

FCC Test Report

FCC ID	:	PY312400222
Equipment	:	ProSAFE® Single Band 802.11n Wireless Access point
Model No.	:	WN203
Brand Name	:	NETGEAR
Applicant	:	NETGEAR, Inc.
Address	:	350 East Plumeria Drive, San Jose, California 95134, USA
Standard	:	47 CFR FCC Part 15.247
Received Date	:	Apr. 25, 2013
Tested Date	:	Apr. 25 ~ May 07, 2013

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:

Gary Chang / Manager





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Release Record

Report No.	Version	Description	Issued Date
FR341901	Rev. 01	Initialissue	May 15, 2013



Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.360MHz 49.04 (Margin -9.70dB) - QP	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2483.50MHz 73.98 (Margin -0.02dB) - Peak	Pass
15.247(b)(3)	Fundamental Emission Output Power	Power[dBm]: 11b: 24.32 11g: 23.72 HT20: 22.90 HT40: 15.74	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass



1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information								
Frequency Range (MHz)	IEEE Std. 802.11	Transmit Chains (Ν _{TX})	Data Rate / MCS					
2400-2483.5	b	2412-2462	1-11 [11]	2	1-11 Mbps			
2400-2483.5	g	2412-2462	1-11 [11]	2	6-54 Mbps			
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	MCS 0-15			
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	2	MCS 0-15			

Note 1: RF output power specifies that Maximum Conducted (Average) 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.

1.1.2 Antenna Details

Ant. No.	Туре	Gain (dBi)	Connector	Remark
1	PCB	2.4		
2	PCB	3		
3	Dipole	3	R-SMA	Optional, thisantenna will not be sold with thisdevice.

1.1.3 EUT Operational Condition

Supply Voltage	⊠	AC mains	DC	
Type of DC Source		Internal DC supply	External DC adapter	Battery



1.1.4 Accessories

	Accessories						
No.	Equipment	Description					
		Brand Name: NETGEAR					
		Model Name: SAL012F1 NA					
1	AC Adapter 1	P/N: 332-10366-01					
		Power Rating: I/P: 100-120Vac, 47-63Hz, 0.6A O/P: 12Vdc, 1A					
		PowerLine: 1.8m non-shielded cable w/o core					
		Brand Name: NETGEAR					
		Model Name: AD810F10					
2	AC Adapter 2	P/N: 332-10329-02					
		Power Rating: I/P: 100-120Vac, 50-60Hz, 0.3A O/P: 12Vdc, 1A					
		PowerLine: 1.85m non-shielded cable w/o core					
3	RJ45 cable	1.5m non-shielded w/o core.					

1.1.5 Channel List

Frequenc	y band (MHz)	2400	~2483.5	
802.11 b	/ g / n HT20	802.11n HT40		
Channel	Frequency(MHz)	Channel	Frequency(MHz)	
1	2412	3	2422	
2	2417	4	2427	
3	2422	5	2432	
4	2427	6	2437	
5	2432	7	2442	
6	2437	8	2447	
7	2442	9	2452	
8	2447			
9	2452			
10	2457			
11	2462			



1.1.6 Test Tool and Duty Cycle

Test tool art2_ver_2_28_6	
Duty Cycle Of Test Signal (%)	99.82% - IEEE 802.11b 98.46% - IEEE 802.11g 98.35% - IEEE 802.11n (HT20) 94.83% - IEEE 802.11n (HT40)
Duty Factor	0.01 - IEEE 802.11b 0.07 - IEEE 802.11g 0.07 - IEEE 802.11n (HT20) 0.23 - IEEE 802.11n (HT40)

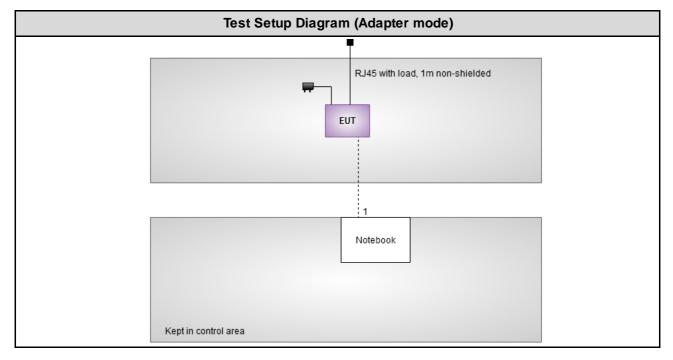
1.2 Local Support Equipment List

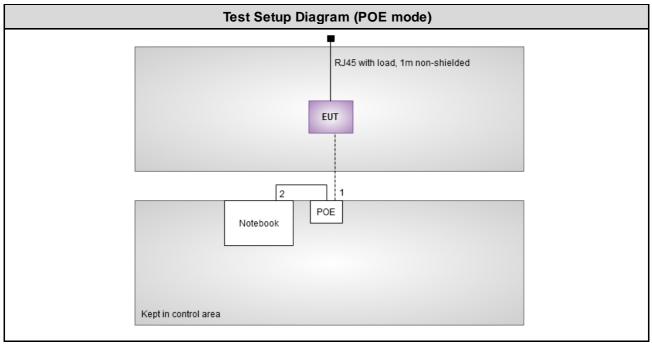
	Support Equipment List								
No.	Equipment	Signal cable / Length (m)							
1	Notebook	DELL	E5420	B6FDBT1	DoC	 RJ45 1.5m non-shielded w/o core. RJ45, 10m non-shielded w/o core. 			
2	PoE	PowerDsine	PD-3001G C/AC						

Note: Item 2 was provided by client.



1.3 Test Setup Chart







1.4 The Equipment List

Test Item	Conducted Emission								
Test Site	Conduction room 1 / (CO01-WS)								
Instrument	Manufacturer Model No. Serial No. Calibration Date Calibration Unti								
EMC Receiver	R&S	ESCS 30	100169	Dec. 12, 2012	Dec. 11, 2013				
LISN	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-667	Dec. 04, 2012	Dec. 03, 2013				
LISN (Support Unit)	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-666	Dec. 04, 2012	Dec. 03, 2013				
ISN	TESEQ	ISN T800	23342	Feb. 17, 2013	Feb. 16, 2014				
ISN	TESEQ	ISN T400	21653	Jun. 22, 2012	Jun. 21, 2013				
ISN	TESEQ	ISN T8-Cat6	27262	Sep. 17, 2012	Sep. 16, 2013				
ISN	TESEQ	ISN ST08	22589	Jan. 24, 2013	Jan. 23, 2014				
RF Current Probe	FCC	F-33-4	121630	Dec. 04, 2012	Dec. 03, 2013				
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Dec. 25, 2012	Dec. 24, 2013				
ESH3-Z6 V-Network	R&S	ESH3-Z6	100920	Nov. 21, 2012	Nov. 20, 2013				
Note: Calibration Interv	al of instruments listed	above is one year.		-	-				

Test Item	Radiated Emission	Radiated Emission							
Test Site	966 chamber 2 / (03CH02-WS)								
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until				
Amplifier	Burgeon	BPA-530	100218	Dec. 14, 2012	Dec. 13, 2013				
Amplifier	Agilent	83017A	MY39501309	Dec. 18, 2012	Dec. 17, 2013				
Spectrum Analyzer	R&S	FSV40	101499	Jan. 28, 2013	Jan. 27, 2014				
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120D	BBHA 9120 D 1095	Jan. 29, 2013	Jan. 28,2014				
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014				
Receiver	R&S	ESR3	101657	Jan. 30,2013	Jan.29,2014				
Bilog Antenna	ScHwarzbeck	VULB9168	VULB9168-524	Jan. 11, 2013	Jan. 10, 2014				
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16140/4	Dec. 25, 2012	Dec. 24, 2013				
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16018/4	Dec. 25, 2012	Dec. 24, 2013				
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16015/4	Dec. 25, 2012	Dec. 24, 2013				
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-003	Dec. 25, 2012	Dec. 24, 2013				
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-004	Dec. 25, 2012	Dec. 24, 2013				
control	EM Electronics	EM1000	060608	N/A	N/A				

Loop Antenna	R&S	HFH2-Z2	100330	Nov 15, 2012	Nov 14, 2013		
Amplifier	MITEQ	AMF-6F-260400 9121372		Apr. 19, 2012	Apr. 18, 2014		
Note: Calibration Interval of instruments listed above is two year.							



Test Item	RF Conducted							
Test Site	(TH01-WS)							
Instrument	Manufacturer	Model No.	Calibration Date	Calibration Until				
Spectrum Analyzer	R&S	FSV 40	101063	Feb. 18, 2013	Feb. 17, 2014			
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov 29, 2012	Nov. 28, 2013			
DC Power Source	G.W.	GPC-6030D	C671845	Jun. 19, 2012	Jun. 18, 2013			
AC Power Source	G.W	APS-9102	EL920581	Jul. 02, 2012	Jul. 01, 2013			
Power Meter	Anritsu	ML2495A	1241002	Oct. 15, 2012	Oct. 14, 2013			
Power Sensor	Anritsu	MA2411B	1027366	Oct. 24, 2012	Oct. 23, 2013			
Signal Generator	R&S	SMB100A	175727	Jan. 14, 2013	Jan. 13, 2014			
RF Cable-2m	HUBER+SUHNER	SUCOFLEX_104	MY16016/4	Dec. 25, 2012	Dec. 24, 2013			
RF Cable-3m	HUBER+SUHNER	SUCOFLEX_104	MY16013/4	Dec. 25, 2012	Dec. 24, 2013			

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247 ANSI C63.10-2009 FCC KDB 558074 D01 DTS Meas Guidance v03 FCC KDB 662911 D01 Multiple Transmitter Output v01r02

Note: The EUT has been tested and complied with FCC part 15B requirement. FCC Part 15B test results are issued to another report.

1.6 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					
Parameters	Uncertainty				
Bandwidth	±35.286 Hz				
Conducted power	±0.536 dB				
Frequency error	±35.286 Hz				
Temperature	±0.3 °C				
Conducted emission	±2.946 dB				
AC conducted emission	±2.43 dB				
Radiated emission	<u>+</u> 2.49 dB				



2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	23°C / 55%	Skys Huang
Radiated Emissions	03CH02-WS	23°C / 62%	Anderson Hong
RF Conducted	TH01-WS	24°C / 63%	Bard Wu

➢ FCC site registration No.: 657002

➢ IC site registration No.: 10807A-2

2.2 The Worst Test Modes and Channel Details

The Worst Test Modes and Channel Details					
Test Item(s)	Conducted Emissions				
Modulation, Data rate	11b/1Mbps				
Test channel (MHz)	2437				
Test Condition	Continoustransmitting				
Test Mode	Operating Mode Description				
A1	Adapter 1 + Internal antenna (ANT 1 + ANT 2)				
B1	POE + Internal antenna (ANT 1 + ANT 2)				
A2	Adapter 1 + External antenna (ANT 3)				
B2	POE + External antenna (ANT 3)				
Adapter 1 and Adapter 2	2 had been pretested and found that Adapter 1 was the worst case for final test and				

Adapter 1 and Adapter 2 had been pretested and found that Adapter 1 was the worst case for final test and only its data was record in this report.

