FCC Test Report

Report No.:	RF181102E08
FCC ID:	2AHKM-CHITA
Test Model:	CHITA
Received Date:	Nov. 06, 2018
Test Date:	Nov. 29, 2018 to Apr. 29, 2019
Issued Date:	June 05, 2019
Applicant:	Hitron Technologies Inc.
Address:	No. 1-8,Li-Hsin 1st Rd.,Hsinchu Science Park, HSINCHU,30078,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

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF181102E08	Original release.	June 05, 2019

1 Certificate of Conformity

Product:	Cable modem
Brand:	Hitron
Test Model:	CHITA
Sample Status:	ENGINEERING SAMPLE
Applicant:	Hitron Technologies Inc.
Test Date:	Nov. 29, 2018 to Apr. 29, 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:** June 05, 2019

Claire Kuan / Specialist

Approved by : _____ , **Date:** June 05, 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 -9.30dB at 2.02344MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 7311.00MHz.
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.
-	Occupied Bandwidth Measurement	-	Reference only

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	1.8 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.5 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.1 dB
	6GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.1 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	Hitron
Test Model	CHITA
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 and VHT (20/40) mode in 2.4GHz
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, 5.26 ~ 5.32GHz, 5.50 ~ 5.72GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 25 802.11n (HT40), 802.11ac (VHT40): 12 802.11ac (VHT80): 6
Output Power	**CDD Mode:** **2.4GHz:** 783.792mW **5.18GHz ~ 5.24GHz:** 706.685mW **5.26 ~ 5.32GHz:** 249.121mW **5.50 ~ 5.72GHz:** 241.757mW **5.745GHz ~ 5.825GHz:** 948.464mW **Beamforming Mode:** **2.4GHz:** 635.588mW **5.18GHz ~ 5.24GHz:** 385.348mW **5.26 ~ 5.32GHz:** 98.256mW **5.50 ~ 5.72GHz:** 98.466mW **5.745GHz ~ 5.825GHz:** 388.918mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ45 cable x 1 (Unshielded, 1.4m)

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 could be supplied with a power adapter as the following table:

Brand	Model	Specification
AOEM	A0505T8-120040	Input: 100-240V, 50-60Hz, 1.4A AC intput cable: Unshielded, 1.4m Output: 12V, 4.0A DC output cable: Unshielded, 1.5m

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

Antenna No.	Chain No.	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length (mm)
1	5G Chain 0	393000022328	3.32	5.15~5.85GHz	PCB	i-pex(MHF)	190
2	2G Chain 0	393000022428	2.61	2.4~2.4835GHz	PCB	i-pex(MHF)	71
	5G Chain 1		4.25	5.15~5.85GHz			
3	2G Chain 1	393000022528	3.25	2.4~2.4835GHz	PCB	i-pex(MHF)	61
	5G Chain 2		3.71	5.15~5.85GHz			
4	2G Chain 2	393000022628	3.54	2.4~2.4835GHz	PCB	i-pex(MHF)	75
	5G Chain 3		4.79	5.15~5.85GHz			

4. The EUT incorporates a MIMO function:

2.4GHz			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	3TX	3RX
802.11g	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
VHT20	MCS0~8 Nss=1	3TX	3RX
	MCS0~8 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX
VHT40	MCS0~9 Nss=1	3TX	3RX
	MCS0~9 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX
5GHz			
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)	MCS0~8 Nss=1	4TX	4RX
	MCS0~8 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~8 Nss=4	4TX	4RX
802.11ac (VHT40)	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~9 Nss=4	4TX	4RX
802.11ac (VHT80)	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~9 Nss=4	4TX	4RX

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

5. 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), VHT20:

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), VHT40:

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.

CDD Mode					
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.

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	11	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.

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	11	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.

CDD Mode					
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
Beamforming Mode (Only for Conducted Output Power)					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
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:

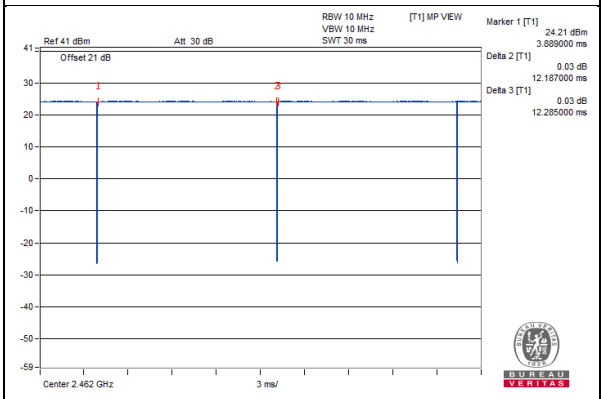
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	22deg. C, 65%RH	120Vac, 60Hz	Rey Chen
RE<1G	22deg. C, 63%RH	120Vac, 60Hz	Andy Ho
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

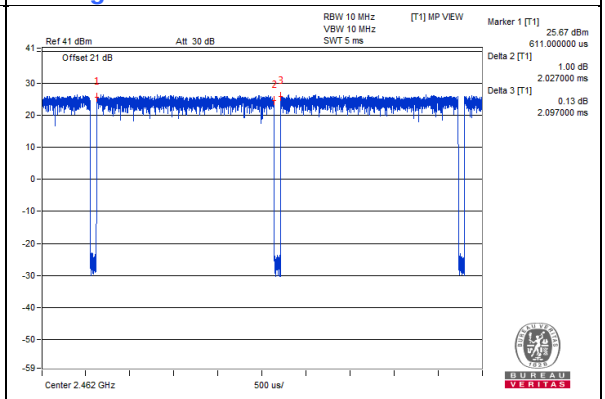
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 12.187/12.285 = 0.992
802.11g: Duty cycle = 2.027/2.097 = 0.967, Duty factor = 10 * log(1/0.967) = 0.15
802.11n (HT20): Duty cycle = 4.969/5.042 = 0.986
802.11n (HT40): Duty cycle = 2.413/2.489 = 0.969, Duty factor = 10 * log(1/0.969) = 0.13

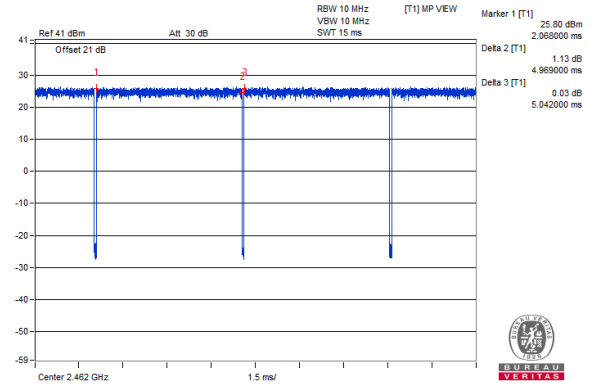
802.11b



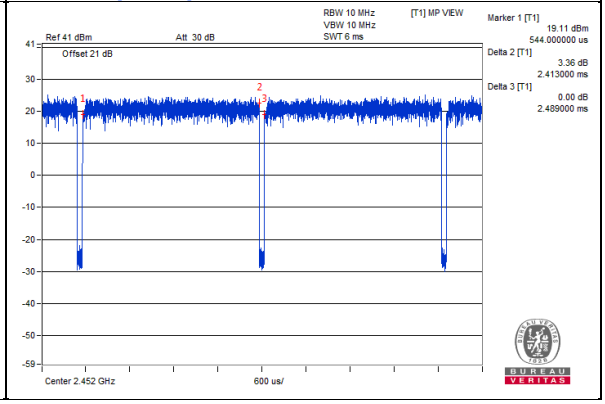
802.11g



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.

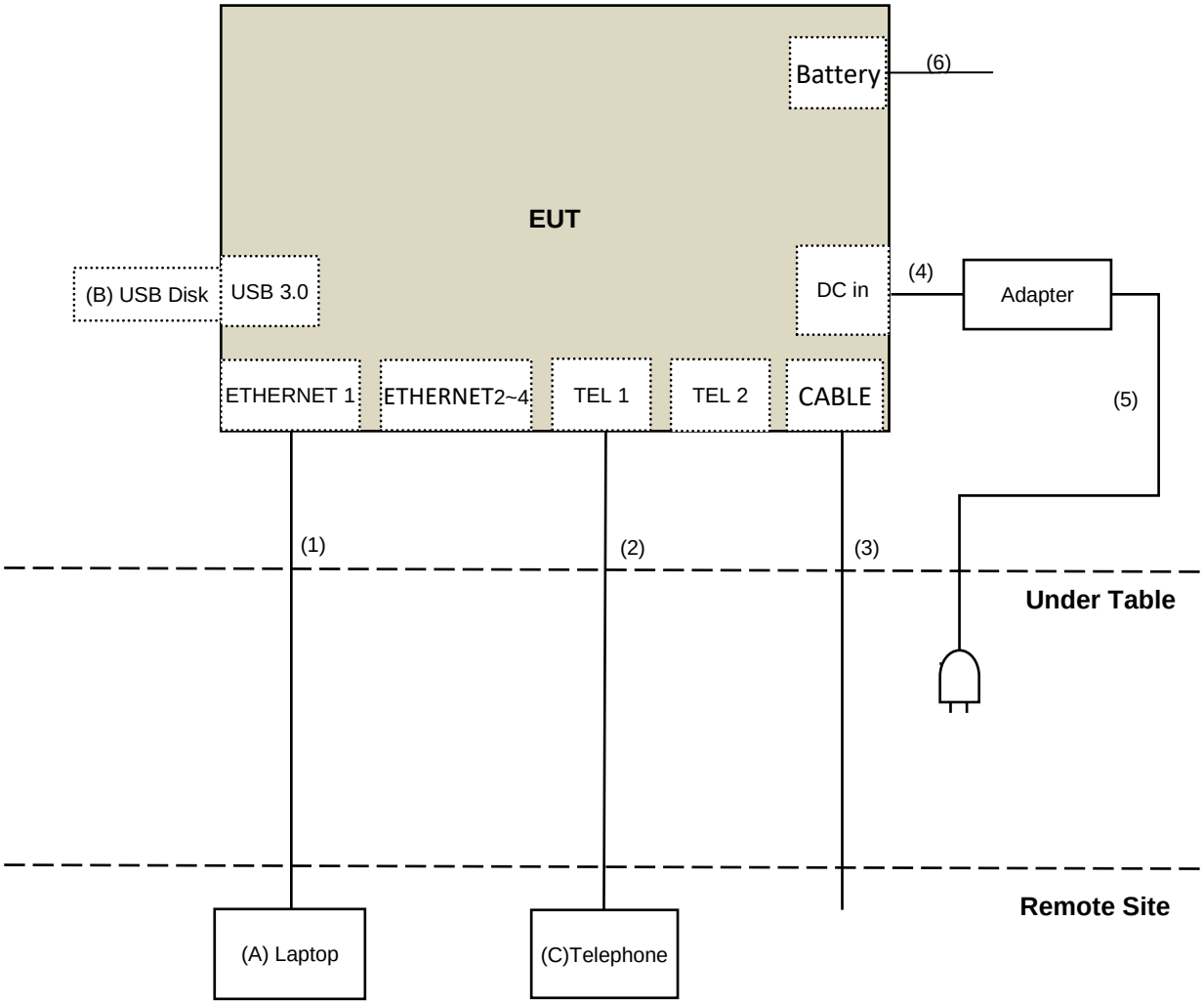
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	USB Disk 3.0	Transcend	16GB	NA	NA	Provided by Lab
C.	Telephone	WONDER	WD-303	7C17KA04011	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-11 Cable	1	10	No	0	Provided by Lab
3.	Coaxial Cable	1	10	Yes	0	Provided by Lab
4.	DC Cable	1	1.5	No	0	Supplied by client
5.	AC Cable	1	1.4	No	0	Supplied by client
6.	Audio Cable	1	1.6	No	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 v05r02
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

For radiated emission below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2018	July 11, 2019
Pre-Amplifier EMCI	EMC001340	980142	Jan. 25, 2019	Jan. 24, 2020
Loop Antenna Electro-Metrics	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
RF Cable	NA	LOOPCAB-001	Jan. 14, 2019	Jan. 13, 2020
RF Cable	NA	LOOPCAB-002	Jan. 14, 2019	Jan. 13, 2020
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 05, 2018	May 04, 2019
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 22, 2018	Nov. 21, 2019
RF Cable	8D	966-3-1	Mar. 18, 2019	Mar. 17, 2020
RF Cable	8D	966-3-2	Mar. 18, 2019	Mar. 17, 2020
RF Cable	8D	966-3-3	Mar. 18, 2019	Mar. 17, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 27, 2018	Sep. 26, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Apr. 29, 2019

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2018	July 11, 2019
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200	160922	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150317	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150322	Jan. 29, 2018	Jan. 28, 2019
Spectrum Analyzer Keysight	N9030A	MY54490679	July 23, 2018	July 22, 2019
Pre-Amplifier EMCI	EMC184045SE	980386	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160924	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
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 test was performed in 966 Chamber No. 3.
3. Tested Date: Nov. 29 to Dec. 03, 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:

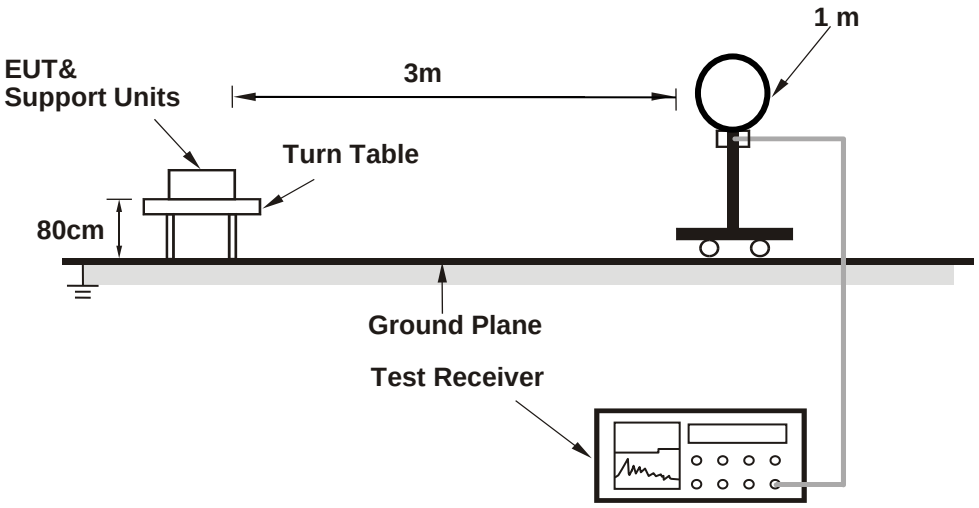
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

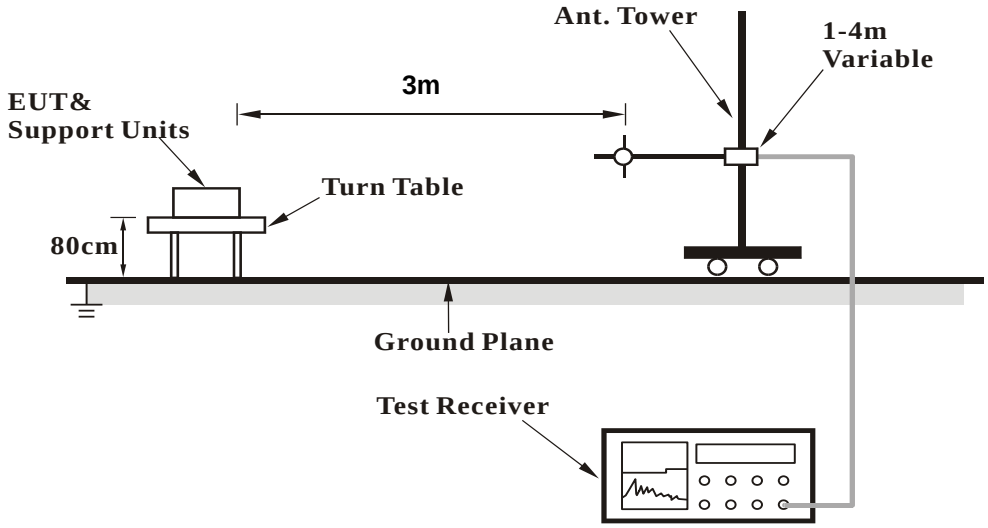
No deviation.

