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## FCC TEST REPORT

Report No: STS1906246W02

Issued for

Shenzhen Huion Animation Technology Co.,Ltd.

Building 28, Quarter 4, HuaiDeCuiGang Industrial  
Park, Fuyong Street, Bao'an District, Shenzhen, China


<b>Product Name:</b>	Creative Pen Tablet
<b>Brand Name:</b>	 HUION
<b>Model Name:</b>	Q11K V2
<b>Series Model:</b>	WH1409 V2, Q620S, Q620M, Q620L, Q630S, Q630M, Q630L, G920S, G920M, G920L, G930S, G930M, G930L, KD200, KD201, KD300, KD301, X10, X20, X30, G10T V2, G10S
<b>FCC ID:</b>	2AFEJ-HWT19A
<b>Test Standard:</b>	FCC Part 15.249

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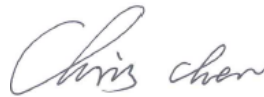
Shenzhen STS Test Services Co., Ltd.  
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**TEST RESULT CERTIFICATION**

**Applicant's Name** .....: Shenzhen Huion Animation Technology Co.,Ltd.  
**Address** .....: Building 28, Quarter 4, HuaiDeCuiGang Industrial Park,Fuyong Street, Bao'an District, Shenzhen, China  
**Manufacture's Name** .....: Shenzhen Huion Animation Technology Co.,Ltd.  
**Address** .....: Building 28, Quarter 4, HuaiDeCuiGang Industrial Park,Fuyong Street, Bao'an District, Shenzhen, China  
**Product Description**  
**Product Name** .....: Creative Pen Tablet  
**Brand Name** .....:   
**Model Name** .....: Q11K V2  
**Series Model** .....: WH1409 V2, Q620S, Q620M, Q620L, Q630S, Q630M, Q630L, G920S, G920M, G920L, G930S, G930M, G930L, KD200, KD201, KD300, KD301, X10, X20, X30, G10T V2, G10S  
**Test Standards**.....: FCC Part15.249  
**Test Procedure** .....: ANSI C63.10-2013  
This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.  
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**Date of Test** .....:  
**Date of performance of tests** ..: 27 June 2019 ~ 20 Aug. 2019  
**Date of Issue** .....: 21 Aug. 2019  
**Test Result**.....: **Pass**

Testing Engineer :



(Chris Chen)

Technical Manager :



(Sunday Hu)

Authorized Signatory :



(Vita Li)





Table of Contents	Page
<b>1. SUMMARY OF TEST RESULTS</b>	<b>5</b>
1.1 TEST FACTORY	6
1.2 MEASUREMENT UNCERTAINTY	6
<b>2. GENERAL INFORMATION</b>	<b>7</b>
2.1 GENERAL DESCRIPTION OF THE EUT	7
2.2 DESCRIPTION OF THE TEST MODES	9
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	10
2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS	11
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	12
<b>3. EMC EMISSION TEST</b>	<b>13</b>
3.1 CONDUCTED EMISSION MEASUREMENT	13
3.2 RADIATED EMISSION MEASUREMENT	17
<b>4. BANDWIDTH TEST</b>	<b>34</b>
4.2 TEST SETUP	34
4.3 EUT OPERATION CONDITIONS	34
4.4 TEST RESULTS	35
<b>5. ANTENNA REQUIREMENT</b>	<b>37</b>
5.1 STANDARD REQUIREMENT	37
5.2 EUT ANTENNA	37
<b>APPENDIX- PHOTOS OF TEST SETUP</b>	<b>38</b>

**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	21 Aug. 2019	STS1906246W02	ALL	Initial Issue





## 1. SUMMARY OF TEST RESULTS

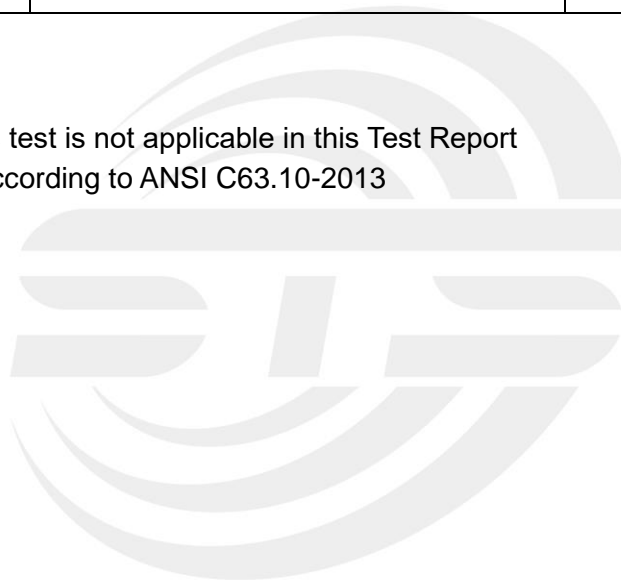
Test procedures according to the technical standards:

FCC Part 15.249 , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	Pass	
15.203	Antenna Requirement	Pass	
15.249	Radiated Spurious Emission	Pass	
15.205	Radiated Band Edge Emission	Pass	
15.249	20dB Bandwidth	Pass	

### NOTE:

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

(2)All tests are according to ANSI C63.10-2013





### 1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

### 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	RF output power,conducted	$\pm 0.71\text{dB}$
2	Unwanted Emissions,conducted	$\pm 0.63\text{dB}$
3	All emissions,radiated 30-200MHz	$\pm 3.43\text{dB}$
4	All emissions,radiated 200MHz-1GHz	$\pm 3.57\text{dB}$
5	All emissions,radiated>1G	$\pm 4.13\text{dB}$
6	Conducted Emission(9KHz-150KHz)	$\pm 3.18\text{dB}$
7	Conducted Emission(150KHz-30MHz)	$\pm 2.70\text{dB}$



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Creative Pen Tablet								
Trade Name									
Model Name	Q11K V2								
Series Model	WH1409 V2, Q620S, Q620M, Q620L, Q630S, Q630M, Q630L, G920S, G920M, G920L, G930S, G930M, G930L, KD200, KD201, KD300, KD301, X10, X20, X30, G10T V2, G10S								
Model Difference	Just different in model name								
Product Description	<p>The EUT is a Creative Pen Tablet</p> <table><tr><td>Operation Frequency:</td><td>2406MHz-2476MHz</td></tr><tr><td>Modulation Type:</td><td>GFSK</td></tr><tr><td>Antenna Designation:</td><td>PCB Antenna</td></tr><tr><td>Antenna Gain(Peak):</td><td>0 dBi</td></tr></table> <p>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.</p>	Operation Frequency:	2406MHz-2476MHz	Modulation Type:	GFSK	Antenna Designation:	PCB Antenna	Antenna Gain(Peak):	0 dBi
Operation Frequency:	2406MHz-2476MHz								
Modulation Type:	GFSK								
Antenna Designation:	PCB Antenna								
Antenna Gain(Peak):	0 dBi								
Channel List	Please refer to the Note 2.								
Power Rating	Input: DC 5V,500mA								
Battery	Rated Voltage: 3.7V Charge Limit: 4.2V Capacity: 2500mAh								
Hardware version number	REV03								
Software version number	180709								

Note:


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



2.

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2406	05	2411	09	2414	13	2417
02	2424	06	2429	10	2433	14	2436
03	2447	07	2451	11	2455	15	2459
04	2467	08	2469	12	2473	16	2476

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1		Q11K V2	PCB	NA	0	Antenna







## 2.2 DESCRIPTION OF THE TEST MODES

For conducted test items and radiated spurious emissions

Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively..

Pretest Mode	Description	Data/Modulation
Mode 1	TX CH01	GFSK
Mode 2	TX CH03	GFSK
Mode 3	TX CH16	GFSK

Note:

(1) All above mode have been measurement, only worst data was reported.

