# FCC TEST REPORT

# (PART 96)

| | |
|---|---|
| Applicant: | DataRemote Incorporated |
| Address: | 18001 Old Cutler Rd. Suite 600, Miami, FL 33157 |

| | |
|---|---|
| Manufacturer or Supplier: | DataRemote Incorporated |
| Address: | 18001 Old Cutler Rd. Suite 600, Miami, FL 33157 |
| Product: | Cellular Backup Router |
| Brand Name: | DATAREMOTE |
| Model Name: | 90X1 |
| FCC ID: | 2AJLF-90X1 |
| Date of tests: | Jul. 17, 2023 ~ Aug. 25, 2023 |

The tests have been carried out according to the requirements of the following standard:

☒ **47 CFR FCC Part 96**

☒ **ANSI 63.26-2015**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

| Prepared by Simon Wang<br>Engineer / Mobile Department | Approved by Luke Lu<br>Manager / Mobile Department |
|---|---|
| Simon Wang<br>Date: Aug. 25, 2023 | Luke Lu<br>Date: Aug. 25, 2023 |

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# RELEASE CONTROL RECORD

| ISSUE NO. | DESCRIPTION | DATE ISSUED |
|---|---|---|
| W7L-P23070006RF11 | Original release | Aug. 25, 2023 |

# 1 SUMMARY OF TEST RESULTS

| 47 CFR FCC PART 96 | | | |
|---|---|---|---|
| FCC CLAUSE | TEST ITEM | RESULT | TEST LAB* |
| 2.1046<br>96.41(b) | Maximum Peak Output Power and Maximum EIRP | Compliance | A |
| 2.1051<br>96.41(e) | Conducted Band Edge | See Note 2 | - |
| 2.1049 | Occupied Bandwidth | See Note 2 | - |
| 2.1055 | Frequency Stability | See Note 2 | - |
| 2.1051<br>96.41(e) | Conducted Spurious Emissions | See Note 2 | - |
| 2.1053<br>96.41(e) | Radiated Spurious Emissions | Compliance<br>See Note 3 | A/B |
| 96.41(g) | Peak-to-Average Power Ratio | See Note 2 | - |

Note:1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2. Refer to Module report FYCR220600021102, FCC ID: XMR2022RM520NGL.

3. For ENDC band, the report only show the worst mode RSE data of original module report, because the antenna type of module and EUT is all the same, and the power of single LTE/NR band is larger than that in ENDC, so single LTE/NR band can cover the RSE risk of ENDC part.

***Test Lab Information Reference**

**Lab A:**

BV 7Layers Communications Technology (Shenzhen) Co., Ltd

**Lab Address:**

No.B102, Dazu Chuangxin Mansion, North of Beihuan Avenue, North Area, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, China

**Accredited Test Lab Cert 3939.01**

**FCC Site Registration No. : 525120; Designation No. : CN1171;**

**Lab B:**

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

**Lab Address:**

Tower N, Innovation Center, 88 Zhuyi Road, High-tech District, Suzhou City, Anhui Province

**Accredited Test Lab Cert 6613.01**

**The FCC Site Registration No. is 434559; The Designation No. is CN1325.**

## 1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| MEASUREMENT | UNCERTAINTY |
|---|---|
| Maximum Peak Output Power | ±2.06dB |
| Frequency Stability | ±76.97Hz |
| Radiated emissions (9KHz~30MHz) | ±2.68dB |
| Radiated emissions (30MHz~1GHz) | ±4.98dB |
| Radiated emissions (1GHz ~6GHz) | ±4.70dB |
| Radiated emissions (6GHz ~18GHz) | ±4.60dB |
| Radiated emissions (18GHz ~40GHz) | ±4.12dB |
| Conducted emissions | ±4.01dB |
| Occupied Channel Bandwidth | ±43.58KHz |
| Band Edge Measurements | ±4.70dB |
| Peak to average ratio | ±0.76dB |

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

## 1.2 TEST SITE AND INSTRUMENTS

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| MXE EMI Receiver | KEYSIGHT | N9038A-544 | MY54450026 | Mar. 28,23 | Mar. 27,24 |
| EXA Signal Analyzer | KEYSIGHT | N9010A-544 | MY54510355 | May.13,23 | May.12,24 |
| Loop Antenna | Schwarzbeck | FMZB 1519B | 00173 | Sep.03,22 | Sep.02,23 |
| Bilog Antenna | ETS-LINDGREN | 3143B | 00161965 | Feb. 18,23 | Feb. 17,24 |
| Horn Antenna | ETS-LINDGREN | 3117 | 00168692 | Feb. 18,23 | Feb. 17,24 |
| Horn Antenna (18GHz-40GHz) | N/A | QWH-SL-18-40-K-SG/QMS-00361 | 15433 | Sep.04, 22 | Sep.03, 23 |
| Radio Communication Analyzer | ANRITSU | MT8820C | 6201465426 | Feb. 14,23 | Feb. 13,24 |
| Signal Pre-Amplifier | EMSI | EMC 9135 | 980249 | May. 06,23 | May. 05,24 |
| Signal Pre-Amplifier | EMSI | EMC 012645B | 980257 | May.11,23 | May.10,24 |
| Signal Pre-Amplifier | EMSI | EMC 184045B | 980259 | Feb. 17,23 | Feb.16,24 |
| 3m Semi-anechoic Chamber | ETS-LINDGREN | 9m*6m*6m | Euroshieldpn-CT0001143-1216 | May. 18,23 | May. 17,26 |
| Test Software | E3 | V 9.160323 | N/A | N/A | N/A |
| Test Software | JS1120 | 3.1.36 | N/A | N/A | N/A |
| 10dB Attenuator | JFW/USA | 50HF-010-SMA | 50HF-010-SMA | May. 06,23 | May. 05,24 |
| Power Meter | Anritsu | ML2495A | 1506002 | Feb. 14,23 | Feb. 13,24 |
| Power Sensor | Anritsu | MA2411B | 1339352 | Feb. 14,23 | Feb. 13,24 |
| Temperature Chamber | ESPEC | SH-242 | 93000855 | May. 06,23 | May. 05,24 |
| MXG Analog Microvave Signal Generator | KEYSIGHT | N5183A | MY50143024 | Feb. 14,23 | Feb. 13,24 |
| Base station R&S CMW500 | Rohde&Schwarz | CMW500 | 153085 | May.11,23 | May.10,24 |
| DC Source | Kikusui/JP | PMX18-5A | N/A | Aug. 11,23 | Aug. 10,24 |
| Radio Communication Analyzer | Starpoint | SP9500-CTS | 20460 | Oct. 13,22 | Oct. 12,23 |

**NOTE:** 1. The calibration interval of the above test instruments is 12 months or 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.

3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| Pre-Amplifier | R&S | SCU18F1 | 100815 | Aug.30,22 | Aug.29,24 |
| Pre-Amplifier | R&S | SCU08F1 | 101028 | Sep.16,22 | Sep.15,24 |
| Vector Signal Generator | R&S | SMBV100B | 102176 | Feb.16,22 | Feb.15,24 |
| Signal Generator | R&S | SMB100A | 182185 | Feb.16,22 | Feb.15,24 |
| 3m Fully-anechoic Chamber | TDK | 9m*6m*6m | HRSW-SZ-EMC-01Chamber | Nov.25,22 | Nov.24,25 |
| 3m Semi-anechoic Chamber | TDK | 9m*6m*6m | HRSW-SZ-EMC-02Chamber | Nov.25,22 | Nov.24,25 |
| EMI TEST Receiver | R&S | ESR26 | 101734 | Feb.25,22 | Feb.24,24 |
| EMI TEST Receiver | R&S | ESW44 | 101973 | Feb.25,22 | Feb.24,24 |
| Bilog Antenna | SCHWARZBECK | VULB 9163 | 1264 | Feb.28,22 | Feb.27,24 |
| Horn Antenna | ETS-LINDGREN | 3117 | 227836 | Aug.22,22 | Aug.21,24 |
| Horn Antenna (18GHz-40GHz) | Steatite Q-par Antennas | QMS 00880 | 23486 | Feb.23,22 | Feb.22,24 |
| Horn Antenna | Steatite Q-par Antennas | QMS 00208 | 23485 | Aug.22,22 | Aug.21,24 |
| Loop Antenna | SCHWARZ | HFH2-Z2/Z2E | 100976 | Feb.23,22 | Feb.22,24 |
| WIDEBANDRADIO COMMUNICATION TESTER | R&S | CMW500 | 169399 | Jun.27,22 | Jun.26,24 |
| Test Software | EMC32 | EMC32 | N/A | N/A | N/A |
| 6DB attenuator | Tonscend Technology Co., Ltd | N/A | 23062787 | N/A | N/A |
| Test Software | ELEKTRA | ELEKTRA4.32 | N/A | N/A | N/A |
| Open Switch and Control Unit | R&S | OSP220 | 101964 | Oct.01,22 | Sep.30,24 |
| DC Source | HYELEC | HY3010B | 551016 | Aug.31,22 | Aug.30,24 |
| Hygrothermograph | DELI | 20210528 | SZ014 | Sep.06,22 | Sep.05,24 |
| PC | LENOVO | E14 | HRSW0024 | N/A | N/A |
| TMC-AMI18843A(CABLE) | R&S | HF290-NMNM-7.00M | N/A | N/A | N/A |
| TMC-AMI18843A(CABLE) | R&S | HF290-NMNM-4.00M | N/A | N/A | N/A |
| CABLE | R&S | W13.02 | N/A | Apr.28,23 | Oct.27,23 |
| CABLE | R&S | W12.14 | N/A | Apr.28,23 | Oct.27,23 |
| CABLE | R&S | J12J103539-00-1 | SEP-03-20-069 | Apr.28,23 | Oct.27,23 |
| CABLE | R&S | J12J103539-00-1 | SEP-03-20-070 | Apr.28,23 | Oct.27,23 |
| Temperature Chamber | votsch | VT4002 | 58566078100050 | May.31,22 | May.30,24 |

**NOTE:** 1. The calibration interval of the above test instruments is 12 months or 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.

3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 434559; The Designation No. is CN1325.

# 2 GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

| | | |
|---|---|---|
| **PRODUCT** | Cellular Backup Router | |
| **BRAND NAME** | DATAREMOTE | |
| **MODEL NAME** | 90X1 | |
| **NOMINAL VOLTAGE** | 19Vdc(adapter or host equipment)<br>11.1Vdc (Li-ion, battery) | |
| **MODULATION TECHNOLOGY** | **5G NR** | DFT-s-OFDM(Pi/2BPSK,QPSK,16QAM,64QAM,256QAM);<br>CP-OFDM(QPSK,16QAM,64QAM,256QAM); |
| **SUPPORT ENDC COMBINE** | **NR Band n48** | 2A_n48A |
| | | 5A_n48A |
| | | 13A_n48A |
| | | 66A_n48A |
| **FREQUENCY RANGE** | **NR Band n48** | 3555 MHz ~ 3694.98MHz |
| **EMISSION DESIGNATOR** | **NR Band n48**<br>**Channel Bandwidth: 10MHz** | QPSK: 8M75G7D<br>16QAM: 8M80W7D<br>64QAM: 8M71W7D<br>256QAM: 8M71W7D |
| | **NR Band n48**<br>**Channel Bandwidth: 20MHz** | QPSK: 18M4G7D<br>16QAM: 18M5W7D<br>64QAM: 18M4W7D<br>256QAM: 18M4W7D |
| | **NR Band n48**<br>**Channel Bandwidth: 40MHz** | QPSK: 38M2G7D<br>16QAM: 38M3W7D<br>64QAM: 38M2W7D<br>256QAM: 38M1W7D |
| **MAX. EIRP POWER** | **NR Band n48**<br>**Channel Bandwidth: 10MHz** | 117.5mW |
| | **NR Band n48**<br>**Channel Bandwidth: 20MHz** | 120.79mW |
| | **NR Band n48**<br>**Channel Bandwidth: 40MHz** | 124.75mW |

| | |
|---|---|
| **ANTENNA GAIN** | Monopole Antenna with -2.38 dBi gain for NR Band n48 |
| **HW VERSION** | 1.0 |
| **SW VERSION** | 1.0 |
| **I/O PORTS** | Refer to user's manual |
| **DATA CABLE** | Ethernet cable: non-shielded cable, with w/o ferrite core, 1.5 meter<br>Phone Cable: non-shielded cable, with w/o ferrite core, 1.5 meter |
| **EXTREME TEMPERATURE** | 0-40 ℃ |
| **EXTREME VOLTAGE** | 3.6V - 24V |