	The Worst Test Modes and Channel Details					
Fundamental Emission Output PowerTest Item(s)6dB bandwidth Power spectral density						
Modulation, Data rate	11b/1Mbps, 11g/6Mbps					
Test channel (MHz)	2412, 2437, 2462					
Test Condition	Continoustransmitting					
Modulation, Data rate	HT20/MCS 8, HT40/MCS 8					
Test channel (MHz)	HT20: 2412, 2437, 2462 HT40: 2422, 2437, 2452					
Test Condition	Continoustransmitting					



	The Worst Test Modes and Channel Details
Test Item(s)	Radiated emission (below 1GHz)
Modulation, Data rate	11b/1Mbps
Test channel (MHz)	2437
Test Condition	Continoustransmitting
Test Mode	Operating Mode Description
A1	Adapter 1 + Internal antenna (ANT 1 + ANT 2)
B1	POE + Internal antenna (ANT 1 + ANT 2)
A2	Adapter 1 + External antenna (ANT 3)
B2	POE + External antenna (ANT 3)
Test Item(s)	Radiated emission (abov e 1GHz)
Modulation, Data rate	11b/1Mbps, 11g/6Mbps
Test channel (MHz)	11b, 11g: 2412, 2437, 2462
Test Condition	Continoustransmitting
Test Mode	Operating Mode Description
A1	Adapter 1 + Internal antenna (ANT 1 + ANT 2)
A2	Adapter 1 + External antenna (ANT 3)
Modulation, Data rate	HT20/MCS 8, HT40/MCS 8
Test channel (MHz)	HT20: 2412, 2437, 2462 HT40: 2422, 2437, 2452
Test Condition	Continoustransmitting
Test Mode	Operating Mode Description
A1	Adapter 1 + Internal antenna (ANT 1 + ANT 2)
A2	Adapter 1 + External antenna (ANT 3)



3 Transmitter Test Results

3.1 Conducted Emissions

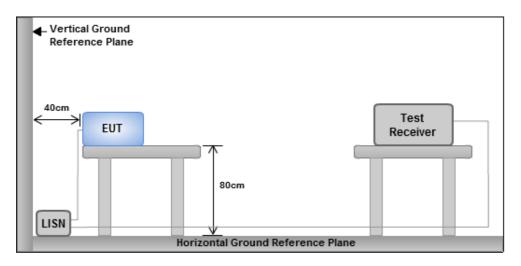
3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit						
Frequency Emission (MHz) Quasi-Peak Average						
0.15-0.5	66 - 56 *	56 - 46 *				
0.5-5	56	46				
5-30 60 50						
Note 1: * Decreases with the logarithm of the frequency.						

3.1.2 Test Procedures

- 1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
- 2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
- 3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.

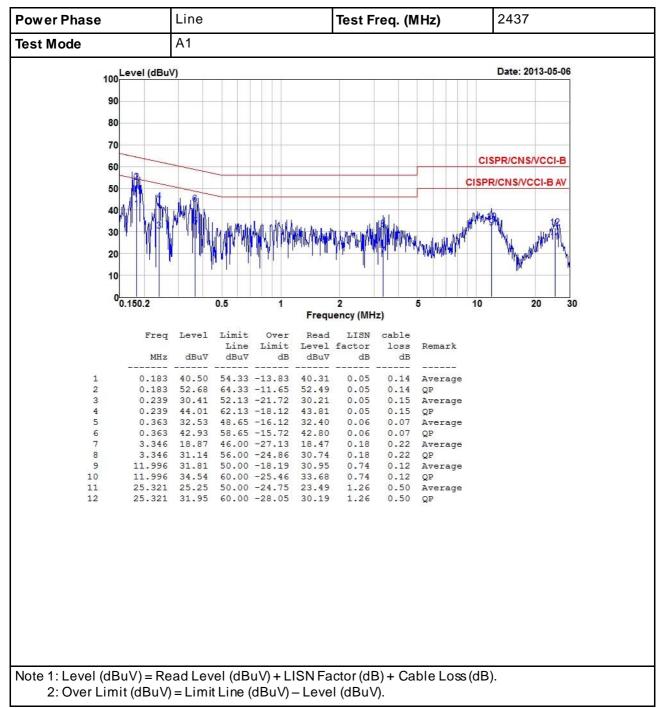
3.1.3 Test Setup



Note: 1. Support units were connected to second LISN.

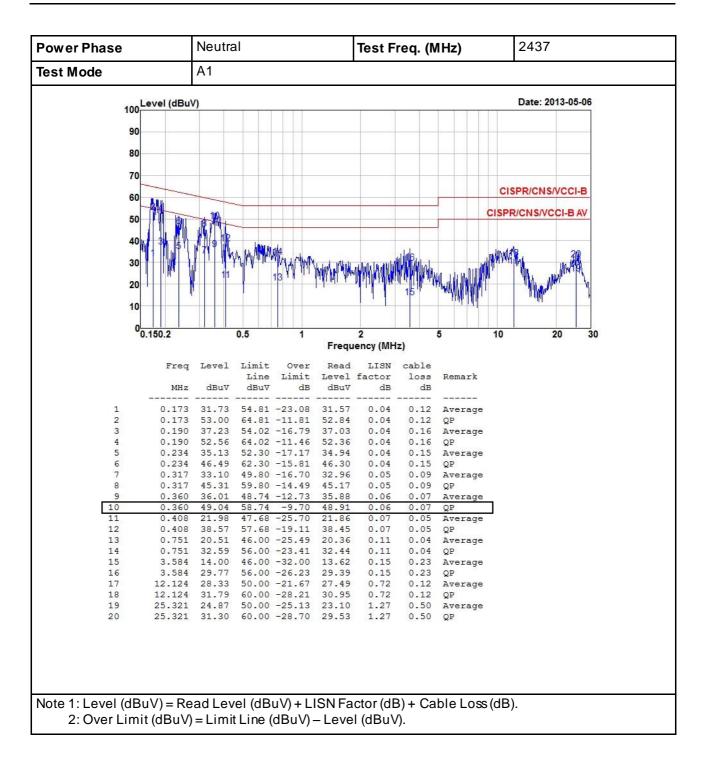
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes



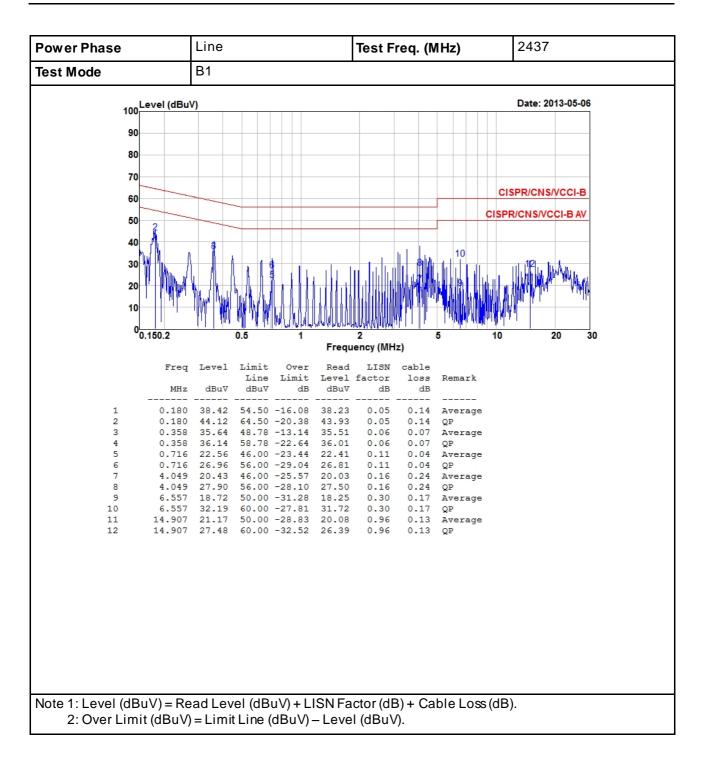


3.1.4 Test Result of Conducted Emissions

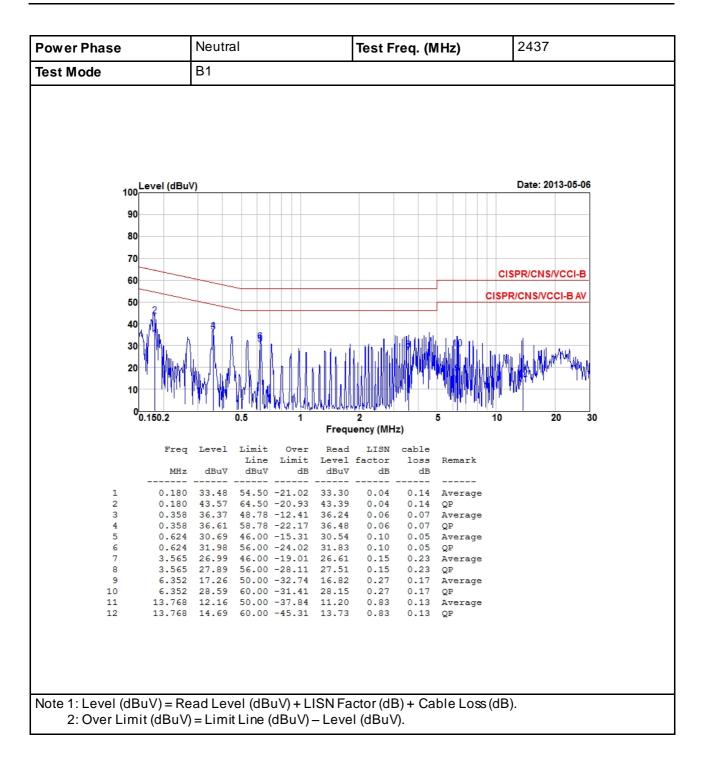




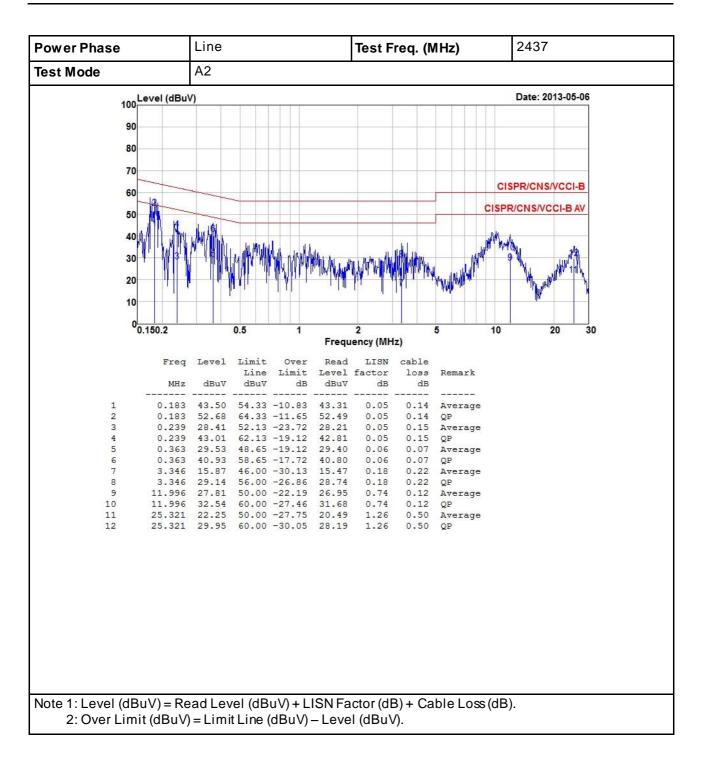




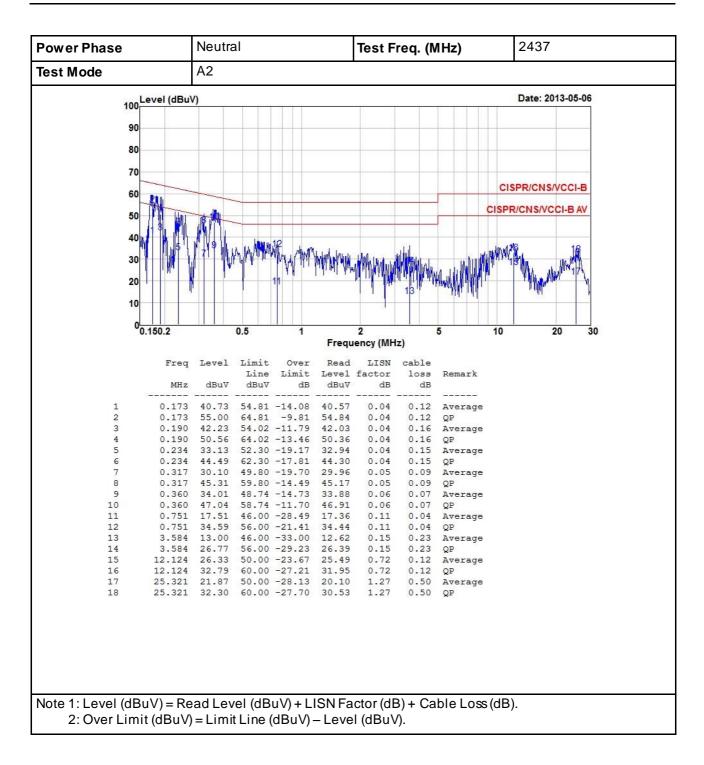




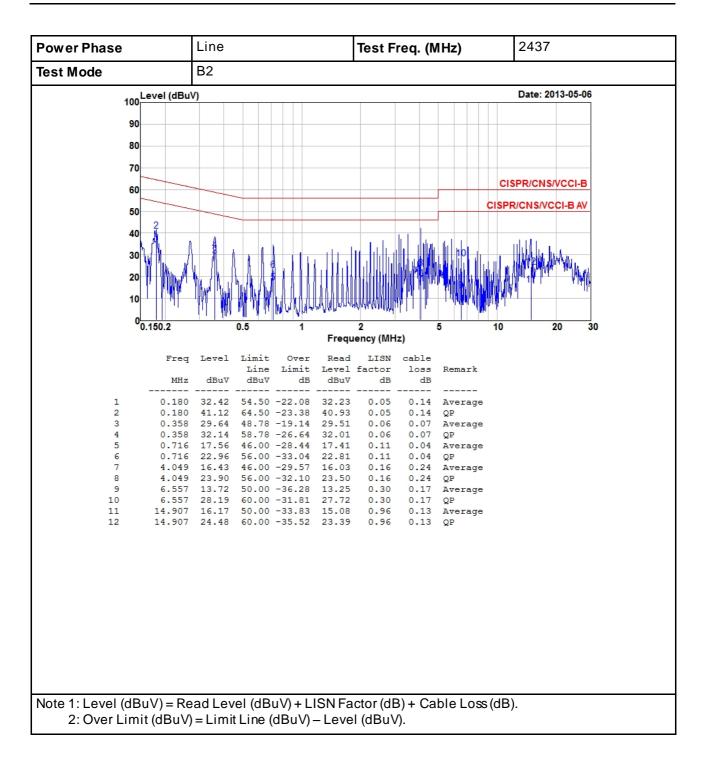




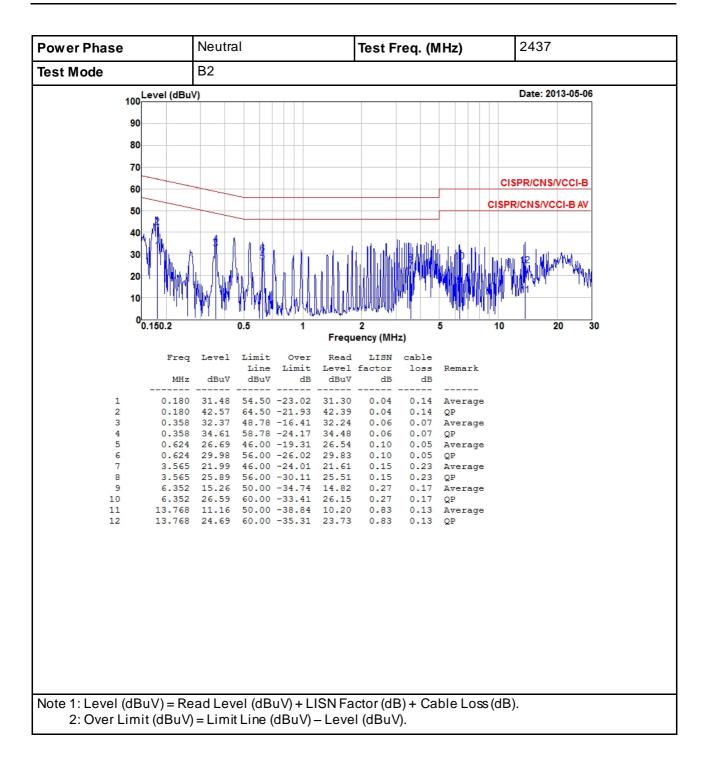














3.2 6dB Bandwidth and Occupied Bandwidth

3.2.1 Limit of 6dB Bandwidth

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

3.2.2 Test Procedures

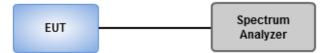
Procedure for 6dB bandwidth

- 1. Set resolution bandwidth = 100 kHz, Video bandwidth = 300 kHz for 11b/g/HT20 mode Set resolution bandwidth = 1 MHz, Video bandwidth = 3 MHz for HT40 mode
- 2. Detector = Peak, Trace mode = max hold.
- 3. Sweep = auto couple, Allow the trace to stabilize.
- 4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

Procedure for 99% occupied bandwidth

- 1. Set resolution bandwidth = 300 kHz, Video bandwidth = 1 MHz for 11b/g/HT20 mode Set resolution bandwidth = 1 MHz, Video bandwidth = 3 MHz for HT40 mode
- 2. Detector = Peak, Trace mode = max hold.
- 3 Sweep = auto couple, Allow the trace to stabilize.
- 4 Use the 99 % power bandwidth function of the instrument to measure occupied bandwidth

3.2.3 Test Setup





Modulation			Limit (kHz)			
Mode	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Limit (kHz)
11b	2412	10.09 10.09		500		
11b	2437	10.09	10.09			500
11b	2462	10.09	10.09			500
11g	2412	16.35	16.35			500
11g	2437	16.35	16.35			500
11g	2462	16.35	16.35			500
HT20	2412	17.62	17.57			500
HT20	2437	17.62	17.62			500
HT20	2462	17.62	17.62			500
HT40	2422	37.33	37.10			500
HT40	2437	37.45	36.75			500
HT40	2452	37.33	36.75			500

3.2.4 Test Result of 6dB Bandwidth and Occupied Bandwidth





Modulation		99% Occupied Bandwidth (MHz)					
Mode	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3		
11b	2412	13.95	14.07				
11b	2437	13.84	13.95				
11b	2462	13.95	13.95				
11g	2412	17.19	16.90				
11g	2437	18.06	17.66				
11g	2462	17.25	16.90				
HT20	2412	18.23	18.12				
HT20	2437	18.52	18.35				
HT20	2462	18.29	18.12				
HT40	2422	40.06	38.90				
HT40	2437	40.06	38.67				
HT40	2452	40.06	38.78				





3.3 **RF Output Power**

3.3.1 Limit of RF Output Power

Conducted powershall not exceed 1 Watt.

- Antenna gain <= 6dBi, no any corresponding reduction is in output power limit.
- □ Antenna gain > 6dBi
 - Non Fixed, point to point operations. The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB
 - Fixed, point to point operations Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations, no any corresponding reduction is in transmitter peak output power

3.3.2 Test Procedures

- Maximum PeakConducted Output Power
 - □ Spectrum analyzer
 - 1. Set RBW = 1MHz, VBW = 3MHz, Detector = Peak.
 - 2. Sweep time = auto, Trace mode = max hold, Allow trace to fully stabilize.
 - 3. Use the spectrum analyzer channel power measurement function with the band limits set equal to the DTS bandwidth edges.

Power meter

- 1. A broadband Peak RF power meter is used for output power measurement. The video bandwidth of power meter is greater than 6dB bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.
- Maximum Conducted Output Power

□ Spectrum analyzer

- 1. Set RBW = 1MHz, VBW = 3MHz, Detector = RMS.
- 2. Set the sweep time to: ≥10 x (number of measurement points in sweep) x (maximum data rate per stream).
- 3. Perform the measurement over a single sweep.
- 4. Use the spectrum analyzer's band power measurement function with band limits set equal to the EBW(26dBc) band edges.

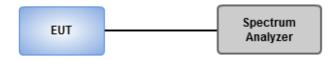
Power meter

1. A broadband Average RF power meter is used for output power measurement. The video bandwidth of power meter is greater than 6dB bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.



3.3.3 Test Setup

RF Output Power (Spectrum Analyzer)



RF Output Power (Power Meter)



3.3.4 Test Result of Maximum Output Power

Modulation			Peak Pov	ver (dBm)		Total	Total	Limit
Mode	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Power (mW)	Power (dBm)	(dBm)
11b	2412	16.35	16.06			83.516	19.22	30
11b	2437	21.46	21.15			270.275	24.32	30
11b	2462	16.43	16.1			84.692	19.28	30
11g	2412	12.88	12.43			36.907	15.67	30
11g	2437	20.94	20.46			235.338	23.72	30
11g	2462	13.51	13.43			44.468	16.48	30
HT20	2412	12.11	11.7			31.047	14.92	30
HT20	2437	20.21	19.54			194.904	22.90	30
HT20	2462	14.05	14.08			50.996	17.08	30
HT40	2422	8.7	8.32			14.205	11.52	30
HT40	2437	12.87	12.58			37.478	15.74	30
HT40	2452	9.38	9.17			16.930	12.29	30



3.4 Power Spectral Density

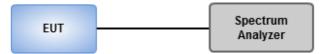
3.4.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in 3kHz band

3.4.2 Test Procedures

- Method AVGPSD-1 (For 11 b / g / HT20 mode).
 - 1. Set the RBW = 100kHz, VBW = 300kHz.
 - 2. Detector = RMS, Sweep time = auto couple.
 - 3. Employ trace averaging (RMS) mode over 100 traces
 - 4. Use the peak marker function to determine the maximum amplitude level.
- Method AVGPSD-2 Alternative (For HT40 mode)
 - 1. Set the RBW = 100 kHz, VBW = 300 kHz.
 - 2. Detector = RMS
 - 3. Set the sweep time = 8.07 s
 - 4. Perform the measurement over a single sweep.
 - 5. Use the peak marker function to determine the maximum amplitude level.

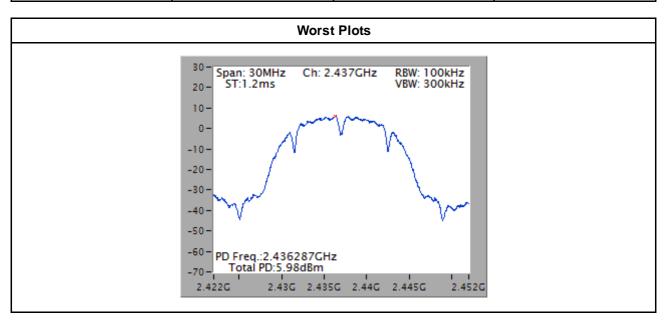
3.4.3 Test Setup





3.4.4 Test Result of Power Spectral Density

Modulation Mode	Freq. (MHz)	Total Power Spectral Density (dBm/100kHz)	Limit (dBm/3kHz)
11b	2412	0.46	8
11b	2437	5.98	8
11b	2462	1.13	8
11g	2412	-5.13	8
11g	2437	3.02	8
11g	2462	-3.99	8
HT20	2412	-5.85	8
HT20	2437	1.91	8
HT20	2462	-4.40	8
HT40	2422	-12.49	8
HT40	2437	-8.53	8
HT40	2452	-11.74	8





3.5 Unwanted Emissions into Restricted Frequency Bands

3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

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:

Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit **Note 2:**

Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.5.2 Test Procedures

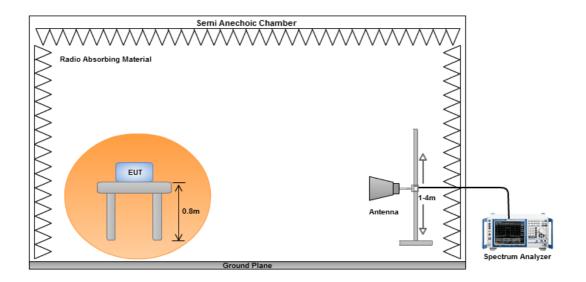
- 1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT isplaced at a height of 0.8 m test table above the ground plane.
- 2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
- 3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

- 1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
- 2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
- 3. RBW=1MHz, VBW=3MHz and RMS detector is for average measured value of radiated emission above 1GHz.



