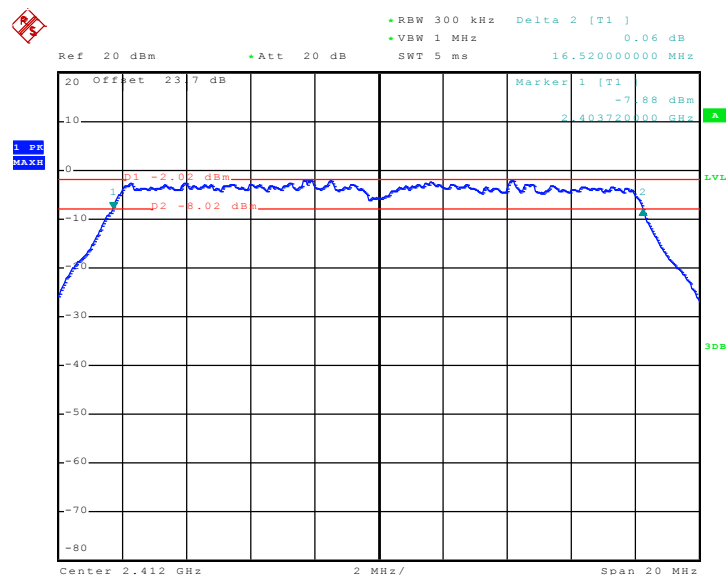
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Test Mode :	802.11g	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.52	0.5	Pass
06	2437	16.52	0.5	Pass
11	2462	16.52	0.5	Pass

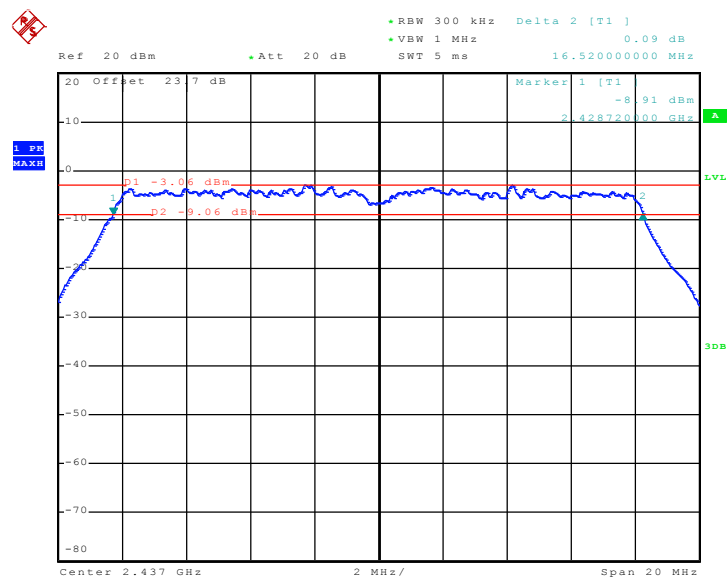
6 dB Bandwidth Plot on 802.11g Channel 01



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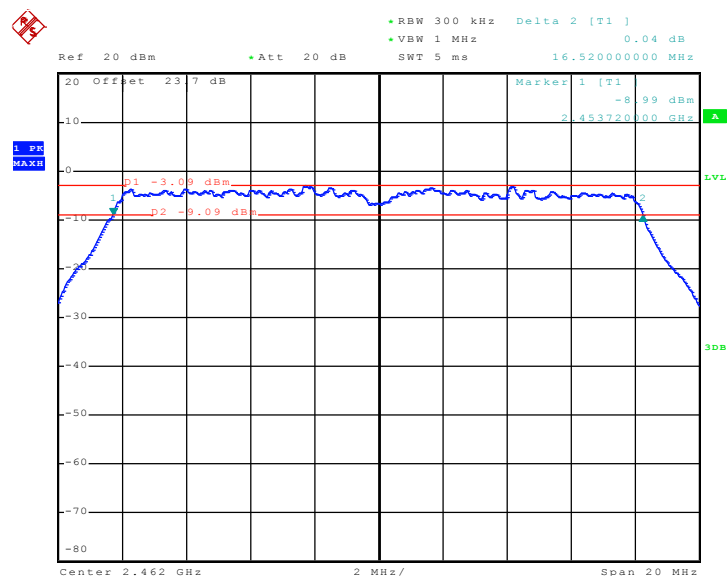


6 dB Bandwidth Plot on 802.11g Channel 06



Date: 27.JUN.2012 01:46:26

6 dB Bandwidth Plot on 802.11g Channel 11



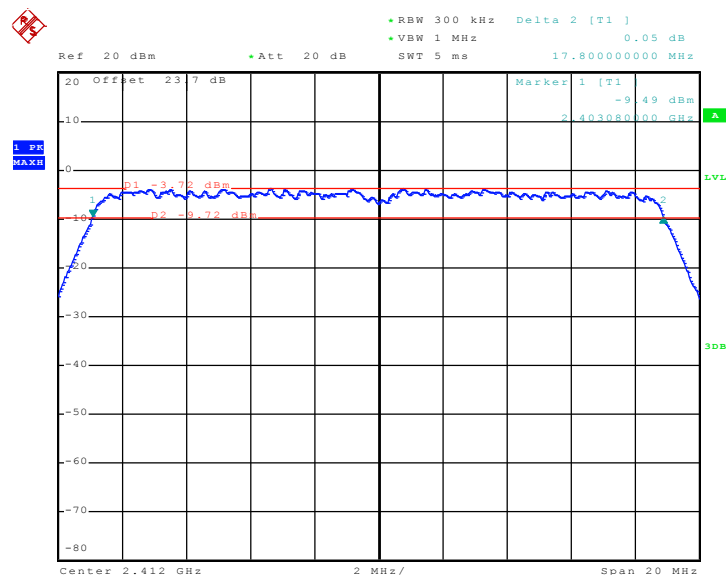
Date: 27.JUN.2012 01:50:05



Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.80	0.5	Pass
06	2437	17.80	0.5	Pass
11	2462	17.80	0.5	Pass

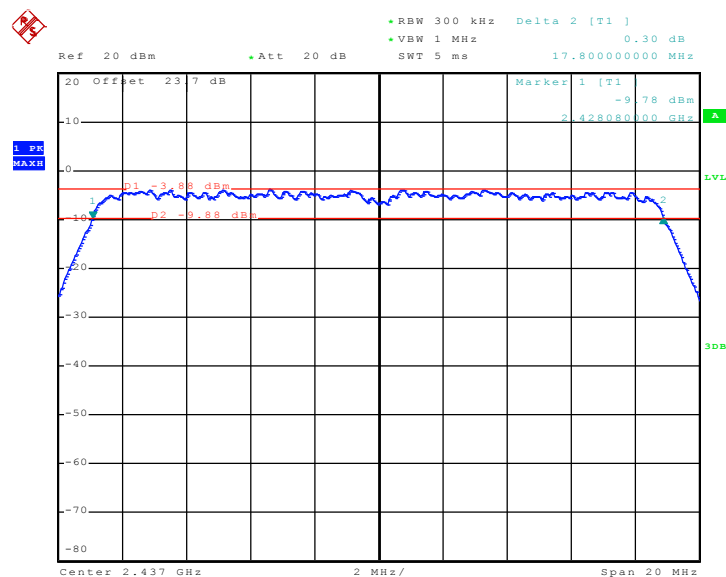
6 dB Bandwidth Plot on 802.11n HT-20 Channel 01



Date: 28.JUN.2012 01:26:37

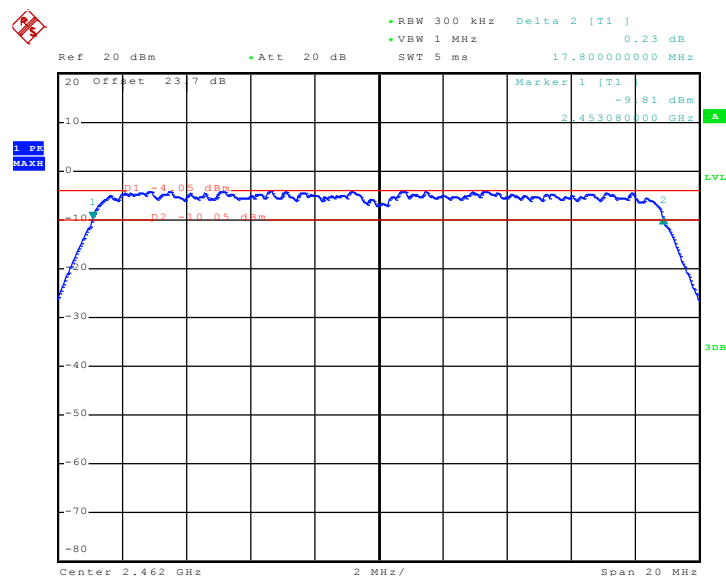


6 dB Bandwidth Plot on 802.11n HT-20 Channel 06



Date: 28.JUN.2012 01:29:49

6 dB Bandwidth Plot on 802.11n HT-20 Channel 11



Date: 28.JUN.2012 01:32:39



Channel	Frequency (MHz)	802.11n HT-40 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
03	2422	36.56	0.5	Pass
06	2437	36.56	0.5	Pass
09	2452	36.64	0.5	Pass

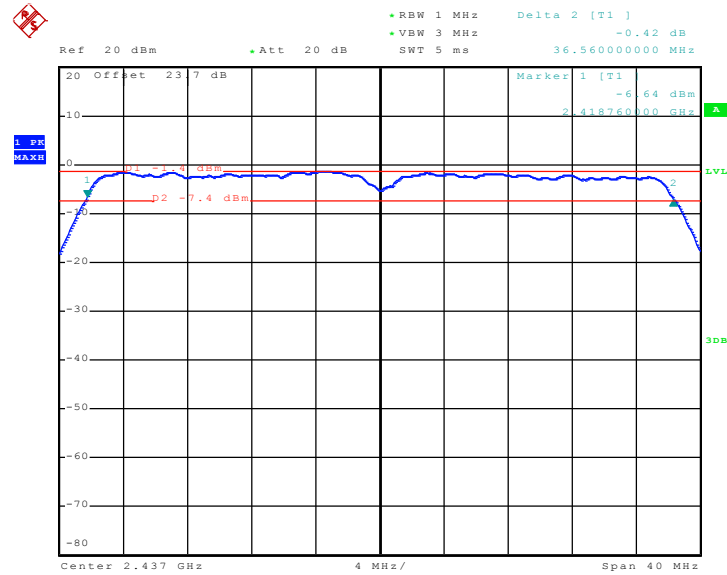
• RBW 1 MHz
 • VBW 3 MHz
 Delta 2 [T1]
 -0.36 dB
 36.56000000 MHz
 Ref 20 dBm
 • Att 20 dB
 SWT 5 ms

20 Offset 23.7 dB
 Marker 1 [T1]
 -5.35 dBm
 2.403760000 GHz
 1.98
 MAXH
 p1 -0.00 dBm
 p2 -6.07 dBm
 2
 -80
 -70
 -60
 -50
 -40
 -30
 -20
 -10
 0
 10
 20
 Center 2.422 GHz
 4 MHz/
 Span 40 MHz

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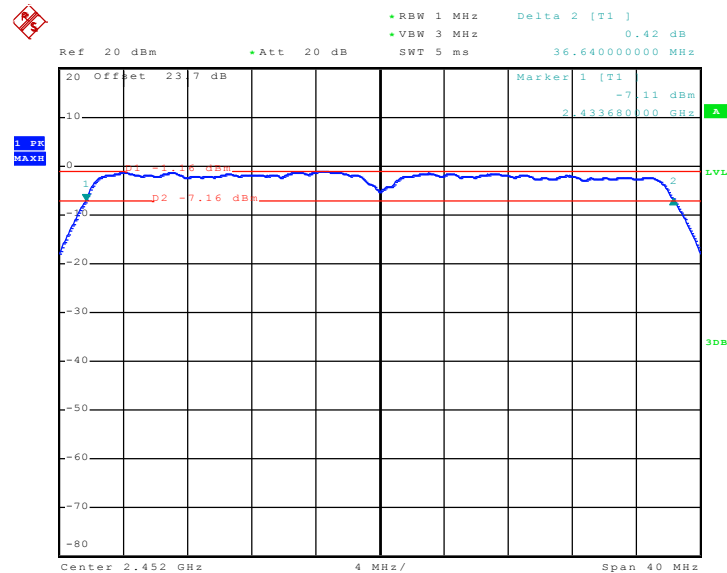


6 dB Bandwidth Plot on 802.11n HT-40 Channel 06



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6 dB Bandwidth Plot on 802.11n HT-40Channel 09



Date: 27.JUN.2012 02:13:18

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

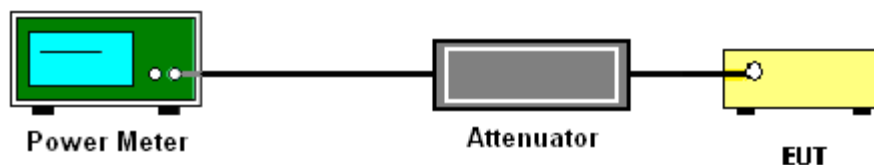
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure 7.2.1.3 Option 3(peak power meter method) of FCC KDB No. 558074 DTS Meas. Guidance DR01.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test Mode :	802.11b	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.40	30	Pass
06	2437	19.19	30	Pass
11	2462	18.85	30	Pass

Test Mode :	802.11g	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	16.47	30	Pass
06	2437	16.05	30	Pass
11	2462	15.84	30	Pass

Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	14.48	30	Pass
06	2437	14.39	30	Pass
11	2462	14.45	30	Pass

Test Mode :	2.4GHz 802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-40 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	14.52	30	Pass
06	2437	14.24	30	Pass
09	2452	14.31	30	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	24~26℃
Test Engineer :	Book Lin	Relative Humidity :	50~53%
Duty Cycle:	100%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	14.60
06	2437	14.48
11	2462	13.73

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Book Lin	Relative Humidity :	50~53%
Duty Cycle:	100%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	6.17
06	2437	5.21
11	2462	5.37

Test Mode :	802.11n HT-20	Temperature :	24~26℃
Test Engineer :	Book Lin	Relative Humidity :	50~53%
Duty Cycle:	100%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11n HT-20 Average Output Power (dBm)
01	2412	5.15
06	2437	4.83
11	2462	4.92

Test Mode :	802.11n HT-40	Temperature :	24~26℃
Test Engineer :	Book Lin	Relative Humidity :	50~53%
Duty Cycle:	100%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11n HT-40 Average Output Power (dBm)
03	2422	4.81
06	2437	4.69
09	2452	4.77

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3KHz band at any time interval of continuous transmission.

