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FCC RADIO TEST REPORT

Applicant's company	**PEGATRON CORPORATION**
Applicant Address	5F., NO. 76, LIGONG ST., BEITOU DISTRICT, TAIPEI CITY 112 Taiwan
FCC ID	**VUIDPC3941**
Manufacturer's company	**MAINTEK COMPUTER**
Manufacturer Address	233 Jinfeng Rd., Suzhou, Jiangsu, PRC

Product Name	Wireless Residential Voice Gateway
Brand Name	technicolor
Model No.	DPC3941T , DPC3941 , DPC3941XXXX (X can be 0-9, A-Z, a-z or blank)
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	Nov. 19, 2015
Final Test Date	Apr. 28, 2016
Submission Type	Class II Change

Statement

Test result included in this report is for the IEEE 802.11n and IEEE 802.11b/g of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart C**, **KDB558074 D01 v03r05** and **KDB 662911 D01 v02r01**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3D1632-04AA	Rev. 01	Initial issue of report	May 12, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	Wireless Residential Voice Gateway
Brand Name	:	technicolor
Model No.	:	DPC3941T , DPC3941 , DPC3941XXXX (X can be 0-9, A-Z, a-z or blank)
Applicant	:	PEGATRON CORPORATION
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Nov. 19, 2015 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.247(b)(3)	Maximum Conducted Output Power	Complies	5.38 dB
4.2	15.247(e)	Power Spectral Density	Complies	7.00 dB
4.3	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.4	15.247(d)	Radiated Emissions	Complies	0.54 dB
4.5	15.247(d)	Band Edge Emissions	Complies	0.03 dB
4.6	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	Internal power supply
Modulation	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n: see the below table
Data Modulation	IEEE 802.11b: DSSS (BPSK / QPSK / CCK) IEEE 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	IEEE 802.11b: DSSS (1/ 2/ 5.5/11) IEEE 802.11g: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n: see the below table
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11 for 20MHz bandwidth ; 7 for 40MHz bandwidth
Channel Band Width (99%)	IEEE 802.11b: 14.00 MHz IEEE 802.11g: 16.56 MHz IEEE 802.11n MCS0 (HT20): 18.08 MHz IEEE 802.11n MCS0 (HT40): 36.64 MHz
Maximum Conducted Output Power	IEEE 802.11b: 24.62 dBm IEEE 802.11g: 26.68 dBm IEEE 802.11n MCS0 (HT20): 26.65 dBm IEEE 802.11n MCS0 (HT40): 21.45 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☐ With beamforming	☒ Without beamforming

Antenna and Band width

Antenna	Three (TX)	
Band width Mode	20 MHz	40 MHz
IEEE 802.11b	V	X
IEEE 802.11g	V	X
IEEE 802.11n	V	V

IEEE 11n Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	3	MCS 0-23
802.11n (HT40)	3	MCS 0-23
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT supports HT20 and HT40. Note 2: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n		

3.2. Accessories

Power line*1, Non-shielded, 2m

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	P/N	Antenna Type	Connector	Gain (dBi)	
						2.4GHz	5GHz
1	Wanshih	WPB263	UC3WF10087	PCB Antenna	I-PEX	2.03	-
2	Wanshih	WPB265	UC3WF10089	PCB Antenna	I-PEX	1.73	-
3	Wanshih	WPB264	UC3WF10088	PCB Antenna	I-PEX	2.11	-
4	ACON	Cisco_DPC_3941	APP6P-701222	PCB Antenna	I-PEX	-	1.95
5	ACON	Cisco_DPC_3941	APP6P-701221	PCB Antenna	I-PEX	-	1.34
6	ACON	Cisco_DPC_3941	APP6P-701220	PCB Antenna	I-PEX		2.03

Note: The EUT has six antennas.

For 2.4GHz function:

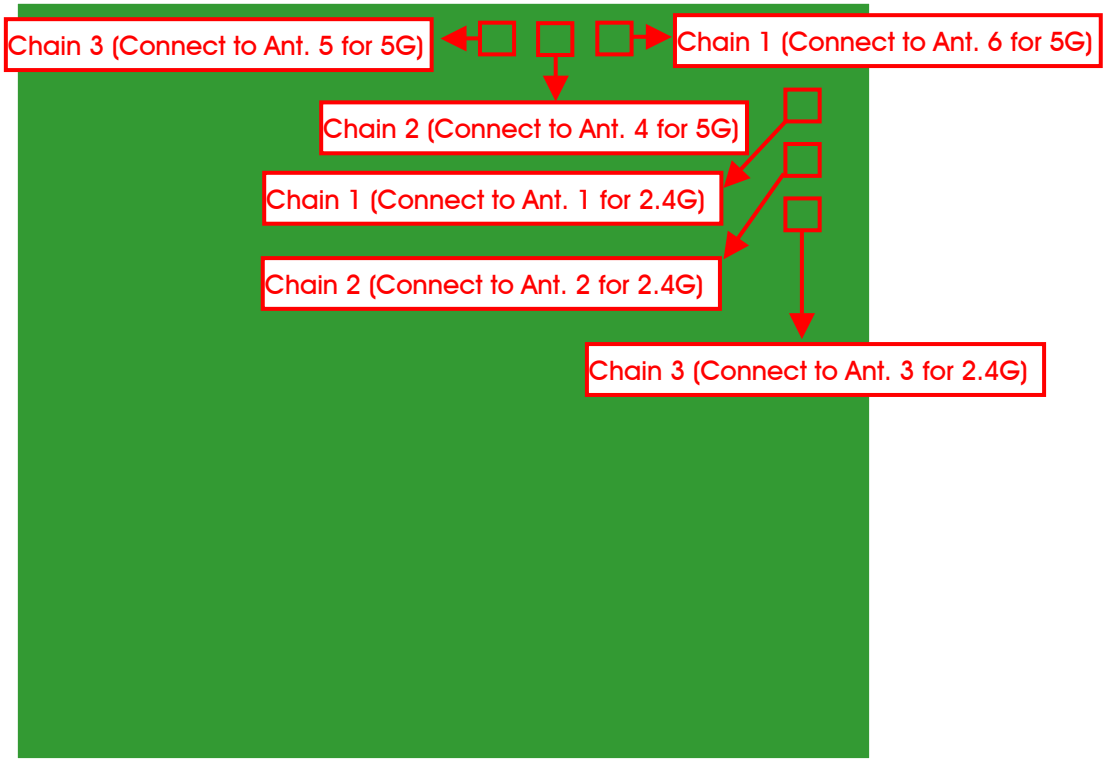
For IEEE 802.11b/g/n mode:

Chain 1, Chain 2 and Chain 3 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n/ac mode (3TX/3RX):

Chain 1, Chain 2 and Chain 3 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are two bandwidth systems.

For 20MHz bandwidth systems, use Channel 1~Channel 11.

For 40MHz bandwidth systems, use Channel 3~Channel 9.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz	-	-

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Chain
Maximum Conducted Output Power	11b/CCK	1 Mbps	6/11	1+2+3
Power Spectral Density	11b/CCK	1 Mbps	6/11	1+2+3
6dB Spectrum Bandwidth	11b/CCK	1 Mbps	6/11	1+2+3
Radiated Emissions 9kHz~1GHz	CTX	-	-	-
Radiated Emissions 1GHz~10th Harmonic	11b/CCK	1 Mbps	1/6/11	1+2+3
	11g/BPSK	6 Mbps	1/6/11	1+2+3
	11n HT20	MCS0	1/6/11	1+2+3
	11n HT40	MCS0	3/6/9	1+2+3
Band Edge Emissions	11b/CCK	1 Mbps	1/6/11	1+2+3
	11g/BPSK	6 Mbps	1/6/11	1+2+3
	11n HT20	MCS0	1/6/11	1+2+3
	11n HT40	MCS0	3/6/9	1+2+3

The following test modes were performed for all tests:

For Radiated Emission test (Below 1GHz):

Mode 1. EUT Yaxis 2.4G WLAN Function- CTX

Mode 2. EUT Yaxis 5G WLAN Function- CTX

Mode 1 is the worst case, so it was selected to record in this test report.

For Radiated Emission test (Above 1GHz):

Mode 1. EUT Yaxis - CTX

For Co-location MPE and Radiated Emission Co-location Test:

The EUT could be applied with 2.4GHz WLAN function, 5GHz WLAN function and DECT; therefore Co-location Maximum Permissible Exposure (Please refer to FA3D1632-04) and Radiated Emission Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz WLAN function, 5GHz WLAN function and DECT.

3.6. Table for Testing Locations

Test Site Location				
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.			
TEL:	886-3-656-9065			
FAX:	886-3-656-9085			
Test Site No.	**Site Category**	**Location**	**FCC Reg. No.**	**IC File No.**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D
TH01-CB	OVEN Room	Hsin Chu	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC).

3.7. Table for Multiple Listing

The EUT has three model names, which are identical to each other in all aspects except for the following table:

Model Name	Information of Tuner Chip	Remark
DPC3941	1. Mxl267, Upstream channels (24 x 8) 2. Mxl267D, Upstream channels (24 x 8)	Original
DPC3941T	1. Mxl267, Upstream channels (24 x 8) 2. Mxl267D, Upstream channels (24 x 8)	Original
DCP3941XXXX (X can be 0-9, A-Z, a-z or blank)	1. Mxl267, Upstream channels (24 x 8) 2. Mxl267D, Upstream channels (24 x 8)	New

Note:

1. The different model name of the tuner chip serves as marketing strategy
2. According to above, there is only model: DPC3941T were selected to test and record in the report as a result.

3.8. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR3D1632-01AA

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Adding a new tuner chip Mxl267D which is identical to the original tuner chip Mxl267. 2. Removing 3 antennas: (1. Brand: Wanshih, Model Name: WPB266; 2. Brand: Wanshih, Model Name: WPB268; 3. Brand: Wanshih, Model Name: WPB267). 3. Removing the tuner chip Mxl265 4. Changing the Brand name. 5. Adding a new model number DPC3941XXXX (X can be 0-9, A-Z, a-z or blank).	After evaluating, it is not necessary to re-test.
6. Changing the antenna location for tuner chip Mxl267.	Maximum Conducted Output Power Power Spectral Density. 6dB Spectrum Bandwidth. Radiated Emissions. Band Edge Emissions.
7. Changing 2.4GHz PA from P/N: SE2605L to P/N: SE2605L-RN due to changing of manufacturing process.	After evaluating, the worst case is found at 802.1111g (2437 MHz) and 802.11n HT40 (2437 MHz), and retest this channel only. The test item as below Radiated Emissions(Above 1GHz). Band Edge Emissions.

Note1: The above test items will be based on original output power to re-test.

Note2: For item 6 Configuration IEEE 802.11b Channel 6, 11 power reduced due to limitation of Band Edge Emissions, so the Maximum Conducted Output Power Measurement、Power Spectral Density Measurement and 6dB Spectrum Bandwidth Measurement were retested.

Note3: For item 7 the above test items will be based on original output maximum power to re-test.

