

FCC Test Report (DFS Band)

Report No.: RF190806E11A-1

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Test Model: EX5510-B0, PX7511-B0, DX5510-B0

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Release Control Record

Issue No.	Description	Date Issued
RF190806E11A-1	Original release.	Dec. 19, 2019

1 Certificate of Conformity

Product: Dual-Band Wireless AX Gigabit Ethernet Gateway,
Wireless AX 10G PON Gateway with VoIP,
Wireless AX VDSL Bonding Gateway

Brand: ZYXEL

Test Model: EX5510-B0, PX7511-B0, DX5510-B0

Sample Status: ENGINEERING SAMPLE

Applicant: Zyxel Communications Corporation

Test Date: Aug. 17 to Sep. 10, 2019

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 :  , **Date:** Dec. 19, 2019
Claire Kuan / Specialist

Approved by :  , **Date:** Dec. 19, 2019
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 -11.12dB at 0.9664MHz.
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 -0.1dB at 5725.00MHz, 5470.00MHz, 5725.00MHz.
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.

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 (DFS Band)

Product	Dual-Band Wireless AX Gigabit Ethernet Gateway, Wireless AX 10G PON Gateway with VoIP, Wireless AX VDSL Bonding Gateway
Brand	ZYXEL
Test Model	EX5510-B0, PX7511-B0, DX5510-B0
CPU Model No.	EX5510-B0: BCM68360 PX7511-B0: BCM68580X DX5510-B0: BCM63158
RF Chip Model No.	2.4G Chip: BCM43684 5G Chip: BCM43684
FW Version	EX5510-B0: V5.15(ABQX.0)C0 PX7511-B0: V5.15(ABPT.0)b4 DX5510-B0: V5.16(ABRC.0)b3
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from adapter or UPS
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 3466.7Mbps 802.11ax: up to 4803.9Mbps
Operating Frequency	5.25~ 5.32GHz, 5.5 ~ 5.72GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 16 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 8 802.11ac (VHT80), 802.11ax (HE80): 4 802.11ac (VHT160), 802.11ax (HE160): 2
Output Power	Non-Beamforming Mode: 5.25~ 5.32GHz: 249.522mW 5.5 ~ 5.72GHz: 248.699mW Beamforming Mode: 5.25~ 5.32GHz: 249.522mW 5.5 ~ 5.72GHz: 248.699mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	for EX5510-B0 - AC Adaptor, Brand:DVE, Model:DSA-42PFH-12 FUS 120350 - Ethernet Cable , Non-shielded, 1m x1 - Wallmount kit x1 for PX7511-B0 - AC Adaptor, Brand:DVE, Model:DSA-42PFH-12 FUS 120350 - Ethernet Cable , Non-shielded, 1.8m x1 - Phone Cable , Non-shielded, 1.8m x1 for DX5510-B0 - AC Adaptor, Brand:DVE, Model:DSA-42PFH-12 FUS 120350 - Ethernet Cable , Non-shielded, 1.8m x1 - Phone Cable , Non-shielded, 1.8m x1 - Wallmount kit x1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF190806E11-1 as the following:
◆ Add DFS band <5.25 ~ 5.32GHz, 5.5 ~ 5.72GHz>
2. According to above condition, all test items need to be performed. And all data were verified to meet the requirements.
3. The EUT has below product names and model names which are identical to each other in all aspects except for the followings:

Equipment Name	Model	CPU	35b/g.fast Bonding	XGS-PON	WAN (2.5G)	LAN (10G/2.5G)	LAN (GE)	USB 3.1	FXS	Wi-Fi	Adapter	UPS
Dual-Band Wireless AX Gigabit Ethernet Gateway	EX5510-B0	BCM68360	-	-	x1	-	x4	x1	-	V	12V/3.5A	-
Wireless AX 10G PON Gateway with VoIP	PX7511-B0	BCM68580X	-	x1	-	x1	x4	x1	x2	V	12V/3.5A	V
Wireless AX VDSL Bonding Gateway	DX5510-B0	BCM63158	x1	-	x1	-	x4	x1	-	V	12V/3.5A	-

4. The EUT must be supplied power adapter or UPS (only for model: PX7511-B0) as following table:

Adapter		
Brand	Model No.	Spec.
DVE	DSA-42PFH-12 FUS 120350	Input: 100-240Vac, 1.2A, 50/60Hz Output: 12V, 3.5A DC Output cable: Unshielded, 1.5m with one core
UPS (only for test, not for sale)		
Brand	Model No.	Spec.
CyberPower	DTC36U12V3-G	Input: 100-240Vac, 1.0A, 50-60Hz Output: 12V, 36W

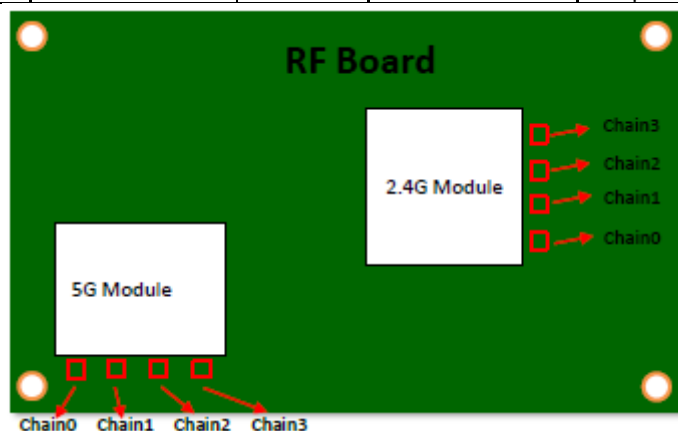
5. Simultaneously transmission condition.

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

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

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

Ant. No.	Chain No.	Brand	Model	Antenna Gain (dBi)	Frequency range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
1	2G Chain 2	Airgain	65-034-000014B	0.12	2.4~2.4835	Dipole	i-pex (MHF)	150
2	2G Chain 3		65-034-000015B	0.12	2.4~2.4835 5.15~5.85 (5G for RX zero wait DFS)	Dipole	i-pex (MHF)	100
3	2G Chain 0		65-034-000016B	0.12	2.4~2.4835	Dipole	i-pex (MHF)	65
4	2G Chain 1		65-034-000017B	0.12	2.4~2.4835	Dipole	i-pex (MHF)	130
5	5G Chain 2	Airgain	65-034-000018B	0	5.15~5.85	Dipole	i-pex (MHF)	195
6	5G Chain 0		65-034-000019B	0	5.15~5.85	Dipole	i-pex (MHF)	150
7	5G Chain 3		65-034-000020B	0	5.15~5.85	Dipole	i-pex (MHF)	250
8	5G Chain 1		65-034-000021B	0	5.15~5.85	Dipole	i-pex (MHF)	230



* Antenna port location

7. For Model: PX7511-B0, AC power conducted emissions was pre-tested under the following modes:

Test Mode	Description
Mode A	Power from adapter
Mode B	Power from UPS

Note: From the above modes, the worst case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

8. For Model: PX7511-B0, radiated emissions was pre-tested under the following modes:

Test Mode	Description
Mode A	Power from adapter
Mode B	Power from UPS

Note: From the above modes, the worst case was found in **Mode A**. Therefore only the test data of the mode was recorded in this report.

9. 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
802.11ac (VHT160)	4TX	4RX
802.11ax (HE20)	4TX	4RX
802.11ax (HE40)	4TX	4RX
802.11ax (HE80)	4TX	4RX
802.11ax (HE160)	4TX	4RX

Note:

1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and non-beamforming 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, 160MHz) and 802.11ax mode for 20MHz (40MHz, 80MHz, 160MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

10. The power setting are list as below:

Non-Beamforming Mode									
802.11a		802.11ax (HE20)		802.11ax (HE40)		802.11ax (HE80)		802.11ax (HE160)	
Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting
5260	73	5260	72	5270	71	5290	72	5250	78
5300	73	5300	72	5310	72	5530	72	5570	72
5320	73	5320	72	5510	72	5610	72		
5500	73	5500	72	5550	72	5690	72		
5580	73	5580	72	5670	72				
5700	73	5700	72	5710	72				
5720	73	5720	72						
802.11ac (VHT20)		802.11ac (VHT40)		802.11ac (VHT80)			802.11ac (VHT160)		
Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting		Frequency (MHz)	Frequency (MHz)	
5260	72	5270	71	5290	72		5250	78	
5300	72	5310	72	5530	72		5570	72	
5320	72	5510	72	5610	72				
5500	72	5550	72	5690	72				
5580	72	5670	72						
5700	72	5710	72						
5720	72								
Beamforming Mode									
802.11ax (HE20)		802.11ax (HE40)		802.11ax (HE80)		802.11ax (HE160)			
Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting	Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (MHz)
5260	72	5270	71	5290	72	5250	78		
5300	72	5310	72	5530	72	5570	72		
5320	72	5510	72	5610	72				
5500	72	5550	72	5690	72				
5580	72	5670	72						
5700	72	5710	72						
5720	72								
802.11ac (VHT20)		802.11ac (VHT40)		802.11ac (VHT80)		802.11ac (VHT160)			
Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting	Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (MHz)
5260	72	5270	71	5290	72	5250	78		
5300	72	5310	72	5530	72	5570	72		
5320	72	5510	72	5610	72				
5500	72	5550	72	5690	72				
5580	72	5670	72						
5700	72	5710	72						
5720	72								

11. 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 5250 ~ 5320MHz

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

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

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

Channel	Frequency
58	5290 MHz

1 straddle channel is provided for 802.11ac (VHT160), 802.11ax (HE160):

Channel	Frequency
50	5250 MHz

FOR 5500 ~ 5720MHz

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	144	5720 MHz

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

3 channels are provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	138	5690 MHz
122	5610 MHz		

1 straddle channel is provided for 802.11ac (VHT160), 802.11ax (HE160):

Channel	Frequency
114	5570 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	Model: EX5510-B0
2	-	√	√	-	Model: PX7511-B0
3	-	√	√	-	Model: DX5510-B0

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.

Non-Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	5250-5320	52 to 64	52, 60, 64	OFDM	BPSK	6Mb/s
802.11ax (HE20)		52 to 64	52, 60, 64	OFDMA	BPSK	MCS0
802.11ax (HE40)		54 to 62	54, 62	OFDMA	BPSK	MCS0
802.11ax (HE80)		58	58	OFDMA	BPSK	MCS0
802.11ax (HE160)		50	50	OFDMA	BPSK	MCS0
802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6Mb/s
802.11ax (HE20)		100 to 144	100, 116, 140, 144	OFDMA	BPSK	MCS0
802.11ax (HE40)		102 to 142	102, 110, 134, 142	OFDMA	BPSK	MCS0
802.11ax (HE80)		106 to 138	106, 122, 138	OFDMA	BPSK	MCS0
802.11ax (HE160)		114	114	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.

Non-Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE20)	5250-5320 5500-5720	52 to 64 100 to 144	60	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.

Non-Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE20)	5250-5320 5500-5720	52 to 64 100 to 144	60	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.

Non-Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	5250-5320	52 to 64	52, 60, 64	OFDM	BPSK	6Mb/s
802.11ac (VHT20) (Output power only)		52 to 64	52, 60, 64	OFDM	BPSK	MCS0
802.11ac (VHT40) (Output power only)		54 to 62	54, 62	OFDM	BPSK	MCS0
802.11ac (VHT80) (Output power only)		58	58	OFDM	BPSK	MCS0
802.11ac (VHT160) (Output power only)		50	50	OFDM	BPSK	MCS0
802.11ax (HE20)		52 to 64	52, 60, 64	OFDMA	BPSK	MCS0
802.11ax (HE40)		54 to 62	54, 62	OFDMA	BPSK	MCS0
802.11ax (HE80)		58	58	OFDMA	BPSK	MCS0
802.11ax (HE160)		50	50	OFDMA	BPSK	MCS0
802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6Mb/s
802.11ac (VHT20) (Output power only)		100 to 144	100, 116, 140, 144	OFDM	BPSK	MCS0
802.11ac (VHT40) (Output power only)		102 to 142	102, 110, 134, 142	OFDM	BPSK	MCS0
802.11ac (VHT80) (Output power only)		106 to 138	106, 122, 138	OFDM	BPSK	MCS0
802.11ac (VHT160) (Output power only)		114	114	OFDM	BPSK	MCS0
802.11ax (HE20)		100 to 144	100, 116, 140, 144	OFDMA	BPSK	MCS0
802.11ax (HE40)		102 to 142	102, 110, 134, 142	OFDMA	BPSK	MCS0
802.11ax (HE80)		106 to 138	106, 122, 138	OFDMA	BPSK	MCS0
802.11ax (HE160)		114	114	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)	5250-5320	52 to 64	52, 60, 64	OFDM	BPSK	MCS0
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	MCS0
802.11ac (VHT80)		58	58	OFDM	BPSK	MCS0
802.11ac (VHT160)		50	50	OFDM	BPSK	MCS0
802.11ax (HE20)		52 to 64	52, 60, 64	OFDMA	BPSK	MCS0
802.11ax (HE40)		54 to 62	54, 62	OFDMA	BPSK	MCS0
802.11ax (HE80)		58	58	OFDMA	BPSK	MCS0
802.11ax (HE160)		50	50	OFDMA	BPSK	MCS0
802.11ac (VHT20)	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	MCS0
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	MCS0
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	MCS0
802.11ac (VHT160)		114	114	OFDM	BPSK	MCS0
802.11ax (HE20)		100 to 144	100, 116, 140, 144	OFDMA	BPSK	MCS0
802.11ax (HE40)		102 to 142	102, 110, 134, 142	OFDMA	BPSK	MCS0
802.11ax (HE80)		106 to 138	106, 122, 138	OFDMA	BPSK	MCS0
802.11ax (HE160)		114	114	OFDMA	BPSK	MCS0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE $\geq$ 1G	23deg. C, 68%RH	120Vac, 60Hz	Jeff Lee
RE<1G	22deg. C, 66%RH	120Vac, 60Hz	Andy Ho Ryan Du
	23deg. C, 68%RH		
	23deg. C, 66%RH		
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = 2.063 ms/2.095 ms = 0.985

802.11ac (VHT20): Duty cycle = 1.486 ms/1.521 ms = 0.977, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.1$

802.11ac (VHT40): Duty cycle = 0.779 ms/0.812 ms = 0.959, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.18$

802.11ac (VHT80): Duty cycle = 0.413 ms/0.447 ms = 0.924, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.34$

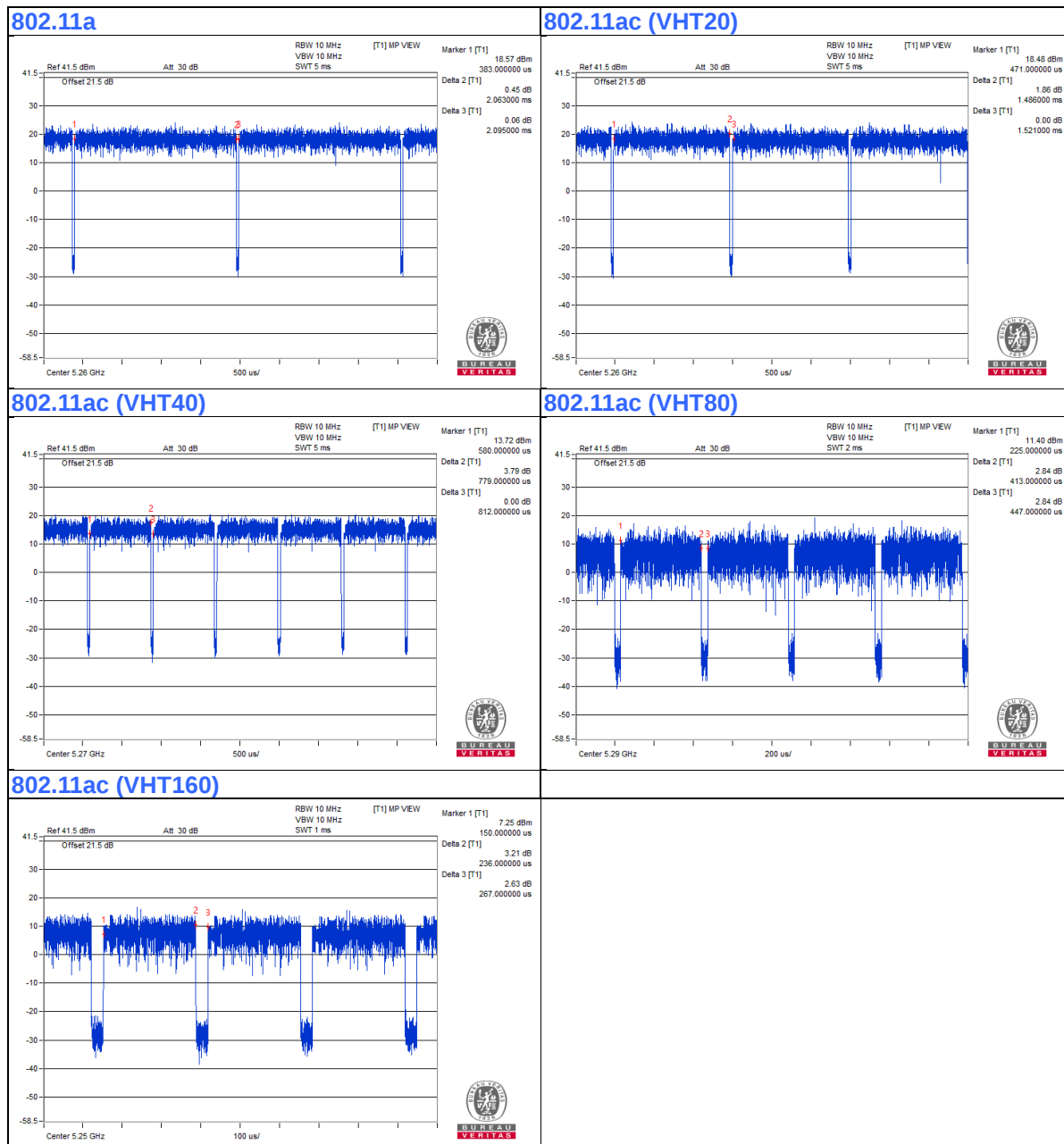
802.11ac (VHT160): Duty cycle = 0.236 ms/0.267 ms = 0.884, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.54$

802.11ax (HE20): Duty cycle = 1.486 ms/1.521 ms = 0.977, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.1$

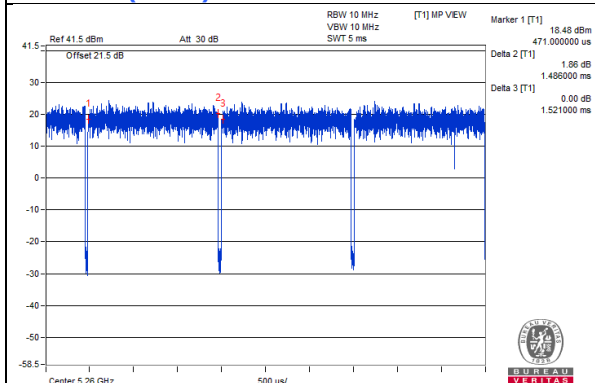
802.11ax (HE40): Duty cycle = 0.779 ms/0.812 ms = 0.959, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.18$

802.11ax (HE80): Duty cycle = 0.413 ms/0.447 ms = 0.924, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.34$

