

Test Report

FCC ID : ZXW-WF68

Date of issue: Jun. 16, 2017

Report Number:	MTi170706E051
Sample Description:	Mobile Computer
Model(s):	WF68, WF68S, WF88
Applicant:	Widely Ltd.
Address:	Unit 205, 2/F, Lakeside 2, No.10 Science Park West Avenue, Hong Kong Science Park, Shatin, N.T., HONG KONG.
Date of Test:	May. 26, 2017 to Jun. 16, 2017

Shenzhen Microtest Co., Ltd.
<http://www.mtitest.com>



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TEST RESULT CERTIFICATION	
Applicant's name	Widefly Ltd.
Address	Unit 205, 2/F, Lakeside 2, No.10 Science Park West Avenue, Hong Kong Science Park, Shatin, N.T., HONG KONG.
Manufacture's Name	Widefly Ltd.
Address	Unit 205, 2/F, Lakeside 2, No.10 Science Park West Avenue, Hong Kong Science Park, Shatin, N.T., HONG KONG.
Product description	
Product name	Mobile Computer
Model and/or type reference :	WF68
Serial Model	WF68S, WF88
Standards	FCC Part15.247
Test procedure	ANSI C63.10-2013

Tested by:



Ace Chai

Jun. 15, 2017

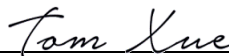
Reviewed by:



Smith Chen

Jun. 16, 2017

Approved by:



Tom Xue

Jun. 16, 2017

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	
15.247 (d)	Power Spectral Density	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen Toby Technology Co., Ltd.

Add.: 10/F.,A Block, Jiada R&D Bldg., No.5 Songpingshan, Road, Science&Technology Park,
Shenzhen, 518057

FCC Registration No.:811562

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Mobile Computer	
Trade Name	Widely	
Model Name	WF68	
Serial Model	WF68S, WF88	
Model Difference	N/A	
Product Description	The EUT is a Mobile Computer	
	Operation Frequency:	BLE 2402-2480MHz
	Modulation Type:	GFSK
	Bit Rate of Transmitter	1Mbps
	Number Of Channel	40
	Antenna Designation:	Please see Note 3.
	Output Power(Conducted):	BLE: -2.48 dBm (Max.)
	Antenna Gain (dBi)	-0.76dbi
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.		
Channel List	Please refer to the Note 2.	
Adapter	Model: UT-133E- 5200ZY AC Power Input: 100-240V~50/60Hz 0.3A MAX Output :5V DC, 2000mA	
Battery	Model:EU955164PV 3.8V 4600mAh	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2.

Channel List for BLE							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	--	---	20	2440	38	2476
02	2404	--	---	--	---	39	2478
03	2406	19	2438	--	---	40	2480

3.

Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	integrated antenna	-	-0.76dBi	BT Antenna

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	BLE CH1/ CH20/ CH40
Mode 2	Link Mode

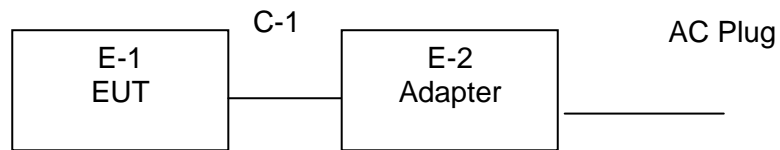
For Conducted Emission	
Final Test Mode	Description
Mode 2	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	BLE CH1/ CH20/ CH40

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	Rugged Smartphone	DragonKing	WF68	N/A	EUT
E-2	Adapter	N/A	UT-133E- 5200ZY	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.0m	
C-2	NO	NO	0.8m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

For RF conducted test:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
Signal Analyzer	Agilent	N9010A	MY48030494	2017/11/4
4 Ch. Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	TW54063513	2017/11/4
X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY54080019	2017/11/4
vector Signal Generator	Agilent	E4438C	US44271917	2017/11/4
vector Signal Generator	Agilent	E4438C	MY49070163	2017/11/4
Dc Power Supply	GW	GPR-6030D	/	2017/11/4
Temperature & Humidity Chamber	GIANT FORCE	GTH-056P	GF-94454-1	2017/11/4
Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	120909	2017/11/4

For Radiated test:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
Broadband TRILOG Antenna	Schwarabeck	VULB9163	9163-872	2017/11/14
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1145	2017/11/14
Amplifier	HP	8447D	3113A06150	2017/11/4
Amplifier	Agilent	8449B	3008A02400	2017/11/4
Test Receiver	Schwarabeck	ESPI7	100314	2017/11/4
Spectrum analyzer	Agilent	E4407B	MY41441082	2017/11/4
Signal Generator	R&S	SMT 06	832080/007	2017/11/4

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

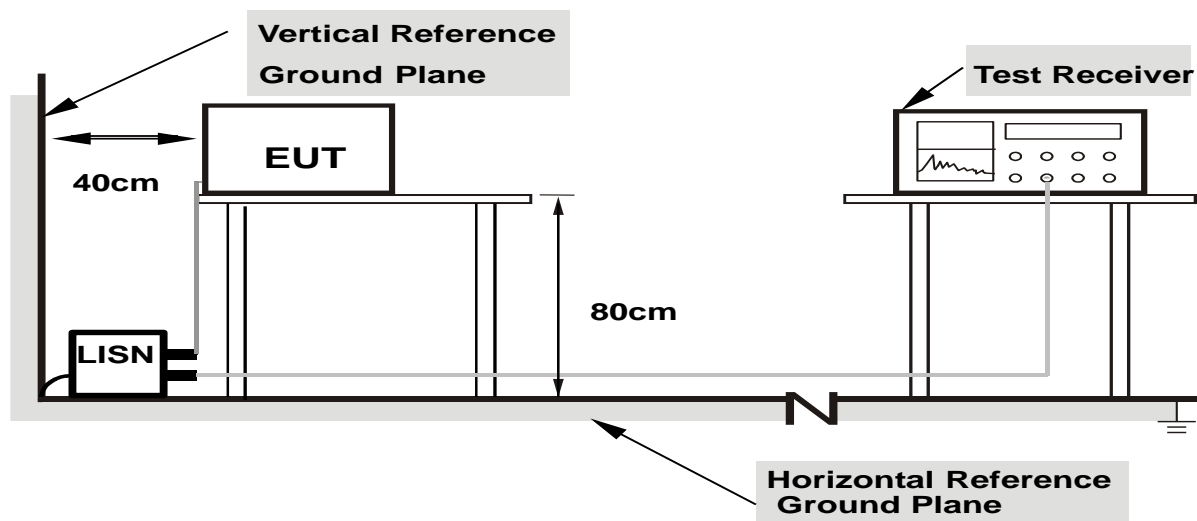
3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