(2) We have be tested for all avaialbe U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V,50/60Hz is shown in the report

For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 4 : Keeping TX

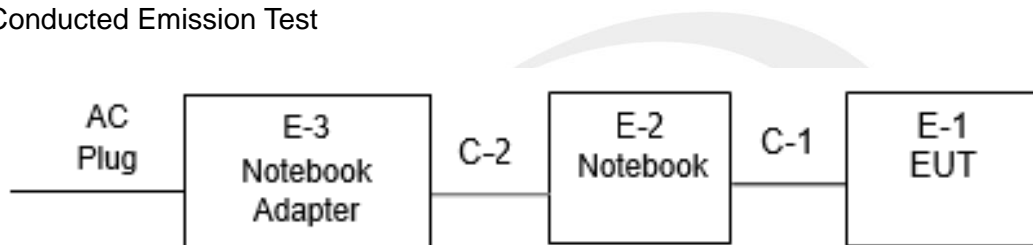
### 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

#### Radiated Spurious Emission Test



#### Conducted Emission Test





## 2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND 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.

### Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

### Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Notebook	HP	500-320cx	N/A	N/A
E-3	Notebook Adapter	HP	HSTNN-CA15	N/A	N/A
C-1	USB Cable	N/A	100cm	N/A	N/A
C-2	DC Cable	N/A	110cm	N/A	N/A

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

## Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2018.10.13	2019.10.12
Signal Analyzer	Agilent	N9020A	MY51110105	2019.03.02	2020.03.01
Active loop Antenna	ZHINAN	ZN30900C	16035	2018.03.11	2021.03.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.1
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	9120D-1343	2018.10.19	2021.10.18
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10
Pre-Amplifier(0.1M-3G Hz)	EM	EM330	060665	2018.10.13	2019.10.12
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK201808090 1	2018.10.13	2019.10.12
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11	2019.10.10
turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			

## Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2018.10.13	2019.10.12
LISN	R&S	ENV216	101242	2018.10.11	2019.10.10
LISN	EMCO	3810/2NM	23625	2018.10.11	2019.10.10
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11	2019.10.10
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 CE)			

## RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2018.10.13	2019.10.12
Signal Analyzer	Agilent	N9020A	MY49100060	2018.10.13	2019.10.12
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11	2019.10.10
Test SW	FARAD	LZ-RF /LzRf-3A3			



### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.249 limit in the table below has to be followed.

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

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.

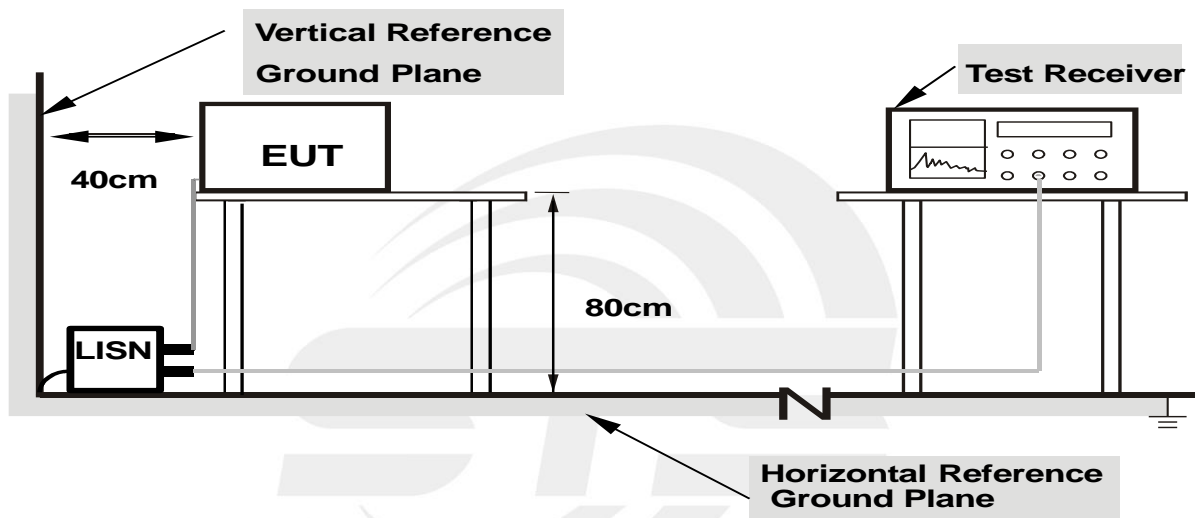
The following table is the setting of the receiver

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 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical 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 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**

### 3.1.4 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.



## 3.1.5 TEST RESULTS

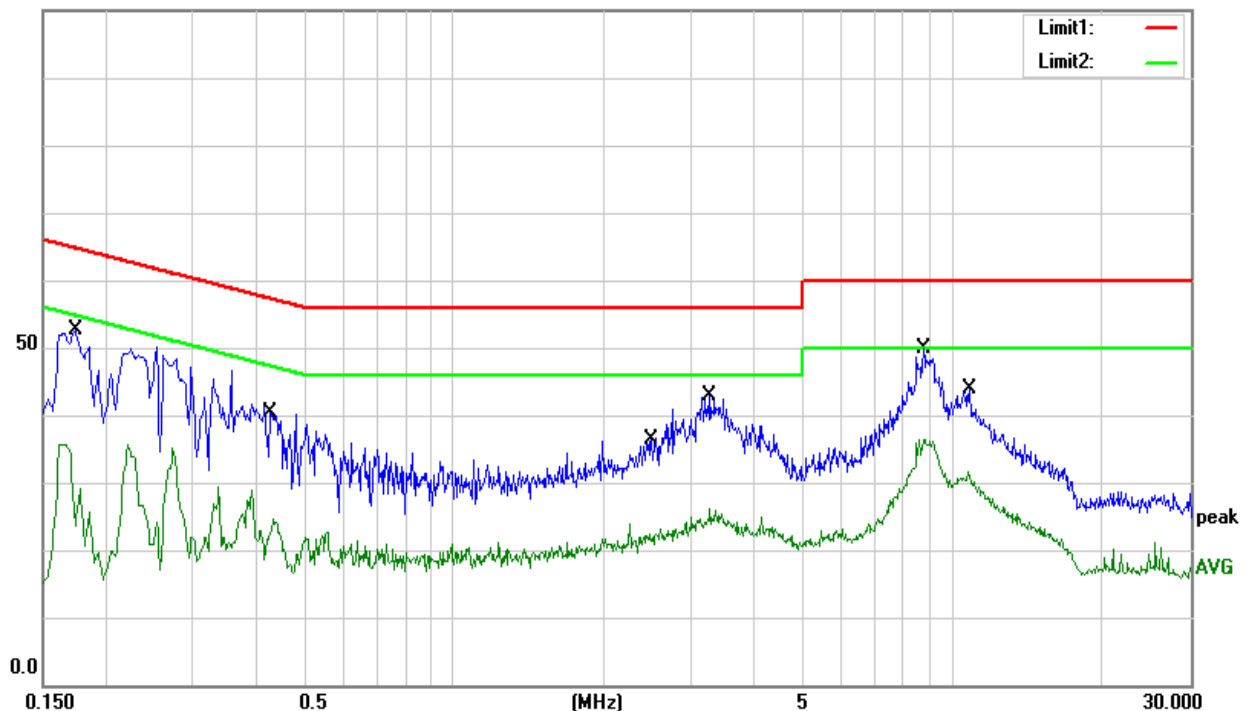
Temperature:	25.3 °C	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 4		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1740	32.47	20.24	52.71	64.77	-12.06	QP
0.1740	15.40	20.24	35.64	54.77	-19.13	AVG
0.4300	19.93	20.49	40.42	57.25	-16.83	QP
0.4300	2.12	20.49	22.61	47.25	-24.64	AVG
2.4980	16.46	20.02	36.48	56.00	-19.52	QP
2.4980	4.81	20.02	24.83	46.00	-21.17	AVG
3.2660	22.82	19.98	42.80	56.00	-13.20	QP
3.2660	5.86	19.98	25.84	46.00	-20.16	AVG
8.7580	29.80	20.04	49.84	60.00	-10.16	QP
8.7580	16.38	20.04	36.42	50.00	-13.58	AVG
10.7820	23.86	20.11	43.97	60.00	-16.03	QP
10.7820	11.58	20.11	31.69	50.00	-18.31	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) – Limit

