

FCC Test Report

Report No.: RF191219E11

FCC ID: PY320100477

Test Model: CBR750

Received Date: Dec. 20, 2019

Test Date: Jan. 15 to 26, 2020

Issued Date: Feb. 10, 2020

Applicant: NETGEAR, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty.....	6
2.2 Modification Record.....	6
3 General Information	7
3.1 General Description of EUT.....	7
3.2 Description of Test Modes.....	9
3.2.1 Test Mode Applicability and Tested Channel Detail.....	10
3.3 Duty Cycle of Test Signal.....	12
3.4 Description of Support Units.....	13
3.4.1 Configuration of System under Test.....	14
3.5 General Description of Applied Standards and References.....	15
4 Test Types and Results	16
4.1 Radiated Emission and Bandedge Measurement.....	16
4.1.1 Limits of Radiated Emission and Bandedge Measurement.....	16
4.1.2 Test Instruments.....	17
4.1.3 Test Procedures.....	19
4.1.4 Deviation from Test Standard.....	20
4.1.5 Test Setup.....	20
4.1.6 EUT Operating Conditions.....	21
4.1.7 Test Results.....	22
4.2 Conducted Emission Measurement.....	36
4.2.1 Limits of Conducted Emission Measurement.....	36
4.2.2 Test Instruments.....	36
4.2.3 Test Procedures.....	37
4.2.4 Deviation from Test Standard.....	37
4.2.5 Test Setup.....	37
4.2.6 EUT Operating Conditions.....	37
4.2.7 Test Results.....	38
4.3 6dB Bandwidth Measurement.....	40
4.3.1 Limits of 6dB Bandwidth Measurement.....	40
4.3.2 Test Setup.....	40
4.3.3 Test Instruments.....	40
4.3.4 Test Procedure.....	40
4.3.5 Deviation from Test Standard.....	40
4.3.6 EUT Operating Conditions.....	40
4.3.7 Test Result.....	41
4.4 Conducted Output Power Measurement.....	43
4.4.1 Limits of Conducted Output Power Measurement.....	43
4.4.2 Test Setup.....	43
4.4.3 Test Instruments.....	43
4.4.4 Test Procedures.....	43
4.4.5 Deviation from Test Standard.....	43
4.4.6 EUT Operating Conditions.....	43
4.4.7 Test Results.....	44
4.5 Power Spectral Density Measurement.....	46
4.5.1 Limits of Power Spectral Density Measurement.....	46
4.5.2 Test Setup.....	46
4.5.3 Test Instruments.....	46
4.5.4 Test Procedure.....	46
4.5.5 Deviation from Test Standard.....	46
4.5.6 EUT Operating Condition.....	46

4.5.7 Test Results	47
4.6 Conducted Out of Band Emission Measurement.....	49
4.6.1 Limits of Conducted Out of Band Emission Measurement	49
4.6.2 Test Setup.....	49
4.6.3 Test Instruments	49
4.6.4 Test Procedure	49
4.6.5 Deviation from Test Standard	49
4.6.6 EUT Operating Condition	49
4.6.7 Test Results	49
5 Pictures of Test Arrangements.....	58
Appendix – Information of the Testing Laboratories	59

Release Control Record

Issue No.	Description	Date Issued
RF191219E11	Original release.	Feb. 10, 2020

1 Certificate of Conformity

Product: Orbi Cable Modem Router

Brand: NETGEAR

Test Model: CBR750

Sample Status: ENGINEERING SAMPLE

Applicant: NETGEAR, Inc.

Test Date: Jan. 15 to 26, 2020

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10: 2013

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

Prepared by : Phoenix Huang , **Date:** Feb. 10, 2020
Phoenix Huang / Specialist

Approved by : Clark Lin , **Date:** Feb. 10, 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 -16.22 dB at 0.50547 MHz.
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 2386.20 MHz, 2390.00 MHz and 2483.50 MHz.
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	9kHz ~ 30MHz	3.0 dB
	30MHz ~ 1GHz	4.9 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.1 dB
	6GHz ~ 18GHz	4.9 dB
	18GHz ~ 40GHz	5.2 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Orbi Cable Modem Router
Brand	NETGEAR
Test Model	CBR750
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	19Vdc 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 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), 802.11ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 4 802.11ac (VHT80), 802.11ax (HE80): 2
Output Power	CDD Mode: 2.412 ~ 2.462GHz: 985.266 mW 5.18 ~ 5.24GHz: 834.824 mW 5.745 ~ 5.825GHz: 995.5 mW Beamforming Mode: 2.412 ~ 2.462GHz: 624.53 mW 5.18 ~ 5.24GHz: 825.342 mW 5.745 ~ 5.825GHz: 793.985 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ-45 Cable x 1 (Unshielded, 1.8 m)

Note:

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

Radio 1	Radio 2	Radio 3
WLAN (2.4GHz)	WLAN (5GHz LB)	WLAN (5GHz HB)

2. Simultaneously transmission condition.

Condition	Technology		
1	WLAN (2.4GHz)	WLAN (5GHz LB)	WLAN (5GHz HB)

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

3. The EUT must be supplied one power adapter and following different models could be chosen as following table:

No.	Brand	Model No.	P/N	Spec.
1	NETGEAR	2ABS060K 1 NJ	332-11475-01	Input: 100-120Vac, 1.7A, 50/60Hz Output: 19V, 3.16A DC Output cable: Unshielded, 1.8m
2	NETGEAR	AD2003F10	332-11488-01	Input: 100-120Vac, 1.5A, 50/60Hz Output: 19V, 3.16A DC Output cable: Unshielded, 1.8m

Note: From the above adapters, the AC Power Conducted Emission and Radiated Emissions worse case was found in **Adapter No. 2**. Therefore only the test data of the mode was recorded in this report.

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

Frequency range (GHz)	Directional Antenna Gain (dBi)	Antenna Type	Antenna Connector
2.4 ~ 2.4835	5.34	Dipole	i-pex(MHF)
5.15 ~ 5.25	5.52		
5.25 ~ 5.35	5.45		
5.47 ~ 5.725	6.88		
5.725 ~ 5.85	6.97		

Note: More detailed information, please refer to antenna specification.

5. The EUT incorporates a MIMO function:

2.4GHz Band (Radio 1)				
MODULATION MODE	TX & RX CONFIGURATION			
802.11b	2TX		2RX	
802.11g	2TX		2RX	
802.11n (HT20)	2TX		2RX	
802.11n (HT40)	2TX		2RX	
VHT20	2TX		2RX	
VHT40	2TX		2RX	
802.11ax (HE20)	2TX		2RX	
802.11ax (HE40)	2TX		2RX	
MODULATION MODE	5GHz Low Band (Radio 2)		5GHz High Band (Radio 3)	
	TX & RX CONFIGURATION			
802.11a	2TX	2RX	4TX	4RX
802.11n (HT20)	2TX	2RX	4TX	4RX
802.11n (HT40)	2TX	2RX	4TX	4RX
802.11ac (VHT20)	2TX	2RX	4TX	4RX
802.11ac (VHT40)	2TX	2RX	4TX	4RX
802.11ac (VHT80)	2TX	2RX	4TX	4RX
802.11ax (HE20)	2TX	2RX	4TX	4RX
802.11ax (HE40)	2TX	2RX	4TX	4RX
802.11ax (HE80)	2TX	2RX	4TX	4RX

Note:

- All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
- 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.
- 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/ac 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 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, 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, 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 \geq 1G	RE $<$ 1G	PLC	APCM	
-	√	√	√	√	-

Where **RE \geq 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	6	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	6	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 \geq 1G	24deg. C, 74%RH	120Vac, 60Hz	Kevin Ko
RE $<$ 1G	24deg. C, 63%RH	120Vac, 60Hz	Kevin Ko
PLC	25deg. C, 75%RH	120Vac, 60Hz	Kevin Ko
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98%, duty factor shall be considered.

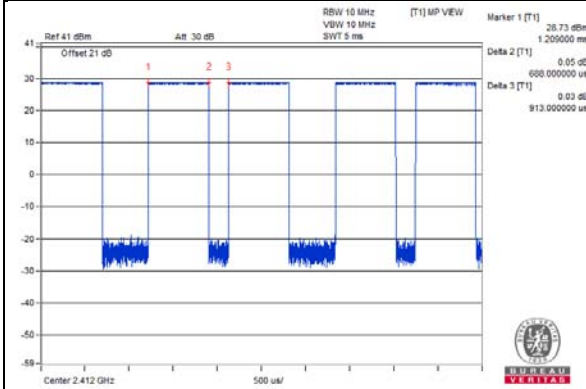
802.11b: Duty cycle = 0.688 ms/0.913 ms = 0.754, Duty factor = 10 * log (1/Duty cycle) = 1.23 dB

802.11g: Duty cycle = 1.975 ms/2.116 ms = 0.933, Duty factor = 10 * log (1/Duty cycle) = 0.3 dB

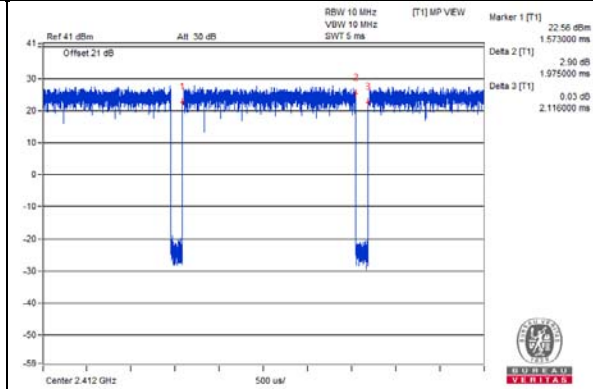
802.11ax (HE20): Duty cycle = 5.451 ms/5.683 ms = 0.959, Duty factor = 10 * log (1/Duty cycle) = 0.18 dB

802.11ax (HE40): Duty cycle = 5.45 ms/5.735 ms = 0.95, Duty factor = 10 * log (1/Duty cycle) = 0.22 dB

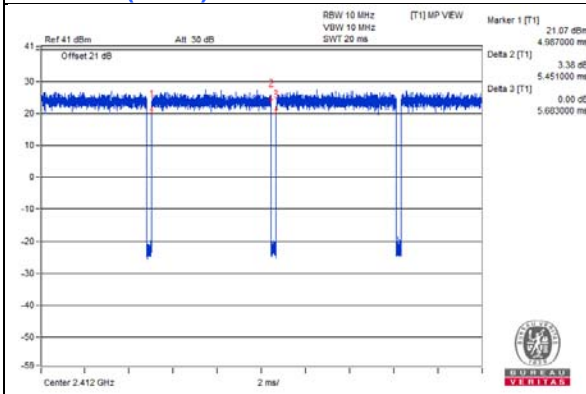
802.11b



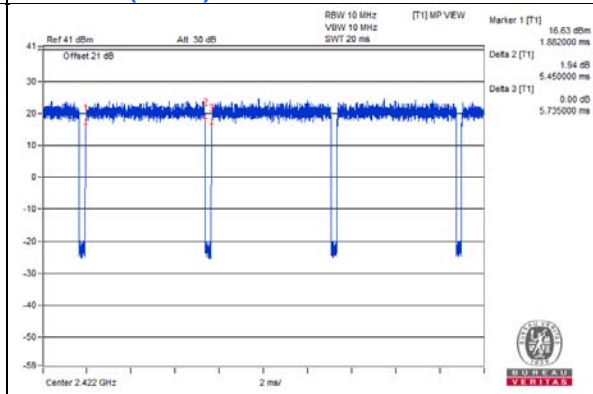
802.11g



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.

