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FCC TEST REPORT

Report No:STS1811019W02

Issued for

DewertOkin GmbH

Weststr. 1, 32278 Kirchlingern, Germany

Product Name:	RF-TOUCHLINE
Brand Name:	OKIN
Model Name:	P1217
Series Model:	N/A
FCC ID:	O3YTOUCHLINE
Test Standard:	FCC Part 15.249

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**TEST RESULT CERTIFICATION**

Applicant's name: DewertOkin GmbH

Address: Weststr. 1, 32278 Kirchlingern, Germany

Manufacture's Name: DewertOkin GmbH

Address: Weststr. 1, 32278 Kirchlingern, Germany

Product description

Product Name: RF-TOUCHLINE

Brand Name: OKIN

Model Name: P1217

Series Model: N/A

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 : 02 Nov.2018 ~06 Nov.2018

Date of Issue : 12 Nov.2018

Test Result : **Pass**

Testing Engineer :

(Chris chen)

Technical Manager :

(Sunday Hu)

Authorized Signatory :

(Vita Li)





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**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	12 Nov.2018	STS1811019W02	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	N/A	--
15.203	Antenna Requirement	Pass	--
15.249	Radiated Spurious Emission	Pass	--
15.205	Radiated Band Edge Emission	Pass	--
15.249	Occupied 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. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China

FCC Registration No.: 625569

IC Registration No.: 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	RF-TOUCHLINE								
Trade Name	OKIN								
Model Name	P1217								
Series Model	N/A								
Model Difference	The product is provided with different quantity of keys and different key-symbols and different colors depends on customer requirements, the different variants have the same model name and internal circuit								
Product Description	The EUT is RF-TOUCHLINE <table><tr><td>Operation Frequency:</td><td>2403MHz-2480MHz</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>1.1 dBi</td></tr></table> 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.	Operation Frequency:	2403MHz-2480MHz	Modulation Type:	GFSK	Antenna Designation:	PCB Antenna	Antenna Gain(Peak):	1.1 dBi
Operation Frequency:	2403MHz-2480MHz								
Modulation Type:	GFSK								
Antenna Designation:	PCB Antenna								
Antenna Gain(Peak):	1.1 dBi								
Channel List	Please refer to the Note 2.								
Power Rating	Input: DC4.5V(by 3*1.5Vd.c. AAA battery)								
Hardware version number	V1.3								
Software version number	DP2								

Note:

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2403	02	2440	03	2480

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	OKIN	P1217	PCB	NA	1.1	Antenna



2.2 DESCRIPTION OF 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 CH02	GFSK
Mode 3	TX CH03	GFSK

Note:

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

(2) We have be tested for all avaiable 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





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

E-1
EUT

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
N/A	N/A	N/A	N/A	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 LISTS

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	2018.03.08	2019.03.07
Active loop Antenna	ZHINAN	ZN30900C	16035	2017.03.11	2020.03.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.01
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	9120D-1343	2017.10.27	2020.10.26
SHF-EHF Horn Antenna (15G-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2019.03.10
Pre-mpifier (0.1M-3GHz)	EM	EM330	060665	2018.03.09	2019.03.08
PreAmplifier (1G-18GHz)	SKET	LNPA-01018G-4 5	SK2018080901	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

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	2018.10.13	2019.10.12
LISN	EMCO	3810/2NM	23625	2018.10.13	2019.10.12
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11	2019.10.10

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
USB RF power sensor	DARE	RPR3006W	15100041SNO03	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



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

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	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.

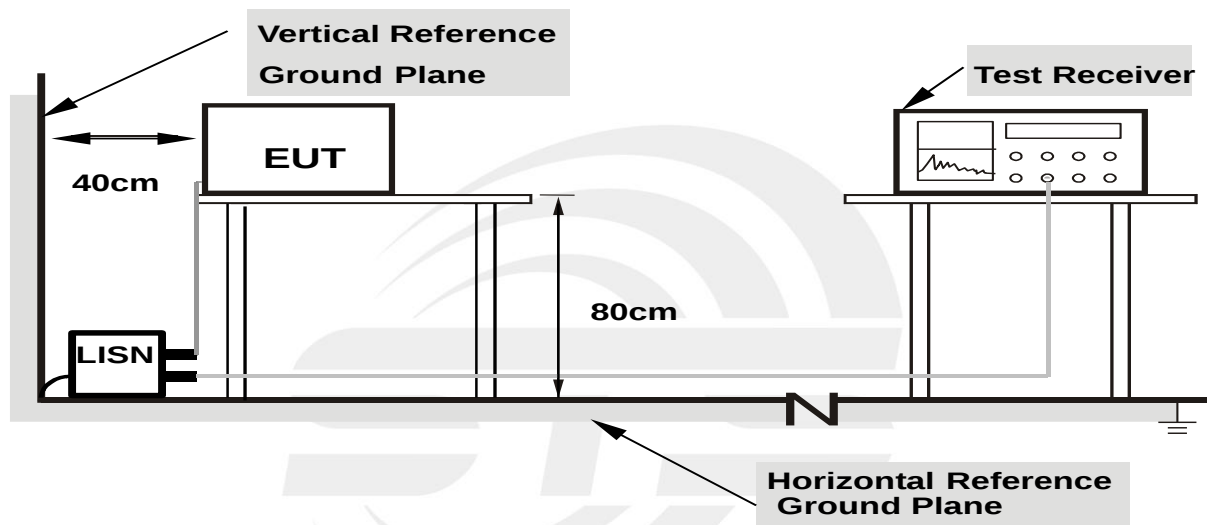
The following table is the setting of the receiver

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 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:	24℃	Relative Humidity:	60%
Test Voltage:	AC 120V/60Hz	Phase:	L/N
Test Mode:	N/A		

Note: EUT is only power by battery, so it is not applicable for this test.





