



# FCC Test Report

Report No: FCS202107039W01

Issued for

Applicant:	SHENZHEN ENGETE DIANZI KEJI YOUXIAN GONGSI
Address:	E207 hedong mansion haoyunlai square xixiang road baoan area, Shenzhen, Guangdong, China
Product Name:	UHF Wireless Microphone
Brand Name:	BOMGE
Model Name:	BG-220U
Series Model:	JS-12
FCC ID:	2A2QZ-BG-220U
Issued By: Flux Compliance Service Laboratory Add: Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan Tel: 769-27280901 Fax:769-27280901 <a href="http://www.fcs-lab.com">http://www.fcs-lab.com</a>	

## TEST RESULT CERTIFICATION

Applicant's Name.....: SHENZHEN ENGETE DIANZI KEJI YOUXIAN GONGSI

Address.....: E207 hedong mansion haoyunlai square xixiang road baoan area, Shenzhen, Guangdong, China

Manufacture's Name.....: SHENZHEN ENGETE DIANZI KEJI YOUXIAN GONGSI

Address.....: E207 hedong mansion haoyunlai square xixiang road baoan area, Shenzhen, Guangdong, China

### Product Description

Product Name.....: UHF Wireless Microphone

Brand Name .....: BOMGE

Model Name.....: BG-220U

Series Model.....: JS-12

Test Standards.....: FCC Rules and Regulations Part 15 Subpart C section 15.236

Test Procedure.....: ANSI C63.10:2013

This device described above has been tested FCS, 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 (s) of performance of tests.: 27 Jun. 2021 ~ 13 Jul. 2021

Date of Issue.....: 13 Jul. 2021

Test Result.....: Pass

Tested by

:

*Scott Shen*

(Scott Shen)

Reviewed by

:

*Duke Qian*

(Duke Qian)

Approved by

:

*Kait Chen*

(Kait Chen)

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**Revision History**

Rev.	Issue Date	Effect Page	Contents
00	13 Jul. 2021	All	Initial Issue

## 1. SUMMARY OF TEST RESULTS

FCC Part 15 Subpart C section 15.236			
Standard Section	Test Item	Judgment	Remark
FCC Part 15.236(d)	Maximum Radiated Power	PASS	--
FCC Part 15.236(f)(2)	Occupied Bandwidth	PASS	--
FCC Part 15.236(g)	Necessary bandwidth	PASS	--
FCC Part 15.236(f)(3)	Frequency stability	PASS	--
FCC Part 15.236(g)	Emission within the band and outside this band	PASS	--
FCC Part 207(a)	Conducted Emission	NA	--

### 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

Company Name:	Flux Compliance Service Laboratory
Address:	Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan
Telephone:	+86-769-27280901
Fax:	+86-769-27280901
FCC Test Firm Registration Number: 514908 Designation number: CN0127 A2LA accreditation number: 5545.01	

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expended 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	$\pm 0.71$ dB
2	Unwanted Emissions, conducted	$\pm 2.98$ dB
3	Conducted Emission (9KHz-150KHz)	$\pm 4.13$ dB
4	Conducted Emission (150KHz-30MHz)	$\pm 4.74$ dB
5	All emissions,radiated(<1G) 30MHz-1000MHz	$\pm 3.2$ dB
6	All emissions,radiated (1GHz -18GHz)	$\pm 3.66$ dB
7	All emissions,radiated (18GHz -40GHz)	$\pm 4.31$ dB

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	UHF Wireless Microphone
Brand Name	BOMGE
Model Name	BG-220U
Series Model	JS-12
Channel List	Please refer to the Note 2.
Operation frequency	Channel: 470MHz- 608MHz
Modulation Type	FM
Antenna Type	PCB Antenna
Antenna Gain (dBi)	1.0
Power Supply	DC 3V
Battery	2×1.5V dry batteries
Hardware version number	V1.0
Software version number	V1.0
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

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

## 2. Channel List

Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	471.25	02	539.5	03	607.75

Ant.	Atnenna Brand	Antenna Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	DCBX	PCB Antenna	N/A	1.0	Antenna



## 2.2 DESCRIPTION OF THE TEST MODES

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

Test software:FCC tools

The test software was used to control EUT work in continuous TX mode, and select test channel, Wireless mode as below table, the following operating modes were applied for the related test items. All test modes were tested, only the result of the worst case was recorded in the report.

