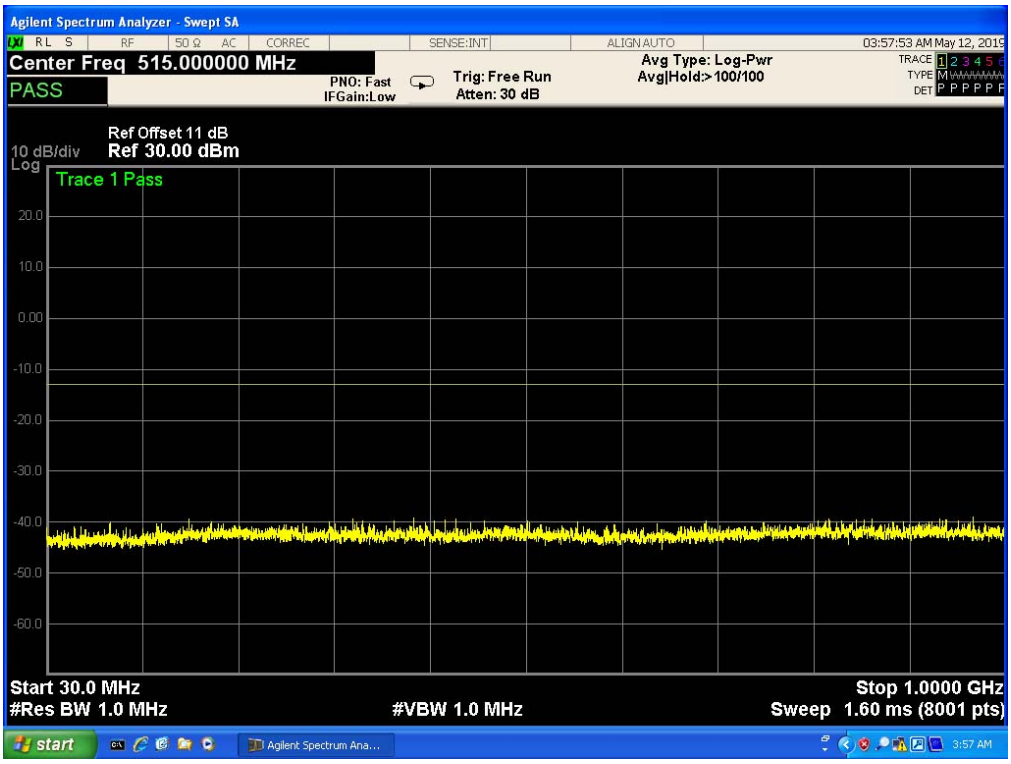
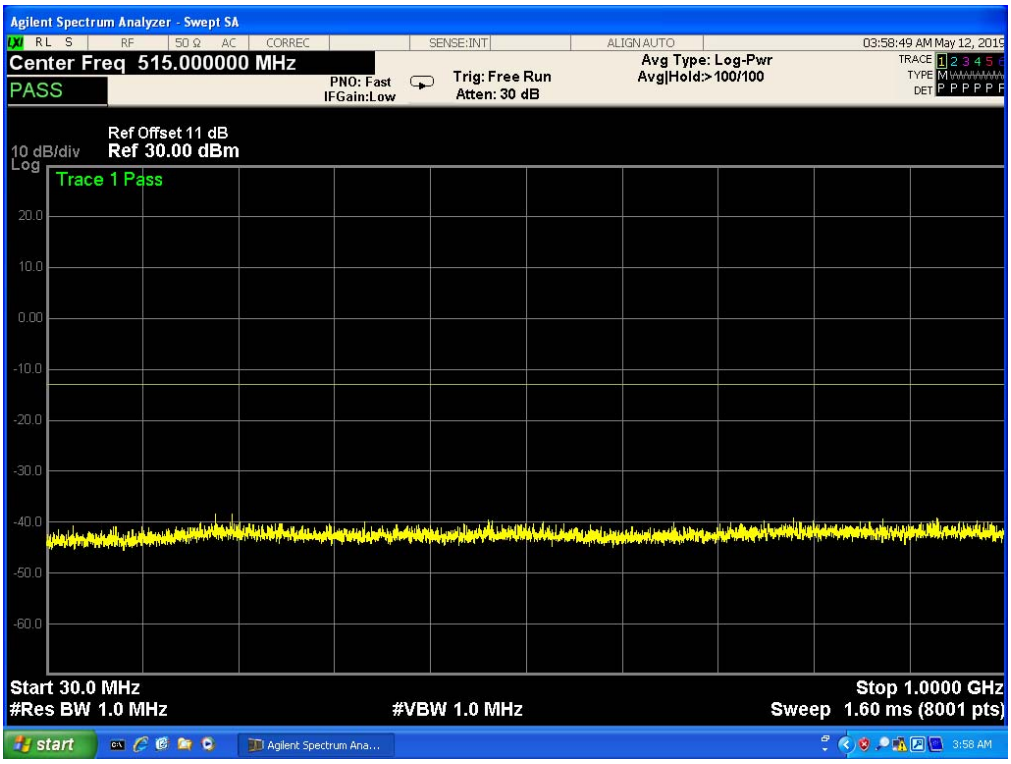
***Band 25,UL Channel 26665,UL Frequency 1912.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM***



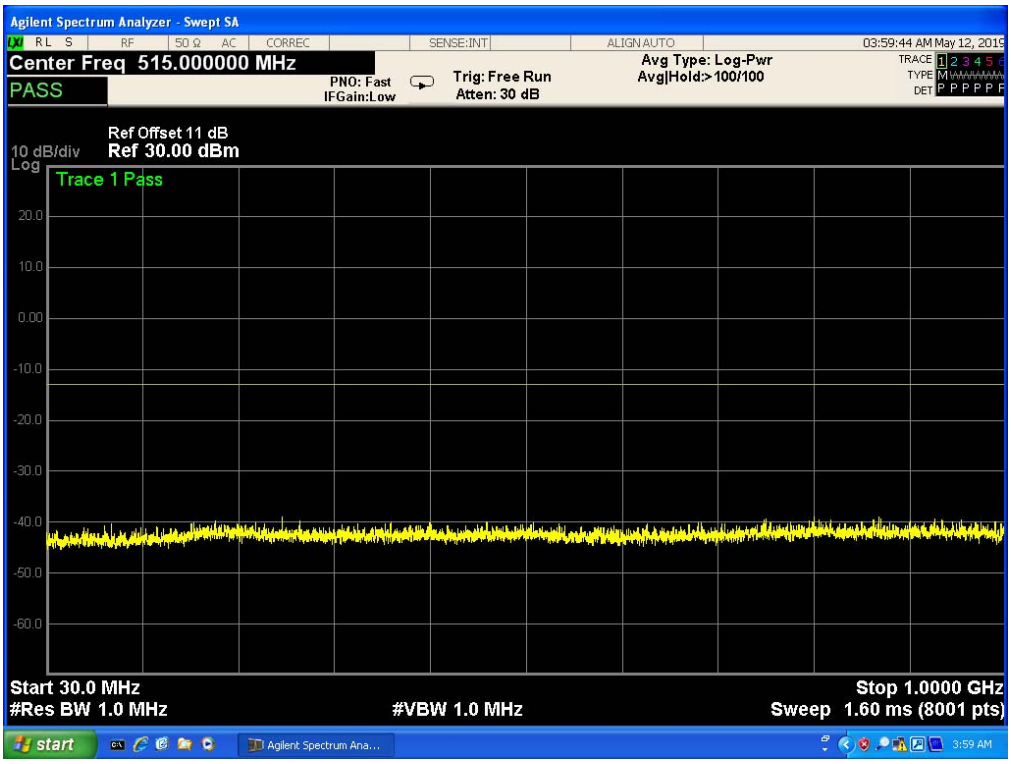

***Band 25,UL Channel 26665,UL Frequency 1912.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM***

***Band 25,UL Channel 26090,UL Frequency 1855.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK***



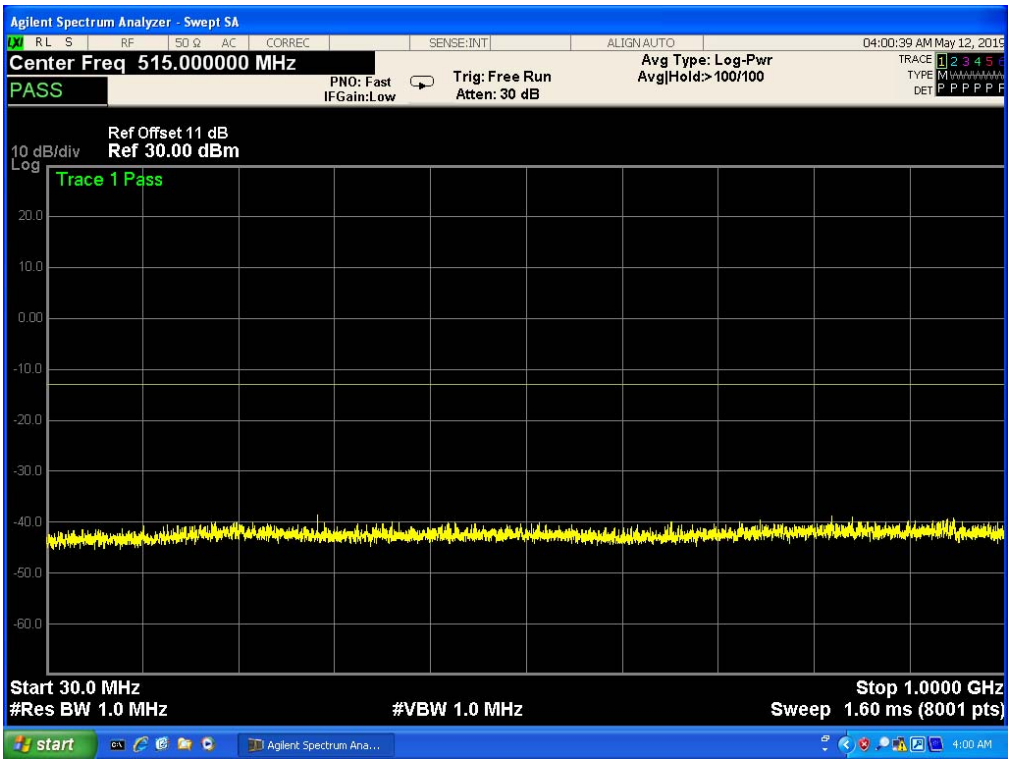

***Band 25,UL Channel 26090,UL Frequency 1855.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK***

***Band 25,UL Channel 26090,UL Frequency 1855.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM***

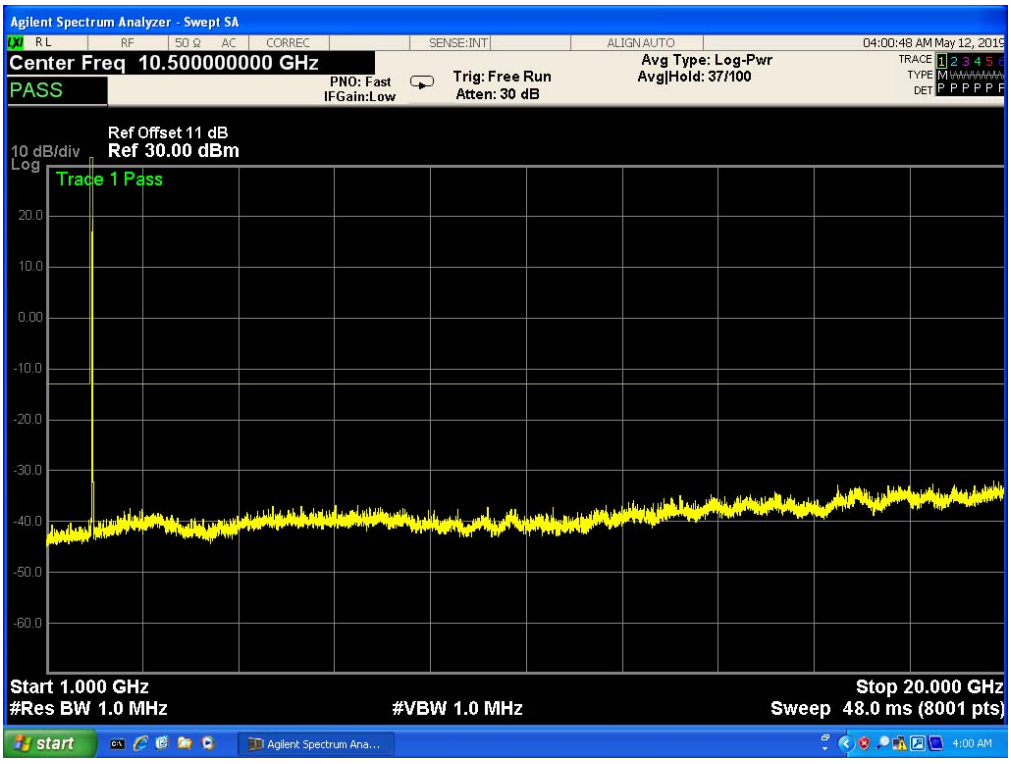



***Band 25,UL Channel 26090,UL Frequency 1855.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM***

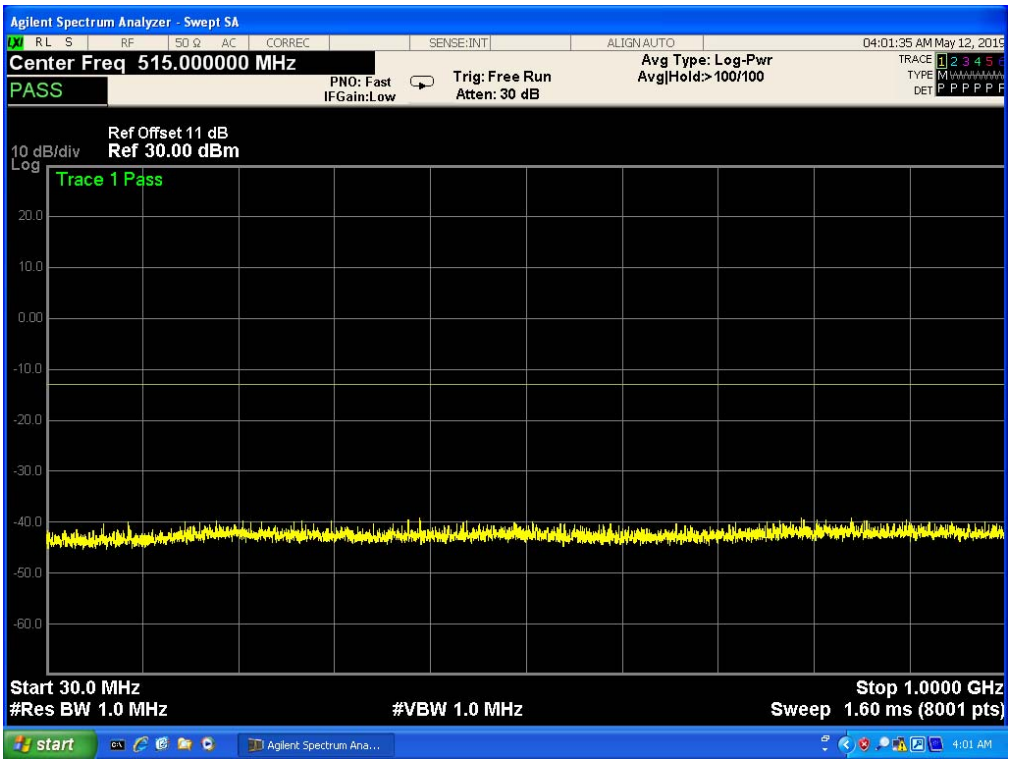
***Band 25,UL Channel 26640,UL Frequency 1910.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK***



