

FCC Test Report (WLAN 2.4GHz)

Report No.: RF170724C44

FCC ID: RSE-589VACV2HP

Equipment Name: Technicolor xDSL Gateway

Trade Name: technicolor

Model Number: TG589vac v2 HP

Gateway code: DSLWBA589HP

Received Date: Jul. 26, 2017

Test Date: Aug. 14 ~ Sep. 02, 2017

Issued Date: Sep. 04, 2017

Applicant: Technicolor Delivery Technologies Belgium

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Release Control Record

Issue No.	Description	Date Issued
RF170724C44	Original release.	Sep. 04, 2017

1 Certificate of Conformity

Equipment Name: Technicolor xDSL Gateway

Trade Name: technicolor

Test Model: TG589vac v2 HP

Gateway code: DSLWBA589HP

Sample Status: Product Unit

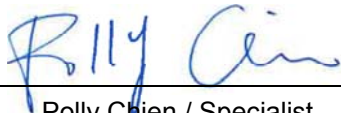
Applicant: Technicolor Delivery Technologies Belgium

Test Date: Aug. 14 ~ Sep. 02, 2017

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF EMI characteristics under the conditions specified in this report.

Prepared by :


Polly Chien / Specialist

Date: Sep. 04, 2017

Approved by :


Ken Liu / Senior Manager

Date: Sep. 04, 2017

2 Summary of Test Results

Applied Standard: 47 CFR FCC Part 15 Subpart C					
Section	Ref. Std. Clause	Description	Measured	Limit	Result
3.9	15.203	Antenna Requirements	-	-	PASS
4.1	15.207	AC Power Conducted Emissions	Margin is -18.00dB at 0.15781MHz.	15.207	PASS
4.2	15.247(b)(3)	Maximum Conducted Output Power	Power [dBm]: 11b: 20.88 dBm 11g: 19.07 dBm 11n(20M): 22.77 dBm 11n(40M): 18.10 dBm	30 dBm	PASS
4.3	15.247(e)	Power Spectral Density	PSD [dBm]: 11b: -11.82 dBm/3kHz 11g: -17.26 dBm/3kHz 11n(20M): -13.54 dBm/3kHz 11n(40M): -20.05 dBm/3kHz	8dBm/3kHz	PASS
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Bandwidth [MHz]: 11b: 8.58 MHz 11g: 16.44 MHz 11n(20M): 17.68 MHz 11n(40M): 35.95 MHz	≥500kHz	PASS
4.5	-	Occupied Bandwidth	Bandwidth [MHz]: 11b: 11.00 MHz 11g: 17.30 MHz 11n(20M): 18.40 MHz 11n(40M): 36.48 MHz	-	-
4.6	15.247(d)	Radiated Emissions	Margin is -4.1dB at 4924.00MHz	-	PASS
4.7	15.247(a)(2)	Band Edge Emissions	Margin is -2.3dB at 2390.00MHz.	-	PASS

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	3.59 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.60 dB
	6GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 Basic Description of Equipment Under Test (WLAN 2.4GHz)

Items	Description			
Equipment Name	Technicolor xDSL Gateway			
Trade Name	technicolor			
Model Number	TG589vac v2 HP			
Product Code	DSLWBA589HP			
FCC ID	RSE-589VACV2HP			
Power Type	From power adapter			
Antenna	Refer section 3.10			
EUT Stage	☒	Product Unit	☐	Pre-Sample
Operating Band and Conducted Output Power	2400~2483.5MHz		☒	IEEE 802.11b: 20.88 dBm
			☒	IEEE 802.11g: 19.07 dBm
			☒	IEEE 802.11n (20MHz): 22.77 dBm
			☒	IEEE 802.11n (40MHz): 18.10 dBm
Product Type	For IEEE 802.11b: WLAN(1TX, 2RX) For IEEE 802.11g: WLAN(1TX, 2RX) For IEEE 802.11n: WLAN(1, 2TX, 2RX)			
Nominal Bandwidth	20MHz / 40MHz			
Modulation	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11n: OFDM (BPSK / QPSK / 16QAM / 64QAM) See the below table			
Data Rate (Mbps)	802.11b mode :DSSS (1/2/5.5/11) 802.11g mode :OFDM (6/9/12/18/24/36/48/54) 802.11n(20MHz) mode(MCS0~MCS23); 802.11n(40MHz) mode(MCS0~MCS23) See the below table			
I/O Ports	DSL Port x 1 LAN Port x 4 WAN Port x 1 USB 2.0 Port x 1			
Hardware Version	Beta			
Software Version	17.3.0098-0900000-20170726032535-47e971d32715b4e9ffb1a4eb97c8bf01874d3e19			

IEEE Std. 802.11n modulation and data rate information

MCS Index	Spatial Streams	Modulation Type	Coding Rate	Data Rate (Mbit/s)			
				20 MHz channel		40 MHz channel	
				800ns GI	400ns GI	800ns GI	400ns GI
0	1	BPSK	1/2	6.5	7.2	13.5	15
1		QPSK	1/2	13	14.4	27	30
2		QPSK	3/4	19.5	21.7	40.5	45
3		16-QAM	1/2	26	28.9	54	60
4		16-QAM	3/4	39	43.3	81	90
5		64-QAM	2/3	52	57.8	108	120
6		64-QAM	3/4	58.5	65	121.5	135
7		64-QAM	5/6	65	72.2	135	150
8	2	BPSK	1/2	13	14.4	27	30
9		QPSK	1/2	26	28.9	54	60
10		QPSK	3/4	39	43.3	81	90
11		16-QAM	1/2	52	57.8	108	120
12		16-QAM	3/4	78	86.7	162	180
13		64-QAM	2/3	104	115.6	216	240
14		64-QAM	3/4	117	130	243	270
15		64-QAM	5/6	130	144.4	270	300

Note: GI means guard interval.

3.2 Accessories

Power supply:

Brand	HONOR
Model	ADS-30FT-12 12027EPCU
P/N	DSL37756990
Input Power	100-240Vac, 50/60Hz, 0.7A
Output Power	12Vdc, 2.25A
Power Line	1.5m power cable without core attached on adapter

3.3 Feature of Equipment Under Test

Please refer to user manual.

3.4 Information Provided by the Manufacturer

Interface Availability

Interface Model	DC Power	ADSL: (ADSL2+) VDSL2 17a: (B8-8, B7-9)	Ethernet LAN 1000Mbps	Ethernet WAN 1000Mbps	USB 2.0	WLAN IEEE 802.11n (2.4GHz)	WLAN IEEE 802.11ac (5GHz)
TG589vac v2 HP	12Vdc, 2.25A	●Annex A	●(4 port)	●(1 port)	●(1 port)	●	●

●: Equipped

○: Not Equipped

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

KDB 558074 D01 DTS Meas Guidance v04, 04/05/2017

KDB 662911 D01 Multiple Transmitter Output v02r01, 10/31/2013

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

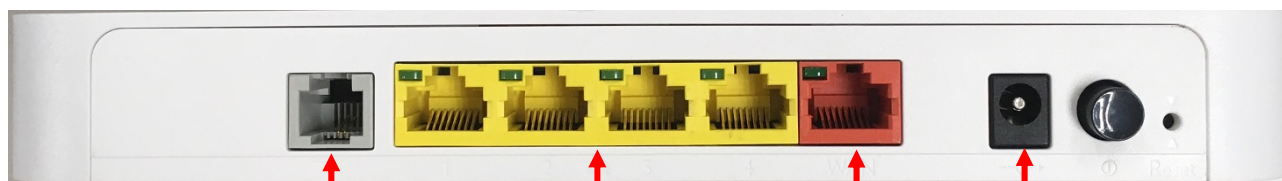
Note: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.6 Cabling Attached to the Equipment

Cable and Interconnection

Interface	Cable type	Cable length delivered with the modem	"Real life" Cable length that can be attached to this type of interface	Cable length to be used for testing	Internal/ external connection
DSL	UTP Cat 3	2 meter flat cable	> 10 meter	10 meter	External
ETH1, WAN	UTP Cat 5	2 meter	> 10 meter	Two 10 meter cables;	Internal
USB 2.0	STP	NA	NA	NA	Internal
AC power	UTP	1.5 meter	>10 meter	1.5 meter	External

3.7 Panel Drawing



DSL

Ethernet 1~4

WAN

Power



USB 2.0

3.8 Transmit Operating Mode

Transmit Operating Mode					Transmit Multiple Antennas				
☒	Operating mode 1 (single antenna)				☒	1TX			
☒	Operating mode 2 (multiple antenna, no beam forming)				☒	2TX	☐	3TX	☐ 4TX
☐	Operating mode 3 (multiple antenna, with beam forming)				☐	2TX	☐	3TX	☐ 4TX
☒	802.11b	Operating mode	☒	1TX	☐	2TX	☐	3TX	☐ Cyclic shift
☒	802.11g	Operating mode	☒	1TX	☐	2TX	☐	3TX	☐ Cyclic shift
☒	802.11n(20MHz)	Operating mode	☒	1TX	☒	2TX	☐	3TX	☐ Cyclic shift
☒	802.11n(40MHz)	Operating mode	☒	1TX	☒	2TX	☐	3TX	☐ Cyclic shift

Note:

For IEEE802.11b, 1Mbps~11Mbps: 1TX

For IEEE802.11g, 6Mbps~54Mbps: 1TX

For IEEE802.11n 20MHz/40MHz, MCS0~MCS7: 1 Stream 1TX; MCS8~MCS15: 2 Stream 2TX

3.9 Antenna Requirements

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

3.10 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	-	-	Printed Antenna	Murata
2	-	-	Printed Antenna	Murata

Antenna & Bandwidth for 2400~2483.5MHz

Antenna	1st (TX)		2nd (TX)	
Bandwidth Mode	20 MHz	40 MHz	20 MHz	40 MHz
802.11b	V	X	X	X
802.11g	V	X	X	X
802.11n	V	V	V	V

For 2400~2483.5MHz

Frequency	Antenna Gain (dBi)			
	Ant. 1 (W2)		Ant. 2 (W1)	
	20 MHz	40 MHz	20 MHz	40 MHz
2412MHz	3.37	-	2.08	-
2422MHz	-	3.16	-	2.01
2437MHz	3.58	3.58	1.69	1.69
2452MHz	-	3.54	-	1.73
2462MHz	3.33	-	1.62	-

Frequency	Maximum Gain (dBi) for SDM mode	
	SDM mode (2 Stream 2 TX) for Power & PSD Gain (KDB 662911 Option 2)	
	20 MHz	40 MHz
2412MHz	0.93	-
2422MHz	-	0.75
2437MHz	1.18	1.18
2452MHz	-	1.04
2462MHz	0.82	-

Note:

1. "TG589vac v2 HP_FCC General antenna table_20160112.xls" files
2. Maximum Correlated Directional Gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$ dBi
3. Maximum Uncorrelated Directional Gain = $10 \log[(10^{G1/10} + 10^{G2/10} + \dots + 10^{GN/10}) / N_{ANT}]$ dBi

3.11 Table for Carrier Frequency

Eleven channels are provided for 802.11b, 802.11g, 802.11n (20MHz):

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

Seven channels are provided for 802.11n (40MHz):

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400MHz ~ 2483.5 MHz	3	2422 MHz	7	2442MHz
	4	2427MHz	8	2447MHz
	5	2432MHz	9	2452MHz
	6	2437MHz		

3.12 Table for Test Modes

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Note	Channel	Data Rate	Antenna
AC Power Line Conducted Emissions	802.11n(20MHz)	OFDM/BPSK	6	-	1+2
Maximum Average Output Power	802.11b	DSSS/DBPSK	1/6/11	1 Mbps	2
	802.11g	OFDM/BPSK	1/6/11	6 Mbps	2
	802.11n(20MHz)		1/6/11	MCS0	2
				MCS8 2S2T SDM	1+2
	802.11n(40MHz)		3/6/9	MCS0	2
				MCS8 2S2T SDM	1+2
Power Spectral Density	802.11b	DSSS/DBPSK	1/6/11	1 Mbps	2
	802.11g	OFDM/BPSK	1/6/11	6 Mbps	2
	802.11n(20MHz)		1/6/11	MCS0	2
				MCS8 2S2T SDM	1+2
	802.11n(40MHz)		3/6/9	MCS0	2
				MCS8 2S2T SDM	1+2
6dB Spectrum Bandwidth	802.11b	DSSS/DBPSK	1/6/11	1 Mbps	2
	802.11g	OFDM/BPSK	1/6/11	6 Mbps	2
	802.11n(20MHz)		1/6/11	MCS0	2
				MCS8 2S2T SDM	1+2
	802.11n(40MHz)		3/6/9	MCS0	2
				MCS8 2S2T SDM	1+2
Band Edge Emissions (Radiated)	802.11b	DSSS/DBPSK	1/6/11	1 Mbps	2
	802.11n(20MHz)	OFDM/BPSK	1/6/11	MCS0	2
				MCS8 2S2T SDM	1+2
	802.11n(40MHz)		3/6/9	MCS0	2
MCS8 2S2T SDM				1+2	
Radiated Emissions Above 1GHz(Radiated)	802.11b	DSSS/DBPSK	1/6/11	1 Mbps	2
	802.11n(20MHz)	OFDM/BPSK	1/6/11	MCS0	2
				MCS8 2S2T SDM	1+2
	802.11n(40MHz)		3/6/9	MCS0	2
MCS8 2S2T SDM				1+2	
Radiated Emissions Below 1GHz(Radiated)	802.11n(20MHz)	OFDM/BPSK	6	-	1+2

Note:

1. The device with multiple operating mode, measurements on the middle channel were tested to determine the worst case mode. (Each modulation family were tested in band edge, spurious emission and in band PSD after investigate worst case mode)
2. Base on txcore command, the 11b/g default mode is 1S1T SISO Ant2, the 802.11n 20MHz/40MHz default mode are 1S1T SISO Ant2, 2S2T SDM Ant1+2.
wl -i wl0 txcore
txcore enabled bitmap (Nsts {4..1}) 0x0f 0x07 0x03 0x01
txcore mask OFDM 0x01 CCK 0x01
3. Base on same power setting with 802.11n mode, the 802.11g mode were only tested the “Maximum Conducted Output Power” , “Power Spectral Density” and “Bandwidth”.
4. Radiated emission test, the EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane.

3.13 Parameters of Test Software Setting

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

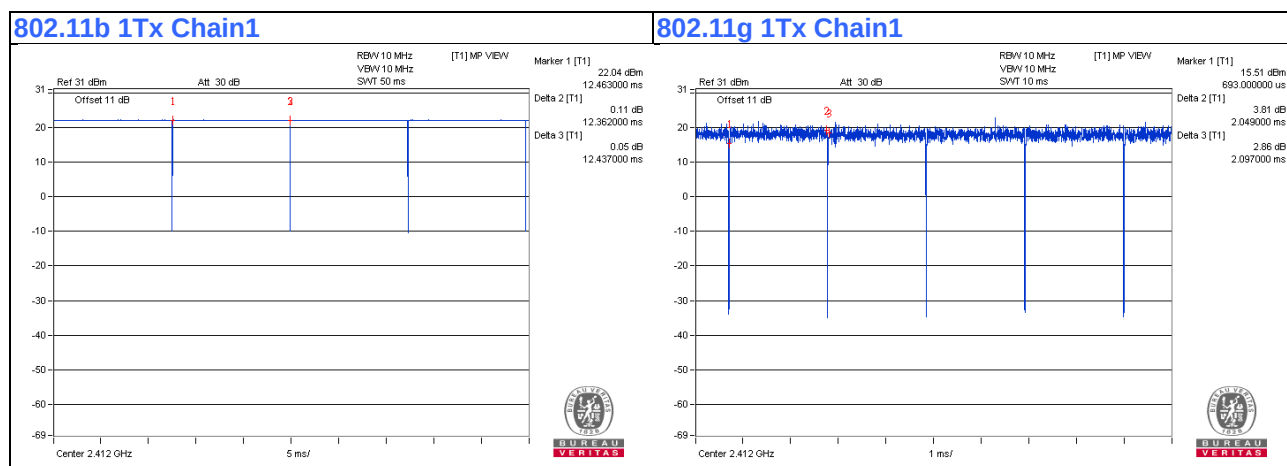
The Power Setting Parameter					
Test Software Version	17.3.0098-0900000-20170726032535-47e971d32715b4e9ffb1a4eb97c8bf01874d3e19				
Worst Modulation Mode	Number of Transmit Chains (NTX)	Frequency (MHz)	Maximum Output Power (dBm)	Power Setting	Data Rate / MCS
802.11b, Ant. 2	1Stream 1TX	2412	18.99	Default(19.5)	1Mbps
802.11b, Ant. 2	1Stream 1TX	2437	20.88	Default(21.25)	1Mbps
802.11b, Ant. 2	1Stream 1TX	2462	20.43	Default(20)	1Mbps
802.11g, Ant. 2	1Stream 1TX	2412	14.14	Default(14.5)	6Mbps
802.11g, Ant. 2	1Stream 1TX	2437	19.07	Default(19.5)	6Mbps
802.11g, Ant. 2	1Stream 1TX	2462	14.03	Default(13.5)	6Mbps
802.11n 20MHz, Ant. 2	1Stream 1TX	2412	14.43	Default(14.5)	MCS0
802.11n 20MHz, Ant. 2	1Stream 1TX	2437	19.24	Default(19.5)	MCS0
802.11n 20MHz, Ant. 2	1Stream 1TX	2462	14.23	Default(13.5)	MCS0
802.11n 20MHz, Ant. 1+2 (SDM)	2Stream 2TX	2412	17.36	Default(14.75)	MCS8
802.11n 20MHz, Ant. 1+2 (SDM)	2Stream 2TX	2437	22.77	Default(20)	MCS8
802.11n 20MHz, Ant. 1+2 (SDM)	2Stream 2TX	2462	17.19	Default(13.75)	MCS8
802.11n 40MHz, Ant. 2	1Stream 1TX	2422	12.85	Default(13)	MCS0
802.11n 40MHz, Ant. 2	1Stream 1TX	2437	15.72	Default(16)	MCS0
802.11n 40MHz, Ant. 2	1Stream 1TX	2437	13.75	Default(13.25)	MCS0
802.11n 40MHz, Ant. 1+2 (SDM)	2Stream 2TX	2422	16.24	Default(13.25)	MCS8
802.11n 40MHz, Ant. 1+2 (SDM)	2Stream 2TX	2437	18.10	Default(15)	MCS8
802.11n 40MHz, Ant. 1+2 (SDM)	2Stream 2TX	2452	16.24	Default(12.5)	MCS8

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

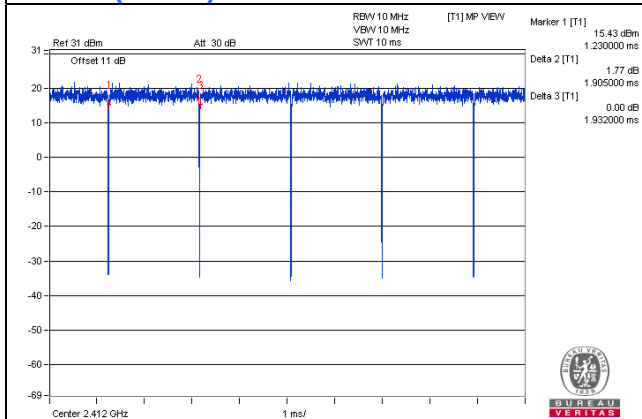
3.14 On Time and Duty Cycle

Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
802.11b 1Tx Chain1	12.362	12.437	99.4	-	-
802.11g 1Tx Chain1	2.049	2.097	97.7	0.10	1
802.11n (20MHz) 1Tx Chain1	1.905	1.932	98.6	-	-
802.11n (20MHz) 2Tx SDM	0.967	0.997	97.0	0.13	3
802.11n (40MHz) 1Tx Chain1	0.925	0.957	96.7	0.15	3
802.11n (40MHz) 2Tx SDM	0.460	0.500	92.0	0.36	3

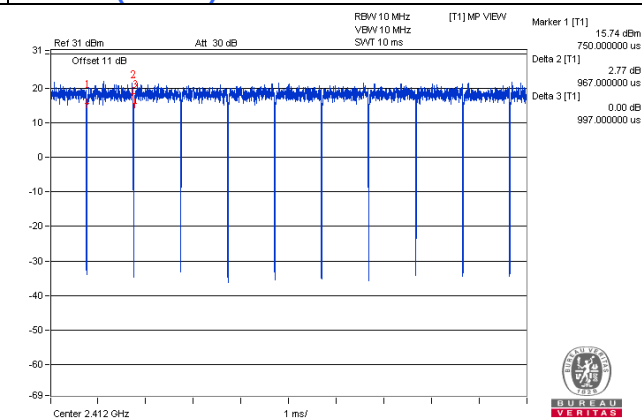
Note: Power measurement using sweep trigger and gating of the power meter, duty factor is not required.



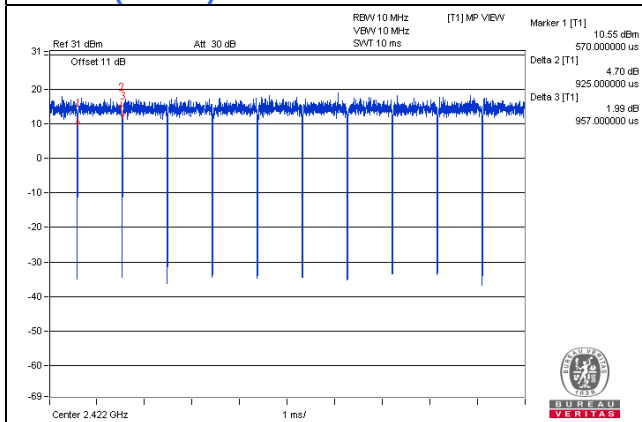
802.11n (20MHz) 1Tx Chain1



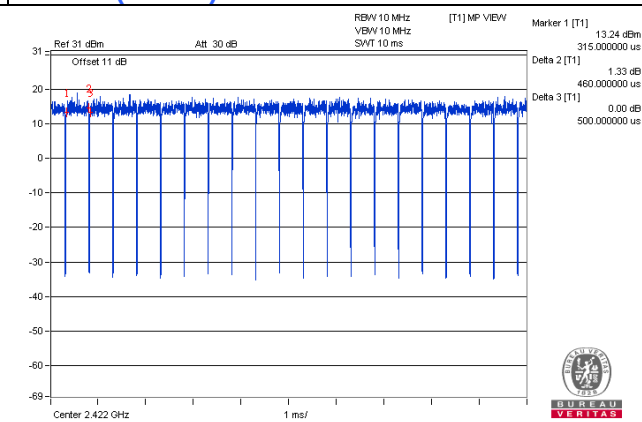
802.11n (20MHz) 2Tx SDM



802.11n (40MHz) 1Tx Chain1



802.11n (40MHz) 2Tx SDM



3.15 Testing Location Information

Test Site Location					
Address	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)				
TEL	886-3-3183232				
FAX	886-3-3270892				
Test Site No.	Site Category	Location	FCC Reg. No.	IC Reg. No.	VCCI Reg. No
Conduction 2	Conduction	Hwa Ya	-	-	C-2047
Chamber 4	966 Chamber	Hwa Ya	215374	7450F-9	-
Oven	Oven	Hwa Ya	-	-	-

3.16 EUT Diagram and Support Equipment

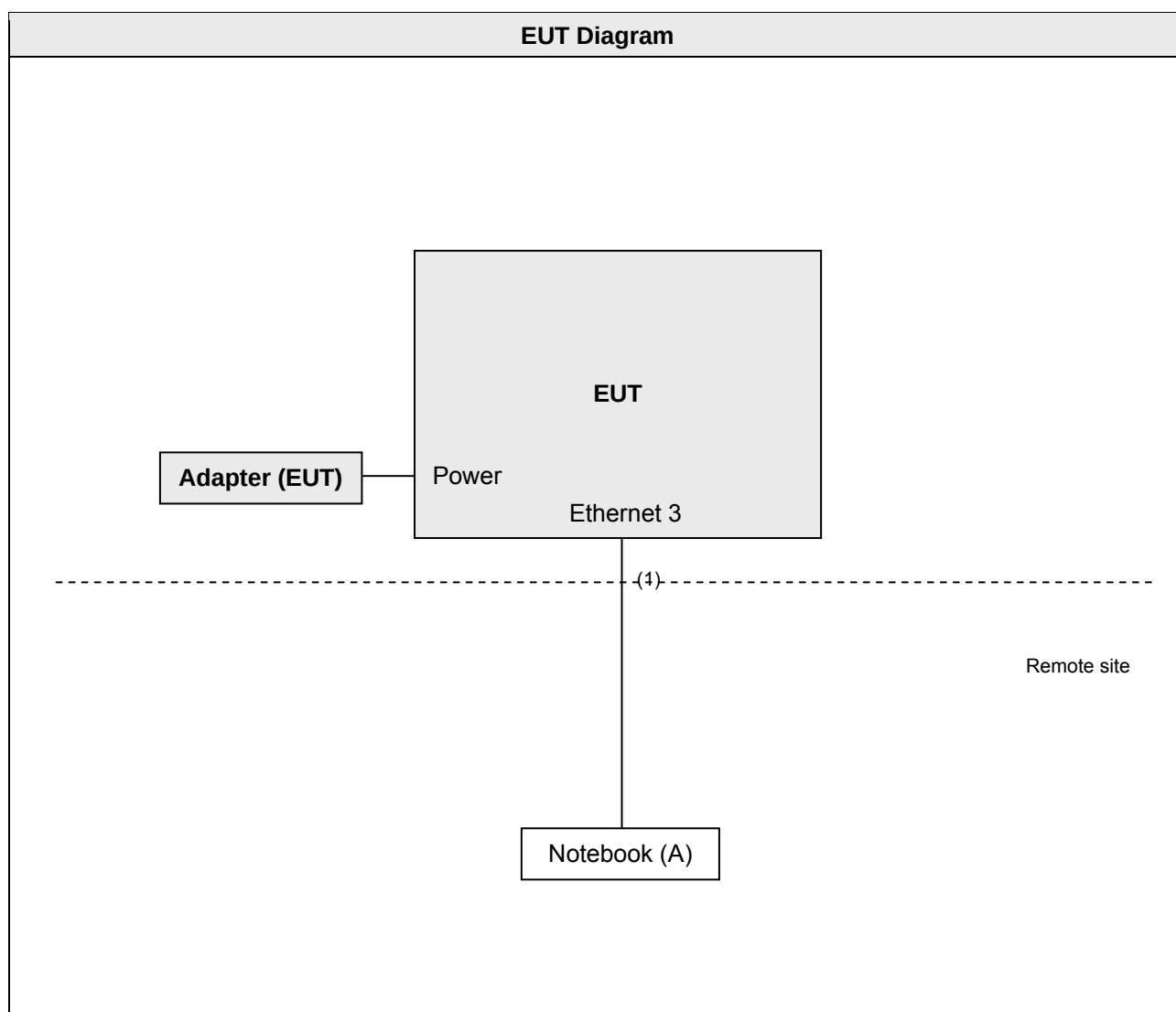
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	D531	CN-0XM006-4864 3-81U-2610	FCC DoC Approved	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45 cable	1	1.8	N	0	Provided by Lab



4 Test Types and Results

4.1 AC Power Conducted Emissions Measurement

4.1.1 Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

4.1.2 Measuring Instruments and Setting

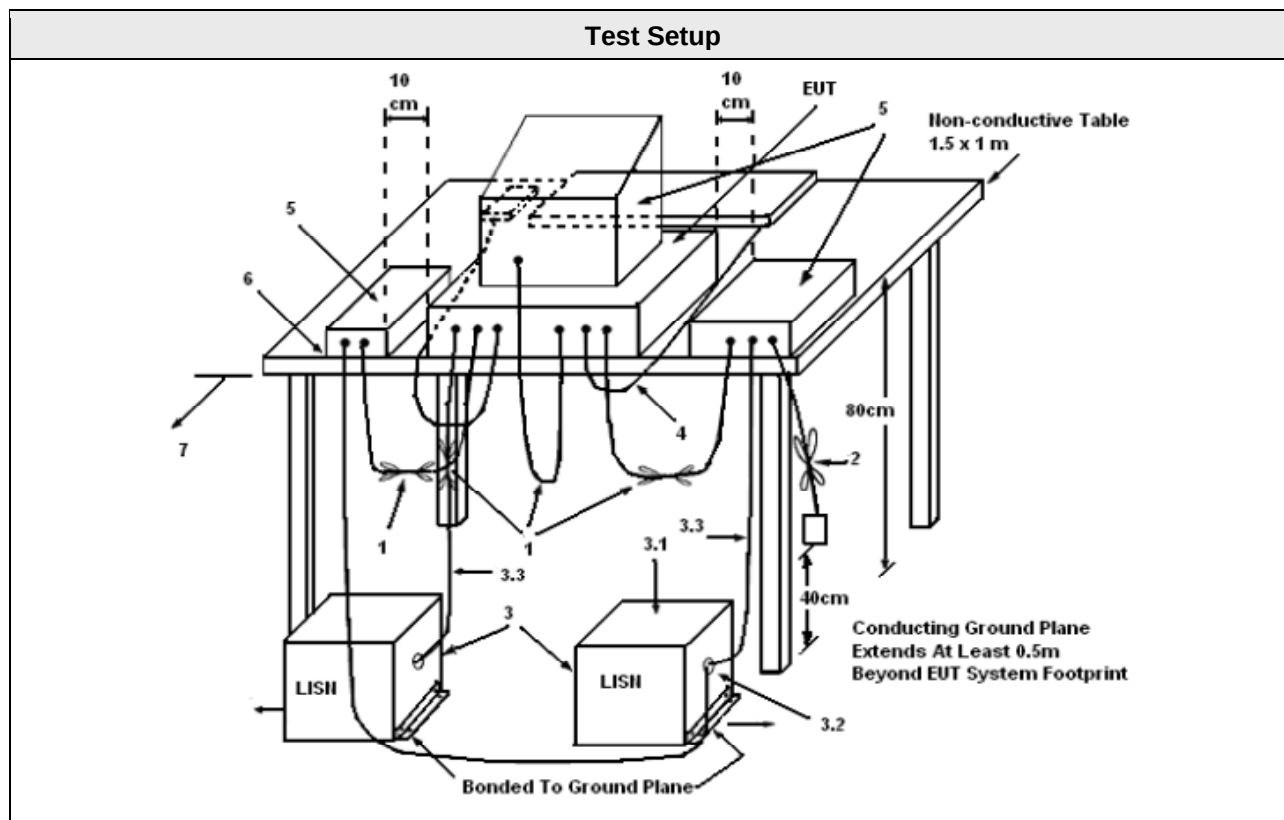
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

4.1.3 Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4 Test Setup Layout



1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
2. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3. EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω . LISN can be placed on top of, or immediately beneath, reference ground plane.
4. All other equipment powered from additional LISN(s).
5. Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
8. Non-EUT components of EUT system being tested.
9. Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
10. Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5 Test Deviation

There are no deviations with the original standard.

