

FCC Test Report

Report No.: RFBFLF-WTW-P21010278-3

FCC ID: MSQI007D

Test Model: ASUS_I007D

Received Date: Jan. 12, 2021

Test Date: Feb. 22 ~ Mar. 03, 2021

Issued Date: Mar. 19, 2021

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FCC Registration / 788550 / TW0003
Designation Number(1):
FCC Registration / 723255 / TW2022
Designation Number(2):



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Release Control Record

Issue No.	Description	Date Issued
RFBFLF-WTW-P21010278-3	Original release	Mar. 19, 2021

1 Certificate of Conformity

Product: EXP21 Smartphone

Brand: ASUS

Test Model: ASUS_I007D

Sample Status: Engineering sample

Applicant: ASUSTeK COMPUTER INC.

Test Date: Feb. 22 ~ Mar. 03, 2021

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

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

Prepared by : Pettie Chen, **Date:** Mar. 19, 2021
Pettie Chen / Senior Specialist

Approved by : Bruce Chen, **Date:** Mar. 19, 2021
Bruce Chen / Senior Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -16.24dB at 0.15000MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -7.8dB at 2483.50MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is Ipex not a standard connector.

Note:

- For 2.4G band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 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	EXP21 Smartphone
Brand	ASUS
Test Model	ASUS_I007D
Sample Status	Engineering sample
Power Supply Rating	7.74 Vdc (Battery) 5 Vdc / 9 Vdc / 12 Vdc / 15Vdc / 20Vdc (Adapter)
Modulation Type	GFSK
Transfer Rate	Up to 2Mbps
Operating Frequency	2402 ~ 2480MHz
Number of Channel	40
Channel Spacing	1MHz
Output Power	BT LE 4.0: 58.749mW BT LE 5.0: 63.826mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Refer to Note
Cable Supplied	Refer to Note

Note:

1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Battery	SCUD	C21P2002	Rating: 7.74 Vdc, 15.2 Wh
Adapter	AOHAI	A320Q-200325C-US	I/P: 100-240Vac, 50/60Hz, 1.5A O/P: 5 Vdc, 3 A; 9 Vdc, 3 A; 12 Vdc, 3A; 15 Vdc, 3 A; 20 Vdc, 3.25 A
Type A to Type C USB Cable	Luxshare	LA9U2026-CS-R	0.5m
Type C to Type C Cable	Luxshare	LA9UC006-CS-R	1.2m
Bluetooth Earphone	Bang & Olufsen	EQ Earbud R	FCC ID: TTUBEOPLAYEQR IC: 3775B-BEOPLAYEQR
		EQ Earbud L	FCC ID: TTUBEOPLAYEQL IC: 3775B-BEOPLAYEQL
Bluetooth Earphone Charging Case	Bang & Olufsen	EQ Charging case	I/P: 5Vdc/500mA O/P: 5Vdc/ R170mA; L170mA

2. The antenna used in this EUT is listed as below table:

Band	Freq. Range	Gain(dBi)			Antenna Type	Connector Type
		Ant 3 Gain (dBi)	Ant 4 Gain (dBi)	Ant 6 Gain (dBi)		
2.4GHz/BT	2400-2500MHz	-3.332	-0.958	0.5	PIFA	Ipex

3. 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.

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

3.2 Description of Test Modes

40 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	-	Ant. 4
B	√	√	√	√	Ant. 6

Where RE $\geq$ 1G: Radiated Emission above 1GHz & Bandedge Measurement
 RE<1G: Radiated Emission below 1GHz
 PLC: Power Line Conducted Emission
 APCM: Antenna Port Conducted Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane (Test Mode A) and X-plane (Test Mode B)**.

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
A, B	0 to 39	0, 19, 39	GFSK	1, 2

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
A, B	0 to 39	0	GFSK	2

Power Line Conducted Emission Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
A, B	0 to 39	0	GFSK	2

Antenna Port Conducted Measurement:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
B	0 to 39	0, 19, 39	GFSK	1, 2

Test Condition:

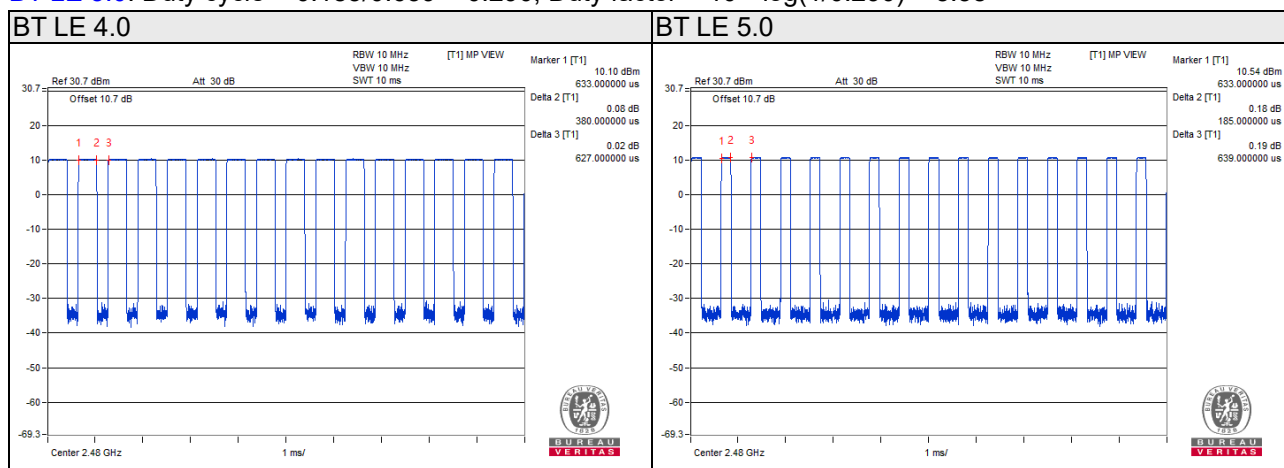
Applicable to	Environmental Conditions	Input Power (System)	Tested by
RE $\geq$ 1G	25 deg. C, 68% RH	120Vac, 60Hz	Ryan Du
RE<1G	25 deg. C, 68% RH	120Vac, 60Hz	Tommy Yang
PLC	25 deg. C, 62% RH	120Vac, 60Hz	Sampson Chen
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Chris Lin

3.3 Duty Cycle of Test Signal

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

BT LE 4.0: Duty cycle = $0.380/0.627 = 0.606$, Duty factor = $10 * \log(1/0.606) = 2.17$

BT LE 5.0: Duty cycle = $0.185/0.639 = 0.290$, Duty factor = $10 * \log(1/0.290) = 5.38$

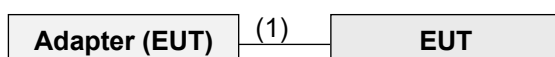


3.4 Description of Support Units

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Type C to Type C Cable	1	0.5	Y	0	Accessory

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and References:

Test standard:

FCC Part 15, Subpart C (15.247)

ANSI C63.10:2013

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

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
RF Cable	5D-FB	LOOPCAB-001	Jan. 07, 2021	Jan. 06, 2022
RF Cable	5D-FB	LOOPCAB-002	Jan. 07, 2021	Jan. 06, 2022
Pre-Amplifier Mini-Circuits	ZFL-1000VH2	QA0838008	Oct. 20, 2020	Oct. 19, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 05, 2020	Nov. 04, 2021
RF Cable	8D	966-3-1	Mar. 17, 2020	Mar. 16, 2021
			Mar. 16, 2021	Mar. 15, 2022
RF Cable	8D	966-3-2	Mar. 17, 2020	Mar. 16, 2021
			Mar. 16, 2021	Mar. 15, 2022
RF Cable	8D	966-3-3	Mar. 17, 2020	Mar. 16, 2021
			Mar. 16, 2021	Mar. 15, 2022
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 24, 2020	Sep. 23, 2021
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC104-SM-SM-1 500	180504	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-2 000	180601	June 09, 2020	June 08, 2021
RF Cable	EMC104-SM-SM-6 000	180602	June 09, 2020	June 08, 2021
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190 004/MY55190007/MY55 210005	Jul. 13, 2020	Jul. 12, 2021

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 Hsinchu Chamber 3. (TAF No.: 2022)

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:

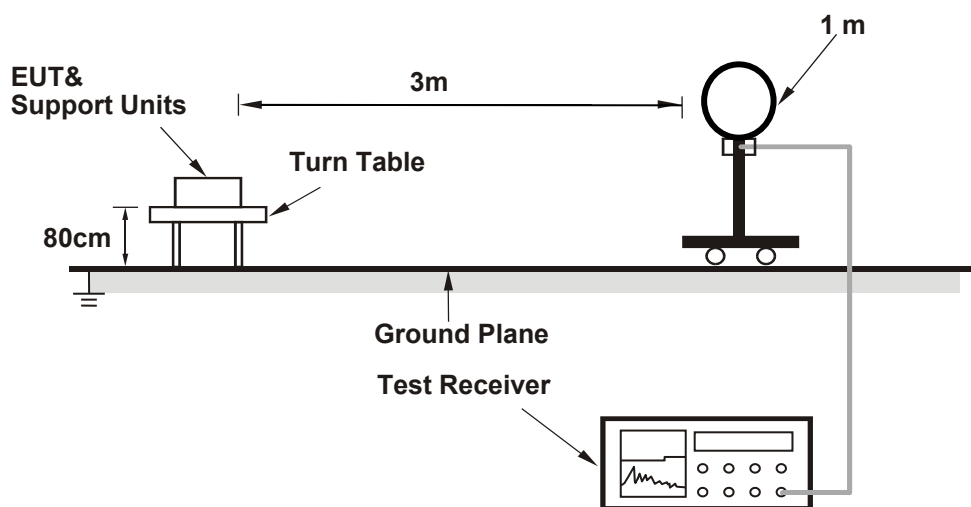
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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. (RBW = 1MHz, VBW = 10kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

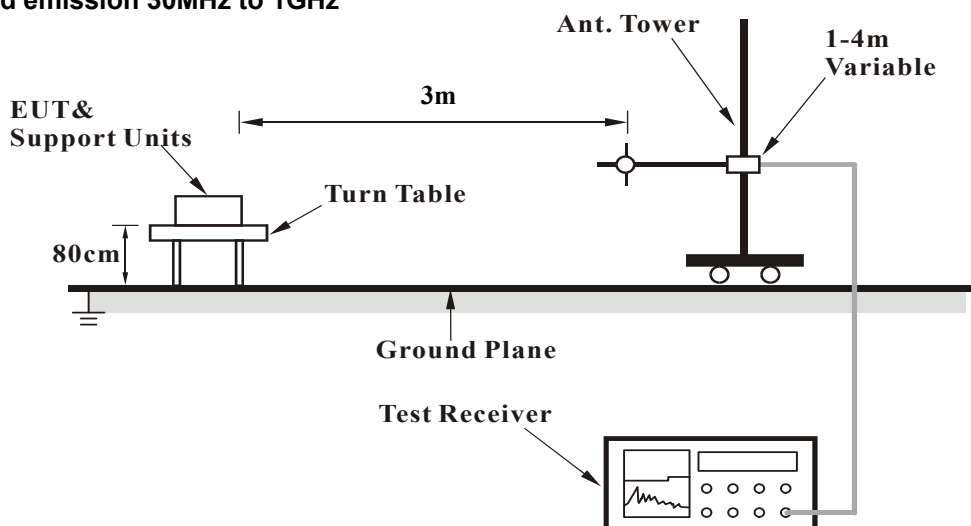
No deviation.

