FCC Test Report

Report No.:	RF180601E04
FCC ID:	O2U-CH7469
Test Model:	CH7469
Series Model:	CH7469XXXXX (The “X” in the model name could be defined as 0~9,A~Z, “-” or blank.)
Received Date:	June 01, 2018
Test Date:	June 30 to July 10, 2018
Issued Date:	Sep. 06, 2018
Applicant:	Compal Broadband Networks, Inc.
Address:	13F.-1, No.1, Taiyuan 1st. St., Zhubei City, Hsinchu County 302, Taiwan (R.O.C.)
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
RF180601E04	Original release.	Sep. 06, 2018

1 Certificate of Conformity

Product: Cable Modem

Brand: cbn

Test Model: CH7469

Series Model: CH7469XXXXX (The "X" in the model name could be defined as 0~9,A~Z, "-" or blank.)

Sample Status: ENGINEERING SAMPLE

Applicant: Compal Broadband Networks, Inc.

Test Date: June 30 to July 10, 2018

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:** Sep. 06, 2018
Wendy Wu / Specialist

Approved by : _____ , **Date:** Sep. 06, 2018
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 -16.56dB at 7.01563MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2390.00MHz, 2483.50MHz.
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 i-pex(MHF) 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

Product	Cable Modem
Brand	cbn
Test Model	CH7469
Series Model	CH7469XXXXX (The “X” in the model name could be defined as 0~9,A~Z, “-” or blank.)
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
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**: 891.996mW **5.18GHz ~ 5.24GHz:** 649.936mW **5.745GHz ~ 5.825GHz:** 972.589mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. Simultaneously transmission condition.

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

2. The EUT has below model names, which are identical to each other in all aspects except for the followings

Brand	Model	Remark
cbn	CH7469	1. For marketing propose 2. The “X” in the model name could be defined as 0~9,A~Z, "-" or blank.
	CH7469XXXXX	

From the above models, model: CH7469 was selected as representative model for the test and its data was recorded in this report.

3. The EUT must be supplied with a power adapter as following table:

Brand	Model No.	Spec.
Frecom	F30L2-120250SPAU	Input: 100-240Vac, 0.8A, 50/60Hz Output: 12V, 2.5A, DC output cable(Unshielded, 2m)

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

Frequency Range (GHz)	Directional Antenna Gain (dBi)	Antenna Type	Connecter Type
2.4~2.4835	6.23	Dipole	i-pex(MHF)
5.15~5.35	6.05		
5.47~5.85	5.44		
Note: More detailed information, please refer to operating description.			

5. The EUT incorporates a MIMO function:

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11ac (VHT20)	MCS 0~8, Nss=1	4TX	4RX
	MCS 0~8, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~8, Nss=4	4TX	4RX
802.11ac (VHT40)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX
802.11ac (VHT80)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX

6. 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

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, 2, 6, 10, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 2, 6, 10, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 4, 6, 8, 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)
802.11g	1 to 11	6	OFDM	BPSK	6

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)
802.11g	1 to 11	6	OFDM	BPSK	6

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, 2, 6, 10, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 2, 6, 10, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 4, 6, 8, 9	OFDM	BPSK	13.5

Test Condition:

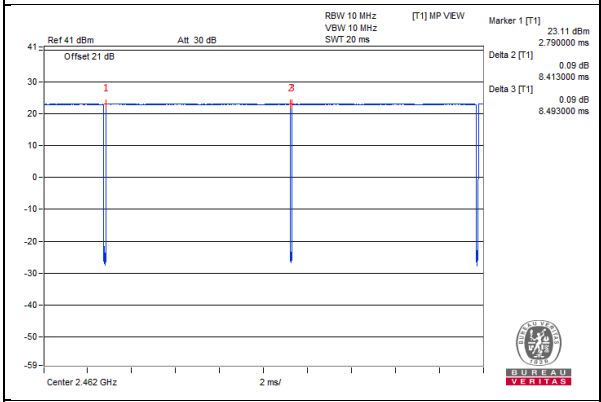
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 68%RH	120Vac, 60Hz	Steven Chiang
RE<1G	22deg. C, 67%RH	120Vac, 60Hz	Frank Chuang
PLC	23deg. C, 76%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

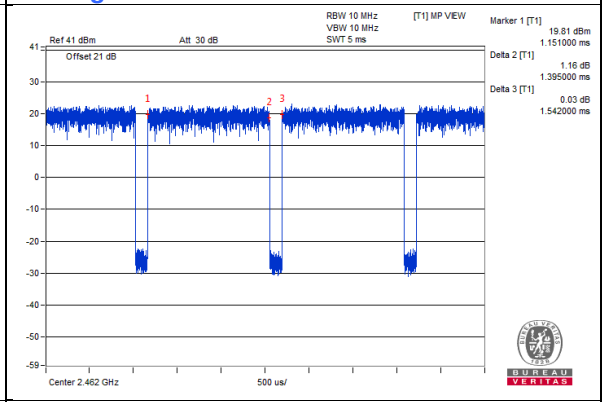
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 8.413/8.493 = 0.991
802.11g: Duty cycle = 1.395/1.542 = 0.905, Duty factor = 10 * log(1/0.905) = 0.44
802.11n (HT20): Duty cycle = 1.309/1.427 = 0.917, Duty factor = 10 * log(1/0.917) = 0.37
802.11n (HT40): Duty cycle = 0.647/0.773 = 0.837, Duty factor = 10 * log(1/0.837) = 0.77

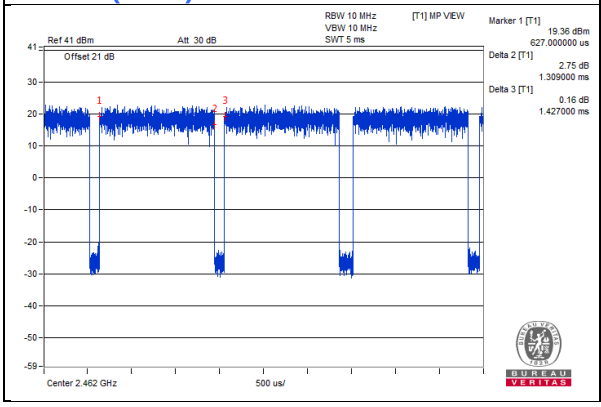
802.11b



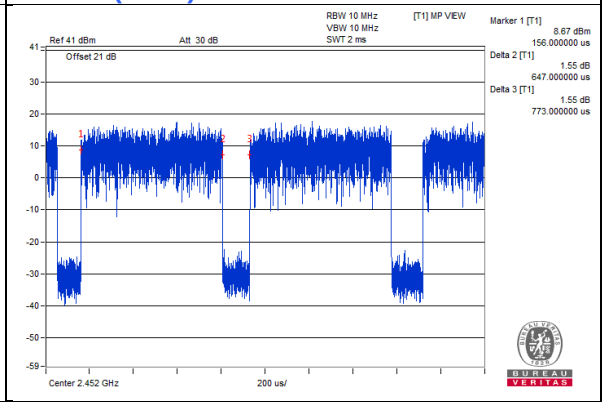
802.11g



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.

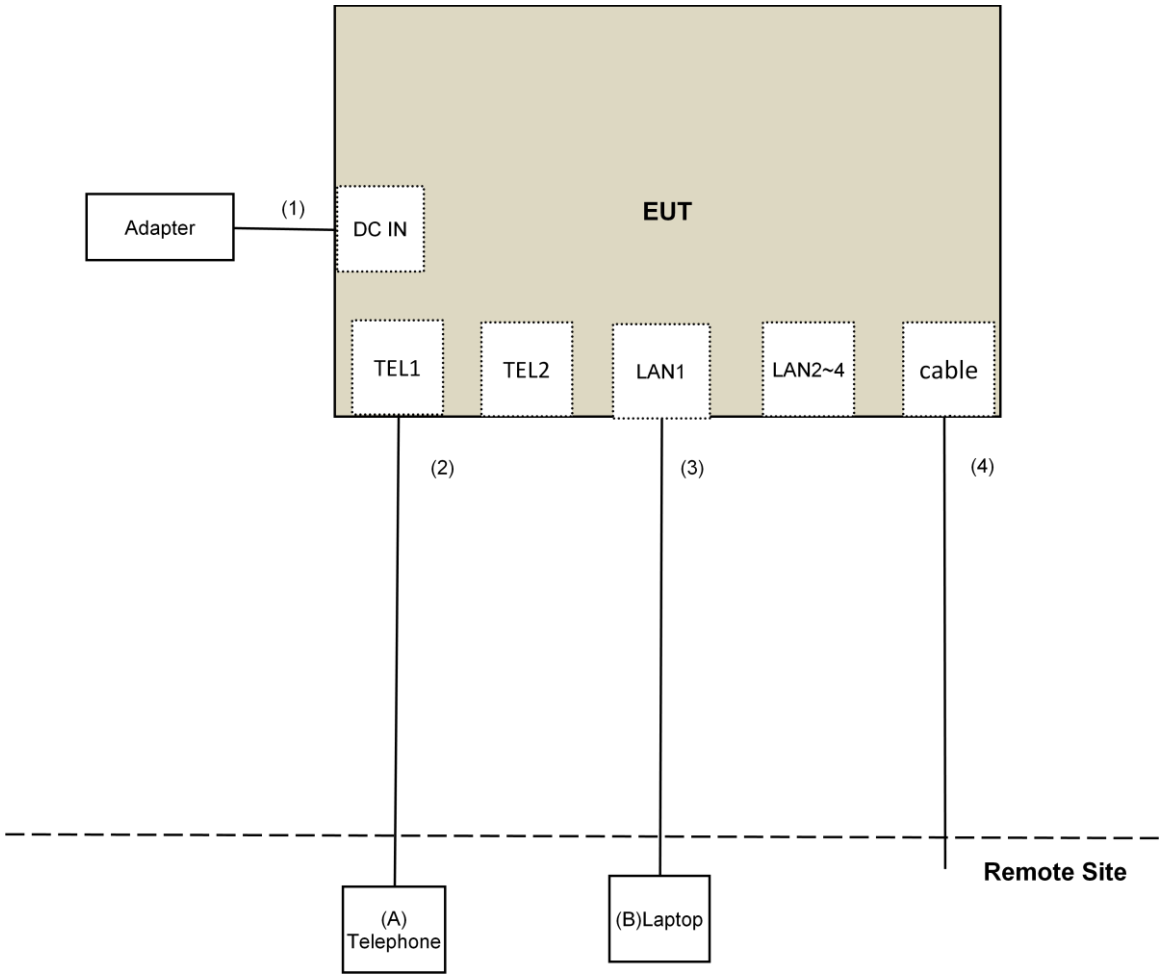
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Telephone	WONDER	WD-303	7C17KA 04011	NA	Provided by Lab
B.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

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	2	No	0	Supplied by client
2.	RJ-11 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	Coaxial Cable	1	10	Yes	0	Provided by Lab

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 DTS Meas Guidance v04
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 20dB 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	264	Dec. 16, 2016	Dec. 15, 2018
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	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
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	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980385	Jan. 29, 2018	Jan. 28, 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	Dec. 14, 2017	Dec. 13, 2018
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

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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: July 09 to 10, 2018

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:

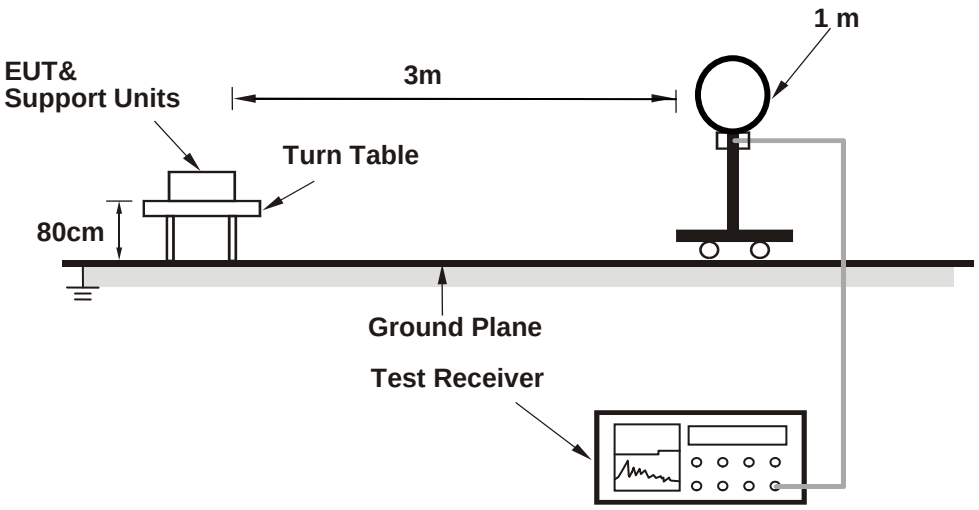
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

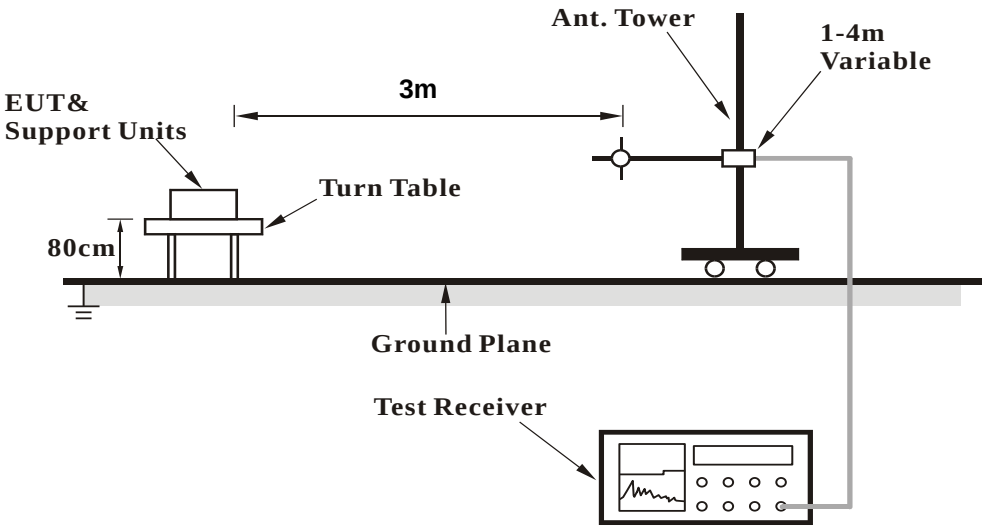
No deviation.