4.1.5 Test Setup

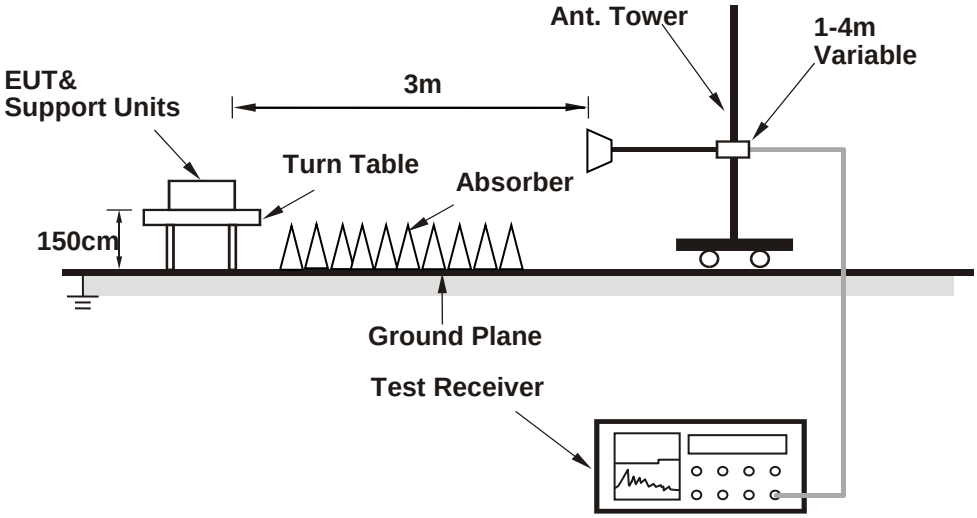
For Radiated emission below 30MHz



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 (QDART_1.0.39) 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	56.5 PK	74.0	-17.5	1.44 H	25	59.2	-2.7
2	2390.00	43.2 AV	54.0	-10.8	1.44 H	25	45.9	-2.7
3	*2412.00	117.2 PK			1.44 H	25	119.9	-2.7
4	*2412.00	114.9 AV			1.44 H	25	117.6	-2.7
5	4824.00	54.7 PK	74.0	-19.3	1.77 H	87	53.1	1.6
6	4824.00	53.1 AV	54.0	-0.9	1.77 H	87	51.5	1.6
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	2390.00	55.9 PK	74.0	-18.1	1.82 V	149	58.6	-2.7
2	2390.00	42.5 AV	54.0	-11.5	1.82 V	149	45.2	-2.7
3	*2412.00	115.7 PK			1.82 V	149	118.4	-2.7
4	*2412.00	113.2 AV			1.82 V	149	115.9	-2.7
5	4824.00	53.8 PK	74.0	-20.2	2.50 V	252	52.2	1.6
6	4824.00	52.7 AV	54.0	-1.3	2.50 V	252	51.1	1.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	*2437.00	113.5 PK			1.51 H	89	116.5	-3.0
2	*2437.00	111.1 AV			1.51 H	89	114.1	-3.0
3	4874.00	48.8 PK	74.0	-25.2	1.87 H	98	47.2	1.6
4	4874.00	48.2 AV	54.0	-5.8	1.87 H	98	46.6	1.6
5	7311.00	53.8 PK	74.0	-20.2	1.77 H	146	46.1	7.7
6	7311.00	50.9 AV	54.0	-3.1	1.77 H	146	43.2	7.7
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	*2437.00	112.0 PK			1.77 V	164	115.0	-3.0
2	*2437.00	109.4 AV			1.77 V	164	112.4	-3.0
3	4874.00	47.2 PK	74.0	-26.8	2.56 V	253	45.6	1.6
4	4874.00	46.9 AV	54.0	-7.1	2.56 V	253	45.3	1.6
5	7311.00	57.2 PK	74.0	-16.8	2.54 V	113	49.5	7.7
6	**7311.00**	**53.9 AV**	**54.0**	**-0.1**	**2.54 V**	**113**	**46.2**	**7.7**

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	112.8 PK			1.53 H	103	115.8	-3.0
2	*2462.00	110.6 AV			1.53 H	103	113.6	-3.0
3	2483.50	55.4 PK	74.0	-18.6	1.53 H	103	58.4	-3.0
4	2483.50	42.1 AV	54.0	-11.9	1.53 H	103	45.1	-3.0
5	4924.00	50.7 PK	74.0	-23.3	1.86 H	87	49.0	1.7
6	4924.00	50.2 AV	54.0	-3.8	1.86 H	87	48.5	1.7
7	7386.00	55.7 PK	74.0	-18.3	1.60 H	153	47.8	7.9
8	7386.00	52.9 AV	54.0	-1.1	1.60 H	153	45.0	7.9
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	*2462.00	111.3 PK			1.76 V	135	114.3	-3.0
2	*2462.00	108.9 AV			1.76 V	135	111.9	-3.0
3	2483.50	49.4 PK	74.0	-24.6	1.76 V	135	52.4	-3.0
4	2483.50	36.5 AV	54.0	-17.5	1.76 V	135	39.5	-3.0
5	4924.00	50.1 PK	74.0	-23.9	2.60 V	245	48.4	1.7
6	4924.00	49.3 AV	54.0	-4.7	2.60 V	245	47.6	1.7
7	7386.00	56.3 PK	74.0	-17.7	2.21 V	116	48.4	7.9
8	7386.00	53.3 AV	54.0	-0.7	2.21 V	116	45.4	7.9

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. 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	56.1 PK	74.0	-17.9	1.58 H	177	58.8	-2.7
2	2390.00	43.5 AV	54.0	-10.5	1.58 H	177	46.2	-2.7
3	*2412.00	118.7 PK			1.58 H	177	121.4	-2.7
4	*2412.00	107.7 AV			1.58 H	177	110.4	-2.7
5	4824.00	51.2 PK	74.0	-22.8	2.00 H	327	49.6	1.6
6	4824.00	39.1 AV	54.0	-14.9	2.00 H	327	37.5	1.6
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	2390.00	54.5 PK	74.0	-19.5	2.07 V	172	57.2	-2.7
2	2390.00	42.4 AV	54.0	-11.6	2.07 V	172	45.1	-2.7
3	*2412.00	119.1 PK			2.07 V	172	121.8	-2.7
4	*2412.00	108.1 AV			2.07 V	172	110.8	-2.7
5	4824.00	49.3 PK	74.0	-24.7	1.65 V	88	47.7	1.6
6	4824.00	36.3 AV	54.0	-17.7	1.65 V	88	34.7	1.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	56.3 PK	74.0	-17.7	1.50 H	179	59.0	-2.7
2	2390.00	43.1 AV	54.0	-10.9	1.50 H	179	45.8	-2.7
3	*2437.00	119.8 PK			1.50 H	179	122.8	-3.0
4	*2437.00	108.6 AV			1.50 H	179	111.6	-3.0
5	2483.50	56.4 PK	74.0	-17.6	1.50 H	179	59.4	-3.0
6	2483.50	44.0 AV	54.0	-10.0	1.50 H	179	47.0	-3.0
7	4874.00	51.1 PK	74.0	-22.9	2.04 H	328	49.5	1.6
8	4874.00	38.8 AV	54.0	-15.2	2.04 H	328	37.2	1.6
9	7311.00	63.1 PK	74.0	-10.9	1.47 H	153	55.4	7.7
10	7311.00	52.2 AV	54.0	-1.8	1.47 H	153	44.5	7.7
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	55.5 PK	74.0	-18.5	2.13 V	168	58.2	-2.7
2	2390.00	42.6 AV	54.0	-11.4	2.13 V	168	45.3	-2.7
3	*2437.00	118.1 PK			2.13 V	168	121.1	-3.0
4	*2437.00	107.7 AV			2.13 V	168	110.7	-3.0
5	2483.50	56.0 PK	74.0	-18.0	2.13 V	168	59.0	-3.0
6	2483.50	42.9 AV	54.0	-11.1	2.13 V	168	45.9	-3.0
7	4874.00	49.1 PK	74.0	-24.9	1.63 V	99	47.5	1.6
8	4874.00	36.1 AV	54.0	-17.9	1.63 V	99	34.5	1.6
9	7311.00	65.2 PK	74.0	-8.8	2.30 V	63	57.5	7.7
10	7311.00	53.8 AV	54.0	-0.2	2.30 V	63	46.1	7.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	120.7 PK			1.48 H	181	123.7	-3.0
2	*2462.00	109.7 AV			1.48 H	181	112.7	-3.0
3	2483.50	67.2 PK	74.0	-6.8	1.48 H	181	70.2	-3.0
4	2483.50	52.8 AV	54.0	-1.2	1.48 H	181	55.8	-3.0
5	4924.00	51.2 PK	74.0	-22.8	2.03 H	335	49.5	1.7
6	4924.00	38.9 AV	54.0	-15.1	2.03 H	335	37.2	1.7
7	7386.00	63.5 PK	74.0	-10.5	1.53 H	142	55.6	7.9
8	7386.00	52.5 AV	54.0	-1.5	1.53 H	142	44.6	7.9
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	*2462.00	119.0 PK			2.02 V	160	122.0	-3.0
2	*2462.00	108.8 AV			2.02 V	160	111.8	-3.0
3	2483.50	61.2 PK	74.0	-12.8	2.02 V	160	64.2	-3.0
4	2483.50	47.2 AV	54.0	-6.8	2.02 V	160	50.2	-3.0
5	4924.00	49.0 PK	74.0	-25.0	1.58 V	115	47.3	1.7
6	4924.00	36.3 AV	54.0	-17.7	1.58 V	115	34.6	1.7
7	7386.00	64.8 PK	74.0	-9.2	2.39 V	65	56.9	7.9
8	7386.00	53.3 AV	54.0	-0.7	2.39 V	65	45.4	7.9

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. 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	55.8 PK	74.0	-18.2	1.52 H	173	58.5	-2.7
2	2390.00	43.0 AV	54.0	-11.0	1.52 H	173	45.7	-2.7
3	*2412.00	118.1 PK			1.52 H	173	120.8	-2.7
4	*2412.00	105.9 AV			1.52 H	173	108.6	-2.7
5	4824.00	50.3 PK	74.0	-23.7	2.01 H	321	48.7	1.6
6	4824.00	38.1 AV	54.0	-15.9	2.01 H	321	36.5	1.6
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	2390.00	55.4 PK	74.0	-18.6	2.07 V	159	58.1	-2.7
2	2390.00	42.8 AV	54.0	-11.2	2.07 V	159	45.5	-2.7
3	*2412.00	116.4 PK			2.07 V	159	119.1	-2.7
4	*2412.00	105.0 AV			2.07 V	159	107.7	-2.7
5	4824.00	48.5 PK	74.0	-25.5	1.47 V	135	46.9	1.6
6	4824.00	35.7 AV	54.0	-18.3	1.47 V	135	34.1	1.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	56.4 PK	74.0	-17.6	1.47 H	163	59.1	-2.7
2	2390.00	43.4 AV	54.0	-10.6	1.47 H	163	46.1	-2.7
3	*2437.00	119.6 PK			1.47 H	163	122.6	-3.0
4	*2437.00	108.2 AV			1.47 H	163	111.2	-3.0
5	2483.50	56.0 PK	74.0	-18.0	1.47 H	163	59.0	-3.0
6	2483.50	43.9 AV	54.0	-10.1	1.47 H	163	46.9	-3.0
7	4874.00	50.6 PK	74.0	-23.4	2.01 H	322	49.0	1.6
8	4874.00	38.6 AV	54.0	-15.4	2.01 H	322	37.0	1.6
9	7311.00	63.6 PK	74.0	-10.4	1.48 H	153	55.9	7.7
10	7311.00	51.2 AV	54.0	-2.8	1.48 H	153	43.5	7.7
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	55.6 PK	74.0	-18.4	2.02 V	178	58.3	-2.7
2	2390.00	42.9 AV	54.0	-11.1	2.02 V	178	45.6	-2.7
3	*2437.00	117.9 PK			2.02 V	178	120.9	-3.0
4	*2437.00	107.3 AV			2.02 V	178	110.3	-3.0
5	2483.50	55.6 PK	74.0	-18.4	2.02 V	178	58.6	-3.0
6	2483.50	42.8 AV	54.0	-11.2	2.02 V	178	45.8	-3.0
7	4874.00	49.1 PK	74.0	-24.9	1.52 V	123	47.5	1.6
8	4874.00	36.2 AV	54.0	-17.8	1.52 V	123	34.6	1.6
9	7311.00	64.3 PK	74.0	-9.7	2.15 V	64	56.6	7.7
10	7311.00	52.2 AV	54.0	-1.8	2.15 V	64	44.5	7.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	120.4 PK			1.46 H	180	123.4	-3.0
2	*2462.00	108.4 AV			1.46 H	180	111.4	-3.0
3	2483.50	67.2 PK	74.0	-6.8	1.46 H	180	70.2	-3.0
4	2483.50	50.6 AV	54.0	-3.4	1.46 H	180	53.6	-3.0
5	4924.00	50.7 PK	74.0	-23.3	2.02 H	310	49.0	1.7
6	4924.00	38.5 AV	54.0	-15.5	2.02 H	310	36.8	1.7
7	7386.00	63.6 PK	74.0	-10.4	1.51 H	168	55.7	7.9
8	7386.00	51.3 AV	54.0	-2.7	1.51 H	168	43.4	7.9
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	*2462.00	118.7 PK			2.05 V	177	121.7	-3.0
2	*2462.00	107.5 AV			2.05 V	177	110.5	-3.0
3	2483.50	61.2 PK	74.0	-12.8	2.05 V	177	64.2	-3.0
4	2483.50	45.0 AV	54.0	-9.0	2.05 V	177	48.0	-3.0
5	4924.00	48.7 PK	74.0	-25.3	1.46 V	130	47.0	1.7
6	4924.00	35.9 AV	54.0	-18.1	1.46 V	130	34.2	1.7
7	7386.00	63.8 PK	74.0	-10.2	2.11 V	60	55.9	7.9
8	7386.00	51.9 AV	54.0	-2.1	2.11 V	60	44.0	7.9

