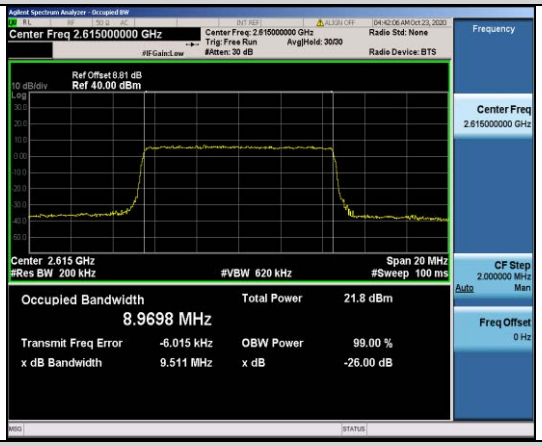
Band38-10MHz-QPSK-38000-50RB#0-8.9539

Band38-10MHz-QPSK-38200-50RB#0-8.9698

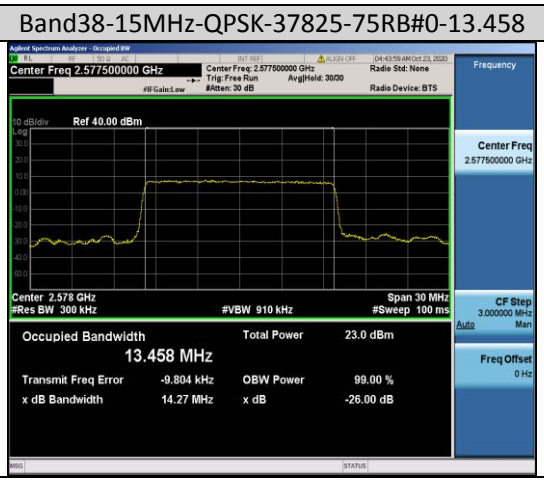


Band38-10MHz-16QAM-37800-50RB#0-8.9667

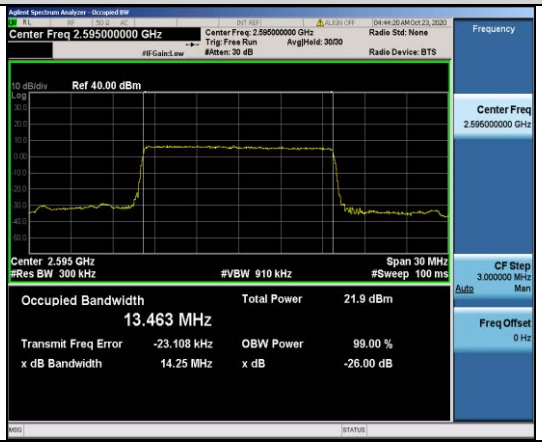
Band38-10MHz-16QAM-38000-50RB#0-8.9575

Band38-10MHz-16QAM-38200-50RB#0-8.9732

Band38-15MHz-QPSK-37825-75RB#0-13.458

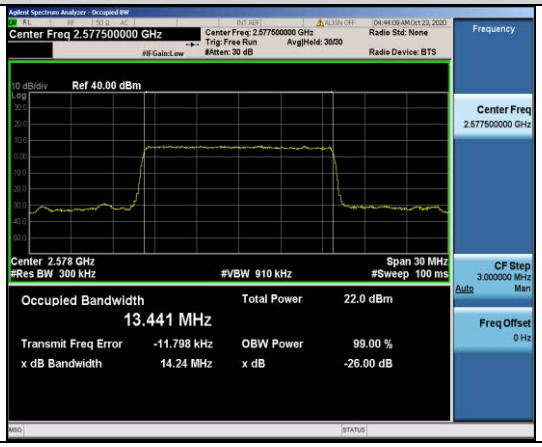


Band38-15MHz-QPSK-38000-75RB#0-13.463



Band38-15MHz-QPSK-38175-75RB#0-13.467

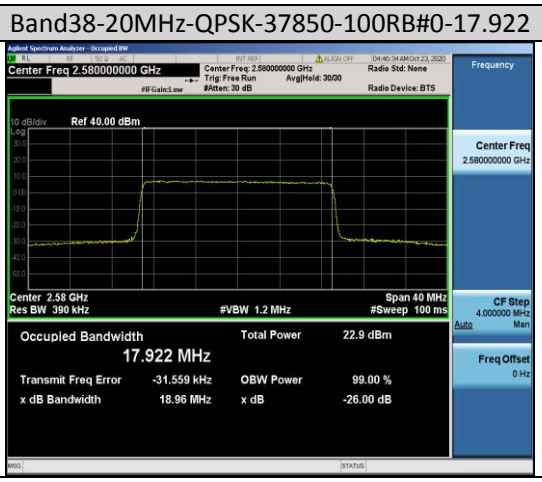
Band38-15MHz-16QAM-37825-75RB#0-13.441



Band38-15MHz-16QAM-38000-75RB#0-13.475

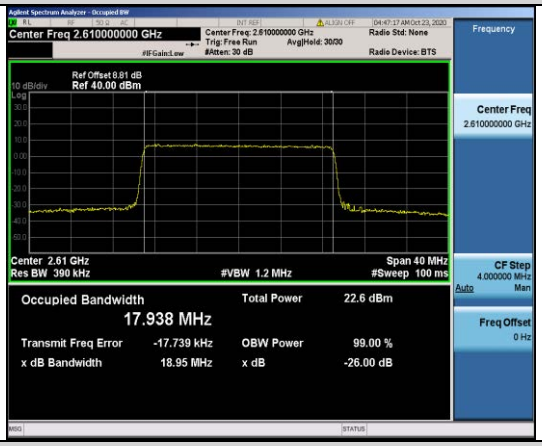
Band38-15MHz-16QAM-38175-75RB#0-13.464

Band38-20MHz-QPSK-37850-100RB#0-17.922



Band38-20MHz-QPSK-38000-100RB#0-17.939

Band38-20MHz-QPSK-38150-100RB#0-17.938

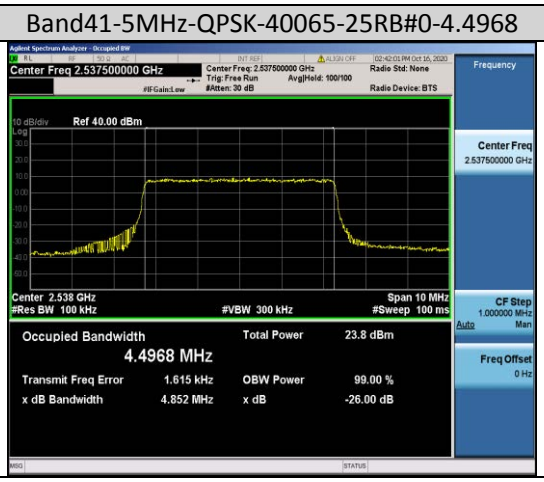


Band38-20MHz-16QAM-37850-100RB#0-17.925

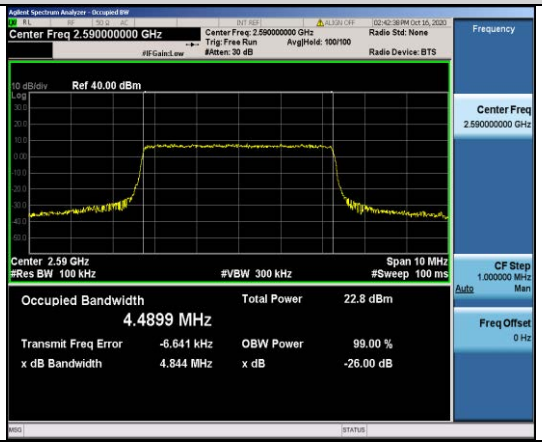
Band38-20MHz-16QAM-38000-100RB#0-17.928

Band38-20MHz-16QAM-38150-100RB#0-17.937

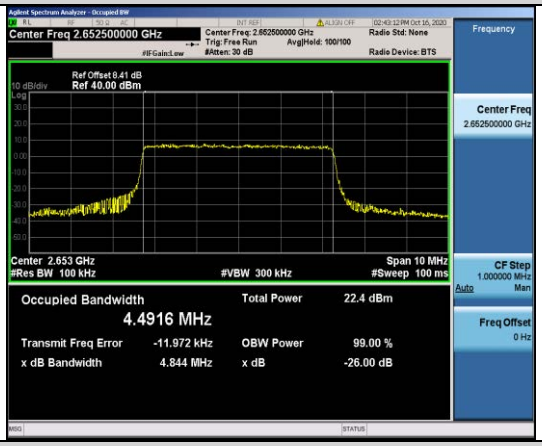
Band41-5MHz-QPSK-40065-25RB#0-4.4968



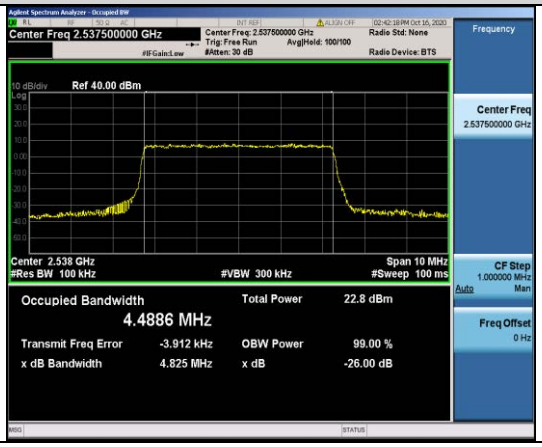
Band41-5MHz-QPSK-40590-25RB#0-4.4899



Band41-5MHz-QPSK-41215-25RB#0-4.4916

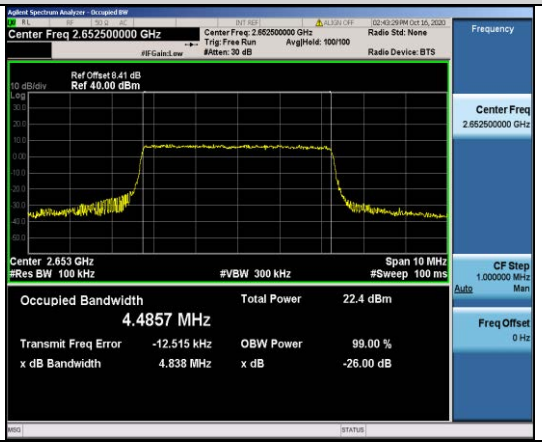


Band41-5MHz-16QAM-40065-25RB#0-4.4886



Band41-5MHz-16QAM-40590-25RB#0-4.4935

Band41-5MHz-16QAM-41215-25RB#0-4.4857



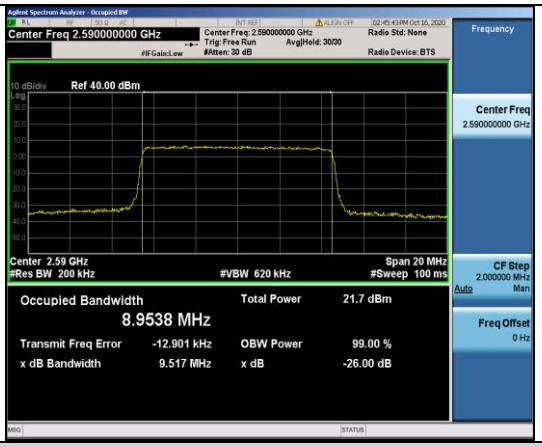
Band41-10MHz-QPSK-40090-50RB#0-8.9771

Band41-10MHz-QPSK-40590-50RB#0-8.9613

Band41-10MHz-QPSK-41190-50RB#0-8.9592

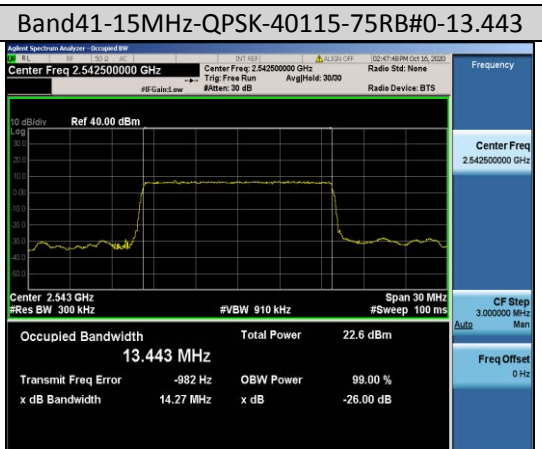
Band41-10MHz-16QAM-40090-50RB#0-8.9683

