

FCC Test Report (BT-LE)

Report No.: RF190614E02-3 R1

FCC ID: B94SNPRC1950

Test Model: SNPRC-1950

Received Date: June 14, 2019

Test Date: Aug. 21 to 31, 2019

Issued Date: Sep. 23, 2019

Applicant: HP Inc.

Address: 3390 East Harmony Road, MS 66 Fort Collins, CO 80528

Manufacturer: HP Singapore (Private) Limited

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

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



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Release Control Record

Issue No.	Description	Date Issued
RF190614E02-3	Original release.	Sep. 18, 2019
RF190614E02-3 R1	1. Modify the applicant and manufacturer information. 2. Modify the description of section 3.1.	Sep. 23, 2019

1 Certificate of Conformity

Product: 802.11a/b/g/n/ac (2.4 / 5 GHz) Wi-Fi radio + BT Radio Module

Brand:



Test Model: SNPRC-1950

Sample Status: ENGINEERING SAMPLE

Applicant: HP Inc.

Manufacturer: HP Singapore (Private) Limited

Test Date: Aug. 21 to 31, 2019

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 EMC characteristics under the conditions specified in this report.

Prepared by : Wendy Wu , **Date:** Sep. 23, 2019
Wendy Wu / Specialist

Approved by : May Chen , **Date:** Sep. 23, 2019
May Chen / Manager

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 -16.57dB at 0.36875MHz.
15.205 & 209 & 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -4.3dB at 43.80MHz.
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	Internal antenna no antenna connector is used. External antenna connector is i-pex(MHF) not a standard connector.

Note:

Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.8 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.0 dB
	30MHz ~ 1GHz	4.8 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.0 dB
	6GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (BT-LE)

Product	802.11a/b/g/n/ac (2.4 / 5 GHz) Wi-Fi radio + BT Radio Module
Brand	
Test Model	SNPRC-1950
Status of EUT	ENGINEERING SAMPLE
Manufacturer	HP Singapore (Private) Limited
Power Supply Rating	DC 3.3V from host equipment
Modulation Type	GFSK
Modulation Technology	DTS
Transfer Rate	Up to 2Mbps
Operating Frequency Band	2400MHz ~ 2483.5MHz
Number of Channel	40
Output Power	BT-LE 1M: 4.365mW BT-LE 2M: 4.645mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. 2.4GHz & 5GHz technology can't transmit at same time.
2. Simultaneously transmission condition.

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

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

3. The EUT has the below configurations:

Part Numbers	Description
0960-4628	straight connector
0960-4622	straight connector
0960-4630	FFC connector

Note: From the above conditions, the worst case radiated emissions was found to be with FFC connector config, therefore only the test data of this config was recorded in this report.

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

Internal Antenna						
Antenna No.	Brand	Model	Ant. Net Gain (dBi)	Frequency range (GHz)	Antenna Type	Connector Type
1	HP Inc.	SNPRC-1950	3.5	2.4-2.5	PCB	None
			4.5	5-6		
External Antenna						
2	Yageo	ANTX300P002B24553	0.9	2.4-2.5	PCB	i-pex(MHF)
			2.3	5.150-5.875		
3	Pulse	SZ0595D	2.5	2.4-2.5	PIFA	i-pex(MHF)
			3	4.9-5.9		
4	Yageo	ANTX200P002B24553	0.9	2.4-2.5	PCB	i-pex(MHF)
			2.3	5.150-5.875		
5	Pulse	SZ07751	2.5	2.4-2.5	PIFA	i-pex(MHF)
			3	4.9-5.9		

Note:

1. The external antenna will fix transmission on Chain 1
2. The Bluetooth technology will fix transmission on Chain 1
3. For radiated emissions test from the above antennas, the Ant. No.: 1, 2, 5 were selected as representative model for the test and its data was recorded in this report.

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 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	
-	√	√	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

Note:

1. The EUT's internal Ant. No.: 1 (Chain 1) PCB antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane (Below 1GHz) & Y-plane (Above 1GHz)**.
2. The EUT's external Ant. No.: 2 (Chain 1) PCB antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane (Below 1GHz) & Y-plane (Above 1GHz)**.
3. The EUT's external Ant. No.: 5 (Chain 1) PIFA antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane (Below 1GHz) & Y-plane (Above 1GHz)**.

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, configurations (Header pin and FFC), antenna types (integrated and external antennas of different vendor and different length), antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 39	0, 19, 39	GFSK	1
0 to 39	0, 19, 39	GFSK	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, configurations (Header pin and FFC), antenna types (integrated and external antennas of different vendor and different length), antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 39	0	GFSK	1

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, configurations (Header pin and FFC), antenna types (integrated and external antennas of different vendor and different length), antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	PACKET TYPE
0 to 39	0	GFSK	1

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, configurations (Header pin and FFC), antenna types (integrated and external antennas of different vendor and different length), antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 39	0, 19, 39	GFSK	1
0 to 39	0, 19, 39	GFSK	2

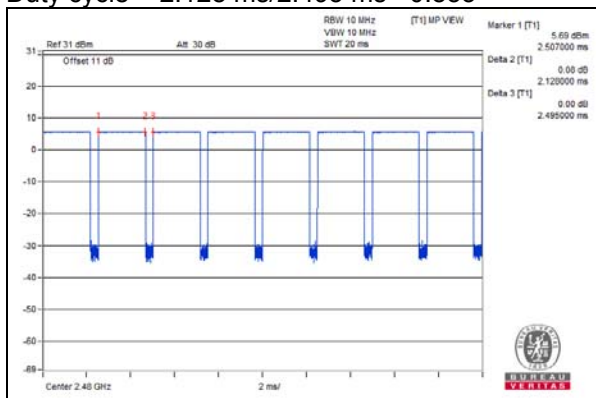
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (System)	TESTED BY
RE $\geq$ 1G	22deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
RE<1G	24deg. C, 69%RH	120Vac, 60Hz	Nelson Teng
PLC	23deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

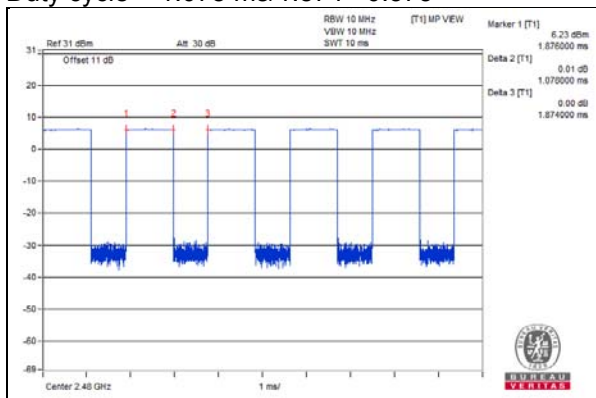
BT-LE 1M

Duty cycle = 2.128 ms/2.495 ms = 0.853



BT-LE 2M

Duty cycle = 1.078 ms/1.874 ms = 0.575



3.4 Description of Support Units

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

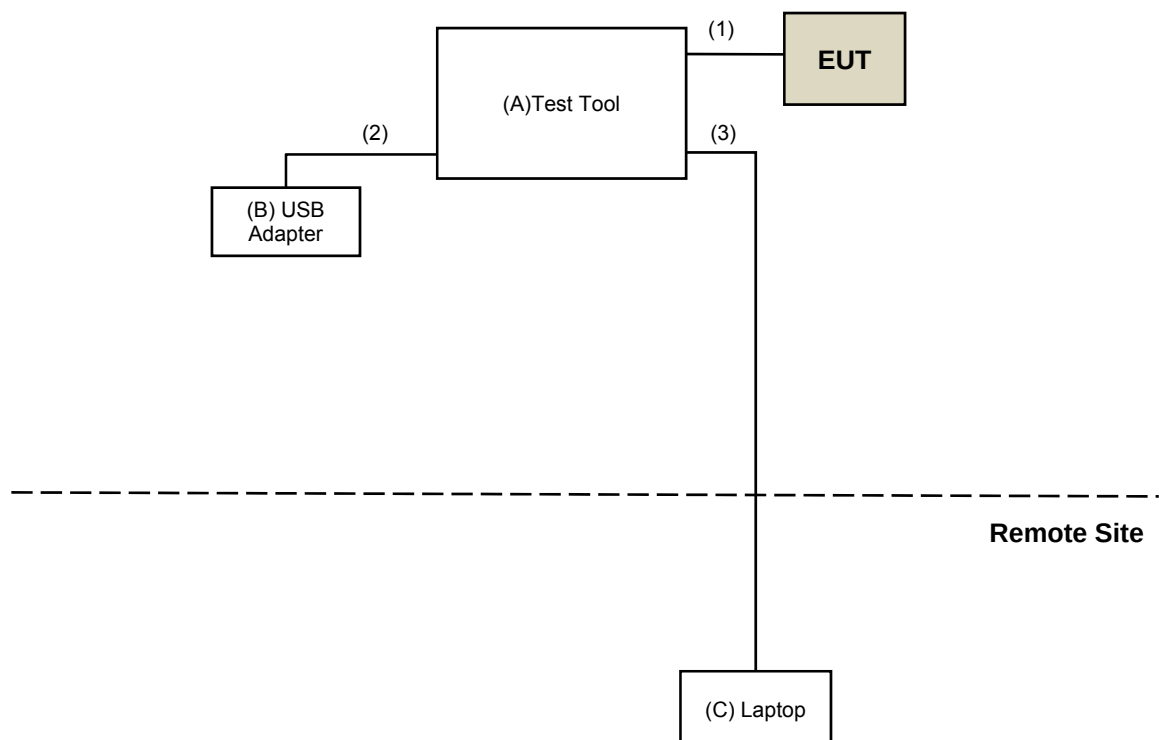
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Test Tool	Realtek	Test Tool	NA	NA	Supplied by client
B.	USB Adapter	ASUS	EXA1205UA	NA	NA	Provided by Lab
C.	Laptop	Dell	Inspiron 15-3567	FV34LJ2	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Data Cable	1	0.05	No	0	Supplied by client
2.	Micro USB Cable	1	1	Yes	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)