3.9. Table for Supporting Units

For Test Site No: 03CH01-CB and TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC

3.10. Table for Parameters of Test Software Setting

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test Software Version	ART2-GUI 2.3					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11b	19.5	20	17	-	-	-
802.11g	15.5	23	18	-	-	-
802.11n MCS0 HT20	15	23	17.5	-	-	-
802.11n MCS0 HT40	-	-	-	12.5	16.5	14

3.11. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.12. Maximum Conducted Output Power for original report

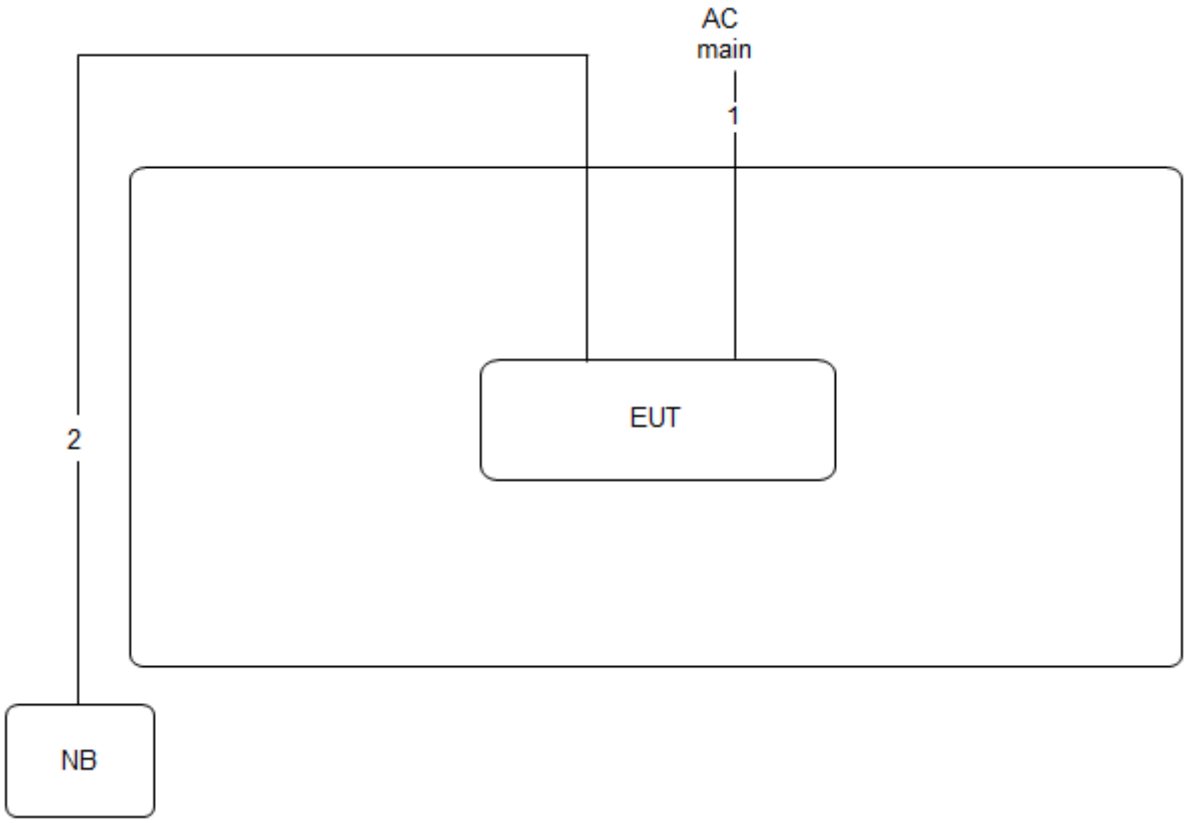
Mode	Channel	Frequency	Conducted Power (dBm)			
			Chain 1	Chain 2	Chain 3	Total
802.11b	1	2412 MHz	19.02	19.82	18.21	23.84
	6	2437 MHz	21.86	22.17	21.04	26.49
	11	2462 MHz	21.37	22.18	20.34	26.13
802.11g	1	2412 MHz	15.08	16.45	15.24	20.41
	6	2437 MHz	21.86	22.63	21.11	26.68
	11	2462 MHz	18.11	16.78	16.72	22.02
802.11n MCS0 HT20	1	2412 MHz	14.43	15.86	14.39	19.72
	6	2437 MHz	21.93	22.52	21.08	26.65
	11	2462 MHz	17.36	17.55	16.55	21.95
802.11n MCS0 HT40	3	2422 MHz	12.58	13.52	12.94	17.80
	6	2437 MHz	16.26	17.58	16.03	21.45
	9	2452 MHz	13.63	14.02	12.91	18.32

3.13. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11b	1.000	1.000	100.00%	0.00	0.01
802.11g	2.020	2.070	97.58%	0.11	0.50
802.11n MCS0 HT20	1.880	1.940	96.91%	0.14	0.53
802.11n MCS0 HT40	0.888	0.924	96.10%	0.17	1.13

3.14. Test Configurations

3.14.1. Radiation Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	2m
2	RJ-45 cable	No	10m

4. TEST RESULT

4.1. Maximum Conducted Output Power Measurement

4.1.1. Limit

The limit for output power is 30dBm.

4.1.2. Measuring Instruments and Setting

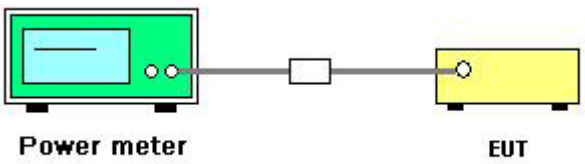
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	Average

4.1.3. Test Procedures

1. Test procedures refer KDB558074 D01 v03r05 section 9.2.3.2 Measurement using a power meter (PM).
2. Multiple antenna systems was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

4.1.4. Test Setup Layout



4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Test Result of Maximum Conducted Output Power

Temperature	25°C	Humidity	45%
Test Engineer	Lucas Huang	Test Date	Dec. 04, 2015

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11b	2437 MHz	20.11	19.36	20.05	24.62	30.00	Complies
	2462 MHz	17.31	17.65	17.68	22.32	30.00	Complies

4.2. Power Spectral Density Measurement

4.2.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

4.2.2. Measuring Instruments and Setting

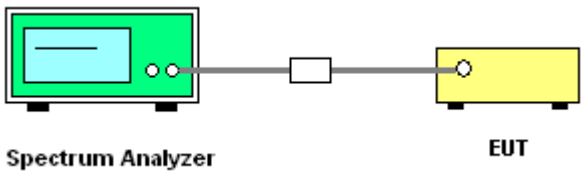
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RBW	3 kHz ≤ RBW ≤ 100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.2.3. Test Procedures

1. Test was performed in accordance with KDB558074 D01 v03r05 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 10.2 Method PKPSD (peak PSD) and KDB 662911 D01 v02r01 section In-Band Power Spectral Density (PSD) Measurements option (b) Measure and sum spectral maximal across the outputs.
2. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The resulting PSD level must be ≤ 8 dBm.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Power Spectral Density

Temperature	25°C	Humidity	45%
Test Engineer	Lucas Huang		

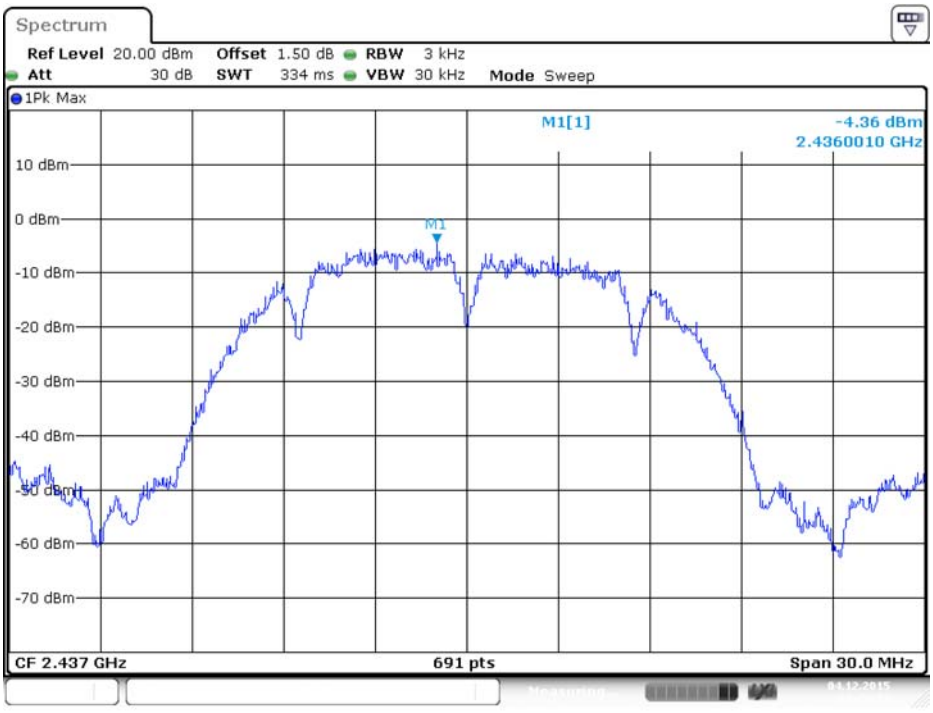
Mode	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11b	2437 MHz	-4.36	-4.45	-4.70	0.27	7.27	Complies
	2462 MHz	-12.39	-10.85	-6.41	-4.34	7.27	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ 6.73dBi, so limit=8(6.73-6)=7.27 dBm/3kHz.

Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

Power Density Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 1



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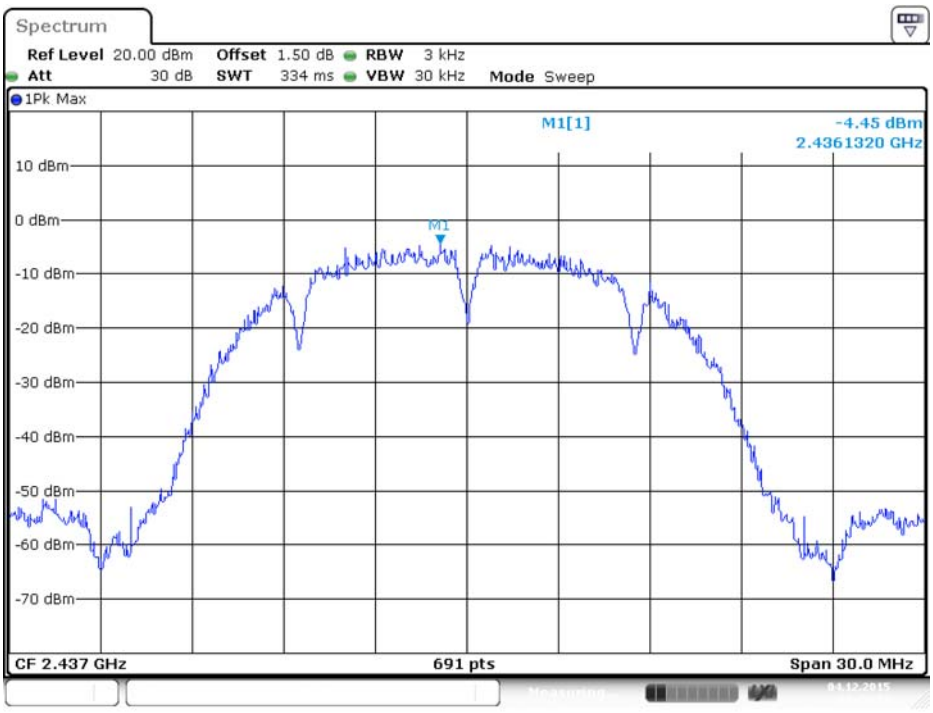
Power Density Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 2