3.5.3 Test Setup

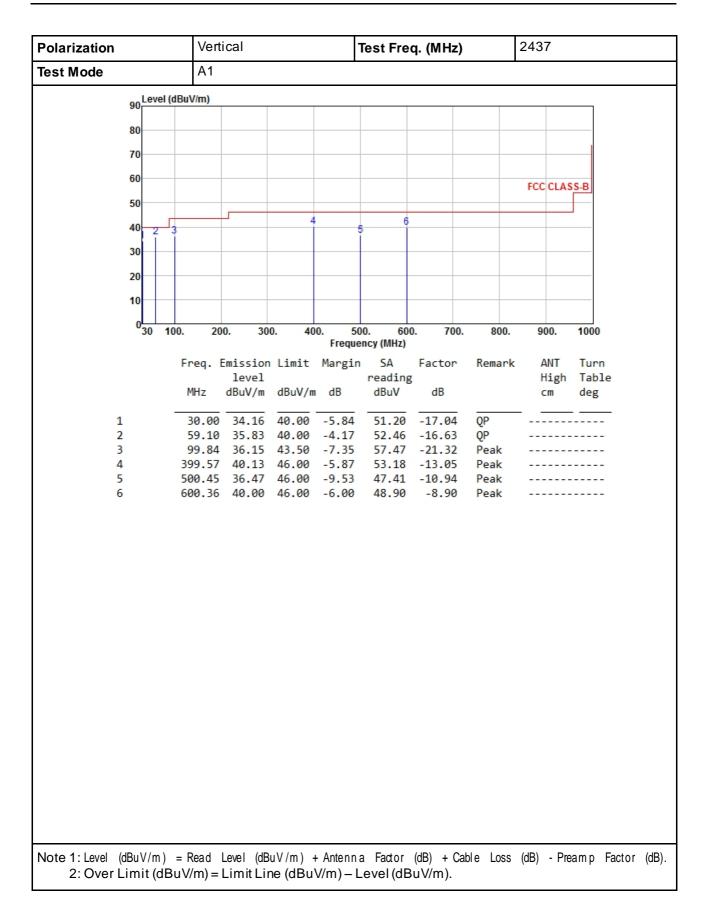




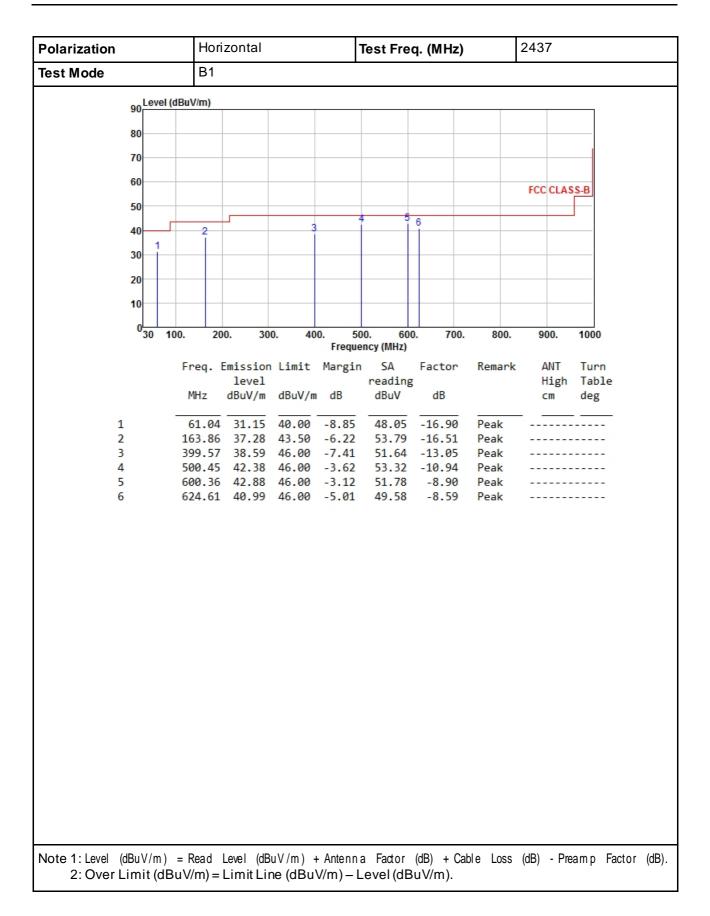
Horizontal 2437 Polarization Test Freq. (MHz) A1 Test Mode 90 Level (dBuV/m) 80 70 60 FCC CLASS-B 50 40 1 30 20 10 0^{__}30 100. 200. 700. 800. 900. 1000 300. 400. 500. 600. Frequency (MHz) Freq. Emission Limit Margin SA Factor Remark ANT Turn level reading High Table dBuV/m dBuV/m dB MHz dBuV dB cm deg Peak 62.01 31.94 40.00 -8.06 49.03 -17.09 1 -----2 166.77 39.53 43.50 -3.97 56.16 -16.63 Peak -----3 250.19 39.46 46.00 -6.54 56.80 -17.34 Peak _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 4 399.57 39.80 46.00 -6.20 52.85 -13.05 Peak 5 500.45 38.91 46.00 -7.09 49.85 -10.94 Peak _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 6 600.36 42.21 46.00 -3.79 51.11 -8.90 Peak -----Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB). 2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

