

# TEST REPORT

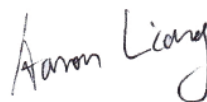
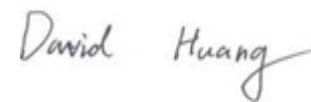
Applicant:	ACCO Brands, Inc.
Address:	1500 Fashion Island Blvd., 3rd Floor, San Mateo, CA 94404, USA

Manufacturer or Supplier	ACCO Brands, Inc.
Address	1500 Fashion Island Blvd., 3rd Floor, San Mateo, CA 94404, USA
Product:	Wireless Dongle
Brand Name:	Kensington
Model:	M01480-D
Additional Model & Model Difference	N/A
Date of tests:	Oct. 25, 2019 ~ Nov. 18, 2019

the tests have been carried out according to the requirements of the following standard:

**FCC Part 15, Subpart C, Section 15.249**

**CONCLUSION: The submitted sample was found to COMPLY with the test requirement**

Tested by Aaron Liang Project Engineer / EMC Department	Approved by David Huang Supervisor / EMC Department
	
Date: Nov. 19, 2019	

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**BUREAU  
VERITAS**

**Test Report No.: RF191025N053**

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**BUREAU  
VERITAS**

Test Report No.: RF191025N053

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF191025N053	Original release	Nov. 19, 2019

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.203	Antenna Requirement	PASS	No antenna connector is used
§15.207 (a)	Conducted Emission	PASS	Compliant
§15.205	Restricted Band of Operation	PASS	Compliant
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant
§15.215(c)	20dB Bandwidth Test	PASS	Compliant

NOTE: Test Lab Information:

**Lab:** Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch

**Test Lab Address:** Zone A, Floor 1, Building 2 Wan Ye Long Technology Park  
South Side of Zhoushi Road, Bao'an District Shenzhen, Guangdong, 518108,  
People's Republic of China

## 2 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	UNCERTAINTY
Radiated emissions	9kHz~30MHz	2.16dB
	30MHz ~ 1GMHz	3.74dB
	1GHz ~ 18GHz	4.66dB
	18GHz ~ 40GHz	4.67dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .



### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Wireless Dongle
<b>MODEL NO.</b>	M01480-D
<b>ADDITIONAL MODELS</b>	N/A
<b>FCC ID</b>	GV3M01480-D
<b>NOMINAL VOLTAGE</b>	DC 5V from USB
<b>MODULATION TECHNOLOGY</b>	GFSK
<b>OPERATING FREQUENCY</b>	2405-2477MHz
<b>ANTENNA TYPE</b>	PCB Antenna, with 5.5dBi gain
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	N/A

**NOTE:**

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 191025N053) for detailed product photo.

### 3.2 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type. The worst case was found when the EUT was positioned on Y axis for radiated emission. The EUT was tested under the following mode.

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	BW	
A	√	√	√	√	DC 5V from USB

Where **RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission

**RE≥1G**: Radiated Emission above 1GHz  
**BW**: 20db bandwidth

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

TESTED CHANNEL	TESTED FREQUENCY
Low	2405 MHz
Middle	2442 MHz
High	2477 MHz

#### Channel List

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	2405	5	2421	9	2440	13	2455
2	2407	6	2428	10	2441	14	2467
3	2410	7	2435	11	2442	15	2468
4	2414	8	2437	12	2449	16	2477

Note: The more detailed channel, please refer to the product specifications

### TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE	25deg. C, 55%RH	DC 5V from USB	Caden Lu
BW	25deg. C, 55%RH	DC 5V from USB	Aaron Liang
PLC	26deg. C, 54%RH	DC 5V from USB	Caden Lu



### 3.3 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, Section 15.249**

**ANSI C63.10-2013**

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

### 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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook computer	LENOVO	E40-30	MP05R5GB	N/A

NO.	DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A



## 4. TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 Limits of Conducted Emission Measurement

##### TEST STANDARD: FCC Part 15, Subpart B (Section: 15.107)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	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 0.50 MHz.
  - (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCS30	8471241027	Apr. 04,19	Apr. 03,20
Artificial Mains Network	SCHWARZBEC K	8127	8127713	Mar. 28,19	Mar. 27,20
ISN	Com-Power	ISN T800	34373	Mar. 28,19	Mar. 27,20
Test software	EZ-EMC	ICP-03A1	N/A	N/A	N/A

- NOTE:**
1. The test was performed at Shielded Room 553.
  2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



#### 4.1.3 Test Procedure

The basic test procedure was in accordance with ANSI C63.4:2014 (section 7).

- a. 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.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20dB) were not recorded.

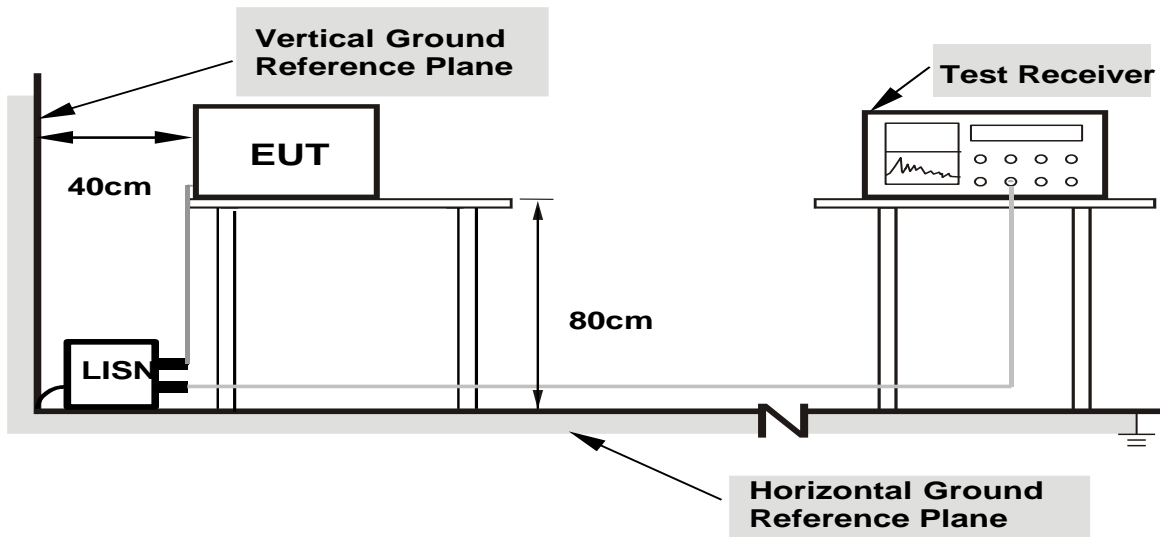
#### **NOTE:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.1.5 Test Setup



- Note: 1.Support units were connected to second LISN.  
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.**

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power of all equipment.
- b. EUT was operated according to the type description in manufacturer's specifications or the User's Manual.

