FCC Test Report (WLAN)

Report No.:	RF180821E03
FCC ID:	I88WSQ20
Test Model:	WSQ20
Received Date:	Oct. 11, 2018
Test Date:	Dec. 18, 2018 to Jan. 04, 2019
Issued Date:	Jan. 15, 2019
Applicant:	Zyxel Communications Corporation
Address:	No.2 Industry East RD. IX, Hsinchu Science Park, Hsinchu 30075, Taiwan
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 R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF180821E03	Original release.	Jan. 15, 2019

1 Certificate of Conformity

Product:	Multy Mini Dual-Band WiFi System Add-on
Brand:	ZYXEL
Test Model:	WSQ20
Sample Status:	ENGINEERING SAMPLE
Applicant:	Zyxel Communications Corporation
Test Date:	Dec. 18, 2018 to Jan. 04, 2019
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 EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Jan. 15, 2019

Wendy Wu / Specialist

Approved by : _____ , **Date:** Jan. 15, 2019

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -11.52dB at 0.50547MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.6 dB at 2483.5MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

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	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (WLAN)

Product	Multy Mini Dual-Band WiFi System Add-on
Brand	ZYXEL
Test Model	WSQ20
RF CPU Model No.	QCA9563
RF Chip Model No.	CSR8811
FW	V02
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** 960.188mW **5GHz:** **CDD Mode** **5.18 ~ 5.24GHz:** 947.747mW **5.745 ~ 5.825GHz:** 992.446mW **Beamforming Mode:** **5.18 ~ 5.24GHz:** 922.217mW **5.745 ~ 5.825GHz:** 967.39mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. There are WLAN and Bluetooth technology used for the EUT. The EUT has below radios as following table:

Radio 1	Radio 2
WLAN	Bluetooth

2. Simultaneously transmission condition.

Condition	Technology	
1	WLAN 2.4GHz	Bluetooth
2	WLAN 5GHz	Bluetooth
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

3. The EUT could be supplied with power adapter as the following table:

No.	Brand	Model No.	Spec.	Remark
1	APD	WA-36A12R	Input: 100-240Vac, 0.9A, 50/60Hz Output: 12V, 3A DC output cable: Unshielded 1.8m	Changeable plug
2	APD	WA-36A12FU	Input: 100-240Vac, 0.9A, 50/60Hz Output: 12V, 3A DC output cable: Unshielded 1.8m	Fixed plug

Note:
1. The Adapters 1 is as same as Adapter 2; except for plug shape is different.
2. From the above adapter, **Adapters 1** was selected for the final test. Therefore only the test data of the mode was recorded in this report.

4. The antennas provided to the EUT, please refer to the following table:

For WLAN				
Chain No	Antenna Net Gain (dBi)	Frequency range (GHz)	Antenna Type	Connector Type
0	0	2.4 ~ 2.4835	PIFA	IPEX
1	0	2.4 ~ 2.4835	PIFA	IPEX
2	0	2.4 ~ 2.4835	PIFA	IPEX
0	0	5.15 ~ 5.25	Dipole	IPEX
	0	5.725 ~ 5.85		
1	0	5.15 ~ 5.25	Dipole	IPEX
	0	5.725 ~ 5.85		
2	0	5.15 ~ 5.25	PIFA	IPEX
	0.7	5.725 ~ 5.85		

For Bluetooth			
Antenna Net Gain(dBi)	Frequency range (MHz)	Antenna Type	Connector Type
2.3	2402~2480	PIFA	IPEX

5. The EUT incorporates a MIMO function.

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	3TX	3RX
802.11g	3TX	3RX
802.11n (HT20)	3TX	3RX
802.11n (HT40)	3TX	3RX
5GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11a	3TX	3RX
802.11n (HT20)	3TX	3RX
802.11n (HT40)	3TX	3RX
802.11ac (VHT20)	3TX	3RX
802.11ac (VHT40)	3TX	3RX
802.11ac (VHT80)	3TX	3RX

Note:
1. All of modulation mode support beamforming function except 2.4GHz & 802.11a modulation mode.

6. The power setting are list as below:

Modulation Mode	Frequency (MHz)	Power Setting
802.11b	2412	25
	2437	25
	2462	25
802.11g	2412	18
	2437	25.5
	2462	18
802.11n (HT20)	2412	18
	2437	25.5
	2462	18
802.11n (HT40)	2422	17
	2437	21.5
	2452	17

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

Channel	Frequency	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where RE≥1G: Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

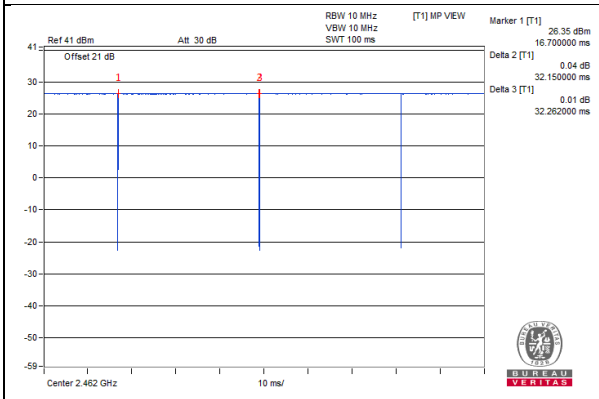
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	22deg. C, 64%RH	120Vac, 60Hz	Steven Chiang
RE<1G	24deg. C, 68%RH	120Vac, 60Hz	Andy Ho
PLC	24deg. C, 76%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

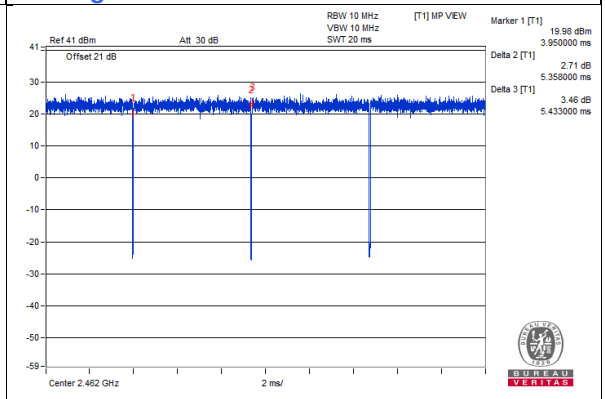
If duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11b: Duty cycle = 32.15/32.262 = 0.997
802.11g: Duty cycle = 5.358/5.433 = 0.986
802.11n (HT20): Duty cycle = 19.725/19.8 = 0.996
802.11n (HT40): Duty cycle = 9.526/9.573 = 0.995

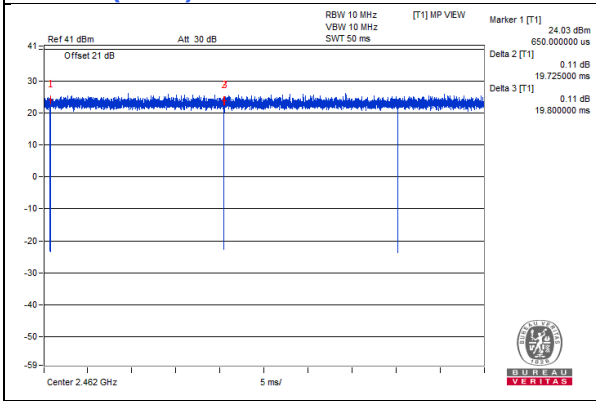
802.11b



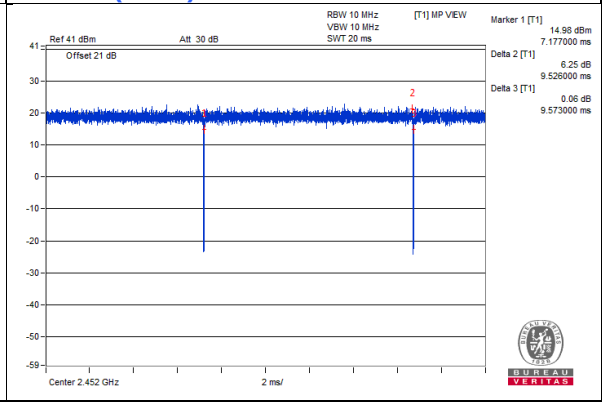
802.11g



802.11n (HT20)



802.11n (HT40)



3.4 Description of Support Units

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.

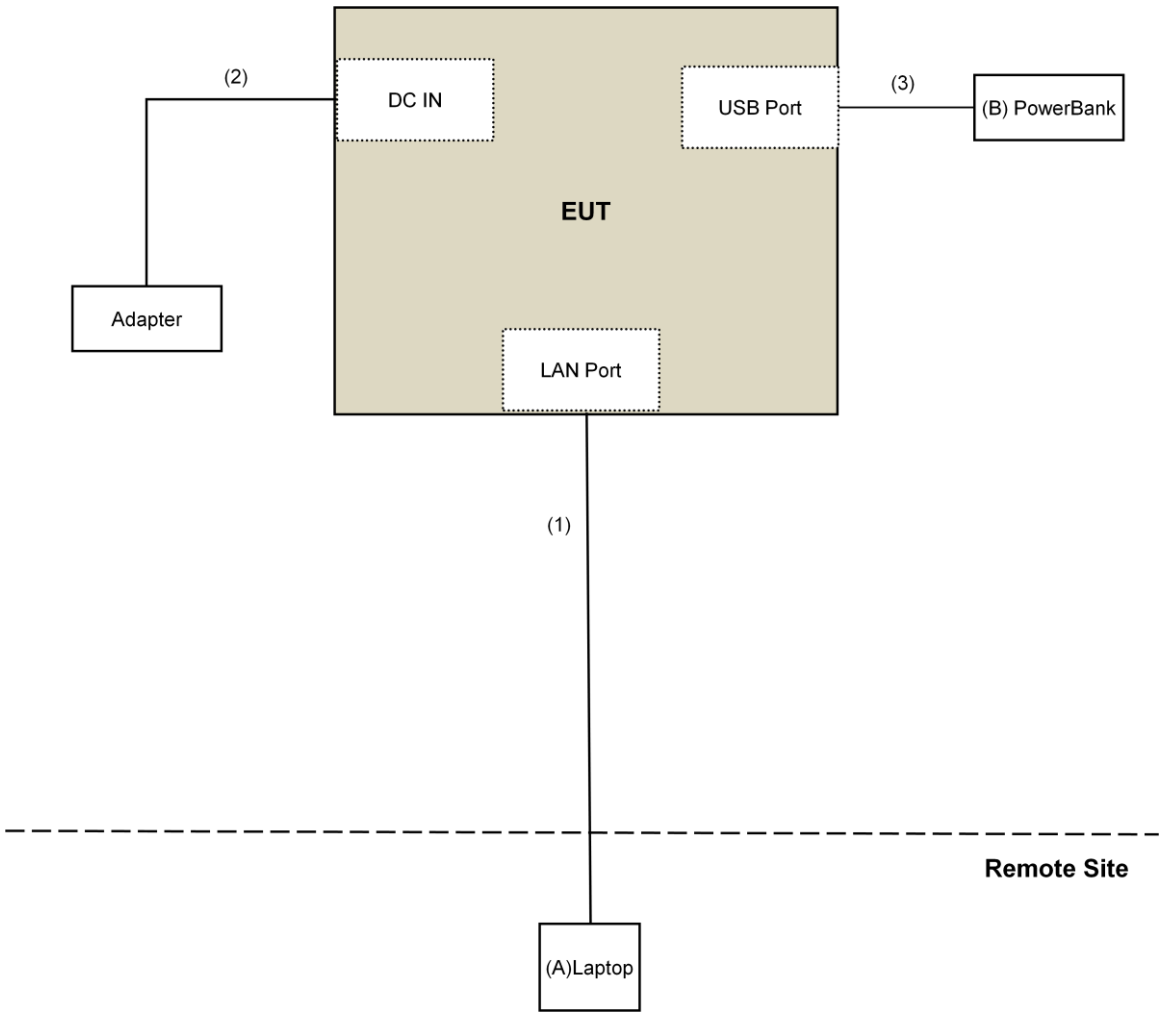
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	PowerBank	MI	PLM09ZM	NA	NA	Supplied by client

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.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	DC Cable	1	1.8	No	0	Supplied by client
3.	microUSB Cable	1	1	Yes	0	Supplied by client

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)
KDB 558074 D01 15.247 Meas Guidance v05
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

Frequencies (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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna Electro-Metrics	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Oct. 30, 2018	Oct. 29, 2019
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 22, 2018	Nov. 21, 2019
RF Cable	8D	966-4-1	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-2	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 25, 2018	Nov. 24, 2019
Pre-Amplifier Mini-Circuits	ZVA-183-S+	AMP-ZVA-03	May 10, 2018	May 09, 2019
RF Cable	EMC104-SM-SM-1200	160923	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150318	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Nov. 25, 2018	Nov. 24, 2019
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018	Apr. 15, 2019

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. 4.
3. The CANADA Site Registration No. is 20331-2
4. Loop antenna was used for all emissions below 30 MHz.
5. Tested Date: Jan. 02 to 04, 2019

