3.5 Conducted Band Edge Measurement

3.5.1 Description of Conducted Band Edge Measurement

27.53 (g) for Band 17

For operations in the 698 -746 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. 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.

27.53 (h) for Band 4

For operations in the 1710 – 1755 MHz band, the FCC limit is 43 + $10\log_{10}$(P[Watts]) dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz 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.

27.53(m)(4): for Band 7

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.

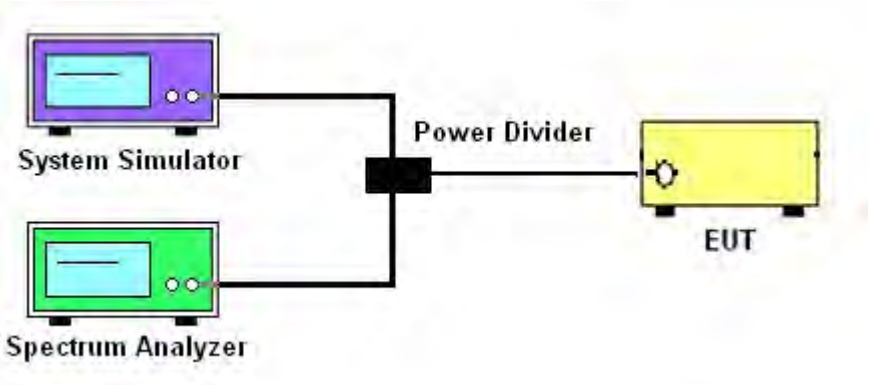
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with RMS detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.
   <For Band 7>
   The limit line is derived from 55+ 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [55 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)
   = -25dBm.

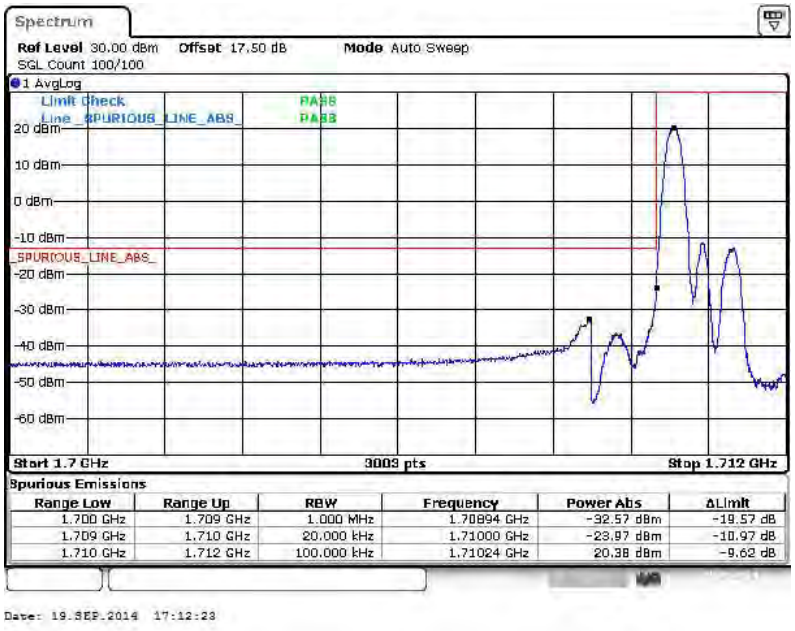
3.5.4 Test Setup



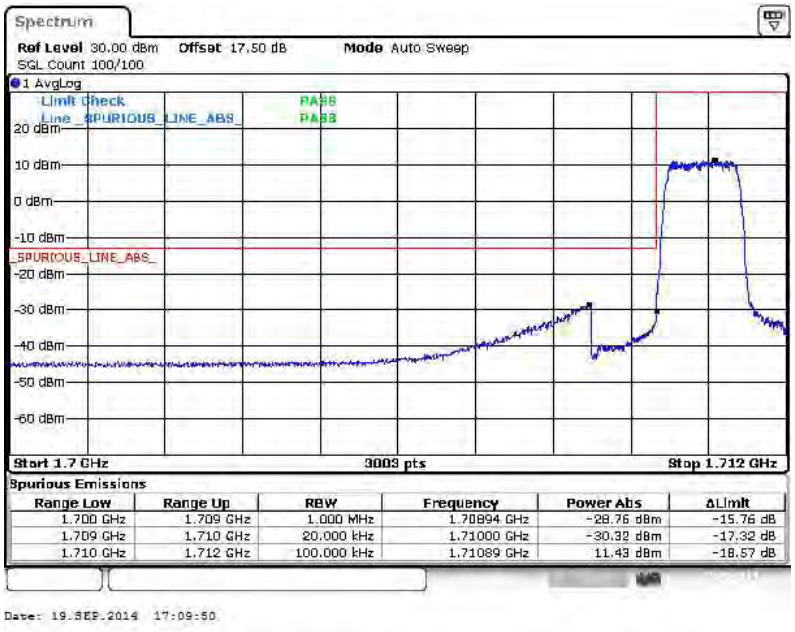
3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	LTE Band 4	Band Width :	1.4MHz / QPSK

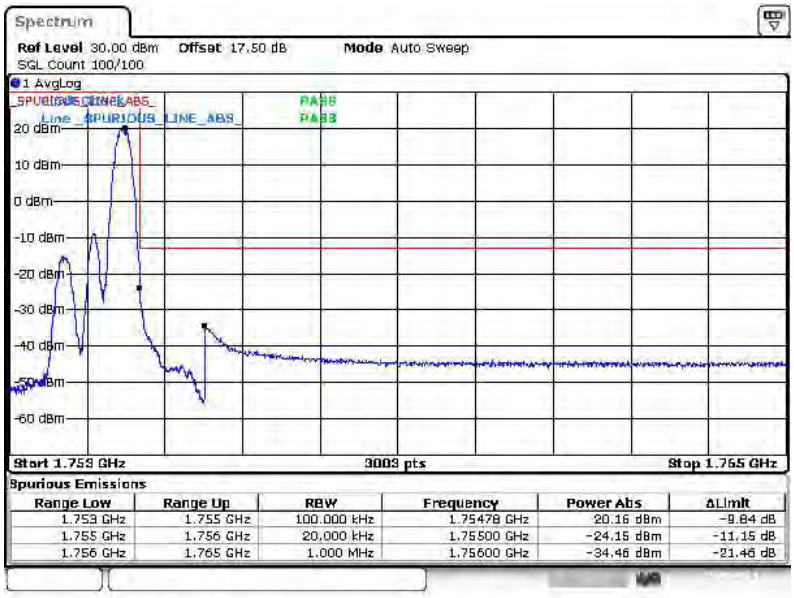
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



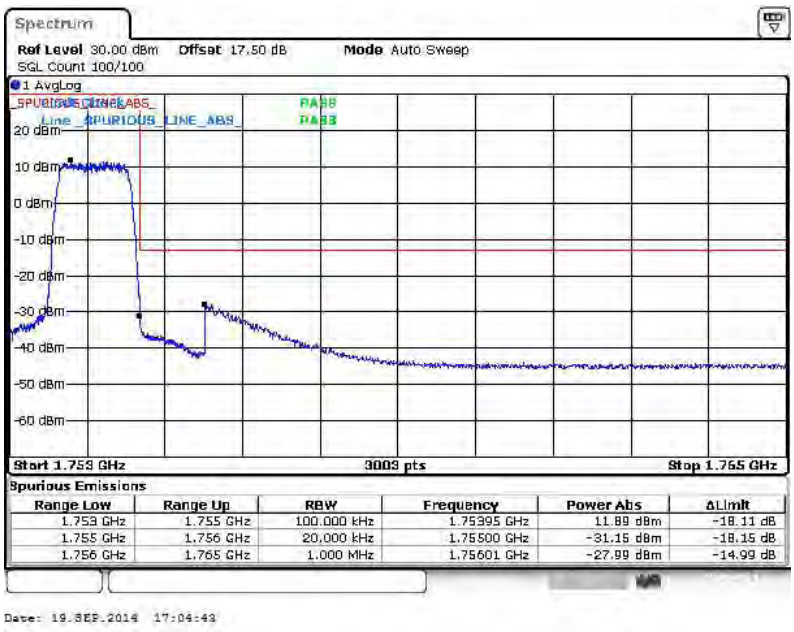
Lower Band Edge Plot for QPSK-RB Size 6, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 5

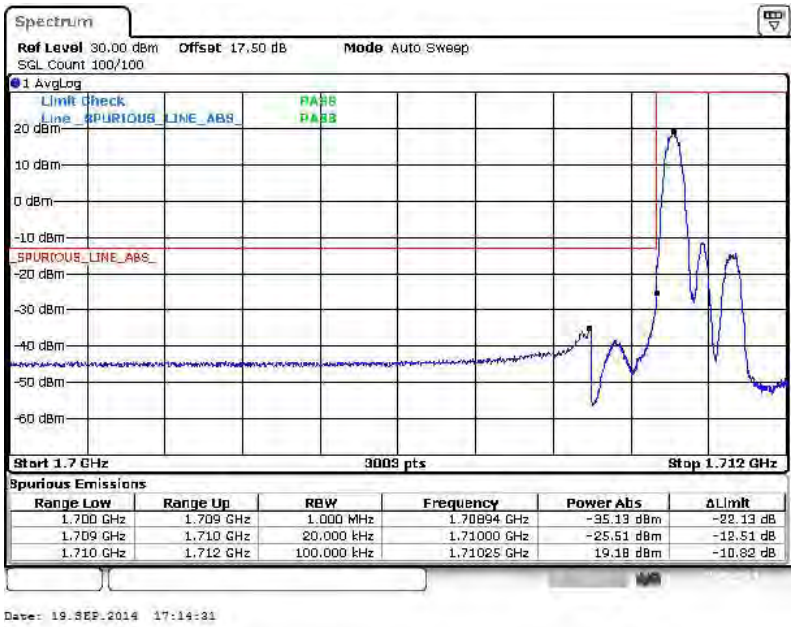


Higher Band Edge Plot for QPSK-RB Size 6, RB Offset 0

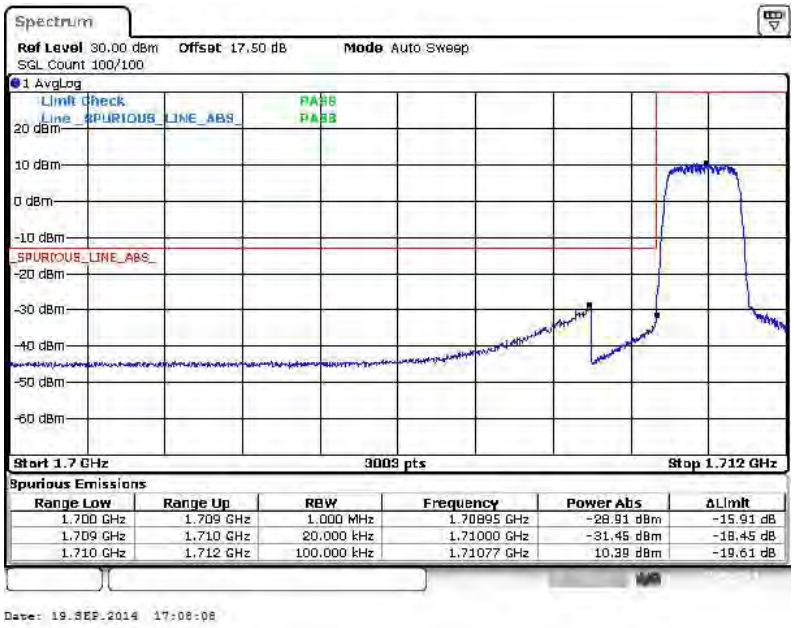


Band :	LTE Band 4	Band Width :	1.4MHz / 16QAM

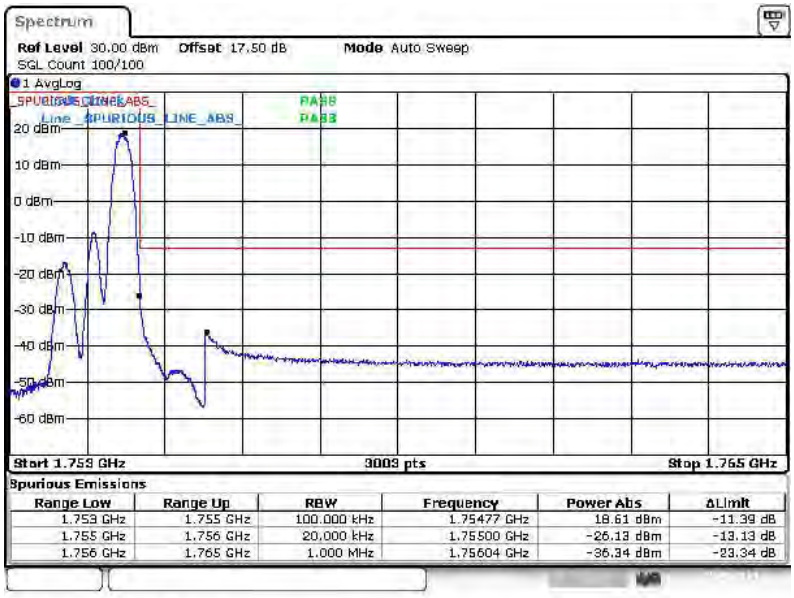
Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



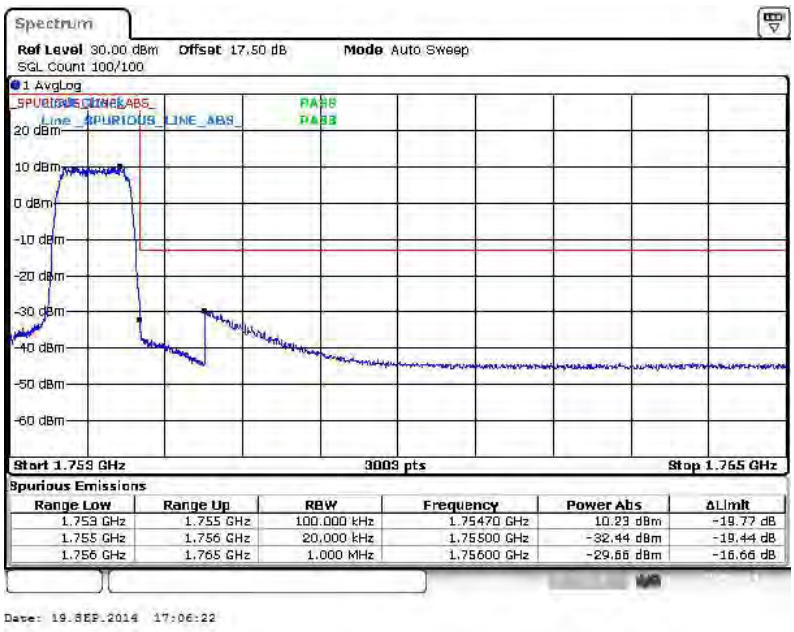
Lower Band Edge Plot for 16QAM-RB Size 6, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 5

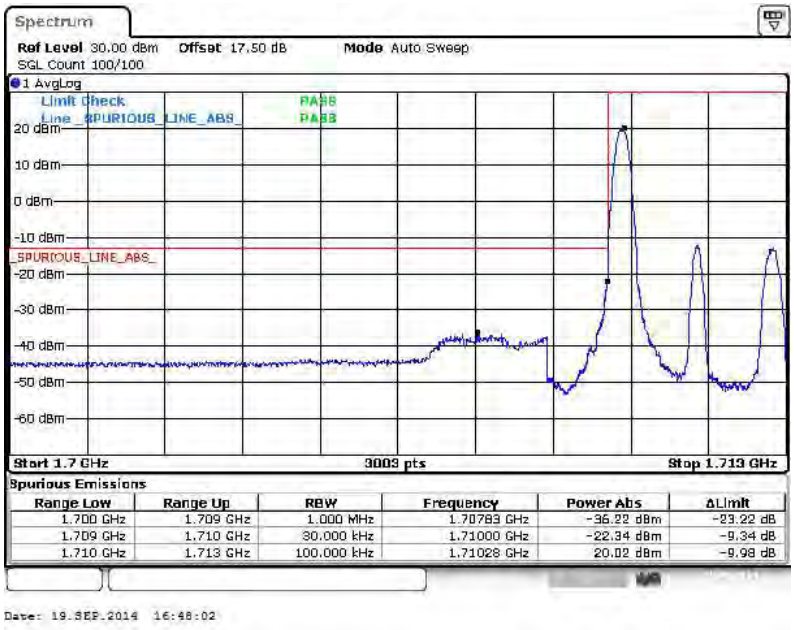


Higher Band Edge Plot for 16QAM-RB Size 6, RB Offset 0

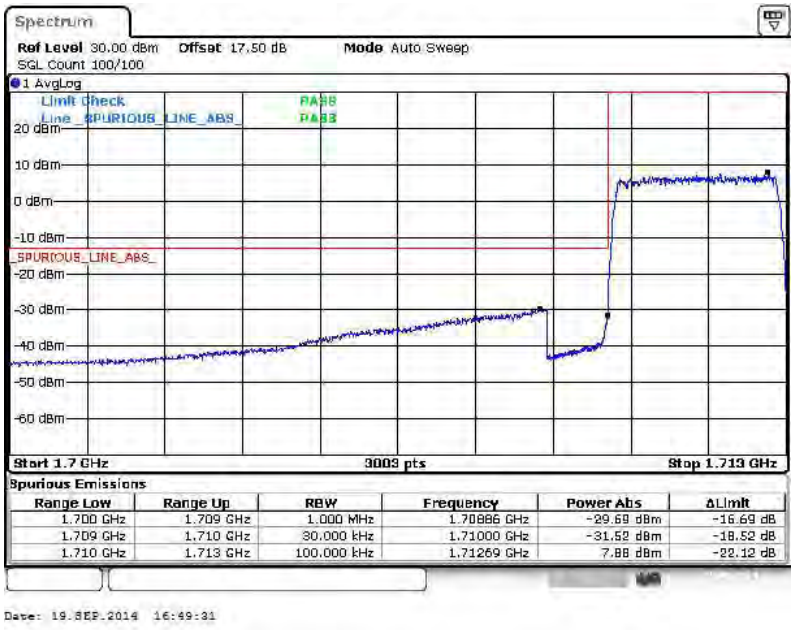


Band :	LTE Band 4	Band Width :	3MHz / QPSK

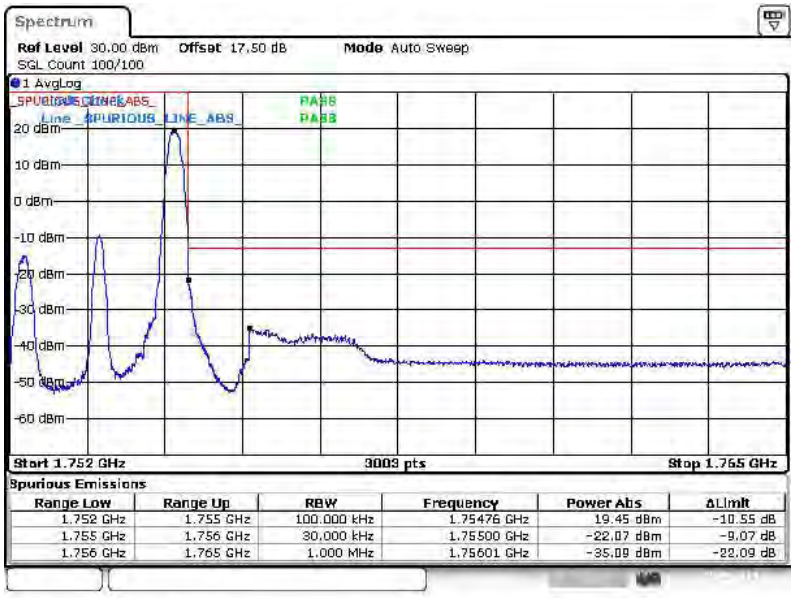
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Lower Band Edge Plot for QPSK-RB Size 15, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 14

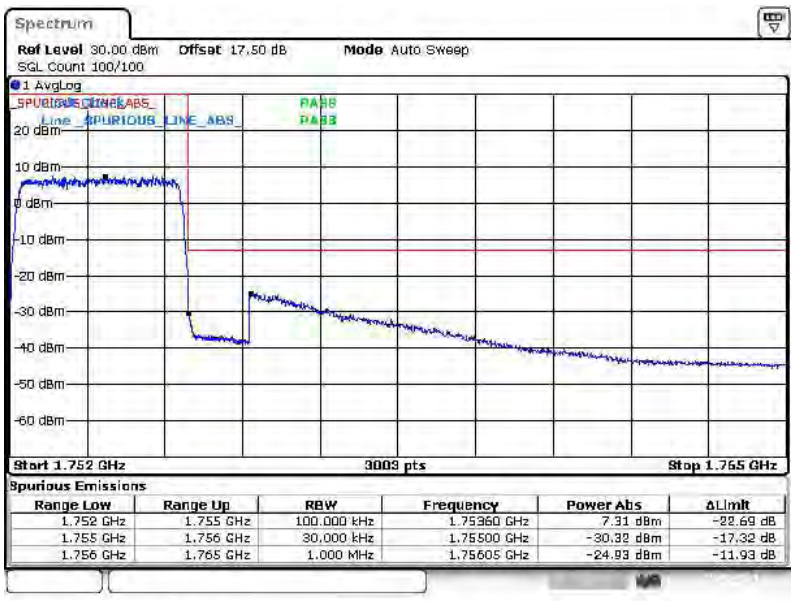


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.752 GHz	1.755 GHz	100.000 kHz	1.75476 GHz	19.45 dBm	-10.55 dB
1.755 GHz	1.756 GHz	30.000 kHz	1.75500 GHz	-22.07 dBm	-9.07 dB
1.756 GHz	1.765 GHz	1.000 MHz	1.75601 GHz	-35.09 dBm	-22.09 dB

Date: 19.SEP.2014 16:55:02

Higher Band Edge Plot for QPSK-RB Size 15, RB Offset 0



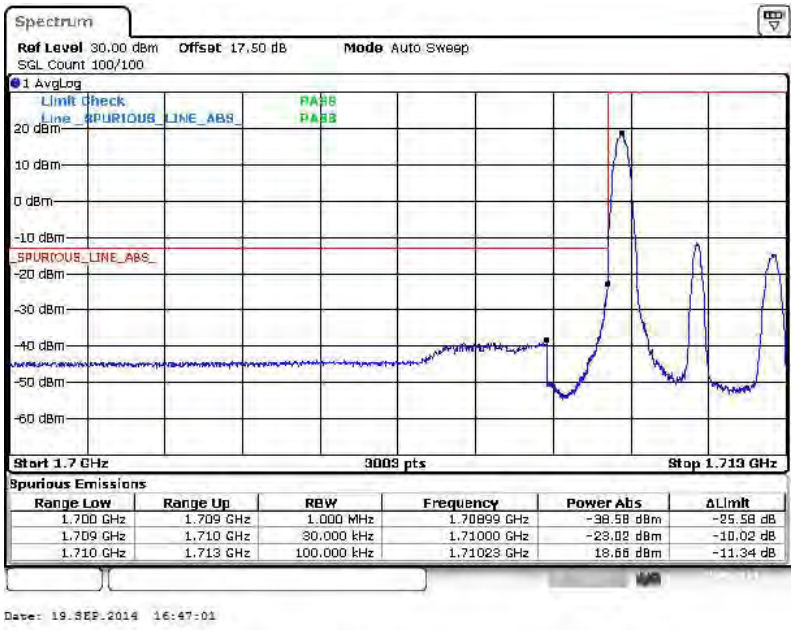
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.752 GHz	1.755 GHz	100.000 kHz	1.75360 GHz	7.31 dBm	-22.69 dB
1.755 GHz	1.756 GHz	30.000 kHz	1.75500 GHz	-30.32 dBm	-17.32 dB
1.756 GHz	1.765 GHz	1.000 MHz	1.75605 GHz	-24.93 dBm	-11.93 dB

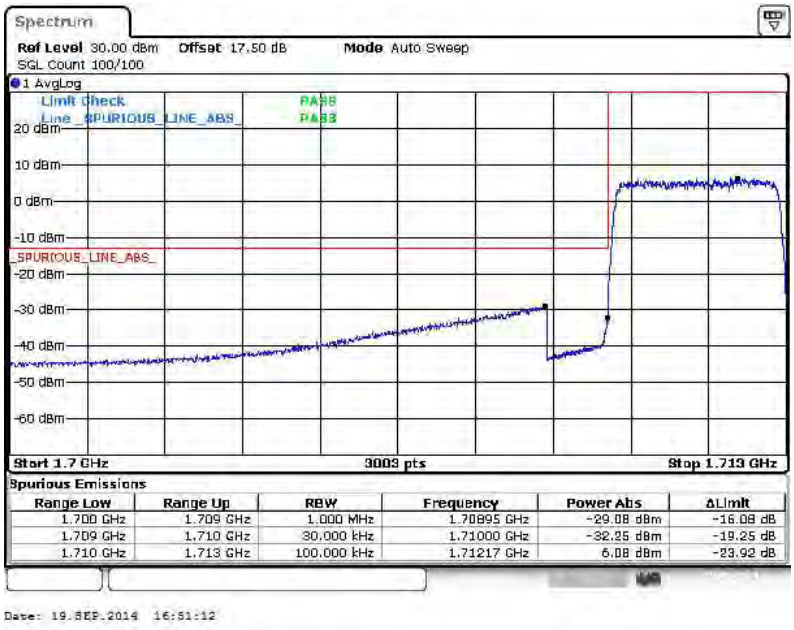
Date: 19.SEP.2014 16:53:51

Band :	LTE Band 4	Band Width :	3MHz / 16QAM

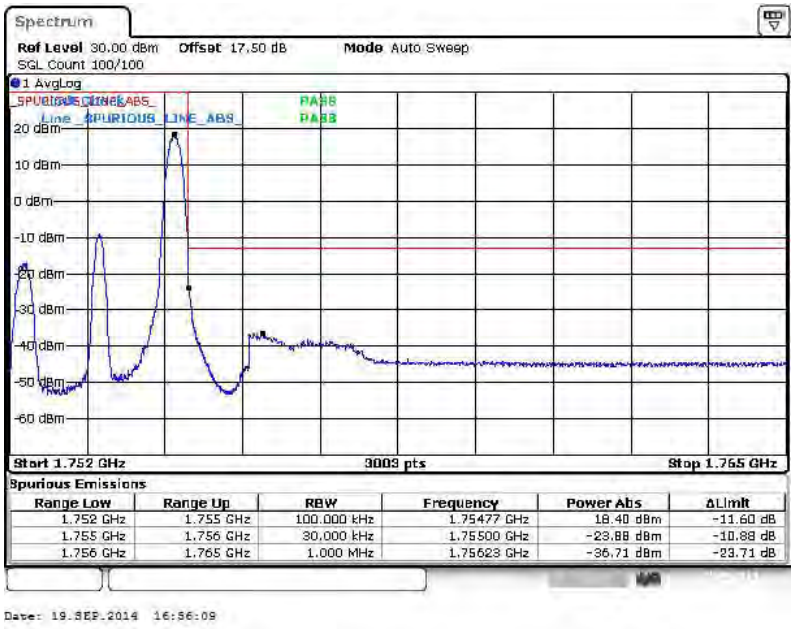
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



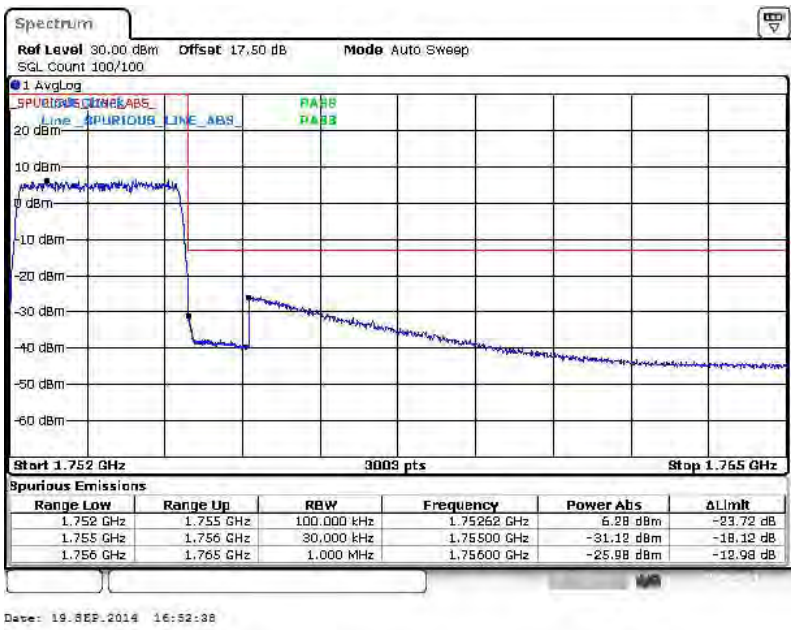
Lower Band Edge Plot for 16QAM-RB Size 15, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 14

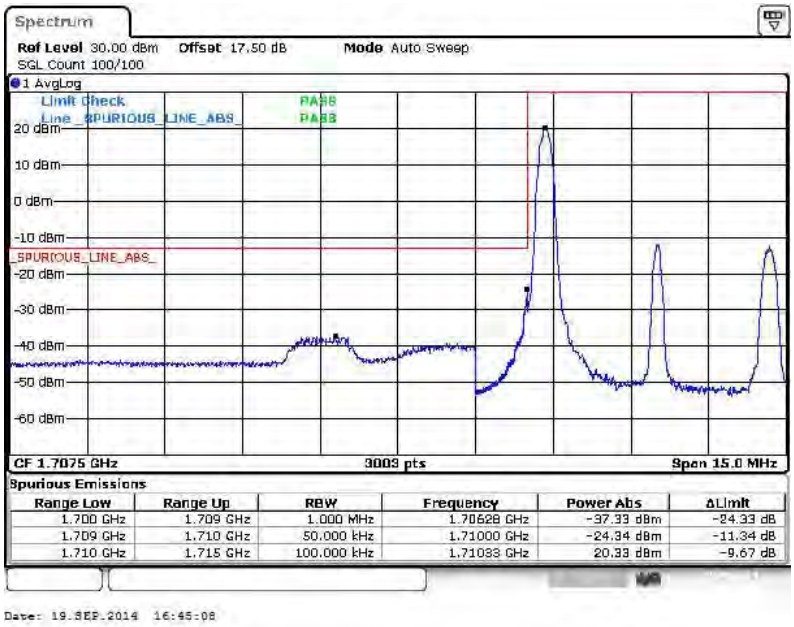


Higher Band Edge Plot for 16QAM-RB Size 15, RB Offset 0

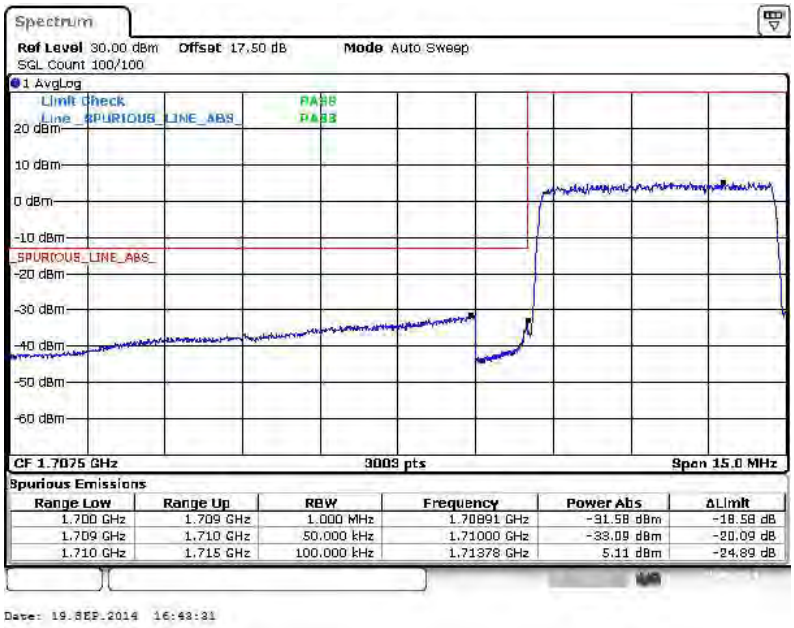


Band :	LTE Band 4	Band Width :	5MHz / QPSK

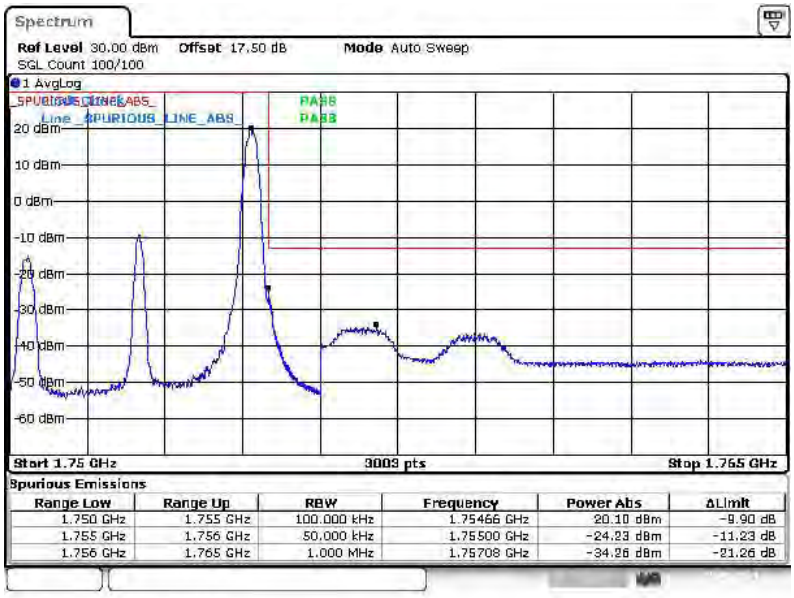
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



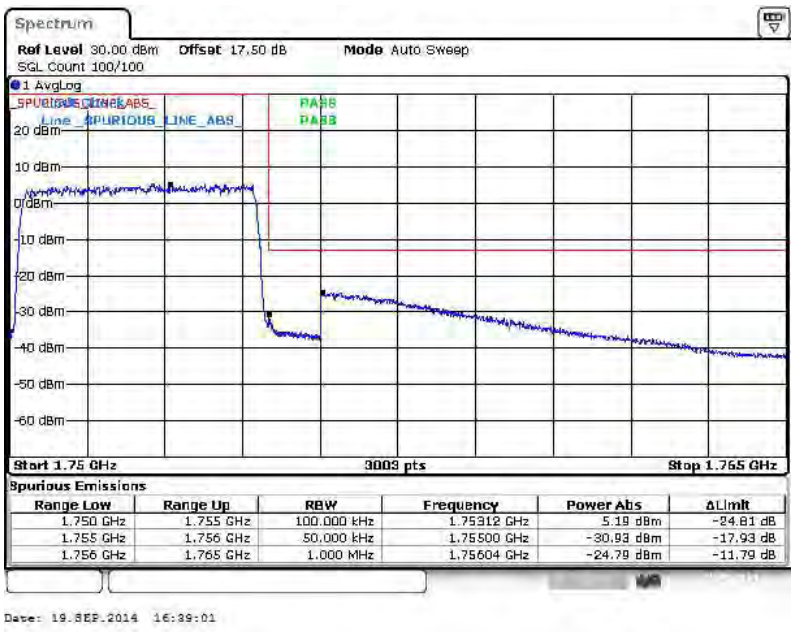
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24

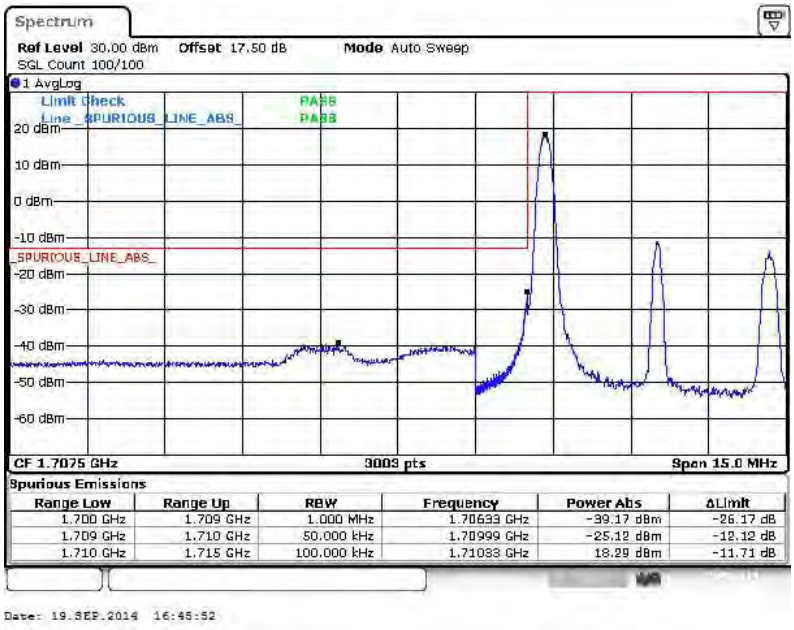


Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0

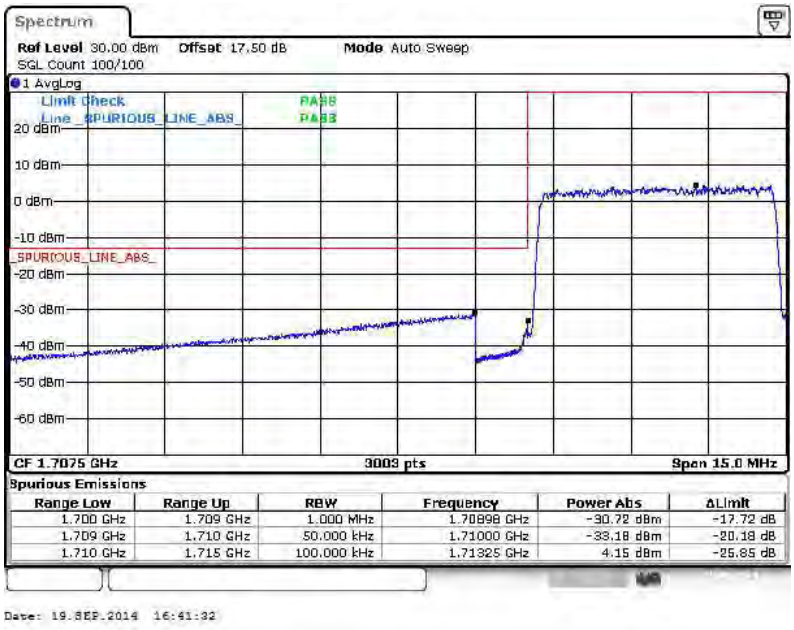


Band :	LTE Band 4	Band Width :	5MHz / 16QAM

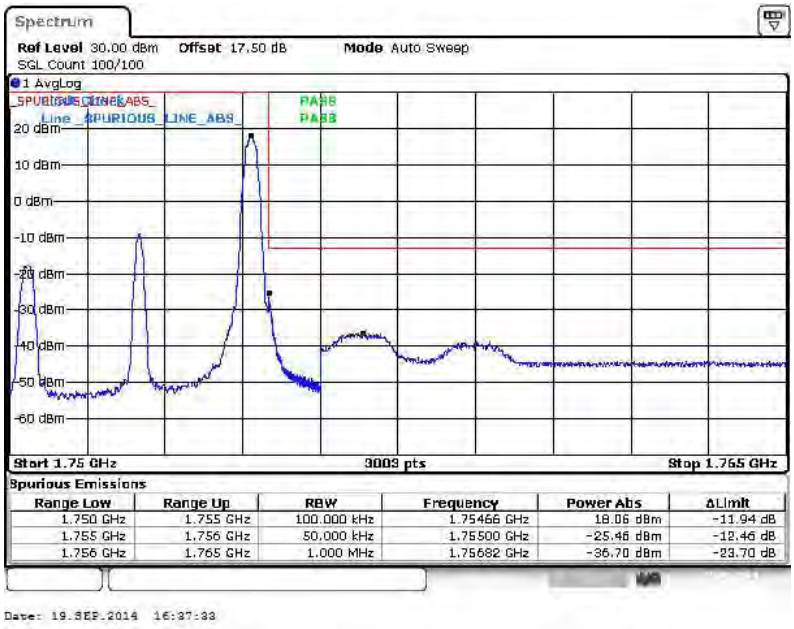
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