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

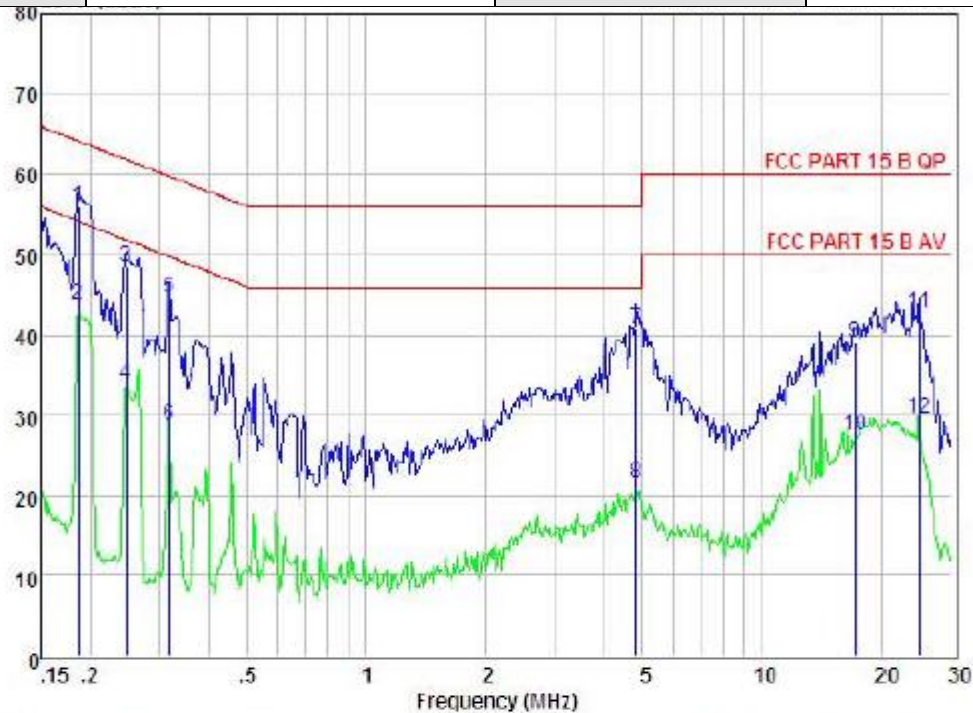
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

EUT :	Mobile Computer	Model Name. :	WF68
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5Vfrom adapter AC 120V/60Hz	Test Mode :	Mode 5

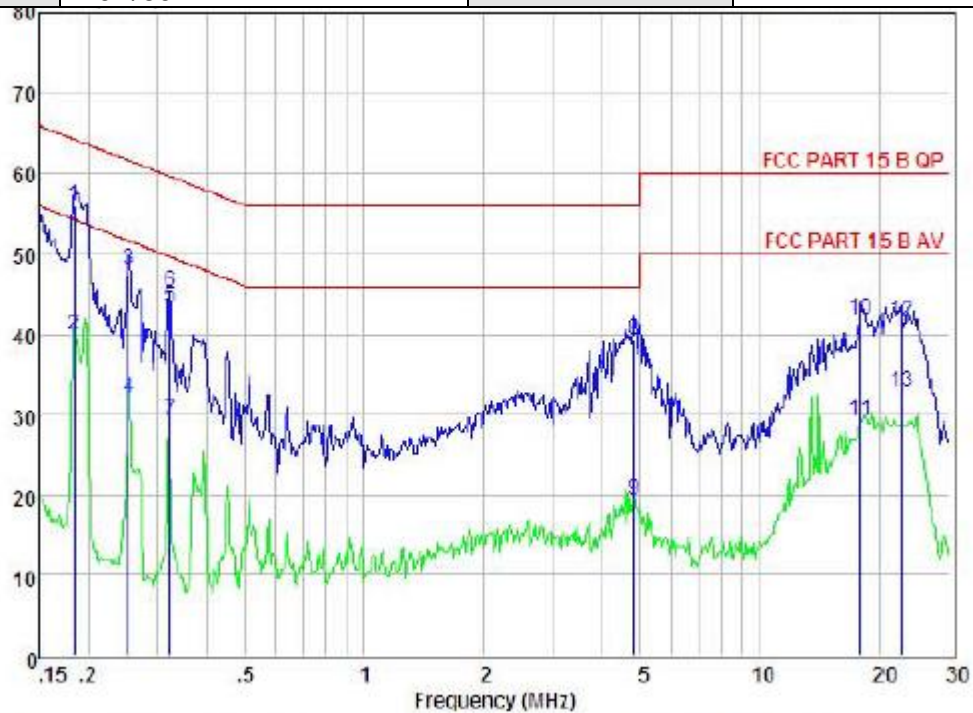


Condition : FCC PART 15 B QP POL: LINE Temp: 23.1°C Hum: 48 %
 EUT :
 Model No :
 Test Mode :
 Power :
 Test Engineer :
 Remark :

Item	Freq MHz	Read Level dBμV	LISN Factor dB	Preamplifier Factor dB	Cable Loss dB	Level dBμV	Limit dBμV	Margin dBμV	Remark
1	0.186	46.28	0.03	-9.52	0.10	55.93	64.20	-8.27	QP
2	0.186	34.15	0.03	-9.52	0.10	43.60	54.20	-10.40	Average
3	0.247	38.81	0.03	-9.52	0.10	48.46	61.86	-13.40	QP
4	0.247	24.15	0.03	-9.52	0.10	33.80	51.86	-18.06	Average
5	0.317	34.93	0.03	-9.56	0.10	44.62	59.80	-15.18	QP
6	0.317	19.12	0.03	-9.56	0.10	28.81	49.80	-20.99	Average
7	4.822	30.63	0.10	-9.91	0.12	40.76	56.00	-15.24	QP
8	4.822	11.27	0.10	-9.91	0.12	21.40	46.00	-24.60	Average
9	17.291	28.64	0.28	-9.82	0.30	39.04	60.00	-20.96	QP
10	17.291	17.14	0.28	-9.82	0.30	27.54	50.00	-22.46	Average
11	24.790	31.95	0.46	-9.82	0.47	42.70	60.00	-17.30	QP
12	24.790	18.94	0.46	-9.82	0.47	29.69	50.00	-20.31	Average

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

EUT :	Mobile Computer	Model Name. :	WF68
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5Vfrom adapter AC 120V/60Hz	Test Mode :	Mode 5



Condition : FCC PART 15 B QP POL: NEUTRAL Temp: 23.1°C Hum: 48 %
EUT :
Model No :
Test Mode :
Power :
Test Engineer :
Remark :

Item	Freq MHz	Read Level dBuV	LISN Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	0.184	46.34	0.03	-9.52	0.10	55.99	64.28	-8.29	QP
2	0.184	30.32	0.03	-9.52	0.10	39.97	54.28	-14.31	Average
3	0.253	38.34	0.03	-9.56	0.10	46.03	61.64	-15.61	QP
4	0.253	22.35	0.03	-9.56	0.10	32.04	51.64	-19.60	Average
5	0.322	33.60	0.03	-9.56	0.10	43.29	59.66	-16.37	QP
6	0.322	35.60	0.03	-9.56	0.10	45.29	59.66	-14.37	QP
7	0.322	19.53	0.03	-9.56	0.10	29.22	49.66	-20.44	Average
8	4.822	29.11	0.10	-9.91	0.12	39.24	56.00	-16.76	QP
9	4.822	9.26	0.10	-9.91	0.12	19.39	46.00	-26.61	Average
10	18.039	31.48	0.29	-9.82	0.32	41.91	60.00	-18.09	QP
11	18.039	18.77	0.29	-9.82	0.32	29.20	50.00	-20.80	Average
12	22.655	30.91	0.41	-9.81	0.42	41.55	60.00	-18.45	QP
13	22.655	22.14	0.41	-9.81	0.42	32.78	50.00	-17.22	Average

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

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- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

