

FCC ID: ZNFD722P Report No.: DRTFCC1409-1220(1) Total 62 Pages

RF TEST REPORT

	Test item	:	Multi Band GSM/WCDMA/LTE Phone with Bluetooth, WLAN and NFC
	Model No. Order No.	:	LG-D722p, LGD722p, D722p, LG-D722P, LGD722P, D722P, LG-D722AR, LGD722AR, D722AR, LG-D722ar, LGD722ar, D722ar, LG-D722pa, D722pa, LGD722pa, LG-D722PA, D722PA, LGD722PA DEMC1408-03374
	Date of receipt	:	2014-08-11
	Test duration	:	2014-08-18 ~ 2014-09-02
	Date of issue	:	2014-10-08
	Use of report	:	FCC Original Grant
Applicant	: LG Electronics	s M	obileComm U.S.A., Inc.
	1000 Sylvan A	ve	nue, Englewood Cliffs NJ 07632
Test laboratory	: DT&C Co., Lto	d.	
	42, Yurim-ro,	154	beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935
Т	est specification	:	FCC Part 15 Subpart C 247 RSS-210 Issue 8: 2010
т	est environment	:	See appended test report
т	est result	:	🛛 Pass 🗌 Fail

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full, without the written approval of DT&C Co., Ltd.

Tested by:

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Engineer HoonPyo Lee Reviewed by:

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Technical Manager Geunki Son

TRF-RF-213(04)140314

DT&C Co., Ltd.

Test Report Version

Test Report No.	Date	Description
DRTFCC1409-1220	Sep. 24, 2014	Initial issue
DRTFCC1409-1220(1)	Oct. 08, 2014	EUT description update

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1. GENERAL INFORMATION

Applicant	:	LG Electronics MobileComm U.S.A., Inc.
Address	:	1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID	:	ZNFD722P
EUT	:	Multi Band GSM/WCDMA/LTE Phone with Bluetooth, WLAN and NFC
Model	:	LG-D722p
Additional Model(s)	:	LGD722p, D722p, LG-D722P, LGD722P, D722P, LG-D722AR, LGD722AR, D722AR, LG-D722ar, LGD722ar, D722ar, LG-D722pa, D722pa, LGD722pa, LG-D722PA, D722PA, LGD722PA
Data of Test	:	2014-08-18 ~ 2014-09-02
Contact person	:	Jacob Cho

2. EUT DESCRIPTION

Product	Multi Band GSM/WCDMA/LTE Phone with Bluetooth, WLAN and NFC
Model Name	LG-D722p, LGD722p, D722p, LG-D722P, LGD722P, D722P, LG-D722AR, LGD722AR, D722AR, LG-D722ar, LGD722ar, D722ar, LG-D722pa, D722pa, LGD722pa, LG-D722PA, D722PA, LGD722PA ** 18 models are same mechanical, electrical and functional. ** The only difference is the model name, which are changed for marketing purpose.
Power Supply	DC 3.8V
Battery type	Standard Battery: Lithium Ion Battery
Frequency Range	2.4GHz Band • 802.11b/g/n(20 MHz): 2412 MHz ~ 2462 MHz
Max. RF Output Power	2.4GHz Band • 802.11b: 16.43 dBm • 802.11g: 21.09 dBm • 802.11n (HT20): 20.68 dBm
Modulation Type	802.11b: DSSS/CCK 802.11g/n: OFDM
Antenna Specification	Internal Antenna (1TX ,1RX) • 2.4GHz Band Max. peak gain : -4.170 dBi

3. SUMMARY OF TESTS

FCC Part Section(s)	RSS Section(s)	Parameter	Limit	Test Condition	Status Note 1
I. Transmitter	Mode (TX)				
15.247(a)	RSS-210 [A8.2]	6 dB Bandwidth	> 500 kHz		С
15.247(b)	RSS-210 [A8.4]	Transmitter Output Power	< 1 Watt		С
15.247(d)	RSS-210 [A8.5]	Out of Band Emissions / Band Edge	20 dBc in any 100 kHz BW	Conducted	С
15.247(e)	RSS-210 [A8.2]	Transmitter Power Spectral Density	< 8 dBm / 3 kHz		С
-	RSS Gen [4.6.1]	Occupied Bandwidth (99%)	RSS-Gen(4.6.1)		NA
15.205 15.209	RSS-Gen [7.2.2] [7.2.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	<fcc 15.209="" limits<="" td=""><td>Radiated</td><td>C Note 2</td></fcc>	Radiated	C Note 2
15.207	RSS-Gen [7.2.4]	AC Conducted Emissions	< FCC 15.207 limits	AC Line Conducted	С
15.203	-	Antenna Requirements	FCC 15.203	-	С
Note 1: C =Con Note 2: This te		Comply NT =Not Tested NA =N ormed in each axis and the worst ca	ot Applicable se data was reported.		<u>.</u>

4. TEST METHODOLOGY

Generally the tests were performed according to the KDB558074 v03r02. And ANSI C63.10-2009 was used to reference appropriate EUT setup and maximizing procedures of radiated spurious emission and AC line conducted emission testing

4.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

4.3 GENERAL TEST PROCEDURES

Conducted Emissions

The power-line conducted emission test procedure is not described on the KDB 558074 v03r02. So this test was fulfilled with the requirements in Section 6.2 of ANSI C63.10.

The EUT is placed on the non-conductive table, which is 0.8 m above ground plane and the conducted emissions from the EUT measured in the frequency range between 0.15MHz and 30MHz using CISPR Quasi-peak and Average detector.

Radiated Emissions

Basically the radiated tests were performed with KDB 558074 v03r02. But some requirements and procedures like test site requirements, EUT setup and maximizing procedure were fulfilled with the requirements in Section 5 and 6 of the ANSI C63.10 as stated on section 12.1 of the KDB 558074 v03r02.

The EUT is placed on a non-conductive table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the highest emission, the relative positions of the EUT were rotated through three orthogonal axes..

4.4 DESCRIPTION OF TEST MODES

The EUT has been tested with all modes of operating conditions to determine the worst case emission characteristics. A test program is used to control the EUT for staying in continuous transmitting mode.

5. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

6. FACILITIES AND ACCREDITATIONS

6.1 FACILITIES

The open area test site(OATS) or semi anechoic chamber and conducted measurement facility used to collect the radiated and conducted test data are located at the 38, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935. The site is constructed in conformance with the requirements.

- Semi anechoic chamber registration Number : 678747

6.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and peak, quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

7. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203& RSS-Gen [7.1.2]:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. 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 provisions of this section."

The internal antenna is attached on the main PCB using the special spring tension. Therefore this E.U.T Complies with the requirement of §15.203

8. TEST RESULT

8.1 6 dB Bandwidth

Test Requirements and limit, §15.247(a)& RSS-210 [A8.2]

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

The minimum permissible 6dB bandwidth is 500 kHz.

TEST CONFIGURATION

Refer to the APPENDIX I.

TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of KDB558074 v03r02.

- 1. Set resolution bandwidth (RBW) = 100 KHz
- 2. Set the video bandwidth (VBW) \ge 3 x RBW.
- (RBW:100KHz/VBW:300 KHz)
- 3. Detector = **Peak**.
- 4. Trace mode = **max hold**.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Mode	Data Rate	Frequency [MHz]	Test Results[MHz]
		2412	9.063
802.11b	1 Mbps	2437	9.087
		2462	9.101
		2412	15.700
802.11g	6 Mbps	2437	15.360
		2462	16.050
		2412	16.330
802.11n (20 MHz)	MCS 0	2437	15.730
()		2462	15.140