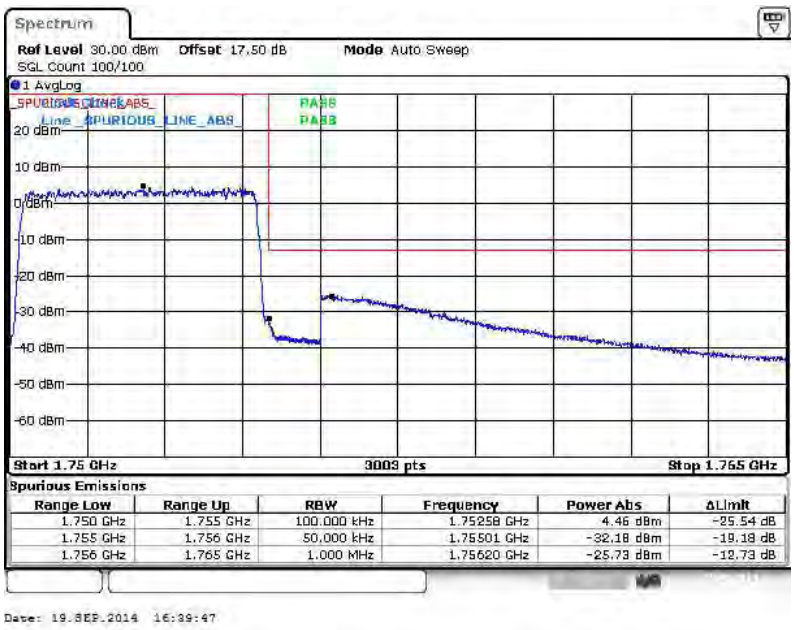
Lower Band Edge Plot for 16QAM-RB Size 25, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24

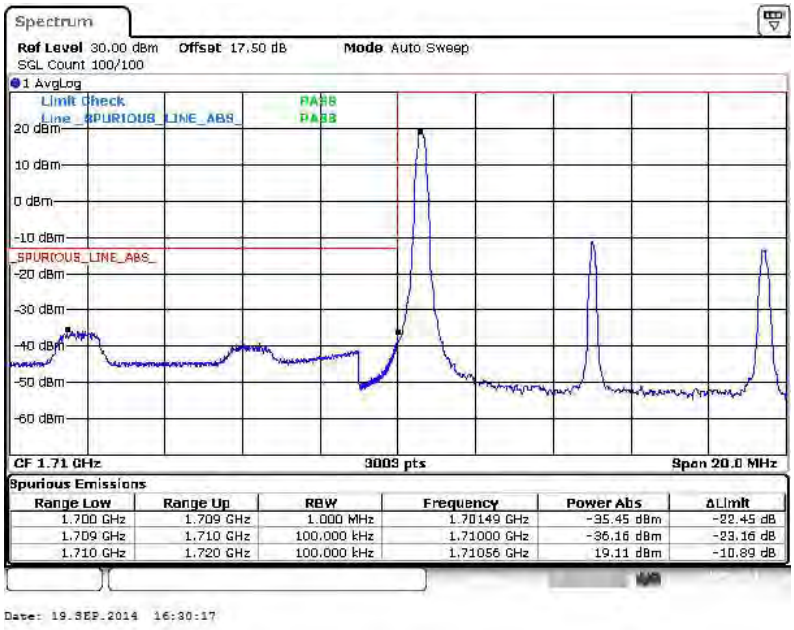


Higher Band Edge Plot for 16QAM-RB Size 25, RB Offset 0

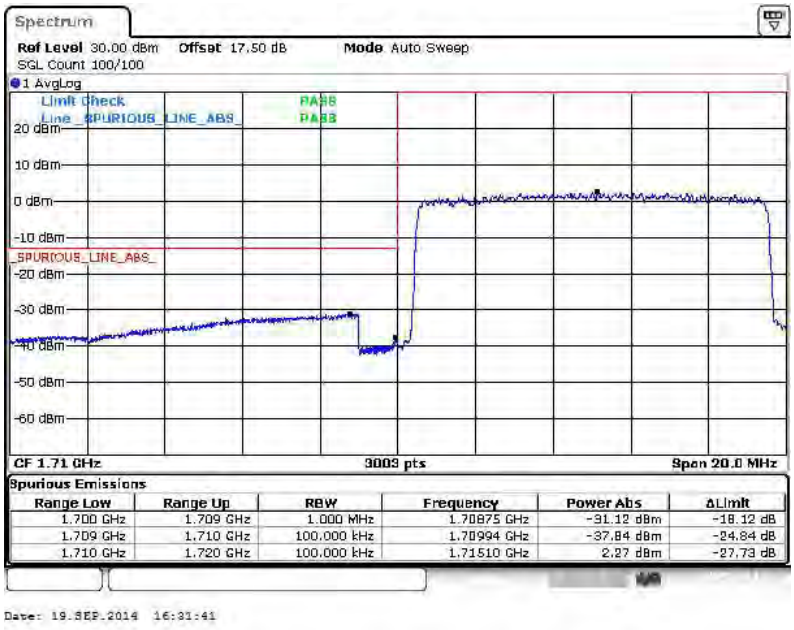


Band :	LTE Band 4	Band Width :	10MHz / QPSK

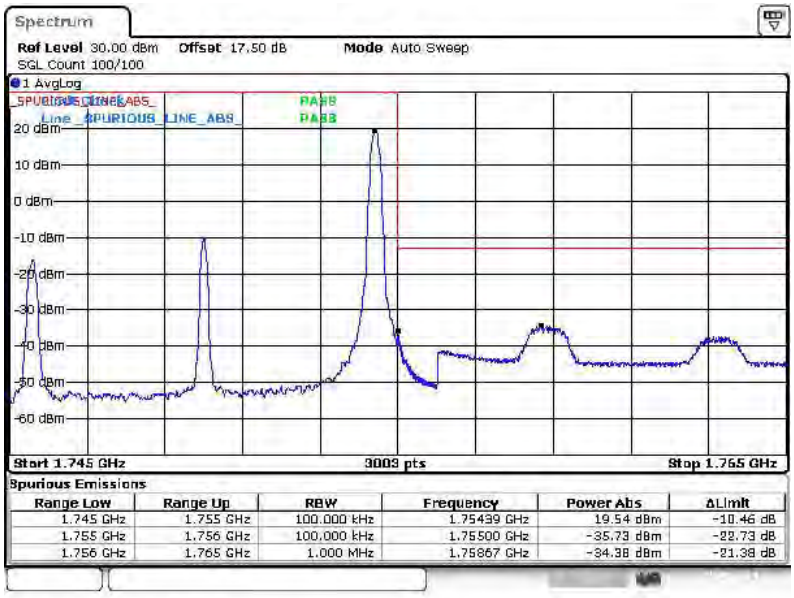
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



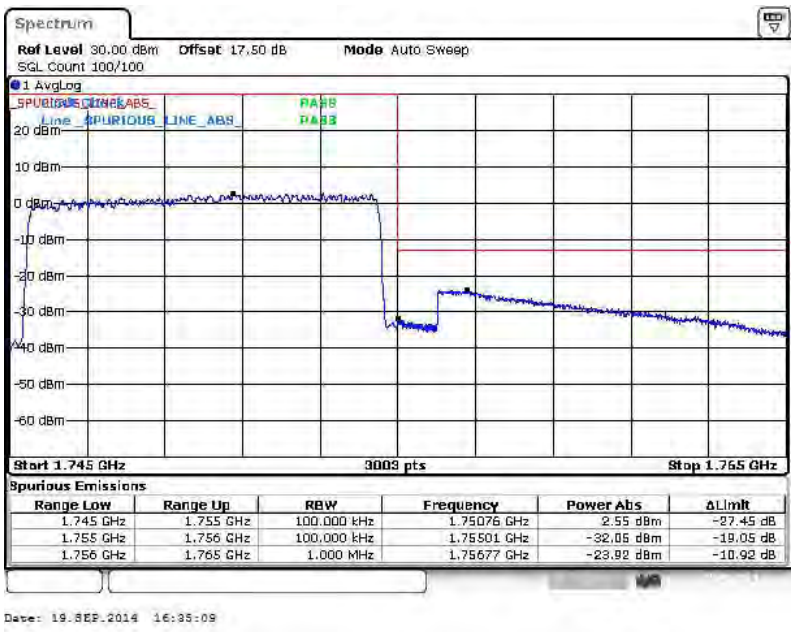
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49

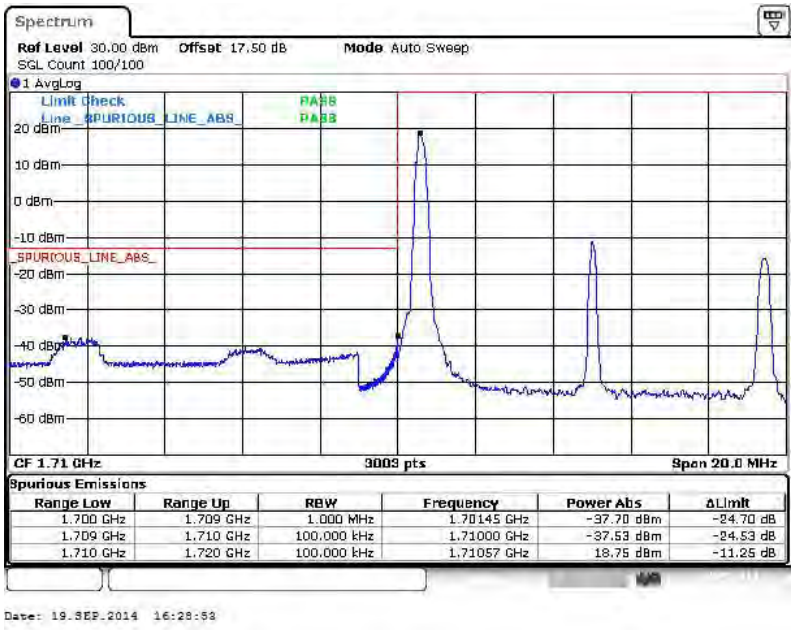


Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0

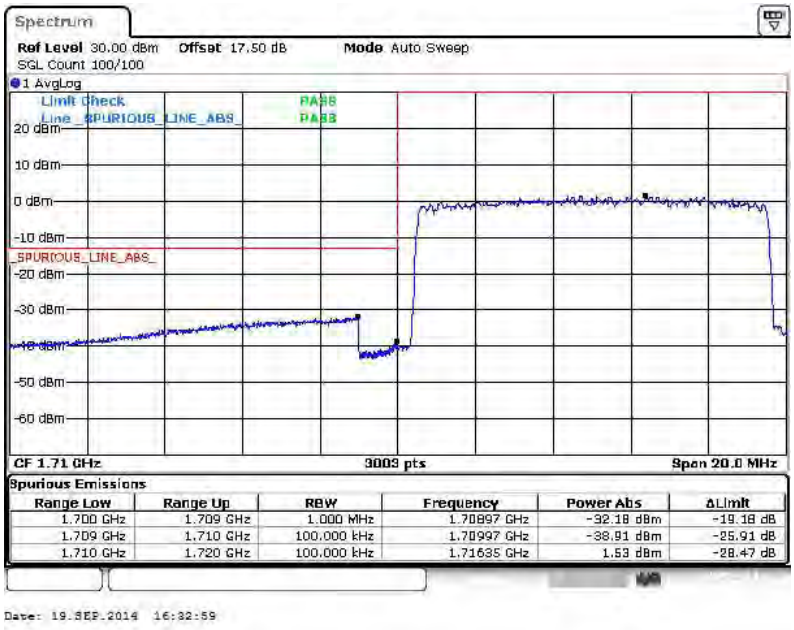


Band :	LTE Band 4	Band Width :	10MHz / 16QAM

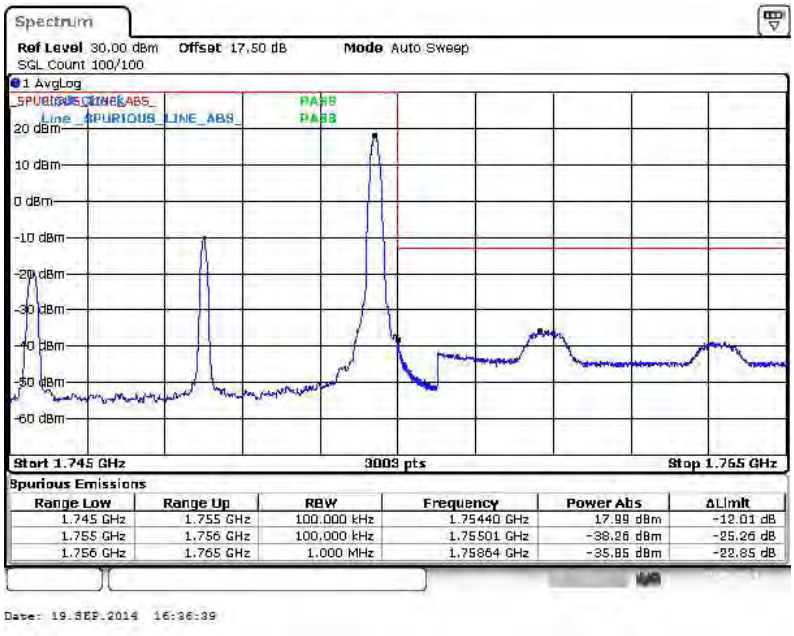
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



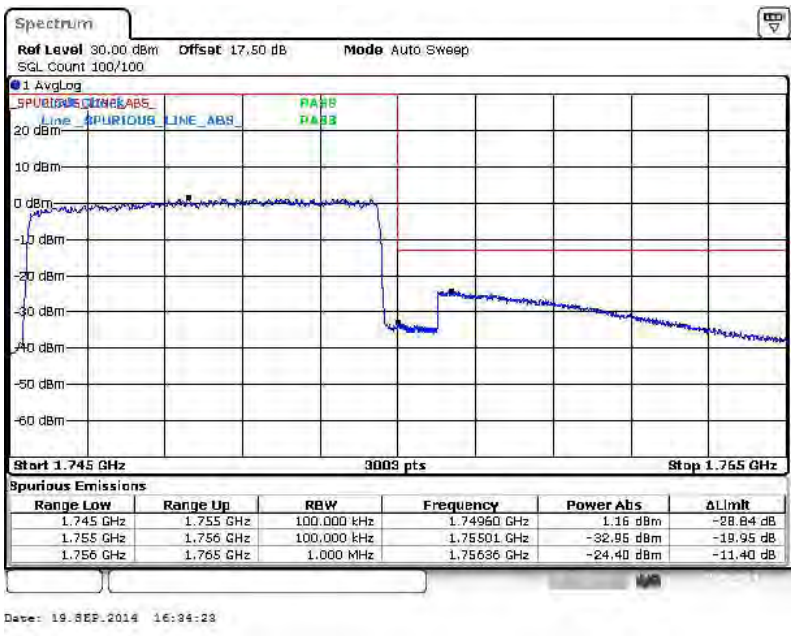
Lower Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 49

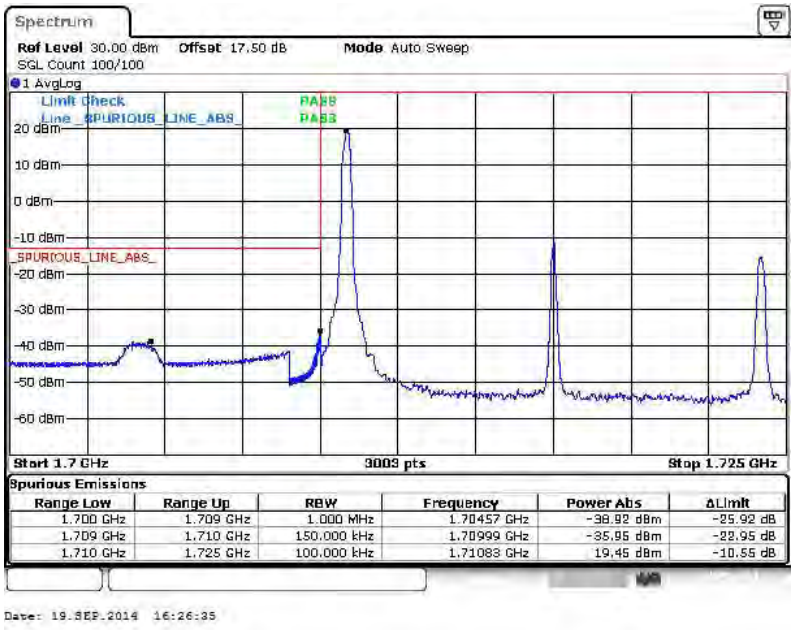


Higher Band Edge Plot for 16QAM-RB Size 50, RB Offset 0

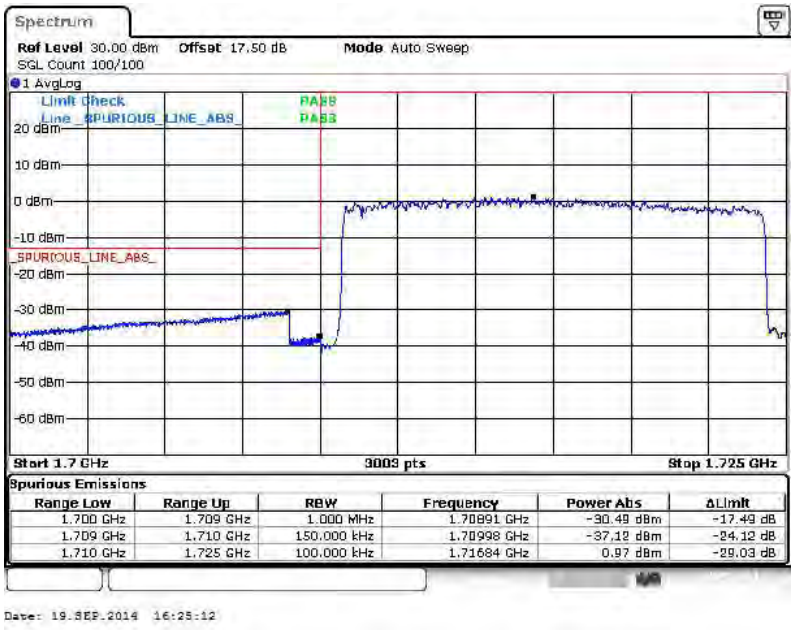


Band :	LTE Band 4	Band Width :	15MHz / QPSK

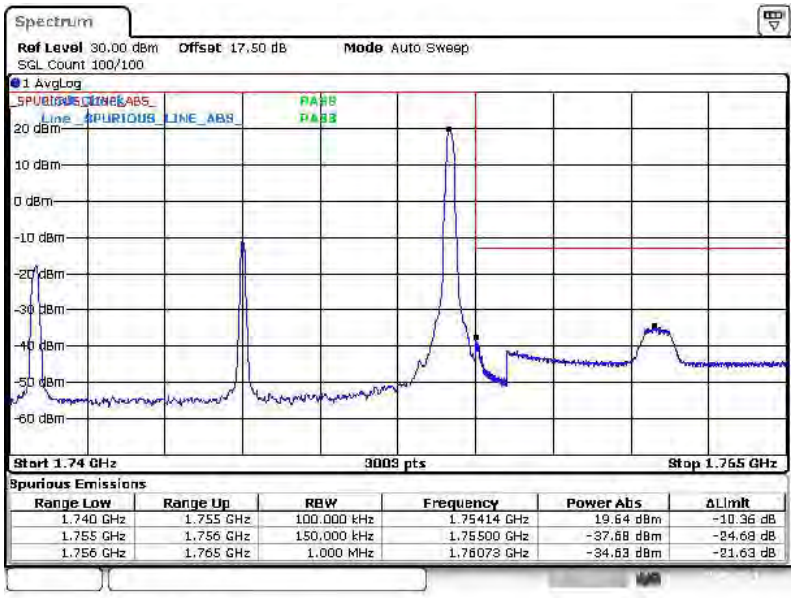
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



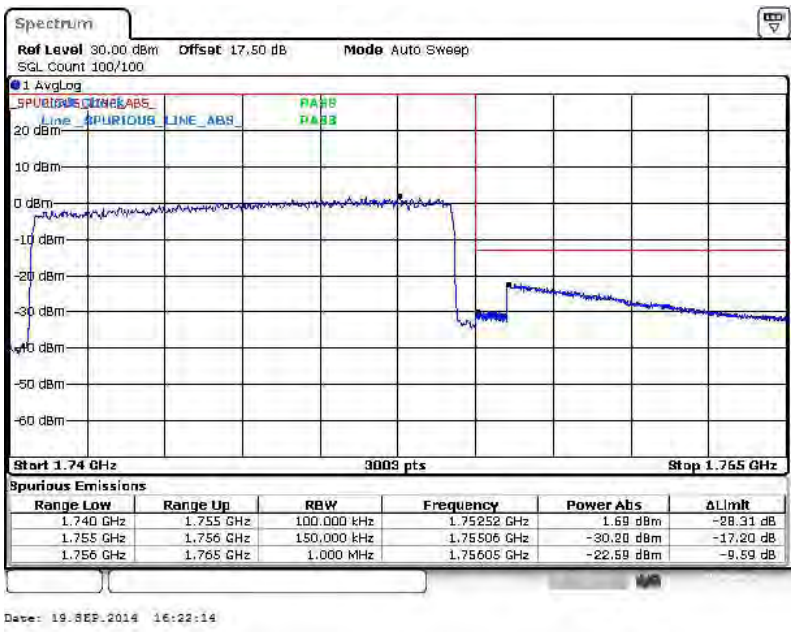
Lower Band Edge Plot for QPSK-RB Size 75, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 74

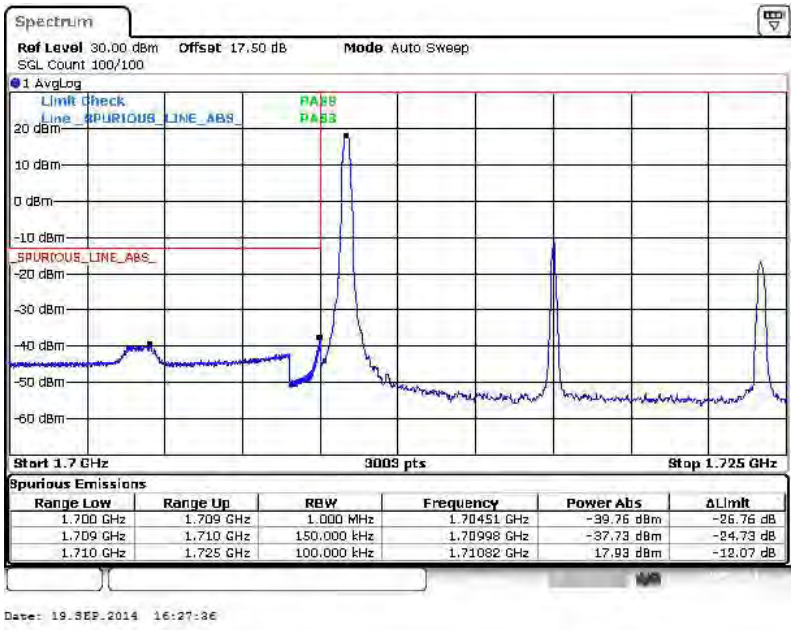


Higher Band Edge Plot for QPSK-RB Size 75, RB Offset 0

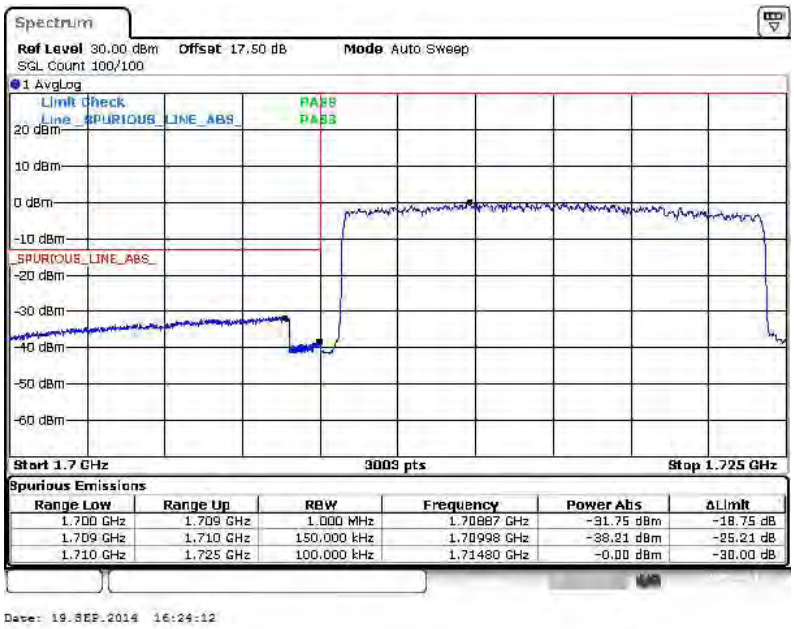


Band :	LTE Band 4	Band Width :	15MHz / 16QAM

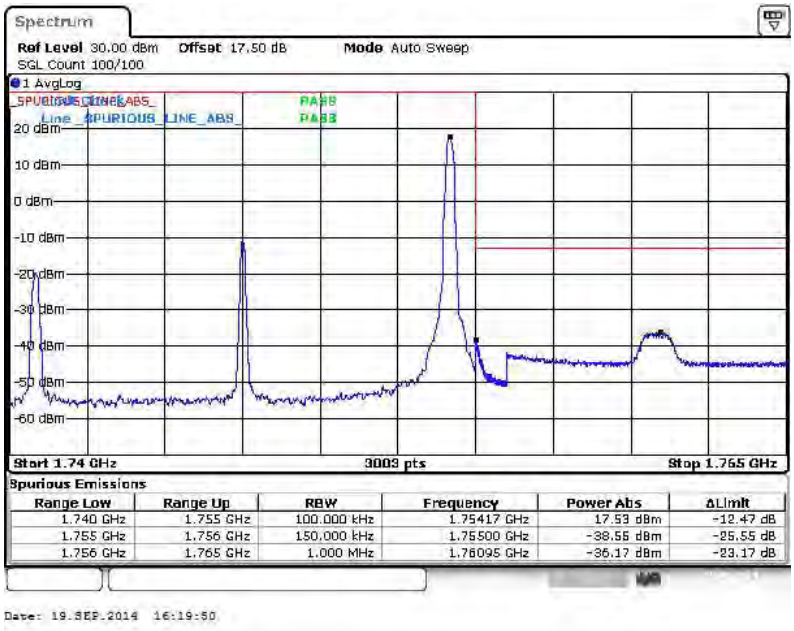
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



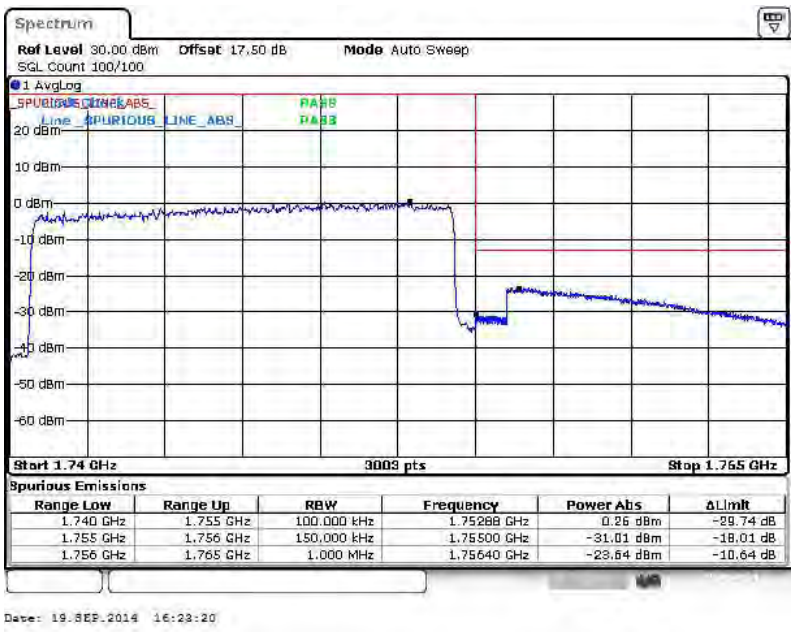
Lower Band Edge Plot for 16QAM-RB Size 75, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 74

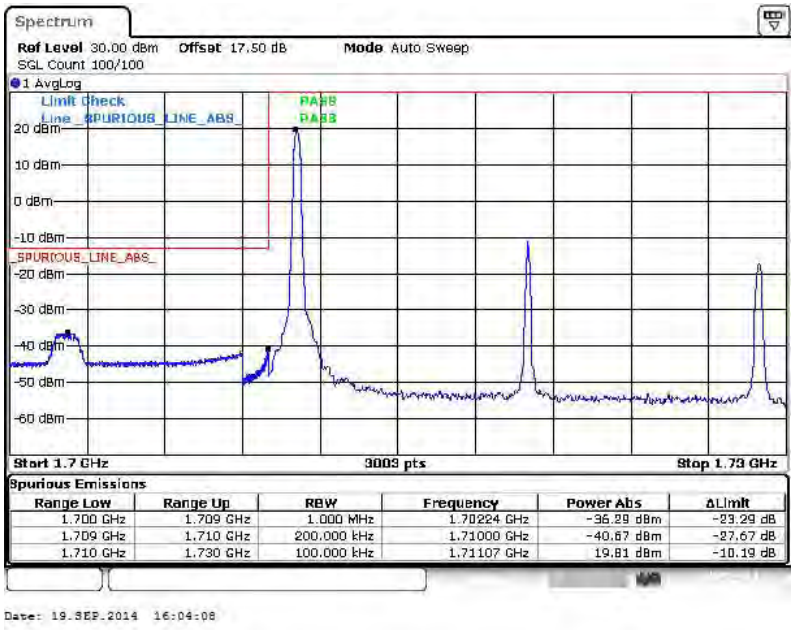


Higher Band Edge Plot for 16QAM-RB Size 75, RB Offset 0

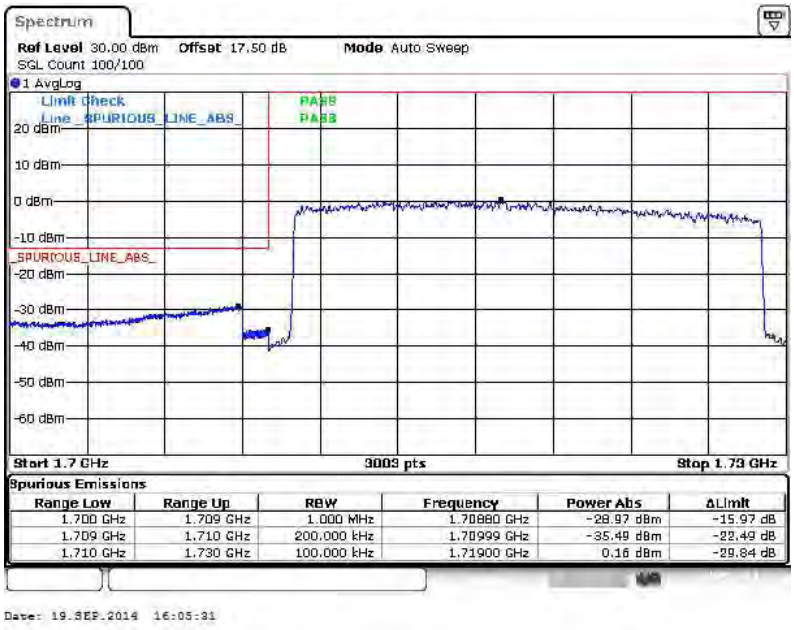


Band :	LTE Band 4	Band Width :	20MHz / QPSK

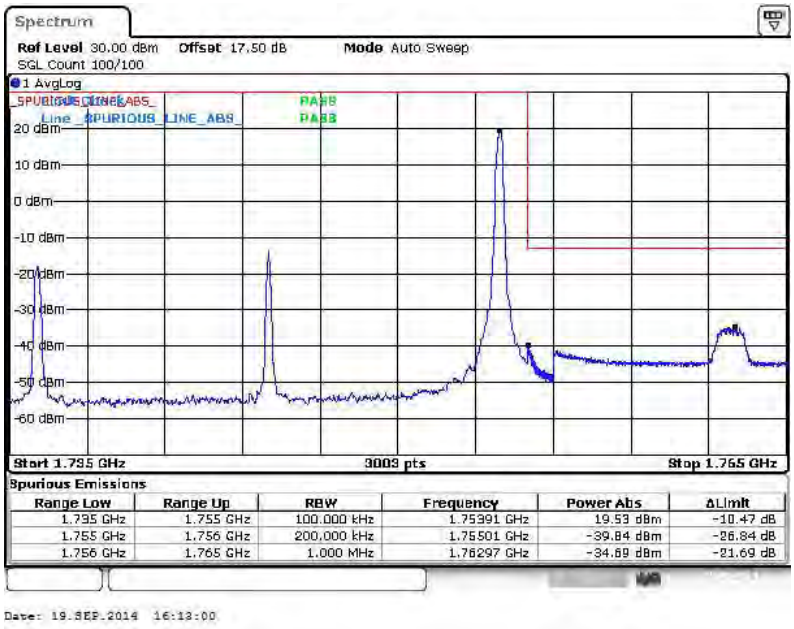
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



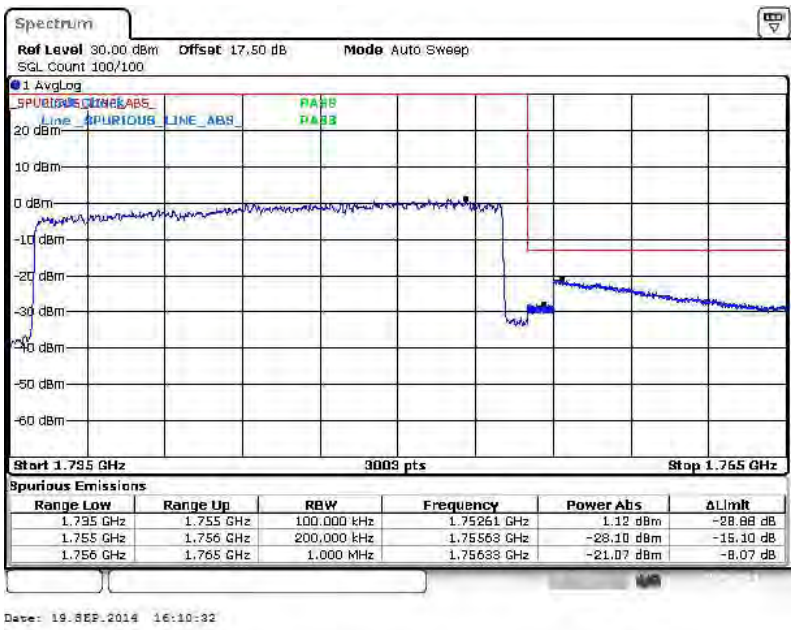
Lower Band Edge Plot for QPSK-RB Size 100, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 99

