MOTOROLA SOLUTIONS

CERTIFICATE 2518.08

SAMM 825

**MOTOROLA PENANG ADV. COMM. LABORATORY**
**Motorola Solutions Malaysia Sdn Bhd,**
**Plot 2A, Medan Bayan Lepas,**
**Mukim 12 S.W.D, 11900 Bayan Lepas,**
**Penang, Malaysia.**

# FCC / ISED TEST REPORT

**Report Revision : Rev.A**

| | | |
|---|---|---|
| **Date/s Tested** | : | 15-April-2024 - 28-June-2024 |
| **Report Issue Date** | : | 09-July-2024 |
| **Manufacturer/Location** | : | Motorola Solutions Malaysia Sdn Bhd |
| **Manufacturer Address** | : | Plot 2A, Medan Bayan Lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia |
| **Requestor** | : | CADOGAN SEAN |
| **Product Type** | : | Hand-held |
| **Product Marketing Name (PMN)** | : | APX N70 |
| **Hardware Version Identification Number (HVIN)** | : | H35KET9PW8AN & H35KET9PW8AN-H |
| **Frequency Band** | : | Refer to section 1.4 |
| **Rated / Max RF Output Power** | : | 199.53mW / 252mW |
| **Applicant Name** | : | Motorola Solutions Inc |
| **Applicant Address** | : | Plot 2A, Medan Bayan Lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia |
| **FCC Registrations** | : | 461337 |
| **ISED Registrations** | : | MY0001 |
| **Firmware Version Identification Number (FVIN)** | : | D03.75.21 (BP), D00.00.16 (AP) |

**The equipment was tested accordance to the requirement listed below:**

| | |
|---|---|
| **(LTE Band 14)**<br>**FCC 47 CFR Part 2 / 90**<br>**ISED RSS GEN / 140** | **PASS** |



Prepared By:

**Awatif Rahman**
**Technician**

Approve Signatory:

**Maheshvaran A/L Rajagopal**
**Responsible Engineer**

# Table of Contents

REVISION HISTORY

| Revision History | Description | Date | Originator |
|---|---|---|---|
| Rev A. | Initial Report | 9 July 2024 | Awatif |

## 1.0. Summary of Test Results

| FCC Clause | ISED Clause | Test Item | Results | Remarks | Serial Number Tested |
|---|---|---|---|---|---|
| 2.1046 | RSS-140 3.1 | Conducted RF Output Power | Pass | Meet the requirement of limit | 022TAD0679 |
| 2.1046 | RSS 140 4.3 | Peak-to-Average Power Ratio | Pass | Meet the requirement of limit | 022TAD0679 |
| 2.1049<br>90.209(7) | RSS-Gen 6.7 | Occupied Bandwidth (-26dBc, 99%) | Pass | Meet the requirement of limit | 022TAD0679 |
| 2.1055<br>90.213 | RSS-Gen 6.11<br>RSS-140 4.2 | Frequency Stability | Pass | Meet the requirement of limit | 022TAD0679 |
| 2.1051<br>90.543(e) | RSS-Gen 6.13<br>RSS-140 4.4 | Band Edge/Emission Mask<br>Conducted Spurious Emission | Pass | Meet the requirement of limit | 022TAD0679 |
| 2.1051<br>90.543(e) | RSS-Gen 6.13<br>RSS-140 4.4 | Conducted Spurious Emissions | Pass | Meet the requirement of limit | 022TAD0679 |
| 2.1051<br>90.543(e) | RSS-140 4.4 | Radiated Spurious Emission | Pass | -43.2260 dBm (Margin: 30.2260 dB, Noise Floor) | 022TAF1521 |
| 90.635(b) | RSS-140 4.3 | Effective Radiated Power (ERP) | Pass | Meet the requirement of limit | 022TAD0679 |
| 90.543(f) | RSS-140 4.4(b) | GNSS (EIRP for 1599 – 1610MHz) | Pass | Meet the requirement of limit | 022TAF1521 |

## 1.1. Measurement Uncertainty

| Measurement | Frequency | Expended Uncertainty (k=1.96) (±dB) |
|---|---|---|
| Radiated Emissions up to 1 GHz | 30MHz ~ 200MHz | 5.01 |
| | 200MHz ~ 1000MHz | 5.01 |
| Radiated Emissions above 1 GHz | 1GHz ~ 18GHz | 5.01 |
| | 18GHz ~ 25GHz | 5.01 |

## 1.2.Equipment List

| DESCRIPTION | MODEL | SERIAL NUMBER | CALIBRATION DATE | CALIBRATION DUE DATE |
|---|---|---|---|---|
| BROADBAND ATE 1 (RF CONDUCTED TESTS) | | | | |
| Wideband Radio Communication Tester | CMW500 | 154550 | 8-Aug-23 | 8-Aug-24 |
| Signal Analyzer | FSV40 | 101431 | 7-Aug-23 | 7-Aug-24 |
| Chamber | SH-641 | 92003150 | 15-Sep-23 | 15-Sep-24 |
| Power Supply | 6652A | 3640A02967 | 15-Oct-23 | 15-Oct-24 |
| Test Software | R&S CMWrun | | | |
| Version | V.1.9.8 | | | |
| RADIATED SPURIOUS EMISSION (EMC CHAMBER 1) | | | | |
| Drg Horn Freq. | SAS-571 | 1143 | 08-Mar-23 | 08-Mar-25 |
| Drg Horn Freq. | SAS-571 | 720 | 18-Apr-23 | 18-Apr-25 |
| Power Supply | NR973A | MY54180189 | 30-Aug-23 | 30-Aug-24 |
| Signal Generator | SMB 100A | 182511 | 4-Jun-21 | 4-Jun-24 |
| Emi Test Receiver | ESW44 | 101731 | 11-Aug-23 | 11-Aug-24 |
| Bilog Antenna | CBL6112B | 2950 | 14-Dec-23 | 14-Dec-24 |
| Bilog Antenna | CBL6112B | 2964 | 25-Sep-23 | 25-Sep-24 |
| Data Logger Thermohygrometer | SDL500 | A.016800 | 21-Jun-23 | 21-Jun-24 |
| Broad-Band Horn Antenna | BBHA9170 | BBHA9170143 | 28-Aug-23 | 28-Aug-24 |
| Preamplifier | PAM-0118P | 269 | 28-Jun-23 | 28-Jun-24 |
| Loop Antenna | 6502 | 00208416 | 26-Oct-23 | 26-Oct-24 |
| 5m Semi-Anechoic Chamber | S800-HX | J2308 | Not required | Not required |
| System Controller | SC104V | 050806-1 | Not required | Not required |
| Turntable Flush Mount 2m | FM2011 | NA | Not required | Not required |
| Antenna Positioning Tower | TLT2 | NA | Not required | Not required |
| Preamplifier 18-40Ghz | Miteq Hi Gain Sucoflex | 002 | Not required | Not required |
| Test Software | EMC_FCC_IC_BLUETOOTH_RE_TEST | | | |
| Version | EMC_FCC_RE_v1.6.5 | | | |

## 1.3.General Information

### General Description of EUT

| | | | | |
|---|---|---|---|---|
| **Product** | APX N70 | | | |
| **Brand** | Motorola Solutions | | | |
| **Test Model** | H35KET9PW8AN & H35KET9PW8AN-H | | | |
| **Power Supply Rating** | 7.5 Vdc | | | |
| **Mode of Operation** | LTE Band 14 | | | |
| **Modulation Type** | QPSK, 16QAM | | | |
| **Operating Frequency** | LTE Band 14 | Channel Bandwidth 5MHz | 790.5MHz~795.5MHz | |
| | | Channel Bandwidth 10MHz | 793.0MHz | |
| **Max. Conducted RF Output Power** | LTE Band 14 QPSK | Channel Bandwidth 5MHz | 23.590dBm (0.229W) | |
| | | Channel Bandwidth 10MHz | **23.668dBm (0.233W)** | |
| | LTE Band 14 16QAM | Channel Bandwidth 5MHz | 22.752dBm (0.188W) | |
| | | Channel Bandwidth 10MHz | **22.841dBm (0.192W)** | |
| **Emission Designator** | LTE Band 14 | | **QPSK** | **16QAM** |
| | | Channel Bandwidth 5MHz | 4M48G7D | 4M47D7W |
| | | Channel Bandwidth 10MHz | 8M91G7D | 8M91D7W |
| **Antenna Type** | LTE Band 14 | Stamped Metal, Antenna LTE Low Band 788 – 798MHz (-1.7dBi) | | |
| **SW Version** | D03.75.21 (BP), D00.00.16 (AP) | | | |
| **HW Version** | P1 | | | |

Note:

1. The EUT contains following accessory devices and data cable.

| Item | Brand | Model or P/N | Specification |
|---|---|---|---|
| Li-ion Battery | MOTOROLA | PMNN4818A | UL 3650mAH (using RN 2170 Li-Ion cell) |

**Description of 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.

| NO. | Product | Brand | Model No. | Serial No. | FCC ID |
|---|---|---|---|---|---|
| 1 | Wideband Radio Communication Tester | R&S | CMW500 | 154550 | NA |

| NO. | Signal Cable Description of The above Support Units |
|---|---|
| 1 | NA |

Note:
1. All power cords of the above support units are non-shielded.
2. Item 1 acted as a communication partner to transfer data.

**EUT Operating Conditions**
The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

**General Description of Applied Standards**
The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**
**FCC 47 CFR Part 90**
**KDB 971168 D01 Power Meas License Digital Systems v03r01**
**KDB 971168 D02 Misc OOBE License Digital Systems v02r01**
**ANSI C63.26-2015**

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

## 1.4.Channel Number and Frequency Info

| Band | Bandwidth supported | Available Channel Number | Test Channel Number | | | Test Channel Frequency (MHz) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Low Channel | Mid Channel | High Channel | Low Channel | Mid Channel | High Channel |
| LTE Band 14 | 5 MHz | 23305 ~ 23355 | 23305 | 23330 | 23355 | 790.5 | 793.0 | 795.5 |
| | 10 MHz | 23330 | - | 23330 | - | - | 793.0 | - |

## 1.5. Test Mode Applicability and Tested Channel Detail

Pre-scan also have been conducted with the accessory devices listed in section table 1.3, only the worst case radiated emission results of the combination test configuration is reported in this report.
The following channel(s) was (were) selected for the final test as listed below:

### LTE Band 14

| Test Item | Available Channel | Tested Channel | Channel Bandwidth | Modulation | Mode |
|---|---|---|---|---|---|
| **Conducted RF Output Power** | 23305 ~ 23355 | 23305, 23330, 23355 | 5 MHz | QPSK, 16QAM | As per table 1.6.3 |
| | 23330 | 23330 | 10 MHz | | |
| **Peak-to-Average Power Ratio** | 23305 ~ 23355 | 23305, 23330, 23355 | 5 MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| | 23330 | 23330 | 10 MHz | | 50 RB / 0 RB Offset |
| **Occupied Bandwidth** | 23305 ~ 23355 | 23305, 23330, 23355 | 5 MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | 23330 | 23330 | 10 MHz | | 50 RB / 0 RB Offset |
| **Frequency Stability** | 23305 ~ 23355 | 23305, 23355 | 5 MHz | QPSK | 25 RB / 0 RB Offset |
| | 23330 | 23330 | 10 MHz | | 50 RB / 0 RB Offset |
| **Band Edge / Emission Mask Conducted Spurious Emission** | 23305 ~ 23355 | 23305, 23330, 23355 | 5 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset<br>25 RB / 0 RB Offset<br>1 RB / 24 RB Offset<br>12 RB / 6 RB Offset |
| | 23330 | 23330 | 10 MHz | | 1 RB / 0 RB Offset<br>50 RB / 0 RB Offset<br>1 RB / 49 RB Offset<br>25 RB / 12 RB Offset |
| **Conducted Spurious Emission** | 23305 ~ 23355 | 23305, 23330, 23355 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | 23330 | 23330 | 10 MHz | | 1 RB / 0 RB Offset |
| **Radiated Spurious Emission** | 23305 ~ 23355 | 23305 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 23330 | 10 MHz | | 1 RB / 0 RB Offset |
| | | 23355 | 5 MHz | | 1 RB / 24 RB Offset |
| **Effective Radiated Power (ERP)** | 23305 ~ 23355 | 23305, 23330, 23355 | 5 MHz | QPSK, 16QAM | As per table 1.6.4 |
| | 23330 | 23330 | 10 MHz | | |
| **GNSS (EIRP for 1599 – 1610MHz)** | **23305 ~ 23355** | 23305 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 23355 | 5 MHz | | 1 RB / 0 RB Offset |

