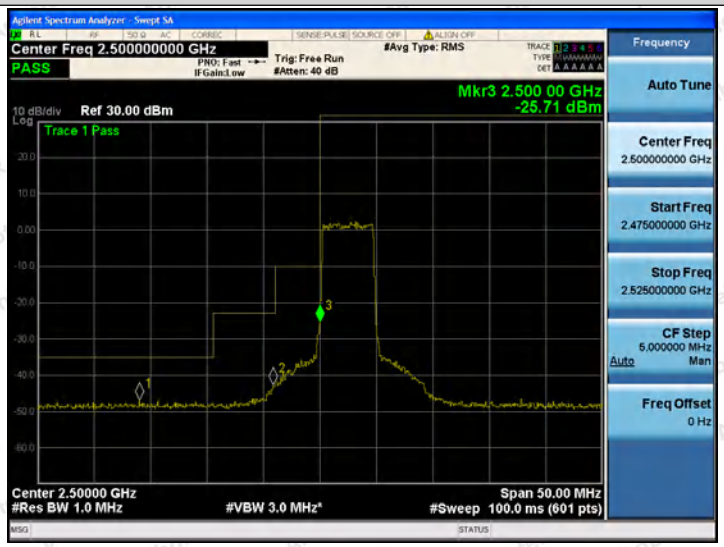
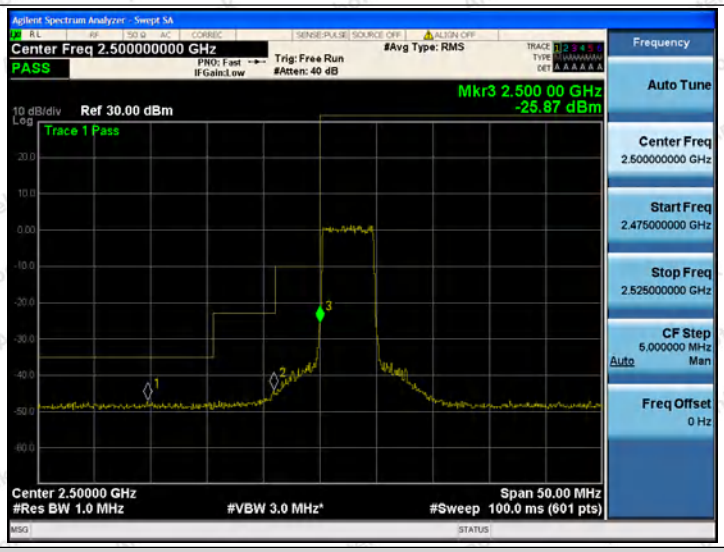
Band7-5MHz-QPSK-20775-25RB#0