4.1.6 EUT Operating during Test

The EUT was placed on the test table and programmed in normal function.

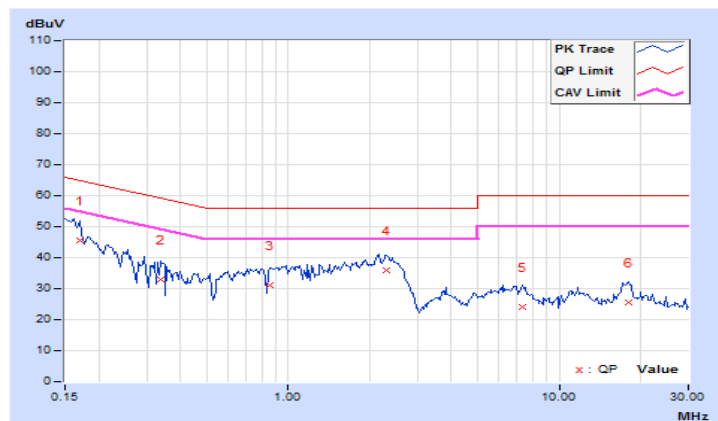
4.1.7 Test Results of AC Power Conducted Emissions

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 75%RH
Tested by	Chris Lin		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16953	10.00	35.53	19.94	45.53	29.94	64.98	54.98	-19.45	-25.04
2	0.33750	10.03	23.10	14.34	33.13	24.37	59.26	49.26	-26.13	-24.89
3	0.85313	10.07	21.11	12.44	31.18	22.51	56.00	46.00	-24.82	-23.49
4	2.30469	10.12	25.81	17.04	35.93	27.16	56.00	46.00	-20.07	-18.84
5	7.29297	10.22	13.79	7.90	24.01	18.12	60.00	50.00	-35.99	-31.88
6	17.95703	10.41	15.04	10.20	25.45	20.61	60.00	50.00	-34.55	-29.39

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

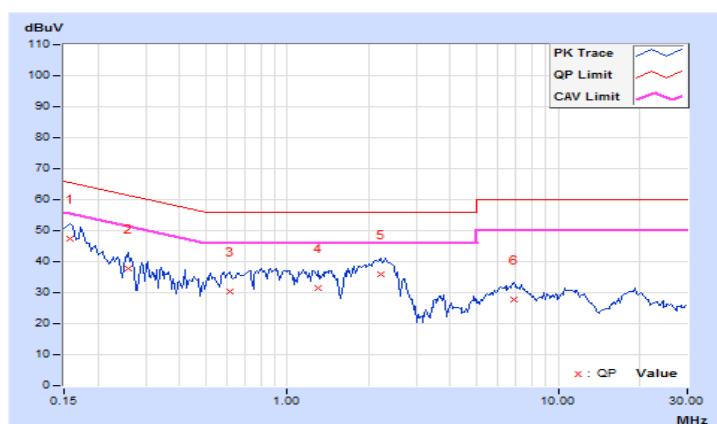


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 75%RH
Tested by	Chris Lin		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.01	37.57	23.10	47.58	33.11	65.58	55.58	-18.00	-22.47
2	0.25938	9.96	27.99	17.69	37.95	27.65	61.45	51.45	-23.50	-23.80
3	0.61094	10.03	20.49	12.26	30.52	22.29	56.00	46.00	-25.48	-23.71
4	1.30859	10.08	21.53	13.79	31.61	23.87	56.00	46.00	-24.39	-22.13
5	2.20703	10.06	25.86	17.37	35.92	27.43	56.00	46.00	-20.08	-18.57
6	6.88672	10.19	17.50	11.50	27.69	21.69	60.00	50.00	-32.31	-28.31

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



4.2 Maximum Conducted Output Power Measurement

4.2.1 Limit

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm). The limit has to be reduced by the amount in dB that the gain of the antenna exceeds 6dBi. For point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

4.2.2 Measuring Instruments and Setting

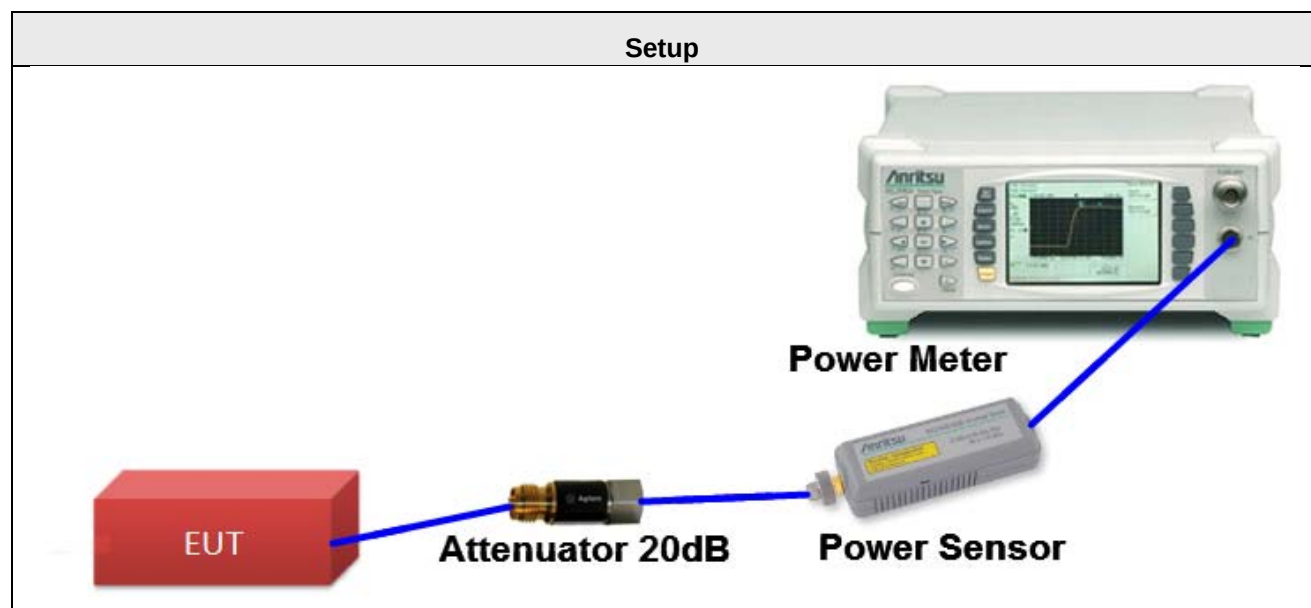
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Power Measurement	Auto
Rise Time	8ns
Sensor Model	MA2411B

4.2.3 Test Procedures

- 1 Test was performed in accordance with Measurement of Digital Transmission Systems Operating under KDB558074 D01 DTS Meas Guidance v04, in section “Maximum conducted output power Method AVGPM-G”, 04/05/2017
- 2 The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power sensor and enable the trigger function to get the all on time transmission. Record the average power level.
- 3 When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.2.4 Test Setup Layout



4.2.5 Test Deviation

There are no deviations with the original standard.

4.2.6 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

4.2.7 Test Results of Maximum Conducted Output Power

Temperature	25°C	Humidity	60%
Test Engineer	Leo Tsai		

FOR AVERAGE POWER

802.11b 1Tx Chain1

Channel	Frequency (MHz)	Conducted Power (dBm)	Directional Gain (dBi)	Max. Limit (dBm)	Result
1	2412	18.99	2.08	30	PASS
6	2437	20.88	1.69	30	PASS
11	2462	20.43	1.62	30	PASS

802.11g 1Tx Chain1

Channel	Frequency (MHz)	Conducted Power (dBm)	Directional Gain (dBi)	Max. Limit (dBm)	Result
1	2412	14.14	2.08	30	PASS
6	2437	19.07	1.69	30	PASS
11	2462	14.03	1.62	30	PASS

802.11n (20MHz) 1Tx Chain1

Channel	Frequency (MHz)	Conducted Power (dBm)	Directional Gain (dBi)	Max. Limit (dBm)	Result
1	2412	14.43	2.08	30	PASS
6	2437	19.24	1.69	30	PASS
11	2462	14.23	1.62	30	PASS

802.11n (20MHz) 2Tx SDM

Channel	Frequency (MHz)	Conducted Power (dBm)			Directional Gain (dBi)	Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total			
1	2412	14.14	14.55	17.36	0.93	30	PASS
6	2437	19.79	19.72	22.77	1.18	30	PASS
11	2462	14.50	13.83	17.19	0.82	30	PASS

Note:

1. Total Conducted Power = Conducted Power [TX 1(unit in W) + TX 2(unit in W)](unit in dBm)
2. Directional Gain <6dBi, so the limit doesn't reduce.

802.11n (40MHz) 1Tx Chain1

Channel	Frequency (MHz)	Conducted Power (dBm)	Directional Gain (dBi)	Max. Limit (dBm)	Result
3	2422	12.85	2.01	30	PASS
6	2437	15.72	1.69	30	PASS
9	2452	13.75	1.73	30	PASS

802.11n (40MHz) 2Tx SDM

Channel	Frequency (MHz)	Conducted Power (dBm)			Directional Gain (dBi)	Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total			
3	2422	13.23	13.22	16.24	0.75	30	PASS
6	2437	15.15	15.02	18.10	1.18	30	PASS
9	2452	13.22	13.24	16.24	1.04	30	PASS

Note:

1. Total Conducted Power = Conducted Power [TX 1(unit in W) + TX 2(unit in W)](unit in dBm)
2. Directional Gain <6dBi, so the limit doesn't reduce.

4.3 Power Spectral Density Measurement

4.3.1 Limit

For digitally modulated systems, the conductive measured power spectral density(PSD) shall not be greater than 8 dBm in any 3 kHz bandwidth during any time interval of continuous transmission.

4.3.2 Measuring Instruments and Setting

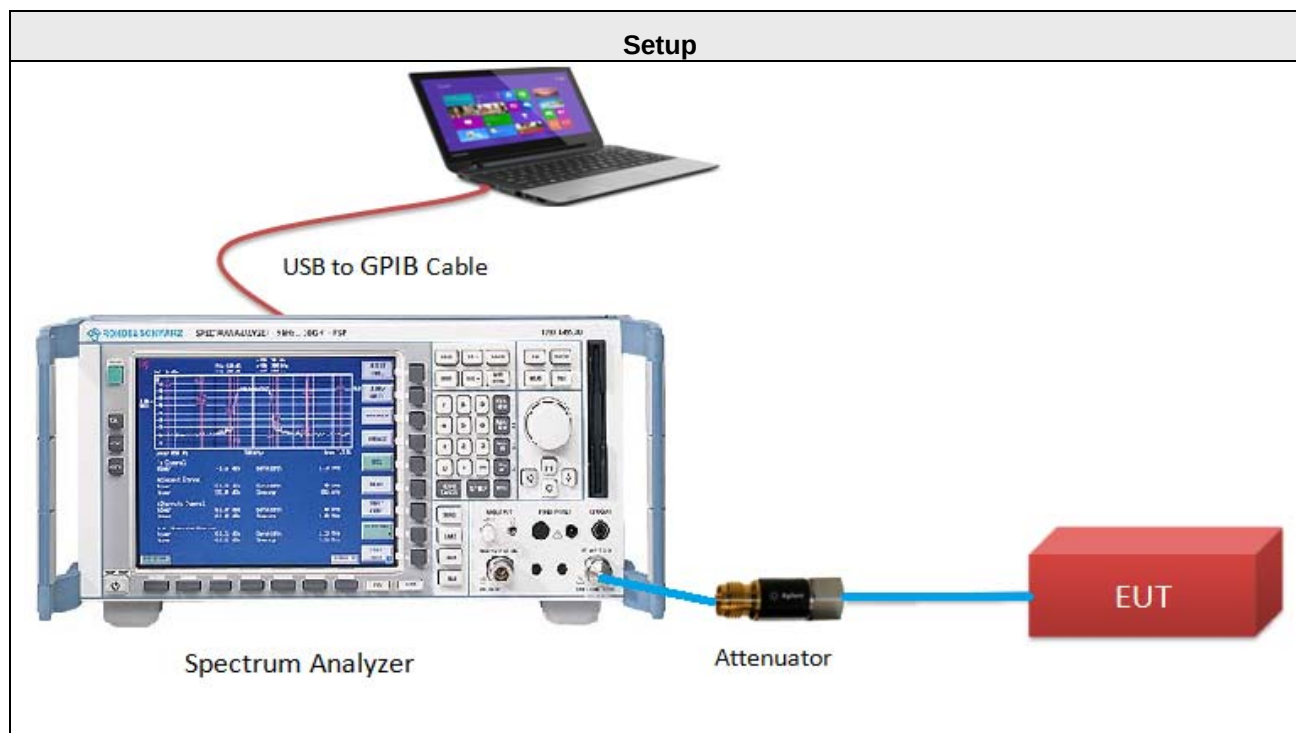
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RBW	Set the RBW ≥ 3 kHz
VBW	Set the VBW $\geq 3 \times$ RBW
Detector	RMS
Trace	Average sweep count 100
Sweep Time	Auto couple

4.3.3 Test Procedures

- 1 The transmitter output (antenna port) was connected to the spectrum analyzer.
- 2 Test was performed in accordance with Measurement of Digital Transmission Systems Operating under KDB558074 D01 DTS Meas Guidance v04, in section "Maximum power spectral density level in the fundamental emissions Method AVGPS-1", 04/05/2017.
- 3 Multiple antenna systems was performed in accordance KDB 662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs (bin-by-bin summing).
- 4 This procedure may be used when the maximum (average) conducted output power was used to demonstrate compliance to the output power limit. The EUT must be configured to transmit continuously (duty cycle $\geq 98\%$) to ensure that measurements are made only when the EUT is transmitting at its maximum power control level (no transmitter off time is to be considered).
- 5 Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
- 6 When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.

4.3.4 Test Setup Layout



4.3.5 Test Deviation

There are no deviations with the original standard.

4.3.6 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

4.3.7 Test Results of Power Spectral Density

Temperature	20°C	Humidity	62%
Test Engineer	Leo Tsai		

802.11b 1Tx Chain1

Channel	Frequency (MHz)	Power Density (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/3kHz)	Result
1	2412	-14.08	2.08	8	PASS
6	2437	-11.82	1.69	8	PASS
11	2462	-12.77	1.62	8	PASS

Note: Directional Gain <6dBi, so the limit doesn't reduce.

802.11g 1Tx Chain1

Channel	Frequency (MHz)	Power Density (dBm/3kHz)	Duty Factor (dB)	PSD With Duty Factor (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/3kHz)	Result
1	2412	-22.33	0.10	-22.23	2.08	8	PASS
6	2437	-17.36	0.10	-17.26	1.69	8	PASS
11	2462	-22.59	0.10	-22.49	1.62	8	PASS

Note: Directional Gain <6dBi, so the limit doesn't reduce.

802.11n (20MHz) 1Tx Chain1

Channel	Frequency (MHz)	Power Density (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/3kHz)	Result
1	2412	-22.28	2.08	8	PASS
6	2437	-17.25	1.69	8	PASS
11	2462	-23.19	1.62	8	PASS

Note: Directional Gain <6dBi, so the limit doesn't reduce.

802.11n (20MHz) 2Tx SDM

Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)	Duty Factor (dB)	PSD With Duty Factor (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/3kHz)	Result
1	2412	-19.03	0.13	-18.90	0.93	8	PASS
6	2437	-13.67	0.13	-13.54	1.18	8	PASS
11	2462	-18.84	0.13	-18.71	0.82	8	PASS

Note:

1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Refer to section 3.14 for duty cycle spectrum plot.

802.11n (40MHz) 1Tx Chain1

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	Duty Factor (dB)	PSD With Duty Factor (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/3kHz)	Result
3	2422	-26.86	0.15	-26.71	2.01	8	PASS
6	2437	-23.85	0.15	-23.70	1.69	8	PASS
9	2452	-25.73	0.15	-25.58	1.73	8	PASS

Note: Directional Gain <6dBi, so the limit doesn't reduce.

802.11n (40MHz) 2Tx SDM

Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)	Duty Factor (dB)	PSD With Duty Factor (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/3kHz)	Result
3	2422	-22.41	0.36	-22.05	0.75	8	PASS
6	2437	-20.53	0.36	-20.17	1.18	8	PASS
9	2452	-22.68	0.36	-22.32	1.04	8	PASS

Note: Directional Gain <6dBi, so the limit doesn't reduce.

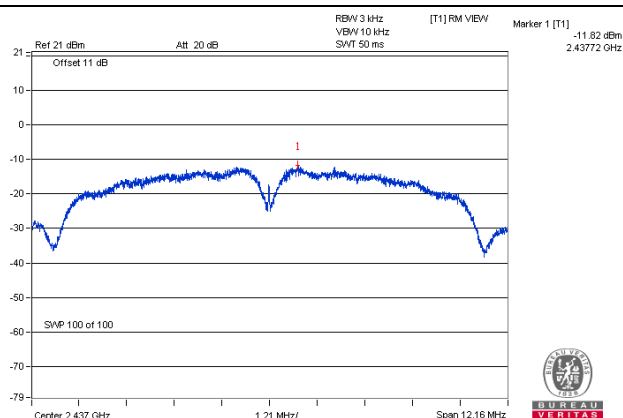
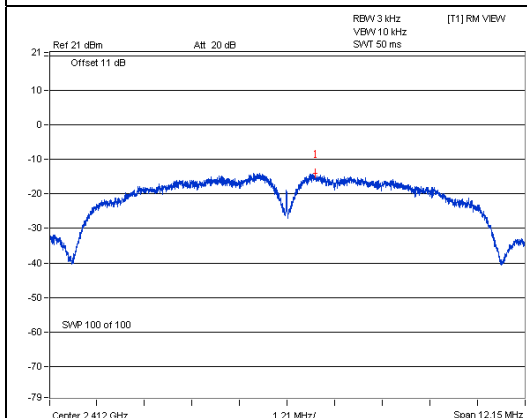
Note:

1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Refer to section 3.14 for duty cycle spectrum plot.

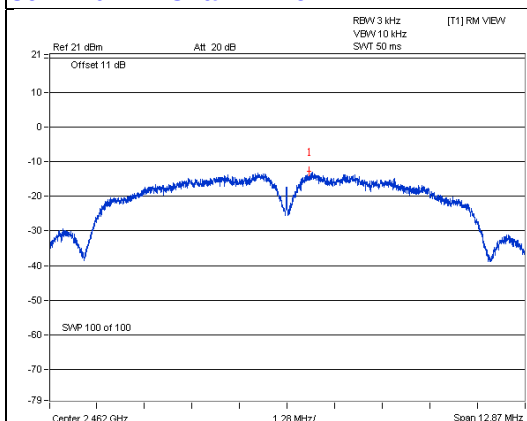
SPECTRUM PLOT

802.11b 1Tx Chain1 2412 MHz

802.11b 1Tx Chain1 2437 MHz

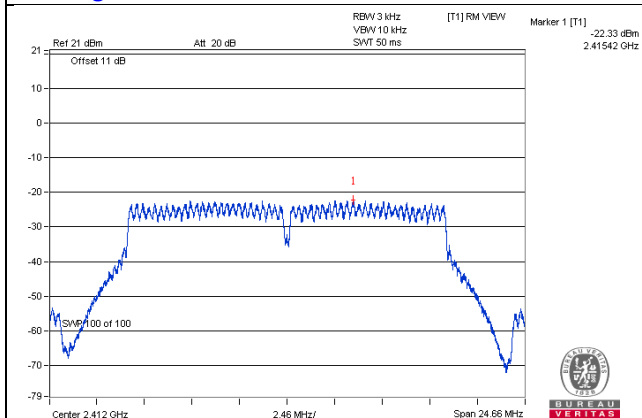


802.11b 1Tx Chain1 2462 MHz

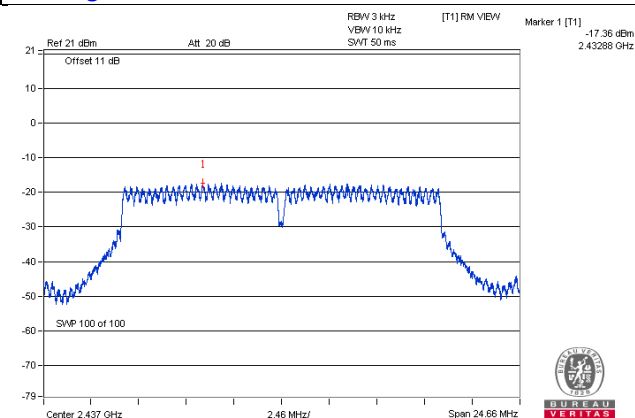


SPECTRUM PLOT

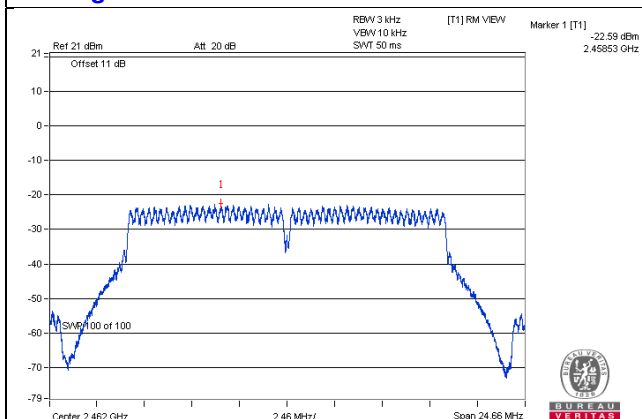
802.11g 1Tx Chain1 2412 MHz



802.11g 1Tx Chain1 2437 MHz



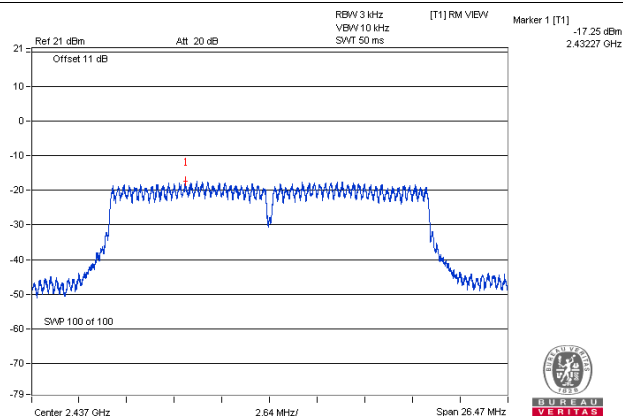
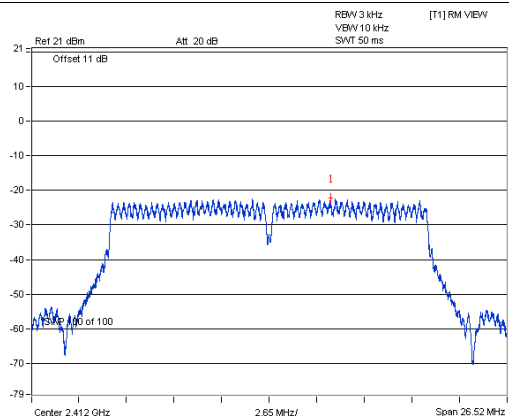
802.11g 1Tx Chain1 2462 MHz



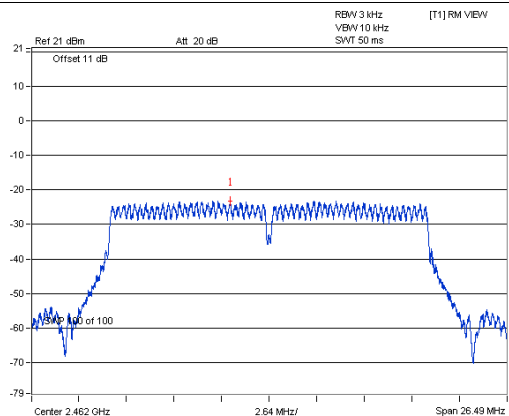
SPECTRUM PLOT

802.11n (20MHz) 1Tx Chain1 2412 MHz

802.11n (20MHz) 1Tx Chain1 2437 MHz

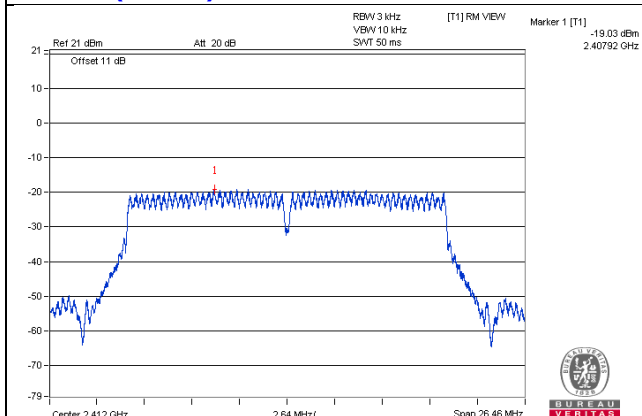


802.11n (20MHz) 1Tx Chain1 2462 MHz

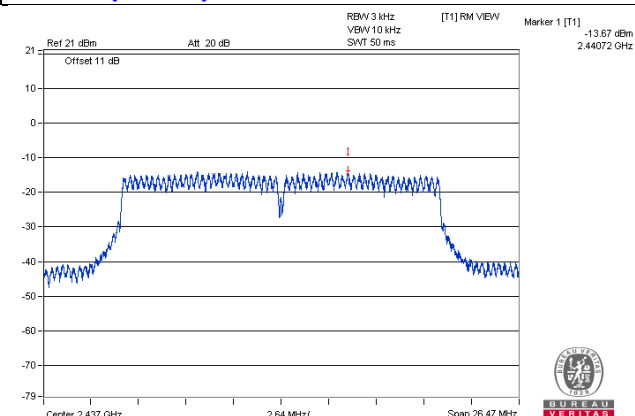


SPECTRUM PLOT

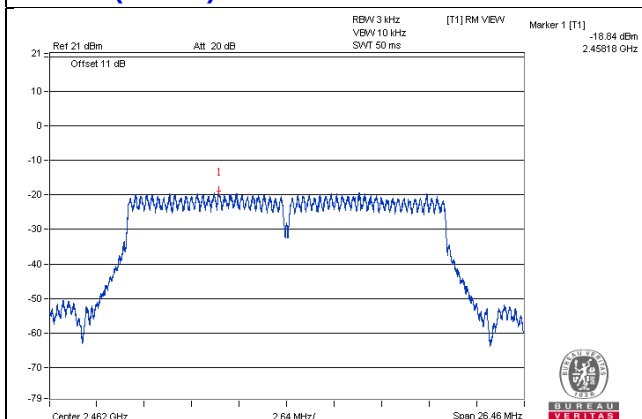
802.11n (20MHz) 2Tx SDM 2412 MHz



802.11n (20MHz) 2Tx SDM 2437 MHz



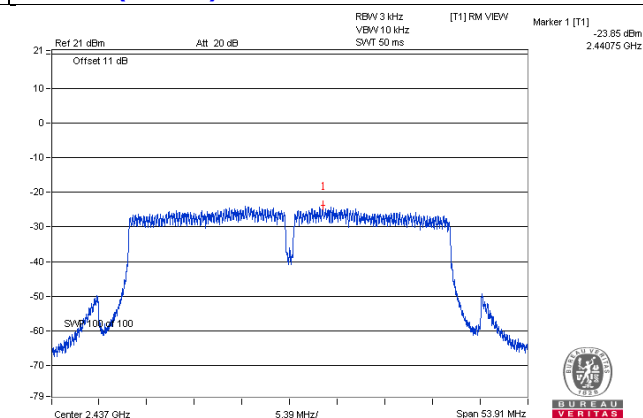
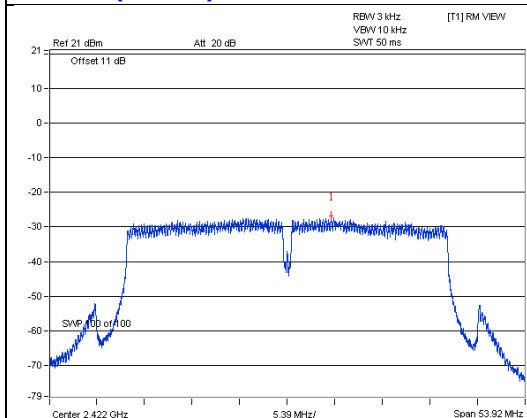
802.11n (20MHz) 2Tx SDM 2462 MHz