4.1.5 Test Setup

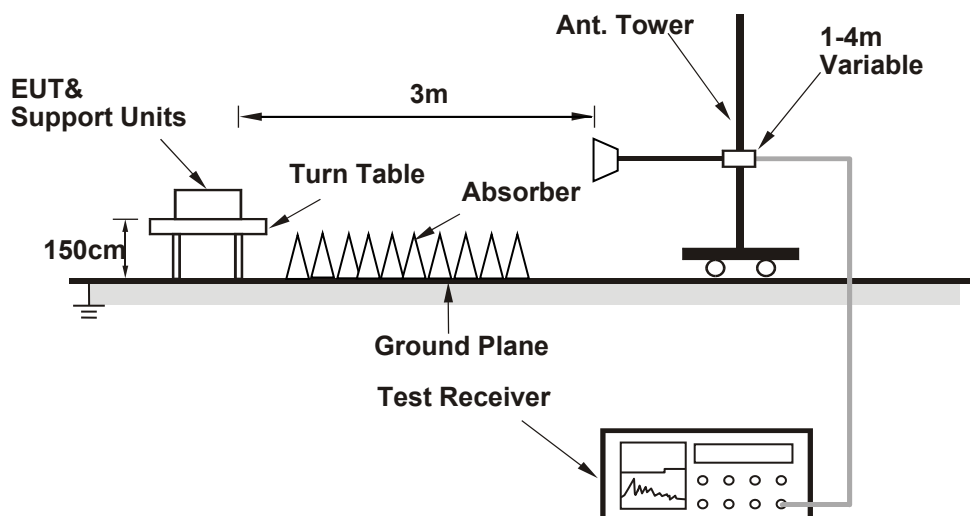
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

- a. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1 GHz Data:

Test Mode A

BT LE 4.0

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2378.85	54.9 PK	74.0	-19.1	1.59 H	307	55.8	-0.9
2	2378.85	43.2 AV	54.0	-10.8	1.59 H	307	44.1	-0.9
3	*2402.00	97.6 PK			1.59 H	307	98.5	-0.9
4	*2402.00	96.5 AV			1.59 H	307	97.4	-0.9
5	4804.00	38.7 PK	74.0	-35.3	1.59 H	215	34.6	4.1
6	4804.00	27.7 AV	54.0	-26.3	1.59 H	215	23.6	4.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2372.39	55.0 PK	74.0	-19.0	2.06 V	269	55.9	-0.9
2	2372.39	43.7 AV	54.0	-10.3	2.06 V	269	44.6	-0.9
3	*2402.00	106.6 PK			2.06 V	269	107.5	-0.9
4	*2402.00	105.1 AV			2.06 V	269	106.0	-0.9
5	4804.00	38.9 PK	74.0	-35.1	1.49 V	36	34.8	4.1
6	4804.00	28.0 AV	54.0	-26.0	1.49 V	36	23.9	4.1

Remarks:

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

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	97.6 PK			1.62 H	298	98.5	-0.9
2	*2440.00	96.6 AV			1.62 H	298	97.5	-0.9
3	4880.00	39.3 PK	74.0	-34.7	1.57 H	209	35.1	4.2
4	4880.00	28.1 AV	54.0	-25.9	1.57 H	209	23.9	4.2
5	7320.00	43.3 PK	74.0	-30.7	1.48 H	353	33.1	10.2
6	7320.00	32.2 AV	54.0	-21.8	1.48 H	353	22.0	10.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	106.6 PK			2.11 V	265	107.5	-0.9
2	*2440.00	104.9 AV			2.11 V	265	105.8	-0.9
3	4880.00	38.6 PK	74.0	-35.4	1.49 V	19	34.4	4.2
4	4880.00	27.4 AV	54.0	-26.6	1.49 V	19	23.2	4.2
5	7320.00	44.0 PK	74.0	-30.0	1.51 V	38	33.8	10.2
6	7320.00	33.2 AV	54.0	-20.8	1.51 V	38	23.0	10.2

Remarks:

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

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	98.2 PK			1.60 H	293	99.0	-0.8
2	*2480.00	97.0 AV			1.60 H	293	97.8	-0.8
3	2492.58	55.5 PK	74.0	-18.5	1.60 H	293	56.3	-0.8
4	2492.58	43.1 AV	54.0	-10.9	1.60 H	293	43.9	-0.8
5	4960.00	39.4 PK	74.0	-34.6	1.51 H	204	34.9	4.5
6	4960.00	28.2 AV	54.0	-25.8	1.51 H	204	23.7	4.5
7	7440.00	43.7 PK	74.0	-30.3	1.46 H	347	33.4	10.3
8	7440.00	32.3 AV	54.0	-21.7	1.46 H	347	22.0	10.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	105.9 PK			1.79 V	225	106.7	-0.8
2	*2480.00	104.9 AV			1.79 V	225	105.7	-0.8
3	2484.39	54.1 PK	74.0	-19.9	1.79 V	225	54.9	-0.8
4	2484.39	43.6 AV	54.0	-10.4	1.79 V	225	44.4	-0.8
5	4960.00	39.2 PK	74.0	-34.8	1.49 V	37	34.7	4.5
6	4960.00	28.0 AV	54.0	-26.0	1.49 V	37	23.5	4.5
7	7440.00	43.8 PK	74.0	-30.2	1.54 V	43	33.5	10.3
8	7440.00	33.4 AV	54.0	-20.6	1.54 V	43	23.1	10.3

Remarks:

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

BT LE 5.0

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2383.48	55.4 PK	74.0	-18.6	1.57 H	308	56.3	-0.9
2	2383.48	43.3 AV	54.0	-10.7	1.57 H	308	44.2	-0.9
3	*2402.00	95.7 PK			1.57 H	308	96.6	-0.9
4	*2402.00	92.7 AV			1.57 H	308	93.6	-0.9
5	4804.00	38.6 PK	74.0	-35.4	1.53 H	229	34.5	4.1
6	4804.00	27.4 AV	54.0	-26.6	1.53 H	229	23.3	4.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2388.15	55.0 PK	74.0	-19.0	1.76 V	228	55.9	-0.9
2	2388.15	43.8 AV	54.0	-10.2	1.76 V	228	44.7	-0.9
3	*2402.00	105.4 PK			1.76 V	228	106.3	-0.9
4	*2402.00	101.7 AV			1.76 V	228	102.6	-0.9
5	4804.00	38.3 PK	74.0	-35.7	1.59 V	42	34.2	4.1
6	4804.00	27.4 AV	54.0	-26.6	1.59 V	42	23.3	4.1

Remarks:

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

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	96.0 PK			1.55 H	308	96.9	-0.9
2	*2440.00	92.9 AV			1.55 H	308	93.8	-0.9
3	4880.00	38.9 PK	74.0	-35.1	1.55 H	223	34.7	4.2
4	4880.00	27.7 AV	54.0	-26.3	1.55 H	223	23.5	4.2
5	7320.00	43.9 PK	74.0	-30.1	1.52 H	339	33.7	10.2
6	7320.00	32.3 AV	54.0	-21.7	1.52 H	339	22.1	10.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	105.3 PK			1.83 V	232	106.2	-0.9
2	*2440.00	101.5 AV			1.83 V	232	102.4	-0.9
3	4880.00	38.6 PK	74.0	-35.4	1.55 V	33	34.4	4.2
4	4880.00	27.7 AV	54.0	-26.3	1.55 V	33	23.5	4.2
5	7320.00	43.8 PK	74.0	-30.2	1.51 V	30	33.6	10.2
6	7320.00	33.0 AV	54.0	-21.0	1.51 V	30	22.8	10.2

Remarks:

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

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	95.6 PK			1.58 H	311	96.4	-0.8
2	*2480.00	92.4 AV			1.58 H	311	93.2	-0.8
3	2486.57	54.9 PK	74.0	-19.1	1.58 H	311	55.7	-0.8
4	2486.57	43.4 AV	54.0	-10.6	1.58 H	311	44.2	-0.8
5	4960.00	39.0 PK	74.0	-35.0	1.51 H	216	34.5	4.5
6	4960.00	27.4 AV	54.0	-26.6	1.51 H	216	22.9	4.5
7	7440.00	43.5 PK	74.0	-30.5	1.53 H	343	33.2	10.3
8	7440.00	32.2 AV	54.0	-21.8	1.53 H	343	21.9	10.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	105.3 PK			1.78 V	224	106.1	-0.8
2	*2480.00	101.4 AV			1.78 V	224	102.2	-0.8
3	2488.76	53.7 PK	74.0	-20.3	1.78 V	224	54.5	-0.8
4	2488.76	43.6 AV	54.0	-10.4	1.78 V	224	44.4	-0.8
5	4960.00	38.8 PK	74.0	-35.2	1.53 V	42	34.3	4.5
6	4960.00	27.7 AV	54.0	-26.3	1.53 V	42	23.2	4.5
7	7440.00	43.8 PK	74.0	-30.2	1.58 V	37	33.5	10.3
8	7440.00	32.9 AV	54.0	-21.1	1.58 V	37	22.6	10.3

Remarks:

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

Test Mode B

BT LE 4.0

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.4 PK	74.0	-18.6	1.01 H	163	56.3	-0.9
2	2390.00	44.2 AV	54.0	-9.8	1.01 H	163	45.1	-0.9
3	*2402.00	110.1 PK			1.01 H	163	111.0	-0.9
4	*2402.00	108.9 AV			1.01 H	163	109.8	-0.9
5	4804.00	38.8 PK	74.0	-35.2	1.61 H	129	34.7	4.1
6	4804.00	27.6 AV	54.0	-26.4	1.61 H	129	23.5	4.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.0 PK	74.0	-19.0	1.48 V	285	55.9	-0.9
2	2390.00	42.1 AV	54.0	-11.9	1.48 V	285	43.0	-0.9
3	*2402.00	100.9 PK			1.48 V	285	101.8	-0.9
4	*2402.00	99.8 AV			1.48 V	285	100.7	-0.9
5	4804.00	38.1 PK	74.0	-35.9	1.40 V	52	34.0	4.1
6	4804.00	27.3 AV	54.0	-26.7	1.40 V	52	23.2	4.1

Remarks:

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

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	111.1 PK			1.03 H	166	112.0	-0.9
2	*2440.00	109.9 AV			1.03 H	166	110.8	-0.9
3	4880.00	38.7 PK	74.0	-35.3	1.70 H	102	34.5	4.2
4	4880.00	27.3 AV	54.0	-26.7	1.70 H	102	23.1	4.2
5	7320.00	44.2 PK	74.0	-29.8	1.90 H	196	34.0	10.2
6	7320.00	33.0 AV	54.0	-21.0	1.90 H	196	22.8	10.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	100.0 PK			1.57 V	277	100.9	-0.9
2	*2440.00	99.4 AV			1.57 V	277	100.3	-0.9
3	4880.00	38.4 PK	74.0	-35.6	1.39 V	32	34.2	4.2
4	4880.00	27.5 AV	54.0	-26.5	1.39 V	32	23.3	4.2
5	7320.00	43.7 PK	74.0	-30.3	1.70 V	77	33.5	10.2
6	7320.00	32.9 AV	54.0	-21.1	1.70 V	77	22.7	10.2