KDB 558074 D01 15.247 Meas Guidance v05r02

ANSI C63.10-2013

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

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.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ESR7 R&S	ESR7	102026	Apr. 24, 2019	Apr. 23, 2020
Spectrum Analyzer Keysight	N9030B	MY57141948	May 25, 2019	May 24, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 30, 2019	May 29, 2020
Loop Antenna Electro-Metrics	EM-6879	264	Jan. 22, 2019	Jan. 21, 2020
RF Cable	NA	LOOPCAB-001	Jan. 14, 2019	Jan. 13, 2020
RF Cable	NA	LOOPCAB-002	Jan. 14, 2019	Jan. 13, 2020
Pre-Amplifier EMCI	EMC330N	980538	Apr. 30, 2019	Apr. 29, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB9168	9168-0842	Nov. 21, 2018	Nov. 20, 2019
RF Cable	8D	966-5-1	May 03, 2019	May 02, 2020
RF Cable	8D	966-5-2	May 03, 2019	May 02, 2020
RF Cable	8D	966-5-3	May 03, 2019	May 02, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	Jan. 28, 2019	Jan. 27, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 25, 2018	Nov. 24, 2019
Pre-Amplifier EMCI	EMC12630SE	980509	May 03, 2019	May 02, 2020
RF Cable EMCI	EMC104-SM-SM-1500	180503	May 03, 2019	May 02, 2020
RF Cable EMCI	EMC104-SM-SM-2000	180501	May 03, 2019	May 02, 2020
RF Cable EMCI	EMC104-SM-SM-6000	180505	May 03, 2019	May 02, 2020
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 28, 2019	Jan. 27, 2020
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 25, 2018	Nov. 24, 2019
RF Cable	EMC102-KM-KM-1200	160924	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC102-KM-KM-1200	160925	Jan. 28, 2019	Jan. 27, 2020
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 04, 2019	June 03, 2020
Power meter Anritsu	ML2495A	1014008	May 13, 2019	May 12, 2020
Power sensor Anritsu	MA2411B	0917122	May 13, 2019	May 12, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 5.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Aug. 28 to 31, 2019

4.1.3 Test Procedures

For Radiated emission below 30MHz

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

NOTE:

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

For Radiated emission above 30MHz

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

Note:

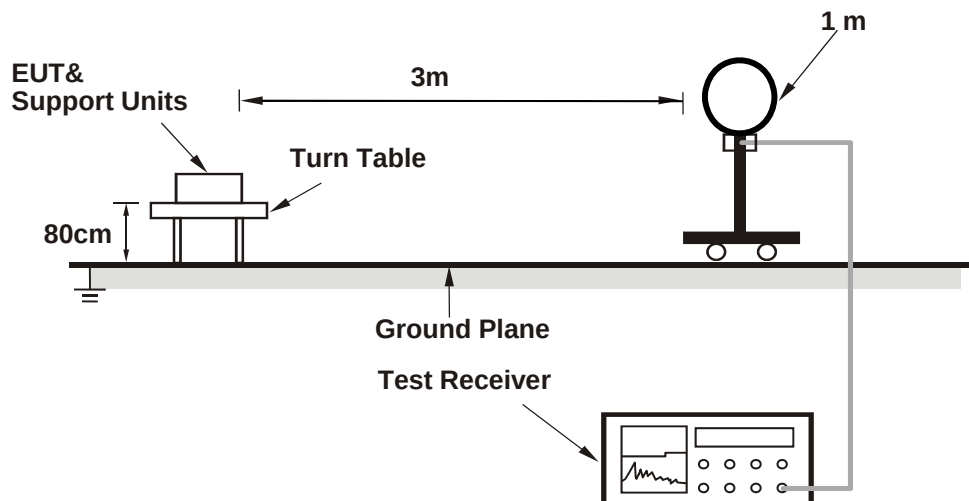
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

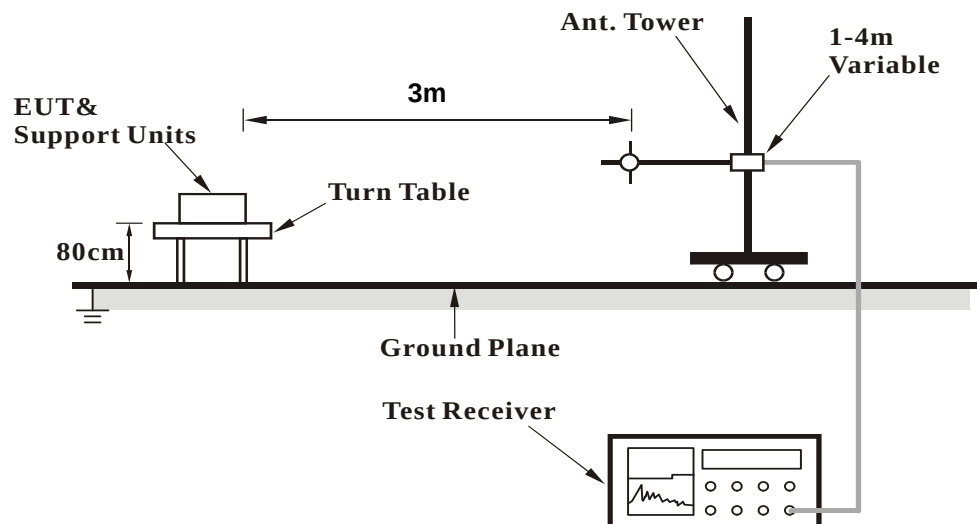
No deviation.

4.1.5 Test Setup

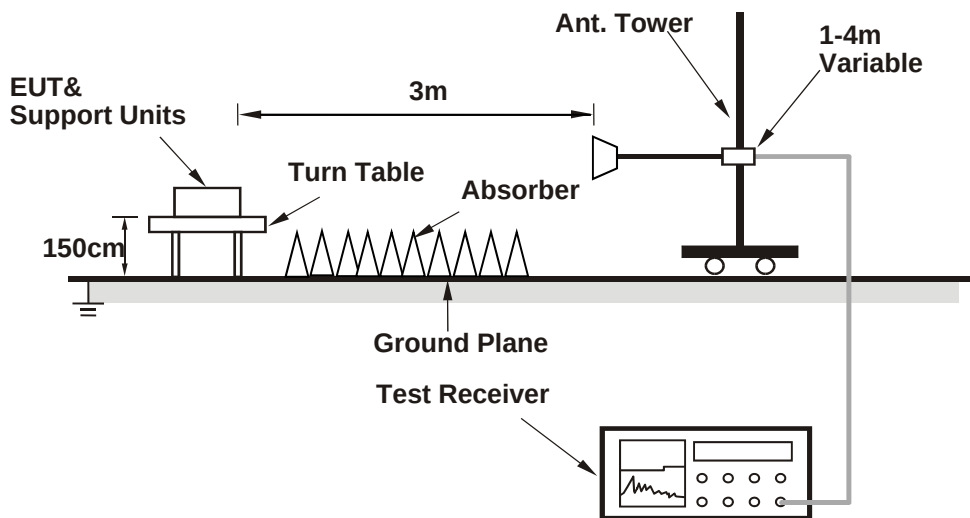
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Controlling software (Raspberry PI v1.02 paste RF) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

For internal Ant. No.: 1 PCB antenna (Model: SNPRC-1950)

BT-LE 1M

Above 1GHz Data :

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.3 PK	74.0	-15.7	1.81 H	200	61.4	-3.1
2	2390.00	46.7 AV	54.0	-7.3	1.81 H	200	49.8	-3.1
3	*2402.00	100.9 PK			1.81 H	200	104.0	-3.1
4	*2402.00	100.4 AV			1.81 H	200	103.5	-3.1
5	4804.00	43.2 PK	74.0	-30.8	2.72 H	322	42.0	1.2
6	4804.00	34.9 AV	54.0	-19.1	2.72 H	322	33.7	1.2
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	2390.00	57.0 PK	74.0	-17.0	1.50 V	204	60.1	-3.1
2	2390.00	44.2 AV	54.0	-9.8	1.50 V	204	47.3	-3.1
3	*2402.00	96.7 PK			1.50 V	204	99.8	-3.1
4	*2402.00	95.8 AV			1.50 V	204	98.9	-3.1
5	4804.00	42.7 PK	74.0	-31.3	1.63 V	38	41.5	1.2
6	4804.00	33.5 AV	54.0	-20.5	1.63 V	38	32.3	1.2

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	100.4 PK			1.77 H	210	103.6	-3.2
2	*2440.00	100.1 AV			1.77 H	210	103.3	-3.2
3	4880.00	43.0 PK	74.0	-31.0	2.72 H	323	41.8	1.2
4	4880.00	34.8 AV	54.0	-19.2	2.72 H	323	33.6	1.2
5	7320.00	47.2 PK	74.0	-26.8	1.56 H	205	40.0	7.2
6	7320.00	38.2 AV	54.0	-15.8	1.56 H	205	31.0	7.2

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	96.5 PK			1.58 V	183	99.7	-3.2
2	*2440.00	96.1 AV			1.58 V	183	99.3	-3.2
3	4880.00	42.6 PK	74.0	-31.4	1.59 V	41	41.4	1.2
4	4880.00	33.4 AV	54.0	-20.6	1.59 V	41	32.2	1.2
5	7320.00	48.3 PK	74.0	-25.7	1.58 V	104	41.1	7.2
6	7320.00	37.9 AV	54.0	-16.1	1.58 V	104	30.7	7.2

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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	100.0 PK			1.76 H	208	103.1	-3.1
2	*2480.00	99.6 AV			1.76 H	208	102.7	-3.1
3	2483.50	58.0 PK	74.0	-16.0	1.76 H	208	61.1	-3.1
4	2483.50	46.7 AV	54.0	-7.3	1.76 H	208	49.8	-3.1
5	4960.00	43.0 PK	74.0	-31.0	2.79 H	315	41.6	1.4
6	4960.00	34.7 AV	54.0	-19.3	2.79 H	315	33.3	1.4
7	7440.00	47.6 PK	74.0	-26.4	1.59 H	195	40.3	7.3
8	7440.00	38.5 AV	54.0	-15.5	1.59 H	195	31.2	7.3
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	96.2 PK			1.61 V	171	99.3	-3.1
2	*2480.00	95.0 AV			1.61 V	171	98.1	-3.1
3	2483.50	56.8 PK	74.0	-17.2	1.61 V	171	59.9	-3.1
4	2483.50	43.8 AV	54.0	-10.2	1.61 V	171	46.9	-3.1
5	4960.00	42.4 PK	74.0	-31.6	1.58 V	31	41.0	1.4
6	4960.00	33.5 AV	54.0	-20.5	1.58 V	31	32.1	1.4
7	7440.00	48.3 PK	74.0	-25.7	1.54 V	74	41.0	7.3
8	7440.00	37.4 AV	54.0	-16.6	1.54 V	74	30.1	7.3

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.