NOTE:

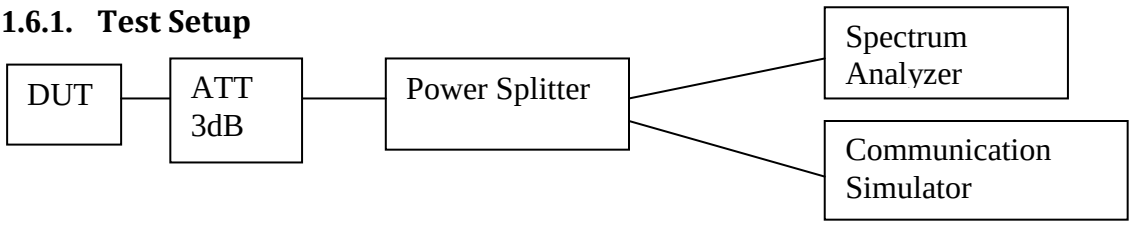
1. The Conducted RF Output Power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, Conducted Spurious Emission and Radiated Emission had been tested under QPSK modes.
2. Band Edge was performed with 1 and full Resource Block at the lowest and highest operating frequency band.
3. The Effective Radiated Power (ERP) was calculated from Conducted RF Output Power in QPSK and 16QAM modulation.
4. The Peak to Average and Occupied Bandwidth was performed with full Resource Block which is the worst case.
5. Frequency stability was performed with full Resource Block in QPSK modulation.

**Test Condition:**

| Test Item | Environmental Conditions | Input Power | Tested By |
|---|---|---|---|
| Conducted RF Output Power | 25ºC, 50% RH | 7.5 Vdc | Awatif Rahman |
| Peak-to-Average Power Ratio | 25ºC, 50% RH | 7.5 Vdc | Awatif Rahman |
| Occupied Bandwidth | 25ºC, 50% RH | 7.5 Vdc | Awatif Rahman |
| Frequency Stability | -30ºC ~ 60ºC | 7.5 Vdc | Awatif Rahman |
| Band Edge / Emission Mask Conducted Spurious Emission | 25ºC, 50% RH | 7.5 Vdc | Awatif Rahman |
| Conducted Spurious Emssion | 25ºC, 50% RH | 7.5 Vdc | Awatif Rahman |
| Radiated Spurious Emission | 23.4ºC, 69.3% RH | 7.5 Vdc | Nazrin & Rezza |
| Equivalent Isotropically Radiated Power (EIRP) | 25ºC, 50% RH | 7.5 Vdc | Awatif Rahman |

## 1.6.Conducted RF Output Power

### 1.6.1. Test Setup




1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. All the measurement were done at low, mid, high channel for each band and different modulation.
5. Record the average power into the test report.

### 1.6.2. Test Limits

FCC: Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

ISED: The e.r.p. for portable equipment including handheld devices shall not exceed 3 W.

### 1.6.3. Conducted RF Output Power – LTE Band 14 (788-798MHz)

| Conducted Output Power (dBm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LTE Band/BW | RB Size | RB Offset | QPSK Modulation | | | 16QAM Modulation | | |
| | | | Low CH | Mid CH | High CH | Low CH | Mid CH | High CH |
| | | | 23305 | 23330 | 23355 | 23305 | 23330 | 23355 |
| | | | 790.5MHz | 793.0MHz | 795.5 MHz | 790.5 MHz | 793.0MHz | 795.5 MHz |
| **Band 14 / 5MHz** | **1** | **0** | **23.59** | 23.414 | 23.39 | **22.752** | 22.401 | 22.386 |
| | **1** | **13** | 23.488 | 23.314 | 23.331 | 22.624 | 22.345 | 22.327 |
| | **1** | **24** | 23.514 | 23.358 | 23.4 | 22.666 | 22.394 | 22.402 |
| | **12** | **0** | 22.512 | 22.385 | 22.392 | 21.519 | 21.315 | 21.355 |
| | **12** | **6** | 22.436 | 22.33 | 22.384 | 21.484 | 21.251 | 21.393 |
| | **12** | **13** | 22.466 | 22.339 | 22.369 | 21.492 | 21.282 | 21.397 |
| | **25** | **0** | 22.489 | 22.28 | 22.415 | 21.556 | 21.27 | 21.367 |

| Conducted Output Power (dBm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LTE Band/BW | RB Size | RB Offset | QPSK Modulation | | | 16QAM Modulation | | |
| | | | Low CH | Mid CH | High CH | Low CH | Mid CH | High CH |
| | | | | 23330 | | | 23330 | |
| | | | | 793.0MHz | | | 793.0MHz | |
| **Band 14 / 10MHz** | **1** | **0** | | **23.668** | | | **22.841** | |
| | **1** | **25** | | 23.432 | | | 22.434 | |
| | **1** | **49** | | 23.518 | | | 22.61 | |
| | **25** | **0** | | 22.347 | | | 21.519 | |
| | **25** | **13** | | 22.368 | | | 21.411 | |
| | **25** | **25** | | 22.414 | | | 21.47 | |
| | **50** | **0** | | 22.354 | | | 21.359 | |

### 1.6.4. Effective Radiated Power - LTE Band 14 (788-798MHz)

| ERP (dBm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LTE Band/BW | RB Size | RB Offset | QPSK Modulation | | | 16QAM Modulation | | |
| | | | Low CH | Mid CH | High CH | Low CH | Mid CH | High CH |
| | | | 23305 | 23330 | 23355 | 23305 | 23330 | 23355 |
| | | | 790.5MHz | 793.0MHz | 795.5 MHz | 790.5 MHz | 793.0MHz | 795.5 MHz |
| **Band 14 / 5MHz** | **1** | **0** | **19.74** | 19.564 | 19.54 | **18.902** | 18.551 | 18.536 |
| | **1** | **13** | 19.638 | 19.464 | 19.481 | 18.774 | 18.495 | 18.477 |
| | **1** | **24** | 19.664 | 19.508 | 19.55 | 18.816 | 18.544 | 18.552 |
| | **12** | **0** | 18.662 | 18.535 | 18.542 | 17.669 | 17.465 | 17.505 |
| | **12** | **6** | 18.586 | 18.48 | 18.534 | 17.634 | 17.401 | 17.543 |
| | **12** | **13** | 18.616 | 18.489 | 18.519 | 17.642 | 17.432 | 17.547 |
| | **25** | **0** | 18.639 | 18.43 | 18.565 | 17.706 | 17.42 | 17.517 |

| ERP (dBm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LTE Band/BW | RB Size | RB Offset | QPSK Modulation | | | 16QAM Modulation | | |
| | | | Low CH | Mid CH | High CH | Low CH | Mid CH | High CH |
| | | | | 23330 | | | 23330 | |
| | | | | 793.0MHz | | | 793.0MHz | |
| **Band 14 / 10MHz** | **1** | **0** | | **19.818** | | | **18.991** | |
| | **1** | **25** | | 19.582 | | | 18.584 | |
| | **1** | **49** | | 19.668 | | | 18.76 | |
| | **25** | **0** | | 18.497 | | | 17.669 | |
| | **25** | **13** | | 18.518 | | | 17.561 | |
| | **25** | **25** | | 18.564 | | | 17.62 | |
| | **50** | **0** | | 18.504 | | | 17.509 | |

The maximum ERP/EIRP from the measured RF output power is given in Equation as follows:

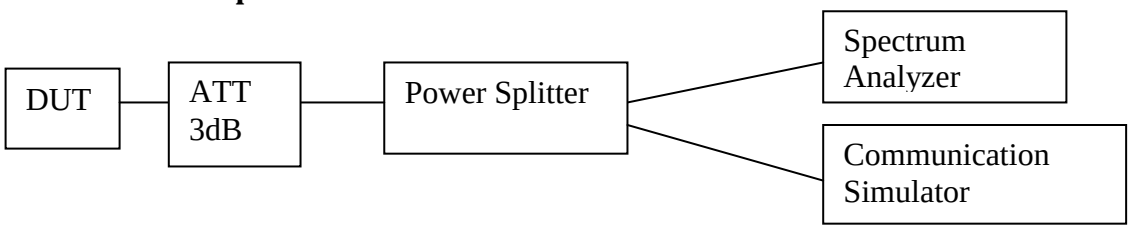
$$\mathbf{EIRP} = \mathbf{P_{Meas}} + \mathbf{G_T}$$
$$\mathbf{ERP} = \mathbf{EIRP} - \mathbf{2.15}$$

Where, ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (Expressed in the same units as PMeas, e.g., dBm)

$\mathbf{P_{Meas}}$ measured transmitter output power, in dBm
$\mathbf{G_T}$ gain of the transmitting antenna, in dBi (EIRP)

## 1.7. Peak-to-Average Power Ratio

### 1.7.1. Test Setup




1) The DUT transmitter output port was connected to communication simulator with above setup.
2) Path loss for the measurement included.
3) Set DUT to transmit maximum power through communication simulator
4) Set the CCDF (Complementary Cumulative Distribution Function) option in the spectrum analyzer.
5) Spectrum Analyzer setting, RBW = 20MHz.
6) Recorded the maximum PAR level associated with a probability of 0.1% as Peak to Average Ratio.
7) All the measurements were done at low, mid, high channel for each band and different modulation.

### 1.7.2. Test Limit

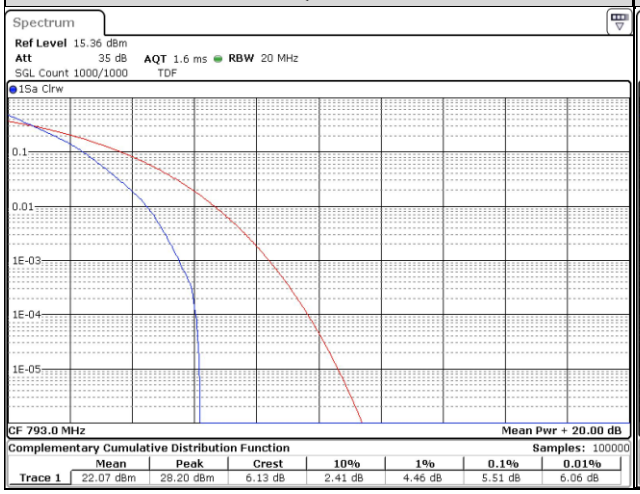
The peak-to-average radio (PAR) of the transmission may not exceed 13 dB.

