



Test Report No.: RF2203WDG0011-7



# TEST REPORT



Applicant	DEI Sales Inc., dba Polk Audio
Address	5541 Fermi Court Carlsbad CA 92008 United States Of America

Manufacturer or Supplier	Sound United, LLC
Address	5541 Fermi Court Carlsbad, CA 92008, USA
Product	MAGNIFI MAX AX SR SOUND BAR SYSTEM
Additional Product	MAGNIFI MAX AX SOUND BAR SYSTEM
Brand Name	POLK
Model	MAGNIFI MAX AX SUBWOOFER
Additional Model & Model Difference	N/A
Date of tests	Apr. 19, 2022 ~ Jun. 22, 2022

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

**FCC Part 15, Subpart E, Section 15.407**

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

Tested by Lucas Chen Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	  Date: Jun. 30, 2022

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## TABLE OF CONTENTS

<b>RELEASE CONTROL RECORD .....</b>	<b>4</b>
<b>1. SUMMARY OF TEST RESULTS.....</b>	<b>5</b>
1.1 MEASUREMENT UNCERTAINTY .....	5
<b>2. GENERAL INFORMATION .....</b>	<b>6</b>
2.1 GENERAL DESCRIPTION OF EUT .....	6
2.2 DESCRIPTION OF TEST MODES.....	6
2.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL .....	8
2.3 DUTY CYCLE OF TEST SIGNAL .....	10
2.4 DESCRIPTION OF SUPPORT UNITS .....	10
2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS .....	11
<b>3. TEST TYPES AND RESULTS.....</b>	<b>12</b>
3.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT .....	12
3.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT .....	12
3.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS .....	13
3.1.3 TEST INSTRUMENTS.....	14
3.1.4 TEST PROCEDURES .....	15
3.1.5 DEVIATION FROM TEST STANDARD .....	15
3.1.6 TEST SETUP .....	16
3.1.7 EUT OPERATING CONDITION .....	17
3.1.8 TEST RESULTS .....	18
3.2 CONDUCTED EMISSION MEASUREMENT .....	31
3.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	31
3.2.2 TEST INSTRUMENTS.....	31
3.2.3 TEST PROCEDURES .....	32
3.2.4 DEVIATION FROM TEST STANDARD .....	32
3.2.5 TEST SETUP .....	32
3.2.6 EUT OPERATING CONDITIONS .....	32
3.2.7 TEST RESULTS .....	33
3.3 TRANSMIT POWER MEASUREMENT .....	35



**BUREAU  
VERITAS**

**Test Report No.: RF2203WDG0011-7**

3.3.1	LIMITS OF TRANSMIT POWER MEASUREMENT .....	35
3.3.2	TEST SETUP .....	35
3.3.3	TEST INSTRUMENTS.....	36
3.3.4	TEST PROCEDURE.....	36
3.3.5	DEVIATION FROM TEST STANDARD .....	37
3.3.6	EUT OPERATING CONDITIONS.....	37
3.3.7	TEST RESULTS .....	38
3.4	PEAK POWER SPECTRAL DENSITY MEASUREMENT .....	42
3.4.1	LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT .....	42
3.4.2	TEST SETUP.....	42
3.4.3	TEST INSTRUMENTS.....	42
3.4.4	TEST PROCEDURES .....	42
3.4.5	DEVIATION FROM TEST STANDARD .....	43
3.4.6	EUT OPERATING CONDITIONS.....	43
3.4.7	TEST RESULTS .....	44
3.5	FREQUENCY STABILITY .....	46
3.5.1	LIMITS OF FREQUENCY STABILITY MEASUREMENT.....	46
3.5.2	TEST SETUP.....	46
3.5.3	TEST INSTRUMENTS.....	46
3.5.4	TEST PROCEDURE.....	47
3.5.5	DEVIATION FROM TEST STANDARD .....	47
3.5.6	EUT OPERATING CONDITION .....	47
3.5.7	TEST RESULTS .....	48
4.	<b>PHOTOGRAPHS OF THE TEST CONFIGURATION.....</b>	<b>49</b>
5.	<b>APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB .....</b>	<b>50</b>



Test Report No.: RF2203WDG0011-7

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF2203WDG0011-7	Original release.	Jun. 30, 2022



## 1. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407 UNDER NEW RULE)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.407(b)(6)	AC Power Conducted Emissions	PASS	Meet the requirement of limit.
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Meet the requirement of limit

### 1.1 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	UNCERTAINTY
Radiated emissions	9KHz ~ 30MHz	2.16dB
	30MHz ~ 1GMHz	4.79dB
	1GHz ~ 18GHz	5.14dB
	18GHz ~ 40GHz	4.37dB

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



Test Report No.: RF2203WDG0011-7

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	MAGNIFI MAX AX SR SOUND BAR SYSTEM
<b>ADDITIONAL PRODUCT</b>	MAGNIFI MAX AX SOUND BAR SYSTEM
<b>MODEL NO.</b>	MAGNIFI MAX AX SUBWOOFER
<b>FCC ID</b>	WLQMAXXSW
<b>POWER SUPPLY</b>	AC 100-240V 50/60Hz
<b>MODULATION TYPE</b>	GFSK
<b>OPERATING FREQUENCY</b>	5160~5240MHz 5735~5840MHz
<b>NUMBER OF CHANNEL</b>	Refer to section 2.2
<b>CONDUCTED OUTPUT POWER</b>	12.331mW (Measured Max.)
<b>ANTENNA TYPE</b>	Chain 0: PCB Antenna, 2.5dBi Gain Chain 1: PCB Antenna, 2.5dBi Gain
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	Refer to user's manual

#### NOTES:

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.: 2203WDG0011-2) for detailed product photo.
4. The working status of the two antennas is as follows.

MODULATION MODE	FUNCTION
GFSK	2 Chains(SISO)

\* It is provided a SISO function, all test items are carried out on the maximum power "chain 1" antenna except Max Average Transmit Power test.



Test Report No.: RF2203WDG0011-7

## 2.2 DESCRIPTION OF TEST MODES

### FOR 5160 ~ 5240MHz

17 channels are provided for GFSK:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	<b>5160</b>	7	5190	13	5220
2	5165	8	5195	14	5225
3	5170	<b>9</b>	<b>5200</b>	15	5230
4	5175	10	5205	16	5235
5	5180	11	5210	<b>17</b>	<b>5240</b>
6	5185	12	5215		

### FOR 5725 ~ 5850MHz

22 channels are provided for GFSK:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	<b>5735</b>	9	5775	17	5815
2	5740	<b>10</b>	<b>5780</b>	18	5820
3	5745	11	5785	19	5825
4	5750	12	5790	20	5830
5	5755	13	5795	21	5835
6	5760	14	5800	<b>22</b>	<b>5840</b>
7	5765	15	5805		
8	5770	16	5810		



## 2.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	AC 120V 60Hz

Where **RE≥1G**: Radiated Emission above 1GHz      **RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission      **APCM**: Antenna Port Conducted Measurement

**NOTE:** "-" means no effect.

### 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, power supply voltage range and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	FREQ. BAND (MHz)	TESTED CHANNEL	MODULATION TYPE
-	5160-5240	1, 9, 17	GFSK
-	5735-5840	1, 10, 22	GFSK

### RADIATED EMISSION TEST (BELOW 1GHz):

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

EUT CONFIGURE MODE	FREQ. BAND (MHz)	TESTED CHANNEL	MODULATION TYPE
-	5735-5840	1	GFSK

### POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	FREQ. BAND (MHz)	TESTED CHANNEL	MODULATION TYPE
-	5735-5840	1	GFSK





Test Report No.: RF2203WDG0011-7

**ANTENNA PORT CONDUCTED MEASUREMENT:**

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

EUT CONFIGURE MODE	FREQ. BAND (MHz)	TESTED CHANNEL	MODULATION TYPE
-	5160-5240	1, 9, 17	GFSK
-	5735-5840	1, 10, 22	GFSK

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE<1G	25deg. C, 55%RH	AC 120V 60Hz	Jelly
RE≥1G	25deg. C, 55%RH	AC 120V 60Hz	Jelly
PLC	23deg. C, 56%RH	AC 120V 60Hz	Summer
APCM	24deg. C, 57%RH	AC 120V 60Hz	Vincent

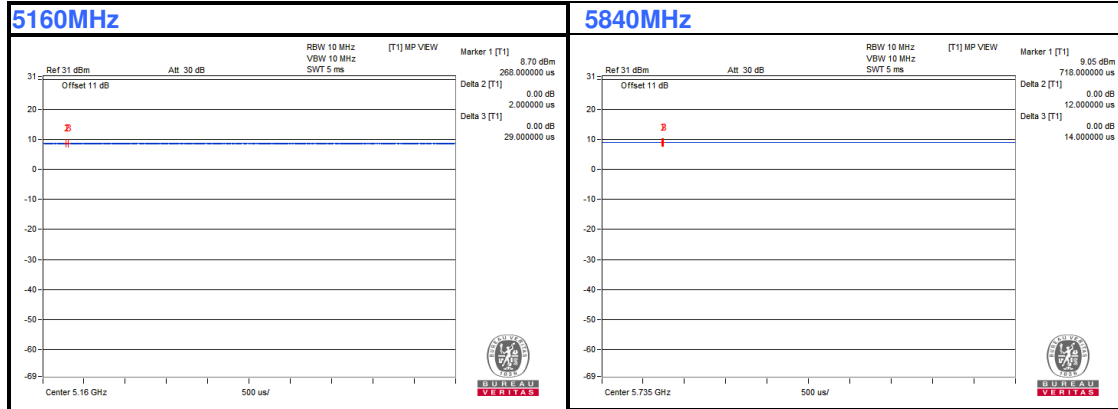


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Test Report No.: RF2203WDG0011-7

### 2.3 DUTY CYCLE OF TEST SIGNAL

GFSK: 100%



### 2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as a dependent 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	N/A	N/A	N/A	N/A	N/A

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

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Test Report No.: RF2203WDG0011-7

## 2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

**FCC Part 15, Subpart E (15.407)**

**789033 D02 General UNII Test Procedures New Rules v02r01**

**ANSI C63.10-2013**

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



Test Report No.: RF2203WDG0011-7

### 3. TEST TYPES AND RESULTS

#### 3.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

##### 3.1.1 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:

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

**NOTES:**

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 30dB under any condition of modulation.



