FCC Test Report

Report No.:	RF200102E06
FCC ID:	RAXCM4652442
Test Model:	CM4652442-MM
Received Date:	Jan. 02, 2020
Test Date:	Jan. 13 to Feb. 15, 2020
Issued Date:	Mar. 30, 2020
Applicant:	Arcadyan Technology Corporation
Address:	No.8, Sec.2, Guangfu Rd.,Hsinchu City 30071, 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
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF200102E06	Original release.	Mar. 30, 2020

1 Certificate of Conformity

Product:	DOCSIS® 3.1 Dual-band AX6000 Wi-Fi 6 Cable Gateway
Brand:	XTREAM
Test Model:	CM4652442-MM
Sample Status:	ENGINEERING SAMPLE
Applicant:	Arcadyan Technology Corporation
Test Date:	Jan. 13 to Feb. 15, 2020
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

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

Prepared by : Phoenix Huang , **Date:** Mar. 30, 2020

Phoenix Huang / Specialist

Approved by : , **Date:** Mar. 30, 2020

Clark Lin / Technical 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 -18.88 dB at 0.48203MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1 dB at 2390.00MHz.
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.

Note:
Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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
Conducted Emissions	-	3.1 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.8 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.0 dB
	6GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	DOCSIS® 3.1 Dual-band AX6000 Wi-Fi 6 Cable Gateway
Brand	XTREAM
Test Model	CM4652442-MM
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 in 2.4GHz 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 600 Mbps 802.11ac: up to 1733.3 Mbps 802.11ax: up to 2401.9 Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462 GHz **5GHz:** 5.18 ~ 5.24 GHz, 5.745 ~ 5.825 GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20), 80211ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 80211ax (HE40): 4 802.11ac (VHT80), 80211ax (HE80): 2
Output Power	**CDD Mode:** **2.412 ~ 2.462 GHz:** 969.053 mW **5.18 ~ 5.24 GHz:** 902.817 mW **5.745 ~ 5.825 GHz:** 934.131 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 621.821 mW **5.18 ~ 5.24 GHz:** 698.724 mW **5.745 ~ 5.825 GHz:** 699.289 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ45 cable x 1 (Unshielded, 1m)

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 must be supplied with a power adapter as following table:

Brand	Model No.	Spec.
Asian Power Devices Inc.	WA-36A12FU	Input: 100-240Vac, 0.9A, 50/60Hz Output: 12Vdc, 3A DC Output cable: Unshielded, 1.5 m

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

Ant. No.	Transmitter Circuit	Model No.	Ant. Net Gain (dBi) (Including cable loss)	Freq. Range (GHz)	Ant. Type	Connector Type	Cable Length (mm)
1	Chain 0	CM4652442- MM R0B	2.42	2.4~2.4835	PIFA	i-pex(MHF)	227
			0.49	5.15~5.85			
2	Chain 1	CM4652442- MM R0B	0.09	2.4~2.4835	PIFA	i-pex(MHF)	171
			1.42	5.15~5.85			
3	Chain 2	CM4652442- MM R0B	1.38	2.4~2.4835	PIFA	i-pex(MHF)	145
			1.44	5.15~5.85			
4	Chain 3	CM4652442- MM R0B	3.69	2.4~2.4835	PIFA	i-pex(MHF)	73
			2.46	5.15~5.85			

4. The directional gain table:

Frequency Range (GHz)	Directional Antenna Gain (dBi)	Antenna Type	Antenna Connector
2.4~2.4835	8.02	PIFA	i-pex(MHF)
5.15~5.85	7.5		
Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 4]			

5. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	4TX	4RX
802.11g	4TX	4RX
802.11n (HT20)	4TX	4RX
802.11n (HT40)	4TX	4RX
VHT20	4TX	4RX
VHT40	4TX	4RX
802.11ax (HE20)	4TX	4RX
802.11ax (HE40)	4TX	4RX
5GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11a	4TX	4RX
802.11n (HT20)	4TX	4RX
802.11n (HT40)	4TX	4RX
802.11ac (VHT20)	4TX	4RX
802.11ac (VHT40)	4TX	4RX
802.11ac (VHT80)	4TX	4RX
802.11ax (HE20)	4TX	4RX
802.11ax (HE40)	4TX	4RX
802.11ax (HE80)	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), VHT mode for 20MHz (40MHz) and 802.11ax mode for 20MHz (40MHz), therefore the manufacturer will control the power for 802.11n/VHT mode is the same as the 802.11ax or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)

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

3.2 Description of Test Mode

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20), VHT20 and 802.11ax (HE20):

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

7 channels are provided for 802.11n (HT40), VHT40 and 802.11ax (HE40):

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

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 Parameter
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

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 Parameter
802.11b	1 to 11	1	DSSS	DBPSK	1Mb/s

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 Parameter
802.11b	1 to 11	1	DSSS	DBPSK	1Mb/s

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 Parameter**
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
VHT20 (Output power only)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
VHT40 (Output power only)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0
Beamforming Mode (output power only)					
Mode	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

Test Condition:

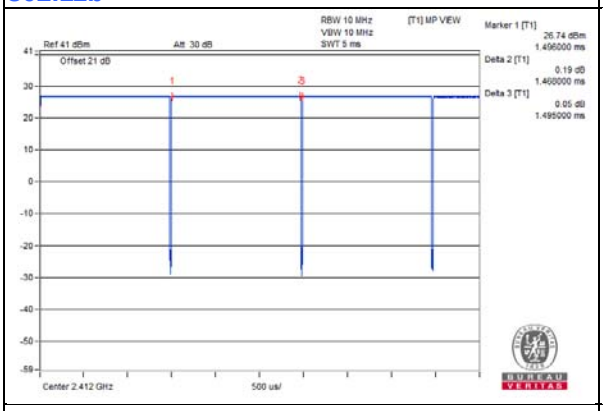
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 58%RH	120Vac, 60Hz	Jeff Lee
RE<1G	22deg. C, 57%RH	120Vac, 60Hz	Jeff Lee
PLC	25deg. C, 75%RH	120Vac, 60Hz	Kevin Ko
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

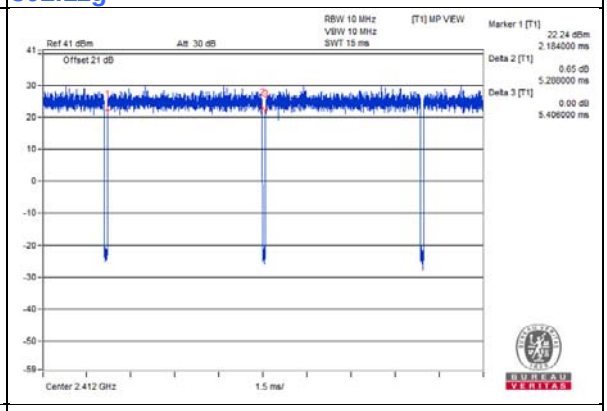
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98 %, duty factor shall be considered.

802.11b: Duty cycle = 1.468/1.495 = 0.982
802.11g: Duty cycle = 5.288/5.406 = 0.978, Duty factor = 10 * log(1/Duty cycle) = 0.10
802.11ax (HE20): Duty cycle = 4.026/4.146 = 0.971, Duty factor = 10 * log(1/Duty cycle) = 0.13
802.11ax (HE40): Duty cycle = 4.177/4.301 = 0.971, Duty factor = 10 * log(1/Duty cycle) = 0.13

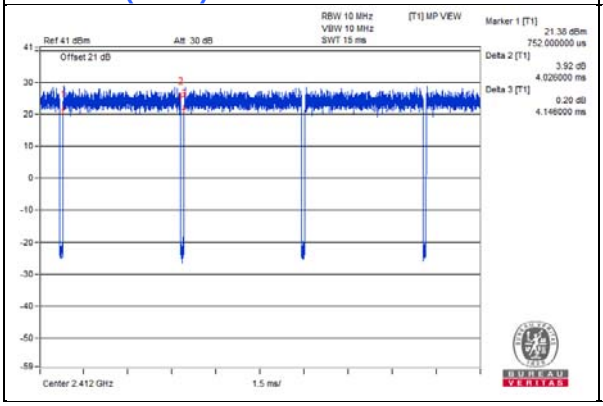
802.11b



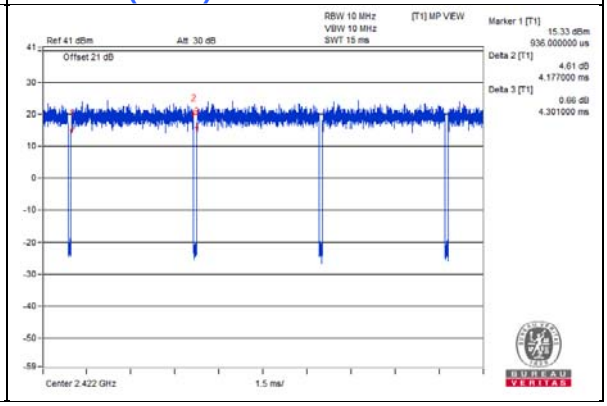
802.11g



802.11ax (HE20)



802.11ax (HE40)



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.

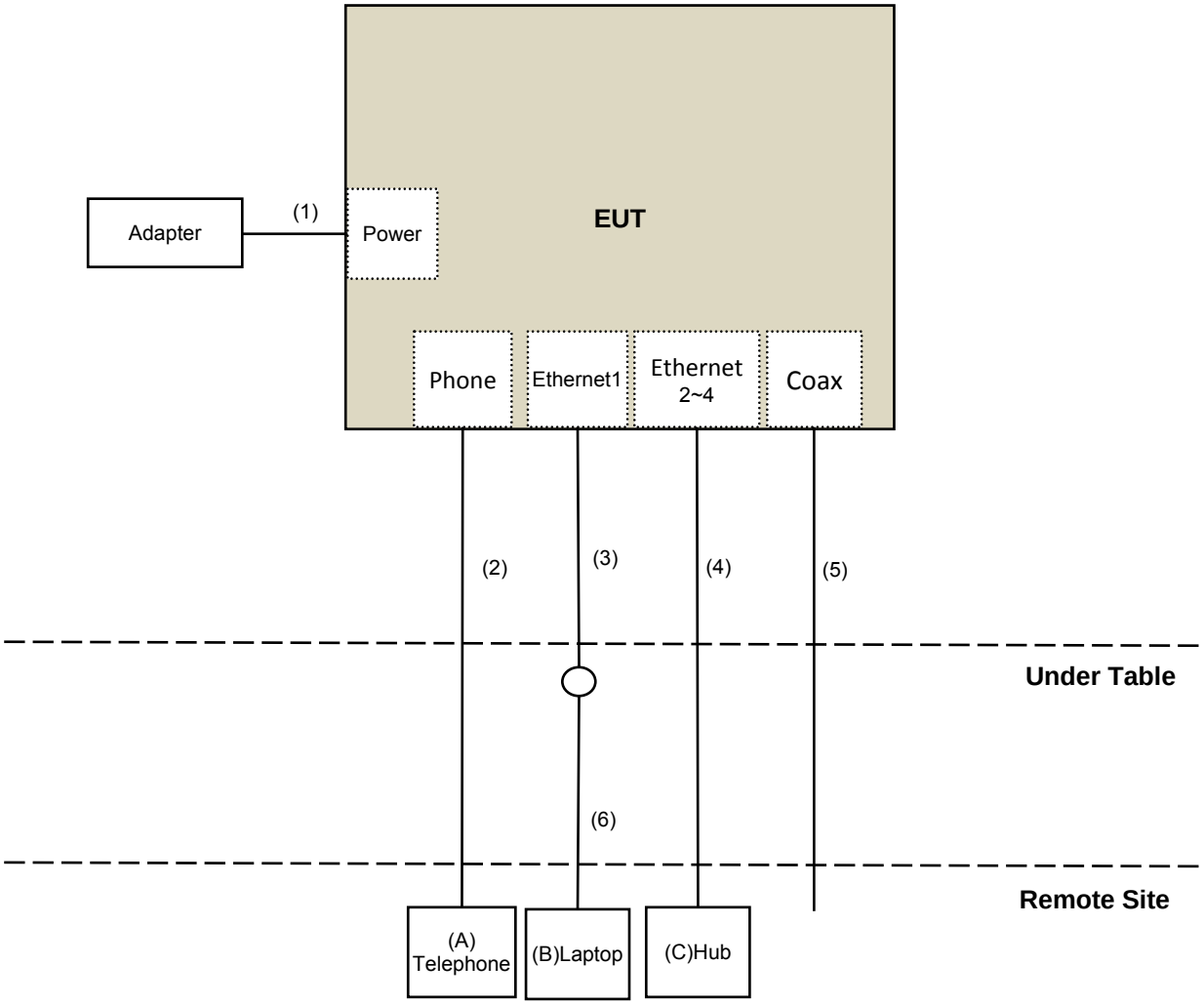
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Telephone	WONDER	WD-303	7C17KA 04011	N/A	Provided by Lab
B.	Laptop	DELL	E6400	D814C A00 APCC	N/A	Provided by Lab
C.	Hub	ZyXEL	GS1100-16	S150H44000046	FCC Doc	Provided by Lab

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and references

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

Test standard:

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

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

References Test Guidance :

KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 662911 D01 Multiple Transmitter Output v02r01

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

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ESR7 R&S	ESR7	102026	Apr. 24, 2019	Apr. 23, 2020
Spectrum Analyzer Keysight	N9030B	MY57141948	May 25, 2019	May 24, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 30, 2019	May 29, 2020
Loop Antenna Electro-Metrics	EM-6879	269	Sep. 16, 2019	Sep. 15, 2020
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier EMCI	EMC330N	980538	Apr. 30, 2019	Apr. 29, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB9168	9168-0842	Nov. 08, 2019	Nov. 07, 2020
RF Cable	8D	966-5-1	May 03, 2019	May 02, 2020
RF Cable	8D	966-5-2	May 03, 2019	May 02, 2020
RF Cable	8D	966-5-3	May 03, 2019	May 02, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	Jan. 28, 2019	Jan. 27, 2020
Software	ADT_Radiated _V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	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. 5.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Jan. 13, 2020

For Radiated Emission above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ESR7 R&S	ESR7	102026	Apr. 24, 2019	Apr. 23, 2020
Spectrum Analyzer Keysight	N9030B	MY57141948	May 25, 2019	May 24, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980509	May 03, 2019	May 02, 2020
RF Cable EMCI	EMC104-SM-SM-1500	180503	May 03, 2019	May 02, 2020
RF Cable EMCI	EMC104-SM-SM-2000	180501	May 03, 2019	May 02, 2020
RF Cable EMCI	EMC104-SM-SM-6000	180505	May 03, 2019	May 02, 2020
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC102-KM-KM-4500	181205	Aug. 26, 2019	Aug. 25, 2020
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA

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. 5.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Feb. 6, 2020

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	June 04, 2019	June 03, 2020
Power meter Anritsu	ML2495A	1014008	May 13, 2019	May 12, 2020
Power sensor Anritsu	MA2411B	0917122	May 13, 2019	May 12, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020

NOTE:
1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Feb. 15, 2020

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:

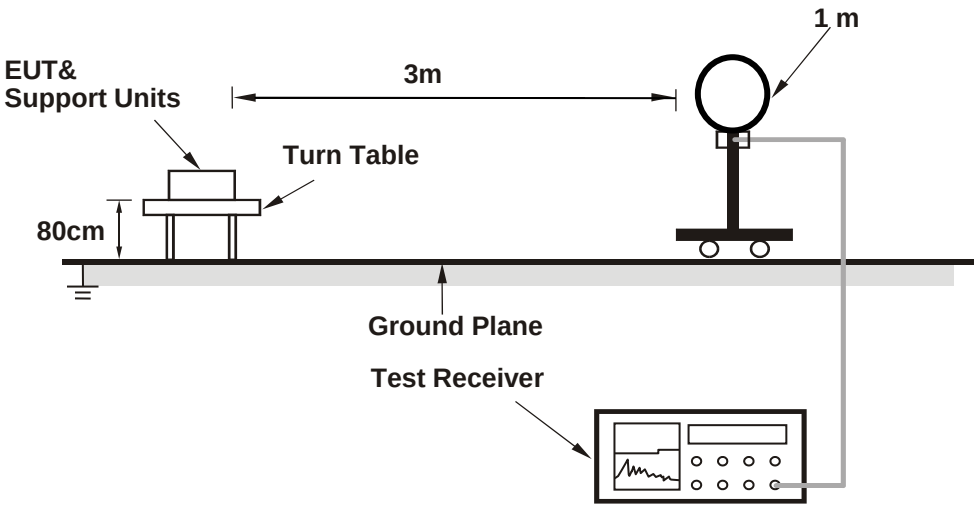
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

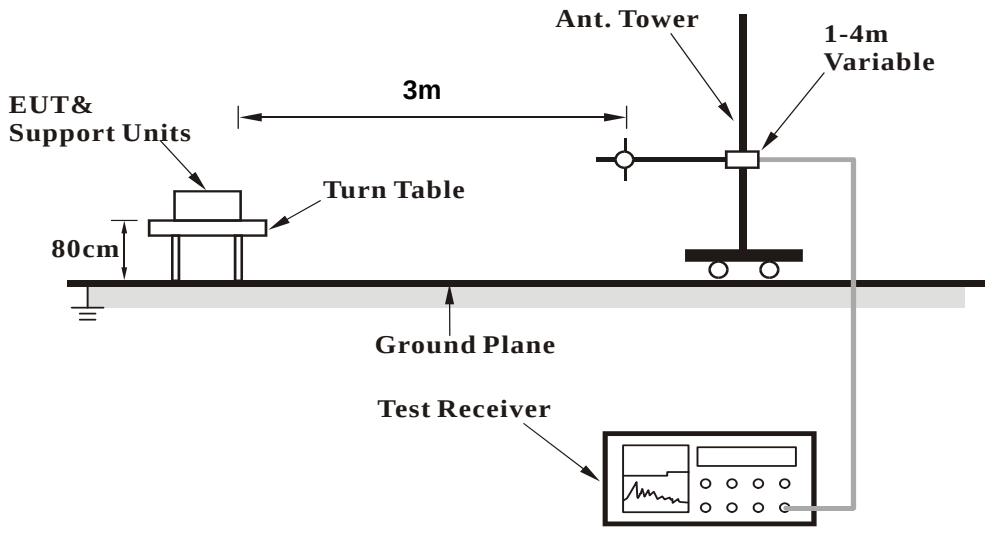
No deviation.