Band7-5MHz-QPSK-21425-25RB#0

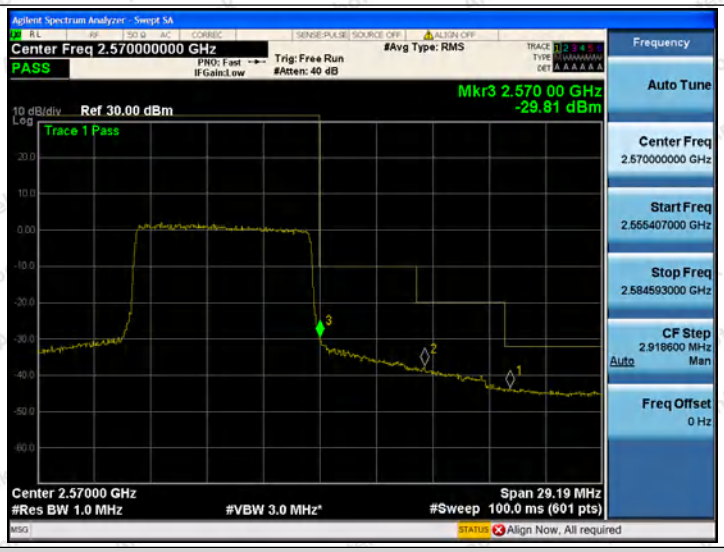
Band7-5MHz-16QAM-20775-25RB#0



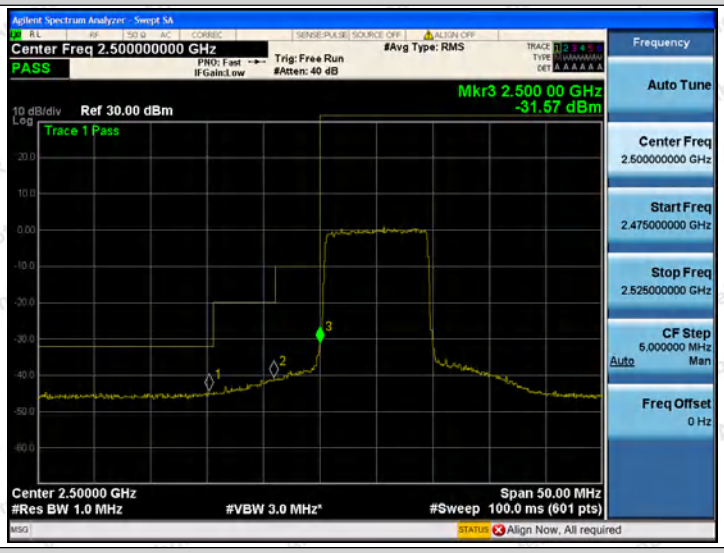

Band7-5MHz-16QAM-21425-25RB#0

Band7-10MHz-QPSK-20800-50RB#0

Band7-10MHz-QPSK-21400-50RB#0




Band7-10MHz-16QAM-20800-50RB#0




Band7-10MHz-16QAM-21400-50RB#0

Band7-15MHz-QPSK-20825-75RB#0

Band7-15MHz-QPSK-21375-75RB#0

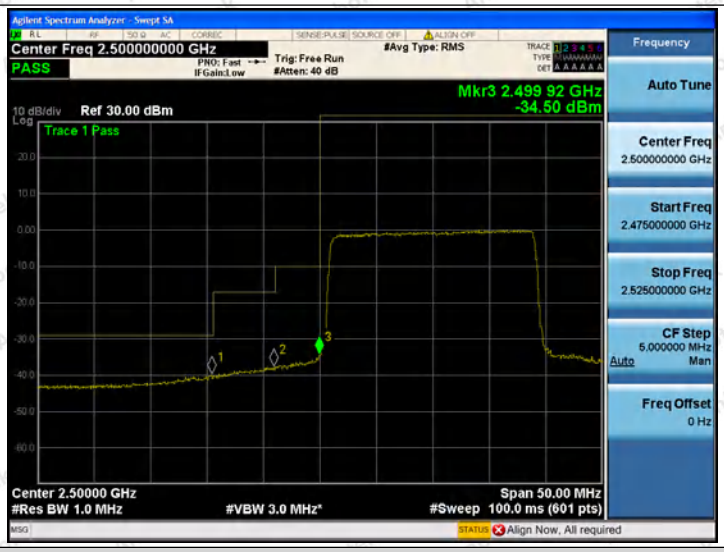
Band7-15MHz-16QAM-20825-75RB#0

Band7-15MHz-16QAM-21375-75RB#0

Band7-20MHz-QPSK-20850-100RB#0

Band7-20MHz-QPSK-21350-100RB#0

Band7-20MHz-16QAM-20850-100RB#0




Band7-20MHz-16QAM-21350-100RB#0

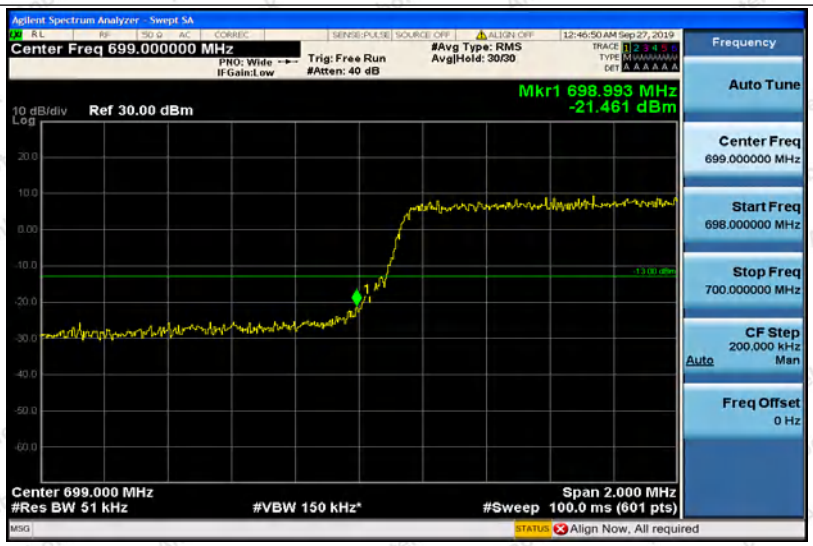
Band12-1.4MHz-QPSK-23017-6RB#0

Band12-1.4MHz-QPSK-23173-6RB#0

Band12-1.4MHz-16QAM-23017-6RB#0

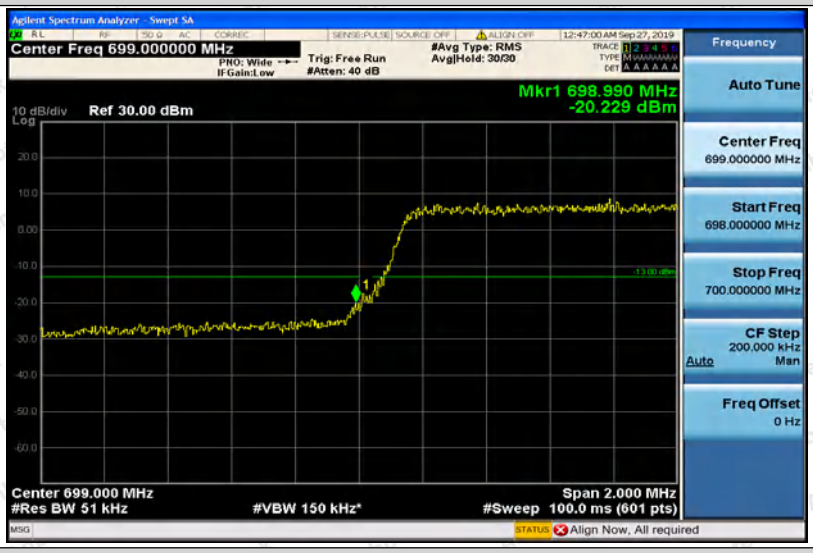
Band12-1.4MHz-16QAM-23173-6RB#0

Band12-3MHz-QPSK-23025-15RB#0



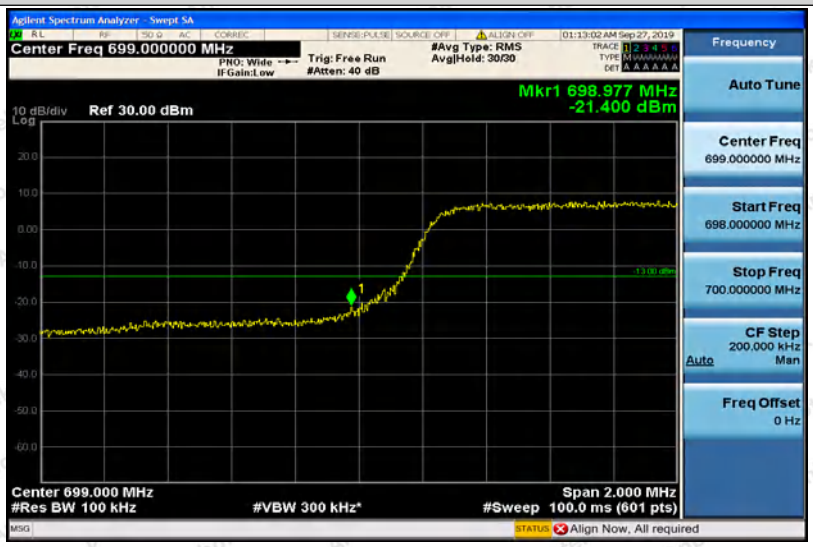

Band12-3MHz-QPSK-23165-15RB#0

Band12-3MHz-16QAM-23025-15RB#0



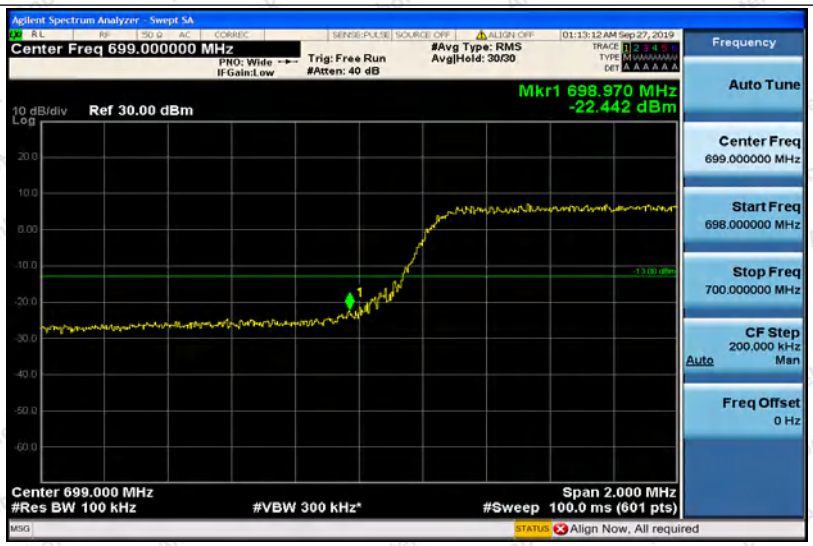

Band12-3MHz-16QAM-23165-15RB#0

Band12-5MHz-QPSK-23035-25RB#0




Band12-5MHz-QPSK-23155-25RB#0

Band12-5MHz-16QAM-23035-25RB#0




Band12-5MHz-16QAM-23155-25RB#0