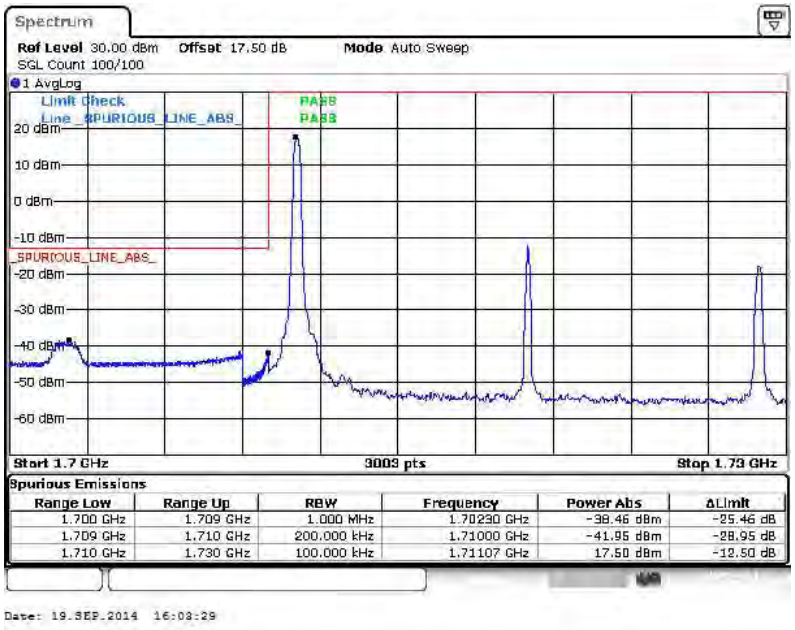


Higher Band Edge Plot for QPSK-RB Size 100, RB Offset 0

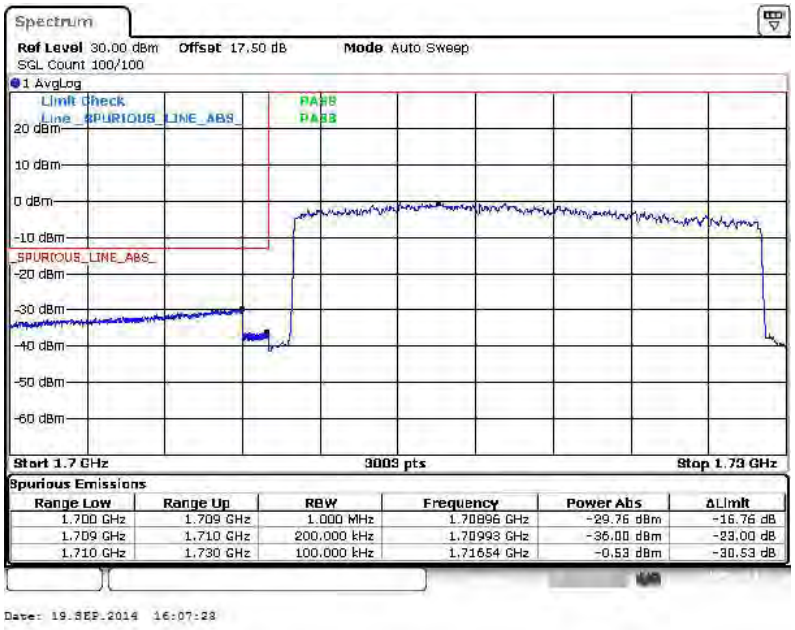


Band :	LTE Band 4	Band Width :	20MHz / 16QAM

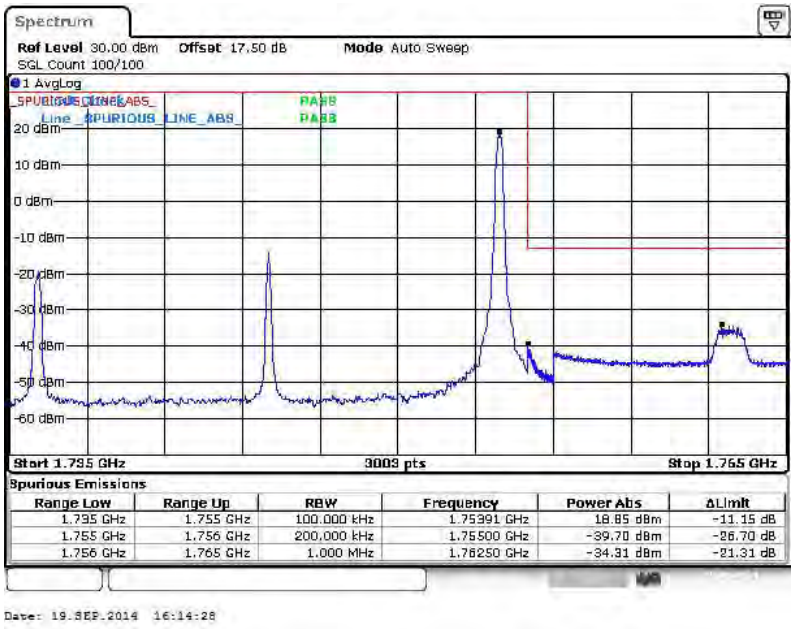
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



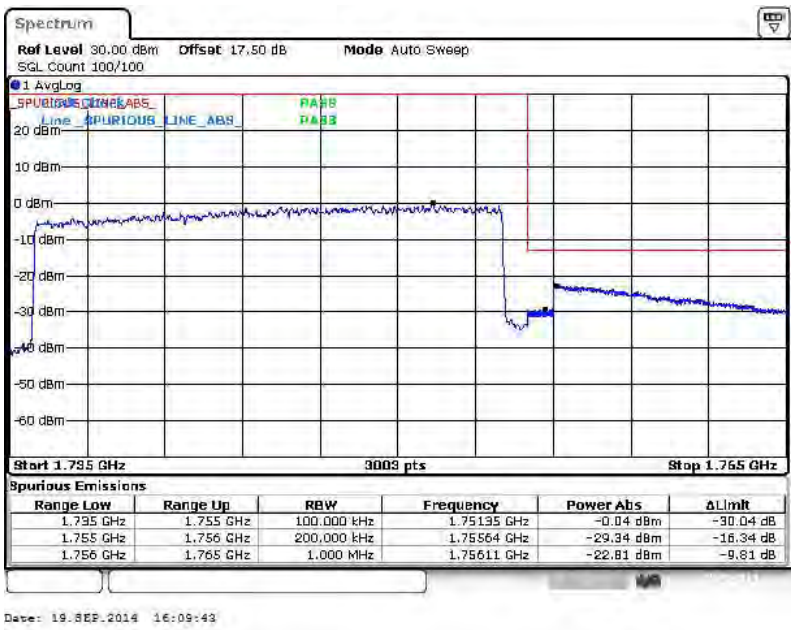
Lower Band Edge Plot for 16QAM-RB Size 100, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 99

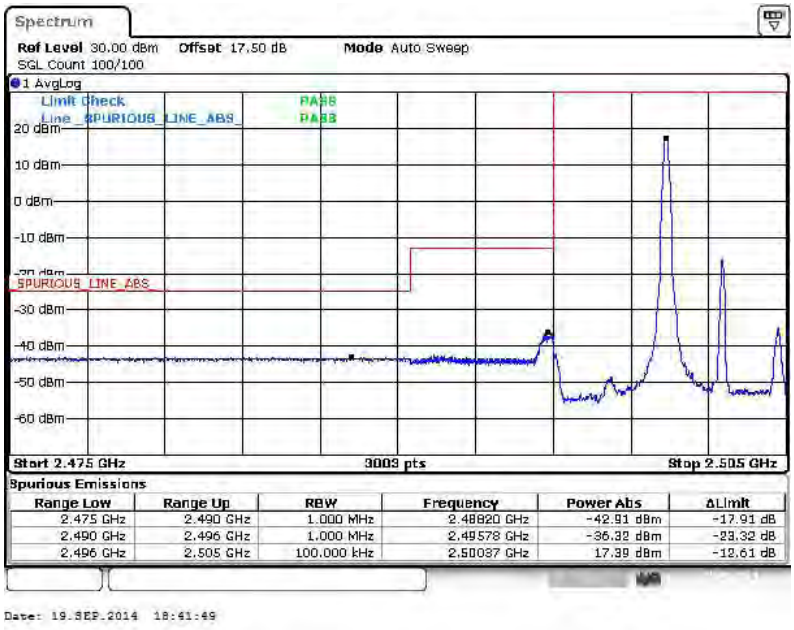


Higher Band Edge Plot for 16QAM-RB Size 100, RB Offset 0

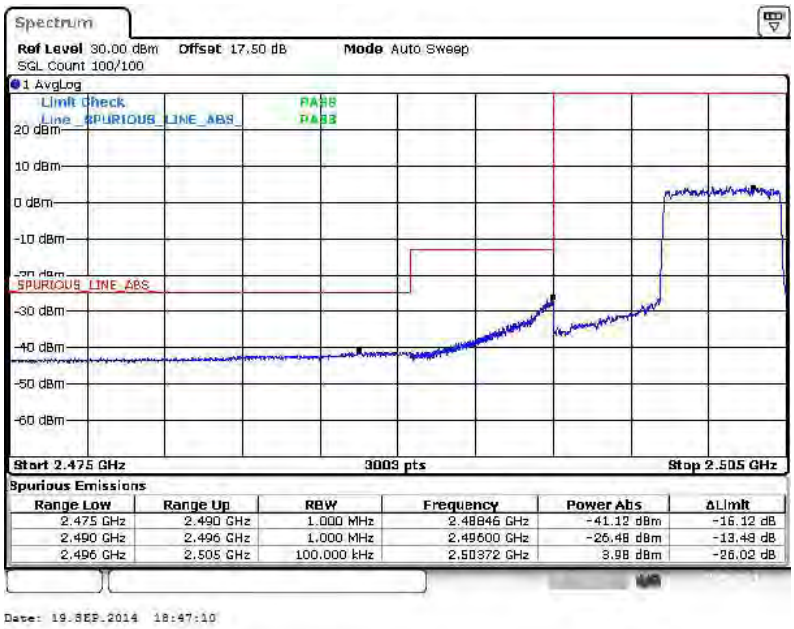


Band :	LTE Band 7	Band Width :	5MHz / QPSK

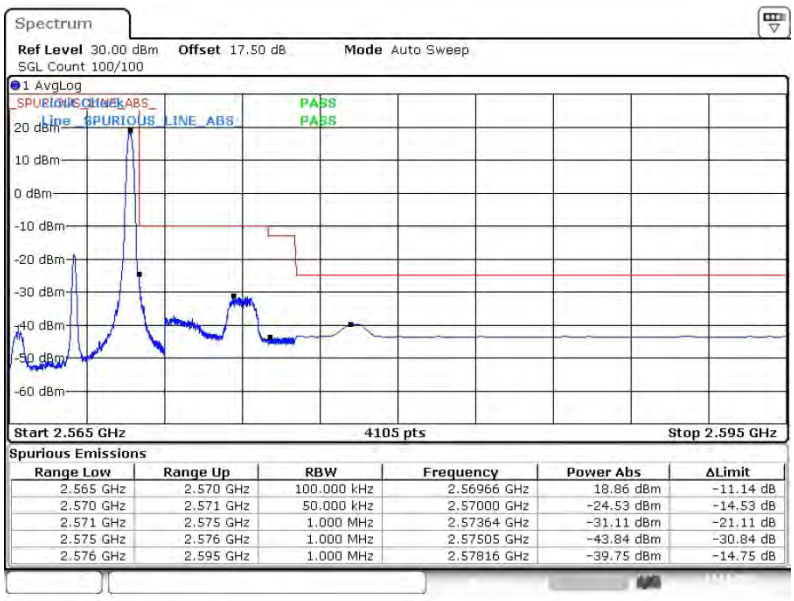
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.565 GHz	2.570 GHz	100.000 kHz	2.56966 GHz	18.86 dBm	-11.14 dB
2.570 GHz	2.571 GHz	50.000 kHz	2.57000 GHz	-24.53 dBm	-14.53 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57364 GHz	-31.11 dBm	-21.11 dB
2.575 GHz	2.576 GHz	1.000 MHz	2.57505 GHz	-43.84 dBm	-30.84 dB
2.576 GHz	2.595 GHz	1.000 MHz	2.57816 GHz	-39.75 dBm	-14.75 dB

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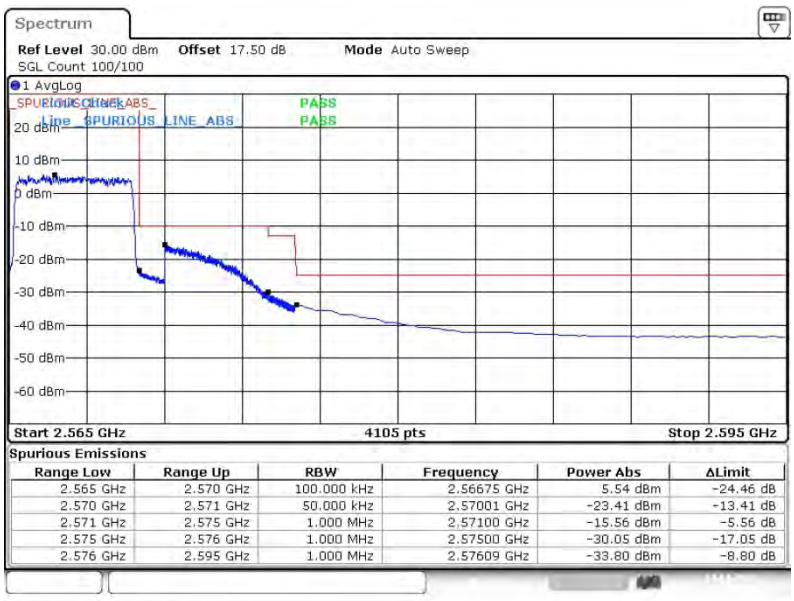
Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0



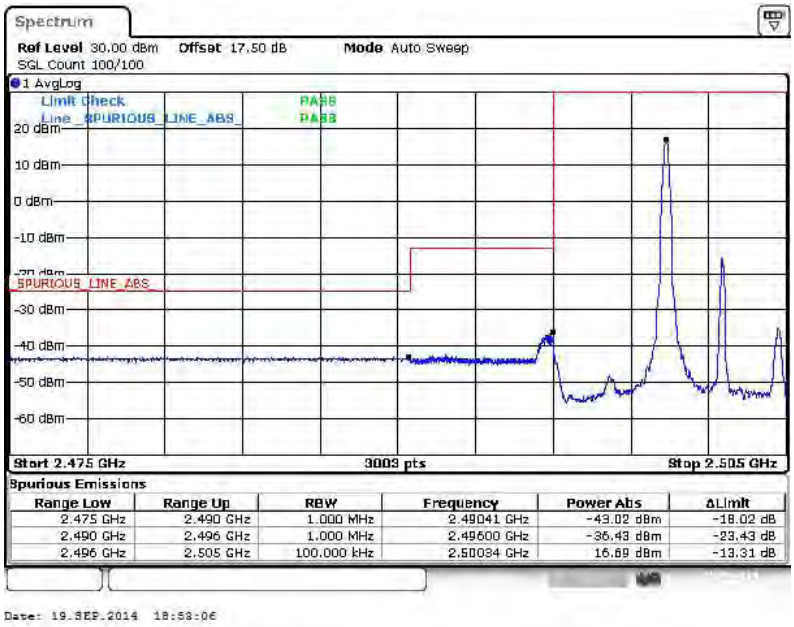
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.565 GHz	2.570 GHz	100.000 kHz	2.56675 GHz	5.54 dBm	-24.46 dB
2.570 GHz	2.571 GHz	50.000 kHz	2.57001 GHz	-23.41 dBm	-13.41 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57100 GHz	-15.56 dBm	-5.56 dB
2.575 GHz	2.576 GHz	1.000 MHz	2.57500 GHz	-30.05 dBm	-17.05 dB
2.576 GHz	2.595 GHz	1.000 MHz	2.57609 GHz	-33.80 dBm	-8.80 dB

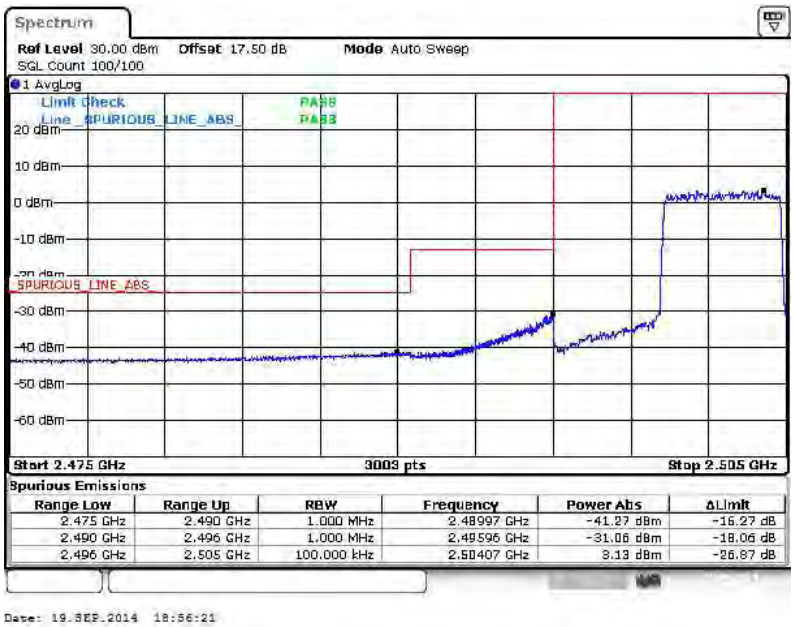
Date: 14.NOV.2014 18:31:53

Band :	LTE Band 7	Band Width :	5MHz / 16QAM

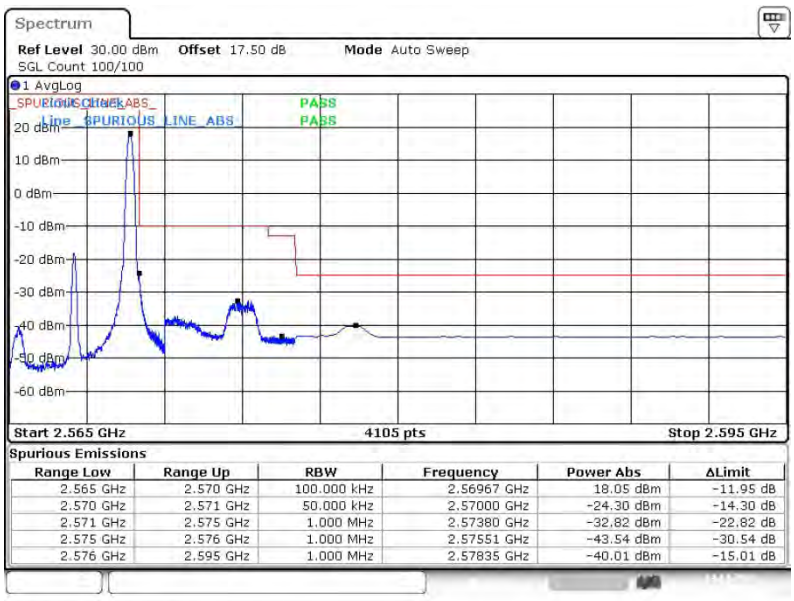
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



Lower Band Edge Plot for 16QAM-RB Size 25, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.565 GHz	2.570 GHz	100.000 kHz	2.56967 GHz	18.05 dBm	-11.95 dB
2.570 GHz	2.571 GHz	50.000 kHz	2.57000 GHz	-24.30 dBm	-14.30 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57380 GHz	-32.82 dBm	-22.82 dB
2.575 GHz	2.576 GHz	1.000 MHz	2.57551 GHz	-43.54 dBm	-30.54 dB
2.576 GHz	2.595 GHz	1.000 MHz	2.57835 GHz	-40.01 dBm	-15.01 dB

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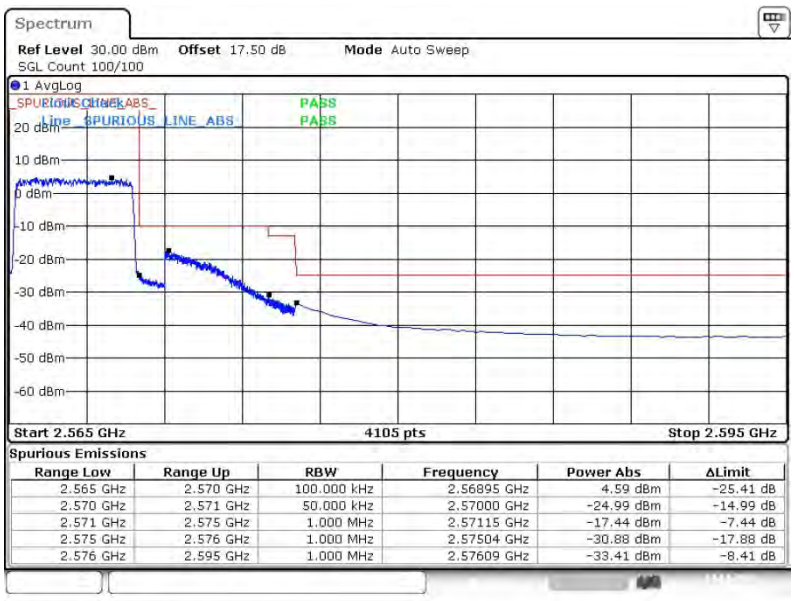
Higher Band Edge Plot for 16QAM-RB Size 25, RB Offset 0



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.565 GHz	2.570 GHz	100.000 kHz	2.56895 GHz	4.59 dBm	-25.41 dB
2.570 GHz	2.571 GHz	50.000 kHz	2.57000 GHz	-24.99 dBm	-14.99 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57115 GHz	-17.44 dBm	-7.44 dB
2.575 GHz	2.576 GHz	1.000 MHz	2.57504 GHz	-30.88 dBm	-17.88 dB
2.576 GHz	2.595 GHz	1.000 MHz	2.57609 GHz	-33.41 dBm	-8.41 dB

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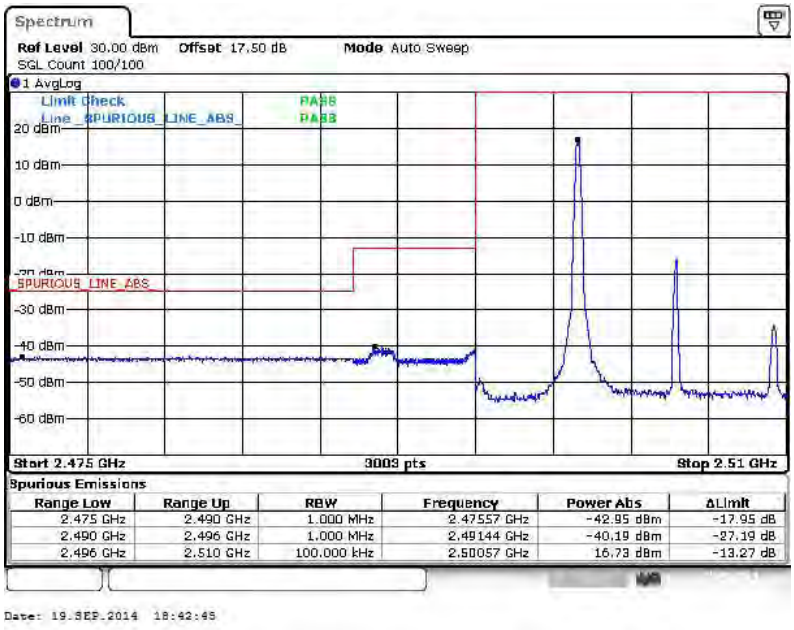
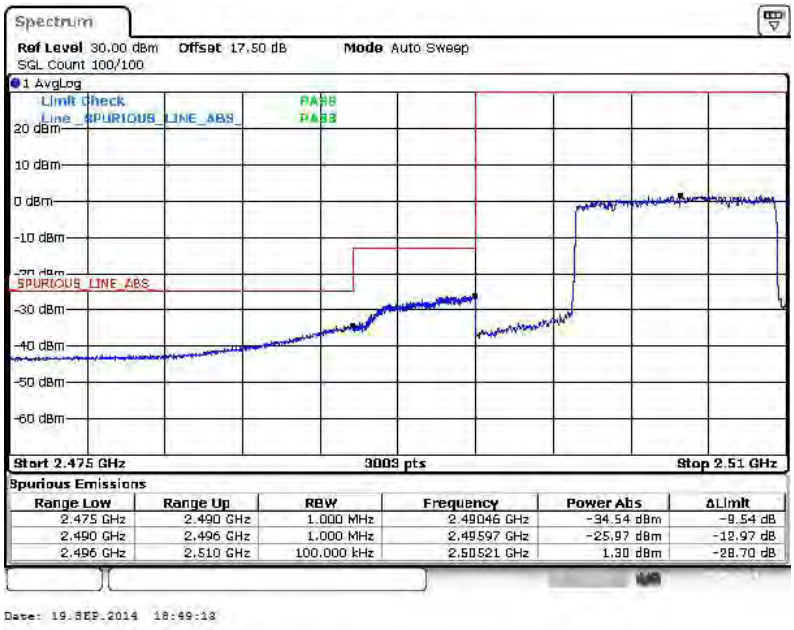
Band :	LTE Band 7	Band Width :	10MHz / QPSK

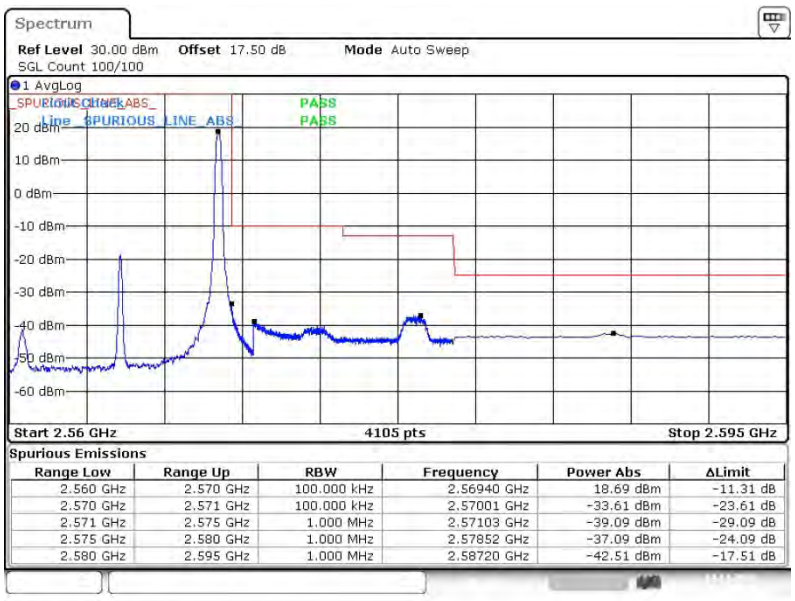
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56940 GHz	18.69 dBm	-11.31 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57001 GHz	-33.61 dBm	-23.61 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57103 GHz	-39.09 dBm	-29.09 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57852 GHz	-37.09 dBm	-24.09 dB
2.580 GHz	2.595 GHz	1.000 MHz	2.58720 GHz	-42.51 dBm	-17.51 dB

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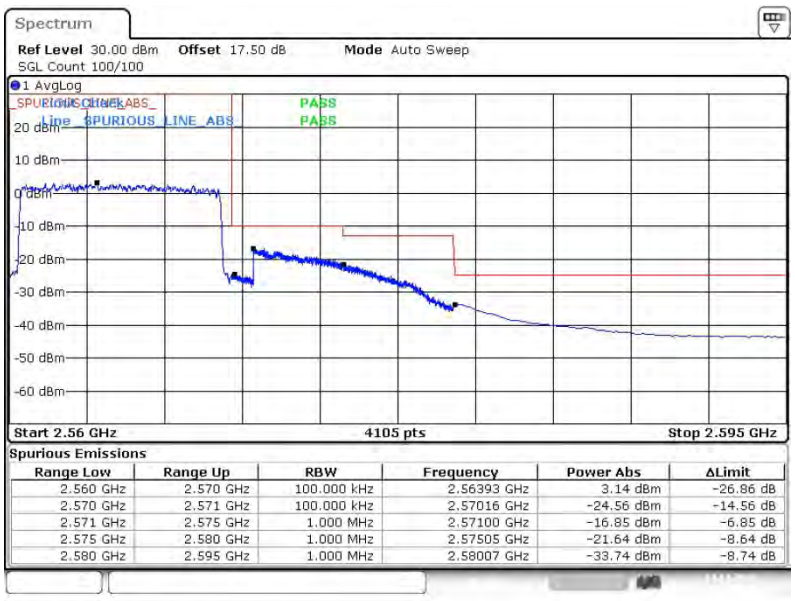
Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0



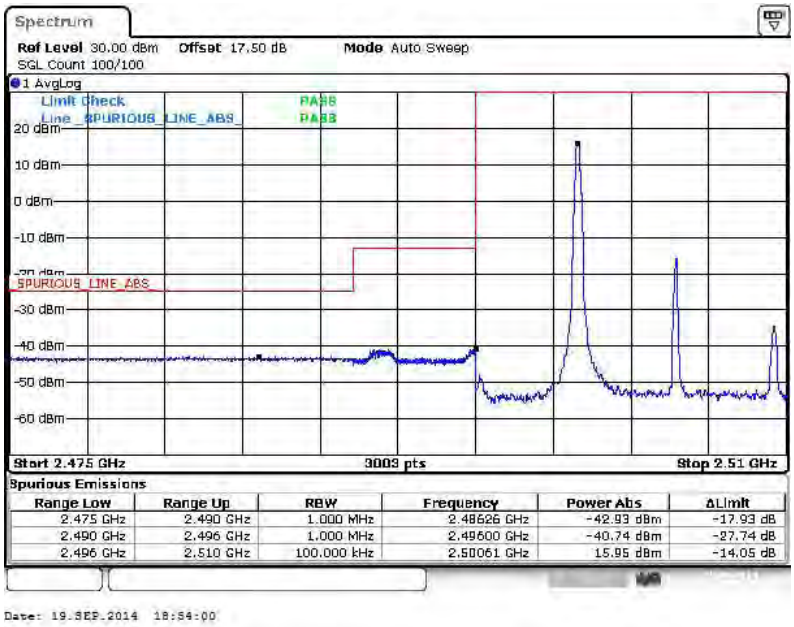
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56393 GHz	3.14 dBm	-26.86 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57016 GHz	-24.56 dBm	-14.56 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57100 GHz	-16.85 dBm	-6.85 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57505 GHz	-21.64 dBm	-8.64 dB
2.580 GHz	2.595 GHz	1.000 MHz	2.58007 GHz	-33.74 dBm	-8.74 dB

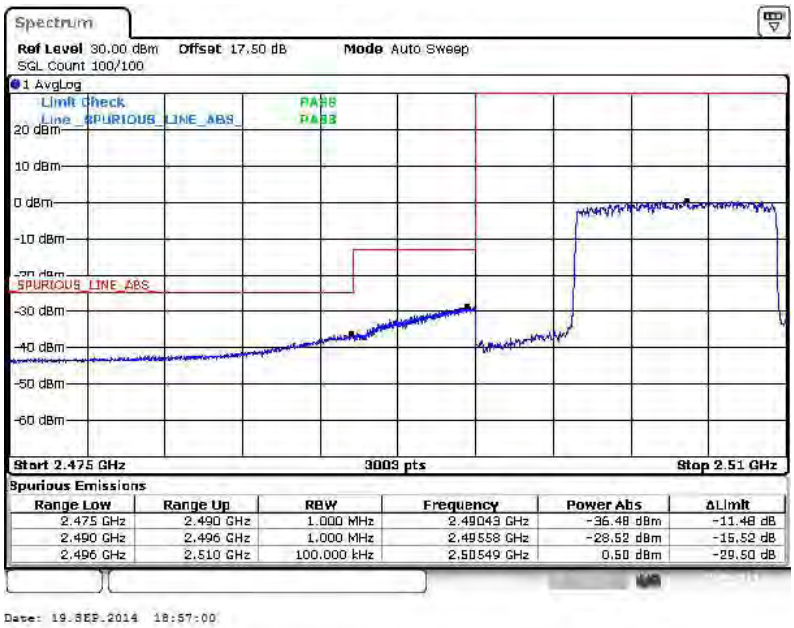
Date: 14.NOV.2014 18:28:51

Band :	LTE Band 7	Band Width :	10MHz / 16QAM

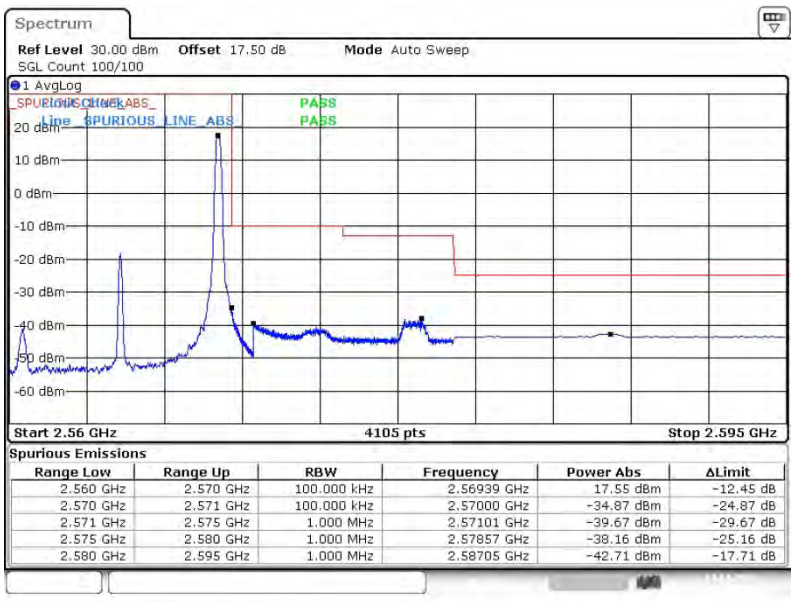
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



Lower Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 49



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56939 GHz	17.55 dBm	-12.45 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-34.87 dBm	-24.87 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57101 GHz	-39.67 dBm	-29.67 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57857 GHz	-38.16 dBm	-25.16 dB
2.580 GHz	2.595 GHz	1.000 MHz	2.58705 GHz	-42.71 dBm	-17.71 dB

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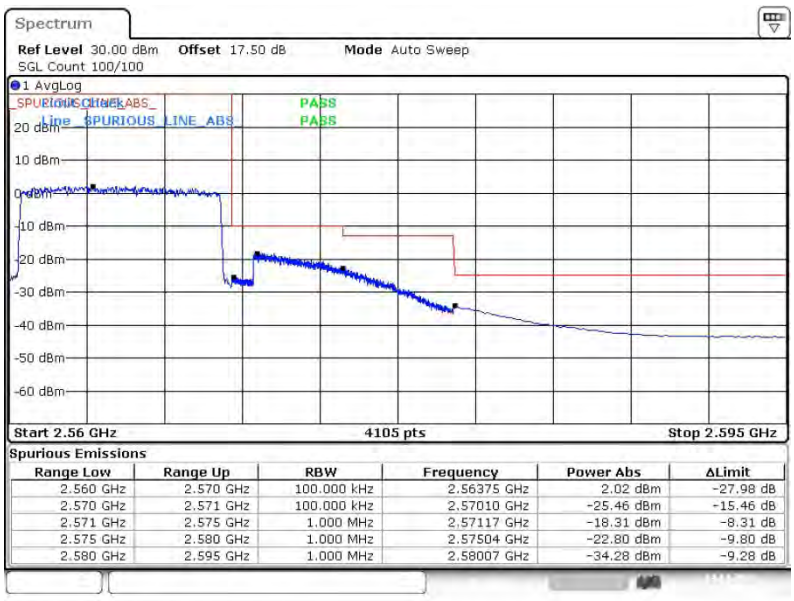
Higher Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56375 GHz	2.02 dBm	-27.98 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57010 GHz	-25.46 dBm	-15.46 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57117 GHz	-18.31 dBm	-8.31 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57504 GHz	-22.80 dBm	-9.80 dB
2.580 GHz	2.595 GHz	1.000 MHz	2.58007 GHz	-34.28 dBm	-9.28 dB

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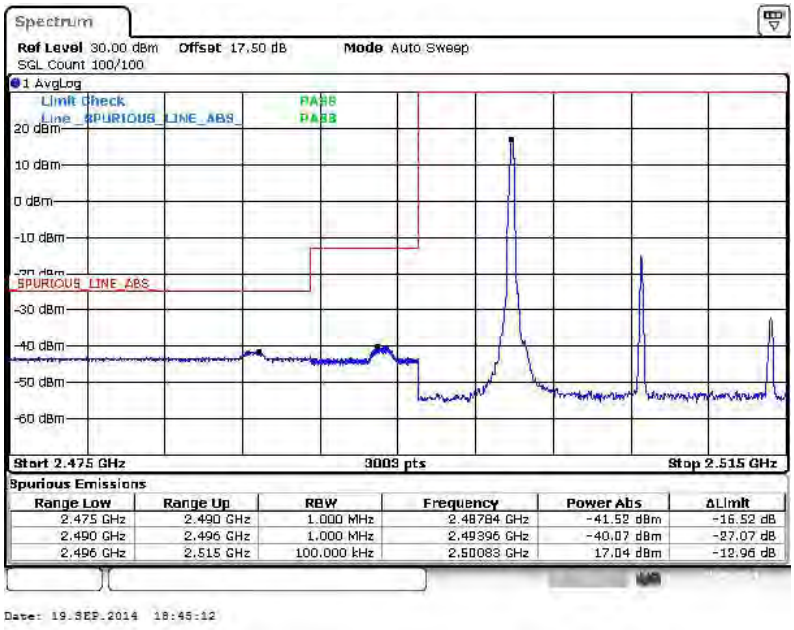
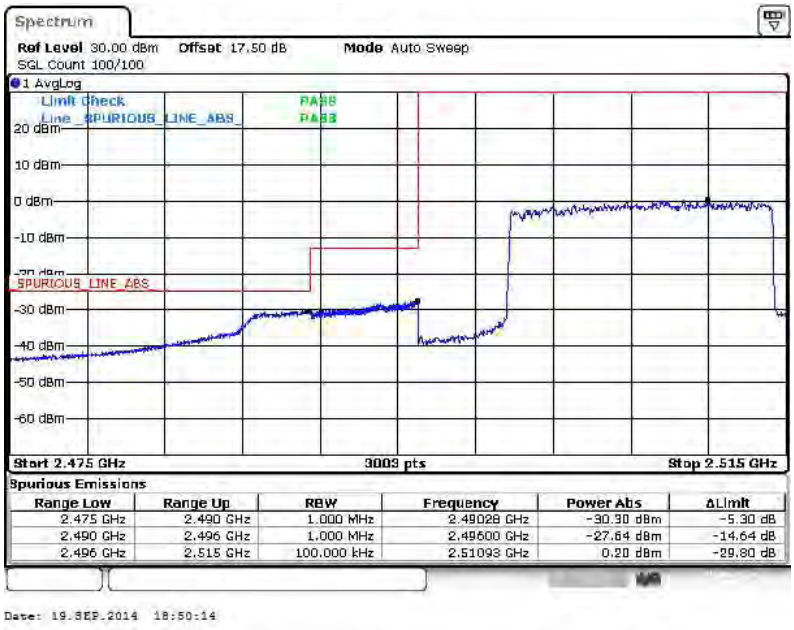
Band :	LTE Band 7	Band Width :	15MHz / QPSK