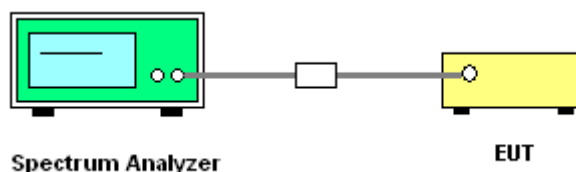
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 5.3.1 (Peak PSD) of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Record the measurement data derived from spectrum analyzer.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 KHz. Video bandwidth (VBW) $\geq$ 300 KHz In order to make an accurate measurement, set the span to 5-30% greater than Emission Bandwidth (EBW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3\text{ kHz}/100\text{ kHz}) = -15.2\text{ dB}$.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

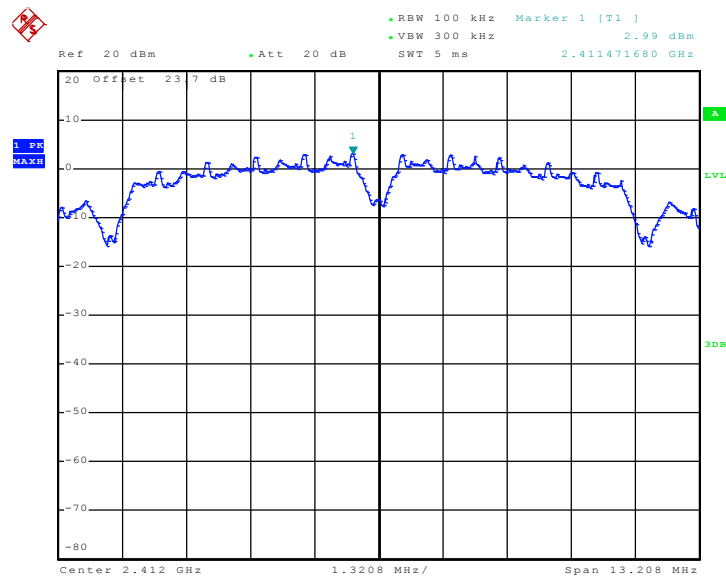
Test Mode :	802.11b	Temperature :	24~26℃
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	2.99	-12.21	8	Pass
06	2437	1.76	-13.44	8	Pass
11	2462	0.75	-14.45	8	Pass

Note:

1. Measured power density (dBm) has offset with cable loss.
2. $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3. $\text{Power Density/ 3kHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

PSD Plot on 802.11b Channel 01



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PSD Plot on 802.11b Channel 11

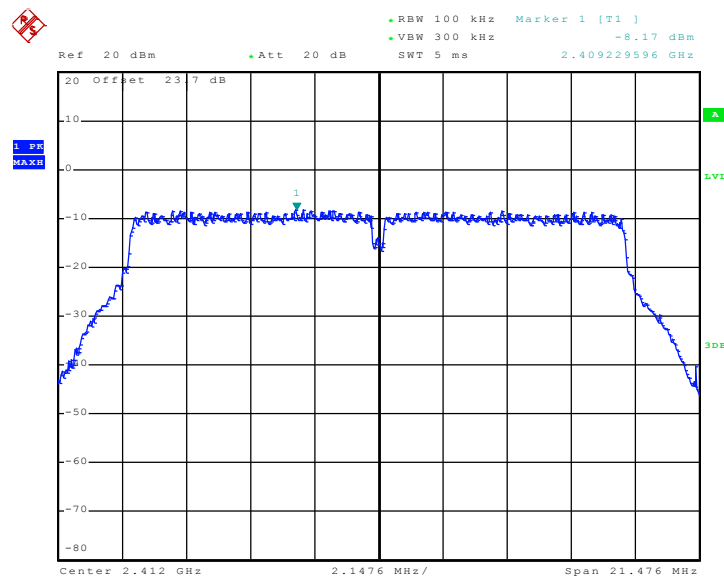


Test Mode :	802.11g	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-8.17	-23.37	8	Pass
06	2437	-7.77	-22.97	8	Pass
11	2462	-8.99	-24.19	8	Pass

Note:

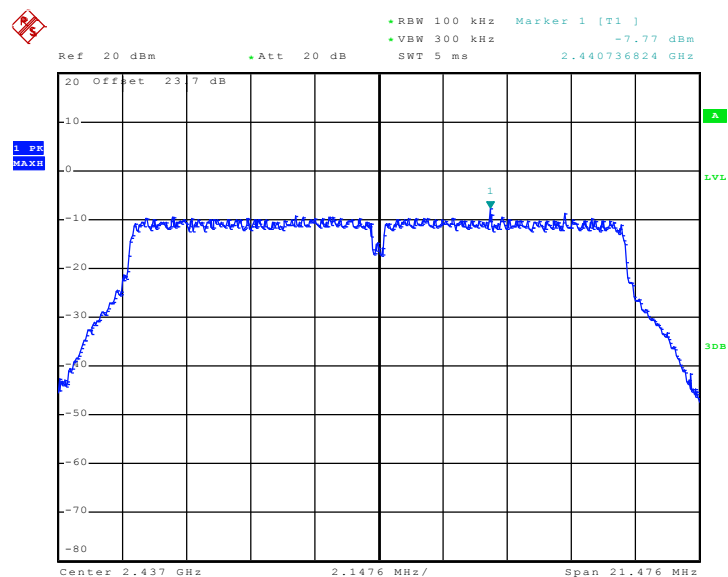
1. Measured power density (dBm) has offset with cable loss.
2. $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3. $\text{Power Density/ 3KHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

PSD Plot on 802.11g Channel 01


Date: 27.JUN.2012 01:40:22

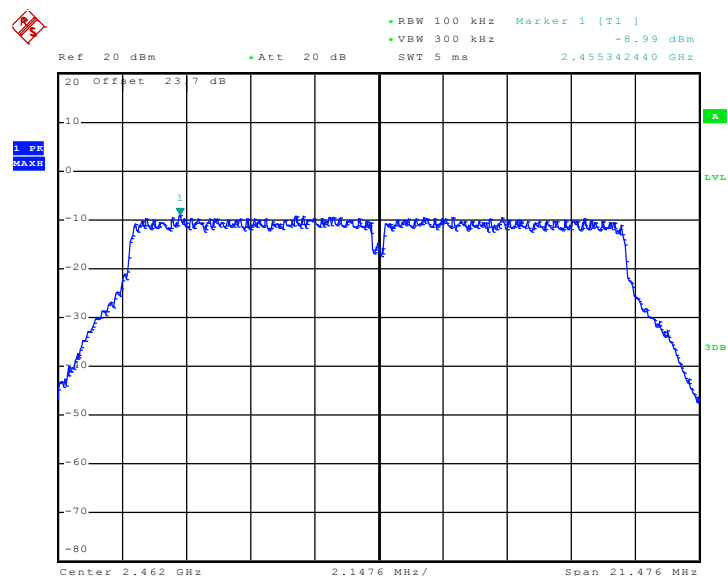


PSD Plot on 802.11g Channel 06



Date: 27.JUN.2012 01:46:58

PSD Plot on 802.11g Channel 11



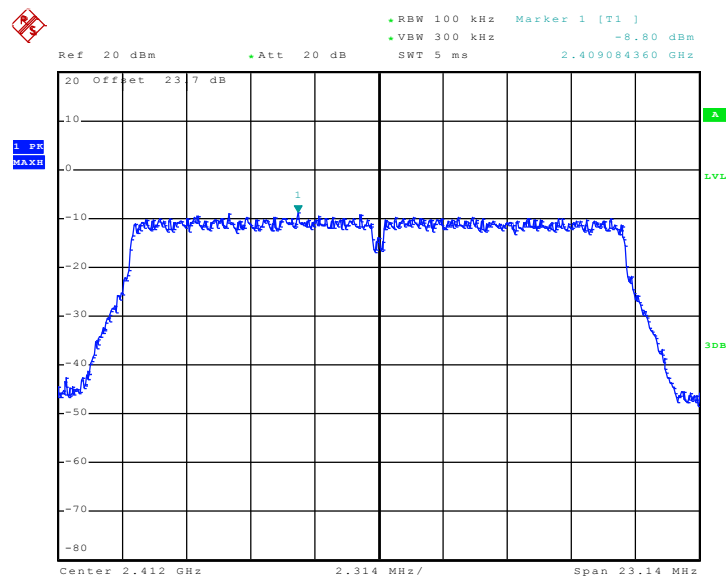
Date: 27.JUN.2012 01:50:35

Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n HT-20 Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-8.80	-24.00	8	Pass
06	2437	-8.81	-24.01	8	Pass
11	2462	-8.81	-24.01	8	Pass

Note:

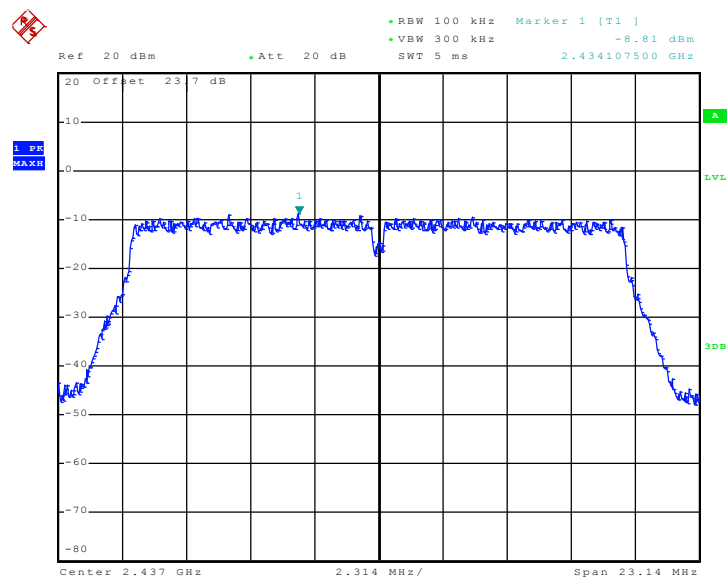
1. Measured power density (dBm) has offset with cable loss.
2. $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3. $\text{Power Density/ 3KHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

PSD Plot on 802.11n HT-20 Channel 01


Date: 28.JUN.2012 01:26:59

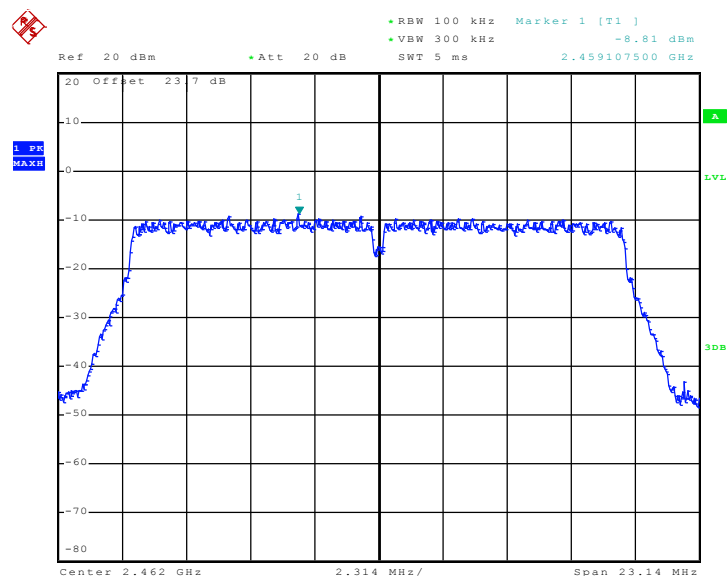


PSD Plot on 802.11n HT-20 Channel 06



Date: 28.JUN.2012 01:30:23

PSD Plot on 802.11n HT-20 Channel 11



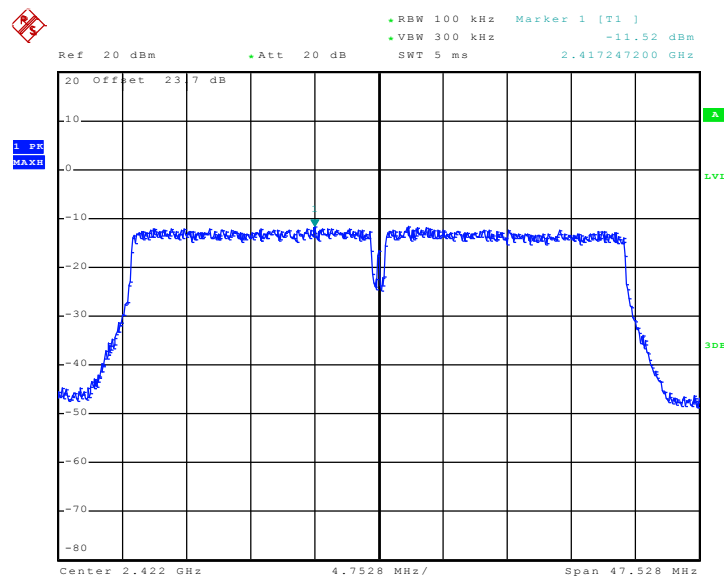
Date: 28.JUN.2012 01:33:07

Test Mode :	802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

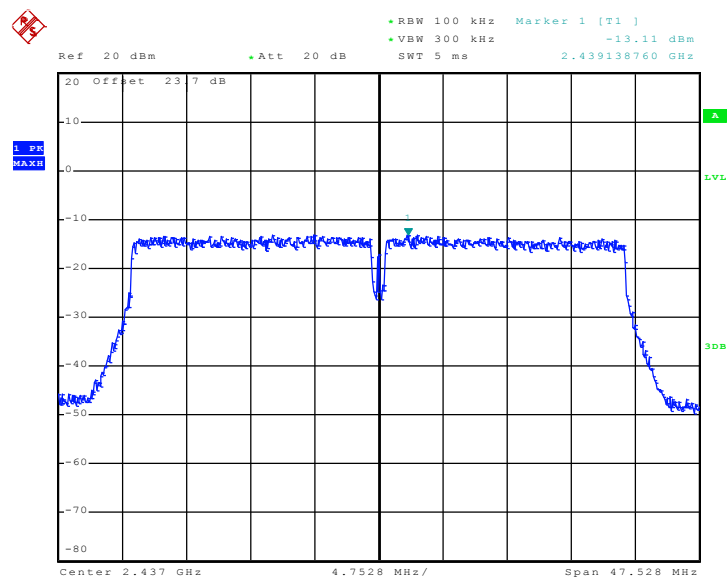
Channel	Frequency (MHz)	802.11n HT-40 Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
03	2422	-11.52	-26.72	8	Pass
06	2437	-13.11	-28.31	8	Pass
09	2452	-12.06	-27.26	8	Pass

