

FCC Test Report

Applicant : BROADCOM CORPORATION
Equipment : 802.11abgn WLAN + BLUETOOTH PCI-E MINICARD
Brand Name : Broadcom
Model No. : BCM943228HMB
FCC ID : QDS-BRCM1058
Standard : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System
Filling Type : Class II Permissive Change

The product sample received on Dec. 19, 2013 and completely tested on Jan. 24, 2014. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

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

Reviewed by:


Wayne Hsu / Assistant Manager



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Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.3	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.247(b)	RF Output Power (Maximum Peak Conducted Output Power)	Power [dBm]:27.70	Power [dBm]:30	Complied
3.2	15.247(c)	Transmitter Radiated Bandedge Emissions	Non-Restricted Bands: 2399.50MHz: 30.02dB Restricted Bands [dBuV/m at 3m]: 2483.50MHz 63.63 (Margin 10.37dB) - PK 52.88 (Margin 1.12dB) - AV	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied
3.3	15.247(c)	Transmitter Radiated Unwanted Emissions	[dBuV/m at 3m]: 4824.000MHz 55.73 (Margin 18.27dB) - PK 50.25 (Margin 3.75dB) - AV	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied



Revision History

Report No.	Version	Description	Issued Date
FR3D1962-02AC	Rev. 01	Initial issue of report	Mar. 06, 2014

1 General Description

1.1 Information

1.1.1 Feature of Equipment Under Test

Product Feature	
Equipment	802.11abgn WLAN + BLUETOOTH PCI-E MINICARD
Brand Name	Broadcom
Model Name.	BCM943228HMB
FCC ID	QDS-BRCM1058
Installed into host	Equipment: Tablet PC Brand Name: Lenovo Marketing name: Lenovo Miix 2 11
EUT supports Radios application	WLAN 11a/b/g/n HT20 HT40 Bluetooth v2.1 + EDR Bluetooth v4.0
EUT Stage	Production Unit

1.1.2 RF Output Power

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	RF Output Power (dBm)
2400-2483.5	b	2412-2462	1-11 [11]	1	21.35
2400-2483.5	g	2412-2462	1-11 [11]	1	25.65
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	27.70
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	2	23.61

Note 1: RF output power specifies that Maximum Peak Conducted Output Power.
 Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
 Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

1.1.3 Antenna Information

Antenna Category	
<input checked="" type="checkbox"/>	Integral antenna (antenna permanently attached)
<input checked="" type="checkbox"/>	Temporary RF connector provided
<input type="checkbox"/>	No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.

Antenna Information			
Antenna 1	Manufacturer	WNC	
	P/N	Main:025.9000X.001	Aux: 025.9000Y.001
	Antenna Type	Main: PIFA Antenna	Aux: PIFA Antenna
	Peak gain	Main Antenna : WLAN(2.4G):1.87 dBi WLAN(5G):-0.16 dBi	Aux Antenna : Bluetooth:0.69 dBi WLAN(2.4G):0.69 dBi WLAN(5G):2.73 dBi
Antenna 2	Manufacturer	HT	
	P/N	Main:025.9000X.0011	Aux:025.9000Y.0011
	Antenna Type	Main:PIFA Antenna	Aux:PIFA Antenna
	Peak gain	Main Antenna : WLAN(2.4G):-1.63dBi WLAN(5G):1.84 dBi	Aux Antenna : Bluetooth:-0.35 dBi WLAN(2.4G):-0.35 dBi WLAN(5G):1.07dBi

Note: Performed the worst configuration for higher gain was test in final test report.

Directional Gain (DG) Result				
Modulation Mode	N _{TX}	N _{SS}	Array Gain (dB)	Power DG (dBi)
11b, 1-11Mbps	1	1	0	1.87
11g, 6-54Mbps	1	1	0	1.87
HT20, M0-15	2	1/2	0	1.32
HT40, M0-M15	2	1/2	0	1.32

Note 2: For all transmitter outputs with unequal antenna gains, directional gain is to be computed as follows:
 Any transmit signals are correlated, Directional Gain = $10 \log[(10^{G^{1/20}} + \dots + 10^{GN/20})^2 / N_{TX}]$
 All transmit signals are completely uncorrelated, Directional Gain = $10 \log[(10^{G^{1/10}} + \dots + 10^{GN/10}) / N_{TX}]$



1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
<input type="checkbox"/> Operated normally mode for worst duty cycle	
<input checked="" type="checkbox"/> Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	Power Duty Factor [dB] – (10 log 1/x)
<input checked="" type="checkbox"/> 94.95% - IEEE 802.11b	0.23
<input checked="" type="checkbox"/> 94.91% - IEEE 802.11g	0.23
<input checked="" type="checkbox"/> 90.56% - IEEE 802.11n (HT20)	0.43
<input checked="" type="checkbox"/> 82.99% - IEEE 802.11n (HT40)	0.81

1.1.5 EUT Operational Condition

Supply Voltage	<input checked="" type="checkbox"/> AC mains	<input type="checkbox"/> DC	<input type="checkbox"/> System
Type of DC Source	<input type="checkbox"/> Internal DC supply	<input checked="" type="checkbox"/> External DC adapter	<input checked="" type="checkbox"/> Battery

1.2 Testing Applied Standards

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

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2009
- ◆ FCC KDB 558074
- ◆ FCC KDB 662911

1.3 Testing Location Information

Testing Location			
<input checked="" type="checkbox"/>	HWA YA	ADD : No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973	
Test Condition	Test Site No.	Test Engineer	Test Environment
RF Conducted	TH02-HY	Alex	24~26°C / 45~49%
Radiated Emission	03CH03-HY	Leo	21.4°C / 35%

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Uncertainty		
Test Item		Uncertainty
RF output power, conducted		±0.63 dB
Unwanted emissions, conducted	9 – 150 kHz	±0.38 dB
	0.15 – 30 MHz	±0.42 dB
	30 – 1000 MHz	±0.51 dB
	1 – 18 GHz	±0.67 dB
	18 – 40 GHz	±0.83 dB
	40 – 200 GHz	N/A
All emissions, radiated	9 – 150 kHz	±2.49 dB
	0.15 – 30 MHz	±2.28 dB
	30 – 1000 MHz	±2.56 dB
	1 – 18 GHz	±3.59 dB
	18 – 40 GHz	±3.82 dB
	40 – 200 GHz	N/A
Temperature		±0.8 °C
Humidity		±3 %
DC and low frequency voltages		±3 %
Time		±1.42 %
Duty Cycle		±1.42 %




2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

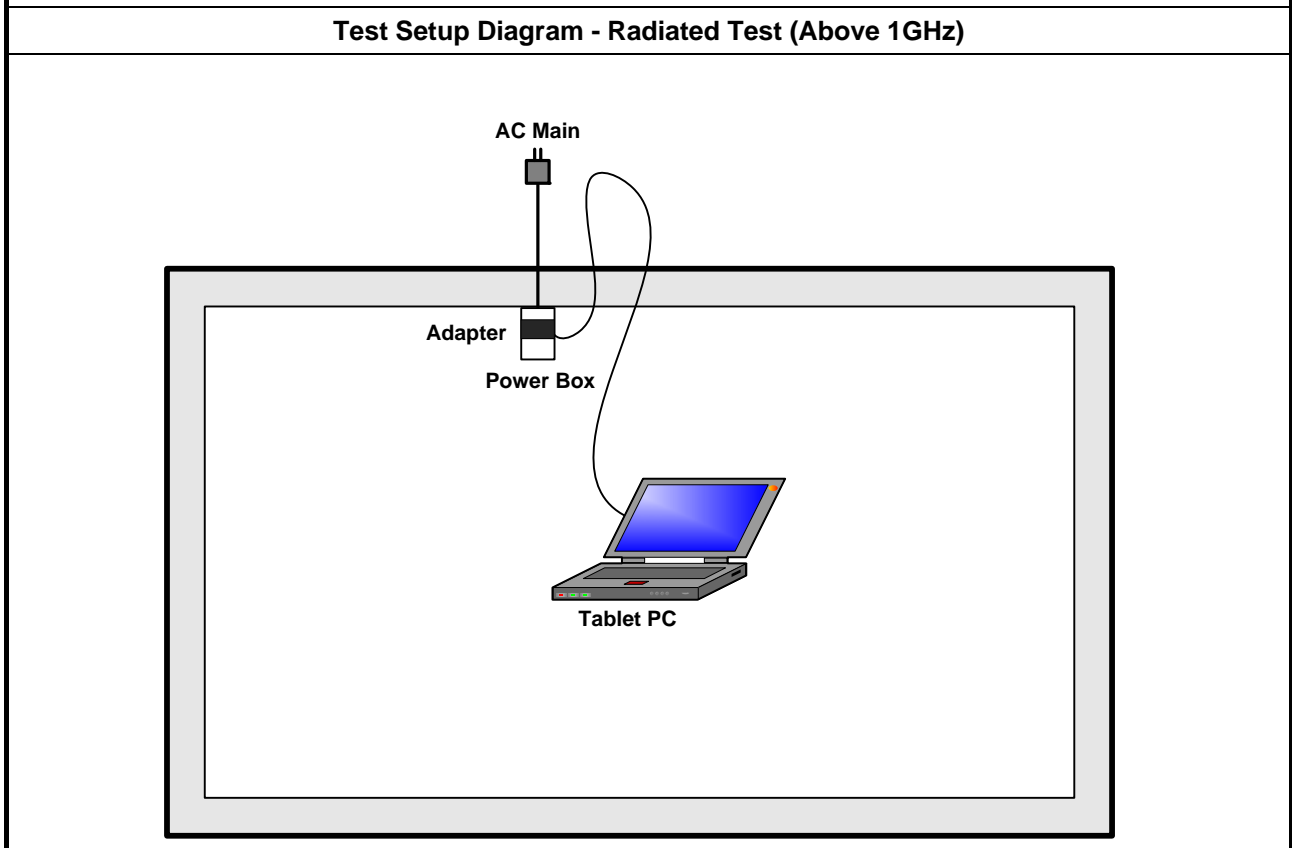
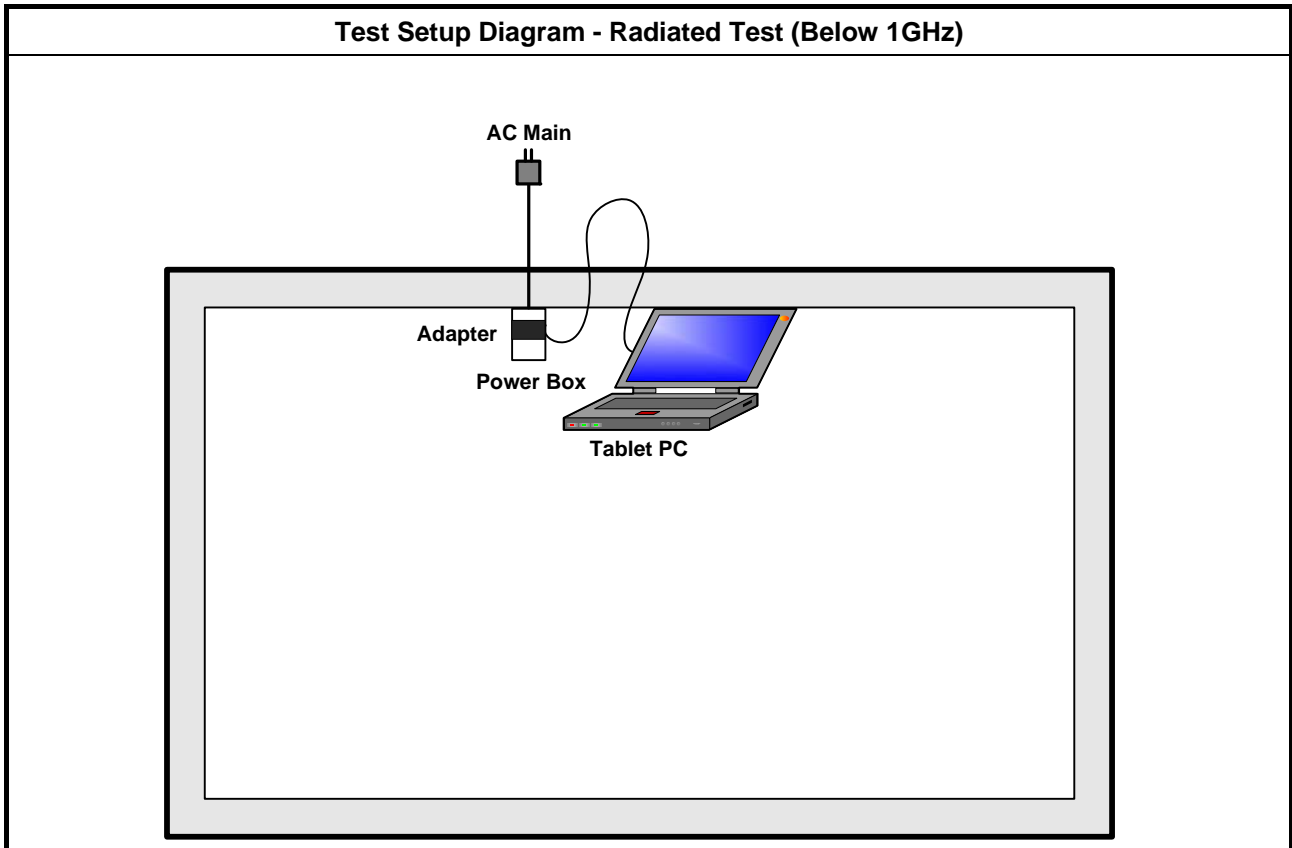
Worst Modulation Used for Conformance Testing			
Modulation Mode	Transmit Chains (N _{TX})	Data Rate / MCS	Worst Data Rate / MCS
11b,1-11Mbps	1	1-11 Mbps	1 Mbps
11g,6-54Mbps	1	6-54 Mbps	6 Mbps
HT20,M0-15	2	M0-15	MCS 0
HT40,M0-15	2	M0-15	MCS 0