**NOTE**:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

| MODULATION MODE | TX FUNCTION |
|---|---|
| **NR** | 2TX/2RX |

**3.** For UL_MIMO Mode, according to the KDB 662911 D01, Basic methodology with $N_{ANT}$ transmit antennas, each with the same directional gain $G_{ANT}$ dBi, being driven by $N_{ANT}$ transmitter outputs of equal power. Directional gain is to be computed as follows:
Directional gain = $G_{ANT}$ + 10 log($N_{ANT}$) dBi **(**For any transmit signals that are *correlated* with each other**).**
So the Gain of N48 can be calculated as below:

| NR Band | $G_{ANT}$ (All antennas with the same Gain) | Directional gain |
|---|---|---|
| 48 | -2.38dBi | 0.63dBi |

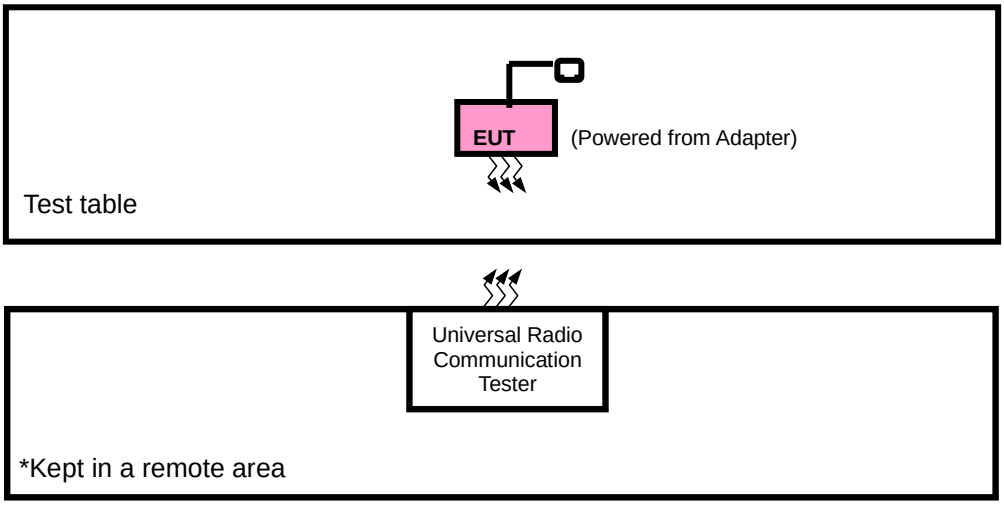
4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

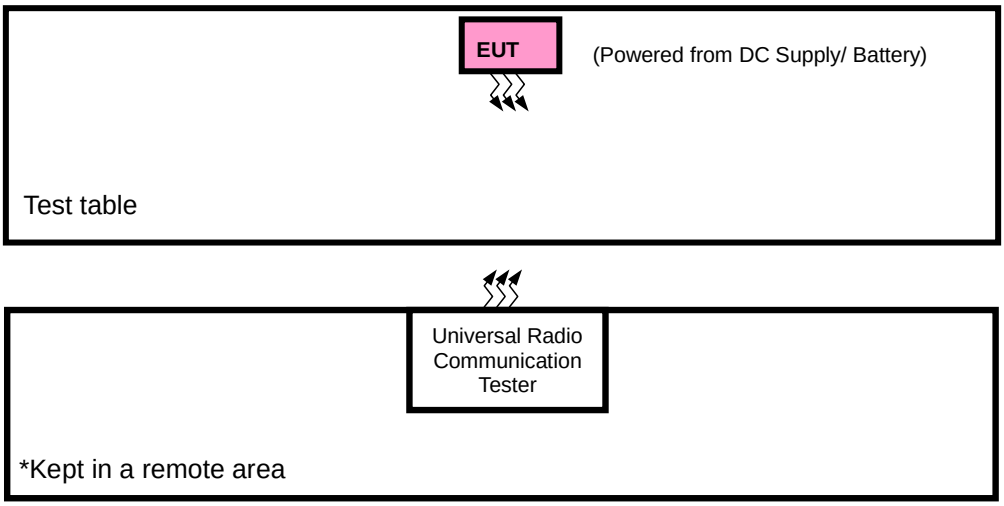
**List of Accessory:**

| ACCESSORIES | MANUFACTURER | MODEL | SPECIFICATION |
|---|---|---|---|
| AC Adapter | Moso Power Supply Technology Co., Ltd. | MS-V3420R190-065L0-US | I/P: 100-240Vac, 1.5A,<br>O/P: 19Vdc, 3.42A |
| Battery | EVE ENERGY CO., LTD. | DRI18650-3S6P | Capacity：10.8Vdc, 15300mAh |
| Ethernet Cable | Wujiang Eksong Electronics Co., LTD. | HQ01-C727 | Signal Line,1.5meter |
| Phone Cable | Wujiang Eksong Electronics Co., LTD. | HQ01-C697 | Signal Line,1.5meter |

## 2.2 CONFIGURATION OF SYSTEM UNDER TEST

### FOR RADIATION EMISSION TEST



## 2.3 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 | DC source | LONG WEI | PS-6403D | 010934269 | N/A |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|---|---|
| 1 | DC Line: Unshielded, Detachable 1.8m |

## 2.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports The worst case was found when positioned on Y-plane for EIRP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

| EUT CONFIGURE MODE | DESCRIPTION |
|---|---|
| A | EUT + Adapter + USB Cable with 5G NR link |
| B | EUT + DC Supply with 5G NR link |

**5G NR n48 MODE (SA_n48, DC_2A_n48A, DC_5A_n48A, DC_13A_n48A, DC_66A_n48A)**

| EUT CONFIGURE MODE | TEST ITEM | AVAILABLE CP-OFDM CHANNEL | AVAILABLE DFT-S-OFDM CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE(DFT-S-OFDM) (INCLUDE CP-OFDM) |
|---|---|---|---|---|---|---|---|
| A | EIRP | 637000 to 646332 | 637000 to 646332 | Low, Middle, High | 10MHz | Pi/2BPSK, QPSK, 16QAM, 64QAM, 256QAM | 1RB/ 0RB Offset |
| | | 637334 to 646000 | 637334 to 646000 | Low, Middle, High | 20MHz | Pi/2BPSK, QPSK, 16QAM, 64QAM, 256QAM | 1RB/ 0RB Offset |
| | | 638000 to 645332 | 638000 to 645332 | Low, Middle, High | 40MHz | Pi/2BPSK, QPSK, 16QAM, 64QAM, 256QAM | 1RB/ 0RB Offset |
| A | RADIATED EMISSION | 637000 to 646332 | 637000 to 646332 | Middle | 10MHz | QPSK | 1RB/ 0RB Offset |
| | | 637334 to 646000 | 637334 to 646000 | Middle | 20MHz | QPSK | 1RB/ 0RB Offset |
| | | 638000 to 645332 | 638000 to 645332 | Low, Middle, High | 40MHz | QPSK | 1RB/ 0RB Offset |

**Note:** 1.This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

2. The test data presented in the report from worst SA_n48

## TEST CONDITION:

| TEST ITEM | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|---|---|---|---|
| ERP&EIRP | 23deg. C, 70%RH | DC 19V By Adapter | Jace Hu |
| RADIATED EMISSION | 23deg. C, 70%RH | DC 19V By Adapter | Jace Hu |

## 2.5 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 96**

**KDB 971168 D02 Power Meas License Digital Systems v02r02**

**KDB 662911 D01 Multiple Transmitter Output v02r01**

**ANSI/TIA/EIA-603-E 2016**

**ANSI 63.26-2015**

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

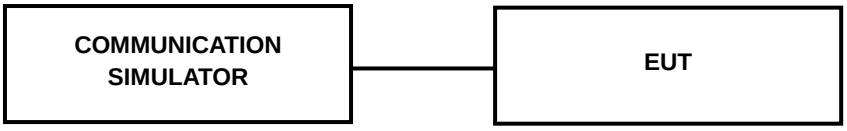
# 3 TEST TYPES AND RESULTS

## 4.1 MAXIMUM EIRP MEASUREMENT

### 3.1.1 LIMITS OF MAXIMUM EIRP MEASUREMENT

| Device | Maximum EIRP (dBm/10 MHz) |
|---|---|
| End User Device | 23 |
| Category A CBSD | 30 |
| Category B CBSD | 47 |

### 3.1.2 TEST SETUP




For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 3.1.3 TEST PROCEDURES

**EIRP MEASUREMENT:**

Per KDB 971168 D01 Power Meas License Digital Systems v03r01 or subclause 5.2.5.5 of ANSI C63.26-2015, the relevant equation for determing the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

ERP or EIRP = $P_{Meas} + G_T - L_C$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as $P_{Meas}$, typically dBW or dBm);

$P_{Meas}$ = measured transmitter output power or PSD, in dBm or dBW;

$G_T$ = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

$L_C$ = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

**CONDUCTED POWER MEASUREMENT:**

a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

### 3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

## 3.1.5 TEST RESULTS

**CONDUCTED OUTPUT POWER (dBm)**

**5G SA**

**EIRP**
**SISO**
**N48**

**CHANNEL BANDWIDTH: 10MHz QPSK**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637000 | 3555 | 21.8 | -2.38 | 19.42 | 87.5 | 23 |
| 641666 | 3624.99 | 21.86 | -2.38 | 19.48 | 88.72 | 23 |
| 646332 | 3694.98 | 21.92 | -2.38 | 19.54 | 89.95 | 23 |

**CHANNEL BANDWIDTH: 10MHz 16QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637000 | 3555 | 21.8 | -2.38 | 19.42 | 87.5 | 23 |
| 641666 | 3624.99 | 21.87 | -2.38 | 19.49 | 88.92 | 23 |
| 646332 | 3694.98 | 21.75 | -2.38 | 19.37 | 86.5 | 23 |

**CHANNEL BANDWIDTH: 10MHz 64QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637000 | 3555 | 20.33 | -2.38 | 17.95 | 62.37 | 23 |
| 641666 | 3624.99 | 20.42 | -2.38 | 18.04 | 63.68 | 23 |
| 646332 | 3694.98 | 20.32 | -2.38 | 17.94 | 62.23 | 23 |

**CHANNEL BANDWIDTH: 10MHz 256QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637000 | 3555 | 18.34 | -2.38 | 15.96 | 39.45 | 23 |
| 641666 | 3624.99 | 18.41 | -2.38 | 16.03 | 40.09 | 23 |
| 646332 | 3694.98 | 18.41 | -2.38 | 16.03 | 40.09 | 23 |

**CHANNEL BANDWIDTH: 20MHz QPSK**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637334 | 3560.01 | 22.1 | -2.38 | 19.72 | 93.76 | 23 |
| 641666 | 3624.99 | 22.05 | -2.38 | 19.67 | 92.68 | 23 |
| 646000 | 3690 | 21.93 | -2.38 | 19.55 | 90.16 | 23 |

**CHANNEL BANDWIDTH: 20MHz 16QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637334 | 3560.01 | 22.23 | -2.38 | 19.85 | 96.61 | 23 |
| 641666 | 3624.99 | 22.11 | -2.38 | 19.73 | 93.97 | 23 |
| 646000 | 3690 | 21.94 | -2.38 | 19.56 | 90.36 | 23 |

**CHANNEL BANDWIDTH: 20MHz 64QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637334 | 3560.01 | 20.63 | -2.38 | 18.25 | 66.83 | 23 |
| 641666 | 3624.99 | 20.56 | -2.38 | 18.18 | 65.77 | 23 |
| 646000 | 3690 | 20.46 | -2.38 | 18.08 | 64.27 | 23 |

**CHANNEL BANDWIDTH: 20MHz 256QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637334 | 3560.01 | 18.63 | -2.38 | 16.25 | 42.17 | 23 |
| 641666 | 3624.99 | 18.59 | -2.38 | 16.21 | 41.78 | 23 |
| 646000 | 3690 | 18.43 | -2.38 | 16.05 | 40.27 | 23 |

**CHANNEL BANDWIDTH: 40MHz QPSK**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 638000 | 3570 | 22.12 | -2.38 | 19.74 | 94.19 | 23 |
| 641666 | 3624.99 | 22.12 | -2.38 | 19.74 | 94.19 | 23 |
| 645332 | 3679.98 | 22.03 | -2.38 | 19.65 | 92.26 | 23 |

**CHANNEL BANDWIDTH: 40MHz 16QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 638000 | 3570 | 22.05 | -2.38 | 19.67 | 92.68 | 23 |
| 641666 | 3624.99 | 22.01 | -2.38 | 19.63 | 91.83 | 23 |
| 645332 | 3679.98 | 22.03 | -2.38 | 19.65 | 92.26 | 23 |