Tested mode, channel , information		
Mode	Channel	Frequency (MHz)
Channel	CH 01	471.25
	CH 02	539.5
	CH 03	607.75

Note: that use new battery during the test

### 2.3 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

#### Support units

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

#### 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.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

## 2.4 EQUIPMENTS LIST

### Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESRP 3	FCS-E001	2021.05.26	2022.05.25
Signal Analyzer	R&S	FSV40-N	FCS-E012	2021.05.26	2022.05.25
Active loop Antenna	ZHINAN	ZN30900C	FCS-E013	2021.07.09	2022.07.10
Bilog Antenna	SCHWARZBECK	VULB 9168	FCS-E002	2020.08.26	2021.08.25
Horn Antenna	SCHWARZBECK	BBHA 9120D	FCS-E003	2020.08.26	2021.08.25
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	FCS-E018	2021.05.26	2022.05.25
Pre-Amplifier(0.1M-3G Hz)	EMCI	EM330N	FCS-E004	2021.05.26	2022.05.25
Pre-Amplifier (1G-18GHz)	N/A	TSAMP-0518SE	FCS-E014	2021.05.26	2022.05.25
Pre-Amplifier (18G-40GHz)	TERA-MW	TRLA-0400	FCS-E019	2021.07.09	2022.07.10
Temperature & Humidity	HTC-1	victor	FCS-E005	2020.08.26	2021.08.25
Signal generator	Agilent	E4421B	FCS-E025	2020.08.26	2021.08.25
power meter	Anritsu	ML2495A	FCS-E30	2021.07.09	2022.07.10

### Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	FCS-E020	2021.05.26	2022.05.25
LISN	R&S	ENV216	FCS-E007	2021.07.09	2022.07.10
LISN	ETS	3810/2NM	FCS-E009	2021.05.26	2022.05.25
Temperature & Humidity	HTC-1	victor	FCS-E008	2021.07.09	2022.07.10

### RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
Spectrum Analyzer	Keysight	N9020A	FCS-E015	2021.05.26	2022.05.25
Spectrum Analyzer	Agilent	E4447A	MY50180039	2021.07.09	2022.07.10
Spectrum Analyzer	R&S	FSV-40	101499	2020.08.26	2021.08.25

### 3 MAXIMUM RADIATED POWER

#### 3.1 LIMIT

Refer to FCC 15.236(d)

In the bands allocated and assigned for broadcast television and in the 600 MHz service band: 50 mW EIRP

#### 3.2 TEST PROCEDURE

A · Connect each EUT's antenna output to power sensor by RF cable and attenuator

#### 3.3 TEST SETUP



#### 3.4 TEST RESULTS

Test mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Cable loss(dBm)	Atnenna Gain (dBi)	EIRP(dBm)	Limit(dBm)	Verdict
Channel	01	471.25	3.48	1.0	1.0	5.48	16.99	PASS
	02	539.5	3.69	1.0	1.0	5.69		
	03	607.75	3.05	1.0	1.0	5.05		

## 4. OCCUPIED BANDWIDTH

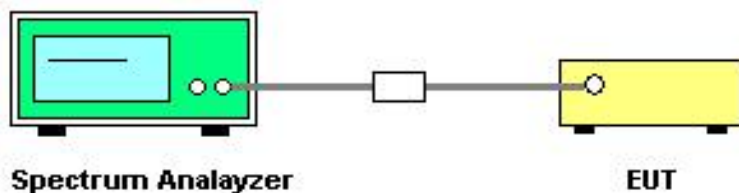
### 4.1 LIMIT

One or more adjacent 25KHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200 kHz

### 4.2 TEST PROCEDURE

Parameter	Setting
Detector	Peak/AV
Sweep time	Auto
Resolution bandwidth	1 % to 5 % of the occupied bandwidth
Video bandwidth:	3 x resolution bandwidth
Span:	2 x emission bandwidth
Trace mode:	Max. hold
Analyzer function:	99% power occupied bandwidth function
EUT:	Modulated signal with max(FM,2.5kHz tone). frequency deviation