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

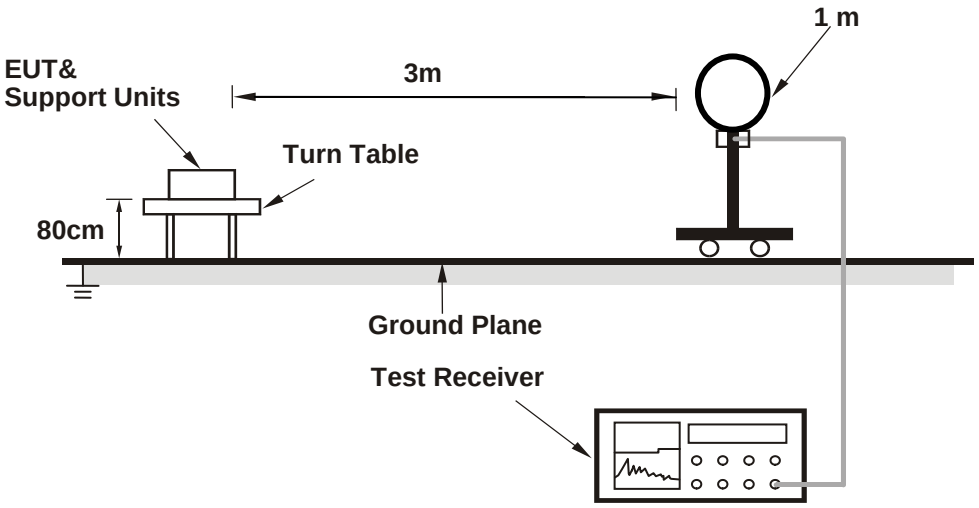
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

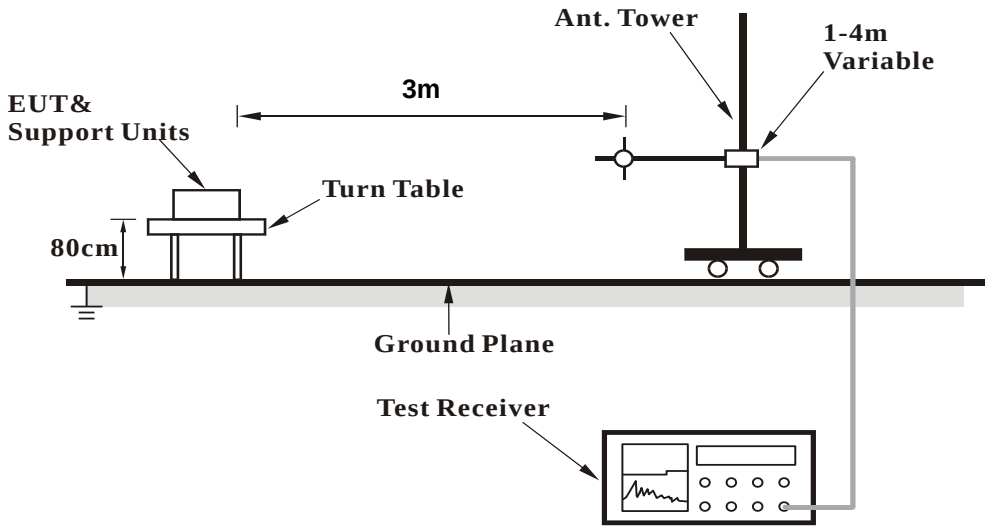
No deviation.

4.1.5 Test Setup

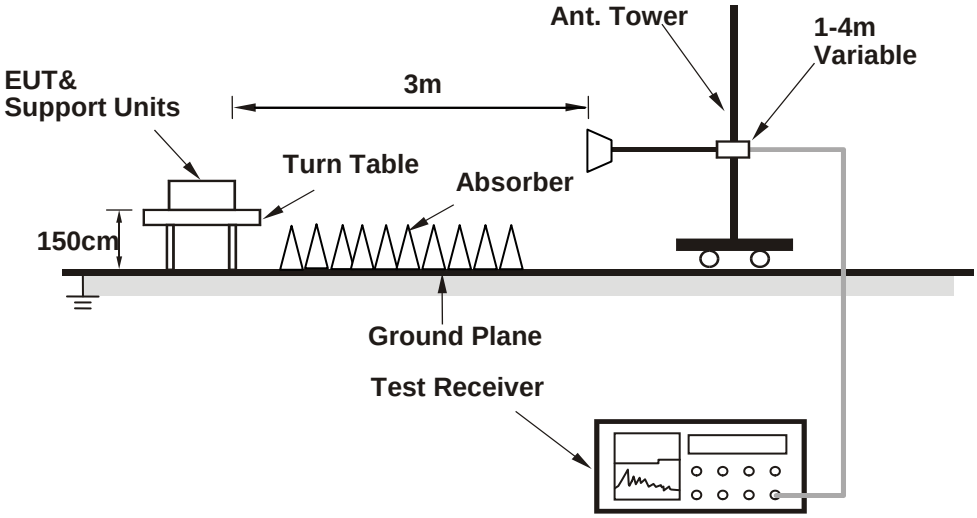
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

a. Connected the EUT with the Laptop which is placed on remote site.
b. Controlling software (QDART-Connectivity (1.0.00053)) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data：

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.3 PK	74.0	-12.7	1.19 H	134	63.3	-2.0
2	2390.00	53.2 AV	54.0	-0.8	1.19 H	134	55.2	-2.0
3	*2412.00	117.0 PK			1.19 H	134	119.1	-2.1
4	*2412.00	114.8 AV			1.19 H	134	116.9	-2.1
5	4824.00	48.0 PK	74.0	-26.0	1.09 H	50	46.0	2.0
6	4824.00	46.4 AV	54.0	-7.6	1.09 H	50	44.4	2.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.3 PK	74.0	-15.7	2.85 V	64	60.3	-2.0
2	2390.00	47.8 AV	54.0	-6.2	2.85 V	64	49.8	-2.0
3	*2412.00	109.2 PK			2.85 V	64	111.3	-2.1
4	*2412.00	107.4 AV			2.85 V	64	109.5	-2.1
5	4824.00	48.4 PK	74.0	-25.6	1.14 V	171	46.4	2.0
6	4824.00	46.7 AV	54.0	-7.3	1.14 V	171	44.7	2.0

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.5 PK	74.0	-15.5	1.15 H	132	60.5	-2.0
2	2390.00	45.7 AV	54.0	-8.3	1.15 H	132	47.7	-2.0
3	*2437.00	116.7 PK			1.15 H	132	118.9	-2.2
4	*2437.00	114.6 AV			1.15 H	132	116.8	-2.2
5	2483.50	59.4 PK	74.0	-14.6	1.15 H	132	61.6	-2.2
6	2483.50	47.6 AV	54.0	-6.4	1.15 H	132	49.8	-2.2
7	4874.00	49.0 PK	74.0	-25.0	1.12 H	44	47.0	2.0
8	4874.00	48.0 AV	54.0	-6.0	1.12 H	44	46.0	2.0
9	7311.00	48.8 PK	74.0	-25.2	1.54 H	272	40.3	8.5
10	7311.00	40.7 AV	54.0	-13.3	1.54 H	272	32.2	8.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.3 PK	74.0	-15.7	2.79 V	57	60.3	-2.0
2	2390.00	45.5 AV	54.0	-8.5	2.79 V	57	47.5	-2.0
3	*2437.00	109.0 PK			2.79 V	57	111.2	-2.2
4	*2437.00	107.3 AV			2.79 V	57	109.5	-2.2
5	2483.50	58.6 PK	74.0	-15.4	2.79 V	57	60.8	-2.2
6	2483.50	45.7 AV	54.0	-8.3	2.79 V	57	47.9	-2.2
7	4874.00	49.2 PK	74.0	-24.8	1.13 V	177	47.2	2.0
8	4874.00	46.6 AV	54.0	-7.4	1.13 V	177	44.6	2.0
9	7311.00	50.4 PK	74.0	-23.6	1.23 V	118	41.9	8.5
10	7311.00	44.9 AV	54.0	-9.1	1.23 V	118	36.4	8.5

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	116.4 PK			1.42 H	162	118.6	-2.2
2	*2462.00	114.4 AV			1.42 H	162	116.6	-2.2
3	2483.50	61.0 PK	74.0	-13.0	1.42 H	162	63.2	-2.2
4	2483.50	53.0 AV	54.0	-1.0	1.42 H	162	55.2	-2.2
5	4924.00	48.5 PK	74.0	-25.5	1.14 H	57	46.5	2.0
6	4924.00	46.8 AV	54.0	-7.2	1.14 H	57	44.8	2.0
7	7386.00	47.8 PK	74.0	-26.2	1.49 H	261	39.2	8.6
8	7386.00	39.7 AV	54.0	-14.3	1.49 H	261	31.1	8.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.0 PK			2.83 V	62	111.2	-2.2
2	*2462.00	107.0 AV			2.83 V	62	109.2	-2.2
3	2483.50	58.1 PK	74.0	-15.9	2.83 V	62	60.3	-2.2
4	2483.50	47.5 AV	54.0	-6.5	2.83 V	62	49.7	-2.2
5	4924.00	48.0 PK	74.0	-26.0	1.12 V	171	46.0	2.0
6	4924.00	46.4 AV	54.0	-7.6	1.12 V	171	44.4	2.0
7	7386.00	49.3 PK	74.0	-24.7	1.24 V	112	40.7	8.6
8	7386.00	43.8 AV	54.0	-10.2	1.24 V	112	35.2	8.6

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.2 PK	74.0	-0.8	1.20 H	157	75.2	-2.0
2	2390.00	52.3 AV	54.0	-1.7	1.20 H	157	54.3	-2.0
3	*2412.00	115.0 PK			1.20 H	157	117.1	-2.1
4	*2412.00	104.9 AV			1.20 H	157	107.0	-2.1
5	4824.00	45.3 PK	74.0	-28.7	1.08 H	26	43.3	2.0
6	4824.00	43.6 AV	54.0	-10.4	1.08 H	26	41.6	2.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.3 PK	74.0	-14.7	2.77 V	60	61.3	-2.0
2	2390.00	46.5 AV	54.0	-7.5	2.77 V	60	48.5	-2.0
3	*2412.00	107.6 PK			2.77 V	60	109.7	-2.1
4	*2412.00	97.5 AV			2.77 V	60	99.6	-2.1
5	4824.00	44.9 PK	74.0	-29.1	1.03 V	176	42.9	2.0
6	4824.00	42.5 AV	54.0	-11.5	1.03 V	176	40.5	2.0

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.8 PK	74.0	-2.2	1.37 H	132	73.8	-2.0
2	2390.00	52.5 AV	54.0	-1.5	1.37 H	132	54.5	-2.0
3	*2437.00	120.3 PK			1.37 H	132	122.5	-2.2
4	*2437.00	109.8 AV			1.37 H	132	112.0	-2.2
5	2483.50	71.6 PK	74.0	-2.4	1.37 H	132	73.8	-2.2
6	**2483.50**	**53.4 AV**	**54.0**	**-0.6**	**1.37 H**	**132**	**55.6**	**-2.2**
7	4874.00	48.8 PK	74.0	-25.2	1.17 H	64	46.8	2.0
8	4874.00	47.1 AV	54.0	-6.9	1.17 H	64	45.1	2.0
9	7311.00	48.2 PK	74.0	-25.8	1.52 H	262	39.7	8.5
10	7311.00	39.8 AV	54.0	-14.2	1.52 H	262	31.3	8.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.3 PK	74.0	-15.7	2.89 V	55	60.3	-2.0
2	2390.00	46.6 AV	54.0	-7.4	2.89 V	55	48.6	-2.0
3	*2437.00	113.0 PK			2.89 V	55	115.2	-2.2
4	*2437.00	102.5 AV			2.89 V	55	104.7	-2.2
5	2483.50	58.7 PK	74.0	-15.3	2.89 V	55	60.9	-2.2
6	2483.50	47.8 AV	54.0	-6.2	2.89 V	55	50.0	-2.2
7	4874.00	48.9 PK	74.0	-25.1	1.09 V	186	46.9	2.0
8	4874.00	46.4 AV	54.0	-7.6	1.09 V	186	44.4	2.0
9	7311.00	50.9 PK	74.0	-23.1	1.24 V	120	42.4	8.5
10	7311.00	45.3 AV	54.0	-8.7	1.24 V	120	36.8	8.5

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.7 PK			1.25 H	153	116.9	-2.2
2	*2462.00	104.4 AV			1.25 H	153	106.6	-2.2
3	**2483.50**	**73.4 PK**	**74.0**	**-0.6**	**1.25 H**	**153**	**75.6**	**-2.2**
4	2483.50	52.1 AV	54.0	-1.9	1.25 H	153	54.3	-2.2
5	4924.00	45.0 PK	74.0	-29.0	1.14 H	29	43.0	2.0
6	4924.00	42.9 AV	54.0	-11.1	1.14 H	29	40.9	2.0
7	7386.00	44.1 PK	74.0	-29.9	1.49 H	239	35.5	8.6
8	7386.00	36.5 AV	54.0	-17.5	1.49 H	239	27.9	8.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.6 PK			2.78 V	58	109.8	-2.2
2	*2462.00	97.3 AV			2.78 V	58	99.5	-2.2
3	2483.50	58.9 PK	74.0	-15.1	2.78 V	58	61.1	-2.2
4	2483.50	46.3 AV	54.0	-7.7	2.78 V	58	48.5	-2.2
5	4924.00	44.4 PK	74.0	-29.6	1.11 V	160	42.4	2.0
6	4924.00	42.0 AV	54.0	-12.0	1.11 V	160	40.0	2.0
7	7386.00	47.2 PK	74.0	-26.8	1.26 V	123	38.6	8.6
8	7386.00	42.0 AV	54.0	-12.0	1.26 V	123	33.4	8.6