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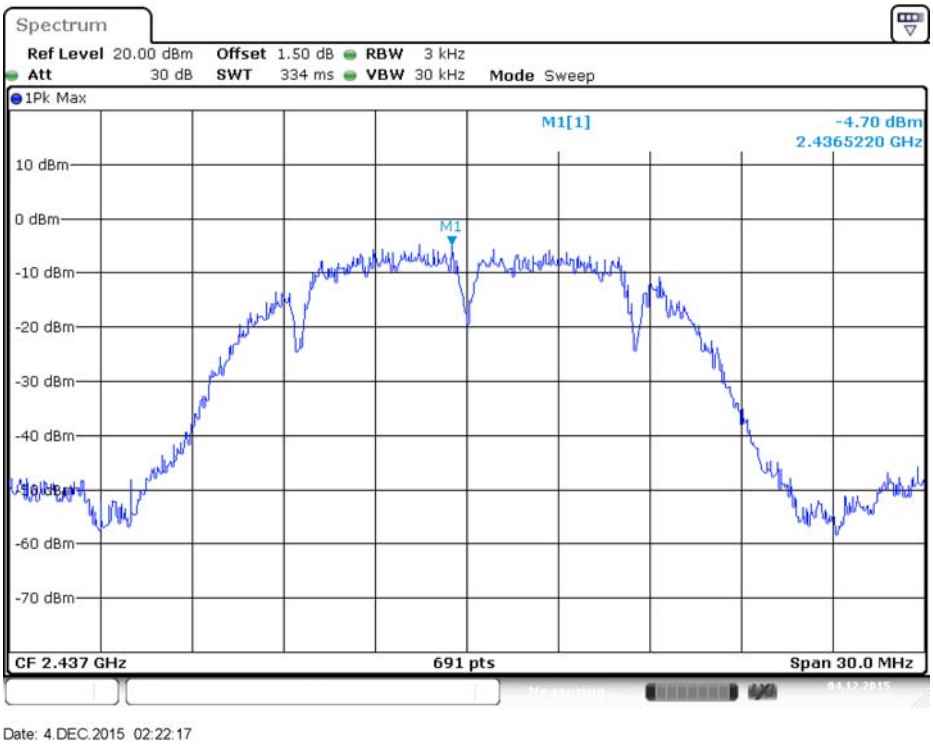
Power Density Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 3



4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

4.3.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

6dB Spectrum Bandwidth	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto
99% Occupied Bandwidth	
Spectrum Parameters	**Setting**
Span	1.5 times to 5.0 times the OBW
RBW	1 % to 5 % of the OBW
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB558074 D01 v03r05 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 8.0 DTS bandwidth=> 8.1 Option 1.
3. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.4.4.

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

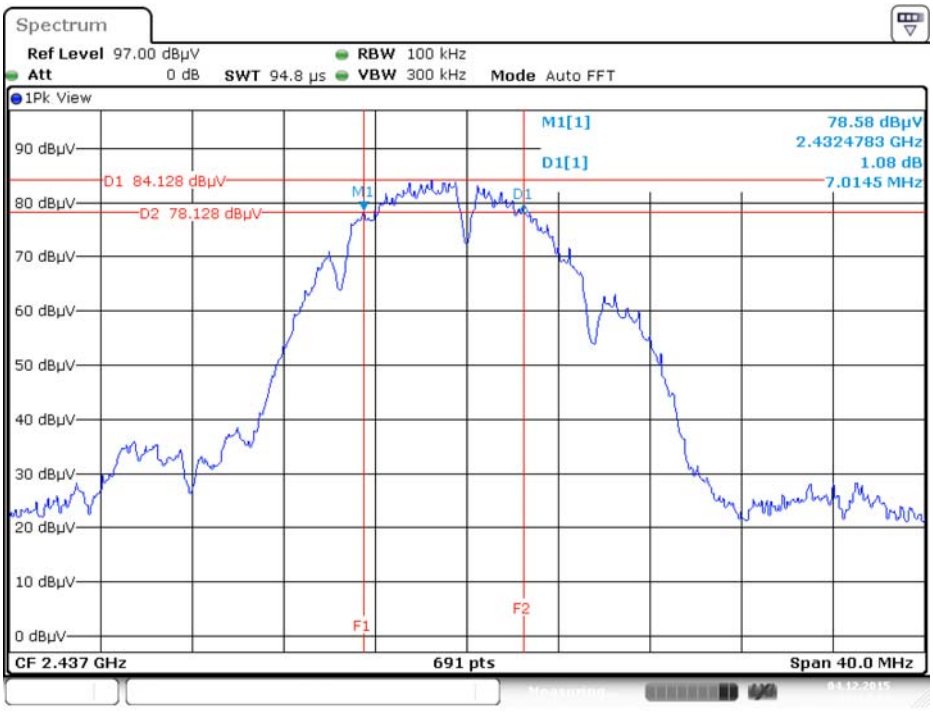
Temperature	25°C	Humidity	45%
Test Engineer	Lucas Huang		

Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11b	2437 MHz	7.01	13.63	500	Complies
	2462 MHz	10.55	13.72	500	Complies

Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 1 + Chain 2 + Chain 3



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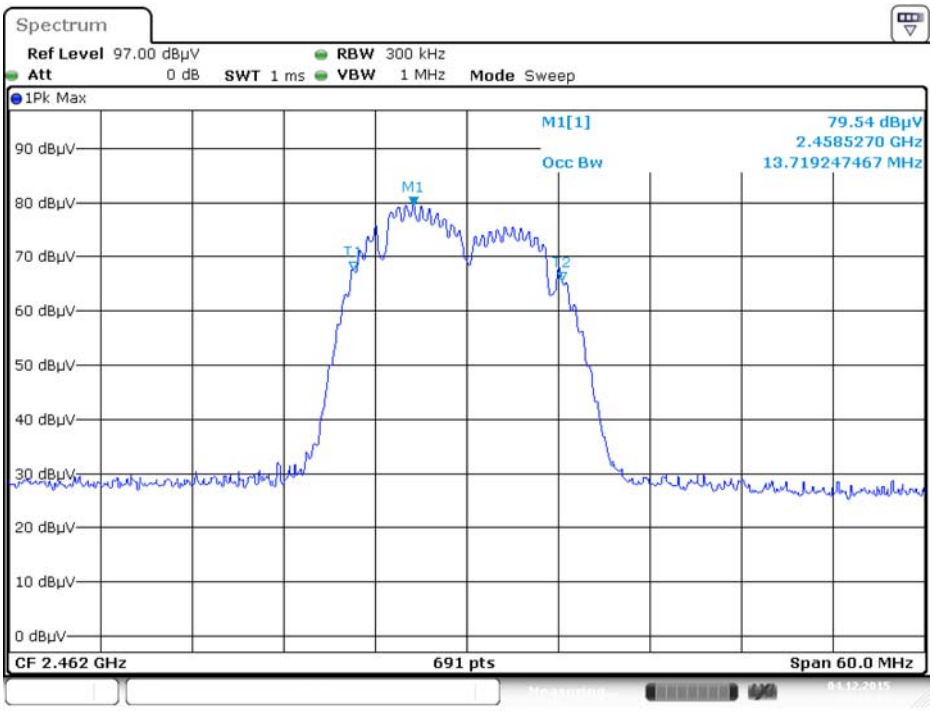
99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 1 + Chain 2 + Chain 3



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4.4. Radiated Emissions Measurement

4.4.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

4.4.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

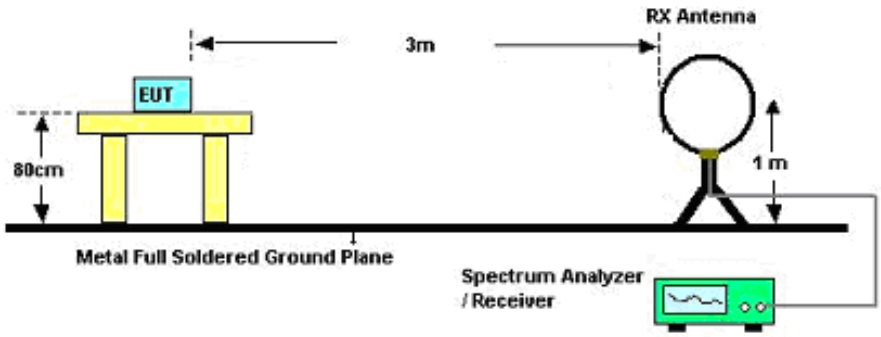
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.4.3. Test Procedures

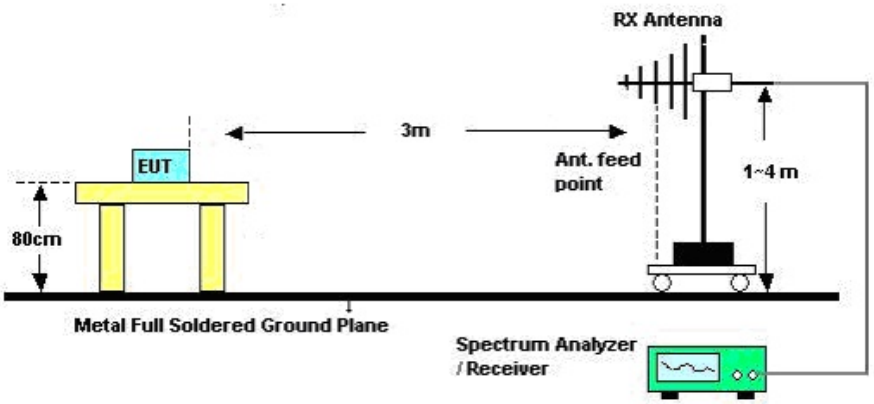
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.4.4. Test Setup Layout

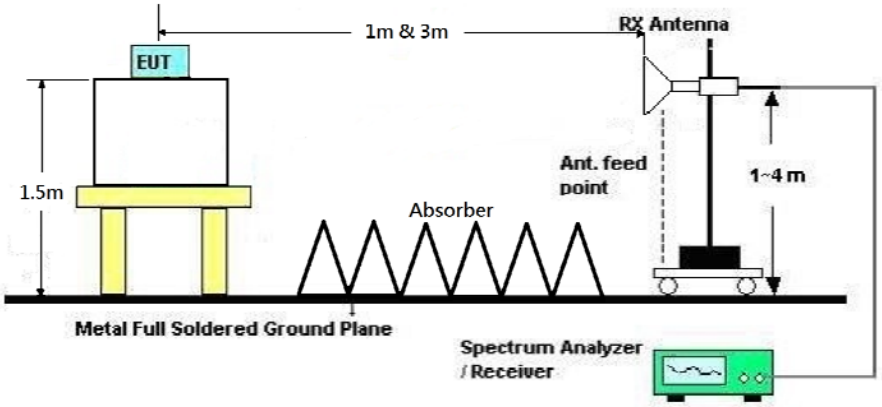
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Results of Radiated Emissions (9kHz~30MHz)

Re-tested for Changing the antenna location for tuner chip Mxl267.

