FCC RF Test Report

APPLICANT : Paden LLC

EQUIPMENT: Electronic Display Device

MODEL NAME : DP75SDI

FCC ID : 2AAIE-0610

STANDARD : FCC Part 15 Subpart C §15.247

CLASSIFICATION : (DTS) Digital Transmission System

The product was completely tested on Jul. 10, 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



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

Report No. : FR332112-04
Report Version : Rev. 01

Page Number

1190

: 1 of 79

TABLE OF CONTENTS

RE	VISIO	N HISTORY	3
su	MMAF	RY OF TEST RESULT	4
1	GEN	ERAL DESCRIPTION	5
	1.1	Applicant	5
	1.2	Feature of Equipment Under Test	5
	1.3	Product Specification of Equipment Under Test	6
	1.4	Modification of EUT	7
	1.5	Testing Site	7
	1.6	Applied Standards	7
2	TEST	CONFIGURATION OF EQUIPMENT UNDER TEST	8
	2.1	Carrier Frequency and Channel	8
	2.2	Pre-Scanned RF Power	9
	2.3	Test Mode	10
	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	12
3	TEST	T RESULT	13
	3.1	6dB Bandwidth Measurement	13
	3.2	Peak Output Power Measurement	16
	3.3	Power Spectral Density Measurement	19
	3.4	Conducted Band Edges and Spurious Emission Measurement	22
	3.5	Radiated Band Edges and Spurious Emission Measurement	41
	3.6	AC Conducted Emission Measurement	73
	3.7	Antenna Requirements	77
4	LIST	OF MEASURING EQUIPMENT	78
5	UNC	ERTAINTY OF EVALUATION	79

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 2 of 79

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR332112-04	Rev. 01	Initial issue of report	Aug. 07, 2013

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 3 of 79

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges	2040-	Pass	-
3.4		Conducted Spurious Emission	- ≤ 20dBc	Pass	-
3.5	15.247(d)	(d) Radiated Band Edges and 15.209(a) & Radiated Spurious Emission 15.247(d)		Pass	Under limit 0.53 dB at 2484.400 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 6.50 dB at 0.502 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

Report No. : FR332112-04

Report Version : Rev. 01 Page Number : 4 of 79

1 General Description

1.1 Applicant

Paden LLC

699 Walnut Street, Suite 400, 4th Floor, Des Moines, Iowa, 50309

1.2 Feature of Equipment Under Test

Product Feature						
Equipment	Electronic Display Device					
Model Name	DP75SDI					
FCC ID	2AAIE-0610					
EUT supports Radios application	GSM/EGPRS/WCDMA/HSDPA/WLAN 11bgn					

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

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 5 of 79

1.3 Product Specification of Equipment Under Test

Product Specification subjective to this standard						
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz					
Maximum Output Power to Antenna	<antenna 1=""> 802.11b: 18.45 dBm (0.0700 W) 802.11g: 22.71 dBm (0.1866 W) 802.11n HT20: 22.73 dBm (0.1875 W) <antenna 2=""> 802.11b: 19.22 dBm (0.0836 W) 802.11g: 23.42 dBm (0.2198 W) 802.11n HT20: 23.57 dBm (0.2275 W) Antenna 1: Fixed Internal Antenna with gain 2.06 dBi</antenna></antenna>					
Antenna Type	Antenna 1: Fixed I Antenna 2 : Fixed		· ·			
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)					
Duty Cycle	SOZ.11g/H. OPDM (BPSK7 QPSK7 TOQAM7 04QAM) Antenna 1> 802.11b: 100 % 802.11n HT20: 98.44 % Antenna 2> 802.11b: 100 % 802.11g: 96.97 % 802.11n HT20: 98.16 %					
		Ant 1.	Ant 2.			
	802.11 b SISO	V	V			
Antenna Function for Transmitter	802.11 g SISO		V			
	802.11 n SISO	V	V			

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 6 of 79

1.4 Modification of EUT

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

1.5 Testing Site

Test Site	SPORTON INT	SPORTON INTERNATIONAL INC.				
	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park,					
Test Site Location	Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.					
	TEL: +886-3-3273456 / FAX: +886-3-3284978					
Took Site No	Sporton Site No. FCC/IC Regist			FCC/IC Registration No.		
Test Site No.	TH02-HY	CO05-HY	03CH08-HY	636805/4086B-2		

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

Remark:

- 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.

Report No. : FR332112-04
Report Version : Rev. 01

Page Number : 7 of 79

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 (X plane for Ant. 1, Y plane for Ant. 2) 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 and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	1	2412	7	2442
	2	2417	8	2447
2400-2483.5 MHz	3	2422	9	2452
2400-2403.3 IVITZ	4	2427	10	2457
	5	2432	11	2462
	6	2437		

Report No. : FR332112-04

Report Version : Rev. 01 Page Number : 8 of 79

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.

<Ant. 1>

802.11b							
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps			
Peak Power (dBm)	Peak Power (dBm) 18.45		18.42	18.24			

802.11g									
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps	
Peak Power (dBm)	<mark>22.71</mark>	22.68	22.64	22.68	22.70	22.66	22.63	22.70	

2.4GHz 802.11n HT20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	<mark>22.73</mark>	22.64	22.67	22.39	22.72	22.68	22.67	22.72

<Ant. 2>

802.11b							
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps			
Peak Power (dBm)	<mark>19.22</mark>	19.17	19.19	19.05			

802.11g								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	<mark>23.42</mark>	23.36	23.38	23.39	23.32	23.33	23.21	23.29

2.4GHz 802.11n HT20								
Data Rate (MHz) MCS0 MCS1 MCS2 MCS3 MCS4 MCS5 MCS6 MCS7								
Peak Power (dBm)	<mark>23.57</mark>	23.55	23.49	23.44	23.56	23.53	23.52	23.51

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 9 of 79

2.3 Test Mode

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

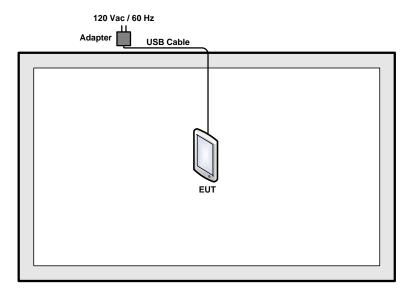
		Test Cases		
	Test Items	Mode	Data Rate	Test Channel
	O ID DW	802.11b	1 Mbps	1/6/11
	6dB BW Power Spectral Density	802.11g	6 Mbps	1/6/11
	Fower Spectral Delisity	802.11n HT20	MSC0	1/6/11
		802.11b	1 Mbps	1/6/11
Conducted	Output Power	802.11g	6 Mbps	1/6/11
TCs		802.11n HT20	MSC0	1/6/11
ics -		802.11b	1 Mbps	1/11
	Conducted Band Edge	802.11g	6 Mbps	1/11
		802.11n HT20	MSC0	1/11
	Conducted Couriers	802.11b	1 Mbps	1/6/11
	Conducted Spurious Emission	802.11g	6 Mbps	1/6/11
	Emission	802.11n HT20	MSC0	1/6/11
		802.11b	1 Mbps	1/11
	Radiated Band Edge	802.11g	6 Mbps	1/11
Radiated		802.11n HT20	MSC0	1/11
TCs	Dadieted Country	802.11b	1 Mbps	1/6/11
	Radiated Spurious Emission	802.11g	6 Mbps	1/6/11
	Emission	802.11n HT20	MSC0	1/6/11
Remark: All t	he Radiated TCs were performe	ed with USB Cable and Adapte	er.	-

	Test Cases							
AC Conducted	Made 4 . CCM950 (CDDS class 9) Idle . W/ ANT int . LISD Coble (Charging from Adoptor)							
Emission	Mode 1 : GSM850 (GPRS class 8) Idle + WLAN Link + USB Cable (Charging from Adapter)							

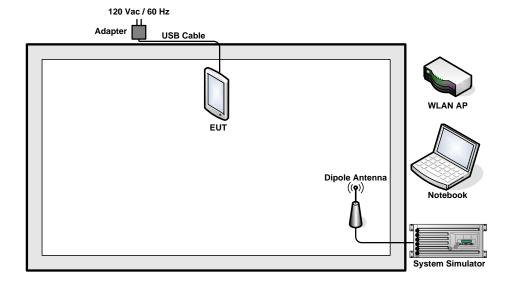
Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 10 of 79

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 11 of 79

2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
	2. Notebook					AC I/P:
2.		DELL	Latitude E6320	FCC DoC	N/A	Unshielded, 1.2 m
2.	Notebook	DELL				DC O/P:
						Shielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Adapter	N/A	PE98ED	Verification	N/A	N/A
5.	USB Cable	N/A	VR47XW	N/A	Unshielded, 1.6 m	N/A

2.6 Description of RF Function Operation Test Setup

The programmed RF utility 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.

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.

 $Offset(dB) = RF \ cable \ loss(dB) + attenuator \ factor(dB).$

= 4.2 + 10 = 14.2 (dB)

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 12 of 79

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.

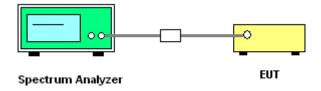
3.1.2 Measuring Instruments

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



Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 13 of 79

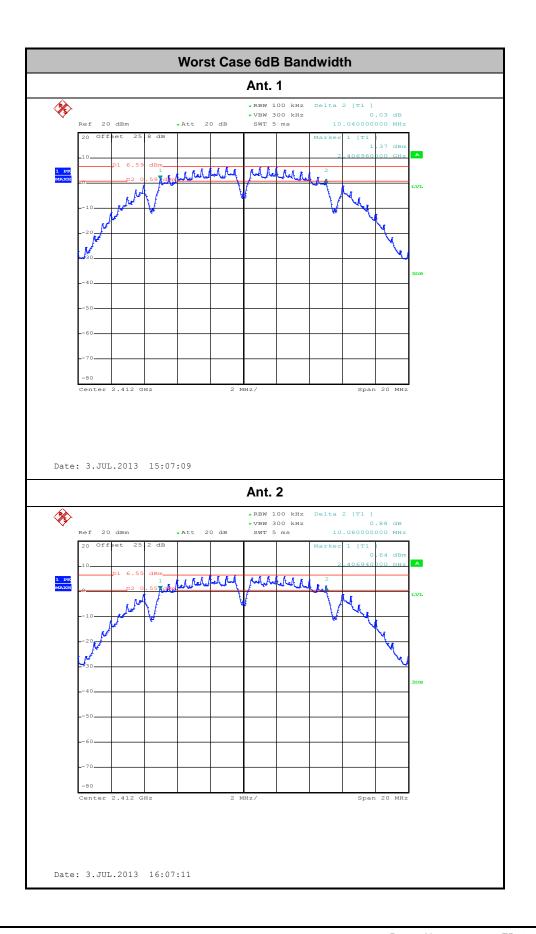
3.1.5 Test Result of 6dB Occupied Bandwidth

Test Band :	2.4GHz	Temperature :	24~26 ℃
Test Engineer :	Coyote Lin	Relative Humidity :	55~58%

	Data			Freq.	6dB Bandv	vidth (MHz)	6dB Bandwidth	
Mod. Rate	N _{TX}	Channel	(MHz)	Antenna 1	Antenna 2	Min. Limit (MHz)	Pass/Fail	
11b	1Mbps	1	1	2412	10.04	10.08	0.5	Pass
11b	1Mbps	1	6	2437	10.04	10.08	0.5	Pass
11b	1Mbps	1	11	2462	10.04	10.08	0.5	Pass
11g	6Mbps	1	1	2412	16.32	16.32	0.5	Pass
11g	6Mbps	1	6	2437	16.34	16.32	0.5	Pass
11g	6Mbps	1	11	2462	16.32	16.32	0.5	Pass
HT20	MCS0	1	1	2412	17.52	17.54	0.5	Pass
HT20	MCS0	1	6	2437	17.28	17.52	0.5	Pass
HT20	MCS0	1	11	2462	17.54	17.28	0.5	Pass

Report No. : FR332112-04

Report Version : Rev. 01 Page Number : 14 of 79



Report Version : FR332112-04
Report Version : Rev. 01
Page Number : 15 of 79

3.2 Peak Output Power Measurement

3.2.1 Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is 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.

