FCC Test Report (WLAN 2.4GHz)

Report No.:	RFBHQC-WTW-P20110057
FCC ID:	RSE-4122TCH2
Product Name:	DGA0122
Product Description:	Dual Band Wi-Fi DSL Gateway
Trade Name:	Technicolor
Model Number:	DGA4122TCH2
Series Model:	DGA4122CPR
Product Code:	DGA4122TCH2, DGA4122CPR
Received Date:	Nov. 05, 2020
Test Date:	Nov. 06 to 26, 2020
Issued Date:	Jan. 27, 2021
Applicant:	Technicolor Delivery Technologies Belgium
Address:	Prins Boudewijnlaan 47 Edegem B-2650 Belgium
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

Testing Laboratory 2022

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Release Control Record

Issue No.	Description	Date Issued
RFBHQC-WTW-P20110057	Original release.	Jan. 27, 2021

1 Certificate of Conformity

Product Name:	DGA0122
Product Description:	Dual Band Wi-Fi DSL Gateway
Trade Name:	Technicolor
Test Model:	DGA4122TCH2
Series Model:	DGA4122CPR
Product Code:	DGA4122TCH2, DGA4122CPR
Sample Status:	Product Unit
Applicant:	Technicolor Delivery Technologies Belgium
Test Date:	Nov. 06 to 26, 2020
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 : _____ , **Date:** Jan. 27, 2021

Claire Kuan / Specialist

Approved by : _____ , **Date:** Jan. 27, 2021

Clark Lin / Technical Manager

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 -12.33dB at 6.84375MHz.	-	PASS
4.2	15.247(b)(3)	Maximum Conducted Output Power	Power [dBm]: 11b: 23.26 dBm 11g: 24.97 dBm 11n 20M: 25.25 dBm 11n 40M: 21.67 dBm	30 dBm	PASS
4.3	15.247(e)	Power Spectral Density	PSD [dBm]: 11b: -11.25 dBm/3kHz 11g: -9.72 dBm/3kHz 11n 20M: -11.23 dBm/3kHz 11n 40M: -15.04 dBm/3kHz	8dBm/3kHz	PASS
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Bandwidth [MHz]: 11b: 7.06 MHz 11g: 16.33 MHz 11n 20M: 17.55 MHz 11n 40M: 35.71 MHz	≥500kHz	PASS
4.5	-	Occupied 99% Bandwidth	Bandwidth [MHz]: 11b: 11.91 MHz 11g: 17.88 MHz 11n 20M: 18.84 MHz 11n 40M: 37.39 MHz	-	-
4.6	15.247(d)	Radiated Emissions	Margin is -1.0dB at 7386.00MHz	-	PASS
4.7	15.247(a)(2)	Band Edge Emissions	Margin is -0.1dB at 2389.60MHz and 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	1.9 dB
Conducted emissions	-	2.5 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 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
Product Name	DGA0122
Product Description	Dual Band Wi-Fi DSL Gateway
Trade Name	Technicolor
Model Number	DGA4122TCH2
Series Model	DGA4122CPR
Product Code	DGA4122TCH2, DGA4122CPR
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: 23.26 dBm ■ IEEE 802.11g: 24.97 dBm ■ IEEE 802.11n 20MHz: 25.25 dBm ■ IEEE 802.11n 40MHz: 21.67 dBm
Product Type	For IEEE 802.11b: WLAN(1TX, 2RX) For IEEE 802.11g: WLAN(2TX, 2RX) For IEEE 802.11n: WLAN(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~MCS15); 802.11n 40MHz mode(MCS0~MCS15)
I/O Ports	ADSL Port x 1 FXS Port x 2 LAN Port x 4 WAN Port x 1 USB 2.0 Port x 1
Hardware Version	Beta2a
Software Version	19.4.0419-4389025-20200927140853- abcf33bd2a813810535b075fbbd7b195d963bf37

802.11n Data Rate spec

Standard	Index	Data Rate (Mbps)		Standard	Index	Data Rate (Mbps)	
		LGI (800ns)	SGI (400ns)			LGI (800ns)	SGI (400ns)
11n 20MHz 1 stream	MCS0	6.5	7.2	11n 40MHz 1 stream	MCS0	13.5	15
	MCS1	13	14.4		MCS1	27	30
	MCS2	19.5	21.7		MCS2	40.5	45
	MCS3	26	28.9		MCS3	54	60
	MCS4	39	43.3		MCS4	81	90
	MCS5	52	57.8		MCS5	108	120
	MCS6	58.5	65		MCS6	121.5	135
	MCS7	65	72.2		MCS7	135	150
11n 20MHz 2 stream	MCS8	13	14.4	11n 40MHz 2 stream	MCS8	27	30
	MCS9	26	28.9		MCS9	54	60
	MCS10	39	43.3		MCS10	81	90
	MCS11	52	57.8		MCS11	108	120
	MCS12	78	86.7		MCS12	162	180
	MCS13	104	115.6		MCS13	216	240
	MCS14	117	130		MCS14	243	270
	MCS15	130	144.4		MCS15	270	300

3.2 Accessories

Brand	HONOR
Model	ADS-24FUA-12Y 12024EPCU
P/N	6245817A
Input Power	100-240Vac, 50/60Hz, Max. 0.7A
Output Power	12Vdc, 2.0A
Power Line	1.5m

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	FXS	WLAN IEEE 802.11n (2.4GHz)	WLAN IEEE 802.11ac (5GHz)
DGA4122TCH2 (EUT)	12Vdc,2A	● Annex A	●(4 port)	●(1 port)	●(1 port)	●(2 port)	●	●

● : Equipped
○ : Not Equipped

3.5 General Description of Applied Standards and References

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

Test standard:

FCC Part 15, Subpart C (15.247)
ANSI C63.10-2013

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

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02, 04/02/2019
KDB 662911 D01 Multiple Transmitter Output v02r01, 10/31/2013

All test items have been performed as a reference to the above KDB test guidance.

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
Ethernet	UTP Cat 5	2 meter	> 10 meter	Two 10 meter cables;	Internal
WAN	UTP Cat 5	2 meter	> 10 meter	10 meter cable;	External
AC power	UTP	1.5 meter	>10 meter	1.5 meter	External
FXS1/2	UTP Cat 3	2 meter	> 10 meter	1 meter cable	Internal
USB 2.0	STP	NA	NA	NA	Internal
DSL	UTP Cat 3	2 meter cable	> 10 meter	10 meter	External

3.7 Transmit Operating Mode

Transmit Operating Mode							Transmit Muitiple Antennas					
■	Operating mode 1 (single antenna)						■	1TX				
■	Operating mode 2 (muitiple antenna, no beam forming)						■	2TX	□	3TX	□	4TX
□	Operating mode 3 (muitiple 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 IEEE802.11n,
MCS0~MCS7: 1S1T SISO, 1S2T CDD mode;
MCS8~MCS15: 2S2T SDM mode;

3.8 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.

3.9 Antenna Information

2.4G Antenna Information					
Ant.	Brand	Model No.	Antenna Type	Cable Length	Connector
2G1	Technicolor	--	Metallic Antenna	--	Murata
2G2	Technicolor	--	Metallic Antenna	--	Murata

Antenna & Bandwidth for 2400~2483.5MHz

Number of Transmit Antennas	1TX		2TX	
Bandwidth Mode	20 MHz	40 MHz	20 MHz	40 MHz
802.11b	V	X	X	X
802.11g	V	X	V	X
802.11n	V	V	V	V

For 2400~2483.5MHz

Frequency	Max. Antenna Gain (dBi)		Max Gain (dBi) for CDD mode
	2G-Ant. 1	2G-Ant. 2	CDD Mode
2400~2483.5MHz	2.71	3.52	6.13

Note:
1. Antenna Gain refer to “DGA0122-Lab2_Antenna_Test_Report_20191125” files.
2. Maximum Correlated Directional Gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}]$ dBi
3. Maximum Uncorrelated Directional Gain = $10 \log[(10^{G1/10} + 10^{G2/10} + \ldots + 10^{GN/10}) / N_{ANT}]$ dBi

3.10 Table for Carrier Frequency

Eleven channels are provided for Bandwidth 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 Bandwidth 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		

3.11 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	1
	802.11g	OFDM/BPSK	1/6/11	6 Mbps	1+2
	802.11n 20MHz	OFDM/BPSK	1/6/11	1S2T MCS0 CDD	1+2
	802.11n 40MHz		3/6/9	1S2T MCS0 CDD	1+2
Power Spectral Density	802.11b	DSSS/DBPSK	1/6/11	1 Mbps	1
	802.11g	OFDM/BPSK	1/6/11	6 Mbps	1+2
	802.11n 20MHz	OFDM/BPSK	1/6/11	1S2T MCS0 CDD	1+2
	802.11n 40MHz		3/6/9	1S2T MCS0 CDD	1+2
6dB Spectrum Bandwidth	802.11b	DSSS/DBPSK	1/6/11	1 Mbps	1
	802.11g	OFDM/BPSK	1/6/11	6 Mbps	1+2
	802.11n 20MHz	OFDM/BPSK	1/6/11	1S2T MCS0 CDD	1+2
	802.11n 40MHz		3/6/9	1S2T MCS0 CDD	1+2
Band Edge Emissions (Radiated)	802.11b	DSSS/DBPSK	1/6/11	1 Mbps	1
	802.11n 20MHz	OFDM/BPSK	1/6/11	1S2T MCS0 CDD	1+2
	802.11n 40MHz		3/6/9	1S2T MCS0 CDD	1+2
Radiated Emissions Above 1GHz(Radiated)	802.11b	DSSS/DBPSK	1/6/11	1 Mbps	1
	802.11n 20MHz	OFDM/BPSK	1/6/11	1S2T MCS0 CDD	1+2
	802.11n 40MHz		3/6/9	1S2T MCS0 CDD	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 emissions and in band PSD after investigate worst case mode)
2. Base on tx core command, the 11b default mode is 1S1T SISO, the 11g default mode is 1S2T CDD, the 802.11n 20MHz/ 40MHz, default mode are 1S2T CDD, the SDM mode cover by the CDD mode withe the same setting

wl -i wl0 txcore
txcore enabled bitmap (Nsts {4..1}) 0x0f 0x00 0x03 0x03
txcore mask OFDM 0x03 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”.

3.12 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	19.4.0419-4389025-20200927140853-abcf33bd2a813810535b075fbbd7b195d963bf37				
Worst Modulation Mode	**Number of Transmit Chains (NTX)**	**Frequency (MHz)**	**Maximum Output Power (dBm)**	**Power Setting**	**Data Rate / MCS**
802.11b, ANT1	1Stream 1TX	2412	23.26	Default(22.5)	1Mbps
802.11b, ANT1	1Stream 1TX	2437	23.18	Default(22.5)	1Mbps
802.11b, ANT1	1Stream 1TX	2462	22.95	Default(22.5)	1Mbps
802.11g, ANT1+2 (CDD)	1Stream 2TX	2412	21.16	Default(18.25)	6Mbps
802.11g, ANT1+2 (CDD)	1Stream 2TX	2437	24.97	Default(21.5)	6Mbps
802.11g, ANT1+2 (CDD)	1Stream 2TX	2462	21.04	Default(18.5)	6Mbps
802.11n 20MHz, ANT1+2 (CDD)	1Stream 2TX	2412	21.34	Default(18.25)	MCS0
802.11n 20MHz, ANT1+2 (CDD)	1Stream 2TX	2437	25.25	Default(22)	MCS0
802.11n 20MHz, ANT1+2 (CDD)	1Stream 2TX	2462	21.17	Default(18.5)	MCS0
802.11n 40MHz, ANT1+2 (CDD)	1Stream 2TX	2422	19.76	Default(16.5)	MCS0
802.11n 40MHz, ANT1+2 (CDD)	1Stream 2TX	2437	21.67	Default(18.75)	MCS0
802.11n 40MHz, ANT1+2 (CDD)	1Stream 2TX	2452	20.23	Default(17.5)	MCS0

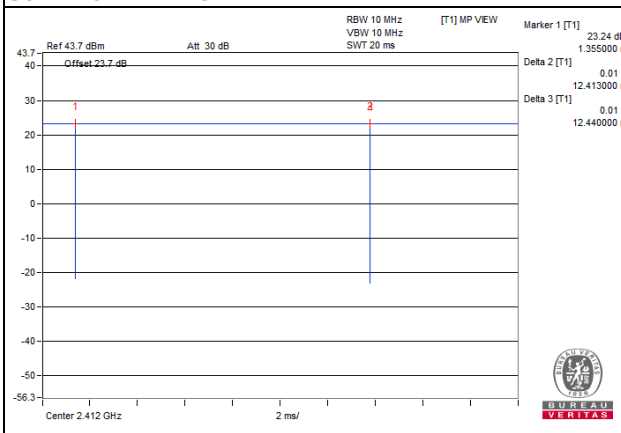
Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

3.13 On Time and Duty Cycle

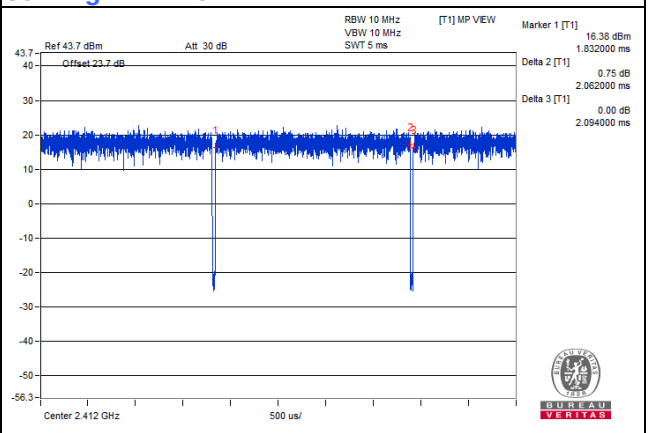
Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
802.11b 1Tx Ant1	12.413	12.44	99.8	0	-
802.11g 2Tx CDD	2.062	2.094	98.5	0	-
802.11n 20MHz 2Tx CDD	1.919	1.965	97.7	0.1	1
802.11n 40MHz 2Tx CDD	0.943	0.974	96.8	0.14	2

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

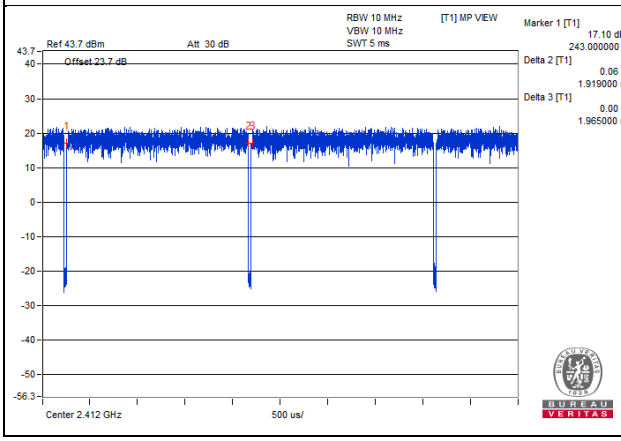
802.11b 1Tx Ant1



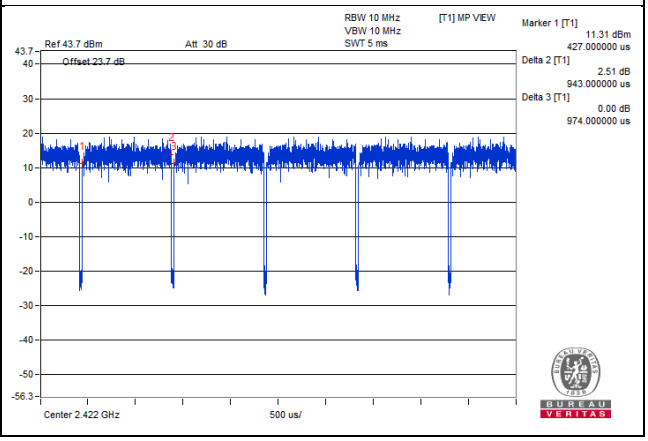
802.11g 1Tx Ant1



802.11n 20MHz 2Tx CDD



802.11n 40MHz 2Tx CDD



3.14 Testing Location Information

Test Site Location					
Address	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan				
TEL	886-3-6668565				
FAX	886-3-6668323				
Test Site No.	**Site Category**	**Location**	**FCC Reg. No.**	**IC Reg. No.**	**VCCI Reg. No**
Conduction 1	Conduction	Hsinchu	-	-	-
Chamber 3	966 Chamber	Hsinchu	-	-	-
Oven 2	Oven	Hsinchu	-	-	-

3.15 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.

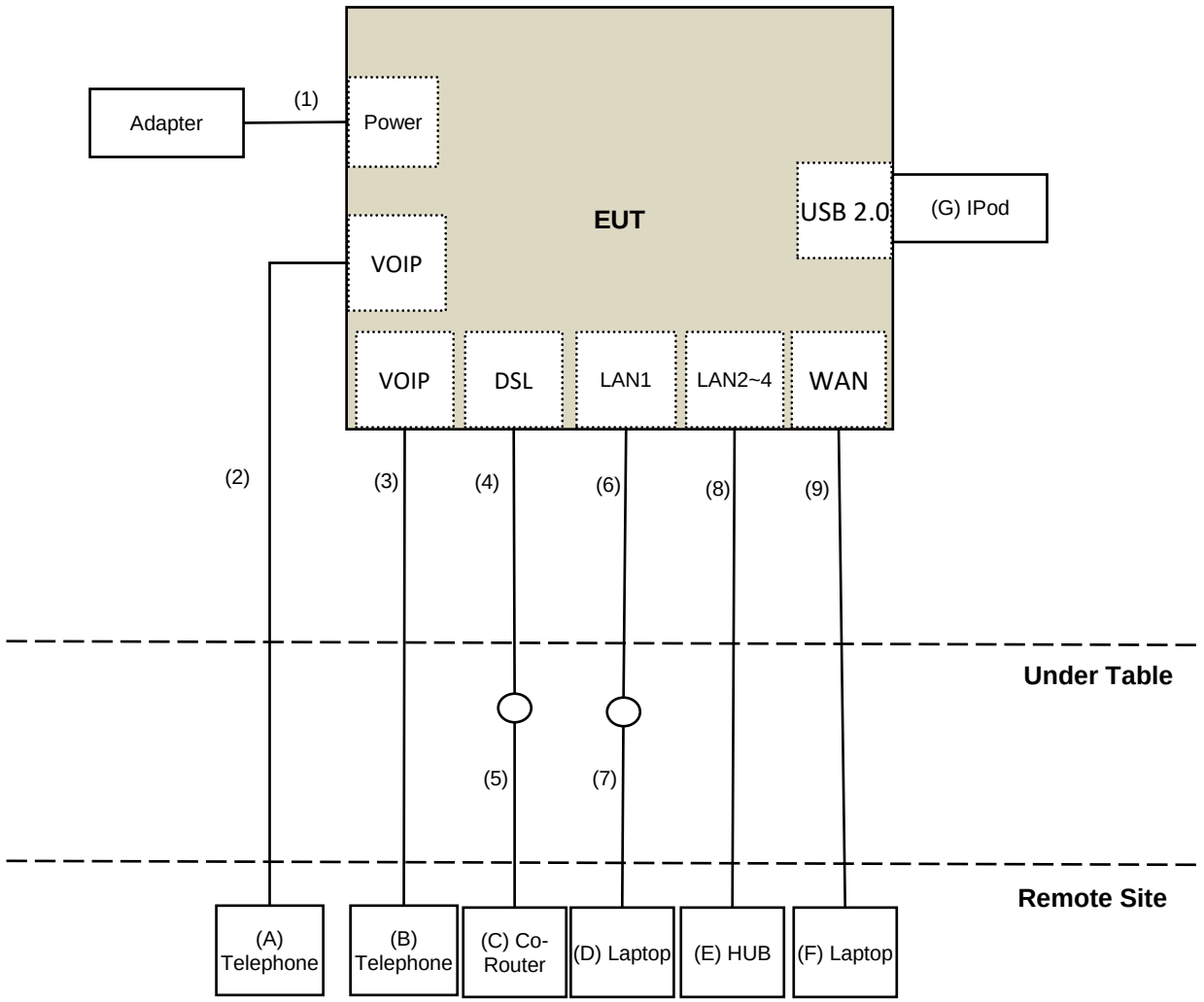
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Telephone	WONDER	WD-303	7C17KA04011	NA	Provided by Lab
B.	Telephone	Romeo	TE-812	97285638	NA	Provided by Lab
C.	Co-Router	ZyXEL	IES-1000	S4Z3112558	NA	Provided by Lab
D.	Laptop	DELL	E5430	GM1SKV1	DoC	Provided by Lab
E.	HUB	ZyXEL	GS1100-16	S150H44000046	DoC	Provided by Lab
F.	Laptop	DELL	E5430	DM1SKV1	DoC	Provided by Lab
G.	iPod	Apple	MD778TA/A	CC4JL03FF4T1	NA	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.2	No	0	Supplied by client
2.	RJ-11 Cable	1	10	No	0	Provided by Lab
3.	RJ-11 Cable	1	10	No	0	Provided by Lab
4.	RJ-11 Cable	1	1.5	No	0	Supplied by client
5.	RJ-11 Cable	1	10	No	0	Provided by Lab
6.	RJ-45 Cable	1	1.5	No	0	Supplied by client
7.	RJ-45 Cable	1	10	No	0	Provided by Lab
8.	RJ-45 Cable	3	10	No	0	Provided by Lab
9.	RJ-45 Cable	1	10	No	0	Provided by Lab

EUT Diagram


Adapter
(1)
Power
EUT
USB 2.0
(G) IPod
VOIP
VOIP
DSL
LAN1
LAN2~4
WAN
(2)
(3)
(4)
(6)
(8)
(9)
Under Table
(5)
(7)
Remote Site
(A) Telephone
(B) Telephone
(C) Co-Router
(D) Laptop
(E) HUB
(F) Laptop

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 instruments list in this report. The following table is the setting of the receiver

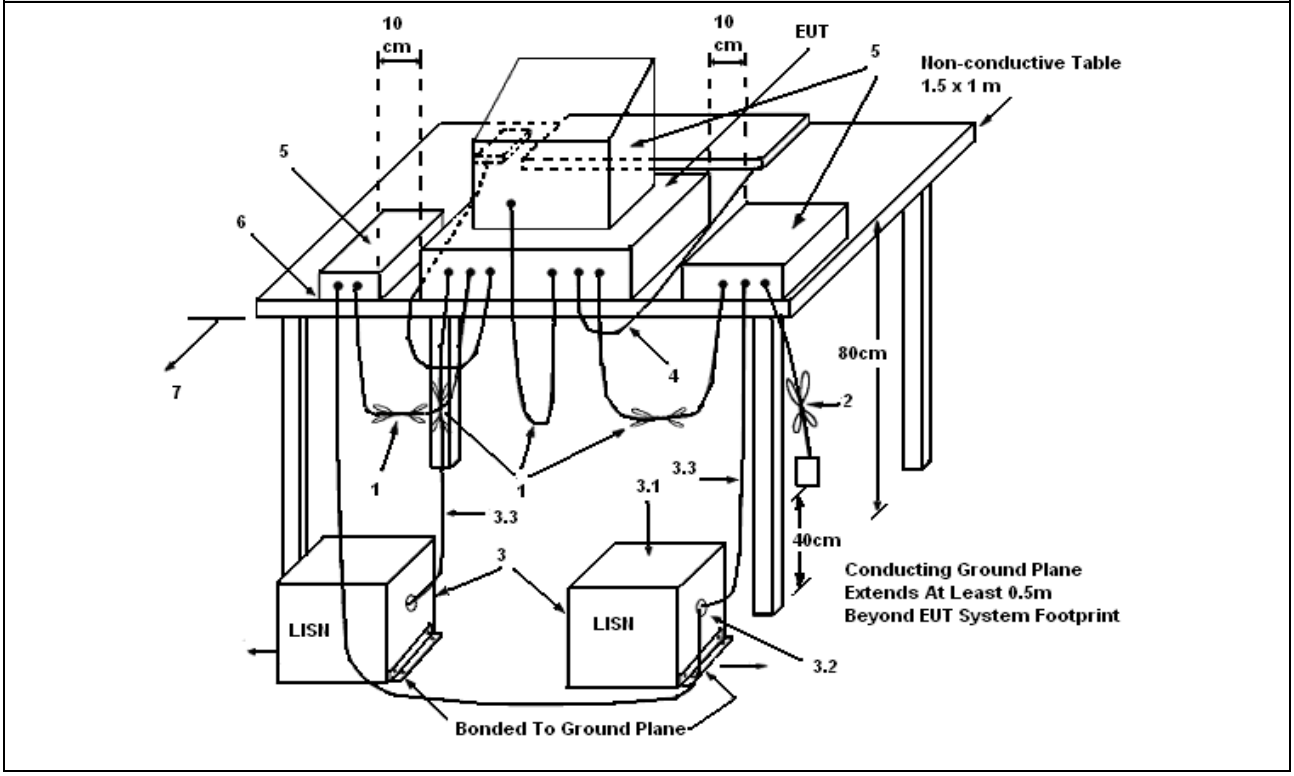
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

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

Test Setup



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.