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. 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	55.6 PK	74.0	-18.4	1.44 H	155	58.3	-2.7
2	2390.00	43.5 AV	54.0	-10.5	1.44 H	155	46.2	-2.7
3	*2422.00	114.9 PK			1.44 H	155	117.8	-2.9
4	*2422.00	102.3 AV			1.44 H	155	105.2	-2.9
5	4844.00	50.5 PK	74.0	-23.5	2.03 H	304	48.9	1.6
6	4844.00	38.5 AV	54.0	-15.5	2.03 H	304	36.9	1.6
7	7266.00	57.4 PK	74.0	-16.6	1.58 H	161	49.6	7.8
8	7266.00	45.7 AV	54.0	-8.3	1.58 H	161	37.9	7.8
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	56.0 PK	74.0	-18.0	1.44 V	169	58.7	-2.7
2	2390.00	43.3 AV	54.0	-10.7	1.44 V	169	46.0	-2.7
3	*2422.00	113.3 PK			1.44 V	169	116.2	-2.9
4	*2422.00	101.6 AV			1.44 V	169	104.5	-2.9
5	4844.00	49.1 PK	74.0	-24.9	1.37 V	148	47.5	1.6
6	4844.00	36.3 AV	54.0	-17.7	1.37 V	148	34.7	1.6
7	7266.00	57.7 PK	74.0	-16.3	2.10 V	64	49.9	7.8
8	7266.00	46.4 AV	54.0	-7.6	2.10 V	64	38.6	7.8

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	56.9 PK	74.0	-17.1	1.48 H	21	59.6	-2.7
2	2390.00	43.1 AV	54.0	-10.9	1.48 H	21	45.8	-2.7
3	*2437.00	114.9 PK			1.48 H	21	117.9	-3.0
4	*2437.00	103.1 AV			1.48 H	21	106.1	-3.0
5	2483.50	57.2 PK	74.0	-16.8	1.48 H	21	60.2	-3.0
6	2483.50	44.2 AV	54.0	-9.8	1.48 H	21	47.2	-3.0
7	4874.00	50.3 PK	74.0	-23.7	1.99 H	296	48.7	1.6
8	4874.00	38.2 AV	54.0	-15.8	1.99 H	296	36.6	1.6
9	7311.00	56.7 PK	74.0	-17.3	1.53 H	172	49.0	7.7
10	7311.00	45.2 AV	54.0	-8.8	1.53 H	172	37.5	7.7
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	56.1 PK	74.0	-17.9	1.44 V	167	58.8	-2.7
2	2390.00	42.6 AV	54.0	-11.4	1.44 V	167	45.3	-2.7
3	*2437.00	114.3 PK			1.44 V	167	117.3	-3.0
4	*2437.00	102.5 AV			1.44 V	167	105.5	-3.0
5	2483.50	56.8 PK	74.0	-17.2	1.44 V	167	59.8	-3.0
6	2483.50	43.1 AV	54.0	-10.9	1.44 V	167	46.1	-3.0
7	4874.00	48.8 PK	74.0	-25.2	1.42 V	140	47.2	1.6
8	4874.00	36.1 AV	54.0	-17.9	1.42 V	140	34.5	1.6
9	7311.00	57.4 PK	74.0	-16.6	2.15 V	66	49.7	7.7
10	7311.00	46.2 AV	54.0	-7.8	2.15 V	66	38.5	7.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	114.9 PK			1.59 H	14	117.9	-3.0
2	*2452.00	103.3 AV			1.59 H	14	106.3	-3.0
3	2483.50	72.0 PK	74.0	-2.0	1.59 H	14	75.0	-3.0
4	2483.50	52.1 AV	54.0	-1.9	1.59 H	14	55.1	-3.0
5	2487.90	69.2 PK	74.0	-4.8	1.59 H	14	72.1	-2.9
6	2487.90	53.8 AV	54.0	-0.2	1.59 H	14	56.7	-2.9
7	4904.00	50.5 PK	74.0	-23.5	2.03 H	303	48.8	1.7
8	4904.00	38.6 AV	54.0	-15.4	2.03 H	303	36.9	1.7
9	7356.00	57.3 PK	74.0	-16.7	1.49 H	157	49.4	7.9
10	7356.00	45.6 AV	54.0	-8.4	1.49 H	157	37.7	7.9
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	*2452.00	114.1 PK			1.42 V	89	117.1	-3.0
2	*2452.00	102.5 AV			1.42 V	89	105.5	-3.0
3	2483.50	67.1 PK	74.0	-6.9	1.42 V	89	70.1	-3.0
4	2483.50	51.9 AV	54.0	-2.1	1.42 V	89	54.9	-3.0
5	2487.90	63.2 PK	74.0	-10.8	1.42 V	89	66.1	-2.9
6	2487.90	48.2 AV	54.0	-5.8	1.42 V	89	51.1	-2.9
7	4904.00	48.6 PK	74.0	-25.4	1.40 V	144	46.9	1.7
8	4904.00	35.8 AV	54.0	-18.2	1.40 V	144	34.1	1.7
9	7356.00	57.3 PK	74.0	-16.7	2.12 V	58	49.4	7.9
10	7356.00	46.1 AV	54.0	-7.9	2.12 V	58	38.2	7.9

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

Below 1GHz Data:

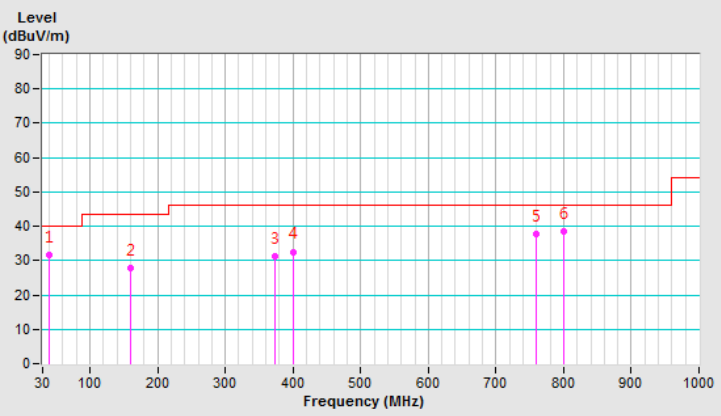
802.11g

CHANNEL	TX Channel 11	**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	38.85	31.5 QP	40.0	-8.5	3.00 H	264	40.9	-9.4
2	159.37	27.8 QP	43.5	-15.7	1.00 H	311	35.8	-8.0
3	372.77	31.4 QP	46.0	-14.6	1.50 H	296	36.3	-4.9
4	400.03	32.6 QP	46.0	-13.4	1.00 H	334	36.9	-4.3
5	759.37	37.6 QP	46.0	-8.4	1.50 H	318	34.3	3.3
6	800.01	38.4 QP	46.0	-7.6	2.00 H	189	34.8	3.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

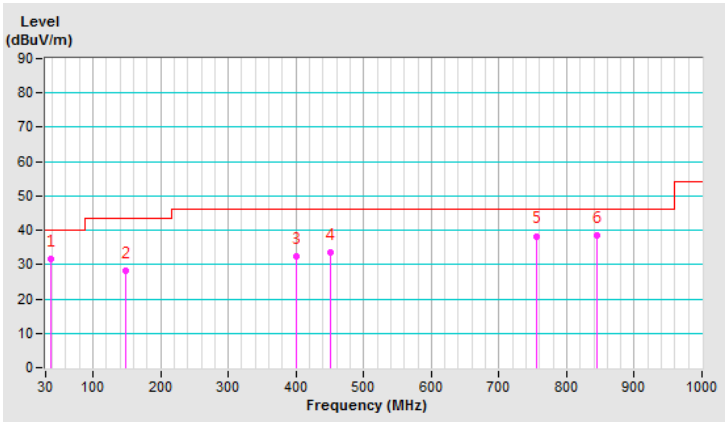


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	38.25	31.6 QP	40.0	-8.4	1.50 V	171	41.0	-9.4
2	149.30	28.3 QP	43.5	-15.2	1.50 V	146	36.0	-7.7
3	400.01	32.3 QP	46.0	-13.7	1.00 V	114	36.6	-4.3
4	450.01	33.7 QP	46.0	-12.3	1.50 V	265	36.9	-3.2
5	755.75	38.3 QP	46.0	-7.7	1.50 V	246	35.0	3.3
6	844.24	38.6 QP	46.0	-7.4	2.00 V	159	34.0	4.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



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	ESH3-Z5	835239/001	Mar. 17, 2019	Mar. 16, 2020
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. 14, 2019	Mar. 13, 2020
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: Apr. 29, 2019

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.

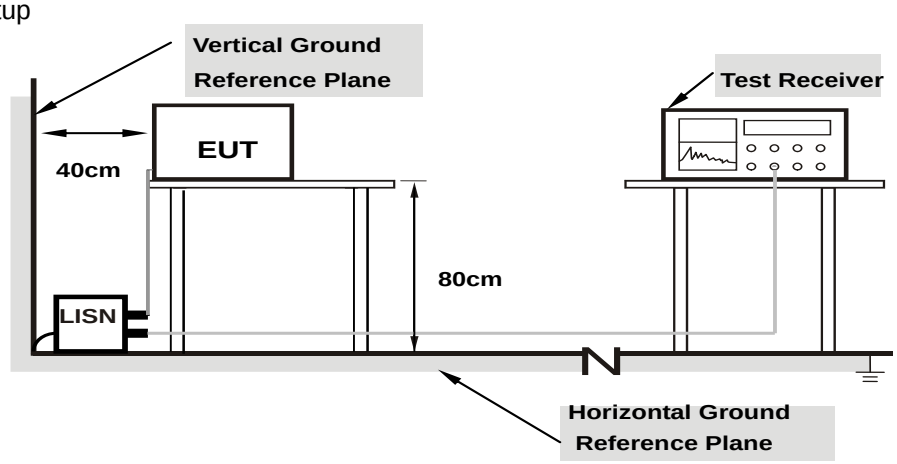
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

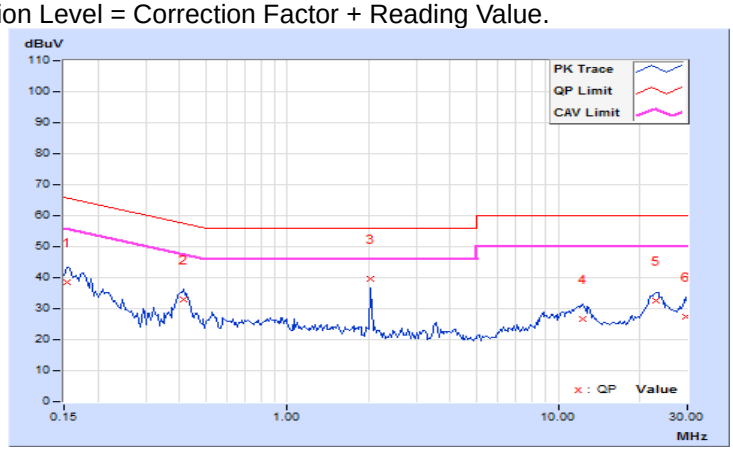
4.2.7 Test Results

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	0.15391	10.03	28.61	14.25	38.64	24.28	65.79	55.79	-27.15	-31.51
2	0.41563	10.08	22.83	16.25	32.91	26.33	57.54	47.54	-24.63	-21.21
3	**2.02344**	**10.19**	**29.48**	**26.51**	**39.67**	**36.70**	**56.00**	**46.00**	**-16.33**	**-9.30**
4	12.32422	10.85	15.72	10.45	26.57	21.30	60.00	50.00	-33.43	-28.70
5	22.96094	11.43	21.08	15.45	32.51	26.88	60.00	50.00	-27.49	-23.12
6	29.58203	11.59	15.65	10.26	27.24	21.85	60.00	50.00	-32.76	-28.15

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.

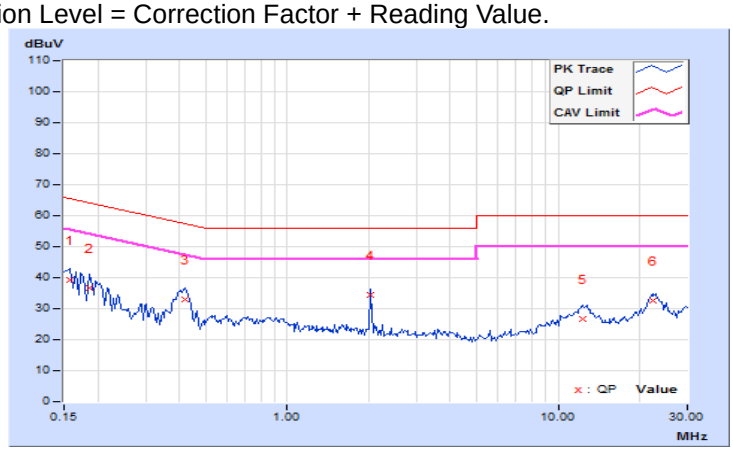


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15781	9.94	29.47	14.83	39.41	24.77	65.58	55.58	-26.17	-30.81
2	0.18516	9.95	26.76	12.92	36.71	22.87	64.25	54.25	-27.54	-31.38
3	0.41953	9.98	23.00	17.67	32.98	27.65	57.46	47.46	-24.48	-19.81
4	2.02734	10.07	24.48	24.10	34.55	34.17	56.00	46.00	-21.45	-11.83
5	12.32031	10.67	16.18	10.99	26.85	21.66	60.00	50.00	-33.15	-28.34
6	22.35938	11.18	21.23	15.79	32.41	26.97	60.00	50.00	-27.59	-23.03

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.