### 4.3 TEST SETUP

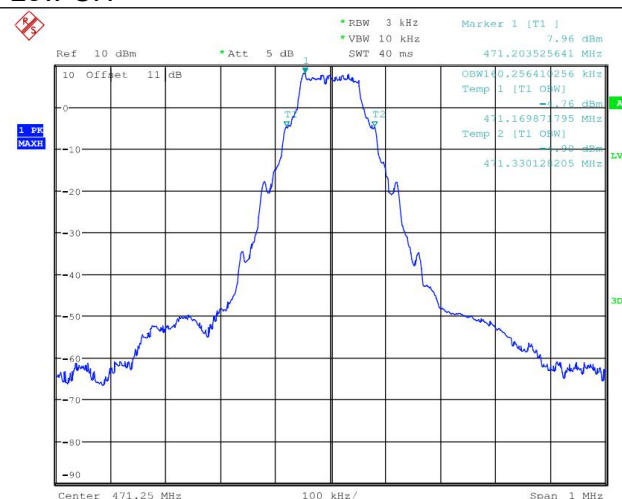


## 4.4 TEST RESULTS

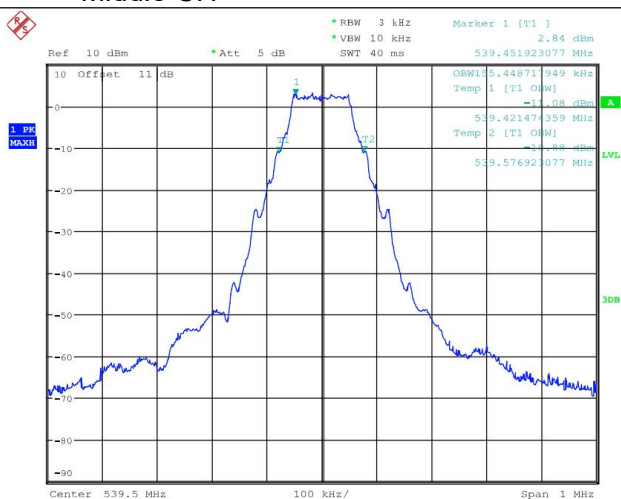
Test mode	Channel	Frequency (MHz)	99% Bandwidth (KHz)	Limit(KHz)	Verdict
Channel	Low CH	471.25	160.25	200	PASS
	Middle CH	539.5	155.45		
	High CH	607.75	153.85		

### Channel

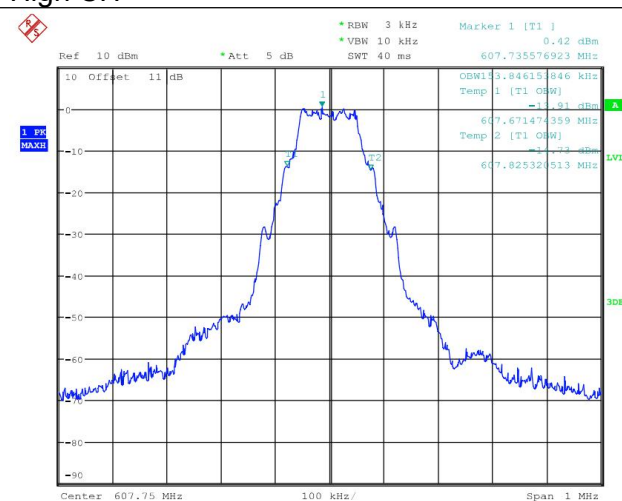
#### Low CH



#### Middle CH



#### High CH



## 5 NECESSARY BANDWIDTH

### 5.1 LIMIT

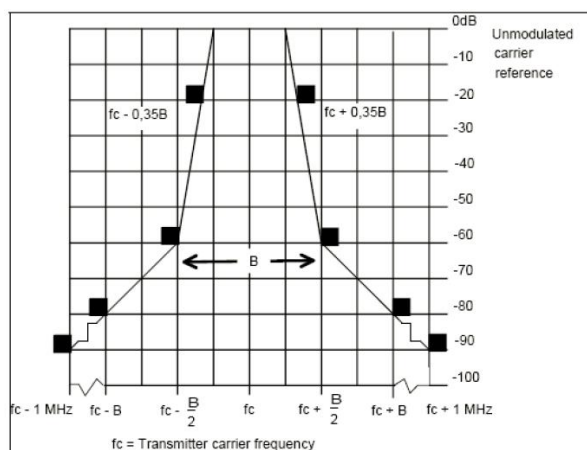
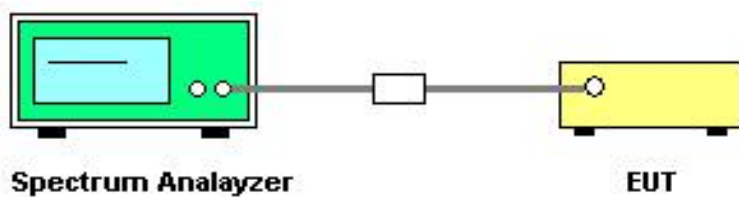