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power
Test Condition	Conducted measurement at transmit chains
Modulation Mode	11b, 11g, HT20, HT40

The Worst Case Mode for Following Conformance Tests			
Tests Item	Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
User Position	<input type="checkbox"/> EUT will be placed in fixed position.		
	<input checked="" type="checkbox"/> EUT will be placed in mobile position and operating multiple positions. EUT shall be performed three orthogonal planes. The worst planes is Y.		
	<input type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed two or three orthogonal planes.		
Operating Mode	<input checked="" type="checkbox"/> 1. AC Power & Radio link (WLAN)		
Modulation Mode	11b, 11g, HT20, HT40		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			

2.3 Test Setup Diagram



3 Transmitter Test Result

3.1 RF Output Power

3.1.1 RF Output Power Limit

RF Output Power Limit	
Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit	
<input checked="" type="checkbox"/> 2400-2483.5 MHz Band:	
<input checked="" type="checkbox"/>	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
<input checked="" type="checkbox"/>	Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
<input type="checkbox"/>	Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
<input type="checkbox"/>	Smart antenna system (SAS):
<input type="checkbox"/>	Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
<input type="checkbox"/>	Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
<input type="checkbox"/>	Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dBm
e.i.r.p. Power Limit:	
<input checked="" type="checkbox"/> 2400-2483.5 MHz Band	
<input checked="" type="checkbox"/>	Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)
<input type="checkbox"/>	Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm
<input type="checkbox"/>	Smart antenna system (SAS)
<input type="checkbox"/>	Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
<input type="checkbox"/>	Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
<input type="checkbox"/>	Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi. P_{eirp} = e.i.r.p. Power in dBm.	

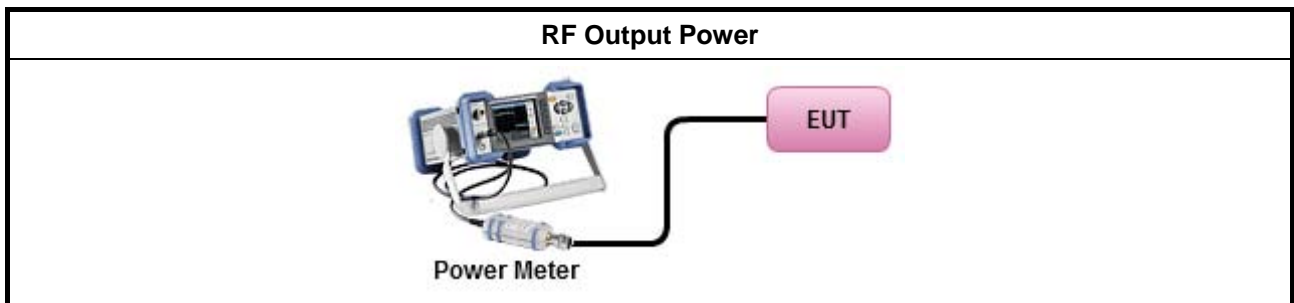
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Maximum Peak Conducted Output Power
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.1.1 Option 1 (RBW ≥ EBW method).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.1.2 Option 2 (integrated band power method).
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 9.1.3 Option 2 (peak power meter for VBW ≥ DTS BW)
<input checked="" type="checkbox"/>	Maximum Conducted Output Power
	[duty cycle ≥ 98% or external video / power trigger]
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.2.2.2 Method AVGSA-1 (spectral trace averaging).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.2.2.3 Method AVGSA-1 Alt. (slow sweep speed)
	duty cycle < 98% and average over on/off periods with duty factor
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
	RF power meter and average over on/off periods with duty factor or gated trigger
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 9.2.3 Method AVGPM (using an RF average power meter).
<input checked="" type="checkbox"/>	For conducted measurement.
<input type="checkbox"/>	The EUT supports single transmit chain and measurements performed on this transmit chain.
<input checked="" type="checkbox"/>	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
<input checked="" type="checkbox"/>	The EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
<input checked="" type="checkbox"/>	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.1.4 Test Setup





3.1.5 Test Result of Maximum Peak Conducted Output Power

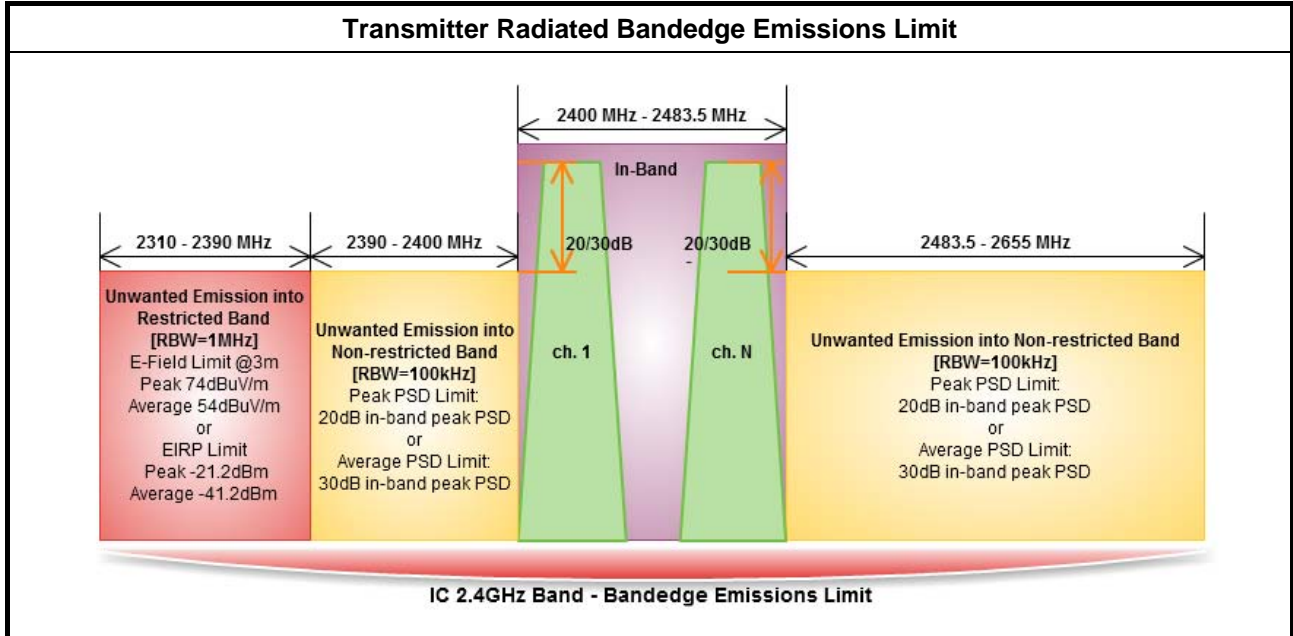
Maximum Peak Conducted Output Power Result									
Condition			RF Output Power (dBm)						
Modulation Mode	N _{TX}	Freq. (MHz)	Chain Port 1	Chain Port 2	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b	1	2412	21.35	-	21.35	30	1.87	23.22	36
11b	1	2437	20.38	-	20.38	30	1.87	22.25	36
11b	1	2462	20.42	-	20.42	30	1.87	22.29	36
11g	1	2412	22.98	-	22.98	30	1.87	24.85	36
11g	1	2437	25.65	-	25.65	30	1.87	27.52	36
11g	1	2462	24.36	-	24.36	30	1.87	26.23	36
HT20	2	2412	20.95	21.93	24.48	30	1.32	25.80	36
HT20	2	2437	24.48	24.89	27.70	30	1.32	29.02	36
HT20	2	2462	19.97	20.88	23.46	30	1.32	24.78	36
HT40	2	2422	18.74	20.76	22.88	30	1.32	24.20	36
HT40	2	2437	19.71	21.33	23.61	30	1.32	24.93	36
HT40	2	2452	17.04	19.60	21.52	30	1.32	22.84	36
Result			Complied						

3.1.6 Test Result of Maximum Conducted Output Power

Maximum Conducted Output Power									
Condition			RF Output Power (dBm)						
Modulation Mode	N _{TX}	Freq. (MHz)	Chain Port 1	Chain Port 2	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b	1	2412	17.64	-	17.64	30	1.87	18.25	36
11b	1	2437	16.38	-	16.38	30	1.87	18.32	36
11b	1	2462	16.45	-	16.45	30	1.87	13.72	36
11g	1	2412	11.85	-	11.85	30	1.87	20.72	36
11g	1	2437	18.85	-	18.85	30	1.87	15.45	36
11g	1	2462	13.58	-	13.58	30	1.87	14.29	36
HT20	2	2412	9.75	10.15	12.97	30	1.32	18.81	36
HT20	2	2437	14.24	14.71	17.49	30	1.32	13.29	36
HT20	2	2462	8.58	9.31	11.97	30	1.32	12.80	36
HT40	2	2422	7.61	9.18	11.48	30	1.32	13.79	36
HT40	2	2437	8.47	10.27	12.47	30	1.32	11.80	36
HT40	2	2452	6.43	8.31	10.48	30	1.32	18.25	36
Result			Complied						

3.2 Transmitter Bandedge Emissions

3.2.1 Transmitter Radiated Bandedge Emissions Limit



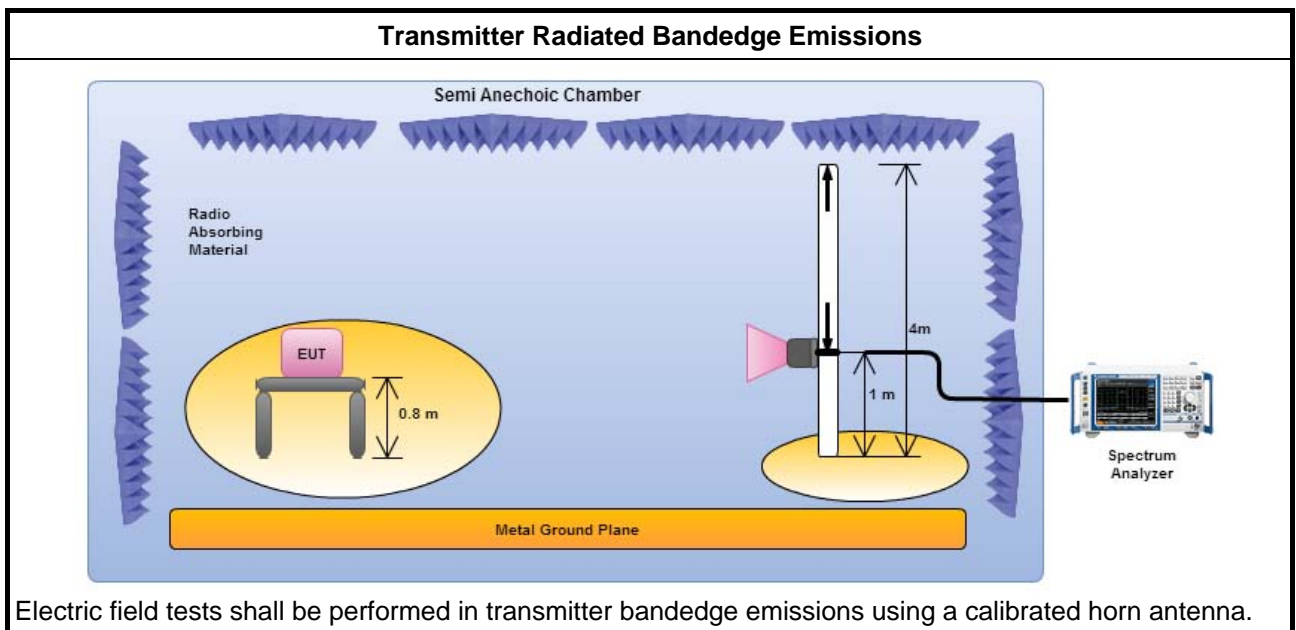
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
<input checked="" type="checkbox"/>	For the transmitter unwanted emissions shall be measured using following options below:
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle $\geq 98\%$)
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW $\geq 1/T$).
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit.
<input checked="" type="checkbox"/>	For the transmitter bandedge emissions shall be measured using following options below:
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.2 for band-edge testing.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements.
<input checked="" type="checkbox"/>	For radiated measurement, refer as FCC KDB 558074, clause 12.2.7 and ANSI C63.10, clause 6.6. Test distance is 3m.