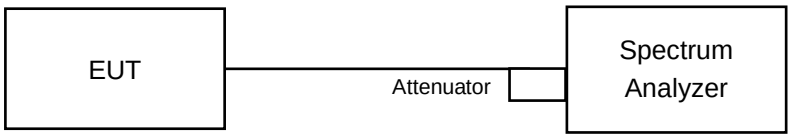


4.3 6dB Bandwidth Measurement

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

CDD Mode

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	8.61	9.62	9.08	0.5	Pass
6	2437	8.60	8.09	8.10	0.5	Pass
11	2462	8.59	8.59	8.10	0.5	Pass

802.11g

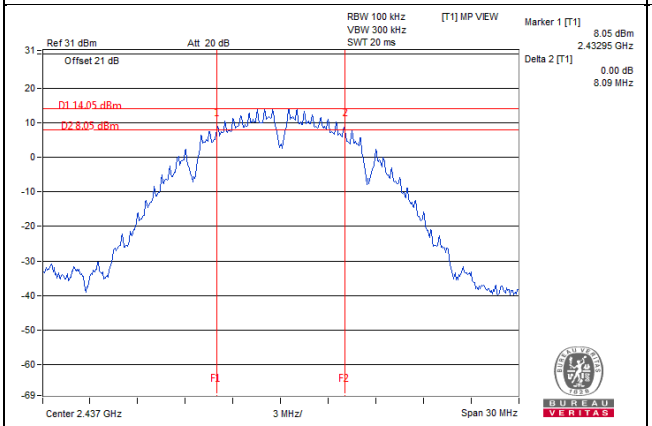
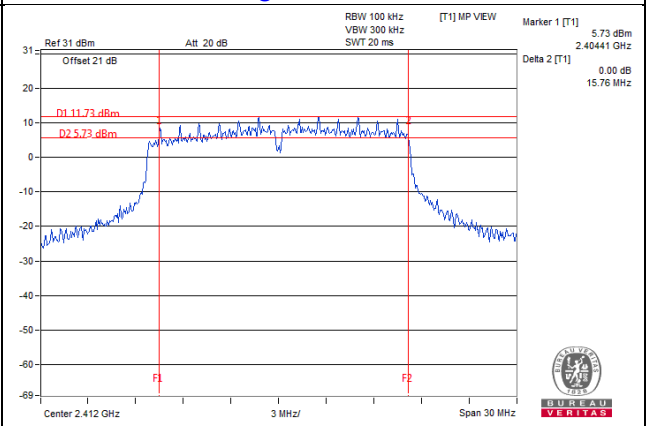
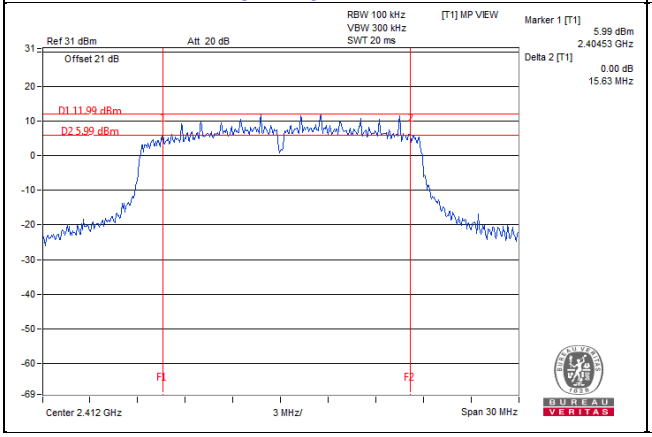
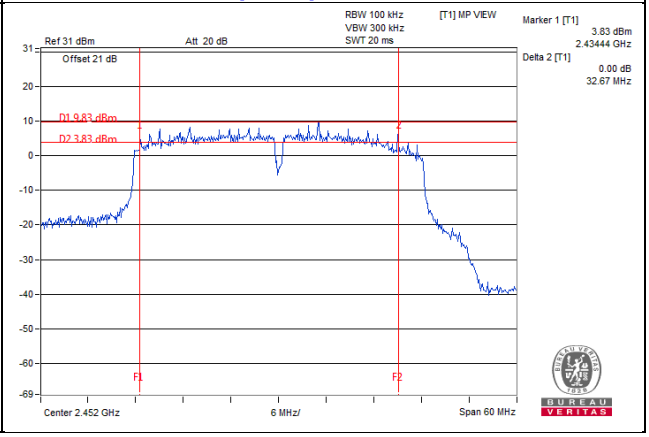
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	15.97	15.76	16.35	0.5	Pass
6	2437	16.36	16.43	16.36	0.5	Pass
11	2462	15.81	16.38	15.78	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	16.96	15.63	16.69	0.5	Pass
6	2437	17.60	17.65	17.61	0.5	Pass
11	2462	16.41	17.25	16.35	0.5	Pass

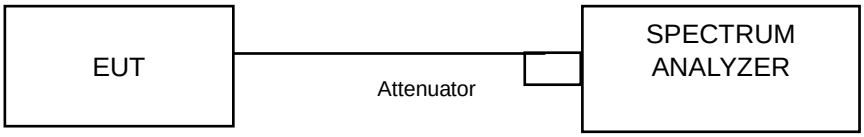
802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
3	2422	35.19	32.78	33.92	0.5	Pass
6	2437	35.19	35.44	35.16	0.5	Pass
9	2452	32.69	35.11	32.67	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH6	**802.11g / Chain 1 : CH1**
	
802.11n (HT20) / Chain 1 : CH1	**802.11n (HT40) / Chain 2 : CH9**
	

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.4.4 Deviation from Test Standard

No deviation.

4.4.5 EUT Operating Conditions

Same as Item 4.3.6.

4.4.6 Test Results

CDD Mode

802.11b

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
1	2412	14.04	14.76	14.04
6	2437	13.20	13.08	13.20
11	2462	13.08	13.44	13.20

802.11g

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
1	2412	16.56	16.68	16.56
6	2437	20.88	33.76	18.60
11	2462	26.88	29.76	17.52

802.11n (HT20)

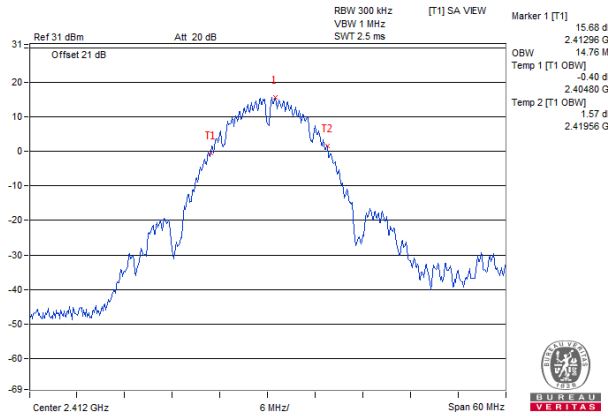
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
1	2412	17.76	18.08	17.76
6	2437	20.04	34.08	18.48
11	2462	27.12	29.76	22.92

802.11n (HT40)

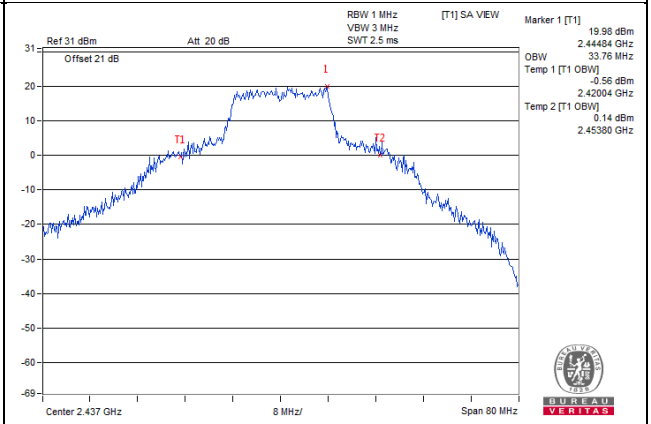
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
3	2422	36.24	36.24	36.00
6	2437	36.48	36.72	36.48
9	2452	36.24	36.96	36.24

Spectrum Plot of Worst Value

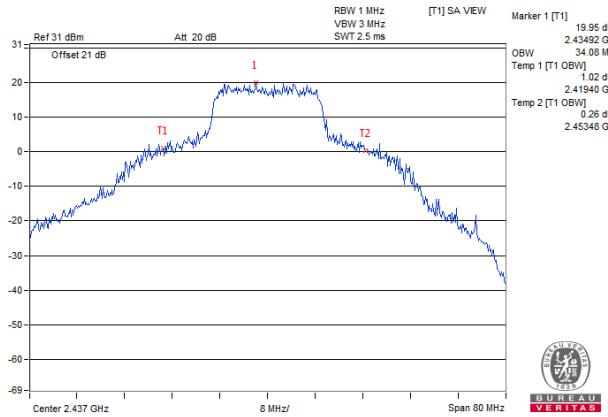
802.11b / Chain 1 : CH1



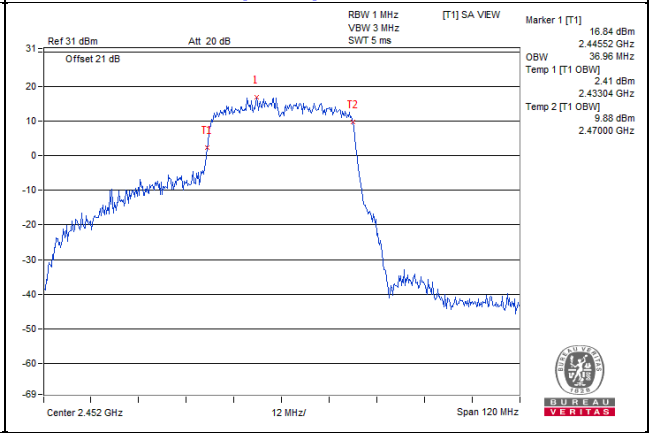
802.11g / Chain 1 : CH6



802.11n (HT20) / Chain 1 : CH6



802.11n (HT40) / Chain 1 : CH9



4.5 Conducted Output Power Measurement

4.5.1 Limits of Conducted Output Power Measurement

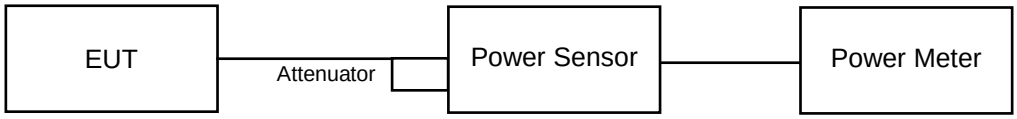
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as Item 4.3.6.

4.5.7 Test Results

CDD Mode

802.11b

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	23.87	23.86	23.62	717.145	28.56	30.00	Pass
6	2437	21.98	22.36	22.13	493.253	26.93	30.00	Pass
11	2462	21.89	22.88	22.33	519.616	27.16	30.00	Pass

802.11g

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	21.46	21.52	21.39	419.586	26.23	30.00	Pass
6	2437	23.51	23.18	23.00	631.884	28.01	30.00	Pass
11	2462	24.21	24.64	23.60	783.792	28.94	30.00	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	21.18	21.40	21.16	399.875	26.02	30.00	Pass
6	2437	23.55	23.15	22.97	631.155	28.00	30.00	Pass
11	2462	24.15	24.57	23.53	771.858	28.88	30.00	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	21.22	21.85	21.37	422.631	26.26	30.00	Pass
6	2437	22.06	22.60	22.41	516.845	27.13	30.00	Pass
9	2452	22.44	22.67	22.62	543.125	27.35	30.00	Pass

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	21.18	21.40	21.16	399.875	26.02	28.09	Pass
6	2437	23.55	23.15	22.97	631.155	28.00	28.09	Pass
11	2462	22.86	23.60	23.29	635.588	28.03	28.09	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 7.91dBi > 6dBi , so the power limit shall be reduced to 30-(7.91-6) = 28.09dBm.

802.11n (HT40)

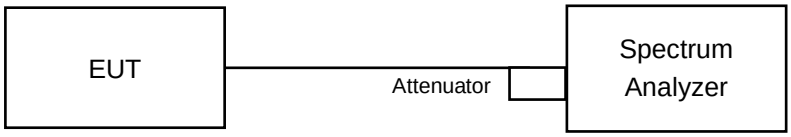
Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	21.22	21.85	21.37	422.631	26.26	28.09	Pass
6	2437	22.06	22.60	22.41	516.845	27.13	28.09	Pass
9	2452	22.44	22.67	22.62	543.125	27.35	28.09	Pass

4.6 Power Spectral Density Measurement

4.6.1 Limits of Power Spectral Density Measurement

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

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

For 802.11b, 802.11n (HT20) test:

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.

For 802.11g, 802.11n (HT40) test:

a. Measure the duty cycle (x).
b. Set instrument center frequency to DTS channel center frequency.
c. Set span to at least 1.5 times the OBW.
d. Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz..
e. Set VBW ≥3 x RBW.
f. Detector = power averaging (RMS) or sample detector (when RMS not available).
g. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h. Sweep time = auto couple.
i. Do not use sweep triggering. Allow sweep to “free run”.
j. Employ trace averaging (RMS) mode over a minimum of 100 traces.
k. Use the peak marker function to determine the maximum amplitude level.
l. Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

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

CDD Mode

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	-7.29	4.77	-2.52	6.09	Pass
	6	2437	-8.82	4.77	-4.05	6.09	Pass
	11	2462	-8.49	4.77	-3.72	6.09	Pass
1	1	2412	-7.06	4.77	-2.29	6.09	Pass
	6	2437	-7.83	4.77	-3.06	6.09	Pass
	11	2462	-6.83	4.77	-2.06	6.09	Pass
2	1	2412	-6.56	4.77	-1.79	6.09	Pass
	6	2437	-8.58	4.77	-3.81	6.09	Pass
	11	2462	-8.27	4.77	-3.50	6.09	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 7.91dBi > 6dBi , so the power density limit shall be reduced to 8-(7.91-6) = 6.09dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=3) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-10.99	4.77	0.15	-6.07	6.09	Pass
	6	2437	-9.92	4.77	0.15	-5.00	6.09	Pass
	11	2462	-9.14	4.77	0.15	-4.22	6.09	Pass
1	1	2412	-10.90	4.77	0.15	-5.98	6.09	Pass
	6	2437	-9.16	4.77	0.15	-4.24	6.09	Pass
	11	2462	-8.05	4.77	0.15	-3.13	6.09	Pass
2	1	2412	-11.16	4.77	0.15	-6.24	6.09	Pass
	6	2437	-9.64	4.77	0.15	-4.72	6.09	Pass
	11	2462	-10.21	4.77	0.15	-5.29	6.09	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 7.91dBi > 6dBi , so the power density limit shall be reduced to 8-(7.91-6) = 6.09dBm.