4.1.5 Test Setup

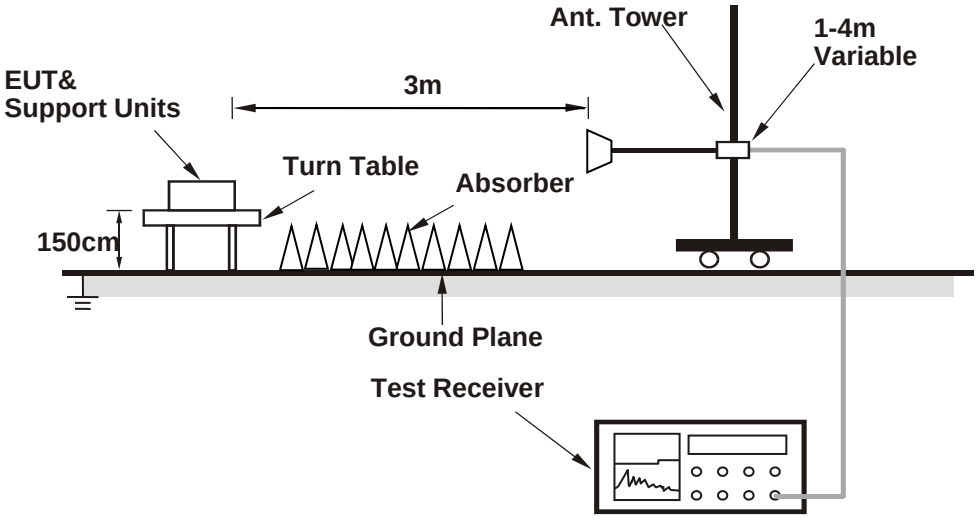
For Radiated emission below 30MHz



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 (accessMTool_3.1.0.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

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	59.9 PK	74.0	-14.1	1.34 H	45	63.0	-3.1
2	2390.00	48.9 AV	54.0	-5.1	1.34 H	45	52.0	-3.1
3	*2412.00	120.2 PK			1.34 H	45	123.3	-3.1
4	*2412.00	117.5 AV			1.34 H	45	120.6	-3.1
5	4824.00	49.1 PK	74.0	-24.9	1.88 H	254	47.9	1.2
6	4824.00	45.1 AV	54.0	-8.9	1.88 H	254	43.9	1.2
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	61.2 PK	74.0	-12.8	2.04 V	300	64.3	-3.1
2	2390.00	51.5 AV	54.0	-2.5	2.04 V	300	54.6	-3.1
3	*2412.00	122.4 PK			2.04 V	300	125.5	-3.1
4	*2412.00	119.9 AV			2.04 V	300	123.0	-3.1
5	4824.00	48.8 PK	74.0	-25.2	2.75 V	224	47.6	1.2
6	4824.00	45.8 AV	54.0	-8.2	2.75 V	224	44.6	1.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	57.4 PK	74.0	-16.6	2.37 H	107	60.5	-3.1
2	2390.00	46.2 AV	54.0	-7.8	2.37 H	107	49.3	-3.1
3	*2437.00	120.4 PK			2.37 H	107	123.5	-3.1
4	*2437.00	117.9 AV			2.37 H	107	121.0	-3.1
5	2483.50	59.0 PK	74.0	-15.0	2.37 H	107	62.1	-3.1
6	2483.50	46.7 AV	54.0	-7.3	2.37 H	107	49.8	-3.1
7	4874.00	49.1 PK	74.0	-24.9	1.82 H	249	48.0	1.1
8	4874.00	45.2 AV	54.0	-8.8	1.82 H	249	44.1	1.1
9	7311.00	43.1 PK	74.0	-30.9	2.10 H	136	35.8	7.3
10	7311.00	32.2 AV	54.0	-21.8	2.10 H	136	24.9	7.3
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	57.8 PK	74.0	-16.2	1.80 V	78	60.9	-3.1
2	2390.00	46.6 AV	54.0	-7.4	1.80 V	78	49.7	-3.1
3	*2437.00	120.4 PK			1.80 V	78	123.5	-3.1
4	*2437.00	117.9 AV			1.80 V	78	121.0	-3.1
5	2483.50	60.0 PK	74.0	-14.0	1.80 V	78	63.1	-3.1
6	2483.50	49.2 AV	54.0	-4.8	1.80 V	78	52.3	-3.1
7	4874.00	48.7 PK	74.0	-25.3	2.72 V	208	47.6	1.1
8	4874.00	45.6 AV	54.0	-8.4	2.72 V	208	44.5	1.1
9	7311.00	42.8 PK	74.0	-31.2	1.10 V	143	35.5	7.3
10	7311.00	31.8 AV	54.0	-22.2	1.10 V	143	24.5	7.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	121.6 PK			2.33 H	98	124.7	-3.1
2	*2462.00	119.1 AV			2.33 H	98	122.2	-3.1
3	2483.50	60.9 PK	74.0	-13.1	2.33 H	98	64.0	-3.1
4	2483.50	49.5 AV	54.0	-4.5	2.33 H	98	52.6	-3.1
5	4924.00	49.8 PK	74.0	-24.2	1.76 H	265	48.6	1.2
6	4924.00	45.6 AV	54.0	-8.4	1.76 H	265	44.4	1.2
7	7386.00	43.0 PK	74.0	-31.0	2.11 H	141	35.6	7.4
8	7386.00	32.3 AV	54.0	-21.7	2.11 H	141	24.9	7.4
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	*2462.00	122.3 PK			2.18 V	298	125.4	-3.1
2	*2462.00	119.8 AV			2.18 V	298	122.9	-3.1
3	2483.50	61.7 PK	74.0	-12.3	2.18 V	298	64.8	-3.1
4	2483.50	50.3 AV	54.0	-3.7	2.18 V	298	53.4	-3.1
5	4924.00	48.1 PK	74.0	-25.9	2.78 V	200	46.9	1.2
6	4924.00	45.2 AV	54.0	-8.8	2.78 V	200	44.0	1.2
7	7386.00	42.7 PK	74.0	-31.3	1.04 V	135	35.3	7.4
8	7386.00	31.5 AV	54.0	-22.5	1.04 V	135	24.1	7.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	72.8 PK	74.0	-1.2	2.32 H	136	75.9	-3.1
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**2.32 H**	**136**	**57.0**	**-3.1**
3	*2412.00	118.0 PK			2.32 H	136	121.1	-3.1
4	*2412.00	108.5 AV			2.32 H	136	111.6	-3.1
5	4824.00	45.9 PK	74.0	-28.1	1.93 H	250	44.7	1.2
6	4824.00	41.5 AV	54.0	-12.5	1.93 H	250	40.3	1.2
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	73.8 PK	74.0	-0.2	1.69 V	275	76.9	-3.1
2	2390.00	53.3 AV	54.0	-0.7	1.69 V	275	56.4	-3.1
3	*2412.00	120.6 PK			1.69 V	275	123.7	-3.1
4	*2412.00	109.9 AV			1.69 V	275	113.0	-3.1
5	4824.00	45.4 PK	74.0	-28.6	2.78 V	220	44.2	1.2
6	4824.00	41.0 AV	54.0	-13.0	2.78 V	220	39.8	1.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	66.3 PK	74.0	-7.7	2.31 H	117	69.4	-3.1
2	2390.00	46.3 AV	54.0	-7.7	2.31 H	117	49.4	-3.1
3	*2437.00	120.6 PK			2.31 H	117	123.7	-3.1
4	*2437.00	110.5 AV			2.31 H	117	113.6	-3.1
5	2483.50	61.5 PK	74.0	-12.5	2.31 H	117	64.6	-3.1
6	2483.50	47.2 AV	54.0	-6.8	2.31 H	117	50.3	-3.1
7	4874.00	47.7 PK	74.0	-26.3	1.76 H	247	46.6	1.1
8	4874.00	43.4 AV	54.0	-10.6	1.76 H	247	42.3	1.1
9	7311.00	40.3 PK	74.0	-33.7	2.14 H	134	33.0	7.3
10	7311.00	31.1 AV	54.0	-22.9	2.14 H	134	23.8	7.3
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	70.3 PK	74.0	-3.7	1.77 V	276	73.4	-3.1
2	2390.00	49.3 AV	54.0	-4.7	1.77 V	276	52.4	-3.1
3	*2437.00	123.1 PK			1.77 V	276	126.2	-3.1
4	*2437.00	112.9 AV			1.77 V	276	116.0	-3.1
5	2483.50	63.1 PK	74.0	-10.9	1.77 V	276	66.2	-3.1
6	2483.50	50.6 AV	54.0	-3.4	1.77 V	276	53.7	-3.1
7	4874.00	47.3 PK	74.0	-26.7	2.71 V	203	46.2	1.1
8	4874.00	43.0 AV	54.0	-11.0	2.71 V	203	41.9	1.1
9	7311.00	40.3 PK	74.0	-33.7	1.05 V	150	33.0	7.3
10	7311.00	31.3 AV	54.0	-22.7	1.05 V	150	24.0	7.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	116.9 PK			1.89 H	106	120.0	-3.1
2	*2462.00	107.1 AV			1.89 H	106	110.2	-3.1
3	2483.50	68.3 PK	74.0	-5.7	1.89 H	106	71.4	-3.1
4	2483.50	50.3 AV	54.0	-3.7	1.89 H	106	53.4	-3.1
5	4924.00	45.6 PK	74.0	-28.4	1.71 H	269	44.4	1.2
6	4924.00	41.5 AV	54.0	-12.5	1.71 H	269	40.3	1.2
7	7386.00	40.5 PK	74.0	-33.5	2.17 H	145	33.1	7.4
8	7386.00	31.6 AV	54.0	-22.4	2.17 H	145	24.2	7.4
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	*2462.00	118.8 PK			1.69 V	273	121.9	-3.1
2	*2462.00	108.9 AV			1.69 V	273	112.0	-3.1
3	2483.50	71.1 PK	74.0	-2.9	1.69 V	273	74.2	-3.1
4	2483.50	53.7 AV	54.0	-0.3	1.69 V	273	56.8	-3.1
5	4924.00	45.5 PK	74.0	-28.5	2.74 V	213	44.3	1.2
6	4924.00	41.2 AV	54.0	-12.8	2.74 V	213	40.0	1.2
7	7386.00	39.9 PK	74.0	-34.1	1.07 V	138	32.5	7.4
8	7386.00	31.0 AV	54.0	-23.0	1.07 V	138	23.6	7.4

REMARKS:

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

802.11ax (HE20)

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	63.5 PK	74.0	-10.5	1.76 H	132	66.6	-3.1
2	2390.00	51.2 AV	54.0	-2.8	1.76 H	132	54.3	-3.1
3	*2412.00	119.3 PK			1.76 H	132	122.4	-3.1
4	*2412.00	106.7 AV			1.76 H	132	109.8	-3.1
5	4824.00	44.6 PK	74.0	-29.4	1.97 H	266	43.4	1.2
6	4824.00	40.0 AV	54.0	-14.0	1.97 H	266	38.8	1.2
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	68.3 PK	74.0	-5.7	1.78 V	275	71.4	-3.1
2	2390.00	53.7 AV	54.0	-0.3	1.78 V	275	56.8	-3.1
3	*2412.00	121.3 PK			1.78 V	275	124.4	-3.1
4	*2412.00	107.3 AV			1.78 V	275	110.4	-3.1
5	4824.00	44.7 PK	74.0	-29.3	2.74 V	211	43.5	1.2
6	4824.00	40.3 AV	54.0	-13.7	2.74 V	211	39.1	1.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	66.2 PK	74.0	-7.8	1.80 H	129	69.3	-3.1
2	2390.00	47.6 AV	54.0	-6.4	1.80 H	129	50.7	-3.1
3	*2437.00	121.9 PK			1.80 H	129	125.0	-3.1
4	*2437.00	110.6 AV			1.80 H	129	113.7	-3.1
5	2483.50	66.1 PK	74.0	-7.9	1.80 H	129	69.2	-3.1
6	2483.50	49.0 AV	54.0	-5.0	1.80 H	129	52.1	-3.1
7	4874.00	46.3 PK	74.0	-27.7	1.81 H	241	45.2	1.1
8	4874.00	42.3 AV	54.0	-11.7	1.81 H	241	41.2	1.1
9	7311.00	41.0 PK	74.0	-33.0	2.10 H	129	33.7	7.3
10	7311.00	31.7 AV	54.0	-22.3	2.10 H	129	24.4	7.3
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	66.1 PK	74.0	-7.9	1.80 V	272	69.2	-3.1
2	2390.00	48.2 AV	54.0	-5.8	1.80 V	272	51.3	-3.1
3	*2437.00	124.4 PK			1.80 V	272	127.5	-3.1
4	*2437.00	111.8 AV			1.80 V	272	114.9	-3.1
5	2483.50	69.5 PK	74.0	-4.5	1.80 V	272	72.6	-3.1
6	2483.50	49.7 AV	54.0	-4.3	1.80 V	272	52.8	-3.1
7	4874.00	46.8 PK	74.0	-27.2	2.65 V	217	45.7	1.1
8	4874.00	42.7 AV	54.0	-11.3	2.65 V	217	41.6	1.1
9	7311.00	41.1 PK	74.0	-32.9	1.05 V	153	33.8	7.3
10	7311.00	31.8 AV	54.0	-22.2	1.05 V	153	24.5	7.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	117.0 PK			1.73 H	128	120.1	-3.1
2	*2462.00	104.9 AV			1.73 H	128	108.0	-3.1
3	2483.50	68.9 PK	74.0	-5.1	1.73 H	128	72.0	-3.1
4	2483.50	53.3 AV	54.0	-0.7	1.73 H	128	56.4	-3.1
5	4924.00	43.2 PK	74.0	-30.8	1.69 H	257	42.0	1.2
6	4924.00	39.0 AV	54.0	-15.0	1.69 H	257	37.8	1.2
7	7386.00	40.3 PK	74.0	-33.7	2.13 H	139	32.9	7.4
8	7386.00	31.3 AV	54.0	-22.7	2.13 H	139	23.9	7.4
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	*2462.00	119.3 PK			1.57 V	284	122.4	-3.1
2	*2462.00	106.8 AV			1.57 V	284	109.9	-3.1
3	2483.50	71.3 PK	74.0	-2.7	1.57 V	284	74.4	-3.1
4	2483.50	53.7 AV	54.0	-0.3	1.57 V	284	56.8	-3.1
5	4924.00	43.3 PK	74.0	-30.7	2.71 V	205	42.1	1.2
6	4924.00	39.2 AV	54.0	-14.8	2.71 V	205	38.0	1.2
7	7386.00	39.9 PK	74.0	-34.1	1.03 V	126	32.5	7.4
8	7386.00	31.0 AV	54.0	-23.0	1.03 V	126	23.6	7.4

