# FCC Test Report

Report No: FCS202006009W01

Issued for

| | |
|---|---|
| Applicant: | Enping Jes Audio Co.,Ltd |
| Address: | No.A6-1,The Second District, Jiangmen Industrial Transfer Industrial Park, Enping City, Guangdong, China |
| Product Name: | wireless microphone |
| Brand Name: | L&Y |
| Model Name: | LY-825 |
| Series Model: | LY2D, LY3D, LY6D, LY8D, LY20, LY40D, LY-810D, LY-812, LY-802D, LY-816D, LY-817, LY-823D, LY-819D, LY-824D, LY-828, LY829, TH00, TH01L, TH02L, TH26, TH29, TH30, TB08, TB09, TB07, LY-40T |
| FCC ID: | 2AWTN-LY825 |

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 http://www.fcs-lab.com

# TEST RESULT CERTIFICATION

| | |
|---|---|
| Applicant's Name ..... : | Enping Jes Audio Co.,Ltd |
| Address ..... : | No.A6-1,The Second District, Jiangmen Industrial Transfer Industrial Park, Enping City, Guangdong, China |
| Manufacture's Name ..... : | Enping Jes Audio Co.,Ltd |
| Address ..... : | No.A6-1,The Second District, Jiangmen Industrial Transfer Industrial Park, Enping City, Guangdong, China |

**Product Description**

| | |
|---|---|
| Product Name ..... : | wireless microphone |
| Brand Name ..... : | L&Y |
| Model Name ..... : | LY-825 |
| Series Model..... : | LY2D, LY3D, LY6D, LY8D, LY20, LY40D, LY-810D, LY-812, LY-802D, LY-816D, LY-817, LY-823D, LY-819D, LY-824D, LY-828, LY829, TH00, TH01L, TH02L, TH26, TH29, TH30, TB08, TB09, TB07, LY-40T |
| 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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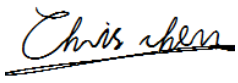
**Date of Test**..... :

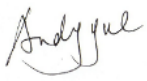
| | |
|---|---|
| Date (s) of performance of tests : | 15 Jun. 2020 ~ 28 Jun. 2020 |
| Date of Issue ..... : | 28 Jun. 2020 |
| Test Result ..... : | Pass |

Tested by : 

(Chris Chen)

Reviewed by : 

(Jack Chen)

Approved by : 

( Andy yue)

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## Revision History

| Rev. | Issue Date | Effect Page | Contents |
|---|---|---|---|
| 00 | 28 Jun. 2020 | 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<br>Designation number: CN0127<br>A2LA accreditation number：5545.01 | |

## 1.2 MEASUREMENT UNCERTAINTY

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

# 2. GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF THE EUT

| | |
|---|---|
| Product Name | wireless microphone |
| Model Name | LY-825 |
| Series Model | LY2D, LY3D, LY6D, LY8D, LY20, LY40D, LY-810D, LY-812, LY-802D, LY-816D, LY-817, LY-823D, LY-819D, LY-824D, LY-828, LY829, TH00, TH01L, TH02L, TH26, TH29, TH30, TB08, TB09, TB07, LY-40T |
| Channel List | Please refer to the Note 2. |
| Operation frequency | Channel A: 512MHz- 526.7MHz<br>Channel B: 527MHz- 541.7MHz |
| Modulation Type | FM |
| Antenna Type | PCB antenna |
| Antenna Gain (dBi) | 1.0 |
| Power Supply | Input: DC 3V (2 X 1.5AA) |
| 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 A | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 01 | 512.0 | 19 | 517.4 | 37 | 522.8 |
| 02 | 512.3 | 20 | 517.7 | 38 | 523.1 |
| 03 | 512.6 | 21 | 518.0 | 39 | 523.4 |
| 04 | 512.9 | 22 | 518.3 | 40 | 523.7 |
| 05 | 513.2 | 23 | 518.6 | 41 | 524.0 |
| 06 | 513.5 | 24 | 518.9 | 42 | 524.3 |
| 07 | 513.8 | 25 | 519.2 | 43 | 524.6 |
| 08 | 514.1 | 26 | 519.5 | 44 | 524.9 |
| 09 | 514.4 | 27 | 519.8 | 45 | 525.2 |
| 10 | 514.7 | 28 | 520.1 | 46 | 525.5 |
| 11 | 515.0 | 29 | 520.4 | 47 | 525.8 |
| 12 | 515.3 | 30 | 520.7 | 48 | 526.1 |
| 13 | 515.6 | 31 | 521.0 | 49 | 526.4 |
| 14 | 515.9 | 32 | 521.3 | 50 | 526.7 |
| 15 | 516.2 | 33 | 521.6 | | |
| 16 | 516.5 | 34 | 521.9 | | |
| 17 | 516.8 | 35 | 522.2 | | |
| 18 | 517.1 | 36 | 522.5 | | |

| Channel B | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 01 | 527.0 | 19 | 532.4 | 37 | 537.8 |
| 02 | 527.3 | 20 | 532.7 | 38 | 538.1 |
| 03 | 527.6 | 21 | 533.0 | 39 | 538.4 |
| 04 | 527.9 | 22 | 533.3 | 40 | 538.7 |
| 05 | 528.2 | 23 | 533.6 | 41 | 539.0 |
| 06 | 528.5 | 24 | 533.9 | 42 | 539.3 |
| 07 | 528.8 | 25 | 534.2 | 43 | 539.6 |
| 08 | 529.1 | 26 | 534.5 | 44 | 539.9 |
| 09 | 529.4 | 27 | 534.8 | 45 | 540.2 |
| 10 | 529.7 | 28 | 535.1 | 46 | 540.5 |
| 11 | 530.0 | 29 | 535.4 | 47 | 540.8 |
| 12 | 530.3 | 30 | 535.7 | 48 | 541.1 |
| 13 | 530.6 | 31 | 536.0 | 49 | 541.4 |
| 14 | 530.9 | 32 | 536.3 | 50 | 541.7 |
| 15 | 531.2 | 33 | 536.6 | | |
| 16 | 531.5 | 34 | 536.9 | | |
| 17 | 531.8 | 35 | 537.2 | | |
| 18 | 532.1 | 36 | 537.5 | | |

## 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 softeware 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 A (FM) | CH 01 | 512.0 |
| | CH 26 | 519.5 |
| | CH 50 | 526.7 |
| Channel B (FM) | CH 01 | 527.0 |
| | CH 26 | 534.5 |
| | CH 50 | 541.7 |
| | | |

## 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 | 2019.10.10 | 2020.10.09 |
| Signal Analyzer | R&S | FSV40-N | FCS-E012 | 2019.10.10 | 2020.10.09 |
| Active loop Antenna | ZHINAN | ZN30900C | FCS-E013 | 2019.10.11 | 2020.10.10 |
| Bilog Antenna | SCHWARZBECK | VULB 9168 | FCS-E002 | 2019.10.26 | 2020.10.25 |
| Horn Antenna | SCHWARZBECK | BBHA 9120D | FCS-E003 | 2019.10.10 | 2020.10.09 |
| SHF-EHF Horn Antenna (18G-40GHz) | A-INFO | LB-180400-KF | FCS-E018 | 2019.10.10 | 2020.10.09 |
| Pre-Amplifier(0.1M-3GHz) | EMCI | EM330N | FCS-E004 | 2019.10.10 | 2020.10.09 |
| Pre-Amplifier (1G-18GHz) | N/A | TSAMP-0518SE | FCS-E014 | 2019.10.03 | 2020.10.02 |
| Pre-Amplifier (18G-40GHz) | TERA-MW | TRLA-0400 | FCS-E019 | 2019.10.08 | 2020.10.07 |
| Temperature & Humidity | HTC-1 | victor | FCS-E005 | 2019.10.10 | 2020.10.09 |

Conduction Test equipment

| Kind of Equipment | Manufacturer | Type No. | Company No. | Last calibration | Calibrated until |
|---|---|---|---|---|---|
| EMI Test Receiver | R&S | ESPI | FCS-E020 | 2019.10.10 | 2020.10.09 |
| LISN | R&S | ENV216 | FCS-E007 | 2019.10.10 | 2020.10.09 |
| LISN | ETS | 3810/2NM | FCS-E009 | 2019.10.15 | 2020.10.14 |
| Temperature & Humidity | HTC-1 | victor | FCS-E008 | 2019.10.10 | 2020.10.09 |

RF Connected Test

| Kind of Equipment | Manufacturer | Type No. | Company No. | Last calibration | Calibrated until |
|---|---|---|---|---|---|
| Spectrum Analyzer | Keysight | N9020A | FCS-E015 | 2019.10.02 | 2020.10.01 |
| Spectrum Analyzer | Agilent | E4447A | MY50180039 | 2019.11.08 | 2020.11.07 |
| Spectrum Analyzer | R&S | FSV-40 | 101499 | 2019.10.10 | 2020.10.09 |