Remarks:

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

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	111.5 PK			1.00 H	168	112.3	-0.8
2	*2480.00	110.4 AV			1.00 H	168	111.2	-0.8
3	2483.50	55.5 PK	74.0	-18.5	1.00 H	168	56.3	-0.8
4	2483.50	44.3 AV	54.0	-9.7	1.00 H	168	45.1	-0.8
5	4960.00	38.3 PK	74.0	-35.7	1.66 H	85	33.8	4.5
6	4960.00	27.2 AV	54.0	-26.8	1.66 H	85	22.7	4.5
7	7440.00	43.8 PK	74.0	-30.2	1.82 H	181	33.5	10.3
8	7440.00	32.3 AV	54.0	-21.7	1.82 H	181	22.0	10.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	100.2 PK			1.55 V	284	101.0	-0.8
2	*2480.00	99.5 AV			1.55 V	284	100.3	-0.8
3	2483.50	54.8 PK	74.0	-19.2	1.55 V	284	55.6	-0.8
4	2483.50	41.6 AV	54.0	-12.4	1.55 V	284	42.4	-0.8
5	4960.00	38.1 PK	74.0	-35.9	1.47 V	30	33.6	4.5
6	4960.00	27.2 AV	54.0	-26.8	1.47 V	30	22.7	4.5
7	7440.00	43.4 PK	74.0	-30.6	1.77 V	79	33.1	10.3
8	7440.00	32.5 AV	54.0	-21.5	1.77 V	79	22.2	10.3

Remarks:

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

BT LE 5.0

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.3 PK	74.0	-18.7	1.01 H	162	56.2	-0.9
2	2390.00	43.5 AV	54.0	-10.5	1.01 H	162	44.4	-0.9
3	*2402.00	110.2 PK			1.01 H	162	111.1	-0.9
4	*2402.00	107.1 AV			1.01 H	162	108.0	-0.9
5	4804.00	39.5 PK	74.0	-34.5	1.64 H	116	35.4	4.1
6	4804.00	28.0 AV	54.0	-26.0	1.64 H	116	23.9	4.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.4 PK	74.0	-19.6	1.46 V	285	55.3	-0.9
2	2390.00	42.6 AV	54.0	-11.4	1.46 V	285	43.5	-0.9
3	*2402.00	102.2 PK			1.46 V	285	103.1	-0.9
4	*2402.00	99.1 AV			1.46 V	285	100.0	-0.9
5	4804.00	38.8 PK	74.0	-35.2	1.41 V	45	34.7	4.1
6	4804.00	28.0 AV	54.0	-26.0	1.41 V	45	23.9	4.1

Remarks:

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

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	111.2 PK			1.02 H	162	112.1	-0.9
2	*2440.00	108.3 AV			1.02 H	162	109.2	-0.9
3	4880.00	39.5 PK	74.0	-34.5	1.65 H	86	35.3	4.2
4	4880.00	27.9 AV	54.0	-26.1	1.65 H	86	23.7	4.2
5	7320.00	44.2 PK	74.0	-29.8	1.81 H	193	34.0	10.2
6	7320.00	33.0 AV	54.0	-21.0	1.81 H	193	22.8	10.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	99.6 PK			1.56 V	269	100.5	-0.9
2	*2440.00	97.8 AV			1.56 V	269	98.7	-0.9
3	4880.00	38.7 PK	74.0	-35.3	1.46 V	32	34.5	4.2
4	4880.00	27.7 AV	54.0	-26.3	1.46 V	32	23.5	4.2
5	7320.00	43.2 PK	74.0	-30.8	1.71 V	82	33.0	10.2
6	7320.00	32.6 AV	54.0	-21.4	1.71 V	82	22.4	10.2

Remarks:

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

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	111.6 PK			1.03 H	170	112.4	-0.8
2	*2480.00	108.6 AV			1.03 H	170	109.4	-0.8
3	2483.50	56.5 PK	74.0	-17.5	1.03 H	170	57.3	-0.8
4	2483.50	46.2 AV	54.0	-7.8	1.03 H	170	47.0	-0.8
5	4960.00	39.2 PK	74.0	-34.8	1.66 H	114	34.7	4.5
6	4960.00	27.8 AV	54.0	-26.2	1.66 H	114	23.3	4.5
7	7440.00	44.1 PK	74.0	-29.9	1.84 H	183	33.8	10.3
8	7440.00	33.0 AV	54.0	-21.0	1.84 H	183	22.7	10.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	100.0 PK			1.58 V	283	100.8	-0.8
2	*2480.00	98.1 AV			1.58 V	283	98.9	-0.8
3	2483.50	55.0 PK	74.0	-19.0	1.58 V	283	55.8	-0.8
4	2483.50	42.0 AV	54.0	-12.0	1.58 V	283	42.8	-0.8
5	4960.00	38.4 PK	74.0	-35.6	1.41 V	50	33.9	4.5
6	4960.00	27.5 AV	54.0	-26.5	1.41 V	50	23.0	4.5
7	7440.00	44.2 PK	74.0	-29.8	1.70 V	100	33.9	10.3
8	7440.00	33.4 AV	54.0	-20.6	1.70 V	100	23.1	10.3

Remarks:

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

Below 1GHz worst-case data:

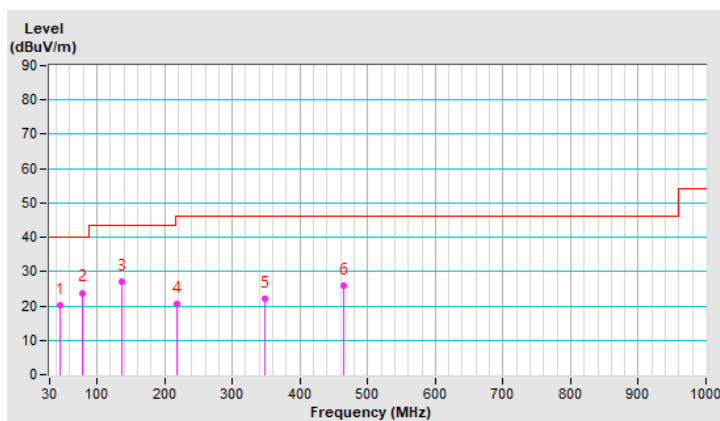
Test Mode A

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	45.08	20.1 QP	40.0	-19.9	3.00 H	205	28.3	-8.2
2	78.09	23.8 QP	40.0	-16.2	2.00 H	4	36.3	-12.5
3	135.80	26.9 QP	43.5	-16.6	2.00 H	242	35.1	-8.2
4	217.91	20.5 QP	46.0	-25.5	1.00 H	98	31.0	-10.5
5	348.38	22.0 QP	46.0	-24.0	1.00 H	44	27.2	-5.2
6	465.19	25.9 QP	46.0	-20.1	1.50 H	149	27.7	-1.8

Remarks:

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

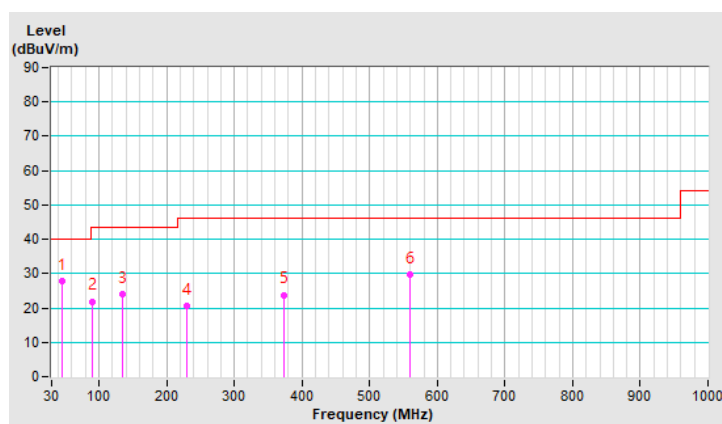


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	44.57	27.7 QP	40.0	-12.3	1.50 V	354	36.0	-8.3
2	90.84	21.9 QP	43.5	-21.6	1.00 V	52	35.6	-13.7
3	134.20	24.1 QP	43.5	-19.4	1.00 V	58	32.4	-8.3
4	229.15	20.5 QP	46.0	-25.5	2.00 V	243	30.5	-10.0
5	373.31	23.8 QP	46.0	-22.2	2.00 V	266	28.2	-4.4
6	560.04	29.6 QP	46.0	-16.4	1.50 V	360	29.5	0.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.



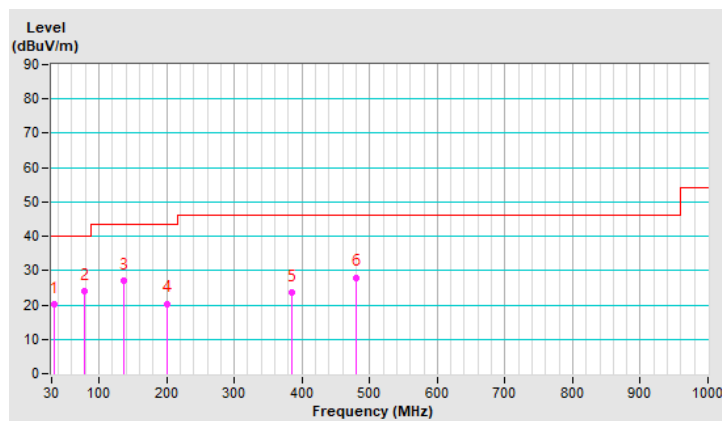
Test Mode B

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.25	20.2 QP	40.0	-19.8	3.00 H	360	29.5	-9.3
2	78.01	23.9 QP	40.0	-16.1	3.00 H	356	36.4	-12.5
3	137.23	27.2 QP	43.5	-16.3	1.50 H	270	35.3	-8.1
4	200.00	20.4 QP	43.5	-23.1	1.50 H	356	31.0	-10.6
5	385.97	23.6 QP	46.0	-22.4	1.00 H	300	27.7	-4.1
6	480.08	28.0 QP	46.0	-18.0	2.00 H	109	29.5	-1.5

Remarks:

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

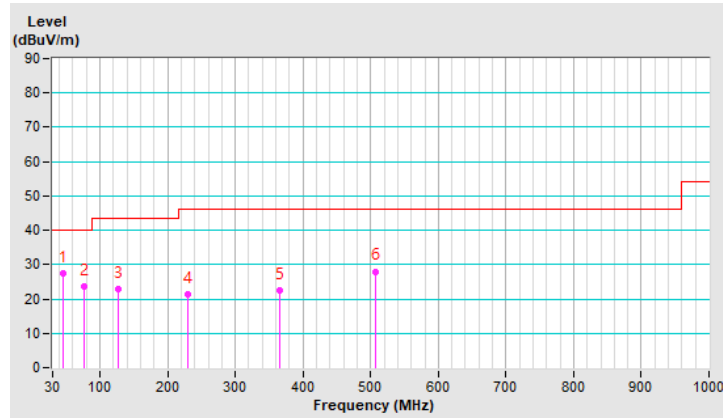


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	45.19	27.4 QP	40.0	-12.6	1.50 V	354	35.6	-8.2
2	77.38	23.5 QP	40.0	-16.5	1.00 V	127	35.9	-12.4
3	126.97	23.0 QP	43.5	-20.5	1.00 V	204	32.1	-9.1
4	229.12	21.2 QP	46.0	-24.8	2.00 V	204	31.2	-10.0
5	364.99	22.6 QP	46.0	-23.4	1.50 V	13	27.3	-4.7
6	506.51	28.0 QP	46.0	-18.0	1.00 V	46	28.8	-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. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.	Cal. Date	Cal. Due
Test Receiver R&S	ESCS 30	847124/029	Oct. 20, 2020	Oct. 19, 2021
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 27, 2020	Oct. 26, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 26, 2020	Oct. 25, 2021
RF Cable	5D-FB	COCCAB-001	Sep. 26, 2020	Sep. 25, 2021
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 29, 2020	Aug. 28, 2021
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in Hsinchu Conduction 1. (TAF No.: 2022)

3. Test Date: Mar. 03, 2021

4.2.3 Test Procedures

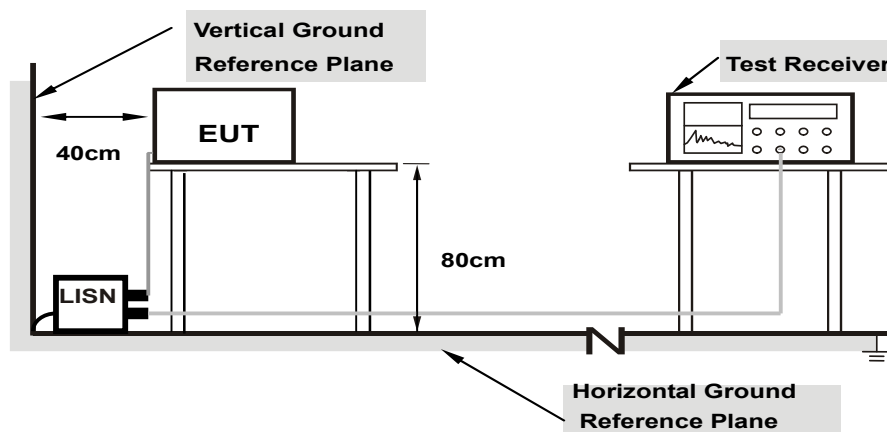
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

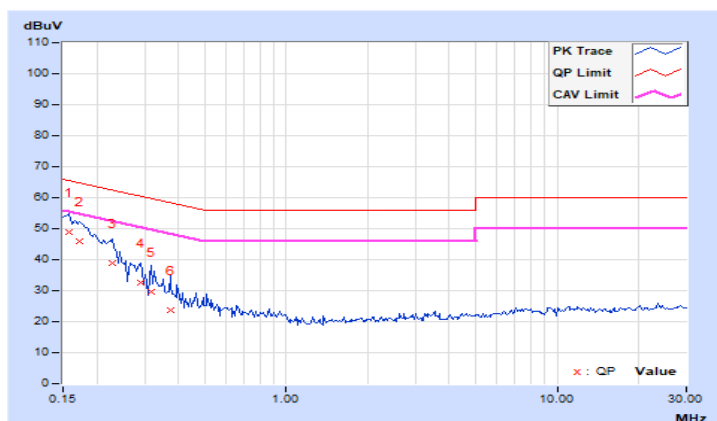
Test Mode A

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.96	38.85	16.97	48.81	26.93	65.58	55.58	-16.77	-28.65
2	0.17344	9.97	36.01	14.63	45.98	24.60	64.79	54.79	-18.81	-30.19
3	0.22812	9.99	28.72	8.08	38.71	18.07	62.52	52.52	-23.81	-34.45
4	0.29063	10.00	22.43	2.58	32.43	12.58	60.51	50.51	-28.08	-37.93
5	0.31797	10.01	19.62	0.54	29.63	10.55	59.76	49.76	-30.13	-39.21
6	0.37266	10.02	13.66	-3.09	23.68	6.93	58.44	48.44	-34.76	-41.51

Remarks:

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

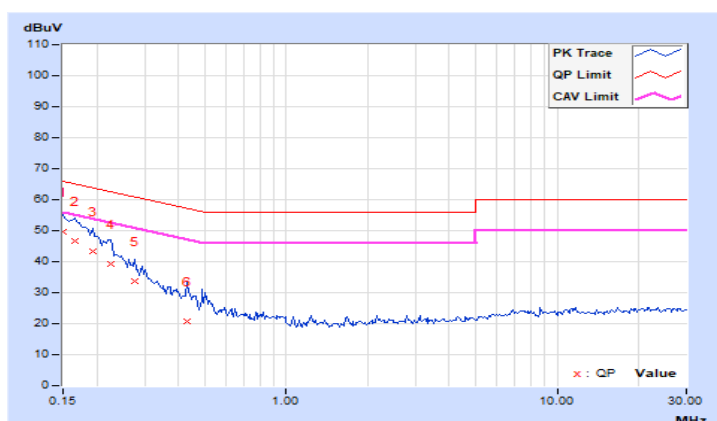


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.94	39.82	18.14	49.76	28.08	66.00	56.00	-16.24	-27.92
2	0.16562	9.95	36.70	15.58	46.65	25.53	65.18	55.18	-18.53	-29.65
3	0.19297	9.97	33.43	12.77	43.40	22.74	63.91	53.91	-20.51	-31.17
4	0.22422	9.98	29.43	9.32	39.41	19.30	62.66	52.66	-23.25	-33.36
5	0.27500	9.99	23.79	4.64	33.78	14.63	60.97	50.97	-27.19	-36.34
6	0.43125	10.01	10.70	-3.25	20.71	6.76	57.23	47.23	-36.52	-40.47

Remarks:

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



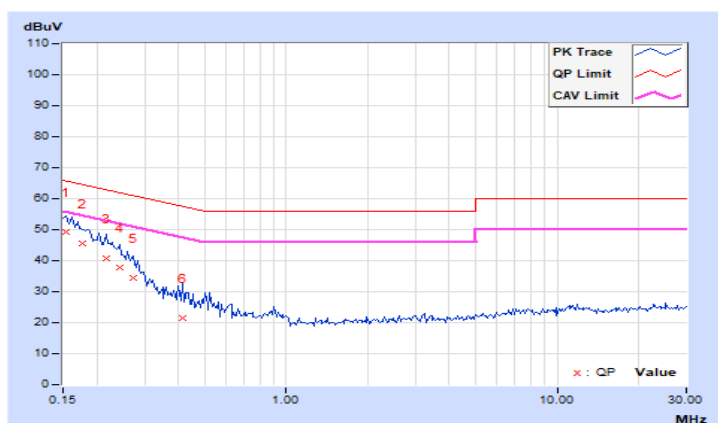
Test Mode B

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.96	39.40	17.97	49.36	27.93	65.79	55.79	-16.43	-27.86
2	0.17734	9.98	35.41	14.61	45.39	24.59	64.61	54.61	-19.22	-30.02
3	0.21641	9.99	30.64	10.20	40.63	20.19	62.96	52.96	-22.33	-32.77
4	0.24375	10.00	27.66	7.74	37.66	17.74	61.97	51.97	-24.31	-34.23
5	0.27109	10.00	24.56	4.99	34.56	14.99	61.08	51.08	-26.52	-36.09
6	0.41563	10.02	11.48	-4.29	21.50	5.73	57.54	47.54	-36.04	-41.81

Remarks:

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

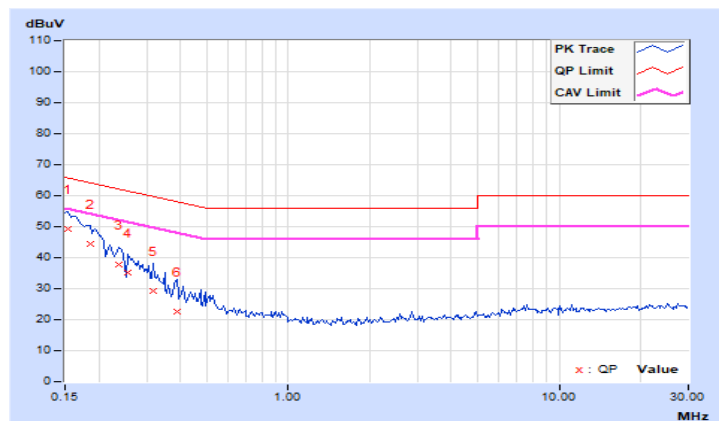


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.94	39.46	17.93	49.40	27.87	65.79	55.79	-16.39	-27.92
2	0.18516	9.97	34.32	13.54	44.29	23.51	64.25	54.25	-19.96	-30.74
3	0.23594	9.99	27.76	7.59	37.75	17.58	62.24	52.24	-24.49	-34.66
4	0.25547	9.99	25.07	5.44	35.06	15.43	61.58	51.58	-26.52	-36.15
5	0.31797	10.00	19.13	1.15	29.13	11.15	59.76	49.76	-30.63	-38.61
6	0.38828	10.01	12.57	-3.22	22.58	6.79	58.10	48.10	-35.52	-41.31

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.

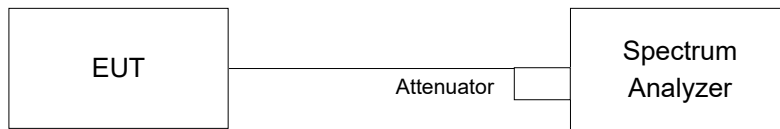


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

- Set resolution bandwidth (RBW) = 100kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.3.5 Deviation from Test Standard

No deviation.