Temperature	24℃	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	CTX
Test Date	Dec. 08, 2015		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

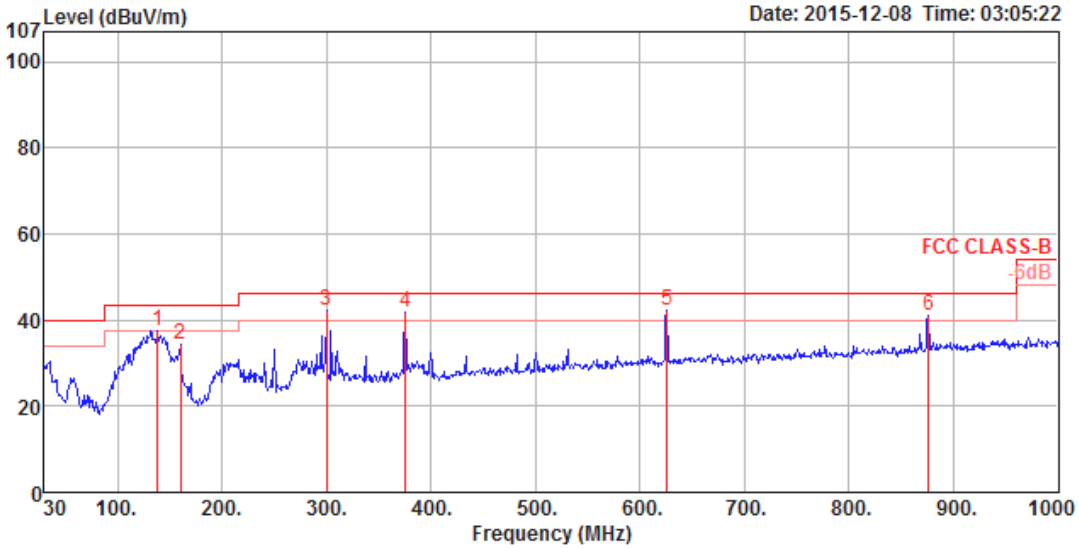
Limit line = specific limits (dBuV) + distance extrapolation factor.

4.4.8. Results of Radiated Emissions (30MHz~1GHz)

Re-test for changing the antenna location for tuner chip MxI267.

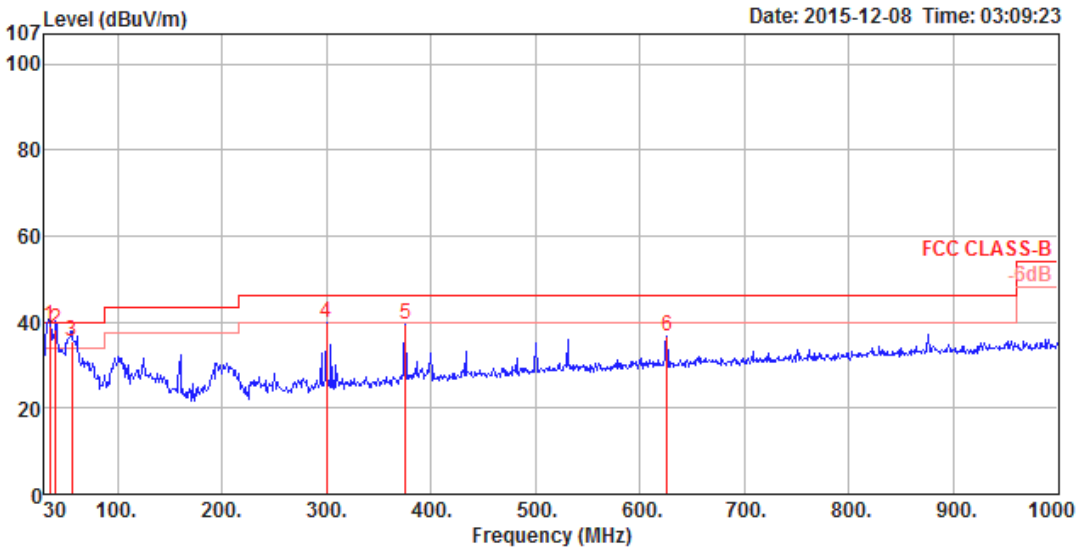
Temperature	24℃	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	CTX

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	138.64	37.47	43.50	-6.03	56.45	1.43	32.56	12.15	HORIZONTAL	121	200	Peak
2	159.98	34.31	43.50	-9.19	54.52	1.55	32.56	10.80	HORIZONTAL	254	150	Peak
3	299.66	42.34	46.00	-3.66	58.93	2.05	32.52	13.88	HORIZONTAL	145	100	Peak
4	375.32	42.05	46.00	-3.95	56.42	2.24	32.54	15.93	HORIZONTAL	240	100	Peak
5	625.58	42.20	46.00	-3.80	52.72	2.89	32.67	19.26	HORIZONTAL	293	125	Peak
6	875.84	40.93	46.00	-5.07	48.18	3.34	31.99	21.40	HORIZONTAL	344	100	Peak

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	34.85	38.99	40.00	-1.01	53.65	0.81	32.64	17.17	VERTICAL	190	100	QP
2	40.67	38.37	40.00	-1.63	56.38	0.95	32.63	13.67	VERTICAL	22	100	QP
3	56.19	35.61	40.00	-4.39	59.64	0.99	32.62	7.60	VERTICAL	1	100	QP
4	299.66	39.92	46.00	-6.08	56.51	2.05	32.52	13.88	VERTICAL	119	100	Peak
5	375.32	39.41	46.00	-6.59	53.78	2.24	32.54	15.93	VERTICAL	283	150	Peak
6	625.58	36.54	46.00	-9.46	47.06	2.89	32.67	19.26	VERTICAL	218	150	Peak

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.4.9. Results for Radiated Emissions (1GHz~10th Harmonic)

Re-test for changing the antenna location for tuner chip MxI267.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4823.94	53.75	74.00	-20.25	49.84	5.61	32.82	34.52	233	254	Peak	HORIZONTAL
2	4824.03	49.68	54.00	-4.32	45.77	5.61	32.82	34.52	233	254	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4823.97	52.01	74.00	-21.99	48.10	5.61	32.82	34.52	271	146	Peak	VERTICAL
2	4824.04	46.29	54.00	-7.71	42.38	5.61	32.82	34.52	271	146	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4874.11	55.85	74.00	-18.15	51.86	5.59	32.91	34.51	296	152	Peak	HORIZONTAL
2	4874.15	53.46	54.00	-0.54	49.47	5.59	32.91	34.51	296	152	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4874.04	51.86	54.00	-2.14	47.87	5.59	32.91	34.51	99	135	Average	VERTICAL
2	4874.14	55.60	74.00	-18.40	51.61	5.59	32.91	34.51	99	135	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4924.06	50.15	54.00	-3.85	46.07	5.58	32.99	34.49	63	169	Average	HORIZONTAL
2	4924.12	53.66	74.00	-20.34	49.58	5.58	32.99	34.49	63	169	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4924.01	52.52	74.00	-21.48	48.44	5.58	32.99	34.49	264	141	Peak	VERTICAL
2	4924.04	47.94	54.00	-6.06	43.86	5.58	32.99	34.49	264	141	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4824.74	34.05	54.00	-19.95	30.14	5.61	32.82	34.52	302	102	Average	HORIZONTAL
2	4824.88	47.29	74.00	-26.71	43.38	5.61	32.82	34.52	302	102	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4823.54	34.21	54.00	-19.79	30.30	5.61	32.82	34.52	299	108	Average	VERTICAL
2	4826.58	48.34	74.00	-25.66	44.42	5.60	32.84	34.52	299	108	Peak	VERTICAL

Temperature	24℃	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4867.00	48.14	74.00	-25.86	44.17	5.60	32.88	34.51	174	101	Peak	HORIZONTAL
2	4869.76	35.61	54.00	-18.39	31.62	5.59	32.91	34.51	174	101	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.60	37.49	54.00	-16.51	33.50	5.59	32.91	34.51	151	118	Average	VERTICAL
2	4873.76	51.16	74.00	-22.84	47.17	5.59	32.91	34.51	151	118	Peak	VERTICAL

Temperature	24℃	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4921.16	32.97	54.00	-21.03	28.91	5.58	32.97	34.49	161	116	Average	HORIZONTAL
2	4932.64	46.54	74.00	-27.46	42.46	5.58	32.99	34.49	161	116	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4930.56	45.89	74.00	-28.11	41.81	5.58	32.99	34.49	168	100	Peak	VERTICAL
2	4933.08	33.21	54.00	-20.79	29.13	5.58	32.99	34.49	168	100	Average	VERTICAL

Temperature	24℃	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11n MCS0 HT20 CH 1 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4820.12	46.01	74.00	-27.99	42.10	5.61	32.82	34.52	178	138	Peak	HORIZONTAL
2	4823.48	32.95	54.00	-21.05	29.04	5.61	32.82	34.52	178	138	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4814.04	45.74	74.00	-28.26	41.83	5.61	32.82	34.52	172	143	Peak	VERTICAL
2	4825.04	33.02	54.00	-20.98	29.10	5.60	32.84	34.52	172	143	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11n MCS0 HT20 CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4869.48	37.01	54.00	-16.99	33.02	5.59	32.91	34.51	198	144	Average	HORIZONTAL
2	4879.72	51.11	74.00	-22.89	47.11	5.59	32.91	34.50	198	144	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4868.00	48.04	74.00	-25.96	44.05	5.59	32.91	34.51	182	141	Peak	VERTICAL
2	4878.72	35.19	54.00	-18.81	31.19	5.59	32.91	34.50	182	141	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11n MCS0 HT20 CH 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4917.04	33.03	54.00	-20.97	28.97	5.58	32.97	34.49	211	129	Average	HORIZONTAL
2	4932.20	46.23	74.00	-27.77	42.15	5.58	32.99	34.49	211	129	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4914.04	33.10	54.00	-20.90	29.04	5.58	32.97	34.49	201	133	Average	VERTICAL
2	4924.92	46.30	74.00	-27.70	42.22	5.58	32.99	34.49	201	133	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11n MCS0 HT40 CH 3 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4844.36	46.27	74.00	-27.73	42.33	5.60	32.86	34.52	205	125	Peak	HORIZONTAL
2	4844.95	32.90	54.00	-21.10	28.96	5.60	32.86	34.52	205	125	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4843.16	32.98	54.00	-21.02	29.04	5.60	32.86	34.52	208	128	Average	VERTICAL
2	4844.06	46.48	74.00	-27.52	42.54	5.60	32.86	34.52	208	128	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11n MCS0 HT40 CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.71	35.42	54.00	-18.58	31.43	5.59	32.91	34.51	191	124	Average	HORIZONTAL
2	4874.18	49.85	74.00	-24.15	45.86	5.59	32.91	34.51	191	124	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.31	50.34	74.00	-23.66	46.35	5.59	32.91	34.51	198	126	Peak	VERTICAL
2	4873.79	35.29	54.00	-18.71	31.30	5.59	32.91	34.51	198	126	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11n MCS0 HT40 CH 9 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4903.54	33.04	54.00	-20.96	29.00	5.59	32.95	34.50	178	126	Average	HORIZONTAL
2	4904.96	46.37	74.00	-27.63	42.33	5.59	32.95	34.50	178	126	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4903.18	33.23	54.00	-20.77	29.19	5.59	32.95	34.50	188	130	Average	VERTICAL
2	4903.75	47.03	74.00	-26.97	42.99	5.59	32.95	34.50	188	130	Peak	VERTICAL

Re-test for changing 2.4GHz PA from P/N: SE2605L to P/N: SE2605L-RN due to changing of manufacturing process.

Temperature	24°C	**Humidity**	51%
Test Engineer	Lucke Hsieh	**Configurations**	IEEE 802.11g CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 28, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4868.61	34.69	54.00	-19.31	29.41	7.08	31.21	33.01	228	184	Average	HORIZONTAL
2	4873.76	46.66	74.00	-27.34	41.38	7.08	31.21	33.01	228	184	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4868.61	46.85	74.00	-27.15	41.57	7.08	31.21	33.01	201	269	Peak	VERTICAL
2	4884.00	37.01	54.00	-16.99	31.70	7.08	31.23	33.00	201	269	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11n MCS0 HT40 CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 28, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4868.65	46.61	74.00	-27.39	41.33	7.08	31.21	33.01	225	302	Peak	HORIZONTAL
2	4885.18	36.13	54.00	-17.87	30.82	7.08	31.23	33.00	225	302	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4873.12	35.12	54.00	-18.88	29.84	7.08	31.21	33.01	189	186	Average	VERTICAL
2	4874.32	47.06	74.00	-26.94	41.78	7.08	31.21	33.01	189	186	Peak	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.5. Emissions Measurement

4.5.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

4.5.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (30dBc in any 100 kHz bandwidth emission)	100 kHz / 300 kHz for Peak

4.5.3. Test Procedures

For Radiated band edges Measurement:

1. The test procedure is the same as section 4.4.3.

For Radiated Out of Band Emission Measurement:

1. Test was performed in accordance with KDB558074 D01 v03r05 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10.1 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure.

