FCC Test Report (WLAN)

Report No.:	RF200102E06-1
FCC ID:	RAXCM4652442
Test Model:	CM4652442-MM
Received Date:	Jan. 02, 2020
Test Date:	Jan. 06 to Feb. 17, 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

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF200102E06-1	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. 06 to Feb. 17, 2020
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) 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 E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -18.61 dB at 0.46250 MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.3 dB at 5649.70 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.

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
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.0 dB
	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 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), 80211ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 80211ax (HE40): 4 802.11ac (VHT80), 80211ax (HE80): 2
Output Power	**CDD Mode:** **2.4 GHz:** 969.053 mW **5.18 ~ 5.24 GHz:** 902.817 mW **5.745 ~ 5.825 GHz:** 934.131 mW **Beamforming Mode:** **2.4 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	RJ-45 Cable x 1 (Unshielded, 1 m)

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), 802.11ac mode for 20MHz (40MHz, 80MHz) and 802.11ax mode for 20MHz (40MHz, 80MHz), 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 refers to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5250MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

Channel	Frequency	Channel	Frequency
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz **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	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6Mb/s
802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	BPSK	MCS0
802.11ax (HE40)		38 to 46	38, 46	OFDMA	BPSK	MCS0
802.11ax (HE80)		42	42	OFDMA	BPSK	MCS0
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6Mb/s
802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	BPSK	MCS0
802.11ax (HE40)		151 to 159	151, 159	OFDMA	BPSK	MCS0
802.11ax (HE80)		155	155	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	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE20)	5180-5240, 5745-5825	36 to 48, 149 to 165	149	OFDMA	BPSK	MCS0

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	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE20)	5180-5240, 5745-5825	36 to 48, 149 to 165	149	OFDMA	BPSK	MCS0

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	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6Mb/s
802.11ac (VHT20) (for output power)		36 to 48	36, 40, 48	OFDM	BPSK	MCS0
802.11ac (VHT40) (for output power)		38 to 46	38, 46	OFDM	BPSK	MCS0
802.11ac (VHT80) (for output power)		42	42	OFDM	BPSK	MCS0
802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	BPSK	MCS0
802.11ax (HE40)		38 to 46	38, 46	OFDMA	BPSK	MCS0
802.11ax (HE80)		42	42	OFDMA	BPSK	MCS0
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6Mb/s
802.11ac (VHT20) (for output power)		149 to 165	149, 157, 165	OFDM	BPSK	MCS0
802.11ac (VHT40) (for output power)		151 to 159	151, 159	OFDM	BPSK	MCS0
802.11ac (VHT80) (for output power)		155	155	OFDM	BPSK	MCS0
802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	BPSK	MCS0
802.11ax (HE40)		151 to 159	151, 159	OFDMA	BPSK	MCS0
802.11ax (HE80)		155	155	OFDMA	BPSK	MCS0
Beamforming Mode (output power only)						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	MCS0
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	MCS0
802.11ac (VHT80)		42	42	OFDM	BPSK	MCS0
802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	BPSK	MCS0
802.11ax (HE40)		38 to 46	38, 46	OFDMA	BPSK	MCS0
802.11ax (HE80)		42	42	OFDMA	BPSK	MCS0
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	MCS0
802.11ac (VHT80)		155	155	OFDM	BPSK	MCS0
802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	BPSK	MCS0
802.11ax (HE40)		151 to 159	151, 159	OFDMA	BPSK	MCS0
802.11ax (HE80)		155	155	OFDMA	BPSK	MCS0

Test Condition:

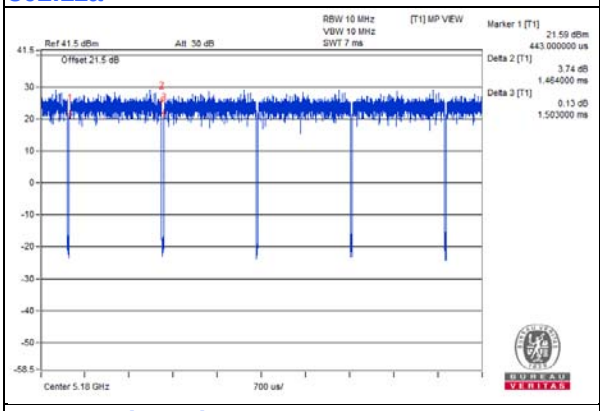
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 58%RH, 22deg. C, 57%RH	120Vac, 60Hz	Jeff Lee
RE<1G	22deg. C, 57%RH	120Vac, 60Hz	Jeff Lee
PLC	25deg. C, 75%RH	120Vac, 60Hz	Kevin Ko
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

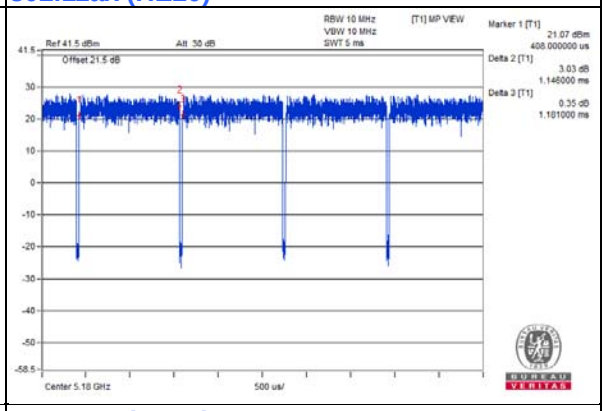
Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 1.464 ms/1.503 ms = 0.974, Duty factor = 10 * log (1/Duty cycle) = 0.11 dB
802.11ax (HE20): Duty cycle = 1.146 ms/1.181 ms = 0.97, Duty factor = 10 * log (1/Duty cycle) = 0.13 dB
802.11ax (HE40): Duty cycle = 1.185 ms/1.22 ms = 0.971, Duty factor = 10 * log (1/Duty cycle) = 0.13 dB
802.11ax (HE80): Duty cycle = 1.223 ms/1.257 ms = 0.973, Duty factor = 10 * log (1/Duty cycle) = 0.12 dB

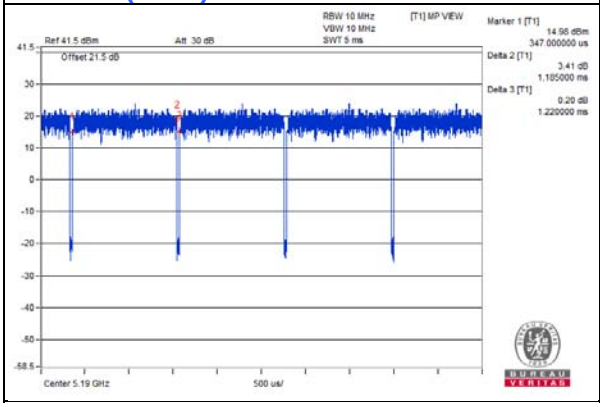
802.11a



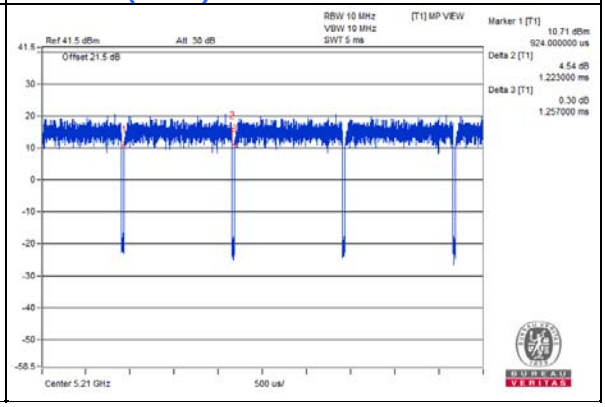
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

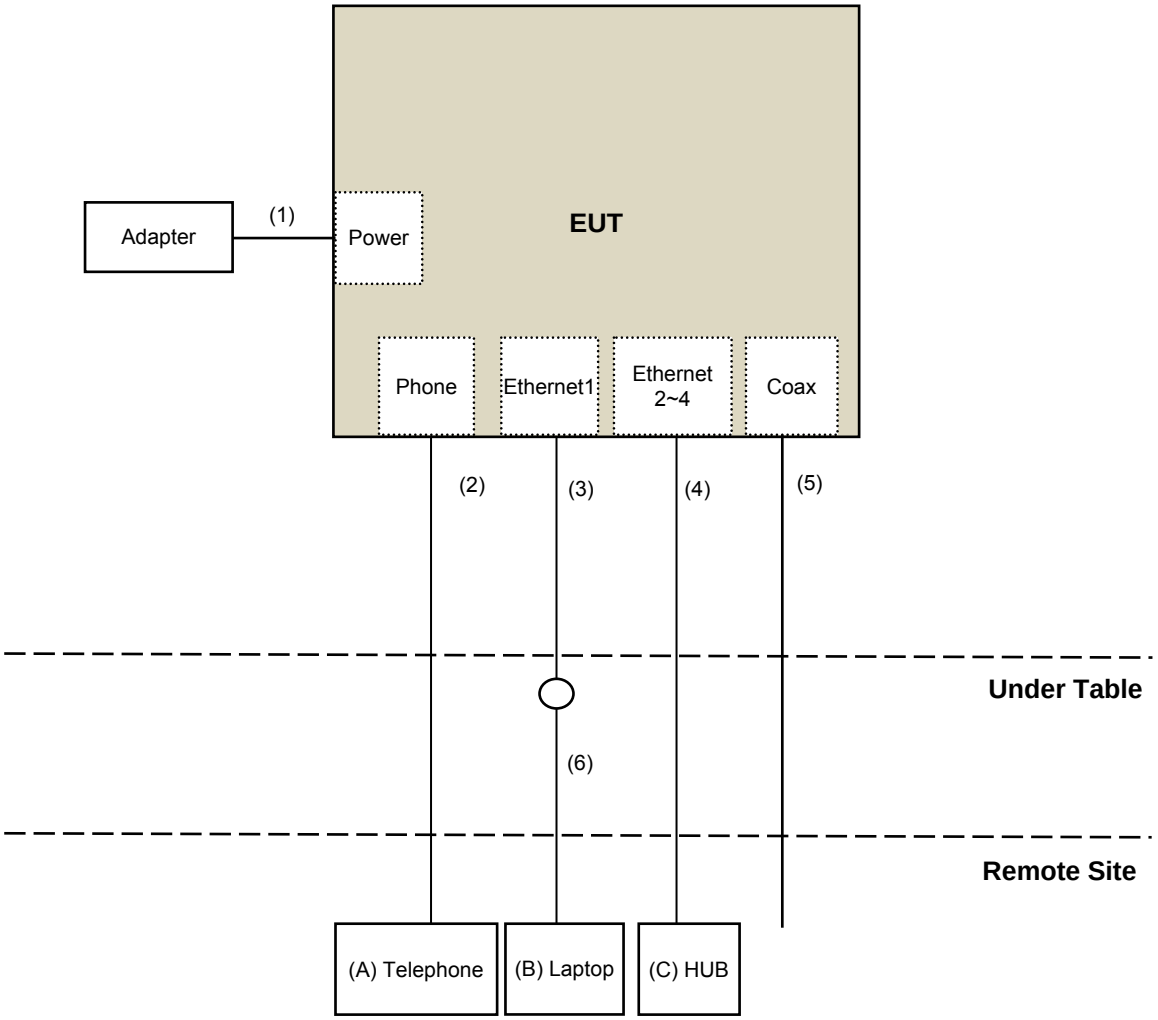
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Telephone	WONDER	WD-303	7C17KA 04011	NA	Provided by Lab
B.	Laptop	DELL	E6400	D814C A00 APCC	NA	Provided by Lab
C.	HUB	ZyXEL	GS1100-16	S150H44000046	FCC DoC	Provided by Lab

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 E (15.407)
ANSI C63.10-2013

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

References Test Guidance:
KDB 789033 D02 General UNII Test Procedure New Rules v02r01
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.

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.

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2(dBμV/m) *1 PK:105.2 (dBμV/m) *2 PK: 110.8(dBμV/m) *3 PK:122.2 (dBμV/m) *4

*1 beyond 75 MHz or more above of the band edge.

*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts).

4.1.2 Test Instruments

For Radiated Emisson (Above 1GHz) test:

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

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. 31, 2020

For OOBE & Radiated Emisson (Below 1GHz) test:

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	264	Jan. 22, 2019	Jan. 21, 2020
RF Cable	NA	LOOPCAB-001	Jan. 14, 2019	Jan. 13, 2020
RF Cable	NA	LOOPCAB-002	Jan. 14, 2019	Jan. 13, 2020
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
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. 28, 2019	Jan. 27, 2020
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 28, 2019	Jan. 27, 2020
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. 5.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Jan. 06 to 13, 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
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 16, 2020	Jan. 15, 2021
True RMS Clamp Meter FLUKE	325	31130711WS	May 21, 2019	May 20, 2020
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

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. 17, 2020

4.1.3 Test Procedure

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:

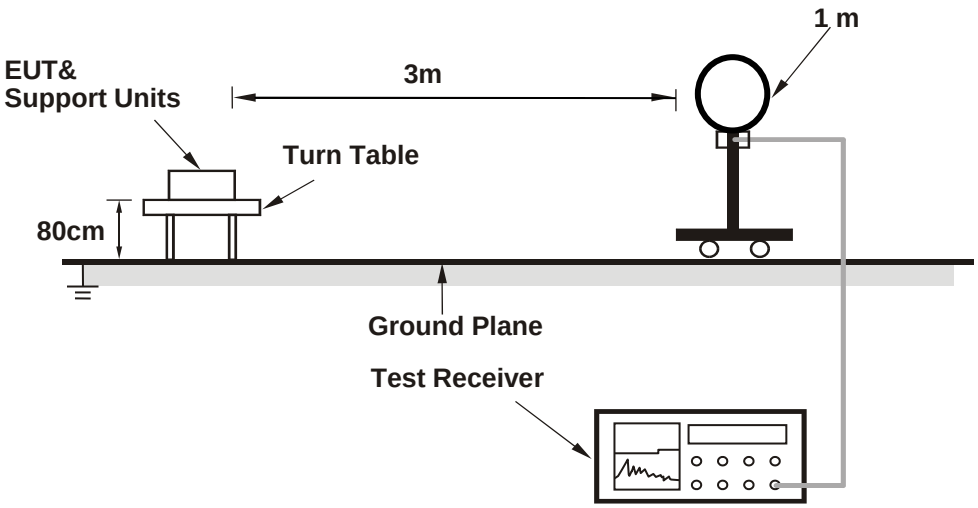
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

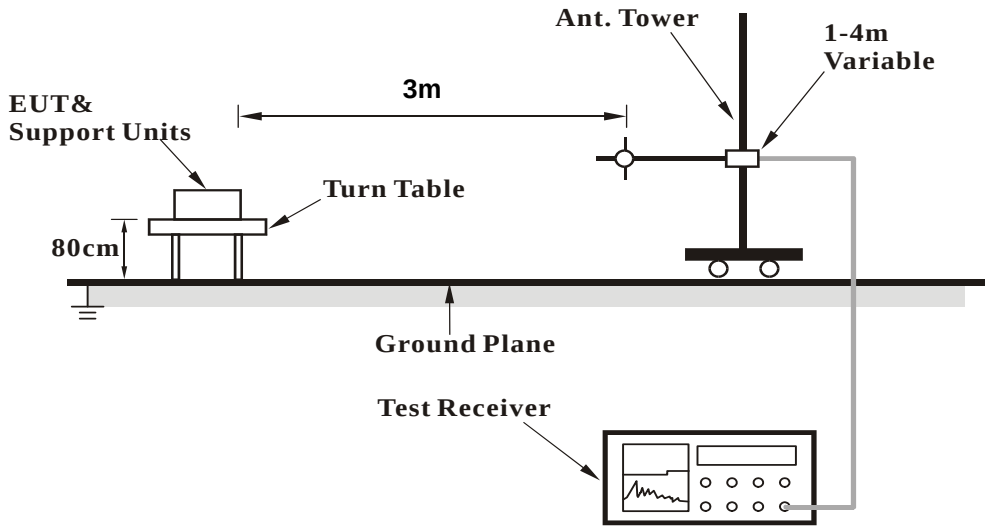
No deviation.