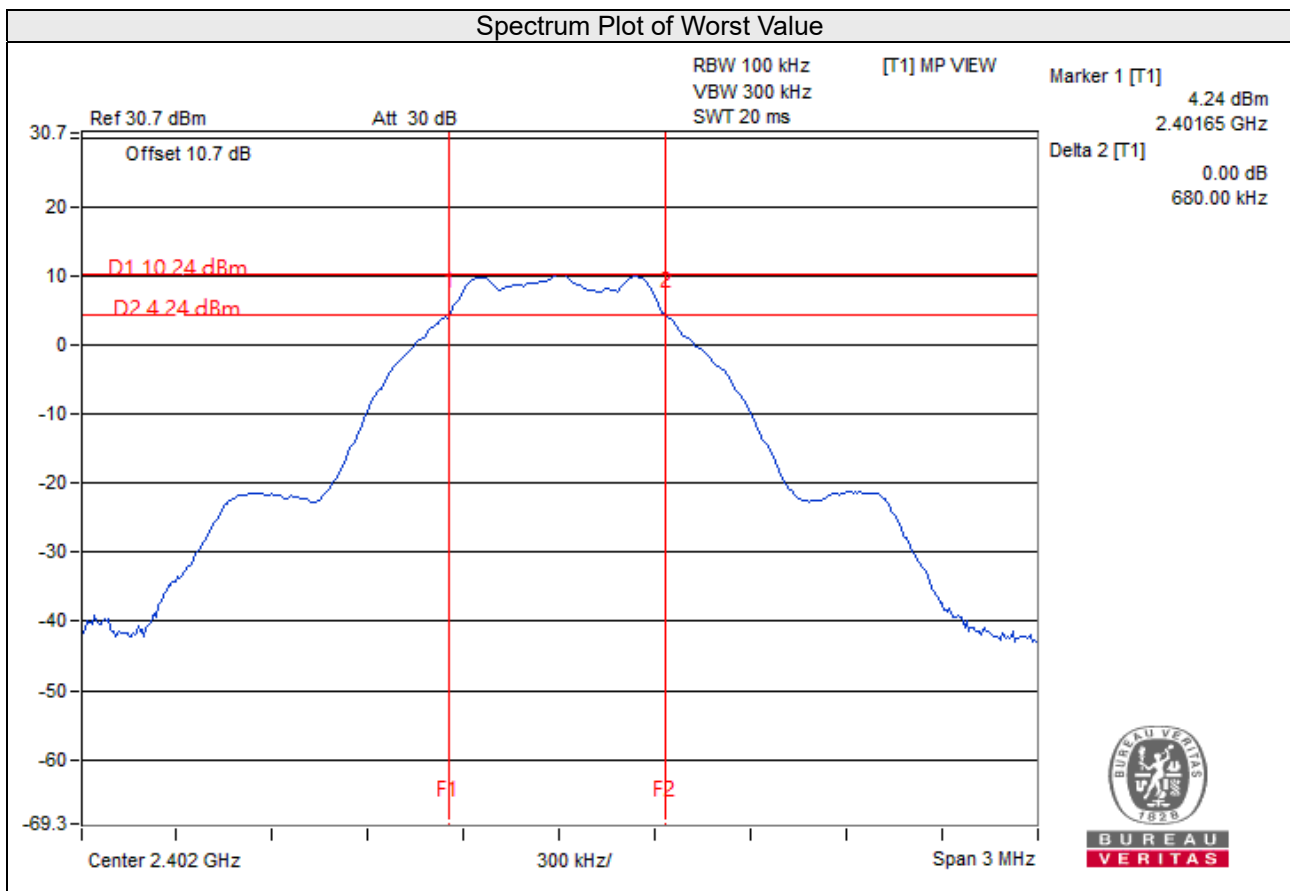
4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

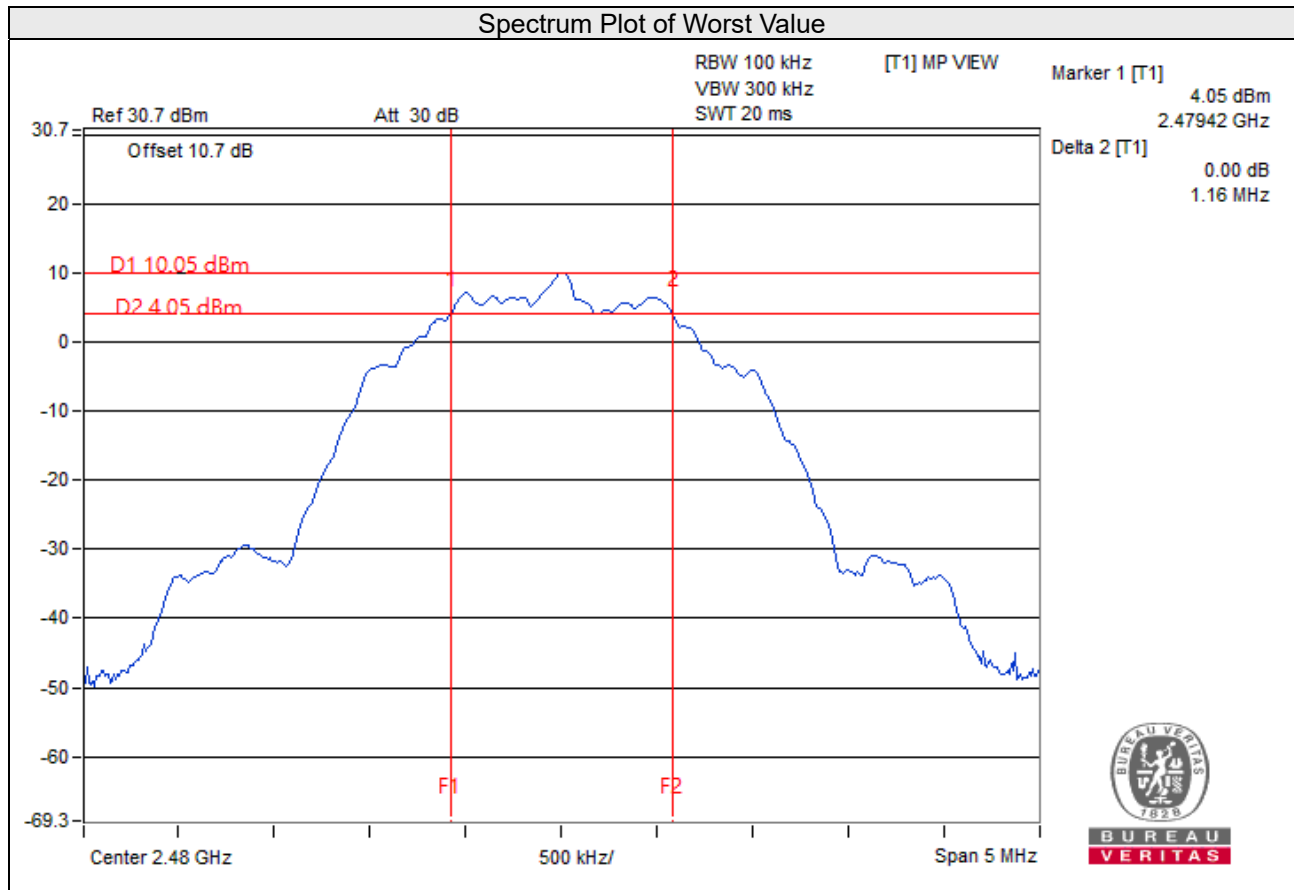
BT LE 4.0

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	0.68	0.5	Pass
19	2440	0.68	0.5	Pass
39	2480	0.68	0.5	Pass



BT LE 5.0

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	1.17	0.5	Pass
19	2440	1.16	0.5	Pass
39	2480	1.16	0.5	Pass

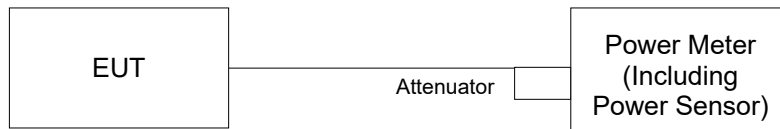


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

For Peak Power

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

For Average Power

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as item 4.3.6.

4.4.7 Test Results

BT LE 4.0

Peak Power

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	58.749	17.69	30.00	Pass
19	2440	57.677	17.61	30.00	Pass
39	2480	56.624	17.53	30.00	Pass

Average Power

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	56.624	17.53
19	2440	55.976	17.48
39	2480	55.081	17.41

BT LE 5.0

Peak Power

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	63.826	18.05	30.00	Pass
19	2440	63.241	18.01	30.00	Pass
39	2480	61.944	17.92	30.00	Pass

Average Power

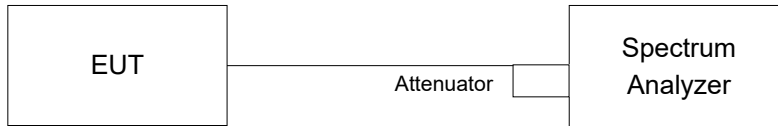
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	59.979	17.78
19	2440	58.884	17.70
39	2480	58.210	17.65

