



2.5 CONDUCTED SPURIOUS EMISSIONS

2.5.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1051
FCC 47 CFR Part 96, Clause 96.41(e)(1)(2)(3)
FCC 47 CFR Part 90, Clause 90.1323(a)
RSS-192, Clause 5.5
RSS-197, Clause 5.7

2.5.2 Standard Applicable

FCC 47 CFR Part 96.41:

(e) 3.5 GHz Emissions and Interference Limits - (1) General protection levels. Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(2) Additional protection levels: Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

RSS-192, Clause 5.5:

The unwanted emissions shall comply with the following limits:

(i) In any 30 kHz bandwidth, the unwanted emission spectral density that is relative to the inband spectral density shall be attenuated at least to the limits shown in Table 1 according to the equipment modulation. The attenuation shall be linearly interpolated between the turning point attenuation limits.

Table 1: Attenuation of Unwanted Emission Limits for Various Access Schemes

Orthogonal Frequency Division Multiple Access (OFDMA)

Turning Point (F/ChS)	0	0.21	0.56	1.5	2
EMO = 2	8 dB	25 dB	27 dB	50 dB	50 dB
EMO = 4	8 dB	27 dB	32 dB	50 dB	50 dB
EMO = 6	8 dB	32 dB	38 dB	50 dB	50 dB

Code Division Multiple Access (CDMA)

Turning Point (F/ChS)	0	0.3	0.5	1	2
EMO Not applicable	0 dB	25 dB	25 dB	45 dB	45 dB

Frequency Division Multiple Access (FDMA)

Turning Point (F/ChS)	0	0.1	0.35	1	2
EMO = 2	23 dB	25 dB	25 dB	45 dB	45 dB
EMO = 3	27 dB	29 dB	29 dB	45 dB	45 dB
EMO = 4 or 6	31 dB	33 dB	33 dB	45 dB	45 dB

Time Division Multiple Access (TDMA)

Turning Point (F/ChS)	0	0.3	0.56	1.5	2
EMO = 2	Not applicable	25 dB	25 dB	45 dB	45 dB
EMO = 4	Not applicable	32 dB	37 dB	45 dB	45 dB
EMO = 6	13 dB	34 dB	42 dB	45 dB	45 dB

The offset frequency from the block edge, F, at each turning point can be determined as follows:
 $F = \text{ChS} * (\text{Turning Point})$; where ChS is defined as the frequency spacing between the centre frequencies of two adjacent channels.

EMO is the equivalent modulation order of the transmitter, defined as $\log_2(\text{number of discrete states which may be assigned to each symbol})$. For example, for quadrature amplitude modulation (QAM):

- 2 = 4 QAM
- 4 = 16 QAM
- 6 = 64 QAM

(ii) In any 1.0 MHz band that is removed from the assigned centre frequency by more than $\pm 250\%$ of the necessary bandwidth, the power of any emission must be attenuated below P_{mean} by at least $43 + 10 \log_{10}(P_{\text{mean}})$ dB, or 70 dB, whichever is less stringent. P_{mean} is the mean output power of the transmitter in watts.



FCC 47 CFR Part 90.1323:

(a) The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth.

RSS-197, Clause 5.7:

The unwanted emissions shall be measured at the frequencies of the highest and lowest channel of all bandwidths and types of modulation that the equipment can operate with a resolution bandwidth of 1 MHz or less, but at least 1% of the occupied bandwidth of the transmitter, provided that the measured power is integrated over a 1 MHz bandwidth.

The power of any emissions outside the frequency band 3650-3700 MHz shall be attenuated below the channel transmitter power P (dBW) by $43 + 10 \log (p)$, where p is measured in watts.

2.5.3 Equipment Under Test and Modification State

Serial No: AZ280418A00132 / Test Configuration A

2.5.4 Date of Test/Initial of test personnel who performed the test

July 01, 09 and 10, 2018 / ZXY

2.5.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

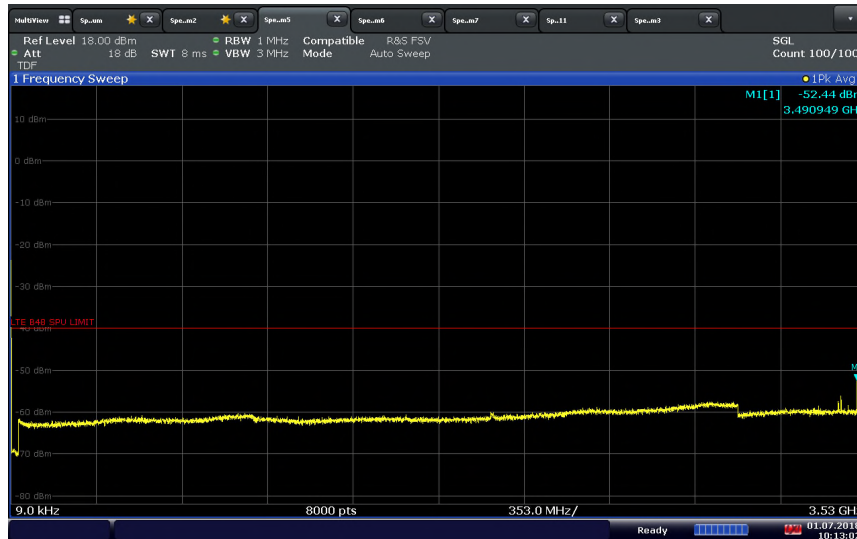
Ambient Temperature	25.2 - 27.8°C
Relative Humidity	39.4 - 49.3 %
ATM Pressure	98.8 - 99.1 kPa

2.5.7 Additional Observations

- This is a conducted test.
- The spectrum was searched from 30MHz to the 10th harmonic.
- Only noise floor measurements observed above 26.5 GHz.
- Low, Middle and High channels on all channel bandwidth and modulation are verified. Only the worst case channel of each band presented.

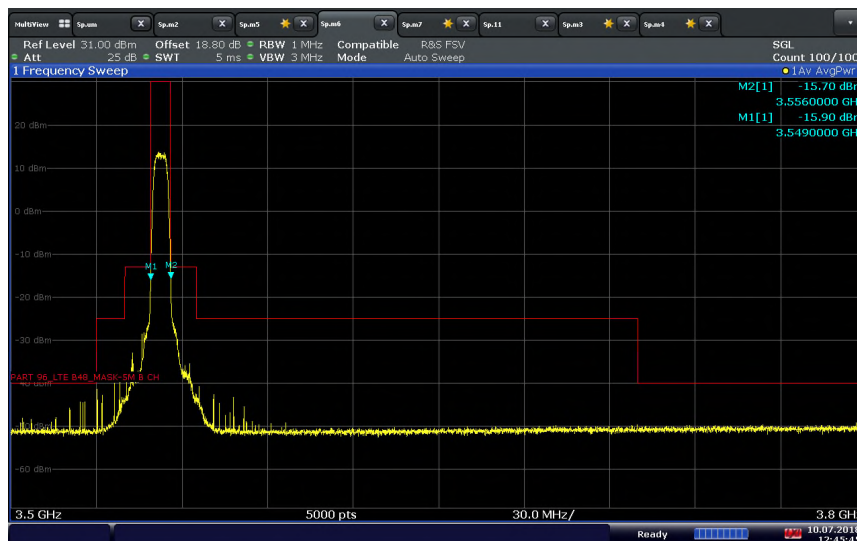
2.5.8 Test Results

LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / Low Channel 3552.5 MHz 9 kHz - 3530 MHz



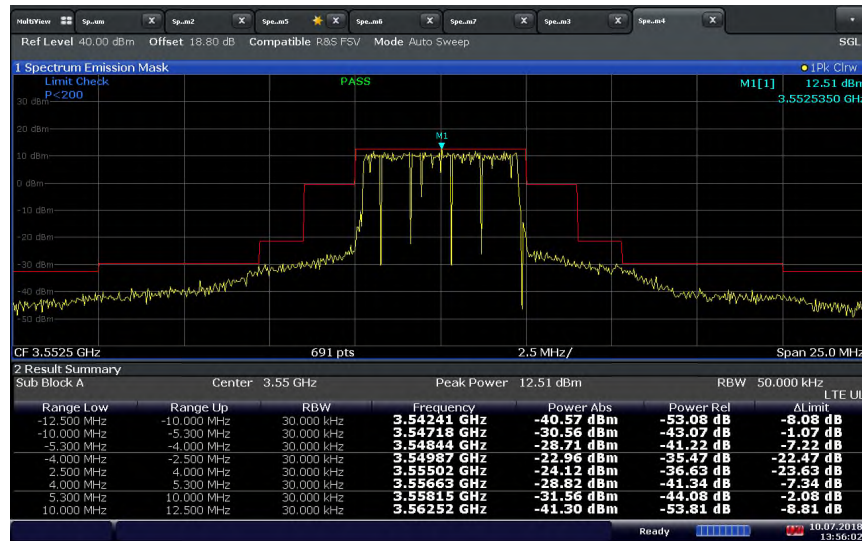
10:13:03 01.07.2018

LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / Low Channel 3552.5 MHz Full RB 3530 kHz - 3720 MHz according to FCC Part 96



12:45:46 10.07.2018

**LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / Low Channel 3552.5 MHz Full RB
 unwanted emission spectral density Mask according to RSS-192**



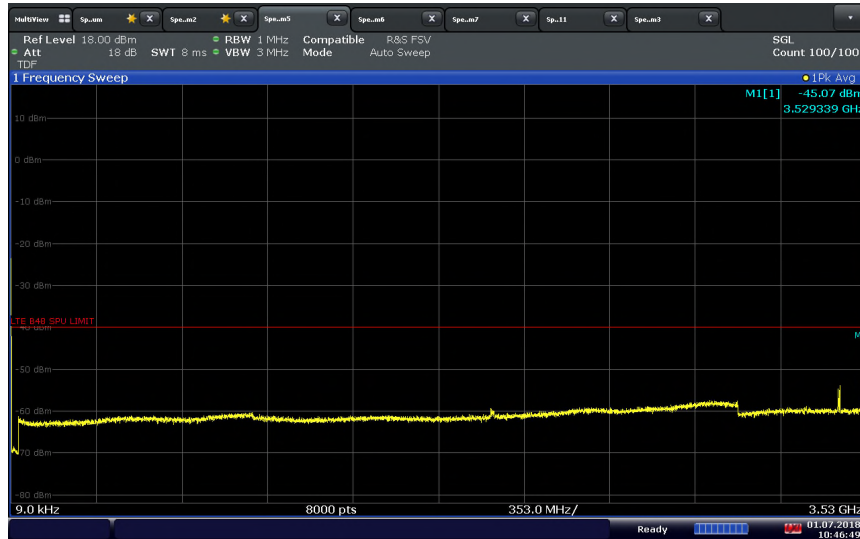
13:56:02 10.07.2018

**LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / Low Channel 3552.5 MHz
 3720 MHz - 26.5 GHz**



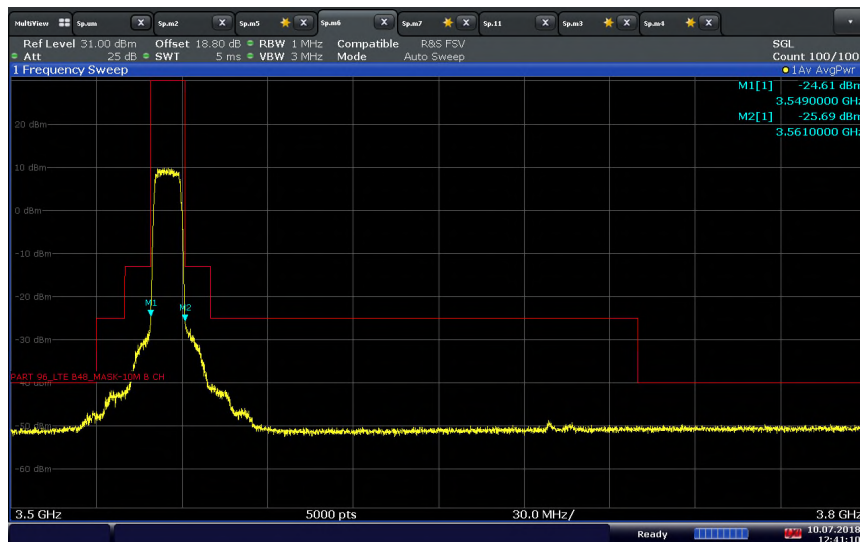
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**LTE Band 48 (3550 – 3650 MHz)_10 MHz BW / QPSK / Low Channel 3555 MHz
 9 kHz - 3530 MHz**



10:46:50 01.07.2018

**LTE Band 48 (3550 – 3650 MHz)_10 MHz BW / QPSK / Low Channel 3555 MHz Full RB
 3530 kHz - 3720 MHz according to FCC Part 96**



12:41:10 10.07.2018

MultiView **Spectrum 4**

Ref Level 28.80 dBm Offset 18.80 dB Compatible R&S FSV Mode Auto Sweep

1 Spectrum Emission Mask

Limit Check $P < 200$

PASS

M1

M1[1] 10.21 dBm 3.558960 GHz

CF 3.555 GHz 691 pts 5.0 MHz/ Span 50.0 MHz

2 Result Summary

Sub Block A

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ALimit
-25.000 MHz	-20.000 MHz	30.000 kHz	3.53482 GHz	-43.44 dBm	-53.64 dB	-8.64 dB
-20.000 MHz	-10.600 MHz	30.000 kHz	3.54363 GHz	-34.54 dBm	-44.75 dB	-2.75 dB
-10.600 MHz	-8.000 MHz	30.000 kHz	3.54607 GHz	-31.95 dBm	-42.15 dB	-8.15 dB
-8.000 MHz	-5.000 MHz	30.000 kHz	3.54996 GHz	-26.05 dBm	-36.25 dB	-23.25 dB
5.000 MHz	8.000 MHz	30.000 kHz	3.56011 GHz	-27.39 dBm	-37.60 dB	-24.60 dB
8.000 MHz	10.600 MHz	30.000 kHz	3.56333 GHz	-29.98 dBm	-40.19 dB	-6.19 dB
10.600 MHz	20.000 MHz	30.000 kHz	3.56644 GHz	-34.71 dBm	-44.91 dB	-2.91 dB
20.000 MHz	25.000 MHz	30.000 kHz	3.57511 GHz	-43.30 dBm	-53.51 dB	-8.51 dB

Ready 10/07/2011 16:04:11

MultiView Sp...m1 Sp...m2 Sp...m3 Sp...m4 Sp...m5 Sp...m6 Sp...m7 Sp...m8 Sp...m9

Ref Level 12.00 dBm Att 12 dB RBW 1 MHz VBW 3 MHz Compatible Mode R&S FSV Auto Sweep

SGL Count 100/100

1 Frequency Sweep

10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm

10% Avg
M1[1] -44.50 dBm
26.367240 GHz

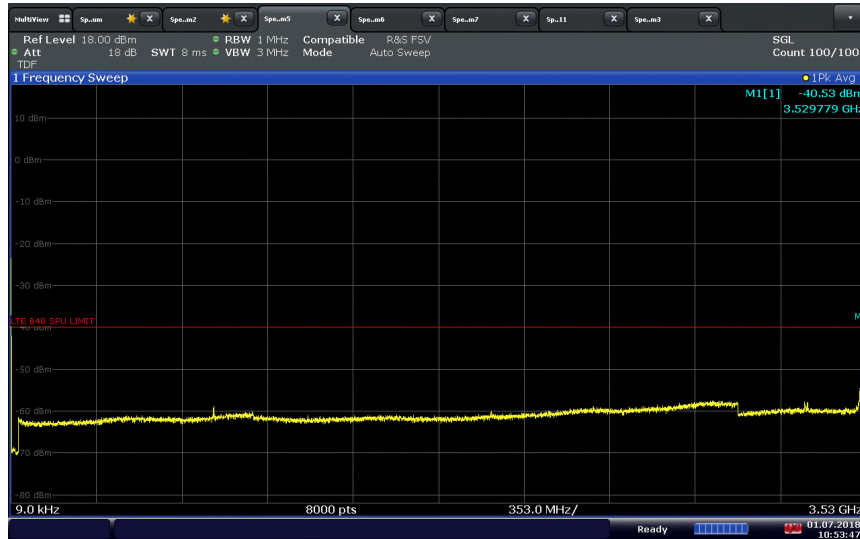
LTE E40 SRP LIMIT

3.72 GHz 32001 pts 2.28 GHz/ 26.5 GHz

Ready 01/07/2017 10:24:40

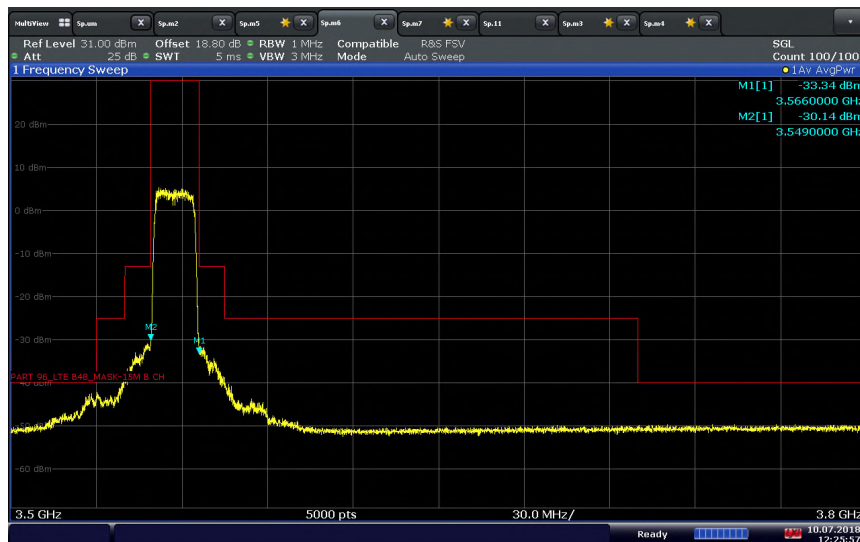
TÜV SÜD AMERICA INC 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone: 858 678 1400 FAX: 858 546 0364

**LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / Low Channel 3557.5 MHz
 9 kHz - 3530 MHz**



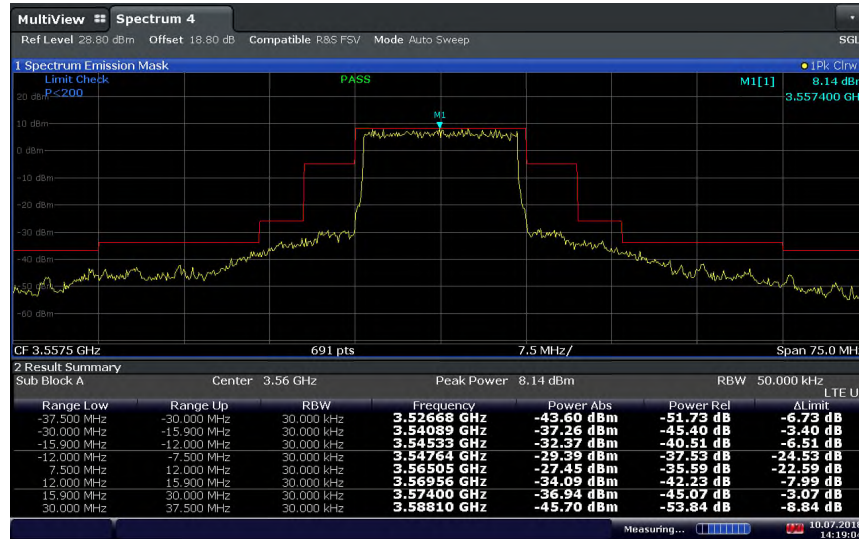
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**LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / Low Channel 3557.5 MHz 1RB 0 offset
 3530 kHz - 3720 MHz according to FCC Part 96**



12:25:58 10.07.2018

**LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / Low Channel 3557.5 MHz full RB
 unwanted emission spectral density Mask according to RSS-192**



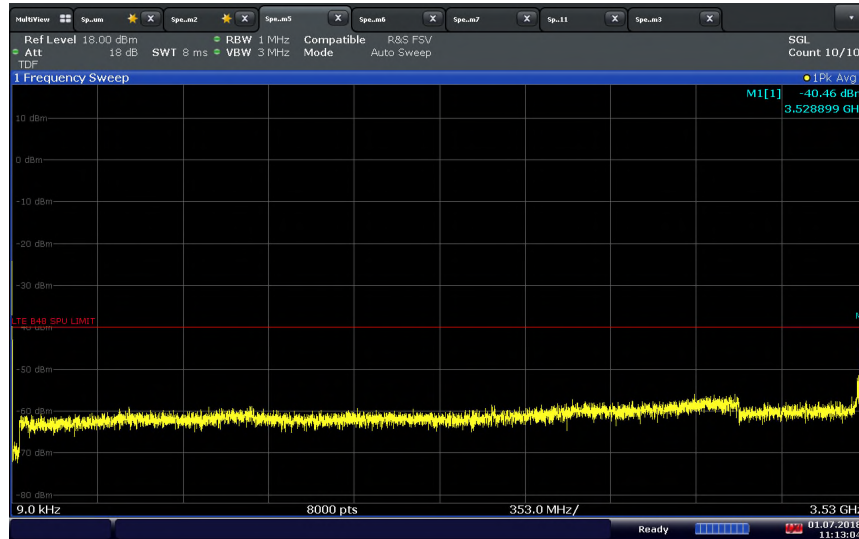
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**LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / Low Channel 3557.5 MHz
 3720 MHz - 26.5 GHz**



10:58:14 01.07.2018

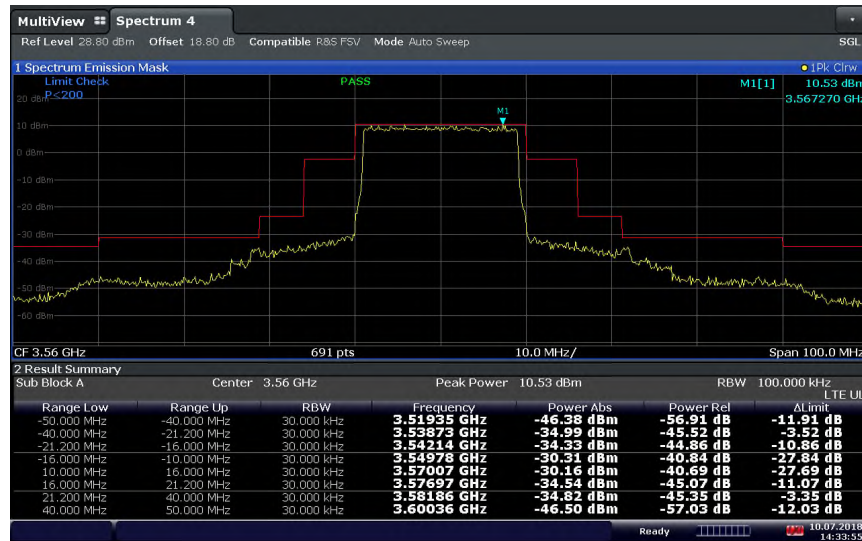
**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / Low Channel 3560 MHz
 9 kHz - 3530 MHz**



**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / Low Channel 3560 MHz full RB
 3530 kHz - 3720 MHz according to FCC Part 96**



**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / Low Channel 3560 MHz full RB
 unwanted emission spectral density Mask according to RSS-192**



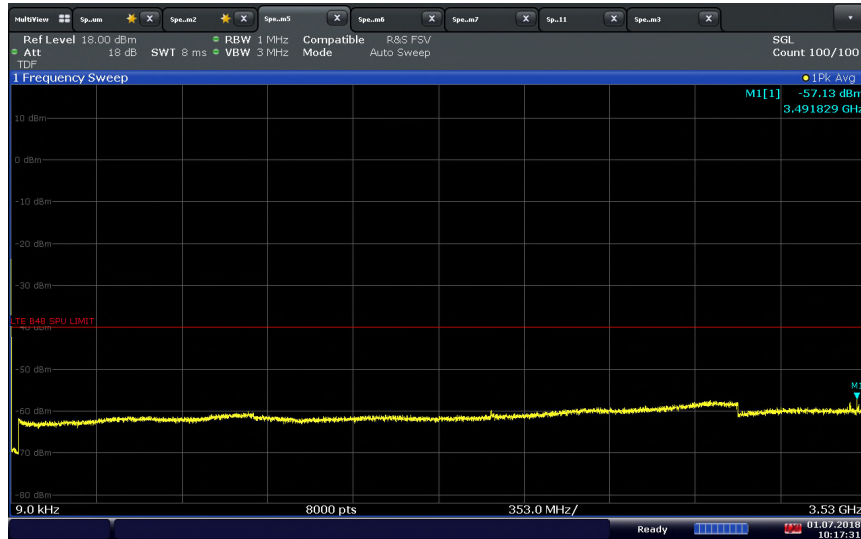
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**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / Low Channel 3560 MHz
 3720 MHz - 26.5 GHz**

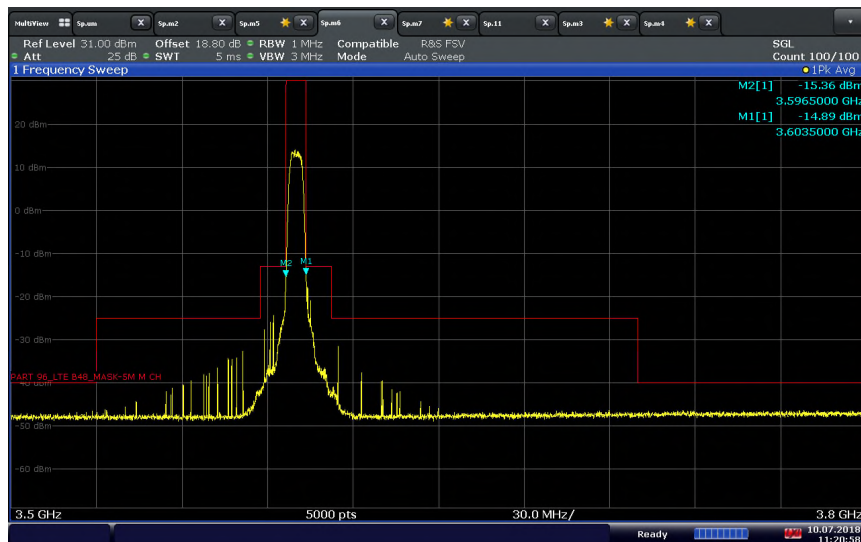


11:15:44 01.07.2018

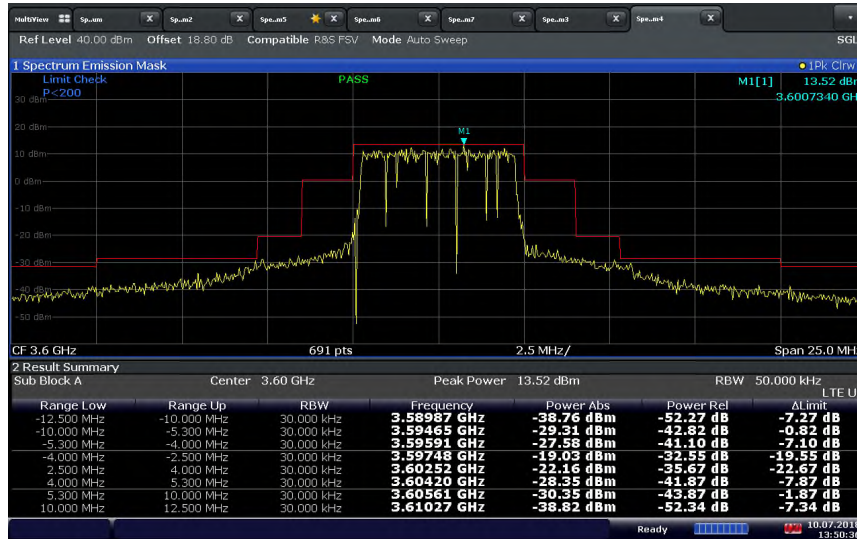
**LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / Middle Channel 3600 MHz
 9 kHz - 3530 MHz**



**LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / Middle Channel 3600 MHz full RB
 3530 kHz - 3720 MHz according to FCC Part 96**



**LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / Middle Channel 3600 MHz full RB
 unwanted emission spectral density Mask according to RSS-192**



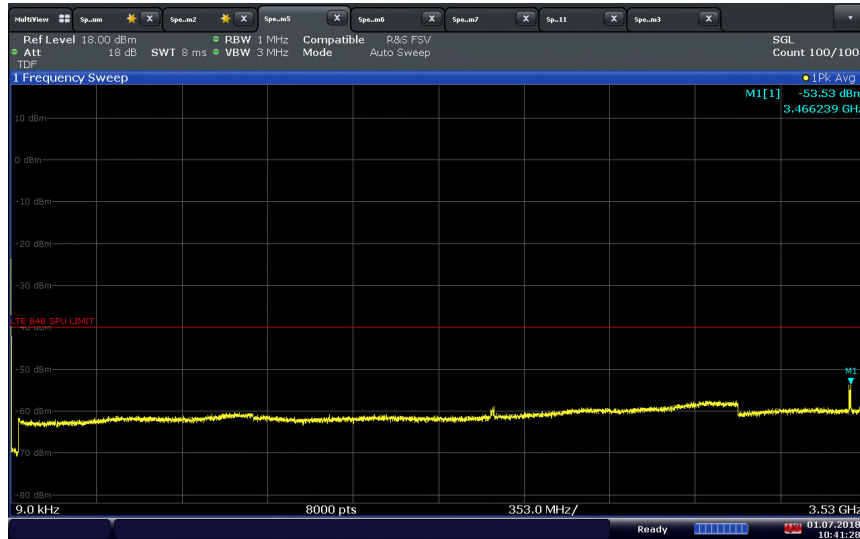
13:50:37 10.07.2018

**LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / Middle Channel 3600 MHz
 3720 MHz - 26.5 GHz**



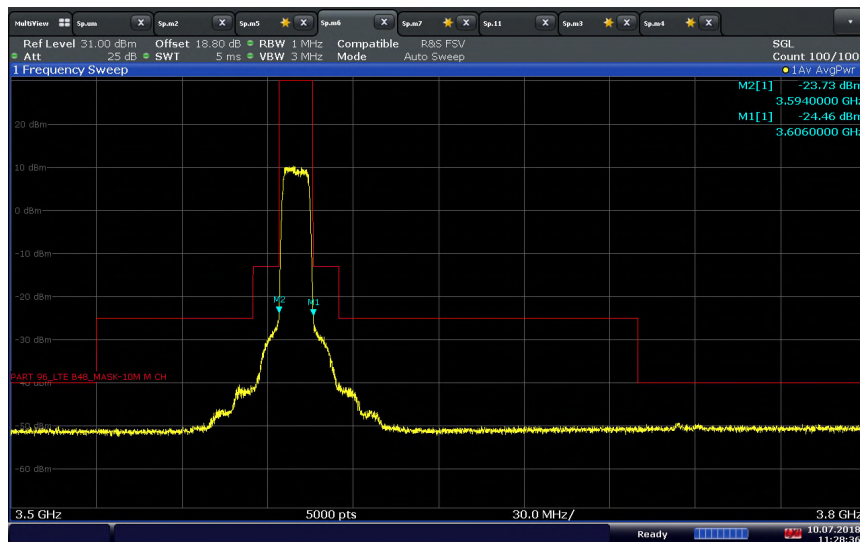
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**LTE Band 48 (3550 – 3650 MHz)_10 MHz BW / QPSK / Middle Channel 3600 MHz
 9 kHz - 3530 MHz**



10:41:29 01.07.2018

**LTE Band 48 (3550 – 3650 MHz)_10 MHz BW / QPSK / Middle Channel 3600 MHz full RB
 3530 kHz - 3720 MHz according to FCC Part 96**



11:28:37 10.07.2018

MultiView Spectrum 4

Ref Level 28.80 dBm Offset 18.80 dB Compatible R/S FSV Mode Auto Sweep SGL

1 Spectrum Emission Mask

Limit Check
P<200

PASS

M1

10.38 dBm
3.599860 GHz

CF 3.6 GHz 691 pts 5.0 MHz/pt Span 50.0 MHz

2 Result Summary

Sub Block A Center 3.60 GHz Peak Power 10.38 dBm RBW 50.000 kHz LTE U

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ALimit
-25.000 MHz	-20.000 MHz	30.000 kHz	3.57953 GHz	-44.55 dBm	-54.93 dB	-9.93 dB
-20.000 MHz	-10.600 MHz	30.000 kHz	3.58878 GHz	-34.42 dBm	-44.81 dB	-2.81 dB
-10.600 MHz	-8.000 MHz	30.000 kHz	3.59159 GHz	-30.08 dBm	-40.46 dB	-5.46 dB
-8.000 MHz	-5.000 MHz	30.000 kHz	3.59496 GHz	-25.07 dBm	-35.46 dB	-22.46 dB
5.000 MHz	8.000 MHz	30.000 kHz	3.60570 GHz	-27.59 dBm	-37.97 dB	-24.97 dB
8.000 MHz	10.600 MHz	30.000 kHz	3.60841 GHz	-30.24 dBm	-40.63 dB	-6.63 dB
10.600 MHz	20.000 MHz	30.000 kHz	3.61071 GHz	-33.87 dBm	-44.25 dB	-2.25 dB
20.000 MHz	25.000 MHz	30.000 kHz	3.62054 GHz	-44.78 dBm	-55.17 dB	-10.17 dB

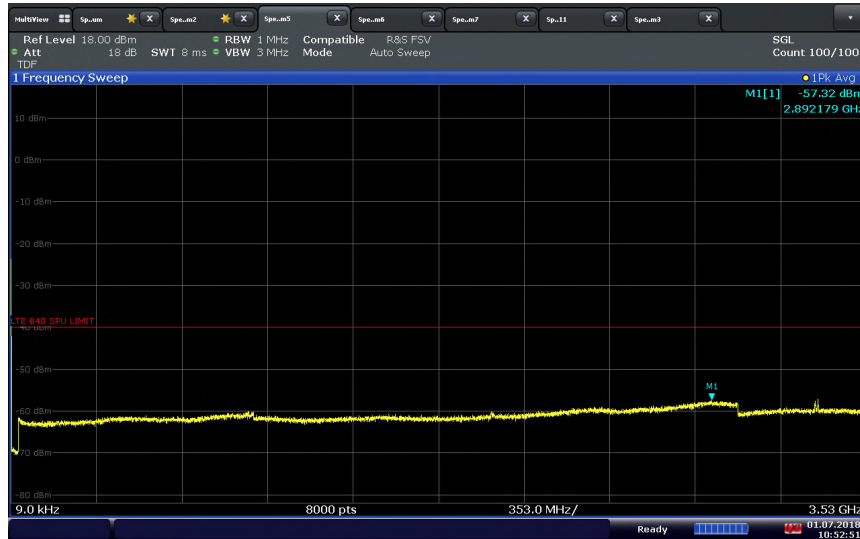
Ready 10/17/2011 14:03:21

LTE Band 48 (3550 – 3650 MHz)_10 MHz BW / QPSK / Middle Channel 3600 MHz
3720 MHz - 26.5 GHz