Test Report No.: RF2203WDG0011-7

### 3.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedures New Rules v01r03	FIELD STRENGTH AT 3m	
	PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	Note	Note

**NOTE:** For transmitters operating in the 5.725-5.85 GHz band:

Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). An alternative to the band emissions mask is specified in Section 15.407(b)(4)(ii). The alternative limits are based on the highest antenna gain specified in the filing. There are also marketing and importation restrictions for the alternative limit.

15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where } P \text{ is the eirp (Watts).}$$



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Test Report No.: RF2203WDG0011-7

### 3.1.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Feb. 22, 23
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	May 09, 23
Active Loop Antenna (9KHz -30MHz)	SCHWARZBECK	FMZB 1519B	1519B-045	May 20, 23
Amplifier (9KHz -1GHz)	Burgeon	BPA-530	100210	Mar. 08, 23
Trilog-Broadband Antenna(20M-2G)	SCHWARZBECK	VULB 9168	01263	Sep. 30, 22
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 21, 23
Horn Antenna (18GHz -40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	May 14, 23
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	May 22, 23
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	May 12, 23
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Jan. 10, 23
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A

#### NOTES:

1. The test was performed in 966 Chamber. (Chenwu)
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.
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.



Test Report No.: RF2203WDG0011-7

### 3.1.4 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. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

#### NOTES:

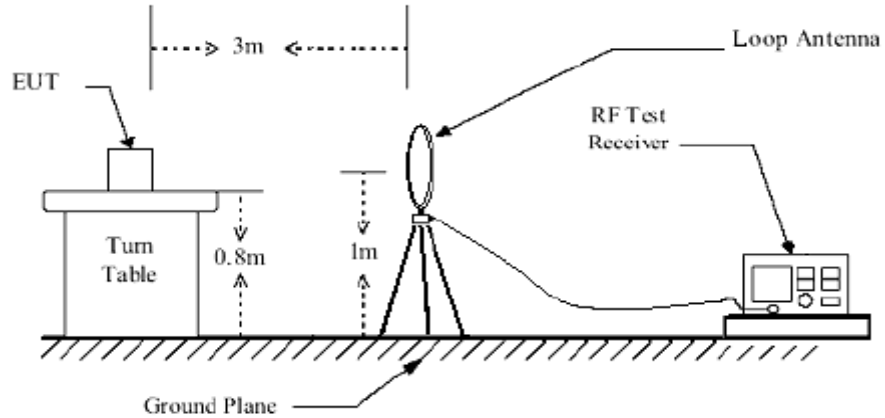
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

### 3.1.5 DEVIATION FROM TEST STANDARD

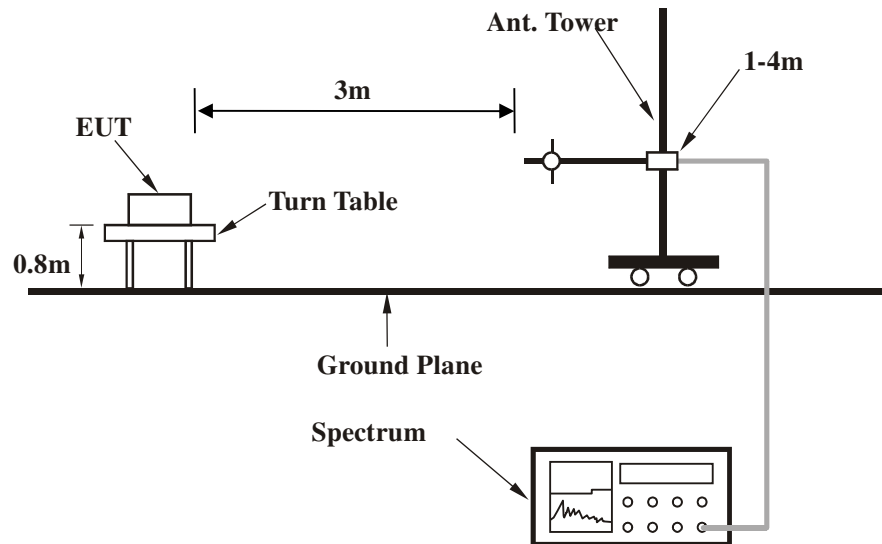
No deviation.

### 3.1.6 TEST SETUP

#### Below 30MHz test setup



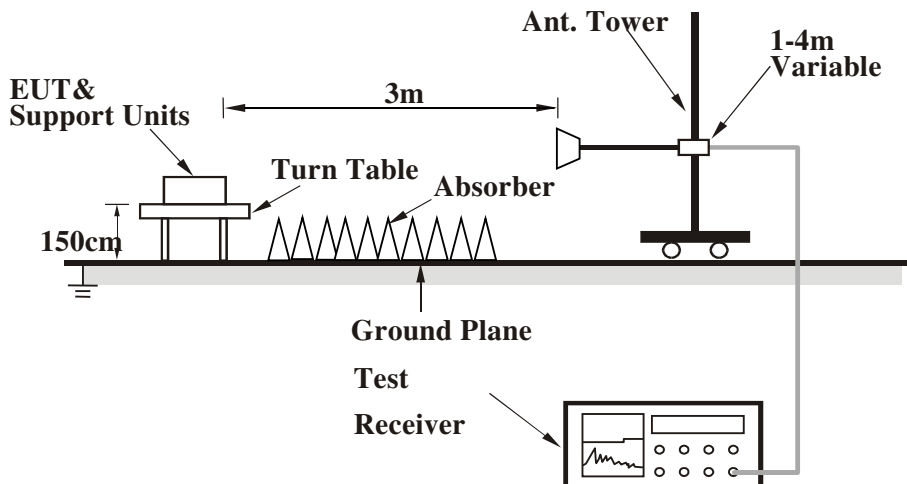
#### Below 1GHz test setup



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



## Above 1GHz test setup



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

### 3.1.7 EUT OPERATING CONDITION

- Set the EUT under full load condition and placed them on a testing table.
- Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the EUT in full functions.



Test Report No.: RF2203WDG0011-7

### 3.1.8 TEST RESULTS

#### BELOW 1GHz WORST-CASE DATA

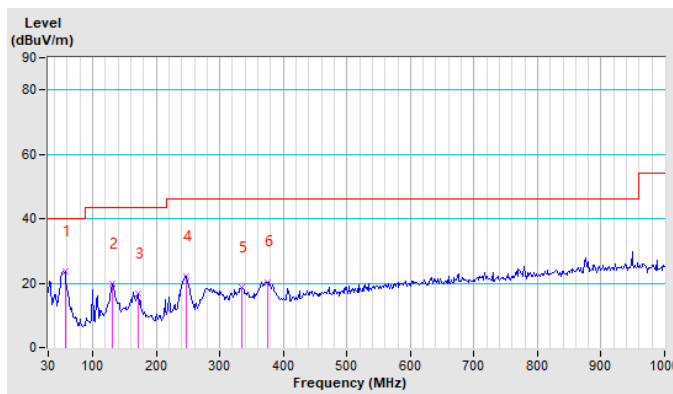
#### GFSK 5735-5840MHz

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	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	56.43	23.71 QP	40.00	-16.29	1.00 H	216	41.66	-17.95
2	131.04	19.95 QP	43.50	-23.55	1.00 H	236	37.70	-17.75
3	171.46	16.72 QP	43.50	-26.78	1.00 H	276	34.11	-17.39
4	247.63	22.10 QP	46.00	-23.90	1.00 H	256	39.34	-17.24
5	334.68	18.51 QP	46.00	-27.49	1.00 H	313	33.09	-14.58
6	375.10	20.38 QP	46.00	-25.62	1.00 H	296	33.89	-13.51

#### 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).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value





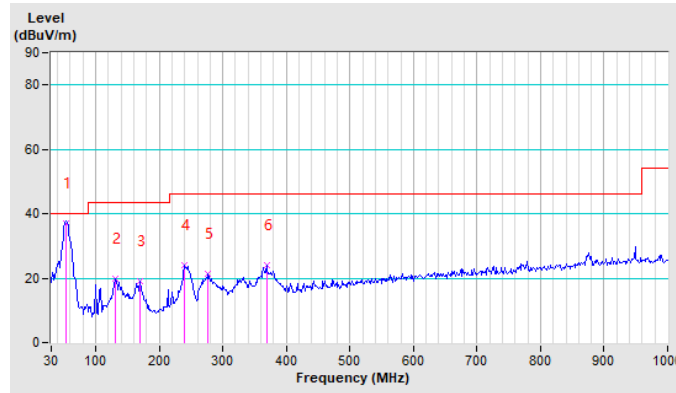
Test Report No.: RF2203WDG0011-7

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	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	53.32	36.95 QP	40.00	-3.05	1.00 V	0	54.59	-17.64
2	131.04	19.95 QP	43.50	-23.55	1.00 V	240	37.70	-17.75
3	169.90	18.97 QP	43.50	-24.53	1.00 V	218	36.21	-17.24
4	239.86	23.84 QP	46.00	-22.16	1.00 V	0	41.34	-17.50
5	277.16	21.37 QP	46.00	-24.63	1.00 V	177	37.37	-16.00
6	368.88	24.07 QP	46.00	-21.93	1.00 V	194	37.76	-13.69

**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).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value





Test Report No.: RF2203WDG0011-7

**ABOVE 1GHz DATA**

**GFSK: 5160~5240MHz**

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		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	5131.70	46.92 PK	74.00	-27.08	1.05 H	210	42.12	4.80
2	5131.70	35.06 AV	54.00	-18.94	1.05 H	210	30.26	4.80
3	5150.00	44.81 PK	74.00	-29.19	1.05 H	210	40.00	4.81
4	5150.00	34.29 AV	54.00	-19.71	1.05 H	210	29.48	4.81
5	*5160.00	96.44 PK			1.05 H	210	91.62	4.82
6	*5160.00	86.91 AV			1.05 H	210	82.09	4.82
7	#10320.00	50.26 PK	68.20	-17.94	1.00 H	219	40.97	9.29
8	15480.00	53.39 PK	74.00	-20.61	1.00 H	296	35.08	18.31
9	15480.00	42.10 AV	54.00	-11.90	1.00 H	296	23.79	18.31
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	5133.00	47.24 PK	74.00	-26.76	1.00 V	216	42.44	4.80
2	5133.00	35.12 AV	54.00	-18.88	1.00 V	216	30.32	4.80
3	5150.00	44.33 PK	74.00	-29.67	1.00 V	216	39.52	4.81
4	5150.00	33.14 AV	54.00	-20.86	1.00 V	216	28.33	4.81
5	*5160.00	96.71 PK			1.00 V	216	91.89	4.82
6	*5160.00	87.12 AV			1.00 V	216	82.30	4.82
7	#10320.00	48.59 PK	68.20	-19.61	1.00 V	203	39.30	9.29
8	15480.00	52.36 PK	74.00	-21.64	1.00 V	69	34.05	18.31
9	15480.00	41.08 AV	54.00	-12.92	1.00 V	69	22.77	18.31

**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).
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.
6. " # " : The radiated frequency is out of the restricted band.