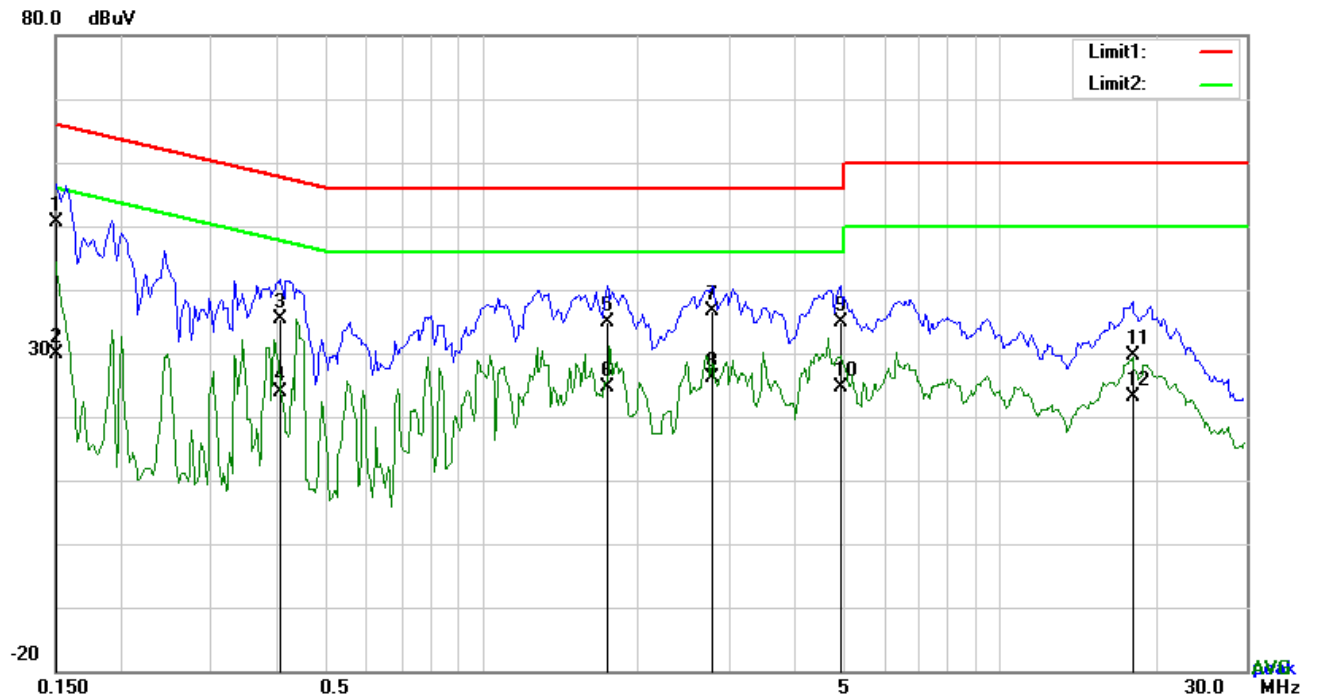


**4.1.7 Test Results**

<b>PHASE</b>	Line	<b>6DB BANDWIDTH</b>	9 kHz
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No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	L1	0.1500	40.62	QP	10.12	50.74	66.00	-15.26
2	L1	0.1500	19.80	AVG	10.12	29.92	56.00	-26.08
3	L1	0.4074	25.32	QP	10.10	35.42	57.70	-22.28
4	L1	0.4074	13.86	AVG	10.10	23.96	47.70	-23.74
5	L1	1.7451	24.66	QP	10.14	34.80	56.00	-21.20
6	L1	1.7451	14.44	AVG	10.14	24.58	46.00	-21.42
7	L1	2.7903	26.37	QP	10.16	36.53	56.00	-19.47
8	L1	2.7903	16.01	AVG	10.16	26.17	46.00	-19.83
9	L1	4.9266	24.67	QP	10.20	34.87	56.00	-21.13
10	L1	4.9266	14.31	AVG	10.20	24.51	46.00	-21.49
11	L1	18.0930	19.31	QP	10.37	29.68	60.00	-30.32
12	L1	18.0930	12.74	AVG	10.37	23.11	50.00	-26.89