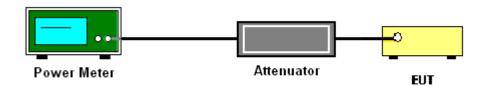
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

- 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



Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 16 of 79

3.2.5 Test Result of Peak Output Power

Test Band :	2.4GHz	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	55~58%

Mod.	Data	N _{TX} Ch.		Freq.		ut Power Bm)	Power Limit		G Bi)	Pass/Fail
	Rate			(MHz)	Ant. 1	Ant. 2	(dBm)	Ant. 1	Ant. 2	
11b	1Mbps	1	1	2412	18.45	18.89	30	2.06	1.54	Pass
11b	1Mbps	1	6	2437	16.23	19.22	30	2.06	1.54	Pass
11b	1Mbps	1	11	2462	16.38	18.51	30	2.06	1.54	Pass
11g	6Mbps	1	1	2412	18.64	18.42	30	2.06	1.54	Pass
11g	6Mbps	1	6	2437	22.71	23.42	30	2.06	1.54	Pass
11g	6Mbps	1	11	2462	18.69	19.57	30	2.06	1.54	Pass
HT20	MCS0	1	1	2412	18.61	17.62	30	2.06	1.54	Pass
HT20	MCS0	1	6	2437	22.73	23.57	30	2.06	1.54	Pass
HT20	MCS0	1	11	2462	17.25	18.95	30	2.06	1.54	Pass

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

Report Version : FR332112-04
Report Version : Rev. 01
Page Number : 17 of 79

3.2.6 Test Result of Average output Power (Reporting Only)

Test Band :	2.4GHz	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity:	55~58%

Mod. Data		N _{TX} Ch.		Freq.		Factor B)		utput (dBm)	Power Limit		G Bi)	Pass/Fail
	Kate			(MHz)	Ant. 1	Ant. 2	Ant. 1	Ant. 2	(dBm)	Ant. 1	Ant. 2	
11b	1Mbps	1	1	2412	0.00	0.00	15.82	16.70	30	2.06	1.54	Pass
11b	1Mbps	1	6	2437	0.00	0.00	13.84	17.21	30	2.06	1.54	Pass
11b	1Mbps	1	11	2462	0.00	0.00	14.04	16.16	30	2.06	1.54	Pass
11g	6Mbps	1	1	2412	0.09	0.13	9.62	9.19	30	2.06	1.54	Pass
11g	6Mbps	1	6	2437	0.09	0.13	14.88	18.07	30	2.06	1.54	Pass
11g	6Mbps	1	11	2462	0.09	0.13	9.38	10.42	30	2.06	1.54	Pass
HT20	MCS0	1	1	2412	0.07	0.08	9.69	8.06	30	2.06	1.54	Pass
HT20	MCS0	1	6	2437	0.07	0.08	14.83	17.98	30	2.06	1.54	Pass
HT20	MCS0	1	11	2462	0.07	0.08	7.54	9.36	30	2.06	1.54	Pass

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

Report Version : FR332112-04
Report Version : Rev. 01
Page Number : 18 of 79

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.

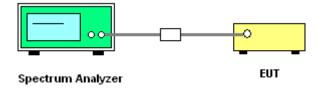
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

- 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



Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 19 of 79

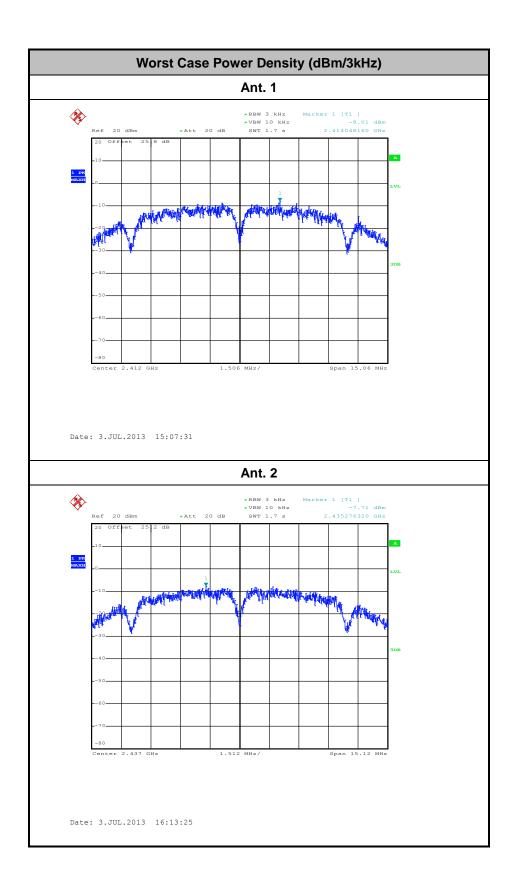
3.3.5 Test Result of Power Spectral Density

Test Band :	2.4GHz	Temperature :	24~26℃
Test Engineer :	Coyote Lin	Relative Humidity :	55~58%

Mod.	Data	N _{TX}	Ch.	Freq.		m/3kHz) Max. Limits		DG (dBi)		Pass/Fail
	Rate			(MHz)	Ant. 1	Ant. 2	(dBm/3kHz)	Ant. 1	Ant. 2	
11b	1Mbps	1	1	2412	-8.01	-9.14	8	2.06	1.54	Pass
11b	1Mbps	1	6	2437	-10.24	-7.71	8	2.06	1.54	Pass
11b	1Mbps	1	11	2462	-10.53	-9.37	8	2.06	1.54	Pass
11g	6Mbps	1	1	2412	-15.31	-15.59	8	2.06	1.54	Pass
11g	6Mbps	1	6	2437	-10.30	-7.80	8	2.06	1.54	Pass
11g	6Mbps	1	11	2462	-15.84	-14.21	8	2.06	1.54	Pass
HT20	MCS0	1	1	2412	-16.50	-17.37	8	2.06	1.54	Pass
HT20	MCS0	1	6	2437	-11.30	-7.73	8	2.06	1.54	Pass
HT20	MCS0	1	11	2462	-17.42	-15.76	8	2.06	1.54	Pass

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

Report Version : FR332112-04
Report Version : Rev. 01
Page Number : 20 of 79



Page Number : 21 of 79

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).

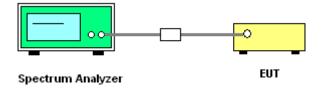
3.4.2 Measuring Instruments

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.
- The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



Report No. : FR332112-04
Report Version : Rev. 01

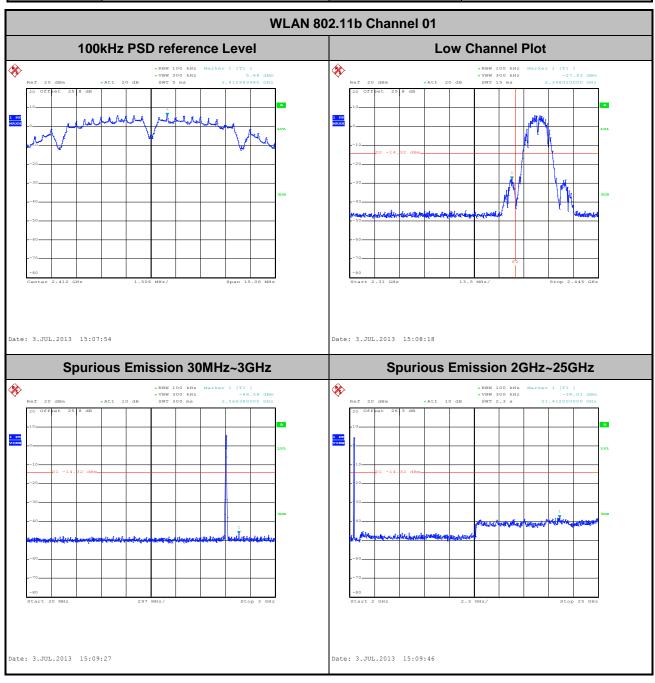
: 22 of 79

Page Number

3.4.5 Test Result of Conducted Band Edges and Spurious Emission

<Antenna 1>

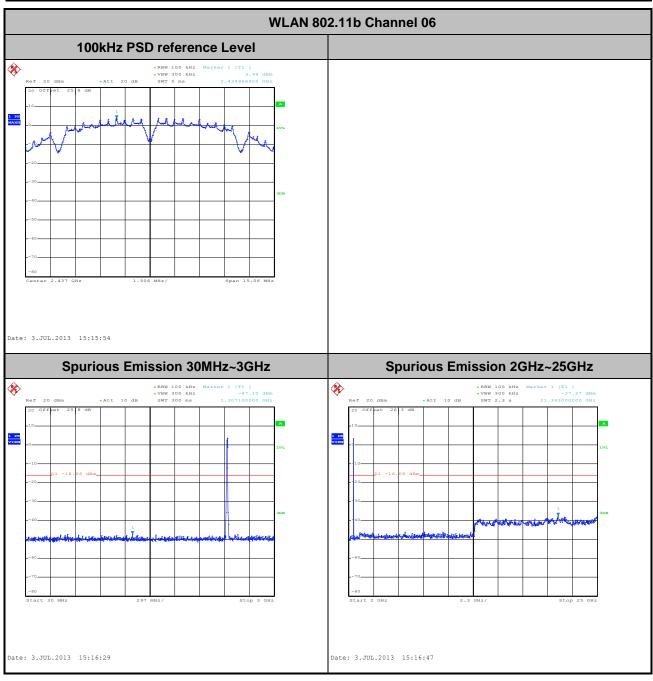
Test Mode :	802.11b	Temperature :	24~26 ℃
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel:	01	Test Engineer :	Coyote Lin



Report No. : FR332112-04
Report Version : Rev. 01

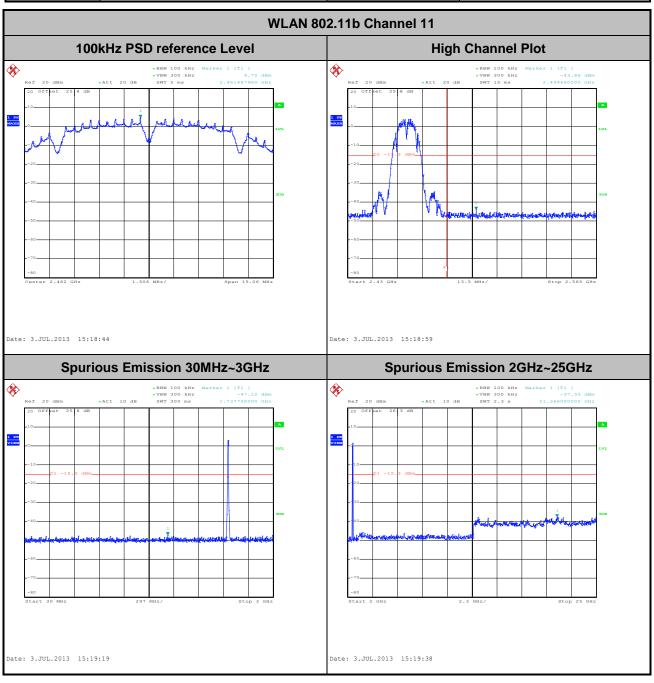
Page Number : 23 of 79

Test Mode :	802.11b	Temperature :	24~26 ℃
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel :	06	Test Engineer :	Coyote Lin



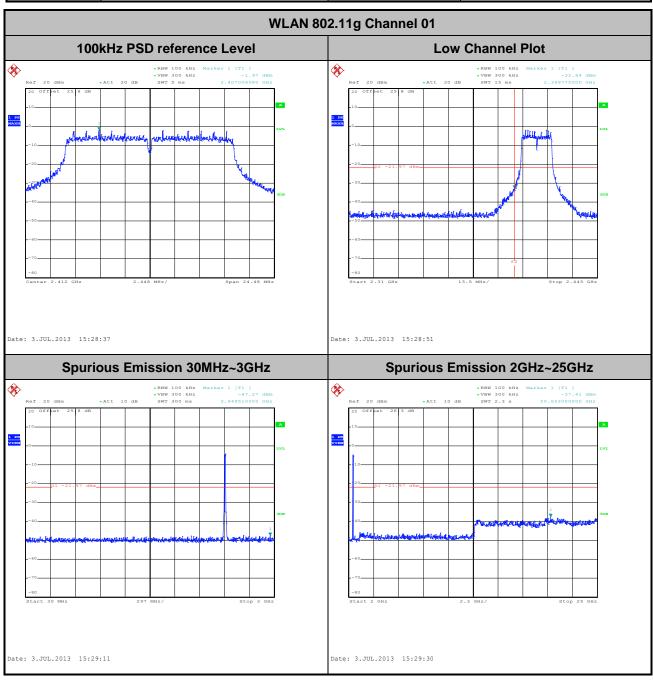
Page Number : 24 of 79

Test Mode :	802.11b	Temperature :	24~26 ℃
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel:	11	Test Engineer :	Coyote Lin