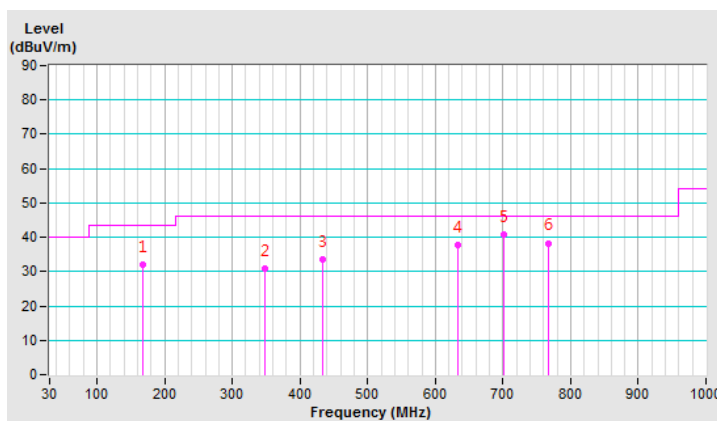
Below 1GHz Data:

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	166.98	31.9 QP	43.5	-11.6	1.75 H	77	50.2	-18.3
2	347.86	30.9 QP	46.0	-15.1	2.00 H	26	47.3	-16.4
3	433.33	33.4 QP	46.0	-12.6	2.00 H	55	47.4	-14.0
4	633.46	37.7 QP	46.0	-8.3	3.00 H	291	47.7	-10.0
5	700.30	40.7 QP	46.0	-5.3	1.00 H	280	49.7	-9.0
6	767.03	38.3 QP	46.0	-7.7	2.00 H	137	46.1	-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 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

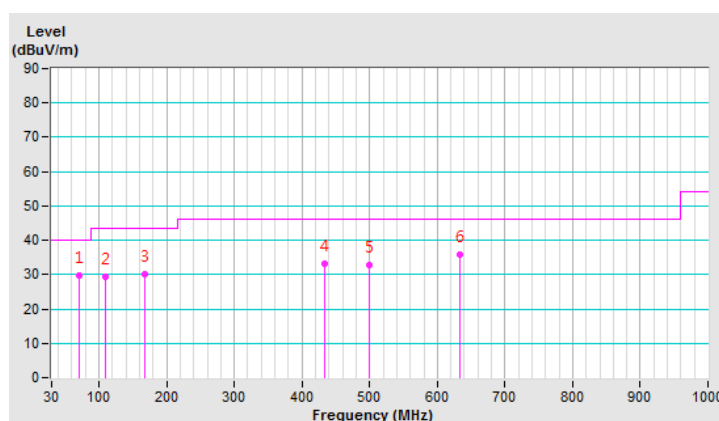


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	70.40	29.8 QP	40.0	-10.2	2.00 V	310	50.0	-20.2
2	108.95	29.5 QP	43.5	-14.0	2.00 V	261	50.4	-20.9
3	167.12	30.0 QP	43.5	-13.5	1.00 V	175	48.3	-18.3
4	433.49	33.1 QP	46.0	-12.9	1.50 V	272	47.1	-14.0
5	499.89	32.9 QP	46.0	-13.1	2.00 V	352	45.7	-12.8
6	632.94	35.7 QP	46.0	-10.3	2.00 V	354	45.7	-10.0

REMARKS:

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



BT-LE 2M

Above 1GHz Data :

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.0 PK	74.0	-15.0	1.84 H	210	62.1	-3.1
2	2390.00	47.5 AV	54.0	-6.5	1.84 H	210	50.6	-3.1
3	*2402.00	100.5 PK			1.84 H	210	103.6	-3.1
4	*2402.00	99.7 AV			1.84 H	210	102.8	-3.1
5	4804.00	42.8 PK	74.0	-31.2	2.71 H	303	41.6	1.2
6	4804.00	34.7 AV	54.0	-19.3	2.71 H	303	33.5	1.2
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	2390.00	57.3 PK	74.0	-16.7	1.58 V	172	60.4	-3.1
2	2390.00	44.6 AV	54.0	-9.4	1.58 V	172	47.7	-3.1
3	*2402.00	96.3 PK			1.58 V	172	99.4	-3.1
4	*2402.00	95.1 AV			1.58 V	172	98.2	-3.1
5	4804.00	42.3 PK	74.0	-31.7	1.62 V	18	41.1	1.2
6	4804.00	33.4 AV	54.0	-20.6	1.62 V	18	32.2	1.2

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	99.9 PK			1.85 H	218	103.1	-3.2
2	*2440.00	99.2 AV			1.85 H	218	102.4	-3.2
3	4880.00	42.3 PK	74.0	-31.7	2.70 H	315	41.1	1.2
4	4880.00	34.5 AV	54.0	-19.5	2.70 H	315	33.3	1.2
5	7320.00	47.4 PK	74.0	-26.6	1.67 H	199	40.2	7.2
6	7320.00	38.7 AV	54.0	-15.3	1.67 H	199	31.5	7.2
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	96.1 PK			1.55 V	170	99.3	-3.2
2	*2440.00	94.7 AV			1.55 V	170	97.9	-3.2
3	4880.00	43.6 PK	74.0	-30.4	1.61 V	27	42.4	1.2
4	4880.00	34.4 AV	54.0	-19.6	1.61 V	27	33.2	1.2
5	7320.00	48.0 PK	74.0	-26.0	1.50 V	79	40.8	7.2
6	7320.00	37.0 AV	54.0	-17.0	1.50 V	79	29.8	7.2

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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	100.7 PK			1.89 H	218	103.8	-3.1
2	*2480.00	100.1 AV			1.89 H	218	103.2	-3.1
3	2483.50	58.9 PK	74.0	-15.1	1.89 H	218	62.0	-3.1
4	2483.50	47.5 AV	54.0	-6.5	1.89 H	218	50.6	-3.1
5	4960.00	43.0 PK	74.0	-31.0	2.75 H	304	41.6	1.4
6	4960.00	34.6 AV	54.0	-19.4	2.75 H	304	33.2	1.4
7	7440.00	47.3 PK	74.0	-26.7	1.64 H	213	40.0	7.3
8	7440.00	38.4 AV	54.0	-15.6	1.64 H	213	31.1	7.3
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	95.8 PK			1.60 V	162	98.9	-3.1
2	*2480.00	94.1 AV			1.60 V	162	97.2	-3.1
3	2483.50	56.4 PK	74.0	-17.6	1.60 V	162	59.5	-3.1
4	2483.50	43.9 AV	54.0	-10.1	1.60 V	162	47.0	-3.1
5	4960.00	43.2 PK	74.0	-30.8	1.59 V	34	41.8	1.4
6	4960.00	34.2 AV	54.0	-19.8	1.59 V	34	32.8	1.4
7	7440.00	47.3 PK	74.0	-26.7	1.58 V	101	40.0	7.3
8	7440.00	36.8 AV	54.0	-17.2	1.58 V	101	29.5	7.3

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.

For external Ant. No.: 2 PCB antenna (Model: ANT300P002B24553)

BT-LE 1M

Above 1GHz Data :

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.8 PK	74.0	-15.2	1.93 H	205	61.9	-3.1
2	2390.00	47.3 AV	54.0	-6.7	1.93 H	205	50.4	-3.1
3	*2402.00	100.4 PK			1.93 H	205	103.5	-3.1
4	*2402.00	99.6 AV			1.93 H	205	102.7	-3.1
5	4804.00	43.4 PK	74.0	-30.6	2.74 H	305	42.2	1.2
6	4804.00	34.8 AV	54.0	-19.2	2.74 H	305	33.6	1.2
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	2390.00	57.4 PK	74.0	-16.6	1.45 V	205	60.5	-3.1
2	2390.00	44.4 AV	54.0	-9.6	1.45 V	205	47.5	-3.1
3	*2402.00	96.5 PK			1.45 V	205	99.6	-3.1
4	*2402.00	95.6 AV			1.45 V	205	98.7	-3.1
5	4804.00	42.9 PK	74.0	-31.1	1.67 V	28	41.7	1.2
6	4804.00	33.4 AV	54.0	-20.6	1.67 V	28	32.2	1.2

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	101.1 PK			1.91 H	211	104.3	-3.2
2	*2440.00	100.3 AV			1.91 H	211	103.5	-3.2
3	4880.00	43.1 PK	74.0	-30.9	2.67 H	315	41.9	1.2
4	4880.00	34.6 AV	54.0	-19.4	2.67 H	315	33.4	1.2
5	7320.00	47.3 PK	74.0	-26.7	1.61 H	205	40.1	7.2
6	7320.00	38.8 AV	54.0	-15.2	1.61 H	205	31.6	7.2
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	96.7 PK			1.63 V	177	99.9	-3.2
2	*2440.00	96.5 AV			1.63 V	177	99.7	-3.2
3	4880.00	42.7 PK	74.0	-31.3	1.56 V	54	41.5	1.2
4	4880.00	33.5 AV	54.0	-20.5	1.56 V	54	32.3	1.2
5	7320.00	48.2 PK	74.0	-25.8	1.56 V	106	41.0	7.2
6	7320.00	37.8 AV	54.0	-16.2	1.56 V	106	30.6	7.2

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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	100.9 PK			1.92 H	232	104.0	-3.1
2	*2480.00	99.9 AV			1.92 H	232	103.0	-3.1
3	2483.50	58.8 PK	74.0	-15.2	1.92 H	232	61.9	-3.1
4	2483.50	47.6 AV	54.0	-6.4	1.92 H	232	50.7	-3.1
5	4960.00	43.2 PK	74.0	-30.8	2.71 H	317	41.8	1.4
6	4960.00	34.6 AV	54.0	-19.4	2.71 H	317	33.2	1.4
7	7440.00	47.4 PK	74.0	-26.6	1.65 H	208	40.1	7.3
8	7440.00	38.5 AV	54.0	-15.5	1.65 H	208	31.2	7.3
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	96.2 PK			1.60 V	160	99.3	-3.1
2	*2480.00	95.3 AV			1.60 V	160	98.4	-3.1
3	2483.50	56.5 PK	74.0	-17.5	1.60 V	160	59.6	-3.1
4	2483.50	43.8 AV	54.0	-10.2	1.60 V	160	46.9	-3.1
5	4960.00	42.0 PK	74.0	-32.0	1.58 V	20	40.6	1.4
6	4960.00	33.4 AV	54.0	-20.6	1.58 V	20	32.0	1.4
7	7440.00	48.7 PK	74.0	-25.3	1.55 V	89	41.4	7.3
8	7440.00	37.6 AV	54.0	-16.4	1.55 V	89	30.3	7.3

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.