**CHANNEL BANDWIDTH: 40MHz 64QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 638000 | 3570 | 20.65 | -2.38 | 18.27 | 67.14 | 23 |
| 641666 | 3624.99 | 20.55 | -2.38 | 18.17 | 65.61 | 23 |
| 645332 | 3679.98 | 20.42 | -2.38 | 18.04 | 63.68 | 23 |

**CHANNEL BANDWIDTH: 40MHz 256QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 638000 | 3570 | 18.65 | -2.38 | 16.27 | 42.36 | 23 |
| 641666 | 3624.99 | 18.63 | -2.38 | 16.25 | 42.17 | 23 |
| 645332 | 3679.98 | 18.42 | -2.38 | 16.04 | 40.18 | 23 |

**MIMO**

**N48**

**CHANNEL BANDWIDTH: 10MHz QPSK**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637000 | 3555 | 19.79 | 0.63 | 20.42 | 110.16 | 23 |
| 641666 | 3624.99 | 20.07 | 0.63 | 20.70 | 117.5 | 23 |
| 646332 | 3694.98 | 19.81 | 0.63 | 20.44 | 110.67 | 23 |

**CHANNEL BANDWIDTH: 10MHz 16QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637000 | 3555 | 19.3 | 0.63 | 19.93 | 98.41 | 23 |
| 641666 | 3624.99 | 19.53 | 0.63 | 20.16 | 103.76 | 23 |
| 646332 | 3694.98 | 19.26 | 0.63 | 19.89 | 97.51 | 23 |

**CHANNEL BANDWIDTH: 10MHz 64QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637000 | 3555 | 17.77 | 0.63 | 18.40 | 69.19 | 23 |
| 641666 | 3624.99 | 17.85 | 0.63 | 18.48 | 70.47 | 23 |
| 646332 | 3694.98 | 18.13 | 0.63 | 18.76 | 75.17 | 23 |

**CHANNEL BANDWIDTH: 10MHz 256QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637000 | 3555 | 15.19 | 0.63 | 15.82 | 38.2 | 23 |
| 641666 | 3624.99 | 15.37 | 0.63 | 16.00 | 39.81 | 23 |
| 646332 | 3694.98 | 14.95 | 0.63 | 15.58 | 36.14 | 23 |

**CHANNEL BANDWIDTH: 20MHz QPSK**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637334 | 3560.01 | 20.08 | 0.63 | 20.71 | 117.77 | 23 |
| 641666 | 3624.99 | 20.19 | 0.63 | 20.82 | 120.79 | 23 |
| 646000 | 3690 | 19.86 | 0.63 | 20.49 | 111.95 | 23 |

**CHANNEL BANDWIDTH: 20MHz 16QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637334 | 3560.01 | 19.5 | 0.63 | 20.13 | 103.05 | 23 |
| 641666 | 3624.99 | 19.76 | 0.63 | 20.39 | 109.4 | 23 |
| 646000 | 3690 | 19.43 | 0.63 | 20.06 | 101.4 | 23 |

**CHANNEL BANDWIDTH: 20MHz 64QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637334 | 3560.01 | 18.32 | 0.63 | 18.95 | 78.53 | 23 |
| 641666 | 3624.99 | 18.08 | 0.63 | 18.71 | 74.31 | 23 |
| 646000 | 3690 | 17.77 | 0.63 | 18.40 | 69.19 | 23 |

**CHANNEL BANDWIDTH: 20MHz 256QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 637334 | 3560.01 | 15.4 | 0.63 | 16.03 | 40.09 | 23 |
| 641666 | 3624.99 | 15.5 | 0.63 | 16.13 | 41.02 | 23 |
| 646000 | 3690 | 15.2 | 0.63 | 15.83 | 38.29 | 23 |

**CHANNEL BANDWIDTH: 40MHz QPSK**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 638000 | 3570 | 20.33 | 0.63 | 20.96 | 124.75 | 23 |
| 641666 | 3624.99 | 20.17 | 0.63 | 20.80 | 120.23 | 23 |
| 645332 | 3679.98 | 20.17 | 0.63 | 20.80 | 120.23 | 23 |

**CHANNEL BANDWIDTH: 40MHz 16QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 638000 | 3570 | 19.84 | 0.63 | 20.47 | 111.44 | 23 |
| 641666 | 3624.99 | 19.72 | 0.63 | 20.35 | 108.4 | 23 |
| 645332 | 3679.98 | 19.53 | 0.63 | 20.16 | 103.76 | 23 |

**CHANNEL BANDWIDTH: 40MHz 64QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 638000 | 3570 | 18.03 | 0.63 | 18.66 | 73.46 | 23 |
| 641666 | 3624.99 | 17.99 | 0.63 | 18.62 | 72.78 | 23 |
| 645332 | 3679.98 | 17.82 | 0.63 | 18.45 | 69.99 | 23 |

**CHANNEL BANDWIDTH: 40MHz 256QAM**

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (dBm/10MHz) |
|---|---|---|---|---|---|---|
| 638000 | 3570 | 15.68 | 0.63 | 16.31 | 42.76 | 23 |
| 641666 | 3624.99 | 15.51 | 0.63 | 16.14 | 41.12 | 23 |
| 645332 | 3679.98 | 15.32 | 0.63 | 15.95 | 39.36 | 23 |

## 4.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

### 3.2.2 TEST PROCEDURES

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

b. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step a. Record the power level of S.G

c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

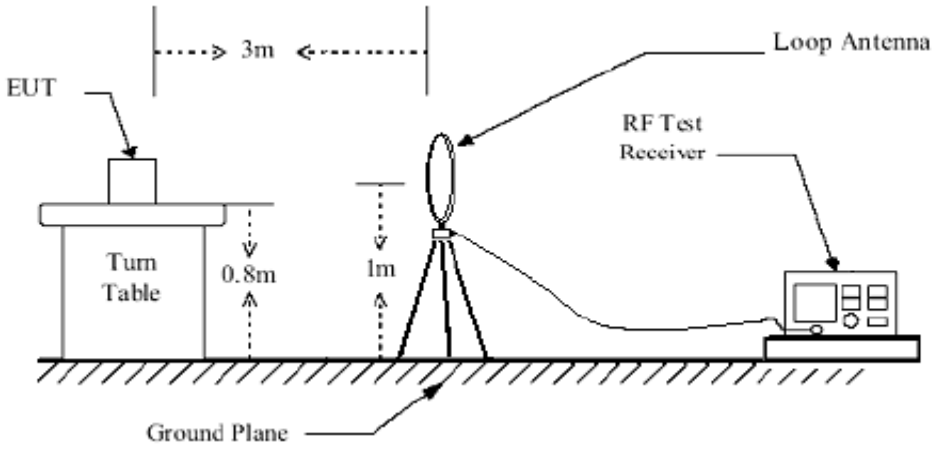
**Note:** The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

### 3.2.3 DEVIATION FROM TEST STANDARD

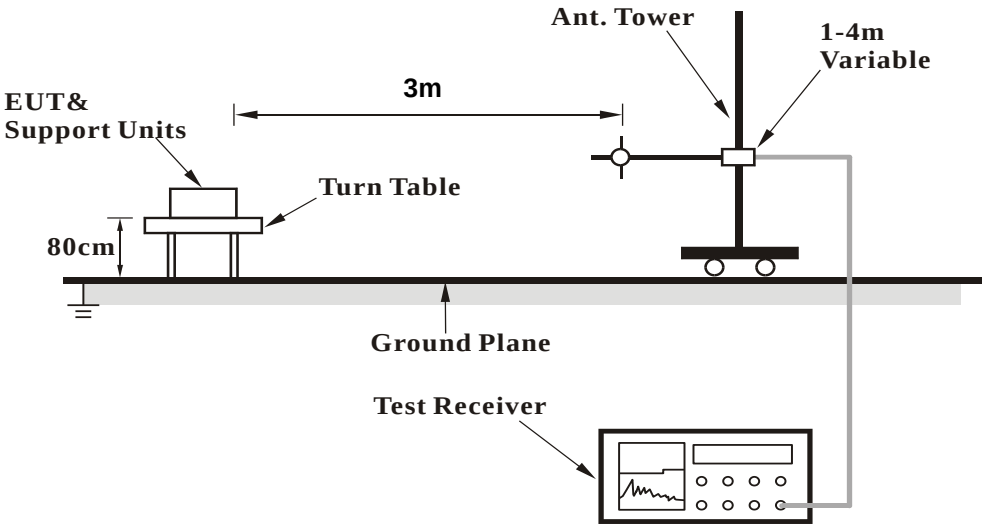
No deviation.