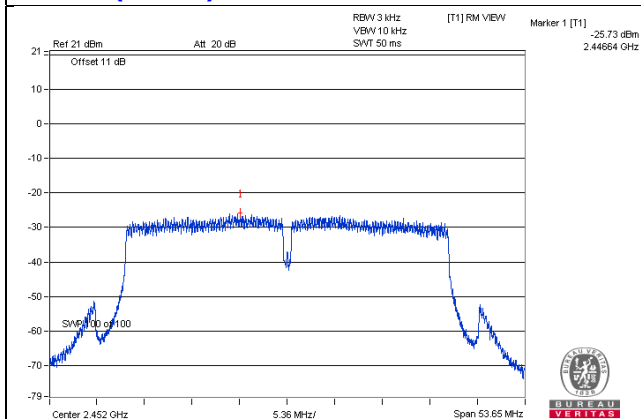
SPECTRUM PLOT

802.11n (40MHz) 1Tx Chain1 2422 MHz

802.11n (40MHz) 1Tx Chain1 2437 MHz

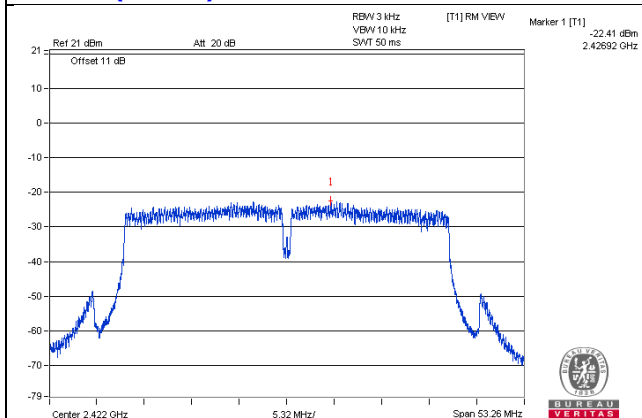


802.11n (40MHz) 1Tx Chain1 2452 MHz

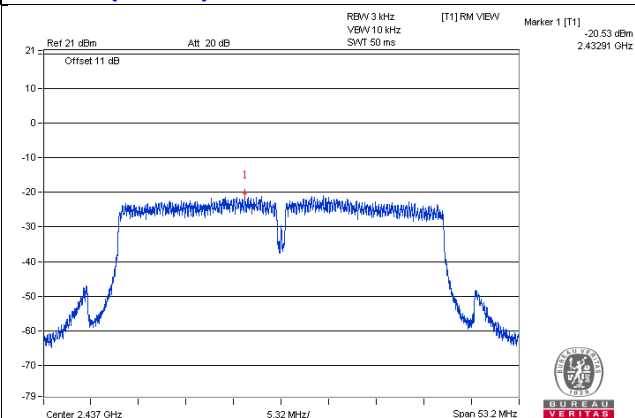


SPECTRUM PLOT

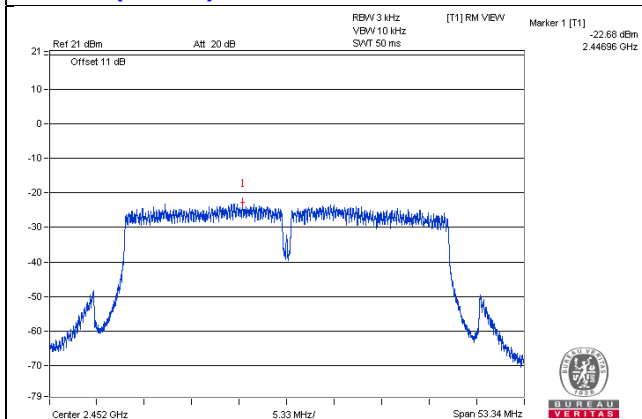
802.11n (40MHz) 2Tx SDM 2422 MHz



802.11n (40MHz) 2Tx SDM 2437 MHz



802.11n (40MHz) 2Tx SDM 2452 MHz



4.4 6dB Bandwidth Measurement

4.4.1 Limit

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

4.4.2 Measuring Instruments and Setting

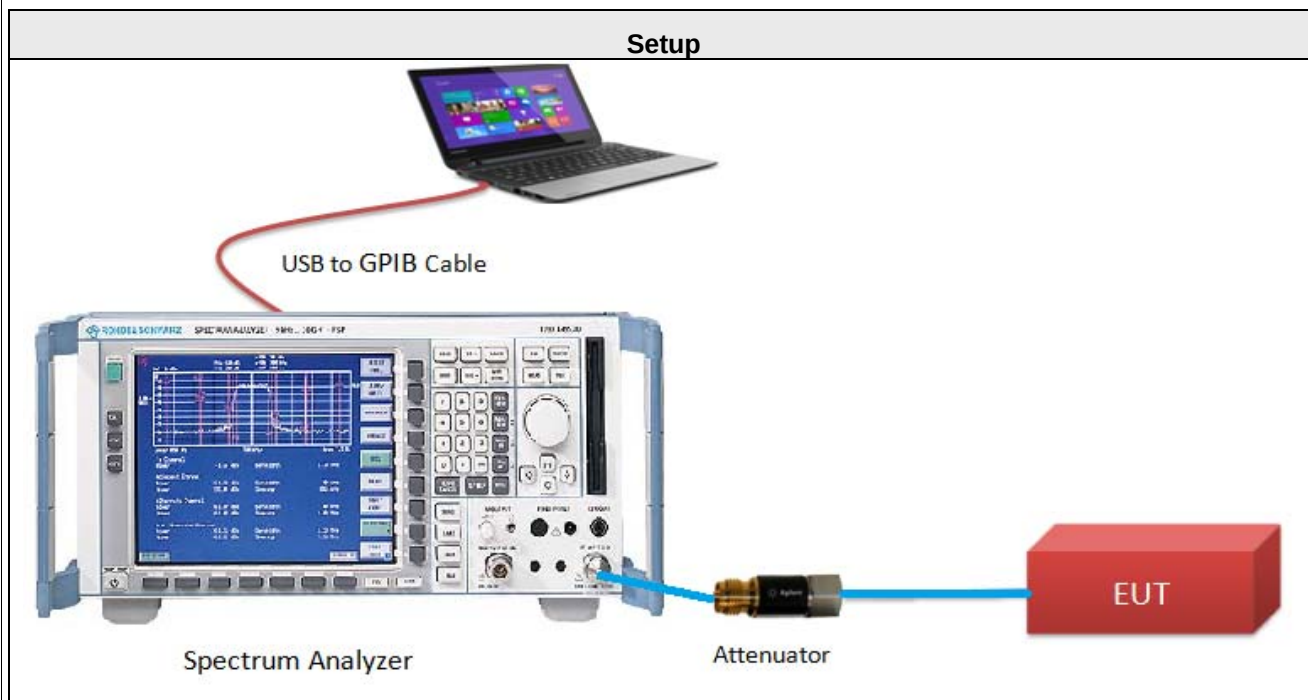
The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100 kHz.
VBW	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.4.3 Test Procedures

- 1 The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
- 2 For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier frequency. A peak reading was taken; two markers were set 6 dB below the maximum level on the right and the left side of the emissions.
- 3 The 6dB bandwidth is the frequency difference between the two markers.

4.4.4 Test Setup Layout



4.4.5 Test Deviation

There are no deviations with the original standard.

4.4.6 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

4.4.7 Test Results of 6dB Bandwidth

Temperature	25°C	Humidity	60%
Test Engineer	Leo Tsai		

802.11b 1Tx Chain1

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	8.10	0.5	PASS
6	2437	8.11	0.5	PASS
11	2462	8.58	0.5	PASS

802.11g 1Tx Chain1

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.44	0.5	PASS
6	2437	16.44	0.5	PASS
11	2462	16.44	0.5	PASS

802.11n (20MHz) 1Tx Chain1

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.68	0.5	PASS
6	2437	17.65	0.5	PASS
11	2462	17.66	0.5	PASS

802.11n (20MHz) 2Tx SDM

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 1	CHAIN 2		
1	2412	17.64	17.65	0.5	PASS
6	2437	17.65	17.67	0.5	PASS
11	2462	17.64	17.67	0.5	PASS

802.11n (40MHz) 1Tx Chain1

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	35.95	0.5	PASS
6	2437	35.94	0.5	PASS
9	2452	35.77	0.5	PASS

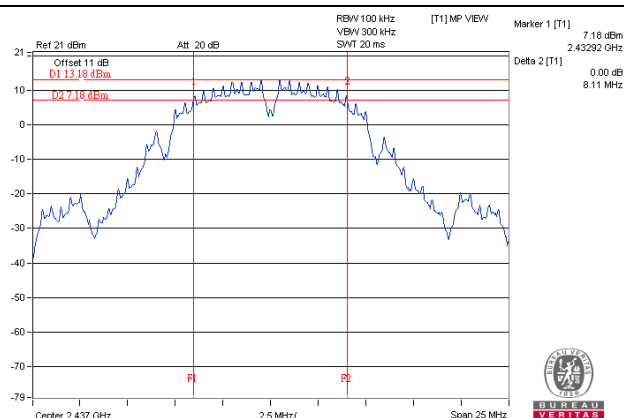
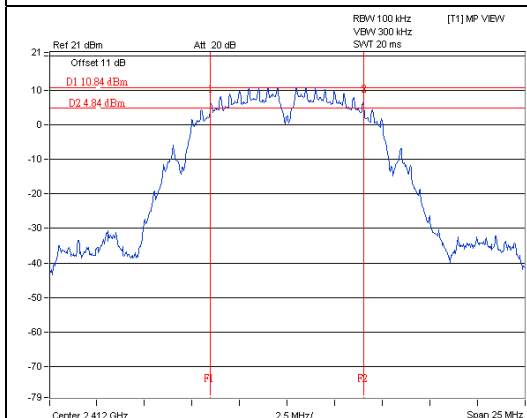
802.11n (40MHz) 2Tx SDM

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 1	CHAIN 2		
3	2422	35.51	35.83	0.5	PASS
6	2437	35.47	35.68	0.5	PASS
9	2452	35.56	35.56	0.5	PASS

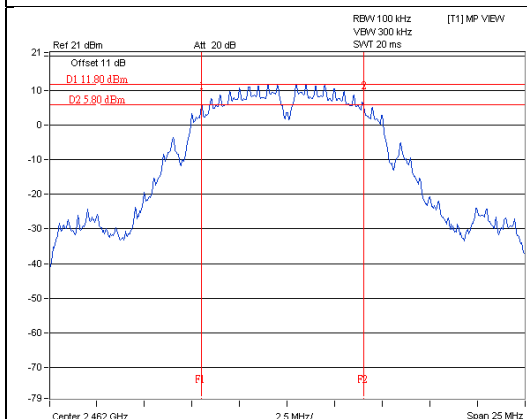
SPECTRUM PLOT

802.11b 1Tx Chain1 CH1

802.11b 1Tx Chain1 CH6



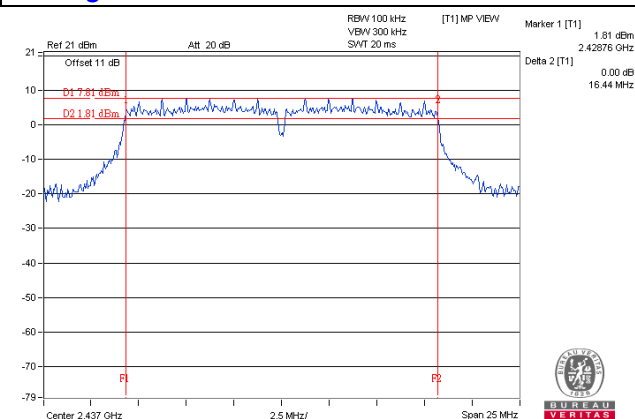
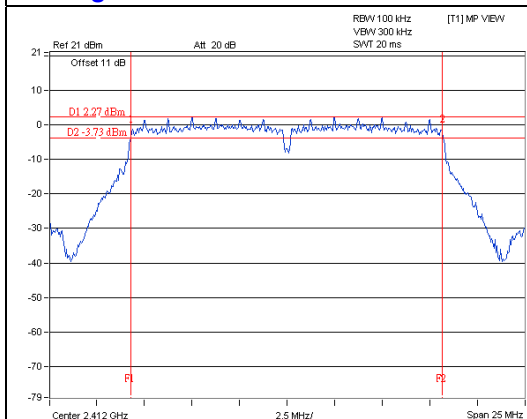
802.11b 1Tx Chain1 CH11



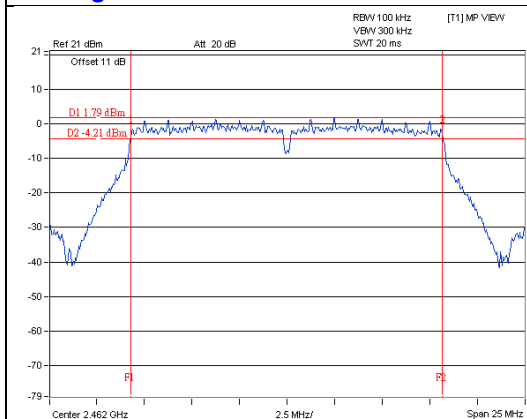
SPECTRUM PLOT

802.11g 1Tx Chain1 CH1

802.11g 1Tx Chain1 CH6

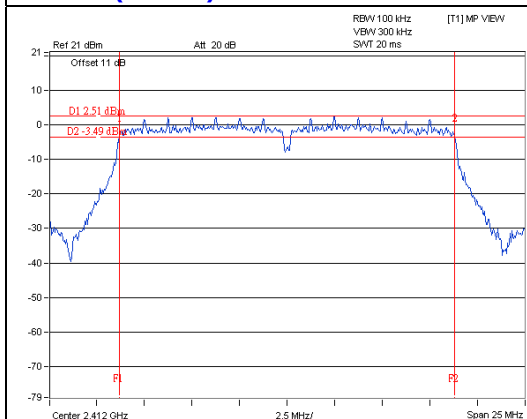


802.11g 1Tx Chain1 CH11

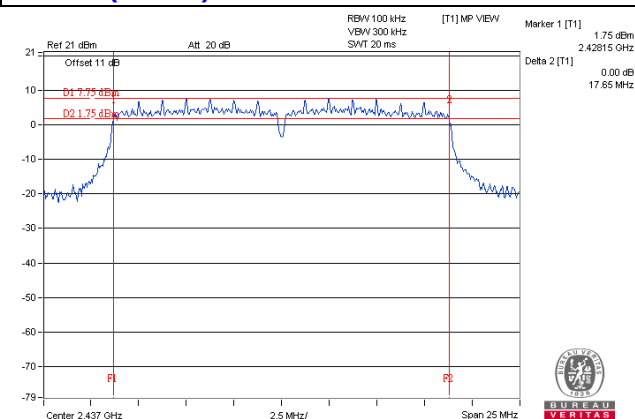


SPECTRUM PLOT

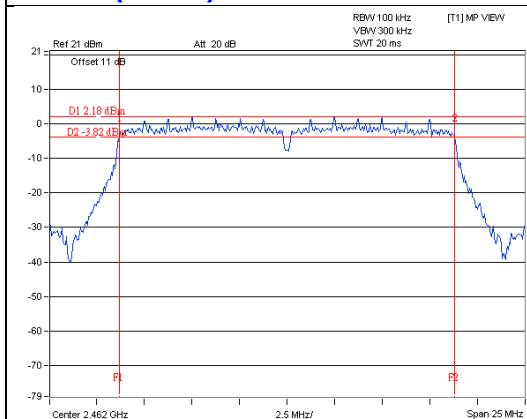
802.11n (20MHz) 1Tx Chain1 CH1



802.11n (20MHz) 1Tx Chain1 CH6

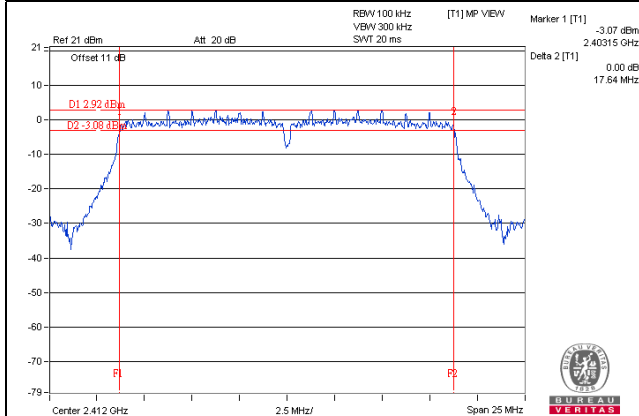


802.11n (20MHz) 1Tx Chain1 CH11

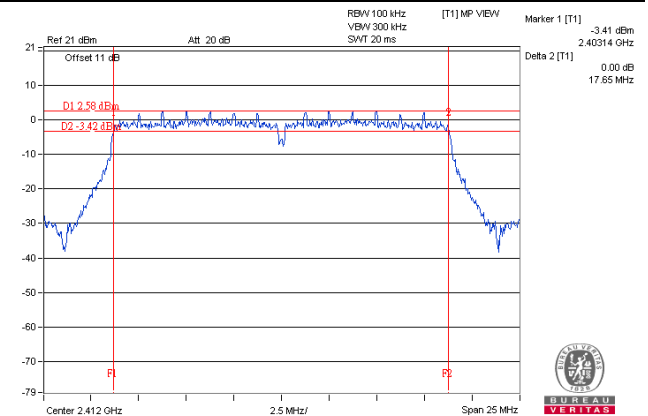


SPECTRUM PLOT

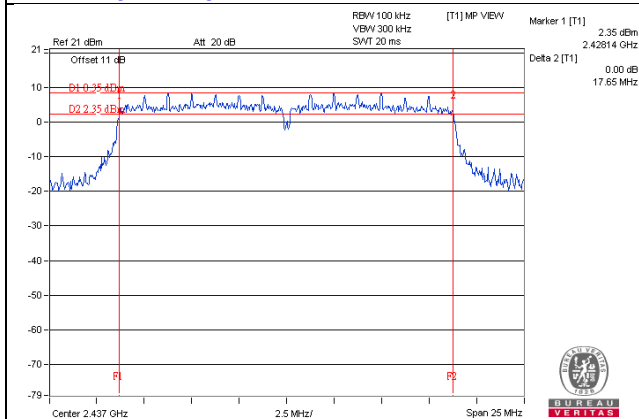
802.11n (20MHz) 2Tx SDM mode Chain1 CH1



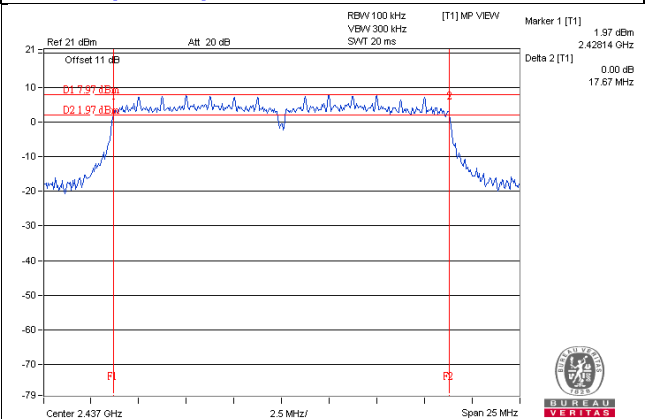
802.11n (20MHz) 2Tx SDM mode Chain2 CH1



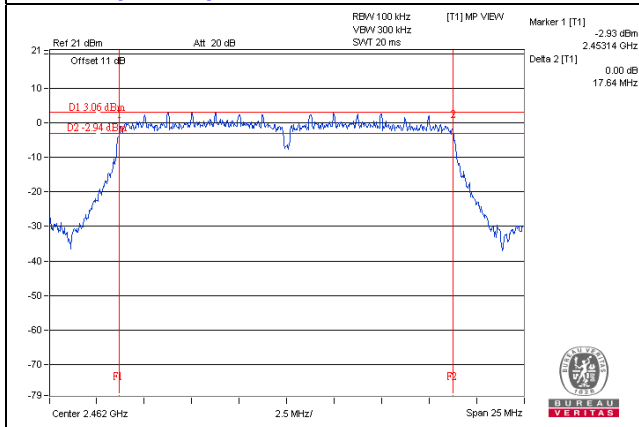
802.11n (20MHz) 2Tx SDM mode Chain1 CH6



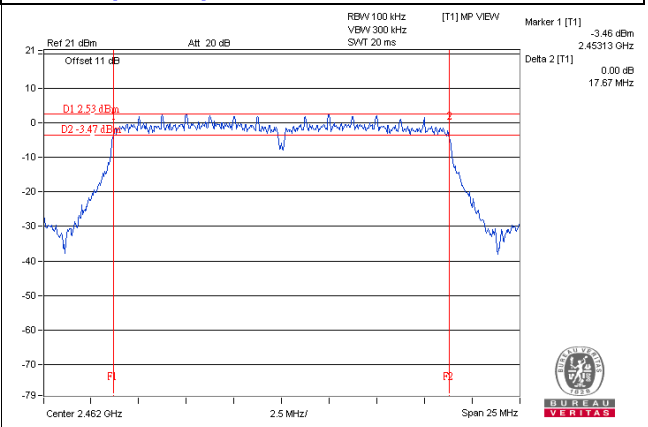
802.11n (20MHz) 2Tx SDM mode Chain2 CH6



802.11n (20MHz) 2Tx SDM mode Chain1 CH11

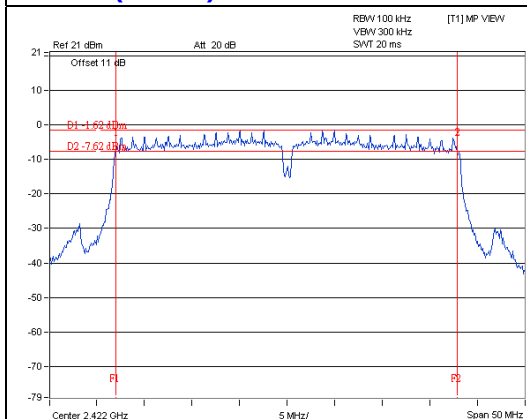


802.11n (20MHz) 2Tx SDM mode Chain2 CH11

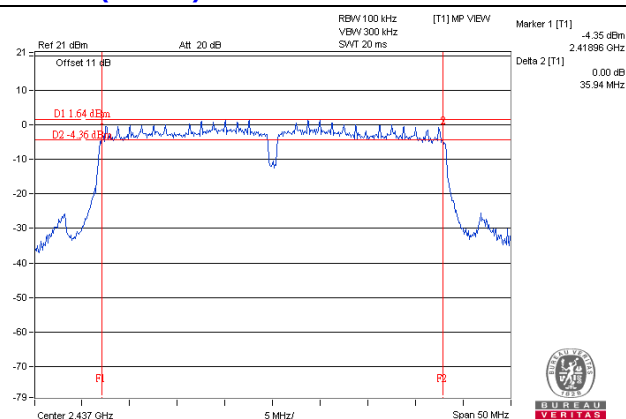


SPECTRUM PLOT

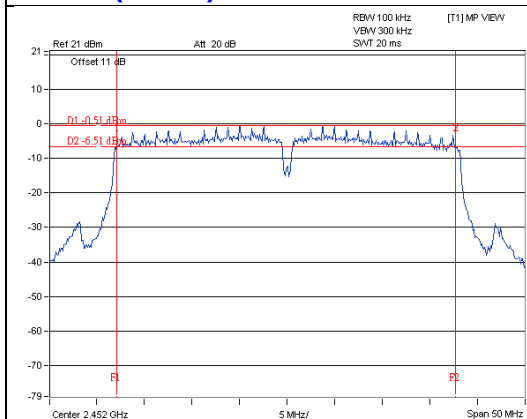
802.11n (40MHz) 1Tx Chain1 CH3



802.11n (40MHz) 1Tx Chain1 CH6

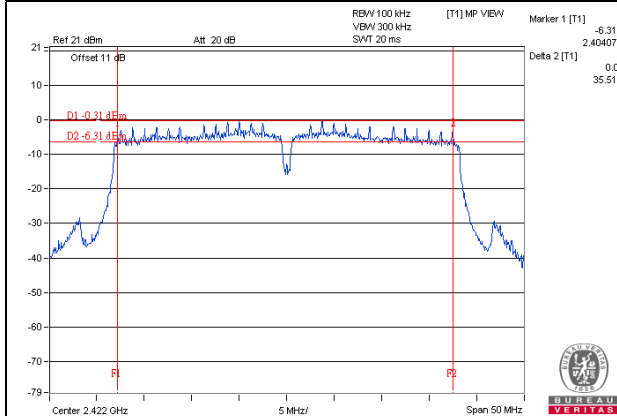


802.11n (40MHz) 1Tx Chain1 CH9

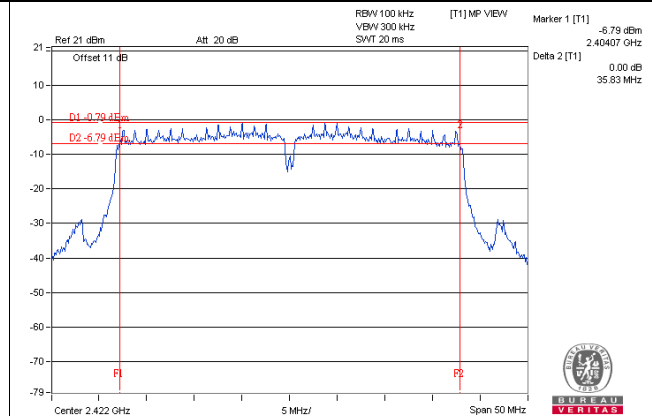


SPECTRUM PLOT

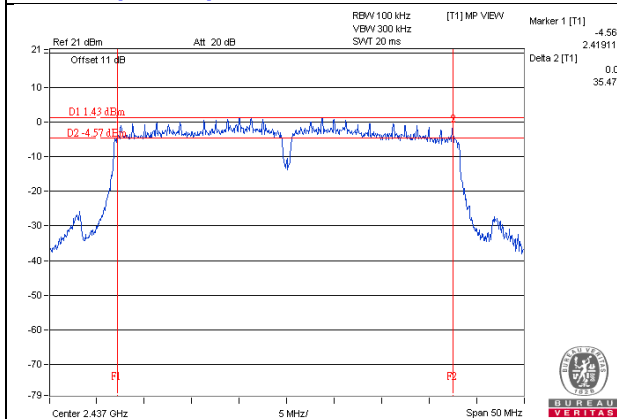
802.11n (40MHz) 2Tx SDM mode Chain1 CH3



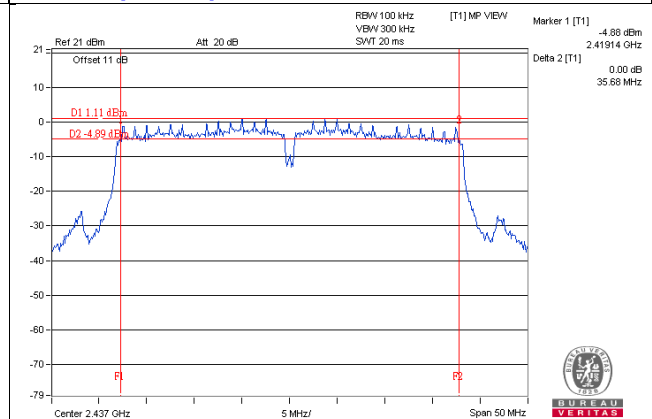
802.11n (40MHz) 2Tx SDM mode Chain2 CH3



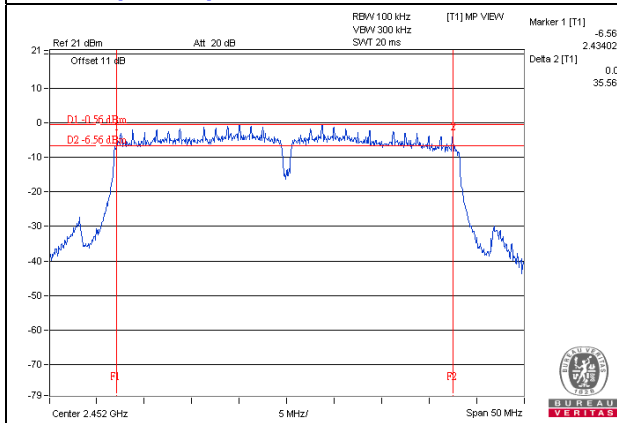
802.11n (40MHz) 2Tx SDM mode Chain1 CH6



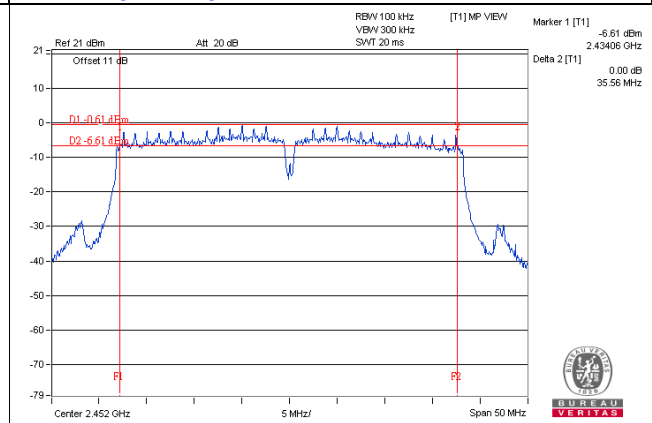
802.11n (40MHz) 2Tx SDM mode Chain2 CH6



802.11n (40MHz) 2Tx SDM mode Chain1 CH9



802.11n (40MHz) 2Tx SDM mode Chain2 CH9



4.5 Occupied Bandwidth Measurement

4.5.1 Measuring Instruments and Setting

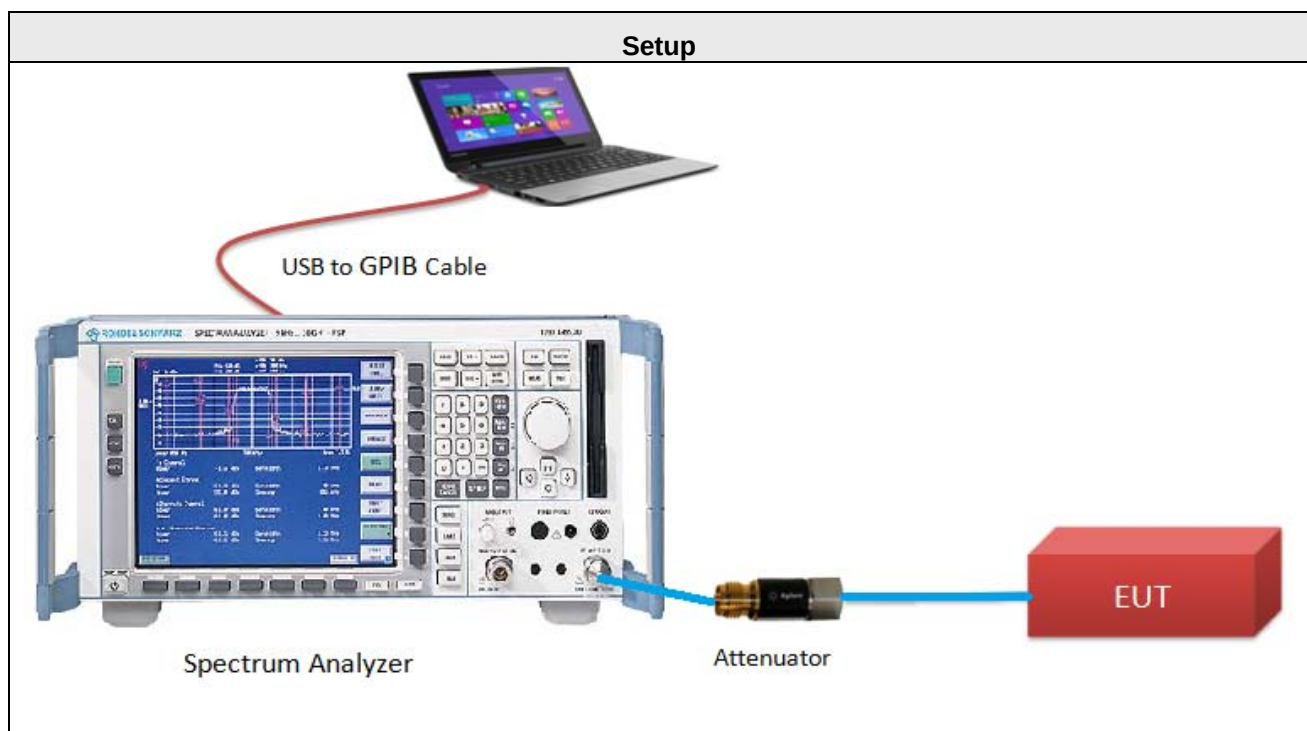
The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RBW	1% to 5% of the anticipated emission bandwidth
VBW	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.5.2 Test Procedure

- 1 The transmitter output (antenna port) was connected to the spectrum analyzer in peak, Max hold mode.
- 2 For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier frequency. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to peak.
- 3 The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.5.3 Test Setup Layout



4.5.4 Test Deviation

There are no deviations with the original standard.