Band41-10MHz-16QAM-40590-50RB#0-8.9538

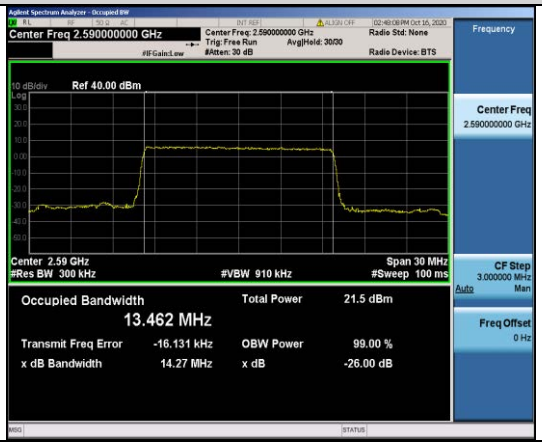


Band41-10MHz-16QAM-41190-50RB#0-8.9662

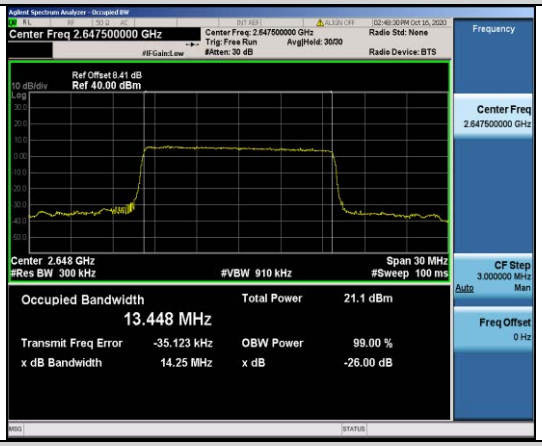
Band41-15MHz-QPSK-40115-75RB#0-13.443



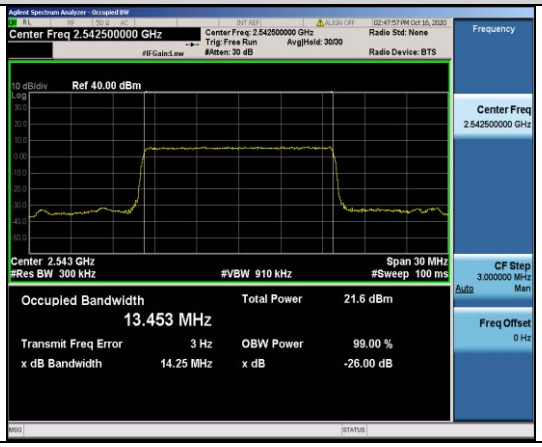
Band41-15MHz-QPSK-40590-75RB#0-13.462



Band41-15MHz-QPSK-41165-75RB#0-13.448



Band41-15MHz-16QAM-40115-75RB#0-13.453



Band41-15MHz-16QAM-40590-75RB#0-13.471

Band41-15MHz-16QAM-41165-75RB#0-13.436

Band41-20MHz-QPSK-40140-100RB#0-17.939

Band41-20MHz-QPSK-40590-100RB#0-17.931

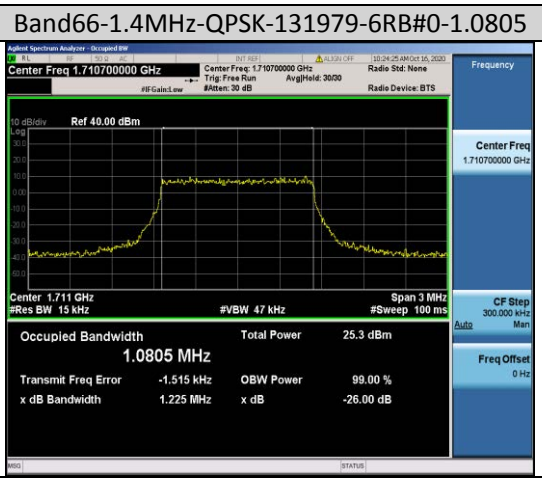
Band41-20MHz-QPSK-41140-100RB#0-17.902

Band41-20MHz-16QAM-40140-100RB#0-17.937

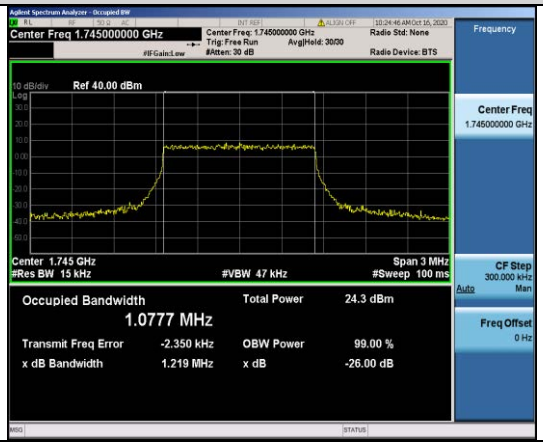
Band41-20MHz-16QAM-40590-100RB#0-17.929

Band41-20MHz-16QAM-41140-100RB#0-17.887

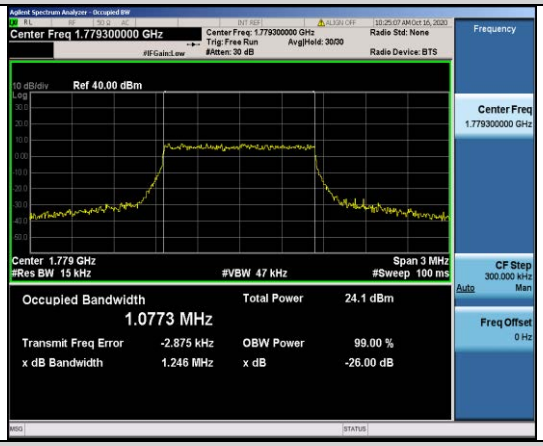
Band66-1.4MHz-QPSK-131979-6RB#0-1.0805



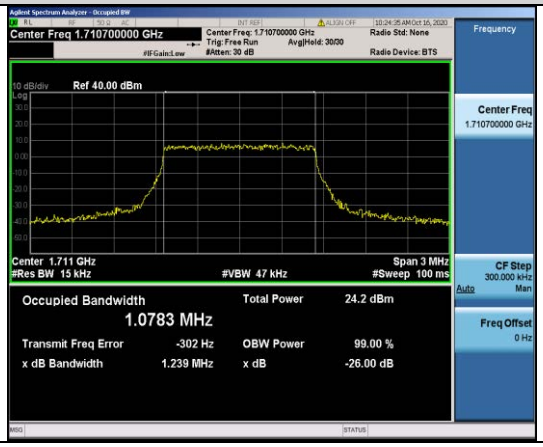
Band66-1.4MHz-QPSK-132322-6RB#0-1.0777



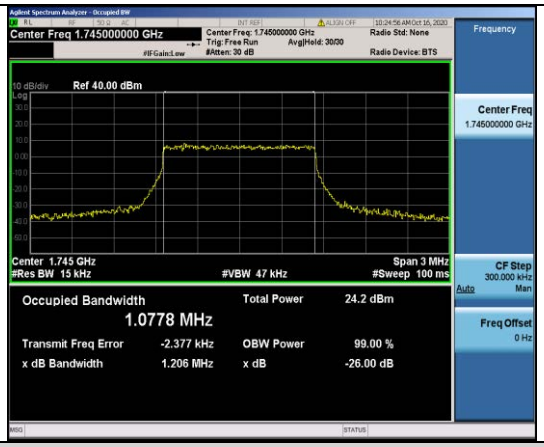
Band66-1.4MHz-QPSK-132665-6RB#0-1.0773



Band66-1.4MHz-16QAM-131979-6RB#0-1.0783



Band66-1.4MHz-16QAM-132322-6RB#0-1.0778



Band66-1.4MHz-16QAM-132665-6RB#0-1.0796

Band66-3MHz-QPSK-131987-15RB#0-2.6864

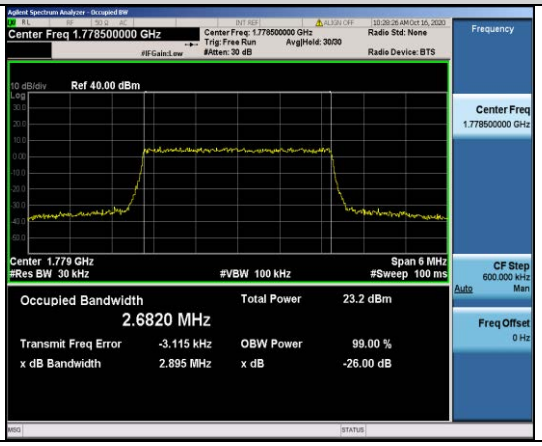
Band66-3MHz-QPSK-132322-15RB#0-2.6799

Band66-3MHz-QPSK-132657-15RB#0-2.6817

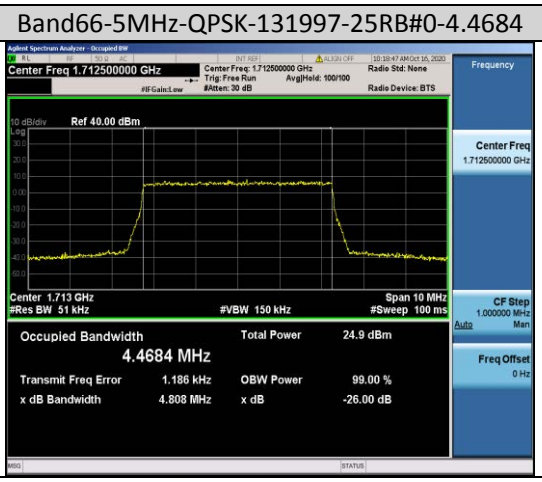
Band66-3MHz-16QAM-131987-15RB#0-2.6856

Band66-3MHz-16QAM-132322-15RB#0-2.6792

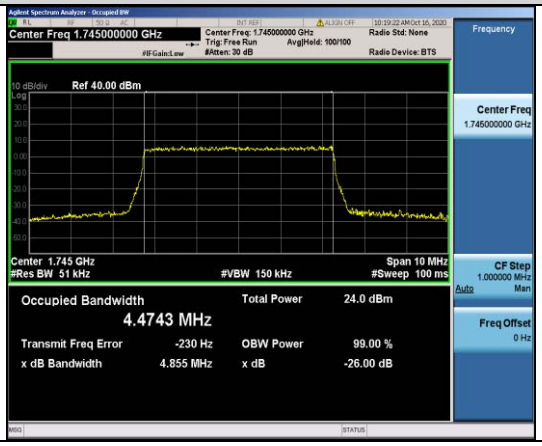
Band66-3MHz-16QAM-132657-15RB#0-2.6820



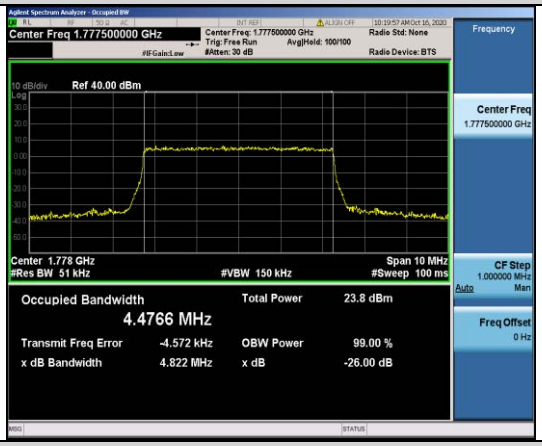
Band66-5MHz-QPSK-131997-25RB#0-4.4684



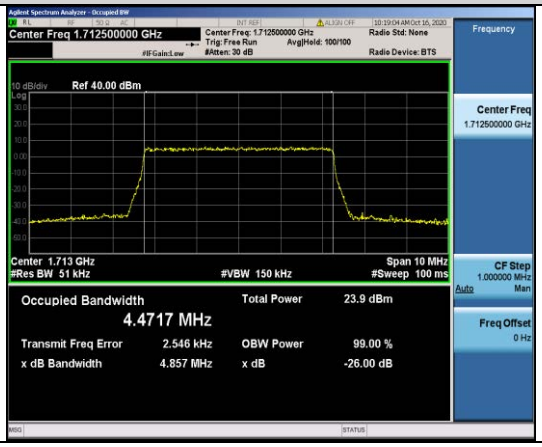