## 3.2.4 TEST SET UP

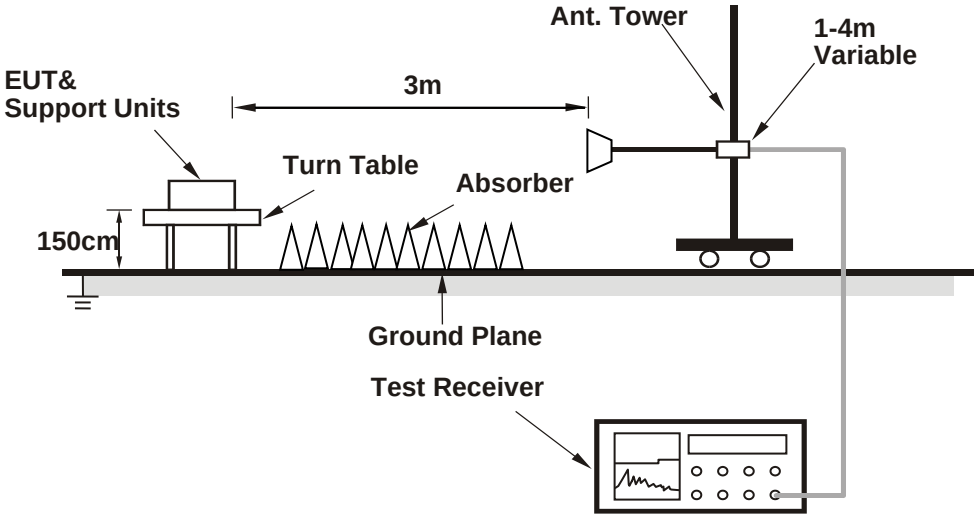
**< Frequency Range below 30MHz >**




**<Frequency Range below 1GHz>**



**<Frequency Range above 1GHz>**




For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 3.2.5 TEST RESULTS

NOTE ： The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

**5G SA BELOW 1GHz WORST-CASE DATA**

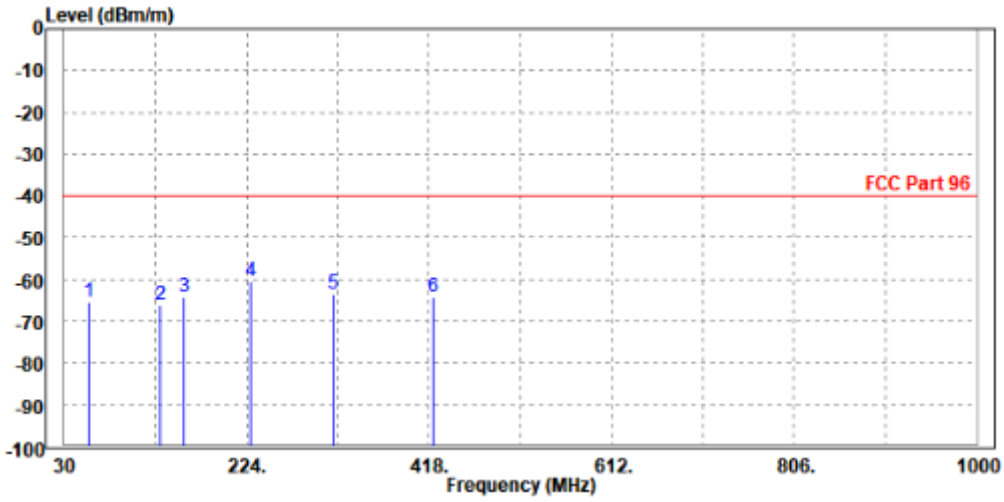
**30 MHz – 1GHz data:**

**N48**

**CHANNEL BANDWIDTH: 40MHz / QPSK**

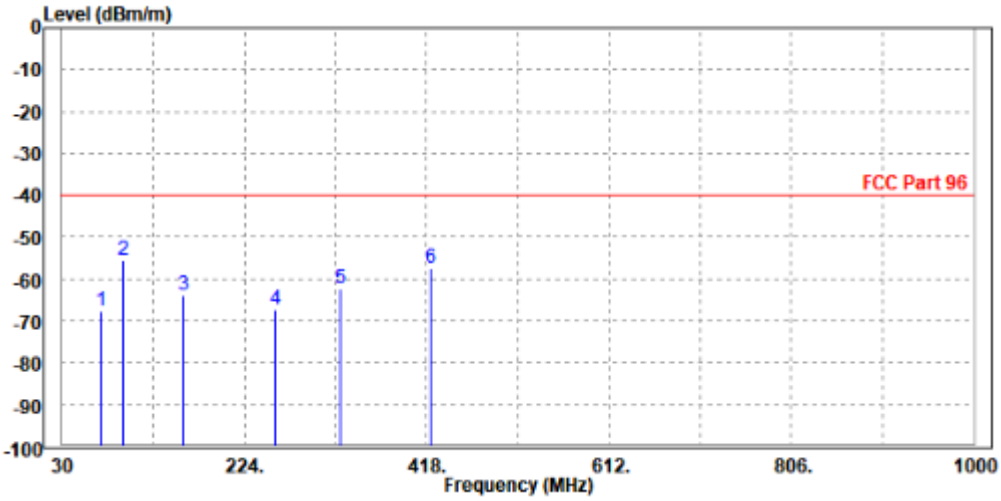
| **MODE** | TX channel 645332 | **FREQUENCY RANGE** | Below 1000MHz |
|---|---|---|---|
| **ENVIRONMENTAL CONDITIONS** | 23deg. C, 70%RH | **INPUT POWER** | AC 120V/60HZ |
| **TESTED BY** | Jace Hu | | |
| **ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M** | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 56.190 | -65.37 | -47.29 | -40.00 | -25.37 | -18.08 | Peak | Horizontal |
| 2 | 132.820 | -66.05 | -45.30 | -40.00 | -26.05 | -20.75 | Peak | Horizontal |
| 3 | 158.040 | -64.08 | -47.60 | -40.00 | -24.08 | -16.48 | Peak | Horizontal |
| 4 PP | 228.850 | -60.52 | -46.54 | -40.00 | -20.52 | -13.98 | Peak | Horizontal |
| 5 | 316.150 | -63.67 | -51.60 | -40.00 | -23.67 | -12.07 | Peak | Horizontal |
| 6 | 422.850 | -64.08 | -54.46 | -40.00 | -24.08 | -9.62 | Peak | Horizontal |



| MODE | TX channel 645332 | FREQUENCY RANGE | Below 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60HZ |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

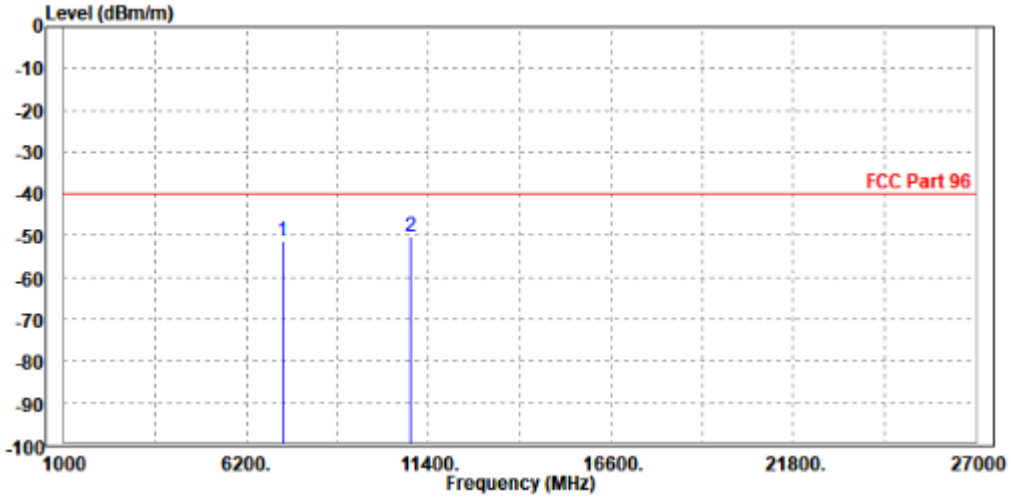
| | | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | | 70.740 | -67.64 | -45.22 | -40.00 | -27.64 | -22.42 | Peak | Vertical |
| 2 | PP | 94.990 | -55.66 | -44.59 | -40.00 | -15.66 | -11.07 | Peak | Vertical |
| 3 | | 159.010 | -64.04 | -47.10 | -40.00 | -24.04 | -16.94 | Peak | Vertical |
| 4 | | 256.980 | -67.17 | -53.96 | -40.00 | -27.17 | -13.21 | Peak | Vertical |
| 5 | | 326.820 | -62.44 | -52.11 | -40.00 | -22.44 | -10.33 | Peak | Vertical |
| 6 | | 421.880 | -57.46 | -48.66 | -40.00 | -17.46 | -8.80 | Peak | Vertical |



**ABOVE 1GHz**
**N48**
**CHANNEL BANDWIDTH: 10MHz / QPSK**

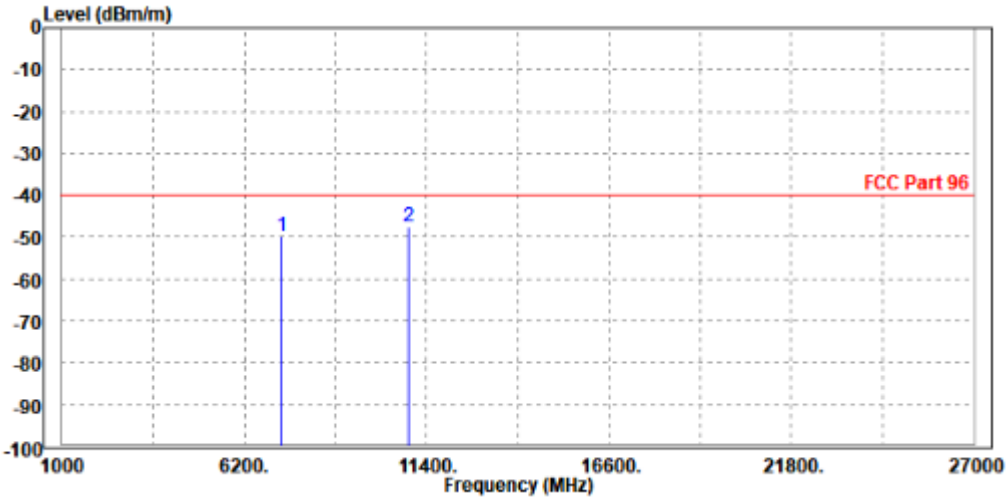
| | | | |
|---|---|---|---|
| **MODE** | TX channel 641666 | **FREQUENCY RANGE** | Above 1000MHz |
| **ENVIRONMENTAL CONDITIONS** | 23deg. C, 70%RH | **INPUT POWER** | AC 120V/60Hz |
| **TESTED BY** | Jace Hu | | |
| **ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M** | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 7240.000 | -51.16 | -63.00 | -40.00 | -11.16 | 11.84 | Peak | Horizontal |
| 2 | PP10874.970 | -50.17 | -69.78 | -40.00 | -10.17 | 19.61 | Peak | Horizontal |



| MODE | TX channel 641666 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

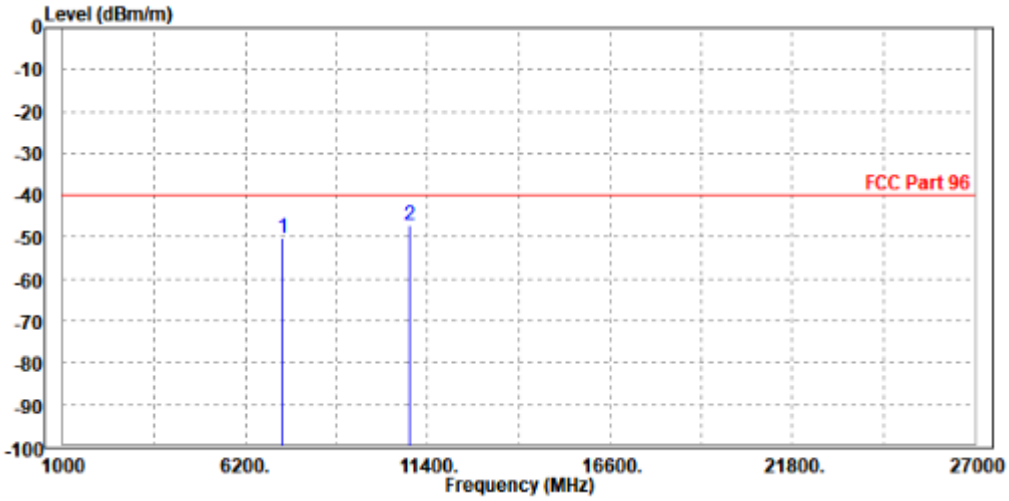
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 7249.980 | -49.63 | -63.34 | -40.00 | -9.63 | 13.71 | Peak | Vertical |
| 2 | PP10874.970 | -47.64 | -67.31 | -40.00 | -7.64 | 19.67 | Peak | Vertical |



**CHANNEL BANDWIDTH: 20MHz / QPSK**

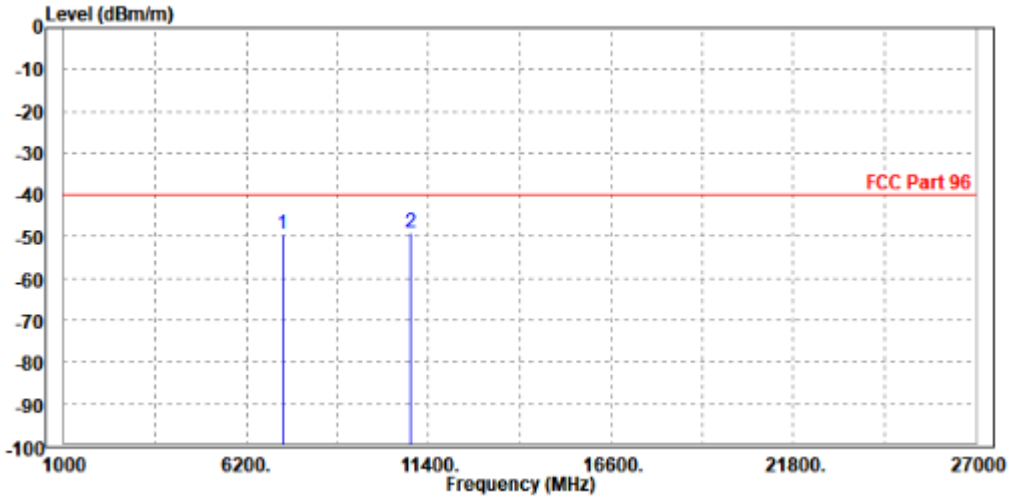
| | | | |
|---|---|---|---|
| **MODE** | TX channel 641666 | **FREQUENCY RANGE** | Above 1000MHz |
| **ENVIRONMENTAL CONDITIONS** | 23deg. C, 70%RH | **INPUT POWER** | AC 120V/60Hz |
| **TESTED BY** | Jace Hu | | |
| **ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M** | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 7249.980 | -50.15 | -61.97 | -40.00 | -10.15 | 11.82 | Peak | Horizontal |
| 2 | PP10874.970 | -47.32 | -66.93 | -40.00 | -7.32 | 19.61 | Peak | Horizontal |



| MODE | TX channel 641666 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 7240.000 | -49.51 | -63.18 | -40.00 | -9.51 | 13.67 | Peak | Vertical |
| 2 | PP10874.970 | -48.97 | -68.64 | -40.00 | -8.97 | 19.67 | Peak | Vertical |