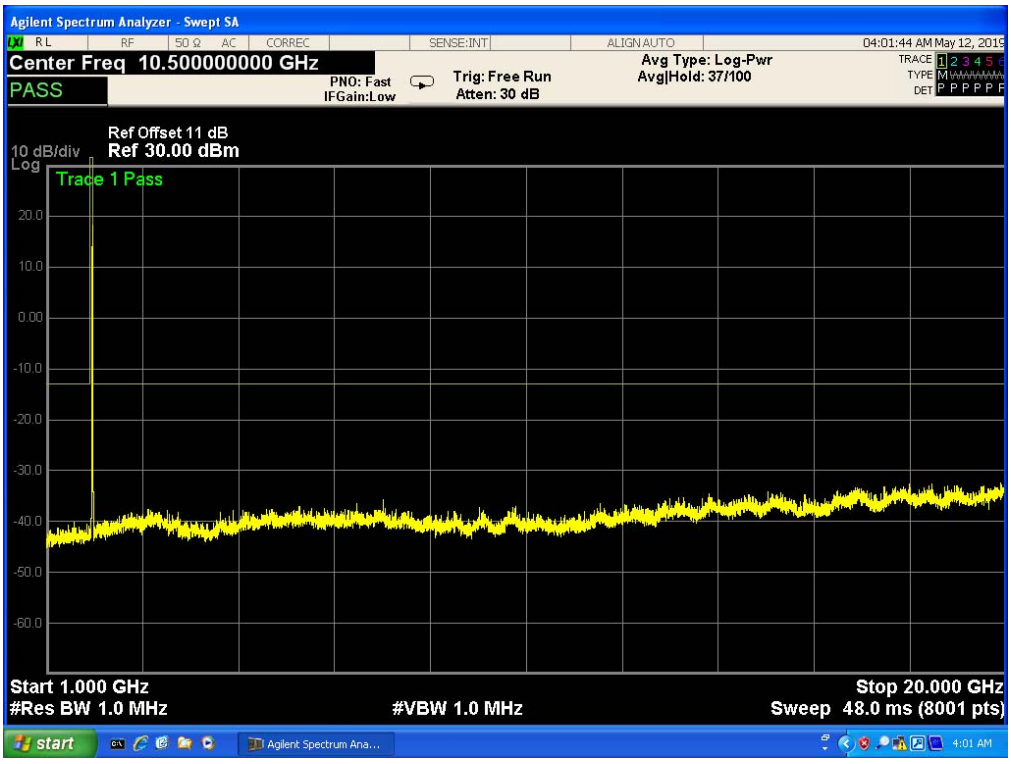

***Band 25,UL Channel 26640,UL Frequency 1910.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK***



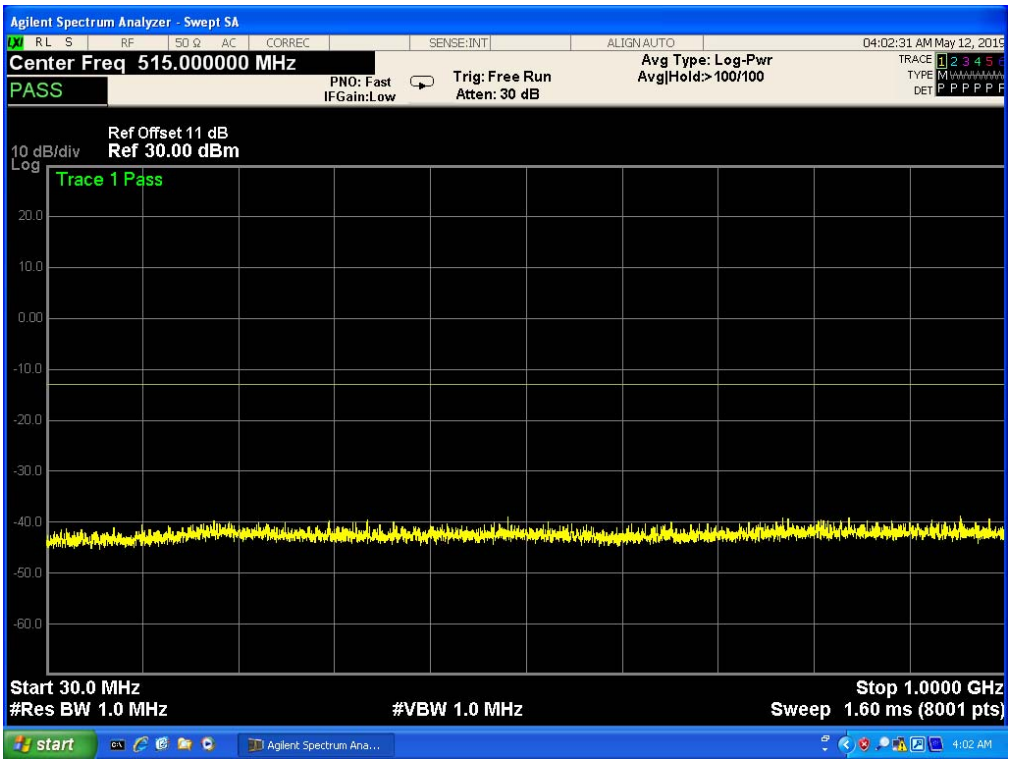
***Band 25,UL Channel 26640,UL Frequency 1910.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM***



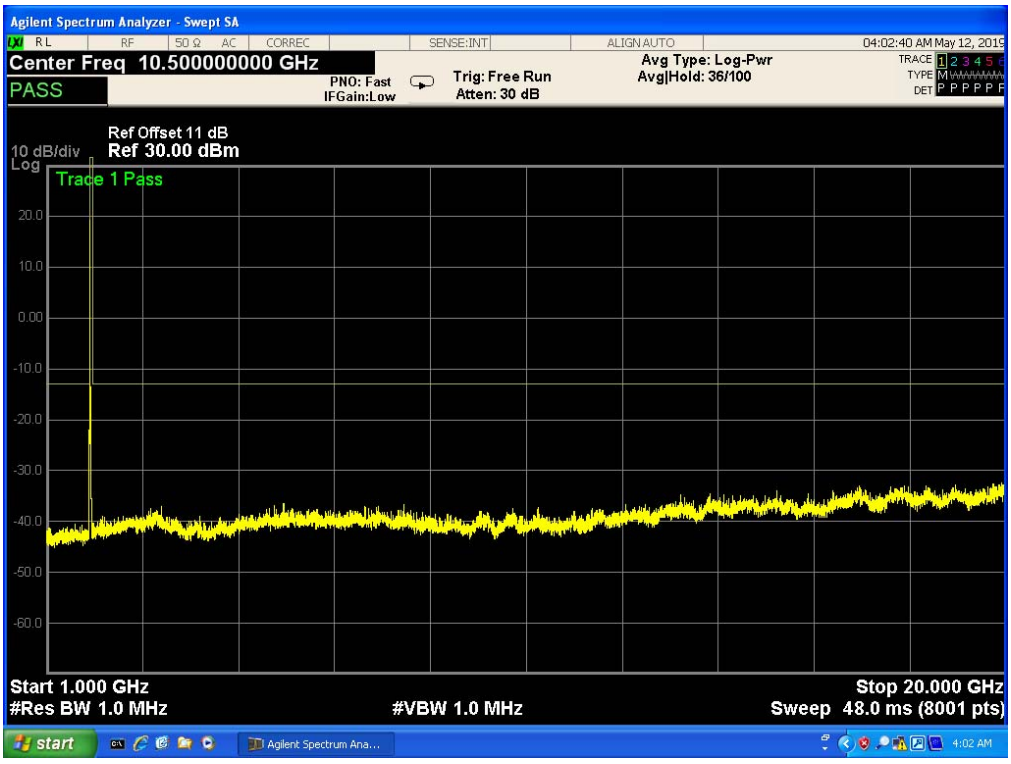

***Band 25,UL Channel 26640,UL Frequency 1910.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM***



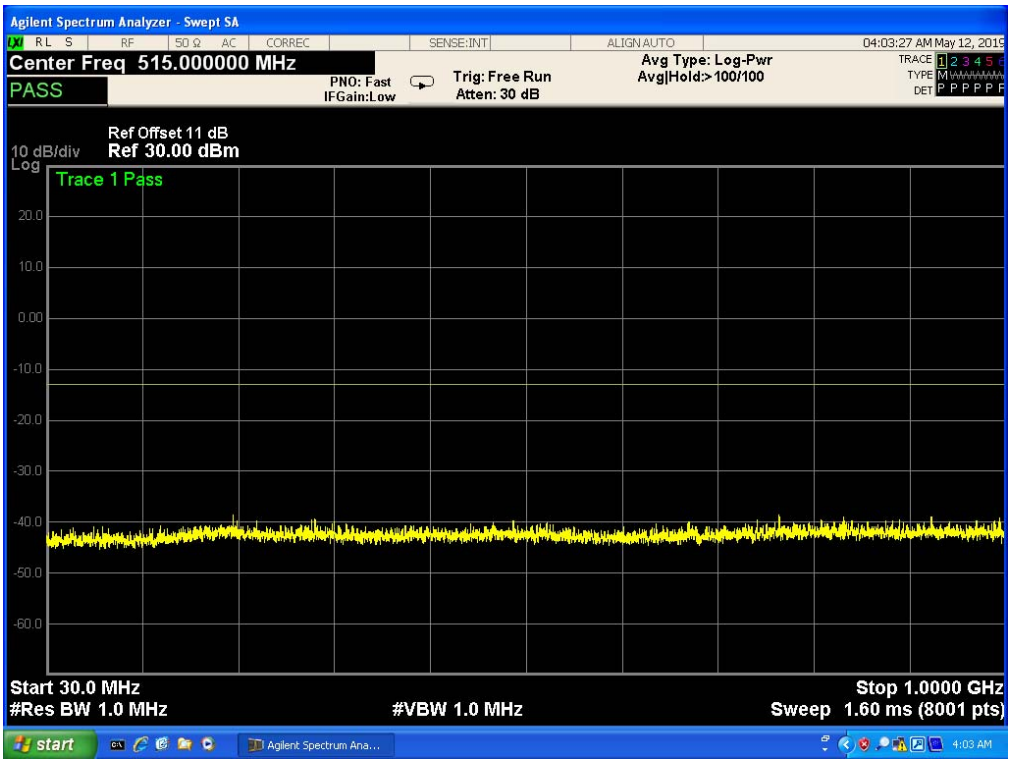
***Band 25,UL Channel 26115,UL Frequency 1857.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK***



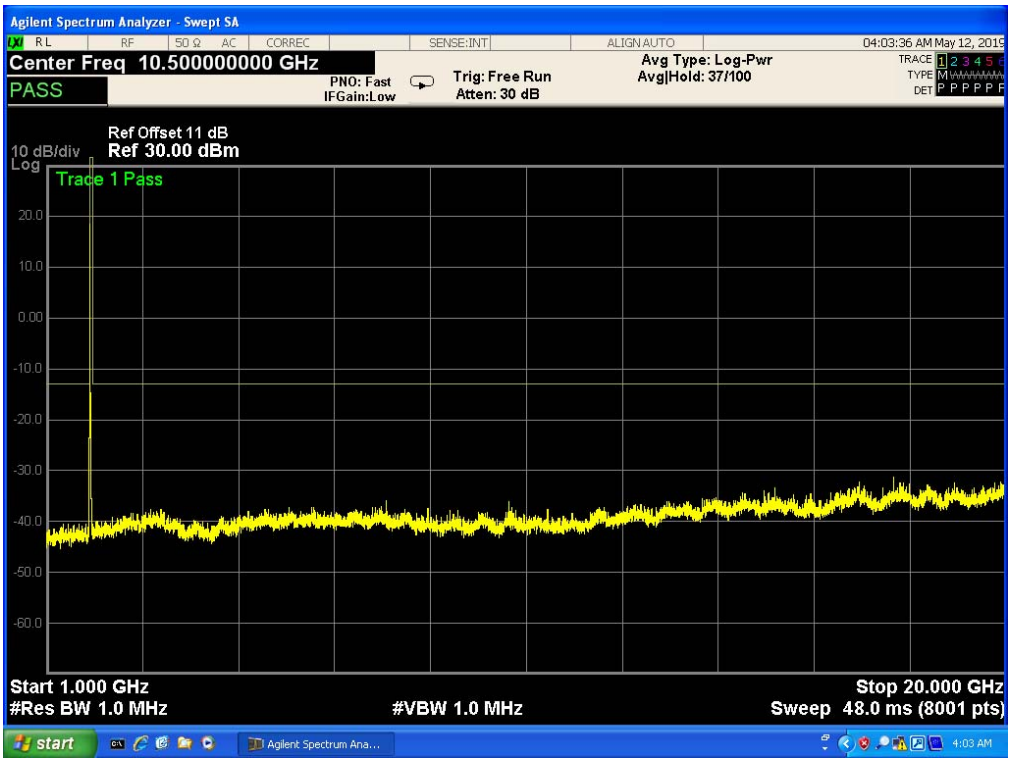

***Band 25,UL Channel 26115,UL Frequency 1857.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK***



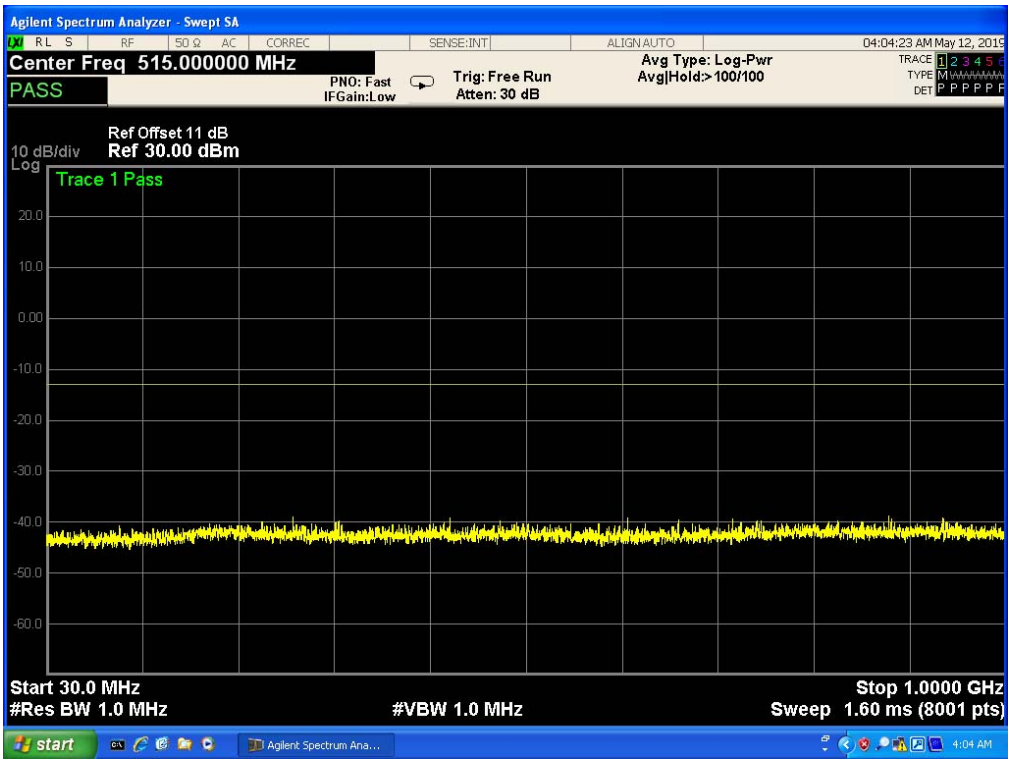
***Band 25,UL Channel 26115,UL Frequency 1857.5,BW 15.0,NO. RB 75,RB POS. Low,16-QAM***



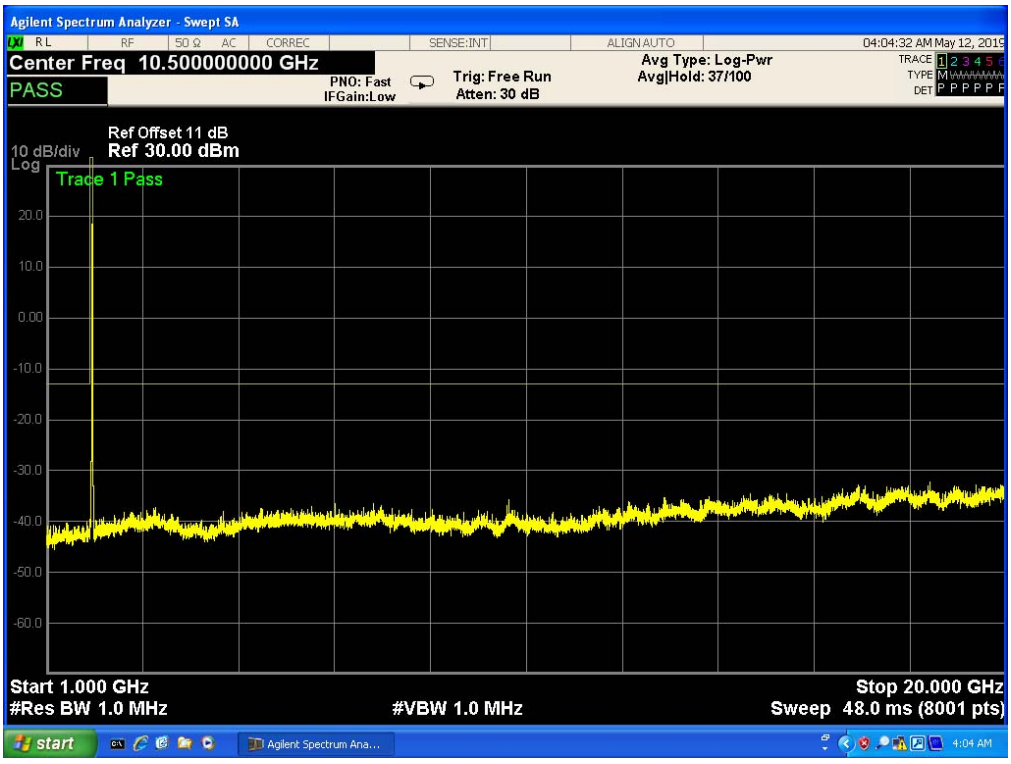

***Band 25,UL Channel 26115,UL Frequency 1857.5,BW 15.0,NO. RB 75,RB POS. Low,16-QAM***



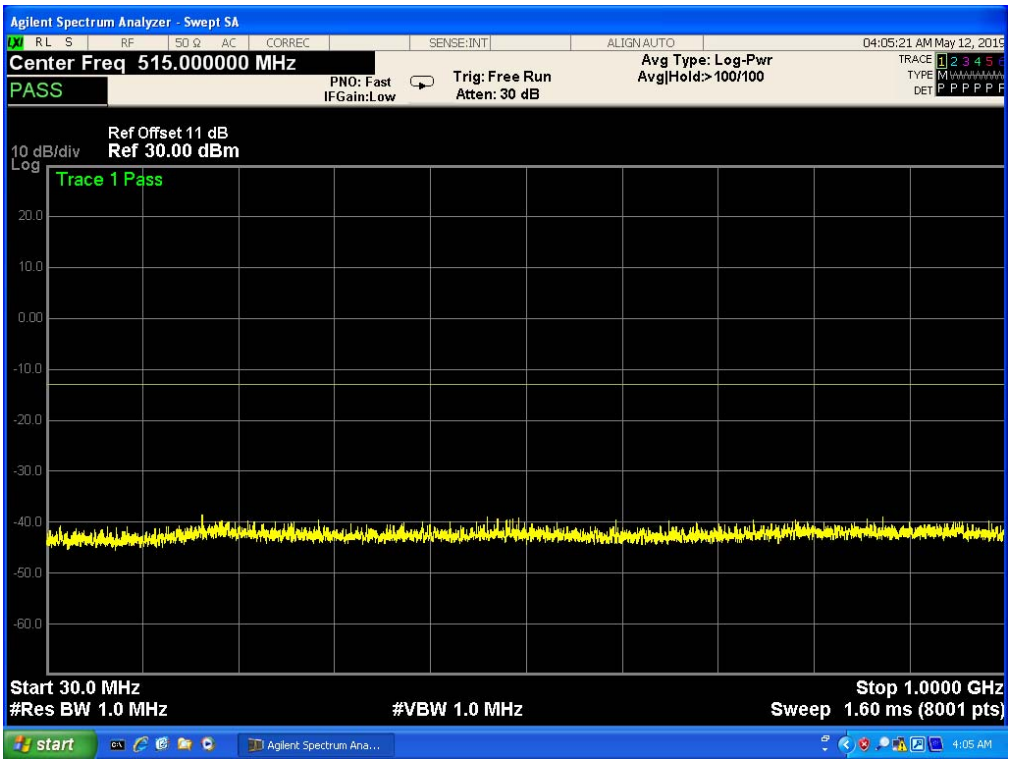
***Band 25,UL Channel 26615,UL Frequency 1907.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK***