Figure 1: Spectrum mask for analogue systems in all bands

### 5.2 TEST PROCEDURE

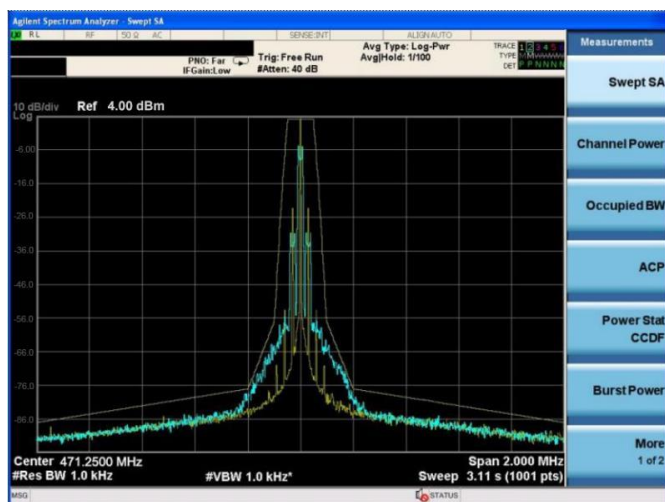
EN300422-1 V1.4.2 Clause 8.3.

### 5.3 TEST SETUP

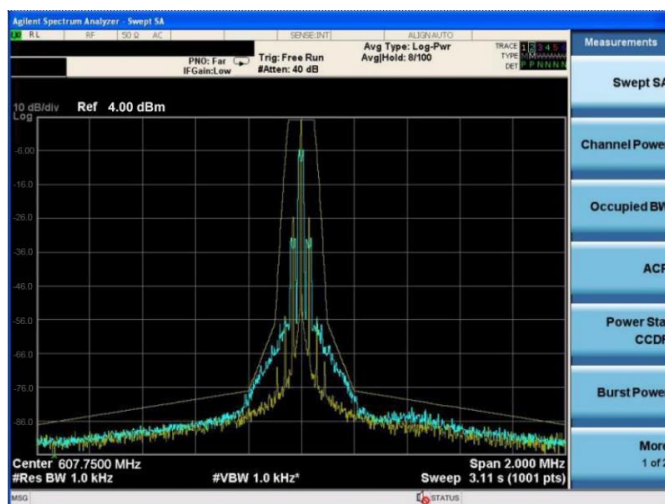


### 5.4 TEST RESULT

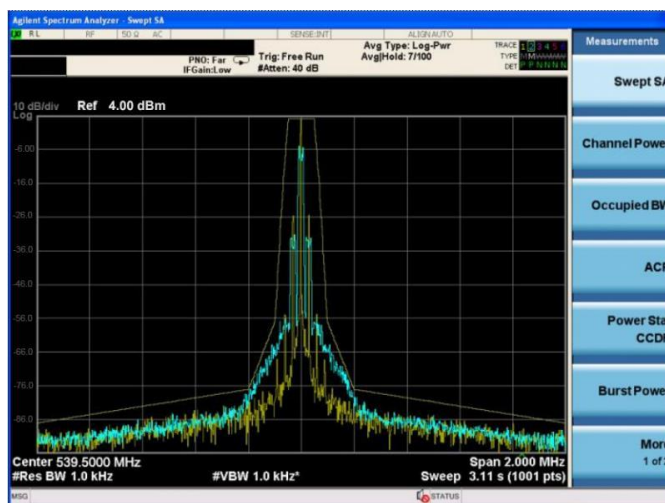
# Emission Mask Channel Low CH



## Middle CH



## High CH



Note:

B: declared channel Bandwidth 200KHz

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## 6. TRANSMITTER UNWANTED EMISSIONS

### 6.1 LIMIT

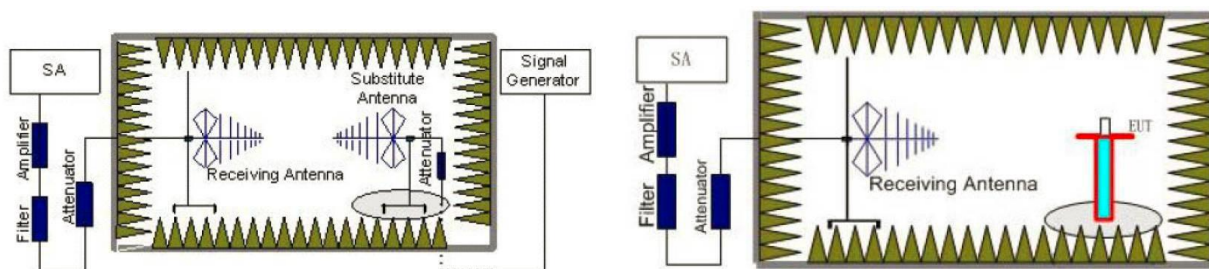
Spurious emissions are emissions outside the frequency range(s) of the equipment. The power of the spurious emissions shall not exceed the limits of table as below:

State	Frequency		
	47MHz to 74MHz, 87.5MHz to 137MHz 174MHz to 230MHz, 470MHz to 862MHz	Other Frequencies below 1000MHz	Frequencies above 1000MHz
Operation	4nW	250nW	1uW
Standby	2nW	2nW	20nW

### 5.2 TEST PROCEDURE

- The transmitter output was connected to the spectrum analyzer through an attenuator. Set spectrum analyzer start 30MHz to 6000MHz with 100 KHz RBW and 300 KHz VBW
- Please refer to ETSI EN 300 422-1 V1.4.2 (2011-08) clause 6.1 for the test conditions.
- Please refer to ETSI EN 300 422-1 V1.4.2 (2011-08) clause 8.4.2 for the measurement method.

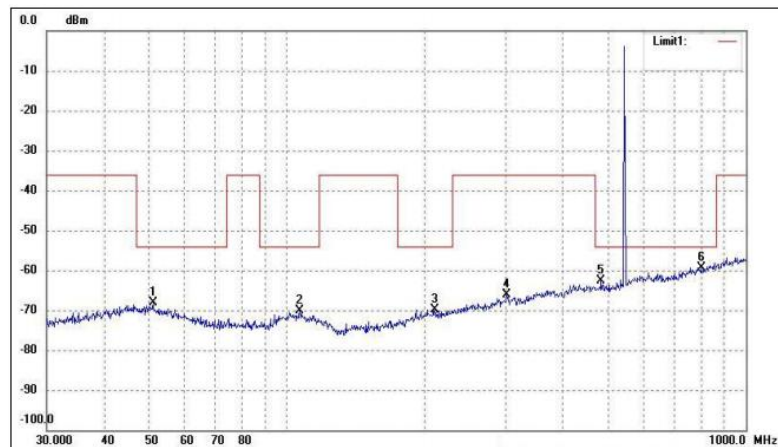
### 5.3 TEST SETUP



## 6.4 TEST RESULTS

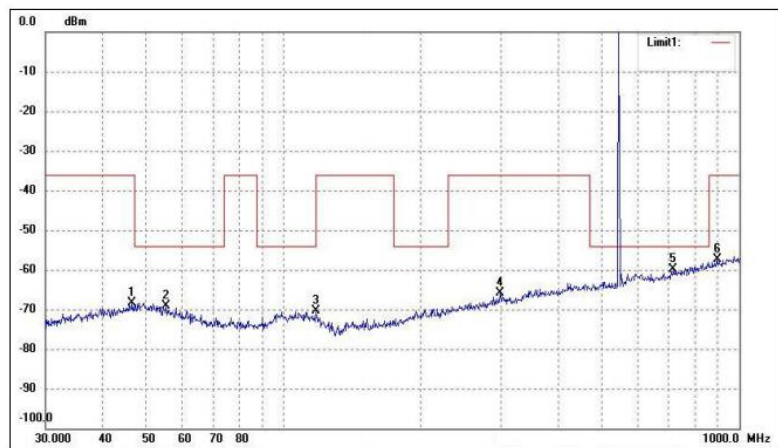
CHNNEL -LOW CH-30MHZ-1000MHZ

Vertical



No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	51.1209	-68.69	0.55	-68.14	-54.00	-14.14	228	100	peak
2	106.7587	-68.83	-1.27	-70.10	-54.00	-16.10	259	100	peak
3	210.0482	-69.01	-0.74	-69.75	-54.00	-15.75	70	100	peak
4	301.4224	-68.73	2.56	-66.17	-36.00	-30.17	350	100	peak
5	483.9094	-67.94	5.40	-62.54	-54.00	-8.54	281	100	peak
6	798.9797	-68.88	9.57	-59.31	-54.00	-5.31	218	100	peak