3.2.4 Test Setup





3.2.5 Transmitter Radiated Bandedge Emissions

2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Non-restricted Band)								
Modulation	N _{TX}	Test Freq. (MHz)	In-band PSD [i] (dBuV/100kHz)	Freq. (MHz)	Out-band PSD [o] (dBuV/100kHz)	[i] – [o] (dB)	Limit (dB)	Pol.
11b	1	2412	108.84	2398.03	65.57	43.27	20	H
11b	1	2462	109.79	2503.80	62.64	47.15	20	H
11g	1	2412	101.16	2398.93	63.01	38.15	20	H
11g	1	2462	103.55	2501.50	53.73	49.82	20	H
HT20,M8-15	2	2412	99.92	2395.46	63.01	36.91	20	H
HT20,M8-15	2	2462	100.58	2501.40	62.76	37.82	20	H
HT40,M8-15	2	2422	95.06	2399.50	65.04	30.02	20	H
HT40,M8-15	2	2452	95.56	2514.44	62.88	32.68	20	H

Note 1: Measurement worst emissions of receive antenna polarization

2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Restricted Band)										
Modulation Mode	N _{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Freq. (MHz) AV	Level (dBuV/m) AV	Limit (dBuV/m) AV	Pol.
11b	1	2412	3	2389.18	63.37	74	2389.52	51.31	54	H
11b	1	2462	3	2483.80	63.63	74	2483.50	52.88	54	H
11g	1	2412	3	2389.63	73.65	74	2389.63	52.49	54	H
11g	1	2462	3	2483.90	72.93	74	2487.40	52.84	54	H
HT20,M8-15	2	2412	3	2389.07	67.21	74	2385.94	52.52	54	H
HT20,M8-15	2	2462	3	2487.50	66.79	74	2483.50	52.33	54	H
HT40,M8-15	2	2422	3	2382.60	65.22	74	2381.54	50.45	54	H
HT40,M8-15	2	2452	3	2494.76	68.70	74	2494.16	52.76	54	H

Note 1: Measurement worst emissions of receive antenna polarization.



3.3 Transmitter Unwanted Emissions

3.3.1 Transmitter Radiated Unwanted Emissions Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to 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.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to 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.

3.3.2 Measuring Instruments

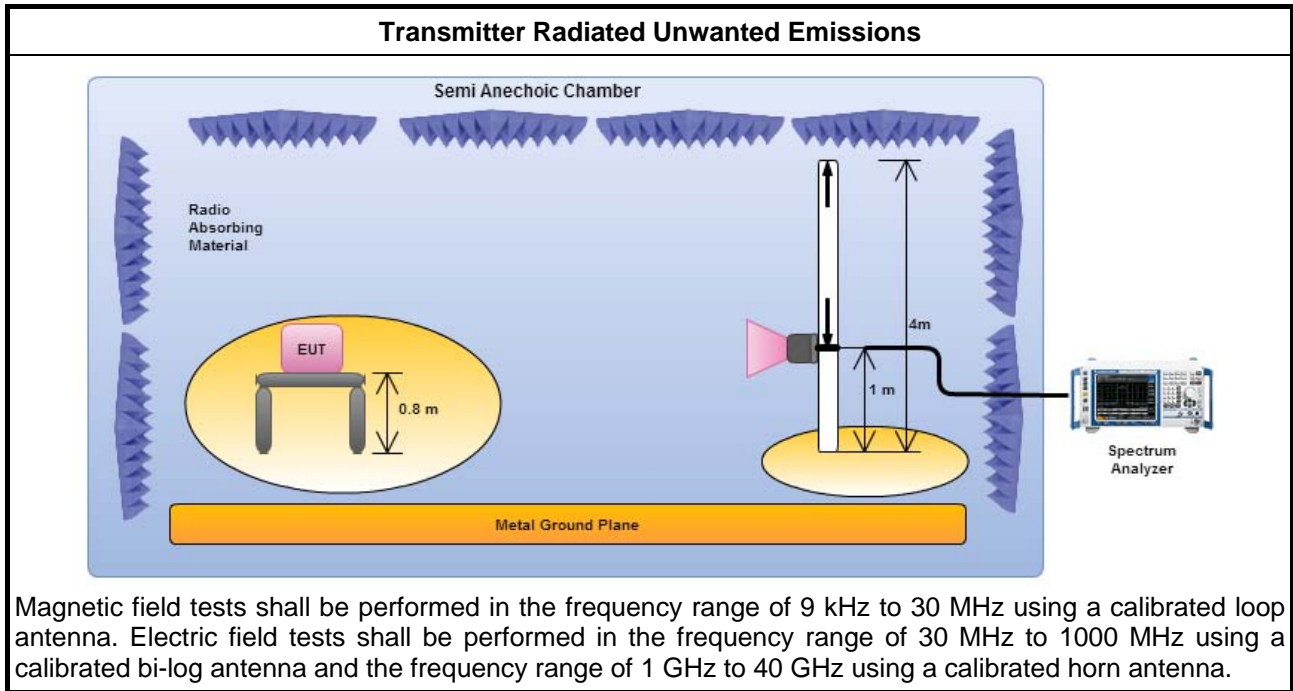
Refer a test equipment and calibration data table in this test report.



3.3.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
<input checked="" type="checkbox"/>	The average emission levels shall be measured in [duty cycle \geq 98 or duty factor].
<input checked="" type="checkbox"/>	For the transmitter unwanted emissions shall be measured using following options below:
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle \geq 98%)
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW \geq 1/T).
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW \geq 1/T, where T is pulse time.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 12.2.3 measurement procedure Quasi-Peak limit.
<input checked="" type="checkbox"/>	For radiated measurement, refer as FCC KDB 558074, clause 12.2.7.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m.
<input checked="" type="checkbox"/>	The any unwanted emissions level shall not exceed the fundamental emission level.
<input checked="" type="checkbox"/>	All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

3.3.4 Test Setup

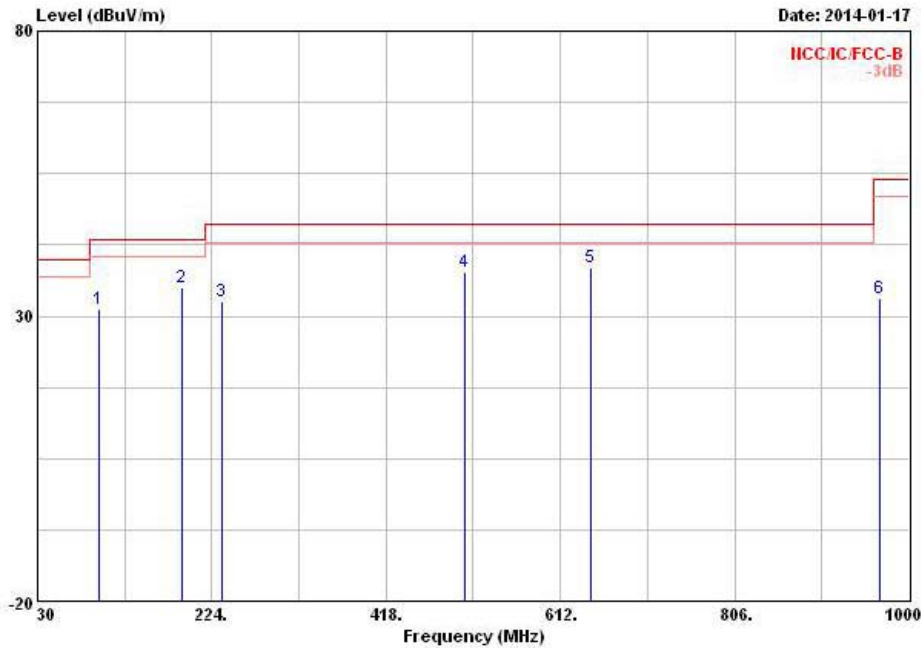


3.3.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

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

3.3.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Operating Mode	1	Polarization	V
Operating Function	AC Power & Radio link (WLAN)		



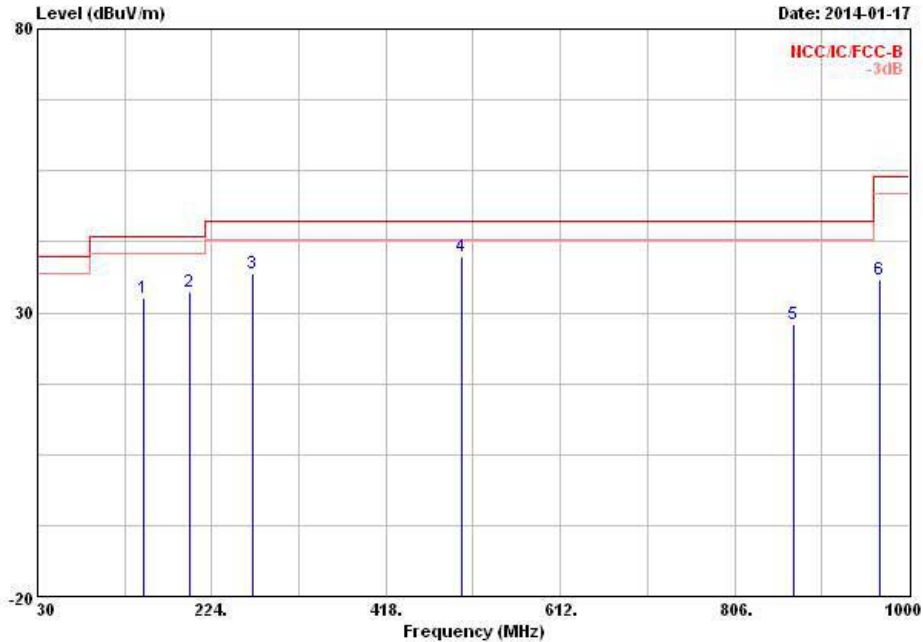
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	98.870	31.14	-12.36	43.50	46.17	10.78	1.58	27.39	Peak	---	---
2	191.020	34.97	-8.53	43.50	50.60	9.13	2.27	27.03	Peak	---	---
3	234.670	32.50	-13.50	46.00	45.75	11.10	2.53	26.88	Peak	---	---
4	506.270	37.74	-8.26	46.00	44.65	17.18	3.80	27.89	Peak	---	---
5	645.950	38.51	-7.49	46.00	43.38	18.77	4.33	27.97	Peak	---	---
6	967.990	33.17	-20.83	54.00	33.96	21.18	5.39	27.36	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)



Transmitter Radiated Unwanted Emissions (Below 1GHz)

Operating Mode	1	Polarization	H
Operating Function	AC Power & Radio link (WLAN)		