***Band 25,UL Channel 26615,UL Frequency 1907.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK***

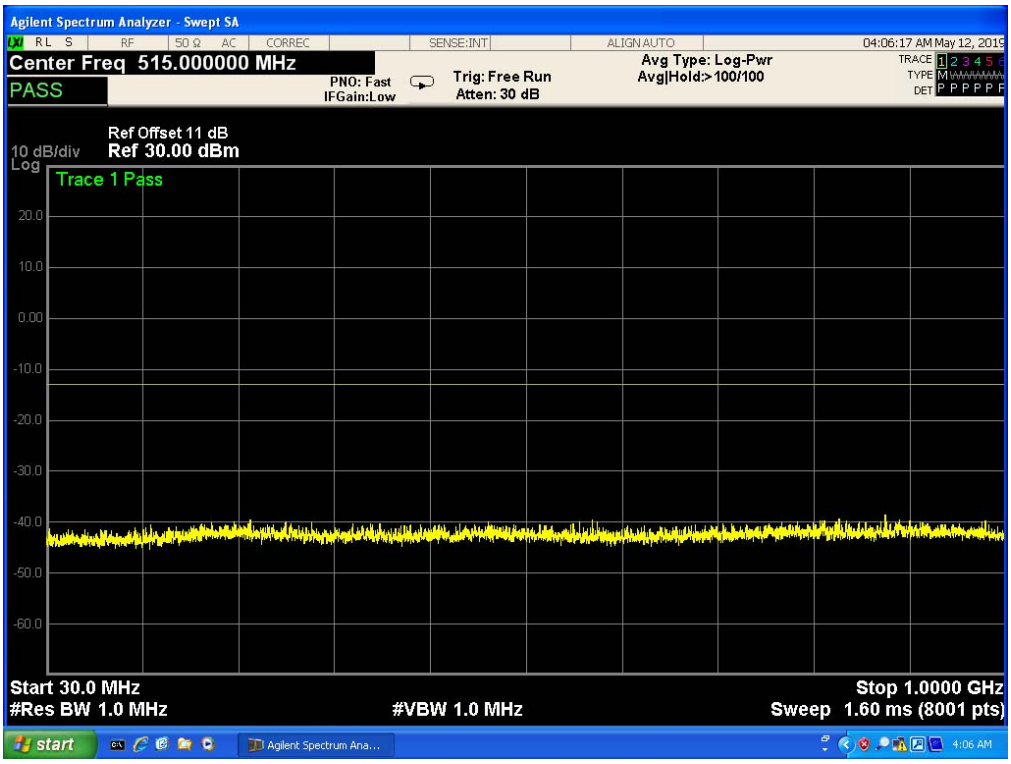


***Band 25,UL Channel 26615,UL Frequency 1907.5,BW 15.0,NO. RB 75,RB POS. Low,16-QAM***



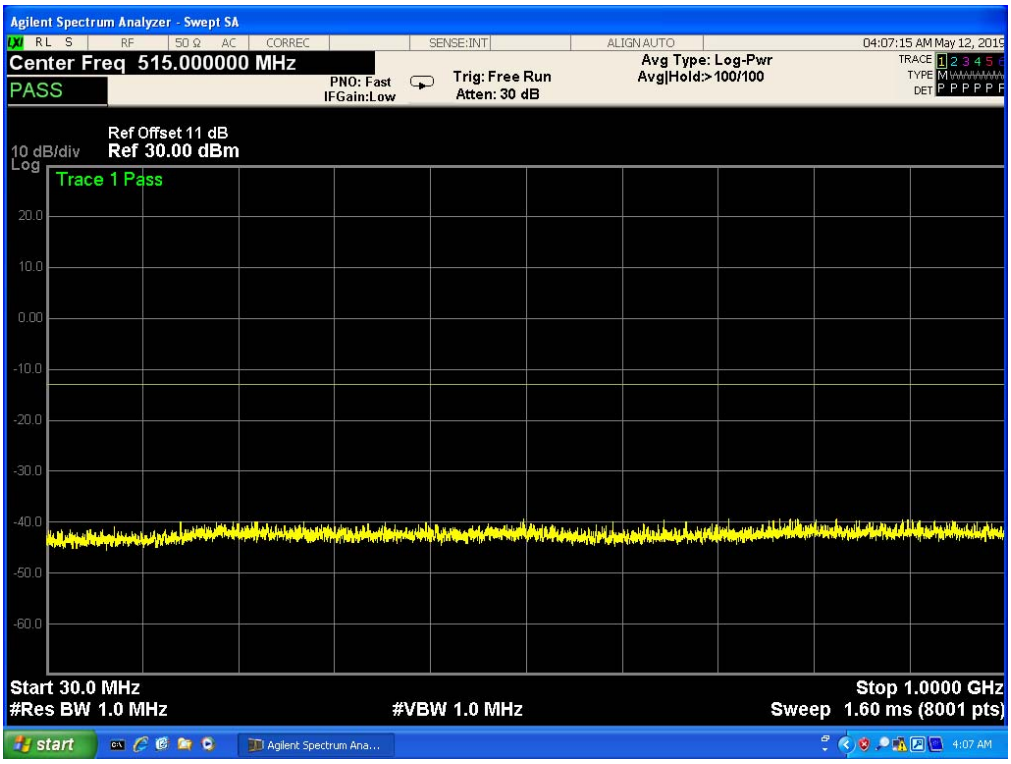

***Band 25,UL Channel 26615,UL Frequency 1907.5,BW 15.0,NO. RB 75,RB POS. Low,16-QAM***

***Band 25,UL Channel 26140,UL Frequency 1860.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK***



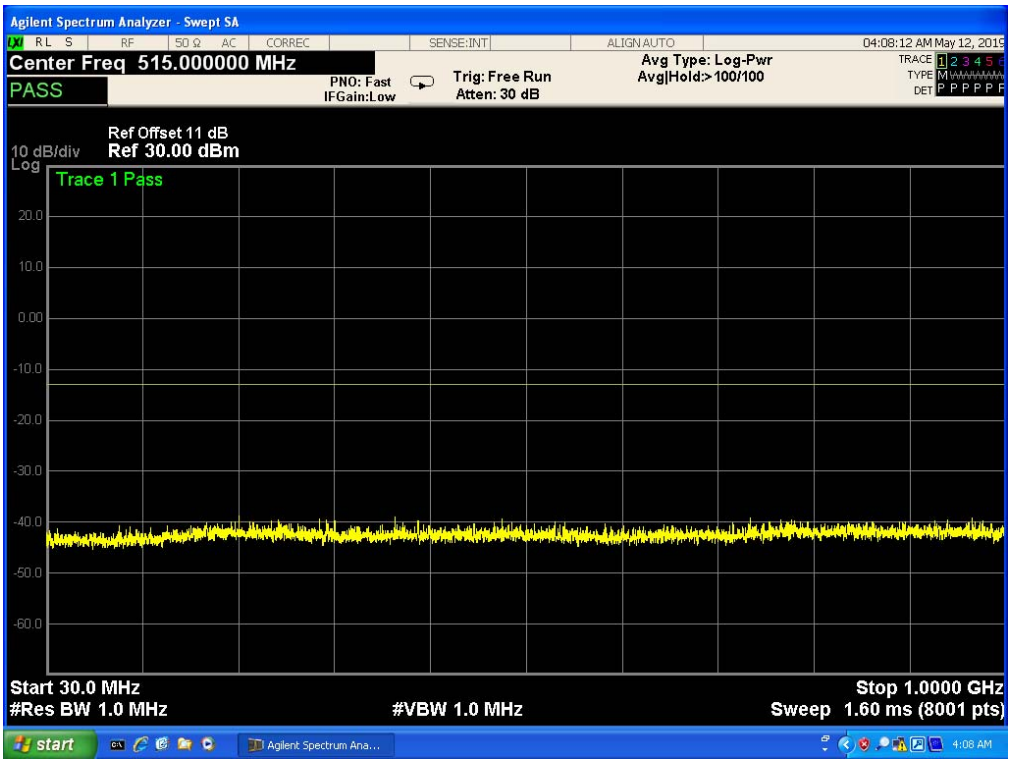

***Band 25,UL Channel 26140,UL Frequency 1860.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK***

*Band 25,UL Channel 26140,UL Frequency 1860.0,BW 20.0,NO. RB 100,RB POS. Low,16-QAM*



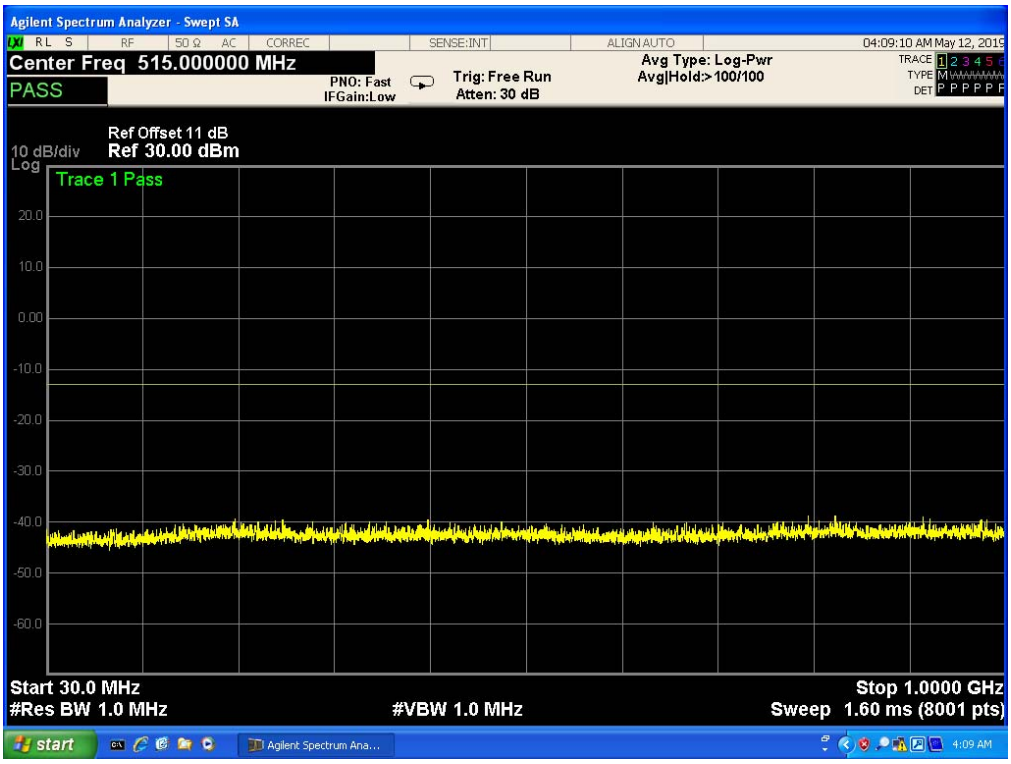

*Band 25,UL Channel 26140,UL Frequency 1860.0,BW 20.0,NO. RB 100,RB POS. Low,16-QAM*

***Band 25,UL Channel 26590,UL Frequency 1905.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK***

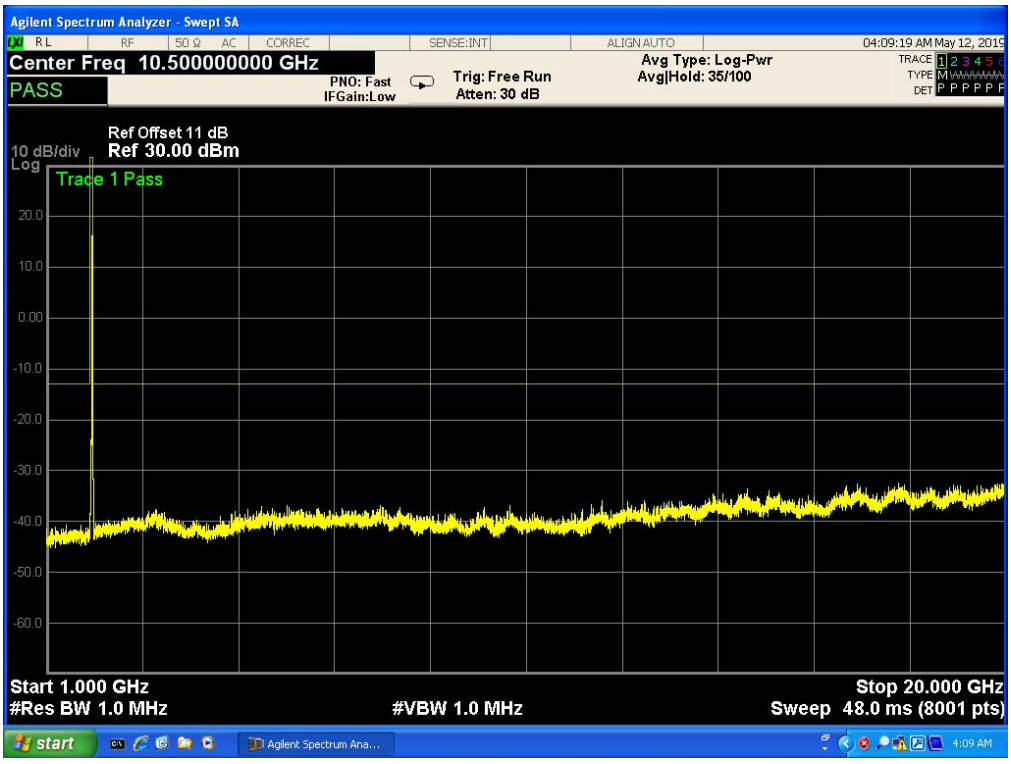



***Band 25,UL Channel 26590,UL Frequency 1905.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK***

*Band 25,UL Channel 26590,UL Frequency 1905.0,BW 20.0,NO. RB 100,RB POS. Low,16-QAM*




*Band 25,UL Channel 26590,UL Frequency 1905.0,BW 20.0,NO. RB 100,RB POS. Low,16-QAM*



# 8. RADIATED MEASUREMENT

## 8.1. RADIATED POWER (ERP & EIRP)

**RULE PART(S)**

FCC: §2.1046, §22.913, §24.232 and §27.50

**LIMITS:**

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.
27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.
27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

**TEST PROCEDURE**

ANSI/TIA-603-E Clause 2.2.17
KDB 971168 v02r01 RF power output using broadband peak and average power meter method.
KDB 971168 D01 Power Meas License Digital Systems v02r01, “Measurement Guidance for Certification of Licensed Digital Transmitters”