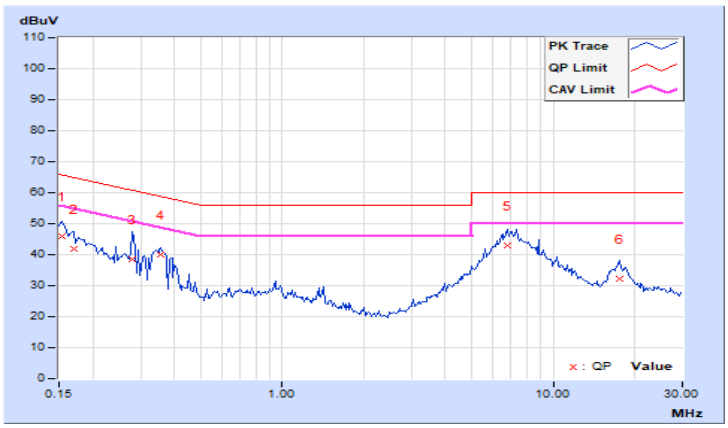
4.1.7 Test Results of AC Power Conducted Emissions

5	**Frequency Range**	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power		120Vac, 60Hz	**Environmental Conditions**	25℃, 65%RH
Test Mode		Mode 1	**Tested by**	Sampson Chen

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	0.15391	9.96	36.00	24.03	45.96	33.99	65.79	55.79	-19.83	-21.80
2	0.16953	9.97	31.91	20.27	41.88	30.24	64.98	54.98	-23.10	-24.74
3	0.27891	10.00	28.54	25.18	38.54	35.18	60.85	50.85	-22.31	-15.67
4	0.35703	10.01	29.97	23.93	39.98	33.94	58.80	48.80	-18.82	-14.86
5	6.80469	10.49	32.50	27.09	42.99	37.58	60.00	50.00	-17.01	-12.42
6	17.57813	11.28	20.96	16.49	32.24	27.77	60.00	50.00	-27.76	-22.23

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

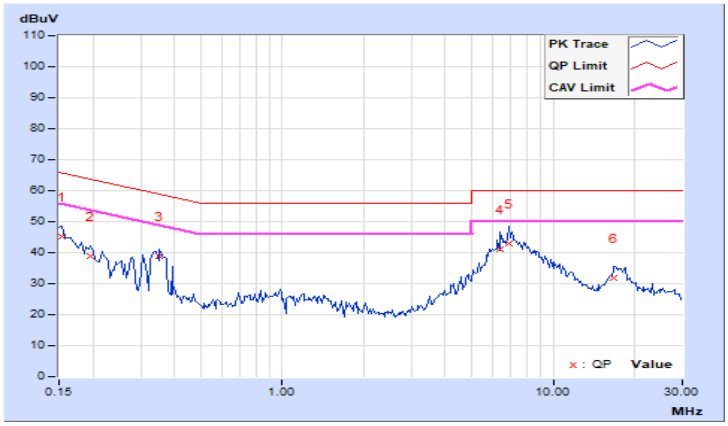


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	25℃, 65%RH
Test Mode	Mode 1	**Tested by**	Sampson Chen

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	0.15391	9.94	35.11	23.65	45.05	33.59	65.79	55.79	-20.74	-22.20
2	0.19687	9.98	29.06	17.76	39.04	27.74	63.74	53.74	-24.70	-26.00
3	0.35313	10.00	28.82	19.46	38.82	29.46	58.89	48.89	-20.07	-19.43
4	6.40234	10.40	30.83	25.33	41.23	35.73	60.00	50.00	-18.77	-14.27
5	**6.84375**	**10.43**	**32.45**	**27.24**	**42.88**	**37.67**	**60.00**	**50.00**	**-17.12**	**-12.33**
6	16.81641	11.00	20.90	16.41	31.90	27.41	60.00	50.00	-28.10	-22.59

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



5.1 Maximum Conducted Output Power Measurement

5.1.1 Limit

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

5.1.2 Measuring Instruments and Setting

Please refer to section 5 of instruments 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

5.1.3 Test Procedures

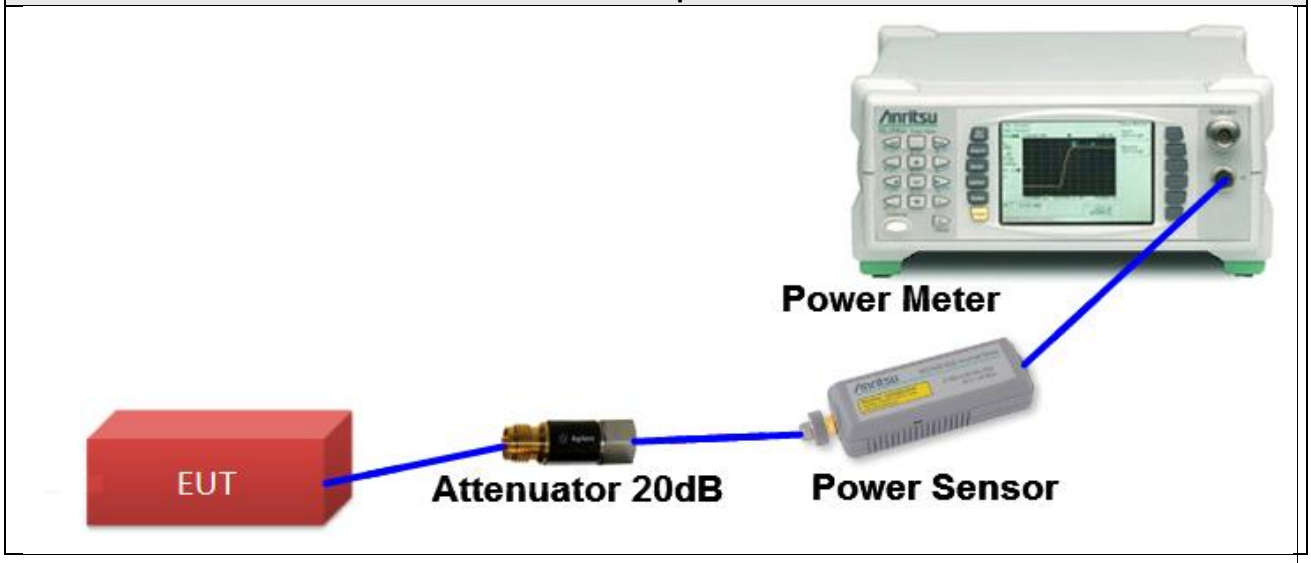
1 Test was performed in accordance with Measurement of Digital Transmission Systems Operating under KDB 558074 D01 15.247 Meas Guidance v05r02, in section “Maximum conducted output power Method AVGPM-G”, 04/02/2019

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.

5.1.4 Test Setup Layout

Setup



5.1.5 Test Deviation

There are no deviations with the original standard.

5.1.6 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

5.1.7 Test Results of Maximum Conducted Output Power

Temperature	25°C	Humidity	60%
Test Engineer	Kevin Ko		

FOR AVERAGE POWER

802.11b 1Tx Ant1

Channel	Frequency (MHz)	Conducted Power (dBm)	Directional Gain (dBi)	Max. Limit (dBm)	Result
1	2412	23.26	2.71	30	PASS
6	2437	23.18	2.71	30	PASS
11	2462	22.95	2.71	30	PASS

802.11g 2Tx CDD

Channel	Frequency (MHz)	Conducted Power (dBm)			Directional Gain (dBi)	Max. Limit (dBm)	Result
		Ant 1	Ant 2	Total			
1	2412	18.04	18.25	21.16	3.52	30	PASS
6	2437	22.07	21.84	24.97	3.52	30	PASS
11	2462	18.21	17.85	21.04	3.52	30	PASS

802.11n 20MHz 2Tx CDD

Channel	Frequency (MHz)	Conducted Power (dBm)			Directional Gain (dBi)	Max. Limit (dBm)	Result
		Ant 1	Ant 2	Total			
1	2412	18.23	18.42	21.34	3.52	30	PASS
6	2437	22.08	22.40	25.25	3.52	30	PASS
11	2462	18.35	17.96	21.17	3.52	30	PASS

802.11n 40MHz 2Tx CDD

Channel	Frequency (MHz)	Conducted Power (dBm)			Directional Gain (dBi)	Max. Limit (dBm)	Result
		Ant 1	Ant 2	Total			
3	2422	16.53	16.95	19.76	3.52	30	PASS
6	2437	18.65	18.66	21.67	3.52	30	PASS
9	2452	17.12	17.32	20.23	3.52	30	PASS

5.2 Power Spectral Density Measurement

5.2.1 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.

5.2.2 Measuring Instruments and Setting

Please refer to section 5 of instruments 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 ≥ 3 x RBW
Detector	RMS
Trace	Average sweep count 100
Sweep Time	Auto couple

5.2.3 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 KDB 558074 D01 15.247 Meas Guidance v05r02, in section “Maximum power spectral density level in the fundamental emissions Method AVGPSD-1”, 04/02/2019.

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).

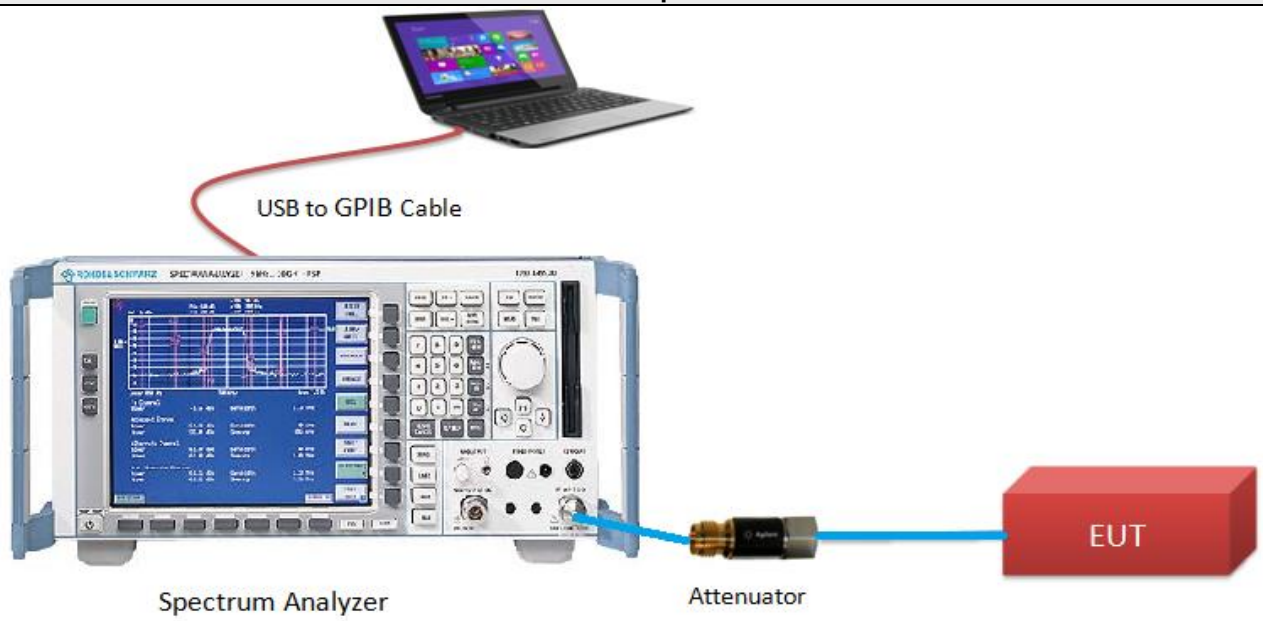
4 This procedure may be used when the maximum (average) conducted output power was used to demonstrate compliance to the output power limit. The EUT must be configured to transmit continuously (duty cycle ≥ 98%) to ensure that measurements are made only when the EUT is transmitting at its maximum power control level (no transmitter off time is to be considered).

5 Ensure that the number of measurement points in the sweep ≥ 2 x 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.

5.2.4 Test Setup Layout

Setup



5.2.5 Test Deviation

There are no deviations with the original standard.

5.2.6 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

5.2.7 Test Results of Power Spectral Density

Temperature	25°C	Humidity	60%
Test Engineer	Kevin Ko		

802.11b 1Tx Ant1

Channel	Frequency (MHz)	Power Density (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/3kHz)	Result
1	2412	-11.60	2.71	8	PASS
6	2437	-11.25	2.71	8	PASS
11	2462	-11.57	2.71	8	PASS
Note: Directional Gain <6dBi, so the limit doesn't reduce.					

802.11g 2Tx CDD

Channel	Frequency (MHz)	Power Density (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/3kHz)	Result
1	2412	-13.33	6.13	7.87	PASS
6	2437	-9.72	6.13	7.87	PASS
11	2462	-13.90	6.13	7.87	PASS
Note: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.13dBi > 6dBi , so the power density limit shall be reduced to 8-(6.13-6) = 7.877dBm.					

802.11n 20MHz 2Tx CDD

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	-15.43	0.10	-15.33	6.13	7.87	PASS
6	2437	-11.33	0.10	-11.23	6.13	7.87	PASS
11	2462	-15.19	0.10	-15.09	6.13	7.87	PASS
Note: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.13dBi > 6dBi , so the power density limit shall be reduced to 8-(6.13-6) = 7.87dBm.							

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 2Tx CDD

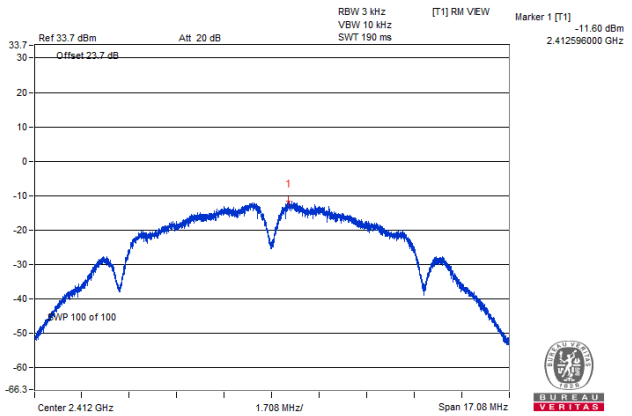
Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)	Duty Factor (dB)	PSD With Duty Factor (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/ 3kHz)	Result
3	2422	-18.83	0.14	-18.69	6.13	7.87	PASS
6	2437	-15.18	0.14	-15.04	6.13	7.87	PASS
9	2452	-17.70	0.14	-17.56	6.13	7.87	PASS
Note: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$)^2 / 2] = 6.13dBi > 6dBi , so the power density limit shall be reduced to 8-(6.13-6) = 7.87dBm.							

Note:

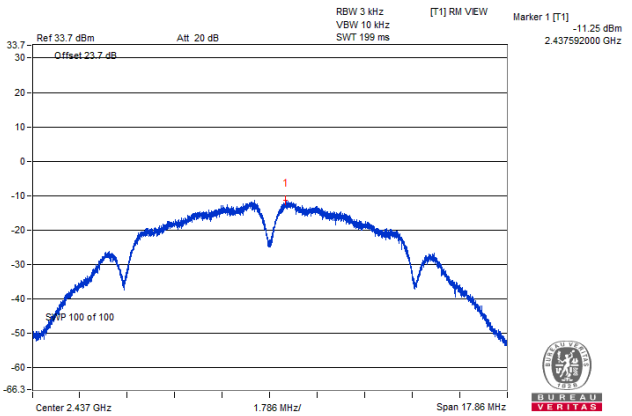
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Refer to section 3.14 for duty cycle spectrum plot.

SPECTRUM PLOT

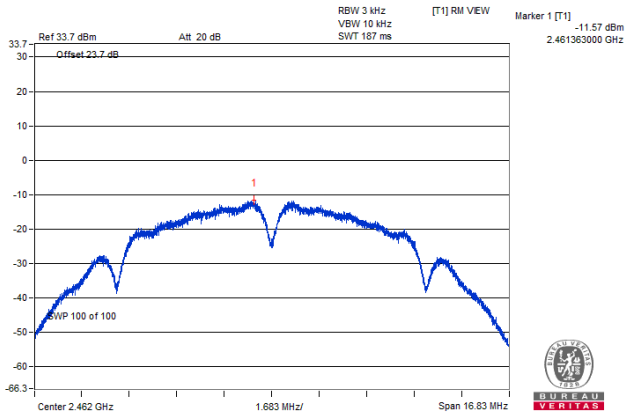
802.11b 1Tx Ant1 2412 MHz

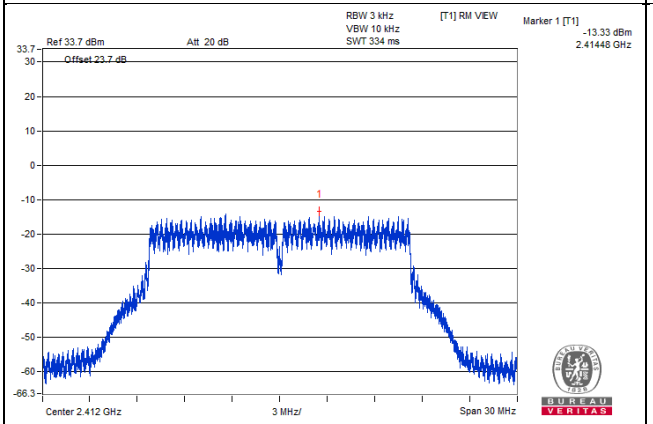
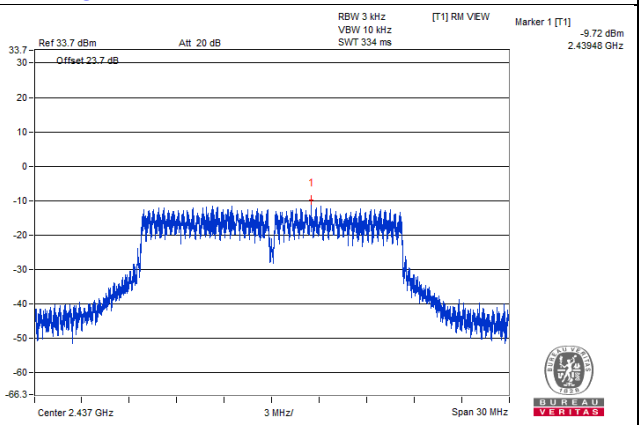
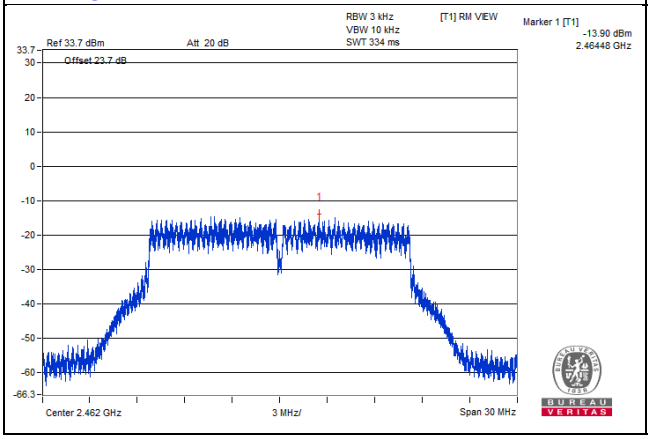


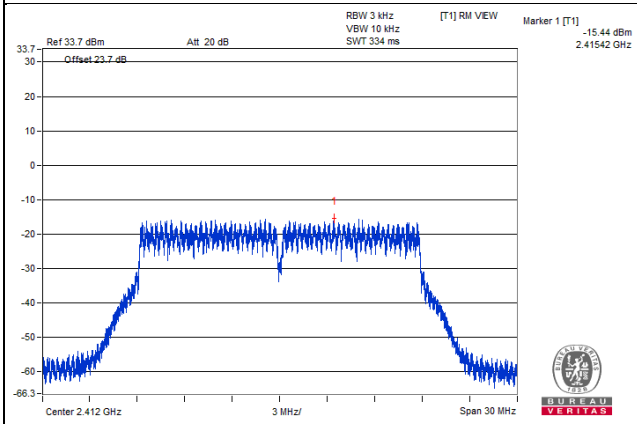
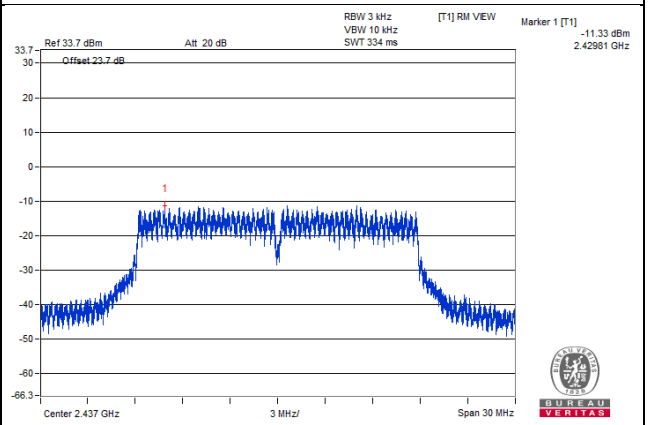
802.11b 1Tx Ant1 2437 MHz



802.11b 1Tx Ant1 2462 MHz



SPECTRUM PLOT	
802.11g 1Tx Ant1 2412 MHz	**802.11g 1Tx Ant1 2437 MHz**
	
802.11g 1Tx Ant1 2462 MHz	
	

SPECTRUM PLOT	
802.11n 20MHz 2Tx CDD 2412 MHz	**802.11n 20MHz 2Tx CDD 2437 MHz**
	
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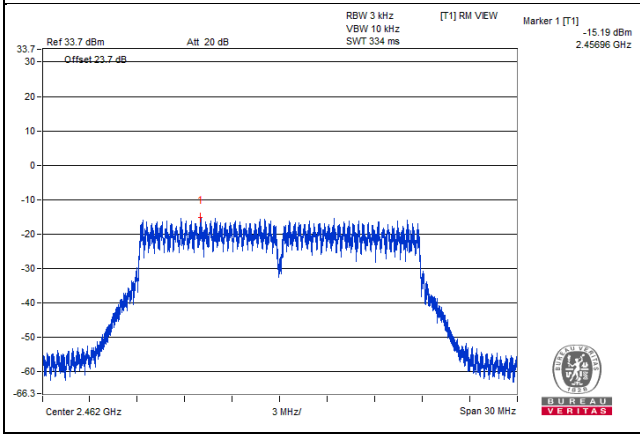
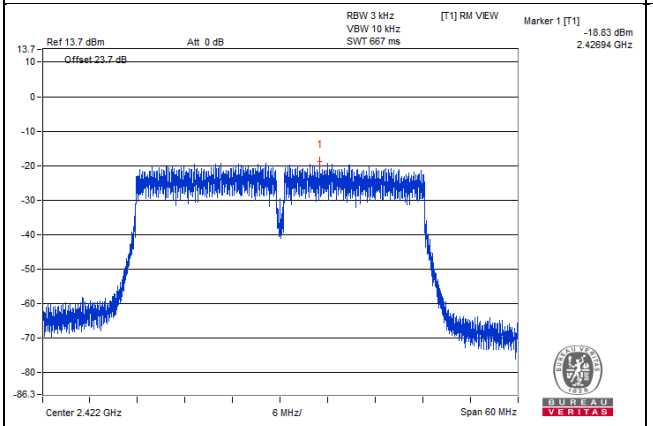
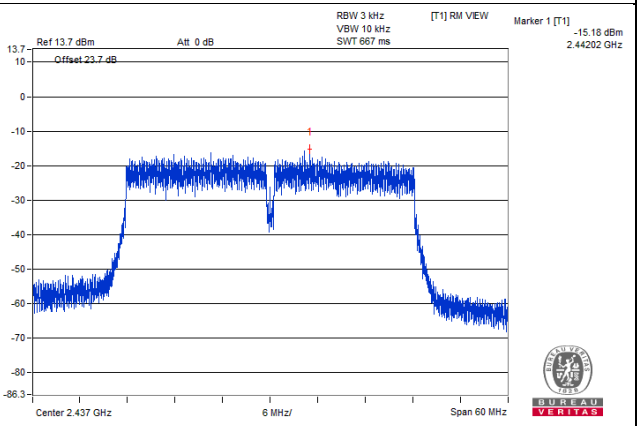
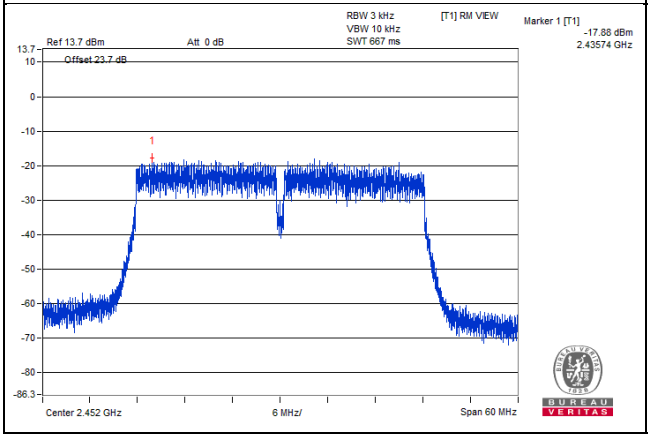
	

SPECTRUM PLOT	
802.11n 40MHz 2Tx CDD 2422 MHz	**802.11n 40MHz 2Tx CDD 2437 MHz**
	
802.11n 40MHz 2Tx CDD 2452 MHz	
	

5.3 6dB Bandwidth Measurement

5.3.1 Limit

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

5.3.2 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	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

5.3.3 Test Procedures

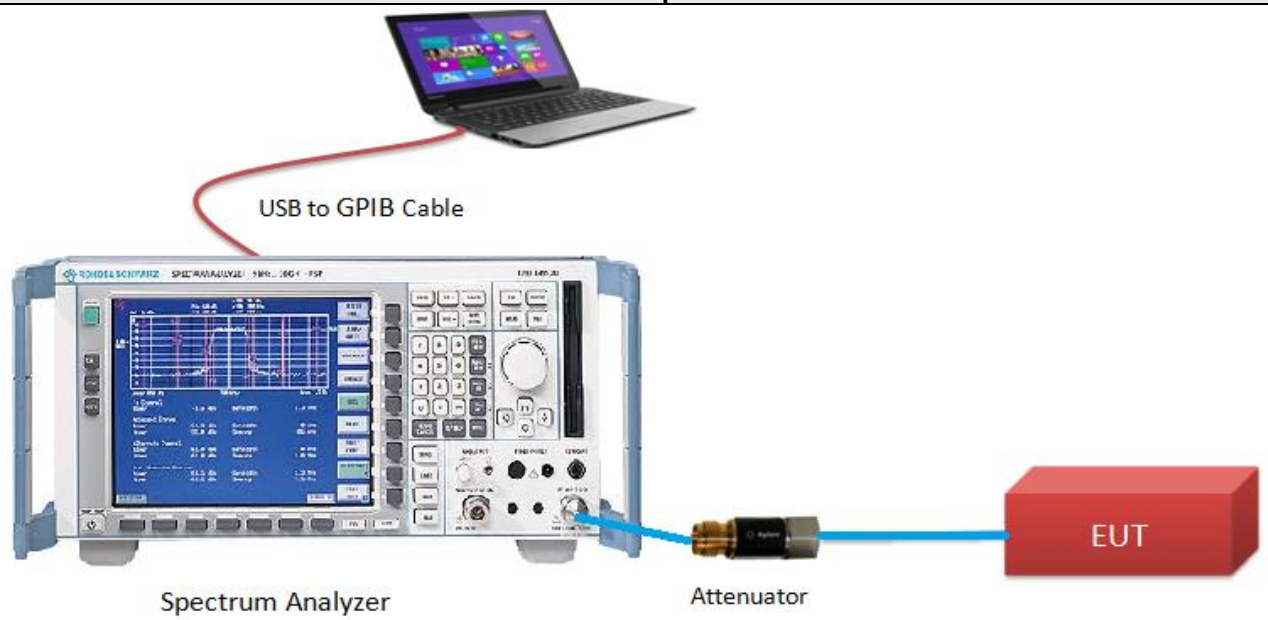
1 The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.

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.

5.3.4 Test Setup Layout

Setup



5.3.5 Test Deviation

There are no deviations with the original standard.