4.5.5 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

4.5.6 Test Results of Occupied Bandwidth

Temperature	25°C	Humidity	60%
Test Engineer	Leo Tsai		

802.11b 1Tx Chain1

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
1	2412	10.26
6	2437	11.00
11	2462	10.60

802.11g 1Tx Chain1

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
1	2412	17.16
6	2437	17.30
11	2462	17.00

802.11n (20MHz) 1Tx Chain1

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
1	2412	18.00
6	2437	18.40
11	2462	17.90

802.11n (20MHz) 2Tx SDM

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 1	CHAIN 2
1	2412	17.83	18.00
6	2437	18.24	18.36
11	2462	17.90	18.00

802.11n (40MHz) 1Tx Chain1

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
3	2422	36.43
6	2437	36.40
9	2452	36.40

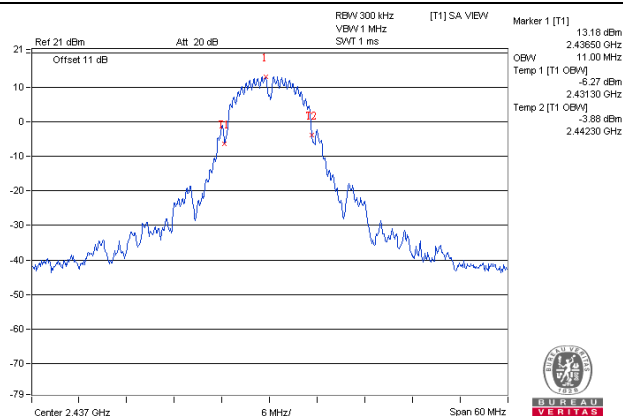
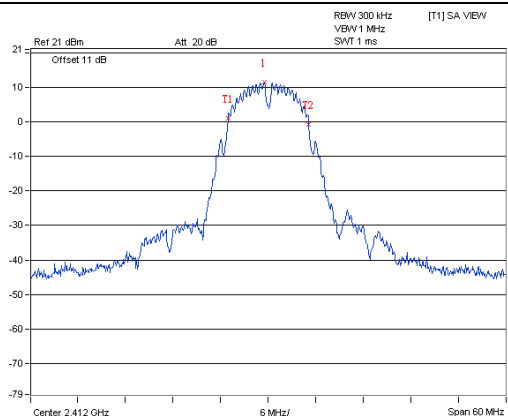
802.11n (40MHz) 2Tx SDM

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 1	CHAIN 2
3	2422	36.36	36.36
6	2437	36.36	36.48
9	2452	36.40	36.40

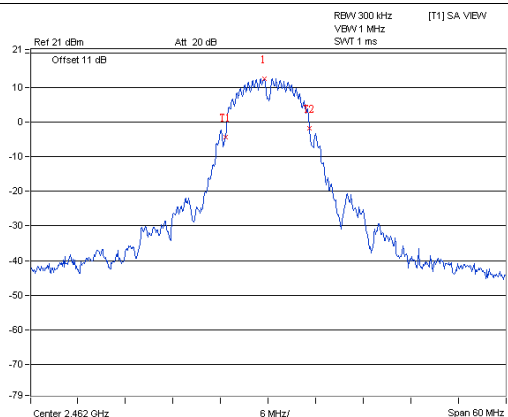
SPECTRUM PLOT

802.11b 1Tx Chain1 CH1

802.11b 1Tx Chain1 CH6



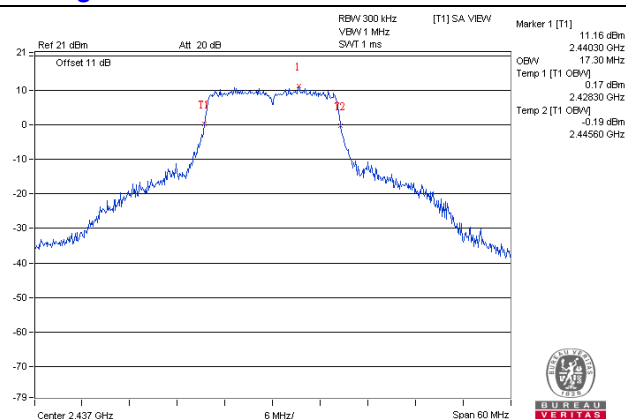
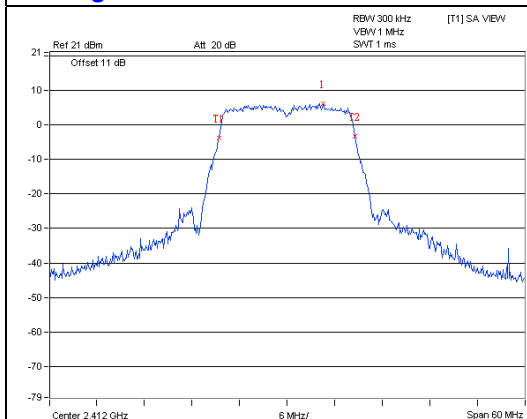
802.11b 1Tx Chain1 CH11



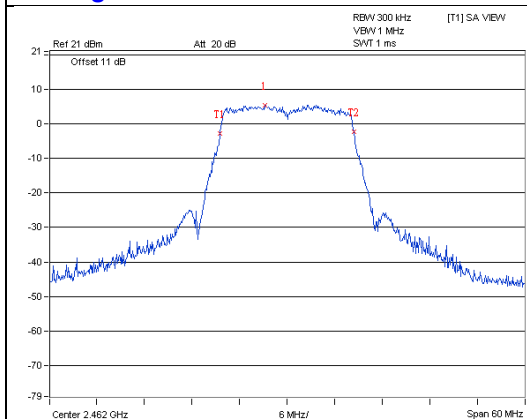
SPECTRUM PLOT

802.11g 1Tx Chain1 CH1

802.11g 1Tx Chain1 CH6

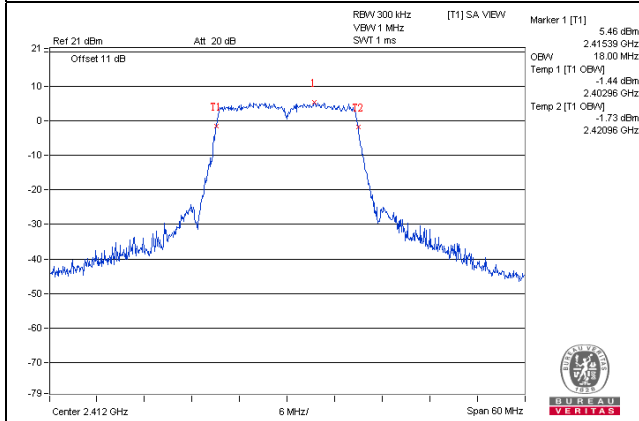


802.11g 1Tx Chain1 CH11

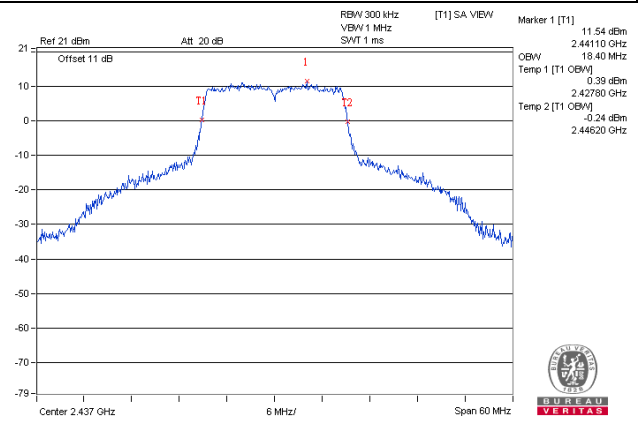


SPECTRUM PLOT

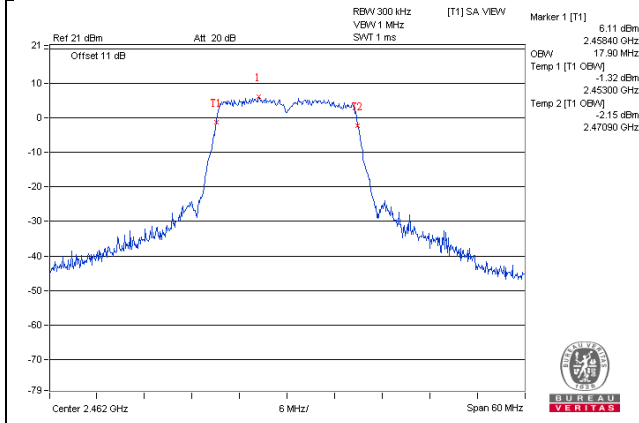
802.11n (20MHz) 1Tx Chain1 CH1



802.11n (20MHz) 1Tx Chain1 CH6

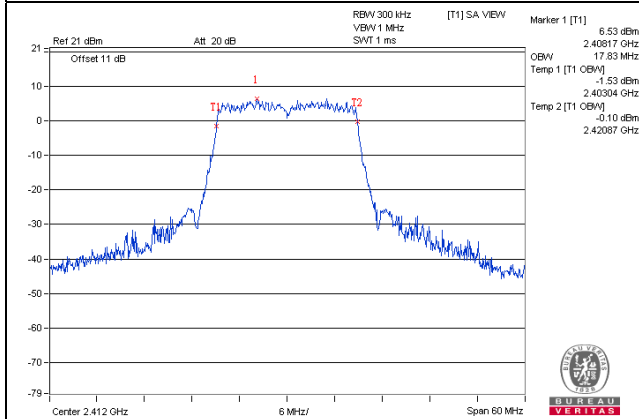


802.11n (20MHz) 1Tx Chain1 CH11

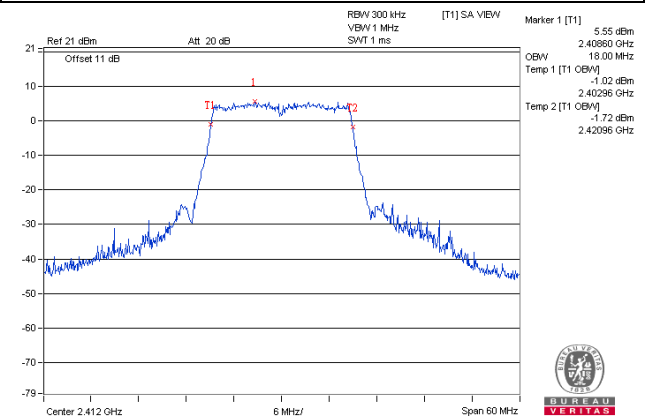


SPECTRUM PLOT

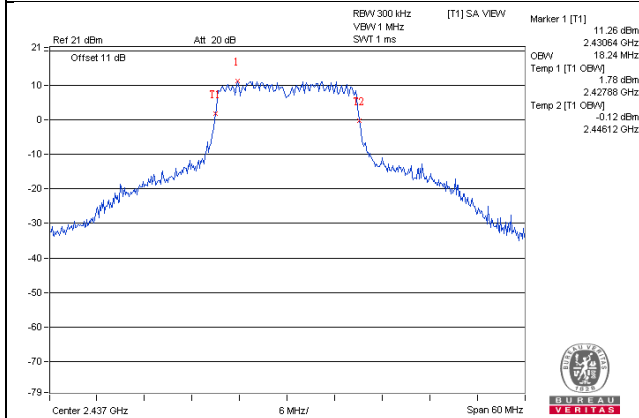
802.11n (20MHz) 2Tx SDM mode Chain1 CH1



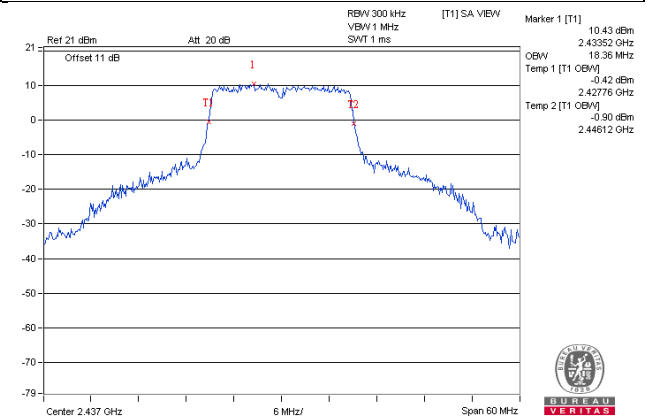
802.11n (20MHz) 2Tx SDM mode Chain2 CH1



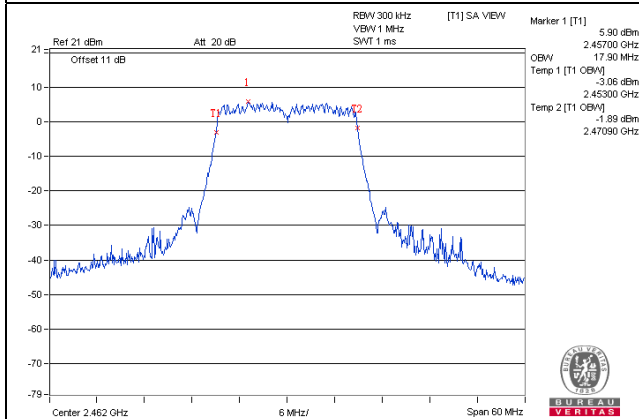
802.11n (20MHz) 2Tx SDM mode Chain1 CH6



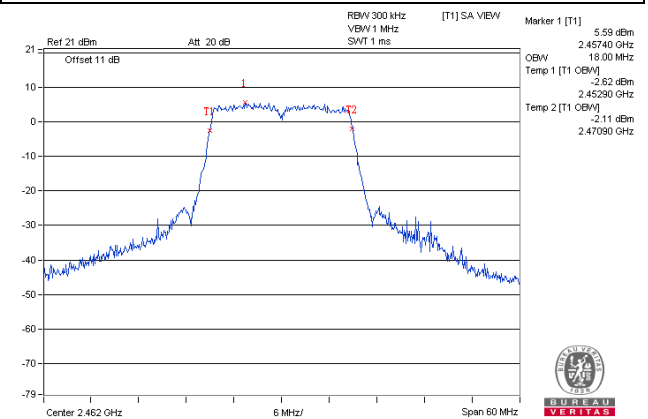
802.11n (20MHz) 2Tx SDM mode Chain2 CH6



802.11n (20MHz) 2Tx SDM mode Chain1 CH11

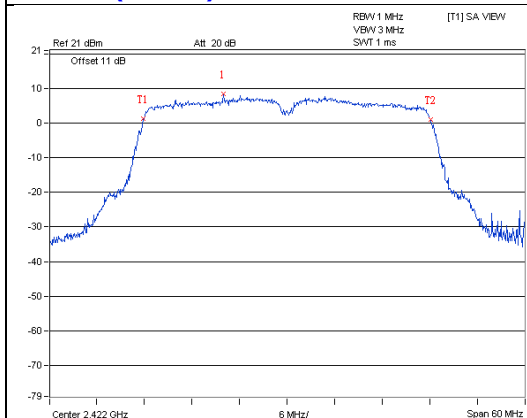


802.11n (20MHz) 2Tx SDM mode Chain2 CH11

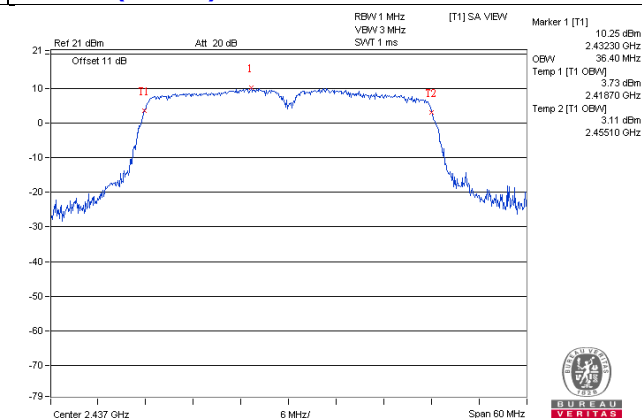


SPECTRUM PLOT

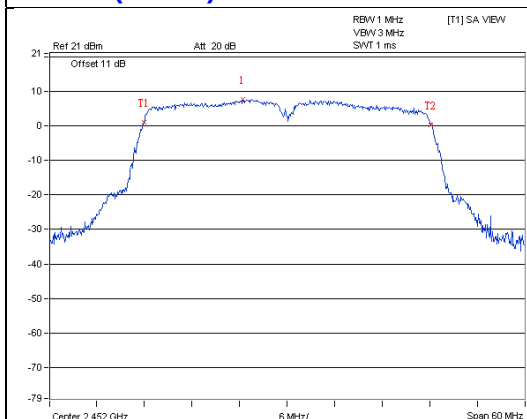
802.11n (40MHz) 1Tx Chain1 CH3



802.11n (40MHz) 1Tx Chain1 CH6

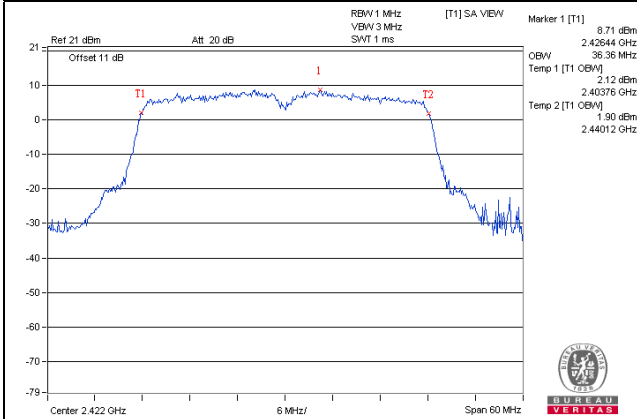


802.11n (40MHz) 1Tx Chain1 CH9

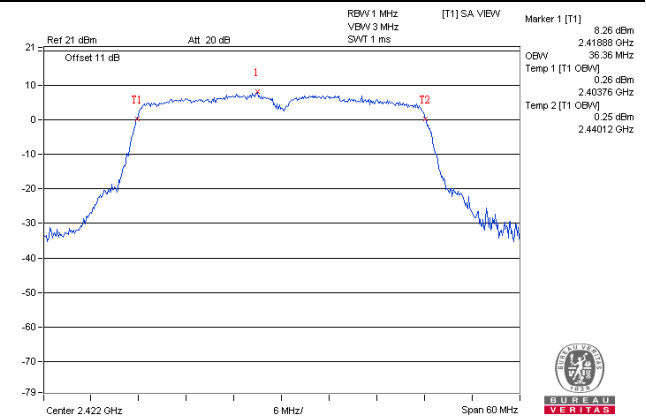


SPECTRUM PLOT

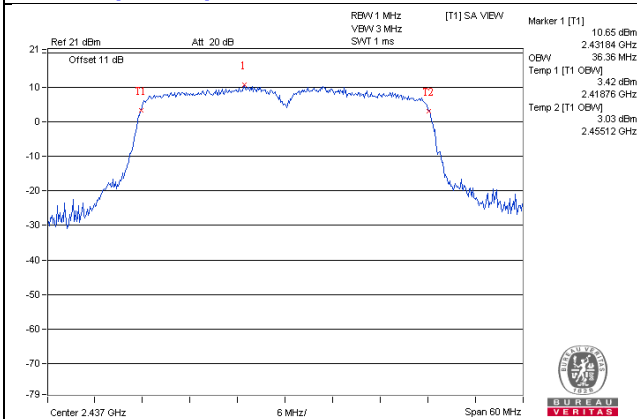
802.11n (40MHz) 2Tx SDM mode Chain1 CH3



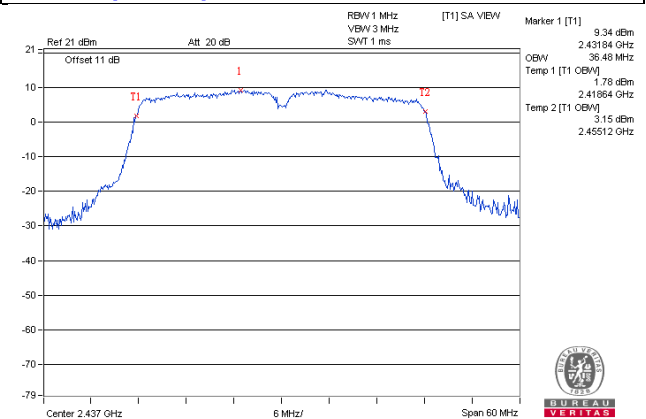
802.11n (40MHz) 2Tx SDM mode Chain2 CH3



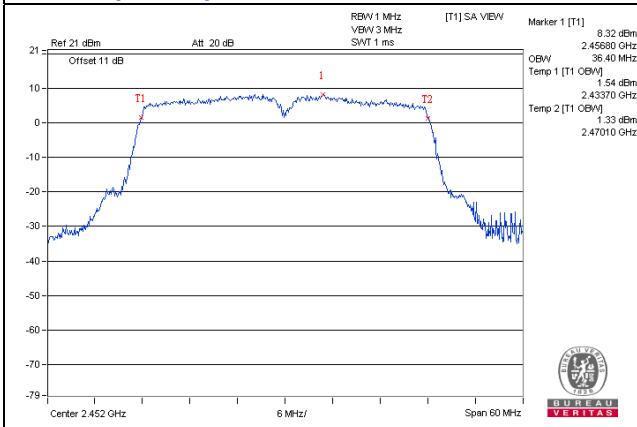
802.11n (40MHz) 2Tx SDM mode Chain1 CH6



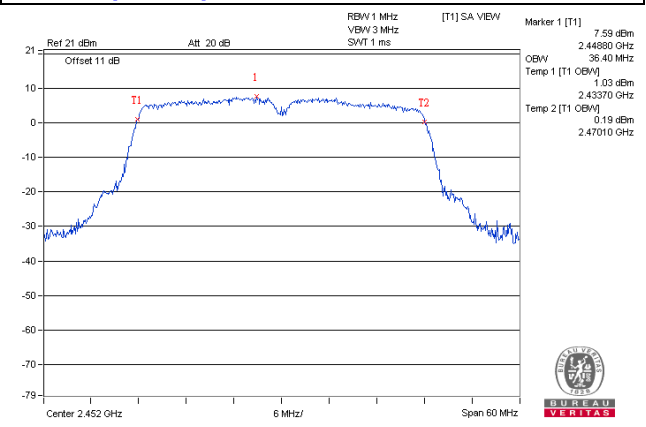
802.11n (40MHz) 2Tx SDM mode Chain2 CH6



802.11n (40MHz) 2Tx SDM mode Chain1 CH9



802.11n (40MHz) 2Tx SDM mode Chain2 CH9



4.6 Radiated Emissions Measurement

4.6.1 Limit

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

Frequency Range (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

4.6.2 Measuring Instruments and Setting

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

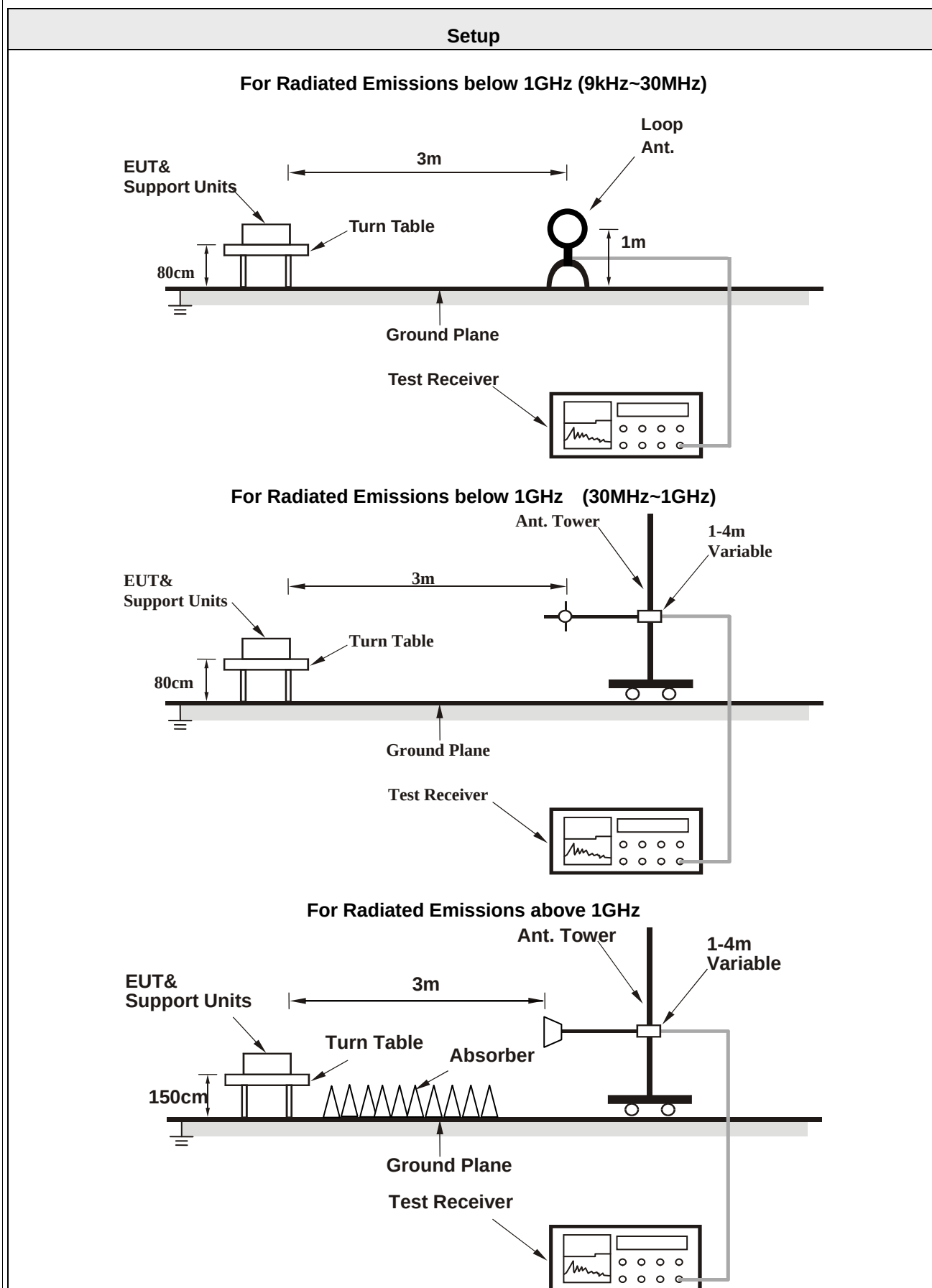
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emissions in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 1/T for Average
RBW / VBW (Emissions in non-restricted band)	100kHz / 300kHz for peak

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

4.6.3 Test Procedure

- 1 Configure the EUT according to ANSI C63.10. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2 Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3 The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4 For each suspected emissions, the antenna tower was scan (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5 Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode
- 6 For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer for Duty $\geq 98\%$, 1MHz RBW and VBW is $\geq 1/T$ for average reading in spectrum analyzer for Duty $< 98\%$.
- 7 When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
- 8 If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9 For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also PASS with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10 As the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.6.4 Test Setup Layout



4.6.5 Test Deviation

There are no deviations with the original standard.