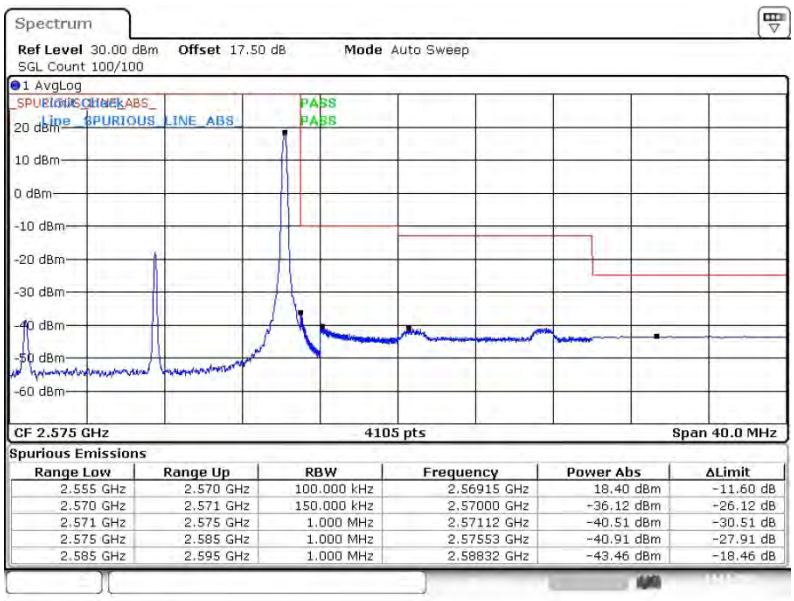
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Lower Band Edge Plot for QPSK-RB Size 75, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 74



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.555 GHz	2.570 GHz	100.000 kHz	2.56915 GHz	18.40 dBm	-11.60 dB
2.570 GHz	2.571 GHz	150.000 kHz	2.57000 GHz	-36.12 dBm	-26.12 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57112 GHz	-40.51 dBm	-30.51 dB
2.575 GHz	2.585 GHz	1.000 MHz	2.57553 GHz	-40.91 dBm	-27.91 dB
2.585 GHz	2.595 GHz	1.000 MHz	2.58832 GHz	-43.46 dBm	-18.46 dB

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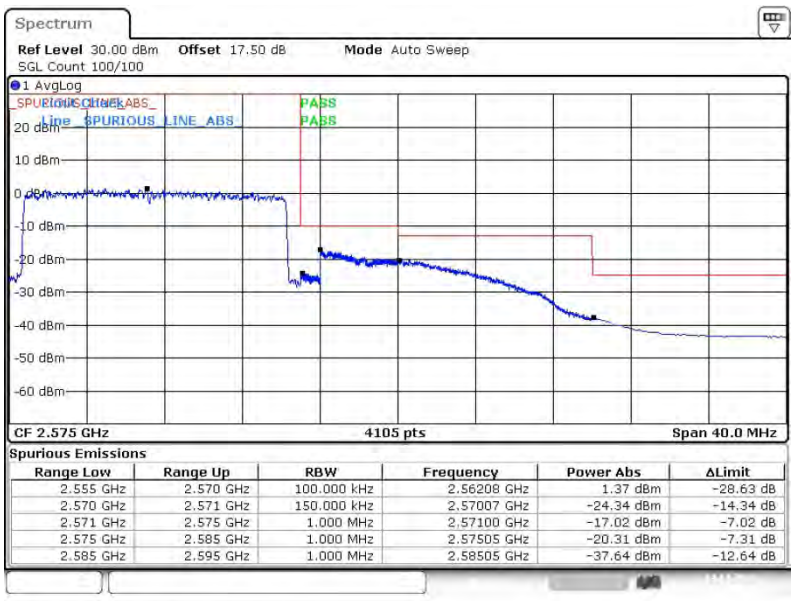
Higher Band Edge Plot for QPSK-RB Size 75, RB Offset 0



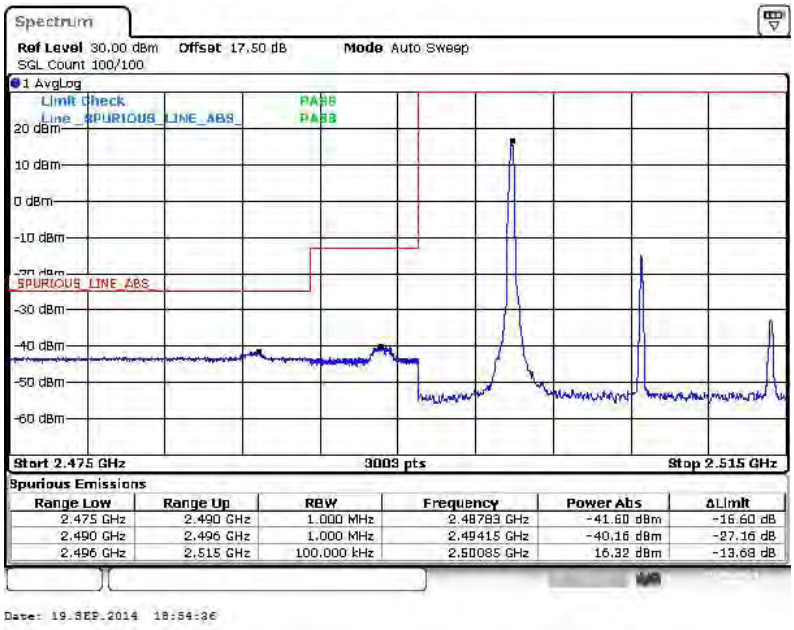
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.555 GHz	2.570 GHz	100.000 kHz	2.56208 GHz	1.37 dBm	-28.63 dB
2.570 GHz	2.571 GHz	150.000 kHz	2.57007 GHz	-24.34 dBm	-14.34 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57100 GHz	-17.02 dBm	-7.02 dB
2.575 GHz	2.585 GHz	1.000 MHz	2.57505 GHz	-20.31 dBm	-7.31 dB
2.585 GHz	2.595 GHz	1.000 MHz	2.58505 GHz	-37.64 dBm	-12.64 dB

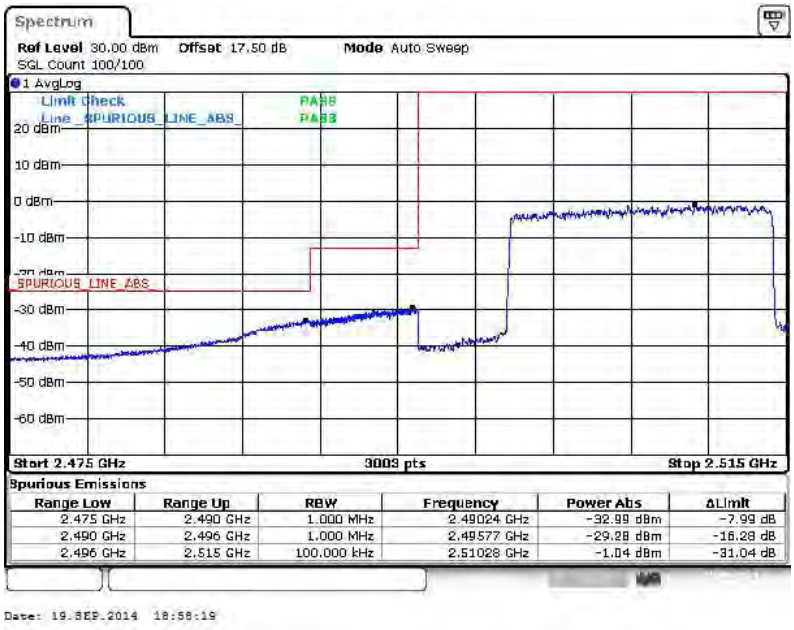
Date: 14.NOV.2014 18:32:29

Band :	LTE Band 7	Band Width :	15MHz / 16QAM

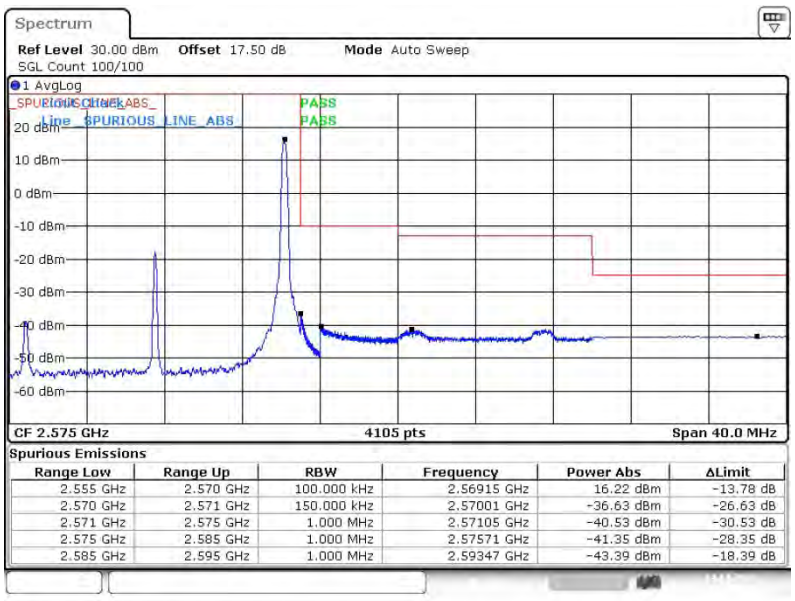
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



Lower Band Edge Plot for 16QAM-RB Size 75, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 74



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.555 GHz	2.570 GHz	100.000 kHz	2.56915 GHz	16.22 dBm	-13.78 dB
2.570 GHz	2.571 GHz	150.000 kHz	2.57001 GHz	-36.63 dBm	-26.63 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57105 GHz	-40.53 dBm	-30.53 dB
2.575 GHz	2.585 GHz	1.000 MHz	2.57571 GHz	-41.35 dBm	-28.35 dB
2.585 GHz	2.595 GHz	1.000 MHz	2.59347 GHz	-43.39 dBm	-18.39 dB

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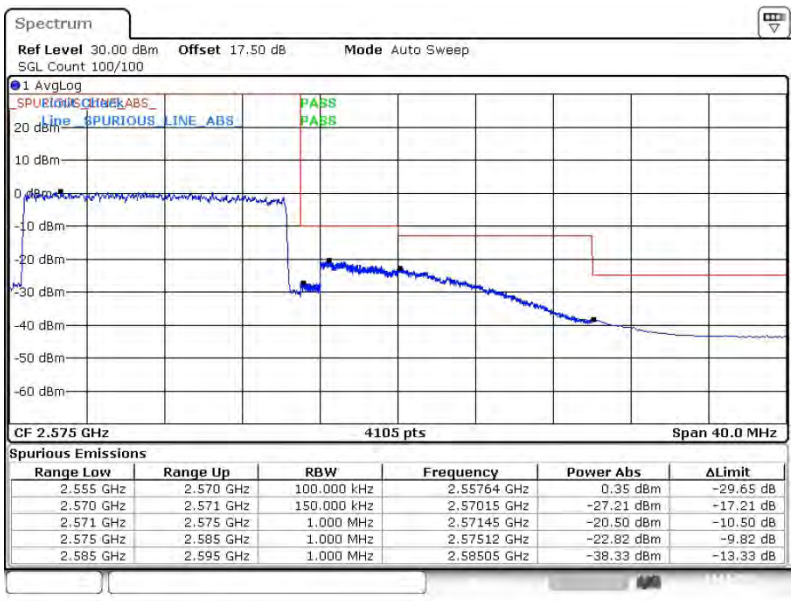
Higher Band Edge Plot for 16QAM-RB Size 75, RB Offset 0



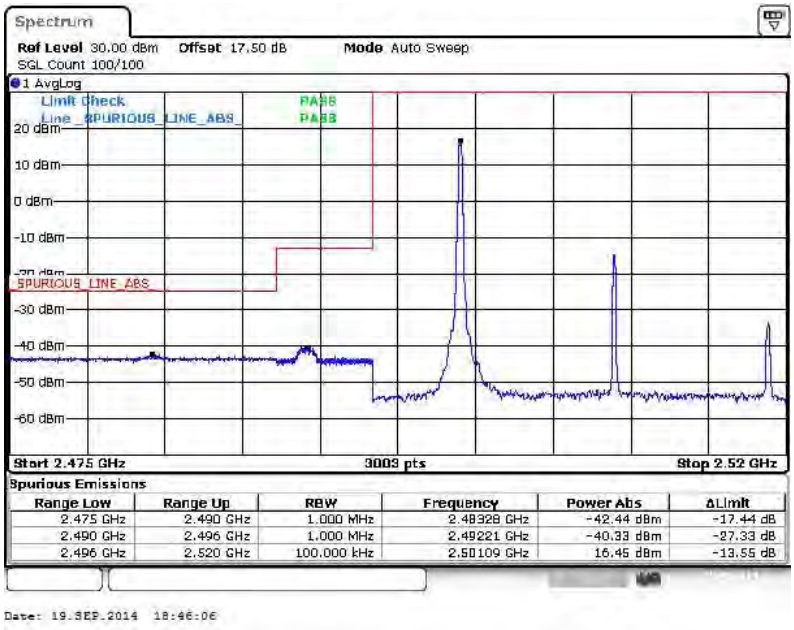
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.555 GHz	2.570 GHz	100.000 kHz	2.55764 GHz	0.35 dBm	-29.65 dB
2.570 GHz	2.571 GHz	150.000 kHz	2.57015 GHz	-27.21 dBm	-17.21 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57145 GHz	-20.50 dBm	-10.50 dB
2.575 GHz	2.585 GHz	1.000 MHz	2.57512 GHz	-22.82 dBm	-9.82 dB
2.585 GHz	2.595 GHz	1.000 MHz	2.58505 GHz	-38.33 dBm	-13.33 dB

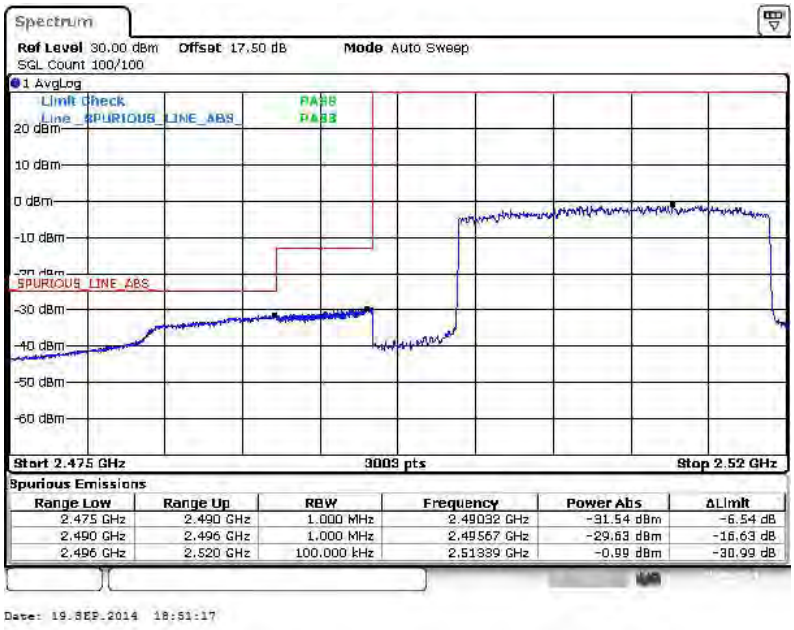
Date: 14.NOV.2014 18:33:29

Band :	LTE Band 7	Band Width :	20MHz / QPSK

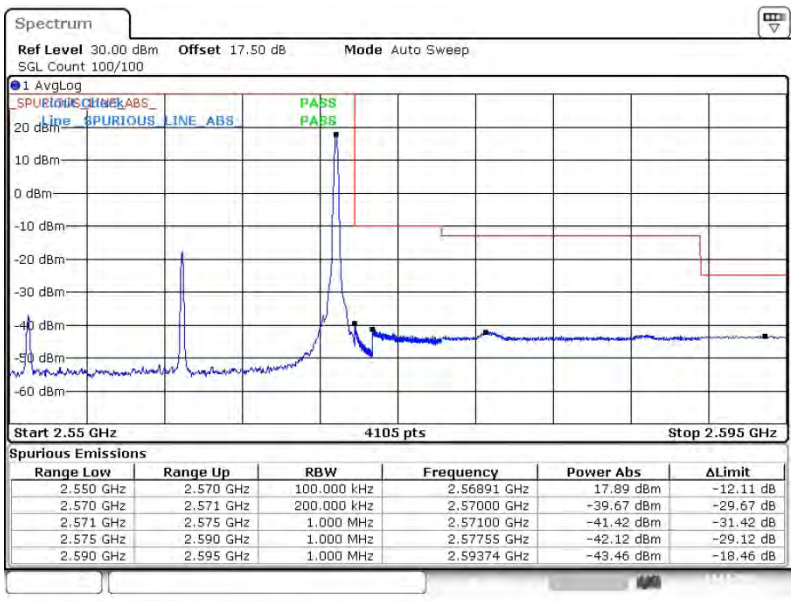
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Lower Band Edge Plot for QPSK-RB Size 100, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 99

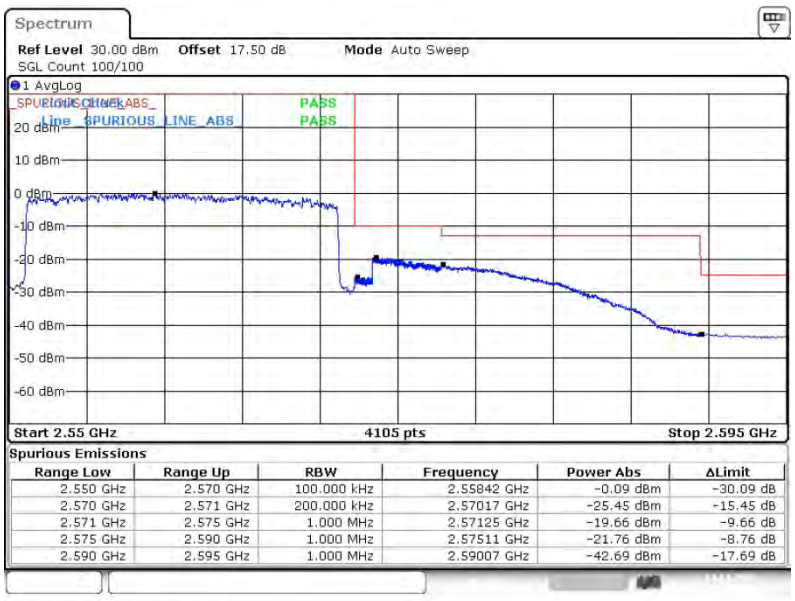


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.550 GHz	2.570 GHz	100.000 kHz	2.56891 GHz	17.89 dBm	-12.11 dB
2.570 GHz	2.571 GHz	200.000 kHz	2.57000 GHz	-39.67 dBm	-29.67 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57100 GHz	-41.42 dBm	-31.42 dB
2.575 GHz	2.590 GHz	1.000 MHz	2.57755 GHz	-42.12 dBm	-29.12 dB
2.590 GHz	2.595 GHz	1.000 MHz	2.59374 GHz	-43.46 dBm	-18.46 dB

Date: 14.NOV.2014 18:34:39

Higher Band Edge Plot for QPSK-RB Size 100, RB Offset 0



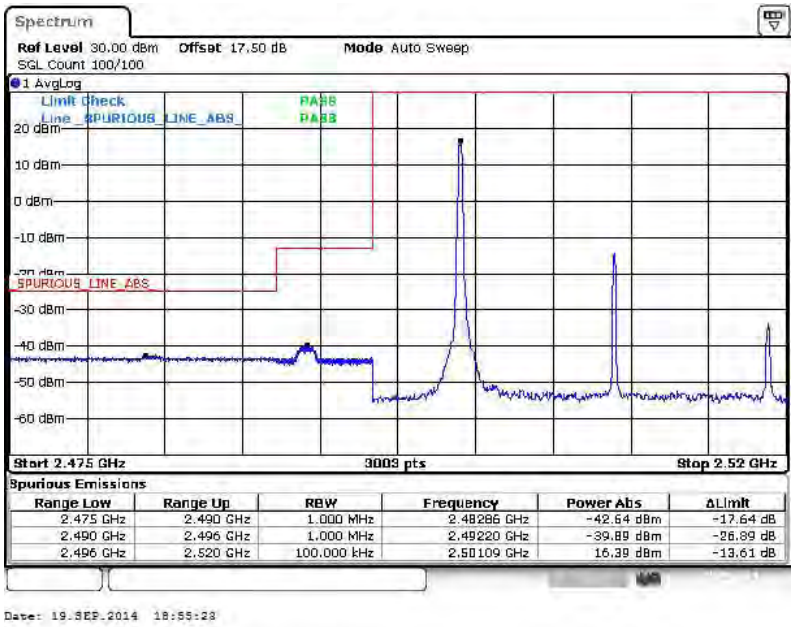
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.550 GHz	2.570 GHz	100.000 kHz	2.55842 GHz	-0.09 dBm	-30.09 dB
2.570 GHz	2.571 GHz	200.000 kHz	2.57017 GHz	-25.45 dBm	-15.45 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57125 GHz	-19.66 dBm	-9.66 dB
2.575 GHz	2.590 GHz	1.000 MHz	2.57511 GHz	-21.76 dBm	-8.76 dB
2.590 GHz	2.595 GHz	1.000 MHz	2.59007 GHz	-42.69 dBm	-17.69 dB

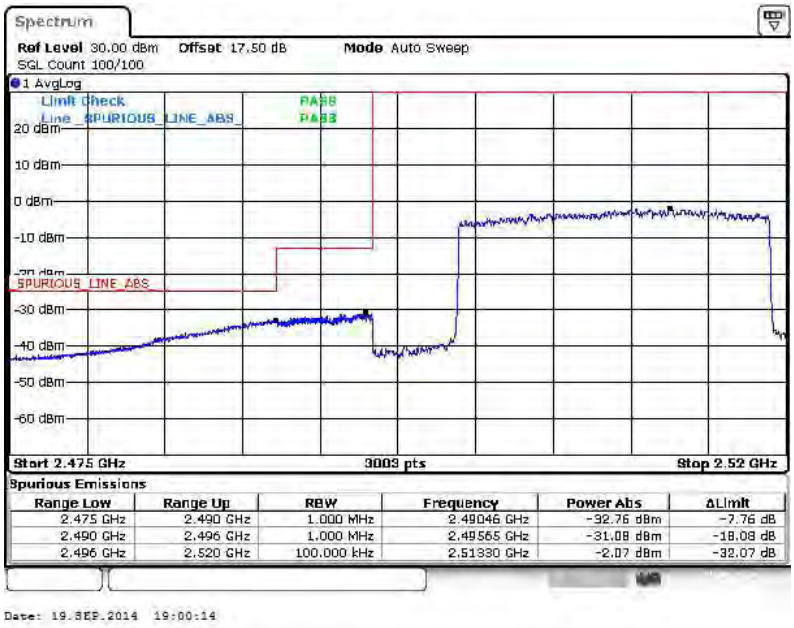
Date: 14.NOV.2014 18:35:07

Band :	LTE Band 7	Band Width :	20MHz / 16QAM

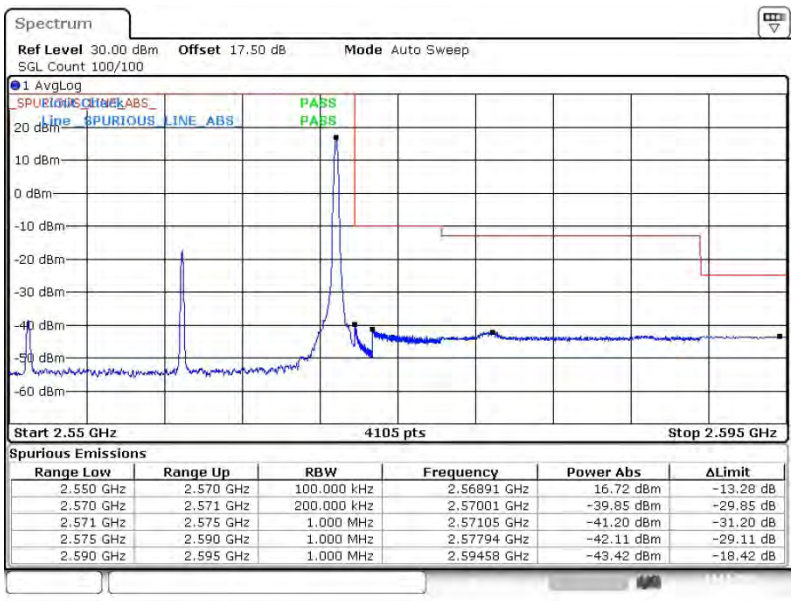
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



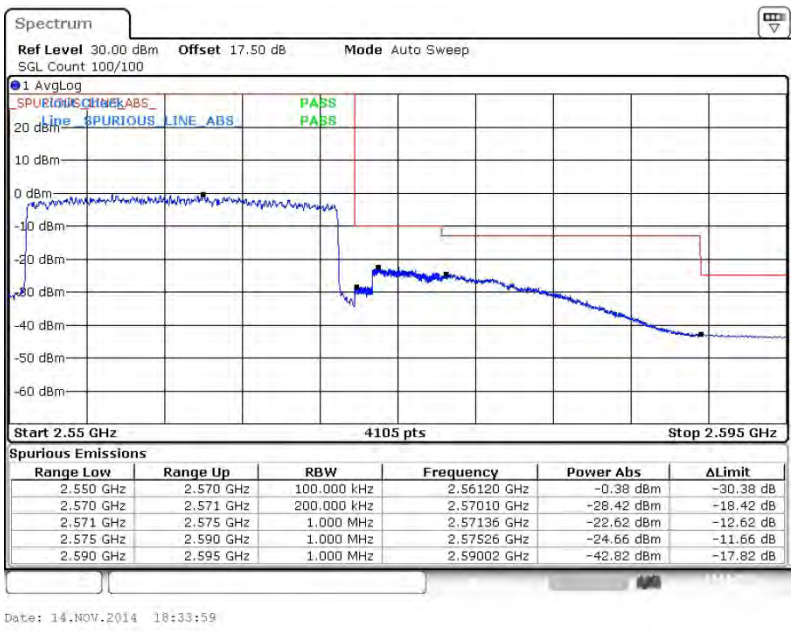
Lower Band Edge Plot for 16QAM-RB Size 100, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 99

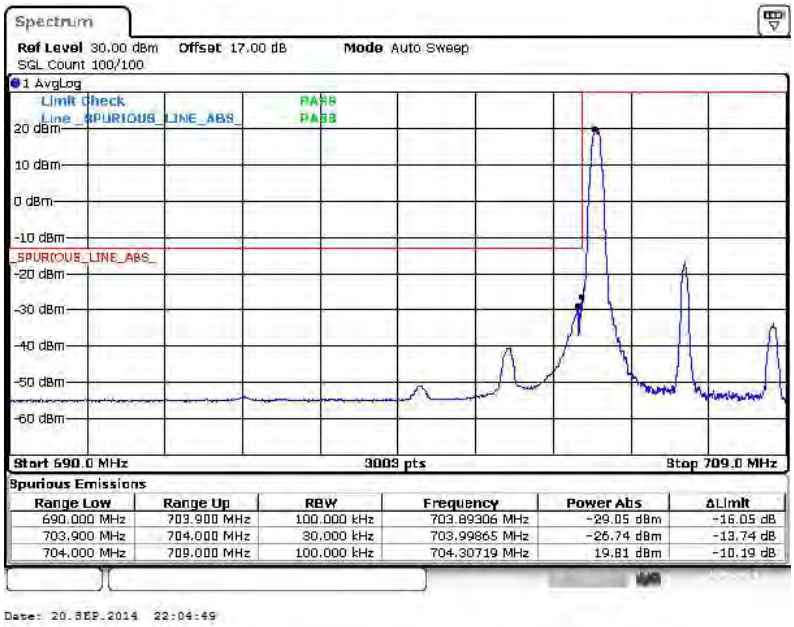


Higher Band Edge Plot for 16QAM-RB Size 100, RB Offset 0

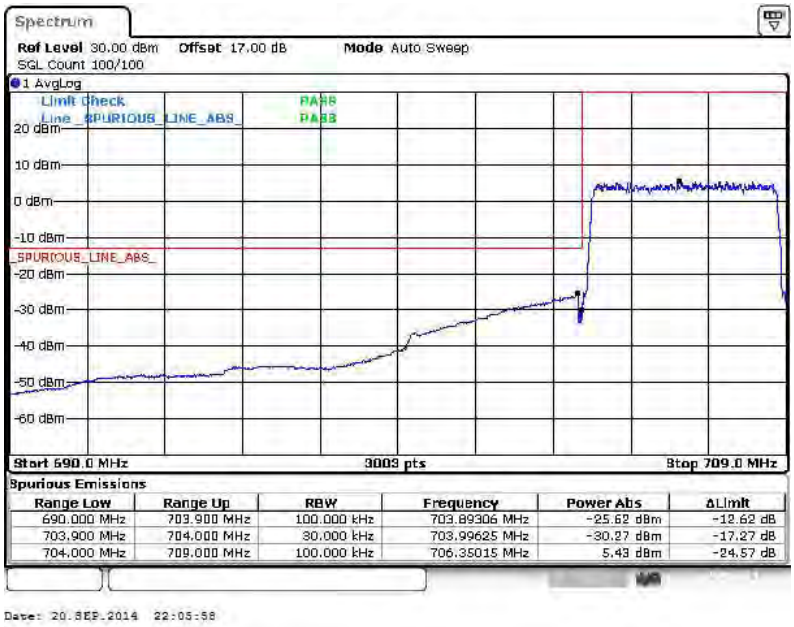


Band :	LTE Band 17	Band Width :	5MHz / QPSK

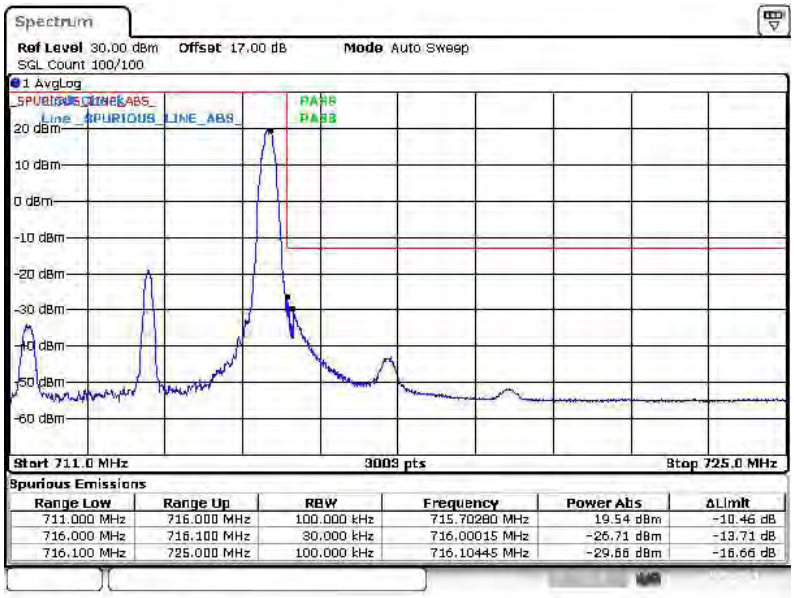
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



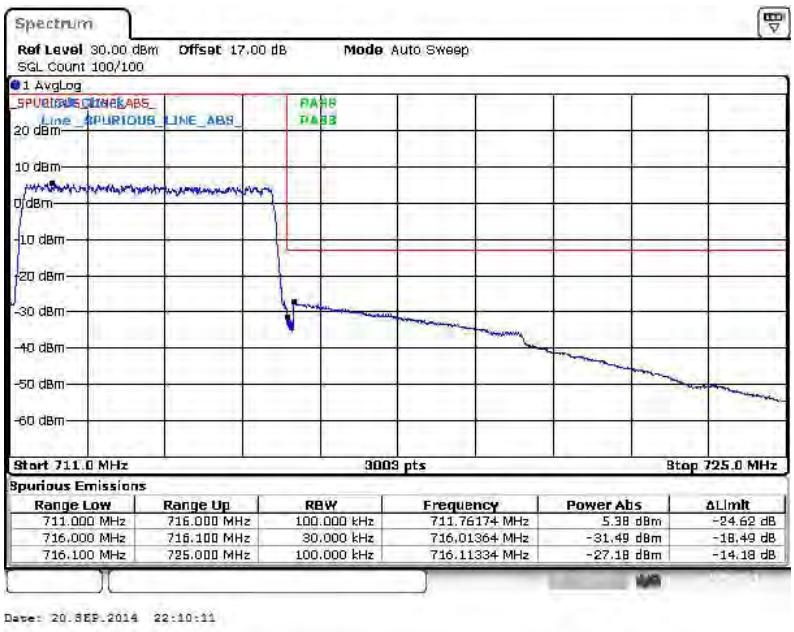
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24

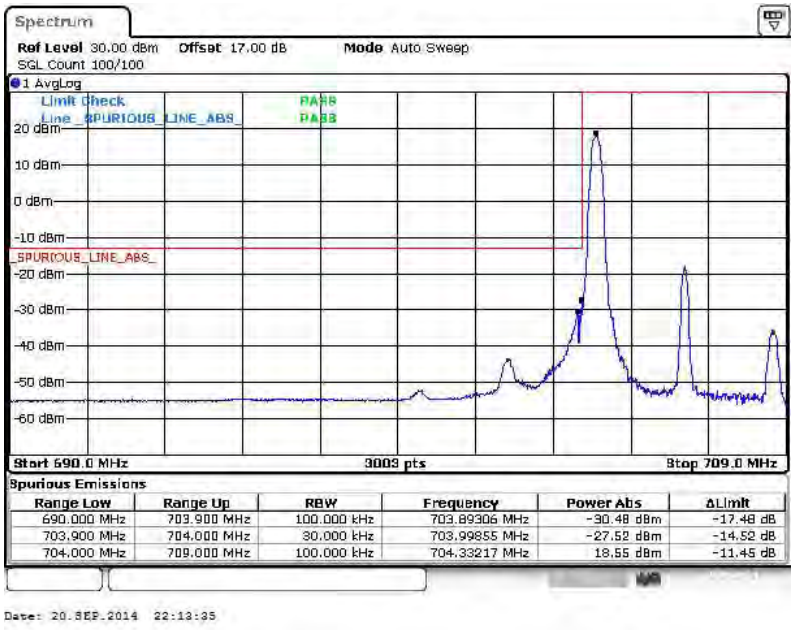


Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0

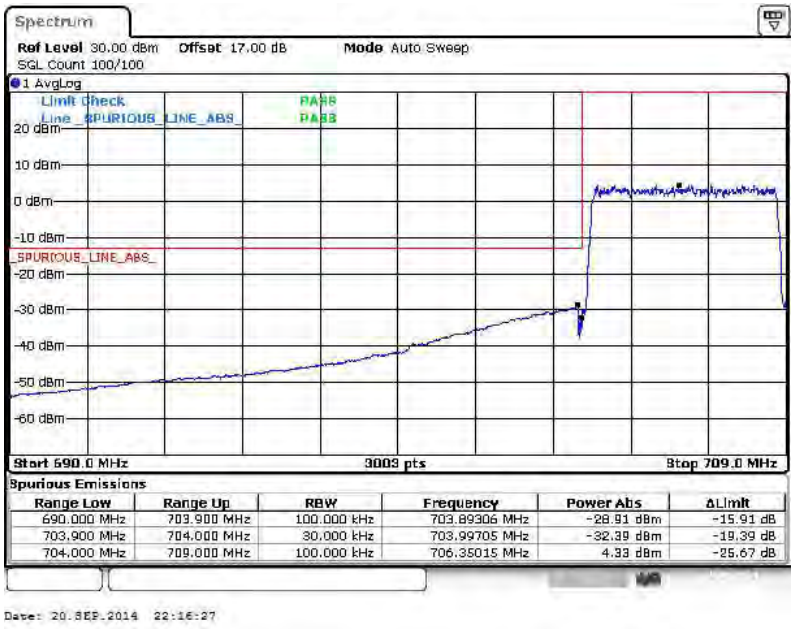


Band :	LTE Band 17	Band Width :	5MHz / 16QAM

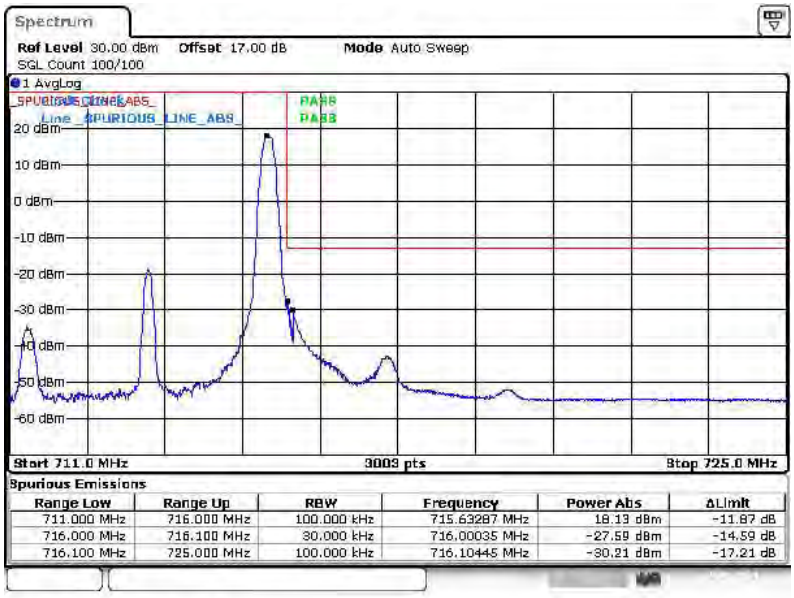
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