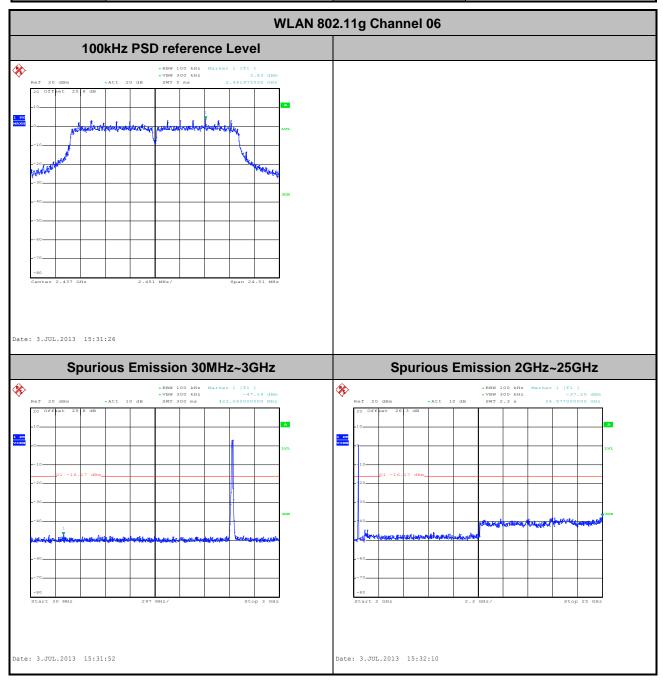
Page Number : 25 of 79

Test Mode :	802.11g	Temperature :	24~26 ℃
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel:	01	Test Engineer :	Coyote Lin



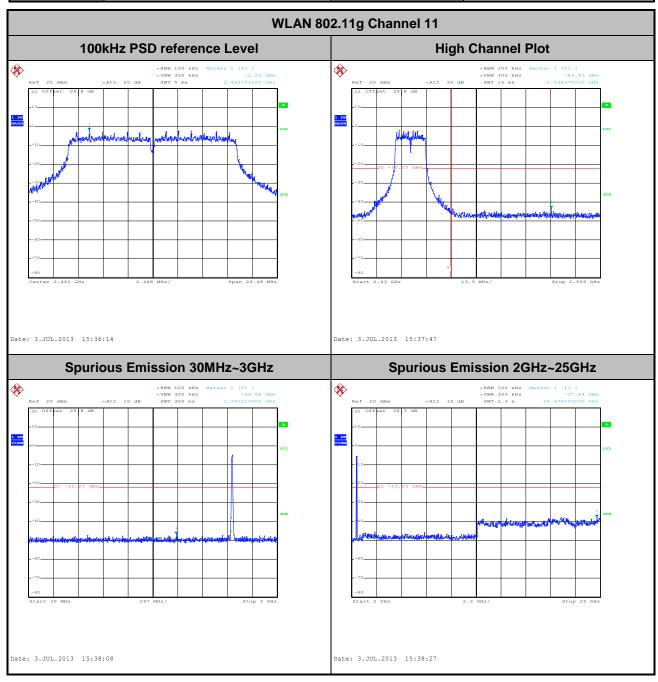
Page Number : 26 of 79

Test Mode :	802.11g	Temperature :	24~26 ℃
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel:	06	Test Engineer :	Coyote Lin



Page Number : 27 of 79

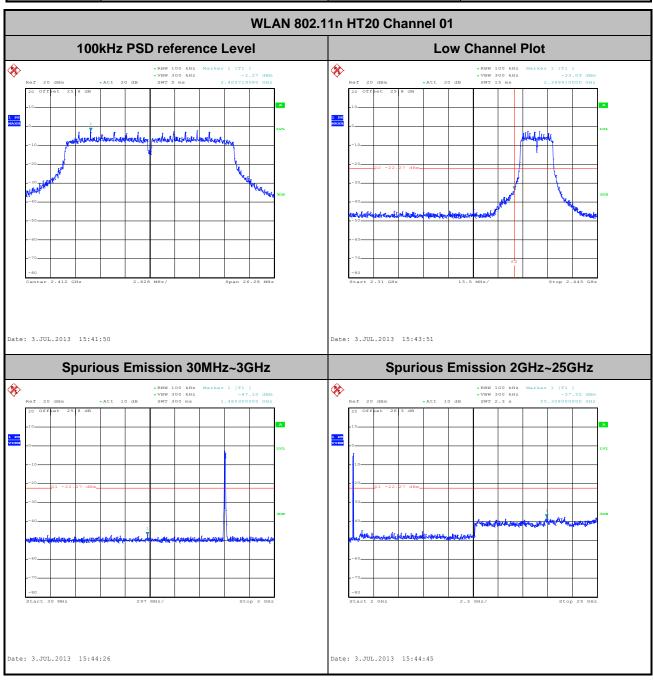
Test Mode :	802.11g	Temperature :	24~26 ℃
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel:	11	Test Engineer :	Coyote Lin



: 28 of 79

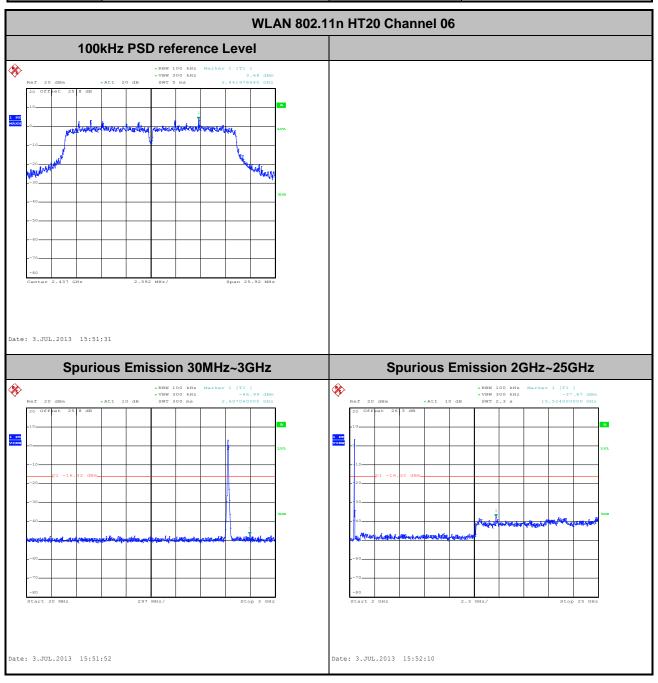
Page Number

Test Mode :	802.11n HT20	Temperature :	24~26 ℃
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel:	01	Test Engineer :	Coyote Lin



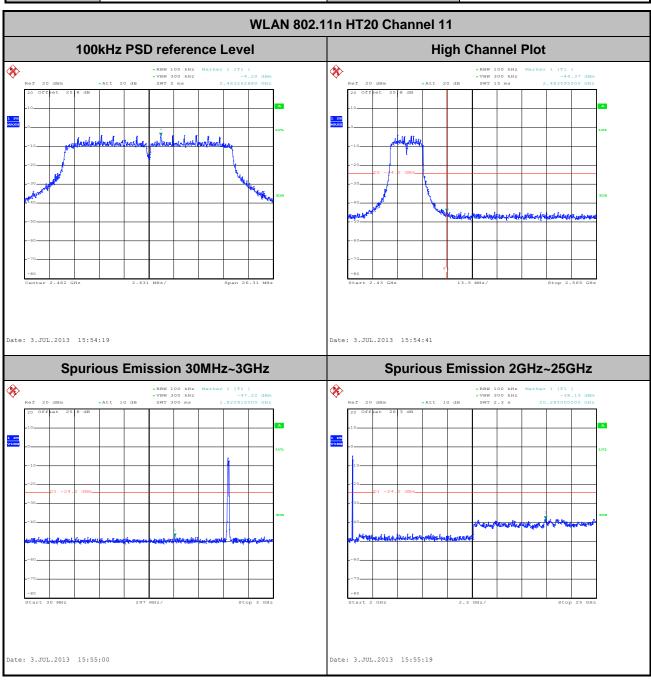
Page Number : 29 of 79

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel:	06	Test Engineer :	Coyote Lin



Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 30 of 79

Test Mode :	802.11n HT20	Temperature :	24~26 ℃
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel:	11	Test Engineer :	Coyote Lin

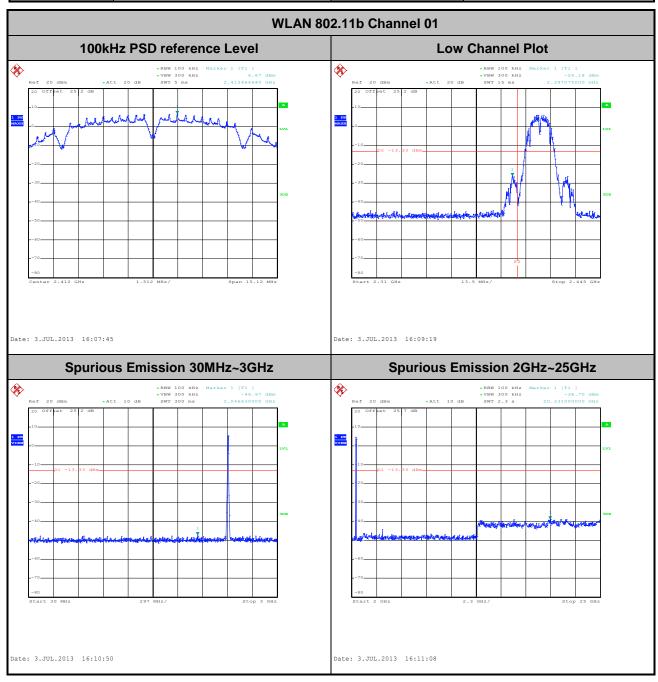


: 31 of 79

Page Number

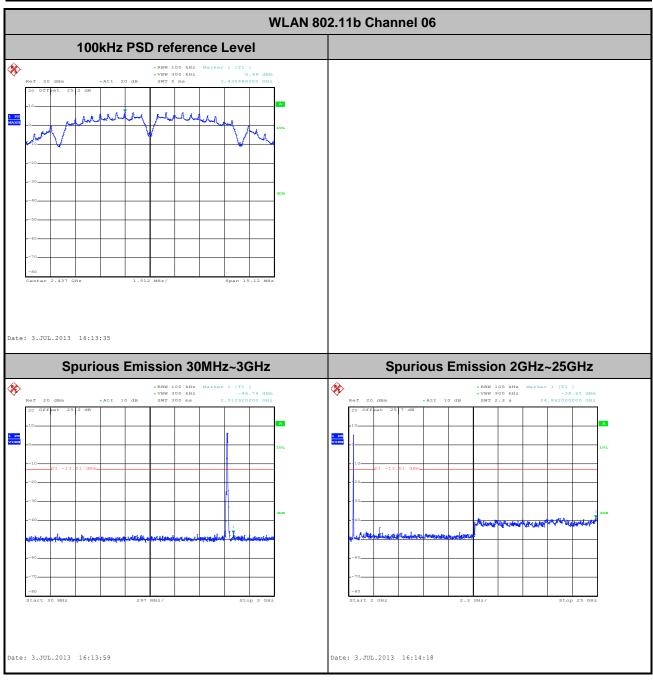
<Antenna 2>

Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel :	01	Test Engineer :	Coyote Lin



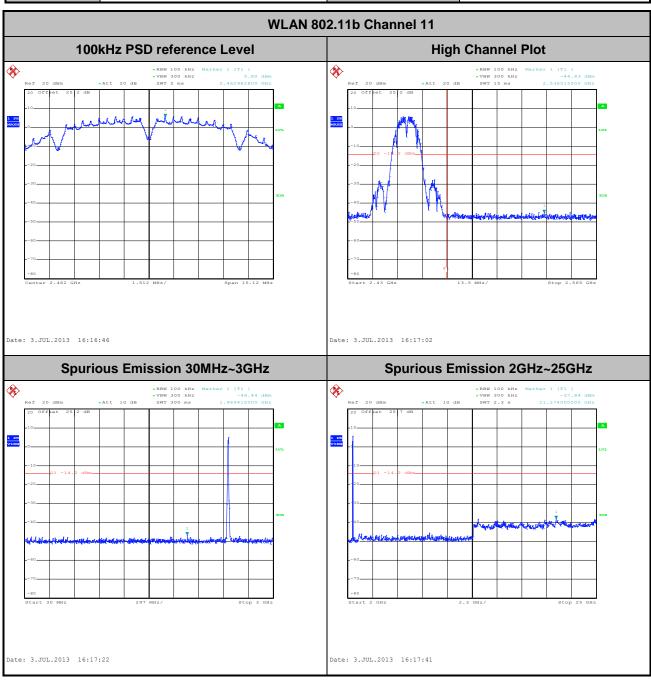
Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 32 of 79

Test Mode :	802.11b	Temperature :	24~26 ℃
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel :	06	Test Engineer :	Coyote Lin



