

FCC RF Test Report

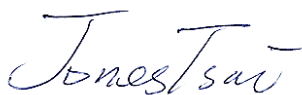
APPLICANT : Noto LLC
EQUIPMENT : Tablet PC
MODEL NAME : P48WVB4
FCC ID : S55-1210
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was completely tested on Jul. 17, 2013. 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: Joseph Lin / Supervisor



Approved 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.

TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Feature of Equipment Under Test	5
1.3 Product Specification of Equipment Under Test.....	5
1.4 Modification of EUT	5
1.5 Testing Site.....	6
1.6 Applied Standards	6
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	7
2.1 Carrier Frequency Channel	7
2.2 Pre-Scanned RF Power.....	8
2.3 Test Mode.....	9
2.4 Connection Diagram of Test System.....	11
2.5 Support Unit used in test configuration and system	12
2.6 Description of RF Function Operation Test Setup.....	12
2.7 Measurement Results Explanation Example.....	13
3 TEST RESULT	14
3.1 6dB Bandwidth Measurement	14
3.2 Output Power Measurement.....	17
3.3 Power Spectral Density Measurement	20
3.4 Conducted Band Edges and Spurious Emission Measurement	23
3.5 Radiated Band Edges and Spurious Emission Measurement	39
3.6 AC Conducted Emission Measurement.....	66
3.7 Antenna Requirements	70
4 LIST OF MEASURING EQUIPMENT	71
5 UNCERTAINTY OF EVALUATION	72

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 0.22 dB at 3654.000 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 8.70 dB at 0.190 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Noto LLC
201 Penn Center Boulevard
Suite 400
Pittsburgh, PA 15235

1.2 Feature of Equipment Under Test

Product Feature	
Equipment	Tablet PC
Model Name	P48WVB4
FCC ID	S55-1210
EUT supports Radios application	WLAN 11abgn / Bluetooth v2.1 + EDR

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

1.3 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	802.11b/g/n : 2412 MHz ~ 2462 MHz 802.11a/n: 5745~5825MHz.
Maximum Output Power to Antenna	<2412 MHz ~ 2462 MHz> 802.11b : 17.58 dBm (0.0573 W) 802.11g : 23.62 dBm (0.2301 W) 802.11n HT20 : 23.42 dBm (0.2198 W) <5745 MHz ~ 5825 MHz> 802.11a : 21.70 dBm (0.1479 W) 802.11n HT20 : 21.32 dBm (0.1355 W)
Antenna Type	802.11b/g/n : Fixed Internal Antenna type with gain 2.80 dBi 802.11a/n : Fixed Internal Antenna type with gain 4.70 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.4 Modification of EUT

No modifications are made to the EUT during all test items.

1.5 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	03CH07-HY	722060/4086B-1

Note: The test site complies with ANSI C63.4 2003 requirement.

1.6 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 v03r01
- ♦ ANSI C63.4-2003

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.

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals 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) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane in WLAN 2.4G and X plane in WLAN 5G) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

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		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4	149	5745	161	5805
	153	5765	165	5825
	157	5785	-	-

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and the highest data rates of peak power were chosen for full test shown in the following tables.

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	17.58	17.52	17.54	17.51

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)	23.62	23.51	23.60	23.59	23.55	23.37	23.47	23.51

2.4GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	23.42	23.34	23.38	23.32	23.34	23.24	23.29	23.24

5GHz 802.11a mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	21.70	21.58	21.58	21.50	21.46	21.56	21.46	21.46

5GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	21.32	21.24	21.21	21.30	21.22	21.19	21.28	21.21

2.3 Test Mode

Final results of test modes, data rates and test channels are shown as following table.

<2.4GHz>

Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW and Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
Conducted Spurious Emission	802.11b	1 Mbps	1/6/11	
	802.11g	6 Mbps	1/6/11	
	802.11n HT20	MCS0	1/6/11	
Radiated TCs	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
Remark: All the Radiated TCs were performed with Adapter 1.				

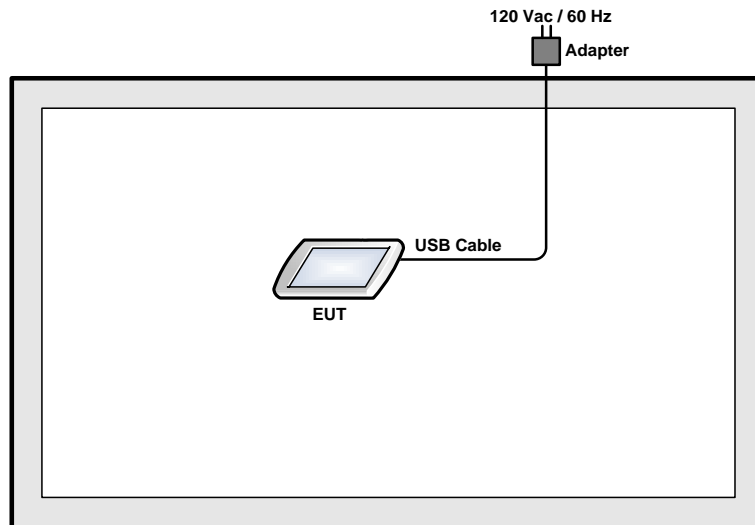
<5GHz>

Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB BW and Power Spectral Density	802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165
	Output Power	802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165
	Conducted Band Edge	802.11a	6 Mbps	149/165
		802.11n HT20	MCS0	149/165
	Conducted Spurious Emission	802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165
	Radiated TCs	Radiated Band Edge	802.11a	6 Mbps
802.11n HT20			MCS0	149/165
Radiated Spurious Emission		802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165
Remark: All the Radiated TCs were performed with Adapter 1.				

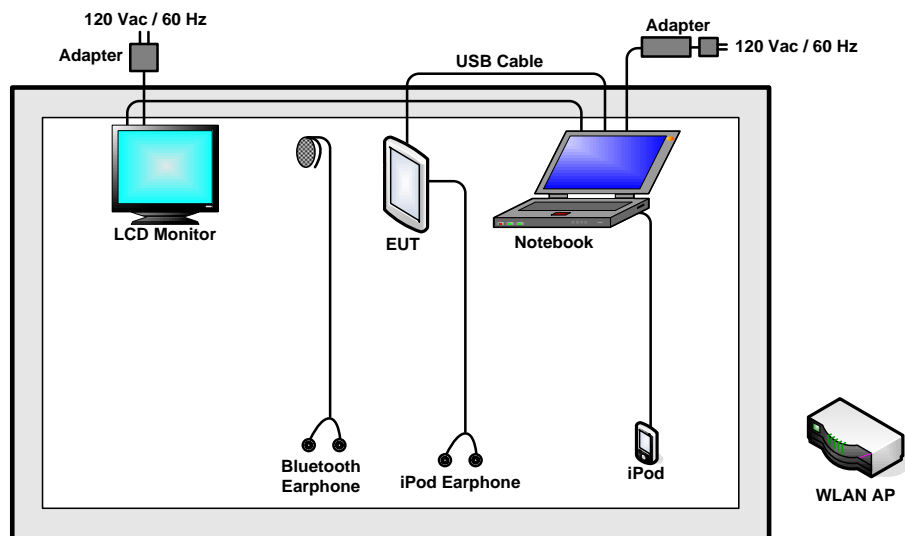
Test Cases	
AC Conducted Emission	Mode 1 : WLAN (2.4G) Link + Bluetooth Link + Earphone + MPEG4 + USB Cable (Data Link with Notebook) Mode 2 : WLAN (5G) Link + Bluetooth Link + Earphone + MPEG4 + USB Cable (Data Link with Notebook)
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.	

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

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.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
5.	iPod Earphone	Apple	N/A	FCC DoC	Unshielded, 1.0 m	N/A
6.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
7.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A
8.	Adapter 1	N/A	N/A	N/A	N/A	N/A
9.	USB Cable	N/A	N/A	N/A	Unshielded, 1.6 m	N/A

2.6 Description of RF Function Operation Test Setup

The programmed RF utility "ComplianceWifiBT", is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

2.7 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)} \end{aligned}$$

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.

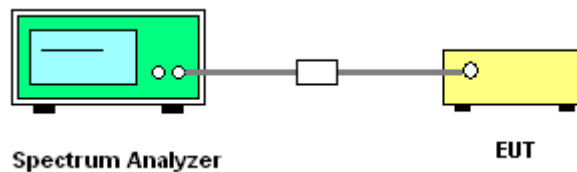
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. Measure and record the results in the test report.

3.1.4 Test Setup



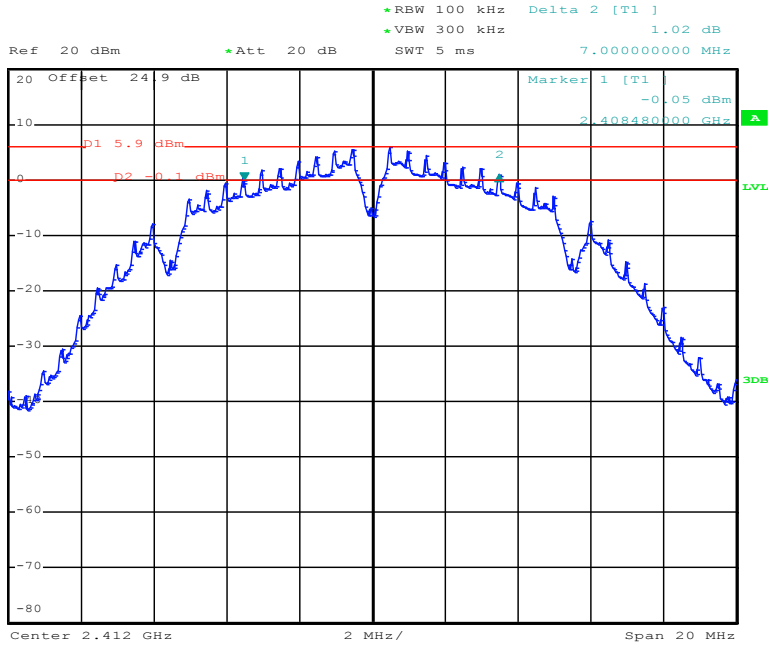
3.1.5 Test Result of 6dB Occupied Bandwidth

Test Band :	2.4GHz + 5GHz band 4	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	7.00	0.5	Pass
11b	1Mbps	1	6	2437	7.04	0.5	Pass
11b	1Mbps	1	11	2462	7.04	0.5	Pass
11g	6Mbps	1	1	2412	15.08	0.5	Pass
11g	6Mbps	1	6	2437	15.08	0.5	Pass
11g	6Mbps	1	11	2462	15.12	0.5	Pass
HT20	MCS0	1	1	2412	15.08	0.5	Pass
HT20	MCS0	1	6	2437	15.08	0.5	Pass
HT20	MCS0	1	11	2462	15.08	0.5	Pass

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11a	6Mbps	1	149	5745	15.10	0.5	Pass
11a	6Mbps	1	157	5785	15.08	0.5	Pass
11a	6Mbps	1	165	5825	15.12	0.5	Pass
HT20	MCS0	1	149	5745	15.12	0.5	Pass
HT20	MCS0	1	157	5785	15.08	0.5	Pass
HT20	MCS0	1	165	5825	15.12	0.5	Pass

Worst Case 6dB Bandwidth



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3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz and 5725-5850MHz, 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.

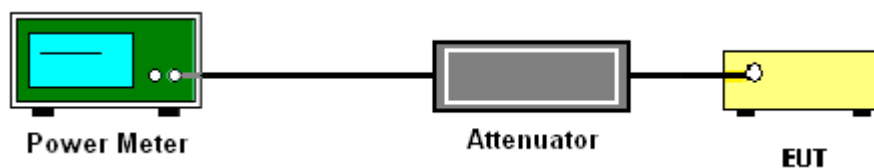
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r01.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
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 :	2.4GHz + 5GHz band 4	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	17.01	30	2.80	Pass
11b	1Mbps	1	6	2437	17.58	30	2.80	Pass
11b	1Mbps	1	11	2462	16.61	30	2.80	Pass
11g	6Mbps	1	1	2412	23.18	30	2.80	Pass
11g	6Mbps	1	6	2437	23.62	30	2.80	Pass
11g	6Mbps	1	11	2462	22.69	30	2.80	Pass
HT20	MCS0	1	1	2412	22.72	30	2.80	Pass
HT20	MCS0	1	6	2437	23.42	30	2.80	Pass
HT20	MCS0	1	11	2462	23.09	30	2.80	Pass

Note: Measured power (dBm) has offset with cable loss.

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	149	5745	20.21	30	4.70	Pass
11a	6Mbps	1	157	5785	21.11	30	4.70	Pass
11a	6Mbps	1	165	5825	21.70	30	4.70	Pass
HT20	MCS0	1	149	5745	20.11	30	4.70	Pass
HT20	MCS0	1	157	5785	20.95	30	4.70	Pass
HT20	MCS0	1	165	5825	21.32	30	4.70	Pass

Note: Measured power (dBm) has offset with cable loss.

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	2.4GHz + 5GHz band 4	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	0.00	13.88	30	2.80	Pass
11b	1Mbps	1	6	2437	0.00	14.54	30	2.80	Pass
11b	1Mbps	1	11	2462	0.00	13.60	30	2.80	Pass
11g	6Mbps	1	1	2412	0.04	14.35	30	2.80	Pass
11g	6Mbps	1	6	2437	0.04	15.15	30	2.80	Pass
11g	6Mbps	1	11	2462	0.04	13.44	30	2.80	Pass
HT20	MCS0	1	1	2412	0.05	13.26	30	2.80	Pass
HT20	MCS0	1	6	2437	0.05	15.06	30	2.80	Pass
HT20	MCS0	1	11	2462	0.05	13.99	30	2.80	Pass

Note: Measured power (dBm) has offset with cable loss and duty factor.

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	149	5745	0.04	11.24	30	4.70	Pass
11a	6Mbps	1	157	5785	0.04	12.48	30	4.70	Pass
11a	6Mbps	1	165	5825	0.04	13.38	30	4.70	Pass
HT20	MCS0	1	149	5745	0.05	11.09	30	4.70	Pass
HT20	MCS0	1	157	5785	0.05	12.47	30	4.70	Pass
HT20	MCS0	1	165	5825	0.05	12.96	30	4.70	Pass

Note: Measured power (dBm) has offset with cable loss and duty factor.

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.