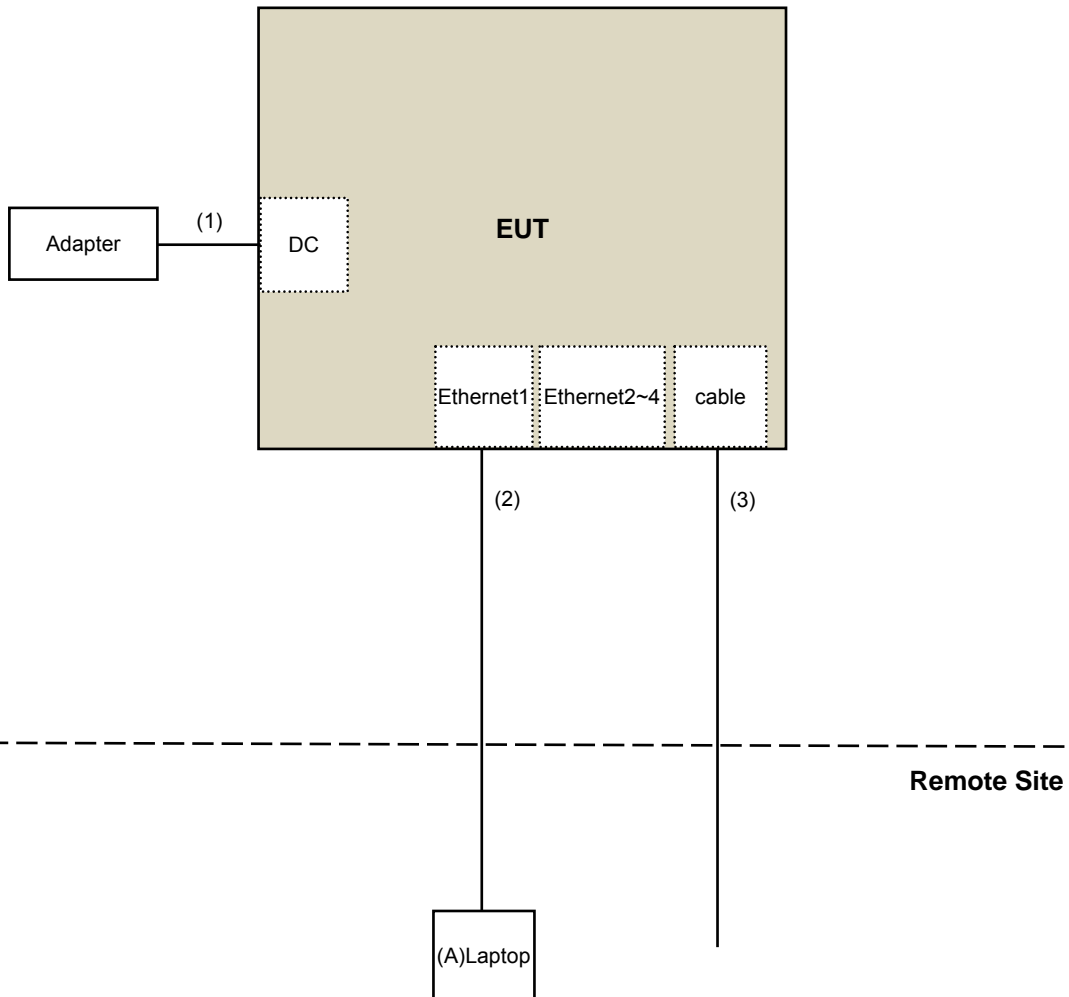
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

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	1.8	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	Coaxial Cable	1	10	Yes	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 Test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 13, 2019	Dec. 12, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 30, 2019	May 29, 2020
Loop Antenna Electro-Metrics	EM-6879	264	Jan. 22, 2019	Jan. 21, 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 Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Oct. 23, 2019	Oct. 22, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 11, 2019	Nov. 10, 2020
RF Cable	8D	966-4-1	Mar. 19, 2019	Mar. 18, 2020
RF Cable	8D	966-4-2	Mar. 19, 2019	Mar. 18, 2020
RF Cable	8D	966-4-3	Mar. 19, 2019	Mar. 18, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Sep. 26, 2019	Sep. 25, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980385	Aug. 15, 2019	Aug. 14, 2020
RF Cable	EMC104-SM-SM-1200	160923	Jan. 15, 2020	Jan. 14, 2021
RF Cable	104 RF cable	131215	Jan. 09, 2020	Jan. 08, 2021
RF Cable	EMC104-SM-SM-6000	180418	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-1200	160925	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. 4.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Jan. 18, 2020

For other test items:

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: Jan. 26, 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:

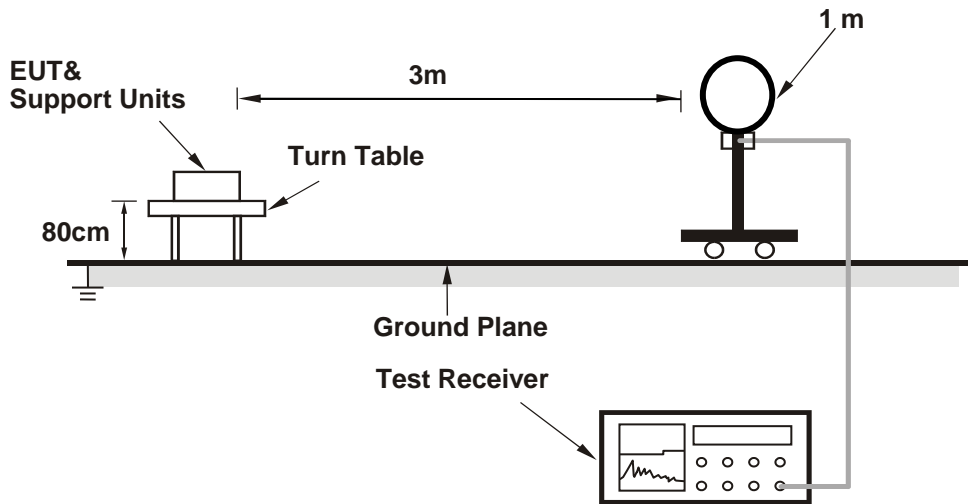
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) 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

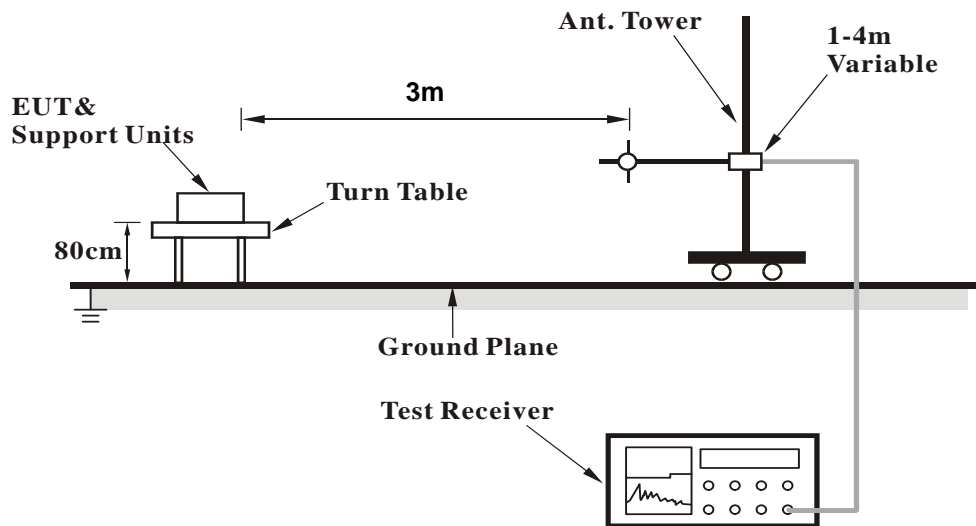
No deviation.

4.1.5 Test Setup

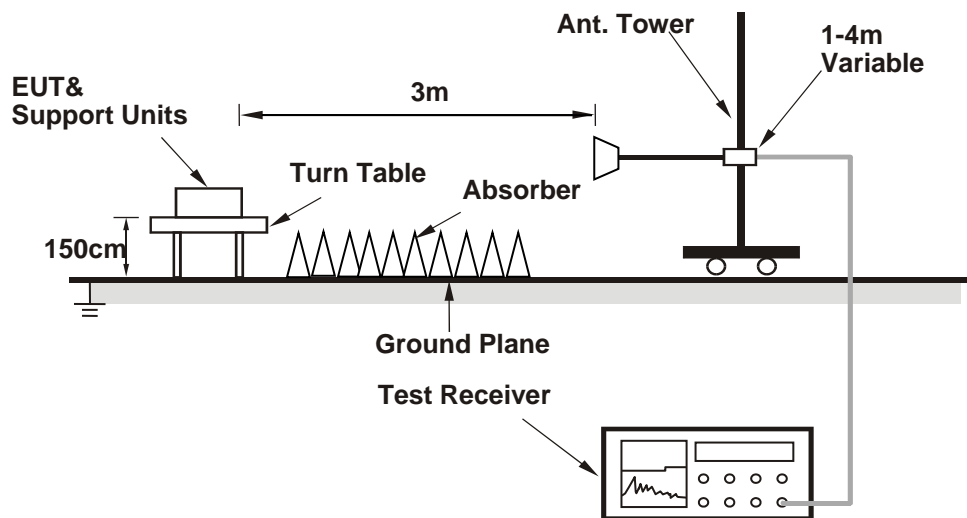
For Radiated emission below 30MHz



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 (QSPR (5.0-00140)) has been activated to set the EUT under transmission condition continuously.

4.1.7 Test Results

CDD Mode:

Above 1GHz Data:

802.11b

CHANNEL	TX Channel 1	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	49.7 PK	74.0	-24.3	2.00 H	54	51.4	-1.7
2	2390.00	43.4 AV	54.0	-10.6	2.00 H	54	45.1	-1.7
3	*2412.00	114.0 PK			2.00 H	54	115.8	-1.8
4	*2412.00	110.5 AV			2.00 H	54	112.3	-1.8
5	4824.00	39.4 PK	74.0	-34.6	1.12 H	35	37.3	2.1
6	4824.00	27.7 AV	54.0	-26.3	1.12 H	35	25.6	2.1

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	60.9 PK	74.0	-13.1	1.98 V	208	62.6	-1.7
2	2390.00	53.6 AV	54.0	-0.4	1.98 V	208	55.3	-1.7
3	*2412.00	123.5 PK			1.98 V	208	125.3	-1.8
4	*2412.00	120.2 AV			1.98 V	208	122.0	-1.8
5	4824.00	39.1 PK	74.0	-34.9	2.31 V	320	37.0	2.1
6	4824.00	28.4 AV	54.0	-25.6	2.31 V	320	26.3	2.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	48.3 PK	74.0	-25.7	1.35 H	293	50.0	-1.7
2	2390.00	37.6 AV	54.0	-16.4	1.35 H	293	39.3	-1.7
3	*2437.00	113.2 PK			1.35 H	293	115.0	-1.8
4	*2437.00	111.2 AV			1.35 H	293	113.0	-1.8
5	2483.50	49.2 PK	74.0	-24.8	1.35 H	293	50.9	-1.7
6	2483.50	36.0 AV	54.0	-18.0	1.35 H	293	37.7	-1.7
7	4874.00	38.5 PK	74.0	-35.5	1.17 H	237	36.3	2.2
8	4874.00	28.2 AV	54.0	-25.8	1.17 H	237	26.0	2.2
9	7311.00	45.6 PK	74.0	-28.4	1.34 H	248	36.6	9.0
10	7311.00	31.4 AV	54.0	-22.6	1.34 H	248	22.4	9.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.8 PK	74.0	-14.2	1.99 V	24	61.5	-1.7
2	2390.00	47.6 AV	54.0	-6.4	1.99 V	24	49.3	-1.7
3	*2437.00	123.0 PK			1.99 V	24	124.8	-1.8
4	*2437.00	120.8 AV			1.99 V	24	122.6	-1.8
5	2483.50	59.9 PK	74.0	-14.1	1.99 V	24	61.6	-1.7
6	2483.50	47.7 AV	54.0	-6.3	1.99 V	24	49.4	-1.7
7	4874.00	38.5 PK	74.0	-35.5	1.35 V	305	36.3	2.2
8	4874.00	27.7 AV	54.0	-26.3	1.35 V	305	25.5	2.2
9	7311.00	44.7 PK	74.0	-29.3	2.17 V	316	35.7	9.0
10	7311.00	31.4 AV	54.0	-22.6	2.17 V	316	22.4	9.0

