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## 9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

# 9.1. Standard Applicable

FCC §22.917(a), §24.238(a), §27.53(h), *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.

FCC §27.53(c) (5) & FCC §27.53(g)

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.

FCC §27.53(h) (3)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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.

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## FCC §27.53(m) (4) (6)

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz 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; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent 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 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). 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. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

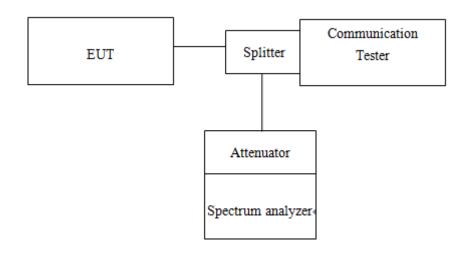
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## 9.2. Test SET-UP



#### 9.3. Measurement Procedure

### **Conducted Emission**

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
- 3. Allow trace to fully stabilize
- 4. Repeat above procedures until all default test channel measured were complete.

## **Band Edge**

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. The band edge of low and high channels for the highest RF powers was measured. Setting RBW ≥ 1% EBW.
- 3. Allow trace to fully stabilize
- 4. Repeat above procedures until all default test channel measured were complete.

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# 9.4. Measurement Equipment Used

| Conducted Emission (measured at antenna port) Test Site |                  |                 |            |            |            |
|---|------------------|-----------------|------------|------------|------------|
| EQUIPMENT   | MFR              | MODEL           | SERIAL     | LAST       | CAL DUE.   |
| TYPE  |                  | NUMBER          | NUMBER     | CAL.       |            |
| Power Meter   | Anritsu          | ML2495A         | 1005007    | 12/15/2016 | 12/14/2017 |
| Power Sensor  | Anritsu          | MA2411B         | 917032     | 12/15/2016 | 12/14/2017 |
| EXA Spectrum Analyzer                                   | Agilent          | N9030A          | MY53120760 | 03/21/2017 | 03/20/2018 |
| DC Block  | Mini-Circuits    | BLK-18-S+       | 1          | 01/05/2017 | 01/04/2018 |
| Coaxial Cable   | HUBER+SUHNE<br>R | SUCOFLEX<br>102 | 23670/2    | 01/05/2017 | 01/04/2018 |
| Attenuator  | Mini-Circuit     | BW-S10W2+       | 2          | 01/05/2017 | 01/04/2018 |
| Splitter  | Agilent          | 11636B          | N/A        | 01/05/2017 | 01/04/2018 |
| DC Power Supply   | Agilent          | E3640A          | MY52410006 | 11/21/2016 | 11/20/2017 |
| Temperature Chamber                                     | TERCHY           | MHG-120LF       | 911009     | 05/19/2017 | 05/18/2018 |
| Radio Communication<br>Analyzer                         | R&S              | CMU200          | 102189     | 02/11/2017 | 02/10/2018 |
| Radio Communication<br>Analyer                          | Anritsu          | MT8820C         | 6201465317 | 01/03/2017 | 01/02/2018 |

### 9.5. Measurement Result:

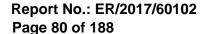
Refer to next pages.

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

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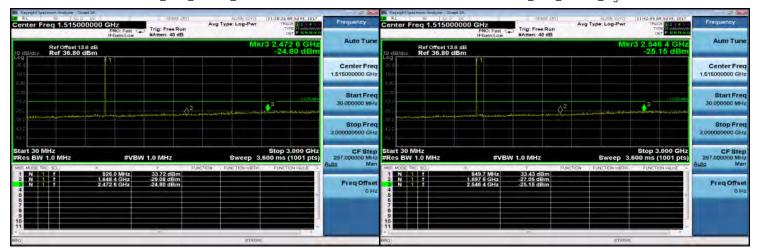
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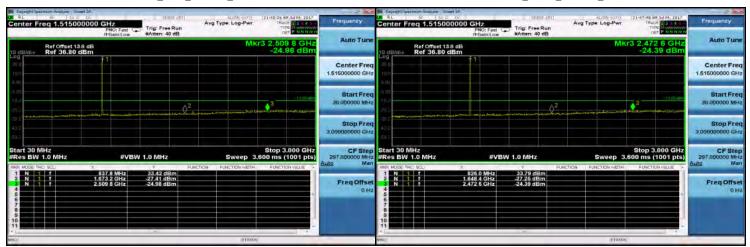
Out of Band Emission Low\_GSM\_850MHz\_LowCH128-824.2

Out of Band Emission Low\_GSM\_850MHz\_HighCH251-848.8



Out of Band Emission Low\_GSM\_850MHz\_MidCH190-836.6

Out of Band Emission Low\_GPRS\_850MHz\_LowCH128-824.2



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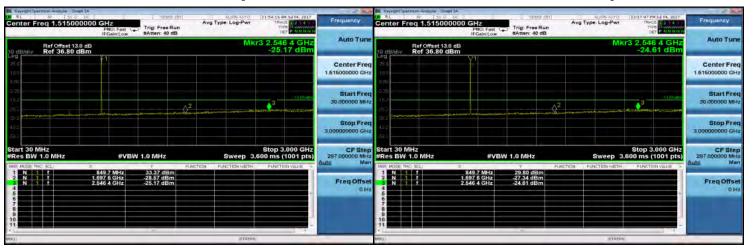
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Out of Band Emission Low\_EDGE\_850MHz\_MidCH190-836.6



Out of Band Emission Low\_GPRS\_850MHz\_HighCH251-848.8

Out of Band Emission Low\_EDGE\_850MHz\_HighCH251-848.8



Out of Band Emission Low\_EDGE\_850MHz\_LowCH128-824.2

Out of Band Emission High\_GSM\_850MHz\_LowCH128-824.2



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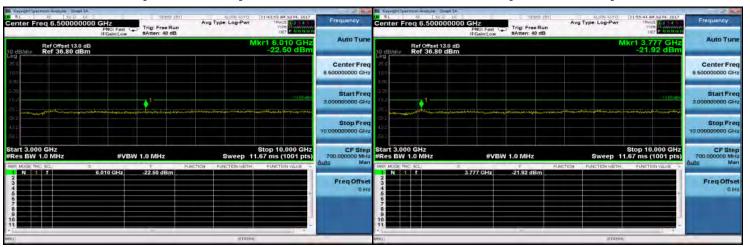
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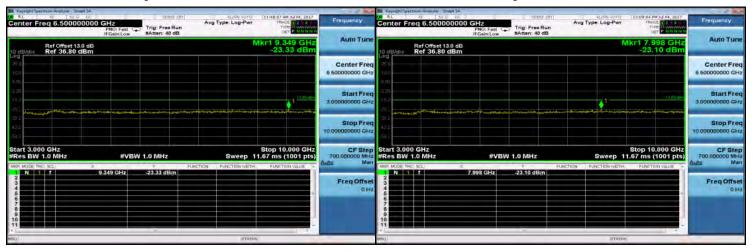
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Out of Band Emission High\_GPRS\_850MHz\_HighCH251-848.8



Out of Band Emission High\_GPRS\_850MHz\_LowCH128-824.2

Out of Band Emission High\_EDGE\_850MHz\_LowCH128-824.2



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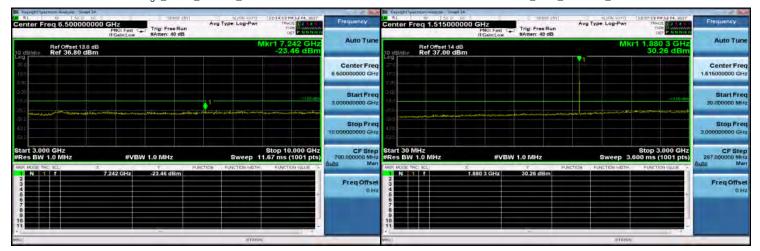
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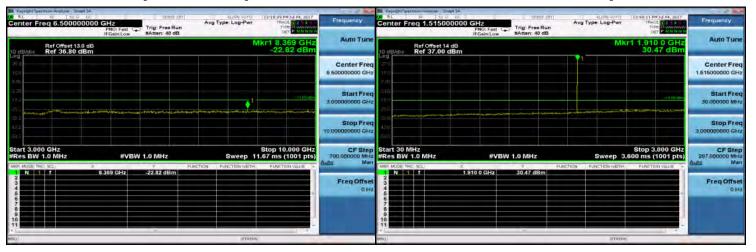
Out of Band Emission High\_EDGE\_850MHz\_MidCH190-836.6

Out of Band Emission Low\_GSM\_1900MHz\_MidCH661-1880



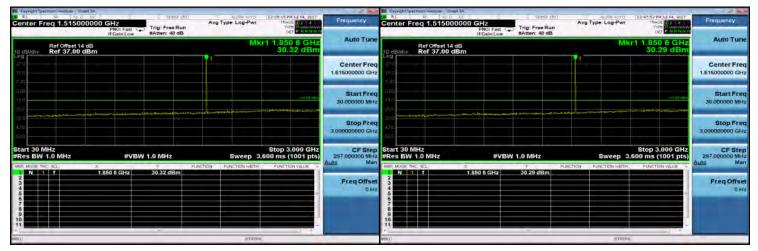
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Out of Band Emission Low\_GSM\_1900MHz\_HighCH810-1909.8



Out of Band Emission Low\_GSM\_1900MHz\_LowCH512-1850.2

Out of Band Emission Low\_GPRS\_1900MHz\_LowCH512-1850.2



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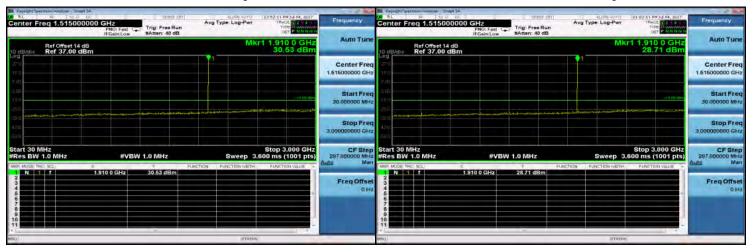
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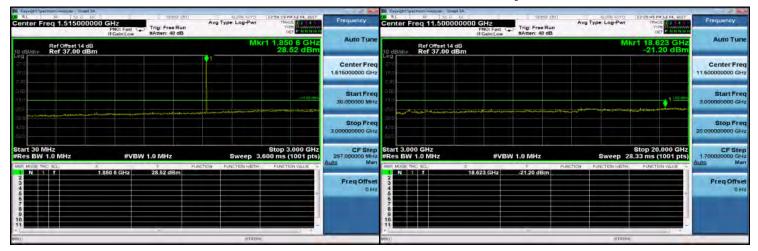
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Out of Band Emission Low\_EDGE\_1900MHz\_HighCH810-1909.8



Out of Band Emission Low\_EDGE\_1900MHz\_LowCH512-1850.2

Out of Band Emission High\_GSM\_1900MHz\_LowCH512-1850.2



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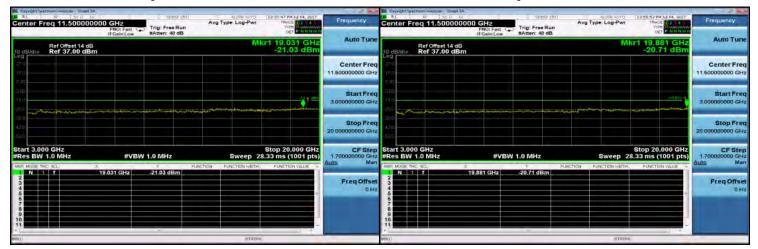
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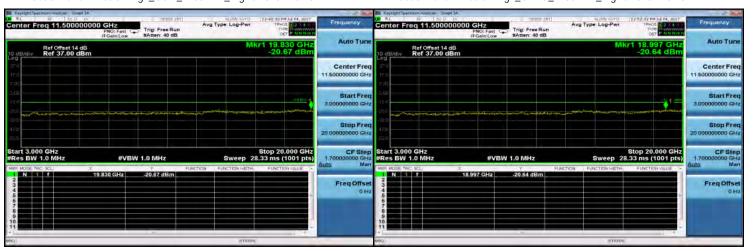
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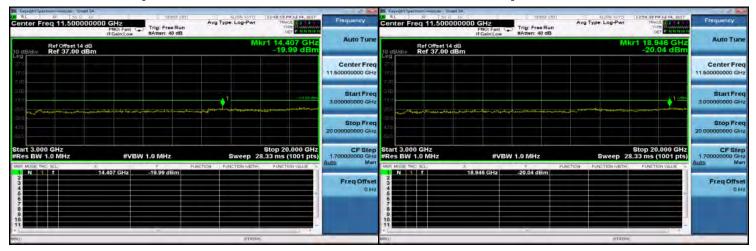
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Out of Band Emission High\_GPRS\_1900MHz\_HighCH810-1909.8



Out of Band Emission High\_GPRS\_1900MHz\_LowCH512-1850.2

Out of Band Emission High\_EDGE\_1900MHz\_LowCH512-1850.2



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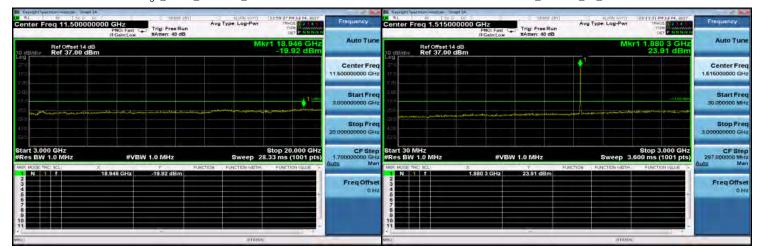
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Out of Band Emission High\_EDGE\_1900MHz\_MidCH661-1880

Out of Band Emission Low\_WCDMA\_B2\_MidCH9400-1880



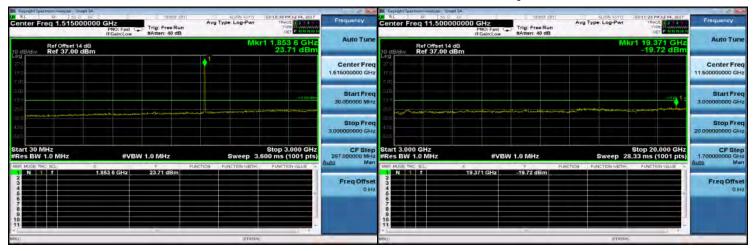
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Out of Band Emission Low\_WCDMA\_B2\_HighCH9538-1907.6



Out of Band Emission Low\_WCDMA\_B2\_LowCH9262-1852.4

Out of Band Emission High\_WCDMA\_B2\_LowCH9262-1852.4



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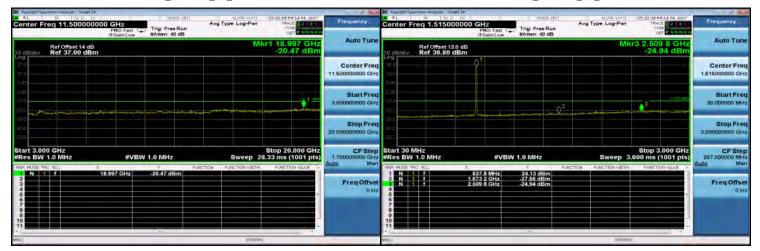
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Out of Band Emission Low\_WCDMA\_B2\_MidCH9400-1880

Out of Band Emission Low\_WCDMA\_B5\_MidCH4183-836.6



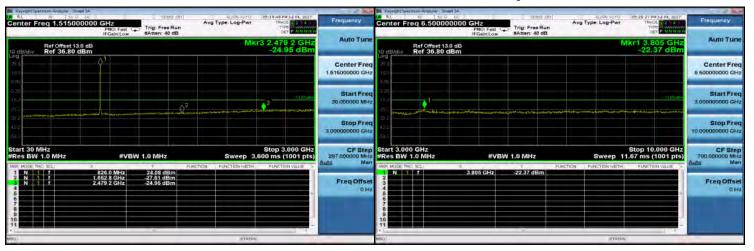
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Out of Band Emission Low\_WCDMA\_B5\_LowCH4132-826.4

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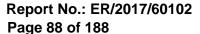
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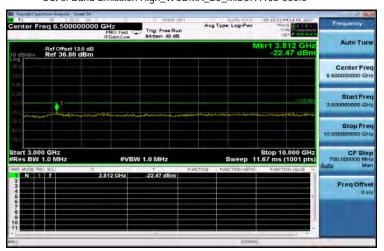
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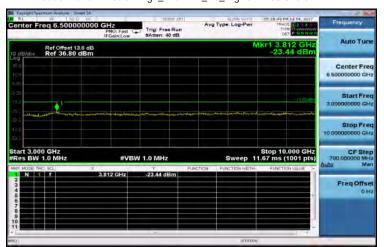




Out of Band Emission High\_WCDMA\_B5\_MidCH4183-836.6



Out of Band Emission High\_WCDMA\_B5\_HighCH4233-846.6



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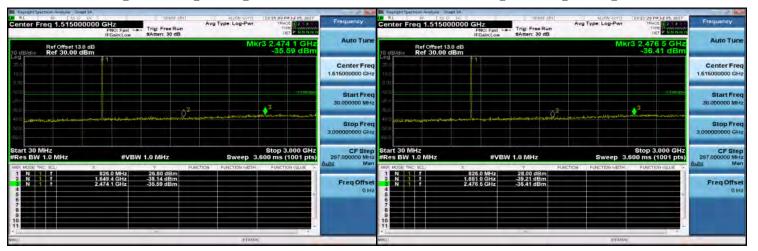
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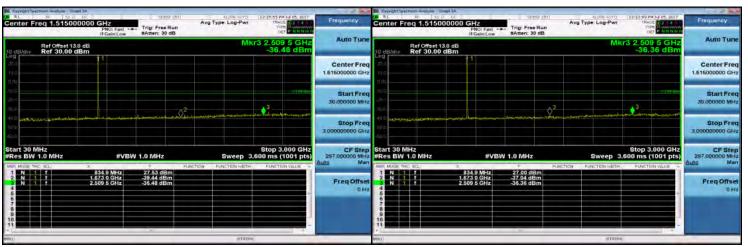
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Out of Band Emission Low\_Band5 3MHz\_QPSK 1 0\_LowCH20415-825.5



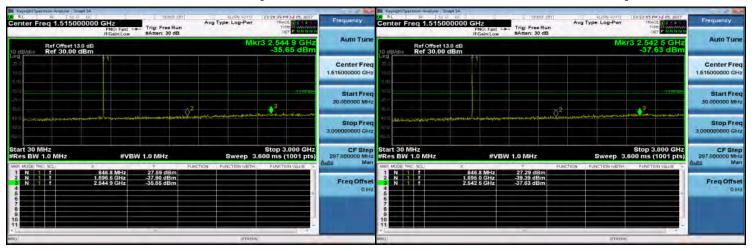
Out of Band Emission Low Band5 1.4MHz QPSK 1.0 MidCH20525-836.5

Out of Band Emission Low Band5 3MHz QPSK 1 0 MidCH20525-836.5



Out of Band Emission Low\_Band5 1.4MHz\_QPSK 1 0\_HighCH20643-848.3

Out of Band Emission Low\_Band5 3MHz\_QPSK 1 0\_HighCH20635-847.5



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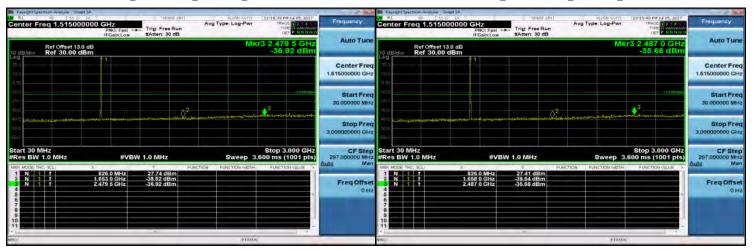
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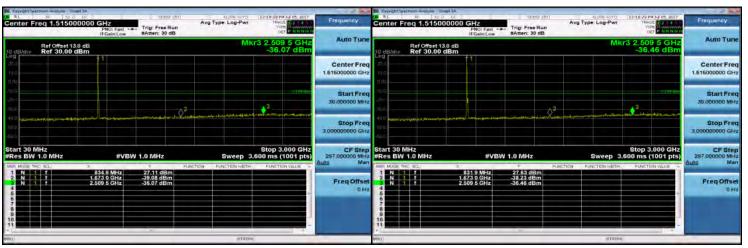
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Out of Band Emission Low\_Band5 10MHz\_QPSK 1 0\_LowCH20450-829



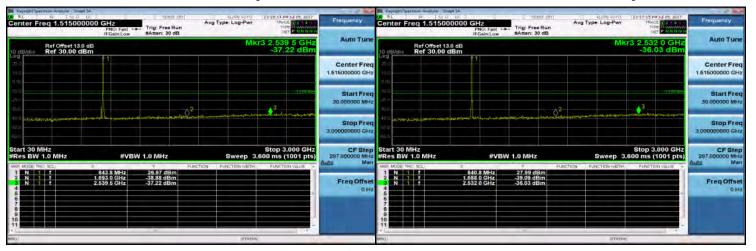
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Out of Band Emission Low\_Band5 10MHz\_QPSK 1 0\_MidCH20525-836.5



Out of Band Emission Low\_Band5 5MHz\_QPSK 1 0\_HighCH20625-846.5

Out of Band Emission Low\_Band5 10MHz\_QPSK 1 0\_HighCH20600-844



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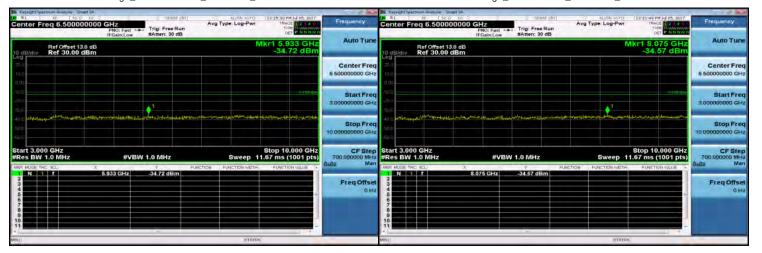
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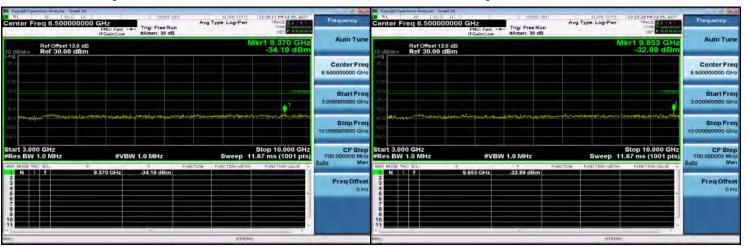
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Out of Band Emission High\_Band5 3MHz\_QPSK 1 0\_LowCH20415-825.5



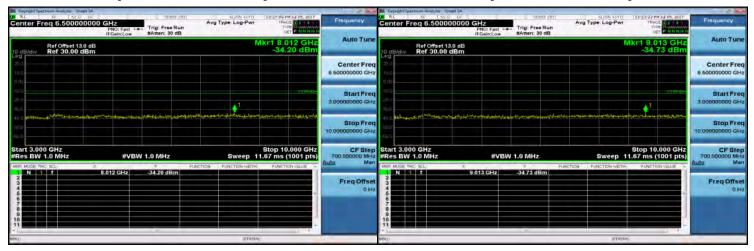
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Out of Band Emission High\_Band5 3MHz\_QPSK 1 0\_MidCH20525-836.5



Out of Band Emission High\_Band5 1.4MHz\_QPSK 1 0\_HighCH20643-848.3

Out of Band Emission High\_Band5 3MHz\_QPSK 1 0\_HighCH20635-847.5



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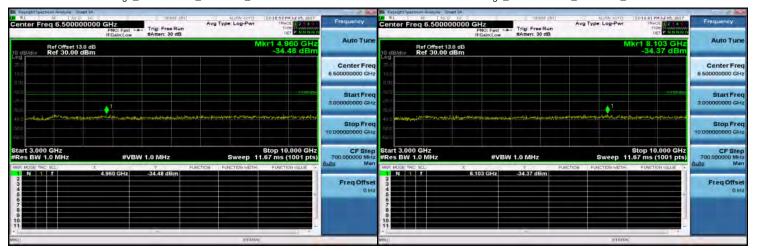
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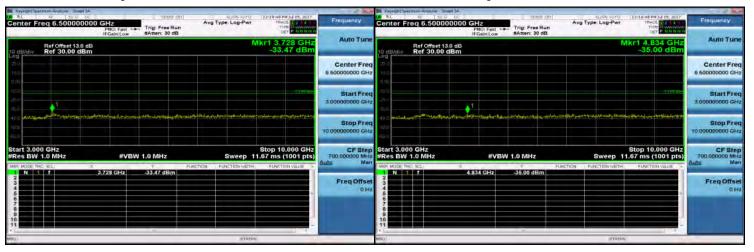
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Out of Band Emission High\_Band5 10MHz\_QPSK 1 0\_LowCH20450-829