Horizontal



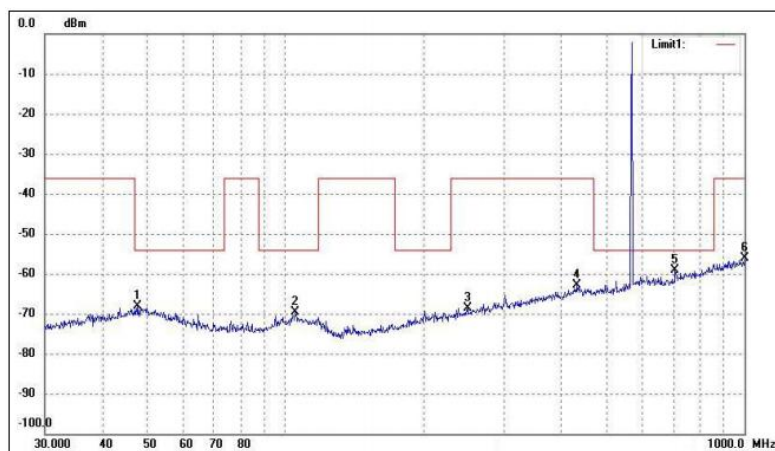
No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	46.5030	-68.94	0.57	-68.37	-36.00	-32.37	327	100	peak
2	55.2207	-68.60	-0.40	-69.00	-54.00	-15.00	108	100	peak
3	117.7725	-68.27	-2.10	-70.37	-54.00	-16.37	62	100	peak
4	298.2681	-68.39	2.47	-65.92	-36.00	-29.92	116	100	peak
5	716.6820	-68.47	8.51	-59.96	-54.00	-5.96	149	100	peak
6	893.8567	-68.46	11.13	-57.33	-36.00	-21.33	152	100	peak

Note :

1. Result = Reading + Corrected Factor Note :
2. The fundamental wave filtered out during the test.

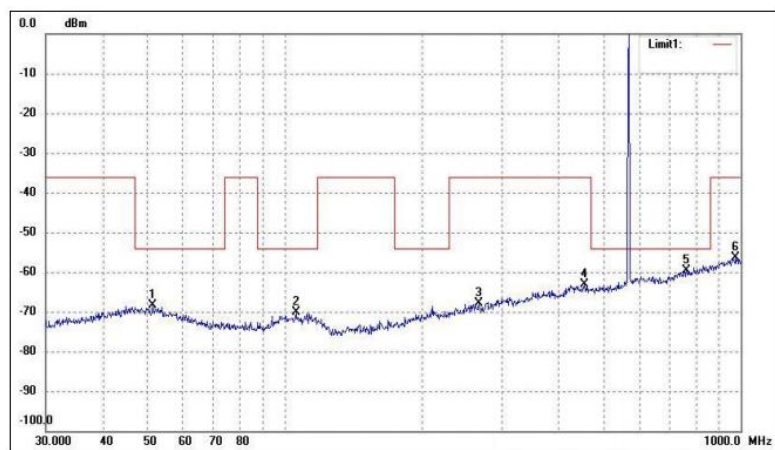
CHNNEL -MIDDLE CH-30MHZ-1000MHZ

Vertical



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	47.8260	-68.88	0.66	-68.22	-54.00	-14.22	222	100	peak
2	105.2718	-68.37	-1.29	-69.66	-54.00	-15.66	171	100	peak
3	249.4250	-69.42	0.77	-68.65	-36.00	-32.65	136	100	peak
4	431.0316	-68.41	5.61	-62.80	-36.00	-26.80	114	100	peak
5	706.6999	-67.34	8.14	-59.20	-54.00	-5.20	277	100	peak
6	1000.0000	-68.42	12.40	-56.02	-36.00	-20.02	109	100	peak

Horizontal



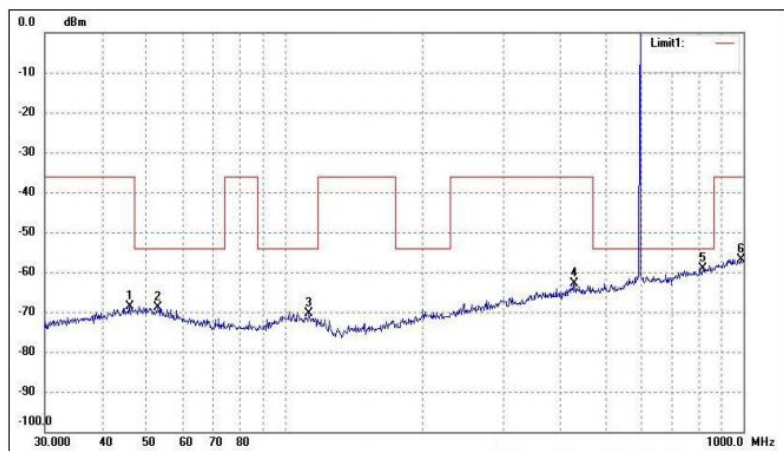
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	51.4807	-68.80	0.47	-68.33	-54.00	-14.33	202	100	peak
2	106.0126	-68.93	-1.28	-70.21	-54.00	-16.21	95	100	peak
3	266.6089	-68.89	1.09	-67.80	-36.00	-31.80	270	100	peak
4	454.3100	-68.53	5.34	-63.19	-36.00	-27.19	116	100	peak
5	760.7036	-68.80	9.26	-59.54	-54.00	-5.54	117	100	peak
6	975.7529	-68.51	12.11	-56.40	-36.00	-20.40	313	100	peak