REMARKS:

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

802.11ax (HE40)

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	63.8 PK	74.0	-10.2	1.75 H	130	66.9	-3.1
2	2390.00	51.4 AV	54.0	-2.6	1.75 H	130	54.5	-3.1
3	*2422.00	115.6 PK			1.75 H	130	118.7	-3.1
4	*2422.00	102.3 AV			1.75 H	130	105.4	-3.1
5	4844.00	36.9 PK	74.0	-37.1	1.72 H	265	35.7	1.2
6	4844.00	31.9 AV	54.0	-22.1	1.72 H	265	30.7	1.2
7	7266.00	40.6 PK	74.0	-33.4	2.13 H	147	33.5	7.1
8	7266.00	31.7 AV	54.0	-22.3	2.13 H	147	24.6	7.1
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	67.0 PK	74.0	-7.0	1.66 V	277	70.1	-3.1
2	2390.00	53.6 AV	54.0	-0.4	1.66 V	277	56.7	-3.1
3	*2422.00	116.0 PK			1.66 V	277	119.1	-3.1
4	*2422.00	102.9 AV			1.66 V	277	106.0	-3.1
5	4844.00	37.3 PK	74.0	-36.7	2.57 V	204	36.1	1.2
6	4844.00	32.2 AV	54.0	-21.8	2.57 V	204	31.0	1.2
7	7266.00	40.5 PK	74.0	-33.5	1.00 V	127	33.4	7.1
8	7266.00	31.5 AV	54.0	-22.5	1.00 V	127	24.4	7.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	70.1 PK	74.0	-3.9	1.74 H	130	73.2	-3.1
2	2390.00	53.7 AV	54.0	-0.3	1.74 H	130	56.8	-3.1
3	*2437.00	119.1 PK			1.74 H	130	122.2	-3.1
4	*2437.00	105.7 AV			1.74 H	130	108.8	-3.1
5	2483.50	71.2 PK	74.0	-2.8	1.74 H	130	74.3	-3.1
6	2483.50	52.5 AV	54.0	-1.5	1.74 H	130	55.6	-3.1
7	4874.00	38.7 PK	74.0	-35.3	1.65 H	253	37.6	1.1
8	4874.00	33.7 AV	54.0	-20.3	1.65 H	253	32.6	1.1
9	7311.00	39.5 PK	74.0	-34.5	2.09 H	139	32.2	7.3
10	7311.00	30.8 AV	54.0	-23.2	2.09 H	139	23.5	7.3
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	71.4 PK	74.0	-2.6	1.77 V	274	74.5	-3.1
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.77 V**	**274**	**57.0**	**-3.1**
3	*2437.00	119.6 PK			1.77 V	274	122.7	-3.1
4	*2437.00	106.4 AV			1.77 V	274	109.5	-3.1
5	2483.50	72.6 PK	74.0	-1.4	1.77 V	274	75.7	-3.1
6	2483.50	52.9 AV	54.0	-1.1	1.77 V	274	56.0	-3.1
7	4874.00	38.2 PK	74.0	-35.8	2.66 V	232	37.1	1.1
8	4874.00	33.3 AV	54.0	-20.7	2.66 V	232	32.2	1.1
9	7311.00	40.0 PK	74.0	-34.0	1.06 V	122	32.7	7.3
10	7311.00	31.3 AV	54.0	-22.7	1.06 V	122	24.0	7.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	114.0 PK			1.75 H	131	117.1	-3.1
2	*2452.00	101.0 AV			1.75 H	131	104.1	-3.1
3	2483.50	66.0 PK	74.0	-8.0	1.75 H	131	69.1	-3.1
4	2483.50	52.1 AV	54.0	-1.9	1.75 H	131	55.2	-3.1
5	4904.00	37.3 PK	74.0	-36.7	1.64 H	262	36.1	1.2
6	4904.00	32.1 AV	54.0	-21.9	1.64 H	262	30.9	1.2
7	7356.00	40.7 PK	74.0	-33.3	2.11 H	130	33.3	7.4
8	7356.00	31.4 AV	54.0	-22.6	2.11 H	130	24.0	7.4
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	*2452.00	114.6 PK			1.71 V	282	117.7	-3.1
2	*2452.00	102.4 AV			1.71 V	282	105.5	-3.1
3	2483.50	66.7 PK	74.0	-7.3	1.71 V	282	69.8	-3.1
4	2483.50	53.7 AV	54.0	-0.3	1.71 V	282	56.8	-3.1
5	4904.00	37.2 PK	74.0	-36.8	2.75 V	208	36.0	1.2
6	4904.00	32.3 AV	54.0	-21.7	2.75 V	208	31.1	1.2
7	7356.00	39.7 PK	74.0	-34.3	1.00 V	137	32.3	7.4
8	7356.00	31.1 AV	54.0	-22.9	1.00 V	137	23.7	7.4

REMARKS:

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

Below 1GHz Data:

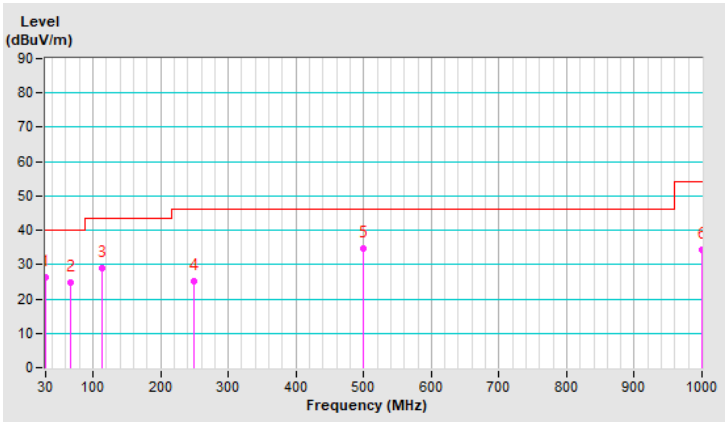
802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.58	26.2 QP	40.0	-13.8	1.00 H	126	40.4	-14.2
2	67.25	24.6 QP	40.0	-15.4	1.50 H	360	38.7	-14.1
3	114.10	28.8 QP	43.5	-14.7	2.00 H	88	44.3	-15.5
4	250.01	25.2 QP	46.0	-20.8	1.00 H	260	39.1	-13.9
5	499.99	34.5 QP	46.0	-11.5	1.50 H	216	42.0	-7.5
6	1000.00	34.4 QP	54.0	-19.6	1.00 H	154	34.4	0.0

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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.

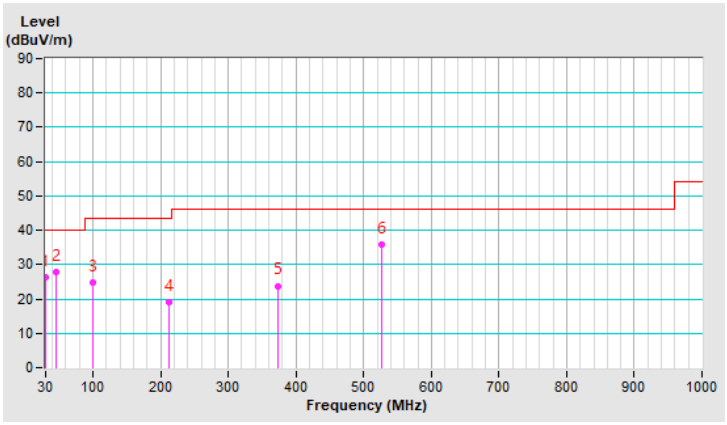


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.63	26.4 QP	40.0	-13.6	1.00 V	316	40.6	-14.2
2	44.79	27.9 QP	40.0	-12.1	1.50 V	1	40.7	-12.8
3	99.99	24.9 QP	43.5	-18.6	1.50 V	211	42.1	-17.2
4	212.42	19.1 QP	43.5	-24.4	1.00 V	360	35.1	-16.0
5	373.49	23.8 QP	46.0	-22.2	1.50 V	240	34.0	-10.2
6	527.00	35.9 QP	46.0	-10.1	1.00 V	96	42.8	-6.9

REMARKS:

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



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. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 17, 2019	Mar. 16, 2020
50 ohms Terminator	50	3	Oct. 23, 2019	Oct. 22, 2020
RF Cable	5D-FB	COCCAB-001	Sep. 27, 2019	Sep. 26, 2020
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: Feb. 5, 2020

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.

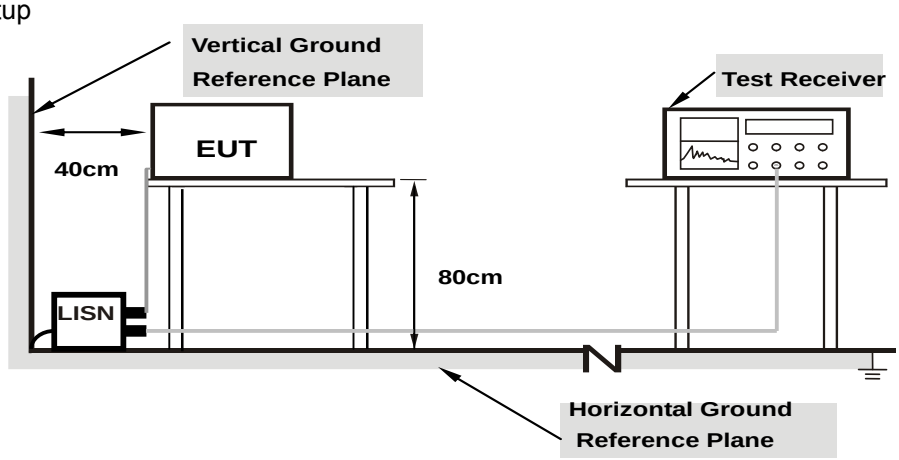
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

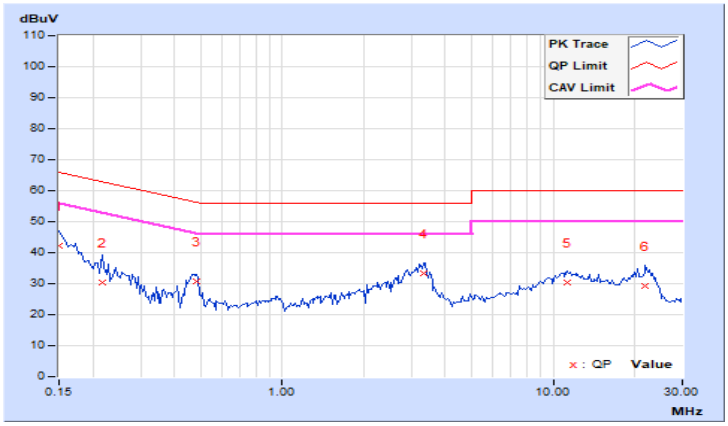
4.2.7 Test Results

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.99	32.35	22.63	42.34	32.62	66.00	56.00	-23.66	-23.38
2	0.21641	9.99	20.40	10.72	30.39	20.71	62.96	52.96	-32.57	-32.25
3	**0.48203**	**10.01**	**20.67**	**17.41**	**30.68**	**27.42**	**56.30**	**46.30**	**-25.62**	**-18.88**
4	3.32813	10.21	23.29	10.59	33.50	20.80	56.00	46.00	-22.50	-25.20
5	11.28125	10.74	19.50	14.06	30.24	24.80	60.00	50.00	-29.76	-25.20
6	21.89453	11.44	17.78	12.24	29.22	23.68	60.00	50.00	-30.78	-26.32

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

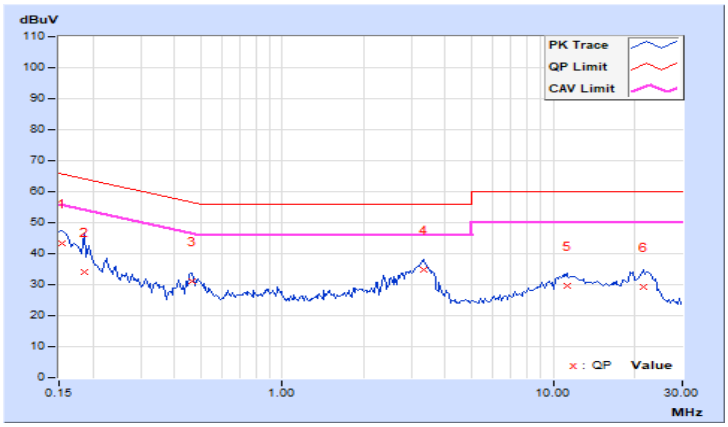


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.99	33.25	22.54	43.24	32.53	65.79	55.79	-22.55	-23.26
2	0.18516	9.99	24.14	12.35	34.13	22.34	64.25	54.25	-30.12	-31.91
3	0.46641	10.01	21.20	12.14	31.21	22.15	56.58	46.58	-25.37	-24.43
4	3.33984	10.19	24.63	11.88	34.82	22.07	56.00	46.00	-21.18	-23.93
5	11.25391	10.65	18.89	14.02	29.54	24.67	60.00	50.00	-30.46	-25.33
6	21.47266	11.15	17.95	12.63	29.10	23.78	60.00	50.00	-30.90	-26.22

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

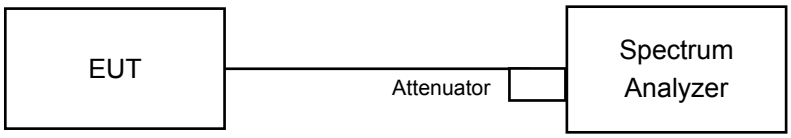


4.3 6dB Bandwidth Measurement

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 from Test 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)				Limit (MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3	Minimum	
1	2412	7.11	7.09	6.63	7.06	0.5	PASS
6	2437	7.04	7.58	6.63	7.1	0.5	PASS
11	2462	7.08	7.08	7.57	6.62	0.5	PASS

802.11g

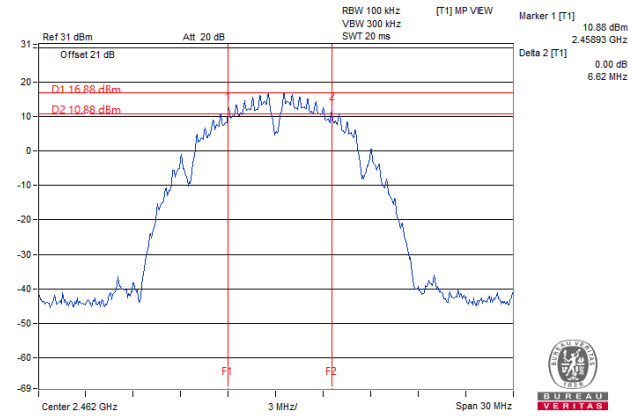
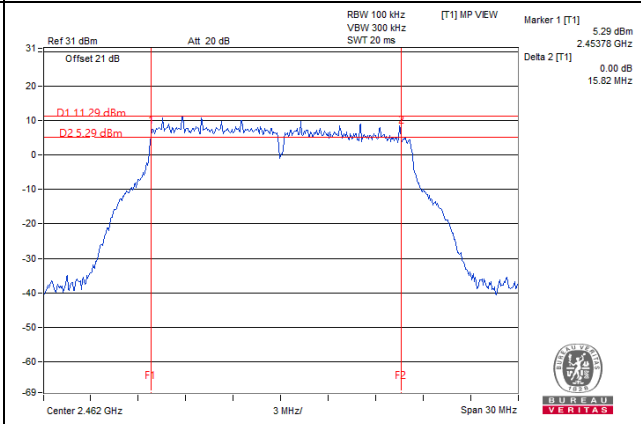
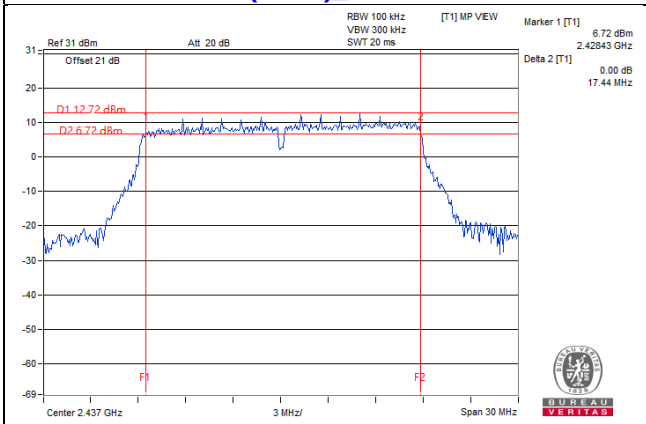
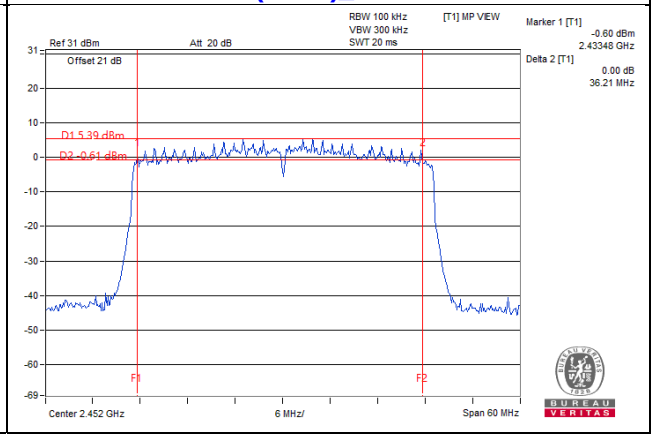
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Limit (MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3	Minimum	
1	2412	16.45	16.43	16.42	16.4	0.5	PASS
6	2437	16.39	16.38	16.46	16.46	0.5	PASS
11	2462	16.45	16.45	15.82	16.41	0.5	PASS