4.5.4. Test Setup Layout

For Radiated band edges Measurement:

This test setup layout is the same as that shown in section 4.4.4.

For Radiated Out of Band Emission Measurement:

This test setup layout is the same as that shown in section 4.4.4.

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Band Edge and Fundamental Emissions

Re-test for changing the antenna location for tuner chip MxI267.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2325.20	61.58	74.00	-12.42	29.82	3.67	28.09	0.00	252	209	Peak	HORIZONTAL
2	2325.60	52.26	54.00	-1.74	20.50	3.67	28.09	0.00	252	209	Average	HORIZONTAL
3	2413.20	113.21			81.47	3.75	27.99	0.00	252	209	Peak	HORIZONTAL
4	2413.60	109.42			77.68	3.75	27.99	0.00	252	209	Average	HORIZONTAL
5	2498.40	62.39	74.00	-11.61	30.66	3.83	27.90	0.00	252	209	Peak	HORIZONTAL
6	2498.40	53.88	54.00	-0.12	22.15	3.83	27.90	0.00	252	209	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2350.60	53.76	54.00	-0.24	22.00	3.70	28.06	0.00	191	244	Average	VERTICAL
2	2359.00	62.49	74.00	-11.51	30.73	3.70	28.06	0.00	191	244	Peak	VERTICAL
3	2435.40	110.06			78.32	3.77	27.97	0.00	191	244	Average	VERTICAL
4	2436.20	114.02			82.28	3.77	27.97	0.00	191	244	Peak	VERTICAL
5	2484.60	57.24	74.00	-16.76	25.51	3.81	27.92	0.00	191	244	Peak	VERTICAL
6	2484.60	45.24	54.00	-8.76	13.51	3.81	27.92	0.00	191	244	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2377.20	62.28	74.00	-11.72	30.53	3.72	28.03	0.00	198	249	Peak	VERTICAL
2	2377.20	53.73	54.00	-0.27	21.98	3.72	28.03	0.00	198	249	Average	VERTICAL
3	2463.20	108.78			77.05	3.79	27.94	0.00	198	249	Peak	VERTICAL
4	2463.60	104.80			73.07	3.79	27.94	0.00	198	249	Average	VERTICAL
5	2499.60	55.94	74.00	-18.06	24.21	3.83	27.90	0.00	198	249	Peak	VERTICAL
6	2499.60	44.96	54.00	-9.04	13.23	3.83	27.90	0.00	198	249	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2462 MHz.

Temperature	24℃	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2372.40	48.86	54.00	-5.14	17.10	3.72	28.04	0.00	206	187	Average	VERTICAL
2	2373.20	60.60	74.00	-13.40	28.84	3.72	28.04	0.00	206	187	Peak	VERTICAL
3	2416.80	101.44			69.70	3.75	27.99	0.00	206	187	Average	VERTICAL
4	2417.20	110.96			79.22	3.75	27.99	0.00	206	187	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2387.80	63.53	74.00	-10.47	31.78	3.73	28.02	0.00	166	234	Peak	VERTICAL
2	2388.20	52.41	54.00	-1.59	20.66	3.73	28.02	0.00	166	234	Average	VERTICAL
3	2431.40	116.76			85.02	3.76	27.98	0.00	166	234	Peak	VERTICAL
4	2431.40	106.97			75.23	3.76	27.98	0.00	166	234	Average	VERTICAL
5	2486.60	47.84	54.00	-6.16	16.11	3.81	27.92	0.00	166	234	Average	VERTICAL
6	2487.80	59.63	74.00	-14.37	27.90	3.81	27.92	0.00	166	234	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2380.80	51.49	54.00	-2.51	19.74	3.72	28.03	0.00	180	237	Average	VERTICAL
2	2381.20	63.11	74.00	-10.89	31.36	3.72	28.03	0.00	180	237	Peak	VERTICAL
3	2462.80	100.59			68.86	3.79	27.94	0.00	180	237	Average	VERTICAL
4	2463.20	110.04			78.31	3.79	27.94	0.00	180	237	Peak	VERTICAL
5	2483.50	47.98	54.00	-6.02	16.25	3.81	27.92	0.00	180	237	Average	VERTICAL
6	2484.00	66.52	74.00	-7.48	34.79	3.81	27.92	0.00	180	237	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2462 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11n MCS0 HT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 26, 2015 / Dec. 03, 2015		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2388.70	72.67	74.00	-1.33	40.39	5.23	0.00	27.05	HORIZONTAL	298	200	Peak
2	2390.00	53.71	54.00	-0.29	21.43	5.23	0.00	27.05	HORIZONTAL	298	200	Average
3	2406.21	104.47			72.11	5.26	0.00	27.10	HORIZONTAL	298	200	Average
4	2407.08	114.73			82.37	5.26	0.00	27.10	HORIZONTAL	298	200	Peak

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.00	64.59	74.00	-9.41	32.84	3.73	28.02	0.00	170	223	Peak	VERTICAL
2	2390.00	53.16	54.00	-0.84	21.41	3.73	28.02	0.00	170	223	Average	VERTICAL
3	2435.40	105.90			74.16	3.77	27.97	0.00	170	223	Average	VERTICAL
4	2437.00	115.99			84.25	3.77	27.97	0.00	170	223	Peak	VERTICAL
5	2483.50	48.09	54.00	-5.91	16.36	3.81	27.92	0.00	170	223	Average	VERTICAL
6	2485.00	59.72	74.00	-14.28	27.99	3.81	27.92	0.00	170	223	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2465.47	113.02			80.49	5.31	0.00	27.22	HORIZONTAL	249	206	Peak
2	2466.49	102.21			69.68	5.31	0.00	27.22	HORIZONTAL	249	206	Average
3	2483.64	53.80	54.00	-0.20	21.20	5.33	0.00	27.27	HORIZONTAL	249	206	Average
4	2484.22	70.89	74.00	-3.11	38.29	5.33	0.00	27.27	HORIZONTAL	249	206	Peak

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11n MCS0 HT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 26, 2015 / Dec. 03, 2015		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2390.00	53.67	54.00	-0.33	21.39	5.23	0.00	27.05	HORIZONTAL	292	197	Average
2	2390.00	71.59	74.00	-2.41	39.31	5.23	0.00	27.05	HORIZONTAL	292	197	Peak
3	2406.37	97.89			65.53	5.26	0.00	27.10	HORIZONTAL	292	197	Average
4	2406.95	107.31			74.95	5.26	0.00	27.10	HORIZONTAL	292	197	Peak
5	2483.50	47.53	54.00	-6.47	14.93	5.33	0.00	27.27	HORIZONTAL	292	197	Average
6	2489.58	61.22	74.00	-12.78	28.60	5.34	0.00	27.28	HORIZONTAL	292	197	Peak

Item 3, 4 are the fundamental frequency at 2422 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2390.00	63.99	74.00	-10.01	32.24	3.73	28.02	0.00	220	180	Peak	HORIZONTAL
2	2390.00	50.67	54.00	-3.33	18.92	3.73	28.02	0.00	220	180	Average	HORIZONTAL
3	2431.40	110.65			78.91	3.76	27.98	0.00	220	180	Peak	HORIZONTAL
4	2431.40	101.03			69.29	3.76	27.98	0.00	220	180	Average	HORIZONTAL
5	2483.50	50.29	54.00	-3.71	18.56	3.81	27.92	0.00	220	180	Average	HORIZONTAL
6	2485.40	66.10	74.00	-7.90	34.37	3.81	27.92	0.00	220	180	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2435.50	98.55			66.11	5.28	0.00	27.16	HORIZONTAL	302	214	Average
2	2436.66	107.61			75.17	5.28	0.00	27.16	HORIZONTAL	302	214	Peak
3	2483.50	69.76	74.00	-4.24	37.16	5.33	0.00	27.27	HORIZONTAL	302	214	Peak
4	2485.24	53.59	54.00	-0.41	20.99	5.33	0.00	27.27	HORIZONTAL	302	214	Average

Item 1, 2 are the fundamental frequency at 2452 MHz.

Re-test for changing 2.4GHz PA from P/N: SE2605L to P/N: SE2605L-RN due to changing of manufacturing process.

Temperature	24°C	**Humidity**	51%
Test Engineer	Lucke Hsieh	**Configurations**	IEEE 802.11g CH 6/ Chain 1 + Chain 2 + Chain 3
Test Date	Dec. 03, 2015		

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2389.80	66.36	74.00	-7.64	34.98	4.33	27.05	0.00	210	323	Peak	VERTICAL
2	2390.00	53.97	54.00	-0.03	22.59	4.33	27.05	0.00	210	323	Average	VERTICAL
3	2427.40	103.59			72.08	4.37	27.14	0.00	210	323	Average	VERTICAL
4	2428.20	113.14			81.63	4.37	27.14	0.00	210	323	Peak	VERTICAL
5	2483.50	51.10	54.00	-2.90	19.41	4.42	27.27	0.00	210	323	Average	VERTICAL
6	2487.40	66.25	74.00	-7.75	34.56	4.42	27.27	0.00	210	323	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11n MCS0 HT40 CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 25, 2016		

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2353.80	53.87	54.00	-0.13	22.60	4.30	26.97	0.00	212	331	Average	VERTICAL
2	2354.60	65.13	74.00	-8.87	33.86	4.30	26.97	0.00	212	331	Peak	VERTICAL
3	2436.20	117.60			86.07	4.37	27.16	0.00	212	331	Peak	VERTICAL
4	2436.60	106.39			74.86	4.37	27.16	0.00	212	331	Average	VERTICAL
5	2485.50	49.42	54.00	-4.58	17.73	4.42	27.27	0.00	212	331	Average	VERTICAL
6	2486.30	61.14	74.00	-12.86	29.45	4.42	27.27	0.00	212	331	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

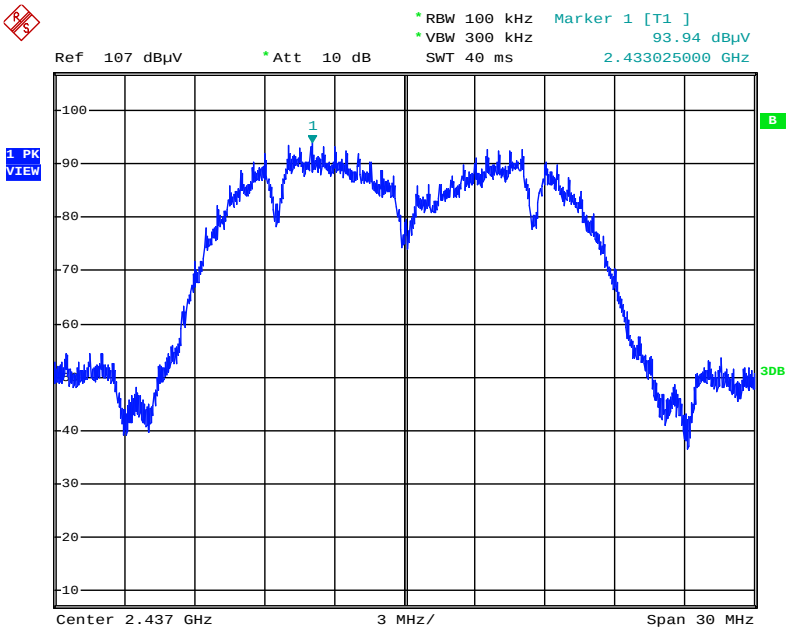
Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