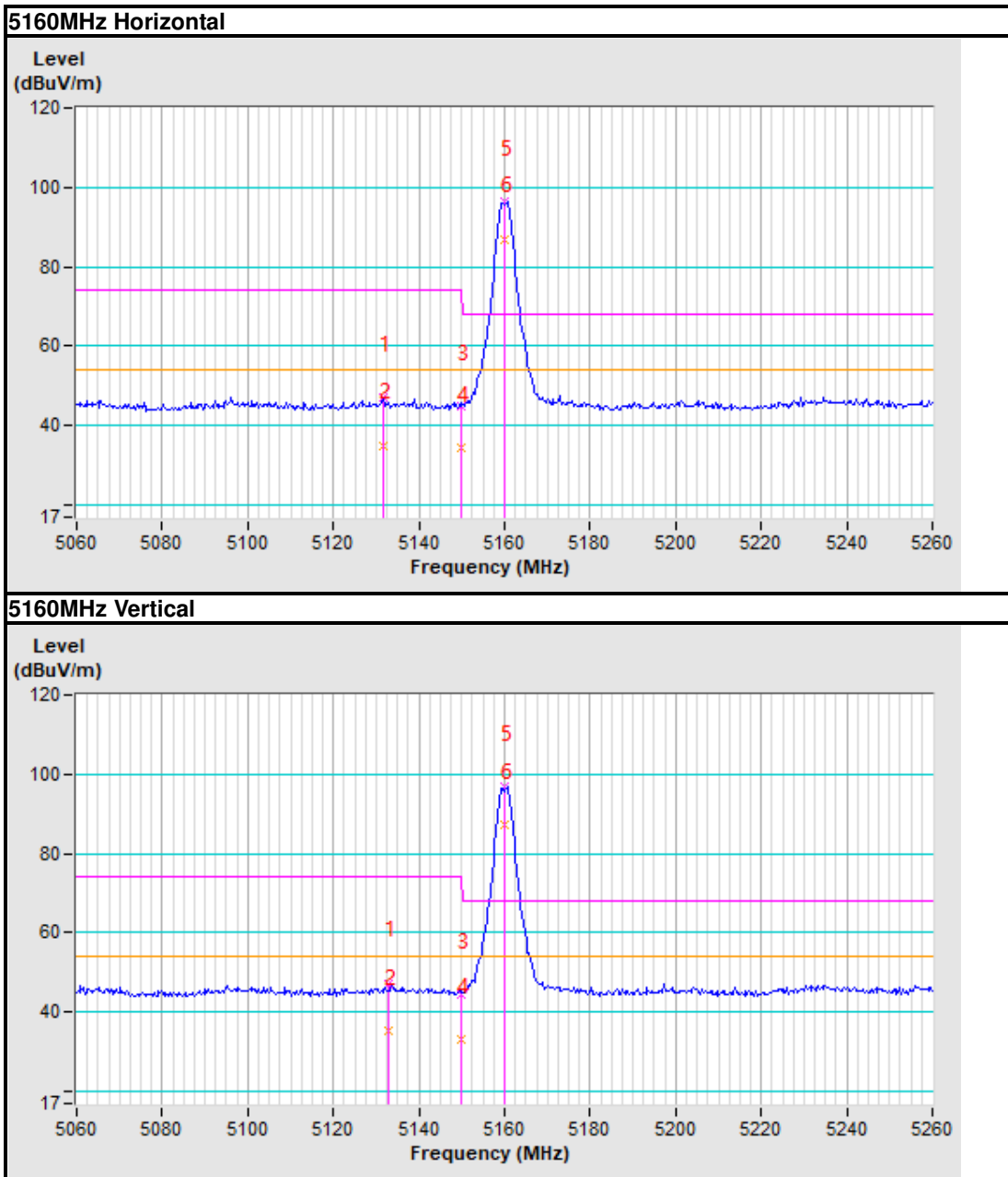
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### Band edge Plot





Test Report No.: RF2203WDG0011-7

<b>CHANNEL</b>	TX Channel 9	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		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	5146.00	37.10 AV	54.00	-16.90	1.00 H	104	32.29	4.81
2	5150.00	45.36 PK	74.00	-28.64	1.00 H	104	40.55	4.81
3	5150.00	34.59 AV	54.00	-19.41	1.00 H	104	29.78	4.81
4	*5200.00	95.23 PK			1.00 H	104	90.36	4.87
5	*5200.00	86.37 AV			1.00 H	104	81.50	4.87
6	#10400.00	54.26 PK	68.20	-13.94	2.00 H	219	44.89	9.37
7	#10400.00	43.69 AV	54.00	-10.31	2.00 H	219	34.32	9.37
8	15600.00	54.18 PK	74.00	-19.82	1.00 H	219	35.42	18.76
9	15600.00	44.73 AV	54.00	-9.27	1.00 H	219	25.97	18.76
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	5148.60	46.25 PK	74.00	-27.75	1.00 V	224	41.44	4.81
2	5148.60	34.10 AV	54.00	-19.90	1.00 V	224	29.29	4.81
3	5150.00	47.36 PK	74.00	-26.64	1.00 V	224	42.55	4.81
4	5150.00	35.10 AV	54.00	-18.90	1.00 V	224	30.29	4.81
5	*5200.00	97.82 PK			1.00 V	224	92.95	4.87
6	*5200.00	87.69 AV			1.00 V	224	82.82	4.87
7	#10400.00	53.36 PK	68.20	-14.84	1.02 V	275	43.99	9.37
8	#10400.00	42.09 AV	54.00	-11.91	1.02 V	275	32.72	9.37
9	15600.00	55.26 PK	74.00	-18.74	1.00 V	114	36.50	18.76
10	15600.00	44.96 AV	54.00	-9.04	1.00 V	114	26.20	18.76

**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).
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.
6. " # ": The radiated frequency is out of the restricted band.

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Test Report No.: RF2203WDG0011-7

<b>CHANNEL</b>	TX Channel 17	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		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	5145.00	45.54 PK	74.00	-28.46	1.00 H	216	40.73	4.81
2	5145.00	36.38 AV	54.00	-17.62	1.00 H	216	31.57	4.81
3	5150.00	45.04 PK	74.00	-28.96	1.00 H	220	40.23	4.81
4	5150.00	34.72 AV	54.00	-19.28	1.00 H	220	29.91	4.81
5	*5240.00	96.52 PK			1.00 H	220	91.61	4.91
6	*5240.00	86.41 AV			1.00 H	220	81.50	4.91
7	5350.00	46.20 PK	74.00	-27.80	1.00 H	216	41.16	5.04
8	5350.00	34.85 AV	54.00	-19.15	1.00 H	216	29.81	5.04
9	5352.96	47.27 PK	74.00	-26.73	1.00 H	216	42.23	5.04
10	5352.96	36.59 AV	54.00	-17.41	1.00 H	216	31.55	5.04
11	#10480.00	51.03 PK	68.20	-17.17	1.00 H	36	41.57	9.46
12	15720.00	53.36 PK	74.00	-20.64	1.00 H	108	34.25	19.11
13	15720.00	43.68 AV	54.00	-10.32	1.00 H	108	24.57	19.11

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	5146.00	44.74 PK	74.00	-29.26	1.00 V	269	39.93	4.81
2	5146.00	35.59 AV	54.00	-18.41	1.00 V	269	30.78	4.81
3	5150.00	44.60 PK	74.00	-29.40	1.00 V	269	39.79	4.81
4	5150.00	35.62 AV	54.00	-18.38	1.00 V	269	30.81	4.81
5	*5240.00	98.41 PK			1.00 V	269	93.50	4.91
6	*5240.00	88.69 AV			1.00 V	269	83.78	4.91
7	#5349.00	46.76 PK	68.20	-21.44	1.00 V	269	41.73	5.03
8	#5349.00	37.10 AV	54.00	-16.90	1.00 V	269	32.07	5.03
9	5350.00	46.81 PK	74.00	-27.19	1.00 V	269	41.77	5.04
10	5350.00	37.30 AV	54.00	-16.70	1.00 V	269	32.26	5.04
11	#10480.00	53.36 PK	68.20	-14.84	1.20 V	216	43.90	9.46
12	15720.00	54.36 PK	74.00	-19.64	1.00 V	105	35.25	19.11
13	15720.00	43.69 AV	54.00	-10.31	1.00 V	105	24.58	19.11

**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).
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.
6. " # ": The radiated frequency is out of the restricted band.