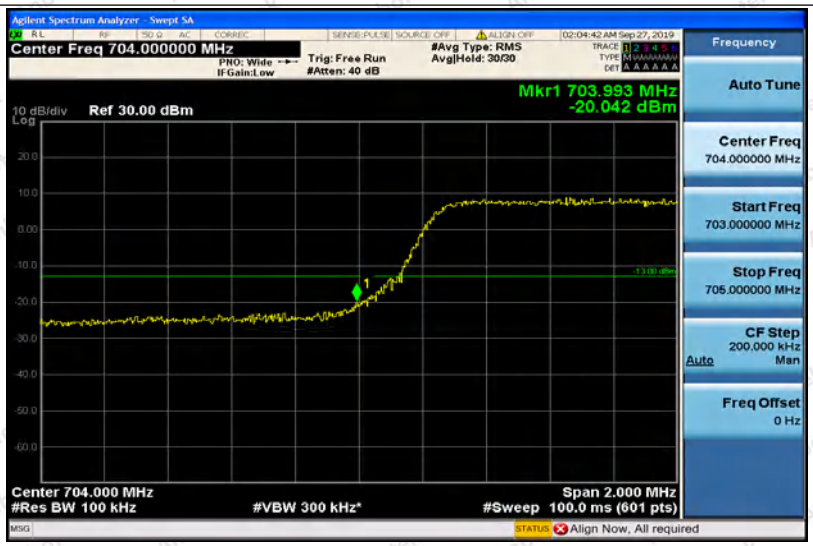
Band12-10MHz-QPSK-23060-50RB#0

Band12-10MHz-QPSK-23130-50RB#0

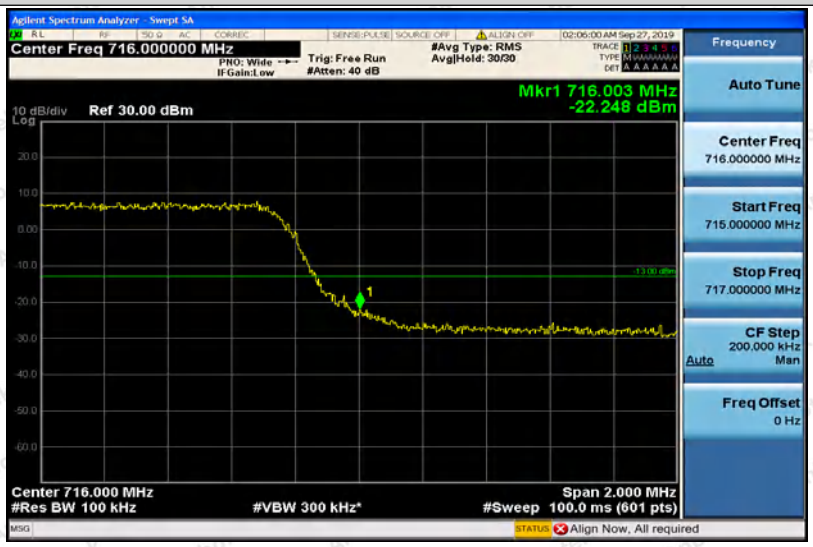
Band12-10MHz-16QAM-23060-50RB#0

Band12-10MHz-16QAM-23130-50RB#0

Band17-5MHz-QPSK-23755-25RB#0




Band17-5MHz-QPSK-23825-25RB#0




Band17-5MHz-16QAM-23755-25RB#0

Band17-5MHz-16QAM-23825-25RB#0

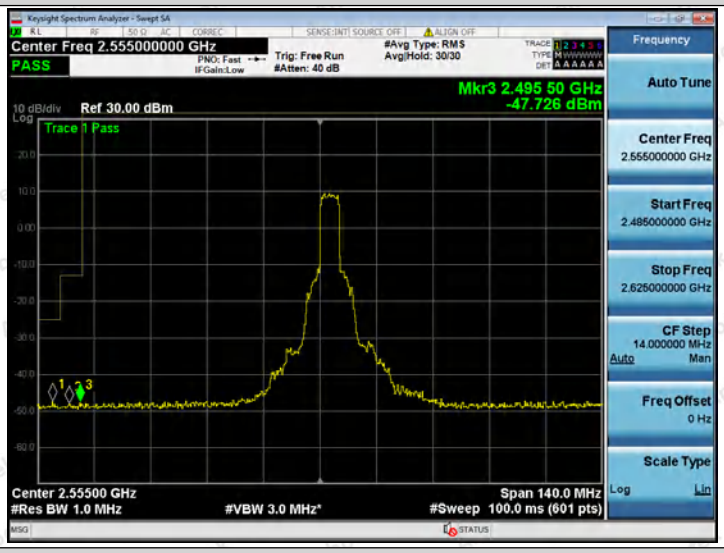
Band17-10MHz-QPSK-23780-50RB#0

Band17-10MHz-QPSK-23800-50RB#0

Band17-10MHz-16QAM-23780-50RB#0

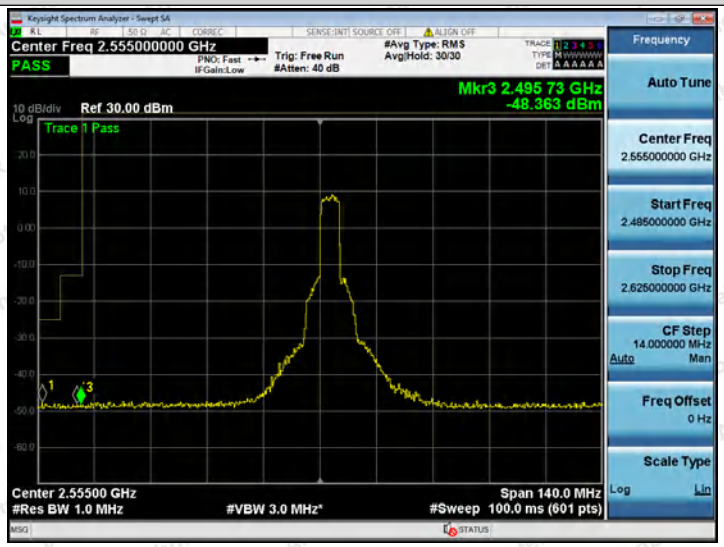
Band17-10MHz-16QAM-23800-50RB#0

Band41-5MHz-QPSK-40265-25RB#0



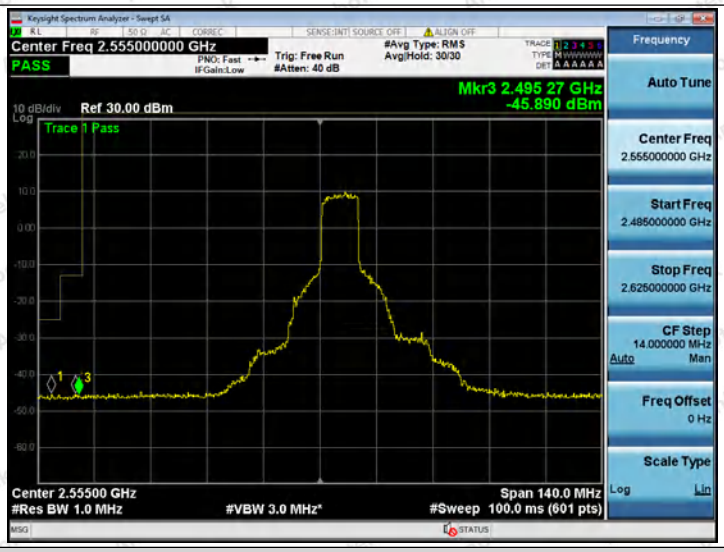

Band41-5MHz-QPSK-41215-25RB#0

Band41-5MHz-16QAM-40265-25RB#0



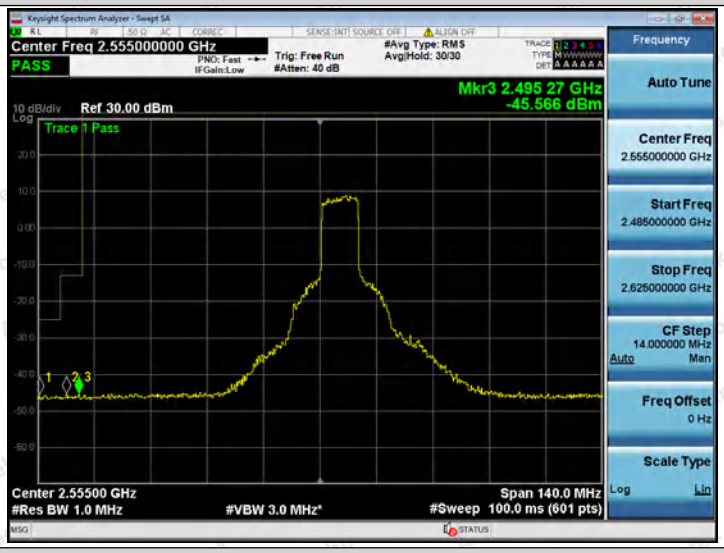

Band41-5MHz-16QAM-41215-25RB#0

Band41-10MHz-QPSK-40290-50RB#0



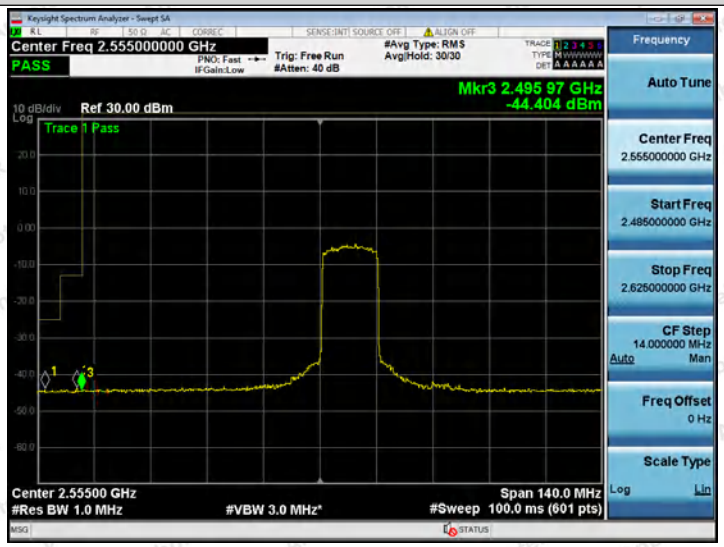

Band41-10MHz-QPSK-41190-50RB#0

Band41-10MHz-16QAM-40290-50RB#0



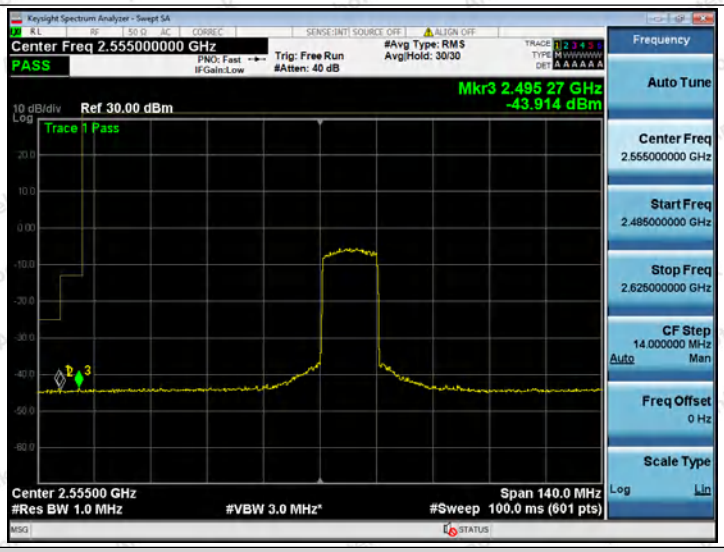

Band41-10MHz-16QAM-41190-50RB#0

Band41-15MHz-QPSK-40315-75RB#0

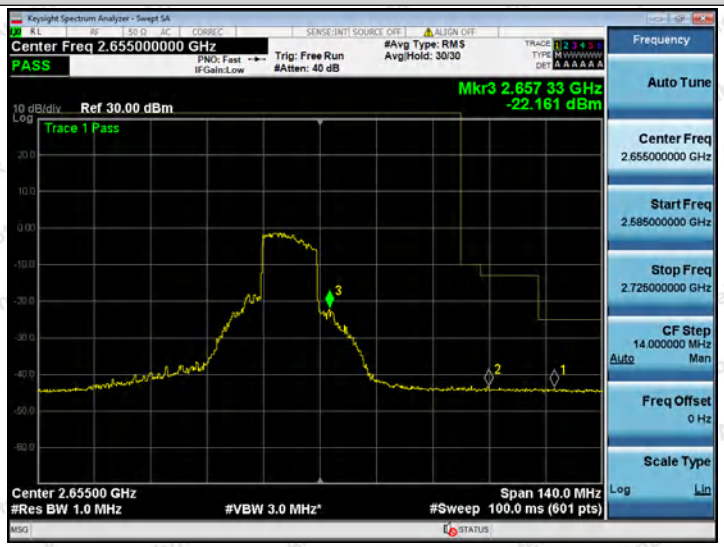



Band41-15MHz-QPSK-41165-75RB#0

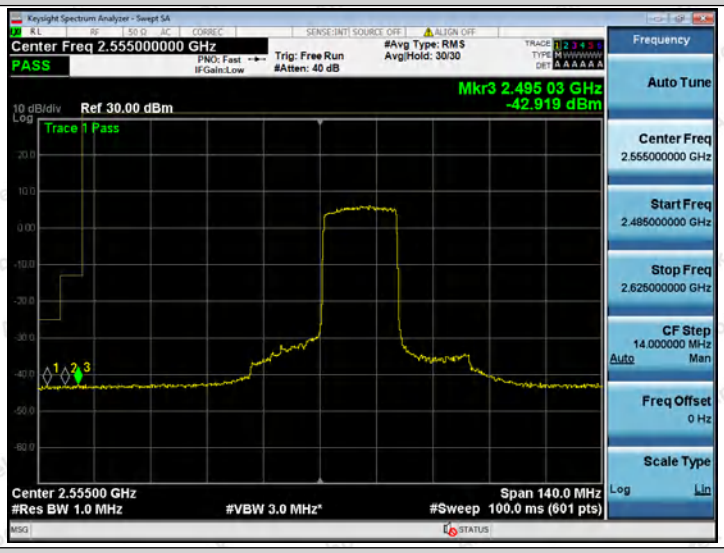
Band41-15MHz-16QAM-40315-75RB#0