# 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; In the 600 MHz guard bands including the duplex gap: 20 mW EIRP

## 3.2 TEST PROCEDURE

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

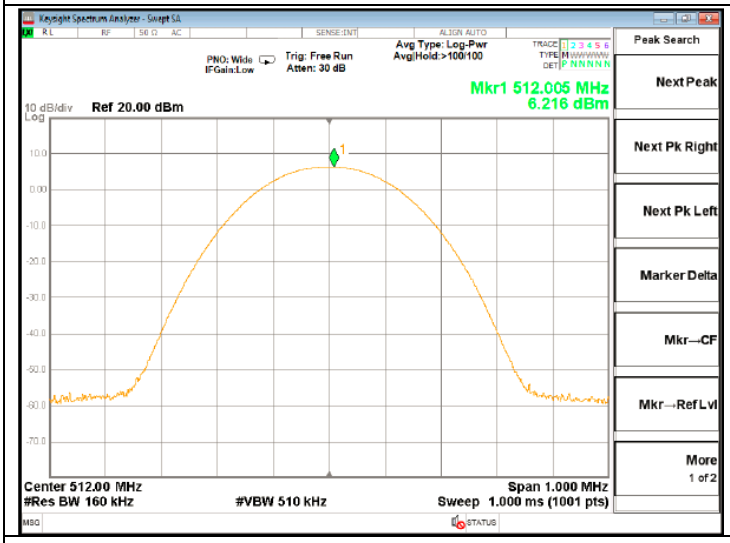
## 3.3 TEST SETUP


## 3.4 TEST RESULTS

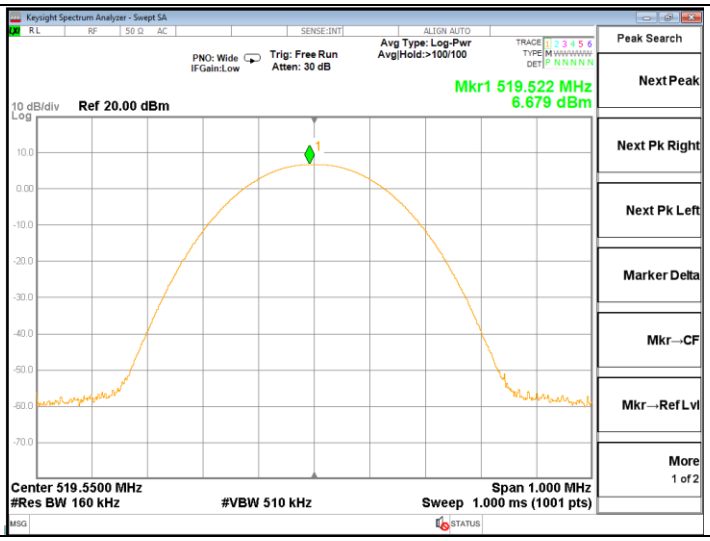
| Test mode | Channel | Frequency （MHz） | Peak Output Power (dBm) | Limit(dBm) | Verdict |
|---|---|---|---|---|---|
| Channel A (FM) | 01 | 512.0 | 6.216 | 16.99 dBm | PASS |
| | 26 | 519.5 | 6.679 | | |
| | 50 | 526.7 | 7.250 | | |
| Channel B (FM) | 01 | 527.0 | 7.596 | | |
| | 26 | 534.5 | 6.251 | | |
| | 50 | 541.7 | 5.837 | | |

Channel A

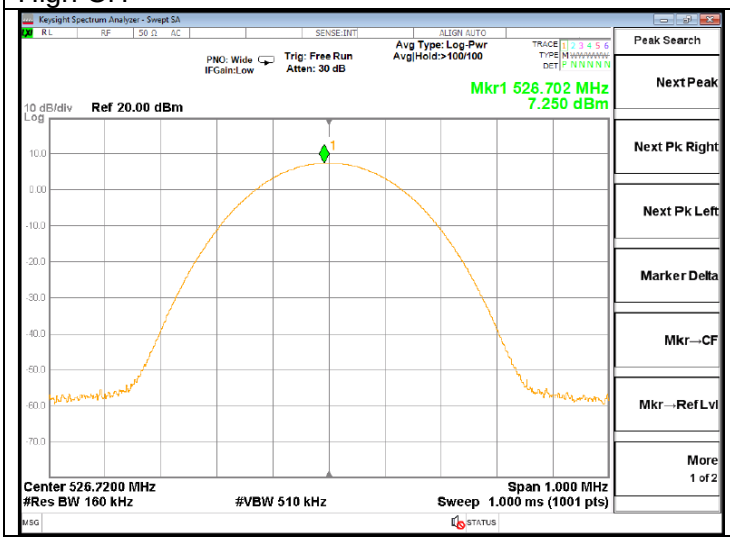
Low CH




Middle CH

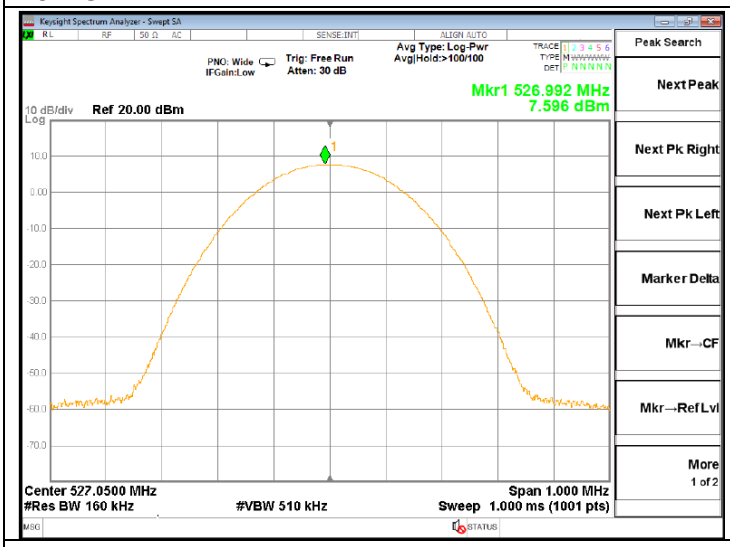



High CH

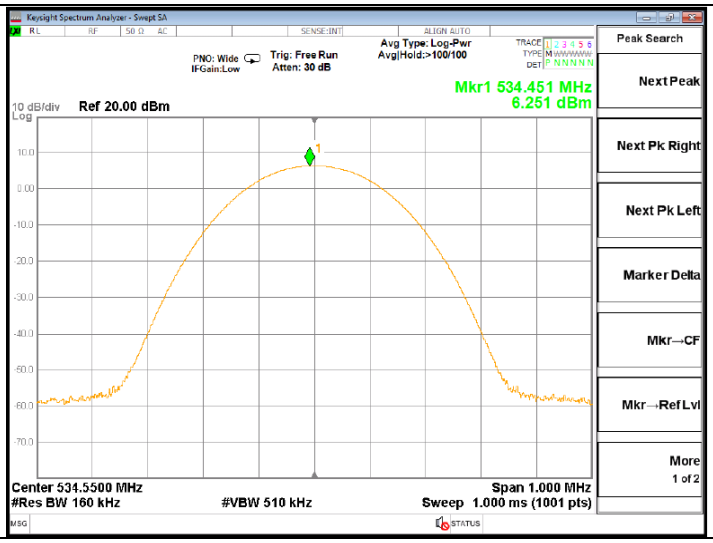


## Channel B

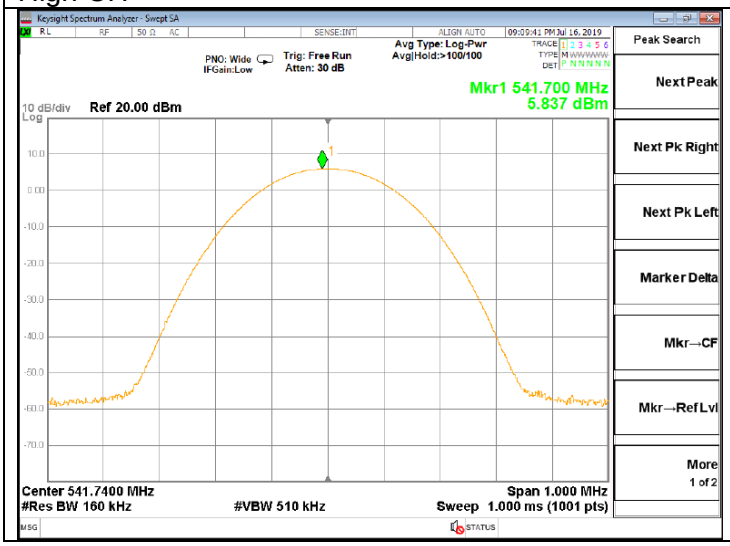
### Low CH




### Middle CH




### High CH



# 4. OCCUPIED BANDWIDTH

## 4.1 LIMIT

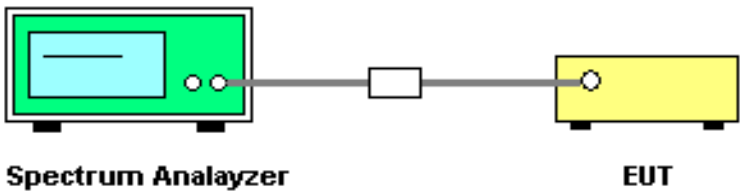
One or more adjacent 25 kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200 kHz