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.
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	110.4 PK			2.45 H	327	112.2	-1.8
2	*2462.00	109.1 AV			2.45 H	327	110.9	-1.8
3	2483.50	50.3 PK	74.0	-23.7	2.45 H	327	52.0	-1.7
4	2483.50	44.4 AV	54.0	-9.6	2.45 H	327	46.1	-1.7
5	4924.00	38.3 PK	74.0	-35.7	1.84 H	76	36.0	2.3
6	4924.00	27.8 AV	54.0	-26.2	1.84 H	76	25.5	2.3
7	7386.00	44.3 PK	74.0	-29.7	2.44 H	116	35.0	9.3
8	7386.00	32.2 AV	54.0	-21.8	2.44 H	116	22.9	9.3

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	*2462.00	119.9 PK			2.14 V	108	121.7	-1.8
2	*2462.00	118.5 AV			2.14 V	108	120.3	-1.8
3	2483.50	60.0 PK	74.0	-14.0	2.14 V	108	61.7	-1.7
4	2483.50	53.5 AV	54.0	-0.5	2.14 V	108	55.2	-1.7
5	4924.00	39.5 PK	74.0	-34.5	1.59 V	298	37.2	2.3
6	4924.00	28.2 AV	54.0	-25.8	1.59 V	298	25.9	2.3
7	7386.00	44.1 PK	74.0	-29.9	1.14 V	354	34.8	9.3
8	7386.00	31.6 AV	54.0	-22.4	1.14 V	354	22.3	9.3

REMARKS:

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

802.11g

CHANNEL	TX Channel 1	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	56.2 PK	74.0	-17.8	1.33 H	152	57.9	-1.7
2	2390.00	43.2 AV	54.0	-10.8	1.33 H	152	44.9	-1.7
3	*2412.00	106.7 PK			1.33 H	152	108.5	-1.8
4	*2412.00	98.7 AV			1.33 H	152	100.5	-1.8
5	4824.00	39.2 PK	74.0	-34.8	2.09 H	12	37.1	2.1
6	4824.00	27.8 AV	54.0	-26.2	2.09 H	12	25.7	2.1

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	67.9 PK	74.0	-6.1	1.98 V	211	69.6	-1.7
2	2390.00	53.7 AV	54.0	-0.3	1.98 V	211	55.4	-1.7
3	*2412.00	118.3 PK			1.98 V	211	120.1	-1.8
4	*2412.00	109.7 AV			1.98 V	211	111.5	-1.8
5	4824.00	39.2 PK	74.0	-34.8	1.37 V	131	37.1	2.1
6	4824.00	27.8 AV	54.0	-26.2	1.37 V	131	25.7	2.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	54.1 PK	74.0	-19.9	2.66 H	304	55.8	-1.7
2	2390.00	43.1 AV	54.0	-10.9	2.66 H	304	44.8	-1.7
3	*2437.00	111.5 PK			2.66 H	304	113.3	-1.8
4	*2437.00	102.6 AV			2.66 H	304	104.4	-1.8
5	2483.50	53.3 PK	74.0	-20.7	2.66 H	304	55.0	-1.7
6	2483.50	41.2 AV	54.0	-12.8	2.66 H	304	42.9	-1.7
7	4874.00	39.3 PK	74.0	-34.7	2.42 H	180	37.1	2.2
8	4874.00	28.0 AV	54.0	-26.0	2.42 H	180	25.8	2.2
9	7311.00	45.1 PK	74.0	-28.9	1.85 H	44	36.1	9.0
10	7311.00	32.4 AV	54.0	-21.6	1.85 H	44	23.4	9.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.9 PK	74.0	-9.1	2.04 V	180	66.6	-1.7
2	2390.00	53.7 AV	54.0	-0.3	2.04 V	180	55.4	-1.7
3	*2437.00	121.8 PK			2.04 V	180	123.6	-1.8
4	*2437.00	111.9 AV			2.04 V	180	113.7	-1.8
5	2483.50	65.1 PK	74.0	-8.9	2.04 V	180	66.8	-1.7
6	2483.50	51.4 AV	54.0	-2.6	2.04 V	180	53.1	-1.7
7	4874.00	39.2 PK	74.0	-34.8	1.75 V	129	37.0	2.2
8	4874.00	28.1 AV	54.0	-25.9	1.75 V	129	25.9	2.2
9	7311.00	44.2 PK	74.0	-29.8	1.16 V	160	35.2	9.0
10	7311.00	32.5 AV	54.0	-21.5	1.16 V	160	23.5	9.0

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.
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	107.7 PK			1.80 H	22	109.5	-1.8
2	*2462.00	97.0 AV			1.80 H	22	98.8	-1.8
3	2483.50	56.4 PK	74.0	-17.6	1.80 H	22	58.1	-1.7
4	2483.50	41.8 AV	54.0	-12.2	1.80 H	22	43.5	-1.7
5	4924.00	38.3 PK	74.0	-35.7	1.75 H	161	36.0	2.3
6	4924.00	28.1 AV	54.0	-25.9	1.75 H	161	25.8	2.3
7	7386.00	44.8 PK	74.0	-29.2	1.86 H	264	35.5	9.3
8	7386.00	32.0 AV	54.0	-22.0	1.86 H	264	22.7	9.3

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	*2462.00	116.9 PK			2.19 V	263	118.7	-1.8
2	*2462.00	107.9 AV			2.19 V	263	109.7	-1.8
3	2483.50	67.8 PK	74.0	-6.2	2.19 V	263	69.5	-1.7
4	2483.50	53.7 AV	54.0	-0.3	2.19 V	263	55.4	-1.7
5	4924.00	39.6 PK	74.0	-34.4	1.90 V	103	37.3	2.3
6	4924.00	28.5 AV	54.0	-25.5	1.90 V	103	26.2	2.3
7	7386.00	44.3 PK	74.0	-29.7	1.53 V	319	35.0	9.3
8	7386.00	32.4 AV	54.0	-21.6	1.53 V	319	23.1	9.3

REMARKS:

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

802.11ax (HE20)

CHANNEL	TX Channel 1	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	55.8 PK	74.0	-18.2	2.26 H	158	57.5	-1.7
2	2390.00	44.3 AV	54.0	-9.7	2.26 H	158	46.0	-1.7
3	*2412.00	109.8 PK			2.26 H	158	111.6	-1.8
4	*2412.00	97.3 AV			2.26 H	158	99.1	-1.8
5	4824.00	39.4 PK	74.0	-34.6	2.10 H	356	37.3	2.1
6	4824.00	27.5 AV	54.0	-26.5	2.10 H	356	25.4	2.1

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	67.7 PK	74.0	-6.3	2.03 V	196	69.4	-1.7
2	2390.00	53.9 AV	54.0	-0.1	2.03 V	196	55.6	-1.7
3	*2412.00	120.7 PK			2.03 V	196	122.5	-1.8
4	*2412.00	107.9 AV			2.03 V	196	109.7	-1.8
5	4824.00	39.7 PK	74.0	-34.3	1.81 V	328	37.6	2.1
6	4824.00	28.1 AV	54.0	-25.9	1.81 V	328	26.0	2.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	57.7 PK	74.0	-16.3	1.27 H	221	59.4	-1.7
2	2390.00	43.0 AV	54.0	-11.0	1.27 H	221	44.7	-1.7
3	*2437.00	111.1 PK			1.27 H	221	112.9	-1.8
4	*2437.00	101.5 AV			1.27 H	221	103.3	-1.8
5	2483.50	53.2 PK	74.0	-20.8	1.27 H	221	54.9	-1.7
6	2483.50	37.8 AV	54.0	-16.2	1.27 H	221	39.5	-1.7
7	4874.00	38.6 PK	74.0	-35.4	2.49 H	78	36.4	2.2
8	4874.00	28.2 AV	54.0	-25.8	2.49 H	78	26.0	2.2
9	7311.00	45.1 PK	74.0	-28.9	1.30 H	187	36.1	9.0
10	7311.00	31.6 AV	54.0	-22.4	1.30 H	187	22.6	9.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.9 PK	74.0	-6.1	2.51 V	218	69.6	-1.7
2	2390.00	53.7 AV	54.0	-0.3	2.51 V	218	55.4	-1.7
3	*2437.00	121.9 PK			2.51 V	218	123.7	-1.8
4	*2437.00	110.8 AV			2.51 V	218	112.6	-1.8
5	2483.50	63.0 PK	74.0	-11.0	2.51 V	218	64.7	-1.7
6	2483.50	49.2 AV	54.0	-4.8	2.51 V	218	50.9	-1.7
7	4874.00	38.8 PK	74.0	-35.2	2.42 V	333	36.6	2.2
8	4874.00	27.8 AV	54.0	-26.2	2.42 V	333	25.6	2.2
9	7311.00	44.7 PK	74.0	-29.3	1.04 V	315	35.7	9.0
10	7311.00	31.7 AV	54.0	-22.3	1.04 V	315	22.7	9.0

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.
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	105.9 PK			2.59 H	159	107.7	-1.8
2	*2462.00	96.0 AV			2.59 H	159	97.8	-1.8
3	2483.50	56.1 PK	74.0	-17.9	2.59 H	159	57.8	-1.7
4	2483.50	44.1 AV	54.0	-9.9	2.59 H	159	45.8	-1.7
5	4924.00	39.6 PK	74.0	-34.4	1.64 H	250	37.3	2.3
6	4924.00	27.9 AV	54.0	-26.1	1.64 H	250	25.6	2.3
7	7386.00	45.8 PK	74.0	-28.2	2.40 H	201	36.5	9.3
8	7386.00	31.7 AV	54.0	-22.3	2.40 H	201	22.4	9.3

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	*2462.00	117.8 PK			2.44 V	2	119.6	-1.8
2	*2462.00	106.4 AV			2.44 V	2	108.2	-1.8
3	2483.50	67.2 PK	74.0	-6.8	2.44 V	2	68.9	-1.7
4	2483.50	53.9 AV	54.0	-0.1	2.44 V	2	55.6	-1.7
5	4924.00	38.8 PK	74.0	-35.2	2.26 V	20	36.5	2.3
6	4924.00	27.5 AV	54.0	-26.5	2.26 V	20	25.2	2.3
7	7386.00	45.2 PK	74.0	-28.8	1.93 V	61	35.9	9.3
8	7386.00	32.5 AV	54.0	-21.5	1.93 V	61	23.2	9.3

REMARKS:

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

802.11ax (HE40)

CHANNEL	TX Channel 3	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	2386.20	56.4 PK	74.0	-17.6	1.24 H	15	58.1	-1.7
2	2386.20	44.3 AV	54.0	-9.7	1.24 H	15	46.0	-1.7
3	2390.00	45.8 PK	74.0	-28.2	1.24 H	15	47.5	-1.7
4	2390.00	38.2 AV	54.0	-15.8	1.24 H	15	39.9	-1.7
5	*2422.00	105.3 PK			1.24 H	15	107.1	-1.8
6	*2422.00	90.9 AV			1.24 H	15	92.7	-1.8
7	4844.00	39.4 PK	74.0	-34.6	1.99 H	191	37.3	2.1
8	4844.00	27.8 AV	54.0	-26.2	1.99 H	191	25.7	2.1
9	7266.00	45.2 PK	74.0	-28.8	1.63 H	58	36.4	8.8
10	7266.00	32.6 AV	54.0	-21.4	1.63 H	58	23.8	8.8

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	2386.20	67.2 PK	74.0	-6.8	1.97 V	3	68.9	-1.7
2	2386.20	53.9 AV	54.0	-0.1	1.97 V	3	55.6	-1.7
3	2390.00	56.4 PK	74.0	-17.6	1.97 V	3	58.1	-1.7
4	2390.00	47.5 AV	54.0	-6.5	1.97 V	3	49.2	-1.7
5	*2422.00	115.2 PK			1.97 V	3	117.0	-1.8
6	*2422.00	102.8 AV			1.97 V	3	104.6	-1.8
7	4844.00	38.8 PK	74.0	-35.2	2.54 V	142	36.7	2.1
8	4844.00	27.9 AV	54.0	-26.1	2.54 V	142	25.8	2.1
9	7266.00	45.5 PK	74.0	-28.5	1.60 V	102	36.7	8.8
10	7266.00	32.4 AV	54.0	-21.6	1.60 V	102	23.6	8.8