4.1.5 Test Setup

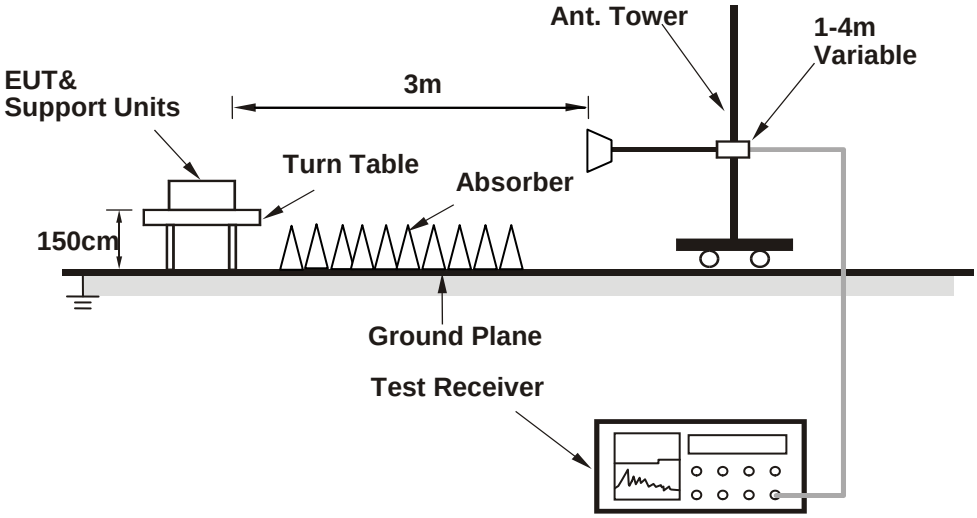
For Radiated emission below 30MHz



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 (MT7603 QA V0.0.0.68) 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	1.96 H	105	63.5	-2.2
2	2390.00	53.6 AV	54.0	-0.4	1.96 H	105	55.8	-2.2
3	*2412.00	112.9 PK			1.96 H	105	115.3	-2.4
4	*2412.00	110.4 AV			1.96 H	105	112.8	-2.4
5	4824.00	48.9 PK	74.0	-25.1	1.80 H	110	47.1	1.8
6	4824.00	46.8 AV	54.0	-7.2	1.80 H	110	45.0	1.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2390.00	63.8 PK	74.0	-10.2	1.64 V	128	66.0	-2.2
2	2390.00	45.9 AV	54.0	-8.1	1.64 V	128	48.1	-2.2
3	*2412.00	110.8 PK			1.64 V	128	113.2	-2.4
4	*2412.00	108.5 AV			1.64 V	128	110.9	-2.4
5	4824.00	52.3 PK	74.0	-21.7	1.90 V	90	50.5	1.8
6	4824.00	50.2 AV	54.0	-3.8	1.90 V	90	48.4	1.8

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	59.4 PK	74.0	-14.6	1.01 H	102	61.6	-2.2
2	2390.00	48.5 AV	54.0	-5.5	1.01 H	102	50.7	-2.2
3	*2437.00	115.5 PK			1.01 H	102	118.1	-2.6
4	*2437.00	113.2 AV			1.01 H	102	115.8	-2.6
5	2483.50	59.6 PK	74.0	-14.4	1.01 H	102	62.0	-2.4
6	2483.50	49.4 AV	54.0	-4.6	1.01 H	102	51.8	-2.4
7	4874.00	48.6 PK	74.0	-25.4	1.85 H	100	46.6	2.0
8	4874.00	46.1 AV	54.0	-7.9	1.85 H	100	44.1	2.0
9	7311.00	52.8 PK	74.0	-21.2	3.31 H	64	44.4	8.4
10	7311.00	48.8 AV	54.0	-5.2	3.31 H	64	40.4	8.4
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	62.5 PK	74.0	-11.5	1.57 V	149	64.7	-2.2
2	2390.00	45.4 AV	54.0	-8.6	1.57 V	149	47.6	-2.2
3	*2437.00	113.6 PK			1.57 V	149	116.2	-2.6
4	*2437.00	111.2 AV			1.57 V	149	113.8	-2.6
5	2483.50	62.1 PK	74.0	-11.9	1.57 V	149	64.5	-2.4
6	2483.50	45.1 AV	54.0	-8.9	1.57 V	149	47.5	-2.4
7	4874.00	50.9 PK	74.0	-23.1	1.84 V	116	48.9	2.0
8	4874.00	49.6 AV	54.0	-4.4	1.84 V	116	47.6	2.0
9	7311.00	55.8 PK	74.0	-18.2	1.75 V	78	47.4	8.4
10	7311.00	53.6 AV	54.0	-0.4	1.75 V	78	45.2	8.4

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. 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	112.9 PK			2.84 H	101	115.5	-2.6
2	*2462.00	111.0 AV			2.84 H	101	113.6	-2.6
3	2483.50	66.1 PK	74.0	-7.9	2.84 H	101	68.5	-2.4
4	2483.50	53.5 AV	54.0	-0.5	2.84 H	101	55.9	-2.4
5	4924.00	49.7 PK	74.0	-24.3	1.85 H	93	47.7	2.0
6	4924.00	47.3 AV	54.0	-6.7	1.85 H	93	45.3	2.0
7	7386.00	53.2 PK	74.0	-20.8	3.29 H	76	44.6	8.6
8	7386.00	48.7 AV	54.0	-5.3	3.29 H	76	40.1	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	111.1 PK			1.60 V	139	113.7	-2.6
2	*2462.00	108.9 AV			1.60 V	139	111.5	-2.6
3	2483.50	64.2 PK	74.0	-9.8	1.60 V	139	66.6	-2.4
4	2483.50	46.3 AV	54.0	-7.7	1.60 V	139	48.7	-2.4
5	4924.00	51.9 PK	74.0	-22.1	1.83 V	83	49.9	2.0
6	4924.00	50.7 AV	54.0	-3.3	1.83 V	83	48.7	2.0
7	7386.00	50.5 PK	74.0	-23.5	1.04 V	81	41.9	8.6
8	7386.00	45.6 AV	54.0	-8.4	1.04 V	81	37.0	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.

802.11g

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	67.5 PK	74.0	-6.5	1.52 H	99	69.7	-2.2
2	2390.00	53.5 AV	54.0	-0.5	1.52 H	99	55.7	-2.2
3	*2412.00	113.6 PK			1.52 H	99	116.0	-2.4
4	*2412.00	104.1 AV			1.52 H	99	106.5	-2.4
5	4824.00	45.2 PK	74.0	-28.8	1.87 H	104	43.4	1.8
6	4824.00	34.5 AV	54.0	-19.5	1.87 H	104	32.7	1.8
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	65.3 PK	74.0	-8.7	1.63 V	125	67.5	-2.2
2	2390.00	49.4 AV	54.0	-4.6	1.63 V	125	51.6	-2.2
3	*2412.00	111.4 PK			1.63 V	125	113.8	-2.4
4	*2412.00	101.9 AV			1.63 V	125	104.3	-2.4
5	4824.00	48.1 PK	74.0	-25.9	2.34 V	78	46.3	1.8
6	4824.00	37.3 AV	54.0	-16.7	2.34 V	78	35.5	1.8

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 2	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	69.4 PK	74.0	-4.6	1.01 H	96	71.6	-2.2
2	2390.00	53.6 AV	54.0	-0.4	1.01 H	96	55.8	-2.2
3	*2417.00	116.5 PK			1.01 H	96	118.9	-2.4
4	*2417.00	106.9 AV			1.01 H	96	109.3	-2.4
5	4834.00	45.7 PK	74.0	-28.3	1.84 H	92	43.9	1.8
6	4834.00	34.9 AV	54.0	-19.1	1.84 H	92	33.1	1.8
7	7251.00	50.2 PK	74.0	-23.8	3.38 H	58	42.1	8.1
8	7251.00	36.9 AV	54.0	-17.1	3.38 H	58	28.8	8.1
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	65.5 PK	74.0	-8.5	1.55 V	147	67.7	-2.2
2	2390.00	49.6 AV	54.0	-4.4	1.55 V	147	51.8	-2.2
3	*2417.00	114.5 PK			1.55 V	147	116.9	-2.4
4	*2417.00	104.7 AV			1.55 V	147	107.1	-2.4
5	4834.00	48.4 PK	74.0	-25.6	2.37 V	80	46.6	1.8
6	4834.00	37.6 AV	54.0	-16.4	2.37 V	80	35.8	1.8
7	7251.00	54.6 PK	74.0	-19.4	1.72 V	81	46.5	8.1
8	7251.00	41.2 AV	54.0	-12.8	1.72 V	81	33.1	8.1

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. 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	61.5 PK	74.0	-12.5	1.00 H	93	63.7	-2.2
2	2390.00	48.5 AV	54.0	-5.5	1.00 H	93	50.7	-2.2
3	*2437.00	118.5 PK			1.00 H	93	121.1	-2.6
4	*2437.00	109.0 AV			1.00 H	93	111.6	-2.6
5	2483.50	64.1 PK	74.0	-9.9	1.00 H	93	66.5	-2.4
6	2483.50	49.1 AV	54.0	-4.9	1.00 H	93	51.5	-2.4
7	4874.00	45.1 PK	74.0	-28.9	1.87 H	101	43.1	2.0
8	4874.00	34.5 AV	54.0	-19.5	1.87 H	101	32.5	2.0
9	7311.00	49.9 PK	74.0	-24.1	3.35 H	63	41.5	8.4
10	7311.00	36.6 AV	54.0	-17.4	3.35 H	63	28.2	8.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.9 PK	74.0	-10.1	1.61 V	130	66.1	-2.2
2	2390.00	45.7 AV	54.0	-8.3	1.61 V	130	47.9	-2.2
3	*2437.00	116.1 PK			1.61 V	130	118.7	-2.6
4	*2437.00	106.7 AV			1.61 V	130	109.3	-2.6
5	2483.50	63.5 PK	74.0	-10.5	1.61 V	130	65.9	-2.4
6	2483.50	45.3 AV	54.0	-8.7	1.61 V	130	47.7	-2.4
7	4874.00	48.2 PK	74.0	-25.8	2.31 V	83	46.2	2.0
8	4874.00	37.3 AV	54.0	-16.7	2.31 V	83	35.3	2.0
9	7311.00	54.3 PK	74.0	-19.7	1.70 V	79	45.9	8.4
10	7311.00	41.0 AV	54.0	-13.0	1.70 V	79	32.6	8.4

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

CHANNEL	TX Channel 10	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	*2457.00	116.4 PK			1.01 H	93	119.0	-2.6
2	*2457.00	106.7 AV			1.01 H	93	109.3	-2.6
3	2483.50	70.7 PK	74.0	-3.3	1.01 H	93	73.1	-2.4
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.01 H**	**93**	**56.2**	**-2.4**
5	4914.00	44.9 PK	74.0	-29.1	1.87 H	115	42.9	2.0
6	4914.00	34.5 AV	54.0	-19.5	1.87 H	115	32.5	2.0
7	7371.00	49.3 PK	74.0	-24.7	3.35 H	49	40.7	8.6
8	7371.00	36.1 AV	54.0	-17.9	3.35 H	49	27.5	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	*2457.00	114.3 PK			1.61 V	154	116.9	-2.6
2	*2457.00	104.7 AV			1.61 V	154	107.3	-2.6
3	2483.50	66.2 PK	74.0	-7.8	1.61 V	154	68.6	-2.4
4	2483.50	50.1 AV	54.0	-3.9	1.61 V	154	52.5	-2.4
5	4914.00	47.8 PK	74.0	-26.2	2.30 V	95	45.8	2.0
6	4914.00	37.0 AV	54.0	-17.0	2.30 V	95	35.0	2.0
7	7371.00	54.5 PK	74.0	-19.5	1.68 V	66	45.9	8.6
8	7371.00	41.0 AV	54.0	-13.0	1.68 V	66	32.4	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.

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	113.6 PK			2.82 H	106	116.2	-2.6
2	*2462.00	103.8 AV			2.82 H	106	106.4	-2.6
3	2483.50	69.0 PK	74.0	-5.0	2.82 H	106	71.4	-2.4
4	2483.50	53.6 AV	54.0	-0.4	2.82 H	106	56.0	-2.4
5	4924.00	44.6 PK	74.0	-29.4	1.86 H	94	42.6	2.0
6	4924.00	34.1 AV	54.0	-19.9	1.86 H	94	32.1	2.0
7	7386.00	49.3 PK	74.0	-24.7	3.30 H	76	40.7	8.6
8	7386.00	36.2 AV	54.0	-17.8	3.30 H	76	27.6	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	111.8 PK			1.60 V	137	114.4	-2.6
2	*2462.00	101.9 AV			1.60 V	137	104.5	-2.6
3	2483.50	66.4 PK	74.0	-7.6	1.60 V	137	68.8	-2.4
4	2483.50	50.5 AV	54.0	-3.5	1.60 V	137	52.9	-2.4
5	4924.00	47.8 PK	74.0	-26.2	2.30 V	85	45.8	2.0
6	4924.00	37.1 AV	54.0	-16.9	2.30 V	85	35.1	2.0
7	7386.00	53.9 PK	74.0	-20.1	1.74 V	71	45.3	8.6
8	7386.00	40.7 AV	54.0	-13.3	1.74 V	71	32.1	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	69.6 PK	74.0	-4.4	1.23 H	95	71.8	-2.2
2	2390.00	53.5 AV	54.0	-0.5	1.23 H	95	55.7	-2.2
3	*2412.00	114.0 PK			1.23 H	95	116.4	-2.4
4	*2412.00	102.9 AV			1.23 H	95	105.3	-2.4
5	4824.00	44.9 PK	74.0	-29.1	1.93 H	97	43.1	1.8
6	4824.00	34.1 AV	54.0	-19.9	1.93 H	97	32.3	1.8
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	65.3 PK	74.0	-8.7	1.64 V	131	67.5	-2.2
2	2390.00	49.2 AV	54.0	-4.8	1.64 V	131	51.4	-2.2
3	*2412.00	111.9 PK			1.64 V	131	114.3	-2.4
4	*2412.00	100.7 AV			1.64 V	131	103.1	-2.4
5	4824.00	48.2 PK	74.0	-25.8	2.25 V	93	46.4	1.8
6	4824.00	37.2 AV	54.0	-16.8	2.25 V	93	35.4	1.8

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 2	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	73.5 PK	74.0	-0.5	1.01 H	94	75.7	-2.2
2	2390.00	53.5 AV	54.0	-0.5	1.01 H	94	55.7	-2.2
3	*2417.00	116.4 PK			1.01 H	94	118.8	-2.4
4	*2417.00	106.2 AV			1.01 H	94	108.6	-2.4
5	4834.00	45.4 PK	74.0	-28.6	1.92 H	117	43.6	1.8
6	4834.00	34.6 AV	54.0	-19.4	1.92 H	117	32.8	1.8
7	7251.00	50.2 PK	74.0	-23.8	3.35 H	76	42.1	8.1
8	7251.00	36.7 AV	54.0	-17.3	3.35 H	76	28.6	8.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.1 PK	74.0	-7.9	1.63 V	150	68.3	-2.2
2	2390.00	49.5 AV	54.0	-4.5	1.63 V	150	51.7	-2.2
3	*2417.00	114.1 PK			1.63 V	150	116.5	-2.4
4	*2417.00	104.1 AV			1.63 V	150	106.5	-2.4
5	4834.00	47.9 PK	74.0	-26.1	2.36 V	74	46.1	1.8
6	4834.00	37.0 AV	54.0	-17.0	2.36 V	74	35.2	1.8
7	7251.00	53.9 PK	74.0	-20.1	1.67 V	81	45.8	8.1
8	7251.00	40.6 AV	54.0	-13.4	1.67 V	81	32.5	8.1

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. 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	62.9 PK	74.0	-11.1	1.00 H	96	65.1	-2.2
2	2390.00	48.7 AV	54.0	-5.3	1.00 H	96	50.9	-2.2
3	*2437.00	118.6 PK			1.00 H	96	121.2	-2.6
4	*2437.00	108.2 AV			1.00 H	96	110.8	-2.6
5	2483.50	66.2 PK	74.0	-7.8	1.00 H	96	68.6	-2.4
6	2483.50	50.1 AV	54.0	-3.9	1.00 H	96	52.5	-2.4
7	4874.00	45.4 PK	74.0	-28.6	1.86 H	104	43.4	2.0
8	4874.00	34.5 AV	54.0	-19.5	1.86 H	104	32.5	2.0
9	7311.00	49.7 PK	74.0	-24.3	3.33 H	63	41.3	8.4
10	7311.00	36.7 AV	54.0	-17.3	3.33 H	63	28.3	8.4
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	62.7 PK	74.0	-11.3	1.65 V	127	64.9	-2.2
2	2390.00	45.8 AV	54.0	-8.2	1.65 V	127	48.0	-2.2
3	*2437.00	116.3 PK			1.65 V	127	118.9	-2.6
4	*2437.00	106.0 AV			1.65 V	127	108.6	-2.6
5	2483.50	64.2 PK	74.0	-9.8	1.65 V	127	66.6	-2.4
6	2483.50	46.1 AV	54.0	-7.9	1.65 V	127	48.5	-2.4
7	4874.00	47.8 PK	74.0	-26.2	2.27 V	75	45.8	2.0
8	4874.00	37.0 AV	54.0	-17.0	2.27 V	75	35.0	2.0
9	7311.00	53.8 PK	74.0	-20.2	1.67 V	76	45.4	8.4
10	7311.00	40.5 AV	54.0	-13.5	1.67 V	76	32.1	8.4