5.3.6 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

5.3.7 Test Results of 6dB Bandwidth

Temperature	25°C	Humidity	60%
Test Engineer	Kevin Ko		

802.11b 1Tx Ant1

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	7.08	0.5	PASS
6	2437	7.06	0.5	PASS
11	2462	7.08	0.5	PASS

802.11g 2Tx CDD

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		ANT 1	ANT 2		
1	2412	16.34	16.42	0.5	PASS
6	2437	16.33	16.42	0.5	PASS
11	2462	16.33	16.43	0.5	PASS

802.11n 20MHz 2Tx CDD

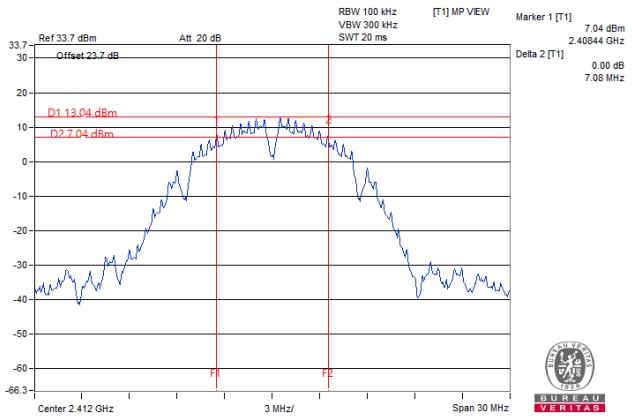
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		ANT 1	ANT 2		
1	2412	17.57	17.65	0.5	PASS
6	2437	17.55	17.63	0.5	PASS
11	2462	17.57	17.66	0.5	PASS

802.11n 40MHz 2Tx CDD

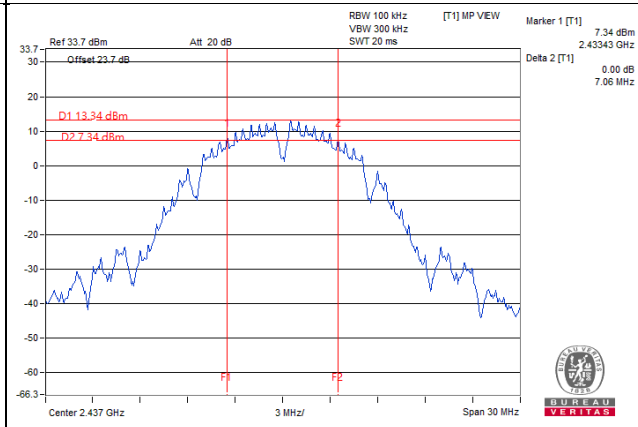
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		ANT 1	ANT 2		
3	2422	35.71	36.49	0.5	PASS
6	2437	35.94	35.85	0.5	PASS
9	2452	36.05	36.44	0.5	PASS

SPECTRUM PLOT

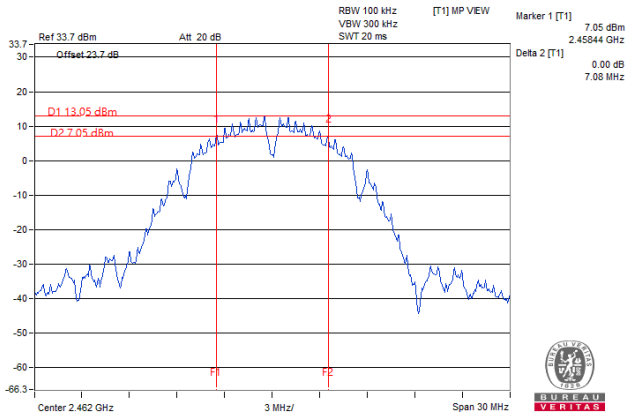
802.11b 1Tx Ant1 CH1



802.11b 1Tx Ant1 CH6

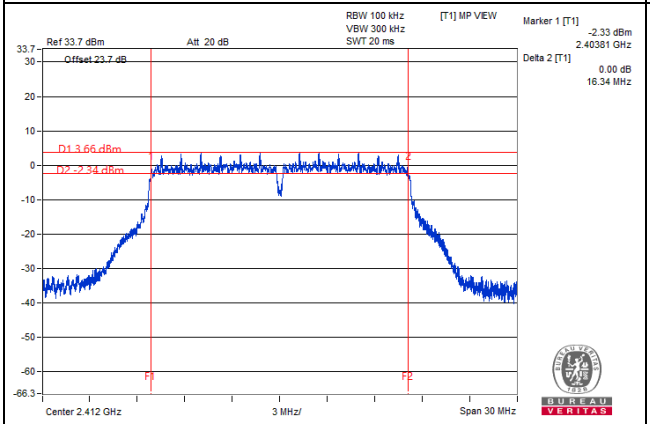


802.11b 1Tx Ant1 CH11

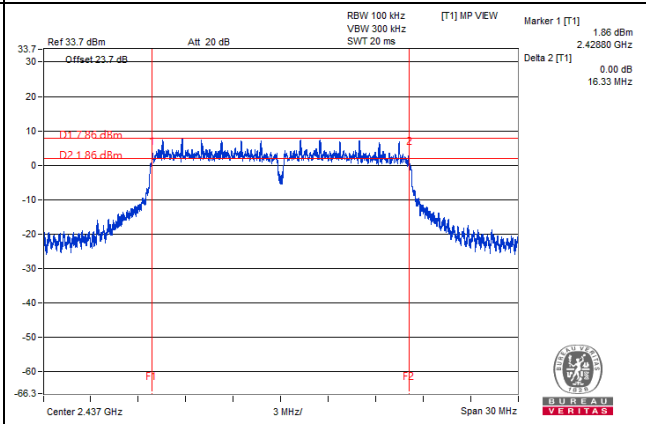


SPECTRUM PLOT

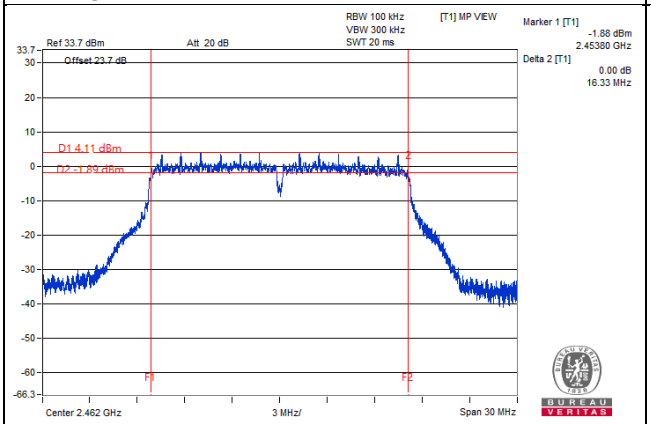
802.11g 2Tx CDD Ant1 CH1



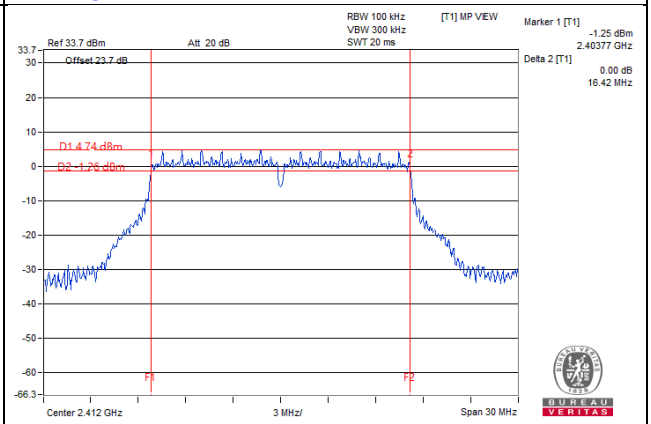
802.11g 2Tx CDD Ant1 CH6



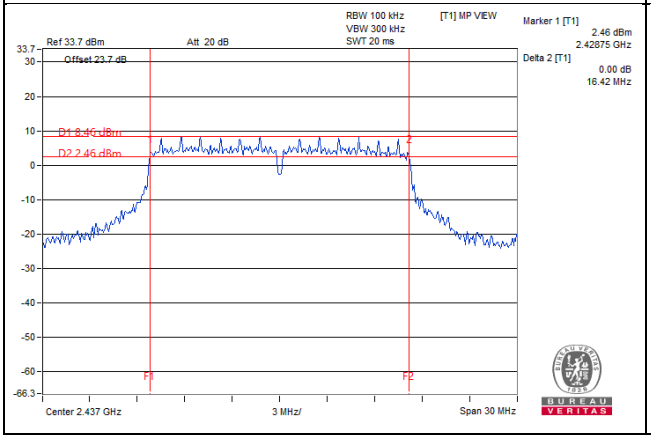
802.11g 2Tx CDD Ant1 CH11



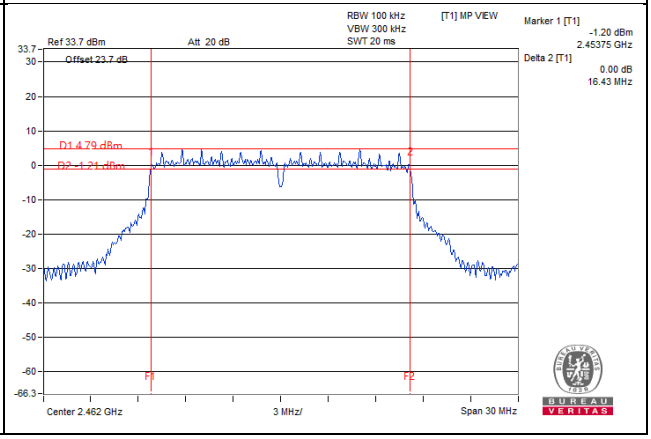
802.11g 2Tx CDD Ant2 CH1



802.11g 2Tx CDD Ant2 CH6

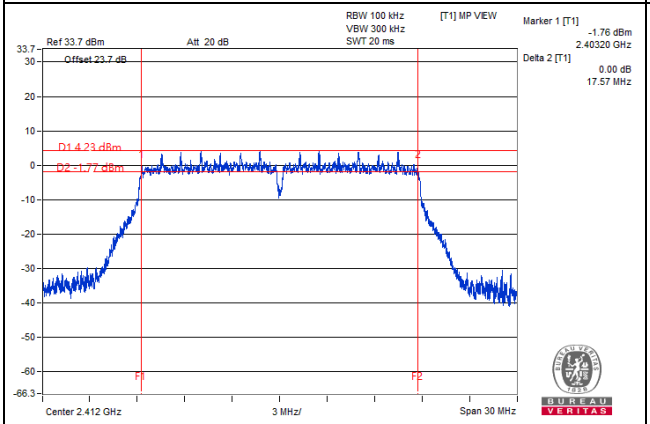


802.11g 2Tx CDD Ant2 CH11

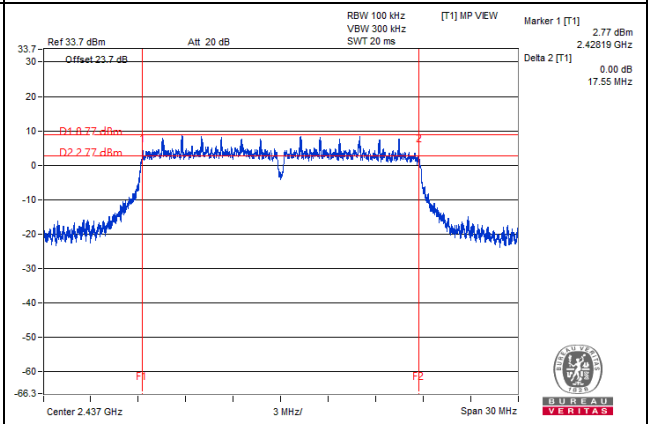


SPECTRUM PLOT

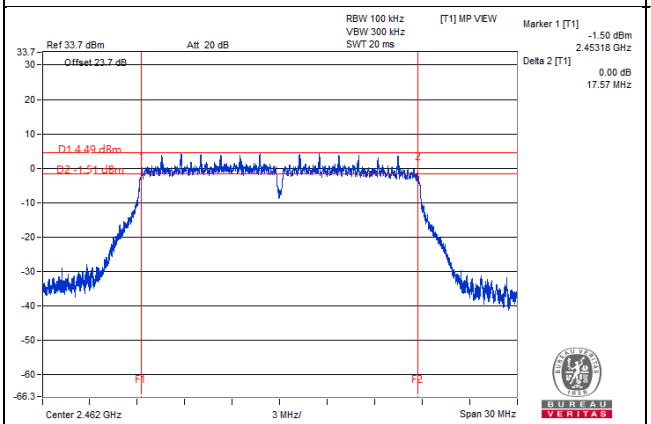
802.11n 20MHz 2Tx CDD Ant1 CH1



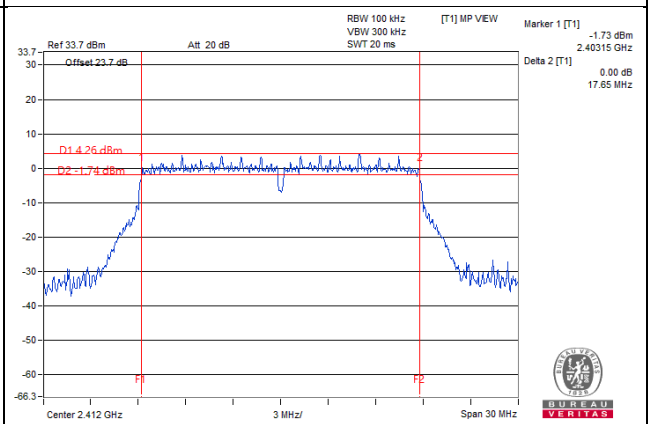
802.11n 20MHz 2Tx CDD Ant1 CH6



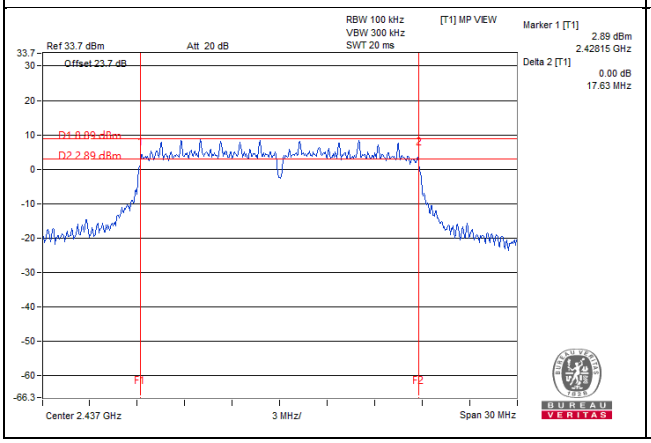
802.11n 20MHz 2Tx CDD Ant1 CH11



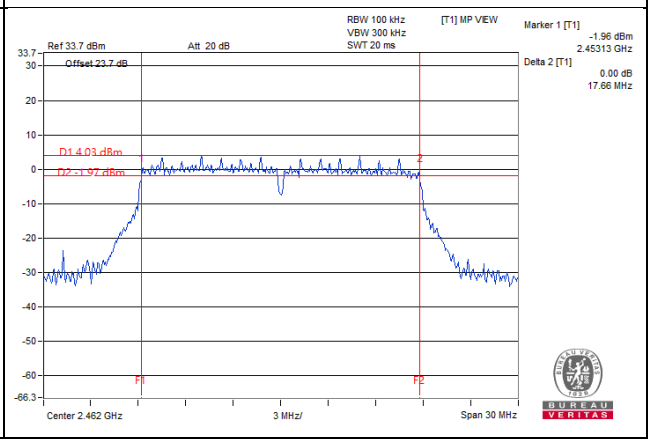
802.11n 20MHz 2Tx CDD Ant2 CH1



802.11n 20MHz 2Tx CDD Ant2 CH6

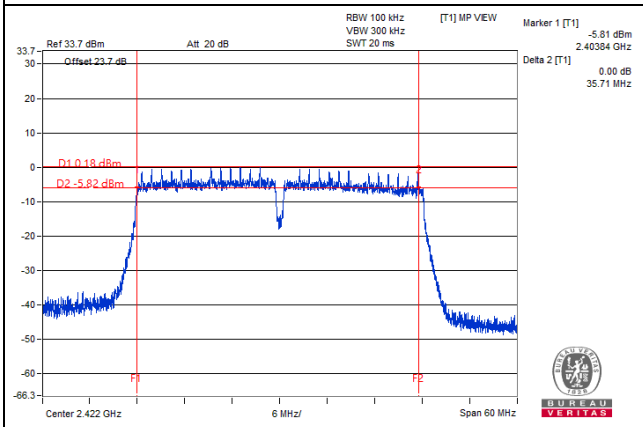


802.11n 20MHz 2Tx CDD Ant2 CH11

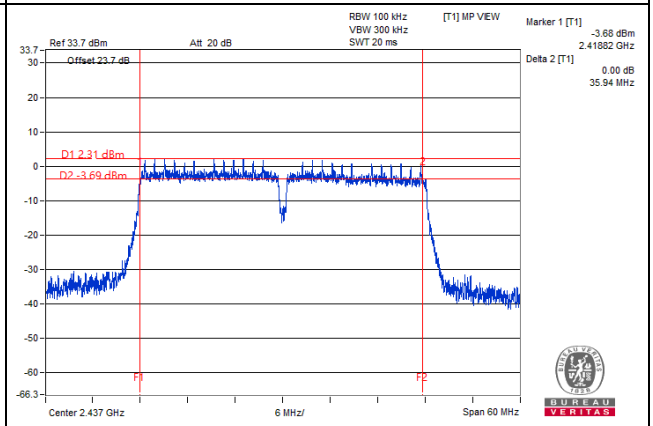


SPECTRUM PLOT

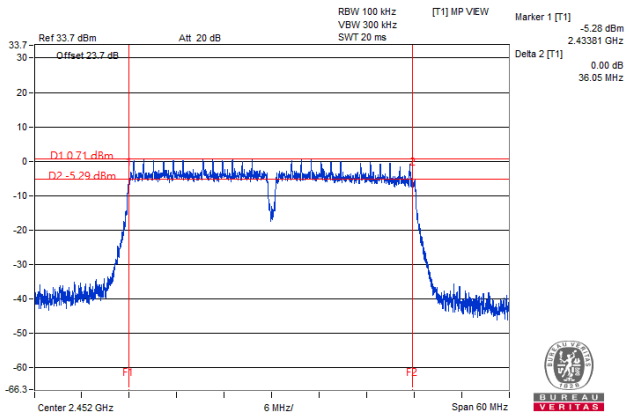
802.11n 40MHz 2Tx CDD Ant1 CH3



802.11n 40MHz 2Tx CDD Ant1 CH6



802.11n 40MHz 2Tx CDD Ant1 CH9



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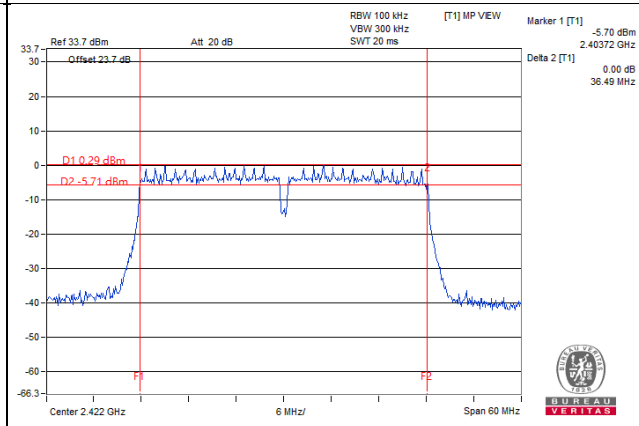
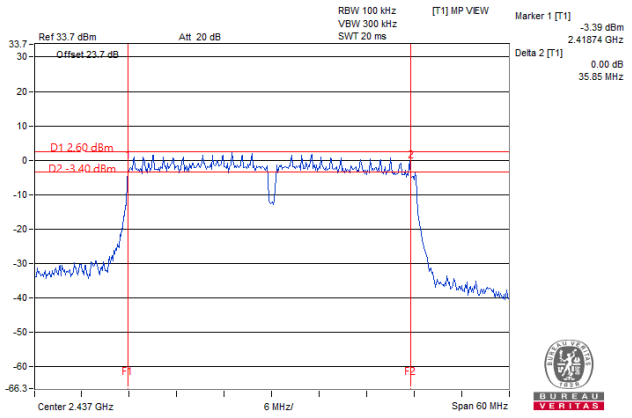
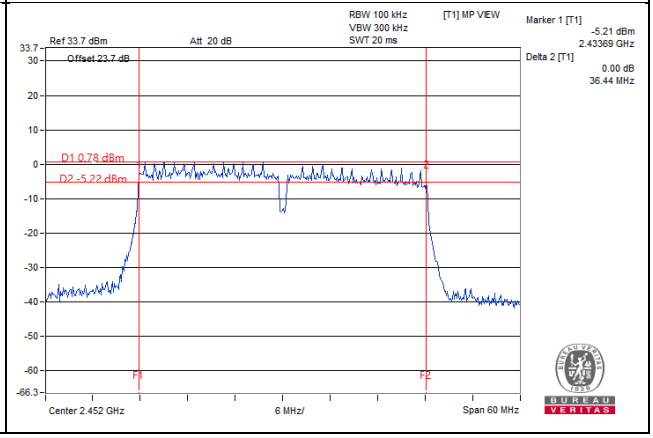


802.11n 40MHz 2Tx CDD Ant2 CH6



802.11n 40MHz 2Tx CDD Ant2 CH9



5.4 Occupied Bandwidth Measurement

5.4.1 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	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

5.4.2 Test Procedure

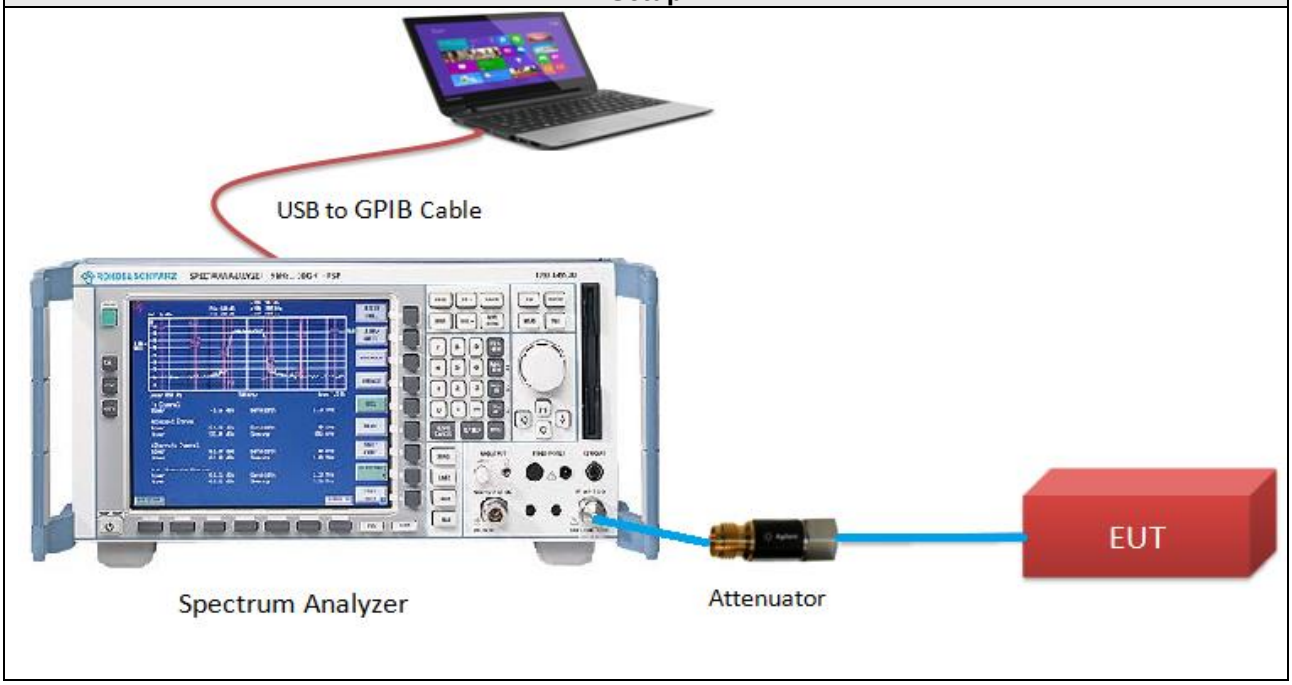
1 The transmitter output (antenna port) was connected to the spectrum analyzer in peak, Max hold mode.

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.

5.4.3 Test Setup Layout

Setup



5.4.4 Test Deviation

There are no deviations with the original standard.