100.0 dBuV



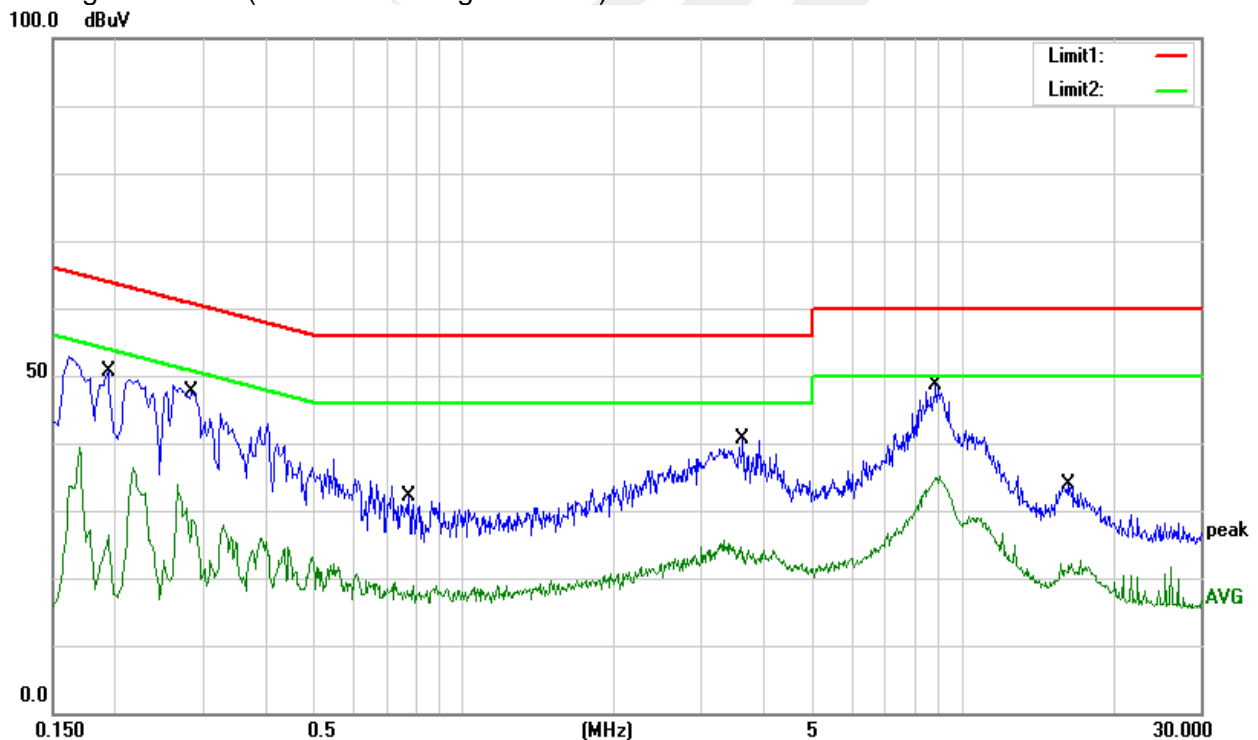


Temperature:	25.3 °C	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 4		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1940	30.30	20.23	50.53	63.86	-13.33	QP
0.1940	16.15	20.23	36.38	53.86	-17.48	AVG
0.2862	26.79	20.66	47.45	60.63	-13.18	QP
0.2862	7.14	20.66	27.80	50.63	-22.83	AVG
0.7780	11.87	20.23	32.10	56.00	-23.90	QP
0.7780	-1.25	20.23	18.98	46.00	-27.02	AVG
3.6340	20.77	19.96	40.73	56.00	-15.27	QP
3.6340	4.12	19.96	24.08	46.00	-21.92	AVG
8.8380	28.48	20.05	48.53	60.00	-11.47	QP
8.8380	15.12	20.05	35.17	50.00	-14.83	AVG
16.2380	14.00	19.98	33.98	60.00	-26.02	QP
16.2380	2.66	19.98	22.64	50.00	-27.36	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) - Limit







### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.249 and the Part 15.209(a) limit in the table below has to be followed.

Standard FCC 15.209

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
960~1000	500	3
Above 1000	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	3

Standard FCC 15.249

Frequency of Emission (MHz)	Field Strength of fundamental (millivolts /meter)	Field Strength of Harmonics (microvolts/meter)
900~928	50	500
2400~2483.5	50	500
5725~5875	50	500
24000~242500	250	2500

Notes:

- (1) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Spectrum Parameter	Setting
Detector	Peak/AV
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB (emission in restricted band)	>20BW
VB (emission in restricted band)	=3xRB



Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
	90kHz~110kHz / RB 200Hz for QP
	110kHz~490kHz / RB 200Hz for PK & AV
	490kHz~30MHz / RB 9kHz for QP
	30MHz~1000MHz / RB 120kHz for QP

### 3.2.2 TEST PROCEDURE

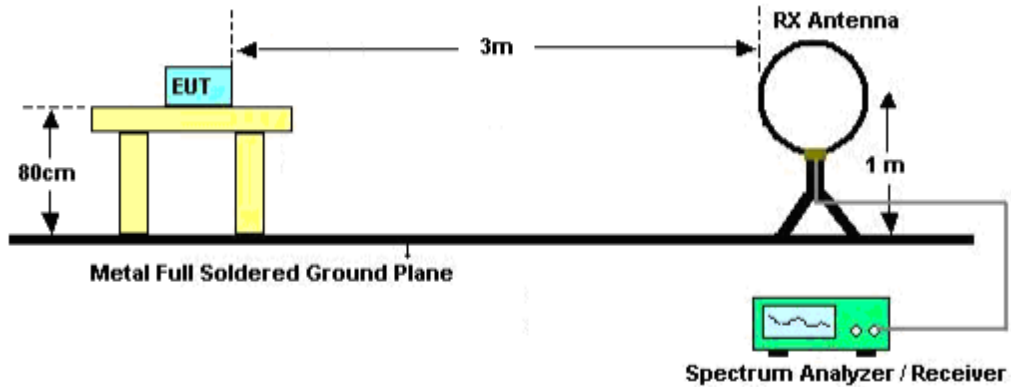
- The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Below 1GHz)
  - The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Above 1GHz)
  - The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarization of the antenna are set to make the measurement.
  - The initial step in collecting radiated emission data is a receive peak detector mode. Pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
  - All readings are peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading complies with the QP limits and then QP Mode measurement didn't perform (Below 1GHz)
  - All readings are Peak mode value unless otherwise stated AVG in column of Note. If the Peak mode measured value complies with the Peak limits and lower than AVG Limits, the EUT shall be deemed to meet Peak & AVG limits and then only Peak mode was measured, but AVG mode didn't perform. (Above 1GHz)
9. 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 axes. The worst case emissions were reported

### 3.2.3 DEVIATION FROM TEST STANDARD

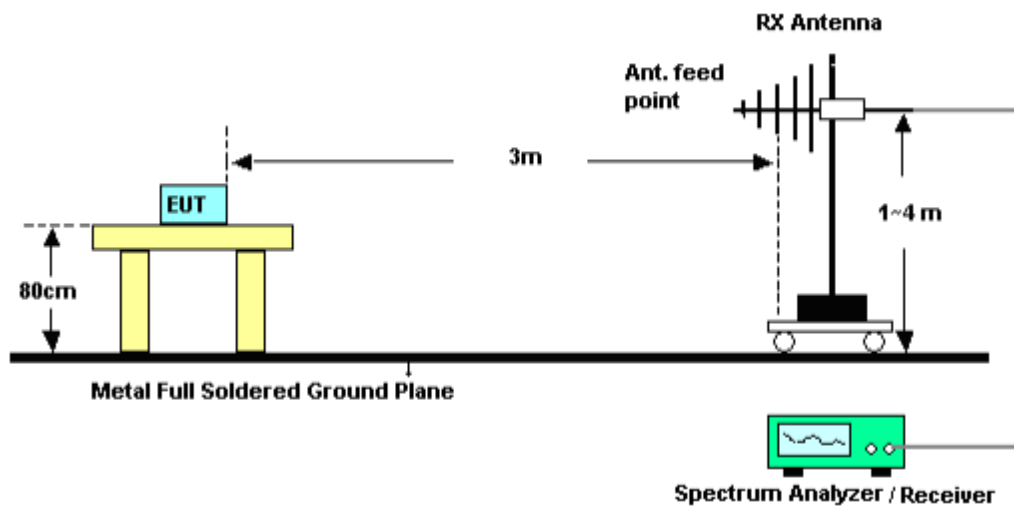
No deviation

### 3.2.4 TEST SETUP

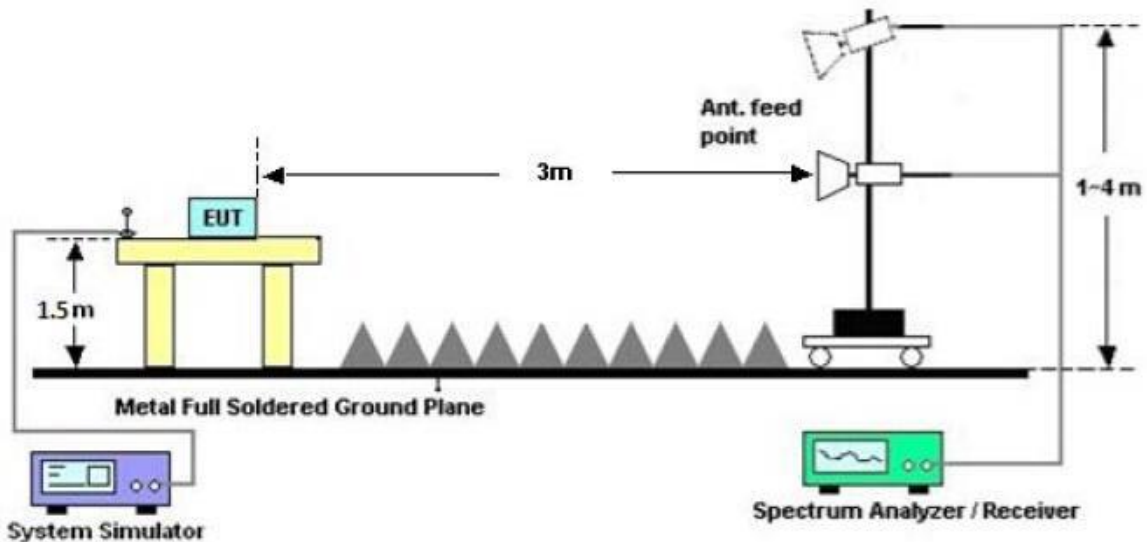
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