4.1.5 Test Setup

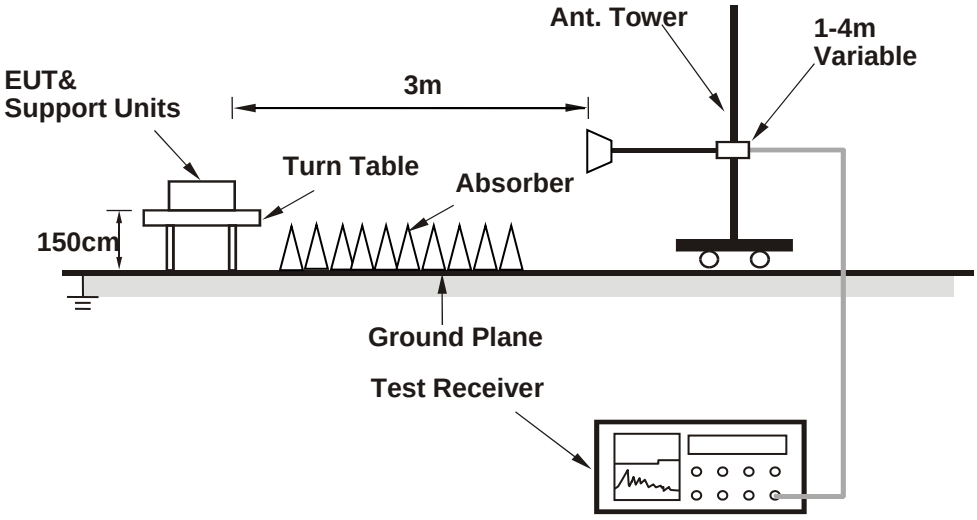
For Radiated emission below 30MHz



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 Condition

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 frenquency.

4.1.7 Test Results

Above 1GHz Data:

802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	73.5 PK	74.0	-0.5	2.03 H	257	71.6	1.9
2	5150.00	49.1 AV	54.0	-4.9	2.03 H	257	47.2	1.9
3	*5180.00	116.5 PK			2.03 H	257	114.8	1.7
4	*5180.00	106.0 AV			2.03 H	257	104.3	1.7
5	#10360.00	47.4 PK	68.2	-20.8	2.10 H	117	35.3	12.1
6	15540.00	45.7 PK	74.0	-28.3	1.34 H	305	33.6	12.1
7	15540.00	33.9 AV	54.0	-20.1	1.34 H	305	21.8	12.1
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	5150.00	73.6 PK	74.0	-0.4	1.86 V	258	71.7	1.9
2	5150.00	49.9 AV	54.0	-4.1	1.86 V	258	48.0	1.9
3	*5180.00	119.5 PK			1.86 V	258	117.8	1.7
4	*5180.00	109.3 AV			1.86 V	258	107.6	1.7
5	#10360.00	48.1 PK	68.2	-20.1	1.93 V	216	36.0	12.1
6	15540.00	46.2 PK	74.0	-27.8	2.44 V	166	34.1	12.1
7	15540.00	33.7 AV	54.0	-20.3	2.44 V	166	21.6	12.1

REMARKS:

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

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	65.7 PK	74.0	-8.3	2.02 H	249	63.8	1.9
2	5150.00	50.1 AV	54.0	-3.9	2.02 H	249	48.2	1.9
3	*5200.00	118.7 PK			2.02 H	249	117.2	1.5
4	*5200.00	109.1 AV			2.02 H	249	107.6	1.5
5	5350.00	57.7 PK	74.0	-16.3	2.02 H	249	56.3	1.4
6	5350.00	45.8 AV	54.0	-8.2	2.02 H	249	44.4	1.4
7	#10400.00	49.1 PK	68.2	-19.1	2.16 H	116	36.7	12.4
8	15600.00	48.6 PK	74.0	-25.4	1.40 H	290	36.8	11.8
9	15600.00	35.5 AV	54.0	-18.5	1.40 H	290	23.7	11.8
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	5150.00	65.6 PK	74.0	-8.4	1.78 V	300	63.7	1.9
2	5150.00	50.0 AV	54.0	-4.0	1.78 V	300	48.1	1.9
3	*5200.00	121.3 PK			1.78 V	300	119.8	1.5
4	*5200.00	111.9 AV			1.78 V	300	110.4	1.5
5	5350.00	57.4 PK	74.0	-16.6	1.78 V	300	56.0	1.4
6	5350.00	45.5 AV	54.0	-8.5	1.78 V	300	44.1	1.4
7	#10400.00	49.7 PK	68.2	-18.5	1.92 V	211	37.3	12.4
8	15600.00	48.6 PK	74.0	-25.4	2.36 V	177	36.8	11.8
9	15600.00	35.5 AV	54.0	-18.5	2.36 V	177	23.7	11.8

REMARKS:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	57.4 PK	74.0	-16.6	1.98 H	247	55.5	1.9
2	5150.00	45.4 AV	54.0	-8.6	1.98 H	247	43.5	1.9
3	*5240.00	119.1 PK			1.98 H	247	117.7	1.4
4	*5240.00	109.2 AV			1.98 H	247	107.8	1.4
5	5350.00	56.9 PK	74.0	-17.1	1.98 H	247	55.5	1.4
6	5350.00	46.5 AV	54.0	-7.5	1.98 H	247	45.1	1.4
7	#10480.00	50.2 PK	68.2	-18.0	2.15 H	110	37.5	12.7
8	15720.00	48.0 PK	74.0	-26.0	1.35 H	297	36.4	11.6
9	15720.00	35.5 AV	54.0	-18.5	1.35 H	297	23.9	11.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.2 PK	74.0	-16.8	2.48 V	327	55.3	1.9
2	5150.00	45.2 AV	54.0	-8.8	2.48 V	327	43.3	1.9
3	*5240.00	122.0 PK			2.48 V	327	120.6	1.4
4	*5240.00	112.1 AV			2.48 V	327	110.7	1.4
5	5350.00	56.6 PK	74.0	-17.4	2.48 V	327	55.2	1.4
6	5350.00	46.2 AV	54.0	-7.8	2.48 V	327	44.8	1.4
7	#10480.00	50.2 PK	68.2	-18.0	1.93 V	213	37.5	12.7
8	15720.00	48.1 PK	74.0	-25.9	2.37 V	152	36.5	11.6
9	15720.00	35.8 AV	54.0	-18.2	2.37 V	152	24.2	11.6

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5646.95	57.5 PK	68.2	-10.7	1.44 H	251	55.5	2.0
2	*5745.00	118.7 PK			1.44 H	251	116.5	2.2
3	*5745.00	109.3 AV			1.44 H	251	107.1	2.2
4	#5956.71	54.0 PK	68.2	-14.2	1.44 H	251	51.2	2.8
5	11490.00	44.5 PK	74.0	-29.5	2.13 H	128	30.6	13.9
6	11490.00	33.3 AV	54.0	-20.7	2.13 H	128	19.4	13.9
7	#17235.00	42.4 PK	68.2	-25.8	1.38 H	315	25.1	17.3
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	#5642.24	61.7 PK	68.2	-6.5	1.51 V	248	59.7	2.0
2	*5745.00	121.9 PK			1.51 V	248	119.7	2.2
3	*5745.00	111.5 AV			1.51 V	248	109.3	2.2
4	#5930.94	55.2 PK	68.2	-13.0	1.51 V	248	52.6	2.6
5	11490.00	45.0 PK	74.0	-29.0	1.91 V	221	31.1	13.9
6	11490.00	33.6 AV	54.0	-20.4	1.91 V	221	19.7	13.9
7	#17235.00	42.7 PK	68.2	-25.5	2.43 V	170	25.4	17.3

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5612.00	58.3 PK	68.2	-9.9	1.55 H	254	56.3	2.0
2	*5785.00	119.7 PK			1.55 H	254	117.4	2.3
3	*5785.00	109.7 AV			1.55 H	254	107.4	2.3
4	#5986.37	54.2 PK	68.2	-14.0	1.55 H	254	51.4	2.8
5	11570.00	45.6 PK	74.0	-28.4	2.12 H	108	31.6	14.0
6	11570.00	33.6 AV	54.0	-20.4	2.12 H	108	19.6	14.0
7	#17355.00	43.1 PK	68.2	-25.1	1.31 H	291	25.2	17.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5629.79	59.1 PK	68.2	-9.1	1.46 V	247	57.1	2.0
2	*5785.00	121.8 PK			1.46 V	247	119.5	2.3
3	*5785.00	111.7 AV			1.46 V	247	109.4	2.3
4	#5966.09	55.6 PK	68.2	-12.6	1.46 V	247	52.8	2.8
5	11570.00	44.7 PK	74.0	-29.3	1.87 V	223	30.7	14.0
6	11570.00	33.6 AV	54.0	-20.4	1.87 V	223	19.6	14.0
7	#17355.00	42.7 PK	68.2	-25.5	2.39 V	168	24.8	17.9

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5590.07	58.2 PK	68.2	-10.0	1.43 H	254	56.2	2.0
2	*5825.00	119.3 PK			1.43 H	254	116.8	2.5
3	*5825.00	109.6 AV			1.43 H	254	107.1	2.5
4	#5947.39	54.1 PK	68.2	-14.1	1.43 H	254	51.3	2.8
5	11650.00	45.4 PK	74.0	-28.6	2.11 H	103	31.5	13.9
6	11650.00	34.1 AV	54.0	-19.9	2.11 H	103	20.2	13.9
7	#17475.00	42.9 PK	68.2	-25.3	1.29 H	306	23.9	19.0
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	#5601.94	59.9 PK	68.2	-8.3	1.56 V	247	57.9	2.0
2	*5825.00	122.5 PK			1.56 V	247	120.0	2.5
3	*5825.00	111.9 AV			1.56 V	247	109.4	2.5
4	#5932.23	56.1 PK	68.2	-12.1	1.56 V	247	53.5	2.6
5	11650.00	44.8 PK	74.0	-29.2	1.86 V	218	30.9	13.9
6	11650.00	33.7 AV	54.0	-20.3	1.86 V	218	19.8	13.9
7	#17475.00	42.4 PK	68.2	-25.8	2.39 V	172	23.4	19.0

REMARKS:

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

802.11ax (HE20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	71.6 PK	74.0	-2.4	2.08 H	251	69.7	1.9
2	5150.00	53.1 AV	54.0	-0.9	2.08 H	251	51.2	1.9
3	*5180.00	118.9 PK			2.08 H	251	117.2	1.7
4	*5180.00	105.8 AV			2.08 H	251	104.1	1.7
5	#10360.00	48.3 PK	68.2	-19.9	2.13 H	125	36.2	12.1
6	15540.00	45.9 PK	74.0	-28.1	1.31 H	303	33.8	12.1
7	15540.00	33.7 AV	54.0	-20.3	1.31 H	303	21.6	12.1
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	5150.00	71.2 PK	74.0	-2.8	1.48 V	332	69.3	1.9
2	5150.00	53.6 AV	54.0	-0.4	1.48 V	332	51.7	1.9
3	*5180.00	121.8 PK			1.48 V	332	120.1	1.7
4	*5180.00	108.7 AV			1.48 V	332	107.0	1.7
5	#10360.00	48.7 PK	68.2	-19.5	1.98 V	206	36.6	12.1
6	15540.00	46.4 PK	74.0	-27.6	2.44 V	169	34.3	12.1
7	15540.00	34.2 AV	54.0	-19.8	2.44 V	169	22.1	12.1

REMARKS:

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

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	68.0 PK	74.0	-6.0	2.08 H	242	66.1	1.9
2	5150.00	52.5 AV	54.0	-1.5	2.08 H	242	50.6	1.9
3	*5200.00	122.8 PK			2.08 H	242	121.3	1.5
4	*5200.00	110.8 AV			2.08 H	242	109.3	1.5
5	#10400.00	48.2 PK	68.2	-20.0	2.14 H	129	35.8	12.4
6	15600.00	47.4 PK	74.0	-26.6	1.36 H	309	35.6	11.8
7	15600.00	35.6 AV	54.0	-18.4	1.36 H	309	23.8	11.8
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	5150.00	67.5 PK	74.0	-6.5	1.24 V	326	65.6	1.9
2	5150.00	52.2 AV	54.0	-1.8	1.24 V	326	50.3	1.9
3	*5200.00	122.9 PK			1.24 V	326	121.4	1.5
4	*5200.00	111.2 AV			1.24 V	326	109.7	1.5
5	#10400.00	48.2 PK	68.2	-20.0	1.96 V	217	35.8	12.4
6	15600.00	46.8 PK	74.0	-27.2	2.43 V	153	35.0	11.8
7	15600.00	35.3 AV	54.0	-18.7	2.43 V	153	23.5	11.8

REMARKS:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	56.4 PK	74.0	-17.6	2.04 H	242	54.5	1.9
2	5150.00	45.9 AV	54.0	-8.1	2.04 H	242	44.0	1.9
3	*5240.00	119.6 PK			2.04 H	242	118.2	1.4
4	*5240.00	107.8 AV			2.04 H	242	106.4	1.4
5	5350.00	56.4 PK	74.0	-17.6	2.04 H	242	55.0	1.4
6	5350.00	44.9 AV	54.0	-9.1	2.04 H	242	43.5	1.4
7	#10480.00	48.9 PK	68.2	-19.3	2.13 H	103	36.2	12.7
8	15720.00	46.0 PK	74.0	-28.0	1.32 H	304	34.4	11.6
9	15720.00	35.6 AV	54.0	-18.4	1.32 H	304	24.0	11.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.1 PK	74.0	-17.9	1.26 V	336	54.2	1.9
2	5150.00	45.4 AV	54.0	-8.6	1.26 V	336	43.5	1.9
3	*5240.00	123.0 PK			1.26 V	336	121.6	1.4
4	*5240.00	111.1 AV			1.26 V	336	109.7	1.4
5	5350.00	56.5 PK	74.0	-17.5	1.26 V	336	55.1	1.4
6	5350.00	44.9 AV	54.0	-9.1	1.26 V	336	43.5	1.4
7	#10480.00	48.8 PK	68.2	-19.4	1.94 V	211	36.1	12.7
8	15720.00	46.1 PK	74.0	-27.9	2.47 V	150	34.5	11.6
9	15720.00	35.4 AV	54.0	-18.6	2.47 V	150	23.8	11.6