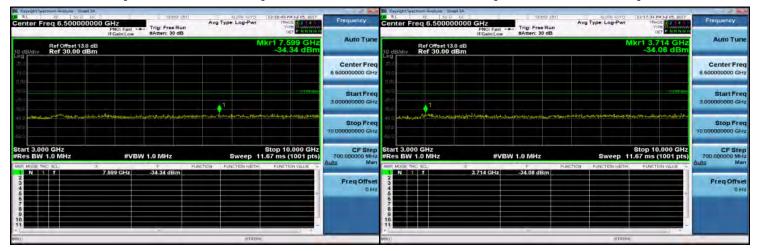
Out of Band Emission High\_Band5 5MHz\_QPSK 1 0\_MidCH20525-836.5

Out of Band Emission High\_Band5 10MHz\_QPSK 1 0\_MidCH20525-836.5



Out of Band Emission High\_Band5 5MHz\_QPSK 1 0\_HighCH20625-846.5

Out of Band Emission High\_Band5 10MHz\_QPSK 1 0\_HighCH20600-844



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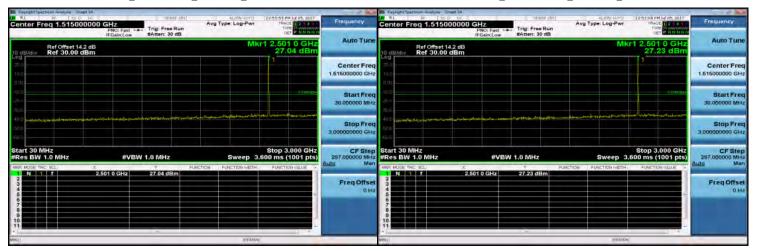
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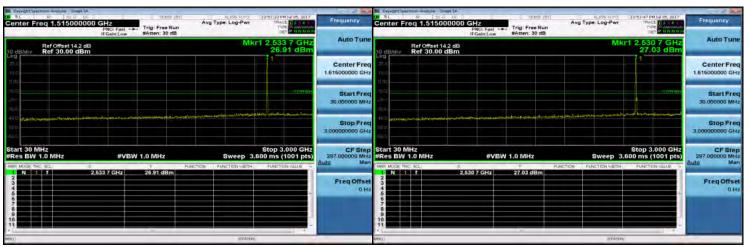
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Out of Band Emission Low\_Band7 10MHz\_QPSK 1 0\_LowCH20800-2505



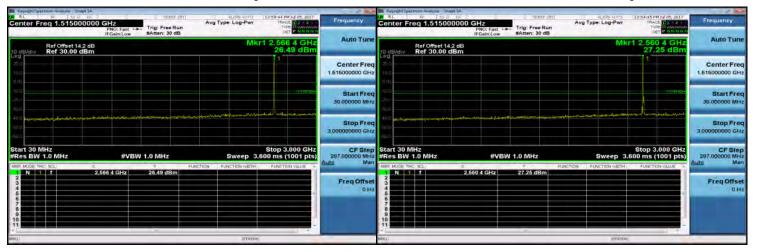
Out of Band Emission Low Band7 5MHz QPSK 1 0 MidCH21100-2535

Out of Band Emission Low\_Band7 10MHz\_QPSK 1 0\_MidCH21100-2535



Out of Band Emission Low\_Band7 5MHz\_QPSK 1 0\_HighCH21425-2567.5

Out of Band Emission Low\_Band7 10MHz\_QPSK 1 0\_HighCH21400-2565



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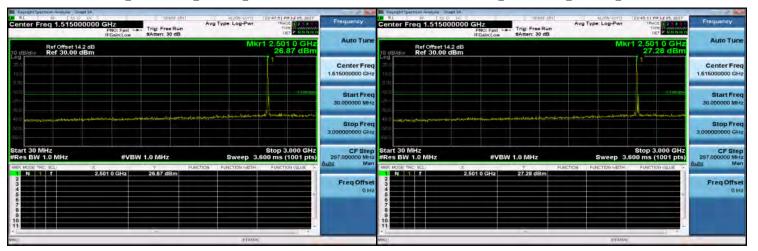
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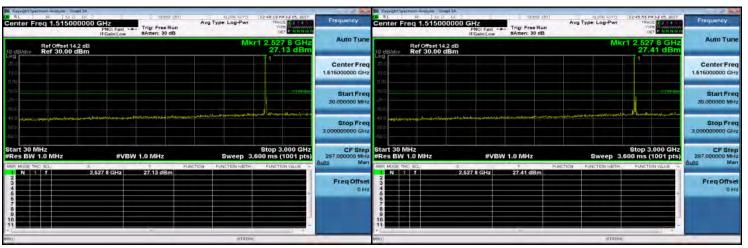
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Out of Band Emission Low\_Band7 20MHz\_QPSK 1 0\_LowCH20850-2510



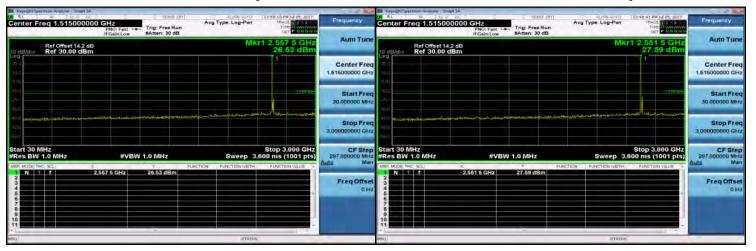
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Out of Band Emission Low Band7 20MHz QPSK 1 0 MidCH21100-2535



Out of Band Emission Low\_Band7 15MHz\_QPSK 1 0\_HighCH21375-2562.5

Out of Band Emission Low\_Band7 20MHz\_QPSK 1 0\_HighCH21350-2560



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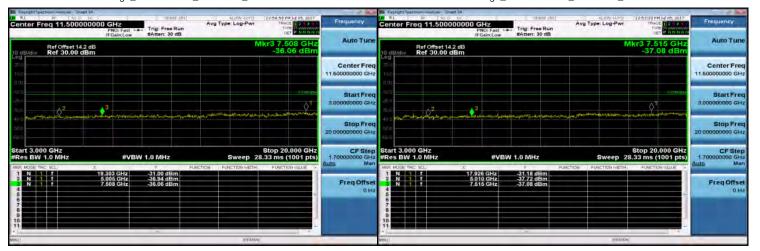
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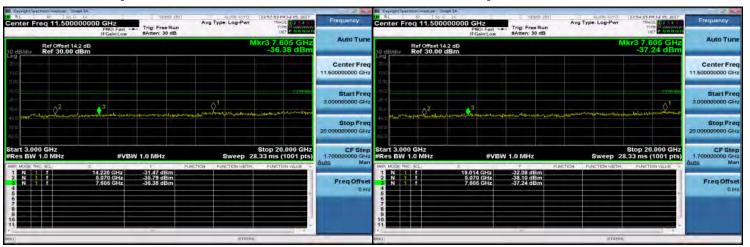
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Out of Band Emission High\_Band7 10MHz\_QPSK 1 0\_LowCH20800-2505



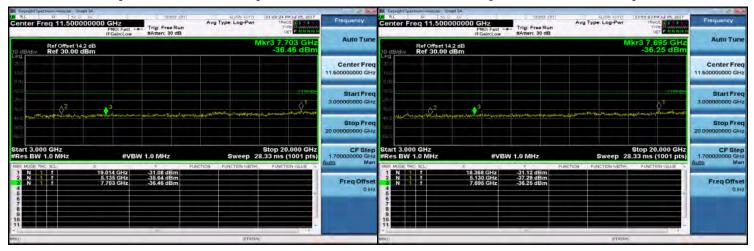
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Out of Band Emission High\_Band7 10MHz\_QPSK 1 0\_MidCH21100-2535



Out of Band Emission High\_Band7 5MHz\_QPSK 1 0\_HighCH21425-2567.5

Out of Band Emission High\_Band7 10MHz\_QPSK 1 0\_HighCH21400-2565



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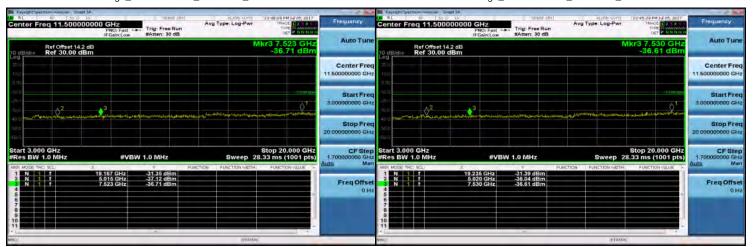
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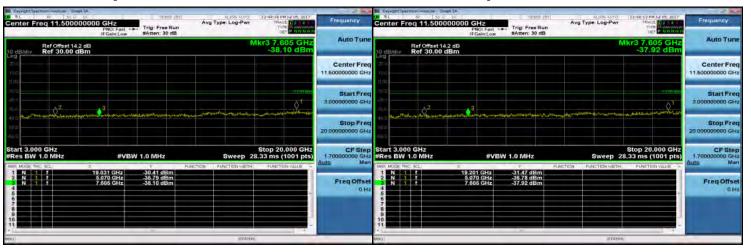
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Out of Band Emission High\_Band7 20MHz\_QPSK 1 0\_LowCH20850-2510



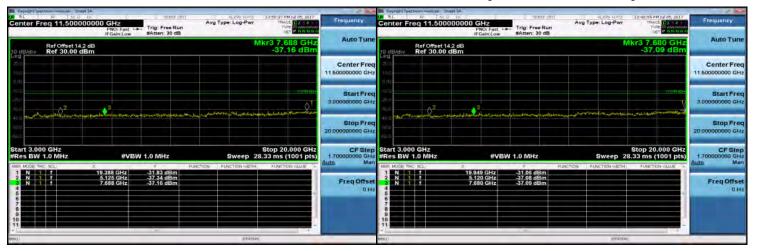
Out of Band Emission High\_Band7 15MHz\_QPSK 1 0\_MidCH20175-1732.5

Out of Band Emission High\_Band7 20MHz\_QPSK 1 0\_MidCH21100-2535



Out of Band Emission High\_Band7 15MHz\_QPSK 1 0\_HighCH21375-2562.5

Out of Band Emission High\_Band7 20MHz\_QPSK 1 0\_HighCH21350-2560



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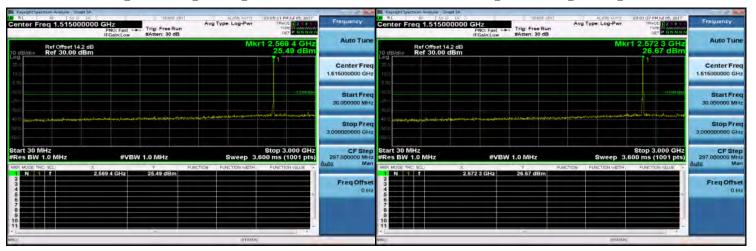
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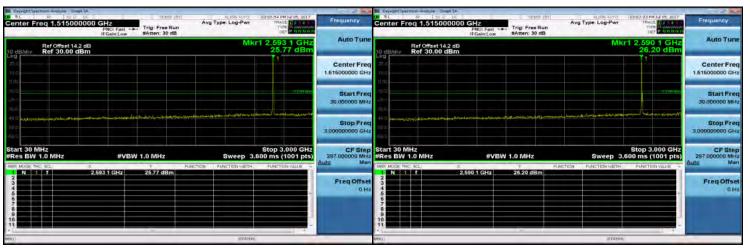
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Out of Band Emission Low\_Band38 10MHz\_QPSK 1 0\_LowCH37800-2575



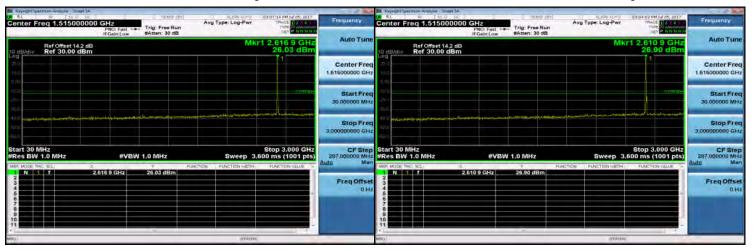
Out of Band Emission Low Band38 5MHz QPSK 1 0 MidCH38000-2595

Out of Band Emission Low Band38 10MHz QPSK 1 0 MidCH38000-2595



Out of Band Emission Low\_Band38 5MHz\_QPSK 1 0\_HighCH38225-2617.5

Out of Band Emission Low\_Band38 10MHz\_QPSK 1 0\_HighCH38200-2615



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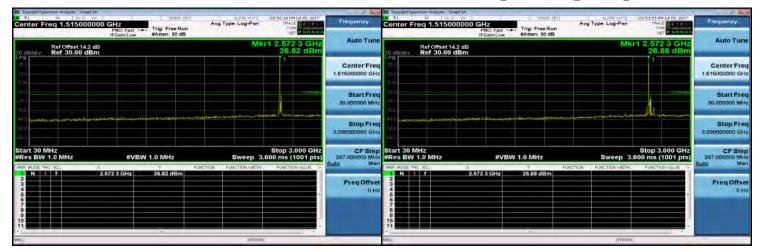
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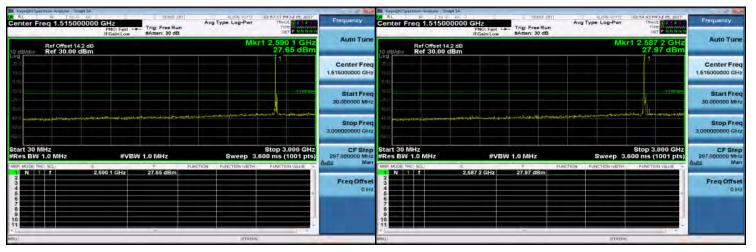
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Out of Band Emission Low\_Band38 20MHz\_QPSK 1 0\_LowCH37850-2580



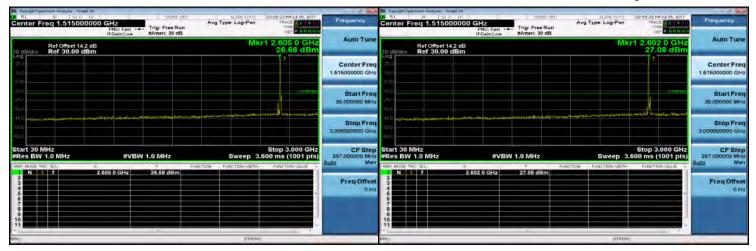
Out of Band Emission Low\_Band38 15MHz\_QPSK 1 0\_MidCH38000-2595

Out of Band Emission Low Band38 20MHz QPSK 1 0 MidCH38000-2595



Out of Band Emission Low\_Band38 15MHz\_QPSK 1 0\_HighCH38175-2612.5

Out of Band Emission Low\_Band38 20MHz\_QPSK 1 0\_HighCH38150-2610



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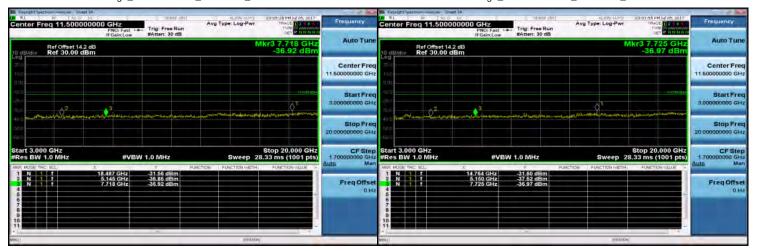
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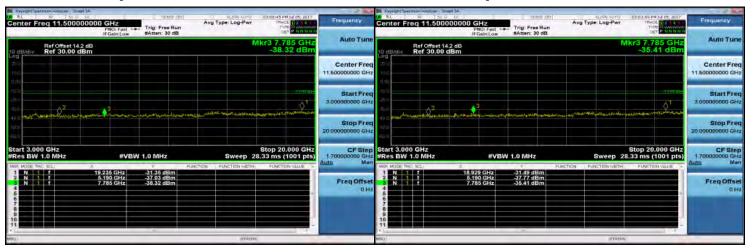
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Out of Band Emission High\_Band38 10MHz\_QPSK 1 0\_LowCH37800-2575



Out of Band Emission High\_Band38 5MHz\_QPSK 1 0\_MidCH38000-2595

Out of Band Emission High\_Band38 10MHz\_QPSK 1 0\_MidCH38000-2595



Out of Band Emission High\_Band38 5MHz\_QPSK 1 0\_HighCH38225-2617.5

Out of Band Emission High\_Band38 10MHz\_QPSK 1 0\_HighCH38200-2615



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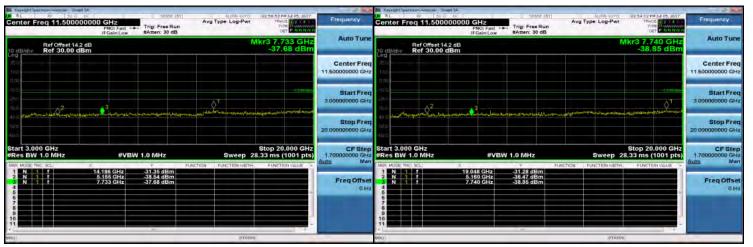
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Out of Band Emission High\_Band38 15MHz\_QPSK 1 0\_LowCH37825-2577.5

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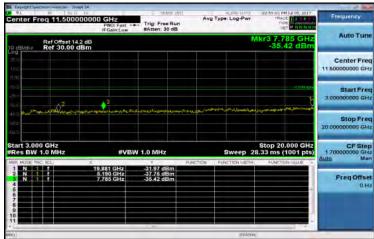


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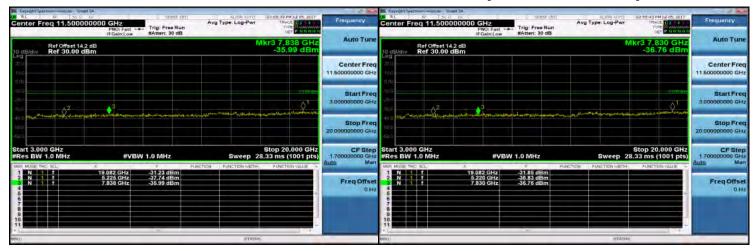


Out of Band Emission High\_Band38 15MHz\_QPSK 1 0\_HighCH38175-2612.5

Out of Band Emission High\_Band38 20MHz\_QPSK 1 0\_MidCH38000-2595



Out of Band Emission High\_Band38 20MHz\_QPSK 1 0\_HighCH38150-2610



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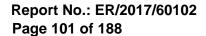
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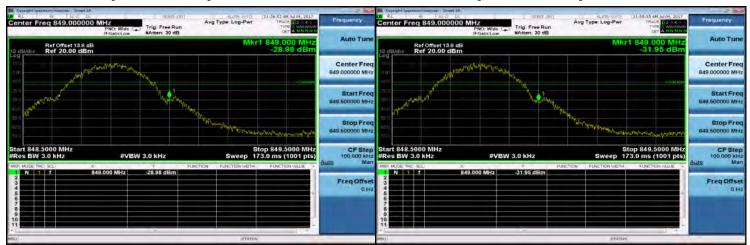
Band Edge\_GSM\_850MHz\_LowCH128-824.2

Band Edge\_GPRS\_850MHz\_LowCH128-824.2



Band Edge\_GSM\_850MHz\_HighCH251-848.8

Band Edge\_GPRS\_850MHz\_HighCH251-848.8



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Band Edge\_EDGE\_850MHz\_LowCH128-824.2

Band Edge\_GSM\_1900MHz\_HighCH810-1909.8



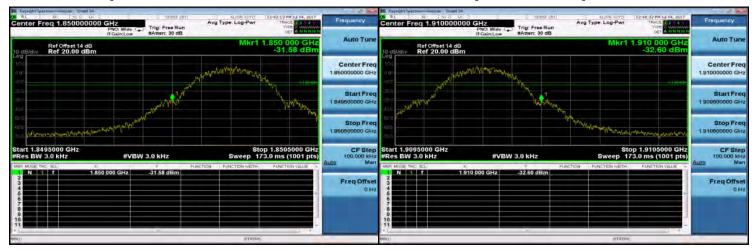
Band Edge\_EDGE\_850MHz\_HighCH251-848.8

Band Edge\_GPRS\_1900MHz\_LowCH512-1850.2



Band Edge\_GSM\_1900MHz\_LowCH512-1850.2

Band Edge\_GPRS\_1900MHz\_HighCH810-1909.8



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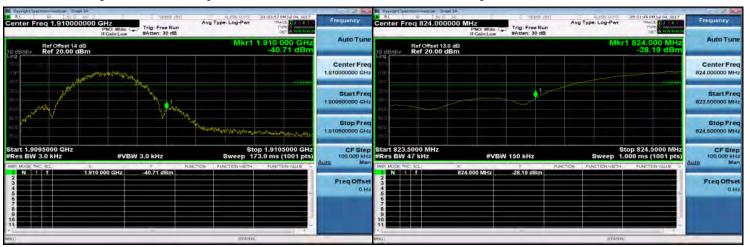
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Band Edge\_WCDMA\_B2\_HighCH9538-1907.6



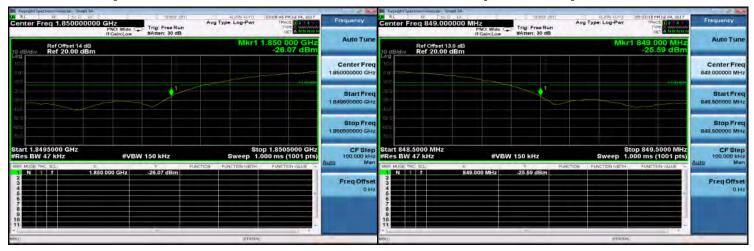
Band Edge\_EDGE\_1900MHz\_HighCH810-1909.8

Band Edge\_WCDMA\_B5\_LowCH4132-826.4



Band Edge\_WCDMA\_B2\_LowCH9262-1852.4

Band Edge\_WCDMA\_B5\_HighCH4233-846.6



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Band Edge\_Band5 1.4MHz\_QPSK 1 0\_LowCH20407-824.7

Band Edge\_Band5 1.4MHz\_QPSK 6 0\_HighCH20643-848.3



Band Edge\_Band5 1.4MHz\_QPSK 1 5\_HighCH20643-848.3

Band Edge\_Band5 3MHz\_QPSK 1 0\_LowCH20415-825.5



Band Edge\_Band5 1.4MHz\_QPSK 6 0\_LowCH20407-824.7

Band Edge\_Band5 3MHz\_QPSK 1 14\_HighCH20635-847.5



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Band Edge\_Band5 3MHz\_QPSK 15 0\_LowCH20415-825.5

Band Edge\_Band5 5MHz\_QPSK 1 24\_HighCH20625-846.5



Band Edge\_Band5 3MHz\_QPSK 15 0\_HighCH20635-847.5

Band Edge\_Band5 5MHz\_QPSK 25 0\_LowCH20425-826.5



Band Edge\_Band5 5MHz\_QPSK 1 0\_LowCH20425-826.5

Band Edge\_Band5 5MHz\_QPSK 25 0\_HighCH20625-846.5



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Band Edge\_Band5 10MHz\_QPSK 1 0\_LowCH20450-829

Band Edge\_Band5 10MHz\_QPSK 50 0\_LowCH20450-829



Band Edge\_Band5 10MHz\_QPSK 1 49\_HighCH20600-844

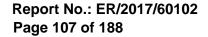
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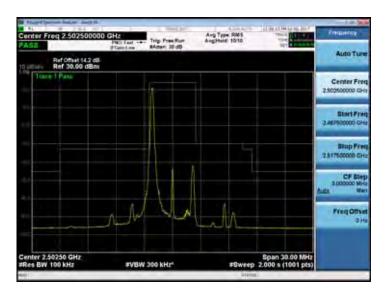
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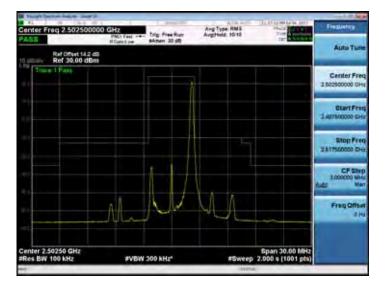




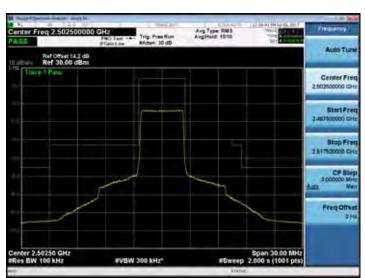
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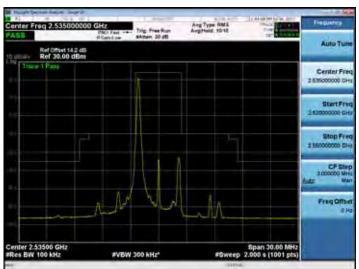
Emission Mask\_Band 7\_5M\_QPSK\_LOW\_RB1,24