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 (micovolts/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

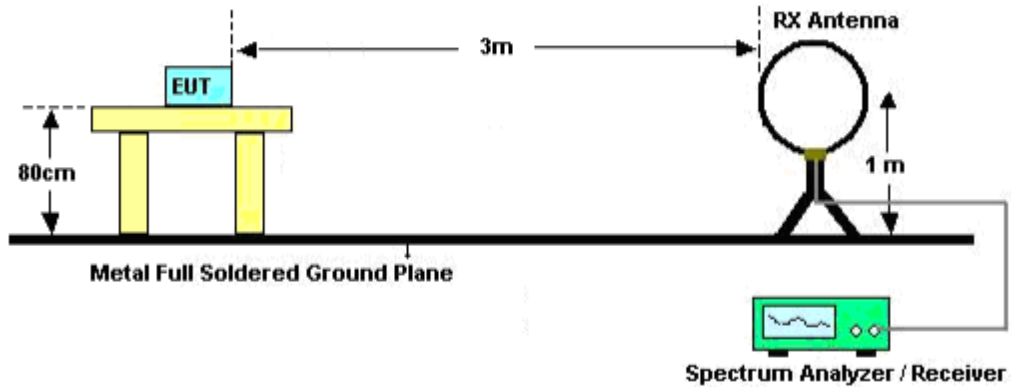
- The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Below 1GHz)
- The measuring distance of 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)
- 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

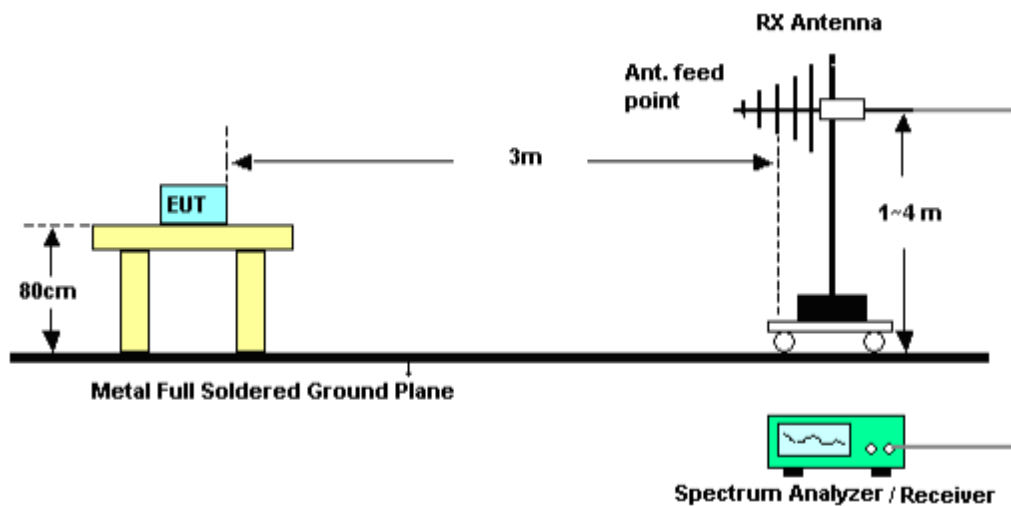
No deviation

3.2.4 TEST SETUP

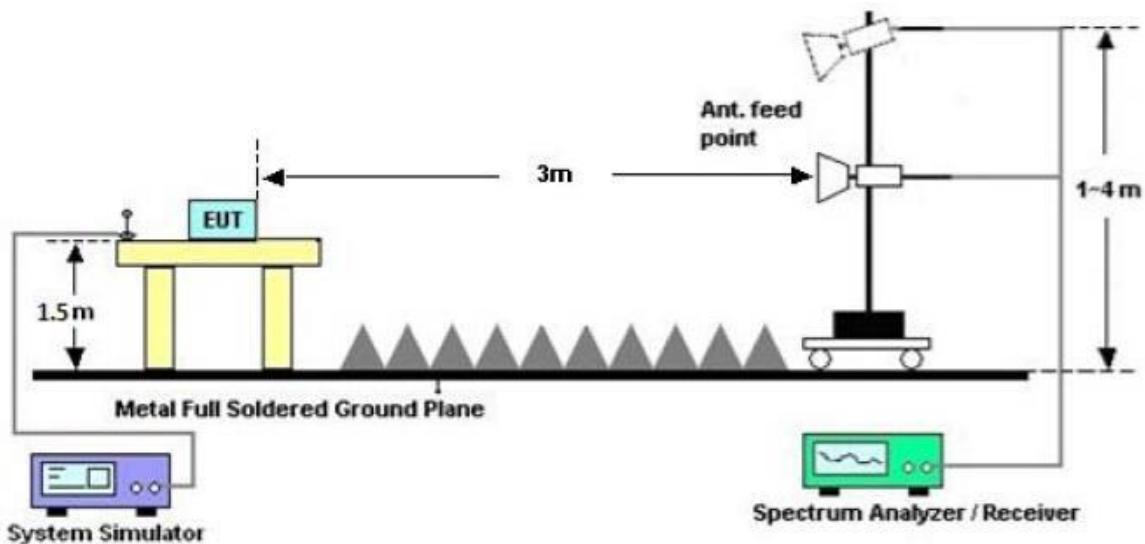
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$

