

Supplemental “Transmit Simultaneously” Test Report

Report No.: RFBWIN-WTW-P23020421-7

FCC ID: J9C-QCNCM825

Test Model: QCNCM825

Received Date: 2023/2/13

Test Date: 2023/5/10 ~ 2023/6/6

Issued Date: 2023/7/5

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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RFBWIN-WTW-P23020421-7	Original release.	2023/7/5

1 Certificate of Conformity

Product: Qualcomm WiFi 7/BT Combo module

Brand: Qualcomm

Test Model: QCNCM825

Sample Status: Engineering sample

Applicant: Qualcomm Technologies, Inc.

Test Date: 2023/5/10 ~ 2023/6/6

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 : Phoenix Huang , **Date:** 2023/7/5
Phoenix Huang / Specialist

Approved by : Wen Yu , **Date:** 2023/7/5
Wen Yu / Assistant Manager

2 Summary of Test Results

FCC Part 15, Subpart C, E (SECTION 15.247, 15.407)			
FCC Clause	Test Item	Result	Remarks
15.207 15.407(b)(6)	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -9.37 dB at 0.57155 MHz.
15.205 / 15.209 / 15.247(d) 15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -3.3 dB at 314.76 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	5.1 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 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	Qualcomm WiFi 7/BT Combo module
Brand	Qualcomm
Test Model	QCNCM825
Status of EUT	Engineering sample
Power Supply Rating	3.3 Vdc from host equipment
Modulation Type	WLAN: CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM for OFDM in 11ac mode 4096QAM for OFDMA in 11ax mode 4096QAM for OFDMA in 11be mode BT-EDR: GFSK, $\pi/4$ -DQPSK, 8DPSK BT-LE: GFSK
Modulation Technology	WLAN: DSSS, OFDM, OFDMA BT-EDR: FHSS BT-LE: DTS
Transfer Rate	WLAN: 802.11a: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 2166.7 Mbps 802.11ax: up to 2969.7 Mbps 802.11be: up to 2882.4 Mbps BT-EDR: Up to 3 Mbps BT-LE: Up to 2 Mbps
Operating Frequency	WLAN: 2.4GHz: 2.412 ~ 2.472 GHz 5GHz: 5.18 GHz ~ 5.25 GHz, 5.25 GHz ~ 5.32 GHz, 5.5 GHz ~ 5.72 GHz, 5.745 GHz ~ 5.825 GHz 5.9GHz: 5.835 GHz ~ 5.885 GHz 6GHz: Under control by Standard Power AP: 5.935 GHz ~ 6.415 GHz 6.535 GHz ~ 6.865 GHz Under control by Low-power Indoor AP: 5.935 GHz ~ 6.415 GHz 6.425 GHz ~ 6.525 GHz 6.535 GHz ~ 6.865 GHz 6.875 GHz ~ 7.115 GHz BT-EDR: 2.402 GHz ~ 2.48 GHz BT-LE: 2.402 GHz ~ 2.48 GHz
Antenna Type	Refer to section 3.2
Antenna Connector	Refer to section 3.2
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. There are Bluetooth and WLAN (2.4 GHz & 5 GHz & 6 GHz) technology used for the EUT.
2. Simultaneously transmission condition.

Condition	Technology	
1	WLAN(2.4 GHz)_Ant 0+1	WLAN(5 GHz)_Ant 0+1
2	WLAN(2.4 GHz)_Ant 0+1	WLAN(6 GHz)_Ant 0+1
3	WLAN(5 GHz)_Ant 0+1	Bluetooth_Ant 0
4	WLAN(5 GHz)_Ant 0+1	Bluetooth_Ant 1
5	WLAN(5 GHz)_Ant 0+1	Bluetooth_Ant 0+1
6	WLAN(6 GHz)_Ant 0+1	Bluetooth_Ant 0
7	WLAN(6 GHz)_Ant 0+1	Bluetooth_Ant 1
8	WLAN(6 GHz)_Ant 0+1	Bluetooth_Ant 0+1
9	WLAN(2.4 GHz)_Ant 0	Bluetooth_Ant 1
10	WLAN(2.4 GHz)_Ant 1	Bluetooth_Ant 0

3. The EUT support OFDMA and Partial RU mode, therefore partial RU combination were investigated and the worst case scenario was identified.

4. The EUT incorporates a MIMO function:

2.4 GHz Band		
Modulation Mode	TX & RX Configuration	
802.11b	2TX / 1TX Diversity	2RX
802.11g	2TX / 1TX Diversity	2RX
802.11n (HT20)	2TX / 1TX Diversity	2RX
802.11n (HT40)	2TX / 1TX Diversity	2RX
VHT20	2TX / 1TX Diversity	2RX
VHT40	2TX / 1TX Diversity	2RX
802.11ax (HE20)	2TX / 1TX Diversity	2RX
802.11ax (HE40)	2TX / 1TX Diversity	2RX
802.11be (EHT20)	2TX / 1TX Diversity	2RX
802.11be (EHT40)	2TX / 1TX Diversity	2RX
802.11ax (RU26/52/106/242/484)	2TX / 1TX Diversity	2RX
802.11be (RU26/52/106/242/484 MRU52+26/106+26)	2TX / 1TX Diversity	2RX

5 GHz Band		
Modulation Mode	TX & RX Configuration	
802.11a	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
802.11ac (VHT20)	2TX	2RX
802.11ac (VHT40)	2TX	2RX
802.11ac (VHT80)	2TX	2RX
802.11ac (VHT160)	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
802.11ax (HE80)	2TX	2RX
802.11ax (HE160)	2TX	2RX
802.11be (EHT20)	2TX	2RX
802.11be (EHT40)	2TX	2RX
802.11be (EHT80)	2TX	2RX
802.11be (EHT160)	2TX	2RX
802.11ax (RU26/52/106/242/484/996/2x996)	2TX	2RX
802.11be (RU26/52/106/242/484/996/2x996 MRU52+26/106+26/ 484+242/996+484)	2TX	2RX
6 GHz Band		
Modulation Mode	TX & RX Configuration	
802.11a	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
802.11ax (HE80)	2TX	2RX
802.11ax (HE160)	2TX	2RX
802.11be (EHT20)	2TX	2RX
802.11be (EHT40)	2TX	2RX
802.11be (EHT80)	2TX	2RX
802.11be (EHT160)	2TX	2RX
802.11be (EHT320)	2TX	2RX
802.11ax (RU26/52/106/242/484/996/996x2)	2TX	2RX
802.11be (RU26/52/106/242/484/996/996x2/996x4/ MRU52+26/106+26/484+242/ /996+484/996x2+484/996x3/ 996x3+484)	2TX	2RX

5. 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 Antenna

The antenna gain was declared by client; please refer to the following table:

Antenna Set	RF Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency Range	Cable Loss (dB)	Antenna Type	Connector Type	Cable Length (mm)
1	Chain0/1	Hong-Bo	260-25094	3.53	2.4~2.4835 GHz	0.74	PIFA	MHF 4L	300
				3.06	5.15~5.25 GHz	1.16			
				3.07	5.25~5.35 GHz	1.18			
				4.81	5.47~5.725 GHz	1.26			
				4.2	5.725~5.850 GHz	1.28			
2	Chain0/1	Hong-Bo	260-25083	5.09	5.850~5.895 GHz	1.29	PIFA	MHF 4L	300
				5.14	5.925~6.425 GHz	1.35			
				5.09	6.425~6.525 GHz	1.38			
				5.16	6.525~6.875 GHz	1.45			
				5.12	6.875~7.125 GHz	1.50			
3	Chain0/1	Hong-Bo	260-25084	3.22	2.4~2.4835 GHz	0.49	Monopole	MHF 4L	200
				3.35	5.150~5.250 GHz	0.76			
				3.42	5.250~5.350 GHz	0.77			
				4.77	5.470~5.725 GHz	0.80			
				4.72	5.725~5.850 GHz	0.84			
				4.71	5.850~5.895 GHz	0.84			
				4.75	5.925~6.425 GHz	0.86			
				4.29	6.425~6.525 GHz	0.91			
				4.81	6.525~6.875 GHz	0.96			
				4.74	6.875~7.125 GHz	0.98			

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE \geq 1G	RE<1G	PLC	OB	
1	√	√	√	√	WLAN(2.4 GHz_Ant 0+1) + WLAN(5 GHz_Ant 0+1)
2	√	√	√	√	WLAN(2.4 GHz_Ant 0+1) + WLAN(6 GHz_Ant 0+1)
3	√	√	√	√	WLAN(5 GHz_Ant 0+1) + Bluetooth (Ant 0)
4	√	√	√	√	WLAN(6 GHz_Ant 0+1) + Bluetooth (Ant 0)
5	√	√	√	-	WLAN(2.4 GHz_Ant 0) + Bluetooth (Ant 1)

Where **RE \geq 1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **OB**: Conducted Out-Band Emission Measurement

Note: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).

Radiated Emission Test (Above 1GHz): (Radiated with 50 ohm load)

- 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.

Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
1	2.4GHz: 802.11be (EHT20) + 5GHz: 802.11be (EHT20)	1 to 13	6	OFDMA	BPSK
		36 to 48; 52 to 64; 100 to 144; 149 to 165	100	OFDMA	BPSK
2	2.4GHz: 802.11be (EHT20) + 6GHz: 802.11be (EHT20)	1 to 13	6	DSSS	DBPSK
		2 to 45; 93 to 113; 117 to 185; 209 to 233	1	OFDMA	BPSK
3	BT-EDR + 5GHz: 802.11be (EHT20)	0 to 78	39	FHSS	GFSK
		36 to 48; 52 to 64; 100 to 144; 149 to 165	100	OFDMA	BPSK
4	BT-EDR + 6GHz: 802.11be (EHT20)	0 to 78	39	FHSS	GFSK
		2 to 45; 93 to 113; 117 to 185; 209 to 233	1	OFDMA	BPSK
5	2.4GHz: 802.11b + BT-EDR	1 to 13	6	DSSS	DBPSK
		0 to 78	39	FHSS	GFSK

Radiated Emission Test (Below 1GHz): (Radiated with 50 ohm load)

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.

Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
1	2.4GHz: 802.11be (EHT20) + 5GHz: 802.11be (EHT20)	1 to 13	6	OFDMA	BPSK
		36 to 48; 52 to 64; 100 to 144; 149 to 165	100	OFDMA	BPSK
2	2.4GHz: 802.11be (EHT20) + 6GHz: 802.11be (EHT20)	1 to 13	6	DSSS	DBPSK
		2 to 45; 93 to 113; 117 to 185; 209 to 233	1	OFDMA	BPSK
3	BT-EDR + 5GHz: 802.11be (EHT20)	0 to 78	39	FHSS	GFSK
		36 to 48; 52 to 64; 100 to 144; 149 to 165	100	OFDMA	BPSK
4	BT-EDR + 6GHz: 802.11be (EHT20)	0 to 78	39	FHSS	GFSK
		2 to 45; 93 to 113; 117 to 185; 209 to 233	1	OFDMA	BPSK
5	2.4GHz: 802.11b + BT-EDR	1 to 13	6	DSSS	DBPSK
		0 to 78	39	FHSS	GFSK

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.

Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
1	2.4GHz: 802.11be (EHT20) + 5GHz: 802.11be (EHT20)	1 to 13	6	OFDMA	BPSK
		36 to 48; 52 to 64; 100 to 144; 149 to 165	100	OFDMA	BPSK
2	2.4GHz: 802.11be (EHT20) + 6GHz: 802.11be (EHT20)	1 to 13	6	DSSS	DBPSK
		2 to 45; 93 to 113; 117 to 185; 209 to 233	1	OFDMA	BPSK
3	BT-EDR + 5GHz: 802.11be (EHT20)	0 to 78	39	FHSS	GFSK
		36 to 48; 52 to 64; 100 to 144; 149 to 165	100	OFDMA	BPSK
4	BT-EDR + 6GHz: 802.11be (EHT20)	0 to 78	39	FHSS	GFSK
		2 to 45; 93 to 113; 117 to 185; 209 to 233	1	OFDMA	BPSK
5	2.4GHz: 802.11b + BT-EDR	1 to 13	6	DSSS	DBPSK
		0 to 78	39	FHSS	GFSK

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.

Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
1	2.4GHz: 802.11be (EHT20) + 5GHz: 802.11be (EHT20)	1 to 13	6	OFDMA	BPSK
		36 to 48; 52 to 64; 100 to 144; 149 to 165	100	OFDMA	BPSK
2	2.4GHz: 802.11be (EHT20) + 6GHz: 802.11be (EHT20)	1 to 13	6	DSSS	DBPSK
		2 to 45; 93 to 113; 117 to 185; 209 to 233	1	OFDMA	BPSK
3	BT-EDR + 5GHz: 802.11be (EHT20)	0 to 78	39	FHSS	GFSK
		36 to 48; 52 to 64; 100 to 144; 149 to 165	100	OFDMA	BPSK
4	BT-EDR + 6GHz: 802.11be (EHT20)	0 to 78	39	FHSS	GFSK
		2 to 45; 93 to 113; 117 to 185; 209 to 233	1	OFDMA	BPSK

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE \geq 1G	27deg. C, 68%RH	3.3 Vdc	Louis Yang
RE<1G	27deg. C, 68%RH	120 Vac, 60 Hz (System)	Louis Yang
PLC	25~27deg. C, 66~68%RH	120 Vac, 60 Hz (System)	Tom Yang
OB	25deg. C, 62%RH	3.3 Vdc	Eric Peng

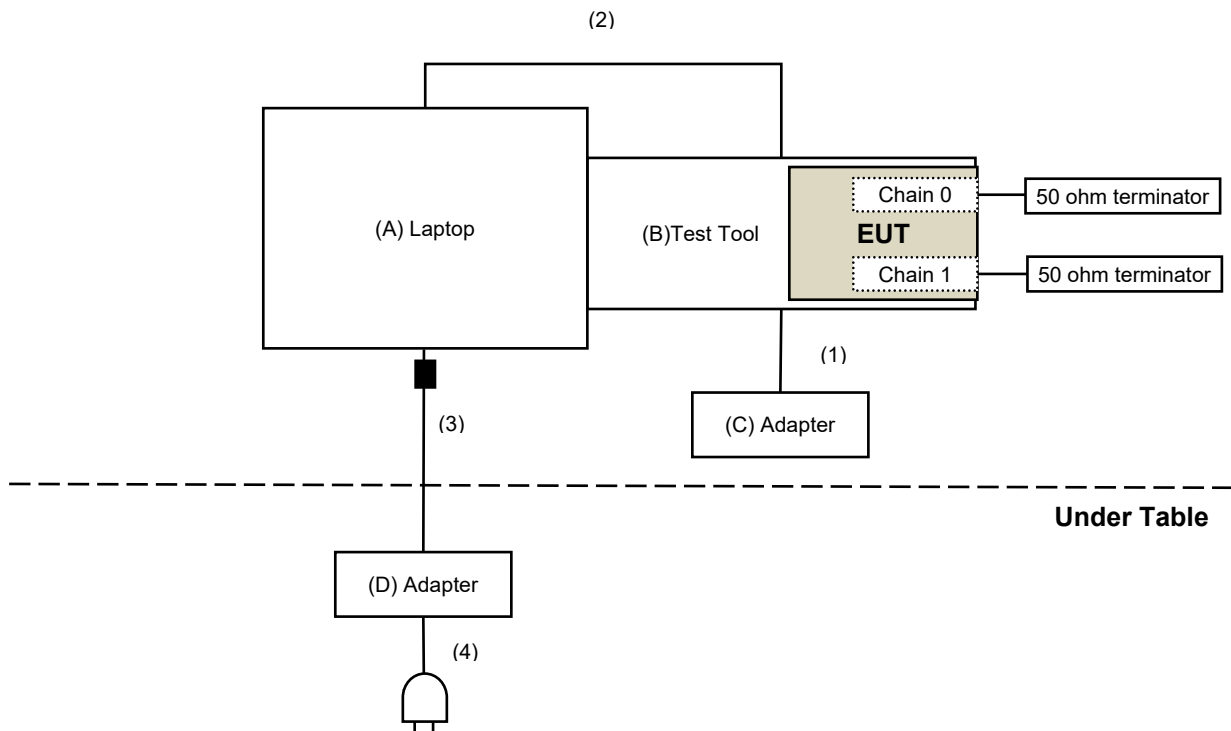
3.3 Description of Support Units

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

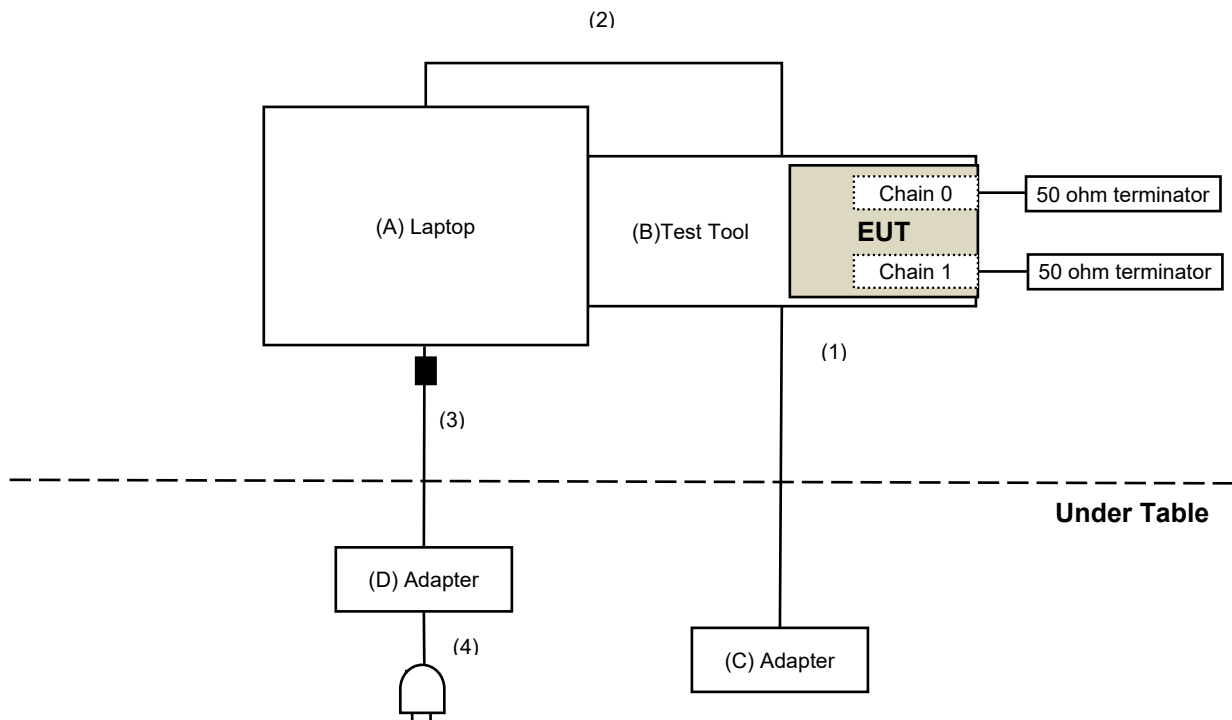
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	Dell	E5420	6FGHKV1	NA	Provided by Lab
B	Test Tool	Qualcomm	NA	NA	NA	Supplied by applicant
C	Adapter	PHIHONG	PSAA12A-120L6	NA	NA	Supplied by applicant
D	Adapter	Dell	LLA65NS2-01	NA	NA	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Cable	1	1.2	No	0	Supplied by applicant
2	Micro USB Cable	1	0.6	Yes	0	Provided by Lab
3	DC Cable	1	1.8	No	1	Provided by Lab
4	AC Cable	1	1.5	No	0	Provided by Lab

