

FCC RF Test Report

APPLICANT : SAMSUNG Electronics Co., LTD.
EQUIPMENT : Mobile Phone
BRAND NAME : Samsung
MODEL NAME : GT-I8190L
MARKETING NAME : GOLDEN
FCC ID : A3LGTI8190L
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Oct. 16, 2012 and completely tested on Oct. 23, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager



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FCC ID : A3LGTI8190L

Page Number : 1 of 148

Report Issued Date : Nov. 05, 2012

Report Version : Rev. 03



TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Feature of Equipment Under Test	5
1.4 Testing Site	6
1.5 Applied Standards	6
1.6 Ancillary Equipment List	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 RF Utility	11
3 TEST RESULT	12
3.1 6dB Bandwidth Measurement	12
3.2 Output Power Measurement	30
3.3 Power Spectral Density Measurement	35
3.4 Conducted Band Edges and Spurious Emission Measurement	68
3.5 Radiated Band Edges and Spurious Emission Measurement	109
3.6 AC Conducted Emission Measurement	142
3.7 Antenna Requirements	146
4 LIST OF MEASURING EQUIPMENT	147
5 UNCERTAINTY OF EVALUATION	148



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR2O1604B	Rev. 01	Initial issue of report	Oct. 26, 2012
FR2O1604B	Rev. 02	Update report for adding description of offsets, RF cable and attenuator for conducted measurement.	Nov. 02, 2012
FR2O1604B	Rev. 03	Update report for adding duty cycle plots and description of offsets, RF cable and attenuator for conducted measurement.	Nov. 05, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	A8.4	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	A8.5	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	-
			Radiated Spurious Emission		Pass	Under limit 2.05 dB at 4824.000 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 17.00 dB at 0.294 MHz
3.7	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

SAMSUNG Electronics Co., LTD.

IT center, 416, Maetan-3dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, Korea

1.2 Manufacturer

SAMSUNG Electronics Co., LTD.

IT center, 416, Maetan-3dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, Korea

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Phone
Brand Name	Samsung
Model Name	GT-I8190L
Marketing Name	GOLDEN
FCC ID	A3LGTI8190L
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/ WLAN 11abgn / Bluetooth
HW Version	REV1.0
SW Version	I8190L.010
EUT Stage	Identical Prototype

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

Product Specification subjective to this standard	
Tx/Rx 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 : 18.91 dBm (0.0778 W) 802.11g : 24.32 dBm (0.2704 W) 802.11n HT20 : 22.60 dBm (0.1820 W) <5745 MHz ~ 5825 MHz> 802.11a : 22.74 dBm (0.1879 W) 802.11n HT20 : 22.35 dBm (0.1718 W)
Antenna Type	802.11b/g/n : FPCB Antenna type with gain -4.00 dBi 802.11a/n : FPCB Antenna type with gain -4.00 dBi
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.			
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH02-HY	CO05-HY	03CH06-HY	722060/4086B-1

1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
- ♦ ANSI C63.4-2003 and ANSI C63.10-2009
- ♦ IC RSS-210 Issue 8
- ♦ IC RSS-Gen Issue 3

Remark:

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

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-825	KA2DIR825A2	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A

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 (Z plane for 2.4GHz & Y plane for 5GHz) 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	159	5795
	151	5755	161	5805
	157	5785	165	5825

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and antenna configurations as following table and the highest power data rates were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	18.91	18.82	18.83	18.88

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)	24.32	24.14	24.17	24.04	24.28	24.12	24.03	23.97

2.4GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	22.60	22.42	22.59	22.44	22.42	22.49	22.51	22.41

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)	22.74	22.59	22.32	22.19	22.34	22.32	22.11	22.17

5GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	22.35	22.29	22.27	22.33	22.22	22.17	22.18	22.23

2.3 Test Mode

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

<2.4GHz>

Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
Radiated TCs	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11

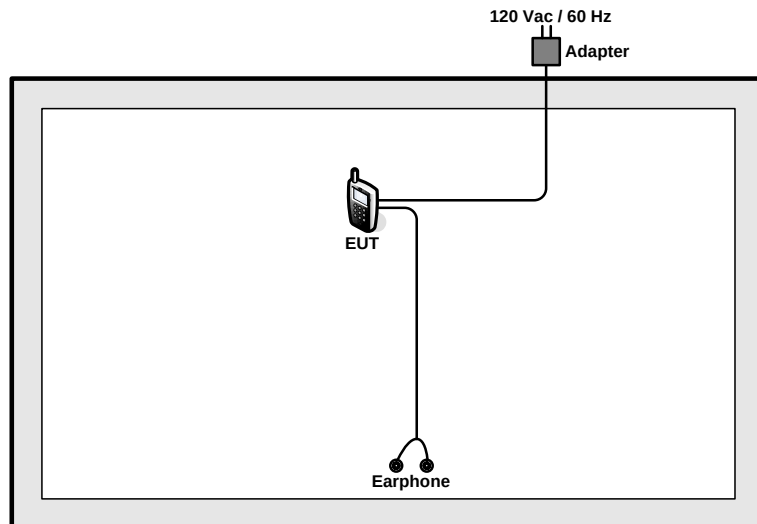
<5GHz>

Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB BW	802.11a	6 Mbps	149/157/165
	Power Spectral Density	802.11n HT20	6.5 Mbps	149/157/165
	Output Power	802.11a	6 Mbps	149/157/165
		802.11n HT20	6.5 Mbps	149/157/165
	Conducted Band Edge	802.11a	6 Mbps	149/165
		802.11n HT20	6.5 Mbps	149/165
	Conducted Spurious Emission	802.11a	6 Mbps	149/157/165
		802.11n HT20	6.5 Mbps	149/157/165
	Radiated TCs	Radiated Band Edge	802.11a	149/165
			802.11n HT20	149/165
		Radiated Spurious Emission	802.11a	149/157/165
			802.11n HT20	149/157/165

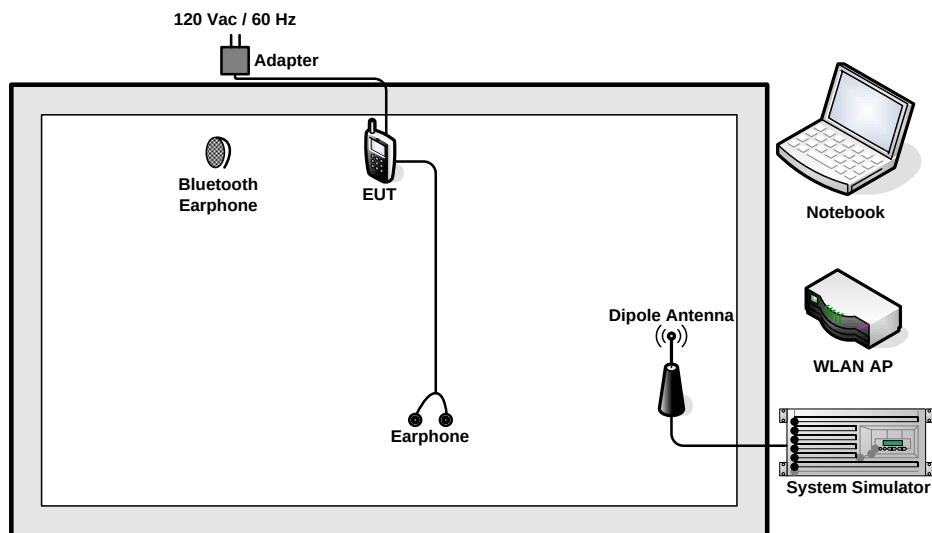
Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link + Earphone + MP3 + Adapter

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 RF Utility

For WLAN function, key in “* # 232339 #” on the EUT directly. Then, the EUT will get into the engineering modes to contact with WLAN AP for continuous transmitting and receiving signals.

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

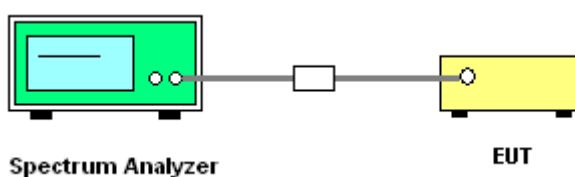
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1-5% of the emission bandwidth (EBW). Set the Video bandwidth (VBW) $\geq 3 * RBW$. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.

3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

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

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	9.02	0.5	Pass
06	2437	8.53	0.5	Pass
11	2462	8.99	0.5	Pass

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

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.09	0.5	Pass
06	2437	15.09	0.5	Pass
11	2462	15.09	0.5	Pass

Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Engineer :	Felix Song	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.12	0.5	Pass
06	2437	15.09	0.5	Pass
11	2462	15.10	0.5	Pass

Test Mode :	802.11a	Temperature :	24~26℃
Test Engineer :	Felix Song	Relative Humidity :	50~53%

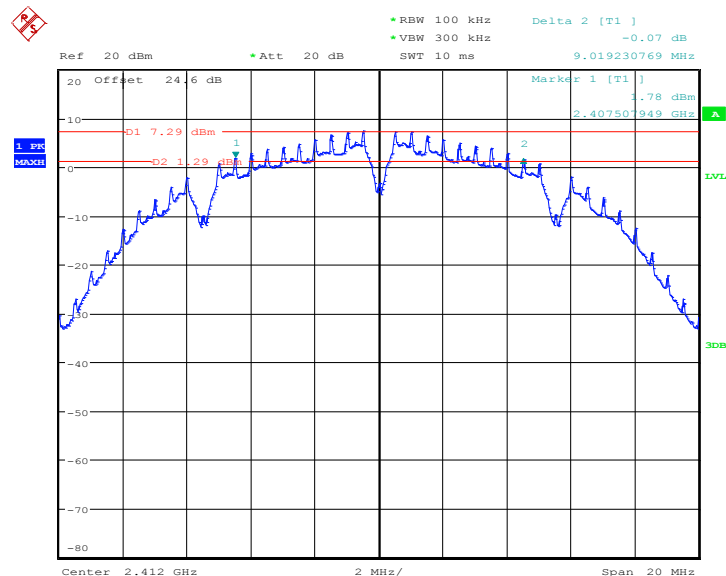
Channel	Frequency (MHz)	802.11a 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
149	5745	15.12	0.5	Pass
157	5785	15.10	0.5	Pass
165	5825	15.10	0.5	Pass

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Felix Song	Relative Humidity :	50~53%

Channel	Frequency (MHz)	5GHz 802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
149	5745	15.10	0.5	Pass
157	5785	15.12	0.5	Pass
165	5825	15.10	0.5	Pass

3.1.6 Test Result of 6dB Bandwidth Plots

6 dB Bandwidth Plot on 802.11b Channel 01



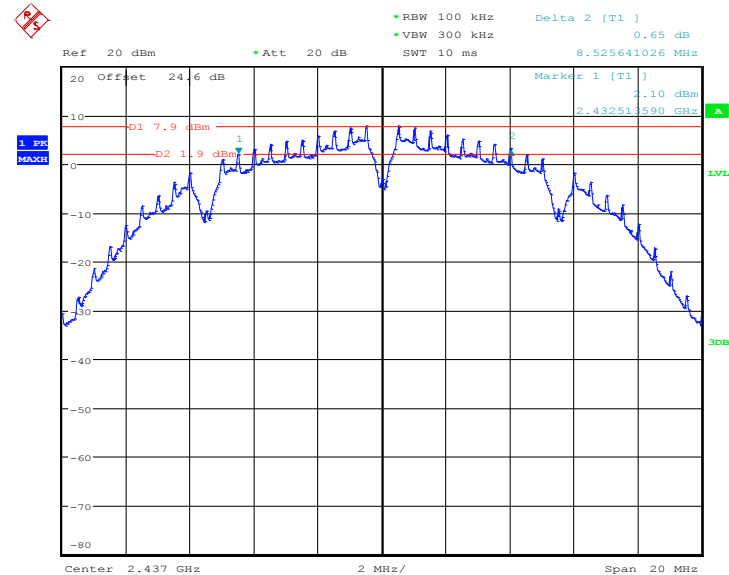
201604-1023 15C 6dB,11b 2412 (ch01)

Date: 23.OCT.2012 15:09:40

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

Example: the 6dB bandwidth test item, the peak point of fundamental signal is 7.29dBm, has added (offset) with the total loss = attenuator factor + cable loss = 24.6dB, where, cable loss = 4.6dB and 20dB attenuator, and then the 6dB bandwidth is measured and compliance with the limit line. Hereafter, each plot of spectrum analyzer has been added the total loss respectively and to demonstrate in compliance with the limit line.

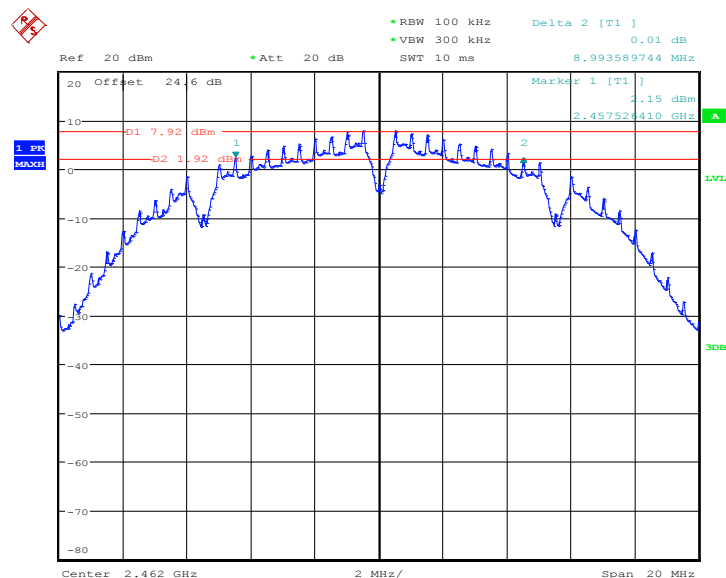
6 dB Bandwidth Plot on 802.11b Channel 06


201604-1023 15C 6dB.11b 2437 (ch06)
Date: 23.OCT.2012 14:14:50

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

6 dB Bandwidth Plot on 802.11b Channel 11

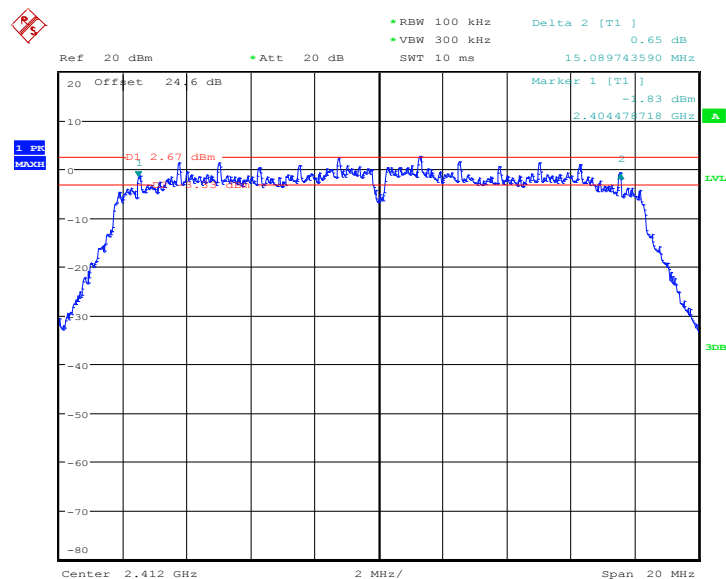


201604-1023 15C 6dB.11b 2462 (ch11)
Date: 23.OCT.2012 14:16:33

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

6 dB Bandwidth Plot on 802.11g Channel 01

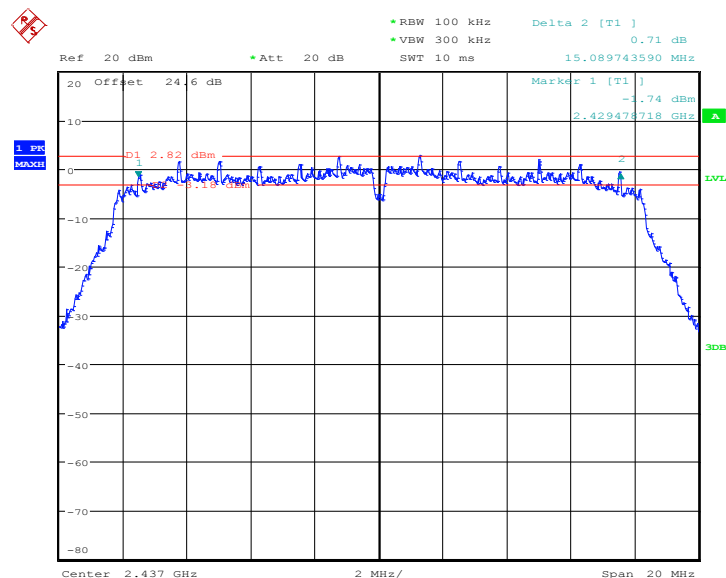


201604-1023 15C 6dB.11g 2412 (ch01)
Date: 23.OCT.2012 14:18:30

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

6 dB Bandwidth Plot on 802.11g Channel 06

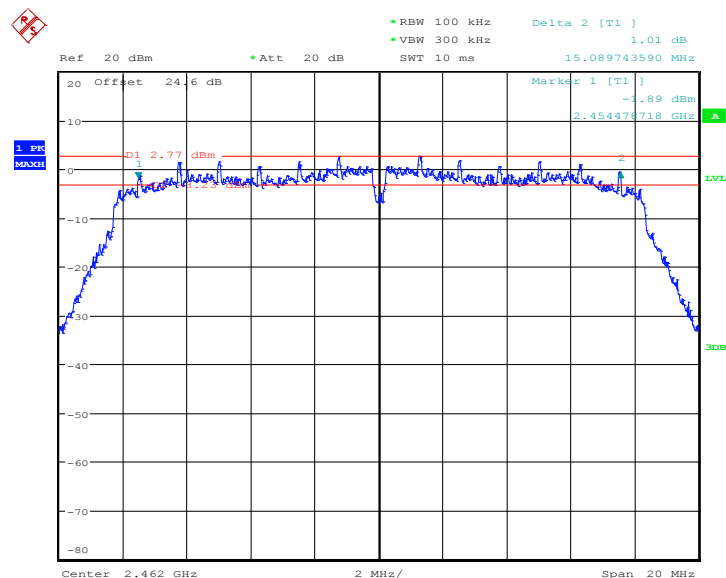


201604-1023 15C 6dB.11g 2437 (ch06)
Date: 23.OCT.2012 14:26:18

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

6 dB Bandwidth Plot on 802.11g Channel 11

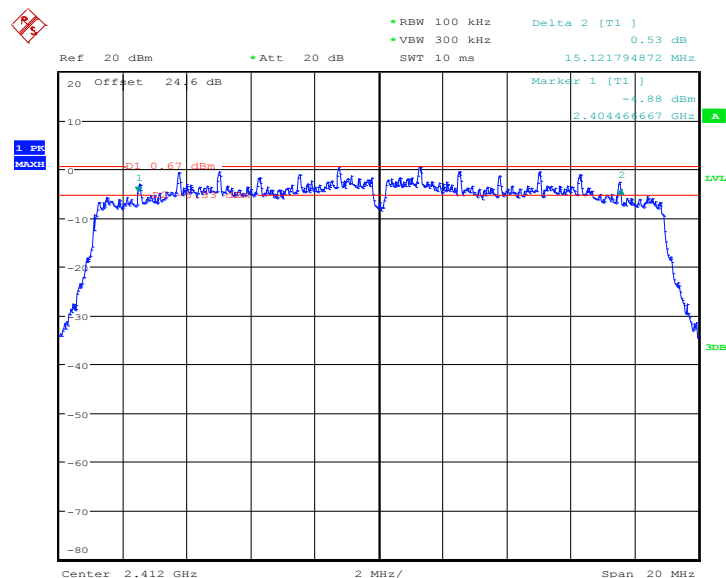


201604-1023 15C 6dB.11g 2462 (ch11)
Date: 23.OCT.2012 14:27:50

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

6 dB Bandwidth Plot on 2.4GHz 802.11n HT20 Channel 01

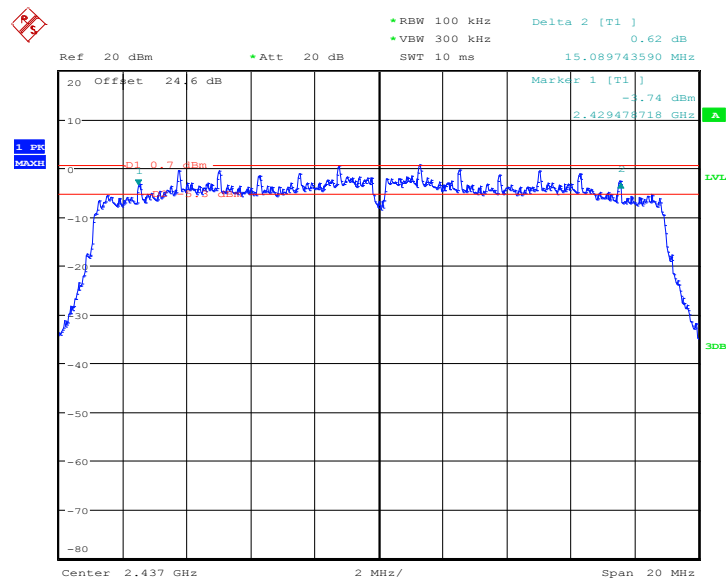


201604-1023 15C 6dB.11g_N20 2412 (ch01)
 Date: 23.OCT.2012 14:33:33

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

6 dB Bandwidth Plot on 2.4GHz 802.11n HT20 Channel 06

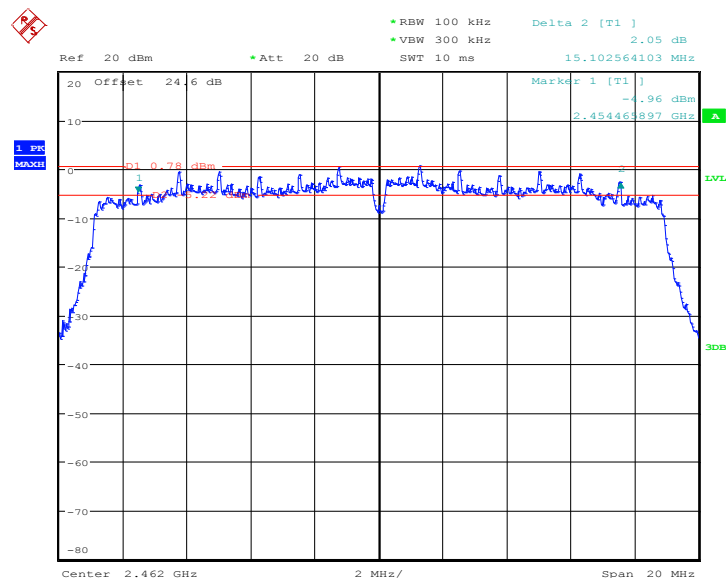


201604-1023 15C 6dB.11g_N20 2437 (ch06)
Date: 23.OCT.2012 14:40:17

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

6 dB Bandwidth Plot on 2.4GHz 802.11n HT20 Channel 11



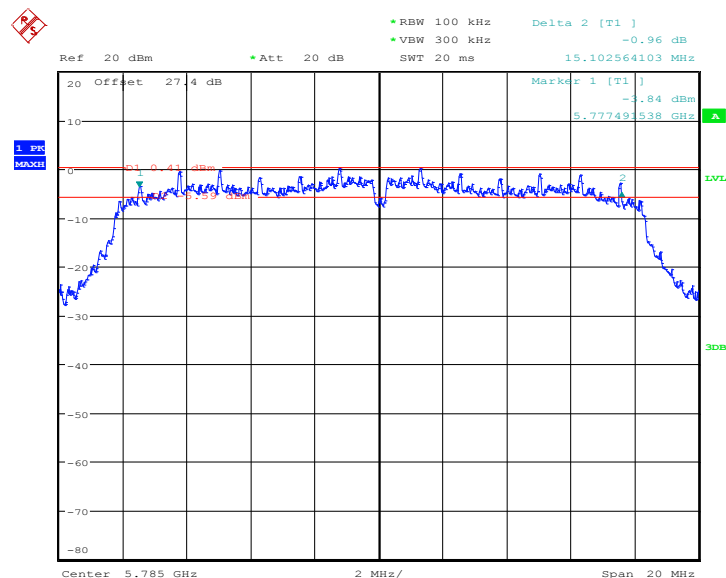
201604-1023 15C 6dB.11g_N20 2462 (ch11)
 Date: 23.OCT.2012 14:43:18

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.