Band66-5MHz-QPSK-132322-25RB#0-4.4743



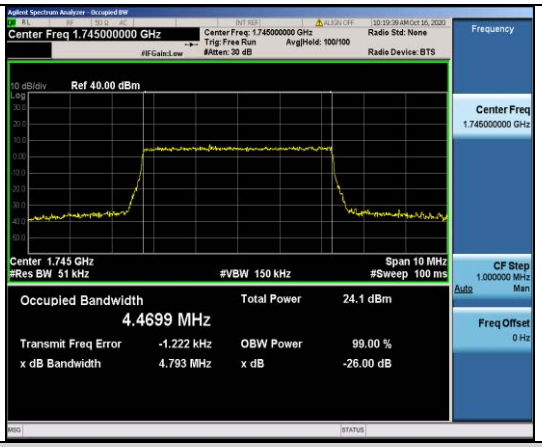
Band66-5MHz-QPSK-132647-25RB#0-4.4766



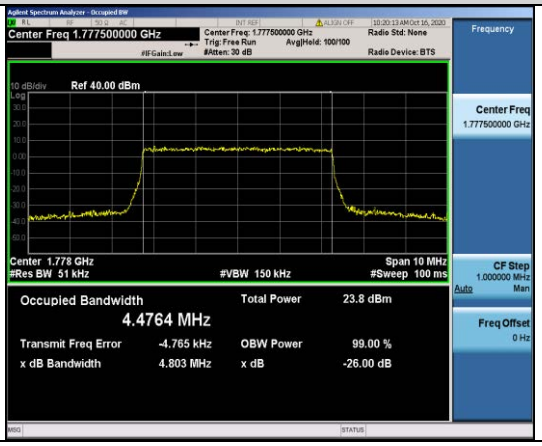
Band66-5MHz-16QAM-131997-25RB#0-4.4717



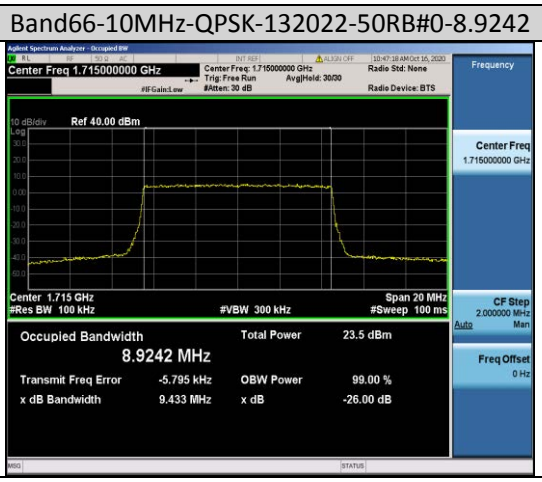
Band66-5MHz-16QAM-132322-25RB#0-4.4699



Band66-5MHz-16QAM-132647-25RB#0-4.4764



Band66-10MHz-QPSK-132022-50RB#0-8.9242



Band66-10MHz-QPSK-132322-50RB#0-8.9320

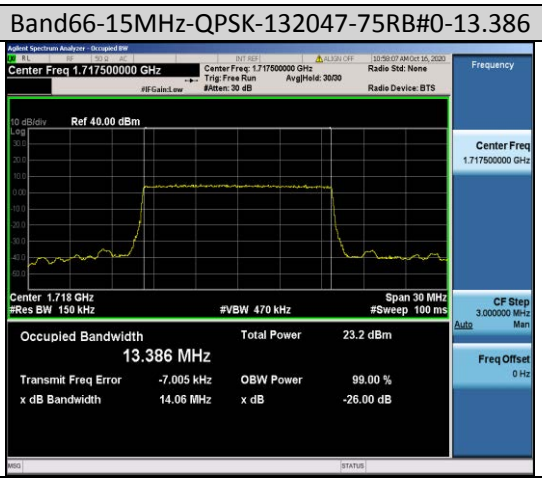
Band66-10MHz-QPSK-132622-50RB#0-8.9150

Band66-10MHz-16QAM-132022-50RB#0-8.9260

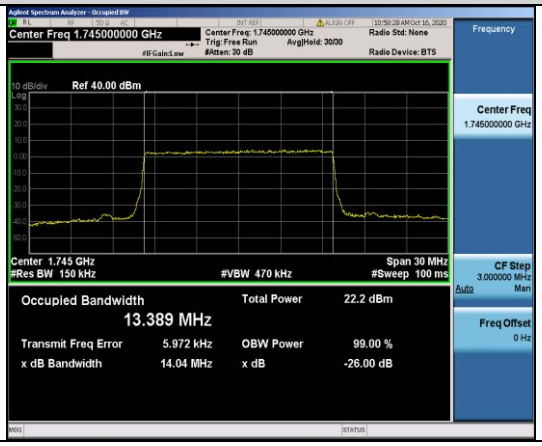
Band66-10MHz-16QAM-132322-50RB#0-8.9170

Band66-10MHz-16QAM-132622-50RB#0-8.9234

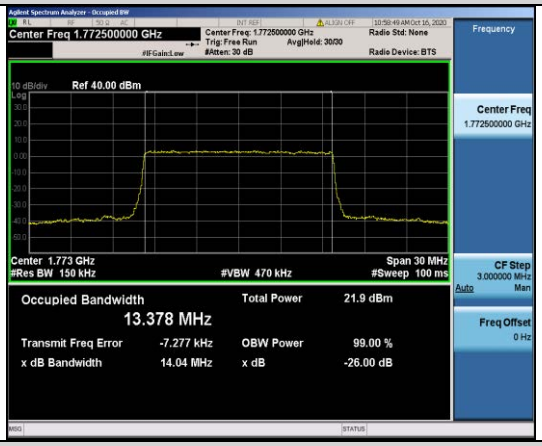
Band66-15MHz-QPSK-132047-75RB#0-13.386



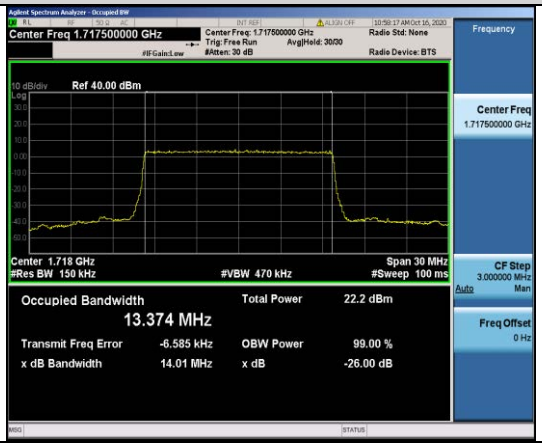
Band66-15MHz-QPSK-132322-75RB#0-13.389



Band66-15MHz-QPSK-132597-75RB#0-13.378

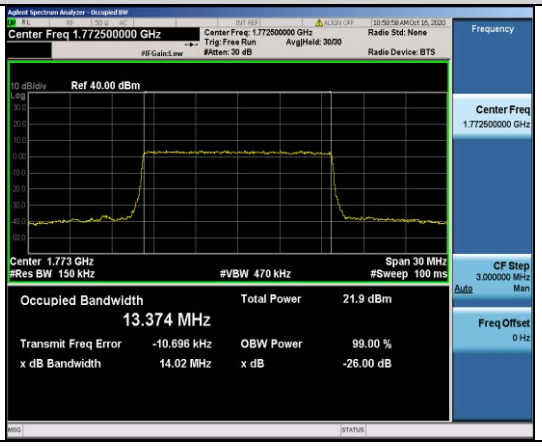


Band66-15MHz-16QAM-132047-75RB#0-13.374

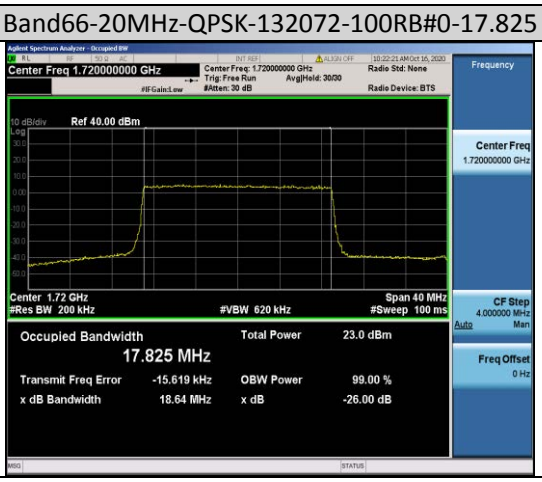


Band66-15MHz-16QAM-132322-75RB#0-13.380

Band66-15MHz-16QAM-132597-75RB#0-13.374



Band66-20MHz-QPSK-132072-100RB#0-17.825



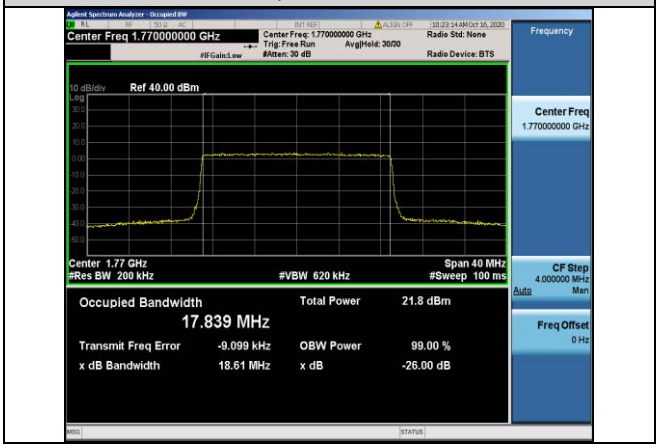
Band66-20MHz-QPSK-132322-100RB#0-17.862

Band66-20MHz-QPSK-132572-100RB#0-17.845

Band66-20MHz-16QAM-132072-100RB#0-17.850

Band66-20MHz-16QAM-132322-100RB#0-17.869

Band66-20MHz-16QAM-132572-100RB#0-17.839



5.4. Spurious Emission at Antenna Terminal

5.4.1. Test Standard

FCC: CFR Part 2.1051, CFR Part 22.917, CFR Part 24.238, CFR Part 27.53

5.4.2. Test Limit

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in FCC 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.
(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. For all power levels +30dBm to 0dBm, this becomes a constant specification of -13dBm.

FCC 22.917 Emission limitations for cellular equipment.
The rules in this section govern the spectral characteristics of emissions in the Cellular Radio telephone Service.
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1MHz 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 of 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.

FCC 24.238 Emission limitations for Broadband PCS equipment.
The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.
(b) Measurement procedure. Compliance with these provisions 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. 100 kHz of 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.

FCC: §27.53
(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:
(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;
(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;
(g) For operations in the 600 MHz band and 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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.
(h) AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.
(m)(4) For mobile digital stations, the attenuation factor shall be not less than 43 + 10 log (P)dB at the channel edge and 55 + 10 log (P) dB at 5.5 megahertz from the channel edges.(Channel edges are defined under
§27.5 (i) Frequency assignment for the BRS/EBS band)
(m)(6) Measurement procedure. 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. 100 kHz of 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.