TEST RESULTS: Comply

RESULT PLOTS

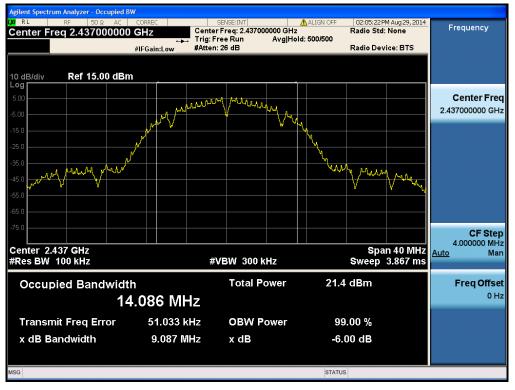
6 dB Bandwidth

Test Mode: 802.11b & 1 Mbps & 2412 MHz

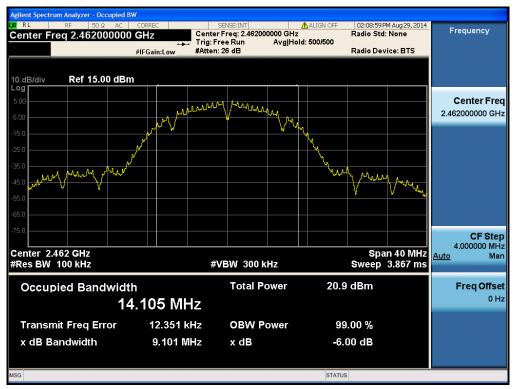


6 dB Bandwidth

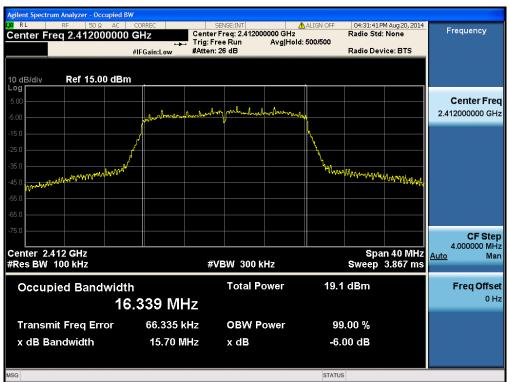
Test Mode: 802.11b & 1 Mbps & 2437 MHz



Test Mode: 802.11b & 1 Mbps & 2462 MHz

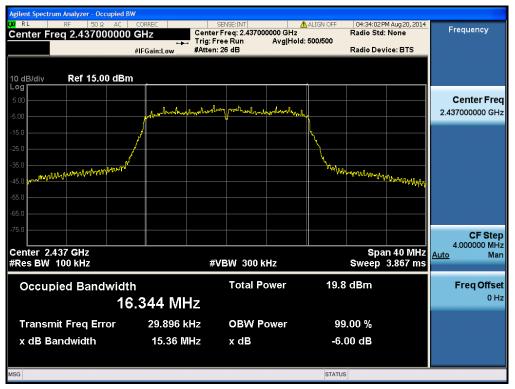


Test Mode: 802.11g & 6 Mbps & 2412 MHz

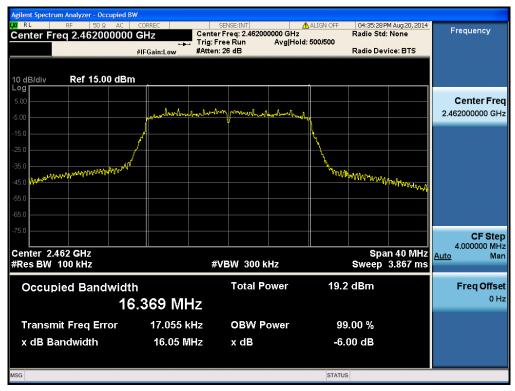


6 dB Bandwidth

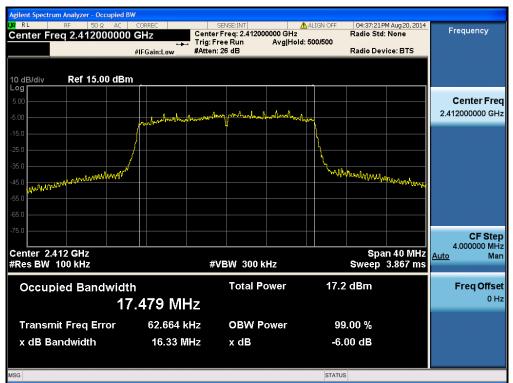
Test Mode: 802.11g & 6 Mbps & 2437 MHz



Test Mode: 802.11g & 6 Mbps & 2462 MHz

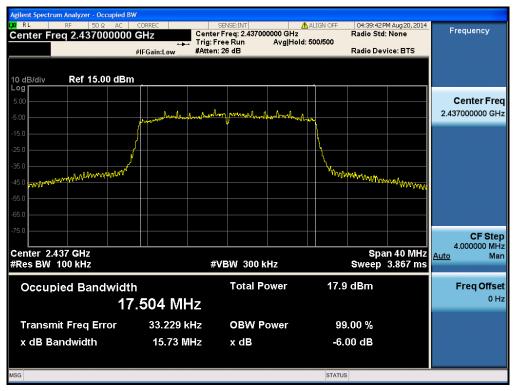


Test Mode: 802.11n & MCS 0 & 2412 MHz

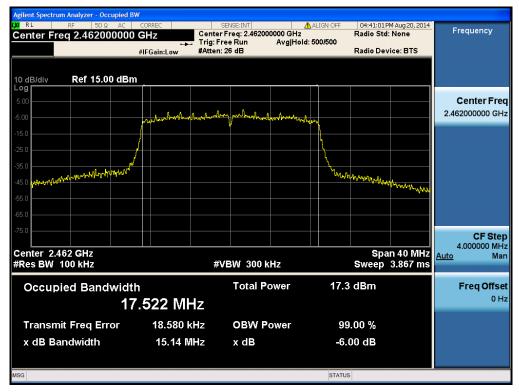


6 dB Bandwidth

Test Mode: 802.11n & MCS 0 & 2437 MHz



Test Mode: 802.11n & MCS 0 & 2462 MHz

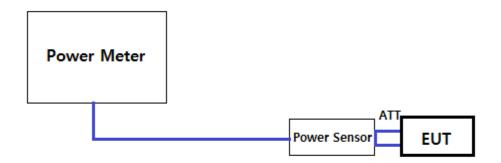


8.2 Maximum Peak Conducted Output Power

Test Requirements and limit, §15.247(b) & RSS-210 [A8.4]

The maximum permissible conducted output power is 1 Watt.

TEST CONFIGURATION



TEST PROCEDURE:

1. PKPM1 Peak power meter method of KDB558074 v03r02

The maximum conducted output powers were measured using a broadband peak RF power meter which has greater video bandwidth than DUT's DTS bandwidth and utilize a fast-responding diode detector.

2. Method AVGPM-G (Measurement using a gated RF average power meter) of KDB558074 v03r02

The average conducted output powers were measured using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

- Measurement Data: Comply

- Test Results

Mode				Test Result [dBm]								
	Channel	Frequency [MHz]	Detector		DATA RATE [Mbps]							
				1	2	5.5	11	NA	NA	NA	NA	
	4	2412	PK	15.81	15.74	15.71	15.80	-	-	-	-	
	1		AV	13.32	13.23	13.27	13.28	-	-	-	-	
000 445	C	2437	PK	16.43	16.33	15.73	16.38	-	-	-	-	
802.11b	6		AV	13.89	13.76	13.37	13.85	-	-	-	-	
		0.400	PK	15.68	15.64	15.59	15.67	-	-	-	-	
	11	2462	AV	13.22	13.08	13.11	13.17	-	-	-	-	

		Frequency [MHz]		Test Result [dBm]									
Mode C	Channel		Detector	tor DATA RATE [Mbps]									
				6	9	12	18	24	36	48	54		
		1 2412	PK	20.59	20.39	20.41	20.25	20.31	20.26	20.24	20.12		
	I		AV	12.02	12.01	12.00	11.96	11.96	11.89	11.99	11.98		
902 11 a	G	2437	PK	21.09	20.99	20.82	20.81	20.70	20.78	20.73	20.83		
802.11g	6		AV	12.61	12.59	12.54	12.42	12.55	12.55	12.54	12.53		
	44	2462	PK	20.77	20.62	20.59	20.51	20.51	20.41	20.40	20.39		
	11	2462	AV	11.92	11.78	11.85	11.76	11.80	11.87	11.84	11.71		

		Frequency [MHz]		Test Result [dBm]									
Mode	Channel		Detector	or DATA RATE [MCS]									
				0	1	2	3	4	5	6	7		
		2412	PK	20.17	19.96	19.62	19.78	19.60	19.42	19.46	19.32		
	1		AV	10.00	9.92	9.97	9.96	9.93	9.94	9.96	9.94		
802.11n	6	2437	PK	20.68	20.47	20.47	20.34	20.13	19.91	19.94	19.91		
(HT20)	6		AV	10.58	10.53	10.48	10.57	10.53	10.55	10.57	10.52		
		11 2462	PK	20.33	19.86	19.81	19.73	19.43	19.50	19.39	19.43		
1	11		AV	9.99	9.94	9.90	9.97	9.80	9.84	9.85	9.92		

8.3 Maximum Power Spectral Density

Test requirements and limit, §15.247(e) & RSS-210[A8.2]

The peak power density is measured with a spectrum analyzer connected to the antenna terminal

while the EUT is operating in transmission mode at the appropriate frequencies.

Minimum Standard – specifies a conducted power spectral density (PSD) limit of 8 dBm in any 3 kHz Band segment within the fundamental EBW during any time interval of continuous transmission.

TEST CONFIGURATION

Refer to the APPENDIX I.

TEST PROCEDURE:

Method PKPSD of KDB558074 v03r02 is used.

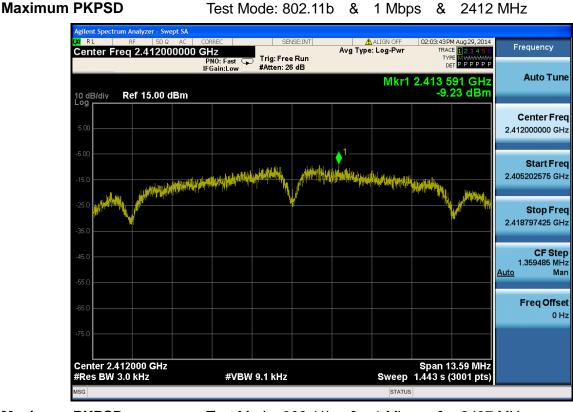
1. Set analyzer center frequency to DTS channel center frequency.