Emission Mask\_Band 7\_5M\_QPSK\_LOW\_RB25,0



Emission Mask\_Band 7\_5M\_QPSK\_MID\_RB1,0



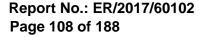
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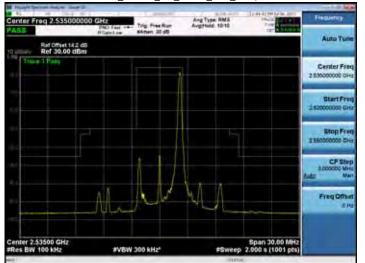
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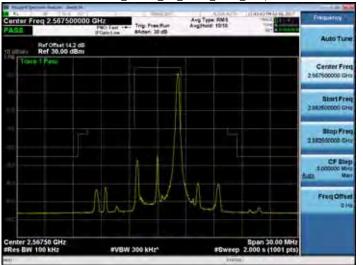




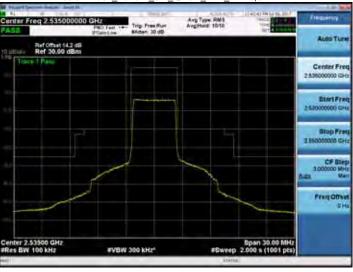
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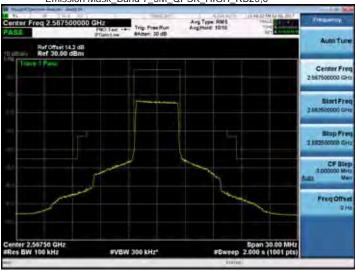
Emission Mask\_Band 7\_5M\_QPSK\_HIGH\_RB1,24



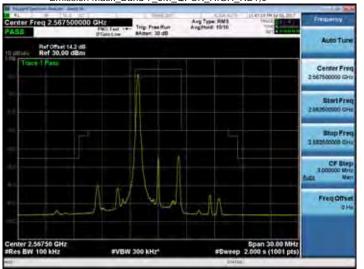
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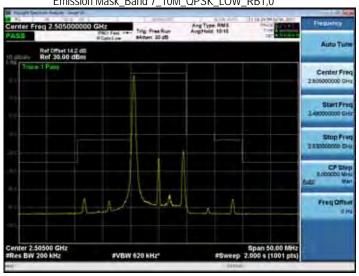
Emission Mask\_Band 7\_5M\_QPSK\_HIGH\_RB25,0



Emission Mask\_Band 7\_5M\_QPSK\_HIGH\_RB1,0

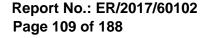


Emission Mask\_Band 7\_10M\_QPSK\_LOW\_RB1,0



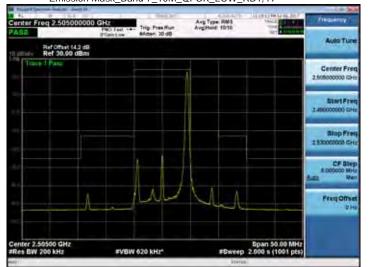
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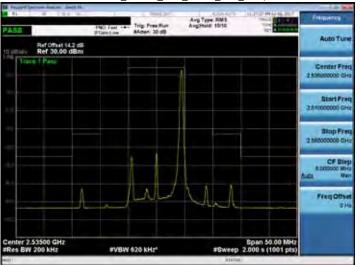




Emission Mask\_Band 7\_10M\_QPSK\_LOW\_RB1,49



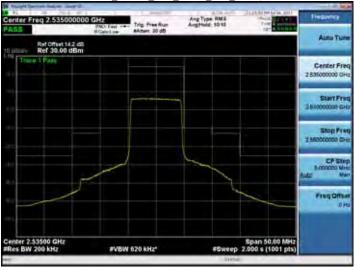
Emission Mask\_Band 7\_10M\_QPSK\_MID\_RB1,49



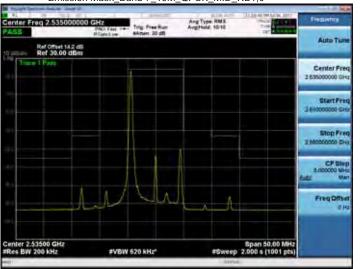
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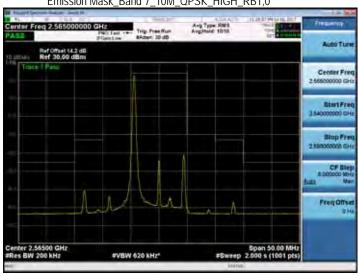
Emission Mask\_Band 7\_10M\_QPSK\_MID\_RB50,0



Emission Mask\_Band 7\_10M\_QPSK\_MID\_RB1.0

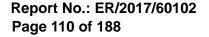


Emission Mask\_Band 7\_10M\_QPSK\_HIGH\_RB1,0



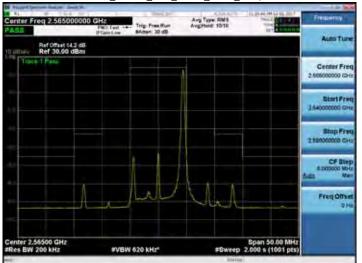
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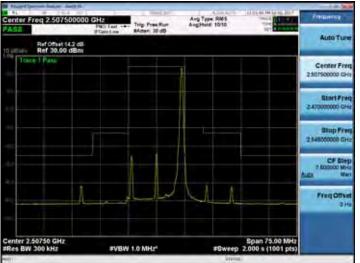




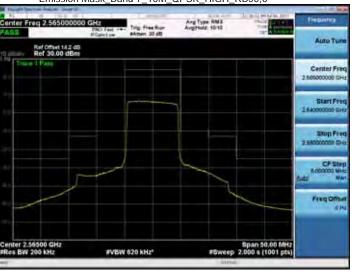
Emission Mask\_Band 7\_10M\_QPSK\_HIGH\_RB1,49



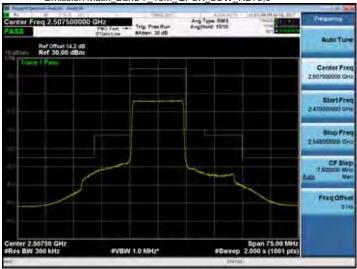




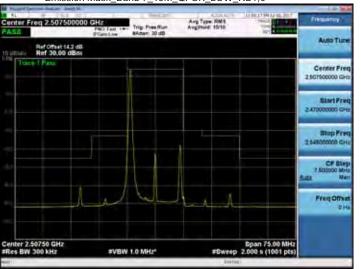
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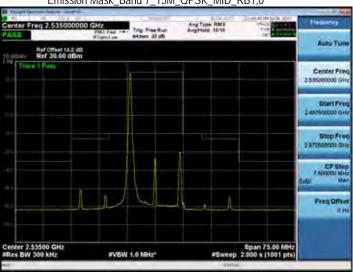
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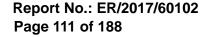


Emission Mask\_Band 7\_15M\_QPSK\_MID\_RB1,0



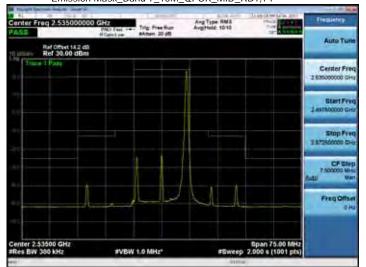
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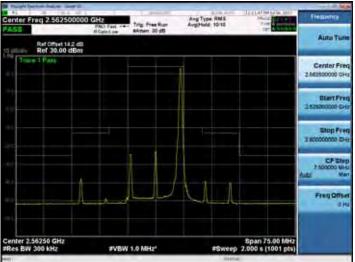




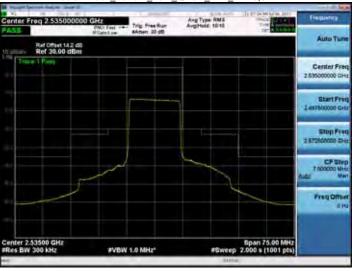
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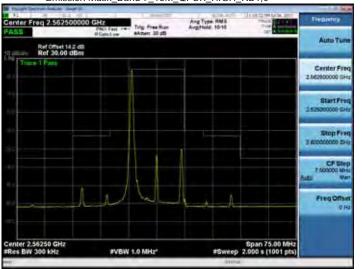
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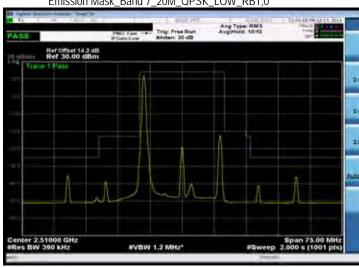
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Emission Mask\_Band 7\_15M\_QPSK\_HIGH\_RB1,0

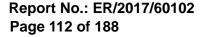


Emission Mask\_Band 7\_20M\_QPSK\_LOW\_RB1,0



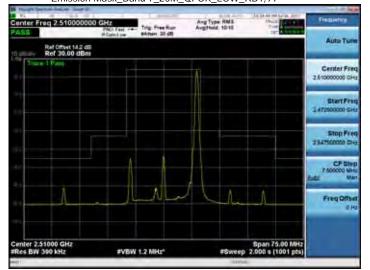
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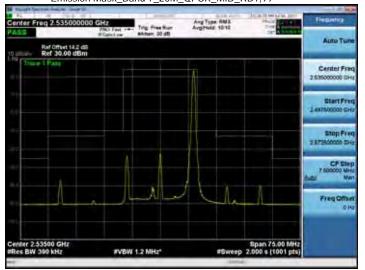




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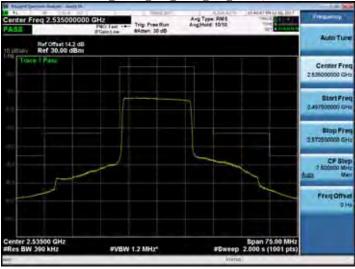
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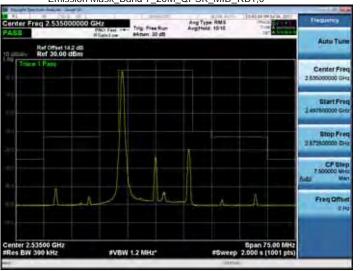
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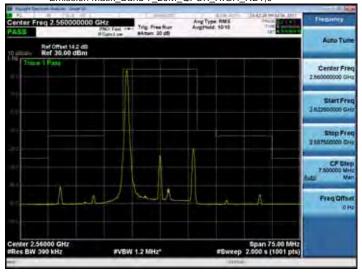
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Emission Mask\_Band 7\_20M\_QPSK\_MID\_RB1.0

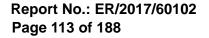


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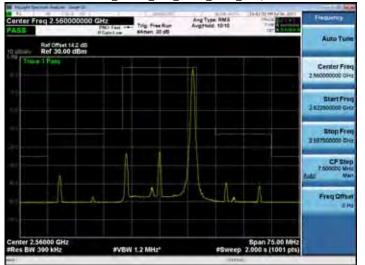
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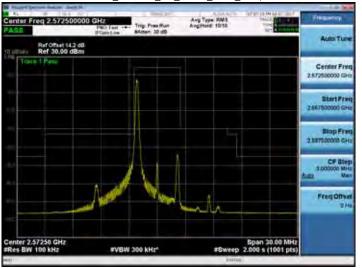
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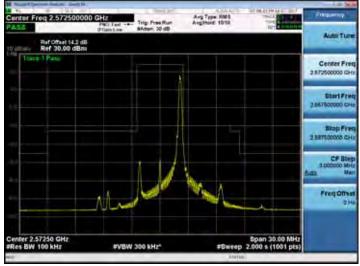
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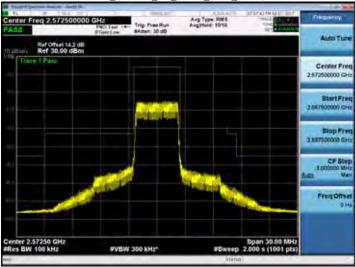
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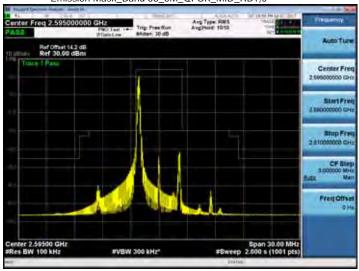
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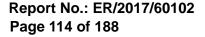


Emission Mask\_Band 38\_5M\_QPSK\_MID\_RB1,0



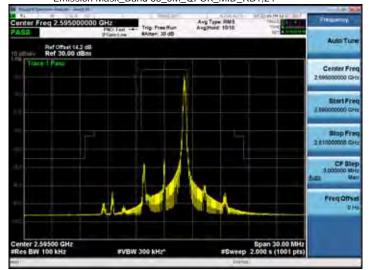
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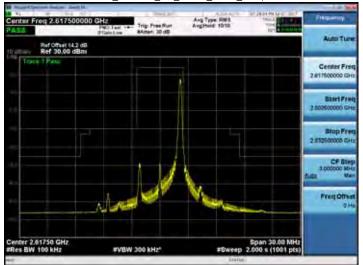




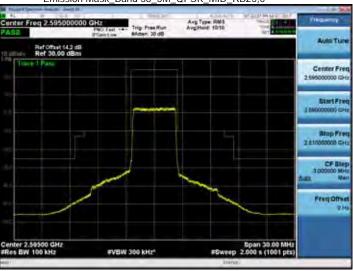
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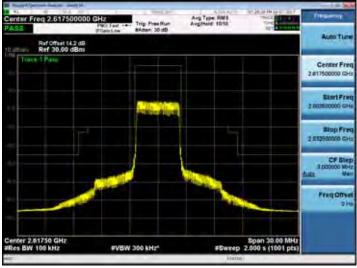
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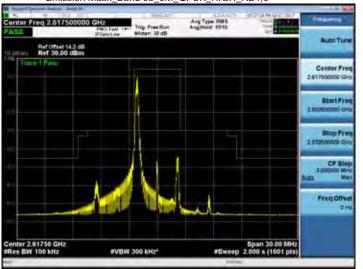
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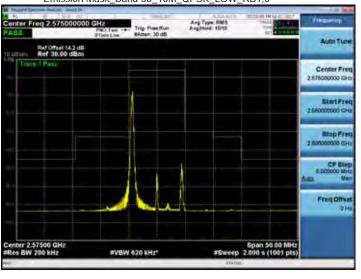
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Emission Mask\_Band 38\_5M\_QPSK\_HIGH\_RB1,0

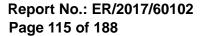


Emission Mask\_Band 38\_10M\_QPSK\_LOW\_RB1,0



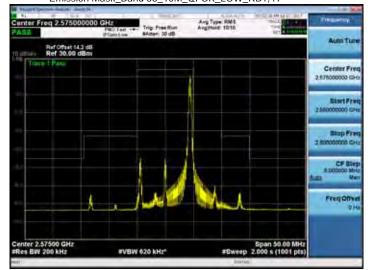
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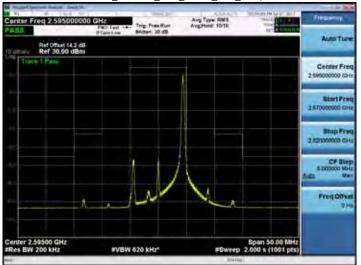




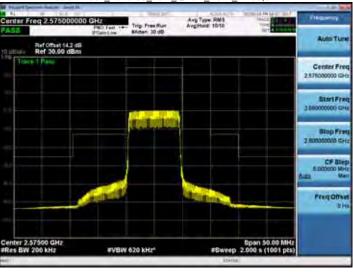
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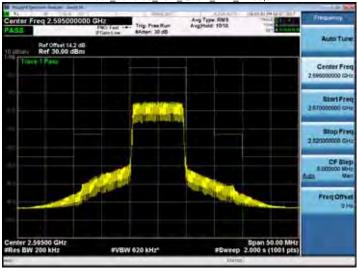
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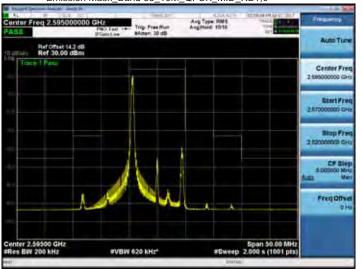
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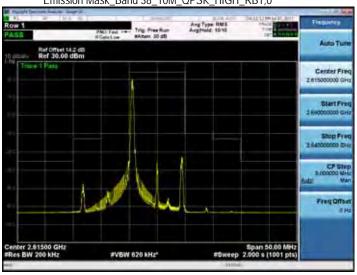
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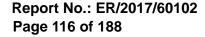


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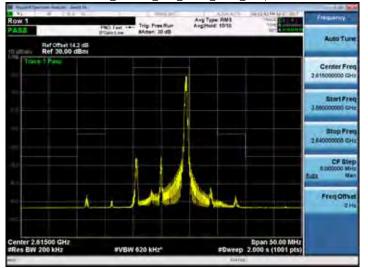
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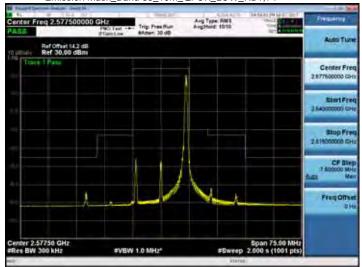




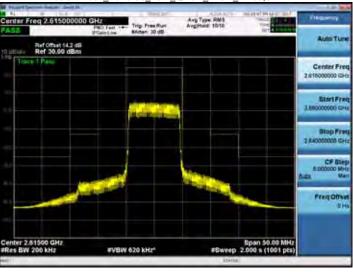
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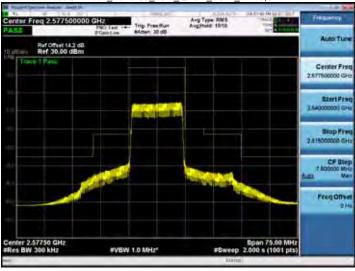
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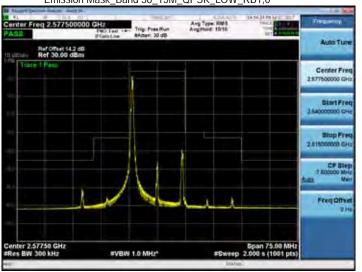
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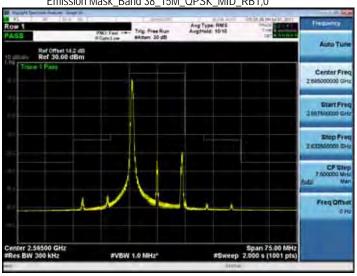
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Emission Mask\_Band 38\_15M\_QPSK\_LOW\_RB1,0

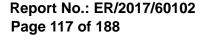


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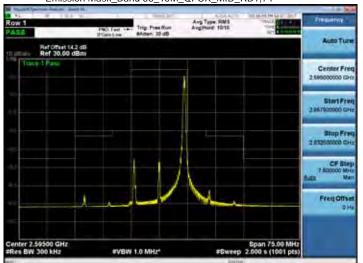
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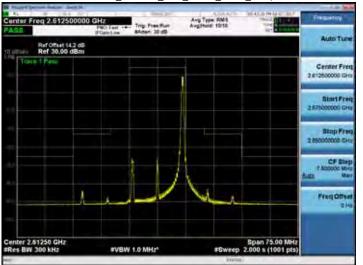




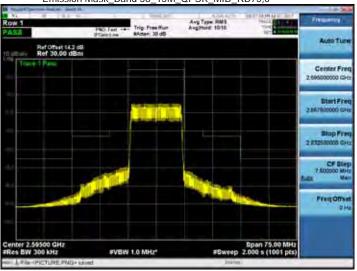
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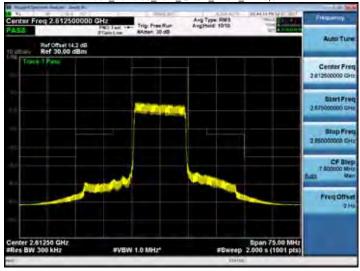
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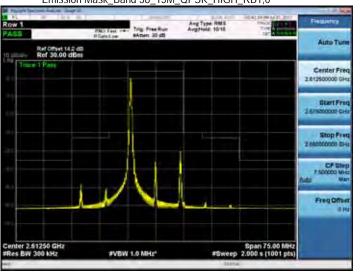
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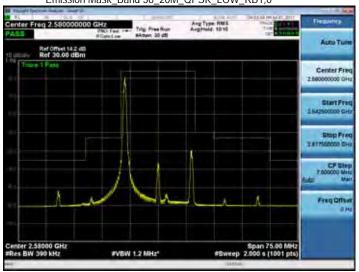
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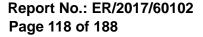


Emission Mask\_Band 38\_20M\_QPSK\_LOW\_RB1,0



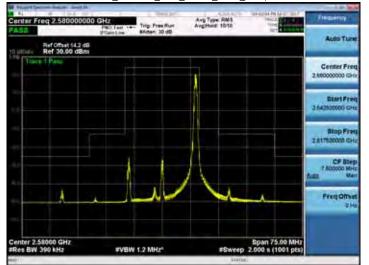
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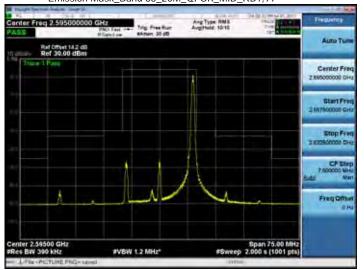




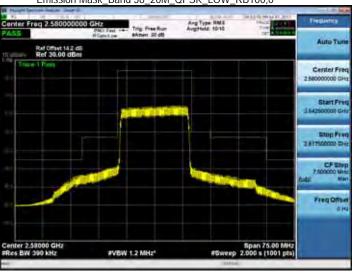
Emission Mask\_Band 38\_20M\_QPSK\_LOW\_RB1,99



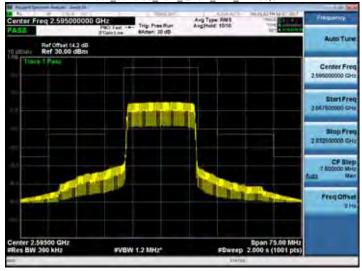
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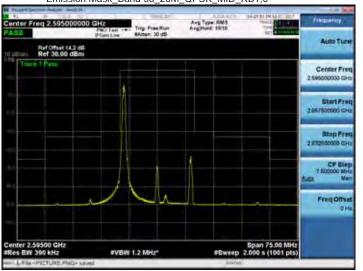
Emission Mask\_Band 38\_20M\_QPSK\_LOW\_RB100,0



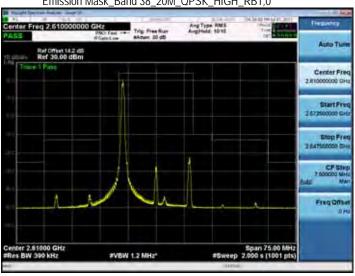
Emission Mask\_Band 38\_20M\_QPSK\_MID\_RB100,0



Emission Mask\_Band 38\_20M\_QPSK\_MID\_RB1,0



Emission Mask\_Band 38\_20M\_QPSK\_HIGH\_RB1,0



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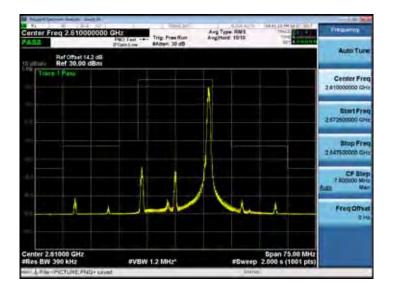
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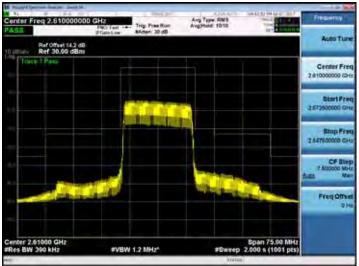


Emission Mask\_Band 38\_20M\_QPSK\_HIGH\_RB1,99

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Emission Mask\_Band 38\_20M\_QPSK\_HIGH\_RB100,0





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#### 10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

### 10.1. Standard Applicable

According to FCC §2.1053,

FCC §22.917(a), §24.238(a), §27.53 (h), the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm).

FCC §27.53(c) (5) & FCC §27.53(g)

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.

FCC §27.53(h) (3)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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.