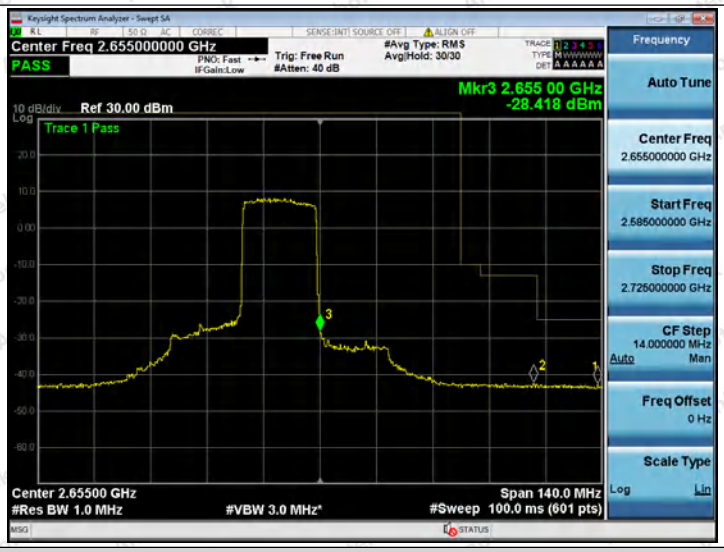

Band41-15MHz-16QAM-41165-75RB#0



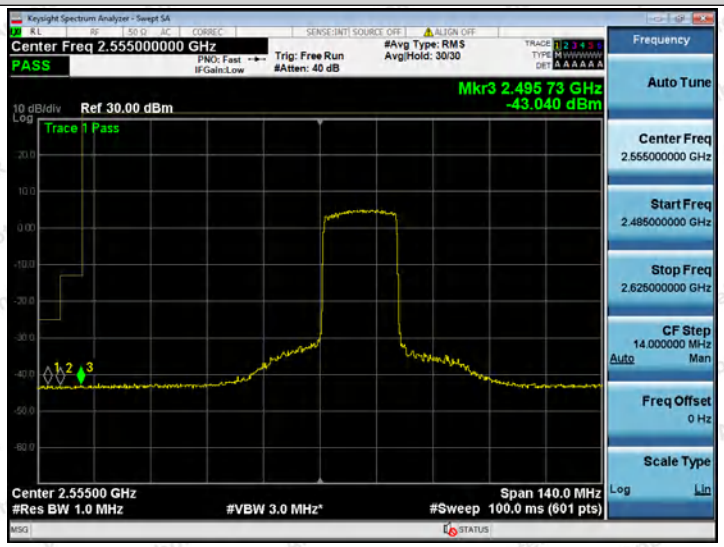

Band41-20MHz-QPSK-40340-100RB#0



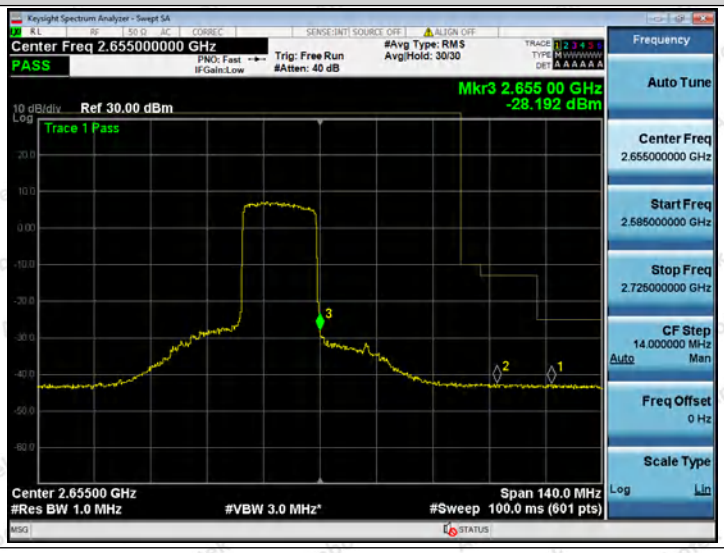

Band41-20MHz-QPSK-41140-100RB#0




Band41-20MHz-16QAM-40340-100RB#0




Band41-20MHz-16QAM-41140-100RB#0



# 10. Frequency Stability

## 10.1. Test Standard and Limit

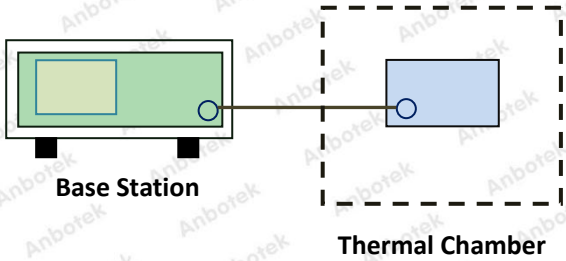
According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

| Frequency Range (MHz) | Base, fixed (ppm) | Mobile ≤ 3 watts (ppm) | Mobile ≤ 3 watts (ppm) |
|---|---|---|---|
| 25 to 50 | 20.0 | 20.0 | 50.0 |
| 50 to 450 | 5.0 | 5.0 | 50.0 |
| 450 to 512 | 2.5 | 5.0 | 5.0 |
| 821 to 896 | 1.5 | 2.5 | 2.5 |
| 928 to 929. | 5.0 | N/A | N/A |
| 929 to 960. | 1.5 | N/A | N/A |
| 2110 to 2220 | 10.0 | N/A | N/A |

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.

## 10.2. Test Setup




## 10.3. Test Procedure

A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage.

Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

10.4. Test Data

| GPRS 850 Test Frequency: 836.6MHz | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | 15 | 0.0179 | 2.5 |
| -20 | | 5 | 0.0060 | 2.5 |