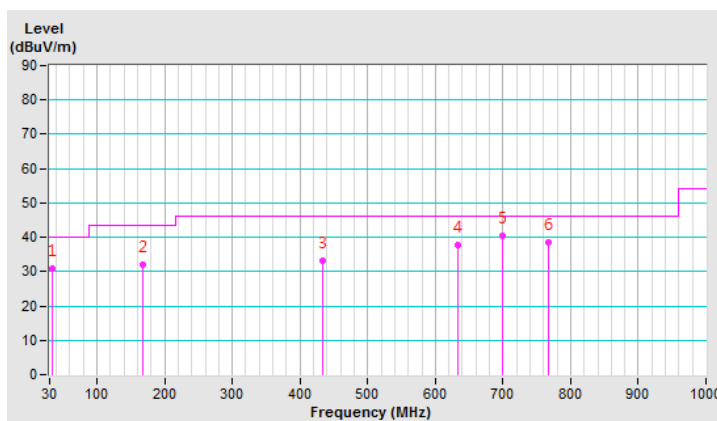
Below 1GHz Data:

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	34.69	30.7 QP	40.0	-9.3	1.50 H	20	49.8	-19.1
2	167.81	32.1 QP	43.5	-11.4	1.50 H	62	50.5	-18.4
3	433.49	33.0 QP	46.0	-13.0	2.00 H	62	47.0	-14.0
4	633.67	37.9 QP	46.0	-8.1	2.50 H	298	47.9	-10.0
5	700.12	40.5 QP	46.0	-5.5	1.00 H	283	49.5	-9.0
6	766.60	38.5 QP	46.0	-7.5	2.00 H	138	46.3	-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 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

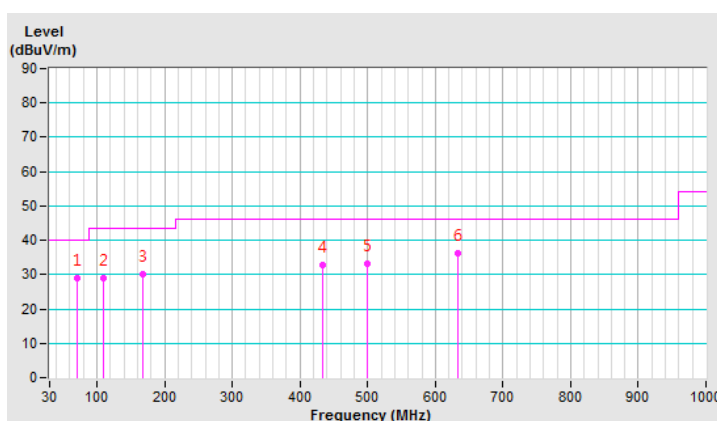


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	70.63	29.1 QP	40.0	-10.9	2.00 V	326	49.4	-20.3
2	108.94	29.1 QP	43.5	-14.4	2.00 V	281	50.0	-20.9
3	167.46	30.1 QP	43.5	-13.4	1.00 V	171	48.4	-18.3
4	433.80	32.9 QP	46.0	-13.1	1.00 V	246	46.9	-14.0
5	500.15	33.0 QP	46.0	-13.0	1.50 V	352	45.8	-12.8
6	633.01	36.1 QP	46.0	-9.9	2.00 V	350	46.1	-10.0

REMARKS:

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



BT-LE 2M

Above 1GHz Data :

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.2 PK	74.0	-15.8	1.94 H	222	61.3	-3.1
2	2390.00	47.1 AV	54.0	-6.9	1.94 H	222	50.2	-3.1
3	*2402.00	100.5 PK			1.94 H	222	103.6	-3.1
4	*2402.00	99.6 AV			1.94 H	222	102.7	-3.1
5	4804.00	42.5 PK	74.0	-31.5	2.66 H	316	41.3	1.2
6	4804.00	34.4 AV	54.0	-19.6	2.66 H	316	33.2	1.2
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	2390.00	57.5 PK	74.0	-16.5	1.63 V	175	60.6	-3.1
2	2390.00	44.9 AV	54.0	-9.1	1.63 V	175	48.0	-3.1
3	*2402.00	96.7 PK			1.63 V	175	99.8	-3.1
4	*2402.00	94.5 AV			1.63 V	175	97.6	-3.1
5	4804.00	42.8 PK	74.0	-31.2	1.65 V	19	41.6	1.2
6	4804.00	33.8 AV	54.0	-20.2	1.65 V	19	32.6	1.2

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	100.7 PK			1.94 H	234	103.9	-3.2
2	*2440.00	99.7 AV			1.94 H	234	102.9	-3.2
3	4880.00	43.7 PK	74.0	-30.3	2.69 H	295	42.5	1.2
4	4880.00	35.3 AV	54.0	-18.7	2.69 H	295	34.1	1.2
5	7320.00	46.7 PK	74.0	-27.3	1.65 H	205	39.5	7.2
6	7320.00	38.2 AV	54.0	-15.8	1.65 H	205	31.0	7.2
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	96.1 PK			1.55 V	184	99.3	-3.2
2	*2440.00	94.7 AV			1.55 V	184	97.9	-3.2
3	4880.00	43.5 PK	74.0	-30.5	1.59 V	18	42.3	1.2
4	4880.00	34.6 AV	54.0	-19.4	1.59 V	18	33.4	1.2
5	7320.00	47.6 PK	74.0	-26.4	1.54 V	83	40.4	7.2
6	7320.00	36.9 AV	54.0	-17.1	1.54 V	83	29.7	7.2

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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	100.7 PK			1.93 H	218	103.8	-3.1
2	*2480.00	99.8 AV			1.93 H	218	102.9	-3.1
3	2483.50	58.8 PK	74.0	-15.2	1.93 H	218	61.9	-3.1
4	2483.50	47.5 AV	54.0	-6.5	1.93 H	218	50.6	-3.1
5	4960.00	43.2 PK	74.0	-30.8	2.70 H	306	41.8	1.4
6	4960.00	34.9 AV	54.0	-19.1	2.70 H	306	33.5	1.4
7	7440.00	47.1 PK	74.0	-26.9	1.61 H	214	39.8	7.3
8	7440.00	38.4 AV	54.0	-15.6	1.61 H	214	31.1	7.3
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	96.1 PK			1.55 V	147	99.2	-3.1
2	*2480.00	94.3 AV			1.55 V	147	97.4	-3.1
3	2483.50	56.7 PK	74.0	-17.3	1.55 V	147	59.8	-3.1
4	2483.50	44.0 AV	54.0	-10.0	1.55 V	147	47.1	-3.1
5	4960.00	42.9 PK	74.0	-31.1	1.53 V	19	41.5	1.4
6	4960.00	33.8 AV	54.0	-20.2	1.53 V	19	32.4	1.4
7	7440.00	46.9 PK	74.0	-27.1	1.57 V	96	39.6	7.3
8	7440.00	36.4 AV	54.0	-17.6	1.57 V	96	29.1	7.3

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.

For external Ant. No.: 5 PIFA antenna (Model: SZ07751)

BT-LE 1M

Above 1GHz Data :

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.6 PK	74.0	-17.4	1.66 H	164	59.7	-3.1
2	2390.00	43.8 AV	54.0	-10.2	1.66 H	164	46.9	-3.1
3	*2402.00	95.5 PK			1.66 H	164	98.6	-3.1
4	*2402.00	94.8 AV			1.66 H	164	97.9	-3.1
5	4804.00	42.0 PK	74.0	-32.0	1.67 H	32	40.8	1.2
6	4804.00	33.3 AV	54.0	-20.7	1.67 H	32	32.1	1.2
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	2390.00	58.7 PK	74.0	-15.3	1.97 V	229	61.8	-3.1
2	2390.00	47.4 AV	54.0	-6.6	1.97 V	229	50.5	-3.1
3	*2402.00	100.1 PK			1.97 V	229	103.2	-3.1
4	*2402.00	99.4 AV			1.97 V	229	102.5	-3.1
5	4804.00	42.7 PK	74.0	-31.3	2.64 V	293	41.5	1.2
6	4804.00	34.6 AV	54.0	-19.4	2.64 V	293	33.4	1.2

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	95.2 PK			1.68 H	166	98.4	-3.2
2	*2440.00	94.2 AV			1.68 H	166	97.4	-3.2
3	4880.00	42.3 PK	74.0	-31.7	1.64 H	44	41.1	1.2
4	4880.00	33.3 AV	54.0	-20.7	1.64 H	44	32.1	1.2
5	7320.00	48.0 PK	74.0	-26.0	1.59 H	93	40.8	7.2
6	7320.00	37.6 AV	54.0	-16.4	1.59 H	93	30.4	7.2
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	100.8 PK			1.99 V	213	104.0	-3.2
2	*2440.00	100.0 AV			1.99 V	213	103.2	-3.2
3	4880.00	42.5 PK	74.0	-31.5	2.67 V	305	41.3	1.2
4	4880.00	34.4 AV	54.0	-19.6	2.67 V	305	33.2	1.2
5	7320.00	46.8 PK	74.0	-27.2	1.66 V	211	39.6	7.2
6	7320.00	38.2 AV	54.0	-15.8	1.66 V	211	31.0	7.2

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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	95.0 PK			1.63 H	183	98.1	-3.1
2	*2480.00	94.3 AV			1.63 H	183	97.4	-3.1
3	2483.50	56.7 PK	74.0	-17.3	1.63 H	183	59.8	-3.1
4	2483.50	43.4 AV	54.0	-10.6	1.63 H	183	46.5	-3.1
5	4960.00	42.7 PK	74.0	-31.3	1.71 H	47	41.3	1.4
6	4960.00	33.6 AV	54.0	-20.4	1.71 H	47	32.2	1.4
7	7440.00	48.0 PK	74.0	-26.0	1.62 H	97	40.7	7.3
8	7440.00	37.2 AV	54.0	-16.8	1.62 H	97	29.9	7.3
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	100.7 PK			1.90 V	214	103.8	-3.1
2	*2480.00	99.9 AV			1.90 V	214	103.0	-3.1
3	2483.50	58.3 PK	74.0	-15.7	1.90 V	214	61.4	-3.1
4	2483.50	47.1 AV	54.0	-6.9	1.90 V	214	50.2	-3.1
5	4960.00	43.1 PK	74.0	-30.9	2.64 V	291	41.7	1.4
6	4960.00	34.6 AV	54.0	-19.4	2.64 V	291	33.2	1.4
7	7440.00	47.3 PK	74.0	-26.7	1.55 V	215	40.0	7.3
8	7440.00	38.8 AV	54.0	-15.2	1.55 V	215	31.5	7.3

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.