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.0 PK	74.0	-1.0	1.10 H	146	75.0	-2.0
2	2390.00	52.2 AV	54.0	-1.8	1.10 H	146	54.2	-2.0
3	*2412.00	114.8 PK			1.10 H	146	116.9	-2.1
4	*2412.00	104.6 AV			1.10 H	146	106.7	-2.1
5	4824.00	44.9 PK	74.0	-29.1	1.11 H	20	42.9	2.0
6	4824.00	43.2 AV	54.0	-10.8	1.11 H	20	41.2	2.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.4 PK	74.0	-15.6	2.87 V	49	60.4	-2.0
2	2390.00	47.1 AV	54.0	-6.9	2.87 V	49	49.1	-2.0
3	*2412.00	107.2 PK			2.87 V	49	109.3	-2.1
4	*2412.00	97.0 AV			2.87 V	49	99.1	-2.1
5	4824.00	44.6 PK	74.0	-29.4	1.06 V	158	42.6	2.0
6	4824.00	42.4 AV	54.0	-11.6	1.06 V	158	40.4	2.0

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.3 PK	74.0	-2.7	1.18 H	135	73.3	-2.0
2	2390.00	53.3 AV	54.0	-0.7	1.18 H	135	55.3	-2.0
3	*2437.00	119.8 PK			1.18 H	135	122.0	-2.2
4	*2437.00	109.9 AV			1.18 H	135	112.1	-2.2
5	2483.50	72.3 PK	74.0	-1.7	1.18 H	135	74.5	-2.2
6	2483.50	52.1 AV	54.0	-1.9	1.18 H	135	54.3	-2.2
7	4874.00	49.1 PK	74.0	-24.9	1.13 H	54	47.1	2.0
8	4874.00	47.2 AV	54.0	-6.8	1.13 H	54	45.2	2.0
9	7311.00	47.8 PK	74.0	-26.2	1.46 H	255	39.3	8.5
10	7311.00	39.7 AV	54.0	-14.3	1.46 H	255	31.2	8.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.8 PK	74.0	-16.2	2.78 V	52	59.8	-2.0
2	2390.00	47.2 AV	54.0	-6.8	2.78 V	52	49.2	-2.0
3	*2437.00	112.5 PK			2.78 V	52	114.7	-2.2
4	*2437.00	102.6 AV			2.78 V	52	104.8	-2.2
5	2483.50	58.1 PK	74.0	-15.9	2.78 V	52	60.3	-2.2
6	2483.50	46.0 AV	54.0	-8.0	2.78 V	52	48.2	-2.2
7	4874.00	49.3 PK	74.0	-24.7	1.19 V	181	47.3	2.0
8	4874.00	46.5 AV	54.0	-7.5	1.19 V	181	44.5	2.0
9	7311.00	50.4 PK	74.0	-23.6	1.25 V	111	41.9	8.5
10	7311.00	45.0 AV	54.0	-9.0	1.25 V	111	36.5	8.5

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.6 PK			1.00 H	128	116.8	-2.2
2	*2462.00	104.3 AV			1.00 H	128	106.5	-2.2
3	**2483.50**	**73.4 PK**	**74.0**	**-0.6**	**1.00 H**	**128**	**75.6**	**-2.2**
4	2483.50	50.5 AV	54.0	-3.5	1.00 H	128	52.7	-2.2
5	4924.00	44.9 PK	74.0	-29.1	1.16 H	45	42.9	2.0
6	4924.00	43.0 AV	54.0	-11.0	1.16 H	45	41.0	2.0
7	7386.00	43.5 PK	74.0	-30.5	1.40 H	227	34.9	8.6
8	7386.00	35.8 AV	54.0	-18.2	1.40 H	227	27.2	8.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.4 PK			2.89 V	76	109.6	-2.2
2	*2462.00	97.1 AV			2.89 V	76	99.3	-2.2
3	2483.50	58.9 PK	74.0	-15.1	2.89 V	76	61.1	-2.2
4	2483.50	47.3 AV	54.0	-6.7	2.89 V	76	49.5	-2.2
5	4924.00	44.9 PK	74.0	-29.1	1.08 V	170	42.9	2.0
6	4924.00	42.6 AV	54.0	-11.4	1.08 V	170	40.6	2.0
7	7386.00	47.6 PK	74.0	-26.4	1.21 V	114	39.0	8.6
8	7386.00	42.0 AV	54.0	-12.0	1.21 V	114	33.4	8.6

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.0 PK	74.0	-5.0	1.20 H	133	71.0	-2.0
2	2390.00	53.1 AV	54.0	-0.9	1.20 H	133	55.1	-2.0
3	*2422.00	111.0 PK			1.20 H	133	113.1	-2.1
4	*2422.00	100.8 AV			1.20 H	133	102.9	-2.1
5	4844.00	45.0 PK	74.0	-29.0	1.08 H	40	43.1	1.9
6	4844.00	43.2 AV	54.0	-10.8	1.08 H	40	41.3	1.9
7	7266.00	43.9 PK	74.0	-30.1	1.41 H	242	35.4	8.5
8	7266.00	36.5 AV	54.0	-17.5	1.41 H	242	28.0	8.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.1 PK	74.0	-15.9	2.77 V	71	60.1	-2.0
2	2390.00	47.5 AV	54.0	-6.5	2.77 V	71	49.5	-2.0
3	*2422.00	104.0 PK			2.77 V	71	106.1	-2.1
4	*2422.00	93.8 AV			2.77 V	71	95.9	-2.1
5	4844.00	45.5 PK	74.0	-28.5	1.17 V	165	43.6	1.9
6	4844.00	42.8 AV	54.0	-11.2	1.17 V	165	40.9	1.9
7	7266.00	48.6 PK	74.0	-25.4	1.31 V	133	40.1	8.5
8	7266.00	41.0 AV	54.0	-13.0	1.31 V	133	32.5	8.5

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.9 PK	74.0	-5.1	1.40 H	132	70.9	-2.0
2	2390.00	53.0 AV	54.0	-1.0	1.40 H	132	55.0	-2.0
3	*2437.00	115.1 PK			1.40 H	132	117.3	-2.2
4	*2437.00	104.9 AV			1.40 H	132	107.1	-2.2
5	2483.50	66.7 PK	74.0	-7.3	1.40 H	132	68.9	-2.2
6	2483.50	51.0 AV	54.0	-3.0	1.40 H	132	53.2	-2.2
7	4874.00	46.8 PK	74.0	-27.2	1.16 H	41	44.8	2.0
8	4874.00	45.1 AV	54.0	-8.9	1.16 H	41	43.1	2.0
9	7311.00	45.7 PK	74.0	-28.3	1.45 H	247	37.2	8.5
10	7311.00	37.8 AV	54.0	-16.2	1.45 H	247	29.3	8.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.1 PK	74.0	-15.9	2.84 V	53	60.1	-2.0
2	2390.00	47.4 AV	54.0	-6.6	2.84 V	53	49.4	-2.0
3	*2437.00	107.9 PK			2.84 V	53	110.1	-2.2
4	*2437.00	97.7 AV			2.84 V	53	99.9	-2.2
5	2483.50	56.8 PK	74.0	-17.2	2.84 V	53	59.0	-2.2
6	2483.50	46.0 AV	54.0	-8.0	2.84 V	53	48.2	-2.2
7	4874.00	46.9 PK	74.0	-27.1	1.12 V	175	44.9	2.0
8	4874.00	44.4 AV	54.0	-9.6	1.12 V	175	42.4	2.0
9	7311.00	48.9 PK	74.0	-25.1	1.29 V	129	40.4	8.5
10	7311.00	43.4 AV	54.0	-10.6	1.29 V	129	34.9	8.5

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	110.8 PK			1.37 H	133	113.0	-2.2
2	*2452.00	100.5 AV			1.37 H	133	102.7	-2.2
3	2483.50	68.8 PK	74.0	-5.2	1.37 H	133	71.0	-2.2
4	2483.50	53.0 AV	54.0	-1.0	1.37 H	133	55.2	-2.2
5	4904.00	45.1 PK	74.0	-28.9	1.10 H	31	43.1	2.0
6	4904.00	43.3 AV	54.0	-10.7	1.10 H	31	41.3	2.0
7	7356.00	43.8 PK	74.0	-30.2	1.46 H	237	35.3	8.5
8	7356.00	36.2 AV	54.0	-17.8	1.46 H	237	27.7	8.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	103.5 PK			2.89 V	57	105.7	-2.2
2	*2452.00	93.2 AV			2.89 V	57	95.4	-2.2
3	2483.50	58.4 PK	74.0	-15.6	2.89 V	57	60.6	-2.2
4	2483.50	47.5 AV	54.0	-6.5	2.89 V	57	49.7	-2.2
5	4904.00	44.6 PK	74.0	-29.4	1.08 V	163	42.6	2.0
6	4904.00	42.1 AV	54.0	-11.9	1.08 V	163	40.1	2.0
7	7356.00	47.0 PK	74.0	-27.0	1.25 V	124	38.5	8.5
8	7356.00	41.7 AV	54.0	-12.3	1.25 V	124	33.2	8.5

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

Below 1GHz Data:

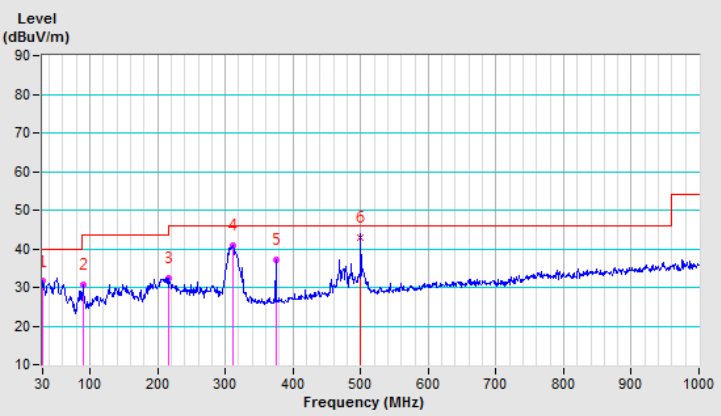
802.11b

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	30.15	31.6 QP	40.0	-8.4	2.00 H	265	41.4	-9.8
2	90.65	30.8 QP	43.5	-12.7	2.00 H	159	44.0	-13.2
3	215.42	32.4 QP	43.5	-11.1	1.50 H	178	42.8	-10.4
4	311.86	41.0 QP	46.0	-5.0	1.50 H	302	47.7	-6.7
5	375.00	37.1 QP	46.0	-8.9	1.00 H	265	42.1	-5.0
6	500.01	42.8 QP	46.0	-3.2	1.96 H	217	44.7	-1.9

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 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.

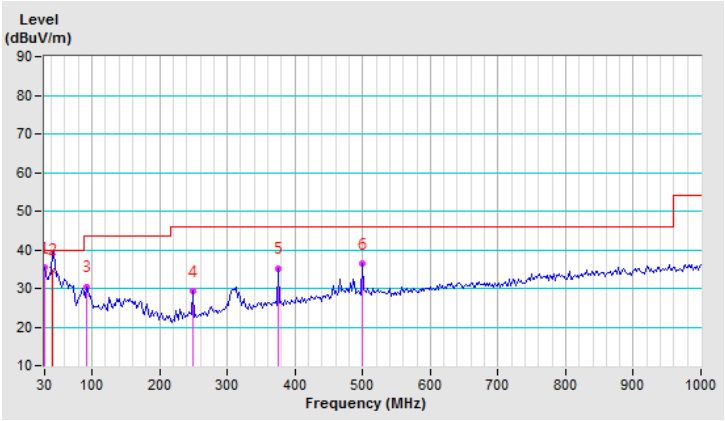


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	35.3 QP	40.0	-4.7	1.00 V	261	45.1	-9.8
2	41.77	34.7 QP	40.0	-5.3	1.00 V	198	43.1	-8.4
3	92.08	30.3 QP	43.5	-13.2	1.00 V	132	43.3	-13.0
4	249.22	29.2 QP	46.0	-16.8	1.00 V	249	37.9	-8.7
5	375.32	35.2 QP	46.0	-10.8	1.50 V	233	40.2	-5.0
6	499.48	36.3 QP	46.0	-9.7	1.50 V	141	38.2	-1.9

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 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.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2018	Oct. 23, 2019
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 22, 2018	Oct. 21, 2019
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 04, 2018	June 03, 2019
50 ohms Terminator	N/A	3	Oct. 22, 2018	Oct. 21, 2019
RF Cable	5D-FB	COCCAB-001	Sep. 28, 2018	Sep. 27, 2019
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
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: Dec. 18, 2018

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

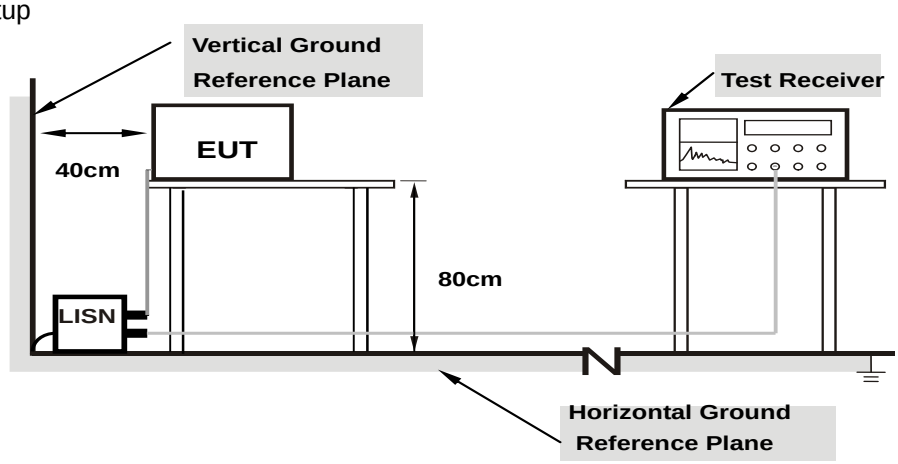
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

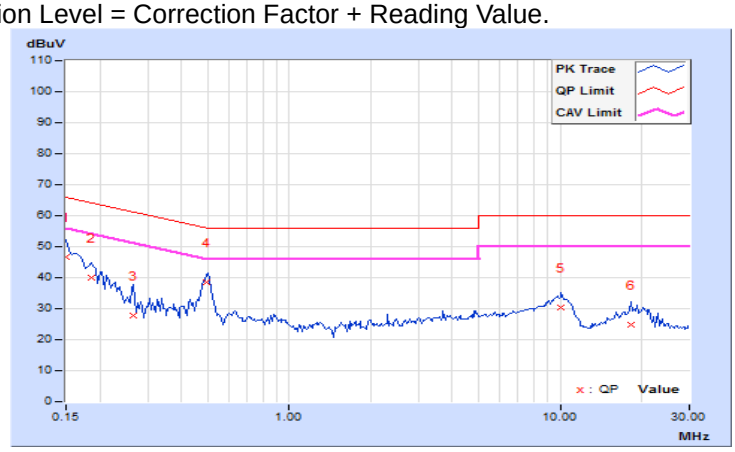
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.03	36.62	20.28	46.65	30.31	66.00	56.00	-19.35	-25.69
2	0.18516	10.04	30.00	14.77	40.04	24.81	64.25	54.25	-24.21	-29.44
3	0.26719	10.06	17.72	2.97	27.78	13.03	61.20	51.20	-33.42	-38.17
4	0.49766	10.09	28.25	22.97	38.34	33.06	56.04	46.04	-17.70	-12.98
5	10.02344	10.70	19.58	12.50	30.28	23.20	60.00	50.00	-29.72	-26.80
6	18.25391	11.24	13.57	5.32	24.81	16.56	60.00	50.00	-35.19	-33.44

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.