5.4.5 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

5.4.6 Test Results of Occupied Bandwidth

Temperature	25°C	Humidity	60%
Test Engineer	Kevin Ko		

802.11b 1Tx Ant1

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
1	2412	11.39
6	2437	11.91
11	2462	11.22

802.11g 2Tx CDD

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		ANT 1	ANT 2
1	2412	16.95	16.95
6	2437	17.88	17.28
11	2462	16.92	16.92

802.11n 20MHz 2Tx CDD

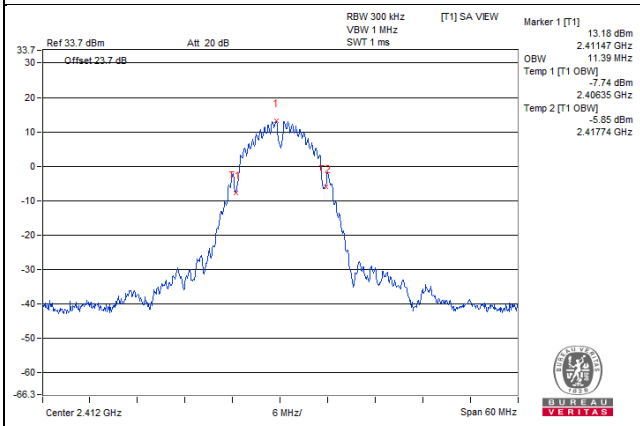
CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		ANT 1	ANT 2
1	2412	18.09	17.92
6	2437	18.84	18.36
11	2462	18.12	18

802.11n 40MHz 2Tx CDD

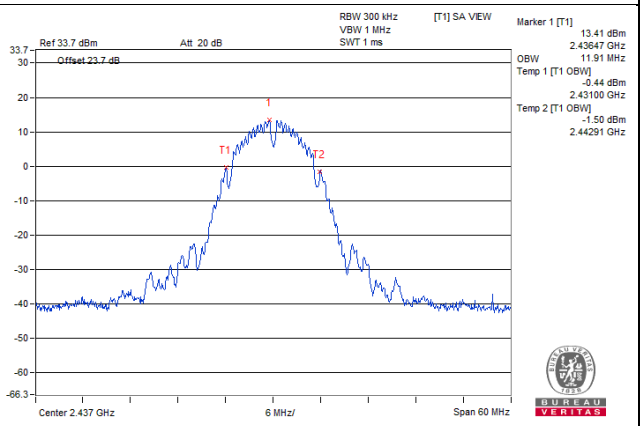
CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		ANT 1	ANT 2
3	2422	37.21	36.72
6	2437	36.69	36.72
9	2452	37.39	36.48

SPECTRUM PLOT

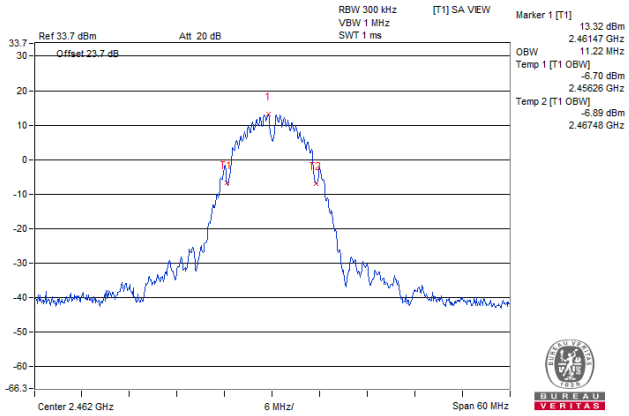
802.11b 1Tx Ant1 CH1



802.11b 1Tx Ant1 CH6

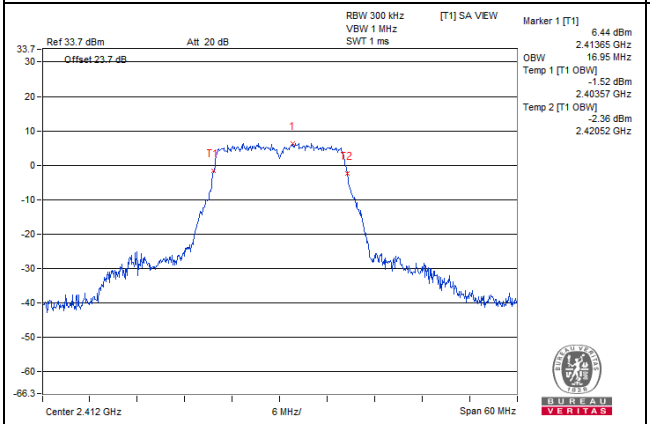


802.11b 1Tx Ant1 CH11

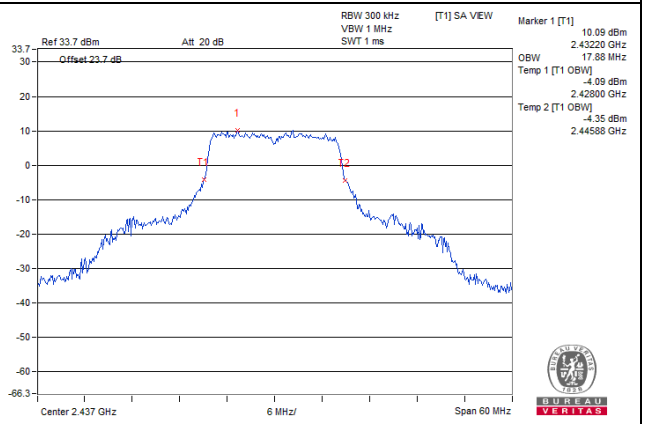


SPECTRUM PLOT

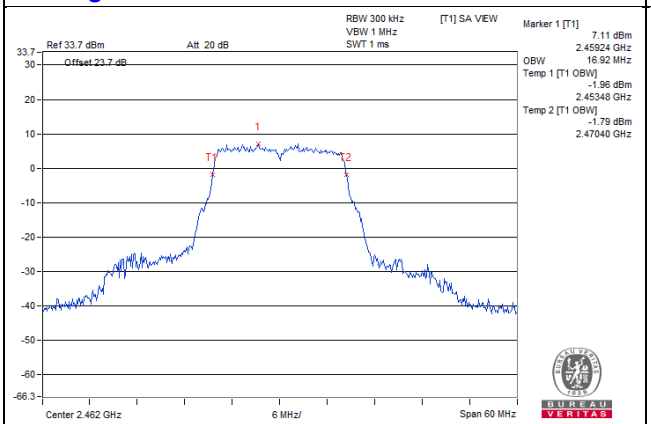
802.11g 2Tx CDD Ant1 CH1



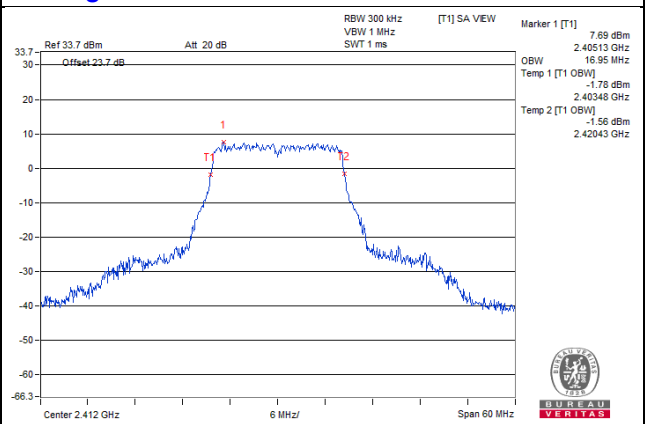
802.11g 2Tx CDD Ant1 CH6



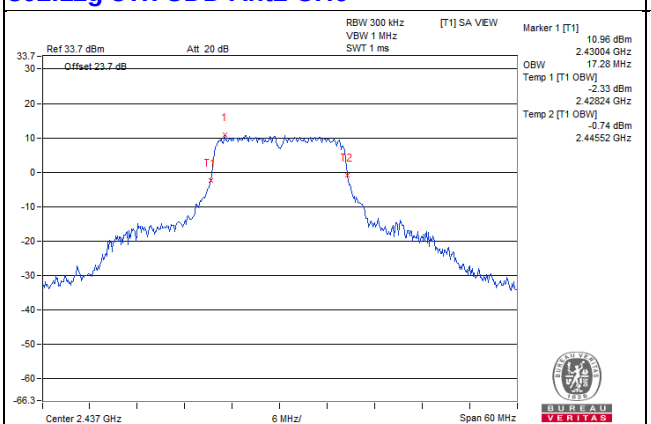
802.11g 2Tx CDD Ant1 CH11



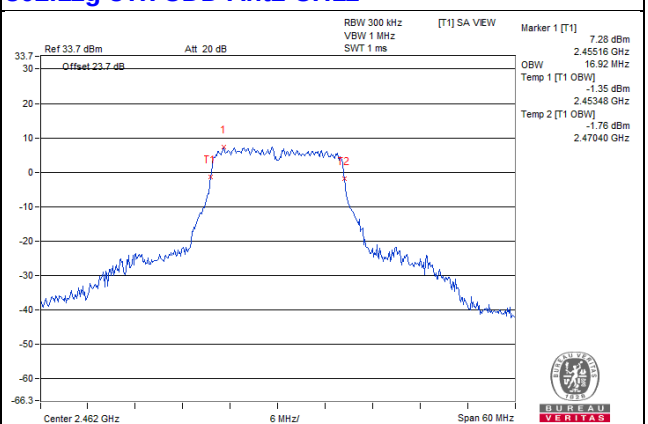
802.11g 2Tx CDD Ant2 CH1



802.11g 3Tx CDD Ant2 CH6

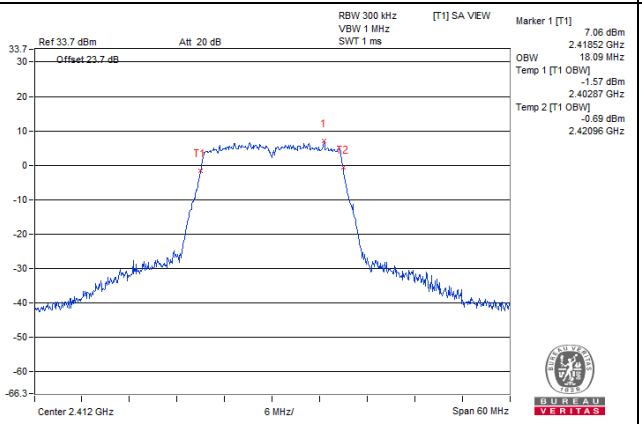


802.11g 3Tx CDD Ant2 CH11

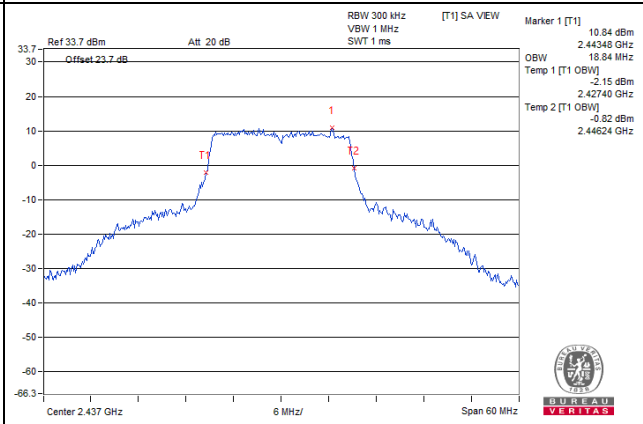


SPECTRUM PLOT

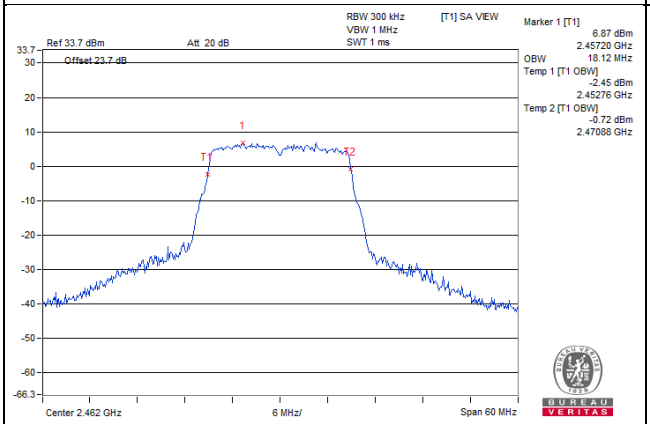
802.11n 20MHz 2Tx CDD Ant1 CH1



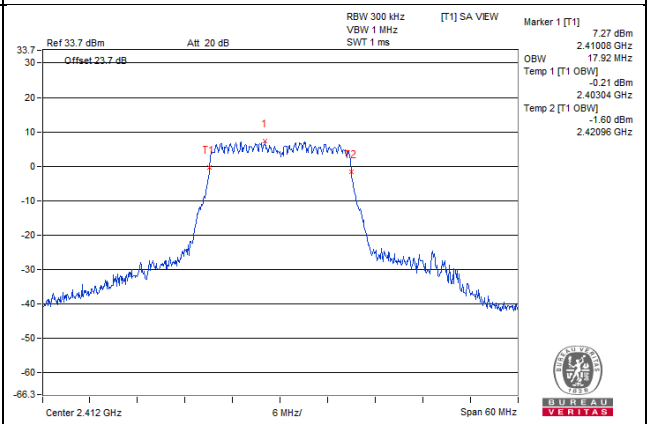
802.11n 20MHz 2Tx CDD Ant1 CH6



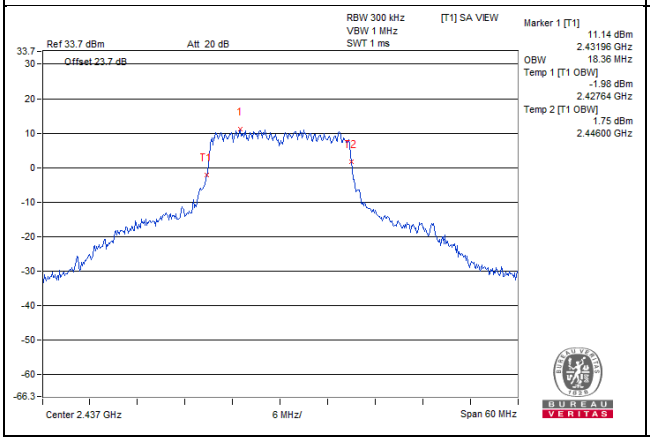
802.11n 20MHz 2Tx CDD Ant1 CH11



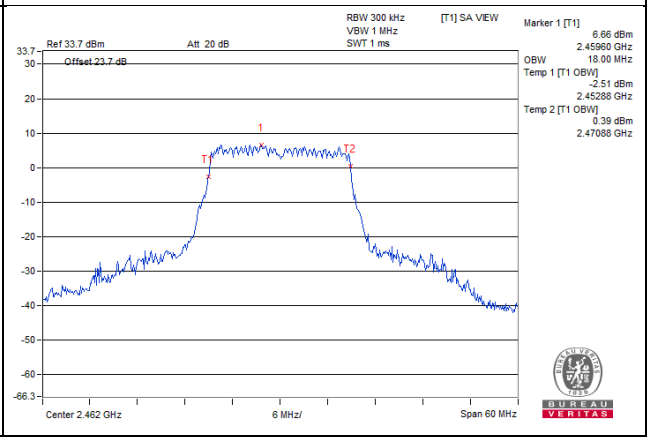
802.11n 20MHz 2Tx CDD Ant2 CH1



802.11n 20MHz 3Tx CDD Ant2 CH6

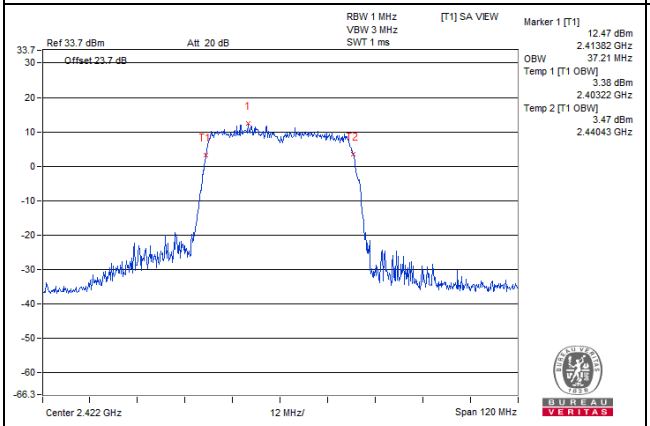


802.11n 20MHz 3Tx CDD Ant2 CH11

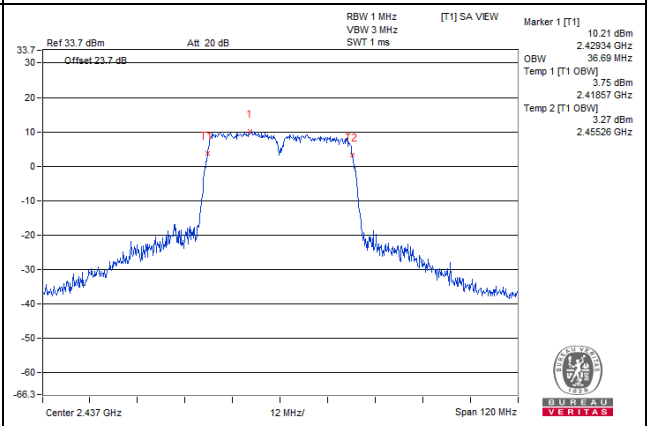


SPECTRUM PLOT

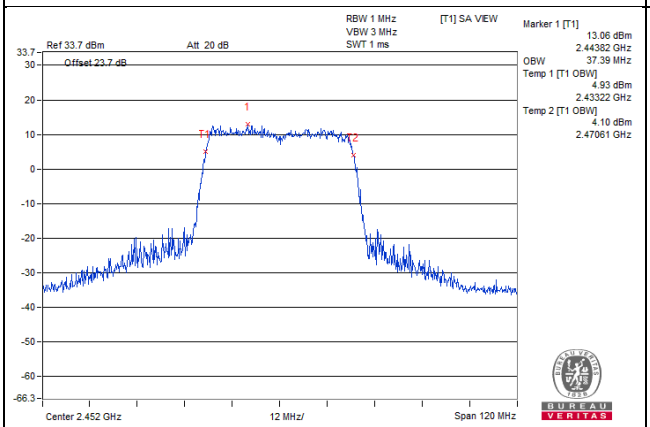
802.11n 40MHz 2Tx CDD Ant1 CH3



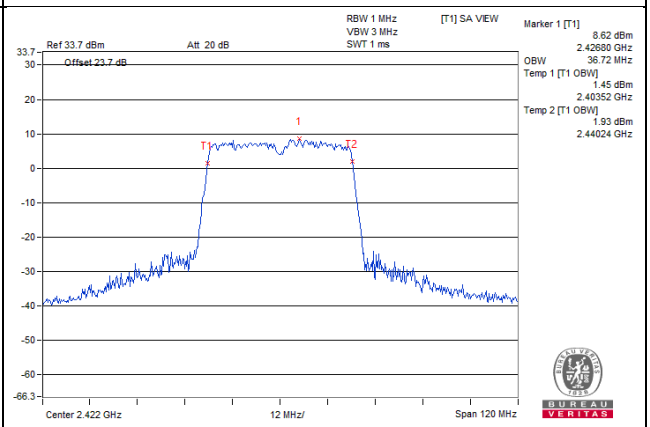
802.11n 40MHz 2Tx CDD Ant1 CH6



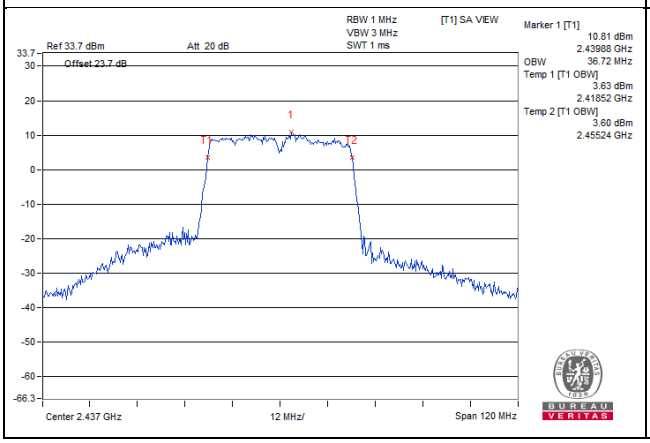
802.11n 40MHz 2Tx CDD Ant1 CH9



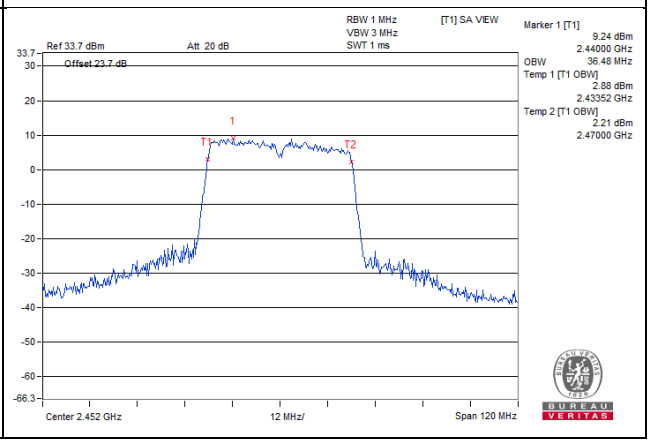
802.11n 40MHz 2Tx CDD Ant2 CH3



802.11n 40MHz 2Tx CDD Ant2 CH6



802.11n 40MHz 2Tx CDD Ant2 CH9



5.5 Radiated Emissions Measurement

5.5.1 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

5.5.2 Measuring Instruments and Setting

Please refer to section 5 of instruments 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

5.5.3 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 ≥ 98%, 1MHz RBW and VBW is ≥ 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.

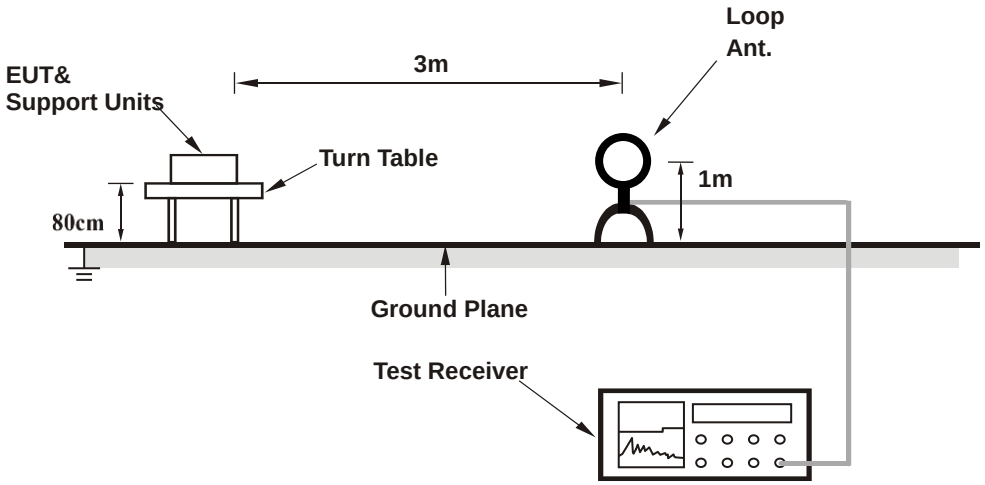
9 For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also PASS with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in 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.

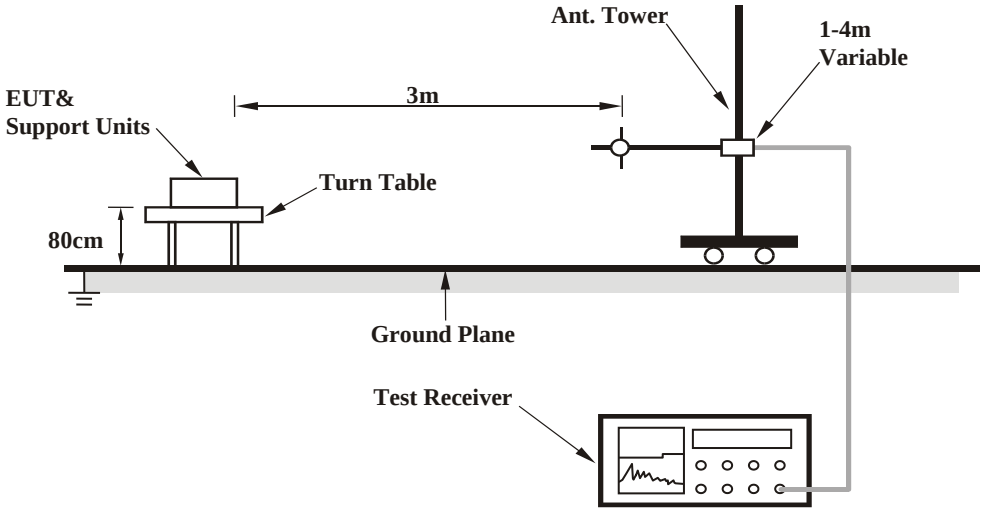
5.5.4 Test Setup Layout

Setup

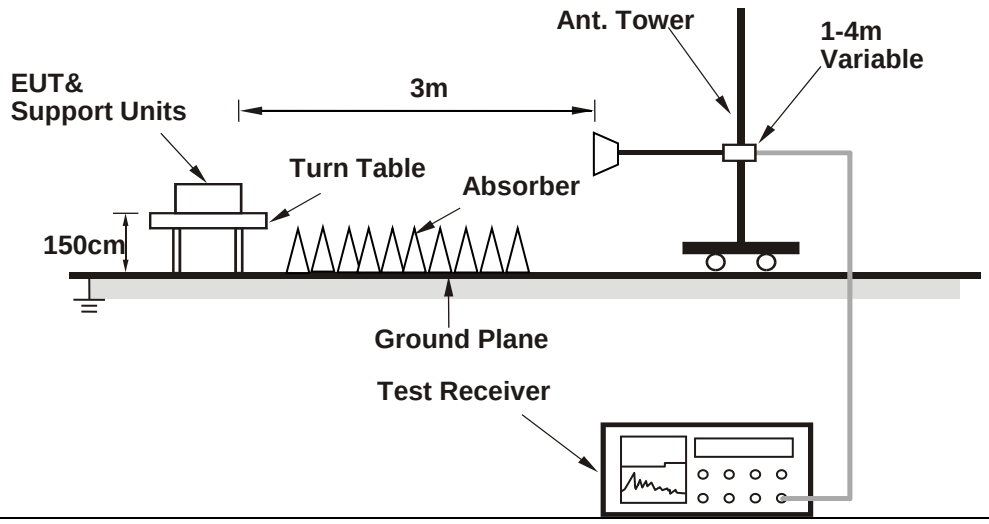
For Radiated Emissions below 1GHz (9kHz~30MHz)



For Radiated Emissions below 1GHz (30MHz~1GHz)



For Radiated Emissions above 1GHz



5.5.5 Test Deviation

There are no deviations with the original standard.

5.5.6 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

5.5.7 Test Results of Radiated Emissions

Temperature	22°C	Humidity	70%
Test Engineer	Ryan Du		

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.