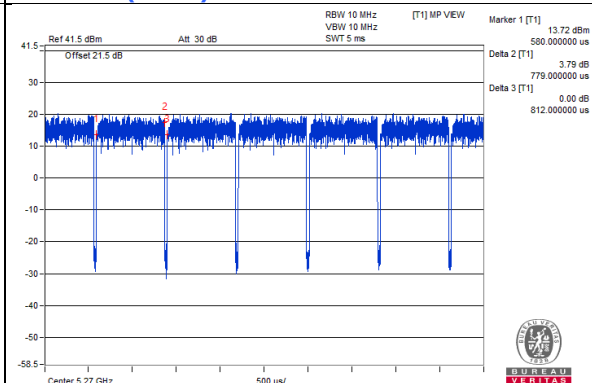
802.11ax (HE160): Duty cycle = 0.236 ms/0.267 ms = 0.884, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.54$



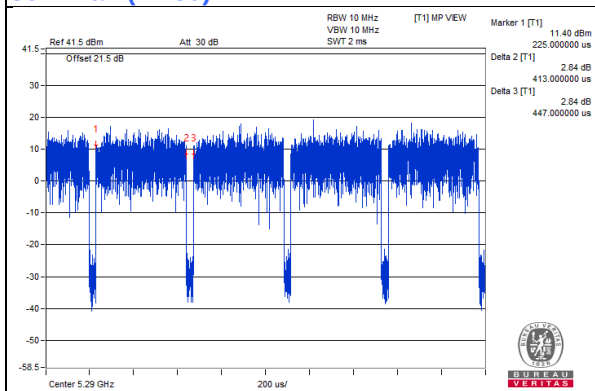
802.11ax (HE20)



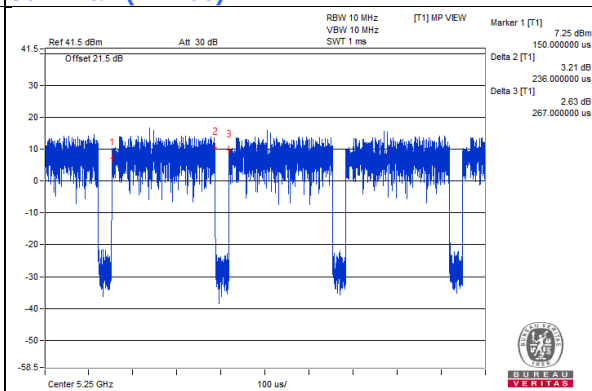
802.11ax (HE40)



802.11ax (HE80)



802.11ax (HE160)



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	Lenovo	81A4	YD02YN7P	FCC DoC	Provided by Lab
B.	UPS	CyberPower	DTC36U12V3-G	NA	NA	Supplied by client

Note:

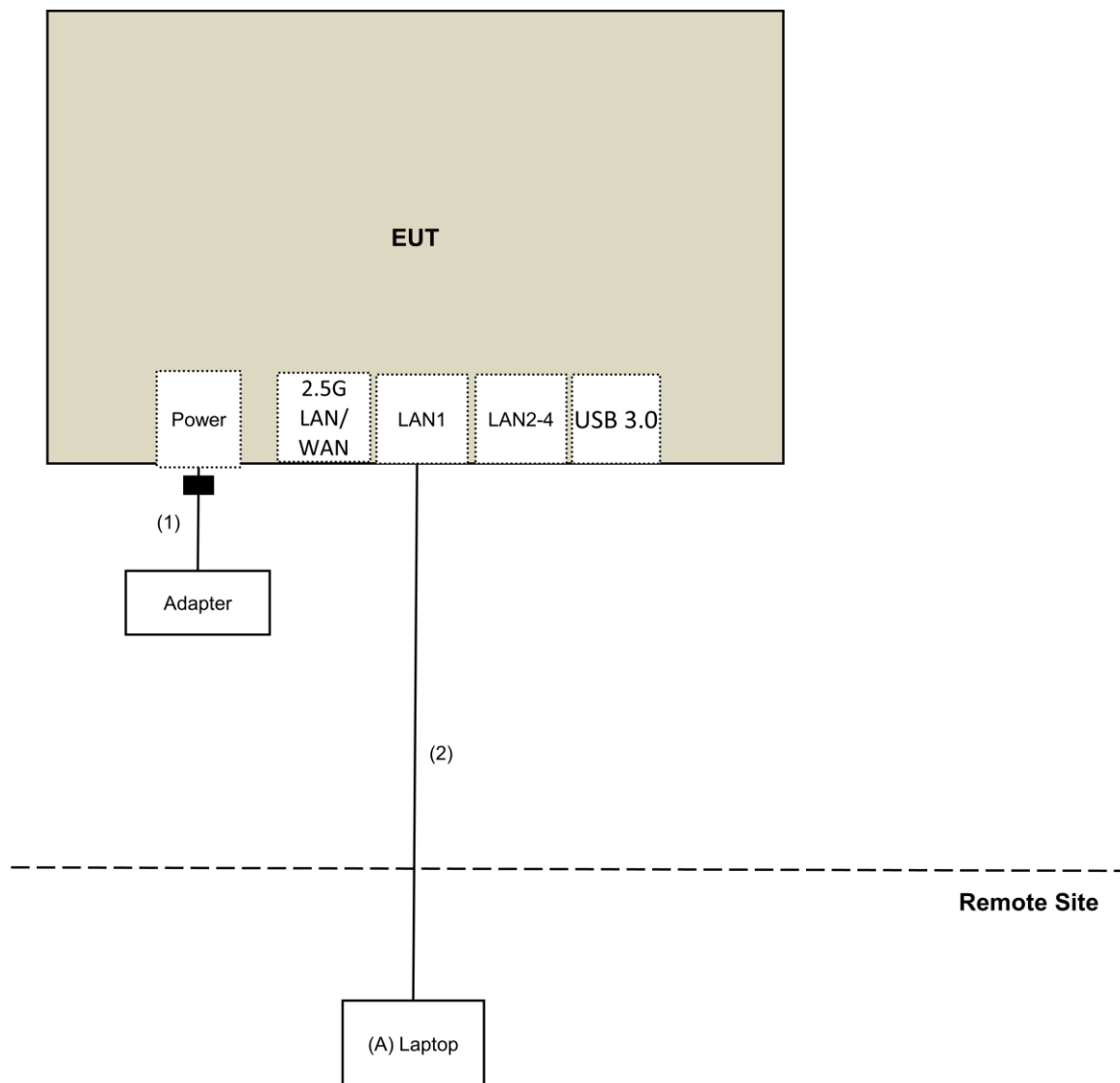
1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.5	No	1	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	UPS Cable	1	2.95	No	0	Supplied by client
4.	AC Cable	1	1.8	No	0	Supplied by client

Note: The core(s) is(are) originally attached to the cable(s).

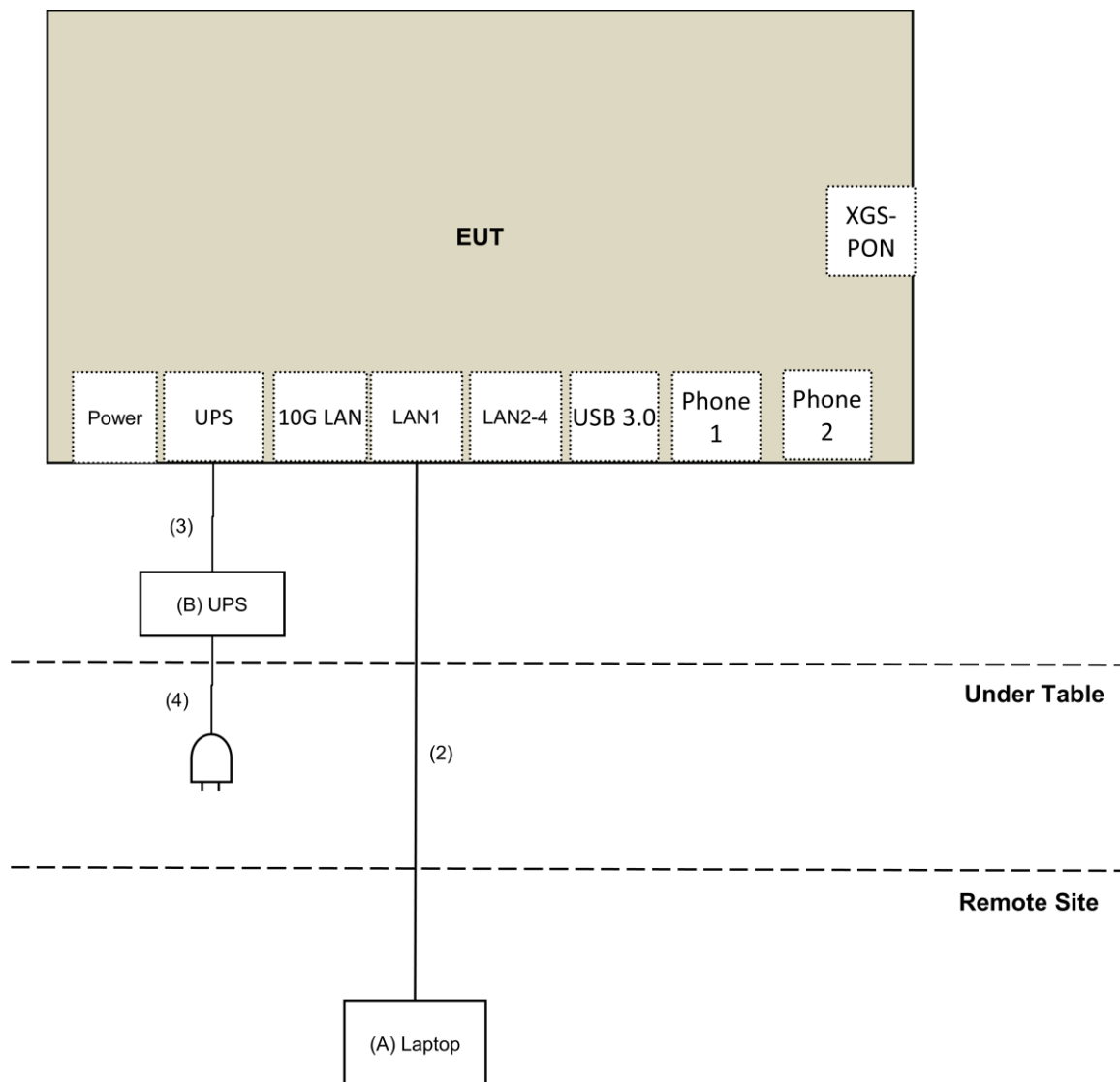
3.4.1 Configuration of System under Test

For Model: EX5510-B0:



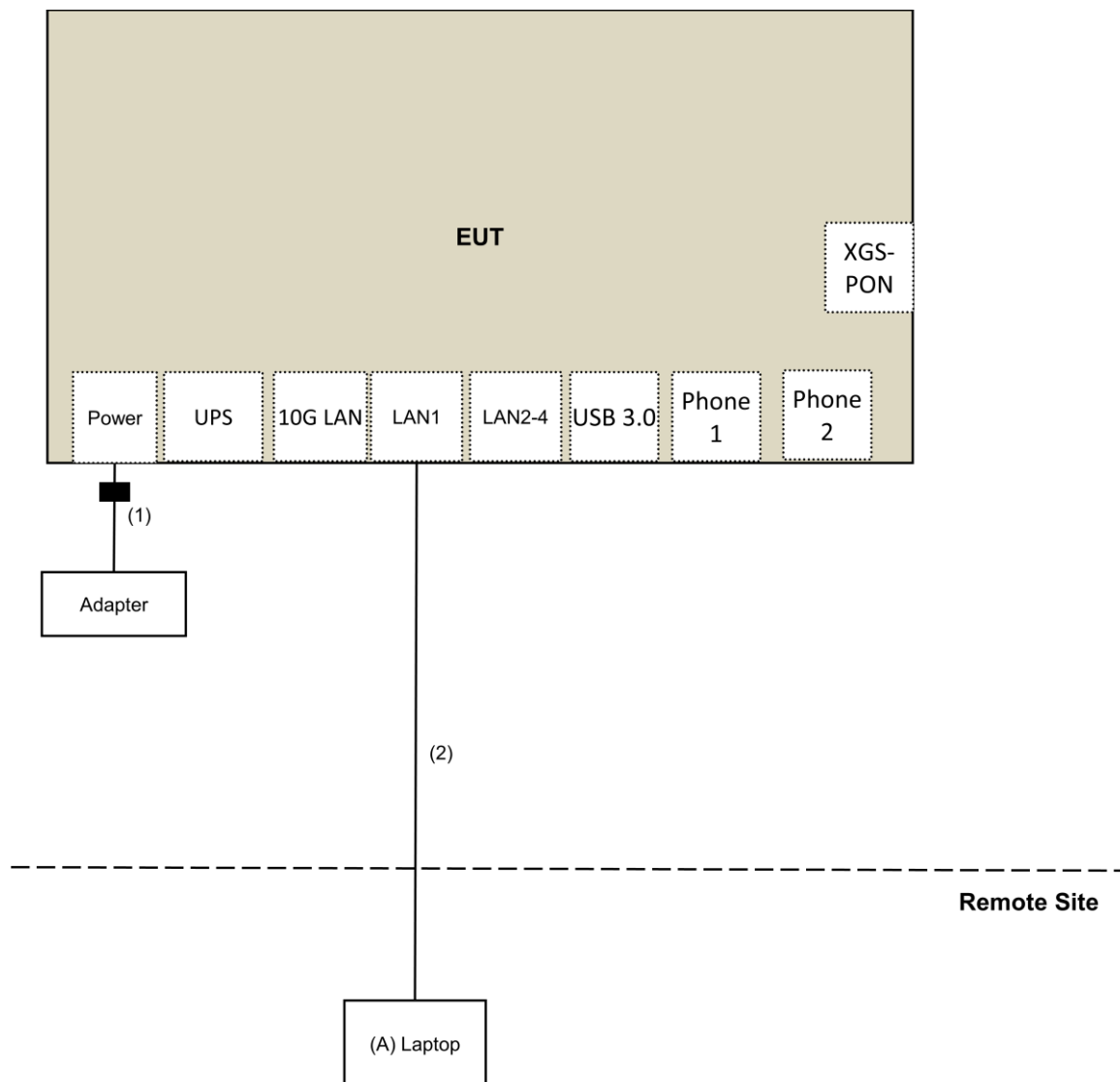
NOTE: The test Configuration was defined by the applicant requirement.

Conducted Emissions test for Model: PX7511-B0:



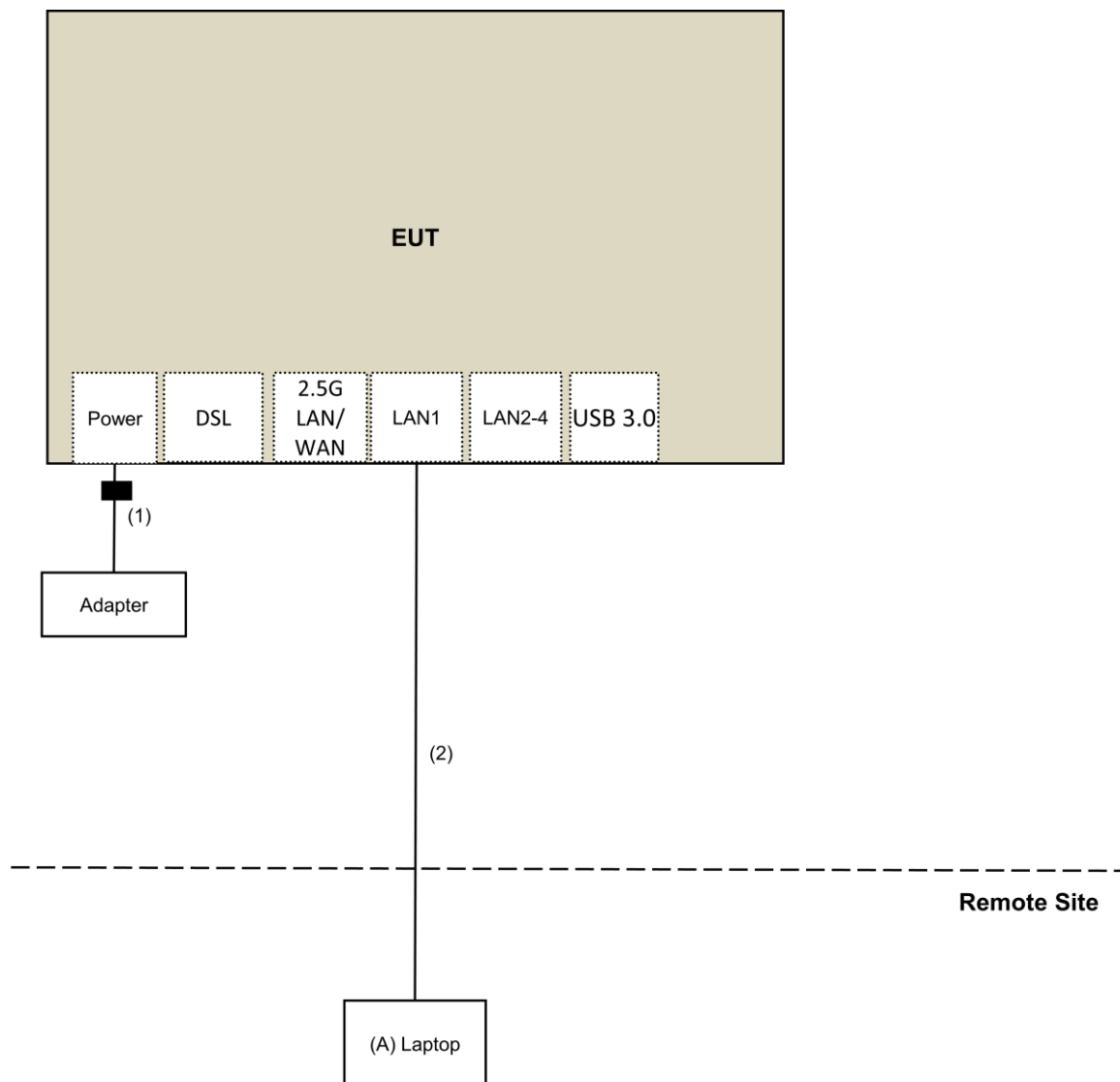
NOTE: The test Configuration was defined by the applicant requirement.

Other test for Model: PX7511-B0:



NOTE: The test Configuration was defined by the applicant requirement.

For Model: DX5510-B0:



NOTE: The test Configuration was defined by the applicant requirement.