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- Margin value = Emission Level – Limit value
- The other emission levels were very low against the limit.
- " * ": 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	56.7 PK	74.0	-17.3	1.53 H	304	58.4	-1.7
2	2390.00	44.5 AV	54.0	-9.5	1.53 H	304	46.2	-1.7
3	*2437.00	106.7 PK			1.53 H	304	108.5	-1.8
4	*2437.00	94.2 AV			1.53 H	304	96.0	-1.8
5	2483.50	57.2 PK	74.0	-16.8	1.53 H	304	58.9	-1.7
6	2483.50	44.3 AV	54.0	-9.7	1.53 H	304	46.0	-1.7
7	4874.00	39.7 PK	74.0	-34.3	1.48 H	337	37.5	2.2
8	4874.00	27.1 AV	54.0	-26.9	1.48 H	337	24.9	2.2
9	7311.00	46.2 PK	74.0	-27.8	1.79 H	160	37.2	9.0
10	7311.00	33.1 AV	54.0	-20.9	1.79 H	160	24.1	9.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.9 PK	74.0	-7.1	2.29 V	17	68.6	-1.7
2	2390.00	53.5 AV	54.0	-0.5	2.29 V	17	55.2	-1.7
3	*2437.00	118.9 PK			2.29 V	17	120.7	-1.8
4	*2437.00	106.2 AV			2.29 V	17	108.0	-1.8
5	2483.50	65.7 PK	74.0	-8.3	2.29 V	17	67.4	-1.7
6	2483.50	50.4 AV	54.0	-3.6	2.29 V	17	52.1	-1.7
7	4874.00	39.6 PK	74.0	-34.4	1.57 V	159	37.4	2.2
8	4874.00	28.2 AV	54.0	-25.8	1.57 V	159	26.0	2.2
9	7311.00	45.8 PK	74.0	-28.2	2.15 V	240	36.8	9.0
10	7311.00	32.9 AV	54.0	-21.1	2.15 V	240	23.9	9.0

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.
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	105.3 PK			1.46 H	13	107.1	-1.8
2	*2452.00	92.5 AV			1.46 H	13	94.3	-1.8
3	2483.50	56.1 PK	74.0	-17.9	1.46 H	13	57.8	-1.7
4	2483.50	43.8 AV	54.0	-10.2	1.46 H	13	45.5	-1.7
5	4904.00	39.7 PK	74.0	-34.3	2.55 H	234	37.5	2.2
6	4904.00	28.5 AV	54.0	-25.5	2.55 H	234	26.3	2.2
7	7356.00	44.8 PK	74.0	-29.2	2.32 H	19	35.7	9.1
8	7356.00	32.2 AV	54.0	-21.8	2.32 H	19	23.1	9.1

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	*2452.00	115.3 PK			2.11 V	325	117.1	-1.8
2	*2452.00	102.7 AV			2.11 V	325	104.5	-1.8
3	2483.50	66.5 PK	74.0	-7.5	2.11 V	325	68.2	-1.7
4	2483.50	53.9 AV	54.0	-0.1	2.11 V	325	55.6	-1.7
5	4904.00	38.3 PK	74.0	-35.7	2.00 V	296	36.1	2.2
6	4904.00	28.4 AV	54.0	-25.6	2.00 V	296	26.2	2.2
7	7356.00	45.0 PK	74.0	-29.0	1.32 V	88	35.9	9.1
8	7356.00	31.9 AV	54.0	-22.1	1.32 V	88	22.8	9.1

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.

Below 1GHz Data:

802.11b

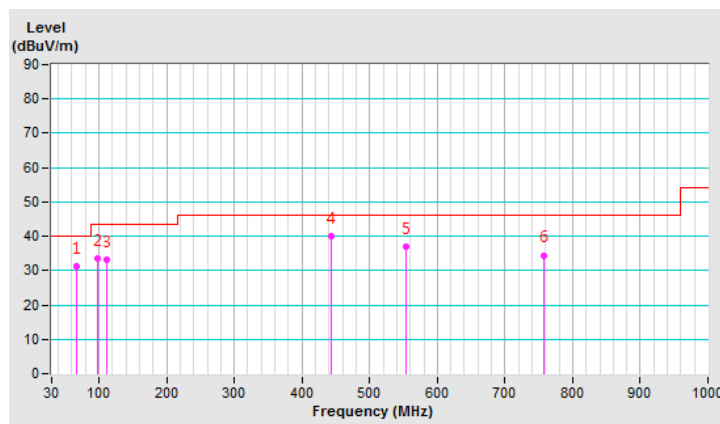
CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	66.62	31.3 QP	40.0	-8.7	1.00 H	22	40.5	-9.2
2	98.46	33.6 QP	43.5	-9.9	2.00 H	287	46.0	-12.4
3	110.80	33.3 QP	43.5	-10.2	1.50 H	77	43.9	-10.6
4	443.41	40.0 QP	46.0	-6.0	2.00 H	158	42.8	-2.8
5	552.98	36.9 QP	46.0	-9.1	1.50 H	86	37.4	-0.5
6	756.80	34.5 QP	46.0	-11.5	1.50 H	81	30.7	3.8

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. 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.

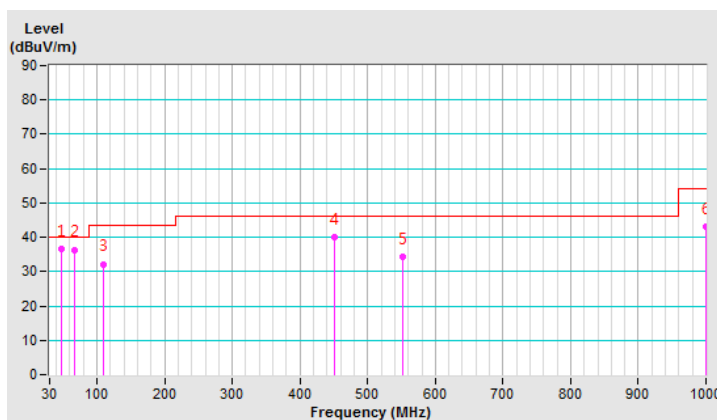


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	47.75	36.5 QP	40.0	-3.5	1.00 V	360	44.3	-7.8
2	66.64	36.4 QP	40.0	-3.6	1.00 V	133	45.6	-9.2
3	108.81	32.2 QP	43.5	-11.3	1.00 V	35	42.9	-10.7
4	451.80	39.9 QP	46.0	-6.1	1.00 V	276	42.5	-2.6
5	552.27	34.1 QP	46.0	-11.9	1.00 V	13	34.7	-0.6
6	1000.00	43.0 QP	54.0	-11.0	1.00 V	159	35.0	8.0

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.



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: Jan. 15, 2020

4.2.3 Test Procedures

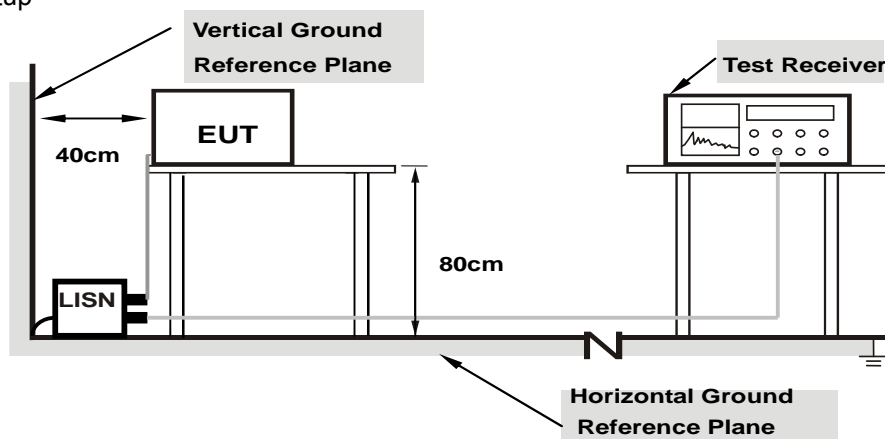
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

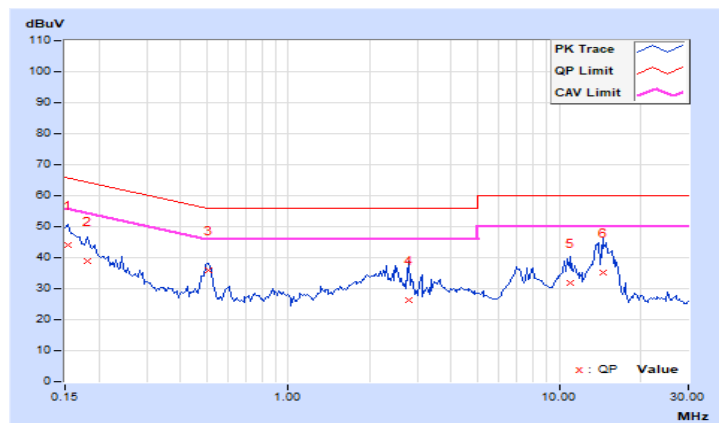
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.99	34.26	20.73	44.25	30.72	65.79	55.79	-21.54	-25.07
2	0.18125	9.99	28.91	15.50	38.90	25.49	64.43	54.43	-25.53	-28.94
3	0.50938	10.01	25.76	18.72	35.77	28.73	56.00	46.00	-20.23	-17.27
4	2.78516	10.17	16.21	10.62	26.38	20.79	56.00	46.00	-29.62	-25.21
5	10.96875	10.72	21.27	15.91	31.99	26.63	60.00	50.00	-28.01	-23.37
6	14.44922	10.97	24.10	17.40	35.07	28.37	60.00	50.00	-24.93	-21.63

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

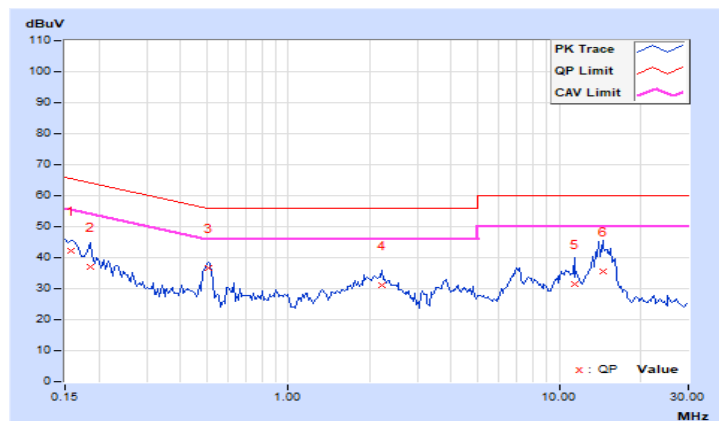


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.99	32.26	20.47	42.25	30.46	65.58	55.58	-23.33	-25.12
2	0.18516	9.99	27.07	14.53	37.06	24.52	64.25	54.25	-27.19	-29.73
3	0.50547	10.02	26.51	19.76	36.53	29.78	56.00	46.00	-19.47	-16.22
4	2.22656	10.13	20.83	15.20	30.96	25.33	56.00	46.00	-25.04	-20.67
5	11.36719	10.65	20.92	15.23	31.57	25.88	60.00	50.00	-28.43	-24.12
6	14.46094	10.82	24.74	18.12	35.56	28.94	60.00	50.00	-24.44	-21.06

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

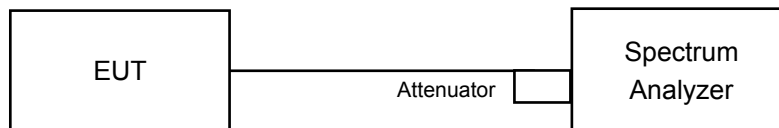


4.3 6dB Bandwidth Measurement

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) $\geq 3 \times$ 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)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	8.10	8.07	0.5	Pass
6	2437	7.60	8.04	0.5	Pass
11	2462	7.59	7.59	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.36	16.37	0.5	Pass
6	2437	16.34	16.35	0.5	Pass
11	2462	16.35	16.38	0.5	Pass

802.11ax (HE20)

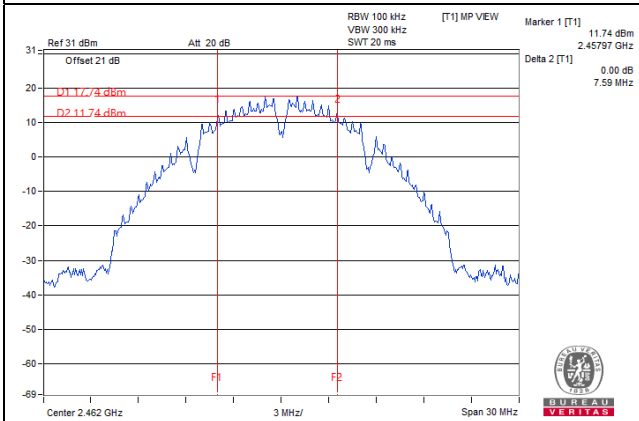
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	19.01	18.95	0.5	Pass
6	2437	18.98	18.82	0.5	Pass
11	2462	18.96	18.88	0.5	Pass