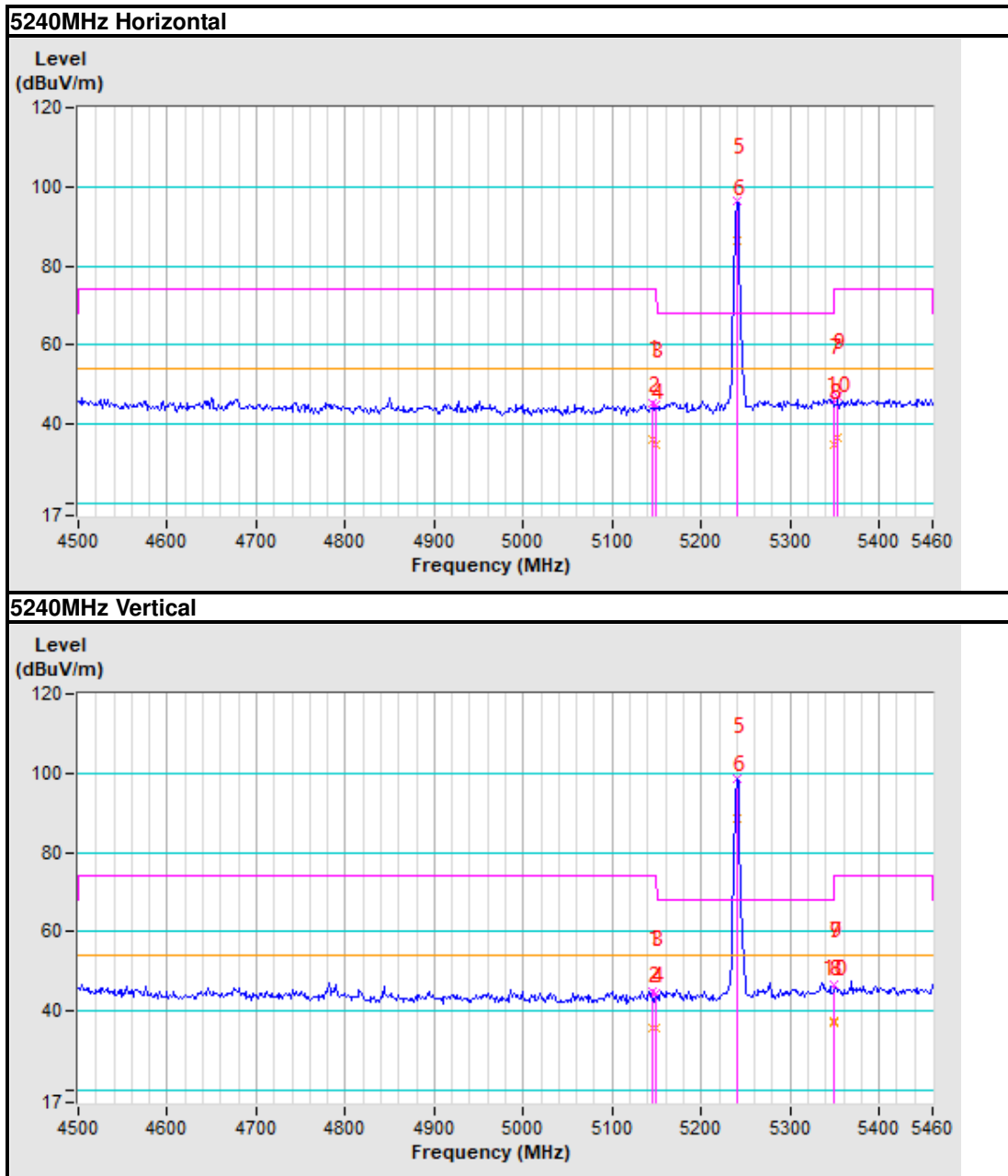
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### Band edge Plot







Test Report No.: RF2203WDG0011-7

**ABOVE 1GHz DATA**

**GFSK: 5735~5840MHz**

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		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	#5661.90	47.73 PK	77.03	-29.30	1.05 H	0	42.28	5.45
2	#5725.00	47.88 PK	122.20	-74.32	1.05 H	252	42.34	5.54
3	*5735.00	94.58 PK			1.00 H	25	89.03	5.55
4	*5735.00	85.01 AV			1.00 H	25	79.46	5.55
5	#5883.65	47.76 PK	98.77	-51.01	1.05 H	0	41.98	5.78
6	11470.00	52.10 PK	74.00	-21.90	1.00 H	169	38.21	13.89
7	11470.00	43.69 AV	54.00	-10.31	1.00 H	169	29.80	13.89
8	#17205.00	53.85 PK	68.20	-14.35	1.00 H	57	32.05	21.80
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	#5654.33	46.93 PK	71.41	-24.48	1.05 V	0	41.50	5.43
2	#5725.00	47.41 PK	122.20	-74.79	1.05 V	0	41.87	5.54
3	*5735.00	98.26 PK			1.00 V	105	92.71	5.55
4	*5735.00	89.45 AV			1.00 V	105	83.90	5.55
5	#5992.55	53.09 PK	68.20	-15.11	1.05 V	0	47.14	5.95
6	11470.00	53.36 PK	74.00	-20.64	1.00 V	105	39.47	13.89
7	11470.00	44.48 AV	54.00	-9.52	1.00 V	105	30.59	13.89
8	#17205.00	54.69 PK	68.20	-13.51	1.00 V	185	32.89	21.80

**REMARKS:**

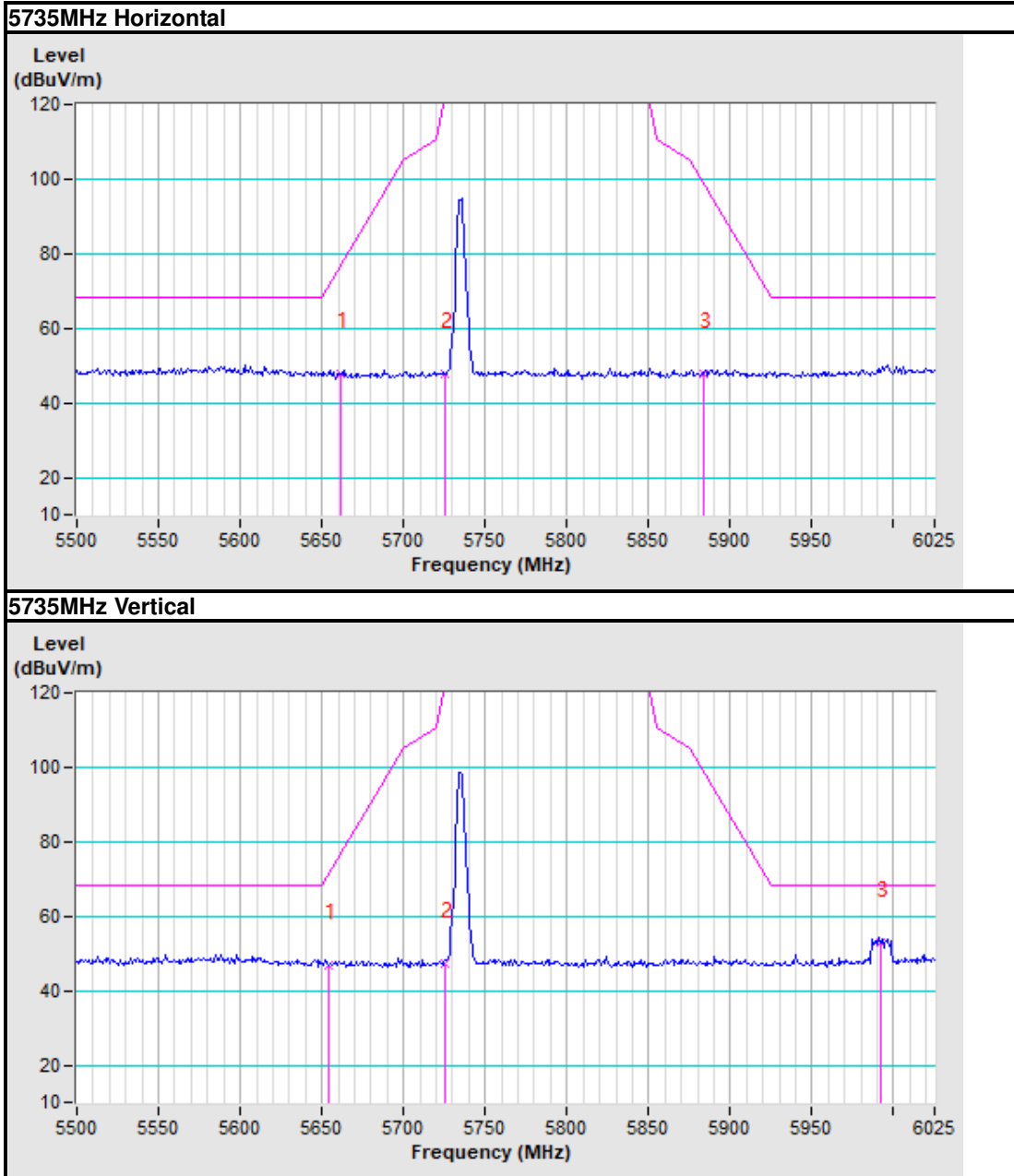
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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**Band edge Plot**





Test Report No.: RF2203WDG0011-7

<b>CHANNEL</b>	TX Channel 10	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		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	#5610.22	47.76 PK	68.20	-20.44	1.05 H	0	42.40	5.36
2	#5671.63	46.25 PK	84.25	-38.00	1.05 H	0	40.79	5.46
3	*5780.00	93.73 PK			1.04 H	206	88.11	5.62
4	*5780.00	84.10 AV			1.04 H	206	78.48	5.62
5	#5920.67	47.54 PK	71.39	-23.85	1.05 H	0	41.70	5.84
6	11560.00	53.36 PK	74.00	-20.64	1.00 H	107	39.27	14.09
7	11560.00	42.10 AV	54.00	-11.90	1.00 H	107	28.01	14.09
8	#17340.00	54.60 PK	68.20	-13.60	1.00 H	204	32.41	22.19
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	#5656.49	47.23 PK	73.02	-25.79	1.05 V	0	41.79	5.44
2	*5780.00	99.45 PK			1.00 V	55	93.83	5.62
3	*5780.00	89.41 AV			1.00 V	55	83.79	5.62
4	#5959.37	47.47 PK	68.20	-20.73	1.05 V	0	41.57	5.90
5	#5991.35	51.70 PK	68.20	-16.50	1.05 V	0	45.75	5.95
6	11560.00	52.10 PK	74.00	-21.90	1.00 V	69	38.01	14.09
7	11560.00	41.86 AV	54.00	-12.14	1.00 V	69	27.77	14.09
8	#17340.00	53.80 PK	68.20	-14.40	1.00 V	100	31.61	22.19

