

Supplemental “Transmit Simultaneously” Test Report

Report No.: RFBDYL-WTW-P21050433-4

FCC ID: 2ARF9CSW630

Test Model: CSW630

Received Date: 2021/05/12

Test Date: 2021/8/4 ~ 2021/8/30

Issued Date: 2021/9/8

Applicant: Versa Networks

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



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Release Control Record

Issue No.	Description	Date Issued
RFBDYL-WTW-P21050433-4	Original release.	2021/9/8

1 Certificate of Conformity

Product: Versa Cloud Services Access Point

Brand: Versa Networks

Test Model: CSW630

Sample Status: Engineering sample

Applicant: Versa Networks

Test Date: 2021/8/4 ~ 2021/8/30

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)

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 : Vivian Huang , **Date:** 2021/9/8
Vivian Huang / Specialist

Approved by : Clark Lin , **Date:** 2021/9/8
Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C, E (SECTION 15.247, 15.407)			
FCC Clause	Test Item	Result	Remarks
15.207 15.407(b)(8)	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -7.27 dB at 0.48203 MHz.
15.205 / 15.209 / 15.247(d) 15.407(b) (1/2/3/4(i/ii)/8)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.7 dB at 17385.00 MHz.

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) (\pm)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Conducted emissions	-	2.5 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Versa Cloud Services Access Point
Brand	Versa Networks
Test Model	CSW630
Status of EUT	Engineering sample
Power Supply Rating	DC 48V from POE DC 12V from power adapter
Modulation Type	WLAN: CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz 1024QAM for OFDMA in 11ax HE mode BT-LE: GFSK
Modulation Technology	WLAN: DSSS, OFDM, OFDMA BT-LE: DTS
Transfer Rate	WLAN: 802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 600 Mbps 802.11ac: up to 3466.7 Mbps 802.11ax: up to 4803.9 Mbps BT-LE: up to 2 Mbps
Operating Frequency	WLAN: 2.4GHz: 2.412 ~ 2.462 GHz 5GHz: 5.18 ~ 5.24 GHz, 5.745 ~ 5.825 GHz BT-LE: 2.402 ~ 2.480 GHz
Number of Channel	WLAN: 2.4GHz: 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7 5GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 4 802.11ac (VHT80), 802.11ax (HE80): 2 BT-LE: 40
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Cable Supplied	NA

Note:

1. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3	Radio 4
WLAN (2.4GHz + 5GHz)	WLAN (5GHz)	Bluetooth	2.4GHz / 5GHz Scanning Radio

2. Simultaneously transmission condition.

Condition	Technology			
1	WLAN (2.4GHz)	WLAN (8TX_5GHz)	Bluetooth	2.4GHz Scanning Radio
2	WLAN (2.4GHz)	WLAN (8TX_5GHz)	Bluetooth	5GHz Scanning Radio
3	WLAN (2.4GHz)	WLAN (4TX_5GHz Low band)	Bluetooth	2.4GHz Scanning Radio
4	WLAN (2.4GHz)	WLAN (4TX_5GHz Low band)	Bluetooth	5GHz Scanning Radio

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

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

Antenna NO.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
5G0_baseline	5.7	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
5G1_baseline	5.9	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
5G2_baseline	5.3	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
5G3_baseline	5.6	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
DUAL0	5.1	2.4~2.4835GHz	PIFA	i-pex(MHF)
	6.3	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
DUAL1	3.4	2.4~2.4835GHz	PIFA	i-pex(MHF)
	5.9	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
DUAL2	4.7	2.4~2.4835GHz	PIFA	i-pex(MHF)
	5.8	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
DUAL3	4.1	2.4~2.4835GHz	PIFA	i-pex(MHF)
	6	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
BLE_baseline	4.5	2.4~2.4835GHz	PIFA	i-pex(MHF)
SCANNING_baseline	5.1	2.4~2.4835GHz	PIFA	i-pex(MHF)
	5.2	5.15~5.85GHz		

4. The EUT was pre-tested under the following modes:

Pre-test Mode	Description
Mode A	Power from adapter
Mode B	Power from PoE, ETH1
Mode C	Power from PoE, ETH2
Mode D	Power from PoE, ETH1+2

From the above modes, the worst case Radiated Emission was found in **Mode D** and Conducted Emission was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

5. The EUT incorporates a MIMO function.

Modulation Mode	Radio 1 - 2.4GHz Band				Radio 4 - 2.4GHz Band (Scanning Radio)			
	TX & RX Configuration				TX & RX Configuration			
802.11b	4TX		4RX		1TX		1RX	
802.11g	4TX		4RX		1TX		1RX	
802.11n (HT20)	4TX		4RX		1TX		1RX	
802.11n (HT40)	4TX		4RX		1TX		1RX	
VHT20	4TX		4RX		-		-	
VHT40	4TX		4RX		-		-	
802.11ax (HE20)	4TX		4RX		-		-	
802.11ax (HE40)	4TX		4RX		-		-	
Modulation Mode	Radio 1 + 2 - 5GHz Band		Radio 1 - 5GHz High Band		Radio 2 - 5GHz Low Band		Radio 4 - 5GHz Band (Scanning Radio)	
	TX & RX Configuration		TX & RX Configuration		TX & RX Configuration		TX & RX Configuration	
802.11a	8TX	8RX	4TX	4RX	4TX	4RX	1TX	1RX
802.11n (HT20)	8TX	8RX	4TX	4RX	4TX	4RX	1TX	1RX
802.11n (HT40)	8TX	8RX	4TX	4RX	4TX	4RX	1TX	1RX
802.11ac (VHT20)	8TX	8RX	4TX	4RX	4TX	4RX	1TX	1RX
802.11ac (VHT40)	8TX	8RX	4TX	4RX	4TX	4RX	1TX	1RX
802.11ac (VHT80)	8TX	8RX	4TX	4RX	4TX	4RX	1TX	1RX
802.11ax (HE20)	8TX	8RX	4TX	4RX	4TX	4RX	-	-
802.11ax (HE40)	8TX	8RX	4TX	4RX	4TX	4RX	-	-
802.11ax (HE80)	8TX	8RX	4TX	4RX	4TX	4RX	-	-

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

7. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.1.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE \geq 1G	RE $<$ 1G	PLC	OB	
-	√	√	√	√	-

Where **RE \geq 1G**: Radiated Emission above 1GHz & Bandedge Measurement **RE $<$ 1G**: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **OB**: Conducted Out-Band Emission Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.

Radiated Emission Test (Above 1GHz):

The tested configurations represent the worst-case mode from all possible combinations by the maximum power.

Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
1	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (DBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11b (Scanning Radio)	1 to 11	6	OFDM	BPSK
2	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (DBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11ac (VHT20) (Scanning Radio)	36 to 48 149 to 165	165	OFDM	BPSK
3	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (SBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11b (Scanning Radio)	1 to 11	6	OFDM	BPSK
4	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (SBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11ac (VHT20) (Scanning Radio)	36 to 48 149 to 165	165	OFDM	BPSK

Radiated Emission Test (Below 1GHz):

The tested configurations represent the worst-case mode from all possible combinations by the maximum power.

Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
1	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (DBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11b (Scanning Radio)	1 to 11	6	OFDM	BPSK
2	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (DBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11ac (VHT20) (Scanning Radio)	36 to 48 149 to 165	165	OFDM	BPSK
3	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (SBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11b (Scanning Radio)	1 to 11	6	OFDM	BPSK
4	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (SBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11ac (VHT20) (Scanning Radio)	36 to 48 149 to 165	165	OFDM	BPSK

Power Line Conducted Emission Test:

The tested configurations represent the worst-case mode from all possible combinations by the maximum power.

Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
1	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (DBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11b (Scanning Radio)	1 to 11	6	OFDM	BPSK
2	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (DBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11ac (VHT20) (Scanning Radio)	36 to 48 149 to 165	165	OFDM	BPSK
3	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (SBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11b (Scanning Radio)	1 to 11	6	OFDM	BPSK
4	802.11b (DBS)	1 to 11	6	OFDM	BPSK
	+ 802.11a (SBS)	36 to 48, 149 to 165	40	OFDM	BPSK
	+ BT-LE	0 to 39	39	DTS	GFSK
	+ 802.11ac (VHT20) (Scanning Radio)	36 to 48 149 to 165	165	OFDM	BPSK

Conducted Out-Band Emission Measurement:

- The tested configurations represent the worst-case mode from all possible combinations by the maximum power.
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
1	802.11b (DBS) + 802.11a (DBS)	1 to 11	6	OFDM	BPSK
		36 to 48, 149 to 165	40	OFDM	BPSK

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE \geq 1G	25deg. C, 75%RH	120Vac, 60Hz	Eric Peng
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Carter Lin
PLC	25deg. C, 64%RH	120Vac, 60Hz	Sampson Chen
OB	21deg. C, 60%RH	120Vac, 60Hz	Nick Chen

3.2 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.	PoE Adapter	GME	GME40B-480135FDA	NA	NA	Supplied by client
B.	Laptop	Lenovo	20U5S01X00 L14	PF-28LKK7	NA	Provided by Lab
C.	Laptop	Lenovo	20U5S01X00 L14	PF-1ANPYA	NA	Provided by Lab
D.	USB Disk	SanDink	BM181225896Z	NA	NA	Provided by Lab
E.	PoE Adapter	MICROELECTRONICS TECH. INC.	TR60A-POE-L	NA	NA	Supplied by client

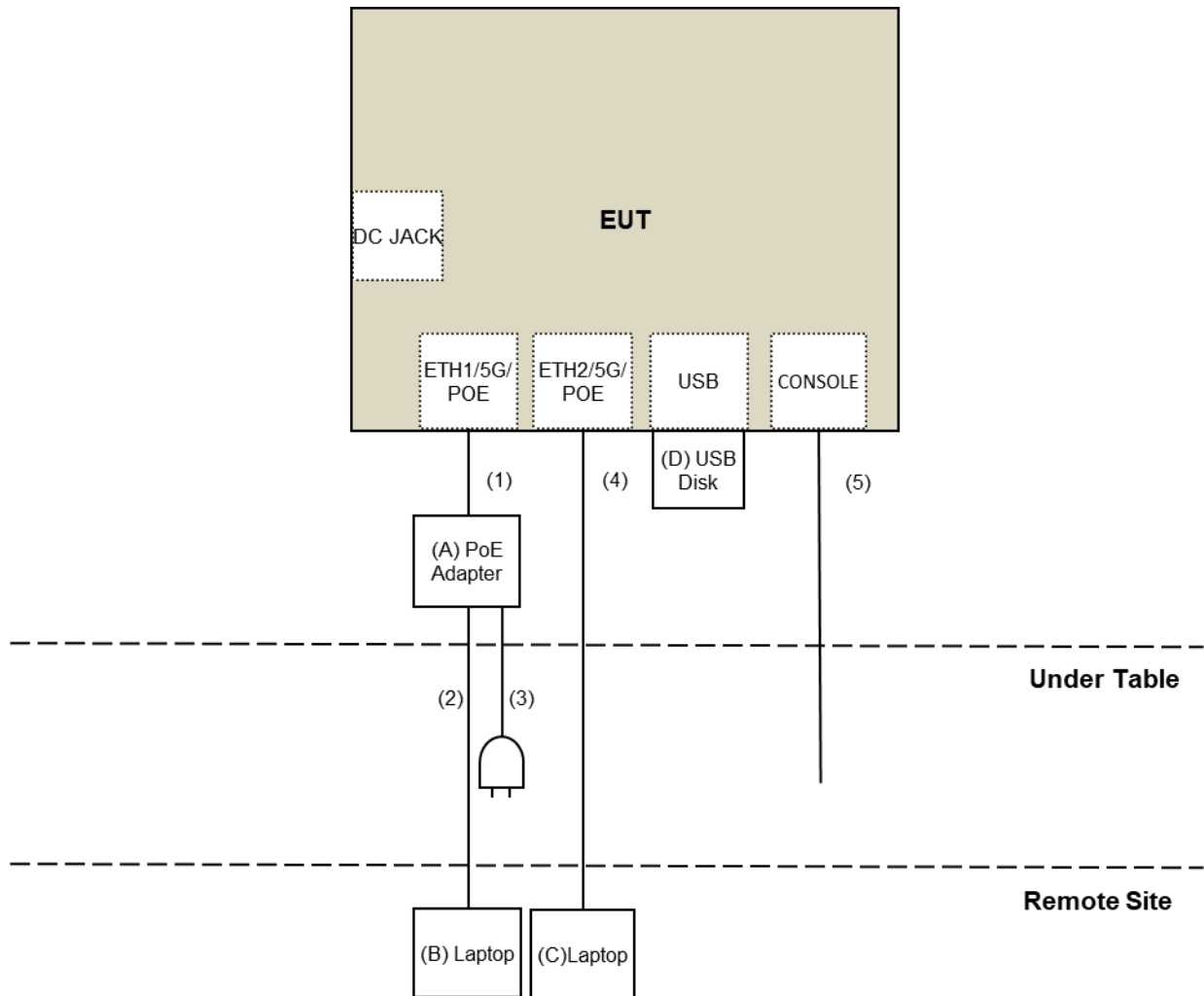
Note:

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

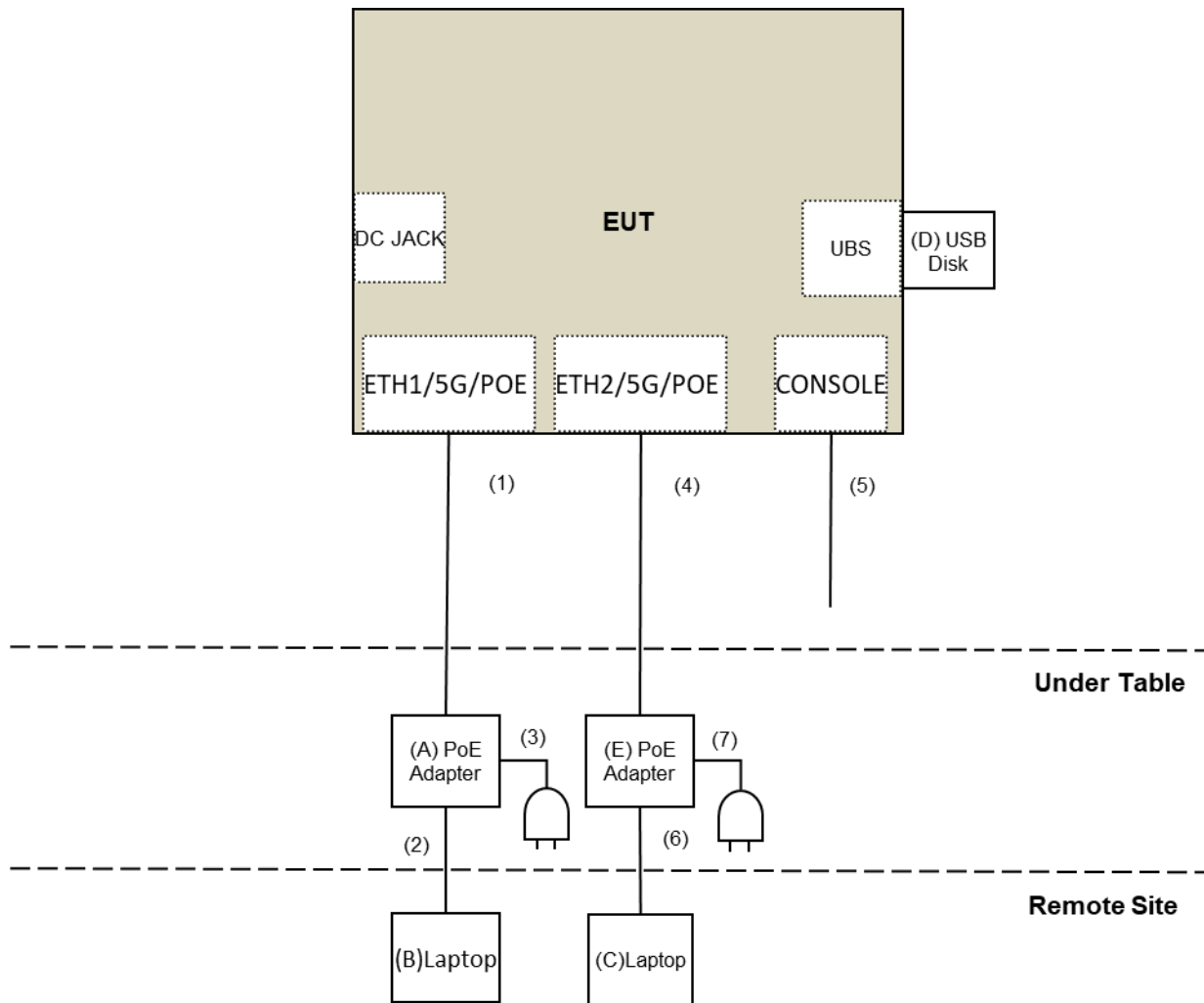
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	3	No	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	AC Cable	1	1.8	No	0	Provided by Lab
4.	RJ-45 Cable	1	10	No	0	Provided by Lab
5.	Console Cable	1	1.8	No	0	Provided by Lab
6.	RJ-45 Cable	1	10	No	0	Provided by Lab
7.	AC Cable	1	1.8	No	0	Provided by Lab