The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

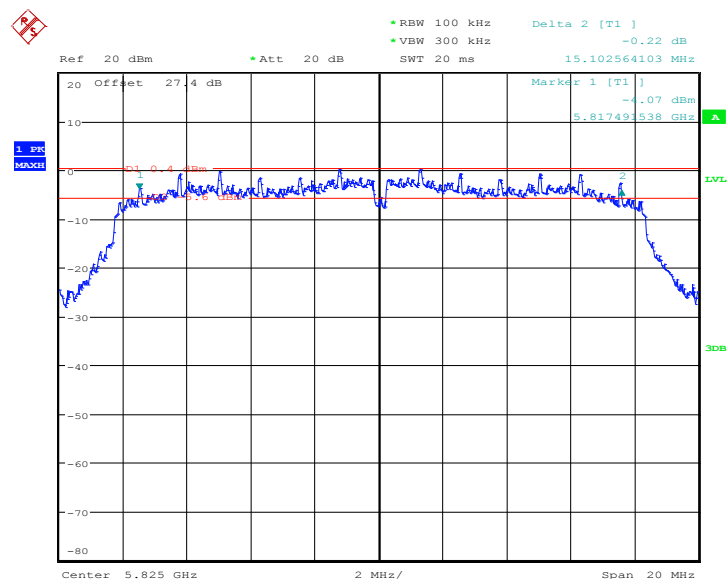


201604-1023 15C 6dB.11a 5785 (ch157)
Date: 23.OCT.2012 15:20:32

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

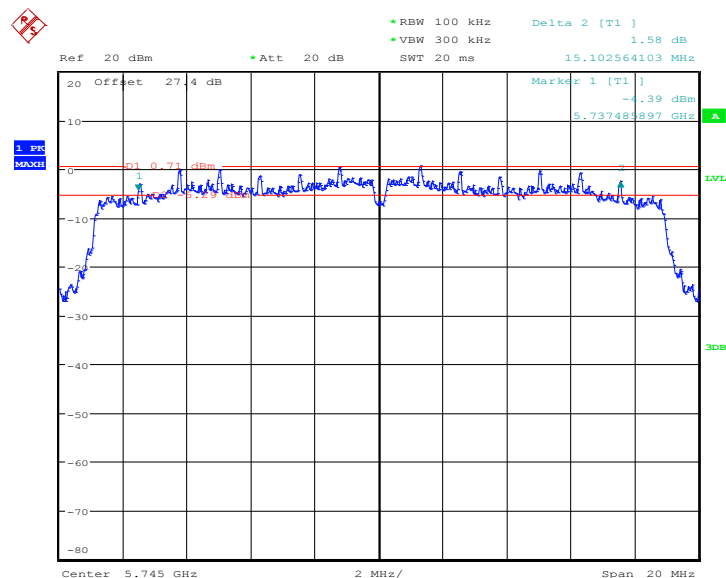
6 dB Bandwidth Plot on 802.11a Channel 165



201604-1023 15C 6dB.11a 5825 (ch165)
 Date: 23.OCT.2012 15:23:36

Note:

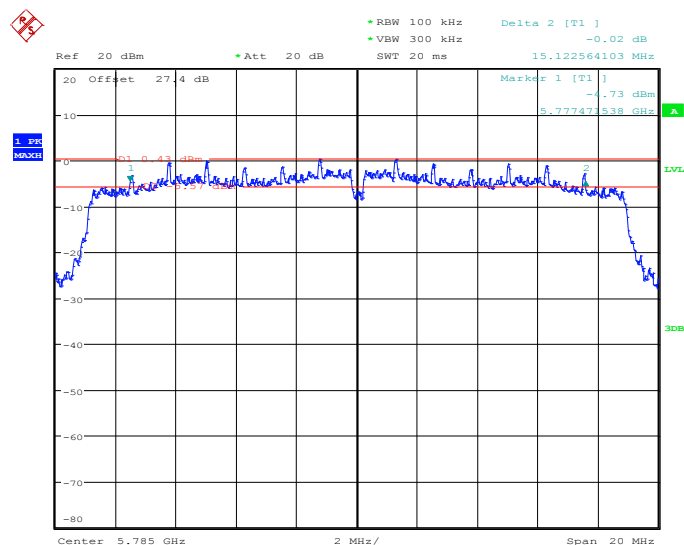
The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.



201604-1023 15C 6dB.11a_N20 5745 (ch149)
Date: 23.OCT.2012 15:28:10

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

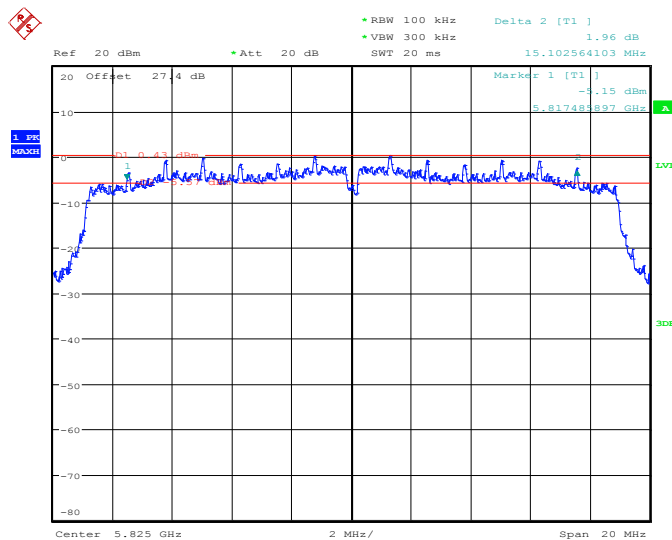
6 dB Bandwidth Plot on 5GHz 802.11n HT20 Channel 157


201604-1023 15C 6dB,11a_N20 5785 (ch157)
 Date: 23.OCT.2012 15:31:12

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

6 dB Bandwidth Plot on 5GHz 802.11n HT20 Channel 165



201604-1023 15C 6dB.11a_N20 5825 (ch165)
Date: 23.OCT.2012 15:34:12

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

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.

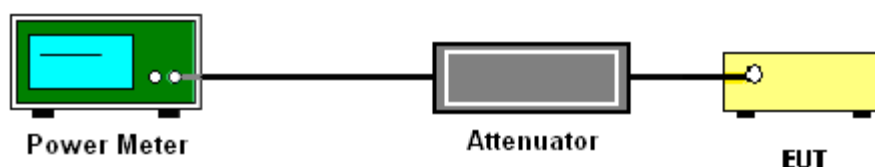
3.2.2 Measuring Instruments

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 v02.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

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

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.63	30	Pass
06	2437	18.91	30	Pass
11	2462	18.87	30	Pass

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

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	24.07	30	Pass
06	2437	24.32	30	Pass
11	2462	24.28	30	Pass

Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Engineer :	Felix Song	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	22.37	30	Pass
06	2437	22.60	30	Pass
11	2462	22.47	30	Pass

Test Mode :	802.11a	Temperature :	24~26°C
Test Engineer :	Felix Song	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	22.58	30	Pass
157	5785	22.74	30	Pass
165	5825	22.69	30	Pass

Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Engineer :	Felix Song	Relative Humidity :	50~53%

Channel	Frequency (MHz)	5GHz 802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	22.23	30	Pass
157	5785	22.35	30	Pass
165	5825	22.34	30	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	24~26°C
Test Engineer :	Felix Song	Relative Humidity :	50~53%
Duty Cycle:	99.08%	Duty Factor:	0.04dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	16.17
06	2437	16.29
11	2462	16.28

Test Mode :	802.11g	Temperature :	24~26°C
Test Engineer :	Felix Song	Relative Humidity :	50~53%
Duty Cycle:	93.23%	Duty Factor:	0.30dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	13.82
06	2437	14.05
11	2462	13.96

Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Engineer :	Felix Song	Relative Humidity :	50~53%
Duty Cycle:	93.33%	Duty Factor:	0.30dB

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Average Output Power (dBm)
01	2412	11.68
06	2437	11.91
11	2462	11.87

Test Mode :	802.11a	Temperature :	24~26℃
Test Engineer :	Felix Song	Relative Humidity :	50~53%
Duty Cycle:	93.46%	Duty Factor:	0.29dB

Channel	Frequency (MHz)	802.11a Average Output Power (dBm)
149	5745	12.07
157	5785	12.16
165	5825	12.10

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Felix Song	Relative Humidity :	50~53%
Duty Cycle:	92.78%	Duty Factor:	0.33dB

Channel	Frequency (MHz)	5GHz 802.11n HT20 Average Output Power (dBm)
149	5745	12.12
157	5785	12.25
165	5825	12.21

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.

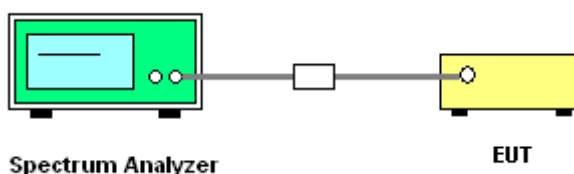
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 9.1 Option 1 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. 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. Record the measurement data derived from spectrum analyzer.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

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

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	7.07	-6.22	8	Pass
06	2437	7.44	-6.79	8	Pass
11	2462	7.43	-6.41	8	Pass

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

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	2.37	-10.17	8	Pass
06	2437	2.77	-11.34	8	Pass
11	2462	1.77	-10.88	8	Pass

Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Engineer :	Felix Song	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-0.02	-13.18	8	Pass
06	2437	0.59	-12.95	8	Pass
11	2462	0.51	-13.57	8	Pass

Test Mode :	802.11a	Temperature :	24~26°C
Test Engineer :	Felix Song	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
149	5745	0.59	-12.73	8	Pass
157	5785	0.21	-13.06	8	Pass
165	5825	-0.01	-12.30	8	Pass

Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Engineer :	Felix Song	Relative Humidity :	50~53%

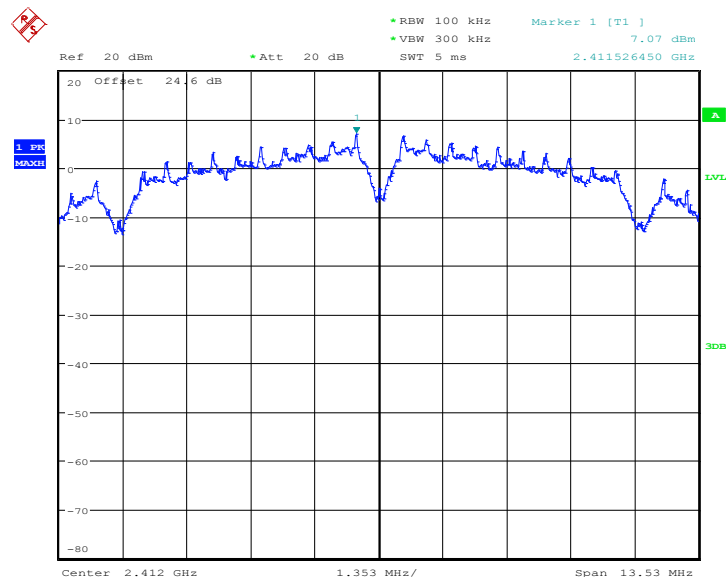
Channel	Frequency (MHz)	5GHz 802.11n HT20 Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
149	5745	0.67	-13.04	8	Pass
157	5785	0.21	-13.21	8	Pass
165	5825	0.38	-13.51	8	Pass

Note:

1. Measured power density (dBm) has offset with cable loss.
2. The Measured power density (dBm)/ 100KHz is reference level and used as 20dBc down for Conducted Band Edges and Conducted Spurious Emission limit line.

3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on 802.11b Channel 01

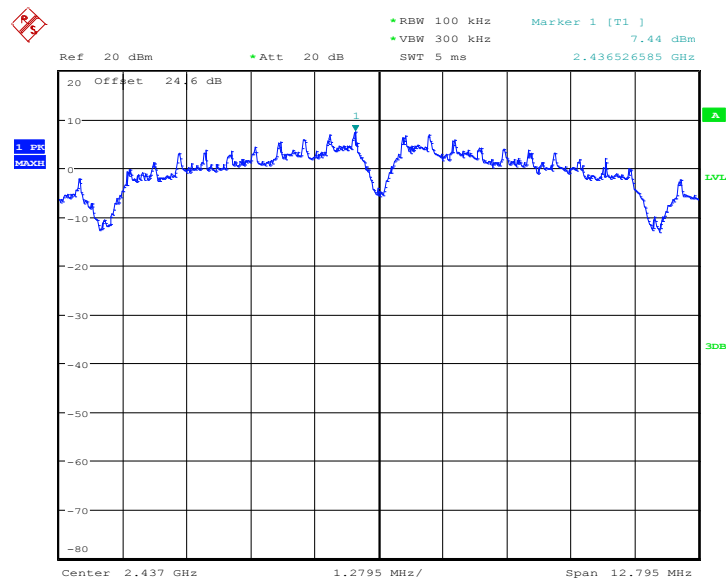


201604-1023 15C PSD (100K) 802.11b 2412 (ch01)
Date: 23.OCT.2012 15:10:22

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot on 802.11b Channel 06

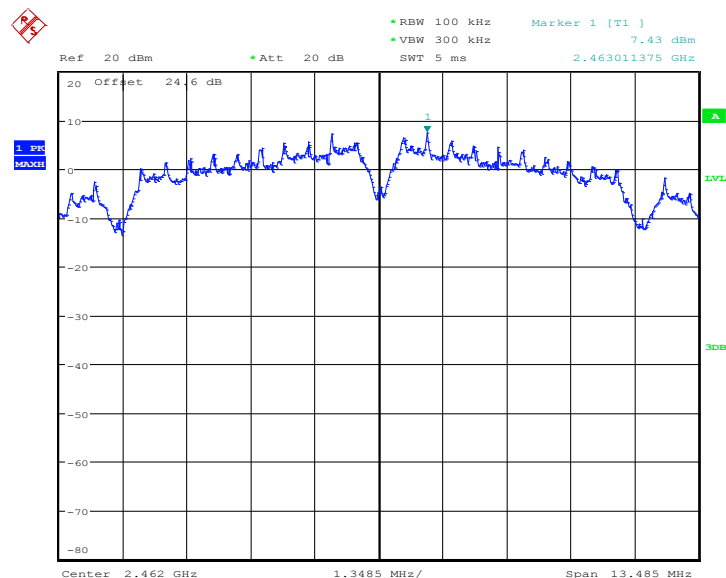


201604-1023 15C PSD (100K) 802.11b 2437 (ch06)
Date: 23.OCT.2012 14:53:37

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot on 802.11b Channel 11

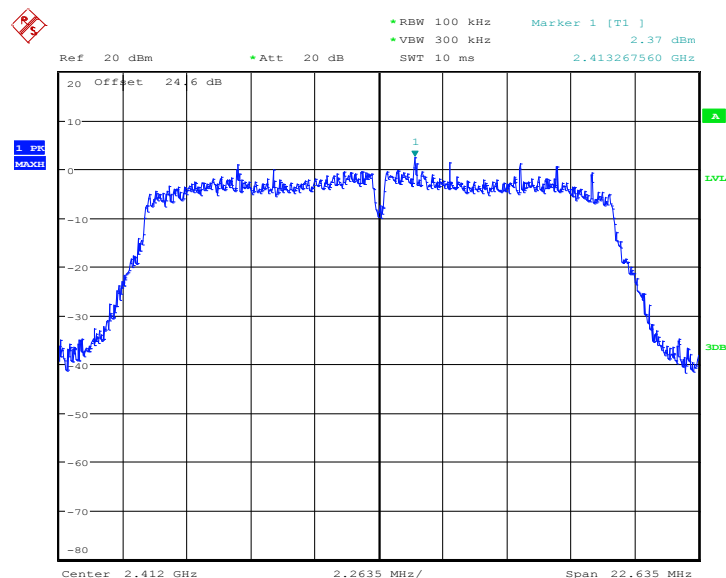


201604-1023 15C PSD (100K) 802.11b 2462 (ch11)
Date: 23.OCT.2012 14:56:16

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot on 802.11g Channel 01

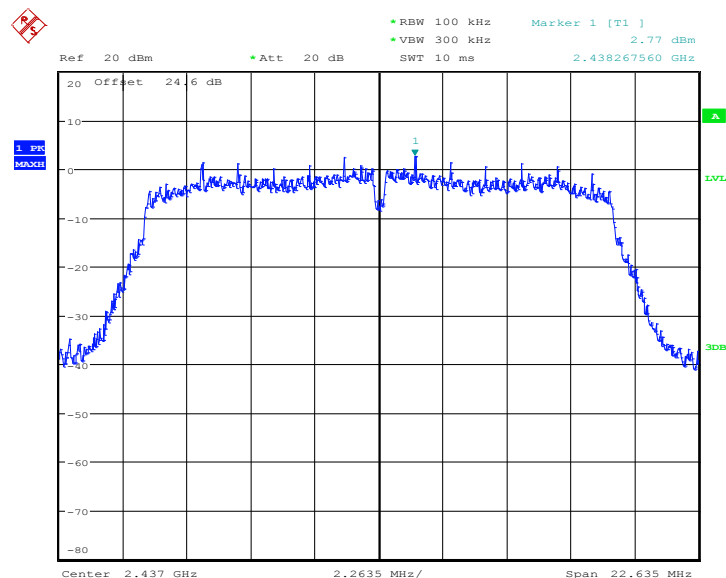


201604-1023 15C PSD (100K) 802.11g 2412 (ch01)
Date: 23.OCT.2012 14:59:16

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot 802.11g Channel 06

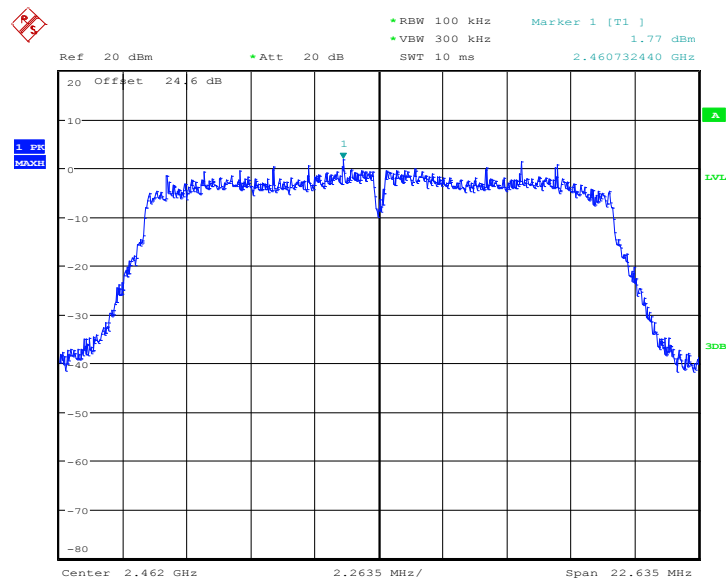


201604-1023 15C PSD (100K) 802.11g 2437 (ch06)
Date: 23.OCT.2012 15:03:35

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

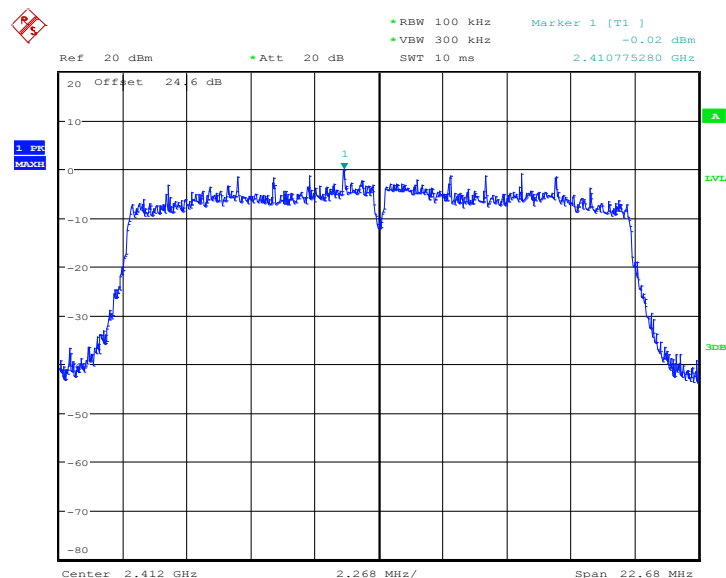
PSD 100kHz Plot 802.11g Channel 11



2o1604-1023 15C PSD (100K) 802.11g 2462 (ch11)
Date: 23.OCT.2012 15:05:37

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

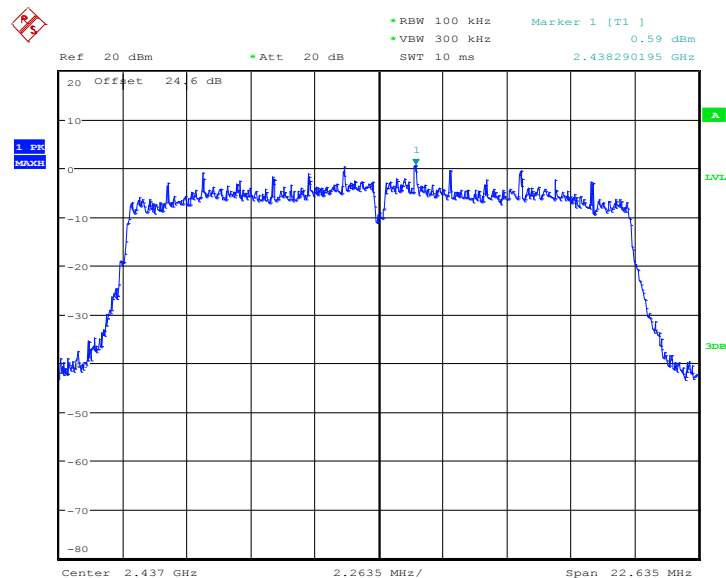


201604-1023 15C PSD (100K) 802.11g_N20 2412 (ch01)
Date: 23.OCT.2012 14:34:36

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot on 2.4GHz 802.11n HT20 Channel 06