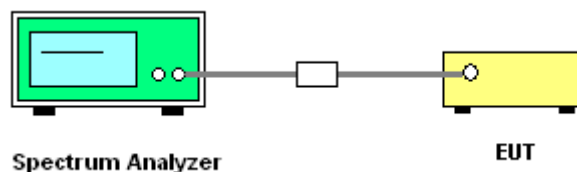
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
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.
6. Measure and record the results in the test report.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Test Mode :	2.4GHz + 5GHz band 4	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

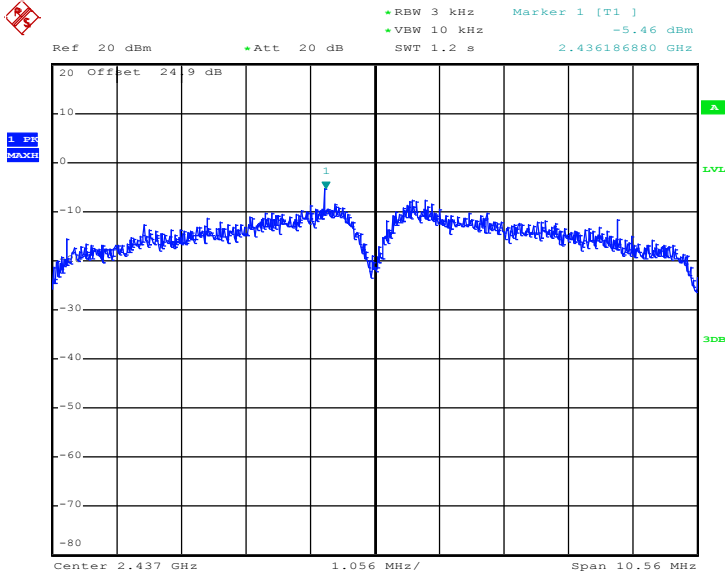
Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)	Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	-8.47	8	2.80	Pass
11b	1Mbps	1	6	2437	-5.46	8	2.80	Pass
11b	1Mbps	1	11	2462	-10.13	8	2.80	Pass
11g	6Mbps	1	1	2412	-10.57	8	2.80	Pass
11g	6Mbps	1	6	2437	-10.41	8	2.80	Pass
11g	6Mbps	1	11	2462	-11.57	8	2.80	Pass
HT20	MCS0	1	1	2412	-10.68	8	2.80	Pass
HT20	MCS0	1	6	2437	-9.67	8	2.80	Pass
HT20	MCS0	1	11	2462	-10.20	8	2.80	Pass

Note: Measured power density (dBm) has offset with cable loss.

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)	Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
11a	6Mbps	1	149	5745	-14.13	8	4.70	Pass
11a	6Mbps	1	157	5785	-13.36	8	4.70	Pass
11a	6Mbps	1	165	5825	-11.75	8	4.70	Pass
HT20	MCS0	1	149	5745	-13.57	8	4.70	Pass
HT20	MCS0	1	157	5785	-12.74	8	4.70	Pass
HT20	MCS0	1	165	5825	-12.17	8	4.70	Pass

Note: Measured power density (dBm) has offset with cable loss.

Worst Case Power Density (dBm/3kHz)



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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).

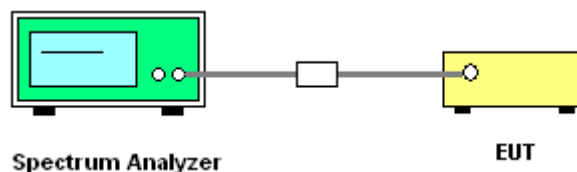
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

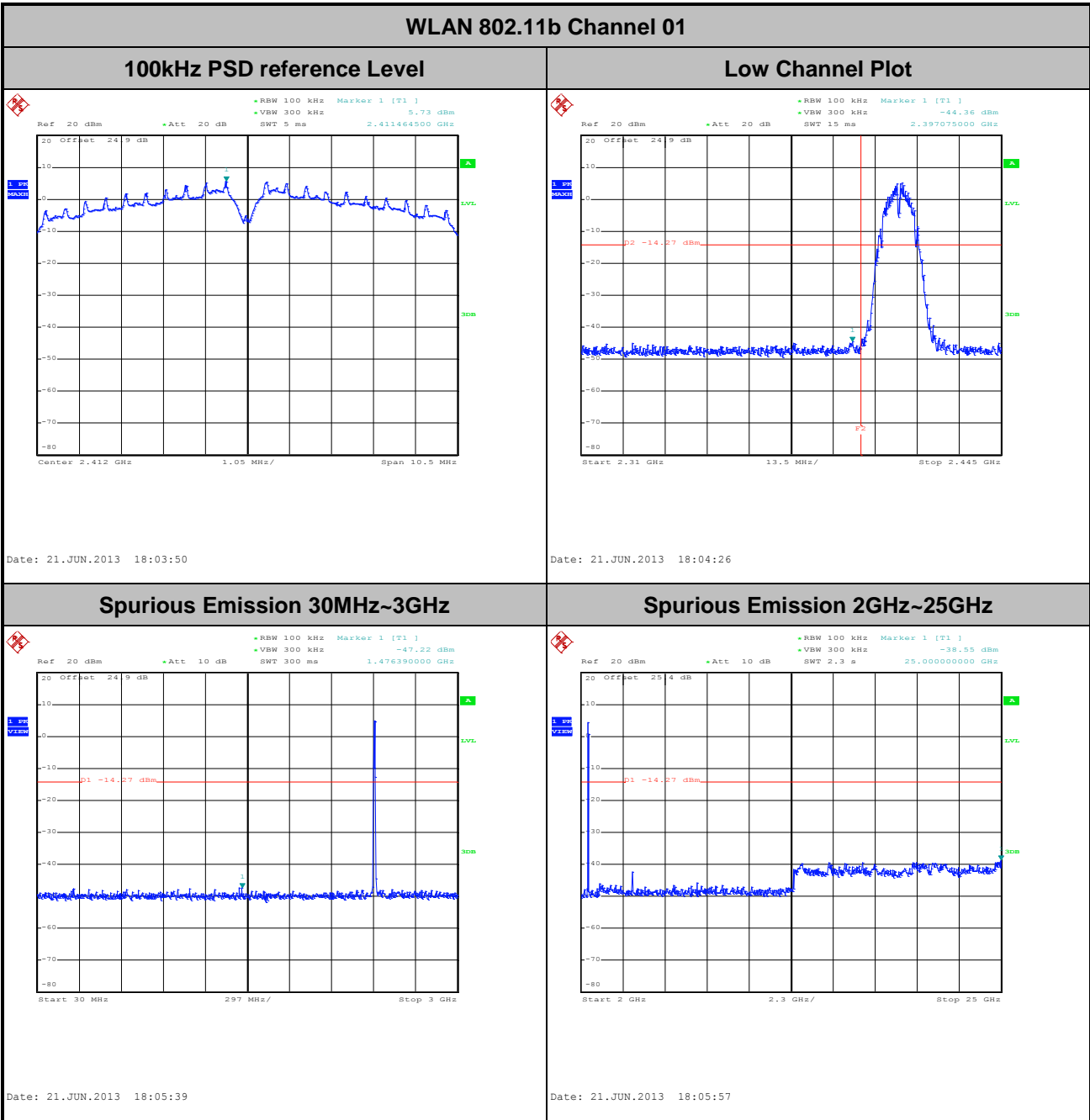
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges and Spurious Emission

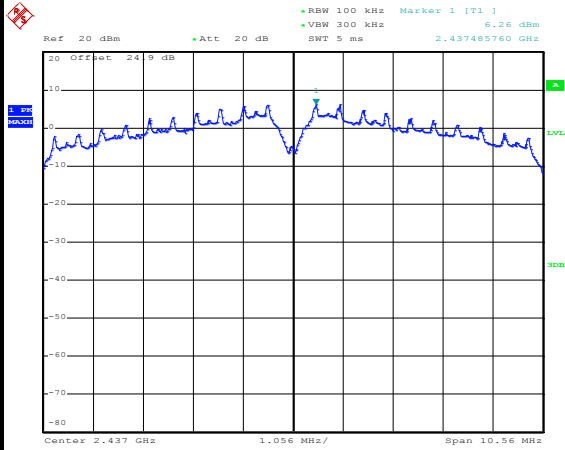
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Coyote Lin



Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Coyote Lin

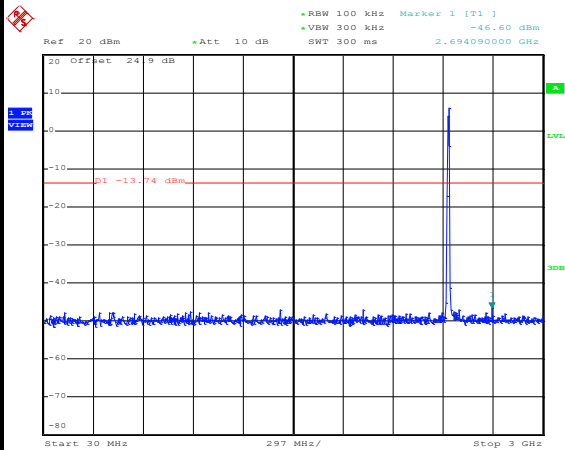
WLAN 802.11b Channel 06

100kHz PSD reference Level



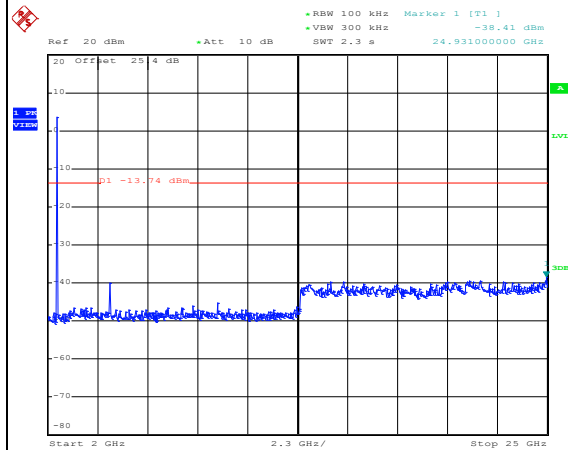
Date: 21.JUN.2013 18:43:34

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2013 18:43:57

Spurious Emission 2GHz~25GHz

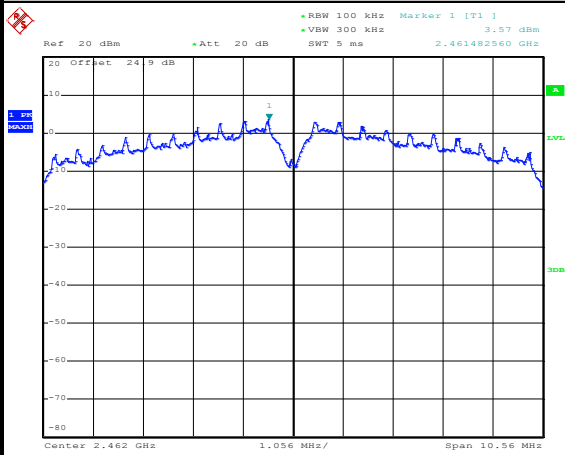


Date: 21.JUN.2013 18:44:16

Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Coyote Lin

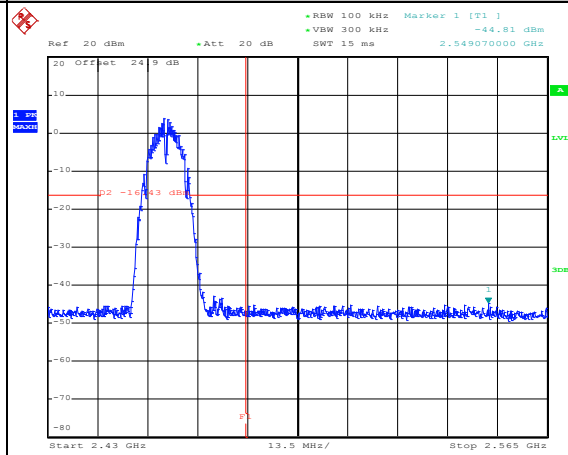
WLAN 802.11b Channel 11

100kHz PSD reference Level



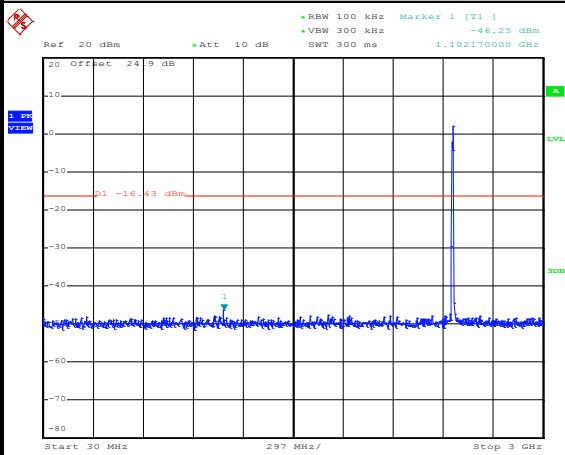
Date: 21.JUN.2013 18:13:26

High Channel Plot



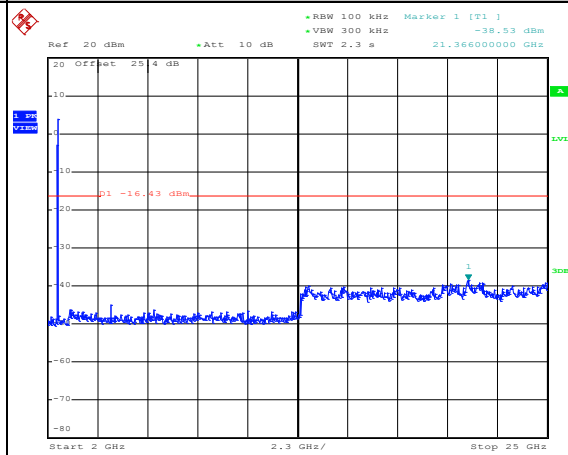
Date: 21.JUN.2013 18:13:42

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2013 18:14:06

Spurious Emission 2GHz~25GHz

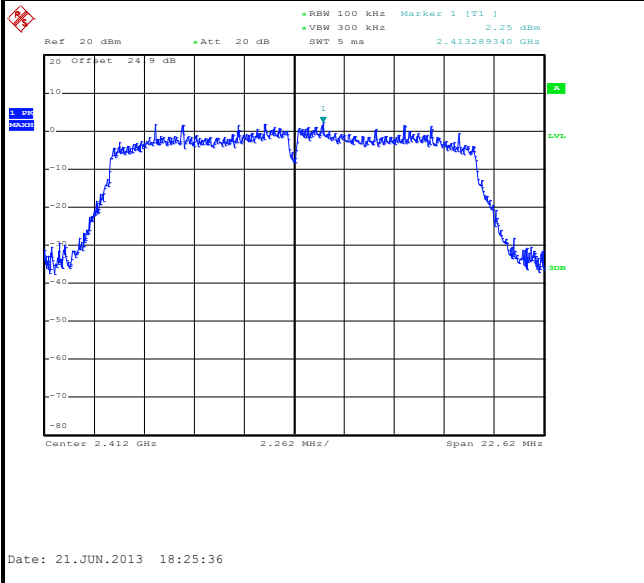


Date: 21.JUN.2013 18:14:24

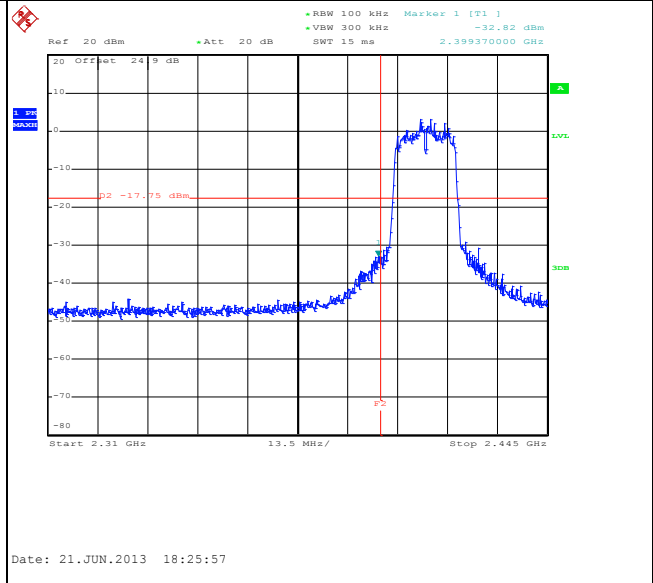
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Coyote Lin

