

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

## INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

**Product Name:** UHF RFID Reader

**Brand Name:** Szok-C

**Model No.:** SRF-4160

**Model Difference:** N/A

**FCC ID:** 2ADGD-SRF4160US

**Report No.:** ER/2017/10089

**Issue Date:** Sep. 18, 2017

**FCC Rule Part:** §15.247, Cat: DSS

**Prepared for:** Szok Energy and Communication Co., Ltd  
17F.-1, No.104, Sec. 1, Xintai 5th Rd., Xizhi Dist,  
New Taipei City 22102, Taiwan(R.O.C.)  
SGS Taiwan Ltd.

**Prepared by:** Electronics & Communication Laboratory  
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## VERIFICATION OF COMPLIANCE

**Applicant:** Szok Energy and Communication Co., Ltd  
Rm. 1, 17F., No. 104, Sec., 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22102, Taiwan(R.O.C.)

**Product Name:** UHF RFID Reader

**Brand Name:** Szok-C

**Model No.:** SRF-4160

**Model Difference:** N/A

**FCC ID:** 2ADGD-SRF4160US

**File Number:** ER/2017/10089

**Date of test:** Feb. 03, 2017 ~ Aug. 23, 2017

**Date of EUT Received:** Feb. 03, 2017

**We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247.

The test results of this report relate only to the tested sample identified in this report.

**Test By:***Louis Chen***Date:**

Sep. 18, 2017

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*Louis Chen / Sr. Engineer***Prepared By:***Tiffany Kao***Date:**

Sep. 18, 2017

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*Tiffany Kao / Clerk***Approved By:***Jim Chang***Date:**

Sep. 18, 2017

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*Jim Chang / Asst. Manager*

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## Revision History

| Report Number | Revision | Description                  | Issue Date    |
|---------------|----------|------------------------------|---------------|
| ER/2017/10089 | Rev.00   | Initial creation of document | Sep. 18, 2017 |
|               |          |                              |               |
|               |          |                              |               |

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## 1. GENERAL INFORMATION

### 1.1. Product description

General:

|                   |                 |
|-------------------|-----------------|
| Product Name:     | UHF RFID Reader |
| Brand Name:       | Szok-C          |
| Model No.:        | SRF-4160        |
| Model Difference: | N/A             |
| Hardware Version: | N/A             |
| Software Version: | N/A             |
| Power Supply:     | DC 12V          |

RFID:

|                      |                              |
|----------------------|------------------------------|
| Frequency Range:     | 902.25 – 927.75MHz           |
| Channel Number:      | 52 channels                  |
| Channel Space:       | 500 kHz steps                |
| Modulation Type:     | PR-ASK, ASK                  |
| Transmit Power:      | 25.37dBm (Peak)              |
| Dwell Time:          | <= 0.4s                      |
| Operating Mode:      | Point-to-Point               |
| Antenna Designation: | Patch Antenna, Gain: 9.88dBi |

This test report applies for RFID function.

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## 1.2. Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards.

## 1.3. Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 (TAF code 0513)

FCC Registration Numbers are: 509634

## 1.4. Special Accessories

There is no special accessory used while test was conducted.

## 1.5. Equipment Modifications

There was no modification incorporated into the EUT.

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## 2. SYSTEM TEST CONFIGURATION

### 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2. EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

### 2.3. Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plan. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

#### 2.3.2 Radiated Emissions

The EUT is placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plan. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

### 2.4. Measurement Results Explanation Example

#### For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

**Note:** The spectrum analyzer offset is derived from RF cable loss 0.8dB and attenuator factor 20dB.

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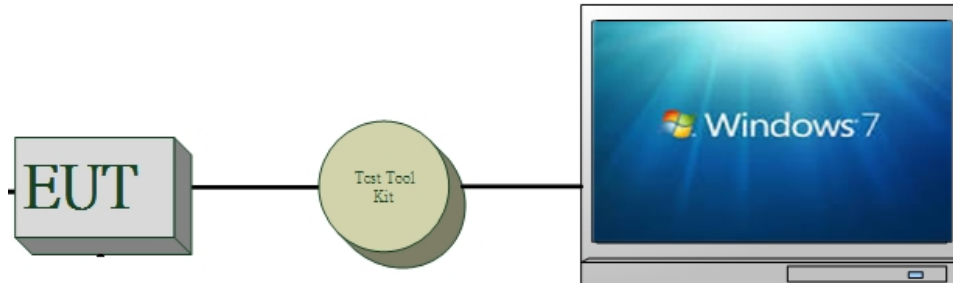
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## 2.5. Configuration of Tested System

**Fig. 2-1 Radiated Emission & Conducted (Antenna Port) Configuration**



**Table 2-1 Equipment Used in Tested System**

| Item | Equipment         | Mfr/Brand | Model/Type No. | Series No. | Data Cable | Power Cord |
|------|-------------------|-----------|----------------|------------|------------|------------|
| 1.   | NFC Test Software | N/A       | N/A            | N/A        | N/A        | N/A        |
| 2.   | Notebook          | Lenovo    | L420           | LR-7HXZA   | Shielded   | Unshielded |
| 3.   | Test Kit          | N/A       | N/A            | N/A        | N/A        | N/A        |

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### 3. SUMMARY OF TEST RESULTS

| FCC Rules                    | Description Of Test                       | Result    |
|------------------------------|-------------------------------------------|-----------|
| §15.207(a)                   | AC Power Line Conducted Emission          | Compliant |
| §15.247(b)(2)                | Peak Output Power                         | Compliant |
| §15.247(a)(1)(i)             | 20dB Bandwidth                            | Compliant |
| §15.247(d)                   | 100 kHz Bandwidth Of Frequency Band Edges | Compliant |
| §15.247(d)<br>§15.209(a) (f) | Spurious Emission                         | Compliant |
| §15.247(a)(1)                | Frequency Separation                      | Compliant |
| §15.247(a)(1)(i)             | Number of hopping frequency               | Compliant |
| §15.247(a)(1)(i)             | Time of Occupancy                         | Compliant |
| §15.203                      | Antenna Requirement                       | Compliant |

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## 4. DESCRIPTION OF TEST MODES

### 4.1 Operated in 902 ~ 928MHz Band

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

A & B channel plan is set for this device, Channel Low, Mid and High with highest rated data rate were chosen as worst case for full testing The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for RFID Transmitter for channel Low, Mid and High the worst case H position was reported.

Channel Low: channel 1 at 902.25MHz  
Channel Mid: channel 25 at 914.75MHz  
Channel High: channel 50 at 927.25MHz

52 channels are provided for RFID

A={ (906250), (923250), (907750), (924750), (903750), (920750), (909250), (904750), (925250), (904250) }  
A={ (907250), (905250), (925750), (903250), (918750), (906750), (926750), (908250), (908750), (912750) }  
A={ (909750), (910250), (922250), (910750), (916250), (911250), (914250), (911750), (924250), (912250) }  
A={ (918250), (913250), (913750), (914750), (905750), (915750), (915250), (916750), (917250), (920250) }  
A={ (917750), (919250), (921250), (919750), (921750), (922750), (926250), (923750), (902750), (902250) }  
A={ (927750), (927250) }  
B={ (906500), (923500), (908000), (925000), (904000), (921000), (909500), (905000), (925500), (904500) }  
B={ (907500), (905500), (926000), (903500), (919000), (907000), (927000), (908500), (909000), (913000) }  
B={ (910000), (910500), (922500), (911000), (916500), (911500), (914500), (912000), (924500), (912500) }  
B={ (918500), (913500), (914000), (915000), (906000), (916000), (915500), (917000), (917500), (920500) }  
B={ (918000), (919500), (921500), (920000), (922000), (923000), (926500), (924000), (903000), (902500) }  
B={ (927600), (927500) }

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## 5. MEASUREMENT UNCERTAINTY

| Test Items                                | Uncertainty              |
|-------------------------------------------|--------------------------|
| AC Power Line Conducted Emission          | +/- 2.586 dB             |
| Peak Output Power                         | +/- 1.55 dB              |
| 20dB Bandwidth                            | +/- 123.36 Hz            |
| 100 KHz Bandwidth Of Frequency Band Edges | +/- 1.55 dB              |
| Frequency Separation                      | +/- 123.36 Hz            |
| Number of hopping frequency               | +/- 123.36 Hz            |
| Time of Occupancy                         | +/- 123.36 Hz            |
| Temperature                               | +/- 0.8 °C               |
| Humidity                                  | +/- 4.7 %                |
| DC / AC Power Source                      | DC= +/- 1%, AC= +/- 0.2% |

### Radiated Spurious Emission:

|                                                              |                            |
|--------------------------------------------------------------|----------------------------|
| Measurement uncertainty<br>(Polarization : <b>Vertical</b> ) | 9kHz – 30MHz: +/- 2.87 dB  |
|                                                              | 30MHz - 180MHz: +/- 3.37dB |
|                                                              | 180MHz -417MHz: +/- 3.19dB |
|                                                              | 0.417GHz-1GHz: +/- 3.19dB  |
|                                                              | 1GHz - 18GHz: +/- 4.04dB   |
|                                                              | 18GHz - 40GHz: +/- 4.04dB  |

|                                                                |                            |
|----------------------------------------------------------------|----------------------------|
| Measurement uncertainty<br>(Polarization : <b>Horizontal</b> ) | 9kHz – 30MHz: +/- 2.87 dB  |
|                                                                | 30MHz - 167MHz: +/- 4.22dB |
|                                                                | 167MHz -500MHz: +/- 3.44dB |
|                                                                | 0.5GHz-1GHz: +/- 3.39dB    |
|                                                                | 1GHz - 18GHz: +/- 4.08dB   |
|                                                                | 18GHz - 40GHz: +/- 4.08dB  |

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

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## 6. CONDUCTED EMISSION TEST

### 6.1. Standard Applicable

According to §15.207, frequency within 150 kHz to 30MHz shall not exceed the limit table as below.

| Frequency range<br>MHz                                                                                                                                                       | Limits<br>dB(μV) |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|
|                                                                                                                                                                              | Quasi-peak       | Average  |
| 0.15 to 0.50                                                                                                                                                                 | 66 to 56         | 56 to 46 |
| 0.50 to 5                                                                                                                                                                    | 56               | 46       |
| 5 to 30                                                                                                                                                                      | 60               | 50       |
| Note<br>1.The lower limit shall apply at the transition frequencies<br>2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. |                  |          |

### 6.2. Measurement Equipment Used:

| Conducted Emission Test Site |             |                         |                  |              |            |
|------------------------------|-------------|-------------------------|------------------|--------------|------------|
| EQUIPMENT<br>TYPE            | MFR         | MODEL<br>NUMBER         | SERIAL<br>NUMBER | LAST<br>CAL. | CAL DUE.   |
| EMI Test Receiver            | R&S         | ESC17                   | 100760           | 05/11/2017   | 05/10/2018 |
| LISN                         | SCHWARZBECK | NSLK 8127               | 8127-649         | 05/22/2017   | 05/21/2018 |
| LISN                         | MESS TEC    | FCC-LISN-50/250-25-2-01 | 4034             | 03/19/2017   | 03/18/2018 |
| Coaxial Cables               | N/A         | WK CE Cable             | N/A              | 11/26/2016   | 11/25/2017 |

### 6.3. EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

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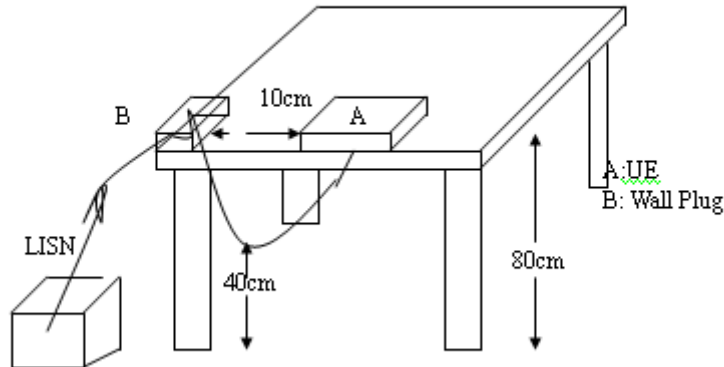
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#### 6.4. Test SET-UP (Block Diagram of Configuration)



#### 6.5. Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

#### 6.6. Measurement Result

N/A, EUT powered from DC 12V.

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## 7. PEAK OUTPUT POWER MEASUREMENT

### 7.1. Standard Applicable

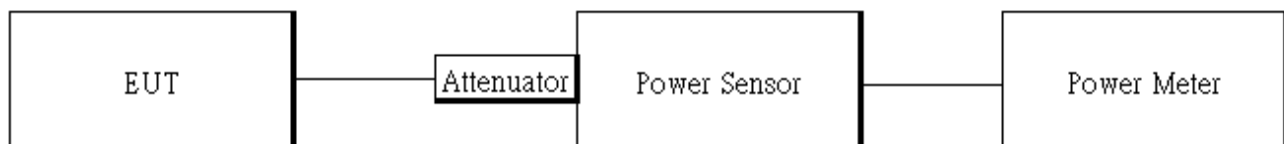
According to §15.247(b)(2), for frequency hopping systems operating in the 902-928 MHz band employing at least 50 hopping channels, The Limit: 1Watt. For systems employing less than 50 hopping channels, The Limit: 0.25 Watts. But at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

### 7.2. Measurement Equipment Used

| SGS Conducted Room    |               |              |               |                  |                 |
|-----------------------|---------------|--------------|---------------|------------------|-----------------|
| Name of Equipment     | Manufacturer  | Model        | Serial Number | Calibration Date | Calibration Due |
| Power Meter           | Anritsu       | ML2495A      | 1005007       | 12/15/2016       | 12/14/2017      |
| Power Sensor          | Anritsu       | MA2411B      | 917032        | 12/15/2016       | 12/14/2017      |
| EXA Spectrum Analyzer | Agilent       | N9030A       | MY53120760    | 03/21/2017       | 03/20/2018      |
| DC Block              | Mini-Circuits | BLK-18-S+    | 1             | 01/05/2017       | 01/04/2018      |
| Coaxial Cable         | HUBER+SUHNER  | SUCOFLEX 102 | 23670/2       | 01/05/2017       | 01/04/2018      |
| Attenuator            | Mini-Circuit  | BW-S10W2+    | 2             | 01/05/2017       | 01/04/2018      |
| Splitter              | Agilent       | 11636B       | N/A           | 01/05/2017       | 01/04/2018      |
| DC Power Supply       | Agilent       | E3640A       | MY52410006    | 11/21/2016       | 11/20/2017      |
| Temperature Chamber   | TERCHY        | MHG-120LF    | 911009        | 05/19/2017       | 05/18/2018      |