FCC 90.691
(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
(1) For any frequency removed from the EA licensee's frequency block by up to and

including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

The power of any emission shall be attenuated below the mean output power P (dBW) by at least 43 + 10 log10(p), measured in a 100 kHz bandwidth for frequencies less than or equal to 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

5.4.3.Test Procedure

1. Connect the equipment as shown in the above diagram.
2. Set the spectrum analyzer to measure peak hold with the required settings.
3. Set the signal generator to a known output power and record the path loss in dB (LOSS) for frequencies up to the tenth harmonic of the EUT's carrier frequency.

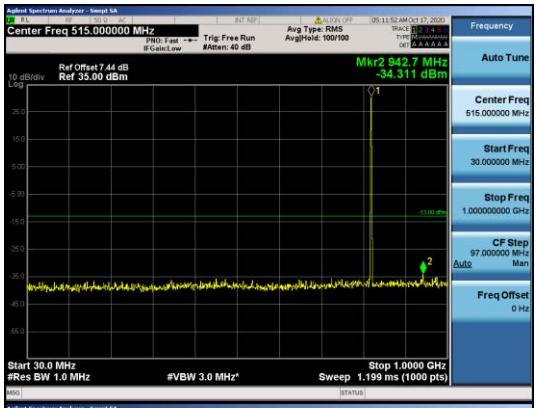
LOSS = Generator Output Power (dBm) – Analyzer reading (dBm).

4. Replace the signal generator with the EUT.
5. Adjust the settings of the Universal Radio Communication Tester (CMU) to set the EUT to its maximum power at the required channel.
6. Set the spectrum analyzer to measure peak hold with the required settings. Offset the spectrum analyzer reference level by the path loss measured above.
7. Measure and record all spurious emissions up to the tenth harmonic of the carrier frequency.
8. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
9. If necessary steps 6 and 7 may be performed with the spectrum analyzer set to average detector.

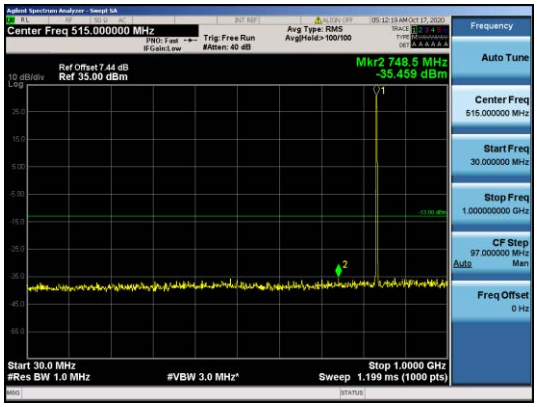
(Note: Step 3 above is performed prior to testing and LOSS is recorded by test software. Steps 2, 6, and 7 above are performed with test software.)