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## FCC §27.53(m) (4) (6)

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz 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; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent 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 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). 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. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

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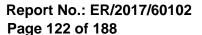




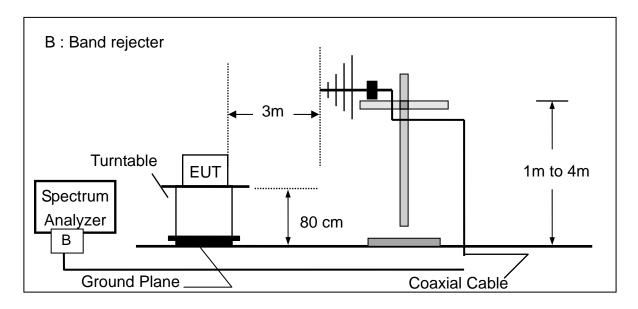
Table 2 — Unwanted Emissions for Mobile, Portable and Low-Power Fixed Subscriber **Equipment** 

| Frequency (MHz) | Attenuation (dB)                     |
|-----------------|--------------------------------------|
| <2200           | $43 + 10 \log_{10}(p)$               |
| 2200 - 2288     | $70 + 10 \log_{10}(p)$               |
| 2288 - 2292     | $67 + 10 \log_{10}(p)$               |
| 2292 - 2296     | $61 + 10 \log_{10}(p)$               |
| 2296 - 2300     | $55 + 10 \log_{10}(p)$               |
| 2300 - 2305     | $43 + 10 \log_{10}(p)$               |
| 2305 - 2320     | $43 + 10 \log_{10}(p)^{\text{Note}}$ |
| 2320 - 2324     | $55 + 10 \log_{10}(p)$               |
| 2324 - 2328     | $61 + 10 \log_{10}(p)$               |
| 2328 - 2337     | $67 + 10 \log_{10}(p)$               |
| 2337 - 2341     | $61 + 10 \log_{10}(p)$               |
| 2341 - 2345     | $55 + 10 \log_{10}(p)$               |
| 2345 - 2360     | $43 + 10 \log_{10}(p)^{\text{Note}}$ |
| 2360 - 2365     | $43 + 10 \log_{10}(p)$               |
| 2365 - 2395     | $70 + 10 \log_{10}(p)$               |
| >2395           | $43 + 10 \log_{10}(p)$               |

Note: Measured at the edges of the highest and lowest frequency range(s) in which the equipment is designed to operate. See Section 5.2 for the permitted frequency ranges for various equipment types.

## 10.2. EUT Setup

Radiated Emission Test Set-Up, Frequency Below 1000MHz

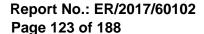


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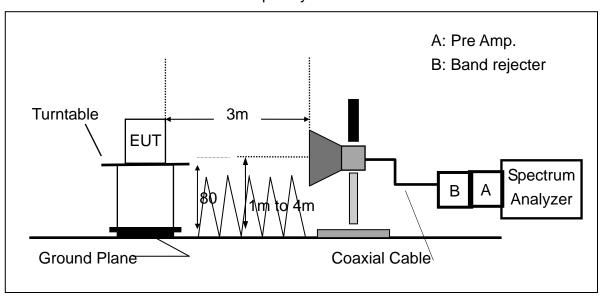
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Radiated Emission Test Set-UP Frequency Over 1 GHz



#### 10.3. Measurement Procedure:

The EUT was placed on a non-conductive; the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequencies (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

ERP (dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

EIRP (dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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# 10.4. Measurement Equipment Used:

| ERP, E                          | EIRP MEASUREM                    | ENT EQUIPME     | NT List 966 (    | Chamber    |            |
|---------------------------------|----------------------------------|-----------------|------------------|------------|------------|
| EQUIPMENT TYPE                  | MFR                              | MODEL<br>NUMBER | SERIAL<br>NUMBER | LAST CAL.  | CAL DUE.   |
| EMI Test Receiver               | R&S                              | ESCI7           | 100760           | 05/11/2017 | 05/10/2018 |
| Spectrum Analyzer               | Agilent                          | E4446A          | MY51100003       | 04/25/2017 | 04/24/2018 |
| Loop Antenna                    | Antenna ETS-Lindgren 6502 148045 |                 | 09/20/2016       | 09/19/2017 |            |
| Bilog Antenna                   | Antenna SCHWAZBECK               |                 | 378              | 12/19/2016 | 12/18/2017 |
| Horn Antenna                    | Schwarzbeck                      | BBHA9120D       | 1441             | 08/01/2016 | 07/31/2017 |
| Pre-Amplifier                   | Agilent                          | 8447D           | 2944A07676       | 01/05/2017 | 01/04/2018 |
| Pre-Amplifier                   | EMC Instruments Corp.            | EMC0126530      | 980038           | 01/05/2017 | 01/04/2018 |
| Turn Table                      | HD                               | DT420           | N/A              | N.C.R      | N.C.R      |
| Antenna Tower                   | ChamPro                          | AM-BS-4500-B    | 060776-ABS       | N.C.R      | N.C.R      |
| Controller                      | ChamPro                          | EM1000          | 60776            | N.C.R      | N.C.R      |
| Low Loss Cable                  | Huber Suhner                     | 966_RX          | 9                | 01/05/2017 | 01/04/2018 |
| 3m Site NSA                     | SGS                              | 966 chamber     | N/A              | 07/01/2017 | 06/30/2018 |
| Low Loss Cable                  | Huber Suhner                     | 966 TX          | 1                | 01/05/2017 | 01/04/2018 |
| Horn Antenna                    | Schwarzbeck                      | BBHA9170        | 184              | 12/12/2016 | 12/11/2017 |
| Pre-Amplifier                   | EMC Instruments Corp.            | EMC184045       | 980135           | 01/05/2017 | 01/04/2018 |
| Radio Communication<br>Analyzer | R&S                              | CMU200          | 102189           | 02/11/2017 | 02/10/2018 |
| Radio Communication<br>Analyer  | Anritsu                          | MT8820C         | 6201465317       | 01/03/2017 | 01/02/2018 |

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:VERTICAL

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#### 10.5. Measurement Result:

EUT Pol.

## Radiated Spurious Emission Measurement Result: GPPRS 850 Mode

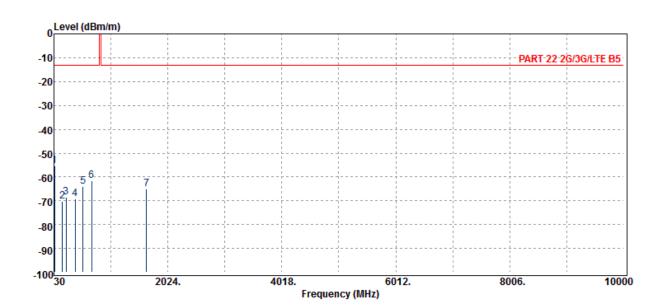
:E2 Plane

:GPRS 850 :21 deg\_C / 62 RH **Operation Band** Temp./Humi.

Measurement Antenna Pol.

Fundamental Frequency :824.2 MHz Engineer

**Operation Mode** :Tx CH LOW



| Freq.   | Note    | ERP    | SG<br>Output Level | Antenna<br>Gain | Cable<br>Loss | Limit  | Margin |
|---------|---------|--------|--------------------|-----------------|---------------|--------|--------|
| MHz     | F/H/E/S | dBm    | dBm                | dBd             | dB            | dBm    | dB     |
|         |         |        |                    |                 |               |        |        |
| 41.64   | S       | -55.26 | -41.42             | -12.83          | -1.00         | -13.00 | -42.26 |
| 179.38  | S       | -70.32 | -69.54             | 0.78            | -1.56         | -13.00 | -57.32 |
| 243.40  | S       | -68.53 | -70.12             | 3.34            | -1.75         | -13.00 | -55.53 |
| 401.51  | S       | -69.24 | -70.67             | 3.82            | -2.39         | -13.00 | -56.24 |
| 537.31  | S       | -64.14 | -65.23             | 3.65            | -2.57         | -13.00 | -51.14 |
| 691.54  | S       | -61.56 | -61.82             | 3.09            | -2.83         | -13.00 | -48.56 |
| 1648.40 | Н       | -64.94 | -67.83             | 7.11            | -4.22         | -13.00 | -51.94 |

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**Operation Band** Fundamental Frequency **Operation Mode** 

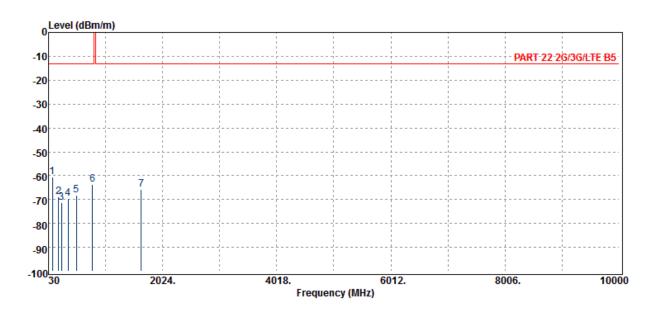
EUT Pol.

:GPRS 850 :824.2 MHz :Tx CH LOW :E2 Plane

Temp./Humi. :21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 95.96   | S       | -60.65 | -58.26       | -1.16   | -1.23 | -13.00 | -47.65 |
| 206.54  | S       | -68.87 | -70.59       | 3.38    | -1.66 | -13.00 | -55.87 |
| 257.95  | S       | -71.26 | -73.12       | 3.63    | -1.77 | -13.00 | -58.26 |
| 374.35  | S       | -69.67 | -71.28       | 3.84    | -2.23 | -13.00 | -56.67 |
| 519.85  | S       | -68.09 | -69.44       | 3.75    | -2.39 | -13.00 | -55.09 |
| 799.21  | S       | -63.81 | -64.26       | 3.34    | -2.90 | -13.00 | -50.81 |
| 1648.40 | Н       | -65.60 | -68.48       | 7.11    | -4.22 | -13.00 | -52.60 |

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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

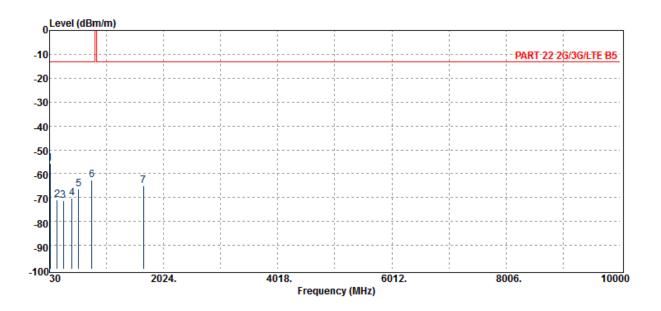
:GPRS 850 :836.6 MHz :Tx CH MID :E2 Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 41.64   | S       | -55.87 | -42.03       | -12.83  | -1.00 | -13.00 | -42.87 |
| 162.89  | S       | -70.85 | -67.93       | -1.42   | -1.49 | -13.00 | -57.85 |
| 269.59  | S       | -71.11 | -72.80       | 3.51    | -1.82 | -13.00 | -58.11 |
| 419.94  | S       | -70.14 | -71.55       | 3.75    | -2.33 | -13.00 | -57.14 |
| 542.16  | S       | -66.32 | -67.33       | 3.63    | -2.62 | -13.00 | -53.32 |
| 772.05  | S       | -62.80 | -63.11       | 3.25    | -2.94 | -13.00 | -49.80 |
| 1673.20 | Н       | -64.94 | -67.85       | 7.20    | -4.29 | -13.00 | -51.94 |



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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

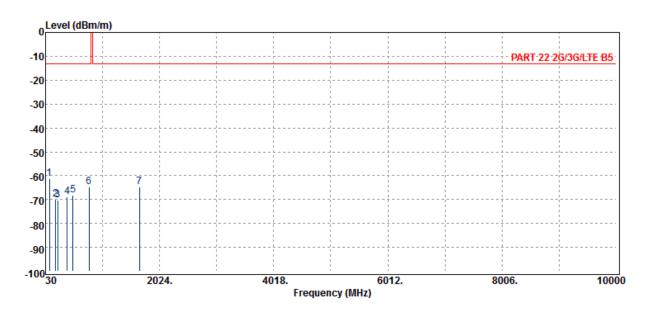
:GPRS 850 :836.6 MHz :Tx CH MID :E2 Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 97.90   | S       | -61.08 | -58.46       | -1.38   | -1.24 | -13.00 | -48.08 |
| 206.54  | S       | -69.82 | -71.54       | 3.38    | -1.66 | -13.00 | -56.82 |
| 239.52  | S       | -70.13 | -71.67       | 3.28    | -1.74 | -13.00 | -57.13 |
| 405.39  | S       | -68.93 | -70.32       | 3.80    | -2.41 | -13.00 | -55.93 |
| 512.09  | S       | -68.20 | -69.64       | 3.79    | -2.35 | -13.00 | -55.20 |
| 793.39  | S       | -64.74 | -65.16       | 3.32    | -2.90 | -13.00 | -51.74 |
| 1673.20 | Н       | -64.67 | -67.58       | 7.20    | -4.29 | -13.00 | -51.67 |



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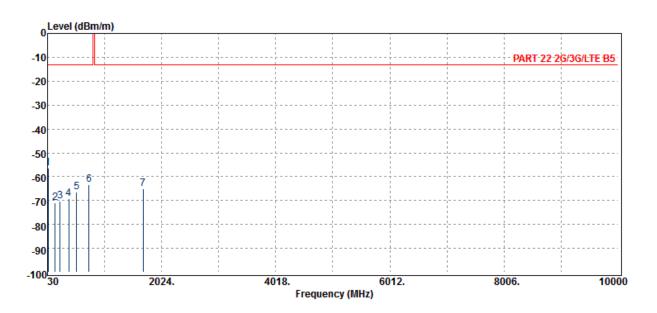
**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

:GPRS 850 :848.8 MHz :Tx CH HIGH :E2 Plane

Temp./Humi. :21 deg\_C / 62 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 41.64   | S       | -56.54 | -42.70       | -12.83  | -1.00 | -13.00 | -43.54 |
| 162.89  | S       | -70.96 | -68.05       | -1.42   | -1.49 | -13.00 | -57.96 |
| 248.25  | S       | -70.33 | -71.99       | 3.41    | -1.75 | -13.00 | -57.33 |
| 400.54  | S       | -69.15 | -70.59       | 3.82    | -2.38 | -13.00 | -56.15 |
| 539.25  | S       | -66.46 | -67.51       | 3.64    | -2.59 | -13.00 | -53.46 |
| 757.50  | S       | -63.17 | -63.34       | 3.21    | -3.03 | -13.00 | -50.17 |
| 1697.60 | Н       | -64.88 | -67.86       | 7.28    | -4.31 | -13.00 | -51.88 |



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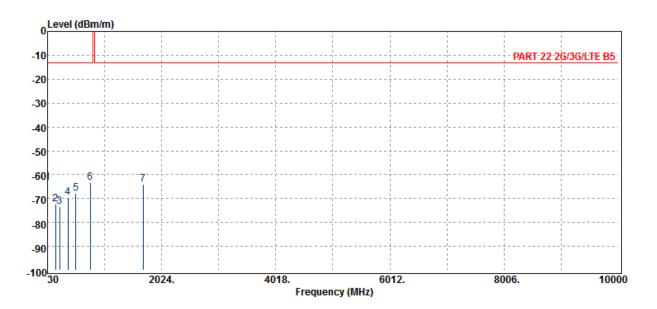
**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

:GPRS 850 :848.8 MHz :Tx CH HIGH :E2 Plane

Temp./Humi. :21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 30.00   | S       | -63.41 | -47.67       | -14.78  | -0.96 | -13.00 | -50.41 |
| 173.56  | S       | -72.23 | -70.44       | -0.26   | -1.53 | -13.00 | -59.23 |
| 241.46  | S       | -73.28 | -74.85       | 3.31    | -1.74 | -13.00 | -60.28 |
| 386.96  | S       | -69.43 | -70.96       | 3.83    | -2.30 | -13.00 | -56.43 |
| 522.76  | S       | -67.76 | -69.07       | 3.73    | -2.42 | -13.00 | -54.76 |
| 778.84  | S       | -63.49 | -63.85       | 3.28    | -2.91 | -13.00 | -50.49 |
| 1697.60 | Н       | -63.91 | -66.88       | 7.28    | -4.31 | -13.00 | -50.91 |



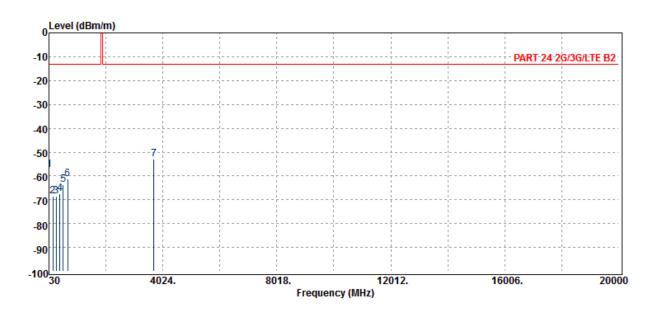
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## Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

**Operation Band** :GPRS 1900 Temp./Humi. :21 deg\_C / 62 RH

Fundamental Frequency :1850.2 MHz Engineer :Tin **Operation Mode** :Tx CH LOW

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 37.76   | S       | -57.49 | -45.34       | -11.17  | -0.98 | -13.00 | -44.49 |
| 173.56  | S       | -68.39 | -68.75       | 1.89    | -1.53 | -13.00 | -55.39 |
| 282.20  | S       | -68.55 | -72.24       | 5.57    | -1.89 | -13.00 | -55.55 |
| 410.24  | S       | -67.52 | -71.06       | 5.93    | -2.40 | -13.00 | -54.52 |
| 524.70  | S       | -63.78 | -67.21       | 5.87    | -2.44 | -13.00 | -50.78 |
| 682.81  | S       | -61.07 | -63.66       | 5.25    | -2.67 | -13.00 | -48.07 |
| 3700.40 | Н       | -53.08 | -58.95       | 12.44   | -6.58 | -13.00 | -40.08 |

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**Operation Band** Fundamental Frequency **Operation Mode** 

EUT Pol.

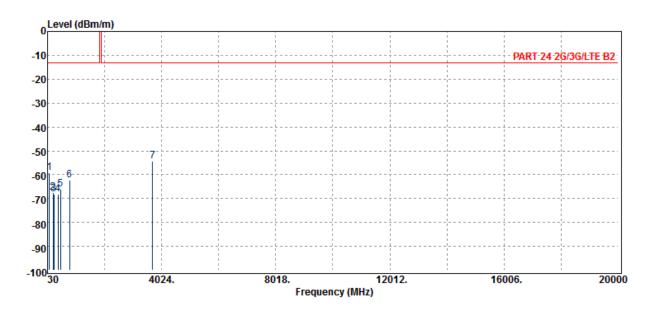
:GPRS 1900 :1850.2 MHz :Tx CH LOW :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 95.96   | S       | -59.21 | -58.97       | 0.99    | -1.23 | -13.00 | -46.21 |
| 220.12  | S       | -67.60 | -71.37       | 5.48    | -1.70 | -13.00 | -54.60 |
| 253.10  | S       | -68.32 | -72.22       | 5.66    | -1.76 | -13.00 | -55.32 |
| 396.66  | S       | -68.02 | -71.64       | 5.97    | -2.36 | -13.00 | -55.02 |
| 482.99  | S       | -65.95 | -69.64       | 5.94    | -2.25 | -13.00 | -52.95 |
| 796.30  | S       | -62.21 | -64.79       | 5.48    | -2.90 | -13.00 | -49.21 |
| 3700.40 | Н       | -54.16 | -60.02       | 12.44   | -6.58 | -13.00 | -41.16 |



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**Operation Band** Fundamental Frequency **Operation Mode** 

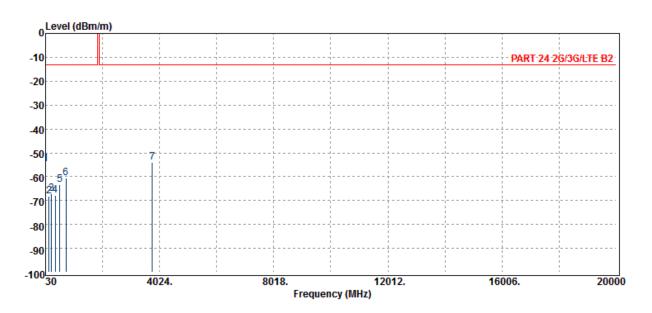
EUT Pol.

:GPRS 1900 :1880 MHz :Tx CH MID :H Plane

Temp./Humi. :21 deg\_C / 62 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 42.61   | S       | -54.62 | -43.08       | -10.54  | -1.01 | -13.00 | -41.62 |
| 159.98  | S       | -68.22 | -67.26       | 0.51    | -1.48 | -13.00 | -55.22 |
| 245.34  | S       | -67.17 | -70.93       | 5.52    | -1.75 | -13.00 | -54.17 |
| 362.71  | S       | -67.89 | -71.75       | 6.00    | -2.15 | -13.00 | -54.89 |
| 531.49  | S       | -63.22 | -66.54       | 5.84    | -2.51 | -13.00 | -50.22 |
| 744.89  | S       | -60.55 | -62.76       | 5.32    | -3.11 | -13.00 | -47.55 |
| 3760.00 | Н       | -53.97 | -59.82       | 12.45   | -6.60 | -13.00 | -40.97 |



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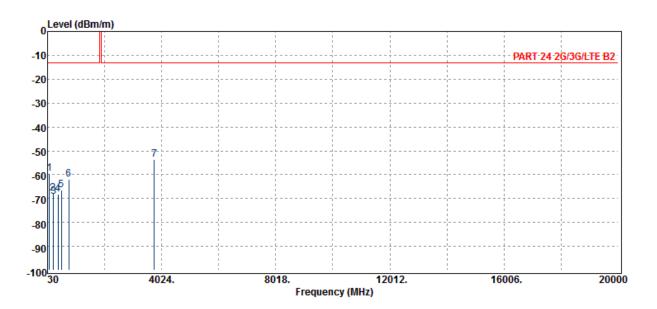
**Operation Band** Fundamental Frequency

:GPRS 1900 :1880 MHz **Operation Mode** :Tx CH MID EUT Pol. :H Plane

Temp./Humi. :21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 97.90   | S       | -59.47 | -59.00       | 0.77    | -1.24 | -13.00 | -46.47 |
| 219.15  | S       | -67.92 | -71.71       | 5.49    | -1.70 | -13.00 | -54.92 |
| 239.52  | S       | -69.24 | -72.93       | 5.43    | -1.74 | -13.00 | -56.24 |
| 398.60  | S       | -68.27 | -71.87       | 5.97    | -2.37 | -13.00 | -55.27 |
| 519.85  | S       | -66.50 | -70.01       | 5.90    | -2.39 | -13.00 | -53.50 |
| 774.96  | S       | -61.79 | -64.28       | 5.41    | -2.92 | -13.00 | -48.79 |
| 3760.00 | Н       | -53.61 | -59.47       | 12.45   | -6.60 | -13.00 | -40.61 |



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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

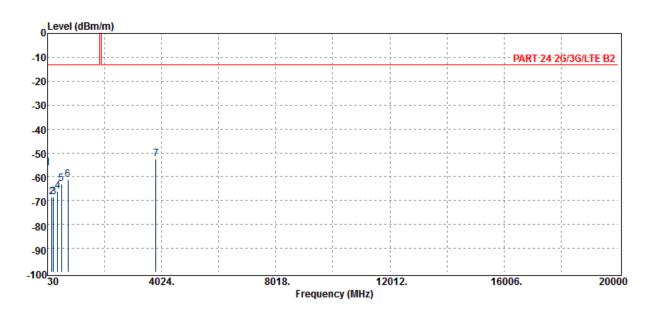
:GPRS 1900 :1909.8 MHz :Tx CH HIGH :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 37.76   | S       | -56.36 | -44.21       | -11.17  | -0.98 | -13.00 | -43.36 |
| 175.50  | S       | -68.55 | -69.25       | 2.24    | -1.54 | -13.00 | -55.55 |
| 243.40  | S       | -68.46 | -72.20       | 5.49    | -1.75 | -13.00 | -55.46 |
| 390.84  | S       | -66.26 | -69.91       | 5.98    | -2.33 | -13.00 | -53.26 |
| 517.91  | S       | -63.06 | -66.60       | 5.91    | -2.37 | -13.00 | -50.06 |
| 740.04  | S       | -61.11 | -63.28       | 5.31    | -3.14 | -13.00 | -48.11 |
| 3819.60 | Н       | -52.77 | -58.58       | 12.47   | -6.65 | -13.00 | -39.77 |



:21 deg\_C / 62 RH

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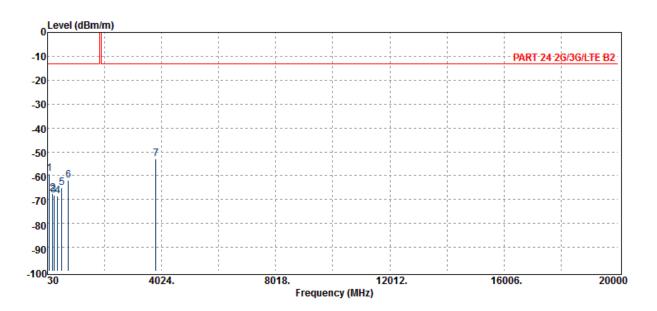
**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

:GPRS 1900 :1909.8 MHz :Tx CH HIGH :H Plane

Temp./Humi.