WLAN 802.11g Channel 01

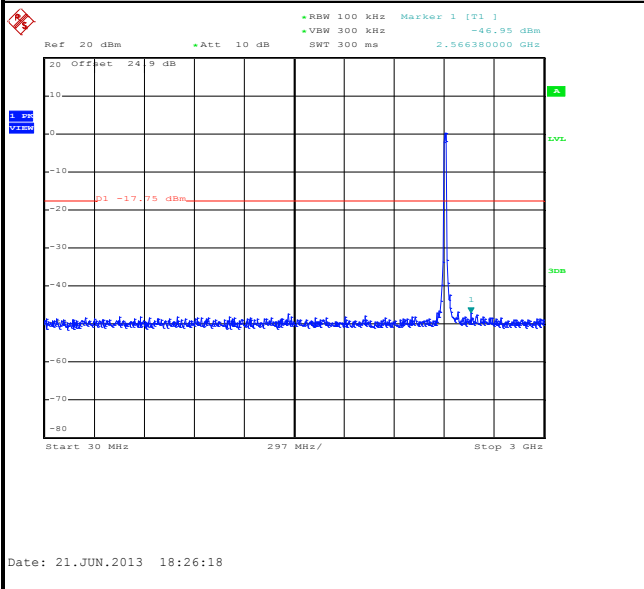
100kHz PSD reference Level



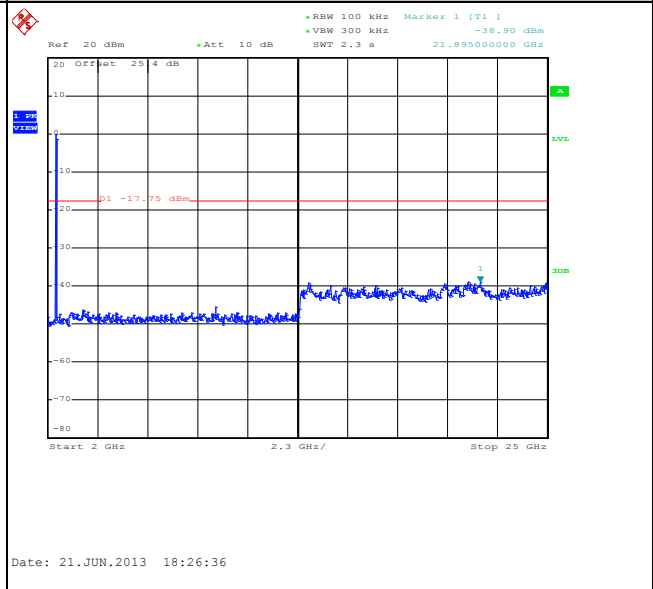
Low Channel Plot



Spurious Emission 30MHz~3GHz



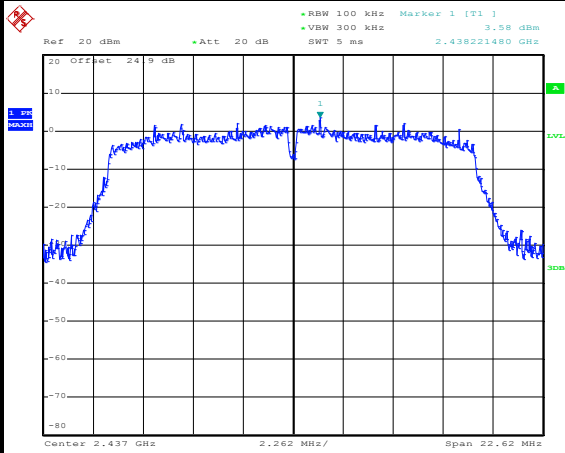
Spurious Emission 2GHz~25GHz



Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Coyote Lin

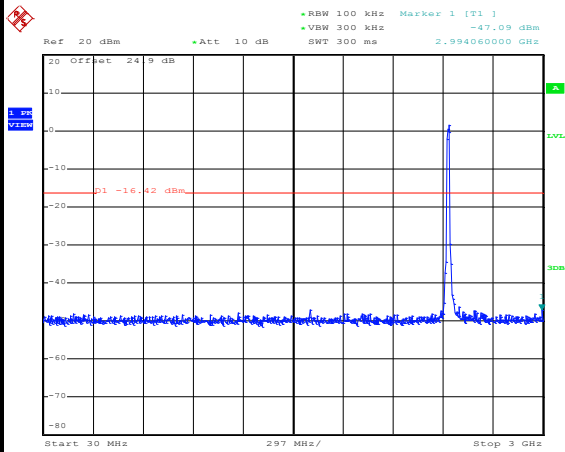
WLAN 802.11g Channel 06

100kHz PSD reference Level



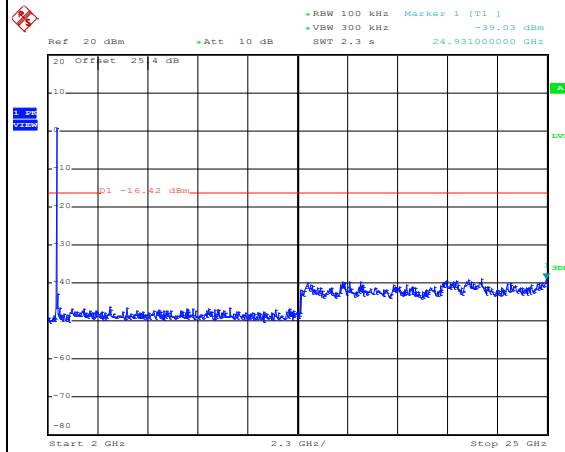
Date: 21.JUN.2013 18:22:33

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2013 18:22:54

Spurious Emission 2GHz~25GHz

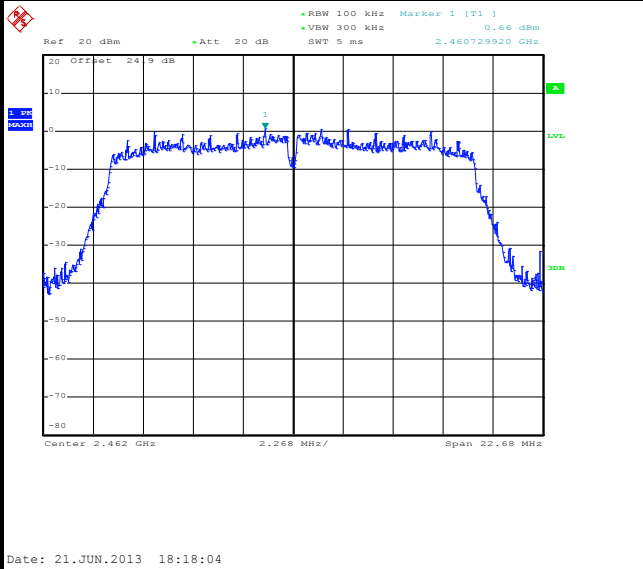


Date: 21.JUN.2013 18:23:12

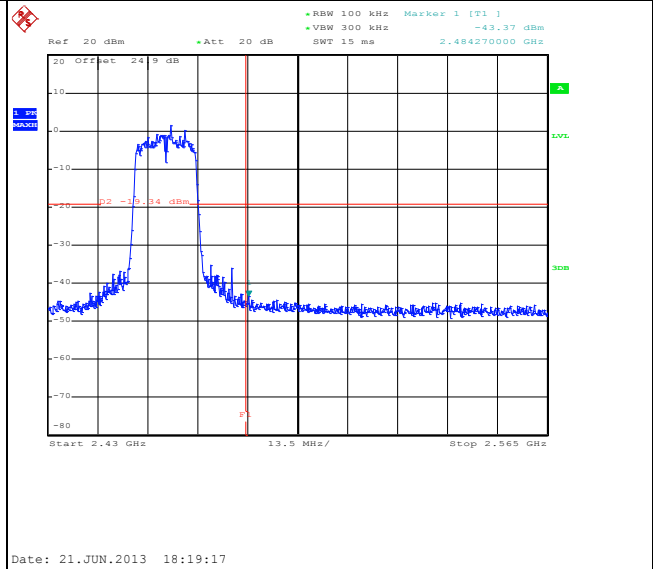
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Coyote Lin