**MODES TESTED**

LTE Band 2
LTE Band 4
LTE Band 5
LTE Band 12
LTE Band 17
LTE Band 25

**RESULTS**

Pass

## 8.2 LTE BAND 2

| Radiated Power (EIRP) for Band 2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/RB SIZE | Frequency | Result | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 1.4MHz Band QPSK | 6/0 | 1850.7 | -1.75 | 3.76 | 28.24 | 22.73 | 187.592 | Horizontal | Pass |
| | | 1880 | -1.49 | 3.91 | 28.22 | 22.82 | 191.398 | Horizontal | Pass |
| | | 1909.3 | -1.50 | 3.93 | 28.2 | 22.77 | 189.196 | Horizontal | Pass |
| 3.0MHz Band QPSK | 15/0 | 1851.5 | -1.75 | 3.77 | 28.23 | 22.71 | 186.624 | Horizontal | Pass |
| | | 1880 | -1.62 | 3.91 | 28.24 | 22.71 | 186.841 | Horizontal | Pass |
| | | 1908.5 | -1.54 | 3.94 | 28.25 | 22.77 | 189.256 | Horizontal | Pass |
| 5.0MHz Band QPSK | 25/0 | 1852.5 | -1.89 | 3.77 | 28.31 | 22.65 | 184.233 | Horizontal | Pass |
| | | 1880 | -1.60 | 3.91 | 28.22 | 22.71 | 186.839 | Horizontal | Pass |
| | | 1907.5 | -1.70 | 3.94 | 28.2 | 22.56 | 180.213 | Horizontal | Pass |
| 10.0MHz Band QPSK | 50/0 | 1855 | -1.86 | 3.79 | 28.33 | 22.68 | 185.287 | Horizontal | Pass |
| | | 1880 | -1.49 | 3.95 | 28.22 | 22.78 | 189.493 | Horizontal | Pass |
| | | 1905 | -1.39 | 3.97 | 28.19 | 22.83 | 191.798 | Horizontal | Pass |
| 15.0MHz Band QPSK | 75/0 | 1857.5 | -1.61 | 3.79 | 28.34 | 22.94 | 196.977 | Horizontal | Pass |
| | | 1880 | -1.33 | 3.95 | 28.22 | 22.94 | 196.739 | Horizontal | Pass |
| | | 1902.5 | -1.24 | 3.97 | 28.18 | 22.97 | 197.993 | Horizontal | Pass |
| 20.0MHz Band QPSK | 100/0 | 1860 | -1.81 | 3.81 | 28.35 | 22.73 | 187.457 | Horizontal | Pass |
| | | 1880 | -1.58 | 3.96 | 28.22 | 22.68 | 185.142 | Horizontal | Pass |
| | | 1900 | -1.28 | 4 | 28.16 | 22.88 | 194.233 | Horizontal | Pass |
| 1.4MHz Band QPSK | 6/0 | 1850.7 | -1.79 | 3.76 | 28.24 | 22.69 | 185.940 | Vertical | Pass |
| | | 1880 | -1.59 | 3.91 | 28.22 | 22.72 | 187.051 | Vertical | Pass |
| | | 1909.3 | -1.60 | 3.93 | 28.2 | 22.67 | 185.119 | Vertical | Pass |
| 3.0MHz Band QPSK | 15/0 | 1851.5 | -1.61 | 3.77 | 28.23 | 22.85 | 192.772 | Vertical | Pass |
| | | 1880 | -1.46 | 3.91 | 28.24 | 22.87 | 193.542 | Vertical | Pass |
| | | 1908.5 | -1.39 | 3.94 | 28.25 | 22.92 | 196.042 | Vertical | Pass |
| 5.0MHz Band QPSK | 25/0 | 1852.5 | -1.81 | 3.77 | 28.31 | 22.73 | 187.471 | Vertical | Pass |
| | | 1880 | -1.51 | 3.91 | 28.22 | 22.80 | 190.741 | Vertical | Pass |
| | | 1907.5 | -1.68 | 3.94 | 28.2 | 22.58 | 181.212 | Vertical | Pass |
| 10.0MHz Band | 50/0 | 1855 | -1.75 | 3.79 | 28.33 | 22.79 | 190.297 | Vertical | Pass |
| | | 1880 | -1.54 | 3.95 | 28.22 | 22.73 | 187.527 | Vertical | Pass |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| QPSK | | 1905 | -1.57 | 3.97 | 28.19 | 22.65 | 183.991 | Vertical | Pass |
| 15.0MHz Band QPSK | 75/0 | 1857.5 | -1.72 | 3.79 | 28.34 | 22.83 | 192.085 | Vertical | Pass |
| | | 1880 | -1.47 | 3.95 | 28.22 | 22.80 | 190.348 | Vertical | Pass |
| | | 1902.5 | -1.19 | 3.97 | 28.18 | 23.02 | 200.372 | Vertical | Pass |
| 20.0MHz Band QPSK | 100/0 | 1860 | -1.73 | 3.81 | 28.35 | 22.81 | 191.083 | Vertical | Pass |
| | | 1880 | -1.63 | 3.96 | 28.22 | 22.63 | 183.047 | Vertical | Pass |
| | | 1900 | -1.11 | 4 | 28.16 | 23.05 | 202.058 | Vertical | Pass |

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

| Radiated Power (EIRP) for Band 2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/RB SIZE | Frequency | Result | | | | | Polarization Of Max. ERP | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | | |
| 1.4MHz Band 16 QAM | 6/0 | 1850.7 | -2.67 | 3.76 | 28.24 | 21.81 | 151.535 | Horizontal | Pass |
| | | 1880 | -2.44 | 3.91 | 28.22 | 21.87 | 153.901 | Horizontal | Pass |
| | | 1909.3 | -2.38 | 3.93 | 28.2 | 21.89 | 154.583 | Horizontal | Pass |
| 3.0MHz Band 16 QAM | 15/0 | 1851.5 | -2.67 | 3.77 | 28.23 | 21.79 | 151.103 | Horizontal | Pass |
| | | 1880 | -2.63 | 3.91 | 28.24 | 21.70 | 148.074 | Horizontal | Pass |
| | | 1908.5 | -2.48 | 3.94 | 28.25 | 21.83 | 152.334 | Horizontal | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 1852.5 | -2.76 | 3.77 | 28.31 | 21.78 | 150.498 | Horizontal | Pass |
| | | 1880 | -2.36 | 3.91 | 28.22 | 21.95 | 156.511 | Horizontal | Pass |
| | | 1907.5 | -2.48 | 3.94 | 28.2 | 21.78 | 150.802 | Horizontal | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 1855 | -2.70 | 3.79 | 28.33 | 21.84 | 152.710 | Horizontal | Pass |
| | | 1880 | -2.38 | 3.95 | 28.22 | 21.89 | 154.675 | Horizontal | Pass |
| | | 1905 | -2.43 | 3.97 | 28.19 | 21.79 | 150.897 | Horizontal | Pass |
| 15.0MHz Band 16 QAM | 75/0 | 1857.5 | -2.76 | 3.79 | 28.34 | 21.79 | 151.132 | Horizontal | Pass |
| | | 1880 | -2.49 | 3.95 | 28.22 | 21.78 | 150.706 | Horizontal | Pass |
| | | 1902.5 | -2.40 | 3.97 | 28.18 | 21.81 | 151.818 | Horizontal | Pass |
| 20.0MHz Band 16 QAM | 100/0 | 1860 | -2.72 | 3.81 | 28.35 | 21.82 | 152.155 | Horizontal | Pass |
| | | 1880 | -2.35 | 3.96 | 28.22 | 21.91 | 155.209 | Horizontal | Pass |
| | | 1900 | -2.46 | 4 | 28.16 | 21.70 | 147.928 | Horizontal | Pass |
| 1.4MHz Band 16 QAM | 6/0 | 1850.7 | -2.61 | 3.76 | 28.24 | 21.87 | 153.667 | Vertical | Pass |
| | | 1880 | -2.54 | 3.91 | 28.22 | 21.77 | 150.366 | Vertical | Pass |
| | | 1909.3 | -2.33 | 3.93 | 28.2 | 21.94 | 156.244 | Vertical | Pass |
| 3.0MHz Band 16 QAM | 15/0 | 1851.5 | -2.69 | 3.77 | 28.23 | 21.77 | 150.429 | Vertical | Pass |
| | | 1880 | -2.62 | 3.91 | 28.24 | 21.71 | 148.413 | Vertical | Pass |
| | | 1908.5 | -2.46 | 3.94 | 28.25 | 21.85 | 153.238 | Vertical | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 1852.5 | -2.71 | 3.77 | 28.31 | 21.83 | 152.525 | Vertical | Pass |
| | | 1880 | -2.56 | 3.91 | 28.22 | 21.75 | 149.738 | Vertical | Pass |
| | | 1907.5 | -2.35 | 3.94 | 28.2 | 21.91 | 155.390 | Vertical | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 1855 | -2.87 | 3.79 | 28.33 | 21.67 | 146.789 | Vertical | Pass |
| | | 1880 | -2.56 | 3.95 | 28.22 | 21.71 | 148.286 | Vertical | Pass |
| | | 1905 | -2.65 | 3.97 | 28.19 | 21.57 | 143.396 | Vertical | Pass |
| 15.0MHz Band | 75/0 | 1857.5 | -2.88 | 3.79 | 28.34 | 21.67 | 146.804 | Vertical | Pass |
| | | 1880 | -2.53 | 3.95 | 28.22 | 21.74 | 149.398 | Vertical | Pass |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 16 QAM | | 1902.5 | -2.48 | 3.97 | 28.18 | 21.73 | 149.072 | Vertical | Pass |
| 20.0MHz Band 16 QAM | 100/0 | 1860 | -2.67 | 3.81 | 28.35 | 21.87 | 153.730 | Vertical | Pass |
| | | 1880 | -2.30 | 3.96 | 28.22 | 21.96 | 157.187 | Vertical | Pass |
| | | 1900 | -2.34 | 4 | 28.16 | 21.82 | 152.213 | Vertical | Pass |

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

8.3 LTE BAND 4

| Radiated Power (EIRP) for Band 4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/RB SIZE | Frequency | Result | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 1.4MHz Band QPSK | 6/0 | 1710.7 | -1.69 | 3.12 | 27.58 | 22.77 | 189.319 | Horizontal | Pass |
| | | 1732.5 | -1.78 | 3.27 | 27.61 | 22.56 | 180.439 | Horizontal | Pass |
| | | 1754.3 | -1.42 | 3.29 | 27.63 | 22.92 | 196.101 | Horizontal | Pass |
| 3.0MHz Band QPSK | 15/0 | 1711.5 | -1.81 | 3.13 | 27.61 | 22.67 | 184.972 | Horizontal | Pass |
| | | 1732.5 | -1.58 | 3.27 | 27.61 | 22.76 | 188.969 | Horizontal | Pass |
| | | 1753.5 | -1.50 | 3.3 | 27.62 | 22.82 | 191.311 | Horizontal | Pass |
| 5.0MHz Band QPSK | 25/0 | 1712.5 | -1.48 | 3.13 | 27.63 | 23.02 | 200.464 | Horizontal | Pass |
| | | 1732.5 | -1.18 | 3.27 | 27.61 | 23.16 | 206.812 | Horizontal | Pass |
| | | 1752.5 | -1.24 | 3.3 | 27.6 | 23.06 | 202.109 | Horizontal | Pass |
| 10.0MHz Band QPSK | 50/0 | 1715 | -1.52 | 3.15 | 27.64 | 22.97 | 198.203 | Horizontal | Pass |
| | | 1732.5 | -1.51 | 3.31 | 27.61 | 22.79 | 190.055 | Horizontal | Pass |
| | | 1750 | -1.41 | 3.33 | 27.59 | 22.85 | 192.966 | Horizontal | Pass |
| 15.0MHz Band QPSK | 75/0 | 1717.5 | -1.83 | 3.15 | 27.65 | 22.67 | 184.890 | Horizontal | Pass |
| | | 1732.5 | -1.41 | 3.31 | 27.61 | 22.89 | 194.537 | Horizontal | Pass |
| | | 1747.5 | -1.43 | 3.33 | 27.57 | 22.81 | 190.980 | Horizontal | Pass |
| 20.0MHz Band QPSK | 100/0 | 1720 | -1.65 | 3.17 | 27.66 | 22.84 | 192.112 | Horizontal | Pass |
| | | 1732.5 | -1.42 | 3.32 | 27.61 | 22.87 | 193.564 | Horizontal | Pass |
| | | 1745 | -1.53 | 3.36 | 27.56 | 22.67 | 184.769 | Horizontal | Pass |
| 1.4MHz Band QPSK | 6/0 | 1710.7 | -1.64 | 3.12 | 27.58 | 22.82 | 191.350 | Vertical | Pass |
| | | 1732.5 | -1.58 | 3.27 | 27.61 | 22.76 | 188.681 | Vertical | Pass |
| | | 1754.3 | -1.56 | 3.29 | 27.63 | 22.78 | 189.627 | Vertical | Pass |
| 3.0MHz Band QPSK | 15/0 | 1711.5 | -1.62 | 3.13 | 27.61 | 22.86 | 193.144 | Vertical | Pass |
| | | 1732.5 | -1.44 | 3.27 | 27.61 | 22.90 | 195.018 | Vertical | Pass |
| | | 1753.5 | -1.60 | 3.3 | 27.62 | 22.72 | 187.214 | Vertical | Pass |
| 5.0MHz Band QPSK | 25/0 | 1712.5 | -1.36 | 3.13 | 27.63 | 23.14 | 206.141 | Vertical | Pass |
| | | 1732.5 | -1.27 | 3.27 | 27.61 | 23.07 | 202.577 | Vertical | Pass |
| | | 1752.5 | -1.19 | 3.3 | 27.6 | 23.11 | 204.471 | Vertical | Pass |
| 10.0MHz Band QPSK | 50/0 | 1715 | -1.63 | 3.15 | 27.64 | 22.86 | 193.016 | Vertical | Pass |
| | | 1732.5 | -1.48 | 3.31 | 27.61 | 22.82 | 191.537 | Vertical | Pass |
| | | 1750 | -1.41 | 3.33 | 27.59 | 22.85 | 192.852 | Vertical | Pass |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 15.0MHz Band QPSK | 75/0 | 1717.5 | -1.76 | 3.15 | 27.65 | 22.74 | 187.852 | Vertical | Pass |
| | | 1732.5 | -1.36 | 3.31 | 27.61 | 22.94 | 196.924 | Vertical | Pass |
| | | 1747.5 | -1.30 | 3.33 | 27.57 | 22.94 | 196.613 | Vertical | Pass |
| 20.0MHz Band QPSK | 100/0 | 1720 | -1.27 | 3.17 | 27.66 | 23.22 | 209.725 | Vertical | Pass |
| | | 1732.5 | -1.45 | 3.32 | 27.61 | 22.84 | 192.179 | Vertical | Pass |
| | | 1745 | -1.42 | 3.36 | 27.56 | 22.78 | 189.847 | Vertical | Pass |

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

| Radiated Power (EIRP) for Band 4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/RB SIZE | Frequency | Result | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 1.4MHz Band 16 QAM | 6/0 | 1710.7 | -2.54 | 3.12 | 27.58 | 21.92 | 155.589 | Horizontal | Pass |
| | | 1732.5 | -2.41 | 3.27 | 27.61 | 21.93 | 155.826 | Horizontal | Pass |
| | | 1754.3 | -2.53 | 3.29 | 27.63 | 21.81 | 151.863 | Horizontal | Pass |
| 3.0MHz Band 16 QAM | 15/0 | 1711.5 | -3.33 | 3.13 | 27.61 | 21.15 | 130.439 | Horizontal | Pass |
| | | 1732.5 | -3.19 | 3.27 | 27.61 | 21.15 | 130.386 | Horizontal | Pass |
| | | 1753.5 | -3.10 | 3.3 | 27.62 | 21.22 | 132.292 | Horizontal | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 1712.5 | -3.47 | 3.13 | 27.63 | 21.03 | 126.828 | Horizontal | Pass |
| | | 1732.5 | -3.34 | 3.27 | 27.61 | 21.00 | 125.797 | Horizontal | Pass |
| | | 1752.5 | -2.35 | 3.3 | 27.6 | 21.95 | 156.625 | Horizontal | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 1715 | -2.70 | 3.15 | 27.64 | 21.79 | 151.029 | Horizontal | Pass |
| | | 1732.5 | -2.40 | 3.31 | 27.61 | 21.90 | 154.801 | Horizontal | Pass |
| | | 1750 | -2.61 | 3.33 | 27.59 | 21.65 | 146.148 | Horizontal | Pass |
| 15.0MHz Band 16 QAM | 75/0 | 1717.5 | -2.54 | 3.15 | 27.65 | 21.96 | 156.886 | Horizontal | Pass |
| | | 1732.5 | -2.37 | 3.31 | 27.61 | 21.93 | 155.900 | Horizontal | Pass |
| | | 1747.5 | -2.27 | 3.33 | 27.57 | 21.97 | 157.244 | Horizontal | Pass |
| 20.0MHz Band 16 QAM | 100/0 | 1720 | -2.79 | 3.17 | 27.66 | 21.70 | 148.060 | Horizontal | Pass |
| | | 1732.5 | -2.57 | 3.32 | 27.61 | 21.72 | 148.548 | Horizontal | Pass |
| | | 1745 | -2.40 | 3.36 | 27.56 | 21.80 | 151.453 | Horizontal | Pass |
| 1.4MHz Band 16 QAM | 6/0 | 1710.7 | -2.59 | 3.12 | 27.58 | 21.87 | 153.981 | Vertical | Pass |
| | | 1732.5 | -2.46 | 3.27 | 27.61 | 21.88 | 154.046 | Vertical | Pass |
| | | 1754.3 | -2.47 | 3.29 | 27.63 | 21.87 | 153.767 | Vertical | Pass |
| 3.0MHz Band 16 QAM | 15/0 | 1711.5 | -3.18 | 3.13 | 27.61 | 21.30 | 134.774 | Vertical | Pass |
| | | 1732.5 | -3.13 | 3.27 | 27.61 | 21.21 | 132.181 | Vertical | Pass |
| | | 1753.5 | -3.06 | 3.3 | 27.62 | 21.26 | 133.715 | Vertical | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 1712.5 | -3.39 | 3.13 | 27.63 | 21.11 | 129.159 | Vertical | Pass |
| | | 1732.5 | -3.17 | 3.27 | 27.61 | 21.17 | 131.036 | Vertical | Pass |
| | | 1752.5 | -3.29 | 3.3 | 27.6 | 21.01 | 126.302 | Vertical | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 1715 | -2.58 | 3.15 | 27.64 | 21.91 | 155.160 | Vertical | Pass |
| | | 1732.5 | -2.37 | 3.31 | 27.61 | 21.93 | 155.871 | Vertical | Pass |
| | | 1750 | -2.56 | 3.33 | 27.59 | 21.70 | 147.815 | Vertical | Pass |
| 15.0MHz Band | 75/0 | 1717.5 | -2.73 | 3.15 | 27.65 | 21.77 | 150.309 | Vertical | Pass |
| | | 1732.5 | -2.58 | 3.31 | 27.61 | 21.72 | 148.653 | Vertical | Pass |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 16 QAM | | 1747.5 | -2.59 | 3.33 | 27.57 | 21.65 | 146.264 | Vertical | Pass |
| 20.0MHz Band 16 QAM | 100/0 | 1720 | -2.65 | 3.17 | 27.66 | 21.84 | 152.922 | Vertical | Pass |
| | | 1732.5 | -2.49 | 3.32 | 27.61 | 21.80 | 151.415 | Vertical | Pass |
| | | 1745 | -2.19 | 3.36 | 27.56 | 22.01 | 158.973 | Vertical | Pass |