802.11ax (HE40)

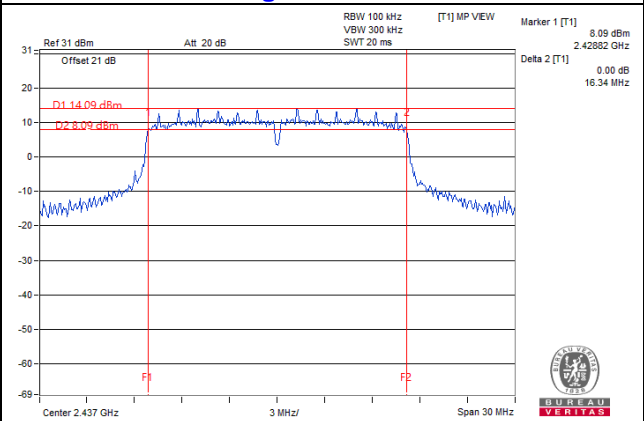
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	38.15	38.06	0.5	Pass
6	2437	38.19	38.09	0.5	Pass
9	2452	38.10	37.90	0.5	Pass

Spectrum Plot of Worst Value

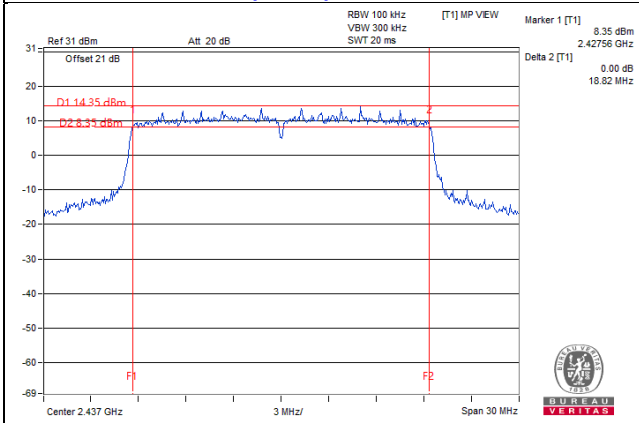
802.11b_Chain 0 / CH11



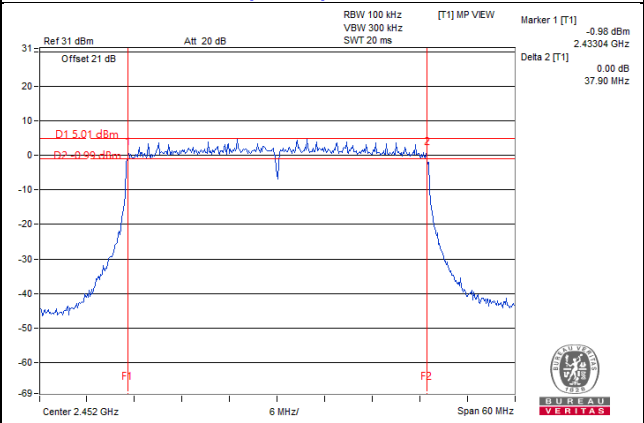
802.11g_Chain 0 / CH6



802.11ax (HE20)_Chain 1 / CH6



802.11ax (HE40)_Chain 1 / 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,

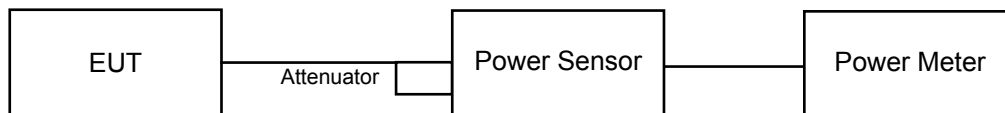
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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
		Chain 0	Chain 1				
1	2412	25.32	25.43	689.549	28.39	30	Pass
6	2437	26.88	26.97	985.266	29.94	30	Pass
11	2462	25.16	24.96	641.424	28.07	30	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.75	21.84	302.38	24.81	30	Pass
6	2437	25.37	25.47	696.721	28.43	30	Pass
11	2462	21.17	20.96	255.657	24.08	30	Pass

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.01	20.04	201.156	23.04	30	Pass
6	2437	24.63	24.73	587.569	27.69	30	Pass
11	2462	19.91	19.71	191.49	22.82	30	Pass

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.30	19.44	173.016	22.38	30	Pass
6	2437	20.24	20.46	216.855	23.36	30	Pass
9	2452	18.51	18.43	140.62	21.48	30	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.33	20.39	217.29	23.37	30	Pass
6	2437	24.90	24.99	624.53	27.96	30	Pass
11	2462	20.25	20.03	206.619	23.15	30	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.55	19.74	184.346	22.66	30	Pass
6	2437	20.55	20.71	231.262	23.64	30	Pass
9	2452	18.77	18.68	149.126	21.74	30	Pass

Beamforming Mode:

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.01	20.04	201.156	23.04	30	Pass
6	2437	24.63	24.73	587.569	27.69	30	Pass
11	2462	19.91	19.71	191.49	22.82	30	Pass

Note: The directional gain is 5.34 dBi < 6 dBi, so the power limit shall not be reduced.

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.30	19.44	173.016	22.38	30	Pass
6	2437	20.24	20.46	216.855	23.36	30	Pass
9	2452	18.51	18.43	140.62	21.48	30	Pass

Note: The directional gain is 5.34 dBi < 6 dBi, so the power limit shall not be reduced.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.33	20.39	217.29	23.37	30	Pass
6	2437	24.90	24.99	624.53	27.96	30	Pass
11	2462	20.25	20.03	206.619	23.15	30	Pass

Note: The directional gain is 5.34 dBi < 6 dBi, so the power limit shall not be reduced.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.55	19.74	184.346	22.66	30	Pass
6	2437	20.55	20.71	231.262	23.64	30	Pass
9	2452	18.77	18.68	149.126	21.74	30	Pass

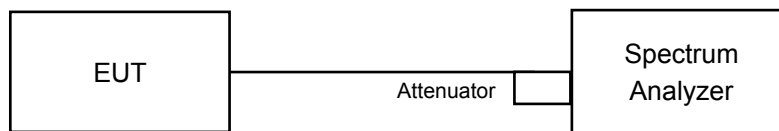
Note: The directional gain is 5.34 dBi < 6 dBi, so the power limit shall not be reduced.

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- a. 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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- e. Set VBW $\geq 3 \times \text{RBW}$.
- f. Detector = power averaging (RMS) or sample detector (when RMS not available).
- g. Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- 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

CDD Mode:

802.11b

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					
1	2412	-7.44	-9.35	1.23	0.3934	-4.05	8.00	Pass
6	2437	-8.03	-6.92	1.23	0.4786	-3.20	8.00	Pass
11	2462	-8.73	-9.97	1.23	0.3114	-5.07	8.00	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 = 5.34 dBi < 6dBi, so the power density limit shall not be reduced.
 3. Refer to section 3.3 for duty cycle spectrum plot.

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					
1	2412	-13.52	-12.98	0.30	0.10158	-9.93	8.00	Pass
6	2437	-10.30	-8.86	0.30	0.23929	-6.21	8.00	Pass
11	2462	-14.39	-13.73	0.30	0.08438	-10.74	8.00	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 = 5.34 dBi < 6dBi, so the power density limit shall not be reduced.
 3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

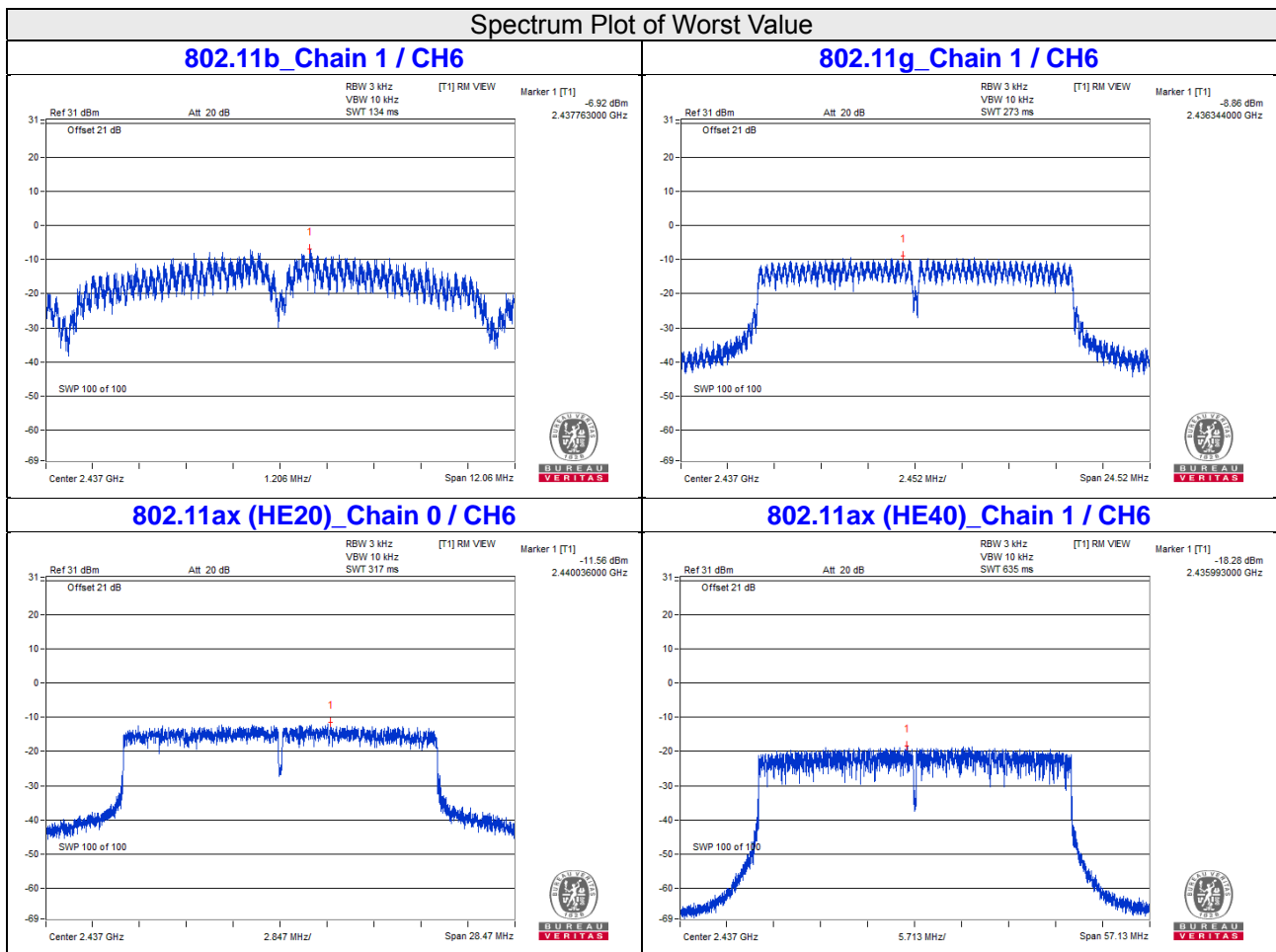
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)		Duty Factor (dB)	Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1					
1	2412	-16.35	-15.85	0.18	0.05127	-12.90	8.00	Pass
6	2437	-11.56	-11.72	0.18	0.14296	-8.45	8.00	Pass
11	2462	-16.61	-16.91	0.18	0.04399	-13.57	8.00	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 = 5.34 dBi < 6dBi, so the power density limit shall not be reduced.
 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					
3	2422	-19.37	-19.23	0.22	0.02473	-16.07	8.00	Pass
6	2437	-18.52	-18.28	0.22	0.03043	-15.17	8.00	Pass
9	2452	-19.88	-20.40	0.22	0.020415	-16.90	8.00	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 = 5.34 dBi < 6dBi, so the power density limit shall not be reduced.
 3. Refer to section 3.3 for duty cycle spectrum plot.