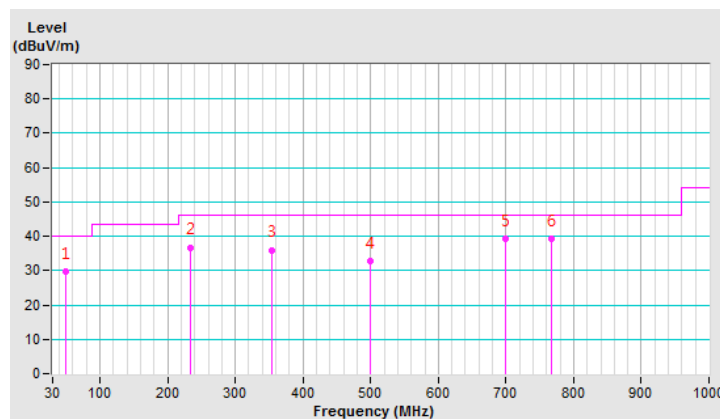
Below 1GHz Data:

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	49.55	29.7 QP	40.0	-10.3	3.00 H	360	47.7	-18.0
2	233.34	36.8 QP	46.0	-9.2	1.00 H	90	56.6	-19.8
3	354.93	36.0 QP	46.0	-10.0	1.00 H	196	52.2	-16.2
4	499.99	32.7 QP	46.0	-13.3	2.00 H	0	45.5	-12.8
5	700.00	39.2 QP	46.0	-6.8	1.00 H	301	48.2	-9.0
6	766.69	39.2 QP	46.0	-6.8	1.00 H	75	47.0	-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 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

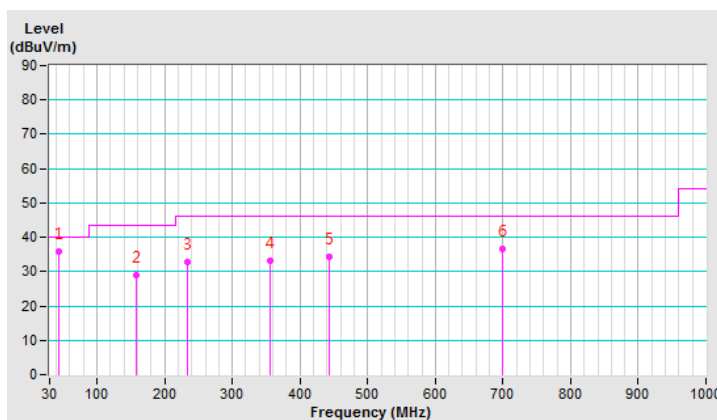


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	43.80	35.7 QP	40.0	-4.3	2.00 V	360	53.9	-18.2
2	157.53	29.0 QP	43.5	-14.5	1.00 V	154	46.8	-17.8
3	233.34	32.9 QP	46.0	-13.1	1.00 V	94	52.7	-19.8
4	354.97	33.0 QP	46.0	-13.0	1.00 V	170	49.2	-16.2
5	442.47	34.1 QP	46.0	-11.9	1.00 V	360	47.7	-13.6
6	700.00	36.7 QP	46.0	-9.3	1.00 V	340	45.7	-9.0

REMARKS:

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



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Above 1GHz Data :

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.5 PK	74.0	-17.5	1.68 H	176	59.6	-3.1
2	2390.00	43.7 AV	54.0	-10.3	1.68 H	176	46.8	-3.1
3	*2402.00	95.3 PK			1.68 H	176	98.4	-3.1
4	*2402.00	94.8 AV			1.68 H	176	97.9	-3.1
5	4804.00	42.7 PK	74.0	-31.3	1.72 H	43	41.5	1.2
6	4804.00	34.0 AV	54.0	-20.0	1.72 H	43	32.8	1.2
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	2390.00	58.4 PK	74.0	-15.6	1.91 V	222	61.5	-3.1
2	2390.00	47.3 AV	54.0	-6.7	1.91 V	222	50.4	-3.1
3	*2402.00	100.5 PK			1.91 V	222	103.6	-3.1
4	*2402.00	99.8 AV			1.91 V	222	102.9	-3.1
5	4804.00	44.0 PK	74.0	-30.0	2.68 V	315	42.8	1.2
6	4804.00	35.4 AV	54.0	-18.6	2.68 V	315	34.2	1.2

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	95.6 PK			1.61 H	169	98.8	-3.2
2	*2440.00	95.0 AV			1.61 H	169	98.2	-3.2
3	4880.00	42.4 PK	74.0	-31.6	1.68 H	38	41.2	1.2
4	4880.00	33.7 AV	54.0	-20.3	1.68 H	38	32.5	1.2
5	7320.00	47.8 PK	74.0	-26.2	1.58 H	110	40.6	7.2
6	7320.00	37.3 AV	54.0	-16.7	1.58 H	110	30.1	7.2
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	100.4 PK			1.97 V	233	103.6	-3.2
2	*2440.00	99.6 AV			1.97 V	233	102.8	-3.2
3	4880.00	43.0 PK	74.0	-31.0	2.72 V	296	41.8	1.2
4	4880.00	34.6 AV	54.0	-19.4	2.72 V	296	33.4	1.2
5	7320.00	46.8 PK	74.0	-27.2	1.59 V	213	39.6	7.2
6	7320.00	38.1 AV	54.0	-15.9	1.59 V	213	30.9	7.2

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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	95.7 PK			1.64 H	172	98.8	-3.1
2	*2480.00	94.7 AV			1.64 H	172	97.8	-3.1
3	2483.50	56.6 PK	74.0	-17.4	1.64 H	172	59.7	-3.1
4	2483.50	43.5 AV	54.0	-10.5	1.64 H	172	46.6	-3.1
5	4960.00	42.7 PK	74.0	-31.3	1.60 H	44	41.3	1.4
6	4960.00	34.0 AV	54.0	-20.0	1.60 H	44	32.6	1.4
7	7440.00	48.1 PK	74.0	-25.9	1.61 H	104	40.8	7.3
8	7440.00	37.4 AV	54.0	-16.6	1.61 H	104	30.1	7.3
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	100.6 PK			1.96 V	226	103.7	-3.1
2	*2480.00	99.4 AV			1.96 V	226	102.5	-3.1
3	2483.50	58.9 PK	74.0	-15.1	1.96 V	226	62.0	-3.1
4	2483.50	47.3 AV	54.0	-6.7	1.96 V	226	50.4	-3.1
5	4960.00	42.9 PK	74.0	-31.1	2.73 V	297	41.5	1.4
6	4960.00	34.4 AV	54.0	-19.6	2.73 V	297	33.0	1.4
7	7440.00	47.2 PK	74.0	-26.8	1.57 V	227	39.9	7.3
8	7440.00	38.4 AV	54.0	-15.6	1.57 V	227	31.1	7.3

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.

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2018	Oct. 23, 2019
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 22, 2018	Oct. 21, 2019
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 17, 2019	Mar. 16, 2020
50 ohms Terminator	N/A	3	Oct. 22, 2018	Oct. 21, 2019
RF Cable	5D-FB	COCCAB-001	Sep. 28, 2018	Sep. 27, 2019
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 14, 2019	Mar. 13, 2020
Software BVADT	BVADT_Cond_V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
- 3 Tested Date: Aug. 21, 2019

4.2.3 Test Procedures

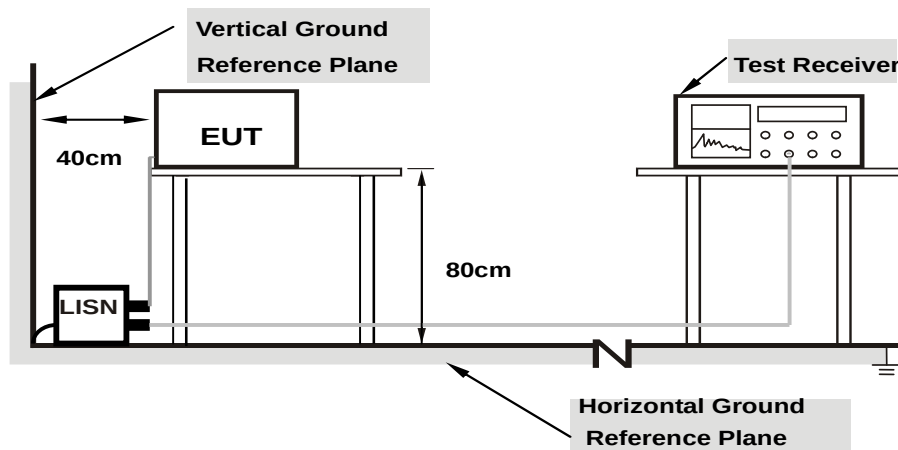
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

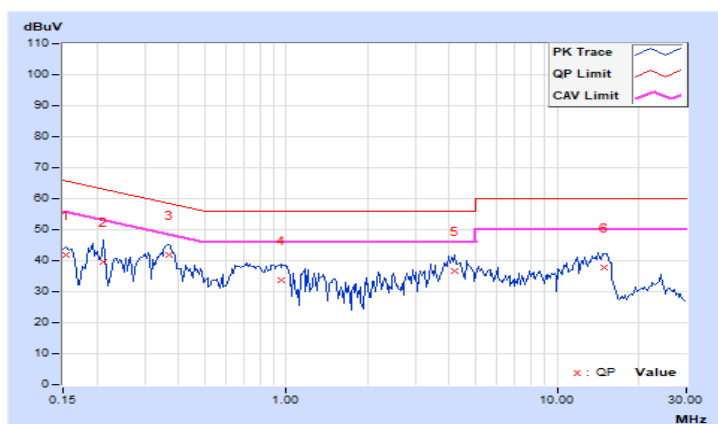
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.97	31.97	21.62	41.94	31.59	65.79	55.79	-23.85	-24.20
2	0.21250	9.97	29.80	12.62	39.77	22.59	63.11	53.11	-23.34	-30.52
3	0.36875	9.98	31.98	19.93	41.96	29.91	58.53	48.53	-16.57	-18.62
4	0.95469	10.03	23.72	10.84	33.75	20.87	56.00	46.00	-22.25	-25.13
5	4.17578	10.27	26.45	13.18	36.72	23.45	56.00	46.00	-19.28	-22.55
6	14.89844	10.99	26.89	18.96	37.88	29.95	60.00	50.00	-22.12	-20.05

REMARKS:

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

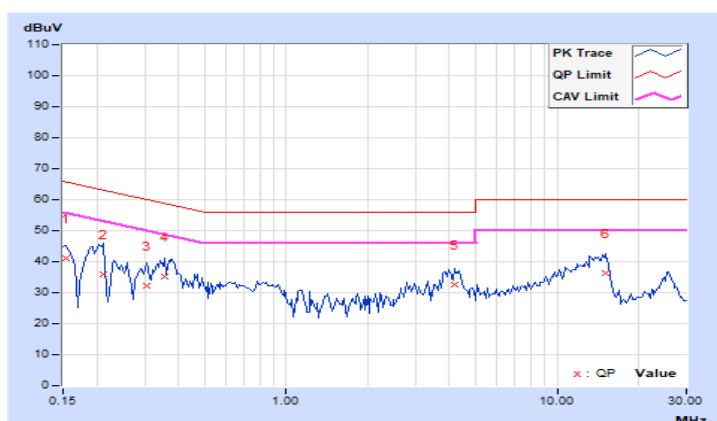


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.95	31.24	16.99	41.19	26.94	65.79	55.79	-24.60	-28.85
2	0.21250	9.95	26.08	8.88	36.03	18.83	63.11	53.11	-27.08	-34.28
3	0.30625	9.96	22.23	8.58	32.19	18.54	60.07	50.07	-27.88	-31.53
4	0.35703	9.97	25.36	10.31	35.33	20.28	58.80	48.80	-23.47	-28.52
5	4.17969	10.20	22.47	8.58	32.67	18.78	56.00	46.00	-23.33	-27.22
6	15.12891	10.83	25.62	15.19	36.45	26.02	60.00	50.00	-23.55	-23.98

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.

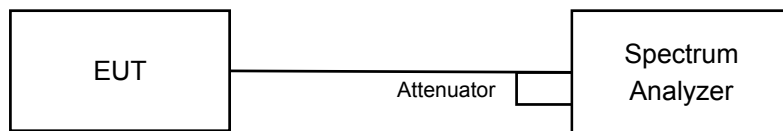


4.3 6dB Bandwidth Measurement

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

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

4.3.5 Deviation from Test Standard

No deviation.