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

8.4 LTE BAND 5

| Radiated Power (ERP) for Band 5 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/ RB SIZE | Frequency | Result | | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Correction (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 1.4MHz Band QPSK | 6/0 | 824.7 | 6.09 | 2.01 | 19.68 | 2.15 | 21.61 | 145.023 | Horizontal | Pass |
| | | 836.5 | 6.14 | 2.01 | 19.77 | 2.15 | 21.75 | 149.791 | Horizontal | Pass |
| | | 848.3 | 6.07 | 2.02 | 19.82 | 2.15 | 21.72 | 148.442 | Horizontal | Pass |
| 3.0MHz Band QPSK | 15/0 | 825.5 | 6.21 | 2.01 | 19.7 | 2.15 | 21.75 | 149.715 | Horizontal | Pass |
| | | 836.5 | 6.13 | 2.01 | 19.77 | 2.15 | 21.74 | 149.193 | Horizontal | Pass |
| | | 847.5 | 6.06 | 2.02 | 19.81 | 2.15 | 21.70 | 147.969 | Horizontal | Pass |
| 5.0MHz Band QPSK | 25/0 | 826.5 | 5.96 | 2.01 | 19.71 | 2.15 | 21.51 | 141.681 | Horizontal | Pass |
| | | 836.5 | 5.93 | 2.01 | 19.77 | 2.15 | 21.54 | 142.683 | Horizontal | Pass |
| | | 846.5 | 5.90 | 2.02 | 19.79 | 2.15 | 21.52 | 141.895 | Horizontal | Pass |
| 10.0MHz Band QPSK | 50/0 | 829 | 5.96 | 2.01 | 19.73 | 2.15 | 21.53 | 142.312 | Horizontal | Pass |
| | | 836.5 | 5.93 | 2.01 | 19.77 | 2.15 | 21.54 | 142.435 | Horizontal | Pass |
| | | 844 | 5.95 | 2.02 | 19.78 | 2.15 | 21.56 | 143.204 | Horizontal | Pass |
| 1.4MHz Band QPSK | 6/0 | 824.7 | 6.23 | 2.01 | 19.68 | 2.15 | 21.75 | 149.728 | Vertical | Pass |
| | | 836.5 | 6.13 | 2.01 | 19.77 | 2.15 | 21.74 | 149.343 | Vertical | Pass |
| | | 848.3 | 6.05 | 2.02 | 19.82 | 2.15 | 21.70 | 148.031 | Vertical | Pass |
| 3.0MHz Band QPSK | 15/0 | 825.5 | 6.19 | 2.01 | 19.7 | 2.15 | 21.73 | 148.881 | Vertical | Pass |
| | | 836.5 | 6.00 | 2.01 | 19.77 | 2.15 | 21.61 | 144.969 | Vertical | Pass |
| | | 847.5 | 6.03 | 2.02 | 19.81 | 2.15 | 21.67 | 146.763 | Vertical | Pass |
| 5.0MHz Band QPSK | 25/0 | 826.5 | 5.94 | 2.01 | 19.71 | 2.15 | 21.49 | 140.796 | Vertical | Pass |
| | | 836.5 | 5.83 | 2.01 | 19.77 | 2.15 | 21.44 | 139.378 | Vertical | Pass |
| | | 846.5 | 6.02 | 2.02 | 19.79 | 2.15 | 21.64 | 145.769 | Vertical | Pass |
| 10.0MHz Band QPSK | 50/0 | 829 | 6.11 | 2.01 | 19.73 | 2.15 | 21.68 | 147.176 | Vertical | Pass |
| | | 836.5 | 6.00 | 2.01 | 19.77 | 2.15 | 21.61 | 144.790 | Vertical | Pass |
| | | 844 | 6.29 | 2.02 | 19.78 | 2.15 | 21.90 | 154.963 | Vertical | Pass |

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

| Radiated Power (ERP) for Band 5 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/ RB SIZE | Frequency | Result | | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Correction (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 1.4MHz Band 16 QAM | 6/0 | 824.7 | 4.97 | 2.01 | 19.68 | 2.15 | 20.49 | 111.990 | Horizontal | Pass |
| | | 836.5 | 5.05 | 2.01 | 19.77 | 2.15 | 20.66 | 116.335 | Horizontal | Pass |
| | | 848.3 | 5.03 | 2.02 | 19.82 | 2.15 | 20.68 | 116.894 | Horizontal | Pass |
| 3.0MHz Band 16 QAM | 15/0 | 825.5 | 5.29 | 2.01 | 19.7 | 2.15 | 20.83 | 120.939 | Horizontal | Pass |
| | | 836.5 | 5.11 | 2.01 | 19.77 | 2.15 | 20.72 | 118.073 | Horizontal | Pass |
| | | 847.5 | 5.01 | 2.02 | 19.81 | 2.15 | 20.65 | 116.105 | Horizontal | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 826.5 | 5.10 | 2.01 | 19.71 | 2.15 | 20.65 | 116.130 | Horizontal | Pass |
| | | 836.5 | 5.14 | 2.01 | 19.77 | 2.15 | 20.75 | 118.775 | Horizontal | Pass |
| | | 846.5 | 5.04 | 2.02 | 19.79 | 2.15 | 20.66 | 116.298 | Horizontal | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 829 | 5.27 | 2.01 | 19.73 | 2.15 | 20.84 | 121.361 | Horizontal | Pass |
| | | 836.5 | 5.15 | 2.01 | 19.77 | 2.15 | 20.76 | 119.220 | Horizontal | Pass |
| | | 844 | 5.18 | 2.02 | 19.78 | 2.15 | 20.79 | 119.863 | Horizontal | Pass |
| 1.4MHz Band 16 QAM | 6/0 | 824.7 | 5.11 | 2.01 | 19.68 | 2.15 | 20.63 | 115.670 | Vertical | Pass |
| | | 836.5 | 5.00 | 2.01 | 19.77 | 2.15 | 20.61 | 115.210 | Vertical | Pass |
| | | 848.3 | 5.05 | 2.02 | 19.82 | 2.15 | 20.70 | 117.489 | Vertical | Pass |
| 3.0MHz Band 16 QAM | 15/0 | 825.5 | 5.13 | 2.01 | 19.7 | 2.15 | 20.67 | 116.815 | Vertical | Pass |
| | | 836.5 | 5.12 | 2.01 | 19.77 | 2.15 | 20.73 | 118.206 | Vertical | Pass |
| | | 847.5 | 4.92 | 2.02 | 19.81 | 2.15 | 20.56 | 113.808 | Vertical | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 826.5 | 5.19 | 2.01 | 19.71 | 2.15 | 20.74 | 118.508 | Vertical | Pass |
| | | 836.5 | 5.14 | 2.01 | 19.77 | 2.15 | 20.75 | 118.891 | Vertical | Pass |
| | | 846.5 | 5.07 | 2.02 | 19.79 | 2.15 | 20.69 | 117.307 | Vertical | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 829 | 5.31 | 2.01 | 19.73 | 2.15 | 20.88 | 122.332 | Vertical | Pass |
| | | 836.5 | 5.26 | 2.01 | 19.77 | 2.15 | 20.87 | 122.082 | Vertical | Pass |
| | | 844 | 5.19 | 2.02 | 19.78 | 2.15 | 20.80 | 120.168 | Vertical | Pass |

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

8.5 LTE BAND 12

| Radiated Power (ERP) for Band 12 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/ RB SIZE | Frequency | Result | | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Correction (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 1.4MHz Band QPSK | 6/0 | 699.7 | 6.42 | 1.91 | 19.21 | 2.15 | 21.57 | 143.501 | Vertical | Pass |
| | | 707.5 | 6.38 | 1.91 | 19.26 | 2.15 | 21.58 | 144.034 | Vertical | Pass |
| | | 715.3 | 6.27 | 1.93 | 19.34 | 2.15 | 21.53 | 142.183 | Vertical | Pass |
| 3.0MHz Band QPSK | 15/0 | 700.5 | 6.17 | 1.91 | 19.21 | 2.15 | 21.32 | 135.632 | Vertical | Pass |
| | | 707.5 | 6.25 | 1.91 | 19.26 | 2.15 | 21.45 | 139.759 | Vertical | Pass |
| | | 714.5 | 6.28 | 1.93 | 19.34 | 2.15 | 21.54 | 142.680 | Vertical | Pass |
| 5.0MHz Band QPSK | 25/0 | 701.5 | 6.48 | 1.91 | 19.23 | 2.15 | 21.65 | 146.162 | Vertical | Pass |
| | | 707.5 | 6.44 | 1.91 | 19.26 | 2.15 | 21.64 | 145.723 | Vertical | Pass |
| | | 713.5 | 6.12 | 1.92 | 19.33 | 2.15 | 21.38 | 137.438 | Vertical | Pass |
| 10.0MHz Band QPSK | 50/0 | 704 | 6.28 | 1.91 | 19.25 | 2.15 | 21.47 | 140.301 | Vertical | Pass |
| | | 707.5 | 6.13 | 1.91 | 19.26 | 2.15 | 21.33 | 135.704 | Vertical | Pass |
| | | 711 | 6.33 | 1.92 | 19.32 | 2.15 | 21.58 | 143.988 | Vertical | Pass |
| 1.4MHz Band QPSK | 6/0 | 699.7 | 6.45 | 1.91 | 19.21 | 2.15 | 21.60 | 144.582 | Horizontal | Pass |
| | | 707.5 | 6.42 | 1.91 | 19.26 | 2.15 | 21.62 | 145.352 | Horizontal | Pass |
| | | 715.3 | 6.40 | 1.93 | 19.34 | 2.15 | 21.66 | 146.511 | Horizontal | Pass |
| 3.0MHz Band QPSK | 15/0 | 700.5 | 6.39 | 1.91 | 19.21 | 2.15 | 21.54 | 142.558 | Horizontal | Pass |
| | | 707.5 | 6.24 | 1.91 | 19.26 | 2.15 | 21.44 | 139.361 | Horizontal | Pass |
| | | 714.5 | 6.44 | 1.93 | 19.34 | 2.15 | 21.70 | 147.755 | Horizontal | Pass |
| 5.0MHz Band QPSK | 25/0 | 701.5 | 6.58 | 1.91 | 19.23 | 2.15 | 21.75 | 149.669 | Horizontal | Pass |
| | | 707.5 | 6.59 | 1.91 | 19.26 | 2.15 | 21.79 | 151.048 | Horizontal | Pass |
| | | 713.5 | 6.14 | 1.92 | 19.33 | 2.15 | 21.40 | 137.906 | Horizontal | Pass |
| 10.0MHz Band QPSK | 50/0 | 704 | 6.35 | 1.91 | 19.25 | 2.15 | 21.54 | 142.575 | Horizontal | Pass |
| | | 707.5 | 6.31 | 1.91 | 19.26 | 2.15 | 21.51 | 141.448 | Horizontal | Pass |
| | | 711 | 6.63 | 1.92 | 19.32 | 2.15 | 21.88 | 154.305 | Horizontal | Pass |

| Radiated Power (EIRP) for Band 12 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/ RB SIZE | Frequency | Result | | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Correction (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 1.4MHz Band 16 QAM | 6/0 | 699.7 | 5.12 | 1.91 | 19.21 | 2.15 | 20.27 | 106.525 | Vertical | Pass |
| | | 707.5 | 4.93 | 1.91 | 19.26 | 2.15 | 20.13 | 103.074 | Vertical | Pass |
| | | 715.3 | 4.89 | 1.93 | 19.34 | 2.15 | 20.15 | 103.593 | Vertical | Pass |
| 3.0MHz Band 16 QAM | 15/0 | 700.5 | 5.40 | 1.91 | 19.21 | 2.15 | 20.55 | 113.551 | Vertical | Pass |
| | | 707.5 | 5.37 | 1.91 | 19.26 | 2.15 | 20.57 | 114.013 | Vertical | Pass |
| | | 714.5 | 5.38 | 1.93 | 19.34 | 2.15 | 20.64 | 115.919 | Vertical | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 701.5 | 5.29 | 1.91 | 19.23 | 2.15 | 20.46 | 111.259 | Vertical | Pass |
| | | 707.5 | 5.48 | 1.91 | 19.26 | 2.15 | 20.68 | 116.966 | Vertical | Pass |
| | | 713.5 | 5.40 | 1.92 | 19.33 | 2.15 | 20.66 | 116.539 | Vertical | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 704 | 5.61 | 1.91 | 19.25 | 2.15 | 20.80 | 120.133 | Vertical | Pass |
| | | 707.5 | 5.47 | 1.91 | 19.26 | 2.15 | 20.67 | 116.794 | Vertical | Pass |
| | | 711 | 5.52 | 1.92 | 19.32 | 2.15 | 20.77 | 119.417 | Vertical | Pass |
| 1.4MHz Band 16 QAM | 6/0 | 699.7 | 5.20 | 1.91 | 19.21 | 2.15 | 20.35 | 108.270 | Horizontal | Pass |
| | | 707.5 | 5.21 | 1.91 | 19.26 | 2.15 | 20.41 | 109.800 | Horizontal | Pass |
| | | 715.3 | 5.03 | 1.93 | 19.34 | 2.15 | 20.29 | 106.898 | Horizontal | Pass |
| 3.0MHz Band 16 QAM | 15/0 | 700.5 | 5.45 | 1.91 | 19.21 | 2.15 | 20.60 | 114.919 | Horizontal | Pass |
| | | 707.5 | 5.32 | 1.91 | 19.26 | 2.15 | 20.52 | 112.806 | Horizontal | Pass |
| | | 714.5 | 5.49 | 1.93 | 19.34 | 2.15 | 20.75 | 118.922 | Horizontal | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 701.5 | 5.40 | 1.91 | 19.23 | 2.15 | 20.57 | 114.131 | Horizontal | Pass |
| | | 707.5 | 5.58 | 1.91 | 19.26 | 2.15 | 20.78 | 119.665 | Horizontal | Pass |
| | | 713.5 | 5.45 | 1.92 | 19.33 | 2.15 | 20.71 | 117.636 | Horizontal | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 704 | 5.68 | 1.91 | 19.25 | 2.15 | 20.87 | 122.320 | Horizontal | Pass |
| | | 707.5 | 5.45 | 1.91 | 19.26 | 2.15 | 20.65 | 116.111 | Horizontal | Pass |
| | | 711 | 5.58 | 1.92 | 19.32 | 2.15 | 20.83 | 121.108 | Horizontal | Pass |

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

8.6 LTE BAND 17

| Radiated Power (ERP) for Band 17 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/ RB SIZE | Frequency | Result | | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Correction (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 5.0MHz Band QPSK | 25/0 | 706.5 | 6.82 | 1.91 | 19.23 | 2.15 | 21.99 | 157.974 | Vertical | Pass |
| | | 710 | 6.71 | 1.91 | 19.26 | 2.15 | 21.91 | 155.328 | Vertical | Pass |
| | | 713.5 | 6.73 | 1.92 | 19.33 | 2.15 | 21.99 | 158.015 | Vertical | Pass |
| 10.0MHz Band QPSK | 50/0 | 709 | 6.95 | 1.91 | 19.25 | 2.15 | 22.14 | 163.650 | Vertical | Pass |
| | | 710 | 6.99 | 1.91 | 19.26 | 2.15 | 22.19 | 165.432 | Vertical | Pass |
| | | 711 | 6.71 | 1.92 | 19.32 | 2.15 | 21.96 | 157.119 | Vertical | Pass |
| 5.0MHz Band QPSK | 25/0 | 706.5 | 6.93 | 1.91 | 19.23 | 2.15 | 22.10 | 162.159 | Vertical | Pass |
| | | 710 | 6.77 | 1.91 | 19.26 | 2.15 | 21.97 | 157.302 | Vertical | Pass |
| | | 713.5 | 6.78 | 1.92 | 19.33 | 2.15 | 22.04 | 159.783 | Vertical | Pass |
| 10.0MHz Band QPSK | 50/0 | 709 | 6.91 | 1.91 | 19.25 | 2.15 | 22.10 | 162.157 | Vertical | Pass |
| | | 710 | 7.02 | 1.91 | 19.26 | 2.15 | 22.22 | 166.617 | Vertical | Pass |
| | | 711 | 6.66 | 1.92 | 19.32 | 2.15 | 21.91 | 155.133 | Vertical | Pass |

| Radiated Power (ERP) for Band 17 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/ RB SIZE | Frequency | Result | | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Correction (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 5.0MHz Band 16 QAM | 25/0 | 706.5 | 5.42 | 1.91 | 19.23 | 2.15 | 20.59 | 114.484 | Vertical | Pass |
| | | 710 | 5.39 | 1.91 | 19.26 | 2.15 | 20.59 | 114.620 | Vertical | Pass |
| | | 713.5 | 5.33 | 1.92 | 19.33 | 2.15 | 20.59 | 114.430 | Vertical | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 709 | 5.31 | 1.91 | 19.25 | 2.15 | 20.50 | 112.295 | Vertical | Pass |
| | | 710 | 5.21 | 1.91 | 19.26 | 2.15 | 20.41 | 109.870 | Vertical | Pass |
| | | 711 | 5.24 | 1.92 | 19.32 | 2.15 | 20.49 | 111.929 | Vertical | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 706.5 | 5.32 | 1.91 | 19.23 | 2.15 | 20.49 | 111.874 | Horizontal | Pass |
| | | 710 | 5.39 | 1.91 | 19.26 | 2.15 | 20.59 | 114.597 | Horizontal | Pass |
| | | 713.5 | 5.34 | 1.92 | 19.33 | 2.15 | 20.60 | 114.768 | Horizontal | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 709 | 5.29 | 1.91 | 19.25 | 2.15 | 20.48 | 111.727 | Horizontal | Pass |
| | | 710 | 5.50 | 1.91 | 19.26 | 2.15 | 20.70 | 117.563 | Horizontal | Pass |
| | | 711 | 5.17 | 1.92 | 19.32 | 2.15 | 20.42 | 110.205 | Horizontal | Pass |