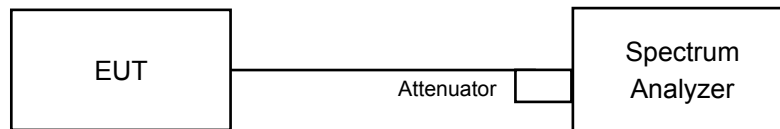


4.6 Conducted Out of Band Emission Measurement

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 \geq 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 OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 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.

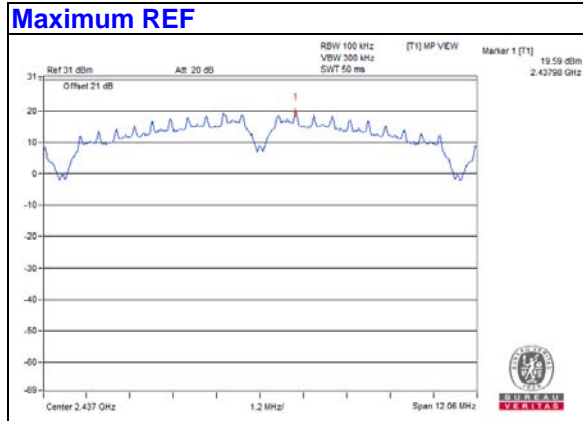
4.6.6 EUT Operating Condition

Same as Item 4.3.6

4.6.7 Test Results

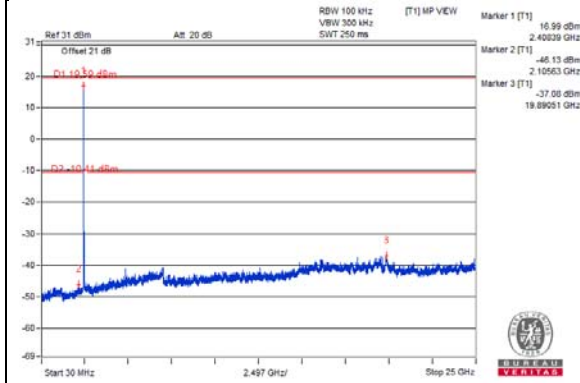
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

CDD Mode:
802.11b

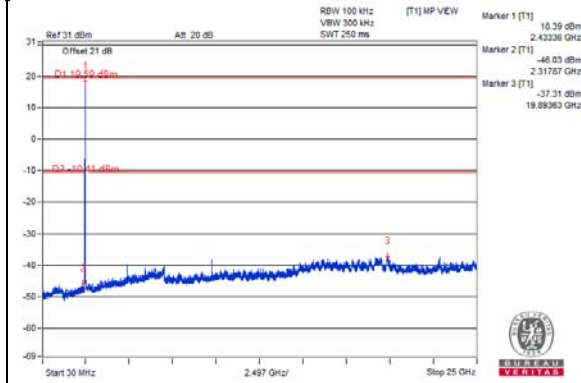


Chain 0

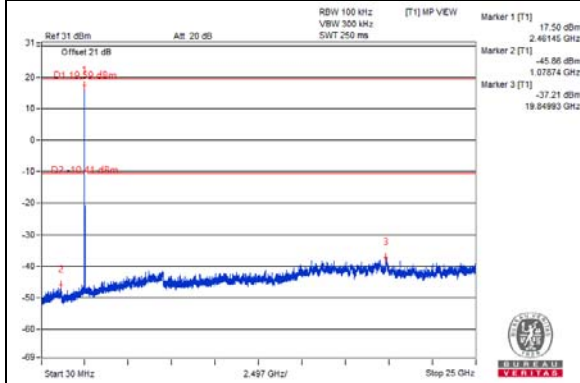
CH 1



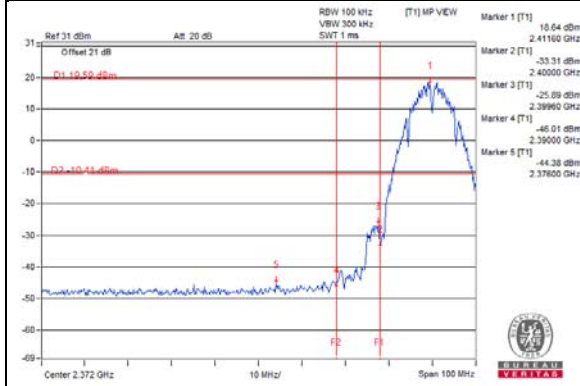
CH 6



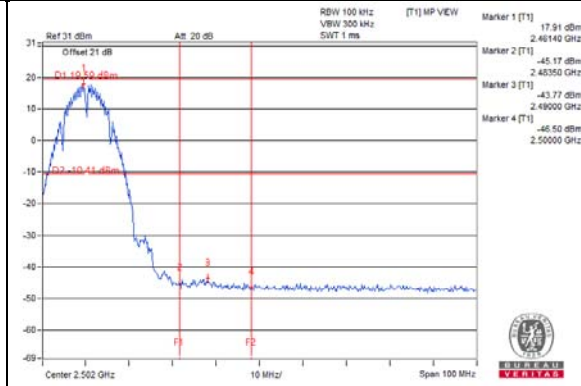
CH 11



CH 1 Band edge

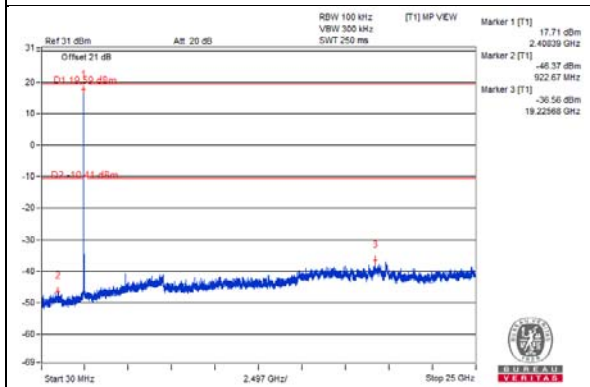


CH 11 Band edge

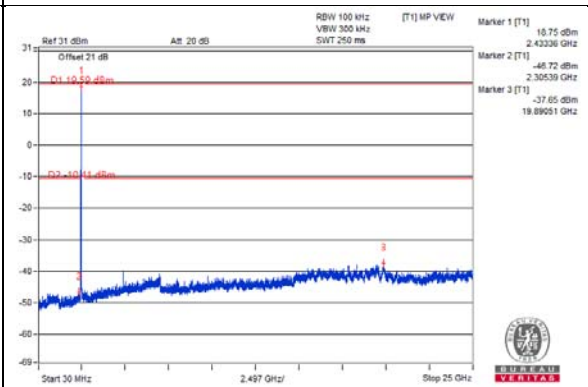


Chain 1

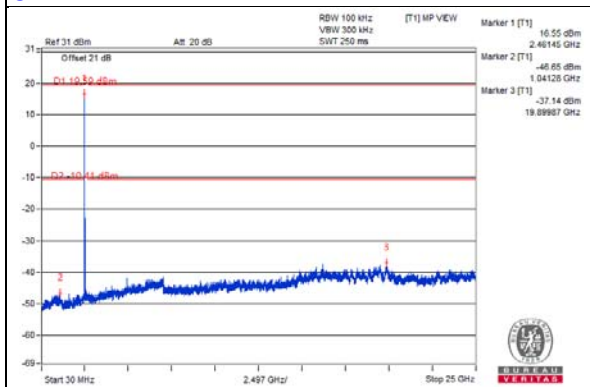
CH 1



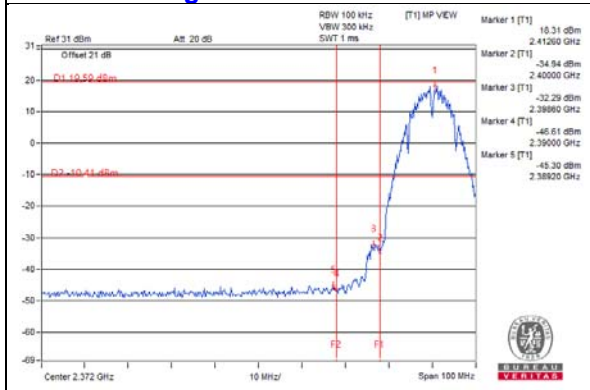
CH 6



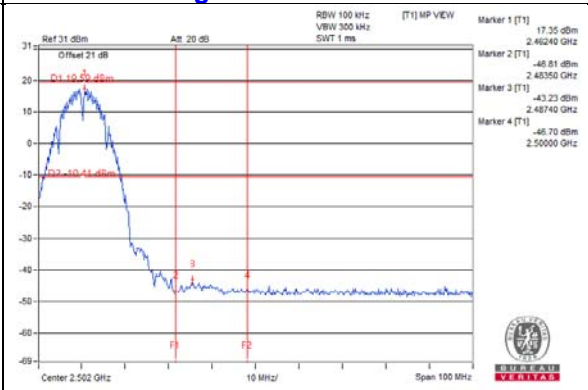
CH 11



CH 1 Band edge

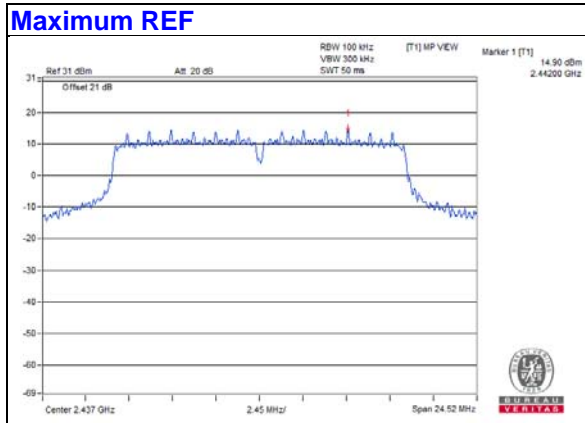


CH 11 Band edge



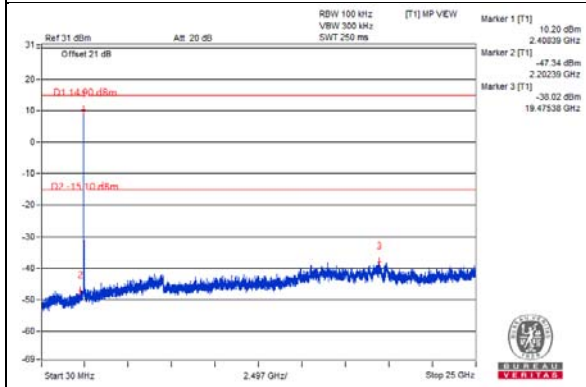
802.11g

Maximum REF

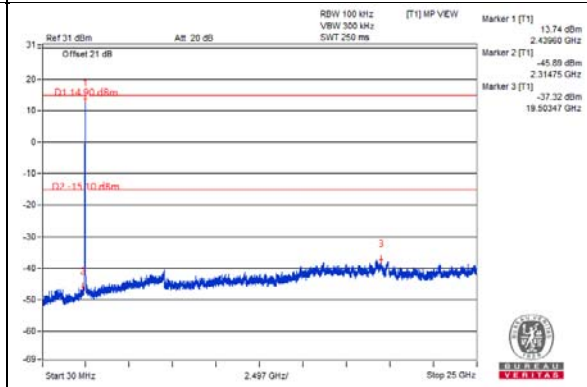


Chain 0

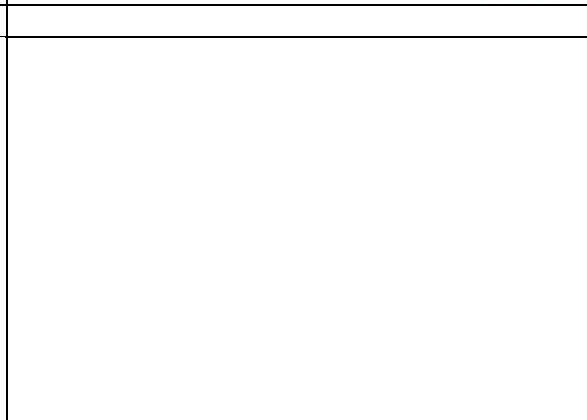
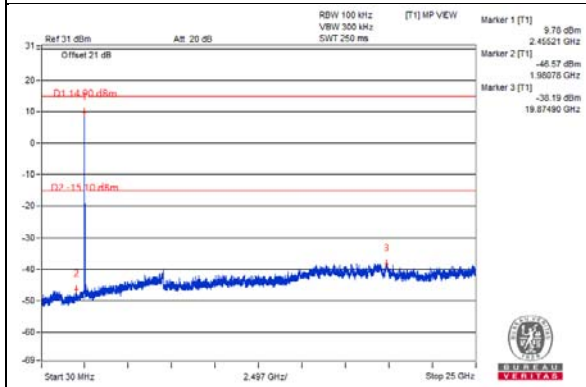
CH 1