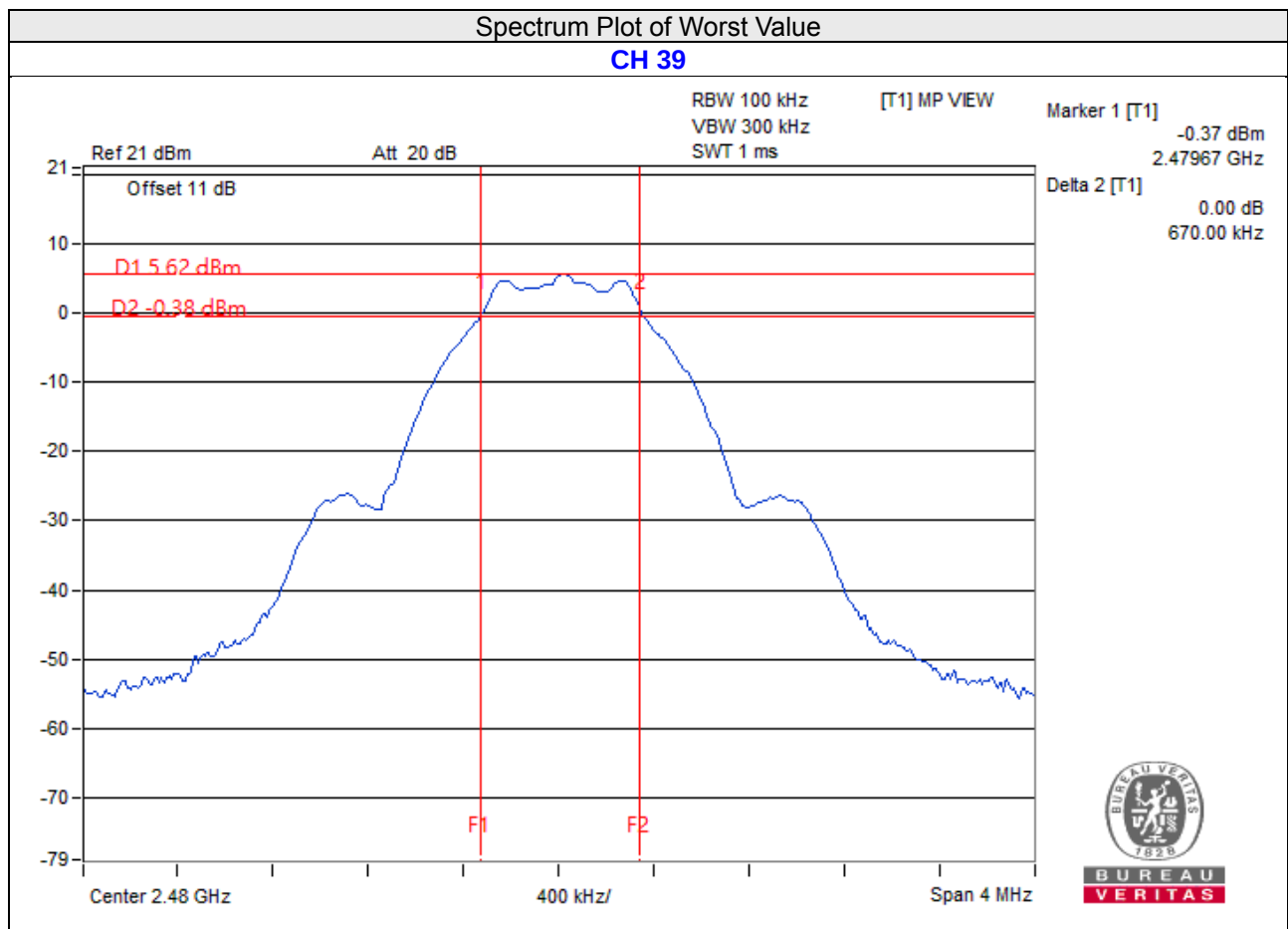
4.3.6 EUT Operating Conditions

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

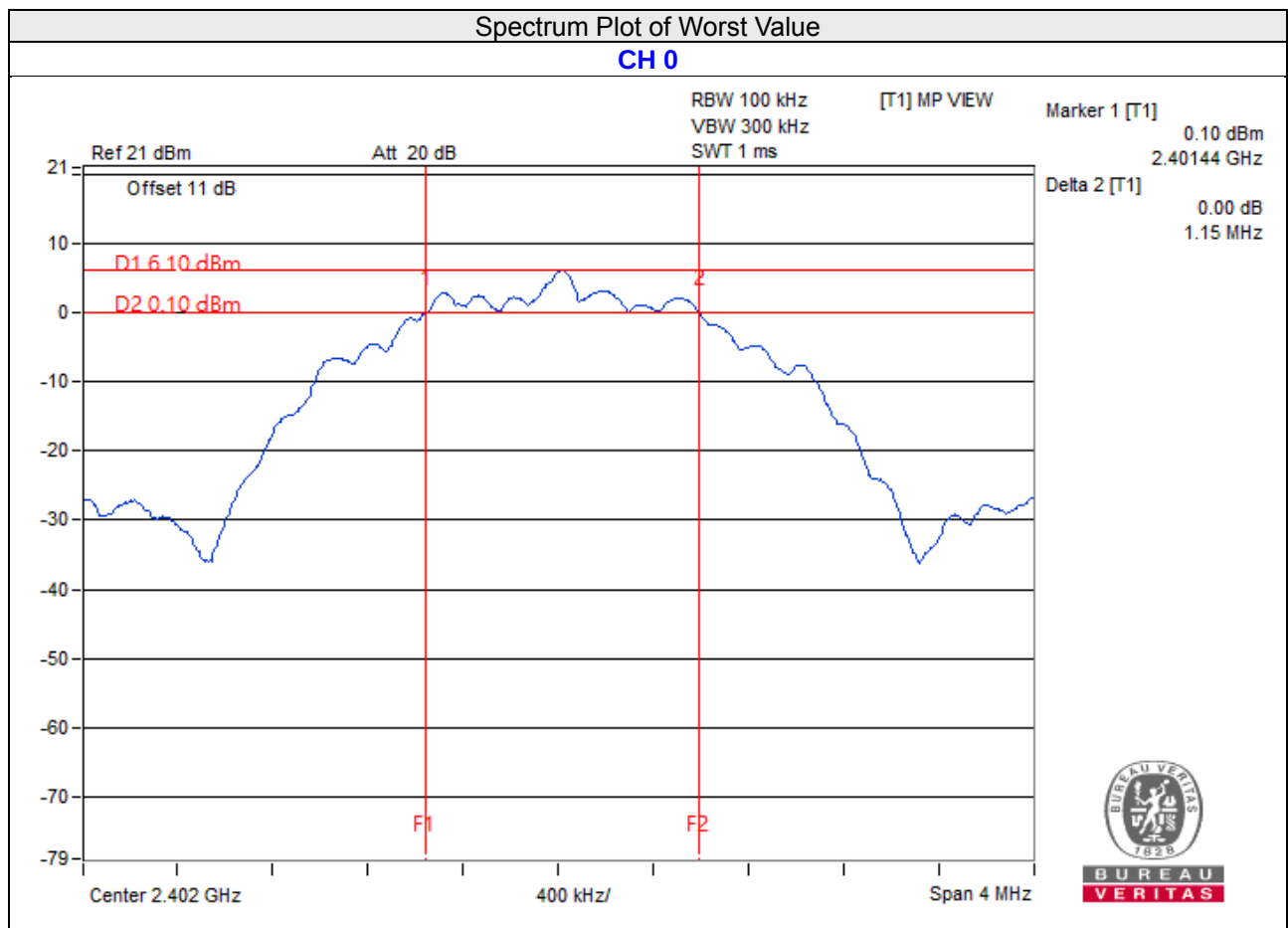
BT-LE 1M

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	0.67	0.5	Pass



BT-LE 2M

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	1.15	0.5	Pass
19	2440	1.15	0.5	Pass
39	2480	1.15	0.5	Pass

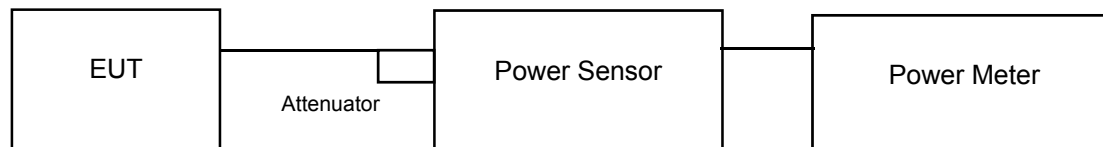


4.4 Conducted Output Power Measurement

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

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.

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

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

4.4.7 Test Results

BT-LE 1M

FOR PEAK POWER

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	4.365	6.40	30	Pass
19	2440	4.15	6.18	30	Pass
39	2480	4.13	6.16	30	Pass

FOR AVERAGE POWER

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	3.864	5.87
19	2440	3.793	5.79
39	2480	3.741	5.73

BT-LE 2M

FOR PEAK POWER

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	4.645	6.67	30	Pass
19	2440	4.395	6.43	30	Pass
39	2480	4.207	6.24	30	Pass

FOR AVERAGE POWER

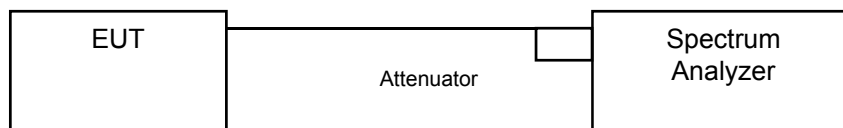
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	4.188	6.22
19	2440	4.064	6.09
39	2480	3.75	5.74

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 3 kHz.

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.