**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).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

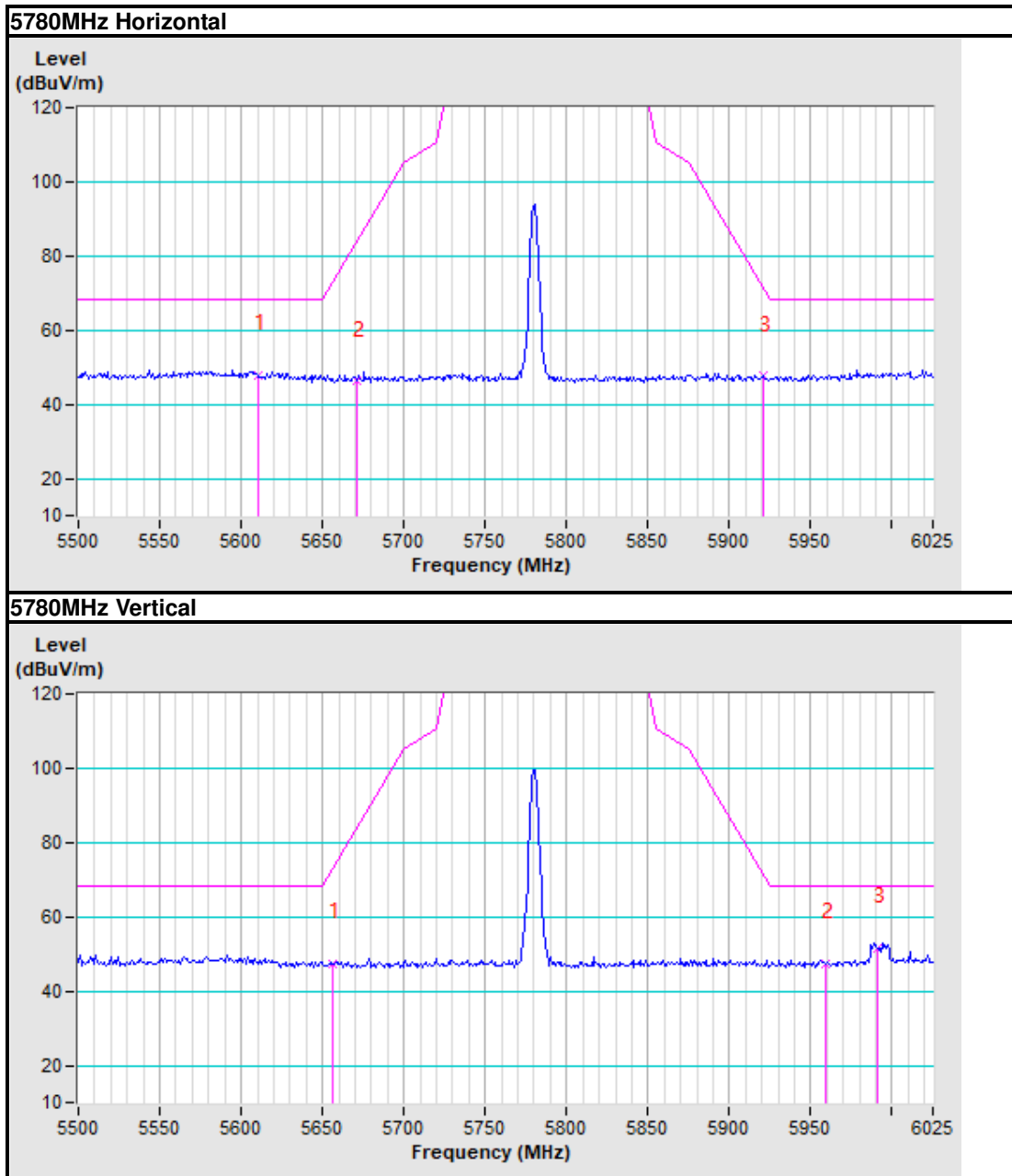
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Band edge Plot





Test Report No.: RF2203WDG0011-7

<b>CHANNEL</b>	TX Channel 22	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		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	#5650.10	46.74 PK	68.27	-21.53	1.05 H	0	41.31	5.43
2	*5840.00	92.65 PK			1.00 H	25	86.94	5.71
3	*5840.00	83.41 AV			1.00 H	25	77.70	5.71
4	#5850.00	46.75 PK	122.20	-75.45	1.05 H	0	41.02	5.73
5	#5938.34	46.63 PK	68.20	-21.57	1.05 H	0	40.76	5.87
6	11680.00	53.75 PK	74.00	-20.25	1.00 H	39	39.60	14.15
7	11680.00	43.85 AV	54.00	-10.15	1.00 H	39	29.70	14.15
8	#17520.00	55.41 PK	68.20	-12.79	1.00 H	240	32.75	22.66
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	#5662.38	47.76 PK	77.39	-29.63	1.05 V	0	42.31	5.45
2	*5840.00	98.46 PK			1.00 V	210	92.75	5.71
3	*5840.00	88.69 AV			1.00 V	210	82.98	5.71
4	#5850.00	48.23 PK	122.20	-73.97	1.05 V	0	42.50	5.73
5	#5993.87	52.82 PK	68.20	-15.38	1.05 V	0	46.87	5.95
6	11680.00	54.36 PK	74.00	-19.64	1.00 V	209	40.21	14.15
7	11680.00	44.69 AV	54.00	-9.31	1.00 V	209	30.54	14.15
8	#17520.00	55.69 PK	68.20	-12.51	1.00 V	104	33.03	22.66

**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).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

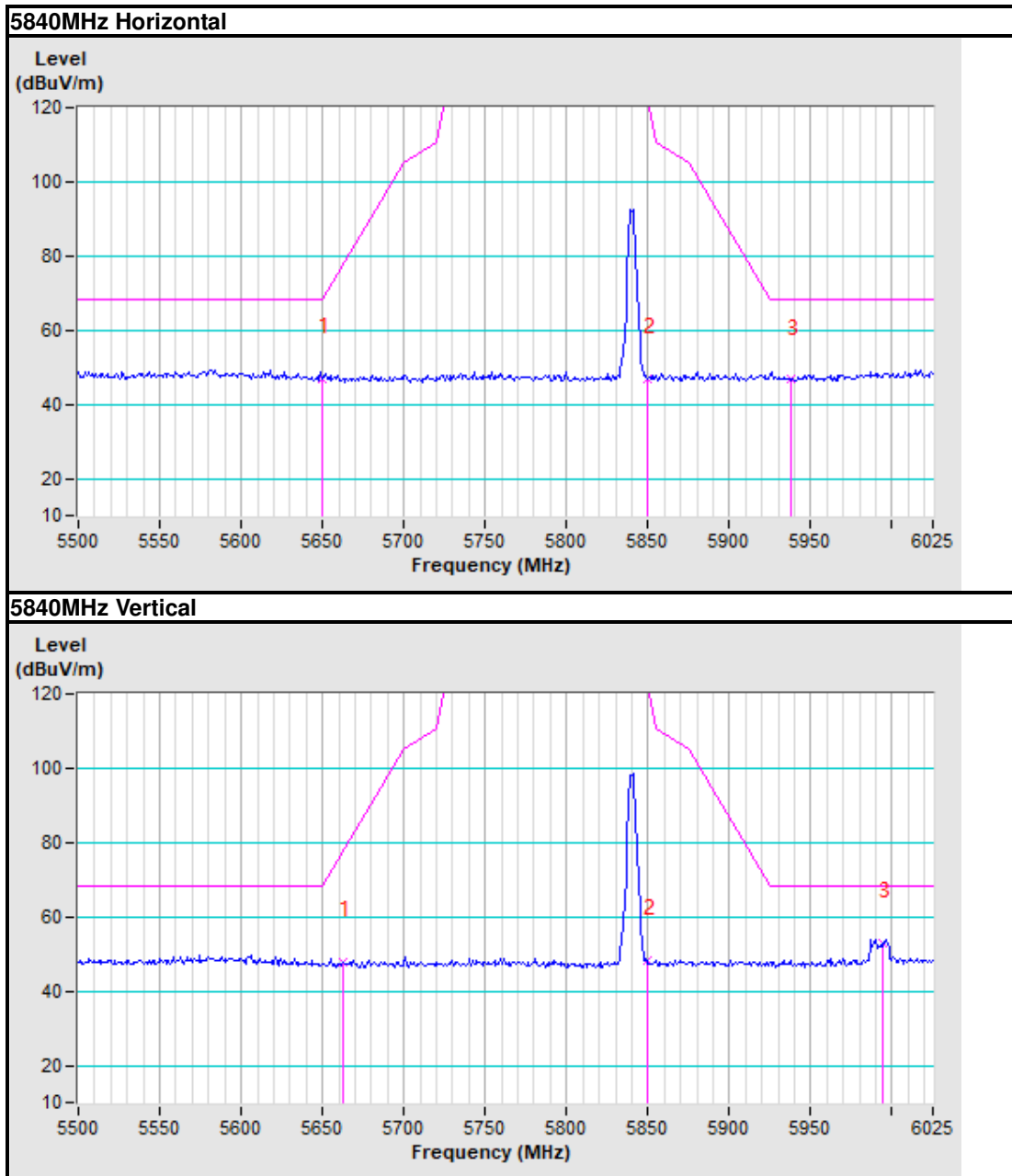
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### Band edge Plot





Test Report No.: RF2203WDG0011-7

## 3.2 CONDUCTED EMISSION MEASUREMENT

### 3.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTES:**
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.
  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.

### 3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Jan. 18,23
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Jan. 23,23
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Jan. 18,23
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Aug. 05,22
Coaxial RF Cable	/	CE CABLE	C2310066D G	Jul. 27,22
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A

- NOTES:**
1. The test was performed in shielded room 553. (Chenwu)
  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.

### 3.2.3 TEST PROCEDURES

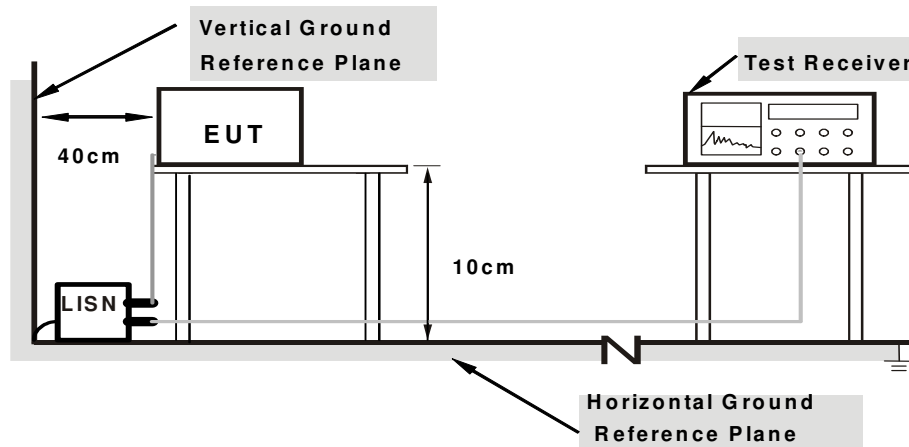
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

### 3.2.4 DEVIATION FROM TEST STANDARD

No deviation.