Note:

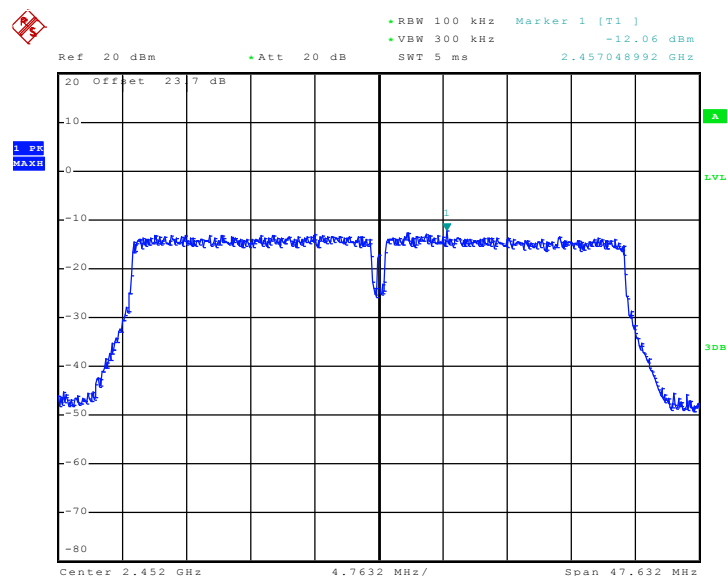
1. Measured power density (dBm) has offset with cable loss.
2. $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3. $\text{Power Density/ 3KHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

PSD Plot on 802.11n HT-40 Channel 03


Date: 27.JUN.2012 02:08:14

PSD Plot on 802.11n HT-40 Channel 06


Date: 27.JUN.2012 02:11:03

PSD Plot on 802.11n HT-40 Channel 09


Date: 27.JUN.2012 02:13:46

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and 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).

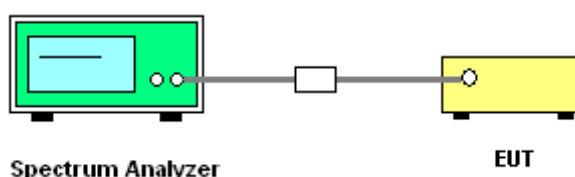
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows the guidelines in the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz, when maximum peak conducted output power procedure is used. The attenuation is set to 30dB, when maximum conducted output power procedure is used.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure and record the results in the test report.

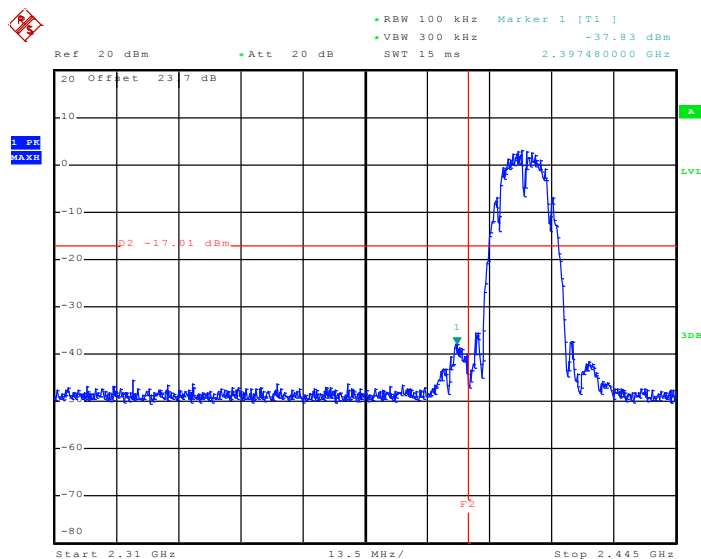
3.4.4 Test Setup



3.4.5 Test Plots of Conducted Band Edges

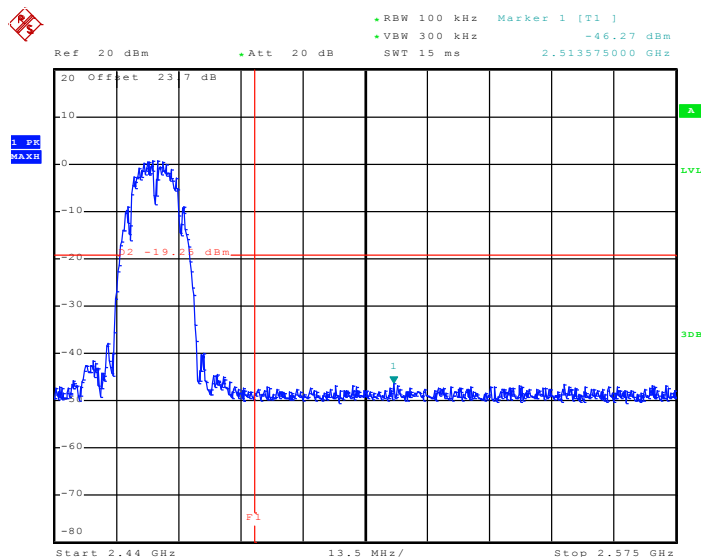
Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Book Lin

Low Band Edge Plot on 802.11b Channel 01



Date: 27.JUN.2012 01:27:55

High Band Edge Plot on 802.11b Channel 11

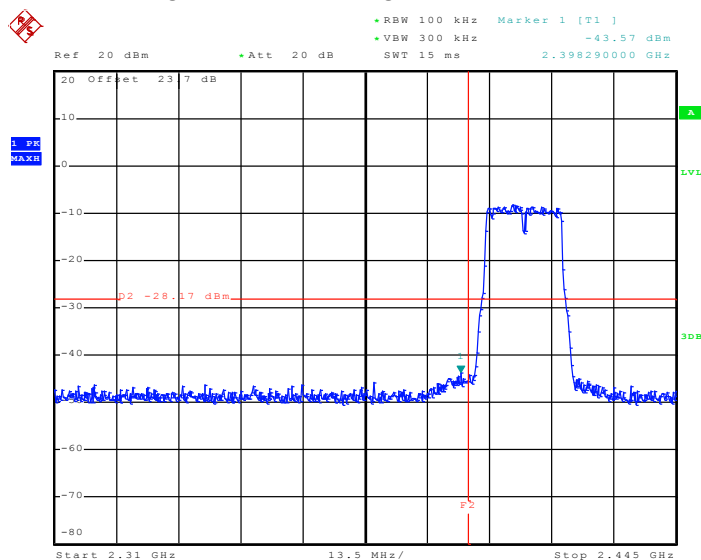


Date: 27.JUN.2012 01:36:51



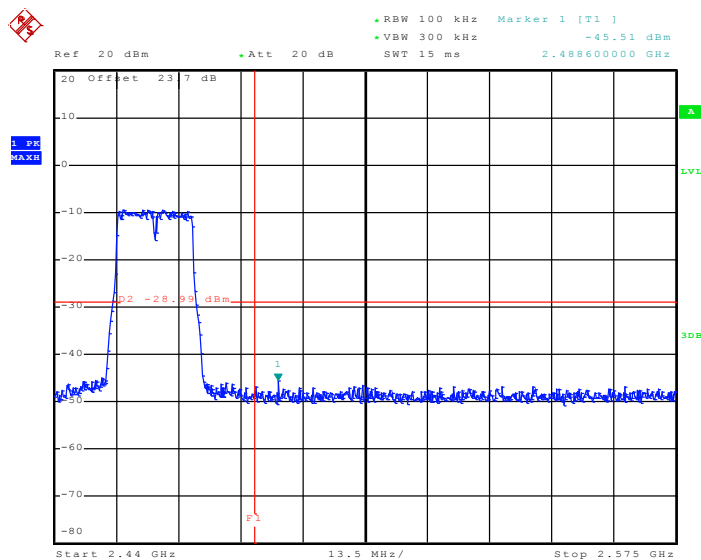
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Book Lin

Low Band Edge Plot on 802.11g Channel 01



Date: 27.JUN.2012 01:40:39

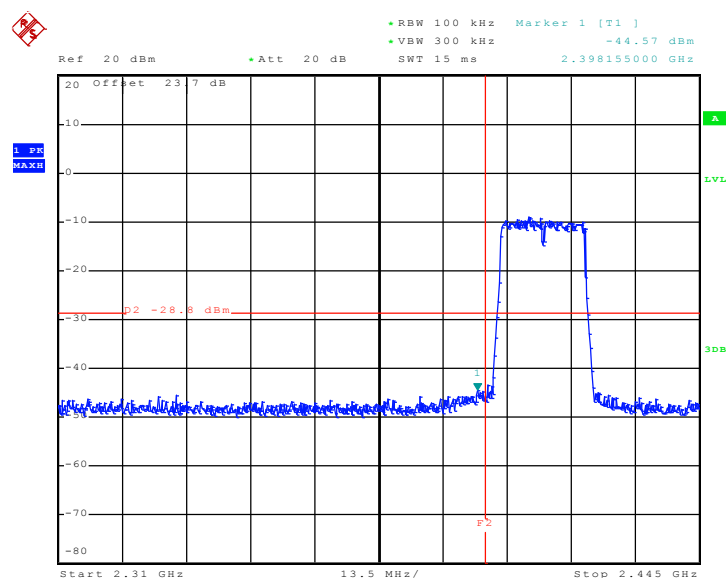
High Band Edge Plot on 802.11g Channel 11



Date: 27.JUN.2012 01:50:52

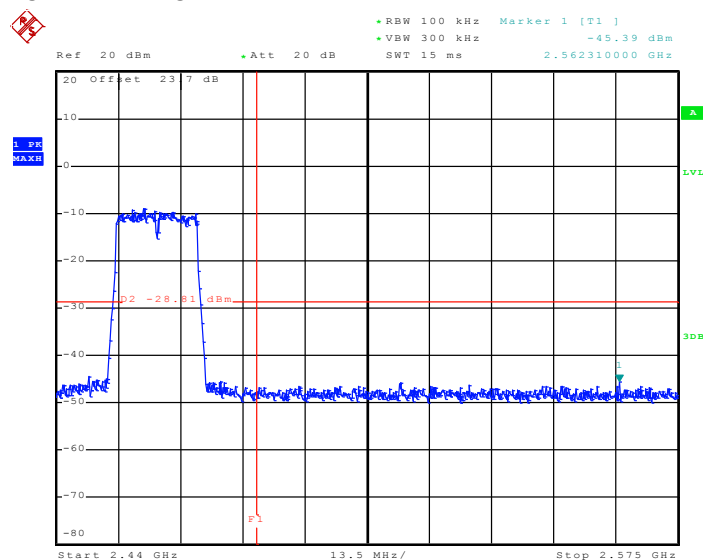
Test Mode :	802.11n HT-20	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Book Lin

Low Band Edge Plot on 802.11n HT-20 Channel 01



Date: 28.JUN.2012 01:27:15

High Band Edge Plot on 802.11n HT-20 Channel 11



Date: 28.JUN.2012 01:33:30



• RBW 100 kHz
 • VBW 300 kHz
 • Marker 1 [T1]
 -43.71 dBm
 Ref 20 dBm
 • Att 20 dB
 SWT 15 ms
 2.392350000 GHz

20 Offset 23.7 dB
 1. PR
 MASK
 -10
 -20
 -30
 -40
 -50
 -60
 -70
 -80
 Start 2.31 GHz
 13.5 MHz/
 Stop 2.445 GHz
 -31.52 dBm
 2.392350000 GHz

Ref 20 dBm Att 20 dB RBW 100 kHz VBW 300 kHz SWT 15 ms

Marker 1 [T1] -46.39 dBm 2.520460000 GHz

20 Offset 23.7 dB

1. Pk MAX

02 -32.06 dBm

1

Start 2.44 GHz 13.5 MHz/ Stop 2.575 GHz

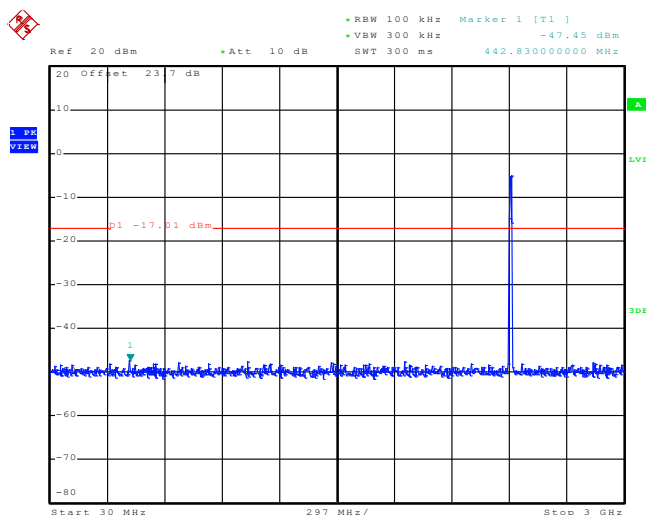
Report Version : Rev. 01

3.4.6 Test Plots of Spurious Emission

Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Book Lin

802.11b 30 MHz~3 GHz

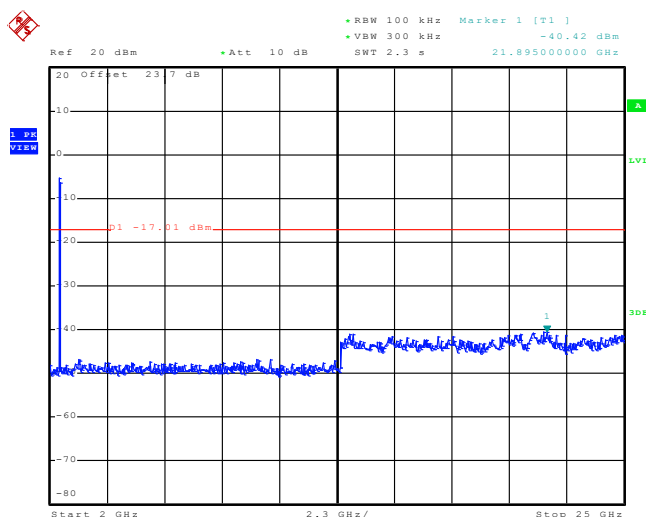
Conducted Spurious Emission Plot on Channel 01