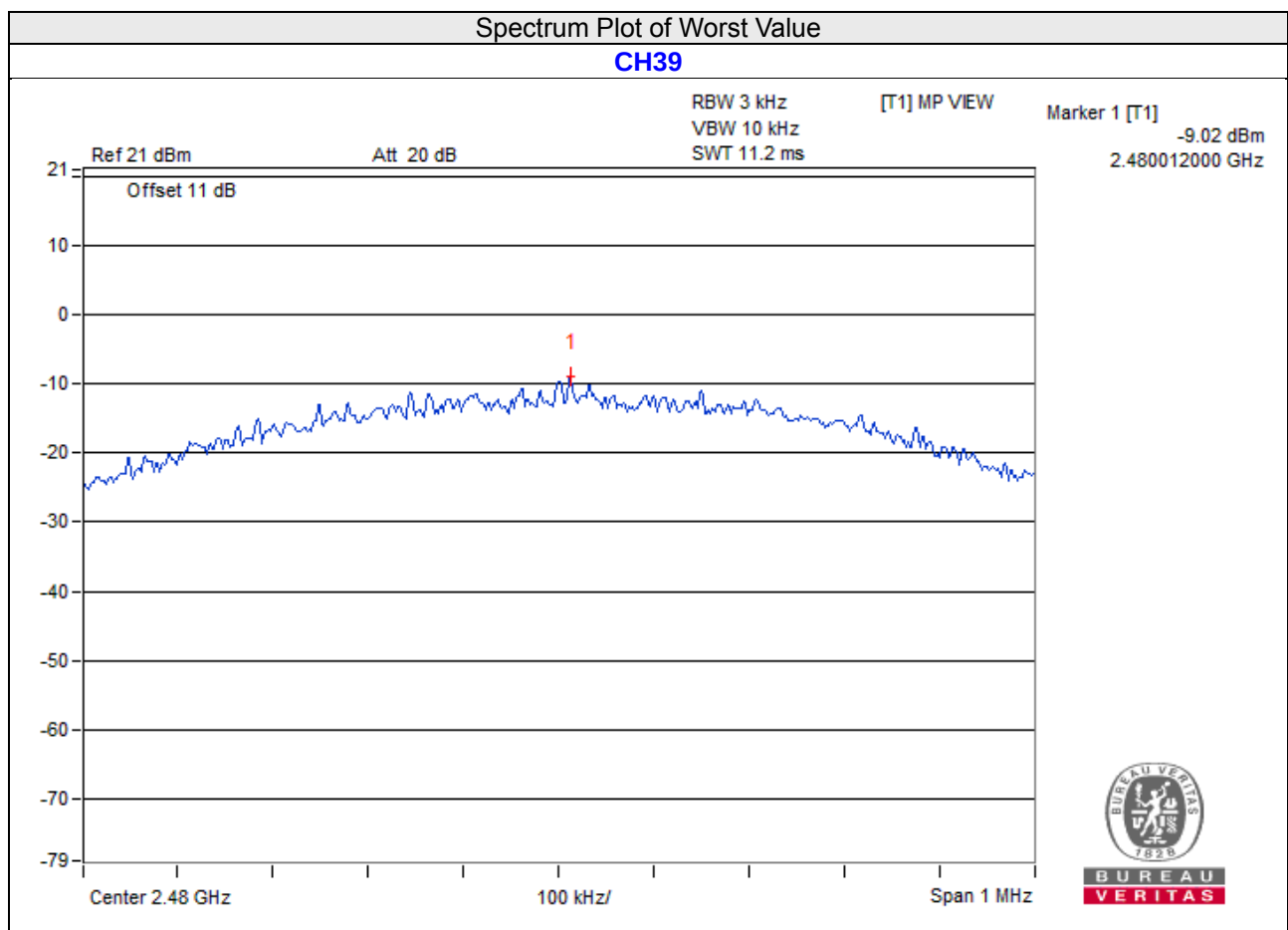
4.5.6 EUT Operating Condition

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

4.5.7 Test Results

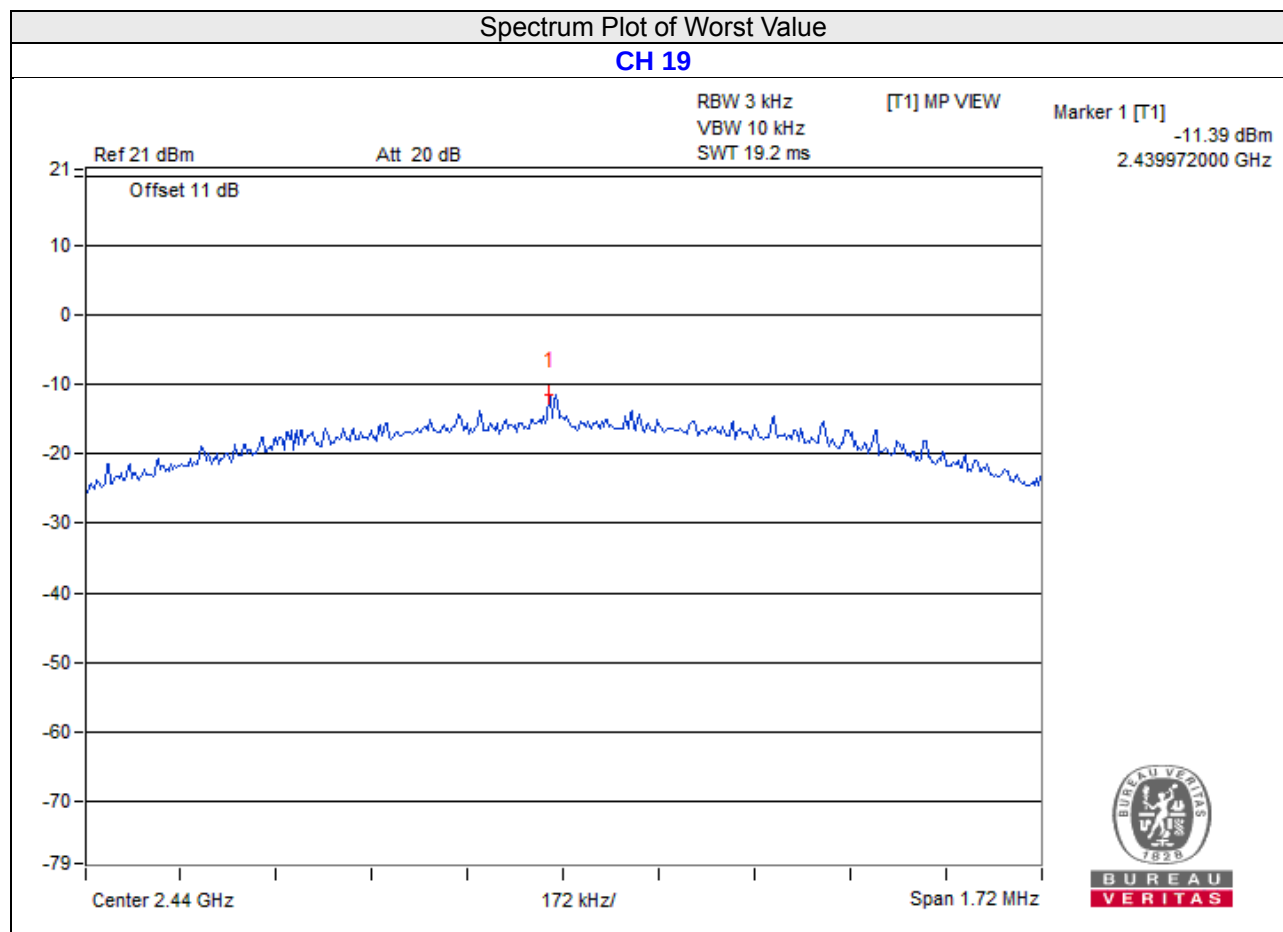
BT-LE 1M

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	2402	-10.48	8	Pass
19	2440	-10.31	8	Pass
39	2480	-9.02	8	Pass



BT-LE 2M

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	2402	-11.40	8	Pass
19	2440	-11.39	8	Pass
39	2480	-12.31	8	Pass

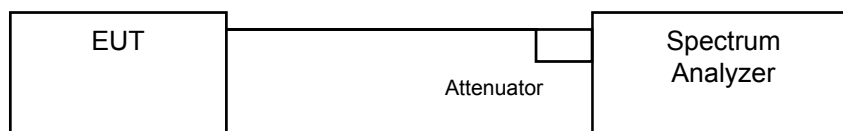


4.6 Conducted Out of Band Emission Measurement

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

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

MEASUREMENT PROCEDURE OOB

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

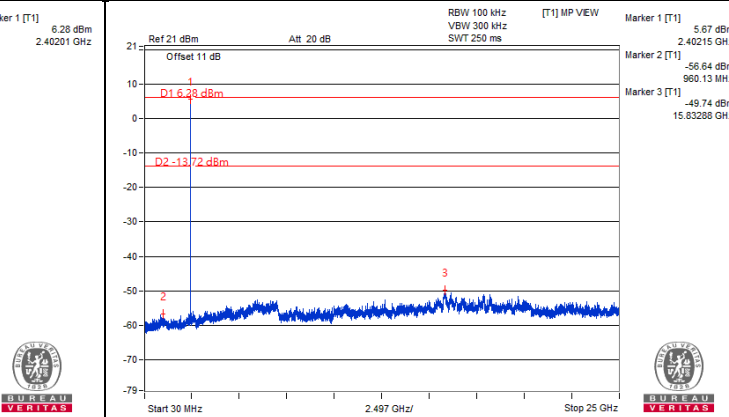
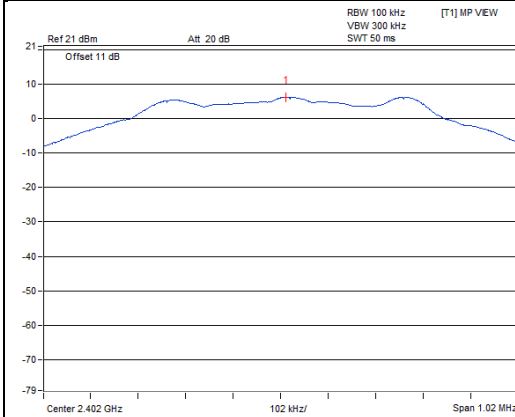
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.6.7 Test Results

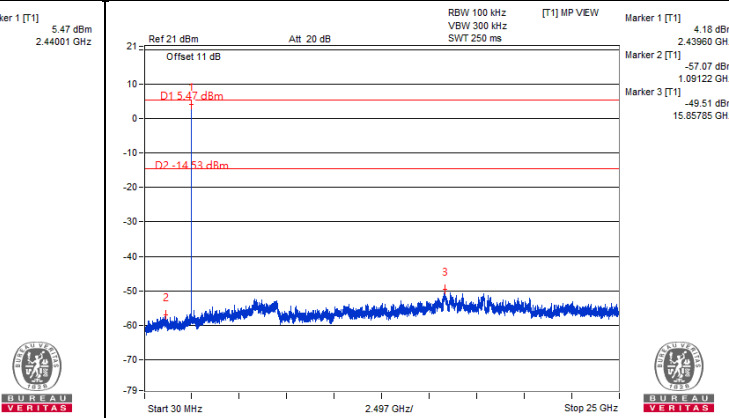
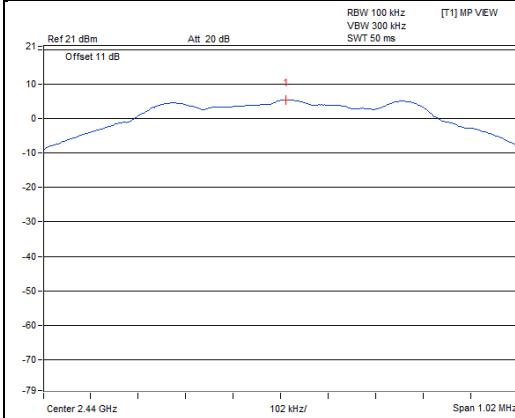
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