## 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. frequency deviation |

## 4.3 TEST SETUP

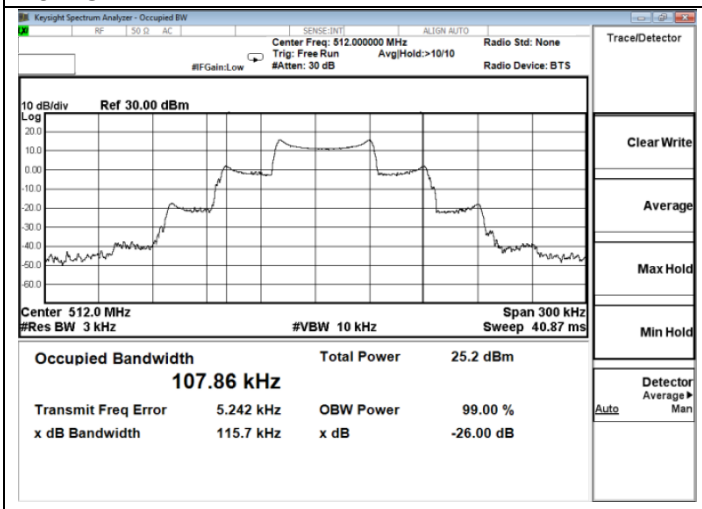


4.4 TEST RESULTS

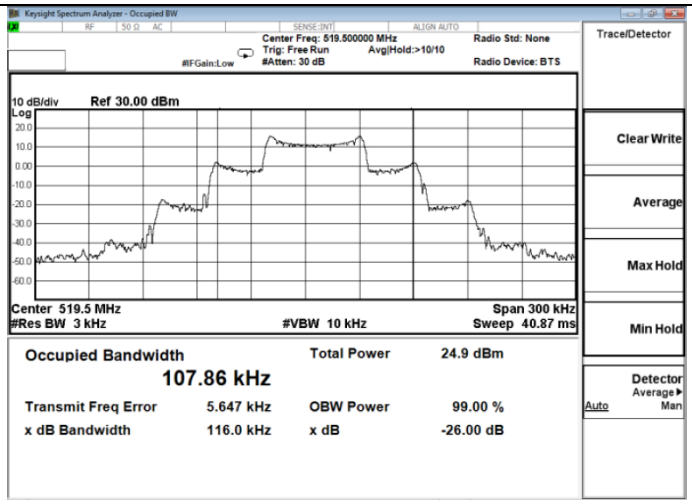
| Test mode | Channel | Frequency （MHz） | 99% Bandwidth (KHz) | Limit(KHz) | Verdict |
|---|---|---|---|---|---|
| Channel A (FM) | 01 | 512.0 | 107.86 | 200 | PASS |
| | 26 | 519.5 | 107.86 | | |
| | 50 | 526.7 | 107.87 | | |
| Channel B (FM) | 01 | 527.0 | 108.55 | | |
| | 26 | 534.5 | 108.57 | | |
| | 50 | 541.7 | 108.24 | | |