**REMARKS:** The emission levels of other frequencies were very low against the limit.

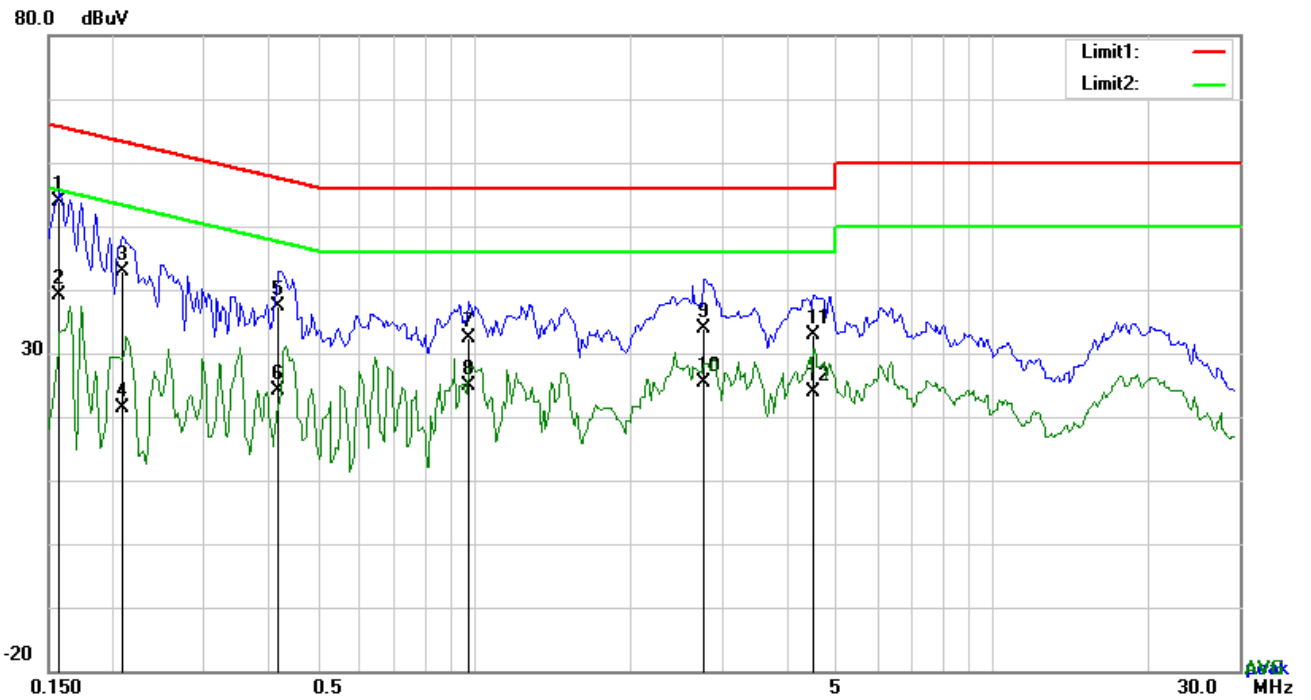




<b>PHASE</b>	Neutral	<b>6DB BANDWIDTH</b>	9 kHz
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No.	P/L	Frequency (MHz)	Reading (dBUV)	Detector	Corrected (dB)	Result (dBUV)	Limit (dBUV)	Margin (dB)
1	N	0.1578	43.68	QP	10.14	53.82	65.58	-11.76
2	N	0.1578	28.96	AVG	10.14	39.10	55.58	-16.48
3	N	0.2085	32.70	QP	10.13	42.83	63.26	-20.43
4	N	0.2085	11.28	AVG	10.13	21.41	53.26	-31.85
5	N	0.4191	27.26	QP	10.12	37.38	57.47	-20.09
6	N	0.4191	14.11	AVG	10.12	24.23	47.47	-23.24
7	N	0.9729	22.12	QP	10.15	32.27	56.00	-23.73
8	N	0.9729	14.64	AVG	10.15	24.79	46.00	-21.21
9	N	2.7708	23.73	QP	10.18	33.91	56.00	-22.09
10	N	2.7708	15.17	AVG	10.18	25.35	46.00	-20.65
11	N	4.5249	22.56	QP	10.20	32.76	56.00	-23.24
12	N	4.5249	13.67	AVG	10.20	23.87	46.00	-22.13

**REMARKS:** The emission levels of other frequencies were very low against the limit.





## 4.2 RADIATED EMISSION MEASUREMENT

### 4.1.8 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), 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.



#### 4.1.9 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESL6	1300.5001K06 -100262-eQ	Apr. 04, 19	Apr. 03, 20
Bilog Antenna	Sunol Sciences	JB6	A110712	Apr. 08, 19	Apr. 07, 20
Active Antenna	CMO-POWER	AL-130	121031	Mar. 27, 19	Mar. 26, 20
Signal Amplifier	HP	8447E	443008	Mar. 28, 19	Mar. 27, 20
Spectrum	Agilent	E4446A	MY46180622	8-May-19	7-May-20
MXA signal analyzer	Agilent	N9020A	MY49100060	Mar. 28, 19	Mar. 27, 20
Horn Antenna	COM-POWER	HAH-118	71259	Mar. 22, 19	Mar. 21, 20
Horn Antenna	COM-POWER	HAH-118	71283	Mar. 20, 19	Mar. 19, 20
SHF-EHF Horn	Schwarzbeck	BBHA9170	BBHA9170147	Jun. 30, 19	Jun. 29, 20
SHF-EHF Horn	Schwarzbeck	BBHA9170	BBHA9170242	Jun. 30, 19	Jun. 29, 20
AMPLIFIER	EM Electornic Corporation	EM01G26G	60613	Mar. 28, 19	Mar. 27, 20
AMPLIFIER	Emc Instruments Corporation	Emc012645	980077	Jan. 04, 19	Jan. 03,20
3m Semi-anechoic Chamber	SAEMC	9m*6m*6m	N/A	Oct. 18,18	Oct. 17,21
Test Software	EZ-EMC	ICP-03A1	N/A	N/A	N/A

**NOTE:**

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 749762.

#### 4.1.10 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. 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 antenna is a broadband antenna, and its height 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

#### **NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

#### 4.1.11 DEVIATION FROM TEST STANDARD

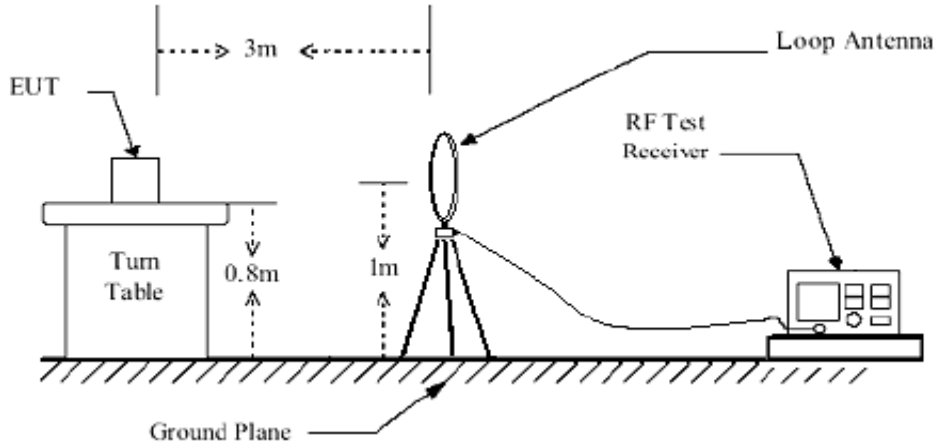
No deviation.



