

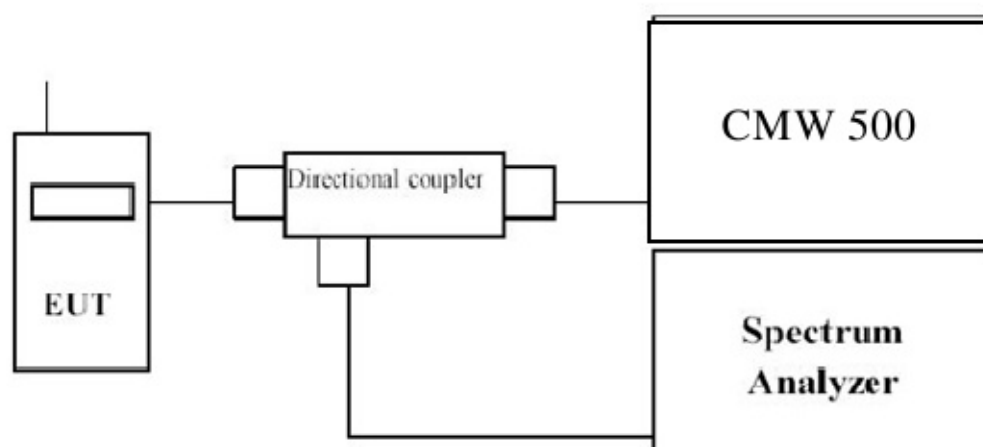
5. Peak To Average Ratio

5.1. Test Equipment

Peak To Average Ratio / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	R&S	FSVA40	101455	2016/11/28	2017/11/27
Wideband Radio Communication Tester	R&S	CMW500	150246	2017/04/19	2018/04/18
Directional Coupler	Agilent	778D	20402	2016/10/07	2017/10/06

5.2. Test Setup



5.3. Test Procedure

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Record the maximum PAPR level associated with a probability of 0.1 %.

5.4. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 5.7.2
ANSI C63.26-2015 Sub-clause 5.2.3.4

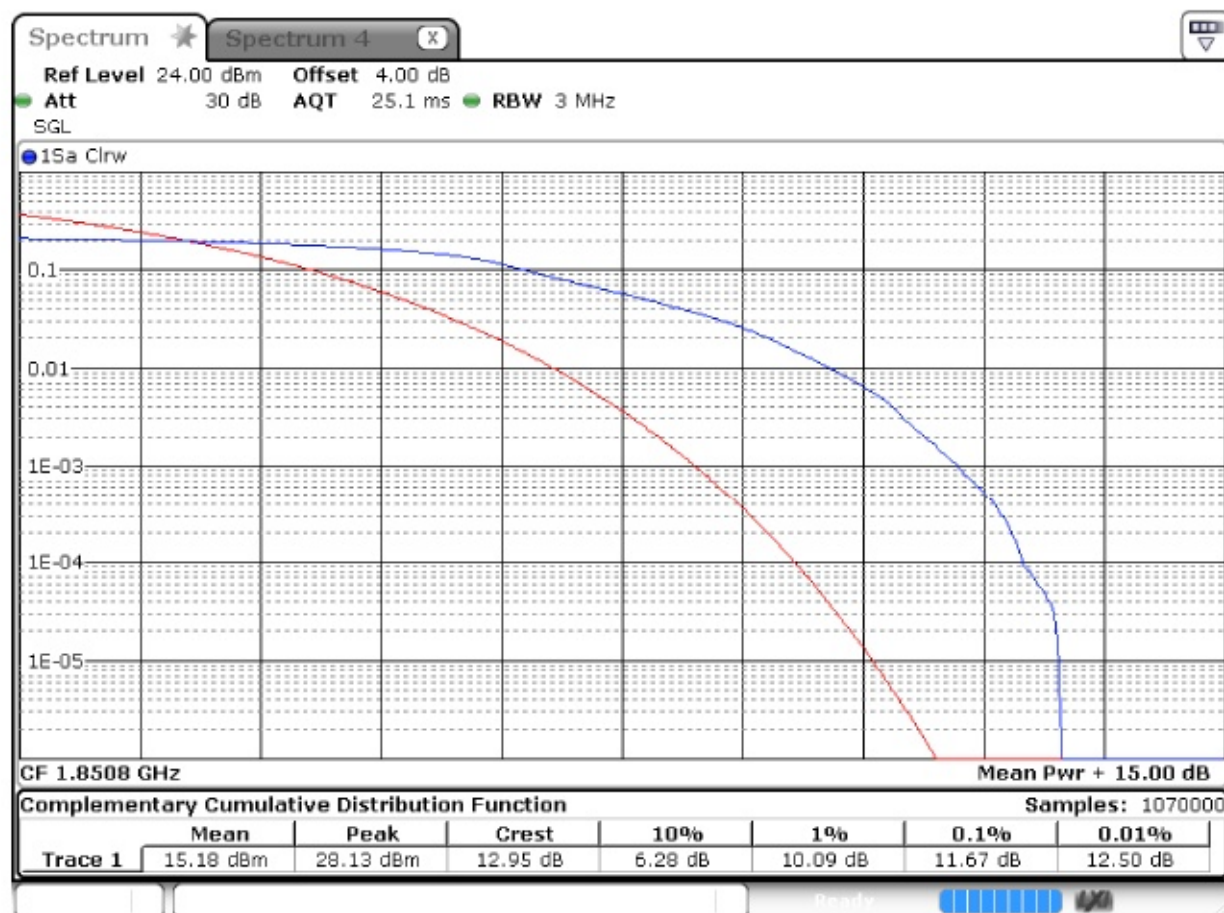
5.5. Uncertainty

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

5.6. Test Result

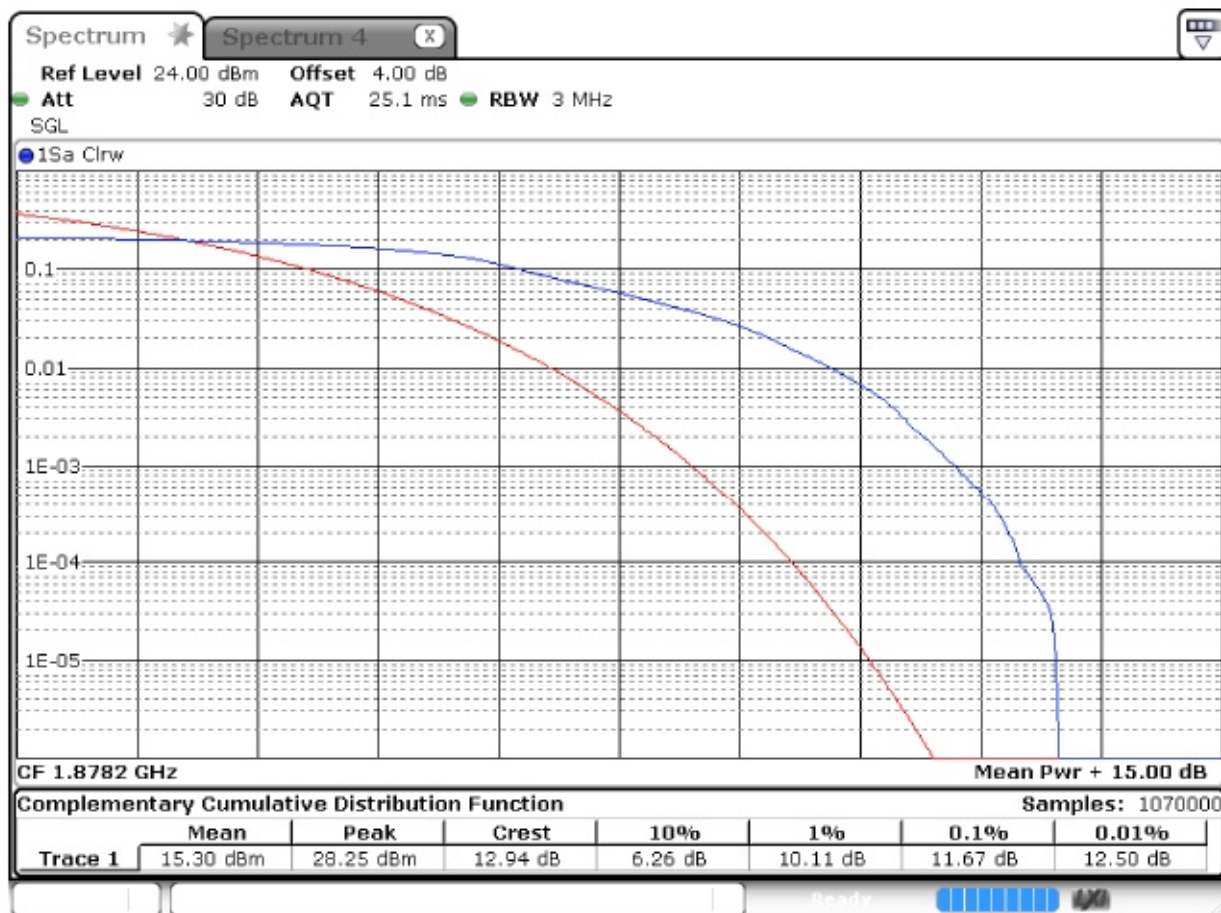
Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 1: LTE_CAT-M1_Band 2_QPSK_Link		
Date of Test	2017/09/08	Test Site	SR10-H