3.5 General Description of Applied Standard 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:

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:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 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 (dBuV/m)	AV:54 (dBuV/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(dBuV/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(dBuV/m) ^{*1} PK:105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK:122.2 (dBuV/m) ^{*4}
	☐ 15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*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:

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

4.1.2 Test Instruments

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. 21, 2018	Nov. 20, 2019
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. 25, 2018	Nov. 24, 2019
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. 25, 2018	Nov. 24, 2019
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
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. 09, 2019	Jan. 08, 2020
True RMS Clamp Meter FLUKE	325	31130711WS	May 21, 2019	May 20, 2020

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: Aug. 17 to Sep. 07, 2019

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:

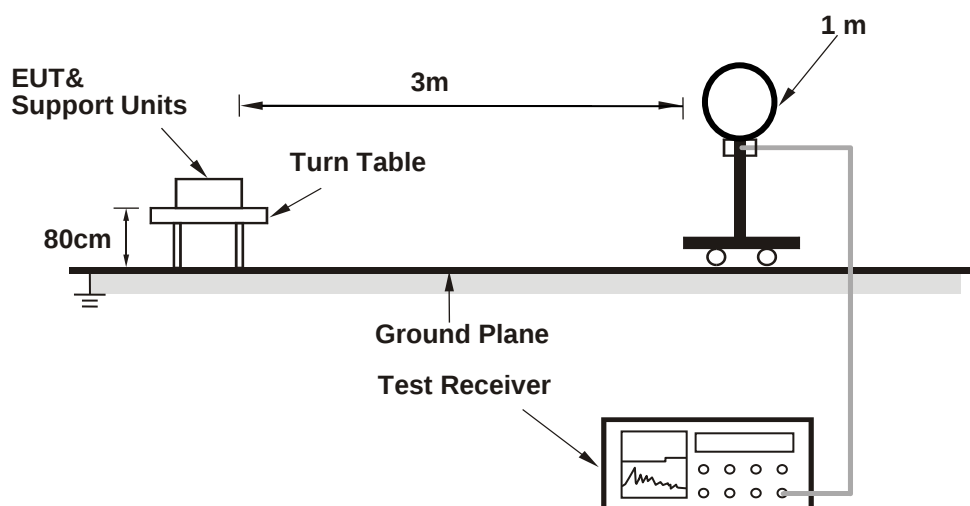
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

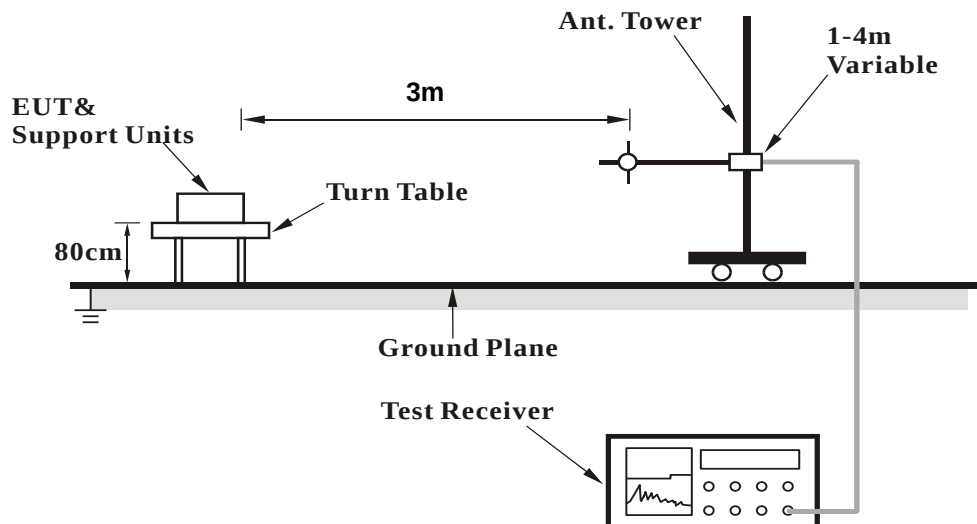
No deviation.

4.1.5 Test Setup

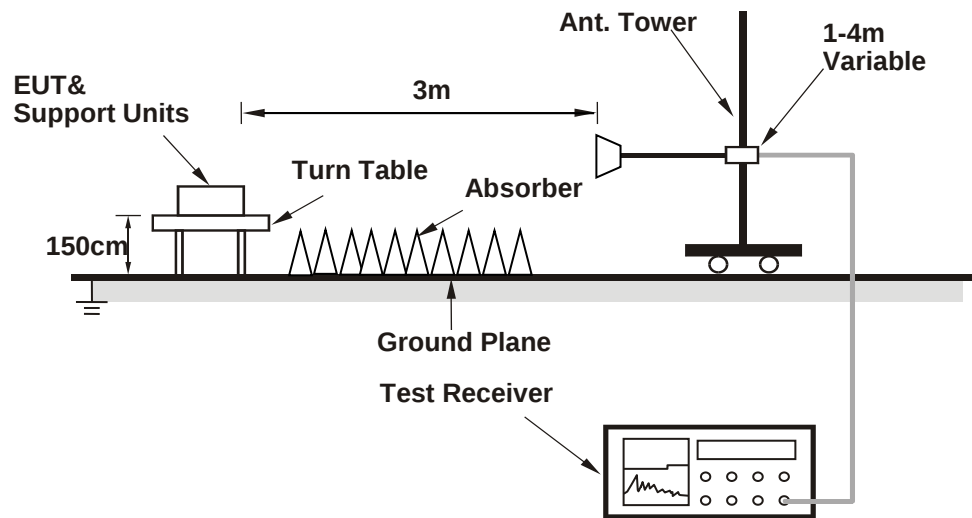
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Condition

- Connected the EUT with the Laptop which is placed on remote site.
- Controlling software (5G Mtool v3.1.0.6) has been activated to set the EUT under transmission condition continuously.

4.1.7 Test Results (Mode 1)

Above 1GHz Data:

802.11a

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	52.3 PK	74.0	-21.7	2.20 H	163	50.2	2.1
2	5150.00	42.4 AV	54.0	-11.6	2.20 H	163	40.3	2.1
3	*5260.00	116.9 PK			2.20 H	163	115.6	1.3
4	*5260.00	109.6 AV			2.20 H	163	108.3	1.3
5	#10520.00	61.1 PK	68.2	-7.1	1.00 H	120	48.3	12.8
6	15780.00	50.8 PK	74.0	-23.2	1.41 H	119	39.1	11.7
7	15780.00	40.0 AV	54.0	-14.0	1.41 H	119	28.3	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	54.3 PK	74.0	-19.7	1.50 V	37	52.2	2.1
2	5150.00	42.2 AV	54.0	-11.8	1.50 V	37	40.1	2.1
3	*5260.00	119.6 PK			1.50 V	37	118.3	1.3
4	*5260.00	110.2 AV			1.50 V	37	108.9	1.3
5	#10520.00	47.0 PK	68.2	-21.2	1.49 V	81	34.2	12.8
6	15780.00	53.6 PK	74.0	-20.4	1.43 V	72	41.9	11.7
7	15780.00	41.3 AV	54.0	-12.7	1.43 V	72	29.6	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 60	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	116.4 PK			2.38 H	170	115.0	1.4
2	*5300.00	109.8 AV			2.38 H	170	108.4	1.4
3	5350.00	57.7 PK	74.0	-16.3	2.38 H	170	56.2	1.5
4	5350.00	47.2 AV	54.0	-6.8	2.38 H	170	45.7	1.5
5	10600.00	65.5 PK	74.0	-8.5	1.17 H	37	52.4	13.1
6	10600.00	53.2 AV	54.0	-0.8	1.17 H	37	40.1	13.1
7	15900.00	52.8 PK	74.0	-21.2	1.24 H	49	41.3	11.5
8	15900.00	41.2 AV	54.0	-12.8	1.24 H	49	29.7	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	*5300.00	120.9 PK			1.46 V	34	119.5	1.4
2	*5300.00	110.9 AV			1.46 V	34	109.5	1.4
3	5350.00	63.9 PK	74.0	-10.1	1.46 V	34	62.4	1.5
4	5350.00	50.1 AV	54.0	-3.9	1.46 V	34	48.6	1.5
5	10600.00	60.5 PK	74.0	-13.5	1.23 V	160	47.4	13.1
6	10600.00	48.4 AV	54.0	-5.6	1.23 V	160	35.3	13.1
7	15900.00	53.9 PK	74.0	-20.1	1.44 V	232	42.4	11.5
8	15900.00	40.7 AV	54.0	-13.3	1.44 V	232	29.2	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	118.3 PK			2.68 H	240	116.8	1.5
2	*5320.00	109.1 AV			2.68 H	240	107.6	1.5
3	5350.00	68.5 PK	74.0	-5.5	2.68 H	240	67.0	1.5
4	5350.00	51.1 AV	54.0	-2.9	2.68 H	240	49.6	1.5
5	10640.00	62.7 PK	74.0	-11.3	1.62 H	64	49.5	13.2
6	10640.00	51.4 AV	54.0	-2.6	1.62 H	64	38.2	13.2
7	15960.00	51.4 PK	74.0	-22.6	1.84 H	238	39.9	11.5
8	15960.00	38.4 AV	54.0	-15.6	1.84 H	238	26.9	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	*5320.00	120.1 PK			1.50 V	37	118.6	1.5
2	*5320.00	110.1 AV			1.50 V	37	108.6	1.5
3	5350.00	73.6 PK	74.0	-0.4	1.50 V	37	72.1	1.5
4	5350.00	53.8 AV	54.0	-0.2	1.50 V	37	52.3	1.5
5	10640.00	56.0 PK	74.0	-18.0	1.44 V	133	42.8	13.2
6	10640.00	45.2 AV	54.0	-8.8	1.44 V	133	32.0	13.2
7	15960.00	48.2 PK	74.0	-25.8	1.17 V	169	36.7	11.5
8	15960.00	37.3 AV	54.0	-16.7	1.17 V	169	25.8	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 100	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	57.0 PK	74.0	-17.0	2.11 H	20	55.1	1.9
2	5460.00	44.3 AV	54.0	-9.7	2.11 H	20	42.4	1.9
3	#5470.00	67.8 PK	68.2	-0.4	1.01 H	140	65.9	1.9
4	*5500.00	115.5 PK			1.08 H	1	113.6	1.9
5	*5500.00	107.3 AV			1.08 H	1	105.4	1.9
6	11000.00	57.5 PK	74.0	-16.5	1.94 H	45	43.9	13.6
7	11000.00	47.4 AV	54.0	-6.6	1.94 H	45	33.8	13.6
8	#16500.00	49.7 PK	68.2	-18.5	1.60 H	357	35.5	14.2
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	5460.00	61.1 PK	74.0	-12.9	1.34 V	32	59.2	1.9
2	5460.00	42.7 AV	54.0	-11.3	1.34 V	32	40.8	1.9
3	#5470.00	67.9 PK	68.2	-0.3	1.34 V	32	66.0	1.9
4	*5500.00	117.3 PK			1.34 V	32	115.4	1.9
5	*5500.00	107.9 AV			1.34 V	32	106.0	1.9
6	11000.00	55.0 PK	74.0	-19.0	1.78 V	60	41.4	13.6
7	11000.00	46.0 AV	54.0	-8.0	1.78 V	60	32.4	13.6
8	#16500.00	48.2 PK	68.2	-20.0	1.56 V	323	34.0	14.2

REMARKS:

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

CHANNEL	TX Channel 116	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	116.2 PK			2.13 H	359	114.1	2.1
2	*5580.00	108.5 AV			2.13 H	359	106.4	2.1
3	11160.00	59.3 PK	74.0	-14.7	1.62 H	84	46.6	12.7
4	11160.00	49.7 AV	54.0	-4.3	1.62 H	84	37.0	12.7
5	#16740.00	53.3 PK	68.2	-14.9	1.00 H	19	37.4	15.9
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	*5580.00	118.5 PK			2.24 V	35	116.4	2.1
2	*5580.00	108.2 AV			2.24 V	35	106.1	2.1
3	11160.00	58.7 PK	74.0	-15.3	1.72 V	67	46.0	12.7
4	11160.00	47.6 AV	54.0	-6.4	1.72 V	67	34.9	12.7
5	#16740.00	51.4 PK	68.2	-16.8	1.87 V	107	35.5	15.9

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.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 140	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	114.5 PK			1.21 H	146	112.3	2.2
2	*5700.00	106.5 AV			1.21 H	146	104.3	2.2
3	#5725.00	61.8 PK	68.2	-6.4	1.21 H	146	59.6	2.2
4	11400.00	57.7 PK	74.0	-16.3	1.77 H	65	44.2	13.5
5	11400.00	47.9 AV	54.0	-6.1	1.77 H	65	34.4	13.5
6	#17100.00	51.0 PK	68.2	-17.2	1.80 H	134	34.2	16.8
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	*5700.00	115.8 PK			2.31 V	40	113.6	2.2
2	*5700.00	105.9 AV			2.31 V	40	103.7	2.2
3	#5725.00	68.1 PK	68.2	-0.1	2.31 V	40	65.9	2.2
4	11400.00	57.0 PK	74.0	-17.0	1.54 V	72	43.5	13.5
5	11400.00	45.8 AV	54.0	-8.2	1.54 V	72	32.3	13.5
6	#17100.00	48.8 PK	68.2	-19.4	1.81 V	237	32.0	16.8

REMARKS:

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

CHANNEL	TX Channel 144	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	49.3 PK	74.0	-24.7	1.25 H	146	47.4	1.9
2	5460.00	39.8 AV	54.0	-14.2	1.25 H	146	37.9	1.9
3	#5470.00	51.2 PK	68.2	-17.0	1.25 H	146	49.3	1.9
4	*5720.00	119.0 PK			1.25 H	146	116.8	2.2
5	*5720.00	111.8 AV			1.25 H	146	109.6	2.2
6	#5850.00	53.2 PK	68.2	-15.0	1.25 H	146	50.6	2.6
7	11440.00	60.3 PK	74.0	-13.7	1.39 H	51	46.6	13.7
8	11440.00	51.1 AV	54.0	-2.9	1.39 H	51	37.4	13.7
9	#17160.00	57.7 PK	68.2	-10.5	2.20 H	132	40.4	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	5460.00	51.5 PK	74.0	-22.5	2.68 V	31	49.6	1.9
2	5460.00	42.1 AV	54.0	-11.9	2.68 V	31	40.2	1.9
3	#5470.00	53.1 PK	68.2	-15.1	2.68 V	31	51.2	1.9
4	*5720.00	120.5 PK			2.68 V	31	118.3	2.2
5	*5720.00	110.8 AV			2.68 V	31	108.6	2.2
6	#5850.00	56.9 PK	68.2	-11.3	2.68 V	31	54.3	2.6
7	11440.00	59.2 PK	74.0	-14.8	2.08 V	61	45.5	13.7
8	11440.00	49.1 AV	54.0	-4.9	2.08 V	61	35.4	13.7
9	#17160.00	54.9 PK	68.2	-13.3	2.00 V	54	37.6	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ax (HE20)

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	54.2 PK	74.0	-19.8	1.59 H	170	52.1	2.1
2	5150.00	42.2 AV	54.0	-11.8	1.59 H	170	40.1	2.1
3	*5260.00	117.4 PK			1.59 H	170	116.1	1.3
4	*5260.00	107.7 AV			1.59 H	170	106.4	1.3
5	#10520.00	55.9 PK	68.2	-12.3	1.01 H	62	43.1	12.8
6	15780.00	48.2 PK	74.0	-25.8	1.52 H	201	36.5	11.7
7	15780.00	37.2 AV	54.0	-16.8	1.52 H	201	25.5	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	52.9 PK	74.0	-21.1	1.38 V	33	50.8	2.1
2	5150.00	41.2 AV	54.0	-12.8	1.38 V	33	39.1	2.1
3	*5260.00	121.1 PK			1.38 V	33	119.8	1.3
4	*5260.00	109.0 AV			1.38 V	33	107.7	1.3
5	#10520.00	54.9 PK	68.2	-13.3	1.43 V	134	42.1	12.8
6	15780.00	49.1 PK	74.0	-24.9	2.02 V	127	37.4	11.7
7	15780.00	38.4 AV	54.0	-15.6	2.02 V	127	26.7	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 60	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	119.3 PK			1.59 H	159	117.9	1.4
2	*5300.00	108.4 AV			1.59 H	159	107.0	1.4
3	5350.00	56.3 PK	74.0	-17.7	1.59 H	159	54.8	1.5
4	5350.00	43.6 AV	54.0	-10.4	1.59 H	159	42.1	1.5
5	10600.00	59.3 PK	74.0	-14.7	1.67 H	77	46.2	13.1
6	10600.00	49.1 AV	54.0	-4.9	1.67 H	77	36.0	13.1
7	15900.00	52.3 PK	74.0	-21.7	1.46 H	281	40.8	11.5
8	15900.00	38.7 AV	54.0	-15.3	1.46 H	281	27.2	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	*5300.00	122.3 PK			1.50 V	33	120.9	1.4
2	*5300.00	110.6 AV			1.50 V	33	109.2	1.4
3	5350.00	65.3 PK	74.0	-8.7	1.50 V	33	63.8	1.5
4	5350.00	51.2 AV	54.0	-2.8	1.50 V	33	49.7	1.5
5	10600.00	56.7 PK	74.0	-17.3	1.48 V	133	43.6	13.1
6	10600.00	46.3 AV	54.0	-7.7	1.48 V	133	33.2	13.1
7	15900.00	51.8 PK	74.0	-22.2	1.46 V	68	40.3	11.5
8	15900.00	37.5 AV	54.0	-16.5	1.46 V	68	26.0	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	115.7 PK			2.12 H	169	114.2	1.5
2	*5320.00	106.4 AV			2.12 H	169	104.9	1.5
3	5350.00	65.0 PK	74.0	-9.0	2.12 H	169	63.5	1.5
4	5350.00	52.7 AV	54.0	-1.3	2.12 H	169	51.2	1.5
5	10640.00	58.0 PK	74.0	-16.0	1.72 H	63	44.8	13.2
6	10640.00	47.9 AV	54.0	-6.1	1.72 H	63	34.7	13.2
7	15960.00	45.0 PK	74.0	-29.0	1.41 H	267	33.5	11.5
8	15960.00	34.8 AV	54.0	-19.2	1.41 H	267	23.3	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	*5320.00	120.6 PK			1.50 V	34	119.1	1.5
2	*5320.00	108.2 AV			1.50 V	34	106.7	1.5
3	5350.00	70.6 PK	74.0	-3.4	1.50 V	34	69.1	1.5
4	5350.00	53.8 AV	54.0	-0.2	1.50 V	34	52.3	1.5
5	10640.00	51.6 PK	74.0	-22.4	1.45 V	134	38.4	13.2
6	10640.00	42.9 AV	54.0	-11.1	1.45 V	134	29.7	13.2
7	15960.00	46.3 PK	74.0	-27.7	1.42 V	73	34.8	11.5
8	15960.00	35.2 AV	54.0	-18.8	1.42 V	73	23.7	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 100	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	62.8 PK	74.0	-11.2	2.14 H	162	60.9	1.9
2	5460.00	43.9 AV	54.0	-10.1	2.14 H	162	42.0	1.9
3	#5470.00	67.2 PK	68.2	-1.0	2.14 H	162	65.3	1.9
4	*5500.00	114.7 PK			2.14 H	162	112.8	1.9
5	*5500.00	105.1 AV			2.14 H	162	103.2	1.9
6	11000.00	57.6 PK	74.0	-16.4	1.72 H	77	44.0	13.6
7	11000.00	47.5 AV	54.0	-6.5	1.72 H	77	33.9	13.6
8	#16500.00	43.5 PK	68.2	-24.7	1.52 H	292	29.3	14.2
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	5460.00	63.1 PK	74.0	-10.9	1.50 V	34	61.2	1.9
2	5460.00	45.5 AV	54.0	-8.5	1.50 V	34	43.6	1.9
3	#5470.00	68.1 PK	68.2	-0.1	1.50 V	34	66.2	1.9
4	*5500.00	119.5 PK			1.50 V	34	117.6	1.9
5	*5500.00	107.0 AV			1.50 V	34	105.1	1.9
6	11000.00	50.8 PK	74.0	-23.2	1.39 V	137	37.2	13.6
7	11000.00	42.6 AV	54.0	-11.4	1.39 V	137	29.0	13.6
8	#16500.00	45.1 PK	68.2	-23.1	1.41 V	88	30.9	14.2

REMARKS:

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

CHANNEL	TX Channel 116	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	118.0 PK			2.42 H	358	115.9	2.1
2	*5580.00	107.6 AV			2.42 H	358	105.5	2.1
3	11160.00	60.1 PK	74.0	-13.9	1.62 H	18	47.4	12.7
4	11160.00	50.0 AV	54.0	-4.0	1.62 H	18	37.3	12.7
5	#16740.00	53.1 PK	68.2	-15.1	1.18 H	18	37.2	15.9
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	*5580.00	119.8 PK			1.54 V	43	117.7	2.1
2	*5580.00	108.6 AV			1.54 V	43	106.5	2.1
3	11160.00	58.3 PK	74.0	-15.7	1.69 V	64	45.6	12.7
4	11160.00	48.6 AV	54.0	-5.4	1.69 V	64	35.9	12.7
5	#16740.00	51.2 PK	68.2	-17.0	1.78 V	105	35.3	15.9

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.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 140	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	115.4 PK			1.25 H	142	113.2	2.2
2	*5700.00	104.8 AV			1.25 H	142	102.6	2.2
3	#5725.00	66.4 PK	68.2	-1.8	1.25 H	142	64.2	2.2
4	11400.00	57.1 PK	74.0	-16.9	1.60 H	46	43.6	13.5
5	11400.00	47.1 AV	54.0	-6.9	1.60 H	46	33.6	13.5
6	#17100.00	55.7 PK	68.2	-12.5	1.42 H	144	38.9	16.8
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	*5700.00	116.6 PK			2.26 V	34	114.4	2.2
2	*5700.00	105.3 AV			2.26 V	34	103.1	2.2
3	#5725.00	68.1 PK	68.2	-0.1	2.26 V	34	65.9	2.2
4	11400.00	55.9 PK	74.0	-18.1	1.71 V	23	42.4	13.5
5	11400.00	45.8 AV	54.0	-8.2	1.71 V	23	32.3	13.5
6	#17100.00	53.3 PK	68.2	-14.9	1.74 V	99	36.5	16.8

REMARKS:

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

CHANNEL	TX Channel 144	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	52.0 PK	74.0	-22.0	1.22 H	150	50.1	1.9
2	5460.00	40.8 AV	54.0	-13.2	1.22 H	150	38.9	1.9
3	#5470.00	53.0 PK	68.2	-15.2	1.22 H	150	51.1	1.9
4	*5720.00	118.9 PK			1.22 H	150	116.7	2.2
5	*5720.00	109.5 AV			1.22 H	150	107.3	2.2
6	#5850.00	52.3 PK	68.2	-15.9	1.22 H	150	49.7	2.6
7	11440.00	59.2 PK	74.0	-14.8	1.67 H	49	45.5	13.7
8	11440.00	50.7 AV	54.0	-3.3	1.67 H	49	37.0	13.7
9	#17160.00	58.3 PK	68.2	-9.9	1.46 H	131	41.0	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	5460.00	51.7 PK	74.0	-22.3	1.98 V	29	49.8	1.9
2	5460.00	43.2 AV	54.0	-10.8	1.98 V	29	41.3	1.9
3	#5470.00	52.4 PK	68.2	-15.8	1.98 V	29	50.5	1.9
4	*5720.00	120.8 PK			1.98 V	29	118.6	2.2
5	*5720.00	109.8 AV			1.98 V	29	107.6	2.2
6	#5850.00	56.3 PK	68.2	-11.9	1.98 V	29	53.7	2.6
7	11440.00	58.4 PK	74.0	-15.6	1.76 V	253	44.7	13.7
8	11440.00	48.2 AV	54.0	-5.8	1.76 V	253	34.5	13.7
9	#17160.00	56.0 PK	68.2	-12.2	1.84 V	55	38.7	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ax (HE40)

CHANNEL	TX Channel 54	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	52.2 PK	74.0	-21.8	2.12 H	170	50.1	2.1
2	5150.00	43.7 AV	54.0	-10.3	2.12 H	170	41.6	2.1
3	*5270.00	116.1 PK			2.12 H	170	114.8	1.3
4	*5270.00	106.8 AV			2.12 H	170	105.5	1.3
5	5353.71	62.9 PK	74.0	-11.1	2.12 H	170	61.4	1.5
6	5353.71	53.0 AV	54.0	-1.0	2.12 H	170	51.5	1.5
7	#10540.00	54.9 PK	68.2	-13.3	1.52 H	120	42.0	12.9
8	15810.00	49.4 PK	74.0	-24.6	1.49 H	118	37.7	11.7
9	15810.00	43.6 AV	54.0	-10.4	1.49 H	118	31.9	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	57.8 PK	74.0	-16.2	1.49 V	212	55.7	2.1
2	5150.00	45.9 AV	54.0	-8.1	1.49 V	212	43.8	2.1
3	*5270.00	118.7 PK			1.49 V	212	117.4	1.3
4	*5270.00	107.0 AV			1.49 V	212	105.7	1.3
5	5353.71	63.9 PK	74.0	-10.1	1.49 V	212	62.4	1.5
6	5353.71	52.5 AV	54.0	-1.5	1.49 V	212	51.0	1.5
7	#10540.00	53.7 PK	68.2	-14.5	1.49 V	81	40.8	12.9
8	15810.00	51.9 PK	74.0	-22.1	1.82 V	234	40.2	11.7
9	15810.00	41.5 AV	54.0	-12.5	1.82 V	234	29.8	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 62	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	110.2 PK			2.33 H	158	108.8	1.4
2	*5310.00	100.9 AV			2.33 H	158	99.5	1.4
3	5350.00	61.5 PK	74.0	-12.5	2.33 H	158	60.0	1.5
4	5350.00	50.6 AV	54.0	-3.4	2.33 H	158	49.1	1.5
5	10620.00	48.5 PK	74.0	-25.5	2.04 H	170	35.4	13.1
6	10620.00	39.8 AV	54.0	-14.2	2.04 H	170	26.7	13.1
7	15930.00	46.5 PK	74.0	-27.5	1.64 H	129	35.0	11.5
8	15930.00	36.3 AV	54.0	-17.7	1.64 H	129	24.8	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	*5310.00	115.2 PK			1.44 V	211	113.8	1.4
2	*5310.00	102.6 AV			1.44 V	211	101.2	1.4
3	5350.00	66.2 PK	74.0	-7.8	1.44 V	211	64.7	1.5
4	5350.00	53.5 AV	54.0	-0.5	1.44 V	211	52.0	1.5
5	10620.00	49.3 PK	74.0	-24.7	1.97 V	130	36.2	13.1
6	10620.00	37.8 AV	54.0	-16.2	1.97 V	130	24.7	13.1
7	15930.00	47.7 PK	74.0	-26.3	1.97 V	208	36.2	11.5
8	15930.00	34.0 AV	54.0	-20.0	1.97 V	208	22.5	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 102	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	58.5 PK	74.0	-15.5	2.28 H	3	56.6	1.9
2	5460.00	44.2 AV	54.0	-9.8	2.28 H	3	42.3	1.9
3	#5470.00	58.3 PK	68.2	-9.9	2.28 H	3	56.4	1.9
4	*5510.00	109.6 PK			2.28 H	3	107.7	1.9
5	*5510.00	99.9 AV			2.28 H	3	98.0	1.9
6	11020.00	48.0 PK	74.0	-26.0	2.05 H	178	34.6	13.4
7	11020.00	39.1 AV	54.0	-14.9	2.05 H	178	25.7	13.4
8	#16530.00	46.9 PK	68.2	-21.3	1.62 H	121	32.4	14.5
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	5460.00	60.7 PK	74.0	-13.3	1.41 V	211	58.8	1.9
2	5460.00	45.6 AV	54.0	-8.4	1.41 V	211	43.7	1.9
3	#5470.00	66.2 PK	68.2	-2.0	1.41 V	211	64.3	1.9
4	*5510.00	113.0 PK			1.41 V	211	111.1	1.9
5	*5510.00	101.0 AV			1.41 V	211	99.1	1.9
6	11020.00	49.2 PK	74.0	-24.8	1.99 V	117	35.8	13.4
7	11020.00	38.0 AV	54.0	-16.0	1.99 V	117	24.6	13.4
8	#16530.00	47.4 PK	68.2	-20.8	1.94 V	215	32.9	14.5

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 110	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5550.00	114.6 PK			1.18 H	160	112.6	2.0
2	*5550.00	104.2 AV			1.18 H	160	102.2	2.0
3	11100.00	53.7 PK	74.0	-20.3	1.57 H	64	40.8	12.9
4	11100.00	44.7 AV	54.0	-9.3	1.57 H	64	31.8	12.9
5	#16650.00	51.0 PK	68.2	-17.2	1.70 H	67	35.8	15.2
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	*5550.00	116.1 PK			1.39 V	210	114.1	2.0
2	*5550.00	103.0 AV			1.39 V	210	101.0	2.0
3	11100.00	52.7 PK	74.0	-21.3	1.88 V	86	39.8	12.9
4	11100.00	42.3 AV	54.0	-11.7	1.88 V	86	29.4	12.9
5	#16650.00	49.2 PK	68.2	-19.0	2.19 V	11	34.0	15.2

REMARKS:

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

CHANNEL	TX Channel 134	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	112.7 PK			1.14 H	148	110.6	2.1
2	*5670.00	103.2 AV			1.14 H	148	101.1	2.1
3	#5725.00	63.7 PK	68.2	-4.5	1.14 H	148	61.5	2.2
4	11340.00	54.3 PK	74.0	-19.7	1.56 H	62	41.3	13.0
5	11340.00	45.0 AV	54.0	-9.0	1.56 H	62	32.0	13.0
6	#17010.00	49.9 PK	68.2	-18.3	1.69 H	74	33.0	16.9
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	*5670.00	113.5 PK			2.21 V	212	111.4	2.1
2	*5670.00	102.7 AV			2.21 V	212	100.6	2.1
3	#5725.00	66.7 PK	68.2	-1.5	2.21 V	212	64.5	2.2
4	11340.00	53.1 PK	74.0	-20.9	1.84 V	72	40.1	13.0
5	11340.00	42.4 AV	54.0	-11.6	1.84 V	72	29.4	13.0
6	#17010.00	49.1 PK	68.2	-19.1	2.15 V	20	32.2	16.9

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.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 142	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	51.1 PK	74.0	-22.9	1.09 H	150	49.2	1.9
2	5460.00	43.2 AV	54.0	-10.8	1.09 H	150	41.3	1.9
3	#5470.00	51.8 PK	68.2	-16.4	1.09 H	150	49.9	1.9
4	*5710.00	116.9 PK			1.09 H	150	114.7	2.2
5	*5710.00	106.3 AV			1.09 H	150	104.1	2.2
6	#5850.00	58.6 PK	68.2	-9.6	1.09 H	150	56.0	2.6
7	11420.00	56.6 PK	74.0	-17.4	2.14 H	99	43.0	13.6
8	11420.00	46.5 AV	54.0	-7.5	2.14 H	99	32.9	13.6
9	#17130.00	46.9 PK	68.2	-21.3	2.02 H	141	29.8	17.1
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	5460.00	52.1 PK	74.0	-21.9	2.12 V	30	50.2	1.9
2	5460.00	44.3 AV	54.0	-9.7	2.12 V	30	42.4	1.9
3	#5470.00	53.3 PK	68.2	-14.9	2.12 V	30	51.4	1.9
4	*5710.00	118.2 PK			2.12 V	30	116.0	2.2
5	*5710.00	107.7 AV			2.12 V	30	105.5	2.2
6	#5850.00	59.1 PK	68.2	-9.1	2.12 V	30	56.5	2.6
7	11420.00	56.4 PK	74.0	-17.6	2.22 V	127	42.8	13.6
8	11420.00	45.5 AV	54.0	-8.5	2.22 V	127	31.9	13.6
9	#17130.00	52.4 PK	68.2	-15.8	2.00 V	238	35.3	17.1

REMARKS:

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

802.11ax (HE80)

CHANNEL	TX Channel 58	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	59.2 PK	74.0	-14.8	2.15 H	169	57.1	2.1
2	5150.00	43.7 AV	54.0	-10.3	2.15 H	169	41.6	2.1
3	*5290.00	108.2 PK			2.15 H	169	106.8	1.4
4	*5290.00	98.2 AV			2.15 H	169	96.8	1.4
5	5350.00	62.4 PK	74.0	-11.6	2.15 H	169	60.9	1.5
6	5350.00	49.7 AV	54.0	-4.3	2.15 H	169	48.2	1.5
7	#10580.00	47.9 PK	68.2	-20.3	2.18 H	103	35.0	12.9
8	15870.00	45.0 PK	74.0	-29.0	2.02 H	149	33.4	11.6
9	15870.00	34.0 AV	54.0	-20.0	2.02 H	149	22.4	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	55.0 PK	74.0	-19.0	1.52 V	214	52.9	2.1
2	5150.00	43.5 AV	54.0	-10.5	1.52 V	214	41.4	2.1
3	*5290.00	110.7 PK			1.52 V	214	109.3	1.4
4	*5290.00	99.4 AV			1.52 V	214	98.0	1.4
5	5350.00	71.8 PK	74.0	-2.2	1.52 V	214	70.3	1.5
6	5350.00	53.6 AV	54.0	-0.4	1.52 V	214	52.1	1.5
7	#10580.00	47.6 PK	68.2	-20.6	2.17 V	138	34.7	12.9
8	15870.00	44.5 PK	74.0	-29.5	1.98 V	239	32.9	11.6
9	15870.00	34.0 AV	54.0	-20.0	1.98 V	239	22.4	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 106	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	62.3 PK	74.0	-11.7	2.11 H	162	60.4	1.9
2	5460.00	45.9 AV	54.0	-8.1	2.11 H	162	44.0	1.9
3	#5470.00	62.1 PK	68.2	-6.1	2.11 H	162	60.2	1.9
4	*5530.00	107.1 PK			2.11 H	162	105.1	2.0
5	*5530.00	96.2 AV			2.11 H	162	94.2	2.0
6	#5725.00	49.3 PK	68.2	-18.9	2.11 H	162	47.1	2.2
7	11060.00	50.4 PK	74.0	-23.6	2.23 H	112	37.2	13.2
8	11060.00	39.8 AV	54.0	-14.2	2.23 H	112	26.6	13.2
9	#16590.00	46.8 PK	68.2	-21.4	2.06 H	138	32.0	14.8
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	5460.00	60.3 PK	74.0	-13.7	1.95 V	205	58.4	1.9
2	5460.00	47.7 AV	54.0	-6.3	1.95 V	205	45.8	1.9
3	#5470.00	67.4 PK	68.2	-0.8	1.95 V	205	65.5	1.9
4	*5530.00	108.4 PK			1.95 V	205	106.4	2.0
5	*5530.00	97.6 AV			1.95 V	205	95.6	2.0
6	#5725.00	54.5 PK	68.2	-13.7	1.95 V	205	52.3	2.2
7	11060.00	45.5 PK	74.0	-28.5	1.39 V	99	32.3	13.2
8	11060.00	35.4 AV	54.0	-18.6	1.39 V	99	22.2	13.2
9	#16590.00	45.6 PK	68.2	-22.6	1.77 V	140	30.8	14.8

REMARKS:

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

CHANNEL	TX Channel 122	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5610.00	108.4 PK			2.14 H	356	106.3	2.1
2	*5610.00	97.4 AV			2.14 H	356	95.3	2.1
3	#5725.00	60.0 PK	68.2	-8.2	2.14 H	356	57.8	2.2
4	11220.00	51.0 PK	74.0	-23.0	2.38 H	67	38.4	12.6
5	11220.00	41.3 AV	54.0	-12.7	2.38 H	67	28.7	12.6
6	#16830.00	48.9 PK	68.2	-19.3	1.37 H	20	32.6	16.3
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	*5610.00	109.6 PK			1.63 V	215	107.5	2.1
2	*5610.00	98.3 AV			1.63 V	215	96.2	2.1
3	#5725.00	67.5 PK	68.2	-0.7	1.63 V	215	65.3	2.2
4	11220.00	48.6 PK	74.0	-25.4	1.38 V	98	36.0	12.6
5	11220.00	38.5 AV	54.0	-15.5	1.38 V	98	25.9	12.6
6	#16830.00	49.0 PK	68.2	-19.2	1.75 V	139	32.7	16.3

REMARKS:

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

CHANNEL	TX Channel 138	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	50.4 PK	74.0	-23.6	2.12 H	353	48.5	1.9
2	5460.00	39.1 AV	54.0	-14.9	2.12 H	353	37.2	1.9
3	#5470.00	55.6 PK	68.2	-12.6	2.12 H	353	53.7	1.9
4	*5690.00	108.8 PK			2.12 H	353	106.7	2.1
5	*5690.00	97.6 AV			2.12 H	353	95.5	2.1
6	#5850.00	57.7 PK	68.2	-10.5	2.12 H	353	55.1	2.6
7	11380.00	56.8 PK	74.0	-17.2	2.36 H	55	43.5	13.3
8	11380.00	40.7 AV	54.0	-13.3	2.36 H	55	27.4	13.3
9	#17070.00	46.8 PK	68.2	-21.4	1.35 H	39	29.9	16.9

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	5460.00	50.3 PK	74.0	-23.7	2.29 V	23	48.4	1.9
2	5460.00	40.2 AV	54.0	-13.8	2.29 V	23	38.3	1.9
3	#5470.00	55.2 PK	68.2	-13.0	2.29 V	23	53.3	1.9
4	*5690.00	117.1 PK			2.29 V	23	115.0	2.1
5	*5690.00	104.3 AV			2.29 V	23	102.2	2.1
6	#5850.00	64.1 PK	68.2	-4.1	2.29 V	23	61.5	2.6
7	11380.00	52.1 PK	74.0	-21.9	1.37 V	122	38.8	13.3
8	11380.00	38.7 AV	54.0	-15.3	1.37 V	122	25.4	13.3
9	#17070.00	47.2 PK	68.2	-21.0	1.72 V	140	30.3	16.9

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.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ax (HE160)

CHANNEL	TX Channel 50	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.9 PK	74.0	-7.1	2.18 H	169	64.8	2.1
2	5150.00	50.0 AV	54.0	-4.0	2.18 H	169	47.9	2.1
3	*5250.00	105.0 PK			2.18 H	169	103.7	1.3
4	*5250.00	95.5 AV			2.18 H	169	94.2	1.3
5	5350.00	70.4 PK	74.0	-3.6	2.18 H	169	68.9	1.5
6	5350.00	48.0 AV	54.0	-6.0	2.18 H	169	46.5	1.5
7	#10500.00	49.7 PK	68.2	-18.5	1.56 H	120	36.9	12.8
8	15750.00	46.3 PK	74.0	-27.7	1.72 H	79	34.6	11.7
9	15750.00	34.6 AV	54.0	-19.4	1.72 H	79	22.9	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	70.1 PK	74.0	-3.9	1.63 V	212	68.0	2.1
2	5150.00	53.6 AV	54.0	-0.4	1.63 V	212	51.5	2.1
3	*5250.00	108.8 PK			1.63 V	212	107.5	1.3
4	*5250.00	96.3 AV			1.63 V	212	95.0	1.3
5	5350.00	69.9 PK	74.0	-4.1	1.63 V	212	68.4	1.5
6	5350.00	52.4 AV	54.0	-1.6	1.63 V	212	50.9	1.5
7	#10500.00	48.1 PK	68.2	-20.1	1.88 V	223	35.3	12.8
8	15750.00	46.4 PK	74.0	-27.6	1.69 V	154	34.7	11.7
9	15750.00	34.5 AV	54.0	-19.5	1.69 V	154	22.8	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 114	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	67.1 PK	74.0	-6.9	2.22 H	172	65.2	1.9
2	5460.00	50.0 AV	54.0	-4.0	2.22 H	172	48.1	1.9
3	#5470.00	67.9 PK	68.2	-0.3	2.22 H	172	66.0	1.9
4	*5570.00	104.6 PK			2.22 H	172	102.5	2.1
5	*5570.00	95.2 AV			2.22 H	172	93.1	2.1
6	#5725.00	60.3 PK	68.2	-7.9	2.22 H	172	58.1	2.2
7	11140.00	49.4 PK	74.0	-24.6	1.59 H	108	36.7	12.7
8	11140.00	40.7 AV	54.0	-13.3	1.59 H	108	28.0	12.7
9	#16710.00	45.6 PK	68.2	-22.6	1.71 H	68	30.0	15.6