WLAN 802.11g Channel 11

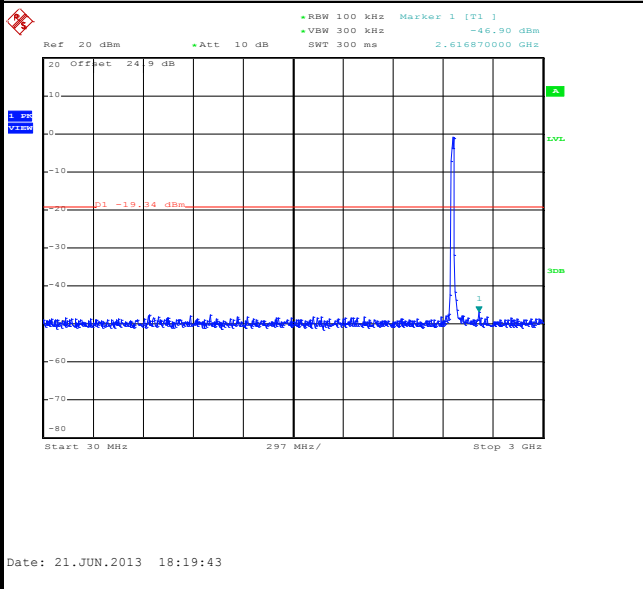
100kHz PSD reference Level



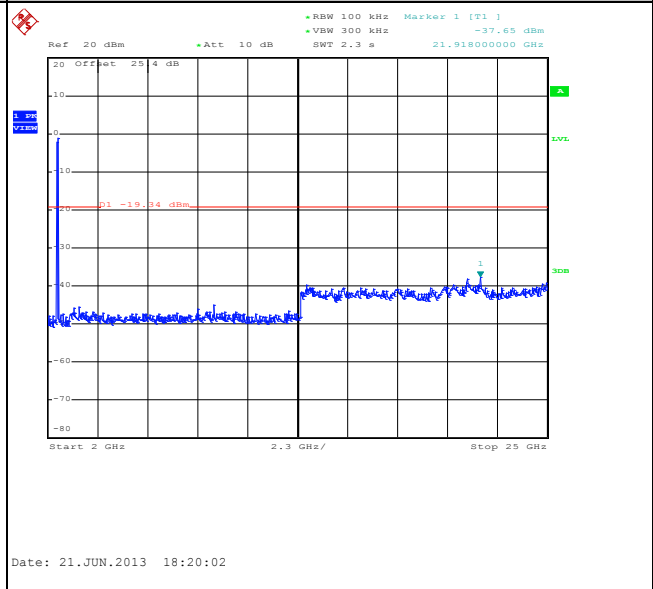
High Channel Plot



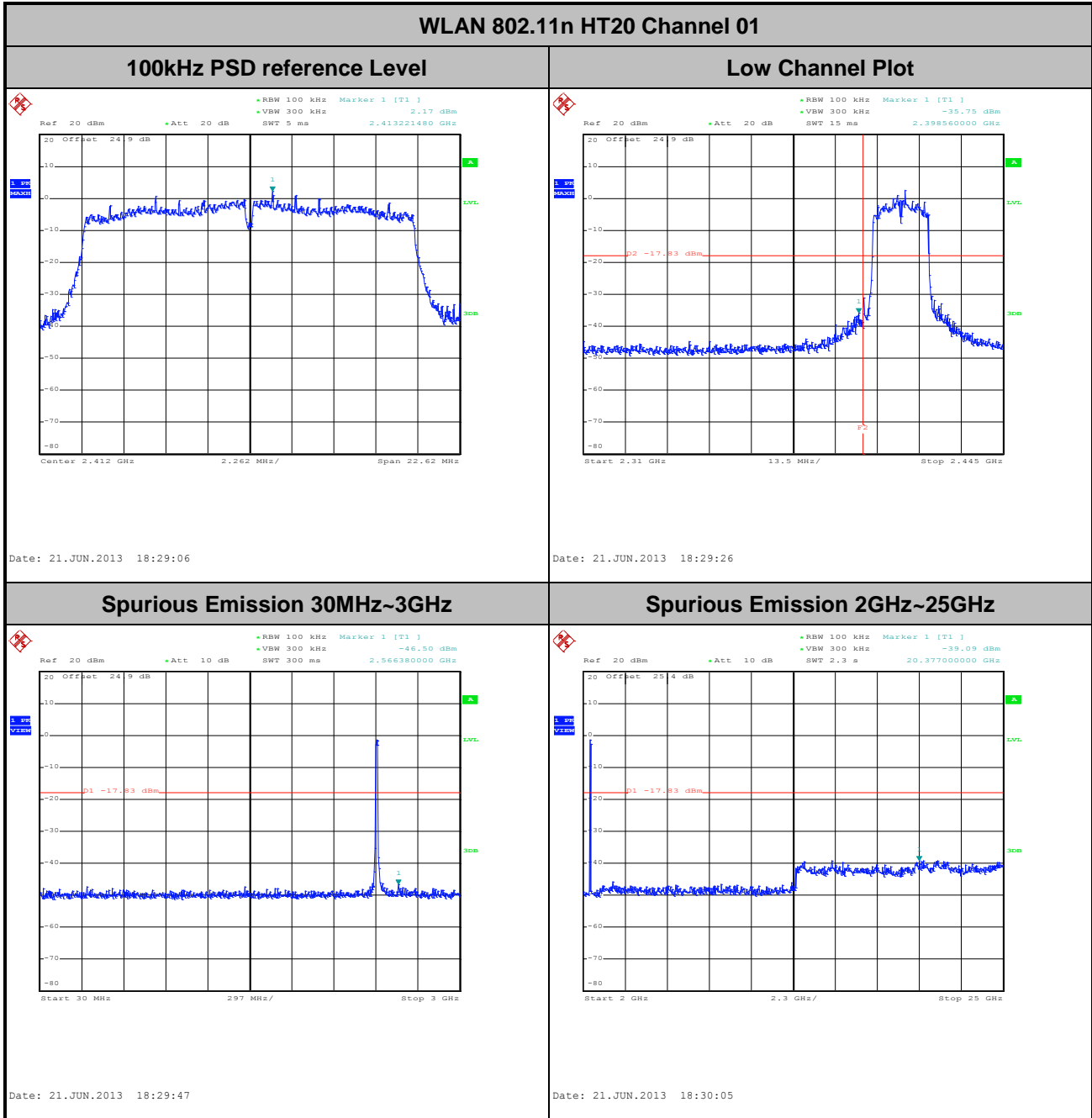
Spurious Emission 30MHz~3GHz



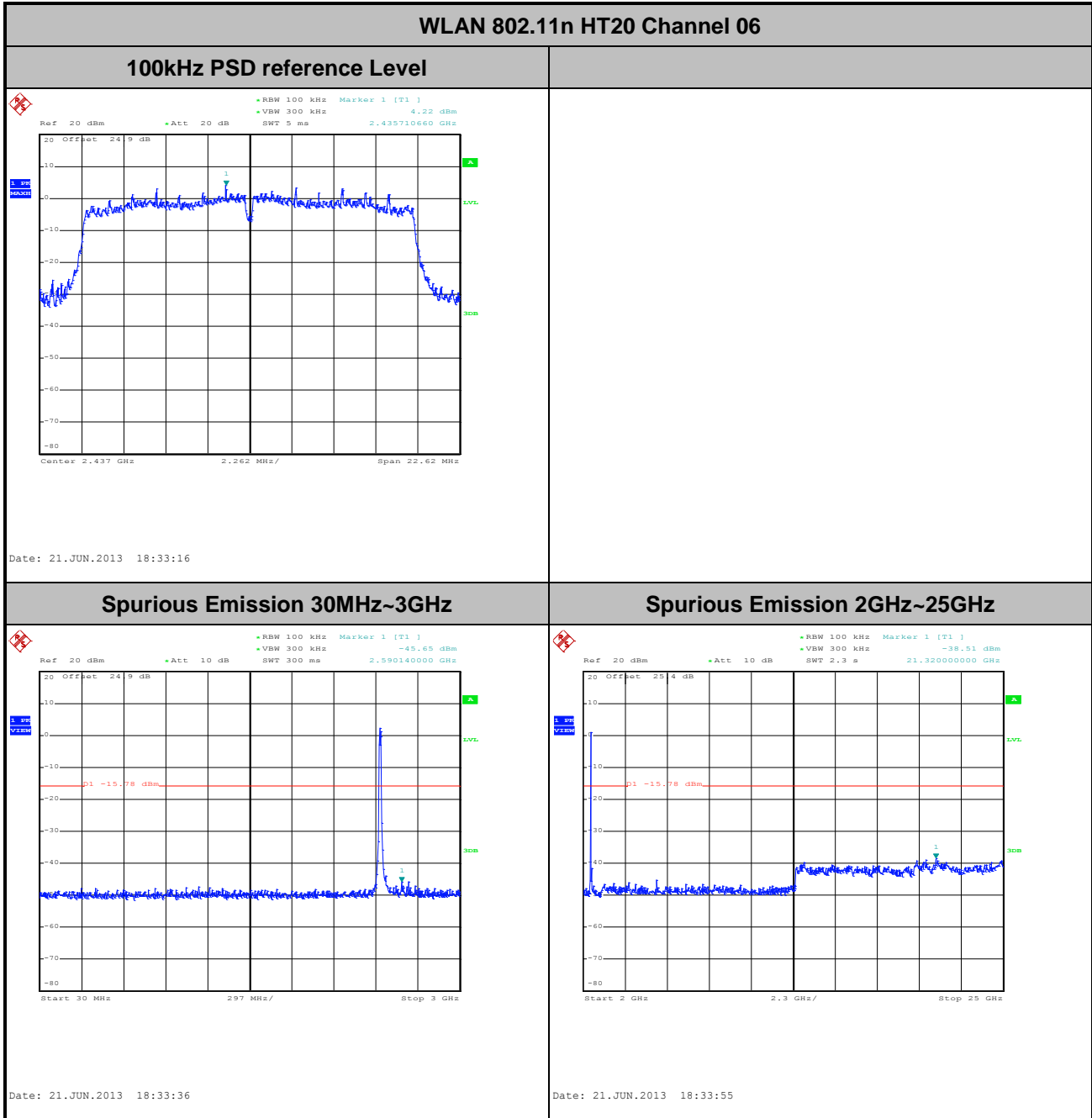
Spurious Emission 2GHz~25GHz



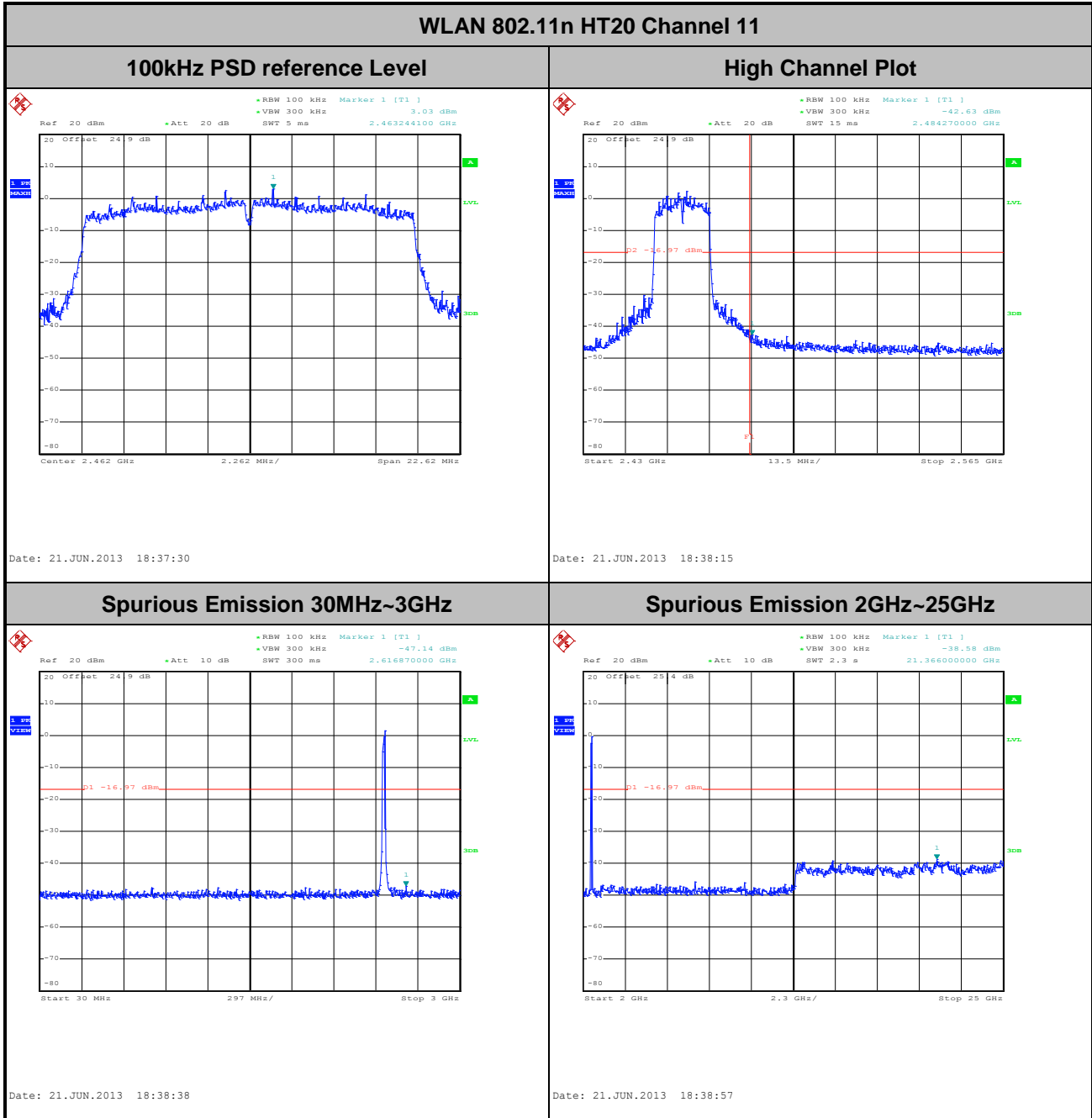
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Coyote Lin



Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Coyote Lin



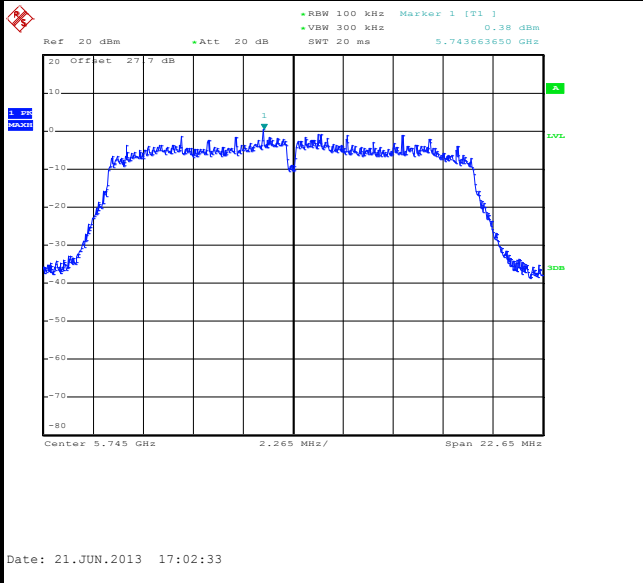
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Coyote Lin



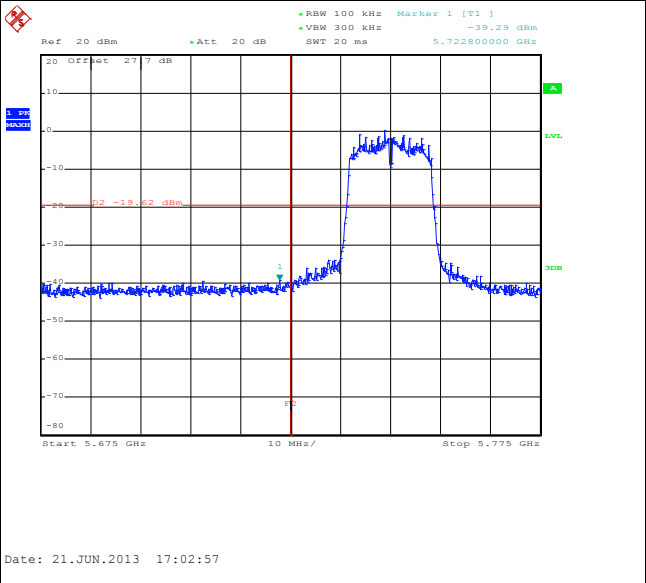
Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	5GHz Low	Relative Humidity :	50~53%
Test Channel :	149	Test Engineer :	Coyote Lin

WLAN 802.11a Channel 149

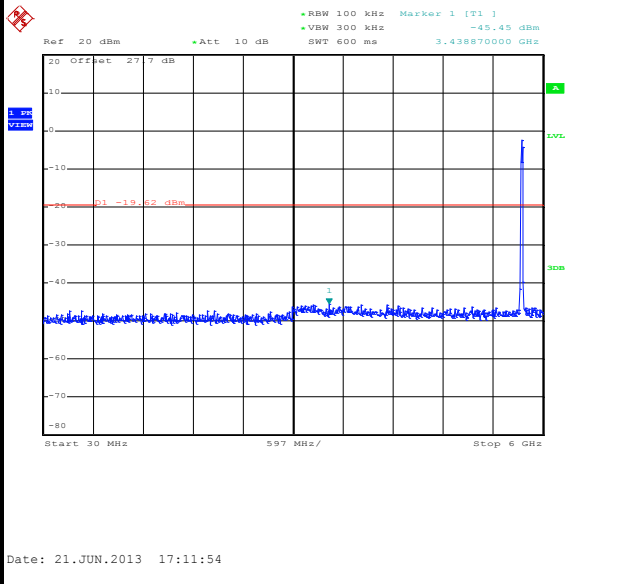
100kHz PSD reference Level



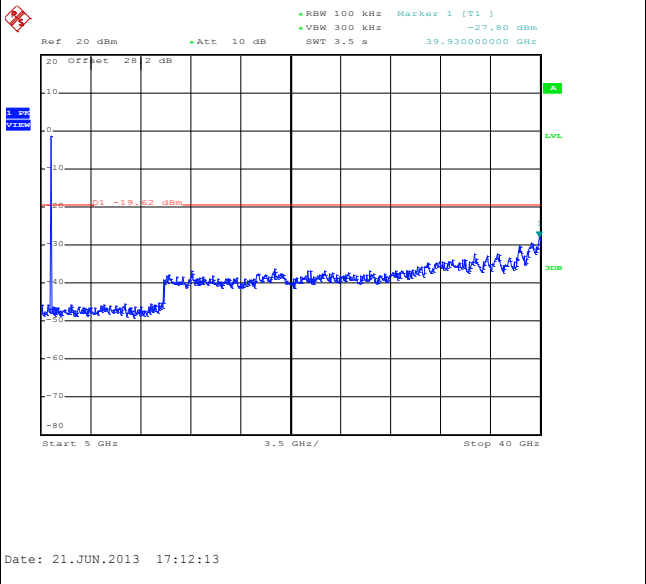
Low Channel Plot



Spurious Emission 30MHz~6GHz



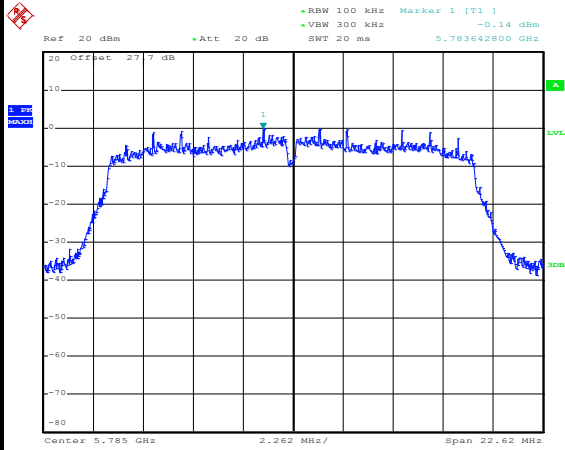
Spurious Emission 5GHz~40GHz



Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	5GHz Mid	Relative Humidity :	50~53%
Test Channel :	157	Test Engineer :	Coyote Lin