1850.7 MHz



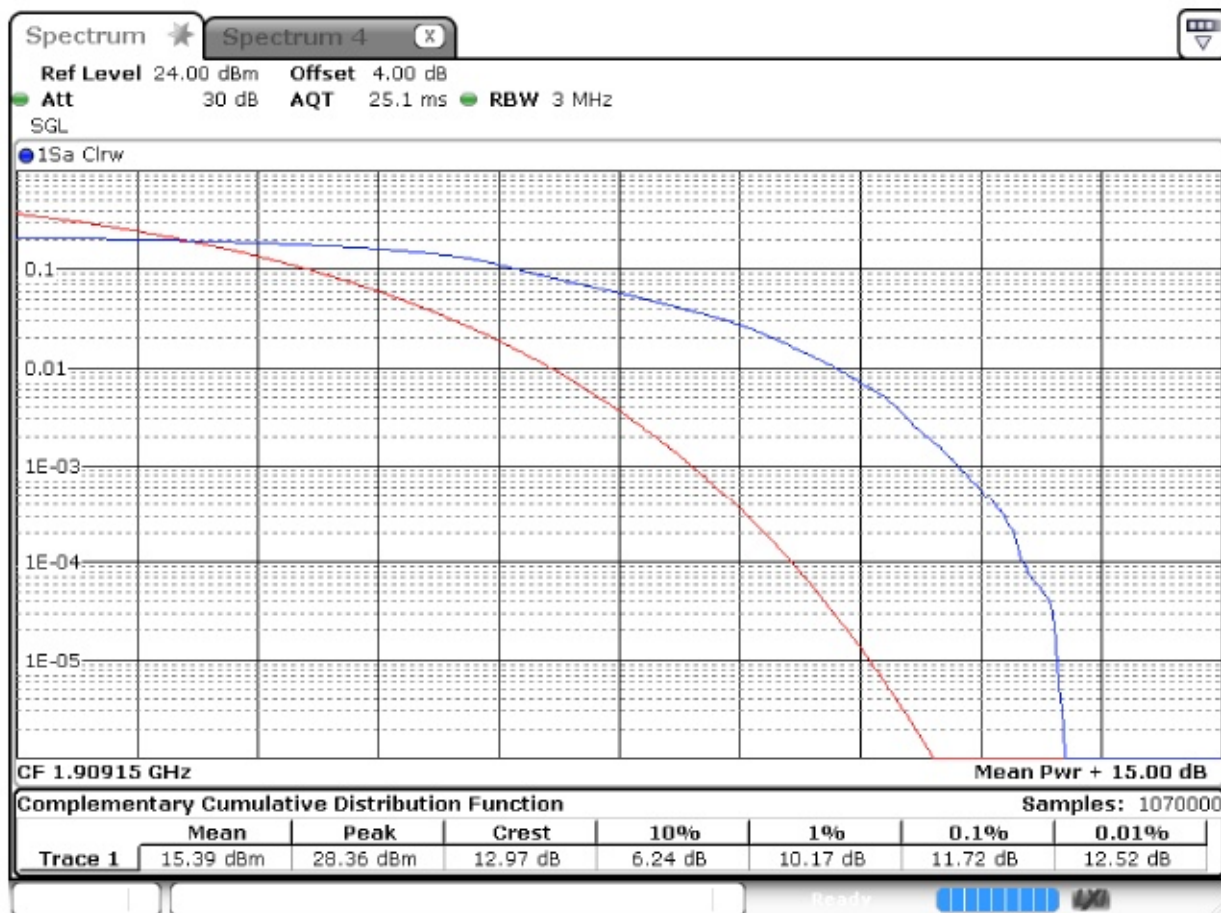
Date: 8.SEP.2017 19:24:53

1878.3 MHz



Date: 8.SEP.2017 19:32:35

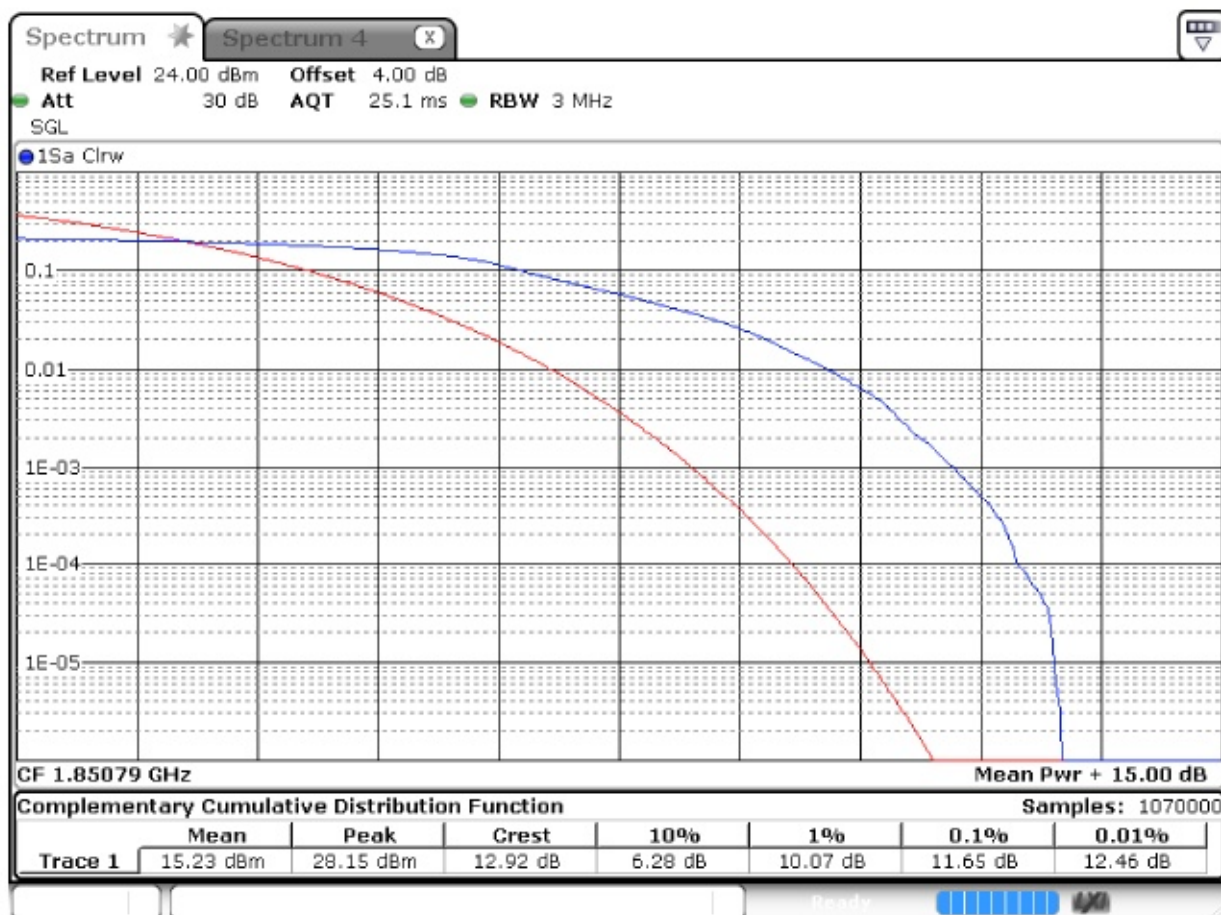
1909.3MHz



Date: 8.SEP.2017 19:37:15

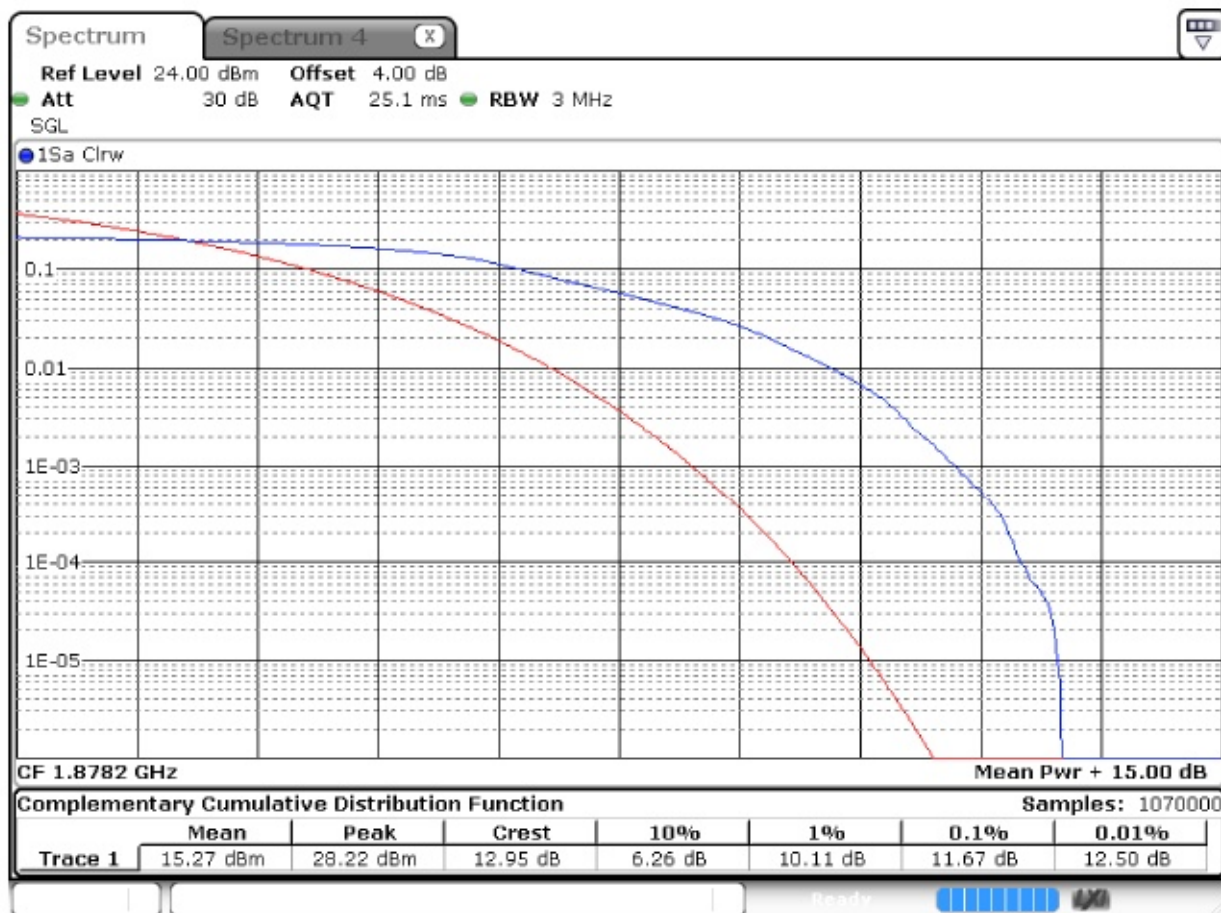
Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 2: LTE_CAT-M1_Band 2_16-QAM_Link		
Date of Test	2017/09/08	Test Site	SR10-H

1850.7 MHz



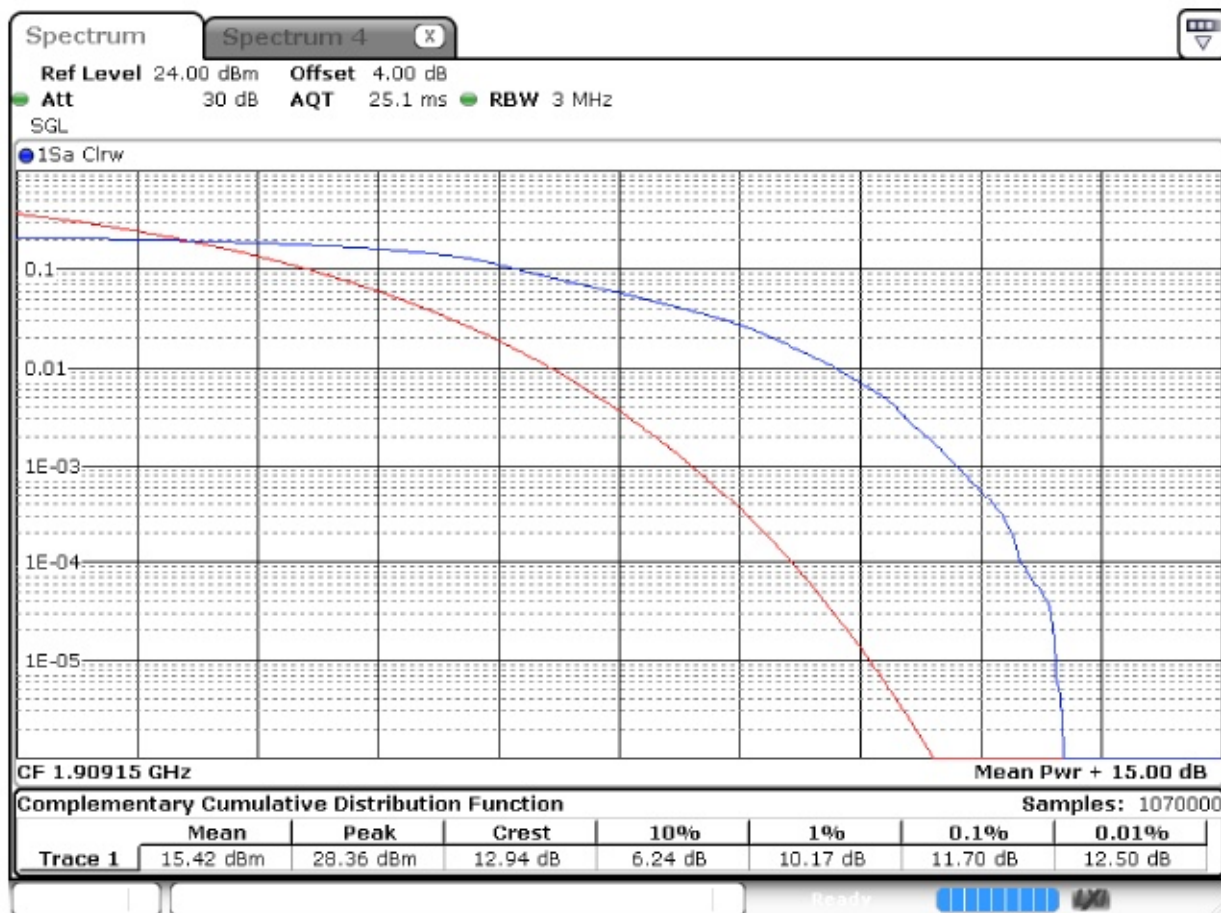
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1878.3 MHz