3.2.1 Configuration of System under Test

AC Power Conducted Emissions test



Radiated Emissions test:



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}
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}

- ^{*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

For Radiated emission test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	2021/7/22	2022/7/21
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Pre_Amplifier EMCI	EMC001340	980142	2021/5/24	2022/5/23
LOOP ANTENNA Electro-Metrics	EM-6879	264	2021/3/5	2022/3/4
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-001	2021/1/7	2022/1/6
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-002	2021/1/7	2022/1/6
Pre_Amplifier Mini-Circuits	ZFL-1000VH2	QA0838008	2020/10/20	2021/10/19
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	2020/11/5	2021/11/4
RF Coaxial Cable COMMATE/PEWC	8D	966-3-1	2021/3/16	2022/3/15
RF Coaxial Cable COMMATE/PEWC	8D	966-3-2	2021/3/16	2022/3/15
RF Coaxial Cable COMMATE/PEWC	8D	966-3-3	2021/3/16	2022/3/15
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	2020/9/24	2021/9/23
Horn Antenna Schwarzbeck	BBHA9120-D	9120D-406	2020/11/22	2021/11/21
Pre_Amplifier EMCI	EMC12630SE	980384	2021/1/11	2022/1/10
RF Coaxial Cable EMCI	EMC104-SM-SM-1500	180504	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-2000	180601	2021/6/8	2022/6/7
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	210201	2021/5/13	2022/5/12
Fix tool for Boresight antenna tower LIOW GUU	FBA-01	FBA_SIP01	NA	NA
Spectrum Analyzer Keysight	N9030A	MY54490679	2021/7/9	2022/7/8
Pre_Amplifier EMCI	EMC184045SE	980387	2021/1/11	2022/1/10
SHF-EHF Horn Schwarzbeck	BBHA 9170	BBHA9170519	2020/11/22	2021/11/21
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2021/1/11	2022/1/10
RF cable (40GHz) EMCI	EMC-KM-KM-4000	200214	2021/3/10	2022/3/9
Spectrum Analyzer Keysight	N9030A	MY54490679	2021/7/9	2022/7/8

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: 2021/8/4 ~ 2021/8/16

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	101516	2021/3/8	2022/3/7
10dB Attenuator Woken	MDCS18N-10	MDCS18N-10-01	2021/4/13	2022/4/12
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

- NOTE:**
1. The test was performed in Oven room 2.
 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. Tested Date: 2021/8/30

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

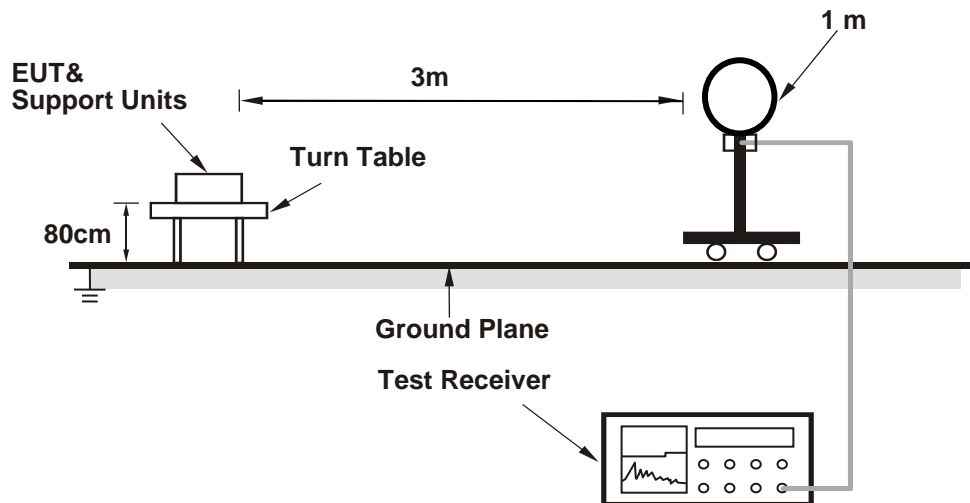
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

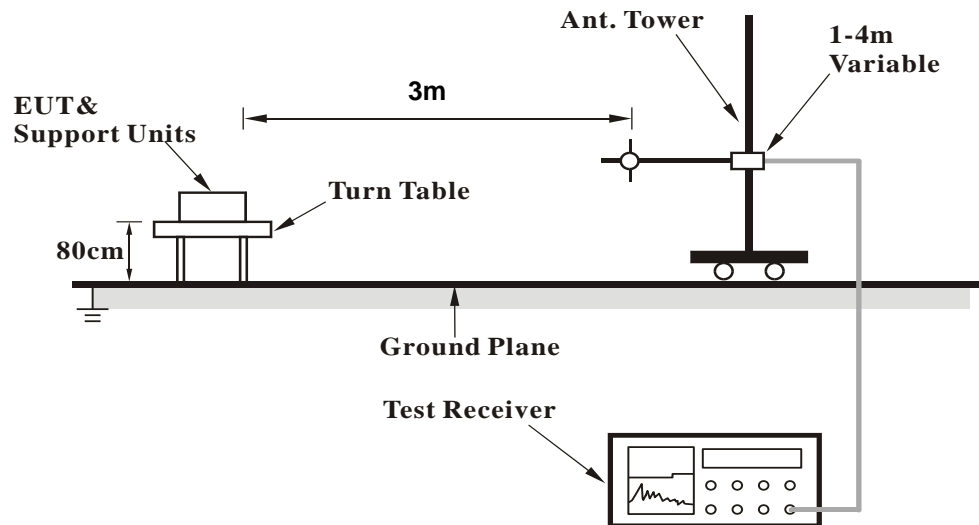
No deviation.

4.1.5 Test Setup

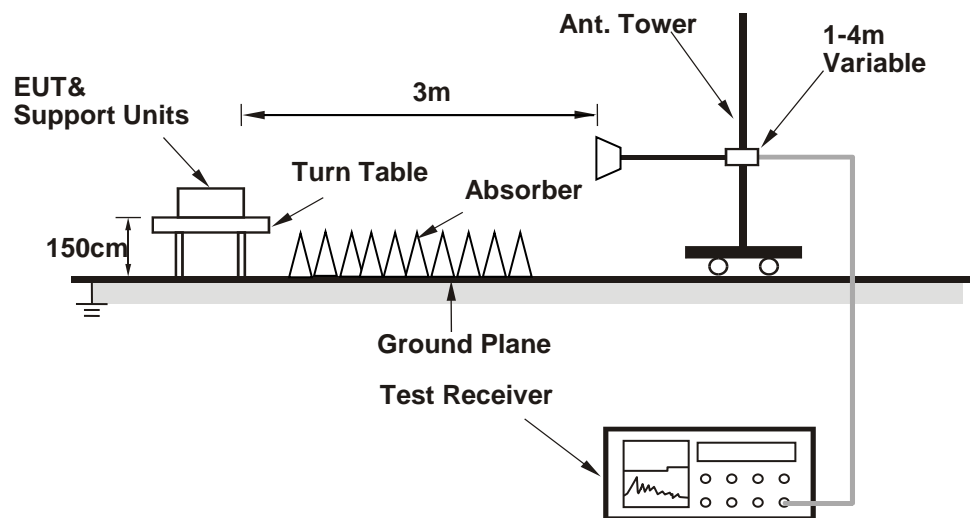
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Controlling software (QSPR Version 5.0-00188) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results (Mode 1)

Above 1GHz Data:

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4874.00	46.4 PK	74.0	-27.6	1.62 H	356	42.6	3.8
2	4874.00	41.8 AV	54.0	-12.2	1.62 H	356	38.0	3.8
3	4924.00	47.6 PK	74.0	-26.4	1.01 H	176	43.7	3.9
4	4924.00	43.1 AV	54.0	-10.9	1.01 H	176	39.2	3.9
5	4960.00	57.0 PK	74.0	-17.0	1.14 H	222	53.0	4.0
6	4960.00	51.9 AV	54.0	-2.1	1.14 H	222	47.9	4.0
7	7311.00	44.8 PK	74.0	-29.2	1.96 H	254	35.1	9.7
8	7311.00	32.8 AV	54.0	-21.2	1.96 H	254	23.1	9.7
9	7386.00	44.1 PK	74.0	-29.9	3.35 H	81	34.4	9.7
10	7386.00	33.5 AV	54.0	-20.5	3.35 H	81	23.8	9.7
11	7440.00	50.0 PK	74.0	-24.0	1.23 H	26	40.3	9.7
12	7440.00	39.2 AV	54.0	-14.8	1.23 H	26	29.5	9.7
13	11590.00	57.7 PK	74.0	-16.3	1.00 H	292	43.1	14.6
14	11590.00	47.5 AV	54.0	-6.5	1.00 H	292	32.9	14.6
15	#17385.00	51.9 PK	68.2	-16.3	1.84 H	302	33.6	18.3