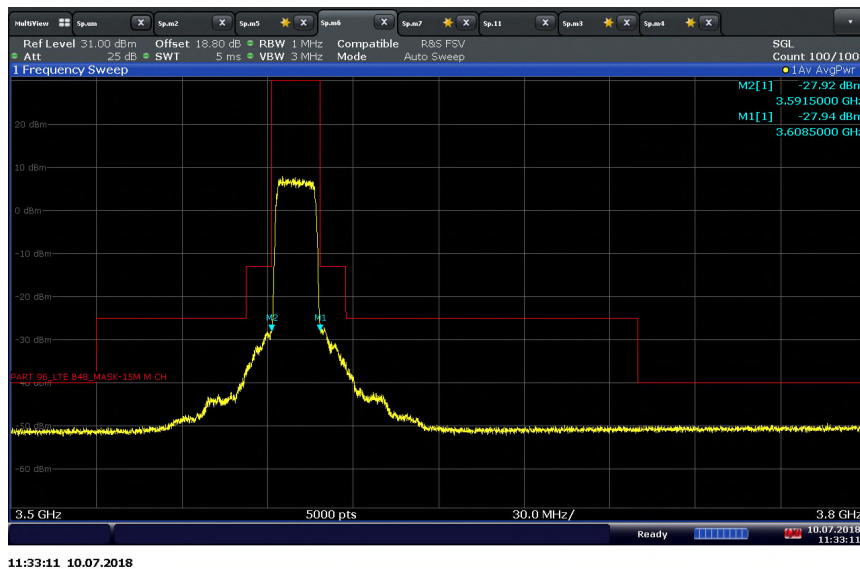


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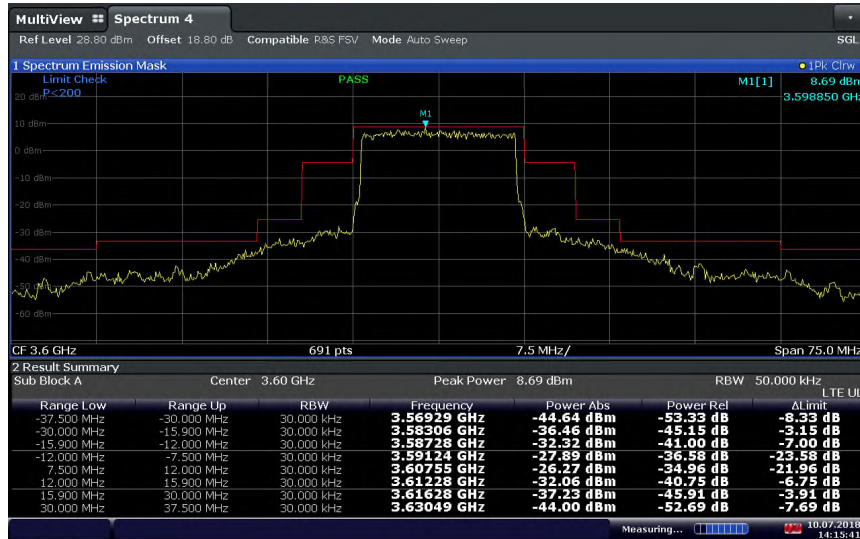
**LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / Middle Channel 3600 MHz
 9 kHz - 3530 MHz**



**LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / Middle Channel 3600 MHz full RB
 3530 kHz - 3720 MHz according to FCC Part 96**



LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / Middle Channel 3600 MHz full RB
unwanted emission spectral density Mask according to RSS-192



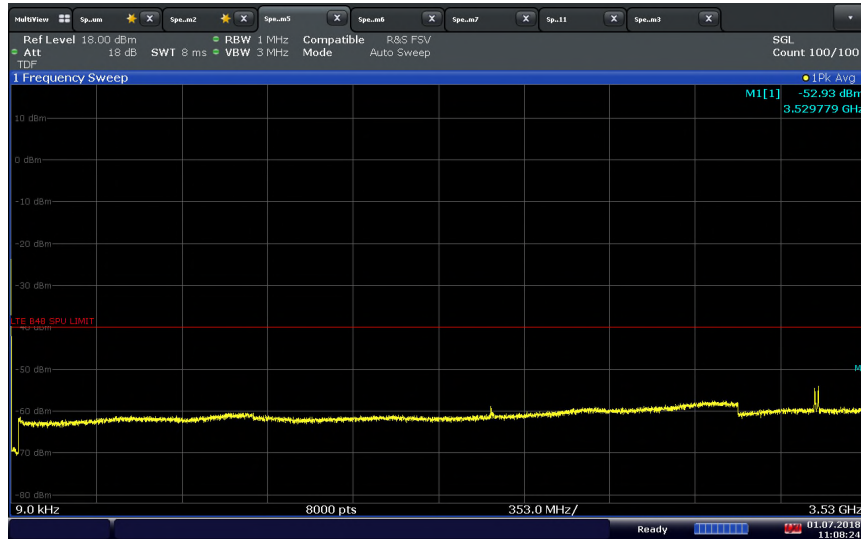
14:15:42 10.07.2018

LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / Middle Channel 3600 MHz
3720 MHz - 26.5 GHz



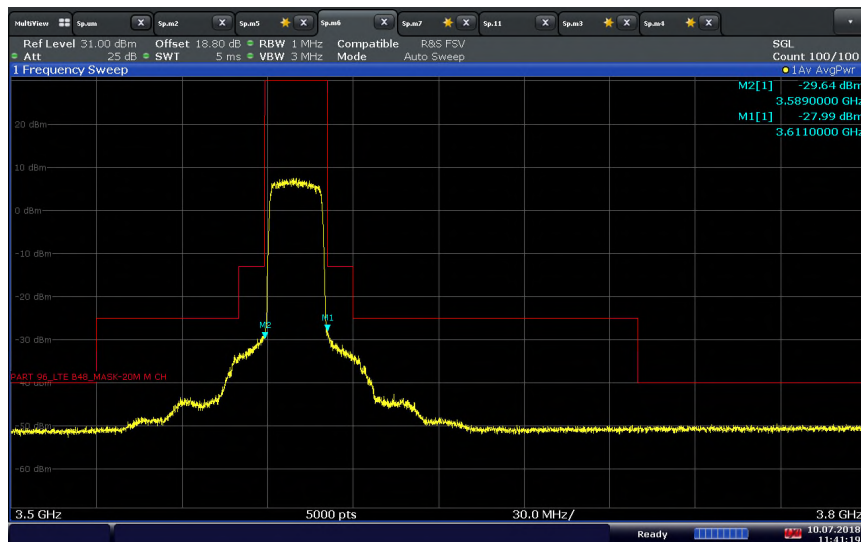
10:58:14 01.07.2018

**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / Middle Channel 3600 MHz
 9 kHz - 3530 MHz**



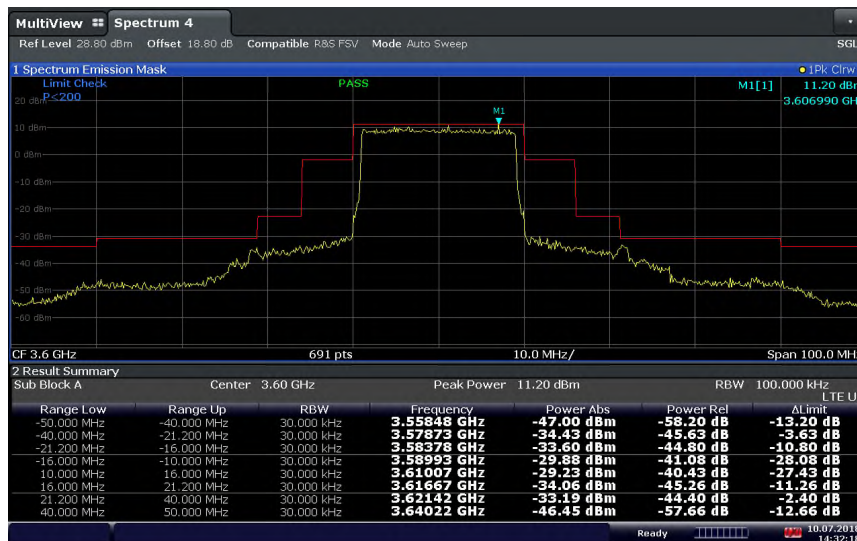
11:08:25 01.07.2018

**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / Middle Channel 3600 MHz full RB
 3530 kHz - 3720 MHz according to FCC Part 96**



11:41:20 10.07.2018

**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / Middle Channel 3600 MHz full RB
 unwanted emission spectral density Mask according to RSS-192**



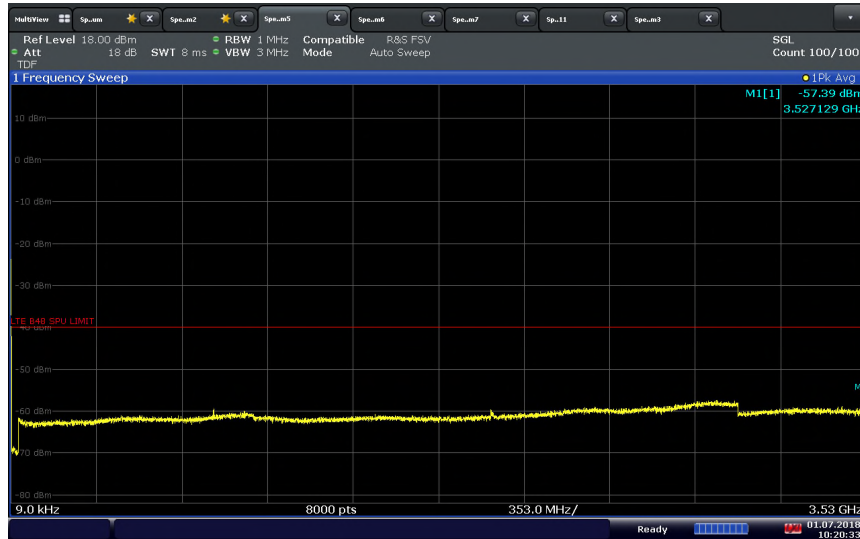
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**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / Middle Channel 3600 MHz
 3720 MHz - 26.5 GHz according to FCC Part 96**



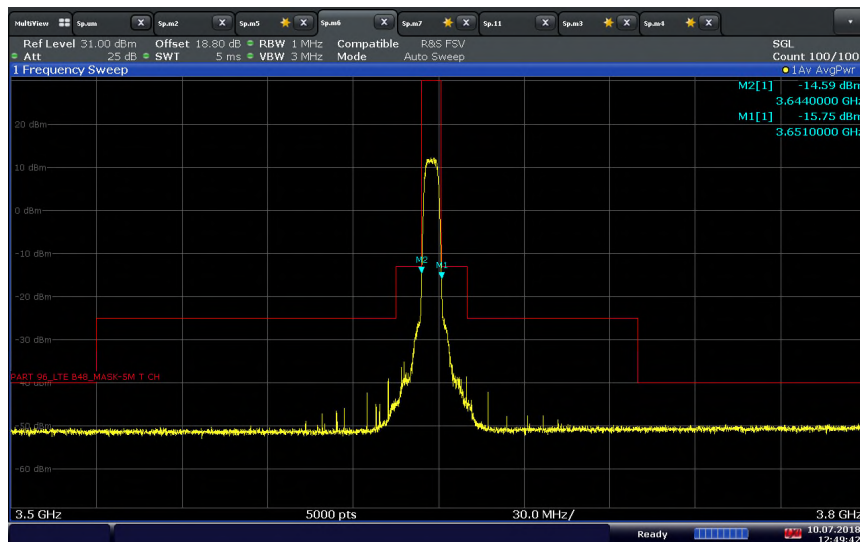
11:07:02 01.07.2018

**LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / High Channel 3647.5 MHz
 9 kHz - 3530 MHz**



10:20:33 01.07.2018

**LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / High Channel 3647.5 MHz full RB
 3530 kHz - 3720 MHz according to FCC Part 96**



12:49:42 10.07.2018

MultiView Spectrum 4

Ref Level 28.80 dBm Offset 18.80 dB Compatible R&S FSV Mode Auto Sweep

1 Spectrum Emission Mask

Limit Check

20 dBm

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

CF 3.6475 GHz 691 pts 2.5 MHz/ Span 25.0 MHz

2 Result Summary

Sub Block A

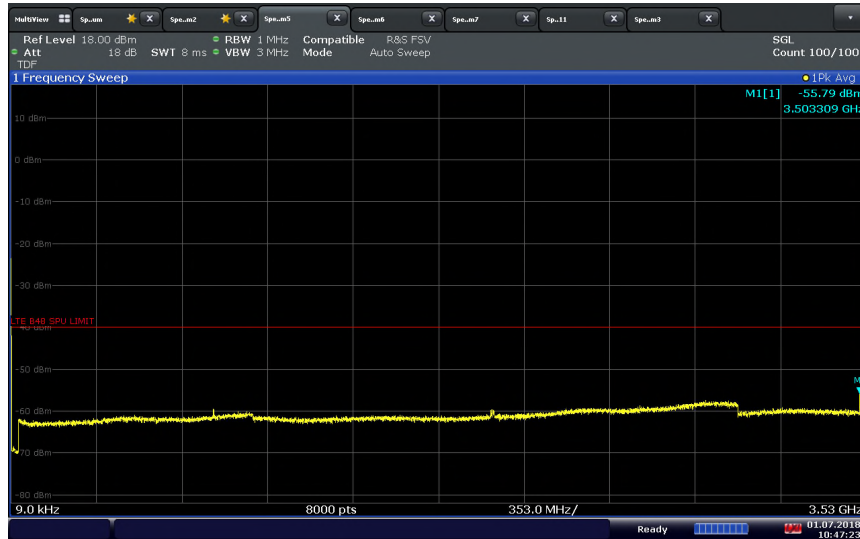
Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ALimit
-12.500 MHz	-10.000 MHz	30.000 kHz	3.63726 GHz	-38.40 dBm	-52.11 dB	-7.11 dB
-10.000 MHz	-5.300 MHz	30.000 kHz	3.64215 GHz	-30.20 dBm	-43.92 dB	-1.92 dB
-5.300 MHz	-4.000 MHz	30.000 kHz	3.64344 GHz	-27.42 dBm	-41.14 dB	-7.14 dB
-4.000 MHz	-2.500 MHz	30.000 kHz	3.64498 GHz	-18.42 dBm	-32.14 dB	-19.14 dB
2.500 MHz	4.000 MHz	30.000 kHz	3.65002 GHz	-22.25 dBm	-35.97 dB	-22.97 dB
4.000 MHz	5.300 MHz	30.000 kHz	3.65163 GHz	-26.50 dBm	-40.21 dB	-6.21 dB
5.300 MHz	10.000 MHz	30.000 kHz	3.65300 GHz	-28.73 dBm	-42.44 dB	-0.44 dB
10.000 MHz	12.500 MHz	30.000 kHz	3.65788 GHz	-38.95 dBm	-52.66 dB	-7.66 dB

Ready 10/17/2011 13:06:31

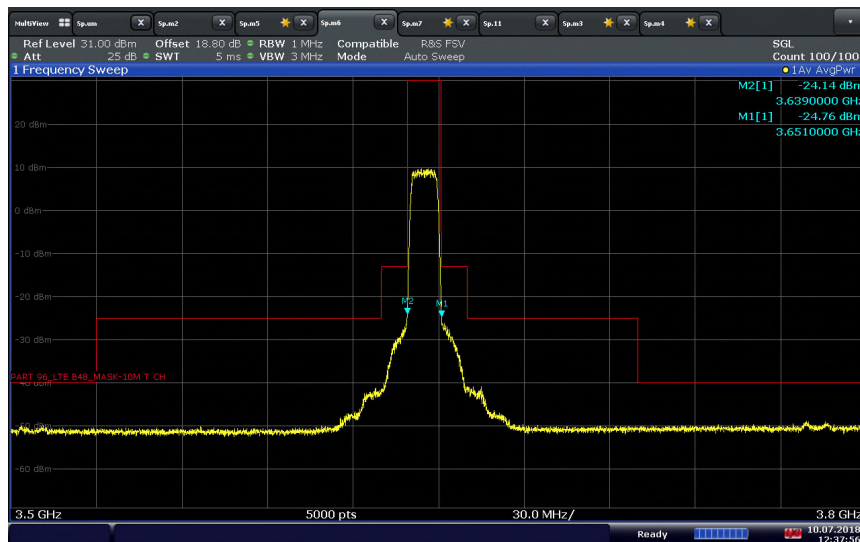
[illegible]

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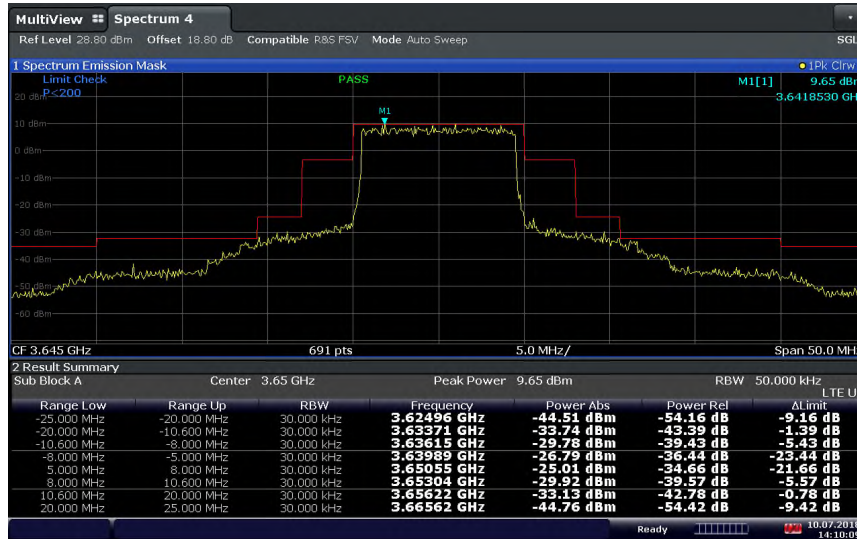
**LTE Band 48 (3550 – 3650 MHz)_10 MHz BW / QPSK / High Channel 3645 MHz
 9 kHz - 3530 MHz**



**LTE Band 48 (3550 – 3650 MHz)_10 MHz BW / QPSK / High Channel 3645 MHz Full RB
 3530 kHz - 3720 MHz according to FCC Part 96**



**LTE Band 48 (3550 – 3650 MHz)_10 MHz BW / QPSK / High Channel 3645 MHz full RB
 unwanted emission spectral density Mask according to RSS-192**