- 2. Set the span to **1.5 times** the DTS bandwidth.
- 3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- 4. Set the VBW \geq 3 x RBW.
- 5. Detector = peak.
- 6. Sweep time = **auto couple**.
- 7. Trace mode = **max hold.**
- 8. Allow trace to fully stabilize.
- 9. Use the **peak marker function** to determine the maximum amplitude level within the RBW.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST RESULTS: Comply

Test Mode	Data Rate	Frequency [MHz]	RBW	PKPSD [dBm]
		2412	3 kHz	-9.23
802.11b	1 Mbps	2437	3 kHz	-7.26
		2462	3 kHz	-7.46
	6 Mbps	2412	3 kHz	-12.02
802.11g		2437	3 kHz	-12.17
		2462	3 kHz	-12.21
		2412	3 kHz	-14.89
802.11n HT20	MCS 0	2437	3 kHz	-13.78
		2462	3 kHz	-14.57

RESULT PLOTS



Maximum PKPSD

Test Mode: 802.11b & 1 Mbps & 2437 MHz



Maximum PKPSD

Test Mode: 802.11b & 1 Mbps & 2462 MHz



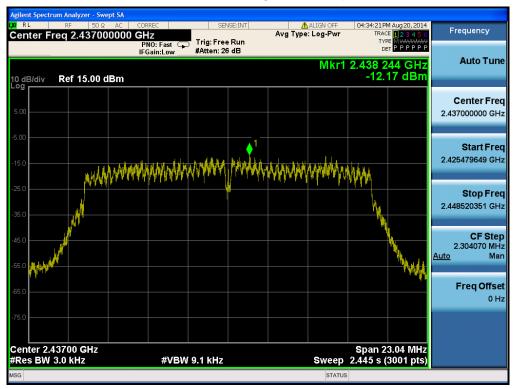
W RL RF 50 Ω AL Conter Trig: Free Run Center Freq 2.412000000 GHz PN0: Fast Free Run Free Run #Atten: 26 dB Aug 20, 2014 Avg Type: Log-Pwr Frequency TYPE DET PPPPPP Auto Tune Mkr1 2.412 330 GHz -12.02 dBm 10 dB/div Log Ref 15.00 dBm **Center Freq** 2.412000000 GHz Start Freq 2.400222243 GHz AAN AMAMAMANI AN AMAMANA ANY AMA ዀጞጞጞጞጚጚቔቚቔጚዸቑቚኇቚኯኯኯጞጞዄኇፙዄዺቚዸ Stop Freq 2.423777757 GHz CF Step 2.355551 MHz Auto Man **Freq Offset** 0 Hz Center 2.41200 GHz #Res BW 3.0 kHz Span 23.56 MHz Sweep 2.499 s (3001 pts) #VBW 9.1 kHz

Test Mode: 802.11g & 6 Mbps & 2412 MHz

Maximum PKPSD

Maximum PKPSD

Test Mode: 802.11g & 6 Mbps & 2437 MHz



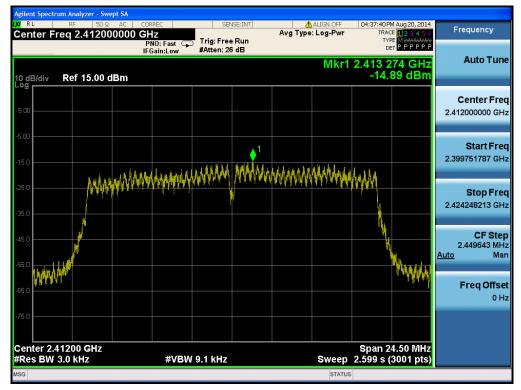
gilent Spectrum Analyzer ALIGN OFF 04:35:48 PM Aug 20, 2014 TRACE 1 2 3 4 5 6 d RL SENSE:INT Center Freq 2.462000000 GHz PN0: Fast IFGain:Low #Atten: 26 dB Frequency Auto Tune Mkr1 2.461 358 GHz -12.21 dBm Ref 15.00 dBm 10 dB/div **Center Freq** 2.462000000 GHz Start Freq • 2.449962087 GHz untervery and the second with the second second second Stop Freq 2.474037913 GHz CF Step 2.407583 MHz Man <u>Auto</u> "NYY **Freq Offset** 0 Hz Center 2.46200 GHz #Res BW 3.0 kHz Span 24.08 MHz Sweep 2.555 s (3001 pts) #VBW 9.1 kHz STATU

Maximum PKPSD

Test Mode: 802.11g & 6 Mbps & 2462 MHz

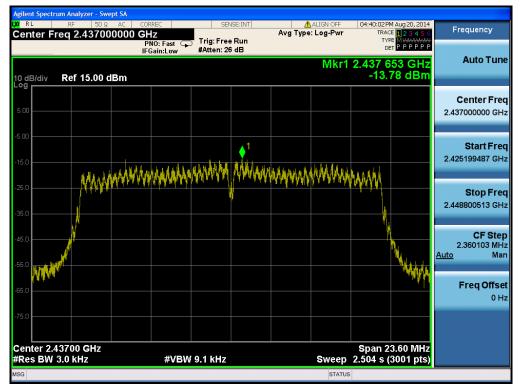
Maximum PKPSD

Test Mode: 802.11n(HT20) & MCS 0 & 2412 MHz



Maximum PKPSD

Test Mode: 802.11n(HT20) & MCS 0 & 2437 MHz



Maximum PKPSD

Test Mode: 802.11n(HT20) & MCS 0 & 2462 MHz



8.4 Out of Band Emissions at the Band Edge / Conducted Spurious Emissions

Test requirements and limit, §15.247(d) & RSS-210 [A8.5]

§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to 15.247(b)(3) requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in band average PSD level.

In either case, attenuation to levels below the general emission limits specified in §15.209(a) is not required.

TEST CONFIGURATION

Refer to the APPENDIX I.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer.

- Measurement Procedure 1 – Reference Level

- 1. Set instrument center frequency to DTS channel center frequency.
- 2. Set the span to \geq 1.5 times the DTS bandwidth.
- 3. Set the RBW = 100 kHz.
- 4. Set the VBW \geq 3 x RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum PSD level

- Measurement Procedure 2 - Unwanted Emissions

- 1. Set the center frequency and span to encompass frequency range to be measured.
- 2. Set the RBW = 100 kHz.(Actual 1 MHz , See below note)
- 3. Set the VBW \geq 3 x RBW.(Actual 3 MHz, See below note)
- 4. Detector = **peak**.
- 5. Ensure that the number of measurement points \geq span/RBW
- 6. Sweep time = auto couple.
- 7. Trace mode = **max hold.**
- 8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
- 9. Use the peak marker function to determine the maximum amplitude level.

Note : The conducted spurious emission was tested with below settings.

Frequency range: 9 KHz ~ 30 MHz

RBW= 100 kHz, VBW= 300kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT: 40001

Frequency range: 30 MHz ~ 10 GHz, 10 GHz~25 GHz RBW= 1MHz, VBW= 3MHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT: 40001

LIMIT LINE = 20 dB below of the reference level of above measurement procedure Step 2. (RBW = 100 KHz, VBW = 300 KHz)

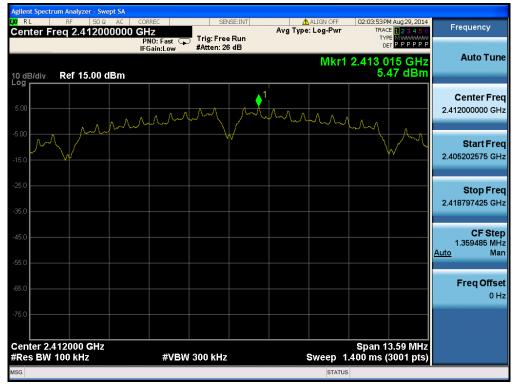
If the emission level with above setting was close to the limit (ie, less than 3 dB margin) then zoom scan is required using RBW = 100 KHz, VBW = 300 KHz, SAPN = 100 MHz and BINS = 2001 to get accurate emission level within 100 KHz BW.

Also the path loss for conducted measurement setup was used as described on the Appendix I of this test report.

RESULT PLOTS

802.11b & 1 Mbps & 2412 MHz

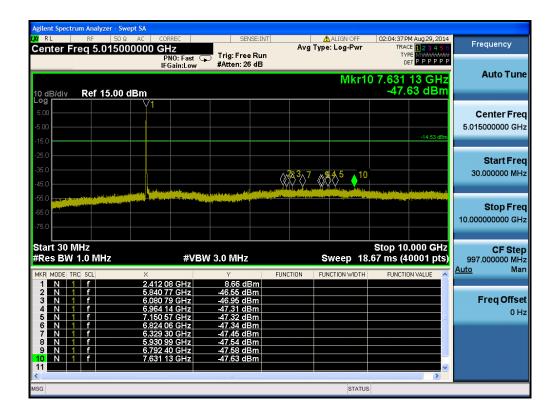
Reference



Low Band-edge



Agilent Spect											
Center F	RF	50 Ω 🚹 DC	CORREC	SENS			ALIGN OFF		M Aug 29, 2014	Fr	equency
Center P	req 15.0	JU4500 W	PNO: Fast	Trig: Free F	Run	a i ype	. Log-i wi	TY			
			IFGain:Lov	v #Atten: 26 v	dB						Auto Tune
							Mkr	2 20.434	4 MHz		Auto Tune
10 dB/div Log	Ref 15	.00 dBm						-65.2	29 dBm		
5.00											enter Freq
-5.00											.004500 MHz
-15.0									-14.53 dBm		
-25.0											
											Start Freq
-35.0											9.000 kHz
-45.0 λ 1											
-55.0						<mark>_</mark> 2					Stop Freq
-65.0	فالمتر والمتحدث والمحاجز	dest some helpeter	a dural and the states	valintaria valle dance for	and the second state of th		in the second second	المناج والمحتوية ومعالم المجالية	-	30	.000000 MHz
-75.0											
Start 9 kl	 ₩7							Stop 3	0.00 MHz		05.04
#Res BW		2	#V	'BW 300 kHz		S	weep 5.3		0001 pts)	2	CF Step .999100 MHz
MKR MODE T		×		Y	FUNCTION		CTION WIDTH		IN VALUE	Auto	Man
1 N	1 f		281.9 kHz	-60.02 dBr	n	PON	CHON WIDTH	PONCTIC			
2 N ⁻ 3	<u>1 f</u>	20	.434 4 MHz	-65.29 dBr	n	_					Freq Offset
4											0 Hz
5						_			=		
7											
8											
10						_					
<									>		
MSG							STATUS	L DC Cou	pled		