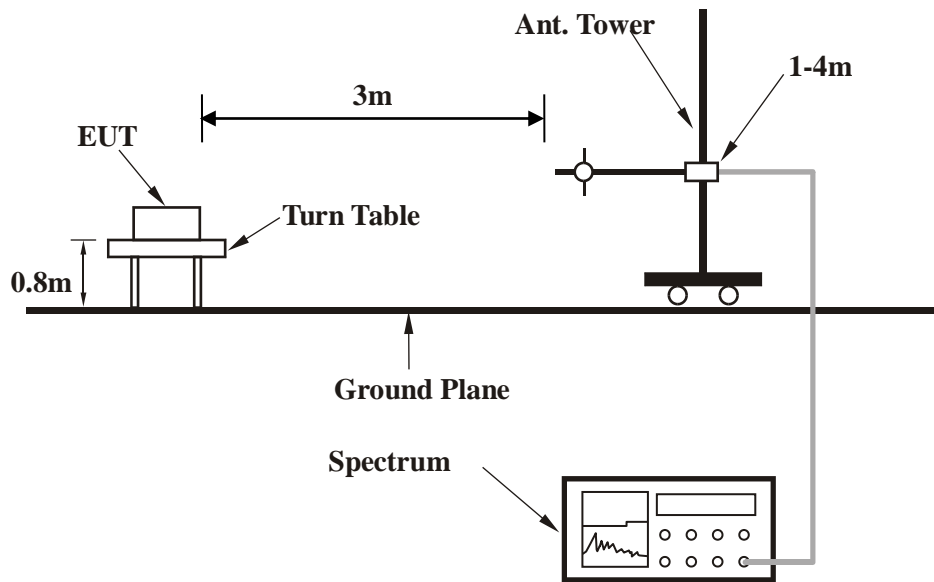


### 4.1.12 TEST SETUP

#### Below 30MHz test setup

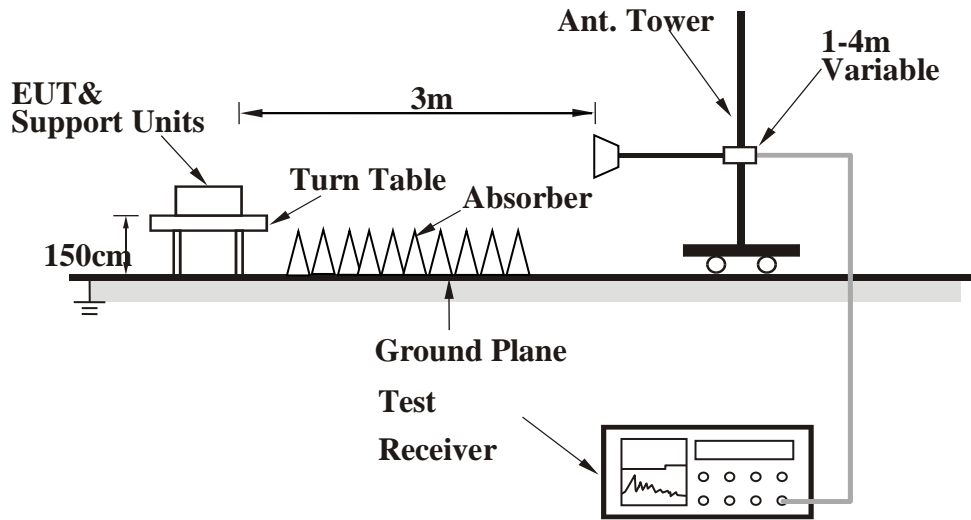


#### Below 1GHz test setup





## Above 1GHz test setup



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

### 4.1.13 EUT OPERATING CONDITIONS

- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.