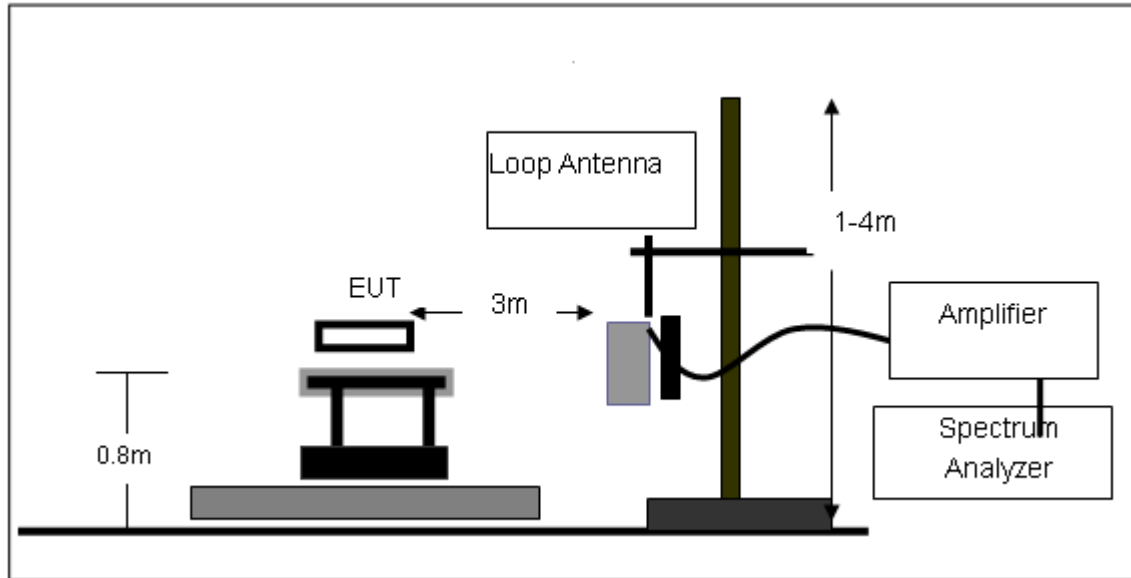
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

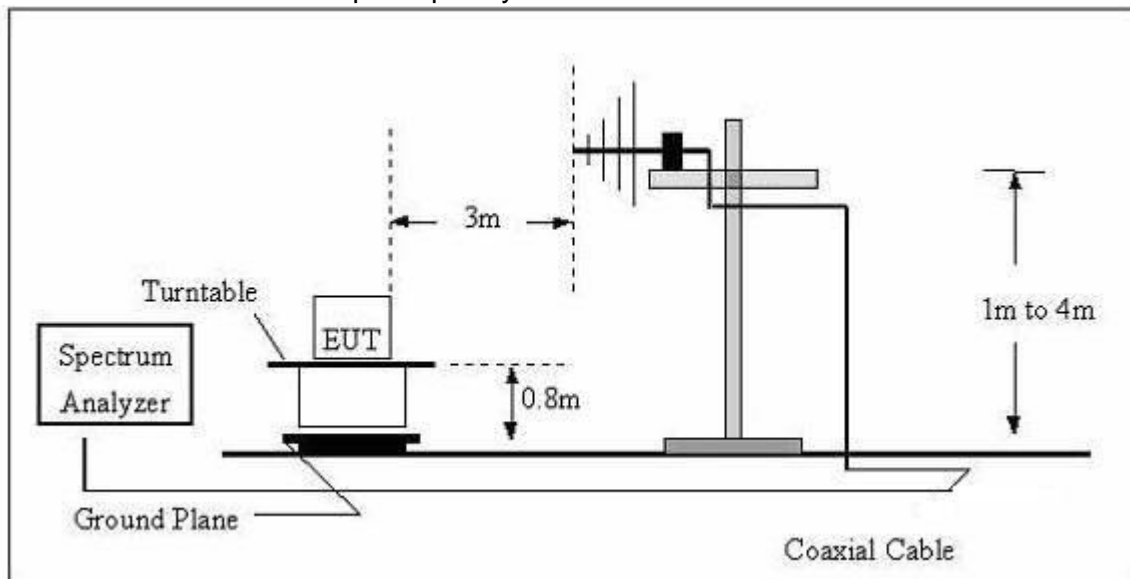
No deviation

3.2.4 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz

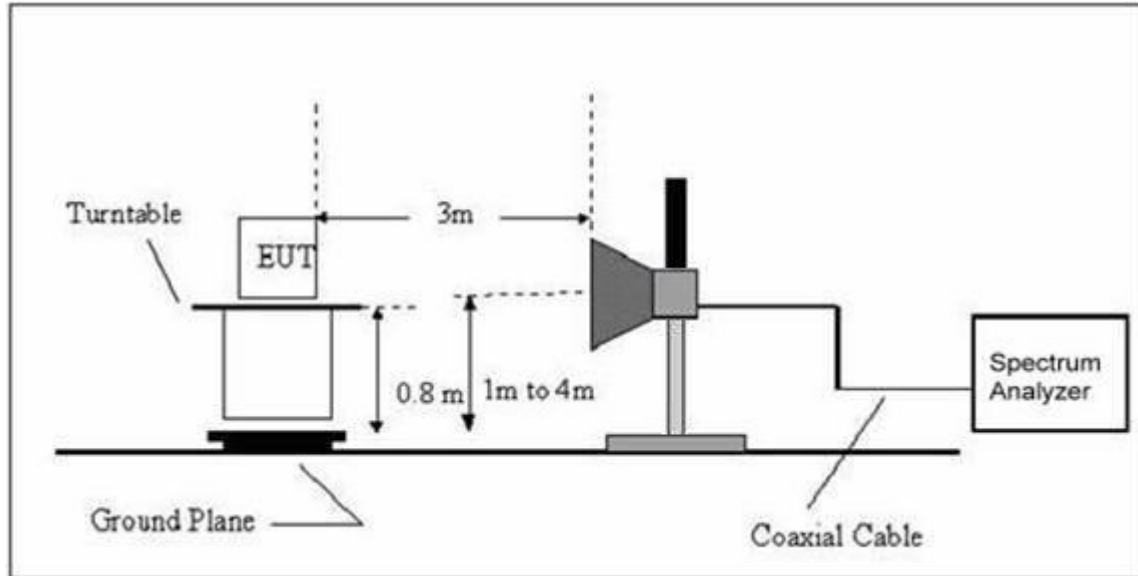


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



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(C) Radiated Emission Test-Up Frequency Above 1GHz

**3.2.5 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT:	Mobile Computer	Model Name. :	WF68
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5Vfrom adapter AC 120V/60Hz
Test Mode :	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})(\text{dB})$;

Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	Mobile Computer	Model Name :	WF68
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	119.4360	16.13	12.08	28.21	43.5	15.29	QP
V	128.1129	16.09	12.2	28.29	43.5	15.21	QP
V	170.7926	20.49	10.35	30.84	43.5	12.66	QP
V	341.9786	12.27	16.19	28.46	46	17.54	QP
V	468.8761	17.39	19.69	37.08	46	8.92	QP
V	935.5462	9.27	29.42	38.69	46	7.31	QP
H	170.7923	27.51	10.35	37.86	43.5	5.64	QP
H	341.9786	25.07	16.19	41.26	46	4.74	QP
H	468.8761	21.02	19.69	40.71	46	5.29	QP
H	726.8052	14.7	26	40.7	46	5.3	QP
H	813.1114	16.24	26.35	42.59	46	3.41	QP
H	854.0247	12.41	27.51	39.92	46	6.08	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