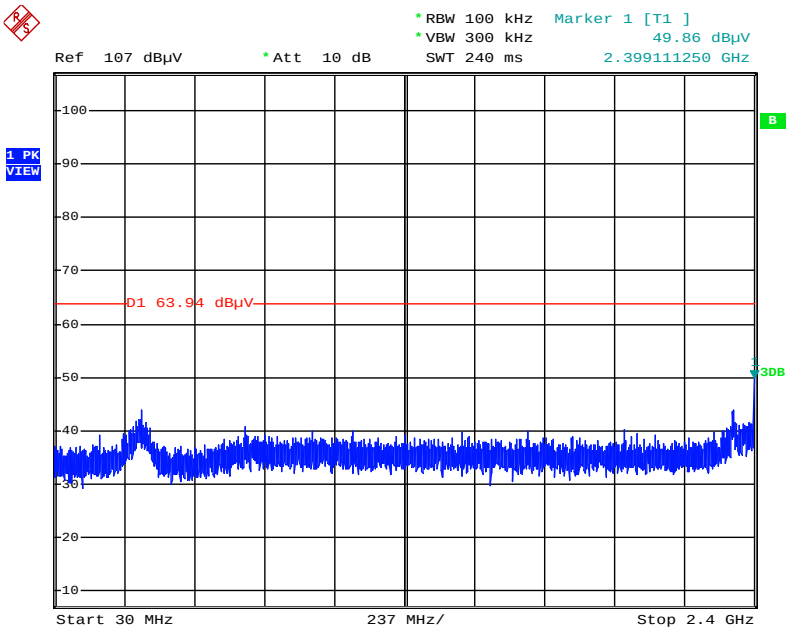
For Emission not in Restricted Band

Plot on Configuration IEEE 802.11b / Reference Level



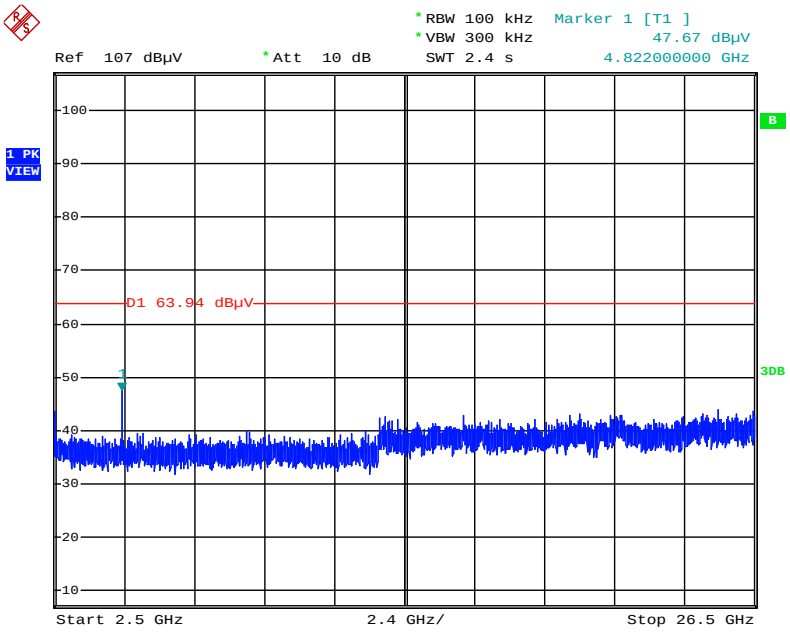
Date: 3.DEC.2015 23:24:45

Plot on Configuration IEEE 802.11b / CH 1 / 30MHz~2400MHz (down 30dBc)



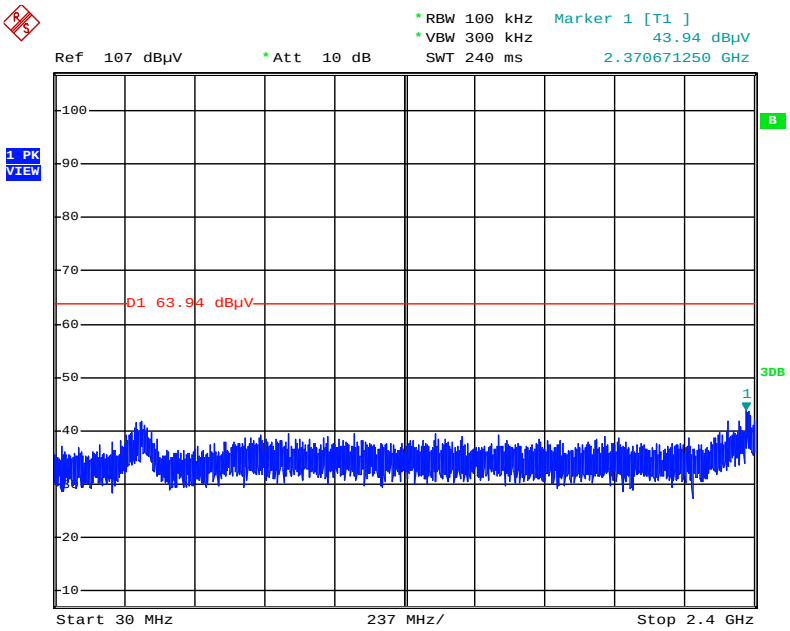
Date: 3.DEC.2015 23:40:33

Plot on Configuration IEEE 802.11b / CH 1 / 2500MHz~26500MHz (down 30dBc)



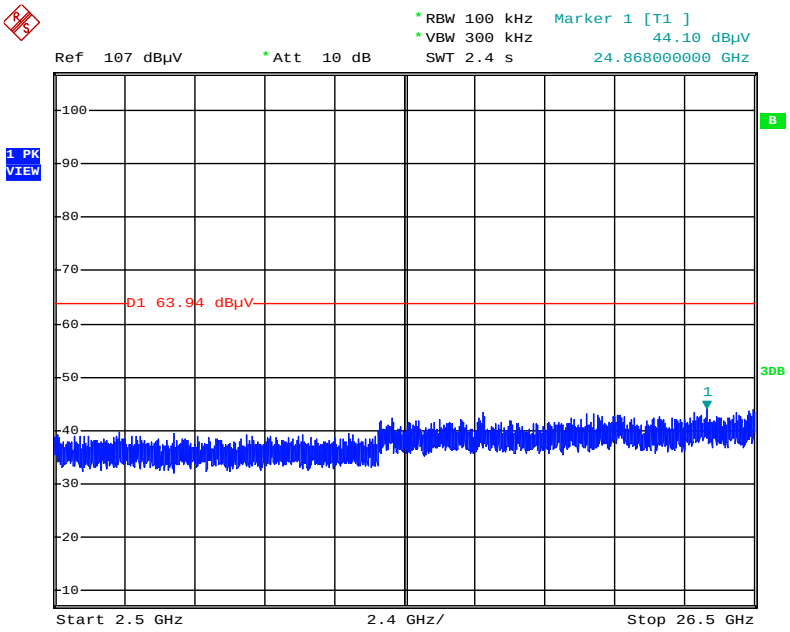
Date: 3.DEC.2015 23:42:28

Plot on Configuration IEEE 802.11b / CH 11 / 30MHz~2400MHz (down 30dBc)



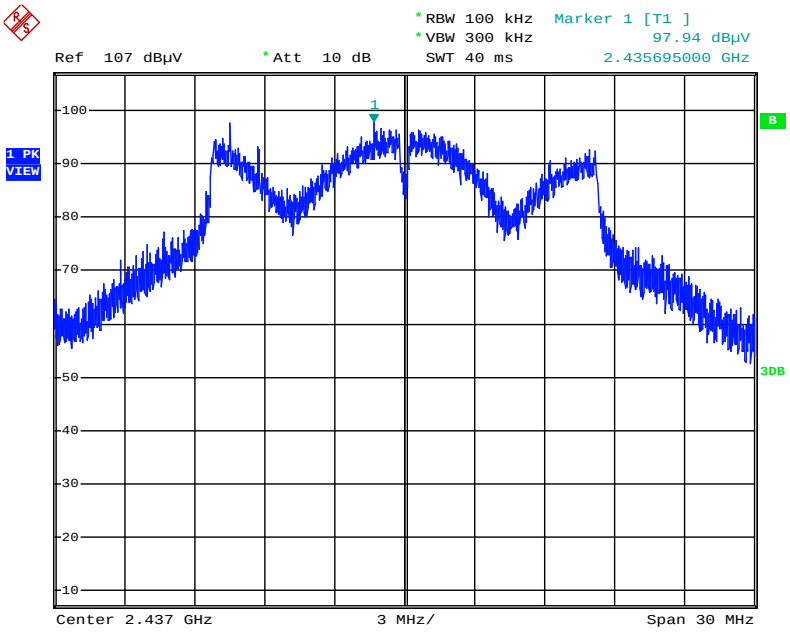
Date: 3.DEC.2015 23:43:49

Plot on Configuration IEEE 802.11b / CH 11 / 2500MHz~26500MHz (down 30dBc)



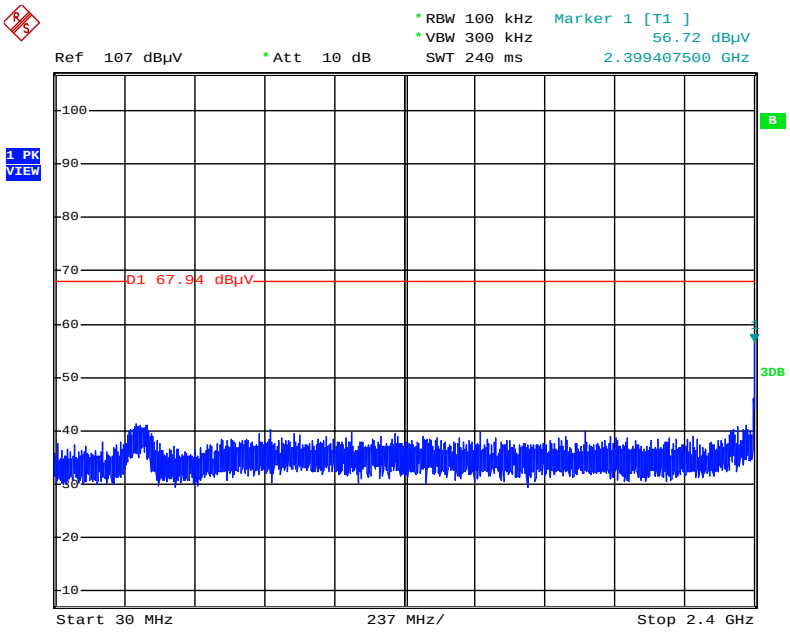
Date: 3.DEC.2015 23:43:23

Plot on Configuration IEEE 802.11g / Reference Level



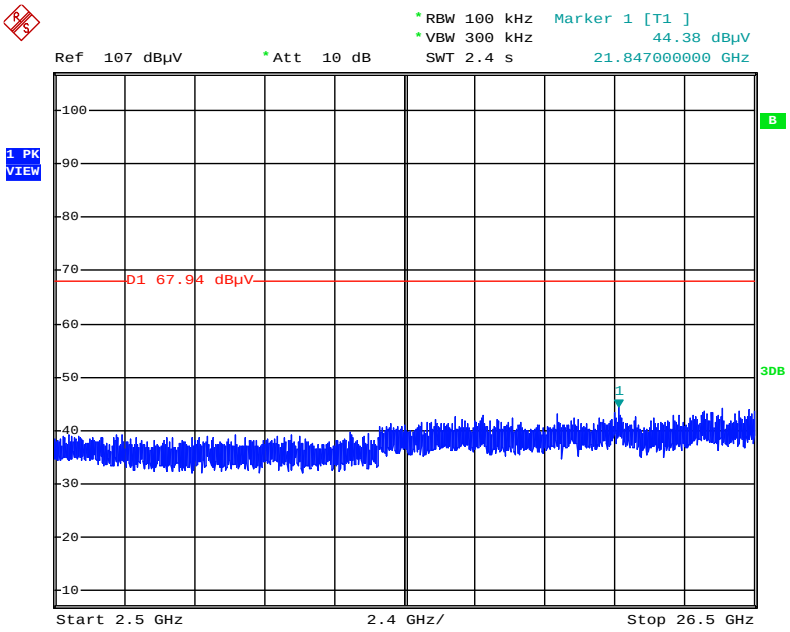
Date: 3.DEC.2015 23:46:10

Plot on Configuration IEEE 802.11g / CH 1 / 30MHz~2400MHz (down 30dBc)