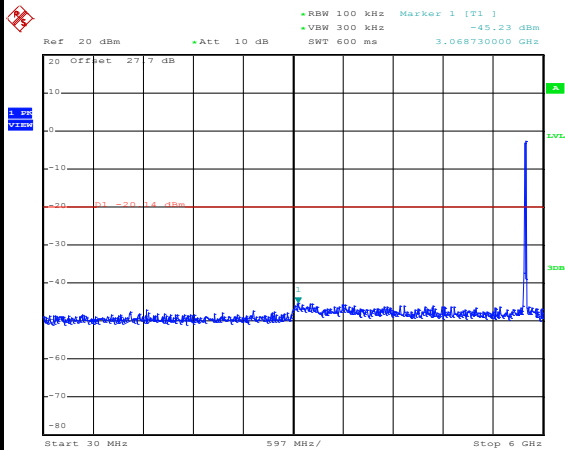
WLAN 802.11a Channel 157

100kHz PSD reference Level



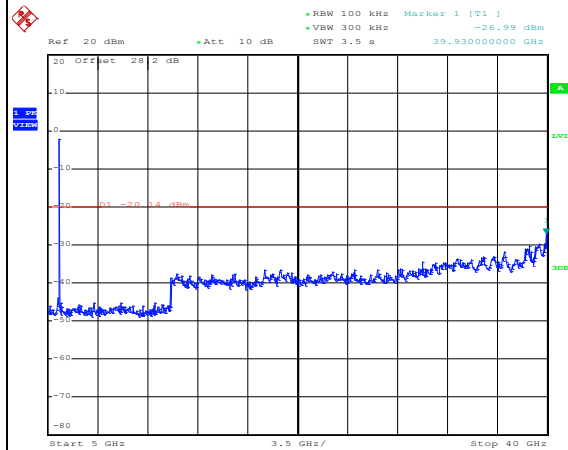
Date: 21.JUN.2013 17:09:56

Spurious Emission 30MHz~6GHz



Date: 21.JUN.2013 17:10:29

Spurious Emission 5GHz~40GHz

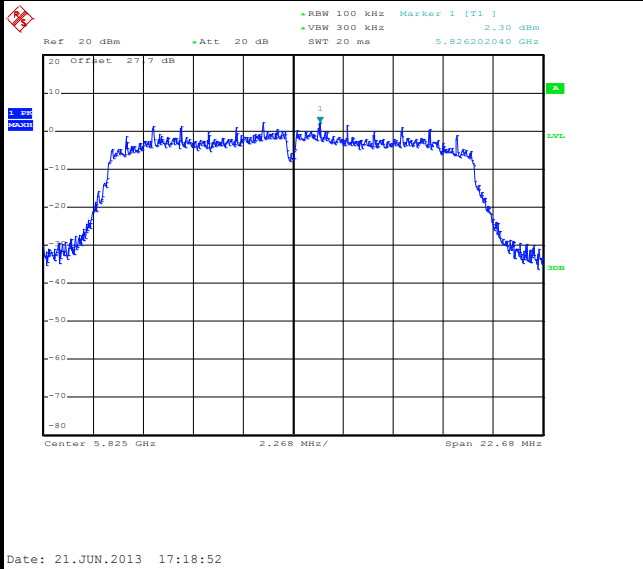


Date: 21.JUN.2013 17:10:48

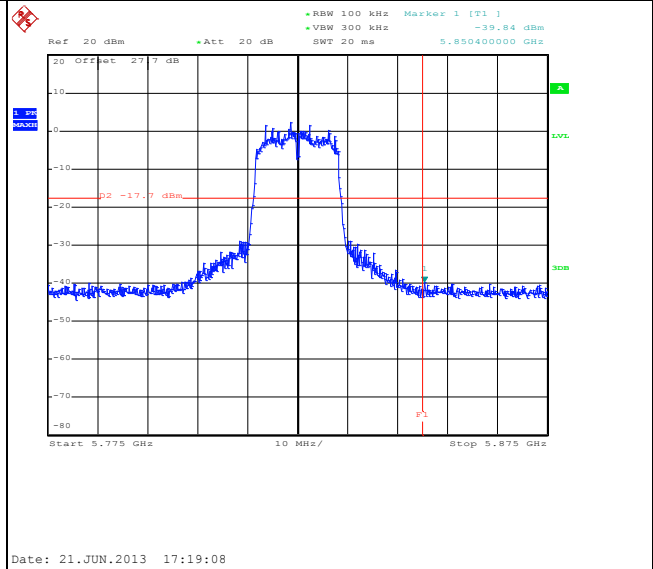
Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	5GHz High	Relative Humidity :	50~53%
Test Channel :	165	Test Engineer :	Coyote Lin

WLAN 802.11a Channel 165

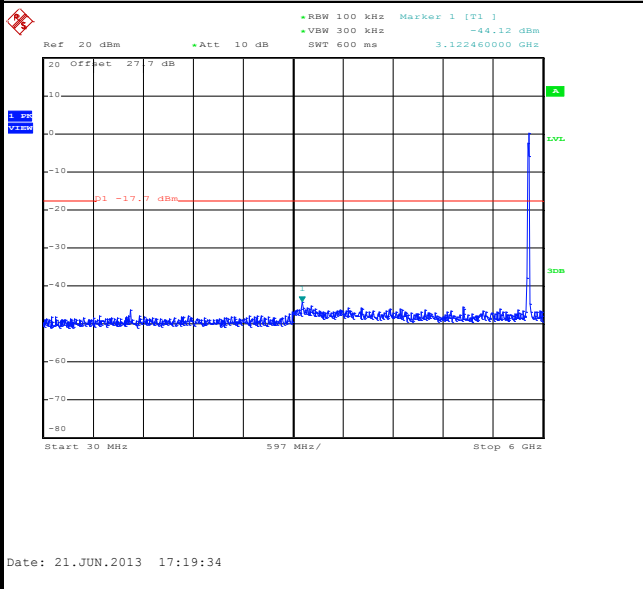
100kHz PSD reference Level



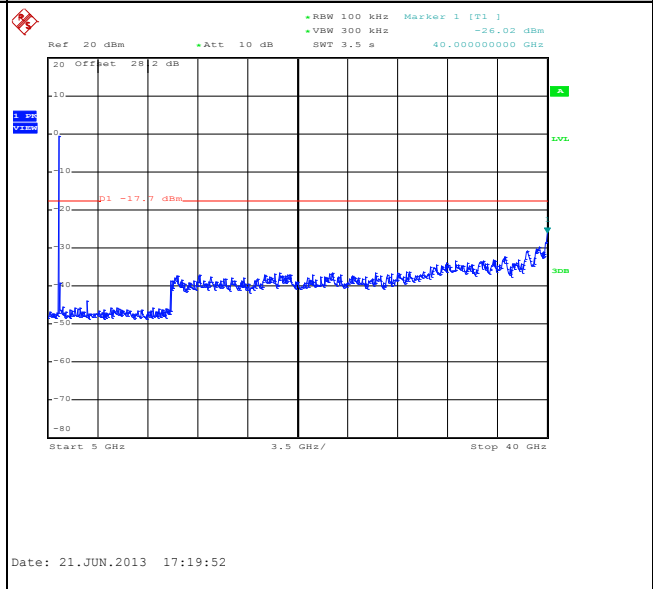
High Channel Plot



Spurious Emission 30MHz~6GHz



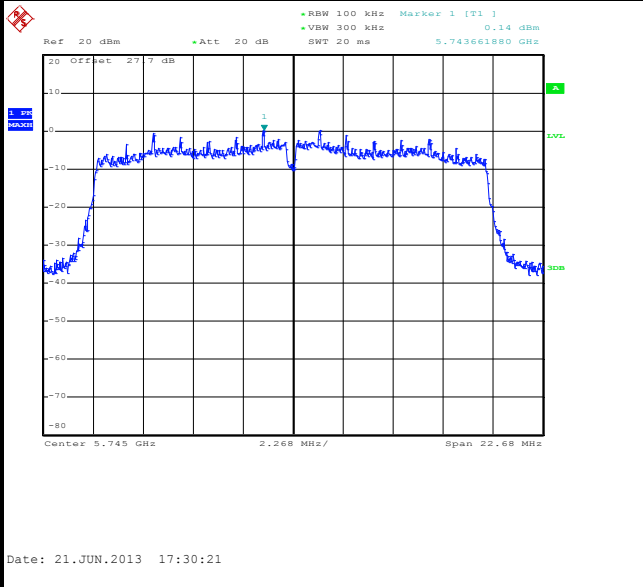
Spurious Emission 5GHz~40GHz



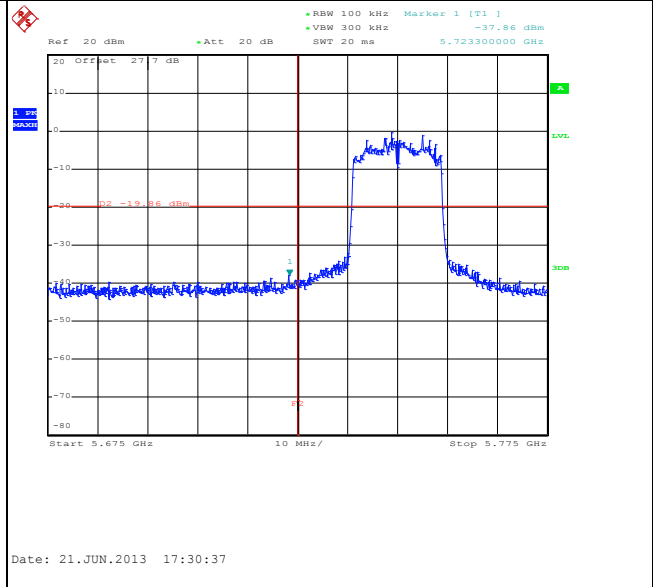
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	5GHz Low	Relative Humidity :	50~53%
Test Channel :	149	Test Engineer :	Coyote Lin

WLAN 802.11n HT20 Channel 149

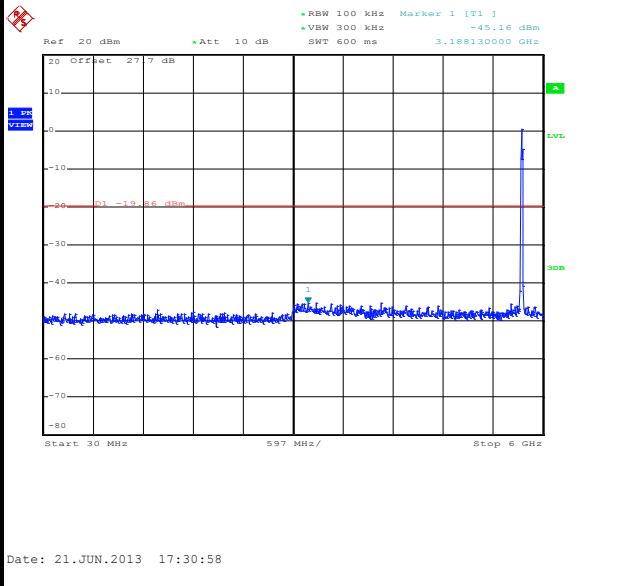
100kHz PSD reference Level



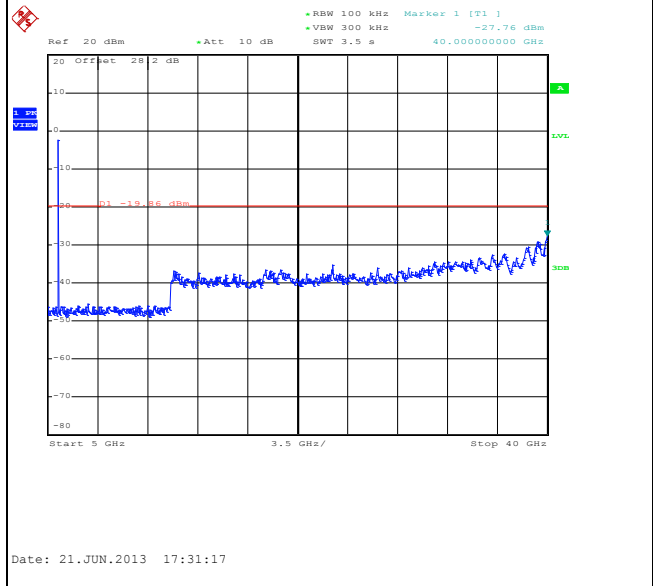
Low Channel Plot



Spurious Emission 30MHz~6GHz



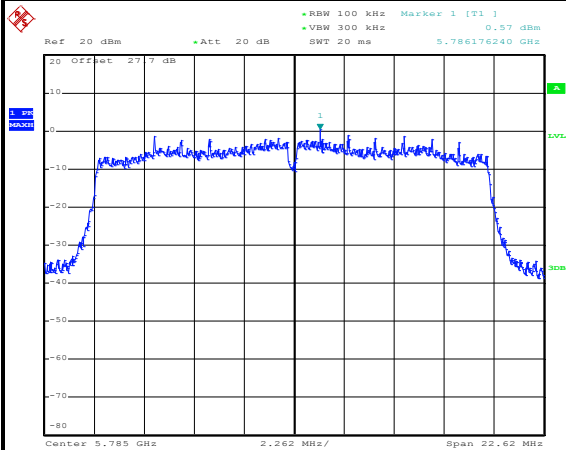
Spurious Emission 5GHz~40GHz



Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	5GHz Mid	Relative Humidity :	50~53%
Test Channel :	157	Test Engineer :	Coyote Lin

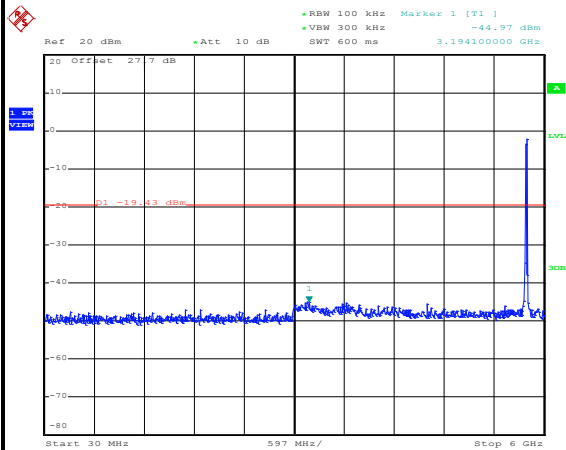
WLAN 802.11n HT20 Channel 157

100kHz PSD reference Level



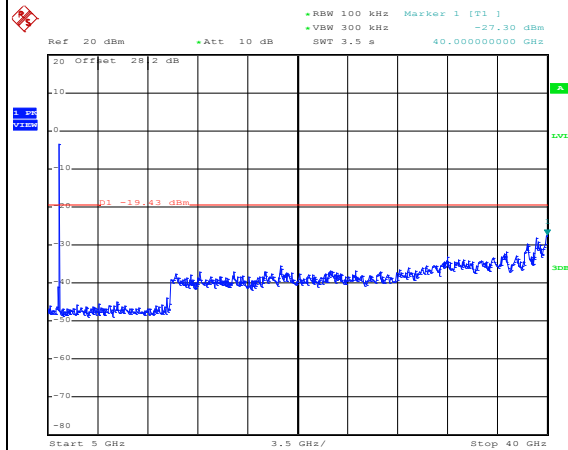
Date: 21.JUN.2013 17:26:07

Spurious Emission 30MHz~6GHz



Date: 21.JUN.2013 17:26:49

Spurious Emission 5GHz~40GHz

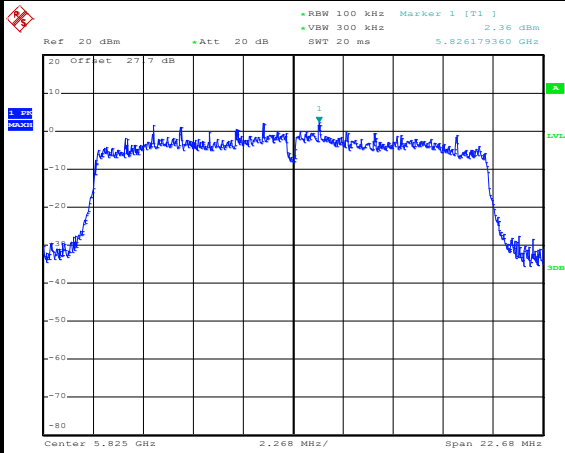


Date: 21.JUN.2013 17:27:08

Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	5GHz High	Relative Humidity :	50~53%
Test Channel :	165	Test Engineer :	Coyote Lin