2. Refer to section 3.3 for duty cycle spectrum plot.

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	-11.54	4.77	-6.77	6.09	Pass
	6	2437	-9.76	4.77	-4.99	6.09	Pass
	11	2462	-9.65	4.77	-4.88	6.09	Pass
1	1	2412	-10.26	4.77	-5.49	6.09	Pass
	6	2437	-9.69	4.77	-4.92	6.09	Pass
	11	2462	-7.25	4.77	-2.48	6.09	Pass
2	1	2412	-11.26	4.77	-6.49	6.09	Pass
	6	2437	-9.87	4.77	-5.10	6.09	Pass
	11	2462	-9.70	4.77	-4.93	6.09	Pass

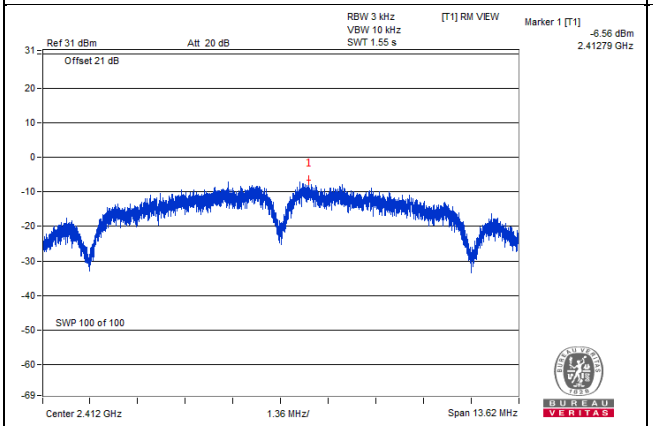
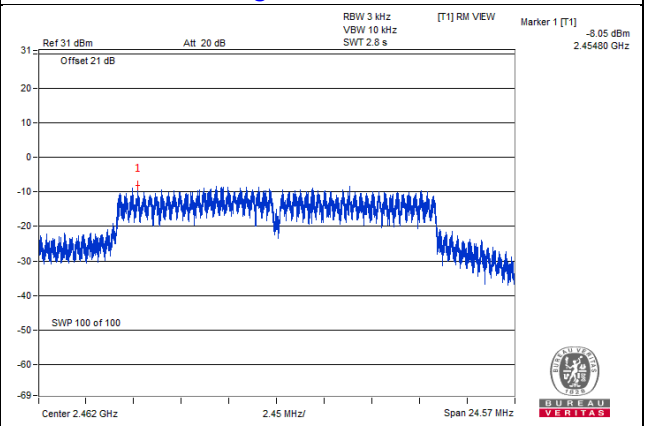
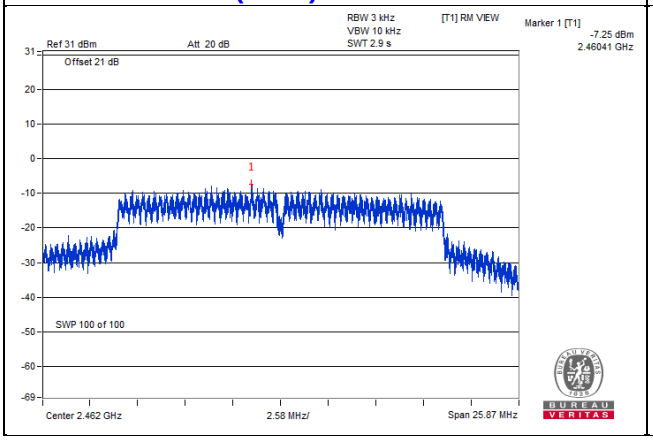
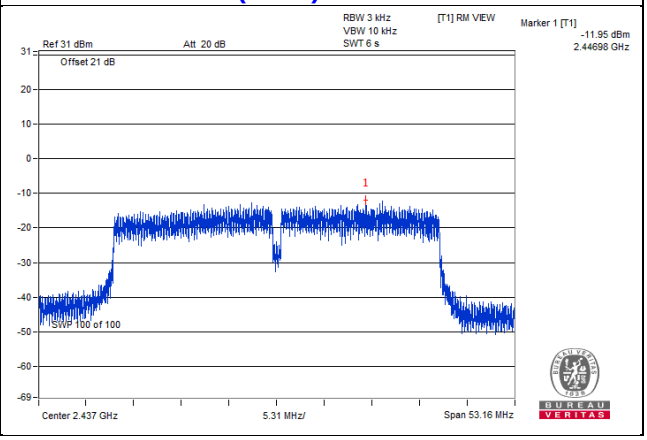
Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 7.91dBi > 6dBi , so the power density limit shall be reduced to 8-(7.91-6) = 6.09dBm.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=3) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-14.33	4.77	0.13	-9.43	6.09	Pass
	6	2437	-14.03	4.77	0.13	-9.13	6.09	Pass
	9	2452	-12.42	4.77	0.13	-7.52	6.09	Pass
1	3	2422	-12.40	4.77	0.13	-7.50	6.09	Pass
	6	2437	-11.95	4.77	0.13	-7.05	6.09	Pass
	9	2452	-12.09	4.77	0.13	-7.19	6.09	Pass
2	3	2422	-14.37	4.77	0.13	-9.47	6.09	Pass
	6	2437	-13.41	4.77	0.13	-8.51	6.09	Pass
	9	2452	-12.74	4.77	0.13	-7.84	6.09	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 7.91dBi > 6dBi , so the power density limit shall be reduced to 8-(7.91-6) = 6.09dBm.

2. Refer to section 3.3 for duty cycle spectrum plot.

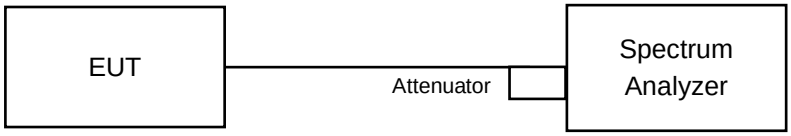
Spectrum Plot of Worst Value	
802.11b / Chain 2: CH1	**802.11g / Chain 1: CH11**
	
802.11n (HT20) / Chain 1: CH11	**802.11n (HT40) / Chain 1: CH6**
	

4.7 Conducted Out of Band Emission Measurement

4.7.1 Limits of Conducted Out of Band Emission Measurement

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

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 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.

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

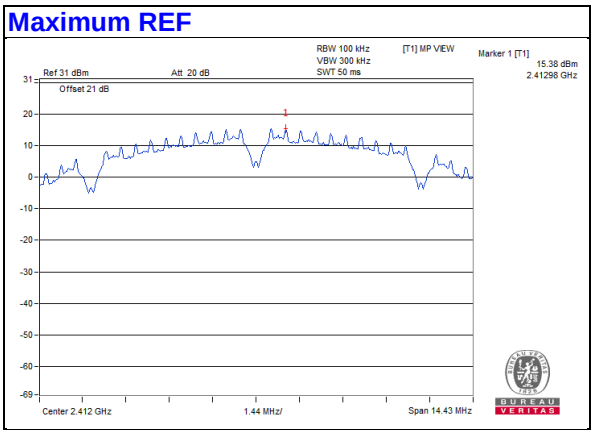
Same as Item 4.3.6

4.7.7 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.