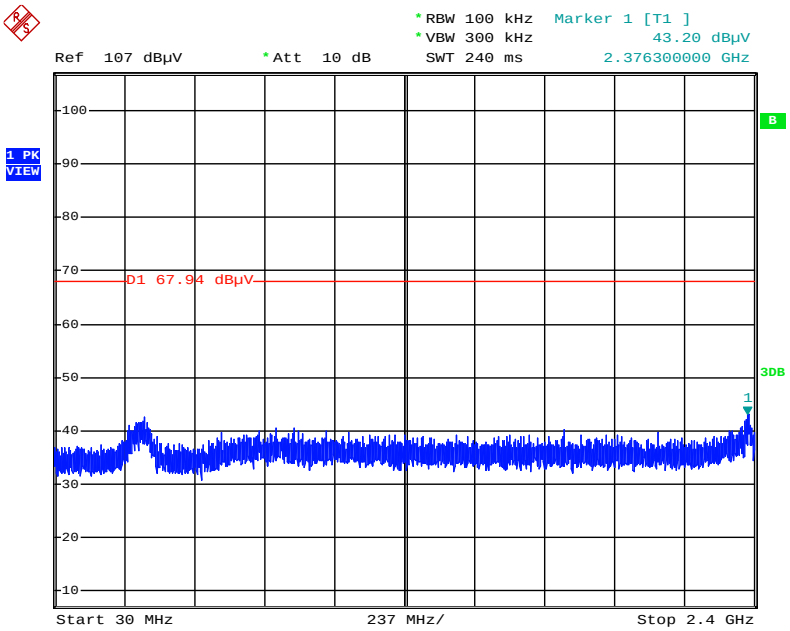
Date: 3.DEC.2015 23:48:08

Plot on Configuration IEEE 802.11g / CH 1 / 2500MHz~26500MHz (down 30dBc)



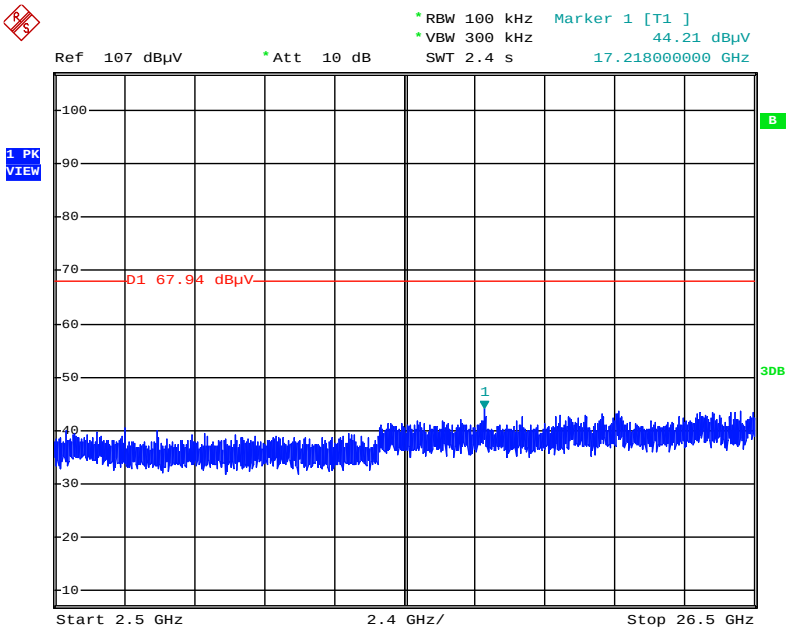
Date: 3.DEC.2015 23:48:43

Plot on Configuration IEEE 802.11g / CH 11 / 30MHz~2400MHz (down 30dBc)



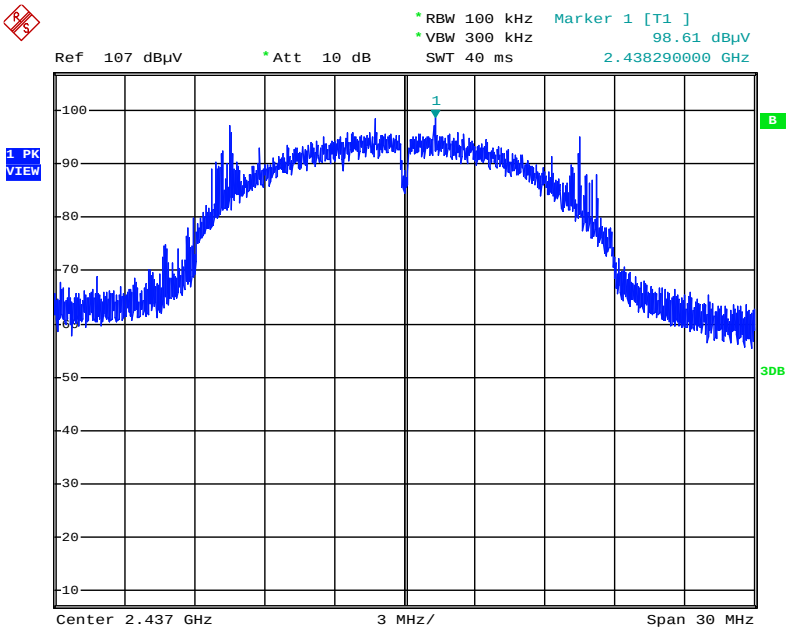
Date: 3.DEC.2015 23:49:50

Plot on Configuration IEEE 802.11g / CH 11 / 2500MHz~26500MHz (down 30dBc)



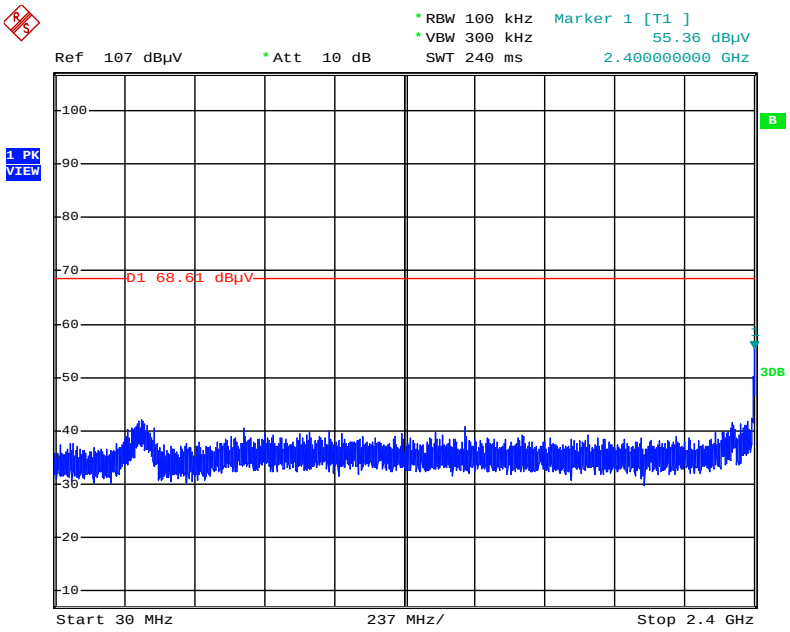
Date: 3.DEC.2015 23:49:26

Plot on Configuration IEEE 802.11n MCS0 HT20 / Reference Level



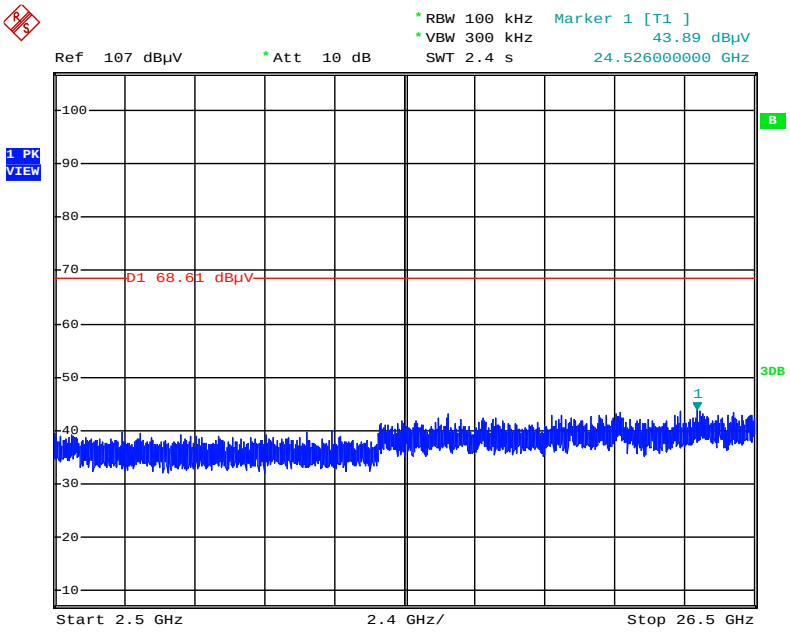
Date: 3.DEC.2015 23:51:37

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



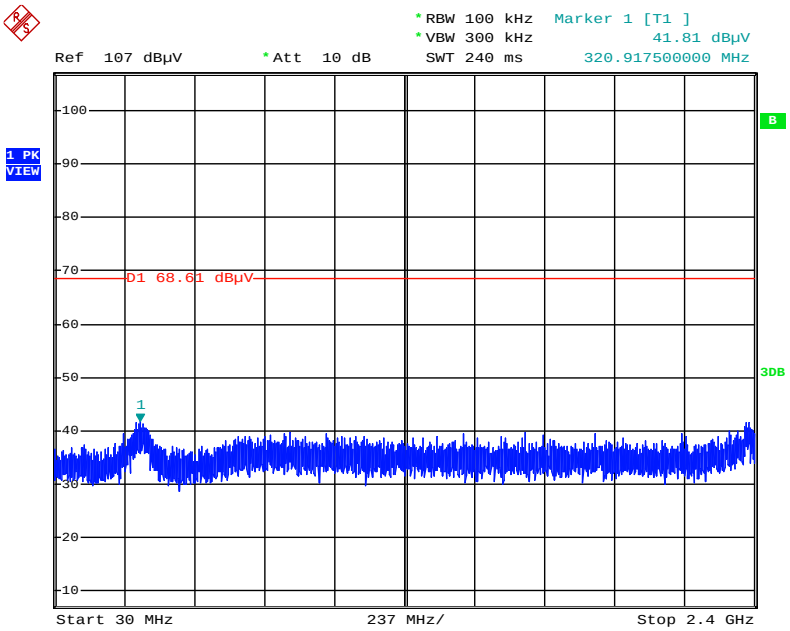
Date: 3.DEC.2015 23:52:40

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 1 / 2500MHz~26500MHz (down 30dBc)