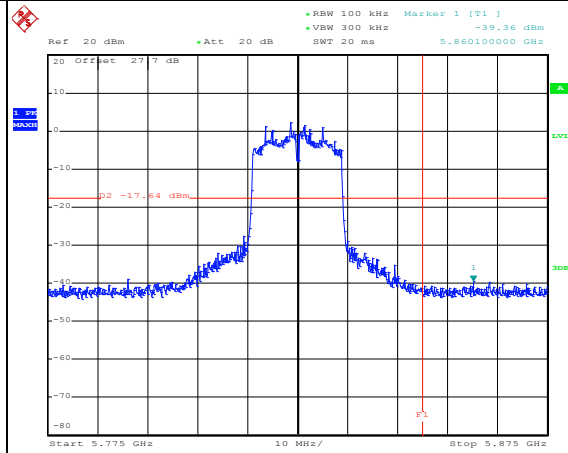
WLAN 802.11n HT20 Channel 165

100kHz PSD reference Level



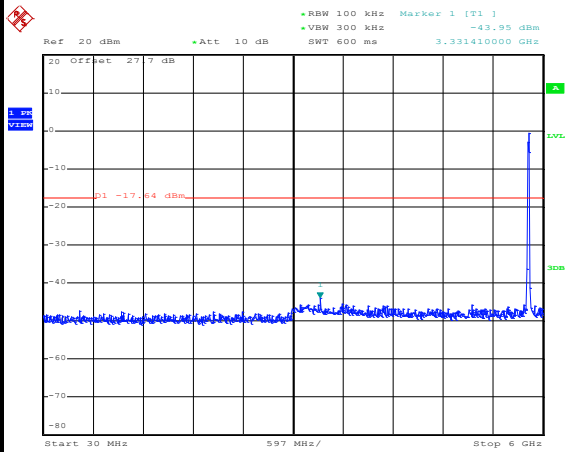
Date: 21.JUN.2013 17:22:31

High Channel Plot



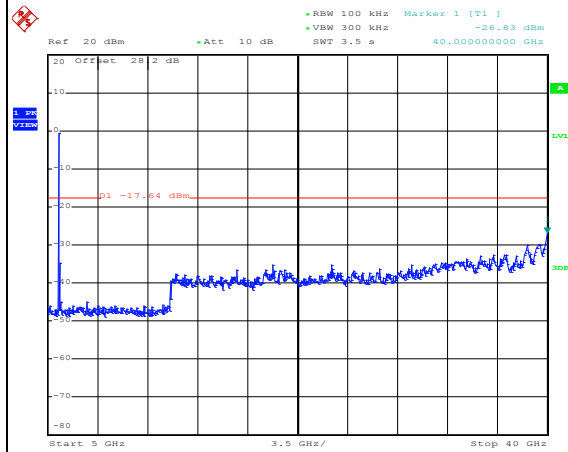
Date: 21.JUN.2013 17:22:46

Spurious Emission 30MHz~6GHz



Date: 21.JUN.2013 17:23:11

Spurious Emission 5GHz~40GHz



Date: 21.JUN.2013 17:23:30

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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 FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
2. 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.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 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.
7. 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.

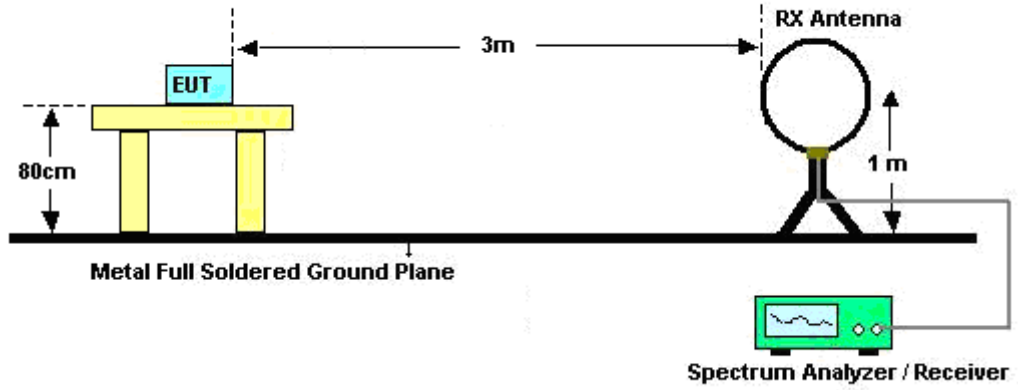
For average measurement:

 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

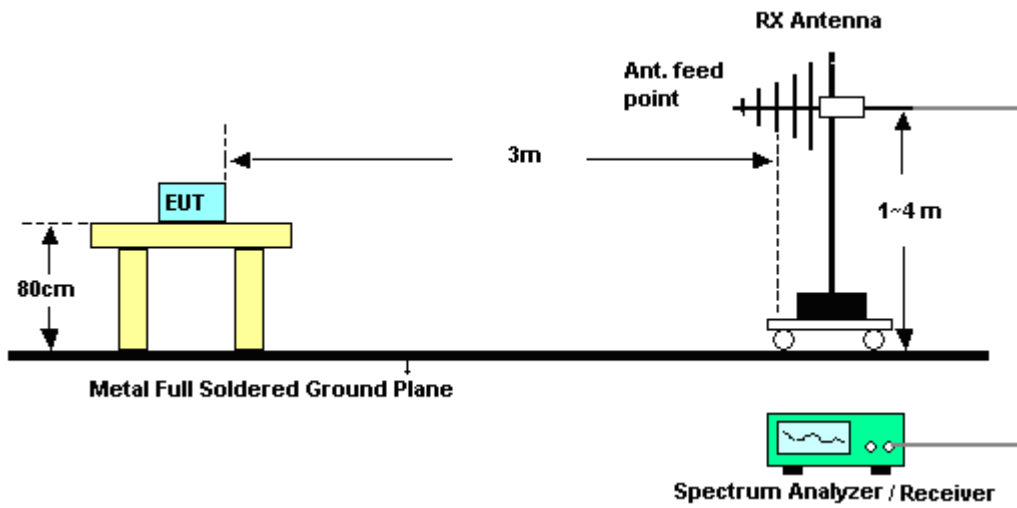
Band	Duty Cycle (%)	T(μ s)	1/T(kHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	99.01	-	-	10Hz
2.4GHz 802.11n HT20	98.94	-	-	10Hz
802.11a	99.01	-	-	10Hz
5GHz 802.11n HT20	98.94	-	-	10Hz

3.5.4 Test Setup

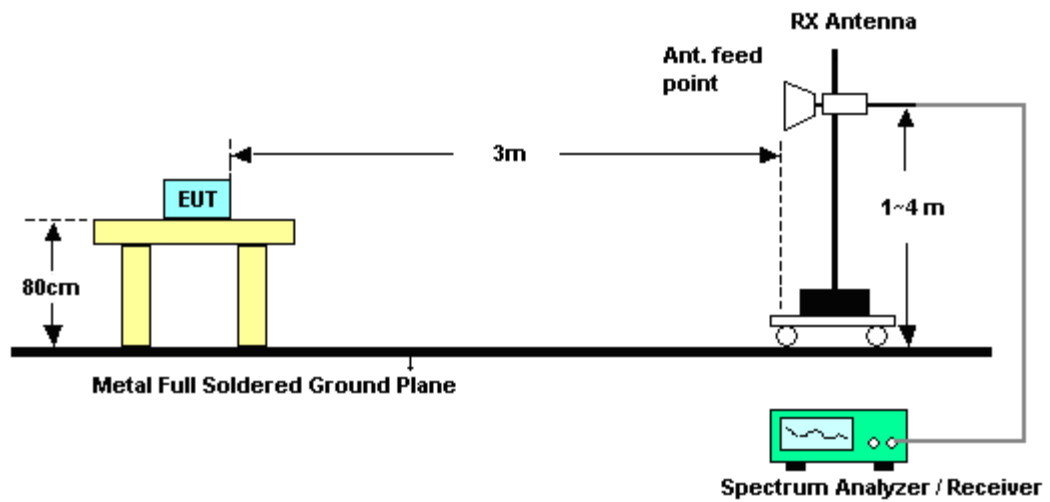
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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 :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	01	Test Engineer :	Eric Shih, Beer Chang, and Ken Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	59.19	-14.81	74	54.28	32.3	6.91	34.3	129	127	Peak
2388.93	47.09	-6.91	54	42.15	32.3	6.91	34.27	129	127	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2377.23	58.77	-15.23	74	53.88	32.28	6.88	34.27	177	101	Peak
2379.84	46.24	-7.76	54	41.35	32.28	6.88	34.27	177	101	Average

Test Mode :	802.11b	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	11	Test Engineer :	Eric Shih, Beer Chang, and Ken Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.82	58.29	-15.71	74	53.28	32.38	7.06	34.43	124	128	Peak
2484.55	46.29	-7.71	54	41.28	32.38	7.06	34.43	124	128	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.28	58.79	-15.21	74	53.78	32.38	7.06	34.43	100	140	Peak
2484.94	47.17	-6.83	54	42.16	32.38	7.06	34.43	100	140	Average

Test Mode :	802.11g	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	01	Test Engineer :	Eric Shih, Beer Chang, and Ken Wu

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
2389.47	71.15	-2.85	74	66.21	32.3	6.91	34.27	100	59	Peak
2390	51.51	-2.49	54	46.6	32.3	6.91	34.3	100	59	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
2388.57	67.6	-6.4	74	62.66	32.3	6.91	34.27	104	112	Peak
2390	49.16	-4.84	54	44.25	32.3	6.91	34.3	104	112	Average

Test Mode :	802.11g	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	11	Test Engineer :	Eric Shih, Beer Chang, and Ken Wu

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
2485.87	70.46	-3.54	74	65.45	32.38	7.06	34.43	119	58	Peak
2483.59	53.37	-0.63	54	48.36	32.38	7.06	34.43	119	58	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
2483.77	71.63	-2.37	74	66.62	32.38	7.06	34.43	125	111	Peak
2483.5	50.99	-3.01	54	45.98	32.38	7.06	34.43	125	111	Average

Test Mode :	802.11n HT20	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	01	Test Engineer :	Eric Shih, Beer Chang, and Ken Wu

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	71.53	-2.47	74	66.59	32.3	6.91	34.27	122	63	Peak
2390	52.79	-1.21	54	47.88	32.3	6.91	34.3	122	63	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
2389.74	67.48	-6.52	74	62.54	32.3	6.91	34.27	103	110	Peak
2390	48.93	-5.07	54	44.02	32.3	6.91	34.3	103	110	Average

Test Mode :	802.11n HT20	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	11	Test Engineer :	Eric Shih, Beer Chang, and Ken Wu

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
2484.25	72.82	-1.18	74	67.81	32.38	7.06	34.43	100	135	Peak
2483.5	53.19	-0.81	54	48.18	32.38	7.06	34.43	100	135	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
2483.74	72.63	-1.37	74	67.62	32.38	7.06	34.43	124	111	Peak
2483.5	53.06	-0.94	54	48.05	32.38	7.06	34.43	124	111	Average

Test Mode :	802.11a	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	149	Test Engineer :	Eric Shih, Beer Chang, and Ken Wu

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
5725	73.07	-17.23	90.3	61.85	35.33	10.04	34.15	100	9	Peak
5745	99.76	-	-	88.53	35.34	10.06	34.17	100	9	Average
5745	110.3	-	-	99.07	35.34	10.06	34.17	100	9	Peak

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
5725	65.48	-19.05	84.53	54.26	35.33	10.04	34.15	184	83	Peak
5745	93.68	-	-	82.45	35.34	10.06	34.17	184	83	Average
5745	104.53	-	-	93.3	35.34	10.06	34.17	184	83	Peak

Test Mode :	802.11a	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	165	Test Engineer :	Eric Shih, Beer Chang, and Ken Wu

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
5825	97.69	-	-	86.45	35.4	10.11	34.27	100	10	Average
5825	108.9	-	-	97.66	35.4	10.11	34.27	100	10	Peak
5850	62.36	-26.54	88.9	51.13	35.41	10.13	34.31	100	10	Peak

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
5825	93.32	-	-	82.08	35.4	10.11	34.27	182	84	Average
5825	104.54	-	-	93.3	35.4	10.11	34.27	182	84	Peak
5850	58.62	-25.92	84.54	47.39	35.41	10.13	34.31	182	84	Peak

Test Mode :	802.11n HT20	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	149	Test Engineer :	Eric Shih, Beer Chang, and Ken Wu

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
5725	72.91	-17.5	90.41	61.69	35.33	10.04	34.15	100	9	Peak
5745	99.18	-	-	87.95	35.34	10.06	34.17	100	9	Average
5745	110.41	-	-	99.18	35.34	10.06	34.17	100	9	Peak

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
5725	67.94	-15.94	83.88	56.72	35.33	10.04	34.15	185	83	Peak
5745	93.27	-	-	82.04	35.34	10.06	34.17	185	83	Average
5745	103.88	-	-	92.65	35.34	10.06	34.17	185	83	Peak

Test Mode :	802.11n HT20	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	165	Test Engineer :	Eric Shih, Beer Chang, and Ken Wu

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
5825	97.55	-	-	86.31	35.4	10.11	34.27	100	10	Average
5825	108.74	-	-	97.5	35.4	10.11	34.27	100	10	Peak
5850	64.33	-24.41	88.74	53.1	35.41	10.13	34.31	100	10	Peak

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
5825	93.04	-	-	81.8	35.4	10.11	34.27	183	84	Average
5825	104.33	-	-	93.09	35.4	10.11	34.27	183	84	Peak
5850	61.68	-22.65	84.33	50.45	35.41	10.13	34.31	183	84	Peak

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

Note: Pre-scanned all test modes and only choose the worst case mode recorded in the test report for radiated spurious emission below 1GHz.