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4874.00	47.0 PK	74.0	-27.0	1.71 V	334	43.2	3.8
2	4874.00	44.7 AV	54.0	-9.3	1.71 V	334	40.9	3.8
3	4924.00	46.6 PK	74.0	-27.4	1.33 V	127	42.7	3.9
4	4924.00	42.0 AV	54.0	-12.0	1.33 V	127	38.1	3.9
5	4960.00	50.2 PK	74.0	-23.8	1.26 V	36	46.2	4.0
6	4960.00	44.4 AV	54.0	-9.6	1.26 V	36	40.4	4.0
7	7311.00	44.1 PK	74.0	-29.9	1.91 V	127	34.4	9.7
8	7311.00	32.8 AV	54.0	-21.2	1.91 V	127	23.1	9.7
9	7386.00	44.9 PK	74.0	-29.1	1.58 V	62	35.2	9.7
10	7386.00	33.0 AV	54.0	-21.0	1.58 V	62	23.3	9.7
11	7440.00	47.8 PK	74.0	-26.2	1.25 V	316	38.1	9.7
12	7440.00	37.9 AV	54.0	-16.1	1.25 V	316	28.2	9.7
13	11590.00	53.0 PK	74.0	-21.0	1.13 V	330	38.4	14.6
14	11590.00	43.5 AV	54.0	-10.5	1.13 V	330	28.9	14.6
15	#17385.00	51.3 PK	68.2	-16.9	1.40 V	26	33.0	18.3

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. "#": The radiated frequency is out of the restricted band.

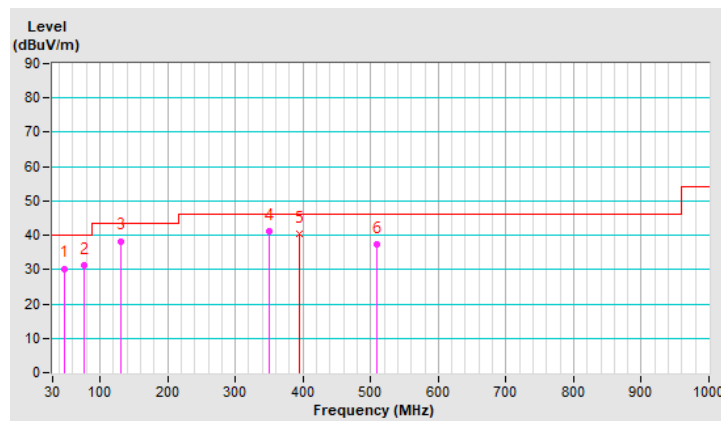
Below 1GHz Data:

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	46.83	30.3 QP	40.0	-9.7	2.50 H	346	38.5	-8.2
2	76.83	31.4 QP	40.0	-8.6	2.00 H	244	43.6	-12.2
3	131.70	38.3 QP	43.5	-5.2	1.50 H	228	47.0	-8.7
4	350.38	41.3 QP	46.0	-4.7	1.00 H	158	46.5	-5.2
5	395.42	40.3 QP	46.0	-5.7	1.00 H	306	44.3	-4.0
6	509.31	37.3 QP	46.0	-8.7	1.50 H	342	38.0	-0.7

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 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.

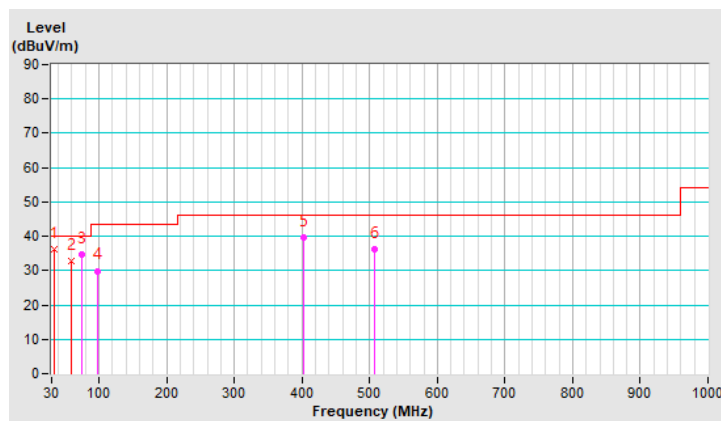


Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBUV)	Correction Factor (dB/m)
1	33.39	36.2 QP	40.0	-3.8	1.00 V	129	45.5	-9.3
2	59.34	32.9 QP	40.0	-7.1	1.00 V	298	41.5	-8.6
3	75.47	34.6 QP	40.0	-5.4	1.00 V	143	46.4	-11.8
4	98.28	29.9 QP	43.5	-13.6	1.00 V	152	42.6	-12.7
5	401.65	39.6 QP	46.0	-6.4	1.00 V	227	43.3	-3.7
6	506.85	36.2 QP	46.0	-9.8	1.00 V	271	37.0	-0.8

Remarks:

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



4.1.8 Test Results (Mode 2)

Above 1GHz Data:

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4874.00	45.8 PK	74.0	-28.2	1.71 H	324	42.0	3.8
2	4874.00	41.1 AV	54.0	-12.9	1.71 H	324	37.3	3.8
3	4960.00	55.7 PK	74.0	-18.3	1.14 H	237	51.7	4.0
4	4960.00	50.8 AV	54.0	-3.2	1.14 H	237	46.8	4.0
5	7311.00	45.3 PK	74.0	-28.7	2.02 H	242	35.6	9.7
6	7311.00	33.4 AV	54.0	-20.6	2.02 H	242	23.7	9.7
7	7440.00	49.9 PK	74.0	-24.1	1.32 H	45	40.2	9.7
8	7440.00	39.2 AV	54.0	-14.8	1.32 H	45	29.5	9.7
9	11590.00	57.8 PK	74.0	-16.2	1.00 H	294	43.2	14.6
10	11590.00	47.3 AV	54.0	-6.7	1.00 H	294	32.7	14.6
11	11650.00	53.3 PK	74.0	-20.7	2.89 H	212	38.9	14.4
12	11650.00	40.9 AV	54.0	-13.1	2.89 H	212	26.5	14.4
13	#17385.00	51.2 PK	68.2	-17.0	1.96 H	335	32.9	18.3
14	#17475.00	57.7 PK	68.2	-10.5	1.96 H	162	38.9	18.8

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4874.00	47.4 PK	74.0	-26.6	1.59 V	334	43.6	3.8
2	4874.00	44.9 AV	54.0	-9.1	1.59 V	334	41.1	3.8
3	4960.00	50.3 PK	74.0	-23.7	1.38 V	28	46.3	4.0
4	4960.00	44.7 AV	54.0	-9.3	1.38 V	28	40.7	4.0
5	7311.00	44.7 PK	74.0	-29.3	1.85 V	129	35.0	9.7
6	7311.00	32.7 AV	54.0	-21.3	1.85 V	129	23.0	9.7
7	7440.00	47.7 PK	74.0	-26.3	1.32 V	302	38.0	9.7
8	7440.00	37.4 AV	54.0	-16.6	1.32 V	302	27.7	9.7
9	11590.00	53.3 PK	74.0	-20.7	1.00 V	330	38.7	14.6
10	11590.00	44.2 AV	54.0	-9.8	1.00 V	330	29.6	14.6
11	11650.00	52.2 PK	74.0	-21.8	1.40 V	256	37.8	14.4
12	11650.00	40.7 AV	54.0	-13.3	1.40 V	256	26.3	14.4
13	#17385.00	51.0 PK	68.2	-17.2	1.44 V	28	32.7	18.3
14	#17475.00	54.5 PK	68.2	-13.7	1.00 V	360	35.7	18.8

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. " # ": The radiated frequency is out of the restricted band.