3.3.1 Configuration of System under Test
For AC Power Conducted Emission test



For Radiated Emission 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 (dBµV/m)	AV:54 (dBµV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBµV/m) ^{*1} PK:105.2 (dBµV/m) ^{*2} PK: 110.8(dBµV/m) ^{*3} PK:122.2 (dBµV/m) ^{*4}
^{*1} beyond 75 MHz or more above of the band edge. ^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 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
EMI Test Receiver R&S	ESR3	102528	2023/2/10	2024/2/9
PXA Signal Analyzer Keysight	N9030B	MY57141948	2023/5/19	2024/5/18
Software	ADT_Radiated_V8.7.0 8	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Preamplifier Agilent	8447D	2944A10636	2023/3/12	2024/3/11
Loop Antenna Electro-Metrics	EM-6879	264	2023/2/21	2024/2/20
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-00 1	2022/12/19	2023/12/18
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-00 2	2022/12/19	2023/12/18
MXA Signal Analyzer Keysight	N9020B	MY60112410	2023/3/6	2024/3/5
Preamplifier EMCI	EMC330N	980538	2023/4/6	2024/4/5
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-0842	2022/10/24	2023/10/23
RF Coaxial Cable COMMATE/PEWC	8D	966-5-1	2023/2/18	2024/2/17
RF Coaxial Cable COMMATE/PEWC	8D	966-5-2	2023/4/6	2024/4/5
RF Coaxial Cable COMMATE/PEWC	8D	966-5-3	2023/2/18	2024/2/17
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	2022/12/28	2023/12/27
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-1819	2022/11/13	2023/11/12
Preamplifier EMCI	EMC12630SE	980509	2023/4/7	2024/4/6
RF Coaxial Cable EMCI	EMC104-SM-SM-1500	180503	2023/4/7	2024/4/6
RF Coaxial Cable EMCI	EMC104-SM-SM-2000	180501	2023/4/7	2024/4/6
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	180506	2023/4/7	2024/4/6
Preamplifier EMCI	EMC184045SE	980387	2022/12/28	2023/12/27
Horn Antenna Schwarzbeck	BBHA 9170	9170-739	2022/11/13	2023/11/12
RF Coaxial Cable EMCI	EMC102-KM-KM-1200	160924	2022/12/28	2023/12/27
RF Coaxial Cable EMCI	EMC-KM-KM-4000	200214	2023/2/20	2024/2/19

Note:

1. The test was performed in 966 Chamber No. 5.
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: 2023/6/6

For other test items:

Description & Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
MXA Signal Analyzer Keysight	N9020B	MY60112409	2023/2/18	2024/2/17
Fixed Attenuator Woken	MDCS18N-10	MDCS18N-10-01	2023/3/27	2024/3/26
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: 2023/6/1

4.1.3 Test Procedures

Radiated versus Conducted Measurement.

The unwanted emission limits in both the restricted and non-restricted bands are based on antenna-port conducted measurements in conjunction with cabinet emissions tests are permitted to demonstrate compliance.

The following steps was performed:

- a. Cabinet emissions measurements. Radiated measurement was performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna was replaced by a termination matching the nominal impedance of the antenna.
- b. Conducted tests was performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT.
- c. EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater.
- d. EIRP adjustments for multiple outputs. (Follow the procedures specified in FCC KDB Publication 662911)
- e. For all of Radiation emission test

For Radiated emission below 30MHz

- e-1.1. 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.
- e-1.2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- e-1.3. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- e-1.4. 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-1.5. 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 200 Hz at frequency below 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz or 10 kHz at frequency (150 kHz to 30 MHz).
3. All modes of operation were investigated and the worst-case emissions are reported.
4. KDB 414788 OATS and Chamber Correlation Justification
 - Based on FCC 15.31(f)(2):measurements may be performed at a distance closer than that specified in the regulations; however, an attempts should be made to avoid making measurements in the near field.
 - OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

For Radiated emission above 30MHz

- e-2.1. 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.
- e-2.2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- e-2.3. 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.
- e-2.4. 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-2.5. 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.
- e-2.6. 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:

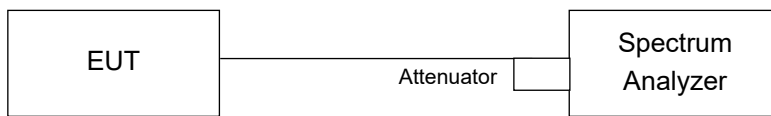
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP), Average detection (AV), Peak detection (PK) at frequency (30MHz to 1 GHz).
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
3. For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10 Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

No deviation.

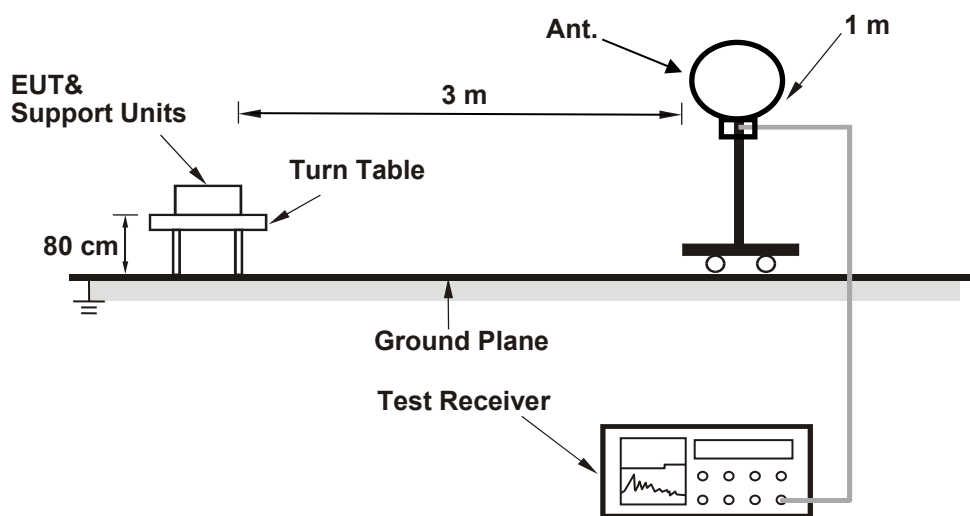
4.1.5 Test Setup

For Conducted Configuration:

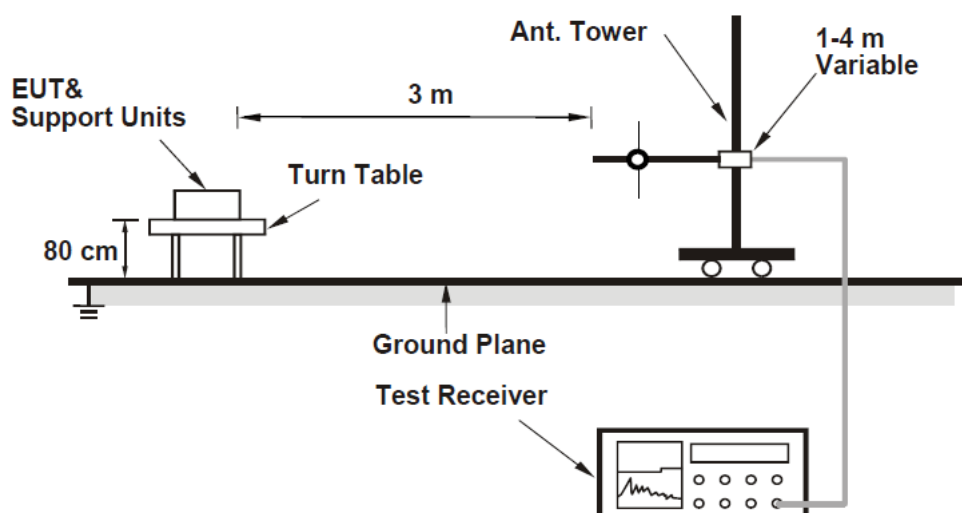


For Radiated Configuration:

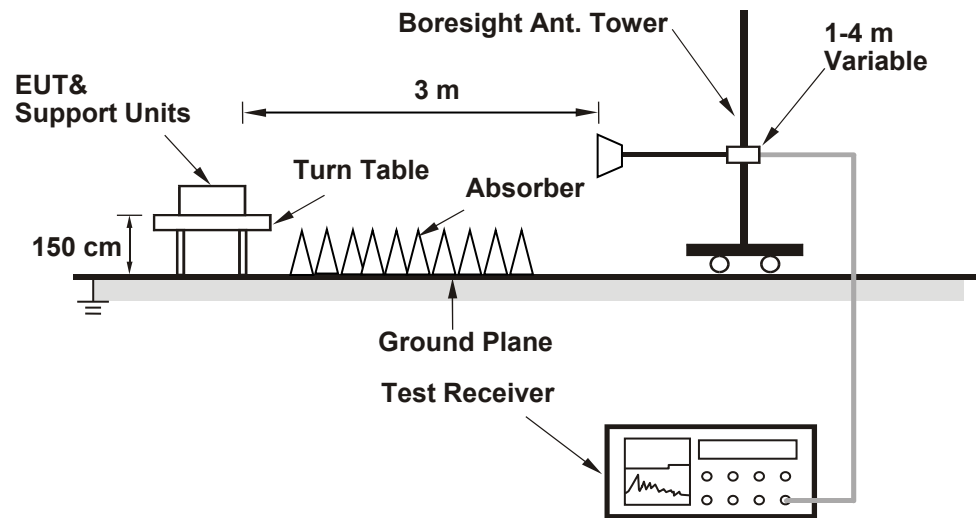
For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

- a. Connected the EUT with the Laptop which is placed on the testing table.
- b. Controlling software (QRCT 4.0.00159.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results (Conducted Measurement)

Radiated versus Conducted Measurement

For Radiated measurement:

The level of unwanted emissions was measured when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation)

For Conducted measurement:

The level of unwanted emissions was measured as their power in a specified load (conducted spurious emissions).

Conducted Emission Convert Formula

- a. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
- b. EIRP Level (dBm) = Raw Value(dBm) + Correction Factor(dB)
- c. Correction Factor is directional gain, and the composite gain will be used when signal support the correlated signal
For the out of band spurious the gain for the specific band may have been used rather than the highest gain across all bands.
For the band edge the gain for the specific band may have been used.

Notes:

1. In restricted bands below 1000 MHz, add upper bound on ground plane reflection:
For f = 30 – 1000 MHz, add 4.7 dB.
2. The conducted emission test was considered some factor to compute test result.

For Mode 1

Above 1GHz Data:

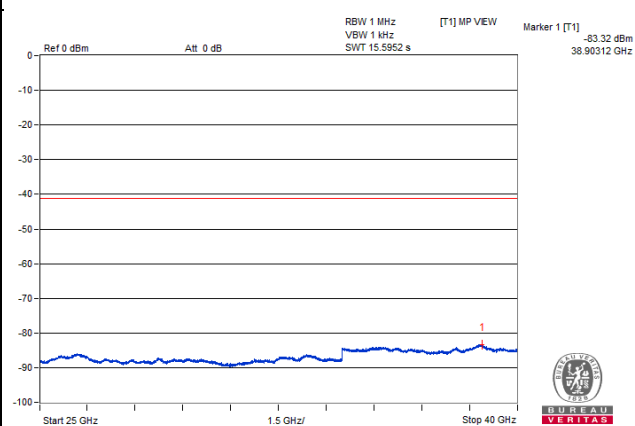
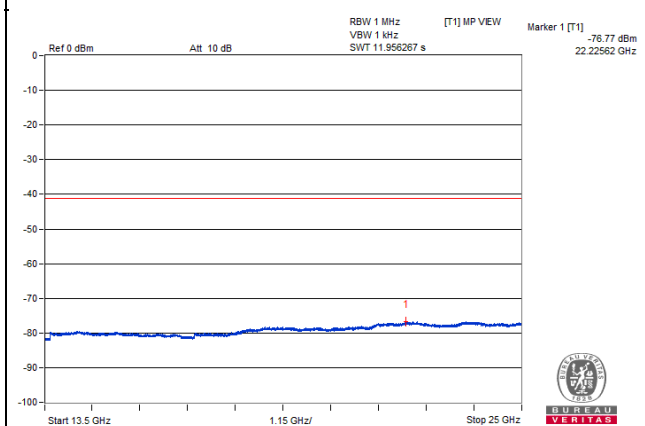
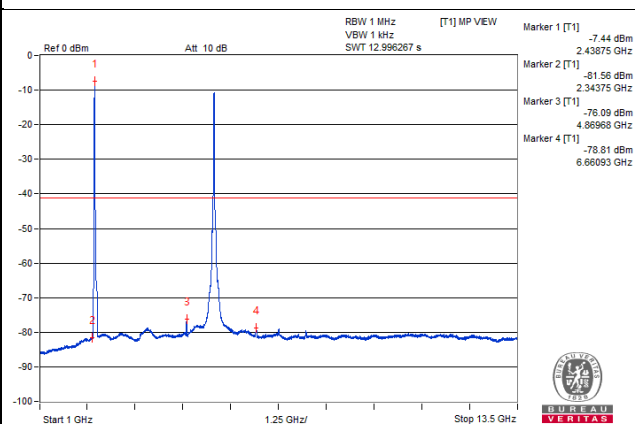
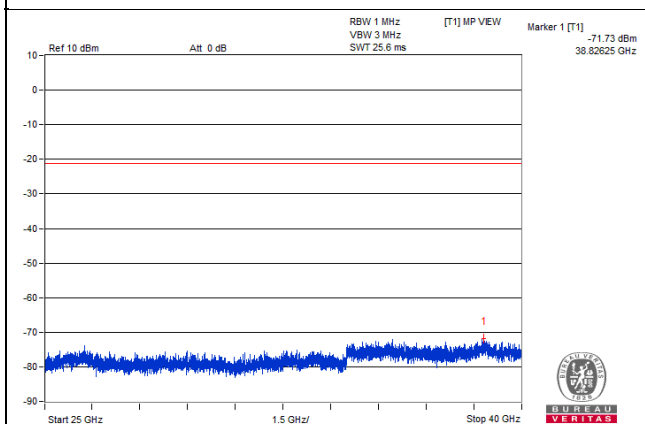
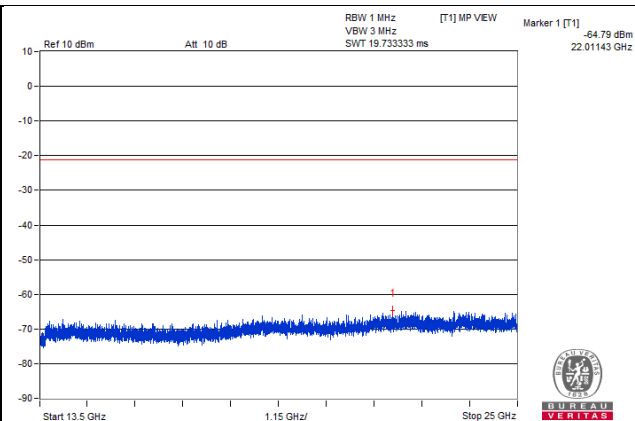
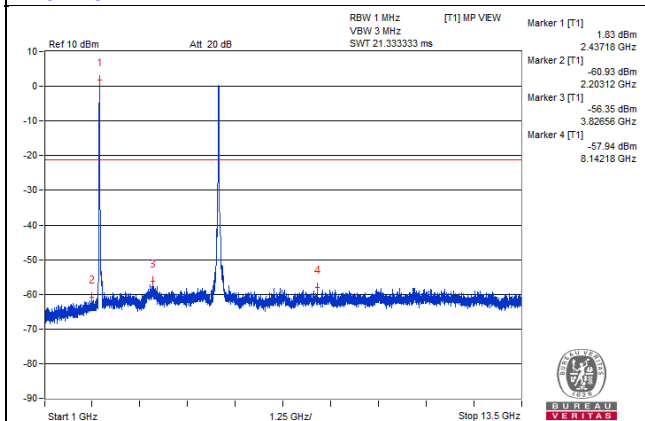
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	4856.25	46.22 PK	74	-27.78	-59.65	-60.87	8.17	-49.04
2	4890.62	26.24 AV	54	-27.76	-80.17	-80.24	8.17	-69.02
3	#6659.37	45.52 PK	68.2	-22.68	-61.98	-60.07	8.17	-49.74
4	7295.31	45.79 PK	74	-28.21	-60.67	-60.63	8.17	-49.47
5	7296.87	25.56 AV	54	-28.44	-80.83	-80.94	8.17	-69.70
6	11012.5	46.86 PK	74	-27.14	-59.57	-59.6	8.17	-48.40
7	11009.37	25.81 AV	54	-28.19	-80.85	-80.43	8.17	-69.45
8	#16513	35.89 PK	68.2	-32.31	-70.02	-71.16	8.17	-59.37