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5632.47	58.0 PK	68.2	-10.2	1.68 H	259	56.0	2.0
2	*5745.00	121.1 PK			1.68 H	259	118.9	2.2
3	*5745.00	109.0 AV			1.68 H	259	106.8	2.2
4	#5965.45	54.4 PK	68.2	-13.8	1.68 H	259	51.6	2.8
5	11490.00	44.7 PK	74.0	-29.3	2.16 H	101	30.8	13.9
6	11490.00	32.7 AV	54.0	-21.3	2.16 H	101	18.8	13.9
7	#17235.00	42.0 PK	68.2	-26.2	1.36 H	317	24.7	17.3
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	#5639.47	60.5 PK	68.2	-7.7	1.51 V	247	58.5	2.0
2	*5745.00	122.2 PK			1.51 V	247	120.0	2.2
3	*5745.00	110.6 AV			1.51 V	247	108.4	2.2
4	#5962.40	54.8 PK	68.2	-13.4	1.51 V	247	52.0	2.8
5	11490.00	45.0 PK	74.0	-29.0	1.90 V	207	31.1	13.9
6	11490.00	33.1 AV	54.0	-20.9	1.90 V	207	19.2	13.9
7	#17235.00	42.7 PK	68.2	-25.5	2.44 V	177	25.4	17.3

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5630.06	56.9 PK	68.2	-11.3	1.64 H	258	54.9	2.0
2	*5785.00	121.3 PK			1.64 H	258	119.0	2.3
3	*5785.00	109.5 AV			1.64 H	258	107.2	2.3
4	#5957.92	55.0 PK	68.2	-13.2	1.64 H	258	52.2	2.8
5	11570.00	48.3 PK	74.0	-25.7	2.14 H	130	34.3	14.0
6	11570.00	33.3 AV	54.0	-20.7	2.14 H	130	19.3	14.0
7	#17355.00	46.7 PK	68.2	-21.5	1.40 H	305	28.8	17.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5629.62	60.0 PK	68.2	-8.2	1.47 V	247	58.0	2.0
2	*5785.00	121.0 PK			1.47 V	247	118.7	2.3
3	*5785.00	110.6 AV			1.47 V	247	108.3	2.3
4	#5932.55	54.7 PK	68.2	-13.5	1.47 V	247	52.1	2.6
5	11570.00	48.6 PK	74.0	-25.4	1.94 V	224	34.6	14.0
6	11570.00	33.8 AV	54.0	-20.2	1.94 V	224	19.8	14.0
7	#17355.00	46.9 PK	68.2	-21.3	2.47 V	168	29.0	17.9

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5623.20	57.7 PK	68.2	-10.5	1.64 H	259	55.7	2.0
2	*5825.00	121.6 PK			1.64 H	259	119.1	2.5
3	*5825.00	109.6 AV			1.64 H	259	107.1	2.5
4	#5946.77	55.7 PK	68.2	-12.5	1.64 H	259	52.9	2.8
5	11650.00	45.1 PK	74.0	-28.9	2.14 H	128	31.2	13.9
6	11650.00	33.0 AV	54.0	-21.0	2.14 H	128	19.1	13.9
7	#17475.00	43.1 PK	68.2	-25.1	1.29 H	298	24.1	19.0
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	#5590.04	60.0 PK	68.2	-8.2	1.56 V	243	58.0	2.0
2	*5825.00	122.7 PK			1.56 V	243	120.2	2.5
3	*5825.00	110.8 AV			1.56 V	243	108.3	2.5
4	#6010.61	57.1 PK	68.2	-11.1	1.56 V	243	54.3	2.8
5	11650.00	45.2 PK	74.0	-28.8	1.93 V	230	31.3	13.9
6	11650.00	33.2 AV	54.0	-20.8	1.93 V	230	19.3	13.9
7	#17475.00	43.0 PK	68.2	-25.2	2.46 V	163	24.0	19.0

REMARKS:

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

802.11ax (HE40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	66.5 PK	74.0	-7.5	2.07 H	245	64.6	1.9
2	5150.00	53.2 AV	54.0	-0.8	2.07 H	245	51.3	1.9
3	*5190.00	111.5 PK			2.07 H	245	109.8	1.7
4	*5190.00	100.9 AV			2.07 H	245	99.2	1.7
5	#10380.00	45.0 PK	68.2	-23.2	2.11 H	108	32.7	12.3
6	15570.00	43.4 PK	74.0	-30.6	1.32 H	320	31.4	12.0
7	15570.00	34.4 AV	54.0	-19.6	1.32 H	320	22.4	12.0
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	5150.00	66.8 PK	74.0	-7.2	2.52 V	331	64.9	1.9
2	5150.00	53.6 AV	54.0	-0.4	2.52 V	331	51.7	1.9
3	*5190.00	114.2 PK			2.52 V	331	112.5	1.7
4	*5190.00	103.7 AV			2.52 V	331	102.0	1.7
5	#10380.00	44.7 PK	68.2	-23.5	1.99 V	207	32.4	12.3
6	15570.00	43.0 PK	74.0	-31.0	2.44 V	151	31.0	12.0
7	15570.00	34.2 AV	54.0	-19.8	2.44 V	151	22.2	12.0

REMARKS:

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

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5230.00	118.7 PK			1.98 H	261	117.2	1.5
2	*5230.00	105.5 AV			1.98 H	261	104.0	1.5
3	5350.00	67.1 PK	74.0	-6.9	1.98 H	261	65.7	1.4
4	5350.00	53.0 AV	54.0	-1.0	1.98 H	261	51.6	1.4
5	#10460.00	45.0 PK	68.2	-23.2	2.08 H	110	32.4	12.6
6	15690.00	42.5 PK	74.0	-31.5	1.33 H	295	31.0	11.5
7	15690.00	33.5 AV	54.0	-20.5	1.33 H	295	22.0	11.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	122.1 PK			2.53 V	326	120.6	1.5
2	*5230.00	108.6 AV			2.53 V	326	107.1	1.5
3	5350.00	67.4 PK	74.0	-6.6	2.53 V	326	66.0	1.4
4	5350.00	53.0 AV	54.0	-1.0	2.53 V	326	51.6	1.4
5	#10460.00	44.8 PK	68.2	-23.4	1.95 V	228	32.2	12.6
6	15690.00	42.7 PK	74.0	-31.3	2.44 V	180	31.2	11.5
7	15690.00	33.7 AV	54.0	-20.3	2.44 V	180	22.2	11.5

REMARKS:

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

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5641.26	60.3 PK	68.2	-7.9	1.78 H	258	58.3	2.0
2	*5755.00	116.5 PK			1.78 H	258	114.3	2.2
3	*5755.00	106.4 AV			1.78 H	258	104.2	2.2
4	#5948.06	54.5 PK	68.2	-13.7	1.78 H	258	51.7	2.8
5	11510.00	44.7 PK	74.0	-29.3	2.11 H	110	30.8	13.9
6	11510.00	32.4 AV	54.0	-21.6	2.11 H	110	18.5	13.9
7	#17265.00	42.5 PK	68.2	-25.7	1.35 H	299	25.1	17.4
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	#5631.89	62.6 PK	68.2	-5.6	1.39 V	250	60.6	2.0
2	*5755.00	118.9 PK			1.39 V	250	116.7	2.2
3	*5755.00	107.4 AV			1.39 V	250	105.2	2.2
4	#5941.13	56.0 PK	68.2	-12.2	1.39 V	250	53.4	2.6
5	11510.00	44.4 PK	74.0	-29.6	1.89 V	225	30.5	13.9
6	11510.00	32.1 AV	54.0	-21.9	1.89 V	225	18.2	13.9
7	#17265.00	42.4 PK	68.2	-25.8	2.41 V	172	25.0	17.4

REMARKS:

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

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5604.40	58.5 PK	68.2	-9.7	1.56 H	256	56.5	2.0
2	*5795.00	117.2 PK			1.56 H	256	114.8	2.4
3	*5795.00	106.7 AV			1.56 H	256	104.3	2.4
4	#5932.02	55.8 PK	68.2	-12.4	1.56 H	256	53.2	2.6
5	11590.00	45.3 PK	74.0	-28.7	2.10 H	121	31.3	14.0
6	11590.00	32.5 AV	54.0	-21.5	2.10 H	121	18.5	14.0
7	#17385.00	43.0 PK	68.2	-25.2	1.33 H	307	24.8	18.2
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	#5641.21	59.6 PK	68.2	-8.6	1.35 V	246	57.6	2.0
2	*5795.00	119.0 PK			1.53 V	246	116.6	2.4
3	*5795.00	108.2 AV			1.53 V	246	105.8	2.4
4	#5925.67	58.3 PK	68.2	-9.9	1.35 V	246	55.7	2.6
5	11590.00	45.2 PK	74.0	-28.8	1.93 V	219	31.2	14.0
6	11590.00	32.2 AV	54.0	-21.8	1.93 V	219	18.2	14.0
7	#17385.00	43.0 PK	68.2	-25.2	2.43 V	156	24.8	18.2

REMARKS:

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

802.11ax (HE80)

CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	65.6 PK	74.0	-8.4	2.04 H	259	63.7	1.9
2	5150.00	53.1 AV	54.0	-0.9	2.04 H	259	51.2	1.9
3	*5210.00	110.2 PK			2.04 H	259	108.7	1.5
4	*5210.00	108.6 AV			2.04 H	259	107.1	1.5
5	5350.00	59.0 PK	74.0	-15.0	2.04 H	259	57.6	1.4
6	5350.00	45.5 AV	54.0	-8.5	2.04 H	259	44.1	1.4
7	#10420.00	44.7 PK	68.2	-23.5	2.06 H	125	32.3	12.4
8	15630.00	41.9 PK	74.0	-32.1	1.30 H	306	30.2	11.7
9	15630.00	33.2 AV	54.0	-20.8	1.30 H	306	21.5	11.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.2 PK	74.0	-7.8	2.34 V	329	64.3	1.9
2	5150.00	53.6 AV	54.0	-0.4	2.34 V	329	51.7	1.9
3	*5210.00	113.2 PK			2.34 V	329	111.7	1.5
4	*5210.00	101.4 AV			2.34 V	329	99.9	1.5
5	5350.00	58.5 PK	74.0	-15.5	2.34 V	329	57.1	1.4
6	5350.00	45.1 AV	54.0	-8.9	2.34 V	329	43.7	1.4
7	#10420.00	44.8 PK	68.2	-23.4	1.93 V	204	32.4	12.4
8	15630.00	42.3 PK	74.0	-31.7	2.38 V	159	30.6	11.7
9	15630.00	33.6 AV	54.0	-20.4	2.38 V	159	21.9	11.7

REMARKS:

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

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5646.31	62.6 PK	68.2	-5.6	1.67 H	258	60.6	2.0
2	*5775.00	111.3 PK			1.67 H	258	109.0	2.3
3	*5775.00	101.2 AV			1.67 H	258	98.9	2.3
4	#5932.52	58.5 PK	68.2	-9.7	1.67 H	258	55.9	2.6
5	11550.00	44.9 PK	74.0	-29.1	2.13 H	113	30.9	14.0
6	11550.00	32.7 AV	54.0	-21.3	2.13 H	113	18.7	14.0
7	#17325.00	41.8 PK	68.2	-26.4	1.29 H	313	24.1	17.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**#5649.70**	**67.9 PK**	**68.2**	**-0.3**	**1.72 V**	**244**	**65.9**	**2.0**
2	*5775.00	115.4 PK			1.72 V	244	113.1	2.3
3	*5775.00	102.6 AV			1.72 V	244	100.3	2.3
4	#5929.55	62.6 PK	68.2	-5.6	1.72 V	244	60.0	2.6
5	11550.00	44.4 PK	74.0	-29.6	1.92 V	227	30.4	14.0
6	11550.00	32.3 AV	54.0	-21.7	1.92 V	227	18.3	14.0
7	#17325.00	41.6 PK	68.2	-26.6	2.39 V	156	23.9	17.7

REMARKS:

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

Below 1GHz Data:

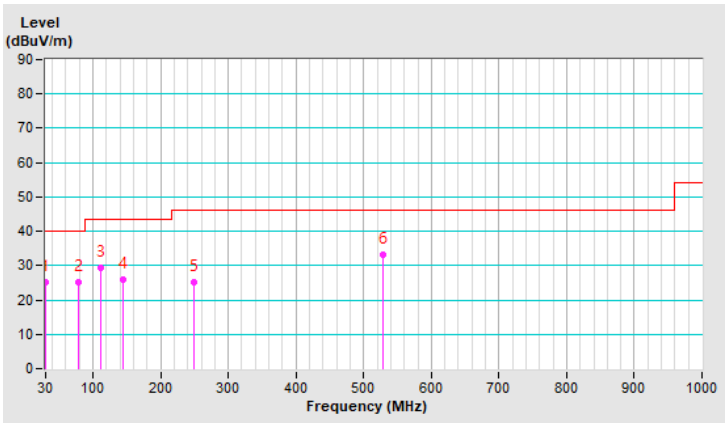
802.11ax (HE20)

CHANNEL	TX Channel 149	**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	30.53	25.1 QP	40.0	-14.9	1.00 H	119	39.3	-14.2
2	79.28	25.2 QP	40.0	-14.8	2.00 H	71	42.5	-17.3
3	112.31	29.4 QP	43.5	-14.1	2.00 H	94	45.0	-15.6
4	144.90	25.8 QP	43.5	-17.7	2.00 H	235	38.6	-12.8
5	250.01	25.3 QP	46.0	-20.7	1.00 H	227	39.2	-13.9
6	528.41	33.3 QP	46.0	-12.7	1.50 H	231	40.2	-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.