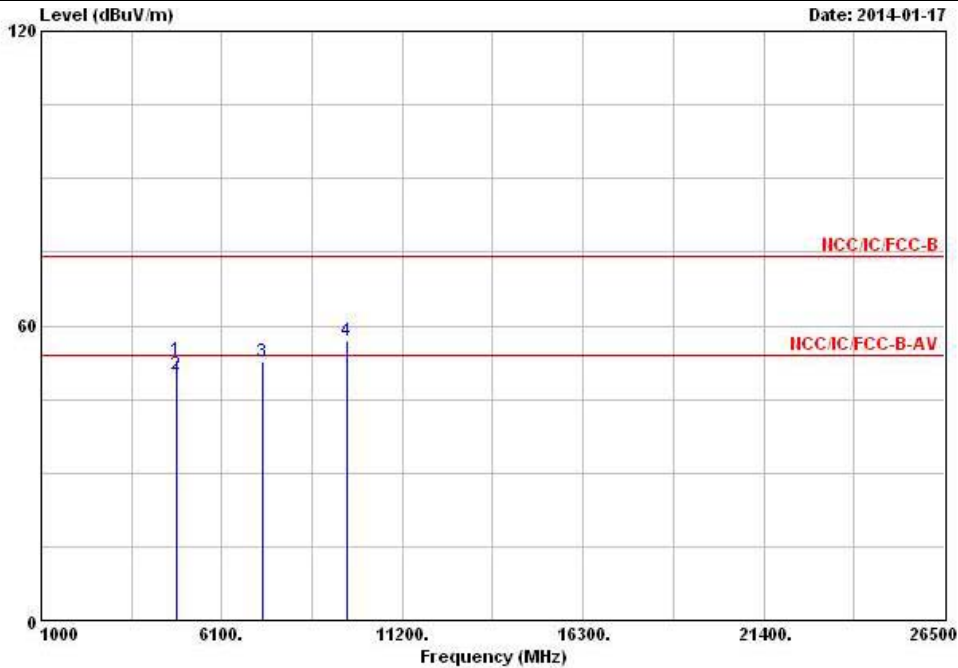
Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg
1 @ 148.340	32.64	-10.86	43.50	47.15	10.68	2.01	27.20	Peak	---	---
2 @ 199.750	33.59	-9.91	43.50	49.02	9.24	2.33	27.00	Peak	---	---
3 @ 269.590	36.86	-9.14	46.00	47.90	12.99	2.73	26.76	Peak	---	---
4 @ 501.420	40.02	-5.98	46.00	46.97	17.15	3.78	27.88	Peak	---	---
5 @ 870.990	27.87	-18.13	46.00	29.90	20.55	5.04	27.62	Peak	---	---
6 @ 967.990	35.74	-18.26	54.00	36.53	21.18	5.39	27.36	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)



3.3.7 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11b	Test Freq. (MHz)	2412
N _{TX}	1	Polarization	V



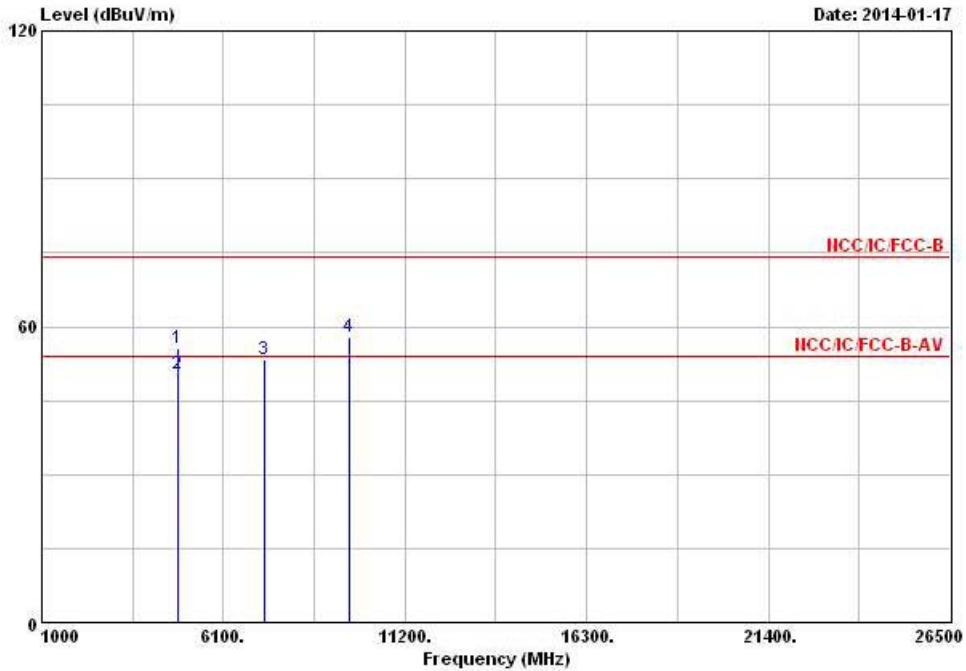
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	53.12	-20.88	74.00	46.75	33.09	5.71	32.43	Peak	---	---
2	4824.000	50.20	-3.80	54.00	43.83	33.09	5.71	32.43	Average	---	---
3	7236.000	52.55			42.09	35.88	7.23	32.65	Peak	---	---
4	9648.000	57.07			43.04	38.34	8.79	33.10	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (112.94 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11b	Test Freq. (MHz)	2412
N _{TX}	1	Polarization	H



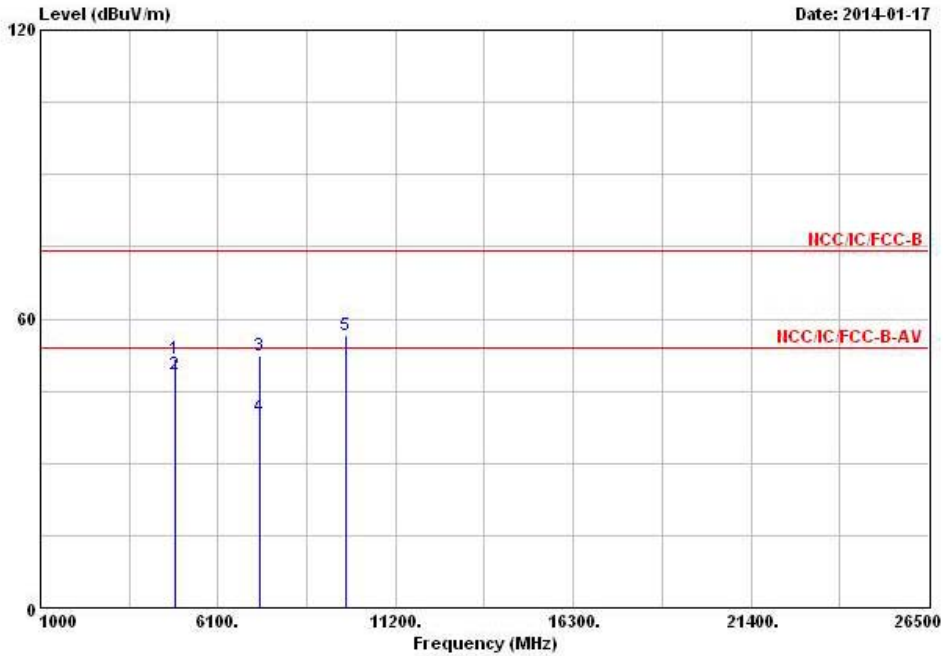
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	55.73	-18.27	74.00	49.36	33.09	5.71	32.43	Peak	---	---
2 @	4824.000	50.25	-3.75	54.00	43.88	33.09	5.71	32.43	Average	---	---
3	7236.000	53.21			42.75	35.88	7.23	32.65	Peak	---	---
4	9648.000	57.92			43.89	38.34	8.79	33.10	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (112.94 dBUV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11b	Test Freq. (MHz)	2437
N _{TX}	1	Polarization	V



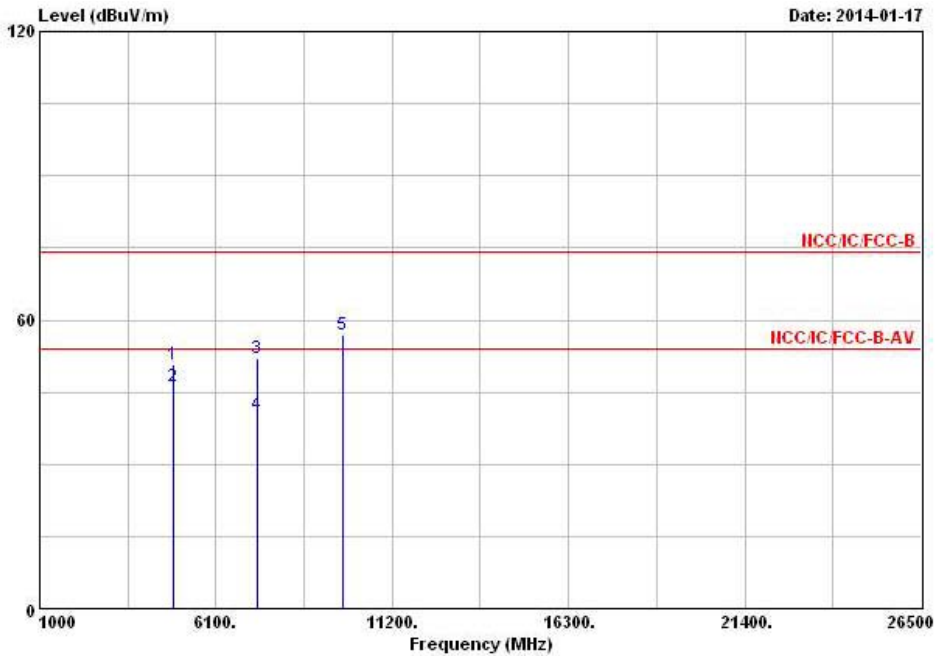
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	51.80	-22.20	74.00	45.32	33.18	5.72	32.42	Peak	---	---
2	4874.000	48.58	-5.42	54.00	42.10	33.18	5.72	32.42	Average	---	---
3	7311.000	52.26	-21.74	74.00	41.60	36.04	7.28	32.66	Peak	---	---
4	7311.000	39.57	-14.43	54.00	28.91	36.04	7.28	32.66	Average	---	---
5	9748.000	56.71			42.45	38.57	8.77	33.08	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (111.33 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11b	Test Freq. (MHz)	2437
N _{TX}	1	Polarization	H



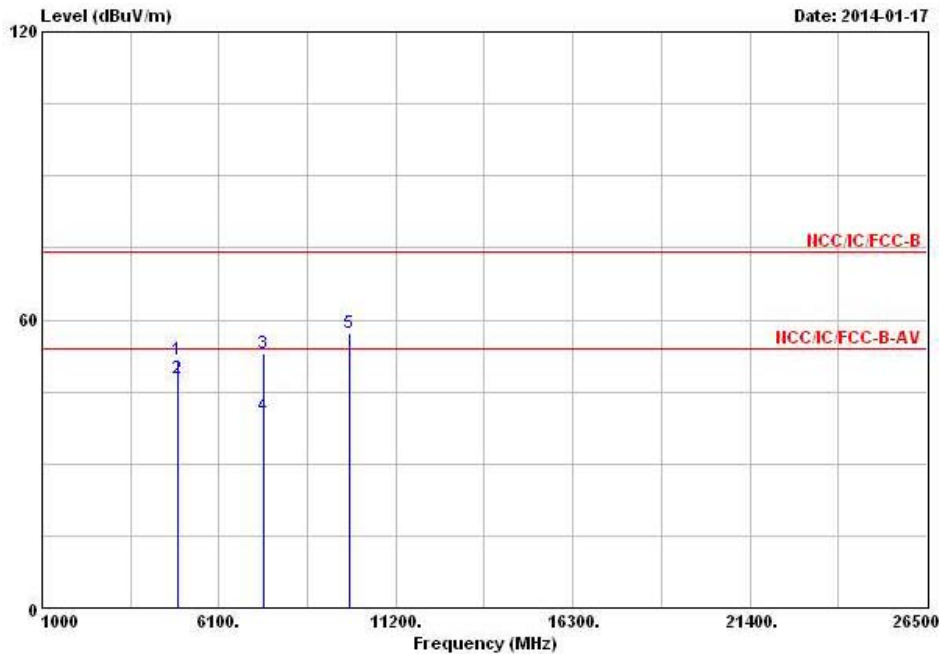
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	4874.000	50.70	-23.30	74.00	44.22	33.18	5.72	32.42	Peak	---
2 @	4874.000	46.32	-7.68	54.00	39.84	33.18	5.72	32.42	Average	---
3	7311.000	51.99	-22.01	74.00	41.33	36.04	7.28	32.66	Peak	---
4	7311.000	40.27	-13.73	54.00	29.61	36.04	7.28	32.66	Average	---
5	9748.000	56.93			42.67	38.57	8.77	33.08	Peak	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (111.33 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11b	Test Freq. (MHz)	2462
N _{TX}	1	Polarization	V