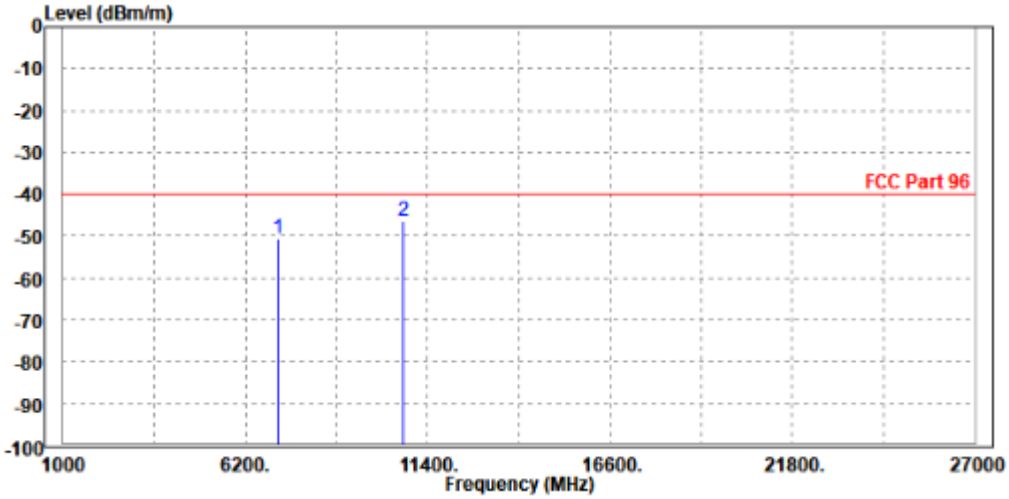


**CHANNEL BANDWIDTH: 40MHz / QPSK**

**CH638000:**

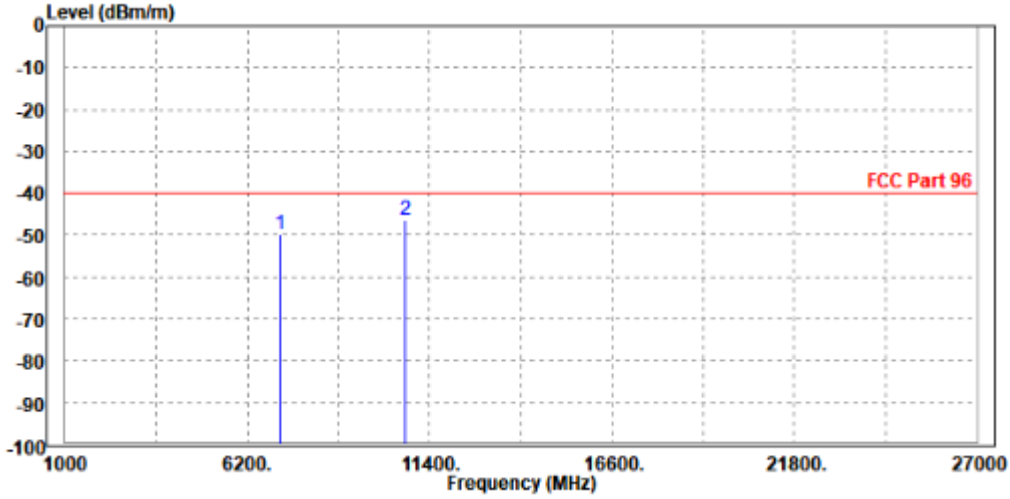
| | | | |
|---|---|---|---|
| **MODE** | TX channel 638000 | **FREQUENCY RANGE** | Above 1000MHz |
| **ENVIRONMENTAL CONDITIONS** | 23deg. C, 70%RH | **INPUT POWER** | AC 120V/60Hz |
| **TESTED BY** | Jace Hu | | |
| **ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M** | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 7140.000 | -50.71 | -62.71 | -40.00 | -10.71 | 12.00 | Peak | Horizontal |
| 2 | PP10698.000 | -46.55 | -65.68 | -40.00 | -6.55 | 19.13 | Peak | Horizontal |



| MODE | TX channel 638000 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

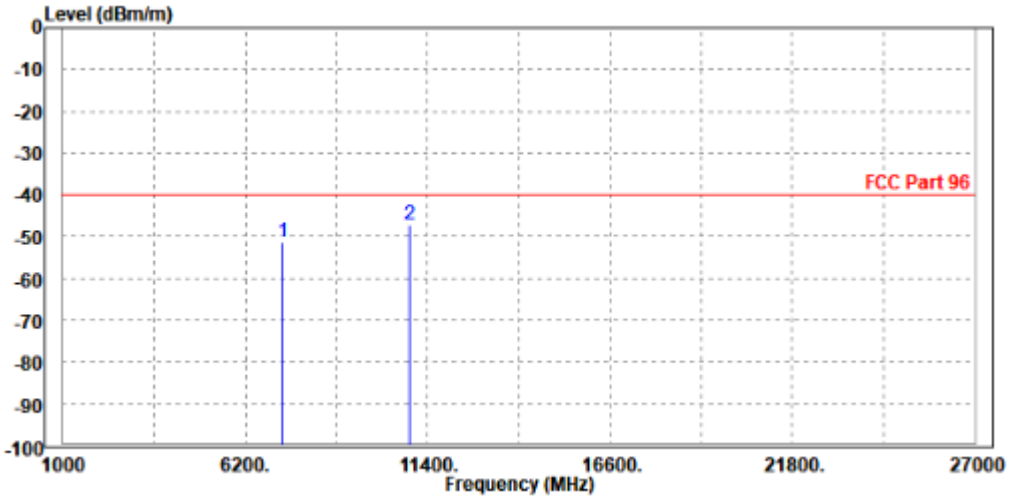
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 7136.000 | -49.92 | -63.19 | -40.00 | -9.92 | 13.27 | Peak | Vertical |
| 2 | PP10698.000 | -46.56 | -65.40 | -40.00 | -6.56 | 18.84 | Peak | Vertical |



**CH641666:**

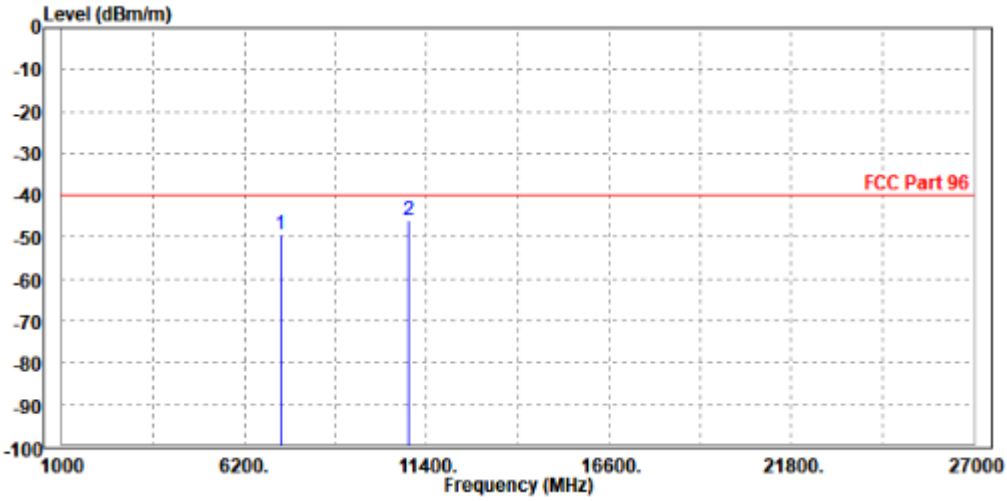
| MODE | TX channel 641666 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 7249.980 | -51.47 | -63.29 | -40.00 | -11.47 | 11.82 | Peak | Horizontal |
| 2 | PP10874.970 | -46.99 | -66.60 | -40.00 | -6.99 | 19.61 | Peak | Horizontal |



| MODE | TX channel 641666 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

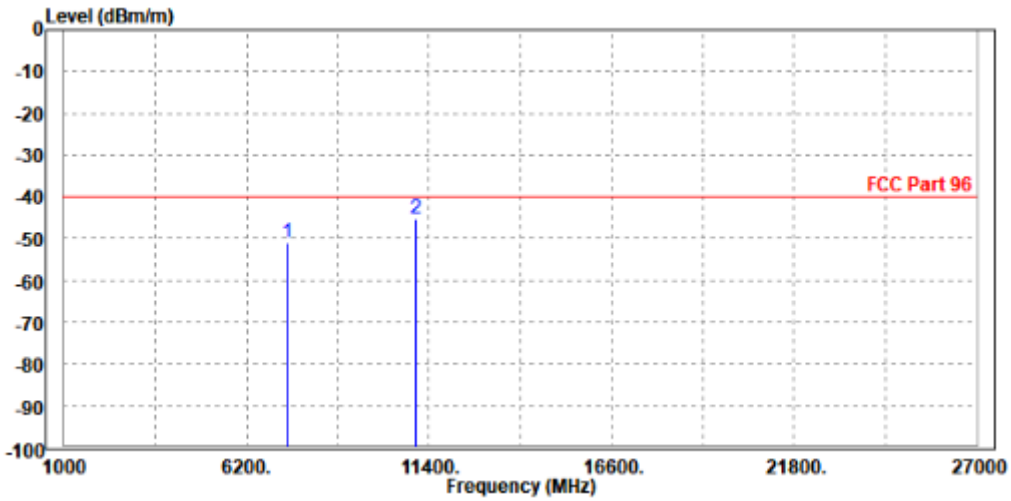
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 7240.000 | -49.59 | -63.26 | -40.00 | -9.59 | 13.67 | Peak | Vertical |
| 2 | PP10874.970 | -46.01 | -65.68 | -40.00 | -6.01 | 19.67 | Peak | Vertical |



**CH645332:**

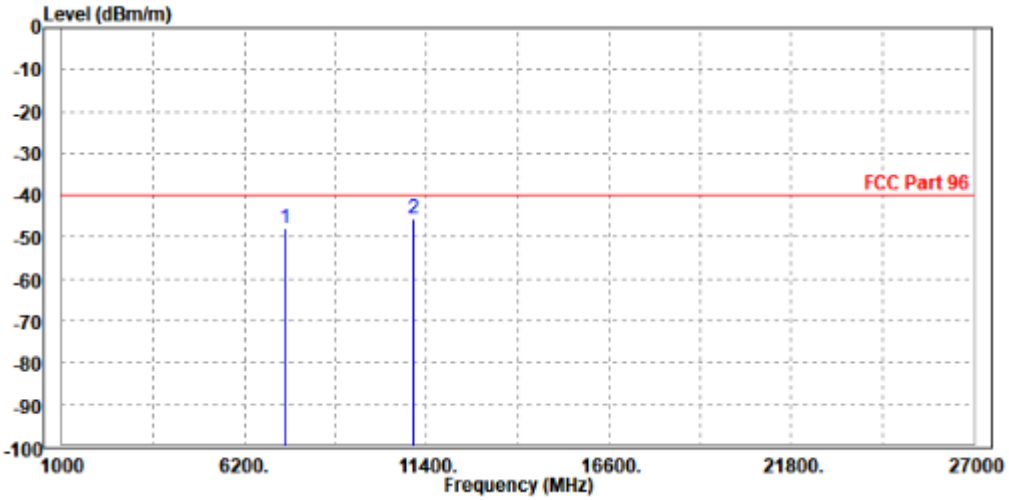
| MODE | TX channel 645332 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 7370.000 | -51.04 | -62.67 | -40.00 | -11.04 | 11.63 | Peak | Horizontal |
| 2 | PP11036.000 | -45.30 | -65.30 | -40.00 | -5.30 | 20.00 | Peak | Horizontal |



| MODE | TX channel 645332 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 7359.960 | -47.85 | -62.00 | -40.00 | -7.85 | 14.15 | Peak | Vertical |
| 2 | PP11036.000 | -45.60 | -65.66 | -40.00 | -5.60 | 20.06 | Peak | Vertical |