### 7.3. Test Set-up:



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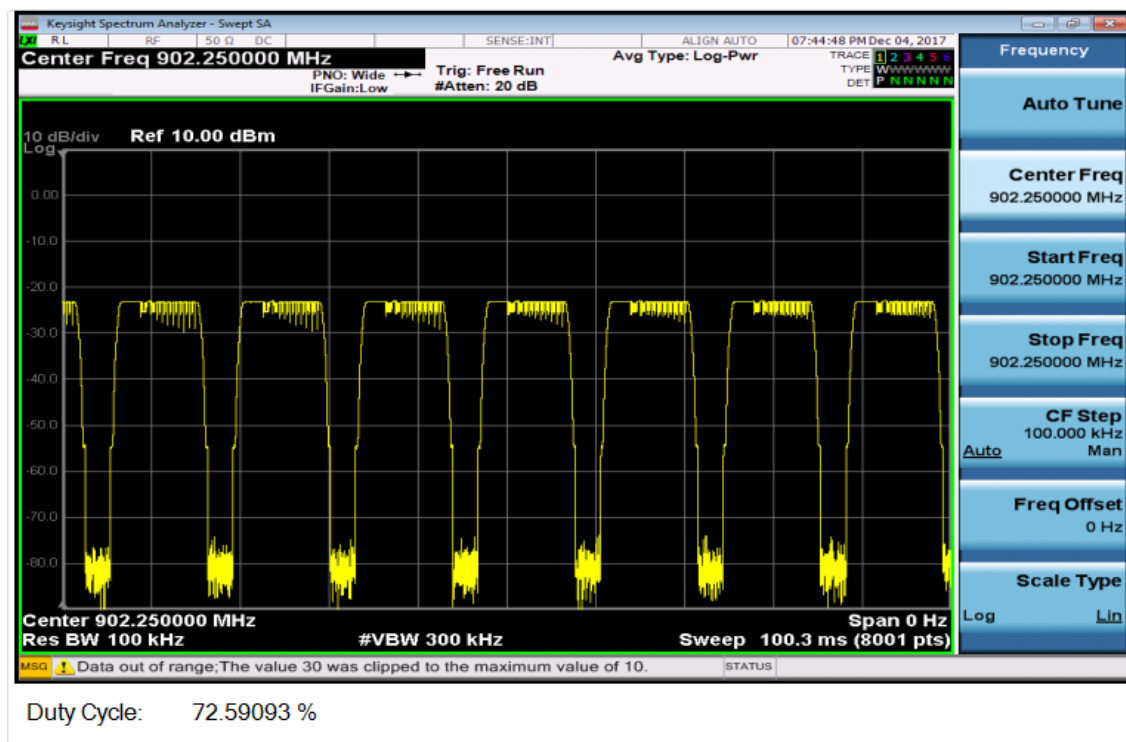
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#### 7.4. Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows ANSI C63.10:2013.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Max Hold, Detector = Peak, RBW  $\geq$  20dB bandwidth)
4. Record the max. reading.
5. Repeat above procedures until all default test channel is completed.

#### 7.5. Measurement Result

##### Duty Factor:



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| RFID |             |                          |                         |           |        |
|------|-------------|--------------------------|-------------------------|-----------|--------|
| CH   | Freq. (MHz) | Peak Out-put Power (dBm) | Peak Out-put Power (mW) | Limit     | RESULT |
| 1    | 902.25      | 25.28                    | 337.29                  | 26.12 dBm | PASS   |
| 25   | 914.75      | <b>25.37</b>             | 344.59                  | 26.12 dBm | PASS   |
| 50   | 927.75      | 24.69                    | 294.58                  | 26.12 dBm | PASS   |
| RFID |             |                          |                         |           |        |
| CH   | Freq. (MHz) | Avg. Out-put Power (dBm) | Avg. Output Power (mW)  | Limit     | RESULT |
| 1    | 902.25      | <b>23.05</b>             | 201.74                  | 26.12 dBm | PASS   |
| 25   | 914.75      | 22.86                    | 193.37                  | 26.12 dBm | PASS   |
| 50   | 927.75      | 22.15                    | 163.95                  | 26.12 dBm | PASS   |

Note:

The antenna gain is greater than 6dBi, the limit reduce as below:

Limit: 30dBm – (9.88– 6dBi) = 26.12dBm

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## 8. 20DB BANDWIDTH

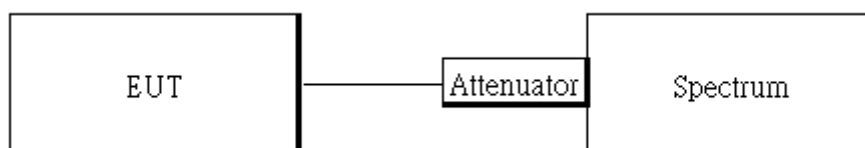
### 8.1. Standard Applicable

According to §15.247(a)(1)(i), for frequency hopping systems operating in the 902 MHz-928 MHz : if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies.

### 8.2. Measurement Equipment Used

Refer to section 7.2 for the plot.

### 8.3. Test Set-up



### 8.4. Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=30 kHz, VBW = 300 kHz, Span= 500kHz, Sweep=auto, Detector = Peak, and Max hold for 20dB Bandwidth test.
4. Mark the peak frequency and -20dB (upper and lower) frequency and Turn on the 99% bandwidth function, max reading.
5. Repeat above procedures until all test default channel is completed

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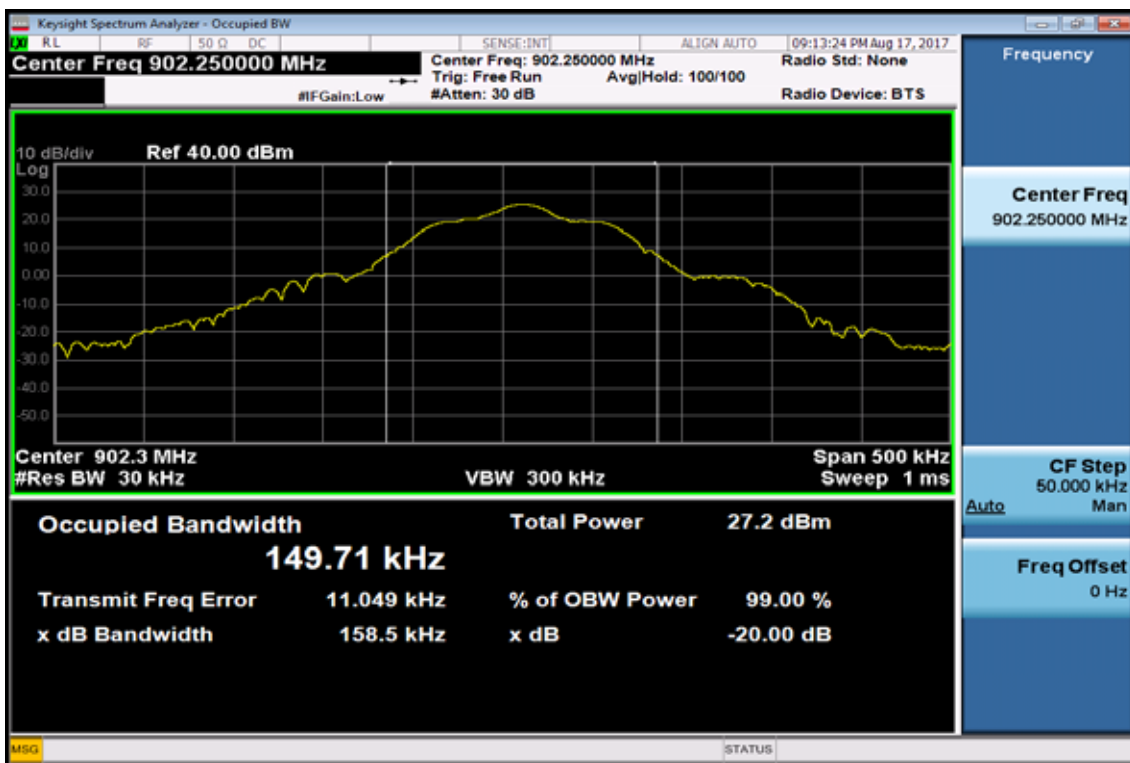
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## 8.5. Measurement Result:

| CH   | Freq.<br>(MHz) | 20dB BW<br>(kHz) |
|------|----------------|------------------|
| Low  | 902.25         | 158.50           |
| Mid  | 914.75         | 160.50           |
| High | 927.75         | <b>160.50</b>    |

## 20dB Band Width Test Data CH-Low



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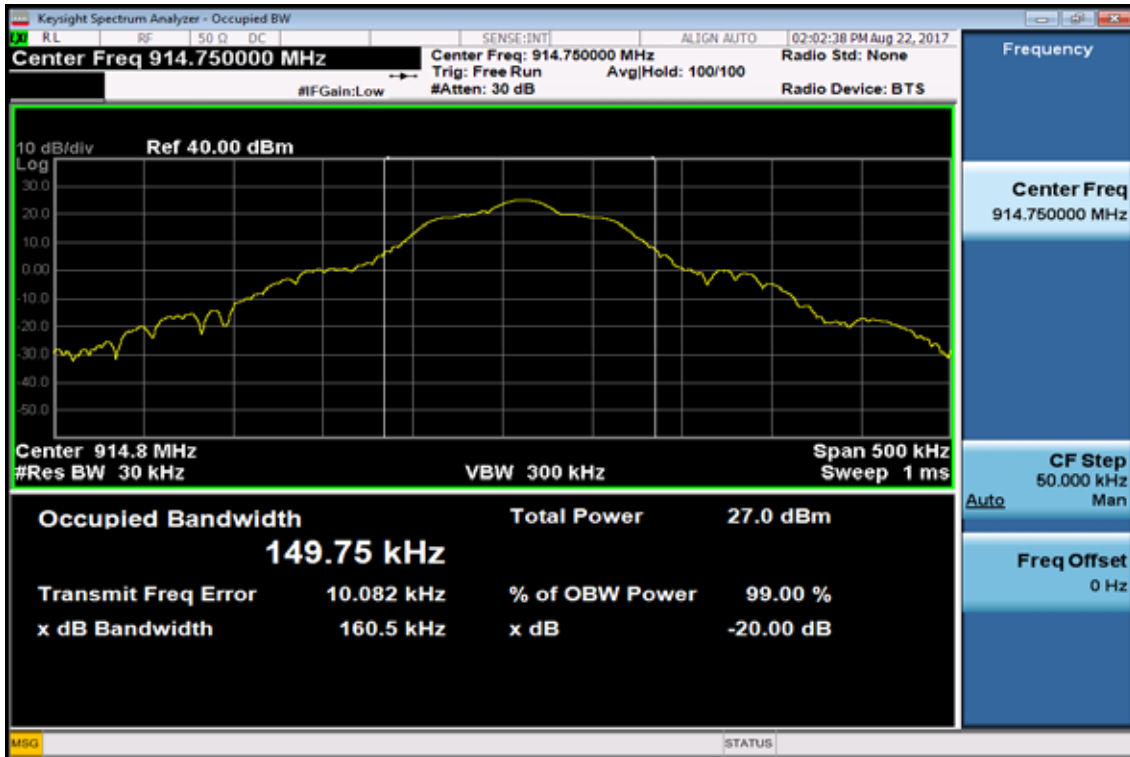
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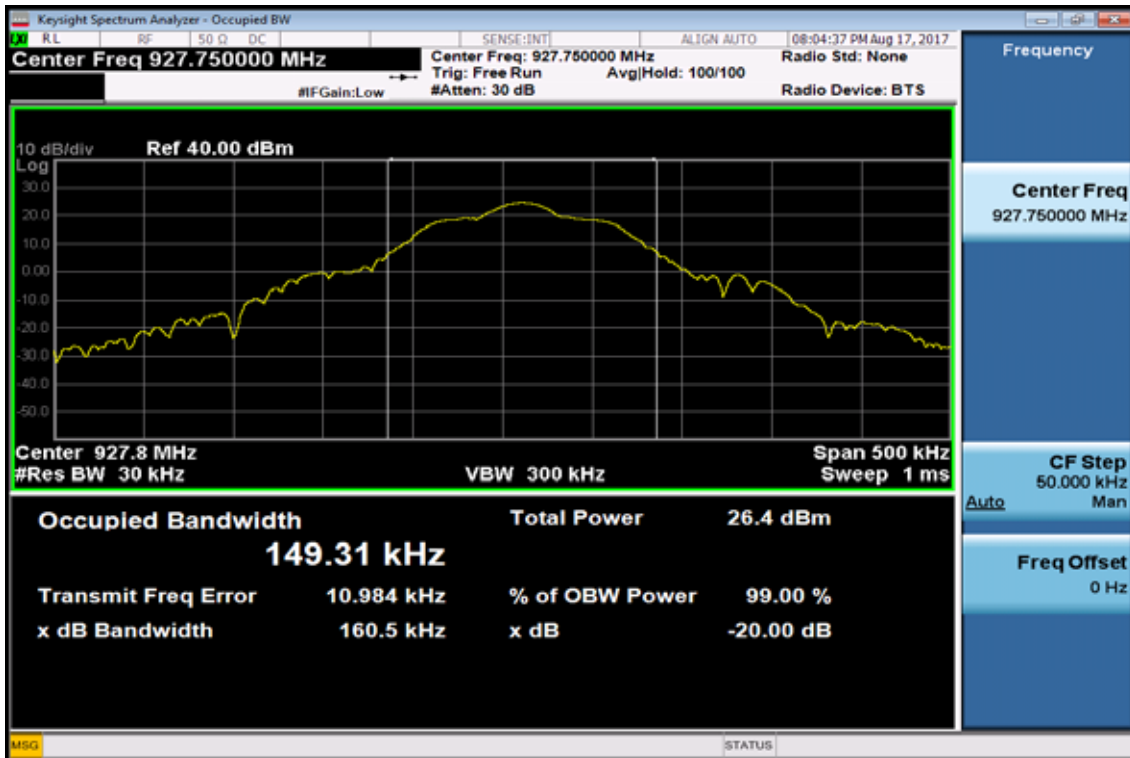
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## 20dB Band Width Test Data CH-Mid



## 20dB Width Test Data CH-High



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## 9. CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

### 9.1. Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

### 9.2. Measurement Equipment Used

#### 9.2.1. Conducted Emission at antenna port:

Refer to section 7.2 for the plot.

### 9.3. Test SET-UP:

#### 9.3.1. Conducted Emission at antenna port:

Refer to section 8.3 for the plot.

### 9.4. Measurement Procedure

#### Conducted Band Edge:

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows ANSI C63.10:2013.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set center frequency of spectrum analyzer = operating frequency.
5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Sweep = auto
6. Mark Peak, 902MHz and 928MHz and record the max. level.
7. Repeat above procedures until all frequency measured were complete.

#### Conducted Spurious Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. The testing follows ANSI C63.10:2013.
3. Set RBW = 100 kHz & VBW = 300 kHz, Detector =Peak, Sweep = Auto
4. Allow trace to fully stabilize.
5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

Repeat above procedures until all default test channel measured were complete.

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## 9.5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

|                           |                                            |
|---------------------------|--------------------------------------------|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude    | AG = Amplifier Gain                        |
| AF = Antenna Factor       |                                            |

## 9.6. Measurement Result: Out-Of-Band EMISSION:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

Note: The occurrence of the spike on the conducted emission is the signal of the fundamental emission.