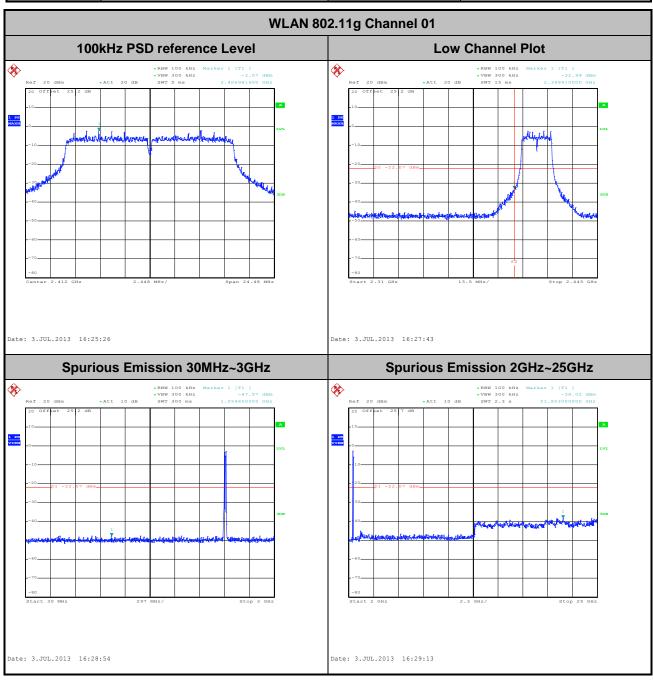
Report Version : FR332112-04
Report Version : Rev. 01
Page Number : 33 of 79

Test Mode :	802.11b	Temperature :	24~26 ℃
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel:	11	Test Engineer :	Coyote Lin



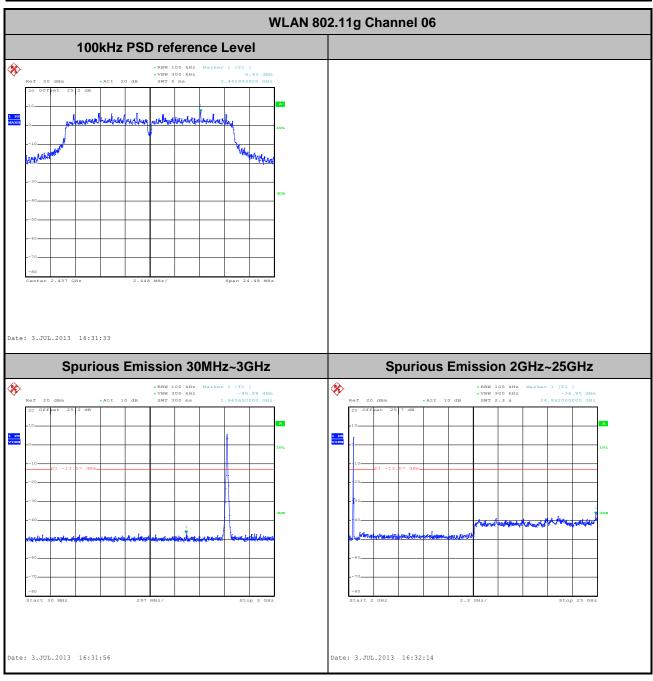
Page Number : 34 of 79

Test Mode :	802.11g	Temperature :	24~26 ℃
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel:	01	Test Engineer :	Coyote Lin



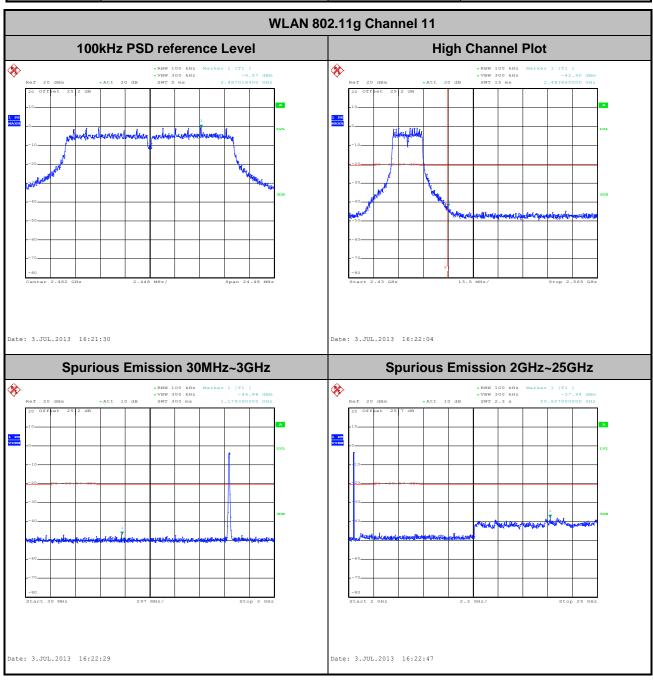
Page Number : 35 of 79

Test Mode :	802.11g	Temperature :	24~26 ℃
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel :	06	Test Engineer :	Coyote Lin



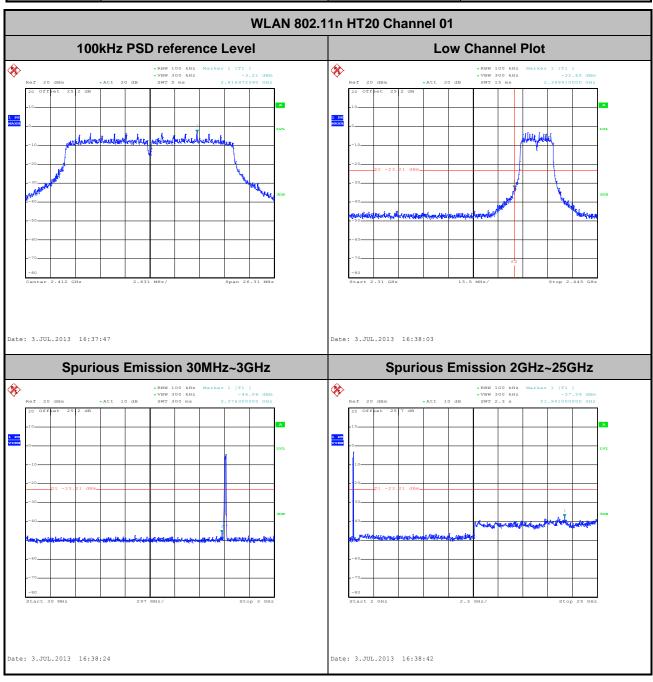
Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 36 of 79

Test Mode :	802.11g	Temperature :	24~26 ℃
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel:	11	Test Engineer :	Coyote Lin



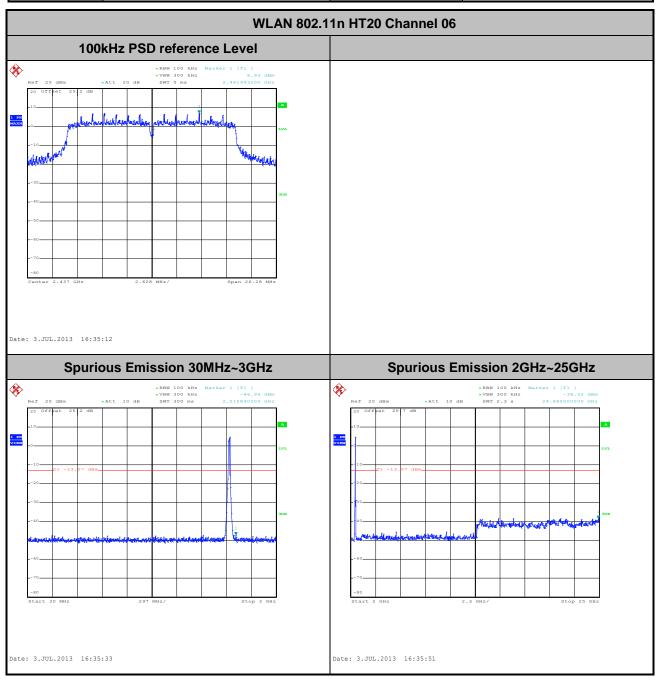
Page Number : 37 of 79

Test Mode :	802.11n HT20	Temperature :	24~26 ℃
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel :	01	Test Engineer :	Coyote Lin



Page Number : 38 of 79

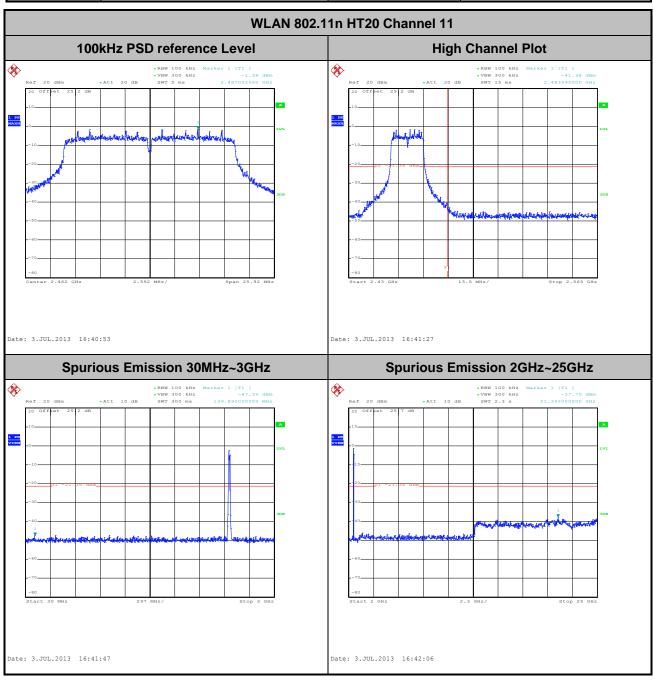
Test Mode :	802.11n HT20	Temperature :	24~26 ℃
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel:	06	Test Engineer :	Coyote Lin



: 39 of 79

Page Number

Test Mode :	802.11n HT20	Temperature :	24~26 ℃
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel:	11	Test Engineer :	Coyote Lin



Page Number : 40 of 79

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	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(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.

Report No. : FR332112-04
Report Version : Rev. 01

Page Number : 41 of 79

3.5.3 Test Procedure

- 1. The testing follows the guidelines in FCC KDB 558074 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 ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \ge 1$ GHz for peak measurement. For average measurement:
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW ≥ 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.

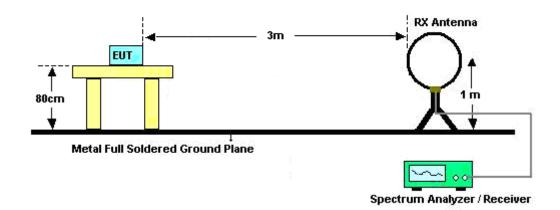
Antenna	Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting
1	802.11b	100.00	-	ī	
1	802.11g	98.06	-	-	10Hz
1	2.4G 802.11n HT20	98.44	-	-	
2	802.11b	100.00	-	-	10Hz
2	802.11g	96.97	1025.641	0.975	1kHz
2	2.4G 802.11n HT20	98.16	-	-	10Hz

Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

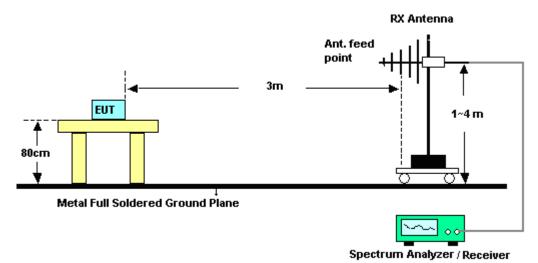
Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 42 of 79

3.5.4 Test Setup

For radiated emissions below 30MHz



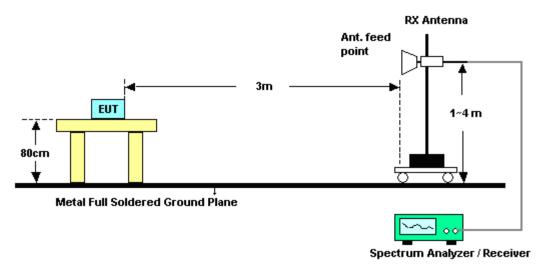
For radiated emissions from 30MHz to 1GHz



Report No. : FR332112-04

Report Version : Rev. 01 Page Number : 43 of 79

For radiated emissions above 1GHz



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

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.