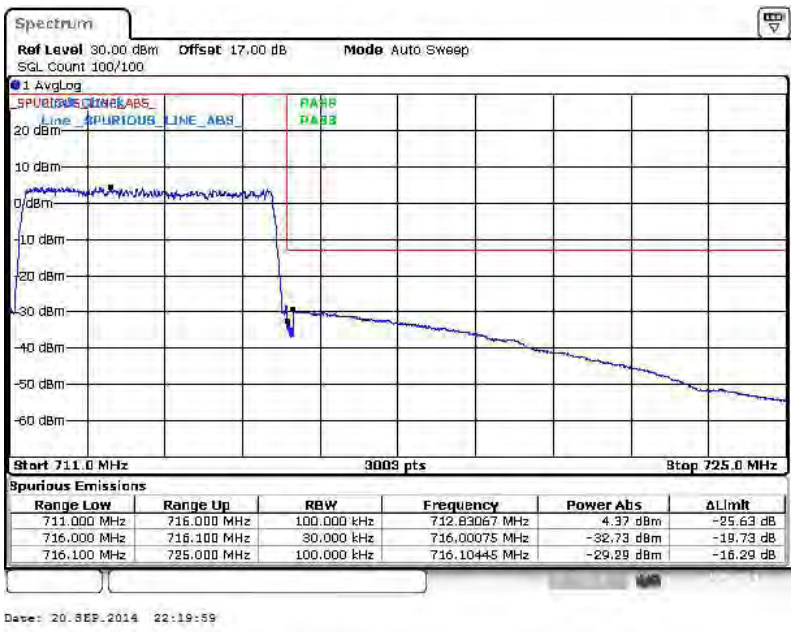
Lower Band Edge Plot for 16QAM-RB Size 25, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24

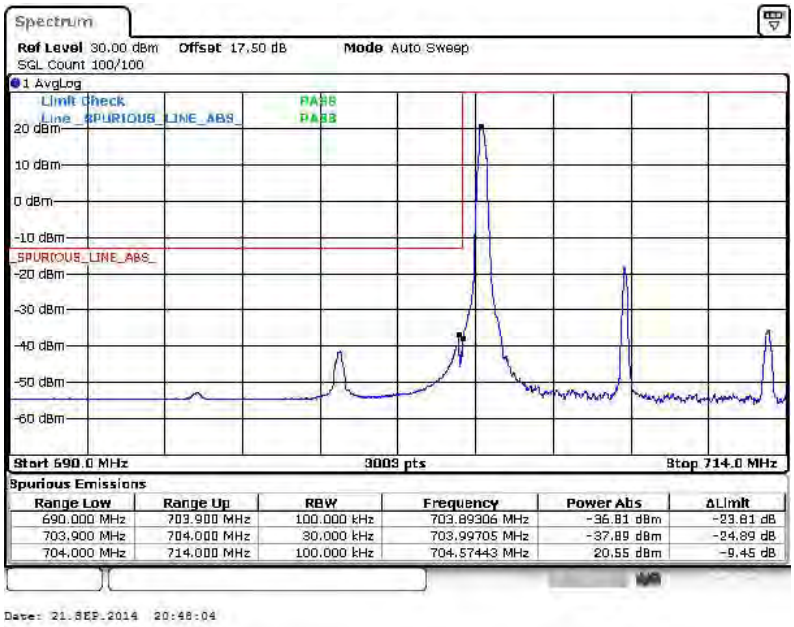


Higher Band Edge Plot for 16QAM-RB Size 25, RB Offset 0

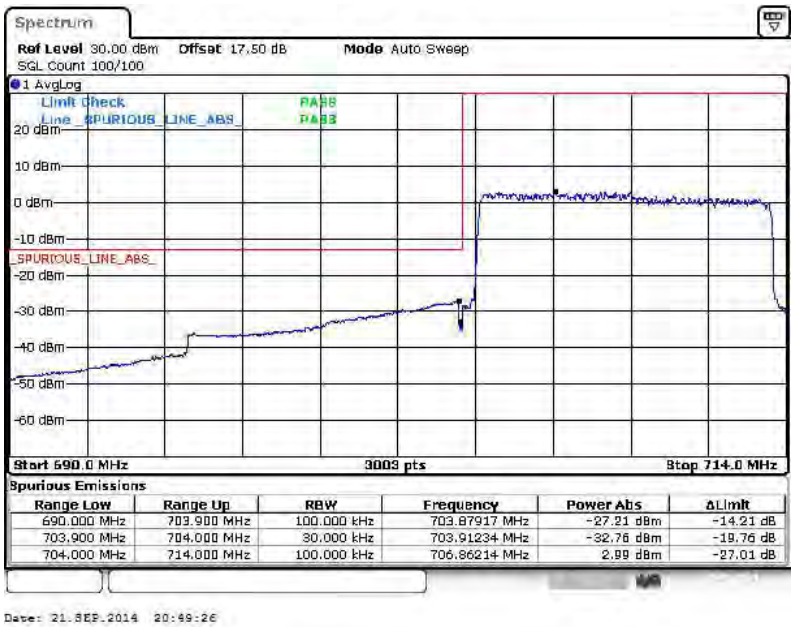


Band :	LTE Band 17	Band Width :	10MHz / QPSK

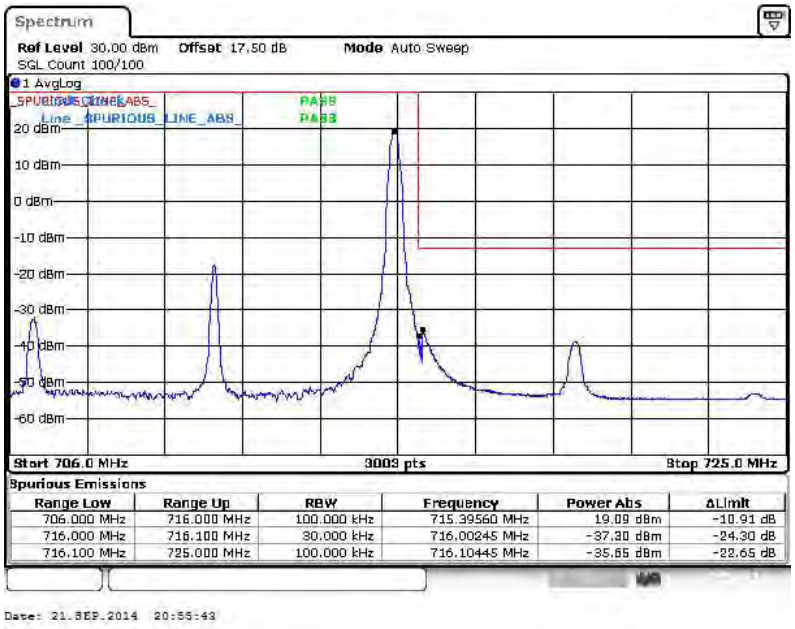
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



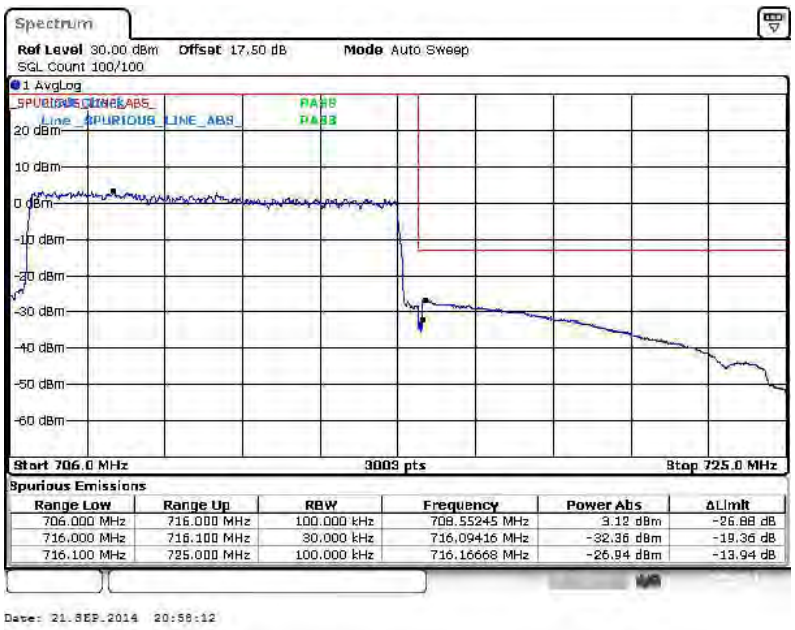
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49

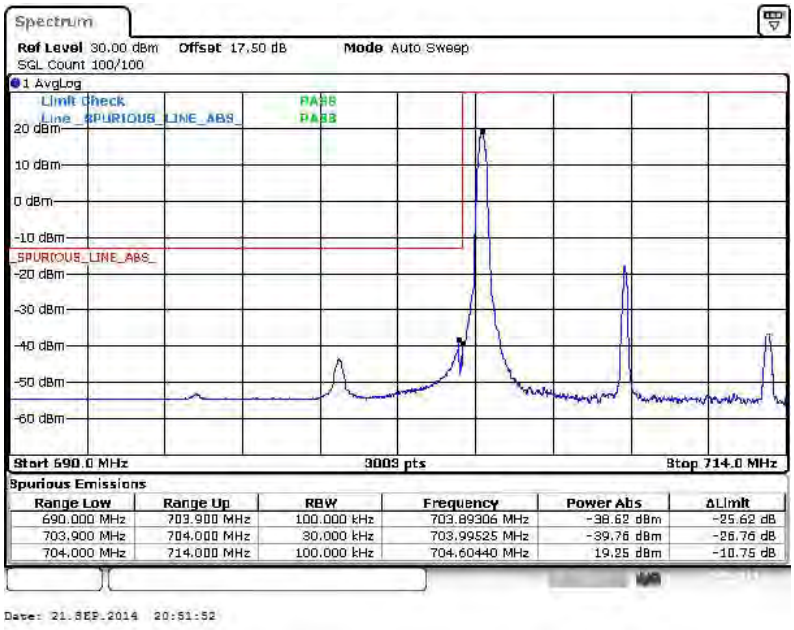


Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0

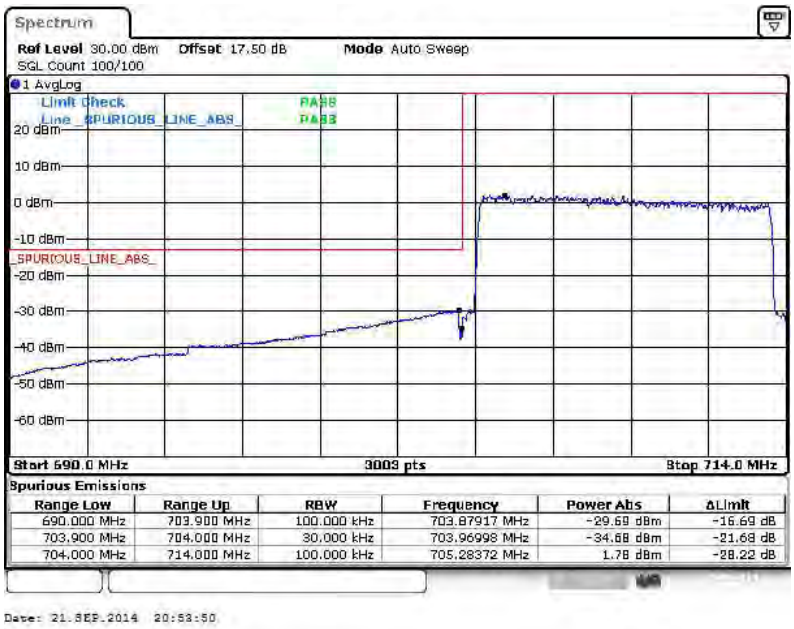


Band :	LTE Band 17	Band Width :	10MHz / 16QAM

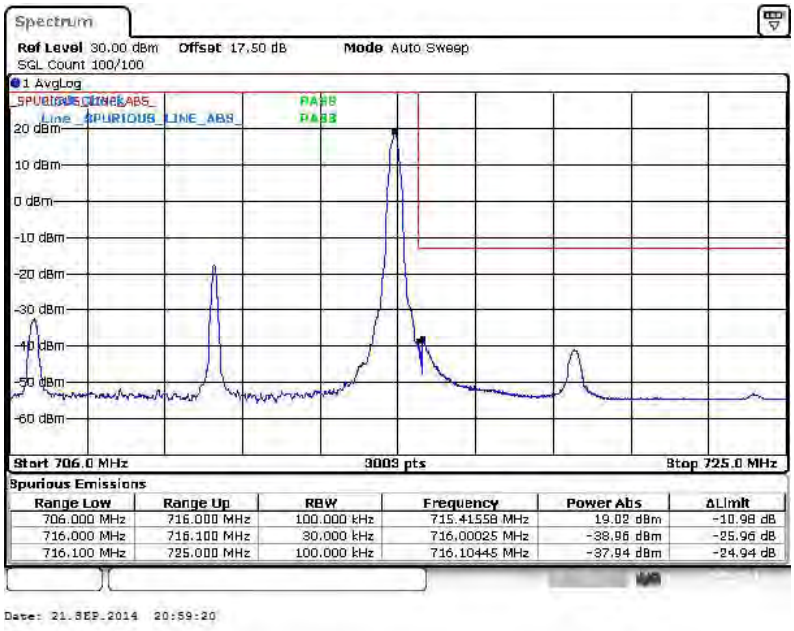
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



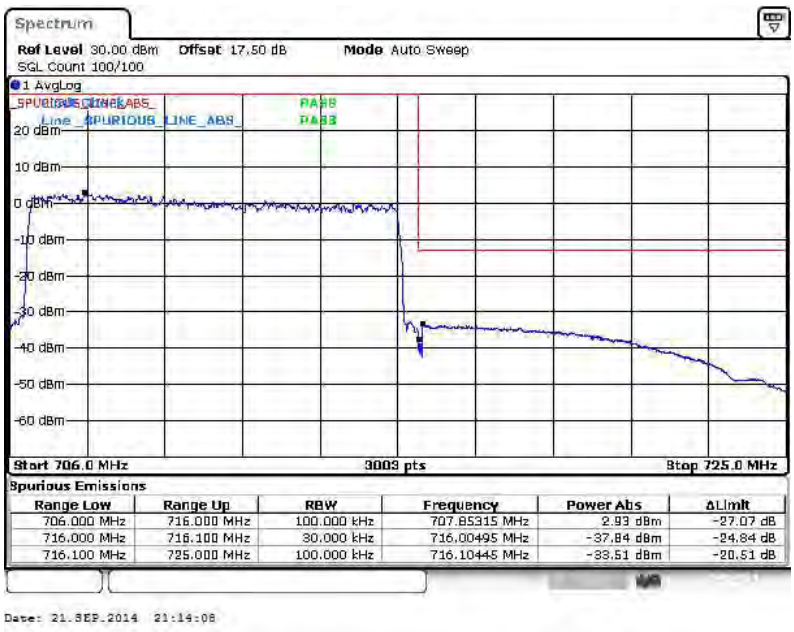
Lower Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 49



Higher Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



3.6 Conducted Spurious Emission Measurement

3.6.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

For Band 7

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30MHz up to a frequency including its 10^{th} harmonic.

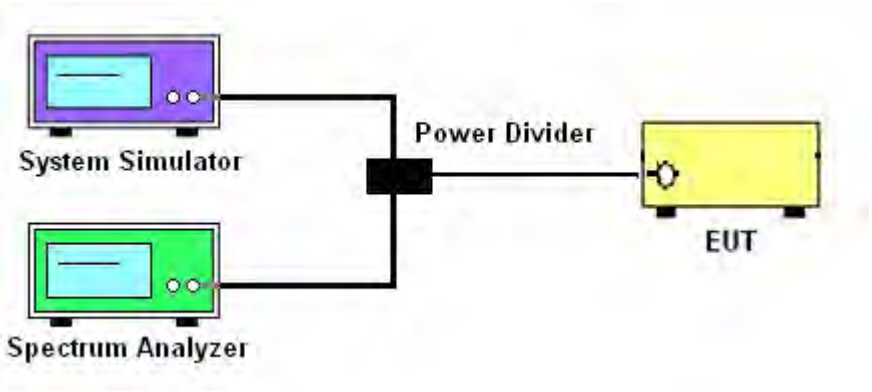
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.
   <For Band 7>
   The limit line is derived from 55+ 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [55 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)
   = -25dBm.

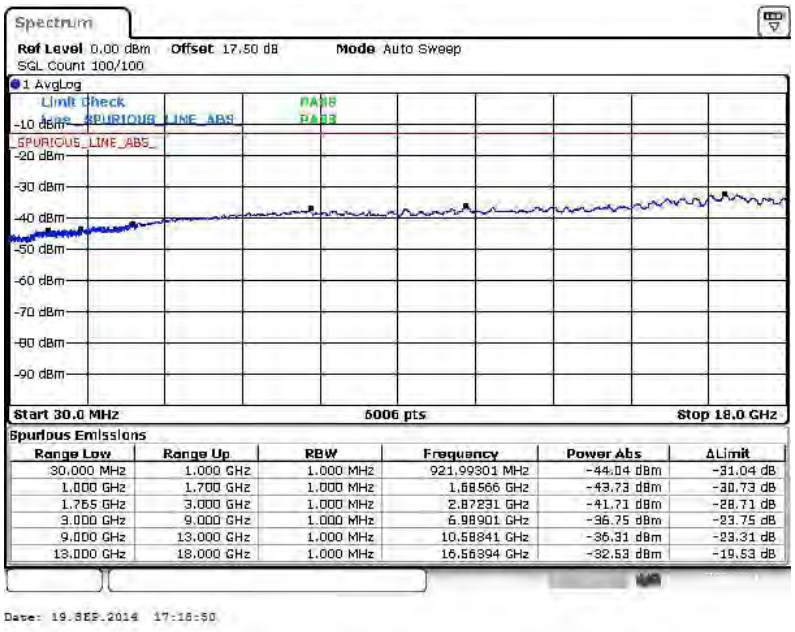
3.6.4 Test Setup



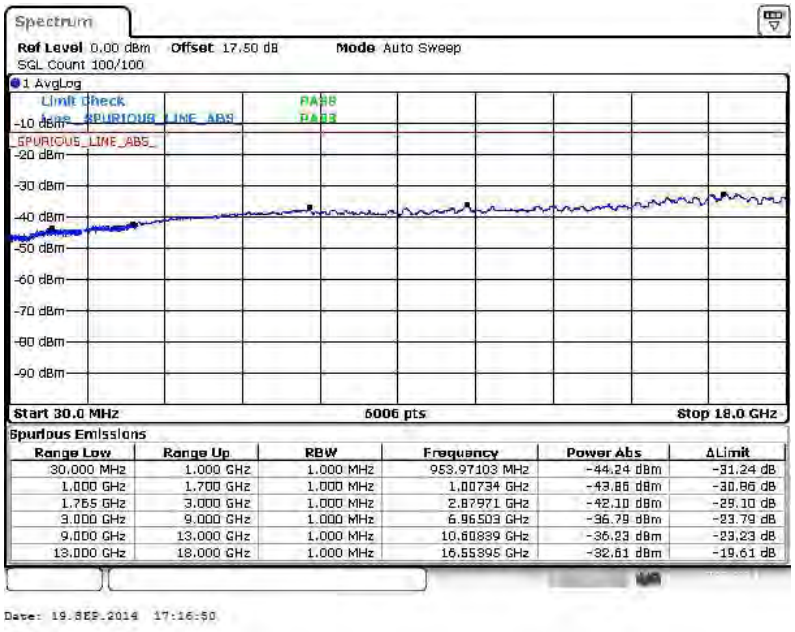
3.6.5 Test Result (Plots) of Conducted Spurious Emission

Band :	LTE Band 4	Channel :	CH19957 (Low)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 5)

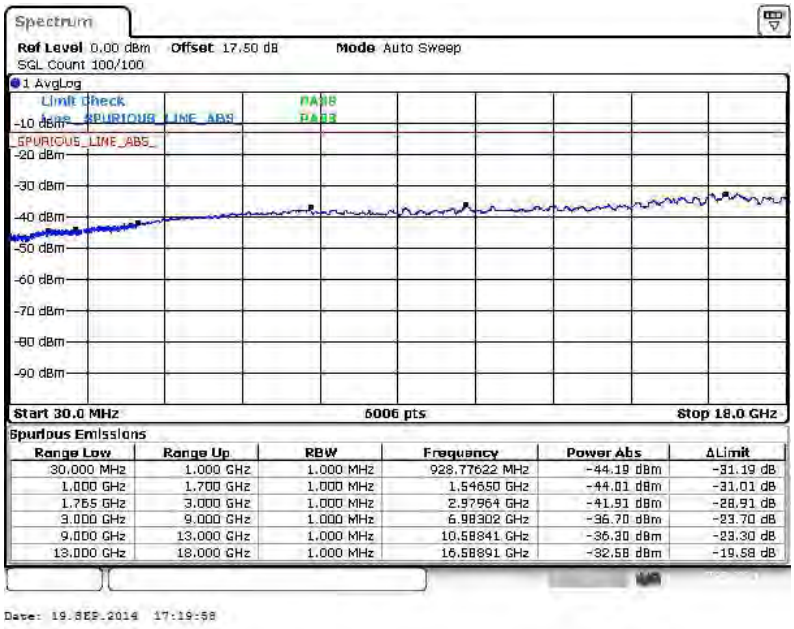


16QAM (RB Size 1, RB Offset 0)

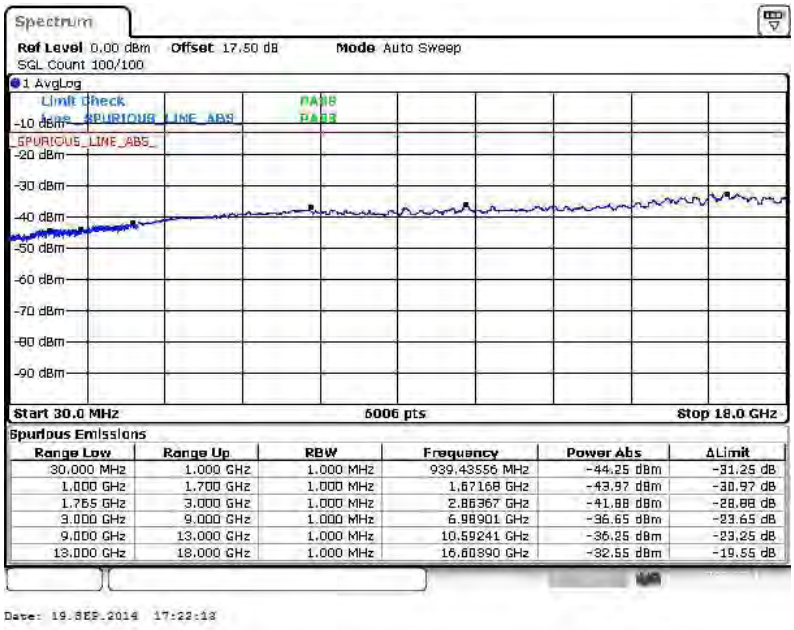


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	1.4MHz		

QPSK (RB Size 3, RB Offset 2)

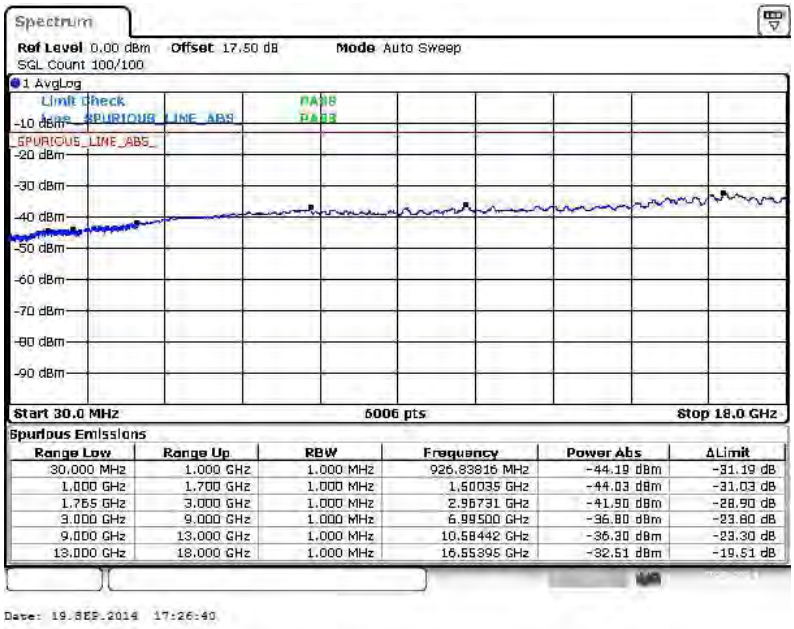


16QAM (RB Size 3, RB Offset 1)

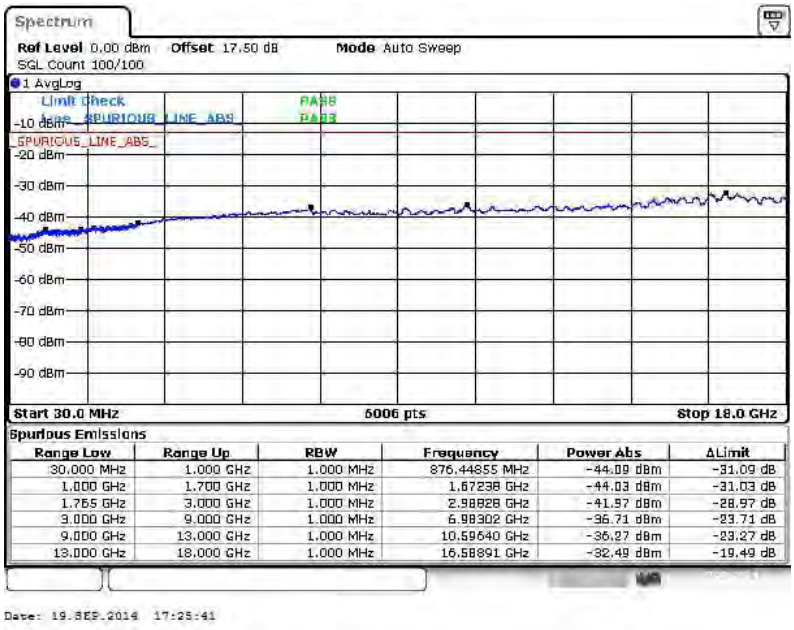


Band :	LTE Band 4	Channel :	CH20393 (High)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 0)

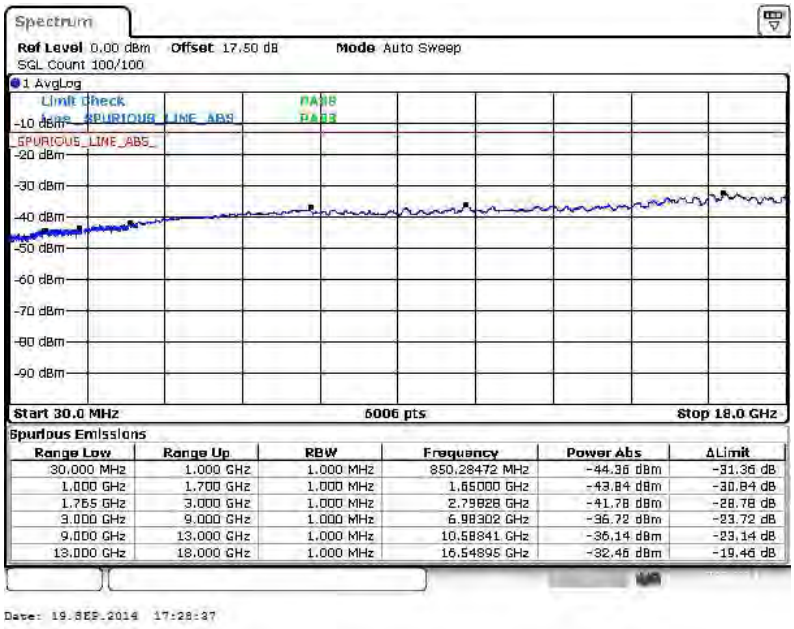


16QAM (RB Size 1, RB Offset 0)

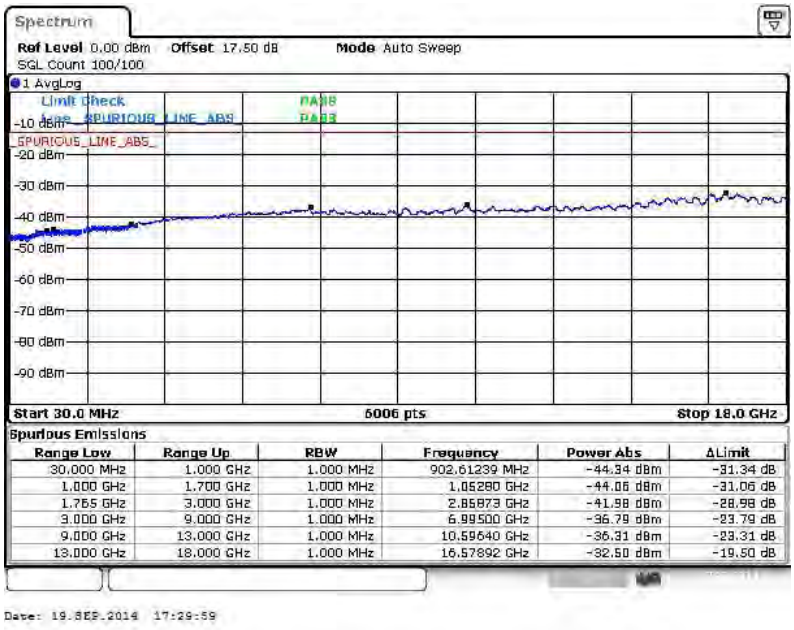


Band :	LTE Band 4	Channel :	CH19965 (Low)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)

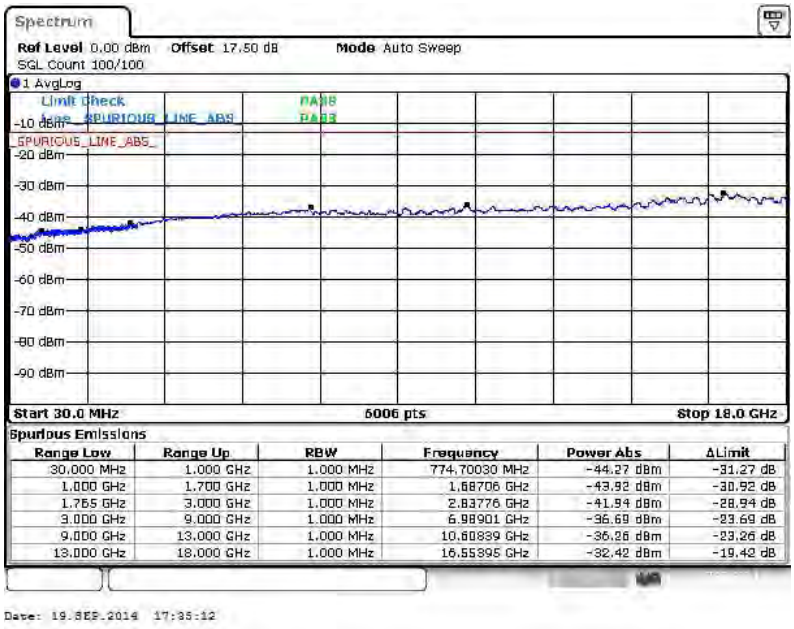


16QAM (RB Size 1, RB Offset 14)

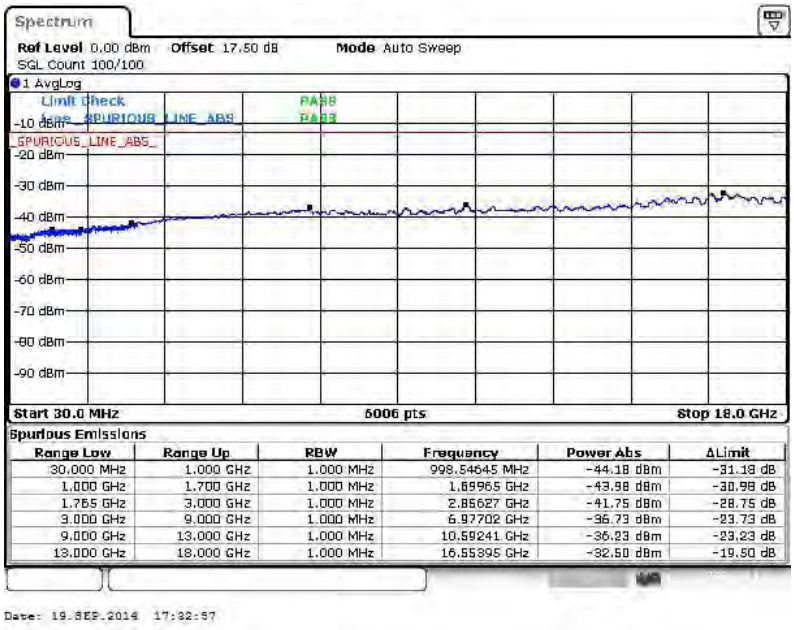


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 14)

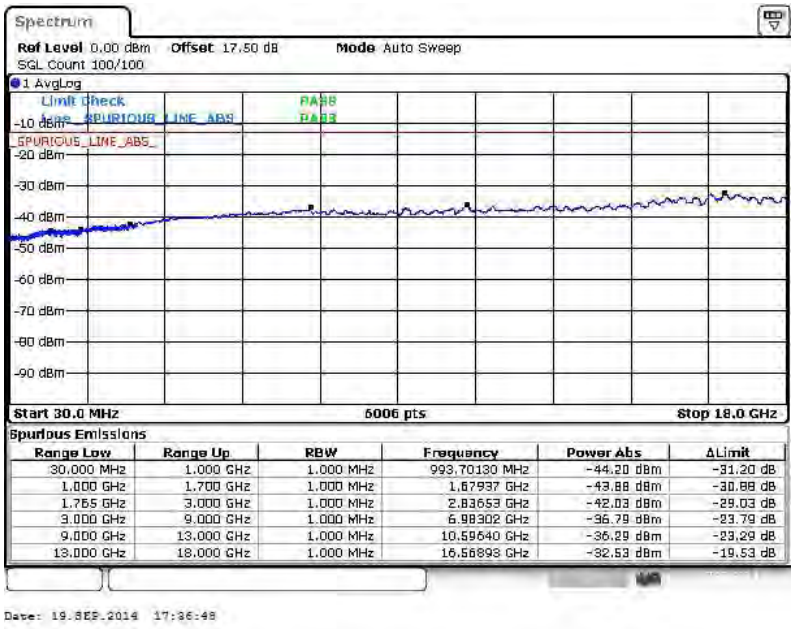


16QAM (RB Size 1, RB Offset 14)

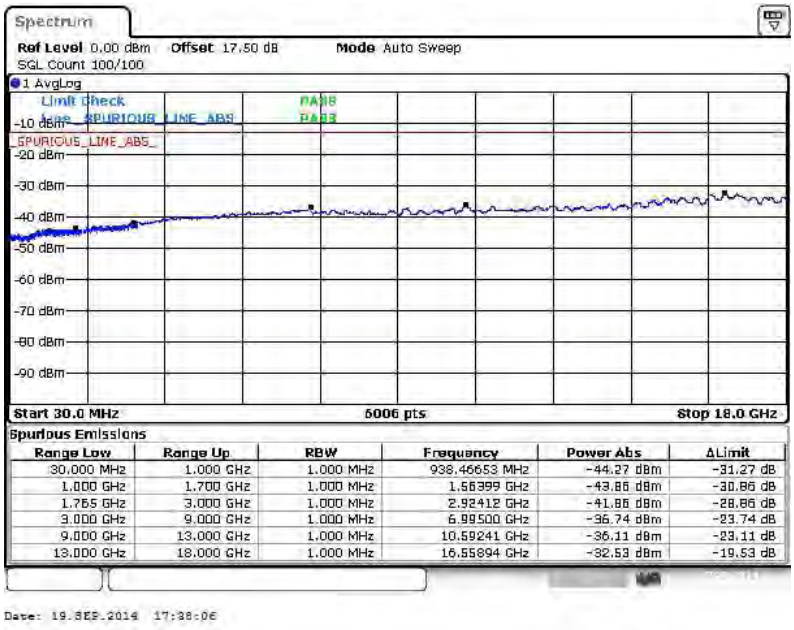


Band :	LTE Band 4	Channel :	CH20385 (High)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 7)

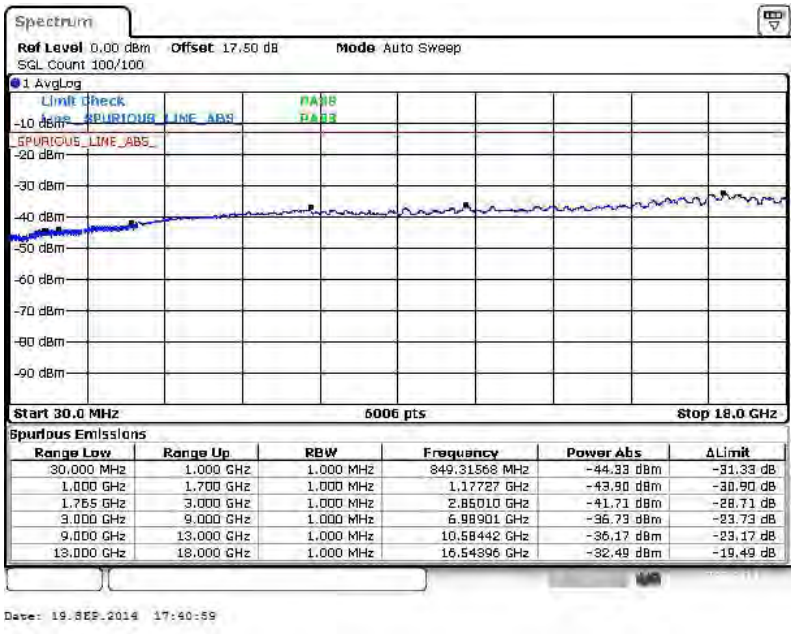


16QAM (RB Size 1, RB Offset 14)

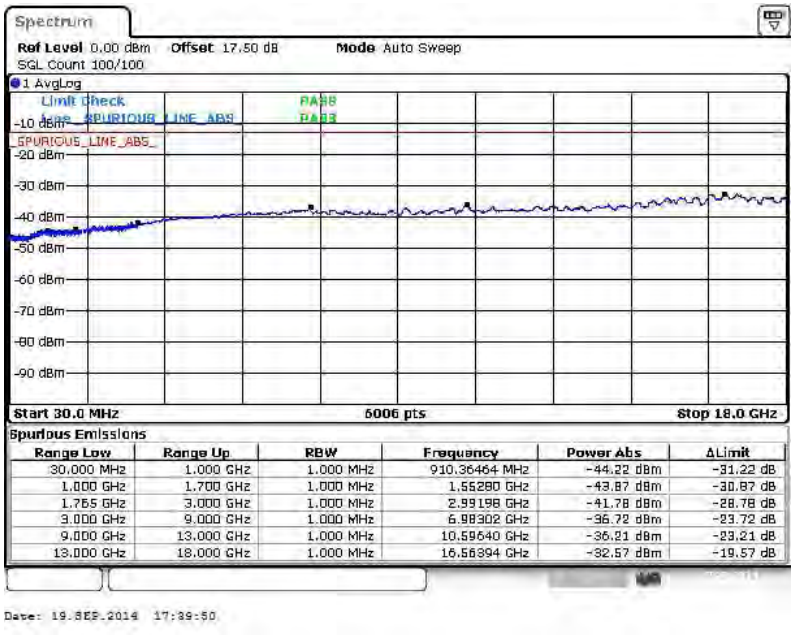


Band :	LTE Band 4	Channel :	CH19975 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)