### 3.2.5 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

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

### 3.2.6 EUT OPERATING CONDITIONS

Same as 3.1.7





Test Report No.: RF2203WDG0011-7

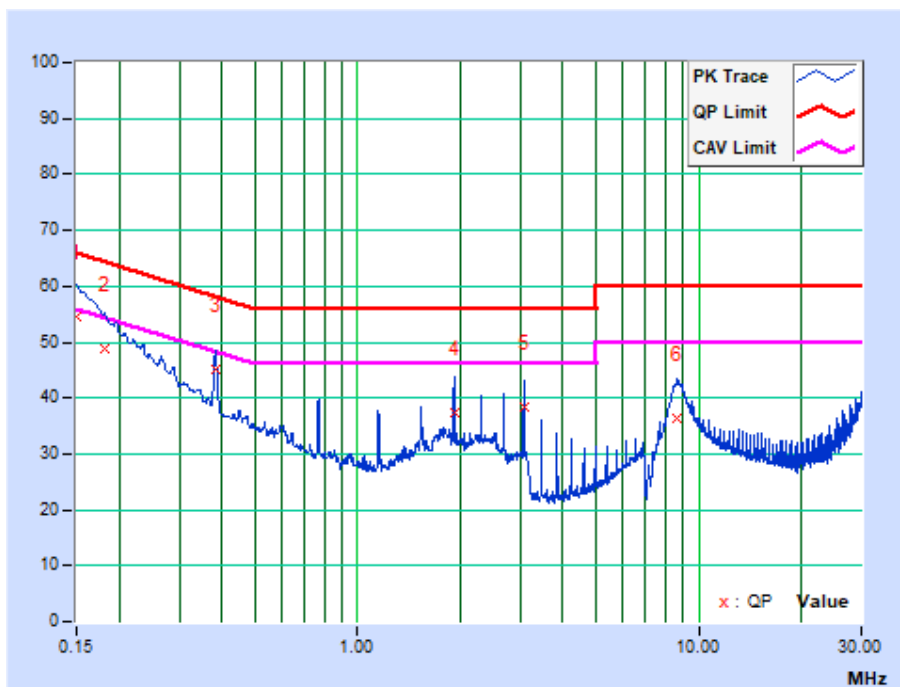
### 3.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: GFSK: 5735-5840MHz CH 1

PHASE	Line	6dB BANDWIDTH	9kHz
-------	------	---------------	------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.90	44.81	26.46	54.71	36.36	66.00	56.00	-11.29	-19.64
2	0.18076	9.91	38.88	19.01	48.79	28.92	64.45	54.45	-15.66	-25.53
<b>3</b>	<b>0.38400</b>	<b>9.95</b>	<b>35.28</b>	<b>32.02</b>	<b>45.23</b>	<b>41.97</b>	<b>58.19</b>	<b>48.19</b>	<b>-12.97</b>	<b>-6.23</b>
4	1.92075	10.10	27.24	23.11	37.34	33.20	56.00	46.00	-18.66	-12.80
5	3.07242	10.13	28.41	23.96	38.54	34.09	56.00	46.00	-17.46	-11.91
6	8.67525	10.28	26.22	19.62	36.50	29.90	60.00	50.00	-23.50	-20.10

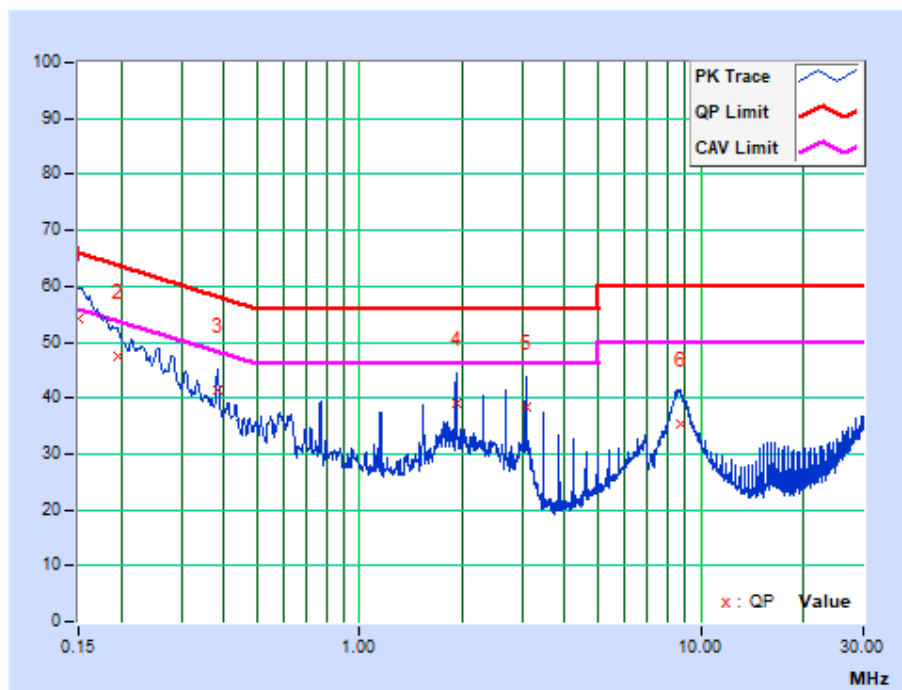
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. The emission levels of other frequencies were very low against the limit.
  3. Margin value = Emission level - Limit value
  4. Correction factor = Insertion loss + Cable loss
  5. Emission Level = Correction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



<b>PHASE</b>	Neutral	<b>6dB BANDWIDTH</b>	9kHz
--------------	---------	----------------------	------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.84	44.53	28.01	54.37	37.85	66.00	56.00	-11.63	-18.15
2	0.19500	9.85	37.59	20.10	47.44	29.95	63.82	53.82	-16.38	-23.87
3	0.38400	9.85	31.48	27.49	41.33	37.34	58.19	48.19	-16.86	-10.85
4	1.92031	9.91	29.27	25.47	39.18	35.38	56.00	46.00	-16.82	-10.62
5	3.07050	9.93	28.59	25.91	38.52	35.84	56.00	46.00	-17.48	-10.16
6	8.70000	10.10	25.25	19.04	35.35	29.14	60.00	50.00	-24.65	-20.86

- 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.



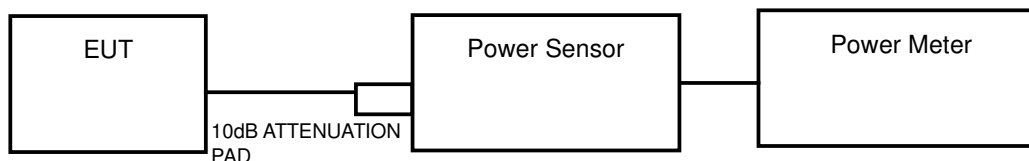
### 3.3 TRANSMIT POWER MEASUREMENT

#### 3.3.1 LIMITS OF TRANSMIT POWER MEASUREMENT

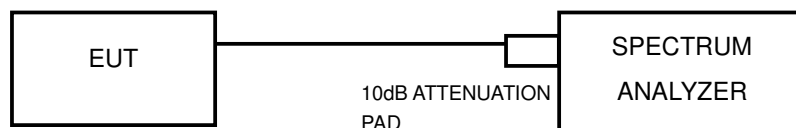
Operation Band	EUT Category		LIMIT
U-NII-1	-	Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
	-	Fixed point-to-point Access Point	1 Watt (30 dBm)
	-	Indoor Access Point	1 Watt (30 dBm)
	√	Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	-		250mW(24dBm) or 11 dBm+10LogB*
U-NII-2C	-		250mW(24dBm) or 11 dBm+10LogB*
U-NII-3	√		1 Watt (30 dBm)

**NOTE:** 1. Where B is the 26dB emission bandwidth in MHz.

#### 3.3.2 TEST SETUP



#### FOR 6/26dB BANDWIDTH





Test Report No.: RF2203WDG0011-7

### 3.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Power Sensor	Keysight	U2021XA	MY57320002	Feb. 23, 23
Power Sensor	Keysight	U2021XA	MY55060018	May 09, 23
Digital Multimeter	FLUKE	15B	A1220010DG	N/A
Humid & Temp Programmable Tester	Haida	HD-225T	110807201	Nov. 03, 22
Oscilloscope	Agilent	DSO9254A	MY51260160	Aug. 11, 22
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Jan. 16, 23
Signal Generator	Agilent	N5183A	MY50140980	Sep. 18, 22
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Sep. 14, 22
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A
DC Source	Keysight	E3642A	MY56146098	N/A
Test software	ADT	ADT_RF Test Software V6.6.5.3	N/A	N/A

#### NOTES:

1. The test was performed in RF Oven room. (Chenwu)
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.

### 3.3.4 TEST PROCEDURE

#### FOR AVERAGE POWER MEASUREMENT

Method PM is 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.



Test Report No.: RF2203WDG0011-7

#### FOR 26dB BANDWIDTH

- 1) Set RBW = approximately 1% of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = RMS.
- 4) Trace mode = max hold.
- 5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

#### FOR 6dB BANDWIDTH

- 1) Set RBW = 100 kHz.
- 2) Set the video bandwidth (VBW)  $\geq 3$  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 frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### 3.3.5 DEVIATION FROM TEST STANDARD

No deviation.