Note :

1. Result = Reading + Corrected Factor Note :
2. The fundamental wave filtered out during the test.

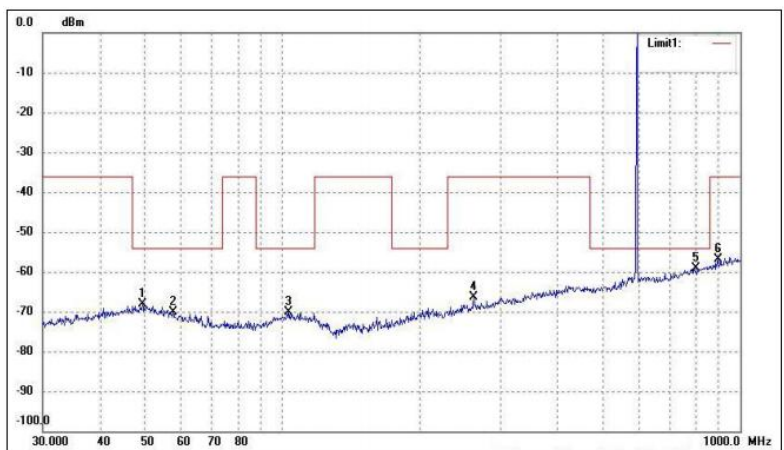
CHNNEL -HIGH CH-30MHZ-1000MHZ

Vertical



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	46.0164	-69.21	0.53	-68.68	-36.00	-32.68	279	100	peak
2	52.9453	-68.92	0.12	-68.80	-54.00	-14.80	100	100	peak
3	112.9196	-68.79	-1.54	-70.33	-54.00	-16.33	316	100	peak
4	428.0193	-68.50	5.61	-62.89	-36.00	-26.89	109	100	peak
5	815.9678	-69.09	9.96	-59.13	-54.00	-5.13	213	100	peak
6	986.0717	-68.99	12.23	-56.76	-36.00	-20.76	321	100	peak

Horizontal



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	49.5328	-68.86	0.78	-68.08	-54.00	-14.08	78	100	peak
2	57.7962	-69.03	-1.02	-70.05	-54.00	-16.05	292	100	peak
3	103.4421	-68.76	-1.33	-70.09	-54.00	-16.09	70	100	peak
4	261.9753	-67.28	1.02	-66.26	-36.00	-30.26	213	100	peak
5	801.7863	-68.72	9.62	-59.10	-54.00	-5.10	263	100	peak
6	893.8567	-67.88	11.13	-56.75	-36.00	-20.75	252	100	peak

Note :

1. Result = Reading + Corrected Factor Note :
2. The fundamental wave filtered out during the test.



## CHANNEL 1GHZ-6GHZ

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel-471.25MHz						
1413.75	-49.69	7.92	-41.77	-30	-11.77	H
1885.00	-57.36	13.97	-43.39	-30	-13.39	H
1413.75	-49.85	7.92	-41.93	-30	-11.93	V
1885.00	-49.21	13.64	-35.57	-30	-5.57	V
Middle Channel-539.5MHz						
1618.50	-54.24	8.27	-45.97	-30	-15.97	H
2158.00	-55.78	13.73	-42.05	-30	-12.05	H
1618.50	-48.86	8.27	-40.59	-30	-10.59	V
2158.00	-48.37	13.73	-34.64	-30	-4.64	V
High Channel-607.75MHz						
1823.25	-52.33	8.27	-44.06	-30	-14.06	H
2431.00	-53.82	13.73	-40.09	-30	-10.09	H
1823.25	-50.79	8.27	-42.52	-30	-12.52	V
2431.00	-47.84	13.73	-34.11	-30	-4.11	V

Note: all other emissions are attenuated 20dB below the limits, so it does not record in report.