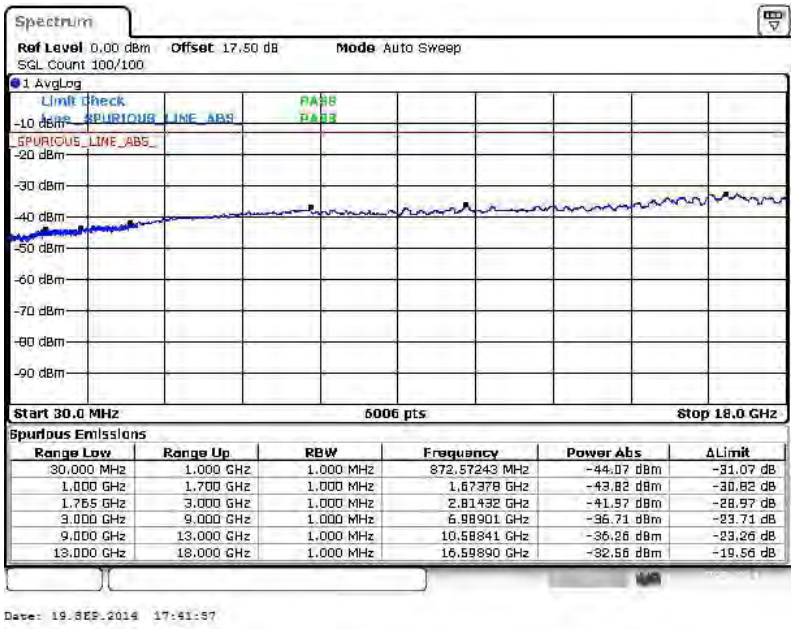


16QAM (RB Size 1, RB Offset 0)

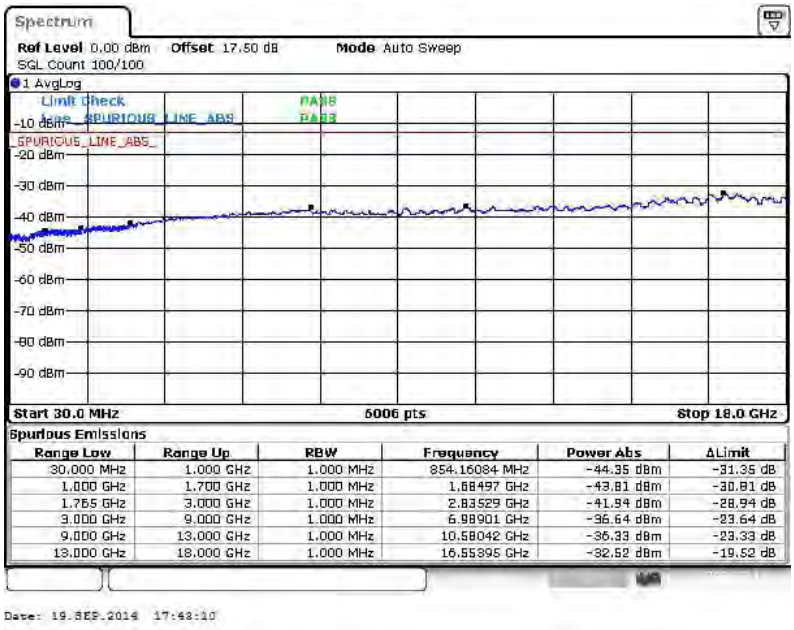


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 12)

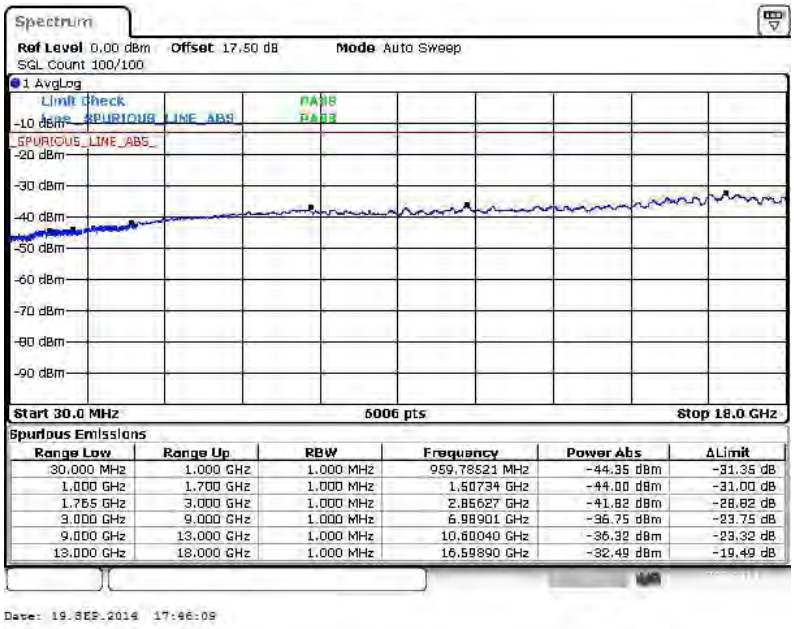


16QAM (RB Size 1, RB Offset 12)

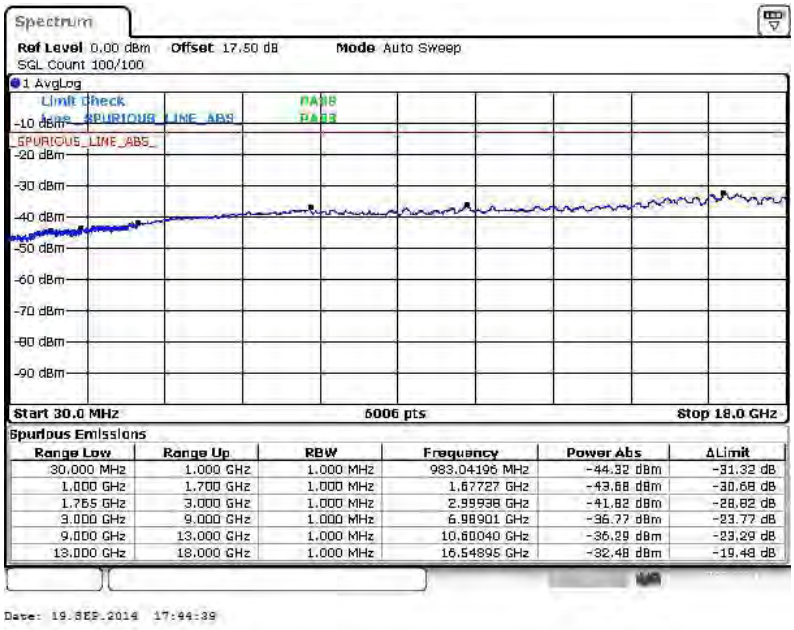


Band :	LTE Band 4	Channel :	CH20375 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)

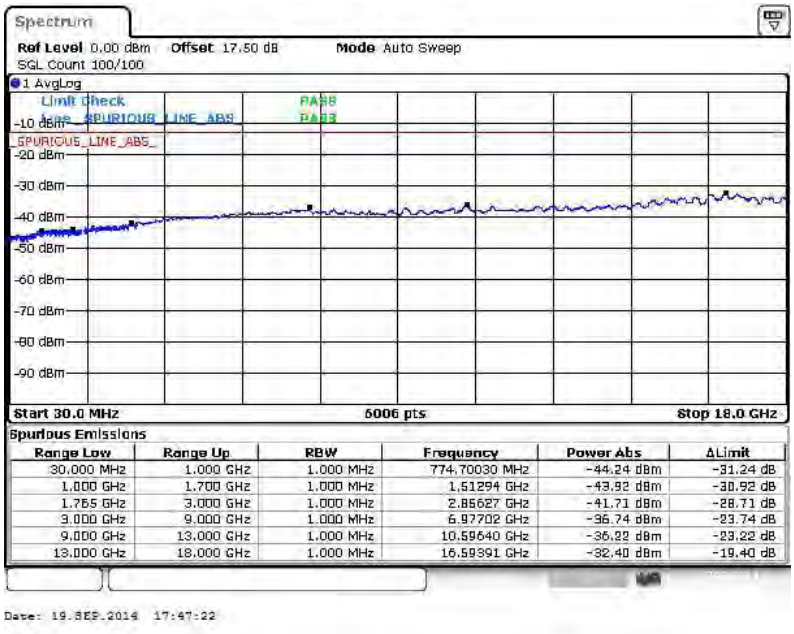


16QAM (RB Size 1, RB Offset 0)

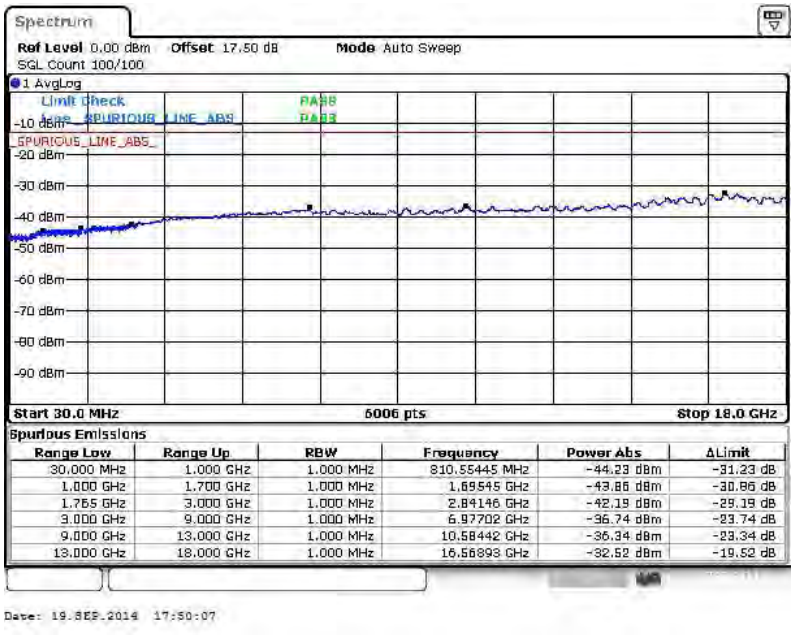


Band :	LTE Band 4	Channel :	CH20000 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)

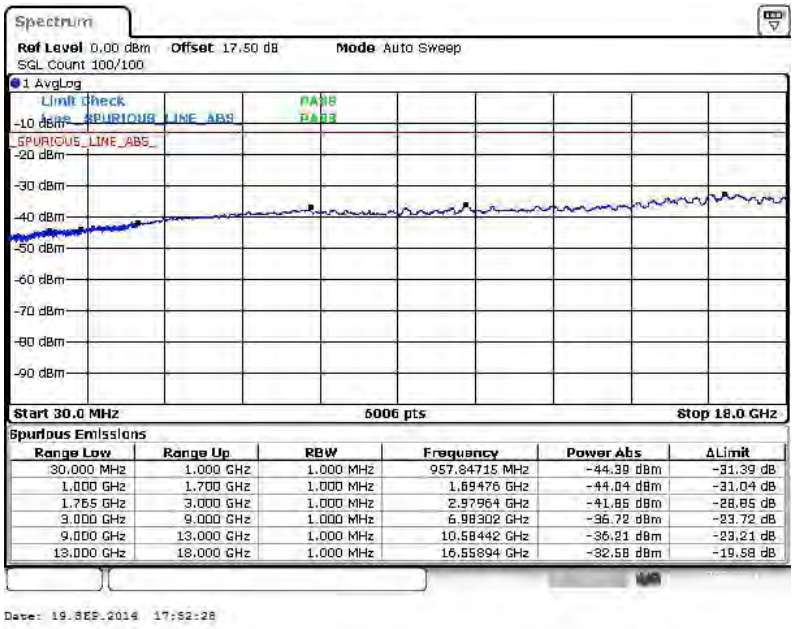


16QAM (RB Size 1, RB Offset 0)

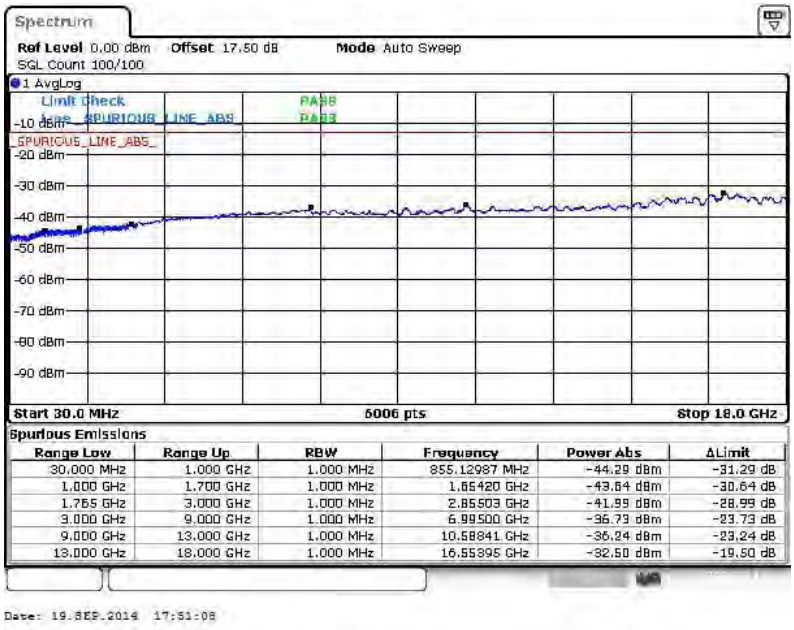


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)

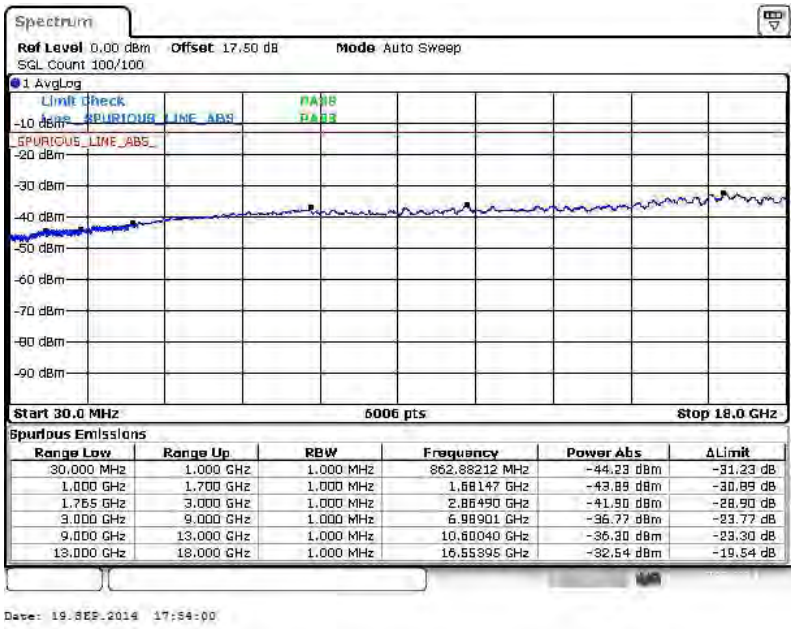


16QAM (RB Size 1, RB Offset 24)

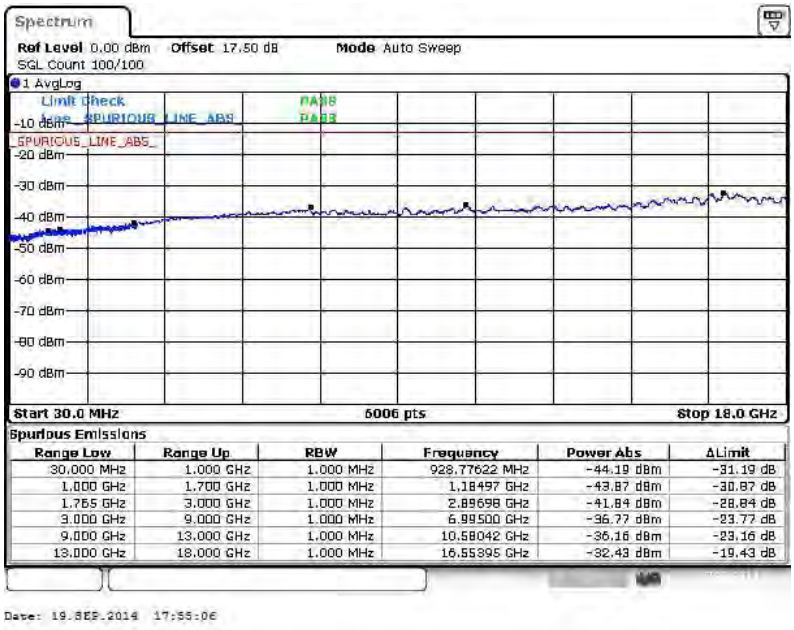


Band :	LTE Band 4	Channel :	CH20350 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)

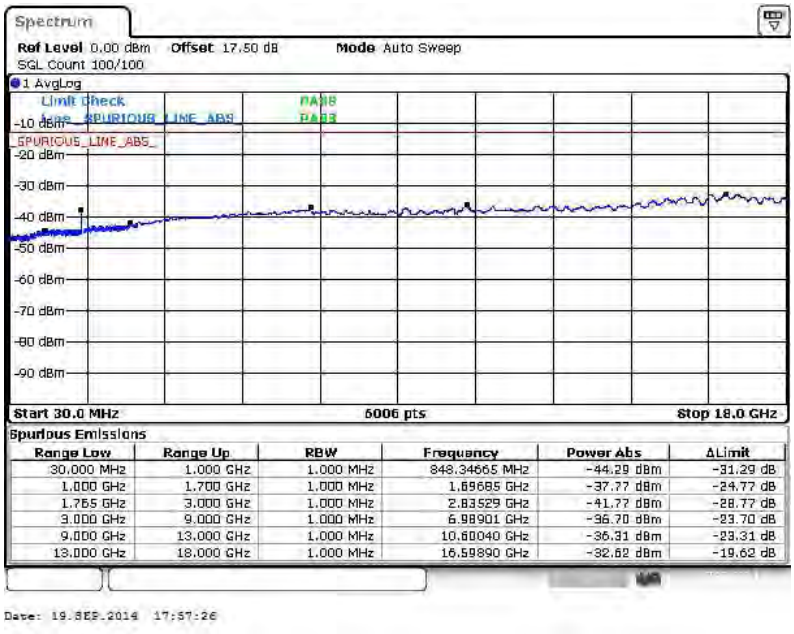


16QAM (RB Size 1, RB Offset 24)

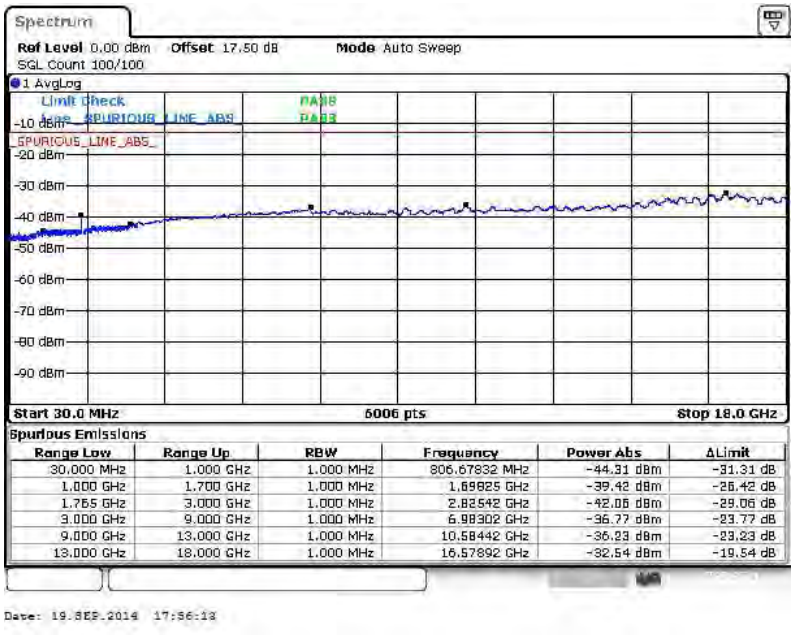


Band :	LTE Band 4	Channel :	CH20025 (Low)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 0)

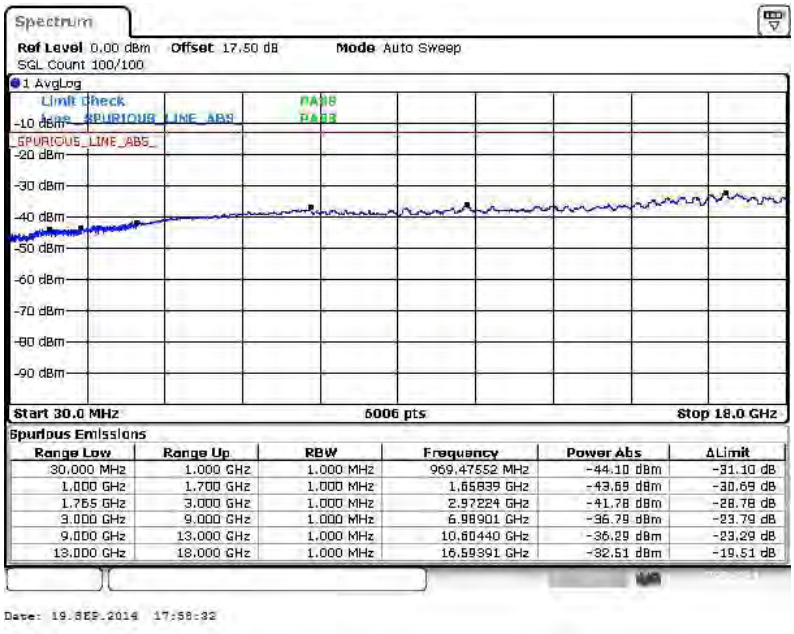


16QAM (RB Size 1, RB Offset 0)

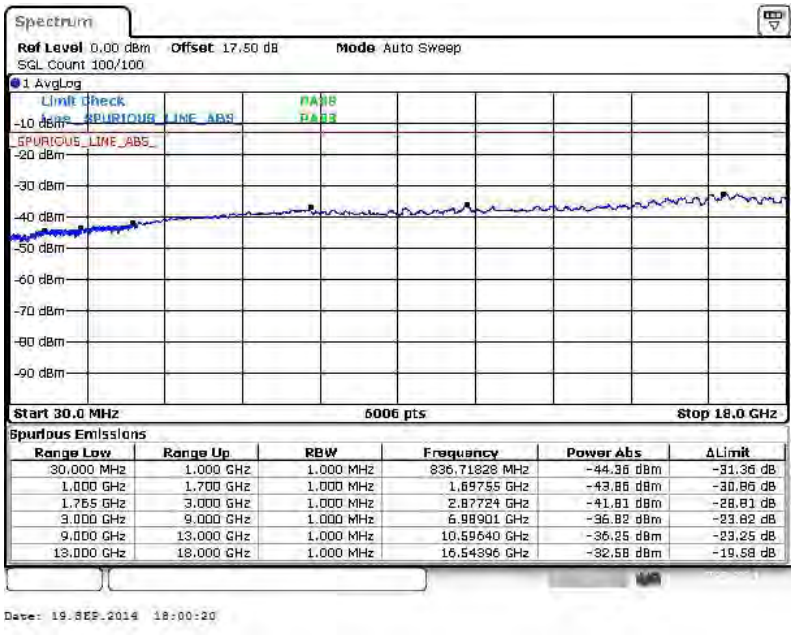


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 0)

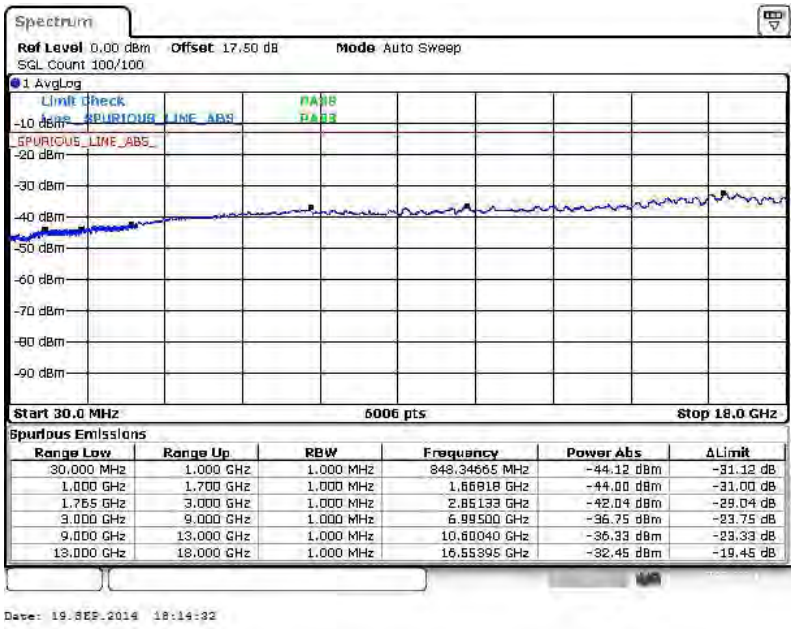


16QAM (RB Size 1, RB Offset 0)

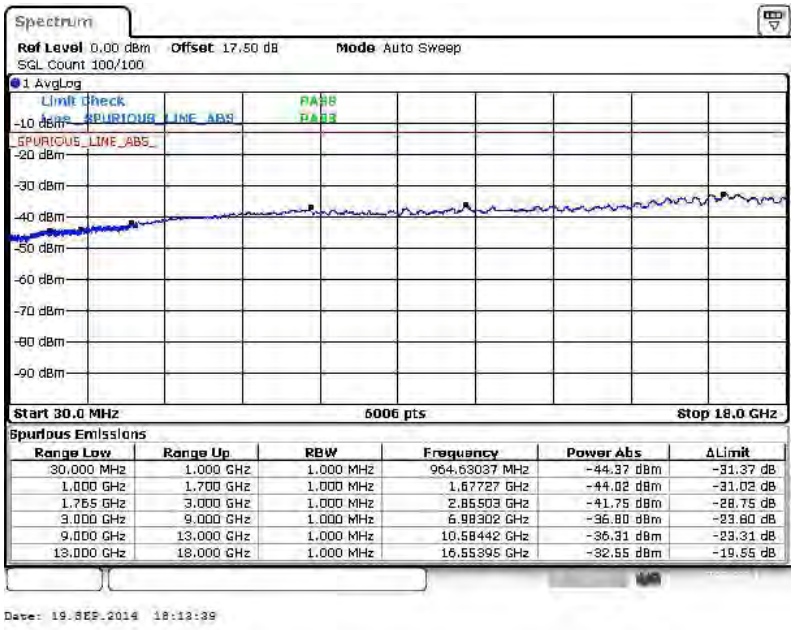


Band :	LTE Band 4	Channel :	CH20325 (High)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 74)

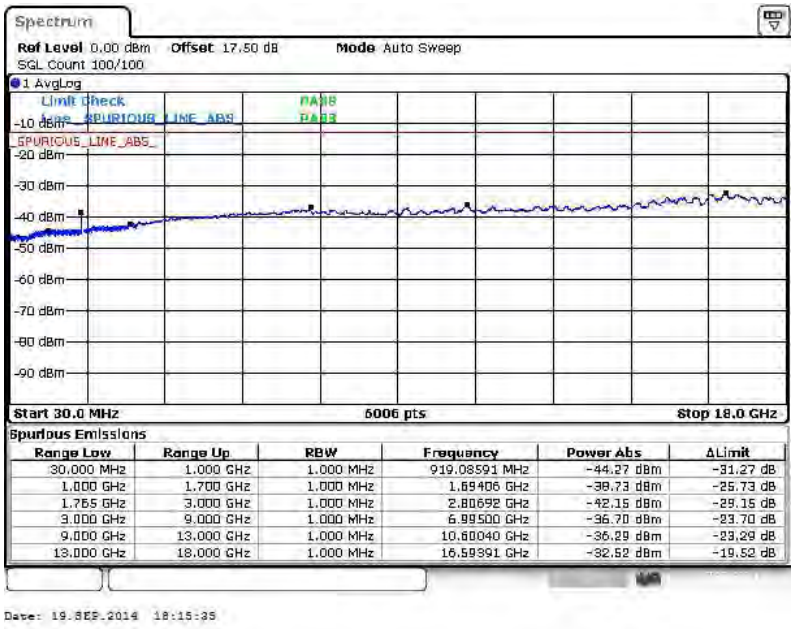


16QAM (RB Size 1, RB Offset 0)

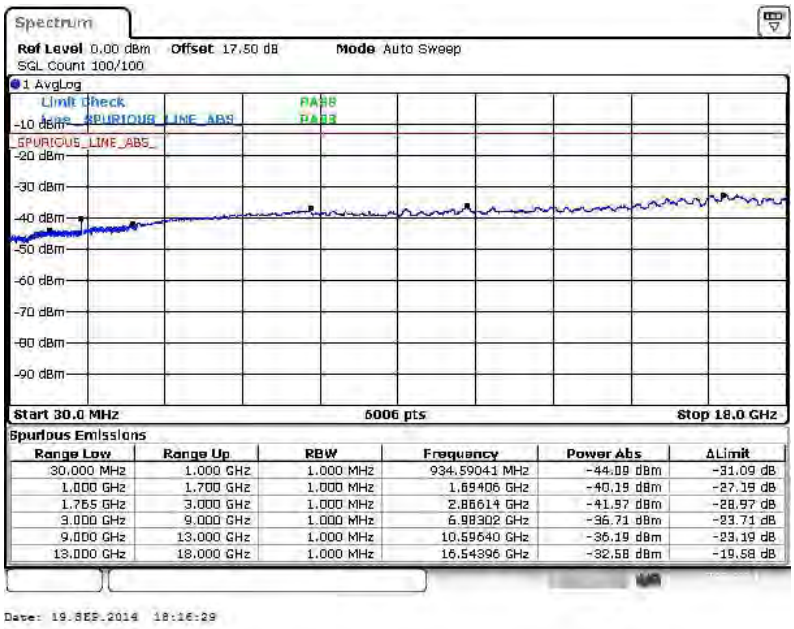


Band :	LTE Band 4	Channel :	CH20050 (Low)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 49)

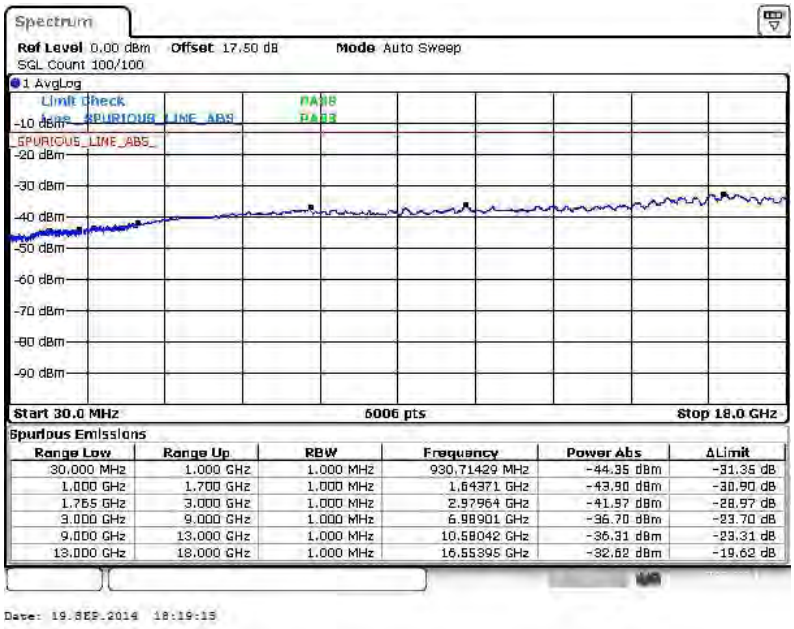


16QAM (RB Size 1, RB Offset 0)

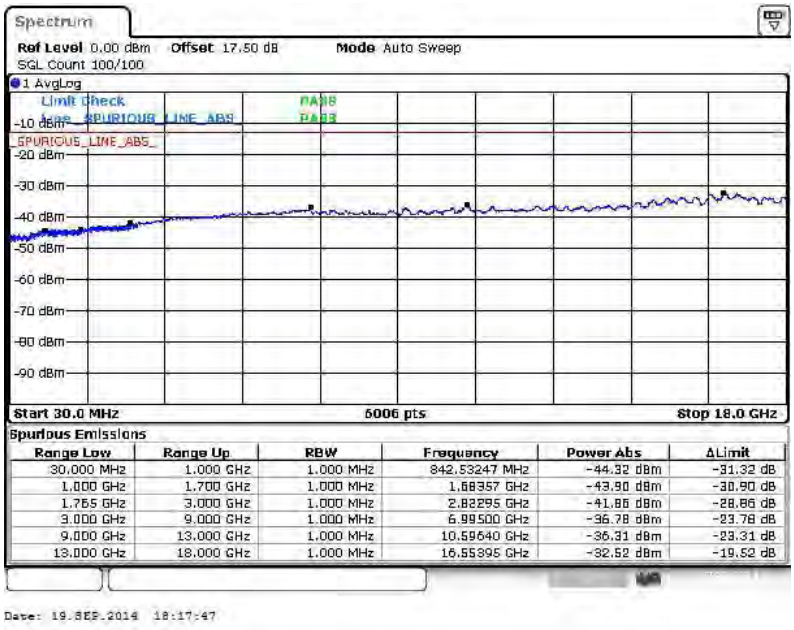


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 49)

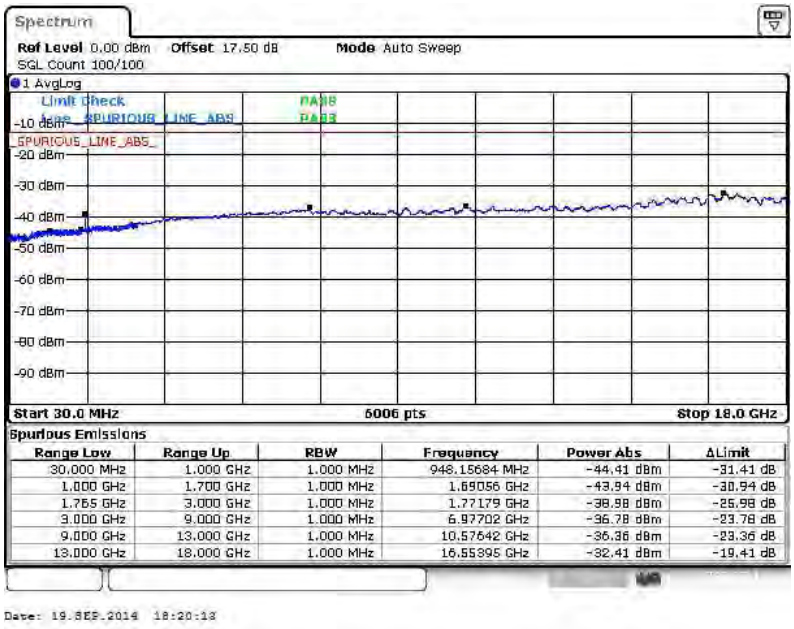


16QAM (RB Size 1, RB Offset 0)

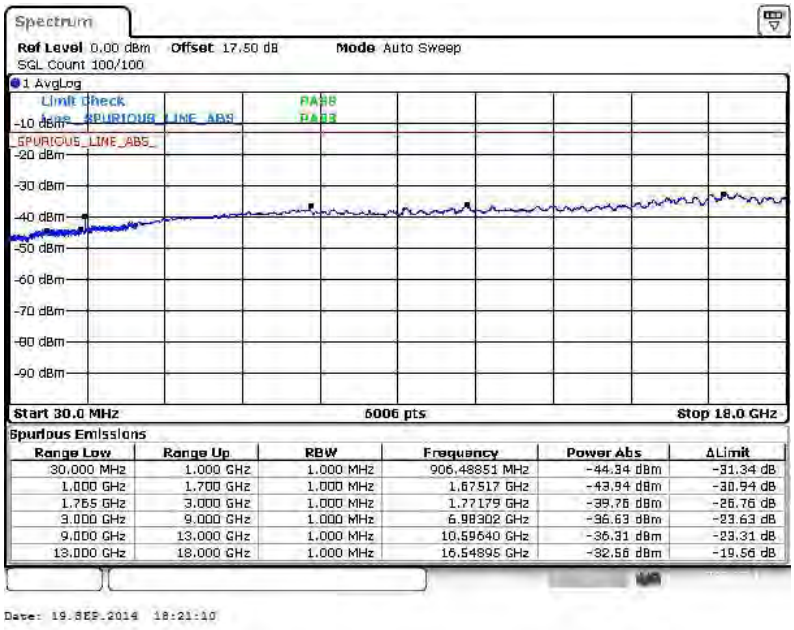


Band :	LTE Band 4	Channel :	CH20300 (High)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 49)