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

CHANNEL	TX Channel 10	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	*2457.00	116.5 PK			1.22 H	89	119.1	-2.6
2	*2457.00	105.9 AV			1.22 H	89	108.5	-2.6
3	2483.50	71.7 PK	74.0	-2.3	1.22 H	89	74.1	-2.4
4	2483.50	53.6 AV	54.0	-0.4	1.22 H	89	56.0	-2.4
5	4914.00	45.1 PK	74.0	-28.9	1.83 H	93	43.1	2.0
6	4914.00	34.3 AV	54.0	-19.7	1.83 H	93	32.3	2.0
7	7371.00	50.0 PK	74.0	-24.0	3.32 H	56	41.4	8.6
8	7371.00	36.6 AV	54.0	-17.4	3.32 H	56	28.0	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	*2457.00	114.7 PK			1.59 V	128	117.3	-2.6
2	*2457.00	103.5 AV			1.59 V	128	106.1	-2.6
3	2483.50	65.6 PK	74.0	-8.4	1.59 V	128	68.0	-2.4
4	2483.50	49.7 AV	54.0	-4.3	1.59 V	128	52.1	-2.4
5	4914.00	48.2 PK	74.0	-25.8	2.33 V	97	46.2	2.0
6	4914.00	37.3 AV	54.0	-16.7	2.33 V	97	35.3	2.0
7	7371.00	54.4 PK	74.0	-19.6	1.75 V	68	45.8	8.6
8	7371.00	40.9 AV	54.0	-13.1	1.75 V	68	32.3	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.

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	114.4 PK			2.83 H	102	117.0	-2.6
2	*2462.00	102.7 AV			2.83 H	102	105.3	-2.6
3	2483.50	70.2 PK	74.0	-3.8	2.83 H	102	72.6	-2.4
4	2483.50	53.7 AV	54.0	-0.3	2.83 H	102	56.1	-2.4
5	4924.00	45.1 PK	74.0	-28.9	1.87 H	110	43.1	2.0
6	4924.00	34.4 AV	54.0	-19.6	1.87 H	110	32.4	2.0
7	7386.00	49.8 PK	74.0	-24.2	3.35 H	58	41.2	8.6
8	7386.00	36.6 AV	54.0	-17.4	3.35 H	58	28.0	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	112.5 PK			1.57 V	141	115.1	-2.6
2	*2462.00	100.7 AV			1.57 V	141	103.3	-2.6
3	2483.50	66.7 PK	74.0	-7.3	1.57 V	141	69.1	-2.4
4	2483.50	50.4 AV	54.0	-3.6	1.57 V	141	52.8	-2.4
5	4924.00	48.7 PK	74.0	-25.3	2.36 V	85	46.7	2.0
6	4924.00	37.8 AV	54.0	-16.2	2.36 V	85	35.8	2.0
7	7386.00	54.3 PK	74.0	-19.7	1.75 V	86	45.7	8.6
8	7386.00	41.0 AV	54.0	-13.0	1.75 V	86	32.4	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	69.2 PK	74.0	-4.8	2.96 H	101	71.4	-2.2
2	**2390.00**	**53.8 AV**	**54.0**	**-0.2**	**2.96 H**	**101**	**56.0**	**-2.2**
3	*2422.00	108.7 PK			2.96 H	101	111.2	-2.5
4	*2422.00	98.1 AV			2.96 H	101	100.6	-2.5
5	4844.00	45.0 PK	74.0	-29.0	1.84 H	101	43.2	1.8
6	4844.00	34.7 AV	54.0	-19.3	1.84 H	101	32.9	1.8
7	7266.00	49.7 PK	74.0	-24.3	3.33 H	74	41.5	8.2
8	7266.00	36.4 AV	54.0	-17.6	3.33 H	74	28.2	8.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.5 PK	74.0	-7.5	1.61 V	129	68.7	-2.2
2	2390.00	50.7 AV	54.0	-3.3	1.61 V	129	52.9	-2.2
3	*2422.00	106.2 PK			1.61 V	129	108.7	-2.5
4	*2422.00	95.7 AV			1.61 V	129	98.2	-2.5
5	4844.00	47.9 PK	74.0	-26.1	2.32 V	70	46.1	1.8
6	4844.00	37.1 AV	54.0	-16.9	2.32 V	70	35.3	1.8
7	7266.00	54.0 PK	74.0	-20.0	1.71 V	77	45.8	8.2
8	7266.00	40.8 AV	54.0	-13.2	1.71 V	77	32.6	8.2

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

CHANNEL	TX Channel 4	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	69.4 PK	74.0	-4.6	2.17 H	113	71.6	-2.2
2	2390.00	53.5 AV	54.0	-0.5	2.17 H	113	55.7	-2.2
3	*2427.00	109.4 PK			2.17 H	113	111.9	-2.5
4	*2427.00	99.4 AV			2.17 H	113	101.9	-2.5
5	4854.00	44.4 PK	74.0	-29.6	1.84 H	92	42.5	1.9
6	4854.00	34.0 AV	54.0	-20.0	1.84 H	92	32.1	1.9
7	7281.00	49.7 PK	74.0	-24.3	3.35 H	59	41.4	8.3
8	7281.00	36.6 AV	54.0	-17.4	3.35 H	59	28.3	8.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.2 PK	74.0	-7.8	1.64 V	146	68.4	-2.2
2	2390.00	50.3 AV	54.0	-3.7	1.64 V	146	52.5	-2.2
3	*2427.00	107.0 PK			1.64 V	146	109.5	-2.5
4	*2427.00	96.8 AV			1.64 V	146	99.3	-2.5
5	4854.00	47.8 PK	74.0	-26.2	2.33 V	70	45.9	1.9
6	4854.00	37.1 AV	54.0	-16.9	2.33 V	70	35.2	1.9
7	7281.00	53.9 PK	74.0	-20.1	1.74 V	70	45.6	8.3
8	7281.00	40.9 AV	54.0	-13.1	1.74 V	70	32.6	8.3

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. 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	65.8 PK	74.0	-8.2	1.00 H	91	68.0	-2.2
2	2390.00	52.1 AV	54.0	-1.9	1.00 H	91	54.3	-2.2
3	*2437.00	111.7 PK			1.00 H	91	114.3	-2.6
4	*2437.00	101.6 AV			1.00 H	91	104.2	-2.6
5	2483.50	66.8 PK	74.0	-7.2	1.00 H	91	69.2	-2.4
6	2483.50	53.5 AV	54.0	-0.5	1.00 H	91	55.9	-2.4
7	4874.00	45.4 PK	74.0	-28.6	1.83 H	87	43.4	2.0
8	4874.00	34.6 AV	54.0	-19.4	1.83 H	87	32.6	2.0
9	7311.00	50.3 PK	74.0	-23.7	3.40 H	78	41.9	8.4
10	7311.00	37.1 AV	54.0	-16.9	3.40 H	78	28.7	8.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.2 PK	74.0	-9.8	1.59 V	138	66.4	-2.2
2	2390.00	48.5 AV	54.0	-5.5	1.59 V	138	50.7	-2.2
3	*2437.00	109.4 PK			1.59 V	138	112.0	-2.6
4	*2437.00	99.3 AV			1.59 V	138	101.9	-2.6
5	2483.50	65.5 PK	74.0	-8.5	1.59 V	138	67.9	-2.4
6	2483.50	49.4 AV	54.0	-4.6	1.59 V	138	51.8	-2.4
7	4874.00	48.2 PK	74.0	-25.8	2.25 V	69	46.2	2.0
8	4874.00	37.4 AV	54.0	-16.6	2.25 V	69	35.4	2.0
9	7311.00	54.0 PK	74.0	-20.0	1.70 V	70	45.6	8.4
10	7311.00	40.7 AV	54.0	-13.3	1.70 V	70	32.3	8.4

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

CHANNEL	TX Channel 8	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	*2447.00	110.1 PK			1.00 H	92	112.7	-2.6
2	*2447.00	99.6 AV			1.00 H	92	102.2	-2.6
3	2483.50	69.5 PK	74.0	-4.5	1.00 H	92	71.9	-2.4
4	2483.50	53.7 AV	54.0	-0.3	1.00 H	92	56.1	-2.4
5	4894.00	44.9 PK	74.0	-29.1	1.87 H	105	42.8	2.1
6	4894.00	34.3 AV	54.0	-19.7	1.87 H	105	32.2	2.1
7	7341.00	50.2 PK	74.0	-23.8	3.37 H	65	41.6	8.6
8	7341.00	36.7 AV	54.0	-17.3	3.37 H	65	28.1	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	*2447.00	107.7 PK			1.61 V	152	110.3	-2.6
2	*2447.00	97.2 AV			1.61 V	152	99.8	-2.6
3	2483.50	66.2 PK	74.0	-7.8	1.61 V	152	68.6	-2.4
4	2483.50	50.3 AV	54.0	-3.7	1.61 V	152	52.7	-2.4
5	4894.00	47.7 PK	74.0	-26.3	2.33 V	69	45.6	2.1
6	4894.00	36.8 AV	54.0	-17.2	2.33 V	69	34.7	2.1
7	7341.00	54.4 PK	74.0	-19.6	1.71 V	73	45.8	8.6
8	7341.00	40.9 AV	54.0	-13.1	1.71 V	73	32.3	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.

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	108.1 PK			1.92 H	105	110.7	-2.6
2	*2452.00	97.8 AV			1.92 H	105	100.4	-2.6
3	2483.50	71.1 PK	74.0	-2.9	1.92 H	105	73.5	-2.4
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.92 H**	**105**	**56.2**	**-2.4**
5	4904.00	45.1 PK	74.0	-28.9	1.90 H	88	43.1	2.0
6	4904.00	34.7 AV	54.0	-19.3	1.90 H	88	32.7	2.0
7	7356.00	50.0 PK	74.0	-24.0	3.34 H	56	41.4	8.6
8	7356.00	36.4 AV	54.0	-17.6	3.34 H	56	27.8	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	*2452.00	105.4 PK			1.59 V	141	108.0	-2.6
2	*2452.00	95.3 AV			1.59 V	141	97.9	-2.6
3	2483.50	66.6 PK	74.0	-7.4	1.59 V	141	69.0	-2.4
4	2483.50	50.6 AV	54.0	-3.4	1.59 V	141	53.0	-2.4
5	4904.00	47.8 PK	74.0	-26.2	2.32 V	86	45.8	2.0
6	4904.00	37.1 AV	54.0	-16.9	2.32 V	86	35.1	2.0
7	7356.00	54.6 PK	74.0	-19.4	1.71 V	79	46.0	8.6
8	7356.00	41.4 AV	54.0	-12.6	1.71 V	79	32.8	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.

Below 1GHz Data:

802.11g

CHANNEL	TX Channel 6	**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	125.04	30.3 QP	43.5	-13.2	2.00 H	78	39.7	-9.4
2	172.83	32.1 QP	43.5	-11.4	2.00 H	271	40.7	-8.6
3	375.03	36.4 QP	46.0	-9.6	1.00 H	53	41.2	-4.8
4	625.00	38.3 QP	46.0	-7.7	1.00 H	360	37.1	1.2
5	675.00	35.5 QP	46.0	-10.5	1.00 H	226	33.8	1.7
6	874.99	39.4 QP	46.0	-6.6	1.50 H	131	34.5	4.9
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	80.97	31.5 QP	40.0	-8.5	1.00 V	155	44.2	-12.7
2	125.01	30.1 QP	43.5	-13.4	1.50 V	360	39.5	-9.4
3	375.03	30.6 QP	46.0	-15.4	1.00 V	3	35.4	-4.8
4	506.25	36.0 QP	46.0	-10.0	1.00 V	290	37.6	-1.6
5	566.80	35.1 QP	46.0	-10.9	1.00 V	44	35.7	-0.6
6	746.01	36.1 QP	46.0	-9.9	2.00 V	360	33.0	3.1

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

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	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 04, 2018	June 03, 2019
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
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: June 30, 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.

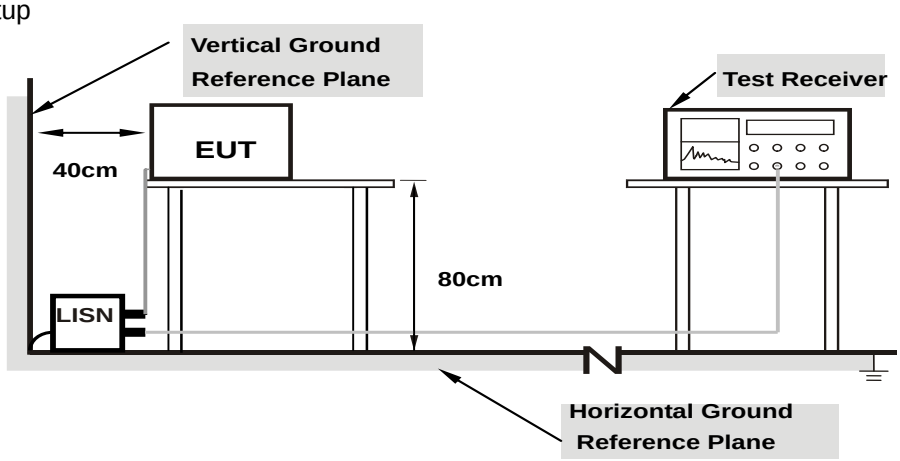
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

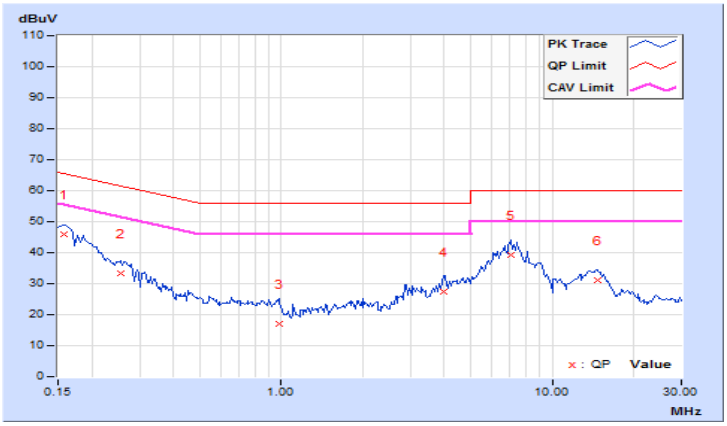
4.2.7 Test Results

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	0.15781	10.05	36.01	22.18	46.06	32.23	65.58	55.58	-19.52	-23.35
2	0.25547	10.08	23.30	7.86	33.38	17.94	61.58	51.58	-28.20	-33.64
3	0.97813	10.17	6.92	0.54	17.09	10.71	56.00	46.00	-38.91	-35.29
4	3.99219	10.34	17.16	11.56	27.50	21.90	56.00	46.00	-28.50	-24.10
5	**7.01563**	**10.53**	**28.90**	**22.91**	**39.43**	**33.44**	**60.00**	**50.00**	**-20.57**	**-16.56**
6	14.66016	11.04	20.15	14.64	31.19	25.68	60.00	50.00	-28.81	-24.32

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.