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:	24.3 °C	Relative Humidity:	47%
Test Voltage:	DC 4.5V	Polarization:	---
Test 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 = $40 \log (\text{specific distance/test distance})$ (dB);

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



Between 30MHz – 1000 MHz Radiation Spurious

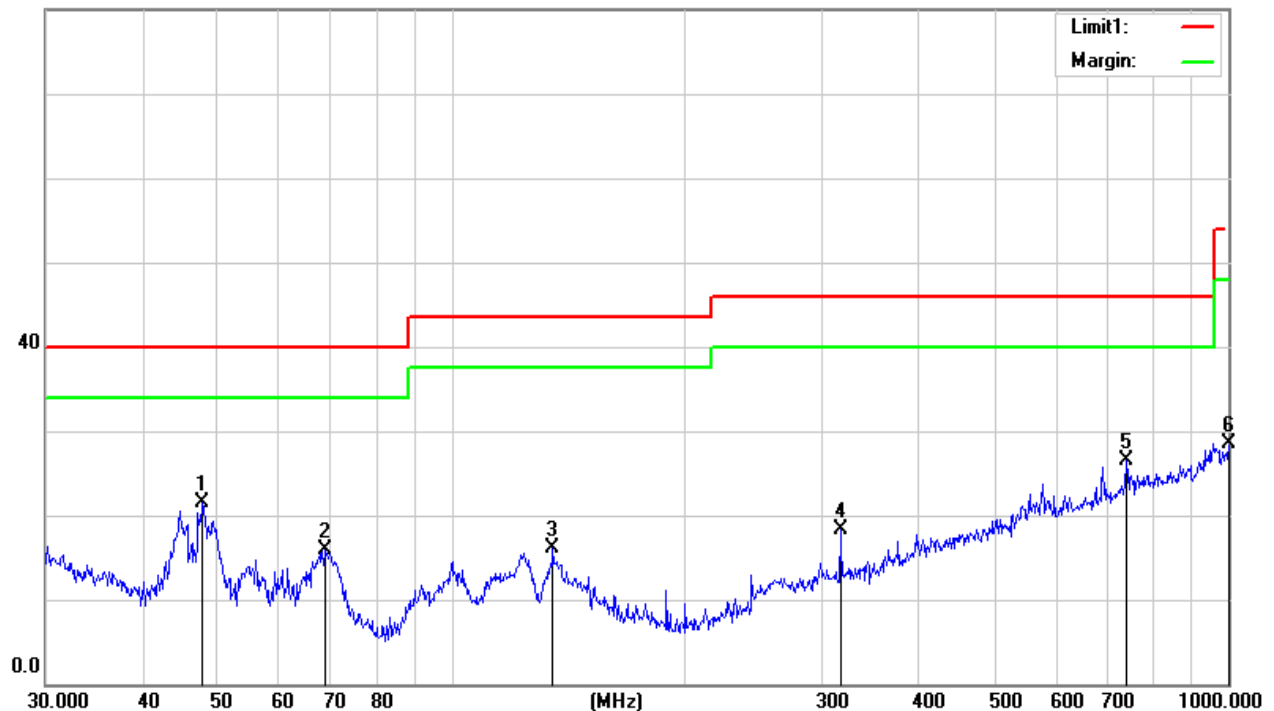
Temperature:	24.3 °C	Relative Humidity:	47%
Test Voltage:	DC 4.5V	Phase:	Horizontal
Test Mode:	Mode 1/2/3(Model 1 worst)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
47.8260	41.89	-20.36	21.53	40.00	-18.47	QP
68.8721	39.94	-24.13	15.81	40.00	-24.19	QP
135.0320	33.63	-17.52	16.11	43.50	-27.39	QP
316.5890	32.64	-14.28	18.36	46.00	-27.64	QP
739.6604	30.11	-3.54	26.57	46.00	-19.43	QP
1000.0000	28.66	-0.07	28.59	54.00	-25.41	QP

Remark:

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

80.0 dBuV/m



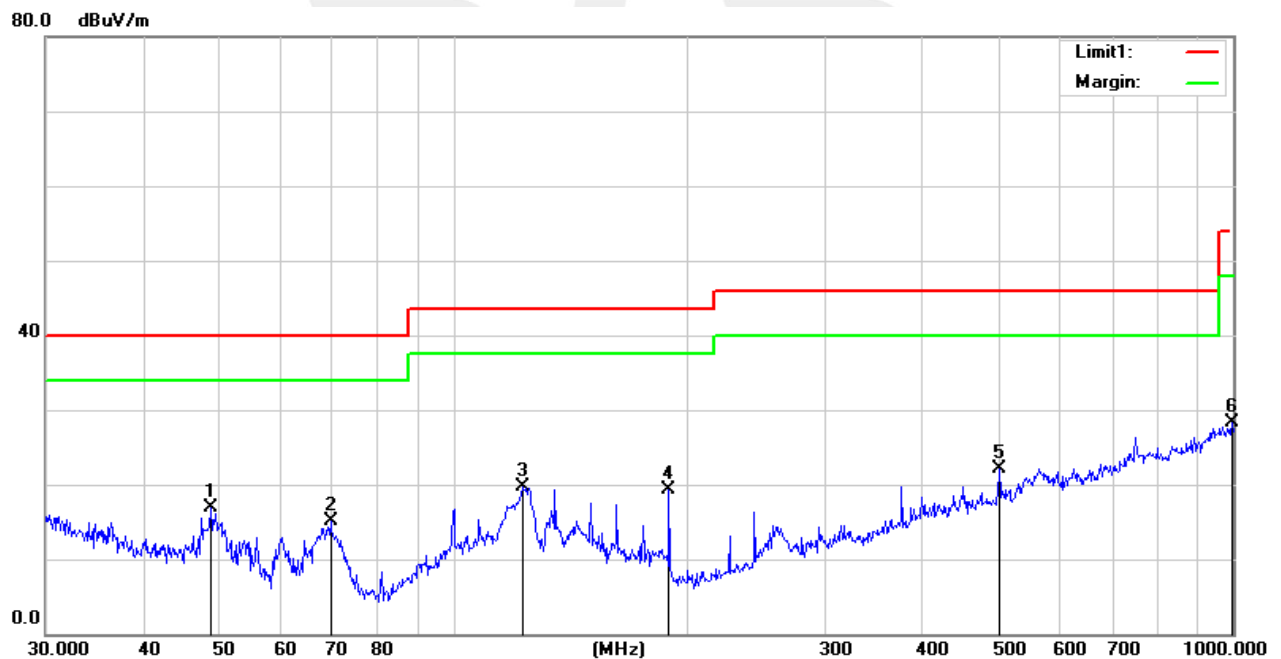


Temperature:	24.3 °C	Relative Humidity:	47%
Test Voltage:	DC 4.5V	Phase:	Vertical
Test Mode:	Mode 1/2/3(Model 1 worst)		

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
48.8430	37.87	-20.89	16.98	40.00	-23.02	QP
69.6004	39.23	-24.11	15.12	40.00	-24.88	QP
122.8340	37.30	-17.65	19.65	43.50	-23.85	QP
189.0742	39.50	-20.18	19.32	43.50	-24.18	QP
501.1790	31.01	-8.90	22.11	46.00	-23.89	QP
996.4995	28.45	-0.09	28.36	54.00	-25.64	QP

Remark:

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





Fundamental frequency:

PK

Frequency (MHz)	Reading (dB μ V/m)	Amplifier	Loss	Antenna Factor	Factor(dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin(dB)	Polarization
	PEAK	(dB)	(dB)	(dB/m)	Corr.	PEAK	PEAK	PEAK	
2403	101.755	44.40	6.03	27.60	-10.77	90.99	114	-23.01	Vertical
2403	99.000	44.40	6.03	27.60	-10.77	88.23	114	-25.77	Horizontal
2440	100.295	44.40	6.04	27.63	-10.73	89.57	114	-24.43	Vertical
2440	99.467	44.40	6.04	27.63	-10.73	88.74	114	-25.26	Horizontal
2480	99.563	44.40	6.06	27.66	-10.68	88.89	114	-25.11	Vertical
2480	98.011	44.40	6.06	27.66	-10.68	87.33	114	-26.67	Horizontal

AV

Frequency (MHz)	Reading (dB μ V/m)	Amplifier	Loss	Antenna Factor	Factor(dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin(dB)	Polarization
	AV	(dB)	(dB)	(dB/m)	Corr.	AV	AV	AV	
2403	78.480	44.40	6.03	27.60	-10.77	67.71	94	-26.29	Vertical
2403	76.177	44.40	6.03	27.60	-10.77	65.41	94	-28.59	Horizontal
2440	77.335	44.40	6.04	27.63	-10.73	66.61	94	-27.39	Vertical
2440	75.187	44.40	6.04	27.63	-10.73	64.46	94	-29.54	Horizontal
2480	77.877	44.40	6.06	27.66	-10.68	67.20	94	-26.80	Vertical
2480	75.390	44.40	6.06	27.66	-10.68	64.71	94	-29.29	Horizontal

Note: RBW>20BW; VBW=3xRBW



Above 1G Radiation Spurious

Frequency	Reading	Amplifier	Loss	Antenna	Corrected	Emission	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	(dB)	Factor	Factor	Level	(dBμV/m)	(dB)	Type	
Low Channel (2403 MHz)										
3264.81	48.03	44.70	6.70	28.20	-9.80	38.23	74.00	-35.77	PK	Vertical
3264.81	38.98	44.70	6.70	28.20	-9.80	29.18	54.00	-24.82	AV	Vertical
3264.82	48.32	44.70	6.70	28.20	-9.80	38.52	74.00	-35.48	PK	Horizontal
3264.82	39.22	44.70	6.70	28.20	-9.80	29.42	54.00	-24.58	AV	Horizontal
4806.37	58.75	44.20	9.04	31.60	-3.56	55.19	74.00	-18.81	PK	Vertical
4806.37	38.23	44.20	9.04	31.60	-3.56	34.67	54.00	-19.33	AV	Vertical
4806.40	58.95	44.20	9.04	31.60	-3.56	55.39	74.00	-18.61	PK	Horizontal
4806.40	38.70	44.20	9.04	31.60	-3.56	35.14	54.00	-18.86	AV	Horizontal
5359.81	46.32	44.20	9.86	32.00	-2.34	43.98	74.00	-30.02	PK	Vertical
5359.81	37.04	44.20	9.86	32.00	-2.34	34.70	54.00	-19.30	AV	Vertical
5359.61	45.64	44.20	9.86	32.00	-2.34	43.30	74.00	-30.70	PK	Horizontal
5359.61	37.73	44.20	9.86	32.00	-2.34	35.39	54.00	-18.61	AV	Horizontal
7211.69	50.92	43.50	11.40	35.50	3.40	54.32	74.00	-19.68	PK	Vertical
7211.69	33.84	43.50	11.40	35.50	3.40	37.24	54.00	-16.76	AV	Vertical
7211.76	51.76	43.50	11.40	35.50	3.40	55.16	74.00	-18.84	PK	Horizontal
7211.76	33.08	43.50	11.40	35.50	3.40	36.48	54.00	-17.52	AV	Horizontal