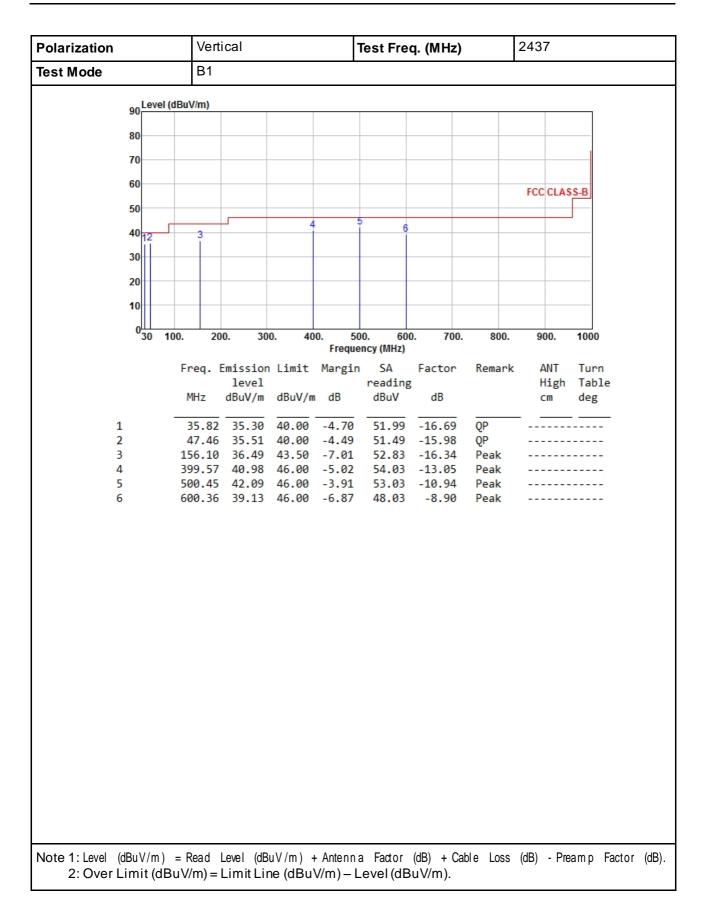




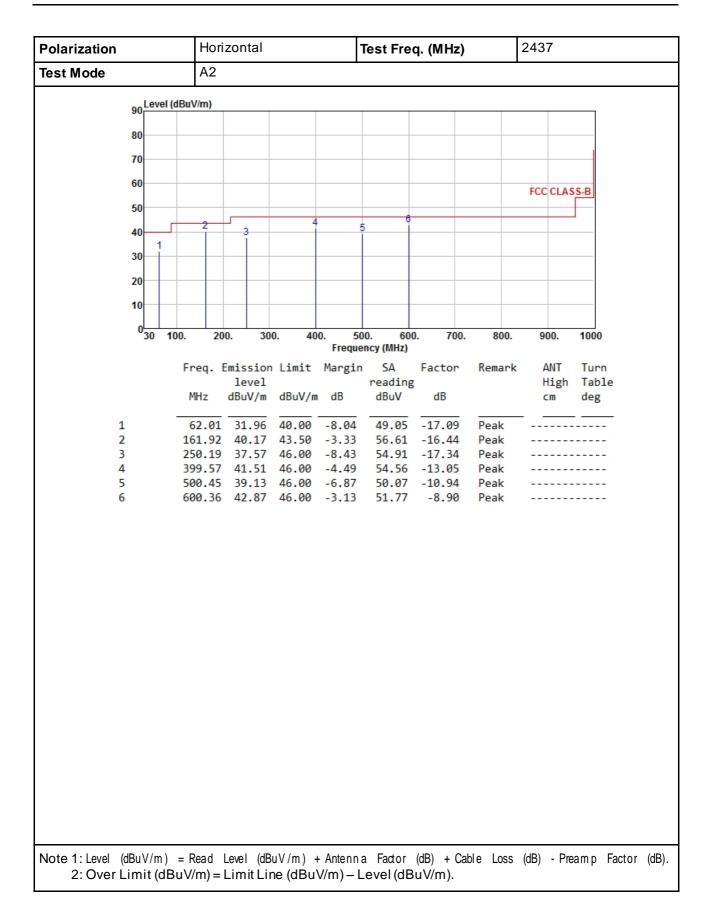




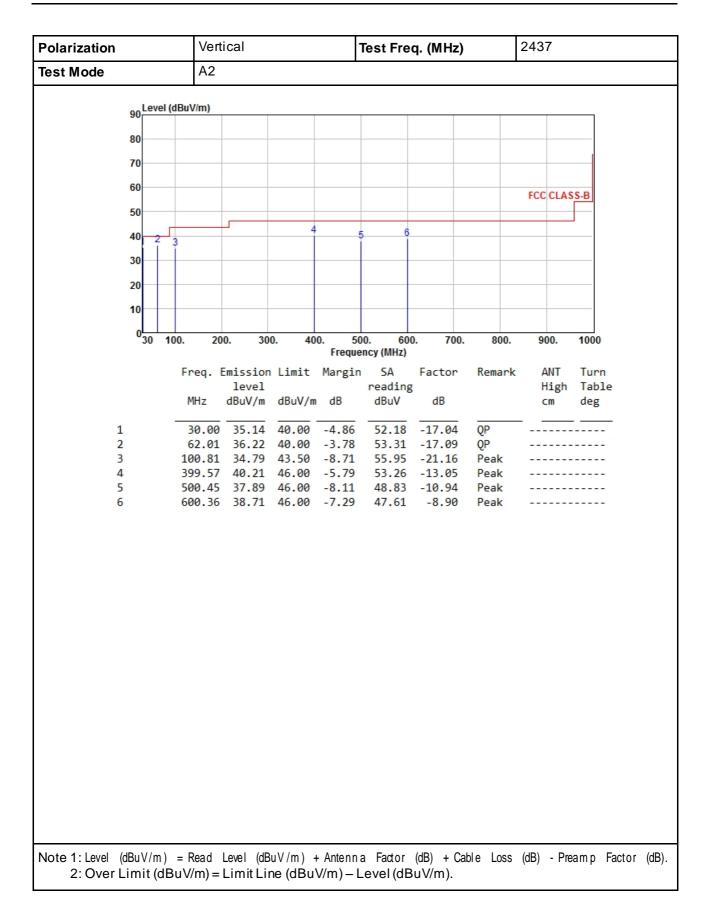




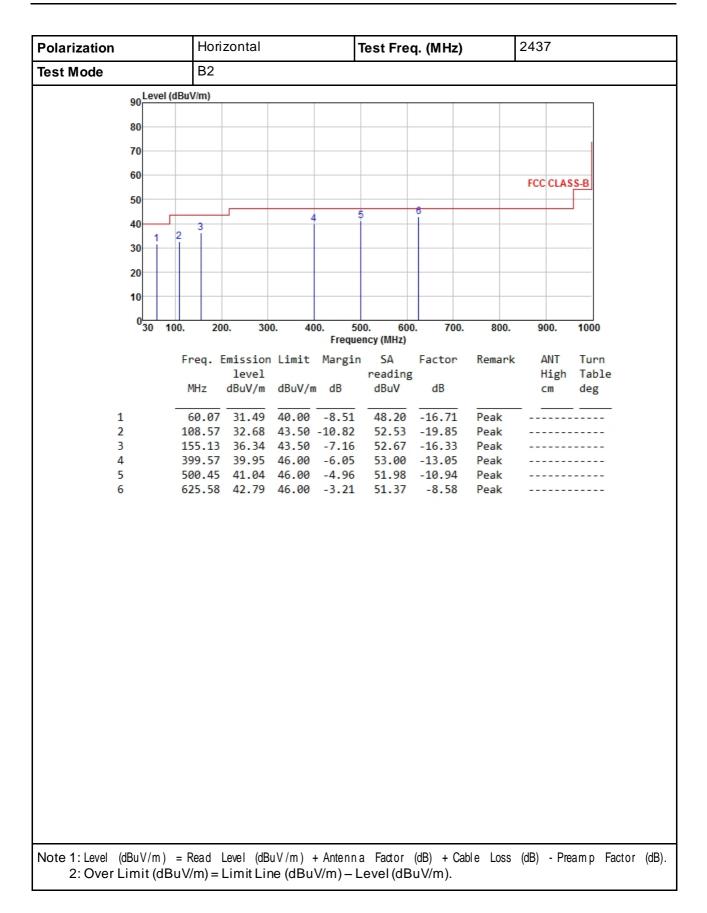




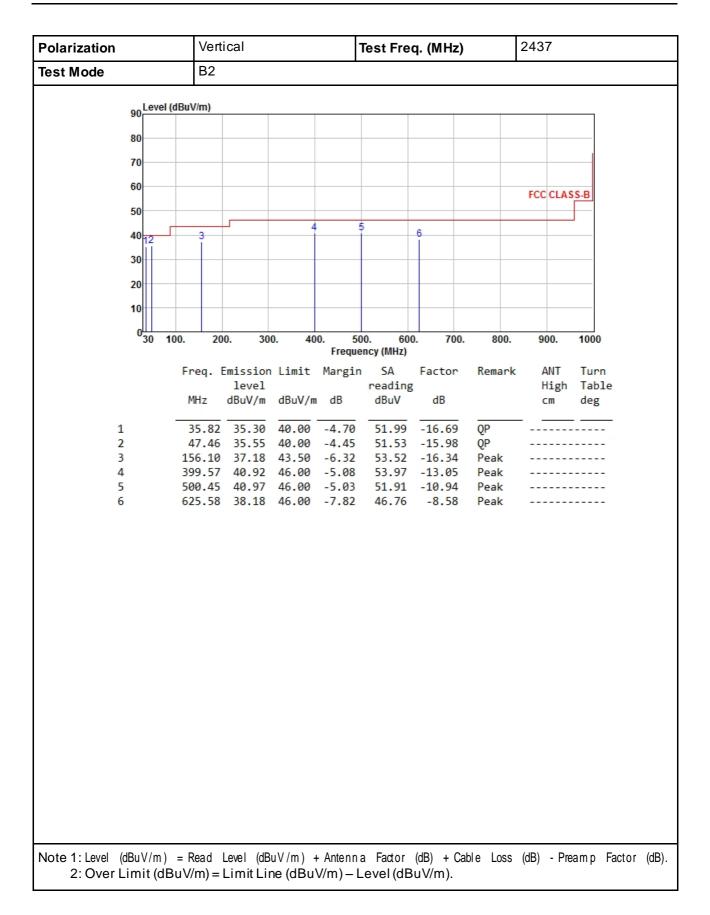






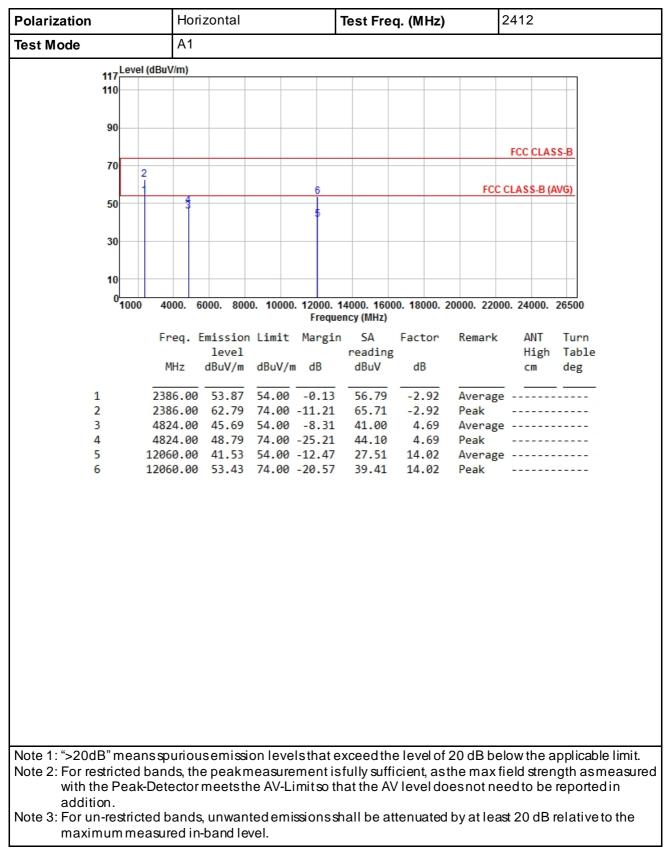








3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11b



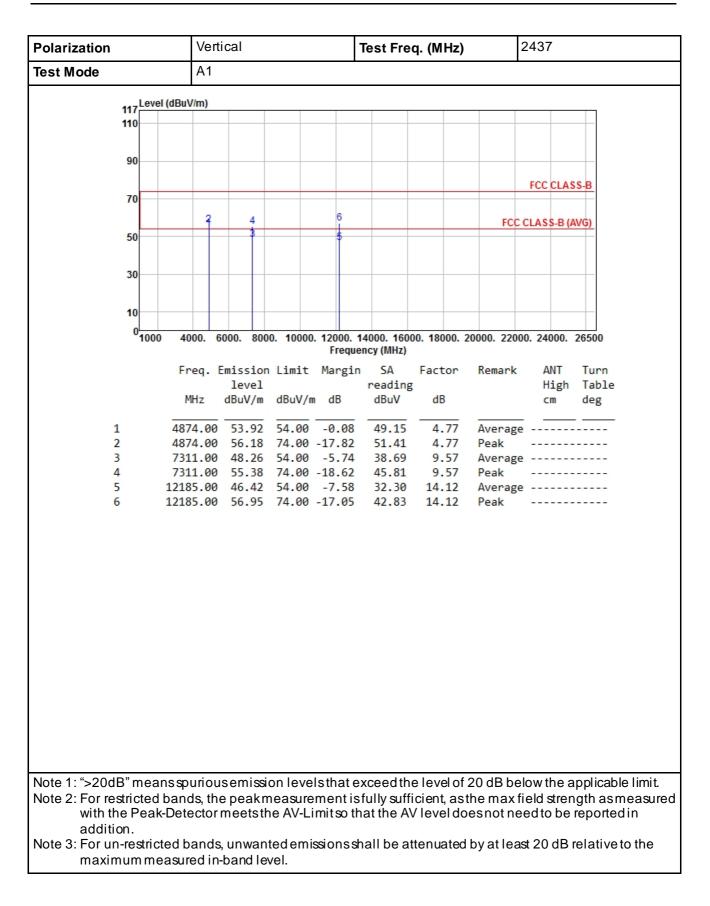


Polarization	olarization Ve			Vertical Test Freq. (MHz) 2412						
Test Mode		A1								
Lev	el (dBuV	/m)								
117										
90										
70									FCC CLAS	SS-B
	_									
50	2	4			6			FCC	CLASS-B (A	4VG)
50	1				Ĩ					
30										
50										
10										
0 <mark></mark>	0 40	00. 6	000. 800	0. 1000		14000. 1600 Jency (MHz)	00. 18000. 2	20000. 220	00. <mark>24</mark> 000.	26500
	Fre	eq. B	Emissior	n <mark>Limi</mark> t			Factor	Remark	ANT	Turn
			level			reading			-	Table
	M	Hz	dBuV/m	dBuV/ı	m <mark>d</mark> B	dBuV	dB		CM	deg
1	238	6.00	42.83	54.00	-11.17	45.75	-2.92	Average	e	
2	238	6.00	54.70	74.00	-19.30	57.62	-2.92	Peak		
3			51.52				4.69	Average	e	
4			53.29 45.03				4.69 14.02	Peak Average		
6			54.60				14.02	Peak		
Note 1: ">20dB" mea	aneen	iriou	somicci	on love	lethat	avcaadth		20 dB ha	lowthe	annlicable limit
Note 2: For restricted	d band	ls, the	epeakn	neasure	ementi	s fully suff	icient, ast	the max	field strer	ngth as measure
with the Pea	k-Dete	ctor	meetstl	ne AV-L	imitsot	that the A	/ level do	esnotne	ed to be	reportedin
addition.	-4 - 1 I	J		4 a al			u	h		
lote 3: For un-restri maximumm					ISSIONS	shall be at	ttenuated	byatlea	ist 20 dB	relative to the
maximiimm	easure	a In-	-pand le	vel.						