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

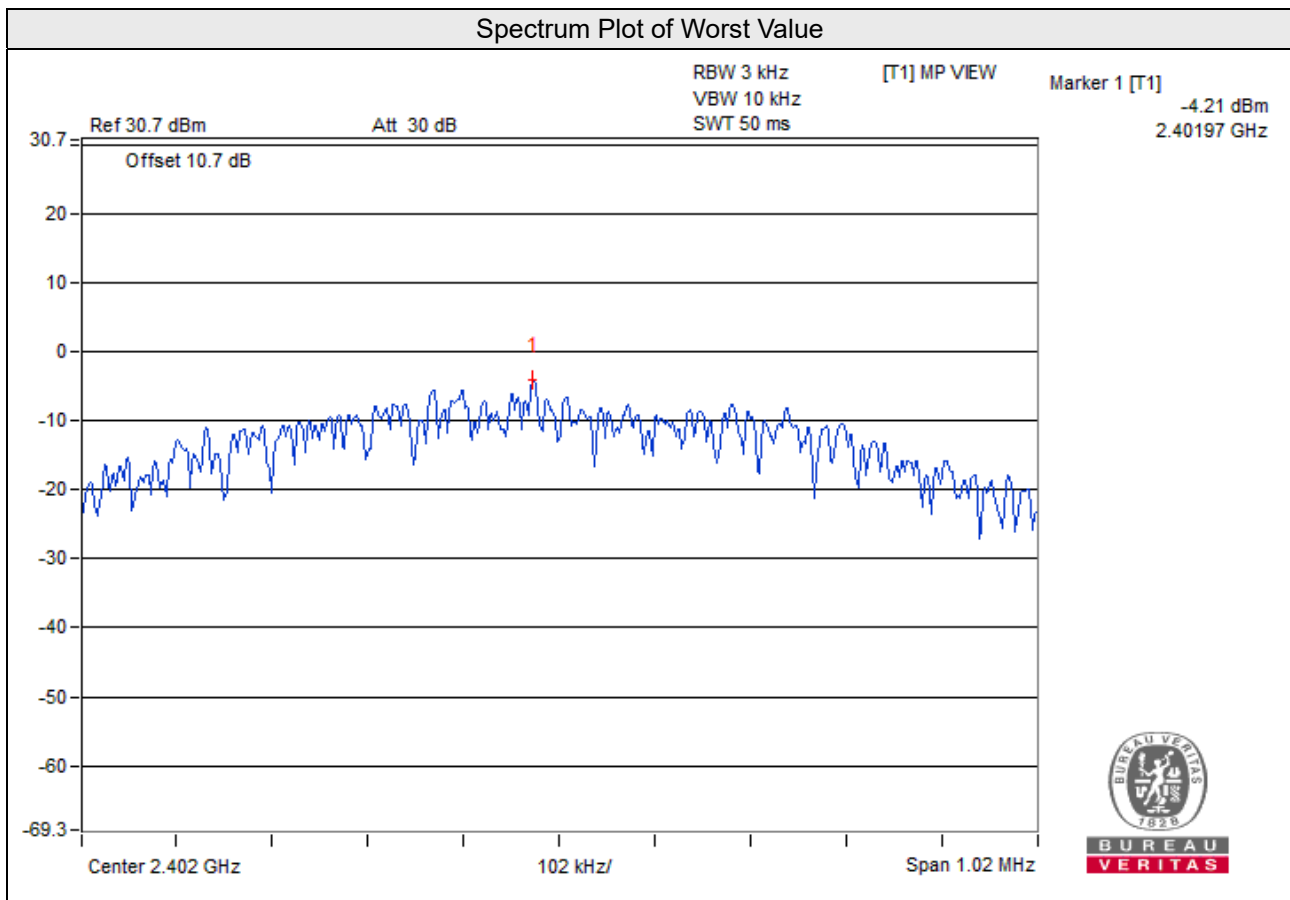
4.5.6 EUT Operating Condition

Same as item 4.3.6

4.5.7 Test Results

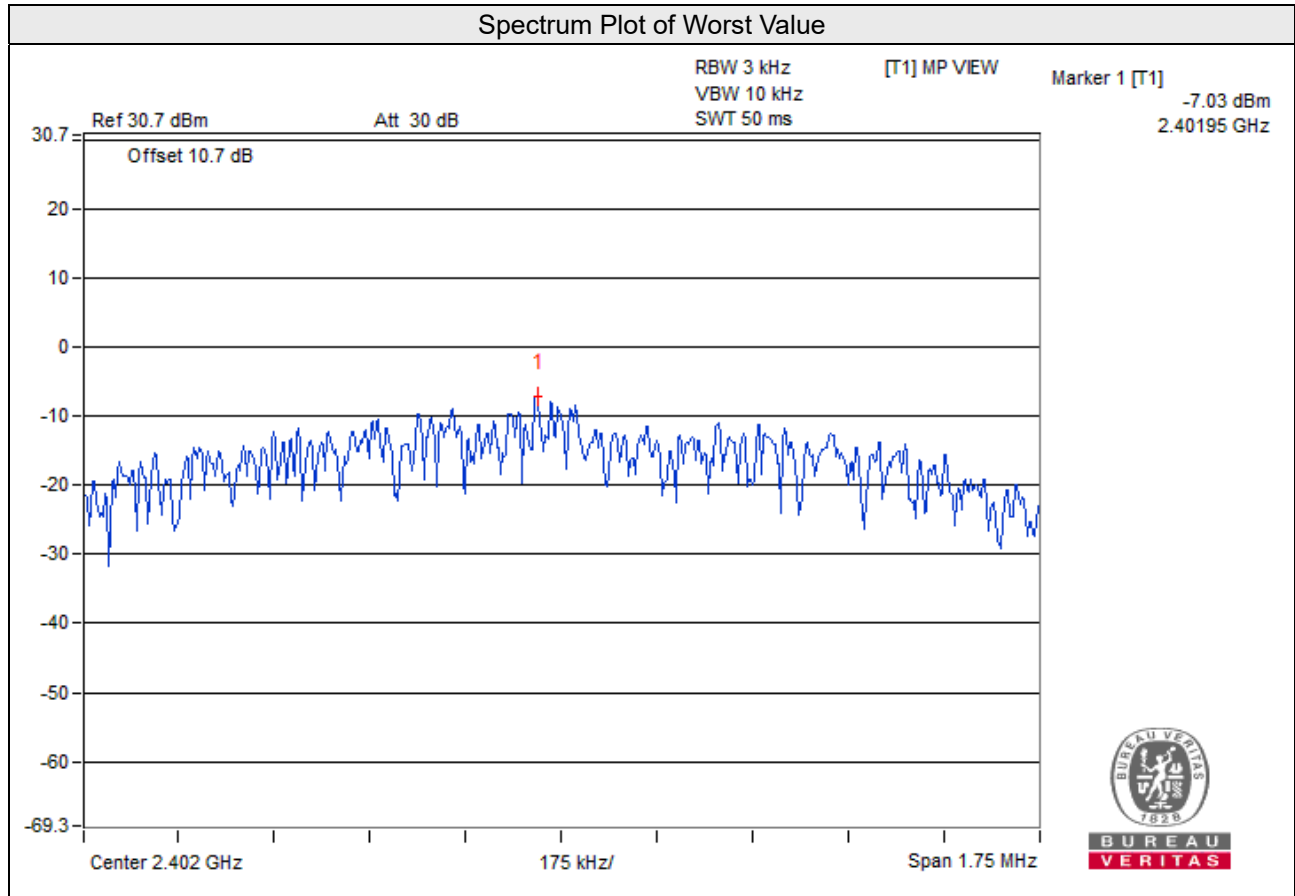
BT LE 4.0

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	2402	-4.21	8.00	Pass
19	2440	-4.57	8.00	Pass
39	2480	-4.73	8.00	Pass



BT LE 5.0

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	2402	-7.03	8.00	Pass
19	2440	-7.23	8.00	Pass
39	2480	-7.42	8.00	Pass

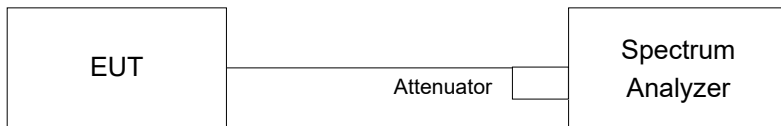


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOB

- Set RBW = 100 kHz.
- Set VBW $\geq$ 300 kHz.
- Detector = peak.
- Sweep = auto couple.
- Trace Mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as item 4.3.6

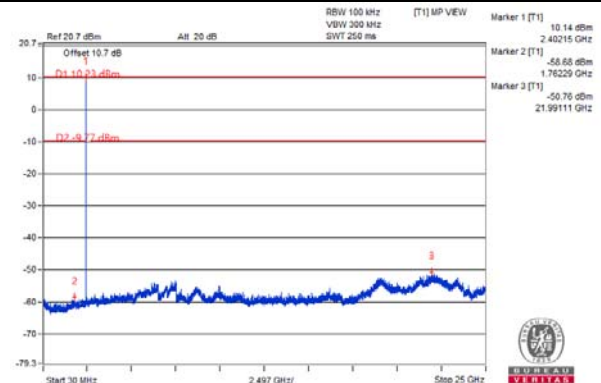
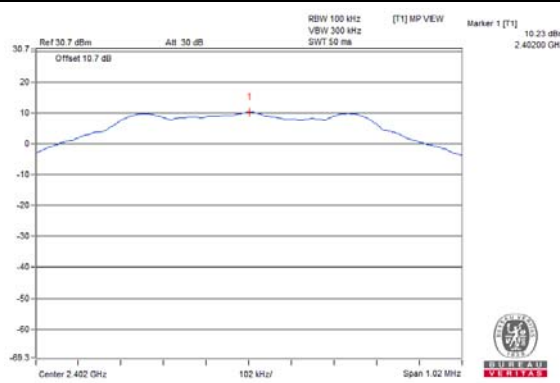
4.6.7 Test Results

The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

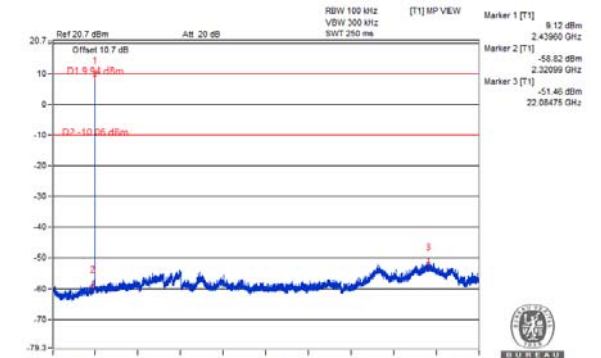
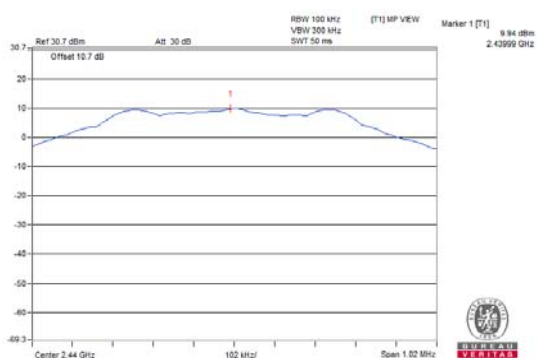
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

BT LE 4.0

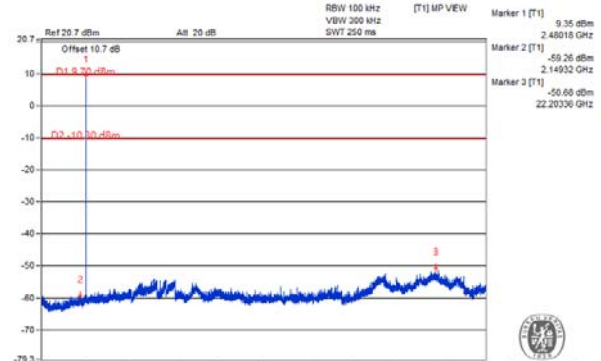
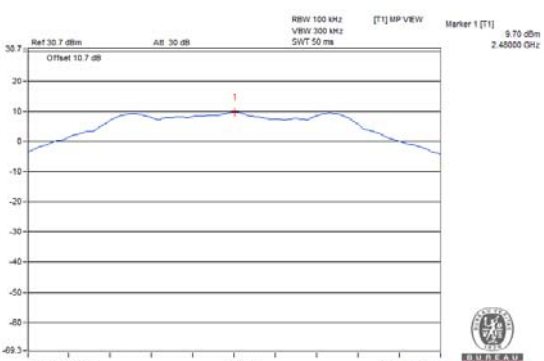
CH 0



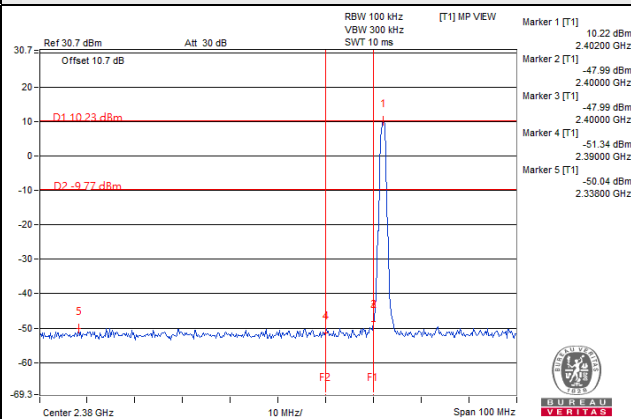
CH 19



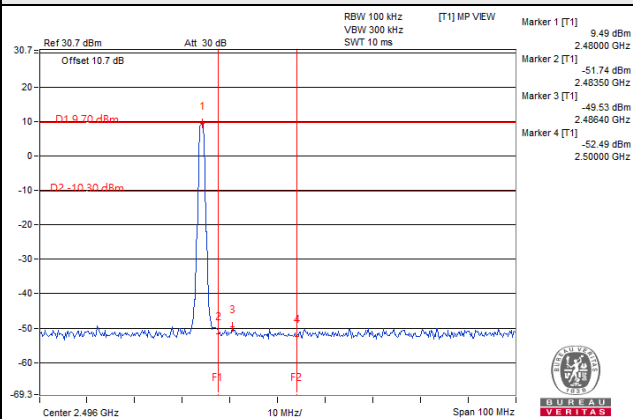
CH 39



CH 0 Band edge

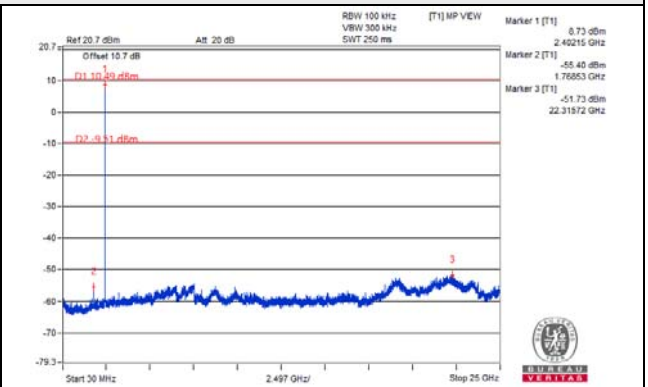
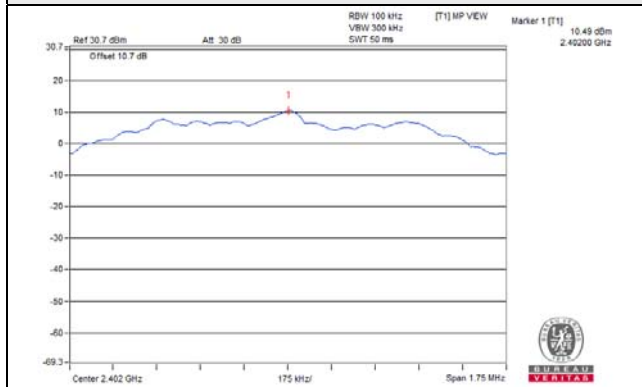