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Limit (MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3	Minimum	
1	2412	19.1	19.05	18.67	19.07	0.5	PASS
6	2437	19.07	18.98	17.44	19.07	0.5	PASS
11	2462	19.14	19.12	18.74	18.97	0.5	PASS

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Limit (MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3	Minimum	
3	2422	37.57	36.73	37.98	36.62	0.5	PASS
6	2437	36.68	36.63	37.15	36.57	0.5	PASS
9	2452	37.66	37.87	36.21	37.53	0.5	PASS

Spectrum Plot of Worst Value	
802.11b_Chain 3 / CH11	**802.11g_Chain 2/ CH11**
	
802.11ax (HE20)_Chain 2 / CH6	**802.11ax (HE40)_Chain 2/ CH9**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

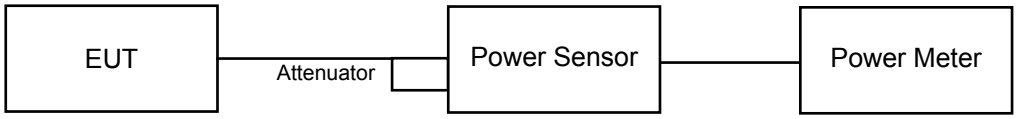
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

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

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

CDD Mode

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
1	2412	23.76	23.53	23.95	24.11	969.053	29.86	30.00	PASS
6	2437	23.78	23.20	23.91	23.88	938.091	29.72	30.00	PASS
11	2462	23.75	23.35	23.90	23.93	946.053	29.76	30.00	PASS

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
1	2412	21.25	21.12	22.03	21.68	569.591	27.56	30.00	PASS
6	2437	23.66	23.25	23.74	23.83	921.761	29.65	30.00	PASS
11	2462	21.07	20.69	21.70	21.24	526.114	27.21	30.00	PASS

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
1	2412	20.18	19.83	20.68	20.27	423.757	26.27	30.00	PASS
6	2437	23.61	23.02	23.68	23.48	886.251	29.48	30.00	PASS
11	2462	19.53	19.24	20.46	19.91	382.811	25.83	30.00	PASS

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
3	2422	18.18	18.53	18.69	18.22	277.386	24.43	30.00	PASS
6	2437	22.08	22.01	22.48	22.03	656.889	28.17	30.00	PASS
9	2452	18.00	18.34	18.57	18.07	267.395	24.27	30.00	PASS

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
1	2412	20.41	20.09	20.94	20.50	448.362	26.52	30.00	PASS
6	2437	23.85	23.24	23.95	23.84	943.94	29.75	30.00	PASS
11	2462	19.78	19.50	20.67	20.18	405.098	26.08	30.00	PASS

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
3	2422	18.37	18.79	18.92	18.46	292.519	24.66	30.00	PASS
6	2437	22.32	22.30	22.76	22.26	697.499	28.44	30.00	PASS
9	2452	18.22	18.59	18.83	18.29	282.488	24.51	30.00	PASS

Beamforming Mode

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
1	2412	20.18	19.83	20.68	20.27	423.757	26.27	27.98	PASS
6	2437	21.88	21.38	21.85	21.79	595.691	27.75	27.98	PASS
11	2462	19.53	19.24	20.46	19.91	382.811	25.83	27.98	PASS

Note: 1. The directional gain = 8.02dBi > 6dBi, so the power limit shall be reduced to 30.00-(8.02-6) = 27.98dBm

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
3	2422	18.18	18.53	18.69	18.22	277.386	24.43	27.98	PASS
6	2437	21.71	21.46	21.69	21.41	574.138	27.59	27.98	PASS
9	2452	18.00	18.34	18.57	18.07	267.395	24.27	27.98	PASS

Note: 1. The directional gain = 8.02dBi > 6dBi, so the power limit shall be reduced to 30.00-(8.02-6) = 27.98dBm

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
1	2412	20.41	20.09	20.94	20.50	448.362	26.52	27.98	PASS
6	2437	22.04	21.51	22.07	22.02	621.821	27.94	27.98	PASS
11	2462	19.78	19.50	20.67	20.18	405.098	26.08	27.98	PASS

Note: 1. The directional gain = 8.02dBi > 6dBi, so the power limit shall be reduced to 30.00-(8.02-6) = 27.98dBm

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
3	2422	18.37	18.79	18.92	18.46	292.519	24.66	27.98	PASS
6	2437	21.94	21.67	21.93	21.51	600.742	27.79	27.98	PASS
9	2452	18.22	18.59	18.83	18.29	282.488	24.51	27.98	PASS

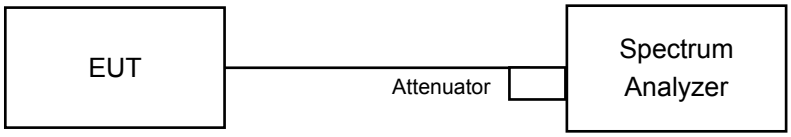
Note: 1. The directional gain = 8.02dBi > 6dBi, so the power limit shall be reduced to 30.00-(8.02-6) = 27.98dBm

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

For 802.11b:

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, 802.11ax (HE20), 802.11ax (HE40):

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.

4.5.5 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

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)				Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
1	2412	-8.13	-7.02	-9.69	-8.97	0.5866	-2.32	5.98	PASS
6	2437	-7.73	-8.79	-7.01	-8.88	0.6293	-2.01	5.98	PASS
11	2462	-7.72	-9.08	-7.20	-8.94	0.6108	-2.14	5.98	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain is 8.02dBi > 6dBi, therefore the limit needs to reduce, so the power density limit shall be reduced to 8-(8.02-6) = 5.98dBm.

802.11g

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)				Duty Factor (dB)	Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3					
1	2412	-13.37	-13.32	-11.85	-12.42	0.10	0.21998	-6.58	5.98	PASS
6	2437	-10.79	-10.46	-10.20	-10.62	0.10	0.36345	-4.40	5.98	PASS
11	2462	-14.80	-11.43	-11.76	-12.28	0.10	0.23605	-6.27	5.98	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain is 8.02dBi > 6dBi, therefore the limit needs to reduce, so the power density limit shall be reduced to 8-(8.02-6) = 5.98dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

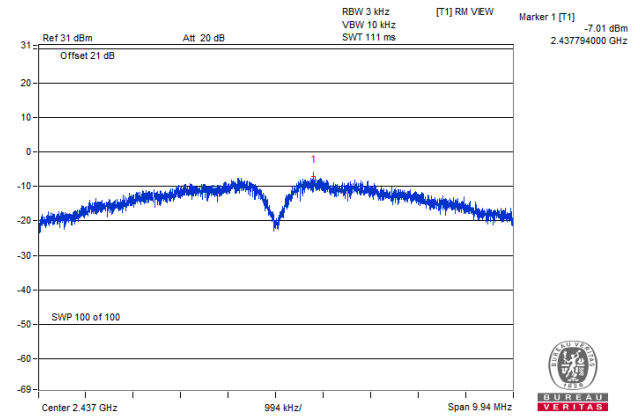
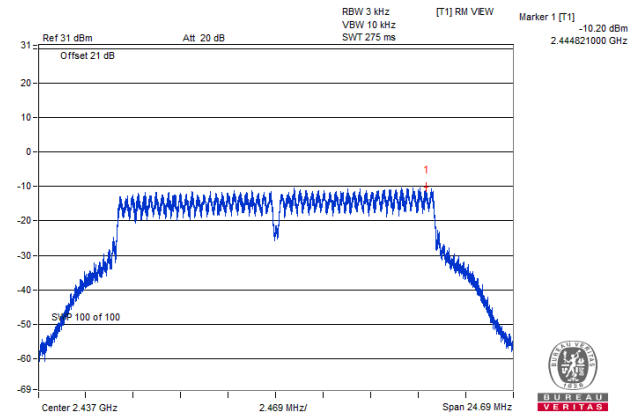
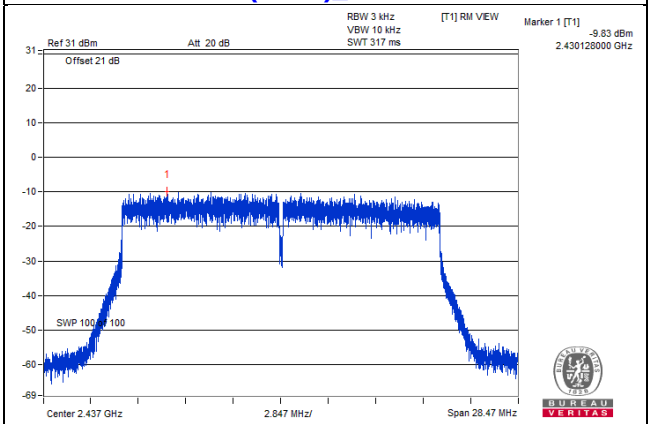
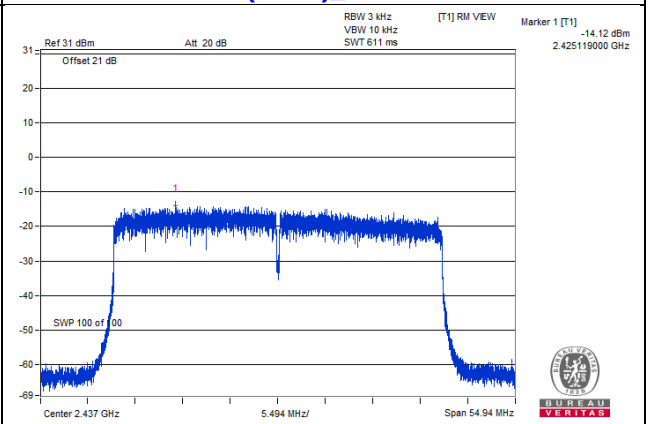
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)				Duty Factor (dB)	Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm3kHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3					
1	2412	-15.19	-13.02	-13.80	-15.15	0.13	0.15694	-8.04	5.98	PASS
6	2437	-12.09	-9.83	-10.39	-11.87	0.13	0.33182	-4.79	5.98	PASS
11	2462	-15.91	-14.39	-14.07	-15.20	0.13	0.13533	-8.69	5.98	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain is 8.02dBi > 6dBi, therefore the limit needs to reduce, so the power density limit shall be reduced to 8-(8.02-6) = 5.98dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)				Duty Factor (dB)	Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3					
3	2422	-19.55	-17.46	-17.00	-18.90	0.13	0.06371	-11.96	5.98	PASS
6	2437	-15.49	-14.12	-14.46	-14.80	0.13	0.13993	-8.54	5.98	PASS
9	2452	-19.37	-17.66	-17.50	-16.66	0.13	0.07008	-11.54	5.98	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain is 8.02dBi > 6dBi, therefore the limit needs to reduce, so the power density limit shall be reduced to 8-(8.02-6) = 5.98dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

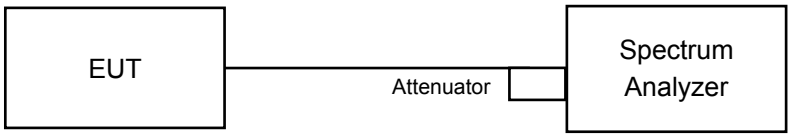
Spectrum Plot of Worst Value	
802.11b_Chain 2 / CH6	**802.11g_Chain 2 / CH6**
	
802.11ax (HE20)_Chain 1 / CH6	**802.11ax (HE40)_Chain 1 / CH6**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