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



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





### 3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$\text{Margin} = \text{PL} - \text{PK L}$  or  $\text{AL} - \text{AV L}$ ; Margin only shown the worst case.

Where

PR = Peak Reading

AR = Average Reading

PL = Peak Level

AL = Average Level

AF = Antenna Factor

PK L = Peak Limit

AV L = AV Limit

For example

Frequency	PR	AR	AF	PL	AL	PK L	AV L	Margin
(MHz)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
2178	40.23	30.31	9.83	50.06	40.14	74.00	54.00	-13.86



### 3.2.6 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.

Below 30 MHz

Temperature:	26 °C	Relative Humidity:	54%
Test Voltage:	DC 3.7V from battery	Polarization:	---
Test Mode:	TX Mode		

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

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



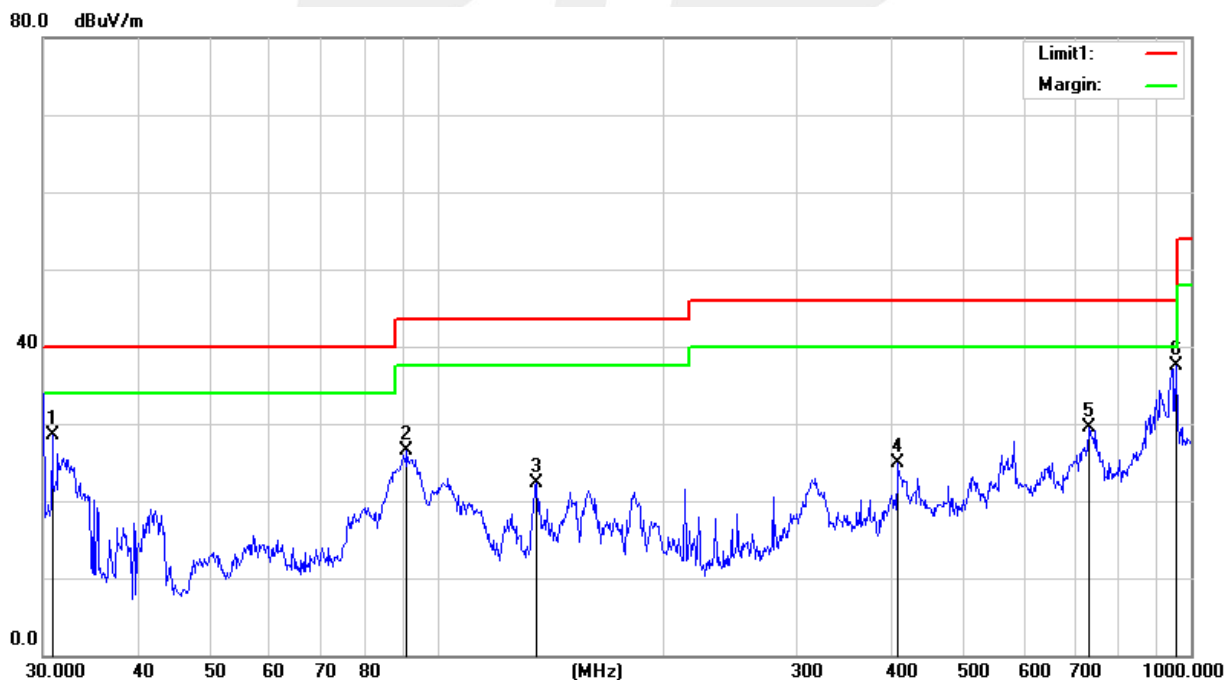
## Between 30MHz – 1000 MHz Radiation Spurious

Temperature:	26 °C	Relative Humidity:	54%
Test Voltage:	DC 3.7V from batery	Phase:	Horizontal
Test Mode:	Mode 1/2/3(Model 1 worst)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
30.8535	41.80	-13.29	28.51	40.00	-11.49	QP
91.1746	47.76	-21.31	26.45	43.50	-17.05	QP
135.5062	40.36	-18.10	22.26	43.50	-21.24	QP
408.9460	35.60	-10.62	24.98	46.00	-21.02	QP
731.9203	31.91	-2.40	29.51	46.00	-16.49	QP
955.4381	35.79	1.68	37.47	46.00	-8.53	QP

Remark:

1. All readings are Quasi-Peak .
2. Margin = Result (Result =Reading + Factor )–Limit



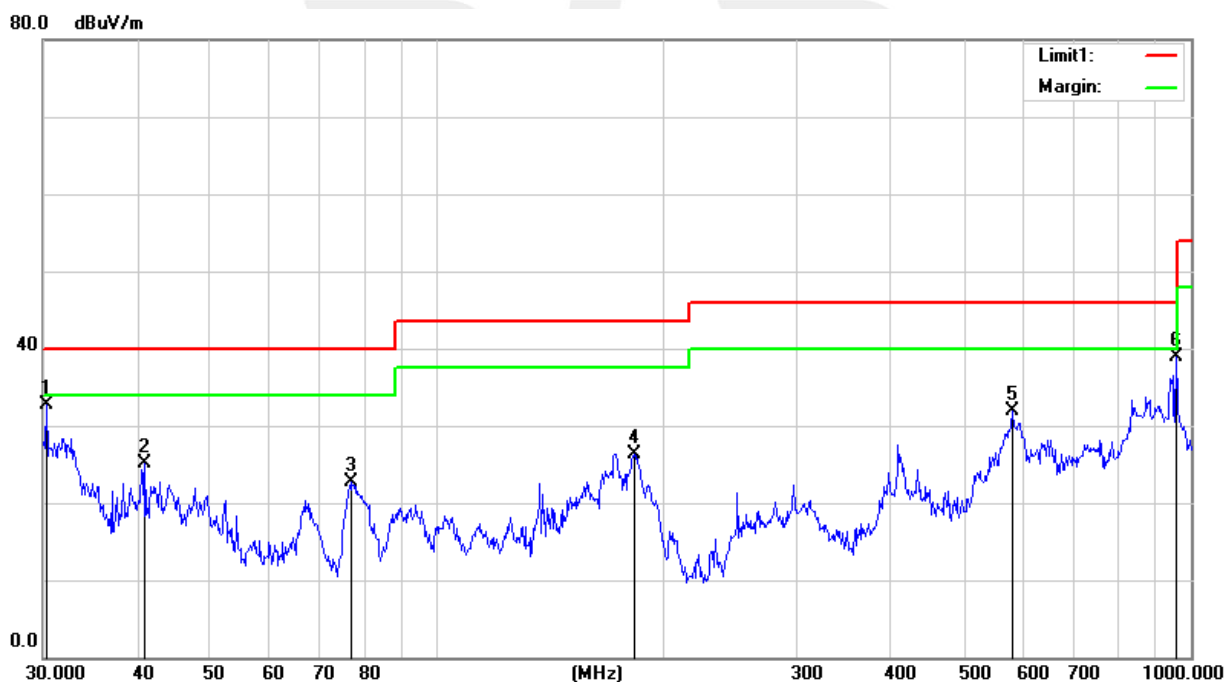


Temperature:	26 °C	Relative Humidity:	54%
Test Voltage:	DC 3.7V from batery	Phase:	Vertical
Test Mode:	Mode 1/2/3(Model 1 worst)		