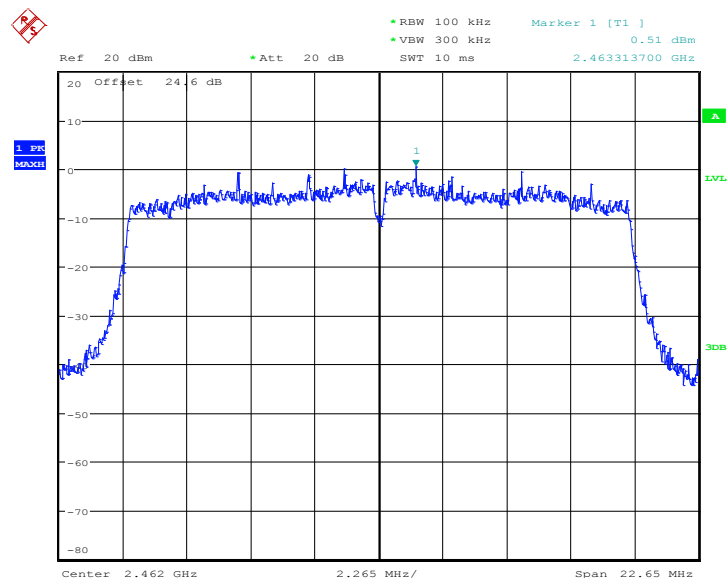


201604-1023 15C PSD (100K) 802.11g_N20 2437 (ch06)
Date: 23.OCT.2012 14:40:49

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot on 2.4GHz 802.11n HT20 Channel 11

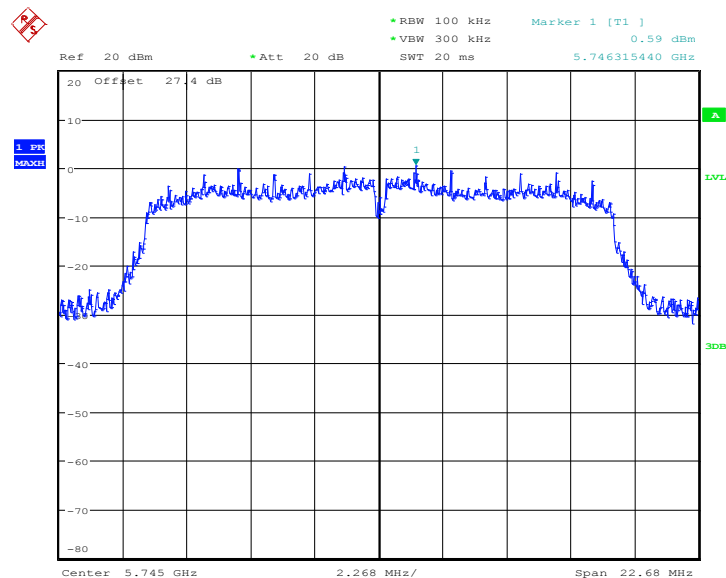


201604-1023 15C PSD (100K) 802.11g_N20 2462 (ch11)
Date: 23.OCT.2012 14:43:48

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot on 802.11a Channel 149

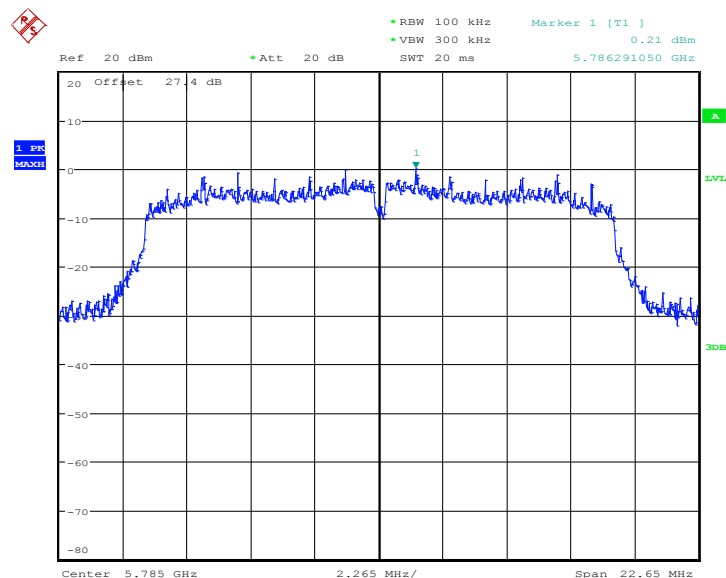


201604-1023 15C PSD (100K) 802.11a 5745 (ch149)
Date: 23.OCT.2012 15:16:38

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot on 802.11a Channel 157

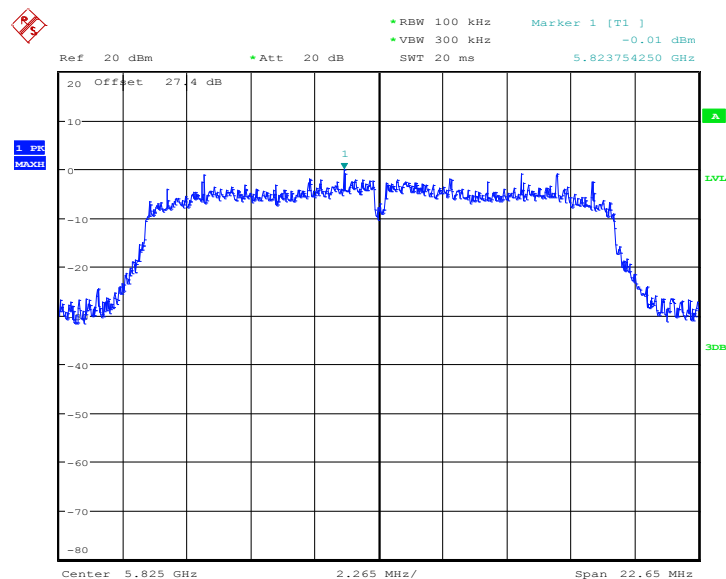


201604-1023 15C PSD (100K) 802.11a 5785 (ch157)
Date: 23.OCT.2012 15:21:09

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot on 802.11a Channel 165

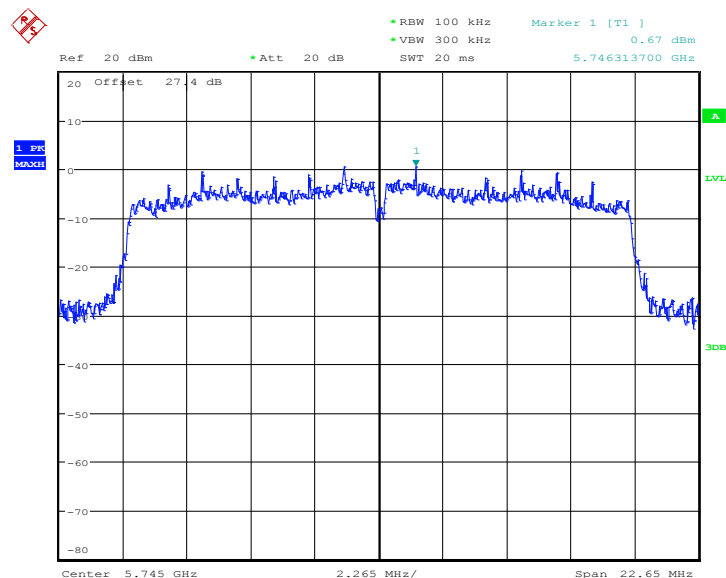


201604-1023 15C PSD (100K) 802.11a 5825 (ch165)
Date: 23.OCT.2012 15:24:15

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

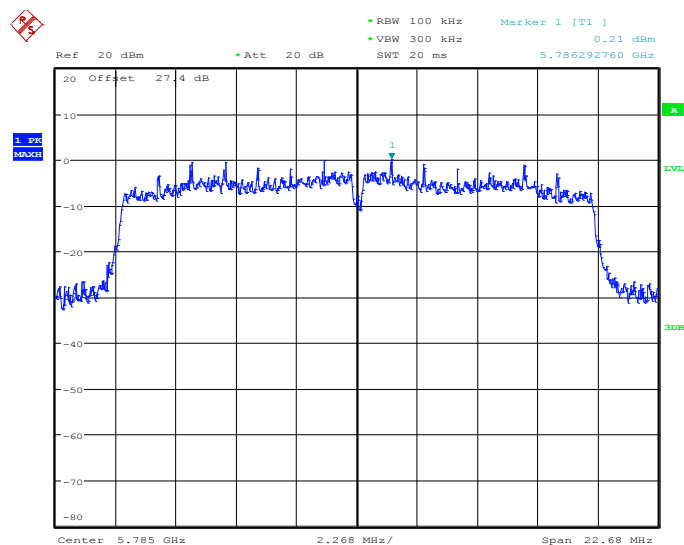
PSD 100kHz Plot on 5GHz 802.11n HT20 Channel 149



201604-1023 15C PSD (100K) 802.11a_N20 5745 (ch149)
Date: 23.OCT.2012 15:28:45

Note:

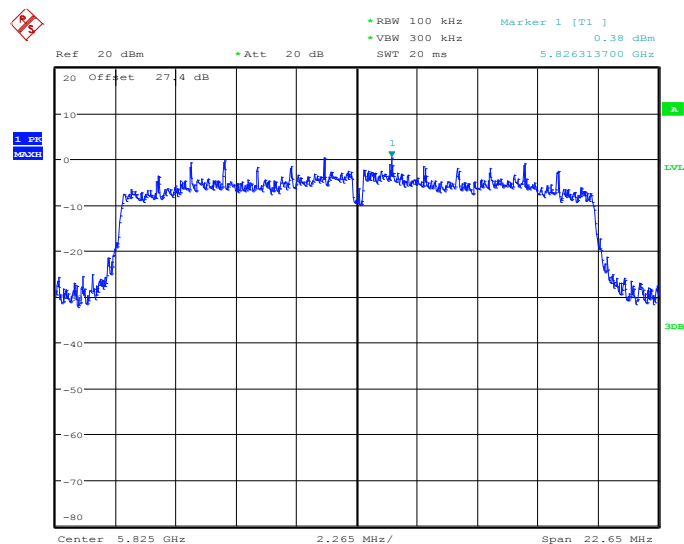
The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot on 5GHz 802.11n HT20 Channel 157


201604-1023 15C PSD (100K) 802.11a_N20 5785 (ch157)
Date: 23.OCT.2012 15:31:41

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 100kHz Plot on 5GHz 802.11n HT20 Channel 165


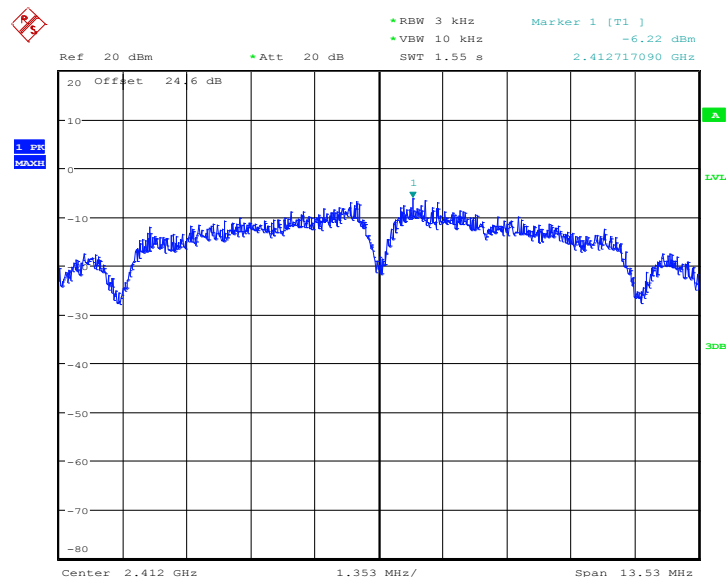
201604-1023 15C PSD (100K) 802.11a_N20 5825 (ch165)
Date: 23.OCT.2012 15:34:49

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on 802.11b Channel 01

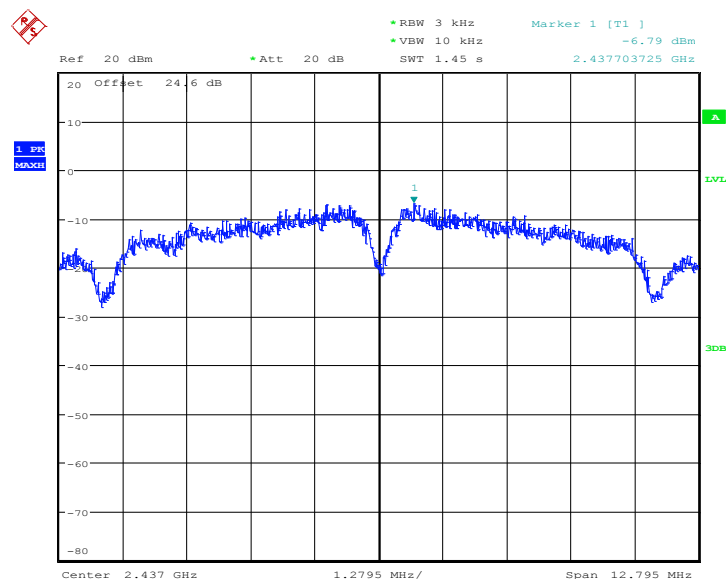


201604-1023 15C PSD 802.11b 2412 (ch01)
Date: 23.OCT.2012 15:10:03

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 802.11b Channel 06

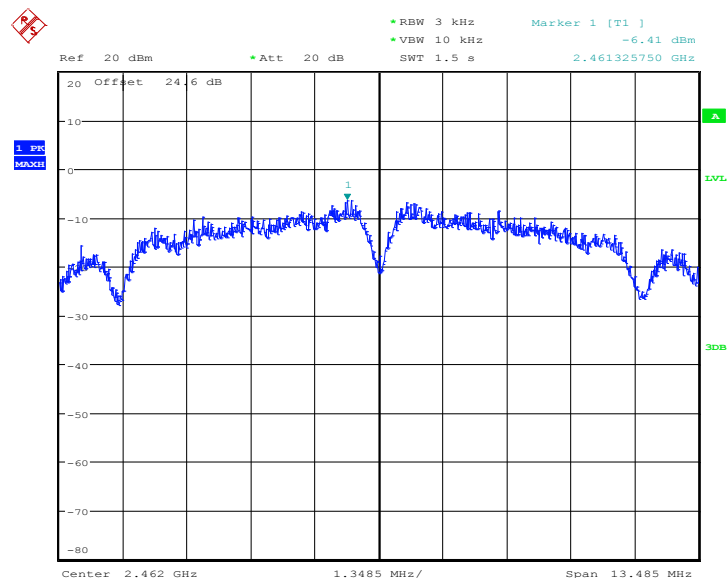


201604-1023 15C PSD 802.11b 2437 (ch06)
Date: 23.OCT.2012 14:53:29

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 802.11b Channel 11

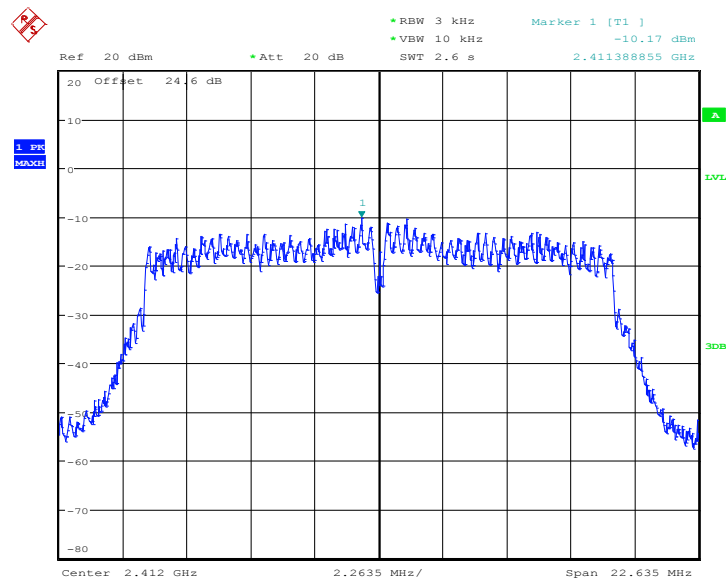


201604-1023 15C PSD 802.11b 2462 (ch11)
Date: 23.OCT.2012 14:55:20

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 802.11g Channel 01

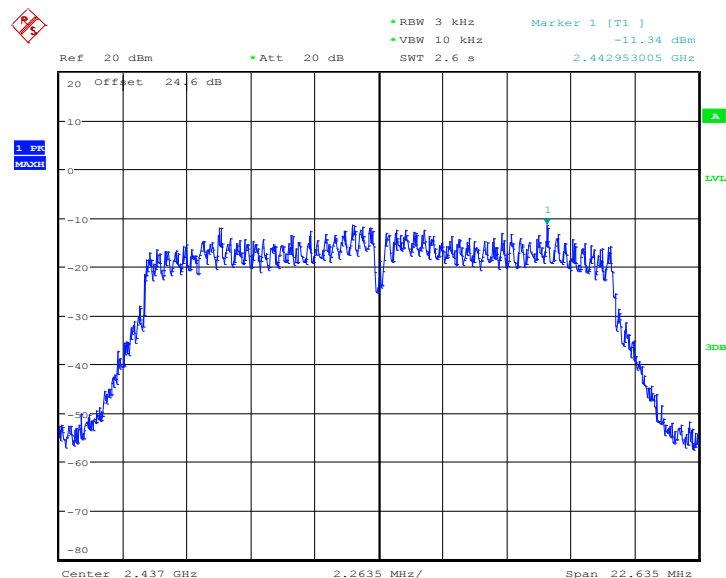


201604-1023 15C PSD 802.11g 2412 (ch01)
Date: 23.OCT.2012 14:58:58

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 802.11g Channel 06

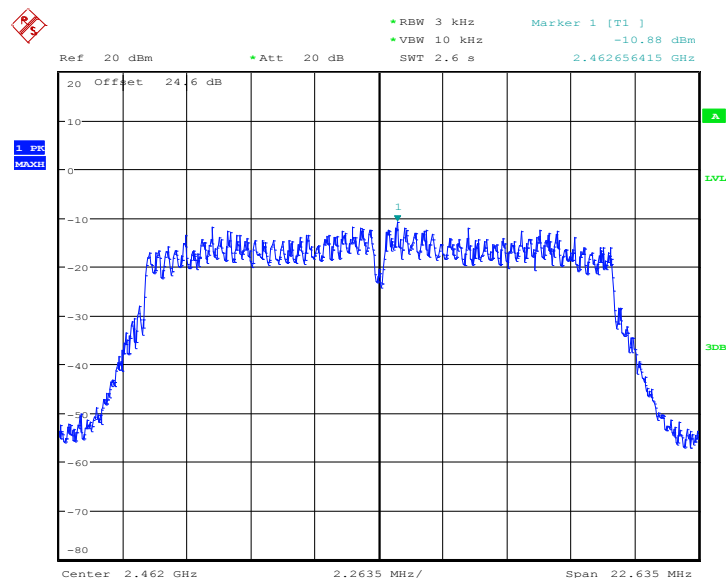


2o1604-1023 15C PSD 802.11g 2437 (ch06)
Date: 23.OCT.2012 15:01:30

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 802.11g Channel 11

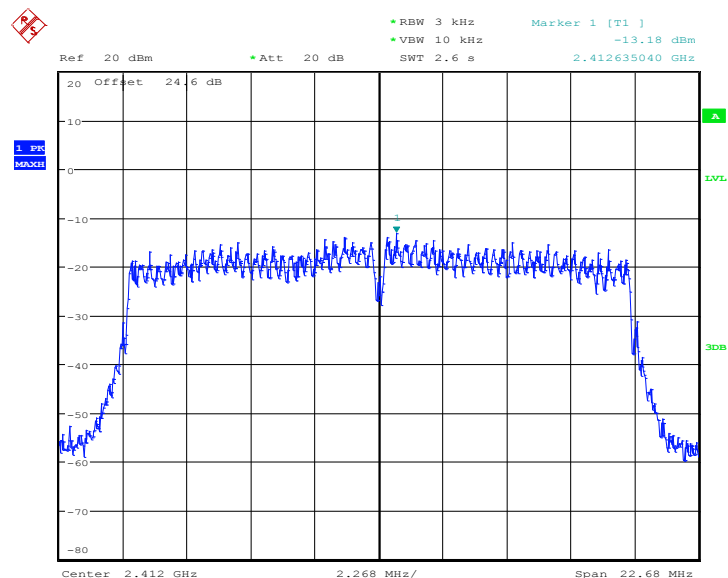


201604-1023 15C PSD 802.11g 2462 (ch11)
Date: 23.OCT.2012 15:05:22

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 2.4GHz 802.11n HT20 Channel 01