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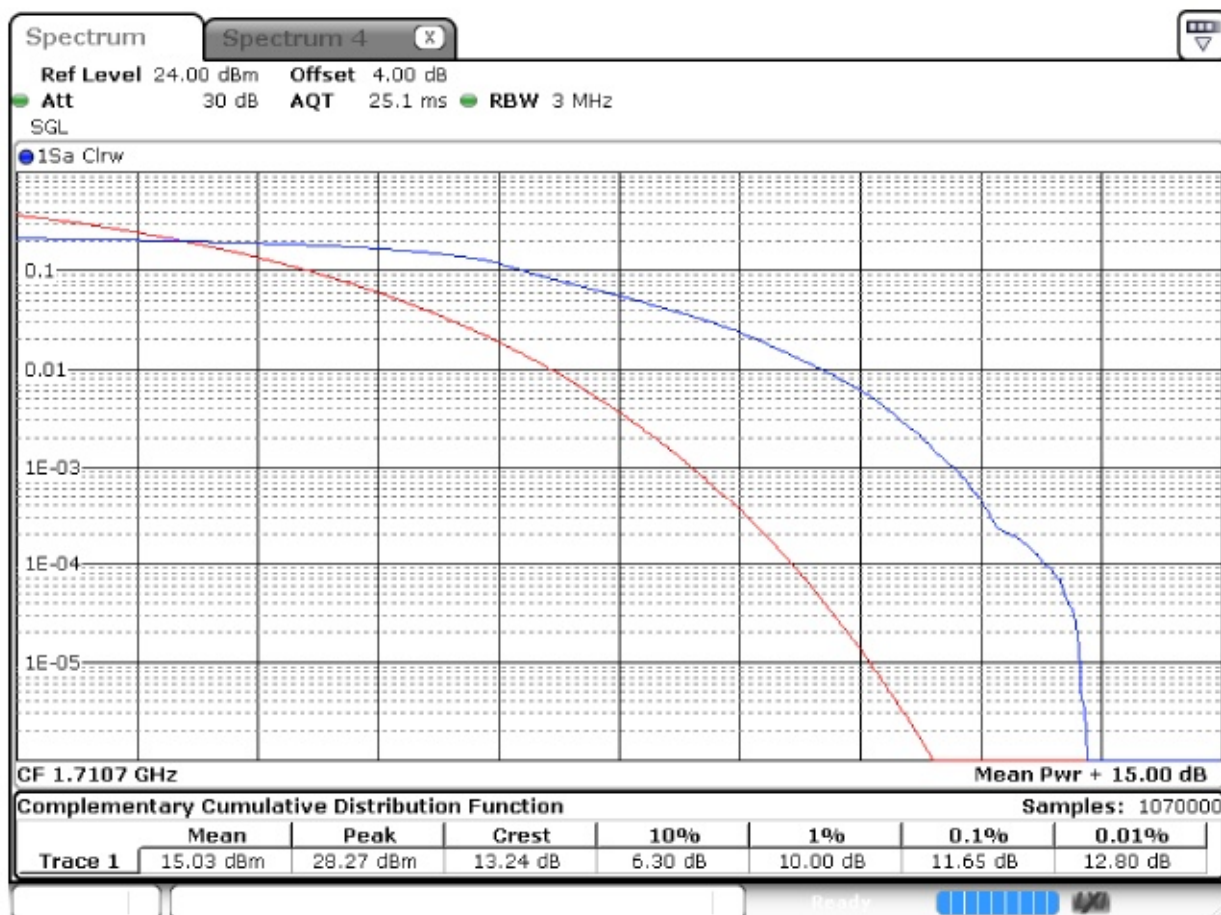
1909.3MHz



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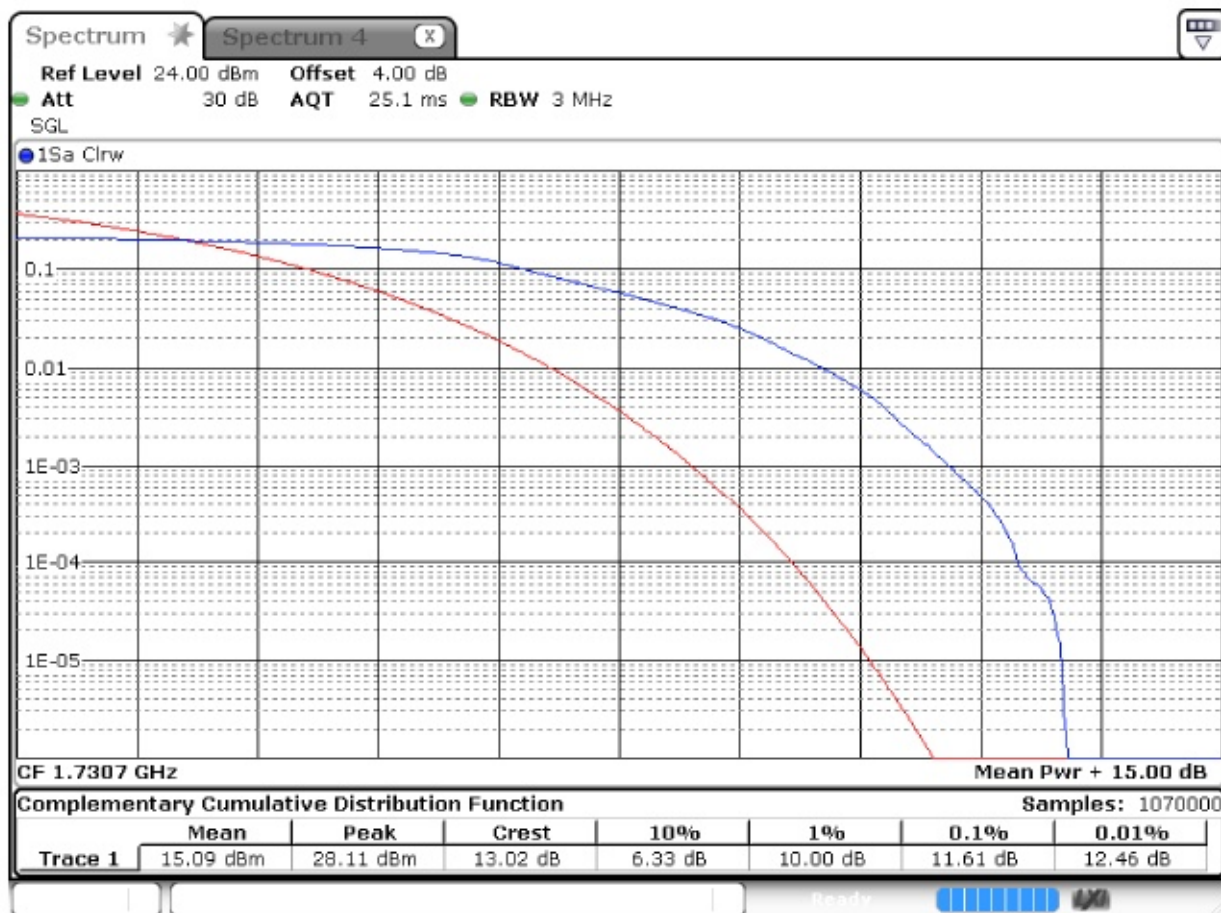
Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 3: LTE_CAT-M1_Band 4_QPSK_Link		
Date of Test	2017/09/08	Test Site	SR10-H