| -10 | | 16 | 0.0191 | 2.5 |
| 0 | | 8 | 0.0096 | 2.5 |
| 10 | | 9 | 0.0108 | 2.5 |
| 20 | | 4 | 0.0048 | 2.5 |
| 30 | | 10 | 0.0120 | 2.5 |
| 40 | | 5 | 0.0060 | 2.5 |
| 50 | | 16 | 0.0191 | 2.5 |
| 20 | 3.4 | 5 | 0.0060 | 2.5 |
| 20 | 4.2 | 7 | 0.0084 | 2.5 |

| EGPRS 850 Test Frequency: 836.6MHz | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | 11 | 0.0131 | 2.5 |
| -20 | | 12 | 0.0143 | 2.5 |
| -10 | | 12 | 0.0143 | 2.5 |
| 0 | | 16 | 0.0191 | 2.5 |
| 10 | | 13 | 0.0155 | 2.5 |
| 20 | | 12 | 0.0143 | 2.5 |
| 30 | | 15 | 0.0179 | 2.5 |
| 40 | | 14 | 0.0167 | 2.5 |
| 50 | | 13 | 0.0155 | 2.5 |
| 20 | 3.4 | 11 | 0.0131 | 2.5 |
| 20 | 4.2 | 11 | 0.0131 | 2.5 |

| GPRS 1900 Test Frequency：1880MHz | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | -5 | -0.0027 | 2.5 |
| -20 | | -9 | -0.0048 | 2.5 |
| -10 | | -12 | -0.0064 | 2.5 |
| 0 | | -2 | -0.0011 | 2.5 |
| 10 | | -11 | -0.0059 | 2.5 |
| 20 | | -8 | -0.0043 | 2.5 |
| 30 | | -1 | -0.0005 | 2.5 |
| 40 | | -1 | -0.0005 | 2.5 |
| 50 | | -3 | -0.0016 | 2.5 |
| 20 | 3.4 | -1 | -0.0005 | 2.5 |
| 20 | 4.2 | -3 | -0.0016 | 2.5 |

| EGPRS 1900 Test Frequency：1880MHz | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | -1 | -0.0005 | 2.5 |