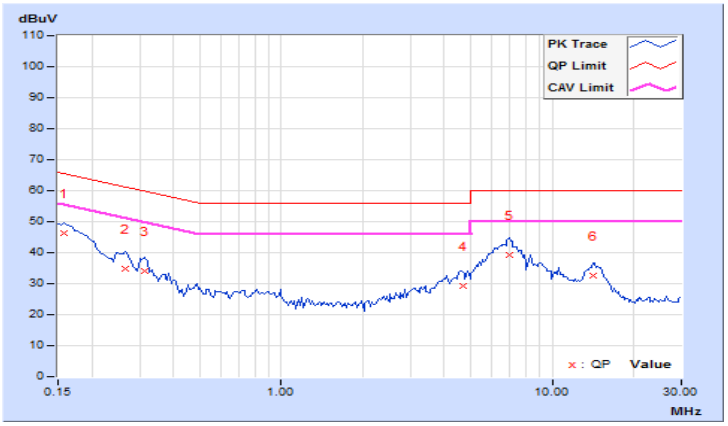


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.96	36.31	22.93	46.27	32.89	65.58	55.58	-19.31	-22.69
2	0.26719	9.99	24.95	12.16	34.94	22.15	61.20	51.20	-26.26	-29.05
3	0.31406	10.00	24.05	13.60	34.05	23.60	59.86	49.86	-25.81	-26.26
4	4.68750	10.23	19.00	13.25	29.23	23.48	56.00	46.00	-26.77	-22.52
5	6.96484	10.36	28.83	22.88	39.19	33.24	60.00	50.00	-20.81	-16.76
6	14.11328	10.81	21.60	16.33	32.41	27.14	60.00	50.00	-27.59	-22.86

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.

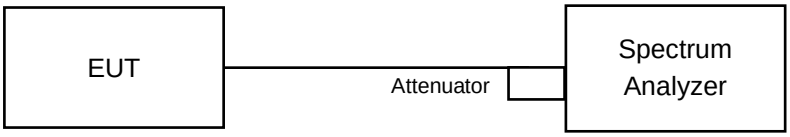


4.3 6dB Bandwidth Measurement

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		
1	2412	9.58	10.05	0.5	Pass
6	2437	10.10	10.14	0.5	Pass
11	2462	10.05	10.03	0.5	Pass

802.11g

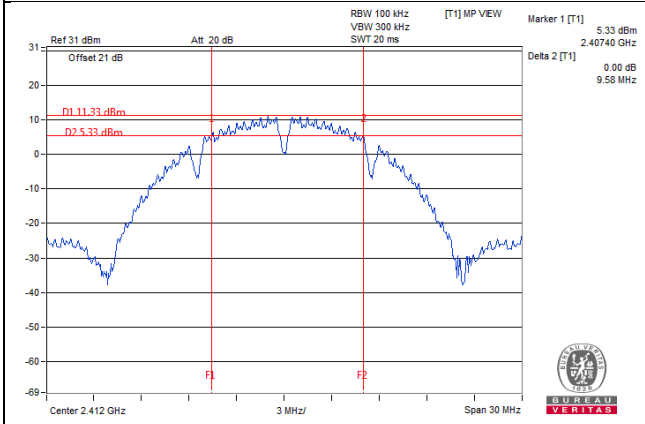
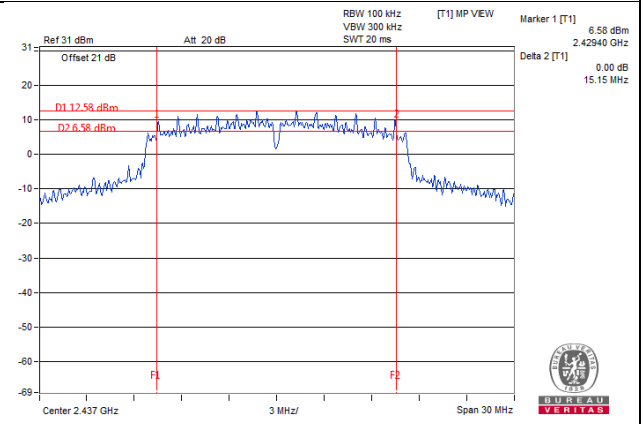
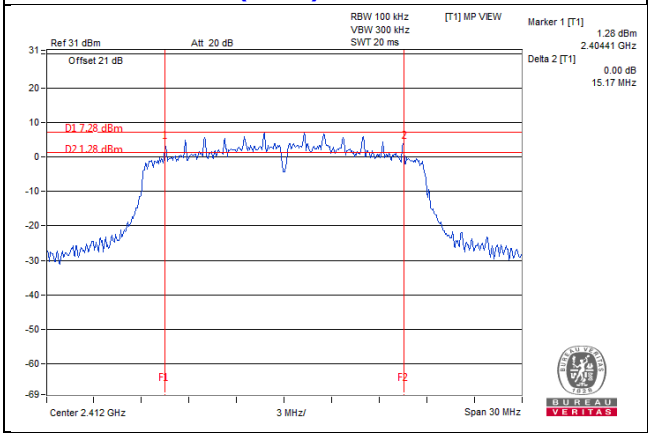
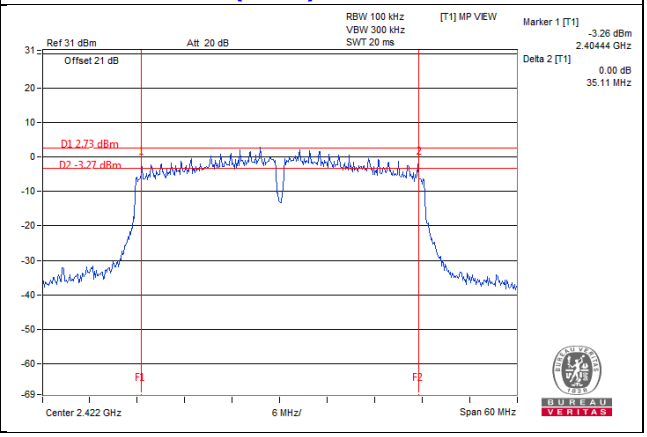
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.17	15.17	0.5	Pass
2	2417	15.17	15.22	0.5	Pass
6	2437	15.19	15.15	0.5	Pass
10	2457	15.19	16.33	0.5	Pass
11	2462	15.18	15.20	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.17	15.73	0.5	Pass
2	2417	15.74	15.21	0.5	Pass
6	2437	15.19	15.76	0.5	Pass
10	2457	16.31	15.77	0.5	Pass
11	2462	15.19	15.74	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.13	35.11	0.5	Pass
4	2427	35.11	35.11	0.5	Pass
6	2437	35.12	35.17	0.5	Pass
8	2447	35.19	35.14	0.5	Pass
9	2452	35.16	35.20	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH1	**802.11g / Chain 1 : CH6**
	
802.11n (HT20) / Chain 0 : CH1	**802.11n (HT40) / Chain 1 : CH3**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

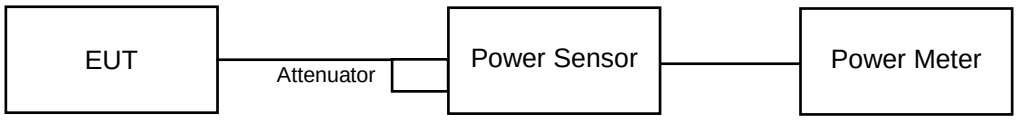
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

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

FOR PEAK POWER

802.11b

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.25	22.64	351.534	25.46	30.00	Pass
6	2437	24.99	25.04	634.654	28.03	30.00	Pass
11	2462	22.33	22.75	359.367	25.56	30.00	Pass

802.11g

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.97	25.07	635.417	28.03	30.00	Pass
2	2417	25.64	25.75	742.275	28.71	30.00	Pass
6	2437	26.32	26.66	891.996	29.50	30.00	Pass
10	2457	25.52	25.69	727.132	28.62	30.00	Pass
11	2462	24.61	24.72	585.551	27.68	30.00	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.42	25.18	606.304	27.83	30.00	Pass
2	2417	25.57	25.69	731.26	28.64	30.00	Pass
6	2437	26.08	26.51	853.222	29.31	30.00	Pass
10	2457	25.42	25.44	698.282	28.44	30.00	Pass
11	2462	24.13	24.71	554.622	27.44	30.00	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	21.26	21.52	275.566	24.40	30.00	Pass
4	2427	23.27	23.39	430.597	26.34	30.00	Pass
6	2437	24.61	24.73	586.235	27.68	30.00	Pass
8	2447	23.75	23.82	478.128	26.80	30.00	Pass
9	2452	21.18	21.42	269.896	24.31	30.00	Pass

FOR AVERAGE POWER

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	20.52	20.58	227.008	23.56
6	2437	23.27	23.45	433.633	26.37
11	2462	20.61	20.65	231.225	23.64

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	18.01	18.12	128.104	21.08
2	2417	20.62	20.73	233.649	23.69
6	2437	22.34	22.47	348	25.42
10	2457	20.55	20.68	230.451	23.63
11	2462	17.44	17.63	113.406	20.55

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	17.51	17.63	114.307	20.58
2	2417	20.29	20.48	218.591	23.40
6	2437	22.26	22.34	339.663	25.31
10	2457	20.18	20.35	212.625	23.28
11	2462	17.18	17.19	104.6	20.20

802.11n (HT40)

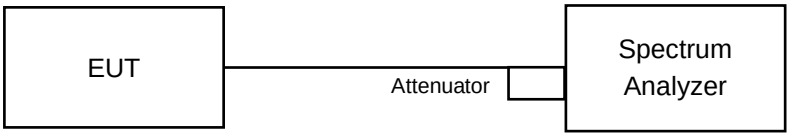
Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	14.72	14.85	60.197	17.80
4	2427	15.56	15.75	73.559	18.67
6	2437	18.19	18.27	133.06	21.24
8	2447	16.21	16.34	84.836	19.29
9	2452	14.63	14.79	59.17	17.72

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 analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

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=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-4.76	3.01	-1.75	7.77	Pass
	6	2437	-0.38	3.01	2.63	7.77	Pass
	11	2462	-3.28	3.01	-0.27	7.77	Pass
1	1	2412	-1.41	3.01	1.60	7.77	Pass
	6	2437	0.88	3.01	3.89	7.77	Pass
	11	2462	-2.35	3.01	0.66	7.77	Pass

Note: 1. Directional gain = 6.23dBi > 6dBi , so the power density limit shall be reduced to 8-(6.23-6) = 7.77dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-7.90	3.01	-4.89	7.77	Pass
	2	2417	-5.69	3.01	-2.68	7.77	Pass
	6	2437	-4.40	3.01	-1.39	7.77	Pass
	10	2457	-6.70	3.01	-3.69	7.77	Pass
	11	2462	-9.44	3.01	-6.43	7.77	Pass
1	1	2412	-9.35	3.01	-6.34	7.77	Pass
	2	2417	-3.52	3.01	-0.51	7.77	Pass
	6	2437	-3.89	3.01	-0.88	7.77	Pass
	10	2457	-3.51	3.01	-0.50	7.77	Pass
	11	2462	-9.13	3.01	-6.12	7.77	Pass

Note: 1. Directional gain = 6.23dBi > 6dBi , so the power density limit shall be reduced to 8-(6.23-6) = 7.77dBm.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.76	3.01	-5.75	7.77	Pass
	2	2417	-8.38	3.01	-5.37	7.77	Pass
	6	2437	-4.43	3.01	-1.42	7.77	Pass
	10	2457	-4.71	3.01	-1.70	7.77	Pass
	11	2462	-10.16	3.01	-7.15	7.77	Pass
1	1	2412	-8.46	3.01	-5.45	7.77	Pass
	2	2417	-5.02	3.01	-2.01	7.77	Pass
	6	2437	-2.72	3.01	0.29	7.77	Pass
	10	2457	-5.35	3.01	-2.34	7.77	Pass
	11	2462	-8.25	3.01	-5.24	7.77	Pass

Note: 1. Directional gain = 6.23dBi > 6dBi , so the power density limit shall be reduced to 8-(6.23-6) = 7.77dBm.

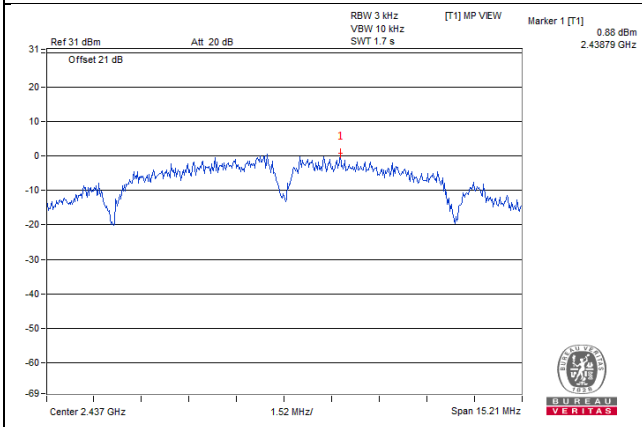
802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-14.22	3.01	-11.21	7.77	Pass
	4	2427	-12.18	3.01	-9.17	7.77	Pass
	6	2437	-11.49	3.01	-8.48	7.77	Pass
	8	2447	-10.49	3.01	-7.48	7.77	Pass
	9	2452	-14.91	3.01	-11.90	7.77	Pass
1	3	2422	-12.67	3.01	-9.66	7.77	Pass
	4	2427	-11.92	3.01	-8.91	7.77	Pass
	6	2437	-9.77	3.01	-6.76	7.77	Pass
	8	2447	-11.47	3.01	-8.46	7.77	Pass
	9	2452	-12.15	3.01	-9.14	7.77	Pass

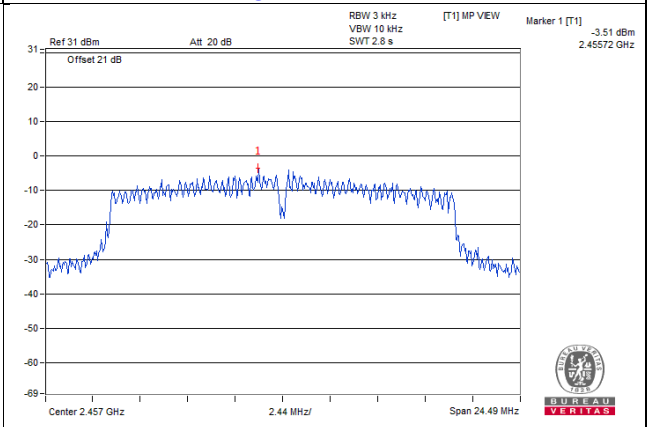
Note: 1. Directional gain = 6.23dBi > 6dBi , so the power density limit shall be reduced to 8-(6.23-6) = 7.77dBm.