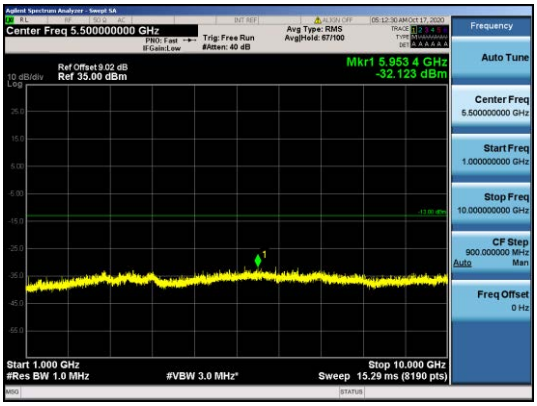
5.4.4.Test Data

For GSM
Test Band=GSM850
Test Mode=GSM/TM1
Test Channel=LCH

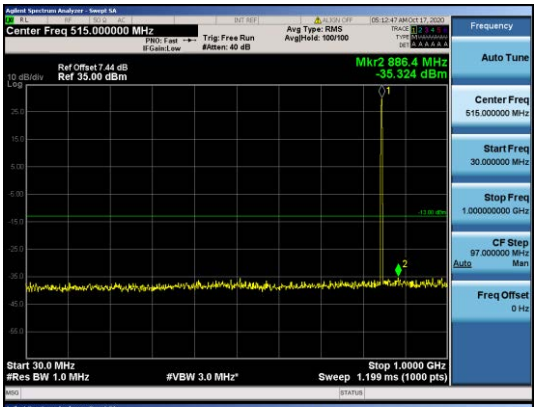


Test Channel=MCH

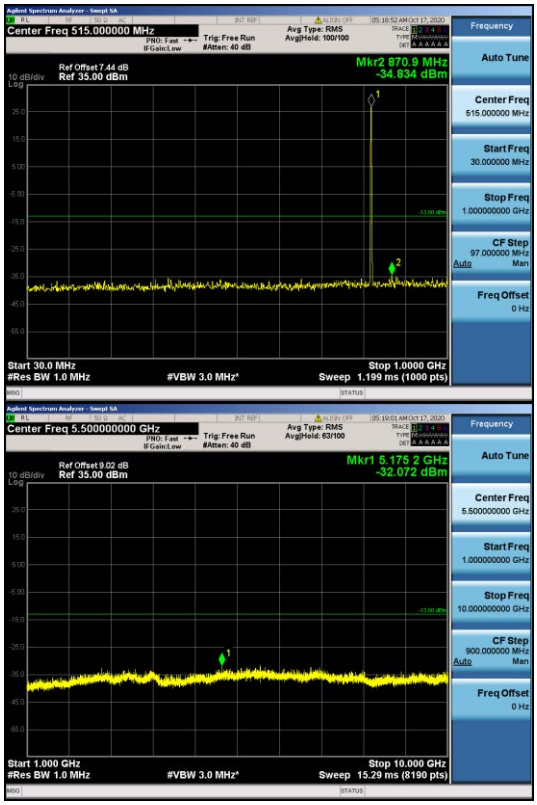




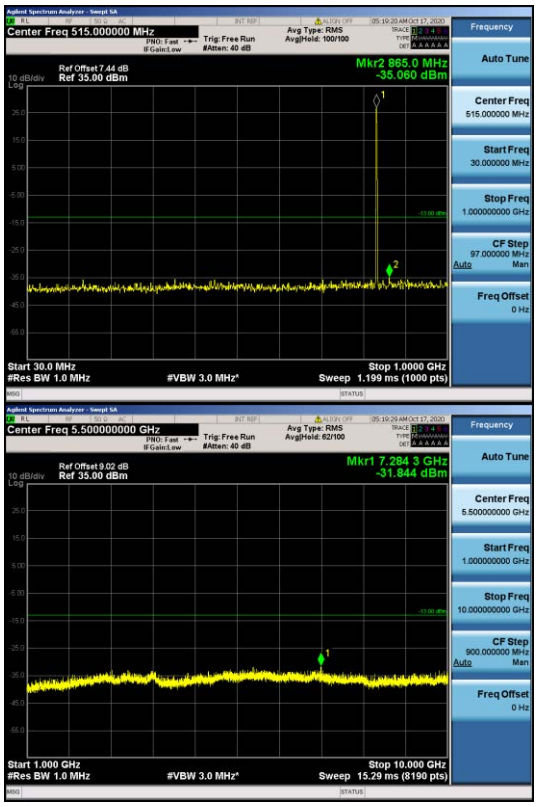
Test Channel=HCH



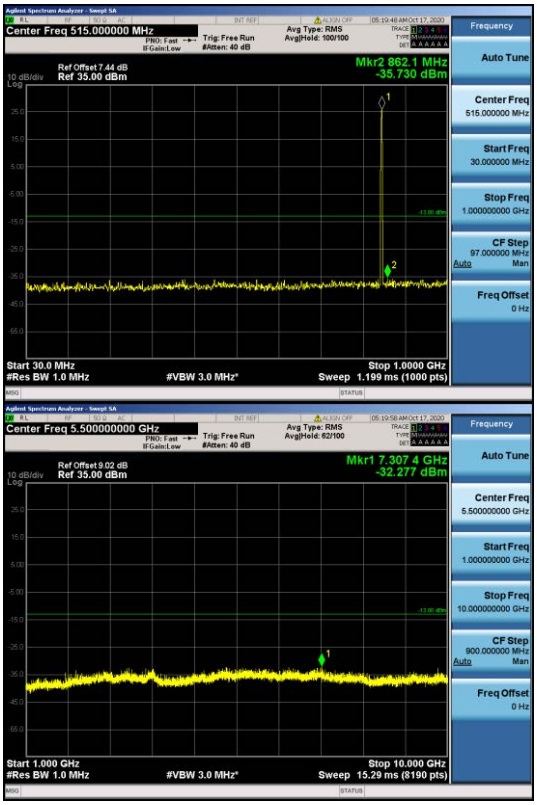
Test Mode=GSM/TM2
Test Channel=LCH



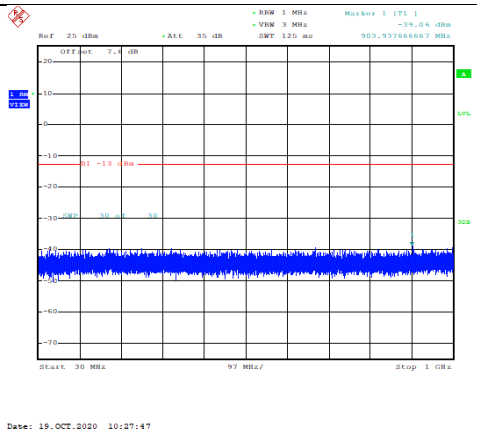
Test Channel=MCH



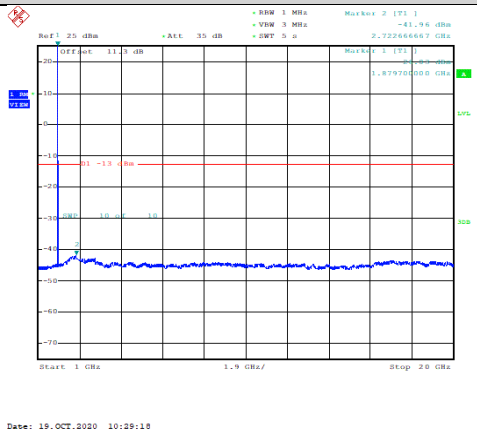
Test Channel=HCH



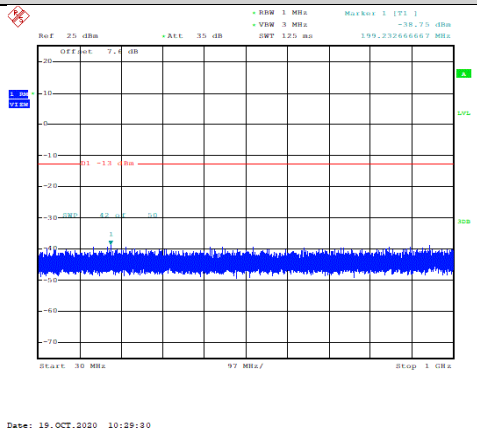
Test Band=GSM1900
Test Mode=GSM/TM1



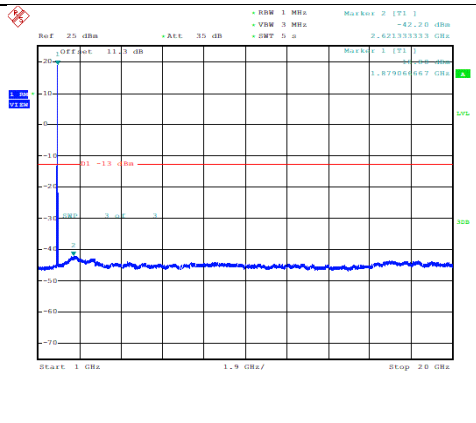
GSM1900-512-0-30~1000MHz-903.94--39.06--13-PASS



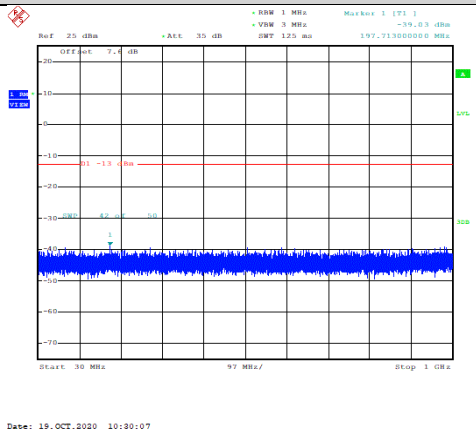
GSM1900-512-0-1000~20000MHz-2722.67--41.96--13-PASS



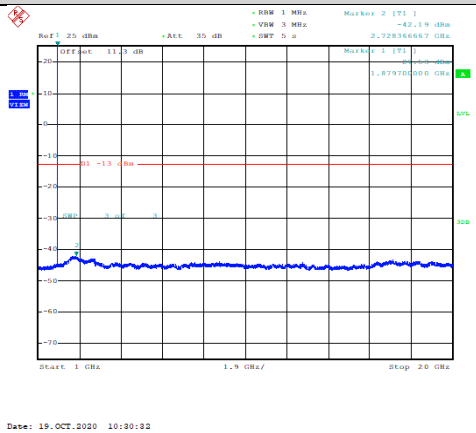
GSM1900-661-0-30~1000MHz-199.23--38.75--13-PASS



GSM1900-661-0-1000~20000MHz-2621.33--42.2--13-PASS

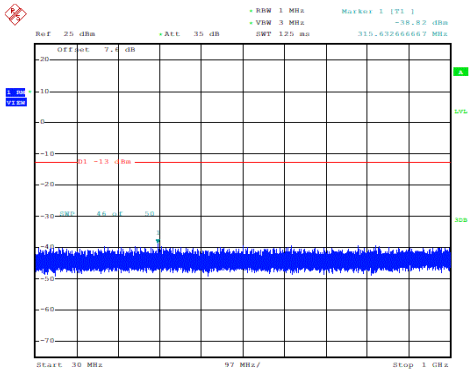


GSM1900-810-0-30~1000MHz-197.71--39.03--13-PASS

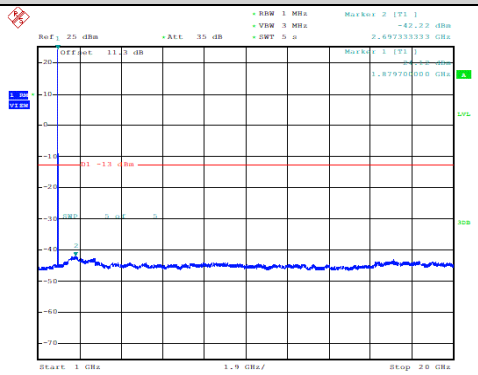


GSM1900-810-0-1000~20000MHz-2728.37--42.19--13-PASS

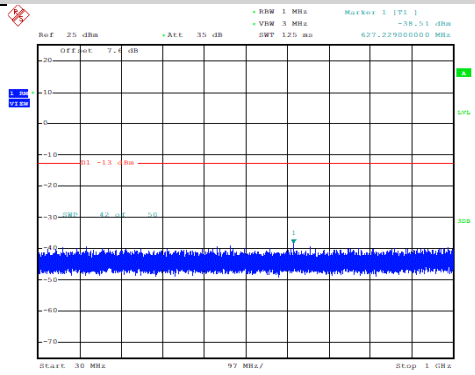
Test Band=GSM1900
Test Mode=GSM/TM2



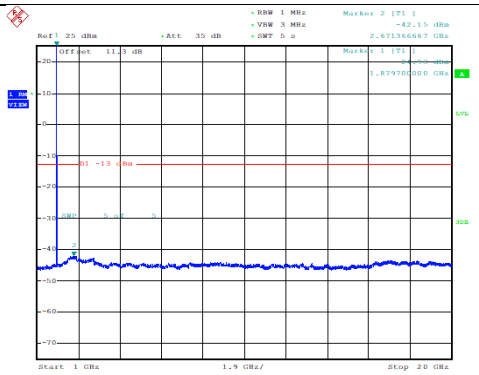
EGPRS1900-512-2-30~1000MHz-315.63--38.82--13-PASS



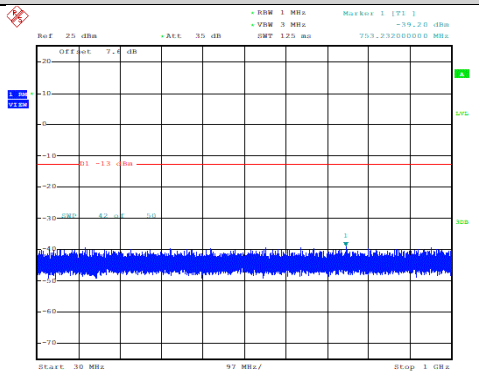
EGPRS1900-512-2-1000~20000MHz-2697.33--42.22--13-PASS



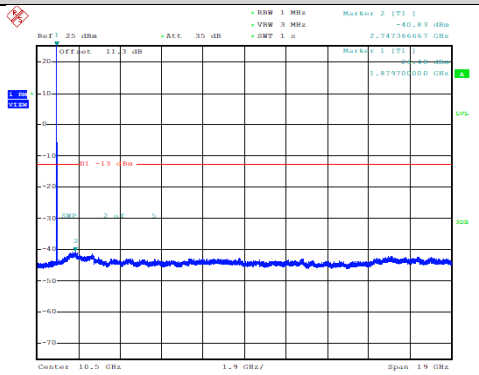
EGPRS1900-661-2-30~1000MHz-627.23--38.51--13-PASS