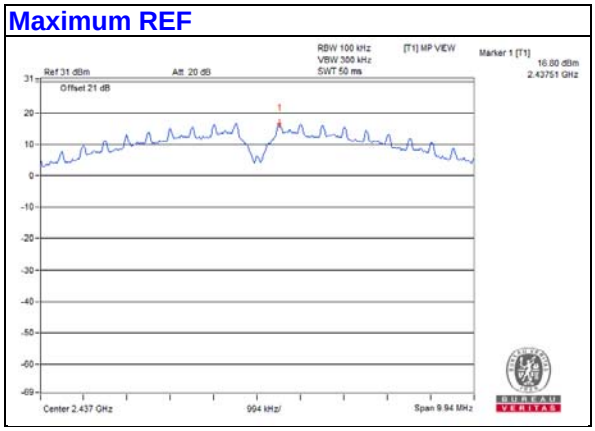
Same as Item 4.3.6

4.6.7 Test Results

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

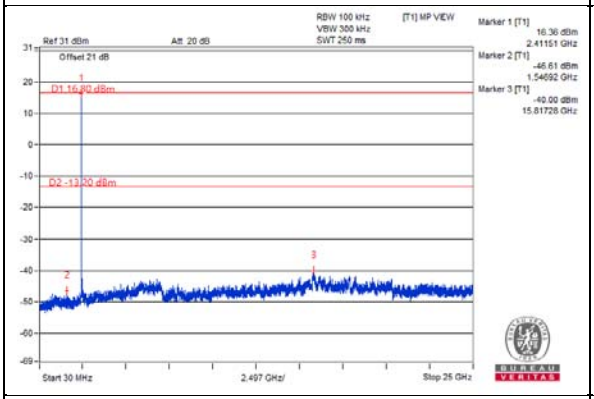
802.11b

Maximum REF

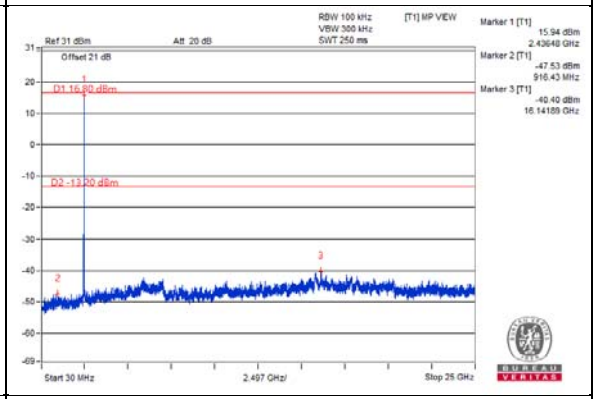


Chain 0

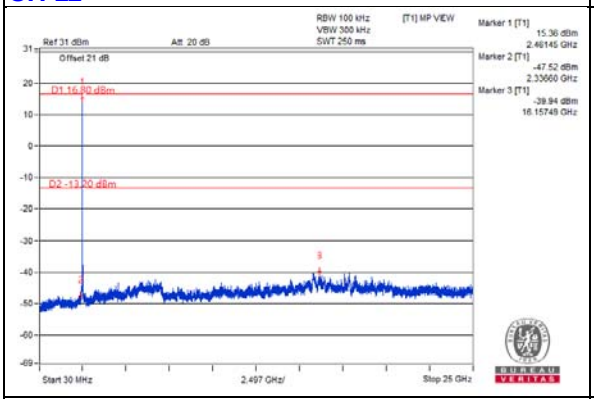
CH 1



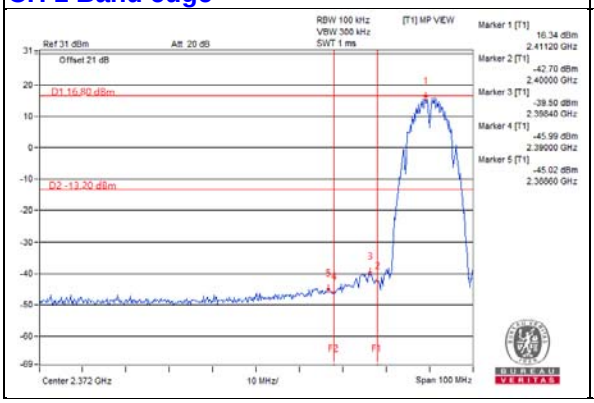
CH 6



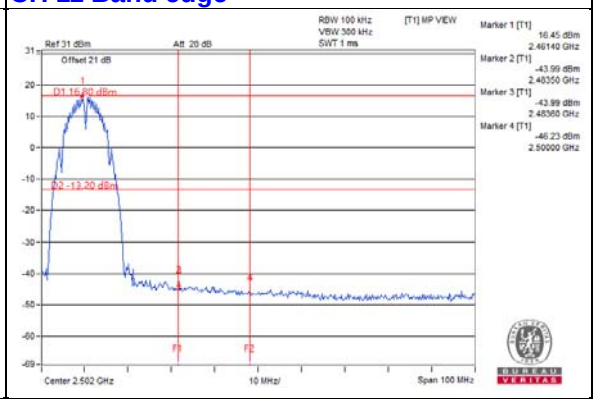
CH 11



CH 1 Band edge

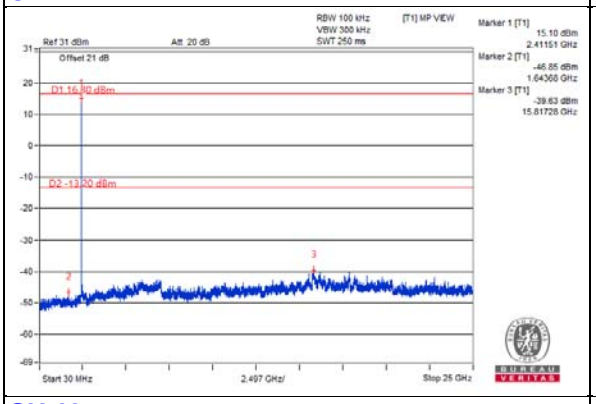


CH 11 Band edge

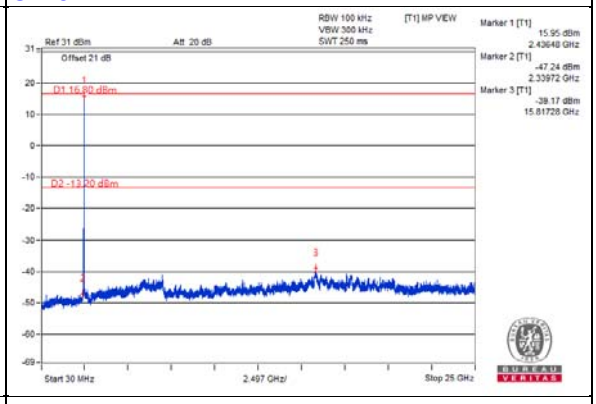


Chain 1

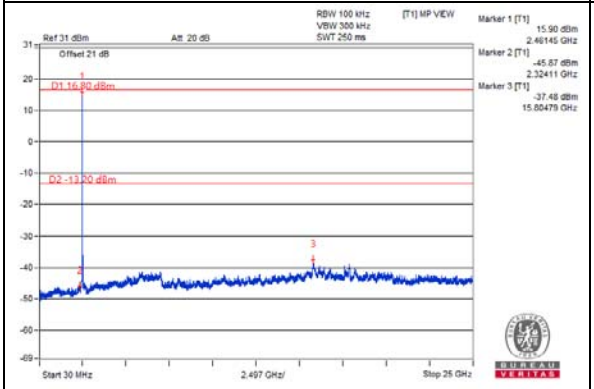
CH 1



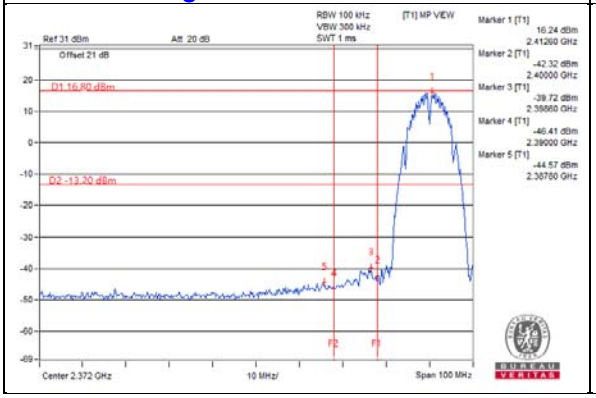
CH 6



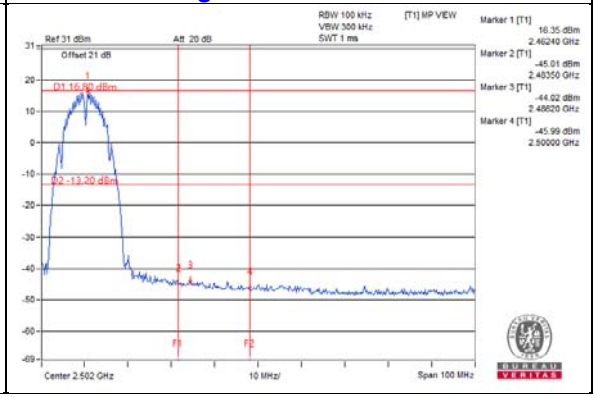
CH 11



CH 1 Band edge

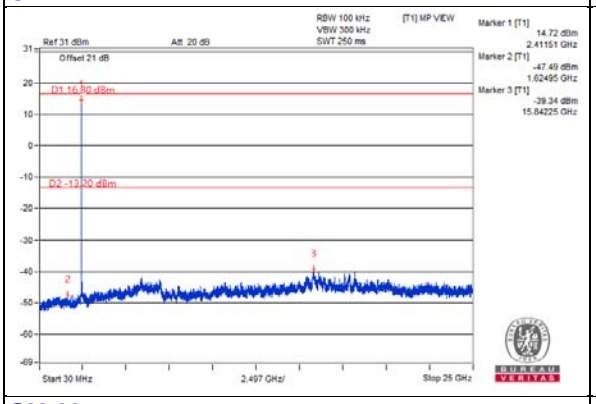


CH 11 Band edge

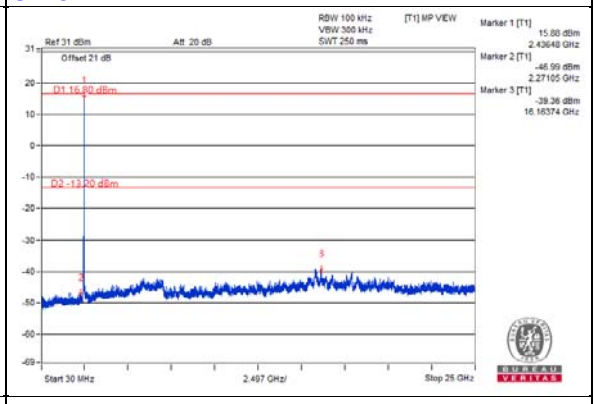


Chain 2

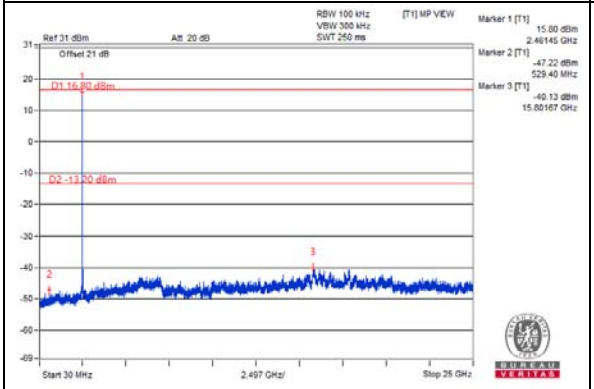
CH 1



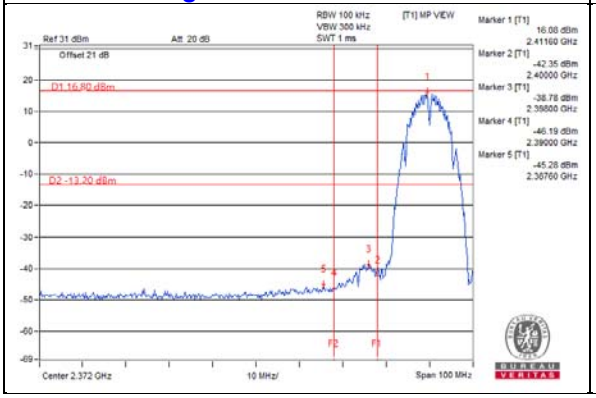
CH 6



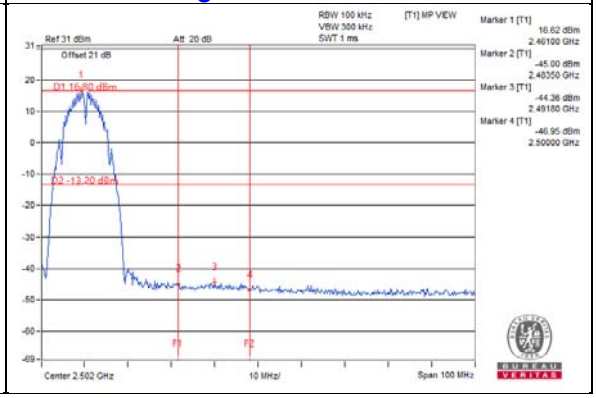
CH 11



CH 1 Band edge

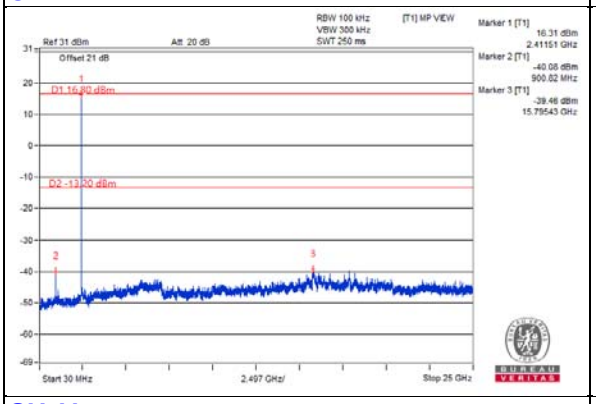


CH 11 Band edge

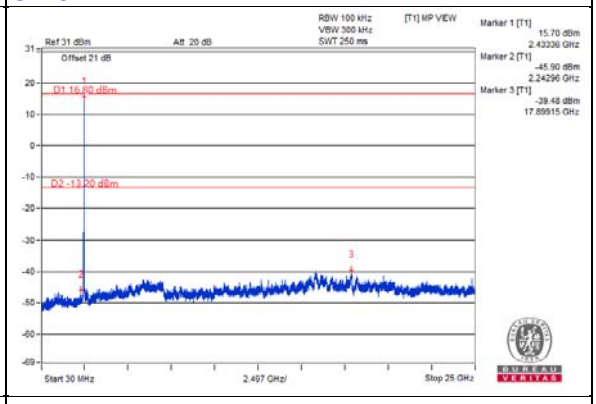


Chain 3

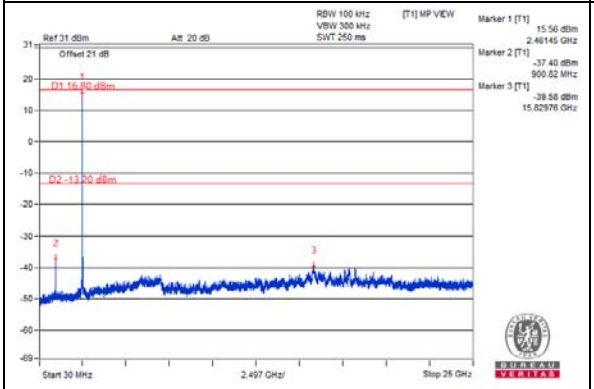
CH 1



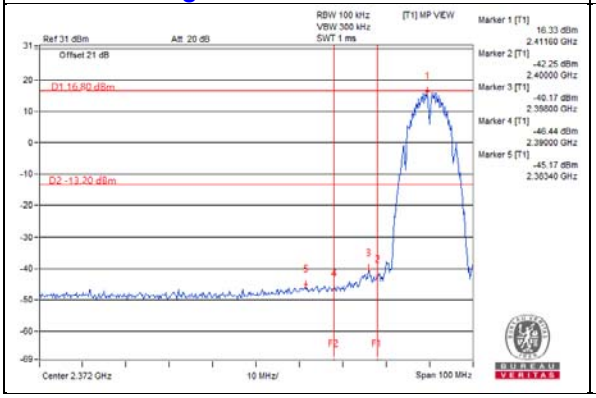
CH 6



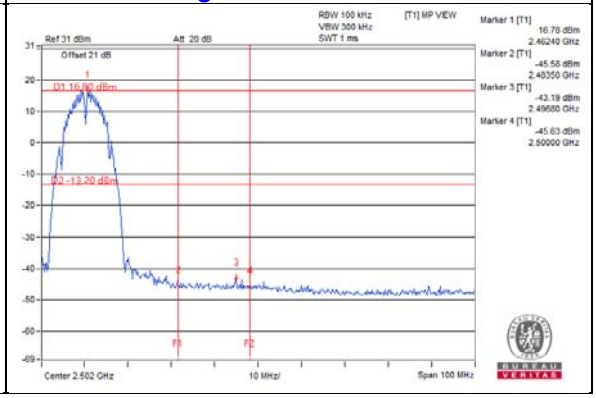
CH 11



CH 1 Band edge

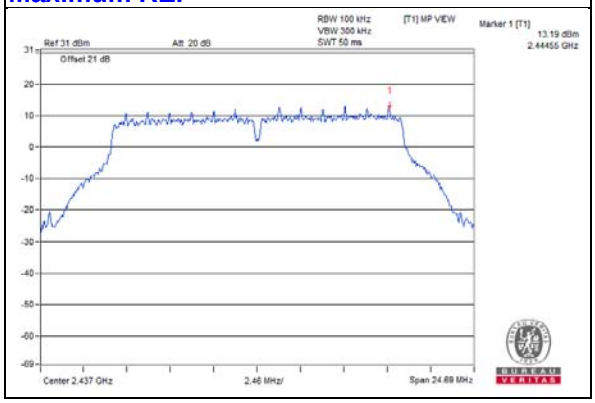