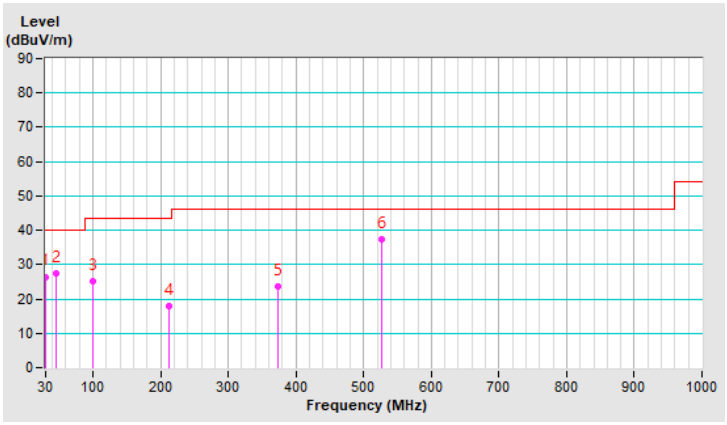


CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	30.58	26.5 QP	40.0	-13.5	1.00 V	1	40.7	-14.2
2	44.65	27.4 QP	40.0	-12.6	1.00 V	45	40.2	-12.8
3	99.99	25.3 QP	43.5	-18.2	1.50 V	187	42.5	-17.2
4	212.22	17.9 QP	43.5	-25.6	1.00 V	71	33.9	-16.0
5	374.27	23.6 QP	46.0	-22.4	1.00 V	131	33.8	-10.2
6	527.05	37.4 QP	46.0	-8.6	1.50 V	214	44.3	-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. 05, 2020

4.2.3 Test Procedure

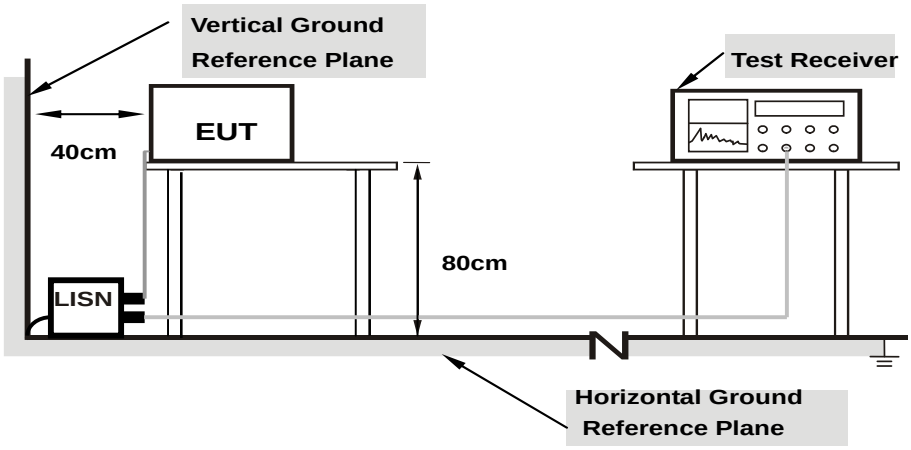
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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: All modes of operation were investigated and the worst-case emissions are reported.

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 Condition

Same as 4.1.6.

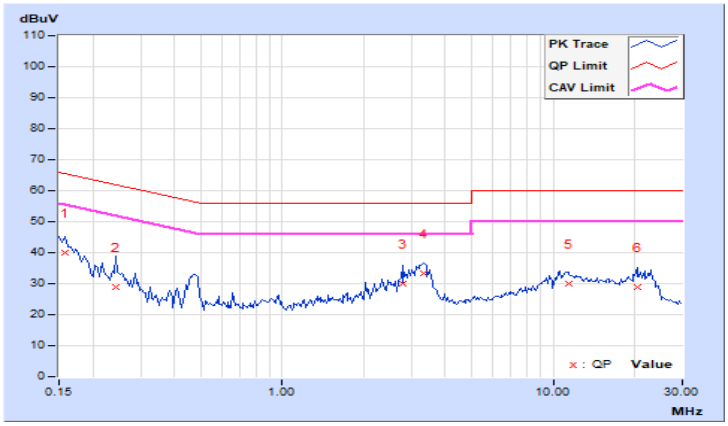
4.2.7 Test Results

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	0.15781	9.99	29.91	18.45	39.90	28.44	65.58	55.58	-25.68	-27.14
2	0.24375	9.99	18.77	10.64	28.76	20.63	61.97	51.97	-33.21	-31.34
3	2.80078	10.18	19.92	9.51	30.10	19.69	56.00	46.00	-25.90	-26.31
4	3.33984	10.21	23.24	10.32	33.45	20.53	56.00	46.00	-22.55	-25.47
5	11.38281	10.75	19.35	14.06	30.10	24.81	60.00	50.00	-29.90	-25.19
6	20.40625	11.38	17.62	11.95	29.00	23.33	60.00	50.00	-31.00	-26.67

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

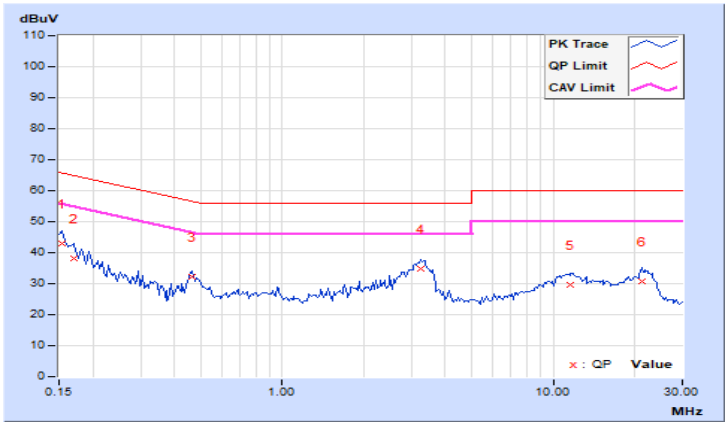


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	33.09	22.32	43.08	32.31	65.79	55.79	-22.71	-23.48
2	0.16953	9.99	28.34	17.22	38.33	27.21	64.98	54.98	-26.65	-27.77
3	**0.46250**	**10.01**	**22.34**	**18.03**	**32.35**	**28.04**	**56.65**	**46.65**	**-24.30**	**-18.61**
4	3.26563	10.18	24.77	12.27	34.95	22.45	56.00	46.00	-21.05	-23.55
5	11.57813	10.67	18.91	13.76	29.58	24.43	60.00	50.00	-30.42	-25.57
6	21.21094	11.14	19.60	12.94	30.74	24.08	60.00	50.00	-29.26	-25.92

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 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Client device	250mW (24 dBm)
U-NII-2A			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 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.

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

Method PM is 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.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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 Results

CDD Mode

POWER OUTPUT

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
36	5180	20.56	21.24	20.54	21.03	486.813	26.87	30.00	Pass
40	5200	22.23	22.46	22.31	22.46	689.72	28.39	30.00	Pass
48	5240	22.02	22.57	22.41	22.51	692.357	28.40	30.00	Pass
149	5745	23.15	23.58	24.04	23.64	919.292	29.63	30.00	Pass
157	5785	23.06	23.43	24.02	23.49	898.3	29.53	30.00	Pass
165	5825	22.98	23.24	23.91	23.32	870.292	29.40	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
36	5180	21.07	21.37	21.09	21.22	525.989	27.21	30.00	Pass
40	5200	21.91	22.27	22.16	22.21	654.672	28.16	30.00	Pass
48	5240	21.94	22.17	21.98	22.24	646.386	28.10	30.00	Pass
149	5745	23.02	23.29	23.89	23.53	884.082	29.46	30.00	Pass
157	5785	22.88	23.16	23.85	23.43	864.056	29.37	30.00	Pass
165	5825	22.91	23.12	23.96	23.28	862.25	29.36	30.00	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
38	5190	19.07	19.39	19.02	19.34	333.32	25.23	30.00	Pass
46	5230	22.87	23.34	23.22	23.58	847.345	29.28	30.00	Pass
151	5755	22.86	23.25	23.38	23.36	839.087	29.24	30.00	Pass
159	5795	22.99	23.17	23.24	23.32	832.205	29.20	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
42	5210	18.02	19.67	19.01	19.44	323.588	25.10	30.00	Pass
155	5775	21.21	21.07	21.47	20.87	522.529	27.18	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				
36	5180	21.29	21.63	21.38	21.46	557.495	27.46	30.00	Pass
40	5200	22.23	22.64	22.41	22.40	698.724	28.44	30.00	Pass
48	5240	22.18	22.48	22.18	22.44	682.791	28.34	30.00	Pass
149	5745	23.23	23.52	24.16	23.77	934.131	29.70	30.00	Pass
157	5785	23.08	23.40	24.14	23.69	915.314	29.62	30.00	Pass
165	5825	23.13	23.36	24.17	23.51	907.964	29.58	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				
38	5190	19.30	19.63	19.27	19.61	352.886	25.48	30.00	Pass
46	5230	23.11	23.57	23.59	23.84	902.817	29.56	30.00	Pass
151	5755	23.12	23.57	23.73	23.61	898.289	29.53	30.00	Pass
159	5795	23.11	23.42	23.54	23.56	877.361	29.43	30.00	Pass

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
42	5210	19.20	19.89	19.25	19.69	357.926	25.54	30.00	Pass
155	5775	21.44	21.28	21.73	21.09	551.057	27.41	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
36	5180	21.07	21.37	21.09	21.22	525.989	27.21	28.50	Pass
40	5200	21.91	22.27	22.16	22.21	654.672	28.16	28.50	Pass
48	5240	21.94	22.17	21.98	22.24	646.386	28.10	28.50	Pass
149	5745	21.81	22.02	22.72	22.27	666.649	28.24	28.50	Pass
157	5785	21.77	21.82	22.70	22.11	651.133	28.14	28.50	Pass
165	5825	21.74	21.79	22.61	22.15	646.736	28.11	28.50	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 4] = 7.5 dBi > 6dBi, so the power limit shall be reduced to 30-(7.5-6) = 28.5 dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
38	5190	19.07	19.39	19.02	19.34	333.32	25.23	28.50	Pass
46	5230	21.92	22.19	22.31	22.40	665.169	28.23	28.50	Pass
151	5755	21.91	22.32	22.35	22.31	667.854	28.25	28.50	Pass
159	5795	21.98	22.34	22.49	22.34	677.972	28.31	28.50	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 4] = 7.5 dBi > 6dBi, so the power limit shall be reduced to 30-(7.5-6) = 28.5 dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
42	5210	18.02	19.67	19.01	19.44	323.588	25.10	28.50	Pass
155	5775	21.21	21.07	21.47	20.87	522.529	27.18	28.50	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 4] = 7.5 dBi > 6dBi, so the power limit shall be reduced to 30-(7.5-6) = 28.5 dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
36	5180	21.29	21.63	21.38	21.46	557.495	27.46	28.50	Pass
40	5200	22.23	22.64	22.41	22.40	698.724	28.44	28.50	Pass
48	5240	22.18	22.48	22.18	22.44	682.791	28.34	28.50	Pass
149	5745	22.01	22.24	22.93	22.47	699.289	28.45	28.50	Pass
157	5785	21.94	22.21	22.86	22.37	688.437	28.38	28.50	Pass
165	5825	21.98	22.16	22.83	22.32	684.673	28.35	28.50	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.5 dBi > 6dBi, so the power limit shall be reduced to 30-(7.5-6) = 28.5 dBm.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
38	5190	19.30	19.63	19.27	19.61	352.886	25.48	28.50	Pass
46	5230	22.23	22.39	22.40	22.51	692.507	28.40	28.50	Pass
151	5755	21.93	22.39	22.45	22.50	682.956	28.34	28.50	Pass
159	5795	22.02	22.31	22.49	22.53	685.916	28.36	28.50	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.5 dBi > 6dBi, so the power limit shall be reduced to 30-(7.5-6) = 28.5 dBm.

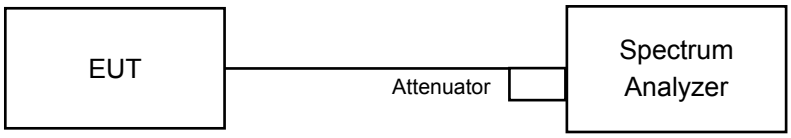
802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
42	5210	19.20	19.89	19.25	19.69	357.926	25.54	28.50	Pass
155	5775	21.44	21.28	21.73	21.09	551.057	27.41	28.50	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.5 dBi > 6dBi, so the power limit shall be reduced to 30-(7.5-6) = 28.5 dBm.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

CDD Mode

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain0	Chain1	Chain2	Chain3
36	5180	17.04	16.92	17.04	17.04
40	5200	16.92	16.92	16.92	16.92
48	5240	17.04	16.92	17.04	17.04
149	5745	17.04	17.16	17.28	17.04
157	5785	17.04	17.28	17.40	17.28
165	5825	17.04	17.40	17.40	17.28

802.11ax (HE20)

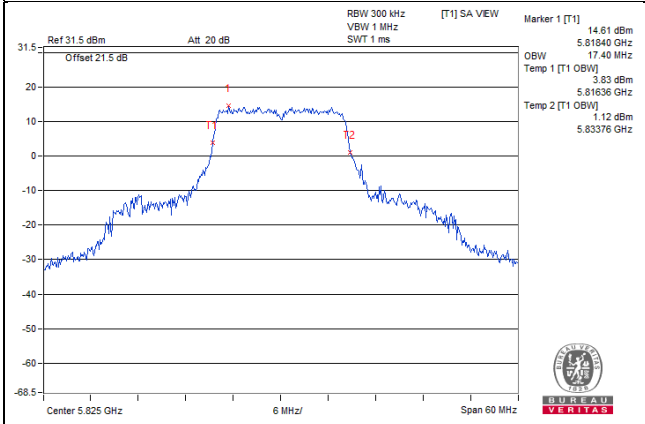
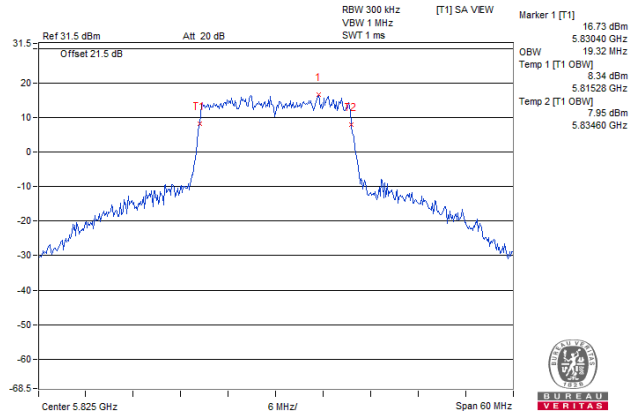
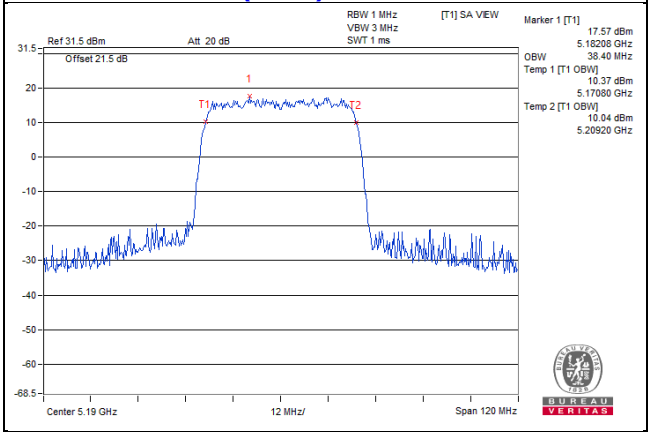
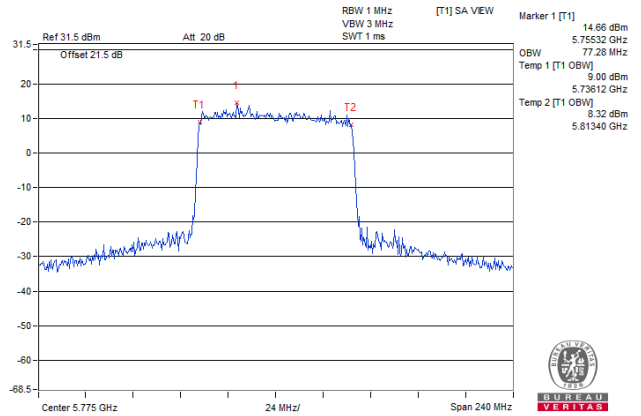
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain0	Chain1	Chain2	Chain3
36	5180	19.20	19.20	19.20	19.20
40	5200	19.20	19.20	19.20	19.20
48	5240	18.12	19.20	19.08	19.20
149	5745	19.20	19.20	19.32	17.04
157	5785	19.08	19.20	19.32	17.28
165	5825	19.20	19.32	19.32	17.28