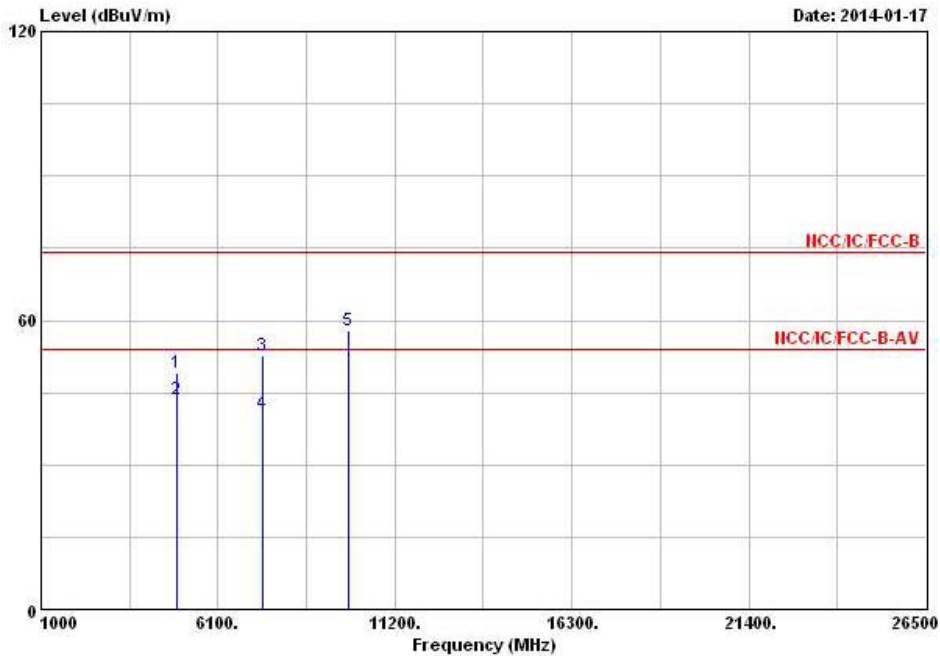
Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Remark	Ant	Table
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1	4924.000	51.68	-22.32	74.00	45.07	33.28	5.74 32.41 Peak	---	---
2	4924.000	47.76	-6.24	54.00	41.15	33.28	5.74 32.41 Average	---	---
3	7386.000	52.91	-21.09	74.00	42.01	36.25	7.34 32.69 Peak	---	---
4	7386.000	40.04	-13.96	54.00	29.14	36.25	7.34 32.69 Average	---	---
5	9848.000	57.29			42.87	38.76	8.74 33.08 Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (112.47 dBuV/m).
 Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11b	Test Freq. (MHz)	2462
N _{TX}	1	Polarization	H



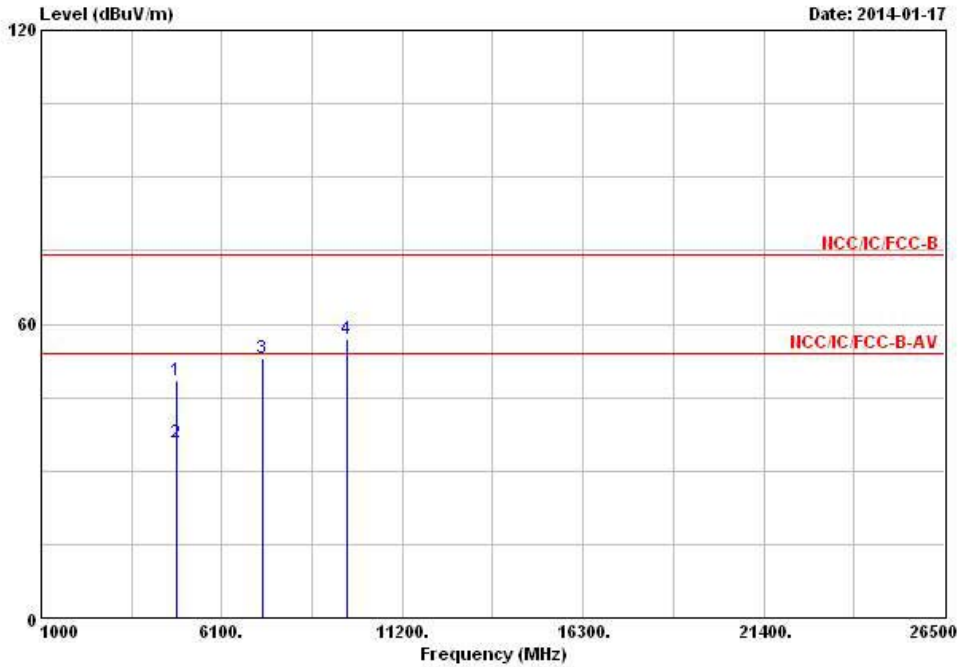
Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Remark	Ant	Table		
MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos		
		dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		
1	4924.000	49.26	-24.74	74.00	42.65	33.28	5.74	32.41	Peak	---	---
2	4924.000	43.54	-10.46	54.00	36.93	33.28	5.74	32.41	Average	---	---
3	7386.000	52.81	-21.19	74.00	41.91	36.25	7.34	32.69	Peak	---	---
4	7386.000	40.52	-13.48	54.00	29.62	36.25	7.34	32.69	Average	---	---
5	9848.000	57.80			43.38	38.76	8.74	33.08	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (112.47 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11g	Test Freq. (MHz)	2412
N _{TX}	1	Polarization	V



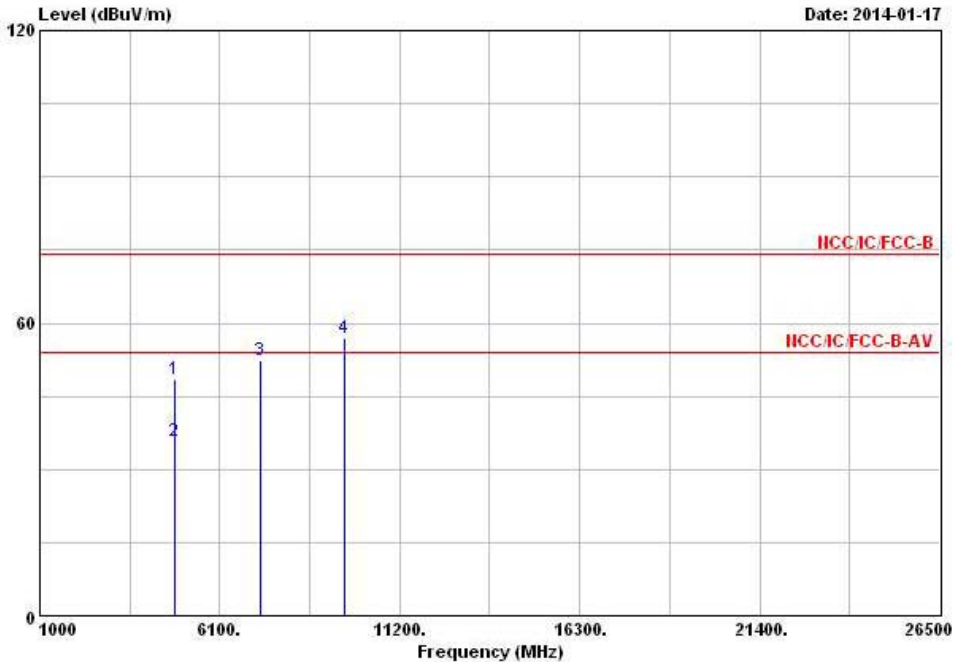
Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	48.34	-25.66	74.00	41.97	33.09	5.71	32.43 Peak	---	---
2	4824.000	35.86	-18.14	54.00	29.49	33.09	5.71	32.43 Average	---	---
3	7236.000	53.02			42.56	35.88	7.23	32.65 Peak	---	---
4	9648.000	56.96			42.93	38.34	8.79	33.10 Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (111.63 dBUV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11g	Test Freq. (MHz)	2412
N _{TX}	1	Polarization	H



Date: 2014-01-17

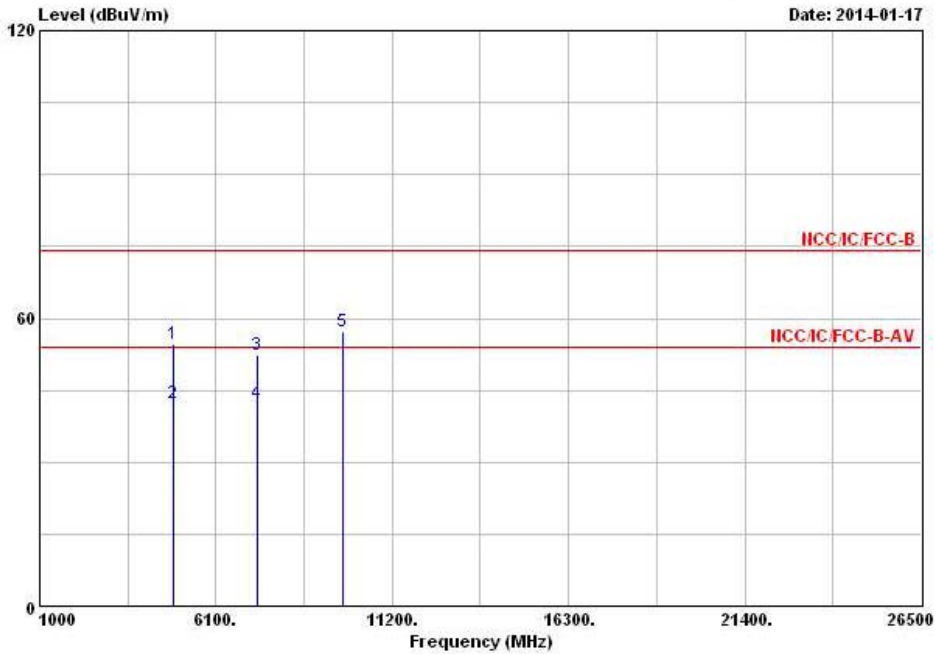
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	48.55	-25.45	74.00	42.18	33.09	5.71	32.43	Peak	---	---
2	4824.000	35.70	-18.30	54.00	29.33	33.09	5.71	32.43	Average	---	---
3	7236.000	52.38			41.92	35.88	7.23	32.65	Peak	---	---
4	9648.000	56.84			42.81	38.34	8.79	33.10	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (111.63 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11g	Test Freq. (MHz)	2437
N _{TX}	1	Polarization	V



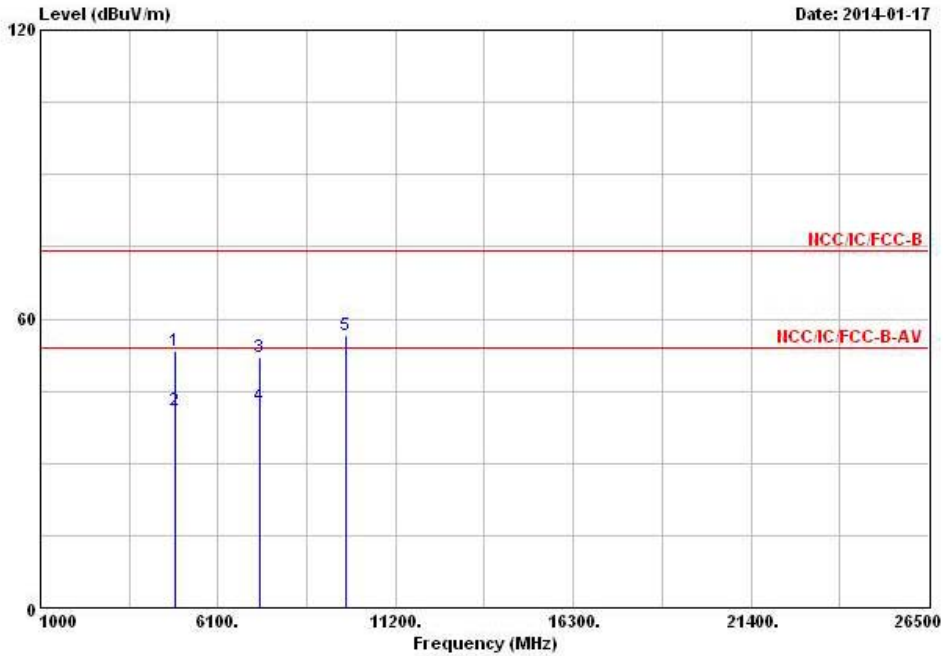
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	54.73	-19.27	74.00	48.25	33.18	5.72	32.42	Peak	---	---
2	4874.000	42.39	-11.61	54.00	35.91	33.18	5.72	32.42	Average	---	---
3	7311.000	52.27	-21.73	74.00	41.61	36.04	7.28	32.66	Peak	---	---
4	7311.000	42.30	-11.70	54.00	31.64	36.04	7.28	32.66	Average	---	---
5	9748.000	57.31			43.05	38.57	8.77	33.08	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (118.13 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11g	Test Freq. (MHz)	2437
N _{TX}	1	Polarization	H