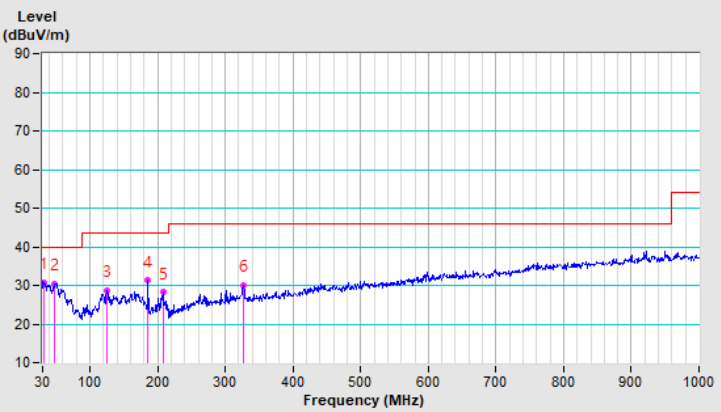
Radiated Emissions Range 30MHz~1GHz

RF Mode	TX 802.11n (HT20)	Channel	CH 6：2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	32.79	30.7 QP	40.0	-9.3	1.00 H	16	39.6	-8.9
2	48.41	30.5 QP	40.0	-9.5	1.00 H	211	38.1	-7.6
3	125.04	28.7 QP	43.5	-14.8	2.00 H	304	37.3	-8.6
4	186.15	31.2 QP	43.5	-12.3	1.50 H	89	40.4	-9.2
5	207.87	28.2 QP	43.5	-15.3	1.00 H	62	38.2	-10.0
6	326.36	30.0 QP	46.0	-16.0	1.00 H	43	34.9	-4.9

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

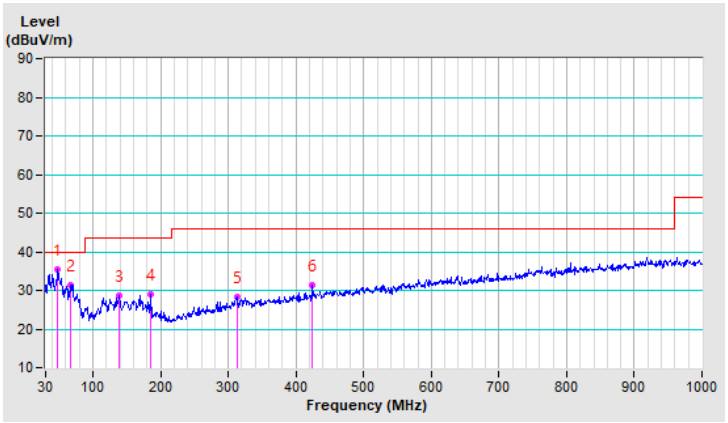


RF Mode	TX 802.11n (HT20)	Channel	CH 6：2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	48.36	35.5 QP	40.0	-4.5	1.00 V	142	43.1	-7.6
2	66.76	31.5 QP	40.0	-8.5	1.00 V	1	40.6	-9.1
3	138.81	28.7 QP	43.5	-14.8	1.50 V	53	36.2	-7.5
4	186.15	29.0 QP	43.5	-14.5	1.00 V	36	38.2	-9.2
5	313.02	28.5 QP	46.0	-17.5	2.00 V	30	33.8	-5.3
6	424.50	31.3 QP	46.0	-14.7	2.00 V	265	33.4	-2.1

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



Temperature	25°C	Humidity	75%
Test Engineer	Andy Ho		

Radiated Emission Range 1GHz~10th Harmonic

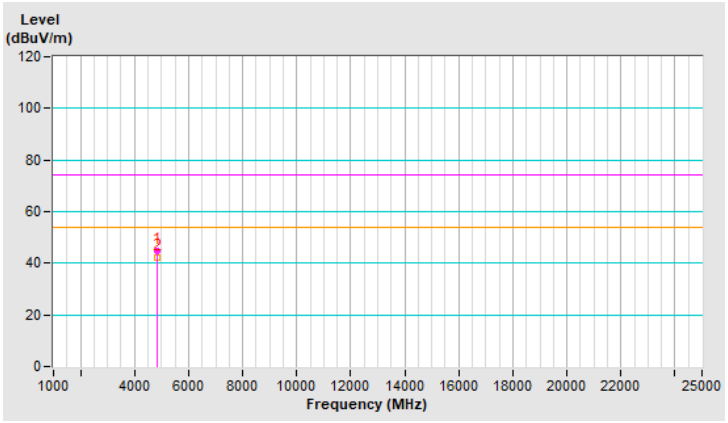
1TX Ant 1

RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	44.9 PK	74.0	-29.1	3.18 H	175	41.7	3.2
2	4824.00	42.3 AV	54.0	-11.7	3.18 H	175	39.1	3.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

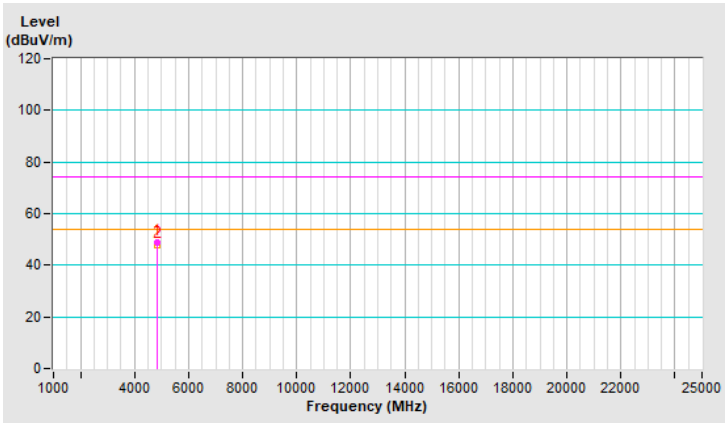


RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	48.9 PK	74.0	-25.1	2.54 V	256	45.7	3.2
2	4824.00	47.7 AV	54.0	-6.3	2.54 V	256	44.5	3.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

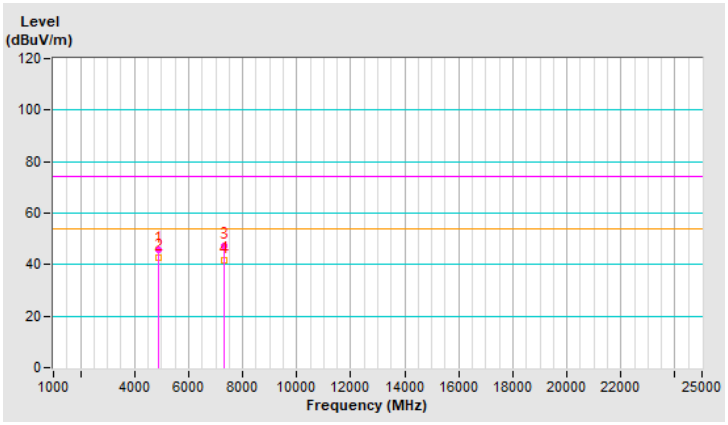


RF Mode	TX 802.11b	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	46.0 PK	74.0	-28.0	3.26 H	188	42.8	3.2
2	4874.00	42.9 AV	54.0	-11.1	3.26 H	188	39.7	3.2
3	7311.00	47.3 PK	74.0	-26.7	2.85 H	143	37.9	9.4
4	7311.00	41.7 AV	54.0	-12.3	2.85 H	143	32.3	9.4

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

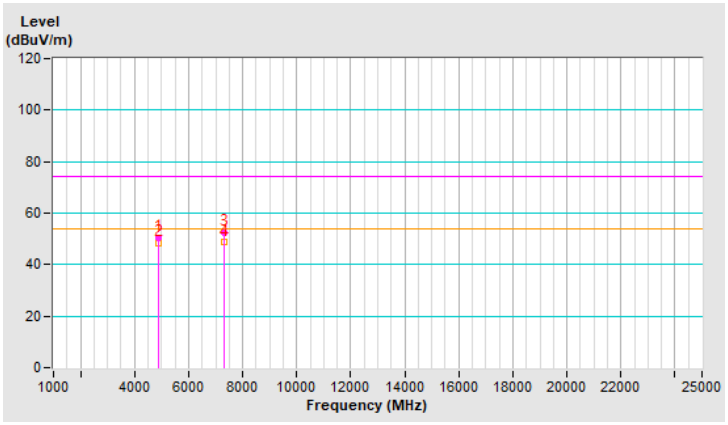


RF Mode	TX 802.11b	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	50.2 PK	74.0	-23.8	2.64 V	240	47.0	3.2
2	4874.00	48.4 AV	54.0	-5.6	2.64 V	240	45.2	3.2
3	7311.00	52.6 PK	74.0	-21.4	3.07 V	150	43.2	9.4
4	7311.00	48.6 AV	54.0	-5.4	3.07 V	150	39.2	9.4

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

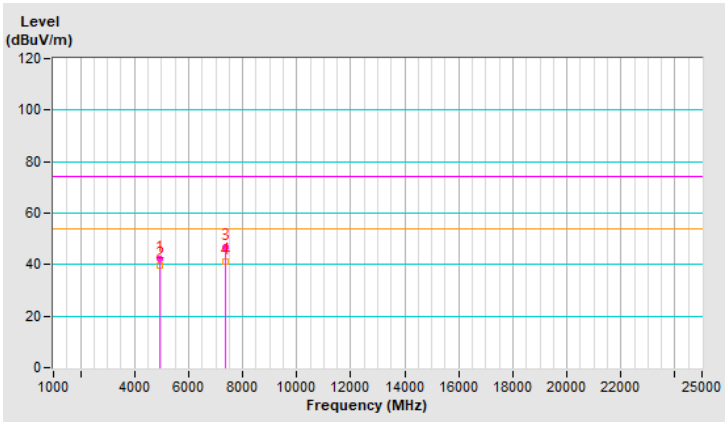


RF Mode	TX 802.11b	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	42.3 PK	74.0	-31.7	3.05 H	167	39.2	3.1
2	4924.00	39.5 AV	54.0	-14.5	3.05 H	167	36.4	3.1
3	7386.00	46.7 PK	74.0	-27.3	2.79 H	231	37.0	9.7
4	7386.00	41.4 AV	54.0	-12.6	2.79 H	231	31.7	9.7

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

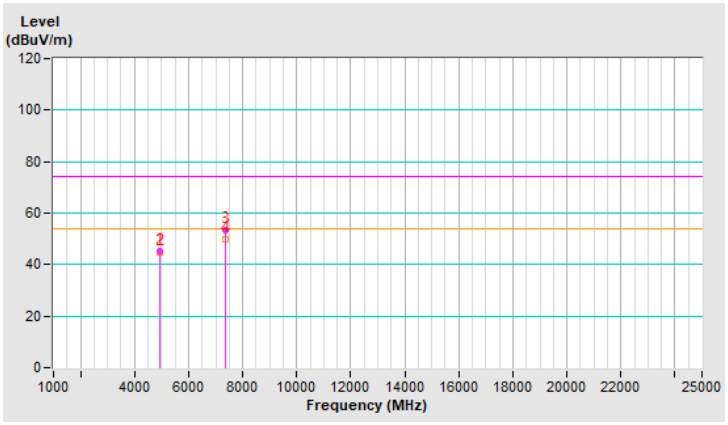


RF Mode	TX 802.11b	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	45.3 PK	74.0	-28.7	3.24 V	278	42.2	3.1
2	4924.00	44.9 AV	54.0	-9.1	3.24 V	278	41.8	3.1
3	7386.00	53.6 PK	74.0	-20.4	3.24 V	149	43.9	9.7
4	7386.00	49.8 AV	54.0	-4.2	3.24 V	149	40.1	9.7

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



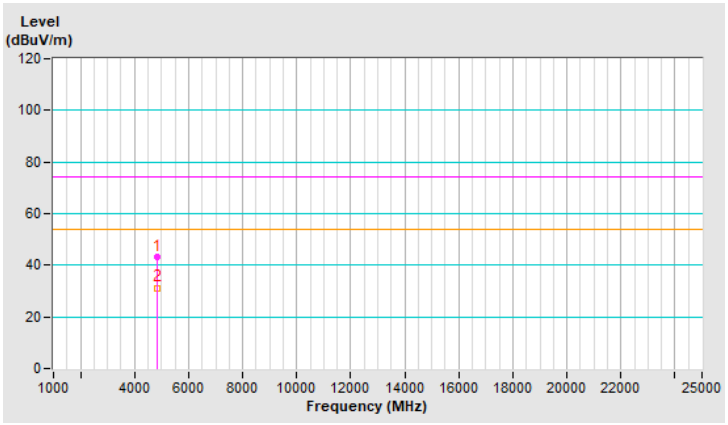
2TX

RF Mode	TX 802.11n 20MHz	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	43.0 PK	74.0	-31.0	3.55 H	248	39.8	3.2
2	4824.00	31.2 AV	54.0	-22.8	3.55 H	248	28.0	3.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

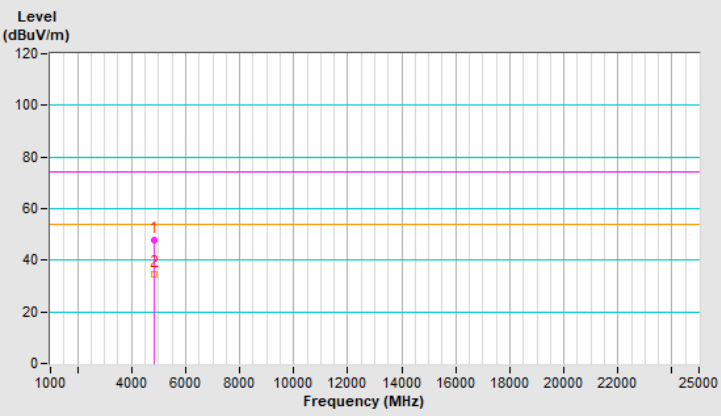


RF Mode	TX 802.11n 20MHz	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	47.9 PK	74.0	-26.1	2.25 V	274	44.7	3.2
2	4824.00	34.6 AV	54.0	-19.4	2.25 V	274	31.4	3.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

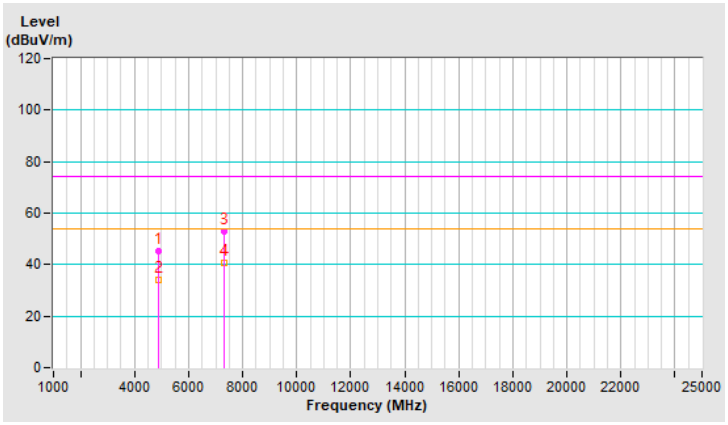


RF Mode	TX 802.11n 20MHz	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	45.2 PK	74.0	-28.8	3.54 H	254	42.0	3.2
2	4874.00	34.2 AV	54.0	-19.8	3.54 H	254	31.0	3.2
3	7311.00	52.8 PK	74.0	-21.2	3.92 H	82	43.4	9.4
4	7311.00	40.8 AV	54.0	-13.2	3.92 H	82	31.4	9.4

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

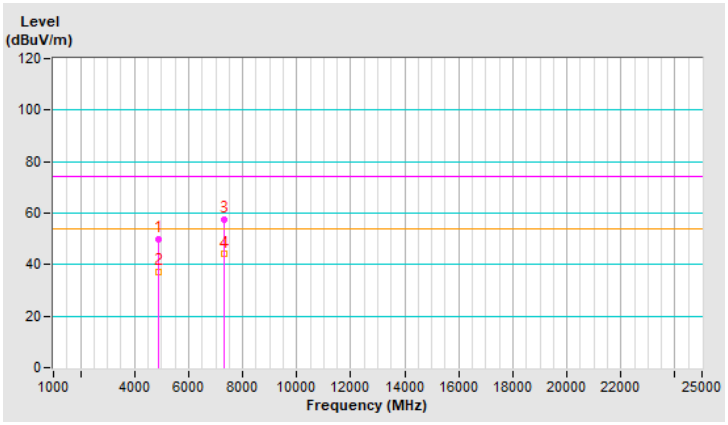


RF Mode	TX 802.11n 20MHz	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	50.0 PK	74.0	-24.0	2.23 V	271	46.8	3.2
2	4874.00	37.2 AV	54.0	-16.8	2.23 V	271	34.0	3.2
3	7311.00	57.4 PK	74.0	-16.6	2.92 V	168	48.0	9.4
4	7311.00	44.0 AV	54.0	-10.0	2.92 V	168	34.6	9.4

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

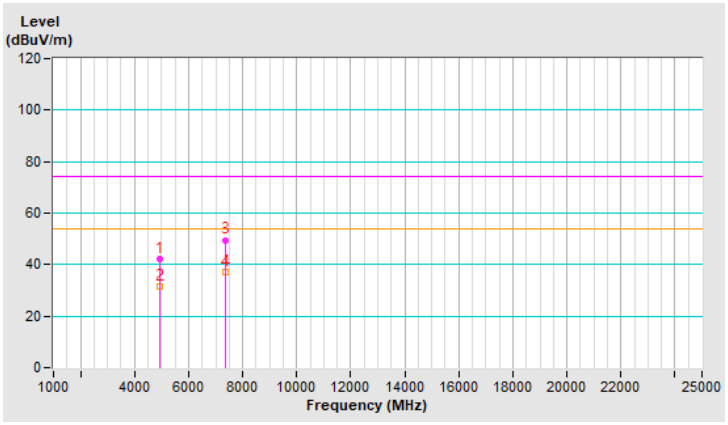


RF Mode	TX 802.11n 20MHz	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	42.0 PK	74.0	-32.0	3.54 H	253	38.9	3.1
2	4924.00	31.3 AV	54.0	-22.7	3.54 H	253	28.2	3.1
3	7386.00	49.3 PK	74.0	-24.7	3.89 H	102	39.6	9.7
4	7386.00	36.9 AV	54.0	-17.1	3.89 H	102	27.2	9.7

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

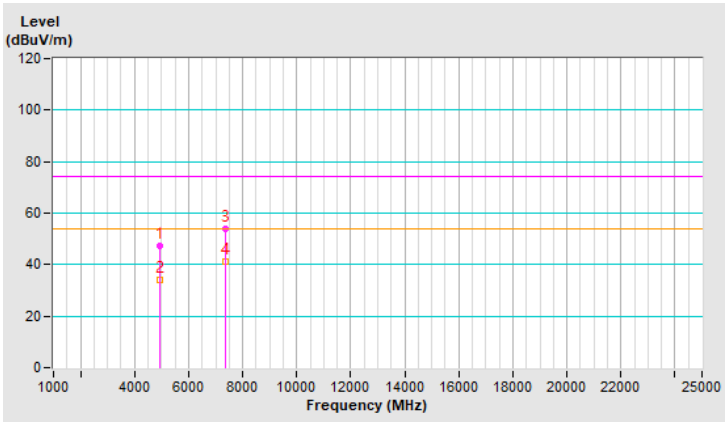


RF Mode	TX 802.11n 20MHz	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	47.2 PK	74.0	-26.8	2.33 V	265	44.1	3.1
2	4924.00	34.3 AV	54.0	-19.7	2.33 V	265	31.2	3.1
3	7386.00	54.1 PK	74.0	-19.9	3.01 V	174	44.4	9.7
4	7386.00	41.2 AV	54.0	-12.8	3.01 V	174	31.5	9.7

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

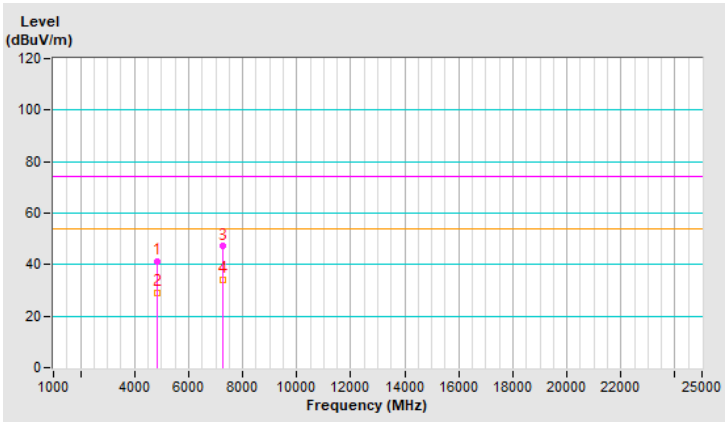


RF Mode	TX 802.11n 40MHz	Channel	CH 3：2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	41.1 PK	74.0	-32.9	3.56 H	258	37.8	3.3
2	4844.00	28.9 AV	54.0	-25.1	3.56 H	258	25.6	3.3
3	7266.00	47.1 PK	74.0	-26.9	3.89 H	117	37.8	9.3
4	7266.00	34.2 AV	54.0	-19.8	3.89 H	117	24.9	9.3

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

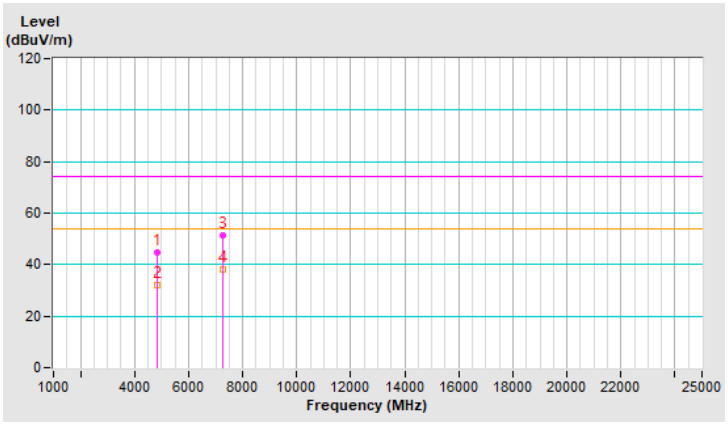


RF Mode	TX 802.11n 40MHz	Channel	CH 3：2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	44.8 PK	74.0	-29.2	2.32 V	271	41.5	3.3
2	4844.00	31.9 AV	54.0	-22.1	2.32 V	271	28.6	3.3
3	7266.00	51.4 PK	74.0	-22.6	2.98 V	183	42.1	9.3
4	7266.00	38.2 AV	54.0	-15.8	2.98 V	183	28.9	9.3

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

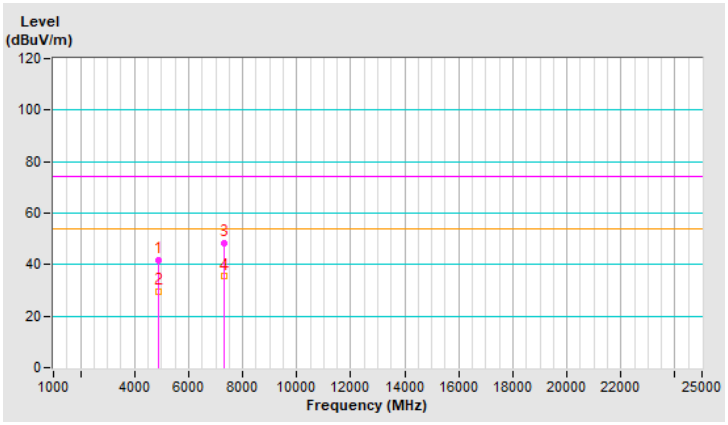


RF Mode	TX 802.11n 40MHz	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	41.9 PK	74.0	-32.1	3.54 H	245	38.7	3.2
2	4874.00	29.6 AV	54.0	-24.4	3.54 H	245	26.4	3.2
3	7311.00	48.2 PK	74.0	-25.8	3.93 H	141	38.8	9.4
4	7311.00	35.4 AV	54.0	-18.6	3.93 H	141	26.0	9.4

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

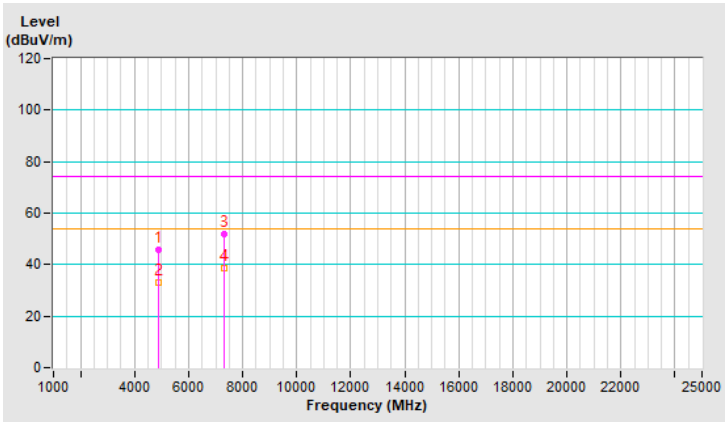


RF Mode	TX 802.11n 40MHz	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	45.8 PK	74.0	-28.2	2.34 V	284	42.6	3.2
2	4874.00	32.9 AV	54.0	-21.1	2.34 V	284	29.7	3.2
3	7311.00	51.9 PK	74.0	-22.1	3.06 V	186	42.5	9.4
4	7311.00	38.7 AV	54.0	-15.3	3.06 V	186	29.3	9.4

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

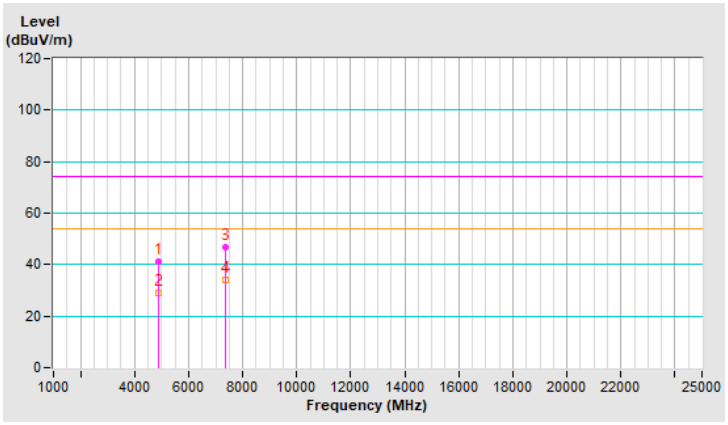


RF Mode	TX 802.11n 40MHz	Channel	CH 9：2452 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	41.1 PK	74.0	-32.9	3.51 H	247	38.0	3.1
2	4904.00	28.9 AV	54.0	-25.1	3.51 H	247	25.8	3.1
3	7356.00	46.9 PK	74.0	-27.1	3.90 H	133	37.4	9.5
4	7356.00	34.2 AV	54.0	-19.8	3.90 H	133	24.7	9.5

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

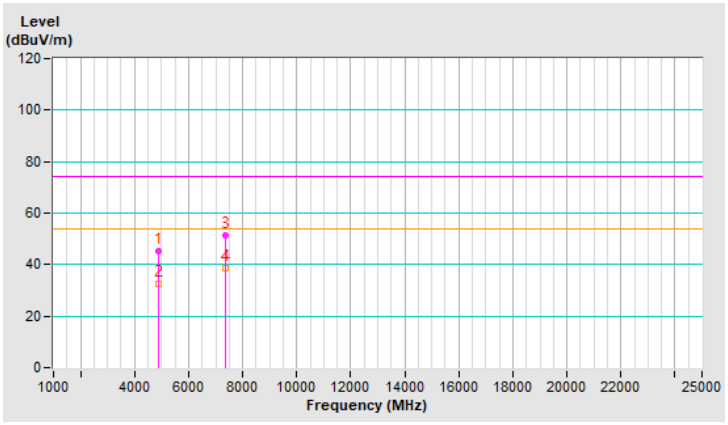


RF Mode	TX 802.11n 40MHz	Channel	CH 9：2452 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	45.4 PK	74.0	-28.6	2.33 V	282	42.3	3.1
2	4904.00	32.4 AV	54.0	-21.6	2.33 V	282	29.3	3.1
3	7356.00	51.3 PK	74.0	-22.7	3.03 V	172	41.8	9.5
4	7356.00	38.5 AV	54.0	-15.5	3.03 V	172	29.0	9.5

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



5.6 Band Edge and Fundamental Emissions Measurement

5.6.1 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 (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

5.6.2 Measuring Instruments and Setting

Please refer to section 5 of instruments 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

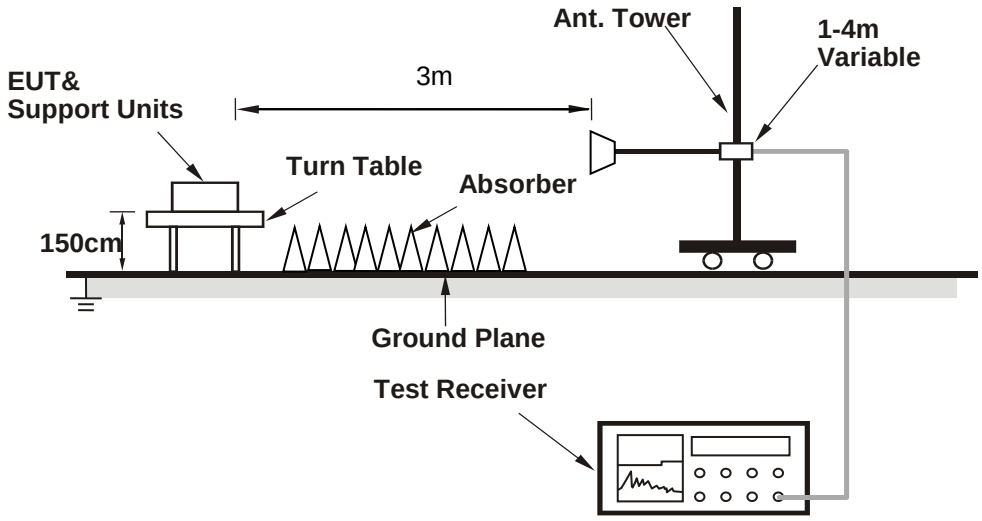
5.6.3 Test Procedure

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 v05 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 11 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure.