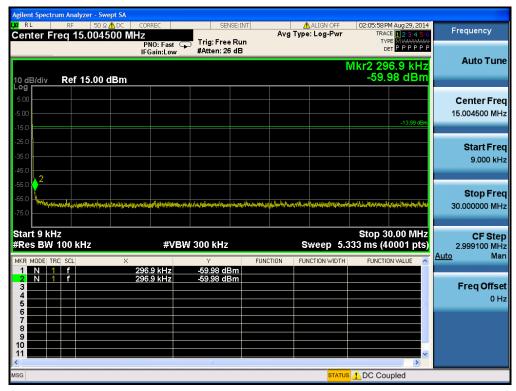


Agilent Spectrum Analyzer - S						
RL RF 50 Center Freq 17.50		SENSE:IN	Avg Ty	ALIGN OFF	02:04:46 PM Aug 29, 2014 TRACE 123456	Frequency
	PNO: Fast IFGain:Low	Trig: Free Run #Atten: 26 dB	1			
				Mkr5 2	4.520 375 GHz -36.83 dBm	Auto Tune
10 dB/div Ref 15.00) dBm				-30.83 UBIII	
5.00						Center Free
-5.00						17.50000000 GH
-15.0					-14.53 dBm	
-25.0					Ś	Start Fre
-35.0				a second and the second second		10.00000000 GH
and an off the state of the sta			and other "Southerspecture		Statistics in the second se	
00.0						Stop Fre
-65.0						25.00000000 GH
-75.0						
Start 10.000 GHz					Stop 25.000 GHz	CF Ste
#Res BW 1.0 MHz	#VE	W 3.0 MHz		Sweep 40.	.00 ms (40001 pts)	1.500000000 GH Auto Ma
MKR MODE TRC SCL	× 24.993 625 GHz	۲ -34.72 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> ima
2 N 1 f	24.771 250 GHz	-35.63 dBm				Freq Offse
3 N 1 f 4 N 1 f	24.386 500 GHz 24.320 125 GHz	-36.18 dBm -36.57 dBm				0 H
5 N 1 f	24.520 375 GHz	-36.83 dBm				
7 8						
9						
11					~	
ISG				STATUS		

802.11b & 1 Mbps & 2437 MHz



Reference



Agilent Spectrum Analyzer - Swept SA						
X RL RF 50 Ω AC Center Freq 5.01500000		SENSE:INT		ALIGN OFF	02:06:11 PM Aug 29, 2014 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast G	Trig: Free Run #Atten: 26 dB				
				Mkr1	0 7.724 10 GHz	Auto Tune
10 dB/div Ref 15.00 dBm					-48.12 dBm	
5.00					-13.99 dBm	Center Freq 5.015000000 GHz
-15.0 -25.0 -36.0 -45.0				\\$\ ² 5 ⁴ \5 ⁶ 1(Start Freq 30.000000 MHz
-55.0						Stop Freq 10.00000000 GHz
Start 30 MHz #Res BW 1.0 MHz	#VBW	/ 3.0 MHz		Sweep 18	Stop 10.000 GHz .67 ms (40001 pts)	CF Step 997.000000 MHz Auto Man
MKR MODE TRC SCL	× 2.437 01 GHz	۲ 9.17 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto
2 N 1 f 77 3 N 1 f 77 4 N 1 f 77 5 N 1 f 77 5 N 1 f 77 6 N 1 f 77 7 N 1 f 66 8 N 1 f 55 9 N 1 f 66 10 N 1 f 77	7.231 01 GHz 7.231 08 GHz 7.254 01 GHz 7.142 10 GHz 7.551 37 GHz 5.261 50 GHz 5.717 14 GHz 5.870 42 GHz 7.724 10 GHz	9.17 GBm 45.90 GBm 47.14 dBm 47.40 dBm 47.48 dBm 47.48 dBm 47.81 dBm 47.81 dBm 48.12 dBm				Freq Offset 0 Hz
MSG				STATUS	×	

Agilent Spectrum Analyzer - S							
Center Freq 17.50	50 Ω AC CORREC SENSE:INT			ALIGN OFF	02:06:20 PM Aug 29, 2014 TRACE 123456	Frequency	
	PNO: Fast ⊂ IFGain:Low	Trig: Free Run #Atten: 26 dB			TYPE MWWWWW DET PPPPP	Auto Tune	
10 dB/div Ref 15.00	Mkr5 24.437 500 GHz -36.58 dBm -36.58 dBm						
-5.00					-13.99 dBm	Center Fre 17.500000000 GH	
-25.0 -35.0 -45.0	Annih serenti kang menjang da kutan dan pertakan kang menjang da kutan kang menjang menjang da kutan kang menja					Start Fre 10.000000000 GH	
-55.0 -65.0 -75.0						Stop Fre 25.000000000 GH	
Start 10.000 GHz #Res BW 1.0 MHz	#VBI	N 3.0 MHz		Sweep 40	Stop 25.000 GHz .00 ms (40001 pts)	CF Ste 1.50000000 GH	
MKR MODE TRC SCL	× 24.942 625 GHz	۲ -34.81 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma	
2 N 1 F 3 N 1 F 4 N 1 F 5 N 1 F 6	24.794 125 GHz 24.624 625 GHz 24.099 250 GHz 24.437 500 GHz	-35.95 dBm -36.33 dBm -36.43 dBm -36.58 dBm				Freq Offse 0 ⊢	
7 8 9 10							
11		ш			>		
ISG				STATUS			

802.11b & 1 Mbps & 2462 MHz



Reference

High Band-edge



RL	RF 50)Ω 🔥 DC 🔤 COI	RREC	CENC	C. IN IT		ALIGN OFF	02:10:00.0	M Aug 29, 2014	
enter F	req 15.004	4500 MHz	z		4		Log-Pwr	TRAC	M AUG 29, 2014 CE 123456 PE M WANANA	Frequency
			NO: Fast ⊂ Gain:Low	#Atten: 26 o				D	PPPPP	
0 dB/div	Ref 15.0	0 dBm					ľ		1.9 kHz 55 dBm	Auto Tun
.og 5.00 5.00										Center Fre 15.004500 MH
15.0 25.0 									-14.73 dBm	Start Fre
35.0 45.0 55.0										9.000 kH
65.0 75.0	ð þ. Marið angen þ. Aktor	ilsendssinslagtsjorteka	ىرىغۇرىلەرلەرلىرى	antilingettisisjonis on alasta	yalan da salah yala ku jina da	beitendertete	ngal wat to be planted	alay halada a ta a a a a a a a a a a a a a a a a	the state of the s	Stop Fre 30.000000 MH
	Hz 100 kHz		#VBI	N 300 kHz		Sv	veep 5.3	Stop 3 33 ms (4	0.00 MHz 0001 pts)	2.999100 MH
Res BW	RC SCL		.9 kHz	۲ -60.55 dBr	FUNCTION		veep 5.3	333 ms (4	0.00 MHz 0001 pts)	2.999100 MH
4KR MODE T 1 N 4 2 N 4 3 4 5 1	RC SCL	281		Y	n		-	333 ms (4	0001 pts)	2.999100 MH <u>Auto</u> Ma Freq Offs
Res BW MKR MODE T 1 N 2 2 N 3 3 4 5 5 5 6 7 8 9	RC SCL	281	.9 kHz	۲ -60.55 dBr	n		-	333 ms (4	0001 pts)	2.999100 MH <u>Auto</u> Ma Freq Offs
Res BW MKR MODE T 1 N 2 2 N 3 3 4 5 5 5 6 7 8 5	RC SCL	281	.9 kHz	۲ -60.55 dBr	n		-	333 ms (4	0001 pts)	CF Ste 2.999100 M- Auto Ma Freq Offso 0 F

			50Ω AC			SI	ENSE:INT	0		LIGN OFF		PM Aug 29, 2014	Frequency
enter	r Fred	5.01	500000		Z 0: Fast (Trig: Fre	e Run	AVS	jiype:i	og-Pwr	т	ACE 123456 YPE MWWWWW	
					o: Fast (ain:Low	#Atten: 2						DETPPPPF	
										Miked	1 6 002	20 CH-	Auto T
	IB/div Ref 15.00 dBm -47.59 dBm												
) dB/di og r	iv R	lef 15.0									-47	Sa nem	
				γ 1									0
													Center F
00													5.015000000
5.0						_	_					-14.73 dBm	
5.0													
													Start F
5.0								<u></u> 10	<u>∧&4</u> ∧/	23 ^5			30.000000
5.0									$\langle X \rangle = \langle X \rangle$	$\Sigma \rightarrow \Sigma$			
5.0	بر الم	فليصبغوا يراي	address address	at the state	a substantia de la compañía de la co	Here and a featball	e <mark>l annailteac</mark> h	- management of the state of th	ar da an an thire bai	and the second of the party of the second	a Burgarana	a bilantan di bilang ang	
	A DESCRIPTION OF THE OWNER OF THE	-	Contraction of the local division of the loc		and the states						and a second		Stop F
5.0													10.000000000
5.0													10.0000000000
	0 MH:											0.000 GHz	
Res E	SW 1.0) MHz			#VB	W 3.0 MH	z		Sw	eep 18	.67 ms (•	40001 pts)	997.000000
KB MOD.	E TRC S	SCI		<		Y		FUNCTION	ELINCT	ION WIDTH	FUNCT	ION VALUE	Auto
	1	f		2.462 18	GHz	8.59 (Bm						
1 N	1	f		7.036 67	GHz	-47.15 c	Bm						
1 N 2 N		f			GHz	-47.25 c							Freq Of
	1					47.20 -							
	1	f f	(5.766 23	GHz	-47.32 c						=	
	1 1 1 1 1 1	f f f		5.766 23 7.671 26 5.626 40	GHz GHz GHz	-47.33 c -47.50 c	IBm IBm						
3 N 4 N 5 N 6 N 7		f f f		5.766 23 7.671 26 5.626 40 5.212 40	GHz GHz GHz GHz	-47.33 c -47.50 c -47.53 c	IBm IBm IBm						
3 N 4 N 5 N 6 N 7 N 8 N		f f f f f		5.766 23 7.671 26 5.626 40 5.212 40 5.258 01	GHz GHz GHz GHz GHz	-47.33 c -47.50 c -47.53 c -47.53 c	IBm IBm IBm						
3 N 4 N 5 N 7 N 8		f f f f f f		5.766 23 7.671 26 5.626 40 5.212 40	GHz GHz GHz GHz GHz GHz	-47.33 c -47.50 c -47.53 c	IBM IBM IBM IBM						
		f f f f f f f		5.766 23 7.671 26 5.626 40 5.212 40 5.258 01 5.036 93	GHz GHz GHz GHz GHz GHz	-47.33 c -47.50 c -47.53 c -47.54 c -47.59 c	IBM IBM IBM IBM						
3 N 4 N 5 N 7 N 8 9		f f f f f f f		5.766 23 7.671 26 5.626 40 5.212 40 5.258 01 5.036 93	GHz GHz GHz GHz GHz GHz	-47.33 c -47.50 c -47.53 c -47.54 c -47.59 c	IBM IBM IBM IBM						