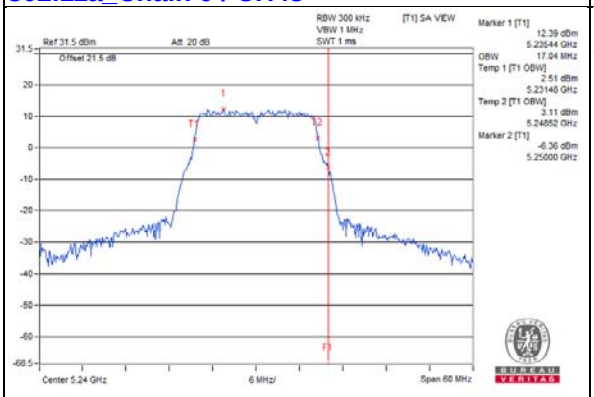
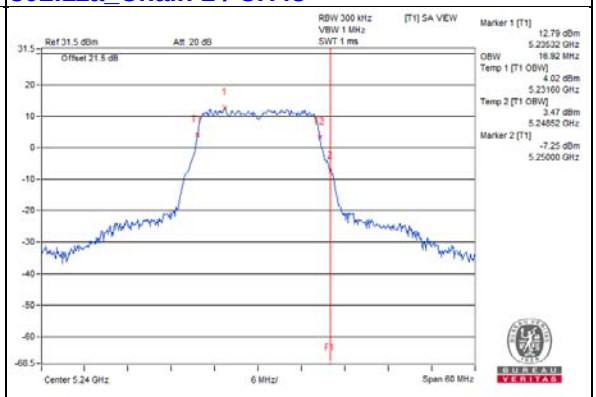
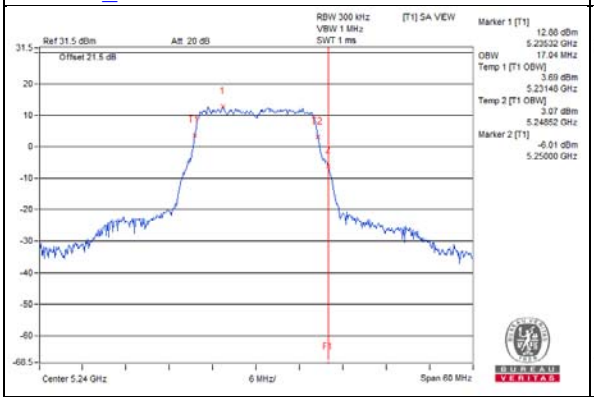
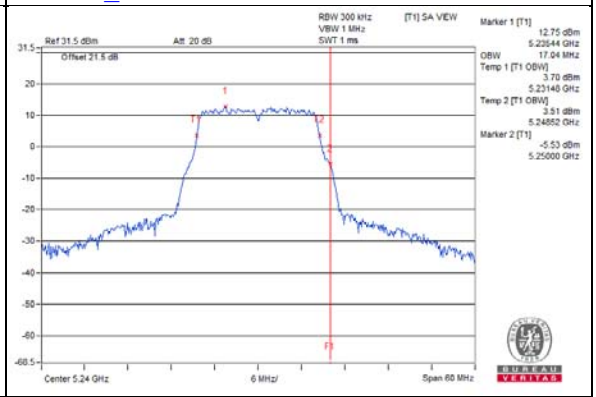
802.11ax (HE40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain0	Chain1	Chain2	Chain3
38	5190	37.92	37.92	37.92	38.40
46	5230	36.96	37.92	37.92	37.92
151	5755	37.92	37.92	38.16	38.16
159	5795	37.92	38.16	38.16	37.20

802.11ax (HE80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain0	Chain1	Chain2	Chain3
42	5210	76.80	76.80	77.28	76.80
155	5775	77.28	76.80	77.28	77.28

Spectrum Plot of Max. Value	
802.11a_Chain 1 / CH165	**802.11ax (HE20)_Chain 1 / CH165**
	
802.11ax (HE40)_Chain 3 / CH38	**802.11ax (HE80)_Chain 0 / CH155**
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11a_Chain 0 / CH48	**802.11a_Chain 1 / CH48**
	
802.11a_Chain 2 / CH48	**802.11a_Chain 3 / CH48**
	
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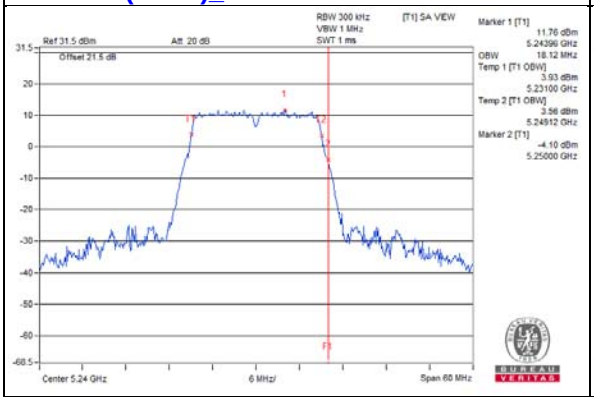
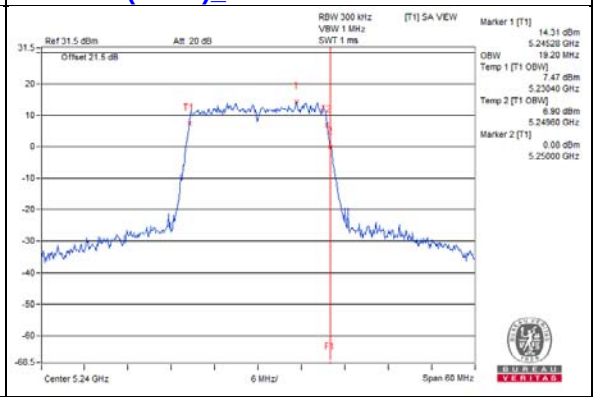
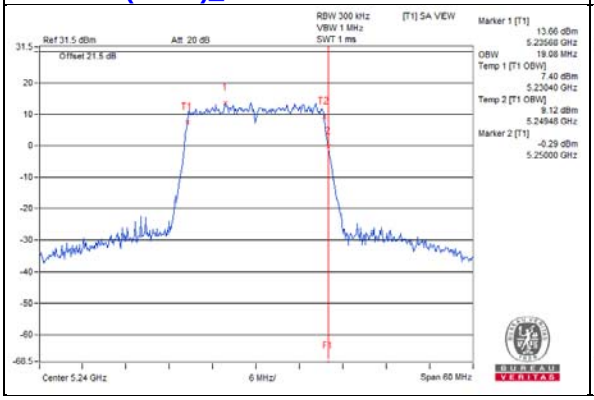
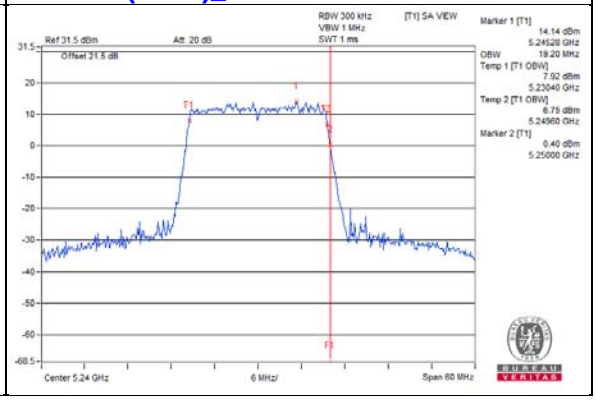
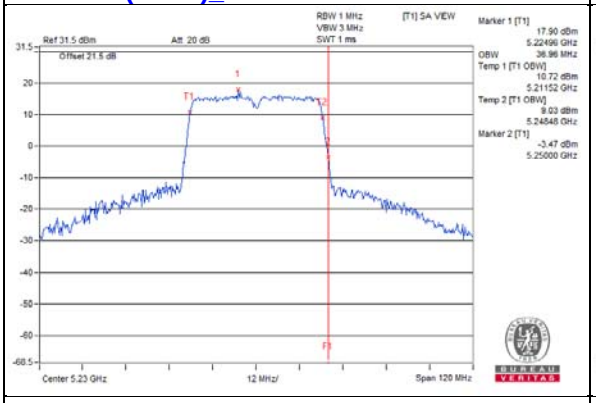
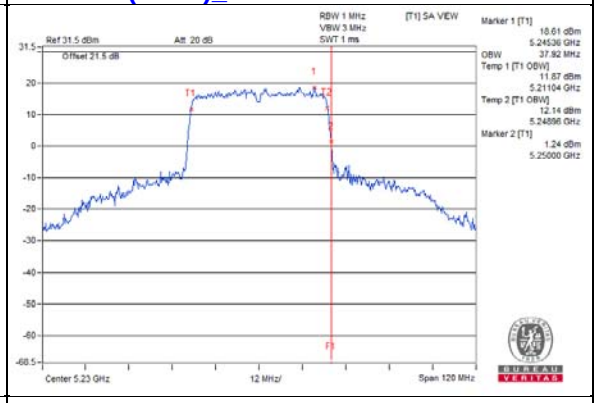
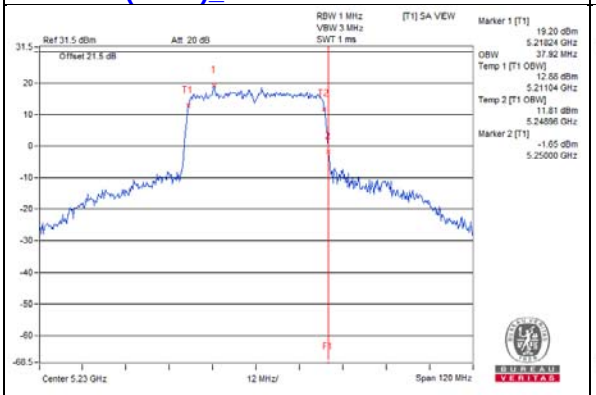
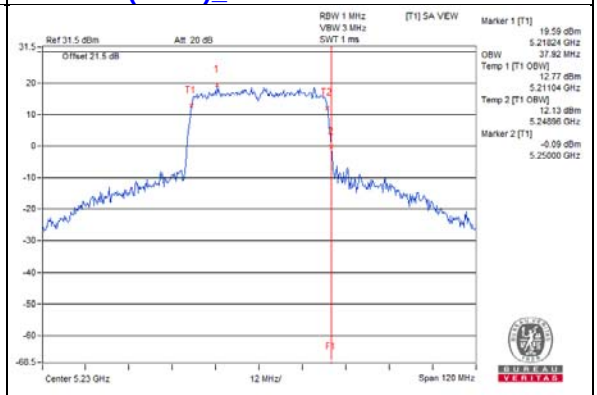
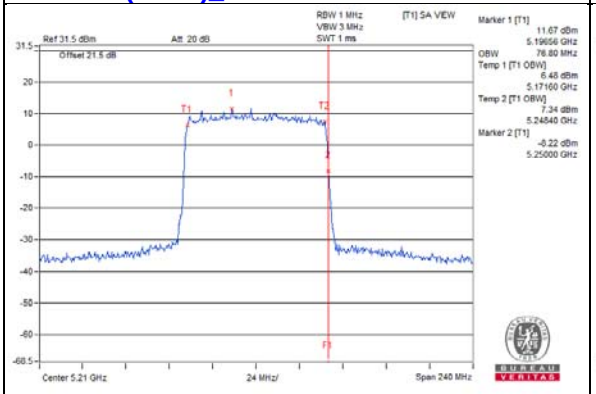
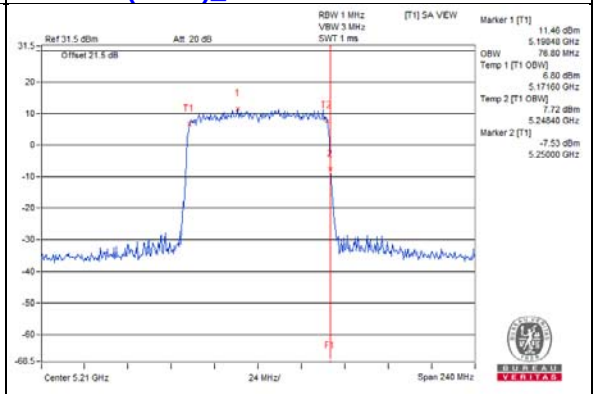
	
802.11ax (HE20)_Chain 2 / CH48	**802.11ax (HE20)_Chain 3 / CH48**
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11ax (HE40)_Chain 0 / CH46	**802.11ax (HE40)_Chain 1 / CH46**
	