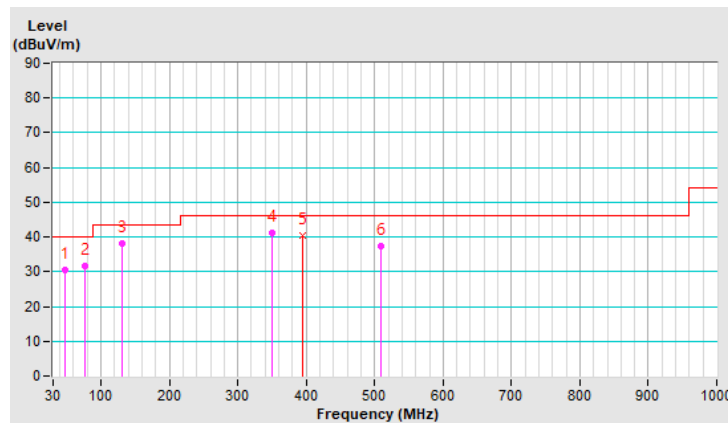
Below 1GHz Data:

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	46.96	30.5 QP	40.0	-9.5	2.50 H	339	38.7	-8.2
2	76.95	31.6 QP	40.0	-8.4	2.00 H	237	43.9	-12.3
3	131.80	38.1 QP	43.5	-5.4	1.50 H	247	46.8	-8.7
4	350.52	41.2 QP	46.0	-4.8	1.00 H	162	46.4	-5.2
5	395.54	40.4 QP	46.0	-5.6	1.00 H	298	44.4	-4.0
6	509.43	37.4 QP	46.0	-8.6	1.50 H	322	38.1	-0.7

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 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.

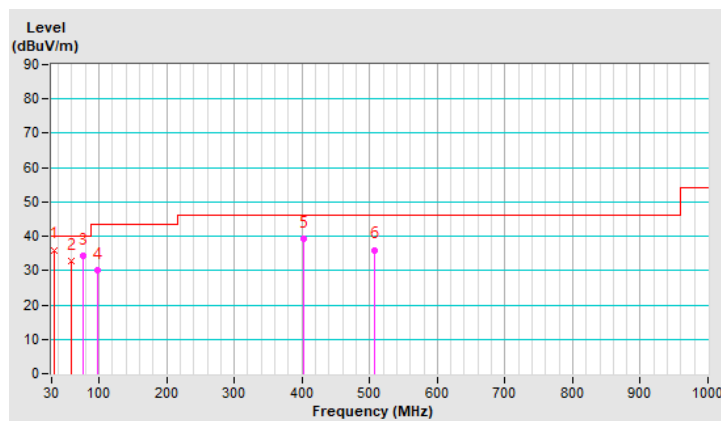


Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBUV)	Correction Factor (dB/m)
1	33.57	36.0 QP	40.0	-4.0	1.00 V	135	45.2	-9.2
2	59.47	32.8 QP	40.0	-7.2	1.00 V	286	41.4	-8.6
3	75.62	34.4 QP	40.0	-5.6	1.00 V	137	46.3	-11.9
4	98.47	30.1 QP	43.5	-13.4	1.00 V	142	42.7	-12.6
5	401.82	39.3 QP	46.0	-6.7	1.00 V	263	43.0	-3.7
6	507.02	36.0 QP	46.0	-10.0	1.00 V	255	36.8	-0.8

Remarks:

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



4.1.9 Test Results (Mode 3)

Above 1GHz Data:

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4874.00	46.1 PK	74.0	-27.9	1.69 H	345	42.3	3.8
2	4874.00	41.3 AV	54.0	-12.7	1.69 H	345	37.5	3.8
3	4924.00	48.0 PK	74.0	-26.0	1.00 H	169	44.1	3.9
4	4924.00	44.0 AV	54.0	-10.0	1.00 H	169	40.1	3.9
5	4960.00	56.5 PK	74.0	-17.5	1.27 H	201	52.5	4.0
6	4960.00	51.6 AV	54.0	-2.4	1.27 H	201	47.6	4.0
7	7311.00	45.1 PK	74.0	-28.9	1.93 H	251	35.4	9.7
8	7311.00	32.8 AV	54.0	-21.2	1.93 H	251	23.1	9.7
9	7386.00	44.4 PK	74.0	-29.6	3.32 H	110	34.7	9.7
10	7386.00	33.9 AV	54.0	-20.1	3.32 H	110	24.2	9.7
11	7440.00	50.1 PK	74.0	-23.9	1.30 H	22	40.4	9.7
12	7440.00	39.3 AV	54.0	-14.7	1.30 H	22	29.6	9.7
13	#10400.00	57.0 PK	68.2	-11.2	1.14 H	311	43.4	13.6
14	15600.00	51.2 PK	74.0	-22.8	1.84 H	327	36.7	14.5
15	15600.00	39.9 AV	54.0	-14.1	1.84 H	327	25.4	14.5

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4874.00	47.3 PK	74.0	-26.7	1.69 V	320	43.5	3.8
2	4874.00	44.9 AV	54.0	-9.1	1.69 V	320	41.1	3.8
3	4924.00	45.8 PK	74.0	-28.2	1.50 V	153	41.9	3.9
4	4924.00	41.2 AV	54.0	-12.8	1.50 V	153	37.3	3.9
5	4960.00	50.5 PK	74.0	-23.5	1.42 V	26	46.5	4.0
6	4960.00	44.4 AV	54.0	-9.6	1.42 V	26	40.4	4.0
7	7311.00	45.0 PK	74.0	-29.0	1.93 V	133	35.3	9.7
8	7311.00	33.4 AV	54.0	-20.6	1.93 V	133	23.7	9.7
9	7386.00	43.4 PK	74.0	-30.6	1.74 V	68	33.7	9.7
10	7386.00	32.0 AV	54.0	-22.0	1.74 V	68	22.3	9.7
11	7440.00	48.0 PK	74.0	-26.0	1.17 V	301	38.3	9.7
12	7440.00	37.3 AV	54.0	-16.7	1.17 V	301	27.6	9.7
13	#10400.00	53.1 PK	68.2	-15.1	1.01 V	327	39.5	13.6
14	15600.00	51.3 PK	74.0	-22.7	1.42 V	38	36.8	14.5
15	15600.00	40.5 AV	54.0	-13.5	1.42 V	38	26.0	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. " # ": The radiated frequency is out of the restricted band.

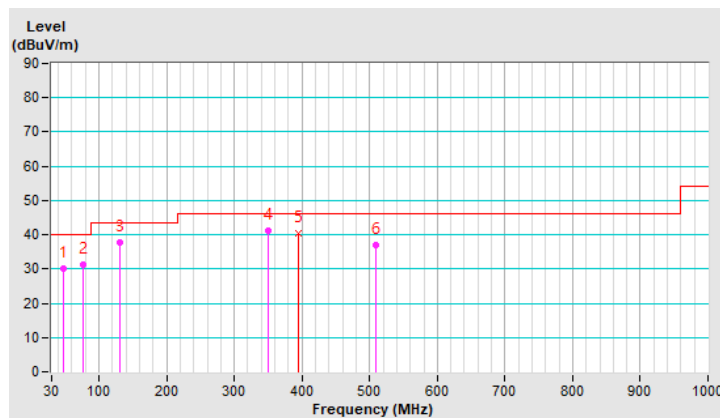
Below 1GHz Data:

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	46.78	30.2 QP	40.0	-9.8	2.50 H	334	38.4	-8.2
2	76.80	31.2 QP	40.0	-8.8	2.00 H	261	43.4	-12.2
3	131.69	37.8 QP	43.5	-5.7	1.50 H	257	46.5	-8.7
4	350.73	41.1 QP	46.0	-4.9	1.00 H	138	46.3	-5.2
5	395.56	40.3 QP	46.0	-5.7	1.00 H	259	44.3	-4.0
6	509.63	37.0 QP	46.0	-9.0	1.50 H	323	37.7	-0.7

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 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.