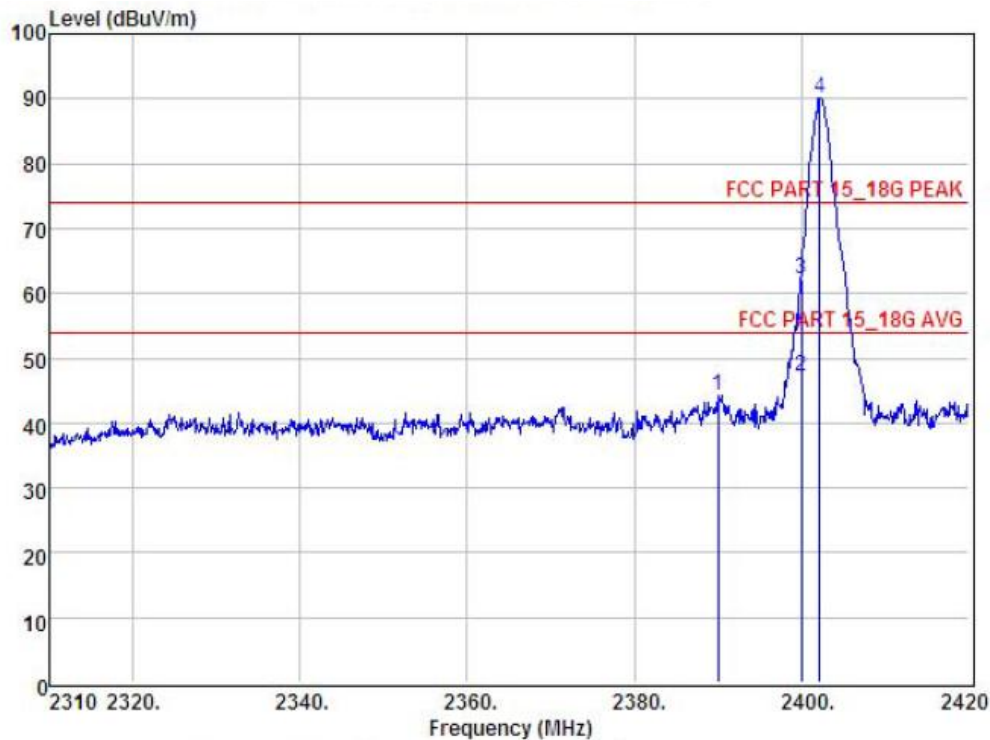
3.2.8 TEST RESULTS (1G-25GHZ)

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Normal Voltage

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (2402 MHz)							
Vertical	2491.777	60.78	-11.65	49.13	74	24.87	Pk
Horizontal	2498.247	57.68	-12.73	44.95	74	29.05	Pk
Vertical	4804.184	57.78	-3.6	54.18	74	19.82	Pk
Horizontal	4804.184	57.78	-9.23	48.55	74	25.45	Pk
Vertical	1485.838	61.48	-17.1	44.38	74	29.62	Pk
Vertical	1636.784	61.17	-16.06	45.11	74	28.89	Pk
Vertical	2095.928	59.98	-11.88	48.1	74	25.9	Pk
Horizontal	1074.301	61.71	-19.69	42.02	74	31.98	Pk
Horizontal	1483.178	60.7	-17.09	43.61	74	30.39	Pk
Horizontal	1895.832	57.72	-14.25	43.47	74	30.53	Pk
Mid Channel (2440 MHz)							
Vertical	2474.777	57.4	-11.65	45.75	74	28.25	Pk
Horizontal	2474.144	58.09	-9.37	48.72	74	25.28	Pk
Vertical	4880.425	57.47	-6.15	51.32	74	22.68	Pk
Horizontal	4880.979	57.47	-6.83	50.64	74	23.36	Pk
Vertical	1433.535	64.46	-17.12	47.34	74	26.66	Pk
Vertical	1636.784	61.79	-16.06	45.73	74	28.27	Pk
Vertical	2284.166	55.53	-12.83	42.7	74	31.3	Pk
Horizontal	1280.515	61.19	-17.82	43.37	74	30.63	Pk
Horizontal	1636.784	60.02	-16.06	43.96	74	30.04	Pk
Horizontal	1892.438	60.14	-14.28	45.86	74	28.14	Pk
High Channel (2480 MHz MHz)							
Vertical	2453.883	58.06	-12.91	45.15	74	28.85	Pk
Horizontal	2453.839	58.06	-11.59	46.47	74	27.53	Pk
Vertical	4960.325	54.57	-9.22	45.35	74	28.65	Pk
Horizontal	4960.683	54.57	-3.64	50.93	74	23.07	Pk
Vertical	1187.688	59.09	-18.27	40.82	74	33.18	Pk
Vertical	1636.784	57.9	-16.06	41.84	74	32.16	Pk
Vertical	2084.693	55.49	-11.99	43.5	74	30.5	Pk
Horizontal	1534.540	58.15	-16.94	41.21	74	32.79	Pk
Horizontal	1786.985	57.86	-15.04	42.82	74	31.18	Pk
Horizontal	1892.438	57.74	-14.28	43.46	74	30.54	Pk

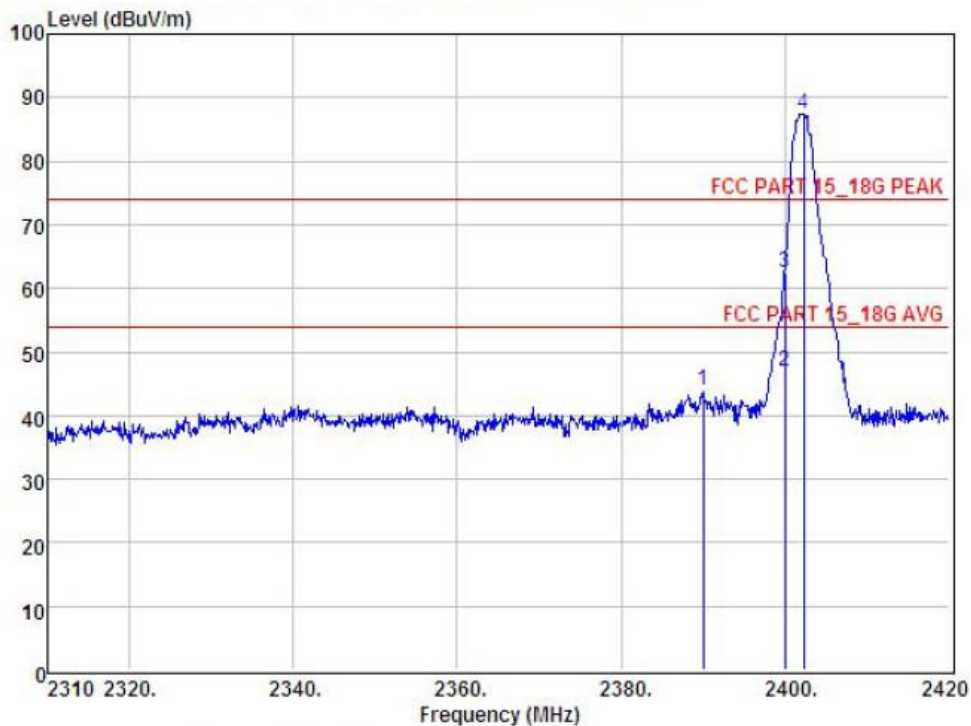
BAND EDGE(Radiated)



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No :
Test Mode : GFSK 2402MHz
Power :
Test Engineer :
Remark :
Temp :
Hum :

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamplifier Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	2390.00	47.67	27.62	34.97	3.92	44.24	74.00	-29.76	Peak
2	2400.00	50.49	27.62	34.97	3.94	47.08	54.00	-6.92	Average
3	2400.00	65.49	27.62	34.97	3.94	62.08	74.00	-11.92	Peak
4	2402.18	93.47	27.62	34.97	3.94	90.06	74.00	16.06	Peak