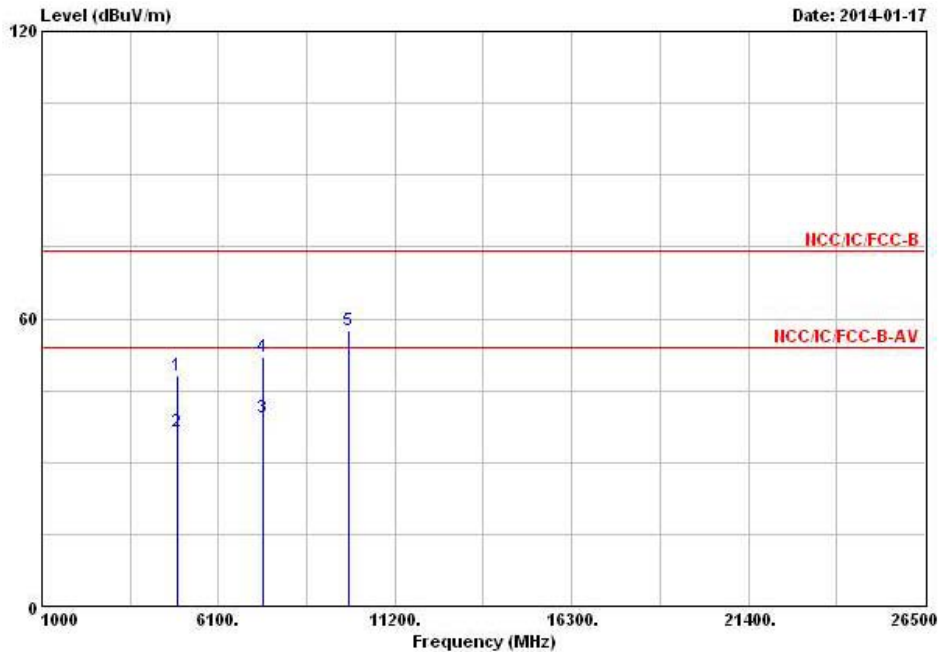
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	53.22	-20.78	74.00	46.74	33.18	5.72	32.42	Peak	---	---
2	4874.000	41.07	-12.93	54.00	34.59	33.18	5.72	32.42	Average	---	---
3	7311.000	52.03	-21.97	74.00	41.37	36.04	7.28	32.66	Peak	---	---
4	7311.000	41.92	-12.08	54.00	31.26	36.04	7.28	32.66	Average	---	---
5	9748.000	56.64			42.38	38.57	8.77	33.08	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (118.13 dBuV/m).
 Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11g	Test Freq. (MHz)	2462
N _{TX}	1	Polarization	V



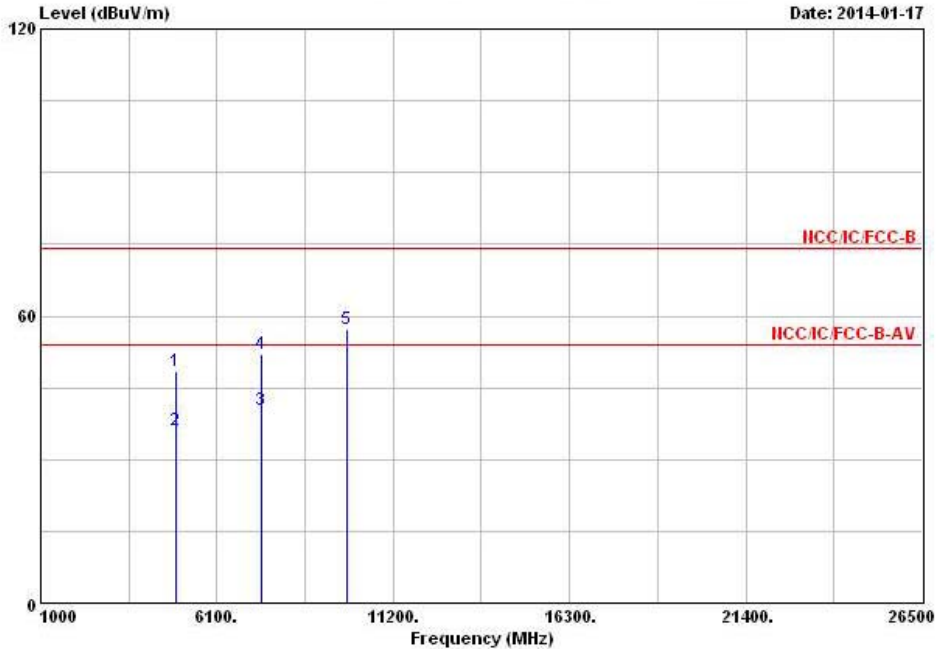
Peak	Freq (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Remark	Ant Pos (cm)	Table Pos (deg)
1	4924.000	48.22	-25.78	74.00	41.61	33.28	5.74	32.41	Peak	---	---
2	4924.000	36.33	-17.67	54.00	29.72	33.28	5.74	32.41	Average	---	---
3	7386.000	39.22	-14.78	54.00	28.32	36.25	7.34	32.69	Average	---	---
4	7386.000	52.19	-21.81	74.00	41.29	36.25	7.34	32.69	Peak	---	---
5	9848.000	57.45			43.03	38.76	8.74	33.08	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (114.07 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	11g	Test Freq. (MHz)	2462
N _{TX}	1	Polarization	H



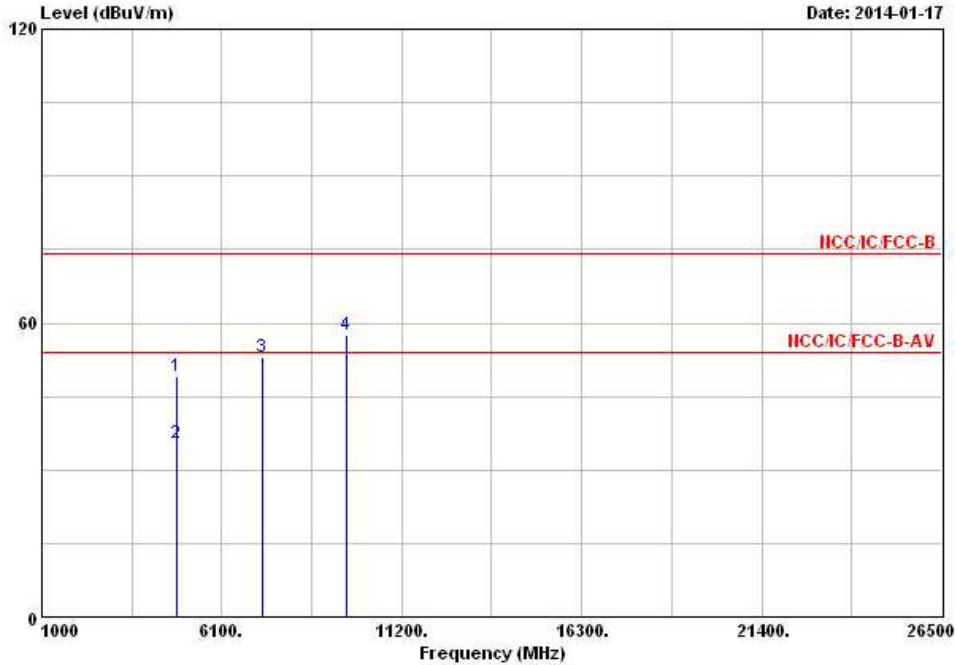
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1	4924.000	48.50	-25.50	74.00	41.89	33.28	5.74	32.41 Peak	---	---
2	4924.000	36.19	-17.81	54.00	29.58	33.28	5.74	32.41 Average	---	---
3	7386.000	40.27	-13.73	54.00	29.37	36.25	7.34	32.69 Average	---	---
4	7386.000	52.15	-21.85	74.00	41.25	36.25	7.34	32.69 Peak	---	---
5	9848.000	57.35			42.93	38.76	8.74	33.08 Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (114.07 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT20	Test Freq. (MHz)	2412
N _{TX}	2	Polarization	V



Date: 2014-01-17

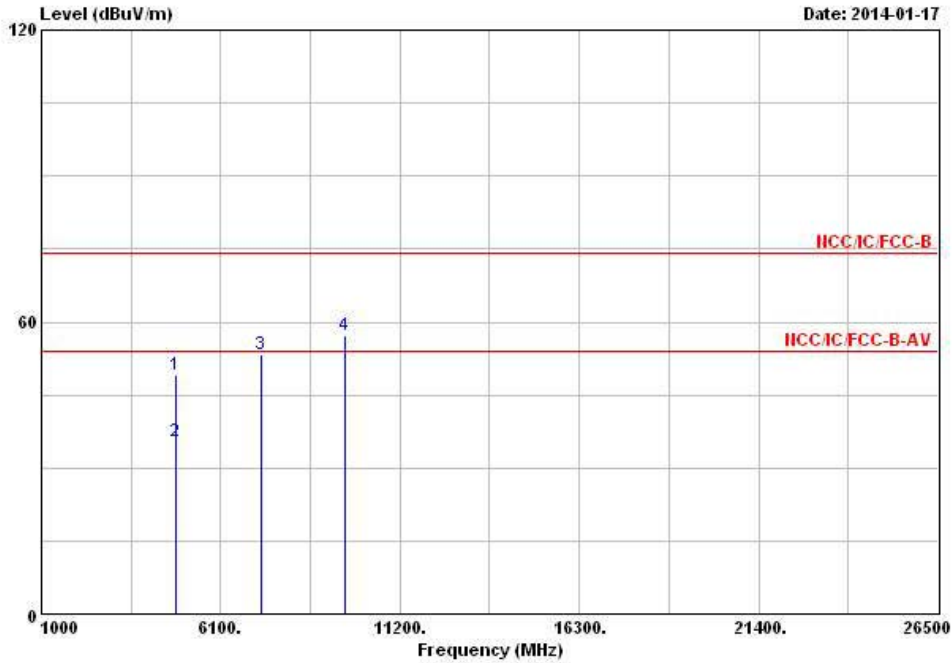
Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	49.03	-24.97	74.00	42.66	33.09	5.71	32.43 Peak	---	---
2	4824.000	35.37	-18.63	54.00	29.00	33.09	5.71	32.43 Average	---	---
3	7236.000	52.93			42.47	35.88	7.23	32.65 Peak	---	---
4	9648.000	57.44			43.41	38.34	8.79	33.10 Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (110.15 dBUV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT20	Test Freq. (MHz)	2412
N _{TX}	2	Polarization	H



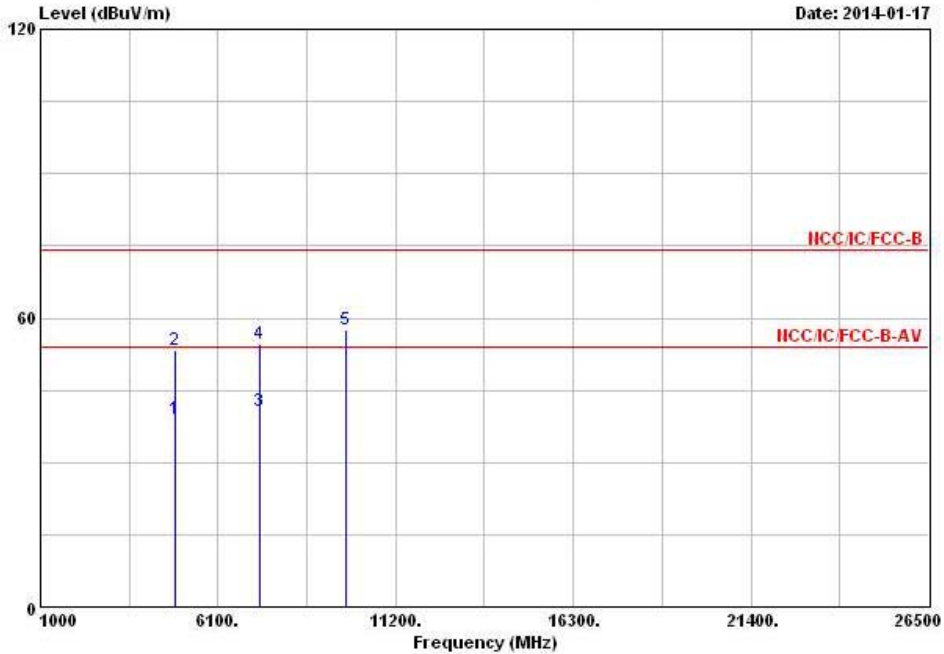
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	49.21	-24.79	74.00	42.84	33.09	5.71	32.43	Peak	---	---
2	4824.000	35.56	-18.44	54.00	29.19	33.09	5.71	32.43	Average	---	---
3	7236.000	53.28			42.82	35.88	7.23	32.65	Peak	---	---
4	9648.000	57.30			43.27	38.34	8.79	33.10	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (110.15 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT20	Test Freq. (MHz)	2437
N _{TX}	2	Polarization	V