Spectrum Plot of Worst Value

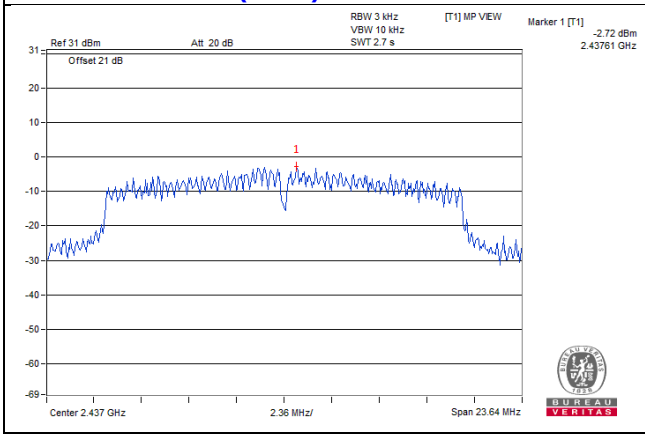
802.11b / Chain 1 : CH6



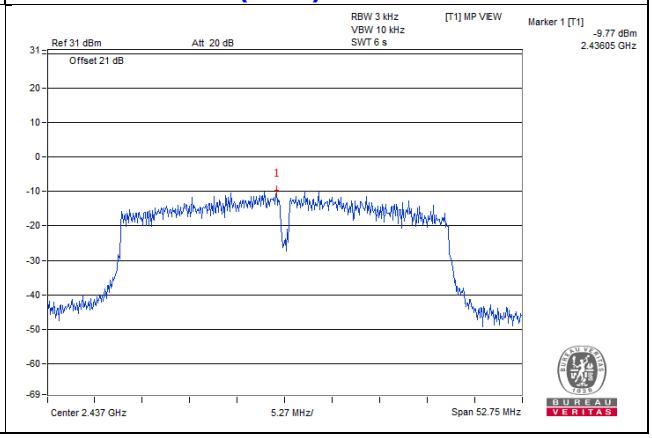
802.11g / Chain 1 : CH10



802.11n (HT20) / Chain 1 : CH6



802.11n (HT40) / Chain 1 : CH6

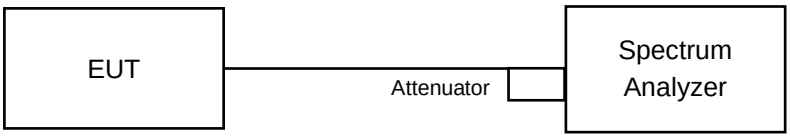


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below -20dB 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

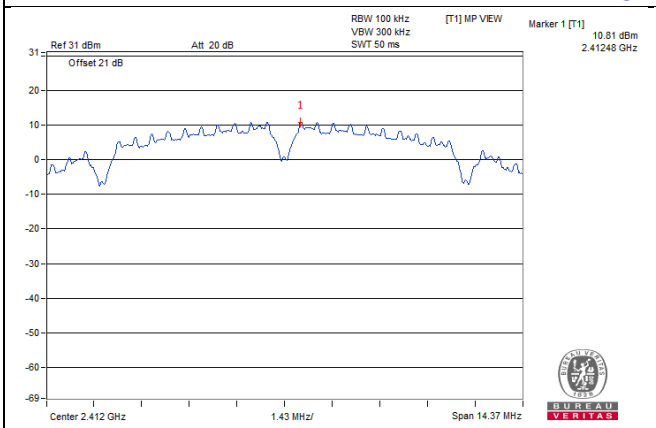
Same as Item 4.3.6

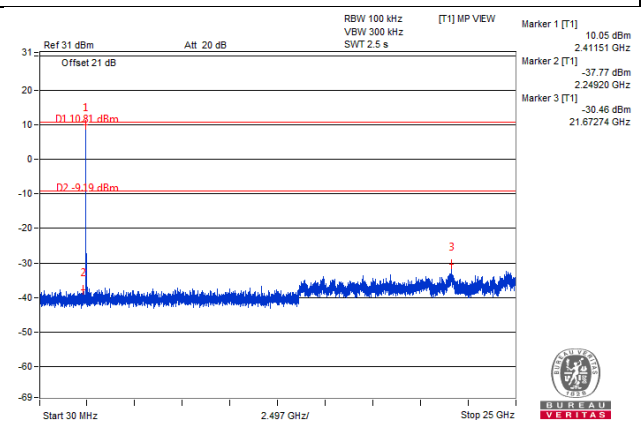
4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