Frequency	Reading	Amplifier	Loss	Antenna	Corrected	Emission	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	(dB)	Factor	Factor	Level	(dBμV/m)	(dB)	Type	
Middle Channel (2440 MHz)										
3264.82	48.15	44.70	6.70	28.20	-9.80	38.35	74.00	-35.65	PK	Vertical
3264.82	38.21	44.70	6.70	28.20	-9.80	28.41	54.00	-25.59	AV	Vertical
3264.61	48.57	44.70	6.70	28.20	-9.80	38.77	74.00	-35.23	PK	Horizontal
3264.61	38.22	44.70	6.70	28.20	-9.80	28.42	54.00	-25.58	AV	Horizontal
4880.54	58.79	44.20	9.04	31.60	-3.56	55.23	74.00	-18.77	PK	Vertical
4880.54	38.75	44.20	9.04	31.60	-3.56	35.19	54.00	-18.81	AV	Vertical
4880.41	59.59	44.20	9.04	31.60	-3.56	56.03	74.00	-17.97	PK	Horizontal
4880.41	39.17	44.20	9.04	31.60	-3.56	35.61	54.00	-18.39	AV	Horizontal
5359.78	45.15	44.20	9.86	32.00	-2.34	42.81	74.00	-31.19	PK	Vertical
5359.78	37.96	44.20	9.86	32.00	-2.34	35.62	54.00	-18.38	AV	Vertical
5359.85	45.90	44.20	9.86	32.00	-2.34	43.56	74.00	-30.44	PK	Horizontal
5359.85	37.66	44.20	9.86	32.00	-2.34	35.32	54.00	-18.68	AV	Horizontal
7320.73	51.42	43.50	11.40	35.50	3.40	54.82	74.00	-19.18	PK	Vertical
7320.73	32.90	43.50	11.40	35.50	3.40	36.30	54.00	-17.70	AV	Vertical
7320.86	51.73	43.50	11.40	35.50	3.40	55.13	74.00	-18.87	PK	Horizontal
7320.86	33.10	43.50	11.40	35.50	3.40	36.50	54.00	-17.50	AV	Horizontal



Frequency	Reading	Amplifier	Loss	Antenna	Corrected	Emission	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	(dB)	Factor	Factor	Level	(dBμV/m)	(dB)	Type	
High Channel (2480 MHz)										
3264.70	48.98	44.70	6.70	28.20	-9.80	39.18	74.00	-34.82	PK	Vertical
3264.70	37.90	44.70	6.70	28.20	-9.80	28.10	54.00	-25.90	AV	Vertical
3264.85	49.12	44.70	6.70	28.20	-9.80	39.32	74.00	-34.68	PK	Horizontal
3264.85	38.76	44.70	6.70	28.20	-9.80	28.96	54.00	-25.04	AV	Horizontal
4960.56	58.81	44.20	9.04	31.60	-3.56	55.25	74.00	-18.75	PK	Vertical
4960.56	38.35	44.20	9.04	31.60	-3.56	34.79	54.00	-19.21	AV	Vertical
4960.48	59.35	44.20	9.04	31.60	-3.56	55.79	74.00	-18.21	PK	Horizontal
4960.48	38.54	44.20	9.04	31.60	-3.56	34.98	54.00	-19.02	AV	Horizontal
5359.74	46.25	44.20	9.86	32.00	-2.34	43.91	74.00	-30.09	PK	Vertical
5359.74	37.53	44.20	9.86	32.00	-2.34	35.19	54.00	-18.81	AV	Vertical
5359.59	45.65	44.20	9.86	32.00	-2.34	43.31	74.00	-30.69	PK	Horizontal
5359.59	37.21	44.20	9.86	32.00	-2.34	34.87	54.00	-19.13	AV	Horizontal
7439.93	51.79	43.50	11.40	35.50	3.40	55.19	74.00	-18.81	PK	Vertical
7439.93	33.85	43.50	11.40	35.50	3.40	37.25	54.00	-16.75	AV	Vertical
7439.72	51.56	43.50	11.40	35.50	3.40	54.96	74.00	-19.04	PK	Horizontal
7439.72	33.43	43.50	11.40	35.50	3.40	36.83	54.00	-17.17	AV	Horizontal

Note:

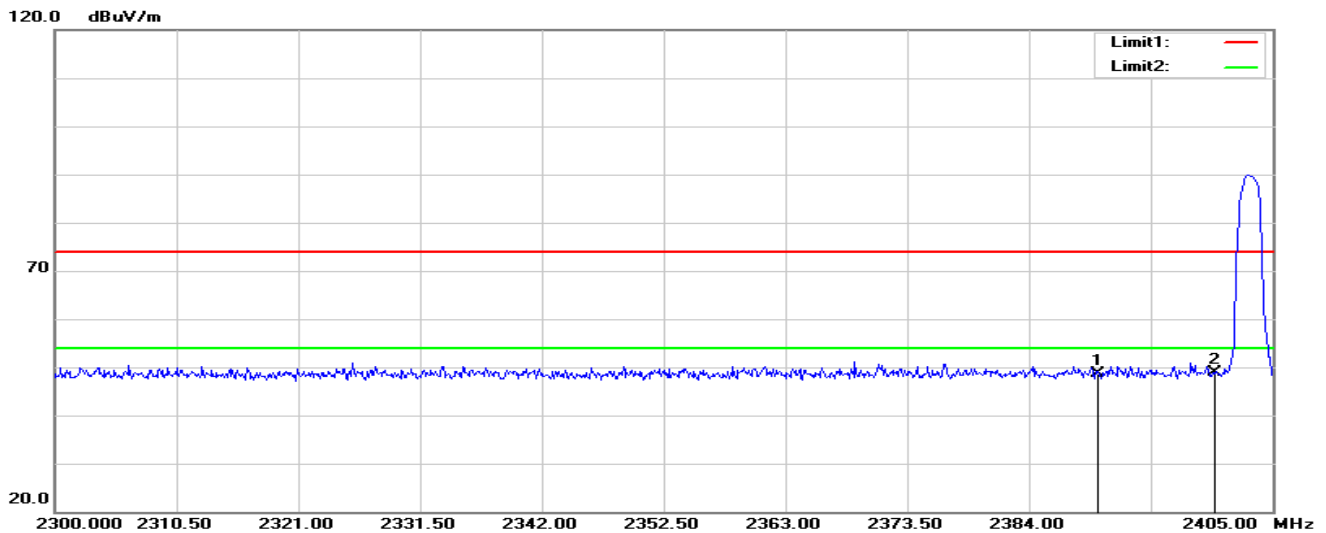
1) Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Emission Level = Reading + Factor

2) The frequency emission of peak points that did not show above the forms are below the limit,
the frequency emission is mainly from the environment noise.

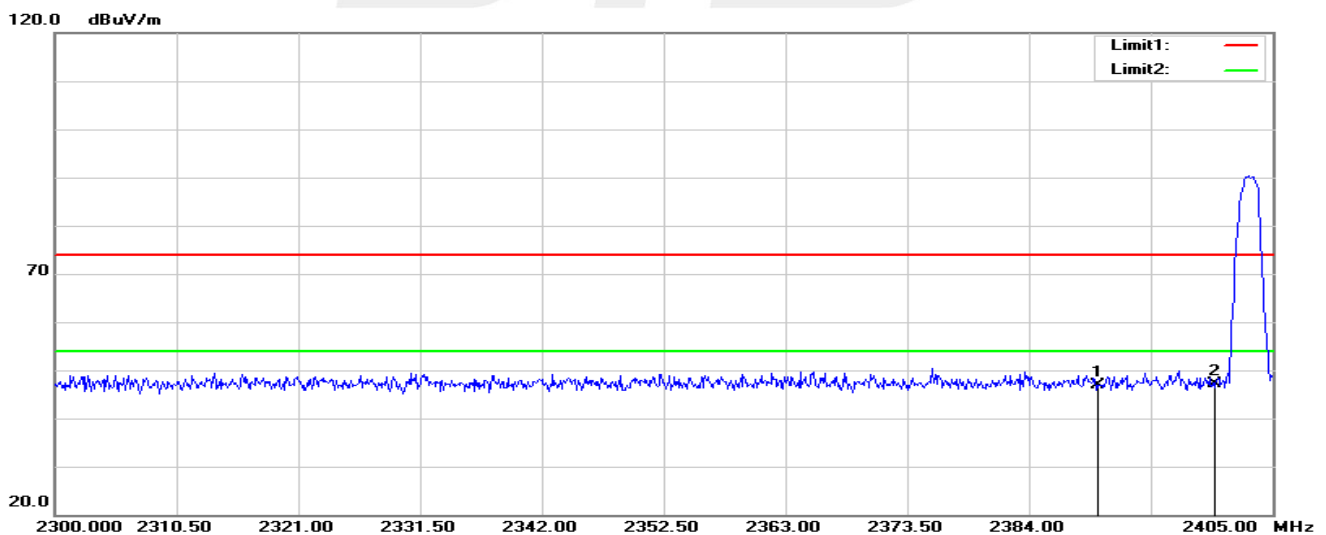


(Radiation Band edge)

GFSK -Low
Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	59.21	-10.48	48.73	74.00	-25.27	peak
2	2400.000	59.22	-10.41	48.81	74.00	-25.19	peak

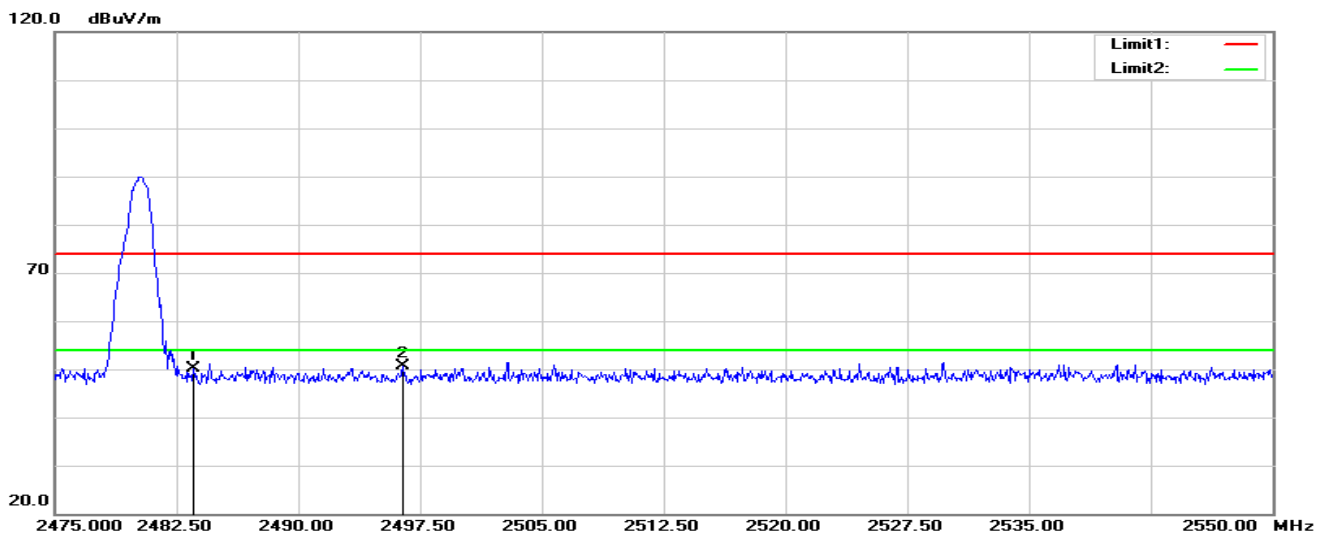
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	57.45	-10.48	46.97	74.00	-27.03	peak
2	2400.000	57.42	-10.41	47.01	74.00	-26.99	peak