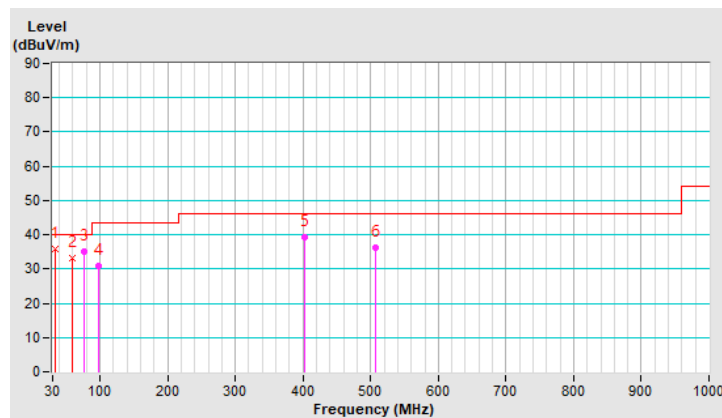


Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	33.37	35.9 QP	40.0	-4.1	1.00 V	163	45.2	-9.3
2	59.57	33.3 QP	40.0	-6.7	1.00 V	258	41.9	-8.6
3	75.74	35.2 QP	40.0	-4.8	1.00 V	147	47.1	-11.9
4	98.60	30.7 QP	43.5	-12.8	1.00 V	144	43.3	-12.6
5	401.98	39.2 QP	46.0	-6.8	1.00 V	261	42.9	-3.7
6	507.02	36.1 QP	46.0	-9.9	1.00 V	263	36.9	-0.8

Remarks:

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



4.1.10 Test Results (Mode 4)

Above 1GHz Data:

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4874.00	46.0 PK	74.0	-28.0	1.73 H	335	42.2	3.8
2	4874.00	41.0 AV	54.0	-13.0	1.73 H	335	37.2	3.8
3	4960.00	56.8 PK	74.0	-17.2	1.22 H	209	52.8	4.0
4	4960.00	52.1 AV	54.0	-1.9	1.22 H	209	48.1	4.0
5	7311.00	45.1 PK	74.0	-28.9	1.95 H	264	35.4	9.7
6	7311.00	32.9 AV	54.0	-21.1	1.95 H	264	23.2	9.7
7	7440.00	50.1 PK	74.0	-23.9	1.26 H	33	40.4	9.7
8	7440.00	39.4 AV	54.0	-14.6	1.26 H	33	29.7	9.7
9	#10400.00	57.1 PK	68.2	-11.1	1.14 H	313	43.5	13.6
10	15600.00	50.2 PK	74.0	-23.8	1.87 H	350	35.7	14.5
11	15600.00	39.3 AV	54.0	-14.7	1.87 H	350	24.8	14.5

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4874.00	46.9 PK	74.0	-27.1	1.64 V	313	43.1	3.8
2	4874.00	44.5 AV	54.0	-9.5	1.64 V	313	40.7	3.8
3	4960.00	50.9 PK	74.0	-23.1	1.41 V	39	46.9	4.0
4	4960.00	44.5 AV	54.0	-9.5	1.41 V	39	40.5	4.0
5	7311.00	45.0 PK	74.0	-29.0	1.90 V	121	35.3	9.7
6	7311.00	33.4 AV	54.0	-20.6	1.90 V	121	23.7	9.7
7	7440.00	48.1 PK	74.0	-25.9	1.15 V	317	38.4	9.7
8	7440.00	37.3 AV	54.0	-16.7	1.15 V	317	27.6	9.7
9	#10400.00	53.9 PK	68.2	-14.3	1.00 V	347	40.3	13.6
10	15600.00	51.5 PK	74.0	-22.5	1.36 V	42	37.0	14.5
11	15600.00	40.7 AV	54.0	-13.3	1.36 V	42	26.2	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. " # ": The radiated frequency is out of the restricted band.

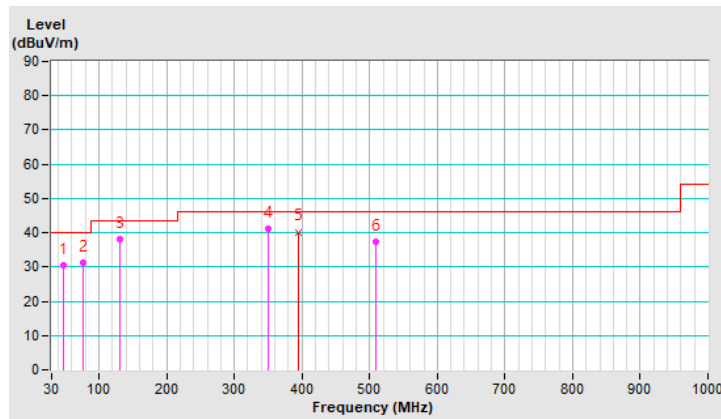
Below 1GHz Data:

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	46.87	30.4 QP	40.0	-9.6	2.50 H	326	38.6	-8.2
2	76.88	31.4 QP	40.0	-8.6	2.00 H	241	43.6	-12.2
3	131.75	38.0 QP	43.5	-5.5	1.50 H	261	46.7	-8.7
4	350.62	41.0 QP	46.0	-5.0	1.00 H	147	46.2	-5.2
5	395.46	40.2 QP	46.0	-5.8	1.00 H	287	44.2	-4.0
6	509.54	37.2 QP	46.0	-8.8	1.50 H	334	37.9	-0.7

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 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.

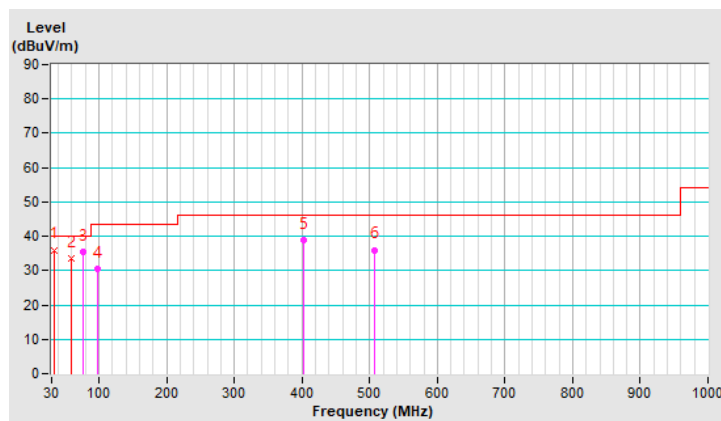


Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBUV)	Correction Factor (dB/m)
1	33.26	36.0 QP	40.0	-4.0	1.00 V	193	45.3	-9.3
2	59.67	33.4 QP	40.0	-6.6	1.00 V	241	42.0	-8.6
3	75.87	35.3 QP	40.0	-4.7	1.00 V	123	47.3	-12.0
4	98.71	30.4 QP	43.5	-13.1	1.00 V	127	43.0	-12.6
5	402.03	39.0 QP	46.0	-7.0	1.00 V	245	42.7	-3.7
6	506.99	36.0 QP	46.0	-10.0	1.00 V	268	36.8	-0.8

Remarks:

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



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	2020/10/20	2021/10/19
LISN R&S	ESH3-Z5	848773/004	2020/10/27	2021/10/26
LISN R & S	ESH3-Z5	835239/001	2021/3/26	2022/3/25
50 ohms Terminator	50	3	2020/10/26	2021/10/25
RF Coaxial Cable JYEBO	5D-FB	COCCAB-001	2020/9/26	2021/9/25
Fixed attenuator STI	STI02-2200-10	005	2020/8/29	2021/8/28
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: 2021/8/10

4.2.3 Test Procedures

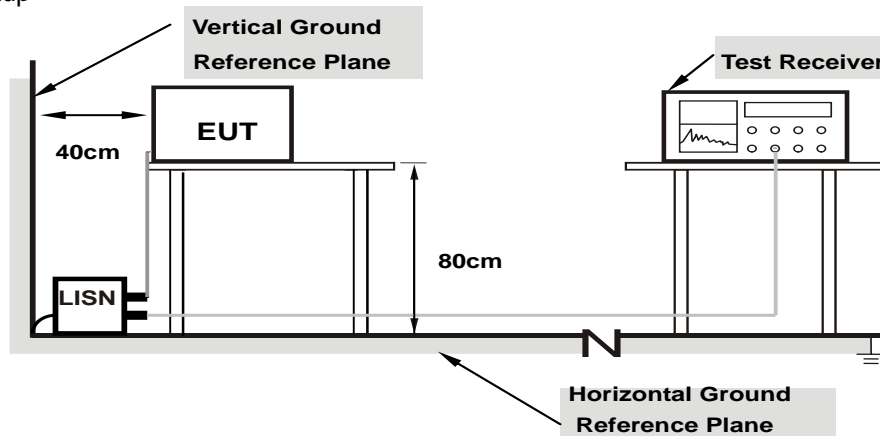
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance 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: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

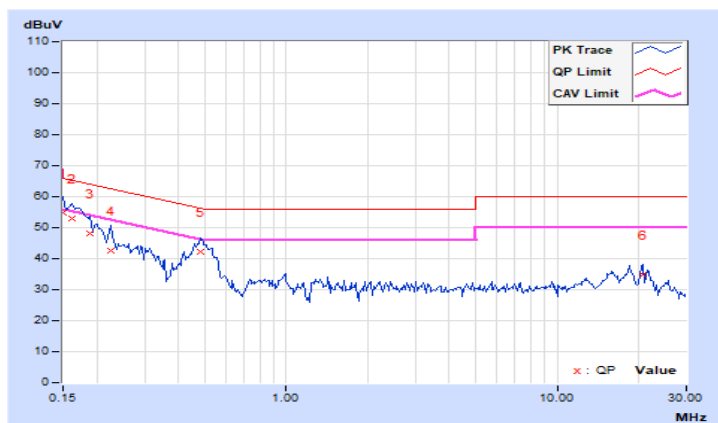
4.2.7 Test Results (Mode 1)