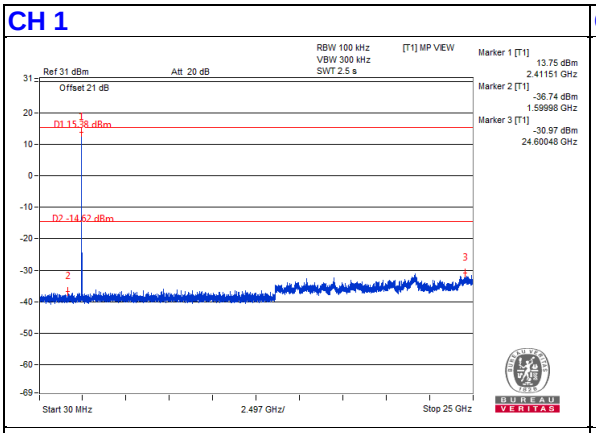
CDD Mode
802.11b

Maximum REF

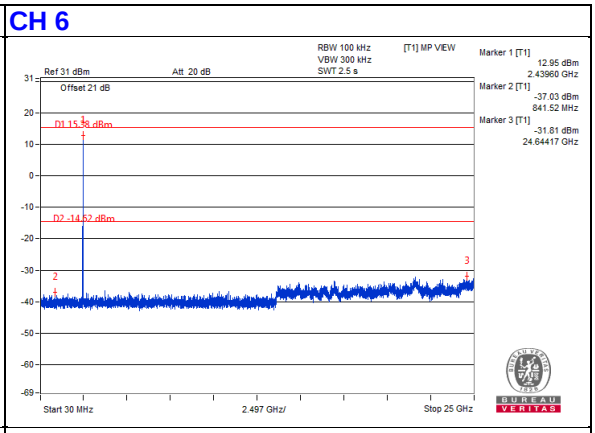


Chain 0

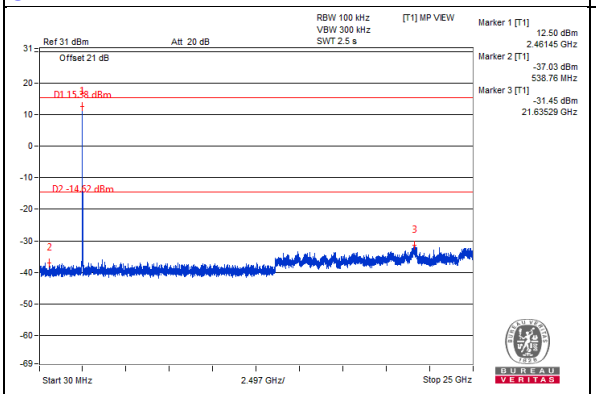
CH 1



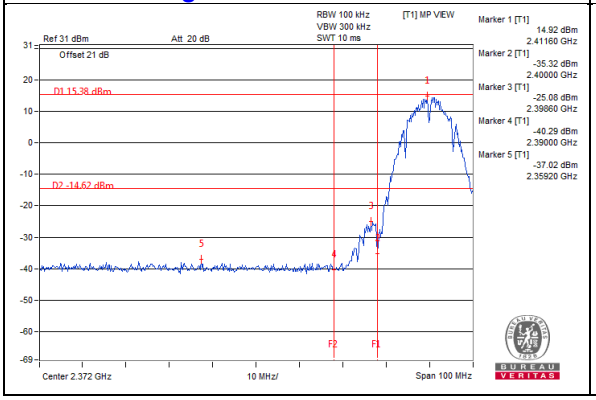
CH 6



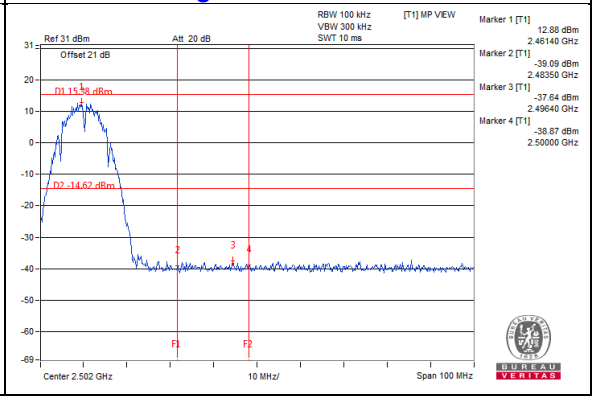
CH 11



CH 1 Band edge

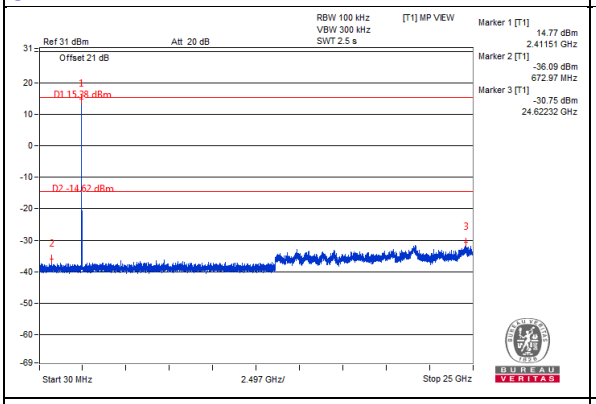


CH 11 Band edge

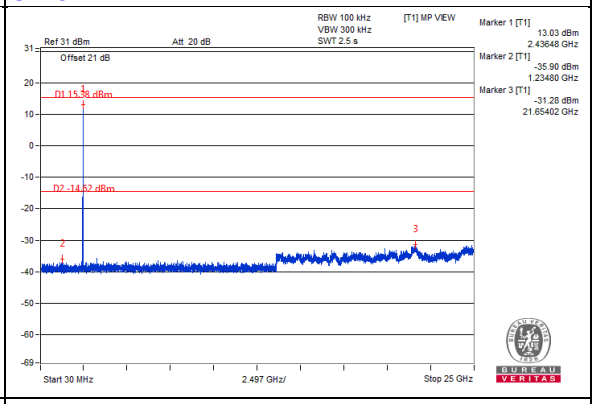


Chain 1

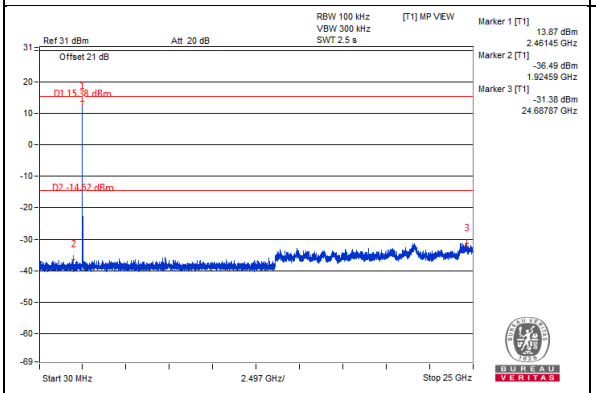
CH 1



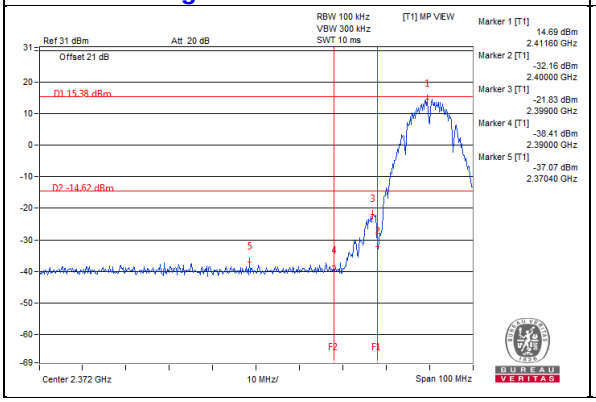
CH 6



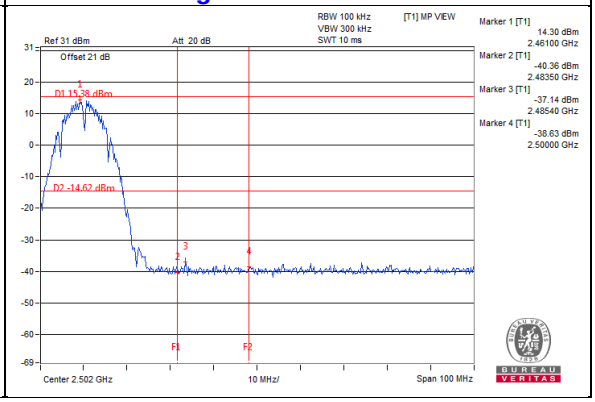
CH 11



CH 1 Band edge

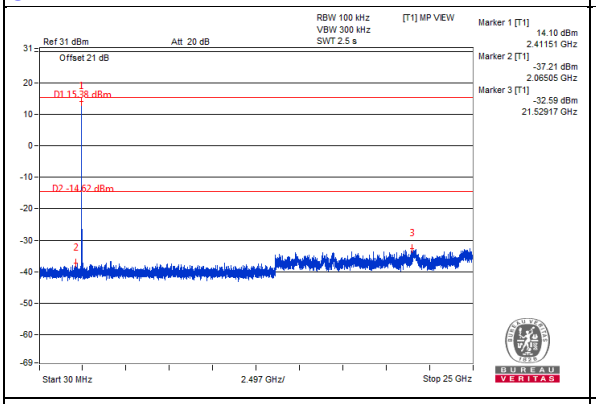


CH 11 Band edge

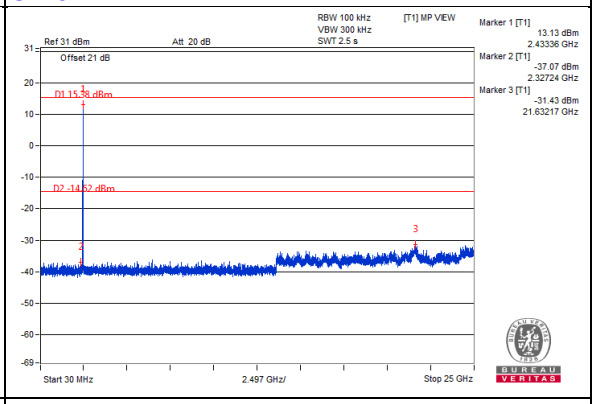


Chain 2

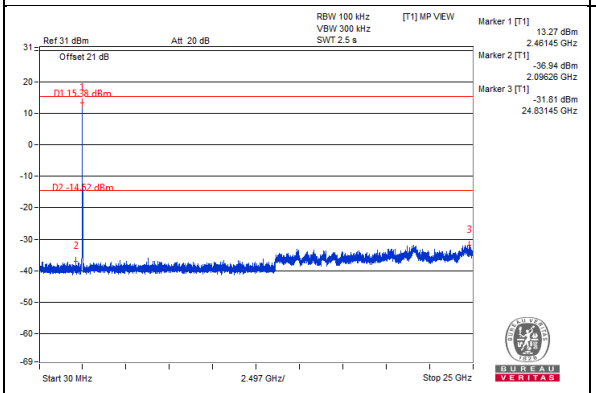
CH 1



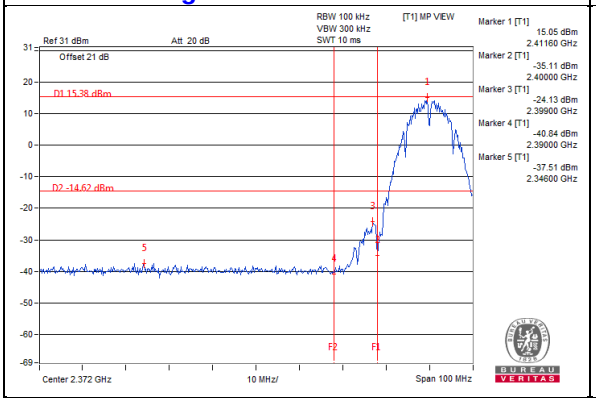
CH 6



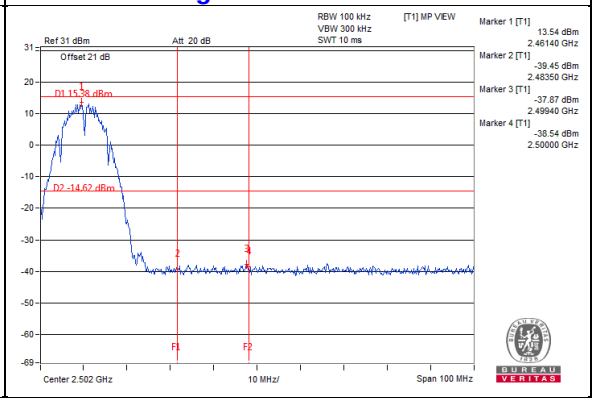
CH 11



CH 1 Band edge

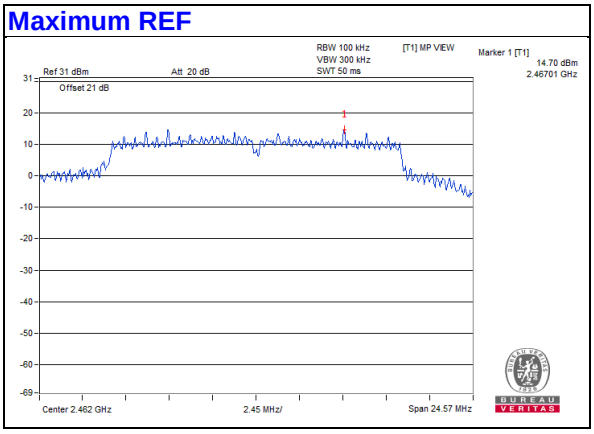


CH 11 Band edge



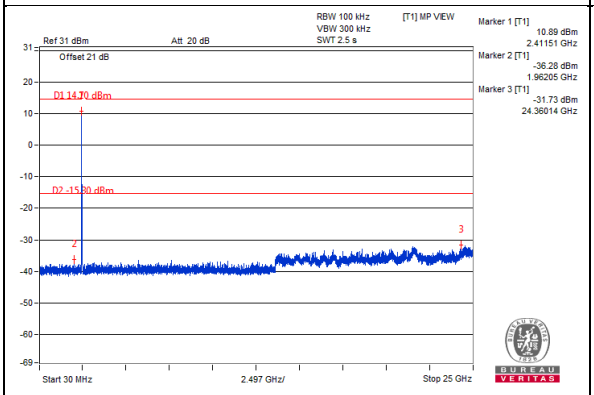