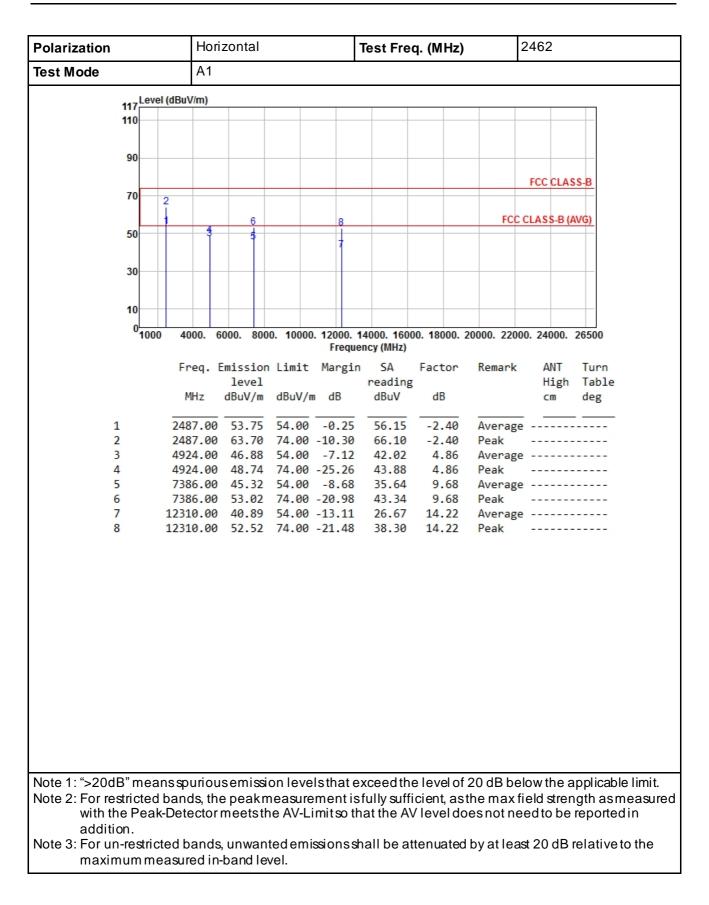


Polarization	H	Horiz	zontal			Test Fre	eq. (MHz)		2437		
lest Mode	/	41				1					
Lev	vel (dBuV/r	n)									
117											
90											
									FCC CLAS	S.B	
70									TOO OLAS		
			4		6			FCC	CLASS-B (A	WG)	
50		1	3		5						
					Ĭ						
30		_		·							
10		_									
0 <mark></mark>	00 400	D. 60	00. 80	000. 1000	0. 12000	. 14000. 160	00. 18000.	20000. 2200	0. 24000.	26500	
						quency (MHz)					
	Fre	q.E	missio level		Marg	in SA reading	Factor	Remark	ANT	Turn Table	
	MH	z		ı n dBuV∕	m dB	dBuV	dB		High cm	deg	
1 2			48.86		-5.1			Average Peak			
3				5 54.00				Average			
4	7311	.00	57.00	5 74.00	-16.9	4 47.49	9.57	Peak			
5				1 54.00 5 74.00				Average Peak			
0	12105	.00	54.90	0 74.00	-19.0	4 40.04	14.12	геак			
Note 1: ">20dB" me											
Note 2: For restricte with the Pea	d bands	s, the	peak	measur	ement	isfully suf	ficient, as	the max f	ield strer	igth as measur	
		1011	neels	ule AV-L		inat the A		Jeshoune	eutobe	eponeum	
addittion											
addition. lote 3: For un-restri	cted ba	nds,	unwa	ntedem	issions	shall be a	ttenuated	byatlea	st 20 dB i	relative to the	

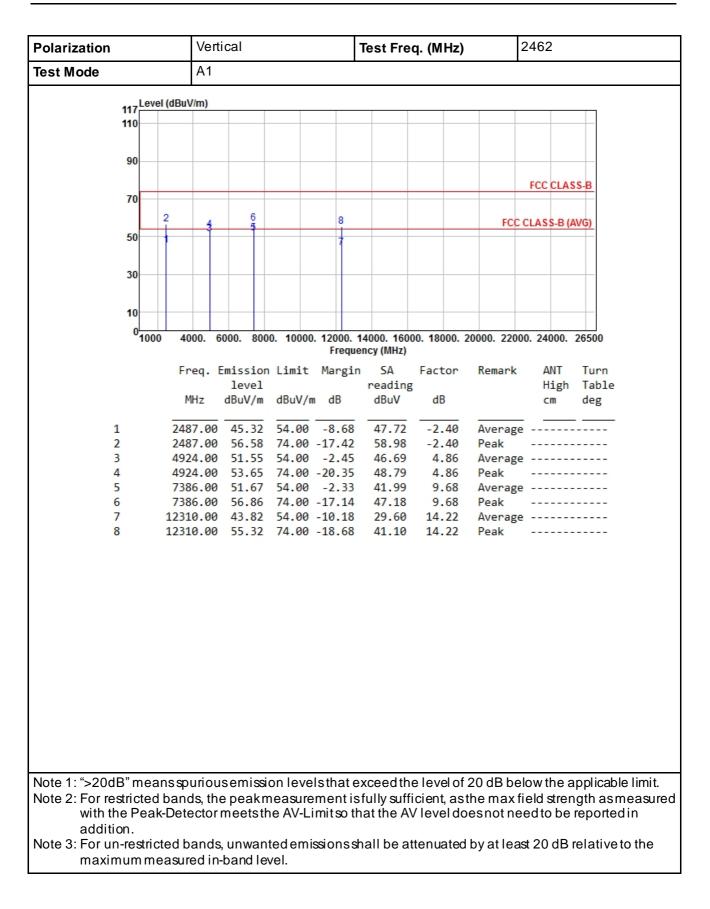








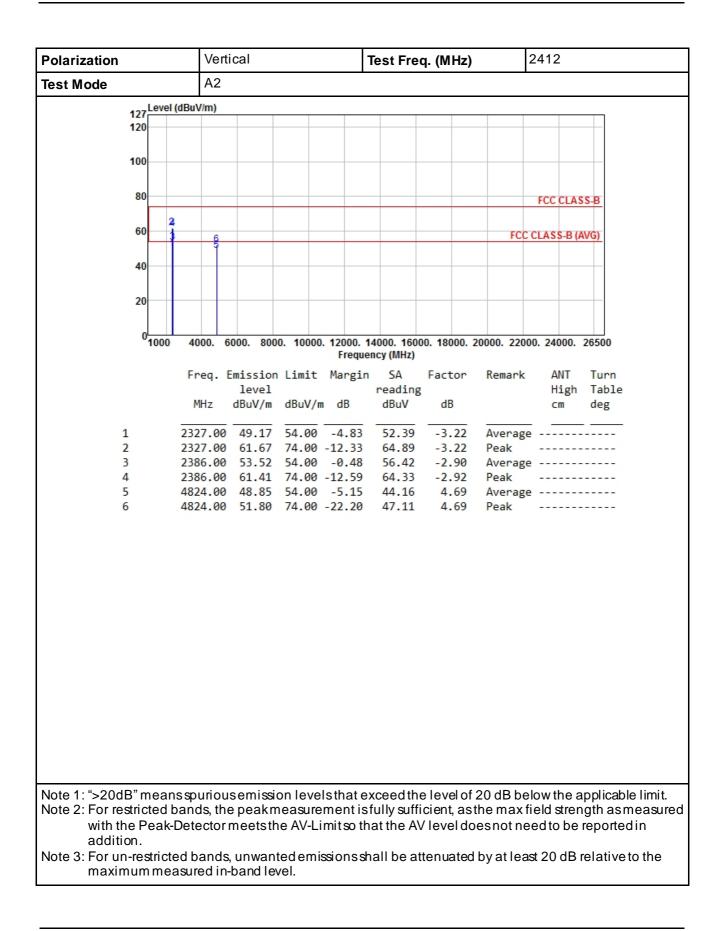




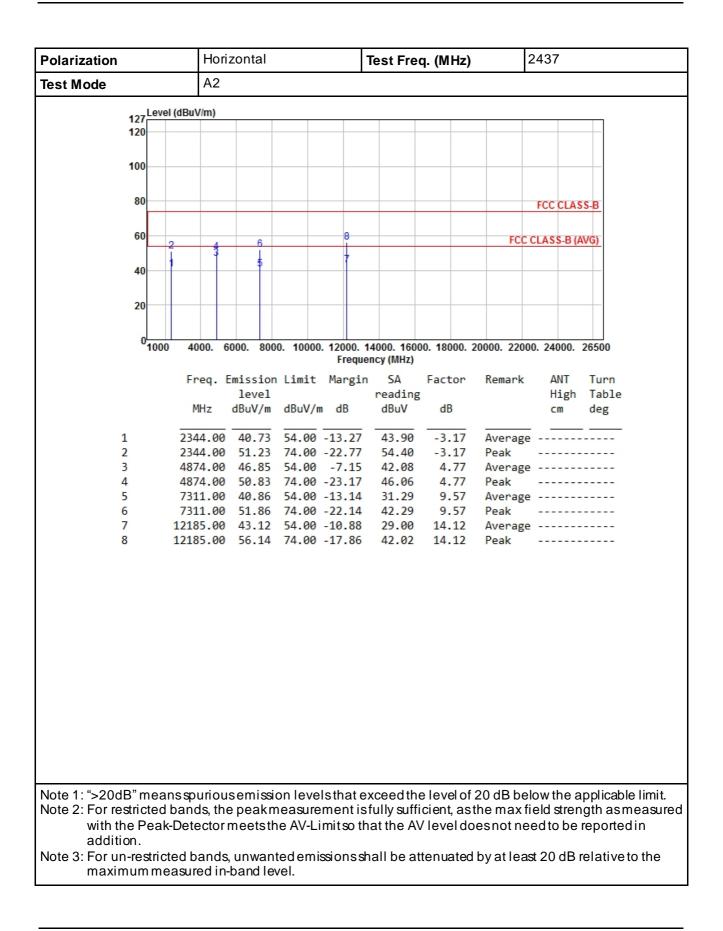


Polarization	Horiz	Horizontal Test Freq. (MHz))	2412		
Test Mode	A2									
127	BuV/m)									
12/										
100										
80								FCC CLAS	SS-B	
60							FCC	CLASS D/	N ICN	
4	ş						FLL	CLASS-B (A	4/6)	
40										
20										
~1000	4000. 60	000. <mark>8</mark> 00	0. 1000		14000. 160 ency (MHz)	00. 18000.	20000. 220	00. 24000.	26500	
	Freq. E	mission	Limit	Margin	n SA	Factor	Remark	ANT	Turn	
		level	10.144	10	reading			High		
	MHz	dBuV/m	dBuV/	m dB	dBuV	dB		CM	deg	
				-17.47	39.75	-3.22	-	2		
	2327.00 2386.00				53.72 46.01	-3.22 -2.90	Peak Average			
	2386.00					-2.90	-			
	1824.00					4.69	0	e		
6 4	1824.00	50.29	/4.00	-23./1	45.60	4.69	Peak			
Note 1: ">20dB" means										
Note 2: For restricted ba with the Peak-D										
addition. Note 3: For un-restricted				issionss	hall be at	ttenuated	dbyatlea	st 20 dB	relative to the	
maximummeas	ured in-l	bandle	vel.							