Date: 28.JUN.2012 01:40:56

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

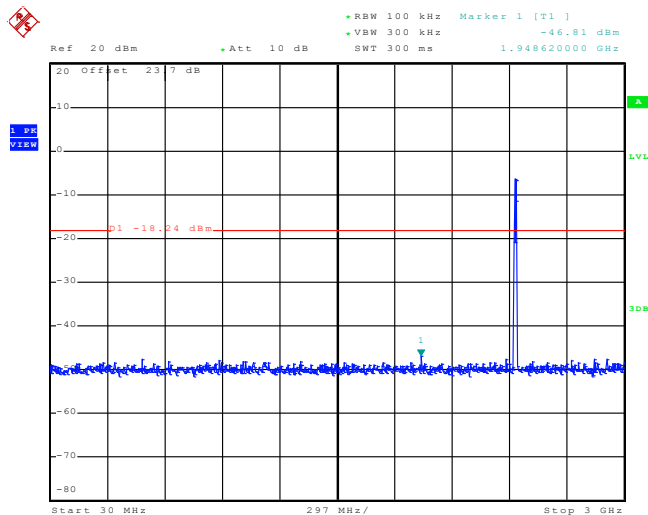


Date: 28.JUN.2012 01:41:14



802.11b 30 MHz~3 GHz

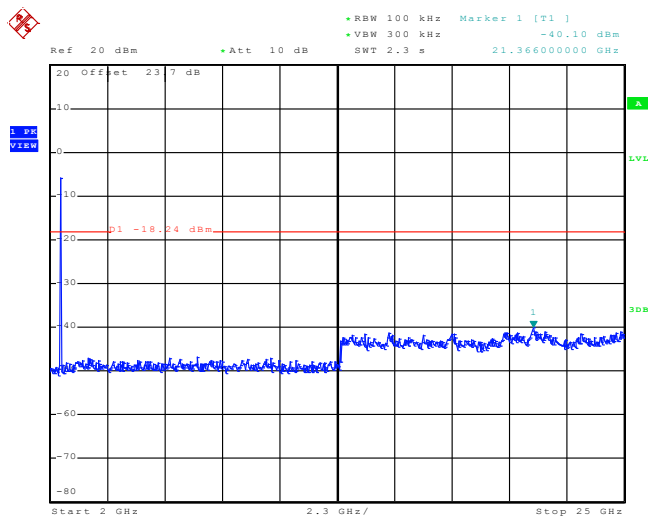
Conducted Spurious Emission Plot on Channel 06



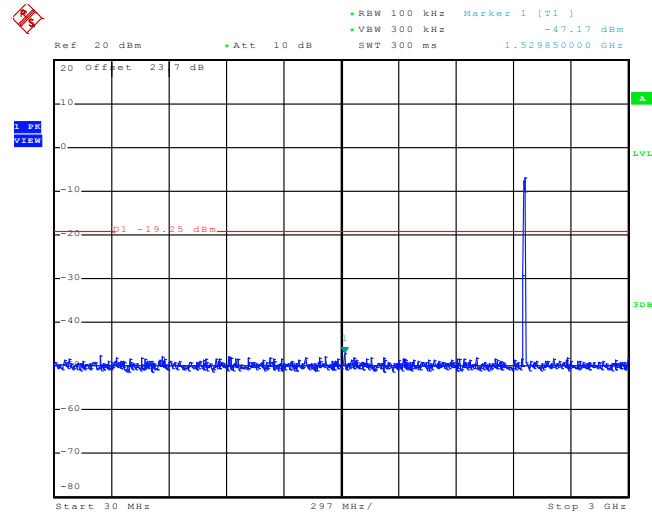
Date: 28.JUN.2012 01:39:58

802.11b 2 GHz~25 GHz

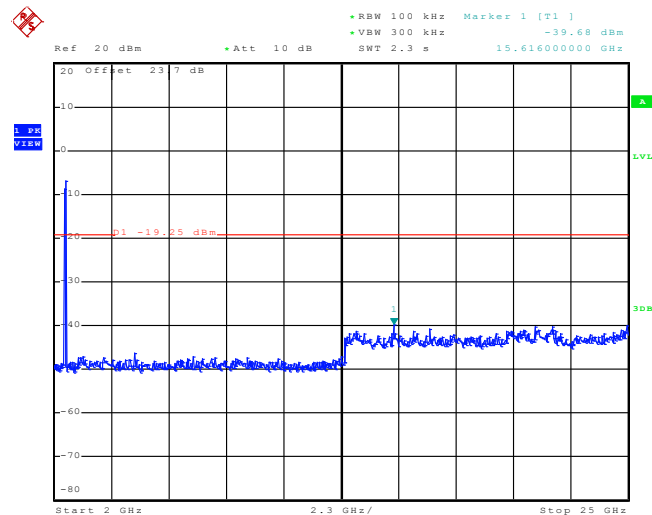
Conducted Spurious Emission Plot on Channel 06



Date: 28.JUN.2012 01:40:16

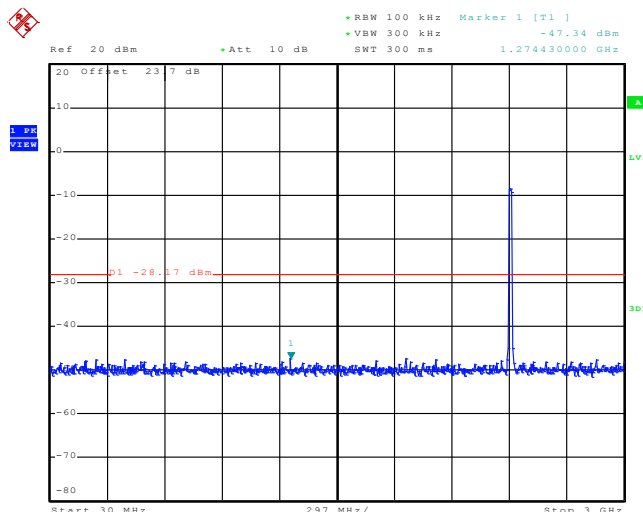
802.11b 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 28.JUN.2012 01:39:08

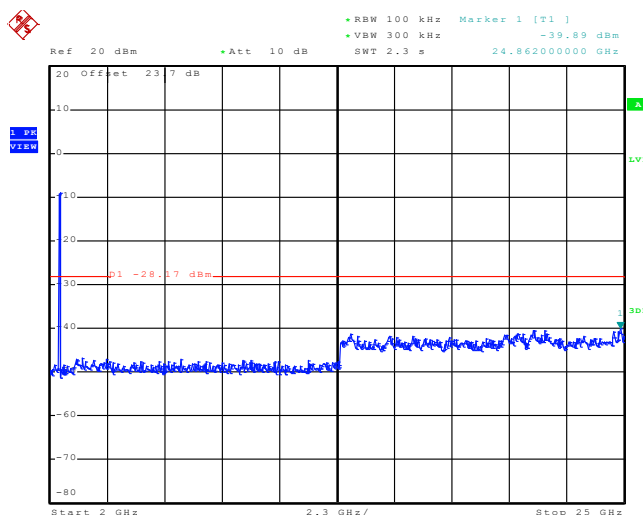
802.11b 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 28.JUN.2012 01:39:25

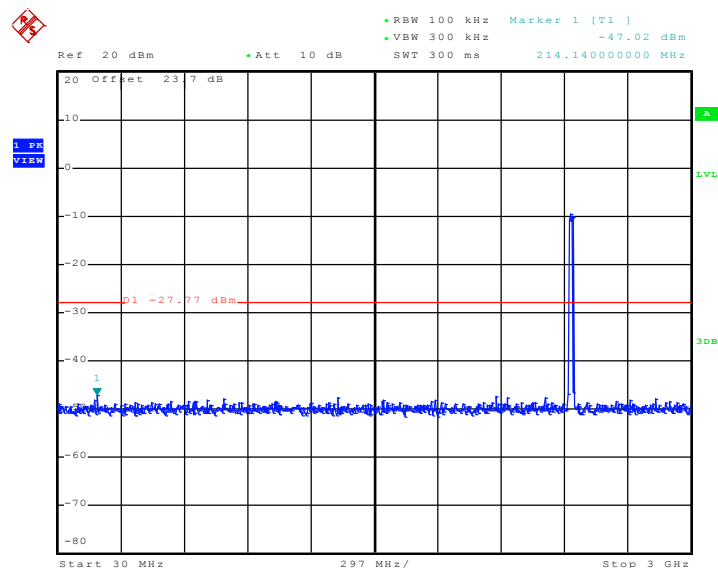
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Book Lin

802.11g 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 01


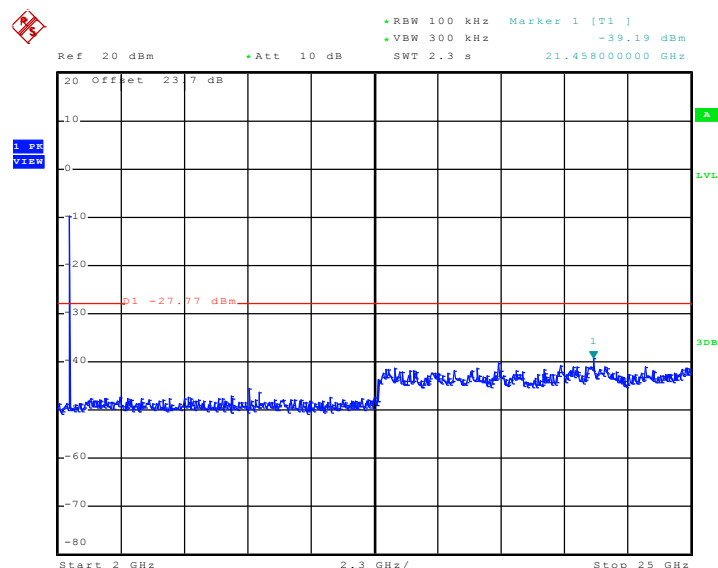
Date: 28.JUN.2012 01:35:42

802.11g 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 01


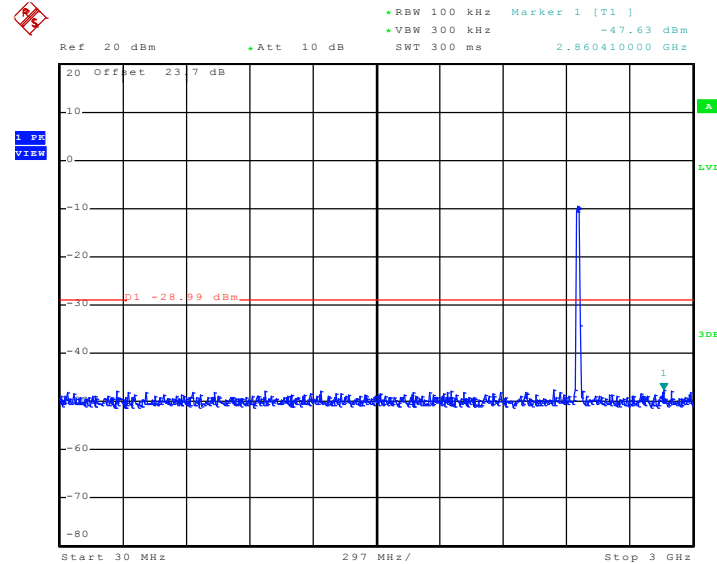
Date: 28.JUN.2012 01:36:00

802.11g 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


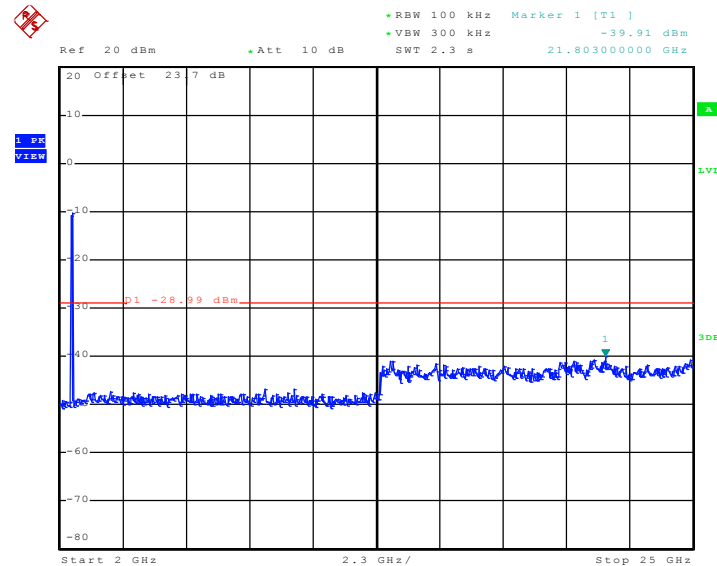
Date: 28.JUN.2012 01:36:43

802.11g 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 28.JUN.2012 01:37:01

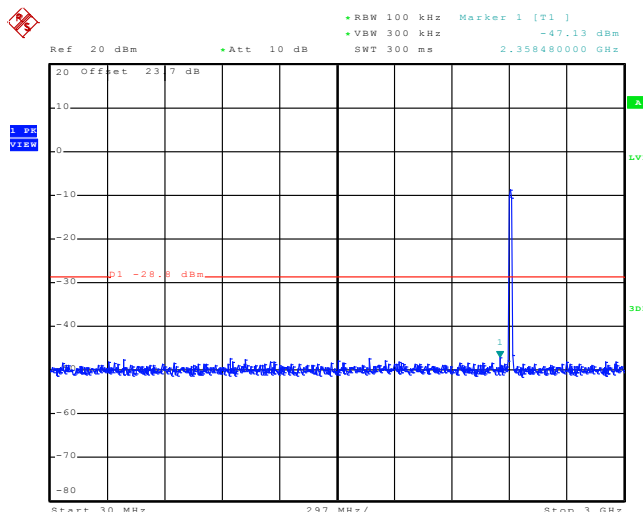
802.11g 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 28.JUN.2012 01:37:53