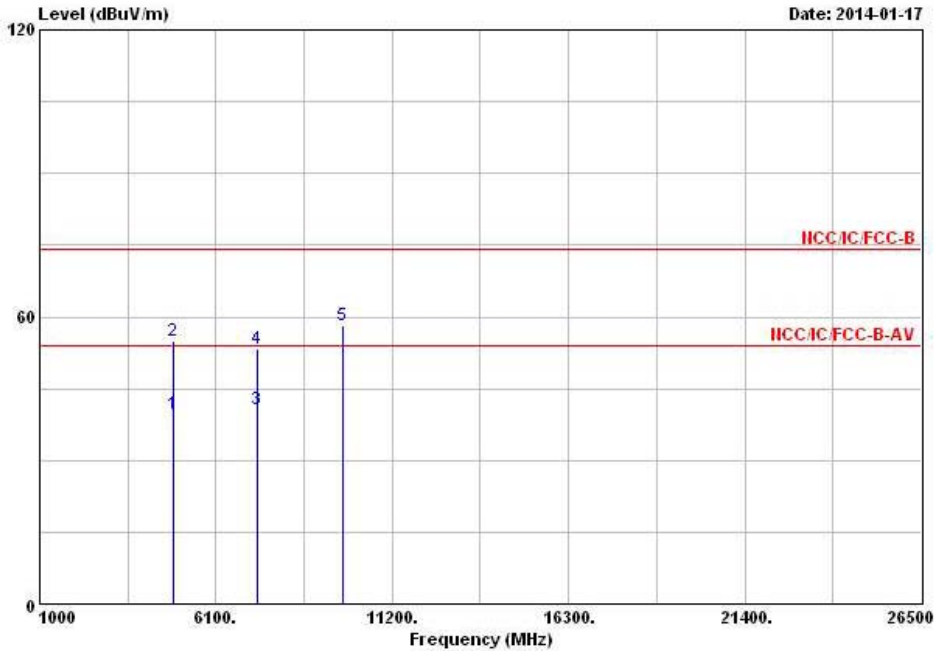
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4878.000	38.95	-15.05	54.00	32.47	33.18	5.72	32.42	Average	---	---
2	4878.000	53.45	-20.55	74.00	46.97	33.18	5.72	32.42	Peak	---	---
3	7311.000	40.70	-13.30	54.00	30.04	36.04	7.28	32.66	Average	---	---
4	7311.000	54.70	-19.30	74.00	44.04	36.04	7.28	32.66	Peak	---	---
5	9748.000	57.66			43.40	38.57	8.77	33.08	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (114.14 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT20	Test Freq. (MHz)	2437
N _{TX}	2	Polarization	H



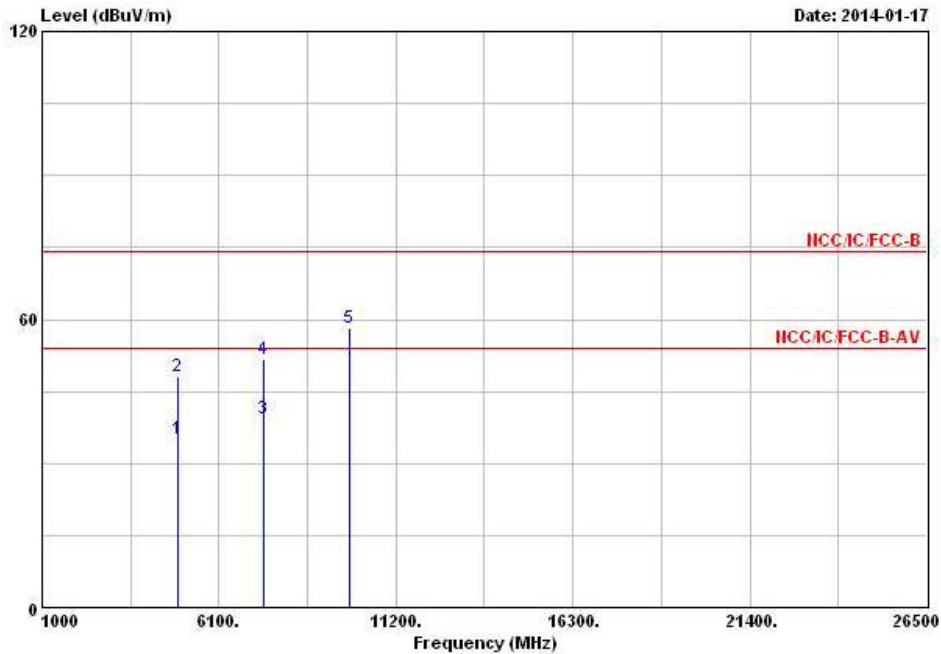
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	39.79	-14.21	54.00	33.31	33.18	5.72	32.42	Average	---	---
2	4874.000	54.90	-19.10	74.00	48.42	33.18	5.72	32.42	Peak	---	---
3	7311.000	40.61	-13.39	54.00	29.95	36.04	7.28	32.66	Average	---	---
4	7311.000	53.42	-20.58	74.00	42.76	36.04	7.28	32.66	Peak	---	---
5	9748.000	58.35			44.09	38.57	8.77	33.08	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (114.14 dBuV/m).
 Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT20	Test Freq. (MHz)	2462
N _{TX}	2	Polarization	V



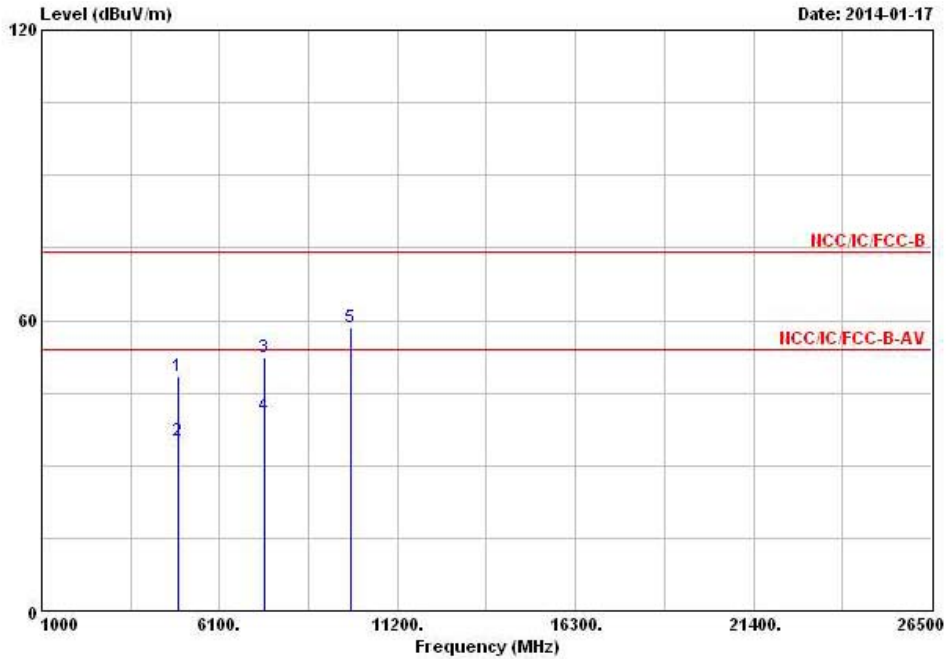
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	4924.000	35.22	-18.78	54.00	28.61	33.28	5.74	32.41	Average	---
2	4924.000	48.15	-25.85	74.00	41.54	33.28	5.74	32.41	Peak	---
3	7386.000	39.22	-14.78	54.00	28.32	36.25	7.34	32.69	Average	---
4	7386.000	51.74	-22.26	74.00	40.84	36.25	7.34	32.69	Peak	---
5	9848.000	58.26			43.84	38.76	8.74	33.08	Peak	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (110.52 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT20	Test Freq. (MHz)	2462
N _{TX}	2	Polarization	H



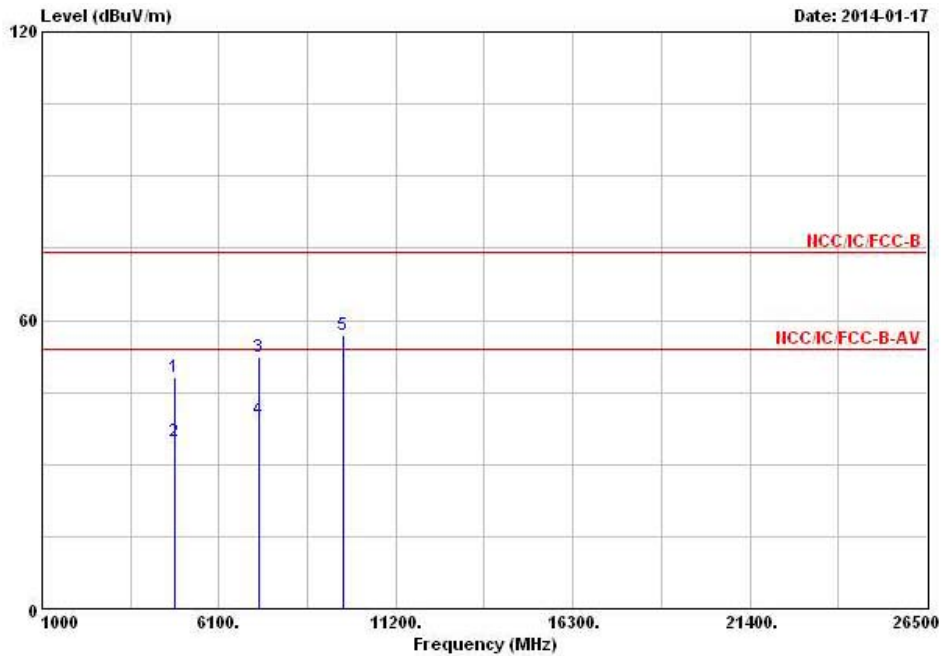
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4924.000	48.53	-25.47	74.00	41.92	33.28	5.74	32.41	Peak	---	---
2	4924.000	35.28	-18.72	54.00	28.67	33.28	5.74	32.41	Average	---	---
3	7386.000	52.26	-21.74	74.00	41.36	36.25	7.34	32.69	Peak	---	---
4	7386.000	40.38	-13.62	54.00	29.48	36.25	7.34	32.69	Average	---	---
5	9848.000	58.39			43.97	38.76	8.74	33.08	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (110.52 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	2422
N _{TX}	2	Polarization	V



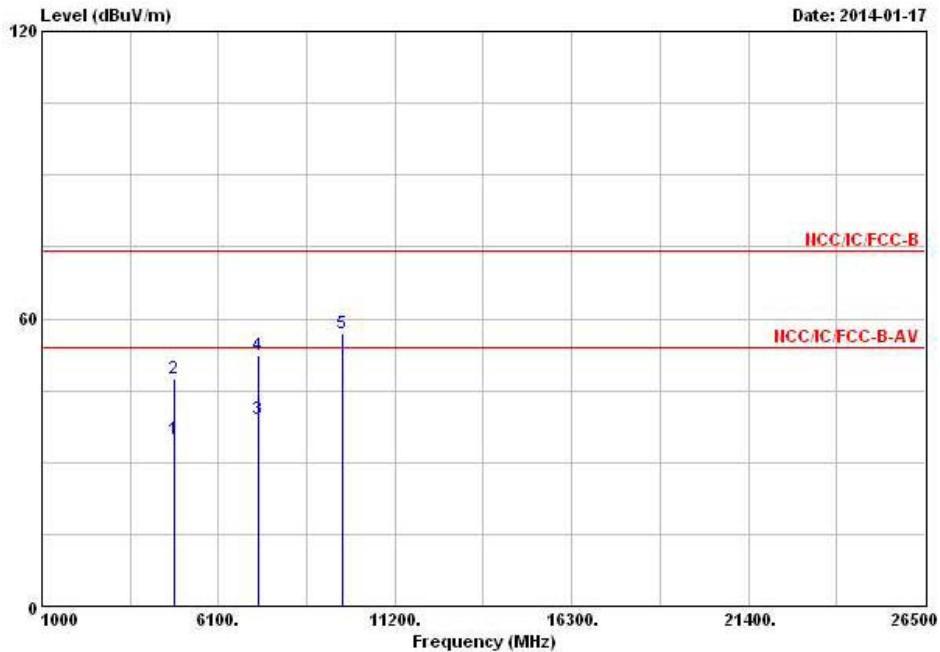
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	4844.000	48.23	-25.77	74.00	41.82	33.12	5.72	32.43	Peak	---
2	4844.000	34.77	-19.23	54.00	28.36	33.12	5.72	32.43	Average	---
3	7266.000	52.34	-21.66	74.00	41.79	35.96	7.25	32.66	Peak	---
4	7266.000	39.23	-14.77	54.00	28.68	35.96	7.25	32.66	Average	---
5	9688.000	56.93			42.82	38.42	8.78	33.09	Peak	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (104.19 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	2422
N _{TX}	2	Polarization	H