**4.1.14 TEST RESULTS**

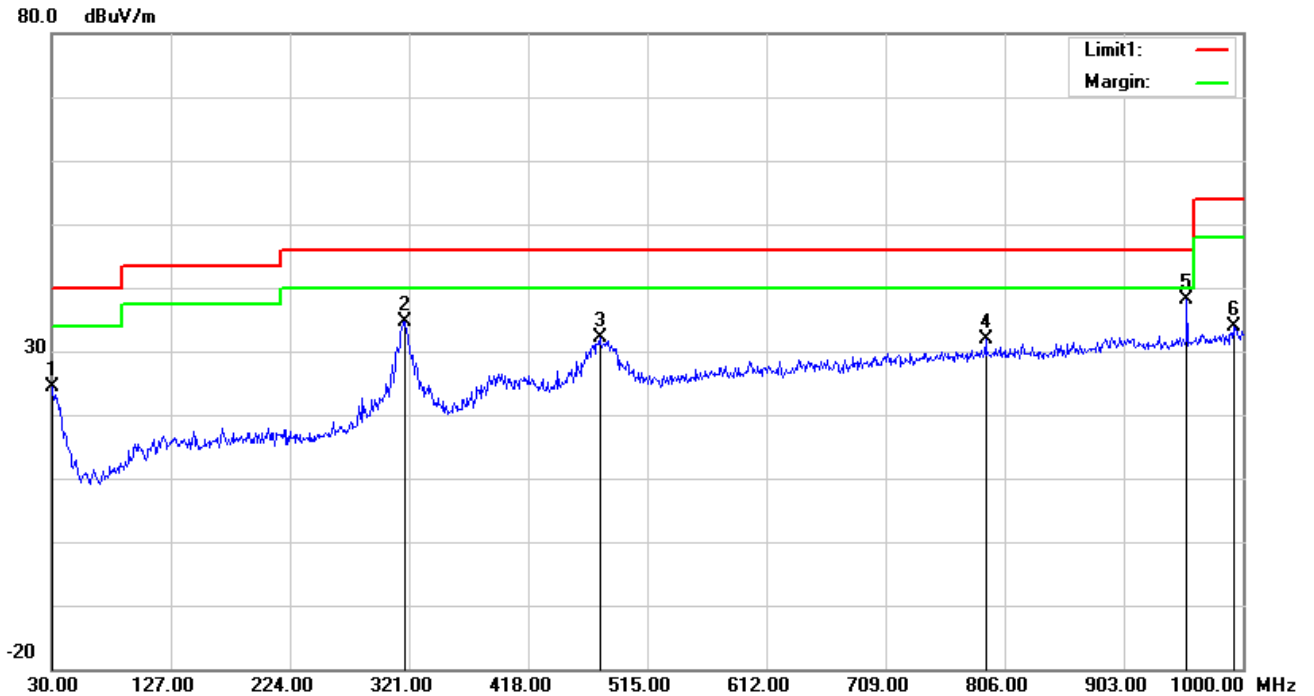
**BELOW 1GHz WORST-CASE DATA**

<b>CHANNEL</b>	TX Middle Channel	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	30.0000	26.34	20.10	22.28	0.13	24.29	40.00	-15.71	100	255
2	317.1200	41.07	14.04	22.24	1.76	34.63	46.00	-11.37	100	257
3	476.2000	33.51	18.41	21.86	2.07	32.13	46.00	-13.87	100	355
4	790.4800	28.30	22.11	21.17	2.54	31.78	46.00	-14.22	100	297
5	954.4100	32.60	23.70	20.78	2.71	38.23	46.00	-7.77	100	304
6	992.2400	27.68	24.18	20.70	2.75	33.91	54.00	-20.09	100	280

**REMARK:**

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 Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.



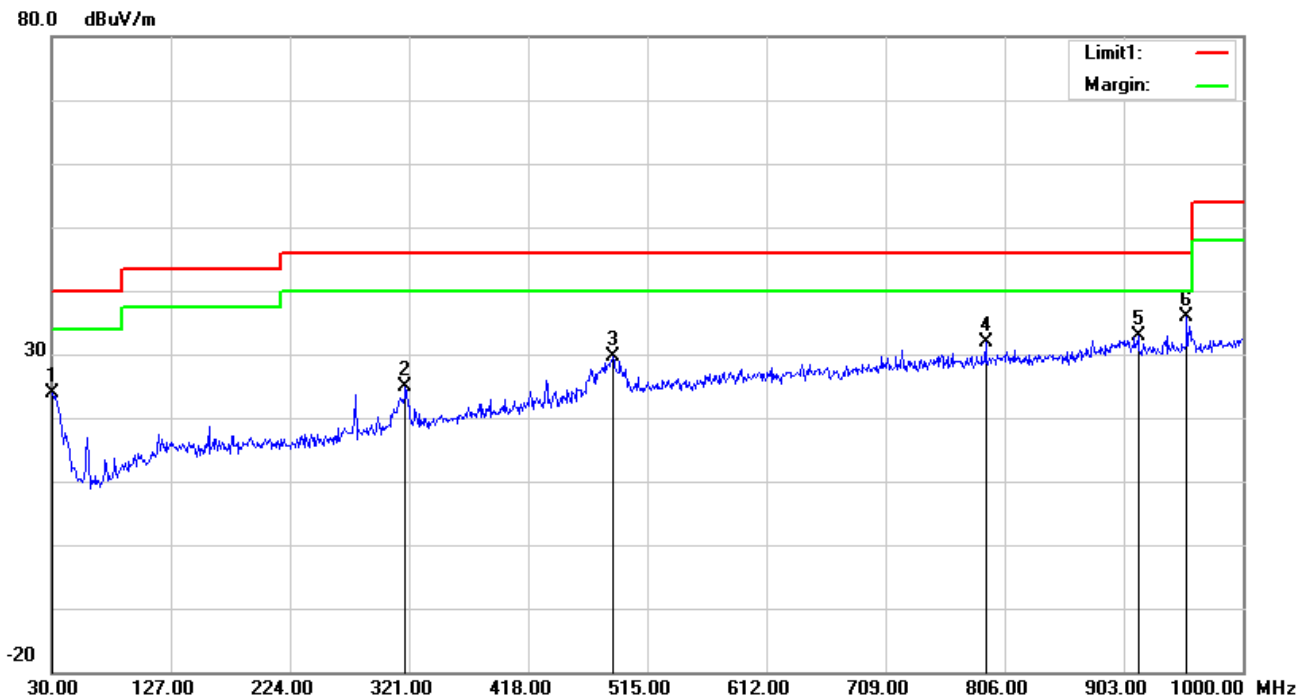


<b>CHANNEL</b>	TX Middle Channel	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 m										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	30.0000	26.05	20.10	22.28	0.13	24.00	40.00	-16.00	100	311
2	318.0900	31.37	14.06	22.24	1.77	24.96	46.00	-21.04	200	211
3	486.8700	30.77	18.54	21.84	2.10	29.57	46.00	-16.43	100	141
4	790.4800	28.37	22.11	21.17	2.54	31.85	46.00	-14.15	100	144
5	914.6400	27.34	23.61	20.85	2.66	32.76	46.00	-13.24	100	252
6	954.4100	30.23	23.70	20.78	2.71	35.86	46.00	-10.14	100	241

**REMARK:**

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 Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.





ABOVE 1GHZ WORST-CASE DATA:

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

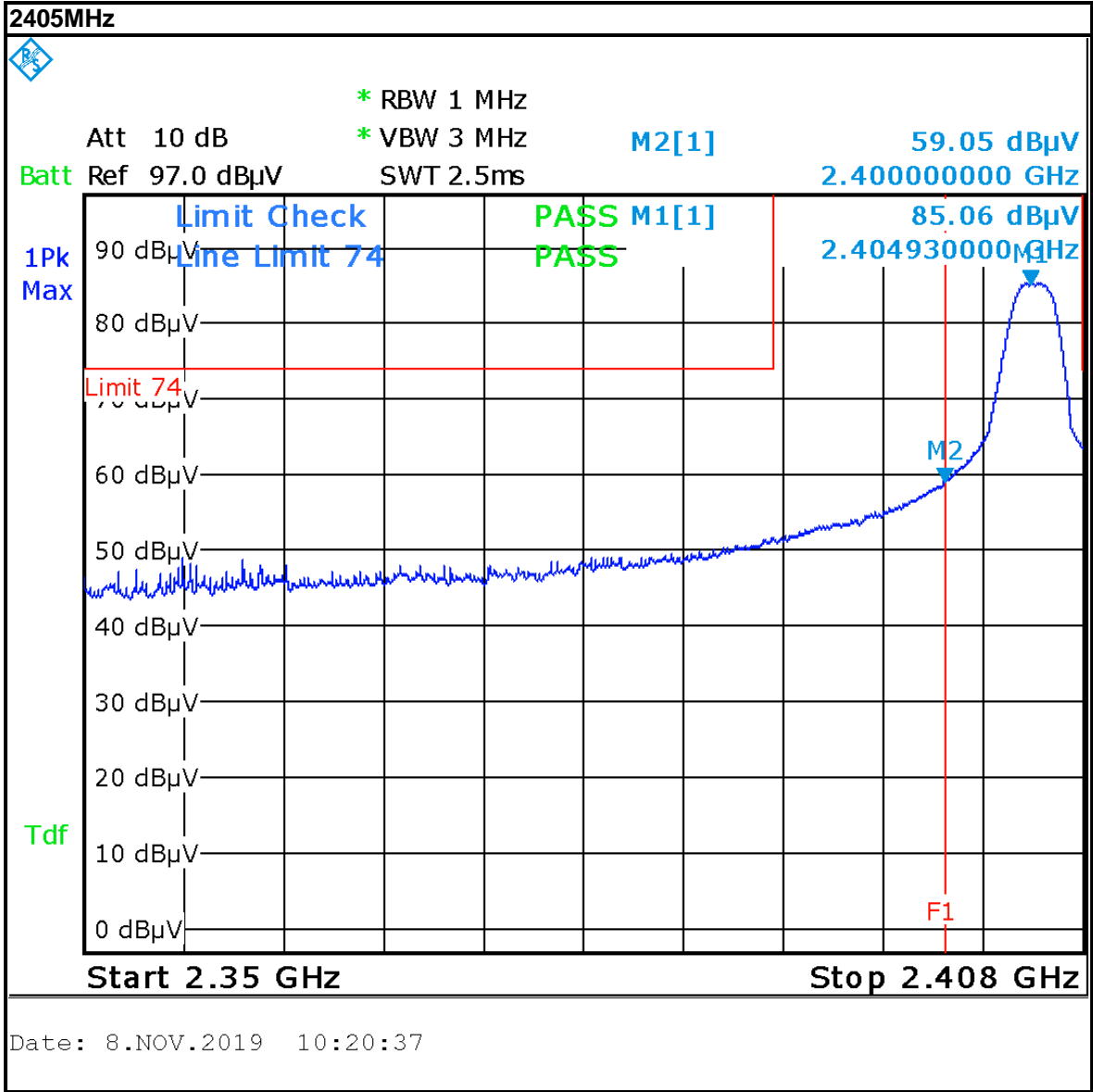
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400	59.05	PK	74	-14.95	107	20	72.75	-13.7
2	2400	47.01	AV	54	-6.99	237	228	60.71	-13.7
3	*2405	85.06	PK	114	-28.94	276	175	98.76	-13.7
4	*2405	73.02	AV	94	-20.98	122	212	86.72	-13.7
5	4810	53.21	PK	74	-20.79	121	357	59.59	-6.38
6	4810	41.17	AV	54	-12.83	181	163	47.55	-6.38
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400	55.24	PK	74	-18.76	186	160	68.94	-13.7
2	2400	43.2	AV	54	-10.8	284	240	56.9	-13.7
3	*2405	82.65	PK	114	-31.35	101	225	96.35	-13.7
4	*2405	70.61	AV	94	-23.39	179	22	84.31	-13.7
5	4810	52.13	PK	74	-21.87	247	41	58.51	-6.38
6	4810	40.09	AV	54	-13.91	197	178	46.47	-6.38

REMARK:

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 Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.



Band edge Plot





CHANNEL	TX Middle Channel	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)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442	87.15	PK	114	-26.85	123	54	100.85	-13.7
2	*2442	75.11	AV	94	-18.89	123	54	88.81	-13.7
3	4884	55.69	PK	74	-18.31	174	360	61.63	-5.94
4	4884	43.65	AV	54	-10.35	174	360	49.59	-5.94
5	2047	51.21	PK	74	-22.79	281	64	65.59	-14.38
6	2047	39.17	AV	54	-14.83	281	64	53.55	-14.38
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442	83.48	PK	114	-30.52	224	118	97.18	-13.7
2	*2442	71.44	AV	94	-22.56	224	118	85.14	-13.7
3	4884	53.48	PK	74	-20.52	213	102	59.42	-5.94
4	4884	41.44	AV	54	-12.56	213	102	47.38	-5.94
5	2664	49.95	PK	74	-24.05	229	143	62.92	-12.97
6	2664	37.91	AV	54	-16.09	229	143	50.88	-12.97

REMARK:

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 Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.



CHANNEL	TX High Channel	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)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2483.5	59.29	PK	74	-14.71	243	282	72.79	-13.5
2	2483.5	47.25	AV	54	-6.75	243	282	60.75	-13.5
3	*2477	87.6	PK	114	-26.4	190	203	101.1	-13.5
4	*2477	75.56	AV	94	-18.44	190	203	89.06	-13.5
5	4954	55.83	PK	74	-18.17	286	238	61.27	-5.44
6	4954	41.67	AV	54	-12.33	286	238	47.11	-5.44
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTOR (PK/AV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2483.5	54.63	PK	74	-19.37	254	112	68.13	-13.5
2	2483.5	42.59	AV	54	-11.41	254	112	56.09	-13.5
3	*2477	83.94	PK	114	-30.06	201	157	97.44	-13.5
4	*2477	71.9	AV	94	-22.1	201	157	85.4	-13.5
5	4954	54.21	PK	74	-19.79	172	251	59.65	-5.44
6	4954	42.17	AV	54	-11.83	172	251	47.61	-5.44

REMARK:

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 Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.