> : FR332112-04 Report No. Report Version : Rev. 01

Page Number : 44 of 79

3.5.6 Test Result of Radiated Spurious at Band Edges

<Ant. 1>

Test Mode :	802.11b	Temperature :	25~26°C
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL										
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark	
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos		
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)		
2387.22	61.11	-12.89	74	58.54	32.27	6.22	35.92	145	53	Peak	
2386.77	52.04	-1.96	54	49.47	32.27	6.22	35.92	145	53	Average	

	ANTENNA POLARITY : VERTICAL											
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark		
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2386.23	60.5	-13.5	74	58.14	32.06	6.22	35.92	100	21	Peak		
2386.41	48.13	-5.87	54	45.77	32.06	6.22	35.92	100	21	Average		

Test Mode :	802.11b	Temperature :	25~26°C
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL										
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark	
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos		
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)		
2488.12	59.39	-14.61	74	56.07	32.7	6.45	35.83	114	51	Peak	
	ı	I					1	ı	l		

	ANTENNA POLARITY : VERTICAL										
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark	
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos		
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)		
2498.41	58.44	-15.56	74	55.09	32.7	6.45	35.8	108	17	Peak	
2486.44	45.04	-8.96	54	41.83	32.59	6.45	35.83	108	17	Average	

Report Version : FR332112-04
Report Version : Rev. 01
Page Number : 45 of 79

Test Mode :	802.11g	Temperature :	25~26°C
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL											
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark		
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2389.56	72.9	-1.1	74	70.33	32.27	6.22	35.92	118	344	Peak		
2390	52.22	-1.78	54	49.63	32.27	6.22	35.9	118	344	Average		

	ANTENNA POLARITY : VERTICAL											
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark		
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2389.11	69.72	-4.28	74	67.36	32.06	6.22	35.92	106	7	Peak		
2390	50.79	-3.21	54	48.41	32.06	6.22	35.9	106	7	Average		

Test Mode :	802.11g	Temperature :	25~26°C
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL											
Frequency	ency Level Over Limit Read Antenna Cable Preamp Ant Table Remark											
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2483.59	71.95	-2.05	74	68.7	32.63	6.45	35.83	108	357	Peak		
2483.5	52.94	-1.06	54	49.69	32.63	6.45	35.83	108	357	Average		

	ANTENNA POLARITY : VERTICAL											
Frequency	uency Level Over Limit Read Antenna Cable Preamp Ant Table Remark											
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2483.8	66.06	-7.94	74	62.85	32.59	6.45	35.83	104	4	Peak		
2483.5	49.39	-4.61	54	46.18	32.59	6.45	35.83	104	4	Average		

Report Version : FR332112-04
Report Version : Rev. 01
Page Number : 46 of 79

Test Mode :	802.11n HT20	Temperature :	25~26°C
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL											
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark		
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2389.11	72.1	-1.9	74	69.53	32.27	6.22	35.92	111	0	Peak		

	ANTENNA POLARITY : VERTICAL											
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark		
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2389.38	67.05	-6.95	74	64.69	32.06	6.22	35.92	100	308	Peak		
2390	48.21	-5.79	54	45.83	32.06	6.22	35.9	100	308	Average		

Test Mode :	802.11n HT20	Temperature :	25~26°C
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL											
Frequency	uency Level Over Limit Read Antenna Cable Preamp Ant Table Remark											
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2483.53	72.53	-1.47	74	69.28	32.63	6.45	35.83	112	48	Peak		
2483.5	50.42	-3.58	54	47.17	32.63	6.45	35.83	112	48	Average		

	ANTENNA POLARITY : VERTICAL											
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark		
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2484.91	66.49	-7.51	74	63.28	32.59	6.45	35.83	110	23	Peak		
2483.5	47.55	-6.45	54	44.34	32.59	6.45	35.83	110	23	Average		

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 47 of 79

<Ant. 2>

Test Mode :	802.11b	Temperature :	25~26°C
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL											
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark		
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2387.13	61.88	-12.12	74	59.31	32.27	6.22	35.92	121	22	Peak		
2386.5	52.53	-1.47	54	49.96	32.27	6.22	35.92	121	22	Average		

	ANTENNA POLARITY : VERTICAL												
Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)				
2384.61	59.28	-14.72	74	57.03	31.95	6.22	35.92	101	87	Peak			
2386.32	48.28	-5.72	54	45.92	32.06	6.22	35.92	101	87	Average			

Test Mode :	802.11b	Temperature :	25~26°C
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL											
Frequency	equency Level Over Limit Read Antenna Cable Preamp Ant Table Remark											
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2487.22	63.28	-10.72	74	60.03	32.63	6.45	35.83	115	24	Peak		
2487.25	52.56	-1.44	54	49.31	32.63	6.45	35.83	115	24	Average		

	ANTENNA POLARITY : VERTICAL											
Frequency	ency Level Over Limit Read Antenna Cable Preamp Ant Table Remark											
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2488.6	59.75	-14.25	74	56.43	32.7	6.45	35.83	100	287	Peak		
2487.64	47.33	-6.67	54	44.01	32.7	6.45	35.83	100	287	Average		

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 48 of 79

Test Mode :	802.11g	Temperature :	25~26°C
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL											
Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark		
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2389.74	72.15	-1.85	74	69.58	32.27	6.22	35.92	120	24	Peak		
2390	52.48	-1.52	54	49.89	32.27	6.22	35.9	120	24	Average		

	ANTENNA POLARITY : VERTICAL											
Frequency	Level	Over Limit	Limit Line	Read	Antenna	Cable	Preamp Factor	Ant Pos	Table Pos	Remark		
(B411)	(ID)(()			Level	Factor	Loss						
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2389.83	69.04	-4.96	74	66.66	32.06	6.22	35.9	100	88	Peak		
2390	48.5	-5.5	54	46.12	32.06	6.22	35.9	100	88	Average		

Test Mode :	802.11g	Temperature :	25~26°C
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL												
Frequency	ncy Level Over Limit Read Antenna Cable Preamp Ant Table Remark												
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos				
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)				
2483.89	73.1	-0.9	74	69.85	32.63	6.45	35.83	107	360	Peak			
2483.5	52.45	-1.55	54	49.2	32.63	6.45	35.83	107	360	Average			

	ANTENNA POLARITY : VERTICAL											
Frequency	cy Level Over Limit Read Antenna Cable Preamp Ant Table Remark											
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos			
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)			
2484.1	71.41	-2.59	74	68.2	32.59	6.45	35.83	100	85	Peak		
2483.5	50.92	-3.08	54	47.71	32.59	6.45	35.83	100	85	Average		

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 49 of 79

Test Mode :	802.11n HT20	Temperature :	25~26°C
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL													
Frequency	cy Level Over Limit Read Antenna Cable Preamp Ant Table Remark													
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos					
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)					
2389.29	73.27	-0.73	74	70.7	32.27	6.22	35.92	121	26	Peak				
2390	51.94	-2.06	54	49.35	32.27	6.22	35.9	121	26	Average				

	ANTENNA POLARITY : VERTICAL													
Frequency	Level Over Limit Read Antenna Cable Preamp Ant Table Remark													
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos					
(MHz)	(MHz) (dBμV/m) (dB) (dBμV/m) (dBμV) (dB) (dB) (dB) (cm) (deg)													
2389.47	66.44	-7.56	74	64.08	32.06	6.22	35.92	100	60	Peak				
2390	48.17	-5.83	54	45.79	32.06	6.22	35.9	100	60	Average				

Test Mode :	802.11n HT20	Temperature :	25~26°C
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Kyle Jhuang

	ANTENNA POLARITY : HORIZONTAL													
Frequency	Level Over Limit Read Antenna Cable Preamp Ant Table Remark													
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos					
(MHz)	(dBµV/m) (dB) (dBµV/m) (dBµV) (dB) (dB) (dB) (cm) (deg)													
2484.4	73.47	-0.53	74	70.22	32.63	6.45	35.83	108	349	Peak				
2483.5	53.04	-0.96	54	49.79	32.63	6.45	35.83	108	349	Average				

	ANTENNA POLARITY : VERTICAL													
Frequency	ency Level Over Limit Read Antenna Cable Preamp Ant Table Remark													
	Limit Line Level Factor Loss Factor Pos Pos													
(MHz)	(MHz) (dBμV/m) (dB) (dBμV/m) (dBμV) (dB) (dB) (dB) (cm) (deg)													
2484.64	69.82	-4.18	74	66.61	32.59	6.45	35.83	126	88	Peak				
2483.5	51.02	-2.98	54	47.81	32.59	6.45	35.83	126	88	Average				

Report Vo.: FR332112-04
Report Version: Rev. 01
Page Number: 50 of 79

3.5.7 Test Result of Radiated Spurious 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.

<Ant. 1>

Test Mode :	802.	11b	Temperature :	25~26°C			
Test Channel :	01		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal			
	1.	2414 MHz is fundamer	ental signal which can be ignored.				
Remark :	2.	7236 MHz is not within a restricted band, and its limit line is 20dB below					
		highest emission level.	For example, 111.11 d	$B\mu V/m - 20dB = 91.11 dB\mu V/m$.			

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2414	106.01	-	-	103.29	32.34	6.28	35.9	145	53	Average
2414	111.11	-	-	108.39	32.34	6.28	35.9	145	53	Peak
4824	53.13	-0.87	54	66.24	34.44	8.04	55.59	111	75	Average
4824	54.74	-19.26	74	67.85	34.44	8.04	55.59	111	75	Peak
7236	47.78	-43.33	91.11	58.11	35.61	10.48	56.42	100	0	Peak

Test Mode :	802.	.11b	Temperature :	25~26°C			
Test Channel :	01		Relative Humidity :	47~48%			
Test Engineer :	Kyle	e Jhuang	Polarization :	Vertical			
	1.	2412 MHz is fundamer	ntal signal which can b	e ignored.			
Remark :	2.	3216 MHZ and 7236 N	MHz are not within restricted bands, and its limit line				
		20dB below the highes	t emission level				

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2412	104.01	-	-	101.47	32.16	6.28	35.9	100	21	Average
2412	109.07	-	-	106.53	32.16	6.28	35.9	100	21	Peak
3216	46.87	-42.2	89.07	60.54	33.17	7.2	54.04	103	58	Peak
4824	51.17	-2.83	54	64.28	34.44	8.04	55.59	103	58	Average
4824	53.17	-20.83	74	66.28	34.44	8.04	55.59	103	58	Peak
7236	48.9	-40.17	89.07	59.24	35.6	10.48	56.42	100	0	Peak

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 51 of 79

Test Mode :	802.	11b	Temperature :	25~26°C			
Test Channel :	06		Relative Humidity :	47~48%			
Test Engineer : Kyle Jhuang			Polarization :	Horizontal			
	1.	2435 MHz is Fundame	ental signal which can be ignored.				
	2.	3249 MHz is not within	n a restricted band, and	d its limit line is 20dB below the			
Remark :		highest emission level.					
	3.	Average measuremen	t was not performed if	peak level went lower than the			
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	$(dB\mu V/m)$	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
168.51	33.68	-9.82	43.5	54.73	9.24	1.51	31.8	-	-	Peak
240.87	37.08	-8.92	46	56.13	10.89	1.8	31.74	-	-	Peak
292.98	41.92	-4.08	46	58.84	12.76	1.98	31.66	102	180	Peak
308.4	38.88	-7.12	46	55.21	13.31	2.03	31.67	-	-	Peak
324.5	39.64	-6.36	46	55.6	13.67	2.08	31.71	-	-	Peak
377	41.85	-4.15	46	56.22	15	2.24	31.61	-	-	Peak
2435	106.93	-	-	104.06	32.41	6.34	35.88	115	53	Average
2435	111.99	-	-	109.04	32.49	6.34	35.88	115	53	Peak
3249	48.78	-43.21	91.99	62.37	33	7.46	54.05	100	0	Peak
4875	53.36	-0.64	54	66.53	34.4	8.11	55.68	106	74	Average
4875	54.53	-19.47	74	67.7	34.4	8.11	55.68	106	74	Peak
7311	47.44	-26.56	74	57.63	35.62	10.47	56.28	100	0	Peak

Page Number : 52 of 79

Test Mode :	802.	11b	Temperature :	25~26°C			
Test Channel :	06		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical			
	1.	2439 MHz is Fundamental signal which can be ignored.					
Remark :	2.	Average measuremen	t was not performed if	peak level went lower than the			
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	
168.51	31.18	-12.32	43.5	52.27	9.2	1.51	31.8	-	-	Peak
224.67	35.22	-10.78	46	55.8	9.4	1.75	31.73	-	-	Peak
280.83	36.37	-9.63	46	53.5	12.62	1.94	31.69	100	257	Peak
304.9	34.15	-11.85	46	50.31	13.48	2.02	31.66	-	-	Peak
377	34.99	-11.01	46	49.37	14.99	2.24	31.61	-	-	Peak
381.2	34.97	-11.03	46	49.25	15.06	2.25	31.59	-	-	Peak
2439	102.12	-	-	99.28	32.38	6.34	35.88	146	0	Average
2439	107	-	-	104.16	32.38	6.34	35.88	146	0	Peak
4875	49.89	-24.11	74	63.06	34.4	8.11	55.68	100	0	Peak
7311	47.03	-26.97	74	57.28	35.56	10.47	56.28	100	0	Peak

Report Version : FR332112-04
Report Version : Rev. 01
Page Number : 53 of 79

Test Mode :	802.	11b	Temperature :	25~26°C
Test Channel :	11		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal
	1.	2464 MHz is fundamen	ntal signal which can be	e ignored.
Remark :	2.	Average measurement	t was not performed if	peak level went lower than the
		average limit.		