EGPRS1900-661-2-1000~20000MHz-2671.37--42.15--13-PASS

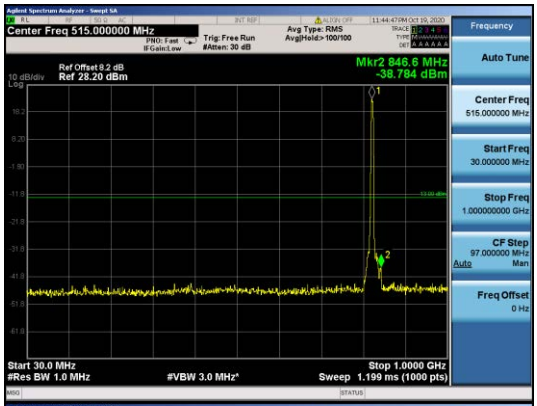


EGPRS1900-810-2-30~1000MHz-753.23--39.2--13-PASS

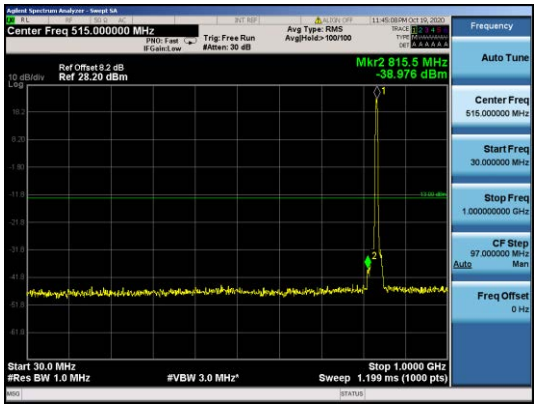


EGPRS1900-810-2-1000~20000MHz-2747.37--40.83--13-PASS

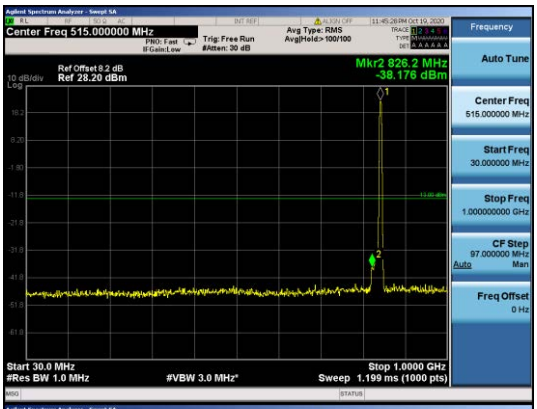
For WCDMA
Test Band=WCDMA850
Test Mode=UMTS/TM3
Test Channel=LCH



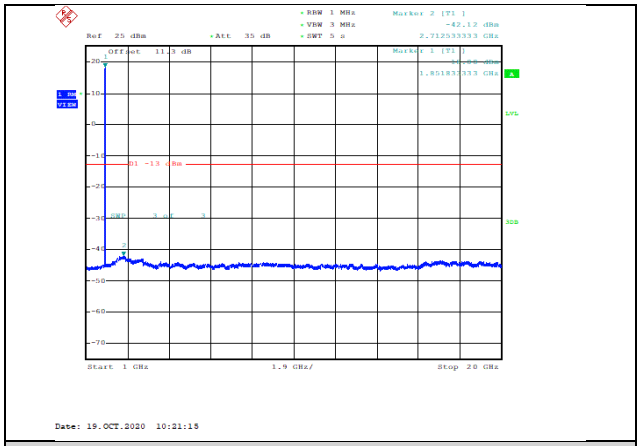
Test Channel=MCH



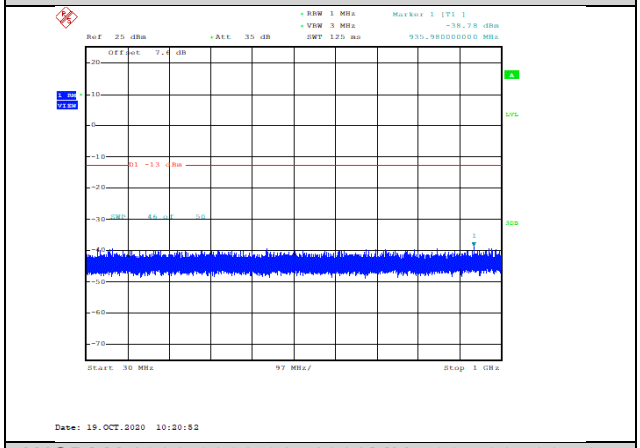
Test Channel=HCH



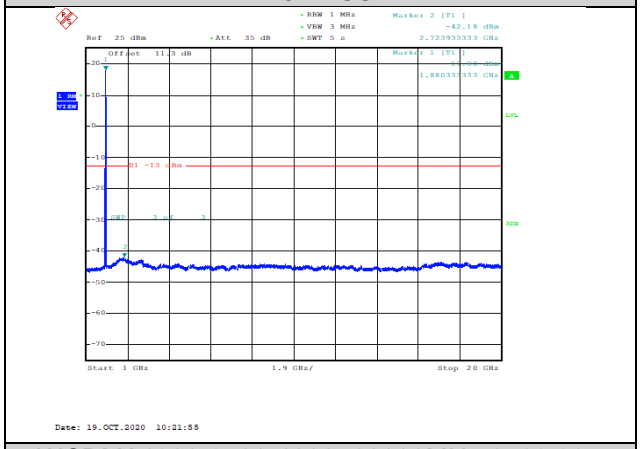
Test Band=WCDMA1900
Test Mode=UMTS/TM3



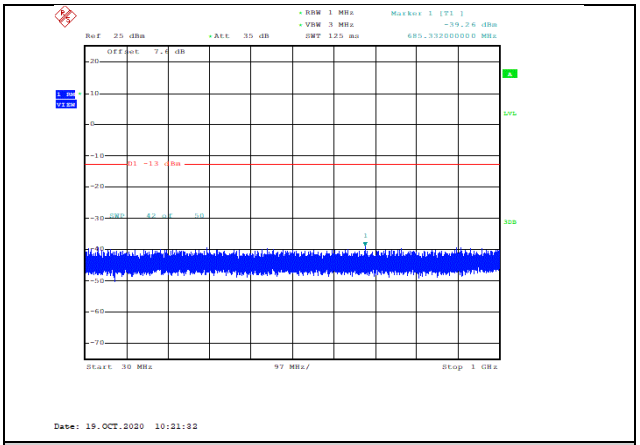
WCDMA1900-9262-1000~20000MHz-2712.53--42.12--13-PASS



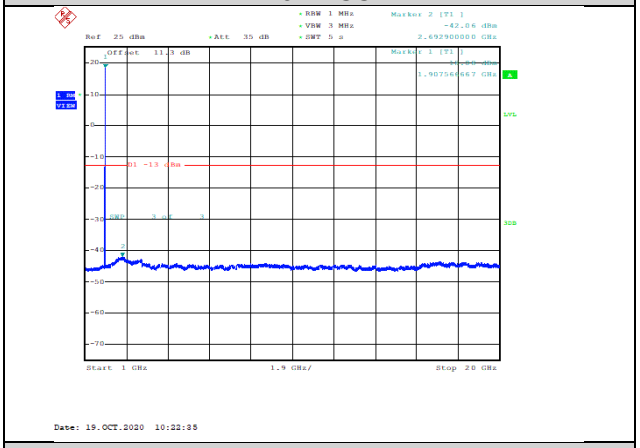
WCDMA1900-9262-30~1000MHz-935.98--38.78--13-PASS



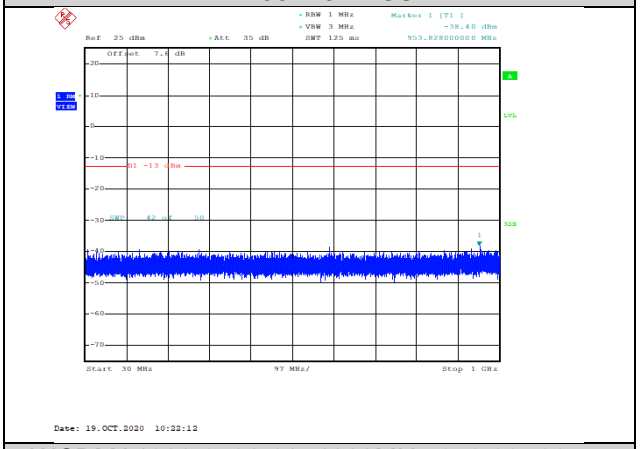
WCDMA1900-9400-1000~20000MHz-2723.93--42.18--13-PASS