4.6.6 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

4.6.7 Test Results of Radiated Emissions

Temperature	25°C	Humidity	69%
Test Engineer	Bond Tseng		

Radiated Emissions Range 9kHz~30MHz

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

Radiated Emissions Range 30MHz~1GHz

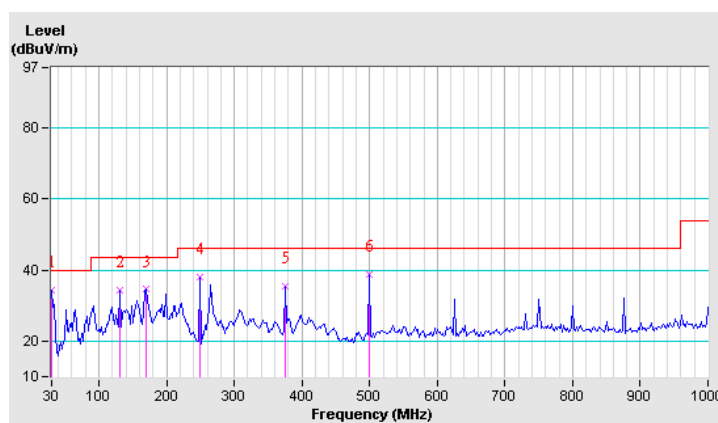
802.11n (20MHz)

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.11	34.5 QP	40.0	-5.5	1.99 H	260	50.00	-15.50
2	130.88	34.2 QP	43.5	-9.3	1.49 H	256	49.30	-15.10
3	169.68	34.5 QP	43.5	-9.0	1.49 H	100	48.40	-13.90
4	249.22	37.9 QP	46.0	-8.1	1.00 H	119	52.20	-14.30
5	375.32	35.6 QP	46.0	-10.4	1.00 H	189	46.90	-11.30
6	499.48	38.8 QP	46.0	-7.2	1.49 H	141	48.20	-9.40

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

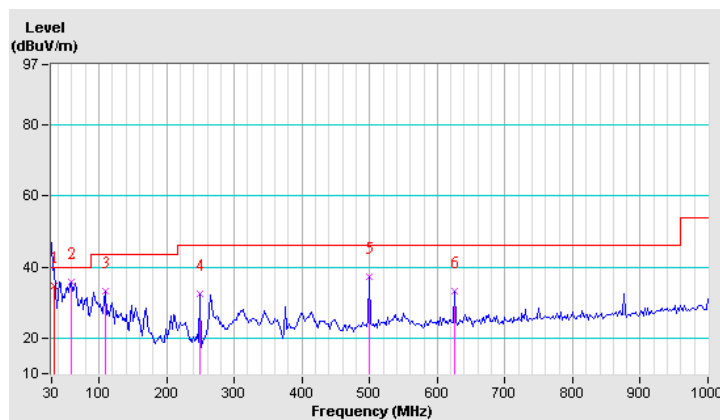


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.66	34.7 QP	40.0	-5.3	1.00 V	326	49.80	-15.10
2	59.10	35.7 QP	40.0	-4.3	1.49 V	6	49.70	-14.00
3	109.54	33.1 QP	43.5	-10.4	1.00 V	162	49.90	-16.80
4	249.22	32.6 QP	46.0	-13.4	1.00 V	349	46.90	-14.30
5	499.48	37.2 QP	46.0	-8.8	1.00 V	248	46.60	-9.40
6	625.58	33.4 QP	46.0	-12.6	1.49 V	188	40.40	-7.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



Radiated Emission Range 1GHz~10th Harmonic

1TX

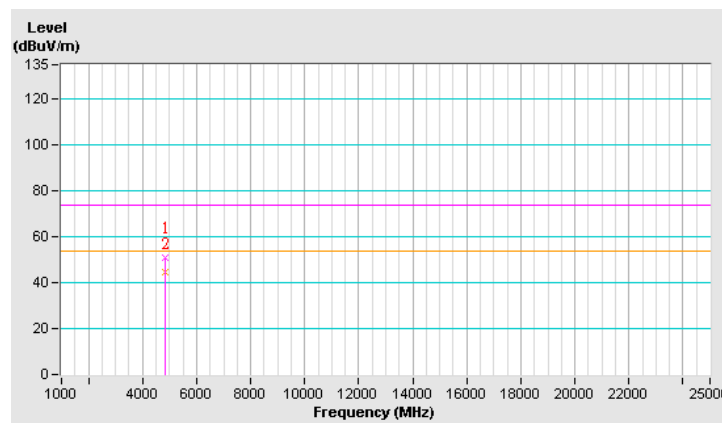
802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4824.00	51.2 PK	74.0	-22.8	3.44 H	300	47.50	3.70
2	4824.00	44.4 AV	54.0	-9.6	3.44 H	300	40.70	3.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

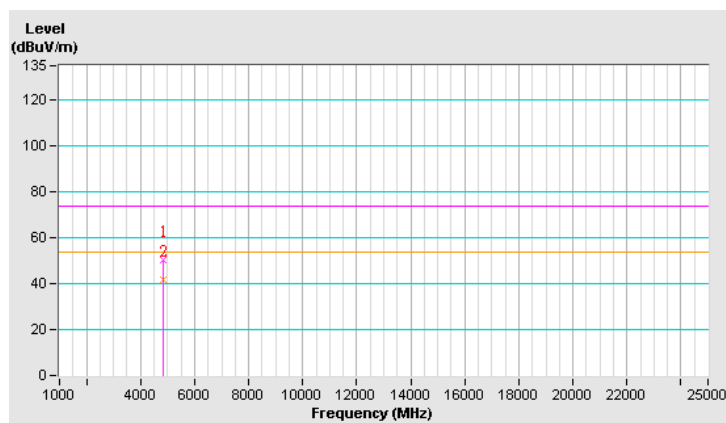


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4824.00	50.6 PK	74.0	-23.4	1.00 V	298	46.90	3.70
2	4824.00	41.9 AV	54.0	-12.1	1.00 V	298	38.20	3.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

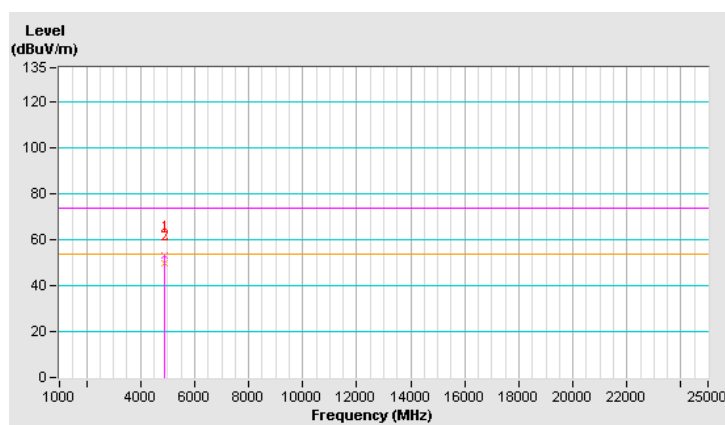


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4874.00	53.2 PK	74.0	-20.8	2.97 H	359	49.30	3.90
2	4874.00	49.6 AV	54.0	-4.4	2.97 H	359	45.70	3.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

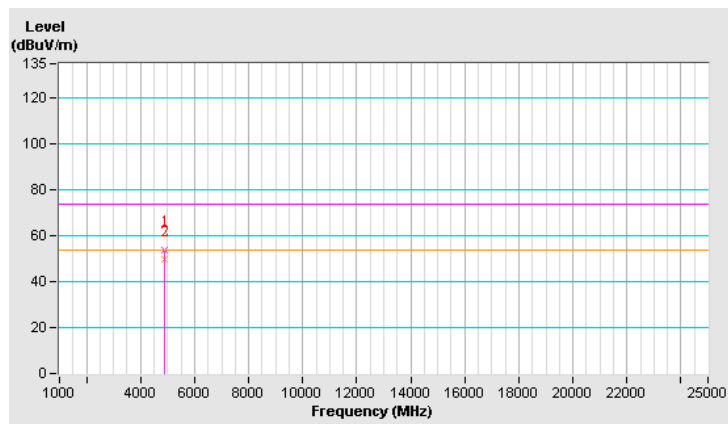


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4874.00	54.0 PK	74.0	-20.0	3.13 V	18	50.10	3.90
2	4874.00	49.8 AV	54.0	-4.2	3.13 V	18	45.90	3.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

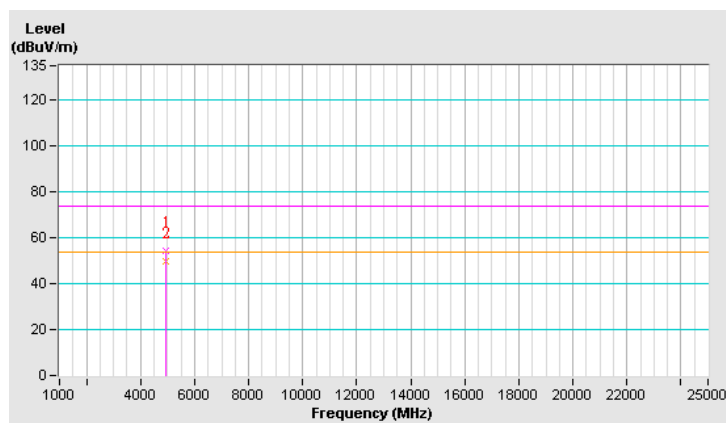


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4924.00	54.3 PK	74.0	-19.7	3.09 H	357	50.30	4.00
2	4924.00	49.9 AV	54.0	-4.1	3.09 H	357	45.90	4.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

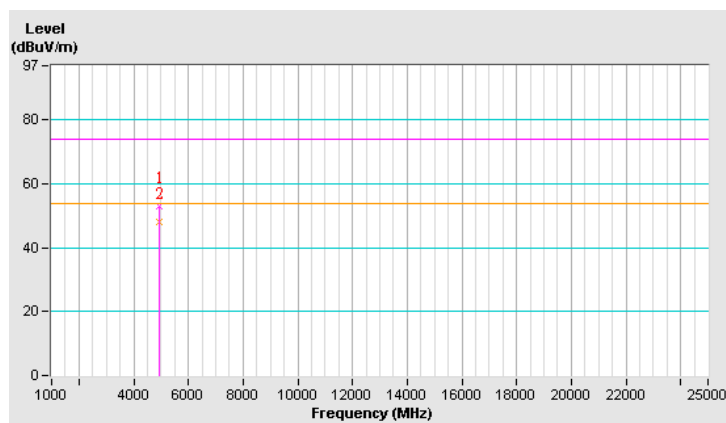


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4924.00	53.0 PK	74.0	-21.0	3.38 V	10	49.00	4.00
2	4924.00	48.1 AV	54.0	-5.9	3.38 V	10	44.10	4.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



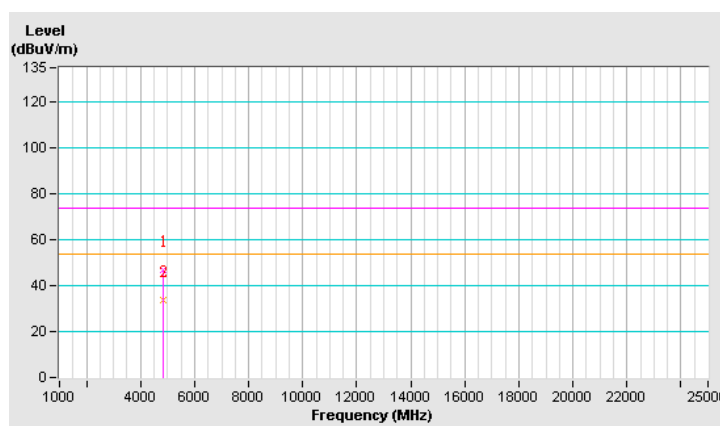
802.11n (20MHz)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4824.00	46.8 PK	74.0	-27.2	2.47 H	144	43.10	3.70
2	4824.00	33.8 AV	54.0	-20.2	2.47 H	144	30.10	3.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

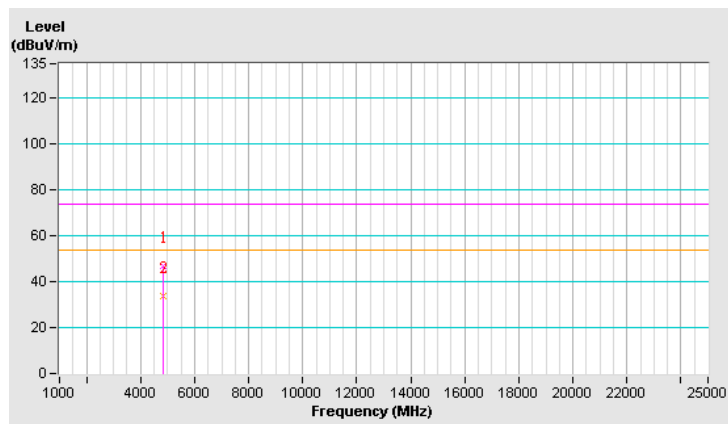


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4824.00	47.0 PK	74.0	-27.0	2.21 V	331	43.30	3.70
2	4824.00	34.0 AV	54.0	-20.0	2.21 V	331	30.30	3.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

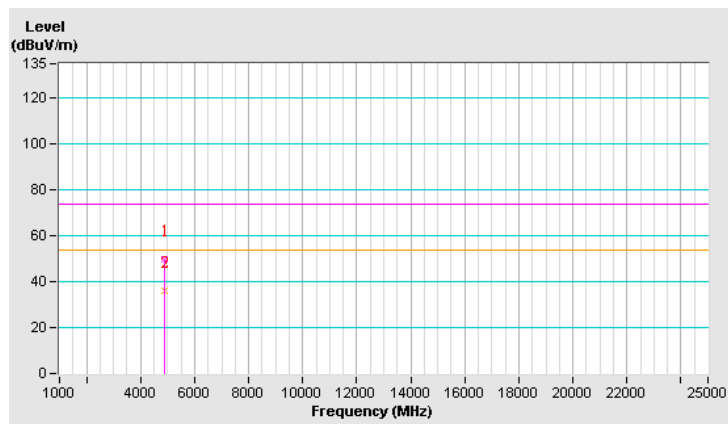


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4874.00	49.8 PK	74.0	-24.2	3.57 H	301	45.90	3.90
2	4874.00	36.1 AV	54.0	-17.9	3.57 H	301	32.20	3.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

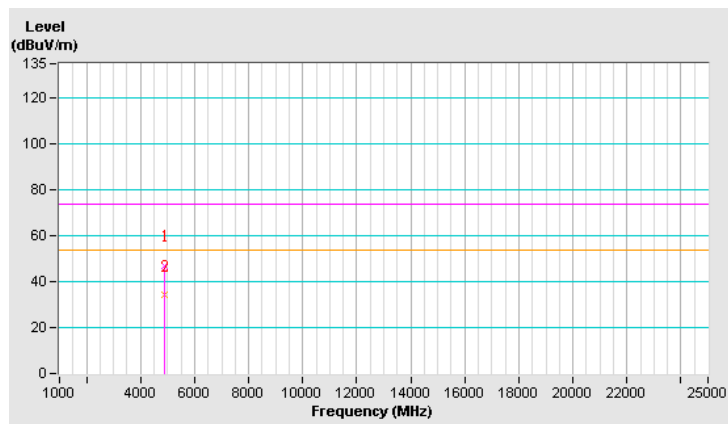


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4874.00	47.2 PK	74.0	-26.8	3.20 V	141	43.30	3.90
2	4874.00	34.3 AV	54.0	-19.7	3.20 V	141	30.40	3.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

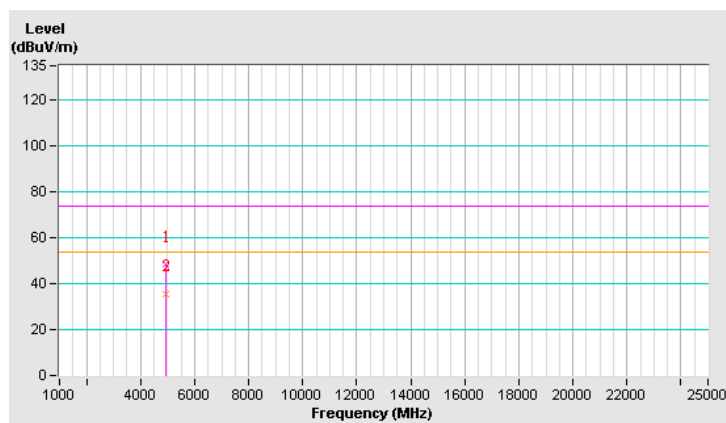


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4924.00	48.3 PK	74.0	-25.7	2.11 H	349	44.30	4.00
2	4924.00	35.5 AV	54.0	-18.5	2.11 H	349	31.50	4.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

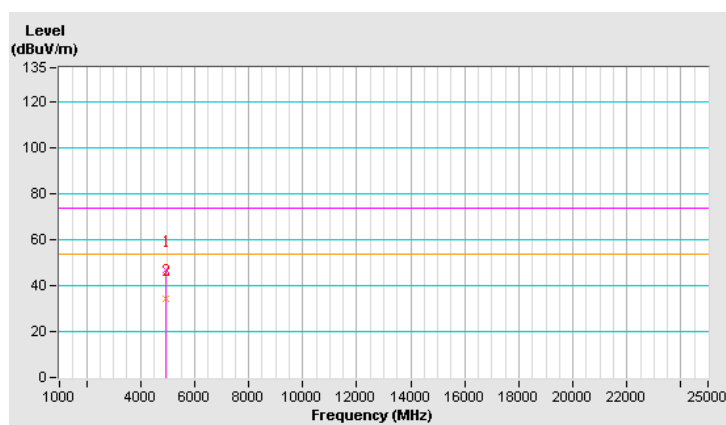


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4927.00	47.0 PK	74.0	-27.0	1.98 V	209	43.00	4.00
2	4927.00	34.3 AV	54.0	-19.7	1.98 V	209	30.30	4.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



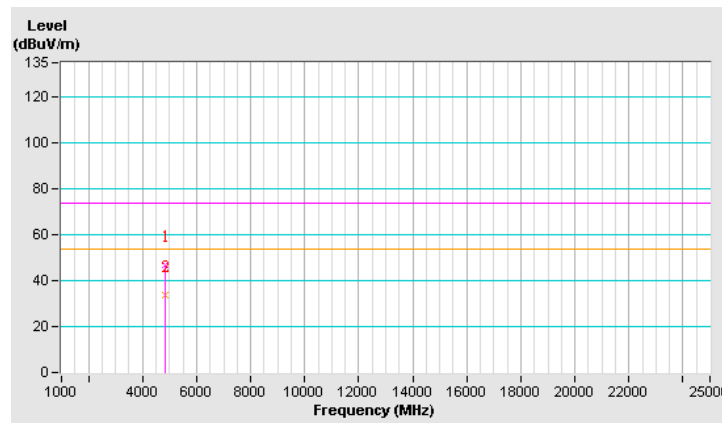
802.11n (40MHz)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4844.00	46.9 PK	74.0	-27.1	3.57 H	150	43.10	3.80
2	4844.00	33.8 AV	54.0	-20.2	3.57 H	150	30.00	3.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

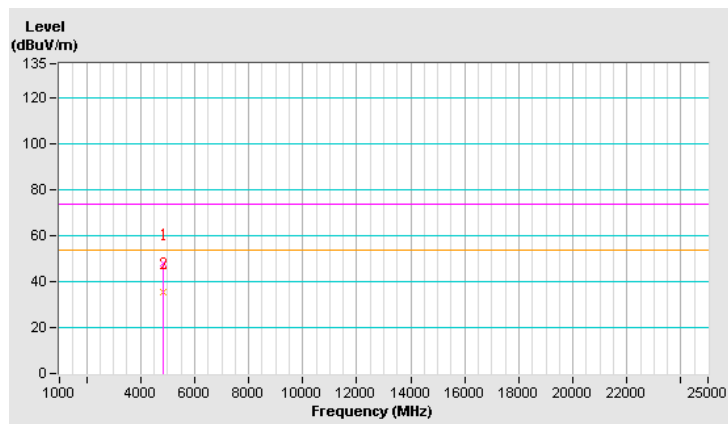


CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4844.00	48.3 PK	74.0	-25.7	3.28 V	146	44.50	3.80
2	4844.00	35.2 AV	54.0	-18.8	3.28 V	146	31.40	3.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

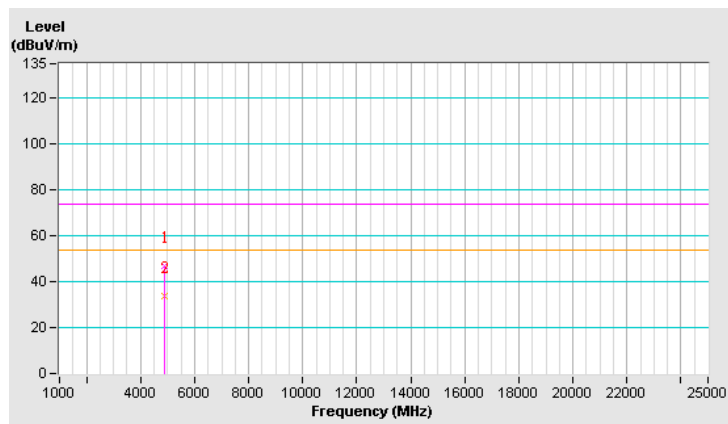


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4874.00	46.8 PK	74.0	-27.2	3.23 H	158	42.90	3.90
2	4874.00	33.8 AV	54.0	-20.2	3.23 H	158	29.90	3.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

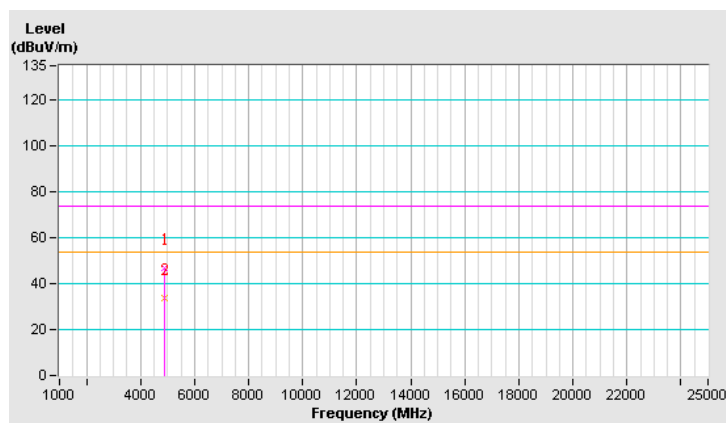


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4874.00	47.0 PK	74.0	-27.0	1.25 V	351	43.10	3.90
2	4874.00	33.8 AV	54.0	-20.2	1.25 V	351	29.90	3.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

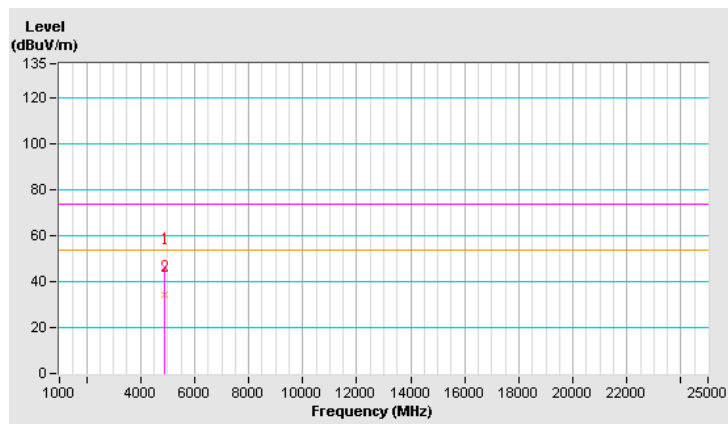


CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4904.00	46.6 PK	74.0	-27.4	1.25 H	97	42.60	4.00
2	4904.00	34.5 AV	54.0	-19.5	1.25 H	97	30.50	4.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

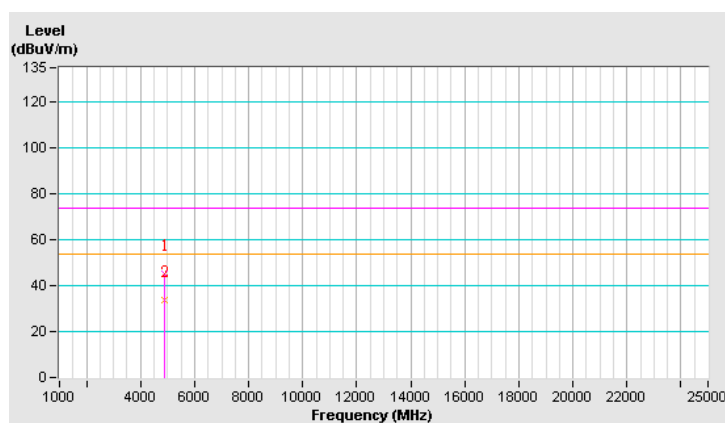


CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4904.00	45.2 PK	74.0	-28.8	1.18 V	256	41.20	4.00
2	4904.00	33.5 AV	54.0	-20.5	1.18 V	256	29.50	4.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



2TX

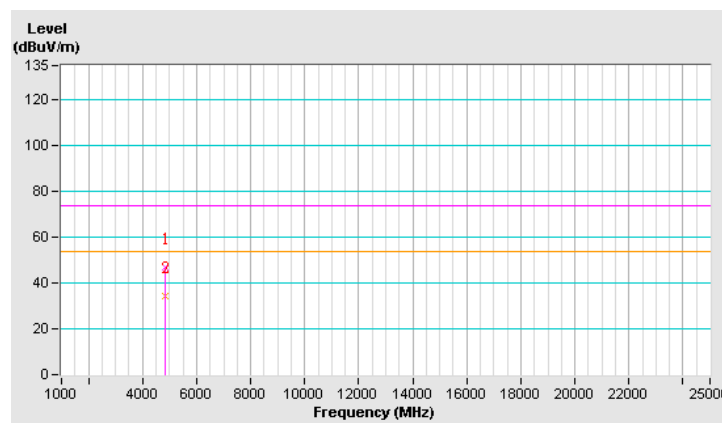
802.11n (20MHz)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4824.00	47.0 PK	74.0	-27.0	1.90 H	283	43.30	3.70
2	4824.00	34.1 AV	54.0	-19.9	1.90 H	283	30.40	3.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

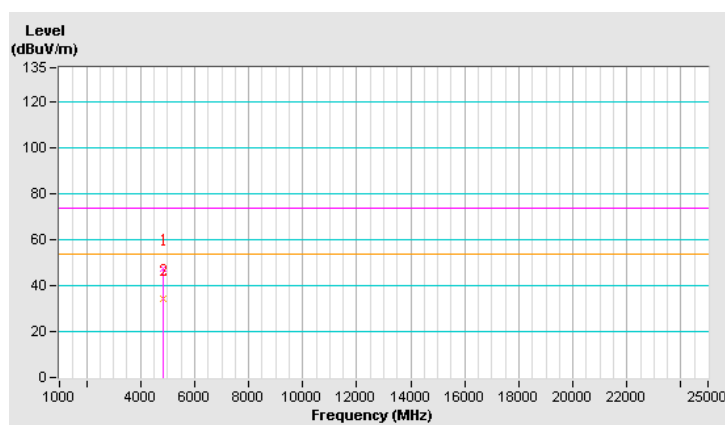


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4824.00	47.5 PK	74.0	-26.5	1.13 V	195	43.80	3.70
2	4824.00	34.2 AV	54.0	-19.8	1.13 V	195	30.50	3.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

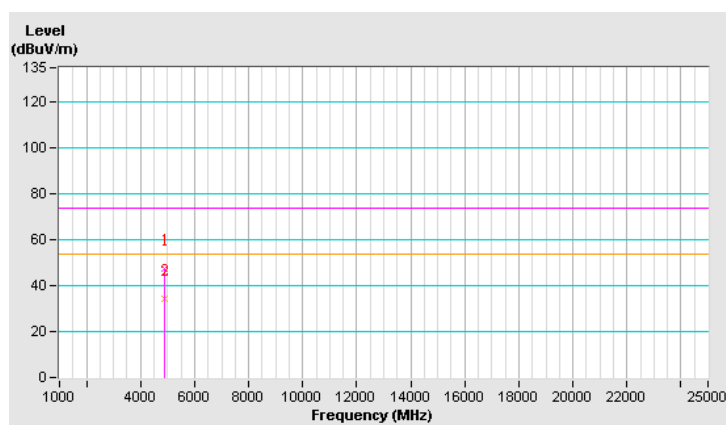


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4874.00	47.6 PK	74.0	-26.4	1.63 H	265	43.70	3.90
2	4874.00	34.3 AV	54.0	-19.7	1.63 H	265	30.40	3.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