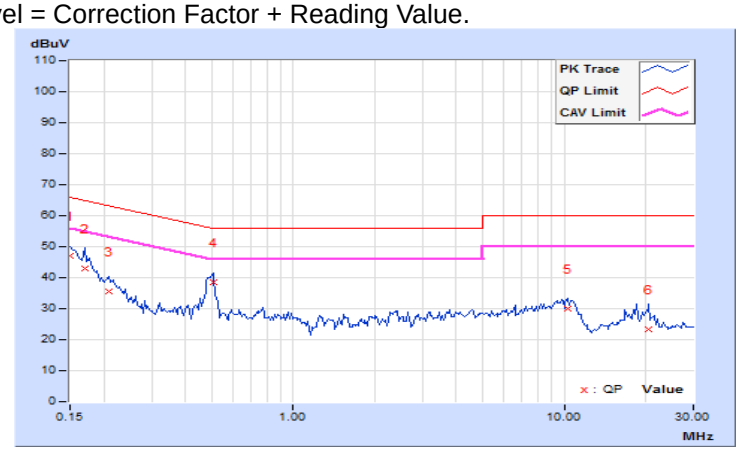


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.94	37.00	19.28	46.94	29.22	66.00	56.00	-19.06	-26.78
2	0.16953	9.94	32.90	15.93	42.84	25.87	64.98	54.98	-22.14	-29.11
3	0.20859	9.95	25.49	10.78	35.44	20.73	63.26	53.26	-27.82	-32.53
4	**0.50547**	**9.98**	**28.55**	**24.50**	**38.53**	**34.48**	**56.00**	**46.00**	**-17.47**	**-11.52**
5	10.36328	10.55	19.30	12.35	29.85	22.90	60.00	50.00	-30.15	-27.10
6	20.57813	11.15	12.29	2.29	23.44	13.44	60.00	50.00	-36.56	-36.56

REMARKS:

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

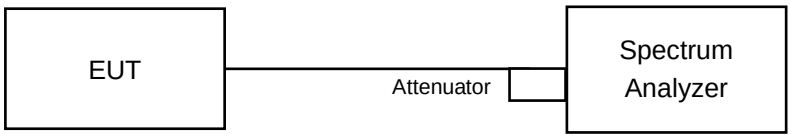


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	7.07	7.08	7.08	0.5	Pass
6	2437	7.02	7.12	7.11	0.5	Pass
11	2462	7.07	6.61	7.11	0.5	Pass

802.11g

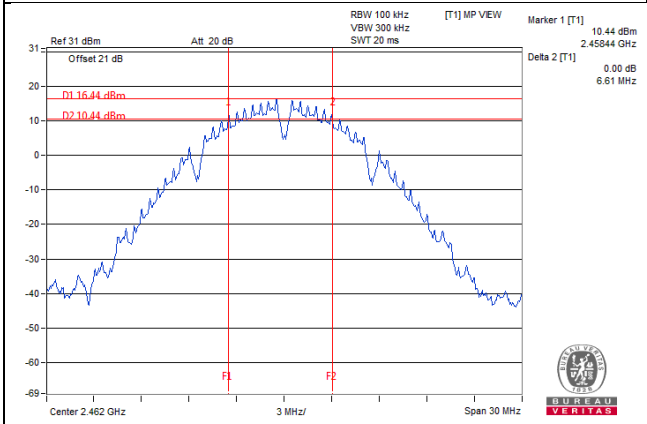
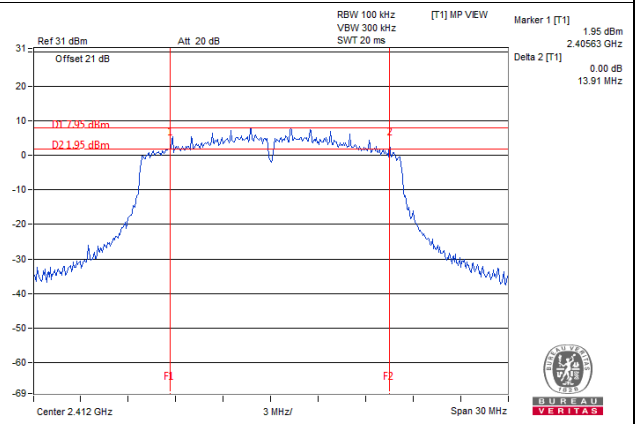
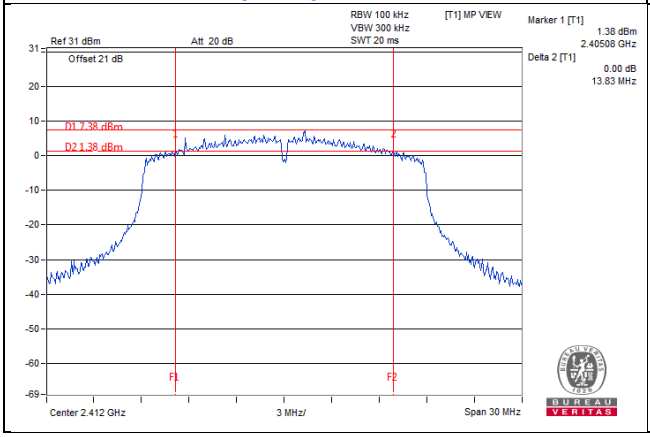
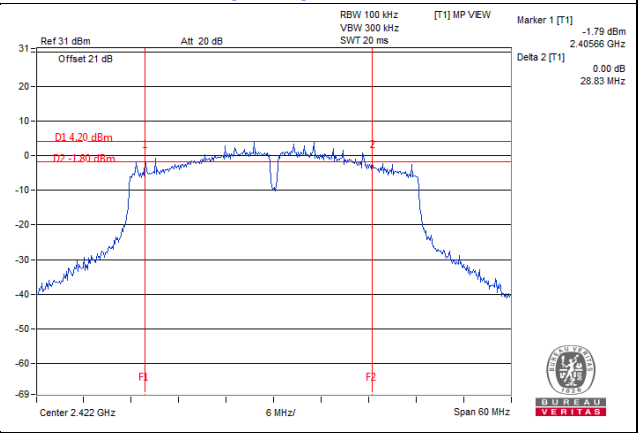
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	13.91	15.17	15.16	0.5	Pass
6	2437	15.05	15.09	15.10	0.5	Pass
11	2462	14.08	15.10	15.14	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	15.10	14.48	13.83	0.5	Pass
6	2437	14.45	15.07	15.06	0.5	Pass
11	2462	14.20	15.28	14.72	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
3	2422	28.83	28.88	35.09	0.5	Pass
6	2437	31.36	30.07	31.34	0.5	Pass
9	2452	28.89	35.11	32.58	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH11	**802.11g / Chain 0 : CH1**
	
802.11n (HT20) / Chain 2 : CH1	**802.11n (HT40) / Chain 0 : CH3**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

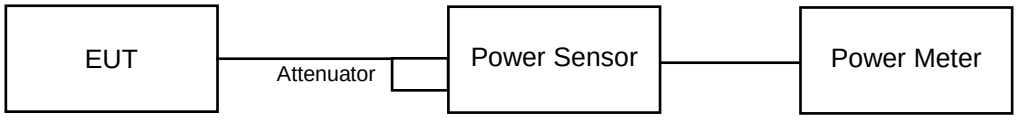
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	25.25	24.97	24.93	960.188	29.82	30.00	Pass
6	2437	25.14	24.44	25.10	928.153	29.68	30.00	Pass
11	2462	25.21	24.52	25.06	935.66	29.71	30.00	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	19.66	19.14	19.39	261.401	24.17	30.00	Pass
6	2437	24.88	24.50	24.97	903.499	29.56	30.00	Pass
11	2462	19.38	18.72	19.30	246.283	23.91	30.00	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	19.33	18.25	19.26	236.871	23.75	30.00	Pass
6	2437	24.92	24.27	24.90	886.787	29.48	30.00	Pass
11	2462	19.22	18.53	19.28	239.568	23.79	30.00	Pass

802.11n (HT40)

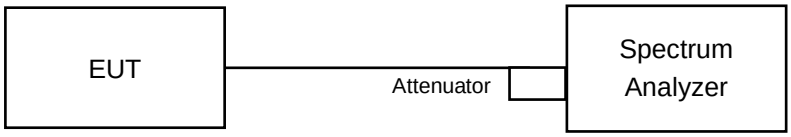
Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	17.96	17.40	17.88	178.847	22.52	30.00	Pass
6	2437	21.52	20.56	21.59	399.881	26.02	30.00	Pass
9	2452	17.65	16.73	17.75	164.874	22.17	30.00	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm in any 3 kHz.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.10	4.77	-3.33	8.00	Pass
	6	2437	-8.39	4.77	-3.62	8.00	Pass
	11	2462	-8.23	4.77	-3.46	8.00	Pass
1	1	2412	-8.21	4.77	-3.44	8.00	Pass
	6	2437	-9.02	4.77	-4.25	8.00	Pass
	11	2462	-8.42	4.77	-3.65	8.00	Pass
2	1	2412	-8.61	4.77	-3.84	8.00	Pass
	6	2437	-8.45	4.77	-3.68	8.00	Pass
	11	2462	-8.72	4.77	-3.95	8.00	Pass

Note: 1. Directional gain = 0dBi + 10log(3) = 4.77dBi < 6dBi , so the power density limit shall not be reduced.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-15.64	4.77	-10.87	8.00	Pass
	6	2437	-10.47	4.77	-5.70	8.00	Pass
	11	2462	-15.47	4.77	-10.70	8.00	Pass
1	1	2412	-15.86	4.77	-11.09	8.00	Pass
	6	2437	-11.00	4.77	-6.23	8.00	Pass
	11	2462	-16.11	4.77	-11.34	8.00	Pass
2	1	2412	-15.77	4.77	-11.00	8.00	Pass
	6	2437	-10.78	4.77	-6.01	8.00	Pass
	11	2462	-13.41	4.77	-8.64	8.00	Pass

Note: 1. Directional gain = 0dBi + 10log(3) = 4.77dBi < 6dBi , so the power density limit shall not be reduced.