Channel A

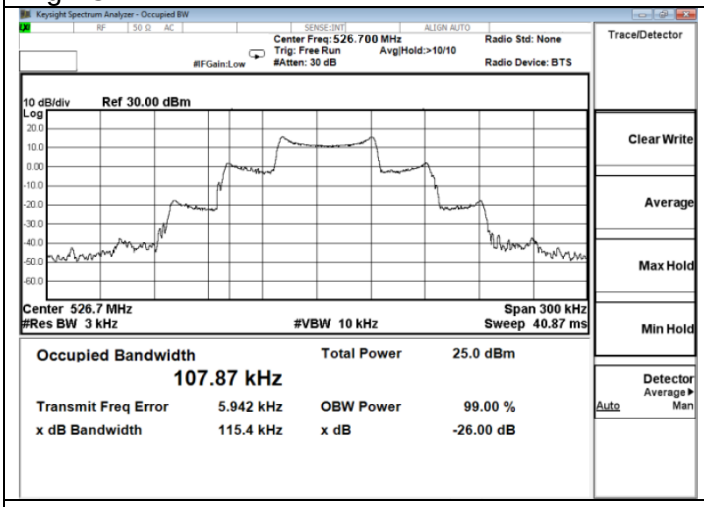
Low CH




Middle CH

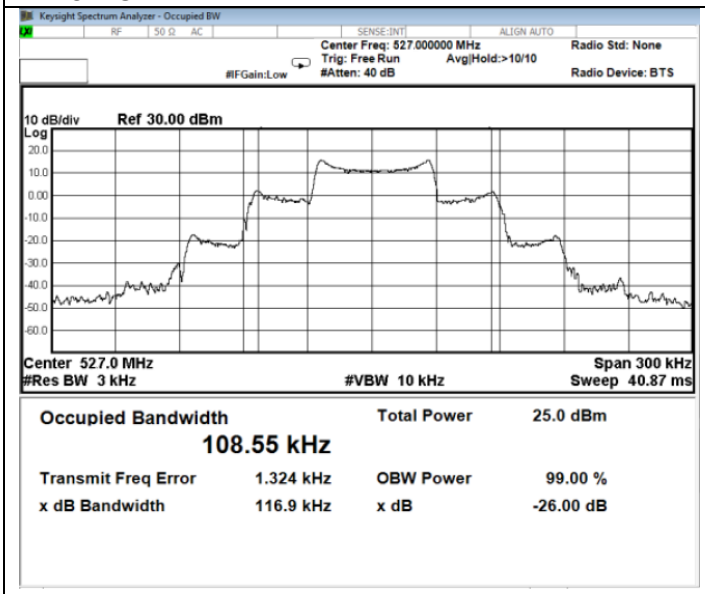



High CH

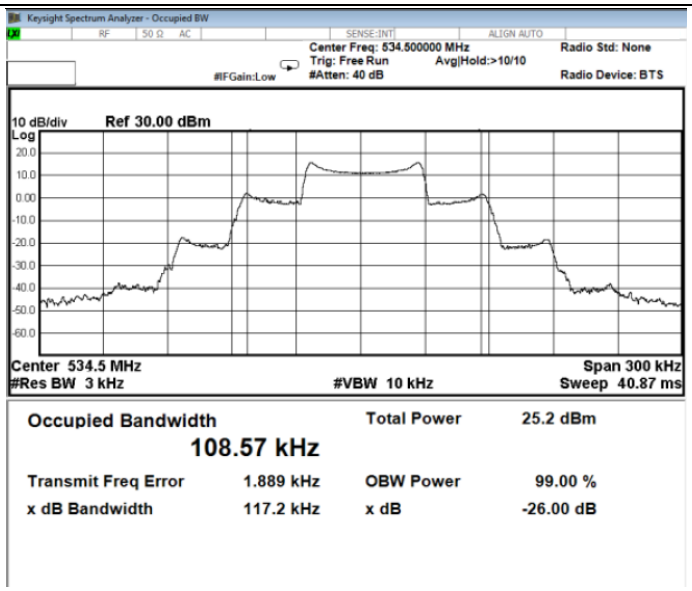


Channel B

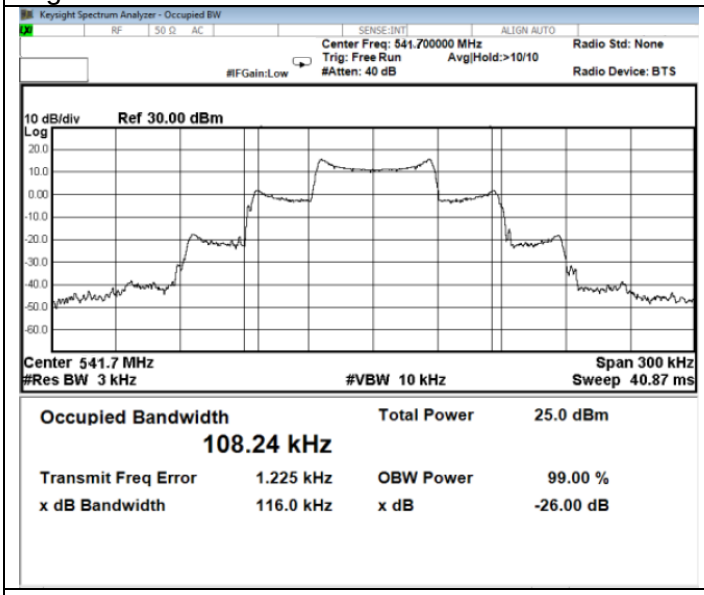
Low CH




Middle CH




High CH



# 5 NECESSARY BANDWITH

## 5.1 LIMIT

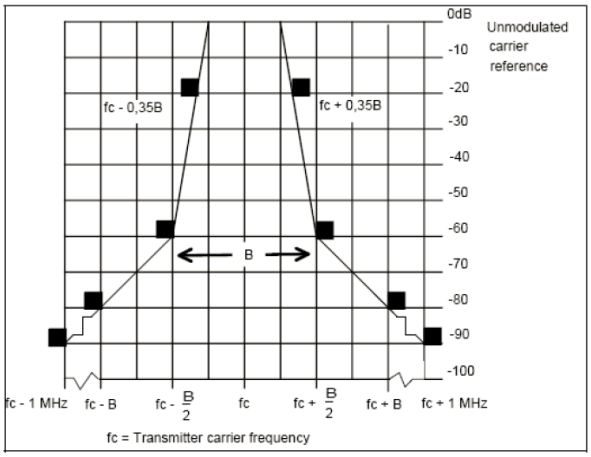
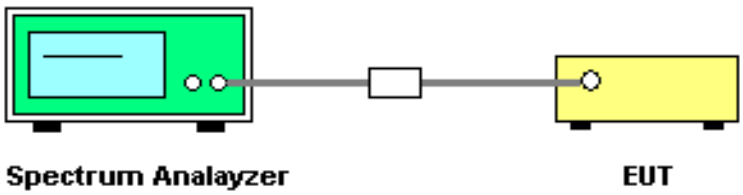



**Figure 1: Spectrum mask for analogue systems in all bands**

## 5.2 TEST PROCEDURE

EN300422-1 V1.4.2 Clause 8.3.

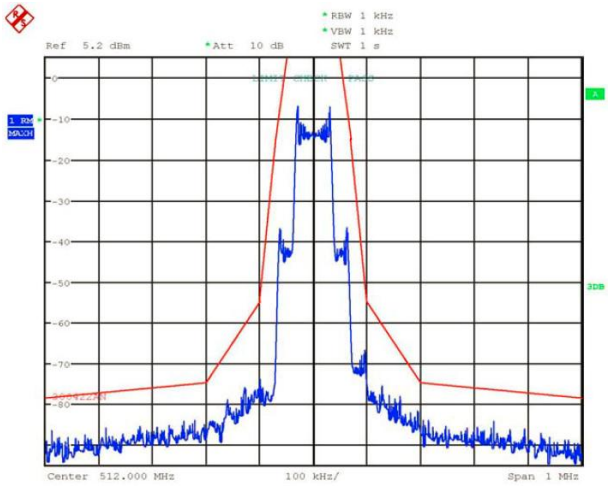
## 5.3 TEST SETUP



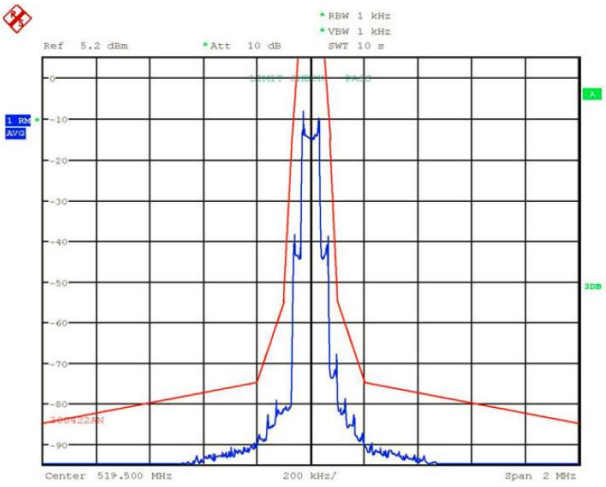

## 5.4 TEST RESULT

Channel A

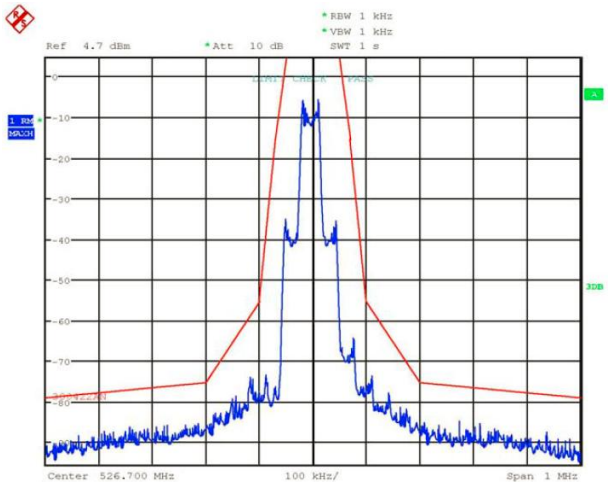
Low CH



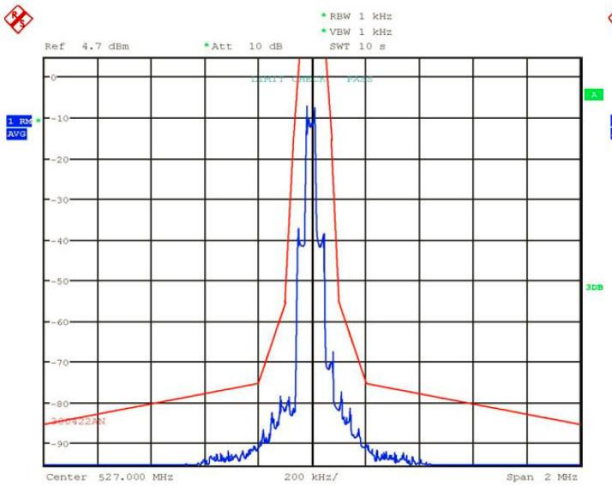

Middle CH



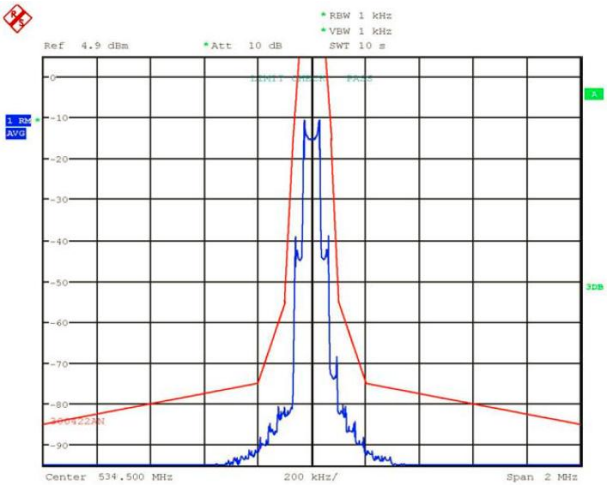

High CH



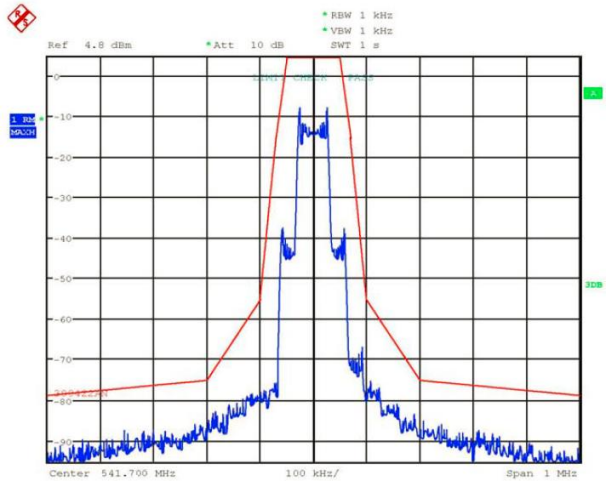
Emission Mask
Channel B
Low CH




Middle CH




High CH



# 6. TRANSMITTER UNWANTED EMISSIONS

## 6.1 LIMIT

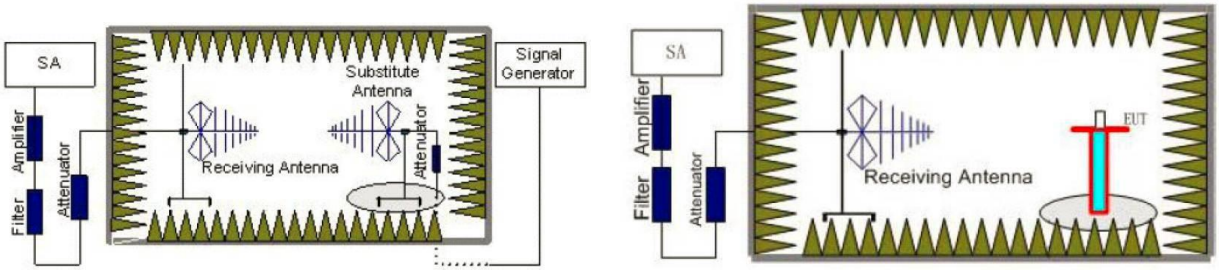
Spurious emissions are emissions outside the frequency range(s) of the equipment. The power of the spurious emissions shall not exceed the limits of table as below:

| 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

1. The transmitter output was connected to the spectrum analyzer through an attenuator. Set spectrum analyzer start 2400MHz to 2483.5MHz with 100 KHz RBW and 300 KHz VBW
2. Please refer to ETSI EN 300 422-1 V1.4.2 (2011-08) clause 6.1 for the test conditions.
3. 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