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
30.3173	45.77	-13.01	32.76	40.00	-7.24	QP
40.9881	43.67	-18.58	25.09	40.00	-14.91	QP
77.0505	46.29	-23.55	22.74	40.00	-17.26	QP
182.5592	46.51	-20.20	26.31	43.50	-17.19	QP
578.6700	37.56	-5.74	31.82	46.00	-14.18	QP
955.4381	37.22	1.68	38.90	46.00	-7.10	QP

Remark:

1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor )–Limit





## Above 1G Radiation Spurious

**GFSK-Low**  
Horizontal

Frequency (MHz)	Peak Reading (dBuV/m)	Average Reading (dBuV/m)	Factor (dB)	Peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Margin(dB)	ANT
2178	40.23	30.31	9.83	50.06	40.14	74.00	54.00	-13.86	Horizontal
3122.5	52.34	41.35	-11.03	41.31	30.32	74.00	54.00	-23.68	Horizontal
4885	51.53	40.57	-4.83	46.70	35.74	74.00	54.00	-18.26	Horizontal
11517.5	51.10	39.19	9.74	60.84	48.93	74.00	54.00	-5.07	Horizontal
14883.75	50.39	39.70	12.42	62.81	52.12	74.00	54.00	-1.88	Horizontal
20560.251	49.35	38.67	14.11	63.46	52.78	74.00	54.00	-1.22	Horizontal

## Vertical

Frequency (MHz)	Peak Reading (dBuV/m)	Average Reading (dBuV/m)	Factor (dB)	Peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Margin(dB)	ANT
1510	40.63	29.55	0.01	40.64	29.56	74.00	54.00	-24.44	Vertical
2202.5	40.43	29.77	10.05	50.48	39.82	74.00	54.00	-14.18	Vertical
4212.5	51.42	40.97	-6.73	44.69	34.24	74.00	54.00	-19.76	Vertical
7580	50.65	40.38	4.15	54.80	44.53	74.00	54.00	-9.47	Vertical
14890	51.27	40.41	12.5	63.77	52.91	74.00	54.00	-1.09	Vertical
20574.251	48.41	37.98	14.13	62.54	52.11	74.00	54.00	-1.89	Vertical



**GFSK-Mid**  
Horizontal

Frequency (MHz)	Peak Reading (dBuV/m)	Average Reading (dBuV/m)	Factor (dB)	Peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Margin(dB)	ANT
1480.5	40.19	29.86	0.86	41.05	30.72	74.00	54.00	-23.28	Horizontal
2178	40.23	30.31	9.83	50.06	40.14	74.00	54.00	-13.86	Horizontal
5615	50.63	39.76	-2.61	48.02	37.15	74.00	54.00	-16.85	Horizontal
8337.5	50.93	39.85	4.05	54.98	43.90	74.00	54.00	-10.10	Horizontal
11517.5	51.10	39.19	9.74	60.84	48.93	74.00	54.00	-5.07	Horizontal
20541	48.38	38.53	14.09	62.47	52.62	74.00	54.00	-1.38	Horizontal

## Vertical

Frequency (MHz)	Peak Reading (dBuV/m)	Average Reading (dBuV/m)	Factor (dB)	Peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Margin(dB)	ANT
1197.5	39.80	29.20	-0.74	39.06	28.46	74.00	54.00	-25.54	Vertical
2993.5	40.60	29.74	7.93	48.53	37.67	74.00	54.00	-16.33	Vertical
4172.5	51.23	40.77	-6.96	44.27	33.81	74.00	54.00	-20.19	Vertical
8337.5	50.93	39.85	4.05	54.98	43.90	74.00	54.00	-10.10	Vertical
14065	49.69	39.70	11.29	60.98	50.99	74.00	54.00	-3.01	Vertical
22072.25	51.92	41.85	9.88	61.80	51.73	74.00	54.00	-2.27	Vertical

**GFSK-High**  
Horizontal

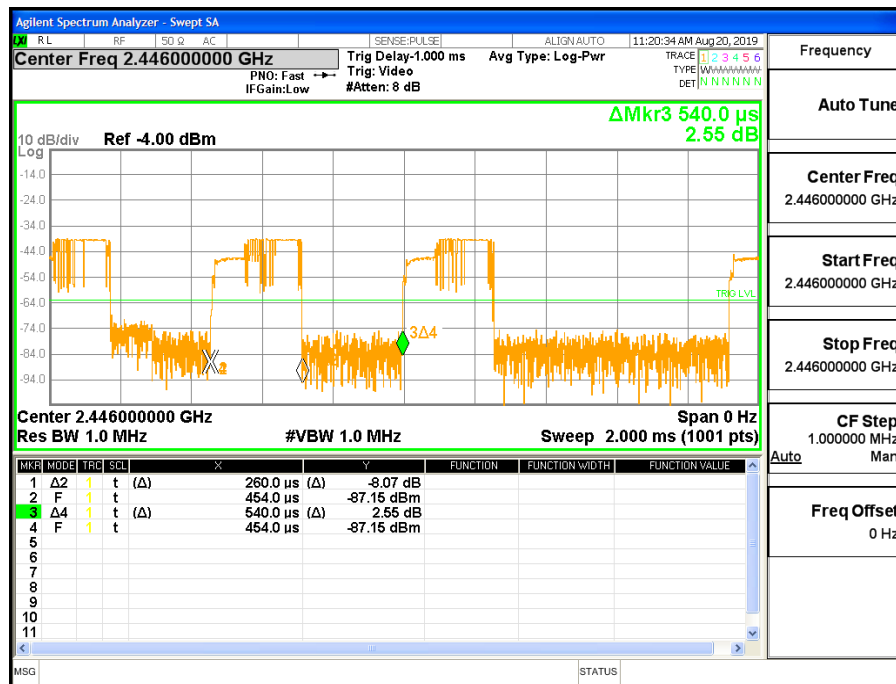
Frequency (MHz)	Peak Reading (dBuV/m)	Average Reading (dBuV/m)	Factor (dB)	Peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Margin(dB)	ANT
1370.5	40.74	30.11	-0.05	40.69	30.06	74.00	54.00	-23.94	Horizontal
2192	39.86	29.97	10.13	49.99	40.10	74.00	54.00	-13.90	Horizontal
5257.5	50.93	40.50	-3.48	47.45	37.02	74.00	54.00	-16.98	Horizontal
8157.5	51.00	40.46	4.51	55.51	44.97	74.00	54.00	-9.03	Horizontal
14865	51.06	39.97	12.17	63.23	52.14	74.00	54.00	-1.86	Horizontal
20567.251	49.64	38.82	14.12	63.76	52.94	74.00	54.00	-1.06	Horizontal

## Vertical

Frequency (MHz)	Peak Reading (dBuV/m)	Average Reading (dBuV/m)	Factor (dB)	Peak Level (dBuV/m)	Average Level (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Margin(dB)	ANT
2194.5	39.80	30.43	10.15	49.95	40.58	74.00	54.00	-13.42	Vertical
5542.5	51.95	39.49	-3.01	48.94	36.48	74.00	54.00	-17.52	Vertical
7060	51.52	39.96	3.05	54.57	43.01	74.00	54.00	-10.99	Vertical
11072.5	49.20	39.63	9.93	59.13	49.56	74.00	54.00	-4.44	Vertical
15061.25	51.33	39.93	11.36	62.69	51.29	74.00	54.00	-2.71	Vertical
20567.251	49.46	38.10	14.12	63.58	52.22	74.00	54.00	-1.78	Vertical