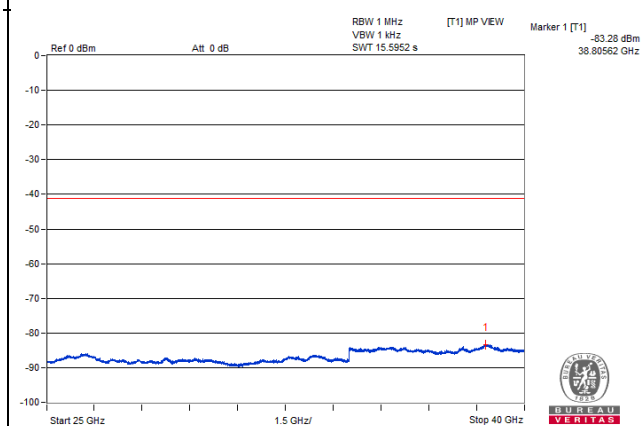
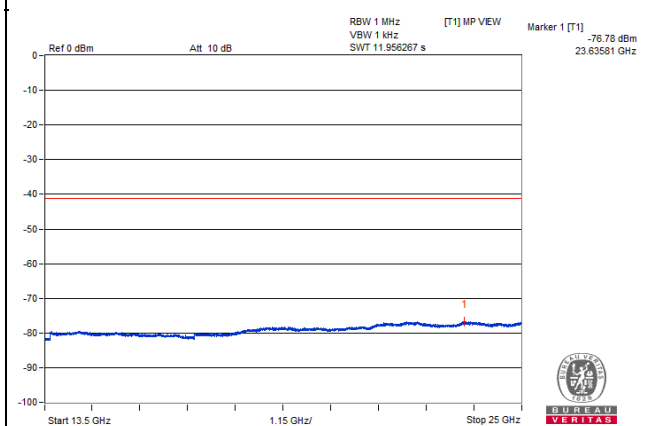
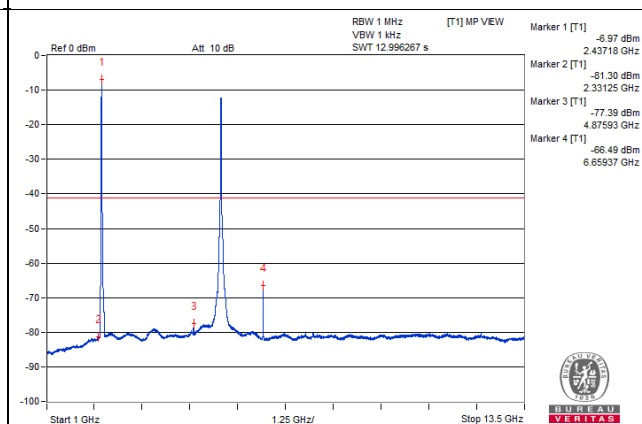
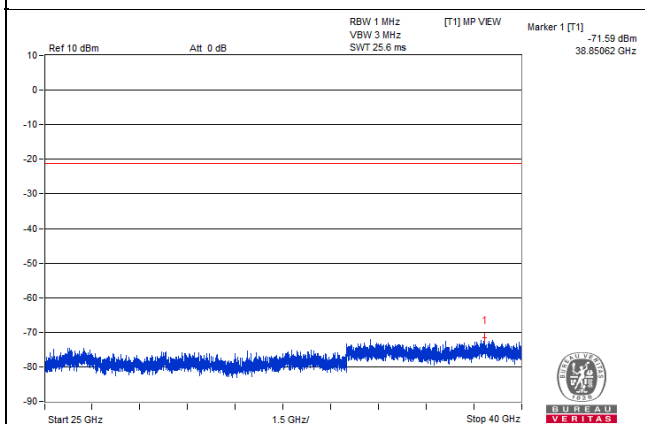
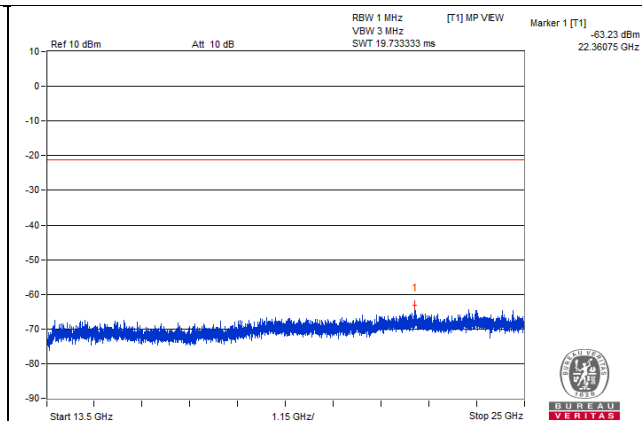
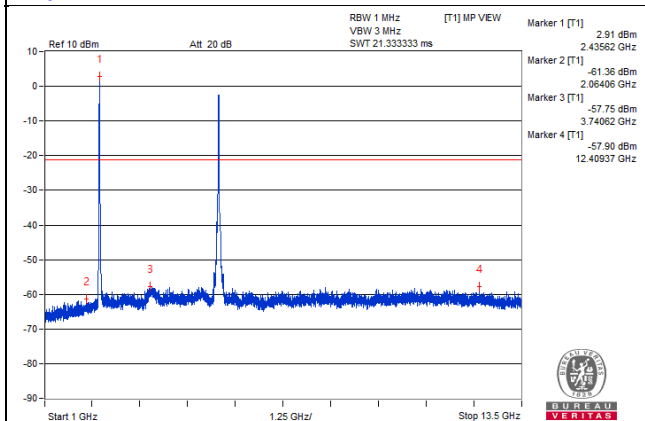
Remarks:

1. Margin value = Emission Level – Limit value
2. The other emission levels were very low against the limit.
3. " # " : The frequency is out of the restricted band.

Chain 0



Chain 1



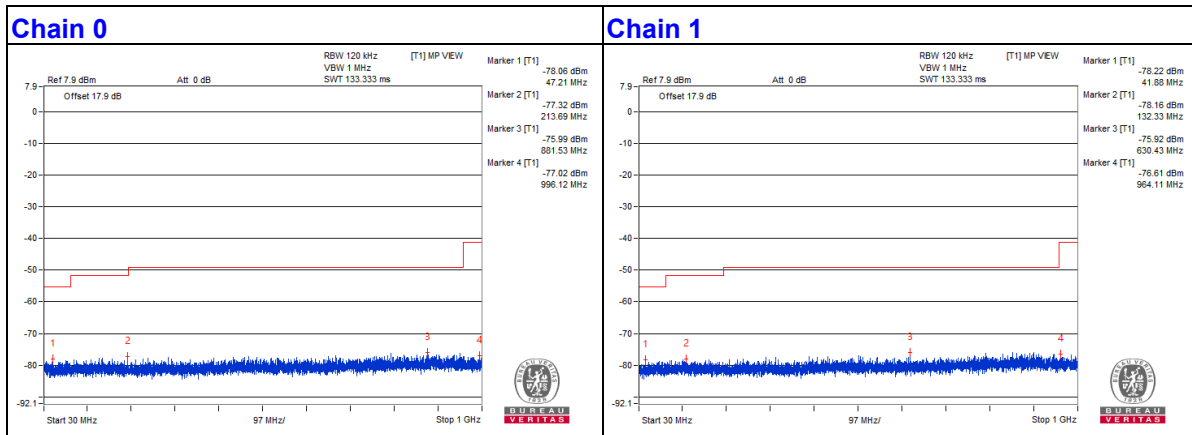
Below 1GHz Data:

Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	77.4	27.04	40	-12.96	-78.44	-80.63	8.17	-68.22
2	180.1	27.6	43.5	-15.9	-78.14	-79.67	8.17	-67.66
3	331.67	28.22	46	-17.78	-79.11	-77.48	8.17	-67.04
4	424.18	28.51	46	-17.49	-78.44	-77.48	8.17	-66.75
5	797.63	29.07	46	-16.93	-78.9	-76.24	8.17	-66.19
6	881.53	29.66	46	-16.34	-75.99	-77.75	8.17	-65.60

Remarks:

1. Margin value = Emission Level – Limit value
2. The other emission levels were very low against the limit.



For Mode 2

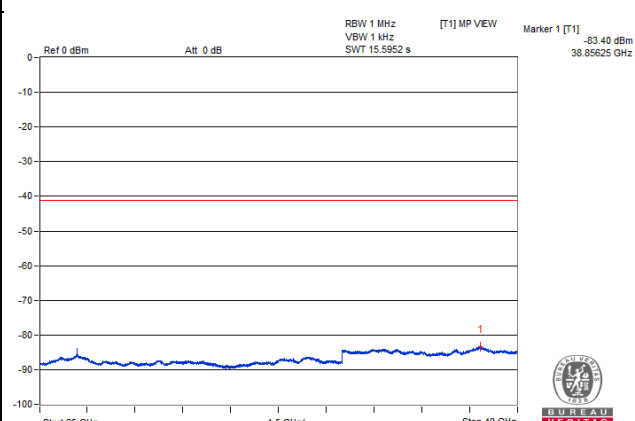
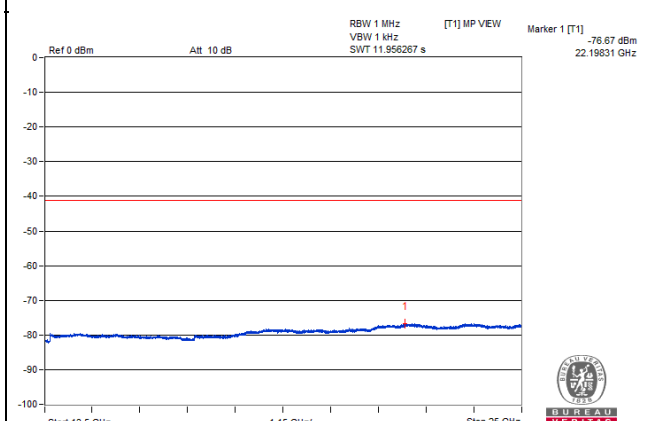
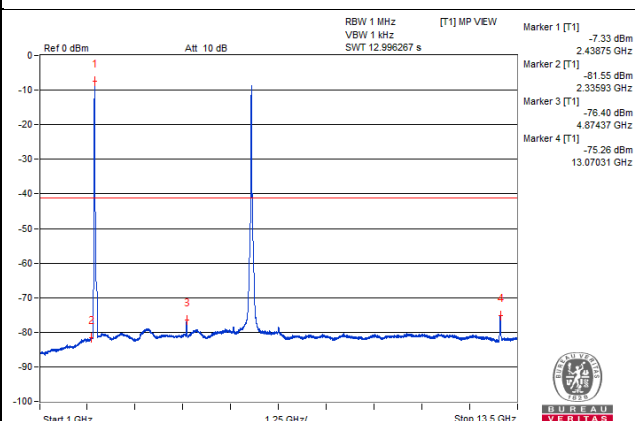
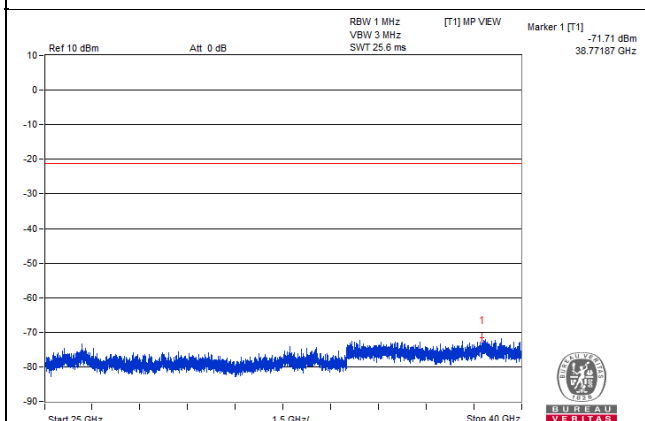
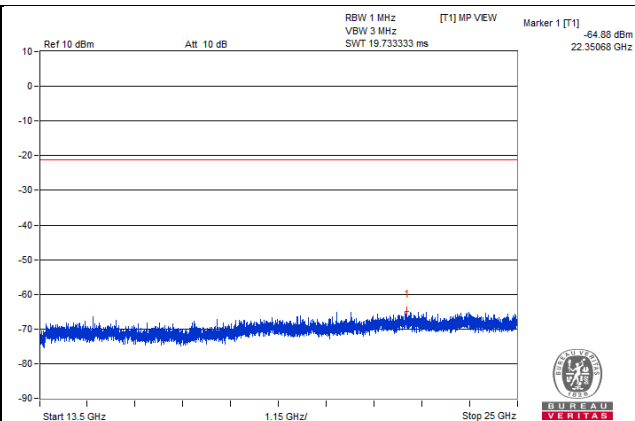
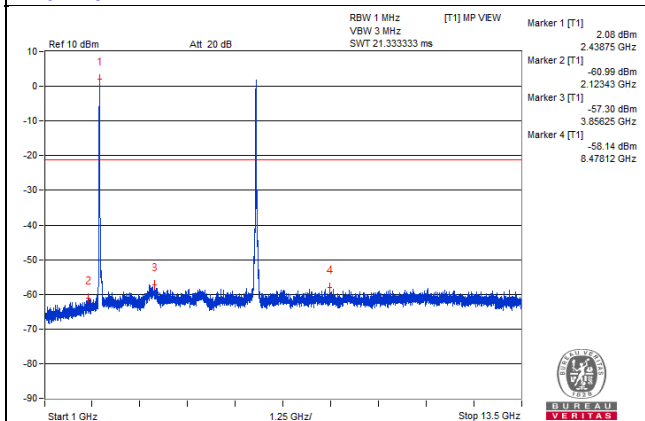
Above 1GHz Data:

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	4890.62	46.16 PK	74	-27.84	-61.22	-59.5	8.17	-49.10
2	4890.62	25.64 AV	54	-28.36	-80.72	-80.88	8.17	-69.62
3	7329.68	46.78 PK	74	-27.22	-60	-59.34	8.17	-48.48
4	7298.43	26.33 AV	54	-27.67	-80.17	-80.06	8.17	-68.93
5	11923.43	46.14 PK	74	-27.86	-60.3	-60.31	8.17	-49.12
6	11904.68	25.22 AV	54	-28.78	-81.4	-81.04	8.17	-70.04
7	17859.93	36.28 PK	74	-37.72	-69.92	-70.42	8.17	-58.98
8	17858.5	26.04 AV	54	-27.96	-80.46	-80.35	8.17	-69.22

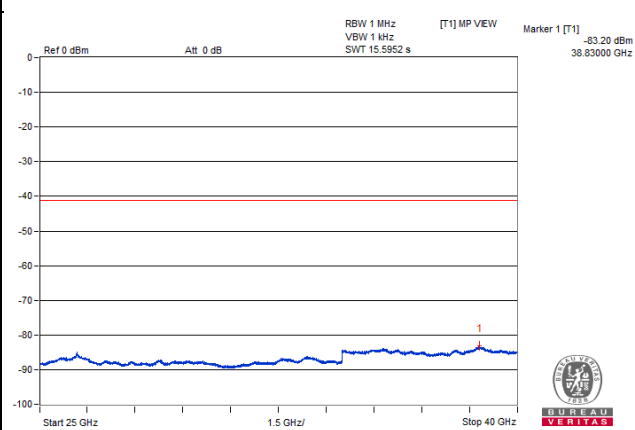
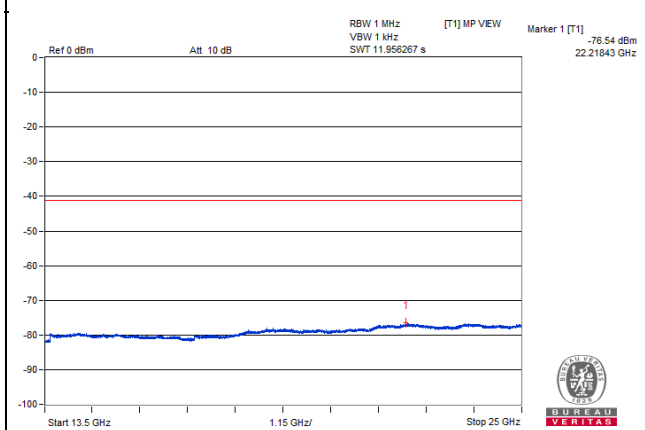
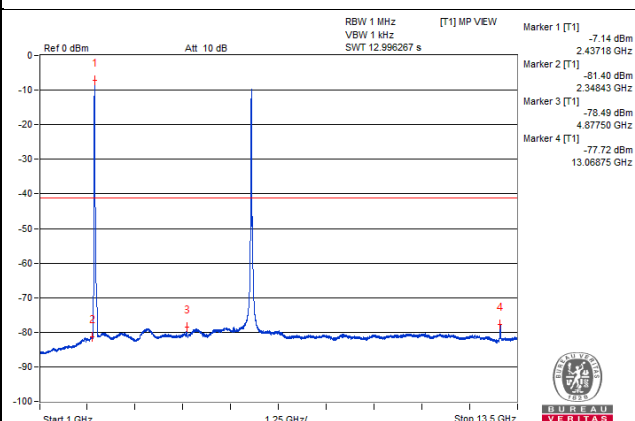
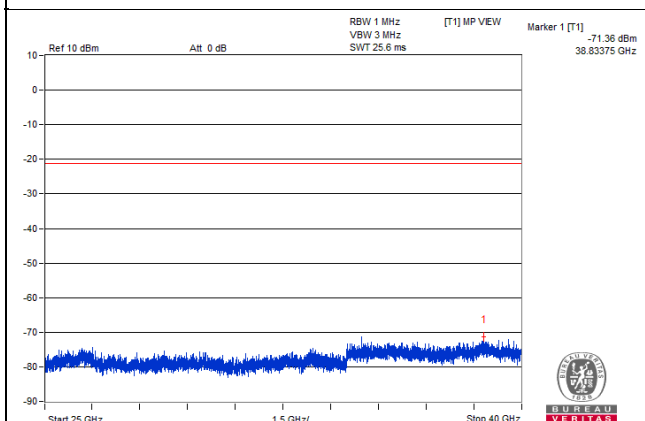
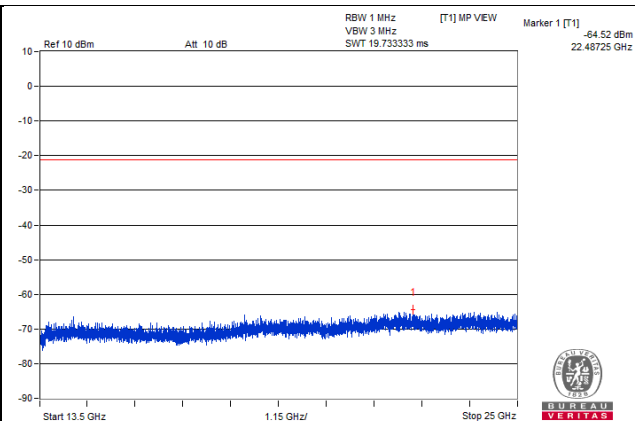
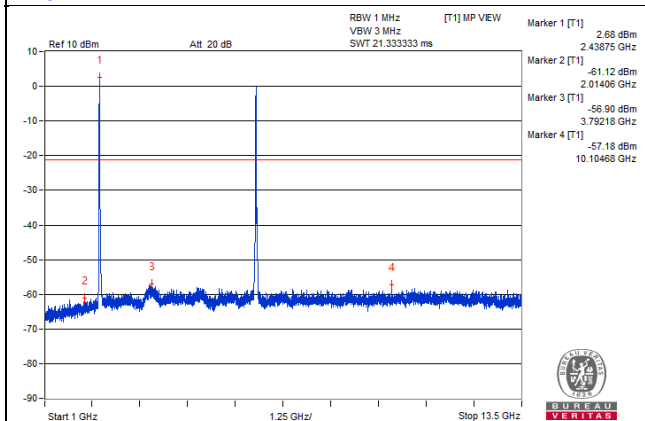
Remarks:

1. Margin value = Emission Level – Limit value
2. The other emission levels were very low against the limit.

Chain 0



Chain 1



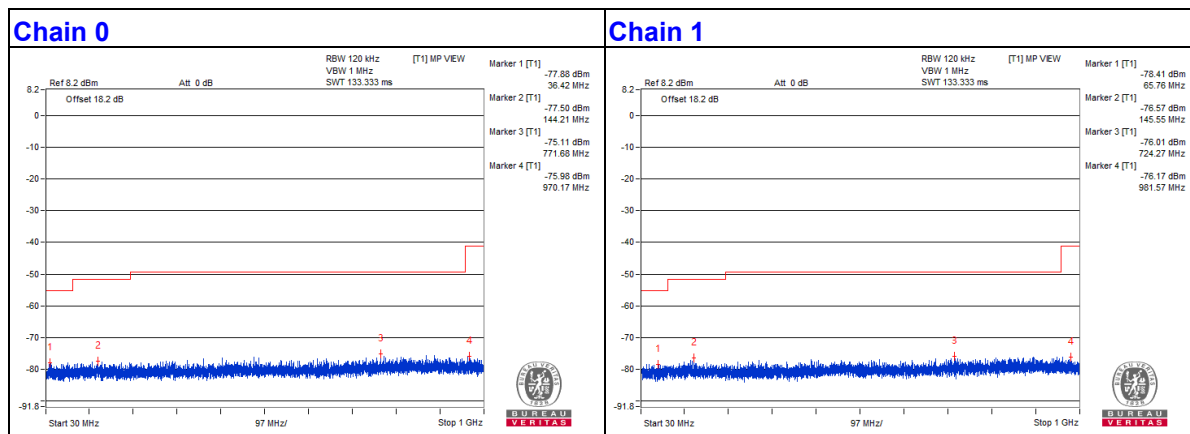
Below 1GHz Data:

Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	65.76	27.46	40	-12.54	-79.63	-78.41	8.17	-67.80
2	145.67	28.31	43.5	-15.19	-80.55	-76.58	8.17	-66.95
3	377.86	28.07	46	-17.93	-76.67	-81.2	8.17	-67.19
4	491.23	28.85	46	-17.15	-76.31	-79.42	8.17	-66.41
5	771.68	29.39	46	-16.61	-75.11	-80.65	8.17	-65.87
6	891.72	29.64	46	-16.36	-75.76	-78.17	8.17	-65.62

Remarks:

1. Margin value = Emission Level – Limit value
2. The other emission levels were very low against the limit.



For Mode 3

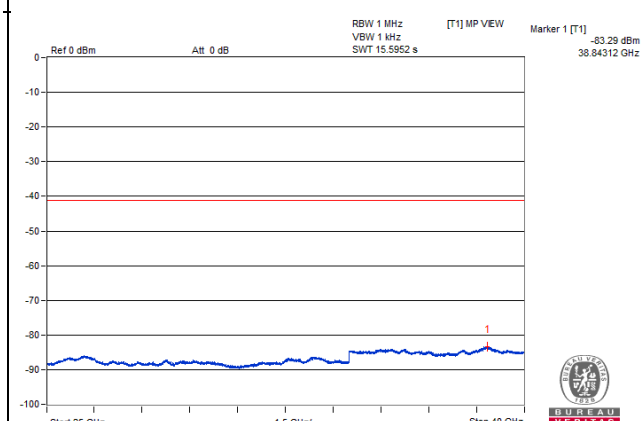
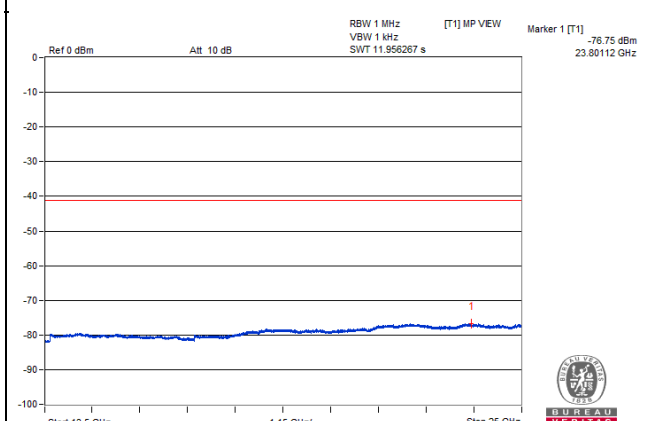
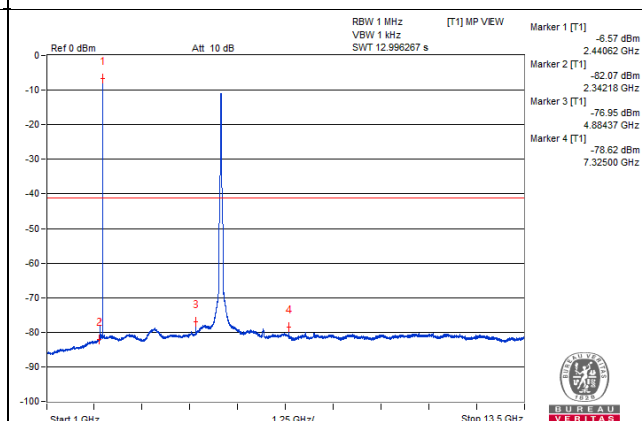
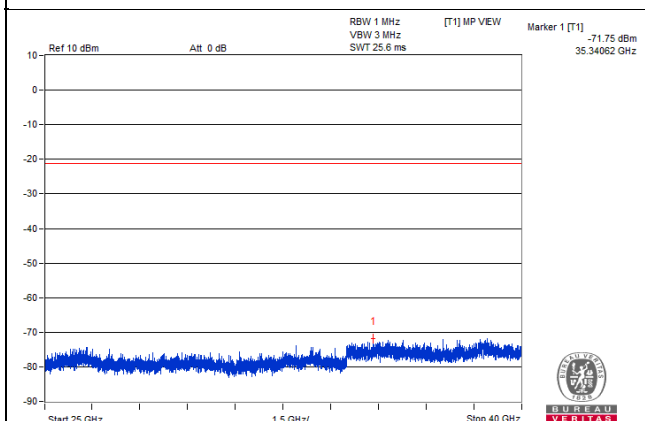
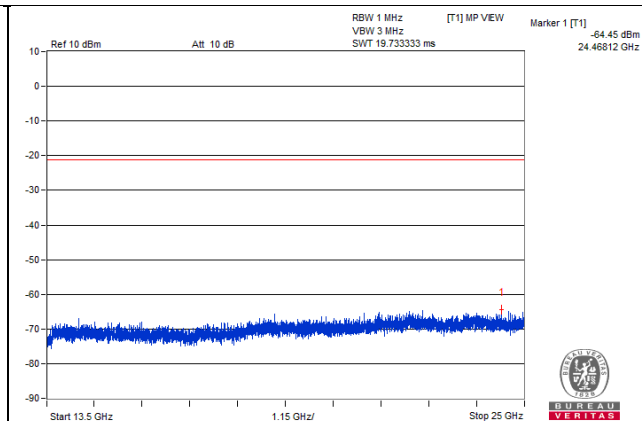
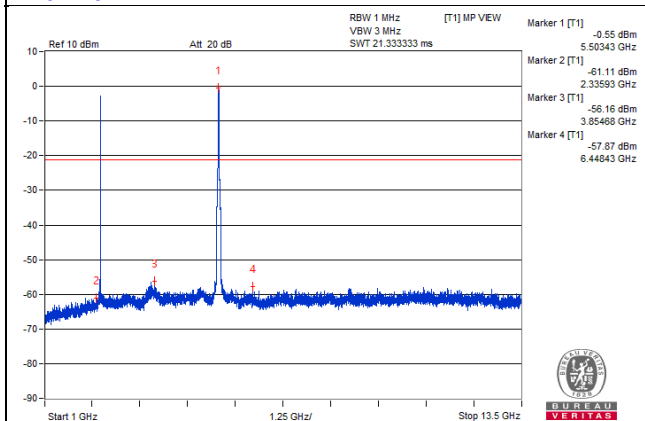
Above 1GHz Data:

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	4885.93	47.07 PK	74	-26.93	-58.8	-60.02	8.17	-48.19
2	4884.37	27.95 AV	54	-26.05	-76.95	-80.91	8.17	-67.31
3	7323.43	45.86 PK	74	-28.14	-59.31	-62.37	8.17	-49.40
4	7325	26.54 AV	54	-27.46	-78.62	-81.72	8.17	-68.72
5	11012.5	46.09 PK	74	-27.91	-59.72	-61.09	8.17	-49.17
6	11003.12	27.82 AV	54	-26.18	-80.48	-77.32	8.17	-67.44
7	#16517.31	35.6 PK	68.2	-32.6	-69.75	-72.29	8.17	-59.66

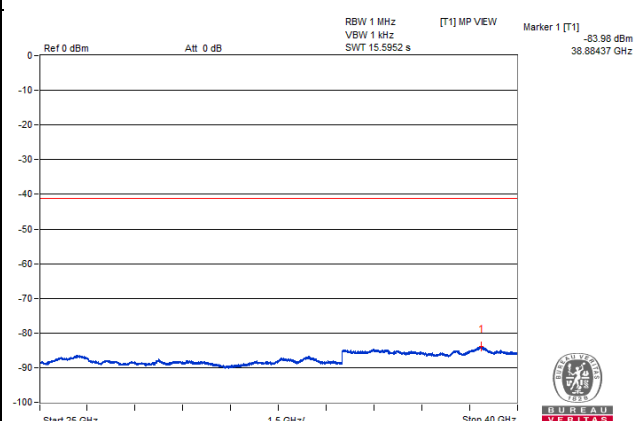
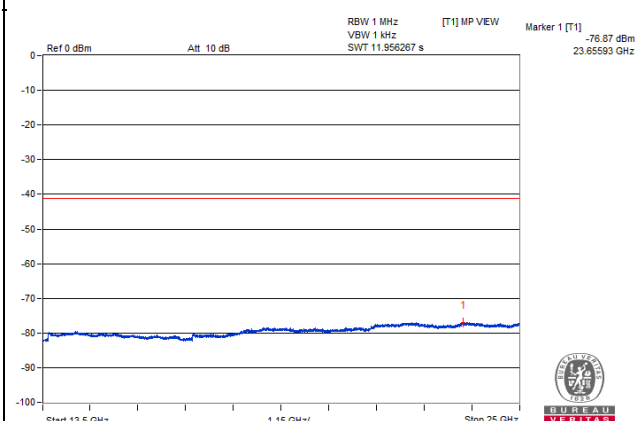
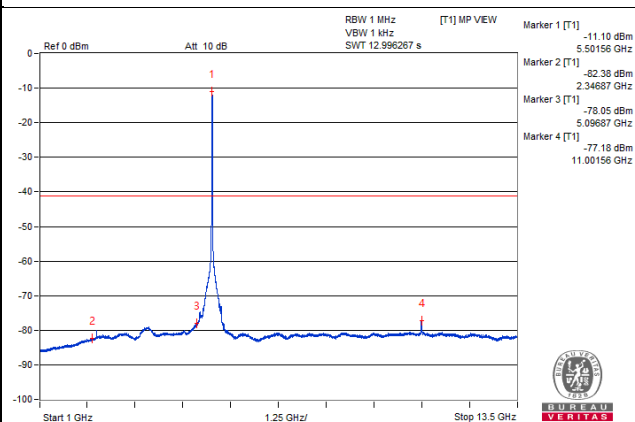
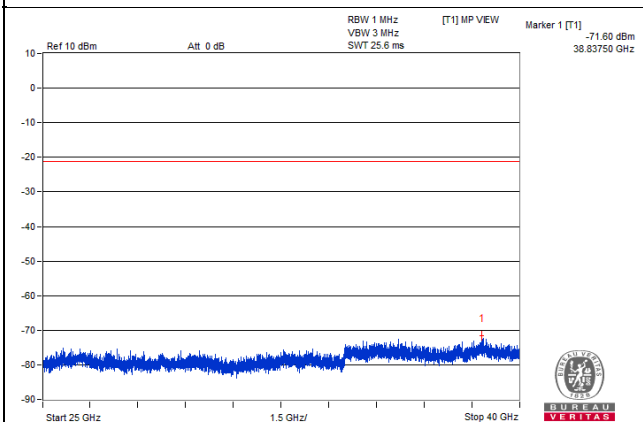
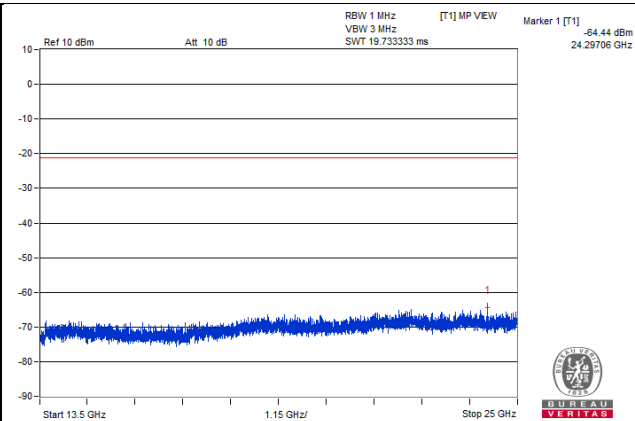
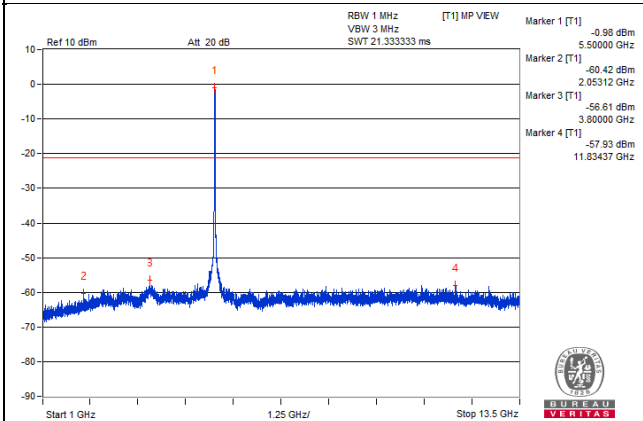
Remarks:

1. Margin value = Emission Level – Limit value
2. The other emission levels were very low against the limit.
3. " # " : The frequency is out of the restricted band.