802.11n (HT20)

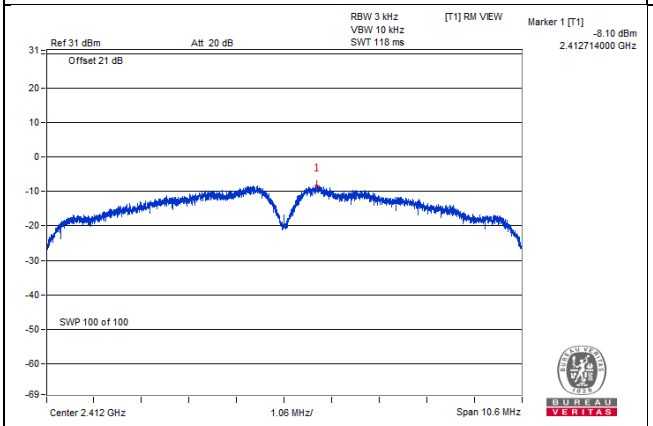
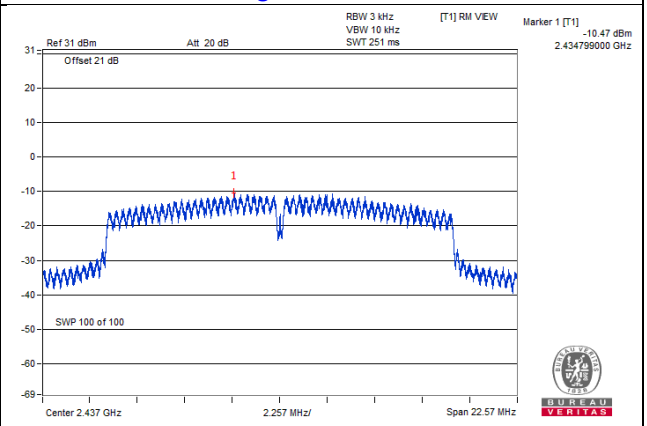
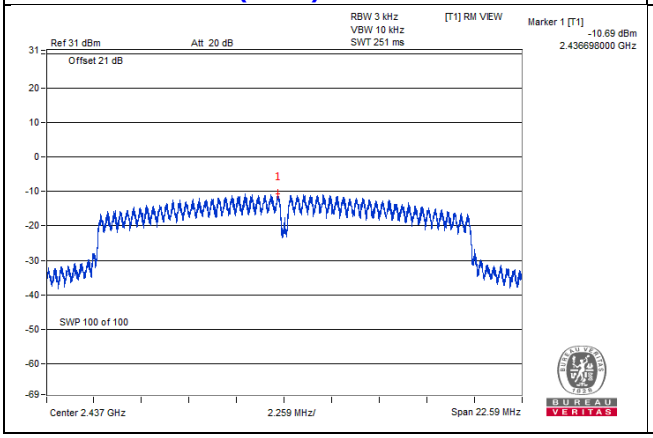
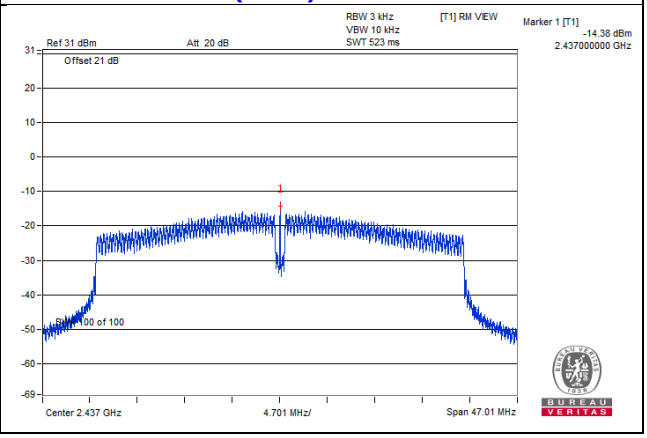
TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-16.41	4.77	-11.64	8.00	Pass
	6	2437	-10.92	4.77	-6.15	8.00	Pass
	11	2462	-16.17	4.77	-11.40	8.00	Pass
1	1	2412	-16.42	4.77	-11.65	8.00	Pass
	6	2437	-10.87	4.77	-6.10	8.00	Pass
	11	2462	-16.13	4.77	-11.36	8.00	Pass
2	1	2412	-15.99	4.77	-11.22	8.00	Pass
	6	2437	-10.69	4.77	-5.92	8.00	Pass
	11	2462	-15.83	4.77	-11.06	8.00	Pass

Note: 1. Directional gain = 0dBi + 10log(3) = 4.77dBi < 6dBi , so the power density limit shall not be reduced.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-19.75	4.77	-14.98	8.00	Pass
	6	2437	-15.86	4.77	-11.09	8.00	Pass
	9	2452	-19.59	4.77	-14.82	8.00	Pass
1	3	2422	-19.50	4.77	-14.73	8.00	Pass
	6	2437	-16.81	4.77	-12.04	8.00	Pass
	9	2452	-20.29	4.77	-15.52	8.00	Pass
2	3	2422	-19.32	4.77	-14.55	8.00	Pass
	6	2437	-14.38	4.77	-9.61	8.00	Pass
	9	2452	-19.74	4.77	-14.97	8.00	Pass

Note: 1. Directional gain = 0dBi + 10log(3) = 4.77dBi < 6dBi , so the power density limit shall not be reduced.

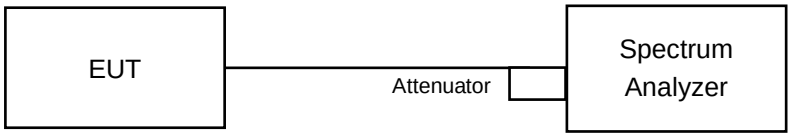
Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH1	**802.11g / Chain 0 : CH6**
	
802.11n (HT20) / Chain 2 : CH6	**802.11n (HT40) / Chain 2 : CH6**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