802.11g & 6 Mbps & 2412 MHz

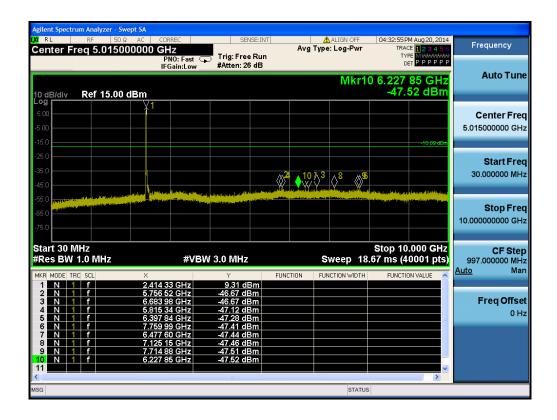


Reference

Low Band-edge



	rum Analyzer - S	Swept SA							
Center F	RF 50 req 15.004					ALIGN OFF	TRAC	M Aug 20, 2014 ^{3E} 1 2 3 4 5 6	Frequency
10 dB/div	Ref 15.00) dBm	PNO: Fast IFGain:Low				Mkr2 28	[™]	Auto Tune
Log 5.00 -5.00 -15.0								-10.09 dDm	Center Freq 15.004500 MHz
-25.0 -35.0 -45.0									Start Freq 9.000 kHz
-55.0 2	nadajidi kalen sentek beler beler	anch ^{the f} aithead the	Appl, en José Aleistern	literijeriske darpt nid _{err} e	tennestellitetilente	geledtine is eitheltereiten	the family of the species of the	haliylandara (mart	Stop Freq 30.000000 MHz
Start 9 kH #Res BW	100 kHz	×	#VI	BW 300 kHz	FUNCTION	Sweep 5.	.333 ms (4	0.00 MHz 0001 pts)	CF Step 2.999100 MHz <u>Auto</u> Man
1 N 1 1 N 1 2 N 1 3 4 1 5 6 6 7 8 9 10 11 11	f	2	187.9 kHz 187.9 kHz	-60.36 dB	m				Freq Offset 0 Hz
MSG						STATU	JS 🚺 DC Cou	ıpled	

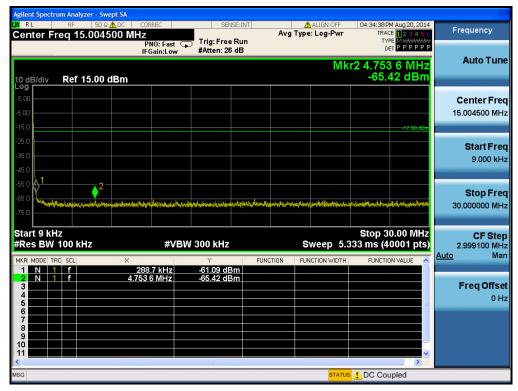




802.11g & 6 Mbps & 2437 MHz



Reference



Agilent Spectrum Analyzer - Swept	SA				
LXU RL RF 50Ω A	AC CORREC	SENSE:INT			
Center Freq 5.015000	000 GHz		Avg Type: Log-		Frequency
	PNO: Fast G	Trig: Free Run #Atten: 26 dB			
	IFGain:Low	#Atteh: 20 ab		,	Auto Tune
			M	kr10 7.797 63 GHz	Autorune
10 dB/div Ref 15.00 dB	5.7			-47.66 dBm	
	¥1				
5.00					Center Freq
-5.00					5.015000000 GHz
-15.0					
-25.0					Start Freq
-35.0			4 7 202		30.000000 MHz
-45.0			$\wedge^4 \wedge^{5'} \wedge^{5''} \wedge^{6''} \wedge$		30.00000 WH 12
	In the state of th	and the second	and the second sec	and the superscription is superscription of the superscription of	
-55.0	and the second	The second s		and a second	
-65.0					Stop Freq
					10.00000000 GHz
-75.0					
Start 30 MHz				Stop 10.000 GHz	CF Step
#Res BW 1.0 MHz	#VBV	W 3.0 MHz	Sweep) 18.67 ms (40001 pts)	997.000000 MHz
MKR MODE TRC SCL	X	Y	FUNCTION FUNCTION W	VIDTH FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f	2.437 26 GHz	10.79 dBm			
2 N 1 f	6.965 38 GHz	-46.29 dBm			F O #
3 N 1 f	7.193 45 GHz	-47.17 dBm			Freq Offset
4 N 1 f	6.028 45 GHz 6.558 85 GHz	-47.32 dBm -47.58 dBm			0 Hz
6 N 1 f	7.737 81 GHz	-47.62 dBm			
7 N 1 f	6.610 20 GHz	-47.63 dBm			
8 N 1 f	7.076 30 GHz	-47.65 dBm			
9 N 1 f 10 N 1 f	7.547 88 GHz	-47.66 dBm			
	7.797 63 GHz	-47.66 dBm		×	
<		ш		>	
MSG			5	STATUS	



802.11g & 6 Mbps & 2462 MHz



Reference

High Band-edge



Agilent Spectrum Analyzer - Swept SA					
🗶 RL RF 50Ω 🛕 DC	CORREC	SENSE:INT	ALIGN OFF	04:36:29 PM Aug 20, 2014	Frequency
Center Freq 15.004500 M	HZ PNO: Fast 😱	frig: Free Run	Avg Type: Log-Pwr	TRACE 123456 TYPE MWWWWW DET PPPPP	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	IFGain:Low	Atten: 26 dB		DET PPPPP	
			Mk	r2 7.877 9 MHz	Auto Tune
10 dB/div Ref 15.00 dBm				-65.15 dBm	
5.00					
					Center Freq
-5.00					15.004500 MHz
-15.0				-17.96 dDm	
-25.0					Start Freq
-35.0					9.000 kHz
-45.0					
-55.0 1	- 2				
-65.0					Stop Freq
-75.0	eren and an international second second	entrational states and the states	er and the states and the states of the stat	and an an and high parts private a straight of the	30.000000 MHz
-70,0					
Start 9 kHz		·		Stop 30.00 MHz	CF Step
#Res BW 100 kHz	#VBW 3	00 kHz	Sweep 5.3	333 ms (40001 pts)	2.999100 MHz
MKR MODE TRC SCL X			CTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
	303.7 kHz -	60.54 dBm 65.15 dBm			
2 N 1 f 7.	8// 9 WHZ ·	05.15 dBm			Freq Offset
4 5					0 Hz
6				=	
7 8					
9					
10					
<				>	
MSG			STATUS	DC Coupled	

RL RF 5	50 Ω AC CORREC	SENSE: IN	T ALIGN OFF	04:36:42 PM Aug 20, 2014	
enter Freq 5.015	5000000 GHz PNO: Fast IEGain:Lov		Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P	Frequency
0 dB/div Ref 15.0			Mkr1	0 7.731 33 GHz -47.83 dBm	Auto Tune
og 5.00 5.00 15.0	¥1			-17.96 dDm	Center Free 5.015000000 GH
25.0 36.0 45.0	2) Millin Localed a Marca -	Start Fre 30.000000 MH
55.0					Stop Fre 10.000000000 G⊦
tart 30 MHz Res BW 1.0 MHz	#\	/BW 3.0 MHz	Sweep 18	Stop 10.000 GHz .67 ms (40001 pts)	CF Ste 997.000000 MH
IKR MODE TRC SCL	× 2.460 44 GHz	ү 9.37 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
2 N 1 f 3 N 1 f 4 N 1 f 5 N 1 f	2.433 52 GHz 7.555 36 GHz 5.996 55 GHz 7.103 47 GHz	-40.26 dBm -46.74 dBm -47.46 dBm -47.62 dBm			Freq Offse 0 ⊦
6 N 1 f 7 N 1 f 8 N 1 f 9 N 1 f	6.343 75 GHz 7.254 01 GHz 6.730 84 GHz 5.795 65 GHz 7.731 33 GHz	-47.66 dBm -47.67 dBm -47.77 dBm -47.82 dBm -47.83 dBm			
		Hieo abiii		~	

	Analyzer - Sv						
enter Fre		2 AC CORREC 0000000 GHz PN0: Fas	SENSE:IN Trig: Free Rui	Avg	ALIGN OFF	04:36:51 PM Aug 20, 2014 TRACE 1 2 3 4 5 6 TYPE M	Frequency
10 dB/div	Ref 15.00	IFGain:Lo	#Atten: 26 dB		Mkr5 2	3.849 875 GHz -37.44 dBm	Auto Tun
5.00						-17.90 dDm	Center Fre 17.500000000 GH
-25.0	, str., M.J., manush				La, utaga a sul a particular de la constitución de la constitución de la constitución de la constitución de la		Start Fre 10.000000000 G⊦
55.0 65.0 75.0							Stop Fre 25.000000000 GH
Start 10.000 Res BW 1.		#\	/BW 3.0 MHz		Sweep 40	Stop 25.000 GHz .00 ms (40001 pts)	CF Ste 1.50000000 GF
KR MODE TRC	SCL f	× 24.998 125 GHz	۲ -35.00 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
2 N 1 3 N 1 4 N 1 5 N 1	f f f	24.922 000 GHz 24.663 625 GHz 24.225 250 GHz 23.849 875 GHz	-35.10 dBm -36.27 dBm -36.72 dBm -37.44 dBm				Freq Offs 0 H
6 7 8 9 10							
11			Ш			×	
SG					STATUS		