CH 39 Band edge

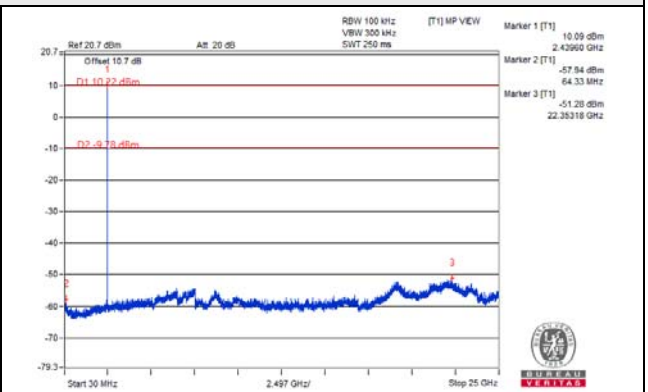
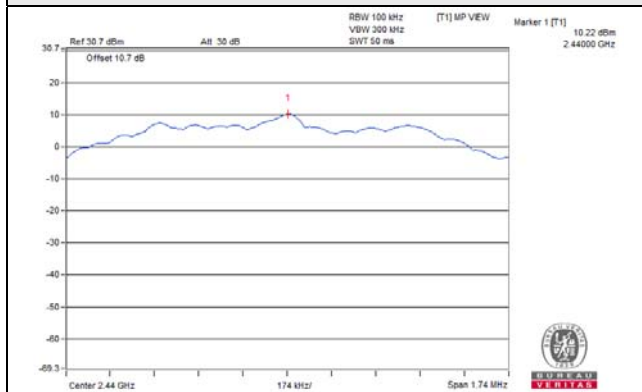


BT LE 5.0

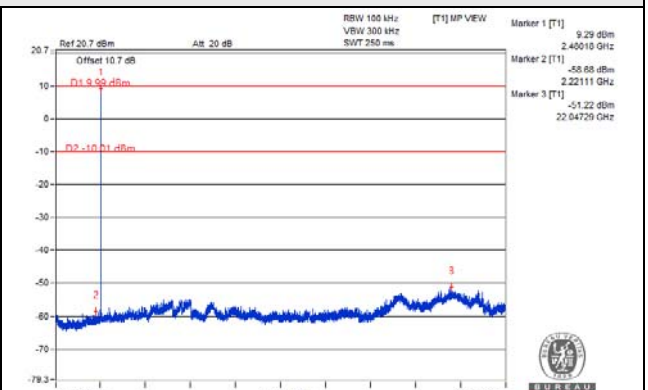
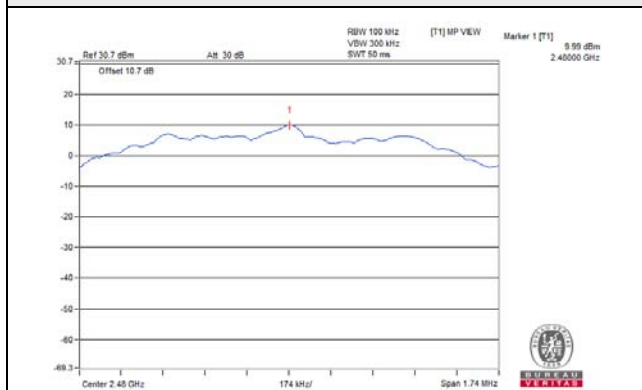
CH 0