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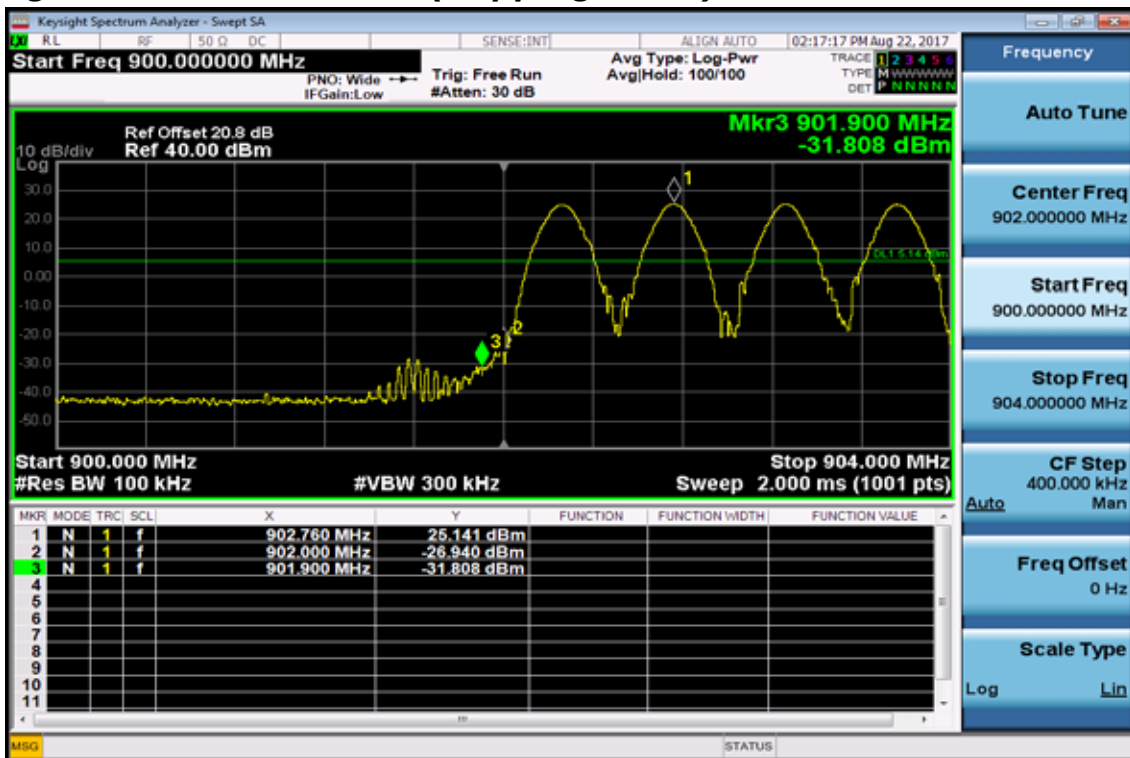
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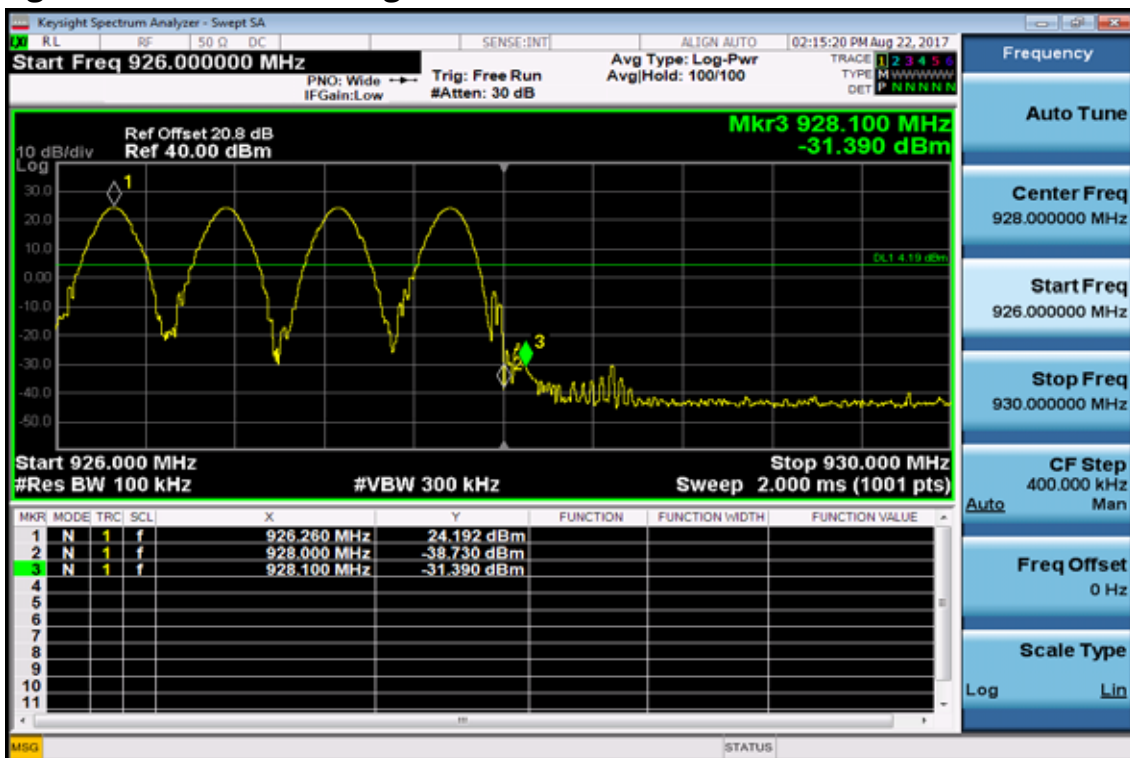
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## 9.7. Measurement Result: 100 kHz BANDWIDTH OF BNAD EDGE Band Edges Test Data CH-Low (Hopping mode)



## Band Edges Test Data CH-High



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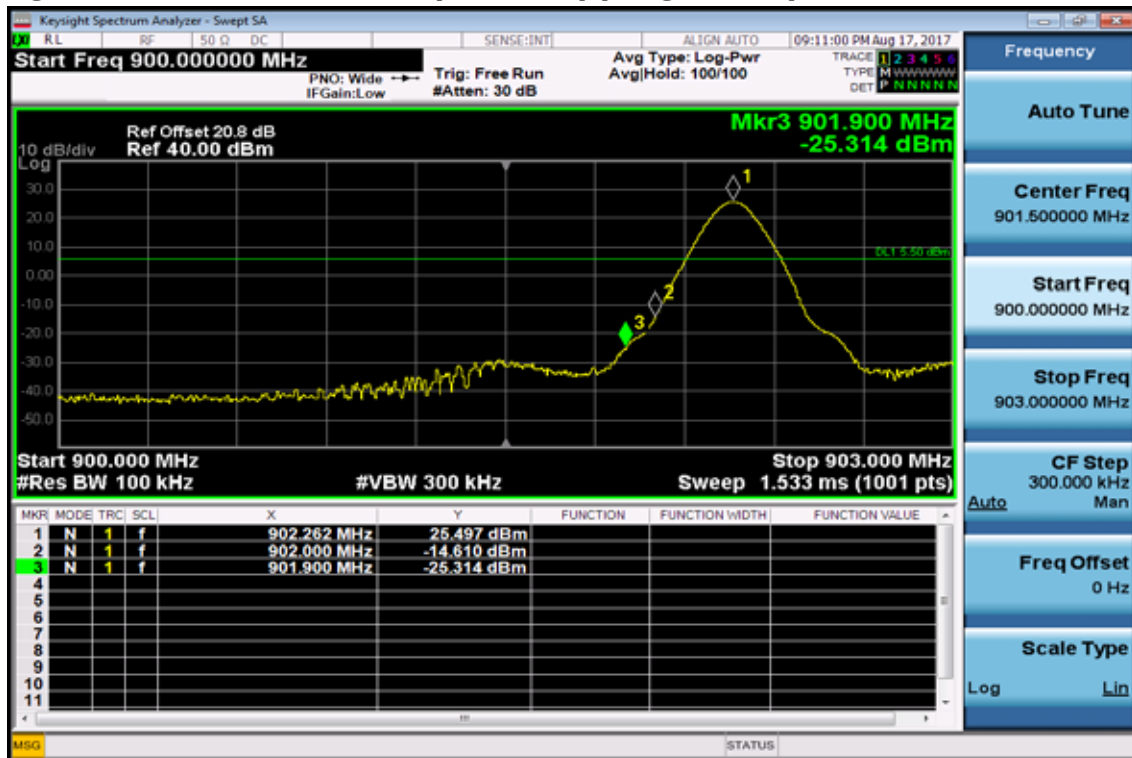
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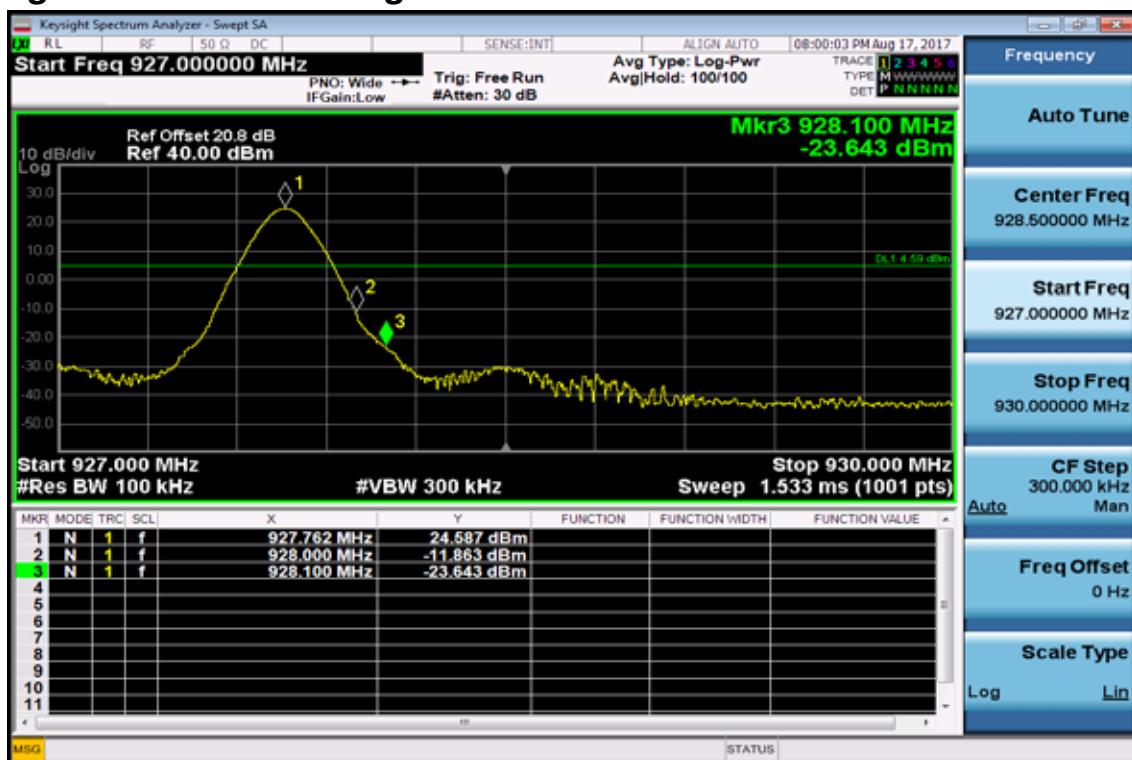
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## Band Edges Test Data CH-Low (Non-Hopping mode)



## Band Edges Test Data CH-High



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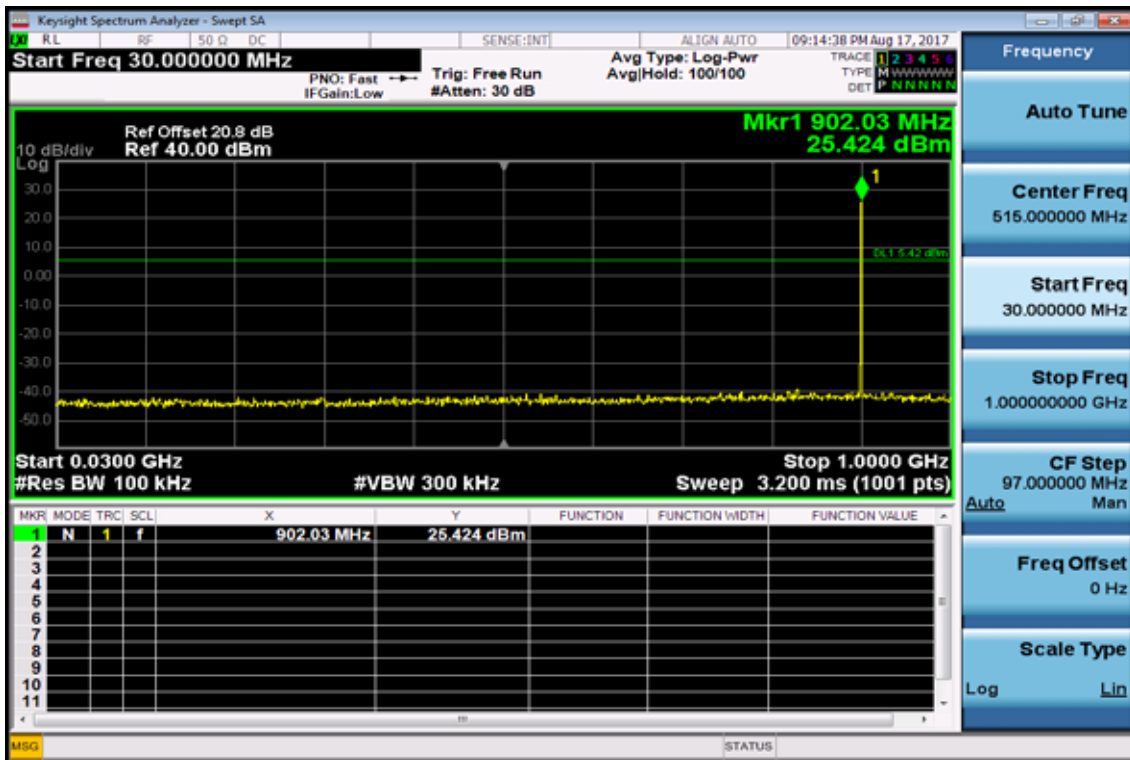
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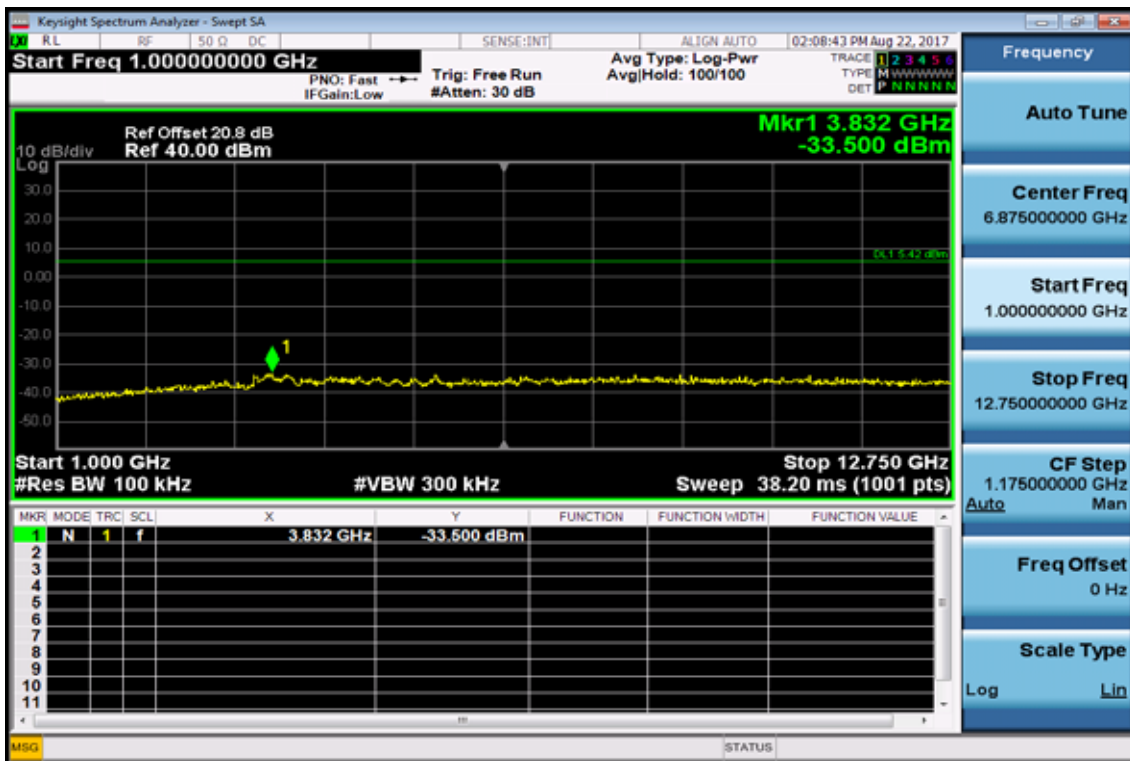
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## 9.8. Measurement Result: Conducted Spurious Emission Measurement Result Ch Low 30MHz – 1GHz