802.11g

Maximum REF

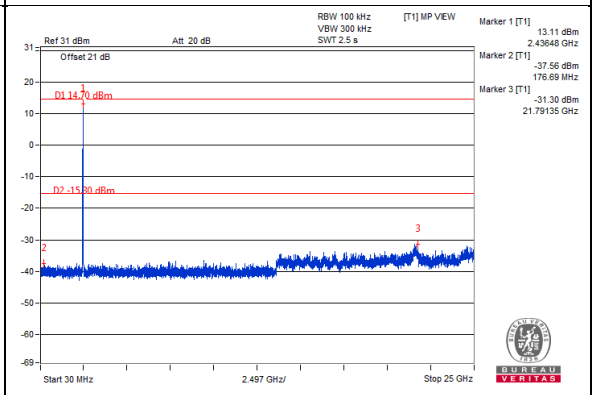


Chain 0

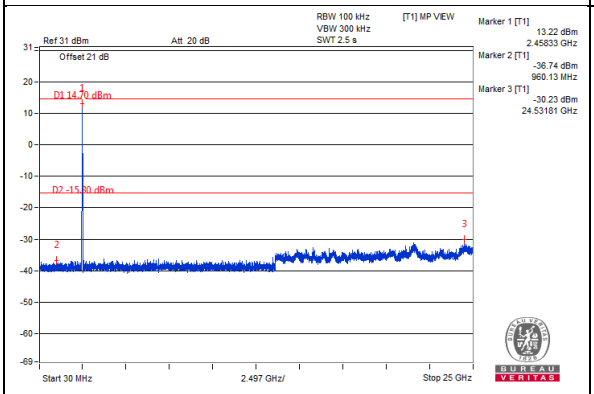
CH 1



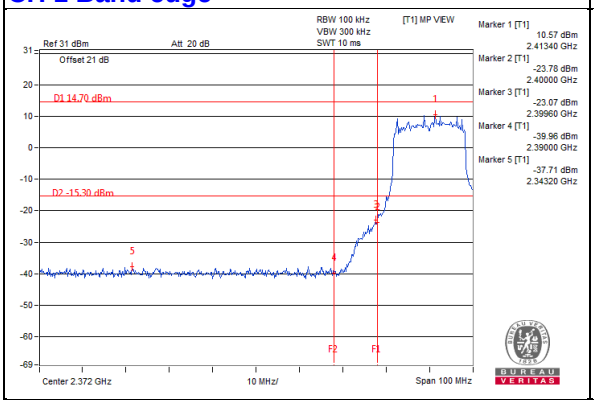
CH 6



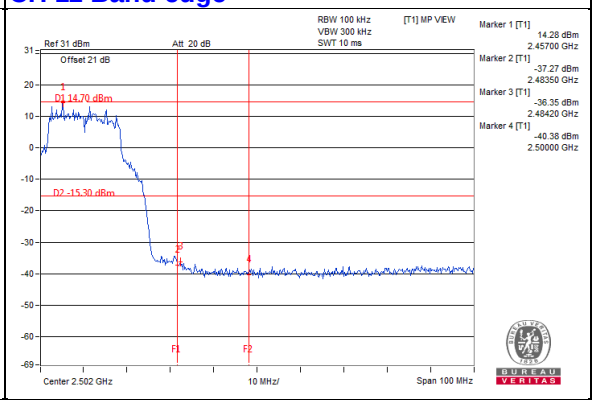
CH 11



CH 1 Band edge

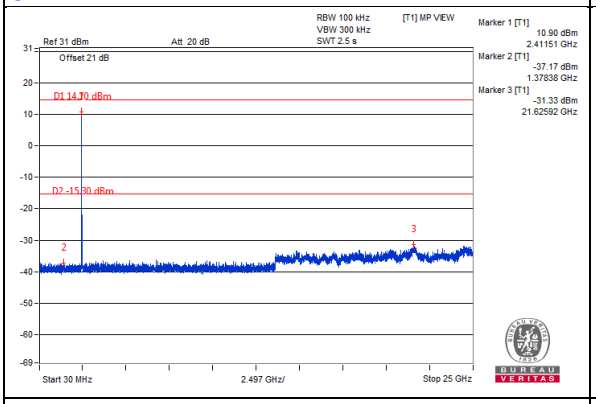


CH 11 Band edge

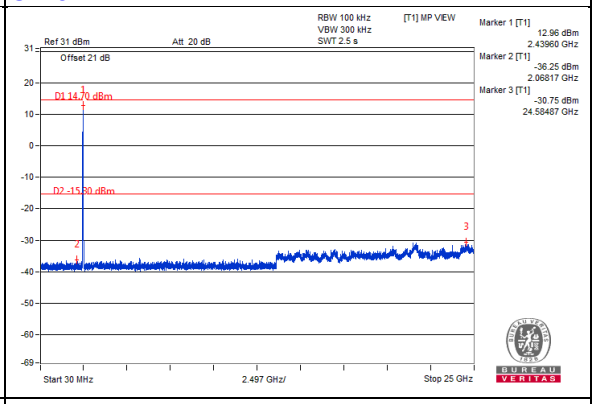


Chain 1

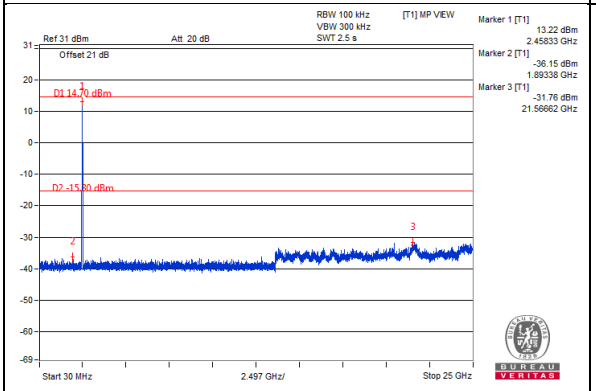
CH 1



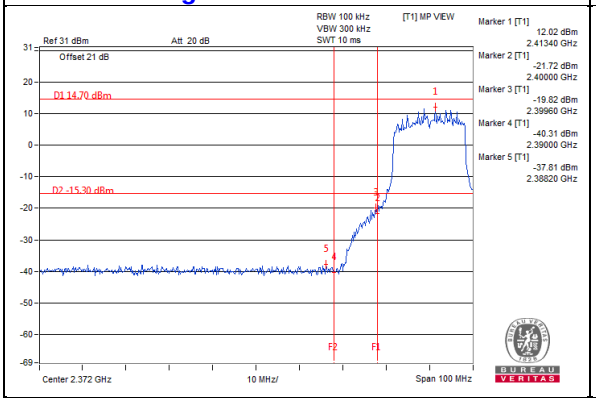
CH 6



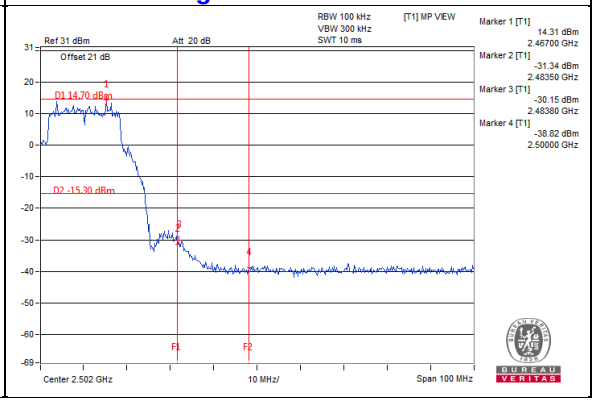
CH 11



CH 1 Band edge

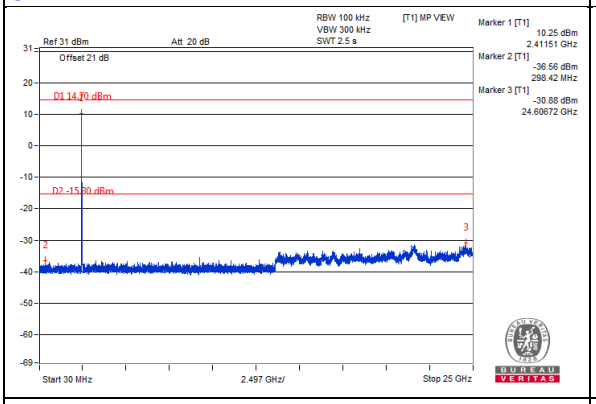


CH 11 Band edge

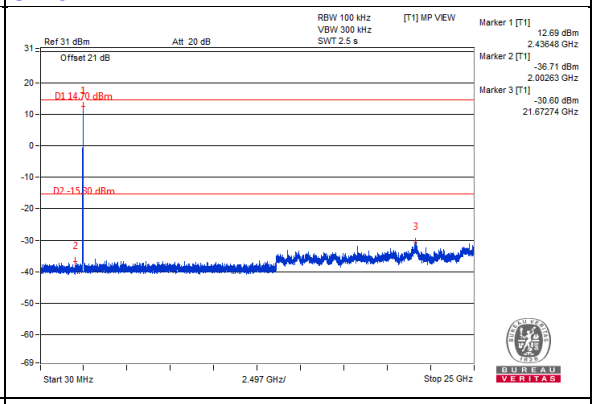


Chain 2

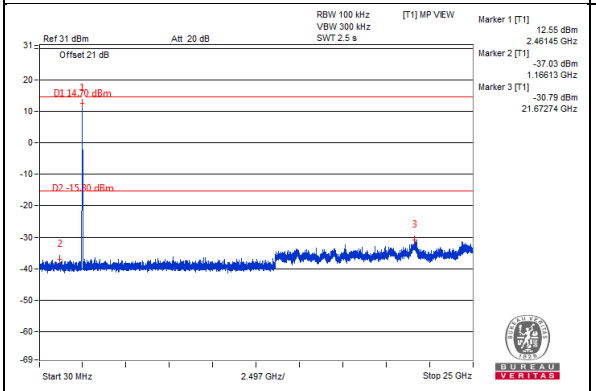
CH 1



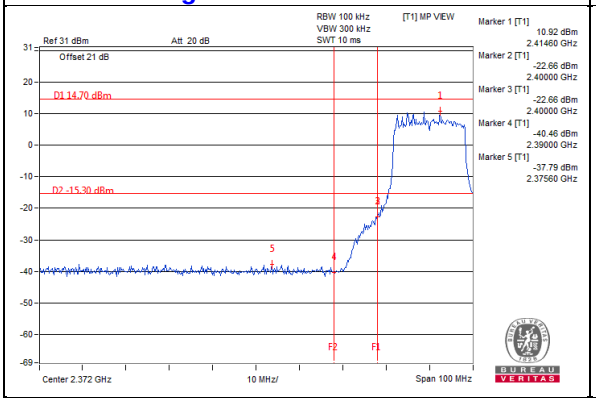
CH 6



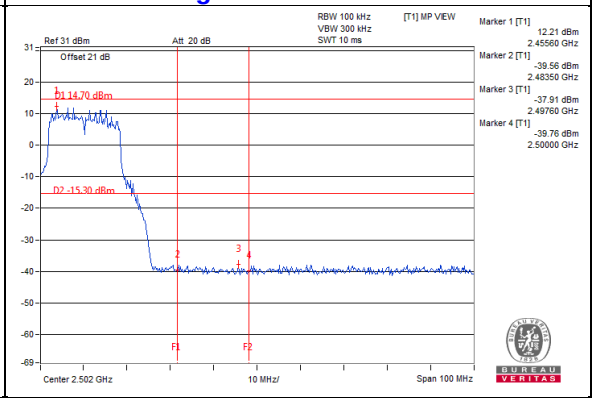
CH 11



CH 1 Band edge

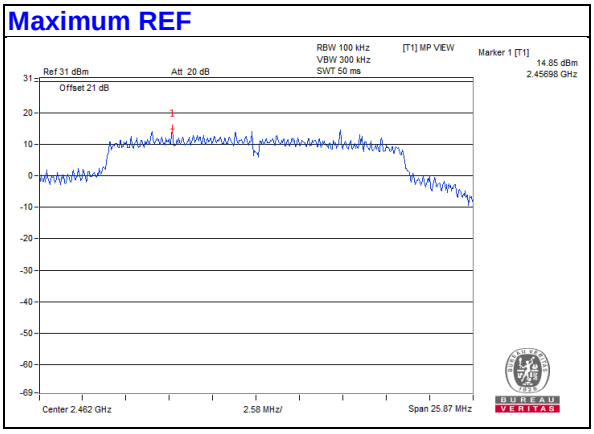


CH 11 Band edge



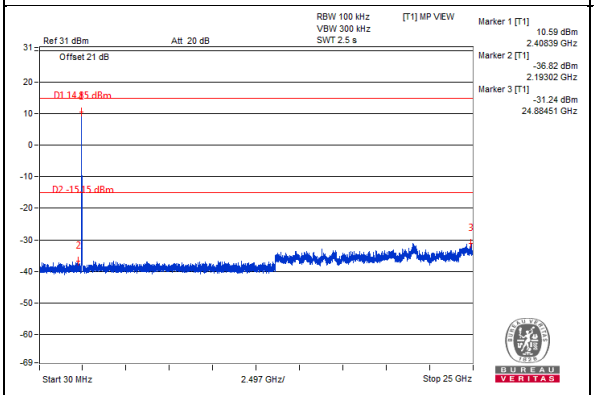
802.11n (HT20)