BT-LE 1M

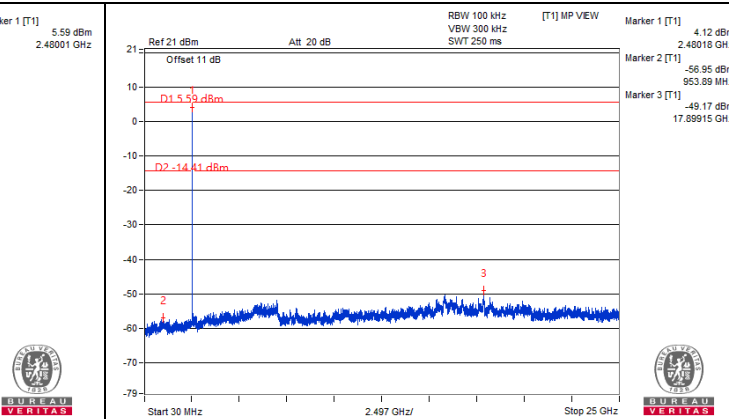
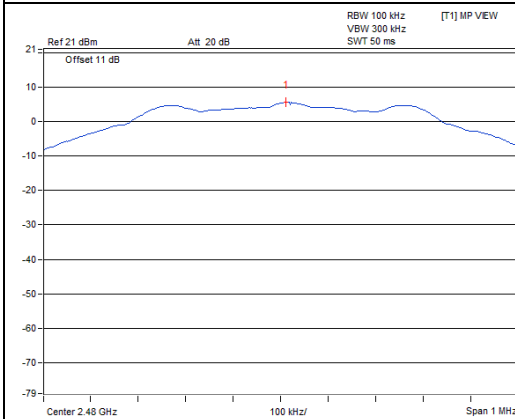
CH 0



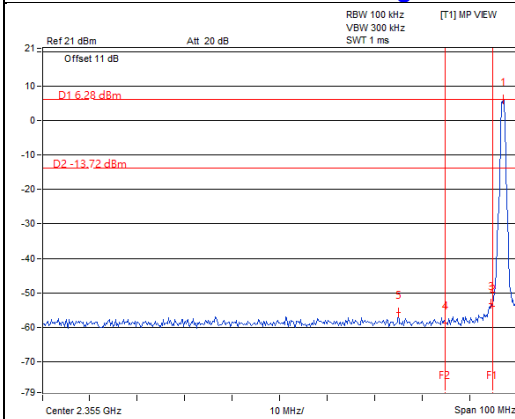
CH 19



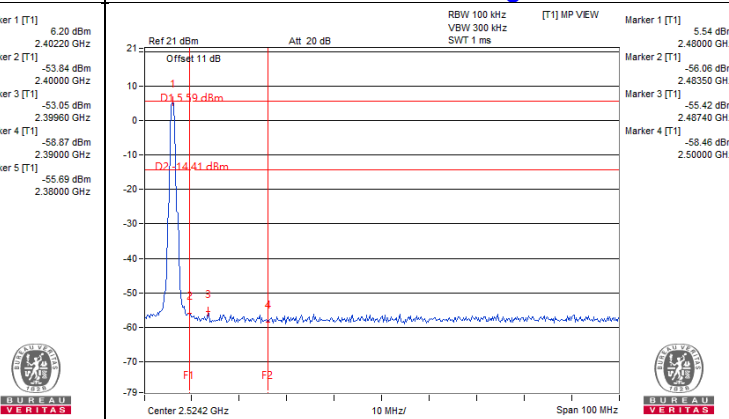
CH 39



CH 0 Band edge

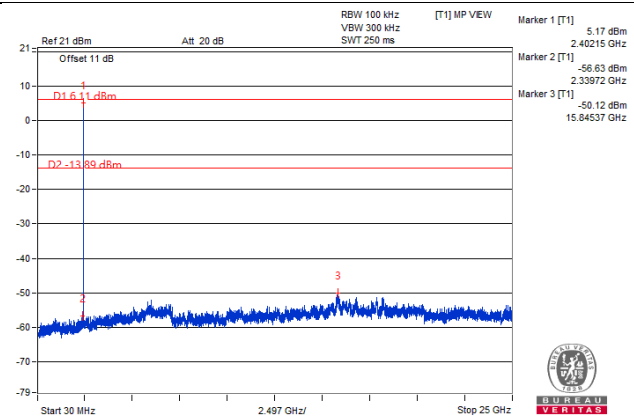
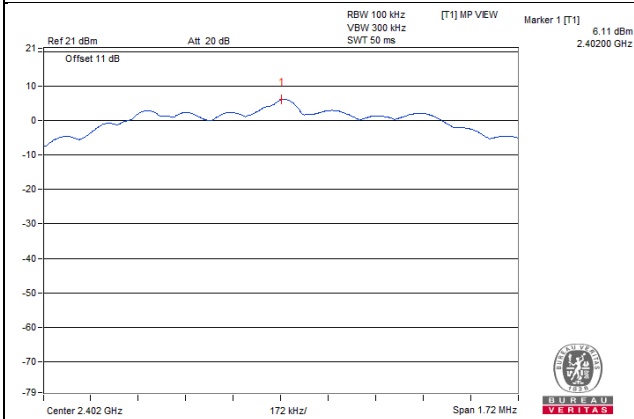


CH 39 Band edge

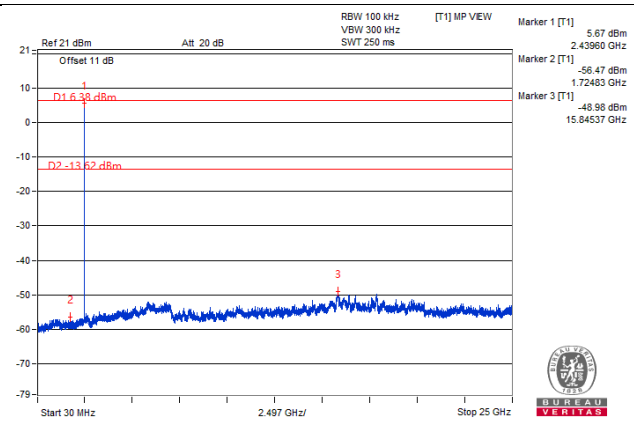
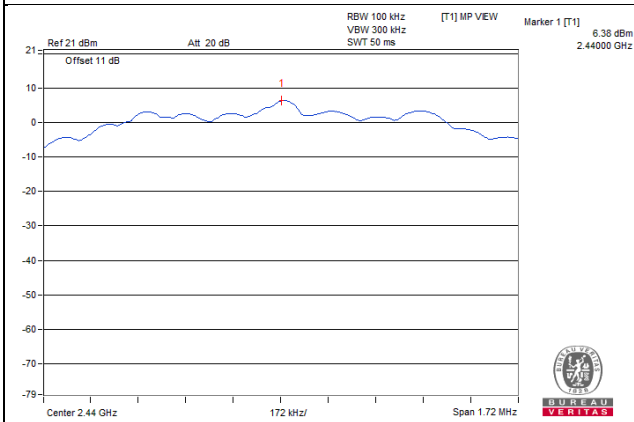


BT-LE 2M

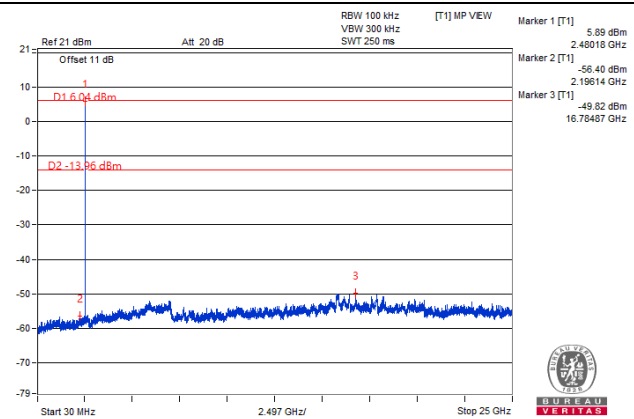
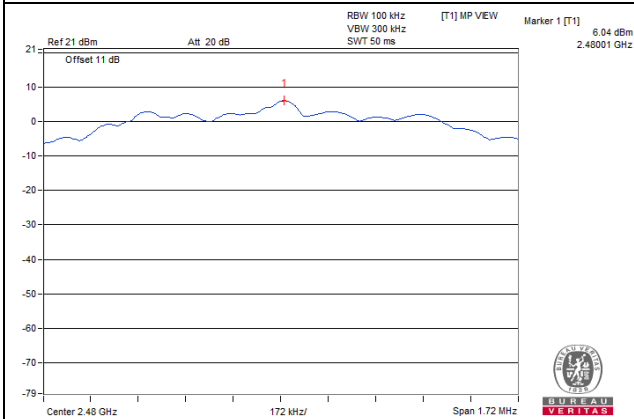
CH 0



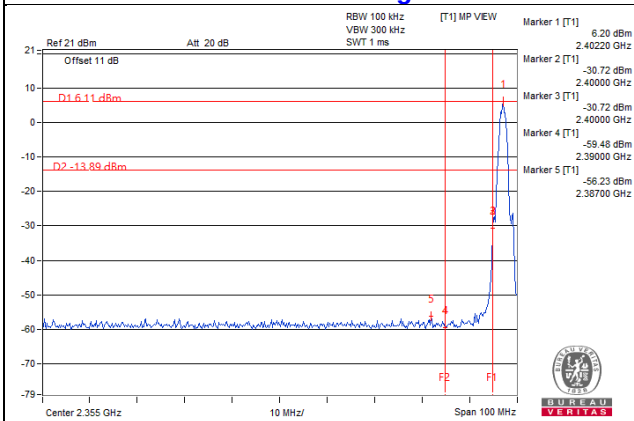
CH 19



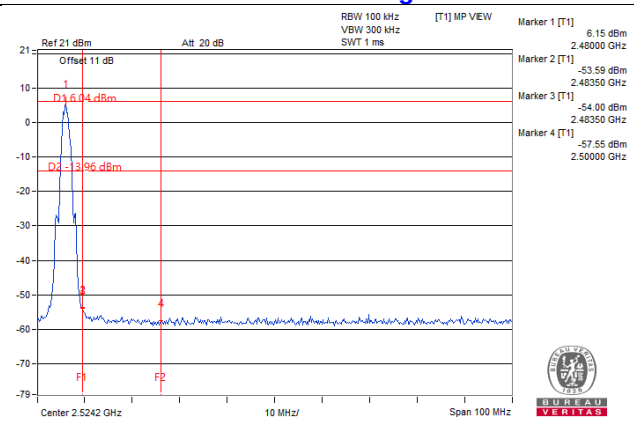
CH 39



CH 0 Band edge



CH 39 Band edge



5 Pictures of Test Arrangements

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

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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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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