1710.7 MHz



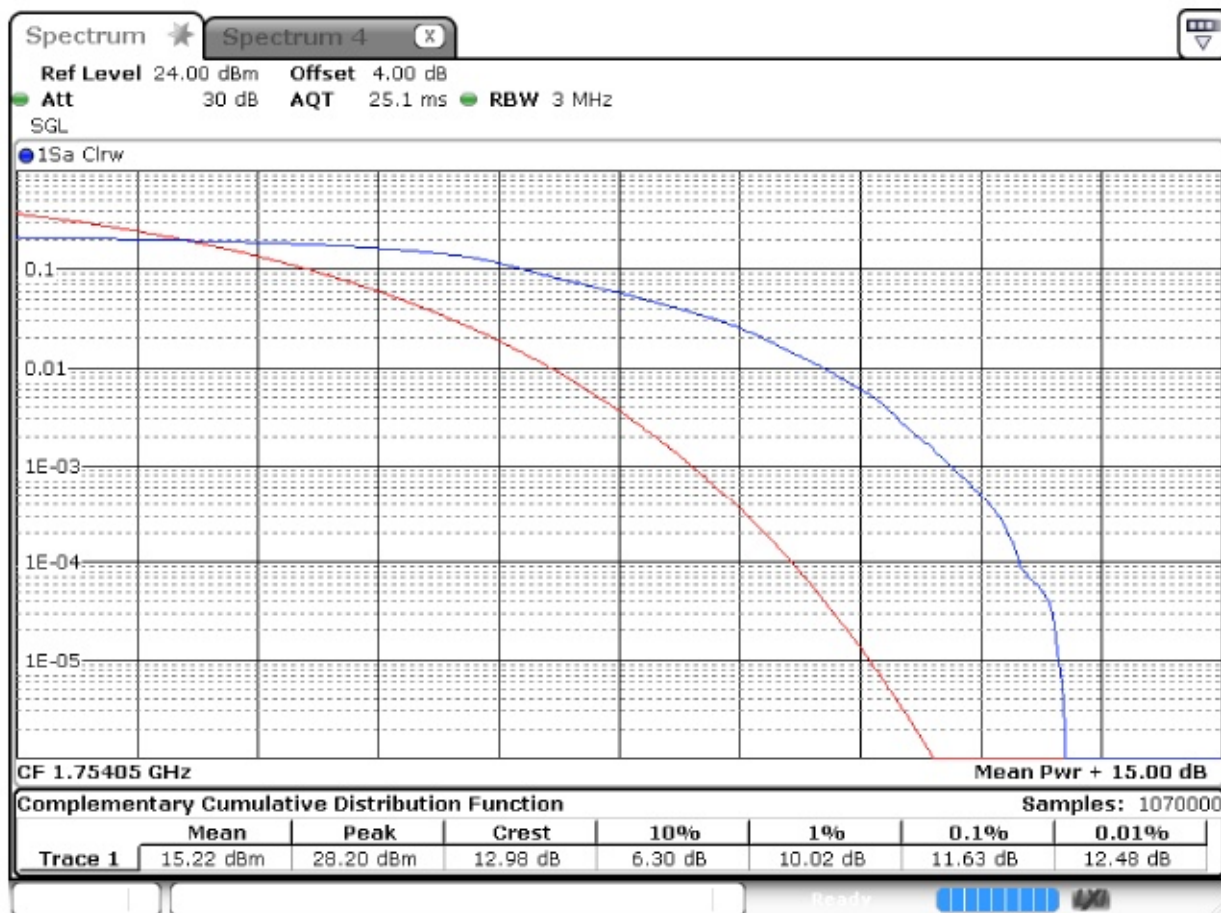
Date: 8.SEP.2017 19:42:53

1730.8 MHz



Date: 8.SEP.2017 19:45:02

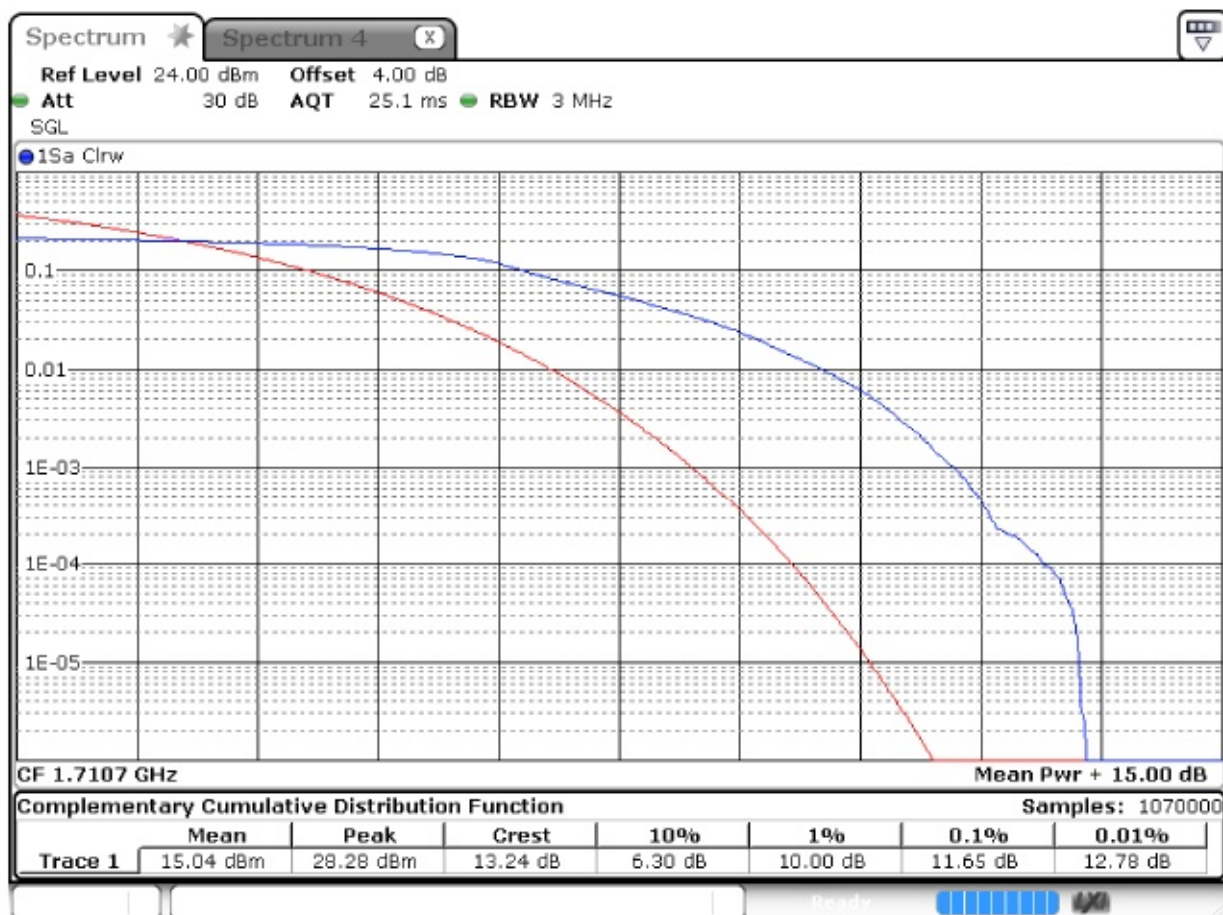
1754.3 MHz



Date: 8.SEP.2017 19:49:04

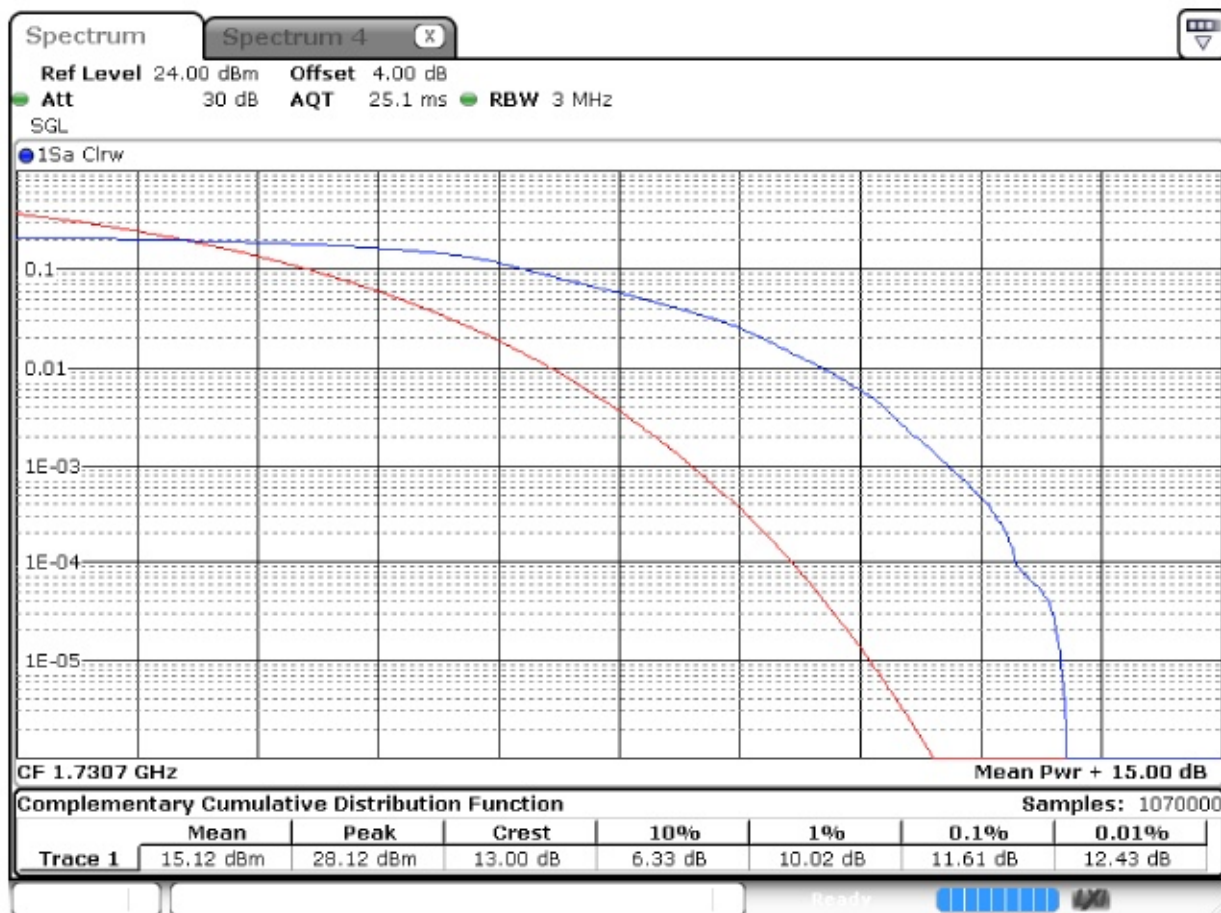
Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 4: LTE_CAT-M1_Band 4_16-QAM_Link		
Date of Test	2017/09/08	Test Site	SR10-H

1710.7 MHz



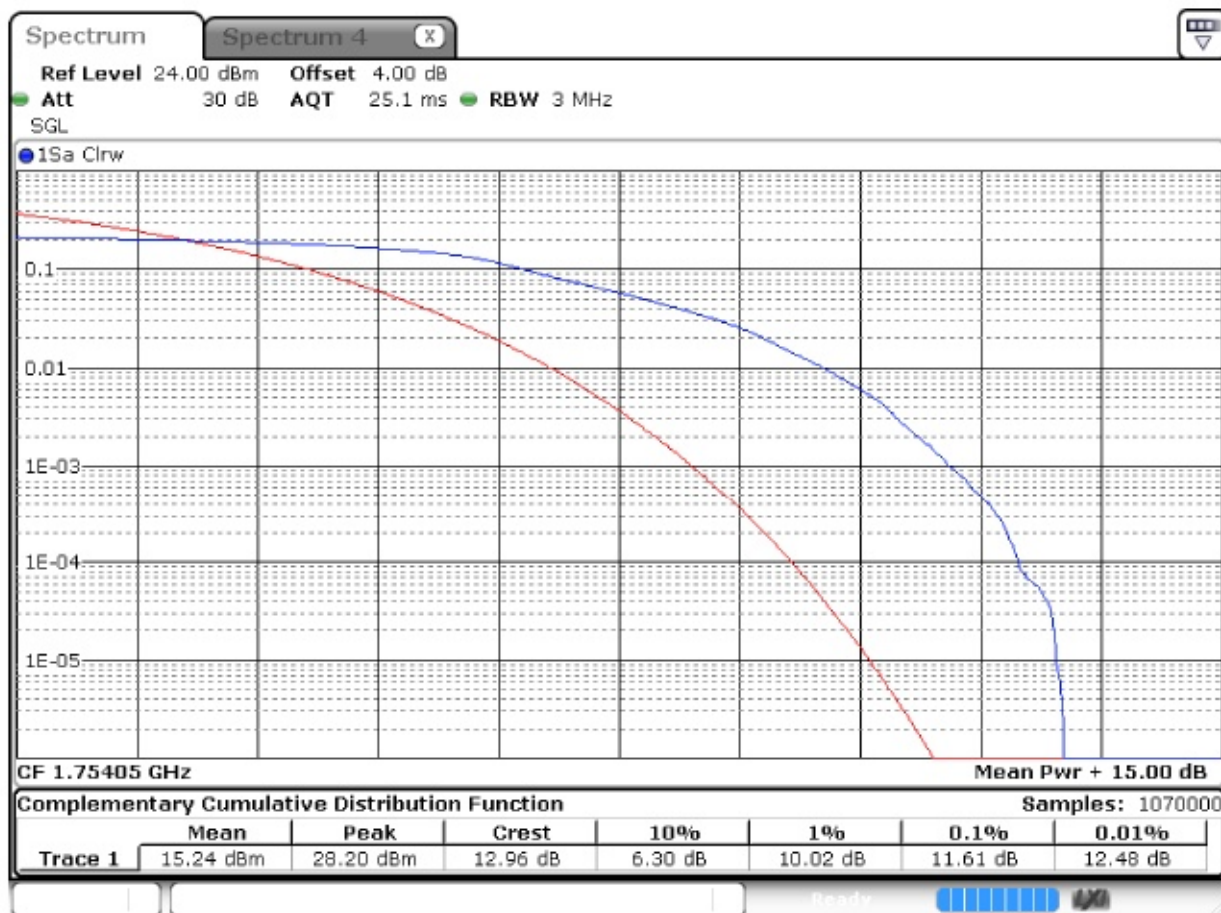
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1730.8 MHz