### 3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



Test Report No.: RF2203WDG0011-7

### 3.3.7 TEST RESULTS

#### OUTPUT POWER:

GFSK: 5160~5240MHz

##### CHAIN 0

Channel Number	FREQ. (MHz)	AVG. CONDUCTED POWER (dBm)	LIMIT (dBm)	PASS /FAIL
1	5160	9.43	24.00	PASS
9	5200	9.55	24.00	PASS
17	5240	10.38	24.00	PASS

##### CHAIN 1

Channel Number	FREQ. (MHz)	AVG. CONDUCTED POWER (dBm)	LIMIT (dBm)	PASS /FAIL
1	5160	9.48	24.00	PASS
9	5200	10.18	24.00	PASS
17	5240	<b>10.91</b>	24.00	PASS

GFSK: 5735~5840MHz

##### CHAIN 0

Channel Number	FREQ. (MHz)	AVG. CONDUCTED POWER (dBm)	LIMIT (dBm)	PASS /FAIL
1	5735	9.69	30.00	PASS
10	5780	9.68	30.00	PASS
22	5840	9.25	30.00	PASS

##### CHAIN 1

Channel Number	FREQ. (MHz)	AVG. CONDUCTED POWER (dBm)	LIMIT (dBm)	PASS /FAIL
1	5735	9.72	30.00	PASS
10	5780	9.75	30.00	PASS
22	5840	9.38	30.00	PASS



Test Report No.: RF2203WDG0011-7

### 26dB BANDWIDTH:

GFSK : 5160~5240MHz

Channel Number	Freq. (MHz)	26dB DOWN BANDWIDTH (MHz)	PASS /FAIL
1	5160	4.68	PASS
9	5200	4.68	PASS
17	5240	4.65	PASS

### 6dB BANDWIDTH

GFSK : 5735~5840MHz

Channel Number	Freq. (MHz)	6dB DOWN BANDWIDTH (MHz)	PASS /FAIL
1	5735	1.94	PASS
10	5780	1.98	PASS
22	5840	1.98	PASS

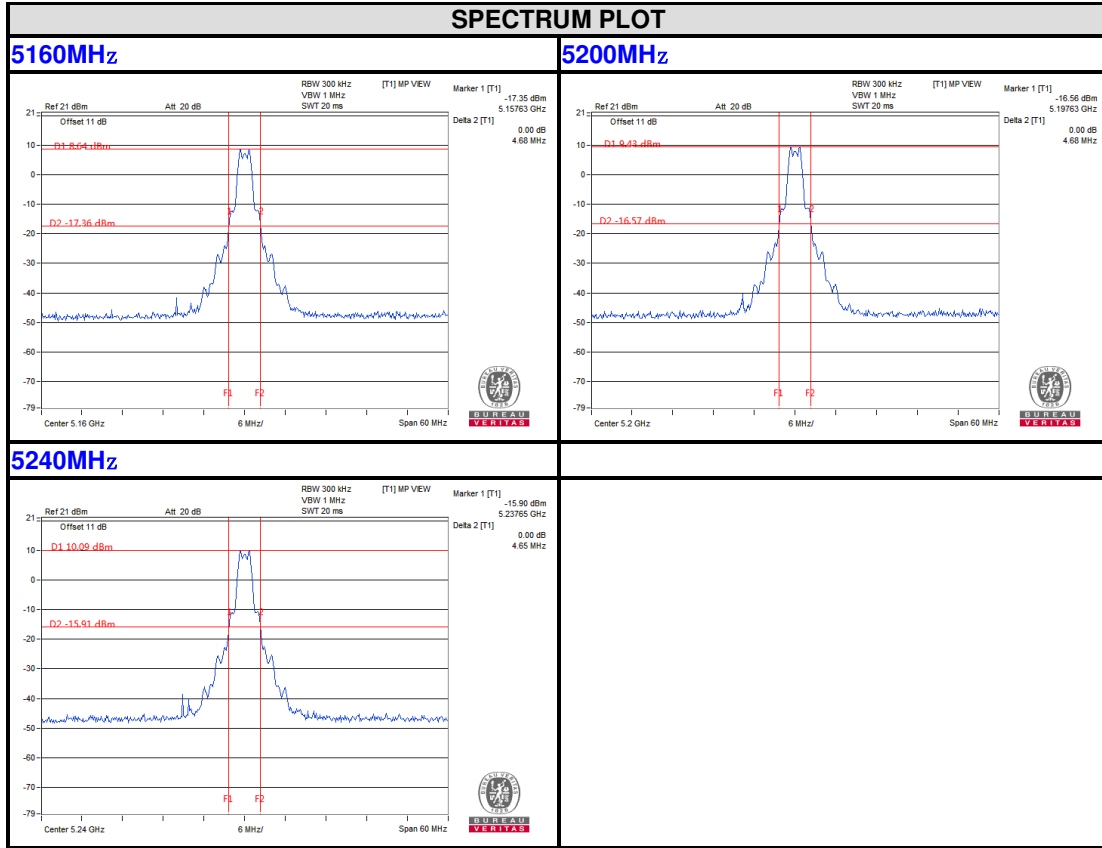


BUREAU VERITAS

Test Report No.: RF2203WDG0011-7

### 26dB bandwidth Test Plot

GFSK : 5160~5240MHz



Bureau Veritas Shenzhen Co., Ltd.  
Dongguan Branch

No. 96, Guantai Road (Houjie Section), Houjie  
Town, Dongguan City, Guangdong Province.  
523942. People's Republic of China.

Tel: +86 769 8998 2098  
Fax: +86 769 8593 1080  
Email: [customerservice.dg@bureauveritas.com](mailto:customerservice.dg@bureauveritas.com)

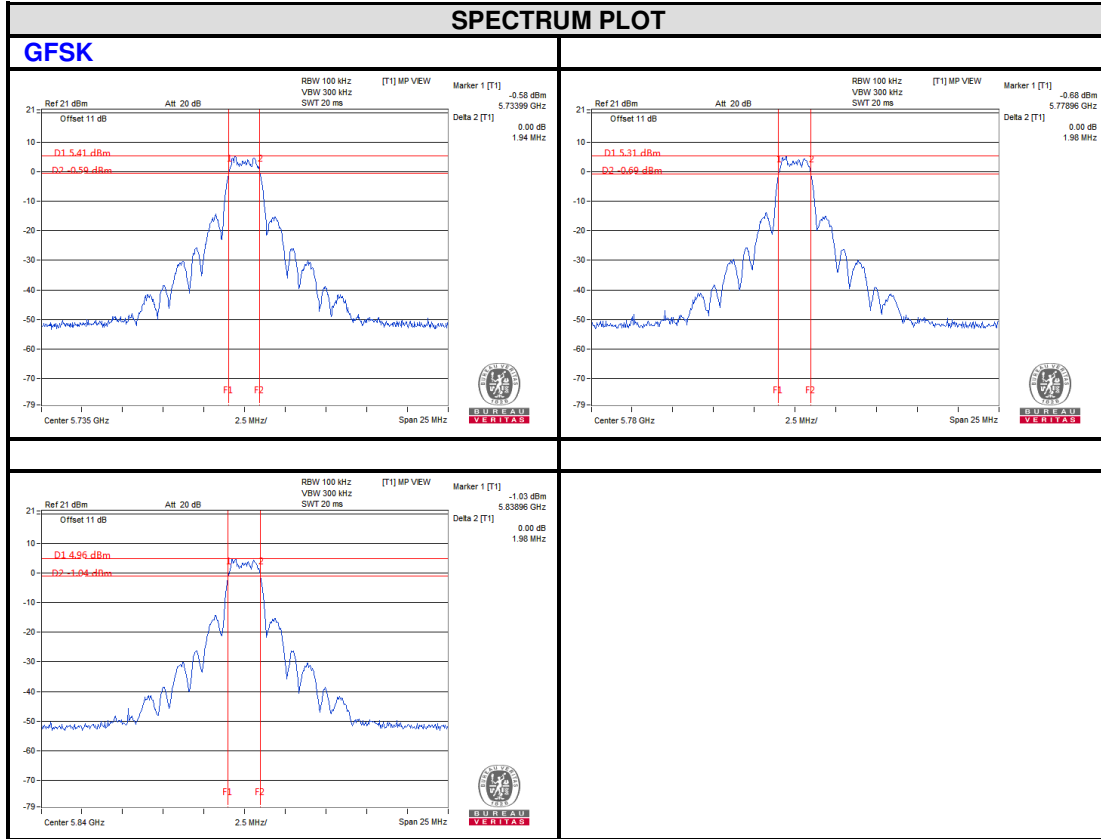




BUREAU VERITAS

Test Report No.: RF2203WDG0011-7

### 6dB BANDWIDTH



Bureau Veritas Shenzhen Co., Ltd.  
Dongguan Branch

No. 96, Guantai Road (Houjie Section), Houjie  
Town, Dongguan City, Guangdong Province.  
523942. People's Republic of China.

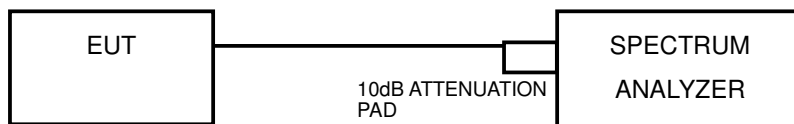
Tel: +86 769 8998 2098  
Fax: +86 769 8593 1080  
Email: [customerservice\\_dg@bureauveritas.com](mailto:customerservice_dg@bureauveritas.com)

### 3.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

#### 3.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1	-	Outdoor Access Point	17dBm/ MHz
	-	Fixed point-to-point Access Point	
	-	Indoor Access Point	
	√	Mobile and Portable client device	11dBm/ MHz
U-NII-2A	-		11dBm/ MHz
U-NII-2C	-		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

#### 3.4.2 TEST SETUP



#### 3.4.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

#### 3.4.4 TEST PROCEDURES

##### For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 1MHz, Set VBW =3 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to “free run”.
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Record the max value and add 10 log (1/duty cycle)



Test Report No.: RF2203WDG0011-7

### For U-NII-3 band:

Using method SA-2

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 300 kHz, Set VBW = 1 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to "free run".
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Record the max value and add 10 log (1/duty cycle)