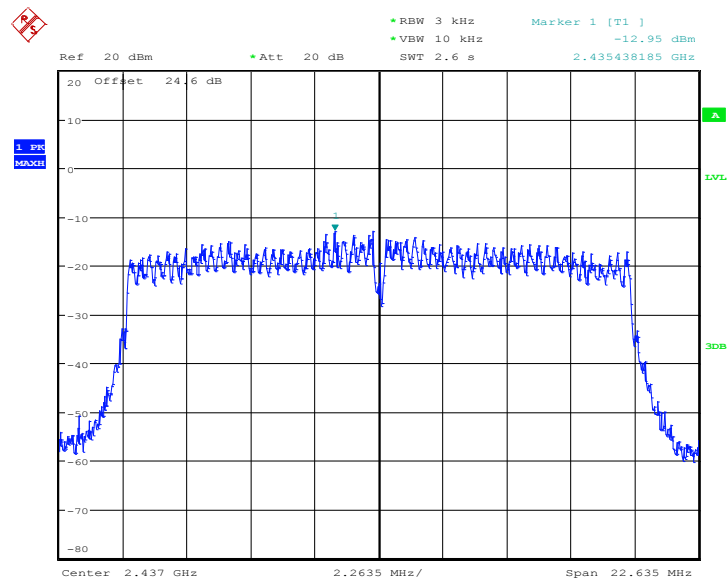


2o1604-1023 15C PSD 802.11g_N20 2412 (ch01)
Date: 23.OCT.2012 14:34:16

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 2.4GHz 802.11n HT20 Channel 06

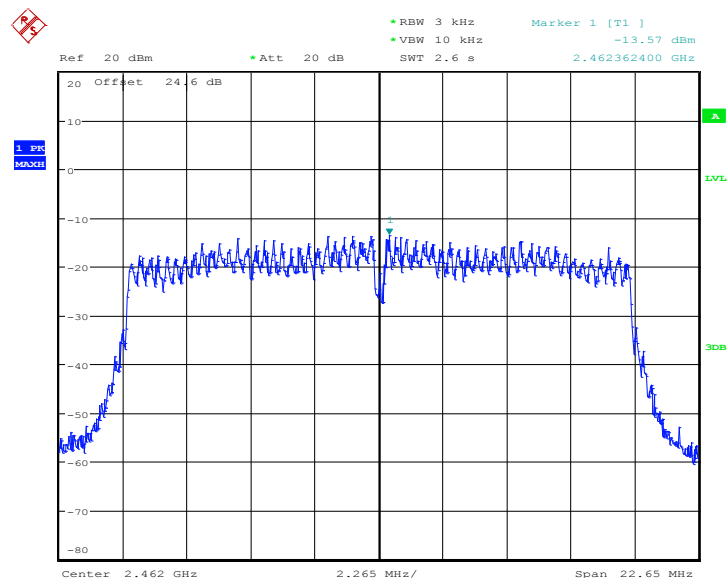


201604-1023 15C PSD 802.11g_N20 2437 (ch06)
Date: 23.OCT.2012 14:40:42

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 2.4GHz 802.11n HT20 Channel 11

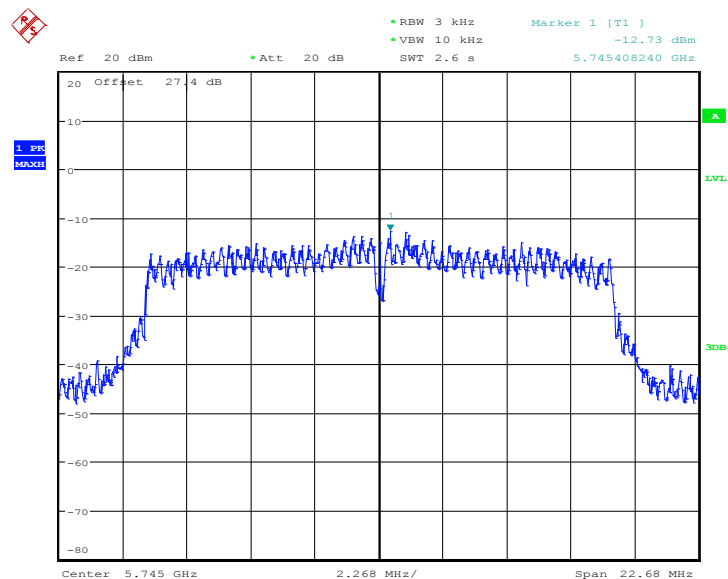


2o1604-1023 15C PSD 802.11g_N20 2462 (ch11)
Date: 23.OCT.2012 14:43:41

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 802.11a Channel 149

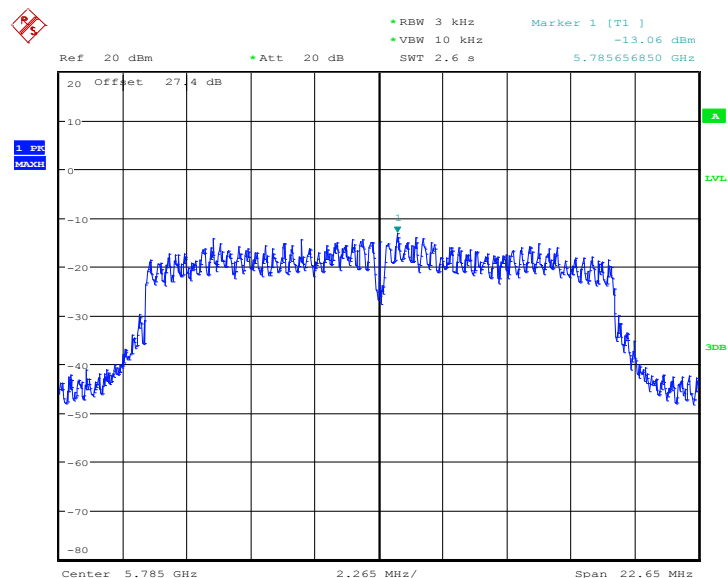


201604-1023 15C PSD 802.11a 5745 (ch149)
Date: 23.OCT.2012 15:16:32

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 802.11a Channel 157

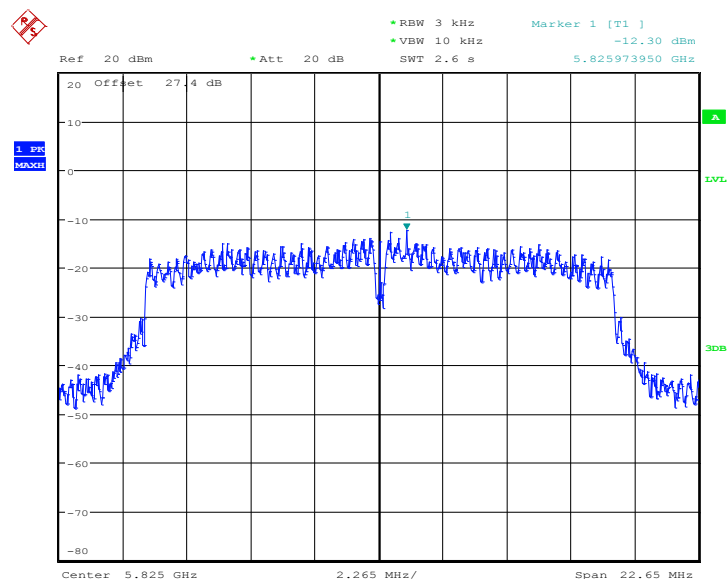


201604-1023 15C PSD 802.11a 5785 (ch157)
Date: 23.OCT.2012 15:20:57

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 802.11a Channel 165

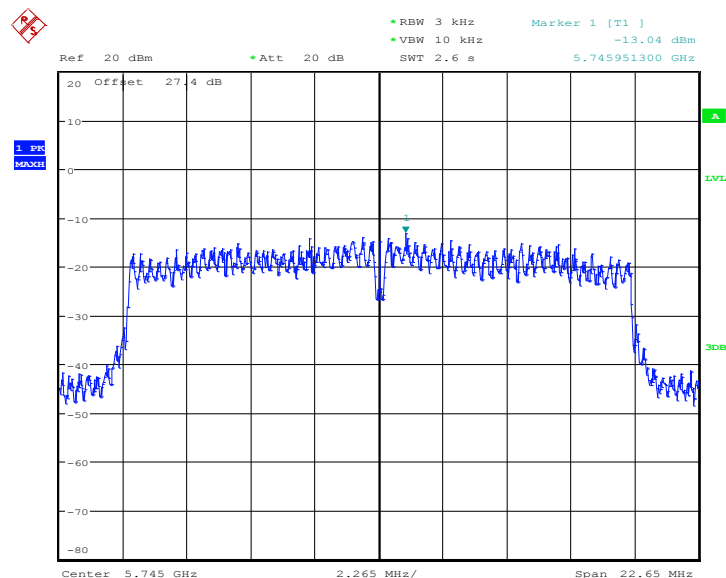


201604-1023 15C PSD 802.11a 5825 (ch165)
Date: 23.OCT.2012 15:24:04

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 5GHz 802.11n HT20 Channel 149

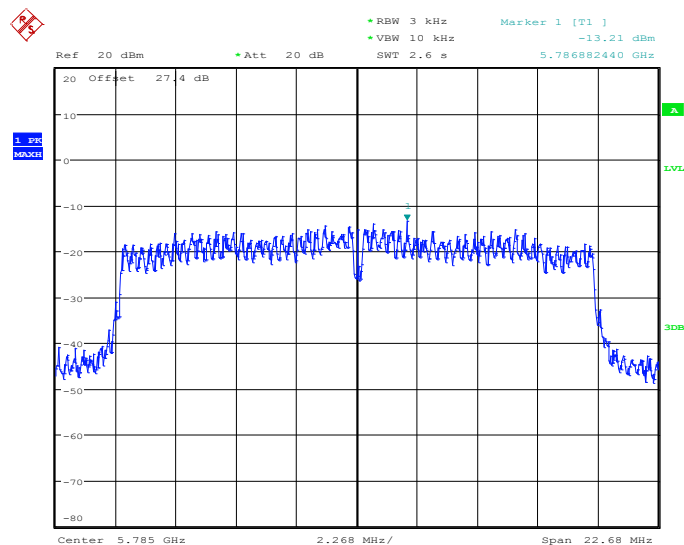


2o1604-1023 15C PSD 802.11a_N20 5745 (ch149)
Date: 23.OCT.2012 15:28:38

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 5GHz 802.11n HT20 Channel 157

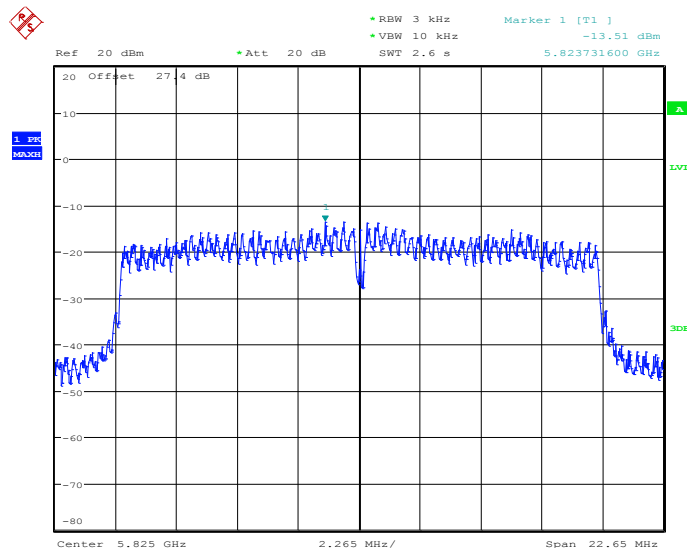


201604-1023 15C PSD 802.11a_N20 5785 (ch157)
Date: 23.OCT.2012 15:31:36

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

PSD 3kHz Plot on 5GHz 802.11n HT20 Channel 165



201604-1023 15C PSD 802.11a_N20 5825 (ch165)
Date: 23.OCT.2012 15:34:43

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

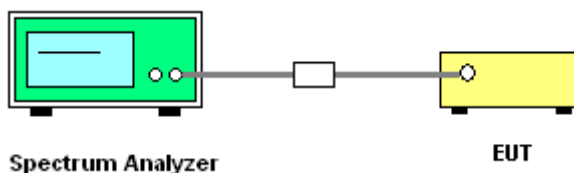
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz, when maximum peak conducted output power procedure is used. The attenuation is set to 30dB, when maximum conducted output power procedure is used.
4. Measure and record the results in the test report.

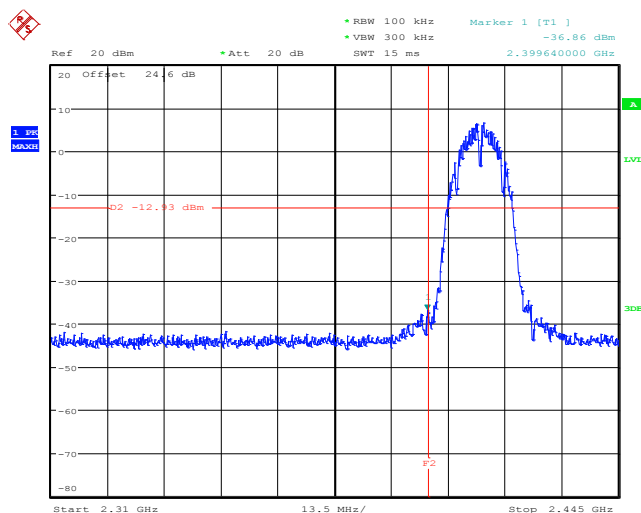
3.4.4 Test Setup



3.4.6 Test Result of Conducted Spurious at Band Edges

Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Felix Song

Low Band Edge Plot on 802.11b Channel 01

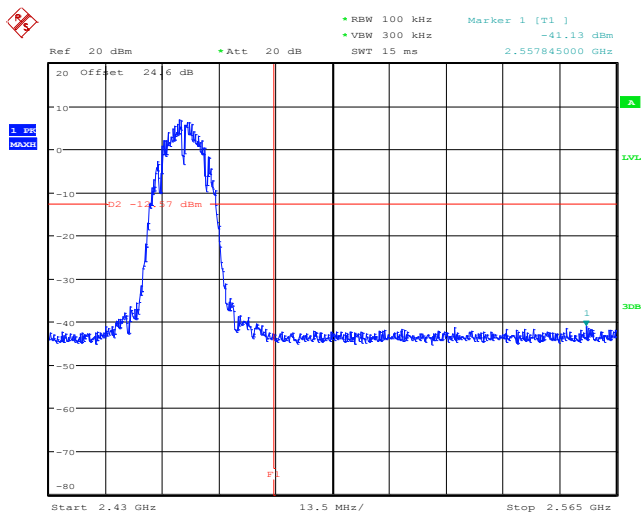


201604-1023 15C BandEdge 802.11b 2412 (ch01)
Date: 23.OCT.2012 15:10:42

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

High Band Edge Plot on 802.11b Channel 11

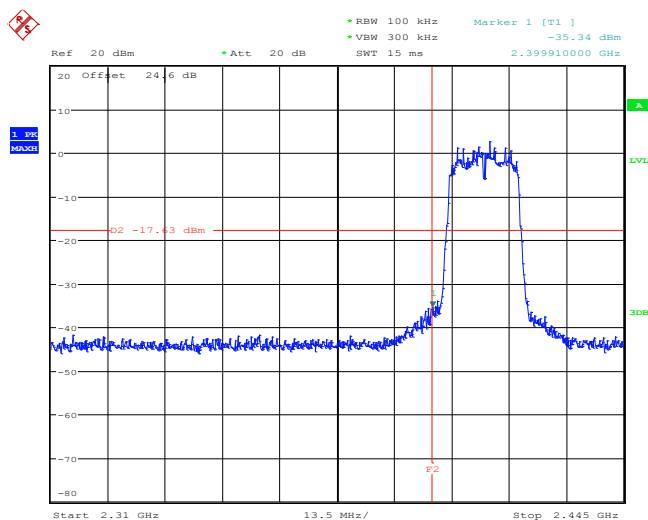


2o1604-1023 15C BandEdge 802.11b 2462 (ch11)
 Date: 23.OCT.2012 14:56:39

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

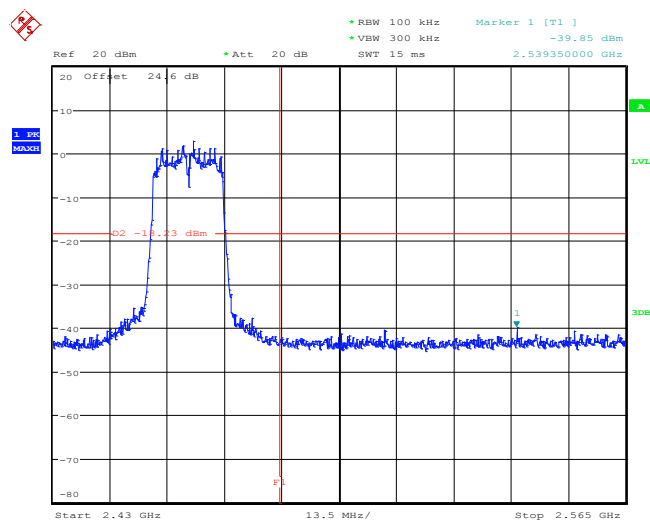
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Felix Song

Low Band Edge Plot on 802.11g Channel 01


201604-1023 15C BandEdge 802.11g 2412 (ch01)
Date: 23.OCT.2012 14:59:44

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.



201604-1023 15C BandEdge 802.11g 2462 (ch11)
Date: 23.OCT.2012 15:06:05

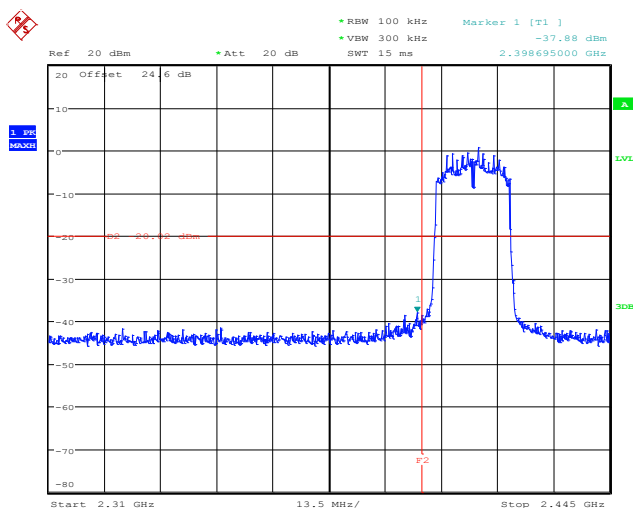
Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.



Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Felix Song

Low Band Edge Plot on 2.4GHz 802.11n HT20 Channel 01



201604-1023 15C BandEdge 802.11g_N20 2412 (ch01)
Date: 23.OCT.2012 14:35:13

Note:

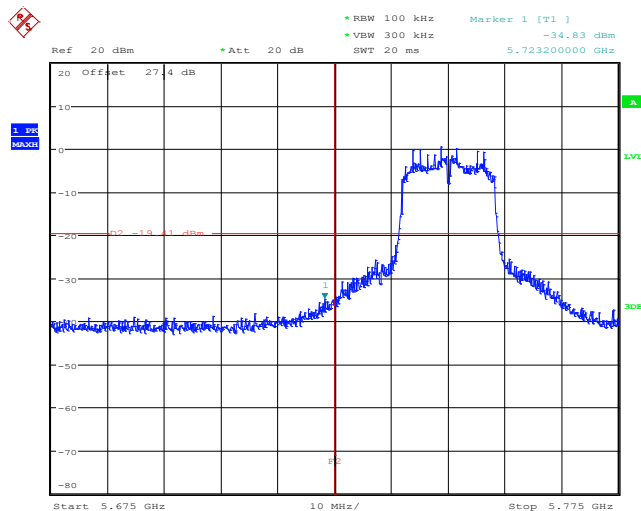
The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.