802.11n(HT20) & MCS 0 & 2412 MHz



Reference

Low Band-edge



Agilent Spectrum Analyzer - Swept SA					
🗶 RL RF 50 Ω 🧥 DC CORREC	SENSE:IN		🛕 ALIGN OFF	04:38:22 PM Aug 20, 2014	
Center Freq 15.004500 MHz	👝 Trig: Free Run		Type: Log-Pwr	TRACE 12345 (TYPE MUNAMAN	
PNO: Fast IEGain:Low	#Atten: 26 dB			DET PPPPF	
IFGaiii.Low	Fracen. 20 4B				Auto Tune
			MKC	2 13.603 9 MHz	
10 dB/div Ref 15.00 dBm				-65.26 dBm	
Log					
5.00					Center Freq
-5.00					15.004500 MHz
-15.0					
				-19.54 dBm	
-25.0					Start Freq
-35.0					9.000 kHz
-45.0					5.000 KHZ
1					
-55.0	2				Oton Eron
-65.0		for the state of the latter	te or e an tens technic techni	وماروا والمعارية المحالية وتفاريا ومناوية والمقار	Stop Freq
-75.0	and all states over the south that the		Cardwood and a state of the sta		30.000000 MHz
10.0					
Start 9 kHz				Stop 30.00 MHz	CF Step
	3W 300 kHz		Sweep 5.3	33 ms (40001 pts)	2.999100 MHz
					Auto Man
MKR MODE TRC SCL X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1 N 1 f 281.9 kHz 2 N 1 f 13.603 9 MHz	-60.06 dBm -65.26 dBm				
3					Freq Offset
4					- 0 Hz
5				3	
7					
8					
9					
11				~	
<				>	
MSG			STATUS	1 DC Coupled	

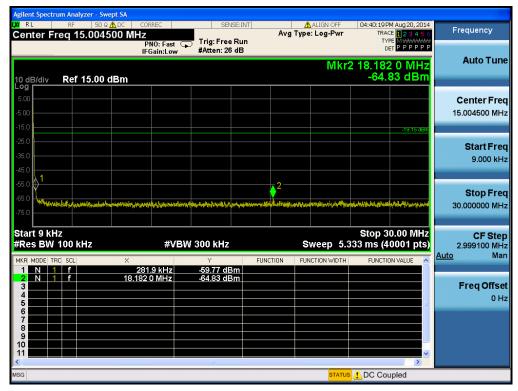
Agilent Spectrum Analyzer -						
Center Freg 5.015	0Ω AC CORREC	SENSE:IN		ALIGN OFF	04:38:35 PM Aug 20, 2014 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast C IFGain:Low	▶ Trig: Free Run #Atten: 26 dB		-	TYPE MWWWWW DET PPPPP	Auto Tune
10 dB/div Ref 15.0				Mkr1	0 7.720 86 GHz -47.88 dBm	Auto Tune
5.00						Center Freq 5.015000000 GHz
-15.0 -25.0 -35.0 -45.0			<u>\</u> \} \} \} \} \} \} \} \} \} \}	8 ₀ 79 ↓10	-19.54 dBm	Start Freq 30.000000 MHz
-55.0 -65.0 -75.0						Stop Freq 10.00000000 GHz
Start 30 MHz #Res BW 1.0 MHz		W 3.0 MHz			Stop 10.000 GHz .67 ms (40001 pts)	CF Step 997.000000 MHz Auto Man
MKR MODE TRC SCL	× 2.411 33 GHz	∀ 6.43 dBm	FUNCTION FL	JNCTION WIDTH	FUNCTION VALUE	
2 N 1 f 3 N 1 f 4 N 1 f 5 N 1 f	6.304 87 GHz 5.722 37 GHz 6.612 94 GHz 6.178 25 GHz	-47.54 dBm -47.61 dBm -47.69 dBm -47.71 dBm				Freq Offset 0 Hz
6 N 1 F 7 N 1 f 8 N 1 f 9 N 1 f 10 N 1 f	5.852 98 GHz 7.178 74 GHz 6.828 29 GHz 7.305 11 GHz 7.720 86 GHz	-47.72 dBm -47.76 dBm -47.77 dBm -47.80 dBm -47.88 dBm				
MSG				STATUS		

gilent Spectrum Analyzer					
enter Freq 17.5	50 Ω AC CORREC 000000000 GHz PNO: Fast IEGain:Low	Trig: Free Run #Atten: 26 dB	ALIGN OFF	04:38:44 PM Aug 20, 2014 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P P	Frequency
10 dB/div Ref 15	.00 dBm		Mkr5 2	3.599 375 GHz -38.64 dBm	Auto Tun
-og 5.00 					Center Fre 17.500000000 GH
25.0 35.0 45.0	erang and built of the first of	a a su a de la constante de la		-19.54 dBm	Start Fre 10.000000000 G⊦
55.0 65.0 75.0					Stop Fre 25.00000000 GF
Start 10.000 GHz Res BW 1.0 MHz	#VI	3W 3.0 MHz	Sweep 40	Stop 25.000 GHz .00 ms (40001 pts)	CF Ste 1.50000000 GH
IKR MODE TRC SCL	× 24.989 500 GHz	۲ -34.72 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Ma
2 N 1 f 3 N 1 f 4 N 1 f 5 N 1 f	24.493 000 GHz 23.950 000 GHz 24.149 875 GHz 23.599 375 GHz	-36.10 dBm -36.88 dBm -36.89 dBm -38.64 dBm			Freq Offs 0 F
6 7 8 9 10					
				>	
SG			STATUS		

802.11n(HT20) & MCS 0 & 2437 MHz



Reference



enter Freq 5.0150	00000 GHz PNO: Fast	SENSE:INT	Avg Type: Log-Pwr	04:40:32 PM Aug 20, 2014 TRACE 1 2 3 4 5 6 TYPE M	Frequency
0 dB/div Ref 15.00	IFGain:Low	#Atten: 26 dB	Mkr1	0 6.247 29 GHz -47.94 dBm	Auto Tune
5.00 15.00				-19.15 abin	Center Fre 5.015000000 GH
25.0 95.0 45.0		م می اور با می اور		inn Abely yn y befyd y y dref barre fedinafu y y dref	Start Fre 30.000000 M⊦
55.0 75.0			ferlim yo, wa ka ka su, u aki aki si Mitoura yo yo kabaya		Stop Fre 10.000000000 GH
tart 30 MHz Res BW 1.0 MHz	#VBI	N 3.0 MHz	Sweep 18	Stop 10.000 GHz .67 ms (40001 pts)	CF Ste 997.000000 MH Auto Ma
1 N 1 f 2 N 1 f 3 N 1 f 5 N 1 f 5 N 1 f 6 N 1 f 7 N 1 f 8 N 1 f 9 N 1 f 0 N 1 f 1	2.436 01 GHz 2.465 67 GHz 5.758 51 GHz 6.470 12 GHz 6.790 91 GHz 6.939 21 GHz 7.114 43 GHz 6.805 36 GHz 6.692 70 GHz 6.247 29 GHz	7,72 dBm 44,54 dBm 46,77 dBm 47,25 dBm 47,30 dBm 47,57 dBm 47,64 dBm 47,80 dBm 47,90 dBm 47,94 dBm			Freq Offs 0 F



802.11n(HT20) & MCS 0 & 2462 MHz

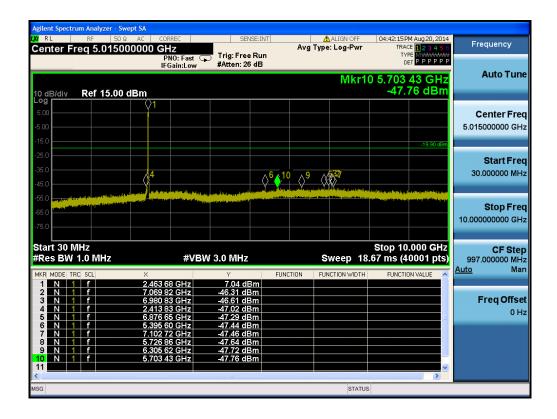


Reference

High Band-edge



Agilent Spectrum Analyzer						
KIRL RF		SENSE:II		ALIGN OFF	04:42:02 PM Aug 20, 2014 TRACE 1 2 3 4 5 (Frequency
Center Freq 15.0	PNO: Fast	🕞 Trig: Free Ru	n -	i ype. Log-Fwi		
	IFGain:Lov	#Atten: 26 dB			,	Auto Tune
				Mkr	2 16.294 9 MHz	Autorune
10 dB/div Ref 15. Log	.00 dBm				-64.68 dBm	
5.00						Center Freq
-5.00						15.004500 MHz
-15.0						10.004000 11112
-15.0					-19.90 dBm	
						Start Freq
-35.0						9.000 kHz
-45.0						
-55.0			∠ 2			Stop Freq
-65.0	a south the state of the second state of the second	terre in a terresting disconstances	المالا والمقال المحمد المشاوا وموالي	when the second s	ليبرشأ سيسطر ليستقو ستأساط سانين	30.000000 MHz
-75.0						00.000000 11112
Start 9 kHz					Stop 30.00 MHz	
#Res BW 100 kHz	#\	/BW 300 kHz		Sweep 5.3	333 ms (40001 pts)	CF Step 2.999100 MHz
MKR MODE TRC SCL	×	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto Man
1 N 1 f	283.4 kHz	-57.25 dBm	PONCTION	PONCTION WIDTH	FONCTION VALUE	
2 N 1 f	16.294 9 MHz	-64.68 dBm				Freq Offset
4						0 Hz
5					=	
7						
8						
10						
<					>	
MSG				STATUS	L DC Coupled	