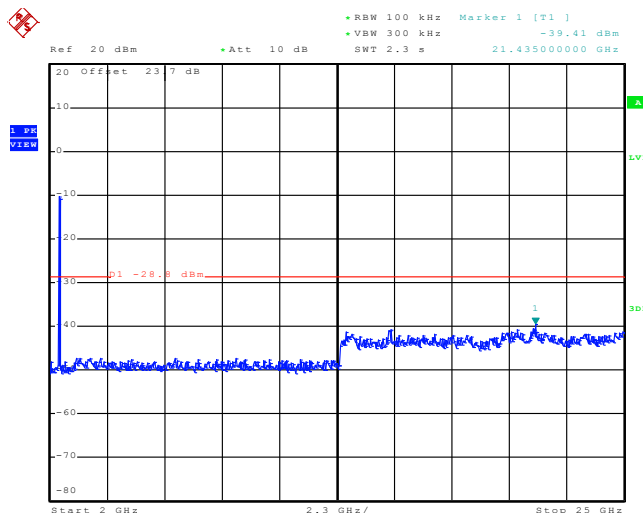
802.11g 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 28.JUN.2012 01:38:10

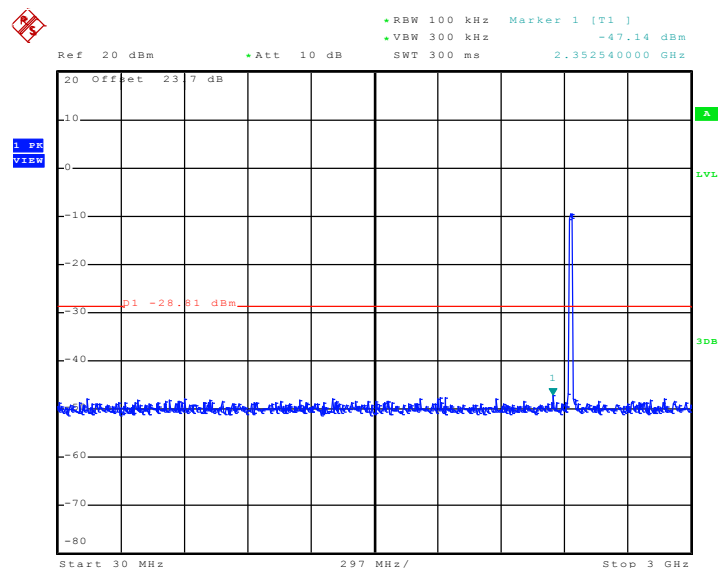
Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Book Lin

802.11n HT-20 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 01


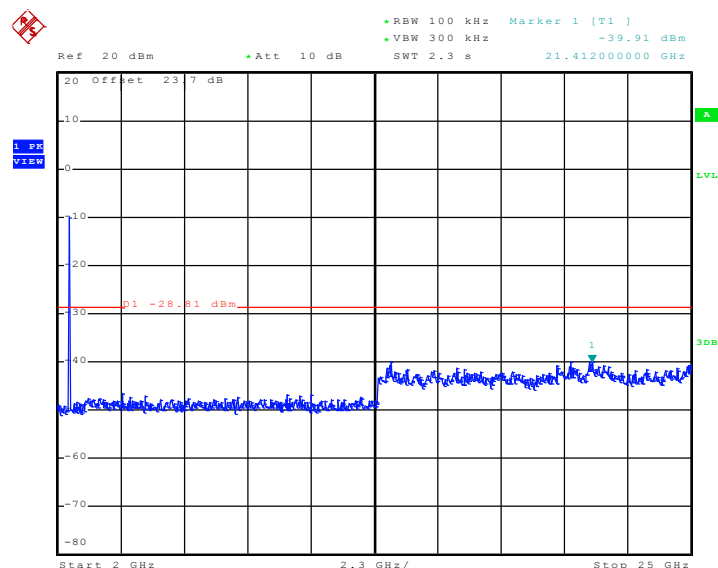
Date: 28.JUN.2012 01:27:38

802.11n HT-20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 01


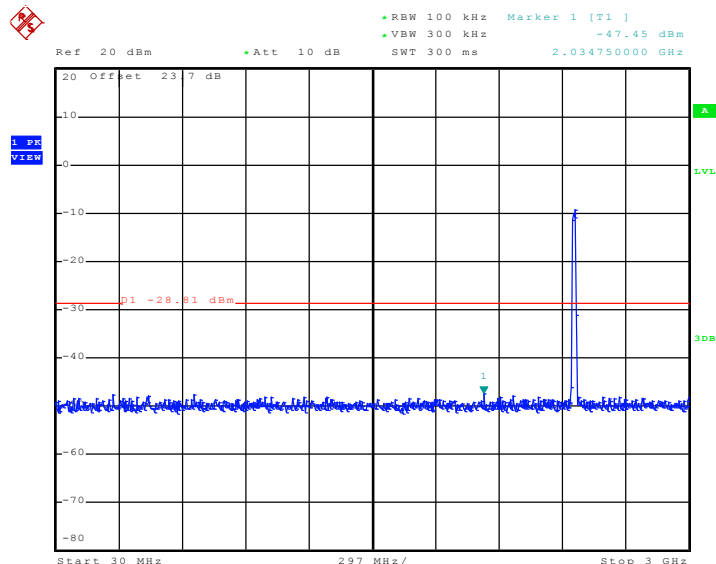
Date: 28.JUN.2012 01:27:55

802.11n HT-20 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


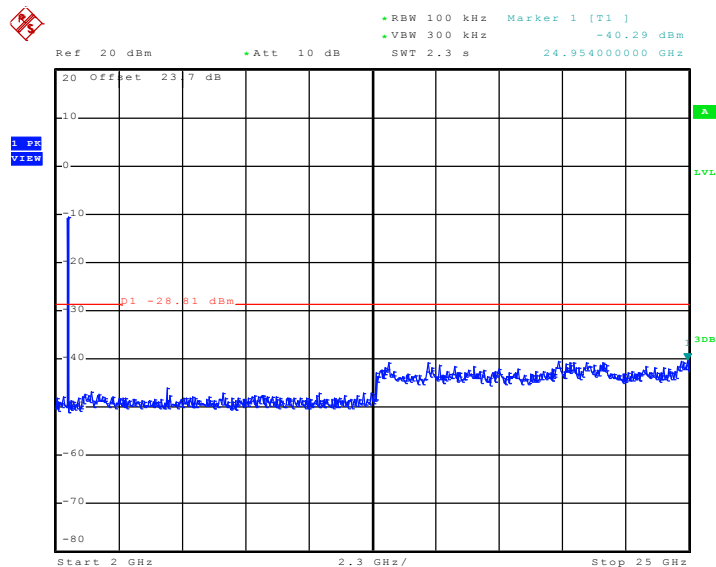
Date: 28.JUN.2012 01:30:44

802.11n HT-20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 28.JUN.2012 01:31:01

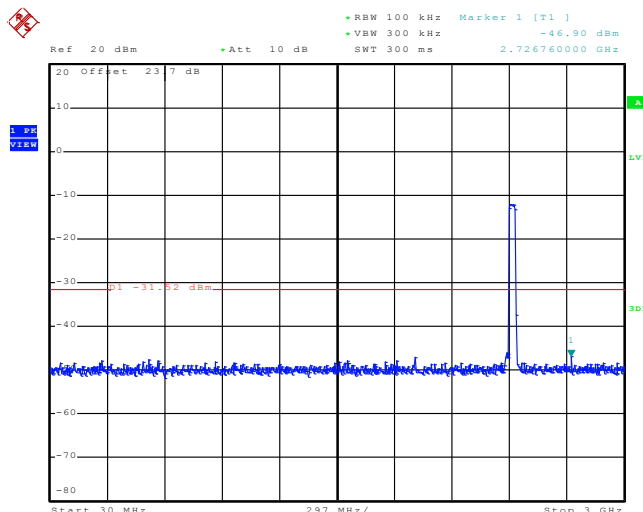
802.11n HT-20 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 28.JUN.2012 01:33:51

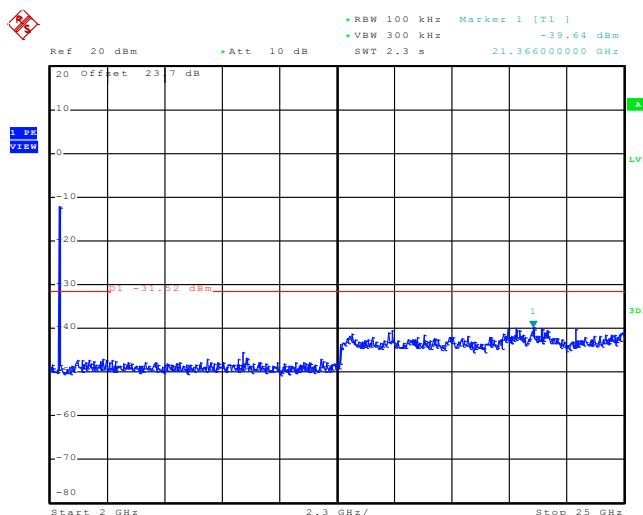
802.11n HT-20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 28.JUN.2012 01:34:09

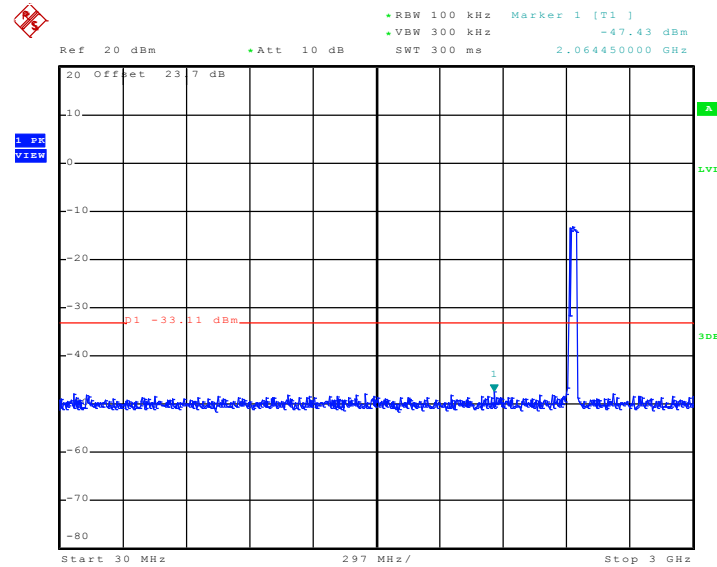
Test Mode :	802.11n HT-40	Temperature :	24~26
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53
Test Channel :	03, 06, 09	Test Engineer :	Book Lin

802.11n HT-40 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 03


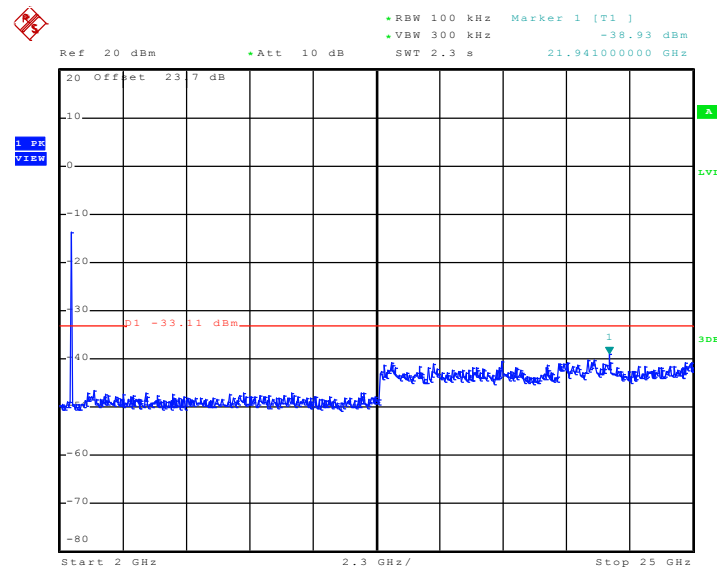
Date: 28.JUN.2012 01:22:51

802.11n HT-40 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 03


Date: 28.JUN.2012 01:23:09

802.11n HT-40 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 28.JUN.2012 01:21:41

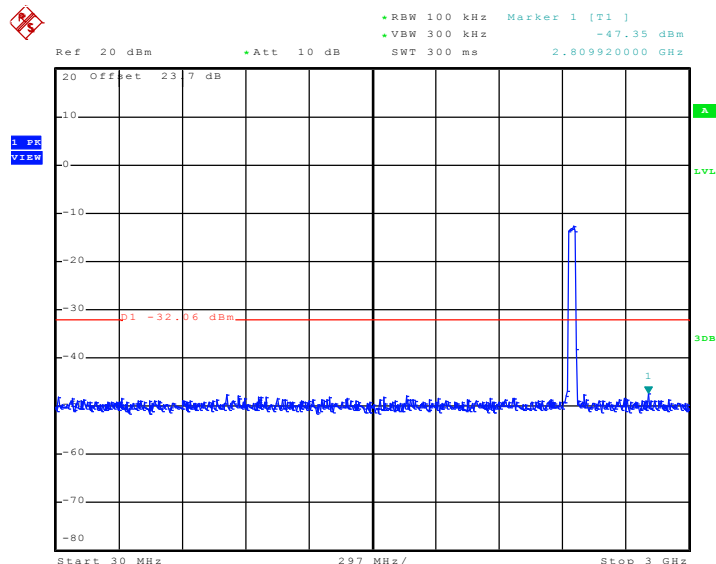
802.11n HT-40 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 28.JUN.2012 01:21:59