CH 11 Band edge



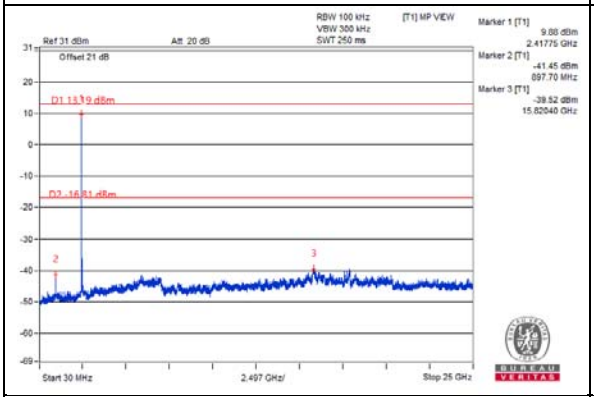
802.11g

Maximum REF

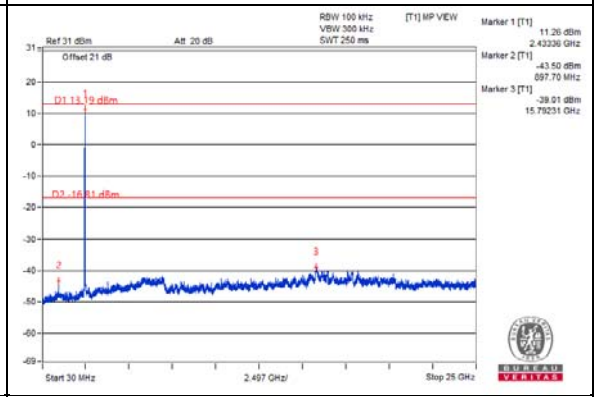


Chain 0

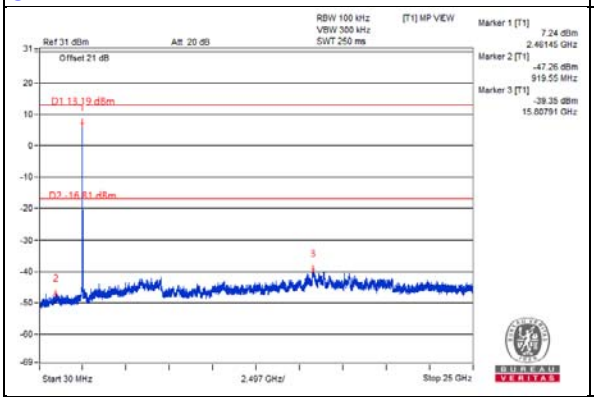
CH 1



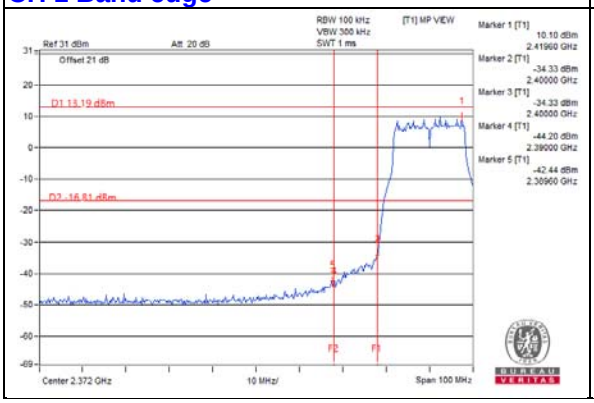
CH 6



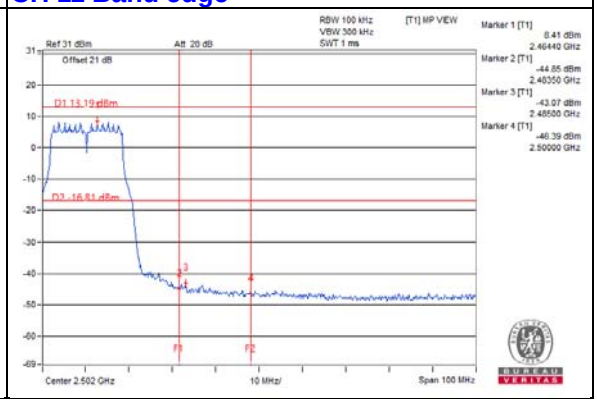
CH 11



CH 1 Band edge

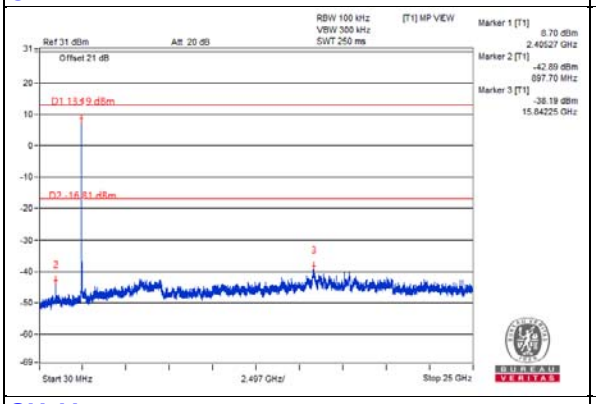


CH 11 Band edge

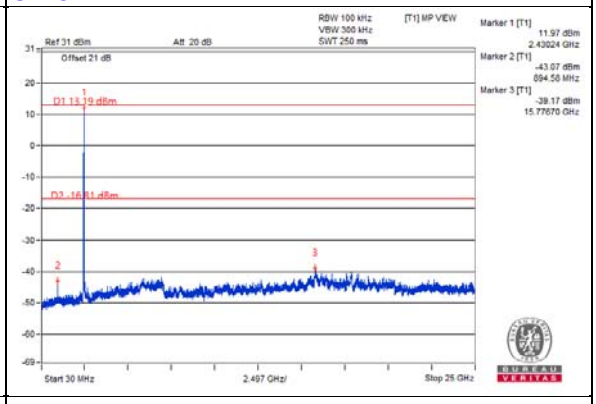


Chain 1

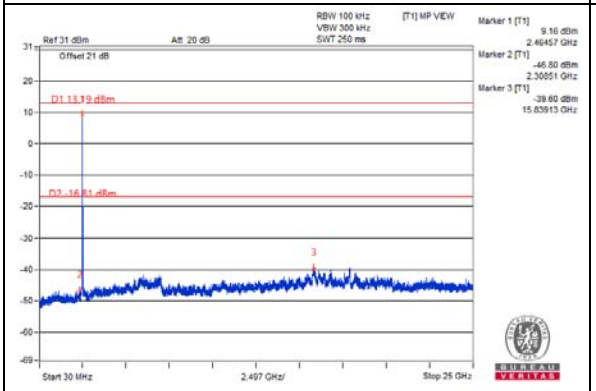
CH 1



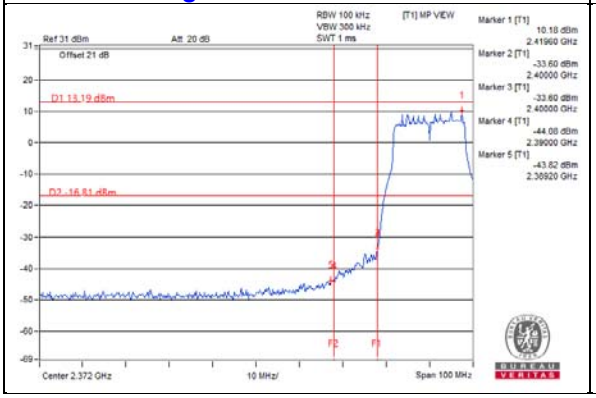
CH 6



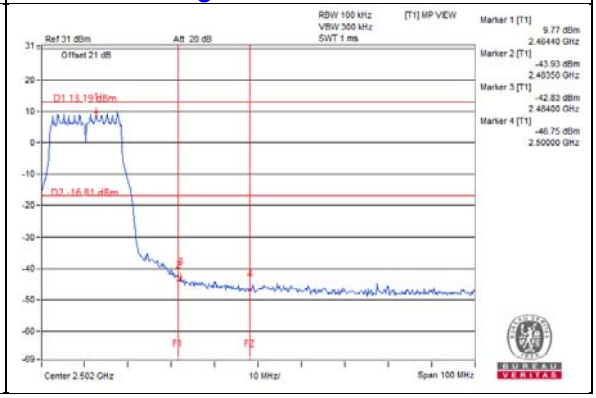
CH 11



CH 1 Band edge

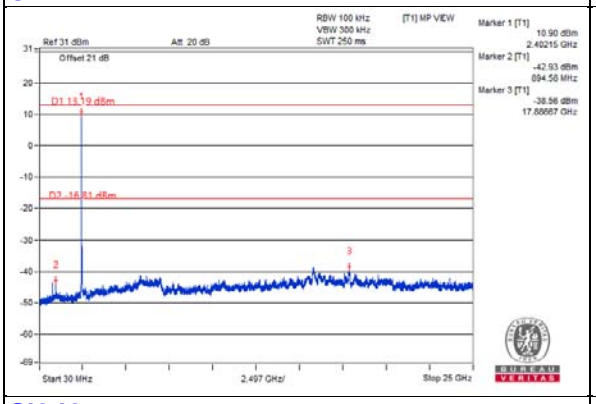


CH 11 Band edge

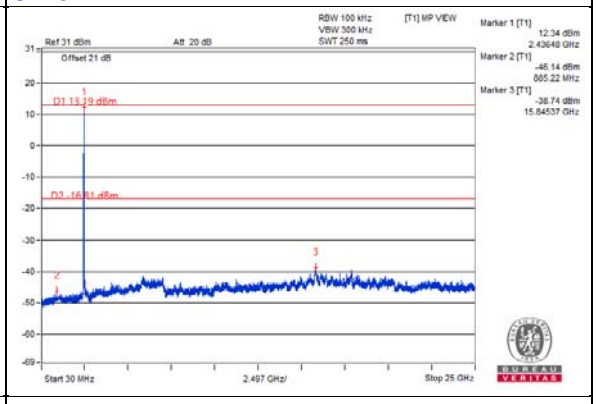


Chain 2

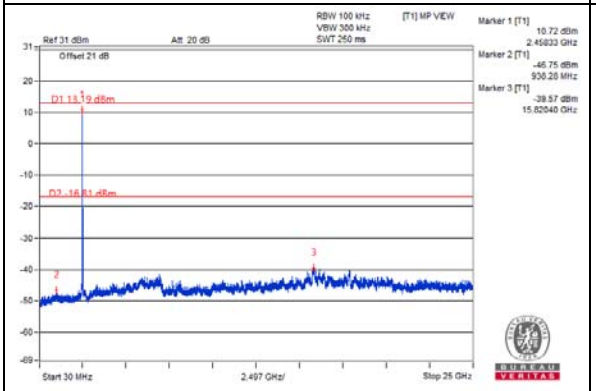
CH 1



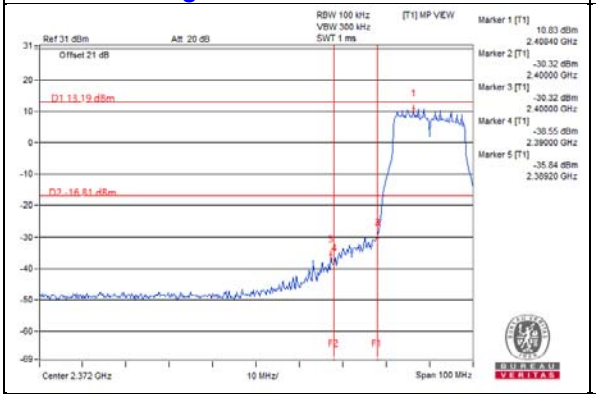
CH 6



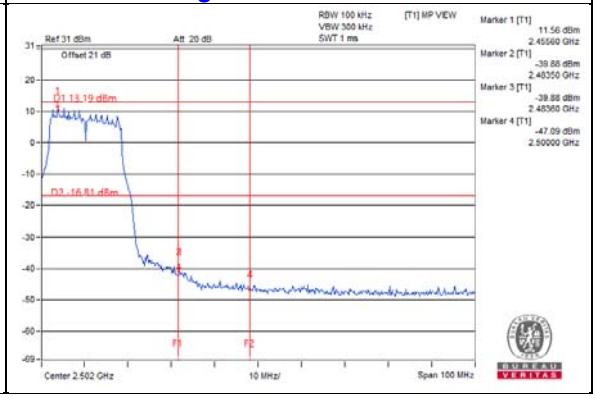
CH 11



CH 1 Band edge

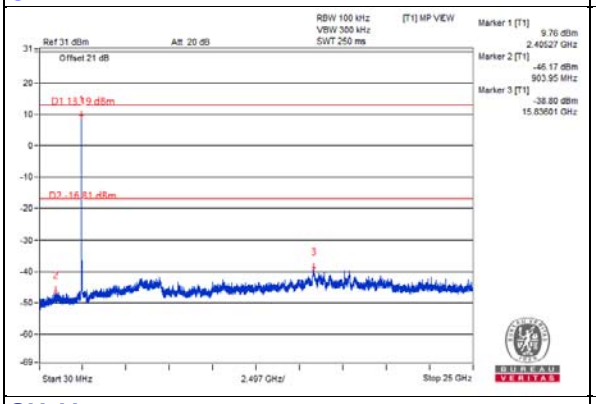


CH 11 Band edge

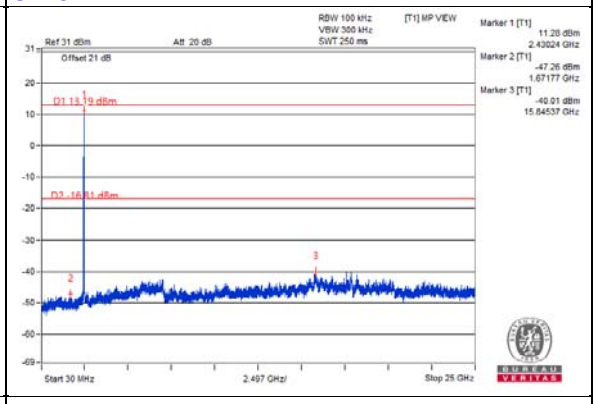


Chain 3

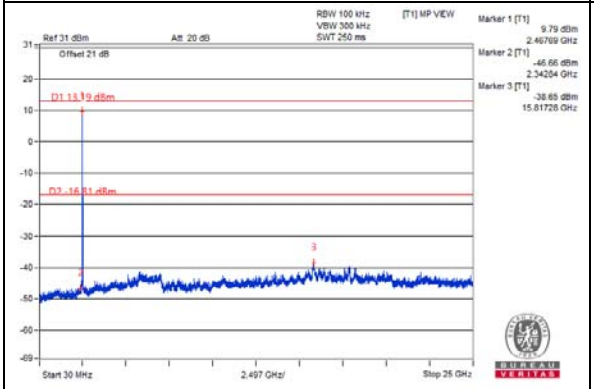
CH 1



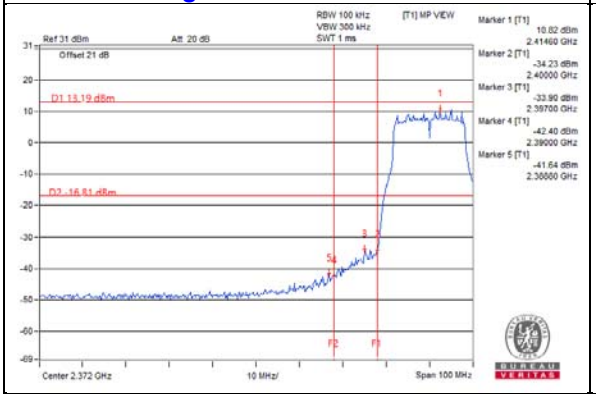
CH 6



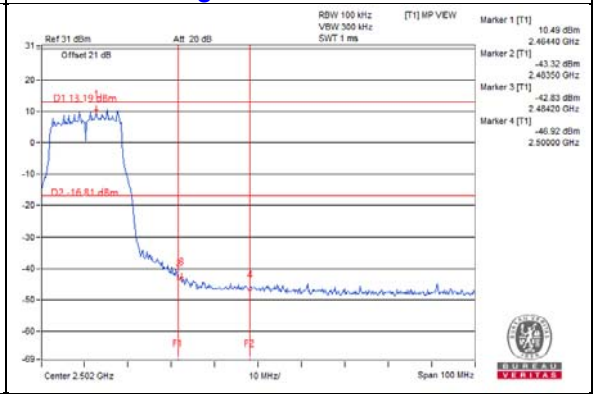
CH 11



CH 1 Band edge

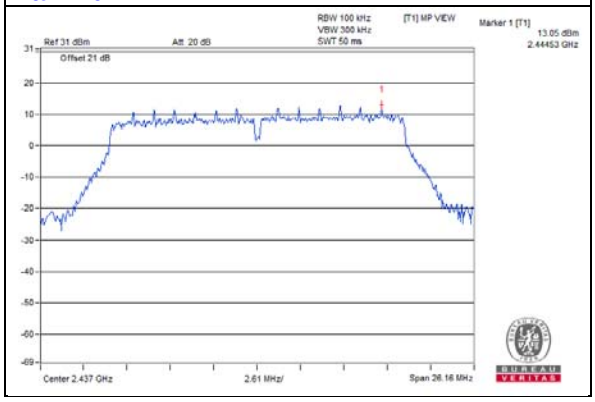


CH 11 Band edge



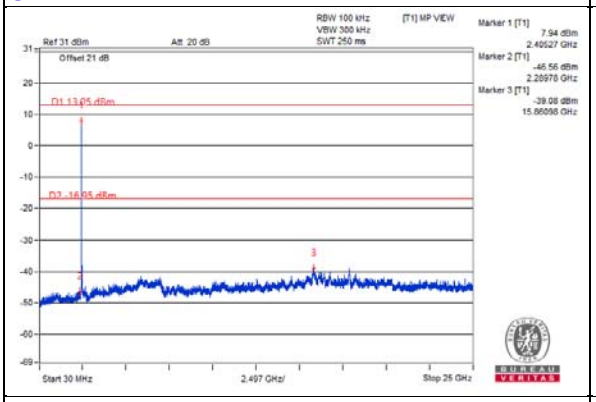
802.11ax (HE20)