8.5 Radiated Spurious Emissions

Test Requirements and limit,

§15.247(d), §15.205, §15.209 & RSS-210 [A8.5], RSS-Gen [7.2.2], RSS-Gen [7.2.5]

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) and (b), then the 15.209(a) limit in the table below has to be followed

- FCC Part 15.209(a) and (b)

Frequency (MHz)	Limit (uV/m)	Measurement Distance (meter)
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

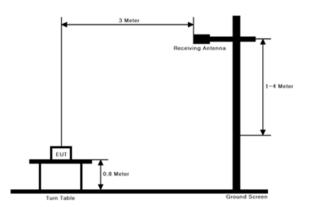
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	156.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	156.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	156.7 ~ 156.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900		
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240	3600 ~ 4400		
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

• FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

• FCC Part 15.205(b): The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a non-conductive table, which is 0.8 m above ground plane.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

6. Repeat above procedures until the measurements for all frequencies are complete.

Measurement Instrument Setting for Radiated Emission Measurements.

The radiated emission was tested according to the section 6.3 6.4, 6.5 and 6.6 of the ANSI C63.10-2009 with following settings.

Peak Measurement :

RBW = As specified in below table , VBW ≥ 3 x RBW, Sweep = Auto, Detector = Peak, Trace mode = Max Hold until the trace stabilizes.

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

Average Measurement :

1.RBW = 1 MHz (unless otherwise specified).

- 2. VBW \geq 3 x RBW.
- 3. Detector = RMS (Number of points $\geq 2 \times \text{Span} / \text{RBW}$)
- 4. Averaging type = power (i.e., RMS).
- 5. Sweep time = auto.
- 6. Perform a trace average of at least 100 traces.

7. A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:

1) If power averaging (RMS) mode was used in step 4, then the applicable correction factor is 10 log(1/x), where x is the duty cycle.

2) If linear voltage averaging mode was used in step 4, then the applicable correction factor is 20 log(1/x), where x is the duty cycle.

3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

Duty Cycle Corrections (Refer to appendix II for duty cycle measurement procedure and plots)

Band	Duty Cycle(%)	T _{on} (ms)	T _{on} + T _{off} (ms)	DCF = 10log(1/Duty) (dB)
802.11b	99.04	12.390	12.510	0.04
802.11g	95.38	2.065	2.165	0.21
802.11n(HT20)	95.05	1.920	2.020	0.22
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

9 KHz ~ 25 GHz Data(802.11b & 1 Mbps)

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.17	Н	Y	PK	49.47	0.64	N/A	N/A	50.11	74.00	23.89
2389.21	Н	Y	AV	40.77	0.64	N/A	N/A	41.41	54.00	12.59
4823.92	Н	Z	PK	50.04	5.93	N/A	N/A	55.97	74.00	18.03
4824.02	Н	Z	AV	44.92	5.93	N/A	N/A	50.85	54.00	3.15
-	-	-	-	-		-	-		-	-
-	-	-	-	-		-	-		-	-

Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.08	Н	Z	PK	46.54	6.09	N/A	N/A	52.63	74.00	21.37
4873.96	Н	Z	AV	43.48	6.09	N/A	N/A	49.57	54.00	4.43
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2485.23	Н	Y	PK	48.67	1.11	N/A	N/A	49.78	74.00	24.22
2484.26	Н	Y	AV	39.07	1.11	N/A	N/A	40.18	54.00	13.82
4924.21	Н	Z	PK	48.11	6.39	N/A	N/A	54.50	74.00	19.50
4924.10	Н	Z	AV	41.79	6.39	N/A	N/A	48.18	54.00	5.82
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

- 1. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz. So Distance Correction Factor :- 9.54dB = 20*log(1m/3m)
- 2. No other spurious and harmonic emissions were found greater than listed emissions on above table.
- 3. Above listed point data is the worst case data.

4. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F+ DCF + Distance Factor / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCF = Duty Cycle Correction Factor.

9 KHz ~ 25 GHz Data(802.11g & 6 Mbps)

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.21	Н	Y	PK	64.35	0.64	N/A	N/A	64.99	74.00	9.01
2389.88	Н	Y	AV	49.52	0.64	0.21	N/A	50.37	54.00	3.63
4829.30	Н	Z	PK	52.86	5.93	N/A	N/A	58.79	74.00	15.21
4826.30	Н	Z	AV	41.36	5.93	0.21	N/A	47.50	54.00	6.50
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4873.06	Н	Z	PK	48.25	6.09	N/A	N/A	54.34	74.00	19.66
4874.30	Н	Z	AV	37.41	6.09	0.21	N/A	43.71	54.00	10.29
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.61	Н	Y	PK	63.56	1.11	N/A	N/A	64.67	74.00	9.33
2483.54	Н	Y	AV	47.28	1.11	0.21	N/A	48.60	54.00	5.40
4925.72	Н	Z	PK	45.27	6.39	N/A	N/A	51.66	74.00	22.34
4924.00	Н	Z	AV	35.91	6.39	0.21	N/A	42.51	54.00	11.49
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

- 1. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz. So Distance Correction Factor :- 9.54dB = 20*log(1m/3m)
- 2. No other spurious and harmonic emissions were found greater than listed emissions on above table.
- 3. Above listed point data is the worst case data.
- 4. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F+ DCF + Distance Factor / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCF = Duty Cycle Correction Factor.

9 KHz ~ 25 GHz Data(802.11n HT20 & MCS 0)

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.75	Н	Y	PK	60.42	0.64	N/A	N/A	61.06	74.00	12.94
2389.84	Н	Y	AV	45.70	0.64	0.22	N/A	46.56	54.00	7.44
4823.66	Н	Z	PK	47.94	5.93	N/A	N/A	53.87	74.00	20.13
4824.22	Н	Z	AV	37.64	5.93	0.22	N/A	43.79	54.00	10.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)			Margin (dB)
4874.74	Н	Z	PK	45.91	6.09	N/A	N/A	52.00	74.00	22.00
4874.16	Н	Z	AV	35.85	6.09	0.22	N/A	42.16	54.00	11.84
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.91	V	Y	PK	59.55	1.11	N/A	N/A	60.66	74.00	13.34
2483.50	V	Y	AV	45.49	1.11	0.22	N/A	46.82	54.00	7.18
4924.10	Н	Z	PK	44.68	6.39	N/A	N/A	51.07	74.00	22.93
4924.16	Н	Z	AV	35.44	6.39	0.22	N/A	42.05	54.00	11.95
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

- 1. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz. So Distance Correction Factor :- 9.54dB = 20*log(1m/3m)
- 2. No other spurious and harmonic emissions were found greater than listed emissions on above table.
- 3. Above listed point data is the worst case data.
- 4. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F+ DCF + Distance Factor / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCF = Duty Cycle Correction Factor.

8.6 Power-line Conducted Emissions

Test Requirements and limit, §15.207& RSS-Gen [7.2.4]

For an intentional radiator which 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 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

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

* Decreases with the logarithm of the frequency

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs for the actual connections between EUT and support equipment.

Test Mode

The all modes of EUT operation were investigated and the worst case mode was reported.

TEST PROCEDURE

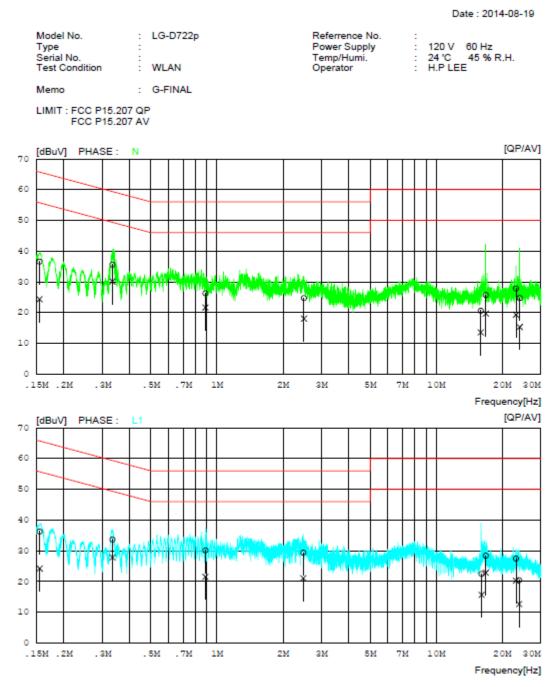
- 1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
- 2. The EUT is connected via LISN to the test power supply.
- 3. The measurement results are obtained as described below:
- 4. Detectors Quasi Peak and Average Detector.