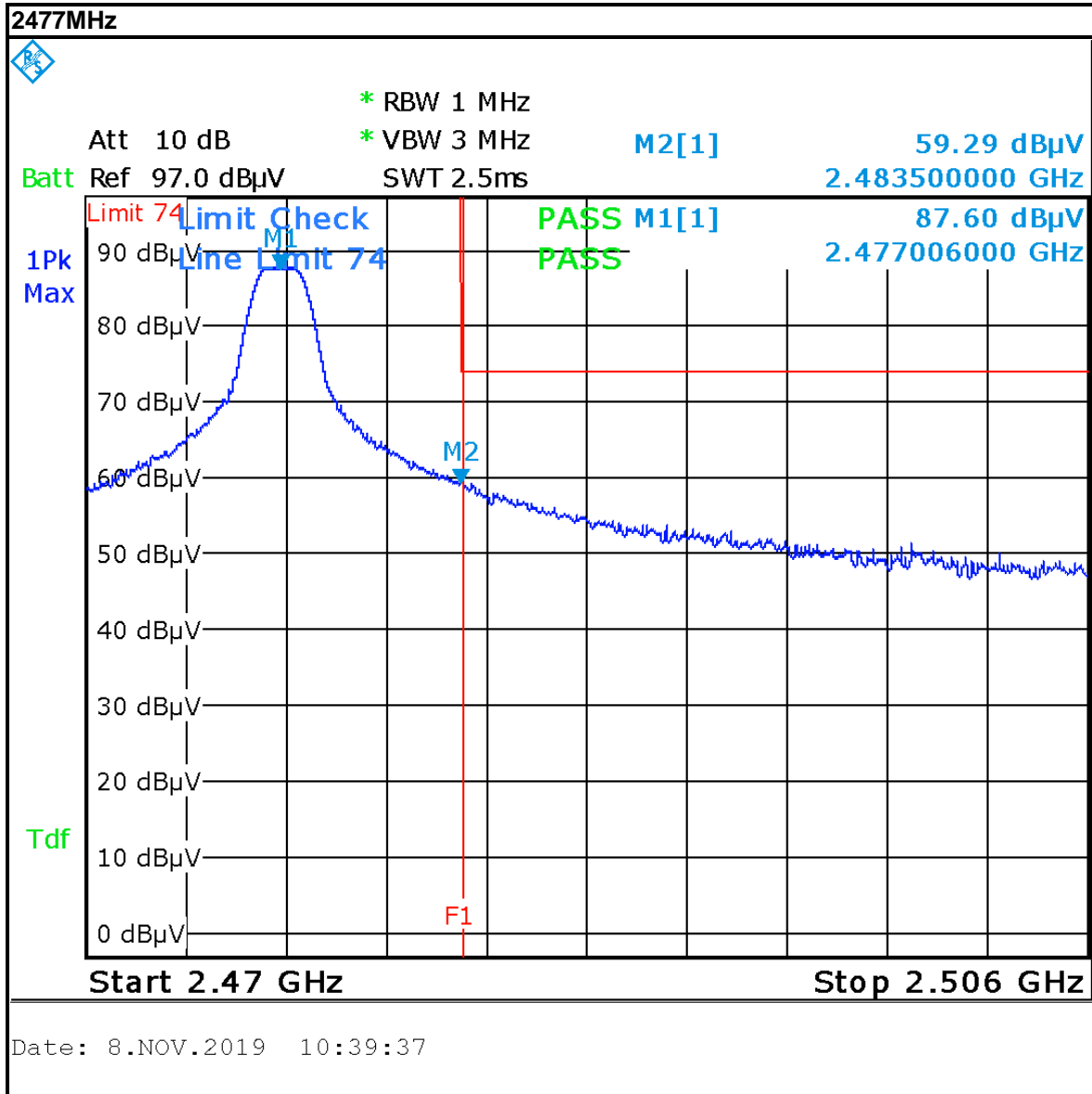




BUREAU VERITAS

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### Band edge Plot





### 4.3 20DB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

#### 4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Wireless Connectivity Tester	R&S	CMW270	1201.0002K75	Nov. 29, 18	Nov. 28, 19
MXA VEXTOR SIGNAL	Agilent	n5182a	MY50140530	Mar. 28,19	Mar. 27,20
MXA signal analyzer	Agilent	n9020a	MY49100060	Mar. 28,19	Mar. 27,20
RF Control Unit	Tonscend	JS0806-2	188060112	Mar. 28,19	Mar. 27,20
Signal Generation	Agilent	E4421B	US40051152	Nov. 29, 18	Nov. 28, 19
DC Power Supply	Agilent	E3640A	MY40004013	Mar. 28,19	Mar. 27,20
Programmable Temperature & Humidity Chamber	Hongjin	HYC-TH-225 DH	DG-180746	Mar. 28,19	Mar. 27,20
Test System	Tonscend	JS 1120-3	N/A	N/A	N/A
Power Splitter	Weinschel	1580-1	TL177	Mar. 20,19	Mar. 19,20
Universal Radio Communication	ROHDE&SCHWARZ	CMU200	112012	Mar. 28,19	Mar. 27,20
Universal Radio Communication	ROHDE&SCHWARZ	CMU200	121393	Mar. 28,19	Mar. 27,20
Wireless Communication Test Set	ROHDE&SCHWARZ	CMW500	1201.0002K500-155842-Gd	Aug. 06, 19	Aug. 05, 20

**NOTE:**

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

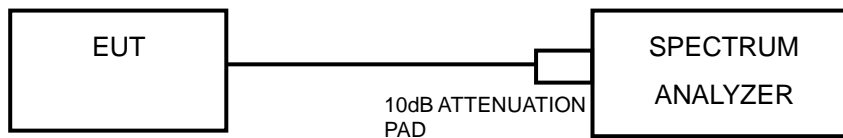
#### 4.3.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.5 TEST SETUP