**UL_MIMO:**

**5G SA**

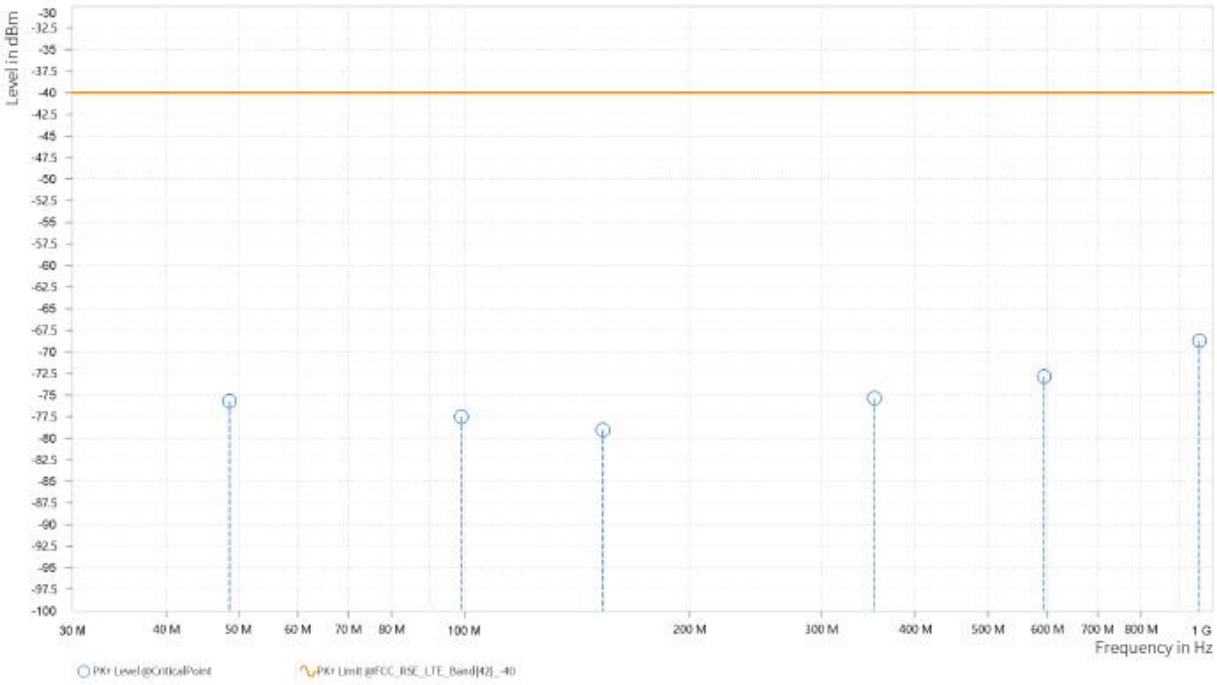
**30 MHz – 1GHz data:**

**N48**

**CHANNEL BANDWIDTH: 10MHz / QPSK**

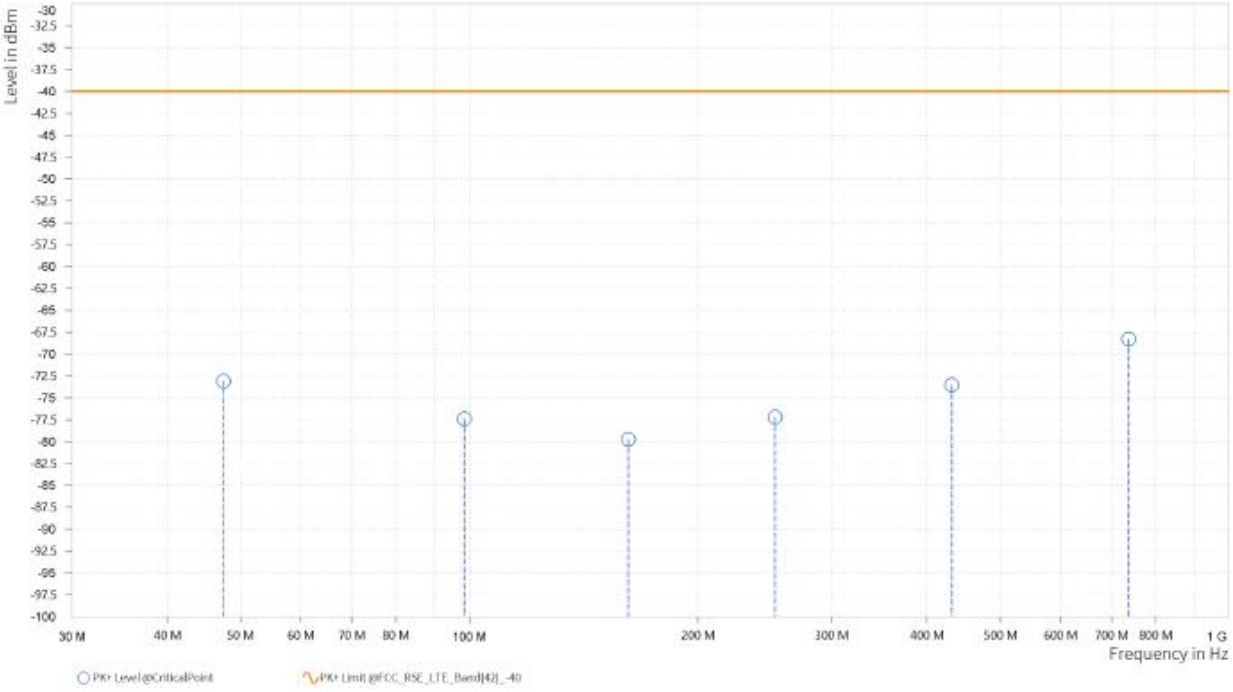
| | | | |
|---|---|---|---|
| **MODE** | TX channel 646332 | **FREQUENCY RANGE** | Below 1000MHz |
| **ENVIRONMENTAL CONDITIONS** | 23deg. C, 70%RH | **INPUT POWER** | AC 120V/60HZ |
| **TESTED BY** | Jace Hu | | |
| **ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M** | | | |

| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 1 | 48.600 | -75.73 | -40.00 | 35.73 | -0.65 | H | 177.4 | 2 |
| 1 | 99.100 | -77.50 | -40.00 | 37.50 | -2.65 | H | 177.4 | 2 |
| 1 | 153.050 | -79.03 | -40.00 | 39.03 | -9.09 | H | 26.8 | 2 |
| 1 | 352.950 | -75.37 | -40.00 | 35.37 | 1.78 | H | 355.4 | 2 |
| 2 | 594.238 | -72.87 | -40.00 | 32.87 | 5.42 | H | 359 | 1 |
| 2 | 957.513 | -68.72 | -40.00 | 28.72 | 10.75 | H | 115.4 | 1 |



| MODE | TX channel 646332 | FREQUENCY RANGE | Below 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60HZ |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 1 | 47.450 | -73.08 | -40.00 | 33.08 | 1.45 | V | 182.3 | 1 |
| 1 | 98.550 | -77.39 | -40.00 | 37.39 | 1.56 | V | 182.3 | 1 |
| 1 | 162.000 | -79.73 | -40.00 | 39.73 | -6.47 | V | 1 | 1 |
| 1 | 252.450 | -77.19 | -40.00 | 37.19 | -0.96 | V | 175.1 | 2 |
| 1 | 431.350 | -73.54 | -40.00 | 33.54 | 4.14 | V | 0.9 | 2 |
| 2 | 737.329 | -68.27 | -40.00 | 28.27 | 7.90 | V | 99.8 | 2 |



**ABOVE 1GHz**

**Note:** For higher frequency, the emission is too low to be detected.

**N48**

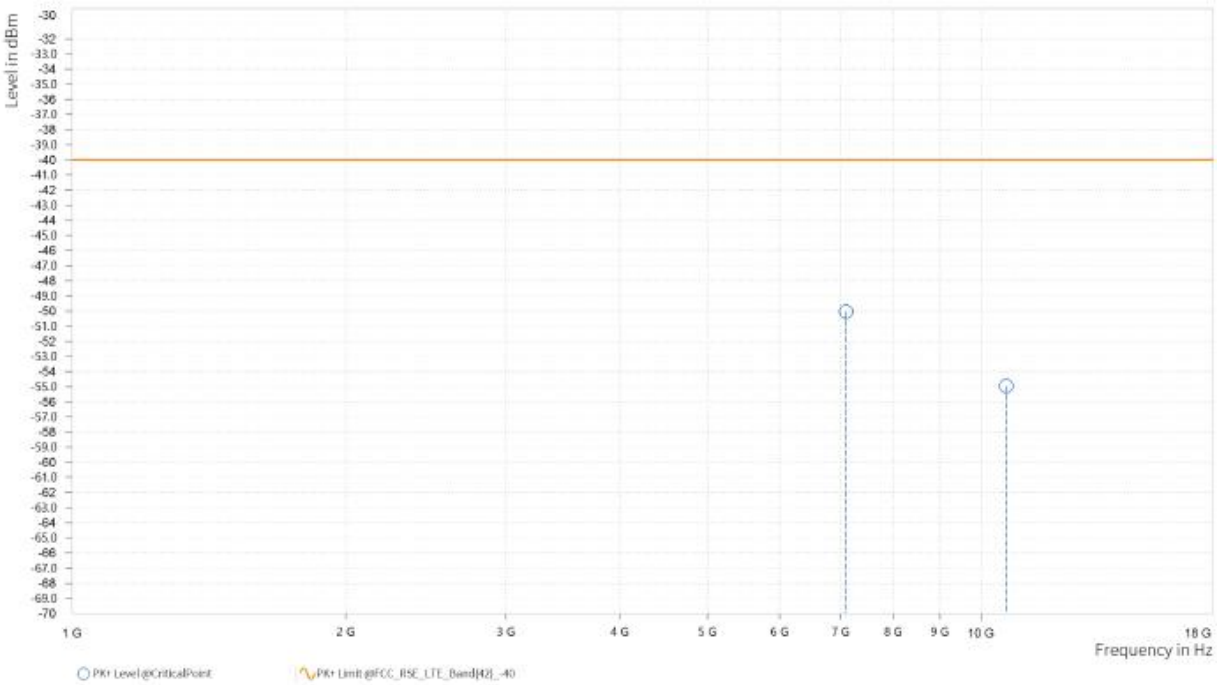
**Note: For frequency above 18GHz, the emission was tested 20db below the limit so the data not recorded in the sheet.**

**CHANNEL BANDWIDTH: 10MHz / QPSK**

**CH637000**

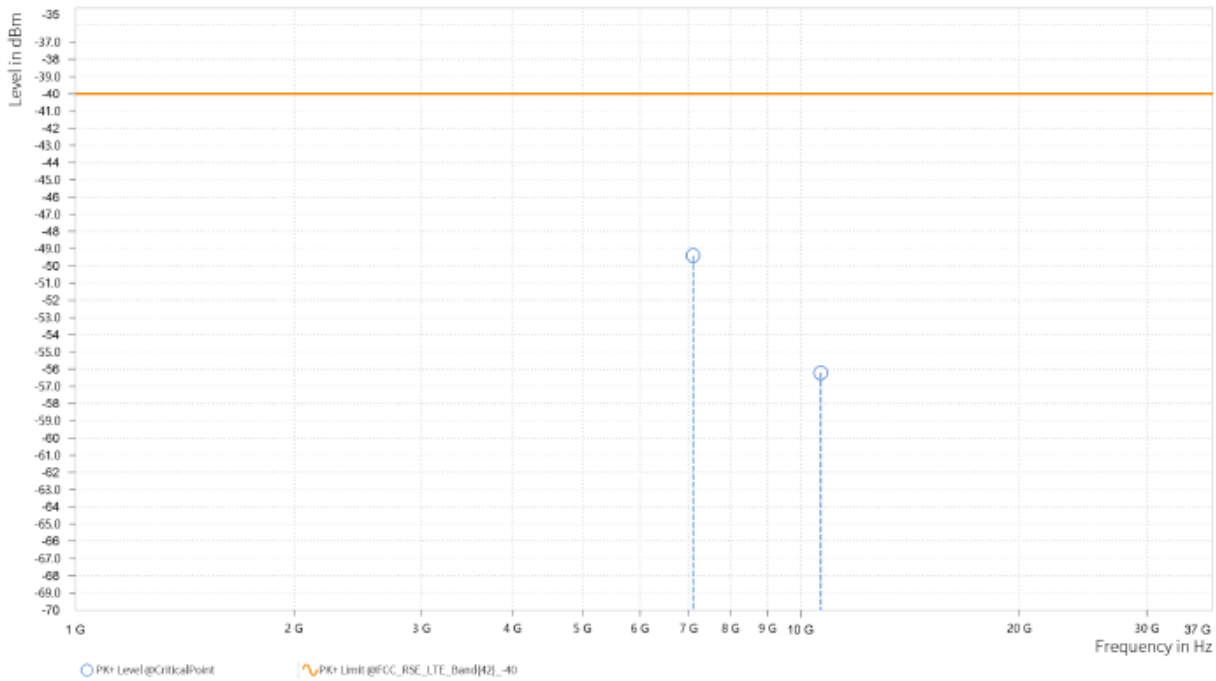
| **MODE** | TX channel 637000 | **FREQUENCY RANGE** | Above 1000MHz |
|---|---|---|---|
| **ENVIRONMENTAL CONDITIONS** | 23deg. C, 70%RH | **INPUT POWER** | AC 120V/60Hz |
| **TESTED BY** | Jace Hu | | |
| **ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M** | | | |

| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 5 | 7,100.030 | -50.05 | -40.00 | 10.05 | 23.81 | H | 1 | 1 |
| 6 | 10,649.500 | -54.97 | -40.00 | 14.97 | 15.58 | H | 1 | 2 |