RESULT PLOTS

AC Line Conducted Emissions (Graph)

Test Mode: 802.11g & 6 Mbps & 2437 MHz

Results of Conducted Emission



AC Line Conducted Emissions (List)

Test Mode: 802.11g & 6 Mbps & 2437 MHz

Results of Conducted Emission

Date : 2014-08-19

Type Seria	el No. al No. Condition	-	LG-D72 WLAN	2р		P	eferrence ower Sup emp/Hum perator	oply	: 24		0 Hz 5 % R.H.	
Mem	0	:	G-FINA	L								
LIMI	T : FCC P15 FCC P15											
NC	FREQ	READ		C.FACTOR	REST		LIM			GIN	PHASE	
	[MHz]	QP	AV	C-18-1	QP [dBuV]	AV	QP [dBuV]	AV	QP	AV		
	[MNS]	[dbuv]	[dBuV]	[dB]	[abuv]	[abuv]	[dbuv]	[abuv]	[dBuV]	[abuv]		
1	0.15507	26.7	14.5	9.9	36.6	24.4	65.7	55.7	29.1	31.3	N	
2	0.33356	25.7	20.2	9.9	35.6	30.1	59.4	49.4	23.8	19.3	N	
3	0.88573	16.4	11.7	9.9	26.3	21.6	56.0	46.0	29.7	24.4	N	
4	2.49200		8.0	10.0		18.0	56.0	46.0	31.3	28.0	N	
5	15.97660		3.3	10.3	20.6	13.6	60.0	50.0	39.4	36.4	N	
6	16.84020		9.4	10.3		19.7	60.0	50.0	34.3	30.3	N	
7	23.12840		8.7	10.6	27.8	19.3	60.0	50.0	32.2	30.7	N	
8	24.04320		4.7	10.6	24.8	15.3	60.0	50.0	35.2	34.7	N	
9	0.15524		14.3	9.9	36.2	24.2	65.7	55.7	29.5	31.5	Ll	
10	0.33373		17.9	9.9	33.7	27.8	59.4	49.4	25.7	21.6	Ll	
11	0.88562		11.6	9.9	30.1	21.5	56.0	46.0	25.9	24.5	Ll	
12	2.47600			10.0		21.0	56.0	46.0	26.6	25.0	Ll	
13	16.10740		5.4	10.3		15.7	60.0	50.0	37.6	34.3	L1	
14	16.83980		12.6	10.3	28.4	22.9	60.0	50.0	31.6	27.1	Ll	
15	23.12840		9.7	10.6	27.4		60.0	50.0	32.6	29.7	Ll	
16	23.89400	9.8	2.1	10.6	20.4	12.7	60.0	50.0	39.6	37.3	Ll	

8.7 Occupied Bandwidth

Test Requirements, RSS-Gen [4.6.1]

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99 % emission bandwidth, as calculated or measured.

TEST CONFIGURATION

Refer to the APPENDIX I.

TEST PROCEDURE

The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1 %. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual.

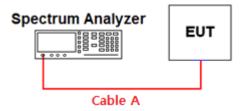
TEST RESULTS: NA

9. LIST OF TEST EQUIPMENT

Туре	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
MXA Signal Analyzer	Agilent	N9020A	14/03/28	15/03/28	MY50510026
Digital Multimeter	H.P	34401A	14/02/27	15/02/27	3146A13475
Dynamic Measurement DC Source	Agilent Technologies	66332A	13/09/24	14/09/24	MY43000211
Thermohygrometer	BODYCOM	BJ5478	14/03/03	15/03/03	1209
Vector Signal Generator	Rohde Schwarz	SMJ100A	14/01/07	15/01/07	100148
Signal Generator	Rohde Schwarz	SMF100A	14/07/01	15/07/01	102341
Attenuator(3dB)	SMAJK	SMAJK-2-3	13/10/22	14/10/22	3
High-pass filter	Wainwright	WHKX3.0	14/09/11	15/09/11	9
LOOP Antenna	Schwarzbeck	FMZB1513	12/09/24	14/09/24	1513-128
BILOG ANTENNA	SCHAFFNER	CBL6112B	12/11/06	14/11/06	2737
Horn Antenna	ETS-LINDGREN	3117	14/05/12	16/05/12	00140394
HORN ANT	A.H.Systems	SAS-574	13/03/20	15/03/20	154
Amplifier (22dB)	H.P	8447E	14/01/07	15/01/07	2945A02865
Amplifier (30dB)	Agilent	8449B	14/02/27	15/02/27	3008A00370
EMI TEST RECEIVER	R&S	ESU	14/01/07	15/01/07	100014
EMI TEST RECEIVER	R&S	ESCI	14/02/27	15/02/27	100910
CVCF	EM TEST	NETWAVE 60-400	14/05/26	15/05/26	P1311115470
LISN	SCHWARZBECK	NNLK8121	14/08/18	15/08/18	NNLK8121-580
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2496A/ MA2411B	13/10/29	14/10/29	1338004 / 1306053

APPENDIX I Conducted Test set up Diagram &Path loss Information

Conducted Measurement



Path loss information

Frequency (GHz)	Path Loss (dB)	Frequency (GHz)	Path Loss (dB)
0.03	0.32	15	5.17
1	1.45	20	5.79
2412 & 2441 & 2462	2.1	25	7.94
5	2.88	-	-
10	3.95	-	-

Note. 1: The path loss from EUT to Spectrum analyzer was measured and used for test. Path loss (=S/A's offset value) = Cable A (Attenuator, Applied only when it was used externally)

APPENDIX II Duty cycle plots

TEST PROCEDURE

Duty Cycle measured using section 6.0 b) of KDB558074 v03r02 :

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

Set the center frequency of the instrument to the center frequency of the transmission. Set RBW \geq OBW if possible; otherwise, set RBW to the largest available value. Set VBW \geq RBW. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T \leq 16.7 microseconds.)

Duty Cycle Corrections factor

Mode	Duty Cycle(%)	T _{on} (ms)	T _{on} + T _{off} (ms)	DCF = 10log(1/Duty) (dB)
802.11b	99.04	12.390	12.510	0.04
802.11g	95.38	2.065	2.165	0.21
802.11n(HT20)	95.05	1.920	2.020	0.22
-	-	-	-	-
-	-	-	-	-

Measurement set-up of RBW

Mode	50/T	RBW (≤VBW)
802.11b	4.036 kHz	8 MHz
802.11g	24.213 kHz	8 MHz
802.11n(HT20)	26.042 kHz	8 MHz
-	-	-
-	-	-

Test Plots :

lent Spectrum Analyzer - Swept SA Frequency Avg Type: Log-Pwr RACE Trig: Free Run Atten: 40 dB PNO: Fast IFGain:Low Auto Tune ΔMkr3 12.51 ms 1.74 dE Ref 30.00 dBm ▲3∆4 **Center Freq** Xa 2.437000000 GHz Start Freq 2.437000000 GHz Stop Freq 2.437000000 GHz Center 2.437000000 GHz Res BW 8 MHz Span 0 Hz Sweep 30.00 ms (1001 pts) CF Step 8.000000 MHz #VBW 8.0 MHz <u>Auto</u> Man FUNCTION FUNCTION WIDTH 12.39 ms (Δ) 4.220 ms 12.51 ms (Δ) 4.220 ms 1 t (Δ) 1 t (Δ) 1 t (Δ) 1 t (Δ) 0.05 dB <u>16.92 dBm</u> 1.74 dB 16.92 dBm Freq Offset 0 Hz STATUS

Duty Cycle

Duty Cycle

Test Mode: 802.11b & 1 Mbps & 2437 MHz

Test Mode: 802.11g & 6 Mbps & 2437 MHz

Agilent Spectrum Analyzer - Swept SA					
🗶 RL RF 50 Q AC	CORREC PNO: Fast ↔→ IEGain:Low	SENSE:INT Trig: Free Run Atten: 40 dB	ALIGN AUTO Avg Type: Log-Pwr	02:35:34 PM Aug 29, 2014 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P P P P P P	Frequency
10 dB/div Ref 30.00 dBm	IFGain:Low	Atten: 40 dB	Δ	Mkr3 2.165 ms -0.21 dB	Auto Tune
200 100 0.00	duyletradyltiteray	่⊳บ•+¥มใ-4+¥¥ส.]พ¥น มา	∆4 ∿ntflauhannuhlitttflauhthrumuh	Manufleeten Uritari	Center Freq 2.437000000 GHz
-10.0 -20.0 -30.0					Start Fred 2.437000000 GH:
-40.0					Stop Free 2.437000000 GH:
Center 2.437000000 GHz Res BW 8 MHz	#VBW	8.0 MHz	-	Span 0 Hz .000 ms (1001 pts)	CF Step 8.000000 MH: Auto Mar
MKR MODE TRC SCL X	2.065 ms (∆)	2.86 dB	UNCTION FUNCTION WIDTH	FUNCTION VALUE	
2 F 1 t 3 Δ4 1 t (Δ) 4 F 1 t 5	565.0 μs 2.165 ms (Δ) 565.0 μs	15.17 dBm -0.21 dB 15.17 dBm			Freq Offset 0 Hz
6 7 8 9					
10 11 <				×	
MSG			STATUS		

Duty Cycle

Test Mode: 802.11n & MCS 0 & 2437 MHz

Agilent Spectrum Analyzer - Swept SA	
μ RF 50 Ω AC CORREC SENSE:INT ALIGN AUTO 02:40:13 PM Aug 29, 2014 Avg Type: Log-Pwr TRACE 12:3:4:5:6	Frequency
PN0: Fast +	
ΔMkr3 2.020 ms 10 dB/div Ref 30.00 dBm -0.60 dB	Auto Tune
$\frac{200}{100}$ $\frac{1}{000}$	Center Freq 2.437000000 GHz
	Start Freq 2.437000000 GHz
-40.0 -50.0 -60.0	Stop Freq 2.437000000 GHz
Center 2.437000000 GHz Span 0 Hz Res BW 8 MHz #VBW 8.0 MHz Sweep 5.000 ms (1001 pts)	CF Step 8.000000 MHz
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE Δ 1 Δ2 1 t (Δ) 1.920 ms (Δ) -0.26 dB 4<	<u>Auto</u> Man
2 F 1 t 2.535 ms 13.54 dBm 3 Δ4 1 t Δ2.020 ms (Δ) 0.60 dB 4 F 1 t 2.535 ms 13.54 dBm 5 13.54 dBm	Freq Offset 0 Hz
6 7 8 9 10 11	
MSG STATUS	