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	5460.00	65.7 PK	74.0	-8.3	1.58 V	217	63.8	1.9
2	5460.00	52.7 AV	54.0	-1.3	1.58 V	217	50.8	1.9
3	#5470.00	68.0 PK	68.2	-0.2	1.58 V	217	66.1	1.9
4	*5570.00	108.2 PK			1.58 V	217	106.1	2.1
5	*5570.00	96.2 AV			1.58 V	217	94.1	2.1
6	#5725.00	58.8 PK	68.2	-9.4	1.58 V	217	56.6	2.2
7	11140.00	48.4 PK	74.0	-25.6	1.92 V	212	35.7	12.7
8	11140.00	40.4 AV	54.0	-13.6	1.92 V	212	27.7	12.7
9	#16710.00	45.7 PK	68.2	-22.5	1.66 V	145	30.1	15.6

REMARKS:

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

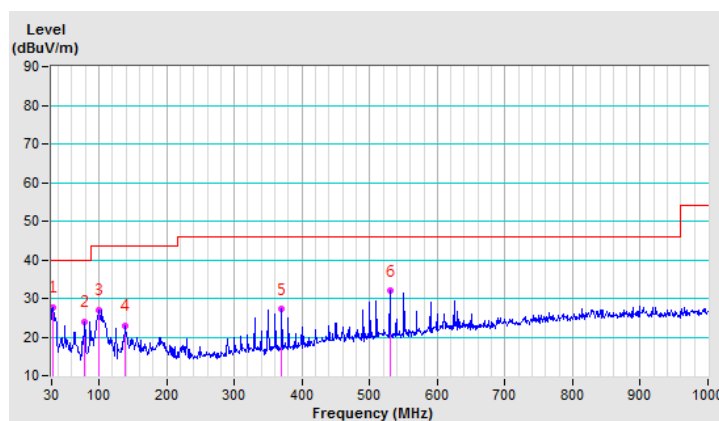
Below 1GHz Data:
802.11ax (HE20)

CHANNEL	TX Channel 60	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	31.84	27.6 QP	40.0	-12.4	1.50 H	1	42.0	-14.4
2	79.04	23.9 QP	40.0	-16.1	3.00 H	242	41.4	-17.5
3	100.28	26.9 QP	43.5	-16.6	2.00 H	263	44.1	-17.2
4	139.52	22.8 QP	43.5	-20.7	1.50 H	249	36.2	-13.4
5	370.00	27.2 QP	46.0	-18.8	1.00 H	292	37.8	-10.6
6	530.01	31.9 QP	46.0	-14.1	1.50 H	1	39.0	-7.1

REMARKS:

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

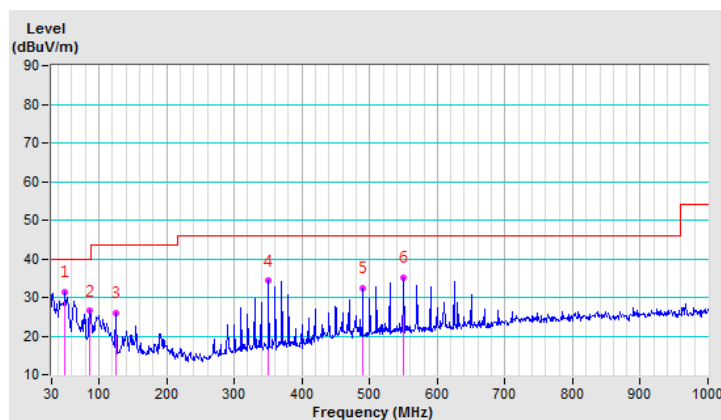


CHANNEL	TX Channel 60	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	49.30	31.4 QP	40.0	-8.6	2.00 V	132	44.4	-13.0
2	86.17	26.5 QP	40.0	-13.5	1.50 V	323	44.9	-18.4
3	124.97	25.9 QP	43.5	-17.6	1.00 V	248	40.5	-14.6
4	349.97	34.3 QP	46.0	-11.7	1.50 V	264	45.6	-11.3
5	490.00	32.4 QP	46.0	-13.6	1.00 V	75	40.3	-7.9
6	549.99	35.1 QP	46.0	-10.9	1.00 V	90	42.0	-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.



4.1.8 Test Results (Mode 2)

Below 1GHz Data:

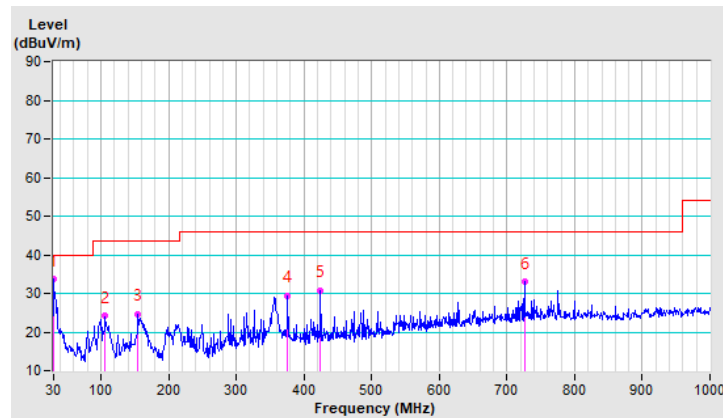
802.11ax (HE20)

CHANNEL	TX Channel 60	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	30.63	33.6 QP	40.0	-6.4	1.00 H	360	48.2	-14.6
2	106.00	24.1 QP	43.5	-19.4	1.50 H	95	40.6	-16.5
3	154.85	24.7 QP	43.5	-18.8	1.50 H	237	37.5	-12.8
4	375.43	29.3 QP	46.0	-16.7	1.00 H	194	39.8	-10.5
5	424.57	30.8 QP	46.0	-15.2	2.00 H	26	40.0	-9.2
6	726.30	32.9 QP	46.0	-13.1	1.00 H	200	36.4	-3.5

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. 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.

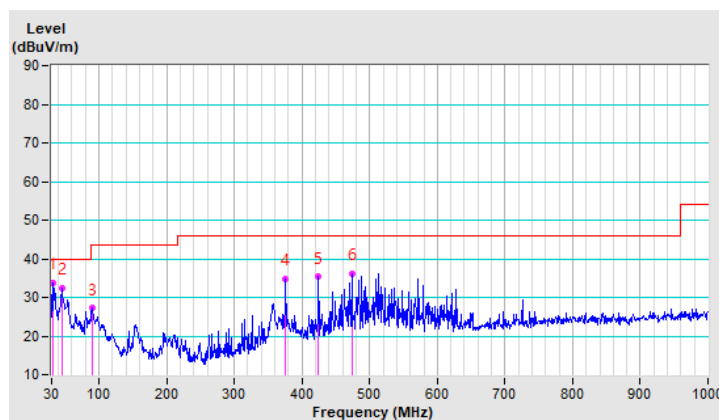


CHANNEL	TX Channel 60	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	32.23	33.8 QP	40.0	-6.2	1.00 V	158	48.2	-14.4
2	46.15	32.5 QP	40.0	-7.5	1.00 V	0	45.5	-13.0
3	89.90	27.2 QP	43.5	-16.3	1.00 V	28	45.6	-18.4
4	375.43	34.7 QP	46.0	-11.3	1.50 V	113	45.2	-10.5
5	424.57	35.3 QP	46.0	-10.7	1.50 V	137	44.5	-9.2
6	473.70	36.2 QP	46.0	-9.8	1.00 V	124	44.2	-8.0

REMARKS:

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



4.1.9 Test Results (Mode 3)

Below 1GHz Data:

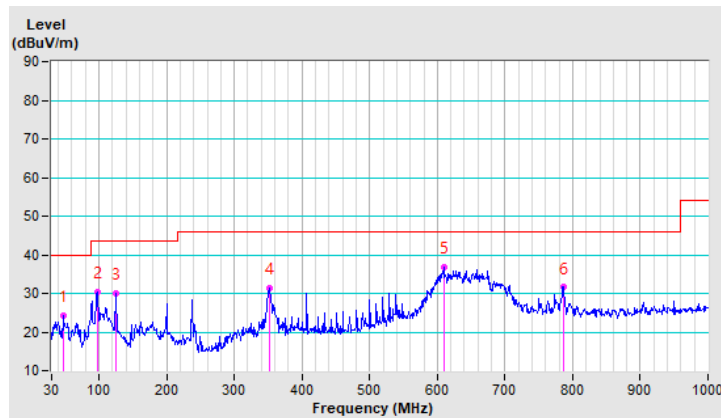
802.11ax (HE20)

CHANNEL	TX Channel 60	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	48.04	24.3 QP	40.0	-15.7	1.00 H	254	37.2	-12.9
2	97.47	30.4 QP	43.5	-13.1	1.50 H	70	48.1	-17.7
3	124.97	30.0 QP	43.5	-13.5	2.00 H	278	44.6	-14.6
4	352.78	31.4 QP	46.0	-14.6	1.00 H	318	42.5	-11.1
5	610.33	36.9 QP	46.0	-9.1	1.50 H	335	41.9	-5.0
6	786.20	31.6 QP	46.0	-14.4	1.00 H	255	34.1	-2.5

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. 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.

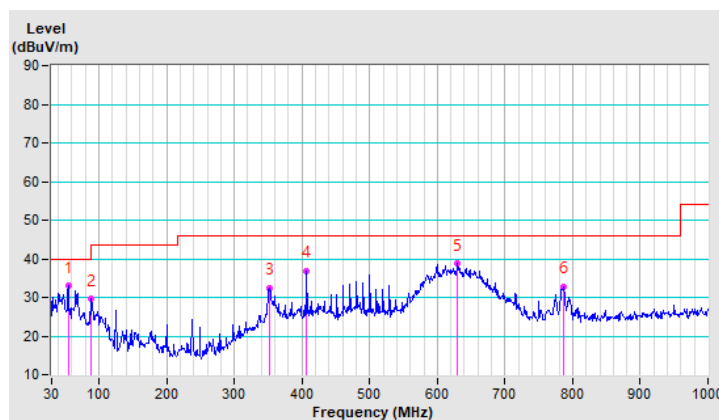


CHANNEL	TX Channel 60	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	54.59	32.9 QP	40.0	-7.1	1.00 V	137	46.1	-13.2
2	89.12	29.5 QP	43.5	-14.0	1.00 V	12	47.8	-18.3
3	352.59	32.3 QP	46.0	-13.7	1.50 V	279	43.4	-11.1
4	407.15	36.7 QP	46.0	-9.3	1.00 V	111	46.5	-9.8
5	630.36	38.7 QP	46.0	-7.3	1.50 V	329	43.6	-4.9
6	786.73	32.7 QP	46.0	-13.3	1.00 V	1	35.2	-2.5

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2018	Oct. 23, 2019
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 22, 2018	Oct. 21, 2019
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 17, 2019	Mar. 16, 2020
50 ohms Terminator	N/A	3	Oct. 22, 2018	Oct. 21, 2019
RF Cable	5D-FB	COCCAB-001	Sep. 28, 2018	Sep. 27, 2019
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 14, 2019	Mar. 13, 2020
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
- 3 Tested Date: Aug. 19 to Sep. 09, 2019

4.2.3 Test Procedure

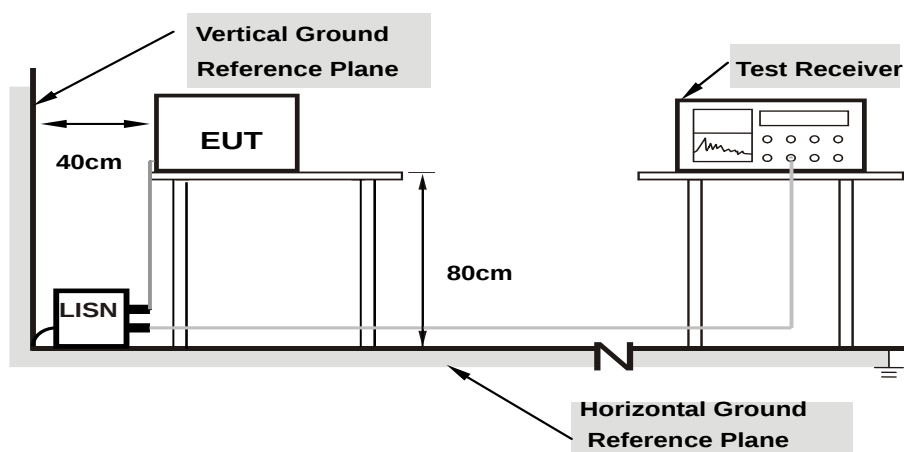
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

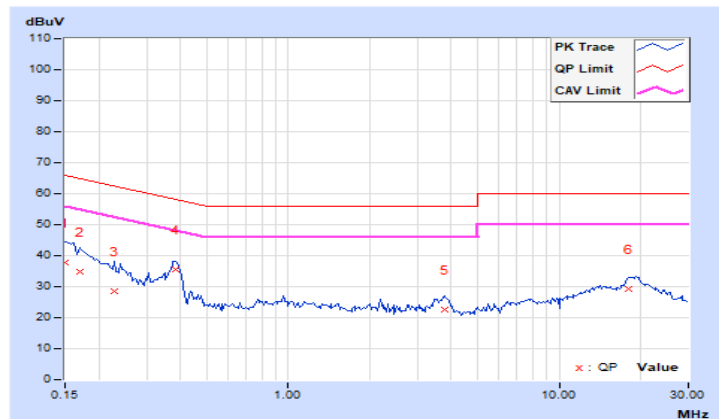
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.97	27.96	11.77	37.93	21.74	66.00	56.00	-28.07	-34.26
2	0.16953	9.97	24.87	9.84	34.84	19.81	64.98	54.98	-30.14	-35.17
3	0.22812	9.98	18.59	7.39	28.57	17.37	62.52	52.52	-33.95	-35.15
4	0.38438	9.99	25.45	16.20	35.44	26.19	58.18	48.18	-22.74	-21.99
5	3.77734	10.25	12.43	5.63	22.68	15.88	56.00	46.00	-33.32	-30.12
6	18.12500	11.23	17.98	12.88	29.21	24.11	60.00	50.00	-30.79	-25.89

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

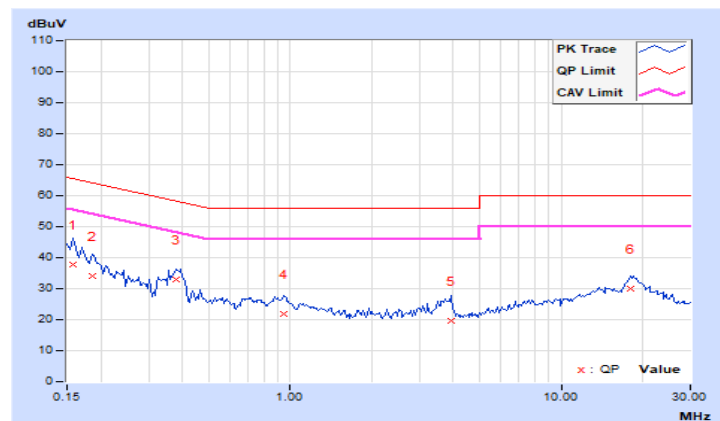


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.95	27.91	11.79	37.86	21.74	65.58	55.58	-27.72	-33.84
2	0.18516	9.96	24.28	10.56	34.24	20.52	64.25	54.25	-30.01	-33.73
3	0.38047	9.98	23.02	14.65	33.00	24.63	58.27	48.27	-25.27	-23.64
4	0.94688	10.02	11.99	4.79	22.01	14.81	56.00	46.00	-33.99	-31.19
5	3.91406	10.20	9.28	2.86	19.48	13.06	56.00	46.00	-36.52	-32.94
6	18.02734	10.99	18.91	13.61	29.90	24.60	60.00	50.00	-30.10	-25.40

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.



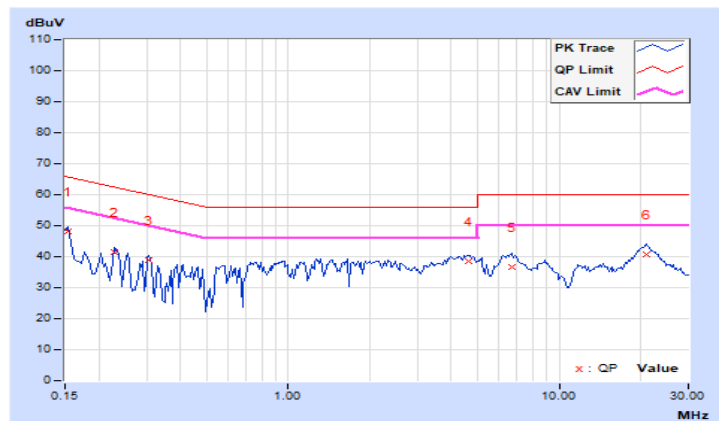
4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15390	9.95	38.11	32.08	48.06	42.03	65.79	55.79	-17.73	-13.76
2	0.22811	9.96	31.39	29.96	41.35	39.92	62.52	52.52	-21.17	-12.60
3	0.30625	9.97	29.10	28.19	39.07	38.16	60.07	50.07	-21.00	-11.91
4	4.60937	10.20	28.40	20.71	38.60	30.91	56.00	46.00	-17.40	-15.09
5	6.71485	10.31	26.49	21.02	36.80	31.33	60.00	50.00	-23.20	-18.67
6	20.97265	11.07	29.56	24.46	40.63	35.53	60.00	50.00	-19.37	-14.47

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

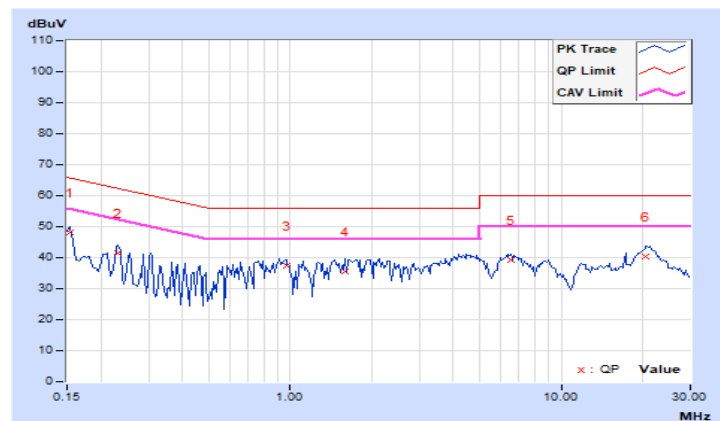


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15390	9.93	38.19	32.49	48.12	42.42	65.79	55.79	-17.67	-13.37
2	0.23202	9.94	31.53	30.06	41.47	40.00	62.38	52.38	-20.91	-12.38
3	0.96640	9.99	27.25	24.89	37.24	34.88	56.00	46.00	-18.76	-11.12
4	1.59374	10.02	25.51	11.26	35.53	21.28	56.00	46.00	-20.47	-24.72
5	6.52345	10.23	28.93	22.48	39.16	32.71	60.00	50.00	-20.84	-17.29
6	20.39062	10.80	29.54	24.47	40.34	35.27	60.00	50.00	-19.66	-14.73

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.