Fre	equency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	•	Remark
	MHz)	(dBuV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	
	,	(** F * /	(ab)	(αΒμν/ιιι)	· 1 /	, ,	,,		\ - /	. 0,	
	2464	105.97	-	-	102.87	32.56	6.39	35.85	114	51	Average
	2464	110.96	-	-	107.86	32.56	6.39	35.85	114	51	Peak
	1000	50.00	0.77	5 4	00.40	04.00	0.00	FF 70	405	0.4	Λ
	4926	53.23	-0.77	54	66.43	34.36	8.22	55.78	105	64	Average
	4926	55.49	-18.51	74	68.69	34.36	8.22	55.78	105	64	Peak
	7386	47.8	-26.2	74	57.8	35.66	10.45	56.11	100	0	Peak

Test Mode :	802.	.11b	Temperature :	25~26°C			
Test Channel :	11		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical			
	1.	2464 MHz is fundamer	ntal signal which can b	e ignored.			
Remark :	2.	Average measurement	t was not performed if	peak level went lower than the			
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2464	100.56	-	-	97.53	32.49	6.39	35.85	108	17	Average
2464	106.47	-	-	103.44	32.49	6.39	35.85	108	17	Peak
4926	49	-5	54	62.2	34.36	8.22	55.78	103	284	Average
4926	51.07	-22.93	74	64.27	34.36	8.22	55.78	103	284	Peak
7386	46.55	-27.45	74	56.72	35.49	10.45	56.11	100	0	Peak

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 54 of 79

Test Mode :	802.	11g	Temperature :	25~26°C
Test Channel :	01		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal
	1.	2410 MHz is fundamen	ntal signal which can b	e ignored.
	2.	3216 MHZ and 7236 N	/IHz are not within rest	ricted bands, and its limit line is
Remark :		20dB below the highes	st emission level.	
	3.	Average measuremen	t was not performed if	peak level went lower than the
		average limit.		

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2410	96.18	-	-	93.46	32.34	6.28	35.9	118	344	Average
2410	107.8	-	-	105.08	32.34	6.28	35.9	118	344	Peak
3216	53.61	-34.19	87.8	67.45	33	7.2	54.04	100	0	Peak
4824	48.63	-25.37	74	61.74	34.44	8.04	55.59	100	0	Peak
7236	46.88	-40.92	87.8	57.21	35.61	10.48	56.42	100	0	Peak

Test Mode :	802.	11g	Temperature :	25~26°C			
Test Channel :	01		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical			
	1.	2410 MHz is fundamen	ntal signal which can be ignored.				
	2.	3216 MHZ and 7236 MHz are not within restricted bands, and its limit lin					
Remark :		20dB below the highes	t emission level.				
	3.	Average measuremen	t was not performed if	peak level went lower than the			
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	$(dB\mu V/m)$	(dB)	$(dB\mu V/m)$	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2410	94.14	-	-	91.6	32.16	6.28	35.9	106	7	Average
2410	105.59	-	-	103.05	32.16	6.28	35.9	106	7	Peak
3216	49.69	-35.9	85.59	63.36	33.17	7.2	54.04	100	0	Peak
4824	47.19	-26.81	74	60.3	34.44	8.04	55.59	100	0	Peak
7236	46.53	-39.06	85.59	56.87	35.6	10.48	56.42	100	0	Peak

Page Number : 55 of 79

Test Mode :	802.	11g	Temperature :	25~26°C			
Test Channel :	06		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal			
	1.	2435 MHz is fundamen	e ignored.				
	2.	3249 MHz is not within	n a restricted band, and	d its limit line is 20dB below the			
Remark :		highest emission level.	highest emission level.				
	3.	Average measuremen	t was not performed if	peak level went lower than the			
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2435	99.9	-	-	97.03	32.41	6.34	35.88	108	28	Average
2435	112.04	-	-	109.17	32.41	6.34	35.88	108	28	Peak
3249	51.55	-40.49	92.04	65.14	33	7.46	54.05	100	0	Peak
4875	47.01	-6.99	54	60.18	34.4	8.11	55.68	105	61	Average
4875	56.32	-17.68	74	69.49	34.4	8.11	55.68	105	61	Peak
7311	46.72	-27.28	74	56.91	35.62	10.47	56.28	100	0	Peak

Test Mode :	802.	.11g	Temperature :	25~26°C
Test Channel :	06		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical
	1.	2439 MHz is fundamer	ntal signal which can b	e ignored.
Remark :	2.	Average measurement	t was not performed if	peak level went lower than the
		average limit.		

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	$(dB\mu V/m)$	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2439	93.89	-	-	91.05	32.38	6.34	35.88	100	310	Average
2439	105.61	-	-	102.77	32.38	6.34	35.88	100	310	Peak
4872	42.24	-11.76	54	55.41	34.4	8.11	55.68	184	41	Average
4872	53.37	-20.63	74	66.54	34.4	8.11	55.68	184	41	Peak
7311	47.02	-26.98	74	57.27	35.56	10.47	56.28	100	0	Peak

Page Number : 56 of 79

Test Mode :	802.	11g	Temperature :	25~26°C
Test Channel :	11		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal
	1.	2462 MHz is fundamen	ntal signal which can b	e ignored.
	2.	3282 MHz is not within	n a restricted band, and	d its limit line is 20dB below the
Remark :		highest emission level.		
	3.	Average measuremen	t was not performed if	peak level went lower than the
		average limit.		

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	$(dB\mu V/m)$	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
232.77	31.37	-14.63	46	51.27	10.05	1.78	31.73	-	-	Peak
280.83	37.25	-8.75	46	54.38	12.62	1.94	31.69	-	-	Peak
292.98	38.59	-7.41	46	55.51	12.76	1.98	31.66	-	-	Peak
308.4	39.63	-6.37	46	55.96	13.31	2.03	31.67	-	-	Peak
312.6	39.65	-6.35	46	55.87	13.42	2.04	31.68	102	128	Peak
365.1	38.83	-7.17	46	53.52	14.79	2.2	31.68	-	-	Peak
2462	98.58	-	-	95.48	32.56	6.39	35.85	108	357	Average
2462	106.83	-	-	103.73	32.56	6.39	35.85	108	357	Peak
3282	51.52	-35.31	86.83	65.02	32.97	7.59	54.06	100	0	Peak
4926	40.46	-13.54	54	53.66	34.36	8.22	55.78	104	85	Average
4926	51.12	-22.88	74	64.32	34.36	8.22	55.78	104	85	Peak
7386	47.84	-26.16	74	57.84	35.66	10.45	56.11	100	0	Peak

Page Number : 57 of 79

Test Mode :	802.	11g	Temperature :	25~26°C			
Test Channel :	11		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical			
	1.	2460 MHz is fundamer	ntal signal which can be ignored.				
	2.	3282 MHz is not within	n a restricted band, and	d its limit line is 20dB below the			
Remark :		highest emission level.					
	3.	Average measurement	t was not performed if	peak level went lower than the			
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	$(dB\mu V/m)$	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
32.7	26.5	-13.5	40	39.88	17.94	0.67	31.99	-	-	Peak
232.77	32.19	-13.81	46	51.81	10.33	1.78	31.73	-	-	Peak
284.88	35.68	-10.32	46	52.74	12.66	1.96	31.68	-	-	Peak
304.9	38.1	-7.9	46	54.26	13.48	2.02	31.66	110	234	Peak
312.6	35.16	-10.84	46	51.09	13.71	2.04	31.68	-	-	Peak
368.6	32.74	-13.26	46	47.34	14.85	2.21	31.66	-	-	Peak
2460	93.39	-	-	90.36	32.49	6.39	35.85	104	4	Average
2460	102.39	-	-	99.36	32.49	6.39	35.85	104	4	Peak
3282	48.97	-33.42	82.39	62.21	33.23	7.59	54.06	100	0	Peak
4923	47.33	-26.67	74	60.57	34.36	8.18	55.78	100	0	Peak
7386	47.06	-26.94	74	57.23	35.49	10.45	56.11	100	0	Peak

Page Number : 58 of 79

Test Mode :	802.	11n HT20	Temperature :	25~26°C
Test Channel :	01		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal
	1.	2410 MHz is fundamen	ntal signal which can b	e ignored.
	2.	3216 MHZ and 7236 N	/IHz are not within rest	ricted bands, and its limit line is
Remark :		20dB below the highes	t emission level.	
	3.	Average measuremen	t was not performed if	peak level went lower than the
		average limit.		

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2410	94.27	-	-	91.55	32.34	6.28	35.9	111	0	Average
2410	106.17	-	-	103.45	32.34	6.28	35.9	111	0	Peak
3216	50.81	-35.36	86.17	64.65	33	7.2	54.04	100	0	Peak
4824	46.96	-27.04	74	60.07	34.44	8.04	55.59	100	0	Peak
7236	47.05	-39.12	86.17	57.38	35.61	10.48	56.42	100	0	Peak

Test Mode :	802.	11n HT20	Temperature :	25~26°C			
Test Channel :	01		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical			
	1.	2410 MHz is fundamen	ental signal which can be ignored.				
	2.	3216 MHZ and 7236 MHz are not within restricted bands, and its limit line					
Remark :		20dB below the highes	st emission level.				
	3.	Average measurement was not performed if peak level went lower than the					
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2410	89.77	-	-	87.23	32.16	6.28	35.9	100	308	Average
2410	101.39	-	-	98.85	32.16	6.28	35.9	100	308	Peak
3216	48.33	-33.06	81.39	62	33.17	7.2	54.04	100	0	Peak
4824	46.01	-27.99	74	59.12	34.44	8.04	55.59	100	0	Peak
7236	47.22	-34.17	81.39	57.56	35.6	10.48	56.42	100	0	Peak

Page Number : 59 of 79

Test Mode :	802.	11n HT20	Temperature :	25~26°C			
Test Channel :	06		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal			
	1.	2435 MHz is fundame	ntal signal which can be ignored.				
	2.	3249 MHz is not within	9 MHz is not within a restricted band, and its limit line is 20dB below the				
Remark :		highest emission level.					
	3.	Average measuremen	t was not performed if	peak level went lower than the			
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2435	99.08	-	-	96.21	32.41	6.34	35.88	106	27	Average
2435	111.36	-	-	108.49	32.41	6.34	35.88	106	27	Peak
3249	50.62	-40.74	91.36	64.21	33	7.46	54.05	100	0	Peak
4875	45.85	-8.15	54	59.02	34.4	8.11	55.68	106	63	Average
4875	55.74	-18.26	74	68.91	34.4	8.11	55.68	106	63	Peak
7311	47.49	-26.51	74	57.68	35.62	10.47	56.28	100	0	Peak

Test Mode :	802.	.11n HT20	Temperature :	25~26°C
Test Channel :	06		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical
	1.	2435 MHz is fundamer	ntal signal which can b	e ignored.
Remark :	2.	Average measuremen	t was not performed if	peak level went lower than the
		average limit.		

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	$(dB\mu V/m)$	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2435	93.25	-	-	90.52	32.27	6.34	35.88	100	310	Average
2435	105.13	-	-	102.4	32.27	6.34	35.88	100	310	Peak
4874	39.66	-14.34	54	52.83	34.4	8.11	55.68	181	56	Average
4874	50.95	-23.05	74	64.08	34.41	8.11	55.65	181	56	Peak
7311	47.32	-26.68	74	57.57	35.56	10.47	56.28	100	0	Peak

Page Number : 60 of 79

Test Mode :	802.	11n HT20	Temperature :	25~26°C
Test Channel :	11		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal
	1.	2460 MHz is fundamen	ntal signal which can b	e ignored.
	2.	3282 MHz is not within	n a restricted band, and	d its limit line is 20dB below the
Remark :		highest emission level.		
	3.	Average measuremen	t was not performed if	peak level went lower than the
		average limit.		

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2460	95.64	-	-	92.54	32.56	6.39	35.85	112	48	Average
2460	107.56	-	-	104.46	32.56	6.39	35.85	112	48	Peak
3282	50.36	-37.2	87.56	63.86	32.97	7.59	54.06	100	0	Peak
4923	37.92	-16.08	54	51.16	34.36	8.18	55.78	105	85	Average
4923	50.04	-23.96	74	63.28	34.36	8.18	55.78	105	85	Peak
7386	47.3	-26.7	74	57.3	35.66	10.45	56.11	100	0	Peak

Test Mode :	802.	11n HT20	Temperature :	25~26°C				
Test Channel :	11		Relative Humidity :	47~48%				
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical				
	1.	2460 MHz is fundamer	ntal signal which can be ignored.					
	2.	3282 MHz is not within a restricted band, and its limit line is 20dB below						
Remark :		highest emission level.						
	3.	Average measurement was not performed if peak level went lower than						
		average limit.						

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2460	91.01	-	-	87.98	32.49	6.39	35.85	110	23	Average
2460	102.82	-	-	99.79	32.49	6.39	35.85	110	23	Peak
3282	47.85	-34.97	82.82	61.09	33.23	7.59	54.06	100	0	Peak
4923	46.64	-27.36	74	59.88	34.36	8.18	55.78	100	0	Peak
7386	47.04	-26.96	74	57.21	35.49	10.45	56.11	100	0	Peak

Page Number : 61 of 79

<Ant. 2>

Test Mode :	802.	11b	Temperature :	25~26°C			
Test Channel :	01		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal			
	1.	2412 MHz is fundamen	ntal signal which can be ignored.				
	2.	7236 MHz is not within a restricted band, and its limit line is 20dB below					
Remark :		highest emission level.	. For example, 112.47d	$B\mu V/m - 20dB = 92.47dB\mu V/m$.			
	3.	Average measurement was not performed if peak level went lower than the					
		average limit.					