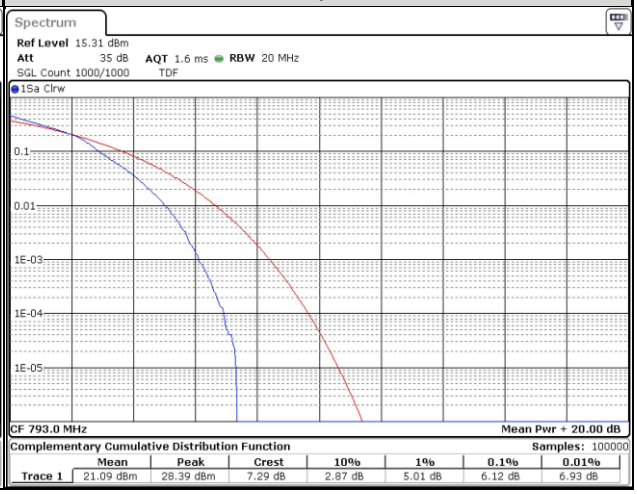
### 1.7.3. Peak To Average Power Ratio – LTE Band 14 (788-798MHz)

**5MHz**

| LTE Band/BW/RB Size/RB Offset | Channel Number | Tx Frequency | Peak To Average (dB) | |
|---|---|---|---|---|
| | | | QPSK Modulation | 16QAM Modulation |
| **Band 14/5MHz/25/0** | Low CH 23305 | 790.5 MHz | 5.275 | 6.058 |
| | Mid CH 23330 | 793 MHz | **5.507** | **6.116** |
| | High CH 23355 | 795.5 MHz | 5.275 | 6 |

| Spectrum Plot of Worst Value | |
|---|---|
| QPSK | 16QAM |

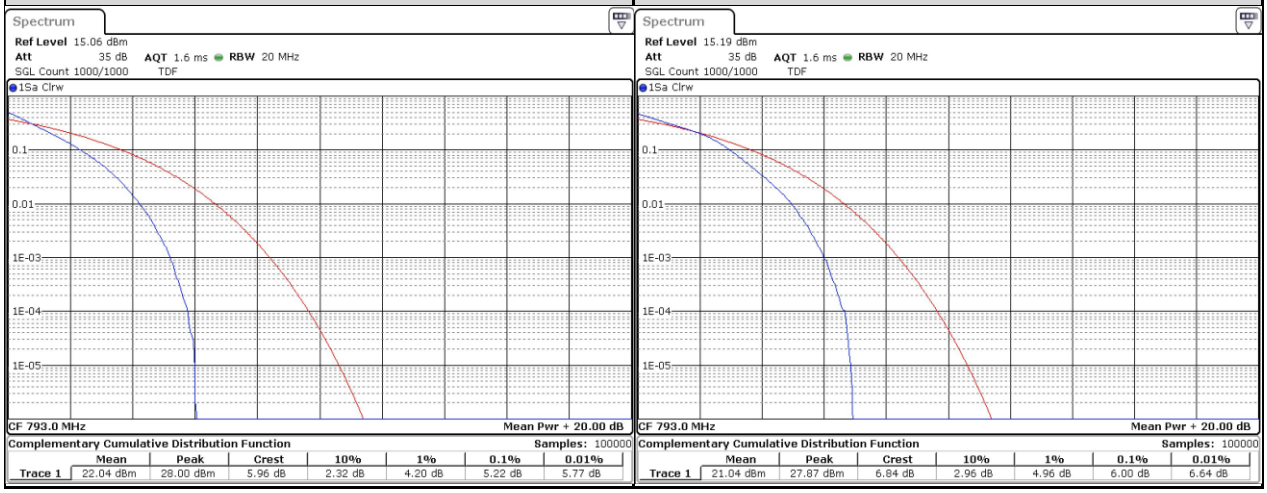


**10MHz**

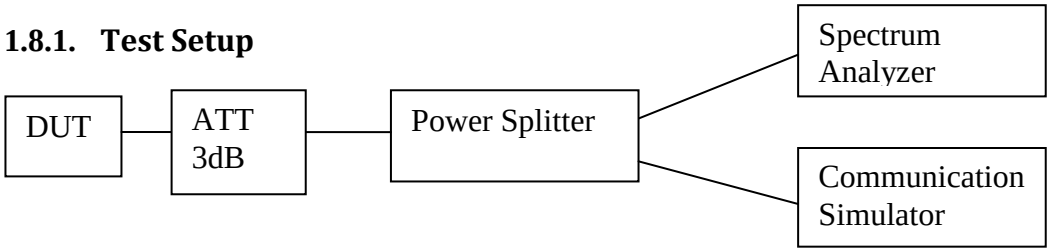
| LTE Band/BW/RB Size/RB Offset | Channel Number | Tx Frequency | Peak To Average (dB) | |
|---|---|---|---|---|
| | | | QPSK Modulation | 16QAM Modulation |
| **Band 14/10MHz/50/0** | Low CH | | | |
| | Mid CH 23330 | 793 MHz | 5.217 | 6 |
| | High CH | | | |

| Spectrum Plot of Worst Value | |
|---|---|
| QPSK | 16QAM |



## 1.8.Occupied Bandwidth

### 1.8.1. Test Setup




1) The DUT transmitter output port was connected to communication simulator with above setup.
2) Path loss for the measurement included.
3) For LTE measurement, set DUT to transmit maximum power & full RB size through communication simulator.
4) For LTE measurement, set DUT to transmit maximum power through communication simulator.
5) Spectrum Analyzer setting, RBW is 1% of OBW and VBW is 3 times of RBW.
6) Measure & record -26dBc and 99% occupied bandwidth (BW).
7) All the measurement was done at low, mid, high channel for each band and different modulation.

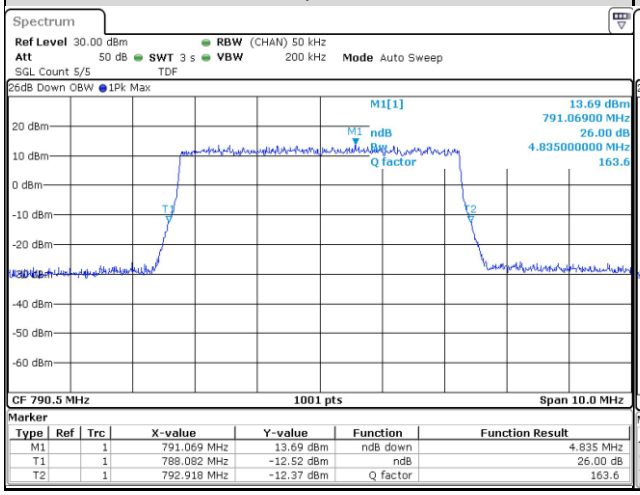
### 1.8.2. Test Limit

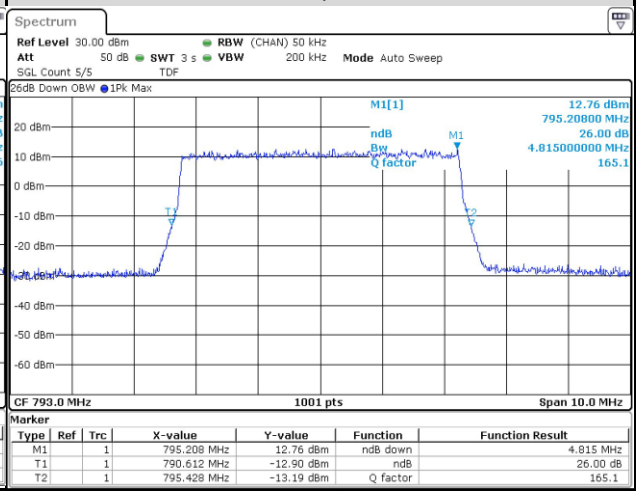
For measurement 99% of occupied bandwidth that is required by FCC 2.1049 and RSS Gen 6.7.

### 1.8.3. Occupied Bandwidth - LTE Band 14 (788-798MHz)

| LTE Band/BW/RB Size/RB Offset | Channel Number | Tx Frequency | -26 dBc Bandwidth (MHz) | |
|---|---|---|---|---|
| | | | QPSK Modulation | 16QAM Modulation |
| **Band 14/5MHz/25/0** | Low CH 23305 | 790.5 MHz | **4.835** | 4.805 |
| | Mid CH 23330 | 793 MHz | 4.825 | **4.815** |
| | High CH 23355 | 795.5 MHz | 4.805 | 4.815 |

| Spectrum Plot of Worst Value | |
|---|---|
| -26 dBC Bandwidth | |
| QPSK | 16QAM |



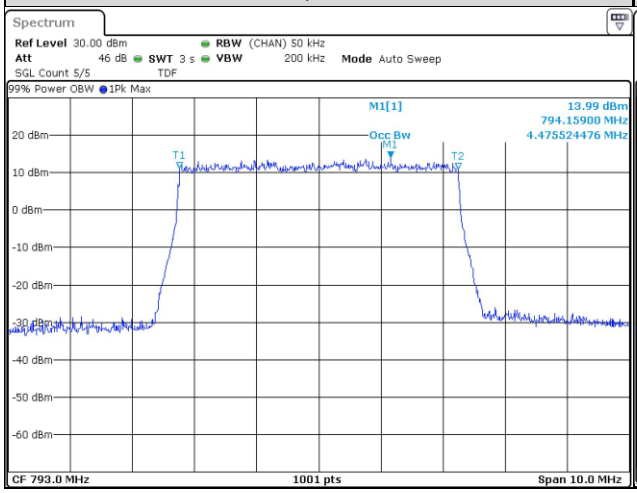



| LTE Band/BW/RB Size/RB Offset | Channel Number | Tx Frequency | 99% Occupied Bandwidth (MHz) | |
|---|---|---|---|---|
| | | | QPSK Modulation | 16QAM Modulation |
| **Band 14/5MHz/25/0** | Low CH 23305 | 790.5 MHz | 4.456 | **4.466** |
| | Mid CH 23330 | 793 MHz | **4.476** | 4.466 |
| | High CH 23355 | 795.5 MHz | 4.456 | 4.456 |

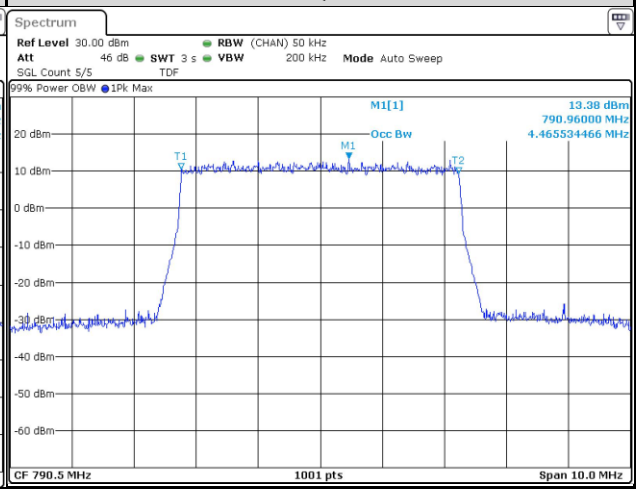
Spectrum Plot of Worst Value

99% Occupied Bandwidth

QPSK




16QAM

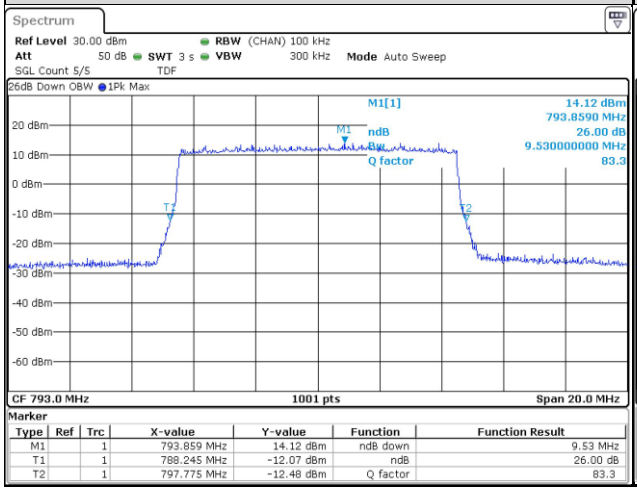



| LTE Band/BW/RB Size/RB Offset | Channel Number | Tx Frequency | -26 dBc Bandwidth (MHz) | |
|---|---|---|---|---|
| | | | QPSK Modulation | 16QAM Modulation |
| **Band 14/10MHz/50/0** | Low CH | | | |
| | Mid CH 23330 | 793 MHz | 9.53 | 9.491 |
| | High CH | | | |