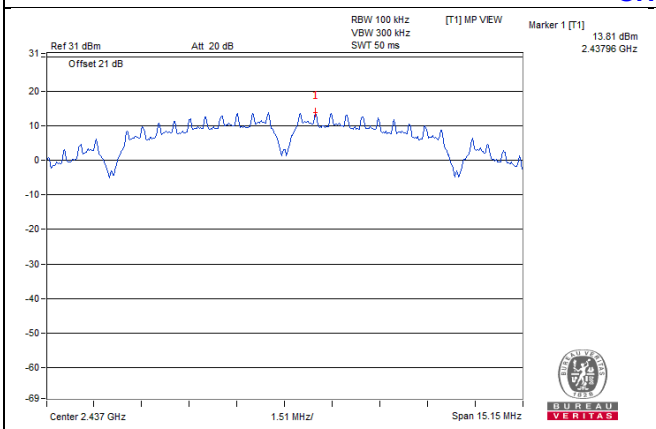
802.11b - Chain 0

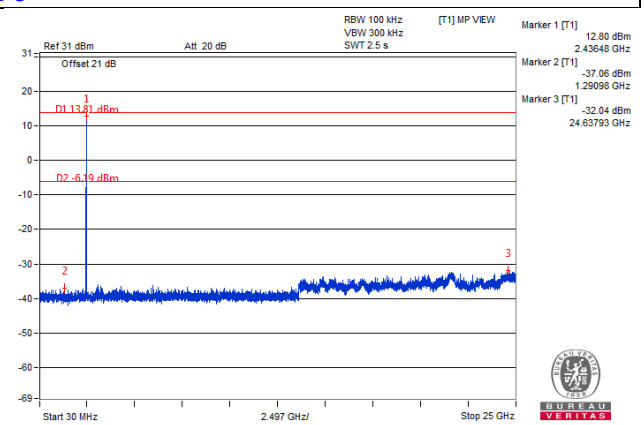
CH 1



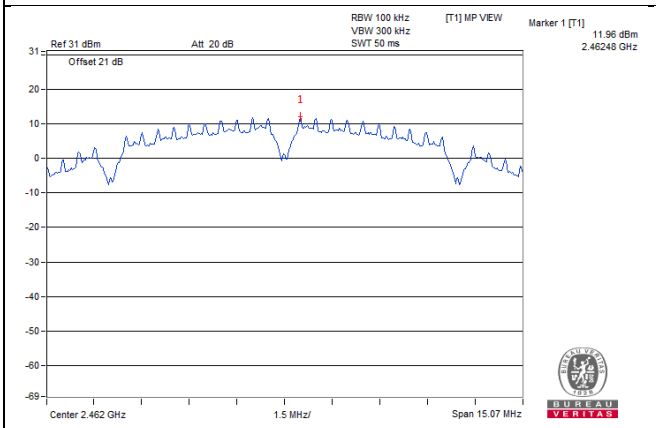


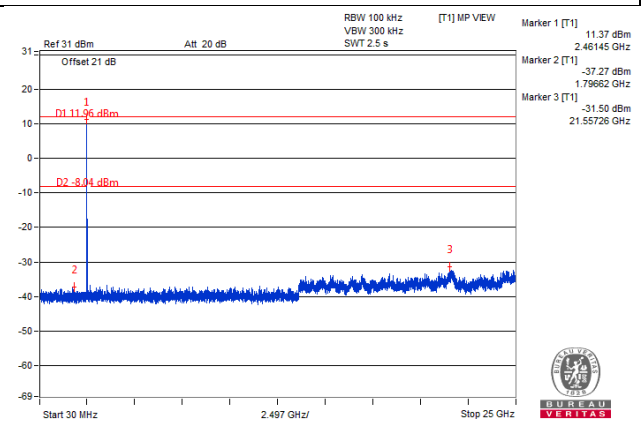
CH 6



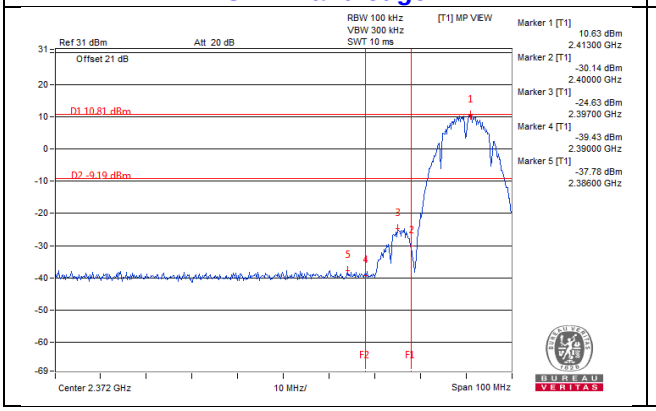


CH 11

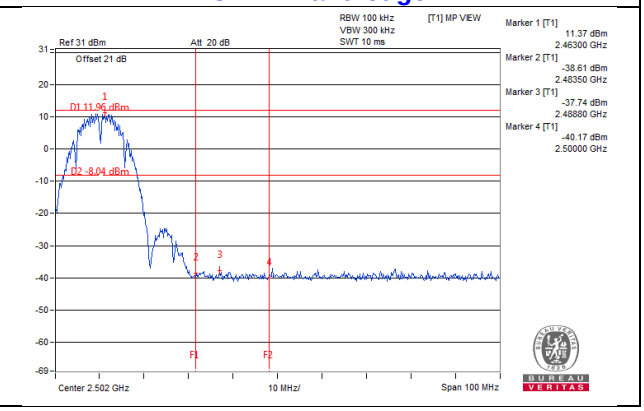




CH 1 Band edge

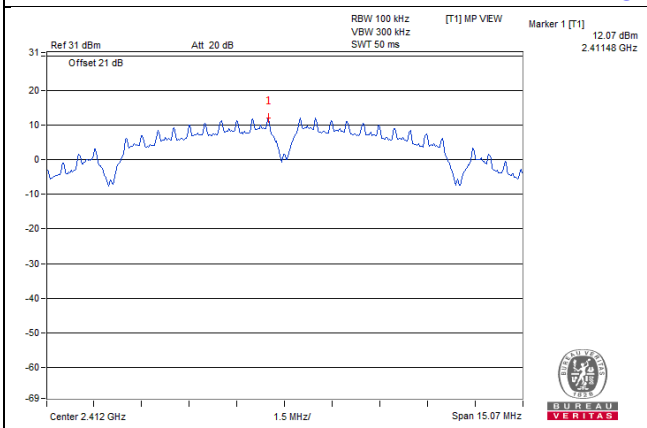


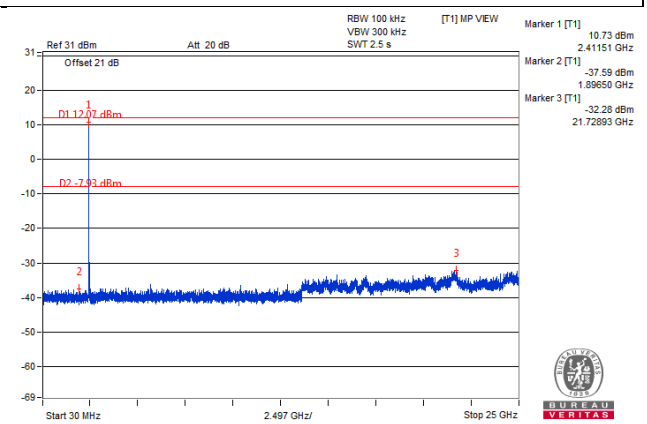
CH 11 Band edge



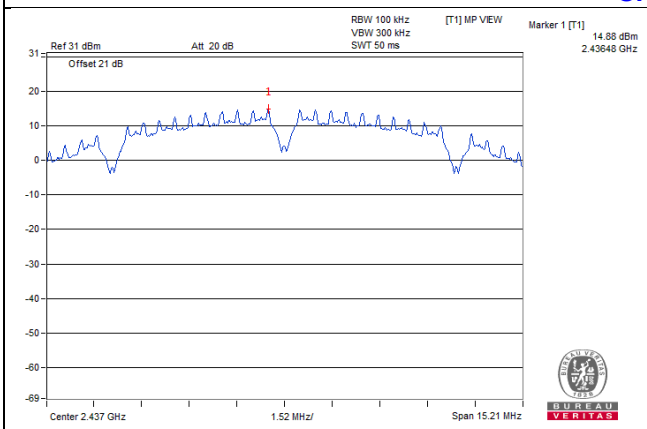
Chain 1

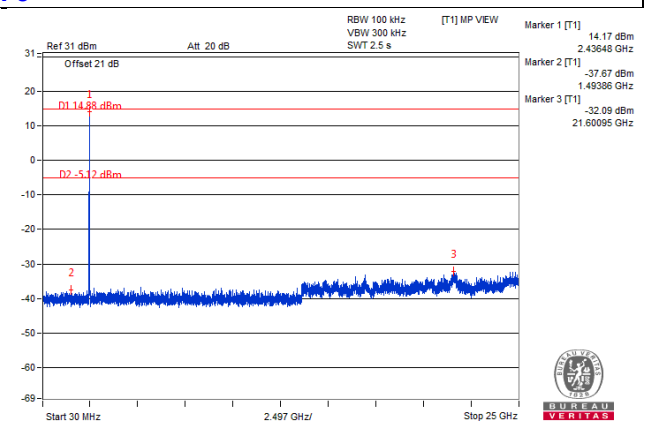
CH 1



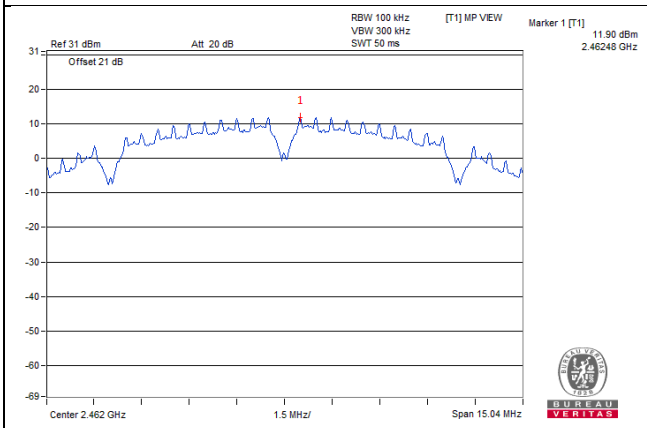


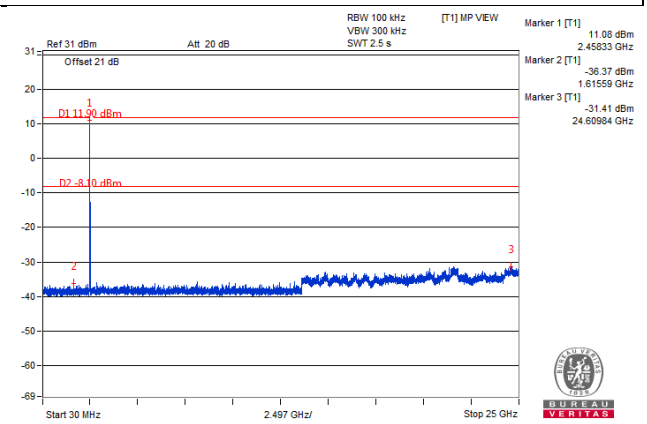
CH 6



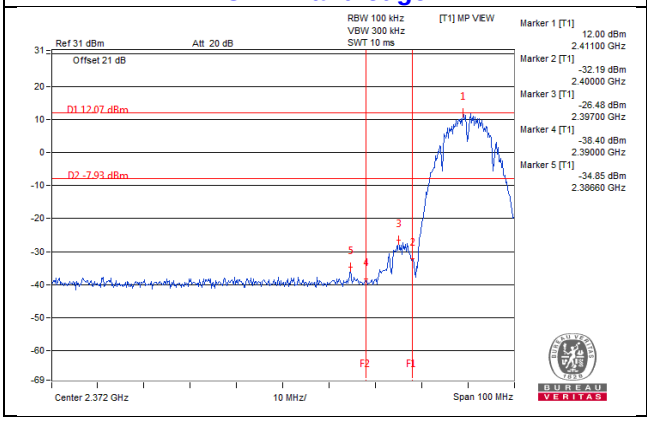


CH 11

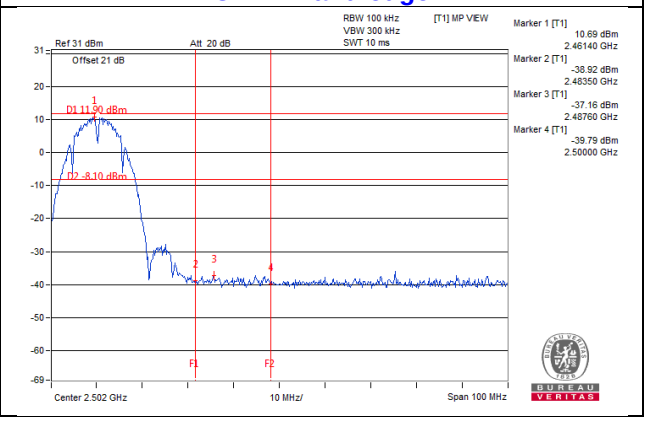




CH 1 Band edge

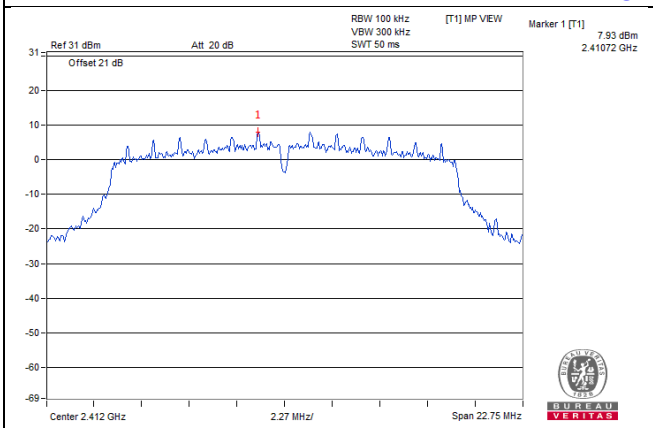


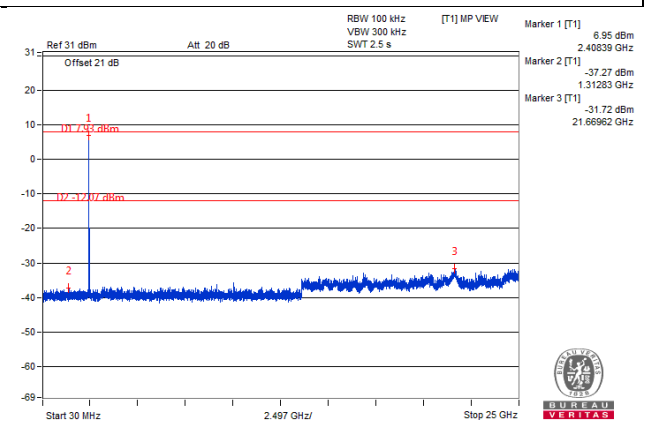
CH 11 Band edge



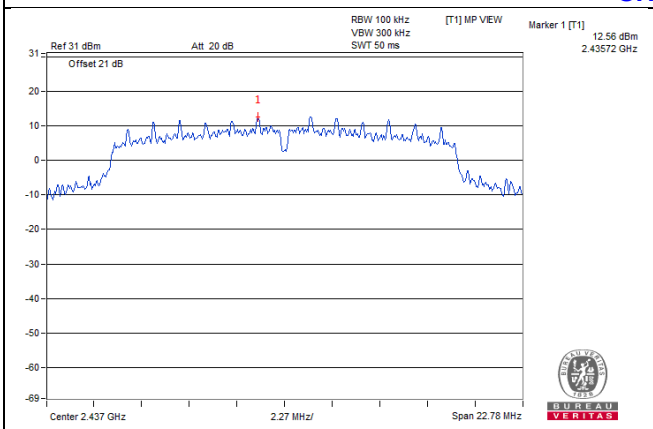
802.11g - Chain 0

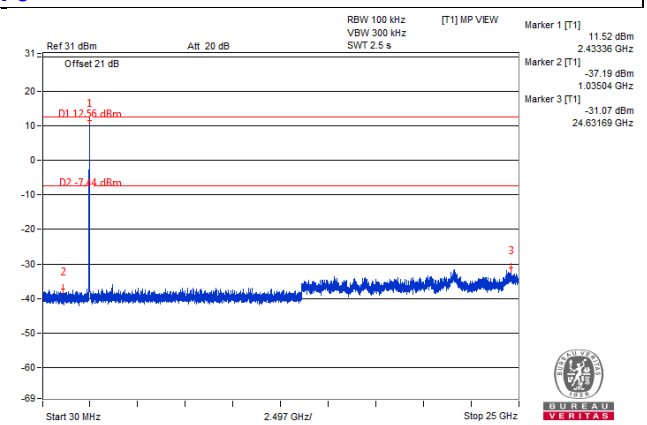
CH 1



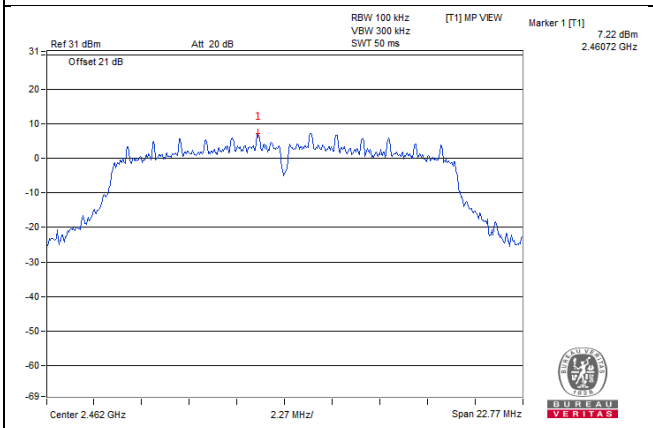


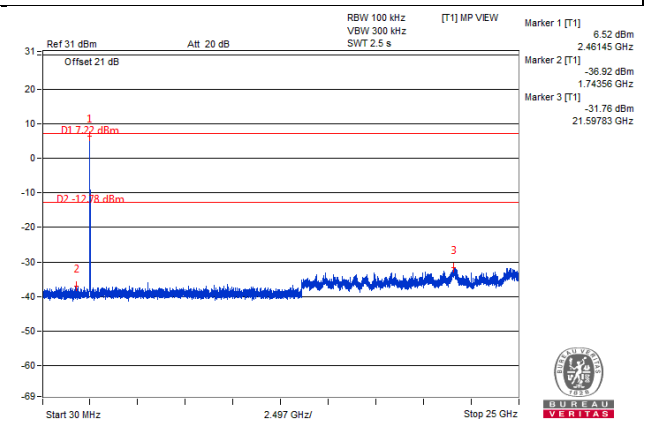
CH 6



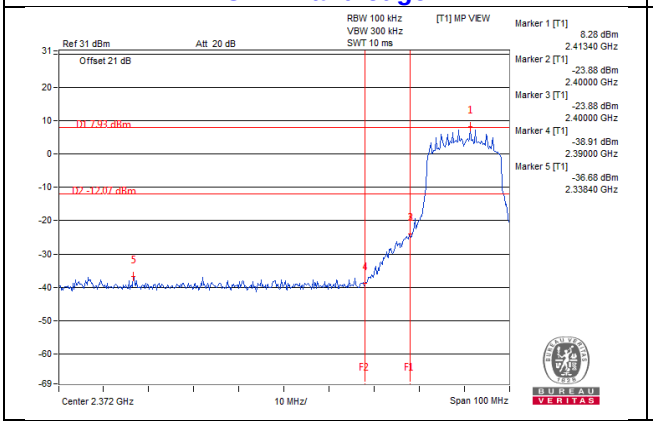


CH 11

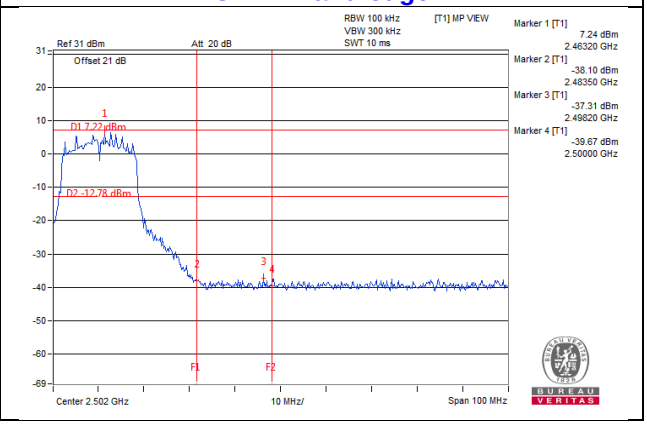




CH 1 Band edge