Maximum REF

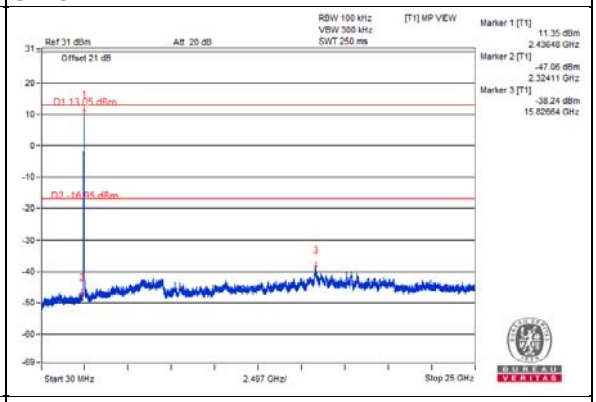


Chain 0

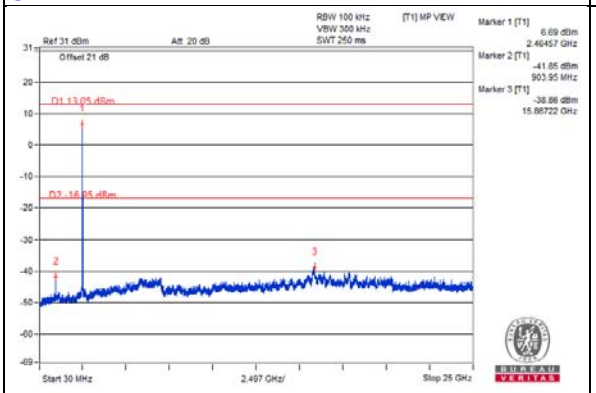
CH 1



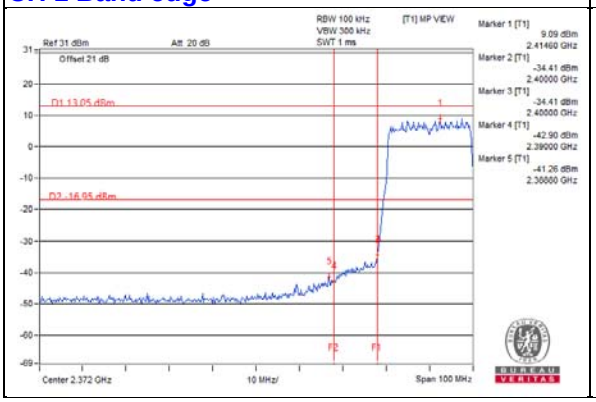
CH 6



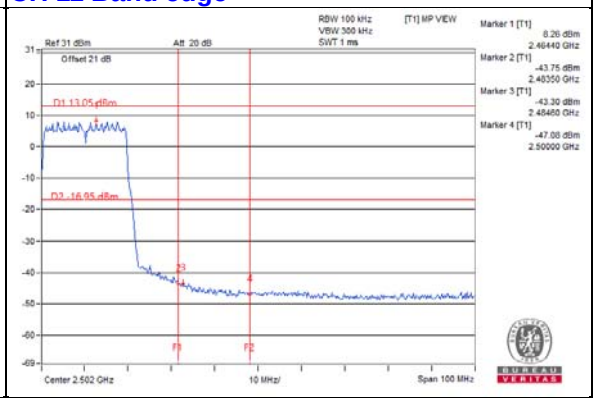
CH 11



CH 1 Band edge

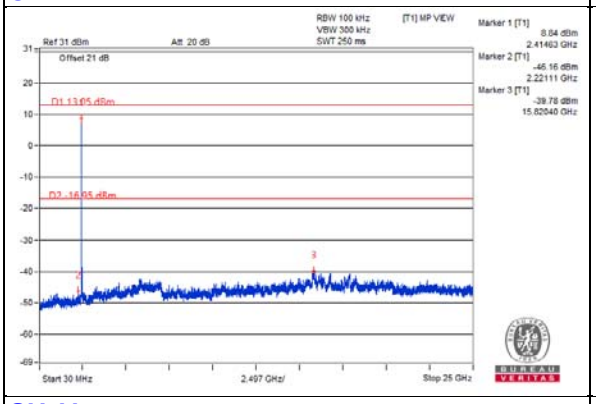


CH 11 Band edge

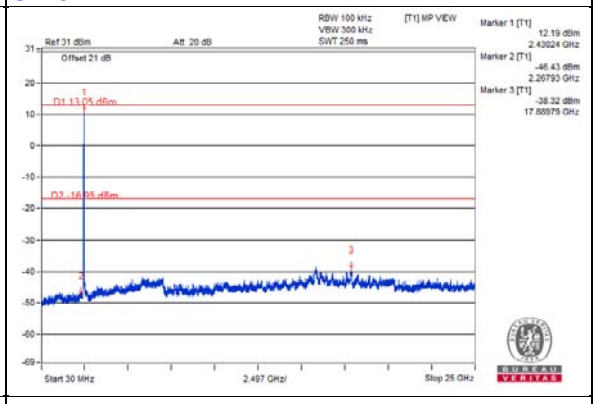


Chain 1

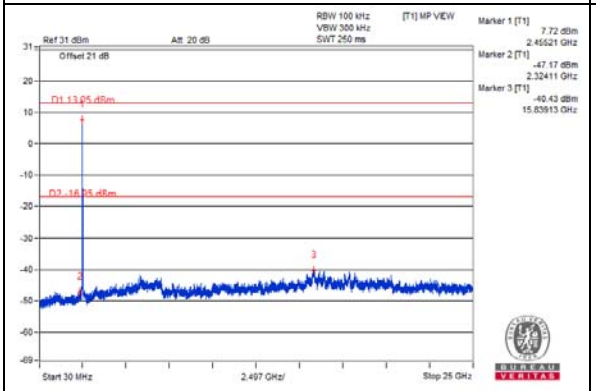
CH 1



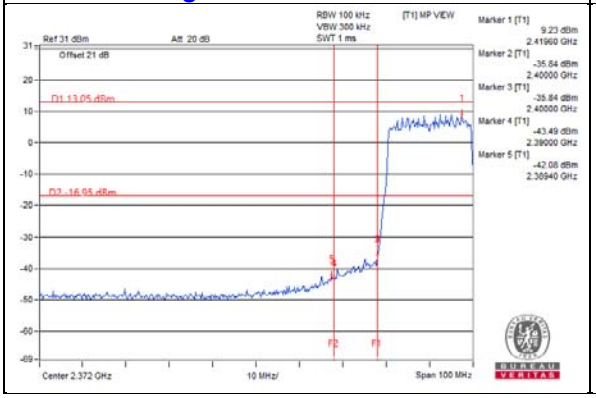
CH 6



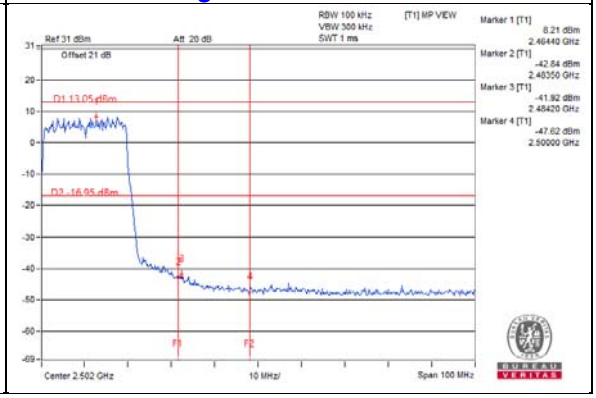
CH 11



CH 1 Band edge

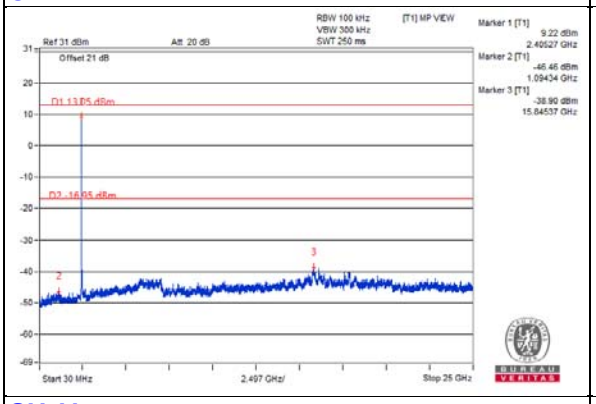


CH 11 Band edge

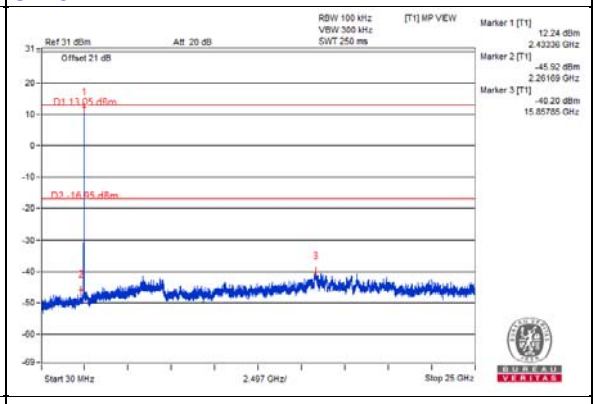


Chain 2

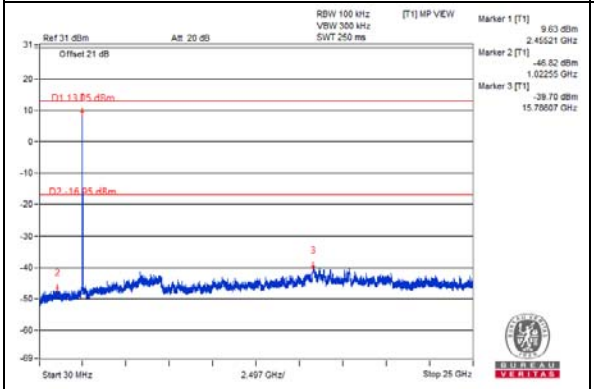
CH 1



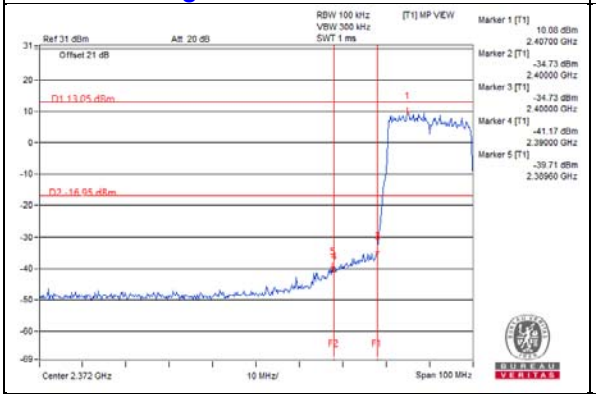
CH 6



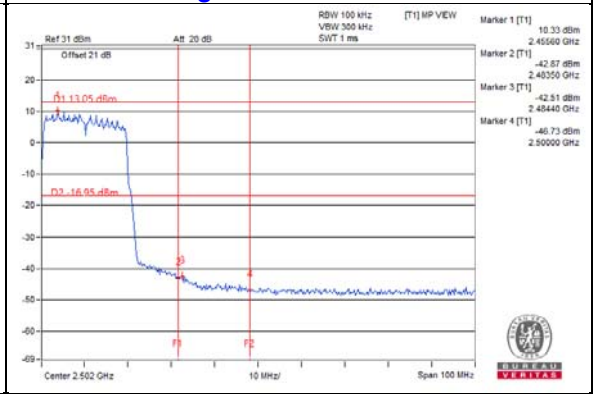
CH 11



CH 1 Band edge

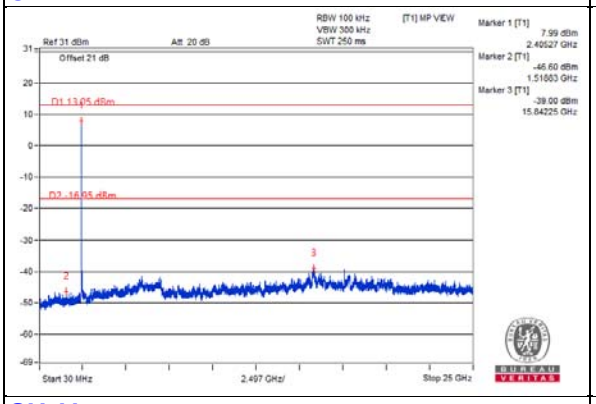


CH 11 Band edge

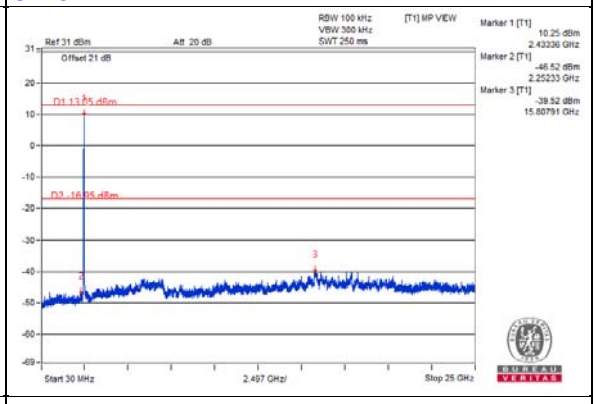


Chain 3

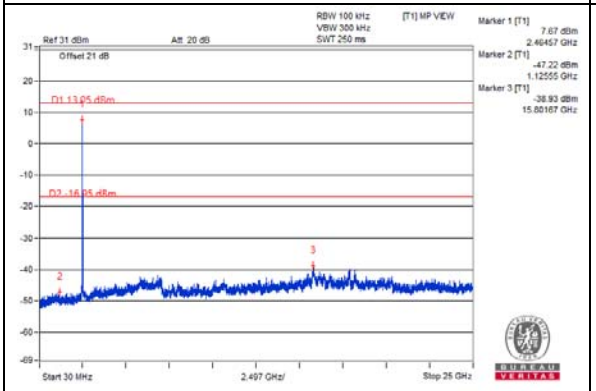
CH 1



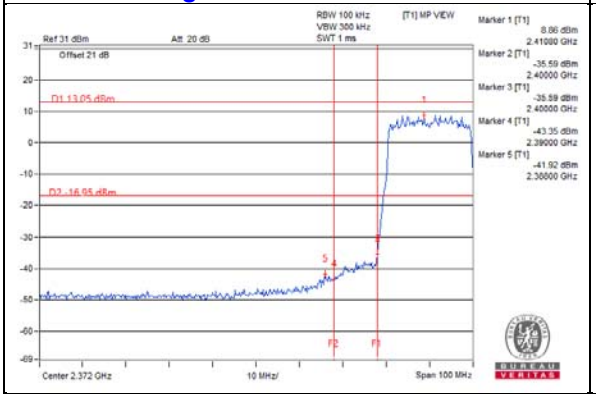
CH 6



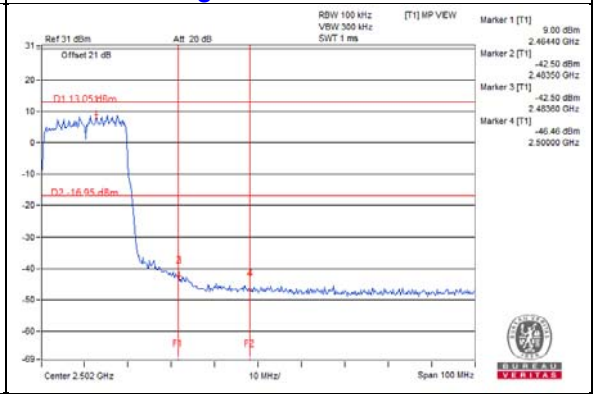
CH 11



CH 1 Band edge

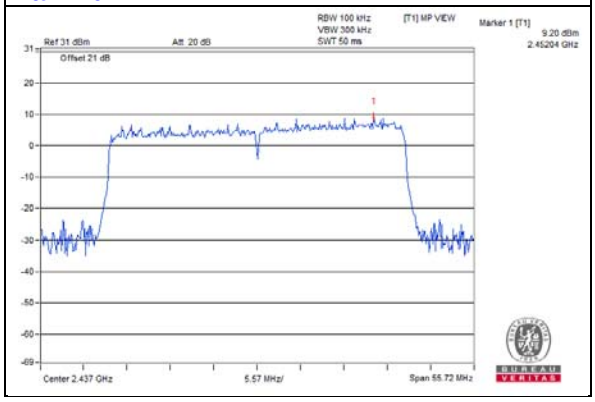


CH 11 Band edge



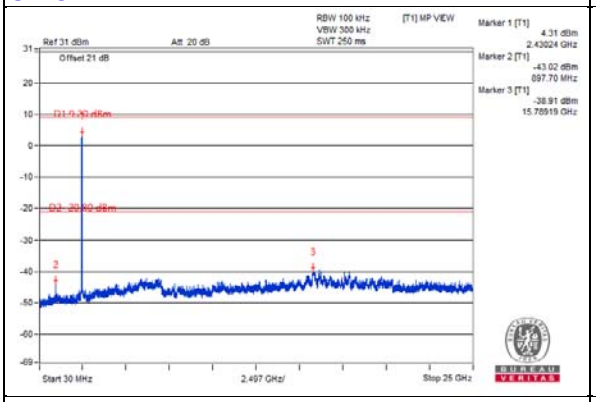
802.11ax (HE40)