| -20 | | -6 | -0.0032 | 2.5 |
| -10 | | -1 | -0.0005 | 2.5 |
| 0 | | -3 | -0.0016 | 2.5 |
| 10 | | 0 | 0.0000 | 2.5 |
| 20 | | -2 | -0.0011 | 2.5 |
| 30 | | 2 | 0.0011 | 2.5 |
| 40 | | 0 | 0.0000 | 2.5 |
| 50 | | 2 | 0.0011 | 2.5 |
| 20 | 3.4 | -1 | -0.0005 | 2.5 |
| 20 | 4.2 | -2 | -0.0011 | 2.5 |

| WCDMA Band V Test Frequency: 836.4MHz | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | 5 | 0.0060 | 2.5 |
| -20 | | -1 | -0.0012 | 2.5 |
| -10 | | 0 | 0.0000 | 2.5 |
| 0 | | 5 | 0.0060 | 2.5 |
| 10 | | 2 | 0.0024 | 2.5 |
| 20 | | 2 | 0.0024 | 2.5 |
| 30 | | -1 | -0.0012 | 2.5 |
| 40 | | -2 | -0.0024 | 2.5 |
| 50 | | 1 | 0.0012 | 2.5 |
| 20 | 3.4 | -1 | -0.0012 | 2.5 |
| 20 | 4.2 | -4 | -0.0048 | 2.5 |

| WCDMA Band II Test Frequency：1880MHz | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | -1 | -0.0005 | 2.5 |
| -20 | | 5 | 0.0027 | 2.5 |
| -10 | | 3 | 0.0016 | 2.5 |
| 0 | | -2 | -0.0011 | 2.5 |
| 10 | | -4 | -0.0021 | 2.5 |
| 20 | | -2 | -0.0011 | 2.5 |
| 30 | | 5 | 0.0027 | 2.5 |
| 40 | | 3 | 0.0016 | 2.5 |
| 50 | | 5 | 0.0027 | 2.5 |
| 20 | 3.4 | -6 | -0.0032 | 2.5 |
| 20 | 4.2 | -2 | -0.0011 | 2.5 |