The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.



Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	149 and 165	Test Engineer :	Felix Song

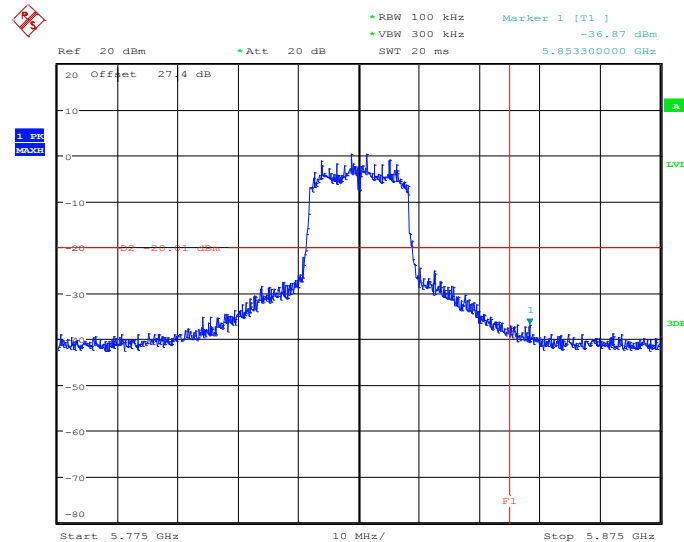
Low Band Edge Plot on 802.11a Channel 149

2o1604-1023 15C BandEdge 802.11a 5745 (ch149)
Date: 23.OCT.2012 15:17:20

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

High Band Edge Plot on 802.11a Channel 165



201604-1023 15C BandEdge 802.11a 5825 (ch165)
Date: 23.OCT.2012 15:24:35

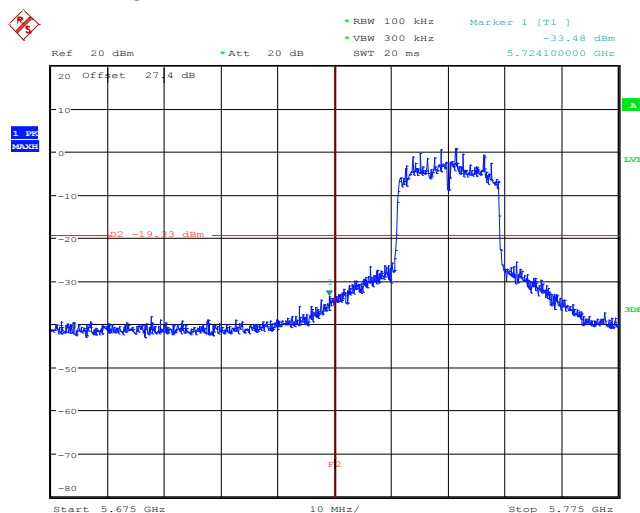
Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.



Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	149 and 165	Test Engineer :	Felix Song

Low Band Edge Plot on 5GHz 802.11n HT20 Channel 149



2o1604-1023 15C BandEdge 802.11a_N20 5745 (ch149)
Date: 23.OCT.2012 15:29:05

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.



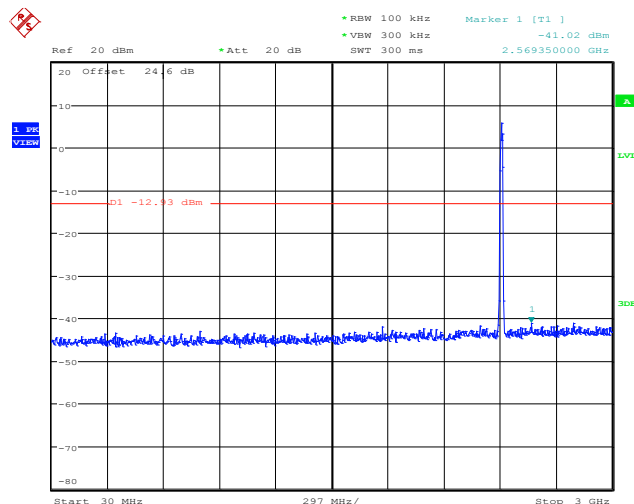
The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

3.4.7 Test Result of Conducted Spurious Emission

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

802.11b 30 MHz~3 GHz

Conducted Spurious Emission Plot on Channel 01



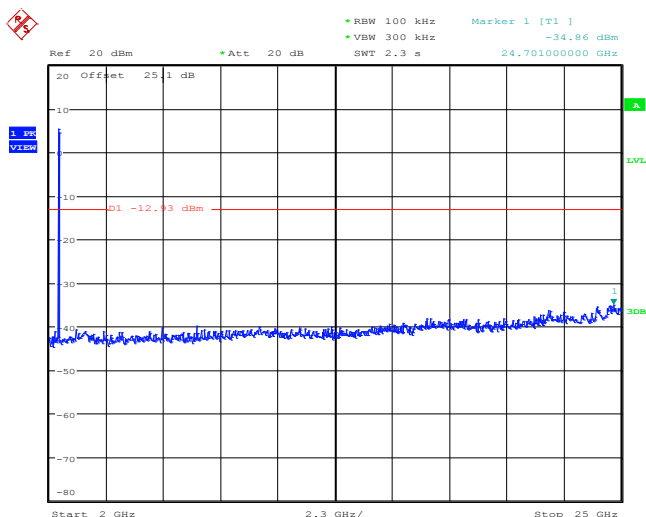
2o1604-1023 15C Spurious 802.11b 2412 (ch01)
Date: 23.OCT.2012 15:48:12

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11b 2 GHz~25 GHz

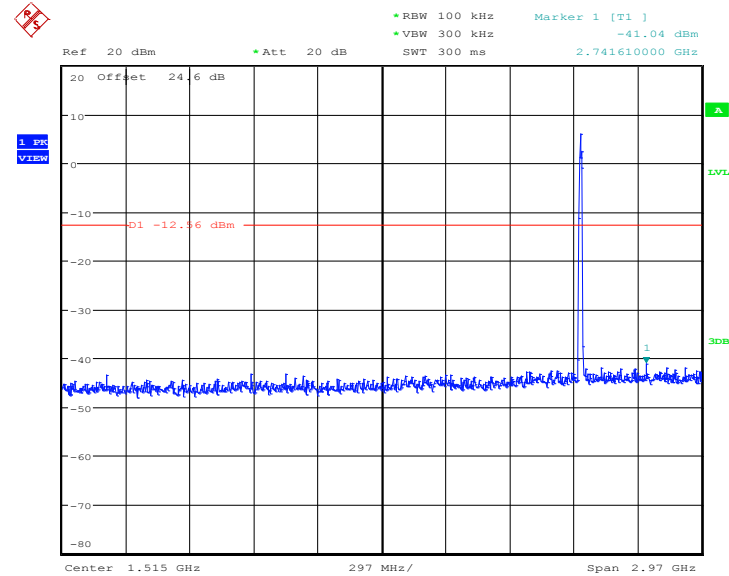
Conducted Spurious Emission Plot on Channel 01



201604-1023 15C Spurious 802.11b 2412 (ch01)
Date: 23.OCT.2012 15:48:29

Note:

The total loss is 25.1dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

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


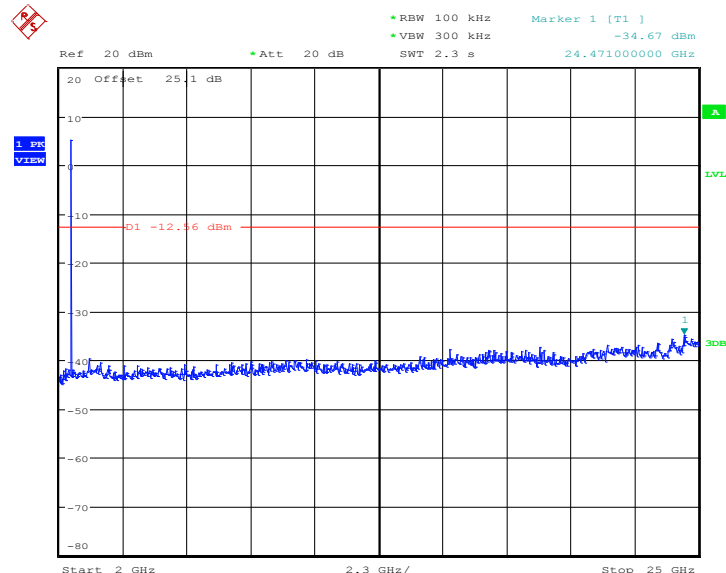
201604-1023 15C Spurious 802.11b 2437 (ch06)
 Date: 23.OCT.2012 15:49:13

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11b 2 GHz~25 GHz

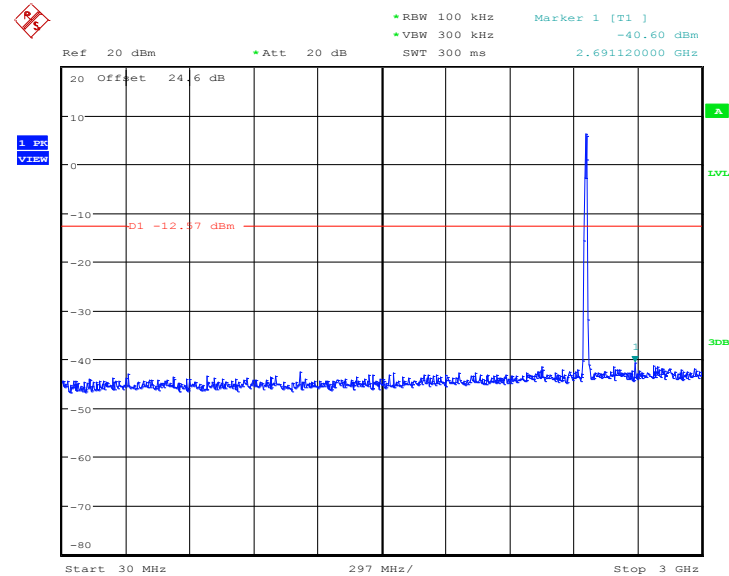
Conducted Spurious Emission Plot on Channel 06



201604-1023 15C Spurious 802.11b 2437 (ch06)
Date: 23.OCT.2012 15:49:30

Note:

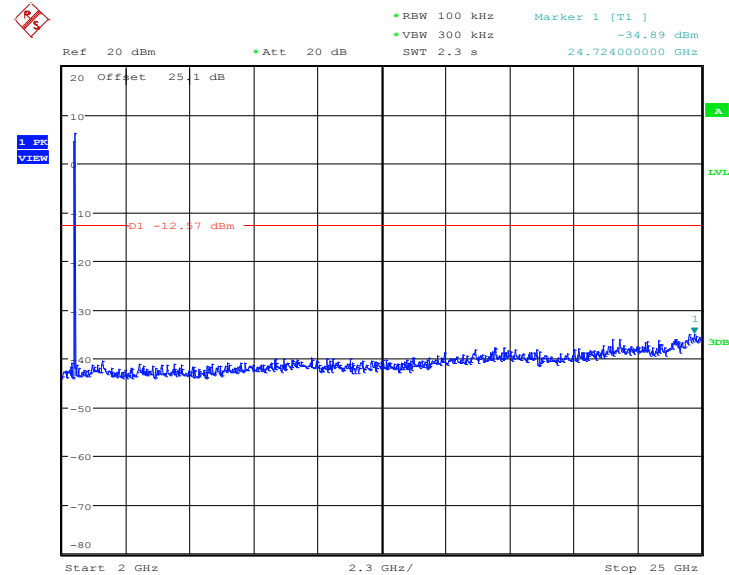
The total loss is 25.1dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

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


201604-1023 15C Spurious 802.11b 2462 (ch11)
Date: 23.OCT.2012 17:14:23

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

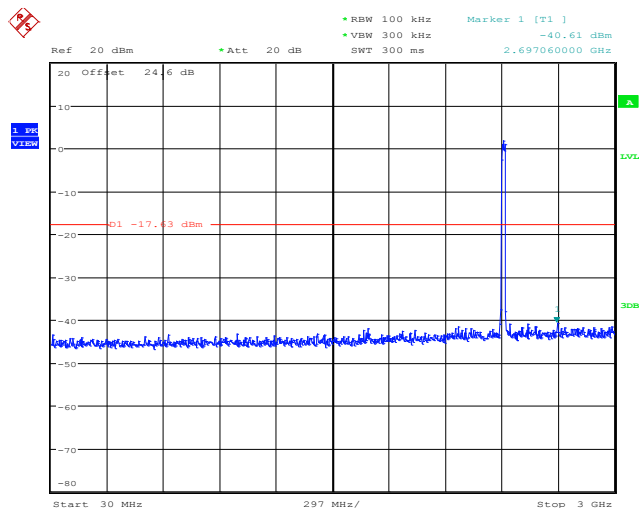
802.11b 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 11


201604-1023 15C Spurious 802.11b 2462 (ch11)
Date: 23.OCT.2012 17:14:40

Note:

The total loss is 25.1dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

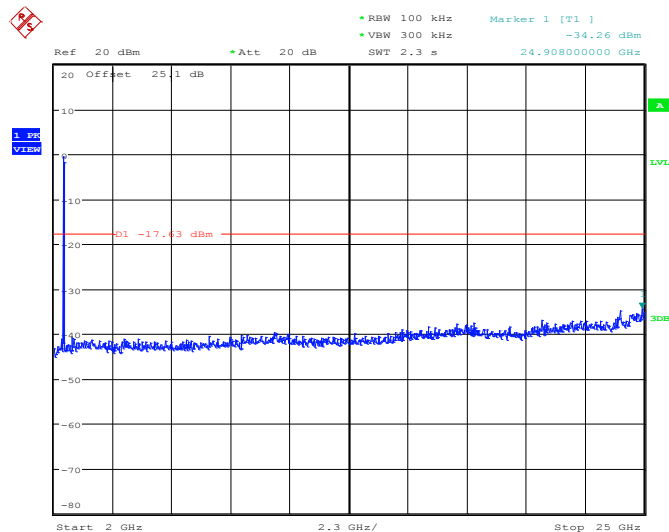
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Felix Song

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


201604-1023 15C Spurious 802.11g 2412 (ch01)
Date: 23.OCT.2012 15:52:21

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

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


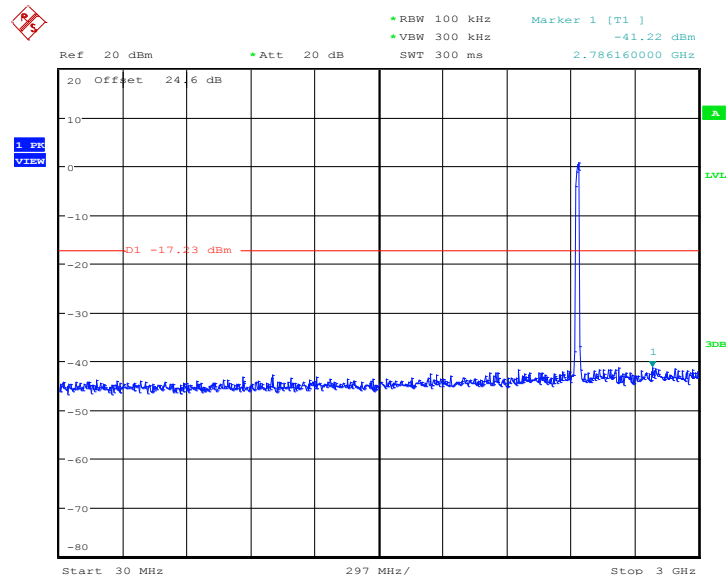
201604-1023 15C Spurious 802.11g 2412 (ch01)
Date: 23.OCT.2012 15:52:38

Note:

The total loss is 25.1dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11g 30 MHz~3 GHz

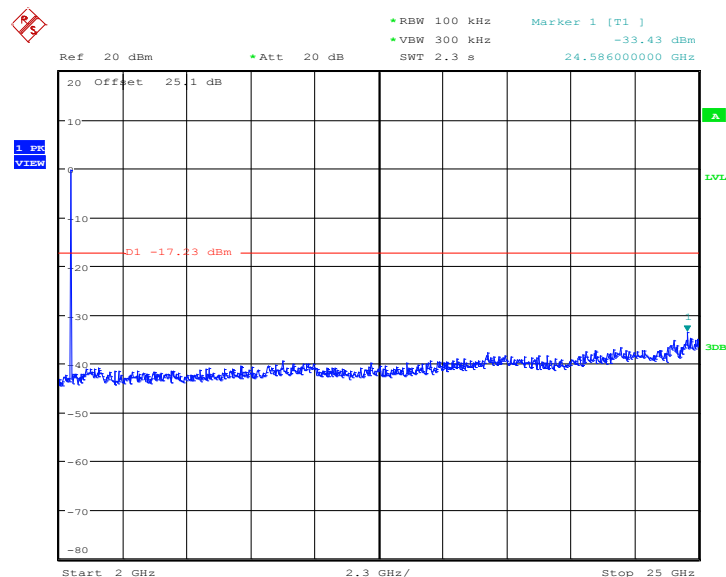
Conducted Spurious Emission Plot on Channel 06



201604-1023 15C Spurious 802.11g 2437 (ch06)
Date: 23.OCT.2012 15:53:25

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

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


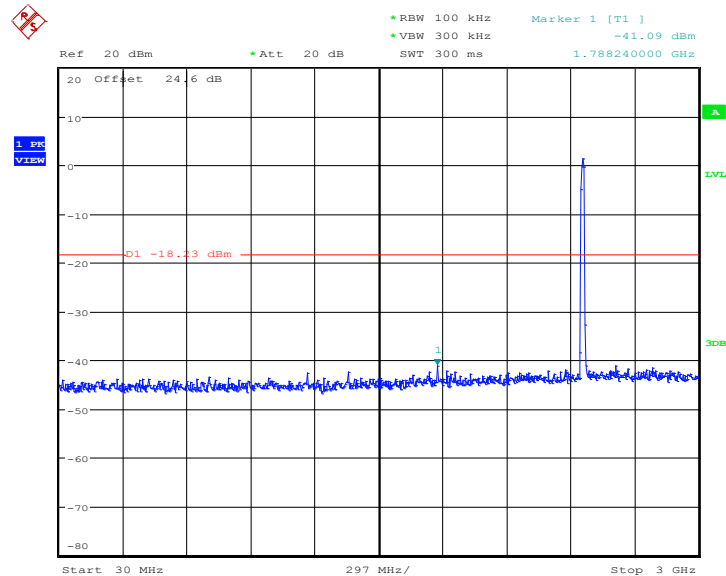
2o1604-1023 15C Spurious 802.11g 2437 (ch06)
Date: 23.OCT.2012 15:53:42

Note:

The total loss is 25.1dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11g 30 MHz~3 GHz

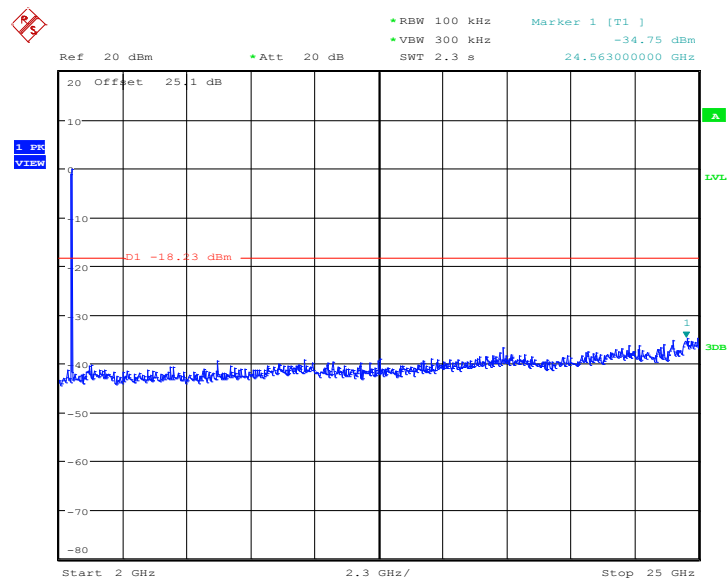
Conducted Spurious Emission Plot on Channel 11



201604-1023 15C Spurious 802.11g 2462 (ch11)
Date: 23.OCT.2012 15:54:38

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

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


201604-1023 15C Spurious 802.11g 2462 (ch11)
Date: 23.OCT.2012 15:54:55

Note:

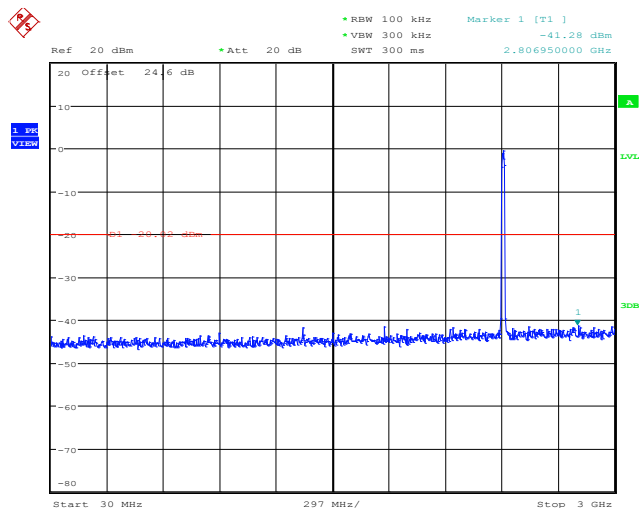
The total loss is 25.1dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.



Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Felix Song

2.4GHz 802.11n HT20 30 MHz~3 GHz

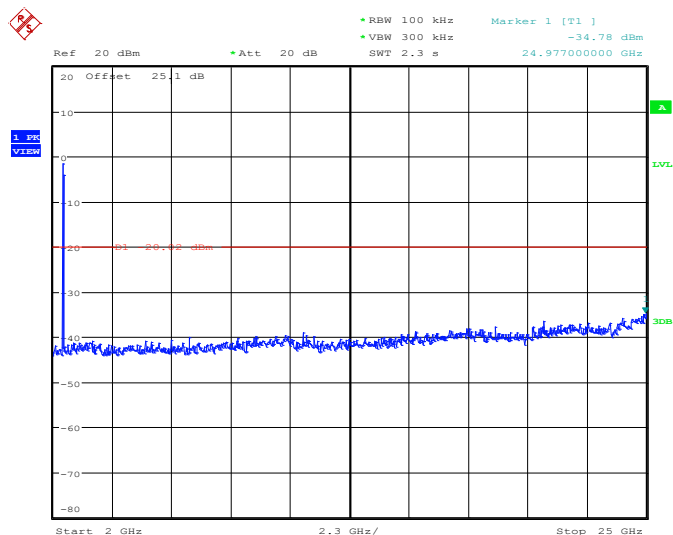
Conducted Spurious Emission Plot on Channel 01



201604-1023 15C Spurious 802.11g_N20 2412 (ch01)
Date: 23.OCT.2012 15:56:52

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

2.4GHz 802.11n HT20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 01


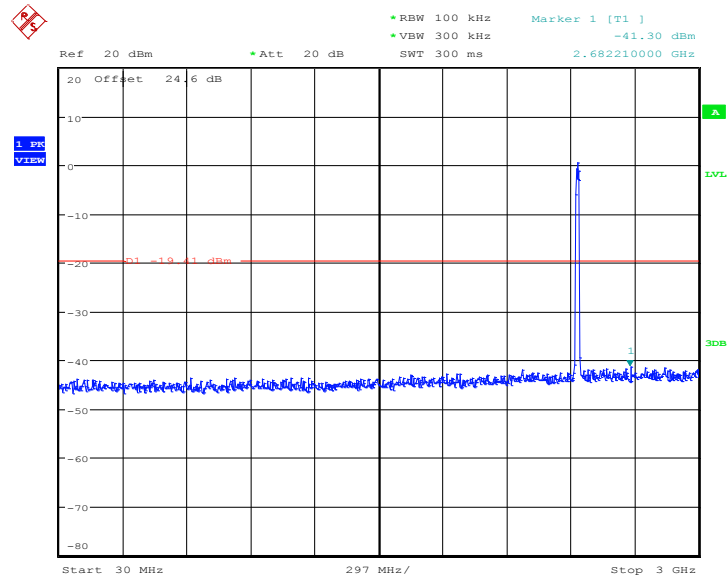
2o1604-1023 15C Spurious 802.11g_N20 2412 (ch01)
Date: 23.OCT.2012 15:57:09

Note:

The total loss is 25.1dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

2.4GHz 802.11n HT20 30 MHz~3 GHz

Conducted Spurious Emission Plot on Channel 06



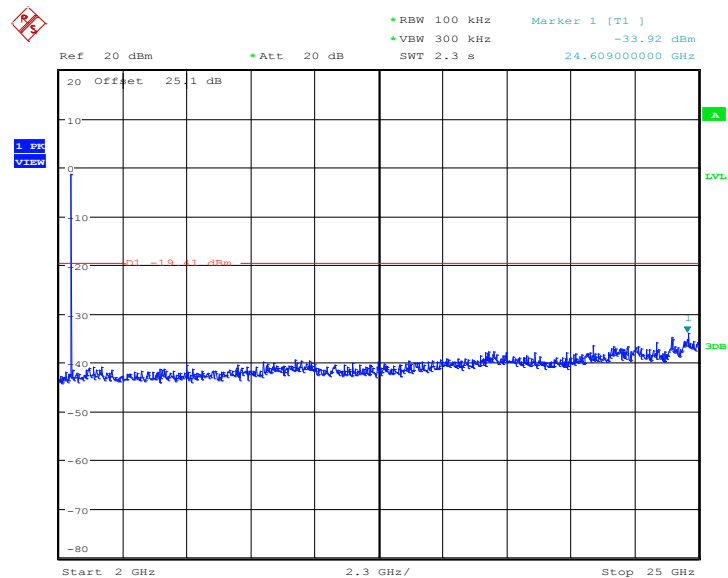
201604-1023 15C Spurious 802.11g_N20 2437 (ch06)
 Date: 23.OCT.2012 15:58:38

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

2.4GHz 802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06



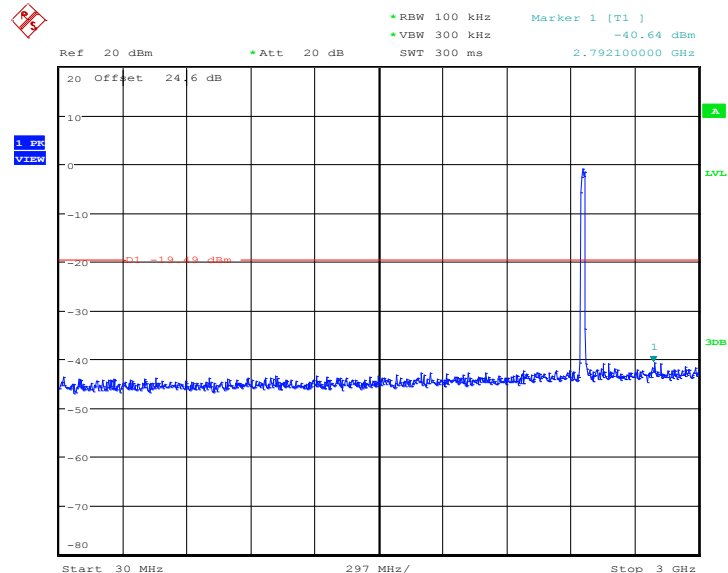
201604-1023 15C Spurious 802.11g_N20 2437 (ch06)
Date: 23.OCT.2012 15:58:55

Note:

The total loss is 25.1dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

2.4GHz 802.11n HT20 30 MHz~3 GHz

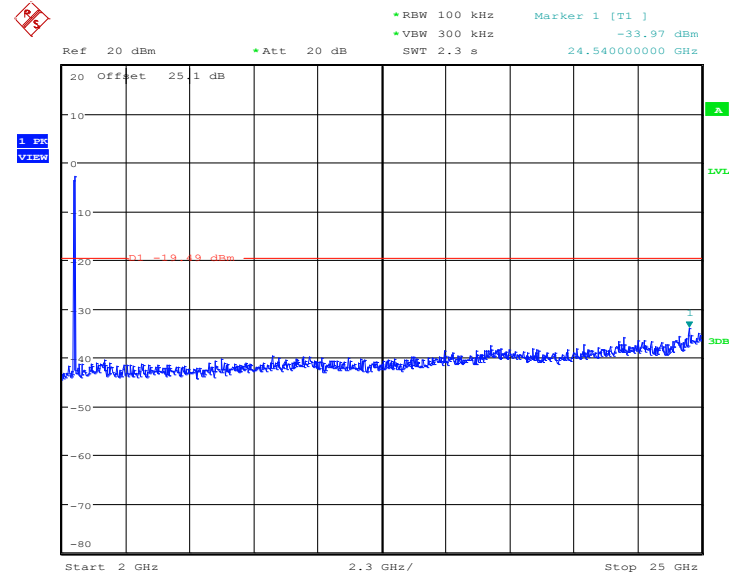
Conducted Spurious Emission Plot on Channel 11



201604-1023 15C Spurious 802.11g_N20 2462 (ch11)
Date: 23.OCT.2012 17:12:24

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

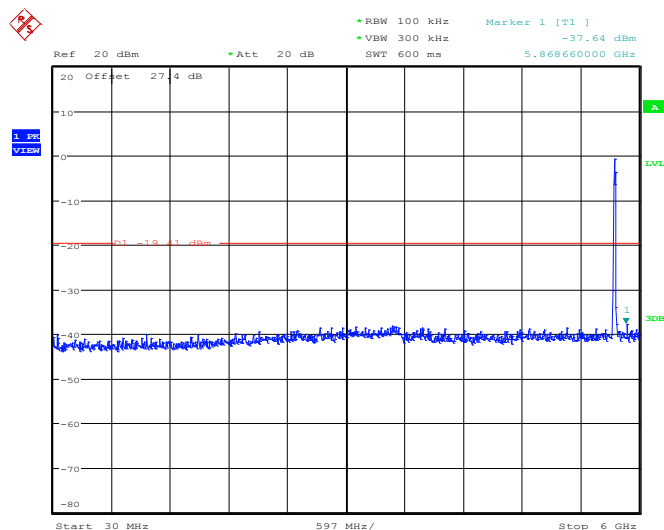
2.4GHz 802.11n HT20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 11


201604-1023 15C Spurious 802.11g_N20 2462 (ch11)
Date: 23.OCT.2012 17:12:41

Note:

The total loss is 25.1dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	30MHz-6GHz and 5G-26.5GHz	Relative Humidity :	50~53%
Test Channel :	149, 157, 165	Test Engineer :	Felix Song

802.11a 30 MHz~6 GHz
Conducted Spurious Emission Plot on Channel 149


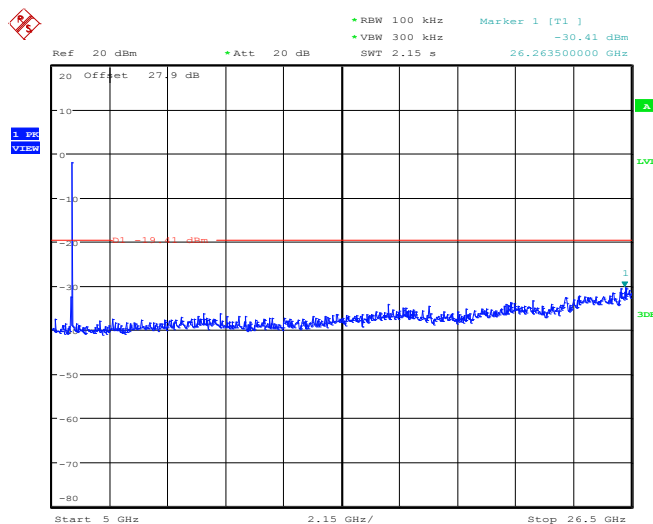
2o1604-1023 15C Spurious 802.11a 5745 (ch149)
Date: 23.OCT.2012 16:09:18

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11a 5 GHz~26.5 GHz

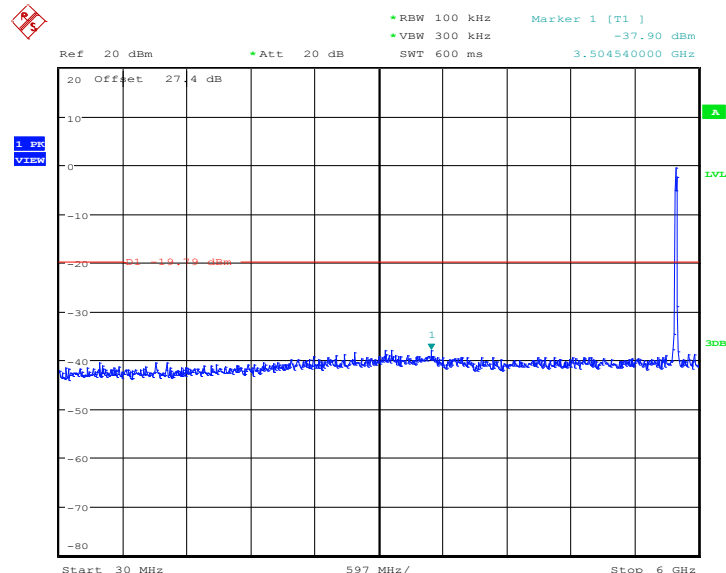
Conducted Spurious Emission Plot on Channel 149



201604-1023 15C Spurious 802.11a 5745 (ch149)
Date: 23.OCT.2012 16:09:35

Note:

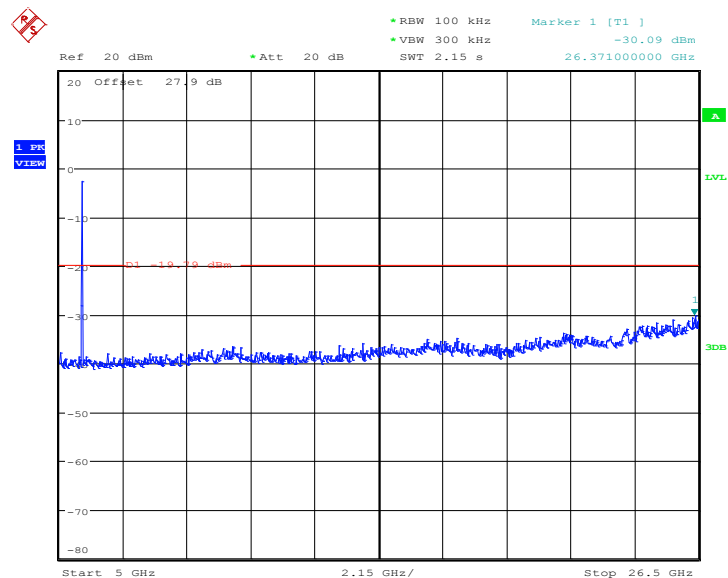
The total loss is 27.9dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11a 30 MHz~6 GHz
Conducted Spurious Emission Plot on Channel 157


201604-1023 15C Spurious 802.11a 5785 (ch157)
 Date: 23.OCT.2012 16:10:17

Note:

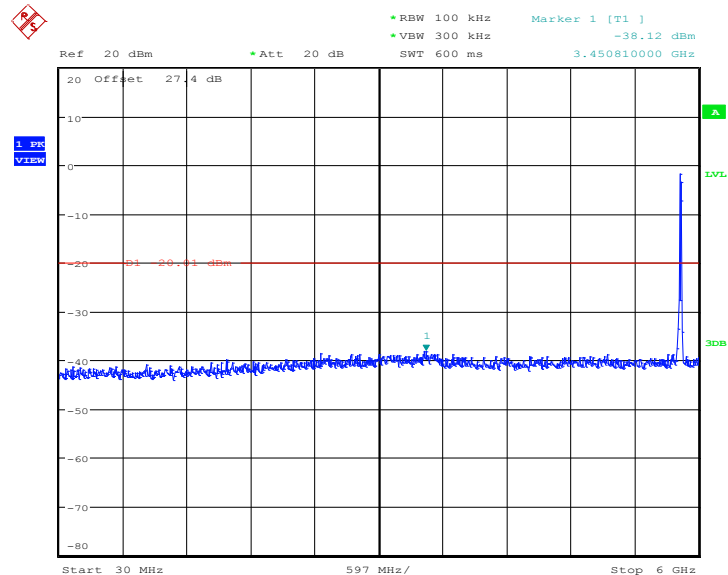
The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11a 5 GHz~26.5 GHz
Conducted Spurious Emission Plot on Channel 157


201604-1023 15C Spurious 802.11a 5785 (ch157)
 Date: 23.OCT.2012 16:10:34

Note:

The total loss is 27.9dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11a 30 MHz~6 GHz
Conducted Spurious Emission Plot on Channel 165


201604-1023 15C Spurious 802.11a 5825 (ch165)

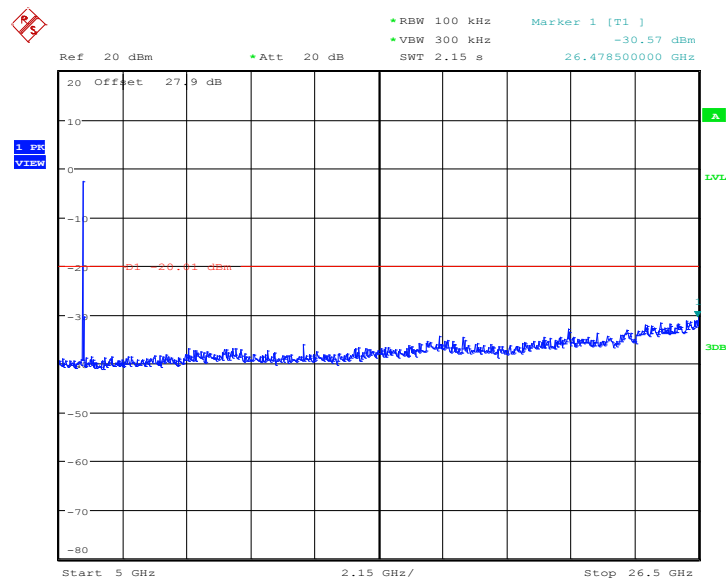
Date: 23.OCT.2012 16:11:22

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11a 5 GHz~26.5 GHz

Conducted Spurious Emission Plot on Channel 165

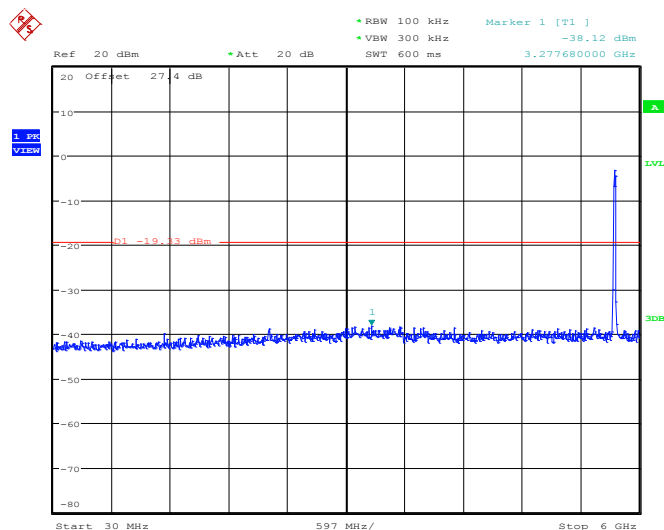


201604-1023 15C Spurious 802.11a 5825 (ch165)
Date: 23.OCT.2012 16:11:39

Note:

The total loss is 27.9dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

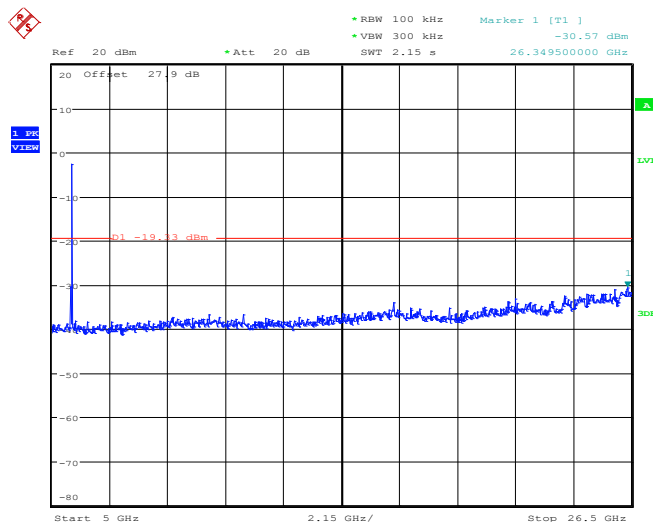
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	30MHz-6GHz and 5G-26.5GHz	Relative Humidity :	50~53%
Test Channel :	149, 157, 165	Test Engineer :	Felix Song

5GHz 802.11n HT20 30 MHz~6 GHz
Conducted Spurious Emission Plot on Channel 149


201604-1023 15C Spurious 802.11a_N20 5745 (ch149)
Date: 23.OCT.2012 16:05:26

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

5GHz 802.11n HT20 5 GHz~26.5 GHz
Conducted Spurious Emission Plot on Channel 149


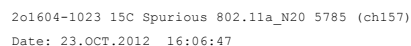
201604-1023 15C Spurious 802.11a_N20 5745 (ch149)
Date: 23.OCT.2012 16:05:43

Note:

The total loss is 27.9dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

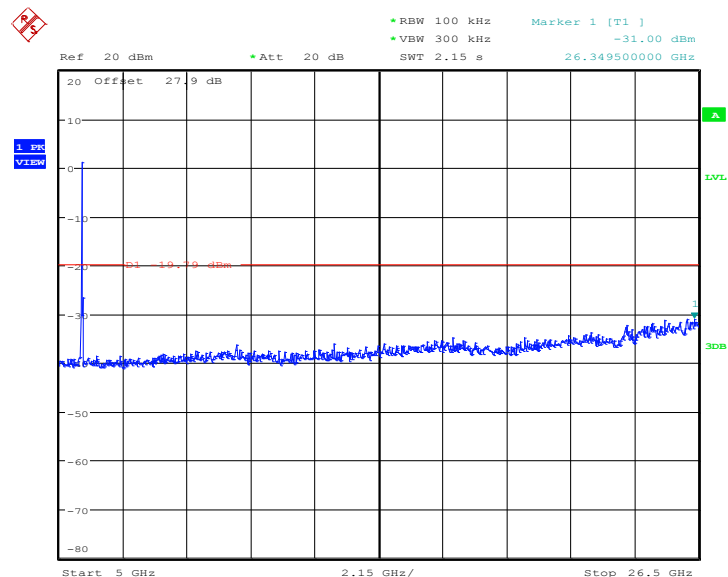


Conducted Spurious Emission Plot on Channel 157



Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

5GHz 802.11n HT20 5 GHz~26.5 GHz
Conducted Spurious Emission Plot on Channel 157


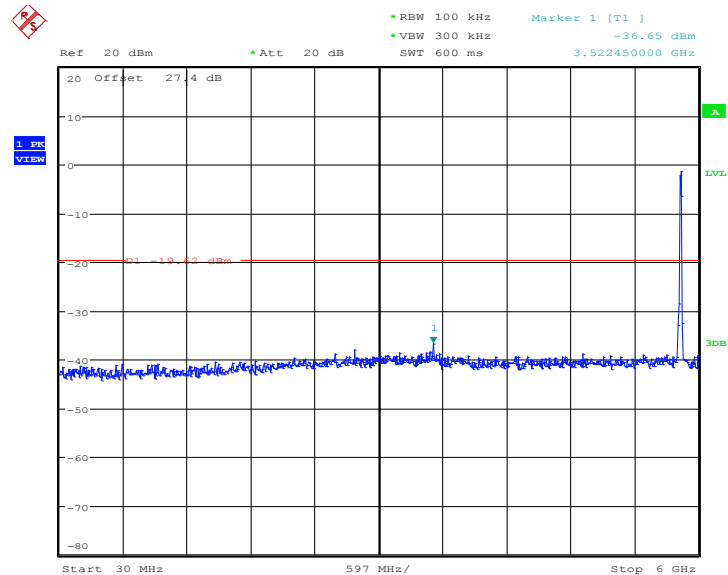
201604-1023 15C Spurious 802.11a_N20 5785 (ch157)
Date: 23.OCT.2012 16:07:04