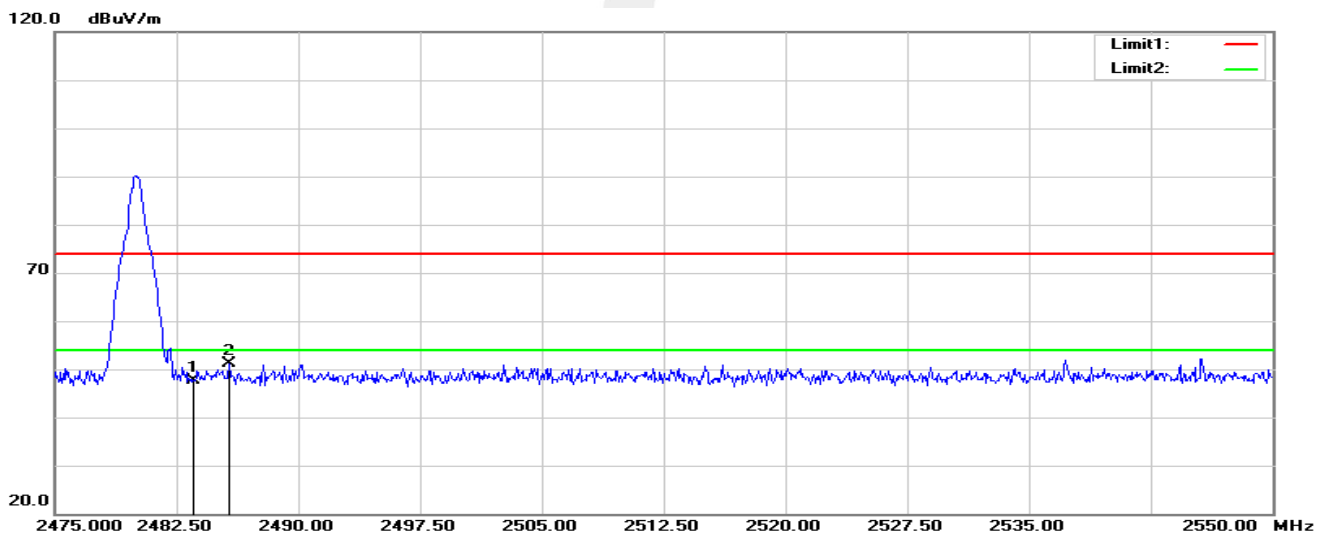


GFSK -High Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	60.13	-9.99	50.14	74.00	-23.86	peak
2	2496.450	60.61	-9.93	50.68	74.00	-23.32	peak

Vertical



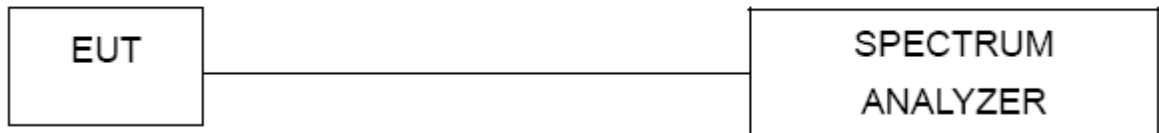
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	57.57	-9.99	47.58	74.00	-26.42	peak
2	2485.725	61.03	-9.98	51.05	74.00	-22.95	peak

4. BANDWIDTH TEST

4.1 TEST PROCEDURE

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

4.2 TEST SETUP



4.3 EUT OPERATION CONDITIONS

TX mode.