## Ch Low 3GHz – 12.5GHz



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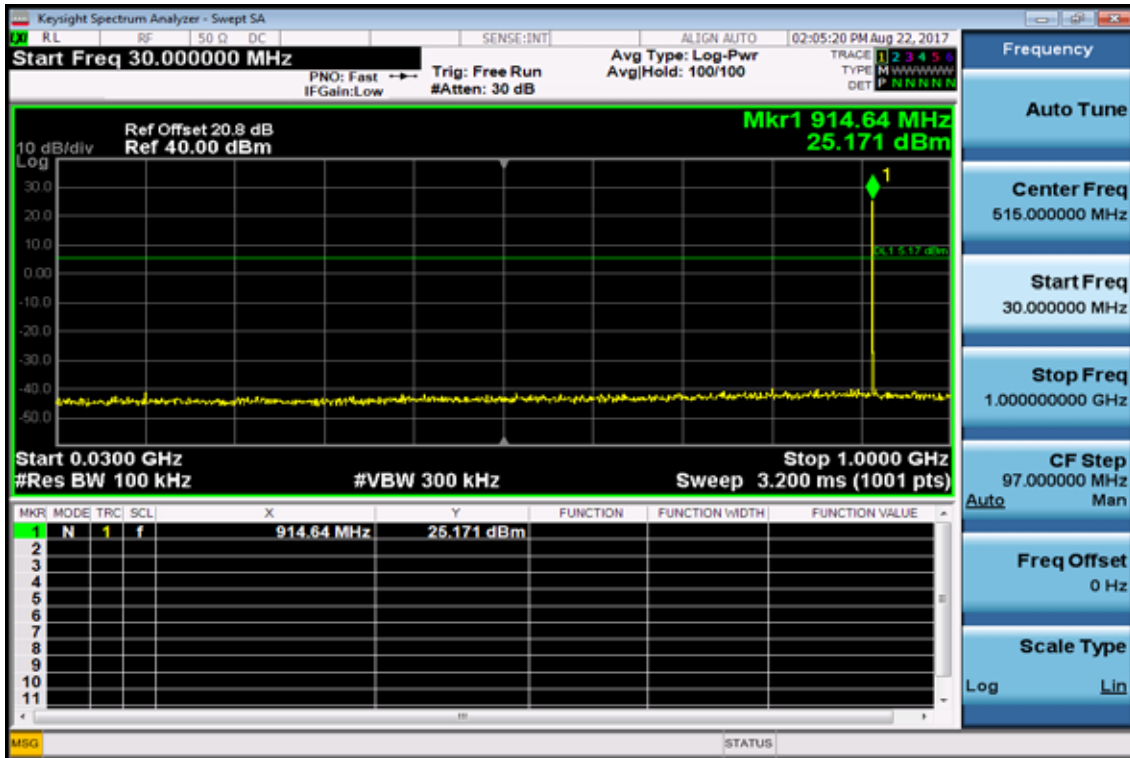
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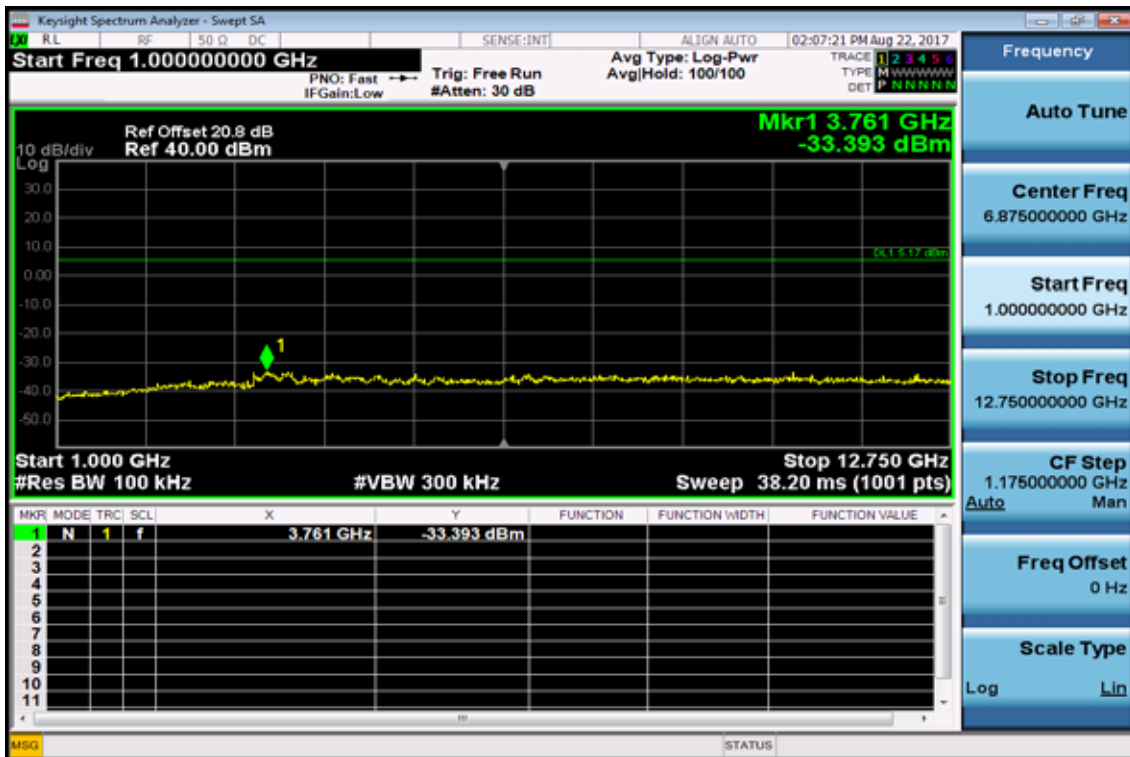
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## Ch Mid 30MHz – 1GHz



## Ch Mid 3GHz – 12.5GHz



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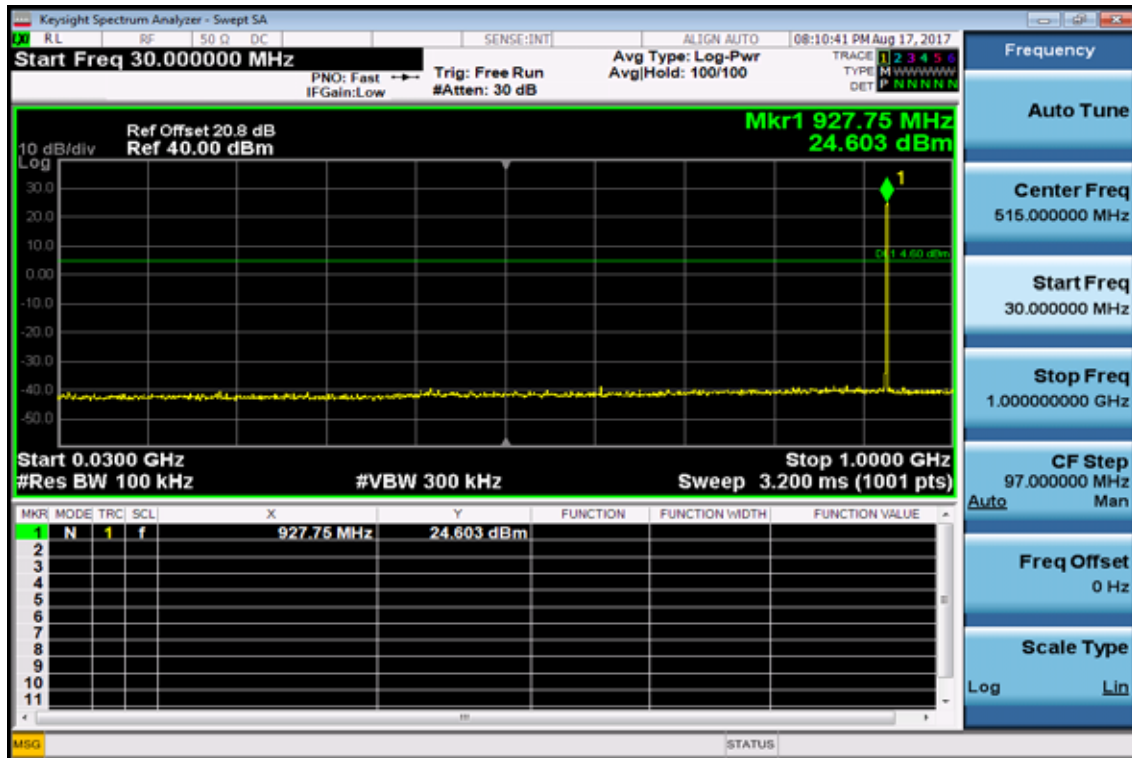
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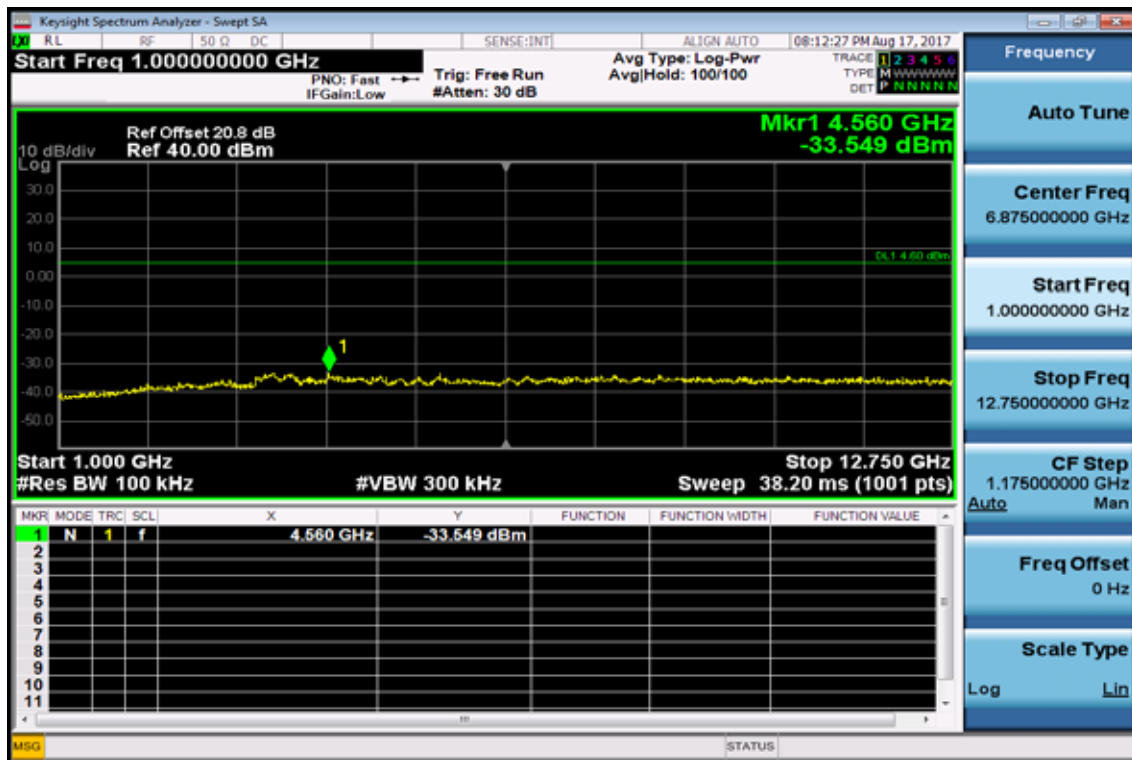
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## Ch High 30MHz – 1GHz



## Ch High 3GHz – 12.5GHz



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## 10. SPURIOUS RADIATED EMISSION TEST

### 10.1. Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 limit as below.

And according to §15.33(a) (1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

| Frequency (MHz) | Field strength (microvolts/meter) | Distance (meters) |
|-----------------|-----------------------------------|-------------------|
| 0.009-0.490     | 2400/F(kHz)                       | 300               |
| 0.490-1.705     | 24000/F(kHz)                      | 30                |
| 1.705-30        | 30                                | 30                |
| 30-88           | 100                               | 3                 |
| 88-216          | 150                               | 3                 |
| 216-960         | 200                               | 3                 |
| Above 960       | 500                               | 3                 |

#### Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (dBμV/m)

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## 10.2. Measurement Equipment Used:

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|-------------------|-----------------------|--------------|---------------|------------------|-----------------|
| Name of Equipment | Manufacturer          | Model        | Serial Number | Calibration Date | Calibration Due |
| EMI Test Receiver | R&S                   | ESCI7        | 100760        | 05/11/2017       | 05/10/2018      |
| Spectrum Analyzer | Agilent               | E4446A       | MY51100003    | 04/25/2017       | 04/24/2018      |
| Loop Antenna      | ETS-Lindgren          | 6502         | 148045        | 09/20/2016       | 09/19/2017      |
| Bilog Antenna     | SCHWAZBECK            | VULB9168     | 378           | 12/19/2016       | 12/18/2017      |
| Horn Antenna      | Schwarzbeck           | BBHA9120D    | 1441          | 08/04/2017       | 08/03/2018      |
| Pre-Amplifier     | Agilent               | 8447D        | 2944A07676    | 01/03/2017       | 01/02/2018      |
| Pre-Amplifier     | EMC Instruments Corp. | EMC0126530   | 980038        | 01/03/2017       | 01/02/2018      |
| Turn Table        | HD                    | DT420        | N/A           | N.C.R            | N.C.R           |
| Antenna Tower     | ChamPro               | AM-BS-4500-B | 060776-ABS    | N.C.R            | N.C.R           |
| Controller        | ChamPro               | EM1000       | 60776         | N.C.R            | N.C.R           |
| Low Loss Cable    | Huber Suhner          | 966_RX       | 9             | 01/05/2017       | 01/04/2018      |
| 3m Site NSA       | SGS                   | 966 chamber  | N/A           | 07/01/2017       | 06/30/2018      |
| Low Loss Cable    | Huber Suhner          | 966 TX       | 1             | 01/05/2017       | 01/04/2018      |
| Horn Antenna      | Schwarzbeck           | BBHA9170     | 184           | 12/12/2016       | 12/11/2017      |
| Pre-Amplifier     | EMC Instruments Corp. | EMC184045    | 980135        | 01/05/2017       | 01/04/2018      |

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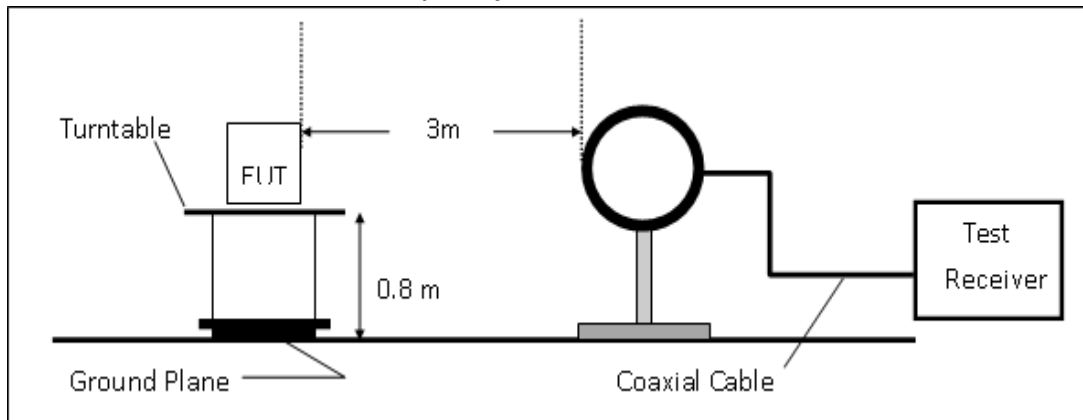
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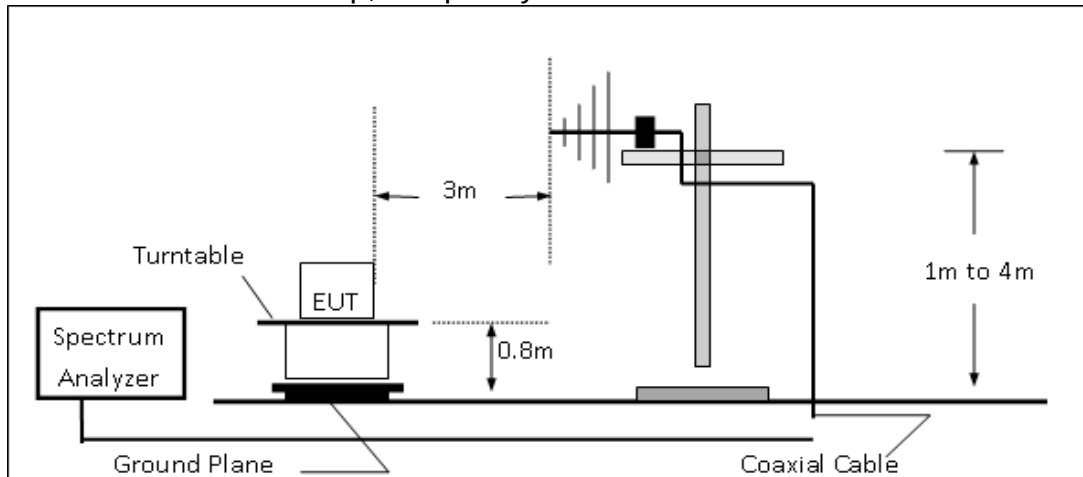
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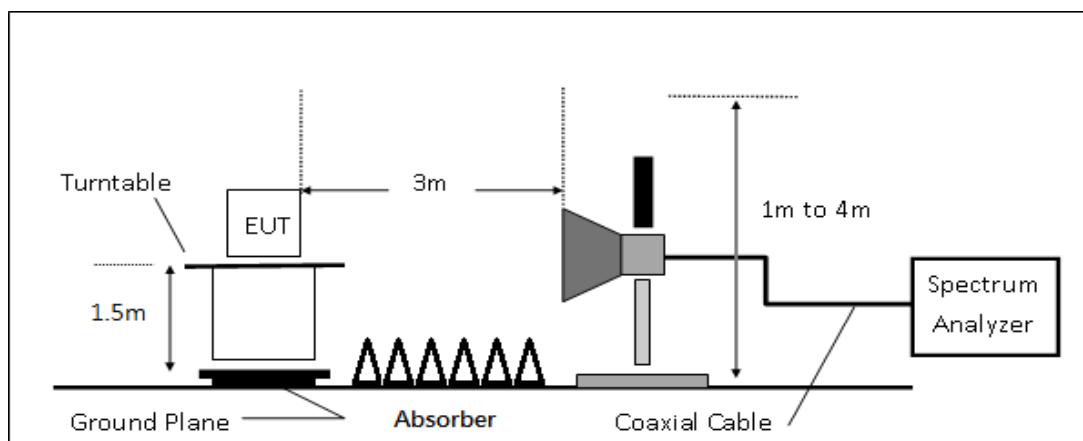
#### (A) Radiated Emission Test Set-UP Frequency Below 30MHz.



#### (B) Radiated Emission Test Set-UP, Frequency form 30MHz to 1000MHz



#### (C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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#### 10.4. Measurement Procedure:

##### Radiated Emission:

1. The testing follows ANSI C63.10:2013.
2. The EUT was placed on a turn table with 0.8m for frequency < 1GHz and 1.5m for frequency > 1GHz above ground plan.
3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
5. Use the follow spectrum analyzer setting:
  - (1) Span = wide enough to fully capture the emission being measured
  - (2) RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz, VBW  $\geq$  RBW, Sweep = auto, Detector function = peak, Trace = max hold
  - (3) For average measurement: use duty cycle correction factor method per 15.35(c)  
 Duty Cycle = On time/100 milliseconds  

$$\text{On time} = N1 \cdot L1 + N2 \cdot L2 + \dots + N(n-1) \cdot L(n-1) + N(n) \cdot L(n)$$
 Where N1 is number of type 1 pulses, L1 is length of type 1 pulses, etc.  
 Average Emission Level = Peak Emission Level +  $20 \cdot \log(\text{duty Cycle})$
6. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
7. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
8. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.  
Repeat above procedures until all frequency of the interest measured were complete.

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### 10.5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

|                           |                                            |
|---------------------------|--------------------------------------------|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude    | AG = Amplifier Gain                        |
| AF = Antenna Factor       |                                            |

The limit of the emission level is expressed in dBuV/m, which converts  $20 \cdot \log(\mu\text{V/m})$

Actual FS(dBuV/m) = SPA. Reading level(dBuV) + Factor(dB)

Factor(dB) = Antenna Factor(dBuV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

### 10.6. Test Results of Radiated Spurious Emissions form 9 kHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported

### 10.7. Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

Note: For the tabular table as presents below,

“F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor

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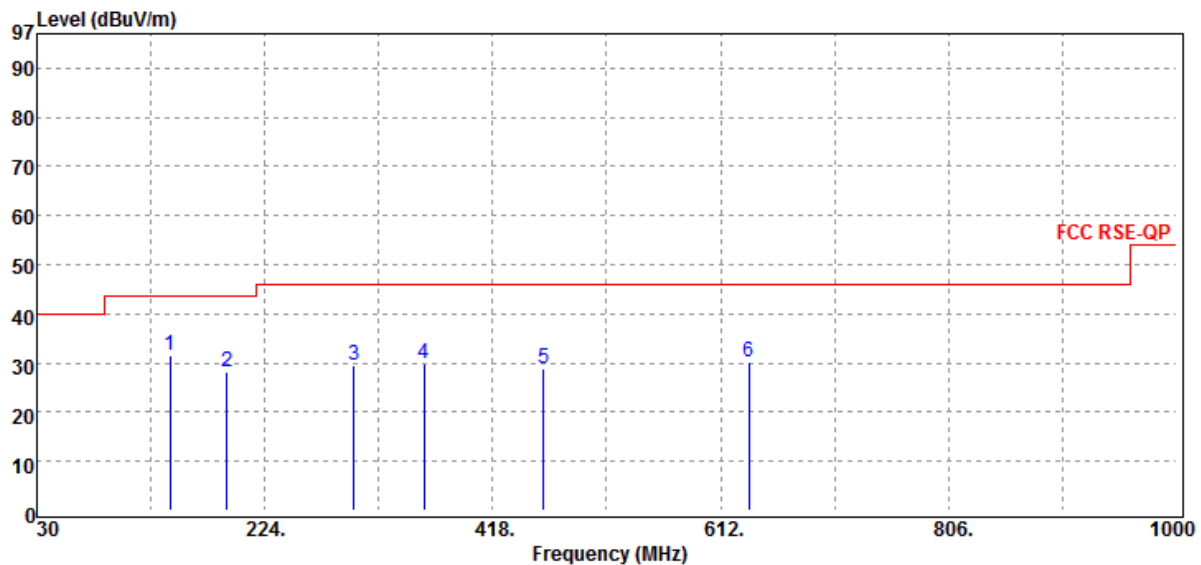
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### 10.7.1. Radiated Spurious Emission Measurement Result

#### For Frequency from 30MHz to 1000MHz

|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :902.25 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH LOW  | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :VERTICAL         |



| Freq.  | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Margin |
|--------|---------|----------|---------------|--------|--------|--------|--------|
|        |         | Mode     | Reading Level |        | FS     | @3m    |        |
| MHz    | F/H/E/S | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 143.49 | S       | Peak     | 39.50         | -8.09  | 31.41  | 43.50  | -12.09 |
| 191.99 | S       | Peak     | 37.57         | -9.42  | 28.15  | 43.50  | -15.35 |
| 299.66 | S       | Peak     | 35.58         | -5.93  | 29.65  | 46.00  | -16.35 |
| 359.80 | S       | Peak     | 34.80         | -4.79  | 30.01  | 46.00  | -15.99 |
| 461.65 | S       | Peak     | 31.51         | -2.60  | 28.91  | 46.00  | -17.09 |
| 636.25 | S       | Peak     | 29.64         | 0.53   | 30.17  | 46.00  | -15.83 |

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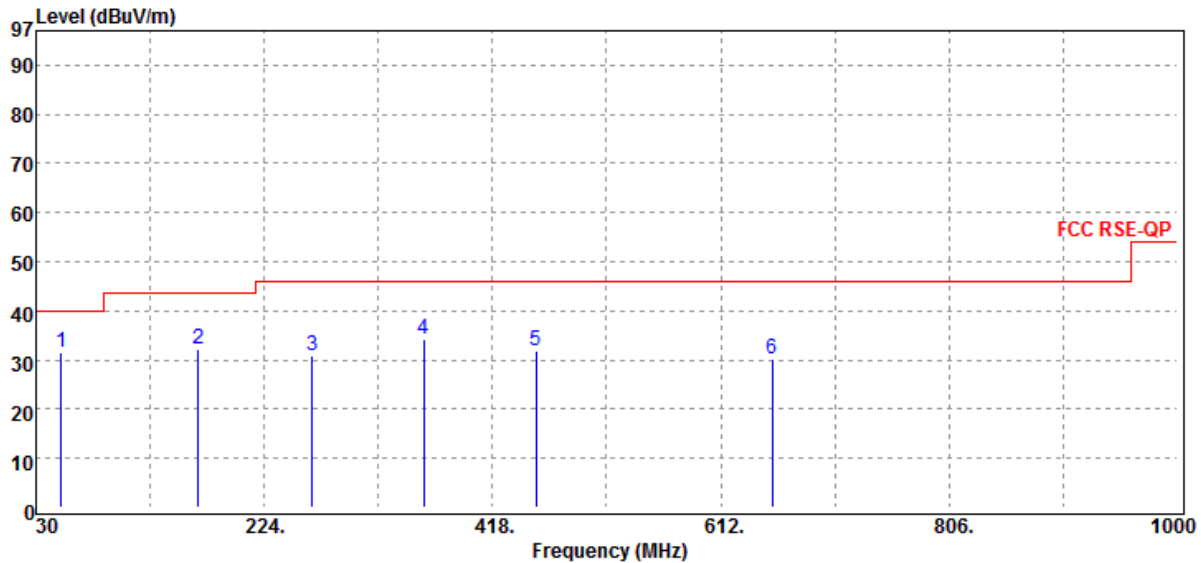
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :902.25 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH LOW  | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :HORIZONTAL       |



| Freq.  | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Margin |
|--------|---------|----------|---------------|--------|--------|--------|--------|
| MHz    | F/H/E/S | Mode     | Reading Level |        | FS     | @3m    |        |
| MHz    | F/H/E/S | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 51.34  | S       | Peak     | 39.34         | -7.75  | 31.59  | 40.00  | -8.41  |
| 167.74 | S       | Peak     | 39.58         | -7.46  | 32.12  | 43.50  | -11.38 |
| 264.74 | S       | Peak     | 37.97         | -7.05  | 30.92  | 46.00  | -15.08 |
| 359.80 | S       | Peak     | 39.08         | -4.79  | 34.29  | 46.00  | -11.71 |
| 454.86 | S       | Peak     | 34.61         | -2.65  | 31.96  | 46.00  | -14.04 |
| 655.65 | S       | Peak     | 29.86         | 0.27   | 30.13  | 46.00  | -15.87 |