WCDMA1900-9400-30~1000MHz-685.33--39.26--13-PASS

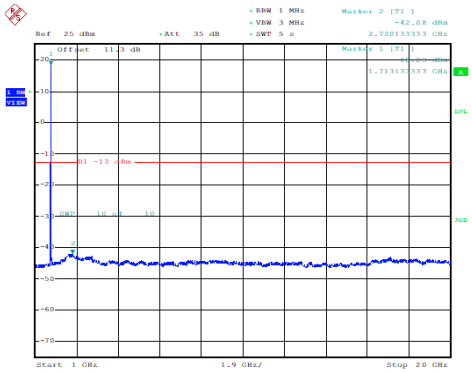


WCDMA1900-9538-1000~20000MHz-2692.9--42.06--13-PASS

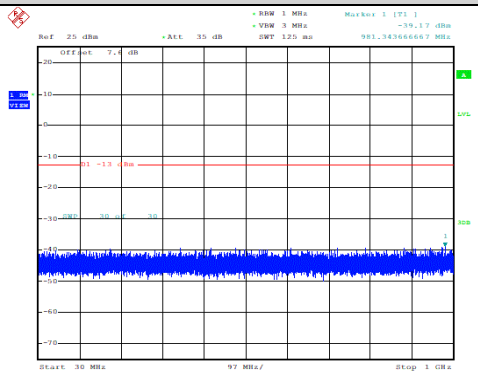


WCDMA1900-9538-30~1000MHz-953.83--38.4--13-PASS

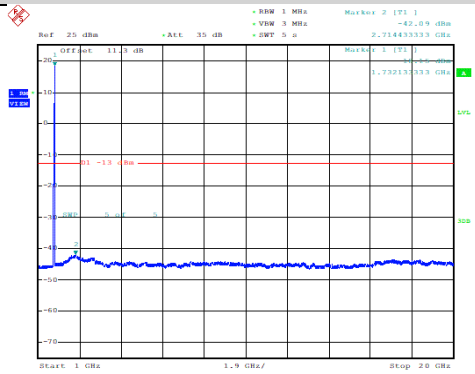
Test Band=WCDMA1700
Test Mode=UMTS/TM3



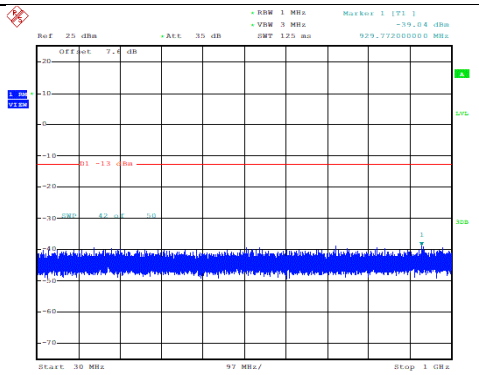
WCDMA1700-1312-1000~20000MHz-2720.13--42.08--13-PASS



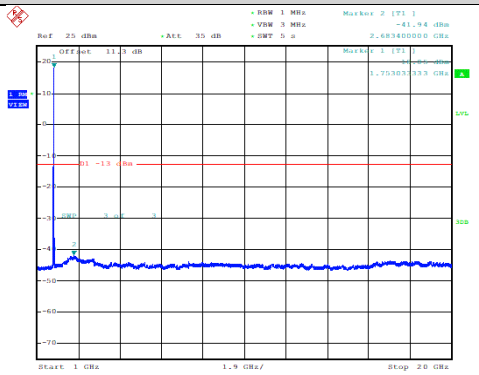
WCDMA1700-1312-30~1000MHz-981.34--39.17--13-PASS



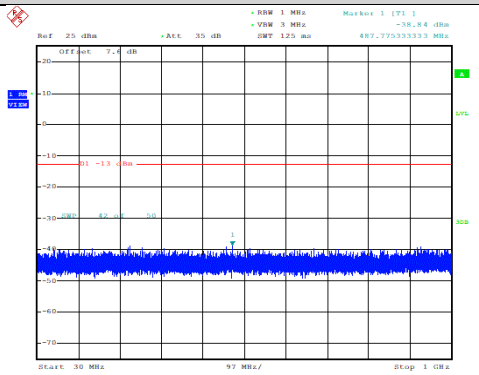
WCDMA1700-1413-1000~20000MHz-2714.43--42.09--13-PASS



WCDMA1700-1413-30~1000MHz-929.77--39.04--13-PASS



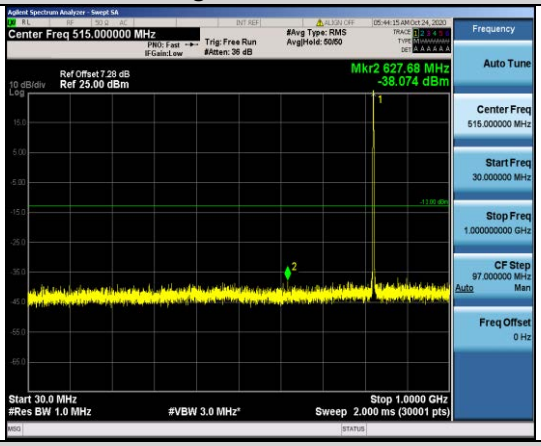
WCDMA1700-1513-1000~20000MHz-2683.4--41.94--13-PASS



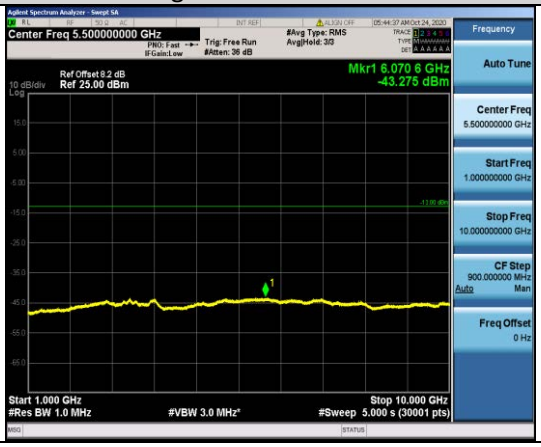
WCDMA1700-1513-30~1000MHz-487.78--38.84--13-PASS

LTE Mode with QPSK Modulation(TM4) &
LTE Mode with 16QAM Modulation(TM5)

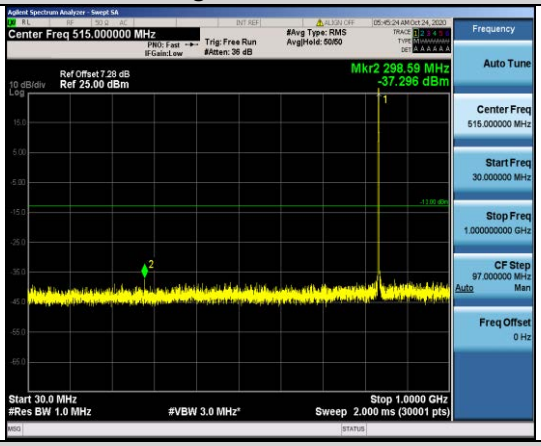
Band5-1.4MHz-QPSK-20407-1RB#0-Range1:30~1000MHz



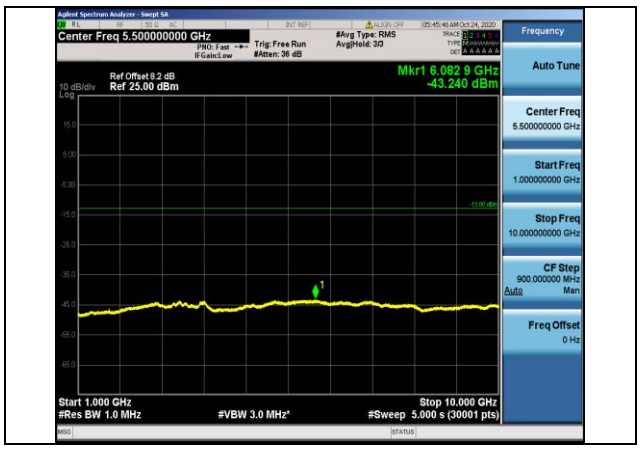
Band5-1.4MHz-QPSK-20407-1RB#0-Range2:1000~10000MHz



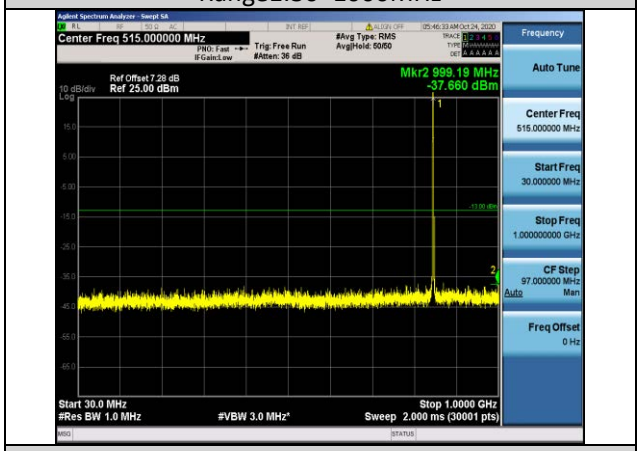
Band5-1.4MHz-QPSK-20525-1RB#0-Range1:30~1000MHz



Band5-1.4MHz-QPSK-20525-1RB#0-Range2:1000~10000MHz



Band5-1.4MHz-QPSK-20643-1RB#0-Range1:30~1000MHz



Band5-1.4MHz-QPSK-20643-1RB#0-Range2:1000~10000MHz