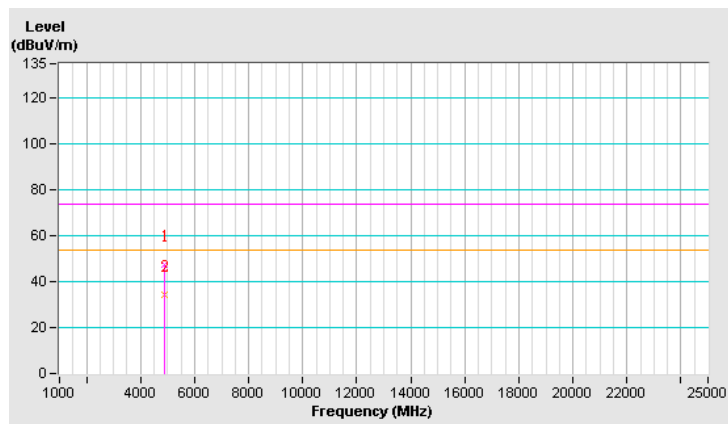


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4874.00	47.4 PK	74.0	-26.6	1.58 V	316	43.50	3.90
2	4874.00	34.2 AV	54.0	-19.8	1.58 V	316	30.30	3.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

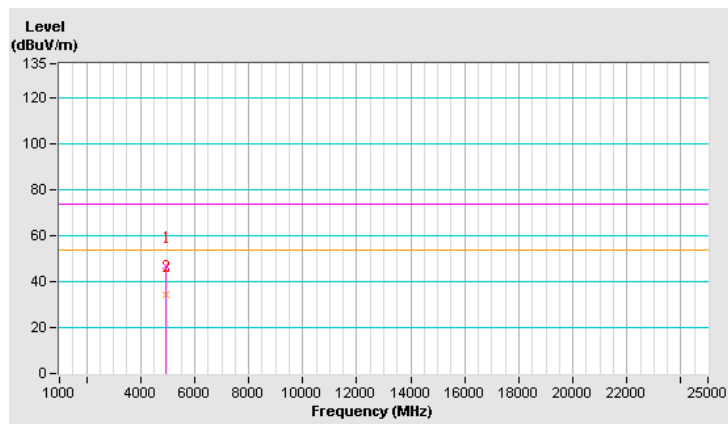


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4924.00	47.0 PK	74.0	-27.0	3.58 H	127	43.00	4.00
2	4924.00	34.1 AV	54.0	-19.9	3.58 H	127	30.10	4.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

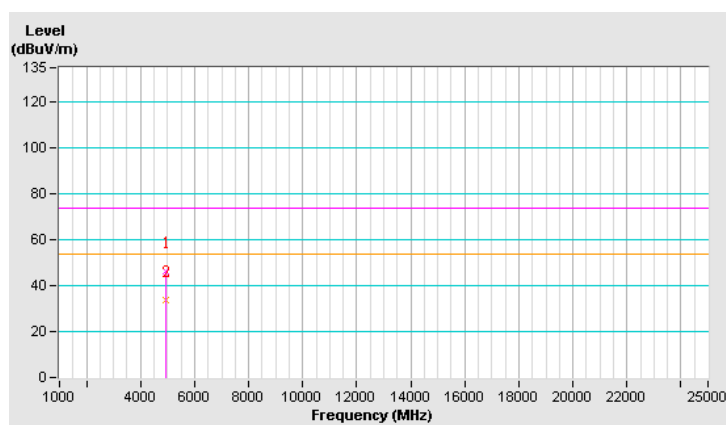


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4924.00	46.5 PK	74.0	-27.5	3.48 V	125	42.50	4.00
2	4924.00	33.7 AV	54.0	-20.3	3.48 V	125	29.70	4.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



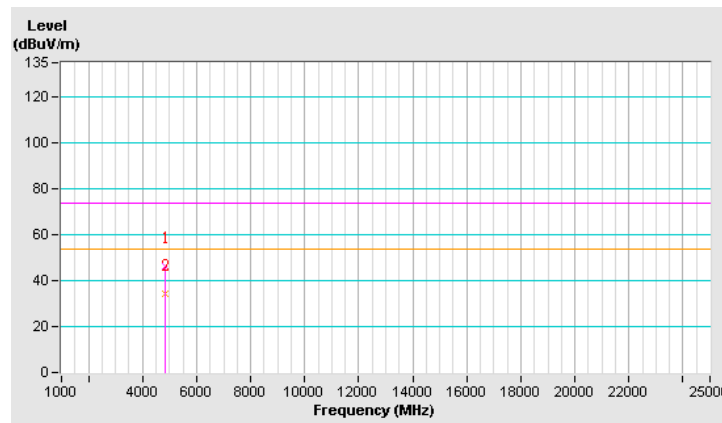
802.11n (40MHz)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4844.00	46.4 PK	74.0	-27.6	1.05 H	97	42.60	3.80
2	4844.00	34.2 AV	54.0	-19.8	1.05 H	97	30.40	3.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

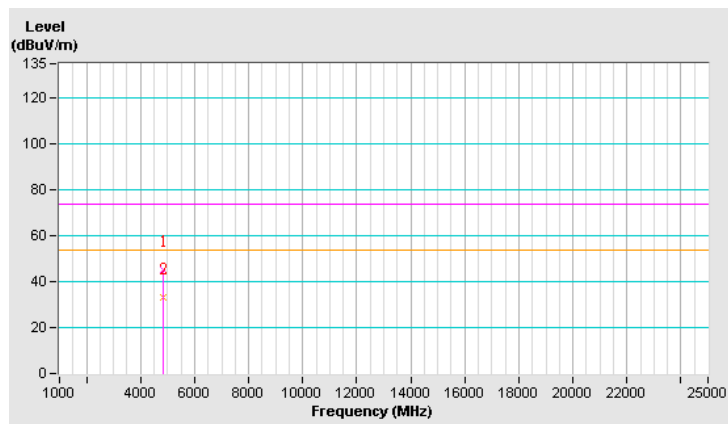


CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4844.00	45.0 PK	74.0	-29.0	1.05 V	87	41.20	3.80
2	4844.00	33.4 AV	54.0	-20.6	1.05 V	87	29.60	3.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

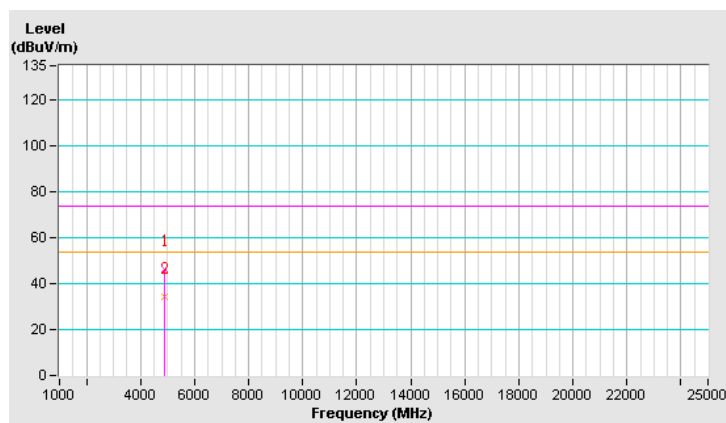


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4874.00	46.5 PK	74.0	-27.5	1.55 H	201	42.60	3.90
2	4874.00	34.3 AV	54.0	-19.7	1.55 H	201	30.40	3.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

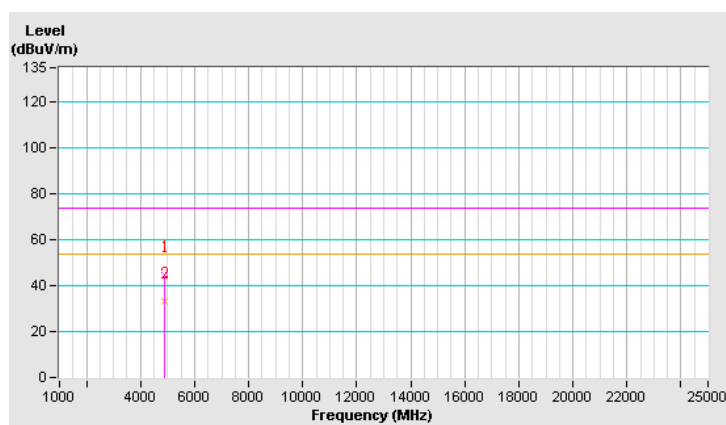


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4874.00	44.5 PK	74.0	-29.5	1.05 V	147	40.60	3.90
2	4874.00	33.2 AV	54.0	-20.8	1.05 V	147	29.30	3.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

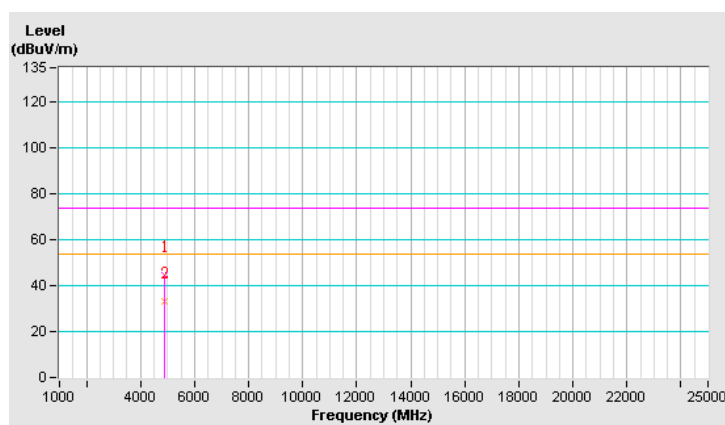


CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4904.00	44.6 PK	74.0	-29.4	2.10 H	120	40.60	4.00
2	4904.00	33.1 AV	54.0	-20.9	2.10 H	120	29.10	4.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

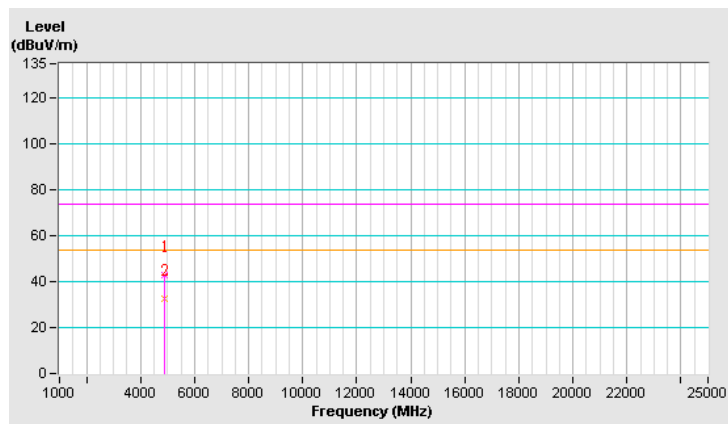


CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4904.00	42.9 PK	74.0	-31.1	2.13 V	125	38.90	4.00
2	4904.00	32.6 AV	54.0	-21.4	2.13 V	125	28.60	4.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



4.7 Band Edge and Fundamental Emissions Measurement

4.7.1 Limit

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

Frequency range (MHz)	Field Strength (mV/meter)	Measurement Distance (m)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.7.2 Measuring Instruments and Setting

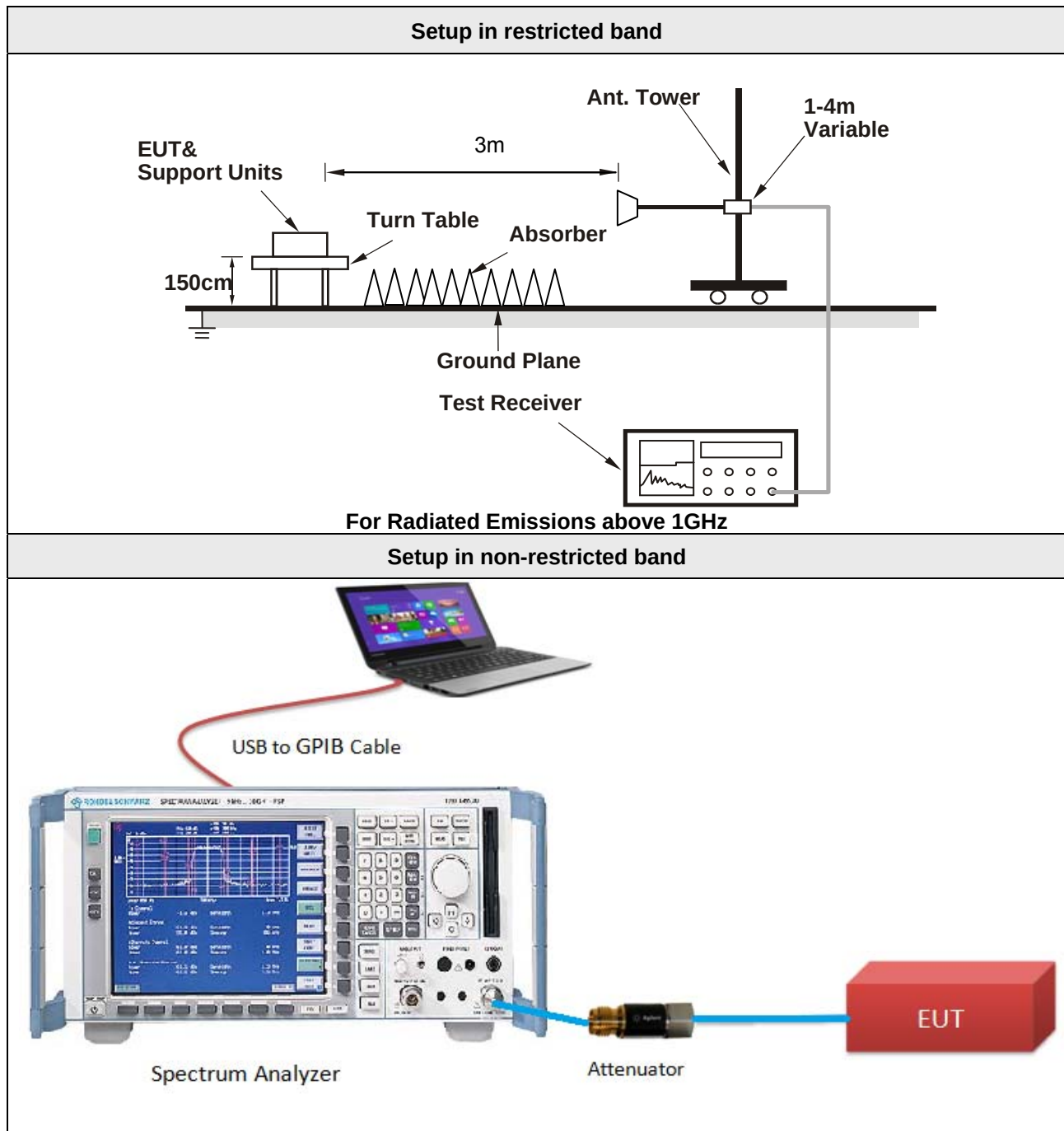
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

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

4.7.3 Test Procedure

- 1 The test procedure is the same as section 4.6.3; only the frequency range investigated is 2310MHz to 2500MHz
- 2 Test for Emissions in non-restricted band was performed in accordance with KDB 558074 D01 v04 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 11 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure.

4.7.4 Test Setup Layout



4.7.5 Test Deviation

There are no deviations with the original standard.

4.7.6 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

4.7.7 Test Results of Band Edge and Fundamental Emissions

Temperature	25°C	Humidity	69%
Test Engineer	Bond Tseng		

1TX

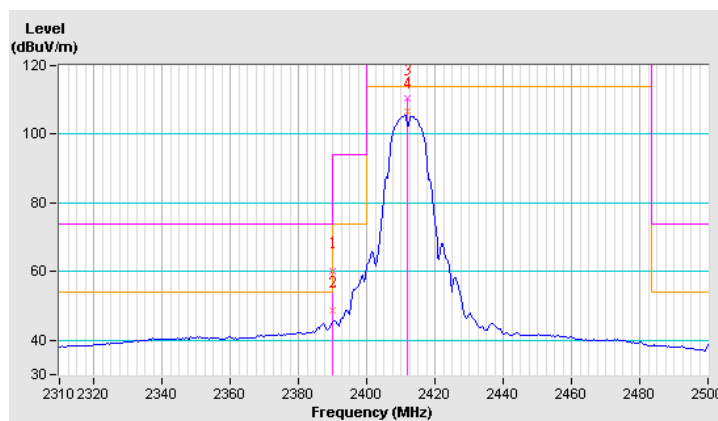
802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.3 PK	74.0	-13.7	3.16 H	323	26.90	33.40
2	2390.00	48.8 AV	54.0	-5.2	3.16 H	323	15.40	33.40
3	*2412.00	110.3 PK			3.16 H	323	76.80	33.50
4	*2412.00	106.5 AV			3.16 H	323	73.00	33.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

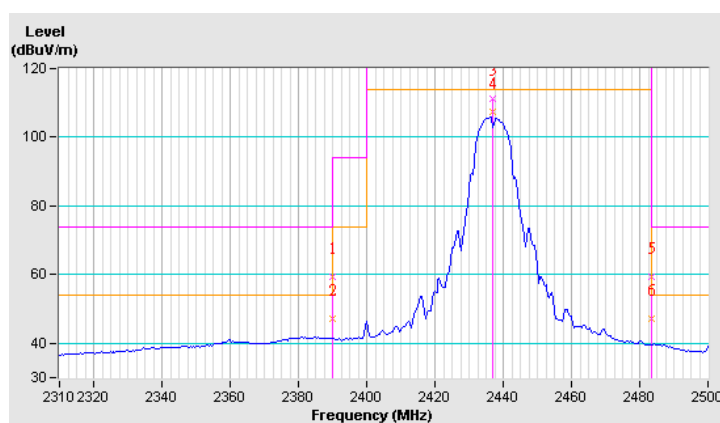


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.5 PK	74.0	-14.5	3.94 H	313	26.10	33.40
2	2390.00	47.3 AV	54.0	-6.7	3.94 H	313	13.90	33.40
3	*2437.00	111.3 PK			3.94 H	313	77.70	33.60
4	*2437.00	107.5 AV			3.94 H	313	73.90	33.60
5	2483.50	59.5 PK	74.0	-14.5	3.94 H	313	25.60	33.90
6	2483.50	47.0 AV	54.0	-7.0	3.94 H	313	13.10	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

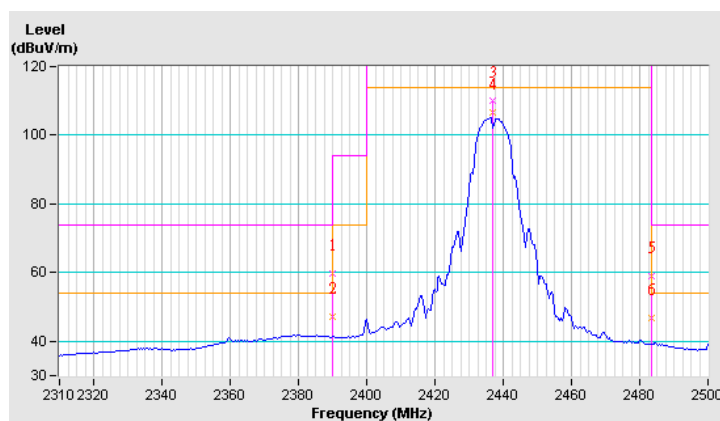


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.7 PK	74.0	-14.3	4.00 V	315	26.30	33.40
2	2390.00	47.3 AV	54.0	-6.7	4.00 V	315	13.90	33.40
3	*2437.00	110.1 PK			4.00 V	315	76.50	33.60
4	*2437.00	106.7 AV			4.00 V	315	73.10	33.60
5	2483.50	59.0 PK	74.0	-15.0	4.00 V	315	25.10	33.90
6	2483.50	46.8 AV	54.0	-7.2	4.00 V	315	12.90	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

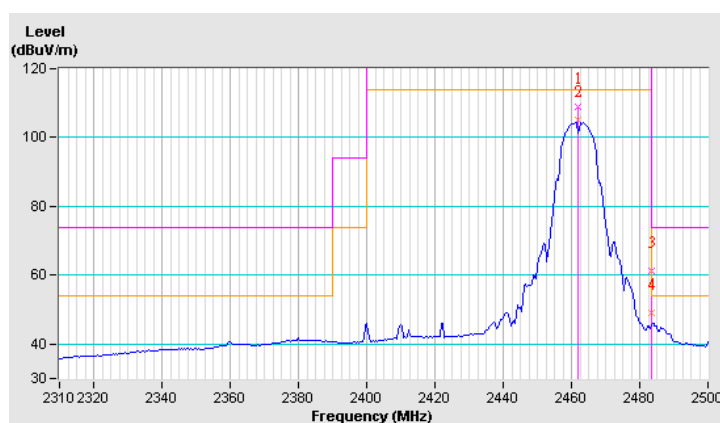


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.8 PK			3.92 H	316	75.00	33.80
2	*2462.00	105.0 AV			3.92 H	316	71.20	33.80
3	2483.50	61.2 PK	74.0	-12.8	3.92 H	316	27.30	33.90
4	2483.50	49.0 AV	54.0	-5.0	3.92 H	316	15.10	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

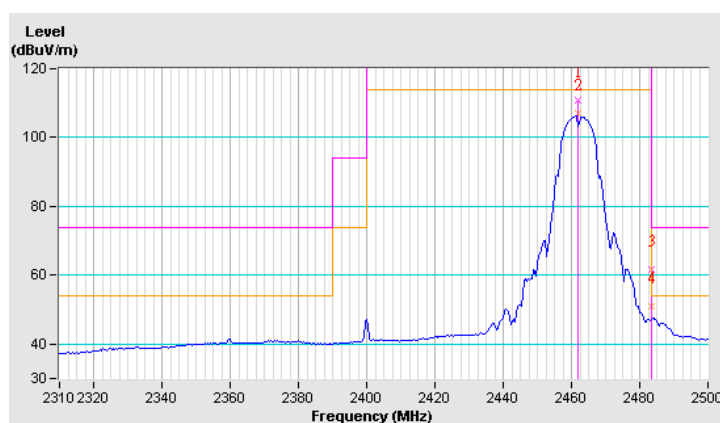


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	110.8 PK			4.00 V	110	77.00	33.80
2	*2462.00	107.1 AV			4.00 V	110	73.30	33.80
3	2483.50	61.8 PK	74.0	-12.2	4.00 V	110	27.90	33.90
4	2483.50	50.9 AV	54.0	-3.1	4.00 V	110	17.00	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



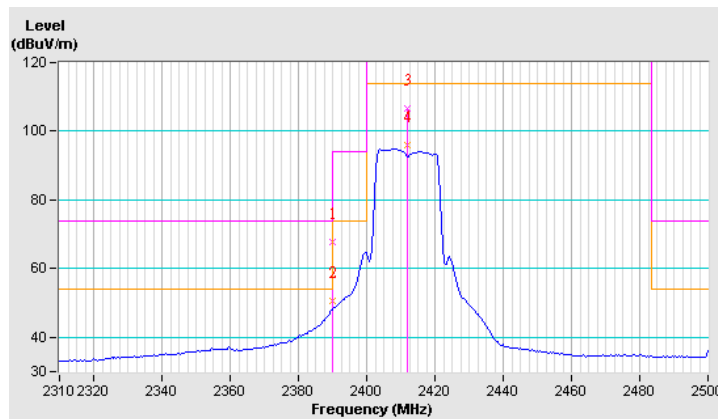
802.11n (20MHz)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.7 PK	74.0	-6.3	3.59 H	309	34.30	33.40
2	2390.00	50.7 AV	54.0	-3.3	3.59 H	309	17.30	33.40
3	*2412.00	106.8 PK			3.59 H	309	73.30	33.50
4	*2412.00	96.1 AV			3.59 H	309	62.60	33.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

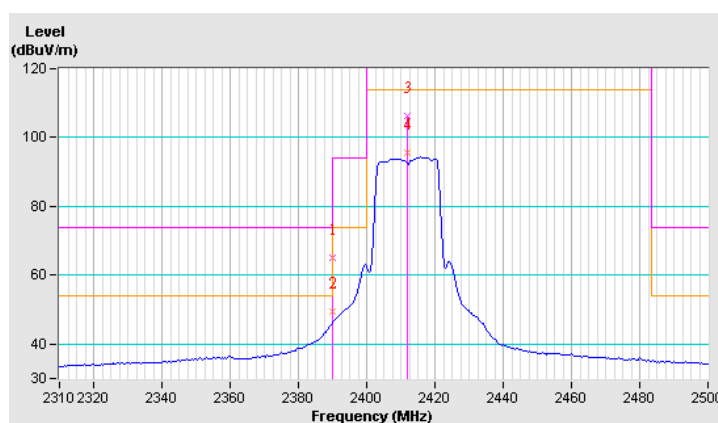


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.9 PK	74.0	-9.1	3.58 V	113	31.50	33.40
2	2390.00	49.3 AV	54.0	-4.7	3.58 V	113	15.90	33.40
3	*2412.00	106.4 PK			3.58 V	113	72.90	33.50
4	*2412.00	95.7 AV			3.58 V	113	62.20	33.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

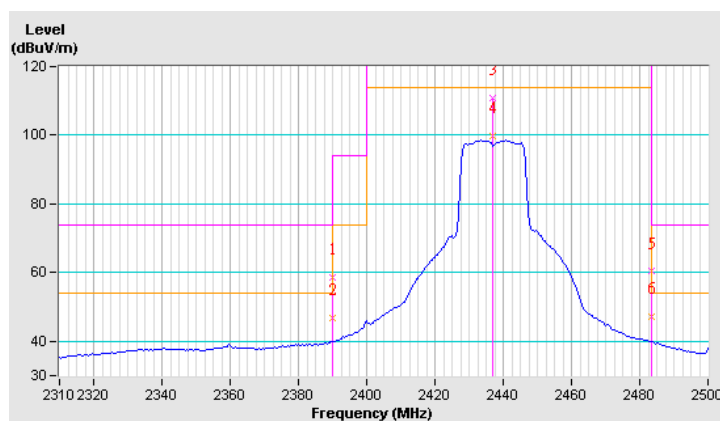


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.6 PK	74.0	-15.4	3.90 H	309	25.20	33.40
2	2390.00	46.6 AV	54.0	-7.4	3.90 H	309	13.20	33.40
3	*2437.00	110.7 PK			3.90 H	309	77.10	33.60
4	*2437.00	99.6 AV			3.90 H	309	66.00	33.60
5	2483.50	60.3 PK	74.0	-13.7	3.90 H	309	26.40	33.90
6	2483.50	47.0 AV	54.0	-7.0	3.90 H	309	13.10	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

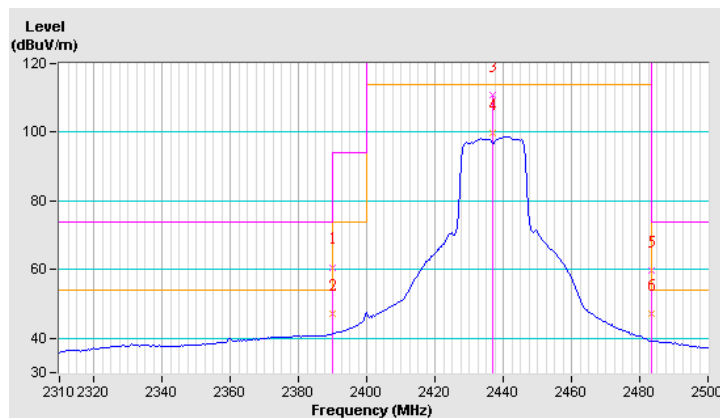


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.7 PK	74.0	-13.3	3.27 V	104	27.30	33.40
2	2390.00	47.3 AV	54.0	-6.7	3.27 V	104	13.90	33.40
3	*2437.00	111.0 PK			3.27 V	104	77.40	33.60
4	*2437.00	99.7 AV			3.27 V	104	66.10	33.60
5	2483.50	59.7 PK	74.0	-14.3	3.27 V	104	25.80	33.90
6	2483.50	47.0 AV	54.0	-7.0	3.27 V	104	13.10	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

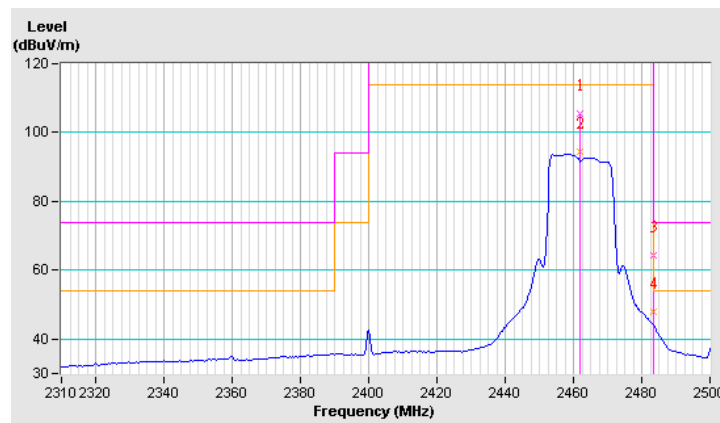


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.5 PK			3.48 H	303	71.70	33.80
2	*2462.00	94.5 AV			3.48 H	303	60.70	33.80
3	2483.50	64.4 PK	74.0	-9.6	3.48 H	303	30.50	33.90
4	2483.50	47.8 AV	54.0	-6.2	3.48 H	303	13.90	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