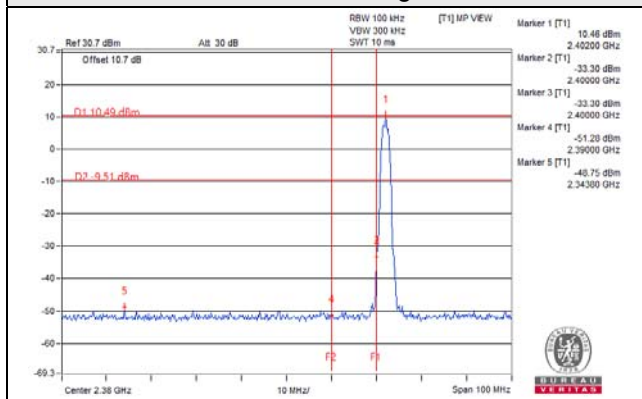
CH 19



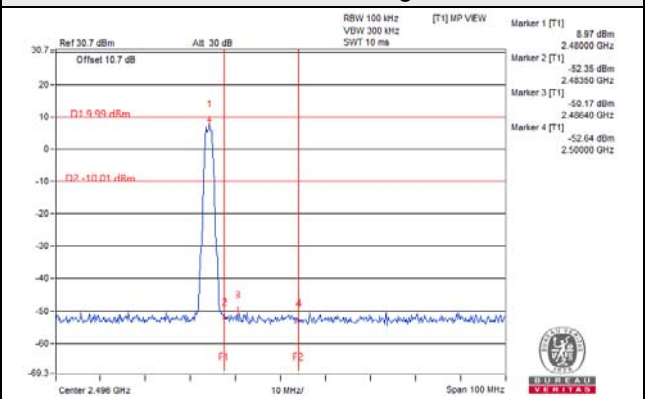
CH 39



CH 0 Band edge



CH 39 Band edge

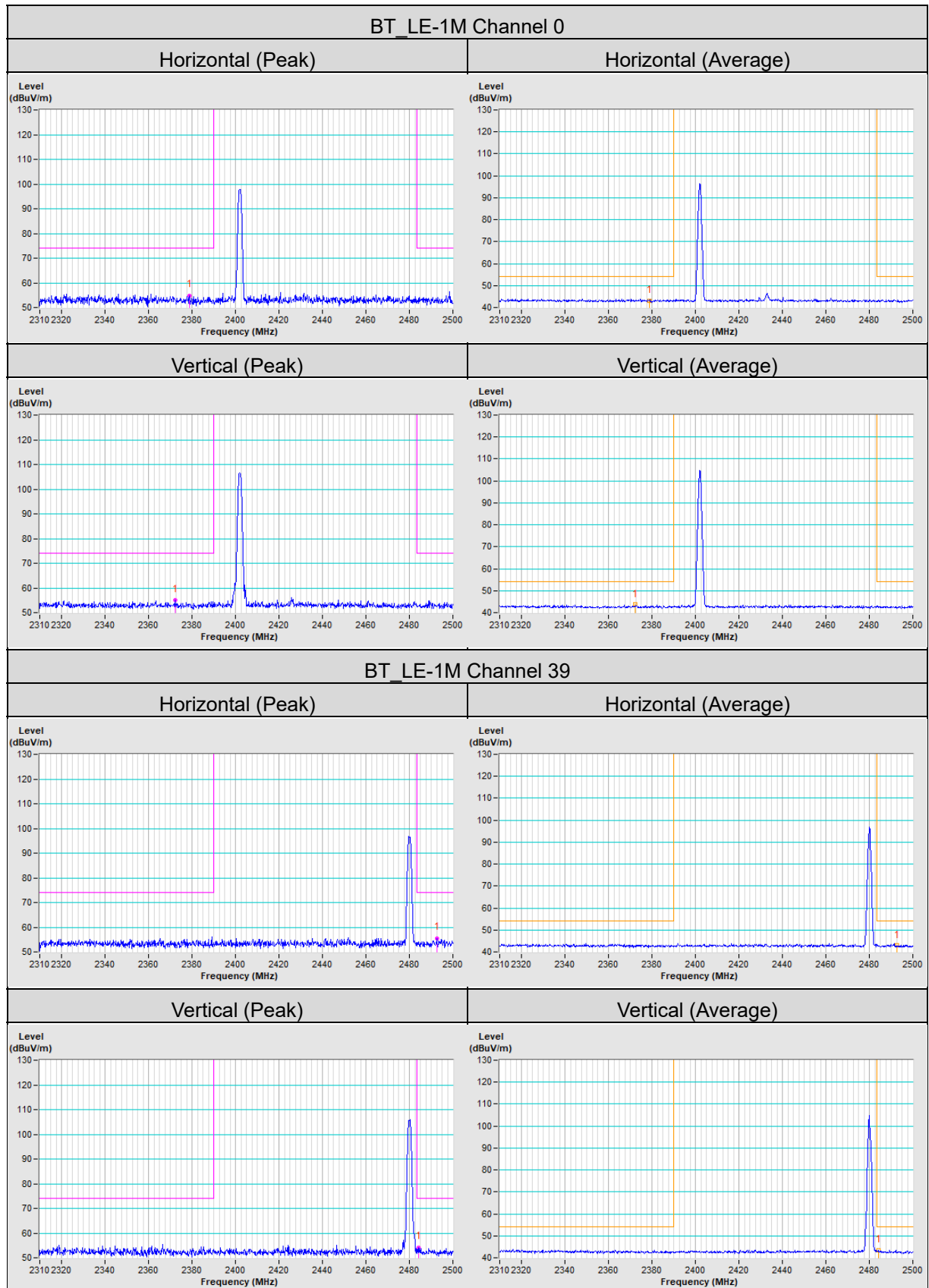


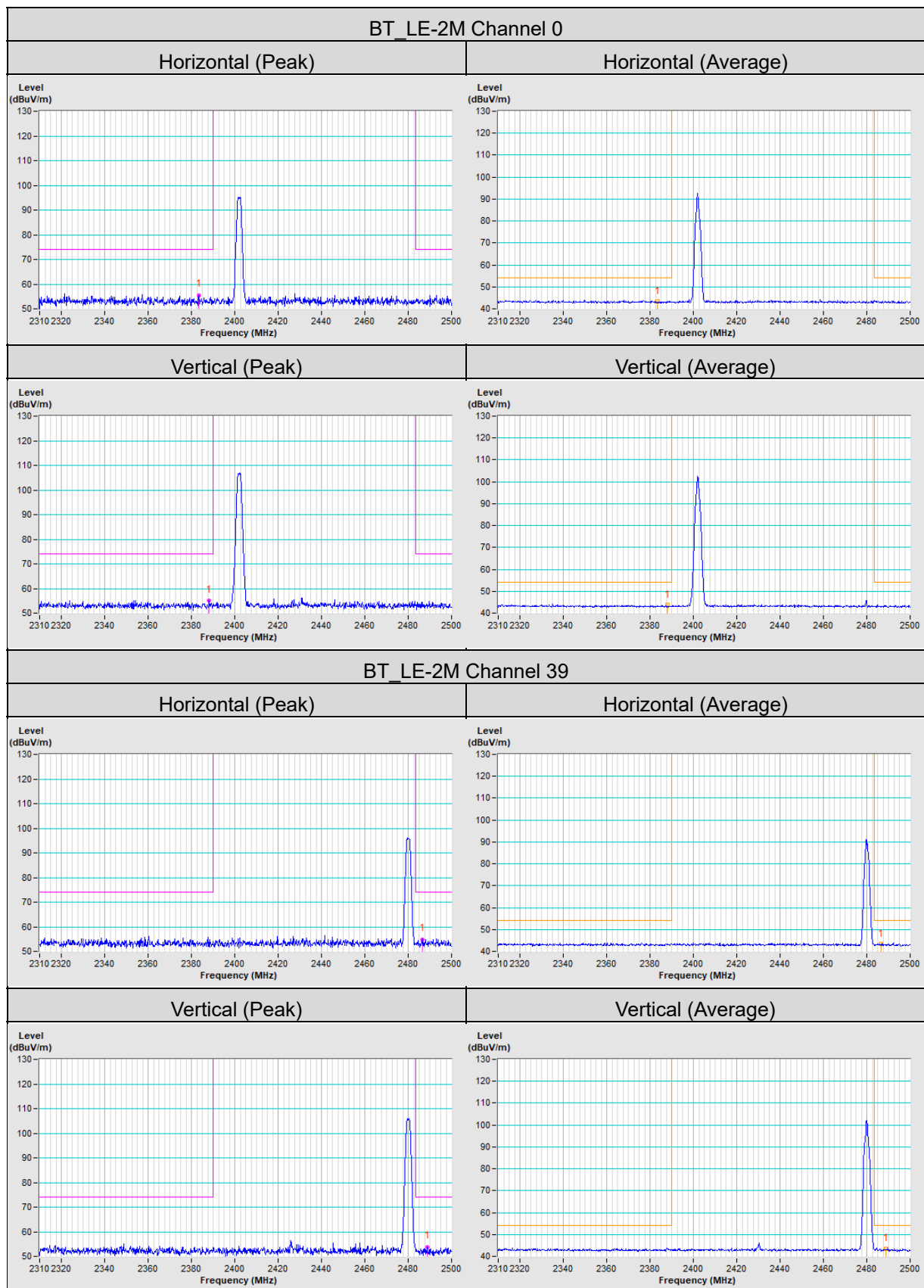
5 Pictures of Test Arrangements

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

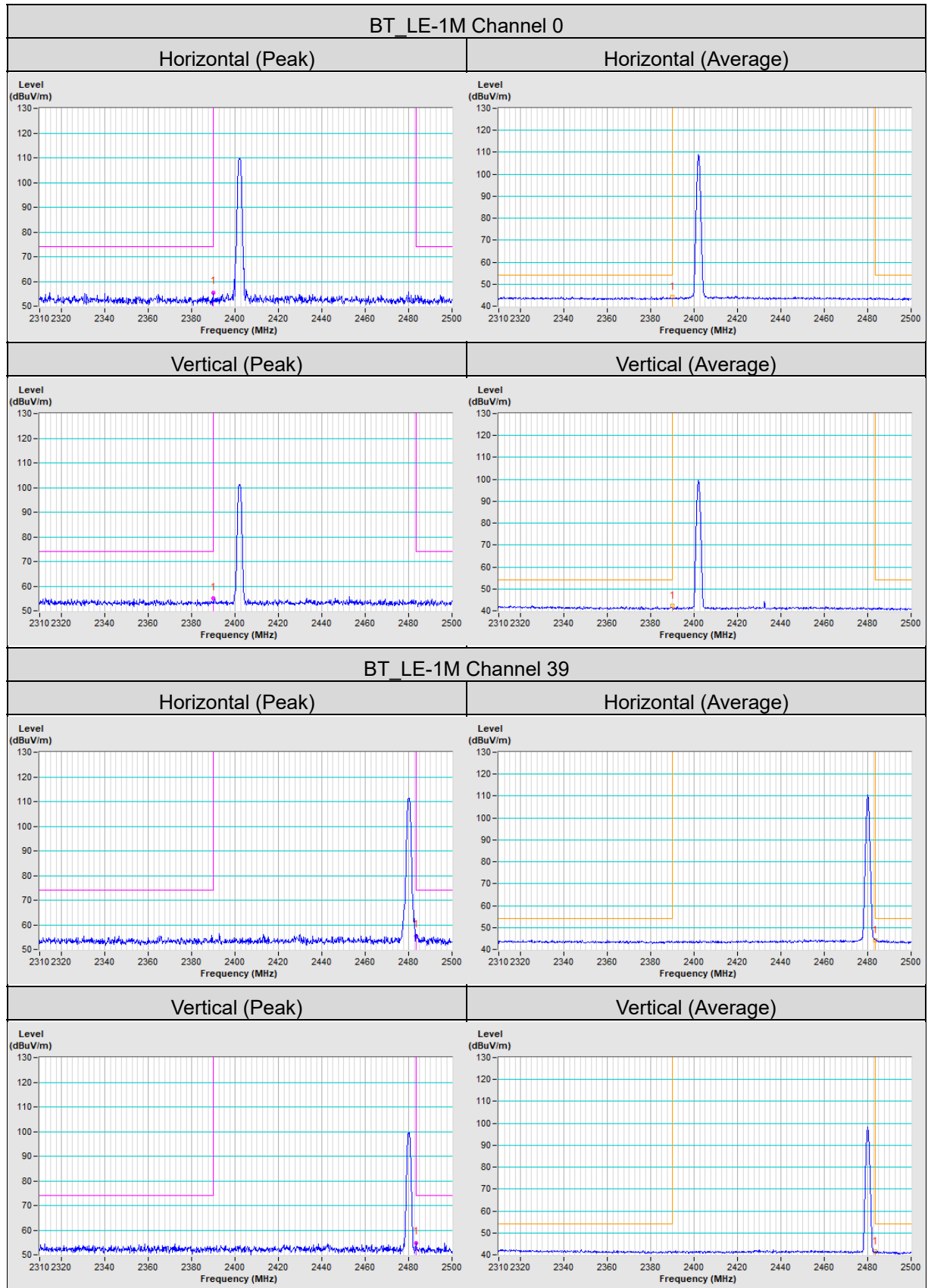
Annex A- Band Edge Measurement

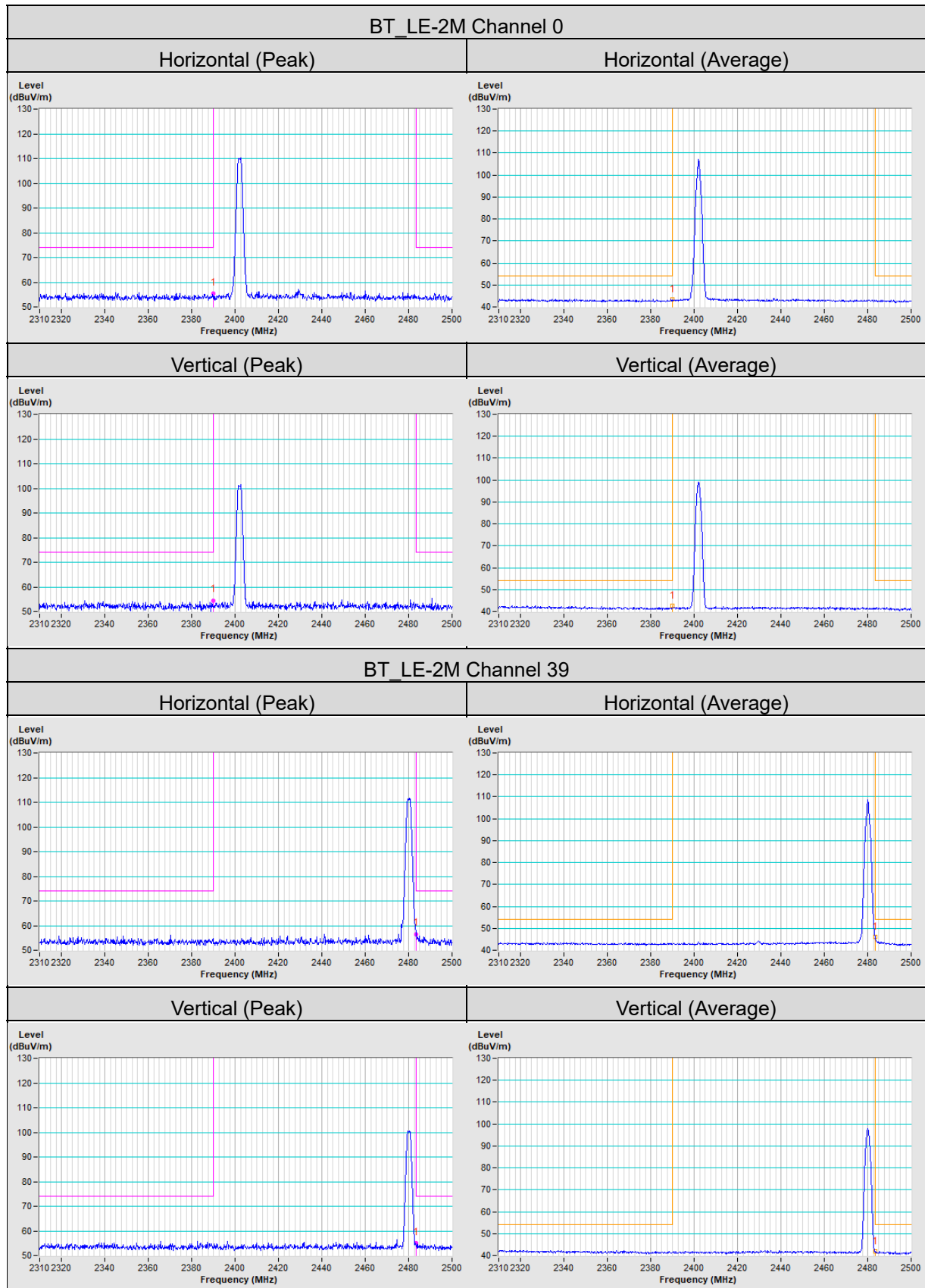
Test Mode A





Test Mode B





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 and approved according to ISO/IEC 17025.

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

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Web Site: www.bureauveritas-adt.com

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

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