| LTE Band II Test Frequency: 1880MHz(QPSK) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V$^{DC}$) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | -4 | -0.0021 | 2.5 |
| -20 | | -6 | -0.0032 | 2.5 |
| -10 | | -6 | -0.0032 | 2.5 |
| 0 | | -4 | -0.0021 | 2.5 |
| 10 | | -6 | -0.0032 | 2.5 |
| 20 | | -3 | -0.0016 | 2.5 |
| 30 | | 5 | 0.0027 | 2.5 |
| 40 | | 5 | 0.0027 | 2.5 |
| 50 | | -2 | -0.0011 | 2.5 |
| 20 | 3.4 | -7 | -0.0037 | 2.5 |
| 20 | 4.2 | -6 | -0.0032 | 2.5 |

| LTE Band II Test Frequency: 1880MHz(16QAM) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V$^{DC}$) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | -6 | -0.0032 | 2.5 |
| -20 | | -9 | -0.0048 | 2.5 |
| -10 | | -6 | -0.0032 | 2.5 |
| 0 | | -9 | -0.0048 | 2.5 |
| 10 | | -5 | -0.0027 | 2.5 |
| 20 | | -8 | -0.0043 | 2.5 |
| 30 | | 5 | 0.0027 | 2.5 |
| 40 | | -7 | -0.0037 | 2.5 |
| 50 | | -6 | -0.0032 | 2.5 |
| 20 | 3.4 | -4 | -0.0021 | 2.5 |
| 20 | 4.2 | -5 | -0.0027 | 2.5 |

| LTE Band IV Test Frequency:1732.5MHz(QPSK) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V$^{DC}$) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | 7 | 0.0040 | 2.5 |
| -20 | | 6 | 0.0035 | 2.5 |
| -10 | | -1 | -0.0006 | 2.5 |
| 0 | | -3 | -0.0017 | 2.5 |
| 10 | | -4 | -0.0023 | 2.5 |
| 20 | | -3 | -0.0017 | 2.5 |
| 30 | | -6 | -0.0035 | 2.5 |
| 40 | | -6 | -0.0035 | 2.5 |
| 50 | | -4 | -0.0023 | 2.5 |
| 20 | 3.4 | -5 | -0.0029 | 2.5 |
| 20 | 4.2 | -2 | -0.0012 | 2.5 |

| LTE Band IV Test Frequency:1732.5MHz(16QAM) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V$^{DC}$) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | 6 | 0.0035 | 2.5 |
| -20 | | 5 | 0.0029 | 2.5 |
| -10 | | -4 | -0.0023 | 2.5 |
| 0 | | -5 | -0.0029 | 2.5 |
| 10 | | -5 | -0.0029 | 2.5 |
| 20 | | -5 | -0.0029 | 2.5 |
| 30 | | -6 | -0.0035 | 2.5 |
| 40 | | -8 | -0.0046 | 2.5 |
| 50 | | -5 | -0.0029 | 2.5 |
| 20 | 3.4 | -5 | -0.0029 | 2.5 |
| 20 | 4.2 | -7 | -0.0040 | 2.5 |

| LTE Band V Test Frequency:836.5MHz(QPSK) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | -7 | -0.0084 | 2.5 |
| -20 | | 5 | 0.0060 | 2.5 |
| -10 | | 9 | 0.0108 | 2.5 |
| 0 | | 4 | 0.0048 | 2.5 |
| 10 | | 9 | 0.0108 | 2.5 |
| 20 | | -6 | -0.0072 | 2.5 |
| 30 | | 2 | 0.0024 | 2.5 |
| 40 | | -2 | -0.0024 | 2.5 |
| 50 | | -7 | -0.0084 | 2.5 |
| 20 | 3.4 | -1 | -0.0012 | 2.5 |
| 20 | 4.2 | -4 | -0.0048 | 2.5 |

| LTE Band V Test Frequency:836.5MHz(16QAM) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | 8 | 0.0096 | 2.5 |
| -20 | | 5 | 0.0060 | 2.5 |
| -10 | | -7 | -0.0084 | 2.5 |
| 0 | | -5 | -0.0060 | 2.5 |
| 10 | | -1 | -0.0012 | 2.5 |
| 20 | | -6 | -0.0072 | 2.5 |
| 30 | | -6 | -0.0072 | 2.5 |
| 40 | | -7 | -0.0084 | 2.5 |
| 50 | | -2 | -0.0024 | 2.5 |
| 20 | 3.4 | -3 | -0.0036 | 2.5 |
| 20 | 4.2 | 6 | 0.0072 | 2.5 |

| LTE Band VII Test Frequency:2535MHz(QPSK) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | -6 | -0.0024 | 2.5 |
| -20 | | 5 | 0.0020 | 2.5 |
| -10 | | 8 | 0.0032 | 2.5 |
| 0 | | 6 | 0.0024 | 2.5 |
| 10 | | 6 | 0.0024 | 2.5 |
| 20 | | -3 | -0.0012 | 2.5 |
| 30 | | 3 | 0.0012 | 2.5 |
| 40 | | -6 | -0.0024 | 2.5 |
| 50 | | -7 | -0.0028 | 2.5 |
| 20 | 3.4 | -4 | -0.0016 | 2.5 |
| 20 | 4.2 | -3 | -0.0012 | 2.5 |

| LTE Band VII Test Frequency:2535MHz(16QAM) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | 5 | 0.0020 | 2.5 |
| -20 | | 6 | 0.0024 | 2.5 |
| -10 | | -3 | -0.0012 | 2.5 |
| 0 | | -4 | -0.0016 | 2.5 |
| 10 | | -4 | -0.0016 | 2.5 |
| 20 | | -5 | -0.0020 | 2.5 |
| 30 | | -7 | -0.0028 | 2.5 |
| 40 | | -6 | -0.0024 | 2.5 |
| 50 | | -5 | -0.0020 | 2.5 |
| 20 | 3.4 | -5 | -0.0020 | 2.5 |
| 20 | 4.2 | -5 | -0.0020 | 2.5 |

| LTE Band12 Test Frequency:707.5MHz(QPSK) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | -8 | -0.0113 | 2.5 |
| -20 | | 6 | 0.0085 | 2.5 |
| -10 | | 7 | 0.0099 | 2.5 |
| 0 | | 4 | 0.0057 | 2.5 |
| 10 | | 9 | 0.0127 | 2.5 |
| 20 | | -4 | -0.0057 | 2.5 |
| 30 | | 7 | 0.0099 | 2.5 |
| 40 | | -2 | -0.0028 | 2.5 |
| 50 | | -6 | -0.0085 | 2.5 |
| 20 | 3.4 | -4 | -0.0057 | 2.5 |
| 20 | 4.2 | -2 | -0.0028 | 2.5 |