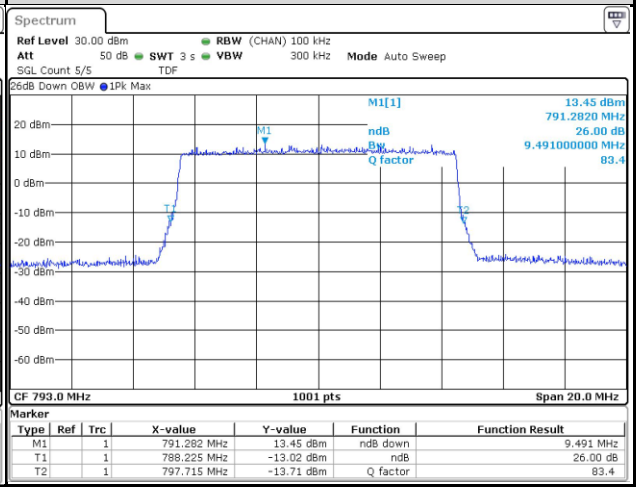
Spectrum Plot of Worst Value

-26 dBC Bandwidth

QPSK

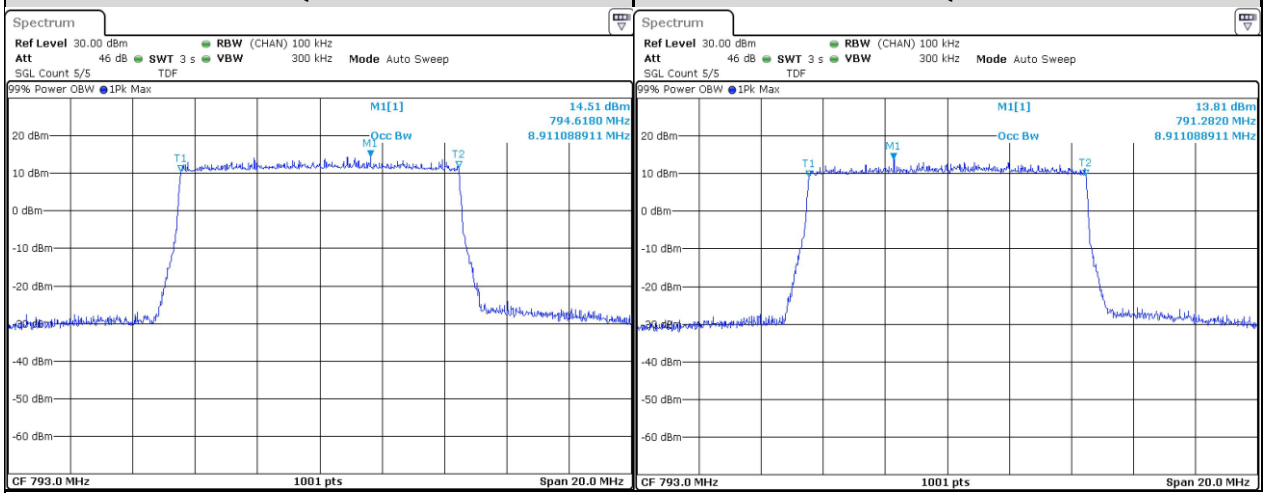



16QAM



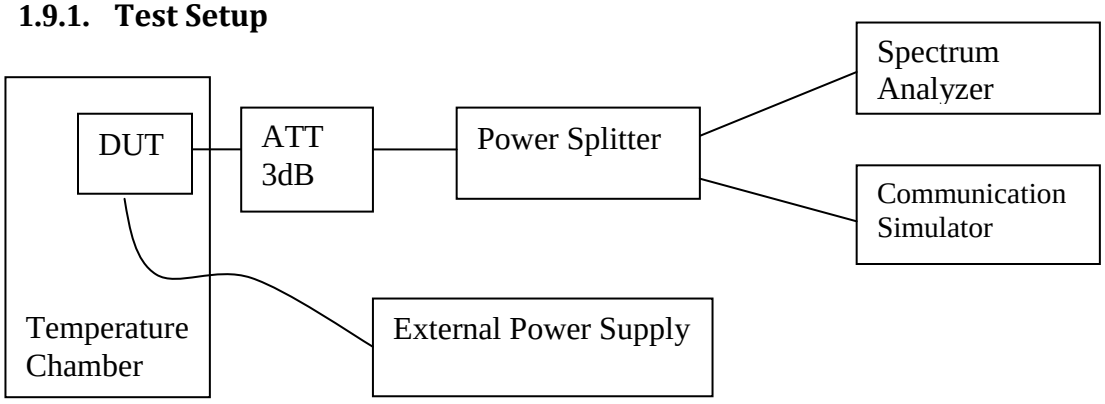
| LTE Band/BW/RB Size/RB Offset | Channel Number | Tx Frequency | 99% Occupied Bandwidth (MHz) | |
|---|---|---|---|---|
| | | | QPSK Modulation | 16QAM Modulation |
| **Band 14/10MHz/50/0** | Low CH | | | |
| | Mid CH 23330 | 793 MHz | 8.911 | 8.911 |
| | High CH | | | |

| Spectrum Plot of Worst Value | |
|---|---|
| 99% Occupied Bandwidth | |
| QPSK | 16QAM |



## 1.9.Frequency Stability

### 1.9.1. Test Setup




1) The DUT is placed in the temperature chamber and DUT is power up by external power supply to control the DC input voltage.
2) The temperature chamber could control the temperature and humidity and external power supply could control the test voltage range from minimum to maximum operating voltage.
3) Measured frequency error from the communication simulator by vary below step :
   i. Vary temperature of the temperature chamber from -30 ~ 60 deg C (10 deg C / Step) and set external supply voltage constant at nominal voltage.
   ii. Vary external supply voltage from minimum to maximum operation voltage support by DUT and set temperature chamber constant at room temp.
4) All the measurement was done at mid channel for each band.

### 1.9.2. Test Limit

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 1.9.3. Frequency Stability - LTE Band 14 (788-798MHz)

| Band | Temp ( Deg C) | Frequency Error VS Temperature | | | |
|---|---|---|---|---|---|
| | | Channel Bandwidth: 5 MHz | | | |
| | | Low Channel | | High Channel | |
| | | 790.5MHz | | 795.5MHz | |
| | | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| **LTE Band 14** | **60** | 790.500005 | 0.005936 | 795.500006 | 0.007679 |
| | **50** | 790.499995 | -0.006388 | 795.500005 | 0.006402 |
| | **40** | 790.500005 | 0.005936 | 795.500007 | 0.008991 |
| | **30** | 790.500006 | 0.007076 | 795.500006 | 0.007589 |
| | **20** | 790.500005 | 0.006931 | 795.500006 | 0.007481 |
| | **10** | 790.500007 | 0.008704 | 795.500009 | 0.010915 |
| | **0** | 790.500005 | 0.006135 | 795.500005 | 0.006833 |
| | **-10** | 790.500004 | 0.004669 | 795.500006 | 0.007732 |
| | **-20** | 790.499996 | -0.005646 | 795.500006 | 0.007031 |
| | **-30** | 790.500007 | 0.008505 | 795.500006 | 0.007894 |

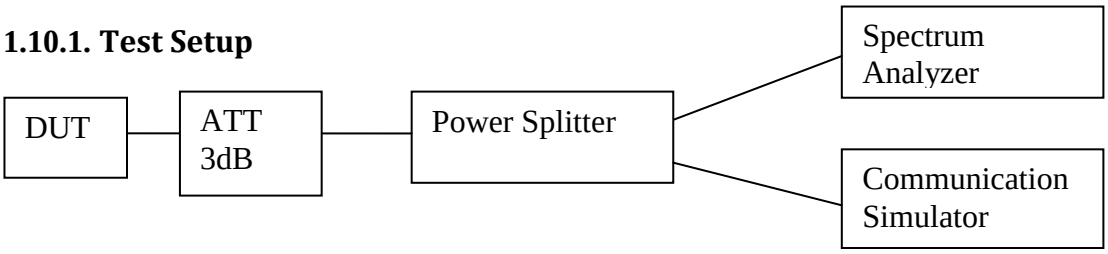
| Band | Voltage (V) | Frequency Error VS Voltage | | | |
|---|---|---|---|---|---|
| | | Channel Bandwidth: 5 MHz | | | |
| | | Low Channel | | High Channel | |
| | | 790.5MHz | | 795.5MHz | |
| | | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| **LTE Band 14** | **9** | 790.500036 | 0.007239 | 795.500046 | 0.008757 |
| | **7.5** | 790.500006 | 0.003891 | 795.500001 | 0.009369 |
| | **6** | 790.500466 | 0.004796 | 795.500045 | 0.005718 |

| Band | Temp ( Deg C) | Frequency Error VS Temperature | |
|---|---|---|---|
| | | Channel Bandwidth: 10 MHz | |
| | | Mid Channel | |
| | | 793MHz | |
| | | Frequency (MHz) | Frequency Error (ppm) |
| **LTE Band 14** | **60** | 793.000026 | 0.033048 |
| | **50** | 792.999997 | -0.004402 |
| | **40** | 793.000004 | 0.005484 |
| | **30** | 792.999995 | -0.005718 |
| | **20** | 792.999996 | -0.004889 |
| | **10** | 793.000006 | 0.007504 |
| | **0** | 793.000005 | 0.005736 |
| | **-10** | 793.000005 | 0.00635 |
| | **-20** | 792.999995 | -0.006278 |
| | **-30** | 793.000005 | 0.006332 |

| Band | Voltage (V) | Frequency Error VS Voltage | |
|---|---|---|---|
| | | Channel Bandwidth: 10 MHz | |
| | | Mid Channel | |
| | | 793MHz | |
| | | Frequency (MHz) | Frequency Error (ppm) |
| **LTE Band 14** | **9** | 793.000064 | 0.007342 |
| | **7.5** | 793.000021 | 0.004961 |
| | **6** | 793.002563 | 0.003987 |

## 1.10. Band Edge/Emission Mask Conducted Spurious Emission

### 1.10.1. Test Setup




1) The DUT transmitter output port was connected to communication simulator with above setup.
2) Path loss for the measurement included.
3) Set DUT to transmit maximum power through communication simulator.
4) The band edges of lowest and highest channels with the highest RF powers were measured.
5) The center frequency of spectrum is the band edge frequency, RBW is 1~3% of OBW and VBW is 3 times of RBW.
6) Record the maximum trace plot into the test report.