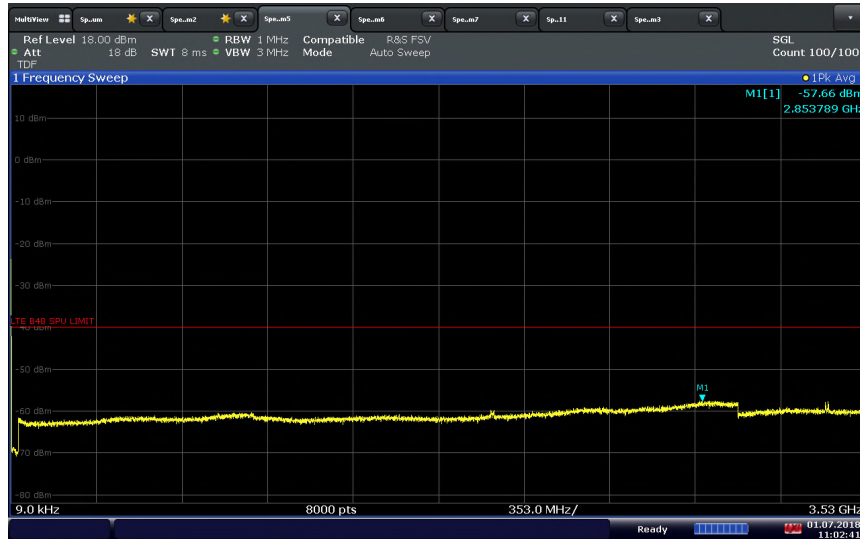
14:10:09 10.07.2018

**LTE Band 48 (3550 – 3650 MHz)_10 MHz BW / QPSK / High Channel 3645 MHz
 3720 MHz - 26.5 GHz**

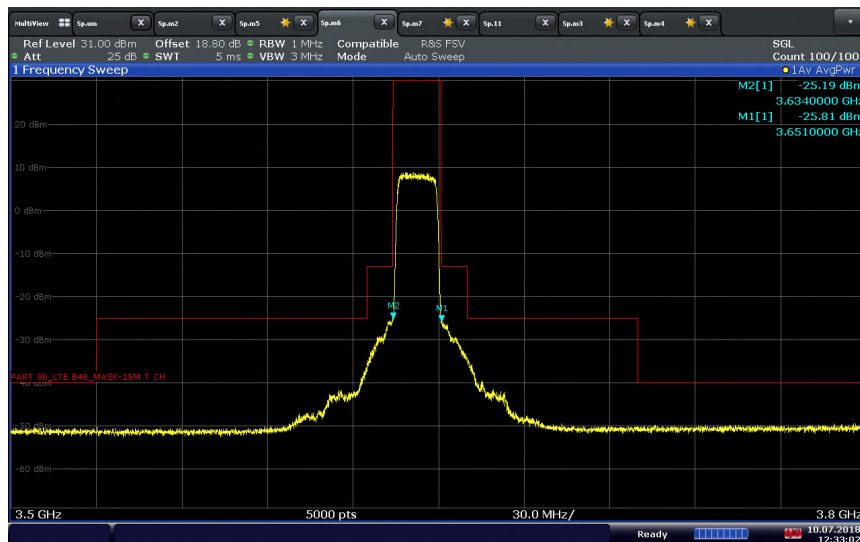


10:49:01 01.07.2018

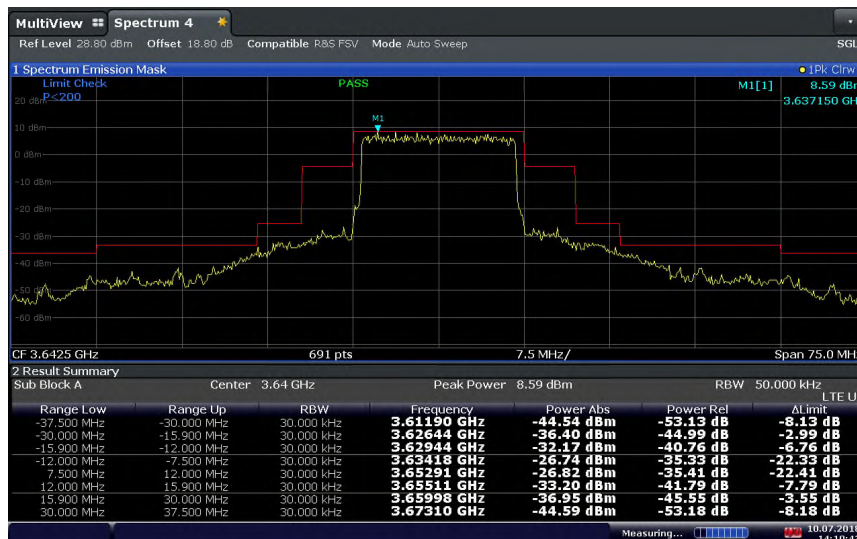
**LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / High Channel 3642.5 MHz
 9 kHz - 3530 MHz**



**LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / High Channel 3642.5 MHz full RB
 3530 kHz - 3720 MHz according to FCC Part 96**



**LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / High Channel 3642.5 MHz full RB
 unwanted emission spectral density Mask according to RSS-192**



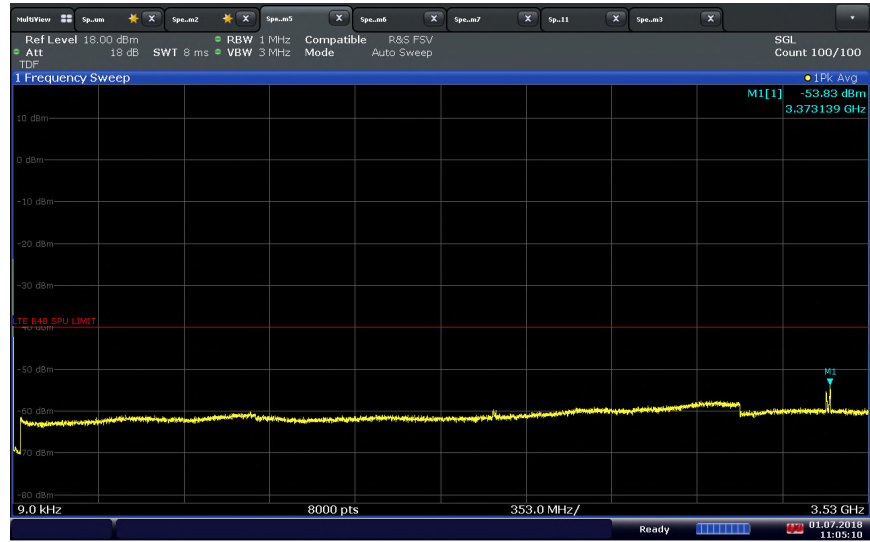
14:19:44 10.07.2018

**LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / High Channel 3642.5 MHz
 3720 MHz - 26.5 GHz**



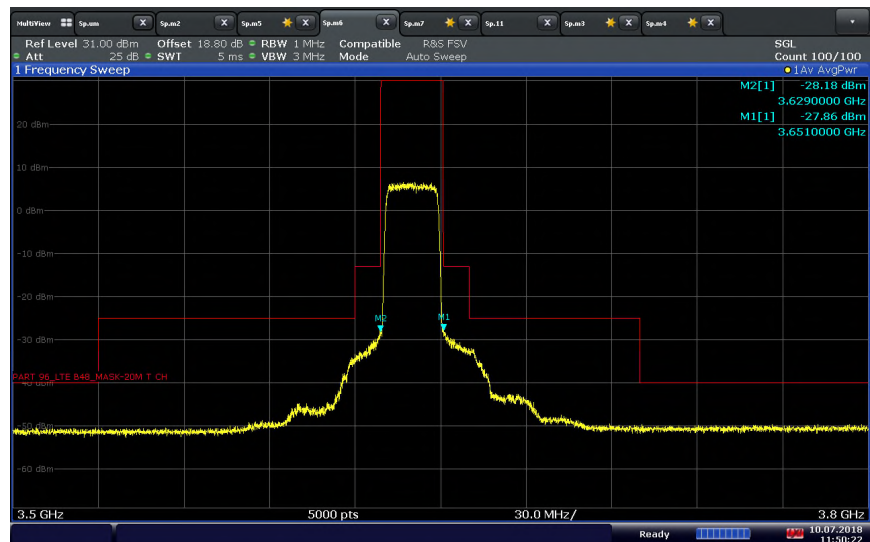
10:59:33 01.07.2018

**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / High Channel 3640 MHz
 9 kHz - 3530 MHz**



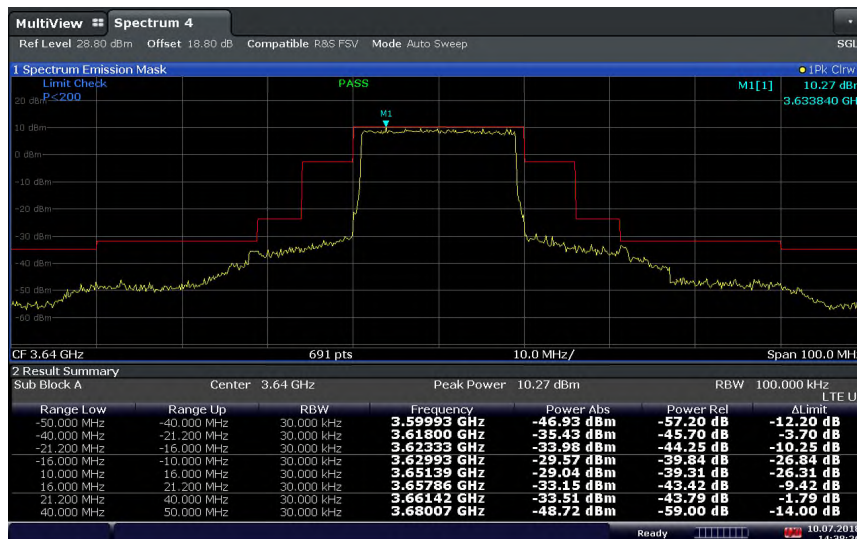
11:05:10 01.07.2018

**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / High Channel 3640 MHz full RB
 3530 kHz - 3720 MHz according to FCC Part 96**



11:50:23 10.07.2018

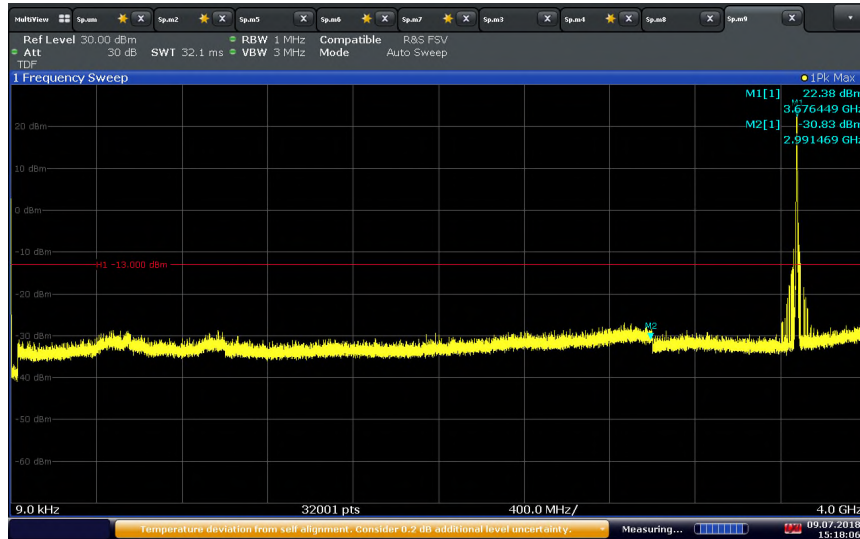
**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / High Channel 3640 MHz full RB
 unwanted emission spectral density Mask according to RSS-192**



**LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / High Channel 3640 MHz
 3720 MHz - 26.5 GHz**



LTE Band 48 (3650 – 3700 MHz)_5 MHz BW / QPSK / Middle Channel 3675 MHz
9 kHz - 4 GHz



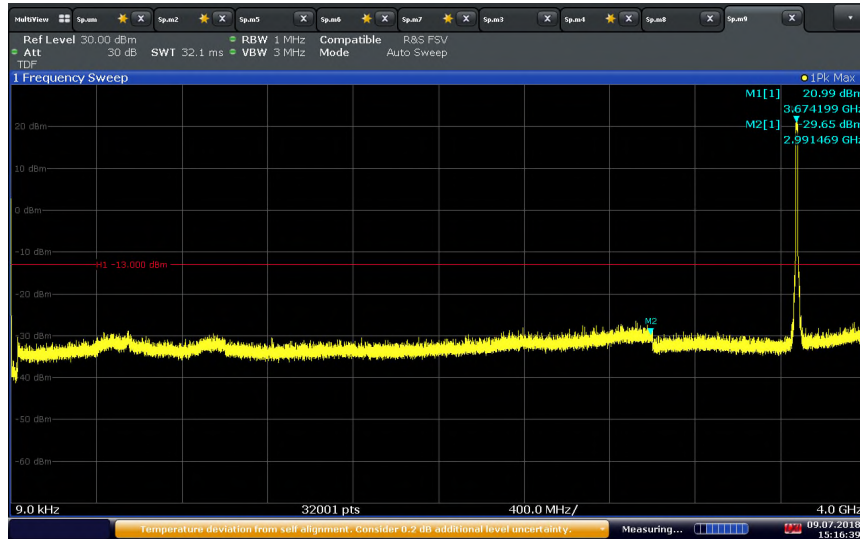
15:18:06 09.07.2018

LTE Band 48 (3550 – 3650 MHz)_5 MHz BW / QPSK / Middle Channel 3675 MHz
4 GHz - 26.5 GHz



15:03:53 09.07.2018

LTE Band 48 (3650 – 3700 MHz)_10 MHz BW / QPSK / Middle Channel 3675 MHz
9 kHz - 4 GHz



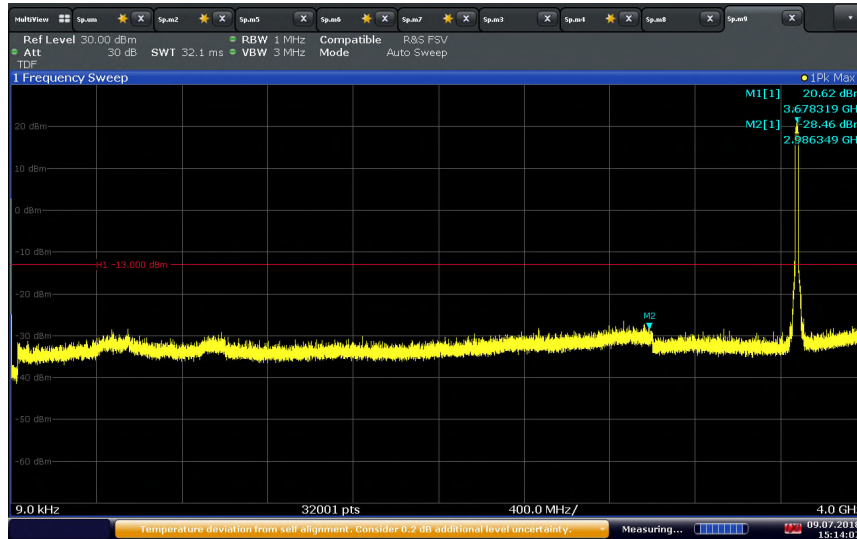
15:16:40 09.07.2018

LTE Band 48 (3550 – 3650 MHz)_10 MHz BW / QPSK / Middle Channel 3675 MHz
4 GHz - 26.5 GHz



15:05:14 09.07.2018

LTE Band 48 (3650 – 3700 MHz)_15 MHz BW / QPSK / Middle Channel 3675 MHz
9 kHz - 4 GHz



15:14:07 09.07.2018

LTE Band 48 (3550 – 3650 MHz)_15 MHz BW / QPSK / Middle Channel 3675 MHz
4 GHz - 26.5 GHz



15:08:08 09.07.2018

LTE Band 48 (3650 – 3700 MHz)_20 MHz BW / QPSK / Middle Channel 3675 MHz
9 kHz - 4 GHz



15:12:42 09.07.2018

LTE Band 48 (3550 – 3650 MHz)_20 MHz BW / QPSK / Middle Channel 3675 MHz
4 GHz - 26.5 GHz



15:10:52 09.07.2018

2.6 FIELD STRENGTH OF SPURIOUS RADIATION

2.6.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1053
FCC 47 CFR Part 96, Clause 96.41(e)
FCC 47 CFR Part 90, Clause 90.1323(a)
RSS-192, Clause 5.5
RSS-197, Clause 5.7

2.6.2 Standard Applicable

FCC 47 CFR Part 96.41:

(e) 3.5 GHz Emissions and Interference Limits - (1) General protection levels. Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(2) Additional protection levels: Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

RSS-192, Clause 5.5:

(ii) In any 1.0 MHz band that is removed from the assigned centre frequency by more than $\pm 250\%$ of the necessary bandwidth, the power of any emission must be attenuated below P_{mean} by at least $43 + 10 \log_{10}(P_{\text{mean}})$ dB, or 70 dB, whichever is less stringent. P_{mean} is the mean output power of the transmitter in watts.

FCC 47 CFR Part 90.1323:

(a) The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth.

RSS-197, Clause 5.7:

The unwanted emissions shall be measured at the frequencies of the highest and lowest channel of all bandwidths and types of modulation that the equipment can operate with a resolution bandwidth of 1 MHz or less, but at least 1% of the occupied bandwidth of the transmitter, provided that the measured power is integrated over a 1 MHz bandwidth.

The power of any emissions outside the frequency band 3650-3700 MHz shall be attenuated below the channel transmitter power P (dBW) by $43 + 10 \log(p)$, where p is measured in watts.