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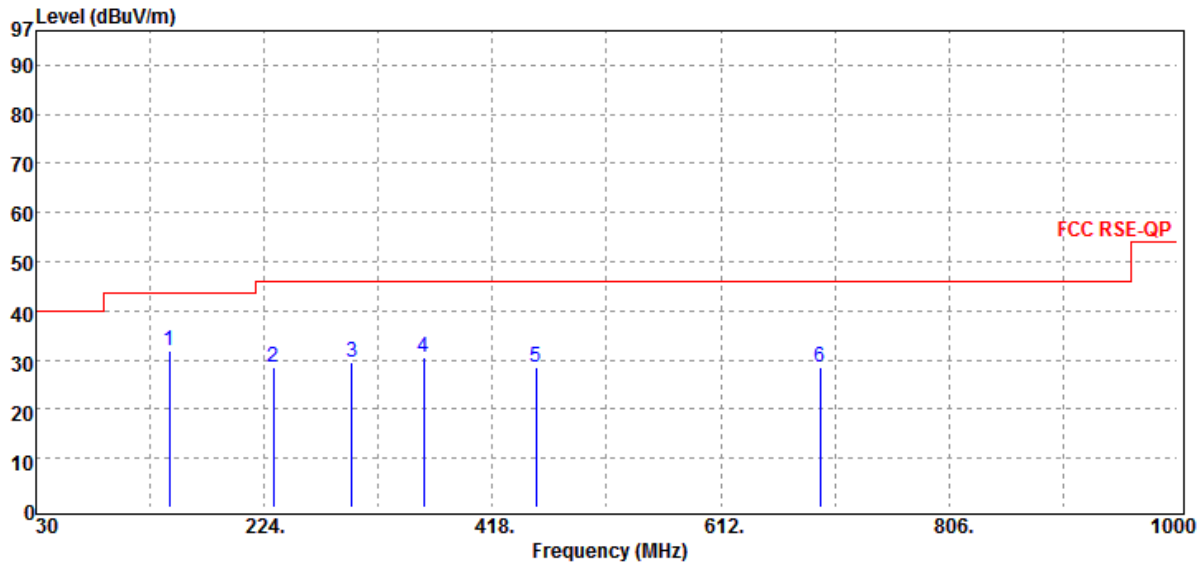
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :914.75 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH MID  | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :VERTICAL         |



| Freq.  | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Margin |
|--------|---------|----------|---------------|--------|--------|--------|--------|
| MHz    | F/H/E/S | Mode     | Reading Level |        | FS     | @3m    |        |
|        |         | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 143.49 | S       | Peak     | 40.04         | -8.09  | 31.95  | 43.50  | -11.55 |
| 231.76 | S       | Peak     | 37.22         | -8.85  | 28.37  | 46.00  | -17.63 |
| 298.69 | S       | Peak     | 35.46         | -5.95  | 29.51  | 46.00  | -16.49 |
| 359.80 | S       | Peak     | 35.21         | -4.79  | 30.42  | 46.00  | -15.58 |
| 454.86 | S       | Peak     | 31.05         | -2.65  | 28.40  | 46.00  | -17.60 |
| 696.39 | S       | Peak     | 27.26         | 1.35   | 28.61  | 46.00  | -17.39 |

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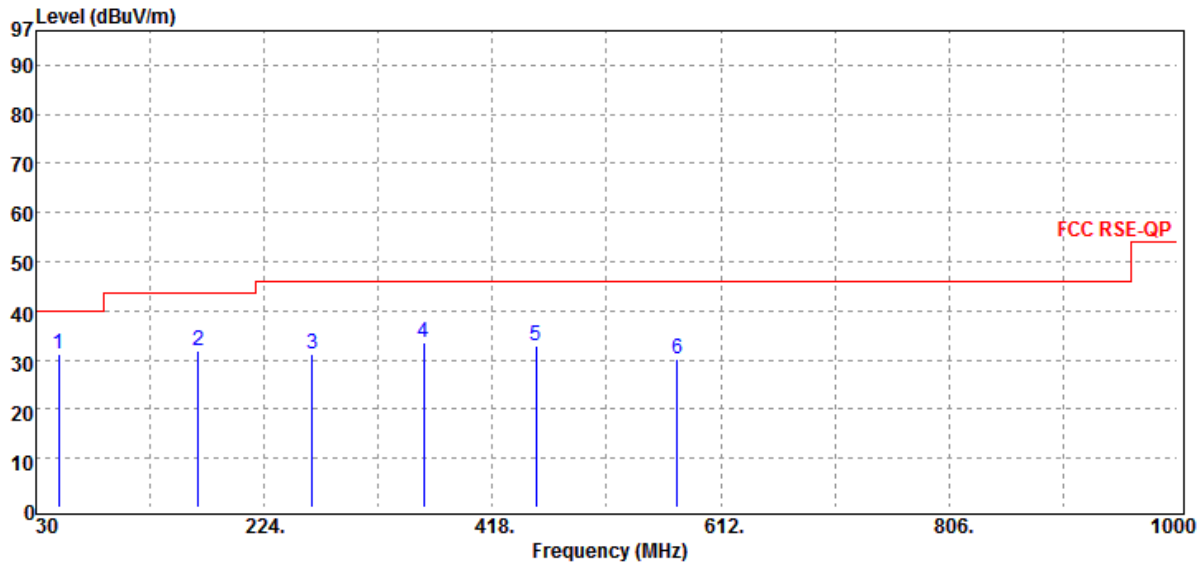
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :914.75 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH MID  | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :HORIZONTAL       |



| Freq.  | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Margin |
|--------|---------|----------|---------------|--------|--------|--------|--------|
| MHz    | F/H/E/S | Mode     | Reading Level |        | FS     | @3m    |        |
|        |         | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 49.40  | S       | Peak     | 39.11         | -7.74  | 31.37  | 40.00  | -8.63  |
| 167.74 | S       | Peak     | 39.38         | -7.46  | 31.92  | 43.50  | -11.58 |
| 264.74 | S       | Peak     | 38.18         | -7.05  | 31.13  | 46.00  | -14.87 |
| 359.80 | S       | Peak     | 38.46         | -4.79  | 33.67  | 46.00  | -12.33 |
| 454.86 | S       | Peak     | 35.41         | -2.65  | 32.76  | 46.00  | -13.24 |
| 575.14 | S       | Peak     | 30.94         | -0.80  | 30.14  | 46.00  | -15.86 |

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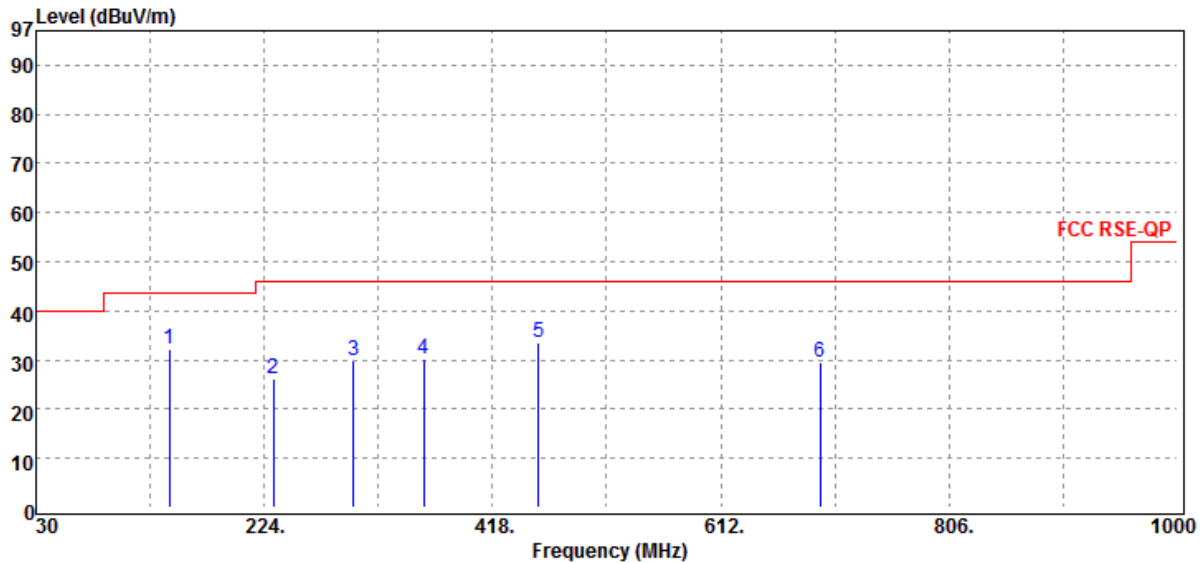
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :927.75 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH HIGH | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :VERTICAL         |



| Freq.  | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Margin |
|--------|---------|----------|---------------|--------|--------|--------|--------|
| MHz    | F/H/E/S | Mode     | Reading Level | dB     | FS     | @3m    | dB     |
|        |         | PK/QP/AV | dBμV          |        | dBμV/m | dBμV/m |        |
| 143.49 | S       | Peak     | 40.17         | -8.09  | 32.08  | 43.50  | -11.42 |
| 231.76 | S       | Peak     | 34.99         | -8.85  | 26.14  | 46.00  | -19.86 |
| 299.66 | S       | Peak     | 35.89         | -5.93  | 29.96  | 46.00  | -16.04 |
| 359.80 | S       | Peak     | 35.06         | -4.79  | 30.27  | 46.00  | -15.73 |
| 456.80 | S       | Peak     | 36.11         | -2.65  | 33.46  | 46.00  | -12.54 |
| 696.39 | S       | Peak     | 28.06         | 1.35   | 29.41  | 46.00  | -16.59 |

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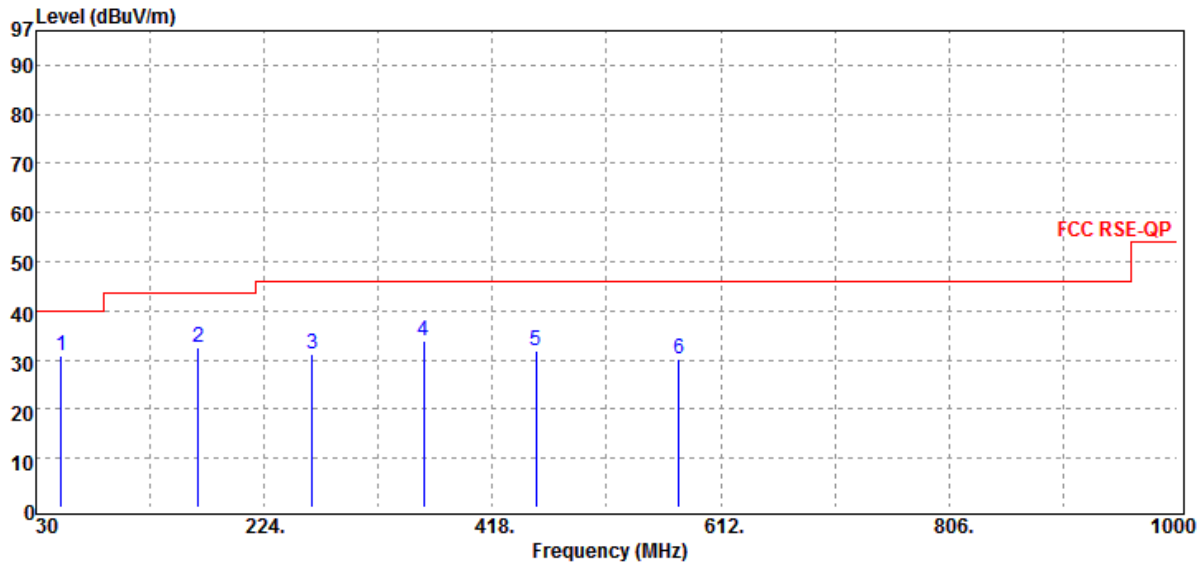
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :927.75 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH HIGH | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :HORIZONTAL       |



| Freq.  | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Margin |
|--------|---------|----------|---------------|--------|--------|--------|--------|
|        |         | Mode     | Reading Level |        | FS     | @3m    |        |
| MHz    | F/H/E/S | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 51.34  | S       | Peak     | 38.78         | -7.75  | 31.03  | 40.00  | -8.97  |
| 167.74 | S       | Peak     | 39.96         | -7.46  | 32.50  | 43.50  | -11.00 |
| 264.74 | S       | Peak     | 38.21         | -7.05  | 31.16  | 46.00  | -14.84 |
| 359.80 | S       | Peak     | 38.69         | -4.79  | 33.90  | 46.00  | -12.10 |
| 454.86 | S       | Peak     | 34.50         | -2.65  | 31.85  | 46.00  | -14.15 |
| 576.11 | S       | Peak     | 30.69         | -0.64  | 30.05  | 46.00  | -15.95 |

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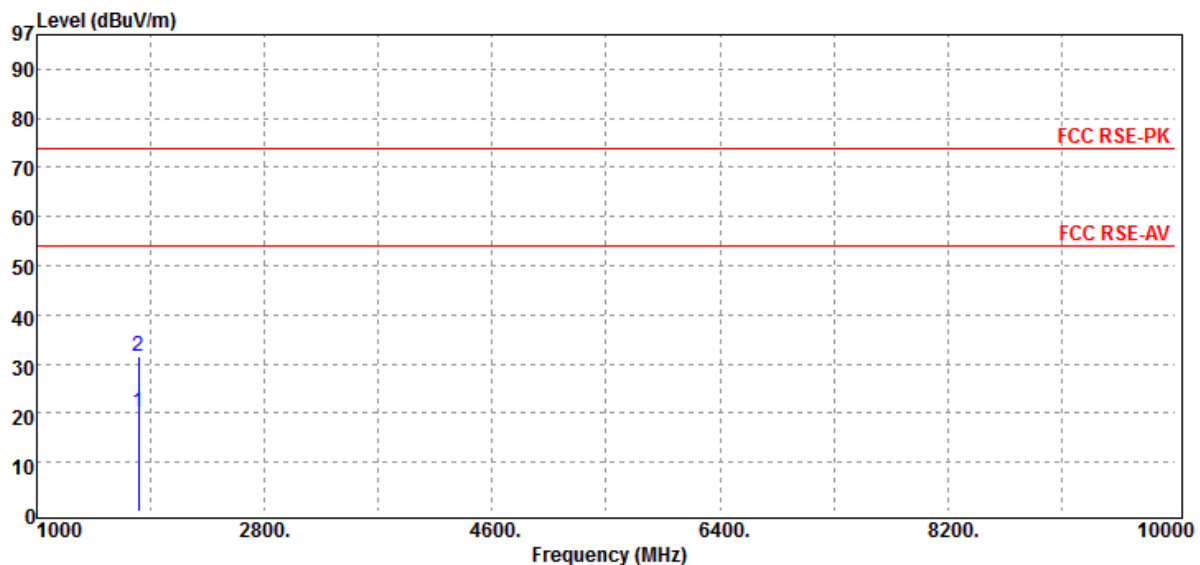
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### For Frequency above 1GHz

|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :902.25 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH LOW  | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :VERTICAL         |



| Freq.   | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Safe   |
|---------|---------|----------|---------------|--------|--------|--------|--------|
|         |         | Mode     | Reading Level |        | FS     | @3m    | Margin |
| MHz     | F/H/E/S | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 1804.50 | H       | Average  | 24.81         | -4.67  | 20.14  | 54.00  | -33.86 |
| 1804.50 | H       | Peak     | 36.18         | -4.67  | 31.51  | 74.00  | -42.49 |