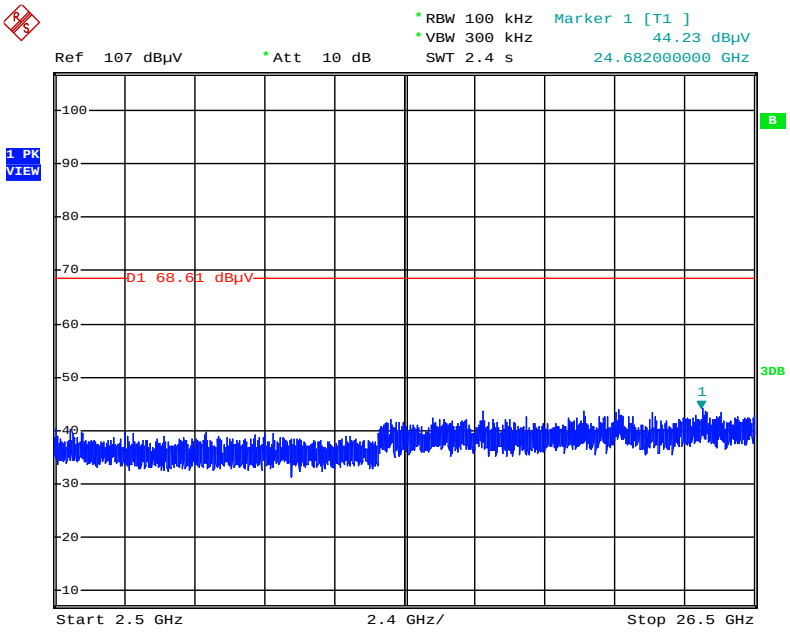
Date: 3.DEC.2015 23:53:08

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



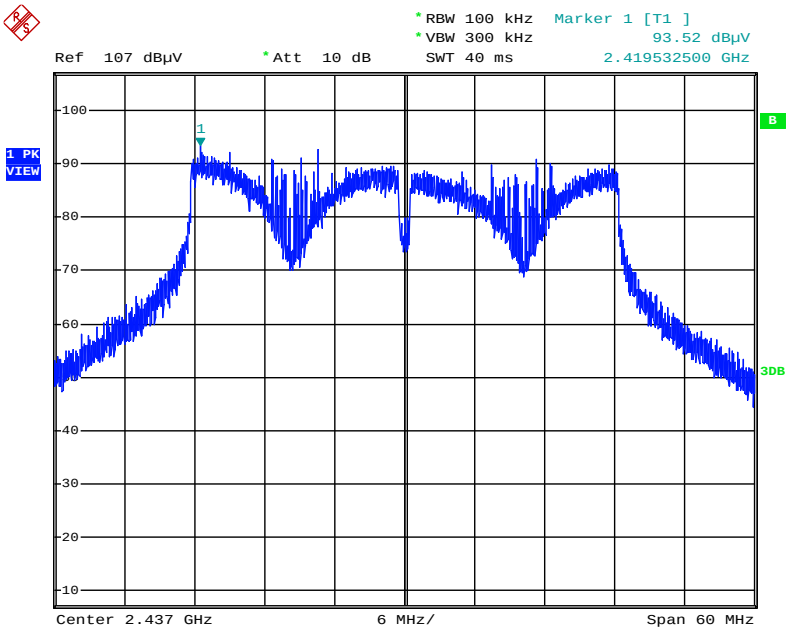
Date: 3.DEC.2015 23:57:01

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 11 / 2500MHz~26500MHz (down 30dBc)



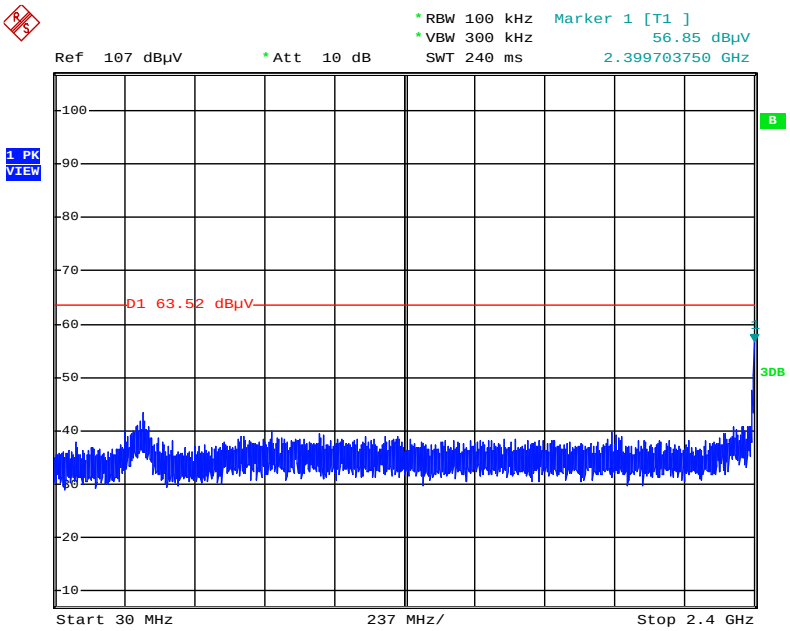
Date: 3.DEC.2015 23:54:47

Plot on Configuration IEEE 802.11n MCS0 HT40 / Reference Level



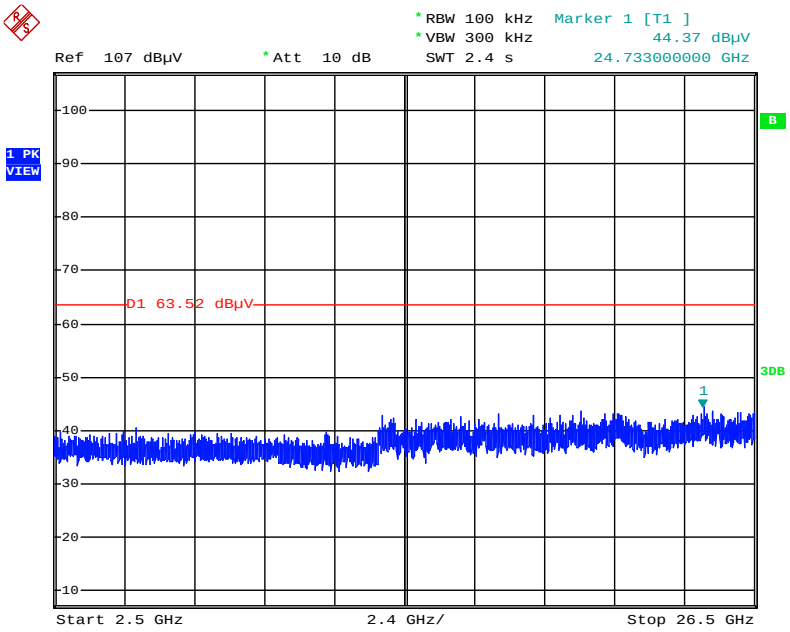
Date: 3.DEC.2015 23:59:04

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



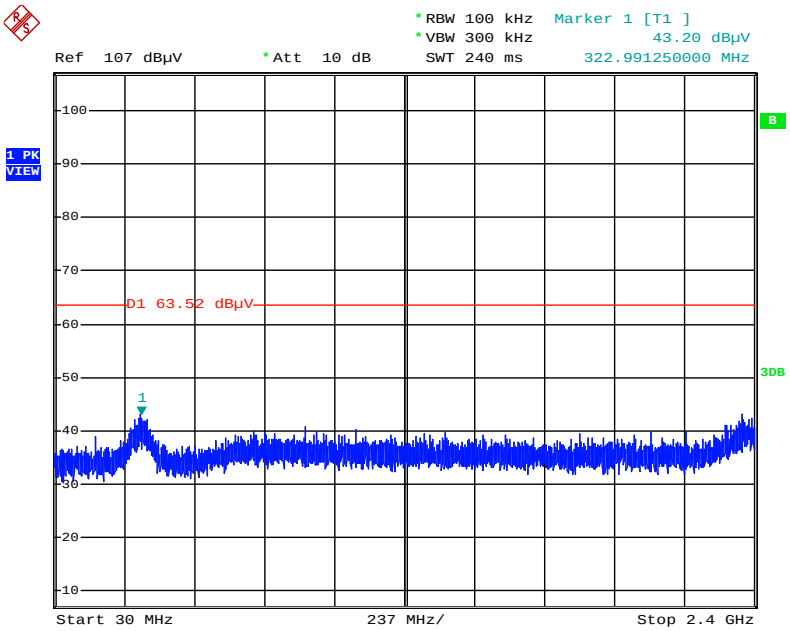
Date: 4.DEC.2015 00:00:14

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 3 / 2500MHz~26500MHz (down 30dBc)



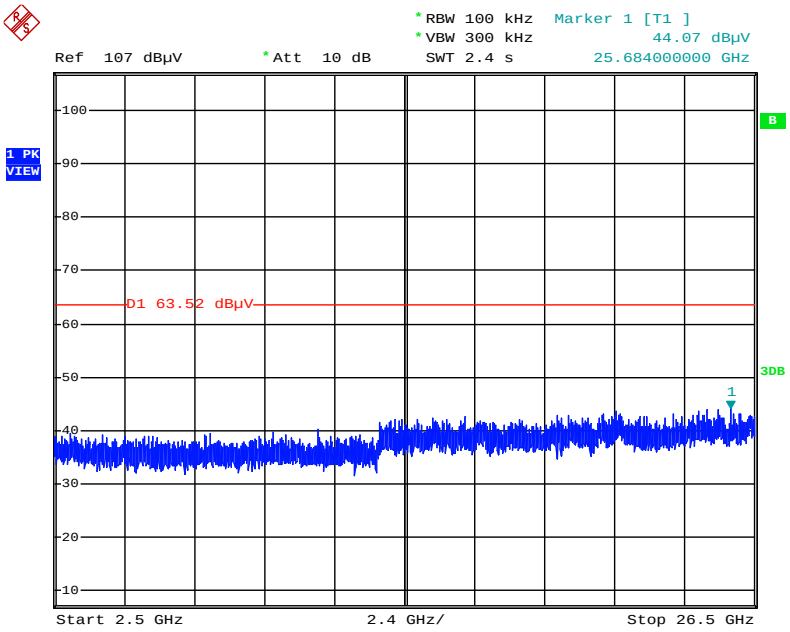
Date: 4.DEC.2015 00:00:56

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



Date: 4.DEC.2015 00:02:10

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 9 / 2500MHz~26500MHz (down 30dBc)



Date: 4.DEC.2015 00:01:50

4.6. Antenna Requirements

4.6.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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 manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.6.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
BILOG ANTENNA	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 12, 2015*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Feb. 24, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Feb.10, 2015	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 13, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 21, 2015	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Oct. 13, 2015	Conducted (TH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 12, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

"*" Calibration Interval of instruments listed above is two years.

N.C.R. means Non-Calibration required.

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%