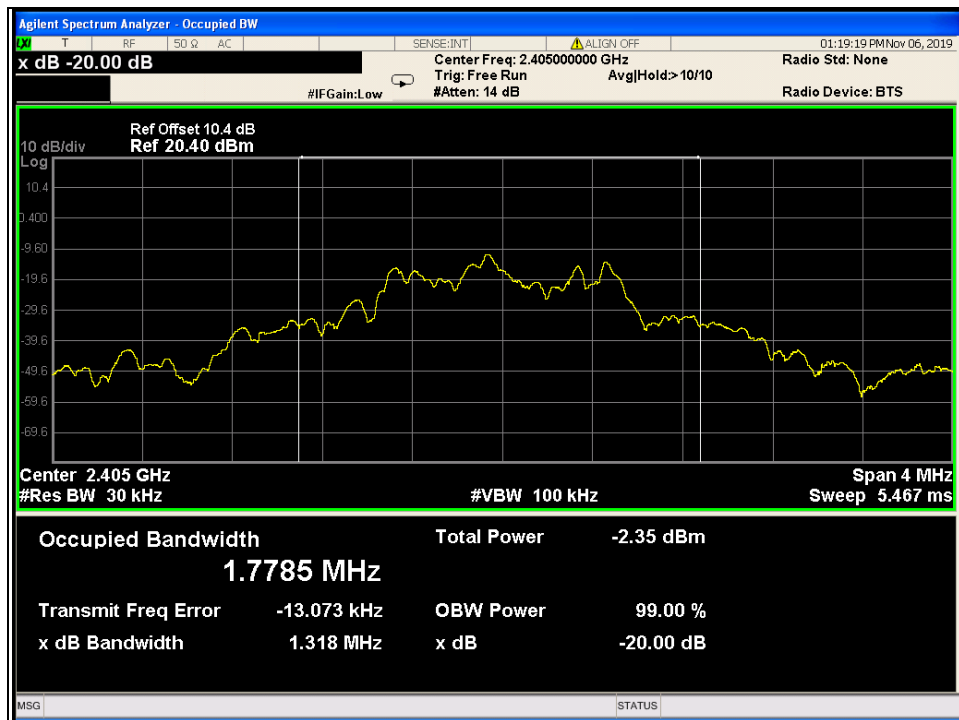
#### 4.3.6 EUT OPERATING CONDITIONS

- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

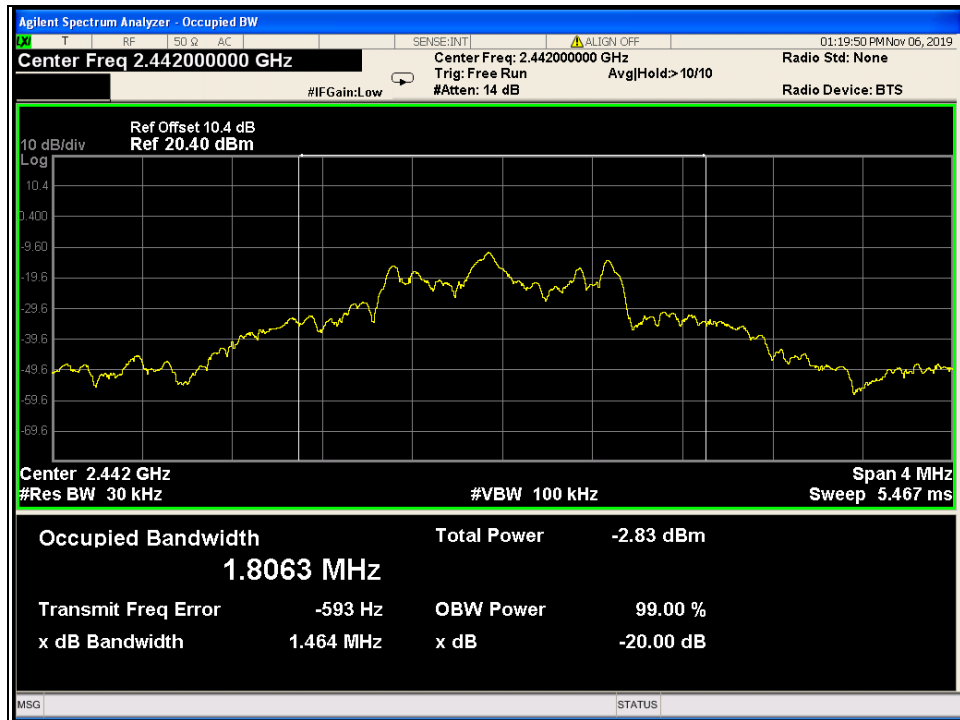
### 4.3.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2410	1.318
Middle	2440	1.464
High	2470	1.467

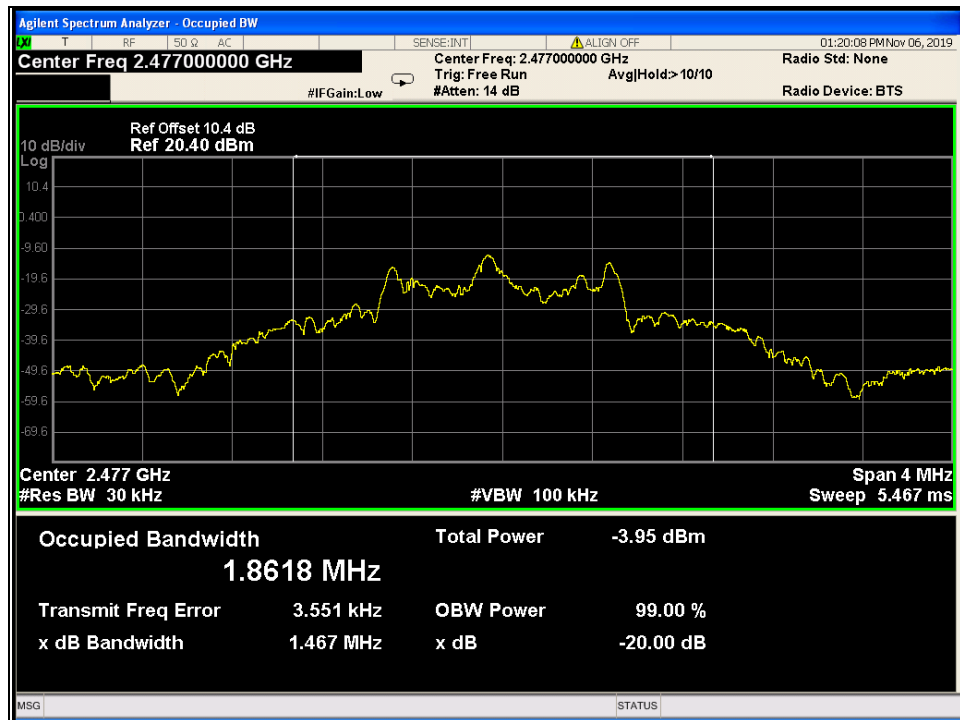
#### Test Data: Low channel



Test Data: Middle channel



Test Data: High channel





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## **5. PHOTOGRAPHS OF THE TEST CONFIGURATION**

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



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## 6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---