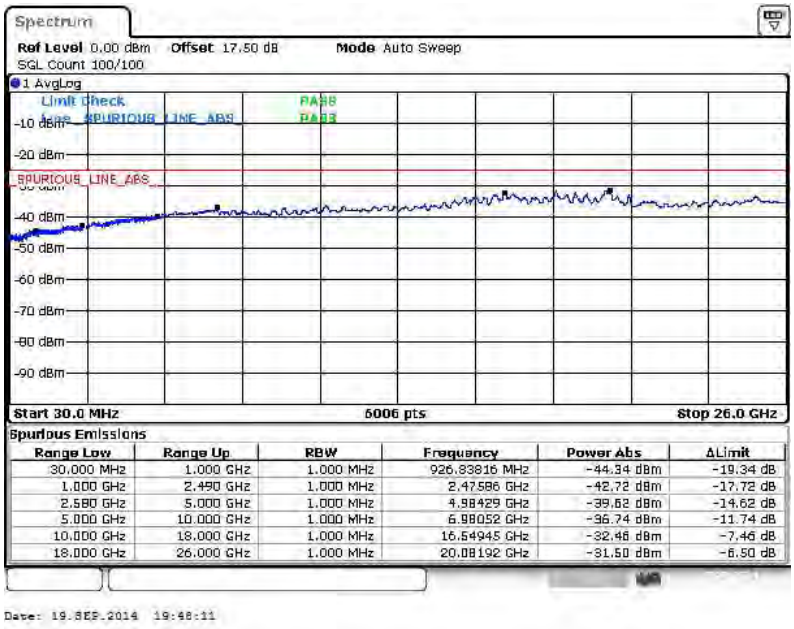


16QAM (RB Size 1, RB Offset 0)

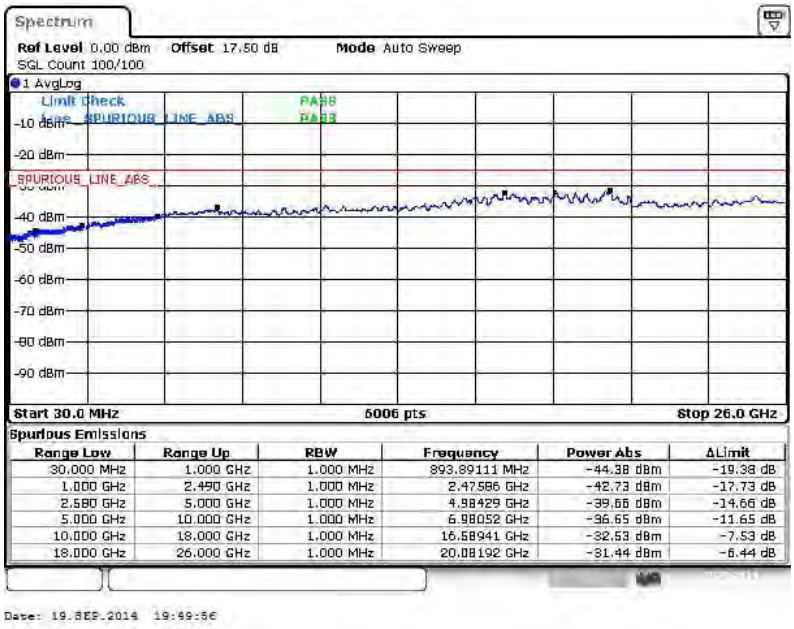


Band :	LTE Band 7	Channel :	CH20775 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)

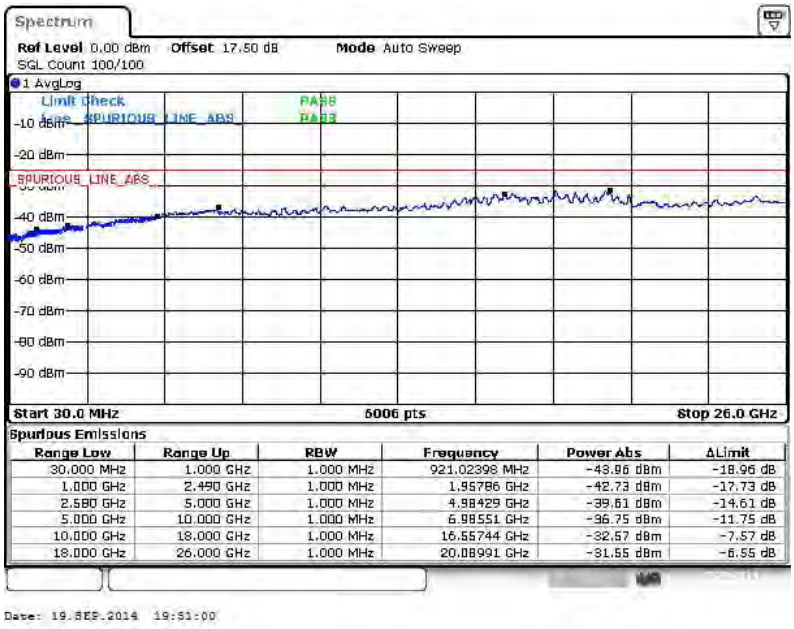


16QAM (RB Size 1, RB Offset 0)

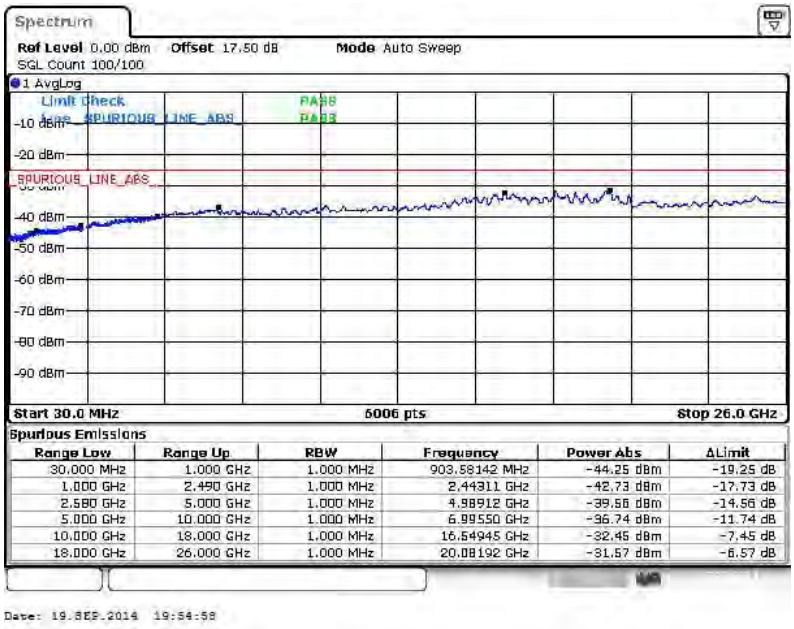


Band :	LTE Band 7	Channel :	CH21100 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)

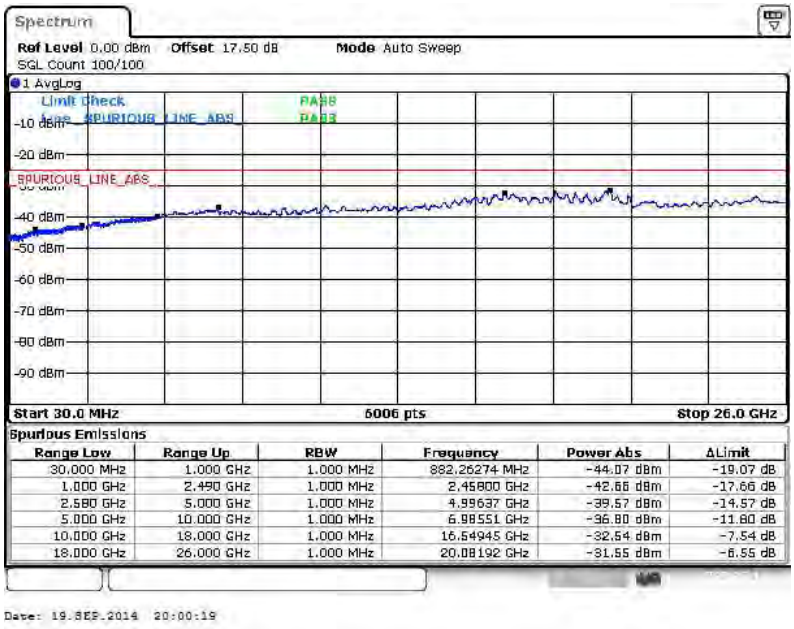


16QAM (RB Size 1, RB Offset 0)

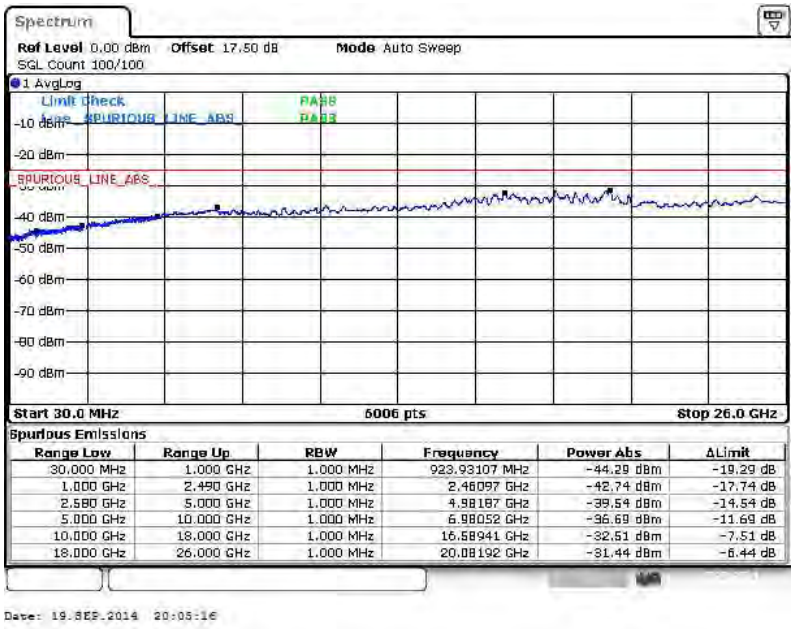


Band :	LTE Band 7	Channel :	CH21425 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 12)

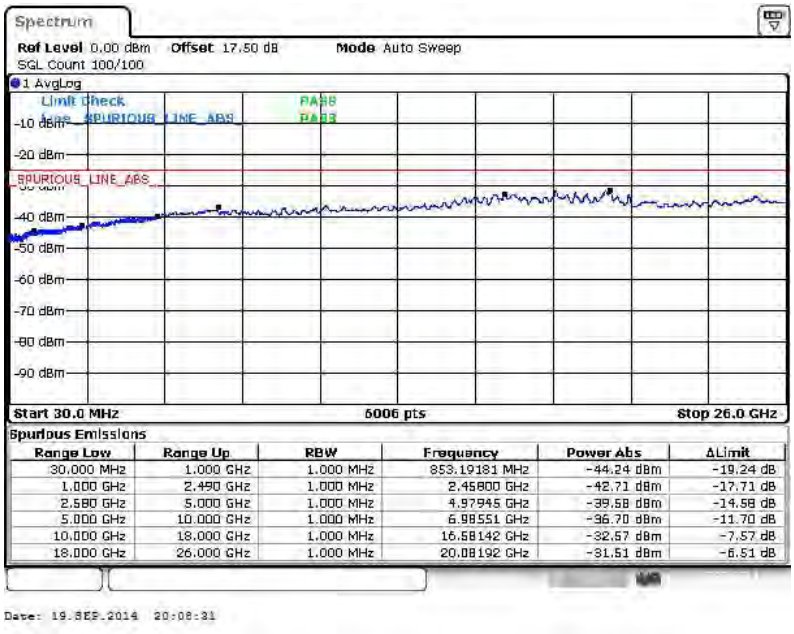


16QAM (RB Size 1, RB Offset 24)

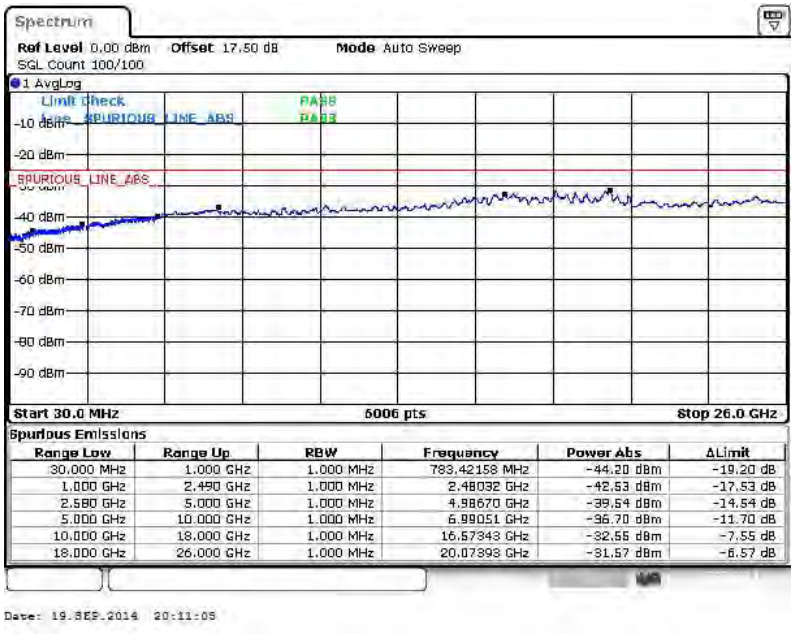


Band :	LTE Band 7	Channel :	CH20800 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

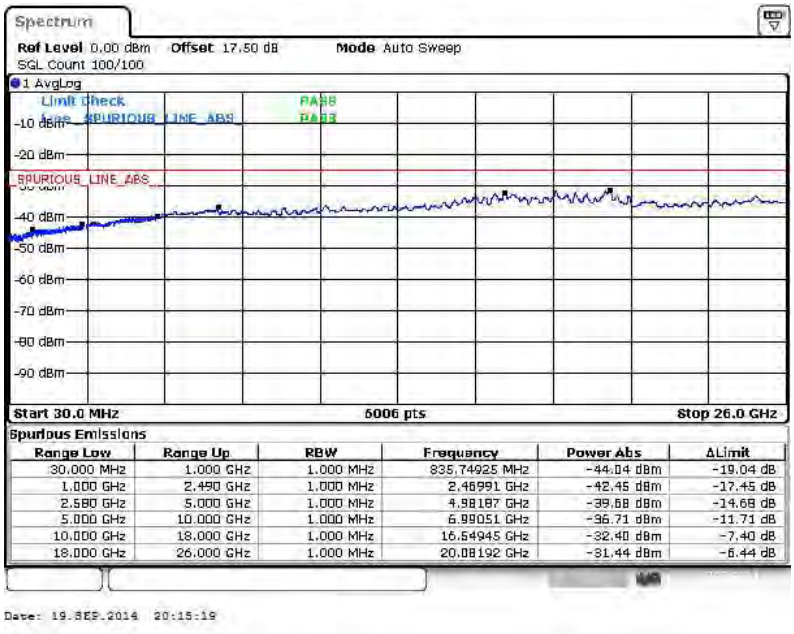


16QAM (RB Size 1, RB Offset 49)

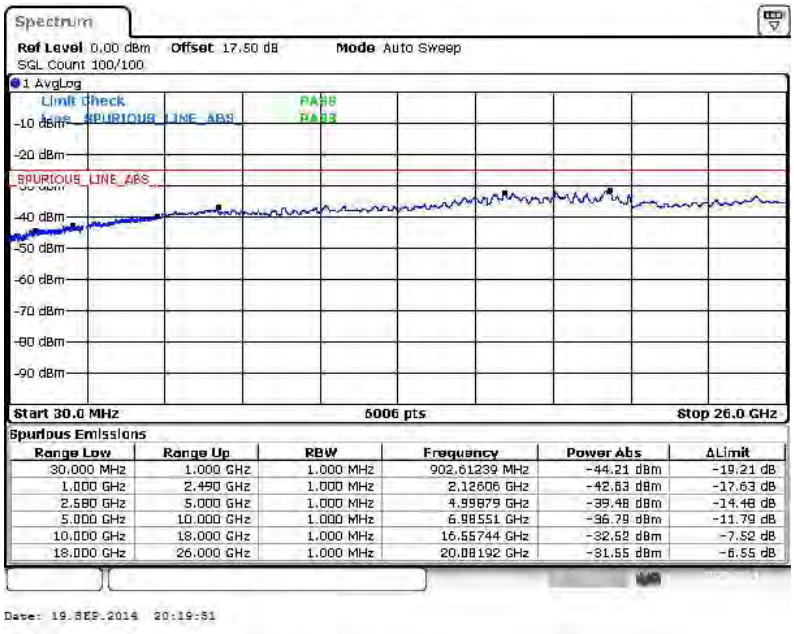


Band :	LTE Band 7	Channel :	CH21100 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

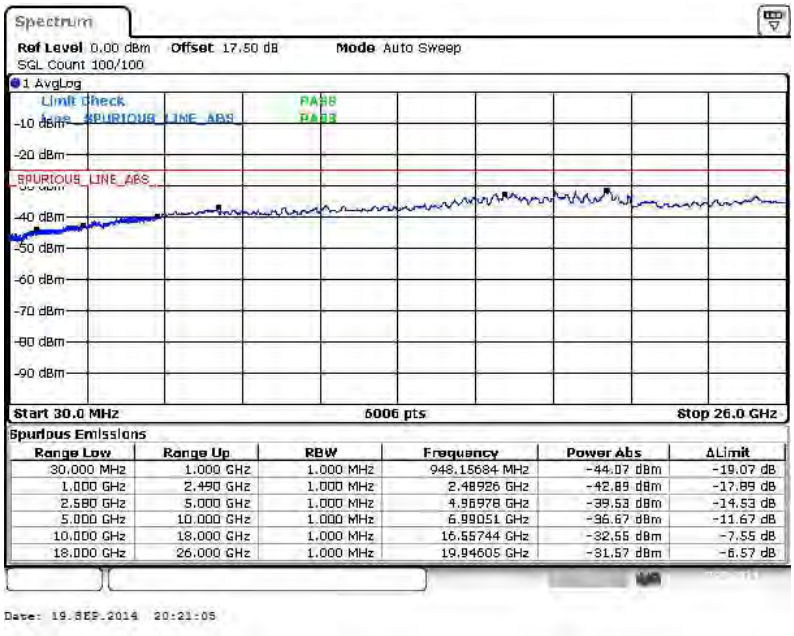


16QAM (RB Size 1, RB Offset 49)

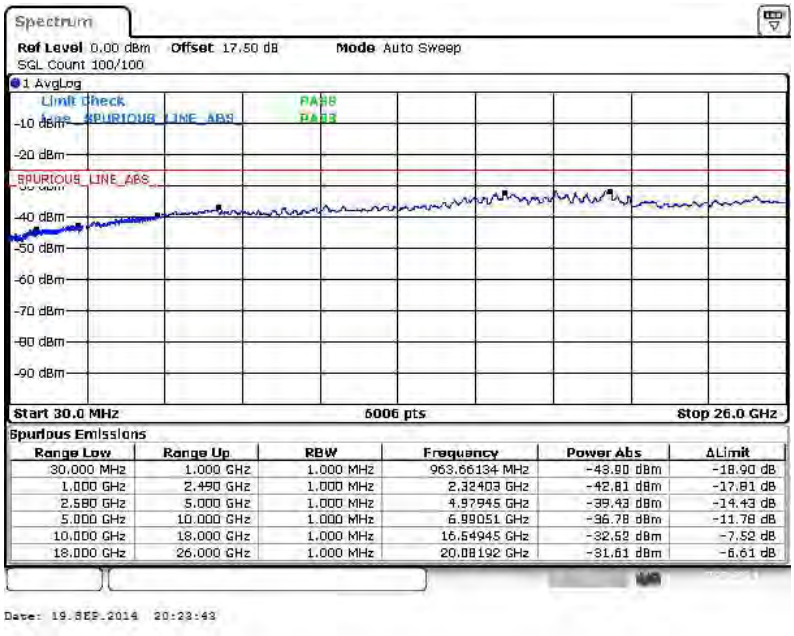


Band :	LTE Band 7	Channel :	CH21400 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

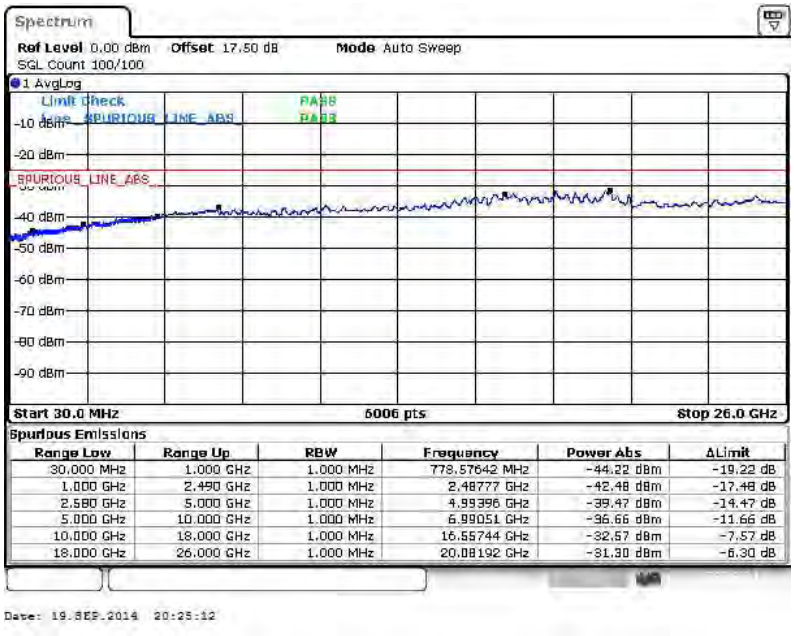


16QAM (RB Size 1, RB Offset 49)

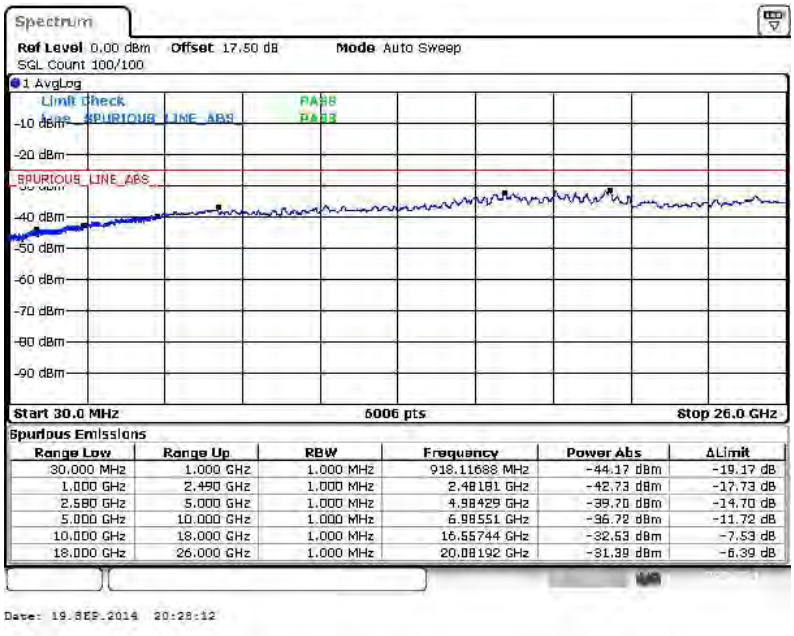


Band :	LTE Band 7	Channel :	CH20825 (Low)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 37)

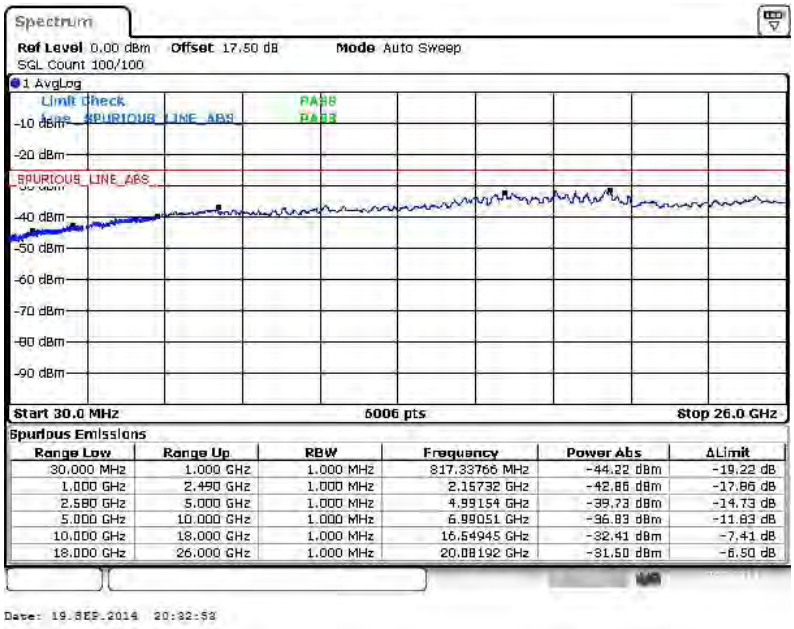


16QAM (RB Size 1, RB Offset 0)

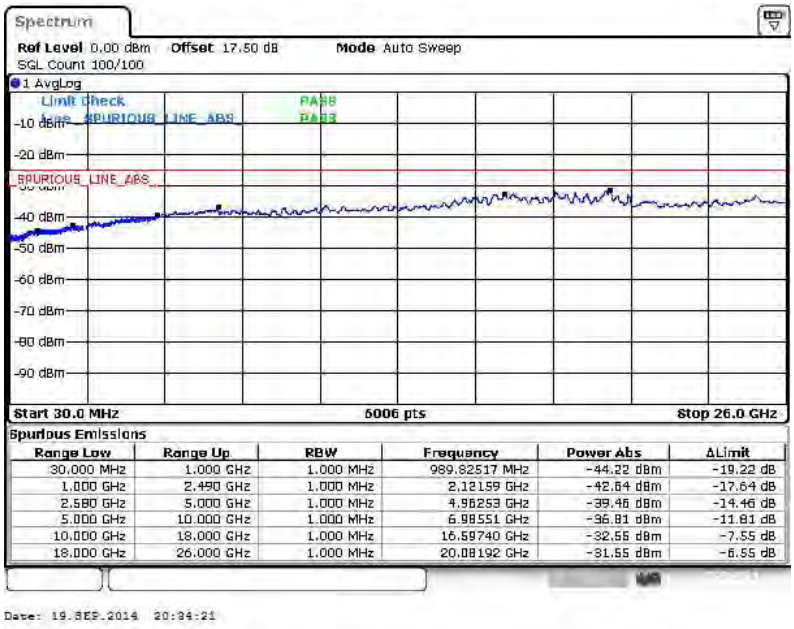


Band :	LTE Band 7	Channel :	CH21100 (Middle)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 37)

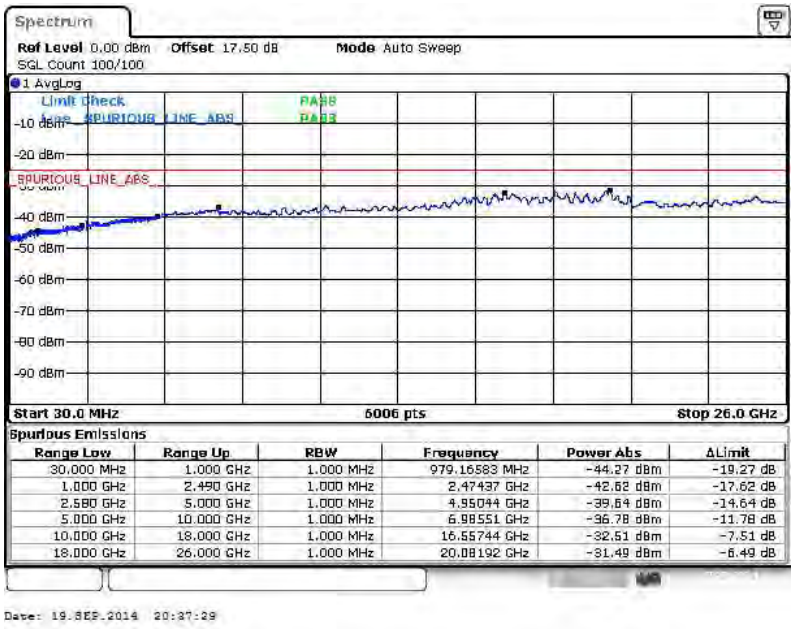


16QAM (RB Size 1, RB Offset 37)

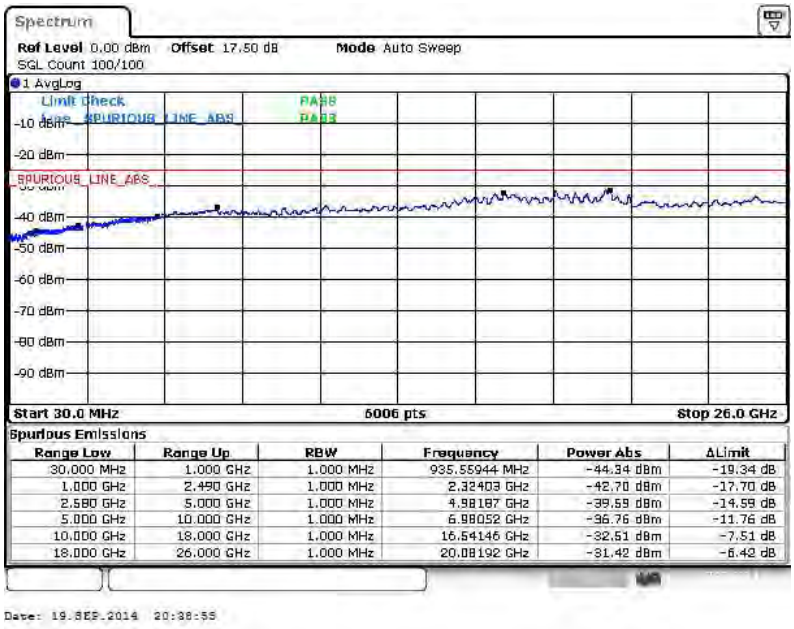


Band :	LTE Band 7	Channel :	CH21375 (High)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 74)

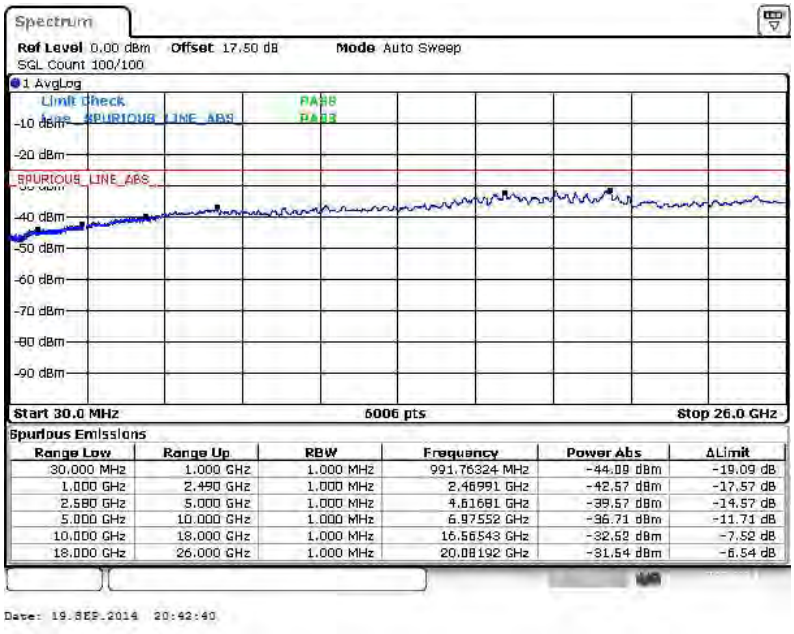


16QAM (RB Size 1, RB Offset 74)

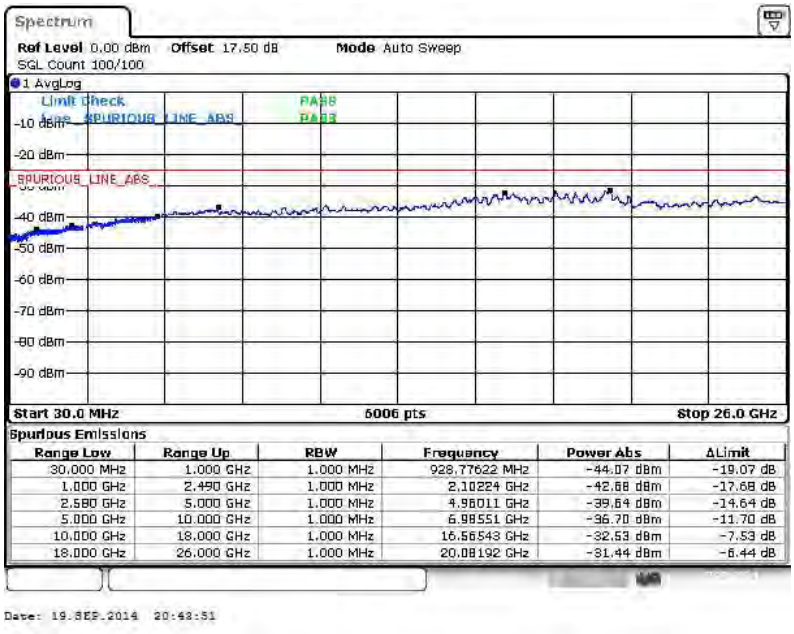


Band :	LTE Band 7	Channel :	CH20850 (Low)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 49)

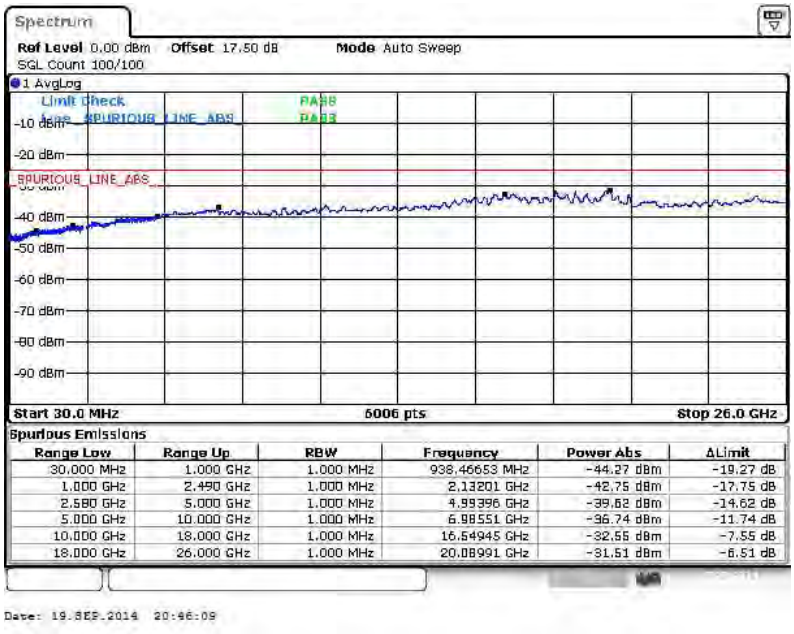


16QAM (RB Size 1, RB Offset 49)

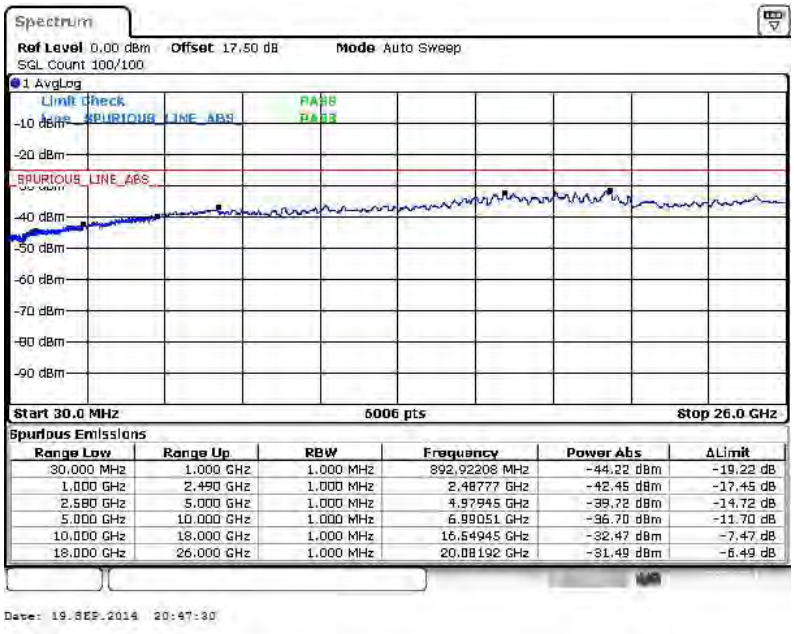


Band :	LTE Band 7	Channel :	CH21100 (Middle)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 49)

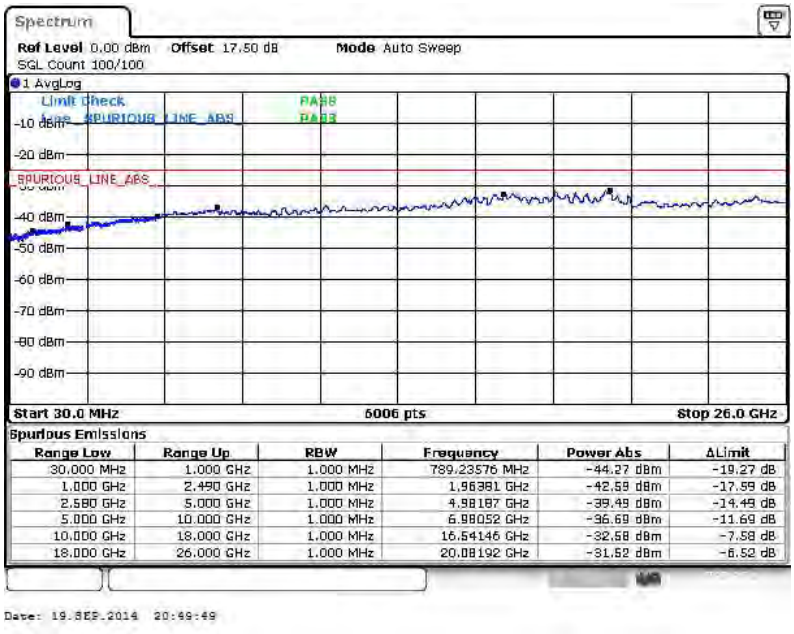


16QAM (RB Size 1, RB Offset 99)