Date: 8.SEP.2017 19:45:31

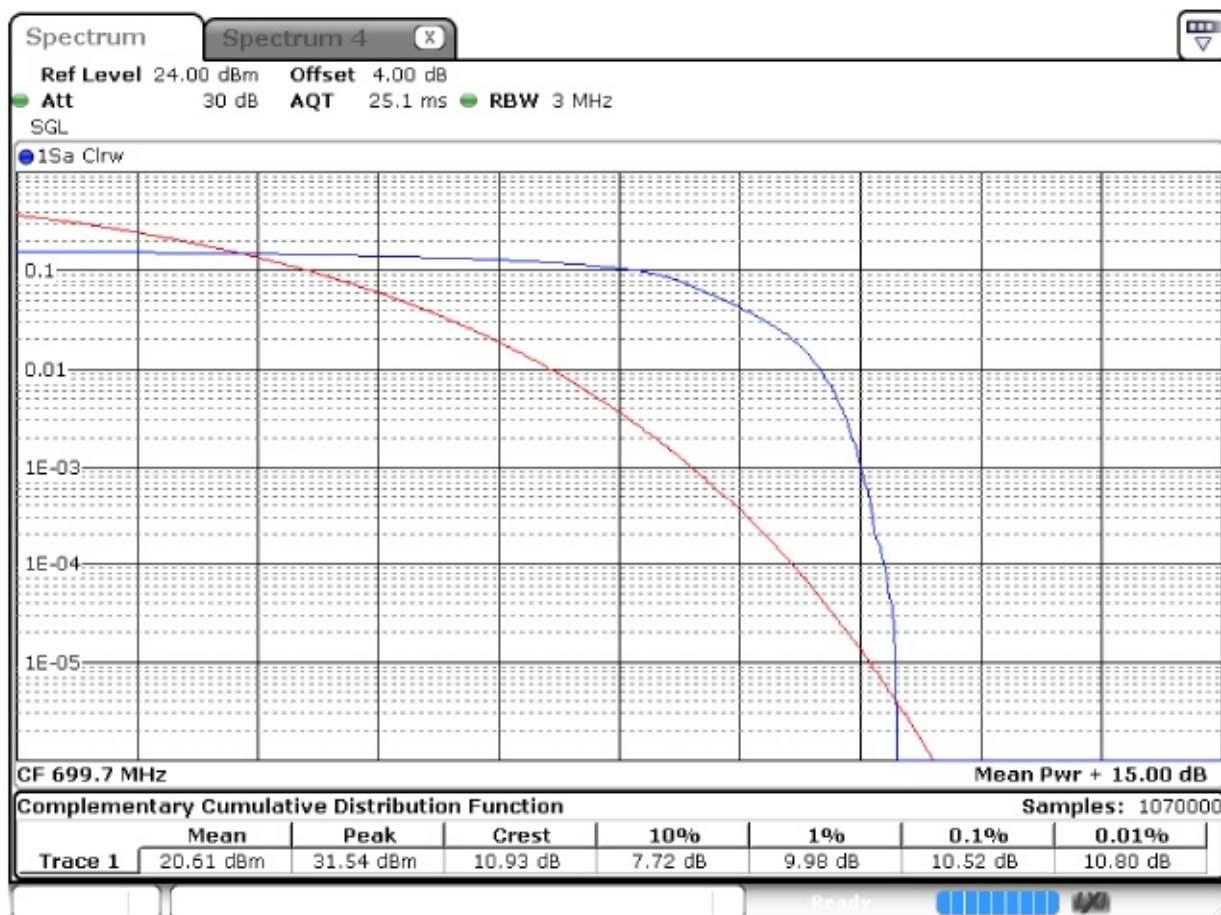
1754.3 MHz



Date: 8.SEP.2017 19:50:24

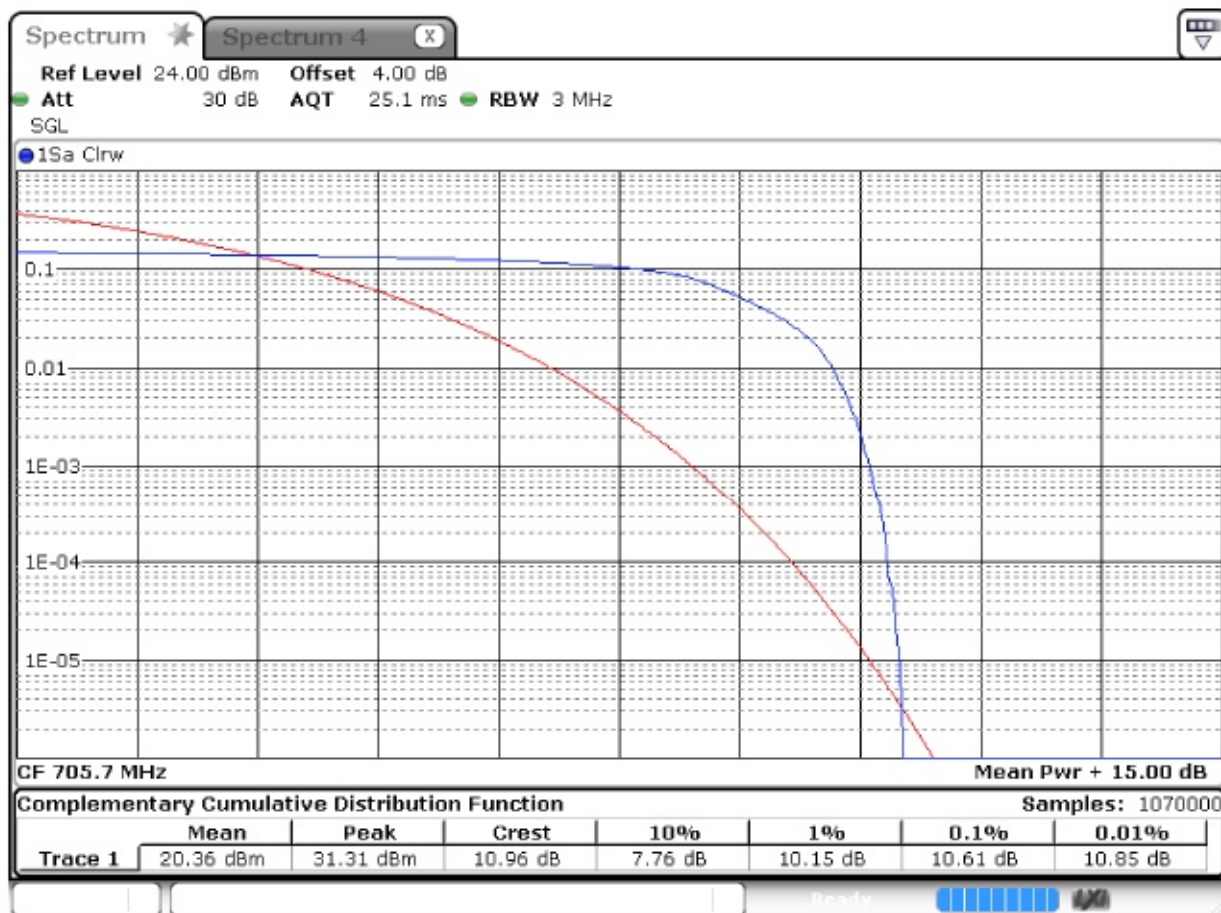
Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 5: LTE_CAT-M1_Band 12_QPSK_Link		
Date of Test	2017/09/08	Test Site	SR10-H