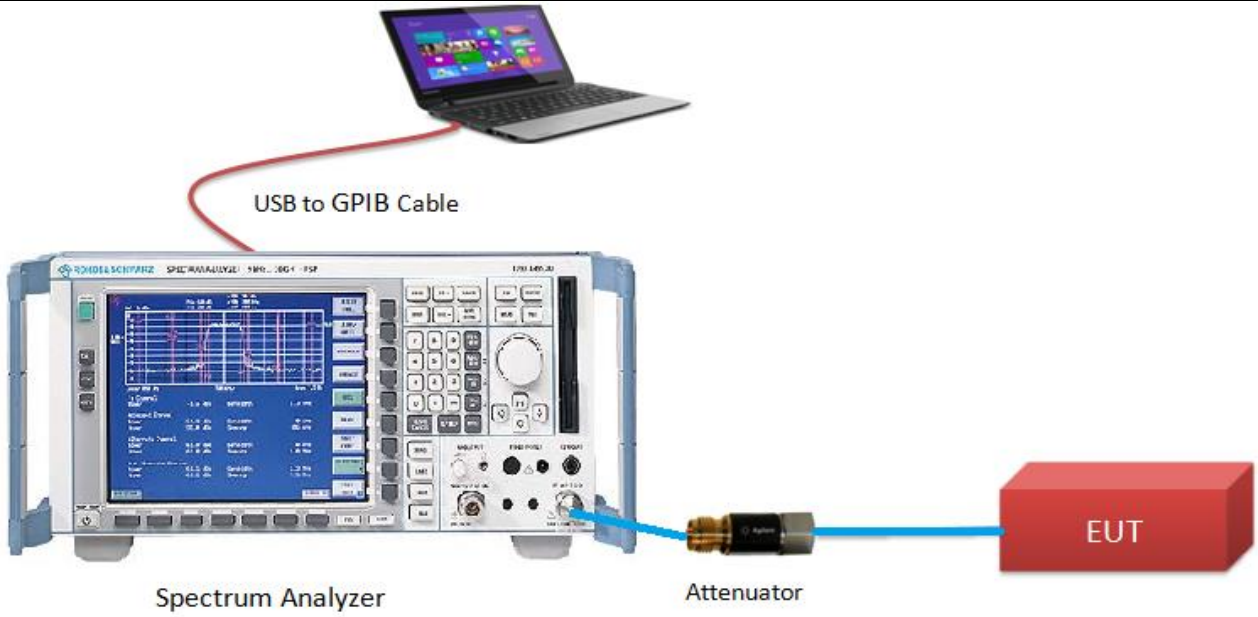
5.6.4 Test Setup Layout

Setup in restricted band



For Radiated Emissions above 1GHz

Setup in non-restricted band



5.6.5 Test Deviation

There are no deviations with the original standard.

5.6.6 EUT Operating Conditions

The EUT was programmed to be in continuously transmitting mode.

5.6.7 Test Results of Band Edge and Fundamental Emissions

Temperature	24°C	Humidity	71%
Test Engineer	Andy Ho		

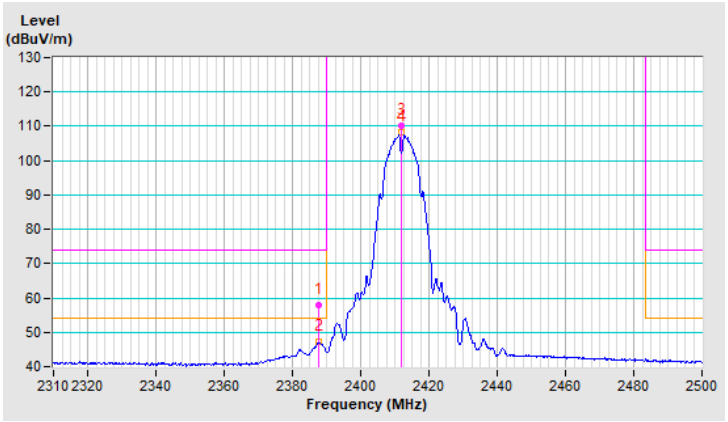
1TX Ant 1

RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2387.70	57.9 PK	74.0	-16.1	1.50 H	49	59.5	-1.6
2	2387.70	47.1 AV	54.0	-6.9	1.50 H	49	48.7	-1.6
3	*2412.00	110.3 PK			1.50 H	49	111.9	-1.6
4	*2412.00	108.1 AV			1.50 H	49	109.7	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

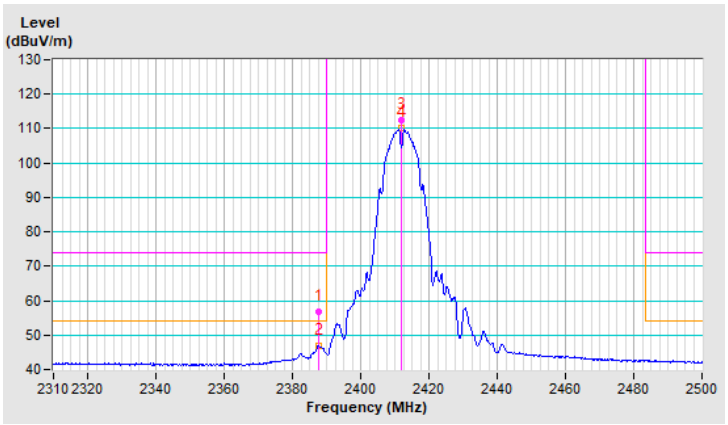


RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2387.70	56.6 PK	74.0	-17.4	3.66 V	246	58.2	-1.6
2	2387.70	46.8 AV	54.0	-7.2	3.66 V	246	48.4	-1.6
3	*2412.00	112.5 PK			3.66 V	246	114.1	-1.6
4	*2412.00	110.3 AV			3.66 V	246	111.9	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

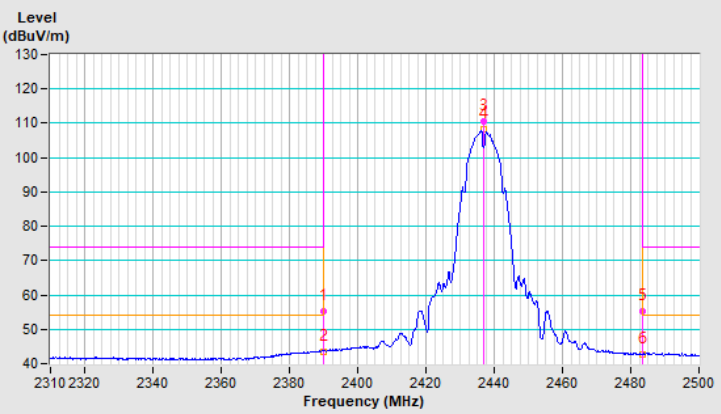


RF Mode	TX 802.11b	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	55.3 PK	74.0	-18.7	1.00 H	30	56.9	-1.6
2	2390.00	43.3 AV	54.0	-10.7	1.00 H	30	44.9	-1.6
3	*2437.00	110.5 PK			1.00 H	30	112.2	-1.7
4	*2437.00	108.3 AV			1.00 H	30	110.0	-1.7
5	2483.50	55.2 PK	74.0	-18.8	1.00 H	30	56.8	-1.6
6	2483.50	42.5 AV	54.0	-11.5	1.00 H	30	44.1	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

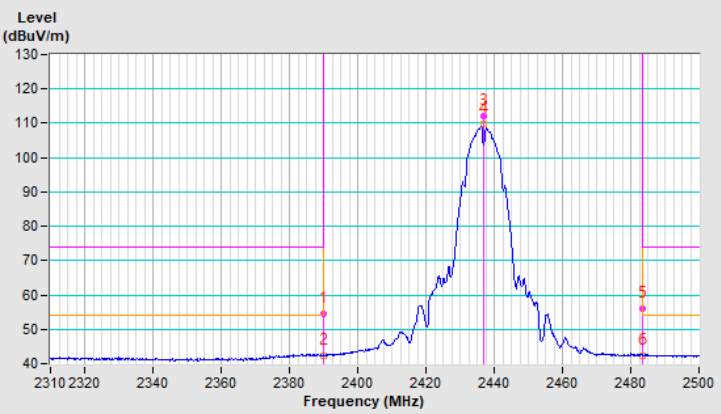


RF Mode	TX 802.11b	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	54.4 PK	74.0	-19.6	3.69 V	253	56.0	-1.6
2	2390.00	42.3 AV	54.0	-11.7	3.69 V	253	43.9	-1.6
3	*2437.00	112.0 PK			3.69 V	253	113.7	-1.7
4	*2437.00	109.7 AV			3.69 V	253	111.4	-1.7
5	2483.50	56.0 PK	74.0	-18.0	3.69 V	253	57.6	-1.6
6	2483.50	42.3 AV	54.0	-11.7	3.69 V	253	43.9	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

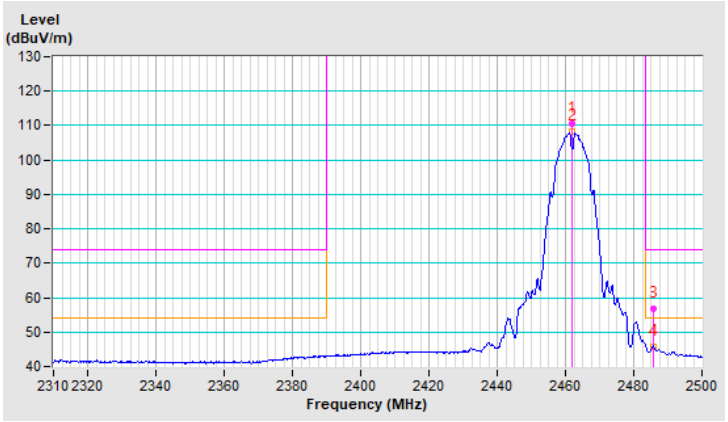


RF Mode	TX 802.11b	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	110.5 PK			1.19 H	49	112.1	-1.6
2	*2462.00	108.3 AV			1.19 H	49	109.9	-1.6
3	2485.70	56.8 PK	74.0	-17.2	1.19 H	49	58.4	-1.6
4	2485.70	45.8 AV	54.0	-8.2	1.19 H	49	47.4	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

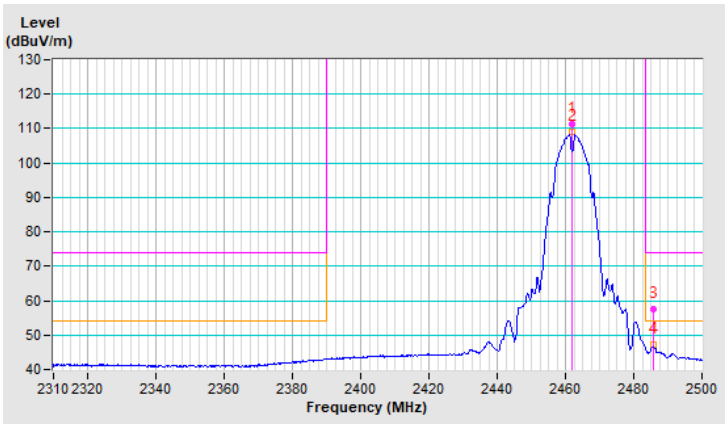


RF Mode	TX 802.11b	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	111.3 PK			2.69 V	265	112.9	-1.6
2	*2462.00	109.0 AV			2.69 V	265	110.6	-1.6
3	2485.70	57.5 PK	74.0	-16.5	2.69 V	265	59.1	-1.6
4	2485.70	47.2 AV	54.0	-6.8	2.69 V	265	48.8	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.



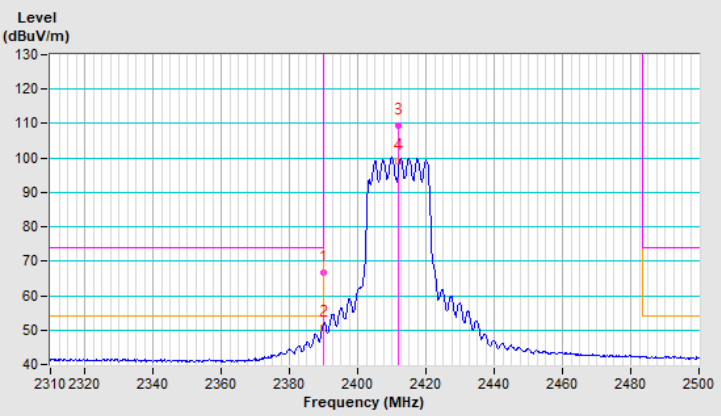
2TX

RF Mode	TX 802.11n 20MHz	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	66.7 PK	74.0	-7.3	1.24 H	130	68.3	-1.6
2	2390.00	50.8 AV	54.0	-3.2	1.24 H	130	52.4	-1.6
3	*2412.00	109.4 PK			1.24 H	130	111.0	-1.6
4	*2412.00	99.2 AV			1.24 H	130	100.8	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

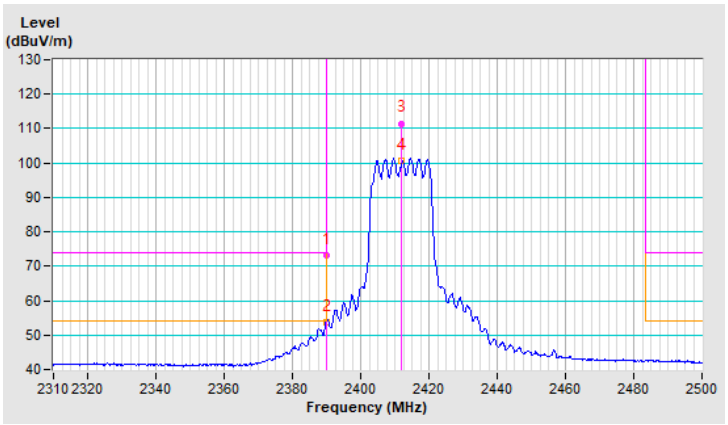


RF Mode	TX 802.11n 20MHz	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	73.2 PK	74.0	-0.8	2.89 V	316	74.8	-1.6
2	2390.00	53.7 AV	54.0	-0.3	2.89 V	316	55.3	-1.6
3	*2412.00	111.5 PK			2.89 V	316	113.1	-1.6
4	*2412.00	100.6 AV			2.89 V	316	102.2	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

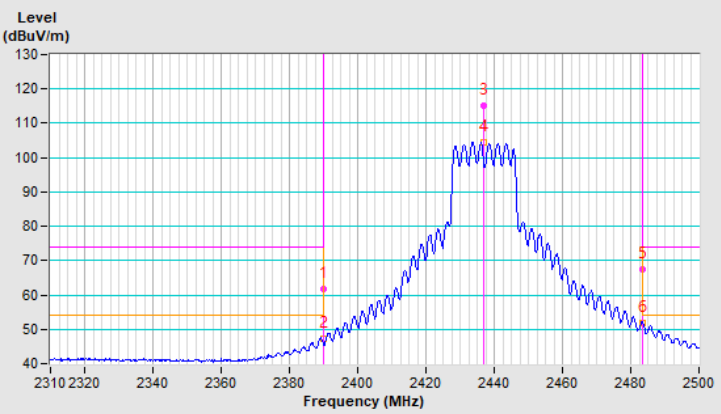


RF Mode	TX 802.11n 20MHz	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	1.00 H	141	63.4	-1.6
2	2390.00	47.2 AV	54.0	-6.8	1.00 H	141	48.8	-1.6
3	*2437.00	115.1 PK			1.00 H	150	116.8	-1.7
4	*2437.00	104.4 AV			1.00 H	150	106.1	-1.7
5	2483.50	67.6 PK	74.0	-6.4	1.00 H	150	69.2	-1.6
6	2483.50	51.7 AV	54.0	-2.3	1.00 H	150	53.3	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

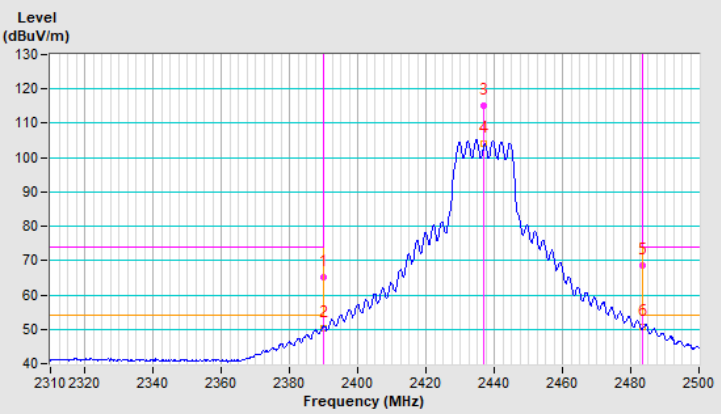


RF Mode	TX 802.11n 20MHz	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	65.3 PK	74.0	-8.7	2.51 V	335	66.9	-1.6
2	2390.00	50.2 AV	54.0	-3.8	2.51 V	335	51.8	-1.6
3	*2437.00	115.0 PK			2.51 V	335	116.7	-1.7
4	*2437.00	104.2 AV			2.51 V	335	105.9	-1.7
5	2483.50	68.5 PK	74.0	-5.5	2.51 V	335	70.1	-1.6
6	2483.50	50.7 AV	54.0	-3.3	2.51 V	335	52.3	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

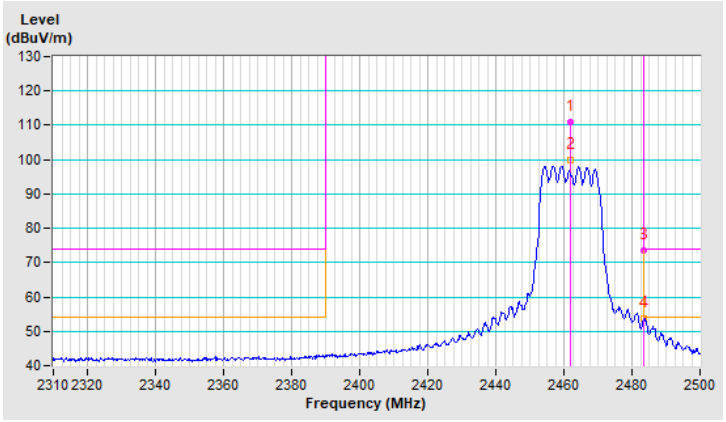


RF Mode	TX 802.11n 20MHz	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	110.9 PK			1.00 H	142	112.5	-1.6
2	*2462.00	99.9 AV			1.00 H	142	101.5	-1.6
3	2483.50	73.6 PK	74.0	-0.4	1.00 H	142	75.2	-1.6
4	2483.50	53.8 AV	54.0	-0.2	1.00 H	142	55.4	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

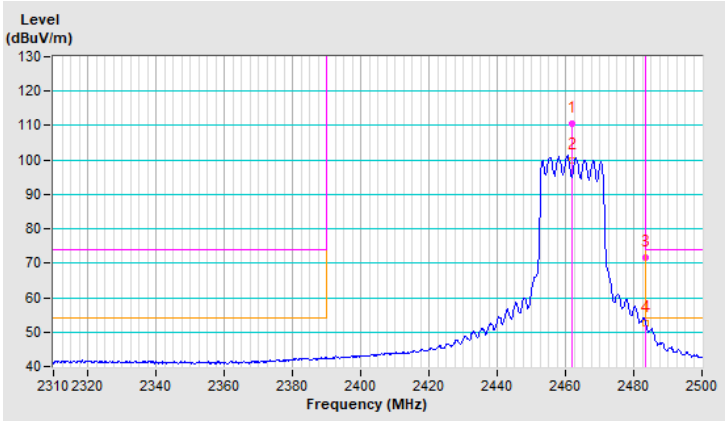


RF Mode	TX 802.11n 20MHz	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	110.4 PK			3.67 V	318	112.0	-1.6
2	*2462.00	99.9 AV			3.67 V	318	101.5	-1.6
3	2483.50	71.7 PK	74.0	-2.3	3.67 V	318	73.3	-1.6
4	2483.50	52.6 AV	54.0	-1.4	3.67 V	318	54.2	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

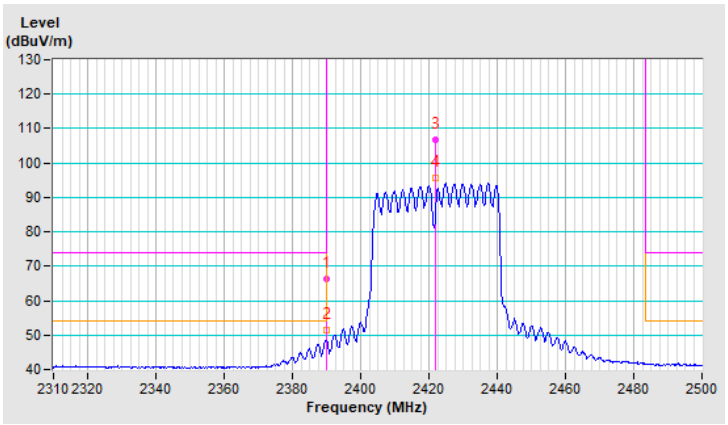


RF Mode	TX 802.11n 40MHz	Channel	CH 3：2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.90	66.3 PK	74.0	-7.7	3.58 H	134	67.9	-1.6
2	2389.90	51.4 AV	54.0	-2.6	3.58 H	134	53.0	-1.6
3	*2422.00	106.8 PK			3.76 H	134	108.4	-1.6
4	*2422.00	95.7 AV			3.76 H	134	97.3	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

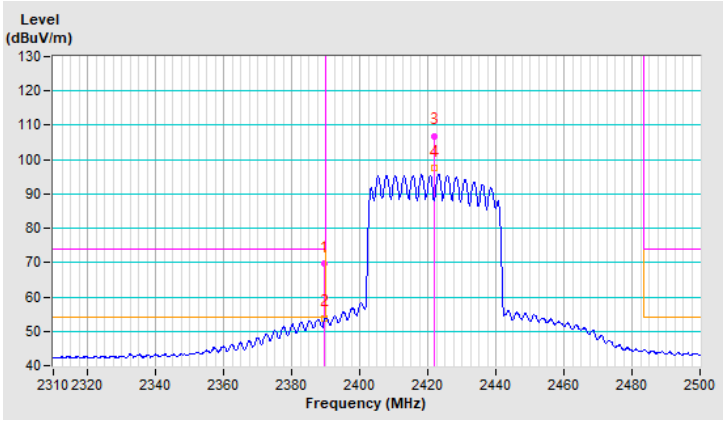


RF Mode	TX 802.11n 40MHz	Channel	CH 3：2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.60	69.8 PK	74.0	-4.2	3.73 V	316	71.4	-1.6
2	**2389.60**	**53.9 AV**	**54.0**	**-0.1**	**3.73 V**	**316**	**55.5**	**-1.6**
3	*2422.00	106.9 PK			3.73 V	316	108.5	-1.6
4	*2422.00	97.5 AV			3.73 V	316	99.1	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

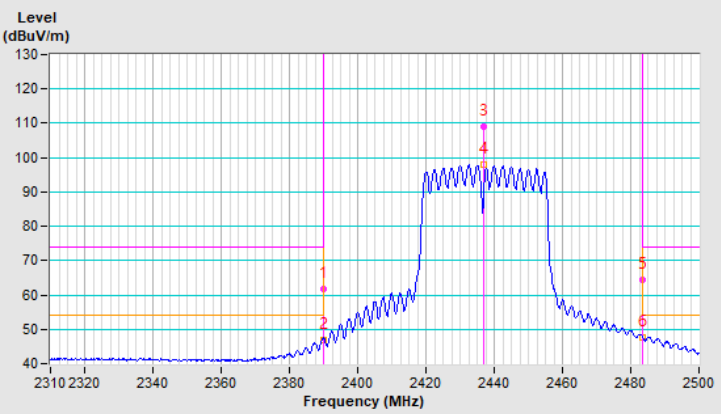


RF Mode	TX 802.11n 40MHz	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	3.58 H	132	63.4	-1.6
2	2390.00	46.9 AV	54.0	-7.1	3.58 H	132	48.5	-1.6
3	*2437.00	109.0 PK			3.58 H	132	110.7	-1.7
4	*2437.00	97.8 AV			3.58 H	132	99.5	-1.7
5	2483.50	64.5 PK	74.0	-9.5	3.58 H	132	66.1	-1.6
6	2483.50	47.5 AV	54.0	-6.5	3.58 H	132	49.1	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

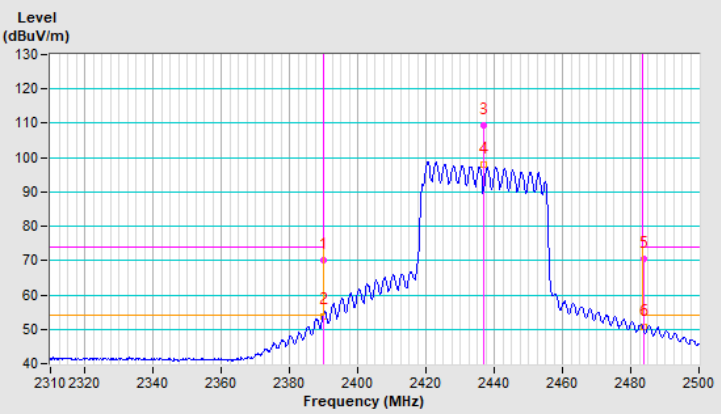


RF Mode	TX 802.11n 40MHz	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	70.0 PK	74.0	-4.0	3.35 V	316	71.6	-1.6
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**3.35 V**	**316**	**55.5**	**-1.6**
3	*2437.00	109.3 PK			3.35 V	316	111.0	-1.7
4	*2437.00	97.9 AV			3.35 V	316	99.6	-1.7
5	2484.00	70.6 PK	74.0	-3.4	3.35 V	316	72.2	-1.6
6	2484.00	50.7 AV	54.0	-3.3	3.35 V	316	52.3	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

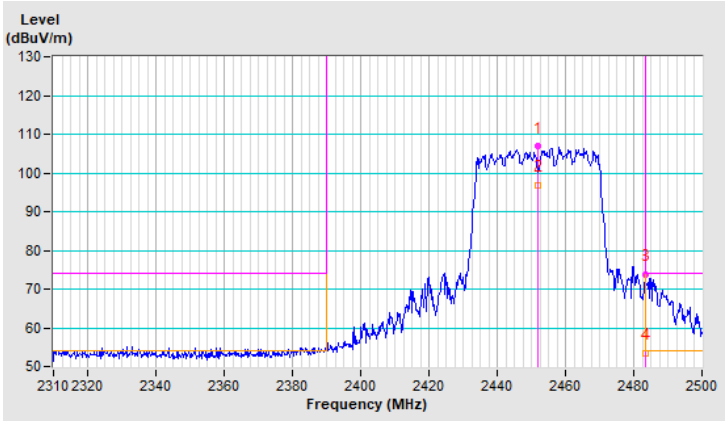


RF Mode	TX 802.11n 40MHz	Channel	CH 9：2452 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	106.8 PK			2.83 H	148	108.4	-1.6
2	*2452.00	96.7 AV			2.83 H	148	98.3	-1.6
3	2483.50	73.7 PK	74.0	-0.3	2.83 H	148	75.3	-1.6
4	2483.50	53.4 AV	54.0	-0.6	2.83 H	148	55.0	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

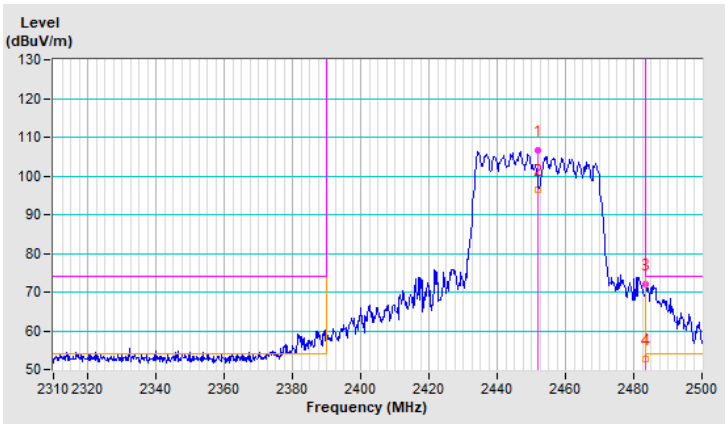


RF Mode	TX 802.11n 40MHz	Channel	CH 9：2452 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	106.7 PK			2.46 V	323	108.3	-1.6
2	*2452.00	96.4 AV			2.46 V	323	98.0	-1.6
3	2483.50	72.1 PK	74.0	-1.9	2.46 V	323	73.7	-1.6
4	2483.50	52.8 AV	54.0	-1.2	2.46 V	323	54.4	-1.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