#### 3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 3.4.6 EUT OPERATING CONDITIONS

Same as 3.3.6



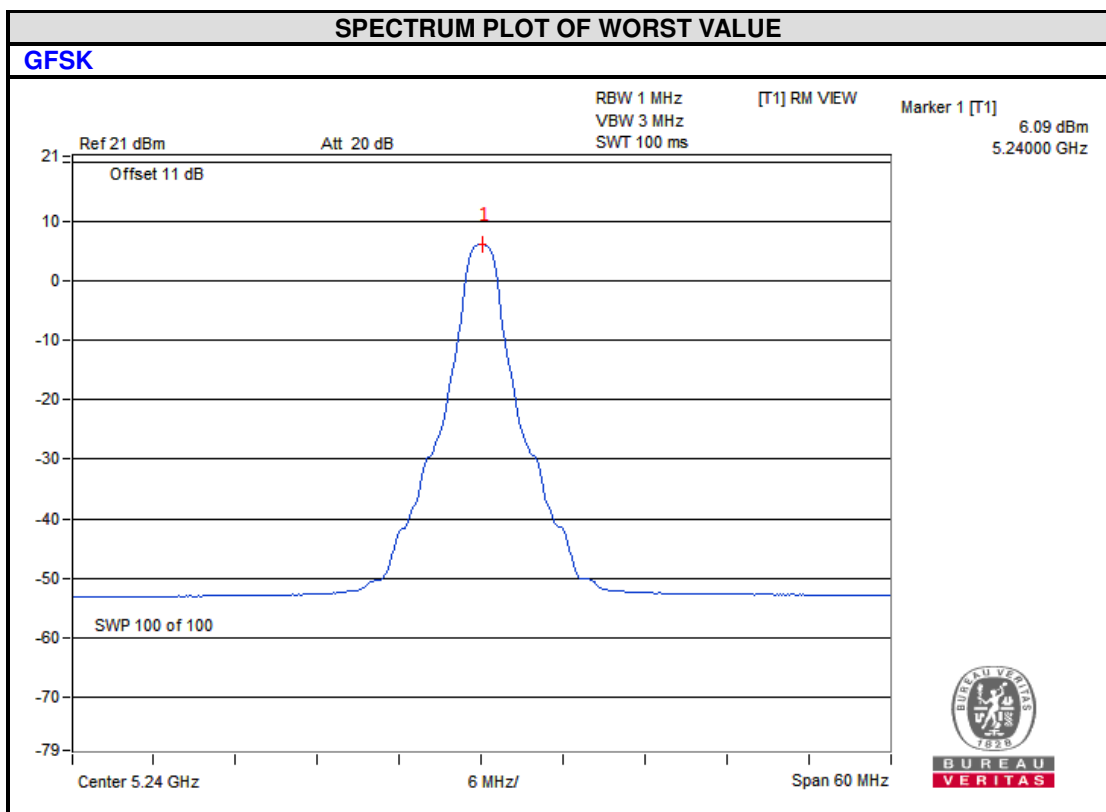
Test Report No.: RF2203WDG0011-7

### 3.4.7 TEST RESULTS

GFSK: 5160~5240MHz

Channel	Frequency (MHz)	PSD (dBm/MHz)	MAX. Limit (dBm)	PASS / FAIL
1	5160	4.58	11.00	PASS
9	5200	5.35	11.00	PASS
17	5240	6.09	11.00	PASS

#### PSD Test Worst Plot



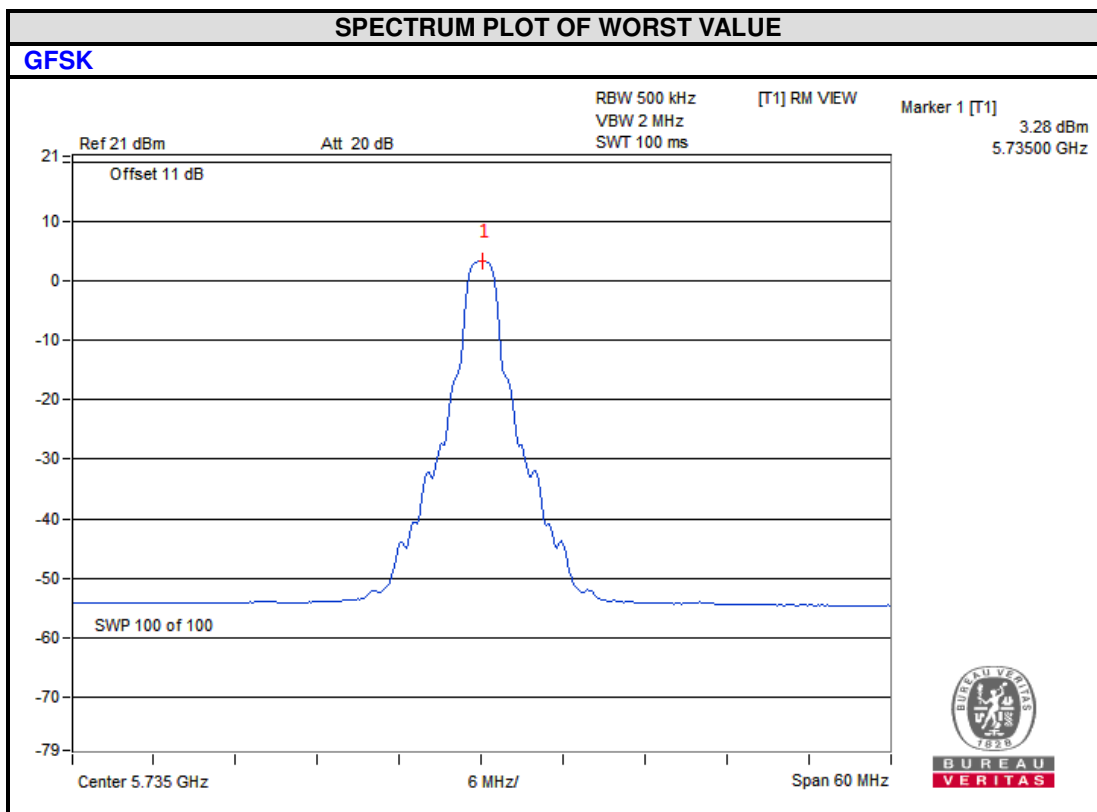


Test Report No.: RF2203WDG0011-7

GFSK: 5730~5840MHz

Channel Number	Frequency (MHz)	RF Power Level in 500kHz BW (dBm)	MAX. Limit (dBm/500k)	PASS / FAIL
1	5735	3.28	30.00	PASS
10	5780	3.09	30.00	PASS
22	5840	2.84	30.00	PASS

PSD Test Worst Plot

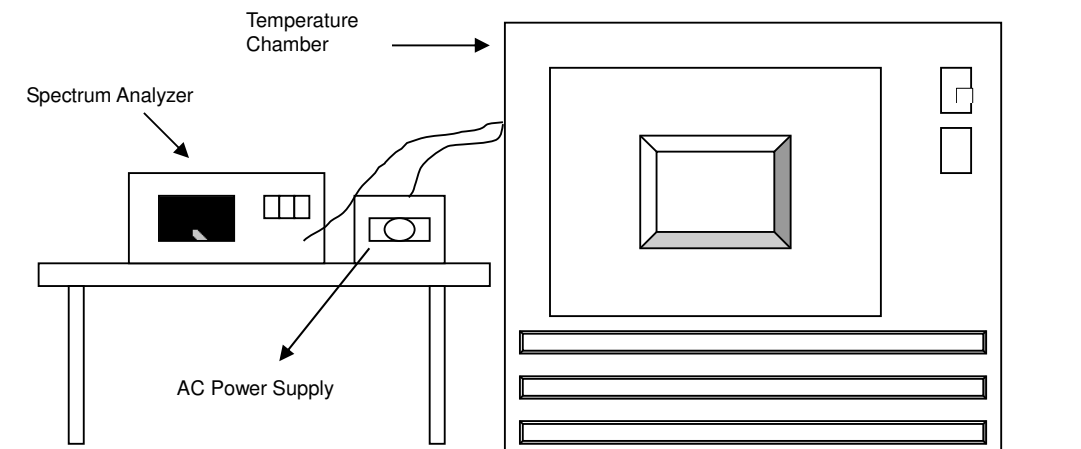


### 3.5 FREQUENCY STABILITY

#### 3.5.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency of the carrier signal shall be maintained within band of operation.

#### 3.5.2 TEST SETUP



#### 3.5.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.



Test Report No.: RF2203WDG0011-7

#### 3.5.4 TEST PROCEDURE

- a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- b. Turn the EUT on and couple its output to a spectrum analyzer.
- c. Turn the EUT off and set the chamber to the highest temperature specified.
- d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

#### 3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 3.5.6 EUT OPERATING CONDITION

Set the EUT transmit at un-modulation mode to test frequency stability.



Test Report No.: RF2203WDG0011-7

### 3.5.7 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5160MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift	Measured Frequency (MHz)	Frequency Drift	Measured Frequency (MHz)	Frequency Drift	Measured Frequency (MHz)	Frequency Drift
50	120	5734.9896	-0.00018	5734.9895	-0.00018	5734.9861	-0.00024	5734.9885	-0.00020
40	120	5734.9997	-0.00001	5734.9891	-0.00019	5734.9982	-0.00003	5734.9892	-0.00019
30	120	5734.9994	-0.00001	5734.9889	-0.00019	5734.9989	-0.00002	5735.0217	0.00038
20	120	5734.9727	-0.00048	5734.9721	-0.00049	5734.9738	-0.00046	5734.9721	-0.00049
10	120	5734.9735	-0.00046	5734.9736	-0.00046	5734.9752	-0.00043	5734.9759	-0.00042
0	120	5734.9793	-0.00036	5734.9757	-0.00042	5734.9763	-0.00041	5734.9765	-0.00041
-10	120	5734.9895	-0.00018	5734.9881	-0.00021	5734.9877	-0.00021	5734.9923	-0.00013
-20	120	5734.981	-0.00033	5734.9823	-0.00031	5734.982	-0.00031	5734.9806	-0.00034
-30	120	5734.9743	-0.00045	5734.9774	-0.00039	5734.9789	-0.00037	5734.9748	-0.00044

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5160MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift	Measured Frequency (MHz)	Frequency Drift	Measured Frequency (MHz)	Frequency Drift	Measured Frequency (MHz)	Frequency Drift
20	138	5734.9719	-0.00049	5734.9722	-0.00048	5734.9746	-0.00044	5734.9710	-0.00051
	120	5734.9727	-0.00048	5734.9721	-0.00049	5734.9738	-0.00046	5734.9721	-0.00049
	102	5734.9729	-0.00047	5734.9726	-0.00048	5734.9737	-0.00046	5734.971	-0.00051





Test Report No.: RF2203WDG0011-7

#### 4. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



Test Report No.: RF2203WDG0011-7

## 5. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

---END---