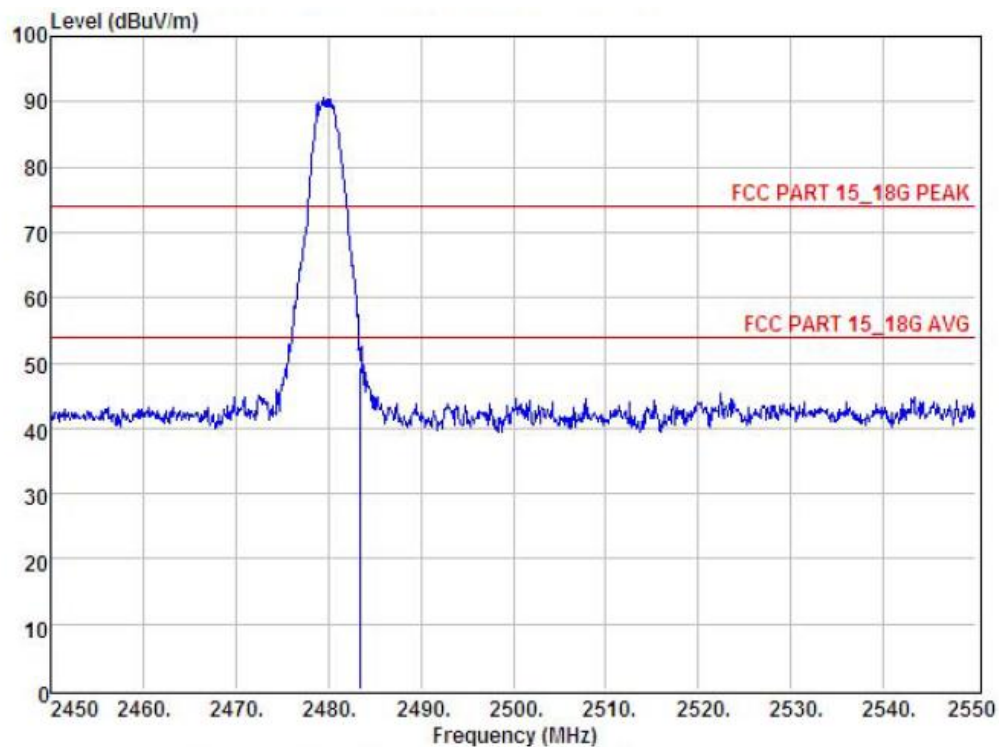
Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No :
Test Mode : GFSK 2402MHz
Power :
Test Engineer :
Remark :
Temp :
Hum :
:

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamplifier Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	2390.00	47.36	27.62	34.97	3.92	43.93	74.00	-30.07	Peak
2	2400.00	50.26	27.62	34.97	3.94	46.85	54.00	-7.15	Average
3	2400.00	65.93	27.62	34.97	3.94	62.52	74.00	-11.48	Peak
4	2402.29	90.88	27.62	34.97	3.94	87.47	74.00	13.47	Peak

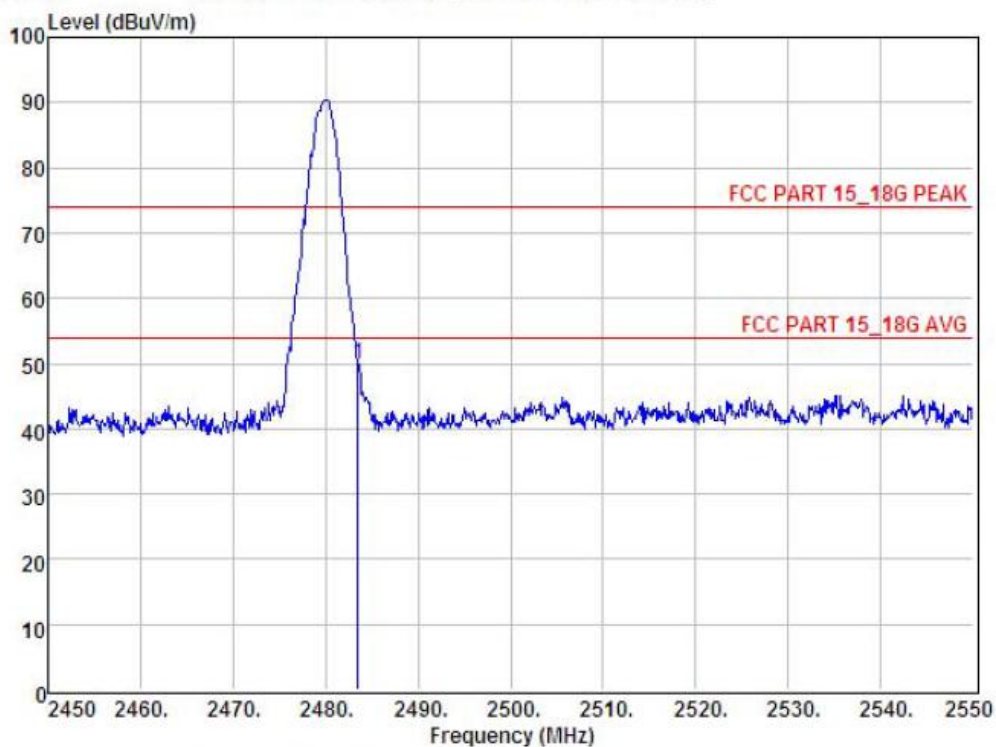
Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No :
Test Mode : GFSK 2480MHz
Power :
Test Engineer :
Remark :
Temp :
Hum :

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	2483.50	52.67	27.59	34.97	4.00	49.29	74.00	-24.71	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No :
Test Mode : GFSK 2480MHz
Power :
Test Engineer :
Remark :
Temp :
Hum :

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	2483.50	53.37	27.59	34.97	4.00	49.99	74.00	-24.01	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

NOTE: The PK value is less than the AV value, AV value is not required.

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW ≥ 3 kHz.
4. Set the VBW $\geq 3 \times$ RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



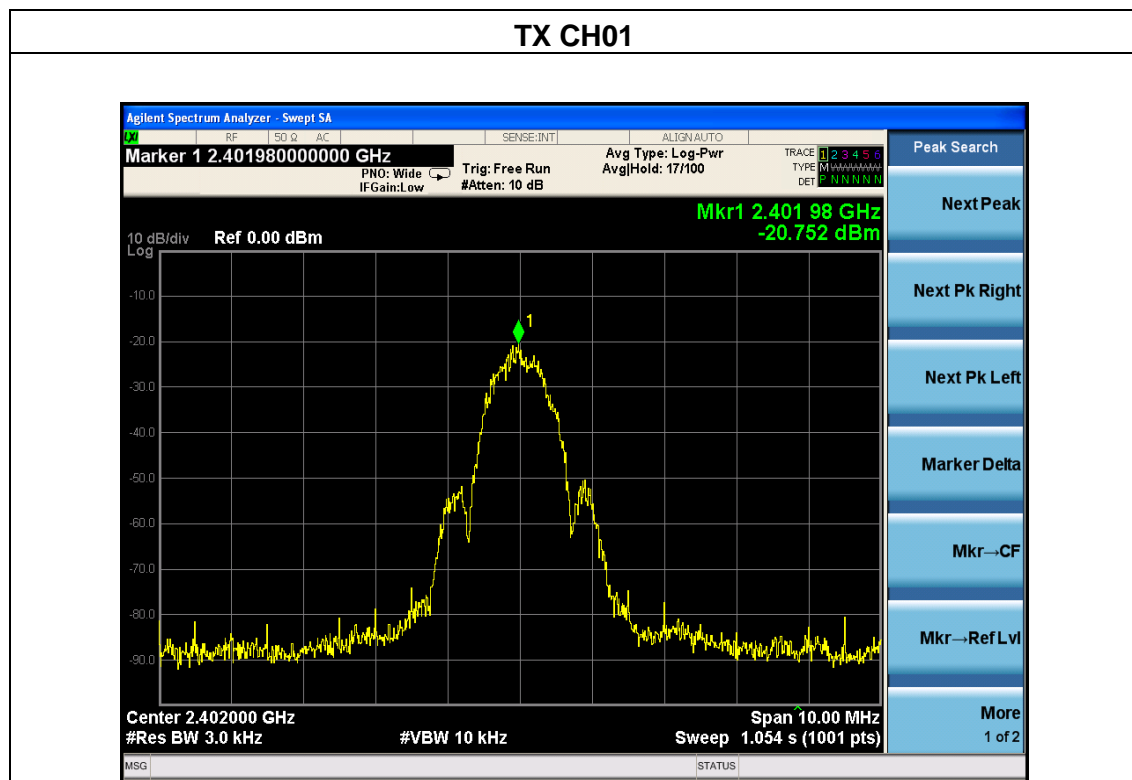
4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