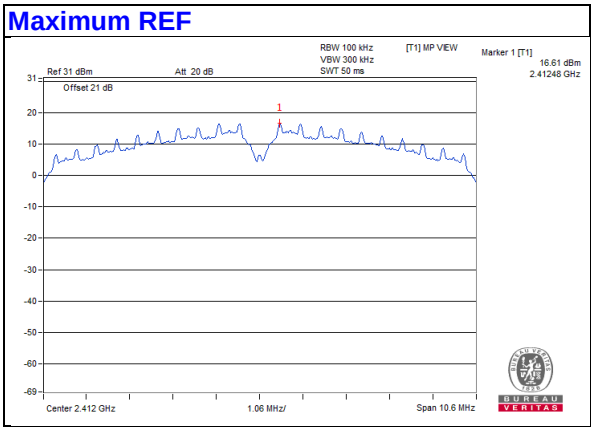
Same as Item 4.3.6

4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

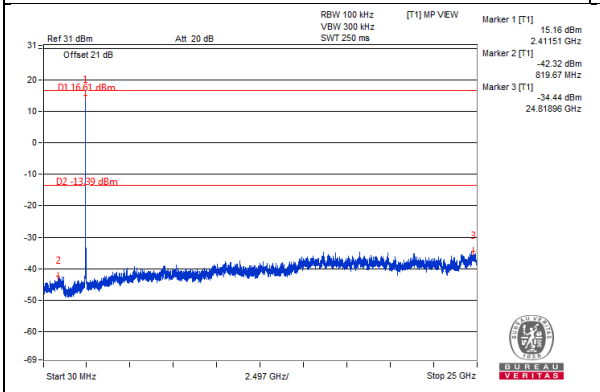
802.11b

Maximum REF

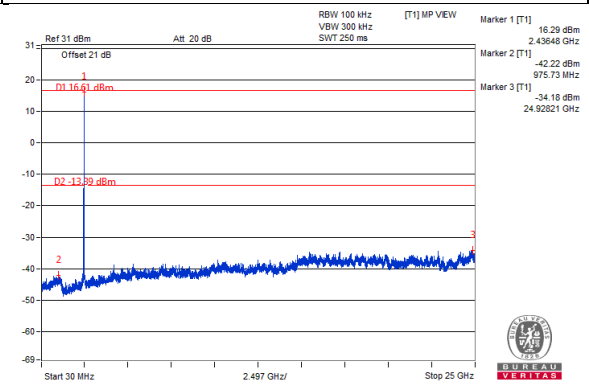


Chain 0

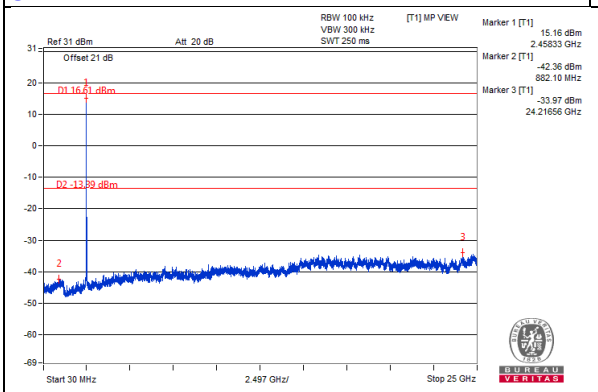
CH 1



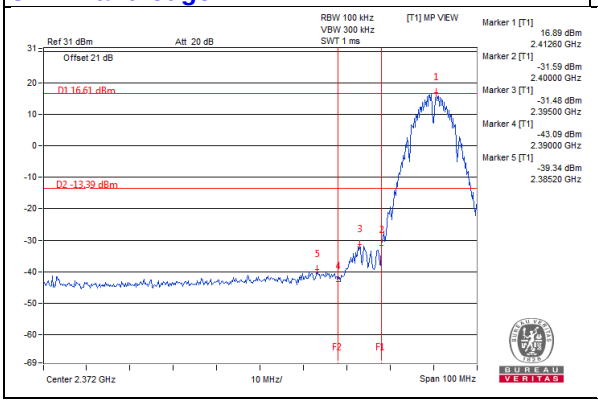
CH 6



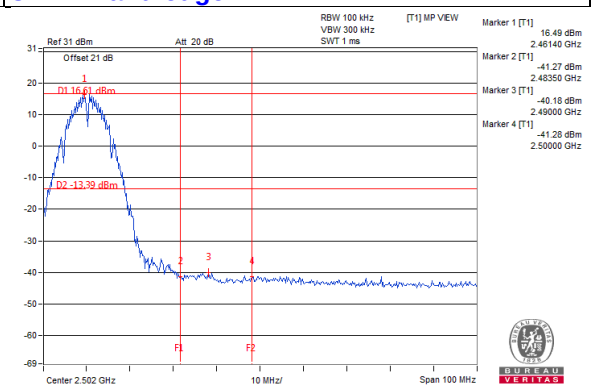
CH 11



CH 1 Band edge

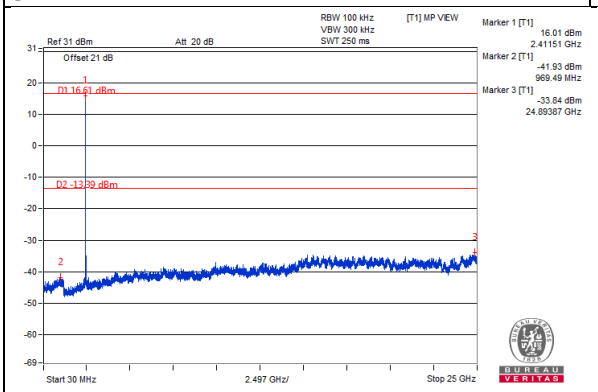


CH 11 Band edge

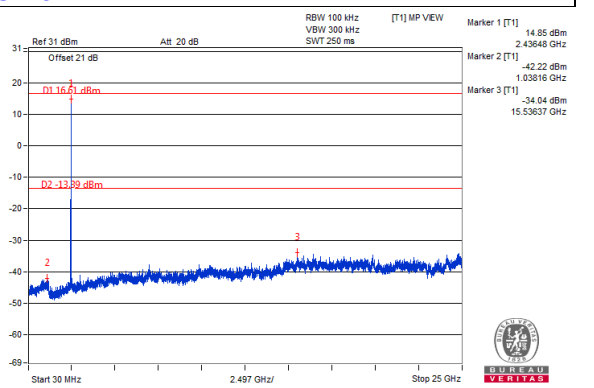


Chain 1

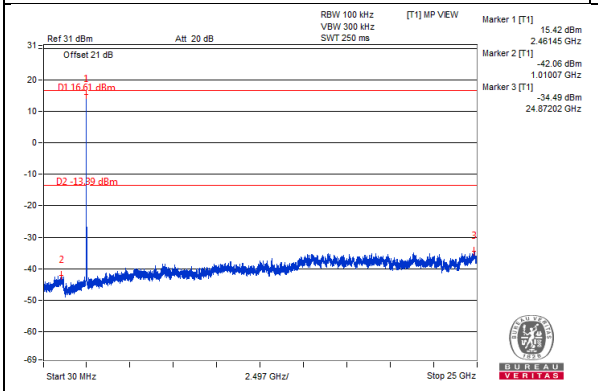
CH 1



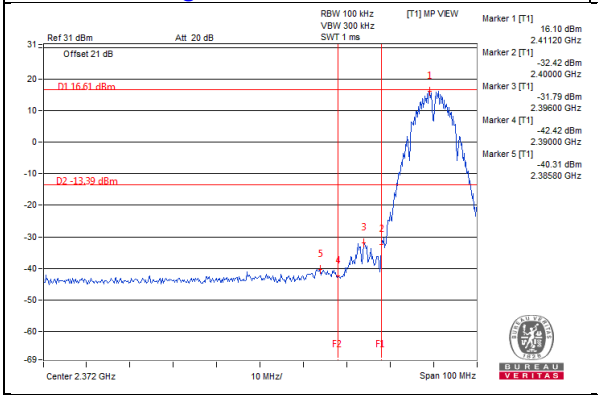
CH 6



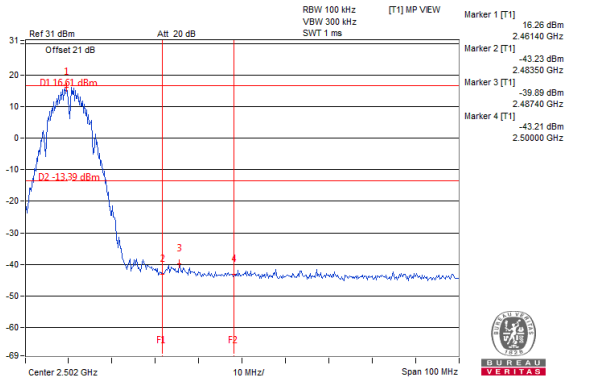
CH 11



CH 1 Band edge

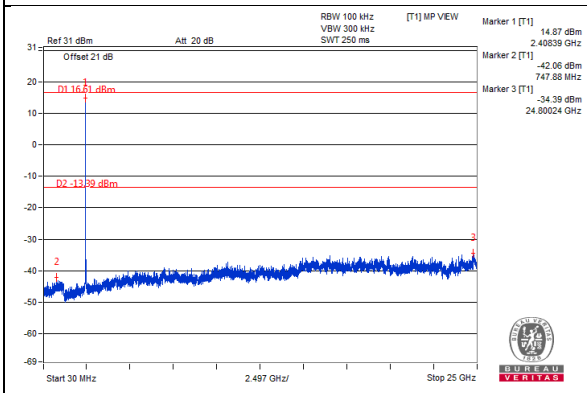


CH 11 Band edge

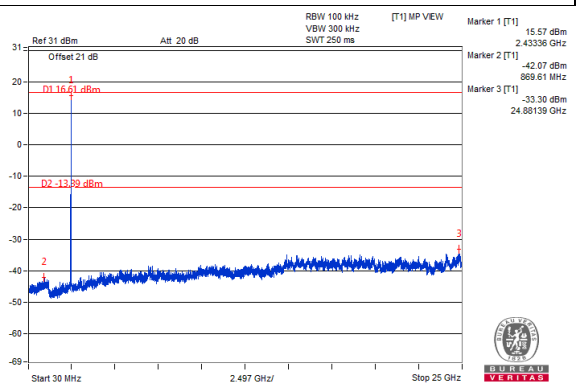


Chain 2

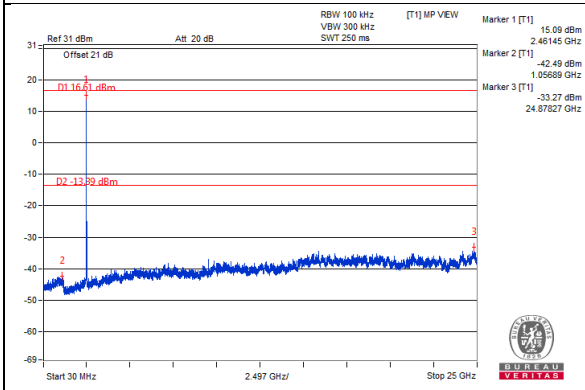
CH 1



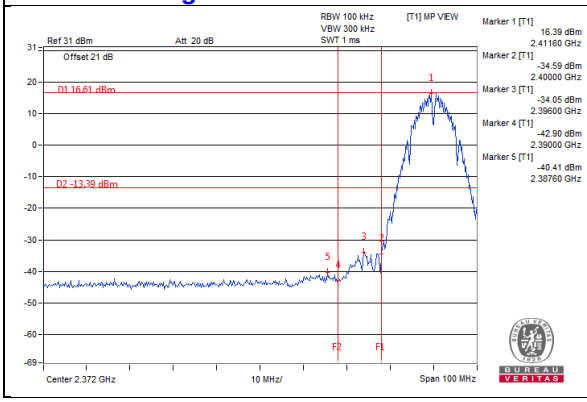
CH 6



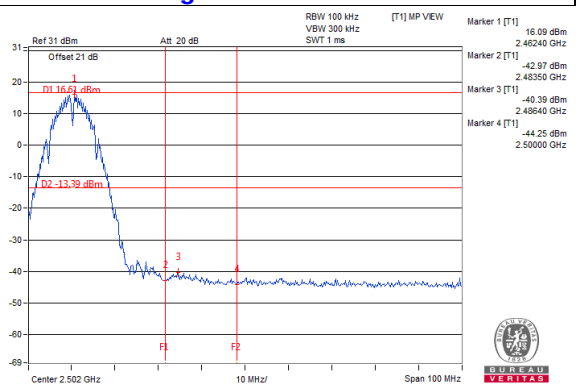
CH 11



CH 1 Band edge

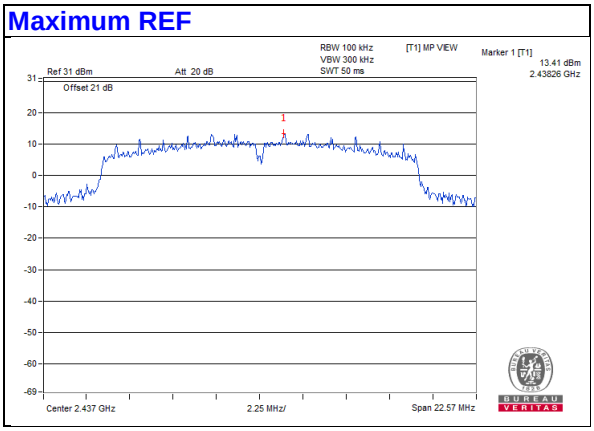