Chain 0



Chain 1



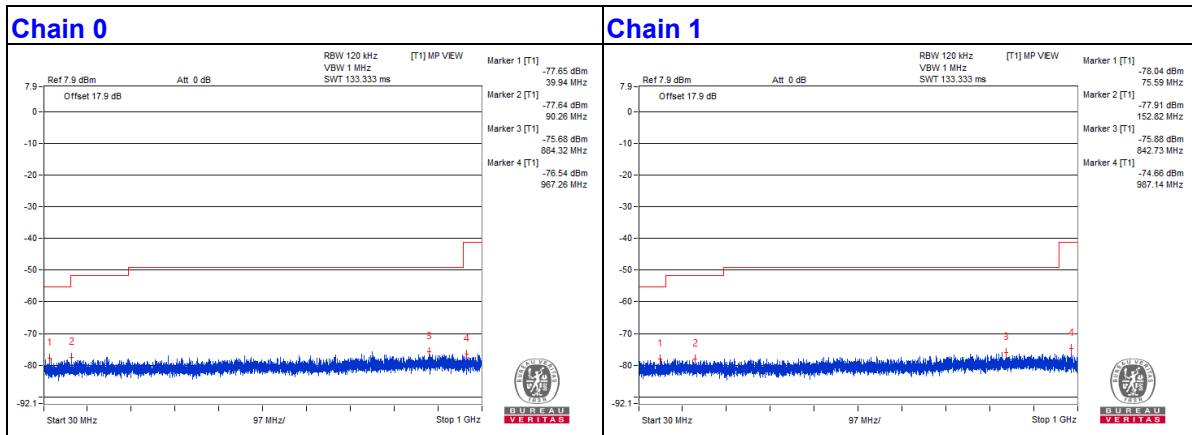
Below 1GHz Data:

Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	84.56	27.51	40	-12.49	-79.13	-78.73	8.17	-67.75
2	109.05	28.17	43.5	-15.33	-78.58	-77.99	8.17	-67.09
3	304.99	28.11	46	-17.89	-77.04	-80.17	8.17	-67.15
4	596.23	28.31	46	-17.69	-77.12	-79.45	8.17	-66.95
5	785.5	29.13	46	-16.87	-76.74	-77.97	8.17	-66.13
6	987.14	30.23	54	-23.77	-78.63	-74.66	8.17	-65.03

Remarks:

1. Margin value = Emission Level – Limit value
2. The other emission levels were very low against the limit.



For Mode 4

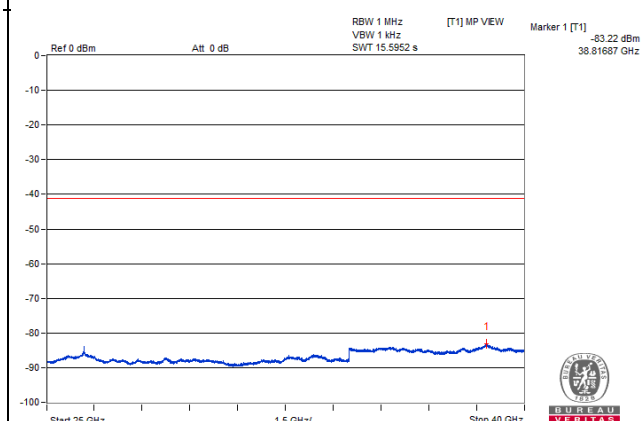
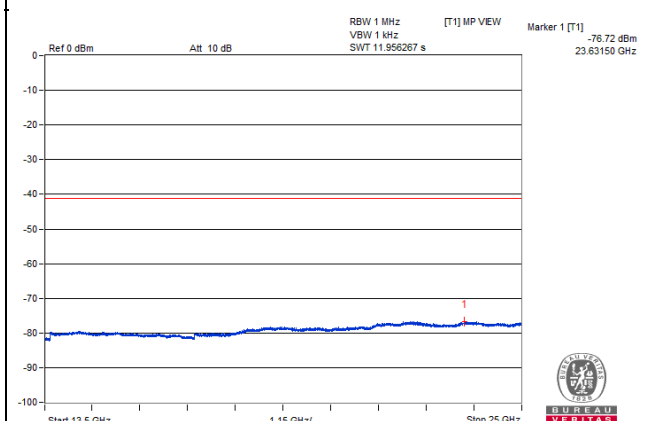
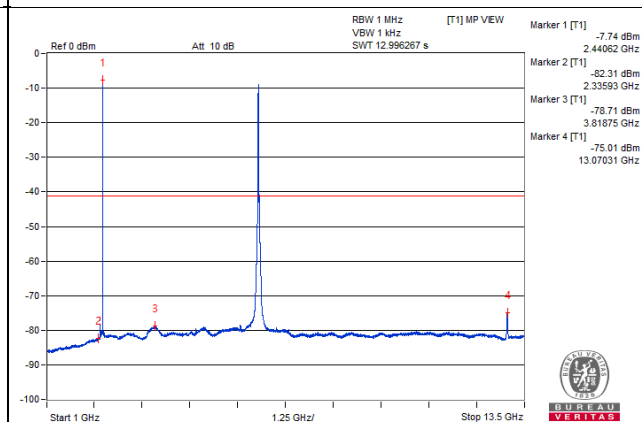
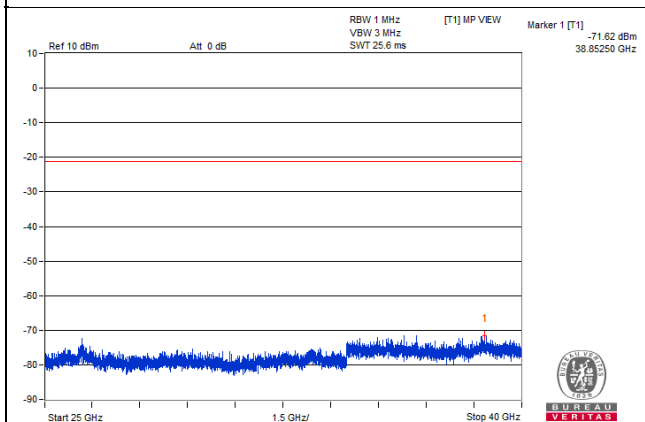
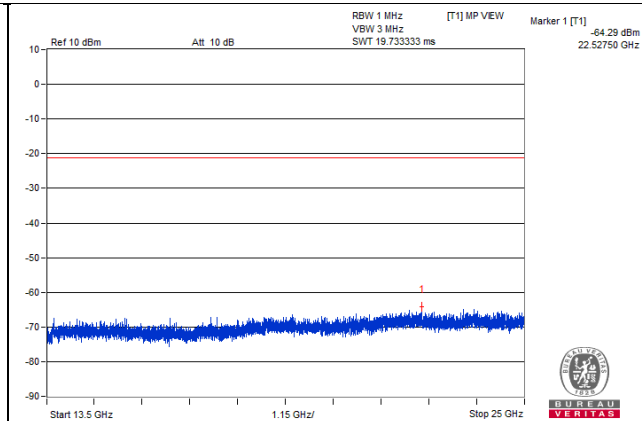
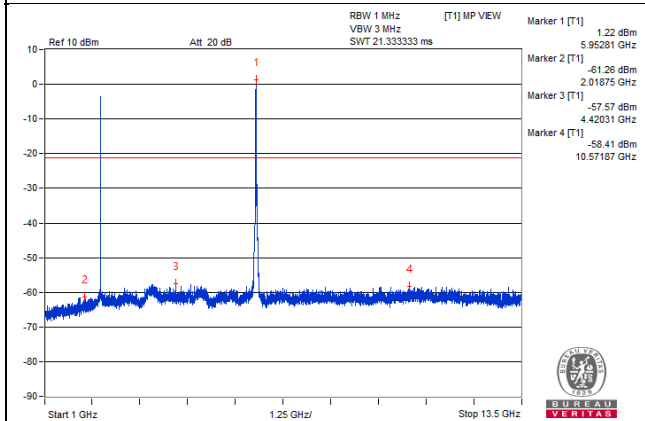
Above 1GHz Data:

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	4871.87	46.33 PK	74	-27.67	-62.39	-58.63	8.17	-48.93
2	4884.37	26.3 AV	54	-27.7	-79.66	-80.69	8.17	-68.96
3	7304.68	46.29 PK	74	-27.71	-60.81	-59.58	8.17	-48.97
4	7325	25.95 AV	54	-28.05	-79.66	-81.53	8.17	-69.31
5	11923.43	45.64 PK	74	-28.36	-61.96	-59.88	8.17	-49.62
6	11909.37	25.75 AV	54	-28.25	-80.97	-80.42	8.17	-69.51
7	17859.93	37.39 PK	74	-36.61	-70.95	-67.73	8.17	-57.87
8	17852.75	26.01 AV	54	-27.99	-80.18	-80.7	8.17	-69.25

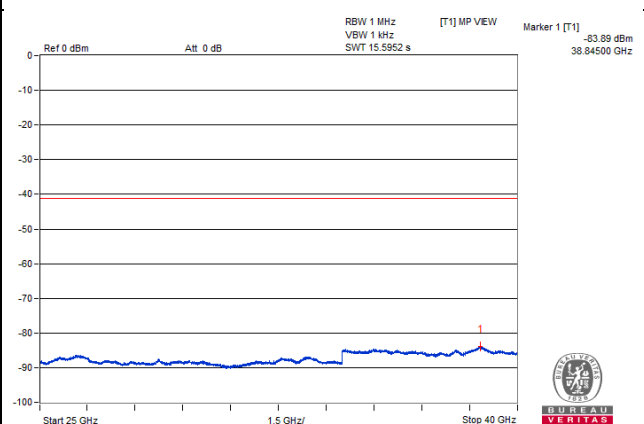
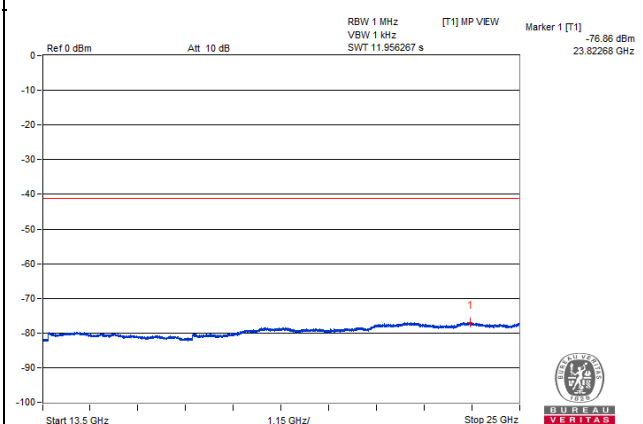
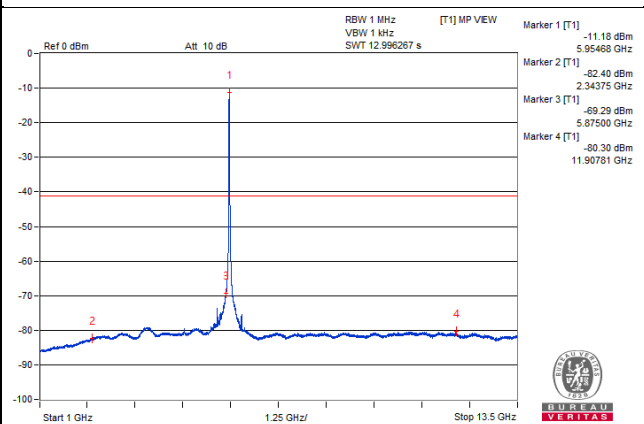
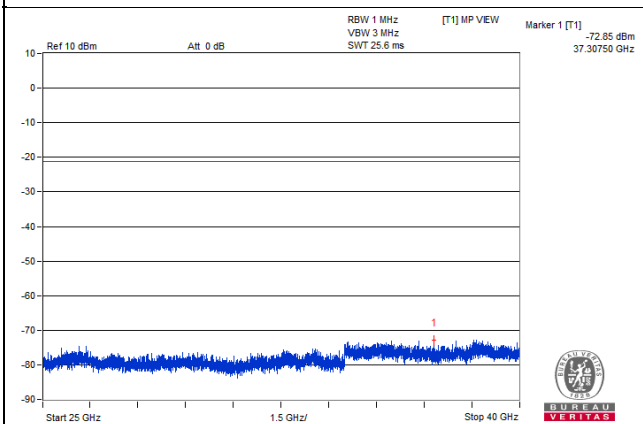
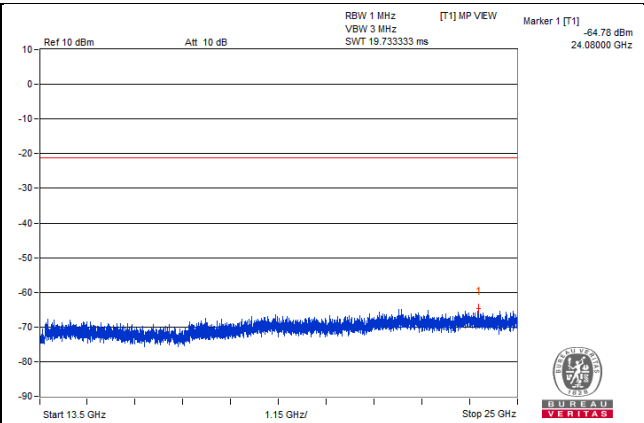
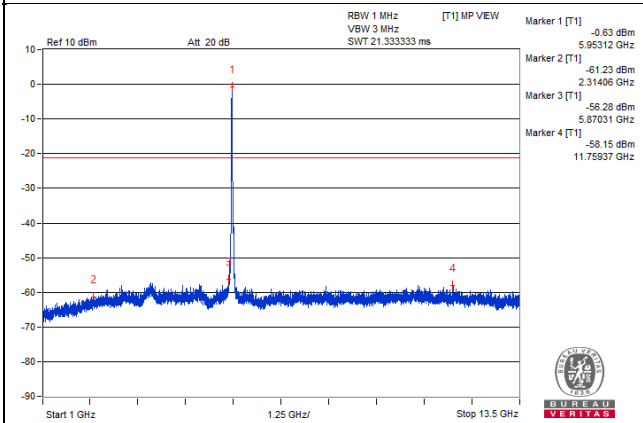
Remarks:

1. Margin value = Emission Level – Limit value
2. The other emission levels were very low against the limit.

Chain 0



Chain 1



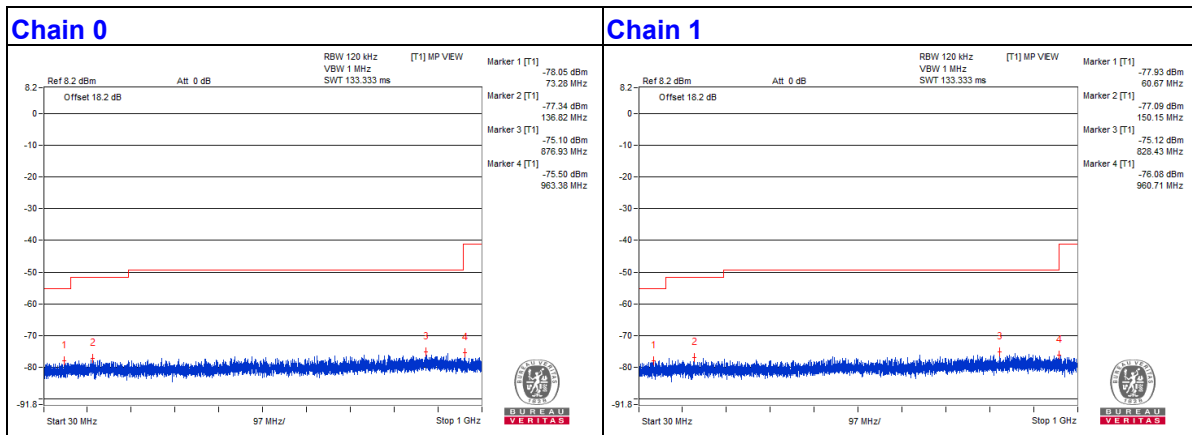
Below 1GHz Data:

Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	59.58	27.36	40	-12.64	-79.72	-78.53	8.17	-67.90
2	150.15	28.15	43.5	-15.35	-79.95	-77.09	8.17	-67.11
3	385.38	28.25	46	-17.75	-77.44	-79.11	8.17	-67.01
4	473.65	28.97	46	-17.03	-77.35	-77.6	8.17	-66.29
5	772.41	29.11	46	-16.89	-76.09	-79.08	8.17	-66.15
6	876.93	30.3	46	-15.7	-75.1	-77.51	8.17	-64.96

Remarks:

1. Margin value = Emission Level – Limit value
2. The other emission levels were very low against the limit.



For Mode 5

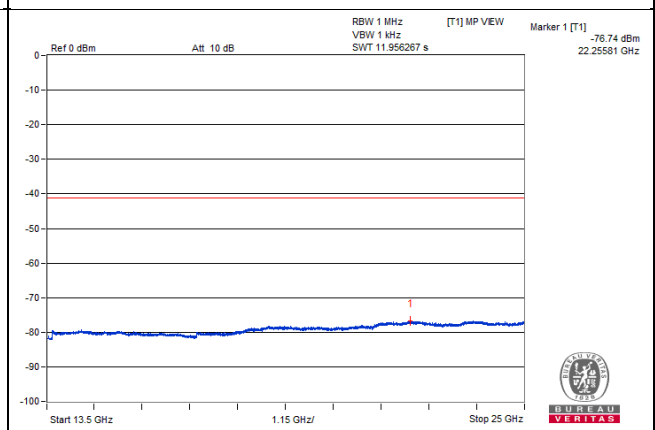
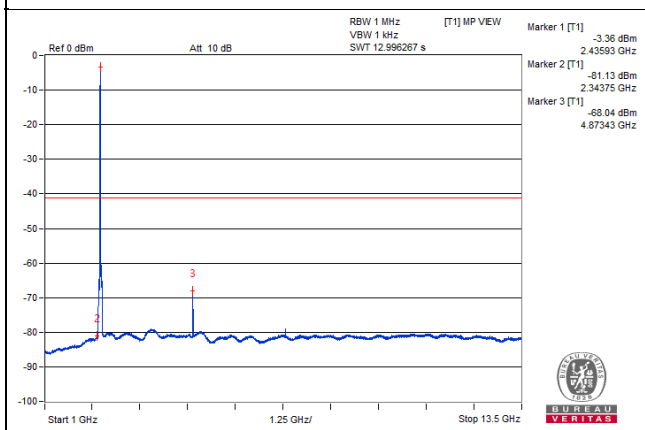
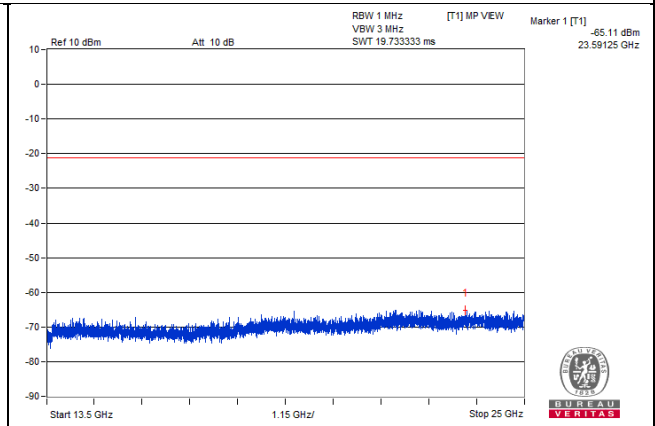
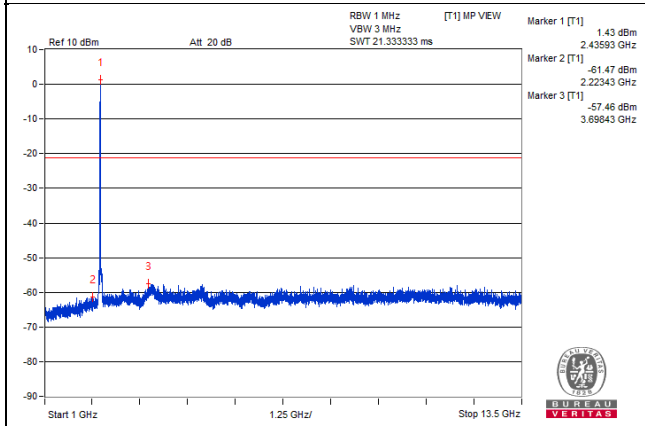
Above 1GHz Data:

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	4865.62	54.55 PK	74	-19.45	-61.06	-47.43	6.54	-40.71
2	4873.43	36.4 AV	54	-17.6	-68.04	-68.82	6.54	-58.86
3	7321.87	54.33 PK	74	-19.67	-62.11	-47.62	6.54	-40.93
4	7326.56	39.19 AV	54	-14.81	-81.53	-62.67	6.54	-56.07
5	4865.62	54.55 PK	74	-19.45	-61.06	-47.43	6.54	-40.71
6	4873.43	36.4 AV	54	-17.6	-68.04	-68.82	6.54	-58.86
7	7321.87	54.33 PK	74	-19.67	-62.11	-47.62	6.54	-40.93
8	7326.56	39.19 AV	54	-14.81	-81.53	-62.67	6.54	-56.07

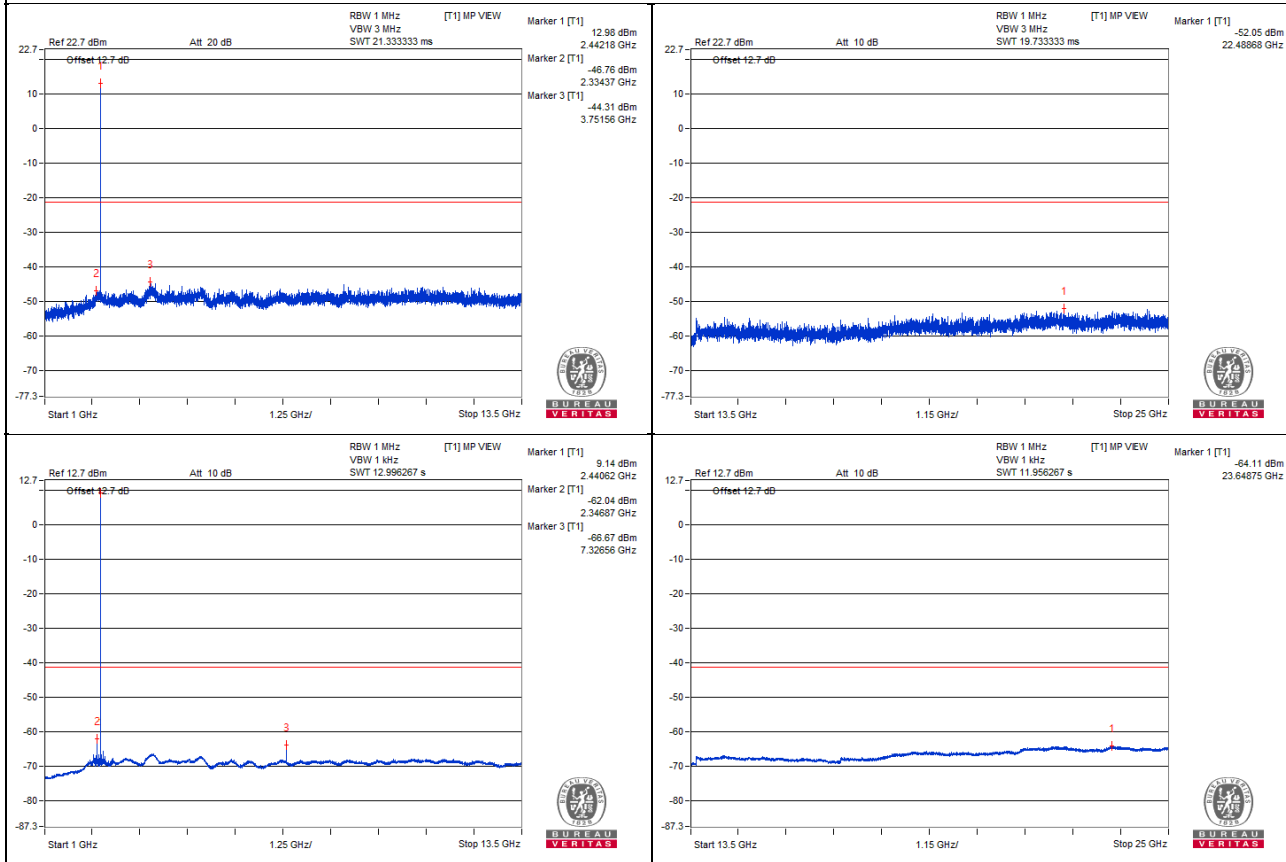
Remarks:

1. Margin value = Emission Level – Limit value
2. The other emission levels were very low against the limit.

Chain 0



Chain 1



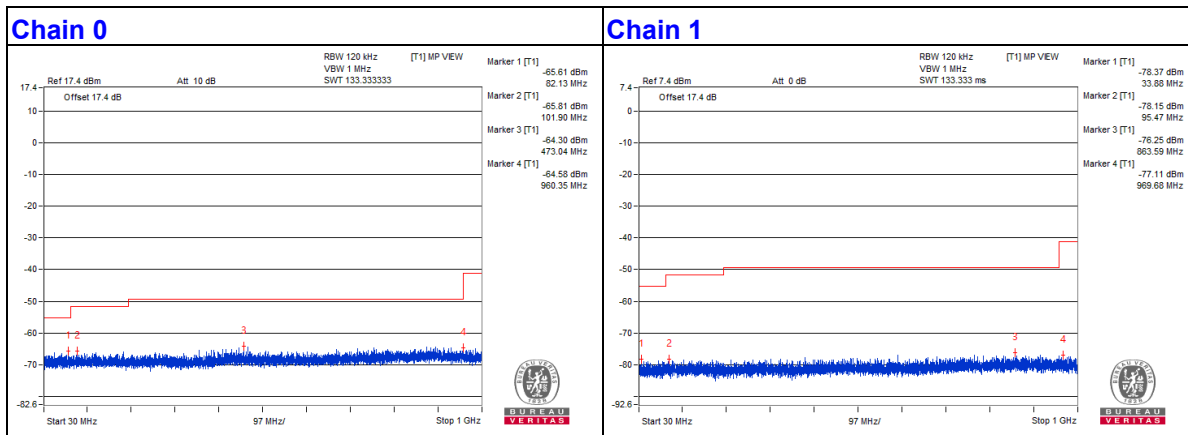
Below 1GHz Data:

Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	82.13	36.35	40	-3.65	-65.61	-79.84	6.54	-58.91
2	101.9	36.09	43.5	-7.41	-65.81	-82.32	6.54	-59.17
3	399.69	36.57	46	-9.43	-65.34	-81.19	6.54	-58.69
4	473.04	37.57	46	-8.43	-64.3	-82.34	6.54	-57.69
5	762.35	37.32	46	-8.68	-64.59	-80.48	6.54	-57.94
6	878.75	37.51	46	-8.49	-64.44	-79.11	6.54	-57.75

Remarks:

1. Margin value = Emission Level – Limit value
2. The other emission levels were very low against the limit.



4.1.8 Test Results (Radiated Measurement)

Radiated test with 50ohm terminator on antenna port.

For Mode 1

Above 1GHz Data:

Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 3 MHz
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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	44.6 PK	74.0	-29.4	1.88 H	319	42.5	2.1
2	4874.00	35.3 AV	54.0	-18.7	1.88 H	319	33.2	2.1
3	7311.00	50.3 PK	74.0	-23.7	2.61 H	291	42.6	7.7
4	7311.00	38.7 AV	54.0	-15.3	2.61 H	291	31.0	7.7
5	#10400.00	43.8 PK	68.2	-24.4	1.07 H	216	31.2	12.6
6	15600.00	46.9 PK	74.0	-27.1	1.26 H	248	36.2	10.7
7	15600.00	35.9 AV	54.0	-18.1	1.26 H	248	25.2	10.7
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	43.8 PK	74.0	-30.2	2.87 V	236	41.7	2.1
2	4874.00	34.5 AV	54.0	-19.5	2.87 V	236	32.4	2.1
3	7311.00	46.4 PK	74.0	-27.6	2.30 V	237	38.7	7.7
4	7311.00	36.4 AV	54.0	-17.6	2.30 V	237	28.7	7.7
5	#10400.00	44.1 PK	68.2	-24.1	1.10 V	214	31.5	12.6
6	15600.00	46.4 PK	74.0	-27.6	1.22 V	126	35.7	10.7
7	15600.00	34.5 AV	54.0	-19.5	1.22 V	126	23.8	10.7

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

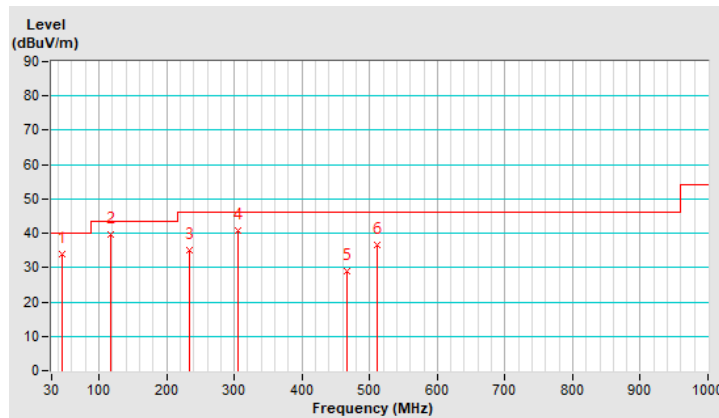
Below 1GHz Data:

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
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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	45.75	33.8 QP	40.0	-6.2	1.50 H	88	47.4	-13.6
2	117.95	39.5 QP	43.5	-4.0	2.00 H	79	55.3	-15.8
3	234.16	35.1 QP	46.0	-10.9	2.00 H	54	50.7	-15.6
4	305.05	40.9 QP	46.0	-5.1	1.50 H	154	53.5	-12.6
5	467.21	29.0 QP	46.0	-17.0	1.50 H	99	37.4	-8.4
6	511.67	36.6 QP	46.0	-9.4	1.50 H	309	44.3	-7.7

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 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

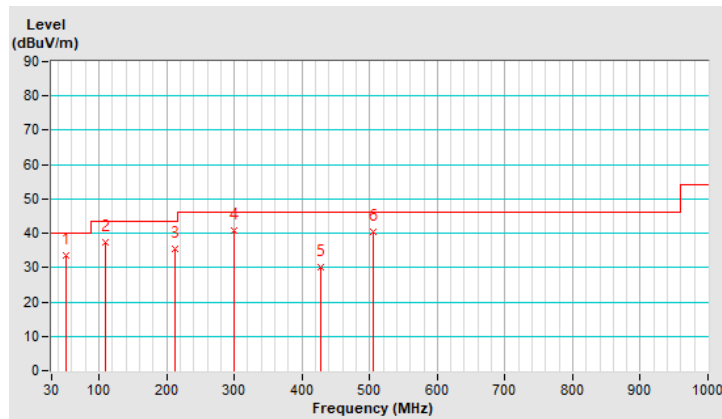


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
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Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	51.53	33.4 QP	40.0	-6.6	2.00 V	203	47.1	-13.7
2	110.18	37.5 QP	43.5	-6.0	2.00 V	227	54.0	-16.5
3	213.32	35.6 QP	43.5	-7.9	2.00 V	80	52.3	-16.7
4	300.06	40.7 QP	46.0	-5.3	1.00 V	148	53.4	-12.7
5	427.29	30.2 QP	46.0	-15.8	1.00 V	214	39.6	-9.4
6	504.64	40.3 QP	46.0	-5.7	2.00 V	242	48.1	-7.8

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 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



For Mode 2

Above 1GHz Data:

Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 3 MHz
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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	45.3 PK	74.0	-28.7	1.81 H	323	43.2	2.1
2	4874.00	35.8 AV	54.0	-18.2	1.81 H	323	33.7	2.1
3	7311.00	50.2 PK	74.0	-23.8	2.59 H	302	42.5	7.7
4	7311.00	38.5 AV	54.0	-15.5	2.59 H	302	30.8	7.7
5	#13070.00	48.3 PK	88.2	-39.9	1.20 H	228	35.7	12.6
6	#13070.00	39.5 AV	68.2	-28.7	1.20 H	228	26.9	12.6
7	19605.00	45.0 PK	74.0	-29.0	1.38 H	165	50.9	-5.9
8	19605.00	35.5 AV	54.0	-18.5	1.38 H	165	41.4	-5.9

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	44.0 PK	74.0	-30.0	2.90 V	236	41.9	2.1
2	4874.00	34.8 AV	54.0	-19.2	2.90 V	236	32.7	2.1
3	7311.00	46.4 PK	74.0	-27.6	2.19 V	265	38.7	7.7
4	7311.00	36.5 AV	54.0	-17.5	2.19 V	265	28.8	7.7
5	#13070.00	50.0 PK	88.2	-38.2	1.07 V	204	37.4	12.6
6	#13070.00	38.6 AV	68.2	-29.6	1.07 V	204	26.0	12.6
7	19605.00	46.4 PK	74.0	-27.6	1.12 V	152	52.3	-5.9
8	19605.00	37.9 AV	54.0	-16.1	1.12 V	152	43.8	-5.9

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

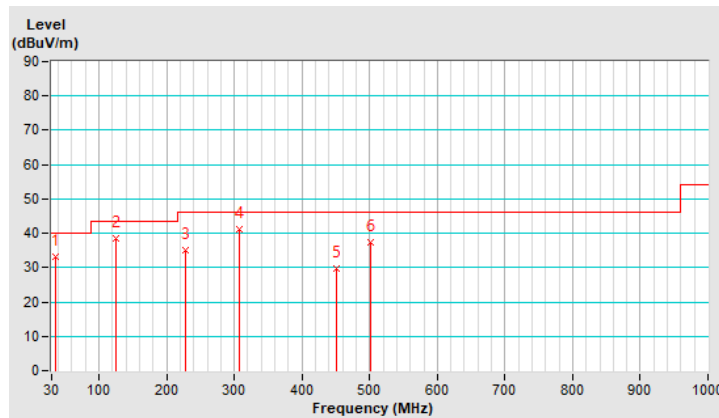
Below 1GHz Data:

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
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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	35.30	33.1 QP	40.0	-6.9	1.50 H	89	47.7	-14.6
2	125.85	38.4 QP	43.5	-5.1	2.00 H	107	53.4	-15.0
3	228.62	35.2 QP	46.0	-10.8	1.00 H	18	51.4	-16.2
4	307.86	41.0 QP	46.0	-5.0	1.00 H	174	53.4	-12.4
5	451.65	29.8 QP	46.0	-16.2	1.00 H	88	38.4	-8.6
6	501.71	37.2 QP	46.0	-8.8	2.00 H	254	45.1	-7.9

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 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

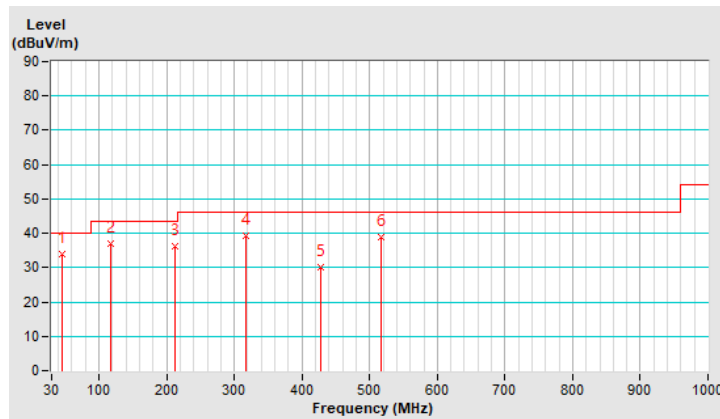


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
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Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	45.31	33.8 QP	40.0	-6.2	2.00 V	195	47.5	-13.7
2	117.36	37.1 QP	43.5	-6.4	1.50 V	295	52.9	-15.8
3	212.55	36.3 QP	43.5	-7.2	2.00 V	68	53.0	-16.7
4	316.70	39.4 QP	46.0	-6.6	2.00 V	157	51.6	-12.2
5	427.67	30.2 QP	46.0	-15.8	1.00 V	167	39.6	-9.4
6	516.27	38.8 QP	46.0	-7.2	1.00 V	233	46.3	-7.5

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 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



For Mode 3
Above 1GHz Data:

Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 3 MHz
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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	4882.00	41.7 PK	74.0	-32.3	1.37 H	298	39.6	2.1
2	4882.00	30.7 AV	54.0	-23.3	1.37 H	298	28.6	2.1
3	7323.00	46.6 PK	74.0	-27.4	1.85 H	169	38.9	7.7
4	7323.00	34.2 AV	54.0	-19.8	1.85 H	169	26.5	7.7
5	#10400.00	44.0 PK	68.2	-24.2	1.17 H	192	31.4	12.6
6	15600.00	46.7 PK	74.0	-27.3	1.26 H	226	36.0	10.7
7	15600.00	35.7 AV	54.0	-18.3	1.26 H	226	25.0	10.7
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	4882.00	41.9 PK	74.0	-32.1	1.65 V	133	39.8	2.1
2	4882.00	32.0 AV	54.0	-22.0	1.65 V	133	29.9	2.1
3	7323.00	46.8 PK	74.0	-27.2	1.98 V	273	39.1	7.7
4	7323.00	35.7 AV	54.0	-18.3	1.98 V	273	28.0	7.7
5	#10400.00	44.3 PK	68.2	-23.9	1.03 V	214	31.7	12.6
6	15600.00	45.2 PK	74.0	-28.8	1.21 V	139	34.5	10.7
7	15600.00	33.9 AV	54.0	-20.1	1.21 V	139	23.2	10.7

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

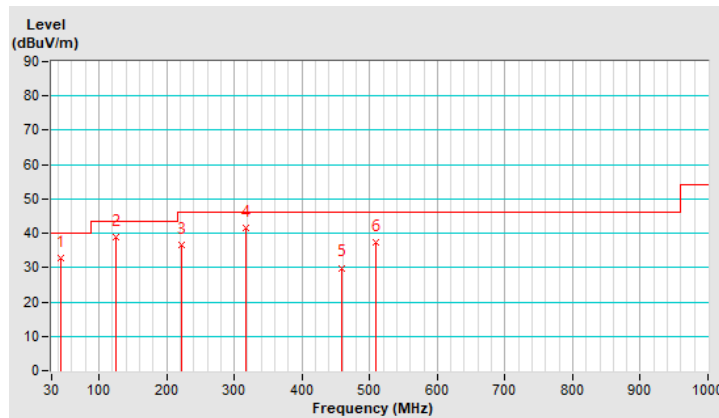
Below 1GHz Data:

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
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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	42.99	32.8 QP	40.0	-7.2	1.50 H	91	46.6	-13.8
2	124.44	38.8 QP	43.5	-4.7	2.00 H	122	54.0	-15.2
3	222.08	36.5 QP	46.0	-9.5	1.50 H	36	52.9	-16.4
4	316.54	41.6 QP	46.0	-4.4	1.50 H	204	53.8	-12.2
5	459.23	29.9 QP	46.0	-16.1	1.50 H	92	38.5	-8.6
6	508.26	37.5 QP	46.0	-8.5	2.00 H	281	45.2	-7.7

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 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



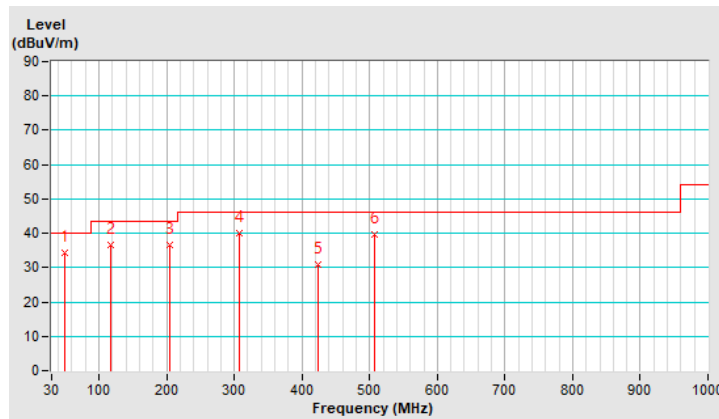
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
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Antenna Polarity & Test Distance : Vertical at 3 m

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	50.33	34.4 QP	40.0	-5.6	1.00 V	205	48.0	-13.6
2	116.53	36.7 QP	43.5	-6.8	1.50 V	234	52.6	-15.9
3	204.10	36.6 QP	43.5	-6.9	2.00 V	72	53.4	-16.8
4	307.70	39.9 QP	46.0	-6.1	1.50 V	153	52.3	-12.4
5	424.37	31.0 QP	46.0	-15.0	1.50 V	183	40.4	-9.4
6	507.55	39.7 QP	46.0	-6.3	1.50 V	214	47.4	-7.7

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 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



For Mode 4

Above 1GHz Data:

Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 3 MHz
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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	4882.00	41.5 PK	74.0	-32.5	1.34 H	316	39.4	2.1
2	4882.00	30.8 AV	54.0	-23.2	1.34 H	316	28.7	2.1
3	7323.00	46.8 PK	74.0	-27.2	1.81 H	176	39.1	7.7
4	7323.00	34.7 AV	54.0	-19.3	1.81 H	176	27.0	7.7
5	#13070.00	48.0 PK	88.2	-40.2	1.23 H	242	35.4	12.6
6	#13070.00	38.9 AV	68.2	-29.3	1.23 H	242	26.3	12.6
7	19605.00	45.9 PK	74.0	-28.1	1.35 H	167	51.8	-5.9
8	19605.00	36.3 AV	54.0	-17.7	1.35 H	167	42.2	-5.9

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	4882.00	41.6 PK	74.0	-32.4	1.63 V	131	39.5	2.1
2	4882.00	31.4 AV	54.0	-22.6	1.63 V	131	29.3	2.1
3	7323.00	46.4 PK	74.0	-27.6	1.91 V	250	38.7	7.7
4	7323.00	35.4 AV	54.0	-18.6	1.91 V	250	27.7	7.7
5	#13070.00	50.2 PK	88.2	-38.0	1.03 V	189	37.6	12.6
6	#13070.00	38.8 AV	68.2	-29.4	1.03 V	189	26.2	12.6
7	19605.00	46.4 PK	74.0	-27.6	1.15 V	152	52.3	-5.9
8	19605.00	37.4 AV	54.0	-16.6	1.15 V	152	43.3	-5.9

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

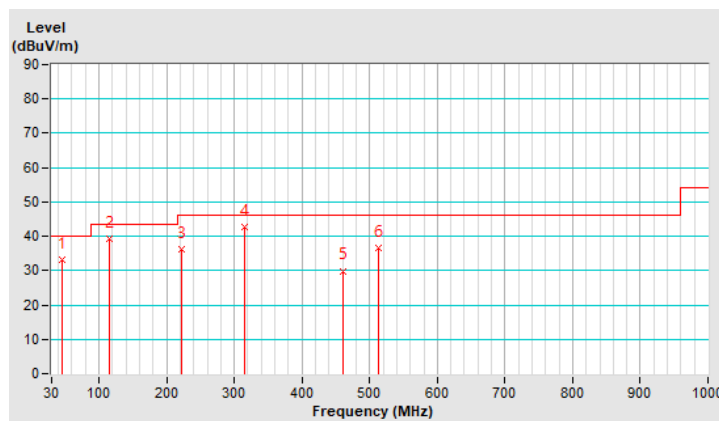
Below 1GHz Data:

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
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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	46.28	33.3 QP	40.0	-6.7	1.00 H	104	46.9	-13.6
2	115.44	39.3 QP	43.5	-4.2	2.00 H	88	55.3	-16.0
3	222.79	36.3 QP	46.0	-9.7	1.50 H	61	52.7	-16.4
4	314.76	42.7 QP	46.0	-3.3	1.50 H	184	54.9	-12.2
5	460.56	29.9 QP	46.0	-16.1	2.00 H	90	38.5	-8.6
6	513.39	36.6 QP	46.0	-9.4	1.50 H	301	44.1	-7.5

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 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

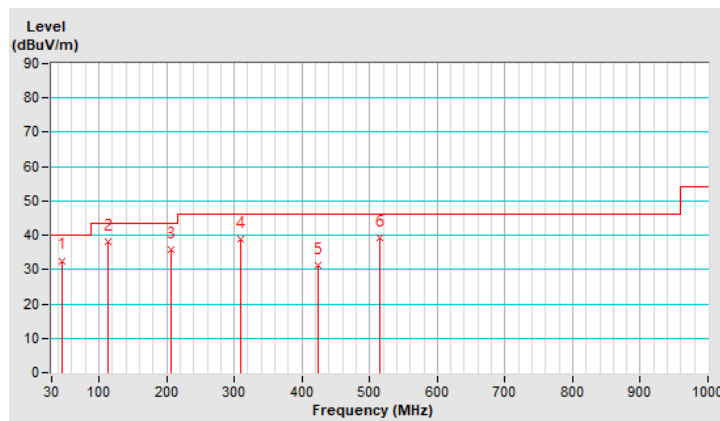


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
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Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	45.10	32.6 QP	40.0	-7.4	1.50 V	231	46.3	-13.7
2	113.57	38.2 QP	43.5	-5.3	2.00 V	276	54.4	-16.2
3	207.03	35.8 QP	43.5	-7.7	1.50 V	42	52.6	-16.8
4	308.60	38.8 QP	46.0	-7.2	1.50 V	146	51.2	-12.4
5	424.42	31.2 QP	46.0	-14.8	1.00 V	196	40.6	-9.4
6	515.86	39.4 QP	46.0	-6.6	2.00 V	226	46.9	-7.5

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 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



For Mode 5
Above 1GHz Data:

Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 3 MHz
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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	44.5 PK	74.0	-29.5	1.88 H	313	42.4	2.1
2	4874.00	35.4 AV	54.0	-18.6	1.88 H	313	33.3	2.1
3	7311.00	50.2 PK	74.0	-23.8	2.59 H	296	42.5	7.7
4	7311.00	38.6 AV	54.0	-15.4	2.59 H	296	30.9	7.7
5	#10400.00	44.4 PK	68.2	-23.8	1.07 H	191	31.8	12.6
6	15600.00	46.7 PK	74.0	-27.3	1.24 H	255	36.0	10.7
7	15600.00	35.5 AV	54.0	-18.5	1.24 H	255	24.8	10.7

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	44.2 PK	74.0	-29.8	2.87 V	243	42.1	2.1
2	4874.00	35.0 AV	54.0	-19.0	2.87 V	243	32.9	2.1
3	7311.00	45.8 PK	74.0	-28.2	2.21 V	236	38.1	7.7
4	7311.00	35.7 AV	54.0	-18.3	2.21 V	236	28.0	7.7
5	#10400.00	44.4 PK	68.2	-23.8	1.01 V	210	31.8	12.6
6	15600.00	45.2 PK	74.0	-28.8	1.18 V	130	34.5	10.7
7	15600.00	33.8 AV	54.0	-20.2	1.18 V	130	23.1	10.7

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

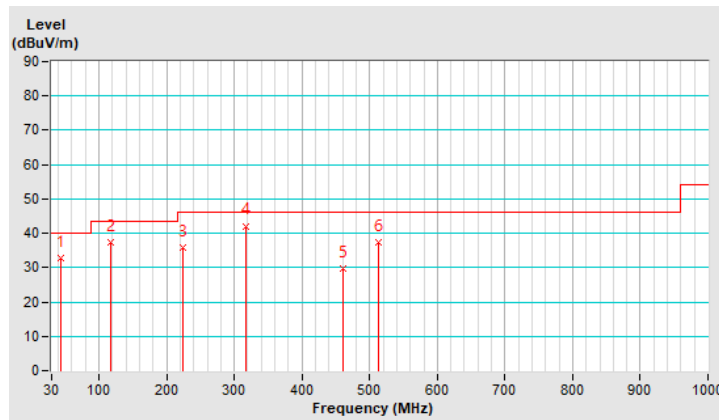
Below 1GHz Data:

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
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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	43.35	32.7 QP	40.0	-7.3	1.50 H	103	46.5	-13.8
2	118.13	37.5 QP	43.5	-6.0	1.00 H	72	53.3	-15.8
3	224.08	35.8 QP	46.0	-10.2	1.50 H	37	52.2	-16.4
4	316.93	42.1 QP	46.0	-3.9	1.50 H	187	54.3	-12.2
5	461.12	29.8 QP	46.0	-16.2	1.50 H	118	38.4	-8.6
6	512.55	37.4 QP	46.0	-8.6	1.50 H	289	44.9	-7.5

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 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

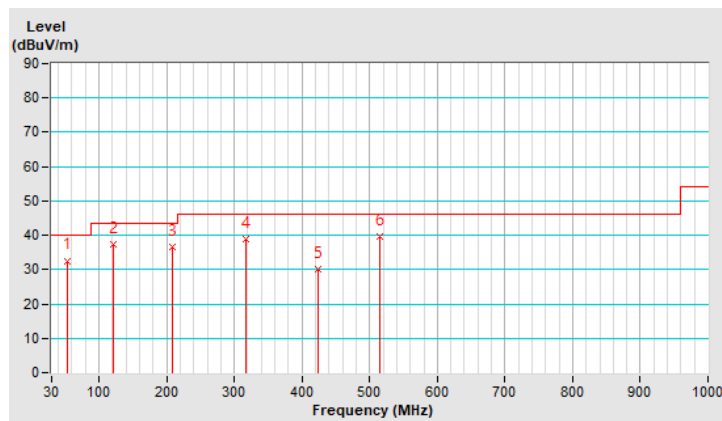


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
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Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	53.52	32.6 QP	40.0	-7.4	1.00 V	216	46.4	-13.8
2	120.94	37.5 QP	43.5	-6.0	1.50 V	234	53.0	-15.5
3	207.88	36.7 QP	43.5	-6.8	1.00 V	64	53.5	-16.8
4	316.34	38.9 QP	46.0	-7.1	1.50 V	135	51.1	-12.2
5	423.13	30.2 QP	46.0	-15.8	1.50 V	189	39.6	-9.4
6	514.36	39.6 QP	46.0	-6.4	1.50 V	242	47.1	-7.5

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 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: 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
EMI Test Receiver R&S	ESCS 30	847124/029	2022/10/14	2023/10/13
LISN R&S	ESH3-Z5	848773/004	2022/10/18	2023/10/17
50 ohm terminal resistance NA	NA	EMC-01	2022/9/27	2023/9/26
RF Coaxial Cable JYEBO	5D-FB	COCCAB-001	2022/8/24	2023/8/23
Fixed Attenuator STI	STI02-2200-10	005	2022/8/24	2023/8/23
Software BVADT	BVADT_Cond_V7.3.7.4	NA	NA	NA

Note:

1. The test was performed in Conduction 1.
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: 2023/5/10 ~ 2023/6/6

4.2.3 Test Procedures

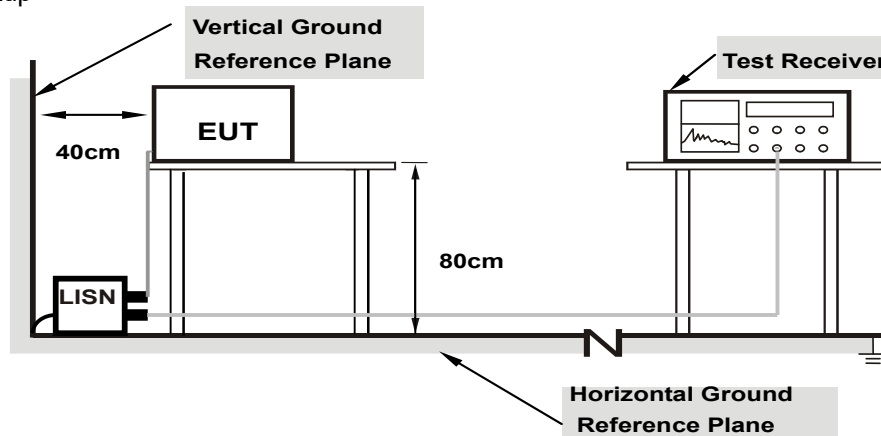
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

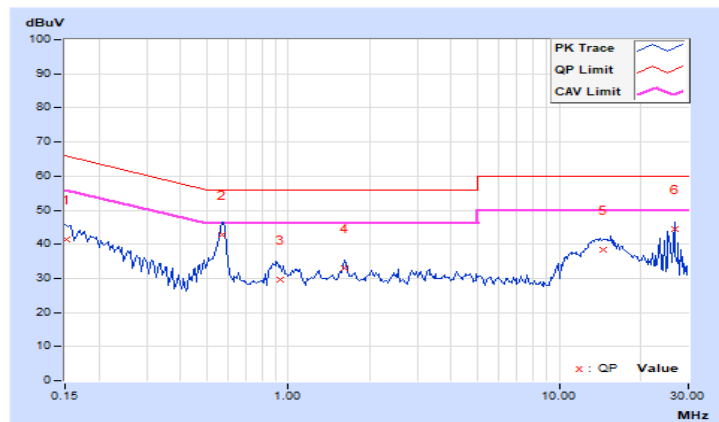
For Mode 1

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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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	0.15106	9.97	31.43	24.62	41.40	34.59	65.94	55.94	-24.54	-21.35
2	0.57155	9.99	32.71	26.64	42.70	36.63	56.00	46.00	-13.30	-9.37
3	0.93153	10.01	19.58	16.71	29.59	26.72	56.00	46.00	-26.41	-19.28
4	1.60560	10.04	22.85	18.14	32.89	28.18	56.00	46.00	-23.11	-17.82
5	14.51475	10.72	27.58	20.46	38.30	31.18	60.00	50.00	-21.70	-18.82
6	26.61952	11.22	33.15	28.68	44.37	39.90	60.00	50.00	-15.63	-10.10

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

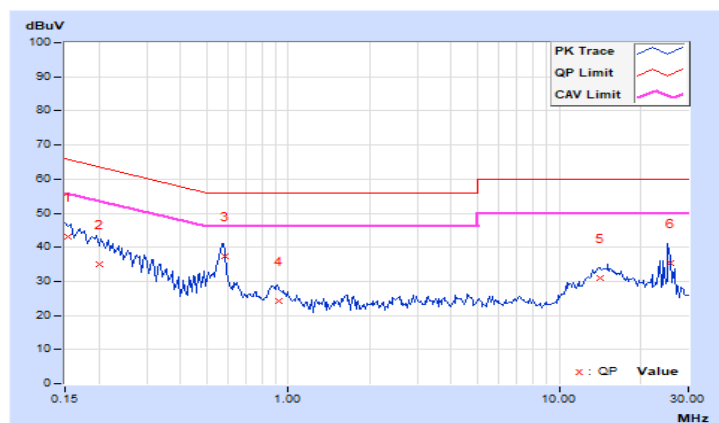


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15401	10.01	32.92	19.63	42.93	29.64	65.78	55.78	-22.85	-26.14
2	0.20177	10.02	24.84	10.43	34.86	20.45	63.54	53.54	-28.68	-33.09
3	0.58151	10.04	27.25	18.46	37.29	28.50	56.00	46.00	-18.71	-17.50
4	0.91711	10.06	14.34	3.15	24.40	13.21	56.00	46.00	-31.60	-32.79
5	14.19208	10.61	20.51	13.46	31.12	24.07	60.00	50.00	-28.88	-25.93
6	25.82541	10.89	24.58	18.36	35.47	29.25	60.00	50.00	-24.53	-20.75

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



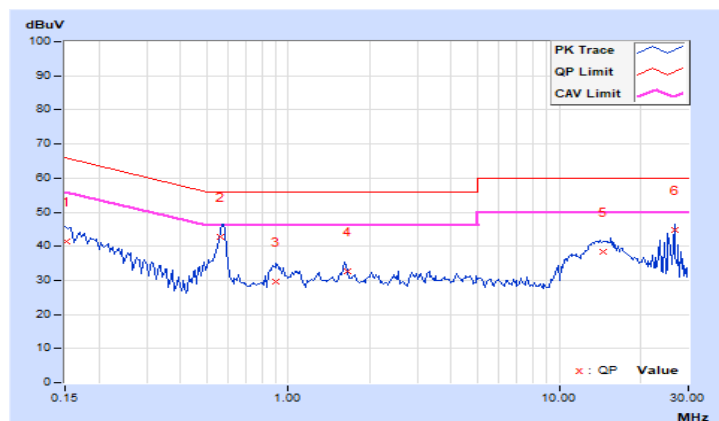
For Mode 2

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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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	0.15253	9.97	31.54	24.71	41.51	34.68	65.86	55.86	-24.35	-21.18
2	0.56317	9.99	32.71	26.46	42.70	36.45	56.00	46.00	-13.30	-9.55
3	0.90297	10.01	19.48	16.78	29.49	26.79	56.00	46.00	-26.51	-19.21
4	1.65371	10.04	22.58	18.36	32.62	28.40	56.00	46.00	-23.38	-17.60
5	14.49862	10.72	27.71	20.86	38.43	31.58	60.00	50.00	-21.57	-18.42
6	26.60959	11.22	33.46	28.43	44.68	39.65	60.00	50.00	-15.32	-10.35