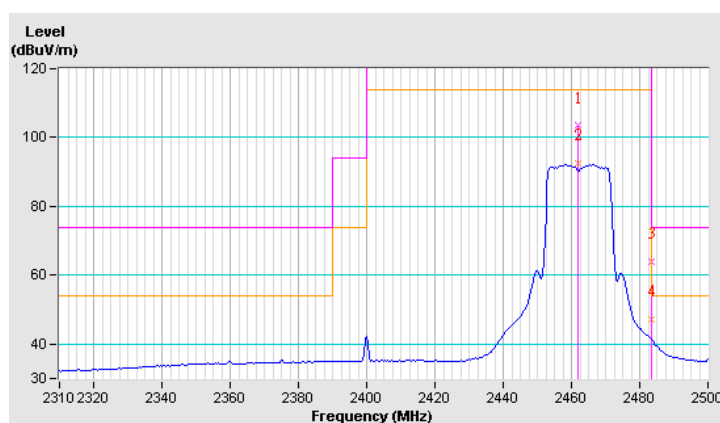


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.4 PK			3.08 V	118	69.60	33.80
2	*2462.00	92.7 AV			3.08 V	118	58.90	33.80
3	2483.50	64.0 PK	74.0	-10.0	3.08 V	118	30.10	33.90
4	2483.50	47.1 AV	54.0	-6.9	3.08 V	118	13.20	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



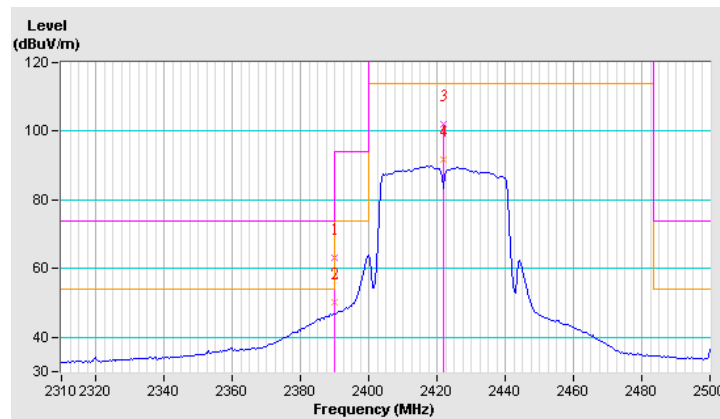
802.11n (40MHz)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.1 PK	74.0	-10.9	3.53 H	315	29.70	33.40
2	2390.00	50.1 AV	54.0	-3.9	3.53 H	315	16.70	33.40
3	*2422.00	102.0 PK			3.53 H	315	68.40	33.60
4	*2422.00	91.6 AV			3.53 H	315	58.00	33.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

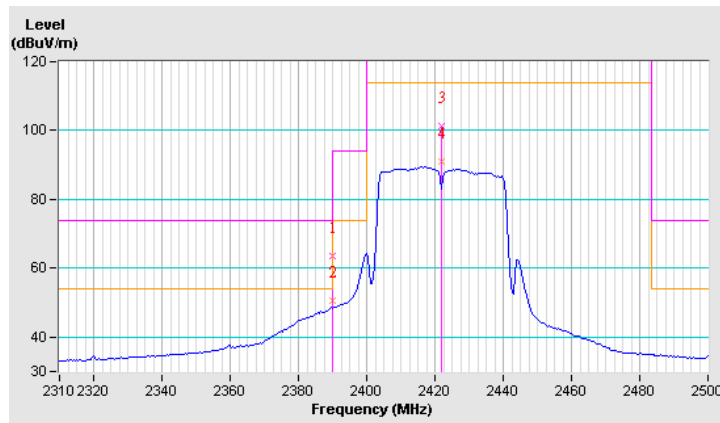


CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.7 PK	74.0	-10.3	3.67 V	103	30.30	33.40
2	2390.00	50.6 AV	54.0	-3.4	3.67 V	103	17.20	33.40
3	*2422.00	101.2 PK			3.67 V	103	67.60	33.60
4	*2422.00	90.9 AV			3.67 V	103	57.30	33.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

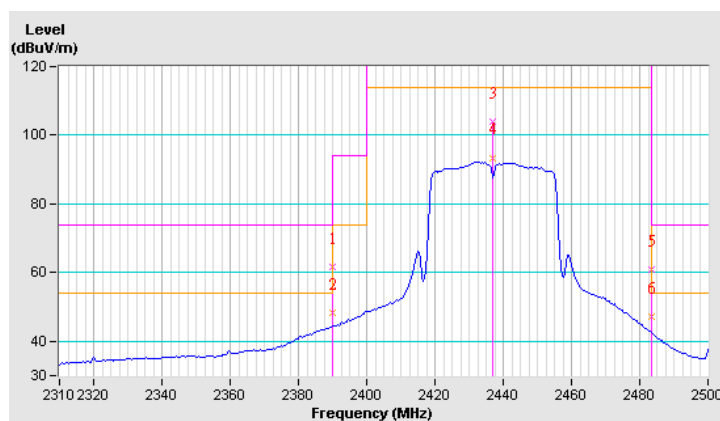


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.8 PK	74.0	-12.2	3.96 H	316	28.40	33.40
2	2390.00	48.3 AV	54.0	-5.7	3.96 H	316	14.90	33.40
3	*2437.00	103.9 PK			3.96 H	316	70.30	33.60
4	*2437.00	93.5 AV			3.96 H	316	59.90	33.60
5	2483.50	60.8 PK	74.0	-13.2	3.96 H	316	26.90	33.90
6	2483.50	47.1 AV	54.0	-6.9	3.96 H	316	13.20	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

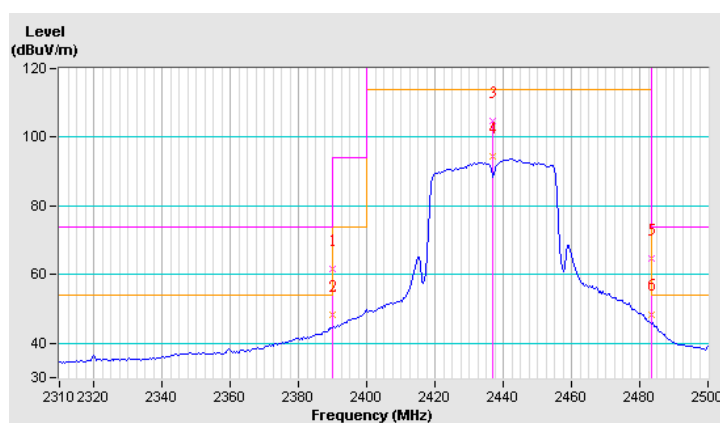


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.5 PK	74.0	-12.5	4.00 V	112	28.10	33.40
2	2390.00	48.3 AV	54.0	-5.7	4.00 V	112	14.90	33.40
3	*2437.00	104.7 PK			4.00 V	112	71.10	33.60
4	*2437.00	94.3 AV			4.00 V	112	60.70	33.60
5	2483.50	64.7 PK	74.0	-9.3	4.00 V	112	30.80	33.90
6	2483.50	48.5 AV	54.0	-5.5	4.00 V	112	14.60	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

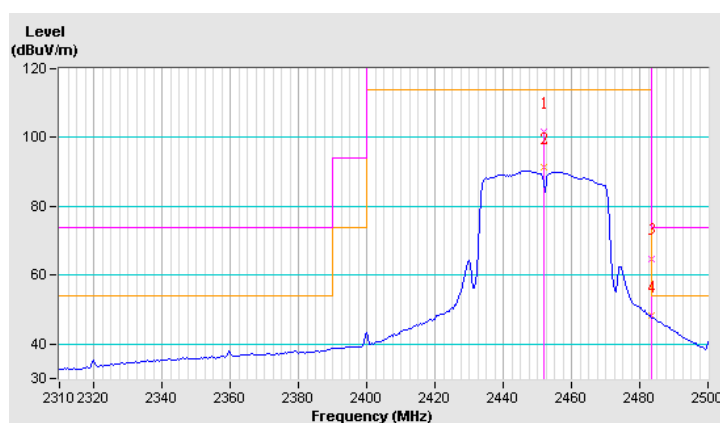


CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	101.7 PK			2.79 H	321	67.90	33.80
2	*2452.00	91.5 AV			2.79 H	321	57.70	33.80
3	2483.50	64.9 PK	74.0	-9.1	2.79 H	321	31.00	33.90
4	2483.50	48.2 AV	54.0	-5.8	2.79 H	321	14.30	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

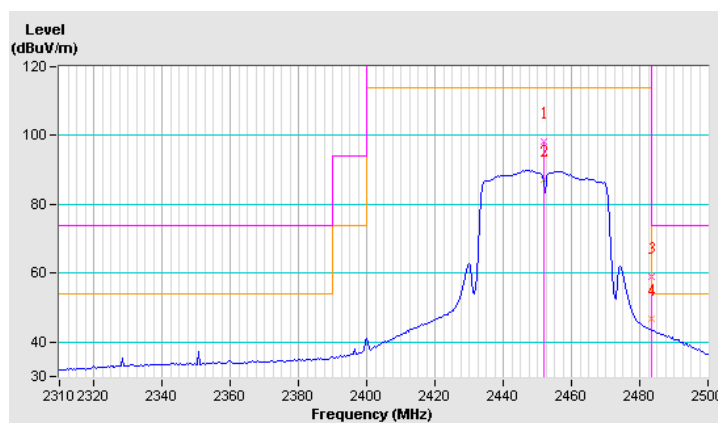


CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	98.3 PK			3.61 V	138	64.50	33.80
2	*2452.00	87.2 AV			3.61 V	138	53.40	33.80
3	2483.50	59.1 PK	74.0	-14.9	3.61 V	138	25.20	33.90
4	2483.50	46.7 AV	54.0	-7.3	3.61 V	138	12.80	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



2TX

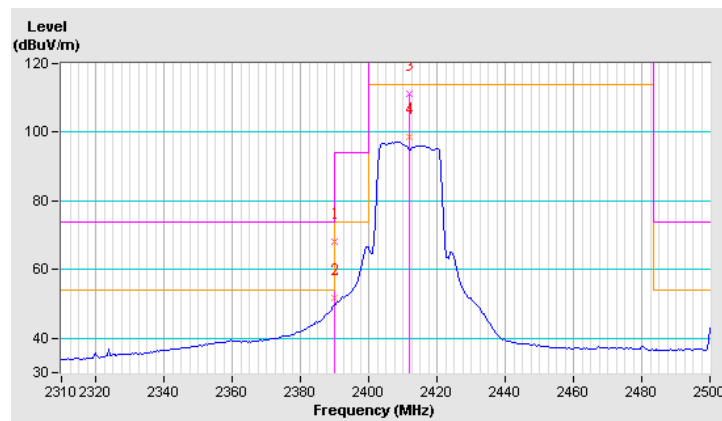
802.11n (20MHz)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.1 PK	74.0	-5.9	3.62 H	296	34.70	33.40
2	2390.00	51.6 AV	54.0	-2.4	3.62 H	296	18.20	33.40
3	*2412.00	111.3 PK			3.62 H	296	77.80	33.50
4	*2412.00	98.5 AV			3.62 H	296	65.00	33.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

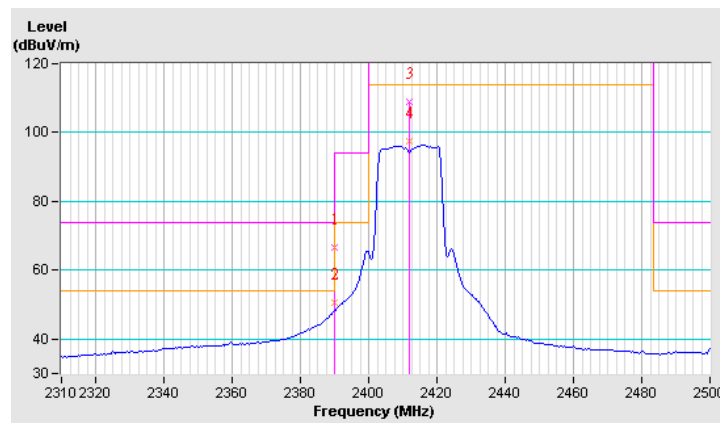


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.6 PK	74.0	-7.4	3.66 V	114	33.20	33.40
2	2390.00	50.6 AV	54.0	-3.4	3.66 V	114	17.20	33.40
3	*2412.00	108.9 PK			3.66 V	114	75.40	33.50
4	*2412.00	97.5 AV			3.66 V	114	64.00	33.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

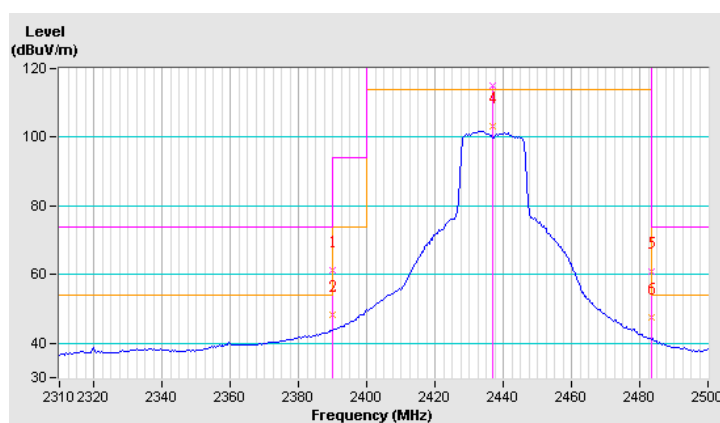


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.2 PK	74.0	-12.8	4.00 H	312	27.80	33.40
2	2390.00	48.2 AV	54.0	-5.8	4.00 H	312	14.80	33.40
3	*2437.00	115.1 PK			4.00 H	312	81.50	33.60
4	*2437.00	103.1 AV			4.00 H	312	69.50	33.60
5	2483.50	61.0 PK	74.0	-13.0	4.00 H	312	27.10	33.90
6	2483.50	47.4 AV	54.0	-6.6	4.00 H	312	13.50	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

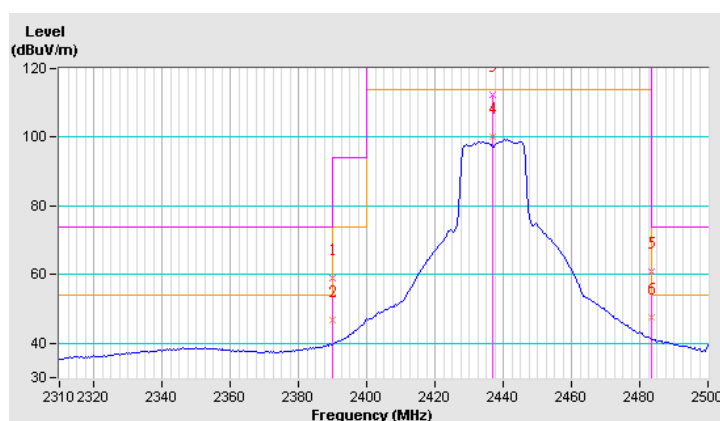


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.1 PK	74.0	-14.9	4.00 V	204	25.70	33.40
2	2390.00	46.7 AV	54.0	-7.3	4.00 V	204	13.30	33.40
3	*2437.00	112.4 PK			4.00 V	204	78.80	33.60
4	*2437.00	100.1 AV			4.00 V	204	66.50	33.60
5	2483.50	60.9 PK	74.0	-13.1	4.00 V	204	27.00	33.90
6	2483.50	47.5 AV	54.0	-6.5	4.00 V	204	13.60	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

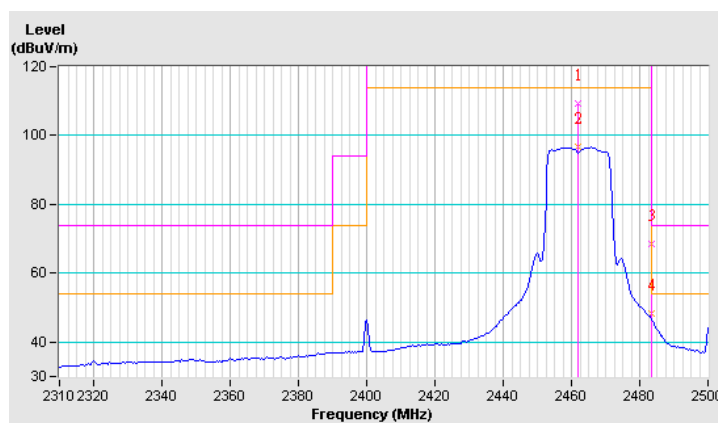


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.2 PK			3.93 H	293	75.40	33.80
2	*2462.00	96.7 AV			3.93 H	293	62.90	33.80
3	2483.50	68.5 PK	74.0	-5.5	3.93 H	293	34.60	33.90
4	2483.50	48.2 AV	54.0	-5.8	3.93 H	293	14.30	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

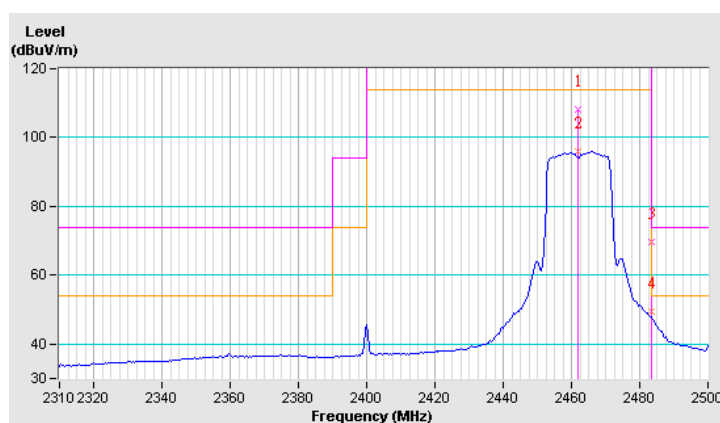


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.1 PK			4.00 V	109	74.30	33.80
2	*2462.00	96.1 AV			4.00 V	109	62.30	33.80
3	2483.50	69.7 PK	74.0	-4.3	4.00 V	109	35.80	33.90
4	2483.50	49.4 AV	54.0	-4.6	4.00 V	109	15.50	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



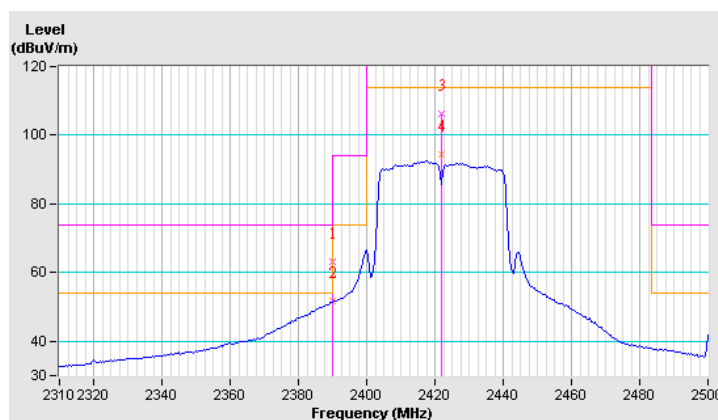
802.11n (40MHz)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.1 PK	74.0	-10.9	2.80 H	303	29.70	33.40
2	2390.00	51.7 AV	54.0	-2.3	2.80 H	303	18.30	33.40
3	*2422.00	106.1 PK			2.80 H	303	72.50	33.60
4	*2422.00	94.4 AV			2.80 H	303	60.80	33.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

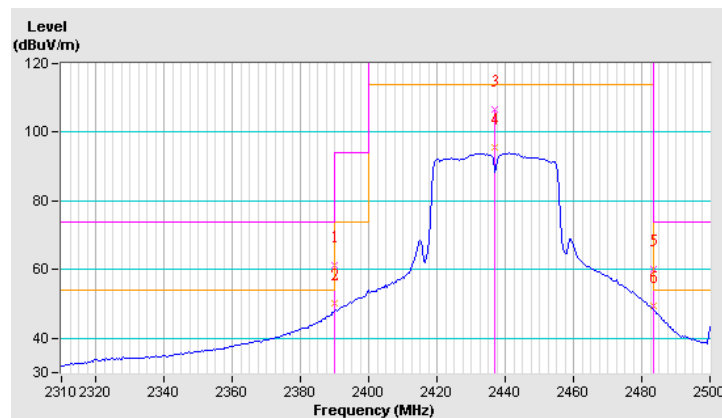


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.4 PK	74.0	-12.6	3.09 H	295	28.00	33.40
2	2390.00	50.1 AV	54.0	-3.9	3.09 H	295	16.70	33.40
3	*2437.00	106.6 PK			3.09 H	295	73.00	33.60
4	*2437.00	95.7 AV			3.09 H	295	62.10	33.60
5	2483.50	60.2 PK	74.0	-13.8	3.09 H	295	26.30	33.90
6	2483.50	49.6 AV	54.0	-4.4	3.09 H	295	15.70	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

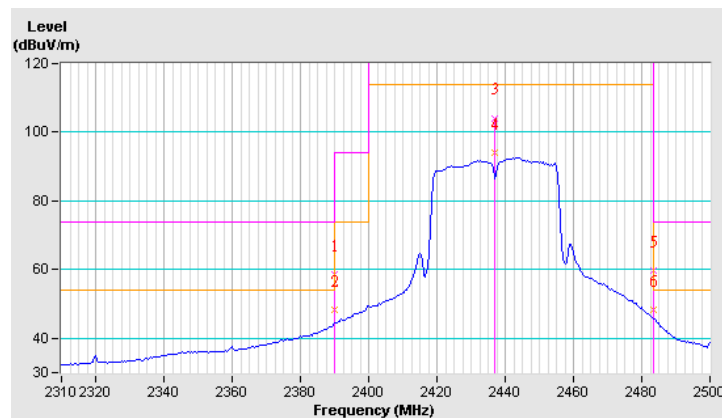


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.7 PK	74.0	-15.3	4.00 V	105	25.30	33.40
2	2390.00	48.3 AV	54.0	-5.7	4.00 V	105	14.90	33.40
3	*2437.00	104.2 PK			4.00 V	105	70.60	33.60
4	*2437.00	94.1 AV			4.00 V	105	60.50	33.60
5	2483.50	59.6 PK	74.0	-14.4	4.00 V	105	25.70	33.90
6	2483.50	48.4 AV	54.0	-5.6	4.00 V	105	14.50	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

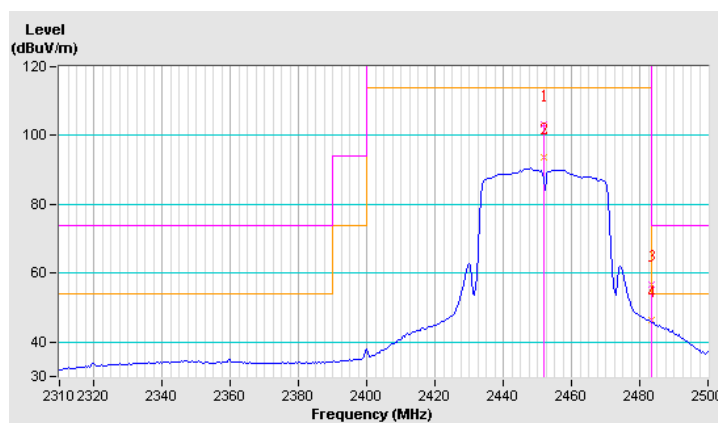


CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	103.2 PK			3.90 H	311	69.40	33.80
2	*2452.00	93.6 AV			3.90 H	311	59.80	33.80
3	2483.50	56.6 PK	74.0	-17.4	3.90 H	311	22.70	33.90
4	2483.50	46.4 AV	54.0	-7.6	3.90 H	311	12.50	33.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

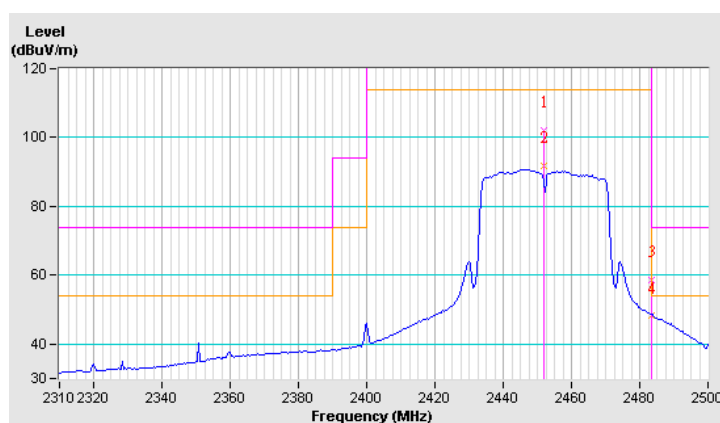


CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	101.9 PK			3.57 V	109	68.10	33.80
2	*2452.00	91.7 AV			3.57 V	109	57.90	33.80
3	2483.50	58.6 PK	74.0	-15.4	3.57 V	109	24.70	33.90
4	2483.50	48.1 AV	54.0	-5.9	3.57 V	109	14.20	33.90

REMARKS:

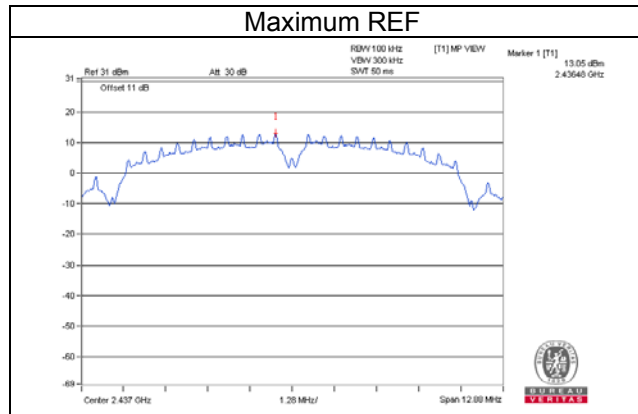
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



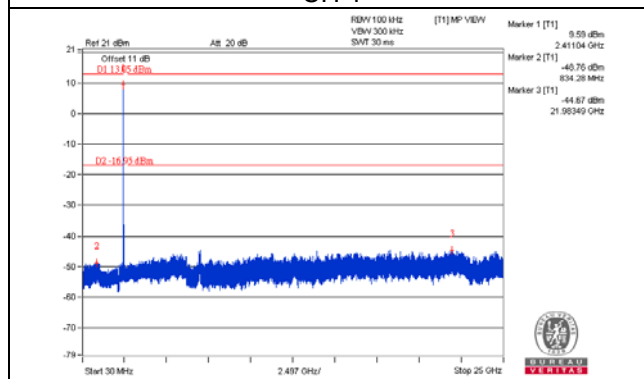
4.7.8 Test Results of Band Edge and Emissions not in Restricted Bands

Below 30dB of the highest emissions level of operating band (in 100kHz Resolution Bandwidth).