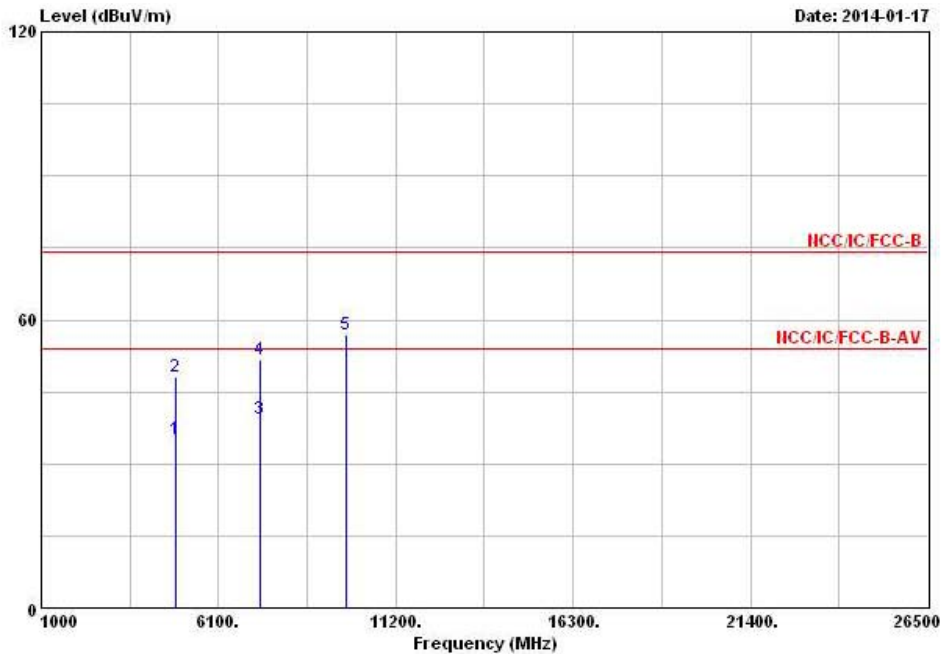
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4844.000	34.82	-19.18	54.00	28.41	33.12	5.72	32.43	Average	---	---
2	4844.000	47.53	-26.47	74.00	41.12	33.12	5.72	32.43	Peak	---	---
3	7266.000	39.08	-14.92	54.00	28.53	35.96	7.25	32.66	Average	---	---
4	7266.000	52.35	-21.65	74.00	41.80	35.96	7.25	32.66	Peak	---	---
5	9688.000	57.02			42.91	38.42	8.78	33.09	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (104.19 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	2437
N _{TX}	2	Polarization	V



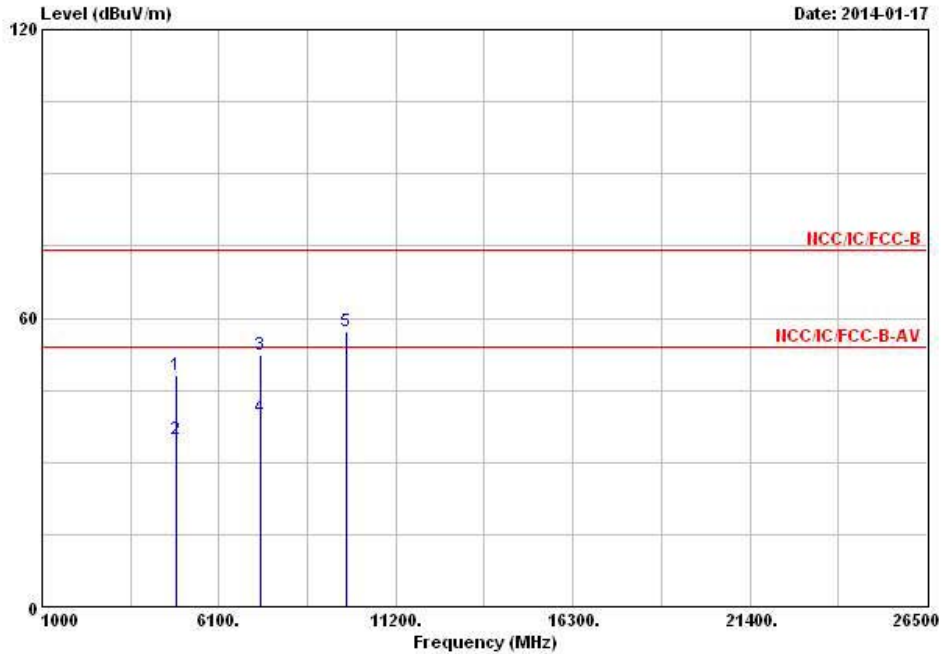
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Remark	Ant	Table	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg	
1	4874.000	34.98	-19.02	54.00	28.50	33.18	5.72	32.42	Average	---	---
2	4874.000	48.08	-25.92	74.00	41.60	33.18	5.72	32.42	Peak	---	---
3	7311.000	39.31	-14.69	54.00	28.65	36.04	7.28	32.66	Average	---	---
4	7311.000	51.77	-22.23	74.00	41.11	36.04	7.28	32.66	Peak	---	---
5	9748.000	56.88			42.62	38.57	8.77	33.08	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (105.50 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	2437
N _{TX}	2	Polarization	H



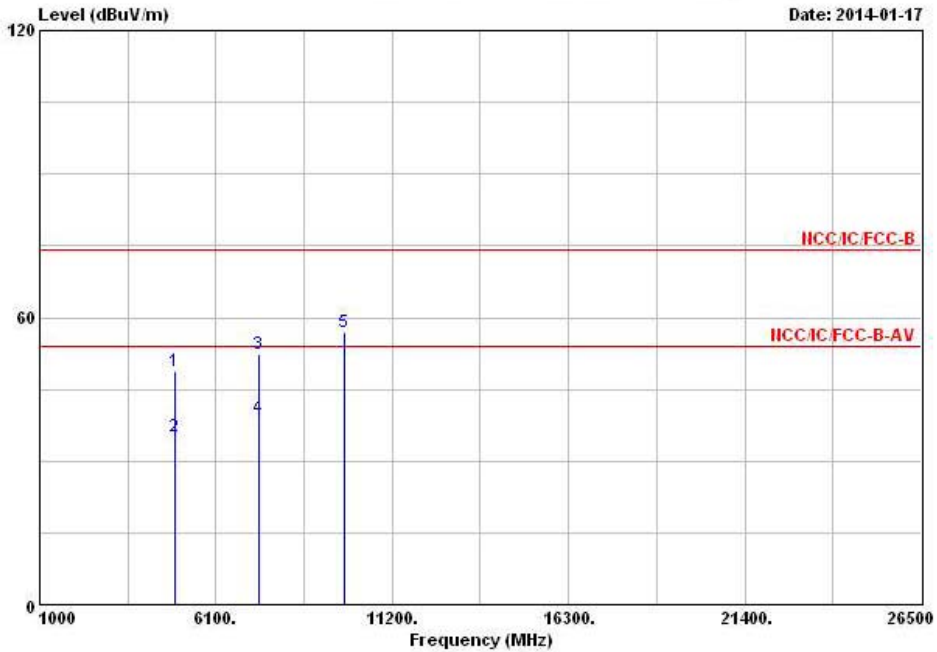
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1	4874.000	48.27	-25.73	74.00	41.79	33.18	5.72	32.42	Peak	---
2	4874.000	34.87	-19.13	54.00	28.39	33.18	5.72	32.42	Average	---
3	7311.000	52.28	-21.72	74.00	41.62	36.04	7.28	32.66	Peak	---
4	7311.000	39.37	-14.63	54.00	28.71	36.04	7.28	32.66	Average	---
5	9748.000	57.23			42.97	38.57	8.77	33.08	Peak	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (105.50 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	2452
N _{TX}	2	Polarization	V



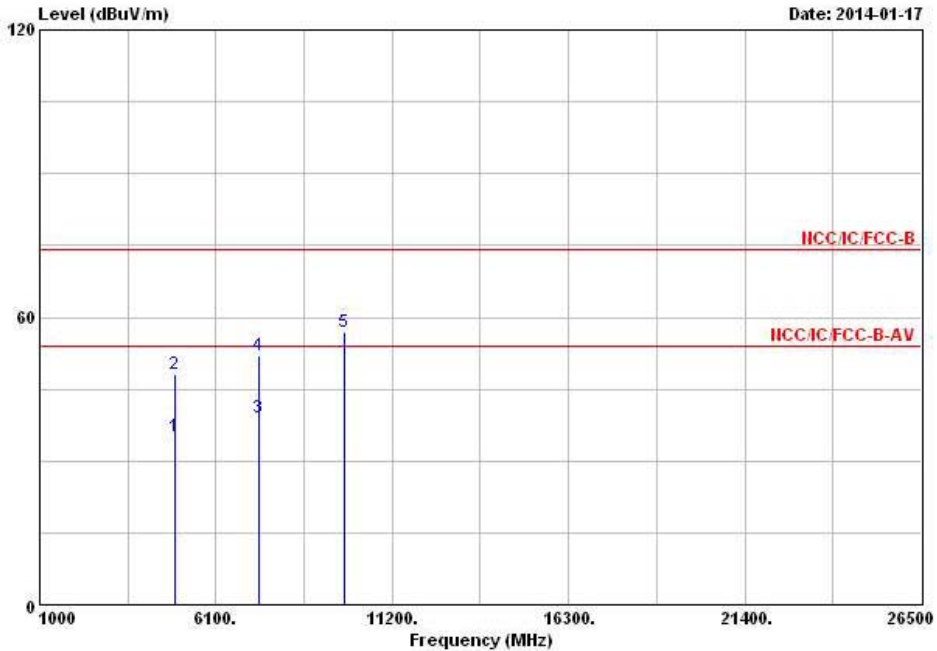
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4904.000	48.62	-25.38	74.00	42.07	33.24	5.73	32.42	Peak	---	---
2	4904.000	35.22	-18.78	54.00	28.67	33.24	5.73	32.42	Average	---	---
3	7356.000	52.49	-21.51	74.00	41.69	36.17	7.31	32.68	Peak	---	---
4	7356.000	39.10	-14.90	54.00	28.30	36.17	7.31	32.68	Average	---	---
5	9808.000	57.00			42.65	38.68	8.75	33.08	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (105.16 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	2452
N _{TX}	2	Polarization	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4904.000	35.17	-18.83	54.00	28.62	33.24	5.73	32.42	Average	---	---
2	4904.000	48.18	-25.82	74.00	41.63	33.24	5.73	32.42	Peak	---	---
3	7356.000	39.04	-14.96	54.00	28.24	36.17	7.31	32.68	Average	---	---
4	7356.000	52.01	-21.99	74.00	41.21	36.17	7.31	32.68	Peak	---	---
5	9808.000	56.82			42.47	38.68	8.75	33.08	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (105.16 dBuV/m).
- Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9KHz ~ 40GHz	Jun. 07, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz ~ 40GHz	Aug. 17, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz ~ 40GHz	Aug. 17, 2013	Conducted (TH02-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Nov. 30, 2013	Radiation (03CH03-HY)
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	May 03, 2013	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1GHz ~ 26.5GHz	Aug. 20, 2013	Radiation (03CH03-HY)
Spectrum	R&S	FSP40	100004	9kHz ~ 40GHz	Mar. 11, 2013	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30MHz ~ 1GHz	Sep. 21, 2013	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	May 31, 2013	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz ~ 40GHz	Jan. 10, 2014	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 16, 2013	Radiation (03CH03-HY)
RF Cable-high	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz ~ 40GHz	Dec. 11, 2013	Radiation (03CH03-HY)
Turn Table	EM Electronics	EM Electronics	060615	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	MF	MF-7802	MF780208179	1 ~ 4 m	N/A	Radiation (03CH03-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	Dec. 02, 2012	Radiation (03CH03-HY)

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