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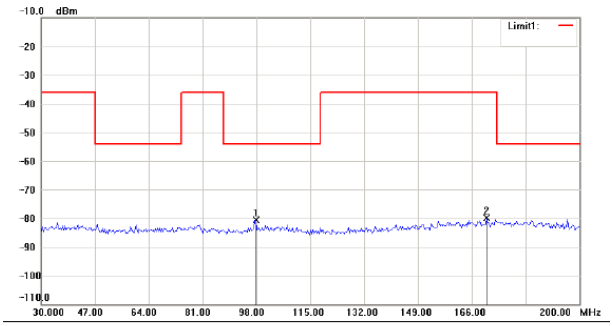
*CHNNEL A –LOW CH–30MHZ-1000MHZ*

### Vertical

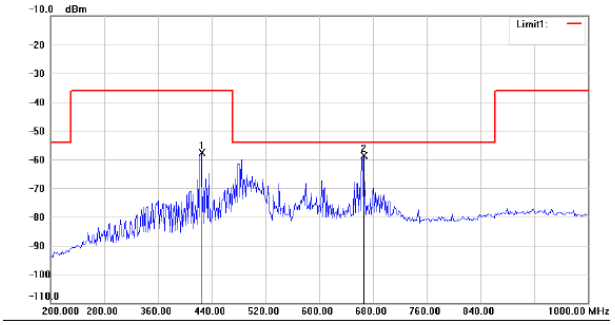

| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 97.7956 | -103.35 | peak | 22.16 | -81.19 | -54.00 | 150 | 250 | -27.19 | |
| * | 180.2405 | -102.23 | peak | 23.23 | -79.00 | -54.00 | 150 | 170 | -25.00 | |


| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 424.4490 | -65.94 | peak | -10.92 | -76.86 | -36.00 | 150 | 300 | -40.86 | |
| * | 483.7675 | -69.68 | peak | -8.21 | -77.89 | -54.00 | 150 | 120 | -23.89 | |

### Horizontal




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| * | 97.4550 | -101.72 | peak | 21.11 | -80.61 | -54.00 | 150 | 220 | -26.61 | |
| | 170.7014 | -102.65 | peak | 22.68 | -79.97 | -36.00 | 150 | 170 | -43.97 | |




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 424.4490 | -48.70 | peak | -8.83 | -57.53 | -36.00 | 150 | 30 | -21.53 | |
| * | 664.9300 | -56.04 | peak | -2.56 | -58.60 | -54.00 | 150 | 210 | -4.60 | |

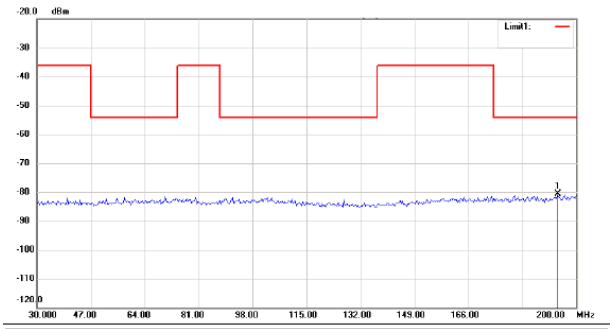
Note :

1. Result = Reading + Corrected Factor Note :

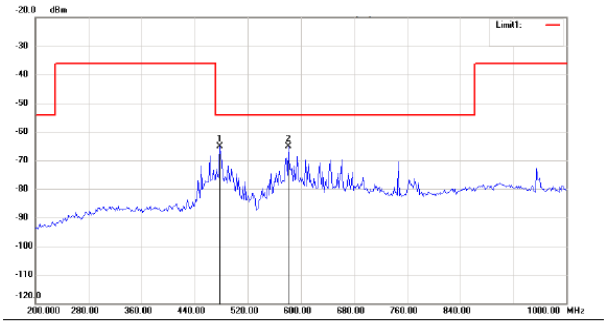
2. The fundamental wave filtered out during the test.

*CHNNEL A –MIDDLE CH–30MHZ-1000MHZ*

## Vertical

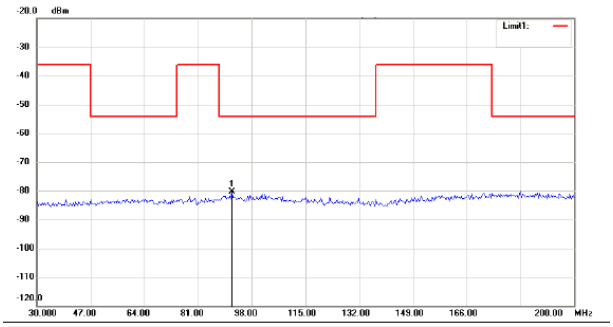



| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| * | 194.2084 | -102.25 | peak | 21.65 | -80.60 | -54.00 | 150 | 70 | -26.60 | |

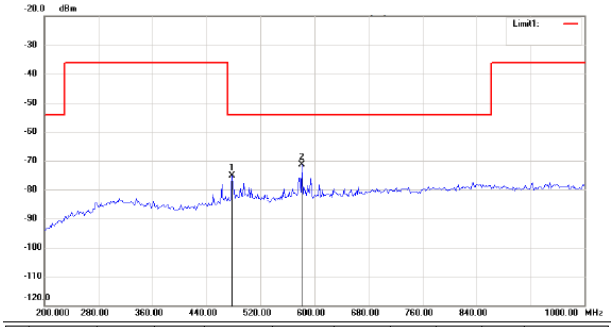



| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 477.3546 | -55.66 | peak | -9.48 | -65.14 | -54.00 | 150 | 300 | -11.14 | |
| * | 581.5630 | -58.44 | peak | -6.58 | -65.02 | -54.00 | 150 | 120 | -11.02 | |

## Horizontal




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| * | 91.6633 | -102.17 | peak | 21.72 | -80.45 | -54.00 | 150 | 40 | -26.45 | |




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 477.3546 | -67.52 | peak | -7.56 | -75.08 | -54.00 | 150 | 120 | -21.08 | |
| * | 581.5630 | -65.61 | peak | -5.79 | -71.40 | -54.00 | 150 | 220 | -17.40 | |

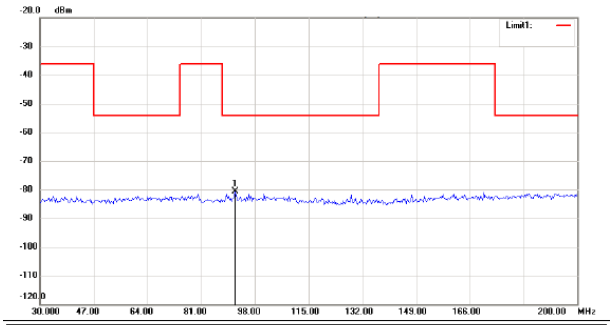
Note :

1. Result = Reading + Corrected Factor Note :

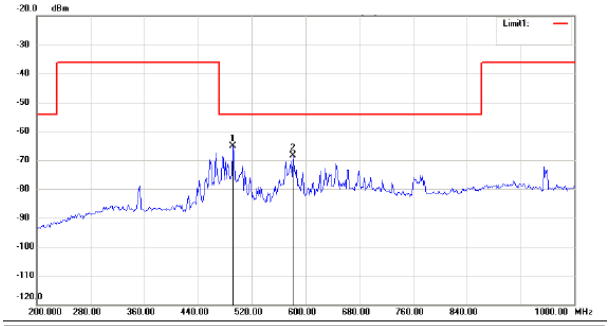
2. The fundamental wave filtered out during the test.