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
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Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.95	44.87	31.19	54.82	41.14	66.00	56.00	-11.18	-14.86
2	0.16172	9.95	42.98	30.13	52.93	40.08	65.38	55.38	-12.45	-15.30
3	0.18906	9.97	38.17	24.84	48.14	34.81	64.08	54.08	-15.94	-19.27
4	0.22422	9.97	32.61	22.11	42.58	32.08	62.66	52.66	-20.08	-20.58
5	0.48203	10.00	32.05	27.55	42.05	37.55	56.30	46.30	-14.25	-8.75
6	20.83594	11.14	23.66	21.54	34.80	32.68	60.00	50.00	-25.20	-17.32

Remarks:

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

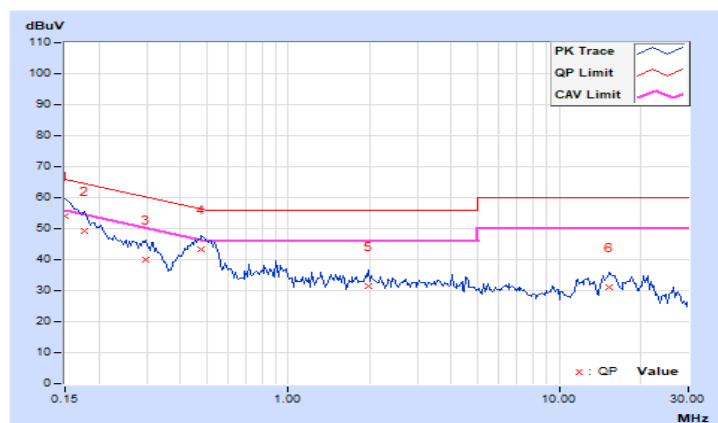


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.92	44.24	31.69	54.16	41.61	66.00	56.00	-11.84	-14.39
2	0.17734	9.94	39.23	27.05	49.17	36.99	64.61	54.61	-15.44	-17.62
3	0.29844	9.95	30.09	24.11	40.04	34.06	60.29	50.29	-20.25	-16.23
4	0.47813	9.97	33.19	28.72	43.16	38.69	56.37	46.37	-13.21	-7.68
5	1.97656	10.04	21.39	16.14	31.43	26.18	56.00	46.00	-24.57	-19.82
6	15.39063	10.65	20.59	15.86	31.24	26.51	60.00	50.00	-28.76	-23.49

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



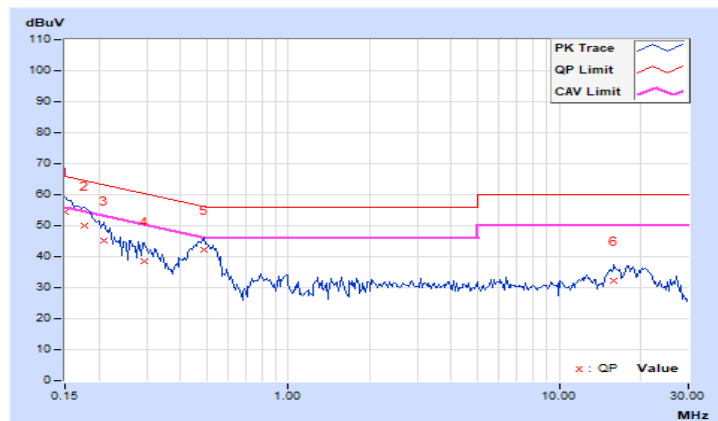
4.2.8 Test Results (Mode 2)

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
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Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.95	44.46	31.33	54.41	41.28	66.00	56.00	-11.59	-14.72
2	0.17734	9.96	40.18	27.51	50.14	37.47	64.61	54.61	-14.47	-17.14
3	0.20859	9.97	35.21	23.32	45.18	33.29	63.26	53.26	-18.08	-19.97
4	0.29453	9.98	28.42	22.01	38.40	31.99	60.40	50.40	-22.00	-18.41
5	0.48594	10.00	32.25	27.67	42.25	37.67	56.24	46.24	-13.99	-8.57
6	15.91016	10.88	21.47	16.80	32.35	27.68	60.00	50.00	-27.65	-22.32

Remarks:

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

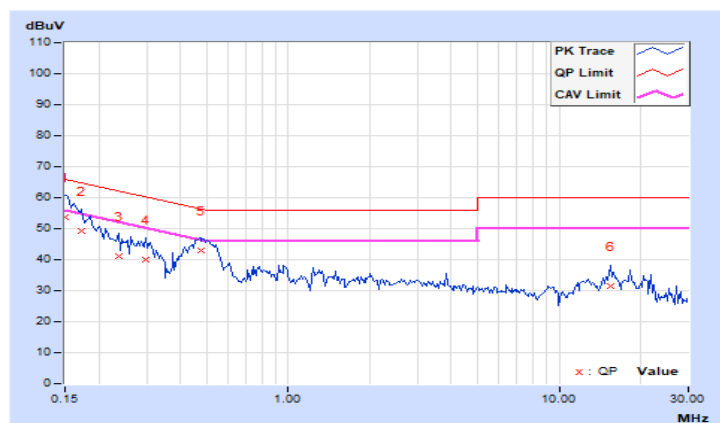


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.92	43.85	31.37	53.77	41.29	66.00	56.00	-12.23	-14.71
2	0.17344	9.93	39.25	27.35	49.18	37.28	64.79	54.79	-15.61	-17.51
3	0.23594	9.95	31.13	22.19	41.08	32.14	62.24	52.24	-21.16	-20.10
4	0.29844	9.95	29.93	24.09	39.88	34.04	60.29	50.29	-20.41	-16.25
5	0.47422	9.96	32.86	28.49	42.82	38.45	56.44	46.44	-13.62	-7.99
6	15.44922	10.65	20.69	15.94	31.34	26.59	60.00	50.00	-28.66	-23.41

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



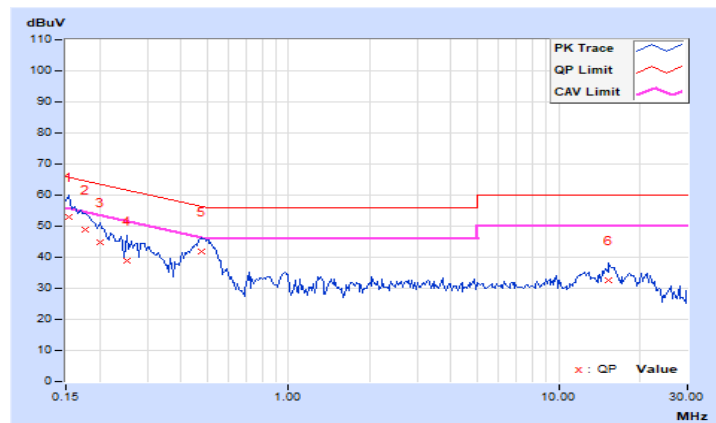
4.2.9 Test Results (Mode 3)

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
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Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.95	43.04	30.01	52.99	39.96	65.79	55.79	-12.80	-15.83
2	0.17734	9.96	38.88	26.30	48.84	36.26	64.61	54.61	-15.77	-18.35
3	0.20078	9.97	34.76	23.18	44.73	33.15	63.58	53.58	-18.85	-20.43
4	0.25156	9.98	28.89	20.28	38.87	30.26	61.71	51.71	-22.84	-21.45
5	0.47422	9.99	31.78	27.41	41.77	37.40	56.44	46.44	-14.67	-9.04
6	15.35156	10.85	21.64	16.84	32.49	27.69	60.00	50.00	-27.51	-22.31