### 1.10.2. Test Limit

FCC:
(e) For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

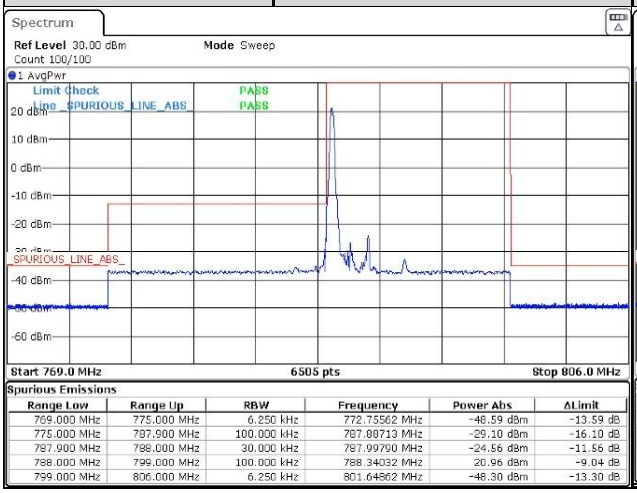
(5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

ISED:
The power of any unwanted emission outside the bands 758-768 MHz and 788-798 MHz shall be attenuated below the transmitter output power P in dBW as follows, where p is the transmitter output power in watts:
For any frequency between 769-775 MHz and 799-806 MHz:
76 + 10 log (p), dB in a 6.25 kHz band for fixed and base station equipment
65 + 10 log (p), dB in a 6.25 kHz band for mobile and portable/hand-held equipment
For any frequency between 775-788 MHz, above 806 MHz, and below 758 MHz: 43 + 10 log (p), dB in a bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency bands 758-768 MHz and 788-798 MHz, a resolution bandwidth of 30 kHz may be employed.

## 1.10.3. Band Edge/Emission Mask Conducted Spurious Emission - LTE Band 14 (788-798MHz)

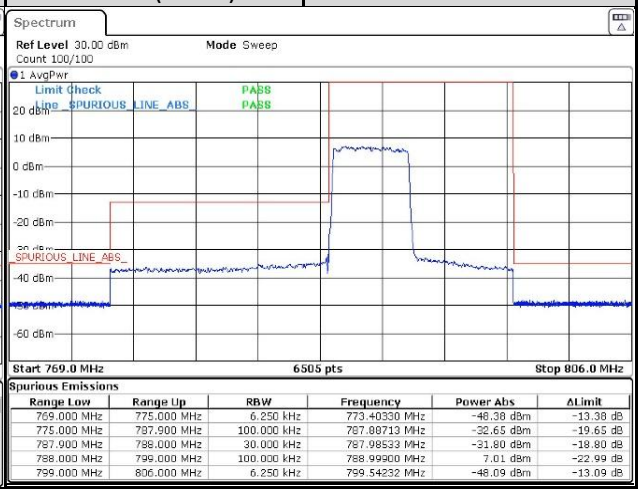
**5MHz**

| Band 14, 5MHz QPSK, Low CH 23305 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

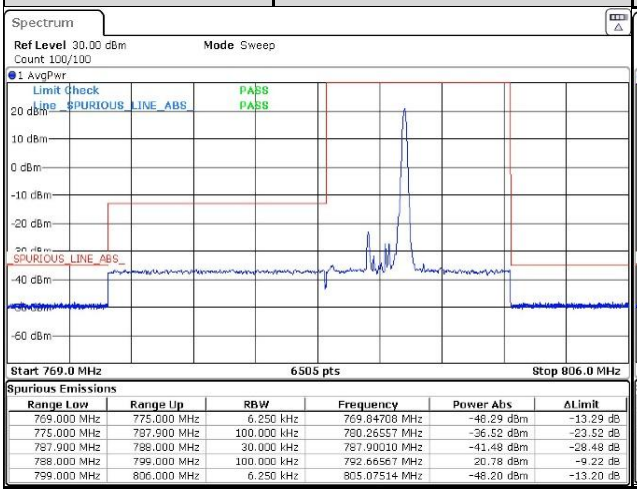
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 772.75562 MHz | -48.59 dBm | -13.59 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.88713 MHz | -29.10 dBm | -16.10 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.99790 MHz | -24.56 dBm | -11.56 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 788.34032 MHz | 20.96 dBm | -9.04 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 801.64862 MHz | -48.30 dBm | -13.30 dB |




Spurious Emissions

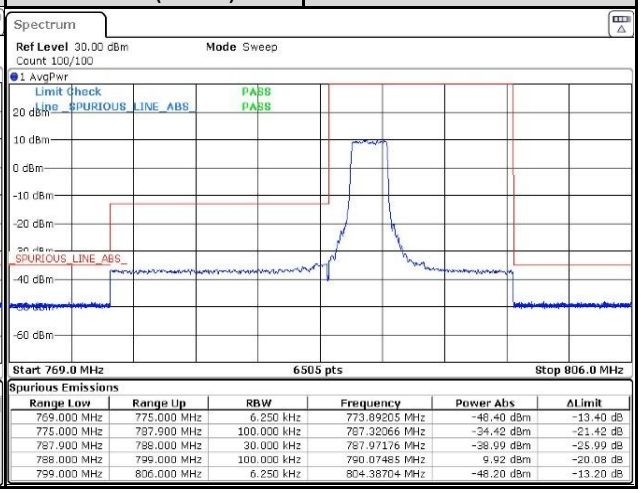
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 773.40330 MHz | -48.38 dBm | -13.38 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.88713 MHz | -32.65 dBm | -19.65 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.98533 MHz | -31.80 dBm | -18.80 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 788.99900 MHz | 7.01 dBm | -22.99 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.54232 MHz | -48.09 dBm | -13.09 dB |

| Band 14, 5MHz QPSK, Low CH 23305 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

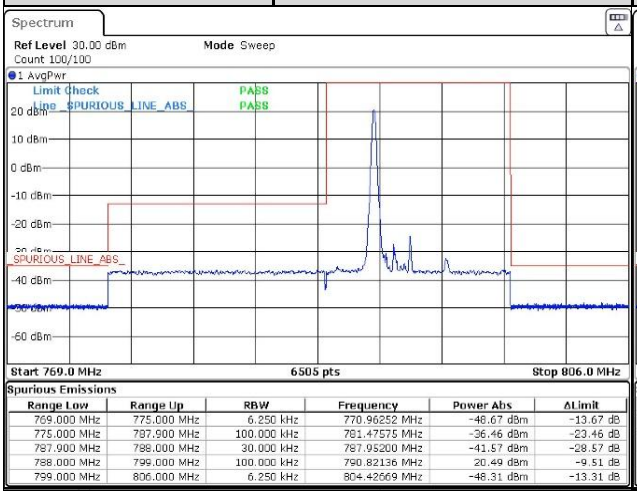
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 769.84708 MHz | -48.29 dBm | -13.29 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 780.26557 MHz | -36.52 dBm | -23.52 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.90010 MHz | -41.48 dBm | -28.48 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 792.66567 MHz | 20.78 dBm | -9.22 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 805.07514 MHz | -48.20 dBm | -13.20 dB |




Spurious Emissions

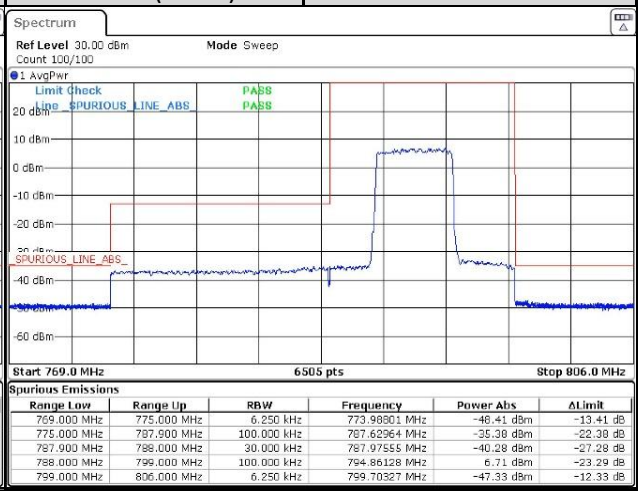
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 773.89205 MHz | -48.40 dBm | -13.40 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.32066 MHz | -34.42 dBm | -21.42 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.97176 MHz | -38.99 dBm | -25.99 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 790.07485 MHz | 9.92 dBm | -20.08 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 804.38704 MHz | -48.20 dBm | -13.20 dB |

| Band 14, 5MHz QPSK, Mid CH 23330 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

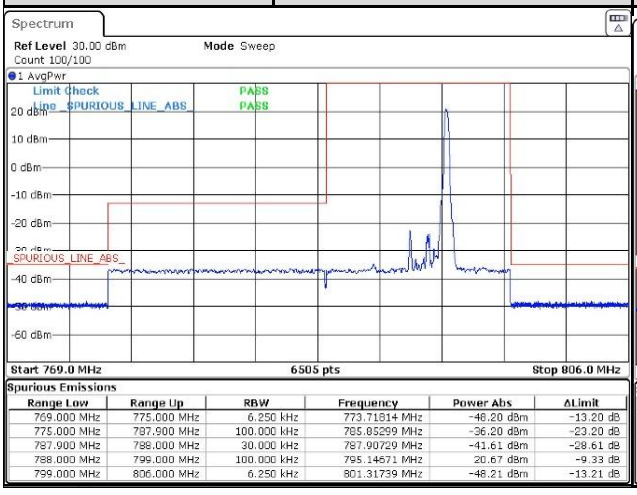
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 770.96252 MHz | -48.67 dBm | -13.67 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 781.47575 MHz | -36.46 dBm | -23.46 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.95200 MHz | -41.57 dBm | -28.57 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 790.82136 MHz | 20.49 dBm | -9.51 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 804.42669 MHz | -48.31 dBm | -13.31 dB |




Spurious Emissions

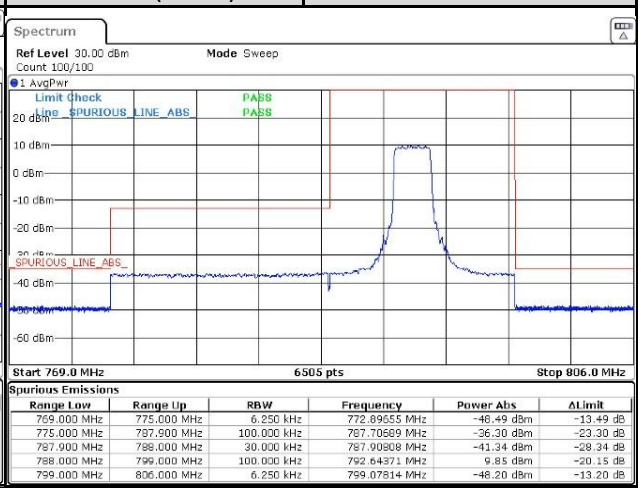
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 773.98801 MHz | -48.41 dBm | -13.41 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.62964 MHz | -35.30 dBm | -22.30 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.97555 MHz | -40.28 dBm | -27.28 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 794.86128 MHz | 6.71 dBm | -23.29 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.70327 MHz | -47.33 dBm | -12.33 dB |

| Band 14, 5MHz QPSK, Mid CH 23330 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

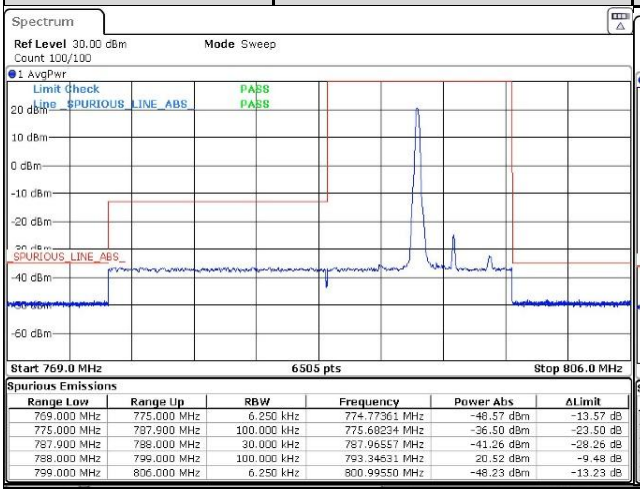
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 773.71814 MHz | -48.20 dBm | -13.20 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 785.85299 MHz | -36.20 dBm | -23.20 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.90729 MHz | -41.61 dBm | -28.61 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 795.14571 MHz | 20.67 dBm | -9.33 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 801.31739 MHz | -48.21 dBm | -13.21 dB |