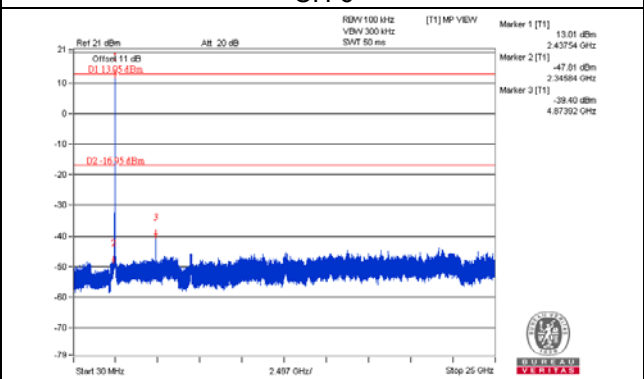
802.11b



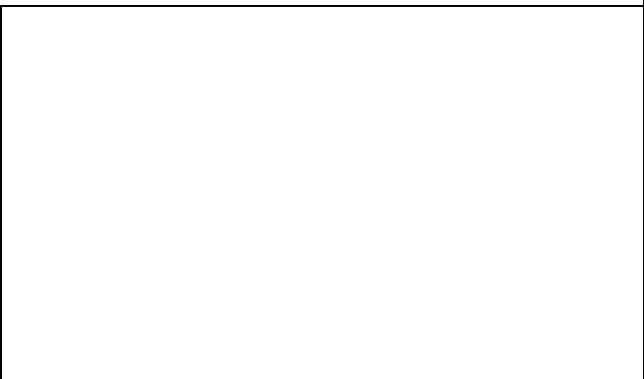
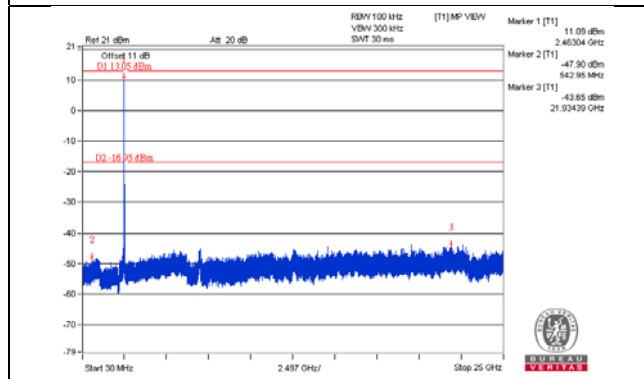
CH 1



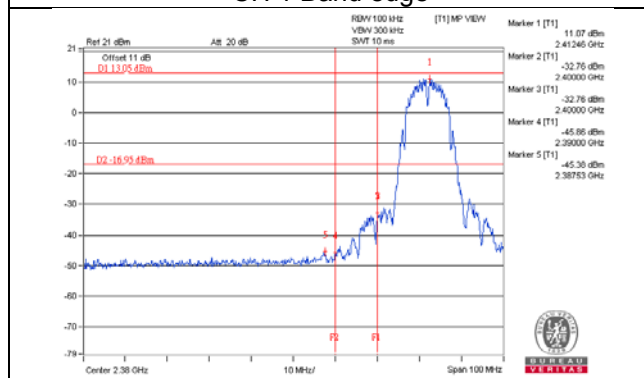
CH 6



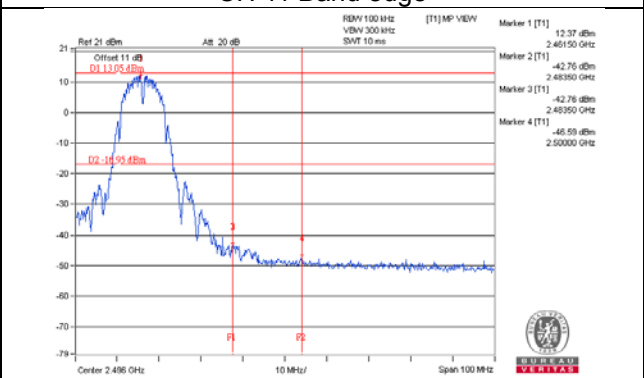
CH 11



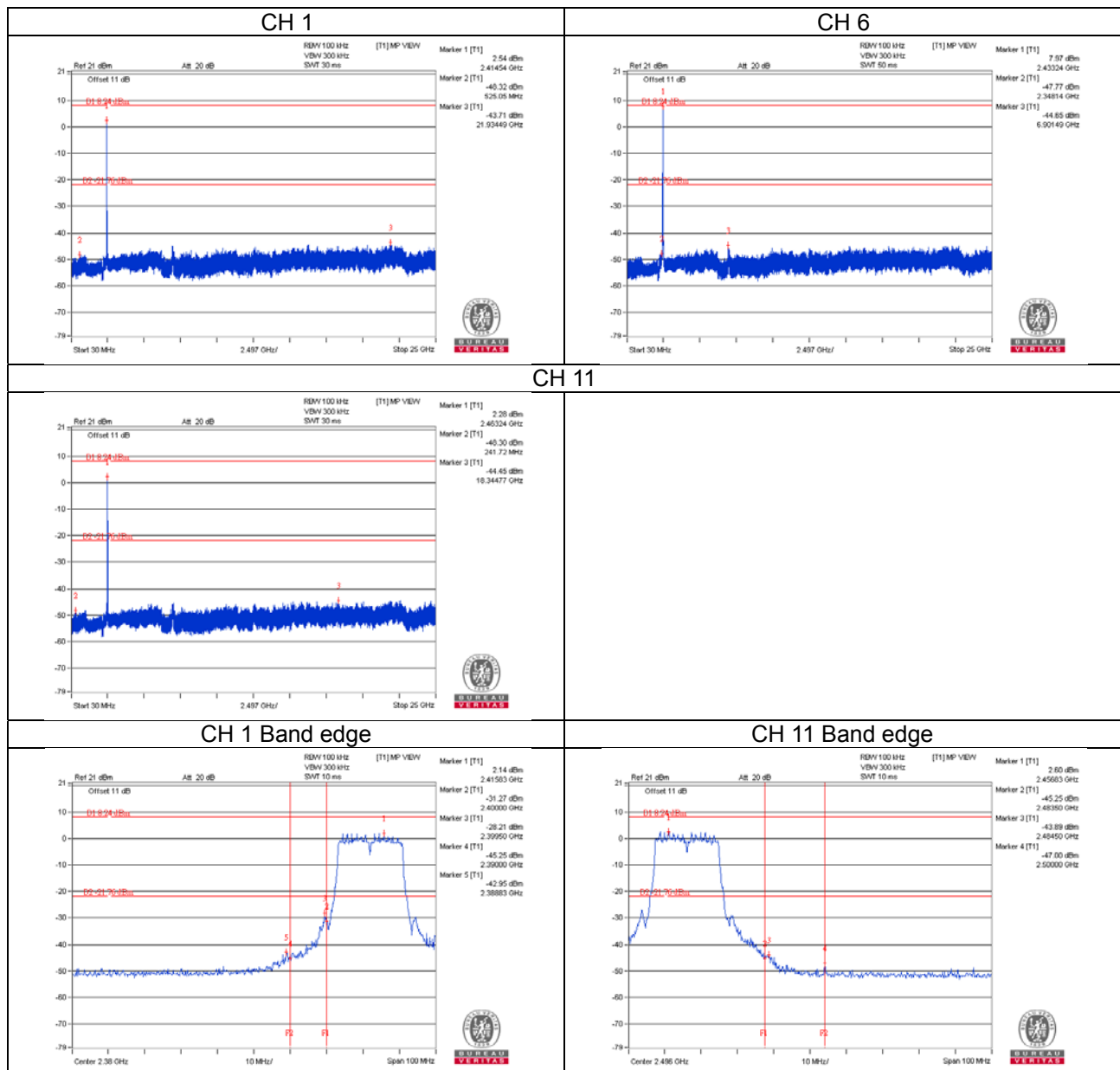
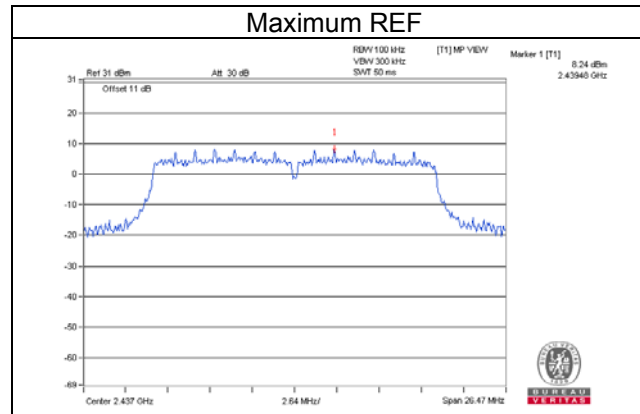
CH 1 Band edge



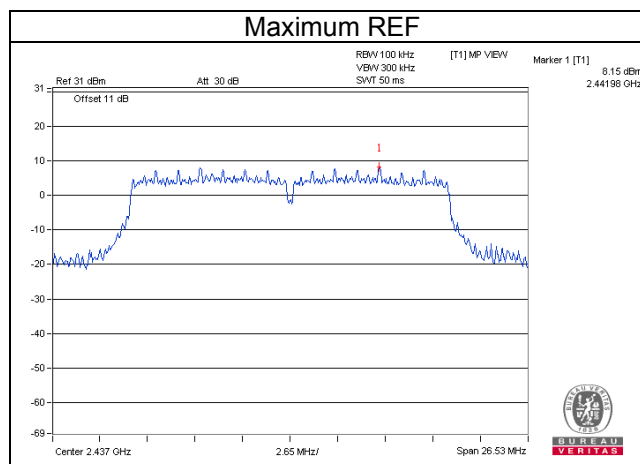
CH 11 Band edge



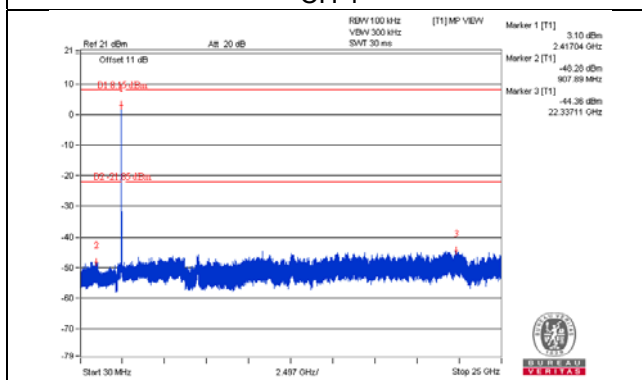
802.11n (20MHz) – 1TX:



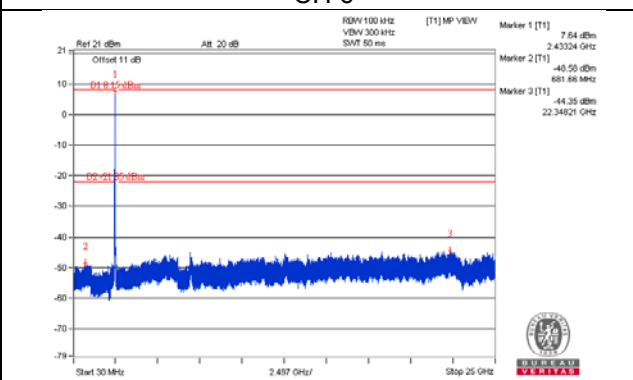
802.11n (20MHz) – 2TX: Chain 1



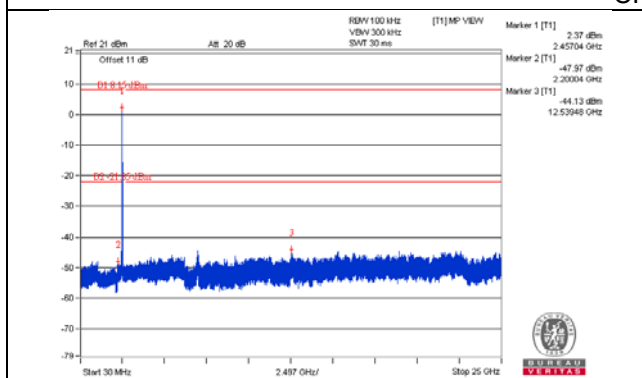
CH 1



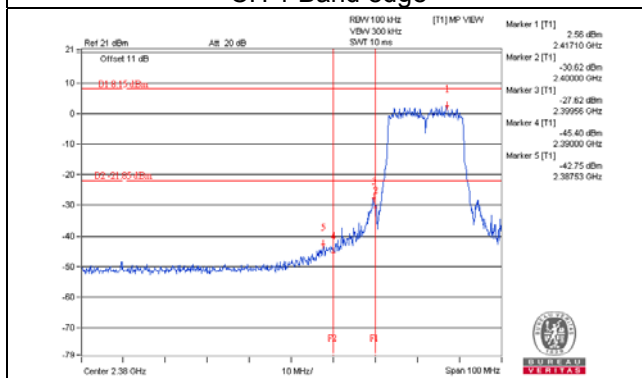
CH 6



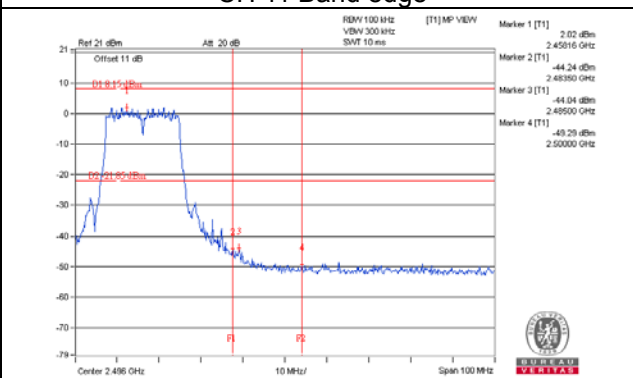
CH 11



CH 1 Band edge

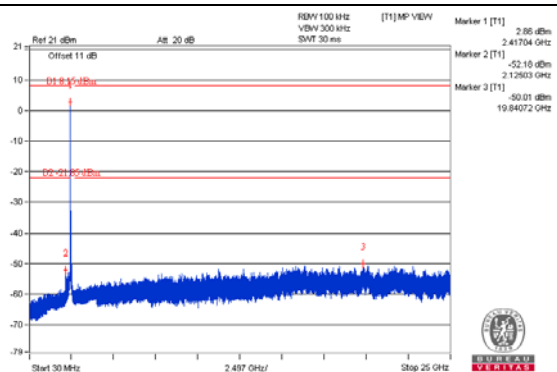


CH 11 Band edge

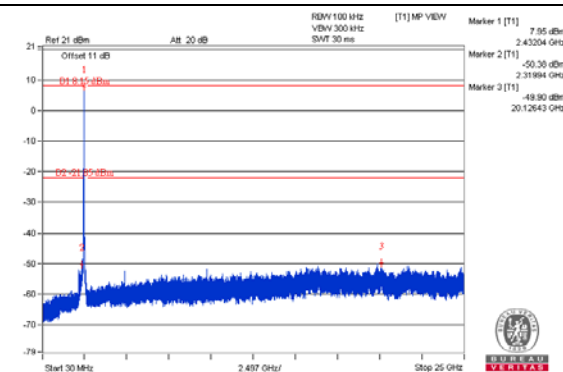


Chain 2

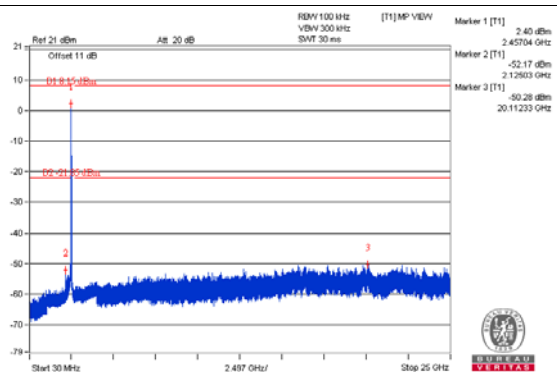
CH 1



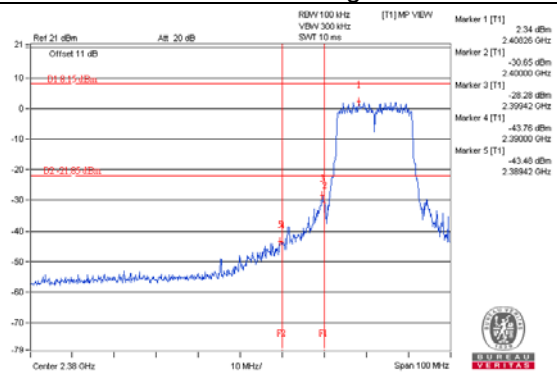
CH 6



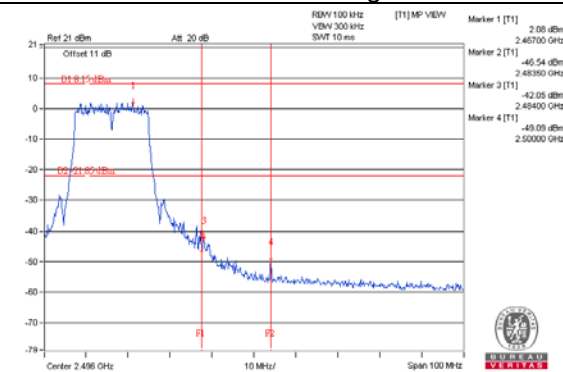
CH 11



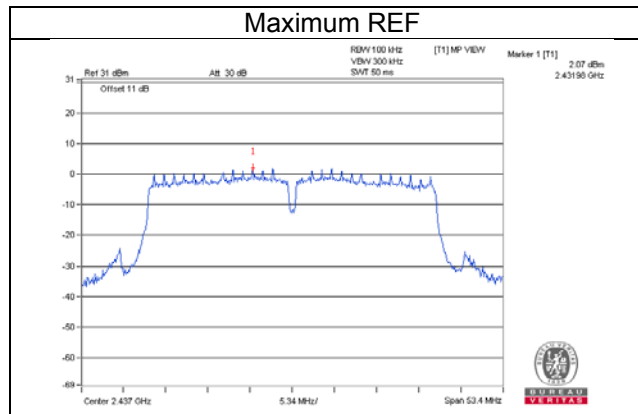
CH 1 Band edge



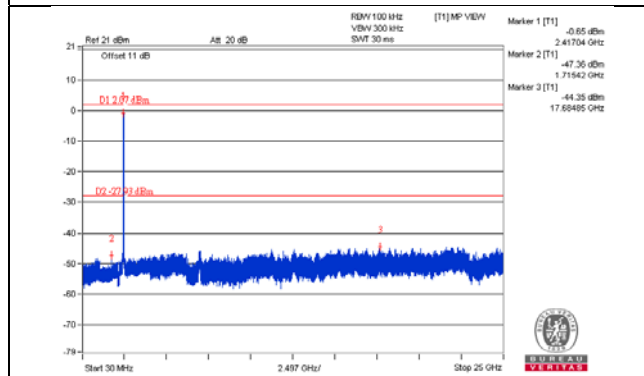
CH 11 Band edge



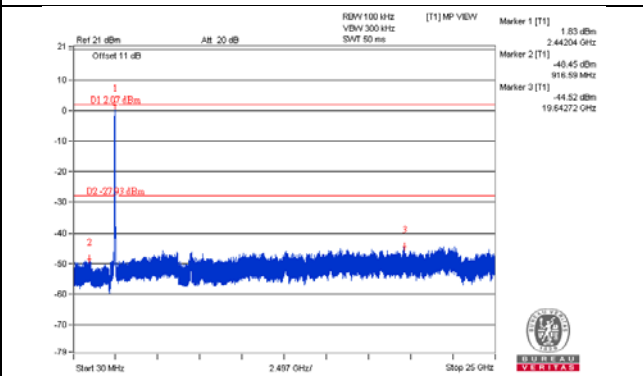
802.11n (40MHz) – 1TX:



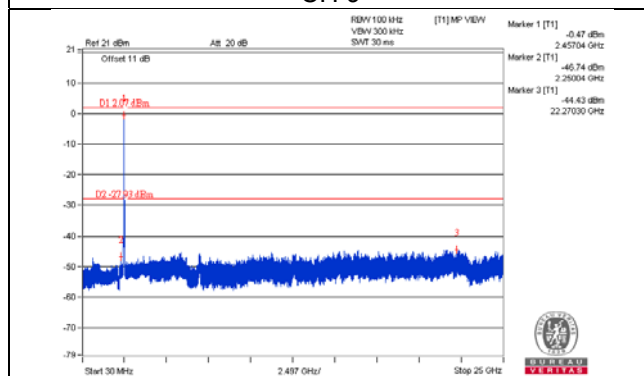
CH 3



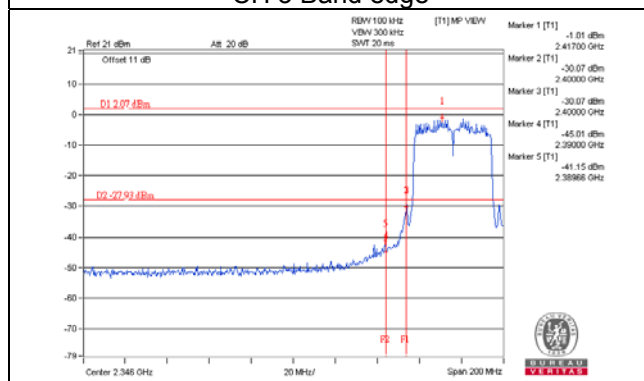
CH 6



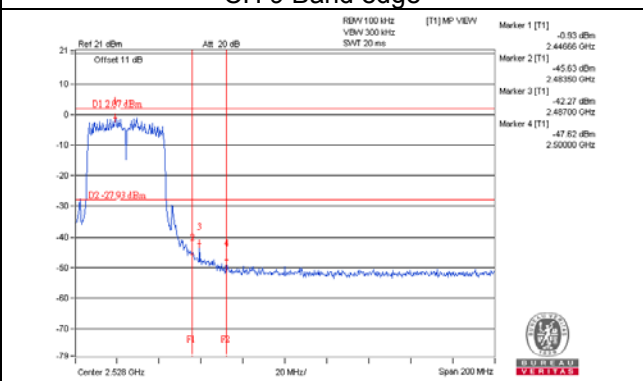
CH 9



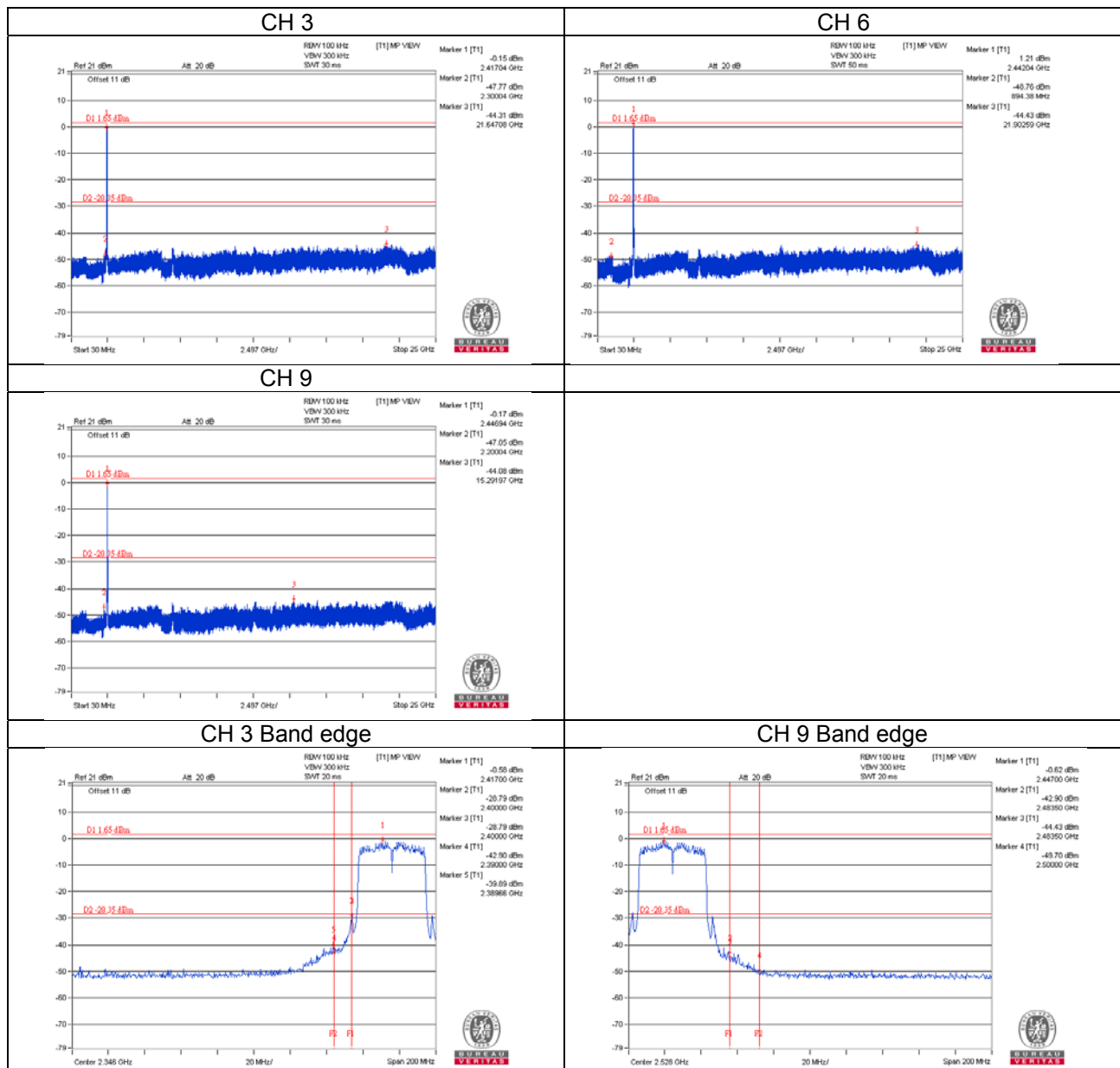
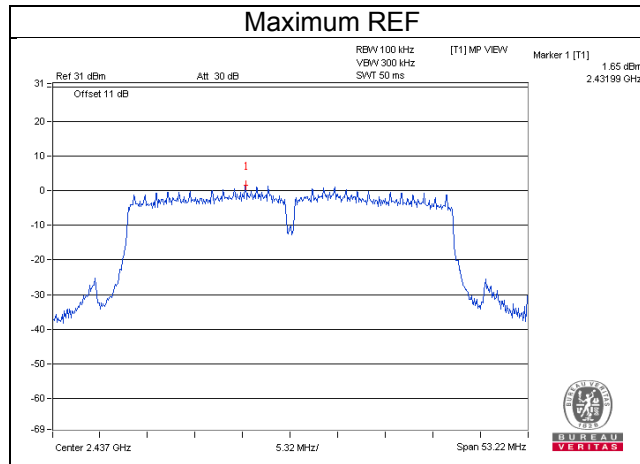
CH 3 Band edge



CH 9 Band edge

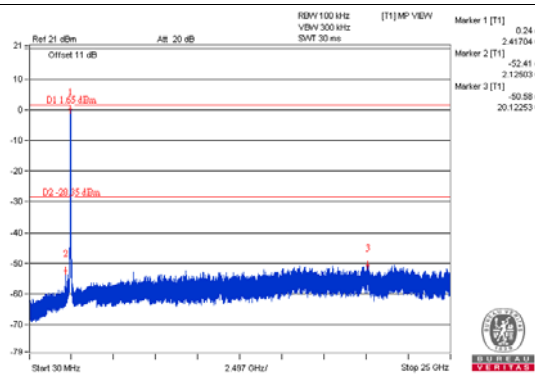


802.11n (40MHz) – 2TX: Chain 1

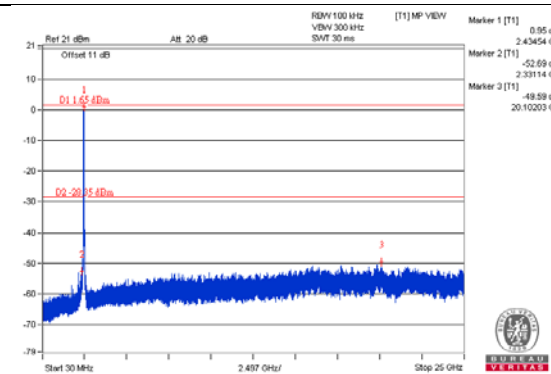


Chain 2

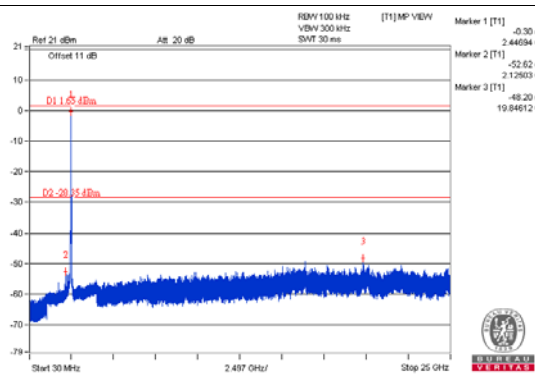
CH 3



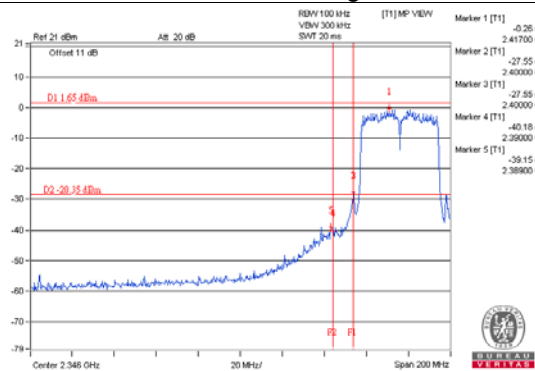
CH 6



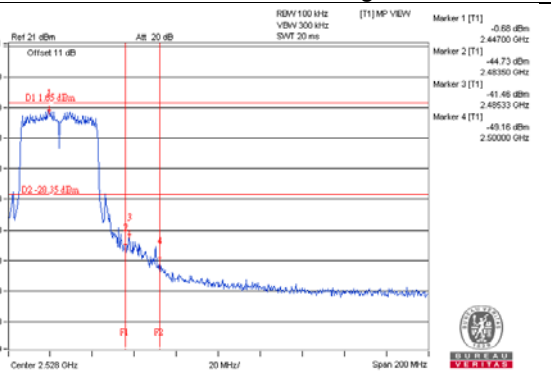
CH 9



CH 3 Band edge



CH 9 Band edge



4.8 List of Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS 30	100288	Aug. 17, 2017	Aug. 16, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 17, 2017	Jan. 16, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ENV216	101196	Apr. 20, 2017	Apr. 19, 2018
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 2.
 3. The VCCI Site Registration No. is C-2047.

Tested date: Aug. 14 ~ Sep. 02, 2017

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Mar. 27, 2017	Mar. 26, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	May. 11, 2017	May. 10, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna EMCI	EM-6879	269	Aug. 10, 2017	Aug. 09, 2018
Preamplifier Agilent	8449B	3008A01638	Feb. 22, 2017	Feb. 21, 2018
Preamplifier Agilent	8447D	2944A10638	Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02 (248780+MY13377)	Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Aug. 08, 2017	Aug. 07, 2018
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 01, 2017	Jul. 31, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA

- Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 9.
 3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
 5. The IC Site Registration No. is IC 7450F-9.

Tested date: Aug. 22, 2017

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
High Speed Peak Power Meter	ML2495A	0824012	Aug. 18, 2017	Aug. 17, 2018
Power Sensor	MA2411B	0738171	Aug. 18, 2017	Aug. 17, 2018

- Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 9.
 3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
 5. The IC Site Registration No. is IC 7450F-9.

Appendix - Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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