CH 11 Band edge



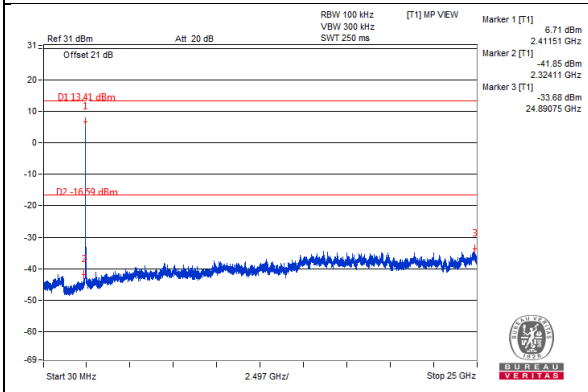
802.11g

Maximum REF

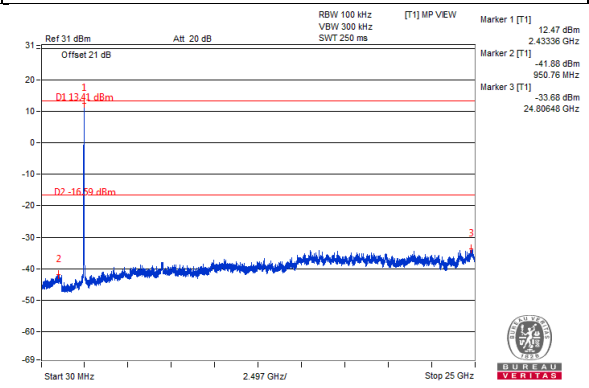


Chain 0

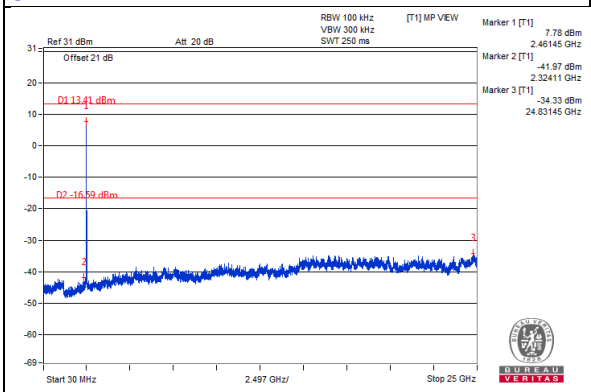
CH 1



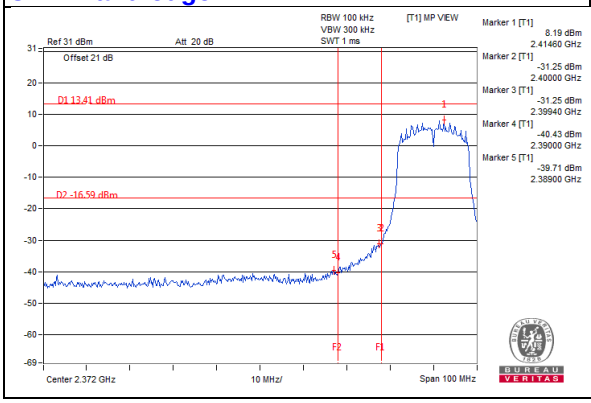
CH 6



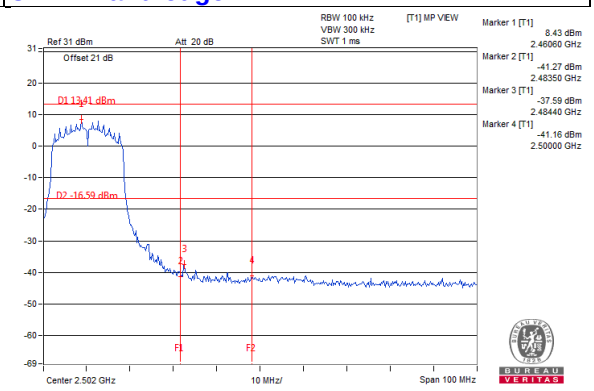
CH 11



CH 1 Band edge

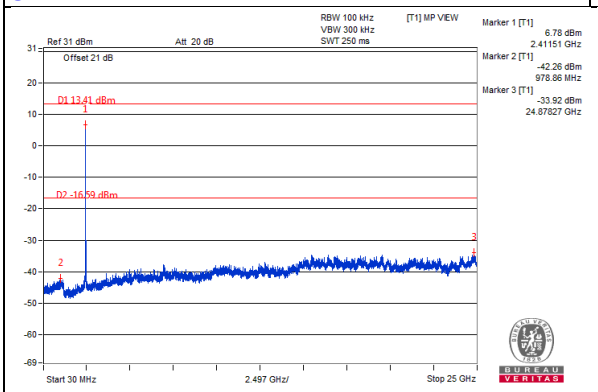


CH 11 Band edge

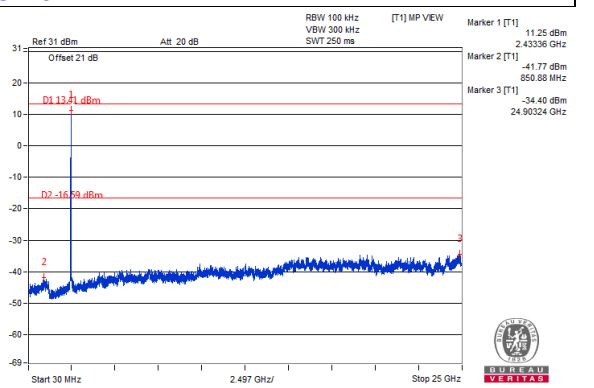


Chain 1

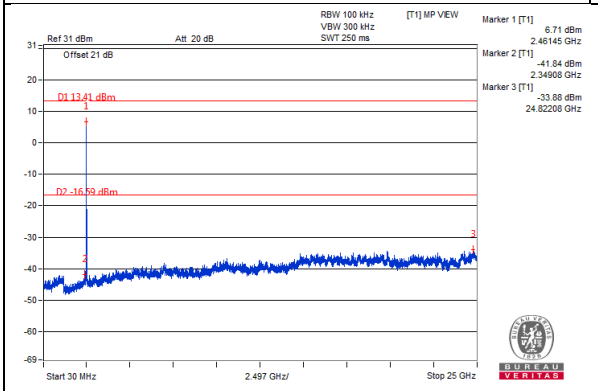
CH 1



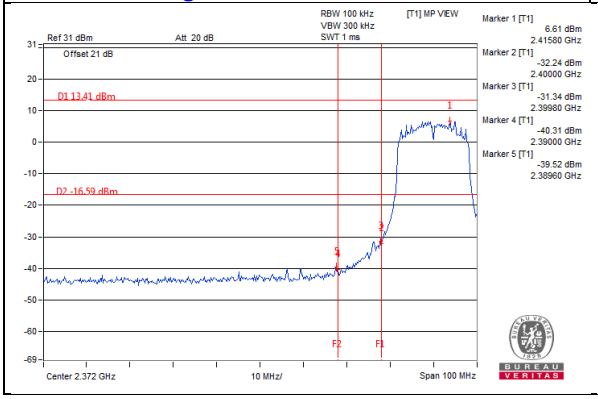
CH 6



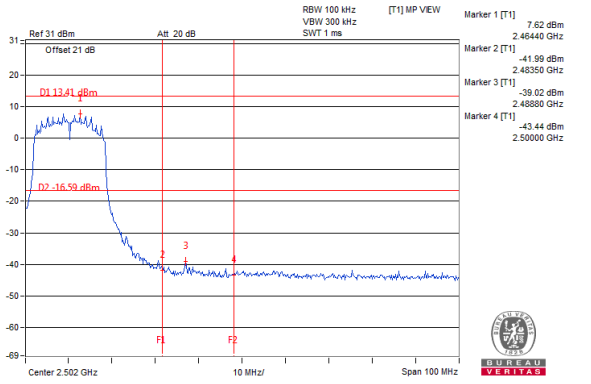
CH 11



CH 1 Band edge

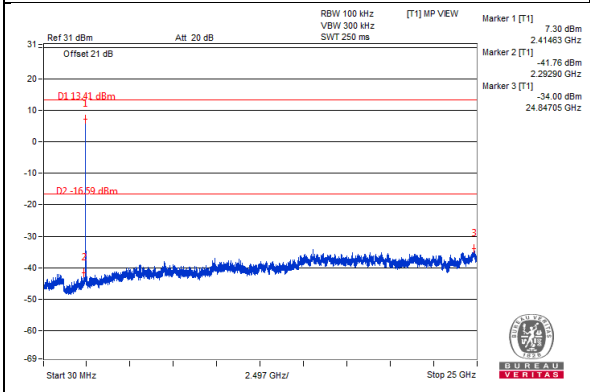


CH 11 Band edge

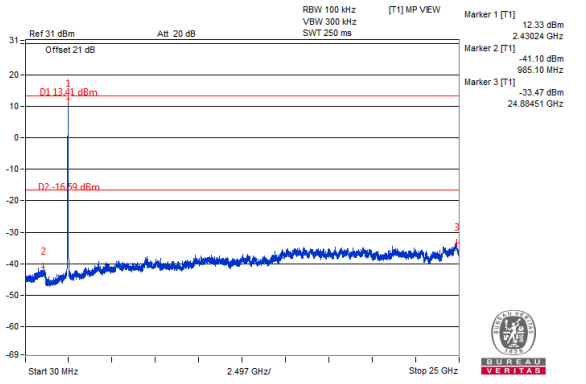


Chain 2

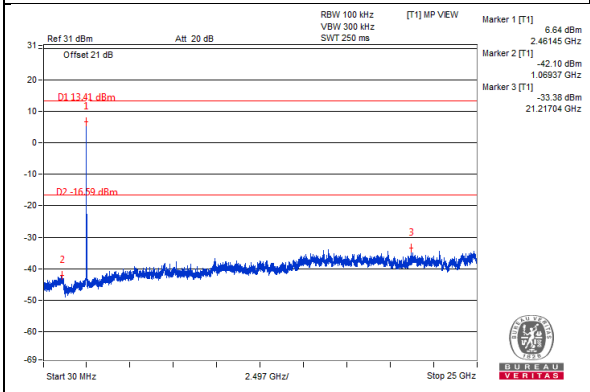
CH 1



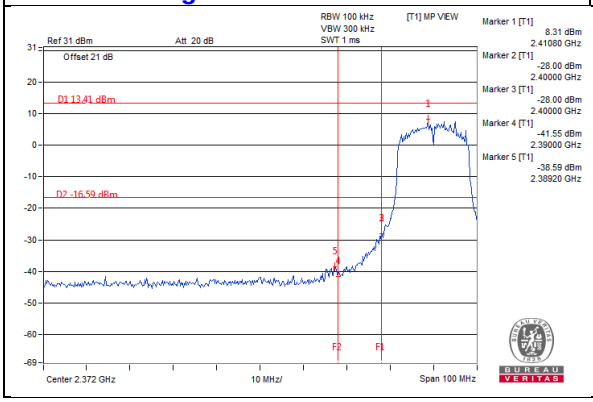
CH 6



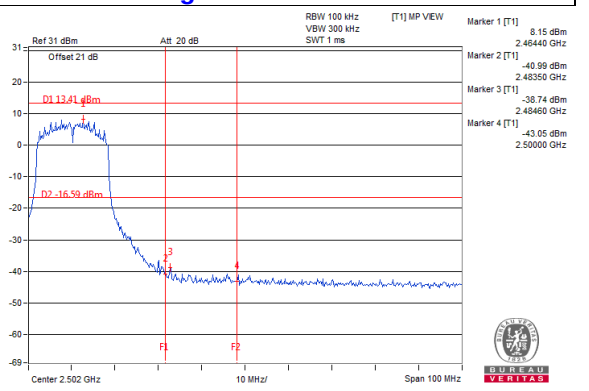
CH 11



CH 1 Band edge

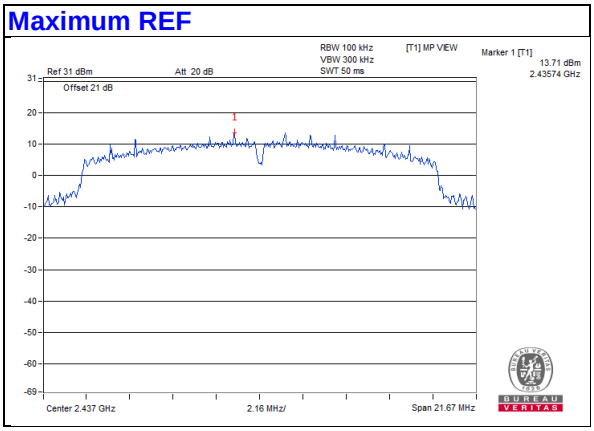


CH 11 Band edge



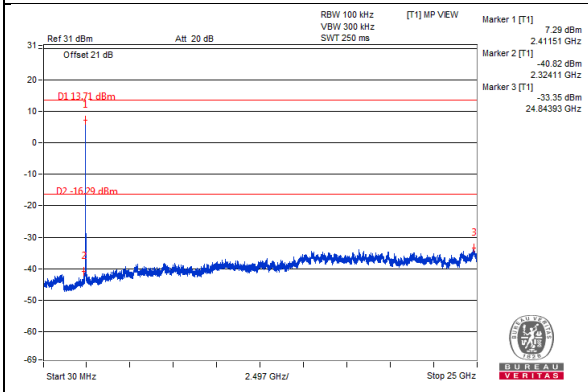
802.11n (HT20)