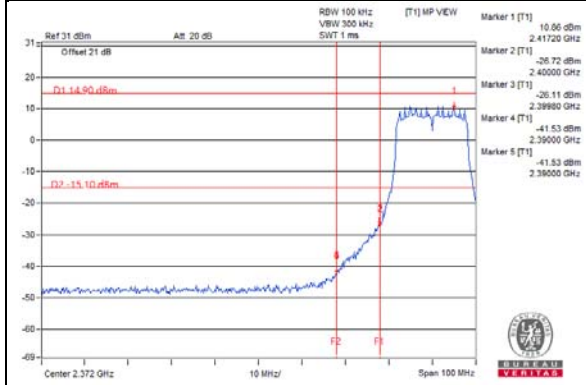
CH 6



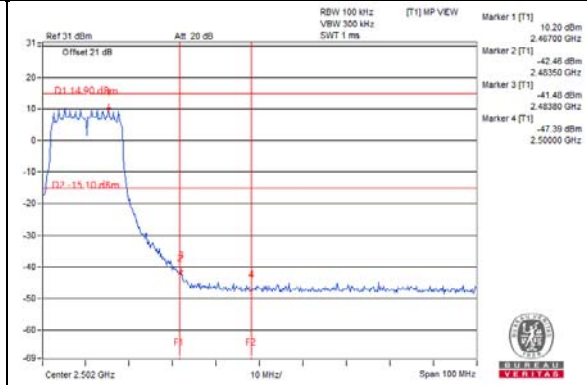
CH 11



CH 1 Band edge

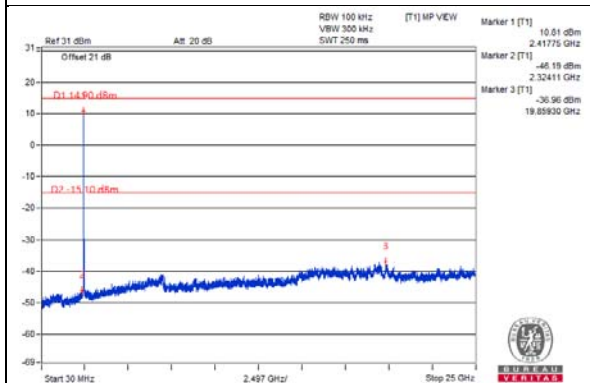


CH 11 Band edge

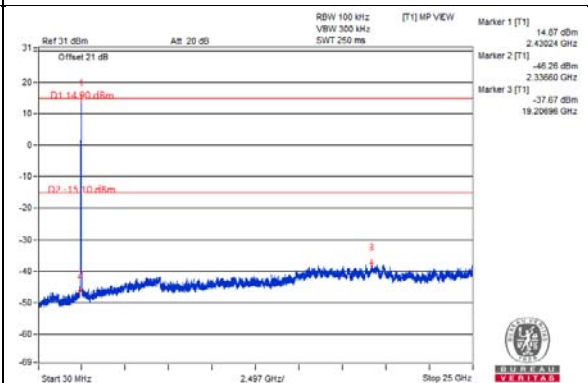


Chain 1

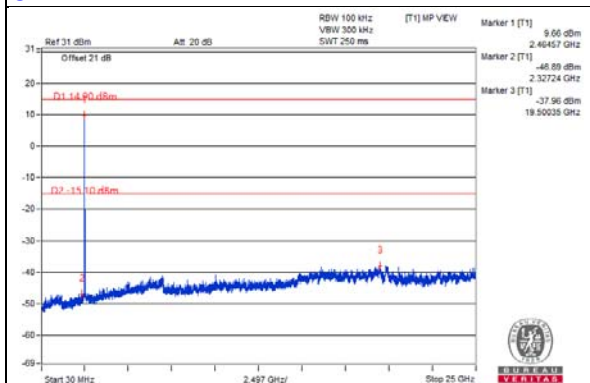
CH 1



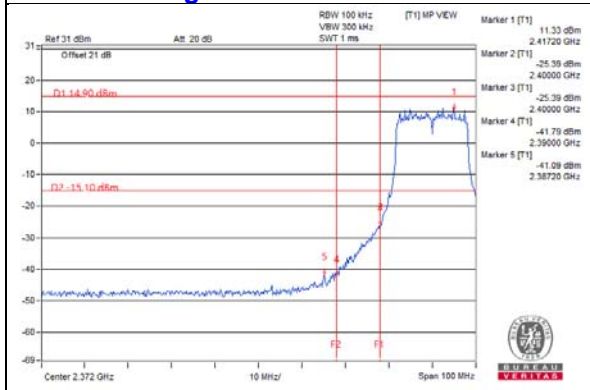
CH 6



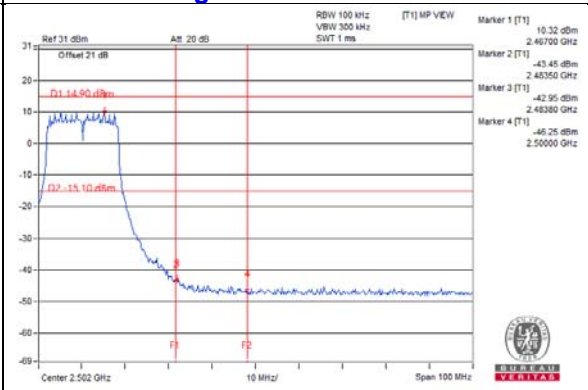
CH 11



CH 1 Band edge

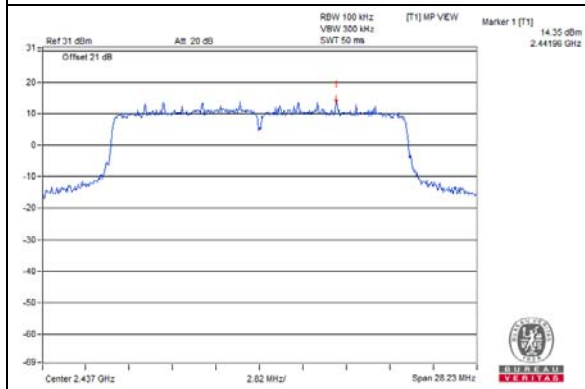


CH 11 Band edge



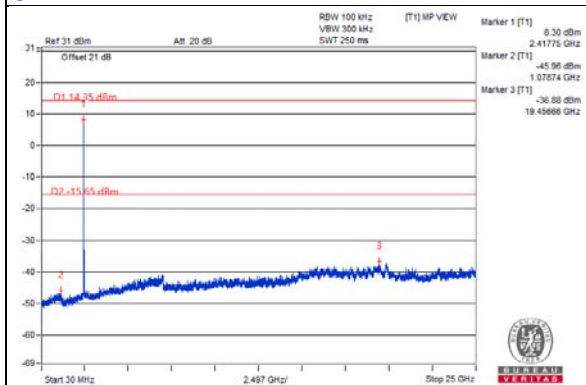
802.11ax (HE20)

Maximum REF

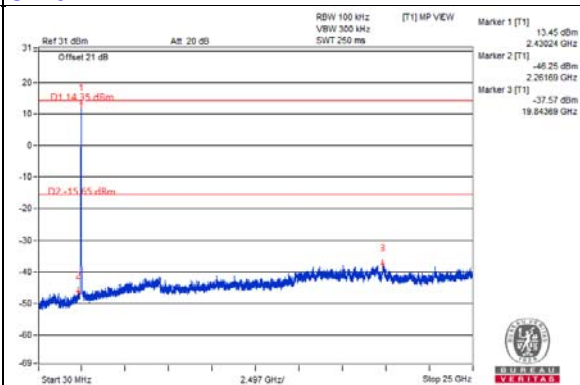


Chain 0

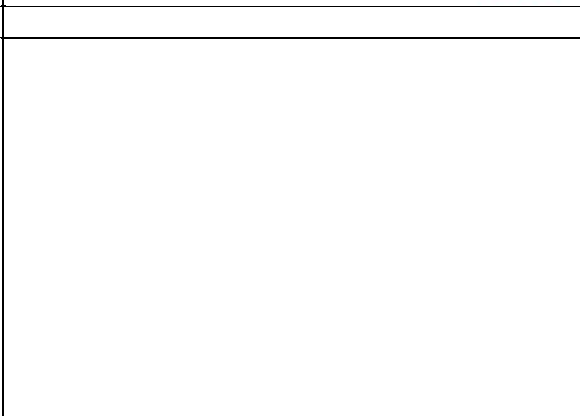
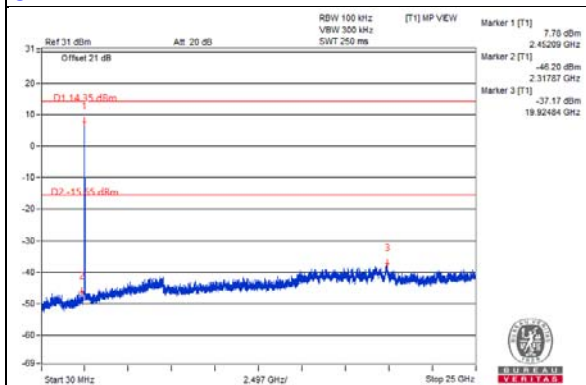
CH 1