## 7. FREQUENCY STABILITY

### 7.1 LIMIT

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.005\%$  of the operating frequency over a temperature variation of  $-20$  degrees to  $+50$  degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C

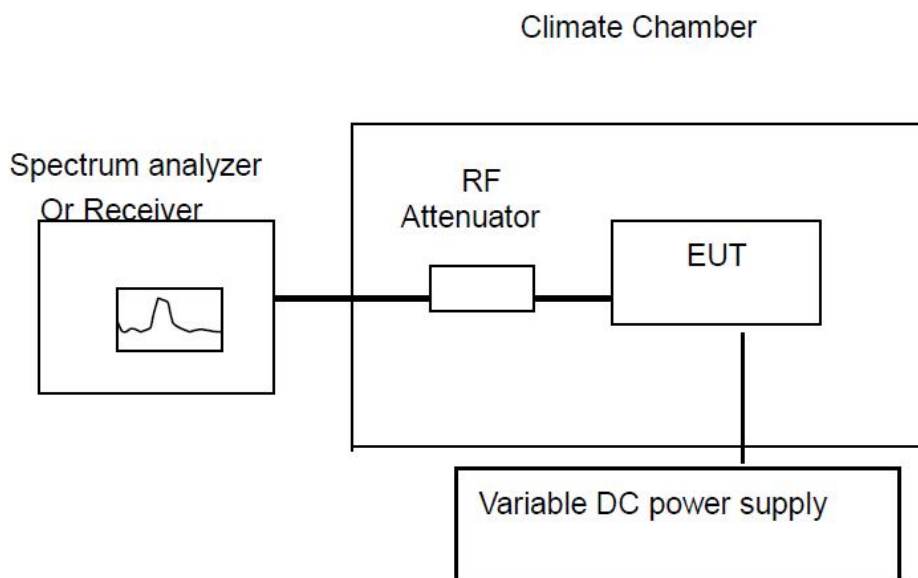
### 7.2 TEST PROCEDURE

a. The EUT was connected to an external DC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber. The DC leads and the RF output cable, exited the chamber through an opening made for that purpose.

After the temperature stabilized the frequency output was recorded from the counter. An external variable DC power supply was connected to the battery terminals of the equipment under test.

b. For hand carried, battery powered equipment primary supply voltage was reduced to the battery operating end point as specified by the manufacturer. The output frequency was recorded for each battery voltage.

### 7.3 TEST SETUP



## 7.4 TEST RESULTS

- (1) Frequency stability versus input voltage (Supply Nominal voltage is DC 3.0V)
- (2) Frequency stability versus input voltage (Supply battery operating end point which shall be specified by the manufacturer DC 2.55V)

Refernce Frequency: 471.25MHz			
Power supply	Environment Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)
DC 2.55V	20	1010	2.02
DC 3.00V	20	1008	2.01
DC 3.45V	20	1015	2.03

Refernce Frequency: 471.25MHz				
Frequency Deviation measured with time Elapse(30 minutes)				
Environment Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Results
50	1008	2.01	50	Pass
40	1009	2.01		
30	1008	2.01		
20	1008	2.01		
10	1009	2.01		
0	1021	2.04		
-10	1007	2.01		
-20	1005	2.00		

Refernce Frequency: 539.5MHz			
Power supply	Environment Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)
DC 2.55V	20	1009	1.97
DC 3.00V	20	1010	1.97
DC 3.45V	20	1006	1.96

Refernce Frequency: 539.5MHz				
Frequency Deviation measured with time Elapse(30 minutes)				
Environment Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Results
50	1008	1.97	50	Pass
40	1006	1.96		
30	1008	1.97		
20	1008	1.97		
10	1007	1.97		
0	1006	1.96		
-10	1006	1.96		
-20	1011	1.97		



Reference Frequency: 607.75MHz			
Power supply	Environment Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)
DC 2.55V	20	1013	1.91
DC 3.00V	20	1011	1.88
DC 3.45V	20	1010	1.88

Reference Frequency: 607.75MHz				
Frequency Deviation measured with time Elapse(30 minutes)				
Environment Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Results
50	1010	1.88	50	Pass
40	1006	1.97		
30	1007	1.99		
20	1005	1.95		
10	1007	1.99		
0	1006	1.97		
-10	1006	1.97		
-20	1007	1.99		

\*\*\*\*\*END OF THE REPORT\*\*\*\*\*