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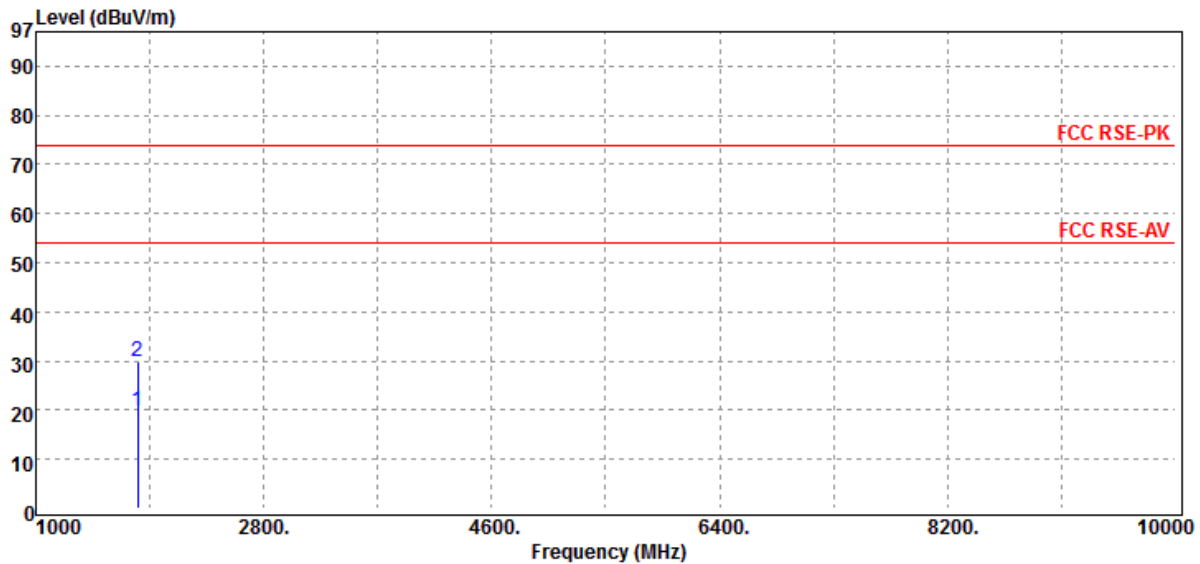
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :902.25 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH LOW  | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :HORIZONTAL       |



| Freq.   | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Safe   |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| MHz     | F/H/E/S | Mode     | Reading Level |        | FS     | @3m    | Margin |
| MHz     | F/H/E/S | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 1804.50 | H       | Average  | 24.46         | -4.67  | 19.79  | 54.00  | -34.21 |
| 1804.50 | H       | Peak     | 34.43         | -4.67  | 29.76  | 74.00  | -44.24 |

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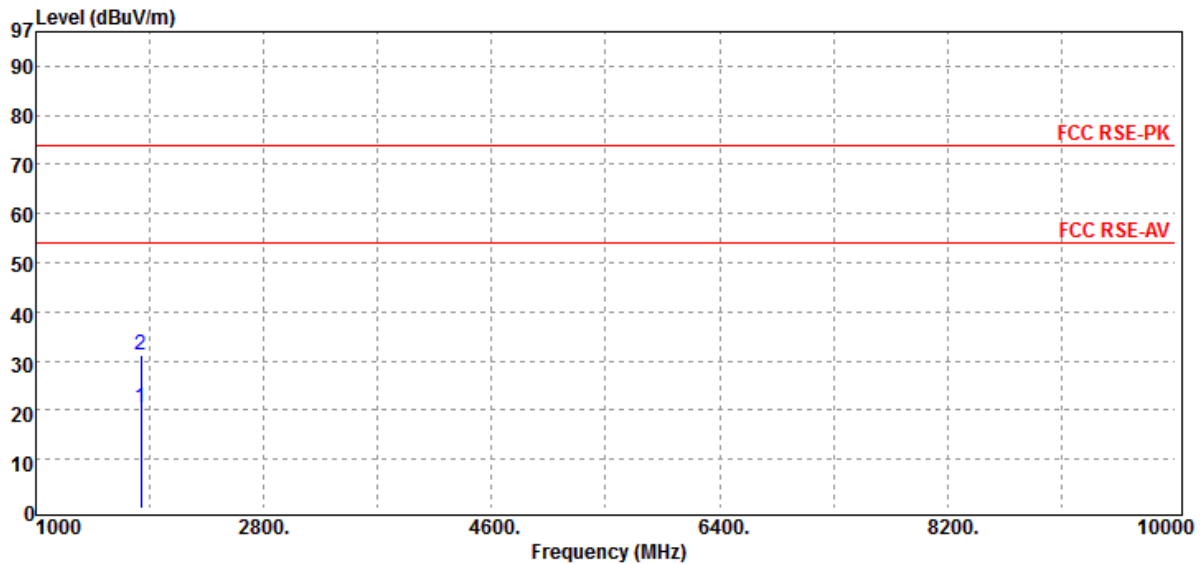
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :914.75 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH MID  | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :VERTICAL         |



| Freq.   | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Safe   |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| MHz     | F/H/E/S | Mode     | Reading Level |        | FS     | @3m    | Margin |
| MHz     | F/H/E/S | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 1829.50 | H       | Average  | 24.94         | -4.50  | 20.44  | 54.00  | -33.56 |
| 1829.50 | H       | Peak     | 35.62         | -4.50  | 31.12  | 74.00  | -42.88 |

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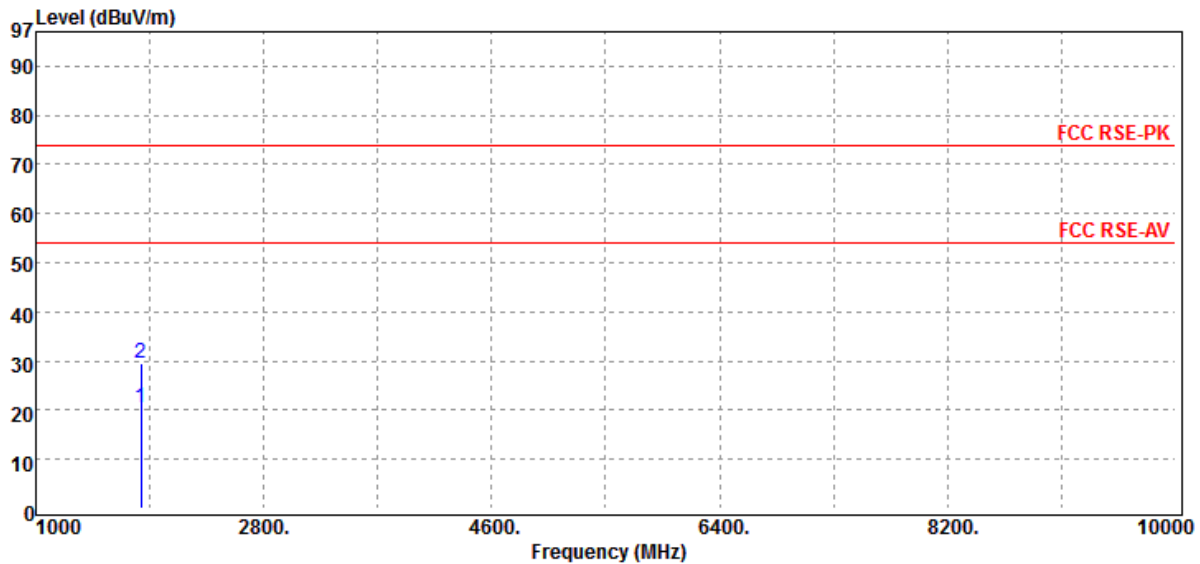
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :914.75 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH MID  | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :HORIZONTAL       |



| Freq.   | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Safe   |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| MHz     | F/H/E/S | Mode     | Reading Level | dB     | FS     | @3m    | Margin |
| MHz     | F/H/E/S | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 1829.50 | H       | Average  | 24.82         | -4.50  | 20.32  | 54.00  | -33.68 |
| 1829.50 | H       | Peak     | 34.03         | -4.50  | 29.53  | 74.00  | -44.47 |

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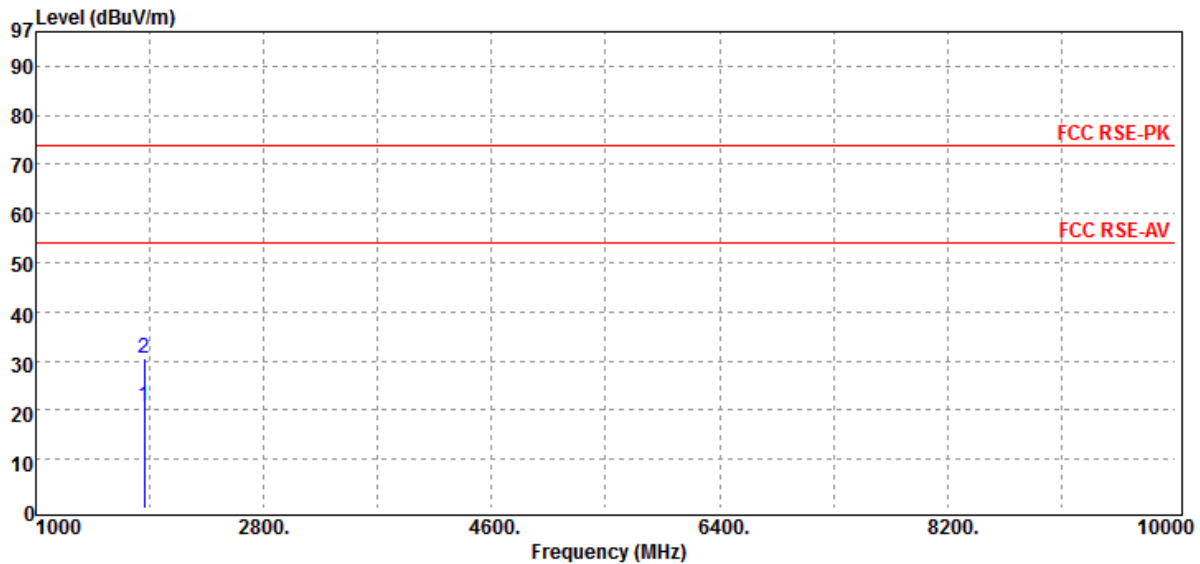
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :927.75 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH HIGH | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :VERTICAL         |



| Freq.   | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Safe   |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| MHz     | F/H/E/S | Mode     | Reading Level |        | FS     | @3m    | Margin |
|         |         | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 1855.50 | H       | Average  | 25.01         | -4.36  | 20.65  | 54.00  | -33.35 |
| 1855.50 | H       | Peak     | 34.91         | -4.36  | 30.55  | 74.00  | -43.45 |

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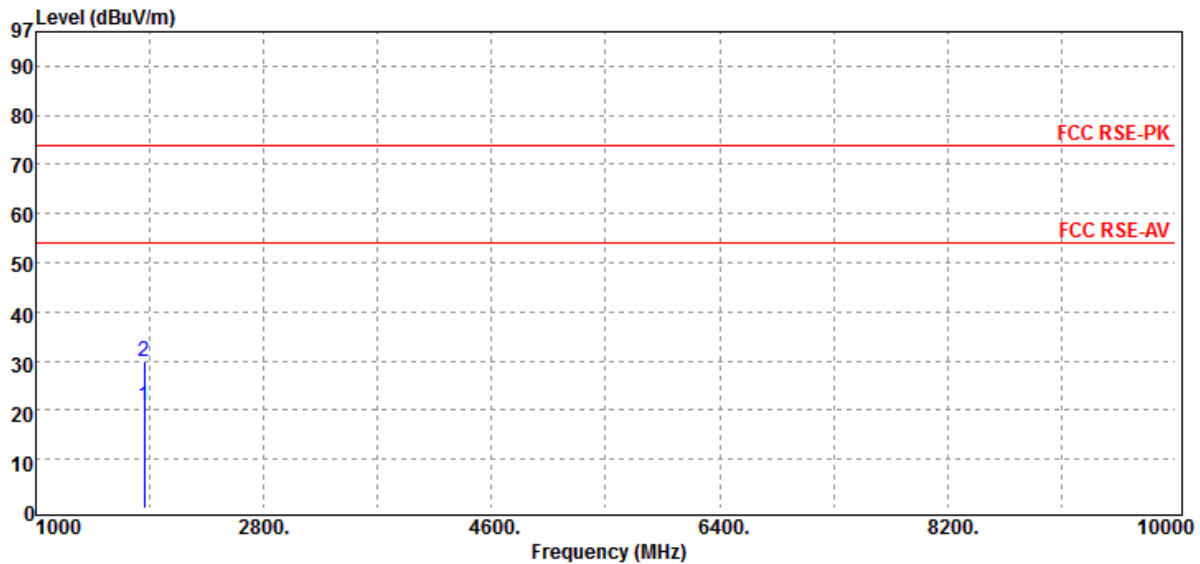
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :900M       | Test Date                | :2017-08-23       |
| Fundamental Frequency | :927.75 MHz | Temp./Humi.              | :21 deg_C / 61 RH |
| Operation Mode        | :Tx CH HIGH | Engineer                 | :Mike             |
| EUT Pol.              | :H Plane    | Measurement Antenna Pol. | :HORIZONTAL       |



| Freq.   | Note    | Detector | Spectrum      | Factor | Actual | Limit  | Safe   |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| MHz     | F/H/E/S | Mode     | Reading Level |        | FS     | @3m    | Margin |
|         |         | PK/QP/AV | dBμV          | dB     | dBμV/m | dBμV/m | dB     |
| 1855.50 | H       | Average  | 25.14         | -4.36  | 20.78  | 54.00  | -33.22 |
| 1855.50 | H       | Peak     | 34.20         | -4.36  | 29.84  | 74.00  | -44.16 |

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## 11. FREQUENCY SEPARATION

### 11.1. Standard Applicable

Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25 kHz or the  $2/3 \times 20\text{dB}$  bandwidth of the hopping channel, whichever is greater.

### 11.2. Measurement Equipment Used:

Refer to section 7.2 for the plot.

### 11.3. Test Set-up:

Refer to section 8.3 for the plot.