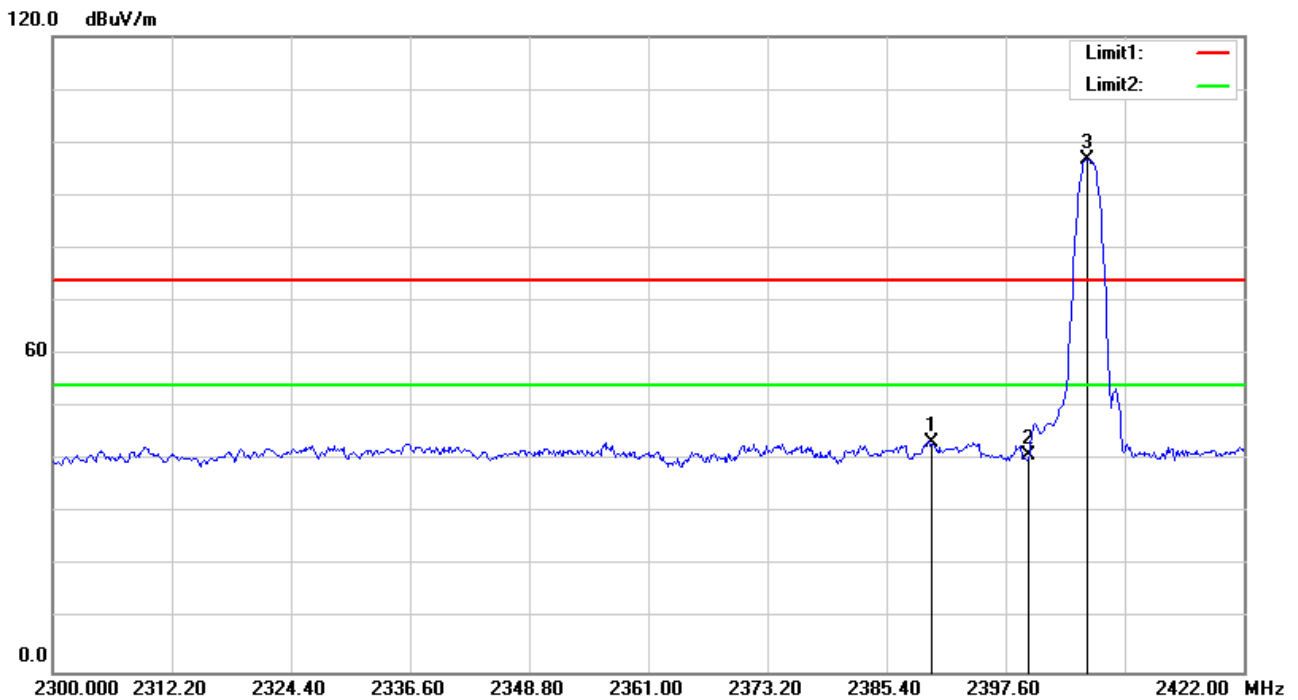


## Duty cycle



Ton ( μs )	Tp ( μs )	Duty Factor
260	540	6.35

Note: Duty Factor=20\*LOG10(1/(Ton/Tp))

(Radiation **Band edge**)**GFSK-Low**  
Horizontal

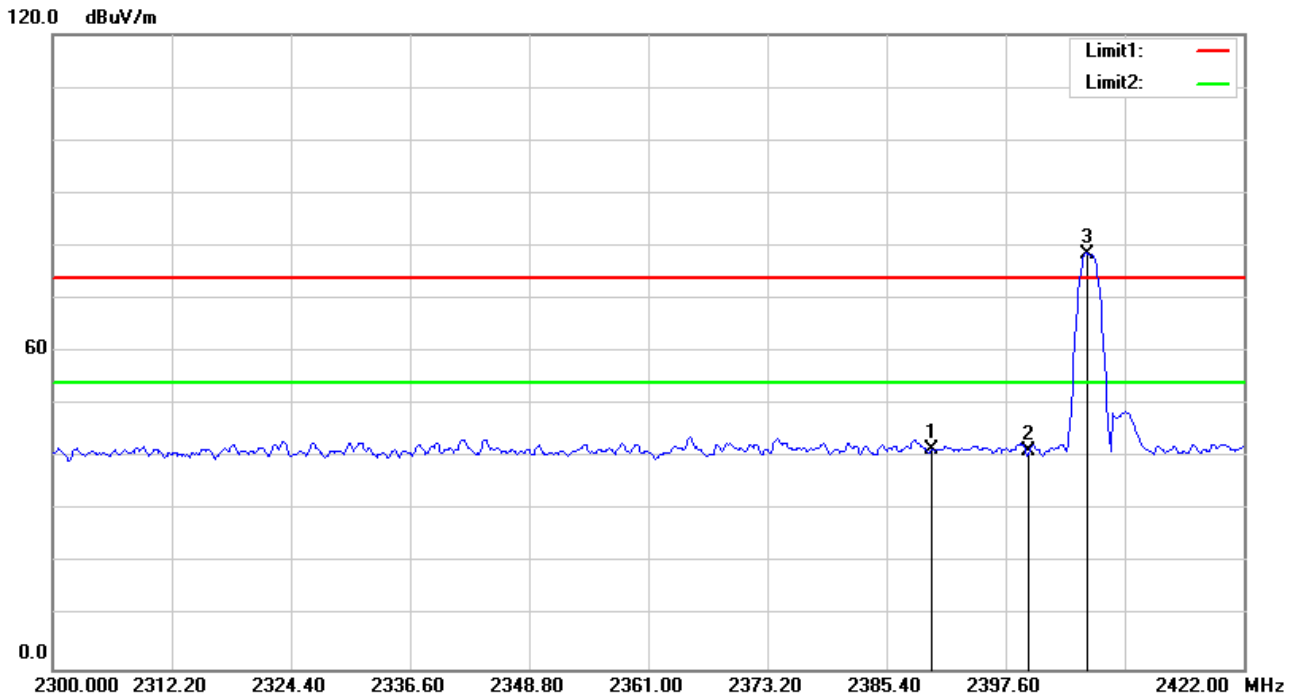
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	38.86	4.34	43.20	74.00	-30.80	peak
2	2400.000	36.58	4.49	41.07	74.00	-32.93	peak

## Fundamental Frequency

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
3	2406.000	92.23	4.49	-	96.72	114.00	-17.28	peak
4	2406.000	92.23	4.49	-6.35	90.37	94.00	-3.63	AV



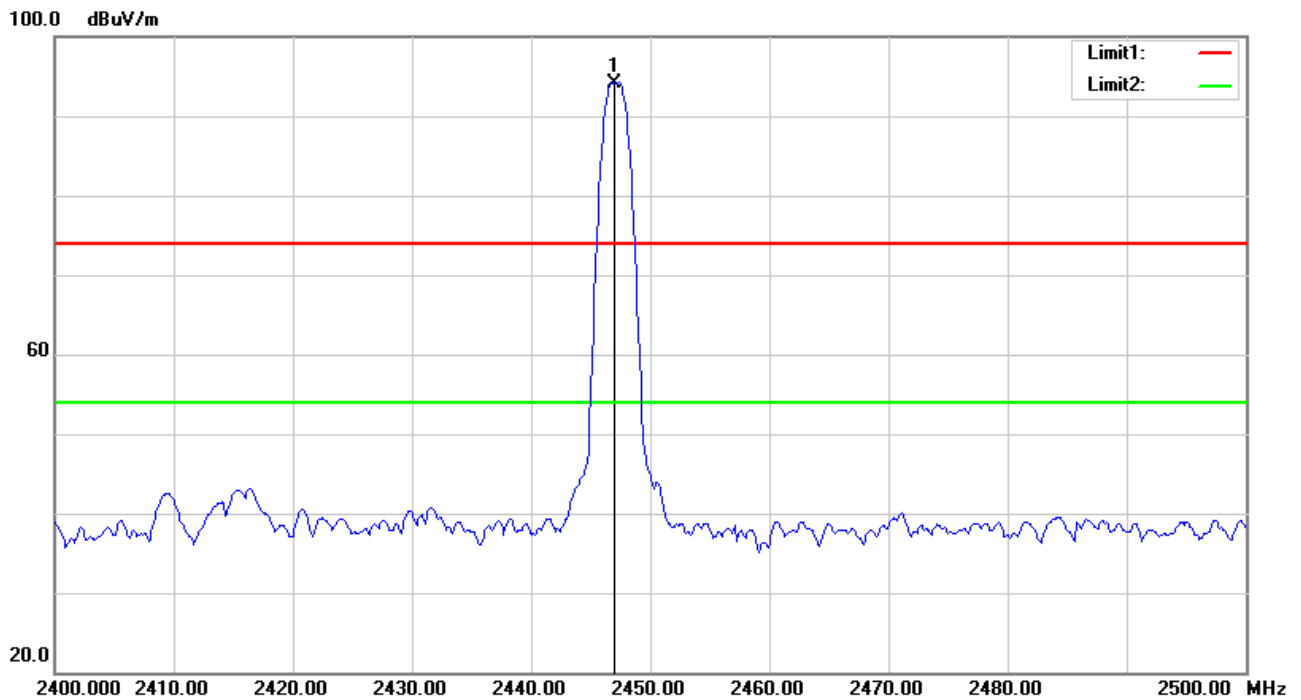
## Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	37.28	4.34	41.62	74.00	-32.38	peak
2	2400.000	36.79	4.49	41.28	74.00	-32.72	peak