2.6.3 Equipment Under Test and Modification State

Serial No: AS190818B00021 / Test Configuration B

2.6.4 Date of Test/Initial of test personnel who performed the test

November 23, 2018 / XYZ

2.6.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.6.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	23.8 °C
Relative Humidity	55.8 %
ATM Pressure	98.8 kPa

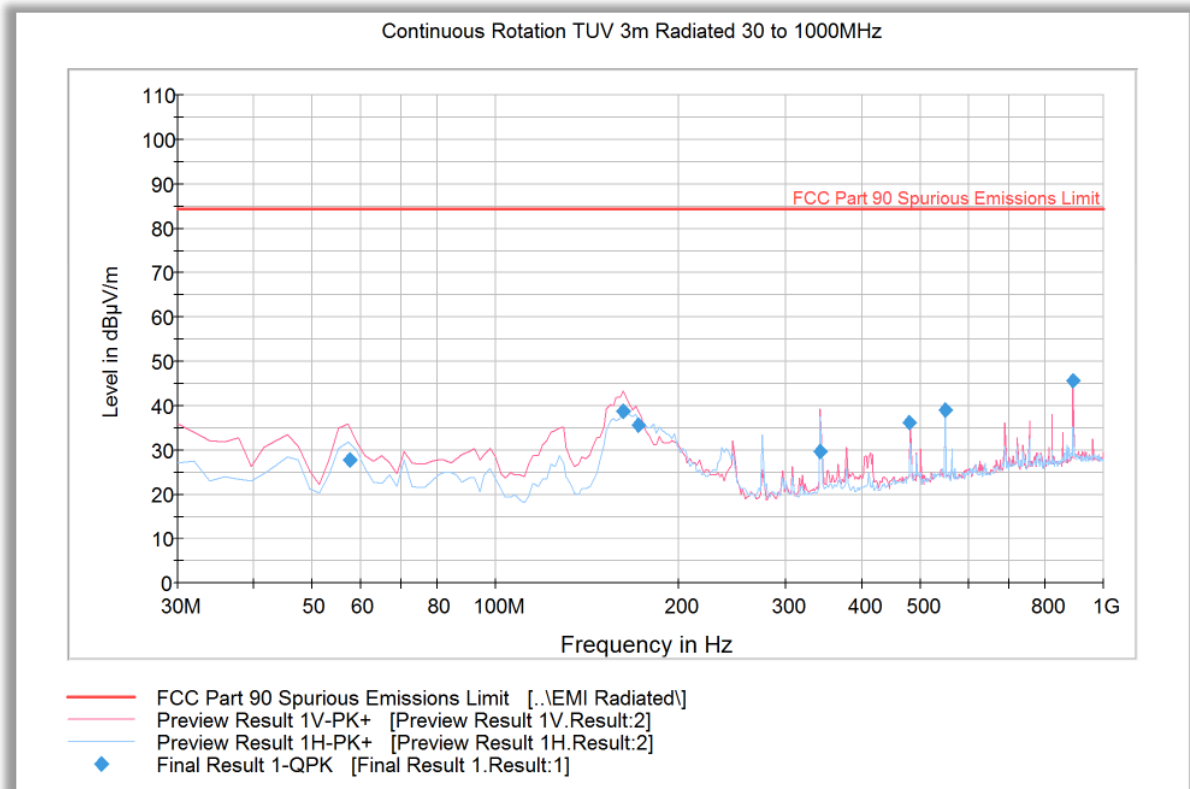
2.6.7 Additional Observations

- This is a radiated test using substitution method as per Unwanted Emissions: Radiated Spurious method of measurement of Sub clause 5.5 of ANSI C63.16-2015.
- Emissions within 6dB of the limit will be proven by substitution method.
- Only the worst case configuration presented in this test report.
- Only noise floor measurements observed above 18GHz.
- Measurement was done using EMC32 V8.53 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only.

2.6.8 Test Results

See attached plots.

2.6.9 Radiated Emission Test Results Below 1GHz – Worst Case Band 48 (3550 – 3650 MHz)_QPSK_15 MHz Bandwidth_Middle Channel_1RB 0 offset

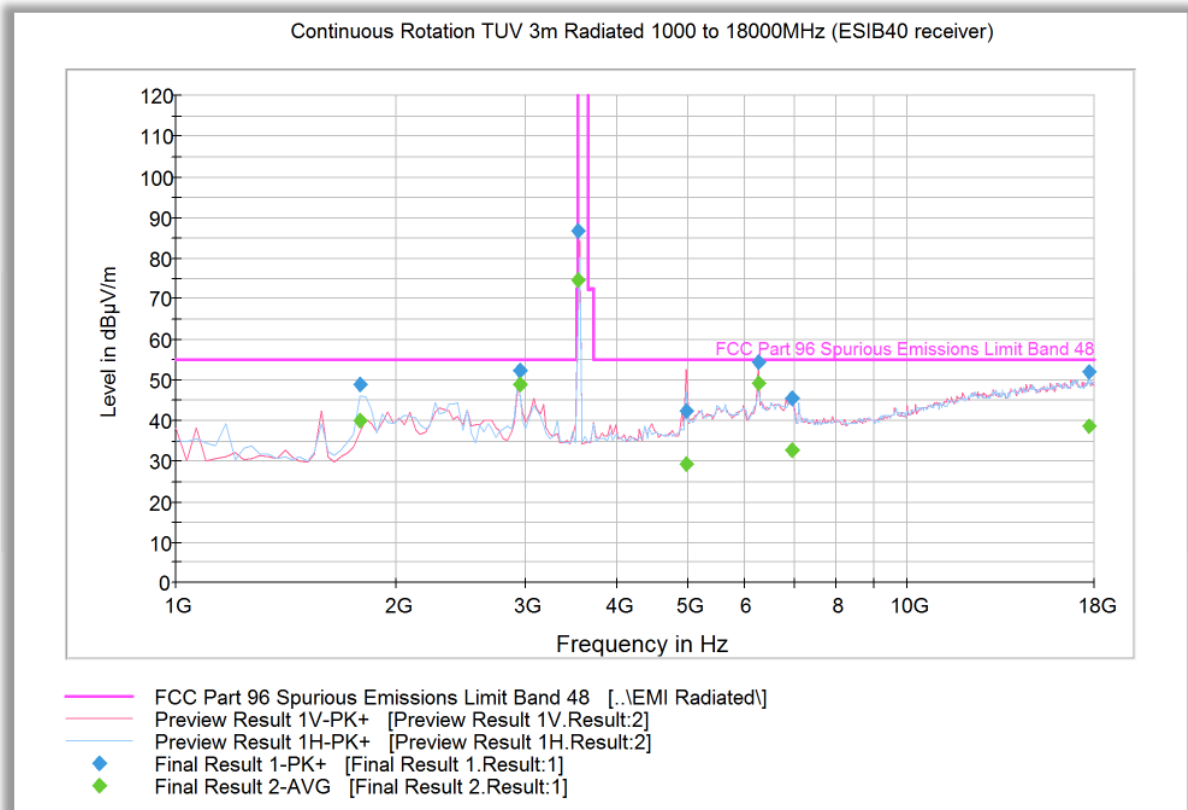


Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
57.534429	27.8	1000.0	120.000	150.0	V	133.0	-16.2	56.6	84.4
161.944369	38.7	1000.0	120.000	100.0	V	15.0	-11.8	45.7	84.4
171.407695	35.7	1000.0	120.000	100.0	V	10.0	-11.6	48.7	84.4
343.005932	29.7	1000.0	120.000	100.0	V	73.0	-5.2	54.7	84.4
480.021964	36.2	1000.0	120.000	100.0	V	104.0	-1.6	48.2	84.4
548.578036	39.1	1000.0	120.000	100.0	V	73.0	-0.8	45.3	84.4
891.486172	45.6	1000.0	120.000	150.0	V	121.0	5.3	38.8	84.4

Test Notes: Only worst case modulation/bandwidth/channel presented for spurious emissions below 1GHz.

2.6.10 Radiated Emission Test Results Above 1GHz – Worst Case Band 48 (3550 – 3650 MHz)_QPSK_15 MHz Bandwidth_Low Channel_1RB 0 offset

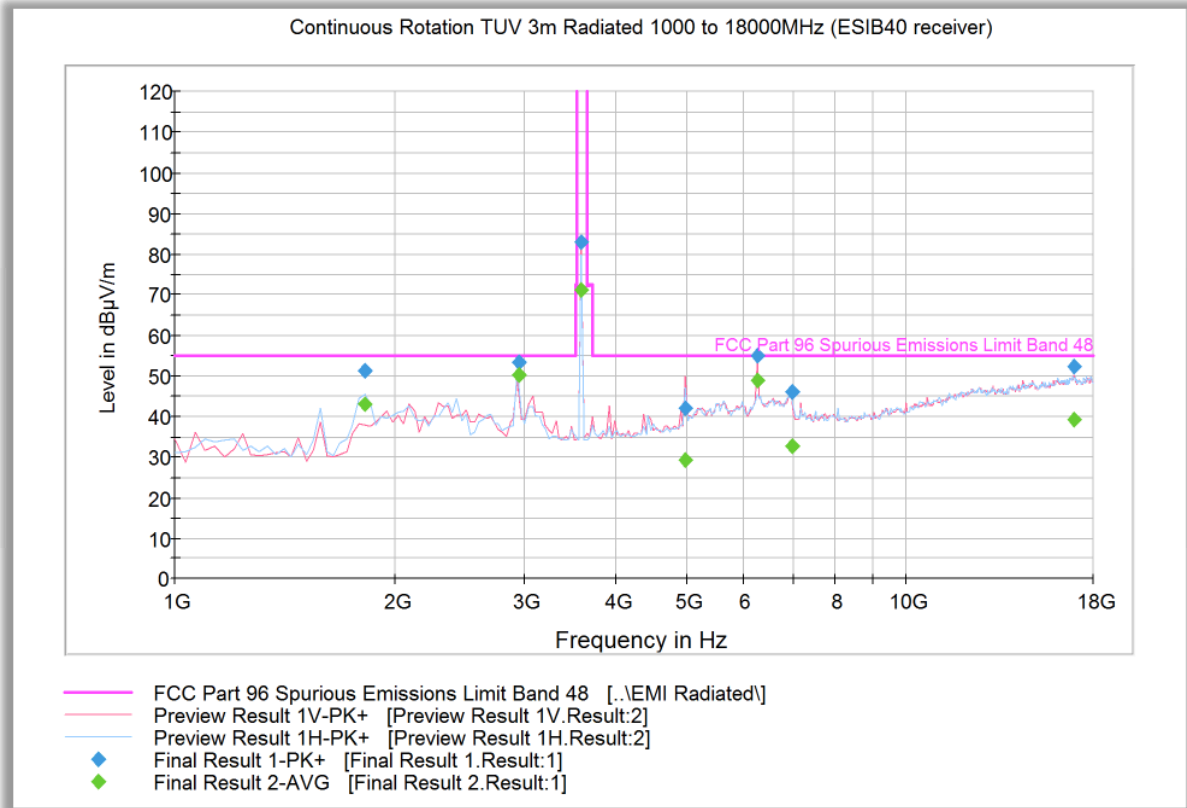


Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Peak Margin (dB)	Limit (dBµV/m)
1790.567134	40.1	1000.0	1000.000	152.2	H	222.0	-3.6	15.1	55.2
2949.283768	48.9	1000.0	1000.000	103.7	H	242.0	0.3	6.3	55.2
3550.910220	74.6	1000.0	1000.000	250.5	V	81.0	1.3	* Fundamental Freq.	
4984.171944	29.4	1000.0	1000.000	151.6	V	241.0	3.6	25.8	55.2
6249.892986	49.2	1000.0	1000.000	303.2	V	289.0	5.8	6.0	55.2
6963.323848	33.0	1000.0	1000.000	303.2	V	297.0	6.3	22.2	55.2
17663.918637	38.8	1000.0	1000.000	281.3	H	141.0	17.7	16.4	55.2

* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

2.6.11 Radiated Emission Test Results Above 1GHz – Worst Case Band 48 (3550 – 3650 MHz)_QPSK__15 MHz Bandwidth_Middle Channel_1RB 0 offset



Average Data

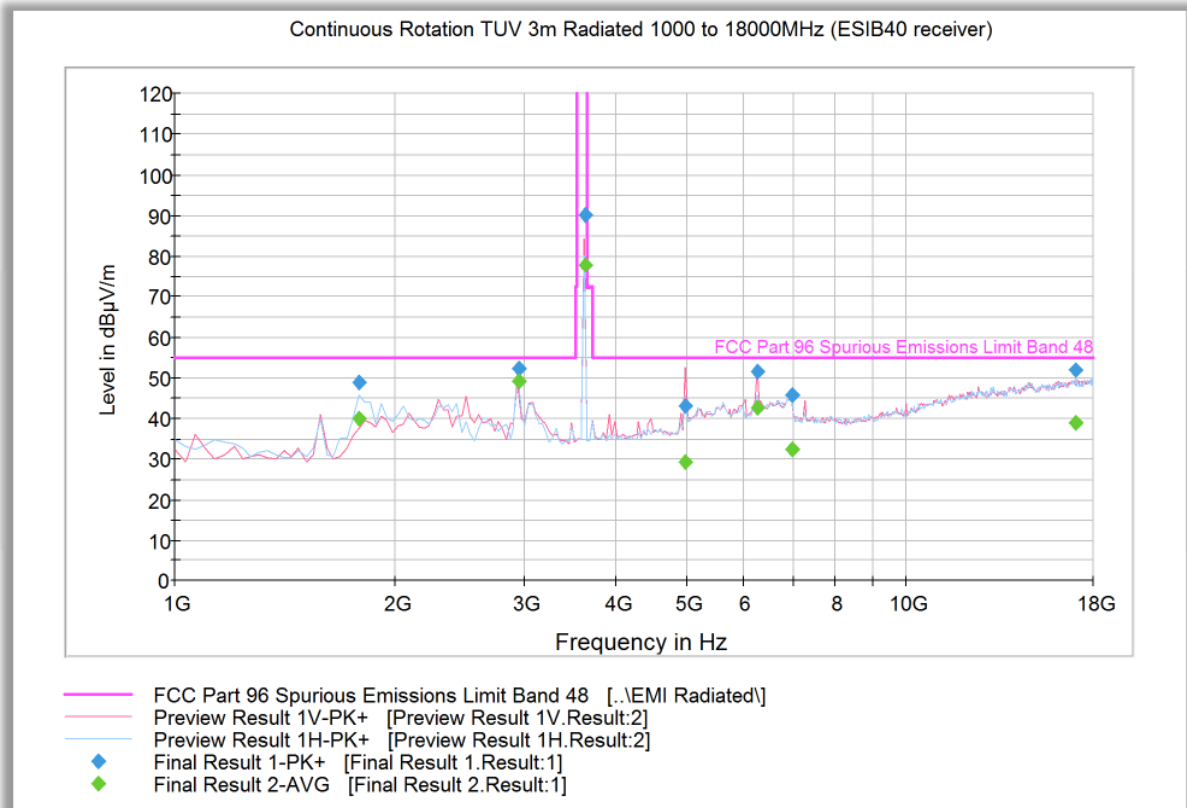
Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Peak Margin (dB)	Limit (dBµV/m)
1816.635271	43.0	1000.0	1000.000	152.2	H	220.0	-3.2	12.2	55.2
2949.283768	50.2	1000.0	1000.000	103.7	H	240.0	0.3	5.0	55.2
3593.378357	70.9	1000.0	1000.000	303.2	H	158.0	1.5	* Fundamental Freq.	
4977.371944	29.3	1000.0	1000.000	316.2	V	240.0	3.6	25.9	55.2
6249.892986	48.9	1000.0	1000.000	200.5	V	240.0	5.8	6.3	55.2
6974.123848	32.7	1000.0	1000.000	166.6	V	42.0	6.3	22.5	55.2
16950.887776	39.4	1000.0	1000.000	352.7	V	20.0	17.8	15.8	55.2

* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

Substitution Data

Frequency (MHz)	Field Strength @ 3 meters (dBµV/m)	Cable Loss (dB)	Substitution Antenna Gain (dBi)	Signal Generator Level (dBm)	Substitution Data SGL+AG-CL (dBm)	Limit (dBm)	Compliance
2949.283768	50.2	4.1	10.23	-51.2	-45.0	-40	Yes

2.6.12 Radiated Emission Test Results Above 1GHz – Worst Case Band 48 (3550 – 3650 MHz)_QPSK__15 MHz Bandwidth_High Channel_1RB 0 offset



Average Data

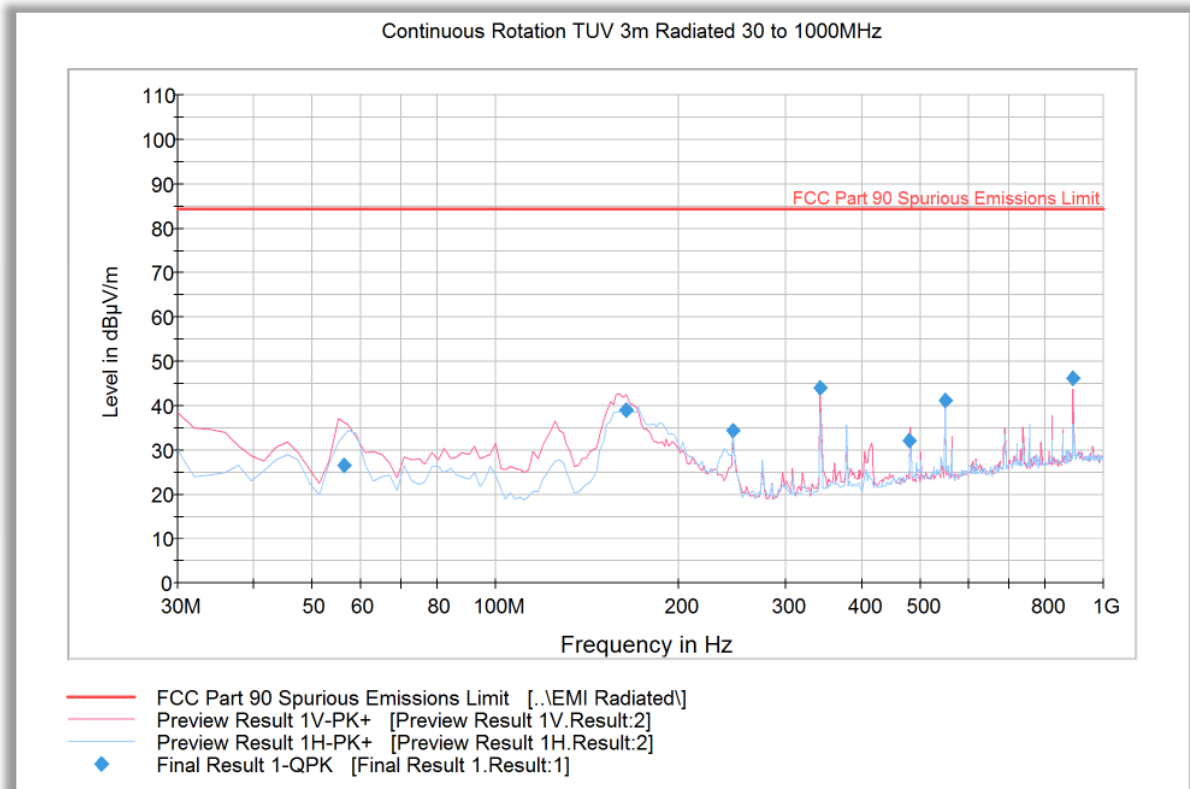
Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Peak Margin (dB)	Limit (dBµV/m)
1790.567134	39.9	1000.0	1000.000	134.7	H	222.0	-3.6	15.3	55.2
2949.283768	49.3	1000.0	1000.000	103.7	H	241.0	0.3	5.9	55.2
3635.846493	78.1	1000.0	1000.000	252.3	V	204.0	1.6	* Fundamental Freq.	
4992.571944	29.4	1000.0	1000.000	194.5	V	239.0	3.7	25.8	55.2
6249.892986	42.6	1000.0	1000.000	252.3	H	292.0	5.8	12.6	55.2
6968.123848	32.5	1000.0	1000.000	252.3	H	39.0	6.3	22.7	55.2
17013.024048	39.1	1000.0	1000.000	184.5	H	79.0	17.7	16.1	55.2

* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

Substitution Data

Frequency (MHz)	Field Strength @ 3 meters (dBµV/m)	Cable Loss (dB)	Substitution Antenna Gain (dBi)	Signal Generator Level (dBm)	Substitution Data SGL+AG-CL (dBm)	Limit (dBm)	Compliance
2949.283768	49.3	4.1	10.23	-52.1	-45.9	-40	Yes

2.6.13 Radiated Emission Test Results Below 1GHz – Worst Case Band 48 (3650 – 3700 MHz)_QPSK_20 MHz BW_High Channel_1RB 0 offset

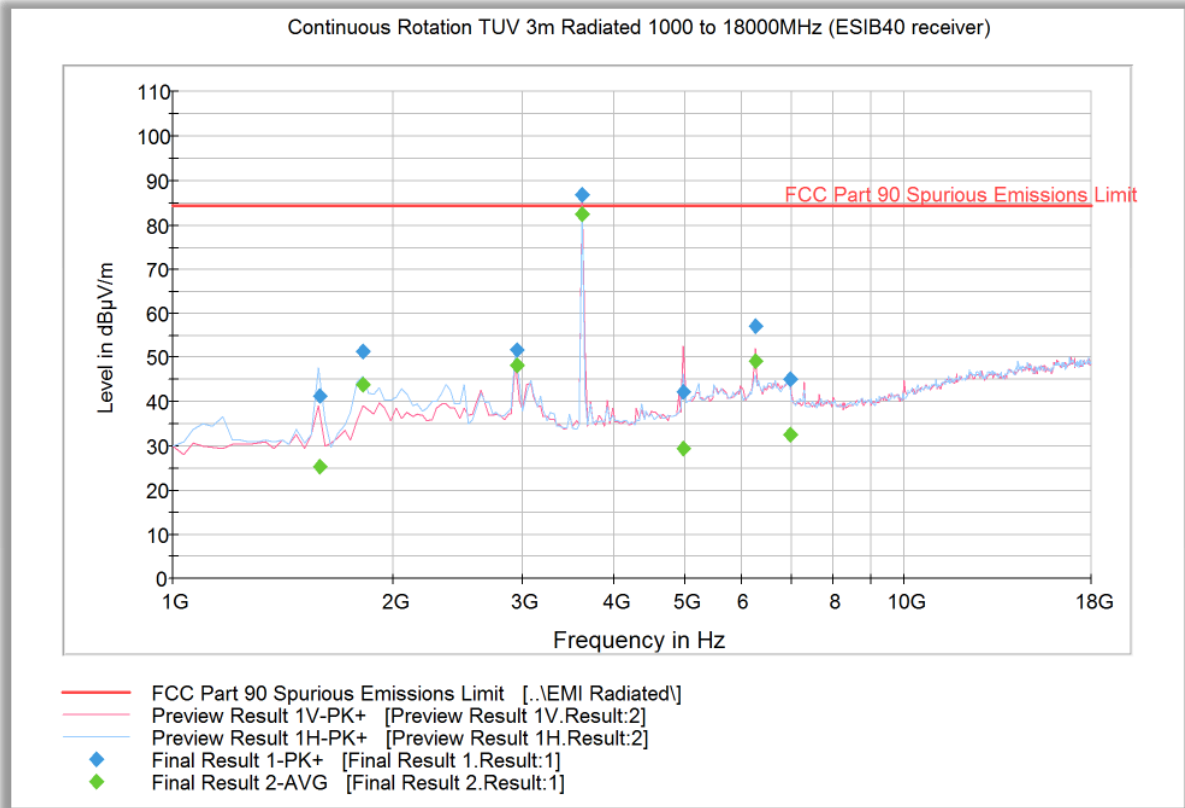


Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
56.350541	26.5	1000.0	120.000	150.0	V	183.0	-16.0	57.9	84.4
164.168257	39.0	1000.0	120.000	100.0	V	9.0	-11.8	45.4	84.4
245.771543	34.4	1000.0	120.000	215.0	H	80.0	-8.7	50.0	84.4
342.885932	44.2	1000.0	120.000	100.0	V	109.0	-5.2	40.2	84.4
480.021964	32.2	1000.0	120.000	100.0	H	224.0	-1.6	52.2	84.4
548.578036	41.3	1000.0	120.000	100.0	H	48.0	-0.8	43.1	84.4
891.486172	46.2	1000.0	120.000	150.0	V	117.0	5.3	38.2	84.4

Test Notes: Only worst case modulation/bandwidth/channel presented for spurious emissions below 1GHz.

2.6.14 Radiated Emission Test Results Above 1GHz – Worst Case Band 48 (3650 – 3700 MHz)_QPSK__20 MHz BW_Low Channel_1RB 0 offset



Peak Data

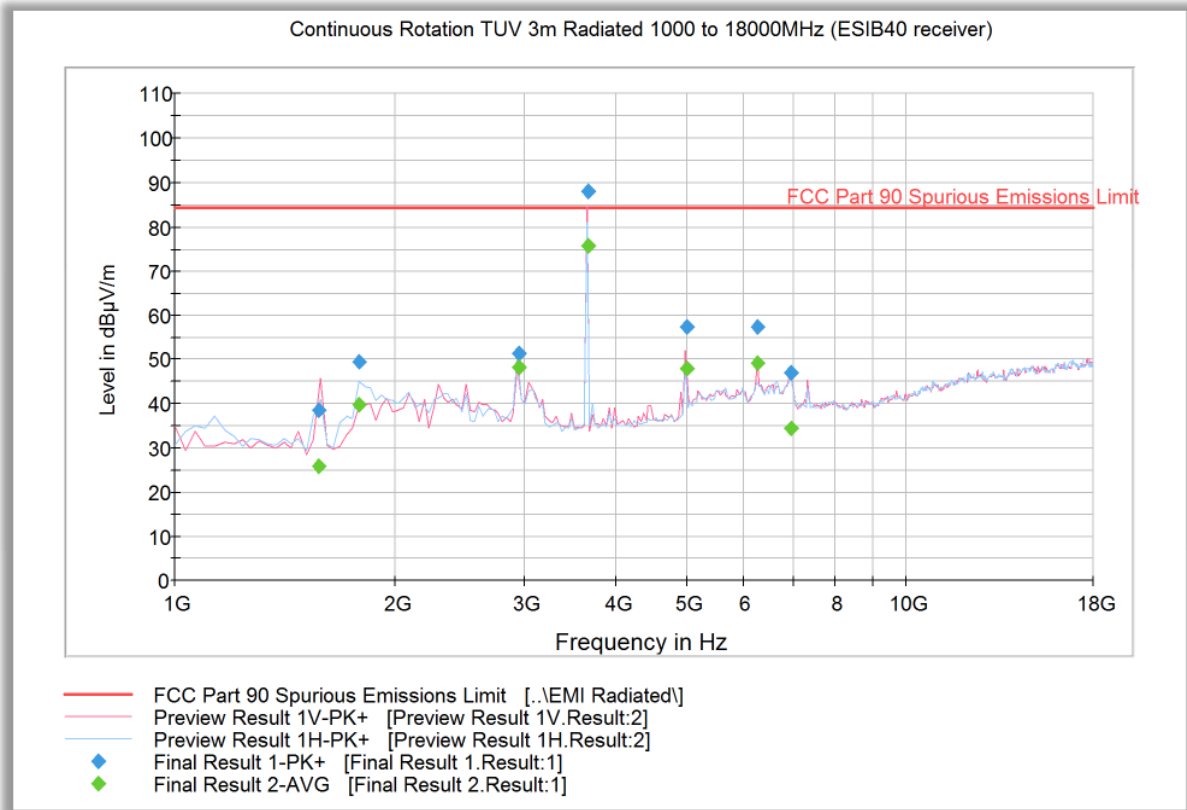
Frequency (MHz)	Max Peak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Peak Margin (dB)	Limit (dBμV/m)
1591.358317	41.3	1000.0	1000.000	223.4	H	169.0	-5.8	43.1	84.4
1816.635271	51.3	1000.0	1000.000	125.7	H	221.0	-3.2	33.1	84.4
2949.283768	51.7	1000.0	1000.000	202.5	V	238.0	0.3	32.7	84.4
3624.646493	86.7	1000.0	1000.000	293.2	V	238.0	1.6	* Fundamental Freq.	
4988.971944	42.3	1000.0	1000.000	242.4	V	238.0	3.6	42.1	84.4
6249.892986	57.2	1000.0	1000.000	303.2	V	289.0	5.8	27.2	84.4
6969.323848	45.2	1000.0	1000.000	203.5	H	221.0	6.3	39.2	84.4

Average Data

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Peak Margin (dB)	Limit (dBμV/m)
1591.358317	25.3	1000.0	1000.000	223.4	H	169.0	-5.8	59.1	84.4
1816.635271	43.7	1000.0	1000.000	125.7	H	221.0	-3.2	40.7	84.4
2949.283768	48.2	1000.0	1000.000	202.5	V	238.0	0.3	36.2	84.4
3624.646493	82.4	1000.0	1000.000	293.2	V	238.0	1.6	* Fundamental Freq.	
4988.971944	29.4	1000.0	1000.000	242.4	V	238.0	3.6	55.0	84.4
6249.892986	49.2	1000.0	1000.000	303.2	V	289.0	5.8	35.2	84.4
6969.323848	32.6	1000.0	1000.000	203.5	H	221.0	6.3	51.8	84.4

* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

2.6.15 Radiated Emission Test Results Above 1GHz – Worst Case Band 48 (3650 – 3700 MHz)_QPSK__20 MHz BW_Middle Channel_1RB 0 offset



Peak Data

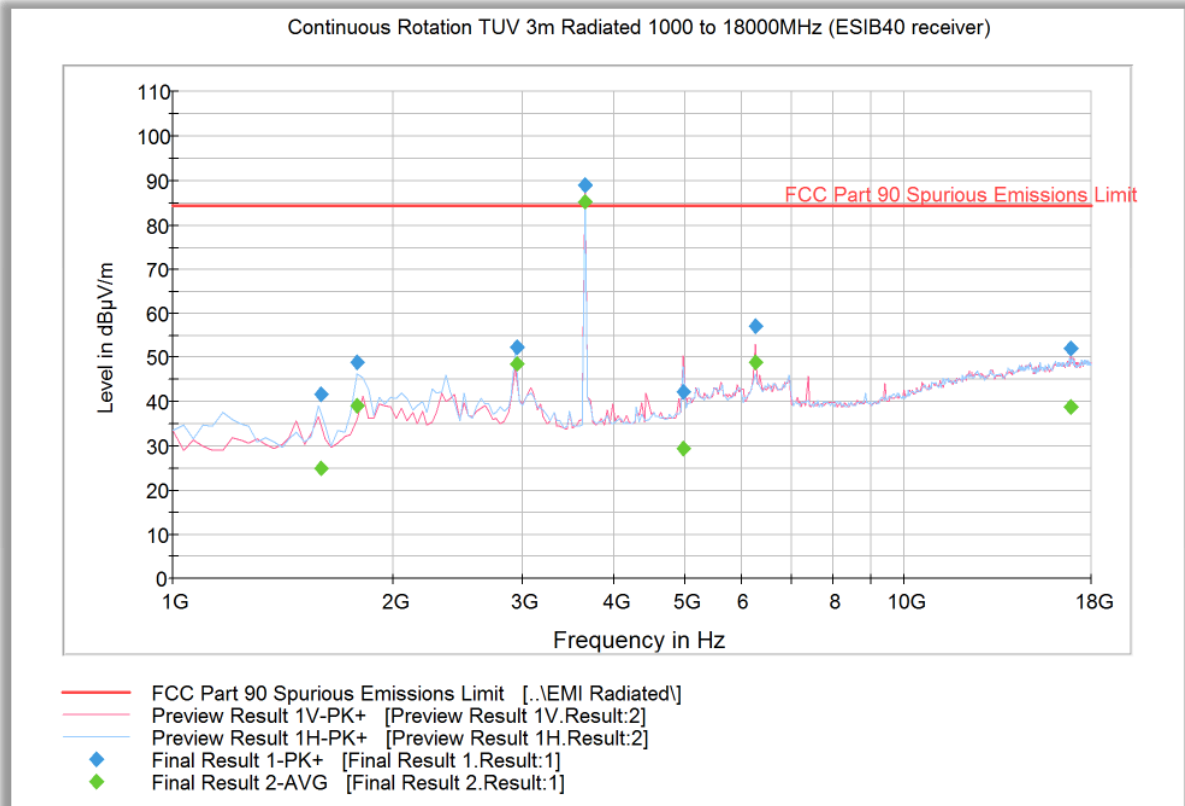
Frequency (MHz)	Max Peak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Peak Margin (dB)	Limit (dBμV/m)
1576.958317	38.7	1000.0	1000.000	352.7	V	149.0	-5.8	45.7	84.4
1790.567134	49.5	1000.0	1000.000	141.7	H	222.0	-3.6	34.9	84.4
2949.283768	51.5	1000.0	1000.000	151.2	V	83.0	0.3	32.9	84.4
3665.914629	88.1	1000.0	1000.000	283.3	V	203.0	1.6	* Fundamental Freq.	
4999.771944	57.3	1000.0	1000.000	242.4	V	241.0	3.7	27.1	84.4
6249.892986	57.5	1000.0	1000.000	304.2	V	289.0	5.8	26.9	84.4
6937.255711	46.9	1000.0	1000.000	303.2	V	263.0	6.3	37.5	84.4

Average Data

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Peak Margin (dB)	Limit (dBμV/m)
1576.958317	25.9	1000.0	1000.000	352.7	V	149.0	-5.8	58.5	84.4
1790.567134	39.9	1000.0	1000.000	141.7	H	222.0	-3.6	44.5	84.4
2949.283768	48.2	1000.0	1000.000	151.2	V	83.0	0.3	36.2	84.4
3665.914629	75.8	1000.0	1000.000	283.3	V	203.0	1.6	* Fundamental Freq.	
4999.771944	47.8	1000.0	1000.000	242.4	V	241.0	3.7	36.6	84.4
6249.892986	49.2	1000.0	1000.000	304.2	V	289.0	5.8	35.2	84.4
6937.255711	34.4	1000.0	1000.000	303.2	V	263.0	6.3	50.0	84.4

* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

2.6.16 Radiated Emission Test Results Above 1GHz – Worst Case Band 48 (3650 – 3700 MHz)_QPSK__20 MHz BW_High Channel_1RB 0 offset



Peak Data

Frequency (MHz)	Max Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Peak Margin (dB)	Limit (dBµV/m)
1592.558317	41.7	1000.0	1000.000	222.4	H	170.0	-5.8	42.7	84.4
1788.567134	48.9	1000.0	1000.000	152.2	H	221.0	-3.6	35.5	84.4
2949.283768	52.2	1000.0	1000.000	203.5	V	240.0	0.3	32.2	84.4
3683.514629	89.1	1000.0	1000.000	250.5	V	200.0	1.6	* Fundamental Freq.	
4990.571944	42.5	1000.0	1000.000	166.6	V	240.0	3.6	41.9	84.4
6249.892986	56.9	1000.0	1000.000	200.5	V	240.0	5.8	27.5	84.4
16846.283367	52.1	1000.0	1000.000	352.7	V	359.0	17.9	32.3	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Peak Margin (dB)	Limit (dBµV/m)
1592.558317	25.0	1000.0	1000.000	222.4	H	170.0	-5.8	59.4	84.4
1788.567134	39.1	1000.0	1000.000	152.2	H	221.0	-3.6	45.3	84.4
2949.283768	48.7	1000.0	1000.000	203.5	V	240.0	0.3	35.7	84.4
3683.514629	85.1	1000.0	1000.000	250.5	V	200.0	1.6	* Fundamental Freq.	
4990.571944	29.3	1000.0	1000.000	166.6	V	240.0	3.6	55.1	84.4
6249.892986	48.9	1000.0	1000.000	200.5	V	240.0	5.8	35.5	84.4
16846.283367	38.9	1000.0	1000.000	352.7	V	359.0	17.9	45.5	84.4

* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.



2.7 FREQUENCY STABILITY

2.7.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.213
RSS-192, Clause 5.3
RSS-197, Clause 5.3

2.7.2 Standard Applicable

RSS-192, Clause 5.3
The carrier frequency shall not depart from the reference frequency in excess of ± 20 ppm.

RSS-197, Clause 5.3
(a) The frequency offset shall be measured according to the procedure described in RSS-Gen and recorded;
(b) Using a resolution bandwidth of 1% of the occupied bandwidth, a reference point at the unwanted emission level which complies with the attenuation of $43 + 10 \log_{10} p$ (watts) on the emission mask of the lowest and highest channel shall be selected, and the frequency at these points shall be recorded as f_L and f_H respectively.
The applicant shall ensure frequency stability by showing that f_L minus the frequency offset and f_H plus the frequency offset shall be within 3650 – 3700 MHz.