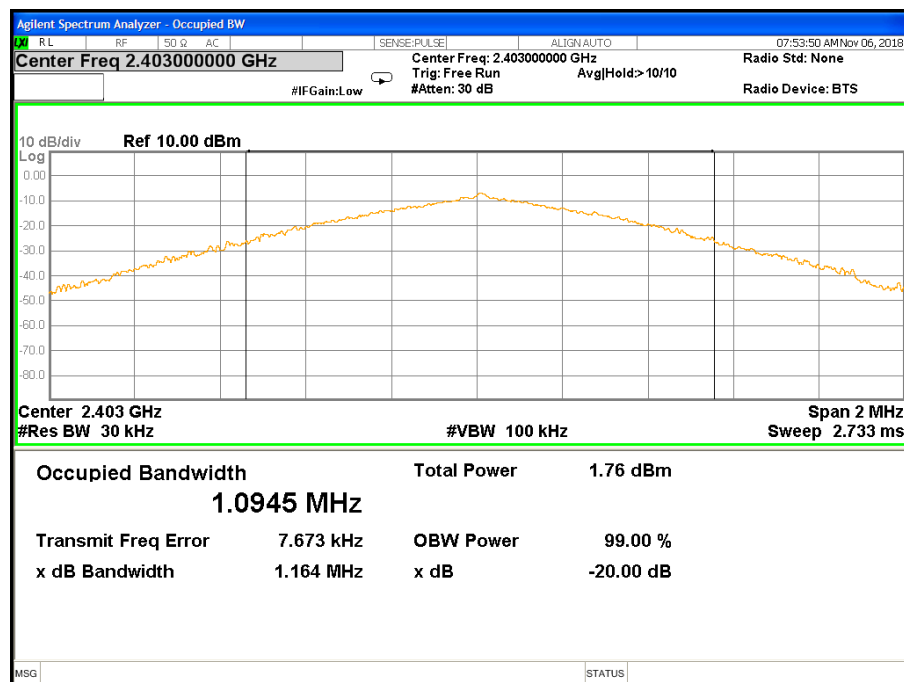


4.4 TEST RESULTS

Temperature:	25 °C	Relative Humidity:	50%
Test Voltage:	DC 4.5V		

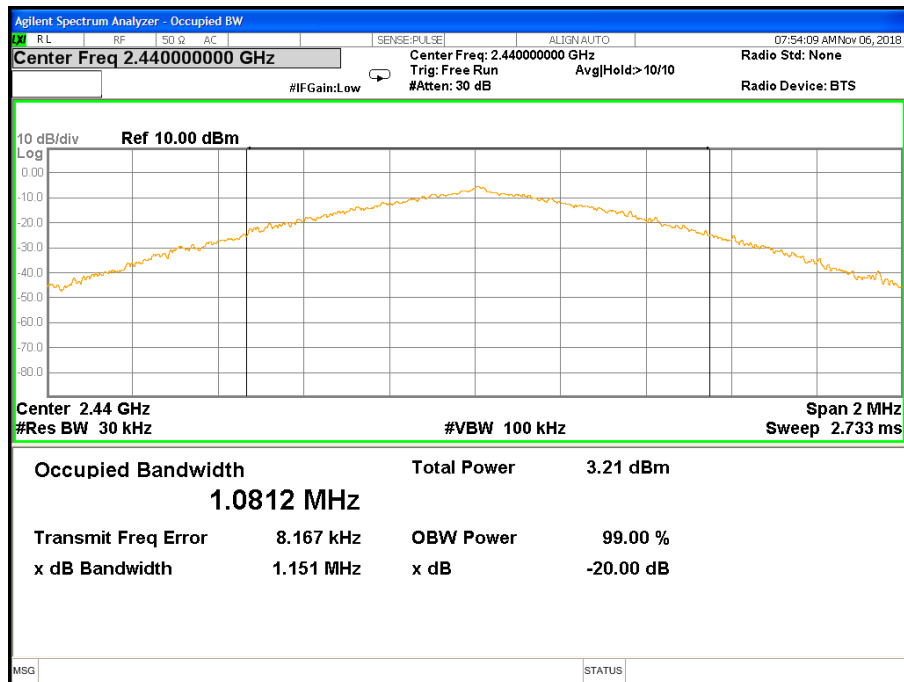
Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)	99% Bandwidth (MHz)
CH01	2403	1.164	1.0945
CH02	2440	1.151	1.0812
CH03	2480	1.136	1.0965

The Lowest Channel:2403MHz

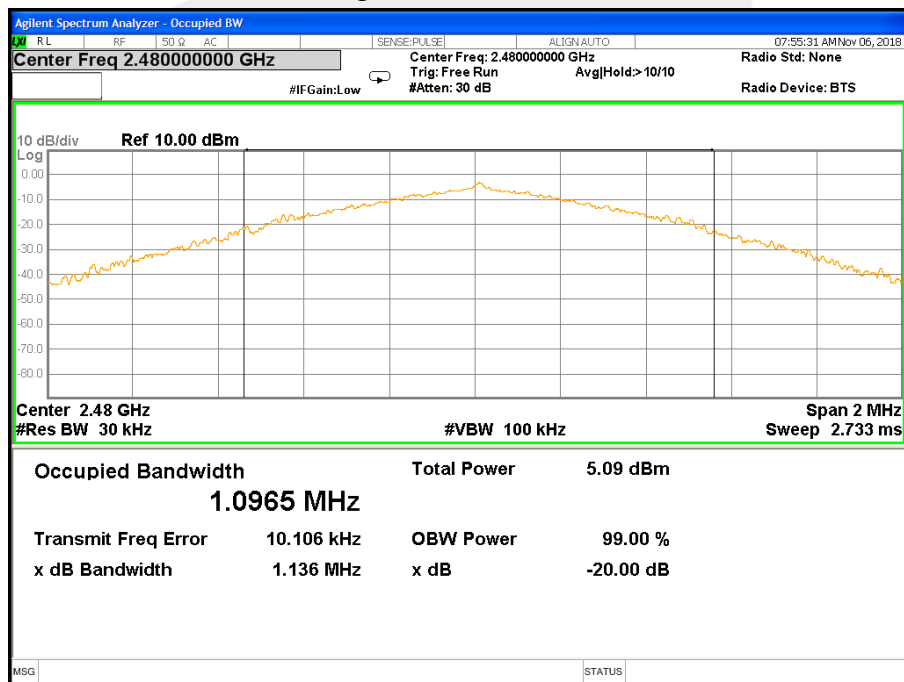




The Middle Channel: 2440MHz



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*****