## Fundamental Frequency

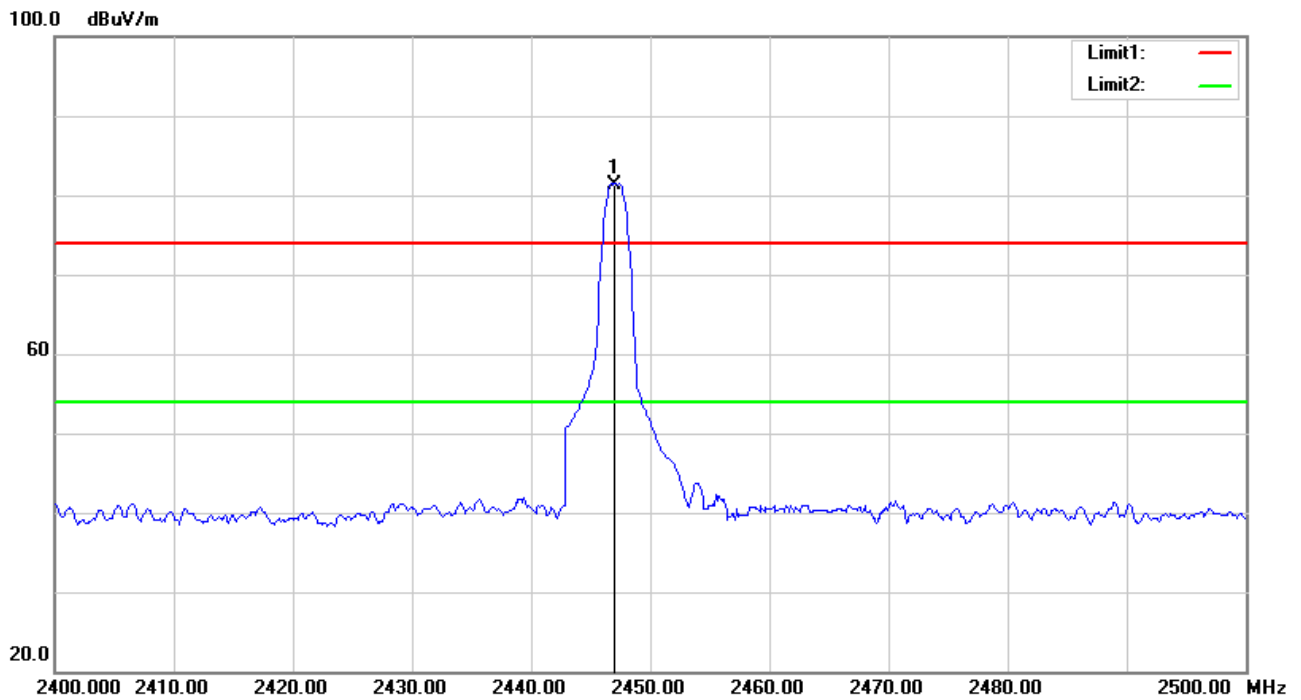
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
3	2406.000	73.91	4.49	-	78.40	114.00	-35.60	peak
4	2406.000	73.91	4.49	-6.35	72.05	94.00	-21.95	AV

**GFSK-Mid**  
Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2447.000	89.64	4.52	-	94.16	114.00	-19.84	peak
2	2447.000	89.64	4.52	-6.35	87.81	94.00	-6.19	AV



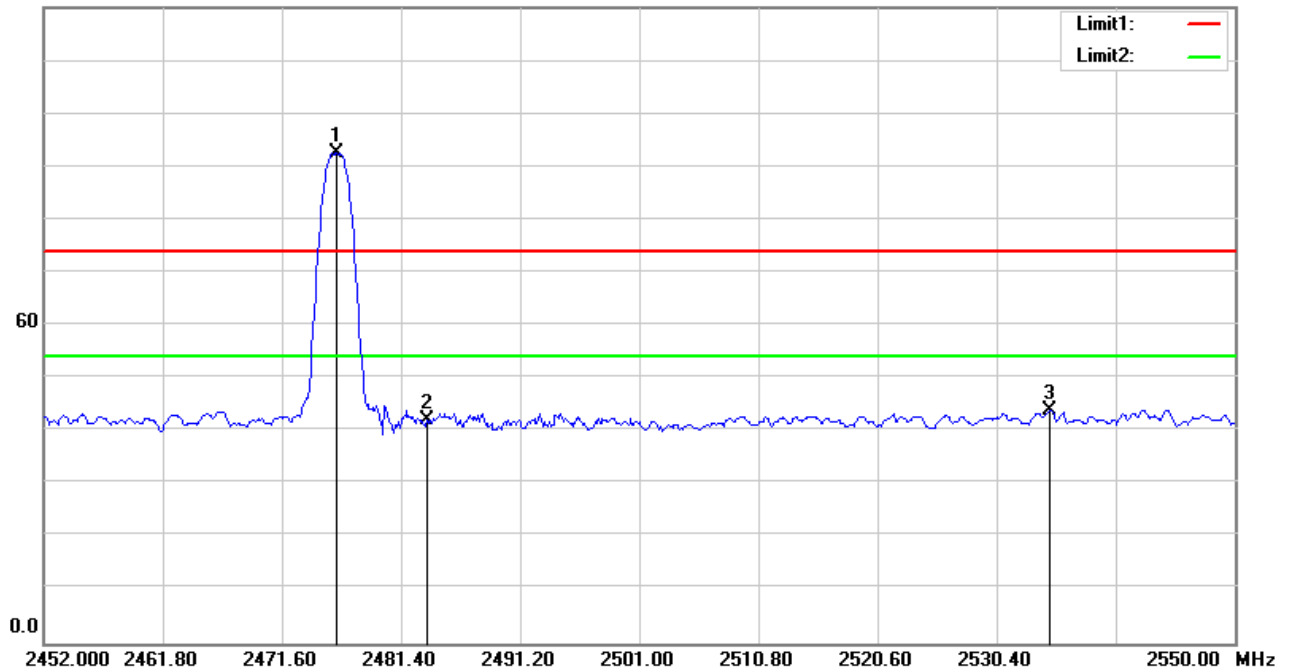
## Vertical



No.	Frequency	Reading	Correct	Duty cycle	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2447.000	76.88	4.52	-	81.40	114.00	-32.60	peak
2	2447.000	76.88	4.52	-6.35	75.05	94.00	-18.95	AV

**GFSK-High**  
Horizontal

120.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	2483.500	37.59	4.60	42.19	74.00	-31.81	peak
3	2534.810	39.09	4.88	43.97	74.00	-30.03	peak

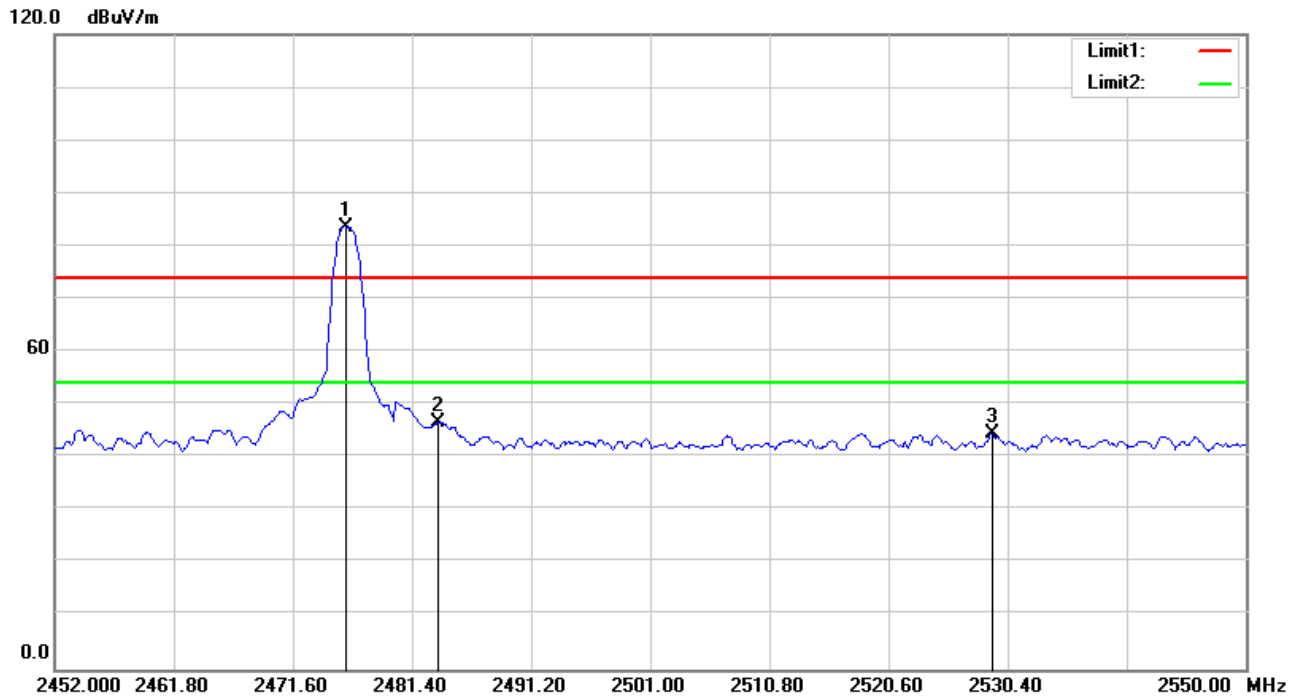
**Fundamental Frequency**

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2476.108	87.87	4.59	-	92.46	114.00	-21.54	peak
4	2476.108	87.87	4.59	-6.35	86.11	94.00	-7.89	AV





## Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	2483.500	42.00	4.60	46.60	74.00	-27.40	peak
3	2529.126	39.64	4.84	44.48	74.00	-29.52	peak

## Fundamental Frequency

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2476.000	79.04	4.59	-	83.63	114.00	-30.37	peak
4	2475.814	79.04	4.59	-6.35	77.28	94.00	-16.72	AV

#### 4. BANDWIDTH TEST

##### 4.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 30KHz, VBW $\geq$ RBW, Sweep time = Auto.

##### 4.2 TEST SETUP



##### 4.3 EUT OPERATION CONDITIONS

TX mode.



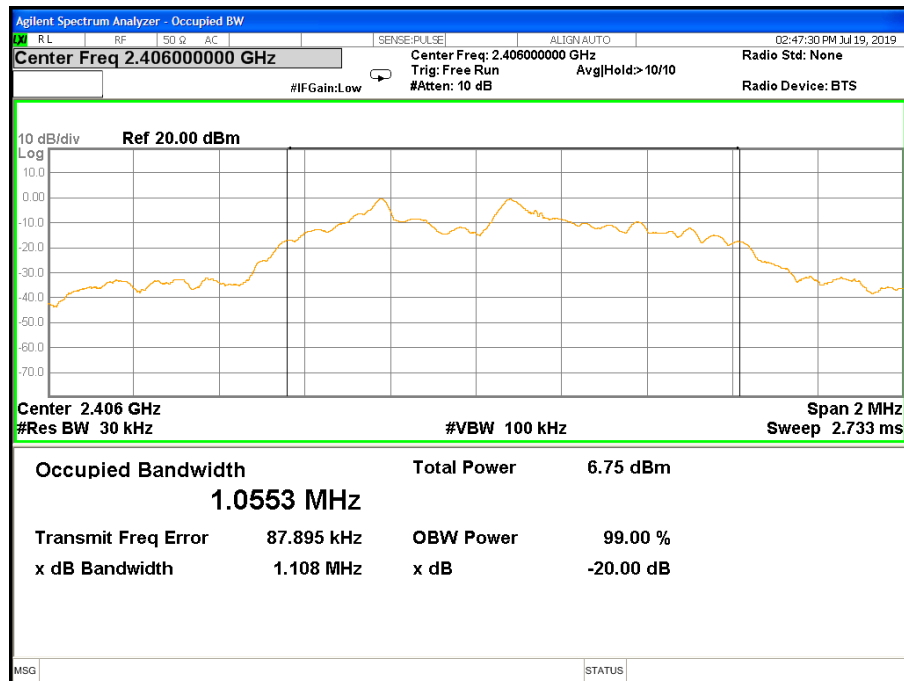


## 4.4 TEST RESULTS

Temperature:	25 °C	Relative Humidity:	50%
Test Voltage:	DC 3.7V from battery		

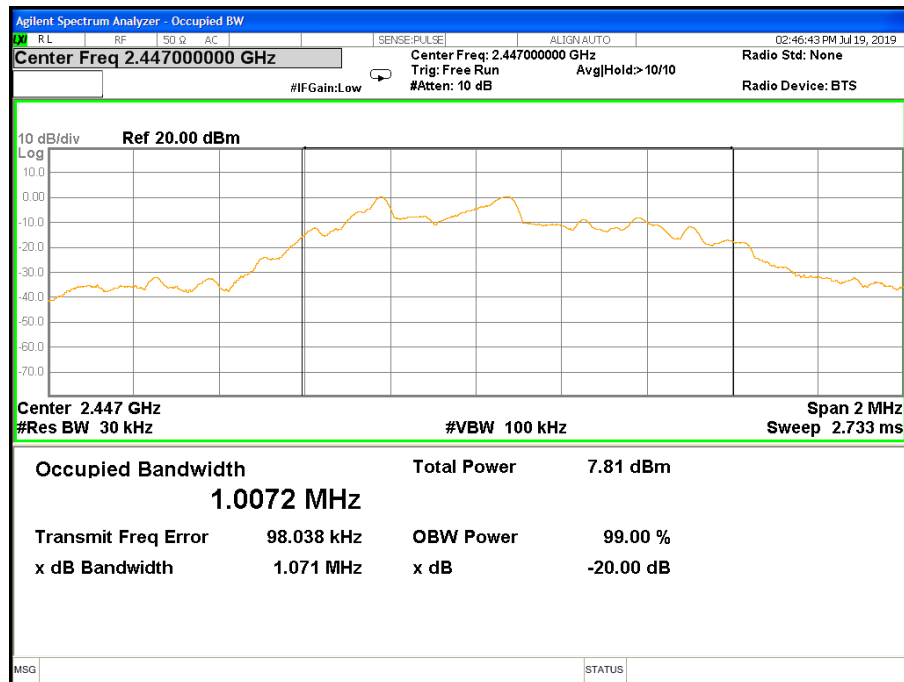
Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)	99% Bandwidth (MHz)
CH01	2406	1.108	1.0553
CH03	2447	1.071	1.0072
CH16	2476	1.065	1.0175

## The Lowest Channel:2401MHz

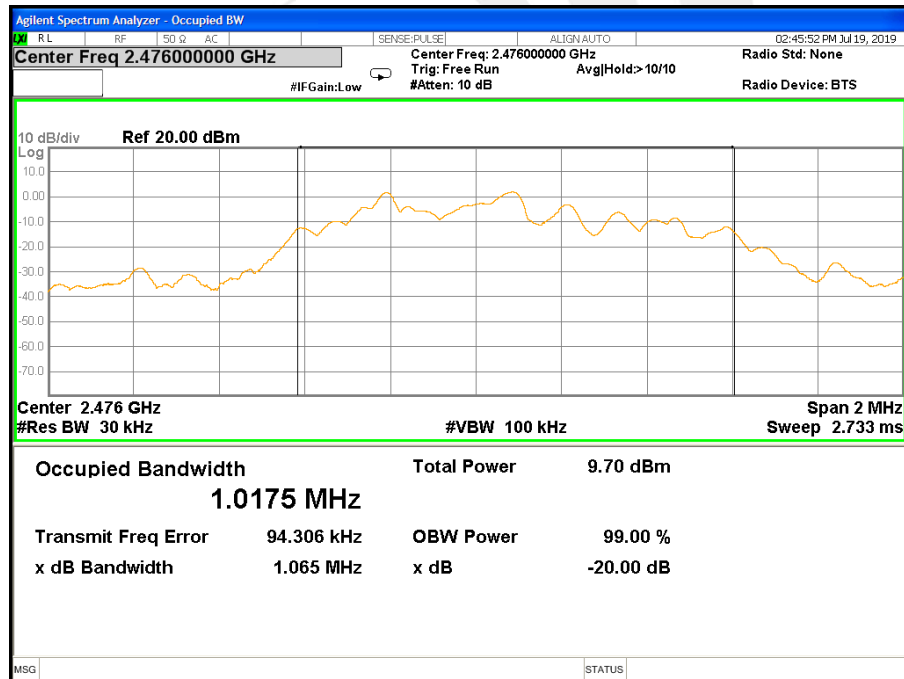




## The Middle Channel: 2440MHz



## The High Channel: 2480MHz





## 5. ANTENNA REQUIREMENT

### 5.1 STANDARD REQUIREMENT

According to the FCC Part 15 Paragraph 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.

### 5.2 EUT ANTENNA

The EUT antenna is PCB Antenna. It conforms to the standard requirements.





## APPENDIX- PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※