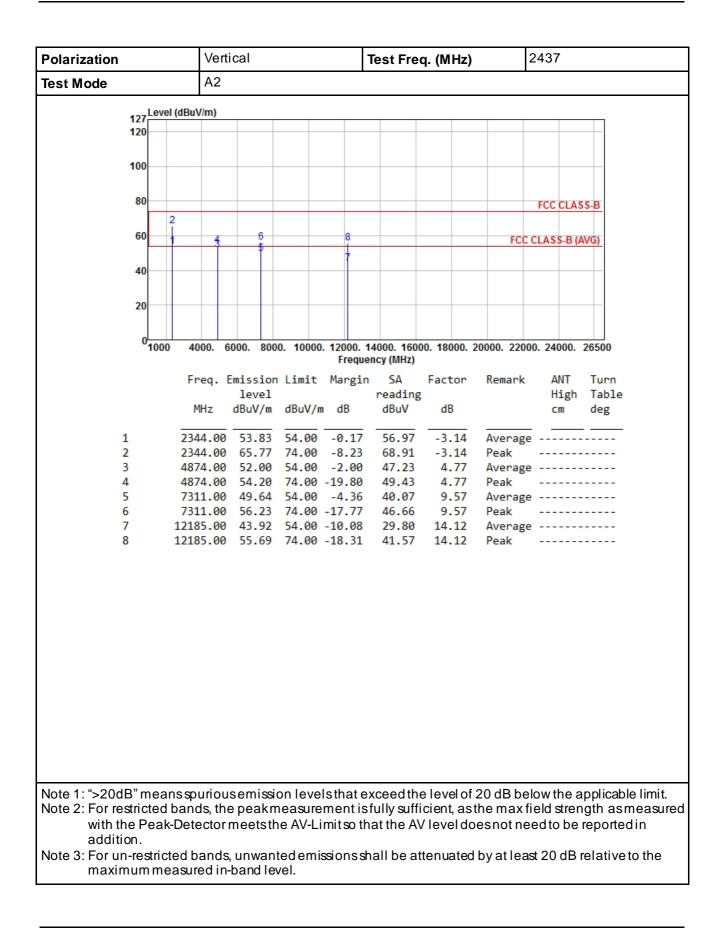








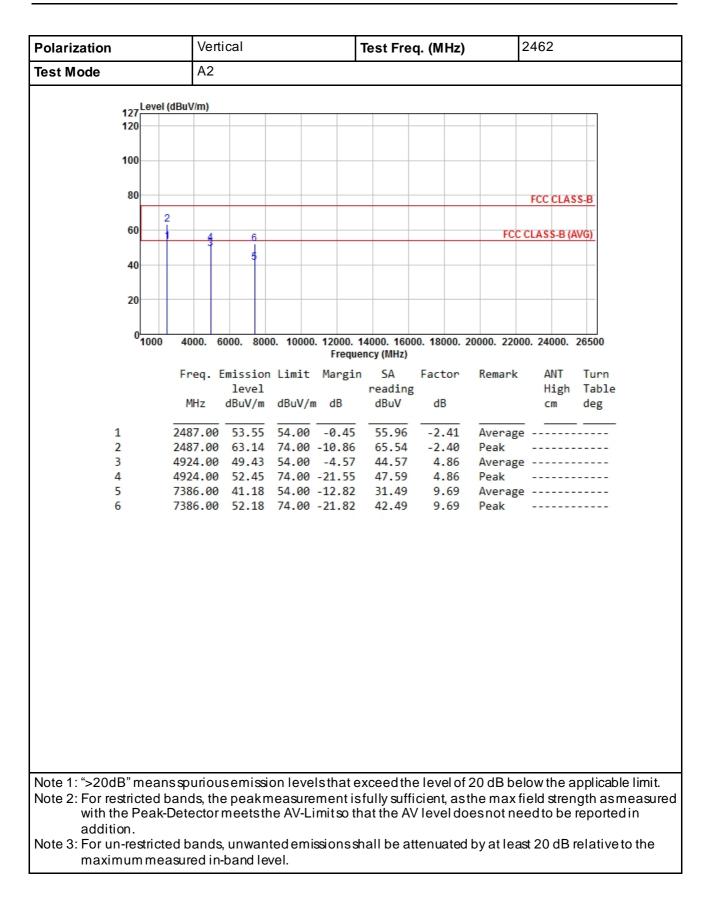






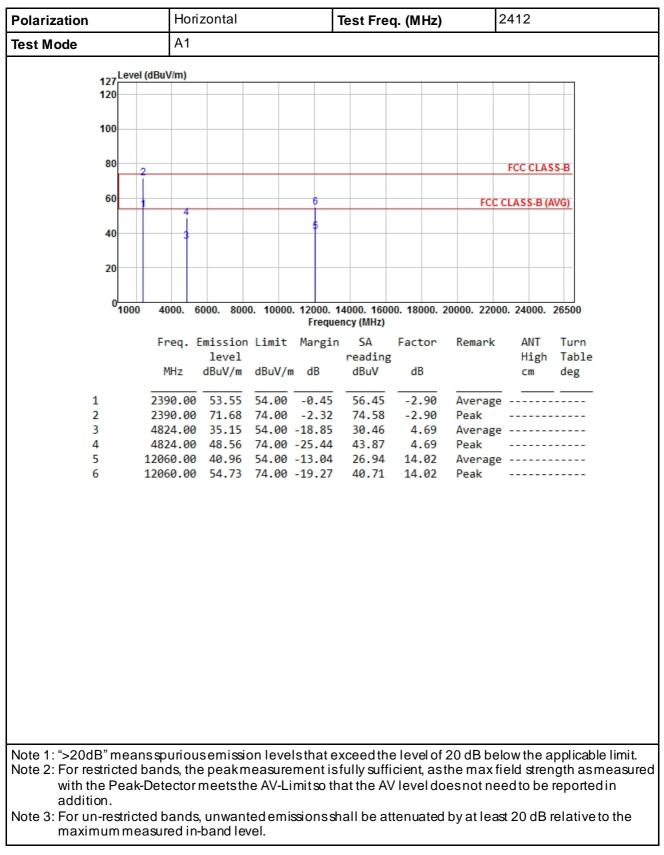
Polarization	Horizontal	Test Freq. (MHz)	2462		
lest Mode	A2				
127	uV/m)				
120					
100					
80			FCC CLASS-B		
60 2	4 6	F	CC CLASS-B (AVG)		
40	5				
20					
01000		0. 14000. 16000. 18000. 20000. 22 quency (MHz)	2000. 24000. 26500		
F	Freq. Emission Limit Mar	gin SA Factor Remar			
	level MHz dBuV/m dBuV/m dB	reading dBuV dB	High Table cm deg		
_					
	487.00 44.58 54.00 -9.4 487.00 56.69 74.00 -17.3		ge		
	407.00 56.69 74.00 -17.3 924.00 47.06 54.00 -6.9		ge		
	924.00 50.88 74.00 -23.1				
	386.00 38.29 54.00 -15.		ge		
6 73	386.00 50.98 74.00 -23.0	02 41.29 9.69 Peak			
lote 2: For restricted bar with the Peak-De	nds, the peak measuremen	it exceed the level of 20 dB b t isfully sufficient, as the ma o that the AV level does not i	x field strength as measure		
	bands, unwanted emission ured in-band level.	sshall be attenuated by at le	east 20 dB relative to the		



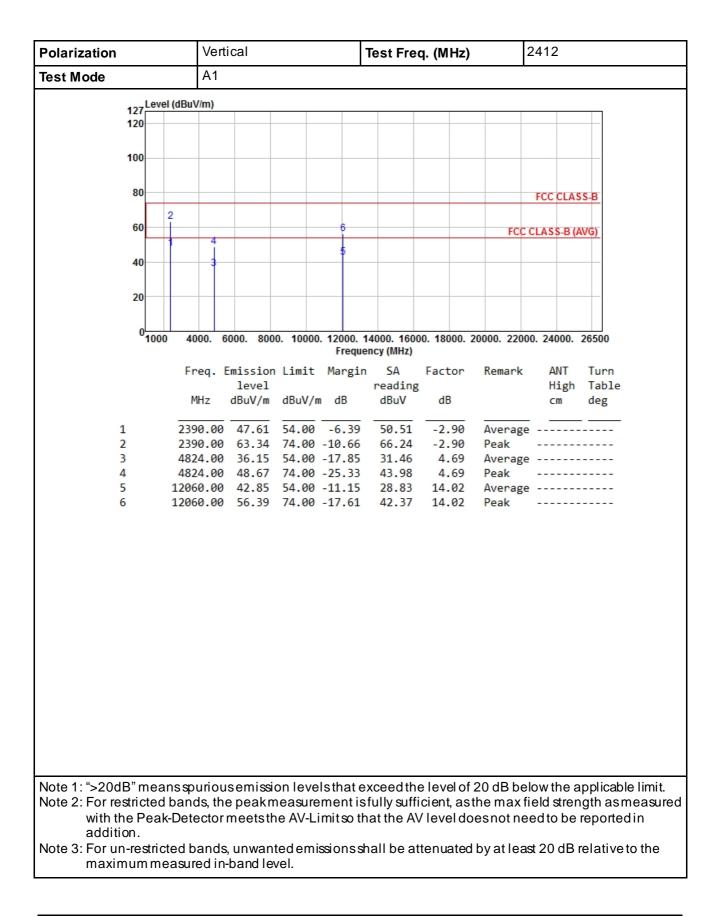




Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11g



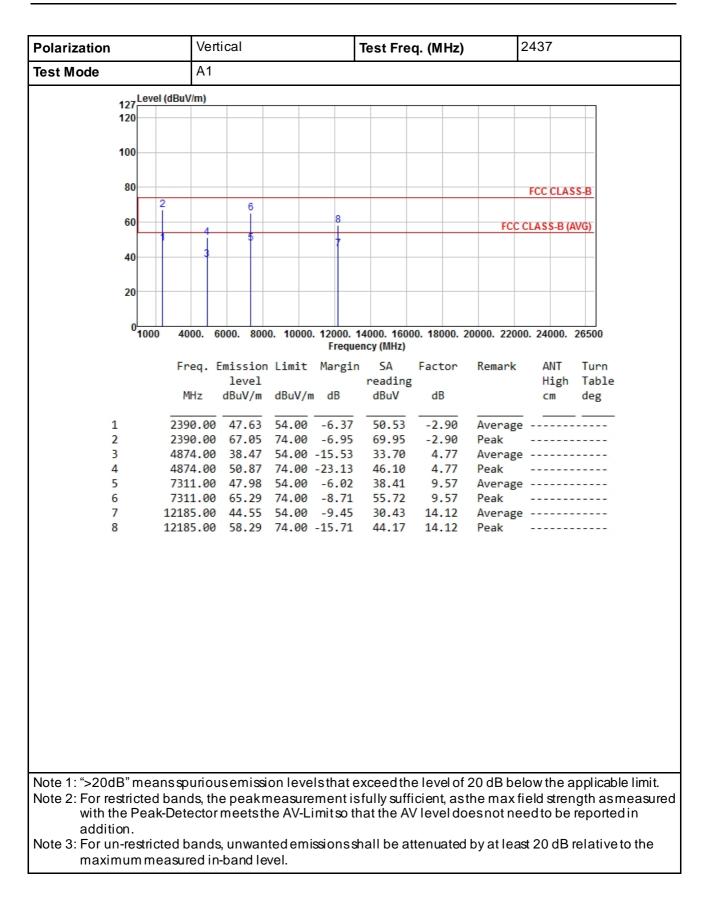






Polarization	Horizont	al	Test Freq. (MI	łz)	2437		
Test Mode	A1						
127 Level (d	BuV/m)						
120							
100							
80 2		6			FCC CLASS-B		
		Ĭ					
60		8		FCC	CCLASS-B (AVG)		
	Ĩ	7					
40	3						
20							
0 <mark></mark> 1000	4000. 6000.	8000. 10000. 12000. Frequ	14000. 16000. 1800 uency (MHz)	00. 20000. 220	00. 24000. 26500		
	Freq. Emiss	sion Limit Margi		or Remark	ANT Turn		
		/el	reading		High Table		
	MHz dBu\	//m dBuV/m dB	dBuV dB		cm deg		
		.58 54.00 -0.42		0	e		
		.97 74.00 -0.03 .37 54.00 -16.63			e		
		.73 74.00 -23.27		77 Peak			
		.16 54.00 -2.84			e		
		.86 74.00 -2.14		57 Peak			
		.72 54.00 -11.28		-	e		
8 1	2185.00 56.	.12 74.00 -17.88	3 42.00 14.3	12 Peak			
Note 1: ">20dB" means Note 2: For restricted ba with the Peak-D	ands, the pea	akmeasurement i	sfully sufficient,	asthe max		easure	
addition. Note 3: For un-restricted	d bands, unv	vantedemissions					
maximummea	sured in-ban	d level.					