802.11n HT-40 30 MHz~3 GHz

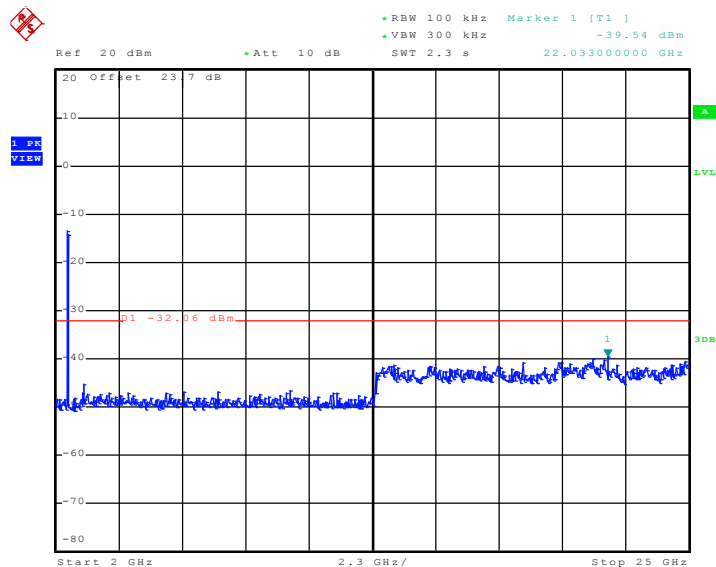
Conducted Spurious Emission Plot on Channel 09



Date: 28.JUN.2012 01:20:24

802.11n HT-40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 09



Date: 28.JUN.2012 01:20:41

3.5 Radiated Emission Measurement

3.5.1 Limit of Radiated Emission

In any 100 KHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

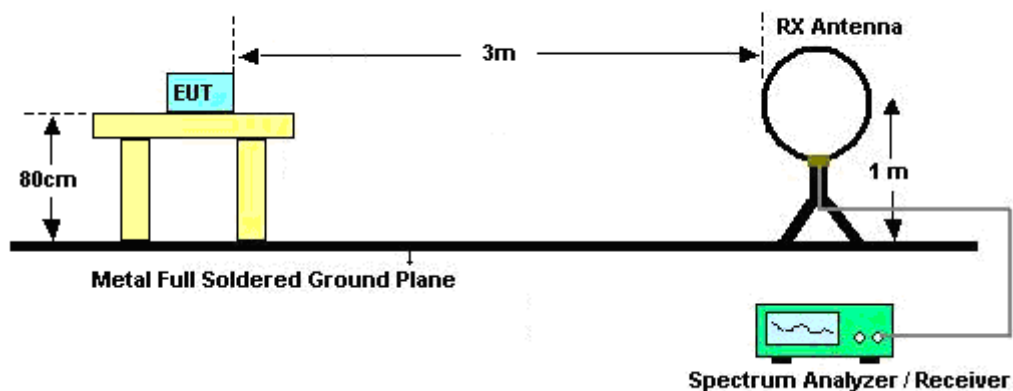
See list of measuring instruments of this test report.

3.5.3 Test Procedures

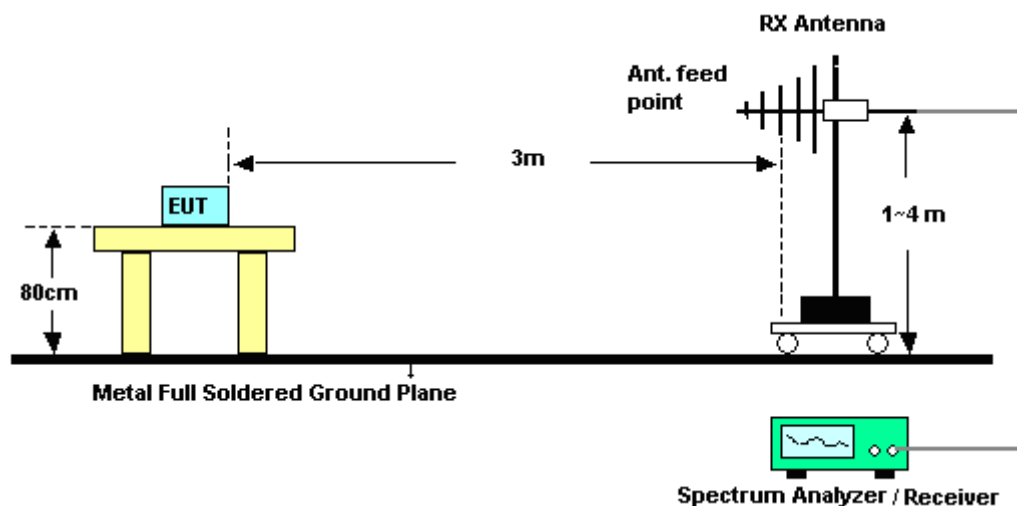
1. The testing follows TCB Workshop 2012, April and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving Antenna, which was mounted on the top of a variable height Antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest radiation.
5. Use the following spectrum analyzer settings:
6. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 KHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for Peak measurement, and then set VBW=10Hz, while maintaining all of the other instrument settings for Average measurement.
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamplifier Factor = Level
8. If the emission level of the EUT measured by the peak detector is more than 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported

3.5.4 Test Setup

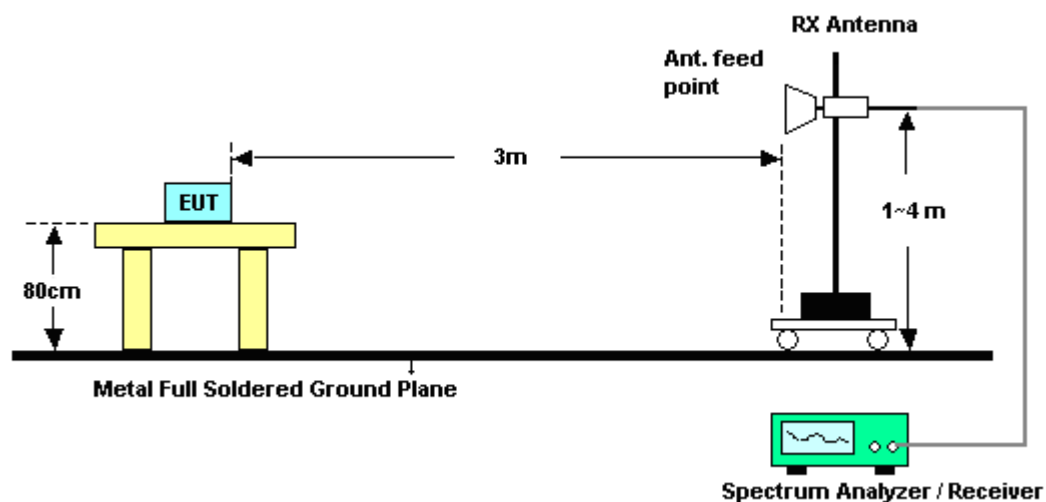
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Band Edges

Test Mode :	802.11b	Temperature :	20~22℃
Test Band :	Low	Relative Humidity :	40~42%
Test Channel :	01	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	58.82	-15.18	74	58.08	32.02	4.58	35.86	106	314	Peak
2389.29	49.7	-4.3	54	48.98	32.02	4.58	35.88	106	314	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	53.54	-20.46	74	52.8	32.02	4.58	35.86	166	244	Peak
2389.29	45.16	-8.84	54	44.44	32.02	4.58	35.88	166	244	Average

Test Mode :	802.11b	Temperature :	20~22℃
Test Band :	High	Relative Humidity :	40~42%
Test Channel :	11	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2488.4	52.86	-21.14	74	51.93	32.1	4.64	35.81	106	311	Peak
2483.5	43.55	-10.45	54	42.63	32.09	4.64	35.81	106	311	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.32	50.39	-23.61	74	49.47	32.09	4.64	35.81	192	242	Peak
2483.5	39.13	-14.87	54	38.21	32.09	4.64	35.81	192	242	Average



Test Mode :	802.11g	Temperature :	20~22℃
Test Band :	Low	Relative Humidity :	40~42%
Test Channel :	01	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.74	64.21	-9.79	74	63.49	32.02	4.58	35.88	107	306	Peak
2390	40.3	-13.7	54	39.56	32.02	4.58	35.86	107	306	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2382.81	57.19	-16.81	74	56.49	32	4.58	35.88	166	239	Peak
2390	37.52	-16.48	54	36.78	32.02	4.58	35.86	166	239	Average

Test Mode :	802.11g	Temperature :	20~22℃
Test Band :	High	Relative Humidity :	40~42%
Test Channel :	11	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.16	70.48	-3.52	74	69.55	32.1	4.64	35.81	106	301	Peak
2483.54	40.23	-13.77	54	39.31	32.09	4.64	35.81	106	301	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.44	68.63	-5.37	74	67.71	32.09	4.64	35.81	200	190	Peak
2483.5	38.11	-15.89	54	37.19	32.09	4.64	35.81	200	190	Average



Test Mode :	802.11n HT-20	Temperature :	20~22℃
Test Band :	Low	Relative Humidity :	40~42%
Test Channel :	01	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2384.61	60.91	-13.09	74	60.21	32	4.58	35.88	107	308	Peak
2390	40.88	-13.12	54	40.14	32.02	4.58	35.86	107	308	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	56.92	-17.08	74	56.18	32.02	4.58	35.86	166	244	Peak
2390	38.24	-15.76	54	37.5	32.02	4.58	35.86	166	244	Average

Test Mode :	802.11n HT-20	Temperature :	20~22℃
Test Band :	High	Relative Humidity :	40~42%
Test Channel :	11	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2498.88	67.46	-6.54	74	66.52	32.1	4.64	35.8	105	307	Peak
2483.5	40.34	-13.66	54	39.42	32.09	4.64	35.81	105	307	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2493	59.57	-14.43	74	58.63	32.1	4.64	35.8	163	239	Peak
2483.5	38.08	-15.92	54	37.16	32.09	4.64	35.81	163	239	Average



Test Mode :	802.11n HT-40	Temperature :	20~22℃
Test Band :	Low	Relative Humidity :	40~42%
Test Channel :	03	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2380.11	64.38	-9.62	74	63.68	32	4.58	35.88	107	311	Peak
2390	47	-7	54	46.26	32.02	4.58	35.86	107	311	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.75	57.94	-16.06	74	57.22	32.02	4.58	35.88	196	241	Peak
2390	43.34	-10.66	54	42.6	32.02	4.58	35.86	196	241	Average

Test Mode :	802.11n HT-40	Temperature :	20~22℃
Test Band :	High	Relative Humidity :	40~42%
Test Channel :	09	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2488.68	62.42	-11.58	74	61.49	32.1	4.64	35.81	105	309	Peak
2484.4	43.15	-10.85	54	42.23	32.09	4.64	35.81	105	309	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2490.42	62.09	-11.91	74	61.16	32.1	4.64	35.81	131	245	Peak
2483.6	39.35	-14.65	54	38.43	32.09	4.64	35.81	131	245	Average

3.5.7 Test Result of Radiated Emission (30 MHz ~ 10th Harmonic)

Test Mode :	802.11b	Temperature :	20~22℃
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 7236 MHz and 9648 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 112.96 dBμV/m - 20dB = 92.96 dBμV/m.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	24.13	-15.87	40	35.27	19.8	0.7	31.64	-	-	Peak
111.27	27.79	-15.71	43.5	46.77	11.4	1.15	31.53	-	-	Peak
265.44	31.49	-14.51	46	47.48	13.36	1.7	31.05	-	-	Peak
332.2	33.29	-12.71	46	48.59	13.88	1.86	31.04	-	-	Peak
831.3	34.08	-11.92	46	37.8	23.12	2.89	29.73	-	-	Peak
914.6	34.87	-11.13	46	38.14	23.74	3.02	30.03	100	36	Peak
2389.29	49.7	-4.3	54	48.98	32.02	4.58	35.88	106	314	Average
2390	58.82	-15.18	74	58.08	32.02	4.58	35.86	106	314	Peak
2412	108.22	-	-	107.46	32.03	4.59	35.86	106	314	Average
2412	112.96	-	-	112.2	32.03	4.59	35.86	106	314	Peak
2496	37	-17	54	36.06	32.1	4.64	35.8	106	314	Average
2496	50.05	-23.95	74	49.11	32.1	4.64	35.8	106	314	Peak
4824	46.05	-27.95	74	64.73	33.83	6.51	59.02	100	0	Peak
7236	49.15	-43.81	92.96	63.13	35.6	8.29	57.87	100	0	Peak
9648	46.27	-46.69	92.96	56.11	36.62	9.48	55.94	100	0	Peak

Test Mode :	802.11b	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 7236 MHz and 9648 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	31.49	-8.51	40	42.63	19.8	0.7	31.64	100	75	Peak
94.8	27.57	-15.93	43.5	48.72	9.2	1.08	31.43	-	-	Peak
265.98	26.15	-19.85	46	42.14	13.36	1.7	31.05	-	-	Peak
664.7	30.28	-15.72	46	37.56	20.25	2.61	30.14	-	-	Peak
831.3	31.13	-14.87	46	34.85	23.12	2.89	29.73	-	-	Peak
914.6	32.38	-13.62	46	35.65	23.74	3.02	30.03	-	-	Peak
2389.29	45.16	-8.84	54	44.44	32.02	4.58	35.88	166	244	Average
2389.83	53.54	-20.46	74	52.8	32.02	4.58	35.86	166	244	Peak
2412	103.64	-	-	102.88	32.03	4.59	35.86	166	244	Average
2412	108.3	-	-	107.54	32.03	4.59	35.86	166	244	Peak
2488	35.4	-18.6	54	34.47	32.1	4.64	35.81	166	244	Average
2488	47.5	-26.5	74	46.57	32.1	4.64	35.81	166	244	Peak
4824	45.7	-28.3	74	64.38	33.83	6.51	59.02	100	0	Peak
7236	52.28	-36.02	88.3	66.26	35.6	8.29	57.87	100	0	Peak
9648	48.83	-39.47	88.3	58.67	36.62	9.48	55.94	100	0	Peak

Test Mode :	802.11b	Temperature :	20~22℃
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 9748 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2382	38.4	-15.6	54	37.7	32	4.58	35.88	107	310	Average
2382	50.54	-23.46	74	49.84	32	4.58	35.88	107	310	Peak
2437	107.36	-	-	106.55	32.04	4.61	35.84	107	310	Average
2437	112.19	-	-	111.38	32.04	4.61	35.84	107	310	Peak
2488	36.85	-17.15	54	35.92	32.1	4.64	35.81	107	310	Average
2488	49.65	-24.35	74	48.72	32.1	4.64	35.81	107	310	Peak
4874	45.14	-28.86	74	63.67	33.82	6.53	58.88	100	0	Peak
7311	48.92	-25.08	74	62.89	35.6	8.42	57.99	100	0	Peak
9748	46.32	-45.87	92.19	55.96	36.76	9.49	55.89	100	0	Peak