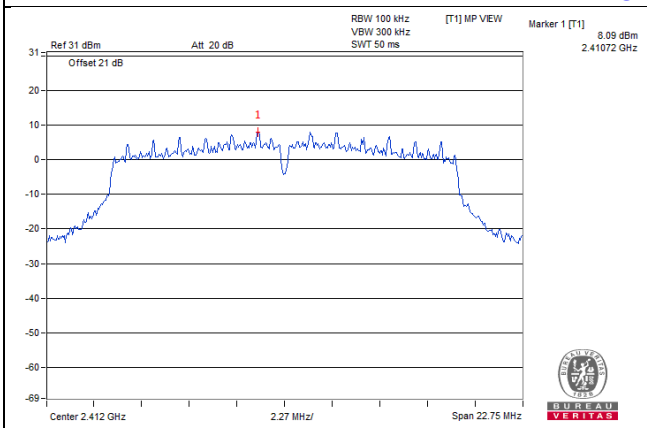


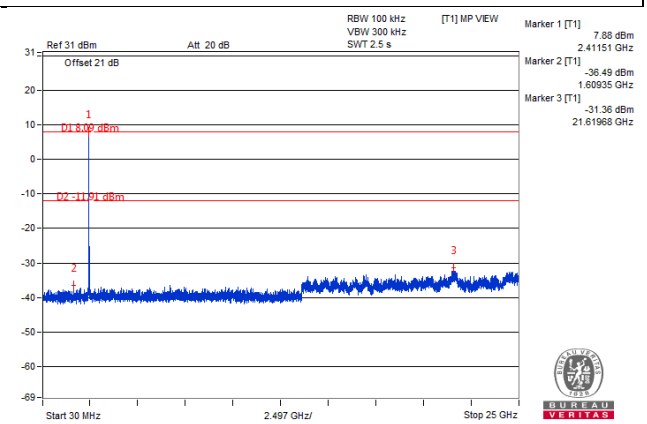
CH 11 Band edge



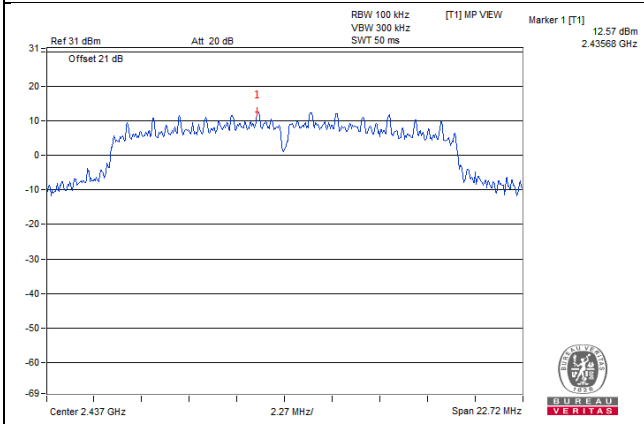
Chain 1

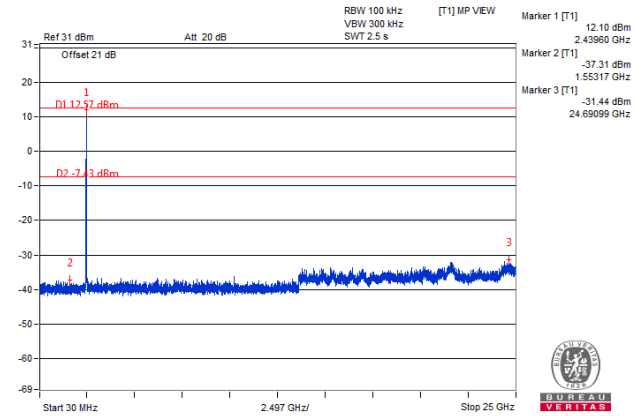
CH 1



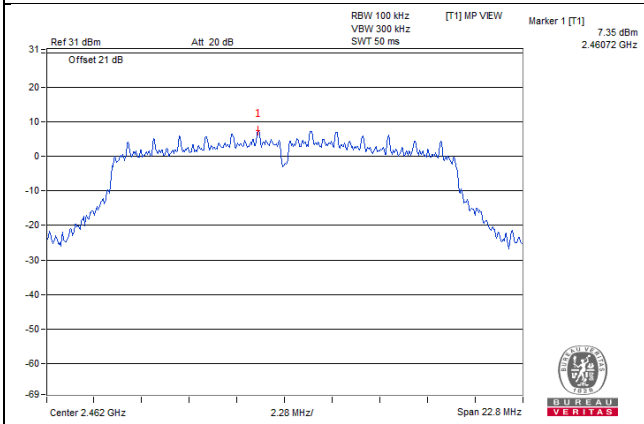


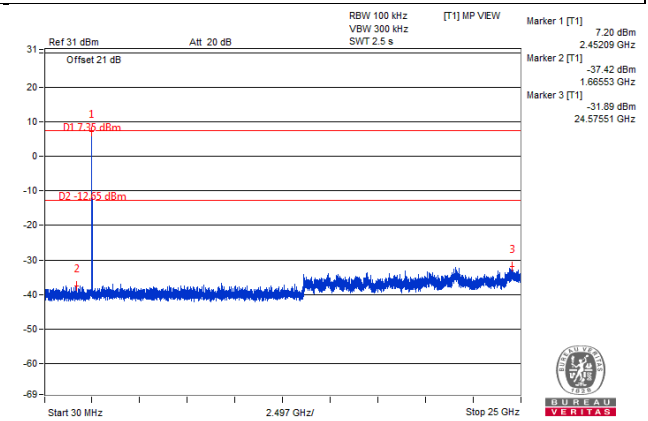
CH 6



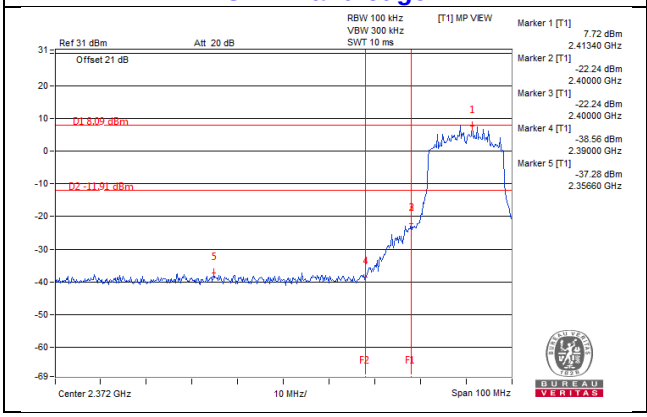


CH 11

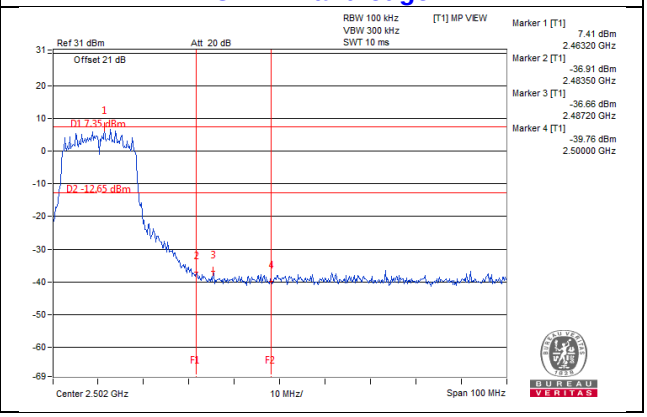




CH 1 Band edge

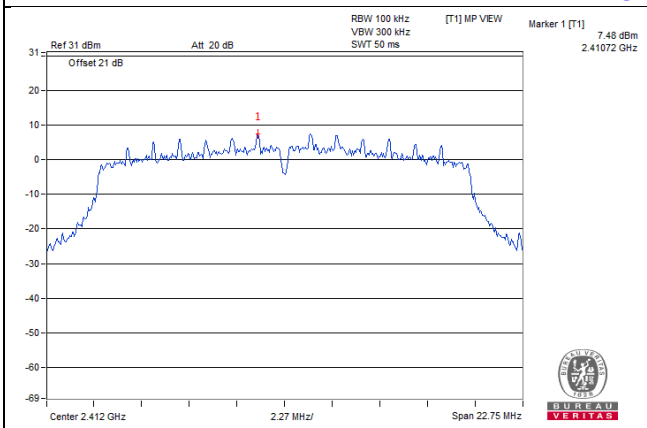


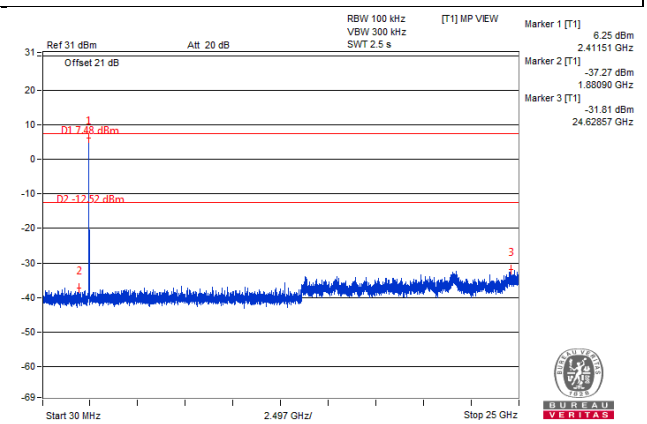
CH 11 Band edge



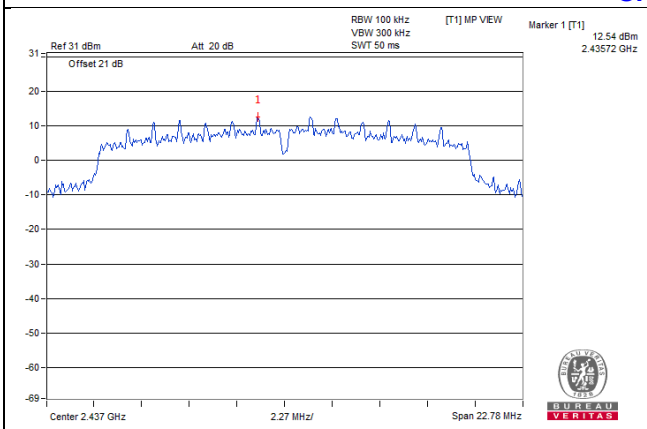
802.11n (HT20) - Chain 0

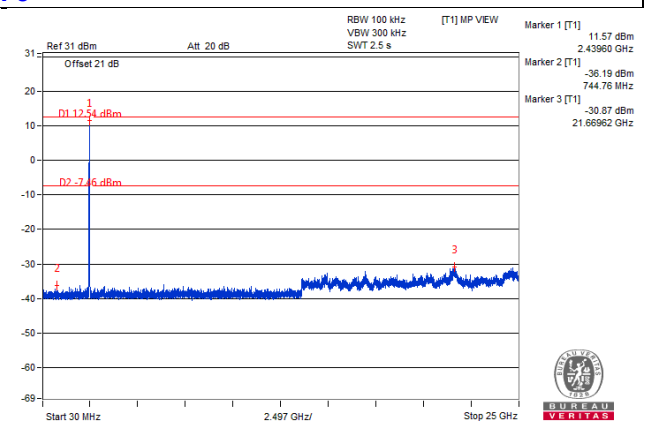
CH 1



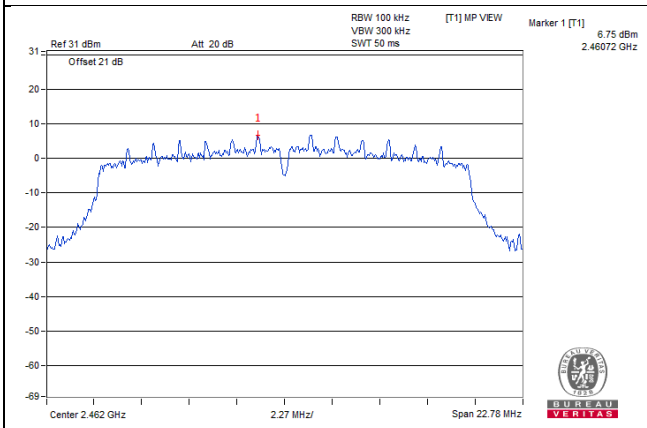


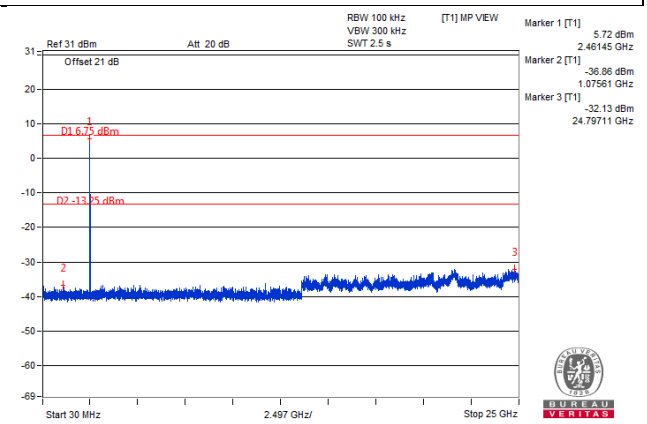
CH 6



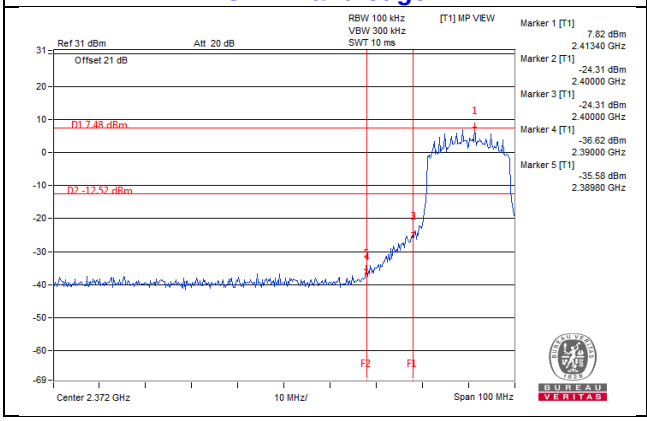


CH 11

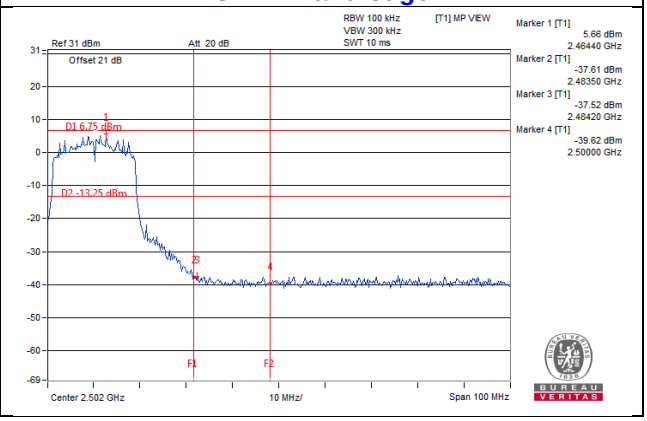




CH 1 Band edge

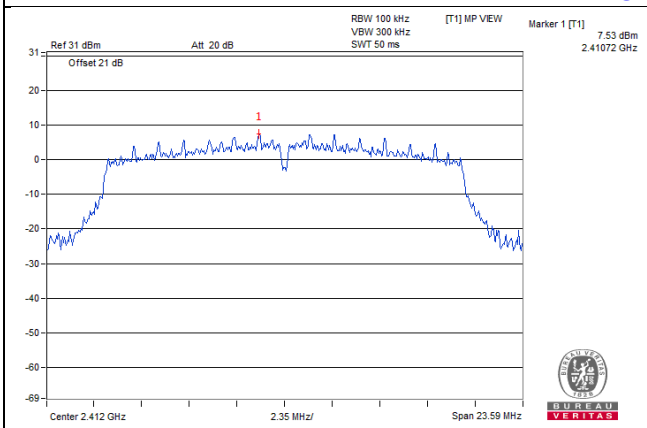


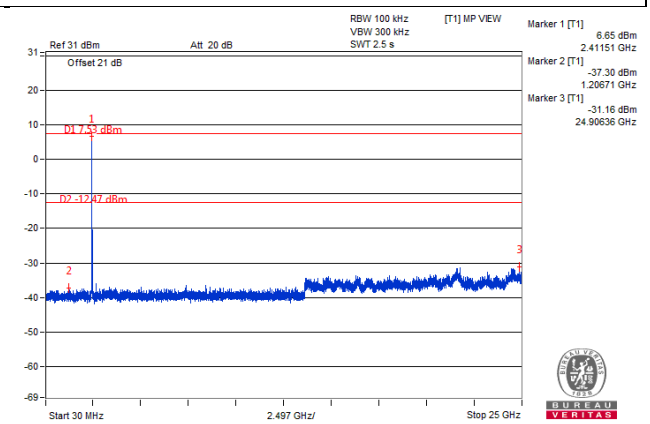
CH 11 Band edge



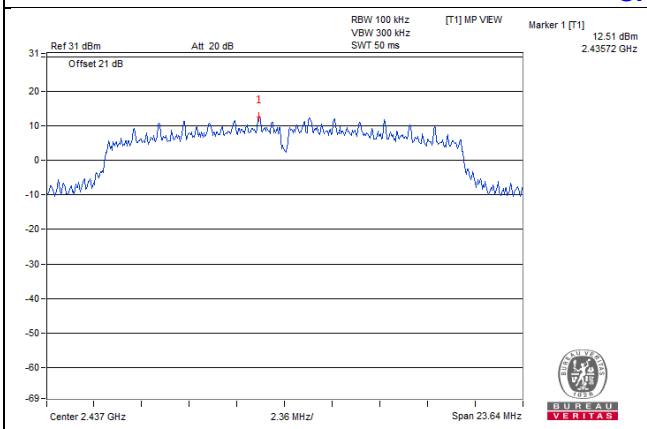
Chain 1

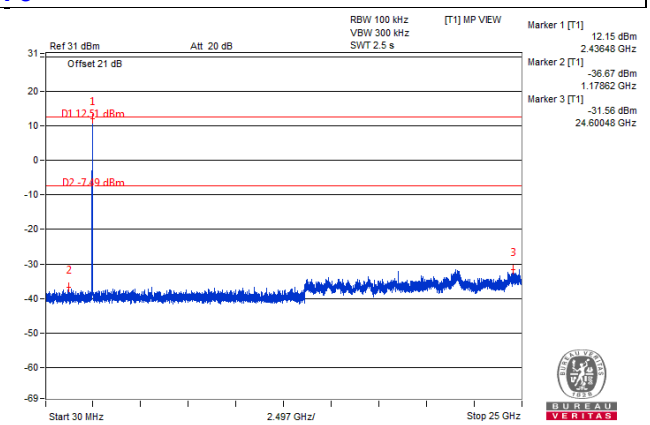
CH 1



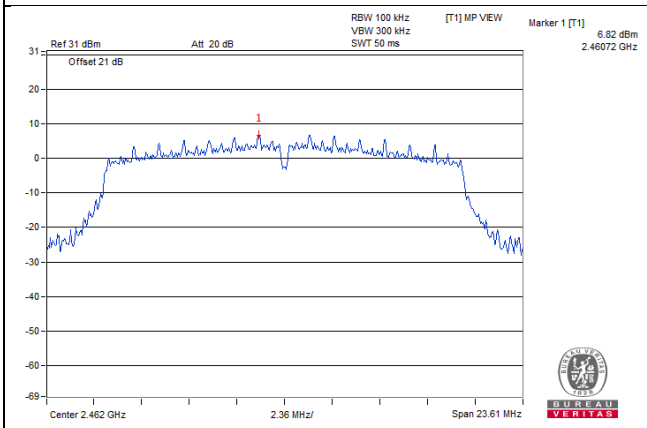


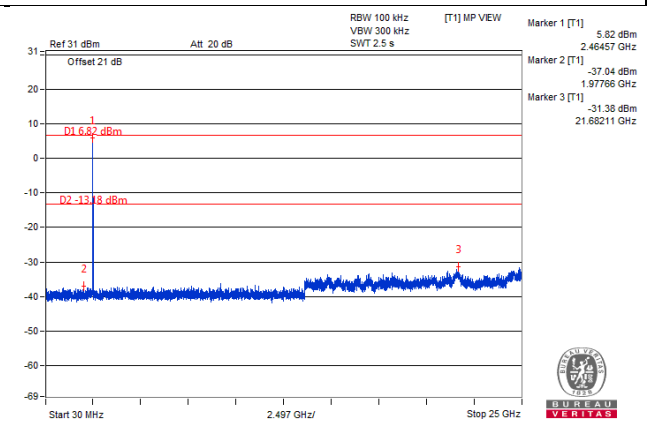
CH 6



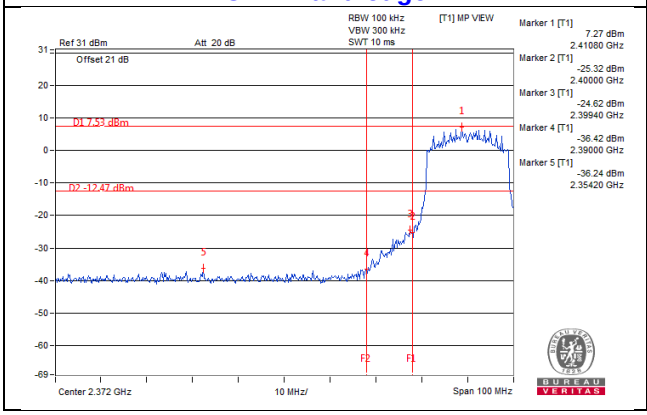