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| -       |         |        | Output Level | Gain    | Loss  |        |        |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 95.96   | S       | -59.04 | -58.80       | 0.99    | -1.23 | -13.00 | -46.04 |
| 207.51  | S       | -67.62 | -71.53       | 5.57    | -1.66 | -13.00 | -54.62 |
| 253.10  | S       | -68.20 | -72.11       | 5.66    | -1.76 | -13.00 | -55.20 |
| 388.90  | S       | -68.39 | -72.06       | 5.98    | -2.31 | -13.00 | -55.39 |
| 526.64  | S       | -65.15 | -68.55       | 5.86    | -2.46 | -13.00 | -52.15 |
| 755.56  | S       | -62.11 | -64.42       | 5.35    | -3.04 | -13.00 | -49.11 |
| 3819.60 | Н       | -52.78 | -58.60       | 12.47   | -6.65 | -13.00 | -39.78 |



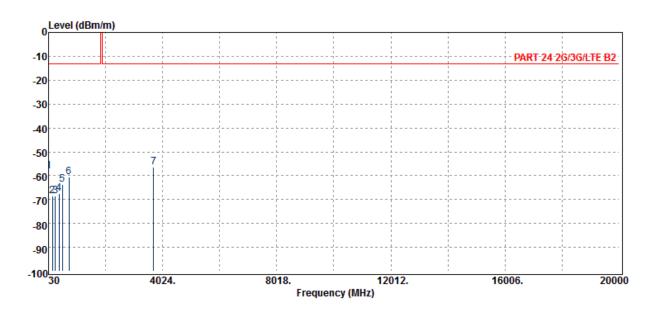
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## Radiated Spurious Emission Measurement Result: HSDPA Band 2 Mode

**Operation Band** Temp./Humi. :HSDPA B2 :21 deg\_C / 62 RH

Fundamental Frequency :1852.4 MHz Engineer :Tin **Operation Mode** :Tx CH LOW

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 32.91   | S       | -58.28 | -45.37       | -11.94  | -0.97 | -13.00 | -45.28 |
| 168.71  | S       | -68.54 | -68.17       | 1.15    | -1.51 | -13.00 | -55.54 |
| 265.71  | S       | -68.59 | -72.52       | 5.73    | -1.80 | -13.00 | -55.59 |
| 403.45  | S       | -67.41 | -70.97       | 5.96    | -2.40 | -13.00 | -54.41 |
| 513.06  | S       | -63.76 | -67.34       | 5.94    | -2.35 | -13.00 | -50.76 |
| 745.86  | S       | -60.49 | -62.71       | 5.32    | -3.10 | -13.00 | -47.49 |
| 3704.80 | Н       | -56.57 | -62.43       | 12.44   | -6.58 | -13.00 | -43.57 |

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**Operation Band** Fundamental Frequency **Operation Mode** 

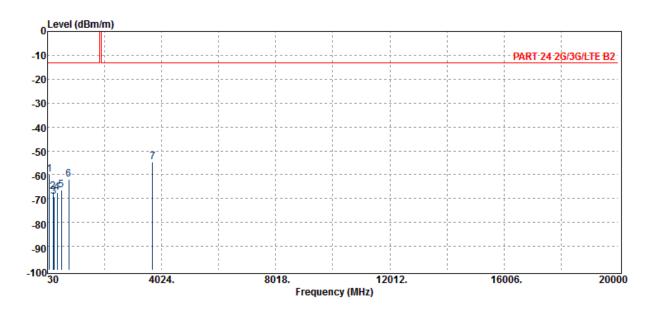
EUT Pol.

:HSDPA B2 :1852.4 MHz :Tx CH LOW :H Plane

Temp./Humi. :21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 95.96   | S       | -59.69 | -59.45       | 0.99    | -1.23 | -13.00 | -46.69 |
| 220.12  | S       | -67.21 | -70.98       | 5.48    | -1.70 | -13.00 | -54.21 |
| 255.04  | S       | -69.15 | -73.09       | 5.71    | -1.76 | -13.00 | -56.15 |
| 371.44  | S       | -67.50 | -71.28       | 5.99    | -2.21 | -13.00 | -54.50 |
| 512.09  | S       | -66.52 | -70.11       | 5.94    | -2.35 | -13.00 | -53.52 |
| 767.20  | S       | -62.09 | -64.51       | 5.39    | -2.97 | -13.00 | -49.09 |
| 3704.80 | Н       | -54.52 | -60.38       | 12.44   | -6.58 | -13.00 | -41.52 |



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**Operation Band** Fundamental Frequency **Operation Mode** 

EUT Pol.

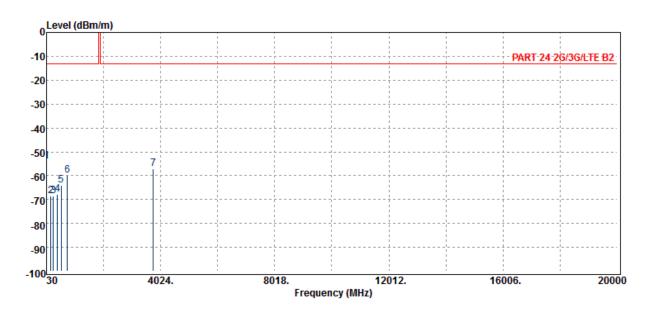
:HSDPA B2 :1880 MHz :Tx CH MID :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 41.64   | S       | -53.91 | -42.23       | -10.68  | -1.00 | -13.00 | -40.91 |
| 177.44  | S       | -68.59 | -69.62       | 2.59    | -1.55 | -13.00 | -55.59 |
| 274.44  | S       | -68.50 | -72.27       | 5.62    | -1.85 | -13.00 | -55.50 |
| 411.21  | S       | -67.92 | -71.45       | 5.93    | -2.39 | -13.00 | -54.92 |
| 537.31  | S       | -64.07 | -67.31       | 5.80    | -2.57 | -13.00 | -51.07 |
| 759.44  | S       | -60.03 | -62.37       | 5.36    | -3.02 | -13.00 | -47.03 |
| 3760.00 | Н       | -57.06 | -62.91       | 12.45   | -6.60 | -13.00 | -44.06 |



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**Operation Band** Fundamental Frequency **Operation Mode** 

EUT Pol.

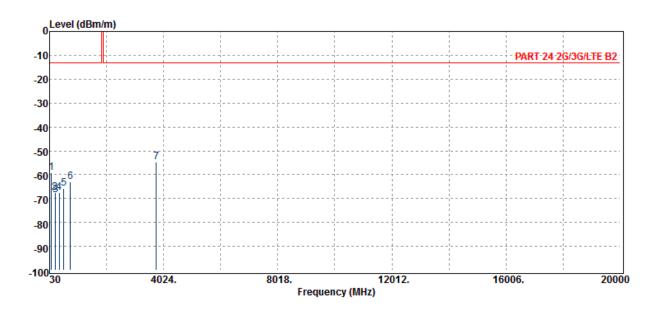
:HSDPA B2 :1880 MHz :Tx CH MID :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG<br>Output Level | Antenna<br>Gain | Cable<br>Loss | Limit  | Margin |
|---------|---------|--------|--------------------|-----------------|---------------|--------|--------|
| MHz     | F/H/E/S | dBm    | dBm                | dBi             | dB            | dBm    | dB     |
|         |         |        |                    |                 |               |        |        |
| 97.90   | S       | -59.10 | -58.62             | 0.77            | -1.24         | -13.00 | -46.10 |
| 219.15  | S       | -67.46 | -71.26             | 5.49            | -1.70         | -13.00 | -54.46 |
| 239.52  | S       | -68.67 | -72.36             | 5.43            | -1.74         | -13.00 | -55.67 |
| 366.59  | S       | -67.45 | -71.27             | 6.00            | -2.17         | -13.00 | -54.45 |
| 524.70  | S       | -65.70 | -69.13             | 5.87            | -2.44         | -13.00 | -52.70 |
| 757.50  | S       | -62.92 | -65.25             | 5.36            | -3.03         | -13.00 | -49.92 |
| 3760.00 | Н       | -54.57 | -60.43             | 12.45           | -6.60         | -13.00 | -41.57 |



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**Operation Band** Fundamental Frequency **Operation Mode** 

EUT Pol.

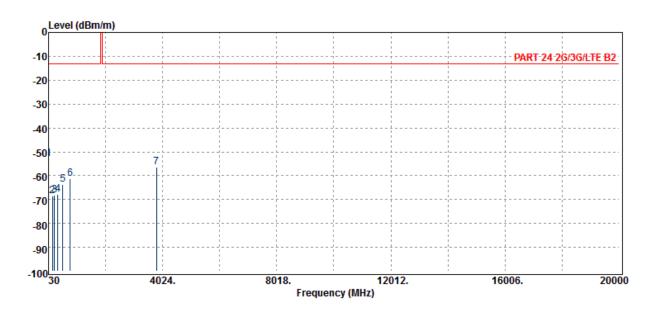
:HSDPA B2 :1907.6 MHz :Tx CH HIGH :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 41.64   | S       | -52.91 | -41.22       | -10.68  | -1.00 | -13.00 | -39.91 |
| 173.56  | S       | -68.57 | -68.92       | 1.89    | -1.53 | -13.00 | -55.57 |
| 241.46  | S       | -68.06 | -71.77       | 5.46    | -1.74 | -13.00 | -55.06 |
| 353.01  | S       | -67.81 | -71.75       | 6.01    | -2.07 | -13.00 | -54.81 |
| 522.76  | S       | -63.75 | -67.21       | 5.88    | -2.42 | -13.00 | -50.75 |
| 791.45  | S       | -61.36 | -63.92       | 5.47    | -2.90 | -13.00 | -48.36 |
| 3815.20 | Н       | -56.46 | -62.29       | 12.46   | -6.63 | -13.00 | -43.46 |

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**Operation Band** Fundamental Frequency **Operation Mode** 

EUT Pol.

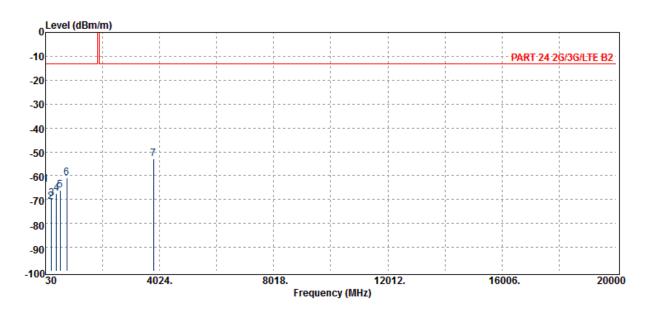
:HSDPA B2 :1907.6 MHz :Tx CH HIGH :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| ·       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 30.00   | S       | -63.65 | -50.07       | -12.63  | -0.96 | -13.00 | -50.65 |
| 220.12  | S       | -70.82 | -74.59       | 5.48    | -1.70 | -13.00 | -57.82 |
| 243.40  | S       | -69.45 | -73.19       | 5.49    | -1.75 | -13.00 | -56.45 |
| 413.15  | S       | -67.62 | -71.17       | 5.92    | -2.38 | -13.00 | -54.62 |
| 537.31  | S       | -65.97 | -69.20       | 5.80    | -2.57 | -13.00 | -52.97 |
| 774.96  | S       | -60.76 | -63.25       | 5.41    | -2.92 | -13.00 | -47.76 |
| 3815.20 | Н       | -52.90 | -58.74       | 12.46   | -6.63 | -13.00 | -39.90 |



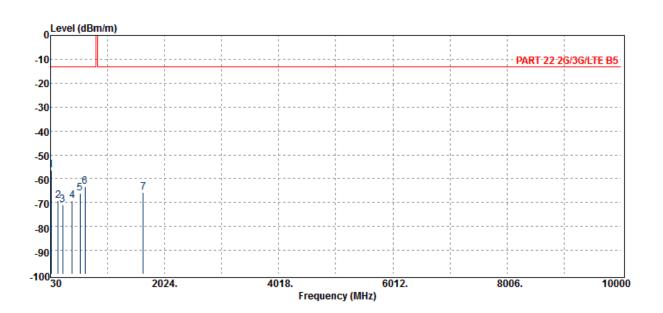
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## Radiated Spurious Emission Measurement Result: HSDPA Band 5 Mode

**Operation Band** :HSDPA B5 Temp./Humi. :21 deg\_C / 62 RH

**Fundamental Frequency** :826.4 MHz Engineer

**Operation Mode** :Tx CH LOW EUT Pol. :E2 Plane :VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG<br>Output Level | Antenna<br>Gain | Cable<br>Loss | Limit  | Margin |
|---------|---------|--------|--------------------|-----------------|---------------|--------|--------|
| MHz     | F/H/E/S | dBm    | dBm                | dBd             | dB            | dBm    | dB     |
|         |         |        |                    |                 |               |        |        |
| 42.61   | S       | -56.40 | -42.71             | -12.69          | -1.01         | -13.00 | -43.40 |
| 165.80  | S       | -69.14 | -66.43             | -1.21           | -1.50         | -13.00 | -56.14 |
| 240.49  | S       | -70.80 | -72.35             | 3.29            | -1.74         | -13.00 | -57.80 |
| 410.24  | S       | -69.20 | -70.58             | 3.78            | -2.40         | -13.00 | -56.20 |
| 546.04  | S       | -65.97 | -66.91             | 3.61            | -2.66         | -13.00 | -52.97 |
| 634.31  | S       | -63.30 | -64.01             | 3.17            | -2.45         | -13.00 | -50.30 |
| 1652.80 | Н       | -65.83 | -68.72             | 7.12            | -4.24         | -13.00 | -52.83 |

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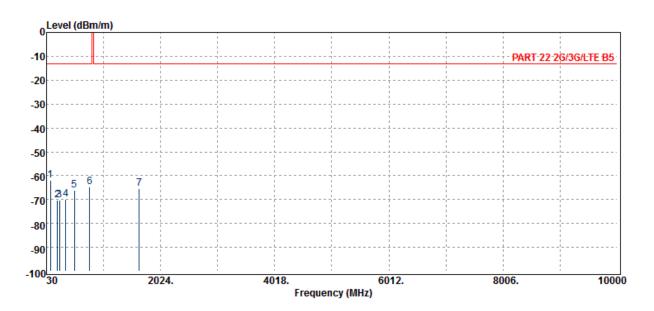
**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

:HSDPA B5 :826.4 MHz :Tx CH LOW :E2 Plane

Temp./Humi. :21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |  |
|---------|---------|--------|--------------|---------|-------|--------|--------|--|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |  |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |  |
|         |         |        |              |         |       |        |        |  |
| 97.90   | S       | -61.84 | -59.22       | -1.38   | -1.24 | -13.00 | -48.84 |  |
| 219.15  | S       | -70.07 | -71.72       | 3.34    | -1.70 | -13.00 | -57.07 |  |
| 256.01  | S       | -70.19 | -72.01       | 3.58    | -1.77 | -13.00 | -57.19 |  |
| 362.71  | S       | -69.76 | -71.46       | 3.85    | -2.15 | -13.00 | -56.76 |  |
| 516.94  | S       | -65.96 | -67.35       | 3.76    | -2.37 | -13.00 | -52.96 |  |
| 783.69  | S       | -64.66 | -65.05       | 3.29    | -2.91 | -13.00 | -51.66 |  |
| 1652.80 | Н       | -65.43 | -68.32       | 7.12    | -4.24 | -13.00 | -52.43 |  |



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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

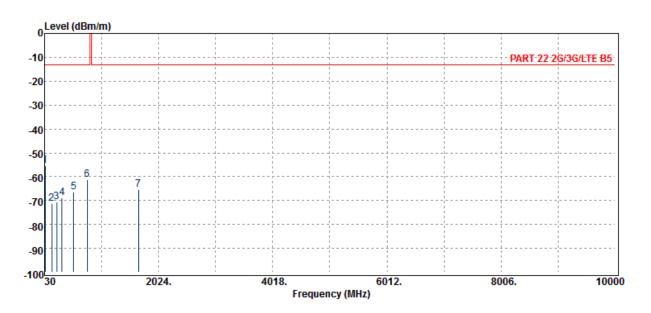
:HSDPA B5 :836.6 MHz :Tx CH MID :E2 Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        |        |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 41.64   | S       | -55.52 | -41.69       | -12.83  | -1.00 | -13.00 | -42.52 |
| 154.16  | S       | -71.28 | -67.93       | -1.90   | -1.45 | -13.00 | -58.28 |
| 243.40  | S       | -70.61 | -72.20       | 3.34    | -1.75 | -13.00 | -57.61 |
| 335.55  | S       | -68.87 | -70.74       | 3.80    | -1.93 | -13.00 | -55.87 |
| 541.19  | S       | -66.58 | -67.61       | 3.63    | -2.61 | -13.00 | -53.58 |
| 774.96  | S       | -61.31 | -61.65       | 3.26    | -2.92 | -13.00 | -48.31 |
| 1673.20 | Н       | -65.27 | -68.18       | 7.20    | -4.29 | -13.00 | -52.27 |

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:21 deg\_C / 62 RH

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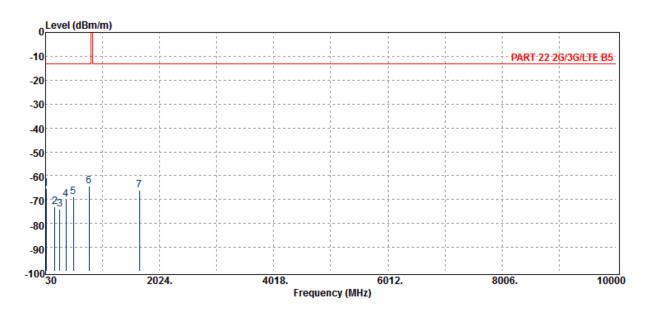
**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

:HSDPA B5 :836.6 MHz :Tx CH MID :E2 Plane

Temp./Humi.

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 37.76   | S       | -65.37 | -51.07       | -13.32  | -0.98 | -13.00 | -52.37 |
| 194.90  | S       | -72.87 | -74.08       | 2.83    | -1.62 | -13.00 | -59.87 |
| 279.29  | S       | -74.13 | -75.69       | 3.43    | -1.87 | -13.00 | -61.13 |
| 386.96  | S       | -69.84 | -71.37       | 3.83    | -2.30 | -13.00 | -56.84 |
| 515.00  | S       | -68.92 | -70.34       | 3.77    | -2.36 | -13.00 | -55.92 |
| 789.51  | S       | -64.50 | -64.90       | 3.31    | -2.90 | -13.00 | -51.50 |
| 1673.20 | Н       | -65.96 | -68.87       | 7.20    | -4.29 | -13.00 | -52.96 |



:21 deg\_C / 62 RH

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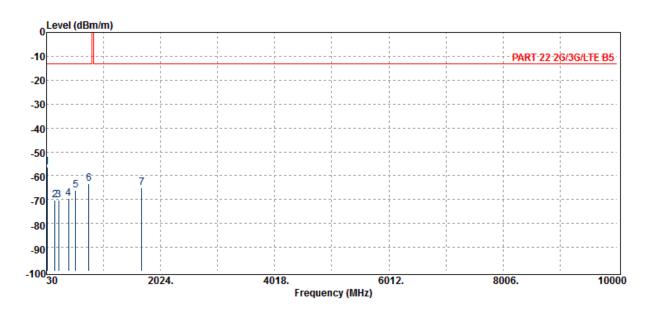
**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

:HSDPA B5 :846.6 MHz :Tx CH HIGH :E2 Plane

Temp./Humi.

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 41.64   | S       | -56.44 | -42.60       | -12.83  | -1.00 | -13.00 | -43.44 |
| 178.41  | S       | -70.40 | -69.45       | 0.61    | -1.55 | -13.00 | -57.40 |
| 245.34  | S       | -70.12 | -71.74       | 3.37    | -1.75 | -13.00 | -57.12 |
| 415.09  | S       | -69.58 | -70.98       | 3.77    | -2.37 | -13.00 | -56.58 |
| 536.34  | S       | -66.24 | -67.34       | 3.66    | -2.56 | -13.00 | -53.24 |
| 769.14  | S       | -63.42 | -63.70       | 3.24    | -2.96 | -13.00 | -50.42 |
| 1693.20 | Н       | -64.98 | -67.94       | 7.27    | -4.30 | -13.00 | -51.98 |



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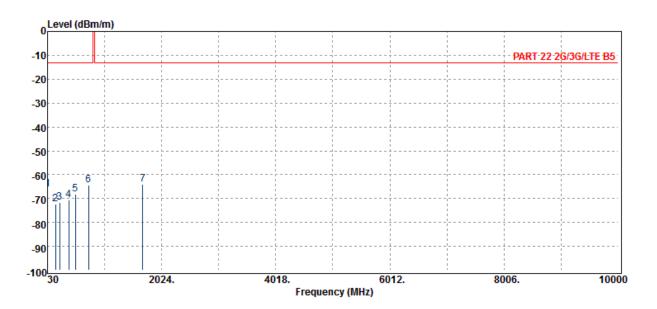
**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

:HSDPA B5 :846.6 MHz :Tx CH HIGH :E2 Plane

Temp./Humi. :21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 30.00   | S       | -65.96 | -50.23       | -14.78  | -0.96 | -13.00 | -52.96 |
| 173.56  | S       | -72.49 | -70.70       | -0.26   | -1.53 | -13.00 | -59.49 |
| 243.40  | S       | -71.50 | -73.09       | 3.34    | -1.75 | -13.00 | -58.50 |
| 403.45  | S       | -70.47 | -71.88       | 3.81    | -2.40 | -13.00 | -57.47 |
| 517.91  | S       | -68.22 | -69.61       | 3.76    | -2.37 | -13.00 | -55.22 |
| 747.80  | S       | -64.25 | -64.34       | 3.18    | -3.09 | -13.00 | -51.25 |
| 1693.20 | Н       | -63.97 | -66.94       | 7.27    | -4.30 | -13.00 | -50.97 |



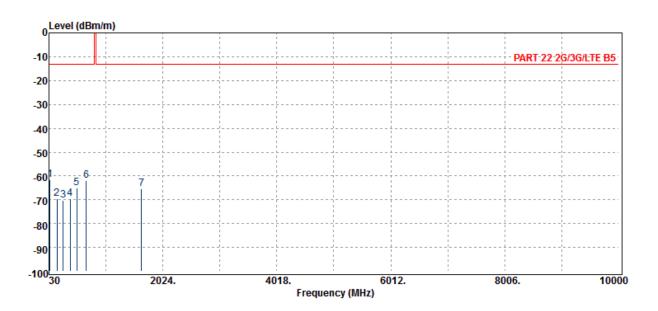
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# Radiated Spurious Emission Measurement Result: LTE-Band 5 (The Worst Case)

Temp./Humi. **Operation Band** :LTE B5 :22 deg C / 61 RH

Fundamental Frequency :826.5 MHz Engineer :Tin **Operation Mode** :Tx CH LOW

EUT Pol. :E2 Plane :VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 44.55   | S       | -61.58 | -48.15       | -12.42  | -1.02 | -13.00 | -48.58 |
| 167.74  | S       | -69.42 | -66.84       | -1.07   | -1.51 | -13.00 | -56.42 |
| 282.20  | S       | -70.08 | -71.62       | 3.42    | -1.89 | -13.00 | -57.08 |
| 403.45  | S       | -69.46 | -70.87       | 3.81    | -2.40 | -13.00 | -56.46 |
| 516.94  | S       | -65.14 | -66.54       | 3.76    | -2.37 | -13.00 | -52.14 |
| 683.78  | S       | -62.10 | -62.52       | 3.10    | -2.69 | -13.00 | -49.10 |
| 1653.00 | Н       | -65.25 | -68.13       | 7.12    | -4.24 | -13.00 | -52.25 |

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**Operation Band** Fundamental Frequency **Operation Mode** 

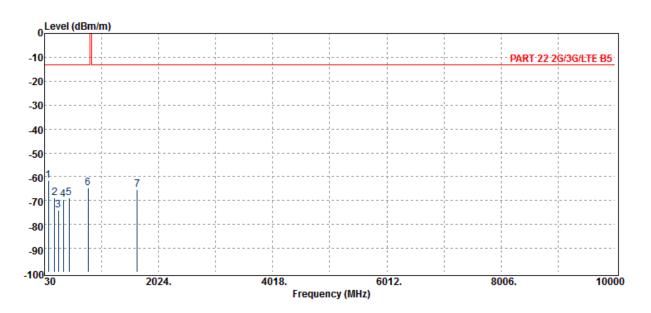
EUT Pol.