Spurious Emissions

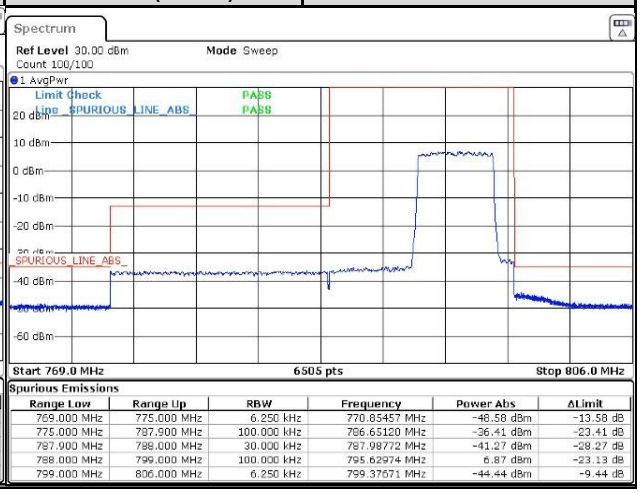
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 772.89555 MHz | -48.49 dBm | -13.49 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.70589 MHz | -36.30 dBm | -23.30 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.90908 MHz | -41.34 dBm | -28.34 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 792.64371 MHz | 9.85 dBm | -20.15 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.07814 MHz | -48.20 dBm | -13.20 dB |

| Band 14, 5MHz QPSK, High CH 23355 | | | |
|---|---|---|---|
| RB = 1 | Offset =X-1 | RB = X (100%) | Offset = 0 |




Spurious Emissions

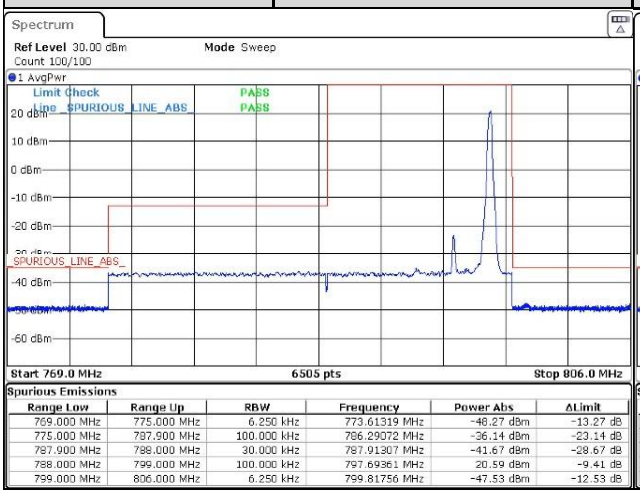
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 774.77361 MHz | -48.57 dBm | -13.57 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 775.68234 MHz | -36.50 dBm | -23.50 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.96557 MHz | -41.26 dBm | -28.26 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 793.34531 MHz | 20.52 dBm | -9.48 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 800.99550 MHz | -48.23 dBm | -13.23 dB |




Spurious Emissions

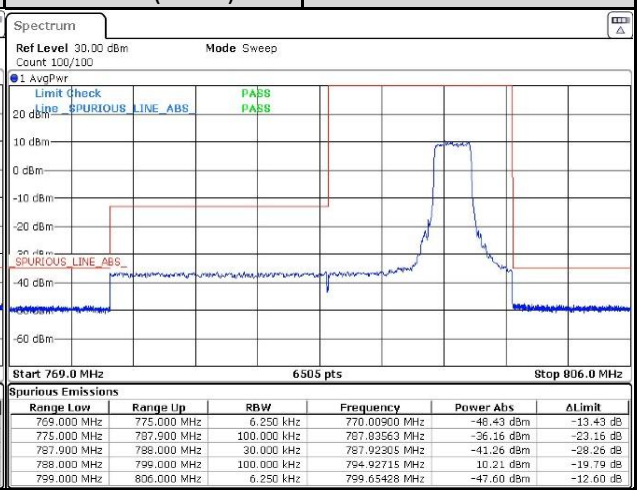
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 770.85457 MHz | -48.58 dBm | -13.58 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 786.65120 MHz | -36.41 dBm | -23.41 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.98772 MHz | -41.27 dBm | -28.27 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 795.62974 MHz | 6.87 dBm | -23.13 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.37671 MHz | -44.44 dBm | -9.44 dB |

| Band 14, 5MHz QPSK, High CH 23355 | | | |
|---|---|---|---|
| RB = 1 | Offset =X-1 | RB = X (100%) | Offset = 0 |




Spurious Emissions

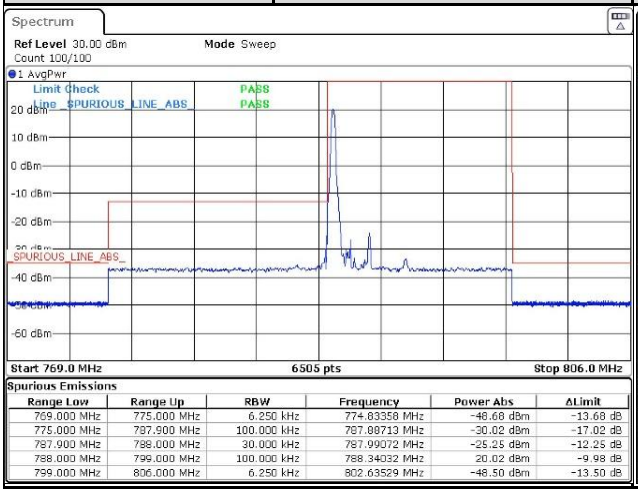
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 773.61319 MHz | -48.27 dBm | -13.27 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 786.29072 MHz | -36.14 dBm | -23.14 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.91307 MHz | -41.67 dBm | -28.67 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 797.69361 MHz | 20.59 dBm | -9.41 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.81756 MHz | -47.53 dBm | -12.53 dB |




Spurious Emissions

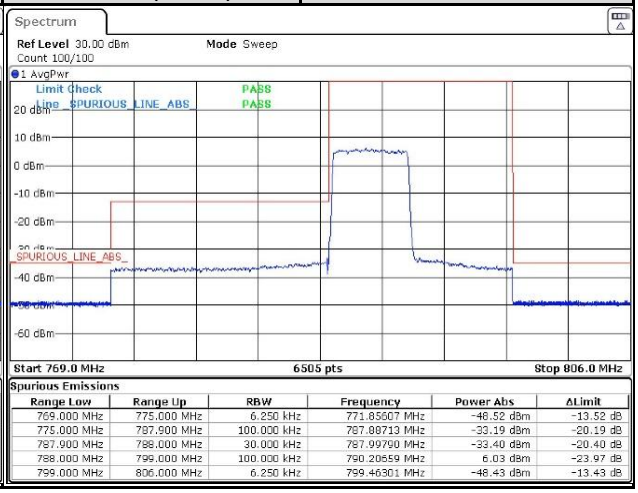
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 770.00900 MHz | -48.43 dBm | -13.43 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.83563 MHz | -36.16 dBm | -23.16 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.92305 MHz | -41.26 dBm | -28.26 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 794.92715 MHz | 10.21 dBm | -19.79 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.65428 MHz | -47.60 dBm | -12.60 dB |

| Band 14, 5MHz 16-QAM, Low CH 23305 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

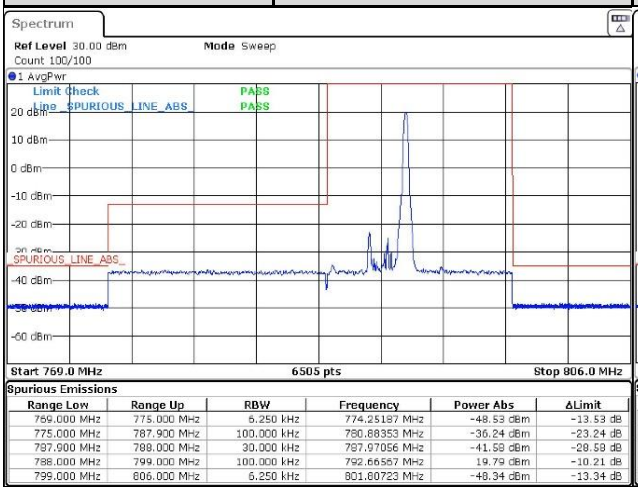
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 774.83358 MHz | -48.68 dBm | -13.68 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.88713 MHz | -30.02 dBm | -17.02 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.99072 MHz | -25.25 dBm | -12.25 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 788.34032 MHz | 20.02 dBm | -9.98 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 802.63529 MHz | -48.50 dBm | -13.50 dB |




Spurious Emissions

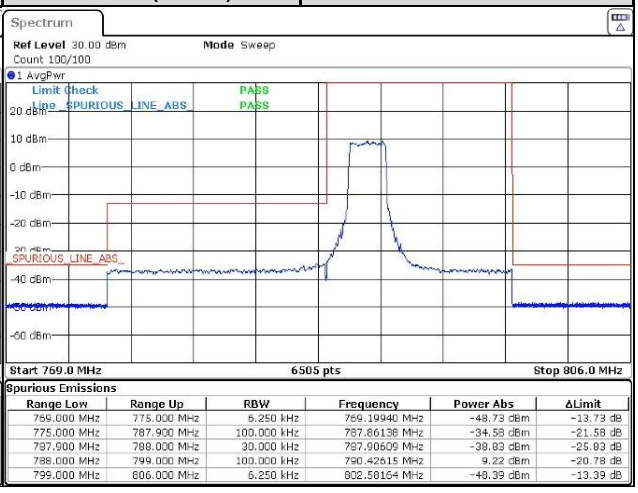
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 771.85507 MHz | -46.52 dBm | -13.52 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.88713 MHz | -33.19 dBm | -20.19 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.99790 MHz | -33.40 dBm | -20.40 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 790.20559 MHz | 6.03 dBm | -23.97 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.46801 MHz | -48.43 dBm | -13.43 dB |

| Band 14, 5MHz 16-QAM, Low CH 23305 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

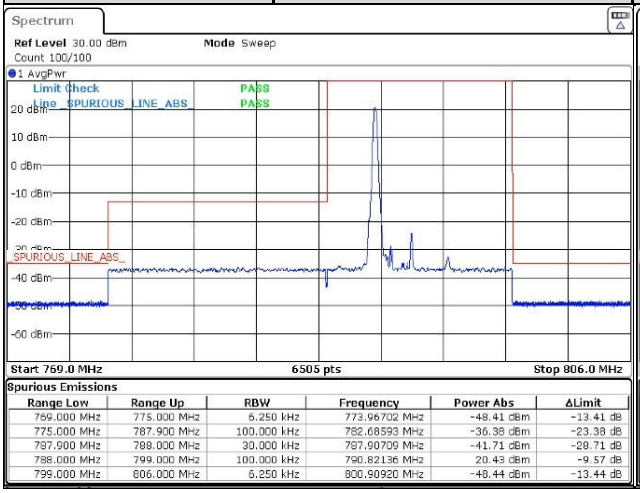
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 774.25187 MHz | -48.53 dBm | -13.53 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 780.88353 MHz | -36.24 dBm | -23.24 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.97056 MHz | -41.59 dBm | -28.59 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 792.66557 MHz | 19.79 dBm | -10.21 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 801.80723 MHz | -48.34 dBm | -13.34 dB |