Maximum REF

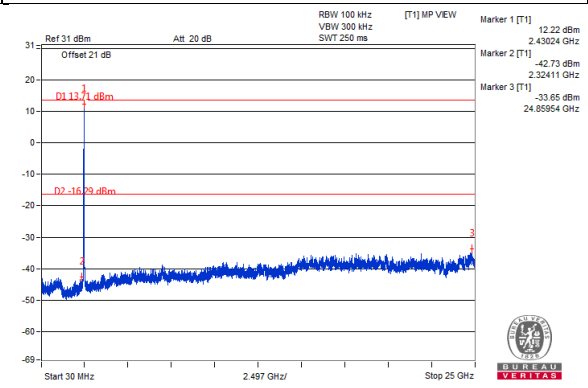


Chain 0

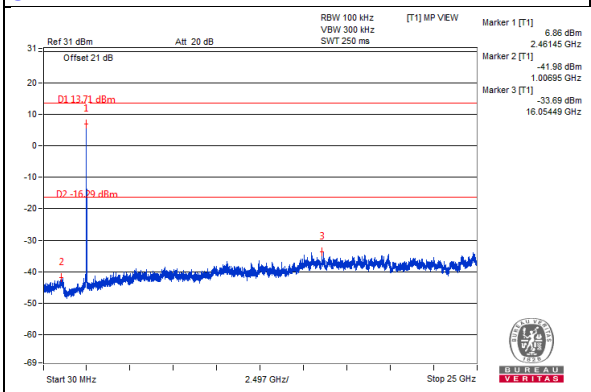
CH 1



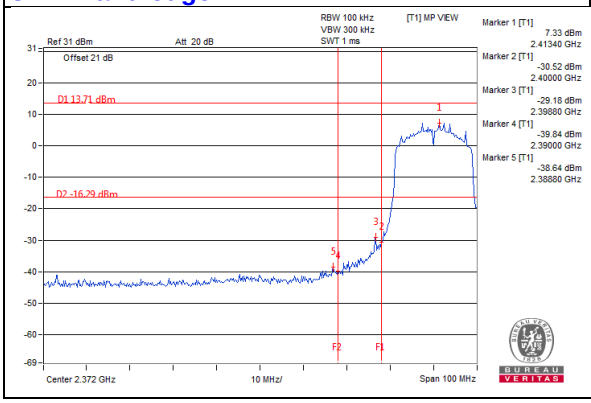
CH 6



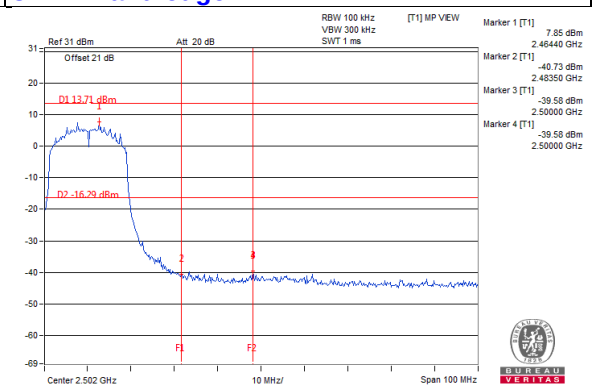
CH 11



CH 1 Band edge

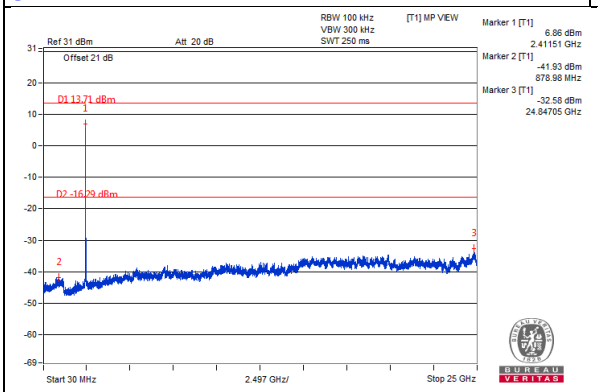


CH 11 Band edge

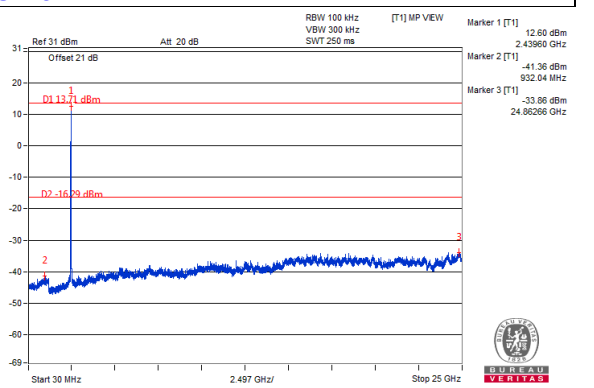


Chain 1

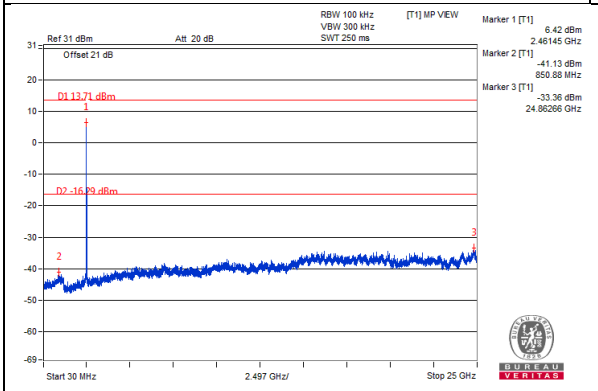
CH 1



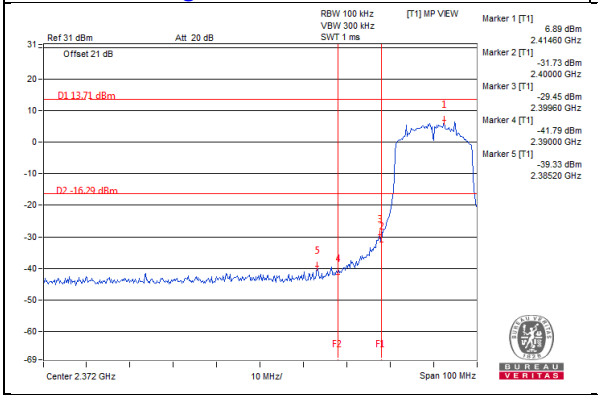
CH 6



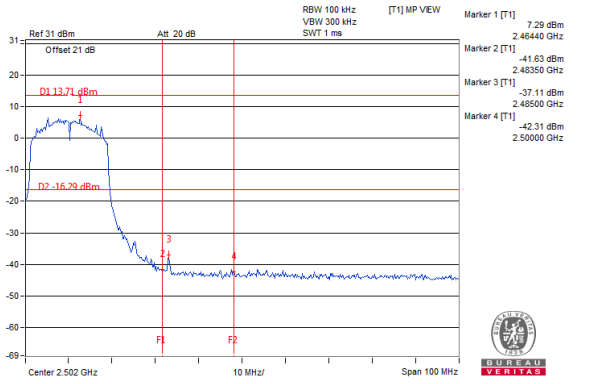
CH 11



CH 1 Band edge

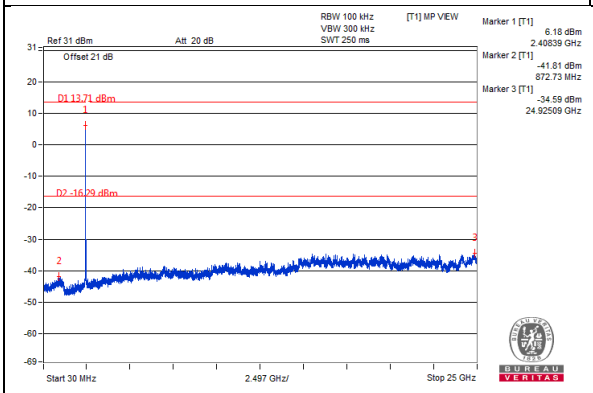


CH 11 Band edge

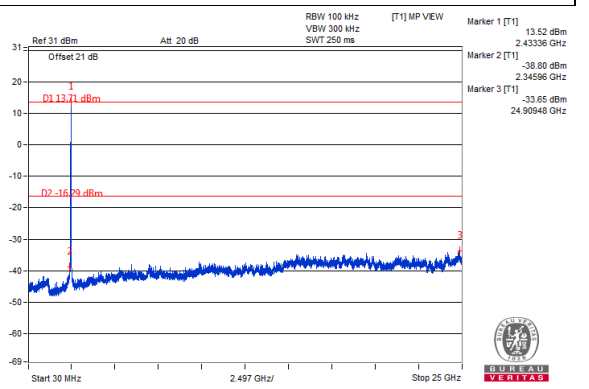


Chain 2

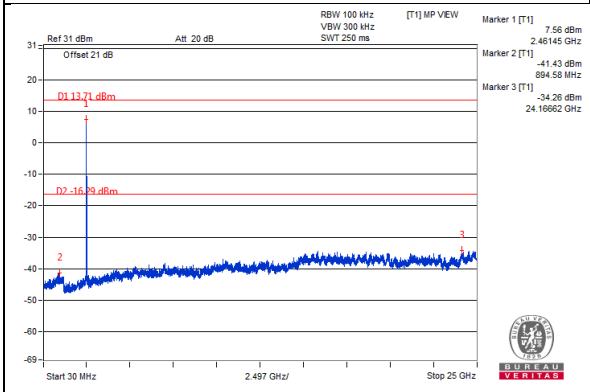
CH 1



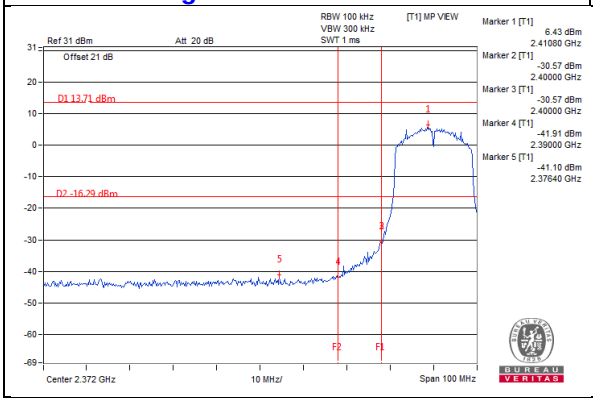
CH 6



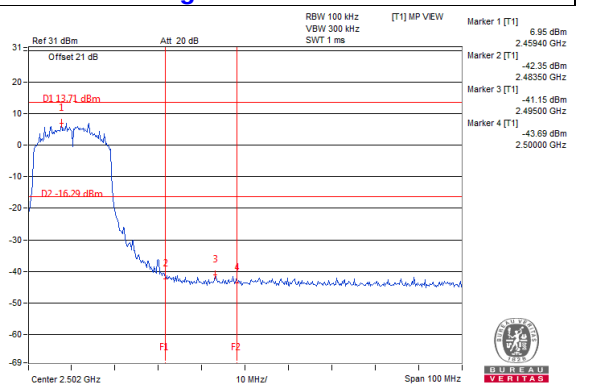
CH 11



CH 1 Band edge

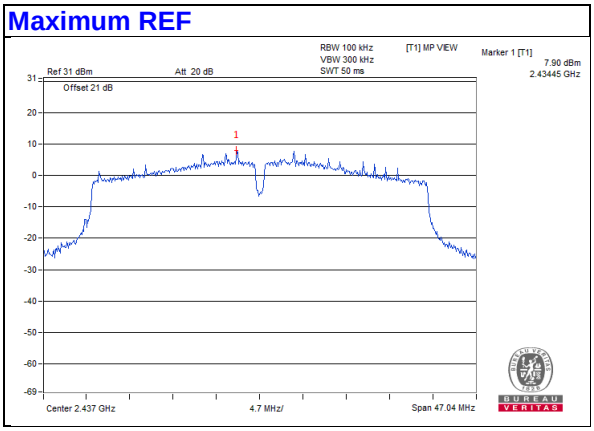


CH 11 Band edge



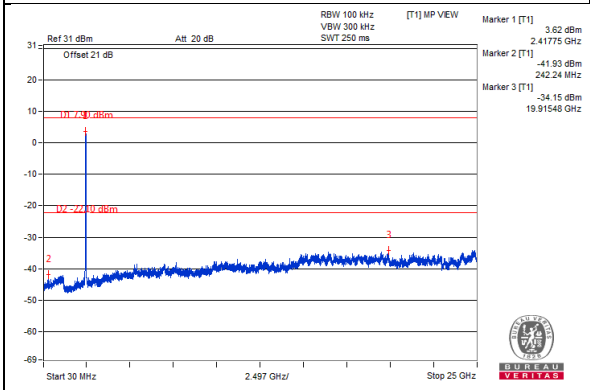
802.11n (HT40)

Maximum REF

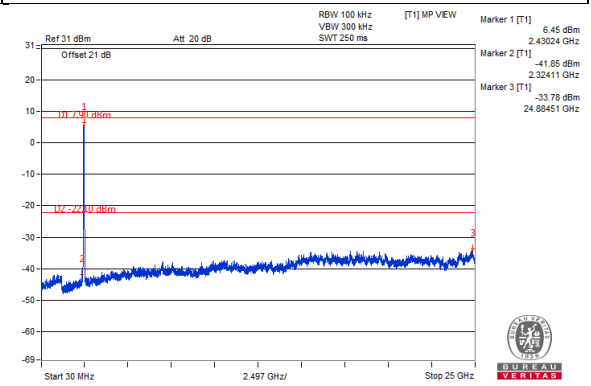


Chain 0

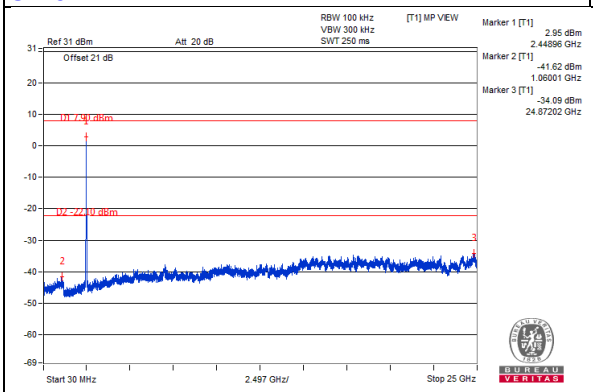
CH 3



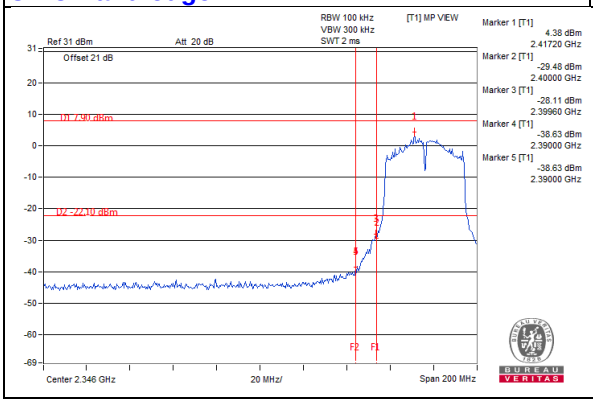
CH 6



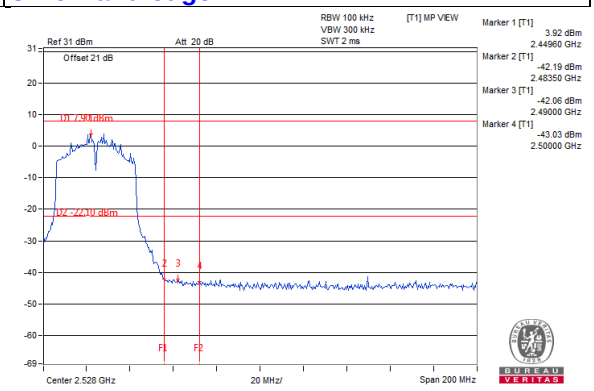
CH 9



CH 3 Band edge

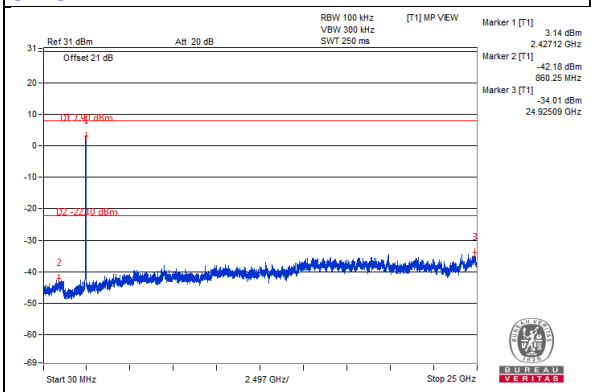


CH 9 Band edge

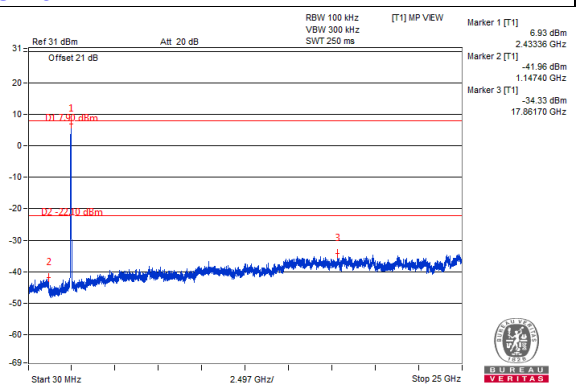


Chain 1

CH 3



CH 6



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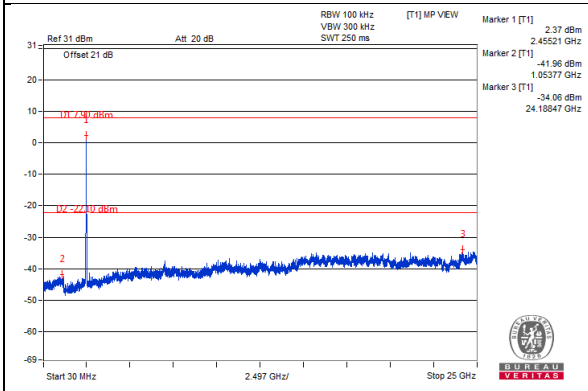
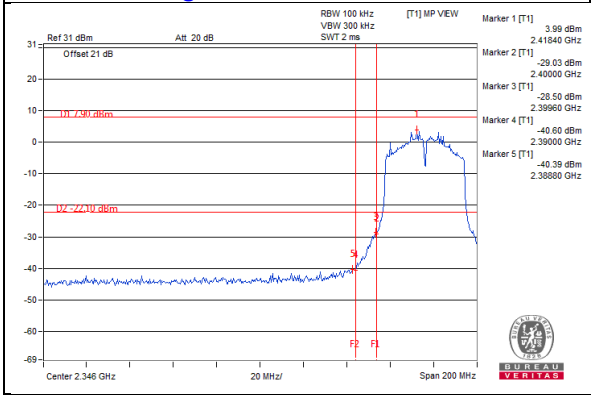
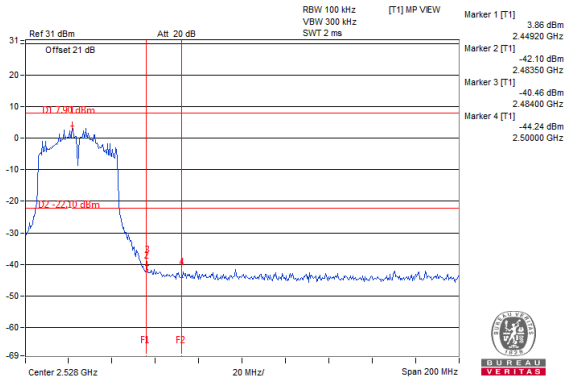


CH 3 Band edge

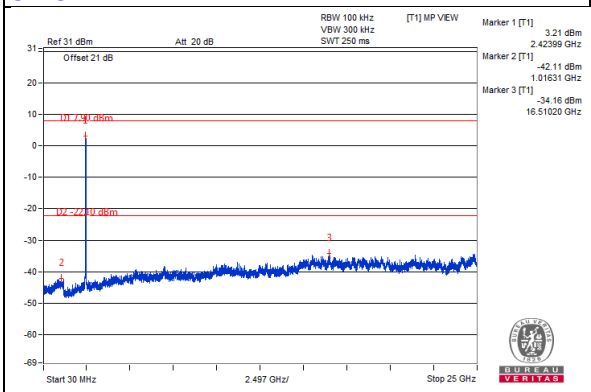


CH 9 Band edge

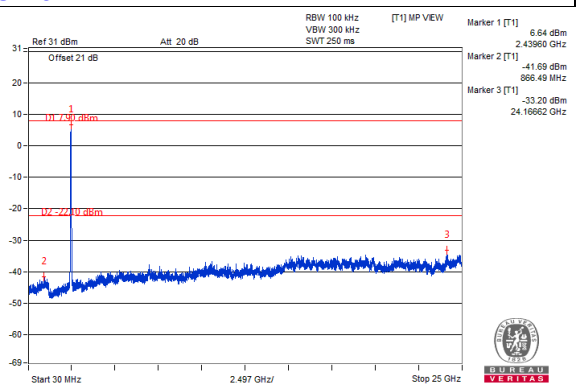


Chain 2

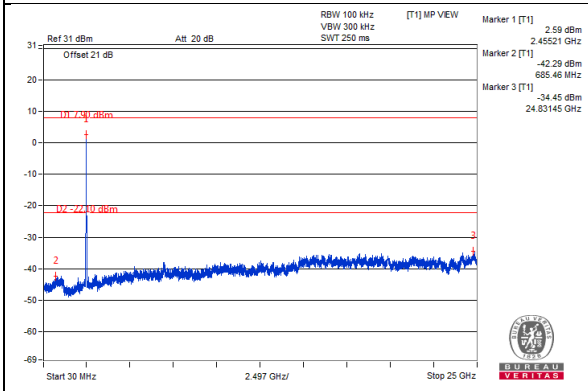
CH 3



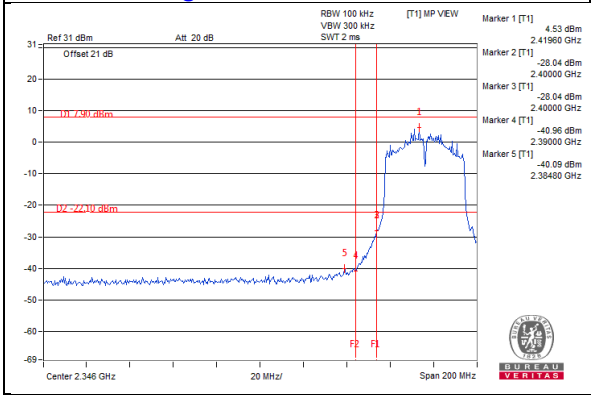
CH 6



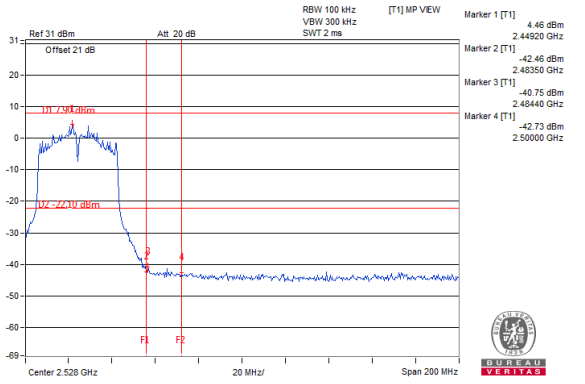
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

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