Test Mode :	802.11b	Temperature :	20~22℃
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 9748 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388	36.08	-17.92	54	35.36	32.02	4.58	35.88	162	244	Average
2388	48.69	-25.31	74	47.97	32.02	4.58	35.88	162	244	Peak
2437	103.67	-	-	102.84	32.06	4.61	35.84	162	244	Average
2437	108.41	-	-	107.58	32.06	4.61	35.84	162	244	Peak
2484	35.76	-18.24	54	34.84	32.09	4.64	35.81	162	244	Average
2484	48.46	-25.54	74	47.54	32.09	4.64	35.81	162	244	Peak
4874	48.32	-25.68	74	66.85	33.82	6.53	58.88	100	0	Peak
7311	48.22	-5.78	54	62.19	35.6	8.42	57.99	100	91	Average
7311	52.69	-21.31	74	66.66	35.6	8.42	57.99	100	91	Peak
9748	49.17	-39.24	88.41	58.81	36.76	9.49	55.89	100	0	Peak

Test Mode :	802.11b	Temperature :	20~22℃
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 9848 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2380	37.32	-16.68	54	36.62	32	4.58	35.88	106	311	Average
2380	50.24	-23.76	74	49.54	32	4.58	35.88	106	311	Peak
2462	106.62	-	-	105.76	32.07	4.62	35.83	106	311	Average
2462	111.39	-	-	110.53	32.07	4.62	35.83	106	311	Peak
2483.5	43.55	-10.45	54	42.63	32.09	4.64	35.81	106	311	Average
2488.4	52.86	-21.14	74	51.93	32.1	4.64	35.81	106	311	Peak
4924	45.19	-28.81	74	63.56	33.81	6.56	58.74	100	0	Peak
7386	45.9	-28.1	74	59.88	35.6	8.55	58.13	100	0	Peak
9848	48.38	-43.01	91.39	57.83	36.88	9.51	55.84	100	0	Peak

Test Mode :	802.11b	Temperature :	20~22℃
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 9848 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2382	34.84	-19.16	54	34.14	32	4.58	35.88	192	242	Average
2382	46.7	-27.3	74	46	32	4.58	35.88	192	242	Peak
2462	101.18	-	-	100.32	32.07	4.62	35.83	192	242	Average
2462	105.95	-	-	105.09	32.07	4.62	35.83	192	242	Peak
2483.5	39.13	-14.87	54	38.21	32.09	4.64	35.81	192	242	Average
2484.32	50.39	-23.61	74	49.47	32.09	4.64	35.81	192	242	Peak
4924	49.28	-24.72	74	67.65	33.81	6.56	58.74	100	0	Peak
7386	48.23	-25.77	74	62.21	35.6	8.55	58.13	100	0	Peak
9848	51.65	-34.3	85.95	61.1	36.88	9.51	55.84	100	0	Peak

Test Mode :	802.11g	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.74	64.21	-9.79	74	63.49	32.02	4.58	35.88	107	306	Peak
2390	40.3	-13.7	54	39.56	32.02	4.58	35.86	107	306	Average
2412	96.35	-	-	95.59	32.03	4.59	35.86	107	306	Average
2412	107.17	-	-	106.41	32.03	4.59	35.86	107	306	Peak
2500	35.72	-18.28	54	34.78	32.1	4.64	35.8	107	306	Average
2500	47.91	-26.09	74	46.97	32.1	4.64	35.8	107	306	Peak

Test Mode :	802.11g	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2382.81	57.19	-16.81	74	56.49	32	4.58	35.88	166	239	Peak
2390	37.52	-16.48	54	36.78	32.02	4.58	35.86	166	239	Average
2412	91.64	-	-	90.88	32.03	4.59	35.86	166	239	Average
2412	102.42	-	-	101.66	32.03	4.59	35.86	166	239	Peak
2494	34.88	-19.12	54	33.94	32.1	4.64	35.8	166	239	Average
2494	46.74	-27.26	74	45.8	32.1	4.64	35.8	166	239	Peak

Test Mode :	802.11g	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2362	36.35	-17.65	54	35.68	31.99	4.57	35.89	108	307	Average
2362	49.19	-24.81	74	48.52	31.99	4.57	35.89	108	307	Peak
2437	95.63	-	-	94.82	32.04	4.61	35.84	108	307	Average
2437	106.54	-	-	105.73	32.04	4.61	35.84	108	307	Peak
2492	35.26	-18.74	54	34.32	32.1	4.64	35.8	108	307	Average
2492	48.23	-25.77	74	47.29	32.1	4.64	35.8	108	307	Peak

Test Mode :	802.11g	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2380	35.02	-18.98	54	34.32	32	4.58	35.88	164	241	Average
2380	47.37	-26.63	74	46.67	32	4.58	35.88	164	241	Peak
2437	91.05	-	-	90.22	32.06	4.61	35.84	164	241	Average
2437	101.91	-	-	101.08	32.06	4.61	35.84	164	241	Peak
2484	34.87	-19.13	54	33.95	32.09	4.64	35.81	164	241	Average
2484	47.48	-26.52	74	46.56	32.09	4.64	35.81	164	241	Peak



Test Mode :	802.11g	Temperature :	20~22℃
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	23.46	-16.54	40	34.6	19.8	0.7	31.64	-	-	Peak
110.46	27.88	-15.62	43.5	46.96	11.3	1.15	31.53	-	-	Peak
268.41	31.06	-14.94	46	47.35	13.09	1.7	31.08	-	-	Peak
332.2	33.78	-12.22	46	49.08	13.88	1.86	31.04	-	-	Peak
831.3	33.96	-12.04	46	37.68	23.12	2.89	29.73	-	-	Peak
914.6	36.33	-9.67	46	39.6	23.74	3.02	30.03	100	157	Peak
2358	38.28	-15.72	54	37.61	31.99	4.57	35.89	106	301	Average
2358	52.45	-21.55	74	51.78	31.99	4.57	35.89	106	301	Peak
2462	96.54	-	-	95.68	32.07	4.62	35.83	106	301	Average
2462	107.48	-	-	106.62	32.07	4.62	35.83	106	301	Peak
2483.54	40.23	-13.77	54	39.31	32.09	4.64	35.81	106	301	Average
2484.16	70.48	-3.52	74	69.55	32.1	4.64	35.81	106	301	Peak

Test Mode :	802.11g	Temperature :	20~22°C
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	31.67	-8.33	40	42.81	19.8	0.7	31.64	100	128	Peak
94.8	27.64	-15.86	43.5	48.79	9.2	1.08	31.43	-	-	Peak
266.25	25.86	-20.14	46	41.94	13.27	1.7	31.05	-	-	Peak
664.7	30.02	-15.98	46	37.3	20.25	2.61	30.14	-	-	Peak
831.3	31.6	-14.4	46	35.32	23.12	2.89	29.73	-	-	Peak
914.6	31.34	-14.66	46	34.61	23.74	3.02	30.03	-	-	Peak
2380	35.24	-18.76	54	34.54	32	4.58	35.88	200	190	Average
2380	47.56	-26.44	74	46.86	32	4.58	35.88	200	190	Peak
2462	91.51	-	-	90.65	32.07	4.62	35.83	200	190	Average
2462	102.6	-	-	101.74	32.07	4.62	35.83	200	190	Peak
2483.5	38.11	-15.89	54	37.19	32.09	4.64	35.81	200	190	Average
2484.44	68.63	-5.37	74	67.71	32.09	4.64	35.81	200	190	Peak

Test Mode :	802.11n-HT20	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2384.61	60.91	-13.09	74	60.21	32	4.58	35.88	107	308	Peak
2390	40.88	-13.12	54	40.14	32.02	4.58	35.86	107	308	Average
2412	95.05	-	-	94.29	32.03	4.59	35.86	107	308	Average
2412	106.1	-	-	105.34	32.03	4.59	35.86	107	308	Peak
2494	35.72	-18.28	54	34.78	32.1	4.64	35.8	107	308	Average
2494	47.97	-26.03	74	47.03	32.1	4.64	35.8	107	308	Peak

Test Mode :	802.11n-HT20	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	56.92	-17.08	74	56.18	32.02	4.58	35.86	166	244	Peak
2390	38.24	-15.76	54	37.5	32.02	4.58	35.86	166	244	Average
2412	90.31	-	-	89.55	32.03	4.59	35.86	166	244	Average
2412	101.48	-	-	100.72	32.03	4.59	35.86	166	244	Peak
2484	34.92	-19.08	54	34	32.09	4.64	35.81	166	244	Average
2484	47.08	-26.92	74	46.16	32.09	4.64	35.81	166	244	Peak



Test Mode :	802.11n-HT20	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2384	36.79	-17.21	54	36.09	32	4.58	35.88	108	311	Average
2384	49.1	-24.9	74	48.4	32	4.58	35.88	108	311	Peak
2437	95.44	-	-	94.63	32.04	4.61	35.84	108	311	Average
2437	106.47	-	-	105.66	32.04	4.61	35.84	108	311	Peak
2496	35.18	-18.82	54	34.24	32.1	4.64	35.8	108	311	Average
2496	58.79	-15.21	74	57.85	32.1	4.64	35.8	108	311	Peak

Test Mode :	802.11n-HT20	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2364	34.91	-19.09	54	34.24	31.99	4.57	35.89	163	240	Average
2364	48.46	-25.54	74	47.79	31.99	4.57	35.89	163	240	Peak
2437	90.79	-	-	89.96	32.06	4.61	35.84	163	240	Average
2437	101.9	-	-	101.07	32.06	4.61	35.84	163	240	Peak
2500	34.88	-19.12	54	33.94	32.1	4.64	35.8	163	240	Average
2500	47.5	-26.5	74	46.56	32.1	4.64	35.8	163	240	Peak



Test Mode :	802.11n-HT20	Temperature :	20~22℃
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	23.92	-16.08	40	35.06	19.8	0.7	31.64	-	-	Peak
110.46	27.86	-15.64	43.5	46.94	11.3	1.15	31.53	-	-	Peak
265.98	31.87	-14.13	46	47.86	13.36	1.7	31.05	-	-	Peak
332.2	31.63	-14.37	46	46.93	13.88	1.86	31.04	-	-	Peak
831.3	33.43	-12.57	46	37.15	23.12	2.89	29.73	-	-	Peak
914.6	35.39	-10.61	46	38.66	23.74	3.02	30.03	100	331	Peak
2380	36.51	-17.49	54	35.81	32	4.58	35.88	105	307	Average
2380	49.36	-24.64	74	48.66	32	4.58	35.88	105	307	Peak
2462	96.49	-	-	95.63	32.07	4.62	35.83	105	307	Average
2462	107	-	-	106.14	32.07	4.62	35.83	105	307	Peak
2483.5	40.34	-13.66	54	39.42	32.09	4.64	35.81	105	307	Average
2498.88	67.46	-6.54	74	66.52	32.1	4.64	35.8	105	307	Peak



Test Mode :	802.11n-HT20	Temperature :	20~22°C
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	30.9	-9.1	40	42.04	19.8	0.7	31.64	100	54	Peak
94.8	27.89	-15.61	43.5	49.04	9.2	1.08	31.43	-	-	Peak
266.25	24.79	-21.21	46	40.87	13.27	1.7	31.05	-	-	Peak
332.2	32.12	-13.88	46	47.42	13.88	1.86	31.04	-	-	Peak
831.3	31.88	-14.12	46	35.6	23.12	2.89	29.73	-	-	Peak
914.6	31.27	-14.73	46	34.54	23.74	3.02	30.03	-	-	Peak
2378	35.22	-18.78	54	34.53	32	4.57	35.88	163	239	Average
2378	47.04	-26.96	74	46.35	32	4.57	35.88	163	239	Peak
2462	90.89	-	-	90.03	32.07	4.62	35.83	163	239	Average
2462	102.01	-	-	101.15	32.07	4.62	35.83	163	239	Peak
2483.5	38.08	-15.92	54	37.16	32.09	4.64	35.81	163	239	Average
2493	59.57	-14.43	74	58.63	32.1	4.64	35.8	163	239	Peak



Test Mode :	802.11n-HT40	Temperature :	20~22°C
Test Channel :	03	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2422 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	23.3	-16.7	40	34.44	19.8	0.7	31.64	-	-	Peak
110.46	28.03	-15.47	43.5	47.11	11.3	1.15	31.53	-	-	Peak
266.52	31.67	-14.33	46	47.76	13.27	1.7	31.06	-	-	Peak
332.2	31.38	-14.62	46	46.68	13.88	1.86	31.04	-	-	Peak
831.3	33.6	-12.4	46	37.32	23.12	2.89	29.73	-	-	Peak
914.6	35.18	-10.82	46	38.45	23.74	3.02	30.03	100	185	Peak
2380.11	64.38	-9.62	74	63.68	32	4.58	35.88	107	311	Peak
2390	47	-7	54	46.26	32.02	4.58	35.86	107	311	Average
2422	93.74	-	-	92.95	32.04	4.59	35.84	107	311	Average
2422	104.46	-	-	103.67	32.04	4.59	35.84	107	311	Peak
2490	35.76	-18.24	54	34.83	32.1	4.64	35.81	107	311	Average
2490	57.61	-16.39	74	56.68	32.1	4.64	35.81	107	311	Peak



Test Mode :	802.11n-HT40	Temperature :	20~22°C
Test Channel :	03	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2422 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	31.45	-8.55	40	42.59	19.8	0.7	31.64	100	322	Peak
94.8	27.38	-16.12	43.5	48.53	9.2	1.08	31.43	-	-	Peak
266.25	24.18	-21.82	46	40.26	13.27	1.7	31.05	-	-	Peak
664.7	29.67	-16.33	46	36.95	20.25	2.61	30.14	-	-	Peak
831.3	30.53	-15.47	46	34.25	23.12	2.89	29.73	-	-	Peak
914.6	32.01	-13.99	46	35.28	23.74	3.02	30.03	-	-	Peak
2388.75	57.94	-16.06	74	57.22	32.02	4.58	35.88	196	241	Peak
2390	43.34	-10.66	54	42.6	32.02	4.58	35.86	196	241	Average
2422	88.82	-	-	88.03	32.04	4.59	35.84	196	241	Average
2422	99.6	-	-	98.81	32.04	4.59	35.84	196	241	Peak
2500	35.12	-18.88	54	34.18	32.1	4.64	35.8	196	241	Average
2500	47.7	-26.3	74	46.76	32.1	4.64	35.8	196	241	Peak