Test Mode :	802.11b	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	1. 2413 MHz is fundamental signal which can be ignored. 2. 7239 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. For example, 109.6 dB μ V/m - 20dB = 89.6 dB μ V/m.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2413	105.35	-	-	100.39	32.31	6.95	34.3	129	127	Average
2413	109.6	-	-	104.64	32.31	6.95	34.3	129	127	Peak
3618	53.44	-0.56	54	72.38	32.75	7.41	59.1	115	108	Average
3618	60.42	-13.58	74	79.36	32.75	7.41	59.1	115	108	Peak
4824	50.61	-3.39	54	66.8	33.97	8.77	58.93	108	9	Average
4824	51.89	-22.11	74	68.08	33.97	8.77	58.93	108	9	Peak
7239	44.73	-44.87	89.6	56.01	35.55	10.83	57.66	100	0	Peak

Test Mode :	802.11b	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	<ol style="list-style-type: none"> 2413 MHz is fundamental signal which can be ignored. 7236 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2413	104.3	-	-	99.34	32.31	6.95	34.3	177	101	Average
2413	108.6	-	-	103.64	32.31	6.95	34.3	177	101	Peak
3618	50.78	-3.22	54	69.72	32.75	7.41	59.1	100	153	Average
3618	56.28	-17.72	74	75.22	32.75	7.41	59.1	100	153	Peak
4824	46.04	-27.96	74	62.23	33.97	8.77	58.93	100	0	Peak
7236	40.83	-47.77	88.6	52.11	35.55	10.83	57.66	100	0	Peak

Test Mode :	802.11b	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	1. 2438 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
150.96	29.39	-14.11	43.5	48.16	11.13	1.21	31.11	-	-	Peak
181.47	33.55	-9.95	43.5	54.31	8.91	1.25	30.92	128	47	Peak
229.26	35.85	-10.15	46	54.26	11.12	1.47	31	-	-	Peak
409.9	28.84	-17.16	46	41.29	16.22	2.18	30.85	-	-	Peak
468	29.52	-16.48	46	40.54	17.43	2.35	30.8	-	-	Peak
530.3	29.04	-16.96	46	38.64	18.61	2.51	30.72	-	-	Peak
2438	109.71	-	-	104.59	32.35	6.99	34.22	124	62	Average
2438	113.51	-	-	108.39	32.35	6.99	34.22	124	62	Peak
3654	53.78	-0.22	54	72.74	32.76	7.45	59.17	148	357	Average
3654	58.75	-15.25	74	77.71	32.76	7.45	59.17	148	357	Peak
4875	53.05	-0.95	54	69.11	33.95	8.82	58.83	104	171	Average
4875	52.73	-21.27	74	68.79	33.95	8.82	58.83	104	171	Peak
7311	45.97	-28.03	74	57.25	35.54	10.91	57.73	100	0	Peak

Test Mode :	802.11b	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	1. 2438 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
65.91	31.66	-8.34	40	55.85	6.22	0.81	31.22	136	50	Peak
93.99	26.12	-17.38	43.5	47.17	9.08	0.97	31.1	-	-	Peak
228.18	26.26	-19.74	46	44.74	11.05	1.47	31	-	-	Peak
410.6	27.02	-18.98	46	39.47	16.22	2.18	30.85	-	-	Peak
465.2	25.74	-20.26	46	36.83	17.37	2.34	30.8	-	-	Peak
535.2	23.29	-22.71	46	32.82	18.69	2.52	30.74	-	-	Peak
2438	106.27	-	-	101.15	32.35	6.99	34.22	104	96	Average
2438	110.7	-	-	105.58	32.35	6.99	34.22	104	96	Peak
3657	51.02	-2.98	54	69.98	32.76	7.45	59.17	100	323	Average
3657	54.61	-19.39	74	73.57	32.76	7.45	59.17	100	323	Peak
4875	49.08	-24.92	74	65.14	33.95	8.82	58.83	100	0	Peak
7311	44	-30	74	55.28	35.54	10.91	57.73	100	0	Peak

Test Mode :	802.11b	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	1. 2464 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2464	104.5	-	-	99.5	32.37	7.02	34.39	125	128	Average
2464	108.89	-	-	103.89	32.37	7.02	34.39	125	128	Peak
3693	47.8	-6.2	54	66.77	32.78	7.48	59.23	106	320	Average
3693	51.14	-22.86	74	70.11	32.78	7.48	59.23	106	320	Peak
4923	52.77	-1.23	54	68.7	33.93	8.87	58.73	105	8	Average
4923	54.11	-19.89	74	70.04	33.93	8.87	58.73	105	8	Peak
7386	44.26	-29.74	74	55.55	35.52	10.99	57.8	100	0	Peak

Test Mode :	802.11b	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	102.89	-	-	97.89	32.37	7.02	34.39	100	140	Average
2462	106.99	-	-	101.99	32.37	7.02	34.39	100	140	Peak
3693	46.94	-27.06	74	65.91	32.78	7.48	59.23	100	0	Peak
4923	46.34	-27.66	74	62.27	33.93	8.87	58.73	100	0	Peak
7386	42.28	-31.72	74	53.57	35.52	10.99	57.8	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	<ol style="list-style-type: none"> 2414 MHz is fundamental signal which can be ignored. 7239 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2414	103.57	-	-	98.61	32.31	6.95	34.3	100	59	Average
2414	114.12	-	-	109.16	32.31	6.95	34.3	100	59	Peak
3618	53.43	-0.57	54	72.37	32.75	7.41	59.1	165	356	Average
3618	62.67	-11.33	74	81.61	32.75	7.41	59.1	165	356	Peak
4824	50.61	-23.39	74	66.8	33.97	8.77	58.93	100	0	Peak
7239	52.14	-41.98	94.12	63.42	35.55	10.83	57.66	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	<ol style="list-style-type: none"> 2410 MHz is fundamental signal which can be ignored. 7236 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2410	100.83	-	-	95.87	32.31	6.95	34.3	104	112	Average
2410	111.97	-	-	107.01	32.31	6.95	34.3	104	112	Peak
3615	50.45	-3.55	54	69.39	32.75	7.41	59.1	102	186	Average
3615	59.97	-14.03	74	78.91	32.75	7.41	59.1	102	186	Peak
4824	48.3	-25.7	74	64.49	33.97	8.77	58.93	100	0	Peak
7236	49.69	-42.28	91.97	60.97	35.55	10.83	57.66	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	105.16	-	-	100.19	32.33	6.99	34.35	123	55	Average
2436	116.69	-	-	111.72	32.33	6.99	34.35	123	55	Peak
3654	49.86	-4.14	54	68.82	32.76	7.45	59.17	127	129	Average
3654	62.62	-11.38	74	81.58	32.76	7.45	59.17	127	129	Peak
4878	43.19	-10.81	54	59.22	33.95	8.85	58.83	104	172	Average
4878	54.23	-19.77	74	70.26	33.95	8.85	58.83	104	172	Peak
7311	48.47	-25.53	74	59.75	35.54	10.91	57.73	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	102.07	-	-	97.08	32.35	6.99	34.35	104	87	Average
2437	112.52	-	-	107.57	32.35	6.99	34.39	104	87	Peak
3648	48.67	-5.33	54	67.65	32.76	7.43	59.17	100	332	Average
3648	59.17	-14.83	74	78.15	32.76	7.43	59.17	100	332	Peak
4875	40.98	-13.02	54	57.04	33.95	8.82	58.83	130	274	Average
4875	51.1	-22.9	74	67.16	33.95	8.82	58.83	130	274	Peak
7305	46.97	-27.03	74	58.25	35.54	10.91	57.73	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	1. 2460 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2460	102.98	-	-	97.98	32.37	7.02	34.39	119	58	Average
2460	112.98	-	-	107.98	32.37	7.02	34.39	119	58	Peak
3693	45.67	-8.33	54	64.64	32.78	7.48	59.23	125	359	Average
3693	54.61	-19.39	74	73.58	32.78	7.48	59.23	125	359	Peak
4923	43.13	-10.87	54	59.06	33.93	8.87	58.73	127	176	Average
4923	53.78	-20.22	74	69.71	33.93	8.87	58.73	127	176	Peak
7386	46.04	-27.96	74	57.32	35.52	10.99	57.79	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	100.98	-	-	95.98	32.37	7.02	34.39	125	111	Average
2462	111.68	-	-	106.68	32.37	7.02	34.39	125	111	Peak
3693	40.6	-13.4	54	59.57	32.78	7.48	59.23	133	185	Average
3693	52.87	-21.13	74	71.84	32.78	7.48	59.23	133	185	Peak
4929	38.7	-15.3	54	54.6	33.93	8.9	58.73	149	289	Average
4929	51.95	-22.05	74	67.85	33.93	8.9	58.73	149	289	Peak
7386	44.93	-29.07	74	56.22	35.52	10.99	57.8	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	<ol style="list-style-type: none"> 2414 MHz is fundamental signal which can be ignored. 7236 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2414	103.4	-	-	98.44	32.31	6.95	34.3	122	63	Average
2414	113.62	-	-	108.71	32.31	6.95	34.35	122	63	Peak
3618	51.46	-2.54	54	70.4	32.75	7.41	59.1	167	353	Average
3618	61.52	-12.48	74	80.46	32.75	7.41	59.1	167	353	Peak
4824	50.53	-23.47	74	66.72	33.97	8.77	58.93	100	0	Peak
7236	50.81	-42.81	93.62	62.09	35.55	10.83	57.66	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	<ol style="list-style-type: none"> 2414 MHz is fundamental signal which can be ignored. 7236 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2414	99.89	-	-	94.93	32.31	6.95	34.3	103	110	Average
2414	108.59	-	-	103.68	32.31	6.95	34.35	103	110	Peak
3612	47.93	-6.07	54	66.87	32.75	7.41	59.1	154	163	Average
3612	59.24	-14.76	74	78.18	32.75	7.41	59.1	154	163	Peak
4824	46.48	-27.52	74	62.67	33.97	8.77	58.93	100	0	Peak
7236	47.63	-40.96	88.59	58.91	35.55	10.83	57.66	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	104.1	-	-	99.13	32.33	6.99	34.35	152	66	Average
2436	114.77	-	-	109.8	32.33	6.99	34.35	152	66	Peak
3657	52.22	-1.78	54	71.18	32.76	7.45	59.17	111	352	Average
3657	63.36	-10.64	74	82.32	32.76	7.45	59.17	111	352	Peak
4881	42.72	-11.28	54	58.75	33.95	8.85	58.83	116	176	Average
4881	53.81	-20.19	74	69.84	33.95	8.85	58.83	116	176	Peak
7305	48.22	-25.78	74	59.5	35.54	10.91	57.73	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2440	102.12	-	-	97.13	32.35	6.99	34.35	104	86	Average
2440	113.32	-	-	108.33	32.35	6.99	34.35	104	86	Peak
3654	47.57	-6.43	54	66.53	32.76	7.45	59.17	100	174	Average
3654	59.04	-14.96	74	78	32.76	7.45	59.17	100	174	Peak
4881	41.02	-12.98	54	57.05	33.95	8.85	58.83	144	275	Average
4881	50.54	-23.46	74	66.57	33.95	8.85	58.83	144	275	Peak
7305	47.43	-26.57	74	58.71	35.54	10.91	57.73	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	1. 2464 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2464	102.39	-	-	97.39	32.37	7.02	34.39	100	135	Average
2464	112.9	-	-	107.9	32.37	7.02	34.39	100	135	Peak
3693	46.02	-7.98	54	64.99	32.78	7.48	59.23	160	356	Average
3693	55.94	-18.06	74	74.91	32.78	7.48	59.23	160	356	Peak
4924	43.72	-10.28	54	59.62	33.93	8.9	58.73	114	179	Average
4924	56.16	-17.84	74	72.06	33.93	8.9	58.73	114	179	Peak
7386	46.95	-27.05	74	58.24	35.52	10.99	57.8	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	1. 2464 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2464	101.32	-	-	96.32	32.37	7.02	34.39	124	111	Average
2464	111.87	-	-	106.87	32.37	7.02	34.39	124	111	Peak
3693	44.22	-9.78	54	63.19	32.78	7.48	59.23	101	170	Average
3693	55.21	-18.79	74	74.18	32.78	7.48	59.23	101	170	Peak
4924	40.4	-13.6	54	56.3	33.93	8.9	58.73	123	269	Average
4924	52.16	-21.84	74	68.06	33.93	8.9	58.73	123	269	Peak
7386	45.21	-28.79	74	56.5	35.52	10.99	57.8	100	0	Peak

Test Mode :	802.11a	Temperature :	21~23°C
Test Channel :	149	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	<ol style="list-style-type: none"> 5745 MHz is fundamental signal which can be ignored. 17235 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

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
5745	99.76	-	-	88.53	35.34	10.06	34.17	100	9	Average
5745	110.3	-	-	99.07	35.34	10.06	34.17	100	9	Peak
11490	46.45	-27.55	74	50.71	38.38	14.33	56.97	100	0	Peak
17235	49.99	-40.31	90.3	47.72	41.86	16.6	56.19	100	0	Peak

Test Mode :	802.11a	Temperature :	21~23°C
Test Channel :	149	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	<ol style="list-style-type: none"> 5745 MHz is fundamental signal which can be ignored. 17235 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

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
5745	93.68	-	-	82.45	35.34	10.06	34.17	184	83	Average
5745	104.53	-	-	93.3	35.34	10.06	34.17	184	83	Peak
11490	45.91	-28.09	74	50.17	38.38	14.33	56.97	100	0	Peak
17235	51.21	-33.32	84.53	48.94	41.86	16.6	56.19	100	0	Peak

Test Mode :	802.11a	Temperature :	21~23°C
Test Channel :	157	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	<ol style="list-style-type: none"> 5786 MHz is fundamental signal which can be ignored. 17355 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5786	99.01	-	-	87.79	35.38	10.07	34.23	100	355	Average
5786	110.07	-	-	98.85	35.38	10.07	34.23	100	355	Peak
11571	46.58	-27.42	74	50.49	38.46	14.41	56.78	100	0	Peak
17355	50.21	-39.86	90.07	47.89	41.79	16.75	56.22	100	0	Peak

Test Mode :	802.11a	Temperature :	21~23°C
Test Channel :	157	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	<ol style="list-style-type: none"> 5784 MHz is fundamental signal which can be ignored. 17355 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5784	94.2	-	-	82.99	35.37	10.07	34.23	164	94	Average
5784	104.69	-	-	93.48	35.37	10.07	34.23	164	94	Peak
11571	47.08	-26.92	74	50.99	38.46	14.41	56.78	100	0	Peak
17355	54.9	-29.79	84.69	52.58	41.79	16.75	56.22	100	0	Peak