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

## 8.7 LTE BAND 25

| Radiated Power (EIRP) for Band 25 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/RB SIZE | Frequency | Result | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 1.4MHz Band QPSK | 6/0 | 1850.7 | -2.53 | 3.86 | 28.24 | 21.84 | 152.897 | Vertical | Pass |
| | | 1882.5 | -3.07 | 3.76 | 28.22 | 21.39 | 137.645 | Vertical | Pass |
| | | 1914.3 | -2.67 | 3.91 | 28.20 | 21.61 | 144.936 | Vertical | Pass |
| 3.0MHz Band QPSK | 15/0 | 1851.5 | -2.62 | 3.75 | 28.23 | 21.86 | 153.454 | Vertical | Pass |
| | | 1882.5 | -2.60 | 3.98 | 28.24 | 21.66 | 146.510 | Vertical | Pass |
| | | 1913.5 | -2.40 | 3.87 | 28.25 | 21.98 | 157.801 | Vertical | Pass |
| 5.0MHz Band QPSK | 25/0 | 1852.5 | -2.92 | 3.66 | 28.31 | 21.73 | 148.941 | Vertical | Pass |
| | | 1882.5 | -2.65 | 3.76 | 28.22 | 21.81 | 151.668 | Vertical | Pass |
| | | 1912.5 | -2.85 | 3.91 | 28.20 | 21.44 | 139.164 | Vertical | Pass |
| 10.0MHz Band QPSK | 50/0 | 1855 | -3.23 | 3.90 | 28.33 | 21.20 | 131.871 | Vertical | Pass |
| | | 1882.5 | -3.23 | 3.78 | 28.22 | 21.22 | 132.328 | Vertical | Pass |
| | | 1910 | -3.00 | 3.87 | 28.19 | 21.32 | 135.550 | Vertical | Pass |
| 15.0MHz Band QPSK | 75/0 | 1857.5 | -2.89 | 3.89 | 28.34 | 21.56 | 143.221 | Vertical | Pass |
| | | 1882.5 | -2.33 | 4.00 | 28.22 | 21.90 | 154.775 | Vertical | Pass |
| | | 1907.5 | -2.82 | 3.94 | 28.18 | 21.42 | 138.542 | Vertical | Pass |
| 20.0MHz Band QPSK | 100/0 | 1860 | -3.79 | 3.94 | 28.35 | 20.62 | 115.267 | Vertical | Pass |
| | | 1882.5 | -2.43 | 3.84 | 28.22 | 21.96 | 157.003 | Vertical | Pass |
| | | 1905 | -2.03 | 4.17 | 28.16 | 21.95 | 156.773 | Vertical | Pass |
| 1.4MHz Band QPSK | 6/0 | 1850.7 | -2.40 | 3.90 | 28.24 | 21.94 | 156.166 | Horizontal | Pass |
| | | 1882.5 | -3.09 | 3.74 | 28.22 | 21.39 | 137.707 | Horizontal | Pass |
| | | 1914.3 | -2.51 | 4.06 | 28.20 | 21.63 | 145.702 | Horizontal | Pass |
| 3.0MHz Band QPSK | 15/0 | 1851.5 | -3.57 | 3.63 | 28.23 | 21.02 | 126.530 | Horizontal | Pass |
| | | 1882.5 | -2.72 | 3.91 | 28.24 | 21.61 | 145.026 | Horizontal | Pass |
| | | 1913.5 | -3.34 | 3.87 | 28.25 | 21.05 | 127.227 | Horizontal | Pass |
| 5.0MHz Band QPSK | 25/0 | 1852.5 | -3.39 | 3.71 | 28.31 | 21.21 | 132.091 | Horizontal | Pass |
| | | 1882.5 | -2.86 | 3.93 | 28.22 | 21.43 | 138.902 | Horizontal | Pass |
| | | 1912.5 | -2.96 | 4.03 | 28.20 | 21.21 | 132.082 | Horizontal | Pass |
| 10.0MHz Band | 50/0 | 1855 | -3.10 | 3.96 | 28.33 | 21.27 | 133.888 | Horizontal | Pass |
| | | 1882.5 | -2.41 | 4.15 | 28.22 | 21.66 | 146.673 | Horizontal | Pass |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| QPSK | | 1910 | -2.89 | 3.92 | 28.19 | 21.38 | 137.415 | Horizontal | Pass |
| 15.0MHz Band QPSK | 75/0 | 1857.5 | -2.47 | 3.98 | 28.34 | 21.89 | 154.406 | Horizontal | Pass |
| | | 1882.5 | -3.26 | 3.81 | 28.22 | 21.14 | 130.163 | Horizontal | Pass |
| | | 1907.5 | -2.52 | 4.15 | 28.18 | 21.51 | 141.628 | Horizontal | Pass |
| 20.0MHz Band QPSK | 100/0 | 1860 | -3.28 | 3.70 | 28.35 | 21.37 | 137.026 | Horizontal | Pass |
| | | 1882.5 | -2.70 | 4.05 | 28.22 | 21.47 | 140.361 | Horizontal | Pass |
| | | 1905 | -1.95 | 4.18 | 28.16 | 22.04 | 159.898 | Horizontal | Pass |

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

| Radiated Power (EIRP) for Band 25 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mode | RB/RB SIZE | Frequency | Result | | | | | | Conclusion |
| | | | SG Level (dBm) | Cable Loss (dBm) | Antenna Gain (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP | |
| 1.4MHz Band 16 QAM | 6/0 | 1850.7 | -4.19 | 3.75 | 28.24 | 20.30 | 107.111 | Vertical | Pass |
| | | 1882.5 | -3.78 | 3.98 | 28.22 | 20.47 | 111.332 | Vertical | Pass |
| | | 1914.3 | -3.21 | 4.08 | 28.2 | 20.91 | 123.169 | Vertical | Pass |
| 3.0MHz Band 16 QAM | 15/0 | 1851.5 | -3.85 | 3.64 | 28.23 | 20.74 | 118.672 | Vertical | Pass |
| | | 1882.5 | -3.65 | 4.00 | 28.24 | 20.59 | 114.600 | Vertical | Pass |
| | | 1913.5 | -4.18 | 3.99 | 28.25 | 20.07 | 101.722 | Vertical | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 1852.5 | -4.14 | 3.80 | 28.31 | 20.37 | 108.980 | Vertical | Pass |
| | | 1882.5 | -3.68 | 3.85 | 28.22 | 20.68 | 117.003 | Vertical | Pass |
| | | 1912.5 | -4.28 | 3.83 | 28.2 | 20.09 | 102.061 | Vertical | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 1855 | -3.69 | 3.93 | 28.33 | 20.71 | 117.638 | Vertical | Pass |
| | | 1882.5 | -3.16 | 4.07 | 28.22 | 20.99 | 125.556 | Vertical | Pass |
| | | 1910 | -3.27 | 3.99 | 28.19 | 20.93 | 123.762 | Vertical | Pass |
| 15.0MHz Band 16 QAM | 75/0 | 1857.5 | -3.83 | 3.84 | 28.34 | 20.67 | 116.735 | Vertical | Pass |
| | | 1882.5 | -4.07 | 4.10 | 28.22 | 20.05 | 101.068 | Vertical | Pass |
| | | 1907.5 | -4.17 | 3.94 | 28.18 | 20.07 | 101.557 | Vertical | Pass |
| 20.0MHz Band 16 QAM | 100/0 | 1860 | -3.87 | 3.90 | 28.35 | 20.58 | 114.190 | Vertical | Pass |
| | | 1882.5 | -3.92 | 3.80 | 28.22 | 20.50 | 112.127 | Vertical | Pass |
| | | 1905 | -3.45 | 3.86 | 28.16 | 20.85 | 121.696 | Vertical | Pass |
| 1.4MHz Band 16 QAM | 6/0 | 1850.7 | -3.64 | 3.61 | 28.24 | 20.99 | 125.462 | Horizontal | Pass |
| | | 1882.5 | -3.23 | 4.04 | 28.22 | 20.95 | 124.392 | Horizontal | Pass |
| | | 1914.3 | -3.32 | 4.05 | 28.2 | 20.83 | 121.136 | Horizontal | Pass |
| 3.0MHz Band 16 QAM | 15/0 | 1851.5 | -3.80 | 3.64 | 28.23 | 20.79 | 120.000 | Horizontal | Pass |
| | | 1882.5 | -3.51 | 4.00 | 28.24 | 20.73 | 118.206 | Horizontal | Pass |
| | | 1913.5 | -3.35 | 4.03 | 28.25 | 20.86 | 121.959 | Horizontal | Pass |
| 5.0MHz Band 16 QAM | 25/0 | 1852.5 | -4.48 | 3.69 | 28.31 | 20.15 | 103.425 | Horizontal | Pass |
| | | 1882.5 | -3.46 | 3.79 | 28.22 | 20.97 | 125.007 | Horizontal | Pass |
| | | 1912.5 | -4.10 | 4.09 | 28.2 | 20.02 | 100.406 | Horizontal | Pass |
| 10.0MHz Band 16 QAM | 50/0 | 1855 | -4.35 | 3.86 | 28.33 | 20.12 | 102.825 | Horizontal | Pass |
| | | 1882.5 | -3.61 | 3.82 | 28.22 | 20.79 | 119.839 | Horizontal | Pass |
| | | 1910 | -3.63 | 3.96 | 28.19 | 20.59 | 114.653 | Horizontal | Pass |
| 15.0MHz Band | 75/0 | 1857.5 | -4.29 | 3.83 | 28.34 | 20.22 | 105.098 | Horizontal | Pass |
| | | 1882.5 | -3.52 | 4.02 | 28.22 | 20.69 | 117.108 | Horizontal | Pass |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 16 QAM | | 1907.5 | -3.24 | 4.06 | 28.18 | 20.88 | 122.339 | Horizontal | Pass |
| 20.0MHz Band 16 QAM | 100/0 | 1860 | -3.43 | 3.88 | 28.35 | 21.04 | 126.980 | Horizontal | Pass |
| | | 1882.5 | -3.54 | 3.86 | 28.22 | 20.81 | 120.642 | Horizontal | Pass |
| | | 1905 | -3.93 | 3.95 | 28.16 | 20.28 | 106.743 | Horizontal | Pass |

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

# 9. SPURIOUS RADIATION EMISSION

**RULE PART(S)**

FCC: §2.1053, §22.917, §24.238 and §27.53

**LIMIT**

§22.917 (e) and §24.238 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

**TEST PROCEDURE**

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth in the 1 MHz band immediately outside and adjacent to the channel edge of the equipment. Beyond the 1 MHz band immediately outside the channel edge of the equipment, a resolution bandwidth of 1 MHz shall be employed. A narrower resolution bandwidth is allowed to be used provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz or 1% of the occupied bandwidth as applicable.

The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power, P (dBW), as follows:
a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB; and
b. for mobile subscriber equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB at the channel edges and 55 + 10 Log10 (p) at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts.

**MODES TESTED**

LTE Band 2
LTE Band 4
LTE Band 5
LTE Band 12
LTE Band 17
LTE Band 25

**RESULTS**

PASS

## 9.1 LTE BAND 2

**QPSK EIRP POWER FOR LTE BAND 2 (1.4MHZ BANDWIDTH)**

| Test Results for Low Channel 1850.7MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 3701.4 | -50.30 | 4.04 | 33.51 | -20.83 | -13 | -7.83 | Horizontal |
| 3701.4 | -52.62 | 4.04 | 33.51 | -23.15 | -13 | -10.15 | Vertical |
| 5552.1 | -55.38 | 5.24 | 35.84 | -24.78 | -13 | -11.78 | Vertical |
| 5552.1 | -65.76 | 5.24 | 35.84 | -35.16 | -13 | -22.16 | Horizontal |
| **Test Results for Mid Channel 1880MHz** | | | | | | | |
| 3760 | -51.83 | 4.04 | 33.56 | -22.31 | -13 | -9.31 | Horizontal |
| 3760 | -52.39 | 4.04 | 33.56 | -22.87 | -13 | -9.87 | Vertical |
| 5640 | -52.49 | 5.24 | 35.91 | -21.82 | -13 | -8.82 | Vertical |
| 5640 | -54.99 | 5.24 | 35.91 | -24.32 | -13 | -11.32 | Horizontal |
| **Test Results for High Channel 1909.3MHz** | | | | | | | |
| 3818.6 | -51.34 | 4.04 | 34.00 | -21.38 | -13 | -8.38 | Horizontal |
| 3818.6 | -53.79 | 4.04 | 34.00 | -23.83 | -13 | -10.83 | Vertical |
| 5727.9 | -55.36 | 5.24 | 36.04 | -24.56 | -13 | -11.56 | Vertical |
| 5727.9 | -55.14 | 5.24 | 36.04 | -24.34 | -13 | -11.34 | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 2 (20.0MHZ BANDWIDTH)**

| Test Results for Low Channel 1860MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 3720 | -55.77 | 4.07 | 33.54 | -26.30 | -13 | -13.30 | Horizontal |
| 3720 | -49.58 | 4.07 | 33.54 | -20.11 | -13 | -7.11 | Vertical |
| 5580 | -56.70 | 5.28 | 35.86 | -26.12 | -13 | -13.12 | Vertical |
| 5580 | -57.49 | 5.28 | 35.86 | -26.91 | -13 | -13.91 | Horizontal |
| **Test Results for Mid Channel 1880MHz** | | | | | | | |
| 3760 | -54.97 | 4.04 | 33.56 | -25.45 | -13 | -12.45 | Horizontal |
| 3760 | -51.91 | 4.04 | 33.56 | -22.39 | -13 | -9.39 | Vertical |
| 5640 | -55.82 | 5.24 | 35.91 | -25.15 | -13 | -12.15 | Vertical |
| 5640 | -57.00 | 5.24 | 35.91 | -26.33 | -13 | -13.33 | Horizontal |
| **Test Results for High Channel 1900MHz** | | | | | | | |
| 3800 | -53.33 | 4.04 | 34.00 | -23.37 | -13 | -10.37 | Horizontal |
| 3800 | -54.33 | 4.04 | 34.00 | -24.37 | -13 | -11.37 | Vertical |
| 5700 | -56.26 | 5.24 | 36.04 | -25.46 | -13 | -12.46 | Vertical |
| 5700 | -54.30 | 5.24 | 36.04 | -23.50 | -13 | -10.50 | Horizontal |

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

## 9.2 LTE BAND 4

**QPSK EIRP POWER FOR LTE BAND 4 (1.4MHZ BANDWIDTH)**

| Test Results for Low Channel 1710.7MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 3421.4 | -58.05 | 4.02 | 29.80 | -32.27 | -13 | -19.27 | Horizontal |
| 3421.4 | -55.37 | 4.02 | 29.80 | -29.59 | -13 | -16.59 | Vertical |
| 5132.1 | -59.86 | 5.24 | 35.84 | -29.26 | -13 | -16.26 | Vertical |
| 5132.1 | -60.30 | 5.24 | 35.84 | -29.70 | -13 | -16.70 | Horizontal |
| **Test Results for Mid Channel 1732.5MHz** | | | | | | | |
| 3465 | -49.67 | 4.03 | 30.00 | -23.70 | -13 | -10.70 | Horizontal |
| 3465 | -53.44 | 4.03 | 30.00 | -27.47 | -13 | -14.47 | Vertical |
| 5197.5 | -56.69 | 5.25 | 35.86 | -26.08 | -13 | -13.08 | Vertical |
| 5197.5 | -54.81 | 5.25 | 35.86 | -24.20 | -13 | -11.20 | Horizontal |
| **Test Results for High Channel 1754.3MHz** | | | | | | | |
| 3508.6 | -49.34 | 4.05 | 30.01 | -23.38 | -13 | -10.38 | Horizontal |
| 3508.6 | -55.27 | 4.05 | 30.01 | -29.31 | -13 | -16.31 | Vertical |
| 5262.9 | -55.22 | 5.26 | 35.86 | -24.62 | -13 | -11.62 | Vertical |
| 5262.9 | -52.79 | 5.26 | 35.86 | -22.19 | -13 | -9.19 | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 4 (20.0MHZ BANDWIDTH)**

| Test Results for Low Channel 1720MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 3440 | -55.44 | 4.02 | 29.80 | -29.66 | -13 | -16.66 | Horizontal |
| 3440 | -55.37 | 4.02 | 29.80 | -29.59 | -13 | -16.59 | Vertical |
| 5160 | -58.04 | 5.24 | 35.84 | -27.44 | -13 | -14.44 | Vertical |
| 5160 | -61.13 | 5.24 | 35.84 | -30.53 | -13 | -17.53 | Horizontal |
| **Test Results for Mid Channel 1732.5MHz** | | | | | | | |
| 3465 | -48.84 | 4.03 | 30.00 | -22.87 | -13 | -9.87 | Horizontal |
| 3465 | -52.58 | 4.03 | 30.00 | -26.61 | -13 | -13.61 | Vertical |
| 5197.5 | -58.76 | 5.25 | 35.86 | -28.15 | -13 | -15.15 | Vertical |
| 5197.5 | -57.75 | 5.25 | 35.86 | -27.14 | -13 | -14.14 | Horizontal |
| **Test Results for High Channel 1745MHz** | | | | | | | |
| 3490 | -51.90 | 2.91 | 27.68 | -27.13 | -13 | -14.13 | Horizontal |
| 3490 | -53.22 | 2.91 | 27.68 | -28.45 | -13 | -15.45 | Vertical |
| 5235 | -57.24 | 5.26 | 35.86 | -26.64 | -13 | -13.64 | Vertical |
| 5235 | -56.04 | 5.26 | 35.86 | -25.44 | -13 | -12.44 | Horizontal |