Spurious Emissions

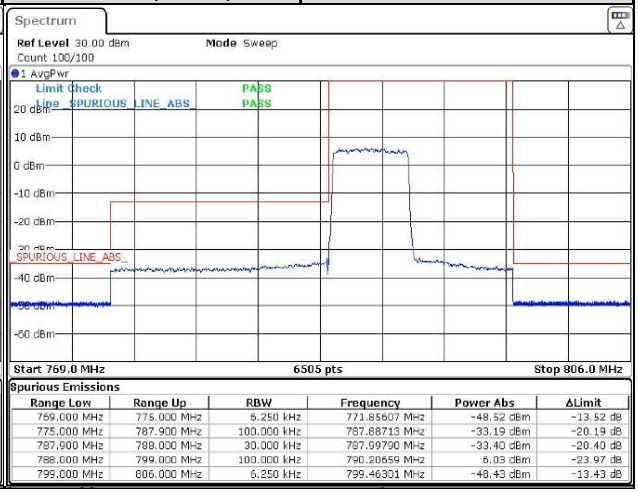
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 769.19940 MHz | -48.73 dBm | -13.73 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.86138 MHz | -34.58 dBm | -21.58 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.90609 MHz | -38.93 dBm | -25.93 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 790.42615 MHz | 9.22 dBm | -20.78 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 802.58164 MHz | -48.39 dBm | -13.39 dB |

| Band 14, 5MHz 16-QAM, Mid CH 23330 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

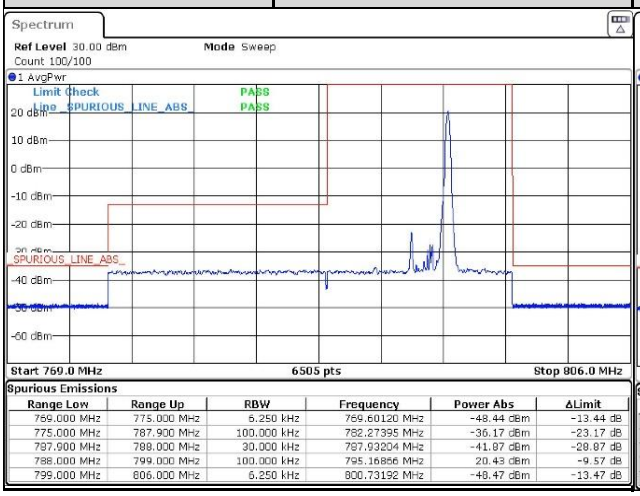
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 773.96702 MHz | -48.41 dBm | -13.41 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 782.68593 MHz | -36.38 dBm | -23.38 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.90709 MHz | -41.71 dBm | -28.71 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 790.82136 MHz | 20.43 dBm | -9.57 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 800.90920 MHz | -48.44 dBm | -13.44 dB |




Spurious Emissions

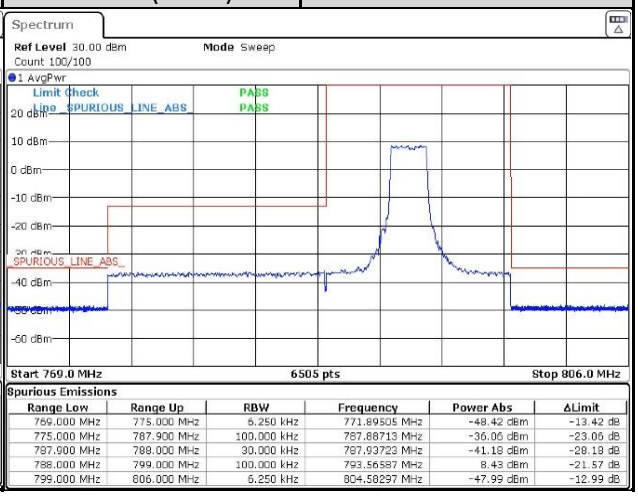
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 771.85607 MHz | -48.52 dBm | -13.52 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.88713 MHz | -33.19 dBm | -20.19 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.99790 MHz | -33.40 dBm | -20.40 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 790.20659 MHz | 6.03 dBm | -23.97 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.46301 MHz | -48.43 dBm | -13.43 dB |

| Band 14, 5MHz 16-QAM, Mid CH 23330 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

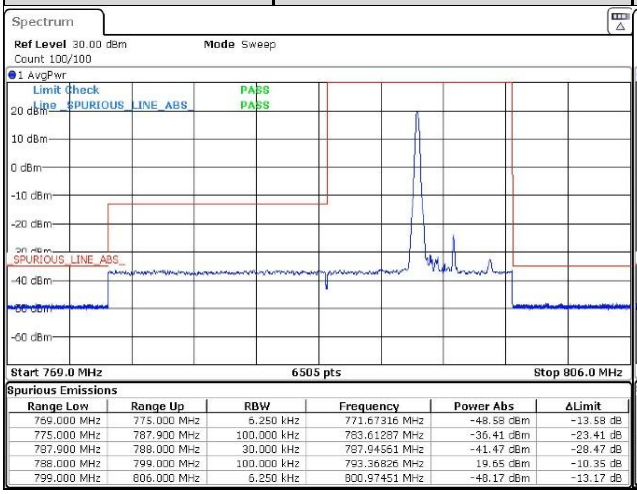
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 769.60120 MHz | -48.44 dBm | -13.44 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 782.27395 MHz | -36.17 dBm | -23.17 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.93204 MHz | -41.87 dBm | -28.87 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 795.16856 MHz | 20.43 dBm | -9.57 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 800.73192 MHz | -48.47 dBm | -13.47 dB |




Spurious Emissions

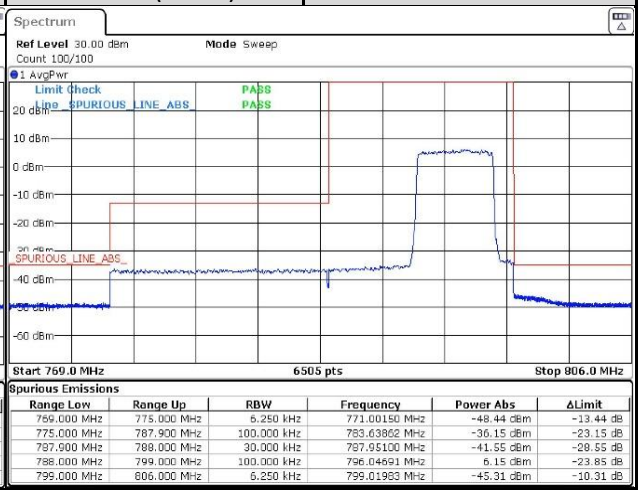
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 771.89505 MHz | -48.42 dBm | -13.42 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.88713 MHz | -36.06 dBm | -23.06 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.93723 MHz | -41.18 dBm | -28.18 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 793.56587 MHz | 8.43 dBm | -21.57 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 804.58297 MHz | -47.99 dBm | -12.99 dB |

| Band 14, 5MHz 16-QAM, High CH 23355 | | | |
|---|---|---|---|
| RB = 1 | Offset =X-1 | RB = X (100%) | Offset = 0 |




Spurious Emissions

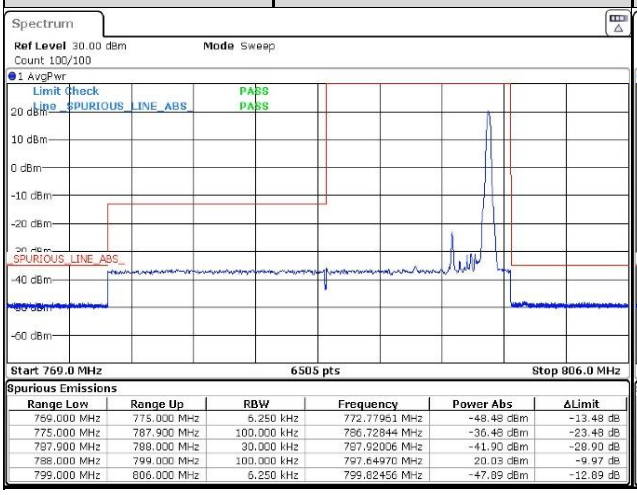
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 771.67316 MHz | -48.58 dBm | -13.58 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 783.61287 MHz | -36.41 dBm | -23.41 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.94561 MHz | -41.47 dBm | -28.47 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 793.36826 MHz | 19.65 dBm | -10.35 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 800.97451 MHz | -48.17 dBm | -13.17 dB |




Spurious Emissions

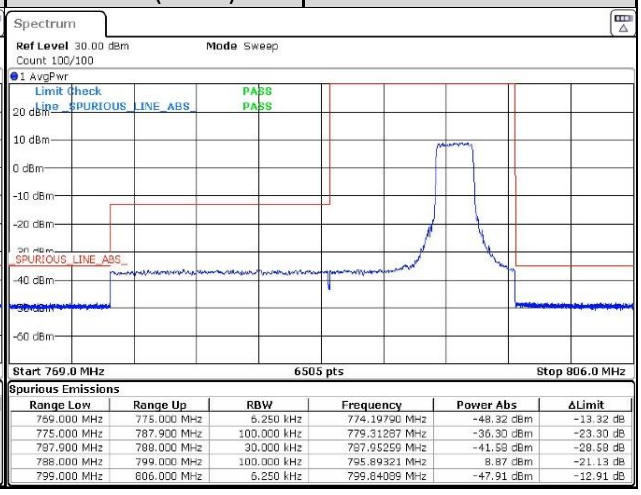
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 771.00150 MHz | -48.44 dBm | -13.44 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 783.63862 MHz | -36.15 dBm | -23.15 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.95100 MHz | -41.55 dBm | -28.55 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 796.04691 MHz | 6.15 dBm | -23.85 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.01983 MHz | -45.31 dBm | -10.31 dB |

| Band 14, 5MHz 16-QAM, High CH 23355 | | | |
|---|---|---|---|
| RB = 1 | Offset =X-1 | RB = X (100%) | Offset = 0 |




Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 772.77951 MHz | -48.48 dBm | -13.48 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 786.72844 MHz | -36.48 dBm | -23.48 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.92006 MHz | -41.90 dBm | -28.90 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 797.64970 MHz | 20.03 dBm | -9.97 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.62456 MHz | -47.89 dBm | -12.89 dB |

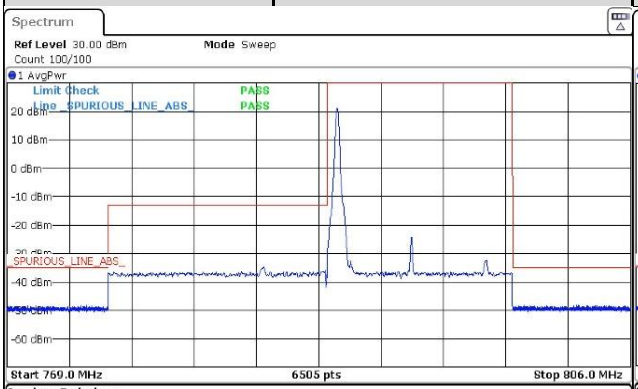



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 774.19790 MHz | -48.32 dBm | -13.32 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 779.31287 MHz | -36.30 dBm | -23.30 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.95259 MHz | -41.59 dBm | -28.59 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 795.89321 MHz | 8.87 dBm | -21.13 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.84089 MHz | -47.91 dBm | -12.91 dB |

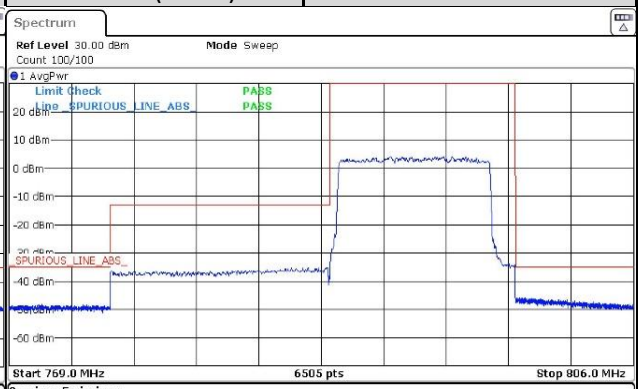
## 10MHz

| Band 14, 10MHz QPSK, Mid CH 23330 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