802.11ax (HE40)_Chain 2 / CH46	**802.11ax (HE40)_Chain 3 / CH46**
	
802.11ax (HE80)_Chain 0 / CH42	**802.11ax (HE80)_Chain 1 / CH42**
	
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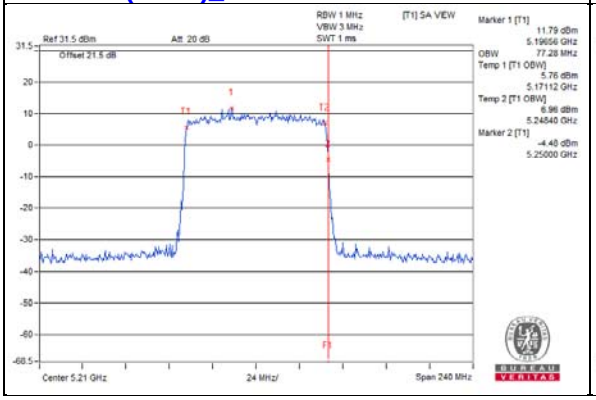
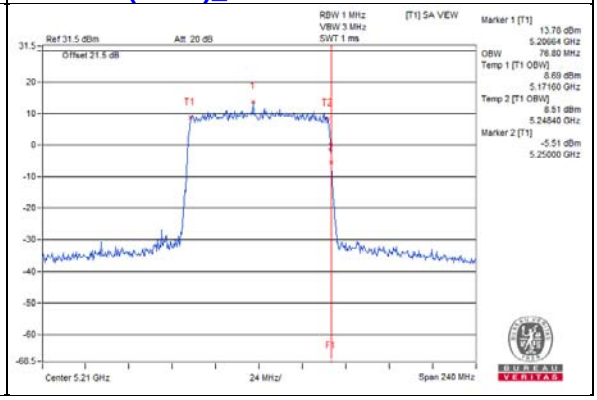
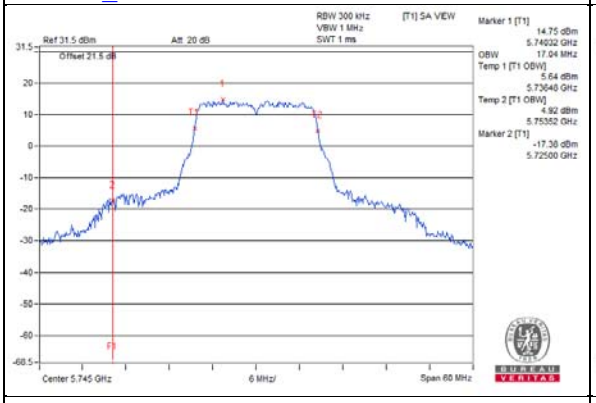
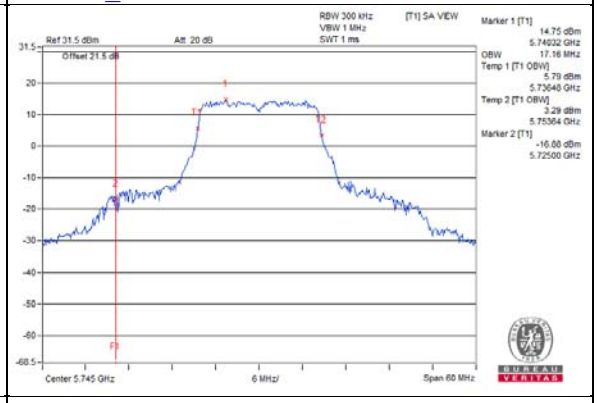
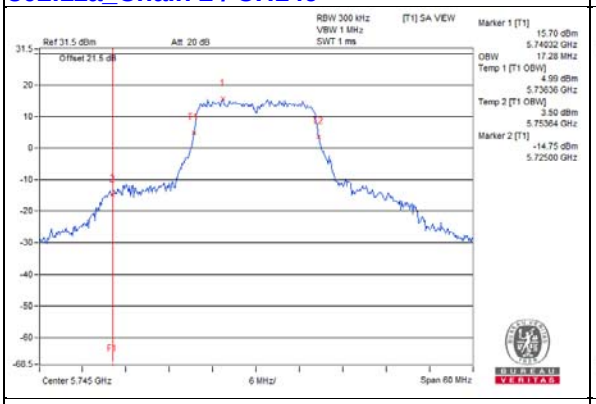
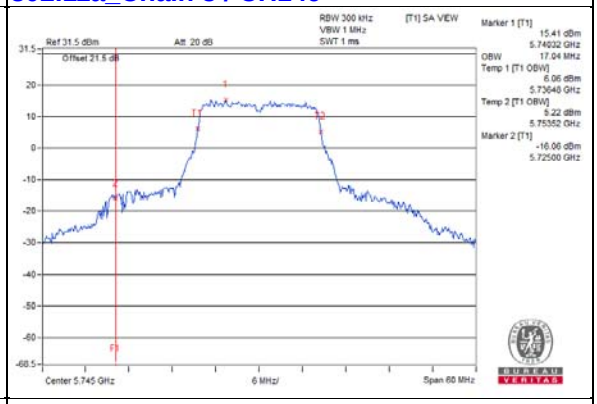
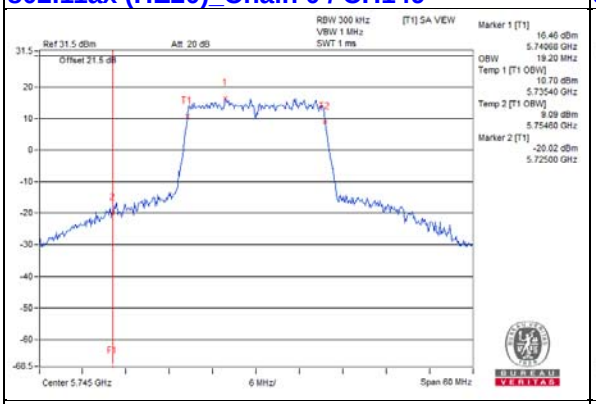
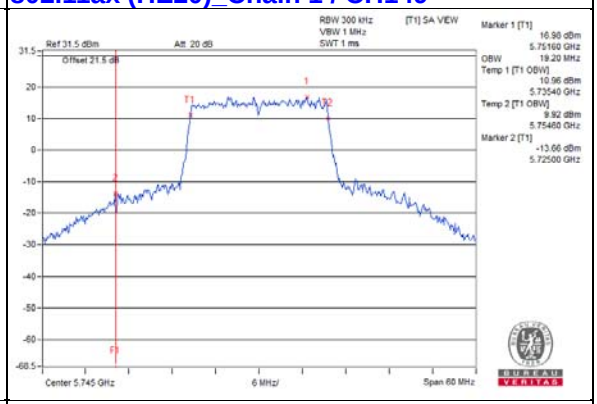
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11a_Chain 0 / CH149	**802.11a_Chain 1 / CH149**
	
802.11a_Chain 2 / CH149	**802.11a_Chain 3 / CH149**
	
802.11ax (HE20)_Chain 0 / CH149	**802.11ax (HE20)_Chain 1 / CH149**
	
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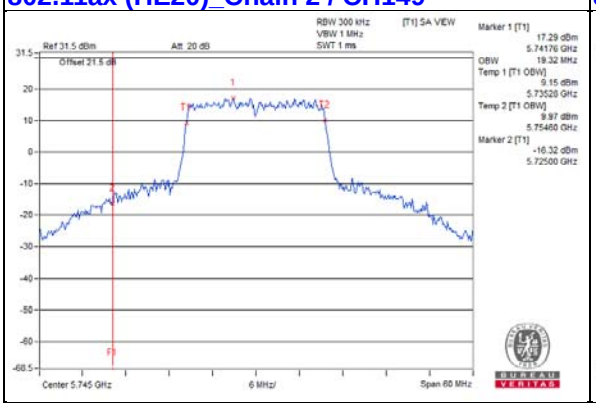
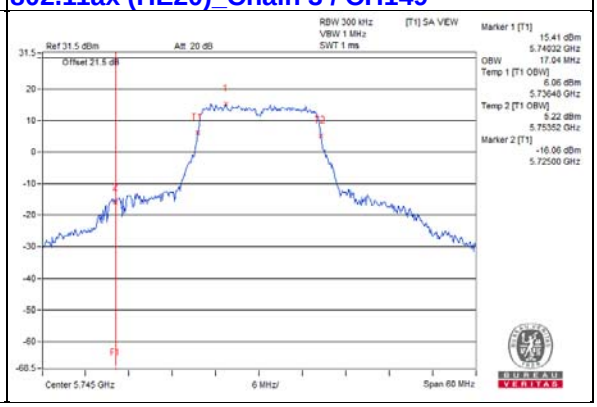
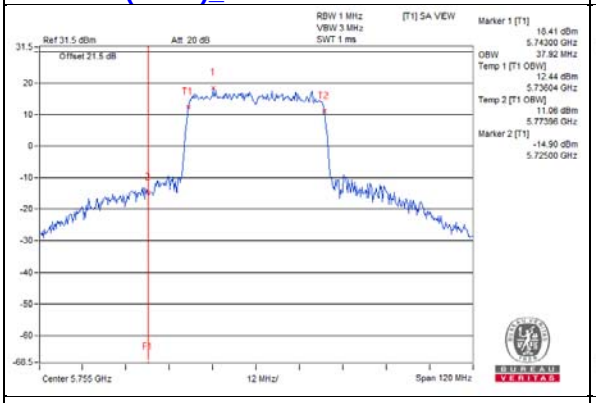
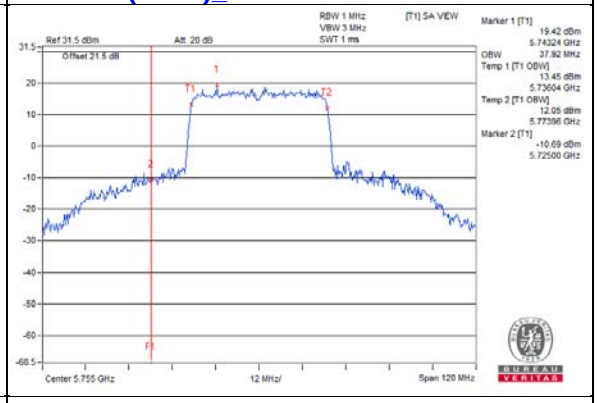
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11ax (HE40)_Chain 0 / CH151	**802.11ax (HE40)_Chain 1 / CH151**
	
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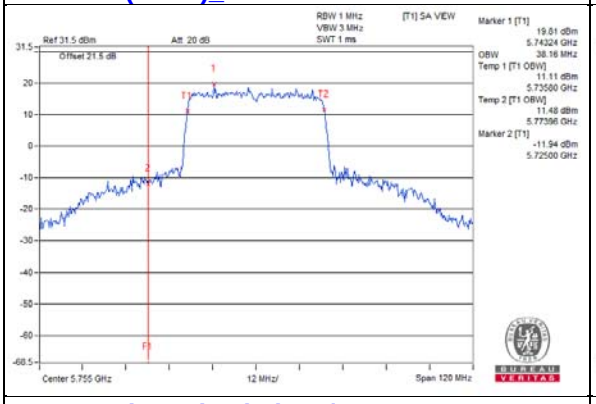	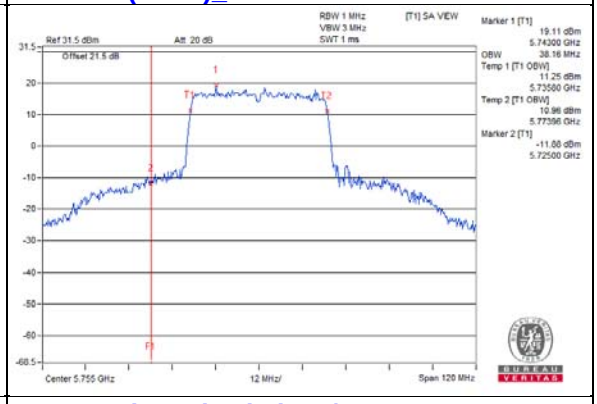
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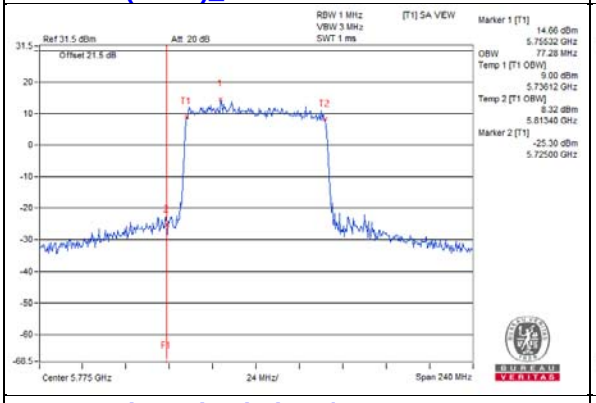
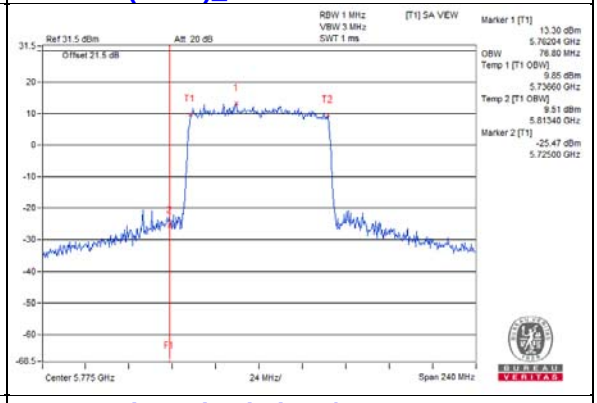
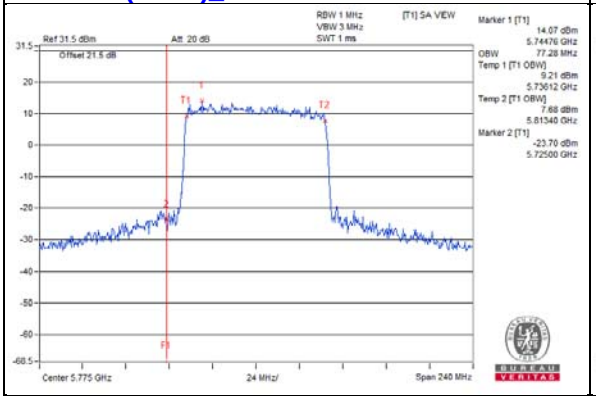
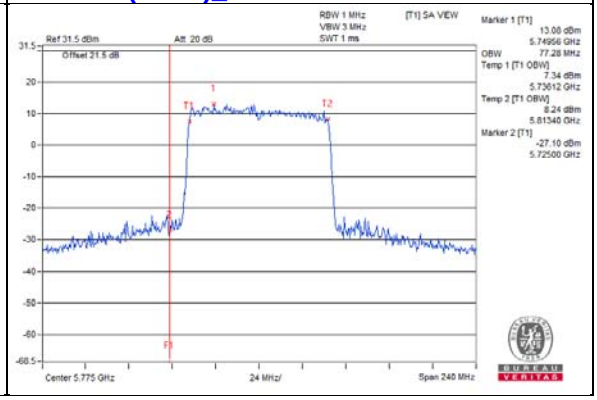
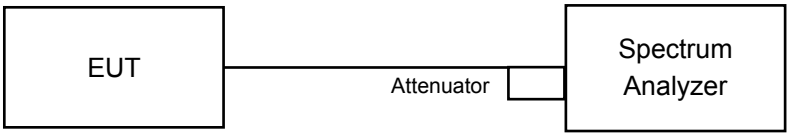
	
802.11ax (HE80)_Chain 2 / CH155	**802.11ax (HE80)_Chain 3 / CH155**
	

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
	√	Indoor Access Point	
		Client device	11dBm/ MHz
U-NII-2A			11dBm/ MHz
U-NII-2C			11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