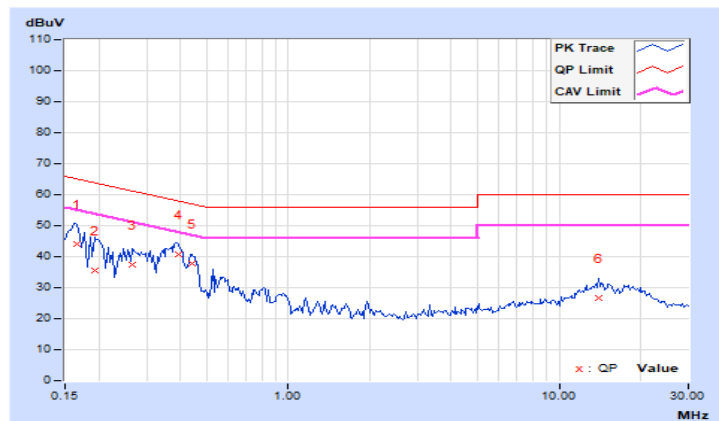
4.2.9 Test Results (Mode 3)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	9.97	34.03	18.79	44.00	28.76	65.18	55.18	-21.18	-26.42
2	0.19297	9.98	25.40	11.55	35.38	21.53	63.91	53.91	-28.53	-32.38
3	0.26719	9.98	27.48	17.77	37.46	27.75	61.20	51.20	-23.74	-23.45
4	0.39219	9.99	30.80	21.96	40.79	31.95	58.02	48.02	-17.23	-16.07
5	0.44297	9.99	27.86	22.32	37.85	32.31	57.01	47.01	-19.16	-14.70
6	13.99609	10.94	15.62	10.02	26.56	20.96	60.00	50.00	-33.44	-29.04

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

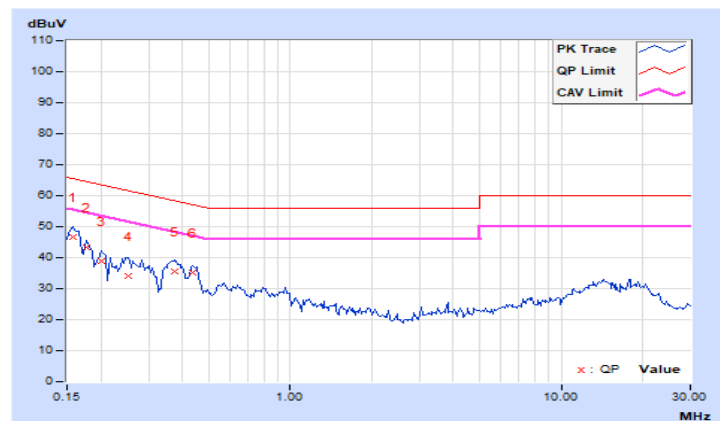


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.95	36.69	22.76	46.64	32.71	65.58	55.58	-18.94	-22.87
2	0.17734	9.96	33.32	18.00	43.28	27.96	64.61	54.61	-21.33	-26.65
3	0.20078	9.96	29.04	18.99	39.00	28.95	63.58	53.58	-24.58	-24.63
4	0.25156	9.97	24.25	12.06	34.22	22.03	61.71	51.71	-27.49	-29.68
5	0.37656	9.98	25.53	10.58	35.51	20.56	58.35	48.35	-22.84	-27.79
6	0.43516	9.98	25.14	18.93	35.12	28.91	57.15	47.15	-22.03	-18.24

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 $\leq$ 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} ;

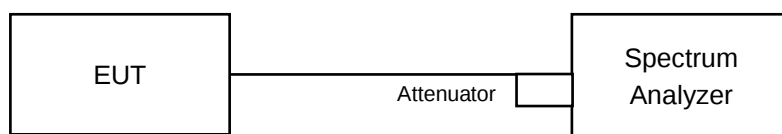
Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

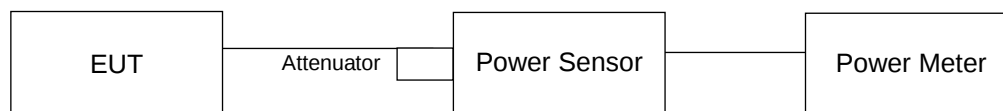
4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

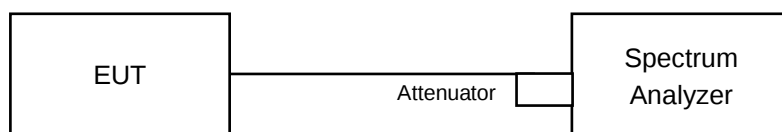
For straddling channel



For other channels:



FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

For straddling channel:

Follow FCC KDB 789033 UNII test procedure:

For 802.11a:

Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep $\geq 2 \text{ Span} / \text{RBW}$.
5. Sweep time = auto.
6. Set trigger to free run (duty cycle ≥ 98 percent)
7. Detector = RMS.
8. Trace average at least 100 traces in power averaging mode
9. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

For other modulation:

Method SA-2

1. Set span to encompass the emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep $\geq 2 \text{ Span} / \text{RBW}$.
5. Sweep time = auto.
6. Detector = RMS.
7. Trace average at least 100 traces in power averaging mode
8. Compute power by integrating the spectrum across the 26 dB EBW of the signal.
9. Duty factor need added to measured value (duty cycle < 98 percent).

For other channels:

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.

FOR 26dB OCCUPIED BANDWIDTH

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW $>$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

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 Result

Non-Beamforming Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
52	5260	18.34	17.34	17.95	17.92	246.751	23.92	24.00	Pass
60	5300	18.27	17.40	18.01	17.51	241.702	23.83	24.00	Pass
64	5320	18.25	17.37	18.02	17.38	239.499	23.79	24.00	Pass
100	5500	18.21	17.33	18.00	17.57	240.541	23.81	24.00	Pass
116	5580	18.29	17.34	18.09	17.56	243.086	23.86	24.00	Pass
140	5700	18.46	17.30	18.02	17.49	243.341	23.86	24.00	Pass
*144 (U-NII-2C Band)	5720	14.89	14.13	14.26	13.90	107.93	20.33	22.96	Pass
*144 (U-NII-3 Band)	5720	9.15	8.59	8.55	8.34	29.434	14.69	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
144	5720	137.364	21.38

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	21.79	21.92	21.86	21.85
60	5300	21.71	21.81	21.84	21.65
64	5320	21.65	21.79	21.86	21.69
100	5500	21.54	21.68	21.86	21.64
116	5580	23.07	23.28	22.98	22.76
140	5700	21.57	21.97	21.88	21.71
144 (U-NII-2C Band)	5720	15.73	15.87	15.92	15.71

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.79	24.38 > 24
60	5300	21.65	24.35 > 24
64	5320	21.65	24.35 > 24
100	5500	21.54	24.33 > 24
116	5580	22.76	24.57 > 24
140	5700	21.57	24.33 > 24
144 (U-NII-2C Band)	5720	15.71	22.96 < 24

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
52	5260	18.44	17.24	17.48	17.56	235.781	23.73	24.00	Pass
60	5300	18.04	17.22	17.70	17.48	231.263	23.64	24.00	Pass
64	5320	17.88	17.34	17.49	17.66	230.026	23.62	24.00	Pass
100	5500	18.08	17.02	18.08	17.53	235.512	23.72	24.00	Pass
116	5580	17.90	17.14	17.98	17.31	230.054	23.62	24.00	Pass
140	5700	17.98	17.08	17.80	17.46	229.831	23.61	24.00	Pass
*144 (U-NII-2C Band)	5720	13.92	13.52	13.91	13.52	96.466	19.84	23.00	Pass
*144 (U-NII-3 Band)	5720	8.29	7.78	8.21	7.79	25.975	14.15	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
144	5720	122.441	20.88

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	21.97	21.80	21.99	22.10
60	5300	21.94	21.80	21.86	22.09
64	5320	21.95	21.83	21.97	21.93
100	5500	21.76	21.75	21.92	21.79
116	5580	23.50	23.65	23.52	23.73
140	5700	21.94	21.91	22.03	21.99
144 (U-NII-2C Band)	5720	15.95	15.89	15.93	15.88

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.80	24.38 > 24
60	5300	21.80	24.38 > 24
64	5320	21.83	24.39 > 24
100	5500	21.75	24.37 > 24
116	5580	23.50	24.71 > 24
140	5700	21.91	24.4 > 24
144 (U-NII-2C Band)	5720	15.88	23 < 24

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
54	5270	17.98	17.27	17.61	17.60	231.36	23.64	24.00	Pass
62	5310	18.08	17.20	17.91	17.48	234.528	23.70	24.00	Pass
102	5510	18.18	16.98	17.64	17.81	234.125	23.69	24.00	Pass
110	5550	18.24	17.53	17.73	17.46	238.317	23.77	24.00	Pass
134	5670	18.12	17.44	17.73	17.53	236.243	23.73	24.00	Pass
*142 (U-NII-2C Band)	5710	14.90	14.73	14.34	14.69	122.194	20.87	24.00	Pass
*142 (U-NII-3 Band)	5710	4.34	4.28	3.84	4.18	10.876	10.36	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
142	5710	133.07	21.24

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
54	5270	41.84	41.69	41.58	41.68
62	5310	41.84	41.59	41.60	41.70
102	5510	41.81	41.64	41.68	41.88
110	5550	41.73	41.57	41.60	41.77
134	5670	41.88	41.54	41.60	41.60
142 (U-NII-2C Band)	5710	35.89	35.82	35.78	36.01

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.58	27.18 > 24
62	5310	41.59	27.18 > 24
102	5510	41.64	27.19 > 24
110	5550	41.57	27.18 > 24
134	5670	41.54	27.18 > 24
142 (U-NII-2C Band)	5710	35.78	26.53 > 24

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	17.30	17.31	18.39	18.19	242.471	23.85	24.00	Pass
106	5530	17.81	17.24	17.79	17.60	231.022	23.64	24.00	Pass
122	5610	17.79	17.07	17.91	17.91	234.654	23.70	24.00	Pass
*138 (U-NII-2C Band)	5690	14.95	14.34	14.44	14.63	124.751	20.96	24.00	Pass
*138 (U-NII-3 Band)	5690	0.52	0.08	0.11	0.37	4.612	6.64	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
138	5690	129.363	21.12

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	82.55	82.09	82.35	82.49
106	5530	82.83	82.18	82.73	82.68
122	5610	82.45	82.09	82.48	82.68
138 (U-NII-2C Band)	5690	76.09	76.08	76.53	76.07

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	82.09	30.14 > 24
106	5530	82.18	30.14 > 24
122	5610	82.09	30.14 > 24
138 (U-NII-2C Band)	5690	76.07	29.81 > 24

802.11ac (VHT160)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
*50 (U-NII-1 Band)	5250	12.48	12.67	12.99	12.91	85.58	19.32	30.00	Pass
*50 (U-NII-2A Band)	5250	12.97	13.15	13.47	13.49	96.208	19.83	24.00	Pass
114	5570	17.85	16.95	17.52	17.84	227.807	23.58	24.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
50	5250	181.788	22.6

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
50 (U-NII-2A Band)	5250	82.14	82.65	81.73	81.97
114	5570	163.03	164.11	162.83	162.65

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
50 (U-NII-2A Band)	5250	81.73	30.12 > 24
114	5570	162.65	33.11 > 24

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
52	5260	18.50	17.45	17.86	17.74	246.908	23.93	24.00	Pass
60	5300	18.48	17.50	17.93	17.82	249.324	23.97	24.00	Pass
64	5320	18.29	17.37	17.94	17.85	245.213	23.90	24.00	Pass
100	5500	18.28	17.36	18.25	17.79	248.699	23.96	24.00	Pass
116	5580	18.16	17.24	18.25	17.66	243.609	23.87	24.00	Pass
140	5700	18.17	17.32	18.16	17.64	243.106	23.86	24.00	Pass
*144 (U-NII-2C Band)	5720	14.60	14.05	14.12	14.00	107.67	20.32	23.00	Pass
*144 (U-NII-3 Band)	5720	9.56	8.90	8.85	8.82	32.849	15.17	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
144	5720	140.519	21.48

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	21.97	21.80	21.99	22.10
60	5300	21.94	21.80	21.86	22.09
64	5320	21.95	21.83	21.97	21.93
100	5500	21.76	21.75	21.92	21.79
116	5580	23.50	23.65	23.52	23.73
140	5700	21.94	21.91	22.03	21.99
144 (U-NII-2C Band)	5720	15.95	15.89	15.93	15.88

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.80	24.38 > 24
60	5300	21.80	24.38 > 24
64	5320	21.83	24.39 > 24
100	5500	21.75	24.37 > 24
116	5580	23.50	24.71 > 24
140	5700	21.91	24.4 > 24
144 (U-NII-2C Band)	5720	15.88	23 < 24

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
54	5270	18.46	17.34	18.01	17.66	245.932	23.91	24.00	Pass
62	5310	18.32	17.37	18.23	17.75	248.589	23.95	24.00	Pass
102	5510	18.28	17.39	18.01	17.83	246.041	23.91	24.00	Pass
110	5550	18.39	17.62	17.94	17.73	248.357	23.95	24.00	Pass
134	5670	18.30	17.46	17.86	17.58	241.701	23.83	24.00	Pass
*142 (U-NII-2C Band)	5710	15.21	14.56	14.77	14.42	124.485	20.95	24.00	Pass
*142 (U-NII-3 Band)	5710	5.82	4.98	4.88	4.86	13.66	11.35	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
142	5710	138.145	21.4

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
54	5270	41.84	41.69	41.58	41.68
62	5310	41.84	41.59	41.60	41.70
102	5510	41.81	41.64	41.68	41.88
110	5550	41.73	41.57	41.60	41.77
134	5670	41.88	41.54	41.60	41.60
142 (U-NII-2C Band)	5710	35.89	35.82	35.78	36.01

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.58	27.18 > 24
62	5310	41.59	27.18 > 24
102	5510	41.64	27.19 > 24
110	5550	41.57	27.18 > 24
134	5670	41.54	27.18 > 24
142 (U-NII-2C Band)	5710	35.78	26.53 > 24

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	17.65	17.40	18.45	18.22	249.522	23.97	24.00	Pass
106	5530	18.03	17.33	18.19	17.64	241.601	23.83	24.00	Pass
122	5610	18.01	17.50	18.23	17.97	248.663	23.96	24.00	Pass
*138 (U-NII-2C Band)	5690	15.33	14.65	14.57	14.59	130.646	21.16	24.00	Pass
*138 (U-NII-3 Band)	5690	2.62	1.63	0.69	1.70	6.423	8.08	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
138	5690	137.069	21.37

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	82.55	82.09	82.35	82.49
106	5530	82.83	82.18	82.73	82.68
122	5610	82.45	82.09	82.48	82.68
138 (U-NII-2C Band)	5690	76.09	76.08	76.53	76.07

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	82.09	30.14 > 24
106	5530	82.18	30.14 > 24
122	5610	82.09	30.14 > 24
138 (U-NII-2C Band)	5690	76.07	29.81 > 24

802.11ax (HE160)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
*50 (U-NII-1 Band)	5250	13.16	13.06	14.09	13.20	98.959	19.95	30.00	Pass
*50 (U-NII-2A Band)	5250	13.85	13.57	13.45	13.62	104.268	20.18	24.00	Pass
114	5570	17.87	17.28	18.01	17.85	238.886	23.78	24.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
50	5250	203.227	23.08

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
50 (U-NII-2A Band)	5250	82.14	82.65	81.73	81.97
114	5570	163.03	164.11	162.83	162.65

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
50 (U-NII-2A Band)	5250	81.73	30.12 > 24
114	5570	162.65	33.11 > 24

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
52	5260	18.44	17.24	17.48	17.56	235.781	23.73	23.98	Pass
60	5300	18.04	17.22	17.70	17.48	231.263	23.64	23.98	Pass
64	5320	17.88	17.34	17.49	17.66	230.026	23.62	23.98	Pass
100	5500	18.08	17.02	18.08	17.53	235.512	23.72	23.98	Pass
116	5580	17.90	17.14	17.98	17.31	230.054	23.62	23.98	Pass
140	5700	17.98	17.08	17.80	17.46	229.831	23.61	23.98	Pass
*144 (U-NII-2C Band)	5720	13.92	13.52	13.91	13.52	96.466	19.84	22.98	Pass
*144 (U-NII-3 Band)	5720	8.29	7.78	8.21	7.79	25.975	14.15	29.98	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

1. For U-NII-2A, 2C: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit- (6.02-6)".
2. For U-NII-3: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to 30-(6.02-6) = 29.98dBm.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
144	5720	122.441	20.88

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	21.97	21.80	21.99	22.10
60	5300	21.94	21.80	21.86	22.09
64	5320	21.95	21.83	21.97	21.93
100	5500	21.76	21.75	21.92	21.79
116	5580	23.50	23.65	23.52	23.73
140	5700	21.94	21.91	22.03	21.99
144 (U-NII-2C Band)	5720	15.95	15.89	15.93	15.88

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.80	24.38 > 24
60	5300	21.80	24.38 > 24
64	5320	21.83	24.39 > 24
100	5500	21.75	24.37 > 24
116	5580	23.50	24.71 > 24
140	5700	21.91	24.4 > 24
144 (U-NII-2C Band)	5720	15.88	23 < 24

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
54	5270	17.98	17.27	17.61	17.60	231.36	23.64	23.98	Pass
62	5310	18.08	17.20	17.91	17.48	234.528	23.70	23.98	Pass
102	5510	18.18	16.98	17.64	17.81	234.125	23.69	23.98	Pass
110	5550	18.24	17.53	17.73	17.46	238.317	23.77	23.98	Pass
134	5670	18.12	17.44	17.73	17.53	236.243	23.73	23.98	Pass
*142 (U-NII-2C Band)	5710	14.90	14.73	14.34	14.69	122.194	20.87	23.98	Pass
*142 (U-NII-3 Band)	5710	4.34	4.28	3.84	4.18	10.876	10.36	29.98	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

1. For U-NII-2A, 2C: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit- (6.02-6)".
2. For U-NII-3: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to 30-(6.02-6) = 29.98dBm.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
142	5710	133.07	21.24

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
54	5270	41.84	41.69	41.58	41.68
62	5310	41.84	41.59	41.60	41.70
102	5510	41.81	41.64	41.68	41.88
110	5550	41.73	41.57	41.60	41.77
134	5670	41.88	41.54	41.60	41.60
142 (U-NII-2C Band)	5710	35.89	35.82	35.78	36.01

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.58	27.18 > 24
62	5310	41.59	27.18 > 24
102	5510	41.64	27.19 > 24
110	5550	41.57	27.18 > 24
134	5670	41.54	27.18 > 24
142 (U-NII-2C Band)	5710	35.78	26.53 > 24

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	17.30	17.31	18.39	18.19	242.471	23.85	23.98	Pass
106	5530	17.81	17.24	17.79	17.60	231.022	23.64	23.98	Pass
122	5610	17.79	17.07	17.91	17.91	234.654	23.70	23.98	Pass
*138 (U-NII-2C Band)	5690	14.95	14.34	14.44	14.63	124.751	20.96	23.98	Pass
*138 (U-NII-3 Band)	5690	0.52	0.08	0.11	0.37	4.612	6.64	29.98	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

1. For U-NII-2A, 2C: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit- (6.02-6)".
2. For U-NII-3: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to 30-(6.02-6) = 29.98dBm.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
138	5690	129.363	21.12

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	82.55	82.09	82.35	82.49
106	5530	82.83	82.18	82.73	82.68
122	5610	82.45	82.09	82.48	82.68
138 (U-NII-2C Band)	5690	76.09	76.08	76.53	76.07

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	82.09	30.14 > 24
106	5530	82.18	30.14 > 24
122	5610	82.09	30.14 > 24
138 (U-NII-2C Band)	5690	76.07	29.81 > 24

802.11ac (VHT160)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
*50 (U-NII-1 Band)	5250	12.48	12.67	12.99	12.91	85.58	19.32	29.98	Pass
*50 (U-NII-2A Band)	5250	12.97	13.15	13.47	13.49	96.208	19.83	23.98	Pass
114	5570	17.85	16.95	17.52	17.84	227.807	23.58	23.98	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

1. For U-NII-2A, 2C: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit- (6.02-6)".
2. For U-NII-3: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to 30-(6.02-6) = 29.98dBm.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
50	5250	181.788	22.6

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
50 (U-NII-2A Band)	5250	82.14	82.65	81.73	81.97
114	5570	163.03	164.11	162.83	162.65

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
50 (U-NII-2A Band)	5250	81.73	30.12 > 24
114	5570	162.65	33.11 > 24

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
52	5260	18.50	17.45	17.86	17.74	246.908	23.93	23.98	Pass
60	5300	18.48	17.50	17.93	17.82	249.324	23.97	23.98	Pass
64	5320	18.29	17.37	17.94	17.85	245.213	23.90	23.98	Pass
100	5500	18.28	17.36	18.25	17.79	248.699	23.96	23.98	Pass
116	5580	18.16	17.24	18.25	17.66	243.609	23.87	23.98	Pass
140	5700	18.17	17.32	18.16	17.64	243.106	23.86	23.98	Pass
*144 (U-NII-2C Band)	5720	14.60	14.05	14.12	14.00	107.67	20.32	22.98	Pass
*144 (U-NII-3 Band)	5720	9.56	8.90	8.85	8.82	32.849	15.17	29.98	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

1. For U-NII-2A: The directional gain = 6.34dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit- (6.34-6)".
2. For U-NII-2C: The directional gain = 6.05dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit- (6.05-6)".