:LTE B5 :826.5 MHz :Tx CH LOW :E2 Plane

Temp./Humi. :22 deg\_C / 61 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 97.90   | S       | -61.53 | -58.91       | -1.38   | -1.24 | -13.00 | -48.53 |
| 207.51  | S       | -68.87 | -70.63       | 3.42    | -1.66 | -13.00 | -55.87 |
| 274.44  | S       | -74.20 | -75.82       | 3.47    | -1.85 | -13.00 | -61.20 |
| 361.74  | S       | -69.47 | -71.18       | 3.85    | -2.14 | -13.00 | -56.47 |
| 459.71  | S       | -68.74 | -70.22       | 3.69    | -2.21 | -13.00 | -55.74 |
| 794.36  | S       | -64.60 | -65.03       | 3.32    | -2.90 | -13.00 | -51.60 |
| 1653.00 | Н       | -65.29 | -68.18       | 7.12    | -4.24 | -13.00 | -52.29 |



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**Operation Band** Fundamental Frequency **Operation Mode** 

EUT Pol.

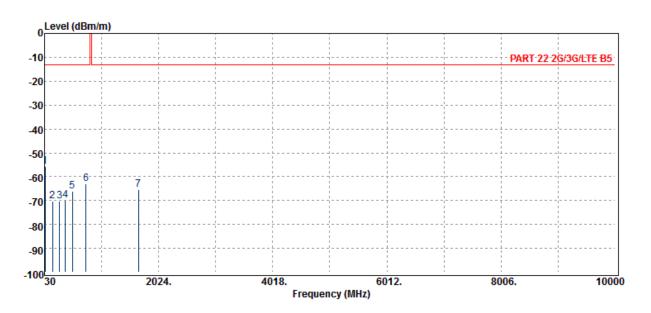
:LTE B5 :836.5 MHz :Tx CH MID :E2 Plane

Temp./Humi.

:22 deg\_C / 61 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 41.64   | S       | -55.76 | -41.93       | -12.83  | -1.00 | -13.00 | -42.76 |
| 173.56  | S       | -70.26 | -68.47       | -0.26   | -1.53 | -13.00 | -57.26 |
| 296.75  | S       | -70.25 | -71.86       | 3.56    | -1.95 | -13.00 | -57.25 |
| 395.69  | S       | -69.87 | -71.34       | 3.82    | -2.35 | -13.00 | -56.87 |
| 519.85  | S       | -66.02 | -67.38       | 3.75    | -2.39 | -13.00 | -53.02 |
| 755.56  | S       | -62.97 | -63.12       | 3.20    | -3.04 | -13.00 | -49.97 |
| 1673.00 | Н       | -65.53 | -68.44       | 7.20    | -4.29 | -13.00 | -52.53 |

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**Operation Band** Fundamental Frequency **Operation Mode** 

EUT Pol.

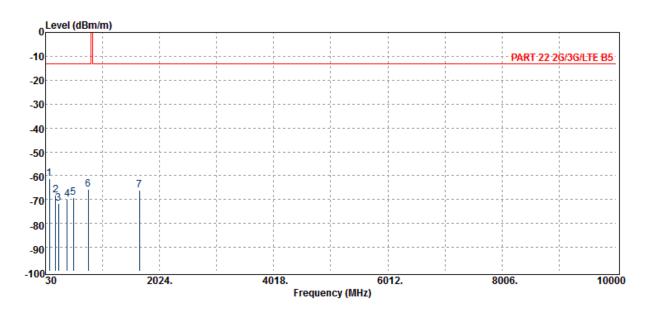
:LTE B5 :836.5 MHz :Tx CH MID :E2 Plane

Temp./Humi.

:22 deg\_C / 61 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 94.99   | S       | -61.38 | -59.11       | -1.04   | -1.23 | -13.00 | -48.38 |
| 206.54  | S       | -68.07 | -69.79       | 3.38    | -1.66 | -13.00 | -55.07 |
| 257.95  | S       | -71.66 | -73.52       | 3.63    | -1.77 | -13.00 | -58.66 |
| 410.24  | S       | -69.94 | -71.32       | 3.78    | -2.40 | -13.00 | -56.94 |
| 517.91  | S       | -69.18 | -70.57       | 3.76    | -2.37 | -13.00 | -56.18 |
| 774.96  | S       | -65.66 | -66.00       | 3.26    | -2.92 | -13.00 | -52.66 |
| 1673.00 | Н       | -65.95 | -68.86       | 7.20    | -4.29 | -13.00 | -52.95 |



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**Operation Band** Fundamental Frequency **Operation Mode** 

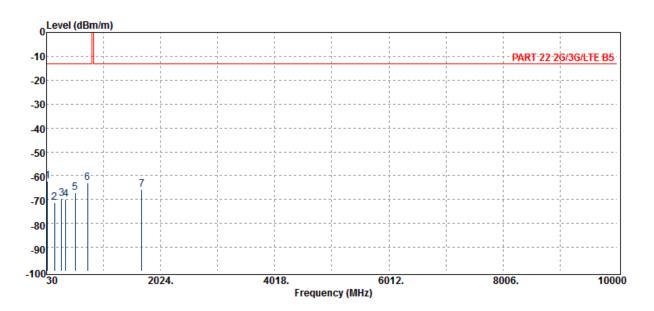
EUT Pol.

:LTE B5 :846.5 MHz :Tx CH HIGH :E2 Plane

Temp./Humi. :22 deg\_C / 61 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 44.55   | S       | -62.38 | -48.94       | -12.42  | -1.02 | -13.00 | -49.38 |
| 173.56  | S       | -71.39 | -69.59       | -0.26   | -1.53 | -13.00 | -58.39 |
| 296.75  | S       | -69.56 | -71.17       | 3.56    | -1.95 | -13.00 | -56.56 |
| 366.59  | S       | -69.99 | -71.67       | 3.85    | -2.17 | -13.00 | -56.99 |
| 531.49  | S       | -67.10 | -68.27       | 3.69    | -2.51 | -13.00 | -54.10 |
| 744.89  | S       | -62.92 | -62.98       | 3.17    | -3.11 | -13.00 | -49.92 |
| 1693.00 | Н       | -65.68 | -68.64       | 7.27    | -4.30 | -13.00 | -52.68 |



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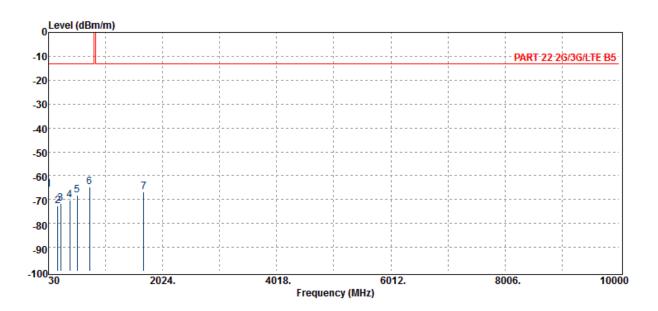
**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

:LTE B5 :846.5 MHz :Tx CH HIGH :E2 Plane

Temp./Humi. :22 deg\_C / 61 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | ERP    | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBd     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 30.00   | S       | -65.58 | -49.85       | -14.78  | -0.96 | -13.00 | -52.58 |
| 194.90  | S       | -72.59 | -73.80       | 2.83    | -1.62 | -13.00 | -59.59 |
| 245.34  | S       | -71.58 | -73.20       | 3.37    | -1.75 | -13.00 | -58.58 |
| 403.45  | S       | -70.29 | -71.70       | 3.81    | -2.40 | -13.00 | -57.29 |
| 534.40  | S       | -68.25 | -69.38       | 3.67    | -2.54 | -13.00 | -55.25 |
| 750.71  | S       | -64.66 | -64.77       | 3.18    | -3.07 | -13.00 | -51.66 |
| 1693.00 | Н       | -66.77 | -69.73       | 7.27    | -4.30 | -13.00 | -53.77 |



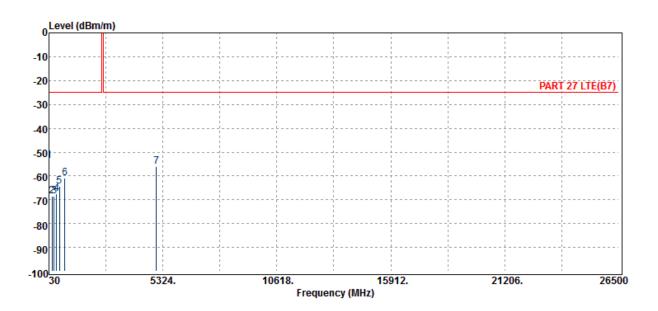
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# Radiated Spurious Emission Measurement Result: LTE-Band 7 (The Worst Case)

Temp./Humi. **Operation Band** :LTE B7 :21 deg C / 62 RH

Fundamental Frequency :2505 MHz Engineer :Tin **Operation Mode** :Tx CH LOW

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| ·       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 39.70   | S       | -53.49 | -41.53       | -10.96  | -0.99 | -25.00 | -28.49 |
| 165.80  | S       | -68.68 | -68.11       | 0.94    | -1.50 | -25.00 | -43.68 |
| 274.44  | S       | -68.43 | -72.20       | 5.62    | -1.85 | -25.00 | -43.43 |
| 379.20  | S       | -67.37 | -71.10       | 5.99    | -2.26 | -25.00 | -42.37 |
| 526.64  | S       | -64.49 | -67.89       | 5.86    | -2.46 | -25.00 | -39.49 |
| 767.20  | S       | -60.89 | -63.31       | 5.39    | -2.97 | -25.00 | -35.89 |
| 5010.00 | Н       | -56.02 | -60.91       | 12.70   | -7.81 | -25.00 | -31.02 |

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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

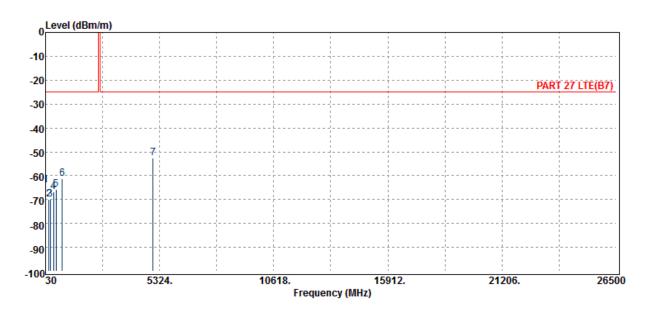
:LTE B7 :2505 MHz :Tx CH LOW :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 37.76   | S       | -63.87 | -51.72       | -11.17  | -0.98 | -25.00 | -38.87 |
| 198.78  | S       | -69.97 | -73.53       | 5.19    | -1.63 | -25.00 | -44.97 |
| 243.40  | S       | -69.92 | -73.66       | 5.49    | -1.75 | -25.00 | -44.92 |
| 411.21  | S       | -66.71 | -70.24       | 5.93    | -2.39 | -25.00 | -41.71 |
| 521.79  | S       | -65.72 | -69.20       | 5.89    | -2.41 | -25.00 | -40.72 |
| 796.30  | S       | -61.21 | -63.79       | 5.48    | -2.90 | -25.00 | -36.21 |
| 5010.00 | Н       | -52.75 | -57.64       | 12.70   | -7.81 | -25.00 | -27.75 |



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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

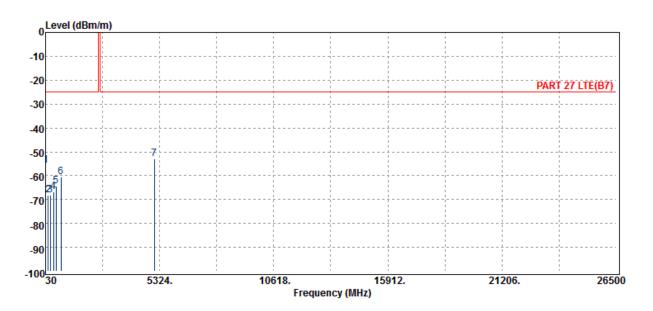
:LTE B7 :2535.0 MHz :Tx CH MID :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 37.76   | S       | -55.72 | -43.57       | -11.17  | -0.98 | -25.00 | -30.72 |
| 160.95  | S       | -68.27 | -67.37       | 0.58    | -1.48 | -25.00 | -43.27 |
| 246.31  | S       | -68.19 | -71.97       | 5.53    | -1.75 | -25.00 | -43.19 |
| 395.69  | S       | -66.72 | -70.34       | 5.97    | -2.35 | -25.00 | -41.72 |
| 516.94  | S       | -64.29 | -67.84       | 5.91    | -2.37 | -25.00 | -39.29 |
| 750.71  | S       | -60.42 | -62.68       | 5.33    | -3.07 | -25.00 | -35.42 |
| 5070.00 | Н       | -53.10 | -57.97       | 12.73   | -7.86 | -25.00 | -28.10 |

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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

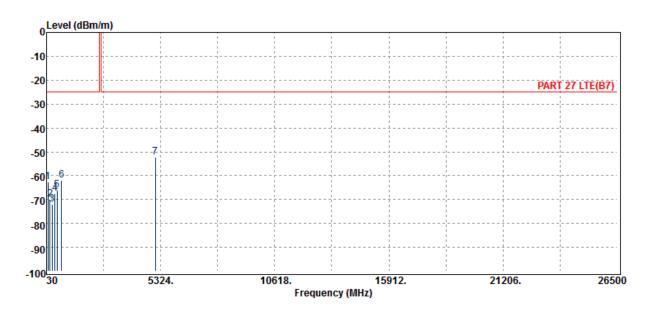
:LTE B7 :2535.0 MHz :Tx CH MID :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| ·       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 97.90   | S       | -62.63 | -62.16       | 0.77    | -1.24 | -25.00 | -37.63 |
| 191.99  | S       | -70.02 | -73.23       | 4.82    | -1.61 | -25.00 | -45.02 |
| 285.11  | S       | -71.93 | -75.60       | 5.58    | -1.90 | -25.00 | -46.93 |
| 415.09  | S       | -67.41 | -70.96       | 5.92    | -2.37 | -25.00 | -42.41 |
| 526.64  | S       | -65.92 | -69.32       | 5.86    | -2.46 | -25.00 | -40.92 |
| 738.10  | S       | -61.98 | -64.15       | 5.31    | -3.13 | -25.00 | -36.98 |
| 5070.00 | Н       | -52.32 | -57.19       | 12.73   | -7.86 | -25.00 | -27.32 |

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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

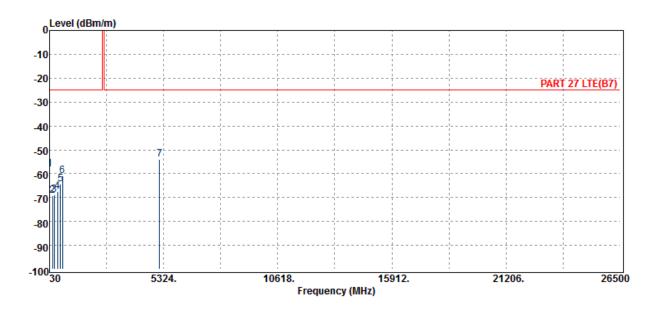
:LTE B7 :2565 MHz :Tx CH HIGH :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 36.79   | S       | -58.08 | -45.82       | -11.28  | -0.98 | -25.00 | -33.08 |
| 178.41  | S       | -69.33 | -70.53       | 2.76    | -1.55 | -25.00 | -44.33 |
| 243.40  | S       | -68.75 | -72.49       | 5.49    | -1.75 | -25.00 | -43.75 |
| 400.54  | S       | -67.55 | -71.14       | 5.97    | -2.38 | -25.00 | -42.55 |
| 542.16  | S       | -64.23 | -67.39       | 5.78    | -2.62 | -25.00 | -39.23 |
| 628.49  | S       | -60.77 | -63.63       | 5.33    | -2.47 | -25.00 | -35.77 |
| 5130.00 | Н       | -54.03 | -58.87       | 12.75   | -7.92 | -25.00 | -29.03 |

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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

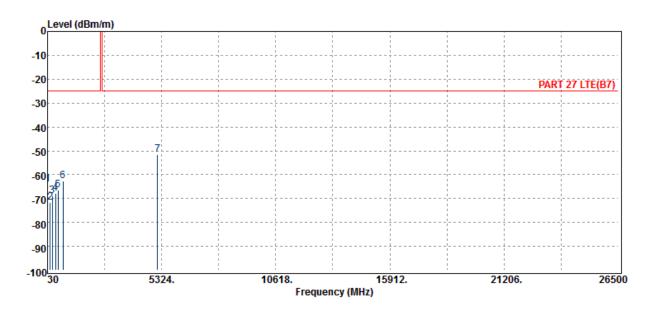
:LTE B7 :2565 MHz :Tx CH HIGH :H Plane

Temp./Humi.

:21 deg\_C / 62 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| ·       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 30.00   | S       | -64.10 | -50.52       | -12.63  | -0.96 | -25.00 | -39.10 |
| 153.19  | S       | -71.52 | -70.28       | 0.20    | -1.44 | -25.00 | -46.52 |
| 241.46  | S       | -68.84 | -72.55       | 5.46    | -1.74 | -25.00 | -43.84 |
| 411.21  | S       | -67.76 | -71.30       | 5.93    | -2.39 | -25.00 | -42.76 |
| 513.06  | S       | -66.60 | -70.18       | 5.94    | -2.35 | -25.00 | -41.60 |
| 744.89  | S       | -62.50 | -64.72       | 5.32    | -3.11 | -25.00 | -37.50 |
| 5130.00 | Н       | -51.50 | -56.34       | 12.75   | -7.92 | -25.00 | -26.50 |



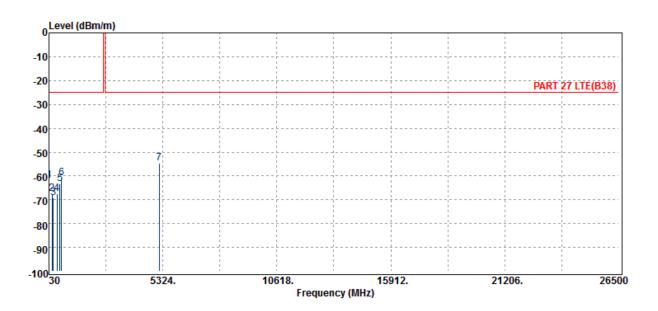
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# Radiated Spurious Emission Measurement Result: LTE-Band 38 (The Worst Case)

Temp./Humi. **Operation Band** :LTE B38 :22 deg C / 61 RH

Fundamental Frequency :2572.5 MHz Engineer :Tin **Operation Mode** :Tx CH LOW

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| ·       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 36.79   | S       | -62.09 | -49.84       | -11.28  | -0.98 | -25.00 | -37.09 |
| 172.59  | S       | -67.41 | -67.60       | 1.71    | -1.53 | -25.00 | -42.41 |
| 240.49  | S       | -69.12 | -72.83       | 5.44    | -1.74 | -25.00 | -44.12 |
| 410.24  | S       | -67.46 | -71.00       | 5.93    | -2.40 | -25.00 | -42.46 |
| 541.19  | S       | -63.30 | -66.48       | 5.78    | -2.61 | -25.00 | -38.30 |
| 619.76  | S       | -60.88 | -63.68       | 5.35    | -2.55 | -25.00 | -35.88 |
| 5145.00 | Н       | -54.55 | -59.37       | 12.76   | -7.94 | -25.00 | -29.55 |



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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

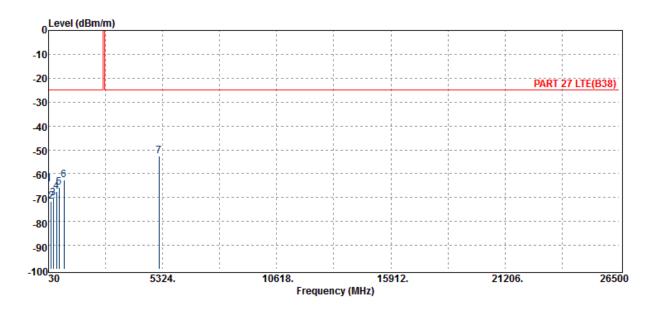
:LTE B38 :2572.5 MHz :Tx CH LOW :H Plane

Temp./Humi.

:22 deg\_C / 61 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG<br>Output Level | Antenna<br>Gain | Cable<br>Loss | Limit  | Margin |
|---------|---------|--------|--------------------|-----------------|---------------|--------|--------|
| MHz     | F/H/E/S | dBm    | dBm                | dBi             | dB            | dBm    | dB     |
|         |         |        |                    |                 |               |        |        |
| 46.49   | S       | -64.29 | -53.37             | -9.89           | -1.03         | -25.00 | -39.29 |
| 153.19  | S       | -71.59 | -70.35             | 0.20            | -1.44         | -25.00 | -46.59 |
| 243.40  | S       | -70.07 | -73.82             | 5.49            | -1.75         | -25.00 | -45.07 |
| 403.45  | S       | -67.64 | -71.20             | 5.96            | -2.40         | -25.00 | -42.64 |
| 512.09  | S       | -65.66 | -69.26             | 5.94            | -2.35         | -25.00 | -40.66 |
| 744.89  | S       | -62.70 | -64.91             | 5.32            | -3.11         | -25.00 | -37.70 |
| 5145.00 | Н       | -52.43 | -57.25             | 12.76           | -7.94         | -25.00 | -27.43 |



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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

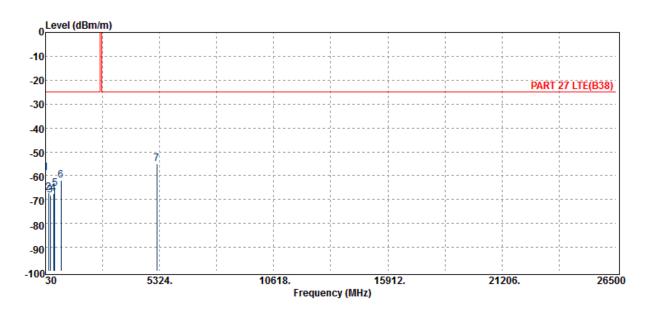
:LTE B38 :2595.0 MHz :Tx CH MID :H Plane

Temp./Humi.

:22 deg\_C / 61 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        | _      |
| 32.91   | S       | -58.68 | -45.77       | -11.94  | -0.97 | -25.00 | -33.68 |
| 173.56  | S       | -67.16 | -67.52       | 1.89    | -1.53 | -25.00 | -42.16 |
| 248.25  | S       | -68.03 | -71.84       | 5.56    | -1.75 | -25.00 | -43.03 |
| 405.39  | S       | -67.58 | -71.12       | 5.95    | -2.41 | -25.00 | -42.58 |
| 453.89  | S       | -65.24 | -68.85       | 5.81    | -2.20 | -25.00 | -40.24 |
| 750.71  | S       | -61.80 | -64.07       | 5.33    | -3.07 | -25.00 | -36.80 |
| 5190.00 | Н       | -54.92 | -59.75       | 12.78   | -7.95 | -25.00 | -29.92 |

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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

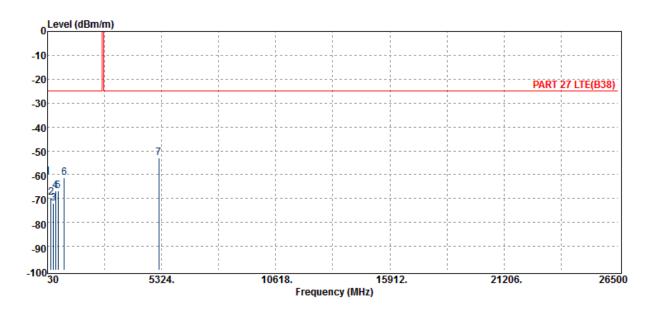
:LTE B38 :2595.0 MHz :Tx CH MID :H Plane

Temp./Humi.