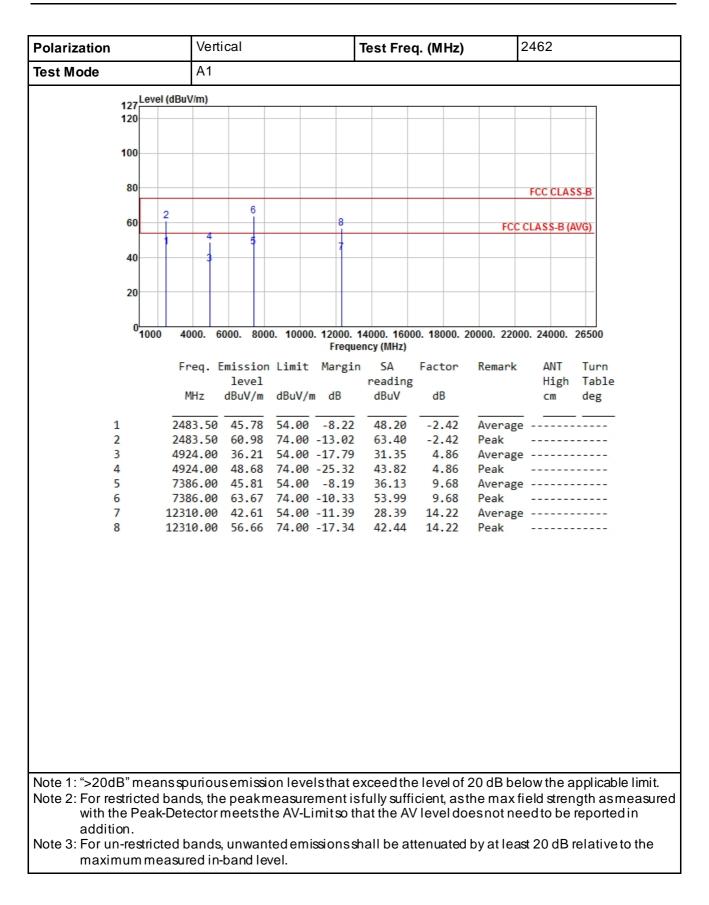






Polarization	H	orizontal			Test Fre	q. (MHz)	:	2462		
Test Mode	A	1								
127 Leve	l (dBuV/m)									
120										
100										
80	2							FCC CLAS	SS-B	
	Ī	6								
60				8			FCC	CLASS-B (A	AVG)	
		4 5								
40		3								
20										
0										
~1000	4000.	6000. 8	000. 10000		14000. 160 ency (MHz)	00. 18000. 3	20000. 2200	0. 24000.	26500	
	Frea	Fmissio	on limit	Margin	n SA	Factor	Remark	ANT	Turn	
		level		101 811	reading		ricinar it		Table	
	MHz	dBuV/r	n dBuV/r	m <mark>d</mark> B	dBuV	dB		cm	deg	
1		50 53.2					_			
2		50 73.72 00 35.40				-2.42 4.86	Peak			
4		00 48.52				4.86	Peak			
5		00 49.29				9.68				
6	7386.0	69.73	3 74.00	-4.27	60.05	9.68	Peak			
7		40.88					0			
8	12310.0	54.70	9 74.00	-19.30	40.48	14.22	Peak			
Note 1: ">20dB" mea										
lote 2: For restricted with the Peak										
addition.	todhar	da unun	ntodom	ionionon	hallbaa	ttopusted	byotlas	4 00 40	rolativa to the	
lote 3: For un-restric				ISSIONSS	nall be a	nenuated	byatiea	si∠∪ aB	ielative to the	
maximumme	asured		evel.							







Polarization	Horizontal	Test Freq. (MHz)	2412		
Test Mode	A2				
127	V/m)		· ·		
120					
100					
80			FCC CLASS-B		
60 4					
2	6	FL	C CLASS-B (AVG)		
40	5				
20					
⁰ 1000 40	000. 6000. 8000. 10000. 12000. Frequ	14000. 16000. 18000. 20000. 22 ency (MHz)	000. 24000. 26500		
Fr	req. Emission Limit Margi				
	level	reading	High Table		
M	1Hz dBuV/m dBuV/m dB	dBuV dB	cm deg		
1 236	50.00 36.85 54.00 -17.15	39.89 -3.04 Avera	ge		
	50.00 46.05 74.00 -27.95				
	90.00 43.05 54.00 -10.95 90.00 57.23 74.00 -16.77		ge		
	24.00 34.38 54.00 -19.62		ge		
6 482	24.00 47.85 74.00 -26.15	43.16 4.69 Peak			
Note 1: ">20dB" means so	uriousemission levels that e	exceed the level of 20 dB h	elow the applicable limit		
Note 2: For restricted band with the Peak-Dete	ds, the peak measurement is ector meets the AV-Limit so the	sfully sufficient, as the max	field strength as measured		
addition. Note 3: For un-restricted b maximum measure	ands, unwanted emissions s ed in-band level.	hall be attenuated by at le	ast 20 dB relative to the		



Polarization	Vertical	Test Freq. (MHz)	2412		
Test Mode	A2				
127 Level (dBu)	V/m)				
120					
100					
80 4			FCC CLASS-B		
60			C CLASS-B (AVG)		
	6		C CLASS-D (AVQ)		
40	5				
20					
0					
01000 40	000. 6000. 8000. 10000. 12000. Fregu	14000. 16000. 18000. 20000. 22 ency (MHz)	000. 24000. 26500		
Fr	req. Emission Limit Margin		k ANT Turn		
	level	reading	High Table		
Μ	MHz dBuV/m dBuV/m dB	dBuV dB	cm deg		
1 236	50.00 48.58 54.00 -5.42	51.62 -3.04 Averag	 ge		
	50.00 57.29 74.00 -16.71				
	90.00 52.95 54.00 -1.05 90.00 73.89 74.00 -0.11		ge		
5 482	24.00 37.55 54.00 -16.45		ge		
6 482	24.00 50.76 74.00 -23.24	46.07 4.69 Peak			
	ourious emission levels that e				
Note 2: For restricted band with the Peak-Det	ds, the peak measurement is ector meets the AV-Limit so t	stully sufficient, as the max hat the AV level does not n	tield strength as measured		
addition.					
Note 3: For un-restricted b	oands, unwanted emissions s	hall be attenuated by at le	east 20 dB relative to the		
maximummeasur	red in-band level.				



Polarization	Horizontal Test Freq. (MHz) 2437				
Test Mode	A2				
l evel (dBu	V/m)				
127 Level (dBu					
120					
100					
100					
80			FCC CLASS-B		
co 2					
60 4	6		FCC CLASS-B (AVG)		
40					
20					
0 1000 40		. 14000. 16000. 18000. 20000. uency (MHz)	. 22000. 24000. 26500		
Fr	req. Emission Limit Marg	in SA Factor Rem	mark ANT Turn		
	level	reading	High Table		
Ν	MHz dBuV/m dBuV/m dB	dBuV dB	cm deg		
4 77					
	90.00 43.95 54.00 -10.0 90.00 59.52 74.00 -14.4		erage		
	83.50 45.07 54.00 -8.93		ak Prage		
	83.50 58.77 74.00 -15.23				
5 487	74.00 36.47 54.00 -17.53	3 31.70 4.77 Ave	erage		
6 487	74.00 49.57 74.00 -24.4	3 44.80 4.77 Pea	ak		
lote 2: For restricted ban		isfully sufficient, as the m	B below the applicable limit. nax field strength as measure ot need to be reported in		
	oands, unwanted emissions red in-band level.	shall be attenuated by a	t least 20 dB relative to the		



Polarization	Vertical	Test Free	q. (MHz)	2	2437		
Test Mode	A2				•		
127 Level (dBu	ıV/m)						7
120							-
100							
100							_
80 2						FCC CLASS-B	F
							-
60	6				FCC	CLASS-B (AVG)	
40	5						_
20							-
°1000 4	1000. 6000. 800	0. 10000. 12000. Frequ	14000. 1600 ency (MHz)	00. 18000. 20	0000. 2200	0. 24000. 265	00
F	req. Emission	n Limit Margi	n SA	Factor	Remark		ırn
	level MHz dBuV/m	dBuV/m dB	reading dBuV	dB		High Ta cm de	able eg
_				ub			=B
	90.00 49.90 90.00 73.72	54.00 -4.10 74.00 -0.28		-2.88 -2.88	Average Peak		
		54.00 -2.90			Average		
		74.00 -1.26 54.00 -14.42			Peak		
		74.00 -21.32			Peak		
lote 1: ">20dB" meanss	ouriousemissi	on levels that	exceed the	e level of 2	20 dB be	low the app	licable limit
lote 2: For restricted bar	ds, the peakn	neasurementi	s fully suffi	cient, astl	ne max fi	eld strength	nasmeasure
with the Peak-Det addition.	ector meets th	ne AV-LIMITSO t	nat the A\	/ leveldoe	esnotne	eato be rep	ortedin
lote 3: For un-restricted	bands, unwan	tedemissions	hall be at	tenuated l	oyatlea	st 20 dB rela	ative to the
maximummeasu					-		



Polarization	Horizontal	Test Freq. (MHz)	2462				
Test Mode	A2						
127	V/m)						
120							
100							
80							
			FCC CLASS-B				
60 4			FCC CLASS-B (AVG)				
23	6						
40 1	5						
20							
0 <mark>000000</mark>	000. 6000. 8000. 10000. 12000.	14000. 16000. 18000. 2000	0. 22000. 24000. 26500				
	Frequ	ency (MHz)					
Fr	req. Emission Limit Margi level	n SA Factor R reading	emark ANT Turn High Table				
N	MHz dBuV/m dBuV/m dB	dBuV dB	cm deg				
4	60.00 37.06 54.00 -16.94	40.40 7.04					
	60.00 37.06 54.00 -16.94 60.00 46.36 74.00 -27.64		verage eak				
	83.50 43.49 54.00 -10.51		verage				
	83.50 57.12 74.00 -16.88 24.00 34.59 54.00 -19.41		eak verage				
	24.00 47.96 74.00 -26.04		eak				
Noto 1. "> 20dD"	urious option lovelathet	avagadtha lavel of 00	dD bolow the applicable limit				
Note 2: For restricted ban		sfully sufficient, as the	dB below the applicable limit. max field strength as measured not need to be reported in				
addition. Note 3: For un-restricted b	bands, unwanted emissions s		at least 20 dB relative to the				
maximummeasu	red in-band level.						



Polarization	Vertical	Vertical Test Freq. (MHz) 2462					
Test Mode	A2						
127	dBuV/m)						
127							
100							
80							
80 4						FCC CLASS-B	
60 <u>2</u> B	6				FCC C	CLASS-B (AVG)	
	ļ						
40							
20							
20							
0	4000. 6000. 8	3000. 10000. 12000	14000. 160	00. 18000. 2	20000. 22000	0. 24000. 26500	
			uency (MHz)				
	Freq. Emissi leve	on Limit Marg		Factor	Remark	ANT Turn	
		′m dBuV/m dB	reading dBuV	dB		High Table cm deg	
	2360.00 48.6	57 54.00 -5.33 55 74.00 -16.35		-3.04 -3.04	Average Peak		
		3 54.00 -1.2	55.16	-2.43	Average		
		37 74.00 -0.13 33 54.00 -16.13			Peak Average		
		6 74.00 -22.94			Peak		
Note 1: ">20dB" means	sspuriousemi	ssion levels that	exceedth	elevelof	20 dB bel	ow the applicab	le limit.
Note 2: For restricted b	ands, the pea	kmeasurement	sfully suff	icient, ast	the max fi	eld strength as r	neasure
with the Peak-L addition.	petectormeets	sthe AV-Limitso	inat the A	vieveldo	esnothee	euto pe reporte	uin
lote 3: For un-restricte	d bands, unwa	antedemissions	shall be a	ttenuated	by at leas	t 20 dB relative	to the
maximummea					-		