Note:

The total loss is 27.9dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

5GHz 802.11n HT20 30 MHz~6 GHz

Conducted Spurious Emission Plot on Channel 165



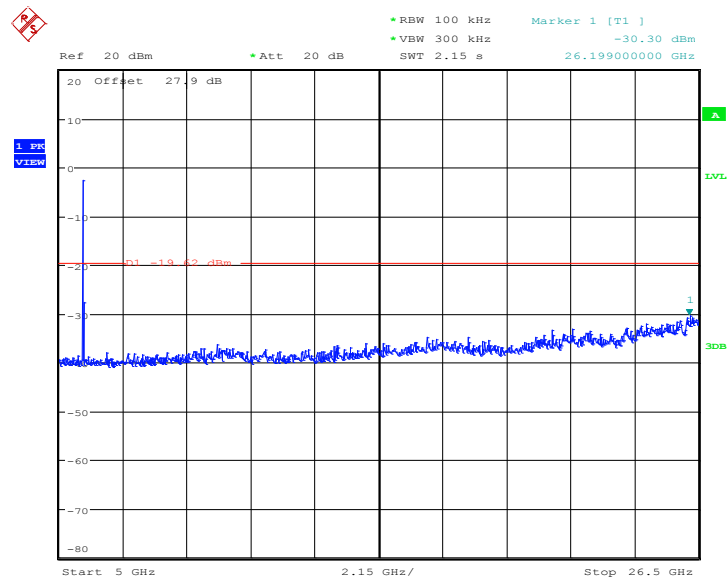
201604-1023 15C Spurious 802.11a_N20 5825 (ch165)
Date: 23.OCT.2012 16:07:46

Note:

The total loss is 27.4dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

5GHz 802.11n HT20 5 GHz~26.5 GHz

Conducted Spurious Emission Plot on Channel 165



201604-1023 15C Spurious 802.11a_N20 5825 (ch165)
Date: 23.OCT.2012 16:08:03

Note:

The total loss is 27.9dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

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

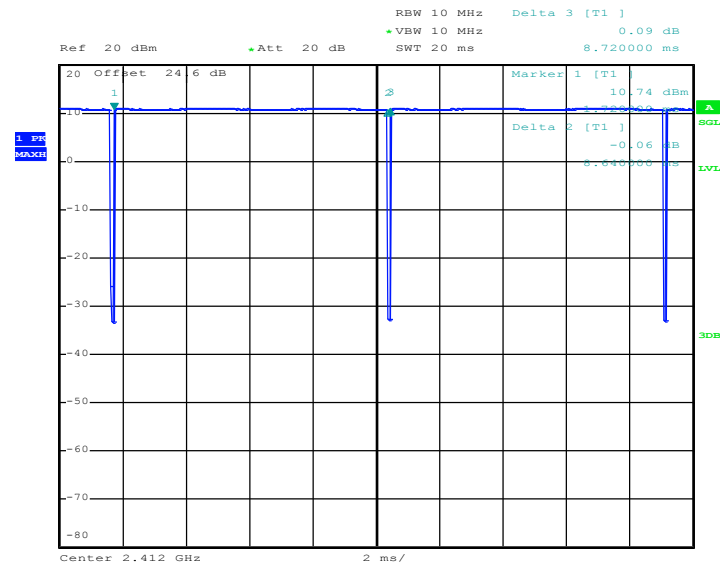
1. The testing follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in 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 - Preamplifier 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(us)	1/T(KHz)	VBW Setting
802.11b	99.08	-	-	10Hz
802.11g	93.23	1432	0.698	1kHz
2.4GHz 802.11n HT20	93.33	1344	0.744	1kHz
802.11a	93.46	1430	0.699	1kHz
5GHz 802.11n HT20	92.78	1336	0.749	1kHz

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

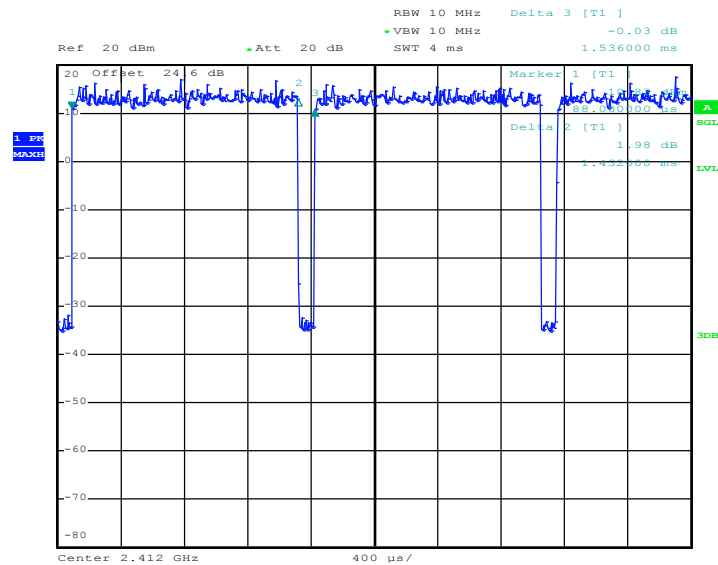
802.11b Duty Cycle


Date: 17.OCT.2012 01:05:59

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11g Duty Cycle

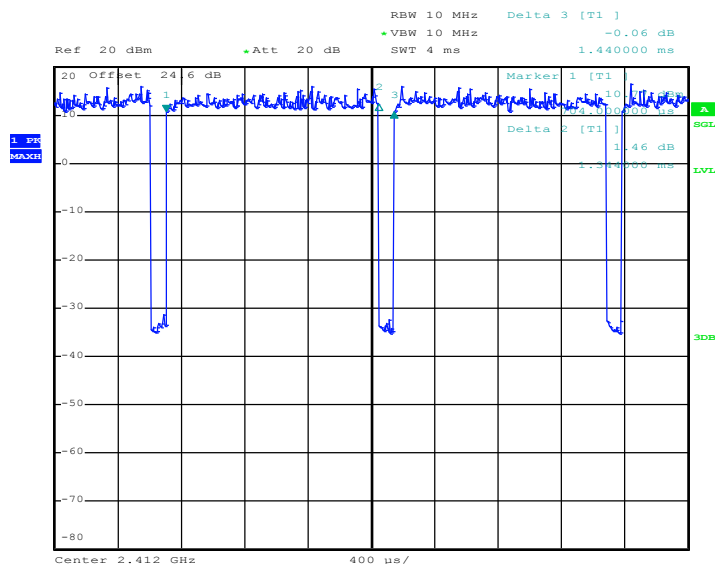


Date: 17.OCT.2012 01:09:34

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

2.4GHz 802.11n HT20 Duty Cycle



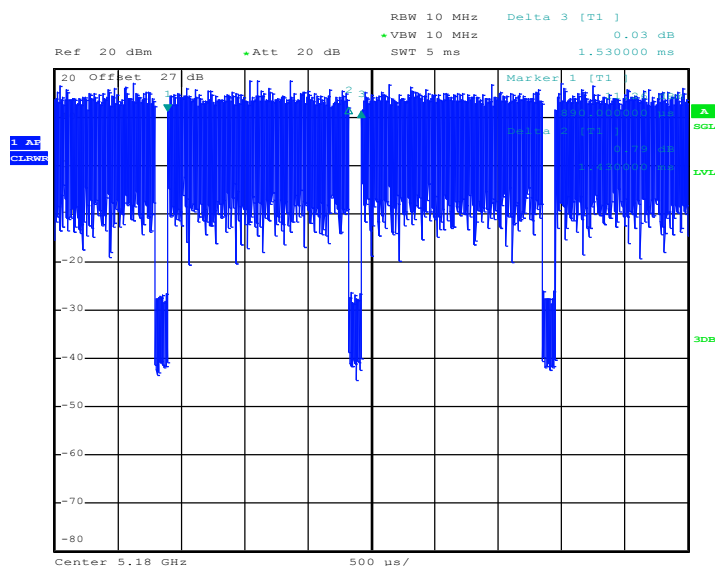
Date: 17.OCT.2012 01:26:12

Note:

The total loss is 24.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.



802.11a Duty Cycle

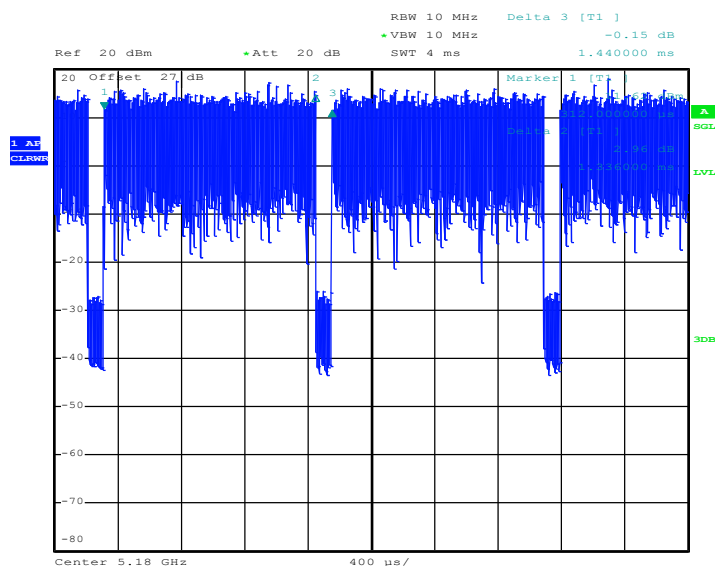


Date: 17.OCT.2012 01:33:26

Note:

The total loss is 27 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

5GHz 802.11n HT20 Duty Cycle



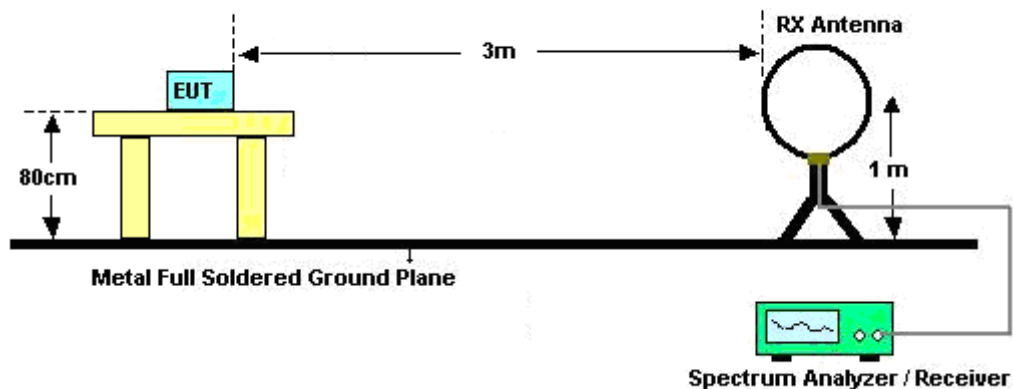
Date: 17.OCT.2012 01:38:31

Note:

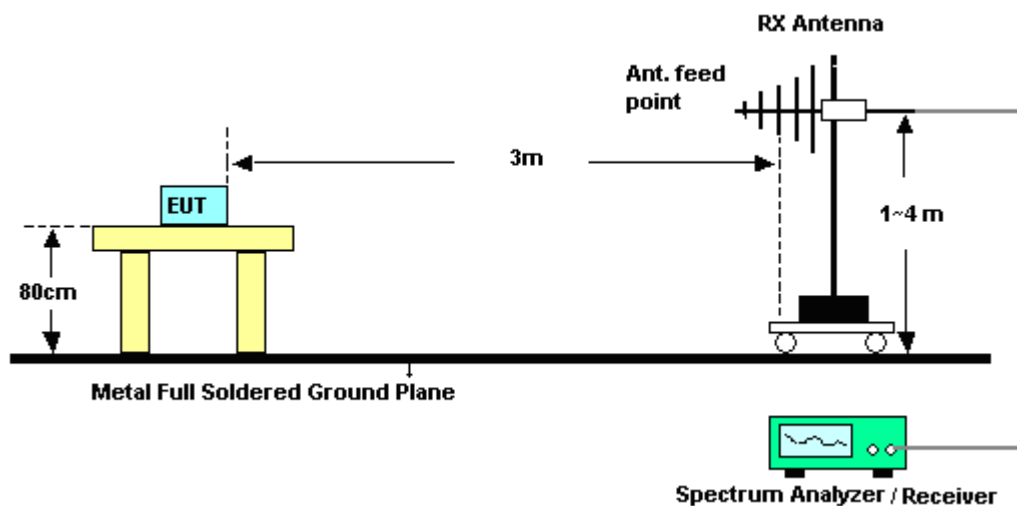
The total loss is 27dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

3.5.4 Test Setup

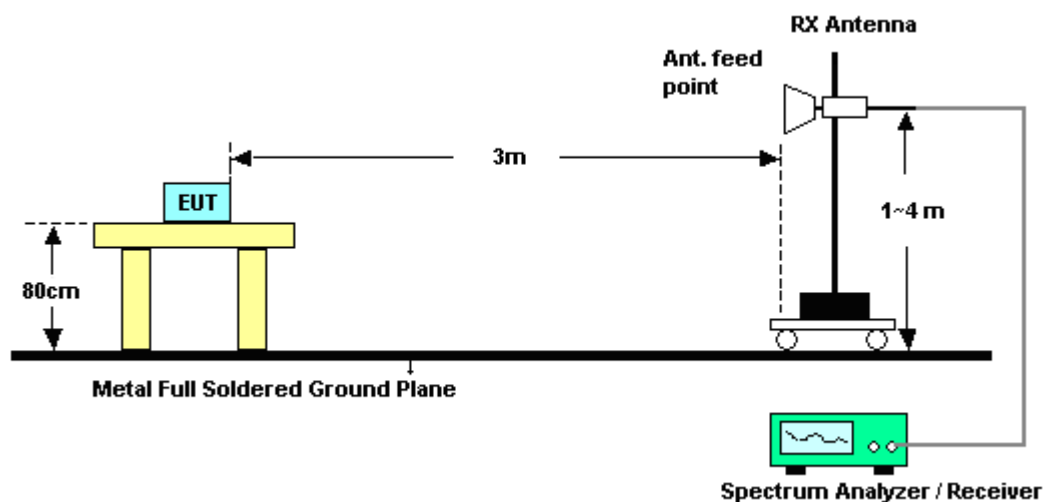
For radiated emissions below 30MHz



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 :	23~24°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Kai Wang and Timberland Lin

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
2386.41	50.87	-23.13	74	46.62	32.36	6.45	34.56	106	299	Peak
2387.13	40.54	-13.46	54	36.29	32.36	6.45	34.56	106	299	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
2385.15	49.16	-24.84	74	44.94	32.33	6.45	34.56	196	258	Peak
2385.69	36.91	-17.09	54	32.66	32.36	6.45	34.56	196	258	Average

Test Mode :	802.11b	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Kai Wang and Timberland Lin

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
2486.86	48.89	-25.11	74	44.37	32.48	6.59	34.55	100	304	Peak
2487.92	36.49	-17.51	54	31.95	32.5	6.59	34.55	100	304	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
2496.5	47.31	-26.69	74	42.77	32.5	6.59	34.55	199	260	Peak
2487.48	34.44	-19.56	54	29.92	32.48	6.59	34.55	199	260	Average



Test Mode :	802.11g	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Kai Wang and Timberland Lin

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
2389.92	62.43	-11.57	74	58.18	32.36	6.45	34.56	107	299	Peak
2390	44.27	-9.73	54	40.02	32.36	6.45	34.56	107	299	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
2390	54.02	-19.98	74	49.77	32.36	6.45	34.56	196	258	Peak
2390	38.04	-15.96	54	33.79	32.36	6.45	34.56	196	258	Average

Test Mode :	802.11g	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Kai Wang and Timberland Lin

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
2483.84	56.63	-17.37	74	52.11	32.48	6.59	34.55	100	301	Peak
2483.52	40.53	-13.47	54	36.01	32.48	6.59	34.55	100	301	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.8	50.99	-23.01	74	46.47	32.48	6.59	34.55	153	261	Peak
2483.72	36.03	-17.97	54	31.51	32.48	6.59	34.55	153	261	Average



Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Kai Wang and Timberland Lin

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
2389.83	63.02	-10.98	74	58.77	32.36	6.45	34.56	107	300	Peak
2390.00	44.51	-9.49	54	40.26	32.36	6.45	34.56	107	300	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
2388.93	54.47	-19.53	74	50.22	32.36	6.45	34.56	196	260	Peak
2390.00	38.01	-15.99	54	33.76	32.36	6.45	34.56	196	260	Average

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Kai Wang and Timberland Lin

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
2483.58	57.07	-16.93	74	52.55	32.48	6.59	34.55	100	301	Peak
2483.54	41.29	-12.71	54	36.77	32.48	6.59	34.55	100	301	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.94	51.41	-22.59	74	46.89	32.48	6.59	34.55	199	279	Peak
2484.38	36.16	-17.84	54	31.64	32.48	6.59	34.55	199	279	Average



Test Mode :	802.11a	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	149	Test Engineer :	Kai Wang and Timberland Lin

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
5745	81.65	-	-	68.66	35.44	11.39	33.84	100	45	Average
5745	91.81	-	-	78.82	35.44	11.39	33.84	100	45	Peak
5725	55.18	-16.63	71.81	42.27	35.41	11.34	33.84	100	45	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
5745	92.39	-	-	79.4	35.44	11.39	33.84	103	348	Average
5745	102.56	-	-	89.57	35.44	11.39	33.84	103	348	Peak
5725	63.96	-18.6	82.56	51.05	35.41	11.34	33.84	103	348	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	165	Test Engineer :	Kai Wang and Timberland Lin

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	80.28	-	-	67.05	35.56	11.51	33.84	100	45	Average
5825	90.01	-	-	76.78	35.56	11.51	33.84	100	45	Peak
5850	54.18	-15.83	70.01	40.88	35.58	11.56	33.84	100	45	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	92.37	-	-	79.14	35.56	11.51	33.84	101	297	Average
5825	101.9	-	-	88.67	35.56	11.51	33.84	101	297	Peak
5850	59.1	-22.8	81.9	45.8	35.58	11.56	33.84	101	297	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	149	Test Engineer :	Kai Wang and Timberland Lin

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
5745	79.66	-	-	66.67	35.44	11.39	33.84	100	46	Average
5745	89.34	-	-	76.35	35.44	11.39	33.84	100	46	Peak
5725	54.41	-14.93	69.34	41.5	35.41	11.34	33.84	100	46	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
5745	90.92	-	-	77.91	35.46	11.39	33.84	101	289	Average
5745	100.97	-	-	87.96	35.46	11.39	33.84	101	289	Peak
5725	64.98	-15.99	80.97	52.07	35.41	11.34	33.84	101	289	Peak

Test Mode :	5GGz 802.11n HT20	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	165	Test Engineer :	Kai Wang and Timberland Lin

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	79.57	-	-	66.34	35.56	11.51	33.84	100	48	Average
5825	89.46	-	-	76.23	35.56	11.51	33.84	100	48	Peak
5850	51.61	-17.85	69.46	38.31	35.58	11.56	33.84	100	48	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	92.72	-	-	79.49	35.56	11.51	33.84	100	302	Average
5825	102.57	-	-	89.34	35.56	11.51	33.84	100	302	Peak
5850	62.3	-20.27	82.57	49	35.58	11.56	33.84	100	302	Peak