*CHNNEL A –HIGH CH–30MHZ-1000MHZ*

## Vertical

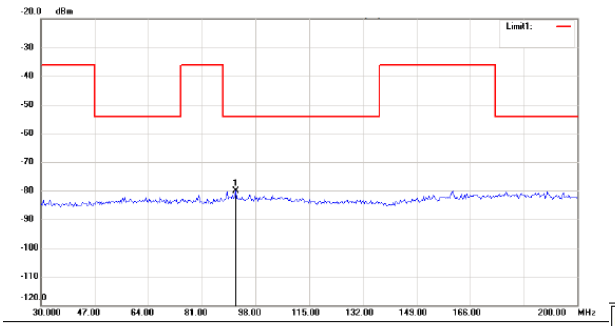



| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| * | 91.6633 | -101.62 | peak | 20.98 | -80.64 | -54.00 | 150 | 300 | -26.64 | |

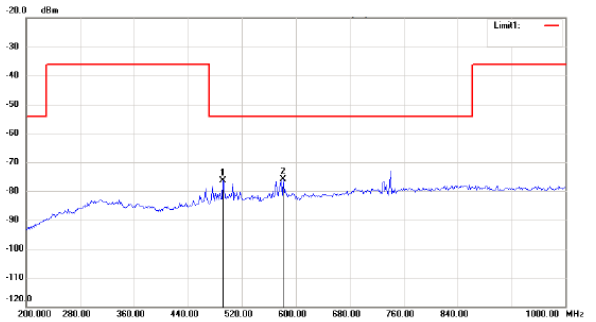



| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| * | 491.7835 | -55.91 | peak | -9.30 | -65.21 | -54.00 | 150 | 300 | -11.21 | |
| | 581.5630 | -61.69 | peak | -6.58 | -68.27 | -54.00 | 150 | 120 | -14.27 | |

## Horizontal




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| * | 91.6633 | -101.73 | peak | 21.72 | -80.01 | -54.00 | 150 | 300 | -26.01 | |




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 491.7835 | -69.29 | peak | -7.02 | -76.31 | -54.00 | 150 | 300 | -22.31 | |
| * | 581.5630 | -70.19 | peak | -5.79 | -75.98 | -54.00 | 150 | 120 | -21.98 | |

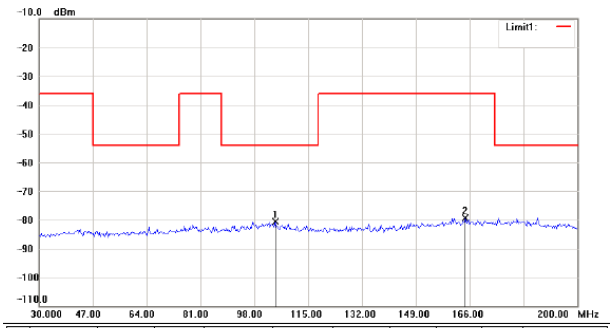
Note :

1. Result = Reading + Corrected Factor Note :

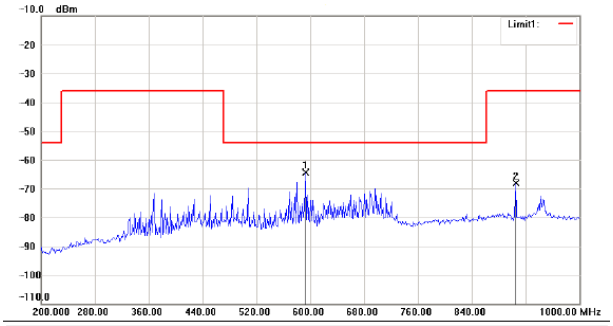
2. The fundamental wave filtered out during the test.

*CHNNEL B –LOW CH–30MHZ-1000MHZ*

## Vertical

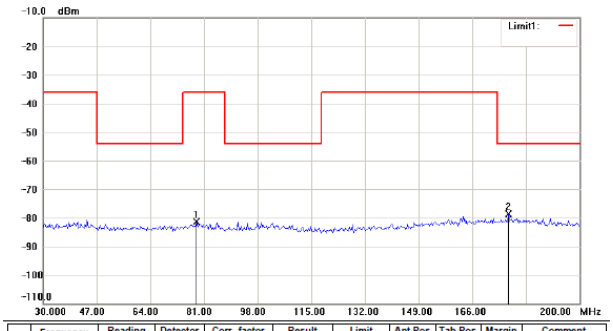



| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| * | 104.6092 | -102.79 | peak | 22.13 | -80.66 | -54.00 | 150 | 210 | -26.66 | |
| | 164.5691 | -102.46 | peak | 23.14 | -79.32 | -36.00 | 150 | 300 | -43.32 | |

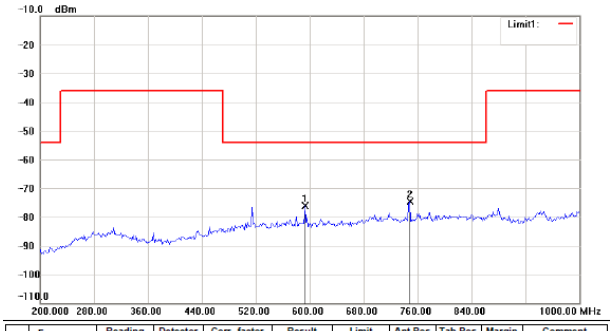



| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| * | 592.7856 | -57.54 | peak | -6.87 | -64.41 | -54.00 | 150 | 120 | -10.41 | |
| | 905.4108 | -66.02 | peak | -2.00 | -68.02 | -36.00 | 150 | 300 | -32.02 | |

## Horizontal




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 78.7174 | -103.38 | peak | 21.93 | -81.45 | -36.00 | 150 | 250 | -45.45 | |
| * | 177.5150 | -101.45 | peak | 22.83 | -78.62 | -54.00 | 150 | 100 | -24.62 | |




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 592.7856 | -70.08 | peak | -5.92 | -76.00 | -54.00 | 150 | 250 | -22.00 | |
| * | 748.2965 | -71.12 | peak | -3.60 | -74.72 | -54.00 | 150 | 170 | -20.72 | |

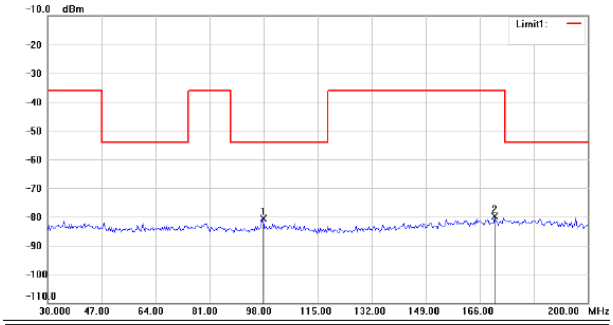
Note :

1. Result = Reading + Corrected Factor Note :

2. The fundamental wave filtered out during the test.

*CHNNEL B –MIDDLE CH–30MHZ-1000MHZ*

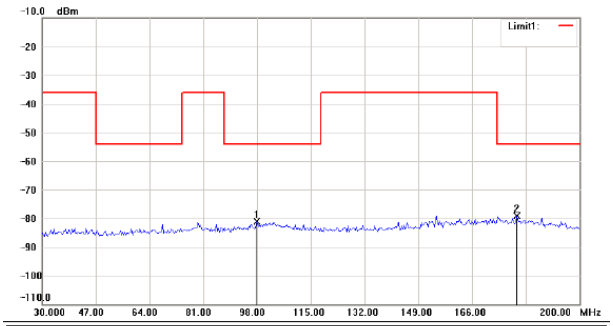
## Vertical



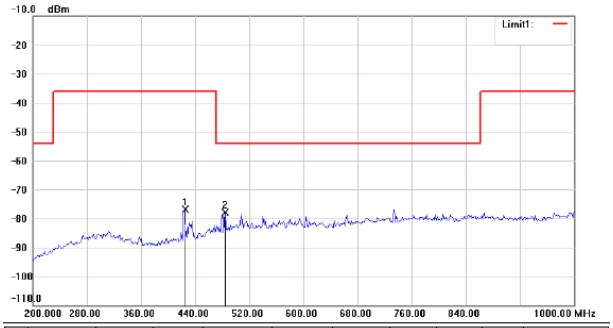

| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| * | 97.4550 | -101.72 | peak | 21.11 | -80.61 | -54.00 | 150 | 220 | -26.61 | |
| | 170.7014 | -102.65 | peak | 22.68 | -79.97 | -36.00 | 150 | 170 | -43.97 | |


| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 454.9098 | -66.54 | peak | -9.11 | -75.65 | -36.00 | 150 | 110 | -39.65 | |
| * | 695.3908 | -75.62 | peak | -2.28 | -77.90 | -54.00 | 150 | 280 | -23.90 | |