Test Mode :	802.11a	Temperature :	21~23°C
Test Channel :	165	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	<ol style="list-style-type: none"> 5825 MHz is fundamental signal which can be ignored. 17475 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

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
5825	97.69	-	-	86.45	35.4	10.11	34.27	100	10	Average
5825	108.9	-	-	97.66	35.4	10.11	34.27	100	10	Peak
11235	45.7	-28.3	74	50.84	38.13	14.01	57.28	100	0	Peak
17475	50	-38.9	88.9	47.64	41.72	16.89	56.25	100	0	Peak

Test Mode :	802.11a	Temperature :	21~23°C
Test Channel :	165	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	<ol style="list-style-type: none"> 5825 MHz is fundamental signal which can be ignored. 17475 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

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
5825	93.32	-	-	82.08	35.4	10.11	34.27	182	84	Average
5825	104.54	-	-	93.3	35.4	10.11	34.27	182	84	Peak
11235	44.8	-29.2	74	49.94	38.13	14.01	57.28	100	0	Peak
17475	50.94	-33.6	84.54	48.58	41.72	16.89	56.25	100	0	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	149	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	<ol style="list-style-type: none"> 5745 MHz is fundamental signal which can be ignored. 17235 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
47.01	31.61	-8.39	40	52.84	9.3	0.67	31.2	102	86	Peak
180.66	27.52	-15.98	43.5	48.29	8.9	1.25	30.92	-	-	Peak
213.6	31.41	-12.09	43.5	51.06	10.04	1.38	31.07	-	-	Peak
407.1	28.81	-17.19	46	41.34	16.16	2.17	30.86	-	-	Peak
473.6	29.07	-16.93	46	39.98	17.53	2.36	30.8	-	-	Peak
524.7	27.46	-18.54	46	37.15	18.51	2.5	30.7	-	-	Peak
5745	99.18	-	-	87.95	35.34	10.06	34.17	100	9	Average
5745	110.41	-	-	99.18	35.34	10.06	34.17	100	9	Peak
11490	45.65	-28.35	74	49.91	38.38	14.33	56.97	100	0	Peak
17235	49.5	-40.91	90.41	47.23	41.86	16.6	56.19	100	0	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	149	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	<ol style="list-style-type: none"> 5745 MHz is fundamental signal which can be ignored. 17235 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
63.75	31.07	-8.93	40	55.32	6.18	0.79	31.22	128	75	Peak
80.76	25.07	-14.93	40	47.67	7.7	0.88	31.18	-	-	Peak
213.6	25.87	-17.63	43.5	45.52	10.04	1.38	31.07	-	-	Peak
405.7	27.79	-18.21	46	40.39	16.12	2.16	30.88	-	-	Peak
467.3	26.13	-19.87	46	37.18	17.41	2.34	30.8	-	-	Peak
995.8	26.6	-27.4	54	28.77	24.54	3.51	30.22	-	-	Peak
5745	93.27	-	-	82.04	35.34	10.06	34.17	185	83	Average
5745	103.88	-	-	92.65	35.34	10.06	34.17	185	83	Peak
11490	46.28	-27.72	74	50.54	38.38	14.33	56.97	100	0	Peak
17235	51	-32.88	83.88	48.73	41.86	16.6	56.19	100	0	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	157	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	<ol style="list-style-type: none"> 5784 MHz is fundamental signal which can be ignored. 17355 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

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
5784	98.77	-	-	87.56	35.37	10.07	34.23	100	356	Average
5784	110.49	-	-	99.28	35.37	10.07	34.23	100	356	Peak
11571	45.15	-28.85	74	49.06	38.46	14.41	56.78	100	0	Peak
17355	48.89	-41.6	90.49	46.57	41.79	16.75	56.22	100	0	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	157	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	<ol style="list-style-type: none"> 5784 MHz is fundamental signal which can be ignored. 17355 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

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
5784	94	-	-	82.79	35.37	10.07	34.23	164	94	Average
5784	104.59	-	-	93.38	35.37	10.07	34.23	164	94	Peak
11571	45.65	-28.35	74	49.56	38.46	14.41	56.78	100	0	Peak
17355	53.69	-30.9	84.59	51.37	41.79	16.75	56.22	100	0	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	165	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Horizontal
Remark :	<ol style="list-style-type: none"> 5825 MHz is fundamental signal which can be ignored. 17475 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

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
5825	97.55	-	-	86.31	35.4	10.11	34.27	100	10	Average
5825	108.74	-	-	97.5	35.4	10.11	34.27	100	10	Peak
11649	46.22	-27.78	74	49.8	38.51	14.52	56.61	100	0	Peak
17475	49.76	-38.98	88.74	47.4	41.72	16.89	56.25	100	0	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	165	Relative Humidity :	51~53%
Test Engineer :	Eric Shih, Beer Chang, and Ken Wu	Polarization :	Vertical
Remark :	<ol style="list-style-type: none"> 5825 MHz is fundamental signal which can be ignored. 17475 MHz is not within a restricted band, and the limit line is 20dB below the highest emission level. Average measurement was not performed if peak level went lower than the average limit. 		

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
5825	93.04	-	-	81.8	35.4	10.11	34.27	183	84	Average
5825	104.33	-	-	93.09	35.4	10.11	34.27	183	84	Peak
11649	47.06	-26.94	74	50.64	38.51	14.52	56.61	100	0	Peak
17475	49.49	-34.84	84.33	47.13	41.72	16.89	56.25	100	0	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 (dB μ V)	
	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.

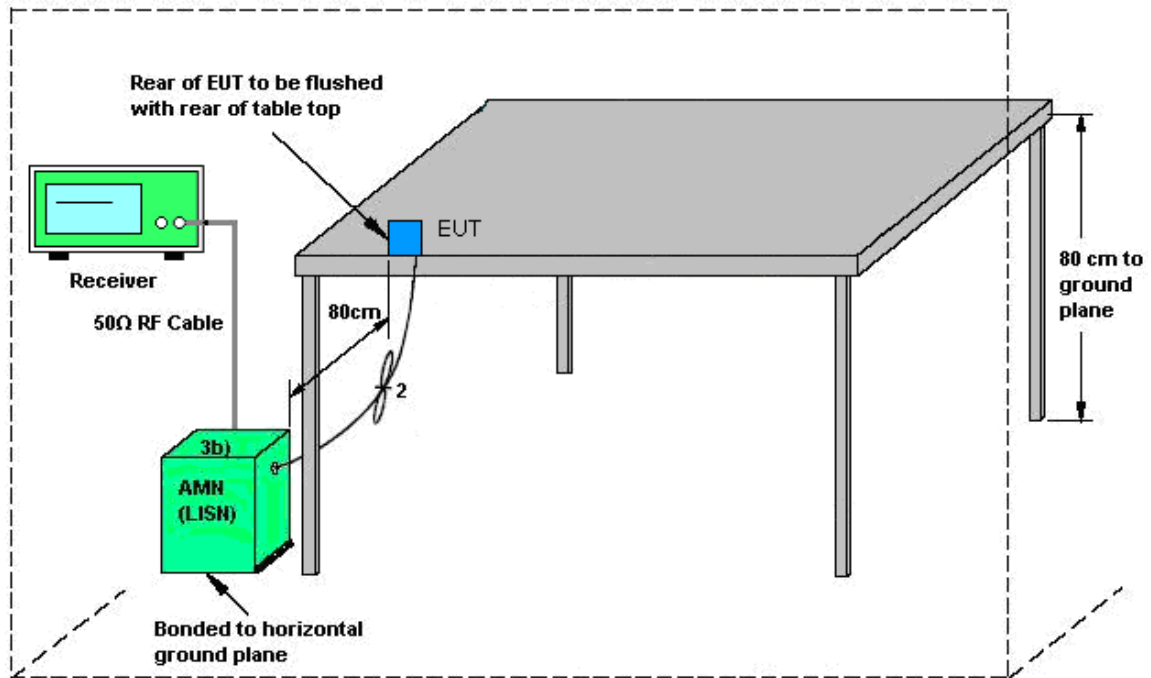
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. The 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.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

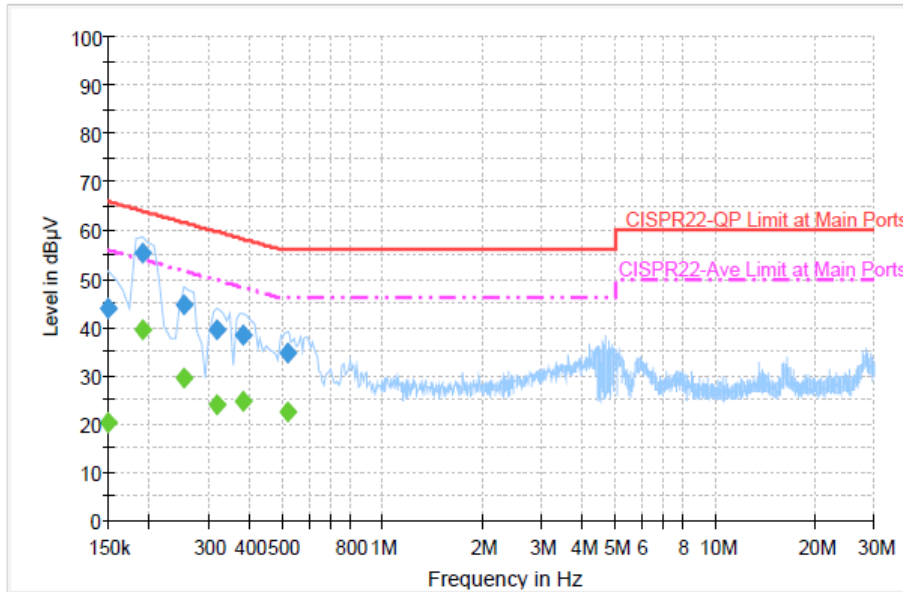
3.6.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (5G) Link + Bluetooth Link + Earphone + MPEG4 + USB Cable (Data Link with Notebook)		



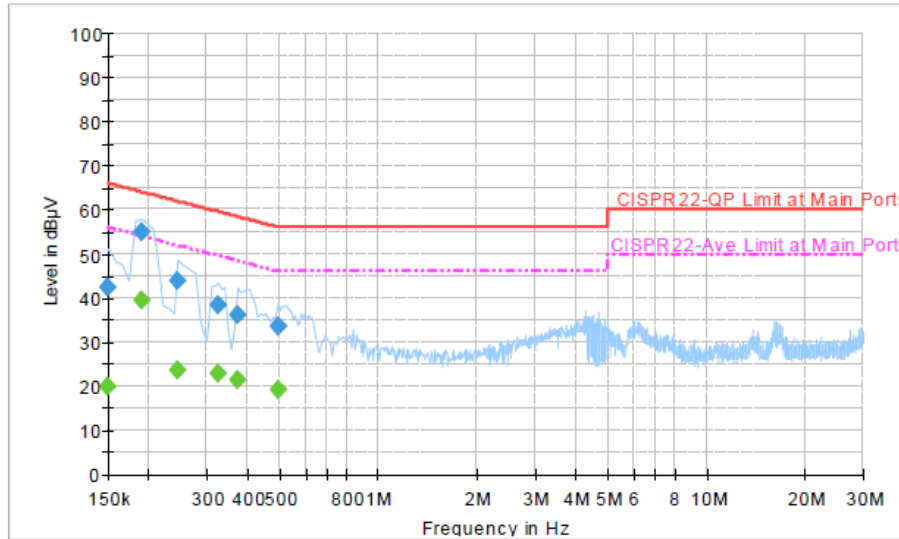
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	43.8	Off	L1	19.4	22.2	66.0
0.190000	55.3	Off	L1	19.4	8.7	64.0
0.254000	44.7	Off	L1	19.5	16.9	61.6
0.318000	39.5	Off	L1	19.4	20.3	59.8
0.382000	38.5	Off	L1	19.4	19.7	58.2
0.518000	34.6	Off	L1	19.4	21.4	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	20.4	Off	L1	19.4	35.6	56.0
0.190000	39.3	Off	L1	19.4	14.7	54.0
0.254000	29.5	Off	L1	19.5	22.1	51.6
0.318000	24.0	Off	L1	19.4	25.8	49.8
0.382000	24.6	Off	L1	19.4	23.6	48.2
0.518000	22.3	Off	L1	19.4	23.7	46.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (5G) Link + Bluetooth Link + Earphone + MPEG4 + USB Cable (Data Link with Notebook)		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	42.6	Off	N	19.4	23.4	66.0
0.190000	54.9	Off	N	19.4	9.1	64.0
0.246000	44.0	Off	N	19.4	17.9	61.9
0.326000	38.5	Off	N	19.4	21.1	59.6
0.374000	36.3	Off	N	19.4	22.1	58.4
0.494000	33.5	Off	N	19.3	22.6	56.1

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	19.8	Off	N	19.4	36.2	56.0
0.190000	39.3	Off	N	19.4	14.7	54.0
0.246000	23.8	Off	N	19.4	28.1	51.9
0.326000	22.8	Off	N	19.4	26.8	49.6
0.374000	21.3	Off	N	19.4	27.1	48.4
0.494000	19.2	Off	N	19.3	26.9	46.1

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	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 07, 2013	Jun. 21, 2013 ~ Jul. 11, 2013	Jun. 06, 2014	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Sep. 08, 2012	Jun. 21, 2013 ~ Jul. 11, 2013	Sep. 07, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Sep. 08, 2012	Jun. 21, 2013 ~ Jul. 11, 2013	Sep. 07, 2013	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 13, 2012	Jun. 19, 2013 ~ Jul. 17, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Jun. 19, 2013 ~ Jul. 17, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Jun. 19, 2013 ~ Jul. 17, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Jun. 19, 2013 ~ Jul. 17, 2013	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9K~7G	Sep. 03, 2012	May 28, 2013 ~ Jul. 11, 2013	Sep. 02, 2013	Radiation (03CH07-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9K~30G	Nov. 30, 2012	May 28, 2013 ~ Jul. 11, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30M~1G	Oct. 06, 2012	May 28, 2013 ~ Jul. 11, 2013	Oct. 05, 2013	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1G~18G	Aug. 22, 2012	May 28, 2013 ~ Jul. 11, 2013	Aug. 21, 2013	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18G~40G	Sep. 28, 2012	May 28, 2013 ~ Jul. 11, 2013	Sep. 27, 2013	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	30M~1G	Feb. 26, 2013	May 28, 2013 ~ Jul. 11, 2013	Feb. 25, 2014	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1G~26.5G	Dec. 01, 2012	May 28, 2013 ~ Jul. 11, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	May 28, 2013 ~ Jul. 11, 2013	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	ChainTek 3000	N/A	N/A	N/A	May 28, 2013 ~ Jul. 11, 2013	N/A	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9kHz ~ 30MHz	Jul. 03, 2012	May 28, 2013 ~ Jul. 11, 2013	Jul. 02, 2014	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
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