| MODE | TX channel 637000 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

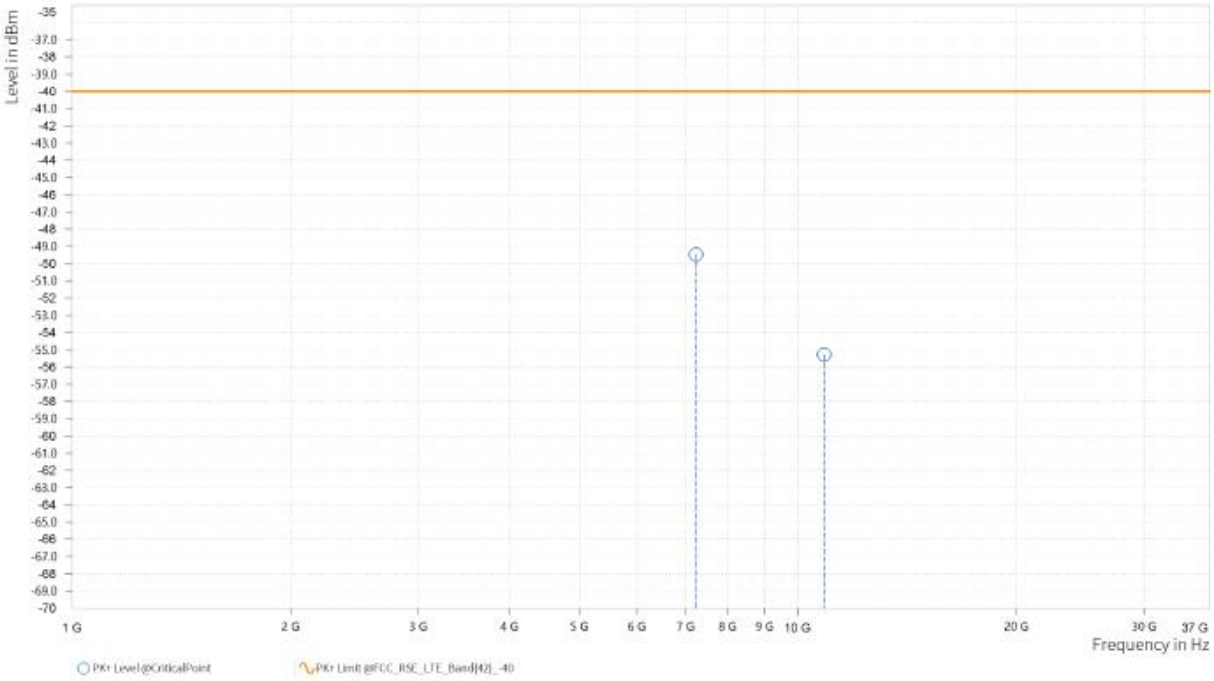
| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 5 | 7,100.030 | -49.40 | -40.00 | 9.40 | 23.79 | V | 359 | 2 |
| 6 | 10,650.000 | -56.21 | -40.00 | 16.21 | 15.78 | V | 6.6 | 2 |



**CH641666**

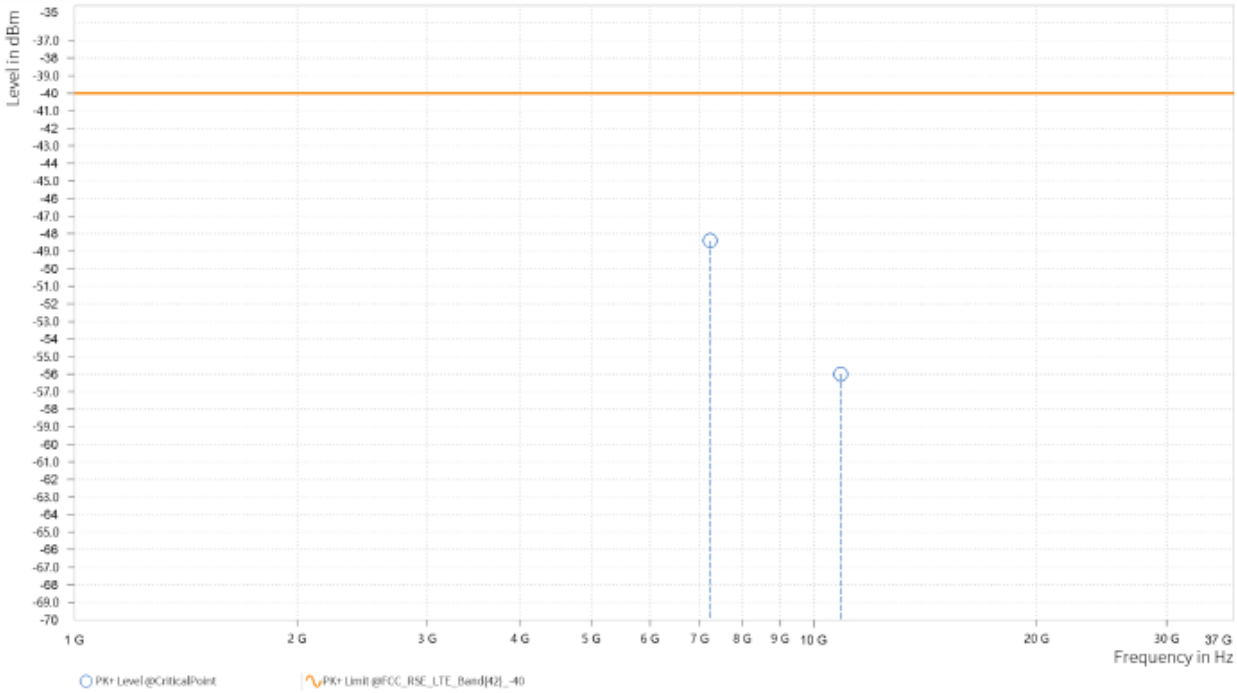
| | | | |
|---|---|---|---|
| **MODE** | TX channel 641666 | **FREQUENCY RANGE** | Above 1000MHz |
| **ENVIRONMENTAL CONDITIONS** | 23deg. C, 70%RH | **INPUT POWER** | AC 120V/60Hz |
| **TESTED BY** | Jace Hu | | |
| **ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M** | | | |

| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 5 | 7,240.152 | -49.46 | -40.00 | 9.46 | 24.65 | H | 1.6 | 2 |
| 6 | 10,860.000 | -55.27 | -40.00 | 15.27 | 16.03 | H | 359 | 1 |



| MODE | TX channel 641666 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

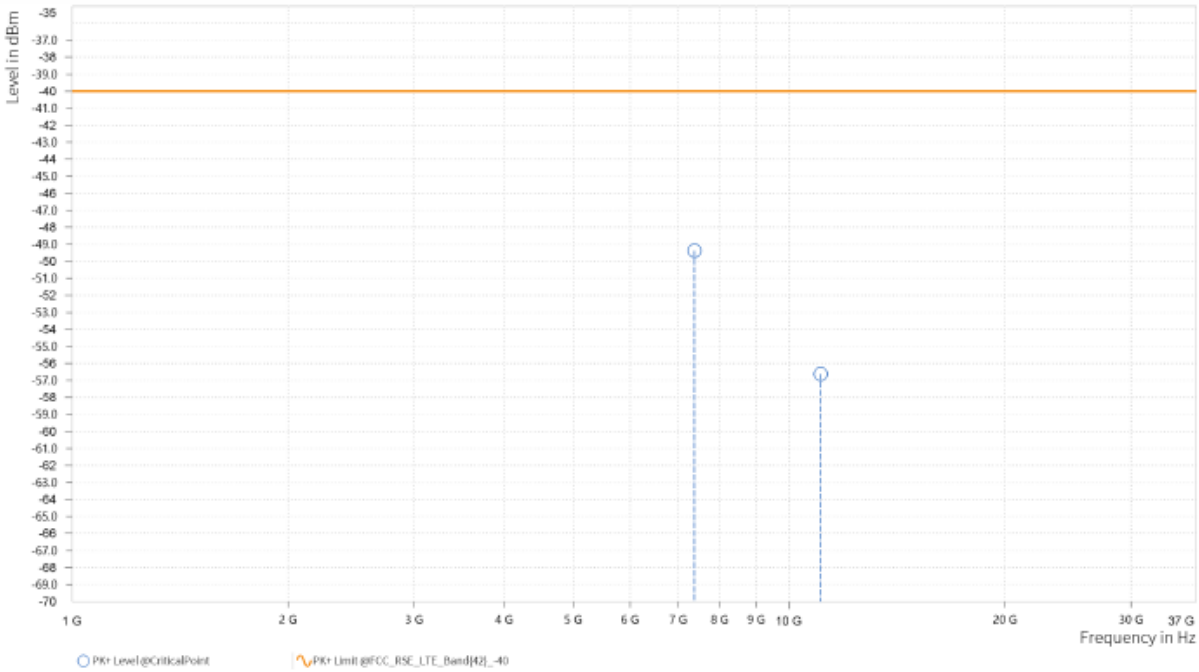
| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 5 | 7,239.894 | -48.40 | -40.00 | 8.40 | 24.62 | V | 275.6 | 1 |
| 6 | 10,860.000 | -55.99 | -40.00 | 15.99 | 16.16 | V | 0.9 | 2 |



**CH646332**

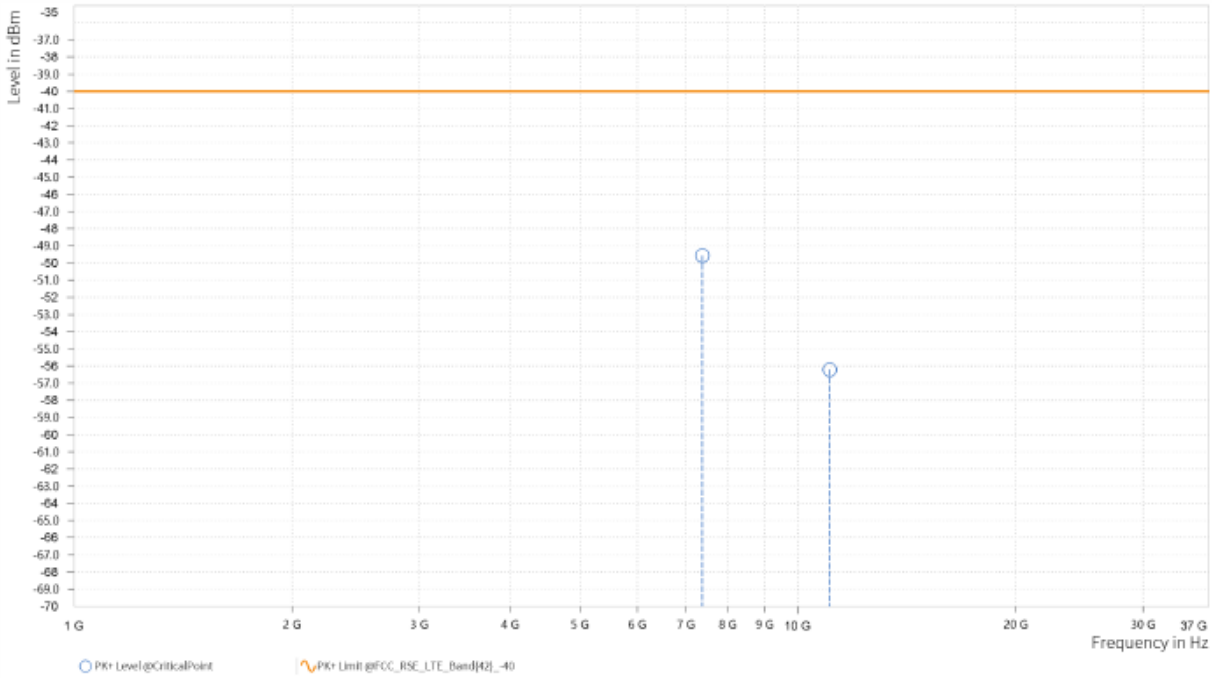
| | | | |
|---|---|---|---|
| **MODE** | TX channel 646332 | **FREQUENCY RANGE** | Above 1000MHz |
| **ENVIRONMENTAL CONDITIONS** | 23deg. C, 70%RH | **INPUT POWER** | AC 120V/60Hz |
| **TESTED BY** | Jace Hu | | |
| **ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M** | | | |

| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 5 | 7,380.015 | -49.38 | -40.00 | 9.38 | 24.36 | H | 1 | 1 |
| 6 | 11,070.000 | -56.62 | -40.00 | 16.62 | 16.09 | H | 359 | 2 |