2.7.3 Equipment Under Test and Modification State

Serial No: AZ280418A00132 / Test Configuration A

2.7.4 Date of Test/Initial of test personnel who performed the test

June 25 and 29, July 09, 2018 / XYZ

2.7.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.7.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	24.8 - 27.8 °C
Relative Humidity	39.4 - 49.0 %
ATM Pressure	98.8 - 98.9 kPa

2.7.7 Additional Observations

- This is a conducted test. The EUT was operated at 3.7 VDC nominal voltage and was placed in the temperature chamber for this evaluation. The EUT was controlled by a CMW500 and utilizing a spectrum analyser for measurement.
- Test performed in 5 MHz Bandwidth Middle channel as the representative configuration.
- Measurement was done using the CMW 500 measurement function.
- The EUT was tested over the temperature -30°C to +50°C in 10°C steps and allowed to sit for 1 hour to allow the equipment and chamber temperature to stabilize. The measurements were then performed.
- Voltage variation was also performed at voltage 3.3VDC and higher 4.3VDC of the nominal voltage at 20°C.
- The maximum frequency deviation for LTE Band 48 was verified against the frequency band edges using reference points F_L and F_H at the unwanted emission level which complies with the attenuation of $43 + 10 \log_{10} p$ (watts) on the emission mask of the lowest and highest channel.

2.7.8 Test Results

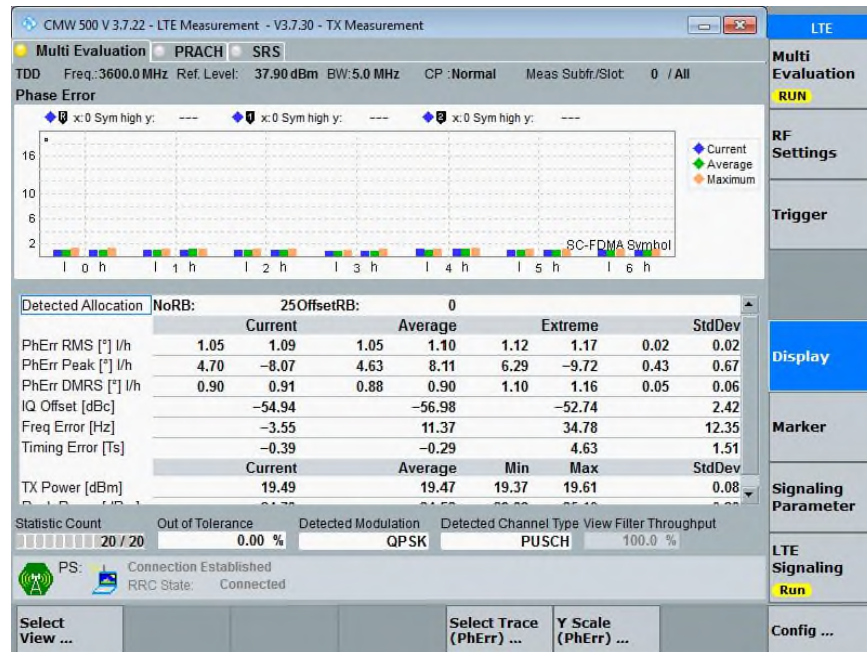
LTE Band 48 (3550-3650 MHz) – QPSK 5 MHz BW-Middle Channel 3600 MHz				
Voltage (VDC)	Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
3.7	-30	44.42	0.012	20
	-20	44.76	0.012	20
	-10	43.80	0.012	20
	0	46.35	0.013	20
	+10	44.45	0.012	20
	+20	34.78	0.014	20
	+30	45.98	0.013	20
	+40	42.43	0.012	20
	+50	40.08	0.011	20
3.3	20	39.54	0.011	20
4.3		39.95	0.011	20

LTE Band 48 (3550-3650 MHz) – QPSK 5 MHz BW						
Voltage (VDC)	Temperature (°C)	F_L (MHz)	$F_L - \text{Freq Error}$ (MHz)	F_H (MHz)	$F_L + \text{Freq Error}$ (MHz)	Compliance
3.7	-30	3550.1427	3550.1427	3649.8988	3649.8988	Yes
	+20	3550.1385	3550.1385	3649.8631	3649.8631	Yes
	+50	3550.1526	3550.1526	3649.8866	3649.8866	Yes
3.3	20	3550.1941	3550.1941	3649.8631	3649.8631	Yes
4.3		3550.1552	3550.1552	3649.9086	3649.9086	Yes

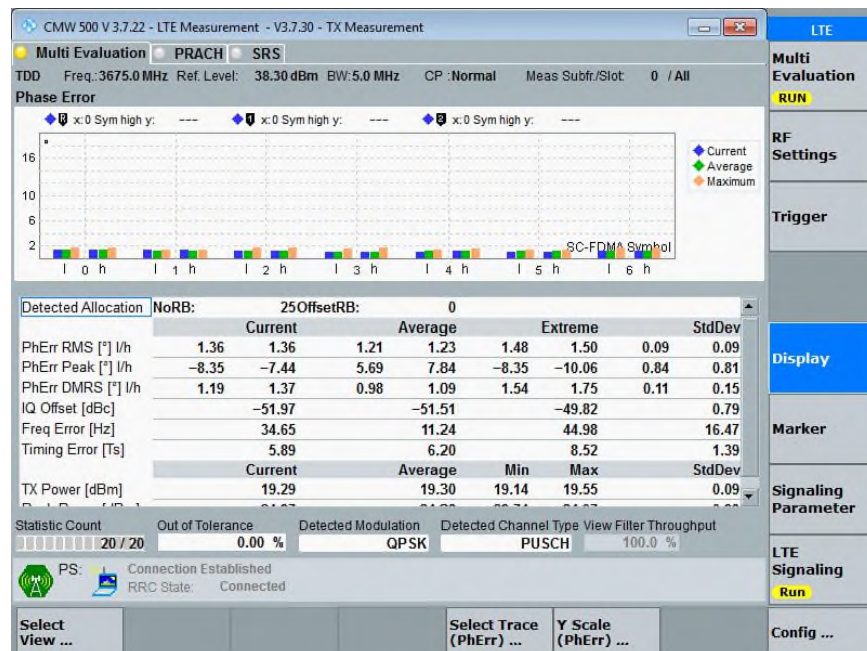
LTE Band 48 (3650-3700 MHz) – QPSK 5 MHz BW-Middle Channel 3675 MHz			
Voltage (VDC)	Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)
3.7	-30	45.09	0.012
	-20	46.53	0.013
	-10	48.09	0.013
	0	51.13	0.014
	+10	47.31	0.013
	+20	44.98	0.012
	+30	46.23	0.013
	+40	44.59	0.012
	+50	40.77	0.011
3.3	20	40.91	0.011
4.3		43.09	0.012

LTE Band 48 (3650-3700 MHz) – QPSK 5 MHz BW						
Voltage (VDC)	Temperature (°C)	F _L (MHz)	F _L – Freq Error (MHz)	F _H (MHz)	F _L + Freq Error (MHz)	Compliance
3.7	-30	3650.1261	3650.1260	3699.857	3699.8571	Yes
	+20	3650.1177	3650.1176	3699.8762	3699.8763	Yes
	+50	3650.1350	3650.1349	3699.8528	3699.8529	Yes
3.3	20	3650.1064	3650.1063	3699.8716	3699.8717	Yes
4.3		3650.0892	3650.0891	3699.8608	3699.8609	Yes

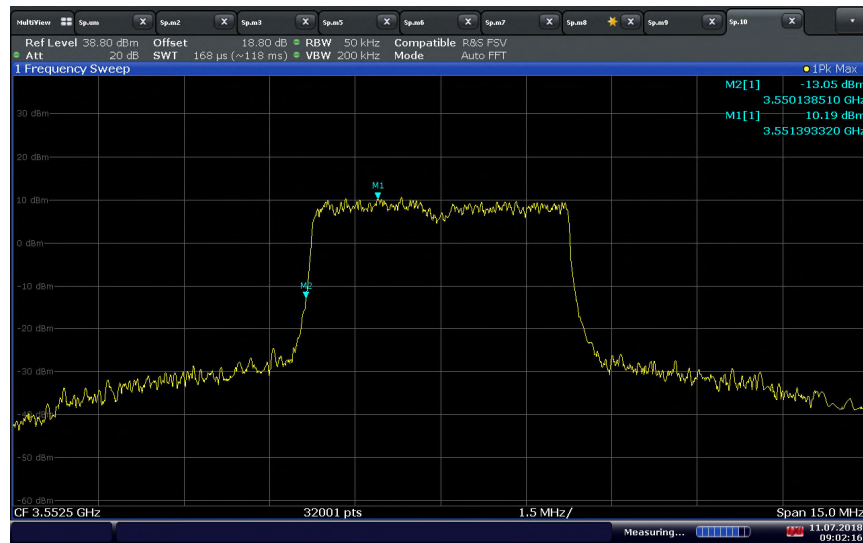
2.7.9 Sample Test Results



LTE Band 48 (3550-3650 MHz) – QPSK 5 MHz BW-Middle Channel 3600 MHz at Normal Voltage 20°C

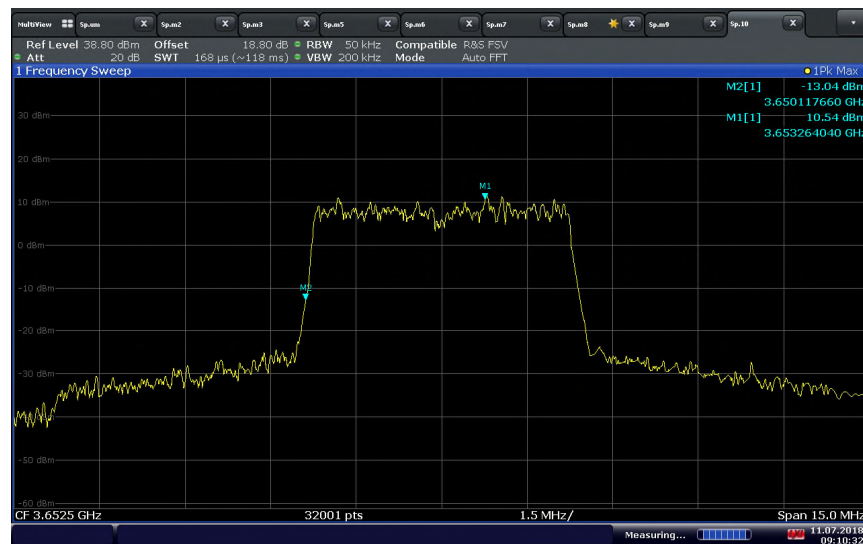


LTE Band 48 (3650-3700 MHz) – QPSK 5 MHz BW-Middle Channel 3675 MHz at Normal Voltage 20°C



09:02:16 11.07.2018

Band 48 (3550-3650 MHz) – QPSK 5 MHz BW Low Channel F_L at Normal Voltage 20°C



09:10:32 11.07.2018

LTE Band 48 (3650-3700 MHz) – QPSK 5 MHz BW Low Channel F_L at Normal Voltage 20°C



2.8 RECEIVER SPURIOUS EMISSIONS

2.8.1 Specification Reference

RSS-192, Clause 5.6
RSS-197, Clause 5.8
RSS-GEN, Clause 7.4

2.8.2 Standard Applicable

RSS-192, Clause 5.6
Receiver spurious emissions shall not exceed -10 dBW/MHz below 21.2 GHz, and -60 dBW/MHz above 21.2 GHz at the antenna connector. A spectrum analyzer resolution bandwidth of 100 kHz shall be used to measure spurious emissions for emissions below 1.0 GHz, and a bandwidth of 1.0 MHz shall be used for emissions above 1.0 GHz.

RSS-197, Clause 5.8
Receiver spurious emissions shall comply with the limit specified in RSS-Gen.

RSS-Gen, Clause 7.4

The spurious emissions from the receiver at any discrete frequency, measured at the antenna port by the antenna-conducted method, shall not exceed 2 nW (-57dBm) in the frequency range 30-1000 MHz and 5 nW (-53dBm) above 1 GHz.

2.8.3 Equipment Under Test and Modification State

Serial No: AZ280418A00132 / Test Configuration C

2.8.4 Date of Test/Initial of test personnel who performed the test

July 26, 2018 / XYZ

2.8.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.8.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

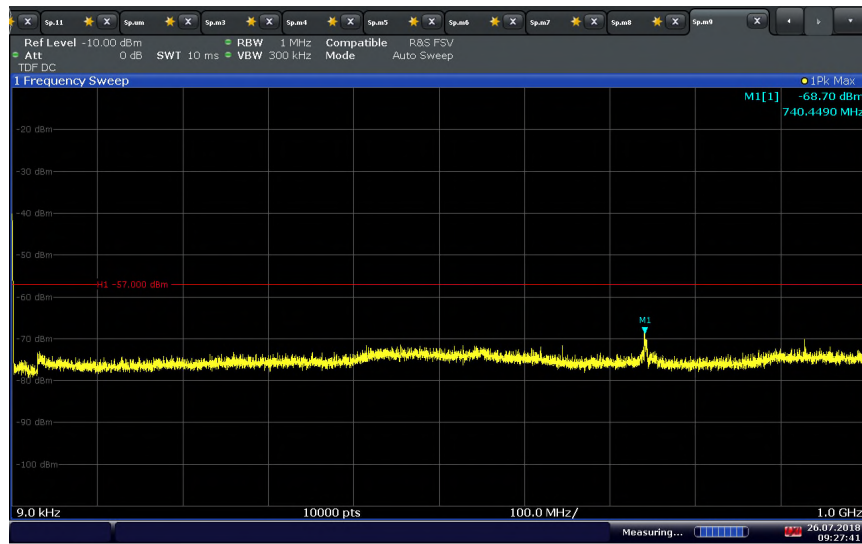
Ambient Temperature	25.9 °C
Relative Humidity	56.1 %
ATM Pressure	99.7 kPa

2.8.7 Additional Observations

- This is a conducted test. The spectrum was searched from 30MHz to the 26.5GHz.
- Test performed on RX only antenna port of the EUT.

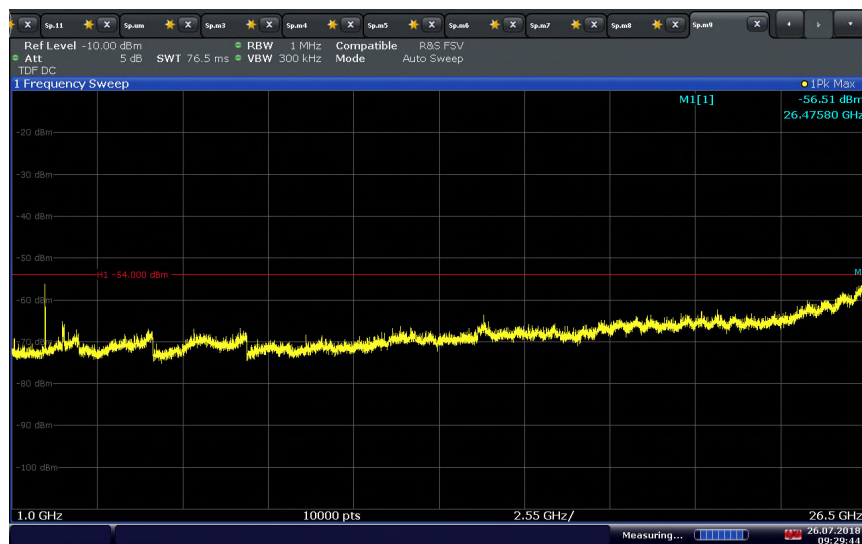
2.8.8 Test Results

Receiver Spurious below 1 GHz



09:27:43 26.07.2018

Receiver Spurious Above 1 GHz



09:29:44 26.07.2018



SECTION 3

TEST EQUIPMENT USED

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

ID Number (SDGE/SDRB)	Test Equipment	Type	Serial Number	Manufacturer	Cal Date	Cal Due Date
Antenna Conducted Port Setup						
7662	P-Series Power Meter	N1911A	MY45100951	Agilent	06/15/18	06/15/19
7661	50MHz-18GHz Wideband Power Sensor	N1921A	MY45241383	Agilent	06/15/18	06/15/19
7608	Vector Signal Generator	SMBV100A	259021	Rhode & Schwarz	09/19/17	09/19/19
7582	Signal/Spectrum Analyzer	FSW26	101614	Rhode & Schwarz	12/14/17	12/14/18
-	Wideband Radio Communication Tester	CMW 500	158164	Rhode & Schwarz	04/04/18	04/04/19
8825	20dB Attenuator	46-20-34	BK5773	Weinschel Corp.	Verified by 7608 and 7582	
-	10dB Attenuator	VAT-10W2+2W	N/A	MCL	Verified by 7608 and 7582	
Radiated Test Setup						
7582	Signal/Spectrum Analyzer	FSW26	101614	Rhode & Schwarz	12/14/17	12/14/18
7608	Vector Signal Generator	SMBV100A	259021	Rhode & Schwarz	09/19/17	09/19/19
1002	Bilog Antenna	3142C	00058717	EMCO	11/20/17	11/20/18
7575	Double-ridged waveguide horn antenna	3117	00155511	EMCO	06/16/18	06/16/20
1193	Pre-amplifier	PAM-0202	185	A.H. Systems, Inc.	04/11/18	04/11/19
8921	High-frequency cable	SucoFlex 100 SX	N/A	Suhner	Verified by 7608 and 7582	
8923	High-frequency cable	Micropore 19057793	N/A	United Microwave Products	Verified by 7608 and 7582	
1040	EMI Test Receiver	ESIB40	100292	Rhode & Schwarz	10/15/18	10/15/19
8628	Pre-amplifier	QLI-01182835-JO	8986002	Quinstar	02/06/18	02/06/19
-	UXM Wireless Test Set	E7515A	MY56180375	Keysight	For Signalling only	
-	Wideband Radio Communication Tester	CMW 500	158164	Rhode & Schwarz	For Signalling only	
Miscellaneous						
6708	Multimeter	34401A	US36086974	Hewlett Packard	07/18/18	07/18/19
7579	Temperature Chamber	115	151617	TestQuity	08/24/18	08/24/19
11312	Mini Environmental Quality Meter	850027	CF099-56010-340	Sper Scientific	02/26/18	02/26/19
	Test Software	EMC32	V8.53	Rhode & Schwarz	N/A	

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:

3.2.1 Conducted Antenna Port Measurement

	Input Quantity (Contribution) X_i	Value	Prob. Dist.	Divisor	$u_i(x)$	$u_i(x)^2$
1	Receiver reading	0.10 dB	Normal, k=1	1.000	0.10	0.01
2	Cable attenuation	1.00 dB	Normal, k=2	2.000	0.50	0.25
3	Receiver sinewave accuracy	0.08 dB	Normal, k=2	2.000	0.04	0.00
4	Receiver pulse amplitude	0.00 dB	Rectangular	1.732	0.00	0.00
5	Receiver pulse repetition rate	0.00 dB	Rectangular	1.732	0.00	0.00
6	Noise floor proximity	0.00 dB	Rectangular	1.732	0.00	0.00
7	Frequency interpolation	0.10 dB	Rectangular	1.732	0.06	0.00
8	Mismatch	0.07 dB	U-shaped	1.414	0.05	0.00
Combined standard uncertainty			Normal	0.52	dB	
Expanded uncertainty			Normal, k=2	1.03	dB	

3.2.2 Radiated Emission Measurements (Below 1GHz)

	Input Quantity (Contribution) X_i	Value	Prob. Dist.	Divisor	$u_i(x)$	$u_i(x)^2$
1	Receiver reading	0.10 dB	Normal, k=1	1.000	0.10	0.01
2	Attenuation: antenna-receiver	0.20 dB	Normal, k=2	2.000	0.10	0.01
3	Antenna factor AF	0.75 dB	Normal, k=2	2.000	0.38	0.14
4	Receiver sinewave accuracy	0.45 dB	Normal, k=2	2.000	0.23	0.05
5	Receiver pulse amplitude	1.50 dB	Rectangular	1.732	0.87	0.75
6	Receiver pulse repetition rate	1.50 dB	Rectangular	1.732	0.87	0.75
7	Noise floor proximity	0.50 dB	Rectangular	1.732	0.29	0.08
8	Mismatch: antenna-receiver	0.95 dB	U-shaped	1.414	0.67	0.45
9	AF frequency interpolation	0.30 dB	Rectangular	1.732	0.17	0.03
10	AF height deviations	0.10 dB	Rectangular	1.732	0.06	0.00
11	Directivity difference at 3 m	3.12 dB	Rectangular	1.732	1.80	3.24
12	Phase center location at 3 m	1.00 dB	Rectangular	1.732	0.58	0.33
13	Cross-polarisation	0.90 dB	Rectangular	1.732	0.52	0.27
14	Balance	0.00 dB	Rectangular	1.732	0.00	0.00
15	Site imperfections	3.76 dB	Triangular	2.449	1.54	2.36
16	Separation distance at 3 m	0.30 dB	Rectangular	1.732	0.17	0.03
17	Effect of setup table material	0.77 dB	Rectangular	1.732	0.44	0.20
18	Table height at 3 m	0.10 dB	Normal, k=2	2.000	0.05	0.00
19	Near-field effects	0.00 dB	Triangular	2.449	0.00	0.00
20	Effect of ambient noise on OATS	0.00 dB				0.00
Combined standard uncertainty			Normal	2.95	dB	
Expanded uncertainty			Normal, k=2	5.90	dB	

3.2.3 Radiated Emission Measurements (Above 1GHz)

	Input Quantity (Contribution) X_i	Value	Prob. Dist.	Divisor	$u_i(x)$	$u_i(x)^2$
1	Receiver reading	0.10 dB	Normal, k=1	1.000	0.10	0.01
2	Attenuation: antenna-receiver	0.20 dB	Normal, k=2	2.000	0.10	0.01
3	Antenna factor AF	0.75 dB	Normal, k=2	2.000	0.38	0.14
4	Receiver sinewave accuracy	0.45 dB	Normal, k=2	2.000	0.23	0.05
5	Receiver pulse amplitude	1.50 dB	Rectangular	1.732	0.87	0.75
6	Receiver pulse repetition rate	1.50 dB	Rectangular	1.732	0.87	0.75
7	Noise floor proximity	0.50 dB	Rectangular	1.732	0.29	0.08
8	Mismatch: antenna-receiver	0.95 dB	U-shaped	1.414	0.67	0.45
9	AF frequency interpolation	0.30 dB	Rectangular	1.732	0.17	0.03
10	AF height deviations	0.10 dB	Rectangular	1.732	0.06	0.00
11	Directivity difference at 3 m	3.12 dB	Rectangular	1.732	1.80	3.24
12	Phase center location at 3 m	1.00 dB	Rectangular	1.732	0.58	0.33
13	Cross-polarisation	0.90 dB	Rectangular	1.732	0.52	0.27
14	Balance	0.00 dB	Rectangular	1.732	0.00	0.00
15	Site imperfections	3.25 dB	Triangular	2.449	1.33	1.76
16	Separation distance at 3 m	0.30 dB	Rectangular	1.732	0.17	0.03
17	Effect of setup table material	0.77 dB	Rectangular	1.732	0.44	0.20
18	Table height at 3 m	0.10 dB	Normal, k=2	2.000	0.05	0.00
19	Near-field effects	0.00 dB	Triangular	2.449	0.00	0.00
20	Effect of ambient noise on OATS	0.00 dB				0.00
	Combined standard uncertainty	Normal		2.85 dB		
	Expanded uncertainty	Normal, k=2		5.70 dB		

3.2.4 Conducted Measurements

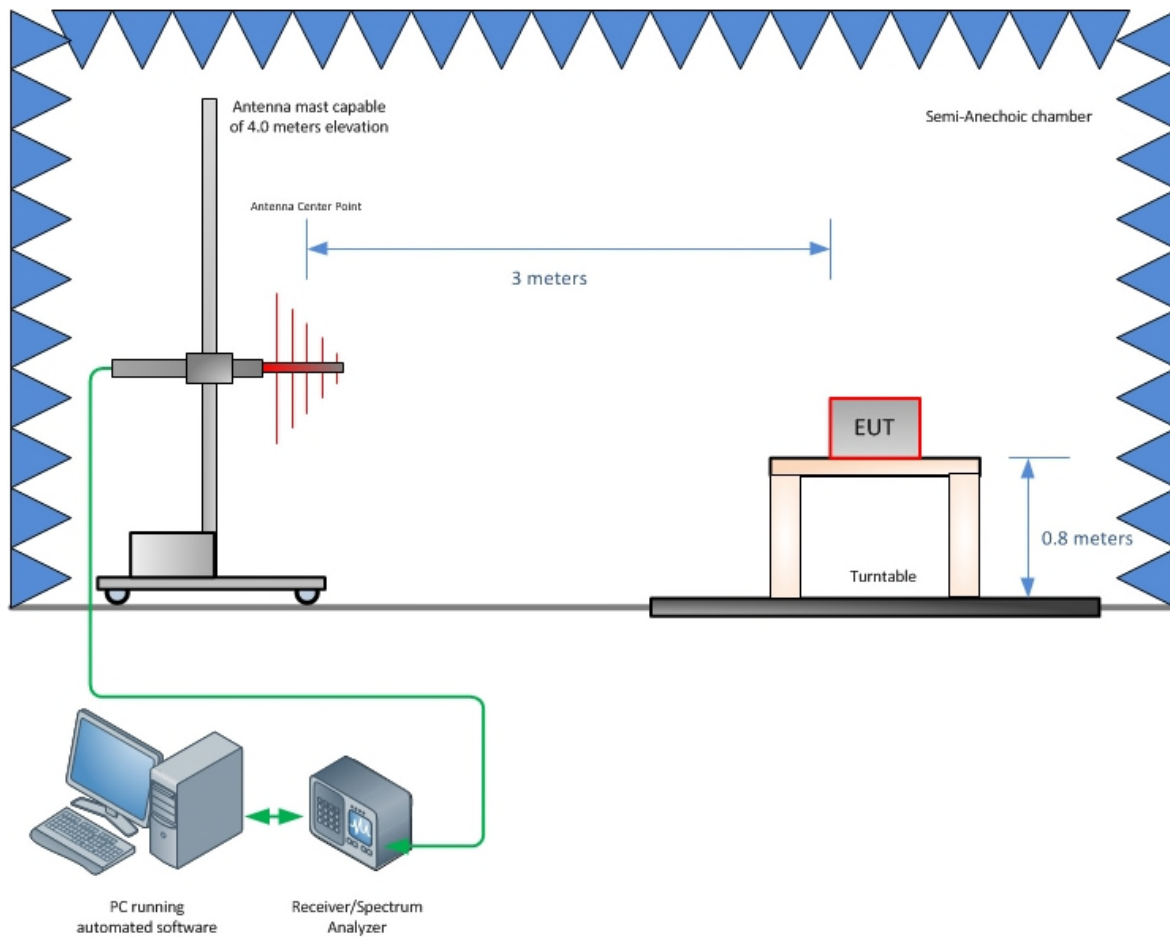
	Input Quantity (Contribution) X_i	Value	Prob. Dist.	Divisor	$u_i(x)$	$u_i(x)^2$
1	Receiver reading	0.10 dB	Normal, k=1	1.000	0.10	0.01
2	LISN-receiver attenuation	0.10 dB	Normal, k=2	2.000	0.05	0.00
3	LISN voltage division factor	0.30 dB	Normal, k=2	2.000	0.15	0.02
4	Receiver sinewave accuracy	0.36 dB	Normal, k=2	2.000	0.18	0.03
5	Receiver pulse amplitude	1.50 dB	Rectangular	1.732	0.87	0.75
6	Receiver pulse repetition rate	1.50 dB	Rectangular	1.732	0.87	0.75
7	Noise floor proximity	0.00 dB	Rectangular	1.732	0.00	0.00
8	AMN VDF frequency interpolation	0.10 dB	Rectangular	1.732	0.06	0.00
9	Mismatch	0.07 dB	U-shaped	1.414	0.05	0.00
10	LISN impedance	2.65 dB	Triangular	2.449	1.08	1.17
11	Effect of mains disturbance	0.00 dB			0.00	0.00
12	Effect of the environment					
Combined standard uncertainty				Normal	1.66 dB	
Expanded uncertainty				Normal, k=2	3.31 dB	



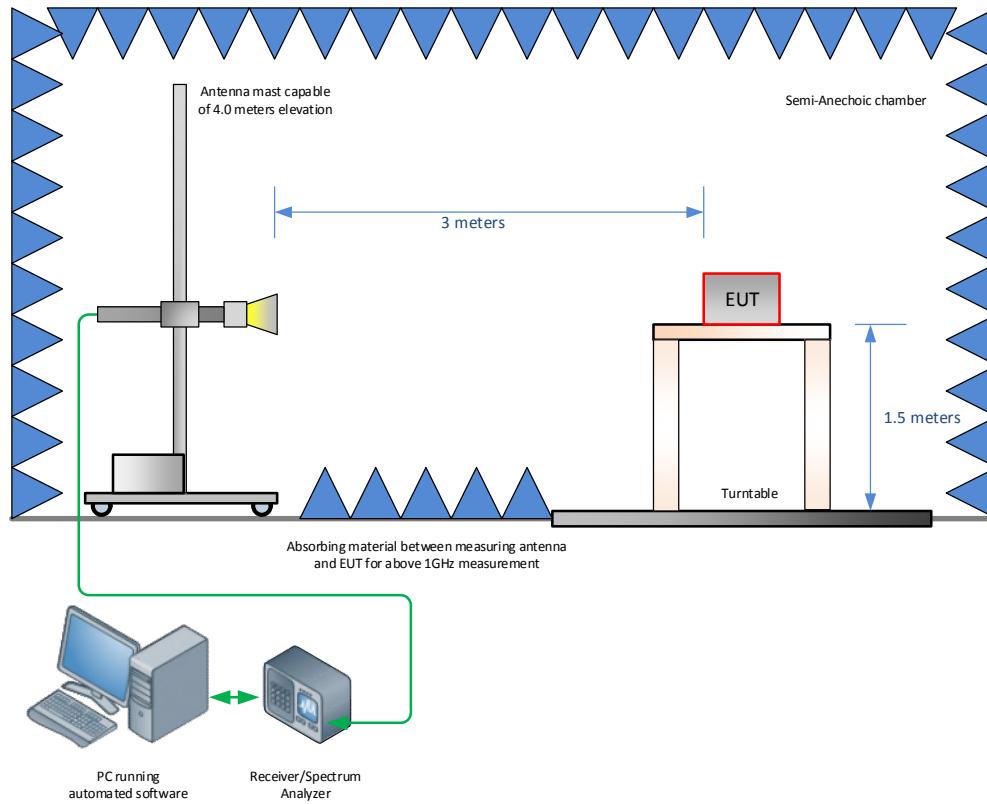
SECTION 4

DIAGRAM OF TEST SETUP

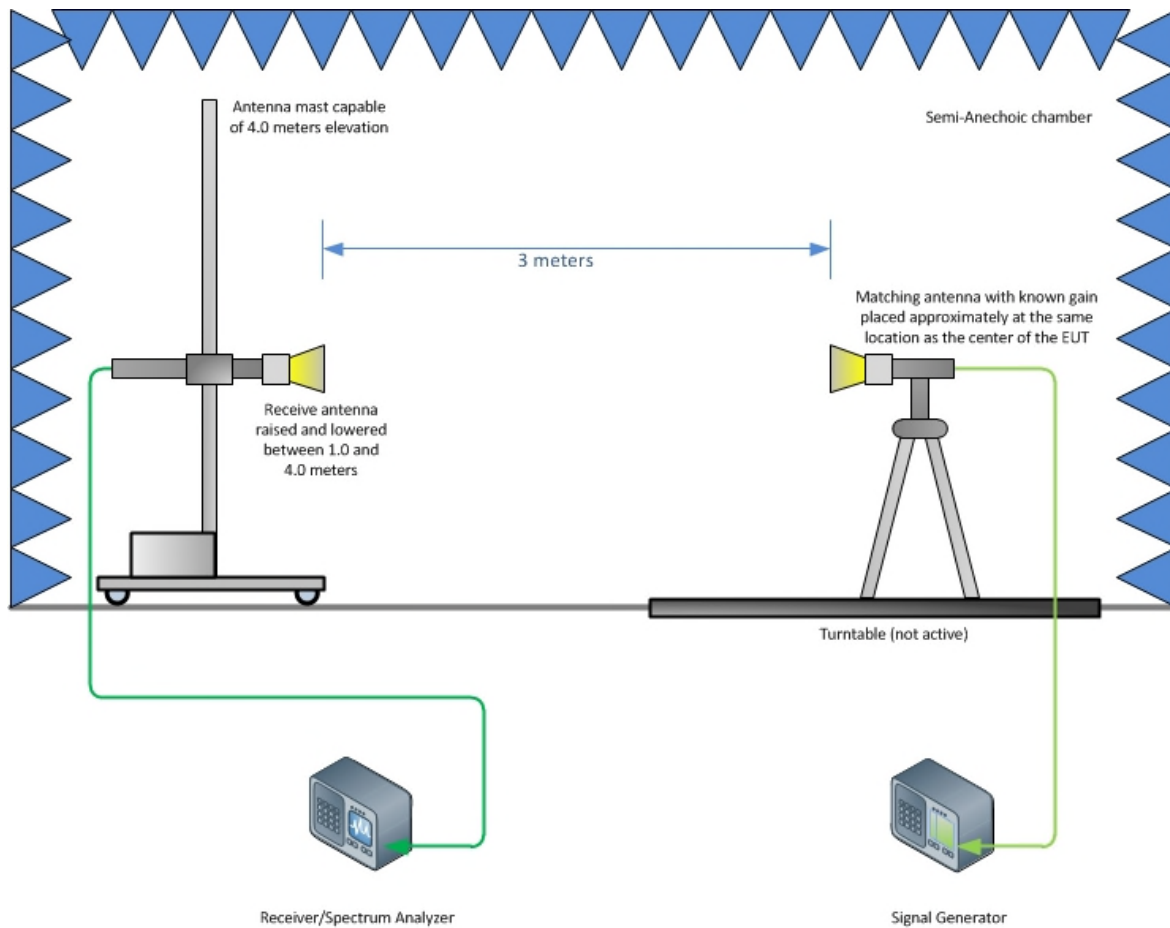
4.1 TEST SETUP DIAGRAM



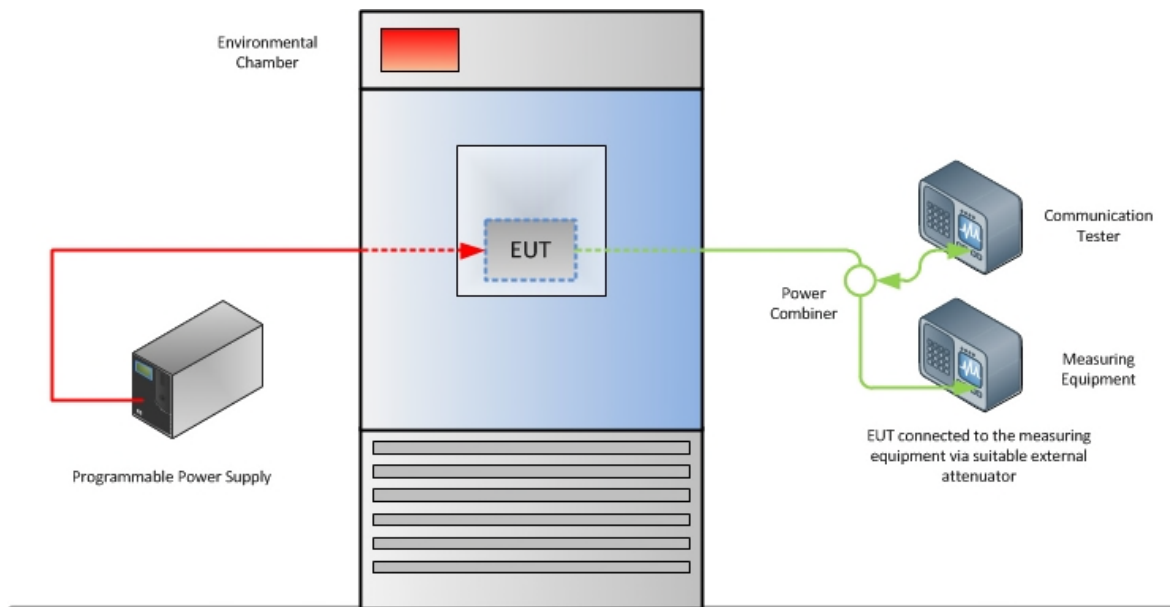
Radiated Emission Test Setup (Below 1GHz)



Radiated Emission Test Setup (Above 1GHz)



Substitution Test Method (Above 1GHz)



Frequency Stability Test Configuration



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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