## Horizontal




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 97.7956 | -103.35 | peak | 22.16 | -81.19 | -54.00 | 150 | 250 | -27.19 | |
| * | 180.2405 | -102.23 | peak | 23.23 | -79.00 | -54.00 | 150 | 170 | -25.00 | |




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 424.4490 | -65.94 | peak | -10.92 | -76.86 | -36.00 | 150 | 300 | -40.86 | |
| * | 483.7675 | -69.68 | peak | -8.21 | -77.89 | -54.00 | 150 | 120 | -23.89 | |

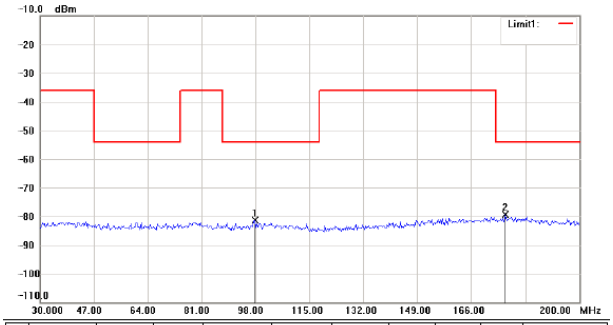
Note :

1. Result = Reading + Corrected Factor Note :

2. The fundamental wave filtered out during the test.

*CHNNEL B –HIGH CH–30MHZ-1000MHZ*

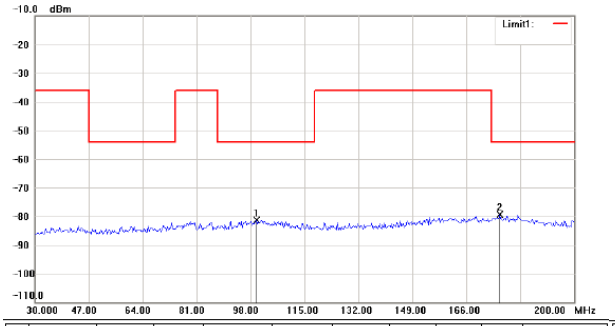
## Vertical



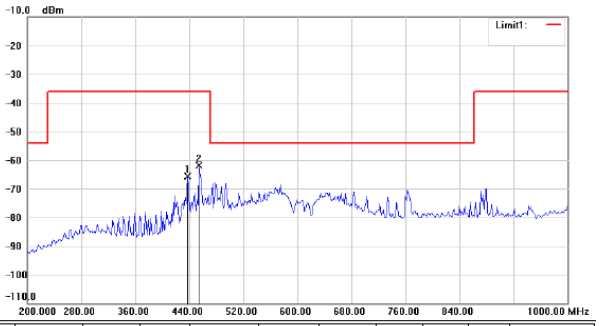

| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 97.7956 | -102.58 | peak | 21.13 | -81.45 | -54.00 | 150 | 250 | -27.45 | |
| * | 176.4930 | -102.06 | peak | 22.80 | -79.26 | -54.00 | 150 | 100 | -25.26 | |


| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 454.9098 | -66.54 | peak | -9.11 | -75.65 | -36.00 | 150 | 110 | -39.65 | |
| * | 695.3908 | -75.62 | peak | -2.28 | -77.90 | -54.00 | 150 | 280 | -23.90 | |

## Horizontal




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 99.8397 | -103.74 | peak | 22.38 | -81.36 | -54.00 | 150 | 250 | -27.36 | |
| * | 176.4930 | -102.71 | peak | 23.23 | -79.48 | -54.00 | 150 | 100 | -25.48 | |




| Mk. | Frequency (MHz) | Reading (dBm) | Detector | Corr. factor (dB) | Result (dBm) | Limit (dBm) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| | 437.2745 | -54.83 | peak | -10.76 | -65.59 | -36.00 | 150 | 120 | -29.59 | |
| * | 454.9098 | -52.45 | peak | -9.42 | -61.87 | -36.00 | 150 | 100 | -25.87 | |

Note :

1. Result = Reading + Corrected Factor Note :

2. The fundamental wave filtered out during the test.

*CHANNEL A 1GHZ-6GHZ*

| Test Channel (MHz) | Frequency (MHz) | Ant. Pol. (H/V) | SG Reading (dBm) | Cable Loss (dB) | Substitute Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 512.000 | 2048.00 | H | -59.54 | 3.71 | 9.37 | -53.88 | -30.00 | -23.88 |
| | 3072.00 | H | -55.62 | 4.85 | 12.67 | -47.80 | -30.00 | -17.80 |
| | 3584.00 | H | -52.46 | 5.54 | 12.67 | -45.33 | -30.00 | -15.33 |
| | 2048.00 | V | -59.50 | 3.71 | 9.37 | -53.84 | -30.00 | -23.84 |
| | 3072.00 | V | -59.44 | 4.12 | 11.23 | -52.33 | -30.00 | -22.33 |
| | 3584.00 | V | -54.83 | 5.54 | 12.67 | -47.70 | -30.00 | -17.70 |
| 519.500 | 2078.00 | H | -60.43 | 3.77 | 9.76 | -54.44 | -30.00 | -24.44 |
| | 4156.00 | H | -59.88 | 4.19 | 11.45 | -52.62 | -30.00 | -22.62 |
| | 4675.50 | H | -50.45 | 5.55 | 12.76 | -43.24 | -30.00 | -13.24 |
| | 2078.00 | V | -64.83 | 3.29 | 10.22 | -57.90 | -30.00 | -27.90 |
| | 4156.00 | V | -59.63 | 4.19 | 11.45 | -52.37 | -30.00 | -22.37 |
| | 4675.50 | V | -55.72 | 6.02 | 13.09 | -48.65 | -30.00 | -18.65 |
| 526.700 | 2106.80 | H | -60.78 | 3.84 | 10.23 | -54.39 | -30.00 | -24.39 |
| | 2633.50 | H | -58.83 | 4.27 | 11.53 | -51.57 | -30.00 | -21.57 |
| | 3160.20 | H | -56.71 | 5.09 | 12.70 | -49.10 | -30.00 | -19.10 |
| | 2106.80 | V | -64.87 | 3.31 | 10.36 | -57.82 | -30.00 | -27.82 |
| | 2633.50 | V | -61.87 | 3.84 | 10.23 | -55.48 | -30.00 | -25.48 |
| | 3160.20 | V | -54.10 | 6.06 | 12.98 | -47.18 | -30.00 | -17.18 |

Note 1: EIRP (dBm) = SG Reading (dBm) - Cable Loss (dB) + Substitute Antenna Gain (dBi)

Note 2: Margin (dB) = EIRP (dBm) - Limit (dBm)

Note 3: All data in this table is based on peak detection. Due to peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak and RMS detector. Thus, the data measured using the peak detector of a spectrum analyzer or EMI receiver will represent the worst-case results.

*CHANNEL B 1GHZ-6GHZ*

| Test Channel (MHz) | Frequency (MHz) | Ant. Pol. (H/V) | SG Reading (dBm) | Cable Loss (dB) | Substitute Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 527.000 | 1581.00 | H | -59.78 | 4.31 | 12.98 | -51.11 | -30.00 | -21.11 |
| | 3162.00 | H | -57.83 | 4.73 | 12.67 | -49.89 | -30.00 | -19.89 |
| | 3689.00 | H | -53.73 | 5.81 | 13.14 | -46.40 | -30.00 | -16.40 |
| | 1581.00 | V | -61.05 | 2.79 | 7.46 | -56.38 | -30.00 | -26.38 |
| | 3162.00 | V | -64.71 | 3.41 | 10.39 | -57.73 | -30.00 | -27.73 |
| | 3689.00 | V | -53.90 | 4.03 | 10.88 | -47.05 | -30.00 | -17.05 |
| 534.500 | 1603.50 | H | -60.17 | 3.86 | 10.44 | -53.59 | -30.00 | -23.59 |
| | 3207.00 | H | -56.60 | 5.12 | 12.73 | -48.99 | -30.00 | -18.99 |
| | 3741.50 | H | -53.94 | 5.80 | 13.14 | -46.60 | -30.00 | -16.60 |
| | 1603.50 | V | -61.72 | 2.79 | 7.46 | -57.05 | -30.00 | -27.05 |
| | 3207.00 | V | -61.61 | 3.86 | 10.44 | -55.03 | -30.00 | -25.03 |
| | 3741.50 | V | -49.47 | 6.36 | 12.17 | -43.66 | -30.00 | -13.66 |
| 541.700 | 1625.10 | H | -59.72 | 2.79 | 7.46 | -55.05 | -30.00 | -25.05 |
| | 3250.20 | H | -57.01 | 4.73 | 12.68 | -49.06 | -30.00 | -19.06 |
| | 3791.90 | H | -53.96 | 5.79 | 13.14 | -46.61 | -30.00 | -16.61 |
| | 1625.10 | V | -60.66 | 2.79 | 7.46 | -55.99 | -30.00 | -25.99 |
| | 3250.20 | V | -57.65 | 4.73 | 12.68 | -49.70 | -30.00 | -19.70 |
| | 3791.90 | V | -54.51 | 5.79 | 13.14 | -47.16 | -30.00 | -17.16 |

Note 1: EIRP (dBm) = SG Reading (dBm) - Cable Loss (dB) + Substitute Antenna Gain (dBi)
Note 2: Margin (dB) = EIRP (dBm) - Limit (dBm)
Note 3: All data in this table is based on peak detection. Due to peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak and RMS detector. Thus, the data measured using the peak detector of a spectrum analyzer or EMI receiver will represent the worst-case results.