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

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	15.78	-24.22	40	27.79	18.9	0.64	31.55	-	-	Peak
135.84	18.44	-25.06	43.5	37.14	11.3	1.29	31.29	-	-	Peak
174.72	22.58	-20.92	43.5	42.63	9.6	1.55	31.2	100	245	Peak
521.9	18.35	-27.65	46	29.63	17.78	2.51	31.57	-	-	Peak
662.6	20.66	-25.34	46	29.93	19.17	2.82	31.26	-	-	Peak
862.1	22.24	-23.76	46	29.46	20.38	3.26	30.86	-	-	Peak
2412	100.1	-	-	95.79	32.38	6.49	34.56	106	299	Average
2412	105.39	-	-	101.08	32.38	6.49	34.56	106	299	Peak
3618	49.84	-24.16	74	62.62	33.27	8.24	54.29	100	0	Peak
4824	51.95	-2.05	54	62.5	34.87	10.17	55.59	100	351	Average
4824	54.04	-19.96	74	64.59	34.87	10.17	55.59	100	351	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	34.1	-5.9	40	46.11	18.9	0.64	31.55	100	219	Peak
53.49	18.98	-21.02	40	42.53	7.24	0.82	31.61	-	-	Peak
129.63	19.82	-23.68	43.5	37.94	11.9	1.27	31.29	-	-	Peak
481.3	21.33	-24.67	46	32.51	17.42	2.31	30.91	-	-	Peak
749.4	21.8	-24.2	46	29.79	19.8	3.05	30.84	-	-	Peak
948.2	23.42	-22.58	46	29.24	20.89	3.35	30.06	-	-	Peak
2412	96.63	-	-	92.32	32.38	6.49	34.56	196	258	Average
2412	101.53	-	-	97.22	32.38	6.49	34.56	196	258	Peak
4824	50.78	-3.22	54	61.33	34.87	10.17	55.59	144	45	Average
4824	52.69	-21.31	74	63.24	34.87	10.17	55.59	144	45	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	98.26	-	-	93.87	32.43	6.52	34.56	132	302	Average
2437	103.53	-	-	99.14	32.43	6.52	34.56	132	302	Peak
3654	48.88	-25.12	74	61.58	33.32	8.33	54.35	100	0	Peak
4874	51.85	-2.15	54	62.5	34.85	10.18	55.68	100	349	Average
4874	53.93	-20.07	74	64.58	34.85	10.18	55.68	100	349	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	94.71	-	-	90.32	32.43	6.52	34.56	192	262	Average
2437	99.59	-	-	95.2	32.43	6.52	34.56	192	262	Peak
4874	50.35	-3.65	54	61	34.85	10.18	55.68	145	46	Average
4874	52.24	-21.76	74	62.89	34.85	10.18	55.68	145	46	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	95.79	-	-	91.34	32.45	6.56	34.56	100	304	Average
2462	101.08	-	-	96.63	32.45	6.56	34.56	100	304	Peak
4924	51.21	-2.79	54	61.95	34.83	10.21	55.78	100	350	Average
4924	53.27	-20.73	74	64.01	34.83	10.21	55.78	100	350	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	91.25	-	-	86.8	32.45	6.56	34.56	199	260	Average
2462	96.24	-	-	91.79	32.45	6.56	34.56	199	260	Peak
4924	50.32	-3.68	54	61.06	34.83	10.21	55.78	140	42	Average
4924	52.19	-21.81	74	62.94	34.83	10.2	55.78	140	42	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	94.63	-	-	90.32	32.38	6.49	34.56	107	299	Average
2412	104.32	-	-	100.01	32.38	6.49	34.56	107	299	Peak
4824	39.36	-14.64	54	49.91	34.87	10.17	55.59	100	350	Average
4824	51.46	-22.54	74	62.01	34.87	10.17	55.59	100	350	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	1. 2412 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
2412	90.77	-	-	86.46	32.38	6.49	34.56	196	258	Average
2412	100.37	-	-	96.06	32.38	6.49	34.56	196	258	Peak
4824	49.69	-24.31	74	60.24	34.87	10.17	55.59	100	0	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	92.34	-	-	87.95	32.43	6.52	34.56	102	301	Average
2437	101.52	-	-	97.13	32.43	6.52	34.56	102	301	Peak
4874	39.59	-14.41	54	50.24	34.85	10.18	55.68	102	348	Average
4874	51.69	-22.31	74	62.34	34.85	10.18	55.68	102	348	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	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 (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
2437	88.74	-	-	84.35	32.43	6.52	34.56	192	259	Average
2437	98.18	-	-	93.79	32.43	6.52	34.56	192	259	Peak
4874	50.23	-23.77	74	60.88	34.85	10.18	55.68	100	0	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	90.76	-	-	86.31	32.45	6.56	34.56	100	301	Average
2462	100.52	-	-	96.07	32.45	6.56	34.56	100	301	Peak
4924	39.14	-14.86	54	49.88	34.83	10.21	55.78	104	347	Average
4924	51.14	-22.86	74	61.88	34.83	10.21	55.78	104	347	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	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	85.81	-	-	81.36	32.45	6.56	34.56	153	261	Average
2462	96.35	-	-	91.9	32.45	6.56	34.56	153	261	Peak
4924	49.49	-24.51	74	60.24	34.83	10.2	55.78	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	15.23	-24.77	40	27.24	18.9	0.64	31.55	-	-	Peak
174.72	23.35	-20.15	43.5	43.4	9.6	1.55	31.2	101	27	Peak
255.45	18.55	-27.45	46	34.86	13.05	1.76	31.12	-	-	Peak
570.2	19.2	-26.8	46	29.12	18.9	2.63	31.45	-	-	Peak
762	20.57	-25.43	46	28.89	19.72	3.05	31.09	-	-	Peak
913.2	22.06	-23.94	46	29.17	20.64	3.36	31.11	-	-	Peak
2412	92.36	-	-	88.05	32.38	6.49	34.56	107	300	Average
2412	102.16	-	-	97.85	32.38	6.49	34.56	107	300	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	33.37	-6.63	40	45.38	18.9	0.64	31.55	100	119	Peak
49.44	19.18	-20.82	40	41.5	8.62	0.79	31.73	-	-	Peak
129.63	20.82	-22.68	43.5	38.94	11.9	1.27	31.29	-	-	Peak
481.3	22.19	-23.81	46	33.37	17.42	2.31	30.91	-	-	Peak
750.1	21.08	-24.92	46	29.05	19.8	3.05	30.82	-	-	Peak
920.2	22.3	-23.7	46	29.15	20.7	3.36	30.91	-	-	Peak
2412	88.7	-	-	84.39	32.38	6.49	34.56	196	260	Average
2412	98.29	-	-	93.98	32.38	6.49	34.56	196	260	Peak

Test Mode :	2.4GHz 802.11n-HT20	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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
2437	90.85	-	-	86.46	32.43	6.52	34.56	131	303	Average
2437	100.68	-	-	96.29	32.43	6.52	34.56	131	303	Peak

Test Mode :	2.4GHz 802.11n-HT20	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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
2437	86.56	-	-	82.17	32.43	6.52	34.56	193	261	Average
2437	96.08	-	-	91.69	32.43	6.52	34.56	193	261	Peak

Test Mode :	2.4GHz 802.11n-HT20	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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	88.68	-	-	84.23	32.45	6.56	34.56	100	301	Average
2462	98.51	-	-	94.06	32.45	6.56	34.56	100	301	Peak

Test Mode :	2.4GHz 802.11n-HT20	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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	84.69	-	-	80.24	32.45	6.56	34.56	199	279	Average
2462	94.22	-	-	89.77	32.45	6.56	34.56	199	279	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	149	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	1. 5745 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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	81.65	-	-	68.66	35.44	11.39	33.84	100	45	Average
5745	91.81	-	-	78.82	35.44	11.39	33.84	100	45	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	149	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	1. 5745 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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	92.39	-	-	79.4	35.44	11.39	33.84	103	348	Average
5745	102.56	-	-	89.57	35.44	11.39	33.84	103	348	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	157	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	1. 5785 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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
5785	82.49	-	-	69.41	35.49	11.43	33.84	100	43	Average
5785	92.06	-	-	78.98	35.49	11.43	33.84	100	43	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	157	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	1. 5785 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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
5785	91.59	-	-	78.51	35.49	11.43	33.84	101	348	Average
5785	101.54	-	-	88.46	35.49	11.43	33.84	101	348	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	165	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	1. 5825 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per 15.31		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.27	15	-25	40	27.01	18.9	0.64	31.55	-	-	Peak
174.72	22.6	-20.9	43.5	42.65	9.6	1.55	31.2	105	129	Peak
255.72	19.19	-26.81	46	35.36	13.18	1.77	31.12	-	-	Peak
492.5	24.28	-21.72	46	35.77	17.63	2.42	31.54	-	-	Peak
779.5	21.72	-24.28	46	30.36	19.8	3.06	31.5	-	-	Peak
866.3	22.16	-23.84	46	29.47	20.34	3.28	30.93	-	-	Peak
5825	80.28	-	-	67.05	35.56	11.51	33.84	100	45	Average
5825	90.01	-	-	76.78	35.56	11.51	33.84	100	45	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	165	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	1. 5825 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per 15.31		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	33.31	-6.69	40	45.32	18.9	0.64	31.55	100	69	Peak
116.4	22.82	-20.68	43.5	40.42	12.48	1.19	31.27	-	-	Peak
219.81	14.96	-31.04	46	35.32	9.1	1.63	31.09	-	-	Peak
460.3	21.44	-24.56	46	33.14	17.02	2.33	31.05	-	-	Peak
748.7	20.98	-25.02	46	29.01	19.78	3.05	30.86	-	-	Peak
848.1	22.11	-23.89	46	29.37	20.2	3.22	30.68	-	-	Peak
5825	92.37	-	-	79.14	35.56	11.51	33.84	101	297	Average
5825	101.9	-	-	88.67	35.56	11.51	33.84	101	297	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	149	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	1. 5745 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per 15.31		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	18.44	-21.56	40	30.45	18.9	0.64	31.55	-	-	Peak
174.72	22.14	-21.36	43.5	42.19	9.6	1.55	31.2	143	29	Peak
255.72	18.66	-27.34	46	34.83	13.18	1.77	31.12	-	-	Peak
548.5	19.96	-26.04	46	29.42	19.07	2.54	31.07	-	-	Peak
763.4	21.07	-24.93	46	29.4	19.73	3.05	31.11	-	-	Peak
891.5	22.44	-23.56	46	29.96	20.51	3.35	31.38	-	-	Peak
5745	79.66	-	-	66.67	35.44	11.39	33.84	100	46	Average
5745	89.34	-	-	76.35	35.44	11.39	33.84	100	46	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	149	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	1. 5745 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per 15.31		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	33.32	-6.68	40	45.33	18.9	0.64	31.55	100	348	Peak
131.79	20.18	-23.32	43.5	38.49	11.7	1.28	31.29	-	-	Peak
284.61	17.61	-28.39	46	33.98	12.88	1.85	31.1	-	-	Peak
460.3	21.33	-24.67	46	33.03	17.02	2.33	31.05	-	-	Peak
748	21.57	-24.43	46	29.63	19.76	3.04	30.86	-	-	Peak
933.5	22.22	-23.78	46	28.63	20.73	3.36	30.5	-	-	Peak
5745	90.92	-	-	77.91	35.46	11.39	33.84	101	289	Average
5745	100.97	-	-	87.96	35.46	11.39	33.84	101	289	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	157	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	1. 5785 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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
5785	81.14	-	-	68.04	35.51	11.43	33.84	100	45	Average
5785	91.03	-	-	77.93	35.51	11.43	33.84	100	45	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	157	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	1. 5785 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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
5785	92.57	-	-	79.49	35.49	11.43	33.84	101	295	Average
5785	102.04	-	-	88.96	35.49	11.43	33.84	101	295	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	165	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Horizontal
Remark :	1. 5825 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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	79.57	-	-	66.34	35.56	11.51	33.84	100	48	Average
5825	89.46	-	-	76.23	35.56	11.51	33.84	100	48	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	165	Relative Humidity :	42~43%
Test Engineer :	Kai Wang and Timberland Lin	Polarization :	Vertical
Remark :	1. 5825 MHz is fundamental signal which can be ignored. 2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31		

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	92.72	-	-	79.49	35.56	11.51	33.84	100	302	Average
5825	102.57	-	-	89.34	35.56	11.51	33.84	100	302	Peak

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

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

*Decreases with the logarithm of the frequency.

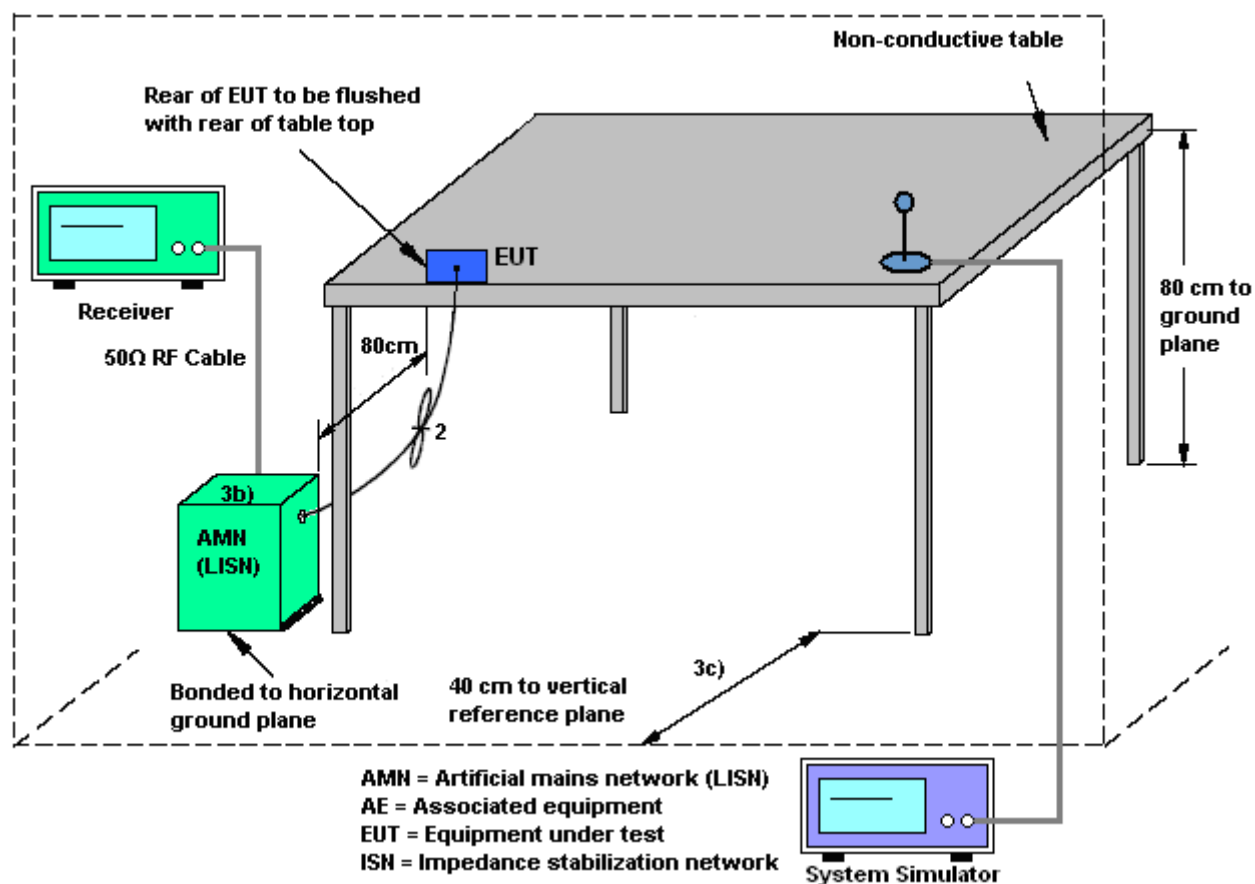
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

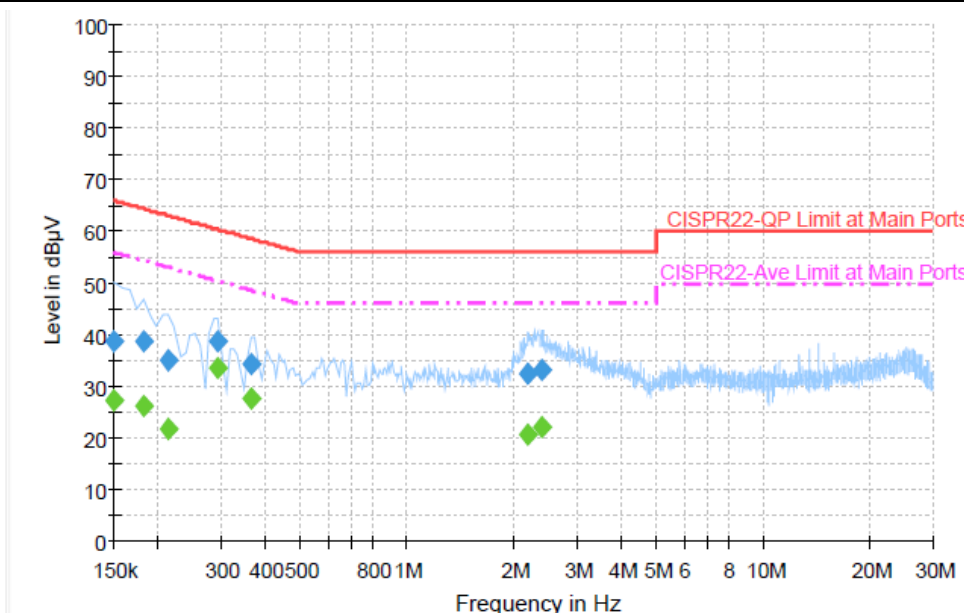
1. The testing follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance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

3.6.4 Test Setup



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 Idle + Bluetooth Link + WLAN Link + Earphone + MP3 + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



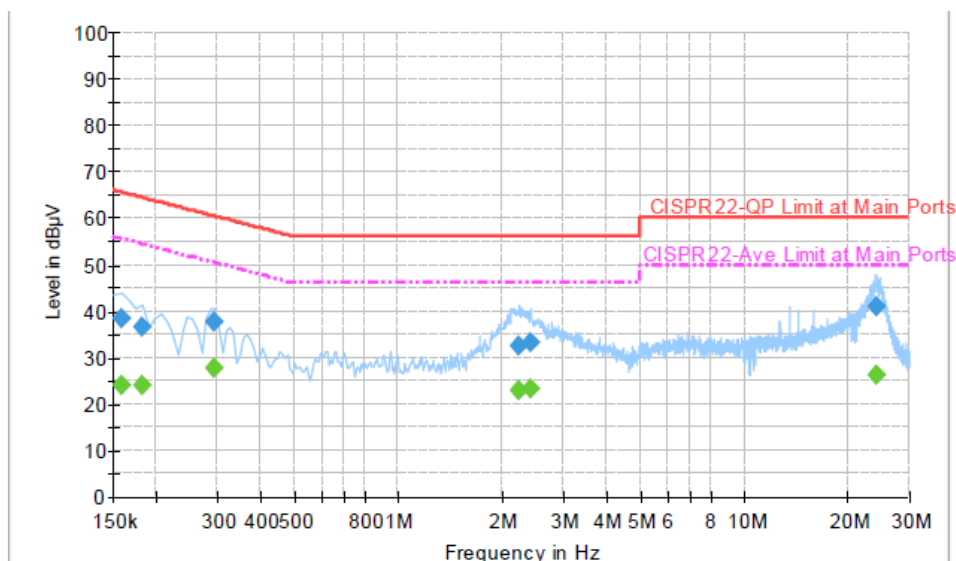
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	38.6	Off	L1	19.4	27.4	66.0
0.182000	38.6	Off	L1	19.4	25.8	64.4
0.214000	35.0	Off	L1	19.4	28.0	63.0
0.294000	38.9	Off	L1	19.4	21.5	60.4
0.366000	34.4	Off	L1	19.4	24.2	58.6
2.182000	32.4	Off	L1	19.6	23.6	56.0
2.382000	33.3	Off	L1	19.6	22.7	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	27.4	Off	L1	19.4	28.6	56.0
0.182000	26.2	Off	L1	19.4	28.2	54.4
0.214000	21.7	Off	L1	19.4	31.3	53.0
0.294000	33.4	Off	L1	19.4	17.0	50.4
0.366000	27.8	Off	L1	19.4	20.8	48.6
2.182000	20.7	Off	L1	19.6	25.3	46.0
2.382000	22.3	Off	L1	19.6	23.7	46.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + Earphone + MP3 + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	38.3	Off	N	19.3	27.3	65.6
0.182000	36.6	Off	N	19.4	27.8	64.4
0.294000	37.5	Off	N	19.4	22.9	60.4
2.238000	32.6	Off	N	19.6	23.4	56.0
2.406000	33.1	Off	N	19.6	22.9	56.0
24.126000	40.8	Off	N	20.0	19.2	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	24.0	Off	N	19.3	31.6	55.6
0.182000	24.2	Off	N	19.4	30.2	54.4
0.294000	27.9	Off	N	19.4	22.5	50.4
2.238000	22.7	Off	N	19.6	23.3	46.0
2.406000	23.3	Off	N	19.6	22.7	46.0
24.126000	26.3	Off	N	20.0	23.7	50.0

3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Connected Construction

Non-standard connector used.

3.7.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Oct. 17, 2012 ~ Oct. 23, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Sep. 08, 2012	Oct. 17, 2012 ~ Oct. 23, 2012	Sep. 07, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Sep. 08, 2012	Oct. 17, 2012 ~ Oct. 23, 2012	Sep. 07, 2013	Conducted (TH02-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz ~ 26.5GHz	Nov. 23, 2011	Oct. 19, 2012~ Oct. 21, 2012	Nov. 22, 2012	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz~30GHz	Nov. 03, 2011	Oct. 19, 2012~ Oct. 21, 2012	Nov. 02, 2012	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz ~ 1000MHz	May 04, 2012	Oct. 19, 2012~ Oct. 21, 2012	May. 03, 2013	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz ~ 2GHz	Oct. 22, 2011	Oct. 19, 2012~ Oct. 21, 2012	Oct. 21, 2012	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2012	Oct. 19, 2012~ Oct. 21, 2012	Jul. 31, 2013	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	Oct. 19, 2012~ Oct. 21, 2012	Sep. 27, 2013	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 13, 2012	Oct. 19, 2012~ Oct. 21, 2012	Apr. 12, 2013	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz ~ 1GHz	Apr. 11, 2012	Oct. 19, 2012~ Oct. 21, 2012	Apr. 10, 2013	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 21, 2012	Oct. 19, 2012~ Oct. 21, 2012	Jul. 20, 2013	Radiation (03CH06-HY)
Pre Amplifier	MITEQ	AMF-7D-00101800-30-10P	159087	1GHz~18GHz	Feb. 27, 2012	Oct. 19, 2012~ Oct. 21, 2012	Feb. 26, 2013	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz ~ 30MHz	Jul. 03, 2012	Oct. 19, 2012~ Oct. 21, 2012	Jul. 02, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Oct. 17, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Oct. 17, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Oct. 17, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Oct. 17, 2012	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 21, 2011	Oct. 17, 2012	Oct. 20, 2013	Conduction (CO05-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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