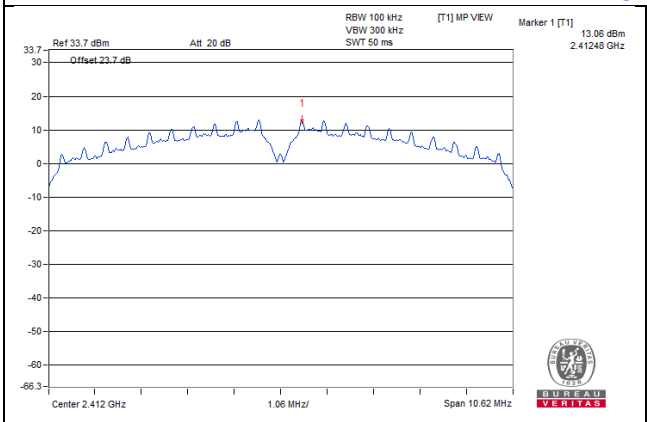


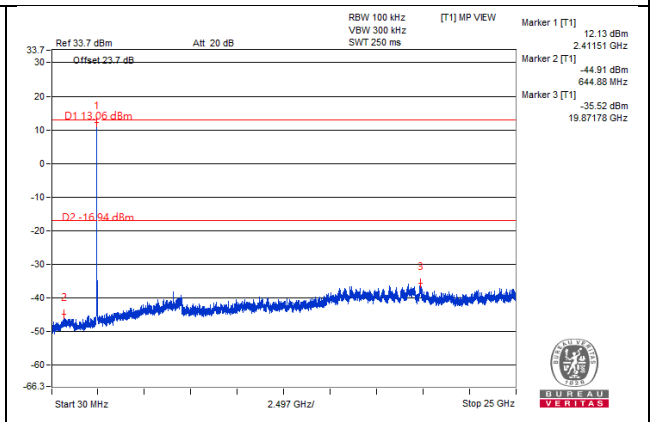
5.6.8 Test Results of Band Edge and Emissions not in Restricted Bands