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

## 9.3 LTE BAND 5

**QPSK EIRP POWER FOR LTE BAND 5 (1.4MHZ BANDWIDTH)**

| Test Results for Low Channel 824.7MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 1649.4 | -54.41 | 2.78 | 27.50 | -29.69 | -13 | -16.69 | Horizontal |
| 1649.4 | -48.95 | 2.78 | 27.50 | -24.23 | -13 | -11.23 | Vertical |
| 2474.1 | -51.91 | 2.90 | 27.80 | -27.01 | -13 | -14.01 | Vertical |
| 2474.1 | -53.07 | 2.90 | 27.80 | -28.17 | -13 | -15.17 | Horizontal |
| **Test Results For Mid Channel 836.5MHz** | | | | | | | |
| 1673 | -54.59 | 2.80 | 27.48 | -29.91 | -13 | -16.91 | Horizontal |
| 1673 | -52.69 | 2.80 | 27.48 | -28.01 | -13 | -15.01 | Vertical |
| 2509.5 | -55.25 | 2.91 | 27.70 | -30.46 | -13 | -17.46 | Vertical |
| 2509.5 | -51.73 | 2.91 | 27.70 | -26.94 | -13 | -13.94 | Horizontal |
| **Test Results for High Channel 848.3MHz** | | | | | | | |
| 1696.6 | -53.22 | 2.82 | 27.43 | -28.61 | -13 | -15.61 | Horizontal |
| 1696.6 | -52.63 | 2.82 | 27.43 | -28.02 | -13 | -15.02 | Vertical |
| 2544.9 | -48.82 | 2.92 | 27.74 | -24.00 | -13 | -11.00 | Vertical |
| 2544.9 | -54.91 | 2.92 | 27.74 | -30.09 | -13 | -17.09 | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 5 (10MHZ BANDWIDTH)**

| Test Results for Low Channel 829MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 1658 | -52.56 | 2.78 | 27.50 | -27.84 | -13 | -14.84 | Horizontal |
| 1658 | -55.11 | 2.78 | 27.50 | -30.39 | -13 | -17.39 | Vertical |
| 2487 | -55.61 | 2.90 | 27.80 | -30.71 | -13 | -17.71 | Vertical |
| 2487 | -48.59 | 2.90 | 27.80 | -23.69 | -13 | -10.69 | Horizontal |
| **Test Results For Mid Channel 836.5MHz** | | | | | | | |
| 1673 | -52.22 | 2.80 | 27.48 | -27.54 | -13 | -14.54 | Horizontal |
| 1673 | -55.02 | 2.80 | 27.48 | -30.34 | -13 | -17.34 | Vertical |
| 2509.5 | -55.84 | 2.91 | 27.70 | -31.05 | -13 | -18.05 | Vertical |
| 2509.5 | -55.23 | 2.91 | 27.70 | -30.44 | -13 | -17.44 | Horizontal |
| **Test Results for High Channel 844MHz** | | | | | | | |
| 1688 | -54.26 | 2.82 | 27.43 | -29.65 | -13 | -16.65 | Horizontal |
| 1688 | -55.06 | 2.82 | 27.43 | -30.45 | -13 | -17.45 | Vertical |
| 2532 | -53.87 | 2.92 | 27.74 | -29.05 | -13 | -16.05 | Vertical |
| 2532 | -55.58 | 2.92 | 27.74 | -30.76 | -13 | -17.76 | Horizontal |

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

## 9.4 LTE BAND 12

**QPSK EIRP POWER FOR LTE BAND 12 (1.4MHZ BANDWIDTH)**

| Test Results for Low Channel 699.7MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 1399.4 | -47.65 | 2.60 | 27.20 | -23.05 | -13 | -10.05 | Horizontal |
| 1399.4 | -49.02 | 2.60 | 27.20 | -24.42 | -13 | -11.42 | Vertical |
| 2099.1 | -48.36 | 2.85 | 27.54 | -23.67 | -13 | -10.67 | Vertical |
| 2099.1 | -48.40 | 2.85 | 27.54 | -23.71 | -13 | -10.71 | Horizontal |
| **Test Results For Mid Channel 707.5MHz** | | | | | | | |
| 1415 | -50.54 | 2.61 | 27.28 | -25.87 | -13 | -12.87 | Horizontal |
| 1415 | -48.14 | 2.61 | 27.28 | -23.47 | -13 | -10.47 | Vertical |
| 2122.5 | -46.72 | 2.87 | 27.59 | -22.00 | -13 | -9.00 | Vertical |
| 2122.5 | -50.76 | 2.87 | 27.59 | -26.04 | -13 | -13.04 | Horizontal |
| **Test Results for High Channel 715.3MHz** | | | | | | | |
| 1430.6 | -50.83 | 2.63 | 27.28 | -26.18 | -13 | -13.18 | Horizontal |
| 1430.6 | -55.25 | 2.63 | 27.28 | -30.60 | -13 | -17.60 | Vertical |
| 2145.9 | -52.04 | 2.88 | 27.60 | -27.32 | -13 | -14.32 | Vertical |
| 2145.9 | -49.44 | 2.88 | 27.60 | -24.72 | -13 | -11.72 | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 12 (10MHZ BANDWIDTH)**

| Test Results for Low Channel 704MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 1408 | -47.90 | 2.61 | 27.26 | -23.25 | -13 | -10.25 | Horizontal |
| 1408 | -51.06 | 2.61 | 27.26 | -26.41 | -13 | -13.41 | Vertical |
| 2112 | -49.96 | 2.87 | 27.58 | -25.25 | -13 | -12.25 | Vertical |
| 2112 | -50.77 | 2.87 | 27.58 | -26.06 | -13 | -13.06 | Horizontal |
| **Test Results for Mid Channel 707.5MHz** | | | | | | | |
| 1415 | -49.22 | 2.61 | 27.28 | -24.55 | -13 | -11.55 | Horizontal |
| 1415 | -53.16 | 2.61 | 27.28 | -28.49 | -13 | -15.49 | Vertical |
| 2122.5 | -51.72 | 2.87 | 27.59 | -27.00 | -13 | -14.00 | Vertical |
| 2122.5 | -51.22 | 2.87 | 27.59 | -26.50 | -13 | -13.50 | Horizontal |
| **Test Results for High Channel 711MHz** | | | | | | | |
| 1422 | -53.08 | 2.62 | 27.28 | -28.42 | -13 | -15.42 | Horizontal |
| 1422 | -48.26 | 2.62 | 27.28 | -23.60 | -13 | -10.60 | Vertical |
| 2133 | -51.36 | 2.87 | 27.60 | -26.63 | -13 | -13.63 | Vertical |
| 2133 | -50.97 | 2.87 | 27.60 | -26.24 | -13 | -13.24 | Horizontal |

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

## 9.5 LTE BAND 17

**QPSK EIRP POWER FOR LTE BAND 17 (5MHZ BANDWIDTH)**

| Test Results for Low Channel 706.5MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 1413 | -49.11 | 2.61 | 27.28 | -24.44 | -13 | -11.44 | Horizontal |
| 1413 | -46.95 | 2.61 | 27.28 | -22.28 | -13 | -9.28 | Vertical |
| 2119.5 | -49.47 | 2.87 | 27.59 | -24.75 | -13 | -11.75 | Vertical |
| 2119.5 | -49.13 | 2.87 | 27.59 | -24.41 | -13 | -11.41 | Horizontal |
| **Test Results For Mid Channel 710MHz** | | | | | | | |
| 1420 | -47.68 | 2.62 | 27.30 | -23.00 | -13 | -10.00 | Horizontal |
| 1420 | -50.44 | 2.62 | 27.30 | -25.76 | -13 | -12.76 | Vertical |
| 2130 | -51.16 | 2.87 | 27.62 | -26.41 | -13 | -13.41 | Vertical |
| 2130 | -53.81 | 2.87 | 27.62 | -29.06 | -13 | -16.06 | Horizontal |
| **Test Results for High Channel 713.5MHz** | | | | | | | |
| 1427 | -50.74 | 2.66 | 27.28 | -26.12 | -13 | -13.12 | Horizontal |
| 1427 | -52.19 | 2.66 | 27.28 | -27.57 | -13 | -14.57 | Vertical |
| 2140.5 | -49.31 | 2.88 | 27.60 | -24.59 | -13 | -11.59 | Vertical |
| 2140.5 | -48.01 | 2.88 | 27.60 | -23.29 | -13 | -10.29 | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 17 (10MHZ BANDWIDTH)**

| Test Results for Low Channel 709MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 1418 | -51.64 | 2.62 | 27.30 | -26.96 | -13 | -13.96 | Horizontal |
| 1418 | -49.50 | 2.62 | 27.30 | -24.82 | -13 | -11.82 | Vertical |
| 2127 | -50.67 | 2.87 | 27.62 | -25.92 | -13 | -12.92 | Vertical |
| 2127 | -53.76 | 2.87 | 27.62 | -29.01 | -13 | -16.01 | Horizontal |
| **Test Results for Mid Channel 710MHz** | | | | | | | |
| 1420 | -51.20 | 2.62 | 27.30 | -26.52 | -13 | -13.52 | Horizontal |
| 1420 | -48.71 | 2.62 | 27.30 | -24.03 | -13 | -11.03 | Vertical |
| 2130 | -53.07 | 2.87 | 27.62 | -28.32 | -13 | -15.32 | Vertical |
| 2130 | -48.65 | 2.87 | 27.62 | -23.90 | -13 | -10.90 | Horizontal |
| **Test Results for High Channel 711MHz** | | | | | | | |
| 1422 | -57.97 | 2.62 | 27.30 | -33.29 | -13 | -20.29 | Horizontal |
| 1422 | -50.30 | 2.62 | 27.30 | -25.62 | -13 | -12.62 | Vertical |
| 2133 | -49.25 | 2.87 | 27.62 | -24.50 | -13 | -11.50 | Vertical |
| 2133 | -52.20 | 2.87 | 27.62 | -27.45 | -13 | -14.45 | Horizontal |

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

## 9.6 LTE BAND 25

**QPSK EIRP POWER FOR LTE BAND 25 (1.4MHZ BANDWIDTH)**

| Test Results for Low Channel 1850.7MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 3701.4 | -50.78 | 2.61 | 27.26 | -26.13 | -13 | -13.13 | Horizontal |
| 3701.4 | -50.40 | 2.61 | 27.26 | -25.75 | -13 | -12.75 | Vertical |
| 5552.1 | -53.70 | 2.87 | 27.58 | -28.99 | -13 | -15.99 | Vertical |
| 5552.1 | -51.57 | 2.87 | 27.58 | -26.86 | -13 | -13.86 | Horizontal |
| **Test Results For Mid Channel 1882.5MHz** | | | | | | | |
| 3765 | -50.03 | 2.63 | 27.28 | -25.38 | -13 | -12.38 | Horizontal |
| 3765 | -51.98 | 2.63 | 27.28 | -27.33 | -13 | -14.33 | Vertical |
| 5647.5 | -49.56 | 2.88 | 27.62 | -24.82 | -13 | -11.82 | Vertical |
| 5647.5 | -51.08 | 2.88 | 27.62 | -26.34 | -13 | -13.34 | Horizontal |
| **Test Results for High Channel 1914.3MHz** | | | | | | | |
| 3828.6 | -53.30 | 2.65 | 27.28 | -28.67 | -13 | -15.67 | Horizontal |
| 3828.6 | -52.66 | 2.65 | 27.28 | -28.03 | -13 | -15.03 | Vertical |
| 5742.9 | -51.45 | 2.88 | 27.70 | -26.63 | -13 | -13.63 | Vertical |
| 5742.9 | -50.96 | 2.88 | 27.70 | -26.14 | -13 | -13.14 | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 25 (20.0MHZ BANDWIDTH)**

| Test Results for Low Channel 1860MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency(MHz) | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit （dBm） | Margin(dBm) | Polarity |
| 3720 | -52.47 | 2.62 | 27.30 | -27.79 | -13 | -14.79 | Horizontal |
| 3720 | -51.97 | 2.62 | 27.30 | -27.29 | -13 | -14.29 | Vertical |
| 5580 | -52.53 | 2.87 | 27.62 | -27.78 | -13 | -14.78 | Vertical |
| 5580 | -51.32 | 2.87 | 27.62 | -26.57 | -13 | -13.57 | Horizontal |
| **Test Results for Mid Channel 1882.5MHz** | | | | | | | |
| 3765 | -53.18 | 2.64 | 27.33 | -28.49 | -13 | -15.49 | Horizontal |
| 3765 | -52.95 | 2.64 | 27.33 | -28.26 | -13 | -15.26 | Vertical |
| 5647.5 | -53.08 | 2.88 | 27.67 | -28.29 | -13 | -15.29 | Vertical |
| 5647.5 | -51.50 | 2.88 | 27.67 | -26.71 | -13 | -13.71 | Horizontal |
| **Test Results for High Channel 1905MHz** | | | | | | | |
| 3810 | -49.21 | 2.64 | 27.33 | -24.52 | -13 | -11.52 | Horizontal |
| 3810 | -52.79 | 2.64 | 27.33 | -28.10 | -13 | -15.10 | Vertical |
| 5715 | -50.92 | 2.88 | 27.67 | -26.13 | -13 | -13.13 | Vertical |
| 5715 | -50.33 | 2.88 | 27.67 | -25.54 | -13 | -12.54 | Horizontal |

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

# 10. FREQUENCY STABILITY

**RULE PART(S)**

FCC: §2.1055, §22.355, §24.235, §27.54

**LIMITS**

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

**TEST PROCEDURE**

Use CMW 500 with Frequency Error measurement capability.

Temp. = −30° to +50°C

Voltage =low voltage, DC 3.2V, Normal, DC 3.85V and High voltage, DC DC 4.2V.

**Frequency Stability vs Temperature:**

The EUT is place inside a temperature chamber. The temperature is set to -30ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

**Frequency Stability vs Voltage:**

The peak frequency error is recorded (worst-case).

**MODES TESTED**

LTE Band 2
LTE Band 4
LTE Band 5
LTE Band 12
LTE Band 17
LTE Band 25

**RESULTS**

See the following pages.

## 10.1 LTE BAND 2

**QPSK, (20MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)** | | | | |
| 3.4 | 1880 | -17.5 | -0.009309 | 2.5 |
| 3.85 | 1880 | -17.8 | -0.009468 | 2.5 |
| 4.2 | 1880 | -17.3 | -0.009202 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [° C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)** | | | | |
| Normal (25C) | 1880 | -17.7 | -0.009415 | 2.5 |
| Extreme (50C) | 1880 | -17.6 | -0.009362 | 2.5 |
| Extreme (40C) | 1880 | -17.7 | -0.009415 | 2.5 |
| Extreme (30C) | 1880 | -17.8 | -0.009468 | 2.5 |
| Extreme (10C) | 1880 | -17.3 | -0.009202 | 2.5 |
| Extreme (0C) | 1880 | -17.2 | -0.009149 | 2.5 |
| Extreme (-10C) | 1880 | -16.9 | -0.008989 | 2.5 |
| Extreme (-20C) | 1880 | -17.1 | -0.009096 | 2.5 |
| Extreme (-30C) | 1880 | -16.8 | -0.008936 | 2.5 |

**16QAM, (20MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)** | | | | |
| 3.4 | 1880 | -19.2 | -0.010213 | 2.5 |
| 3.85 | 1880 | -19.0 | -0.010106 | 2.5 |
| 4.2 | 1880 | -19.2 | -0.010213 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [° C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)** | | | | |
| Normal (25C) | 1880 | -18.9 | -0.010053 | 2.5 |
| Extreme (50C) | 1880 | -19.1 | -0.010160 | 2.5 |
| Extreme (40C) | 1880 | -19.7 | -0.010479 | 2.5 |
| Extreme (30C) | 1880 | -19.2 | -0.010213 | 2.5 |
| Extreme (10C) | 1880 | -18.8 | -0.010000 | 2.5 |
| Extreme (0C) | 1880 | -19.7 | -0.010479 | 2.5 |
| Extreme (-10C) | 1880 | -19.1 | -0.010160 | 2.5 |
| Extreme (-20C) | 1880 | -18.9 | -0.010053 | 2.5 |
| Extreme (-30C) | 1880 | -19.2 | -0.010213 | 2.5 |

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

## 10.2 LTE BAND 4

**QPSK, (10MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)** | | | | |
| 3.4 | 1732.5 | -14.4 | -0.008312 | 2.5 |
| 3.85 | 1732.5 | -14.3 | -0.008254 | 2.5 |
| 4.2 | 1732.5 | -14.4 | -0.008312 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)** | | | | |
| Normal (25C) | 1732.5 | -14.4 | -0.008312 | 2.5 |
| Extreme (50C) | 1732.5 | -14.1 | -0.008139 | 2.5 |
| Extreme (40C) | 1732.5 | -14.8 | -0.008543 | 2.5 |
| Extreme (30C) | 1732.5 | -14.8 | -0.008543 | 2.5 |
| Extreme (10C) | 1732.5 | -14.1 | -0.008139 | 2.5 |
| Extreme (0C) | 1732.5 | -14.3 | -0.008254 | 2.5 |
| Extreme (-10C) | 1732.5 | -14.6 | -0.008427 | 2.5 |
| Extreme (-20C) | 1732.5 | -14.8 | -0.008543 | 2.5 |
| Extreme (-30C) | 1732.5 | -14.2 | -0.008196 | 2.5 |