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

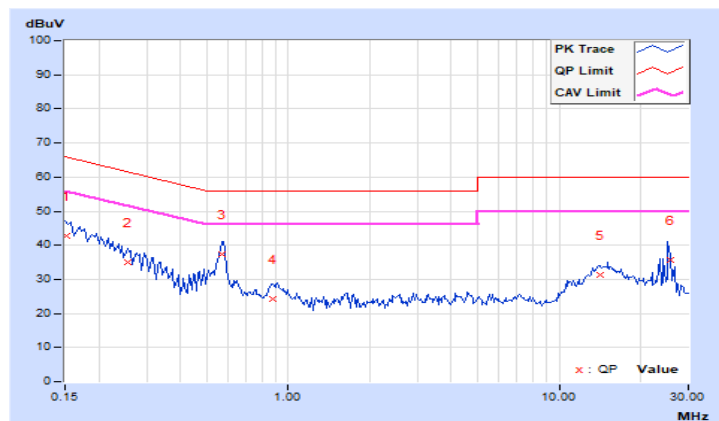


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15231	10.01	32.71	19.79	42.72	29.80	65.87	55.87	-23.15	-26.07
2	0.25714	10.02	24.96	10.58	34.98	20.60	61.52	51.52	-26.54	-30.92
3	0.56954	10.04	27.36	18.58	37.40	28.62	56.00	46.00	-18.60	-17.38
4	0.88192	10.05	14.26	3.06	24.31	13.11	56.00	46.00	-31.69	-32.89
5	14.20155	10.61	20.68	13.71	31.29	24.32	60.00	50.00	-28.71	-25.68
6	25.81726	10.89	24.67	18.43	35.56	29.32	60.00	50.00	-24.44	-20.68

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



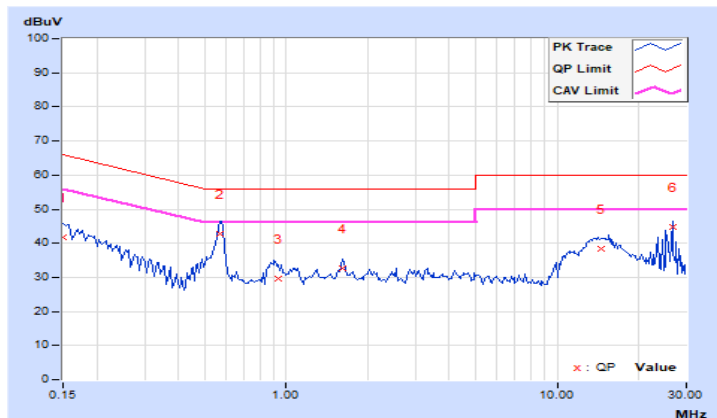
For Mode 3

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
------------------------	----------------	---	---------------------------------------

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	0.15027	9.97	31.65	24.79	41.62	34.76	65.99	55.99	-24.37	-21.23
2	0.57152	9.99	32.80	26.41	42.79	36.40	56.00	46.00	-13.21	-9.60
3	0.92917	10.01	19.53	16.84	29.54	26.85	56.00	46.00	-26.46	-19.15
4	1.61523	10.04	22.64	18.29	32.68	28.33	56.00	46.00	-23.32	-17.67
5	14.52194	10.72	27.83	20.96	38.55	31.68	60.00	50.00	-21.45	-18.32
6	26.61271	11.22	33.55	28.64	44.77	39.86	60.00	50.00	-15.23	-10.14

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

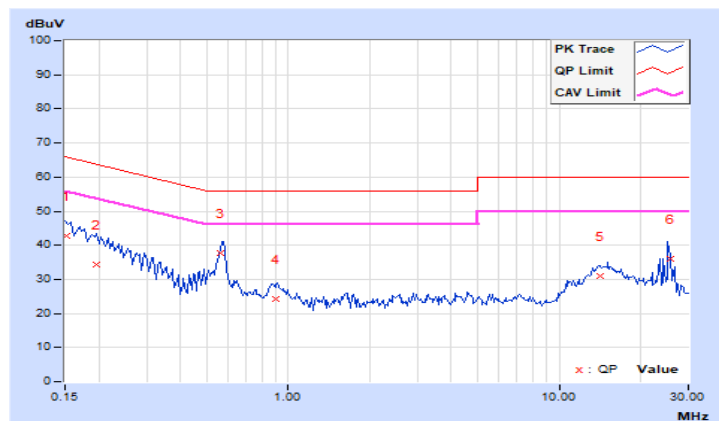


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15098	10.01	32.71	19.22	42.72	29.23	65.95	55.95	-23.23	-26.72
2	0.19584	10.02	24.43	10.75	34.45	20.77	63.79	53.79	-29.34	-33.02
3	0.56392	10.04	27.54	18.71	37.58	28.75	56.00	46.00	-18.42	-17.25
4	0.89713	10.05	14.26	2.49	24.31	12.54	56.00	46.00	-31.69	-33.46
5	14.19266	10.61	20.37	13.54	30.98	24.15	60.00	50.00	-29.02	-25.85
6	25.84315	10.89	24.98	18.77	35.87	29.66	60.00	50.00	-24.13	-20.34

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



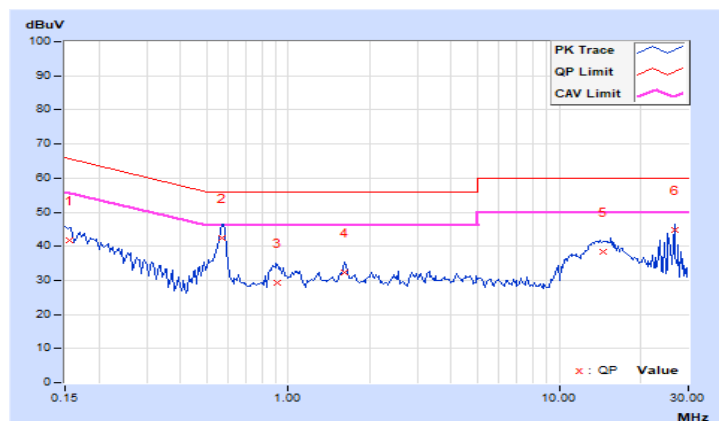
For Mode 4

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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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	0.15519	9.97	31.71	24.62	41.68	34.59	65.72	55.72	-24.04	-21.13
2	0.56950	9.99	32.54	26.43	42.53	36.42	56.00	46.00	-13.47	-9.58
3	0.91052	10.01	19.28	16.87	29.29	26.88	56.00	46.00	-26.71	-19.12
4	1.60926	10.04	22.34	18.82	32.38	28.86	56.00	46.00	-23.62	-17.14
5	14.49171	10.72	27.61	20.71	38.33	31.43	60.00	50.00	-21.67	-18.57
6	26.62923	11.22	33.47	28.35	44.69	39.57	60.00	50.00	-15.31	-10.43

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

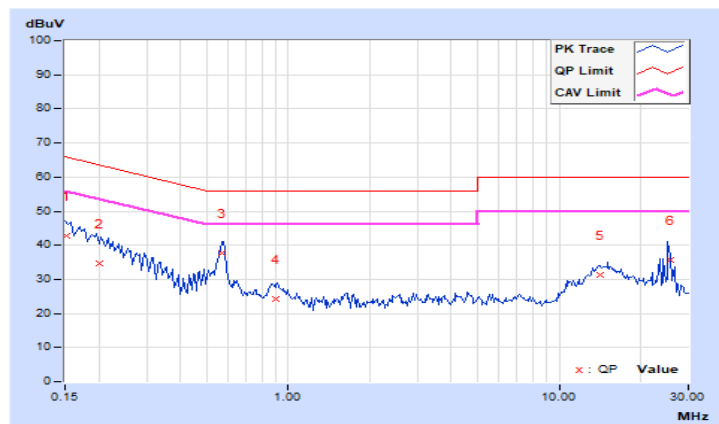


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15243	10.01	32.86	19.42	42.87	29.43	65.87	55.87	-23.00	-26.44
2	0.20197	10.02	24.56	10.71	34.58	20.73	63.53	53.53	-28.95	-32.80
3	0.56926	10.04	27.63	18.80	37.67	28.84	56.00	46.00	-18.33	-17.16
4	0.90155	10.06	14.34	2.58	24.40	12.64	56.00	46.00	-31.60	-33.36
5	14.23157	10.61	20.58	13.43	31.19	24.04	60.00	50.00	-28.81	-25.96
6	25.85524	10.89	24.86	18.80	35.75	29.69	60.00	50.00	-24.25	-20.31

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



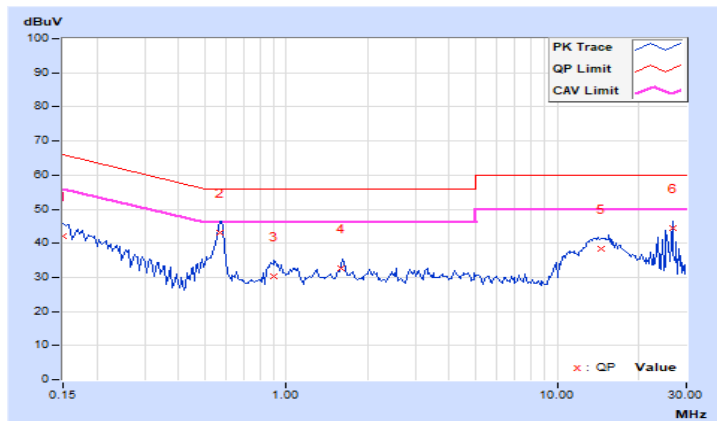
For Mode 5

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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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	0.15079	9.97	32.06	24.71	42.03	34.68	65.96	55.96	-23.93	-21.28
2	0.57093	9.99	33.15	26.61	43.14	36.60	56.00	46.00	-12.86	-9.40
3	0.90127	10.01	20.28	16.54	30.29	26.55	56.00	46.00	-25.71	-19.45
4	1.59762	10.04	22.48	18.15	32.52	28.19	56.00	46.00	-23.48	-17.81
5	14.57377	10.72	27.68	20.59	38.40	31.31	60.00	50.00	-21.60	-18.69
6	26.59717	11.22	33.21	28.34	44.43	39.56	60.00	50.00	-15.57	-10.44

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

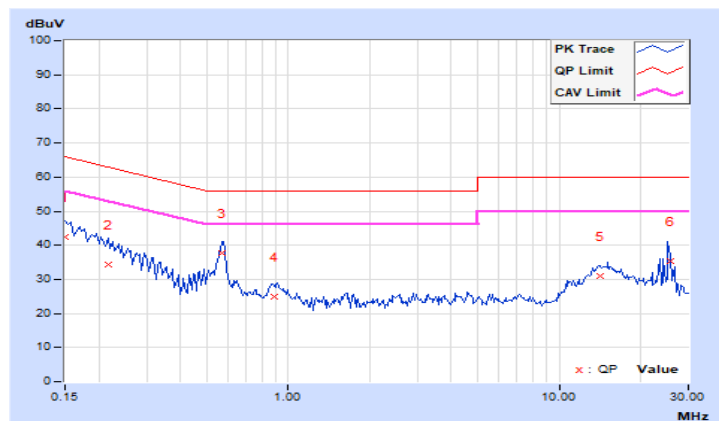


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15037	10.01	32.52	19.73	42.53	29.74	65.98	55.98	-23.45	-26.24
2	0.21792	10.02	24.25	10.92	34.27	20.94	62.90	52.90	-28.63	-31.96
3	0.57152	10.04	27.68	18.75	37.72	28.79	56.00	46.00	-18.28	-17.21
4	0.88717	10.05	14.76	2.64	24.81	12.69	56.00	46.00	-31.19	-33.31
5	14.24314	10.61	20.52	13.53	31.13	24.14	60.00	50.00	-28.87	-25.86
6	25.79297	10.89	24.54	18.23	35.43	29.12	60.00	50.00	-24.57	-20.88

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

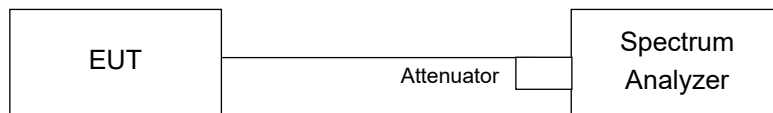


4.3 Conducted Out of Band Emission Measurement

4.3.1 Limits of Conducted Out of Band Emission Measurement

Below 20 dB 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 OOBE

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

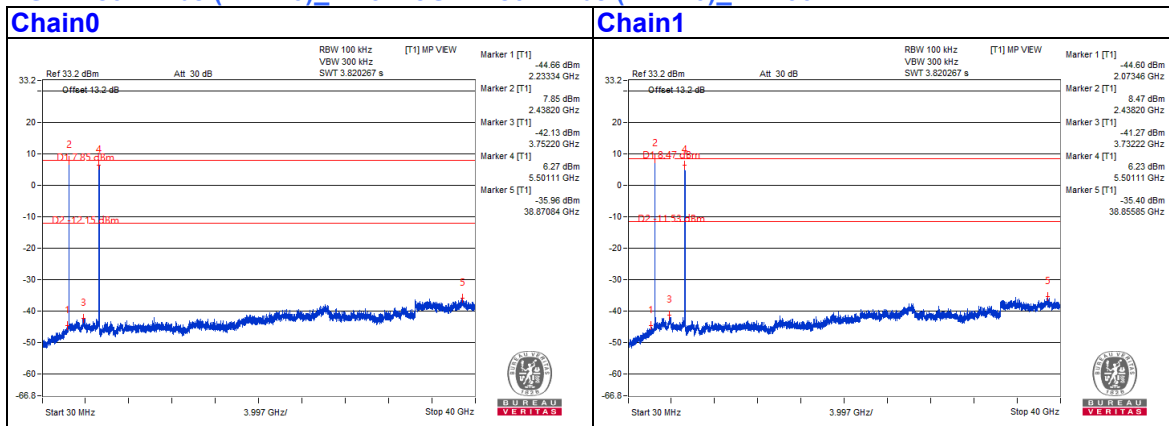
The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

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 20 dB offset below D1. It shows compliance with the requirement.

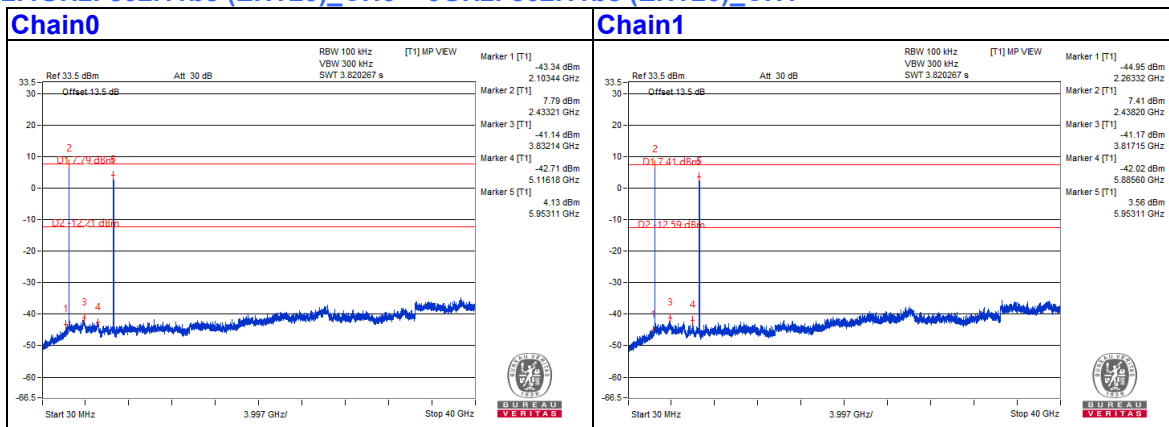
For Mode 1

2.4GHz: 802.11be (EHT20)_CH6 + 5GHz: 802.11be (EHT20)_CH100



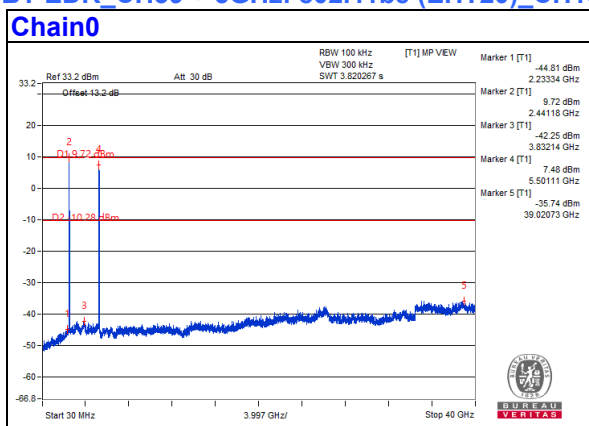
For Mode 2

2.4GHz: 802.11be (EHT20)_CH6 + 6GHz: 802.11be (EHT20)_CH1



For Mode 3

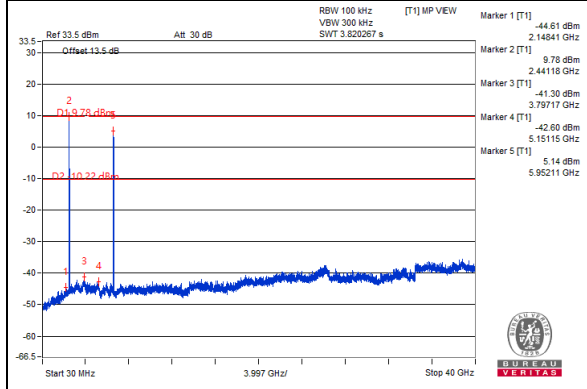
BT-EDR_CH39 + 5GHz: 802.11be (EHT20)_CH100



Note: The test results of Chain1 have been evaluated and there is no non-compliance with the regulatory requirements, so the test data is only presented as a representative of the Chain0.

For Mode 4

BT-EDR_CH39 + 6GHz: 802.11be (EHT20)_CH1
Chain0



Note: The test results of Chain1 have been evaluated and there is no non-compliance with the regulatory requirements, so the test data is only presented as a representative of the Chain0.

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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Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

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Fax: 886-3-6668323

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Tel: 886-3-3183232

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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