CH 11

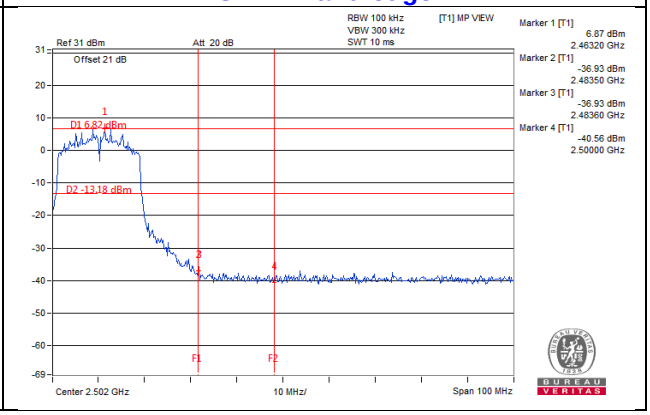




CH 1 Band edge

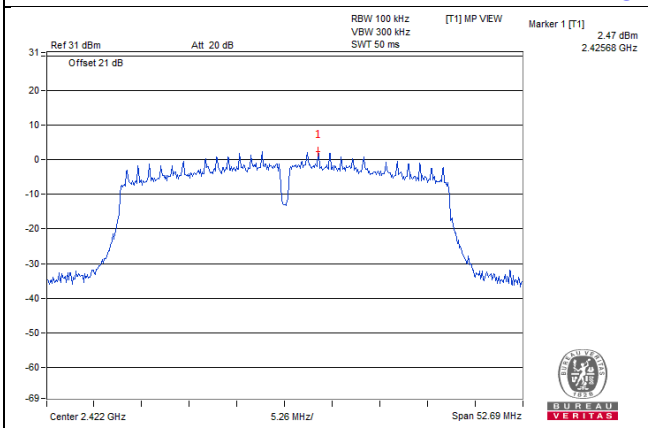


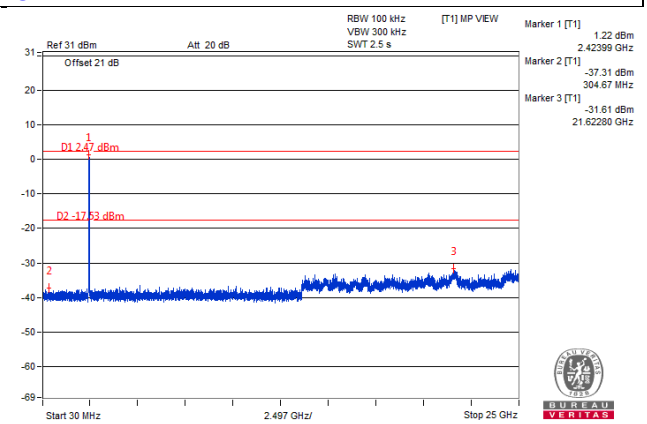
CH 11 Band edge



802.11n (HT40) - Chain 0

CH 3





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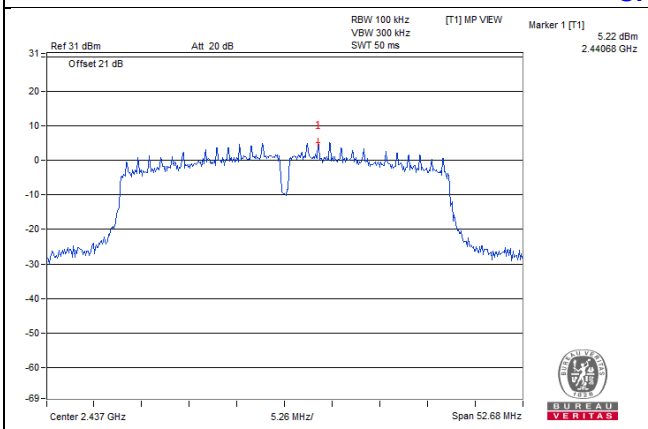
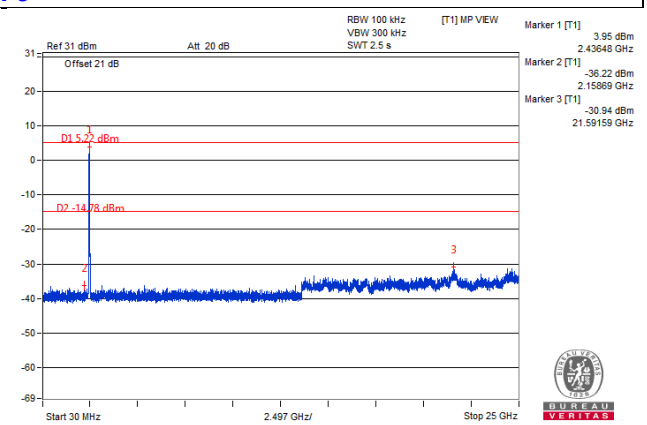
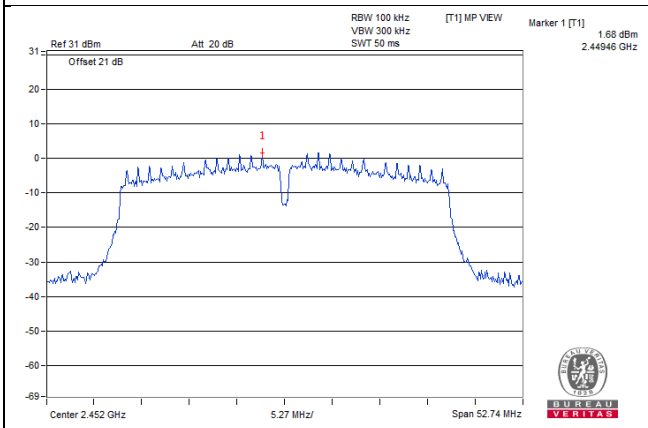
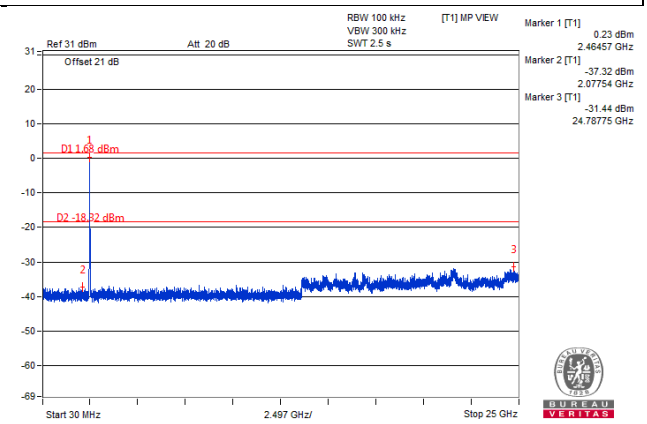


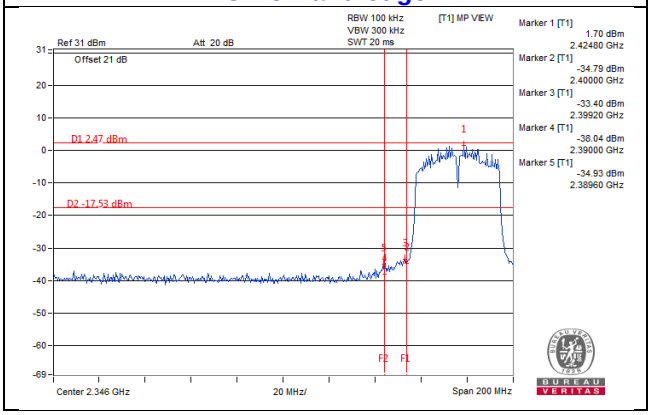


CH 9

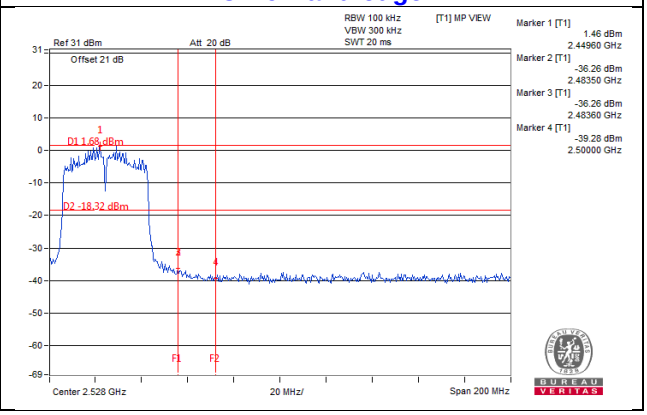




CH 3 Band edge

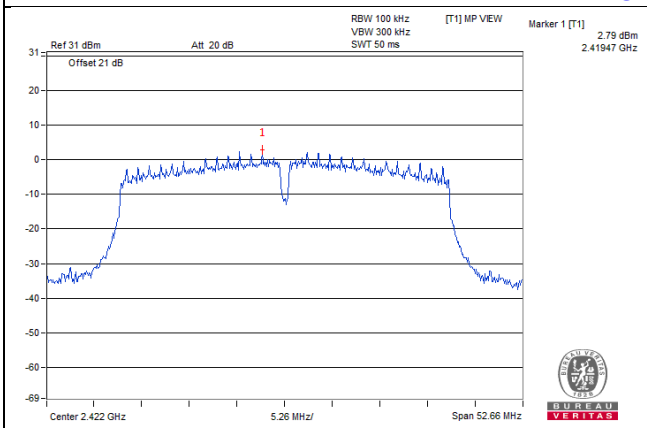


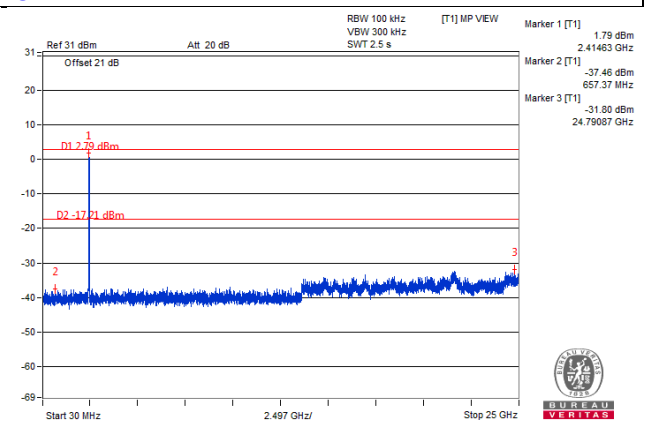
CH 9 Band edge



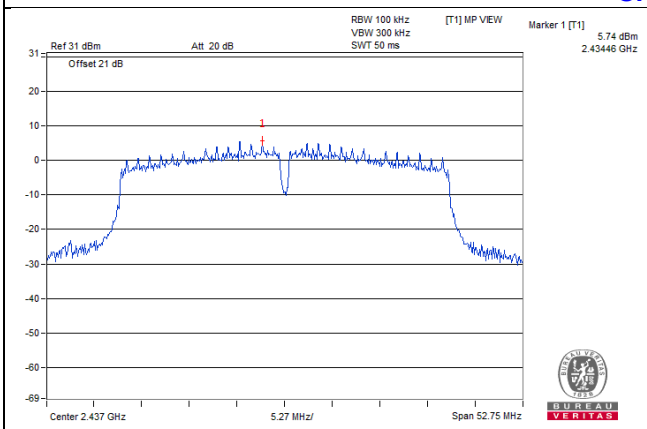
Chain 1

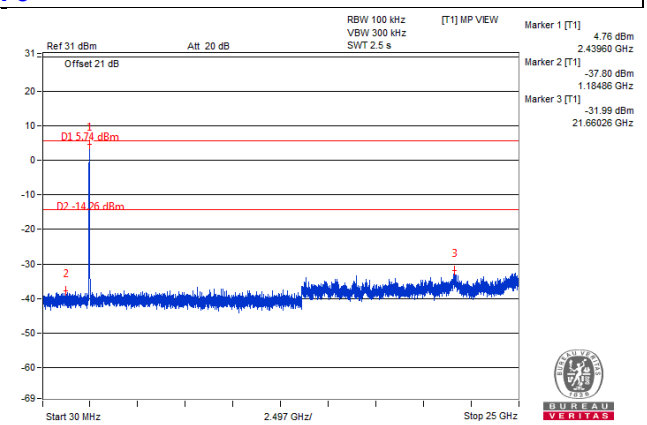
CH 3



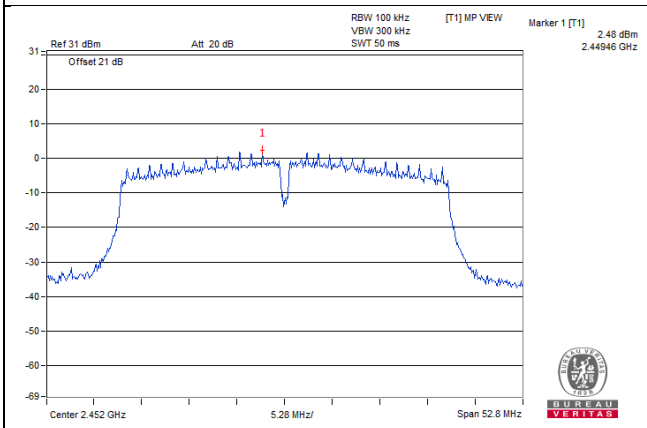


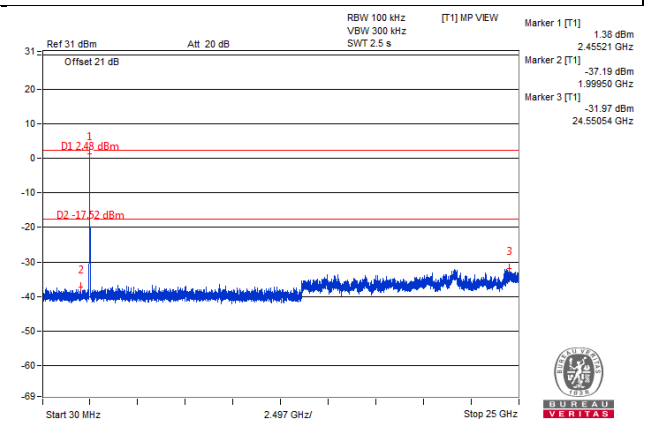
CH 6



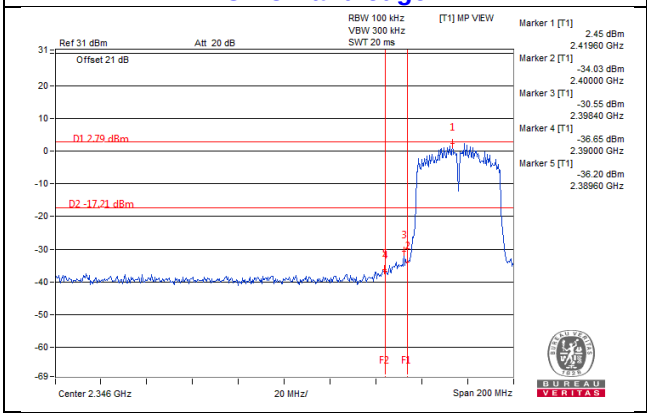


CH 9





CH 3 Band edge



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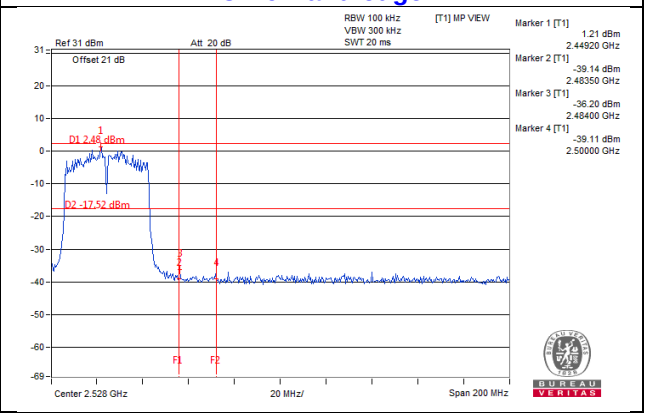

5 Pictures of Test Arrangements

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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