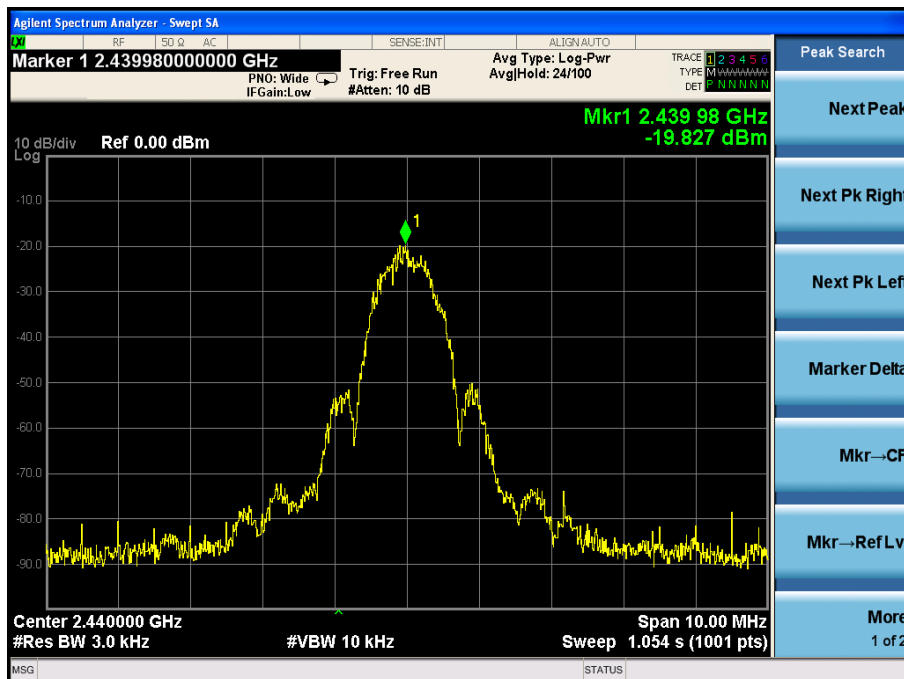
4.1.5 TEST RESULTS

EUT :	Mobile Computer	Model Name :	WF68
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX Mode /CH01, CH20, CH40		

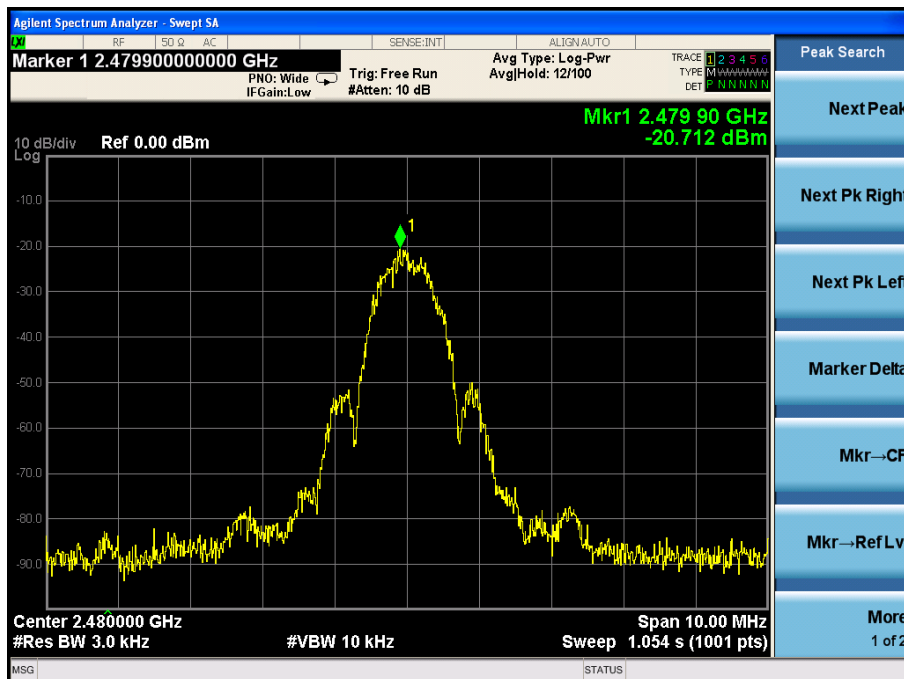
Frequency	Power Density (dBm)	Limit (dBm)	Result
2402 MHz	-20.752	8	PASS
2440 MHz	-20.712	8	PASS
2480 MHz	-19.827	8	PASS



TX CH20



TX CH40



5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

5.1.1 TEST PROCEDURE

1. Set RBW= 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



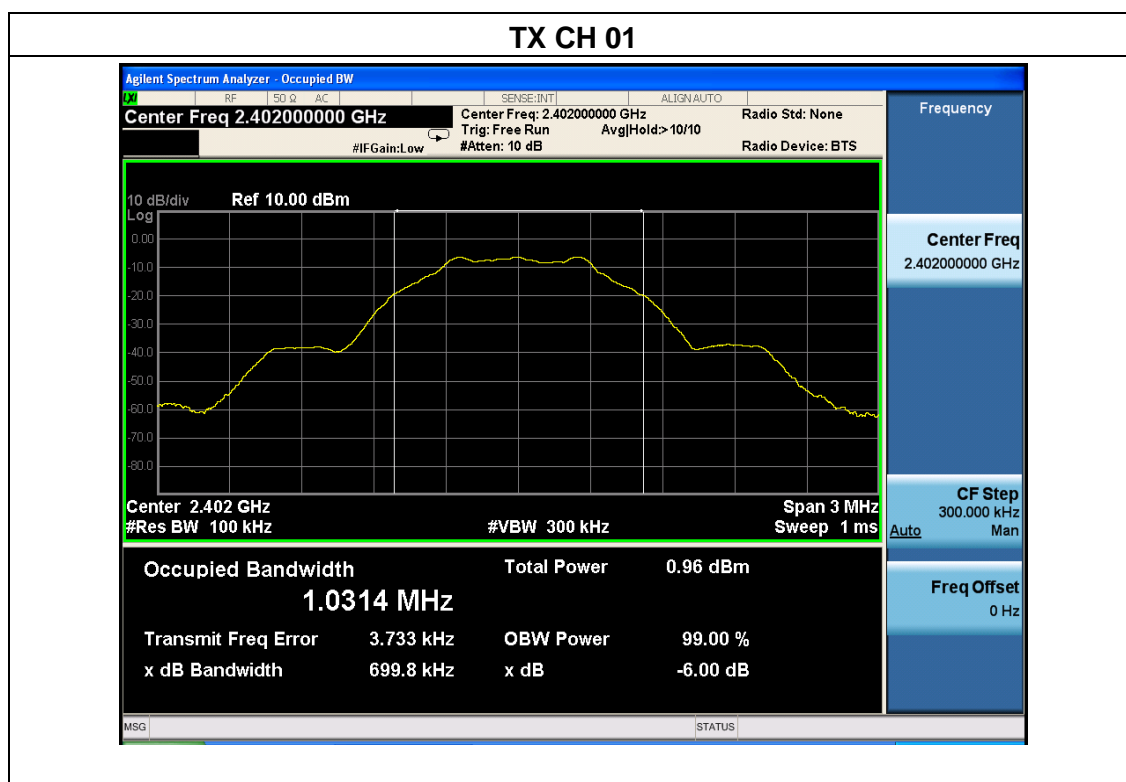
5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

EUT :	Mobile Computer	Model Name :	WF68
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX Mode /CH01, CH20, CH40		