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 U-NII-1 band:

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add 10 log (1/duty cycle)

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

For U-NII-1 band:

802.11a

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
36	5180	7.81	8.09	7.72	8.03	0.11	13.94	15.50	Pass
40	5200	9.09	9.37	9.08	9.23	0.11	15.21	15.50	Pass
48	5240	8.99	9.30	8.96	9.23	0.11	15.14	15.50	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain is 7.5 dBi > 6dBi, so the power density limit shall be reduced to 17-(7.5-6) = 15.5 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
36	5180	7.43	7.81	7.34	7.45	0.13	13.53	15.50	Pass
40	5200	9.34	9.02	9.53	9.49	0.13	15.37	15.50	Pass
48	5240	9.33	9.41	9.54	9.45	0.13	15.45	15.50	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain is 7.5 dBi > 6dBi, so the power density limit shall be reduced to 17-(7.5-6) = 15.5 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
38	5190	2.37	3.47	2.54	2.77	0.13	8.83	15.50	Pass
46	5230	6.11	7.03	6.76	6.98	0.13	12.76	15.50	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain is 7.5 dBi > 6dBi, so the power density limit shall be reduced to 17-(7.5-6) = 15.5 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

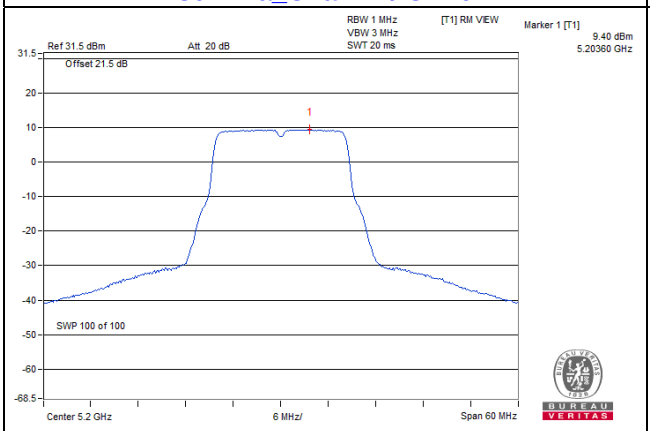
802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3				
42	5210	-0.59	0.18	-0.44	0.14	0.12	5.86	15.50	Pass

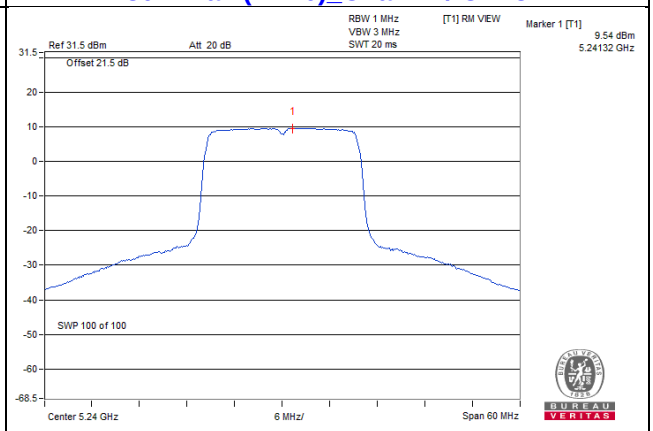
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain is 7.5 dBi > 6dBi, so the power density limit shall be reduced to 17-(7.5-6) = 15.5 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

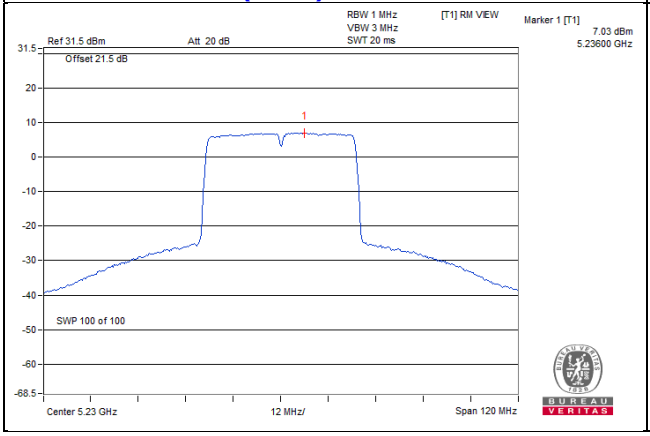
802.11a_Chain 1 / CH40



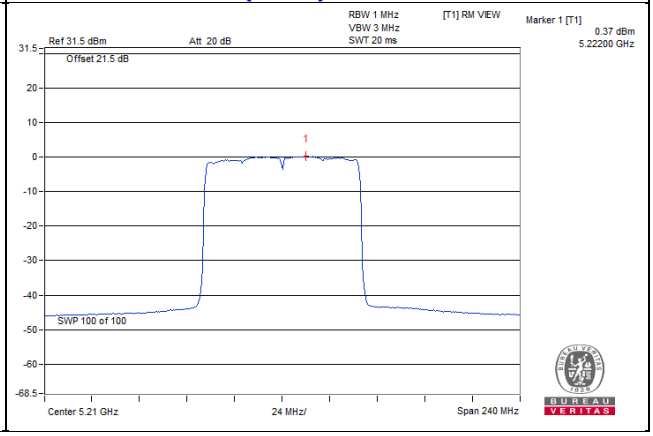
802.11ax (HE20)_Chain 2 / CH48



802.11ax (HE40)_Chain 1 / CH46



802.11ax (HE80)_Chain 1 / CH42



For U-NII-3 band:

802.11a

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3					
149	5745	1.97	2.29	2.49	2.59	0.11	8.48	10.70	28.50	Pass
157	5785	1.96	2.12	2.85	2.52	0.11	8.51	10.73	28.50	Pass
165	5825	1.70	1.94	2.70	2.25	0.11	8.30	10.52	28.50	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 7.5 dBi > 6dBi, so the power density limit shall be reduced to 30-(7.5-6) = 28.5 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3					
149	5745	0.96	1.58	1.80	2.59	0.13	7.92	10.14	28.50	Pass
157	5785	0.93	1.37	1.68	2.52	0.13	7.82	10.04	28.50	Pass
165	5825	0.69	1.10	1.76	2.25	0.13	7.64	9.86	28.50	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 7.5 dBi > 6dBi, so the power density limit shall be reduced to 30-(7.5-6) = 28.5 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3					
151	5755	-3.06	-2.40	-2.22	-2.21	0.13	3.69	5.91	28.50	Pass
159	5795	-3.26	-2.59	-2.39	-2.24	0.13	3.54	5.76	28.50	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 7.5 dBi > 6dBi, so the power density limit shall be reduced to 30-(7.5-6) = 28.5 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

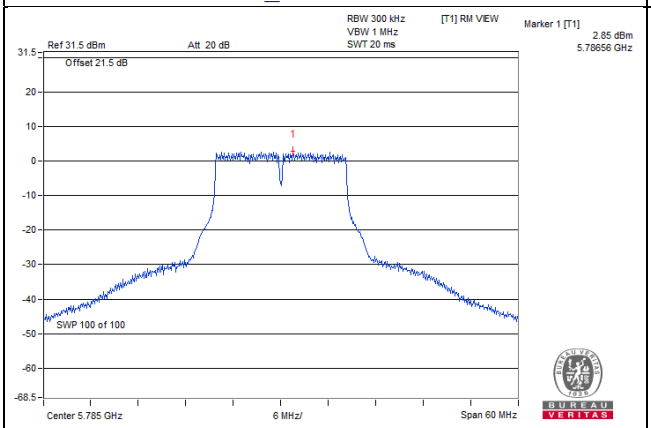
802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3					
155	5775	-7.41	-7.87	-6.88	-7.69	0.12	-1.31	0.91	28.50	Pass

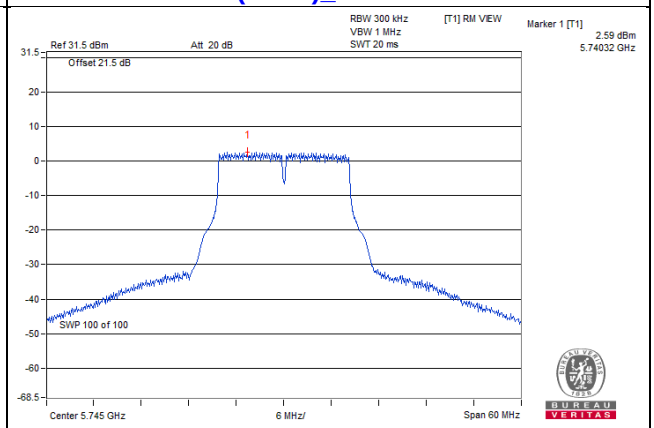
Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain is 7.5 dBi > 6dBi, so the power density limit shall be reduced to 30-(7.5-6) = 28.5 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

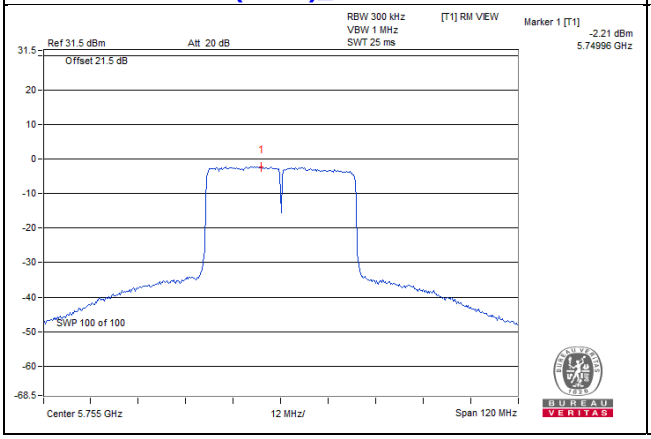
802.11a_Chain 2 / CH157



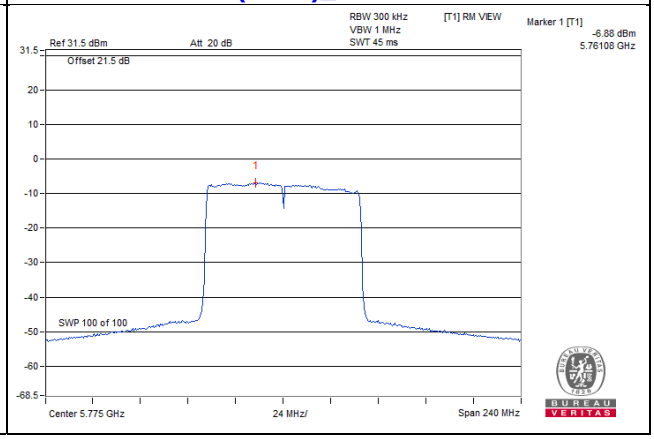
802.11ax (HE20)_Chain 3 / CH149



802.11ax (HE40)_Chain 3 / CH151



802.11ax (HE80)_Chain 2 / CH155

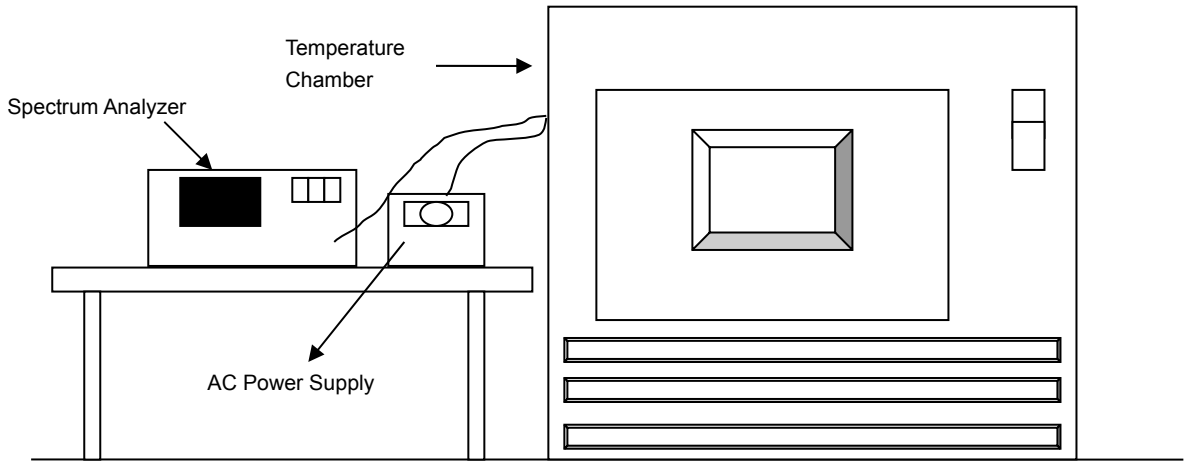


4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation

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

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.

b. Turn the EUT on and couple its output to a spectrum analyzer.

c. Turn the EUT off and set the chamber to the highest temperature specified.

d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.

e. Repeat step (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.

f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	120	5180.0197	Pass	5180.0188	Pass	5180.0214	Pass	5180.0176	Pass
30	120	5179.9794	Pass	5179.9753	Pass	5179.9768	Pass	5179.9784	Pass
20	120	5179.9948	Pass	5179.9945	Pass	5179.9922	Pass	5179.9937	Pass
10	120	5179.9849	Pass	5179.9834	Pass	5179.9832	Pass	5179.9849	Pass
0	120	5180.0081	Pass	5180.0094	Pass	5180.0081	Pass	5180.0073	Pass

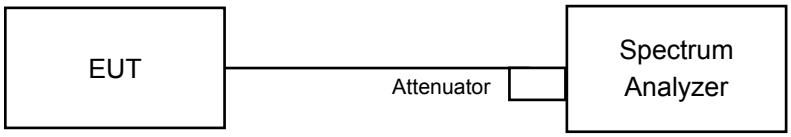
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5179.9945	Pass	5179.9936	Pass	5179.9914	Pass	5179.9928	Pass
	120	5179.9948	Pass	5179.9945	Pass	5179.9922	Pass	5179.9937	Pass
	102	5179.995	Pass	5179.9935	Pass	5179.9912	Pass	5179.9934	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

CDD Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3		
149	5745	16.46	16.44	16.43	16.45	0.5	Pass
157	5785	16.44	16.45	16.42	16.44	0.5	Pass
165	5825	16.44	16.44	16.42	16.44	0.5	Pass

802.11ax (HE20)