:22 deg\_C / 61 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 30.00   | S       | -60.98 | -47.39       | -12.63  | -0.96 | -25.00 | -35.98 |
| 199.75  | S       | -69.52 | -73.13       | 5.24    | -1.63 | -25.00 | -44.52 |
| 299.66  | S       | -72.06 | -75.88       | 5.77    | -1.95 | -25.00 | -47.06 |
| 403.45  | S       | -66.77 | -70.33       | 5.96    | -2.40 | -25.00 | -41.77 |
| 520.82  | S       | -66.69 | -70.18       | 5.89    | -2.40 | -25.00 | -41.69 |
| 796.30  | S       | -61.36 | -63.94       | 5.48    | -2.90 | -25.00 | -36.36 |
| 5190.00 | Н       | -52.82 | -57.66       | 12.78   | -7.95 | -25.00 | -27.82 |

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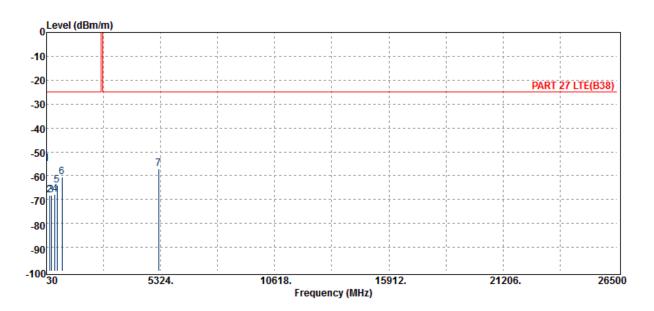
**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

:LTE B38 :2617.5 MHz :Tx CH HIGH :H Plane

Temp./Humi. :22 deg\_C / 61 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| ·       |         |        | Output Level | Gain    | Loss  |        | · ·    |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 39.70   | S       | -55.12 | -43.17       | -10.96  | -0.99 | -25.00 | -30.12 |
| 172.59  | S       | -68.15 | -68.34       | 1.71    | -1.53 | -25.00 | -43.15 |
| 245.34  | S       | -68.02 | -71.79       | 5.52    | -1.75 | -25.00 | -43.02 |
| 416.06  | S       | -67.92 | -71.47       | 5.91    | -2.36 | -25.00 | -42.92 |
| 524.70  | S       | -63.93 | -67.36       | 5.87    | -2.44 | -25.00 | -38.93 |
| 749.74  | S       | -60.41 | -62.66       | 5.33    | -3.08 | -25.00 | -35.41 |
| 5235.00 | Н       | -57.20 | -61.99       | 12.80   | -8.00 | -25.00 | -32.20 |



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**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

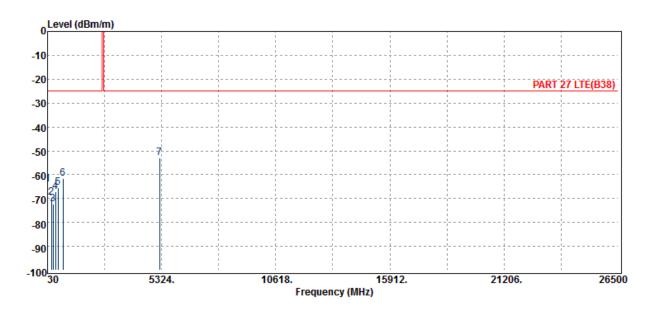
:LTE B38 :2617.5 MHz :Tx CH HIGH :H Plane

Temp./Humi.

:22 deg\_C / 61 RH

Engineer :Tin

:HORIZONTAL Measurement Antenna Pol.



| Freq.   | Note    | EIRP   | SG           | Antenna | Cable | Limit  | Margin |
|---------|---------|--------|--------------|---------|-------|--------|--------|
| •       |         |        | Output Level | Gain    | Loss  |        | •      |
| MHz     | F/H/E/S | dBm    | dBm          | dBi     | dB    | dBm    | dB     |
|         |         |        |              |         |       |        |        |
| 37.76   | S       | -63.96 | -51.81       | -11.17  | -0.98 | -25.00 | -38.96 |
| 219.15  | S       | -69.52 | -73.32       | 5.49    | -1.70 | -25.00 | -44.52 |
| 282.20  | S       | -72.24 | -75.93       | 5.57    | -1.89 | -25.00 | -47.24 |
| 410.24  | S       | -67.02 | -70.56       | 5.93    | -2.40 | -25.00 | -42.02 |
| 522.76  | S       | -65.28 | -68.75       | 5.88    | -2.42 | -25.00 | -40.28 |
| 755.56  | S       | -61.73 | -64.04       | 5.35    | -3.04 | -25.00 | -36.73 |
| 5235.00 | Н       | -53.11 | -57.90       | 12.80   | -8.00 | -25.00 | -28.11 |



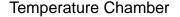
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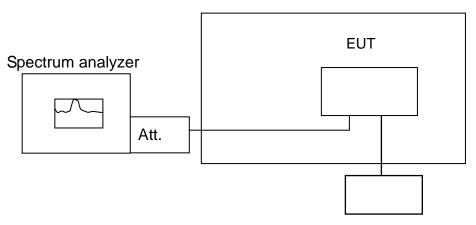
# 11. FREQUENCY STABILITY MEASUREMENT

# 11.1. Standard Applicable:

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

# 11.2. Test Set-up:





Variable DC Power Supply

Note: Measurement setup for testing on Antenna connector

### 11.3. Measurement Procedure:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Set chamber temperature to 25°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint as declared by the manufacturer, record the maximum frequency change.

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# 11.4. Measurement Equipment Used:

| Conduc                          | Conducted Emission (measured at antenna port) Test Site |                 |                  |              |            |  |  |  |
|---------------------------------|---|-----------------|------------------|--------------|------------|--|--|--|
| EQUIPMENT<br>TYPE               | MFR   | MODEL<br>NUMBER | SERIAL<br>NUMBER | LAST<br>CAL. | CAL DUE.   |  |  |  |
| Power Meter                     | Anritsu   | ML2495A         | 1005007          | 12/15/2016   | 12/14/2017 |  |  |  |
| Power Sensor                    | Anritsu   | MA2411B         | 917032           | 12/15/2016   | 12/14/2017 |  |  |  |
| EXA Spectrum Analyz-<br>er      | Agilent   | N9030A          | MY53120760       | 03/21/2017   | 03/20/2018 |  |  |  |
| DC Block                        | Mini-Circuits   | BLK-18-S+       | 1                | 01/05/2017   | 01/04/2018 |  |  |  |
| Coaxial Cable                   | HUBER+SUHNE<br>R  | SUCOFLEX<br>102 | 23670/2          | 01/05/2017   | 01/04/2018 |  |  |  |
| Attenuator                      | Mini-Circuit  | BW-S10W2+       | 2                | 01/05/2017   | 01/04/2018 |  |  |  |
| Splitter                        | Agilent   | 11636B          | N/A              | 01/05/2017   | 01/04/2018 |  |  |  |
| DC Power Supply                 | Agilent   | E3640A          | MY52410006       | 11/21/2016   | 11/20/2017 |  |  |  |
| Temperature Chamber             | TERCHY  | MHG-120LF       | 911009           | 05/19/2017   | 05/18/2018 |  |  |  |
| Radio Communication<br>Analyzer | R&S   | CMU200          | 102189           | 02/11/2017   | 02/10/2018 |  |  |  |
| Radio Communication<br>Analyer  | Anritsu   | MT8820C         | 6201465317       | 01/03/2017   | 01/02/2018 |  |  |  |

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### 11.5. Measurement Result:

# FREQUENCY ERROR vs. VOLTAGE

| Reference Frequency: GPRS 850 Mid Channel 836.6 MHz |                    |           |            |            |  |  |  |  |
|---|--------------------|-----------|------------|------------|--|--|--|--|
|   | Limit: +/- 2.5 ppm |           |            |            |  |  |  |  |
| Power Supply  | Environment        | Frequency |            |            |  |  |  |  |
| Vdc   | Temperature        |           | Delta (Hz) | Limit (Hz) |  |  |  |  |
| Vuc   | ( )                | (MHz)     |            |            |  |  |  |  |
| 4.4   | 20                 | 836600002 | 5          | 2091       |  |  |  |  |
| 3.85  | 20                 | 836599997 | 0          | 2091       |  |  |  |  |
| 3.5   | 20                 | 836599995 | -2         | 2091       |  |  |  |  |
| 2.5<br>(End point)                                  | 20                 | 836600007 | 10         | 2091       |  |  |  |  |

# FREQUENCY ERROR vs. TEMPERATURE

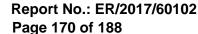
| Reference Frequency: GPRS 850 Mid Channel 836.6 MHz |                    |                    |            |            |  |  |  |
|---|--------------------|--------------------|------------|------------|--|--|--|
|   |                    | Limit: +/- 2.5 ppm |            |            |  |  |  |
| Power Supply  | Environment        | Frequency          |            |            |  |  |  |
| Vdc   | Temperature<br>( ) | (MHz)              | Delta (Hz) | Limit (Hz) |  |  |  |
| 3.85  | 50                 | 836600001          | 11         | 2091       |  |  |  |
| 3.85  | 40                 | 836600000          | 10         | 2091       |  |  |  |
| 3.85  | 30                 | 836599986          | -4         | 2091       |  |  |  |
| 3.85  | 20                 | 836599990          | 0          | 2091       |  |  |  |
| 3.85  | 10                 | 836600015          | 25         | 2091       |  |  |  |
| 3.85  | 0                  | 836600008          | 18         | 2091       |  |  |  |
| 3.85  | -10                | 836599991          | 1          | 2091       |  |  |  |
| 3.85  | -20                | 836600008          | 18         | 2091       |  |  |  |
| 3.85  | -30                | 836600013          | 23         | 2091       |  |  |  |

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FREQUENCY ERROR vs. VOLTAGE

| Reference Frequency: GPRS 1900 Mid Channel 1880 MHz |                    |            |            |            |  |  |  |
|---|--------------------|------------|------------|------------|--|--|--|
| Limit: +/- 2.5 ppm                                  |                    |            |            |            |  |  |  |
| Power Supply  | Environment        | Frequency  |            |            |  |  |  |
| Vdc   | Temperature<br>( ) | (MHz)      | Delta (Hz) | Limit (Hz) |  |  |  |
| 4.4   | 20                 | 1880000001 | 7          | 4700       |  |  |  |
| 3.85  | 20                 | 1879999994 | 0          | 4700       |  |  |  |
| 3.5   | 20                 | 1880000010 | 16         | 4700       |  |  |  |
| 2.5<br>(End point)                                  | 20                 | 1880000010 | 16         | 4700       |  |  |  |

# FREQUENCY ERROR vs. TEMPERATURE

| 1240211012      |   |            |            |            |  |  |  |  |  |
|-----------------|---|------------|------------|------------|--|--|--|--|--|
| R               | Reference Frequency: GPRS 1900 Mid Channel 1880 MHz |            |            |            |  |  |  |  |  |
|                 | Limit: $\pm$ 2.5 ppm = Hz                           |            |            |            |  |  |  |  |  |
| Power<br>Supply | Environment   | Frequency  | Dolto (Uz) | Limit (Uz) |  |  |  |  |  |
| Vdc             | Temperature ( )                                     | (MHz)      | Delta (Hz) | Limit (Hz) |  |  |  |  |  |
| 3.85            | 50  | 1880000000 | -6         | 4700       |  |  |  |  |  |
| 3.85            | 40  | 1880000003 | -3         | 4700       |  |  |  |  |  |
| 3.85            | 30  | 1879999987 | -19        | 4700       |  |  |  |  |  |
| 3.85            | 20  | 1880000006 | 0          | 4700       |  |  |  |  |  |
| 3.85            | 10  | 1880000003 | -3         | 4700       |  |  |  |  |  |
| 3.85            | 0   | 1879999985 | -21        | 4700       |  |  |  |  |  |
| 3.85            | -10   | 1880000007 | 1          | 4700       |  |  |  |  |  |
| 3.85            | -20   | 1880000013 | 7          | 4700       |  |  |  |  |  |
| 3.85            | -30   | 188000007  | 1          | 4700       |  |  |  |  |  |

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# FREQUENCY ERROR vs. VOLTAGE

| Reference Frequency: WCDMA II Mid Channel 1880 MHz |                          |            |            |            |  |  |
|--|--------------------------|------------|------------|------------|--|--|
| Limit: +/- 2.5 ppm                                 |                          |            |            |            |  |  |
| Power Supply                                       | ly Environment Frequency |            |            |            |  |  |
| Vdc  | Temperature<br>( )       | (MHz)      | Delta (Hz) | Limit (Hz) |  |  |
| 4.4  | 20                       | 1879999999 | 3          | 4700       |  |  |
| 3.85   | 20                       | 1879999996 | 0          | 4700       |  |  |
| 3.5  | 20                       | 1880000003 | 7          | 4700       |  |  |
| 2.5<br>(End point)                                 | 20                       | 1879999998 | 2          | 4700       |  |  |

# FREQUENCY ERROR vs. TEMPERATURE

| Reference Frequency: WCDMA II Mid Channel 1880 |                    |            |            |            |  |  |
|--|--------------------|------------|------------|------------|--|--|
| Limit: +/- 2.5 ppm                             |                    |            |            |            |  |  |
| Power Supply                                   | Environment        | Frequency  |            |            |  |  |
| Vdc  | Temperature<br>( ) | (MHz)      | Delta (Hz) | Limit (Hz) |  |  |
| 3.85   | 50                 | 1879999998 | 10         | 4700       |  |  |
| 3.85   | 40                 | 1879999998 | 10         | 4700       |  |  |
| 3.85   | 30                 | 1879999995 | 7          | 4700       |  |  |
| 3.85   | 20                 | 1879999988 | 0          | 4700       |  |  |
| 3.85   | 10                 | 1879999990 | 2          | 4700       |  |  |
| 3.85   | 0                  | 1880000007 | 19         | 4700       |  |  |
| 3.85   | -10                | 1879999985 | -3         | 4700       |  |  |
| 3.85   | -20                | 1880000015 | 27         | 4700       |  |  |
| 3.85   | -30                | 1880000012 | 24         | 4700       |  |  |

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# FREQUENCY ERROR vs. VOLTAGE

|                    | Reference Frequency: WCDMA V Mid Channel 836.6 MHz |           |            |            |  |  |
|--------------------|--|-----------|------------|------------|--|--|
|                    | Limit: +/- 2.5 ppm                                 |           |            |            |  |  |
| Power<br>Supply    | Environment  | Frequency |            |            |  |  |
| Vdc                | Temperature ( )                                    | (MHz)     | Delta (Hz) | Limit (Hz) |  |  |
| 4.4                | 20   | 836599999 | -15        | 2091       |  |  |
| 3.85               | 20   | 836600014 | 0          | 2091       |  |  |
| 3.5                | 20   | 836600006 | -8         | 2091       |  |  |
| 2.5<br>(End Point) | 20   | 836600011 | -3         | 2091       |  |  |

# FREQUENCY ERROR vs. TEMPERATURE

|                 | Refere             | nce Frequency: WCD | MA V Mid Channel | 836.6 MHz   |  |  |
|-----------------|--------------------|--------------------|------------------|-------------|--|--|
|                 | Limit: +/- 2.5 ppm |                    |                  |             |  |  |
| Power<br>Supply | Environment        | Frequency          | Dolto (Uz)       | Limit (Lla) |  |  |
| Vdc             | Temperature ( )    | (MHz)              | Delta (Hz)       | Limit (Hz)  |  |  |
| 3.85            | 50                 | 836599995          | 7                | 2091        |  |  |
| 3.85            | 40                 | 836600010          | 22               | 2091        |  |  |
| 3.85            | 30                 | 836599988          | 0                | 2091        |  |  |
| 3.85            | 20                 | 836599988          | 0                | 2091        |  |  |
| 3.85            | 10                 | 836599993          | 5                | 2091        |  |  |
| 3.85            | 0                  | 836599994          | 6                | 2091        |  |  |
| 3.85            | -10                | 836600012          | 24               | 2091        |  |  |
| 3.85            | -20                | 836599991          | 3                | 2091        |  |  |
| 3.85            | -30                | 836600009          | 21               | 2091        |  |  |

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# FREQUENCY ERROR vs. VOLTAGE

| Reference Frequency: |                 | LTE B5 Mid<br>Channel | 836.5      | MHz 10M QPSK CH<br>20525 |
|----------------------|-----------------|-----------------------|------------|--------------------------|
|                      |                 | Limit: +/- 2          | 2.5 ppm    |                          |
| Power<br>Supply      | Environment     | Frequency             |            |                          |
| Vdc                  | Temperature ( ) | (MHz)                 | Delta (Hz) | Limit (Hz)               |
| 4.4                  | 25              | 836.4999599           | -55.5      | 2091                     |
| 3.85                 | 25              | 836.5000154           | 0          | 2091                     |
| 3.5                  | 25              | 836.4999728           | -42.6      | 2091                     |
| 2.5<br>(End Point)   | 25              | 836.4999708           | -44.6      | 2091                     |

# FREQUENCY ERROR vs. TEMPERATURE

| Reference       | ce Frequency:      | LTE B5 Mid Channel | 836.5      | MHz 10M QPSK CH<br>20525 |  |  |  |
|-----------------|--------------------|--------------------|------------|--------------------------|--|--|--|
|                 | Limit: +/- 2.5 ppm |                    |            |                          |  |  |  |
| Power<br>Supply | Environment        | Frequency          | Dolto (Uz) | Limit (Uz)               |  |  |  |
| Vdc             | Temperature ( )    | (MHz)              | Delta (Hz) | Limit (Hz)               |  |  |  |
| 3.85            | -30                | 836.4999596        | -6.8       | 2091                     |  |  |  |
| 3.85            | -20                | 836.4999645        | -1.9       | 2091                     |  |  |  |
| 3.85            | -10                | 836.5000224        | 56         | 2091                     |  |  |  |
| 3.85            | 0                  | 836.4999728        | 6.4        | 2091                     |  |  |  |
| 3.85            | 10                 | 836.5000175        | 51.1       | 2091                     |  |  |  |
| 3.85            | 20                 | 836.4999664        | 0          | 2091                     |  |  |  |
| 3.85            | 30                 | 836.4999633        | -3.1       | 2091                     |  |  |  |
| 3.85            | 40                 | 836.4999688        | 2.4        | 2091                     |  |  |  |
| 3.85            | 50                 | 836.5000018        | 35.4       | 2091                     |  |  |  |

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# FREQUENCY ERROR vs. VOLTAGE

| LTE DZ M. L. ANN ODOK OLL |                 |                       |            |                          |  |
|---------------------------|-----------------|-----------------------|------------|--------------------------|--|
| Reference                 | Frequency:      | LTE B7 Mid<br>Channel | 2535.0     | MHz 10M QPSK CH<br>21100 |  |
|                           |                 | Limit: +/- 2          | 2.5 ppm    |                          |  |
| Power<br>Supply           | Environment     | Frequency             |            |                          |  |
| Vdc                       | Temperature ( ) | (MHz)                 | Delta (Hz) | Limit (Hz)               |  |
| 4.4                       | 25              | 2535                  | -31.1      | 6338                     |  |
| 3.85                      | 25              | 2535                  | 0          | 6338                     |  |
| 3.5                       | 25              | 2535                  | 3.8        | 6338                     |  |
| 2.5<br>(End Point)        | 25              | 2535                  | 7.1        | 6338                     |  |

### FREQUENCY ERROR vs. TEMPERATURE

| Reference    | ce Frequency:   | LTE B7 Mid Channel | 2535.0     | MHz 10M QPSK CH<br>21100 |
|--------------|-----------------|--------------------|------------|--------------------------|
|              |                 | Limit: +/- 2.5     | ppm        |                          |
| Power Supply | Environment     | Frequency          | Dolto (Hz) | Limit (Uz)               |
| Vdc          | Temperature ( ) | (MHz)              | Delta (Hz) | Limit (Hz)               |
| 3.85         | -30             | 2535               | 28.8       | 6338                     |
| 3.85         | -20             | 2535               | 29.6       | 6338                     |
| 3.85         | -10             | 2535               | 4.6        | 6338                     |
| 3.85         | 0               | 2535               | 0.8        | 6338                     |
| 3.85         | 10              | 2535               | 22.9       | 6338                     |
| 3.85         | 20              | 2535               | 0          | 6338                     |
| 3.85         | 30              | 2535               | 3.2        | 6338                     |
| 3.85         | 40              | 2535               | 0.9        | 6338                     |
| 3.85         | 50              | 2535               | 15.6       | 6338                     |

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# FREQUENCY ERROR vs. VOLTAGE

| Reference Frequency: |                 | LTE B38 Mid<br>Channel | 2595.0     | MHz 10M QPSK CH<br>38000 |
|----------------------|-----------------|------------------------|------------|--------------------------|
|                      |                 | Limit: +/- 2           | 2.5 ppm    |                          |
| Power<br>Supply      | Environment     | Frequency              |            |                          |
| Vdc                  | Temperature ( ) | (MHz)                  | Delta (Hz) | Limit (Hz)               |
| 4.4                  | 25              | 2595                   | -18.8      | 6488                     |
| 3.85                 | 25              | 2595                   | 0          | 6488                     |
| 3.5                  | 25              | 2595                   | -25.8      | 6488                     |
| 2.5<br>(End Point)   | 25              | 2595                   | -23.8      | 6488                     |

# FREQUENCY ERROR vs. TEMPERATURE

| Reference Frequency: |                 | LTE B38 Mid Channel | 2595.0     | MHz 10M QPSK CH<br>38000 |
|----------------------|-----------------|---------------------|------------|--------------------------|
|                      |                 | Limit: +/- 2.5      | ppm        |                          |
| Power<br>Supply      | Environment     | Frequency           | Dolto (Uz) | Limit (Hz)               |
| Vdc                  | Temperature ( ) | (MHz)               | Delta (Hz) | Limit (Hz)               |
| 3.85                 | -30             | 2595                | 55.1       | 6488                     |
| 3.85                 | -20             | 2595                | 50.2       | 6488                     |
| 3.85                 | -10             | 2595                | 3.2        | 6488                     |
| 3.85                 | 0               | 2595                | 36.9       | 6488                     |
| 3.85                 | 10              | 2595                | 8.0        | 6488                     |
| 3.85                 | 20              | 2595                | 0          | 6488                     |
| 3.85                 | 30              | 2595                | 36.4       | 6488                     |
| 3.85                 | 40              | 2595                | 10.3       | 6488                     |
| 3.85                 | 50              | 2595                | 41.8       | 6488                     |

Note: The battery is rated 3.85V dc.

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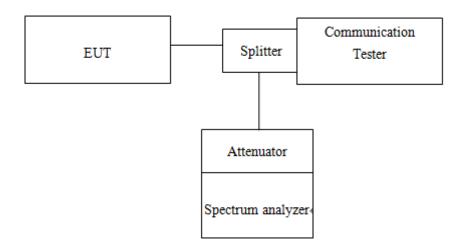
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# 12. PEAK TO AVERAGE RATIO

# 12.1. Standard Applicable

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

### 12.2. Test SET-UP



### 12.3. Measurement Procedure

- 1. KDB 971168 D01 is employed as the following procedure is proper adjusted accordingly:
- 2. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth; & internal =1ms
- 3. Set the number of counts to a value that stabilizes the measured CCDF curve.