Test Mode :	802.11n-HT40	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	39.94	-14.06	54	39.2	32.02	4.58	35.86	106	309	Average
2390	56.37	-17.63	74	55.63	32.02	4.58	35.86	106	309	Peak
2437	92.59	-	-	91.8	32.04	4.59	35.84	106	309	Average
2437	103.46	-	-	102.67	32.04	4.59	35.84	106	309	Peak
2490	37.95	-16.05	54	37.02	32.1	4.64	35.81	106	309	Average
2490	57.92	-16.08	74	56.99	32.1	4.64	35.81	106	309	Peak

Test Mode :	802.11n-HT40	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2384	37.32	-16.68	54	36.62	32	4.58	35.88	165	245	Average
2384	56.74	-17.26	74	56.04	32	4.58	35.88	165	245	Peak
2437	87.31	-	-	86.5	32.04	4.61	35.84	165	245	Average
2437	98.2	-	-	97.39	32.04	4.61	35.84	165	245	Peak
2484	36.11	-17.89	54	35.19	32.09	4.64	35.81	165	245	Average
2484	50.1	-23.9	74	49.18	32.09	4.64	35.81	165	245	Peak

Test Mode :	802.11n-HT40	Temperature :	20~22°C
Test Channel :	09	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2452 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2384	36.52	-17.48	54	35.82	32	4.58	35.88	105	309	Average
2384	57.13	-16.87	74	56.43	32	4.58	35.88	105	309	Peak
2452	92.32	-	-	91.46	32.07	4.62	35.83	105	309	Average
2452	103.19	-	-	102.33	32.07	4.62	35.83	105	309	Peak
2484.4	43.15	-10.85	54	42.23	32.09	4.64	35.81	105	309	Average
2488.68	62.42	-11.58	74	61.49	32.1	4.64	35.81	105	309	Peak

Test Mode :	802.11n-HT40	Temperature :	20~22°C
Test Channel :	09	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2452 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386	35.05	-18.95	54	34.33	32.02	4.58	35.88	131	245	Average
2386	46.79	-27.21	74	46.07	32.02	4.58	35.88	131	245	Peak
2452	87.23	-	-	86.39	32.06	4.61	35.83	131	245	Average
2452	98.27	-	-	97.43	32.06	4.61	35.83	131	245	Peak
2483.6	39.35	-14.65	54	38.43	32.09	4.64	35.81	131	245	Average
2490.42	62.09	-11.91	74	61.16	32.1	4.64	35.81	131	245	Peak

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 KHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

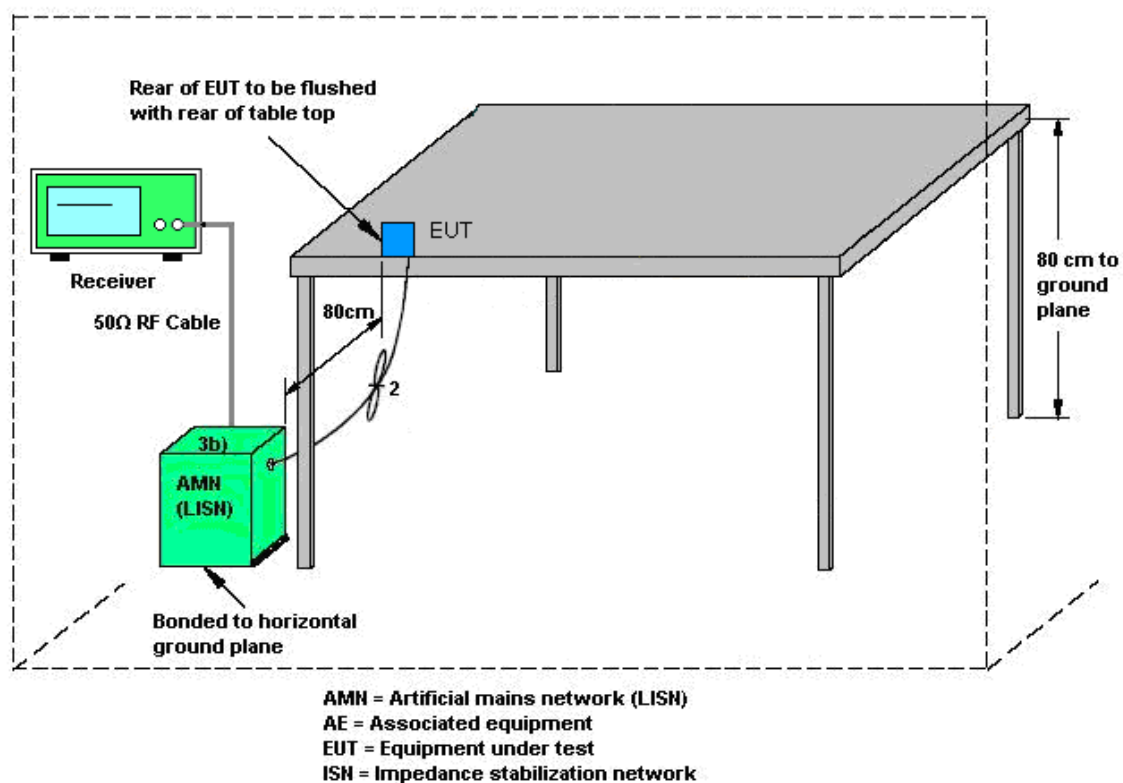
3.6.3 Test Procedures

1. The testing follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 KHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

Note:

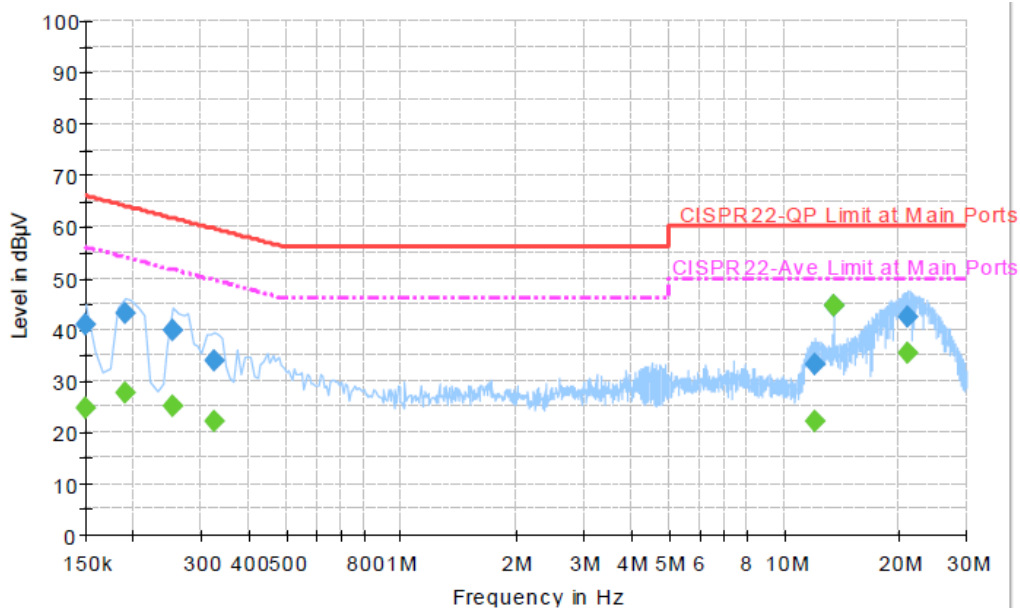
Although C63.4 is designed for Part 15 transmitters that operate above 30 MHz with a detachable antenna, we are willing to accept measurements on a 13.56 MHz transmitter done with a dummy load under the following conditions:

1. First, perform the AC line conducted tests with the antenna attached to make sure the device complies with the 15.207 limits outside the transmitter's fundamental emission band.
2. Second, retest with a dummy load to make sure the device complies with the 15.207 limits inside the transmitter's fundamental emission band. Only the fundamental TX emission band needs to be retested.

Test Setup


3.6.4 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	21~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	50~51%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link + Bluetooth Link + MPEG4 + Docking + NFC On + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit. 13.56 MHz is fundamental signal of NFC which can be ignored.		



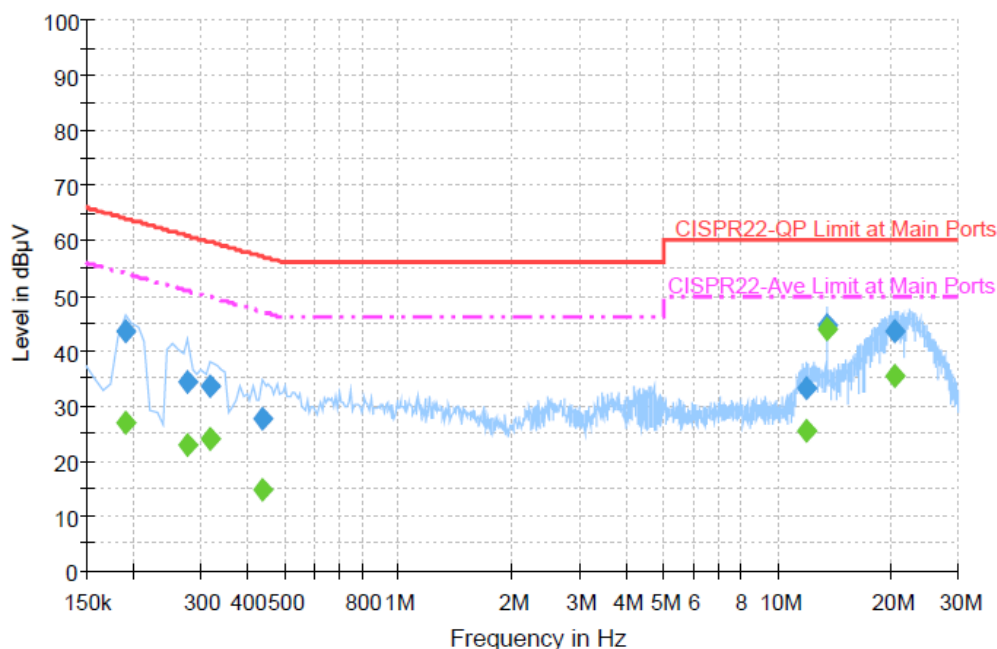
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	40.8	Off	L1	19.4	25.2	66.0
0.190000	43.2	Off	L1	19.4	20.8	64.0
0.254000	40.0	Off	L1	19.5	21.6	61.6
0.326000	33.9	Off	L1	19.4	25.7	59.6
12.094000	33.2	Off	L1	19.8	26.8	60.0
13.566000	44.7	Off	L1	19.8	15.3	60.0
21.150000	42.5	Off	L1	19.9	17.5	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	24.8	Off	L1	19.4	31.2	56.0
0.190000	27.7	Off	L1	19.4	26.3	54.0
0.254000	25.0	Off	L1	19.5	26.6	51.6
0.326000	22.2	Off	L1	19.4	27.4	49.6
12.094000	22.0	Off	L1	19.8	28.0	50.0
13.566000	44.5	Off	L1	19.8	5.5	50.0
21.150000	35.5	Off	L1	19.9	14.5	50.0

Test Mode :	Mode 2	Temperature :	21~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	50~51%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link + Bluetooth Link + MPEG4 + Docking + NFC On + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit. 13.56 MHz is fundamental signal of NFC which can be ignored.		


Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.190000	43.5	Off	N	19.4	20.5	64.0
0.278000	34.4	Off	N	19.4	26.5	60.9
0.318000	33.6	Off	N	19.4	26.2	59.8
0.438000	27.5	Off	N	19.4	29.6	57.1
11.950000	33.2	Off	N	19.8	26.8	60.0
13.558000	44.6	Off	N	19.9	15.4	60.0
20.454000	43.6	Off	N	20.0	16.4	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.190000	27.0	Off	N	19.4	27.0	54.0
0.278000	22.9	Off	N	19.4	28.0	50.9
0.318000	23.9	Off	N	19.4	25.9	49.8
0.438000	14.8	Off	N	19.4	32.3	47.1
11.950000	25.3	Off	N	19.8	24.7	50.0
13.558000	44.0	Off	N	19.9	6.0	50.0
20.454000	35.5	Off	N	20.0	14.5	50.0



3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.7.2 Antenna Connected Construction

Non-standard connector used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Jun. 21, 2012~ Jun. 28, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 18, 2011	Jun. 21, 2012~ Jun. 28, 2012	Sep. 17, 2012	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 18, 2011	Jun. 21, 2012~ Jun. 28, 2012	Sep. 17, 2012	Conducted (TH02-HY)
EMI Test Receiver	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Jul. 26, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Jul. 26, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Jul. 26, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000 W	N/A	N/A	N/A	Jul. 26, 2012	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz ~ 26.5GHz	Dec. 22, 2011	Jul. 04, 2012~ Jul. 06, 2012	Dec. 21, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 2GHz	Oct. 22, 2011	Jul. 04, 2012~ Jul. 06, 2012	Oct. 21, 2012	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 ~ 360 degree	N/A	Jul. 04, 2012~ Jul. 06, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m ~ 4 m	N/A	Jul. 04, 2012~ Jul. 06, 2012	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz ~ 18GHz	Aug. 04, 2011	Jul. 04, 2012~ Jul. 06, 2012	Aug. 03, 2012	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103A	161075	10Hz ~ 1000MHz Gain:32dB	Feb. 27, 2012	Jul. 04, 2012~ Jul. 06, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	MITEQ	AMF-7D-00 101800-30-10P	159087	1GHz~18GHz	Feb. 27, 2012	Jul. 04, 2012~ Jul. 06, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz~26.5GHz	Aug. 30, 2011	Jul. 04, 2012~ Jul. 06, 2012	Aug. 29, 2012	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz ~ 40GHz	Oct. 21, 2011	Jul. 04, 2012~ Jul. 06, 2012	Oct. 20, 2012	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 04, 2012~ Jul. 06, 2012	Jul. 28, 2012	Radiation (03CH05-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz~7GHz	Aug. 22, 2011	Jul. 04, 2012~ Jul. 06, 2012	Aug. 21, 2012	Radiation (03CH05-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	Jul. 04, 2012~ Jul. 06, 2012	Dec. 05, 2012	Radiation (03CH05-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.26
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.54
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
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Appendix A. Photographs of EUT

Please refer to Sporton report number EP260602 as below.