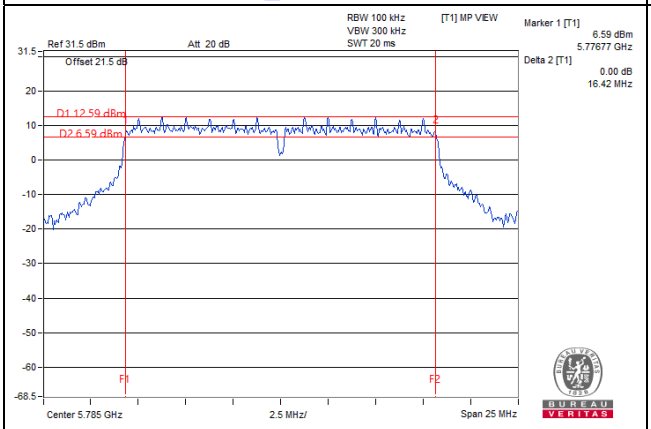
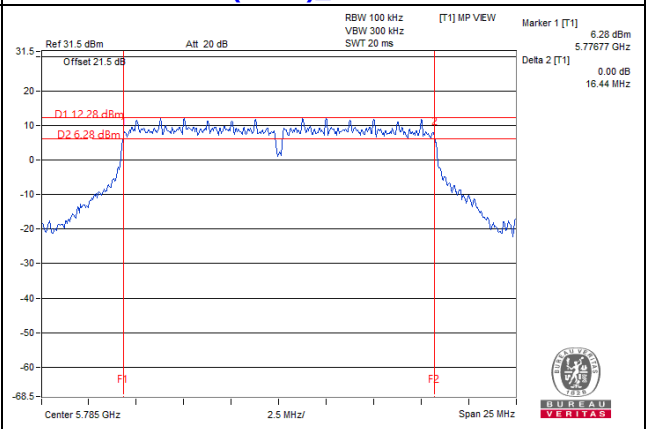
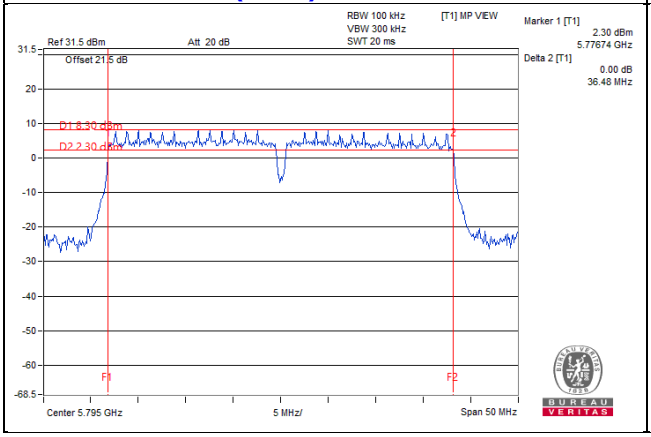
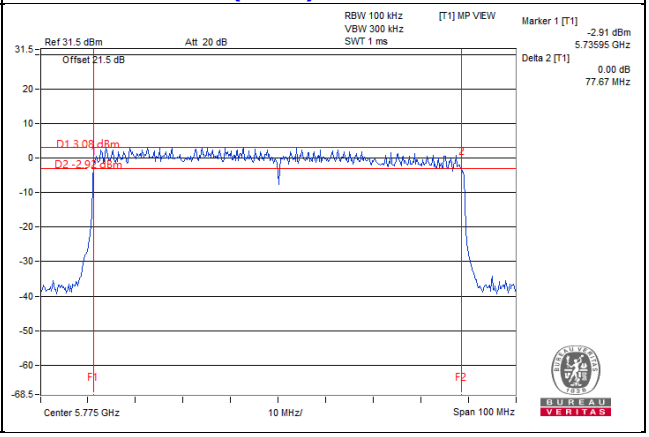
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3		
149	5745	19.12	19.17	19.11	16.45	0.5	Pass
157	5785	19.12	19.12	19.14	16.44	0.5	Pass
165	5825	19.1	19.11	19.12	16.44	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3		
151	5755	37.93	37.92	37.86	37.91	0.5	Pass
159	5795	37.93	37.9	37.91	36.48	0.5	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain0	Chain1	Chain2	Chain3		
155	5775	77.69	77.84	77.67	77.67	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 2 / CH157	**802.11ax (HE20)_Chain 3 / CH157**
	
802.11ax (HE40)_Chain 3 / CH159	**802.11ax (HE80)_Chain 3 / CH155**
	

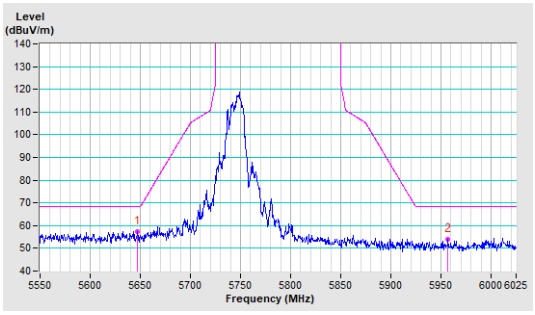
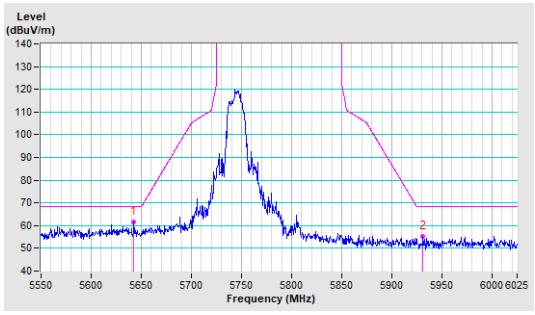
5 Pictures of Test Arrangements

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

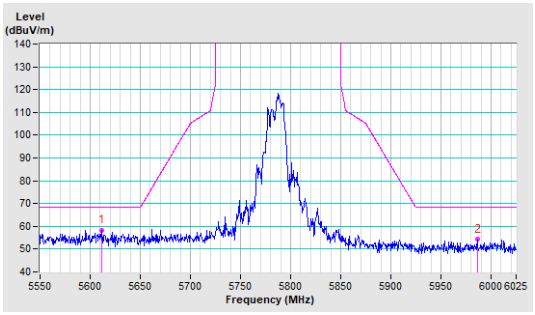
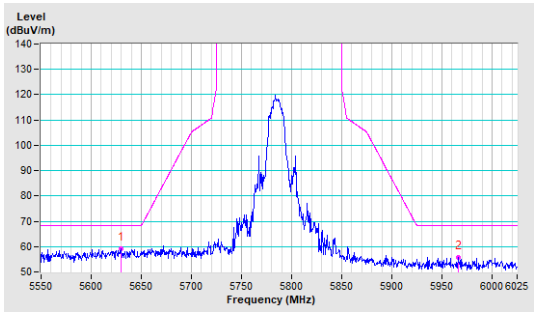
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

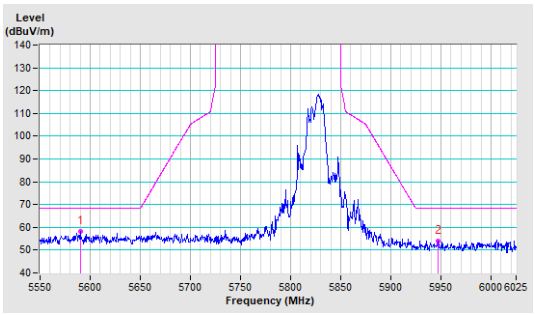
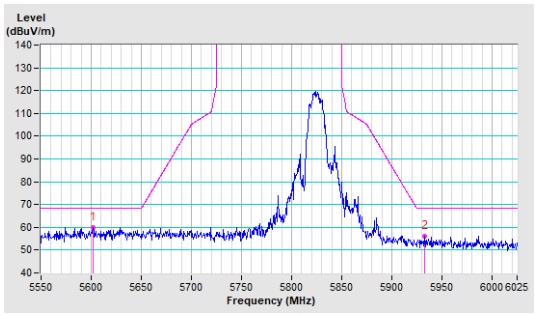
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

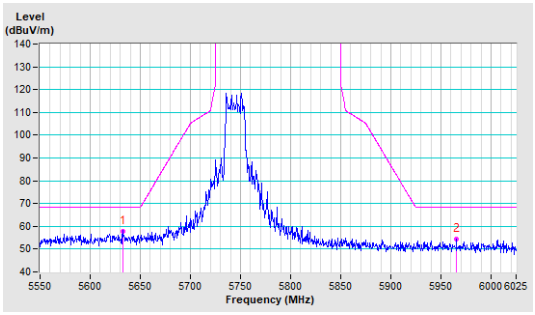
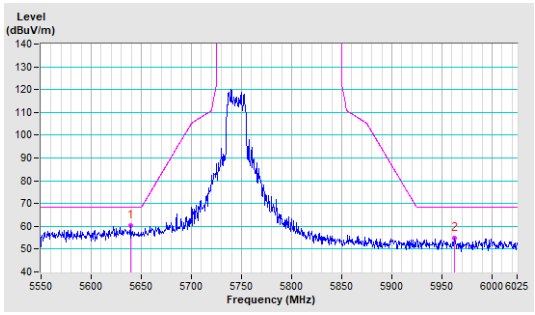
Horizontal	Vertical
	

CH 165 5825 MHz

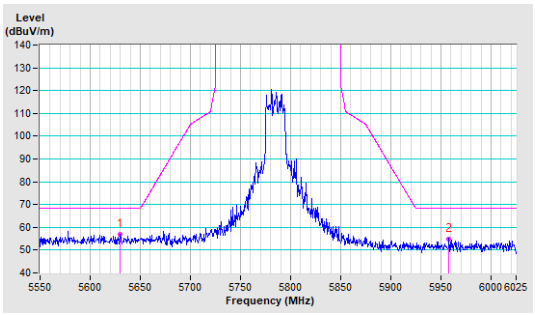
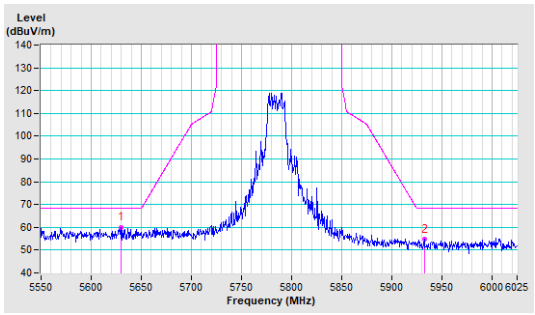
Horizontal	Vertical
	

802.11ax (HE20)

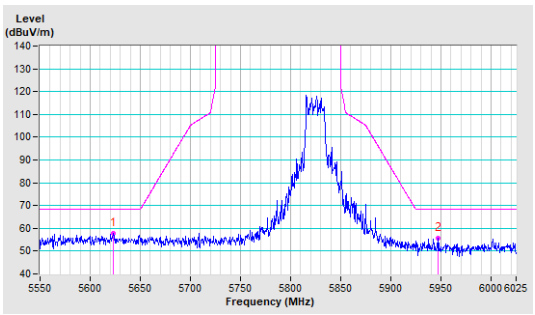
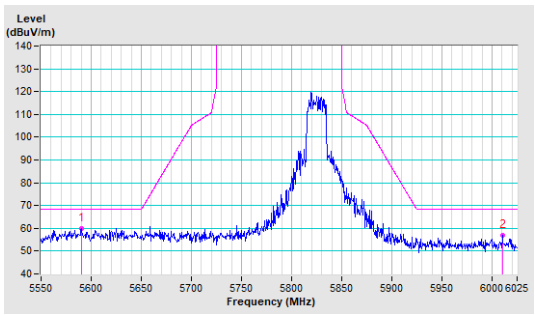
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

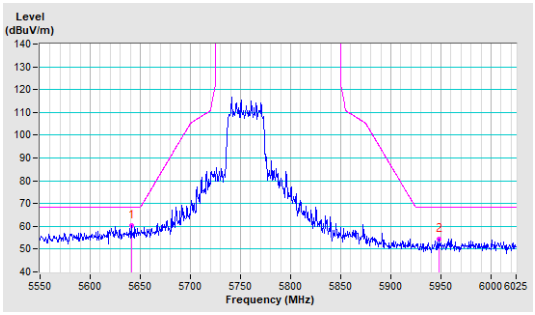
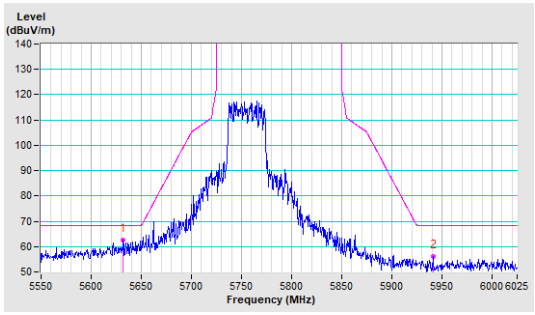
Horizontal	Vertical
	

CH 165 5825 MHz

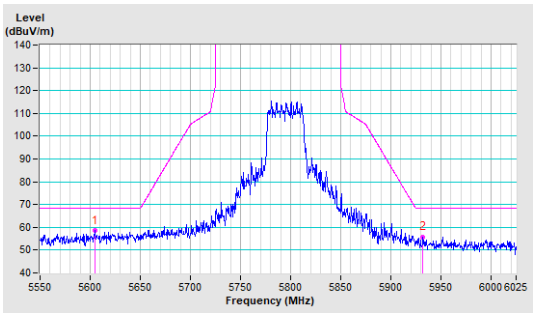
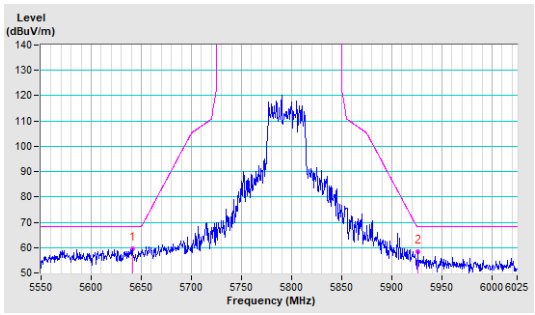
Horizontal	Vertical
	

802.11ax (HE40)

CH 151 5755 MHz

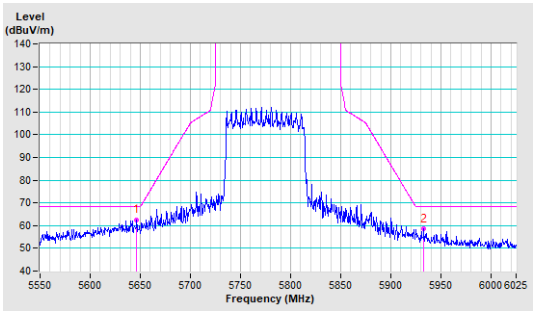
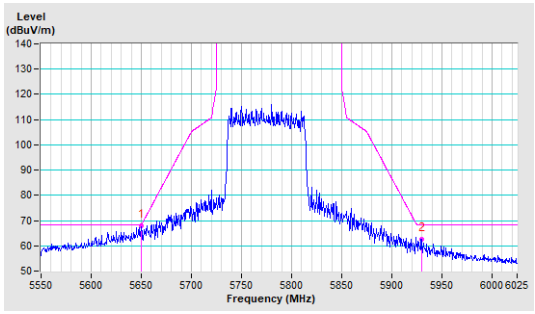
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ax (HE80)

CH 155 5775 MHz

Horizontal	Vertical
	

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

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