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# 12.4. Measurement Equipment Used

| Conduc                          | Conducted Emission (measured at antenna port) Test Site |                 |            |            |            |  |  |  |
|---------------------------------|---|-----------------|------------|------------|------------|--|--|--|
| EQUIPMENT                       | MFR   | MODEL           | SERIAL     | LAST       | CAL DUE.   |  |  |  |
| TYPE                            |   | NUMBER          | NUMBER     | CAL.       |            |  |  |  |
| Power Meter                     | Anritsu   | ML2495A         | 1005007    | 12/15/2016 | 12/14/2017 |  |  |  |
| Power Sensor                    | Anritsu   | MA2411B         | 917032     | 12/15/2016 | 12/14/2017 |  |  |  |
| EXA Spectrum Analyz-<br>er      | Agilent   | N9030A          | MY53120760 | 03/21/2017 | 03/20/2018 |  |  |  |
| DC Block                        | Mini-Circuits   | BLK-18-S+       | 1          | 01/05/2017 | 01/04/2018 |  |  |  |
| Coaxial Cable                   | HUBER+SUHNE<br>R  | SUCOFLEX<br>102 | 23670/2    | 01/05/2017 | 01/04/2018 |  |  |  |
| Attenuator                      | Mini-Circuit  | BW-S10W2+       | 2          | 01/05/2017 | 01/04/2018 |  |  |  |
| Splitter                        | Agilent   | 11636B          | N/A        | 01/05/2017 | 01/04/2018 |  |  |  |
| DC Power Supply                 | Agilent   | E3640A          | MY52410006 | 11/21/2016 | 11/20/2017 |  |  |  |
| Temperature Chamber             | TERCHY  | MHG-120LF       | 911009     | 05/19/2017 | 05/18/2018 |  |  |  |
| Radio Communication<br>Analyzer | R&S   | CMU200          | 102189     | 02/11/2017 | 02/10/2018 |  |  |  |
| Radio Communication<br>Analyer  | Anritsu   | MT8820C         | 6201465317 | 01/03/2017 | 01/02/2018 |  |  |  |

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### 12.5. Measurement Result

# **Tabular Results:**

| Erog           |      | Peak-to-Average |              |              |  |
|----------------|------|-----------------|--------------|--------------|--|
| Freq.<br>(MHz) | СН   | GSM<br>1900     | GPRS<br>1900 | EDGE<br>1900 |  |
| 1850.2         | 9296 | 9.29            | 9.77         | 11.64        |  |
| 1880.0         | 9400 | 9.91            | 9.66         | 11.44        |  |
| 1909.8         | 9538 | 8.76            | 9.80         | 11.44        |  |

| Freq.  | СН   | Peak-to-Average |          |          |  |  |  |
|--------|------|-----------------|----------|----------|--|--|--|
| (MHz)  | СП   | WCDMA II        | HSDPA II | HSUPA II |  |  |  |
| 1850.2 | 9262 | 2.89            | 3.69     | 3.75     |  |  |  |
| 1880.0 | 9400 | 2.94            | 3.43     | 3.63     |  |  |  |
| 1909.8 | 9538 | 2.89            | 3.74     | 3.61     |  |  |  |

| LTE BAND 5                |       |                               |       |                         |       |                               |       |  |  |  |
|---------------------------|-------|-------------------------------|-------|-------------------------|-------|-------------------------------|-------|--|--|--|
| Channel bandwidth: 1.4MHz |       |                               |       | Channel bandwidth: 3MHz |       |                               |       |  |  |  |
| Freq.                     | СН    | Peak-to-Average<br>Ratio (dB) |       | Freq.                   | СН    | Peak-to-Average<br>Ratio (dB) |       |  |  |  |
| (MHz)                     |       | 16QAM                         | LIMIT | (MHz)                   |       | 16QAM                         | LIMIT |  |  |  |
| 824.7                     | 20407 | 5.56                          | 13    | 825.5                   | 20415 | 6.26                          | 13    |  |  |  |
| 836.5                     | 20525 | 5.90                          | 13    | 836.5                   | 20525 | 6.31                          | 13    |  |  |  |
| 848.3                     | 20643 | 5.47                          | 13    | 847.5                   | 20635 | 6.06                          | 13    |  |  |  |

| LTE BAND 5              |       |                               |       |                          |       |                   |       |  |  |  |
|-------------------------|-------|-------------------------------|-------|--------------------------|-------|-------------------|-------|--|--|--|
| Channel bandwidth: 5MHz |       |                               |       | Channel bandwidth: 10MHz |       |                   |       |  |  |  |
| Freq.                   | СН    | Peak-to-Average<br>Ratio (dB) |       | Freq.                    | СН    | Peak-to-<br>Ratio | •     |  |  |  |
| (MHz)                   |       | 16QAM                         | LIMIT | (MHz)                    |       | 16QAM             | LIMIT |  |  |  |
| 826.5                   | 20425 | 6.35                          | 13    | 829.0                    | 20450 | 6.17              | 13    |  |  |  |
| 836.5                   | 20525 | 6.25                          | 13    | 836.5                    | 20525 | 6.26              | 13    |  |  |  |
| 846.5                   | 20625 | 6.12                          | 13    | 844.0                    | 20600 | 6.14              | 13    |  |  |  |

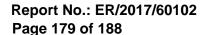
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| LTE BAND 7 |            |                               |       |                          |       |                               |       |  |  |  |
|------------|------------|-------------------------------|-------|--------------------------|-------|-------------------------------|-------|--|--|--|
| С          | hannel ban | dwidth: 5MF                   | łz    | Channel bandwidth: 10MHz |       |                               |       |  |  |  |
| Freq.      | СН         | Peak-to-Average<br>Ratio (dB) |       | Freq.                    | СН    | Peak-to-Average<br>Ratio (dB) |       |  |  |  |
| (MHz)      |            | 16QAM                         | LIMIT | (MHz)                    |       | 16QAM                         | LIMIT |  |  |  |
| 2502.5     | 20775      | 5.76                          | 13    | 2505.0                   | 20800 | 5.85                          | 13    |  |  |  |
| 2535.0     | 21100      | 5.54                          | 13    | 2535.0                   | 21100 | 5.67                          | 13    |  |  |  |
| 2567.5     | 21375      | 5.51                          | 13    | 2565.0                   | 21350 | 5.74                          | 13    |  |  |  |

| LTE BAND 7               |       |                               |       |                          |       |                               |       |  |  |  |
|--------------------------|-------|-------------------------------|-------|--------------------------|-------|-------------------------------|-------|--|--|--|
| Channel bandwidth: 15MHz |       |                               |       | Channel bandwidth: 20MHz |       |                               |       |  |  |  |
| Freq.                    | СН    | Peak-to-Average<br>Ratio (dB) |       | Freq.                    | СН    | Peak-to-Average<br>Ratio (dB) |       |  |  |  |
| (MHz)                    |       | 16QAM                         | LIMIT | (MHz)                    |       | 16QAM                         | LIMIT |  |  |  |
| 2507.5                   | 20825 | 6.13                          | 13    | 2510.0                   | 20850 | 6.64                          | 13    |  |  |  |
| 2535.0                   | 21100 | 6.00                          | 13    | 2535.0                   | 21100 | 6.53                          | 13    |  |  |  |

| LTE BAND 38 |             |                               |       |                          |       |                               |       |  |  |  |
|-------------|-------------|-------------------------------|-------|--------------------------|-------|-------------------------------|-------|--|--|--|
| С           | hannel band | dwidth: 5MH                   | łz    | Channel bandwidth: 10MHz |       |                               |       |  |  |  |
| Freq.       | СН          | Peak-to-Average<br>Ratio (dB) |       | Freq.                    | СН    | Peak-to-Average<br>Ratio (dB) |       |  |  |  |
| (MHz)       |             | 16QAM                         | LIMIT | (MHz)                    |       | 16QAM                         | LIMIT |  |  |  |
| 2572.5      | 37775       | 8.26                          | 13    | 2575.0                   | 37800 | 9.82                          | 13    |  |  |  |
| 2595.0      | 38000       | 8.62                          | 13    | 2595.0                   | 38000 | 8.20                          | 13    |  |  |  |
| 2617.5      | 38225       | 7.96                          | 13    | 2615.0                   | 38200 | 9.14                          | 13    |  |  |  |

| LTE BAND 38              |       |                               |       |                          |       |                               |       |  |  |  |
|--------------------------|-------|-------------------------------|-------|--------------------------|-------|-------------------------------|-------|--|--|--|
| Channel bandwidth: 15MHz |       |                               |       | Channel bandwidth: 20MHz |       |                               |       |  |  |  |
| Freq.                    | СН    | Peak-to-Average<br>Ratio (dB) |       | Freq.                    | СН    | Peak-to-Average<br>Ratio (dB) |       |  |  |  |
| (MHz)                    |       | 16QAM                         | LIMIT | (MHz)                    |       | 16QAM                         | LIMIT |  |  |  |
| 2577.5                   | 37825 | 9.71                          | 13    | 2580.0                   | 37850 | 8.58                          | 13    |  |  |  |
| 2595.0                   | 38000 | 9.81                          | 13    | 2595.0                   | 38000 | 8.43                          | 13    |  |  |  |
| 2612.5                   | 38175 | 9.12                          | 13    | 2610.0                   | 38150 | 9.44                          | 13    |  |  |  |

# **Measurement Results:**

# Please refer to next page.

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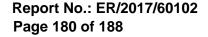
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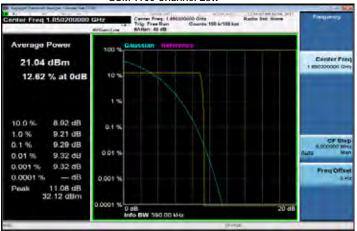
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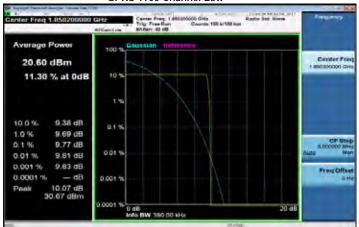




#### **GSM 1900 Channel Low**



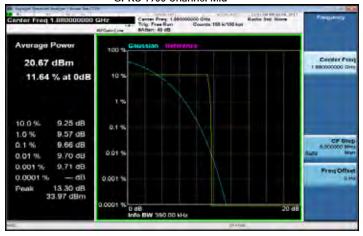
#### **GPRS 1900 Channel Low**



#### GSM 1900 Channel Mid



**GPRS 1900 Channel Mid** 



#### GSM 1900 Channel High



**GPRS 1900 Channel High** 

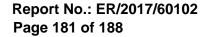


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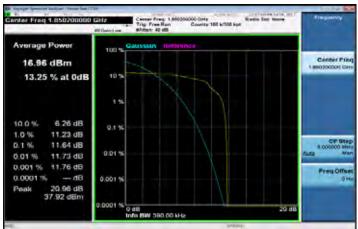
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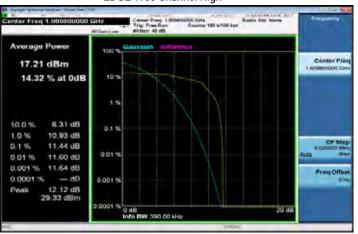


#### **EDGE 1900 Channel Low**

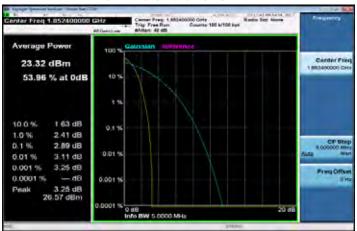




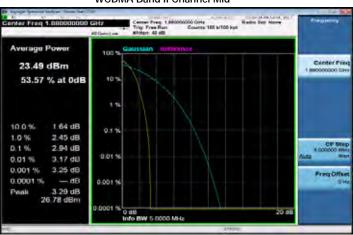
**EDGE 1900 Channel High** 



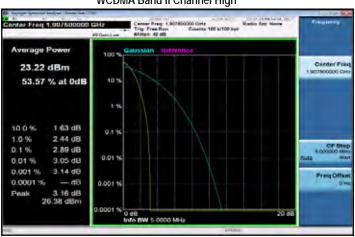
#### WCDMA Band II Channel Low



WCDMA Band II Channel Mid



WCDMA Band II Channel High

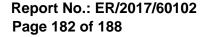


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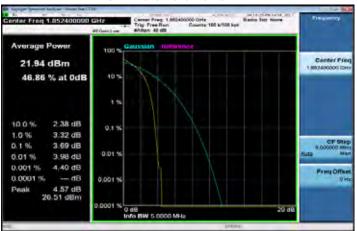
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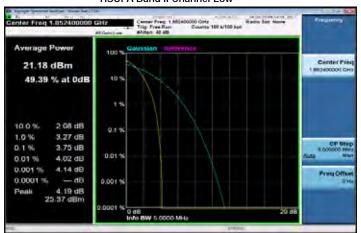




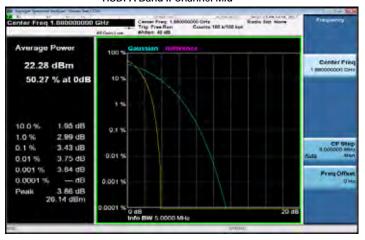
#### **HSDPA Band II Channel Low**



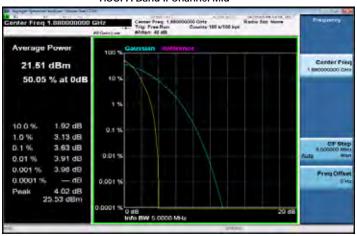
#### **HSUPA Band II Channel Low**



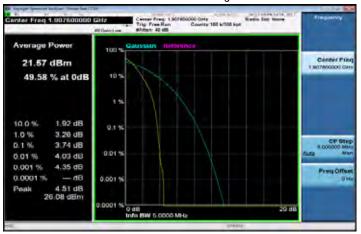
#### **HSDPA Band II Channel Mid**



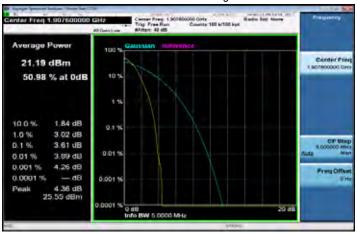
#### **HSUPA Band II Channel Mid**



### **HSDPA Band II Channel High**



### **HSUPA Band II Channel High**

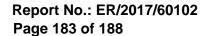


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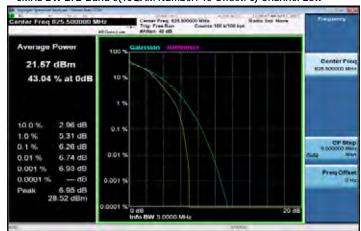




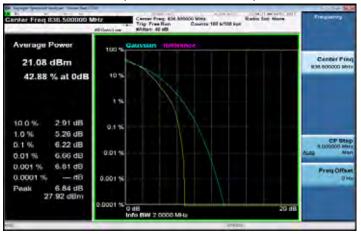
#### 1.4MHz BW LTE-Band 5(16QAM Number: 6 Offset: 0) Channel Low



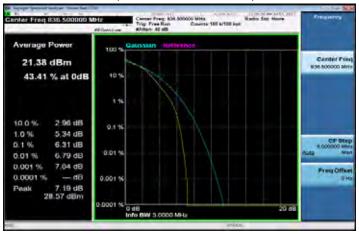
#### 3MHz BW LTE-Band 5(16QAM Number: 15 Offset: 0) Channel Low



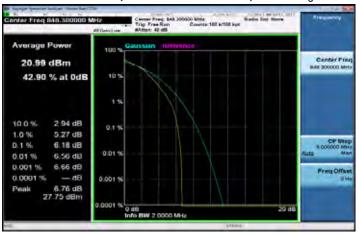
#### 1.4MHz BW LTE-Band 5(16QAM Number: 6 Offset: 0) Channel Mid



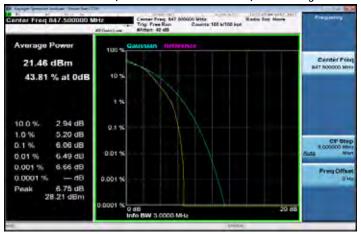
#### 3MHz BW LTE-Band 5(16QAM Number: 15 Offset: 0) Channel Mid



### 1.4MHz BW LTE-Band 5(16QAM Number: 6 Offset: 0) Channel High



3MHz BW LTE-Band 5(16QAM Number: 15 Offset: 0) Channel High



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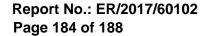
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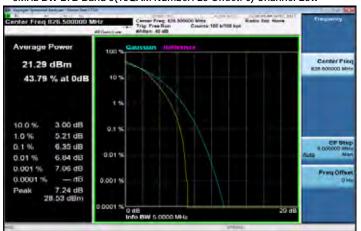
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f (886-2) 2298-0488

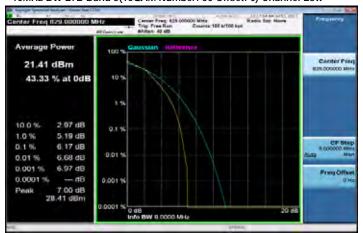




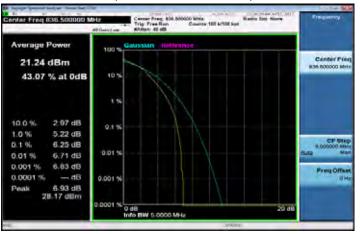
### 5MHz BW LTE-Band 5(16QAM Number: 25 Offset: 0) Channel Low



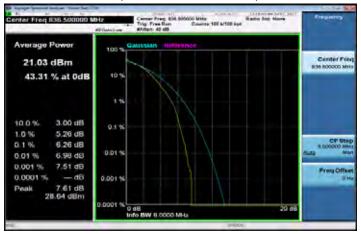
# 10MHz BW LTE-Band 5(16QAM Number: 50 Offset: 0) Channel Low



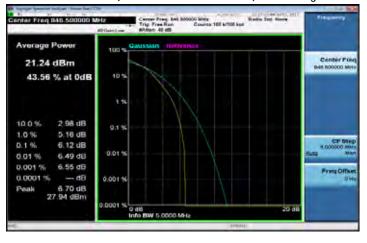
#### 5MHz BW LTE-Band 5(16QAM Number: 25 Offset: 0) Channel Mid



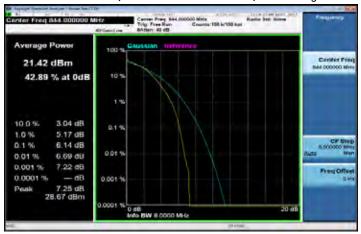
10MHz BW LTE-Band 5(16QAM Number: 50 Offset: 0) Channel Mid



# 5MHz BW LTE-Band 5(16QAM Number: 25 Offset: 0) Channel High



10MHz BW LTE-Band 5(16QAM Number: 50 Offset: 0) Channel High

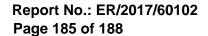


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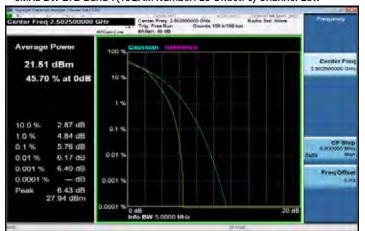
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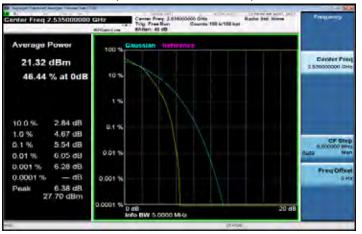
### 5MHz BW LTE-Band 7(16QAM Number: 25 Offset: 0) Channel Low



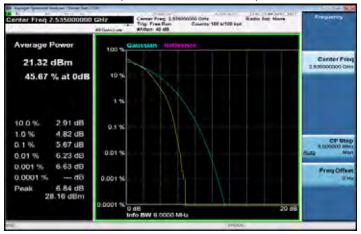
# 10MHz BW LTE-Band 7(16QAM Number: 50 Offset: 0) Channel Low



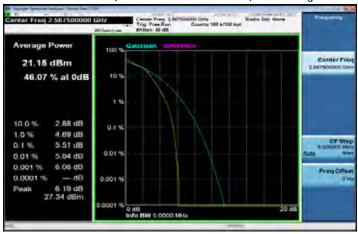
#### 5MHz BW LTE-Band 7(16QAM Number: 25 Offset: 0) Channel Mid



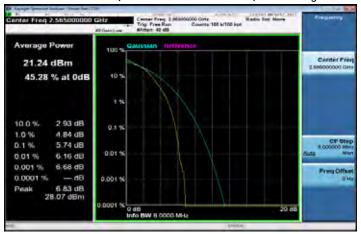
10MHz BW LTE-Band 7(16QAM Number: 50 Offset: 0) Channel Mid



#### 5MHz BW LTE-Band 7(16QAM Number: 25 Offset: 0) Channel High



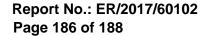
10MHz BW LTE-Band 7(16QAM Number: 50 Offset: 0) Channel High



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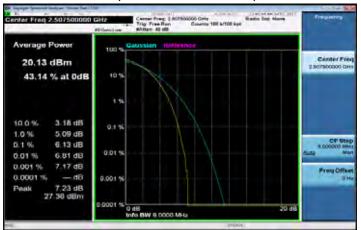
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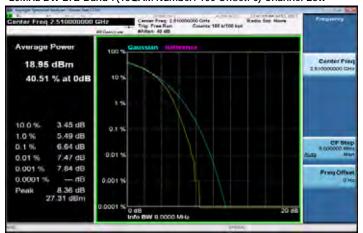




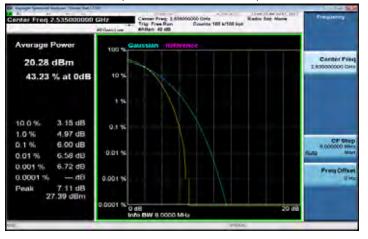
### 15MHz BW LTE-Band 7(16QAM Number: 75 Offset: 0) Channel Low



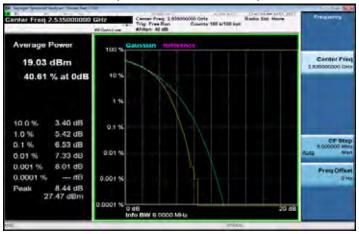
#### 20MHz BW LTE-Band 7(16QAM Number: 100 Offset: 0) Channel Low



#### 15MHz BW LTE-Band 7(16QAM Number: 75 Offset: 0) Channel Mid



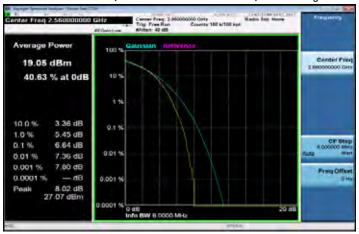
20MHz BW LTE-Band 7(16QAM Number: 100 Offset: 0) Channel Mid



### 15MHz BW LTE-Band 7(16QAM Number: 75 Offset: 0) Channel High



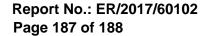
20MHz BW LTE-Band 7(16QAM Number: 100 Offset: 0) Channel High



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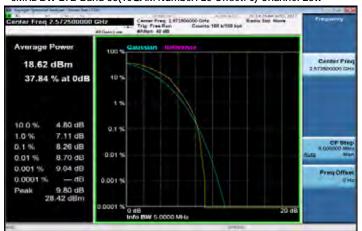
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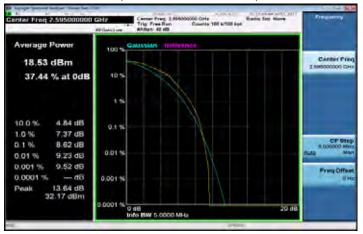
### 5MHz BW LTE-Band 38(16QAM Number: 25 Offset: 0) Channel Low



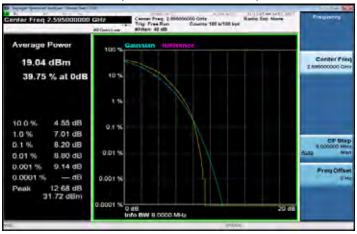
# 10MHz BW LTE-Band 38(16QAM Number: 50 Offset: 0) Channel Low



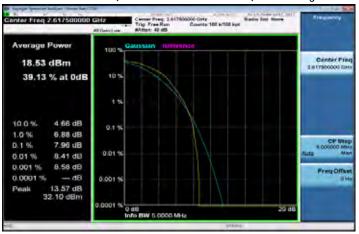
#### 5MHz BW LTE-Band 38(16QAM Number: 25 Offset: 0) Channel Mid



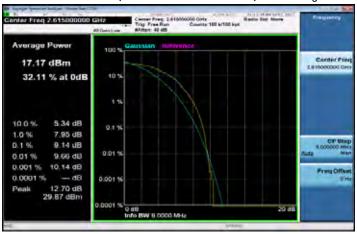
10MHz BW LTE-Band 38(16QAM Number: 50 Offset: 0) Channel Mid



### 5MHz BW LTE-Band 38(16QAM Number: 25 Offset: 0) Channel High



10MHz BW LTE-Band 38(16QAM Number: 50 Offset: 0) Channel High

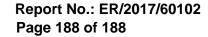


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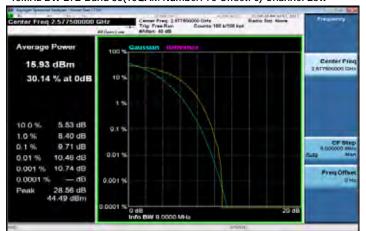
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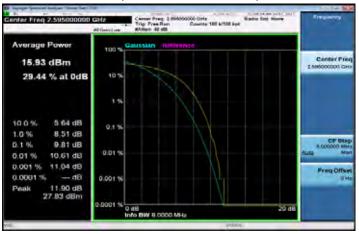
# 15MHz BW LTE-Band 38(16QAM Number: 75 Offset: 0) Channel Low



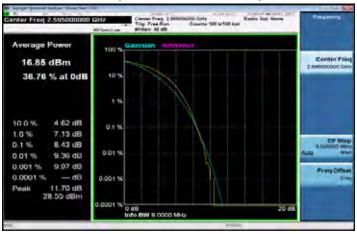
# 20MHz BW LTE-Band 38(16QAM Number: 100 Offset: 0) Channel Low



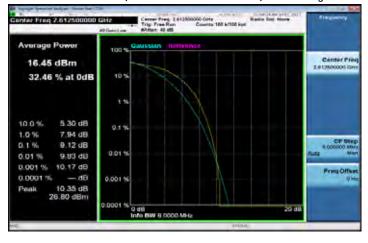
#### 15MHz BW LTE-Band 38(16QAM Number: 75 Offset: 0) Channel Mid



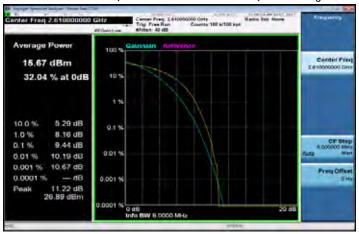
20MHz BW LTE-Band 38(16QAM Number: 100 Offset: 0) Channel Mid



### 15MHz BW LTE-Band 38(16QAM Number: 75 Offset: 0) Channel High



20MHz BW LTE-Band 38(16QAM Number: 100 Offset: 0) Channel High



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