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2412	107.58	-	-	104.86	32.34	6.28	35.9	121	22	Average
2412	112.47	-	-	109.75	32.34	6.28	35.9	121	22	Peak
4824	50.9	-23.1	74	64.01	34.44	8.04	55.59	100	0	Peak
7236	50.97	-41.5	92.47	61.3	35.61	10.48	56.42	100	0	Peak

Test Mode :	802.11b	Temperature :	25~26°C			
Test Channel :	01	Relative Humidity:	47~48%			
Test Engineer :	Kyle Jhuang	Polarization :	Vertical			
	1. 2412 MHz is fundam	ental signal which can be ignored.				
Remark :	2. 7236 MHz is not wit	hin a restricted band, and	d its limit line is 20dB below the			
	highest emission lev	el.				

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant		Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2412	103.89	-	-	101.35	32.16	6.28	35.9	101	87	Average
2412	108.95	-	-	106.41	32.16	6.28	35.9	101	87	Peak
4824	50.48	-3.52	54	63.59	34.44	8.04	55.59	100	127	Average
4824	53	-21	74	66.11	34.44	8.04	55.59	100	127	Peak
7236	49.22	-39.73	88.95	59.56	35.6	10.48	56.42	100	0	Peak

Report Vo.: FR332112-04
Report Version: Rev. 01
Page Number: 62 of 79

Test Mode :	802.11b	Temperature :	25~26°C			
Test Channel :	06	Relative Humidit	ty: 47~48%			
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal			
	1. 2439 MHz is	s Fundamental signal which can be ignored.				
Remark :	2. Average me	asurement was not performe	ed if peak level went lower than the			
	average limi	t.				

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	•	Remark
(MHz)	(dBuV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	
2439	108.59	- (ub)	- -	105.64	32.49	6.34	35.88	110	. 0,	Average
2439	113.62			110.67	32.49	6.34	35.88	110	32	Peak
	113.02	-	-	110.67	32.49	0.34	33.00	110	32	Peak
4875	53.02	-0.98	54	66.19	34.4	8.11	55.68	104	2	Average
4875	54.2	-19.8	74	67.37	34.4	8.11	55.68	104	2	Peak
7311	49.21	-24.79	74	59.4	35.62	10.47	56.28	100	0	Peak

Test Mode :	802.	.11b	Temperature :	25~26°C			
Test Channel :	06		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical			
	1.	2439 MHz is Fundame	ental signal which can be ignored.				
Remark :	2.	Average measuremen	t was not performed if	peak level went lower than the			
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2439	104.24	-	-	101.4	32.38	6.34	35.88	126	82	Average
2439	109.72	-	-	106.88	32.38	6.34	35.88	126	82	Peak
4875	51.12	-2.88	54	64.29	34.4	8.11	55.68	100	31	Average
4875	53.74	-20.26	74	66.91	34.4	8.11	55.68	100	31	Peak
7311	46.74	-27.26	74	56.99	35.56	10.47	56.28	100	0	Peak

Report Vo.: FR332112-04
Report Version: Rev. 01
Page Number: 63 of 79

Test Mode :	802.	11b	Temperature :	25~26°C
Test Channel :	11		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal
	1.	2462 MHz is fundamer	ntal signal which can b	e ignored.
Remark :	2.	Average measurement	t was not performed if	peak level went lower than the
		average limit.		

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
232.77	32.41	-13.59	46	52.31	10.05	1.78	31.73	-	-	Peak
284.88	37.38	-8.62	46	54.48	12.62	1.96	31.68	-	-	Peak
288.93	37.97	-8.03	46	54.98	12.69	1.97	31.67	-	-	Peak
304.9	39.14	-6.86	46	55.54	13.24	2.02	31.66	105	221	Peak
308.4	38.88	-7.12	46	55.21	13.31	2.03	31.67	-	-	Peak
360.9	38.44	-7.56	46	53.21	14.74	2.19	31.7	-	-	Peak
2462	108.38	-	-	105.28	32.56	6.39	35.85	115	24	Average
2462	113.3	-	-	110.2	32.56	6.39	35.85	115	24	Peak
4926	53.36	-0.64	54	66.56	34.36	8.22	55.78	116	11	Average
4926	55.94	-18.06	74	69.14	34.36	8.22	55.78	116	11	Peak
7386	48.49	-25.51	74	58.49	35.66	10.45	56.11	100	0	Peak

Page Number : 64 of 79

Test Mode :	802.	11b	Temperature :	25~26°C			
Test Channel :	11		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical			
	1.	2464 MHz is fundamen	64 MHz is fundamental signal which can be ignored.				
Remark :	2.	Average measurement	t was not performed if	peak level went lower than the			
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
112.35	27.93	-15.57	43.5	48.26	10.32	1.25	31.9	-	-	Peak
236.82	34.08	-11.92	46	53.37	10.66	1.79	31.74	-	-	Peak
292.98	34.58	-11.42	46	51.37	12.89	1.98	31.66	-	-	Peak
308.4	34.96	-11.04	46	51.04	13.56	2.03	31.67	108	220	Peak
312.6	34.31	-11.69	46	50.24	13.71	2.04	31.68	-	-	Peak
377	33.01	-12.99	46	47.39	14.99	2.24	31.61	-	-	Peak
2464	102.25	-	-	99.22	32.49	6.39	35.85	100	287	Average
2464	107.57	-	-	104.54	32.49	6.39	35.85	100	287	Peak
4926	51.54	-2.46	54	64.74	34.36	8.22	55.78	100	112	Average
4926	53.89	-20.11	74	67.09	34.36	8.22	55.78	100	112	Peak
7386	47	-27	74	57.17	35.49	10.45	56.11	100	0	Peak

Report Vo.: FR332112-04
Report Version: Rev. 01
Page Number: 65 of 79

Test Mode :	802.	11g	Temperature :	25~26°C
Test Channel :	01		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal
	1.	2410 MHz is fundamen	ntal signal which can b	e ignored.
	2.	3216 MHZ and 7236 N	/IHz are not within rest	ricted bands, and its limit line is
Remark :		20dB below the highes	st emission level.	
	3.	Average measuremen	t was not performed if	peak level went lower than the
		average limit.		

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2410	96.65	-	-	93.93	32.34	6.28	35.9	120	24	Average
2410	108.33	-	-	105.61	32.34	6.28	35.9	120	24	Peak
3216	49.8	-38.53	88.33	63.64	33	7.2	54.04	100	0	Peak
4824	45.62	-28.38	74	58.73	34.44	8.04	55.59	100	0	Peak
7236	48.13	-40.2	88.33	58.46	35.61	10.48	56.42	100	0	Peak

Test Mode :	802.	11g	Temperature :	25~26°C			
Test Channel :	01		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical			
	1.	2414 MHz is fundamer	ntal signal which can be ignored.				
	2.	7236 MHz is not within	7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.				
Remark :		highest emission level.					
	3.	Average measuremen	t was not performed if	peak level went lower than the			
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	$(dB\mu V/m)$	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2414	92.15	-	-	89.61	32.16	6.28	35.9	100	88	Average
2414	104.55	-	-	102.01	32.16	6.28	35.9	100	88	Peak
4824	45.65	-28.35	74	58.76	34.44	8.04	55.59	100	0	Peak
7236	46.79	-37.76	84.55	57.13	35.6	10.48	56.42	100	0	Peak

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 66 of 79

Test Mode :	802.	11g	Temperature :	25~26°C		
Test Channel :	06		Relative Humidity :	47~48%		
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal		
	1.	2439 MHz is fundamental signal which can be ignored.				
Remark :	d its limit line is 20dB below the					
		highest emission level.				

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2439	105.22	-	-	102.27	32.49	6.34	35.88	120	23	Average
2439	117.33	-	-	114.38	32.49	6.34	35.88	120	23	Peak
4876	45.29	-8.71	54	58.42	34.4	8.15	55.68	104	16	Average
4876	55.16	-18.84	74	68.29	34.4	8.15	55.68	104	16	Peak
7309	48.42	-5.58	54	58.61	35.62	10.47	56.28	100	25	Average
7309	57.3	-16.7	74	67.49	35.62	10.47	56.28	100	25	Peak
9746	52.9	-44.43	97.33	60.31	36.99	11.56	55.96	100	0	Peak

Test Mode :	802.	11g	Temperature :	25~26°C
Test Channel :	06		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical
	1.	2435 MHz is fundamen	ntal signal which can b	e ignored.
Remark :	2.	Average measurement	t was not performed if	peak level went lower than the
		average limit.		

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	($dB\mu V/m$)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2435	101.34	-	-	98.61	32.27	6.34	35.88	103	87	Average
2435	113.05	-	-	110.32	32.27	6.34	35.88	103	87	Peak
4875	47.49	-6.51	54	60.66	34.4	8.11	55.68	100	36	Average
4875	56.34	-17.66	74	69.51	34.4	8.11	55.68	100	36	Peak
7311	50.98	-23.02	74	61.23	35.56	10.47	56.28	100	0	Peak

Page Number : 67 of 79

Test Mode :	802.	11g	Temperature :	25~26°C
Test Channel :	11		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal
	1.	2464 MHz is fundame	ntal signal which can b	e ignored.
	2.	3282 MHz is not within	n a restricted band, and	d its limit line is 20dB below the
Remark :		highest emission level.		
	3.	Average measuremen	t was not performed if	peak level went lower than the
		average limit.		

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2464	95.98	-	-	92.88	32.56	6.39	35.85	107	360	Average
2464	107.57	-	-	104.47	32.56	6.39	35.85	107	360	Peak
3282	48.71	-38.86	87.57	62.21	32.97	7.59	54.06	100	0	Peak
4926	37.3	-16.7	54	50.5	34.36	8.22	55.78	102	199	Average
4926	50.77	-23.23	74	63.97	34.36	8.22	55.78	102	199	Peak
7386	47.66	-26.34	74	57.66	35.66	10.45	56.11	100	0	Peak

Test Mode :	802.11g		Temperature :	25~26°C			
Test Channel :	11		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical			
	1.	2464 MHz is fundamer	ntal signal which can b	e ignored.			
Remark :	2.	Average measuremen	Average measurement was not performed if peak level went lower than t				
		average limit.					

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant		Remark
(MHz)	(dBuV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	
_ ` _ /		, , ,		,	. ,	_ ,	, , ,	, ,		
2464	93.04	-	-	90.01	32.49	6.39	35.85	100	85	Average
2464	104.85	-	-	101.82	32.49	6.39	35.85	100	85	Peak
4926	49.75	-24.25	74	62.95	34.36	8.22	55.78	100	0	Peak
7386	47.16	-26.84	74	57.33	35.49	10.45	56.11	100	0	Peak

: 68 of 79

Page Number

Test Mode :	802.	11n HT20	Temperature :	25~26°C
Test Channel :	01		Relative Humidity :	47~48%
Test Engineer :	Kyle	Jhuang	Polarization :	Horizontal
	1.	2410 MHz is fundamen	ntal signal which can b	e ignored.
	2.	7236 MHz is not within	n a restricted band, and	d its limit line is 20dB below the
Remark :		highest emission level.		
	3.	Average measuremen	t was not performed if	peak level went lower than the
		average limit.		

ĺ	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
			Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
	(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
	2410	95.35	-	-	92.63	32.34	6.28	35.9	121	26	Average
	2410	107.26	-	-	104.54	32.34	6.28	35.9	121	26	Peak
	4824	45.18	-28.82	74	58.29	34.44	8.04	55.59	100	0	Peak
	7236	48.83	-38.43	87.26	59.16	35.61	10.48	56.42	100	0	Peak

Test Mode :	802.	11n HT20	Temperature :	25~26°C			
Test Channel :	01		Relative Humidity :	47~48%			
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical			
	1.	2410 MHz is fundamen	ntal signal which can be ignored.				
	2.	7236 MHz is not within	n a restricted band, and	d its limit line is 20dB below the			
Remark :		highest emission level.					
	3.	Average measuremen	t was not performed if	peak level went lower than the			
		average limit.					

Freque	ncy	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
(MHz	<u>'</u>)	(dBµV/m)	(dB)	(dBµV/m)		(dB)	(dB)	(dB)	(cm)	(deg)	
2410)	90.36	-	-	87.82	32.16	6.28	35.9	100	60	Average
2410)	102.08	-	-	99.54	32.16	6.28	35.9	100	60	Peak
4824	4	46.18	-27.82	74	59.29	34.44	8.04	55.59	100	0	Peak
7236	6	47.88	-34.2	82.08	58.22	35.6	10.48	56.42	100	0	Peak

: 69 of 79

Page Number

Test Mode :	802.11n HT20	Temperature :	25~26°C							
Test Channel :	06	Relative Humidity :	47~48%							
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal							
Remark :	2435 MHz is fundamental si	435 MHz is fundamental signal which can be ignored.								