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
144	5720	140.519	21.48

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	21.97	21.80	21.99	22.10
60	5300	21.94	21.80	21.86	22.09
64	5320	21.95	21.83	21.97	21.93
100	5500	21.76	21.75	21.92	21.79
116	5580	23.50	23.65	23.52	23.73
140	5700	21.94	21.91	22.03	21.99
144 (U-NII-2C Band)	5720	15.95	15.89	15.93	15.88

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.80	24.38 > 24
60	5300	21.80	24.38 > 24
64	5320	21.83	24.39 > 24
100	5500	21.75	24.37 > 24
116	5580	23.50	24.71 > 24
140	5700	21.91	24.4 > 24
144 (U-NII-2C Band)	5720	15.88	23 < 24

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
54	5270	18.46	17.34	18.01	17.66	245.932	23.91	23.98	Pass
62	5310	18.32	17.37	18.23	17.75	248.589	23.95	23.98	Pass
102	5510	18.28	17.39	18.01	17.83	246.041	23.91	23.98	Pass
110	5550	18.39	17.62	17.94	17.73	248.357	23.95	23.98	Pass
134	5670	18.30	17.46	17.86	17.58	241.701	23.83	23.98	Pass
*142 (U-NII-2C Band)	5710	15.21	14.56	14.77	14.42	124.485	20.95	23.98	Pass
*142 (U-NII-3 Band)	5710	5.82	4.98	4.88	4.86	13.66	11.35	29.98	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

1. For U-NII-2A, 2C: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit- (6.02-6)".
2. For U-NII-3: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to 30-(6.02-6) = 29.98dBm.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
142	5710	138.145	21.4

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
54	5270	41.84	41.69	41.58	41.68
62	5310	41.84	41.59	41.60	41.70
102	5510	41.81	41.64	41.68	41.88
110	5550	41.73	41.57	41.60	41.77
134	5670	41.88	41.54	41.60	41.60
142 (U-NII-2C Band)	5710	35.89	35.82	35.78	36.01

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.58	27.18 > 24
62	5310	41.59	27.18 > 24
102	5510	41.64	27.19 > 24
110	5550	41.57	27.18 > 24
134	5670	41.54	27.18 > 24
142 (U-NII-2C Band)	5710	35.78	26.53 > 24

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	17.65	17.40	18.45	18.22	249.522	23.97	23.98	Pass
106	5530	18.03	17.33	18.19	17.64	241.601	23.83	23.98	Pass
122	5610	18.01	17.50	18.23	17.97	248.663	23.96	23.98	Pass
*138 (U-NII-2C Band)	5690	15.33	14.65	14.57	14.59	130.646	21.16	23.98	Pass
*138 (U-NII-3 Band)	5690	2.62	1.63	0.69	1.70	6.423	8.08	29.98	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

1. For U-NII-2A, 2C: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit- (6.02-6)".
2. For U-NII-3: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to 30-(6.02-6) = 29.98dBm.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
138	5690	137.069	21.37

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	82.55	82.09	82.35	82.49
106	5530	82.83	82.18	82.73	82.68
122	5610	82.45	82.09	82.48	82.68
138 (U-NII-2C Band)	5690	76.09	76.08	76.53	76.07

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	82.09	30.14 > 24
106	5530	82.18	30.14 > 24
122	5610	82.09	30.14 > 24
138 (U-NII-2C Band)	5690	76.07	29.81 > 24

802.11ax (HE160)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
*50 (U-NII-1 Band)	5250	13.16	13.06	14.09	13.20	98.959	19.95	29.98	Pass
*50 (U-NII-2A Band)	5250	13.85	13.57	13.45	13.62	104.268	20.18	23.98	Pass
114	5570	17.87	17.28	18.01	17.85	238.886	23.78	23.98	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

1. For U-NII-2A, 2C: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit- (6.02-6)".
2. For U-NII-3: Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power limit shall be reduced to 30-(6.02-6) = 29.98dBm.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
50	5250	203.227	23.08

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

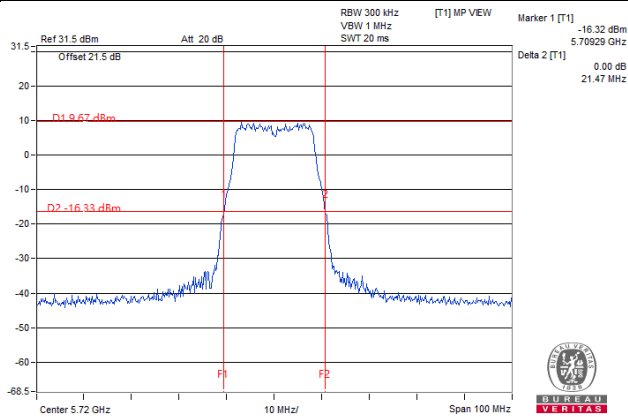
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
50 (U-NII-2A Band)	5250	82.14	82.65	81.73	81.97
114	5570	163.03	164.11	162.83	162.65

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

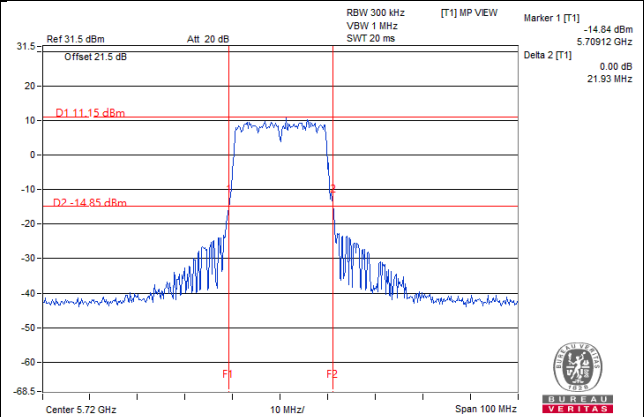
Power Limit = 11dBm + 10logB <U-NII-2A, U-NII-2C>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
50 (U-NII-2A Band)	5250	81.73	30.12 > 24
114	5570	162.65	33.11 > 24

Spectrum Plot of Worst Value

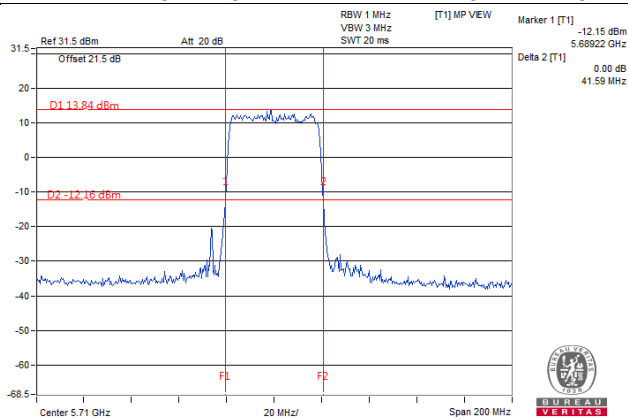
802.11a_Chain 3 / CH144 (U-NII-2C)



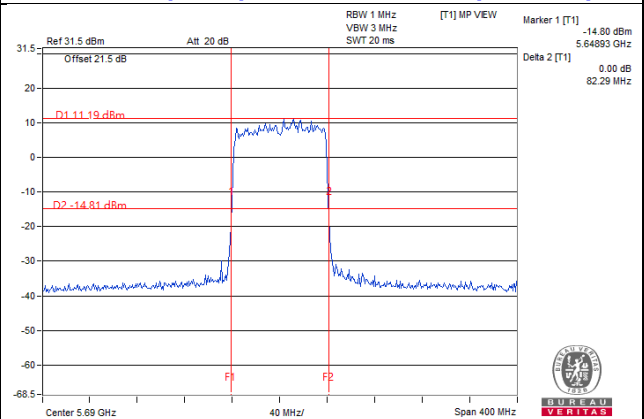
802.11ax (HE20)_Chain 3 / CH144 (U-NII-2C)



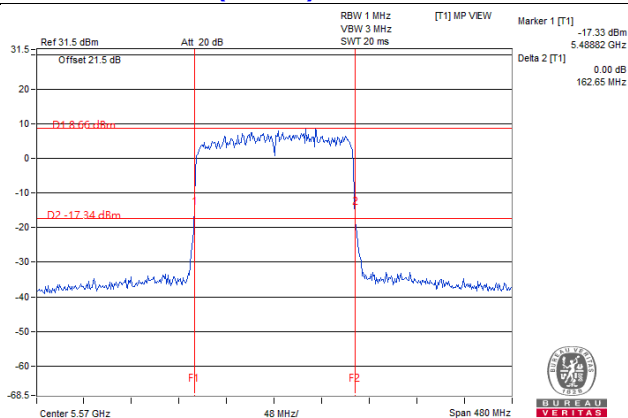
802.11ax (HE40)_Chain 2 / CH142 (U-NII-2C)



802.11ax (HE80)_Chain 3 / CH138 (U-NII-2C)



802.11ax (HE160)_Chain 3 / CH114

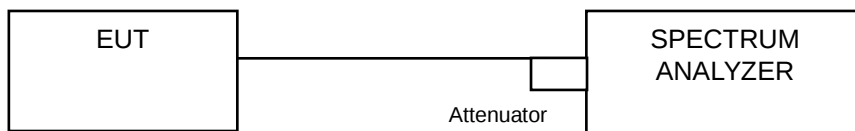


Note:

- For CH144 (U-NII-2C) = 5725MHz - Marker 1
- For CH142 (U-NII-2C) = 5725MHz - Marker 1
- For CH138 (U-NII-2C) = 5725MHz - Marker 1
- For CH50 (U-NII-2A) = Marker 1 + Delta 2 – 5250MHz

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

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	16.92	16.92	16.80	16.92
60	5300	16.80	16.80	16.92	16.80
64	5320	17.04	16.92	16.92	16.80
100	5500	16.92	16.92	17.04	16.92
116	5580	17.04	16.92	16.92	16.92
140	5700	16.92	17.04	16.92	16.92
144 (U-NII-2C Band)	5720	13.52	13.52	13.52	13.52
144 (U-NII-3 Band)	5720	3.40	3.52	3.40	3.28

802.11ax (HE20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	19.08	19.08	19.08	19.08
60	5300	19.08	19.08	19.08	19.08
64	5320	19.08	18.96	19.08	19.08
100	5500	19.08	19.20	19.08	19.08
116	5580	19.08	19.08	19.20	19.08
140	5700	19.08	19.08	19.08	19.08
144 (U-NII-2C Band)	5720	14.72	14.60	14.60	14.60
144 (U-NII-3 Band)	5720	4.36	4.48	4.48	4.36

802.11ax (HE40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
54	5270	37.68	37.92	37.92	37.68
62	5310	37.92	37.92	38.16	37.68
102	5510	37.92	37.92	37.92	37.92
110	5550	37.92	37.68	37.68	37.92
134	5670	37.92	37.92	37.92	37.92
142 (U-NII-2C Band)	5710	33.96	33.96	34.20	33.96
142 (U-NII-3 Band)	5710	3.72	3.72	3.72	3.72

802.11ax (HE80)

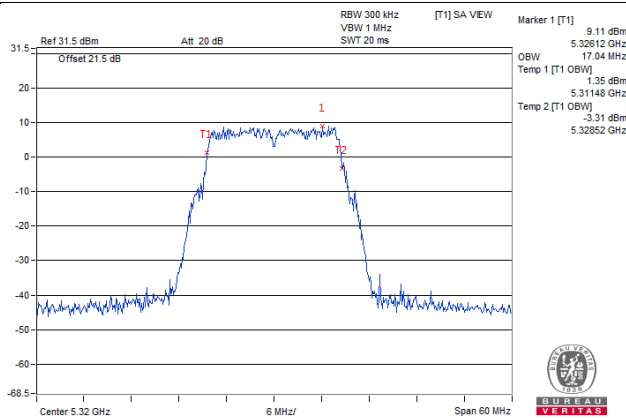
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	77.28	77.28	76.80	76.80
106	5530	77.28	76.80	77.28	77.28
122	5610	77.28	77.28	76.80	77.28
138 (U-NII-2C Band)	5690	73.40	73.40	73.88	73.40
138 (U-NII-3 Band)	5690	3.40	3.40	2.92	3.40

802.11ax (HE160)

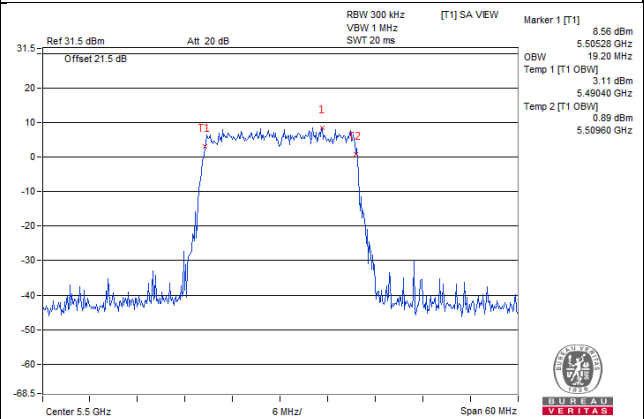
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
50 (U-NII-1 Band)	5250	77.76	77.76	77.76	77.76
50 (U-NII-2A Band)	5250	76.80	77.76	76.80	77.76
114	5570	155.52	155.52	155.52	155.52

Spectrum Plot of Max. Value

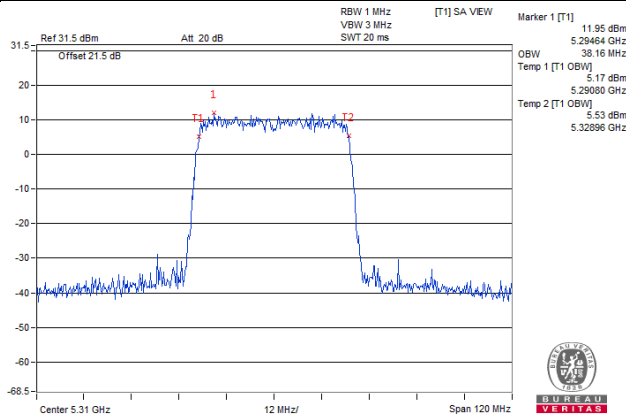
802.11a_Chain 0 / CH64



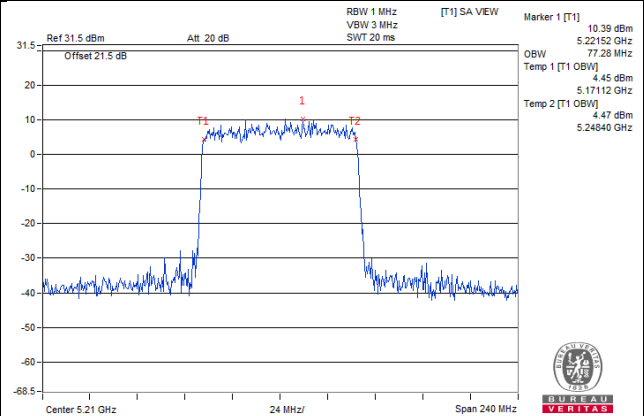
802.11ax (HE20)_Chain 1 / CH100



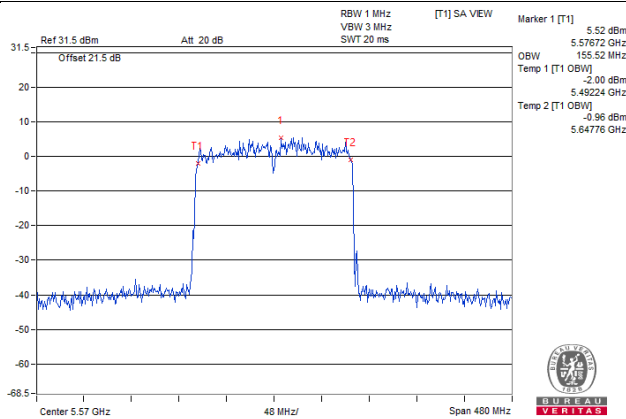
802.11ax (HE40)_Chain 2 / CH62



802.11ax (HE80)_Chain 0 / CH58



802.11ax (HE160)_Chain 0 / CH114



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 802.11a:

For U-NII-2A, U-NII-2C band:

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW $\geq$ 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

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 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 $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$
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

For other modulation:

For U-NII-2A, U-NII-2C 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 $\geq$ 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:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 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 $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$
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