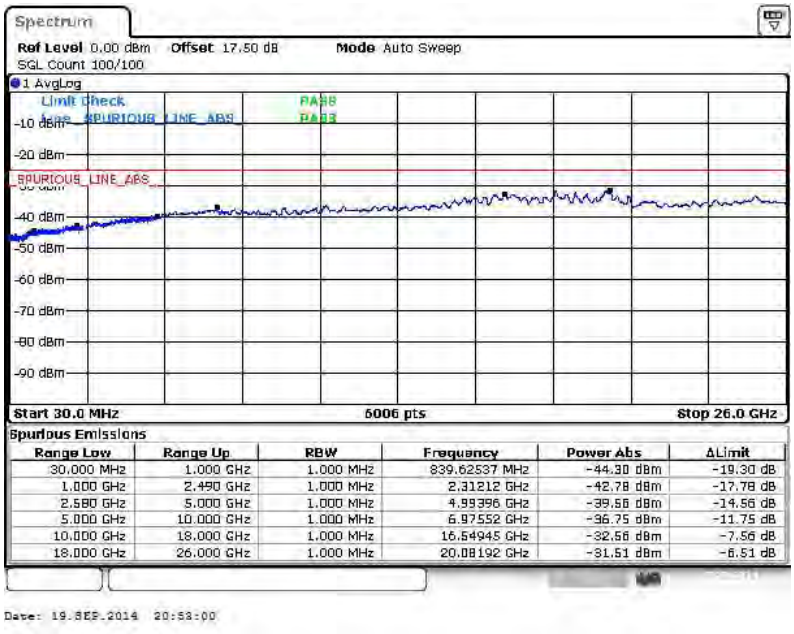


Band :	LTE Band 7	Channel :	CH21350 (High)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 49)

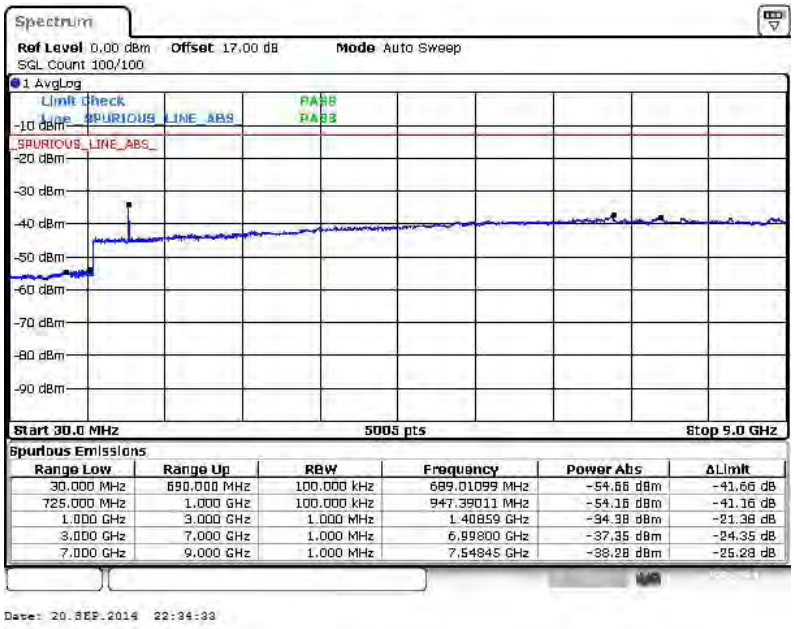


16QAM (RB Size 1, RB Offset 99)

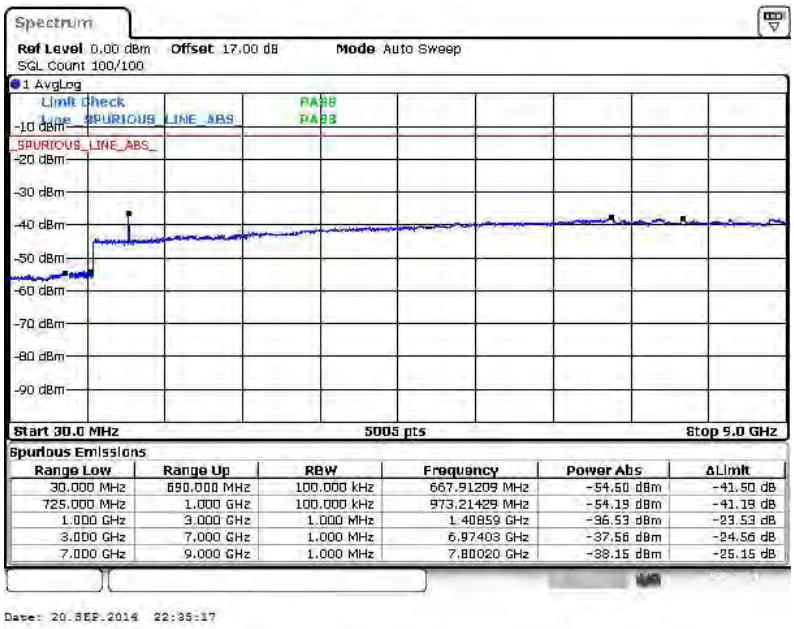


Band :	LTE Band 17	Channel :	CH23755 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 12)

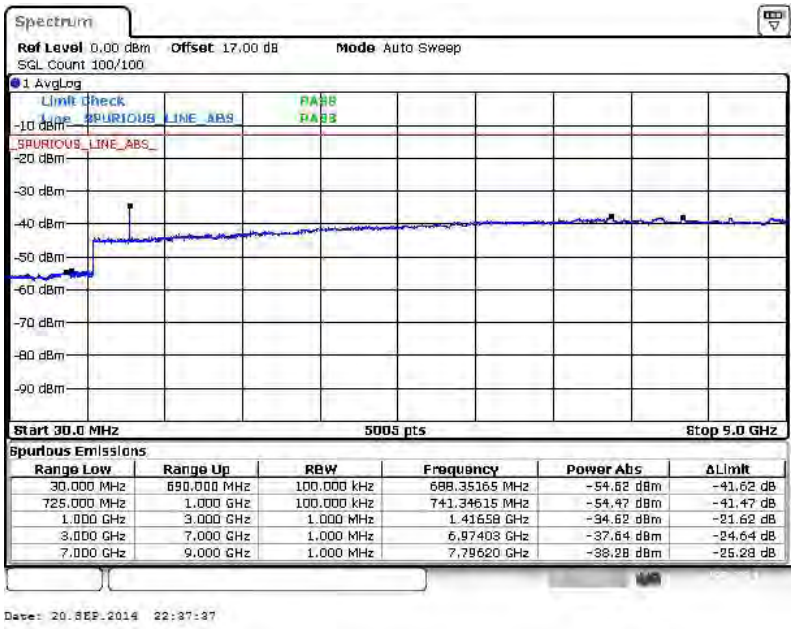


16QAM (RB Size 1, RB Offset 24)

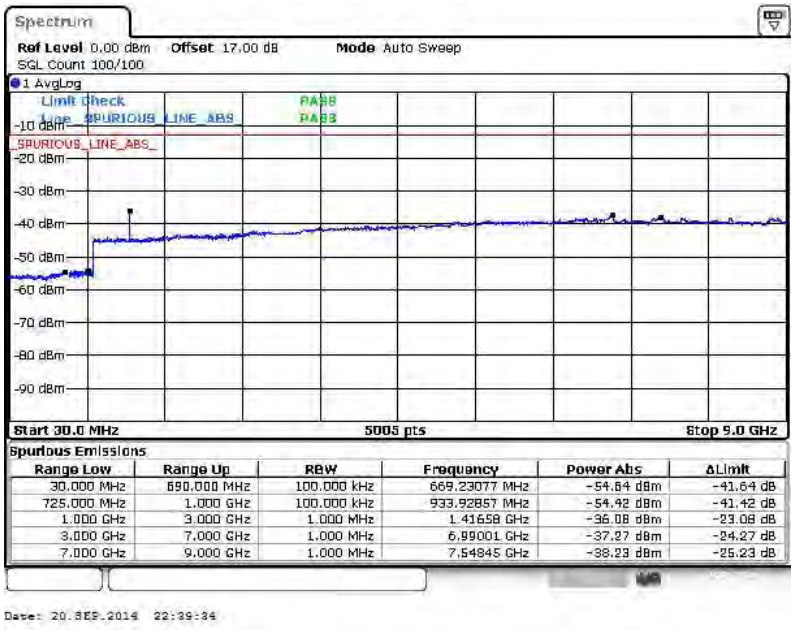


Band :	LTE Band 17	Channel :	CH23790 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)

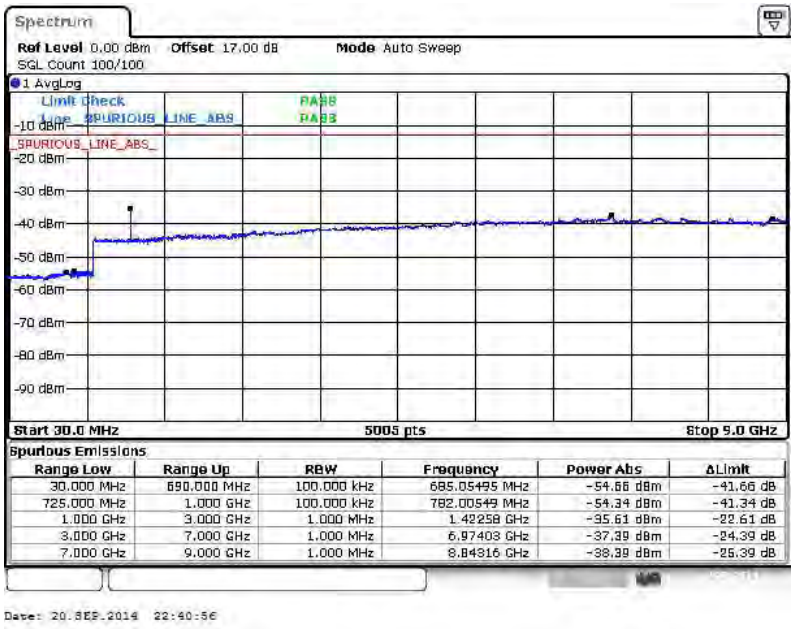


16QAM (RB Size 1, RB Offset 12)

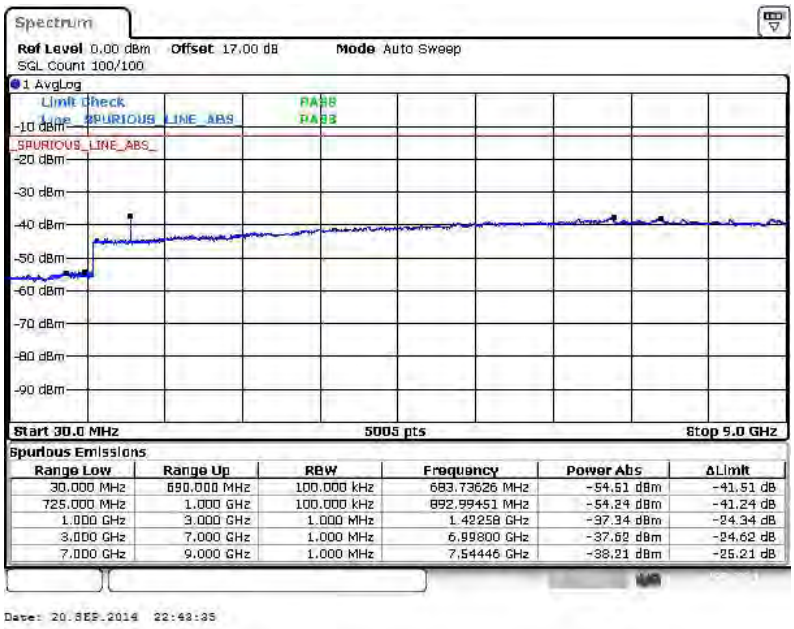


Band :	LTE Band 17	Channel :	CH23825 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)

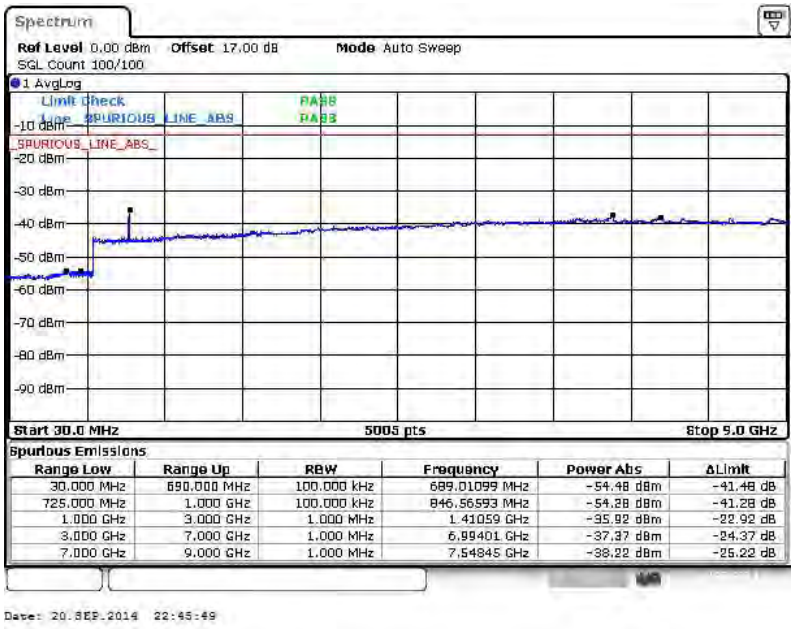


16QAM (RB Size 1, RB Offset 0)

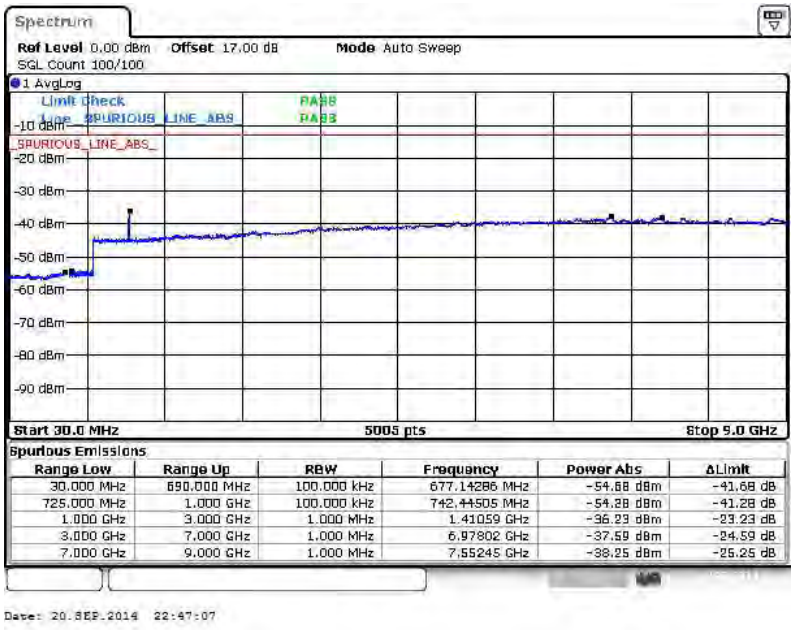


Band :	LTE Band 17	Channel :	CH23780 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

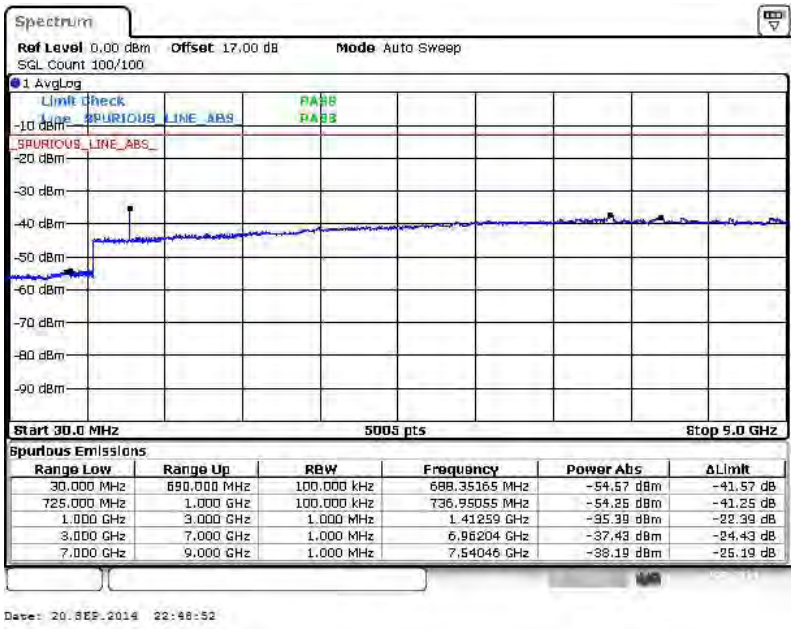


16QAM (RB Size 1, RB Offset 49)

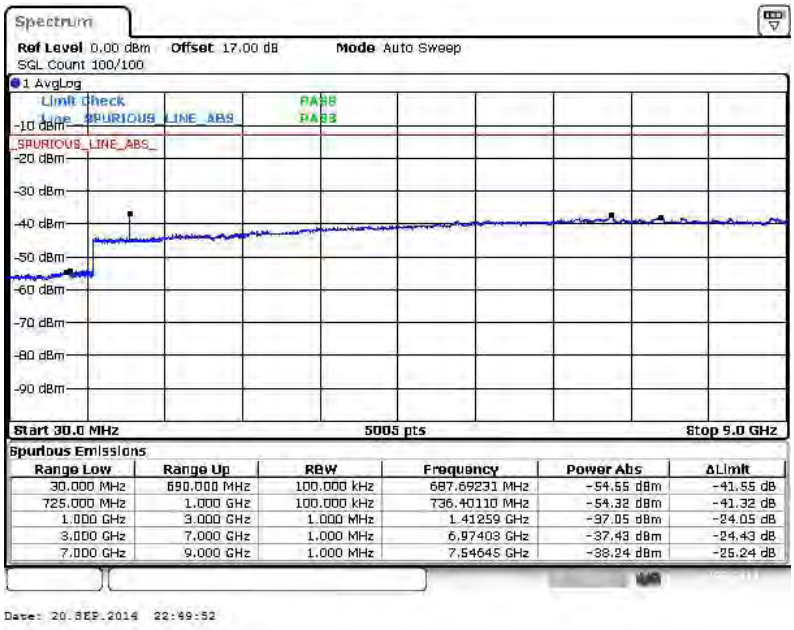


Band :	LTE Band 17	Channel :	CH23790 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

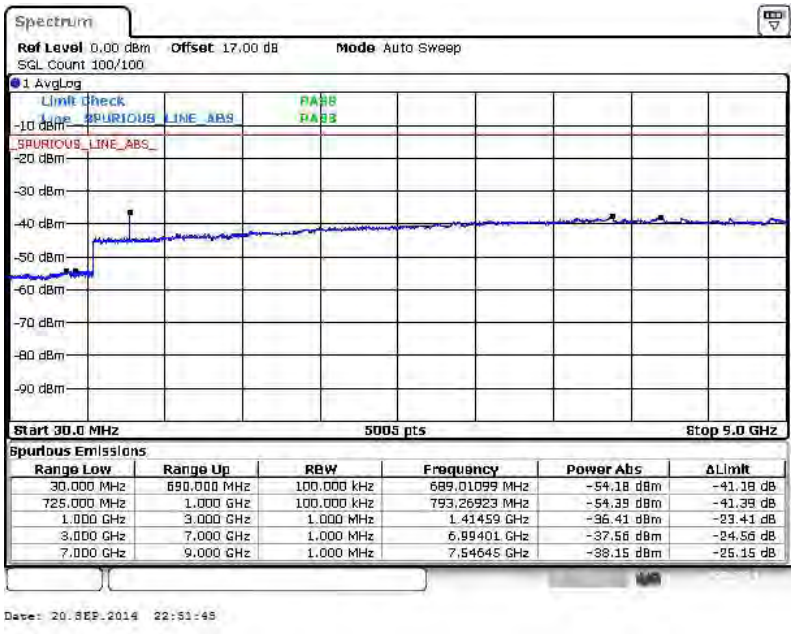


16QAM (RB Size 1, RB Offset 49)

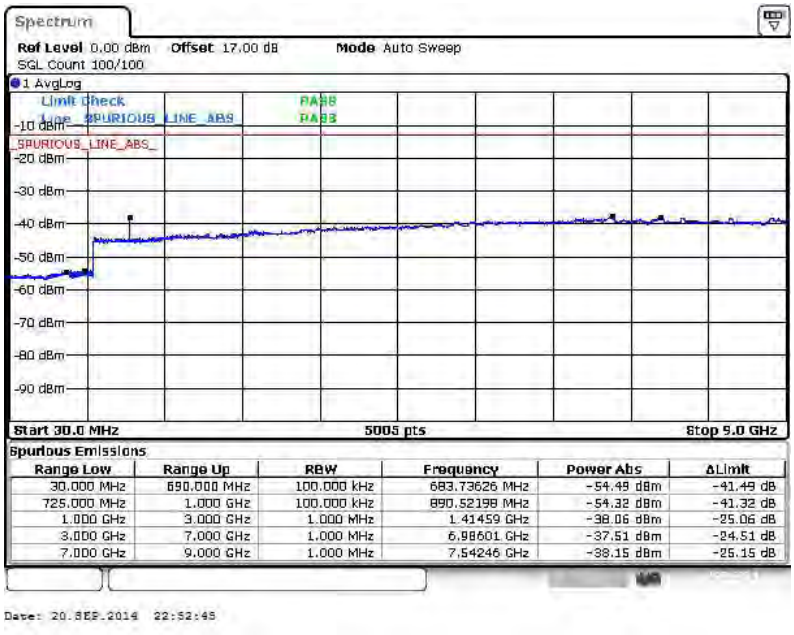


Band :	LTE Band 17	Channel :	CH23800 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)



16QAM (RB Size 1, RB Offset 24)



3.7 Radiated Spurious Emission Measurement

3.7.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

For Band 7
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

For LTE Band 17
For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.7.2 Measuring Instruments

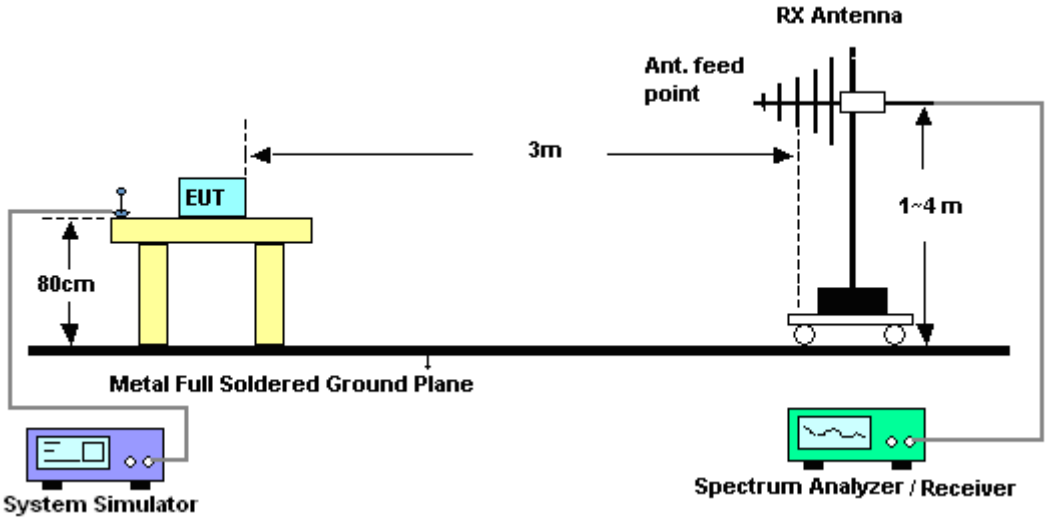
The measuring equipment is listed in the section 4 of this test report.

3.7.3 Test Procedures

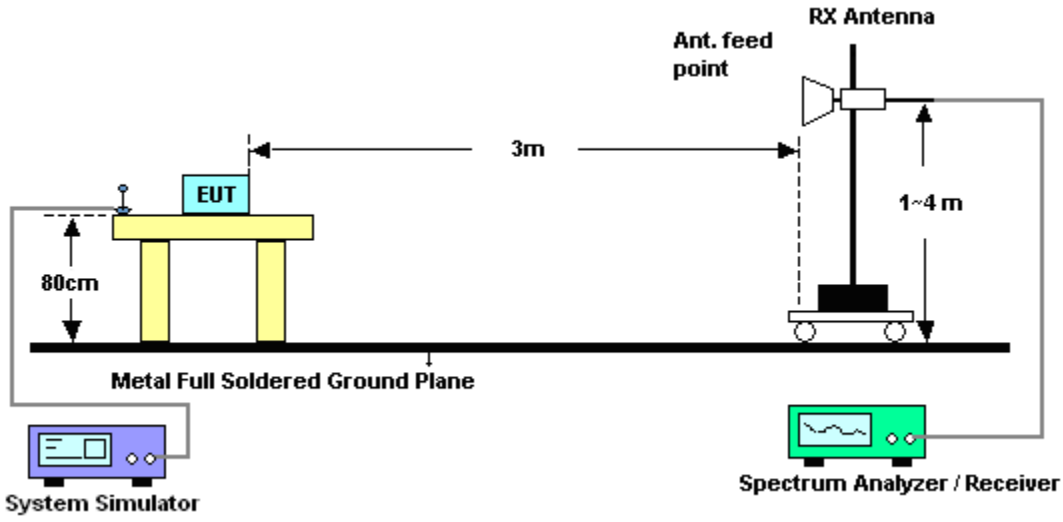
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.
    For Band 7
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [55 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)
    = -25dBm.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15

3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.7.5 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3463.92	-52.78	-13	-39.78	-65.45	-59.78	1.3	8.30	H	Pass
5195.88	-56.10	-13	-43.10	-73.83	-64.62	1.6	10.12	H	Pass
6927.84	-54.62	-13	-41.62	-76.36	-65.02	1.7	12.10	H	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3463.92	-53.87	-13	-40.87	-69.42	-60.87	1.3	8.3	V	Pass
5195.88	-57.37	-13	-44.37	-74.19	-65.89	1.6	10.12	V	Pass
6927.84	-53.38	-13	-40.38	-75.43	-63.78	1.7	12.1	V	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	3MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3462.48	-51.35	-13	-38.35	-64.43	-58.35	1.3	8.30	H	Pass
5193.72	-55.31	-13	-42.31	-73.04	-63.83	1.6	10.12	H	Pass
6924.96	-53.18	-13	-40.18	-74.92	-63.58	1.7	12.10	H	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	3MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3462.48	-53.20	-13	-40.20	-68.75	-60.20	1.3	8.3	V	Pass
5193.72	-56.90	-13	-43.90	-73.72	-65.42	1.6	10.12	V	Pass
6924.96	-53.31	-13	-40.31	-75.36	-63.71	1.7	12.1	V	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3460.68	-52.60	-13	-39.60	-65.27	-59.60	1.3	8.30	H	Pass
5191.02	-55.44	-13	-42.44	-73.17	-63.96	1.6	10.12	H	Pass
6921.36	-53.04	-13	-40.04	-74.78	-63.44	1.7	12.10	H	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3460.68	-53.36	-13	-40.36	-68.91	-60.36	1.3	8.3	V	Pass
5191.02	-56.89	-13	-43.89	-73.71	-65.41	1.6	10.12	V	Pass
6921.36	-52.95	-13	-39.95	-75	-63.35	1.7	12.1	V	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3456.18	-45.53	-13	-32.53	-60.88	-52.53	1.3	8.30	H	Pass
5184.27	-56.26	-13	-43.26	-73.99	-64.78	1.6	10.12	H	Pass
6912.36	-54.02	-13	-41.02	-75.76	-64.42	1.7	12.10	H	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3456.18	-52.55	-13	-39.55	-68.1	-59.55	1.3	8.3	V	Pass
5184.27	-57.27	-13	-44.27	-74.09	-65.79	1.6	10.12	V	Pass
6912.36	-53.54	-13	-40.54	-75.59	-63.94	1.7	12.1	V	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3451.68	-47.40	-13	-34.40	-62.59	-54.40	1.3	8.30	H	Pass
5177.52	-56.17	-13	-43.17	-73.90	-64.69	1.6	10.12	H	Pass
6903.36	-53.73	-13	-40.73	-75.47	-64.13	1.7	12.10	H	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3451.68	-53.10	-13	-40.10	-68.65	-60.10	1.3	8.3	V	Pass
5177.52	-56.29	-13	-43.29	-73.11	-64.81	1.6	10.12	V	Pass
6903.36	-53.60	-13	-40.60	-75.65	-64.00	1.7	12.1	V	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3447.18	-50.61	-13	-37.61	-64.15	-57.61	1.3	8.30	H	Pass
5170.77	-55.85	-13	-42.85	-73.58	-64.37	1.6	10.12	H	Pass
6894.36	-53.20	-13	-40.20	-74.94	-63.60	1.7	12.10	H	Pass

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3447.18	-52.17	-13	-39.17	-67.72	-59.17	1.3	8.3	V	Pass
5170.77	-56.75	-13	-43.75	-73.57	-65.27	1.6	10.12	V	Pass
6894.36	-52.59	-13	-39.59	-74.64	-62.99	1.7	12.1	V	Pass

Band :	LTE Band 7	Temperature :	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5065.68	-62.75	-25	-37.75	-73.69	-69.15	1.2	7.60	H	Pass
7598.52	-57.19	-25	-32.19	-76.00	-65.53	1.56	9.90	H	Pass
10131.36	-54.07	-25	-29.07	-77.59	-63.89	1.78	11.60	H	Pass

Band :	LTE Band 7	Temperature :	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5065.68	-61.58	-25	-36.58	-74.3	-67.98	1.2	7.60	V	Pass
7598.52	-56.81	-25	-31.81	-76.06	-65.15	1.56	9.90	V	Pass
10131.36	-54.24	-25	-29.24	-77.47	-64.06	1.78	11.60	V	Pass

Band :	LTE Band 7	Temperature :	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5060.00	-62.87	-25	-37.87	-73.81	-69.27	1.2	7.60	H	Pass
7591.77	-57.19	-25	-32.19	-76.00	-65.53	1.56	9.90	H	Pass
10122.36	-53.98	-25	-28.98	-77.50	-63.80	1.78	11.60	H	Pass

Band :	LTE Band 7	Temperature :	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5060	-61.79	-25	-36.79	-74.51	-68.19	1.2	7.60	V	Pass
7591.77	-57.21	-25	-32.21	-76.46	-65.55	1.56	9.90	V	Pass
10122.36	-53.60	-25	-28.60	-76.83	-63.42	1.78	11.60	V	Pass

Band :	LTE Band 7	Temperature :	23~25°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5056.68	-63.73	-25	-38.73	-74.67	-70.13	1.2	7.60	H	Pass
7585.02	-57.31	-25	-32.31	-76.12	-65.65	1.56	9.90	H	Pass
10113.36	-53.82	-25	-28.82	-77.34	-63.64	1.78	11.60	H	Pass

Band :	LTE Band 7	Temperature :	23~25°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5056.68	-61.36	-25	-36.36	-74.08	-67.76	1.2	7.60	V	Pass
7585.02	-76.15	-25	-51.15	-76.15	-84.49	1.56	9.90	V	Pass
10113.36	-54.51	-25	-29.51	-77.74	-64.33	1.78	11.60	V	Pass

Band :	LTE Band 7	Temperature :	23~25°C
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5052.18	-63.50	-25	-38.50	-74.44	-69.90	1.2	7.60	H	Pass
7578.27	-57.49	-25	-32.49	-76.30	-65.83	1.56	9.90	H	Pass
10104.36	-53.71	-25	-28.71	-77.23	-63.53	1.78	11.60	H	Pass

Band :	LTE Band 7	Temperature :	23~25°C
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5052.18	-61.34	-25	-36.34	-74.06	-67.74	1.2	7.60	V	Pass
7578.27	-56.41	-25	-31.41	-75.66	-64.75	1.56	9.90	V	Pass
10104.36	-54.14	-25	-29.14	-77.37	-63.96	1.78	11.60	V	Pass

Band :	LTE Band 17	Temperature :	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1415.68	-31.12	-13	-18.12	-47.41	-34.05	0.78	5.86	H	Pass
2123.58	-43.42	-13	-30.42	-66.84	-46.02	1	5.75	H	Pass
2831.36	-60.90	-13	-47.90	-71.26	-65.20	1.05	7.50	H	Pass

Band :	LTE Band 17	Temperature :	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1415.68	-40.72	-13	-27.72	-54.21	-43.65	0.78	5.86	V	Pass
2123.58	-47.09	-13	-34.09	-67.82	-49.69	1.00	5.75	V	Pass
2831.36	-59.90	-13	-46.90	-71.49	-64.20	1.05	7.50	V	Pass

Band :	LTE Band 17	Temperature :	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1411.18	-30.53	-13	-17.53	-46.81	-33.46	0.78	5.86	H	Pass
2116.77	-49.34	-13	-36.34	-70.69	-51.94	1	5.75	H	Pass
2822.36	-59.98	-13	-46.98	-70.34	-64.28	1.05	7.50	H	Pass

Band :	LTE Band 17	Temperature :	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	48~52%
Test Engineer :	Leo Liao and Kaer Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1411.18	-40.53	-13	-27.53	-54.00	-43.46	0.78	5.86	V	Pass
2116.77	-46.95	-13	-33.95	-67.72	-49.55	1.00	5.75	V	Pass
2822.36	-58.93	-13	-45.93	-70.52	-63.23	1.05	7.50	V	Pass

3.8 Frequency Stability Measurement

3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

3.8.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

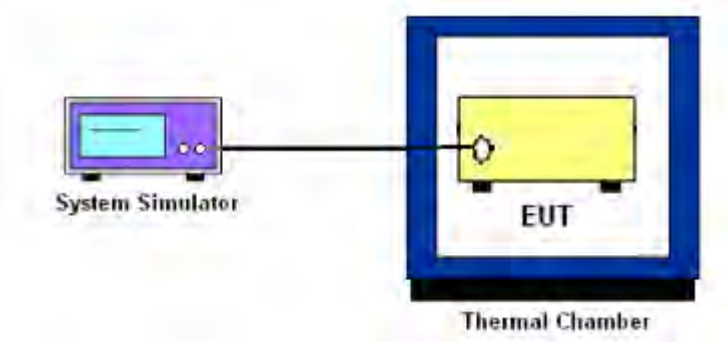
3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.8.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation (FCC)

Band :	LTE Band 4 (QPSK)	Limit (ppm) :	within authorized band

Temperature (°C)	BW 10MHz	Result
	Deviation (ppm)	
50	0.0017	PASS
40	0.0017	
30	0.0012	
20(Ref.)	0.0000	
10	0.0012	
0	0.0006	
-10	0.0127	
-20	0.0006	
-30	0.0139	

Band :	LTE Band 7 (QPSK)	Limit (ppm) :	within authorized band

Temperature (°C)	BW 10MHz	Result
	Deviation (ppm)	
50	0.0221	PASS
40	0.0047	
30	0.0272	
20(Ref.)	0.0000	
10	0.0028	
0	0.0118	
-10	0.0107	
-20	0.0726	
-30	0.1112	

Band :	LTE Band 17 (QPSK)	Limit (ppm) :	within authorized band

Temperature (°C)	BW 10MHz	Result
	Deviation (ppm)	
50	0.0028	PASS
40	0.0014	
30	0.0028	
20(Ref.)	0.0000	
10	0.0014	
0	0.0000	
-10	0.0042	
-20	0.0211	
-30	0.0211	

3.8.7 Test Result of Voltage Variation (FCC)

Band	Bandwidth	Voltage (Volt)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 4	10M	4.2	0.0046	(Note 3.)	PASS
		Normal	0.0000		
		3.4	0.0023		
LTE Band 7	10M	4.2	0.0020	(Note 3.)	PASS
		Normal	0.0000		
		3.4	0.0067		
LTE Band 17	10M	4.2	0.0028	(Note 3.)	PASS
		Normal	0.0000		
		3.4	0.0014		

Remark:

1. Normal Voltage = 3.8V.
2. The manufacturer declared that the EUT could work properly between voltage 3.4V ~ 4.2V.
3. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	May 08, 2014	Sep. 19, 2014~ Nov. 14, 2014	May 07, 2015	Conducted (TH01-SZ)
Thermal Chamber	Hongzhangroup	LP-150U	HD20120425	-40℃~150℃	Feb. 21, 2014	Sep. 19, 2014~ Nov. 14, 2014	Feb. 20, 2015	Conducted (TH01-SZ)
ESCIO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Oct. 24, 2014~ Oct. 29, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Spectrum Analyzer	Agilent	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2014	Oct. 24, 2014~ Oct. 29, 2014	May 25, 2015	Radiation (03CH01-SZ)
Bilog Antenna	TESEQ	CBL 6112D	37877	30MHz~2GHz	Oct. 15, 2014	Oct. 24, 2014~ Oct. 29, 2014	Oct. 14, 2015	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 15, 2014	Oct. 24, 2014~ Oct. 29, 2014	Oct. 14, 2015	Radiation (03CH01-SZ)
Double Ridged Horn Antenna	COM-POWER	AH-840	101073	18GHz~40GHz	Jun. 09, 2014	Oct. 24, 2014~ Oct. 29, 2014	Jun. 08, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz	Feb. 21, 2014	Oct. 24, 2014~ Oct. 29, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	May 08, 2014	Oct. 24, 2014~ Oct. 29, 2014	May 07, 2015	Radiation (03CH01-SZ)
AC Source(AVR)	Chroma	61601	616010001985	100Vac~250Vac	Mar. 25, 2014	Oct. 24, 2014~ Oct. 29, 2014	Mar. 24, 2015	Radiation (03CH01-SZ)
Turn Table	EM Electronics	EM 1000	N/A	0~360 degree	NCR	Oct. 24, 2014~ Oct. 29, 2014	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM Electronics	EM 1000	N/A	1 m~4 m	NCR	Oct. 24, 2014~ Oct. 29, 2014	NCR	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSP 7	100818	9kHz~7GHz	Jul. 17, 2014	Nov. 19, 2014	Jul. 16, 2015	ERP/EIRP (OTA02-SZ)
Quad-Ridged Horn	ETS-Lindgren	3164-08	00102954	700MHz~10000MHz	N/A	Nov. 19, 2014	N/A	ERP/EIRP (OTA02-SZ)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00108147	N/A	N/A	Nov. 19, 2014	N/A	ERP/EIRP (OTA02-SZ)
Switch Control Mainframe	Agilent	3499A	MY42005451	N/A	N/A	Nov. 19, 2014	N/A	ERP/EIRP (OTA02-SZ)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.9**