# 7. FREQUENCY STABILITY

## 7.1 LIMIT

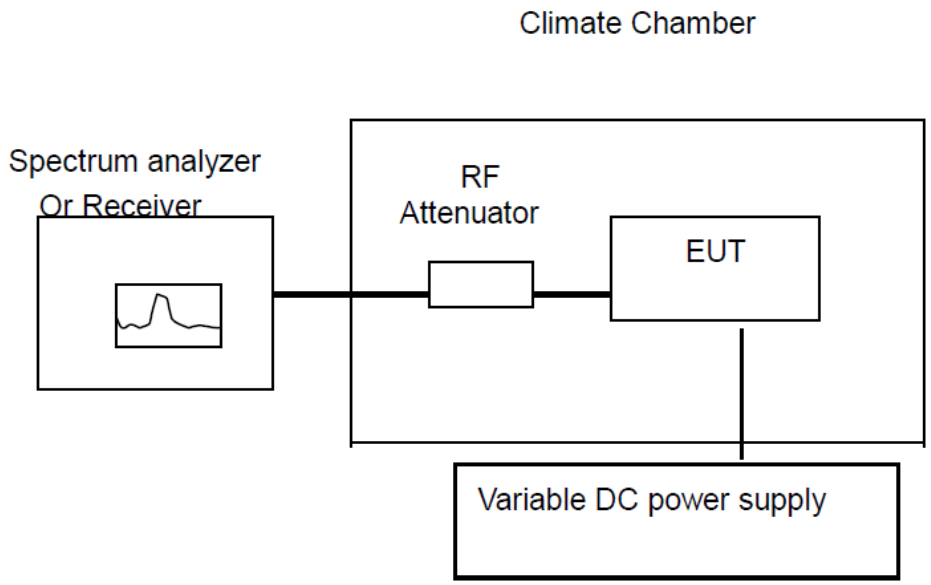
The frequency tolerance of the carrier signal shall be maintained within ±0.005% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature 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 form 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 3V)

(2) Frequency stability versus input voltage (Supply battery operating end point which shall be specified by the manufacturer DC 2.7V)

| Refernce Frequency: 512MHz | | | |
|---|---|---|---|
| Power supply | Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) |
| DC 2.55V | 25 | 1010 | 0.000197 |
| DC 3.0V | 25 | 1008 | 0.000196 |
| DC 3.45V | 25 | 1015 | 0.000198 |

| Refernce Frequency: 512MHz | | | | |
|---|---|---|---|---|
| Frequency Deviation measured with time Elapse(30 minutes) | | | | |
| Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) | Limit (%) | Results |
| 50 | 1021 | 0.000199 | 0.005 | Pass |
| 40 | 1008 | 0.000197 | | |
| 30 | 1005 | 0.000196 | | |
| 20 | 1008 | 0.000197 | | |
| 10 | 1007 | 0.000197 | | |
| 0 | 1009 | 0.000197 | | |
| -10 | 1008 | 0.000197 | | |
| -20 | 1009 | 0.000197 | | |
| -30 | 1010 | 0.000197 | | |

| Refernce Frequency: 519.5MHz | | | |
|---|---|---|---|
| Power supply | Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) |
| DC 2.55V | 25 | 1009 | 0.000194 |
| DC 3.0V | 25 | 1006 | 0.000194 |
| DC 3.45V | 25 | 1010 | 0.000194 |

| Refernce Frequency: 519.5MHz | | | | |
|---|---|---|---|---|
| Frequency Deviation measured with time Elapse(30 minutes) | | | | |
| Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) | Limit (%) | Results |
| 50 | 1011 | 0.000195 | 0.005 | Pass |
| 40 | 1006 | 0.000195 | | |
| 30 | 1006 | 0.000195 | | |
| 20 | 1008 | 0.000194 | | |
| 10 | 1007 | 0.000194 | | |
| 0 | 1008 | 0.000194 | | |
| -10 | 1008 | 0.000194 | | |
| -20 | 1006 | 0.000195 | | |
| -30 | 1011 | 0.000195 | | |

| Refernce Frequency: 526.7MHz | | | |
|---|---|---|---|
| Power supply | Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) |
| DC 2.55V | 25 | 1013 | 0.000192 |
| DC 3.0V | 25 | 1011 | 0.000192 |
| DC 3.45V | 25 | 1010 | 0.000191 |

| Refernce Frequency: 526.7MHz | | | | |
|---|---|---|---|---|
| Frequency Deviation measured with time Elapse(30 minutes) | | | | |
| Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) | Limit (%) | Results |
| 50 | 1010 | 0.000191 | 0.00500 | Pass |
| 40 | 1005 | 0.000191 | | |
| 30 | 1005 | 0.000191 | | |
| 20 | 1006 | 0.000191 | | |
| 10 | 1007 | 0.000192 | | |
| 0 | 1006 | 0.000191 | | |
| -10 | 1007 | 0.000192 | | |
| -20 | 1006 | 0.000191 | | |
| -30 | 1010 | 0.000191 | | |

| Refernce Frequency: 527.0MHz | | | |
|---|---|---|---|
| Power supply | Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) |
| DC 2.55V | 25 | 1011 | 0.000192 |
| DC 3.0V | 25 | 1011 | 0.000192 |
| DC 3.45V | 25 | 1010 | 0.000192 |

| Refernce Frequency: 527.0MHz | | | | |
|---|---|---|---|---|
| Frequency Deviation measured with time Elapse(30 minutes) | | | | |
| Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) | Limit (%) | Results |
| 50 | 1011 | 0.000192 | 0.00500 | Pass |
| 40 | 1005 | 0.000191 | | |
| 30 | 1011 | 0.000192 | | |
| 20 | 1006 | 0.000191 | | |
| 10 | 1007 | 0.000191 | | |
| 0 | 1006 | 0.000191 | | |
| -10 | 1007 | 0.000191 | | |
| -20 | 1006 | 0.000191 | | |
| -30 | 1010 | 0.000192 | | |

| Refernce Frequency: 534.5MHz | | | |
|---|---|---|---|
| Power supply | Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) |
| DC 2.55V | 25 | 1013 | 0.000190 |
| DC 3.0V | 25 | 1011 | 0.000189 |
| DC 3.45V | 25 | 1011 | 0.000189 |

| Refernce Frequency: 534.5MHz | | | | |
|---|---|---|---|---|
| Frequency Deviation measured with time Elapse(30 minutes) | | | | |
| Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) | Limit (%) | Results |
| 50 | 1013 | 0.000190 | 0.00500 | Pass |
| 40 | 1011 | 0.000189 | | |
| 30 | 1011 | 0.000189 | | |
| 20 | 1013 | 0.000190 | | |
| 10 | 1007 | 0.000188 | | |
| 0 | 1006 | 0.000188 | | |
| -10 | 1007 | 0.000188 | | |
| -20 | 1006 | 0.000188 | | |
| -30 | 1011 | 0.000189 | | |

| Refernce Frequency: 541.7MHz | | | |
|---|---|---|---|
| Power supply | Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) |
| DC 2.55V | 25 | 1013 | 0.000187 |
| DC 3.0V | 25 | 1010 | 0.000186 |
| DC 3.45V | 25 | 1013 | 0.000187 |

| Refernce Frequency: 541.7MHz | | | | |
|---|---|---|---|---|
| Frequency Deviation measured with time Elapse(30 minutes) | | | | |
| Environment Temperature(℃) | Frequency Error （Hz） | Frequency Error (%) | Limit (%) | Results |
| 50 | 1013 | 0.000187 | 0.00500 | Pass |
| 40 | 1010 | 0.000186 | | |
| 30 | 1010 | 0.000186 | | |
| 20 | 1013 | 0.000187 | | |
| 10 | 1007 | 0.000186 | | |
| 0 | 1006 | 0.000186 | | |
| -10 | 1007 | 0.000186 | | |
| -20 | 1006 | 0.000186 | | |
| -30 | 1010 | 0.000186 | | |

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