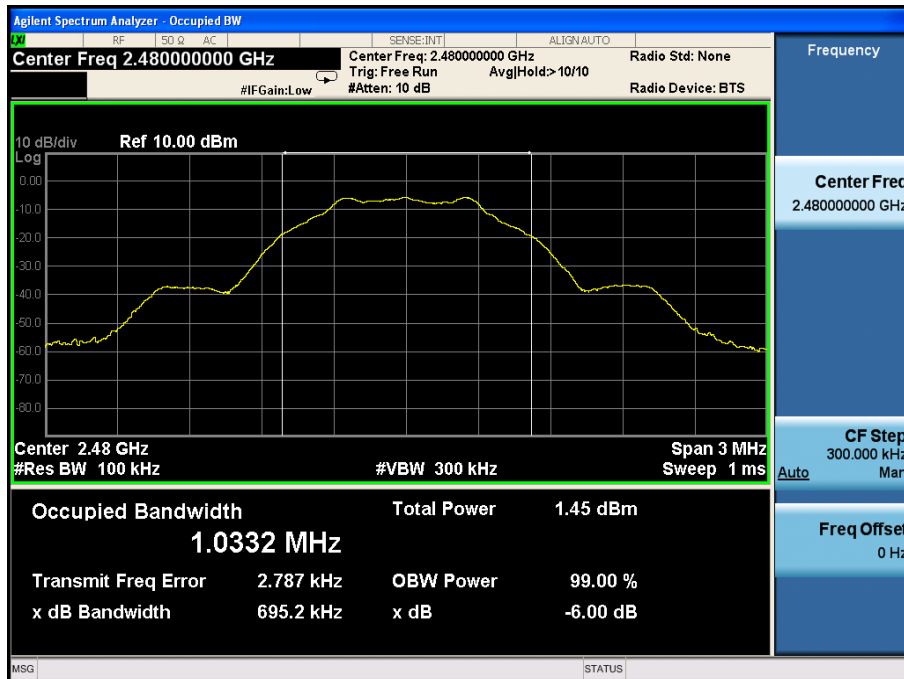
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2402	0.6998	500	Pass
Middle	2440	0.6958	500	Pass
High	2480	0.6952	500	Pass



TX CH 20



TX CH 40



6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

EUT :	Mobile Computer	Model Name :	WF68
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX Mode /CH01, CH20, CH40		

TX BLE Mode			
Test Channe	Frequency	Maximum Conducted Output Power(PK)	LIMIT
	(MHz)	(dBm)	dBm
CH01	2402	-1.56	30
CH06	2440	-1.47	30
CH40	2480	-1.76	30

///

7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE&CONDUCTED EMISSION

APPLICABLE STANDARD

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST PROCEDURE

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- Repeat above procedures until all measured frequencies were complete.

7.1 DEVIATION FROM STANDARD

No deviation.

7.2 TEST SETUP



7.3 EUT OPERATION CONDITIONS

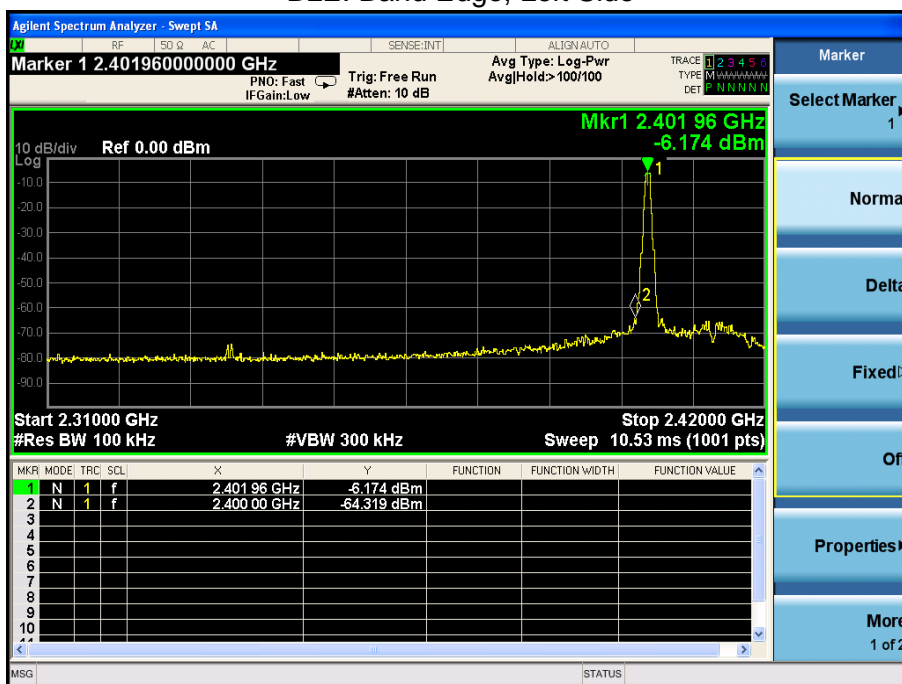
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.4 TEST RESULTS

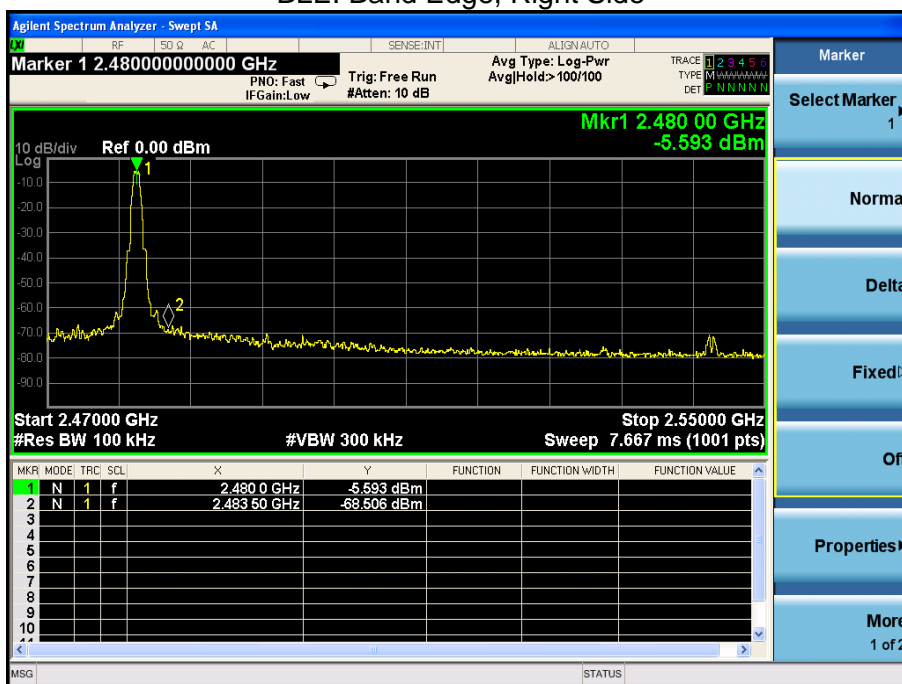
EUT :	Mobile Computer	Model Name :	WF68
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter

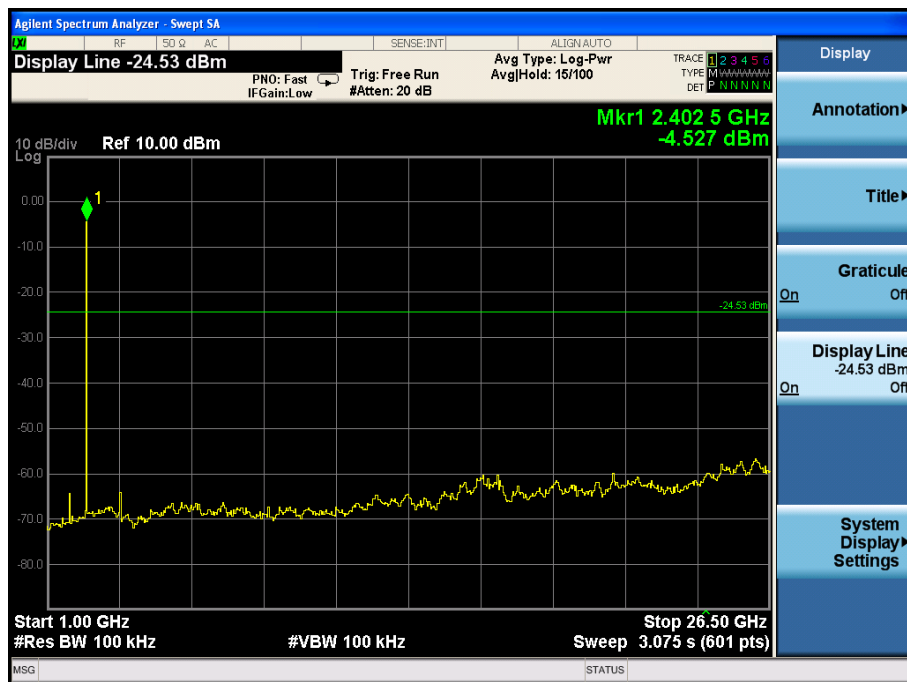
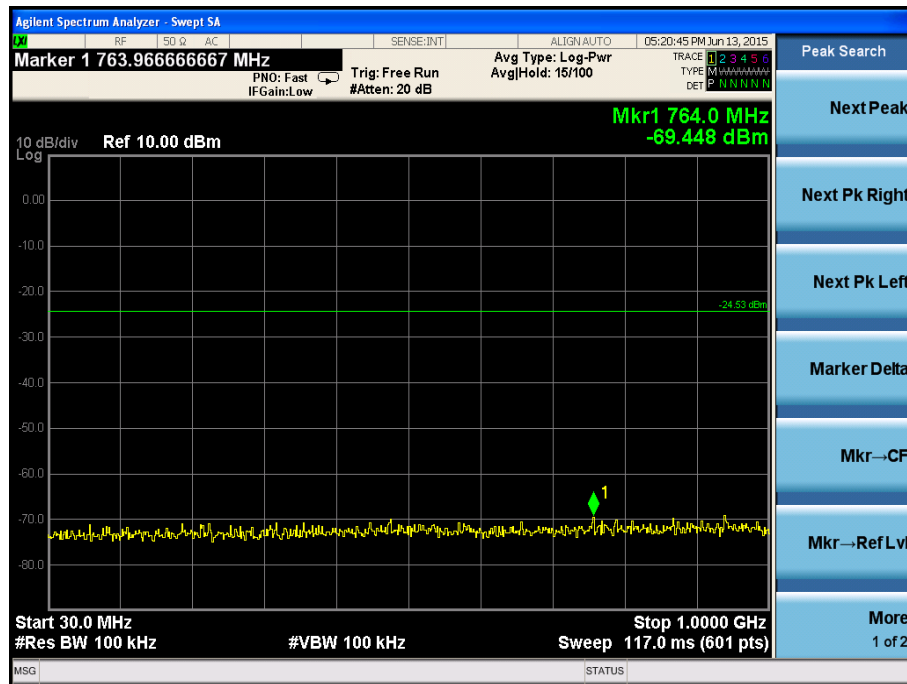
Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
BLE mode			
Left-band	58.145	20	Pass
Right-band	62.193	20	Pass

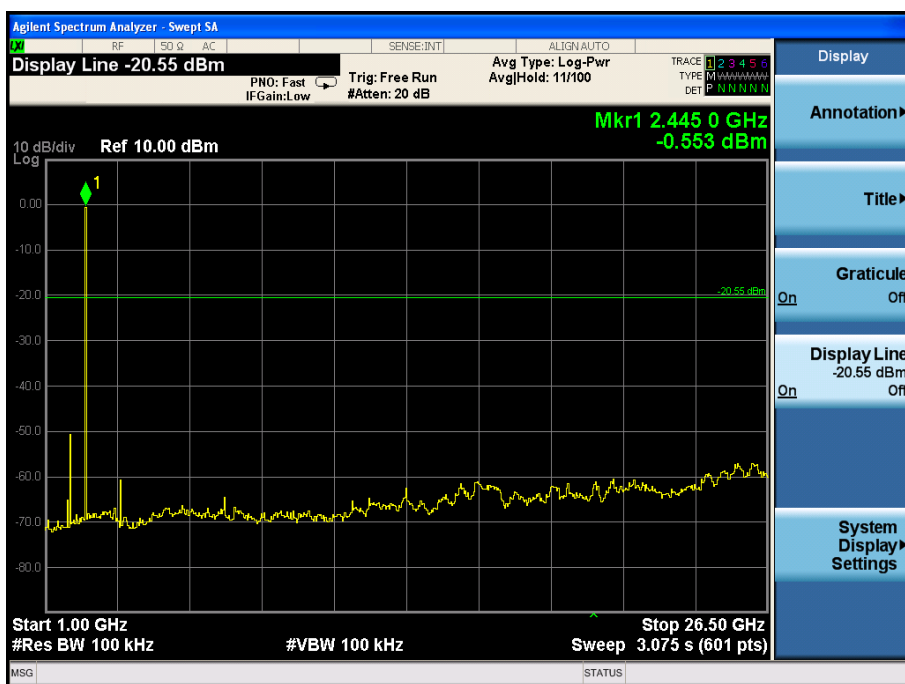
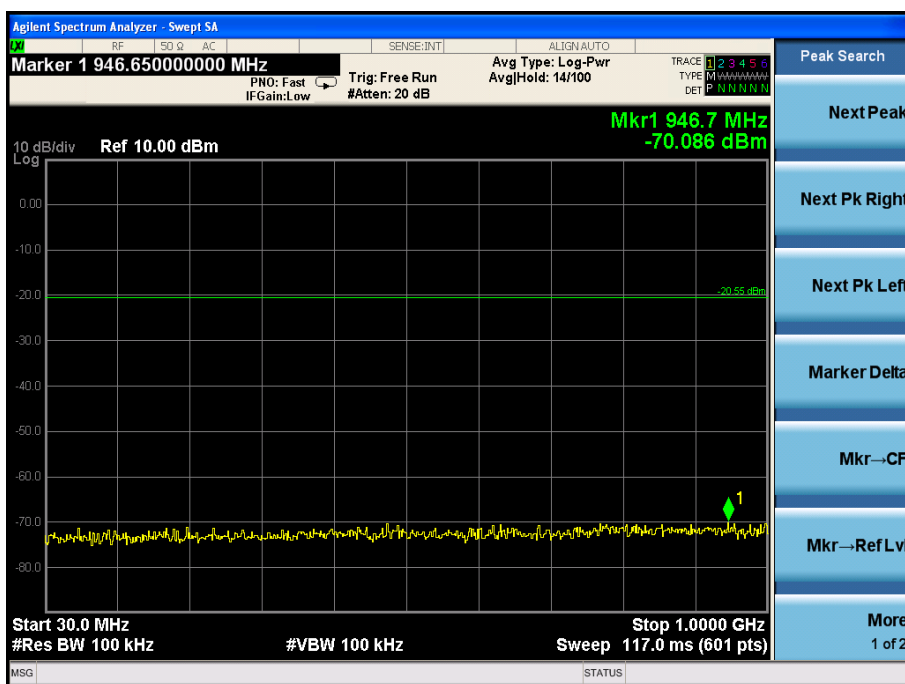
BLE: Band Edge, Left Side



BLE: Band Edge, Right Side









8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2 EUT ANTENNA

The EUT antenna is integrated antenna,-0.76dbi. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

END OF REPORT