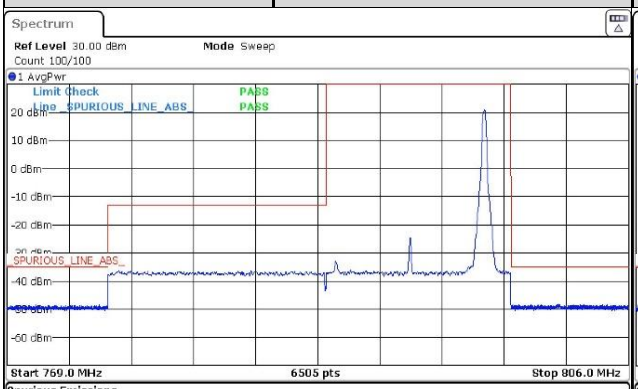
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 773.70615 MHz | -48.32 dBm | -13.32 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 784.20509 MHz | -34.80 dBm | -21.80 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.99990 MHz | -37.38 dBm | -24.38 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 788.58184 MHz | 20.88 dBm | -9.12 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 802.81956 MHz | -48.16 dBm | -13.16 dB |




Spurious Emissions

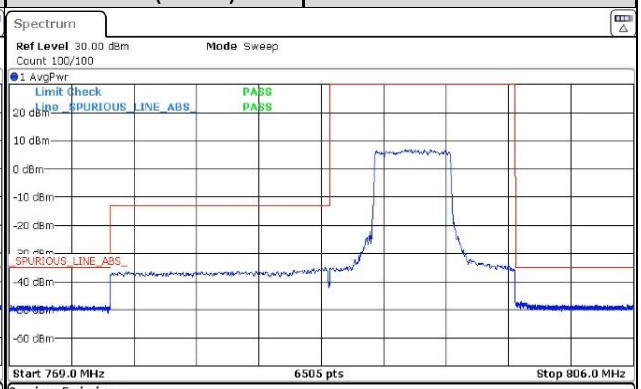
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 770.90255 MHz | -48.27 dBm | -13.27 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.88713 MHz | -35.25 dBm | -22.25 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.98413 MHz | -37.93 dBm | -24.93 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 794.75150 MHz | 3.95 dBm | -26.05 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.23442 MHz | -45.68 dBm | -10.68 dB |

| Band 14, 10MHz QPSK, Mid CH 23330 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

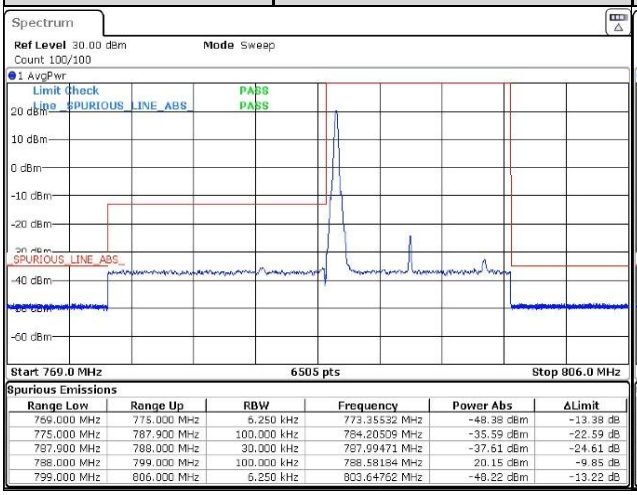
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 774.49175 MHz | -48.48 dBm | -13.48 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 783.53563 MHz | -36.30 dBm | -23.30 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.91407 MHz | -41.75 dBm | -28.75 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 797.43014 MHz | 20.61 dBm | -9.39 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 801.81656 MHz | -48.07 dBm | -13.07 dB |




Spurious Emissions

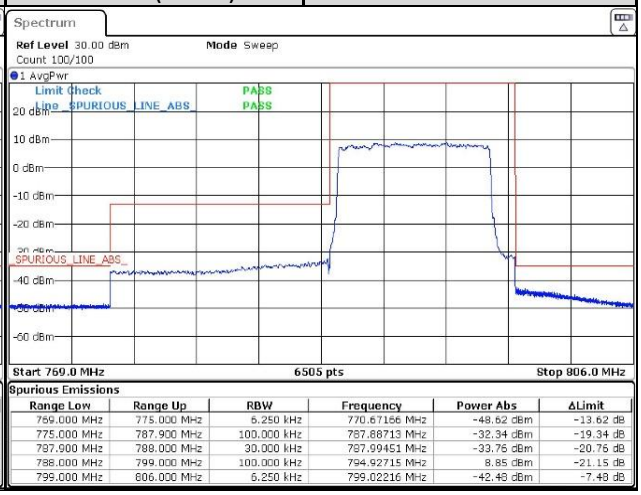
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 6.250 kHz | 770.42579 MHz | -48.43 dBm | -13.43 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.73263 MHz | -35.18 dBm | -22.18 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.91846 MHz | -40.07 dBm | -27.07 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 792.70958 MHz | 6.79 dBm | -23.21 dB |
| 799.000 MHz | 806.000 MHz | 6.250 kHz | 799.32772 MHz | -46.97 dBm | -11.97 dB |

| Band 14, 10MHz 16-QAM, Mid CH 23330 | | | |
|---|---|---|---|
| RB = 1 | Offset = 0 | RB = X (100%) | Offset = 0 |




Spurious Emissions

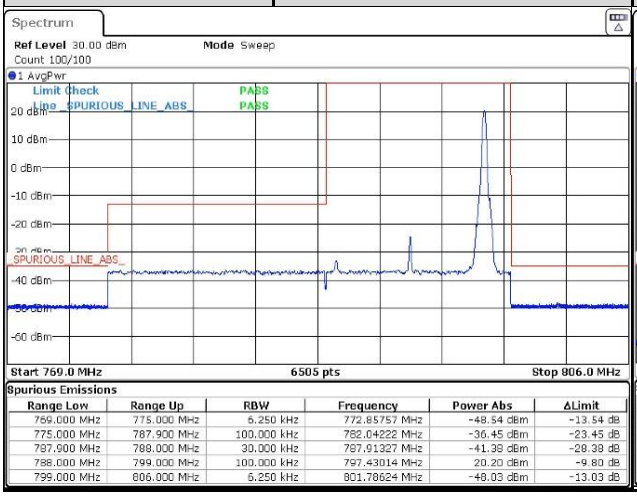
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 5.250 kHz | 773.35532 MHz | -48.38 dBm | -13.38 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 784.20509 MHz | -35.59 dBm | -22.59 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.99471 MHz | -37.61 dBm | -24.61 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 788.58184 MHz | 20.15 dBm | -9.85 dB |
| 799.000 MHz | 806.000 MHz | 5.250 kHz | 803.64762 MHz | -48.22 dBm | -13.22 dB |




Spurious Emissions

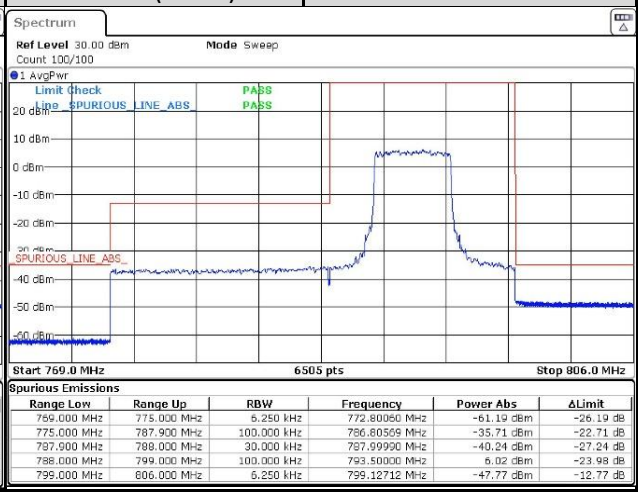
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 5.250 kHz | 770.67166 MHz | -48.62 dBm | -13.62 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 787.88713 MHz | -32.34 dBm | -19.34 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.99451 MHz | -33.76 dBm | -20.76 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 794.92715 MHz | 8.85 dBm | -21.15 dB |
| 799.000 MHz | 806.000 MHz | 5.250 kHz | 799.02216 MHz | -42.48 dBm | -7.48 dB |

| Band 14, 10MHz 16-QAM, Mid CH 23330 | | | |
|---|---|---|---|
| RB = 1 | Offset =X-1 | RB = X (100%) | Offset = 0 |




Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 5.250 kHz | 772.85757 MHz | -48.54 dBm | -13.54 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 782.04222 MHz | -36.45 dBm | -23.45 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.91327 MHz | -41.38 dBm | -28.38 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 797.43014 MHz | 20.20 dBm | -9.80 dB |
| 799.000 MHz | 806.000 MHz | 5.250 kHz | 801.78624 MHz | -48.03 dBm | -13.03 dB |

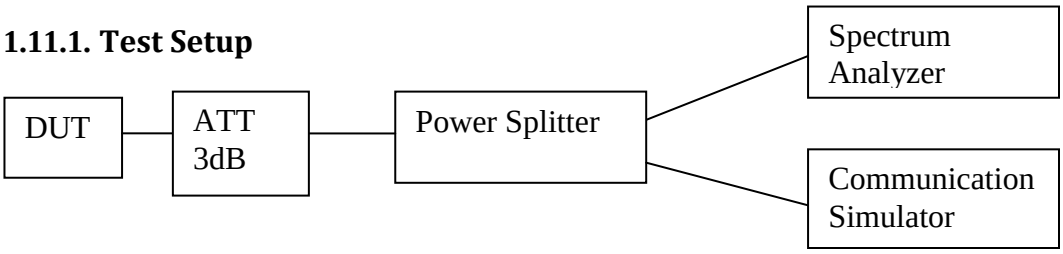



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 769.000 MHz | 775.000 MHz | 5.250 kHz | 772.80060 MHz | -61.19 dBm | -26.19 dB |
| 775.000 MHz | 787.900 MHz | 100.000 kHz | 786.80569 MHz | -35.71 dBm | -22.71 dB |
| 787.900 MHz | 788.000 MHz | 30.000 kHz | 787.99990 MHz | -40.24 dBm | -27.24 dB |
| 788.000 MHz | 799.000 MHz | 100.000 kHz | 793.50000 MHz | 6.02 dBm | -23.98 dB |
| 799.000 MHz | 806.000 MHz | 5.250 kHz | 799.12712 MHz | -47.77 dBm | -12.77 dB |

## 1.11. Conducted Spurious Emission

### 1.11.1. Test Setup




1) The DUT transmitter output port was connected to communication simulator with above setup.
2) Path loss for the measurement included.
3) Set DUT to transmit maximum power through communication simulator.
4) Spectrum Analyzer setting, RBW = 1 MHz, VBW = 3*RBW.
5) The spurious emission of lowest, middle and highest channels with the highest RF powers were measured.
6) Record the maximum trace plot into the test report.

### 1.11.2. Test Limit

FCC:
(e) For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

ISED:
The power of any unwanted emission outside the bands 758-768 MHz and 788-798 MHz shall be attenuated below the transmitter output power P in dBW as follows, where p is the transmitter output power in watts:
For any frequency between 769-775 MHz and 799-806 MHz:
76 + 10 log (p), dB in a 6.25 kHz band for fixed and base station equipment
65 + 10 log (p), dB in a 6.25 kHz band for mobile and portable/hand-held equipment
For any frequency between 775-788 MHz, above 806 MHz, and below 758 MHz: 43 + 10 log (p), dB in a bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency bands 758-768 MHz and 788-798 MHz, a resolution bandwidth of 30 kHz may be employed.