Maximum REF

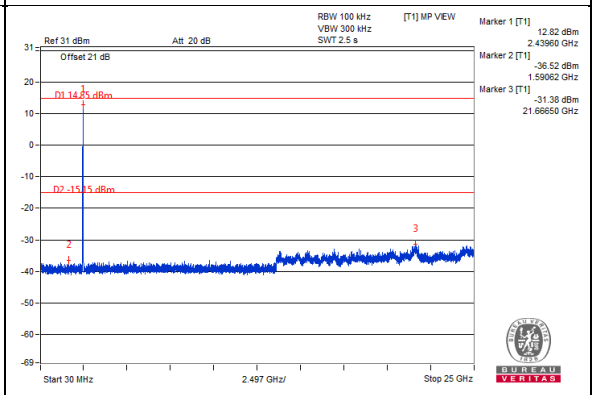


Chain 0

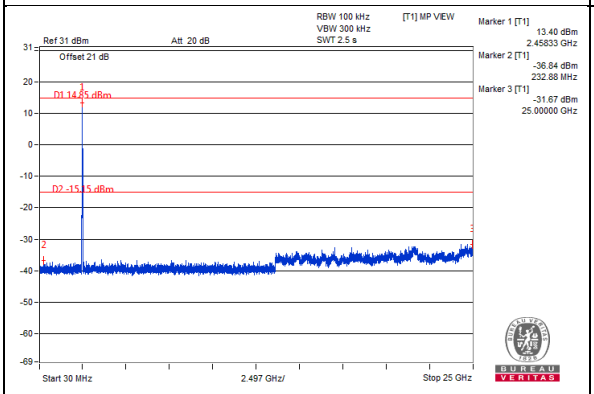
CH 1



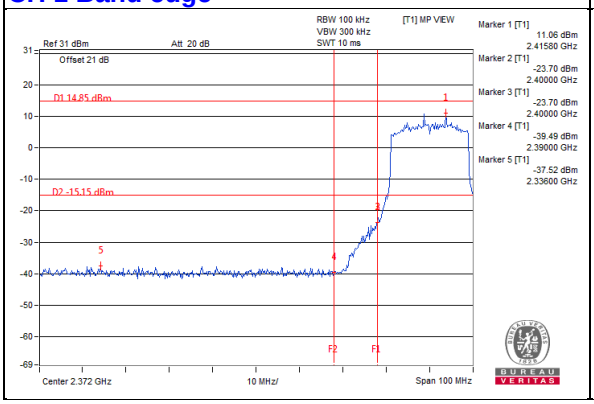
CH 6



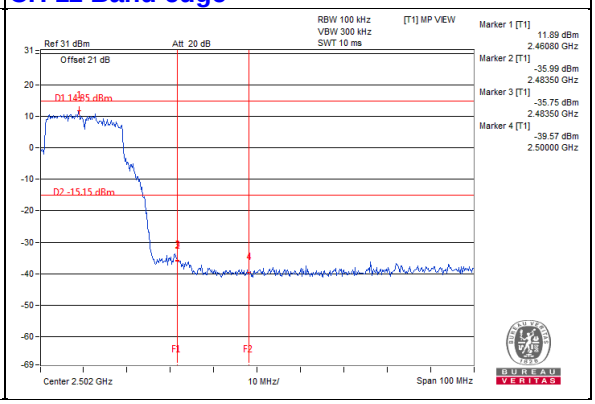
CH 11



CH 1 Band edge

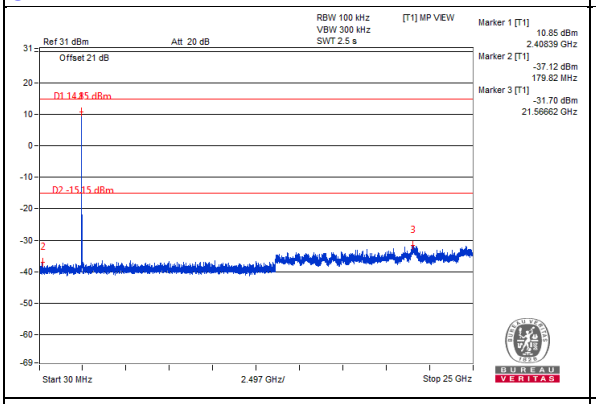


CH 11 Band edge

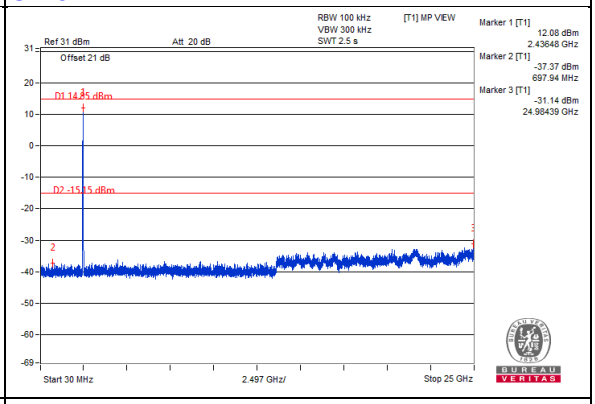


Chain 1

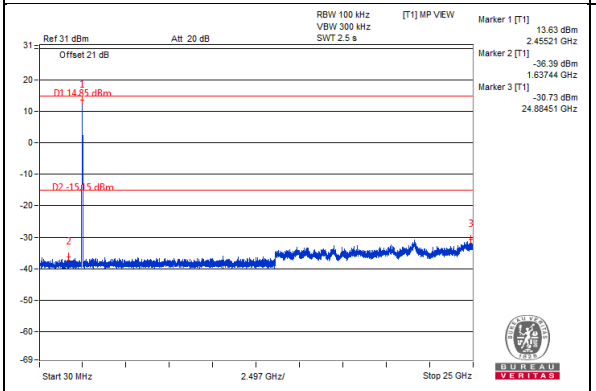
CH 1



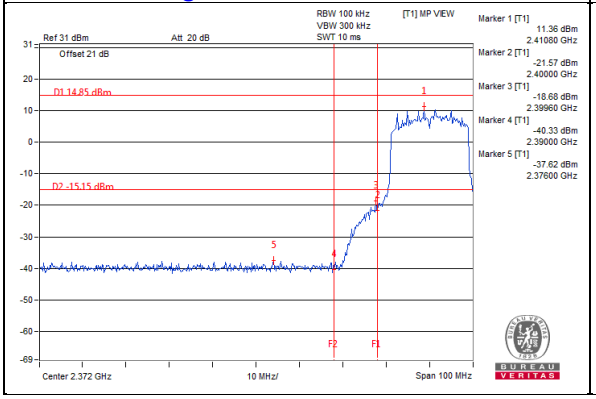
CH 6



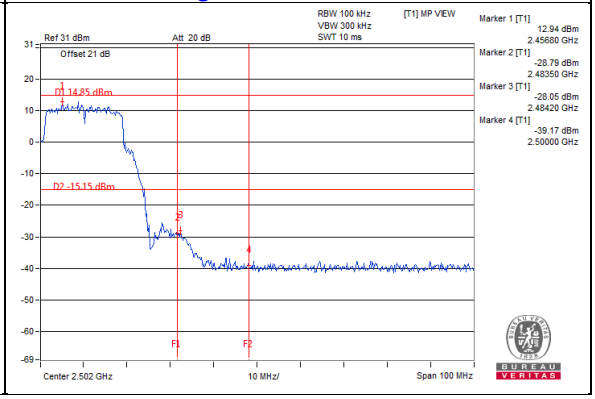
CH 11



CH 1 Band edge

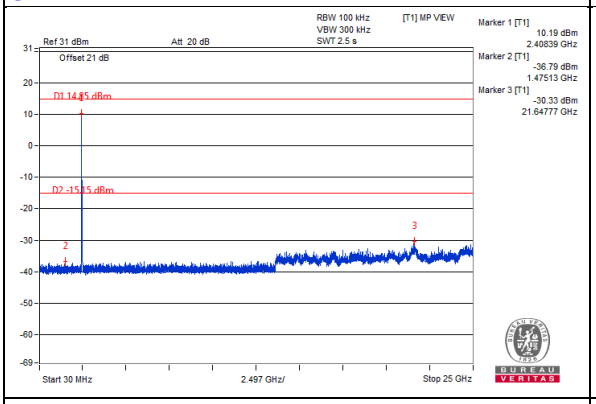


CH 11 Band edge

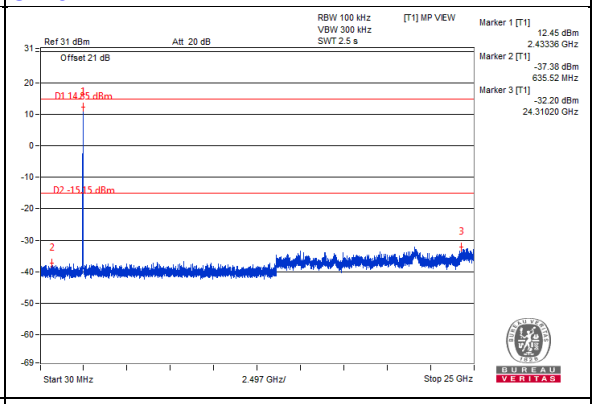


Chain 2

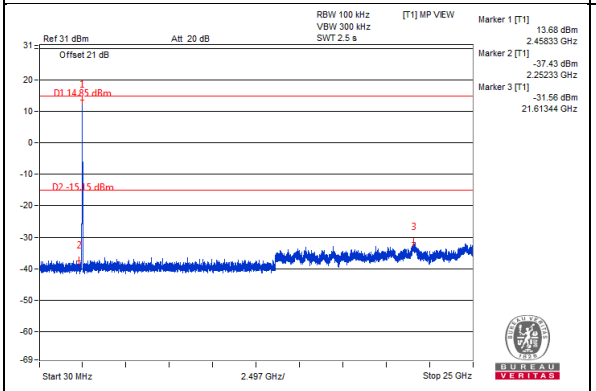
CH 1



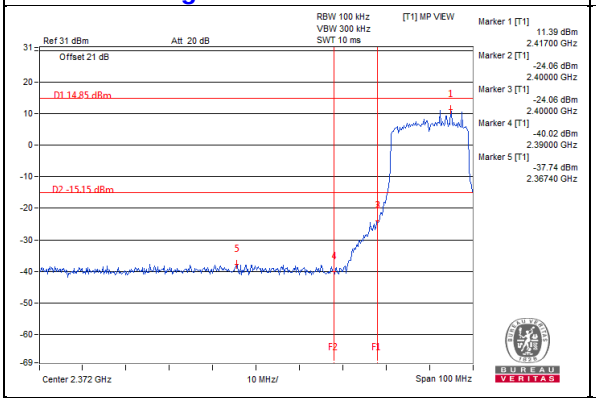
CH 6



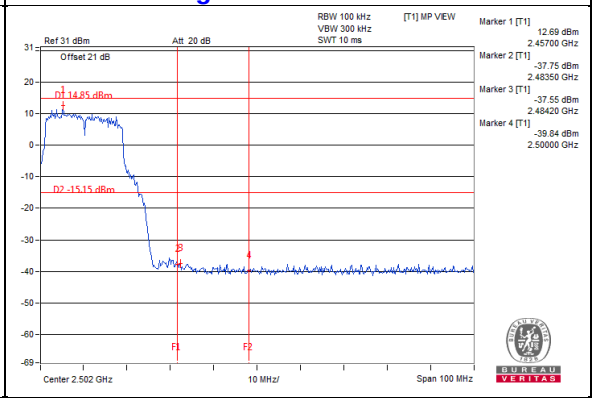
CH 11



CH 1 Band edge

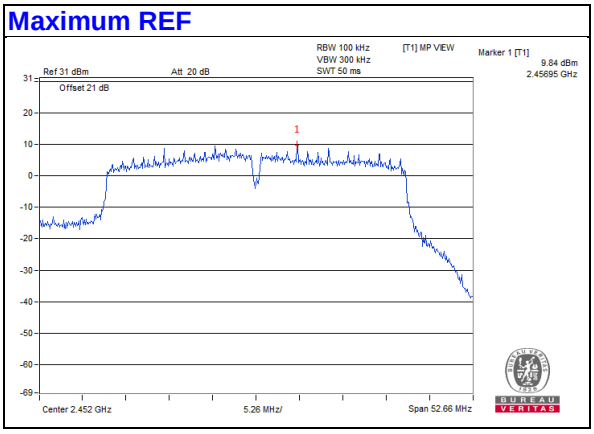


CH 11 Band edge



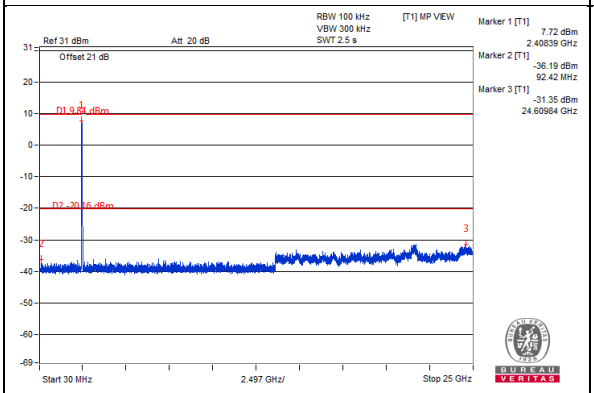
802.11n (HT40)

Maximum REF

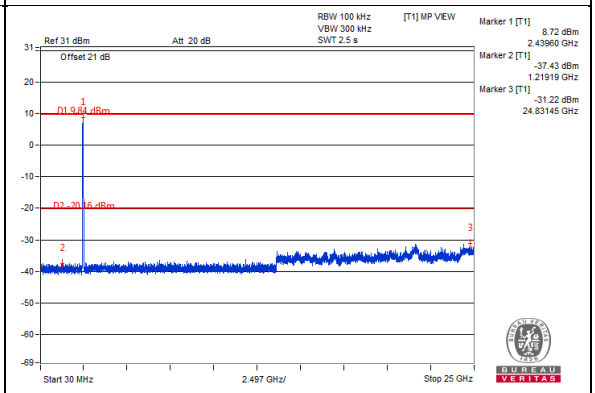


Chain 0

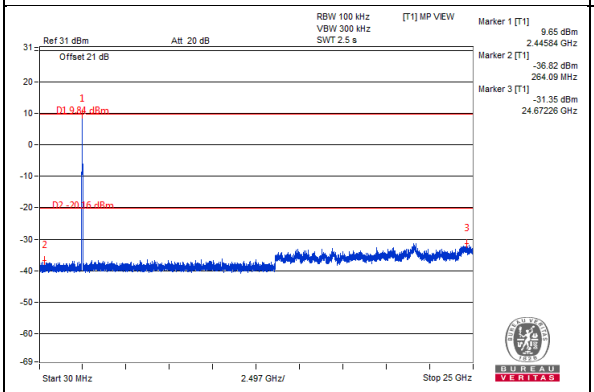
CH 3



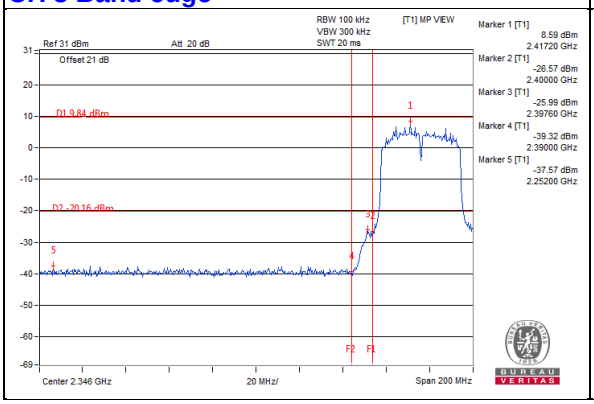
CH 6



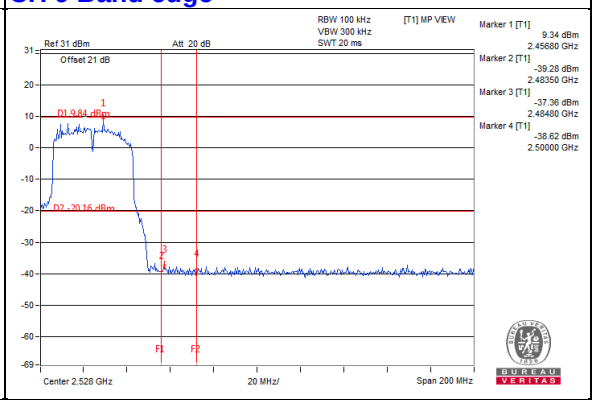
CH 9



CH 3 Band edge

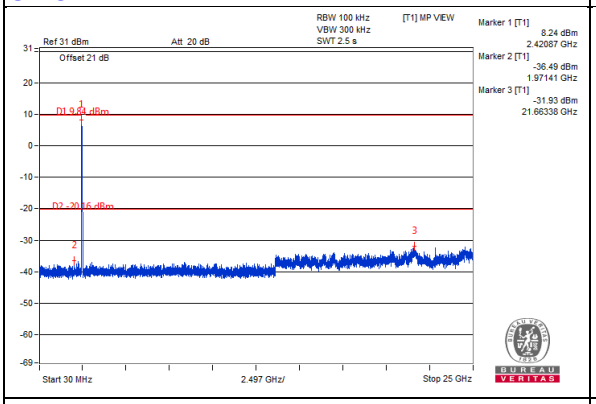


CH 9 Band edge

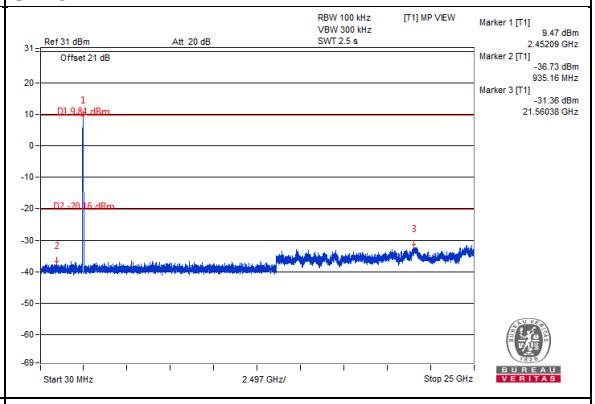


Chain 1

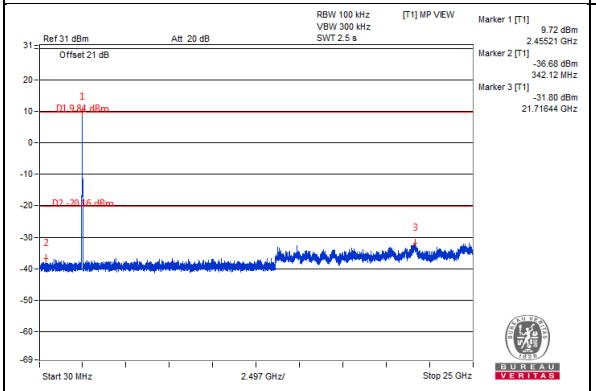
CH 3



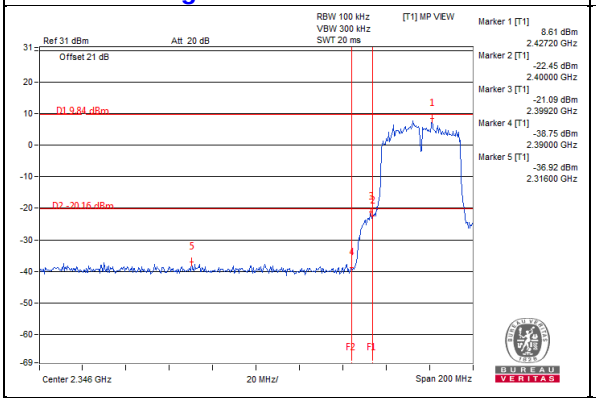
CH 6



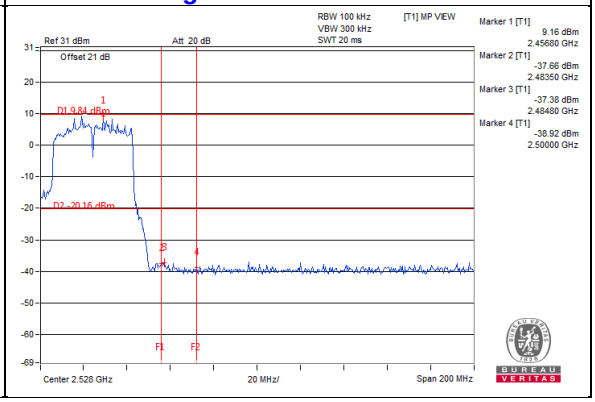
CH 9



CH 3 Band edge

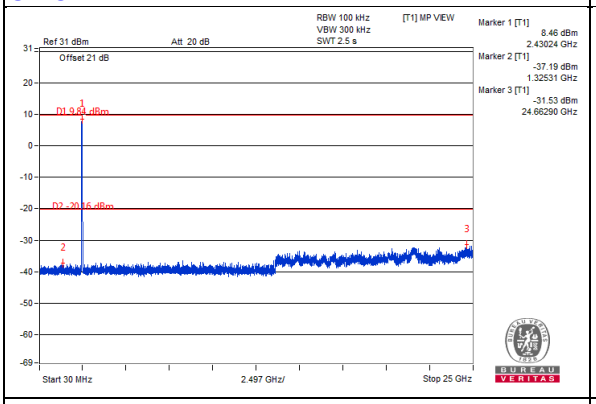


CH 9 Band edge

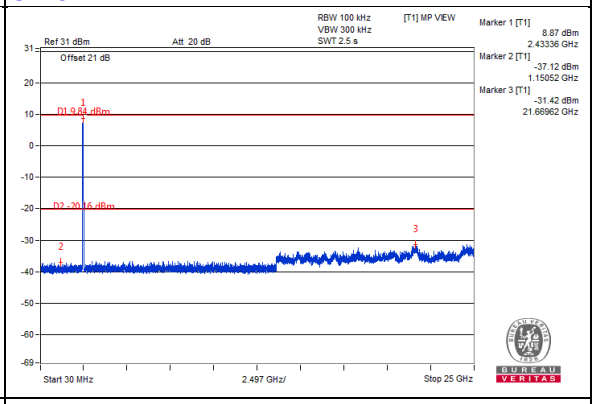


Chain 2

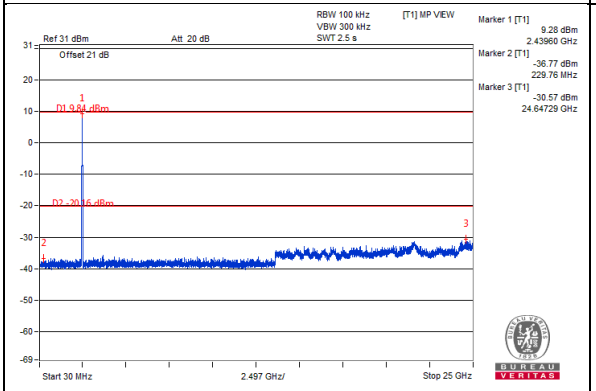
CH 3



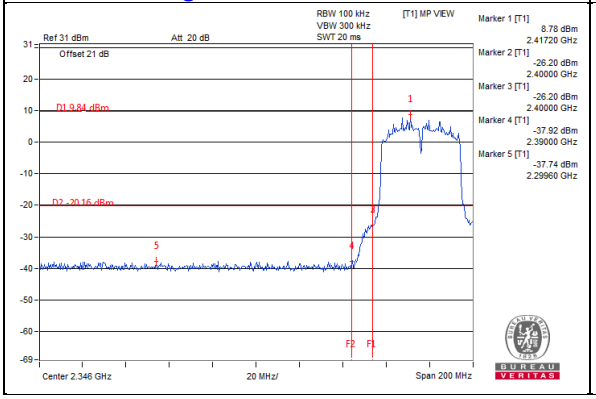
CH 6



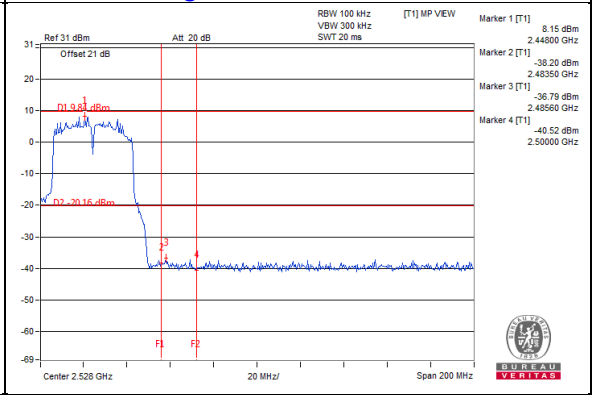
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

Linkou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

--- END ---