| MODE | TX channel 646332 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

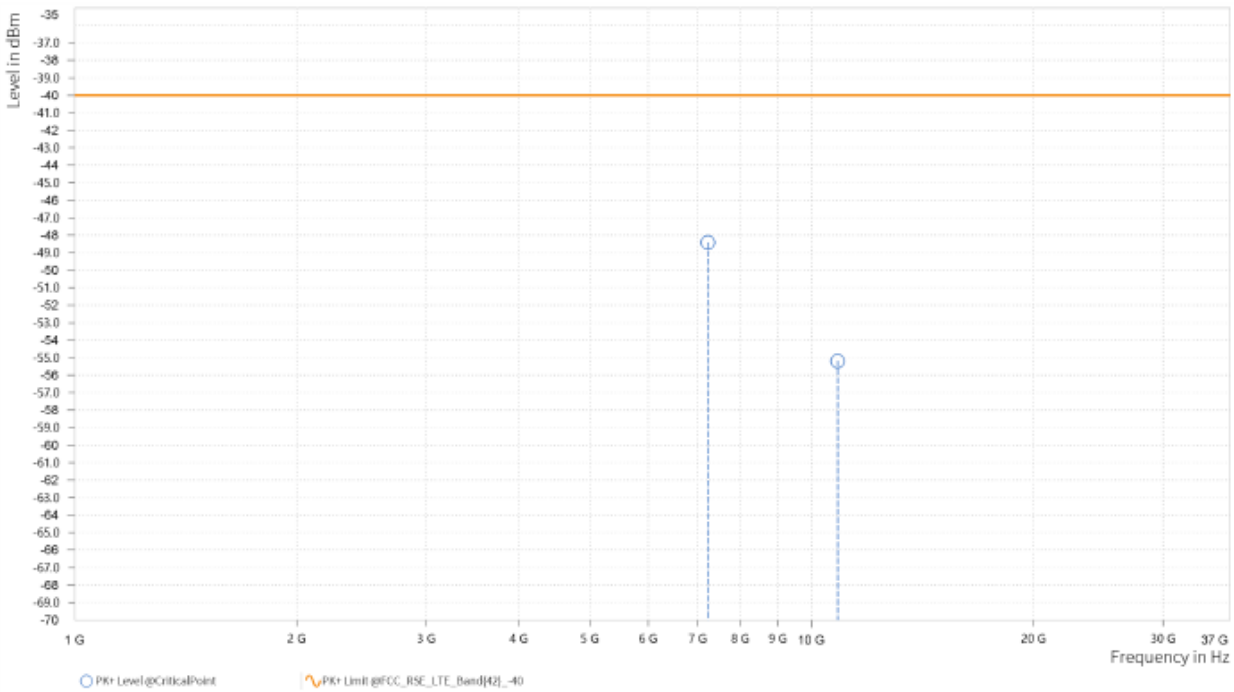
| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 5 | 7,380.015 | -49.57 | -40.00 | 9.57 | 24.40 | V | 359 | 2 |
| 6 | 11,070.000 | -56.21 | -40.00 | 16.21 | 16.28 | V | 352.6 | 1 |



**CHANNEL BANDWIDTH: 20MHz / QPSK**

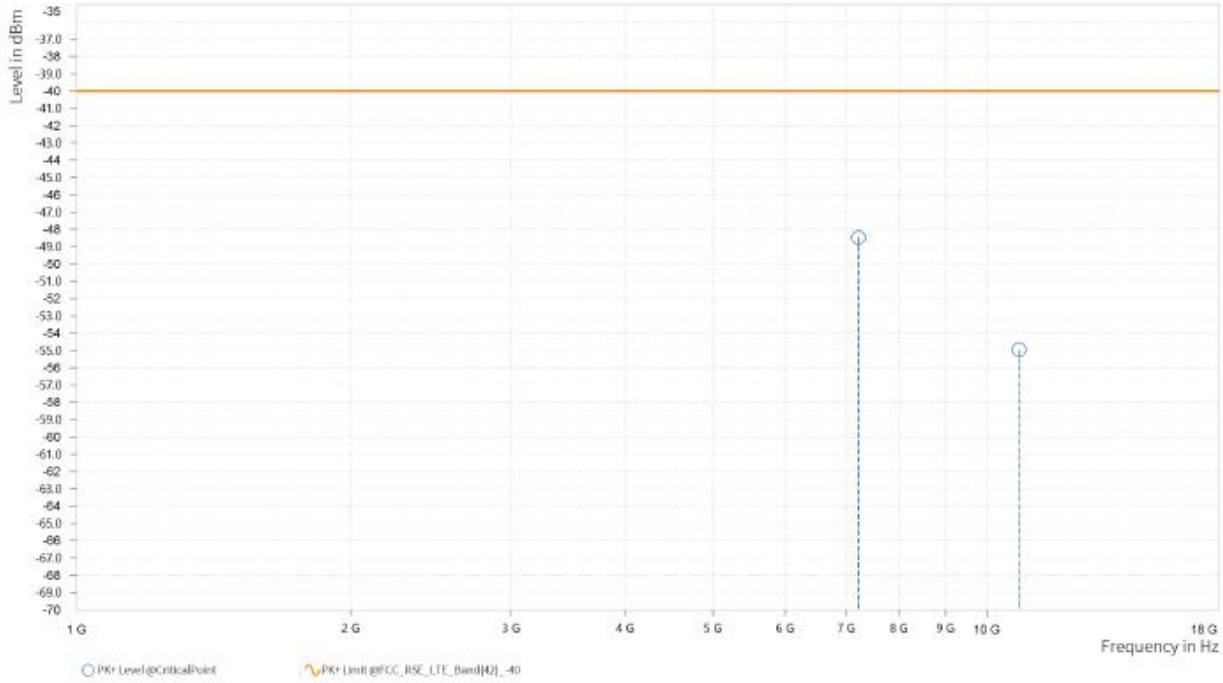
| | | | |
|---|---|---|---|
| **MODE** | TX channel 641666 | **FREQUENCY RANGE** | Above 1000MHz |
| **ENVIRONMENTAL CONDITIONS** | 23deg. C, 70%RH | **INPUT POWER** | AC 120V/60Hz |
| **TESTED BY** | Jace Hu | | |
| **ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M** | | | |

| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 5 | 7,229.848 | -48.41 | -40.00 | 8.41 | 24.53 | H | 0.9 | 2 |
| 6 | 10,845.000 | -55.19 | -40.00 | 15.19 | 16.08 | H | 359.1 | 1 |



| MODE | TX channel 641666 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

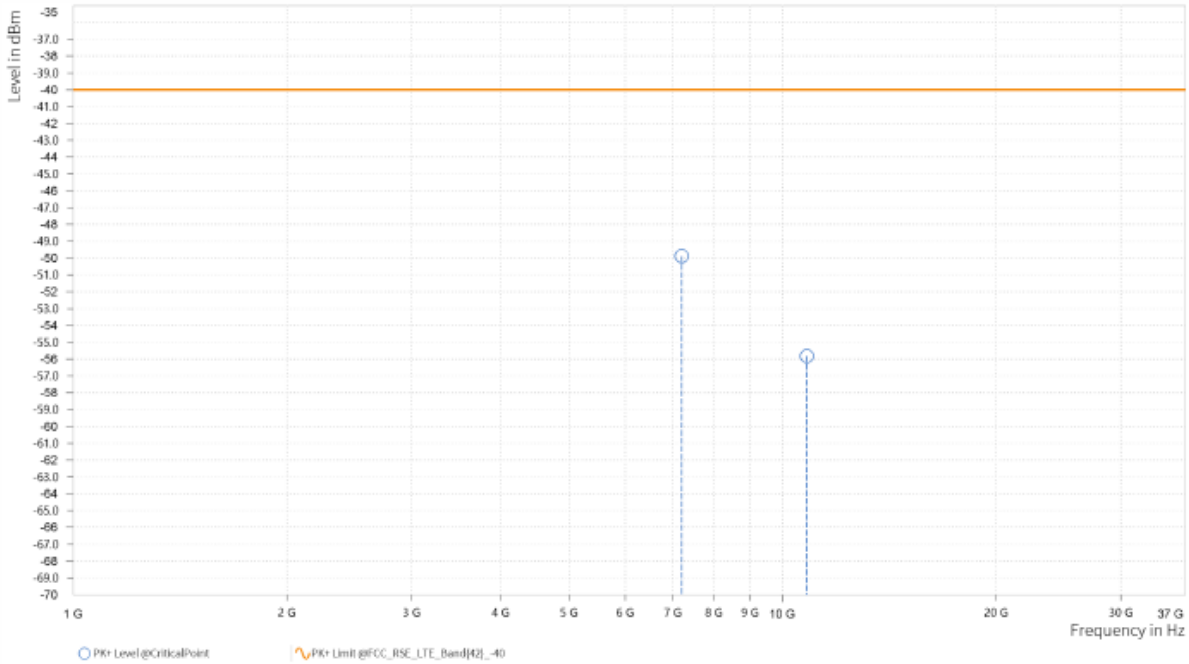
| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 5 | 7,223.409 | -48.47 | -40.00 | 8.47 | 24.42 | V | 278 | 1 |
| 6 | 10,844.500 | -54.94 | -40.00 | 14.94 | 16.21 | V | 353 | 1 |



**CHANNEL BANDWIDTH: 40MHz / QPSK**

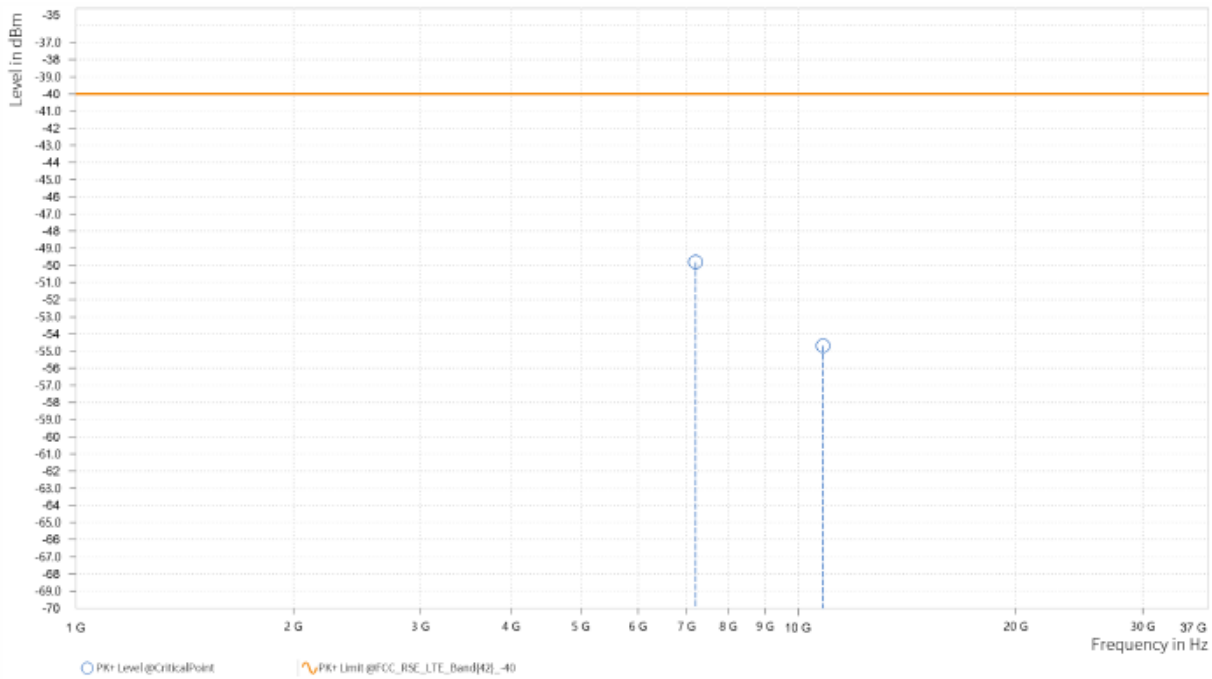
| | | | |
|---|---|---|---|
| **MODE** | TX channel 641666 | **FREQUENCY RANGE** | Above 1000MHz |
| **ENVIRONMENTAL CONDITIONS** | 23deg. C, 70%RH | **INPUT POWER** | AC 120V/60Hz |
| **TESTED BY** | Jace Hu | | |
| **ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M** | | | |

| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 5 | 7,210.015 | -49.89 | -40.00 | 9.89 | 24.28 | H | 359 | 1 |
| 6 | 10,815.000 | -55.82 | -40.00 | 15.82 | 16.18 | H | 0.9 | 2 |



| MODE | TX channel 641666 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | AC 120V/60Hz |
| TESTED BY | Jace Hu | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

| Rg | Frequency [MHz] | PK+ Level [dBm] | PK+ Limit [dBm] | PK+ Margin [dB] | Correction [dB] | Polarization | Azimuth [deg] | Antenna Height [m] |
|---|---|---|---|---|---|---|---|---|
| 5 | 7,209.758 | -49.81 | -40.00 | 9.81 | 24.24 | V | 83.1 | 2 |
| 6 | 10,815.000 | -54.69 | -40.00 | 14.69 | 16.32 | V | 359 | 1 |



# 4 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Tel: +86-755-88696566
Fax: +86-755-88696577

**Email:** customerservice.sw@cn.bureauveritas.com
**Web Site**: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

# 5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

**---END---**