| LTE Band12 Test Frequency:707.5MHz(16QAM) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | 8 | 0.0113 | 2.5 |
| -20 | | 6 | 0.0085 | 2.5 |
| -10 | | -3 | -0.0042 | 2.5 |
| 0 | | -2 | -0.0028 | 2.5 |
| 10 | | -1 | -0.0014 | 2.5 |
| 20 | | -6 | -0.0085 | 2.5 |
| 30 | | -5 | -0.0071 | 2.5 |
| 40 | | -4 | -0.0057 | 2.5 |
| 50 | | -7 | -0.0099 | 2.5 |
| 20 | 3.4 | -5 | -0.0071 | 2.5 |
| 20 | 4.2 | -4 | -0.0057 | 2.5 |

| LTE Band 17 Test Frequency:710MHz(QPSK) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | -8 | -0.0113 | 2.5 |
| -20 | | 7 | 0.0099 | 2.5 |
| -10 | | 5 | 0.0070 | 2.5 |
| 0 | | 8 | 0.0113 | 2.5 |
| 10 | | 9 | 0.0127 | 2.5 |
| 20 | | -1 | -0.0014 | 2.5 |
| 30 | | 7 | 0.0099 | 2.5 |
| 40 | | -5 | -0.0070 | 2.5 |
| 50 | | -6 | -0.0085 | 2.5 |
| 20 | 3.4 | -3 | -0.0042 | 2.5 |
| 20 | 4.2 | -2 | -0.0028 | 2.5 |

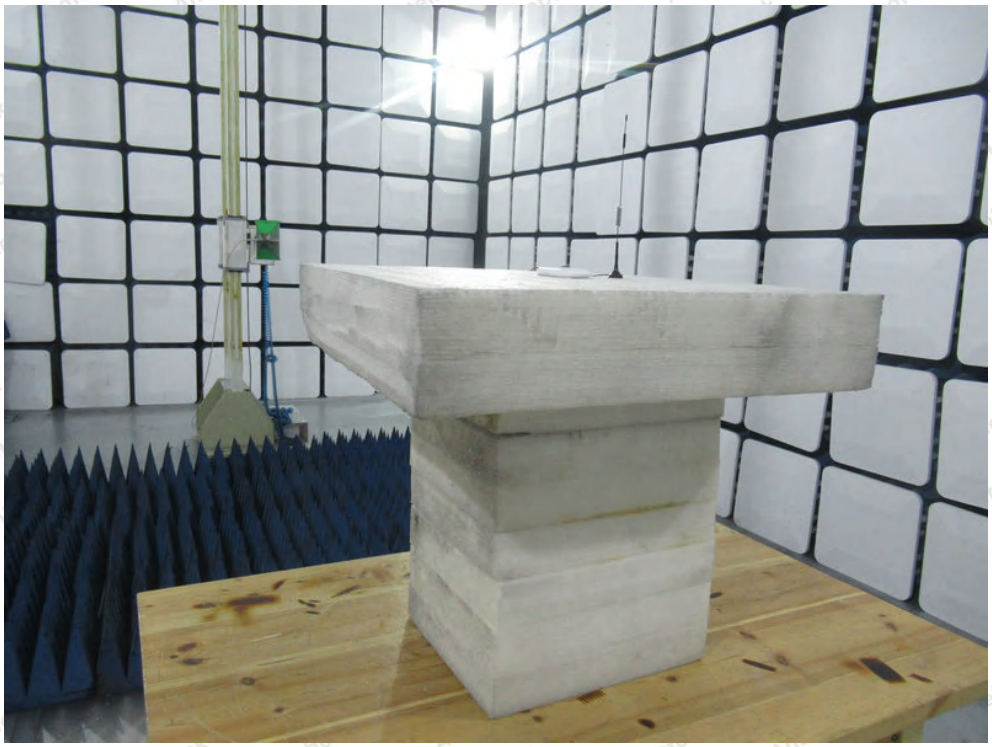
| LTE Band 17 Test Frequency:710MHz(16QAM) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | 7 | 0.0024 | 2.5 |
| -20 | | 6 | 0.0020 | 2.5 |
| -10 | | -4 | -0.0012 | 2.5 |
| 0 | | -3 | -0.0012 | 2.5 |
| 10 | | -7 | -0.0016 | 2.5 |
| 20 | | -6 | -0.0020 | 2.5 |
| 30 | | -4 | -0.0028 | 2.5 |
| 40 | | -8 | -0.0024 | 2.5 |
| 50 | | -6 | -0.0016 | 2.5 |
| 20 | 3.4 | -4 | -0.0020 | 2.5 |
| 20 | 4.2 | -5 | -0.0024 | 2.5 |

| LTE Band 41 Test Frequency:2600MHz(QPSK) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | -6 | -0.0023 | 2.5 |
| -20 | | 6 | 0.0023 | 2.5 |
| -10 | | 7 | 0.0027 | 2.5 |
| 0 | | 7 | 0.0027 | 2.5 |
| 10 | | 6 | 0.0023 | 2.5 |
| 20 | | -3 | -0.0012 | 2.5 |
| 30 | | 3 | 0.0012 | 2.5 |
| 40 | | -6 | -0.0023 | 2.5 |
| 50 | | -7 | -0.0027 | 2.5 |
| 20 | 3.4 | -4 | -0.0015 | 2.5 |
| 20 | 4.2 | -3 | -0.0012 | 2.5 |

| LTE Band 41 Test Frequency:2600MHz(16QAM) | | | | |
|---|---|---|---|---|
| Temperature(℃) | Power Supply (V^DC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.8 | 5 | 0.0019 | 2.5 |
| -20 | | 6 | 0.0023 | 2.5 |
| -10 | | -3 | -0.0012 | 2.5 |
| 0 | | -3 | -0.0012 | 2.5 |
| 10 | | -5 | -0.0019 | 2.5 |
| 20 | | -5 | -0.0019 | 2.5 |
| 30 | | -6 | -0.0023 | 2.5 |
| 40 | | -6 | -0.0023 | 2.5 |
| 50 | | -5 | -0.0019 | 2.5 |
| 20 | 3.4 | -6 | -0.0023 | 2.5 |
| 20 | 4.2 | -6 | -0.0023 | 2.5 |

# APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Radiation Emission Test



# APPENDIX II -- PHOTOGRAPH

Reference to the test report SZAWW190909004-01

---------- End of Report ----------