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

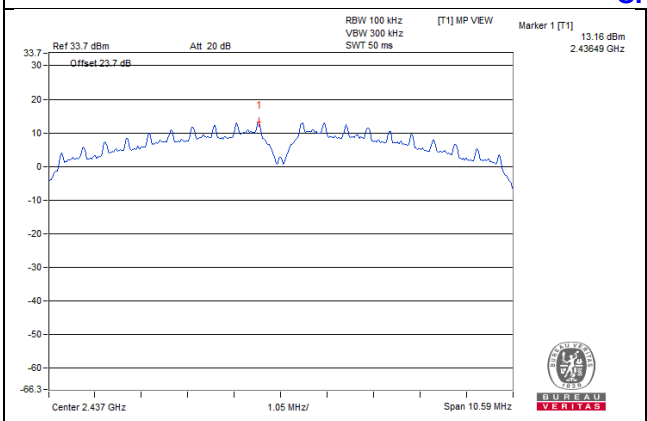
802.11b

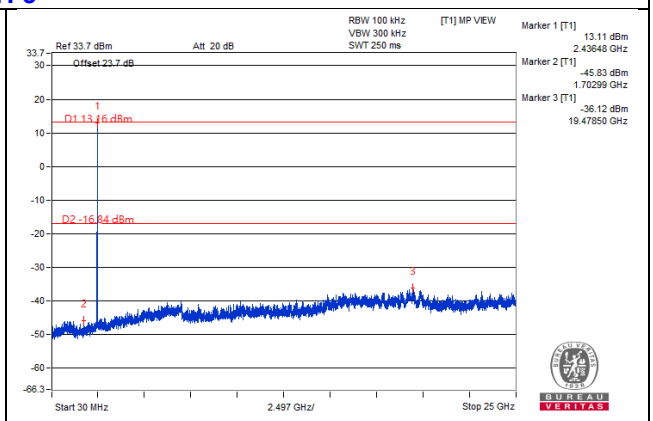
CH 1



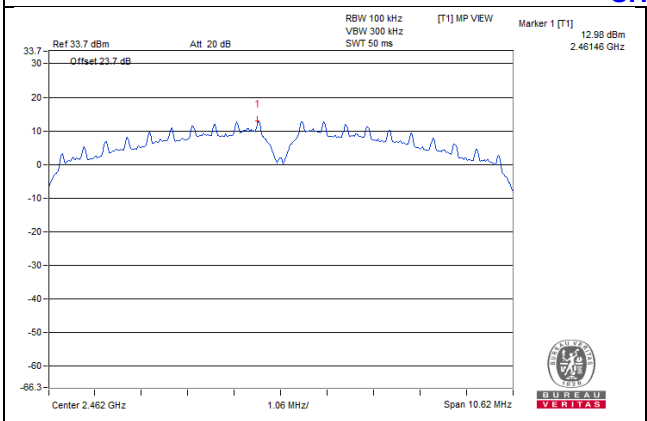


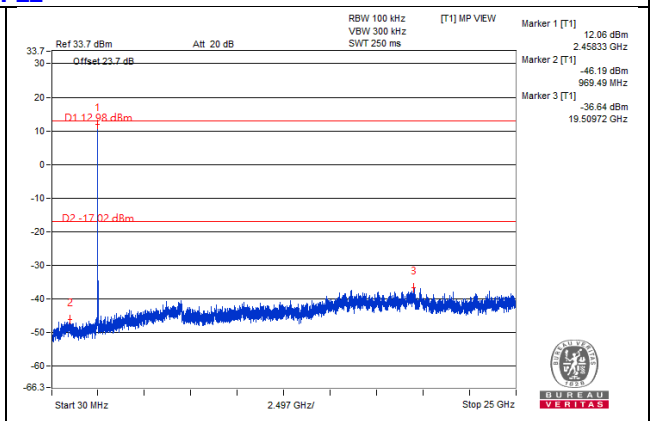
CH 6



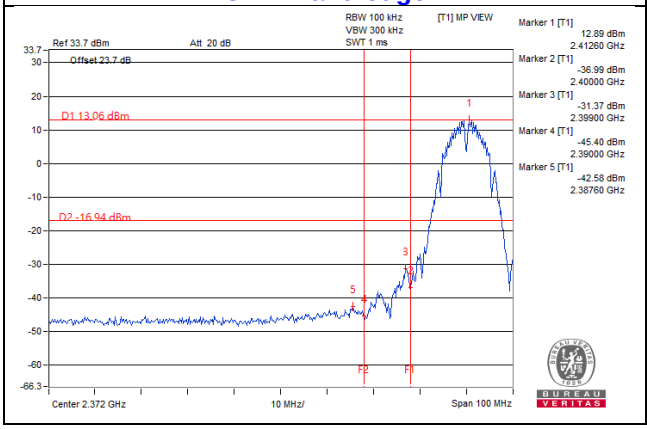


CH 11

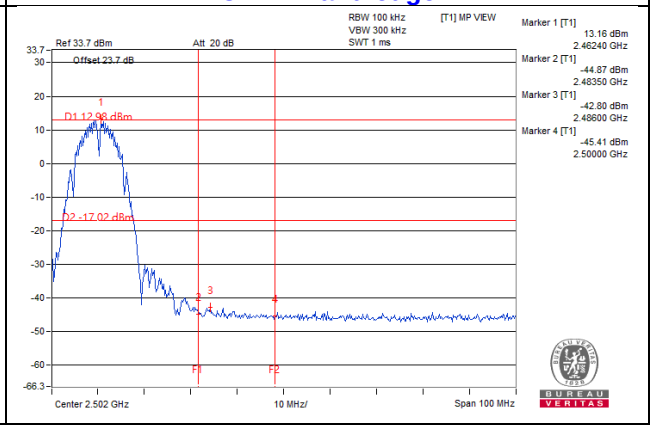




CH 1 Band edge

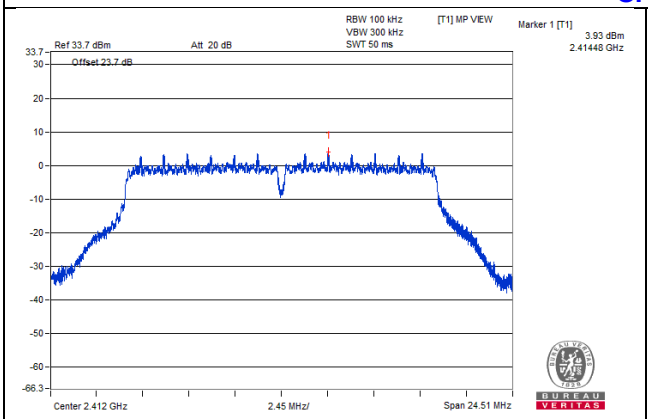


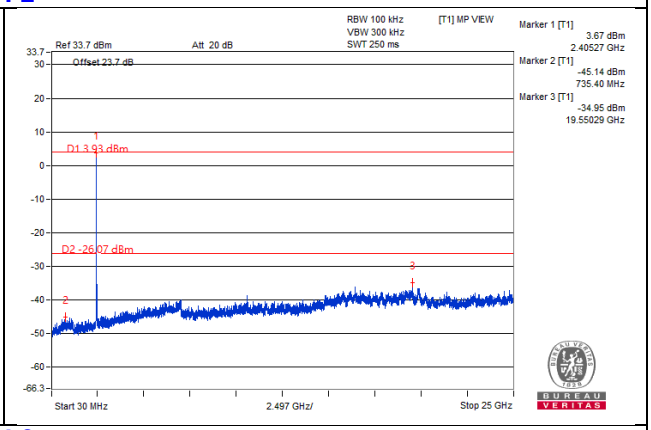
CH 11 Band edge



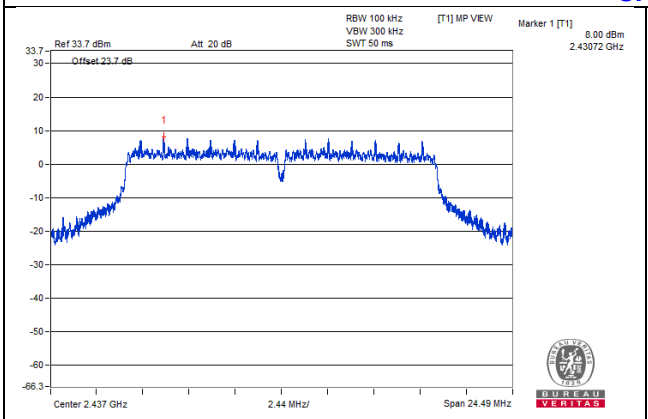
802.11g – 2TX:
Ant 1

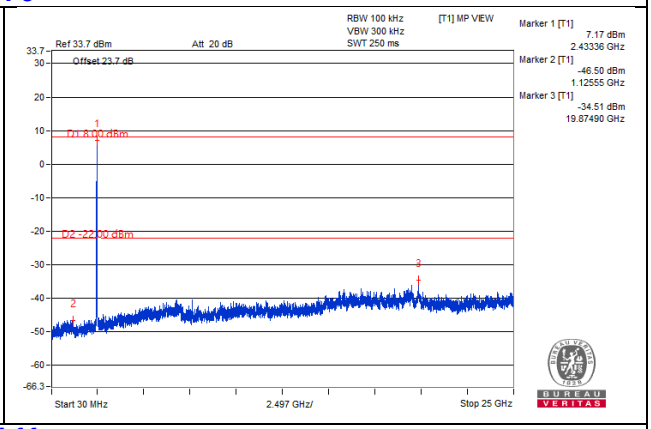
CH 1



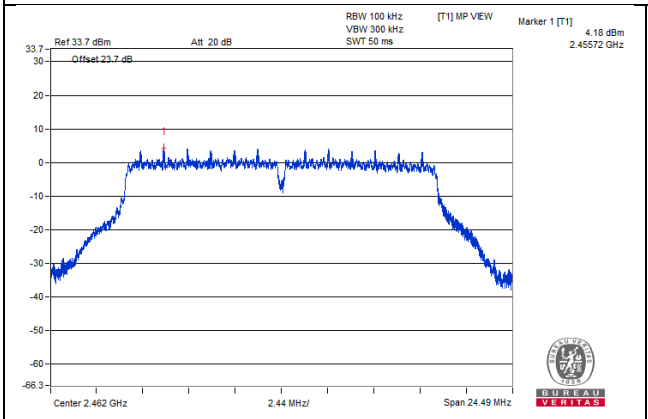


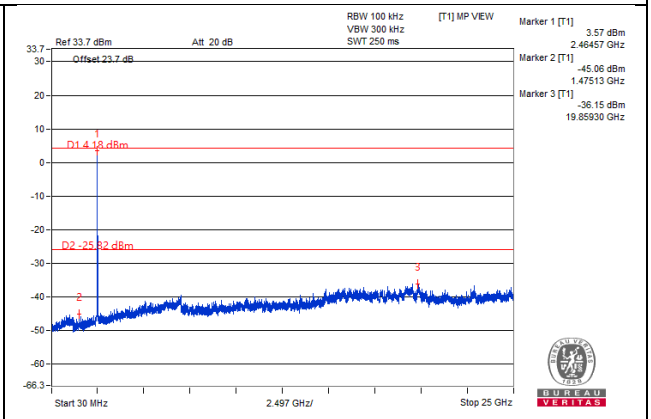
CH 6



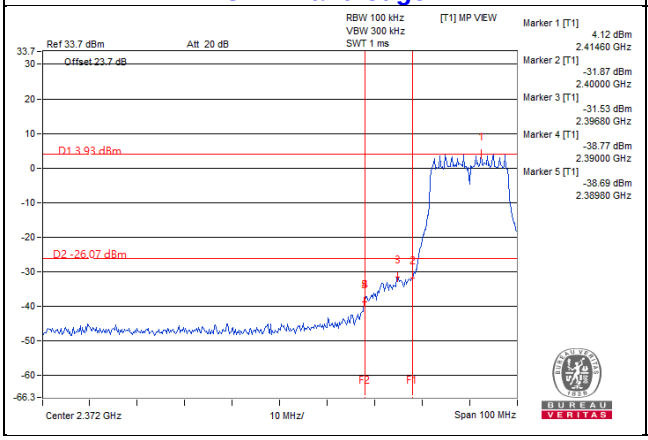


CH 11

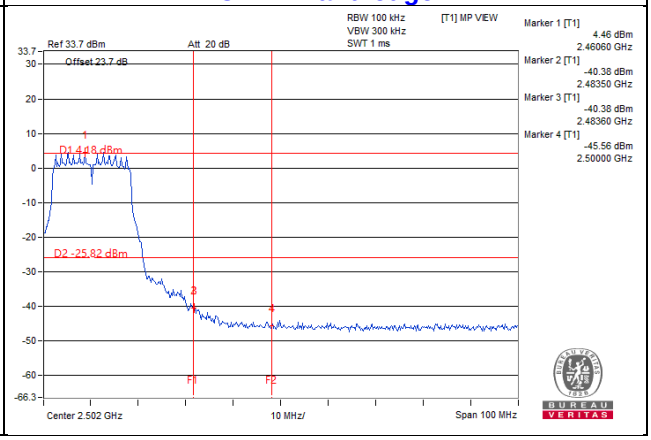




CH 1 Band edge

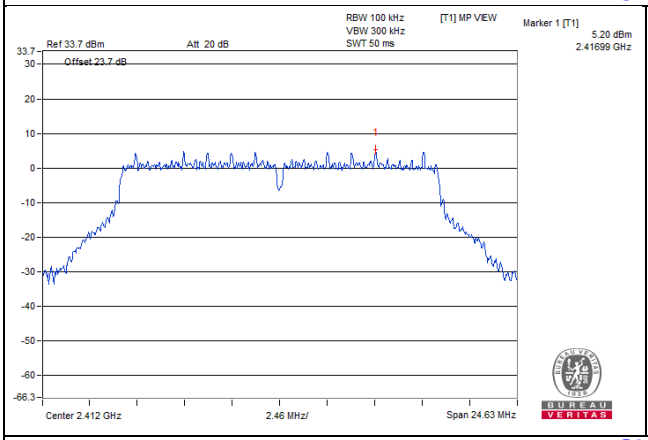


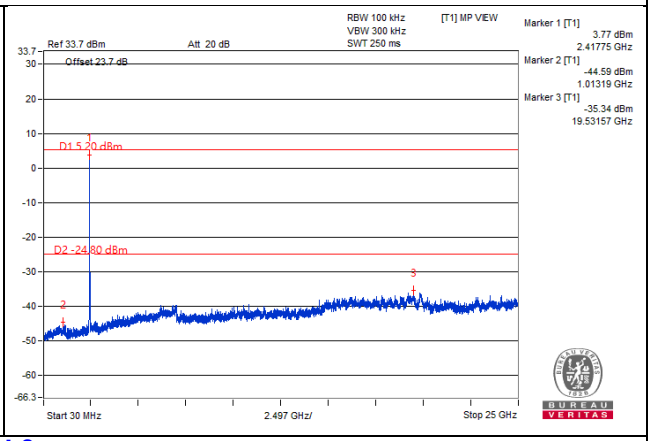
CH 11 Band edge



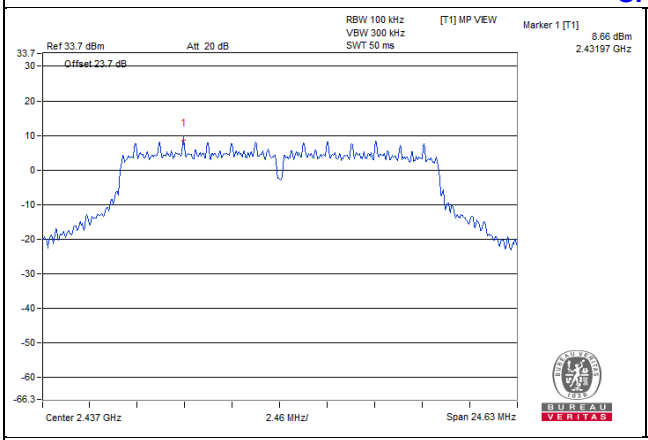
Ant 2

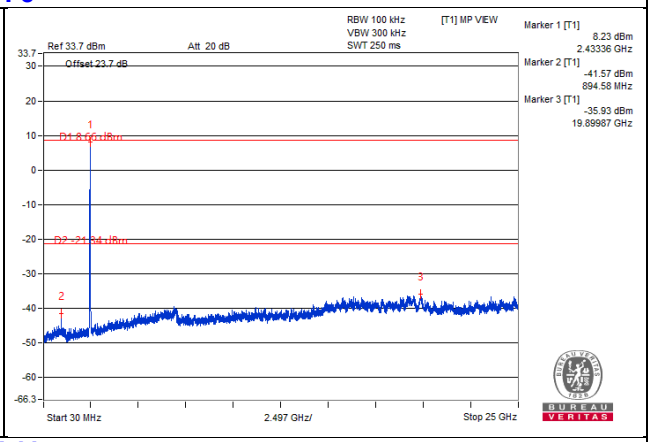
CH 1



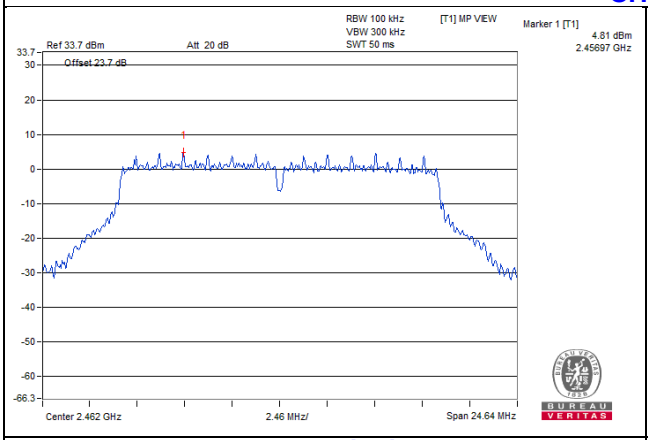


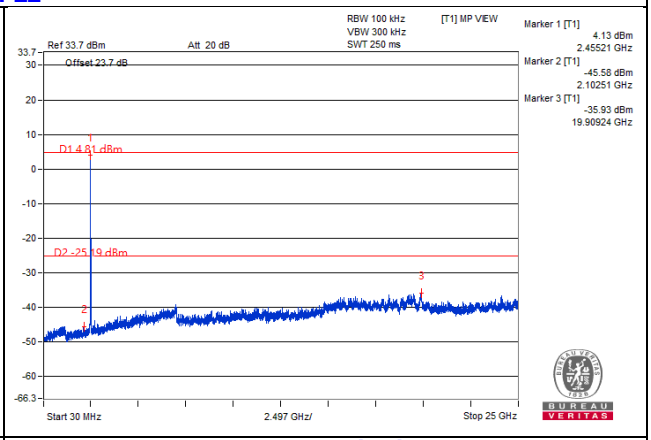
CH 6



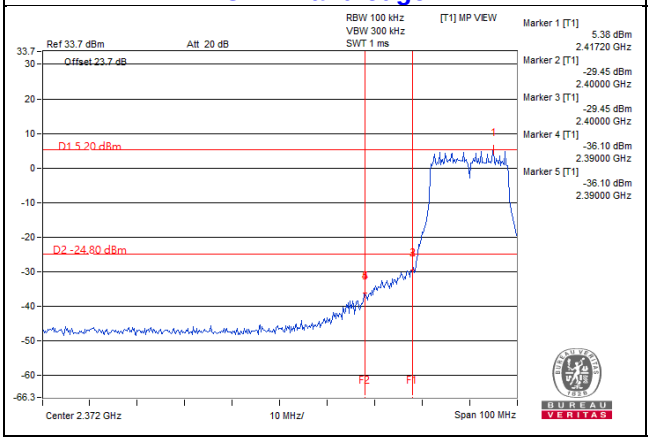


CH 11

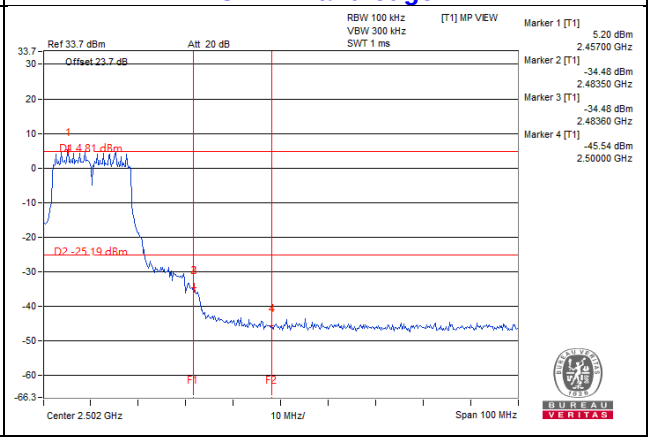




CH 1 Band edge

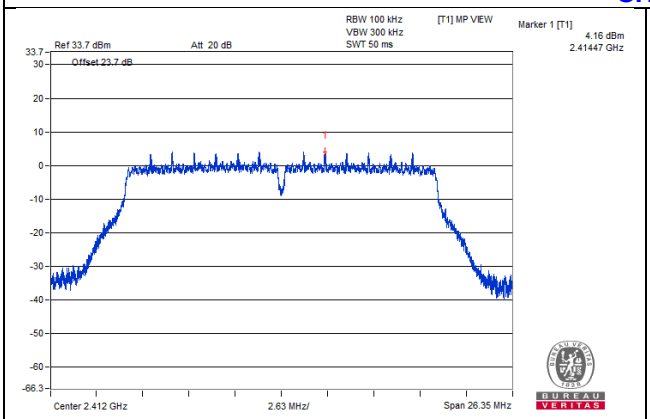


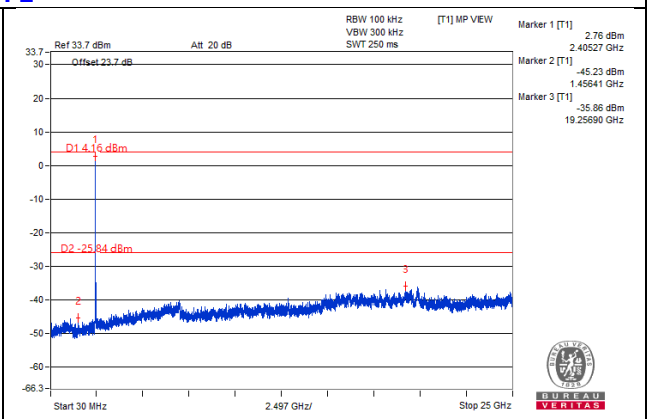
CH 11 Band edge



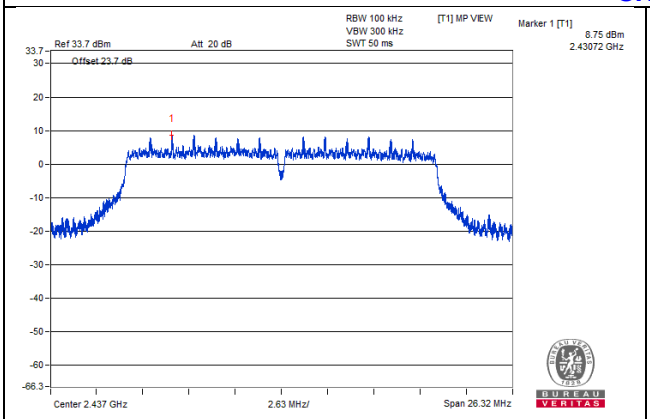
802.11n 20MHz – 2TX:
Ant 1

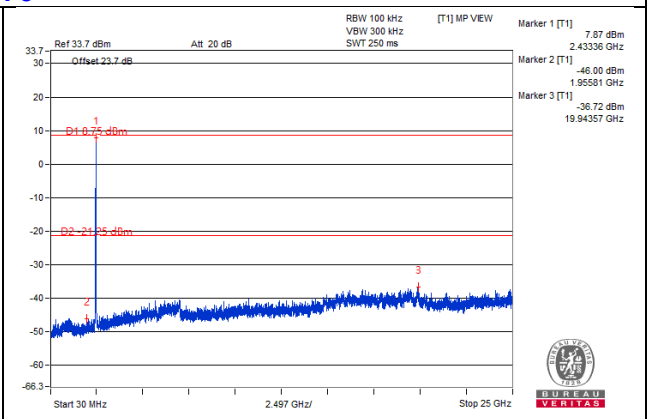
CH 1



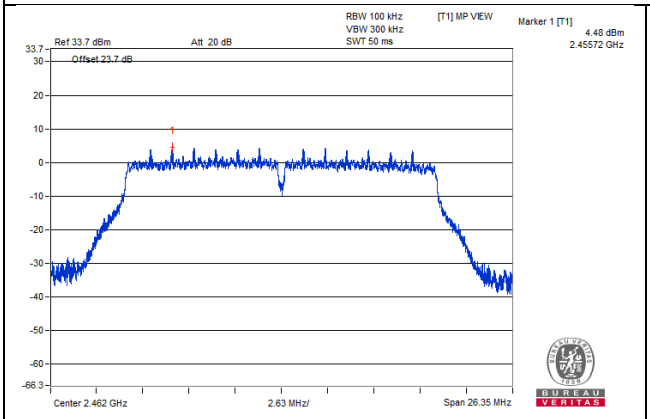


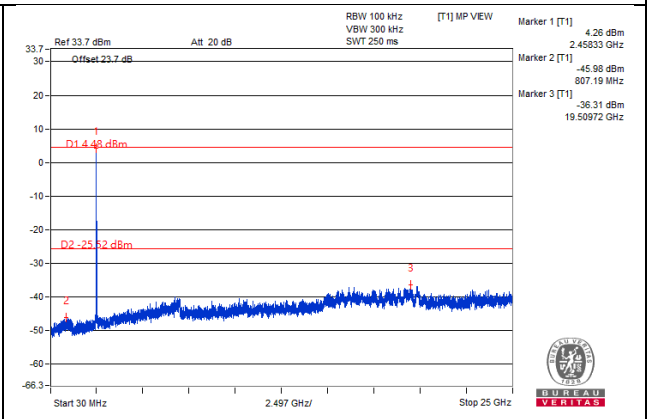
CH 6



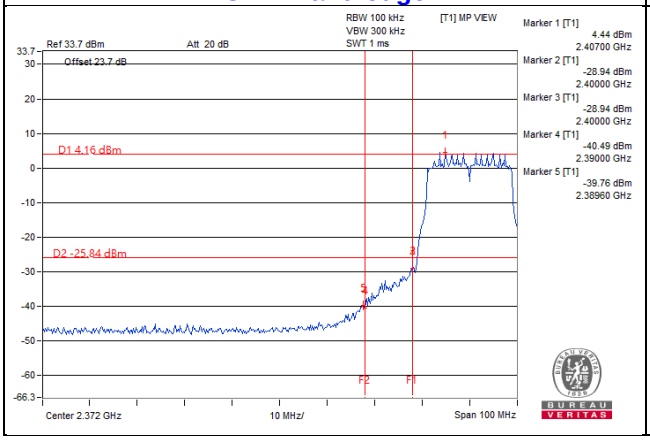


CH 11

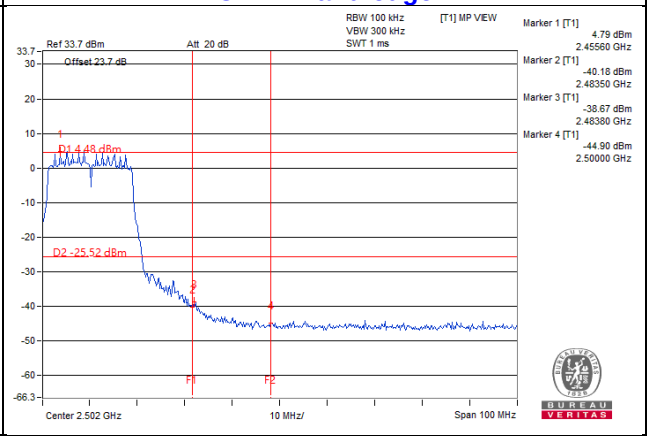




CH 1 Band edge

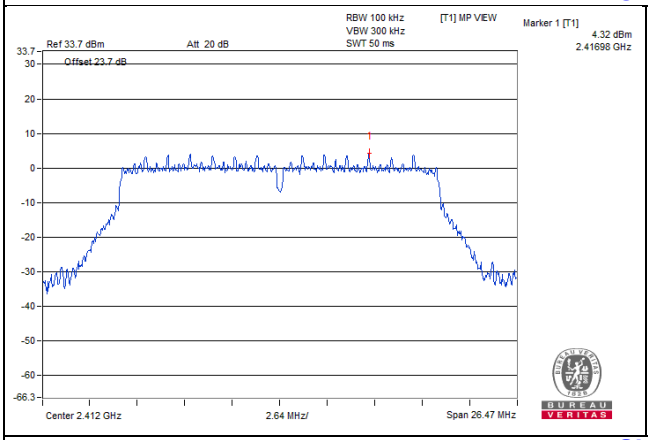


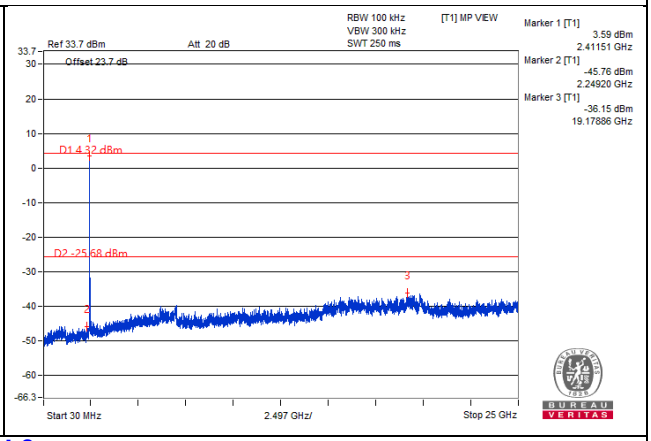
CH 11 Band edge



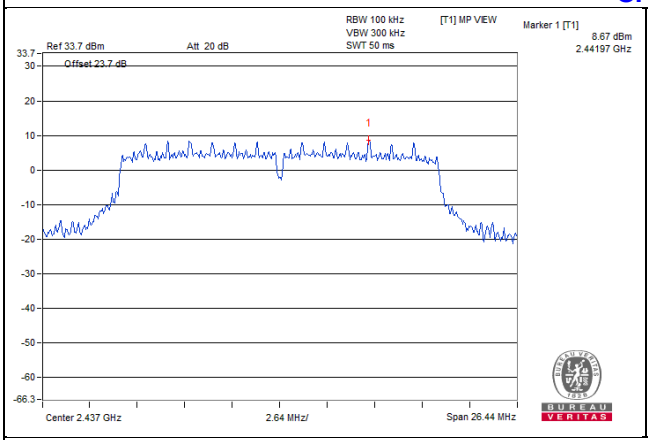
Ant 2

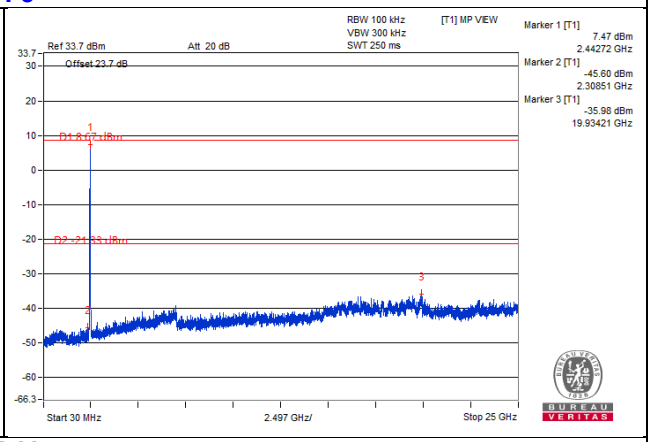
CH 1



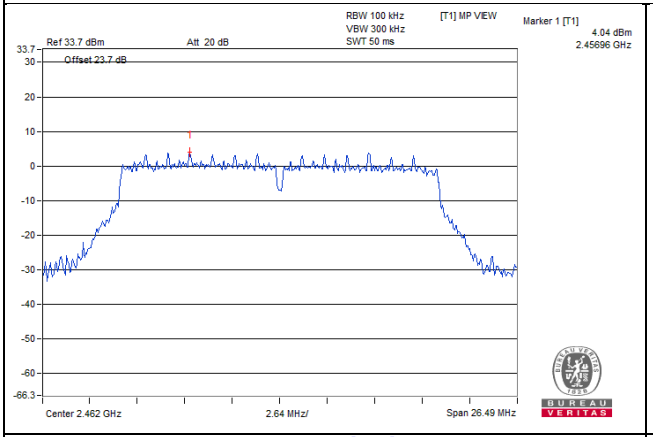


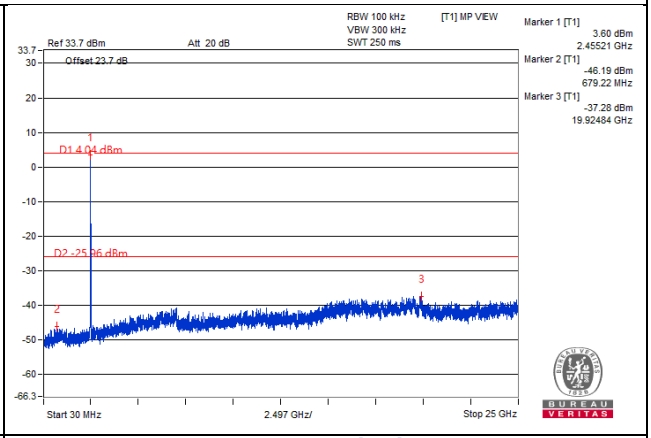
CH 6



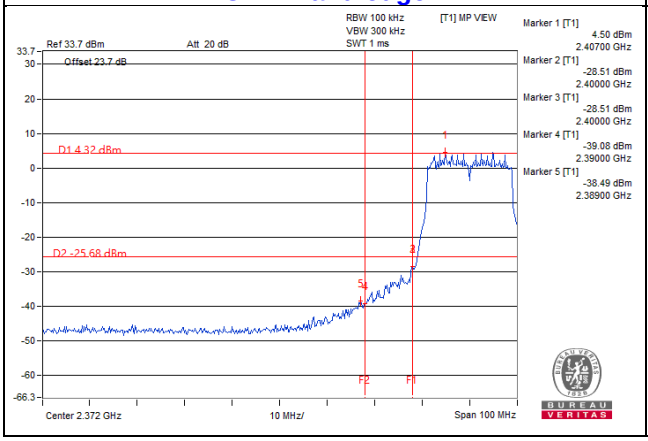


CH 11

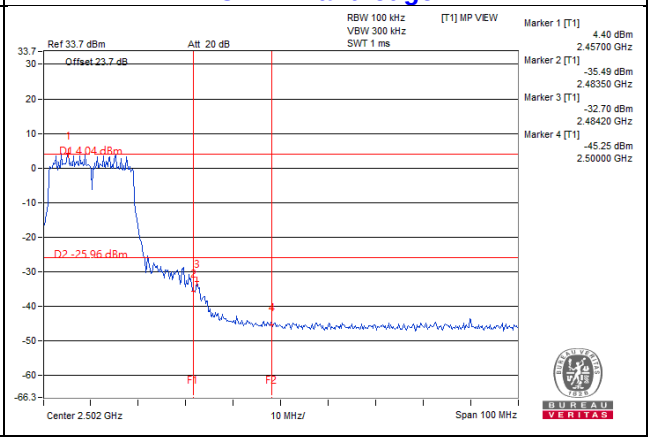




CH 1 Band edge

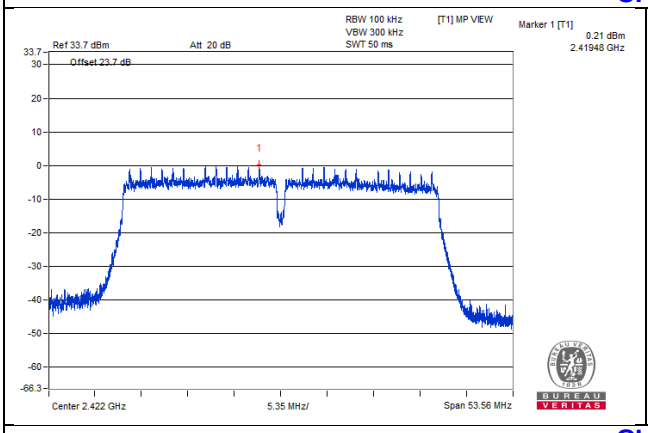


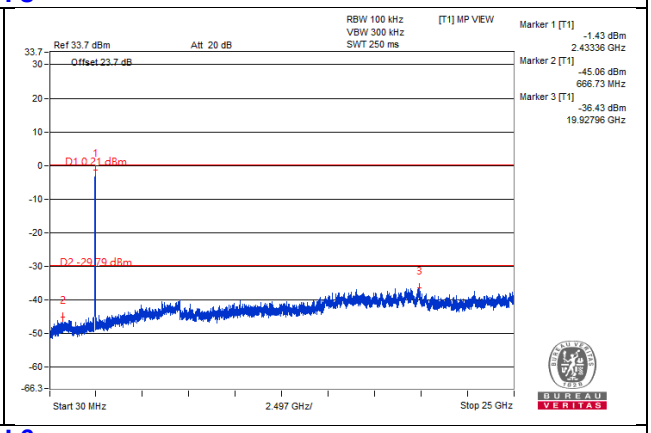
CH 11 Band edge



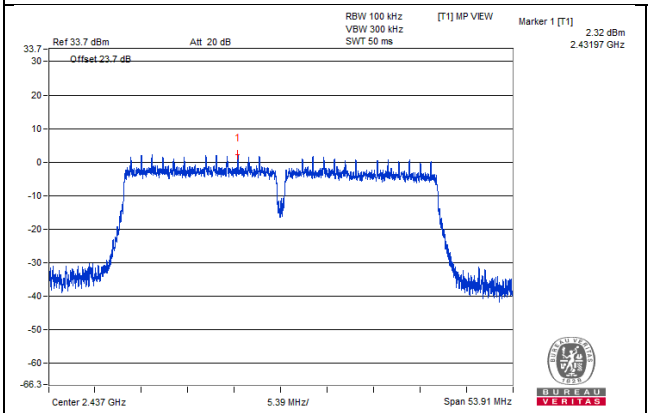
802.11n 40MHz – 2TX:
Ant 1

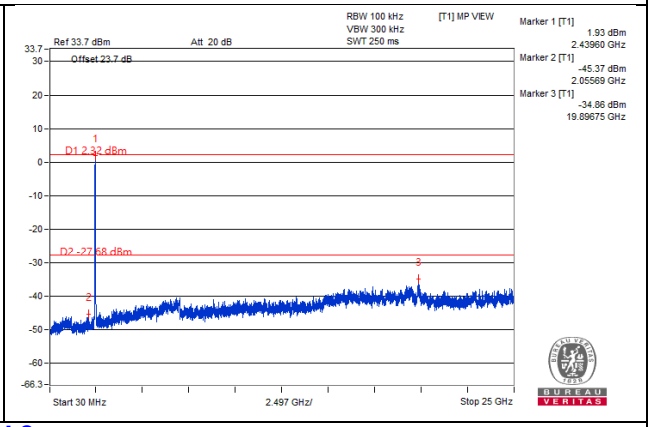
CH 3



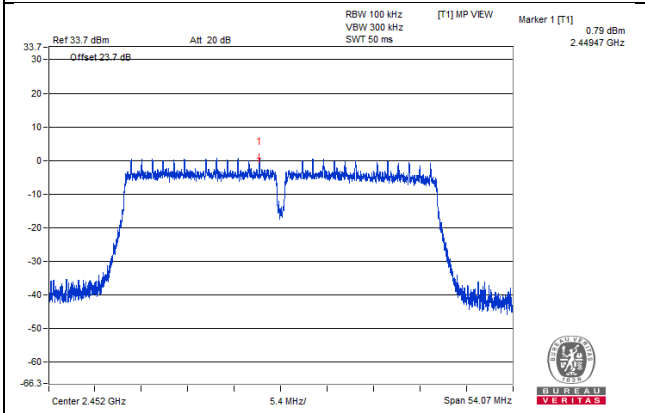


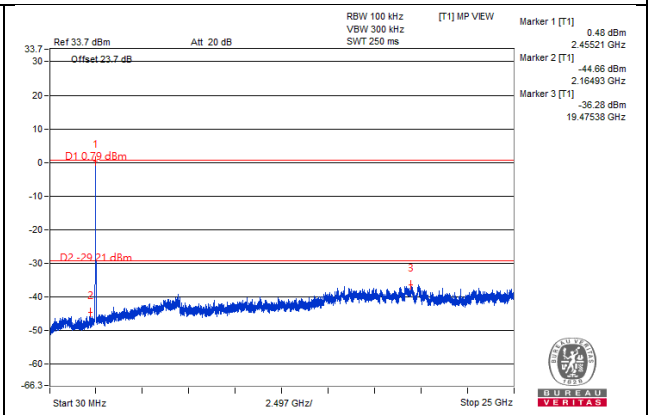
CH 6



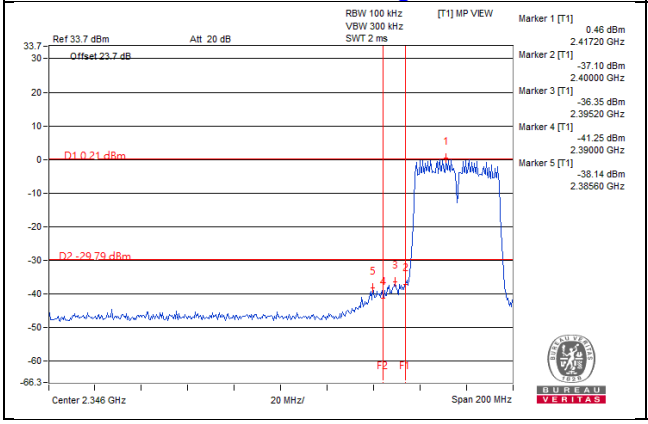


CH 9

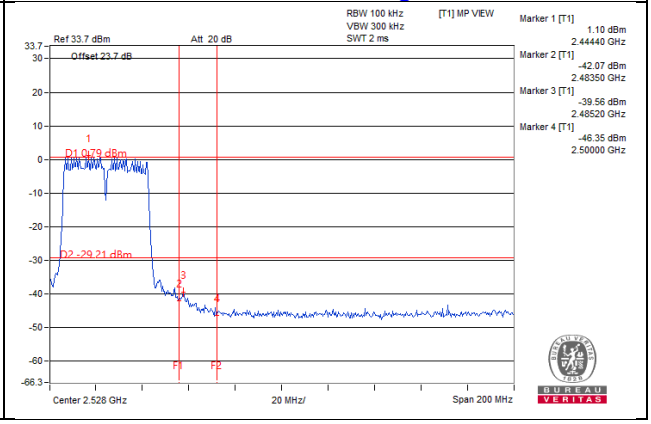




CH 3 Band edge

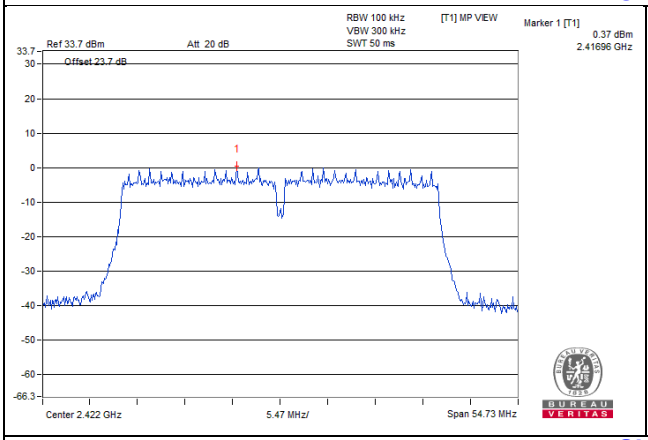


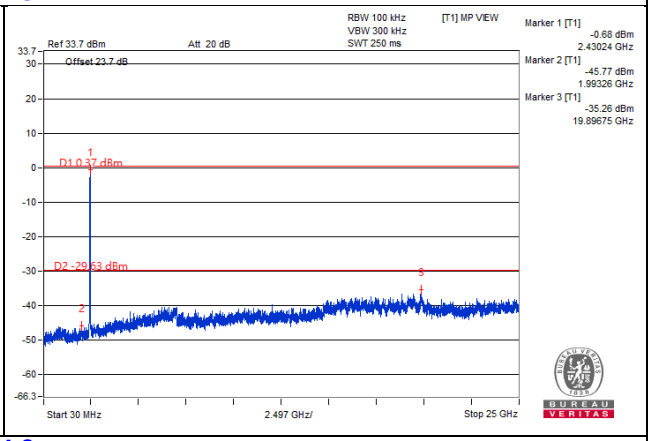
CH 9 Band edge



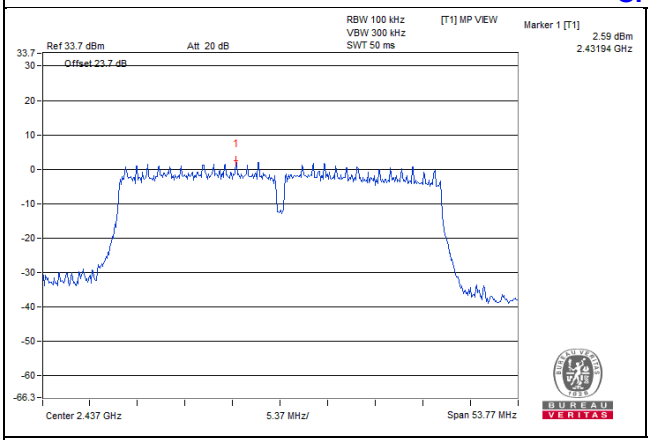
Ant 2

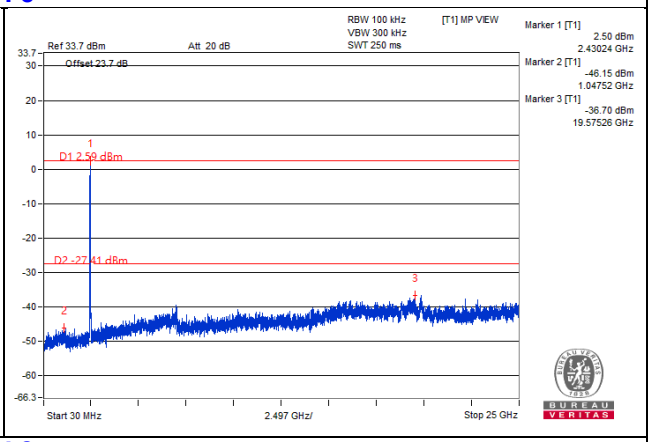
CH 3



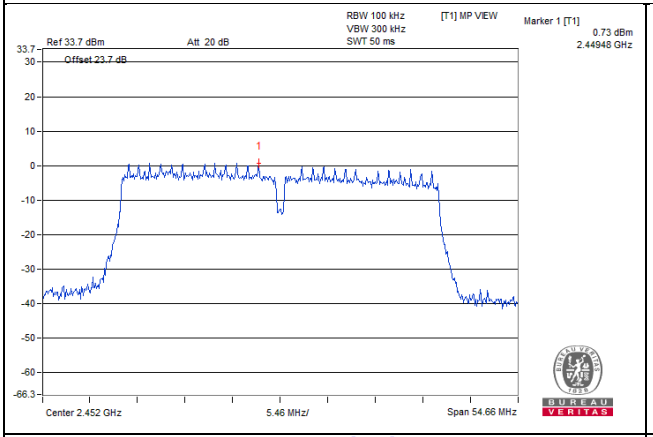


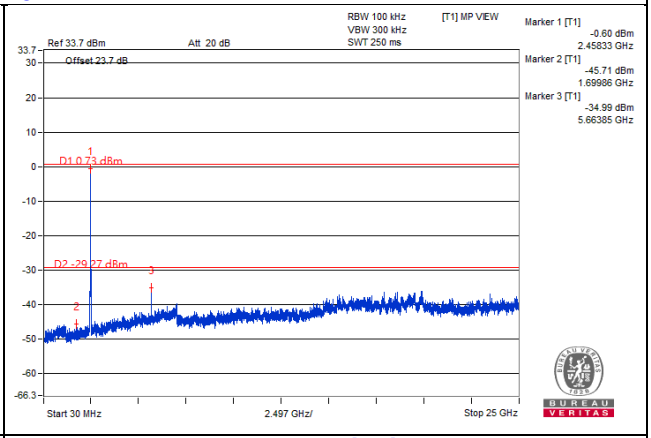
CH 6



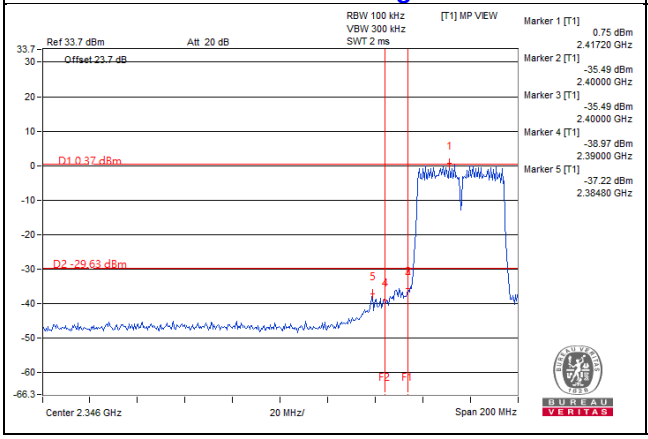


CH 9

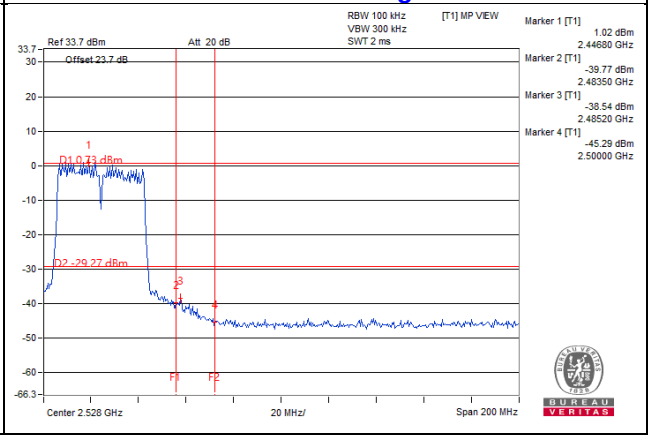




CH 3 Band edge



CH 9 Band edge



5.7 List of Test Instruments

For conducted emission test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 20, 2020	Oct. 19, 2021
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 27, 2020	Oct. 26, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 26, 2020	Oct. 25, 2021
RF Cable	5D-FB	COCCAB-001	Sep. 26, 2020	Sep. 25, 2021
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 29, 2020	Aug. 28, 2021
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3. Tested Date: Nov. 11, 2020

For radiated emission below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 05, 2020	Nov. 04, 2021
RF Cable	8D	966-3-1	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-2	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-3	Mar. 17, 2020	Mar. 16, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 24, 2020	Sep. 23, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	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 966 Chamber No. 3.
3. Tested Date: Nov. 26, 2020

For radiated emission & Band Edge Emissions above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-1500	180504	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-2000	180601	June 09, 2020	June 08, 2021
RF Cable	EMC104-SM-SM-6000	180602	June 09, 2020	June 08, 2021
Spectrum Analyzer Keysight	N9030A	MY54490679	July 13, 2020	July 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	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 966 Chamber No. 3.
3. Tested Date: Nov. 06 to 10, 2020

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Nov. 18, 2020

Appendix - Information of 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:

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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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