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2435	103.94	-	-	101.07	32.41	6.34	35.88	118	22	Average
2435	116.49	-	-	113.62	32.41	6.34	35.88	118	22	Peak
4875	45.92	-8.08	54	59.09	34.4	8.11	55.68	103	16	Average
4875	56.51	-17.49	74	69.68	34.4	8.11	55.68	103	16	Peak
7313	45.43	-8.57	54	55.62	35.62	10.47	56.28	114	53	Average
7313	55.63	-18.37	74	65.82	35.62	10.47	56.28	114	53	Peak

Test Mode :	802.11n HT20	Temperature :	25~26°C					
Test Channel :	06	Relative Humidity :	47~48%					
Test Engineer :	Kyle Jhuang	Cyle Jhuang Polarization : Vertical						
Remark :	2435 MHz is fundamental si	2435 MHz is fundamental signal which can be ignored.						

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
(MHz)	(dBµV/m)	1	(dBµV/m)		(dB)	(dB)	(dB)	(cm)	(deg)	
2435	100.05	-	-	97.32	32.27	6.34	35.88	102	87	Average
2435	112.54	-	-	109.81	32.27	6.34	35.88	102	87	Peak
4875	48.35	-5.65	54	61.52	34.4	8.11	55.68	108	112	Average
4875	58.71	-15.29	74	71.88	34.4	8.11	55.68	108	112	Peak
7313	41.88	-12.12	54	52.13	35.56	10.47	56.28	142	236	Average
7313	52.01	-21.99	74	62.26	35.56	10.47	56.28	142	236	Peak
12180	48.27	-5.73	54	49.56	38.07	13.87	53.23	136	258	Average
12180	58.43	-15.57	74	59.72	38.07	13.87	53.23	136	258	Peak

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 70 of 79

Test Mode :	802.11n HT20		Temperature :	25~26°C	
Test Channel :	11		Relative Humidity :	47~48%	
Test Engineer :	Kyle Jhuang		Polarization :	Horizontal	
	1.	1. 2460 MHz is fundamental signal which can be ignored.			
	2.	3282 MHz is not within	n a restricted band, and	d its limit line is 20dB below the	
Remark :		highest emission level.			
	3.	Average measurement was not performed if peak level went lower than the			
		average limit.			

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
232.77	31.76	-14.24	46	51.66	10.05	1.78	31.73	-	-	Peak
284.88	40.24	-5.76	46	57.34	12.62	1.96	31.68	-	-	Peak
288.93	38.59	-7.41	46	55.6	12.69	1.97	31.67	-	-	Peak
304.9	40.7	-5.3	46	57.1	13.24	2.02	31.66	-	-	Peak
308.4	41.97	-4.03	46	58.3	13.31	2.03	31.67	103	197	Peak
372.8	38.61	-7.39	46	53.11	14.91	2.23	31.64	-	-	Peak
2460	94.71	-	-	91.61	32.56	6.39	35.85	108	349	Average
2460	106.69	-	-	103.59	32.56	6.39	35.85	108	349	Peak
3282	48.29	-38.4	86.69	61.79	32.97	7.59	54.06	100	0	Peak
4926	49.52	-24.48	74	62.72	34.36	8.22	55.78	100	0	Peak
7386	46.89	-27.11	74	56.89	35.66	10.45	56.11	100	0	Peak

Page Number : 71 of 79

Test Mode :	802.	11n HT20	Temperature :	25~26°C		
Test Channel :	11		Relative Humidity :	47~48%		
Test Engineer :	Kyle	Jhuang	Polarization :	Vertical		
	1.	2464 MHz is fundamen	ntal signal which can b	e ignored.		
Remark :	2.	Average measurement was not performed if peak level went lower than t				
		average limit.				

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	
232.77	32.07	-13.93	46	51.69	10.33	1.78	31.73	-	-	Peak
288.93	33.8	-12.2	46	50.72	12.78	1.97	31.67	-	-	Peak
292.98	34.46	-11.54	46	51.25	12.89	1.98	31.66	-	-	Peak
308.4	35.2	-10.8	46	51.28	13.56	2.03	31.67	-	-	Peak
312.6	36.1	-9.9	46	52.03	13.71	2.04	31.68	101	162	Peak
328.7	34.21	-11.79	46	49.68	14.16	2.09	31.72	-	-	Peak
2464	92.68	-	-	89.65	32.49	6.39	35.85	126	88	Average
2464	104.13	-	-	101.1	32.49	6.39	35.85	126	88	Peak
4923	46.96	-27.04	74	60.2	34.36	8.18	55.78	100	0	Peak
7386	47.32	-26.68	74	57.49	35.49	10.45	56.11	100	0	Peak

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 72 of 79

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	Conducted Limit (dBμV)				
(MHz)	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

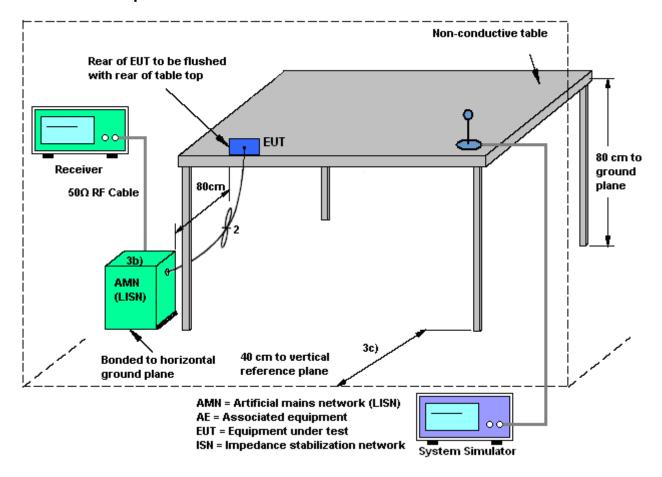
See list of measuring instruments of this test report.

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.

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 73 of 79

3.6.4 Test Setup



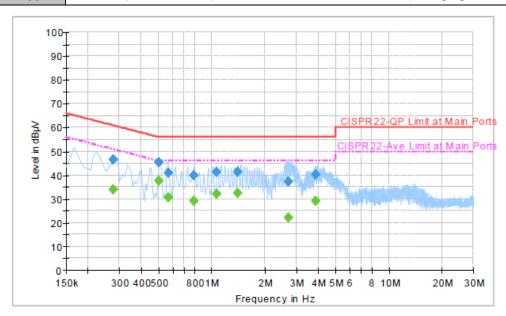
Report No. : FR332112-04
Report Version : Rev. 01

Page Number : 74 of 79

3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line

Function Type: GSM850 (GPRS class 8) Idle + WLAN Link + USB Cable (Charging from Adapter)



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.278000	46.5	Off	L1	19.3	14.4	60.9
0.502000	45.2	Off	L1	19.3	10.8	56.0
0.566000	40.9	Off	L1	19.4	15.1	56.0
0.790000	39.9	Off	L1	19.5	16.1	56.0
1.070000	41.5	Off	L1	19.4	14.5	56.0
1.406000	41.4	Off	L1	19.4	14.6	56.0
2.710000	37.3	Off	L1	19.6	18.7	56.0
3.870000	40.3	Off	L1	19.6	15.7	56.0

Final Result : Average

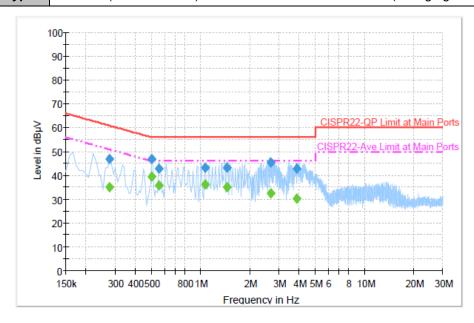
<u> </u>						
ncy Averag	e Filter	Eiltor	Line	Corr.	Margin	Limit
) (dBμ\) Filler	illei	LIIIE	(dB)	(dB)	(dBµV)
00 33.8	Off	Off	L1	19.3	17.1	50.9
00 37.6	Off	Off	L1	19.3	8.4	46.0
00 30.6	Off	Off	L1	19.4	15.4	46.0
00 29.3	Off	Off	L1	19.5	16.7	46.0
00 32.2	Off	Off	L1	19.4	13.8	46.0
00 32.5	Off	Off	L1	19.4	13.5	46.0
00 22.0	Off	Off	L1	19.6	24.0	46.0
00 29.2	Off	Off	L1	19.6	16.8	46.0
00 29.3 00 32.2 00 32.5 00 22.0	Off Off Off	Off Off Off	L1 L1 L1	19.5 19.4 19.4 19.6	16.7 13.8 13.5 24.0	46 46 46

Report No. : FR332112-04

Report Version : Rev. 01 Page Number : 75 of 79

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral

Function Type: GSM850 (GPRS class 8) Idle + WLAN Link + USB Cable (Charging from Adapter)



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.278000	46.7	Off	N	19.4	14.2	60.9
0.502000	46.7	Off	N	19.4	9.3	56.0
0.558000	42.9	Off	N	19.4	13.1	56.0
1.062000	43.0	Off	N	19.4	13.0	56.0
1.454000	43.1	Off	N	19.5	12.9	56.0
2.694000	45.3	Off	N	19.6	10.7	56.0
3.862000	42.9	Off	N	19.6	13.1	56.0

Final Result : Average

mai itesuit	. / tro. ugo					
Frequency	Average	Filter	Lina	Corr.	Margin	Limit
(MHz)	(dBµV)	Filter	Line	(dB)	(dB)	(dBµV)
0.278000	35.0	Off	N	19.4	15.9	50.9
0.502000	39.5	Off	N	19.4	6.5	46.0
0.558000	35.9	Off	N	19.4	10.1	46.0
1.062000	36.1	Off	N	19.4	9.9	46.0
1.454000	34.9	Off	N	19.5	11.1	46.0
2.694000	32.5	Off	N	19.6	13.5	46.0
3.862000	30.3	Off	N	19.6	15.7	46.0

Report No. : FR332112-04
Report Version : Rev. 01

Page Number : 76 of 79

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 is 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.

Report No. : FR332112-04
Report Version : Rev. 01
Page Number : 77 of 79

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz~40GHz	Oct. 29, 2012	May 31, 2013~ Jul. 03, 2013	Oct. 28, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Sep. 08, 2012	May 31, 2013~ Jul. 03, 2013	Sep. 07, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Sep. 08, 2012	May 31, 2013~ Jul. 03, 2013	Sep. 07, 2013	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 13, 2012	Jun. 03, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Jun. 03, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Jun. 03, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Jun. 03, 2013	N/A	Conduction (CO05-HY)
Spectrum Analyzer	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 14, 2012	Jun. 02, 2013~ Jul. 10, 2013	Dec. 13, 2013	Radiation (03CH08-HY)
Bilog Antenna	Schaffner	CBL6111C	2725	30MHz~2GHz	Oct. 06, 2012	Jun. 02, 2013~ Jul. 10, 2013	Oct. 05, 2013	Radiation (03CH08-HY)
Horn Antenna	ESCO	3117	66584	1GHz~18GHz	Aug. 10, 2012	Jun. 02, 2013~ Jul. 10, 2013	Aug. 09, 2013	Radiation (03CH08-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA91702 51	15GHz ~ 40GHz	Sep. 28, 2012	Jun. 02, 2013~ Jul. 10, 2013	Sep. 27, 2013	Radiation (03CH08-HY)
Preamplifier	COM-POWER	PA-103	161075	10Hz~1000MHz Gain:32dB	Feb. 26, 2013	Jun. 02, 2013~ Jul. 10, 2013	Feb. 25, 2014	Radiation (03CH08-HY)
Pre Amplifier	Agilent	8449B	3008A02665	1GHz~26.5GHz	Aug. 28, 2012	Jun. 02, 2013~ Jul. 10, 2013	Aug. 27, 2013	Radiation (03CH08-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	860004/001	9kHz ~ 30MHz	Jul. 03, 2012	Jun. 02, 2013~ Jul. 10, 2013	Jul. 02, 2014	Radiation (03CH08-HY)
Turn Table	HD	HD100	420/611	0 ~ 360 degree	N/A	Jun. 02, 2013~ Jul. 10, 2013	N/A	Radiation (03CH08-HY)
Antenna Mast	HD	HD100	240/666	1 m ~ 4 m	N/A	Jun. 02, 2013~ Jul. 10, 2013	N/A	Radiation (03CH08-HY)

Report No. : FR332112-04
Report Version : Rev. 01

Page Number : 78 of 79

5 Uncertainty of Evaluation

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

Measuring Uncertain	ty for a Level of	2.26
Confidence of 95%	6 (U = 2Uc(y))	2.20

<u>Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)</u>

Measuring Uncertainty for a Level of	2.54
Confidence of 95% (U = 2Uc(y))	2.54

Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

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

Report No. : FR332112-04

Report Version : Rev. 01
Page Number : 79 of 79