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

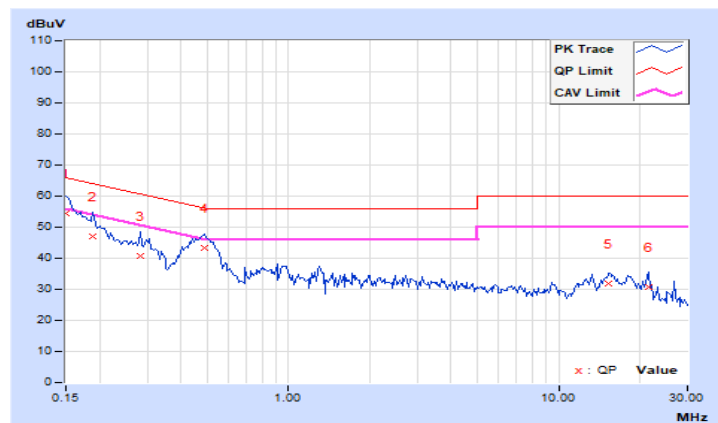


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.92	44.50	31.69	54.42	41.61	66.00	56.00	-11.58	-14.39
2	0.18906	9.94	37.19	25.44	47.13	35.38	64.08	54.08	-16.95	-18.70
3	0.28281	9.95	30.78	23.92	40.73	33.87	60.73	50.73	-20.00	-16.86
4	0.48984	9.97	33.19	28.58	43.16	38.55	56.17	46.17	-13.01	-7.62
5	15.35547	10.65	21.20	15.99	31.85	26.64	60.00	50.00	-28.15	-23.36
6	21.47266	10.87	19.81	12.12	30.68	22.99	60.00	50.00	-29.32	-27.01

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



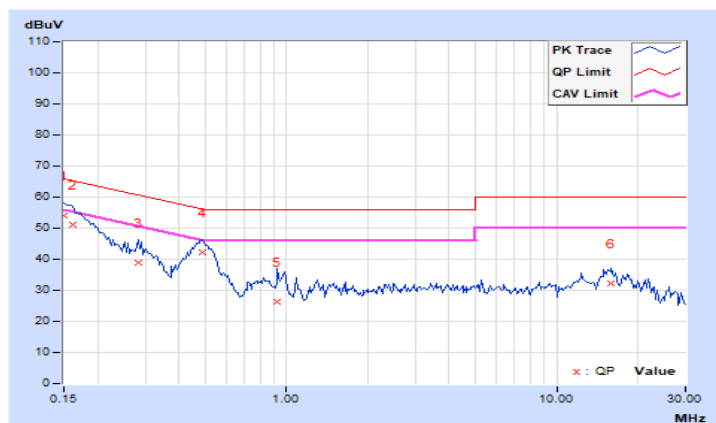
4.2.10 Test Results (Mode 4)

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
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Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.95	44.05	31.07	54.00	41.02	66.00	56.00	-12.00	-14.98
2	0.16172	9.95	41.08	28.33	51.03	38.28	65.38	55.38	-14.35	-17.10
3	0.28281	9.98	28.74	21.95	38.72	31.93	60.73	50.73	-22.01	-18.80
4	0.48984	10.00	32.33	27.65	42.33	37.65	56.17	46.17	-13.84	-8.52
5	0.92734	10.03	16.40	9.79	26.43	19.82	56.00	46.00	-29.57	-26.18
6	15.93359	10.88	21.50	16.74	32.38	27.62	60.00	50.00	-27.62	-22.38

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

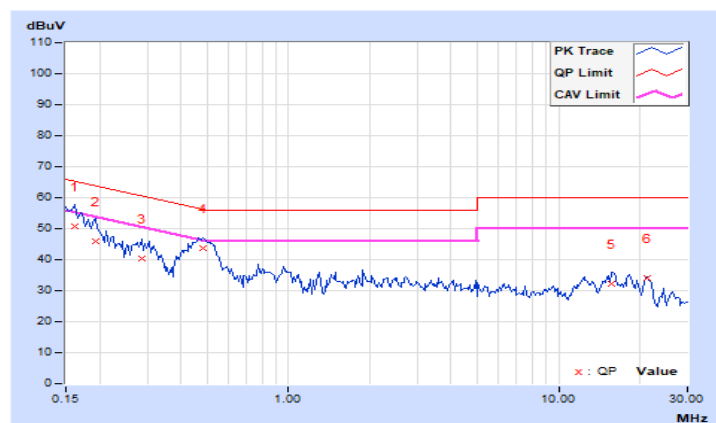


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	9.93	40.92	28.99	50.85	38.92	65.38	55.38	-14.53	-16.46
2	0.19297	9.95	36.06	24.84	46.01	34.79	63.91	53.91	-17.90	-19.12
3	0.28672	9.95	30.30	24.01	40.25	33.96	60.62	50.62	-20.37	-16.66
4	0.48203	9.97	33.55	29.06	43.52	39.03	56.30	46.30	-12.78	-7.27
5	15.69531	10.66	21.72	16.09	32.38	26.75	60.00	50.00	-27.62	-23.25
6	21.17188	10.86	23.22	20.37	34.08	31.23	60.00	50.00	-25.92	-18.77

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

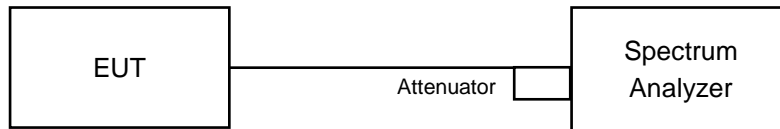


4.3 Conducted Out of Band Emission Measurement

4.3.1 Limits of Conducted Out of Band Emission Measurement

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

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedures

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOB

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

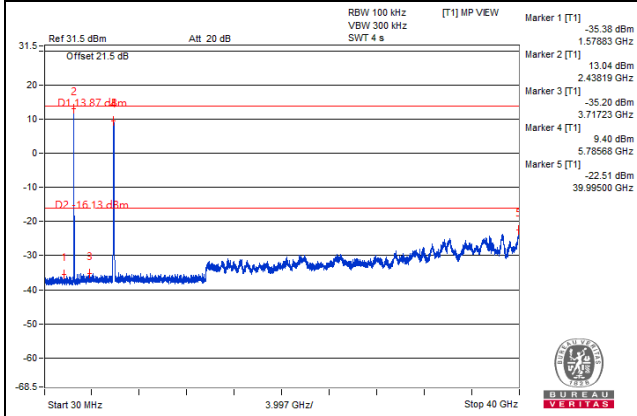
The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.3.7 Test Results

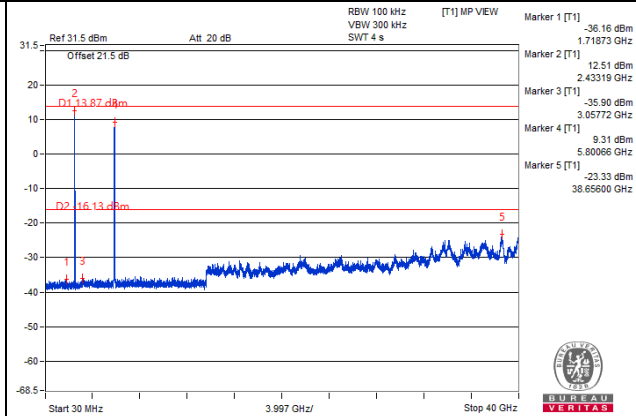
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

2.4GHz_802.11b CH6 (DBS)+ 5GHz_802.11a CH40 (DBS)

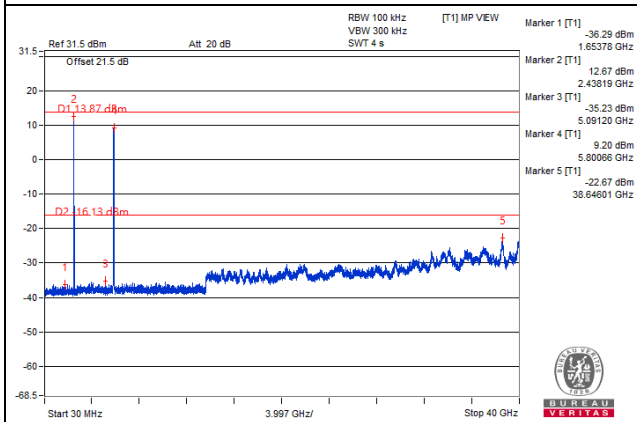
Chain 0



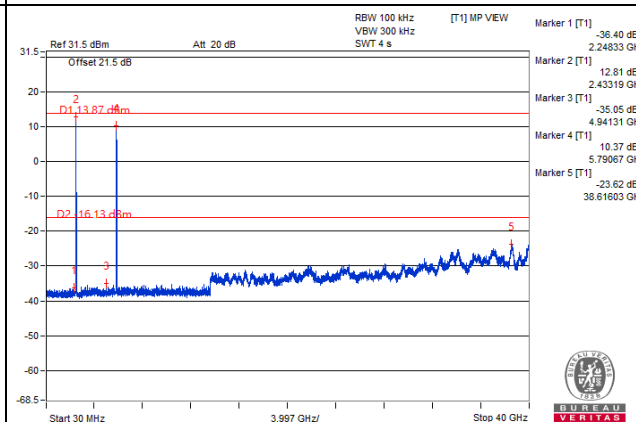
Chain 1



Chain 2



Chain 3



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.

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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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