### 11.4. Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows ANSI C63.10:2015.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set center frequency of spectrum analyzer = middle of hopping channel.
5. Set the spectrum analyzer as RBW, VBW=100 kHz, Adjust Span to 1.5MHz, Sweep = auto.
6. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

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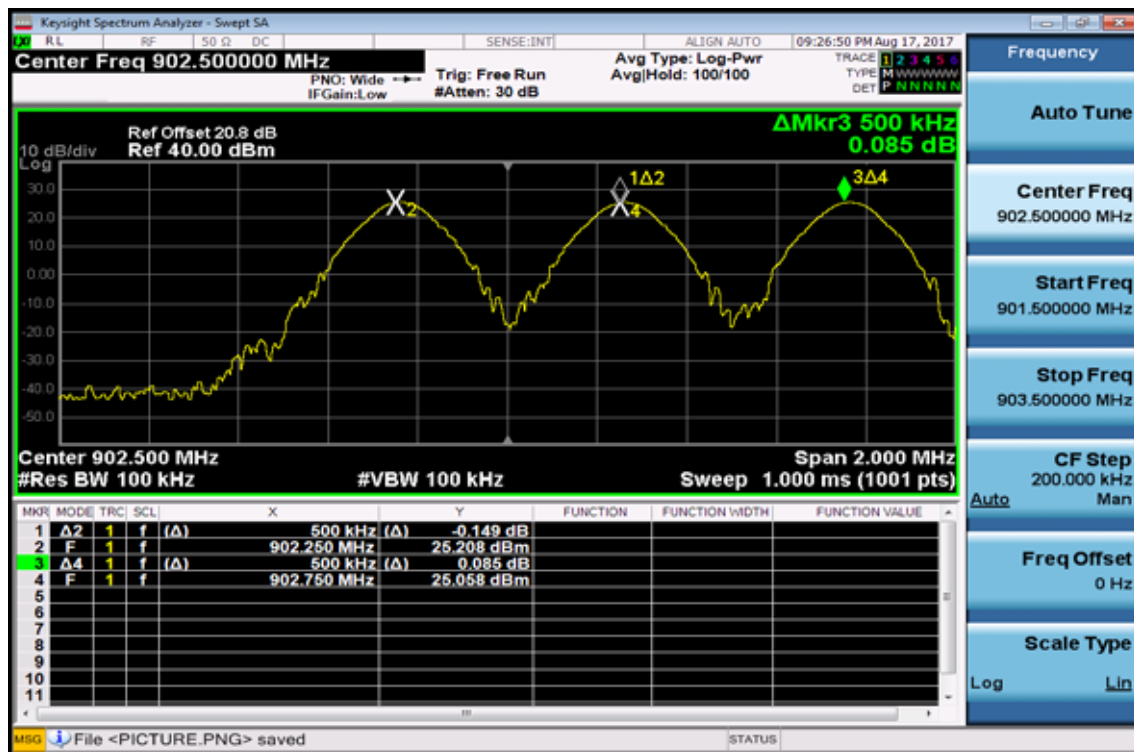
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### 11.5. Measurement Result:

| Channel separation (MHz) | Limit                           | Result |
|--------------------------|---------------------------------|--------|
| 0.5                      | $\geq 25$ kHz or 20dB bandwidth | PASS   |

Note: Refer to next page for plots.

### Frequency Separation Test Data



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## 12. NUMBER OF HOPPING FREQUENCY

### 12.1. Standard Applicable

According to §15.247(a)(1)(i), For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

### 12.2. Measurement Equipment Used:

Refer to section 7.2 for the plot.

### 12.3. Test Set-up:

Refer to section 8.3 for the plot.

### 12.4. Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows ANSI C63.10:2015.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set spectrum analyzer Start=900MHz, Stop = 930MHz, Sweep = auto.
5. Set the spectrum analyzer as RBW=100 kHz, VBW= 300 kHz., Detector = Peak
6. Max hold, view and count how many channel in the band.

### 12.5. Measurement Result:

Note: Refer to next page for plots.

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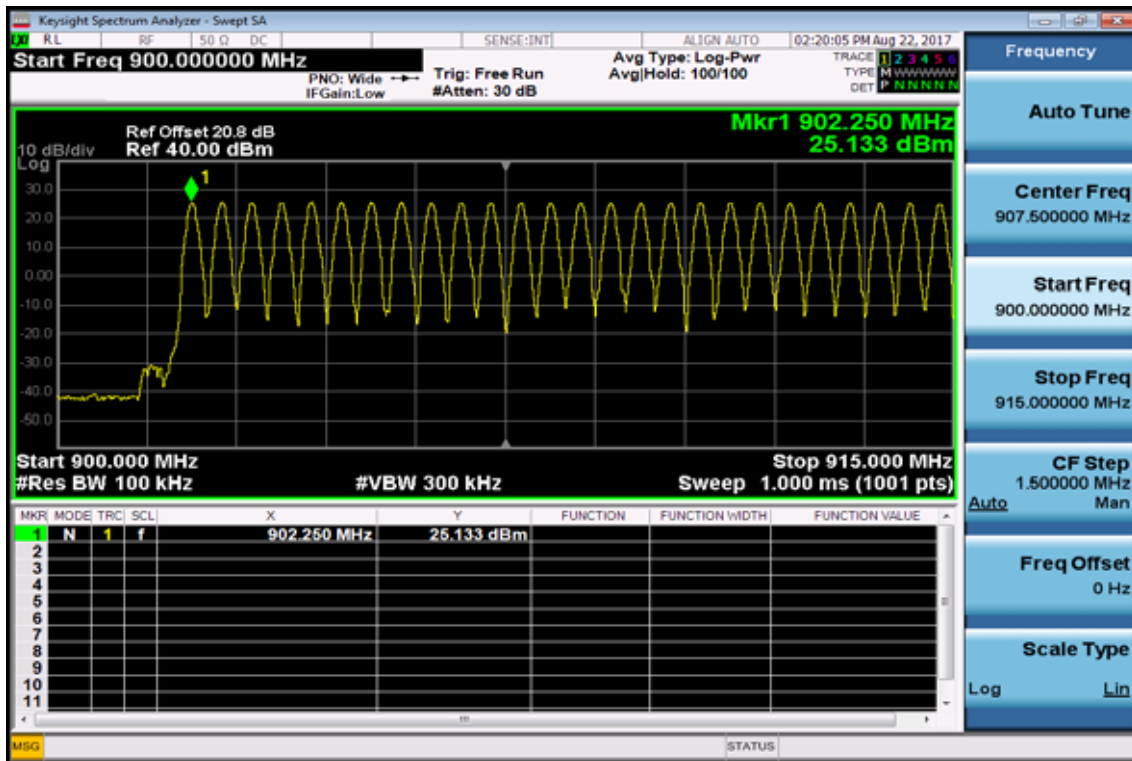
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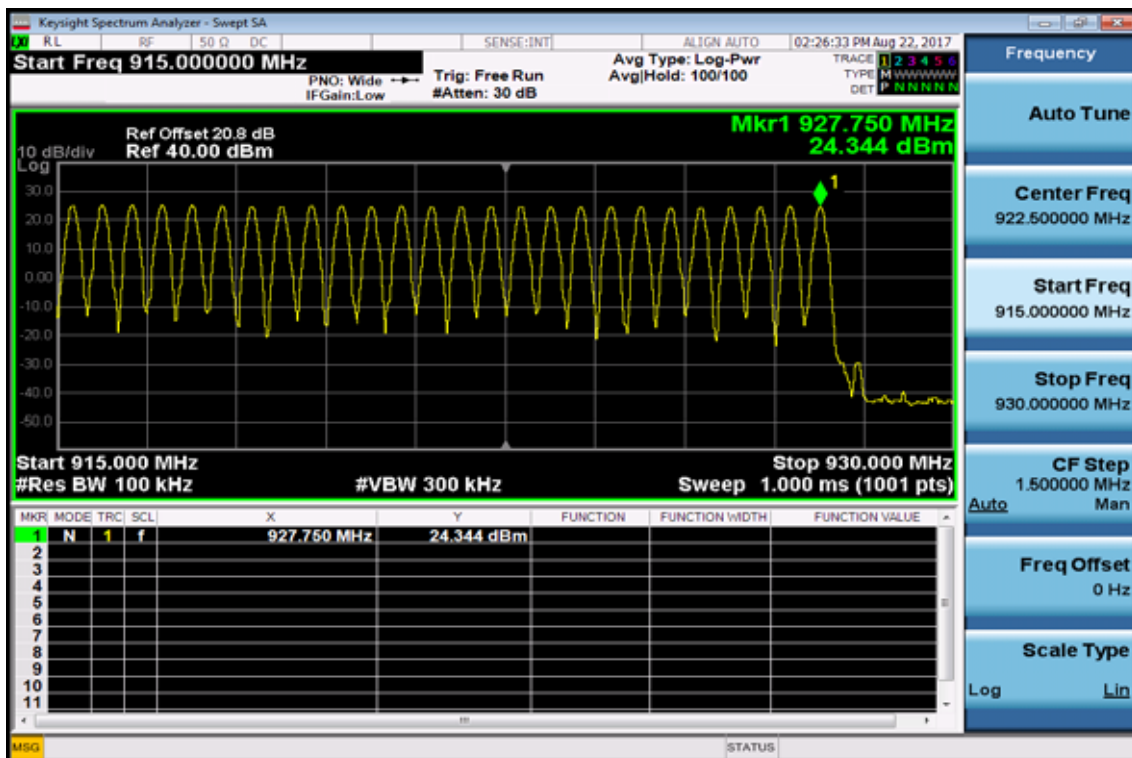
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## Channel Number

### 902 MHz – 915 MHz



### 915 MHz – 928 MHz



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### 13. TIME OF OCCUPANCY (DWELL TIME)

#### 13.1. Standard Applicable

According to §15.247(a)(1)(i), Frequency hopping systems operating in the 902MHz-928MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within a period of 20 seconds.

#### 13.2. Measurement Equipment Used:

Refer to section 7.2 for the plot.

#### 13.3. Test Set-up:

Refer to section 8.3 for the plot.

#### 13.4. Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows ANSI C63.10:2013.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set center frequency of spectrum analyzer = operating frequency.
5. Set the spectrum analyzer as RBW, VBW=100kHz, 300kHz, Span = 0Hz, Detector = Peak.
6. Repeat above procedures until all frequency of the interest measured were complete.

#### 13.5. Tabular Result of the Measurement:

| Number of transmission in a 20s | Length of transmission time (ms): | Measurement Result (ms): | Limit (ms): |
|---------------------------------|-----------------------------------|--------------------------|-------------|
| 21                              | 11                                | 231                      | 400ms       |

#### 13.6. Measurement Result:

Note: Refer to next page for plots.

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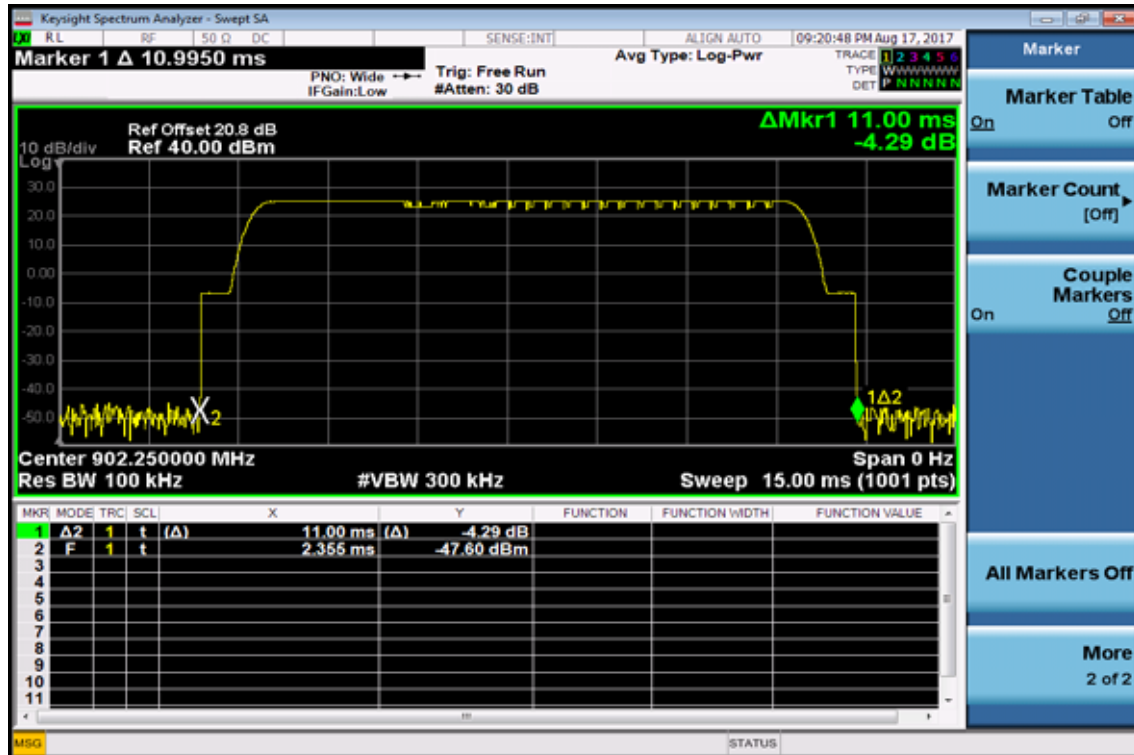
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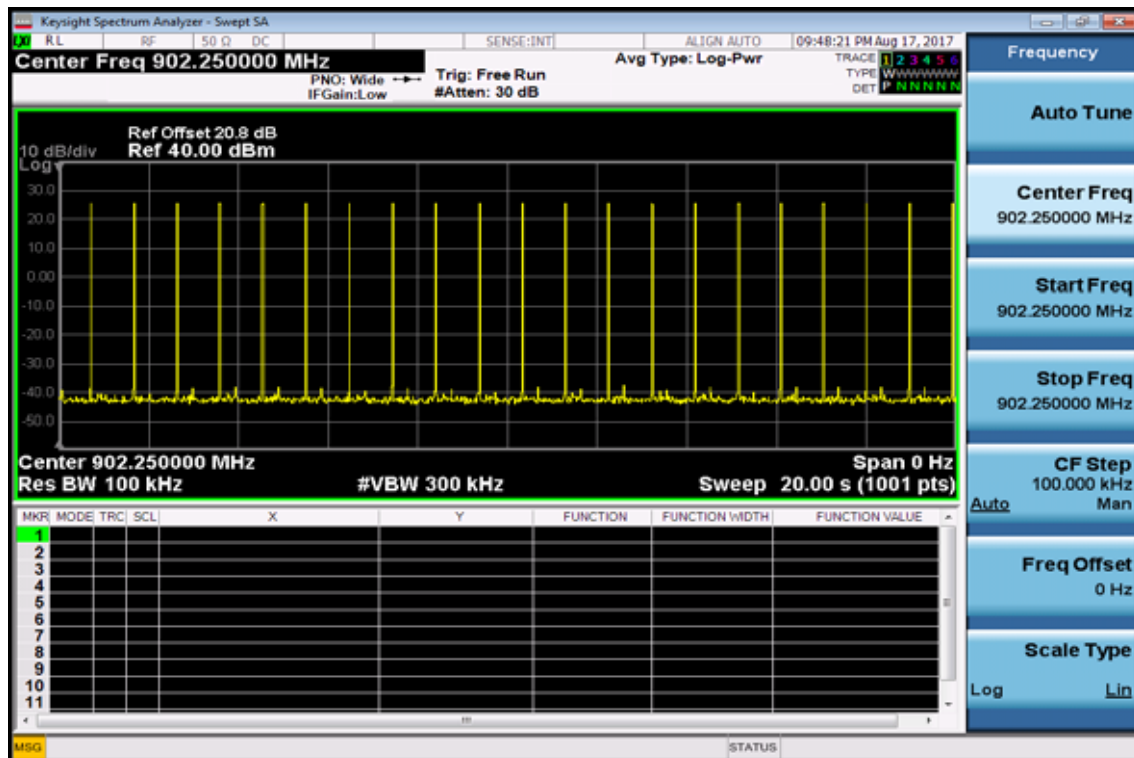
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### Length of transmission time



### Number of transmission in a 20s



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## 14. ANTENNA REQUIREMENT

### 14.1. Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

### 14.2. Antenna Connected Construction

An embedded-in antenna design is used.

The antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

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