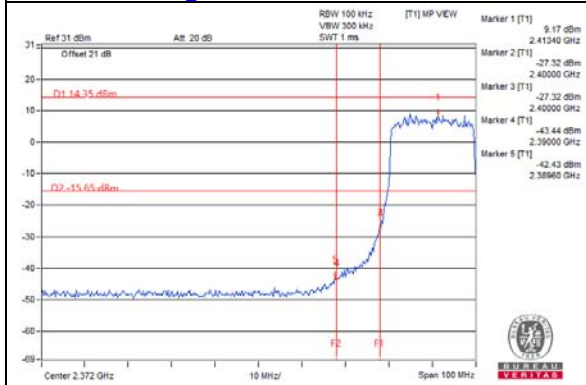
CH 6



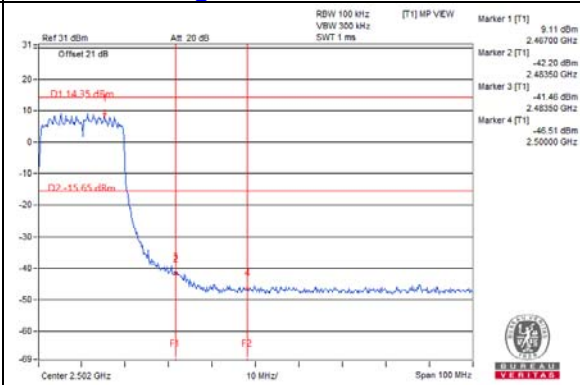
CH 11



CH 1 Band edge

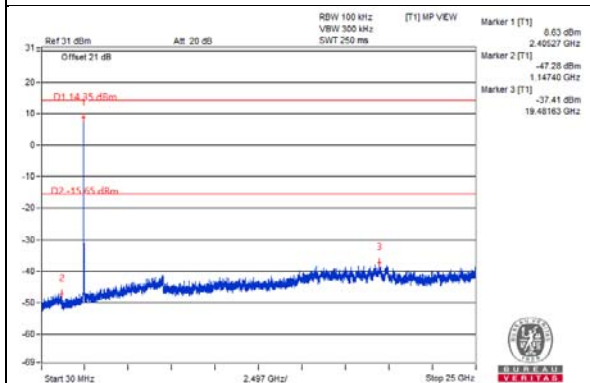


CH 11 Band edge

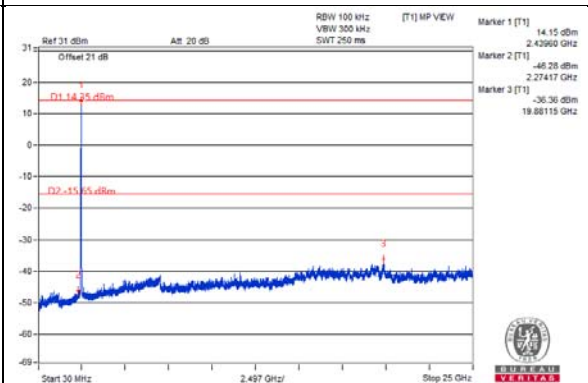


Chain 1

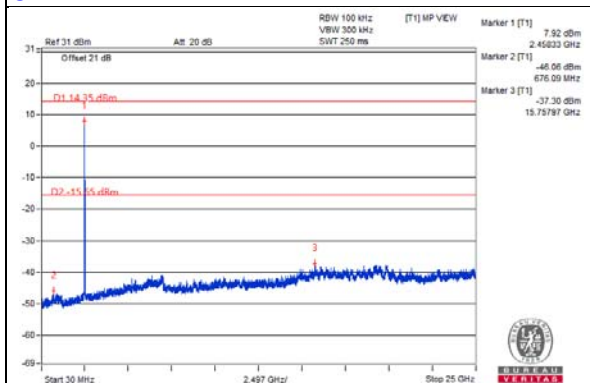
CH 1



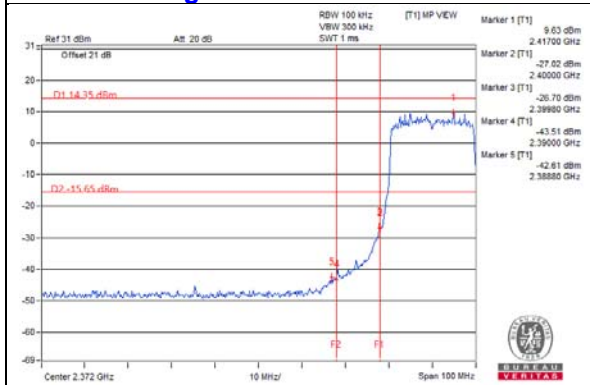
CH 6



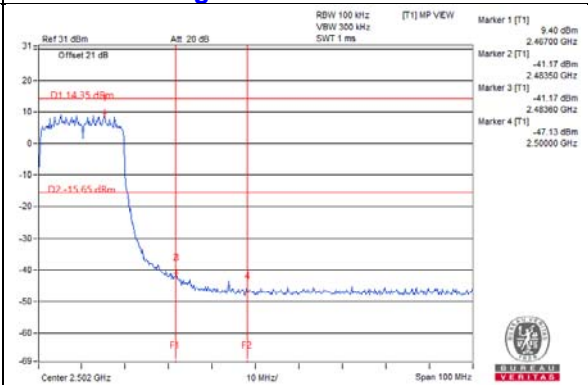
CH 11



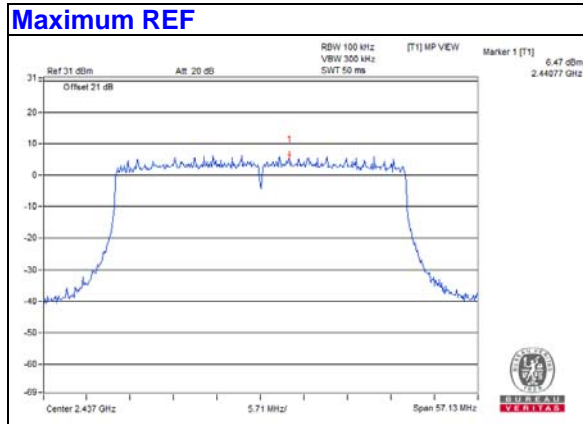
CH 1 Band edge



CH 11 Band edge

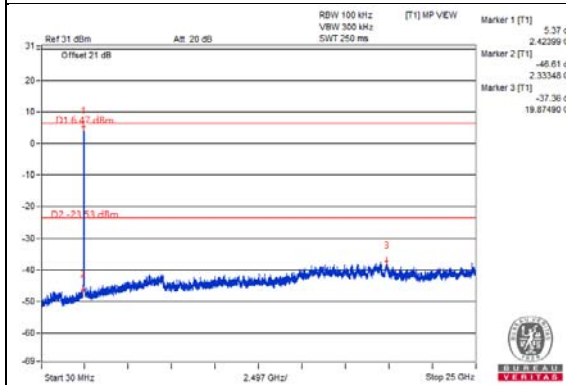


802.11ax (HE40)

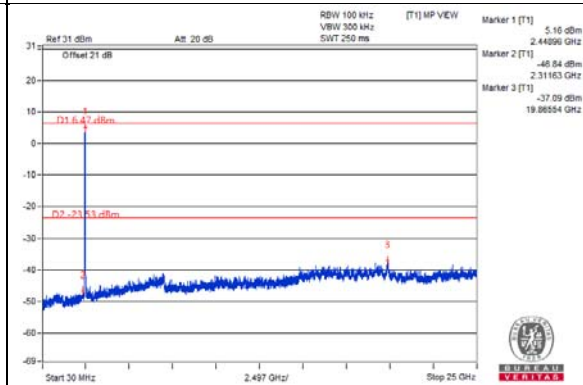


Chain 0

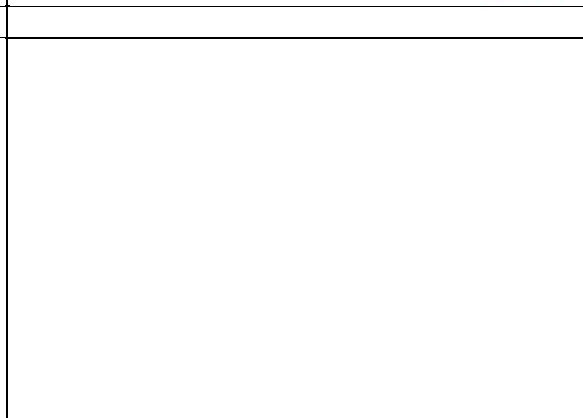
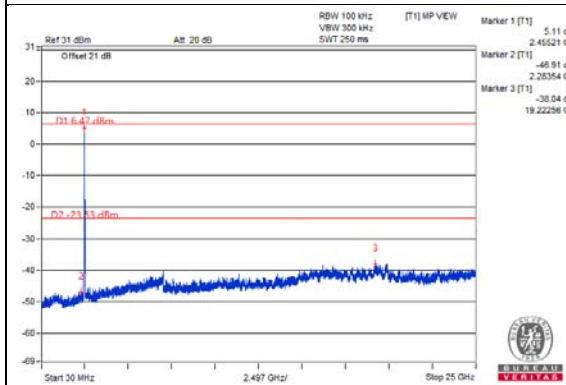
CH 3



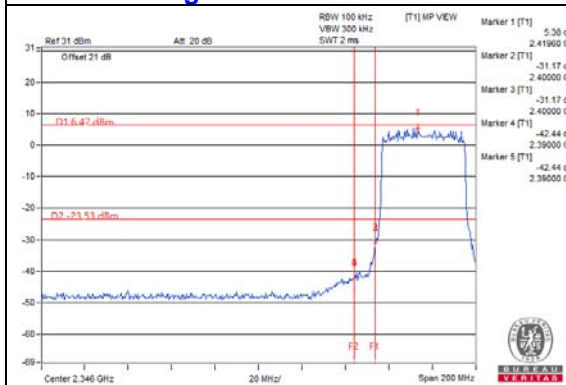
CH 6



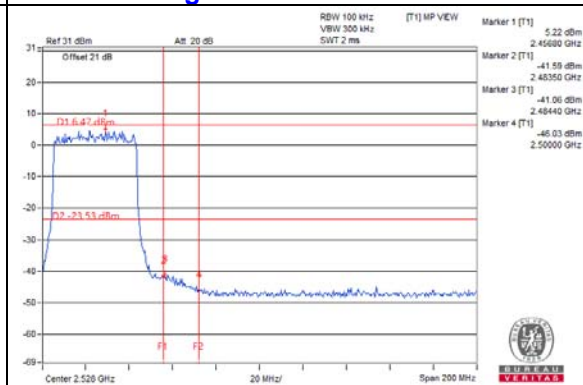
CH 9



CH 3 Band edge

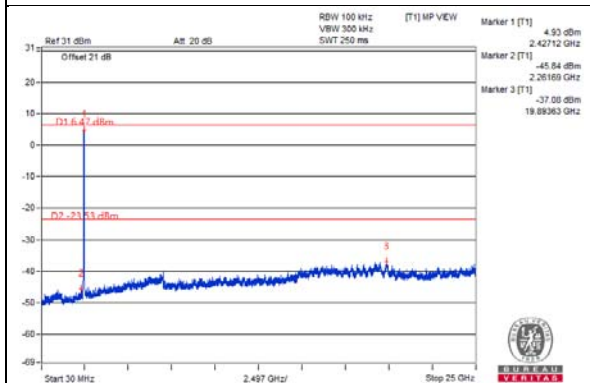


CH 9 Band edge

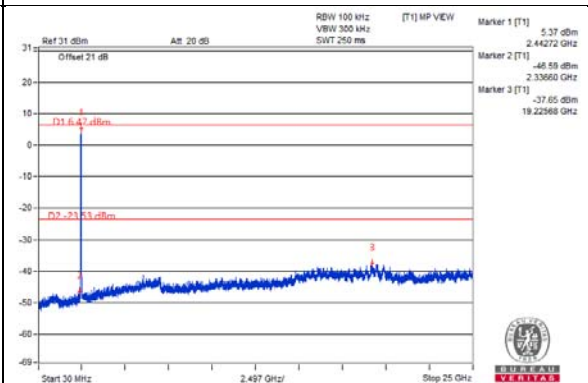


Chain 1

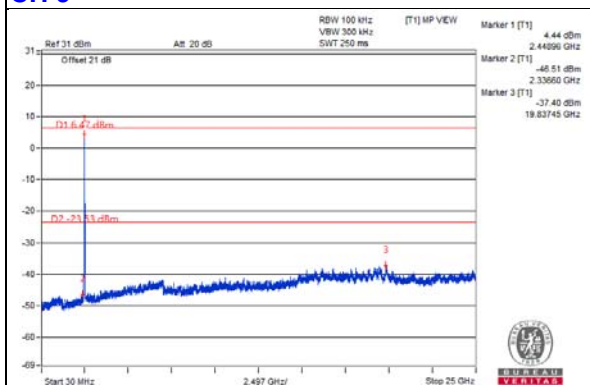
CH 3



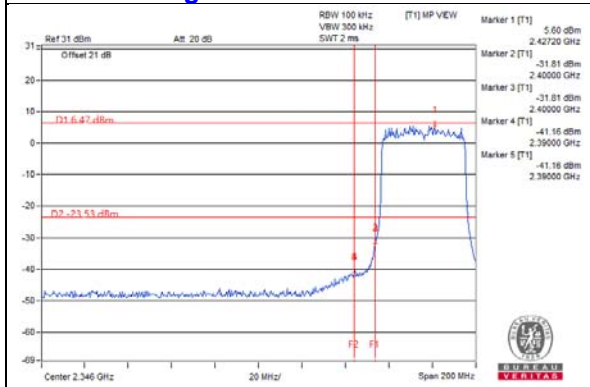
CH 6



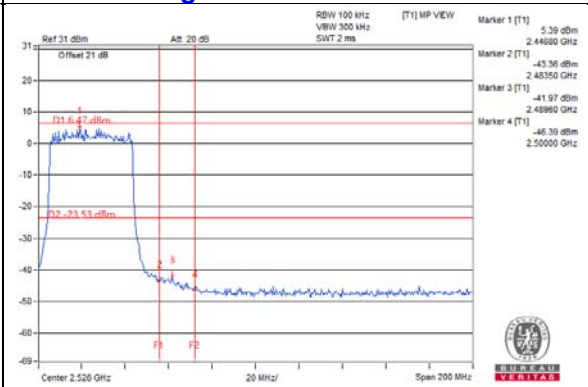
CH 9



CH 3 Band edge



CH 9 Band edge



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:

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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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