Maximum REF

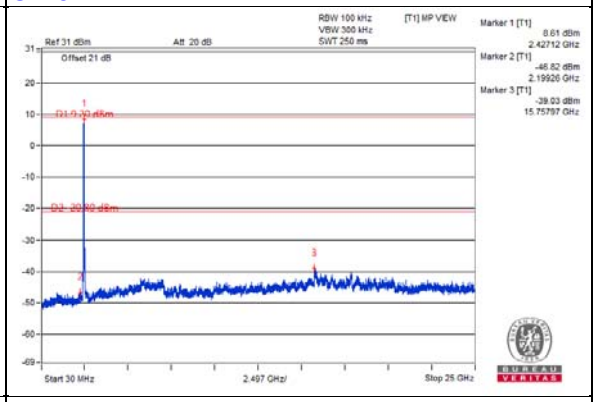


Chain 0

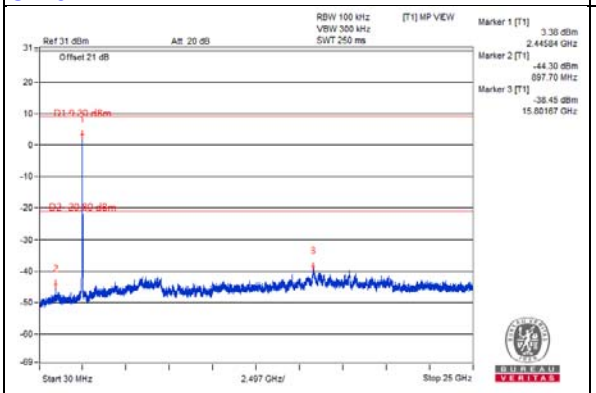
CH 3



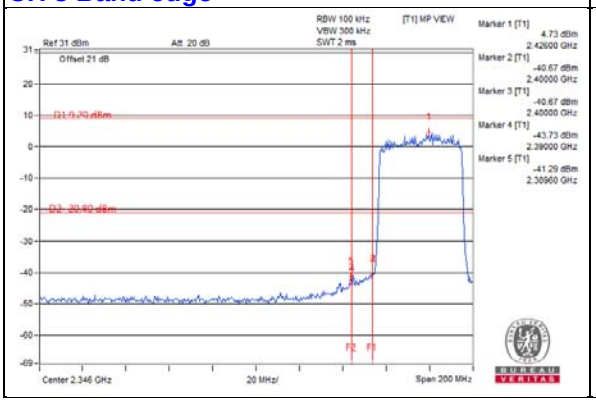
CH 6



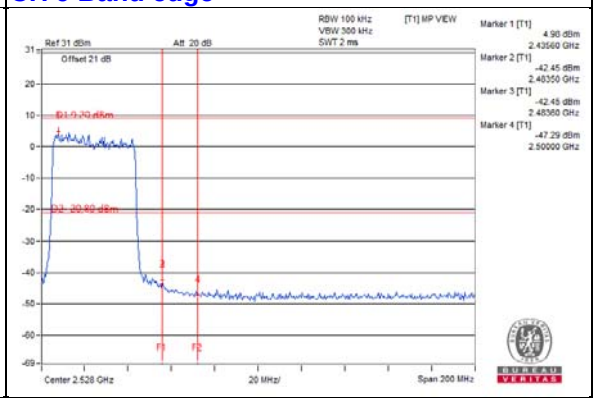
CH 9



CH 3 Band edge

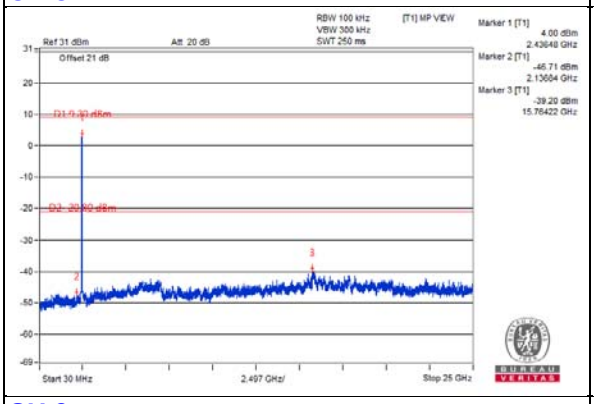


CH 9 Band edge

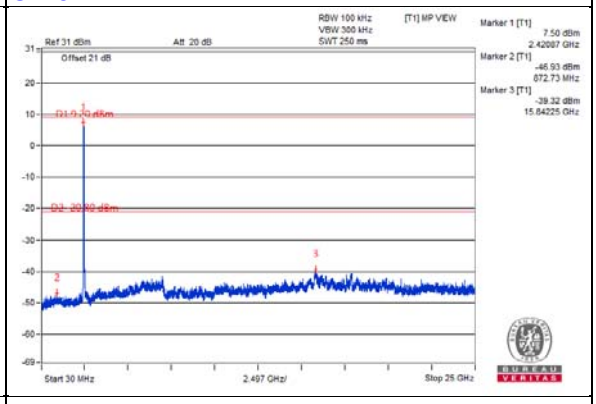


Chain 1

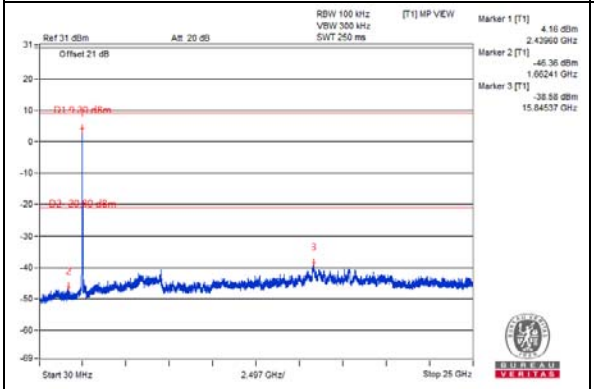
CH 3



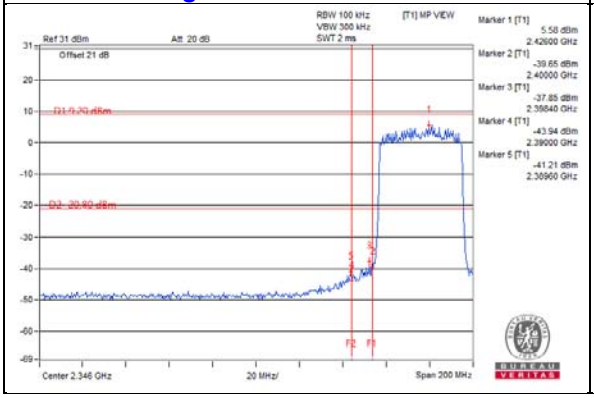
CH 6



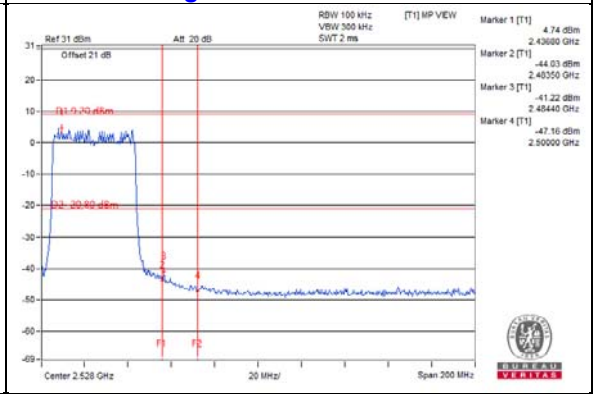
CH 9



CH 3 Band edge

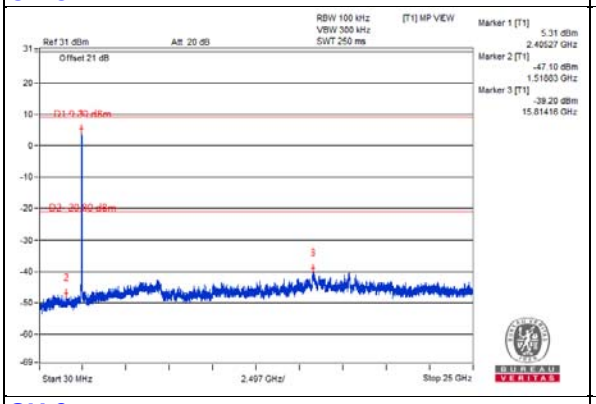


CH 9 Band edge

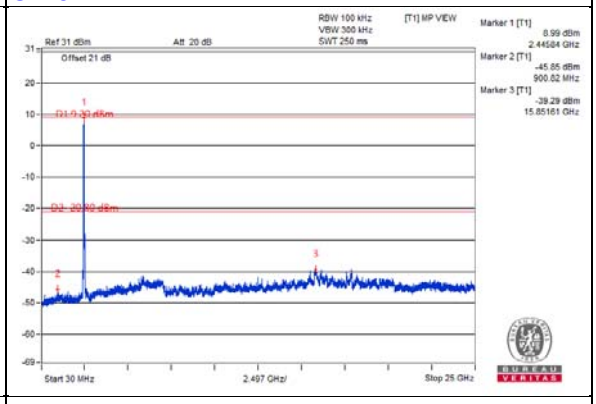


Chain 2

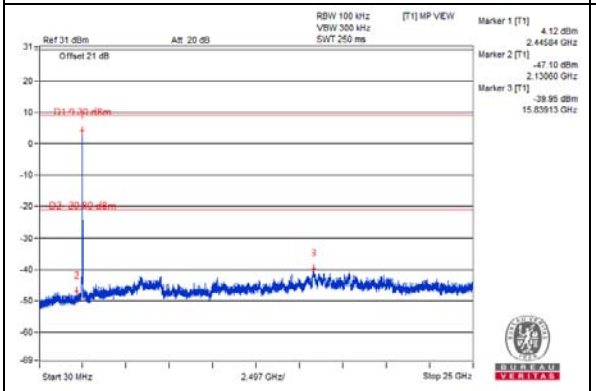
CH 3



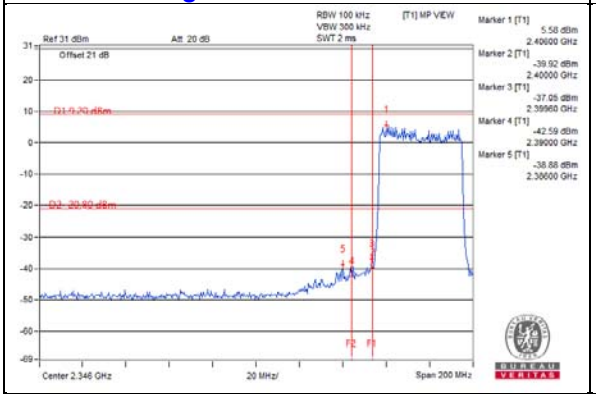
CH 6



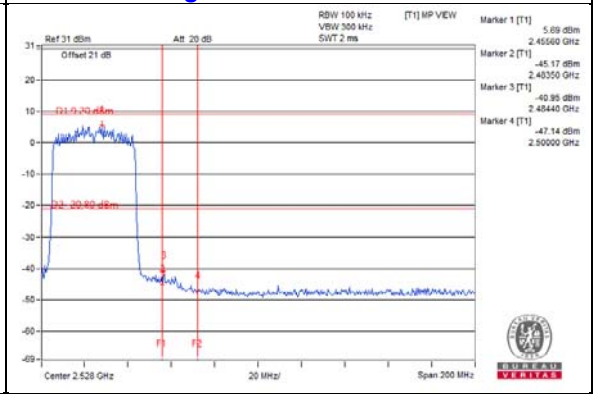
CH 9



CH 3 Band edge

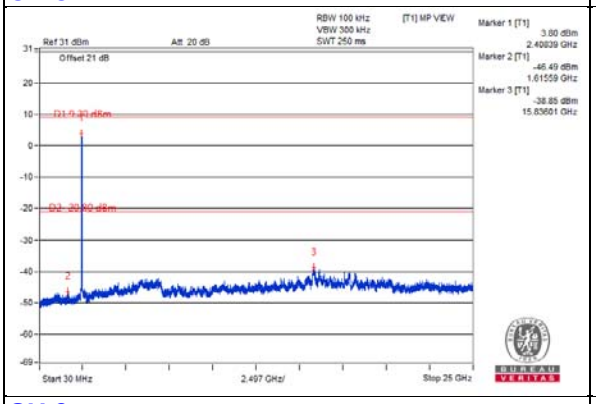


CH 9 Band edge

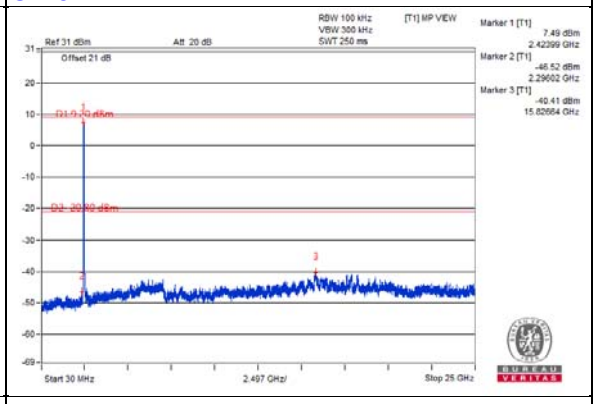


Chain 3

CH 3



CH 6



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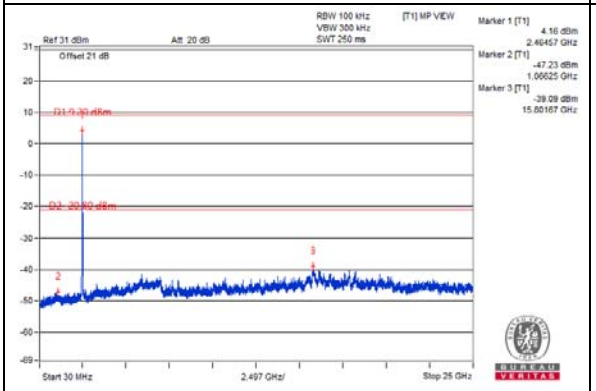
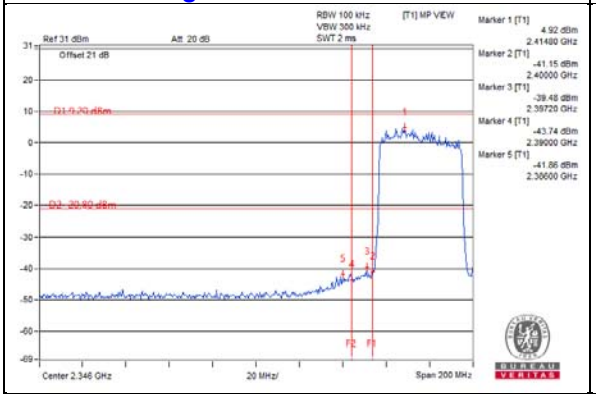


CH 3 Band edge



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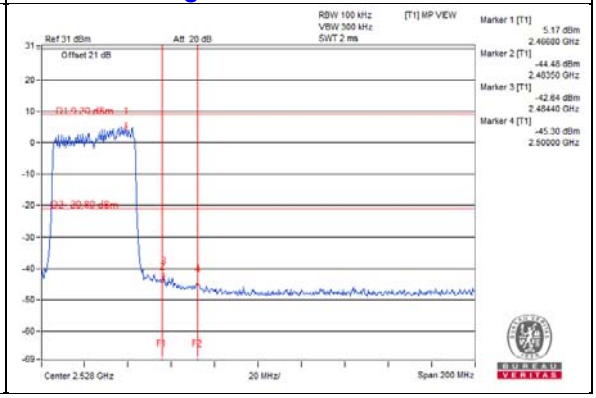

5 Pictures of Test Arrangements

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:

Lin Kou 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.

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