**16QAM, (20MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH) | | | | |
| 3.4 | 1732.5 | -16.7 | -0.009639 | 2.5 |
| 3.85 | 1732.5 | -16.9 | -0.009755 | 2.5 |
| 4.2 | 1732.5 | -16.7 | -0.009639 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH) | | | | |
| Normal (25C) | 1732.5 | -16.8 | -0.009697 | 2.5 |
| Extreme (50C) | 1732.5 | -16.8 | -0.009697 | 2.5 |
| Extreme (40C) | 1732.5 | -16.3 | -0.009408 | 2.5 |
| Extreme (30C) | 1732.5 | -16.6 | -0.009582 | 2.5 |
| Extreme (10C) | 1732.5 | -16.2 | -0.009351 | 2.5 |
| Extreme (0C) | 1732.5 | -15.9 | -0.009177 | 2.5 |
| Extreme (-10C) | 1732.5 | -16.1 | -0.009293 | 2.5 |
| Extreme (-20C) | 1732.5 | -16.7 | -0.009639 | 2.5 |
| Extreme (-30C) | 1732.5 | -16.6 | -0.009582 | 2.5 |

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

## 10.3 LTE BAND 5

**QPSK, (10MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)** | | | | |
| 3.4 | 836.5 | -10.5 | -0.012552 | 2.5 |
| 3.85 | 836.5 | -10.2 | -0.012194 | 2.5 |
| 4.2 | 836.5 | -11.1 | -0.013270 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [° C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)** | | | | |
| Normal (25C) | 836.5 | -10.6 | -0.012672 | 2.5 |
| Extreme (50C) | 836.5 | -11.6 | -0.013867 | 2.5 |
| Extreme (40C) | 836.5 | -11.1 | -0.013270 | 2.5 |
| Extreme (30C) | 836.5 | -10.9 | -0.013030 | 2.5 |
| Extreme (10C) | 836.5 | -10.8 | -0.012911 | 2.5 |
| Extreme (0C) | 836.5 | -10.7 | -0.012791 | 2.5 |
| Extreme (-10C) | 836.5 | -11.3 | -0.013509 | 2.5 |
| Extreme (-20C) | 836.5 | -12.1 | -0.014465 | 2.5 |
| Extreme (-30C) | 836.5 | -11.3 | -0.013509 | 2.5 |

**16QAM, (10MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH) | | | | |
| 3.4 | 836.5 | -13.2 | -0.015780 | 2.5 |
| 3.85 | 836.5 | -13.5 | -0.016139 | 2.5 |
| 4.2 | 836.5 | -13.9 | -0.016617 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [° C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH) | | | | |
| Normal (25C) | 836.5 | -13.8 | -0.016497 | 2.5 |
| Extreme (50C) | 836.5 | -12.9 | -0.015421 | 2.5 |
| Extreme (40C) | 836.5 | -12.9 | -0.015421 | 2.5 |
| Extreme (30C) | 836.5 | -13.1 | -0.015660 | 2.5 |
| Extreme (10C) | 836.5 | -13.3 | -0.015900 | 2.5 |
| Extreme (0C) | 836.5 | -13.3 | -0.015900 | 2.5 |
| Extreme (-10C) | 836.5 | -13.1 | -0.015660 | 2.5 |
| Extreme (-20C) | 836.5 | -13.9 | -0.016617 | 2.5 |
| Extreme (-30C) | 836.5 | -13.8 | -0.016497 | 2.5 |

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

## 10.4 LTE BAND 12

**QPSK, (10MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)** | | | | |
| 3.4 | 707.5 | -16.6 | -0.006548 | 2.5 |
| 3.85 | 707.5 | -16.8 | -0.006627 | 2.5 |
| 4.2 | 707.5 | -16.4 | -0.006469 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [° C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)** | | | | |
| Normal (25C) | 707.5 | -16.3 | -0.006430 | 2.5 |
| Extreme (50C) | 707.5 | -16.1 | -0.006351 | 2.5 |
| Extreme (40C) | 707.5 | -16.2 | -0.006391 | 2.5 |
| Extreme (30C) | 707.5 | -16.2 | -0.006391 | 2.5 |
| Extreme (10C) | 707.5 | -15.8 | -0.006233 | 2.5 |
| Extreme (0C) | 707.5 | -16.9 | -0.006667 | 2.5 |
| Extreme (-10C) | 707.5 | -17.1 | -0.006746 | 2.5 |
| Extreme (-20C) | 707.5 | -16.6 | -0.006548 | 2.5 |
| Extreme (-30C) | 707.5 | -16.7 | -0.006588 | 2.5 |

**16QAM, (10MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| BAND 12 16QAM, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH) | | | | |
| 3.4 | 707.5 | -14.5 | -0.005720 | 2.5 |
| 3.85 | 707.5 | -14.8 | -0.005838 | 2.5 |
| 4.2 | 707.5 | -14.9 | -0.005878 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [° C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH) | | | | |
| Normal (25C) | 707.5 | -14.2 | -0.005602 | 2.5 |
| Extreme (50C) | 707.5 | -14.7 | -0.005799 | 2.5 |
| Extreme (40C) | 707.5 | -14.2 | -0.005602 | 2.5 |
| Extreme (30C) | 707.5 | -15.3 | -0.006036 | 2.5 |
| Extreme (10C) | 707.5 | -14.4 | -0.005680 | 2.5 |
| Extreme (0C) | 707.5 | -15.1 | -0.005957 | 2.5 |
| Extreme (-10C) | 707.5 | -13.9 | -0.005483 | 2.5 |
| Extreme (-20C) | 707.5 | -13.5 | -0.005325 | 2.5 |
| Extreme (-30C) | 707.5 | -14.2 | -0.005602 | 2.5 |

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

## 10.5 LTE BAND 17

**QPSK, (10MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)** | | | | |
| 3.4 | 710.0 | -5.2 | -0.007350 | 2.5 |
| 3.85 | 710.0 | -5.8 | -0.008198 | 2.5 |
| 4.2 | 710.0 | -5.4 | -0.007633 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [° C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)** | | | | |
| Normal (25C) | 710.0 | -5.6 | -0.007915 | 2.5 |
| Extreme (50C) | 710.0 | -6.4 | -0.009046 | 2.5 |
| Extreme (40C) | 710.0 | -5.9 | -0.008339 | 2.5 |
| Extreme (30C) | 710.0 | -6.7 | -0.009470 | 2.5 |
| Extreme (10C) | 710.0 | -6.1 | -0.008622 | 2.5 |
| Extreme (0C) | 710.0 | -3.5 | -0.004947 | 2.5 |
| Extreme (-10C) | 710.0 | -5.9 | -0.008339 | 2.5 |
| Extreme (-20C) | 710.0 | -5.5 | -0.007774 | 2.5 |
| Extreme (-30C) | 710.0 | -6.2 | -0.008763 | 2.5 |

**16QAM, (10MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 17 16QAM, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)** | | | | |
| 3.4 | 710.0 | -11.6 | -0.016396 | 2.5 |
| 3.85 | 710.0 | -11 | -0.015548 | 2.5 |
| 4.2 | 710.0 | -11.2 | -0.015830 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [° C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)** | | | | |
| Normal (25C) | 710.0 | -10.9 | -0.015406 | 2.5 |
| Extreme (50C) | 710.0 | -11.7 | -0.016537 | 2.5 |
| Extreme (40C) | 710.0 | -11.1 | -0.015689 | 2.5 |
| Extreme (30C) | 710.0 | -11.2 | -0.015830 | 2.5 |
| Extreme (10C) | 710.0 | -11.3 | -0.015972 | 2.5 |
| Extreme (0C) | 710.0 | -10.8 | -0.015265 | 2.5 |
| Extreme (-10C) | 710.0 | -11.8 | -0.016678 | 2.5 |
| Extreme (-20C) | 710.0 | -11.4 | -0.016113 | 2.5 |
| Extreme (-30C) | 710.0 | -10.9 | -0.015406 | 2.5 |

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

## 10.6 LTE BAND 25

**QPSK, (20MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 25 QPSK, (CH 26365 RB size 100 RB Offset 0 20MHz BANDWIDTH)** | | | | |
| 3.4 | 1882.5 | -13.4 | -0.018873 | 2.5 |
| 3.85 | 1882.5 | -12.8 | -0.018028 | 2.5 |
| 4.2 | 1882.5 | -12.6 | -0.017746 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 25 QPSK, (CH 26365 RB size 100 RB Offset 0 20MHz BANDWIDTH)** | | | | |
| Normal (25C) | 1882.5 | -12.9 | -0.018169 | 2.5 |
| Extreme (50C) | 1882.5 | -13.4 | -0.018873 | 2.5 |
| Extreme (40C) | 1882.5 | -12.9 | -0.018169 | 2.5 |
| Extreme (30C) | 1882.5 | -13.7 | -0.019296 | 2.5 |
| Extreme (10C) | 1882.5 | -13.6 | -0.019155 | 2.5 |
| Extreme (0C) | 1882.5 | -13.7 | -0.019296 | 2.5 |
| Extreme (-10C) | 1882.5 | -12.8 | -0.018028 | 2.5 |
| Extreme (-20C) | 1882.5 | -13.3 | -0.018732 | 2.5 |
| Extreme (-30C) | 1882.5 | -13.2 | -0.018592 | 2.5 |

**16QAM, (20MHz BANDWIDTH)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 25 16QAM, (CH 26365 RB size 100 RB Offset 0 20MHz BANDWIDTH)** | | | | |
| 3.4 | 1882.5 | -14.7 | -0.020704 | 2.5 |
| 3.85 | 1882.5 | -15 | -0.021127 | 2.5 |
| 4.2 | 1882.5 | -14.5 | -0.020423 | 2.5 |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---|---|---|---|---|
| **BAND 25 16QAM, (CH 26365 RB size 100 RB Offset 0 20MHz BANDWIDTH)** | | | | |
| Normal (25C) | 1882.5 | -14.5 | -0.020423 | 2.5 |
| Extreme (50C) | 1882.5 | -15.6 | -0.021972 | 2.5 |
| Extreme (40C) | 1882.5 | -15.1 | -0.021268 | 2.5 |
| Extreme (30C) | 1882.5 | -14.6 | -0.020563 | 2.5 |
| Extreme (10C) | 1882.5 | -14.7 | -0.020704 | 2.5 |
| Extreme (0C) | 1882.5 | -15.1 | -0.021268 | 2.5 |
| Extreme (-10C) | 1882.5 | -15.4 | -0.021690 | 2.5 |
| Extreme (-20C) | 1882.5 | -14.9 | -0.020986 | 2.5 |
| Extreme (-30C) | 1882.5 | -15.3 | -0.021549 | 2.5 |

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

# 11. Peak-to-Average Ratio

## 11.1 Description of the PAR Measurement

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

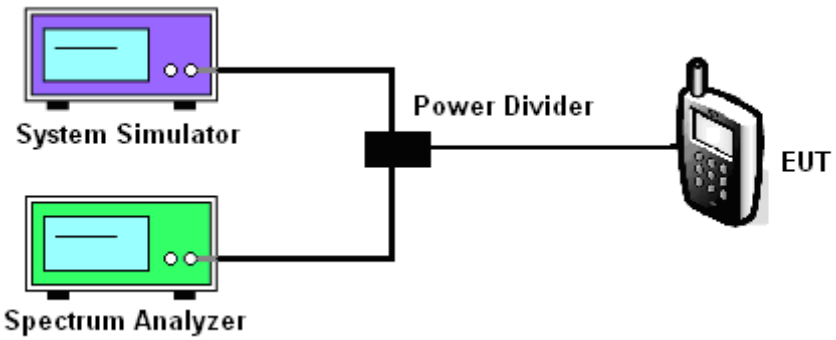
## 11.2 Measuring Instruments

See list of measuring instruments of this test report.

## 11.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For GSM/EGPRS operating modes:
   a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
   b. Set EUT in maximum power output, and triggered the burst signal.
   c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. For UMTS operating modes:
   a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
   b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

## 11.4 Test Setup




**MODES TESTED**

LTE Band 2
LTE Band 4
LTE Band 5
LTE Band 12
LTE Band 17
LTE Band 25

| BAND | CHANNEL | Frequency [MHz] | BANDWIDTH | NO. RB | RB POS. | MODULATION | PAR [dB] |
|---|---|---|---|---|---|---|---|
| 2 | 18900 | 1880.0 | 1.4 | 1 | Low | QPSK | 5.29 |
| 2 | 18900 | 1880.0 | 1.4 | 1 | Low | 16-QAM | 6.14 |
| 2 | 18900 | 1880.0 | 3.0 | 1 | Low | QPSK | 5.22 |
| 2 | 18900 | 1880.0 | 3.0 | 1 | Low | 16-QAM | 5.88 |
| 2 | 18900 | 1880.0 | 5.0 | 1 | Low | QPSK | 5.27 |
| 2 | 18900 | 1880.0 | 5.0 | 1 | Low | 16-QAM | 5.77 |
| 2 | 18900 | 1880.0 | 10.0 | 1 | Low | QPSK | 4.96 |
| 2 | 18900 | 1880.0 | 10.0 | 1 | Low | 16-QAM | 5.87 |
| 2 | 18900 | 1880.0 | 15.0 | 1 | Low | QPSK | 4.86 |
| 2 | 18900 | 1880.0 | 15.0 | 1 | Low | 16-QAM | 5.56 |
| 2 | 18900 | 1880.0 | 20.0 | 1 | Low | QPSK | 4.69 |
| 2 | 18900 | 1880.0 | 20.0 | 1 | Low | 16-QAM | 5.39 |
| 4 | 20175 | 1732.5 | 1.4 | 1 | Low | QPSK | 4.32 |
| 4 | 20175 | 1732.5 | 1.4 | 1 | Low | 16-QAM | 4.84 |
| 4 | 20175 | 1732.5 | 3.0 | 1 | Low | QPSK | 4.18 |
| 4 | 20175 | 1732.5 | 3.0 | 1 | Low | 16-QAM | 4.97 |
| 4 | 20175 | 1732.5 | 5.0 | 1 | Low | QPSK | 4.30 |
| 4 | 20175 | 1732.5 | 5.0 | 1 | Low | 16-QAM | 5.08 |
| 4 | 20175 | 1732.5 | 10.0 | 1 | Low | QPSK | 4.05 |
| 4 | 20175 | 1732.5 | 10.0 | 1 | Low | 16-QAM | 4.89 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4 | 20175 | 1732.5 | 15.0 | 1 | Low | QPSK | 4.13 |
| 4 | 20175 | 1732.5 | 15.0 | 1 | Low | 16-QAM | 4.93 |
| 4 | 20175 | 1732.5 | 20.0 | 1 | Low | QPSK | 4.23 |
| 4 | 20175 | 1732.5 | 20.0 | 1 | Low | 16-QAM | 5.20 |
| 5 | 20525 | 836.5 | 1.4 | 1 | Low | QPSK | 5.10 |
| 5 | 20525 | 836.5 | 1.4 | 1 | Low | 16-QAM | 5.93 |
| 5 | 20525 | 836.5 | 3.0 | 1 | Low | QPSK | 5.29 |
| 5 | 20525 | 836.5 | 3.0 | 1 | Low | 16-QAM | 5.87 |
| 5 | 20525 | 836.5 | 5.0 | 1 | Low | QPSK | 5.71 |
| 5 | 20525 | 836.5 | 5.0 | 1 | Low | 16-QAM | 5.99 |
| 5 | 20525 | 836.5 | 10.0 | 1 | Low | QPSK | 5.12 |
| 5 | 20525 | 836.5 | 10.0 | 1 | Low | 16-QAM | 6.15 |
| 12 | 23095 | 707.5 | 1.4 | 1 | Low | QPSK | 4.45 |
| 12 | 23095 | 707.5 | 1.4 | 1 | Low | 16-QAM | 5.28 |
| 12 | 23095 | 707.5 | 3.0 | 1 | Low | QPSK | 4.74 |
| 12 | 23095 | 707.5 | 3.0 | 1 | Low | 16-QAM | 5.28 |
| 12 | 23095 | 707.5 | 5.0 | 1 | Low | QPSK | 4.93 |
| 12 | 23095 | 707.5 | 5.0 | 1 | Low | 16-QAM | 5.50 |
| 12 | 23095 | 707.5 | 10.0 | 1 | Low | QPSK | 4.79 |
| 12 | 23095 | 707.5 | 10.0 | 1 | Low | 16-QAM | 5.73 |
| 17 | 23790 | 710.0 | 5.0 | 1 | Low | QPSK | 4.94 |
| 17 | 23790 | 710.0 | 5.0 | 1 | Low | 16-QAM | 5.38 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17 | 23790 | 710.0 | 10.0 | 1 | Low | QPSK | 4.42 |
| 17 | 23790 | 710.0 | 10.0 | 1 | Low | 16-QAM | 5.31 |
| 25 | 26365 | 1882.5 | 1.4 | 1 | Low | QPSK | 4.96 |
| 25 | 26365 | 1882.5 | 1.4 | 1 | Low | 16-QAM | 6.14 |
| 25 | 26365 | 1882.5 | 3.0 | 1 | Low | QPSK | 4.98 |
| 25 | 26365 | 1882.5 | 3.0 | 1 | Low | 16-QAM | 6.08 |
| 25 | 26365 | 1882.5 | 5.0 | 1 | Low | QPSK | 5.28 |
| 25 | 26365 | 1882.5 | 5.0 | 1 | Low | 16-QAM | 6.05 |
| 25 | 26365 | 1882.5 | 10.0 | 1 | Low | QPSK | 5.39 |
| 25 | 26365 | 1882.5 | 10.0 | 1 | Low | 16-QAM | 6.20 |
| 25 | 26365 | 1882.5 | 15.0 | 1 | Low | QPSK | 4.96 |
| 25 | 26365 | 1882.5 | 15.0 | 1 | Low | 16-QAM | 5.77 |
| 25 | 26365 | 1882.5 | 20.0 | 1 | Low | QPSK | 4.89 |
| 25 | 26365 | 1882.5 | 20.0 | 1 | Low | 16-QAM | 5.42 |