For U-NII-2A, U-NII-2C:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
52	5260	5.02	4.14	4.68	4.78	10.69	10.98	Pass
60	5300	5.03	3.96	4.71	4.65	10.63	10.98	Pass
64	5320	5.25	3.95	4.83	4.80	10.75	10.98	Pass
100	5500	5.08	3.79	4.84	4.50	10.60	10.98	Pass
116	5580	4.94	3.98	4.96	4.40	10.61	10.98	Pass
140	5700	4.89	4.29	4.14	4.26	10.43	10.98	Pass
144 (U-NII-2C Band)	5720	5.11	4.26	3.93	4.08	10.39	10.98	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. Directional gain = $0\text{dBi} + 10\log(4) = 6.02\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.02 - 6) = 10.98\text{dBm}$.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
52	5260	4.79	3.53	3.99	3.56	0.10	10.12	10.98	Pass
60	5300	4.59	3.51	3.93	4.14	0.10	10.18	10.98	Pass
64	5320	4.53	3.43	3.99	3.92	0.10	10.11	10.98	Pass
100	5500	4.28	3.72	4.33	3.93	0.10	10.19	10.98	Pass
116	5580	4.19	3.56	4.22	3.62	0.10	10.03	10.98	Pass
140	5700	4.17	3.67	3.74	3.71	0.10	9.95	10.98	Pass
144 (U-NII-2C Band)	5720	4.30	3.72	3.79	3.76	0.10	10.02	10.98	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. Directional gain = $0\text{dBi} + 10\log(4) = 6.02\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.02 - 6) = 10.98\text{dBm}$.
 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 With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
54	5270	1.57	0.63	1.14	0.75	0.18	7.24	10.98	Pass
62	5310	1.89	0.63	1.50	1.08	0.18	7.50	10.98	Pass
102	5510	1.18	0.91	1.18	1.28	0.18	7.34	10.98	Pass
110	5550	1.58	0.91	1.41	1.08	0.18	7.45	10.98	Pass
134	5670	1.58	-0.03	0.51	0.32	0.18	6.84	10.98	Pass
142 (U-NII-2C Band)	5710	1.11	0.68	0.57	0.74	0.18	6.98	10.98	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. Directional gain = $0\text{dBi} + 10\log(4) = 6.02\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.02 - 6) = 10.98\text{dBm}$.
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 With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	-1.95	-2.08	-1.59	-1.93	0.34	4.48	10.98	Pass
106	5530	-1.60	-2.05	-1.83	-1.97	0.34	4.50	10.98	Pass
122	5610	-1.65	-2.51	-1.60	-2.09	0.34	4.41	10.98	Pass
138 (U-NII-2C Band)	5690	-1.49	-2.10	-2.66	-2.11	0.34	4.29	10.98	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. Directional gain = $0\text{dBi} + 10\log(4) = 6.02\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.02 - 6) = 10.98\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

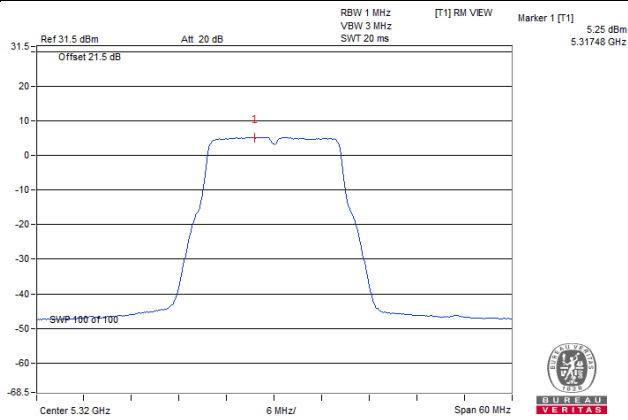
802.11ax (HE160)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
50 (U-NII-1 Band)	5250	-3.33	-3.58	-2.55	-3.40	0.54	3.36	16.98	Pass
50 (U-NII-2A Band)	5250	-3.34	-3.51	-2.98	-3.39	0.54	3.26	10.98	Pass
114	5570	-4.90	-5.31	-4.85	-4.78	0.54	1.61	10.98	Pass

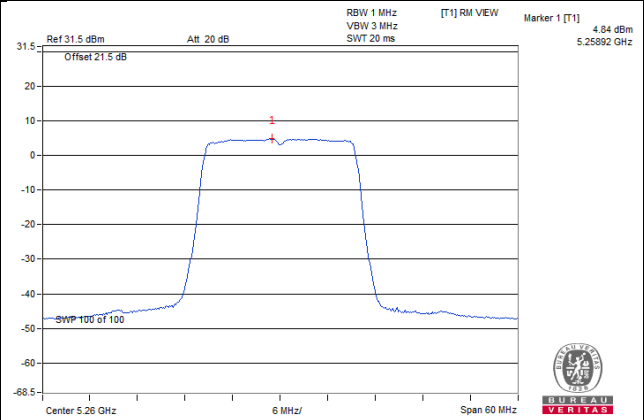
- Note:**
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
 2. Directional gain = $0\text{dBi} + 10\log(4) = 6.02\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.02 - 6) = 10.98\text{dBm}$.
 3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

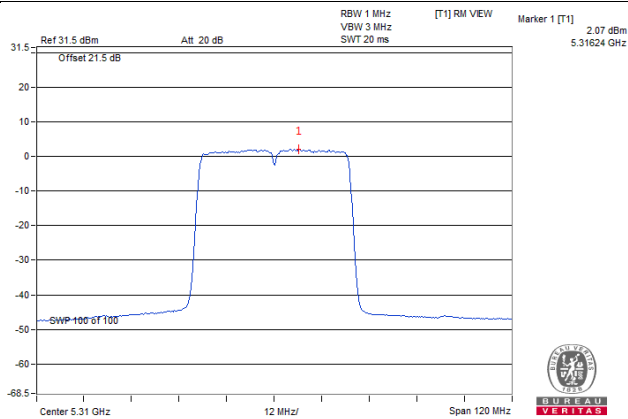
802.11a_Chain 0 / CH64



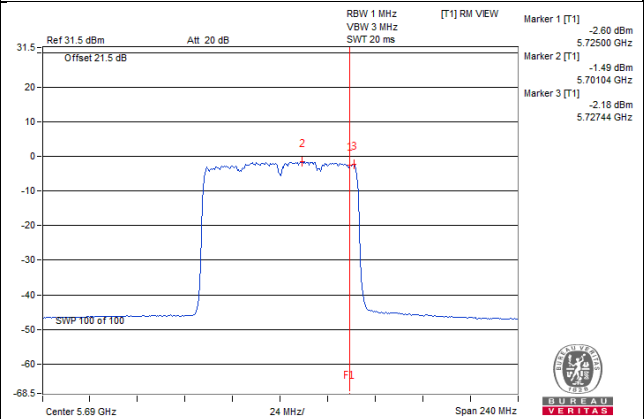
802.11ax (HE20)_Chain 0 / CH52



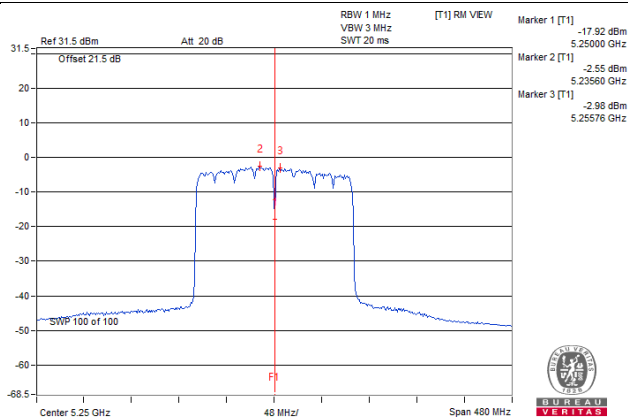
802.11ax (HE40)_Chain 0 / CH62



802.11ax (HE80)_Chain 0 / CH138 (U-NII-2C)



802.11ax (HE160)_Chain 2 / CH50 (U-NII-1)



For U-NII-3:

802.11a

Chan.	Freq. (MHz)	PSD (dBm/300kHz)				Total PSD		Total PSD (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass /Fail
		Chain 0	Chain 1	Chain 2	Chain 3	mW/ 300kHz	dBm/ 300kHz			
144 (U-NII-3 Band)	5720	-3.22	-3.41	-3.86	-3.67	1.7732	2.49	4.71	29.98	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power density limit shall be reduced to 30-(6.02-6) = 29.98dBm.

802.11ax (HE20)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD With Duty Factor		Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
		Chain 0	Chain 1	Chain 2	Chain 3		mW/300 kHz	dBm/300kHz			
144 (U-NII-3 Band)	5720	-4.70	-5.41	-5.23	-5.33	0.10	1.2483	0.96	3.18	29.98	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power density limit shall be reduced to 30-(6.02-6) = 29.98dBm.
 3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD With Duty Factor		Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
		Chain 0	Chain 1	Chain 2	Chain 3		mW/300 kHz	dBm/300kHz			
142 (U-NII-3 Band)	5710	-7.73	-8.54	-8.97	-8.56	0.18	0.599	-2.23	-0.01	29.98	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power density limit shall be reduced to 30-(6.02-6) = 29.98dBm.
 3. Refer to section 3.3 for duty cycle spectrum plot.

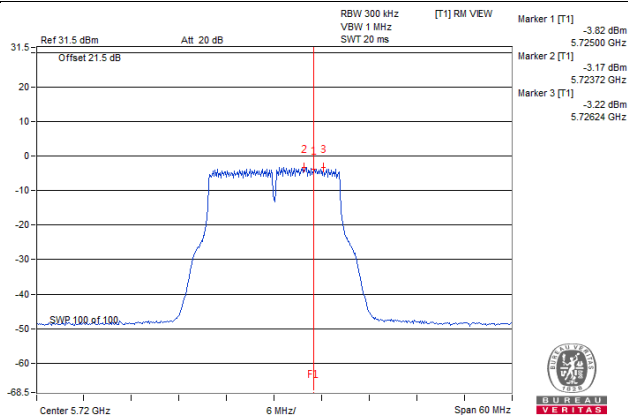
802.11ax (HE80)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD With Duty Factor		Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
		Chain 0	Chain 1	Chain 2	Chain 3		mW/300 kHz	dBm/300kHz			
138 (U-NII-3 Band)	5690	-11.01	-11.91	-12.54	-11.35	0.34	0.29512	-5.30	-3.08	29.98	Pass

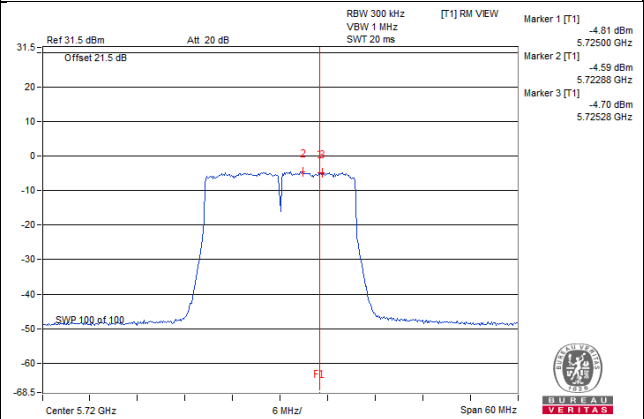
- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. Directional gain = 0dBi + 10log(4) = 6.02dBi > 6dBi, so the power density limit shall be reduced to 30-(6.02-6) = 29.98dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

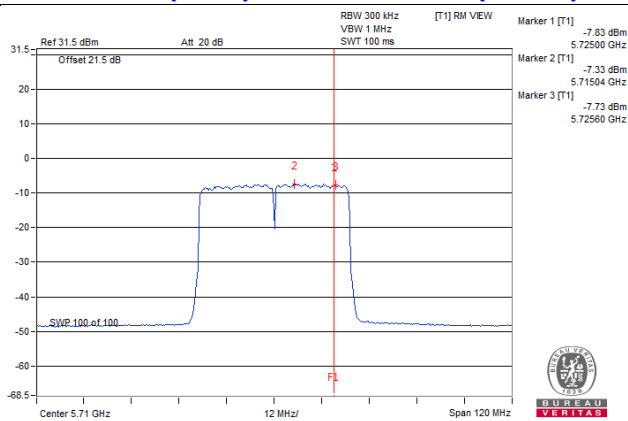
802.11a_Chain 0 / CH144 (U-NII-3)



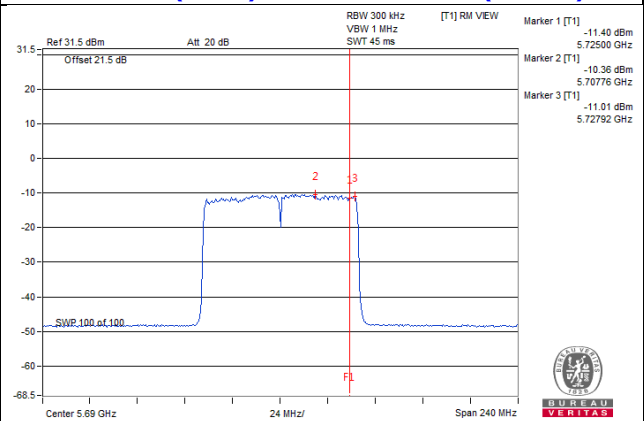
802.11ax (HE20)_Chain 0 / CH144 (U-NII-3)



802.11ax (HE40)_Chain 0 / CH142 (U-NII-3)



802.11ax (HE80)_Chain 0 / CH138 (U-NII-3)

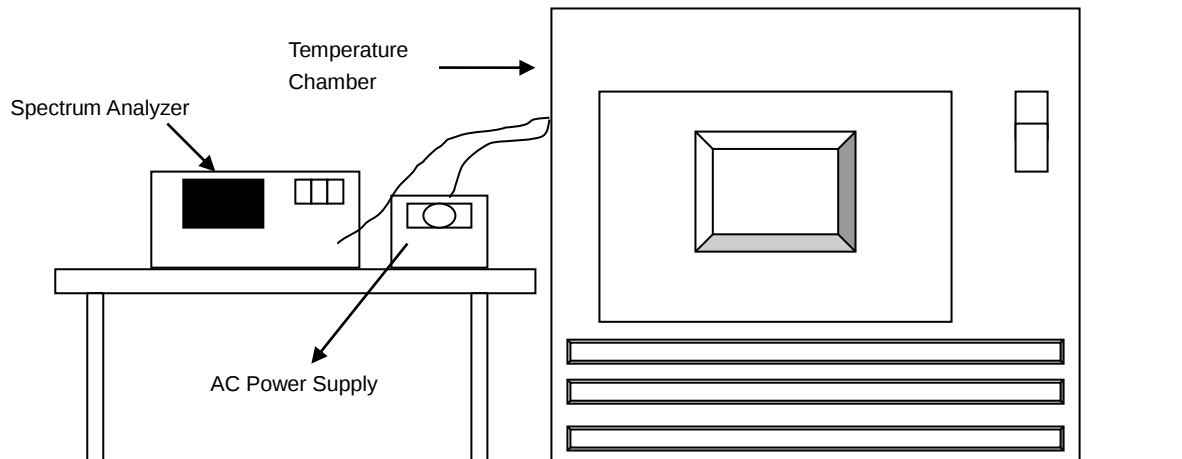


4.6 Frequency Stability Measurement

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

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- 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.
- Repeat step (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.
- 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: 5260 MHz									
TEMP. (°C)	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	5260.0231	PASS	5260.0195	PASS	5260.0246	PASS	5260.0235	PASS
30	120	5259.9925	PASS	5259.9943	PASS	5259.9967	PASS	5259.9932	PASS
20	120	5259.9803	PASS	5259.9777	PASS	5259.9802	PASS	5259.9816	PASS
10	120	5260.0178	PASS	5260.0225	PASS	5260.0224	PASS	5260.0188	PASS
0	120	5260.0187	PASS	5260.0175	PASS	5260.0143	PASS	5260.0176	PASS

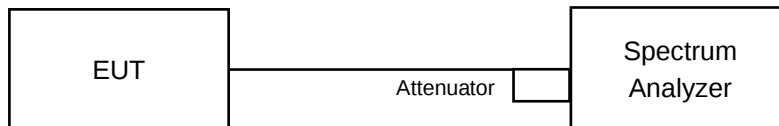
Frequency Stability Versus Voltage									
Operating Frequency: 5260 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5260.0195	PASS	5260.0237	PASS	5260.0227	PASS	5260.0212	PASS
	120	5260.0184	PASS	5260.0224	PASS	5260.0224	PASS	5260.0194	PASS
	102	5260.0181	PASS	5260.0222	PASS	5260.0221	PASS	5260.0202	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

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
144 (U-NII-3 Band)	5720	3.17	3.17	3.17	3.16	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
144 (U-NII-3 Band)	5720	4.50	4.47	4.44	4.47	0.5	Pass

802.11ax (HE40)

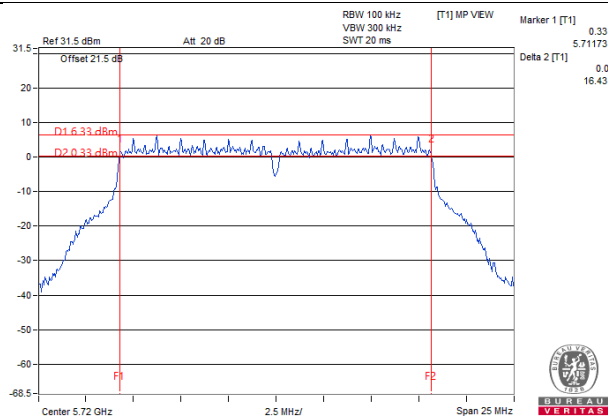
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
142 (U-NII-3 Band)	5710	3.75	3.71	3.76	3.63	0.5	Pass

802.11ax (HE80)

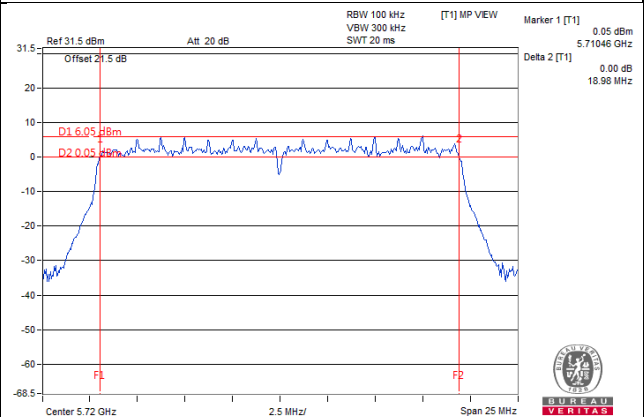
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
138 (U-NII-3 Band)	5690	3.57	3.74	2.84	3.74	0.5	Pass

Spectrum Plot of Worst Value

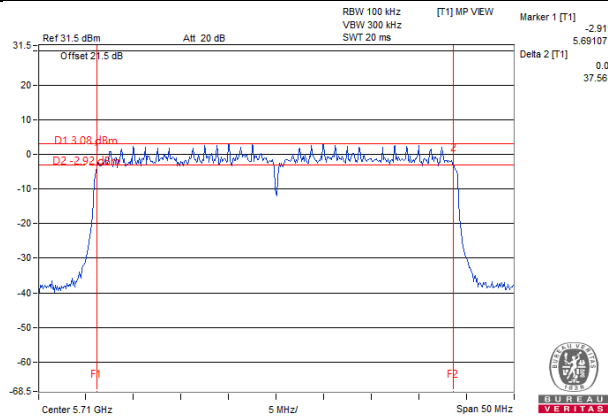
802.11a_Chain 3 / CH144 (U-NII-3)



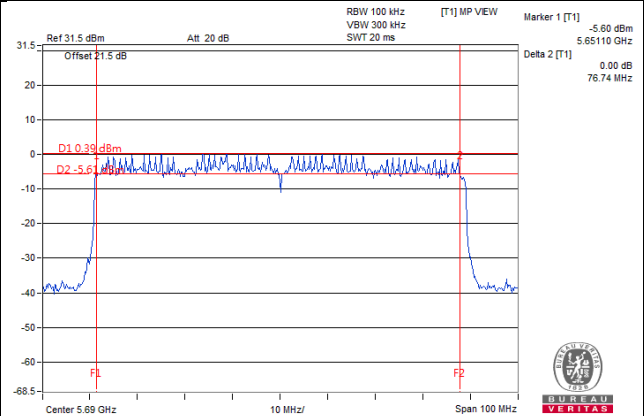
802.11ax (HE20)_Chain 2 / CH144 (U-NII-3)



802.11ax (HE40)_Chain 3 / CH142 (U-NII-3)



802.11ax (HE80)_Chain 2 / CH138 (U-NII-3)



Note: The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

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Web Site: www.bureauveritas-adt.com

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

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