699.7 MHz



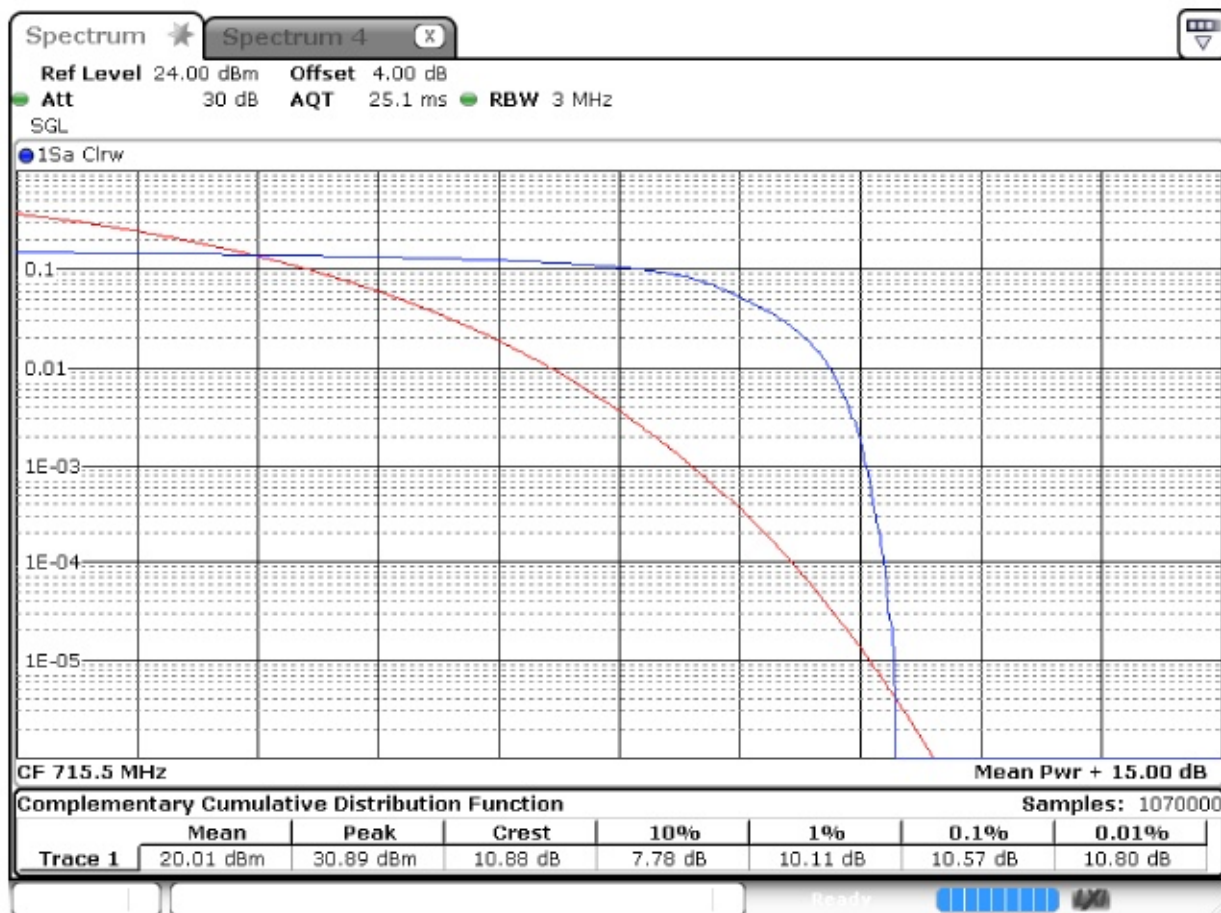
Date: 8.SEP.2017 19:52:39

705.7 MHz



Date: 8.SEP.2017 19:07:32

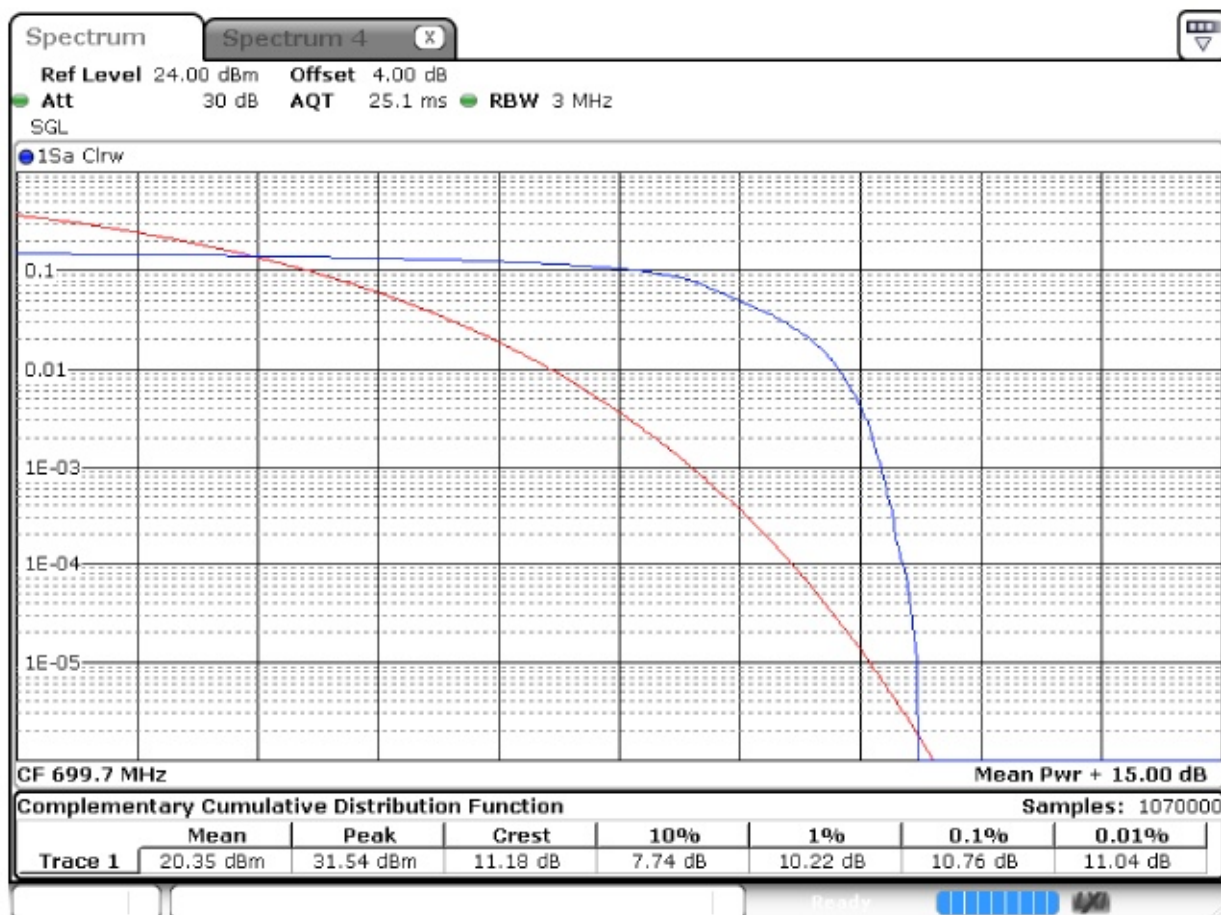
715.3 MHz



Date: 8.SEP.2017 19:04:26

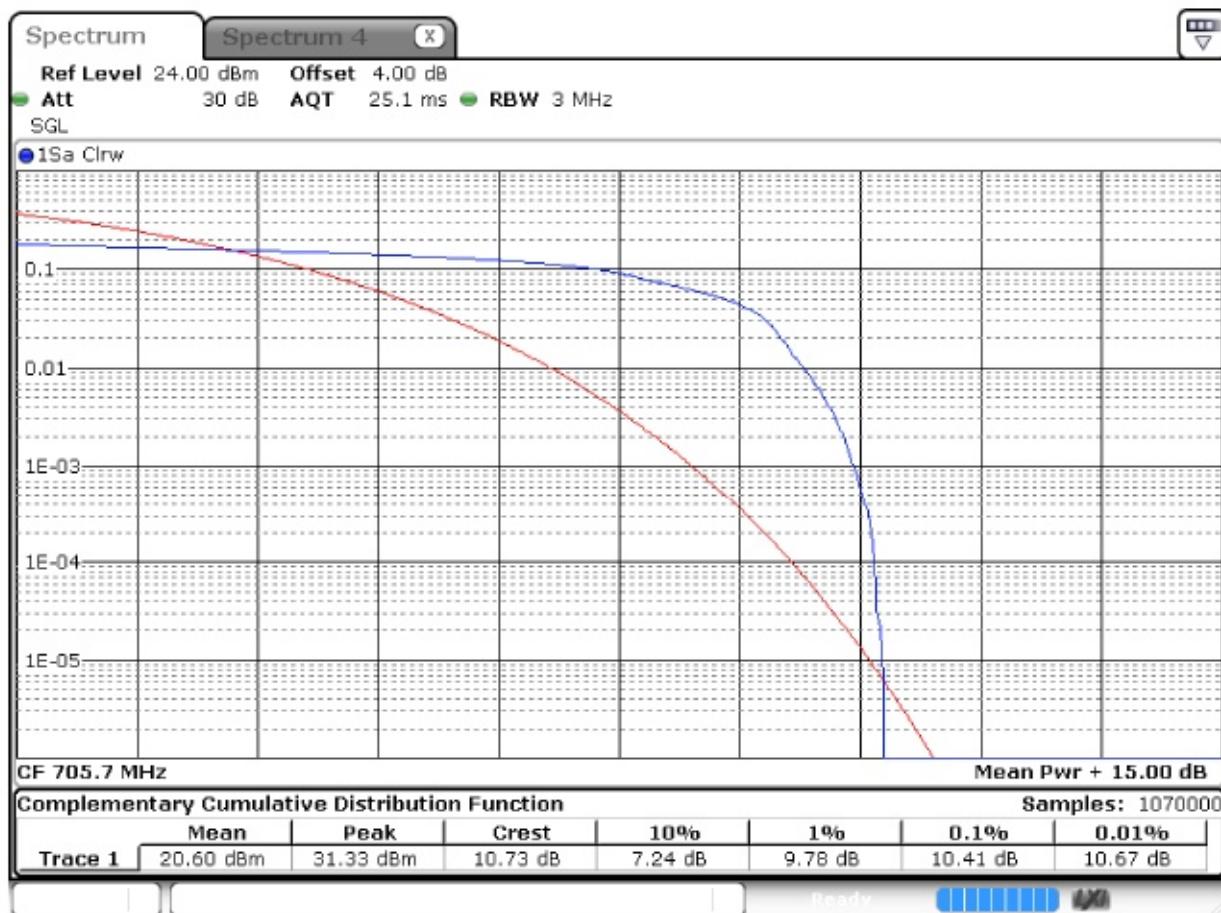
Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 6: LTE_CAT-M1_Band 12_16-QAM_Link		
Date of Test	2017/09/08	Test Site	SR10-H

699.7 MHz



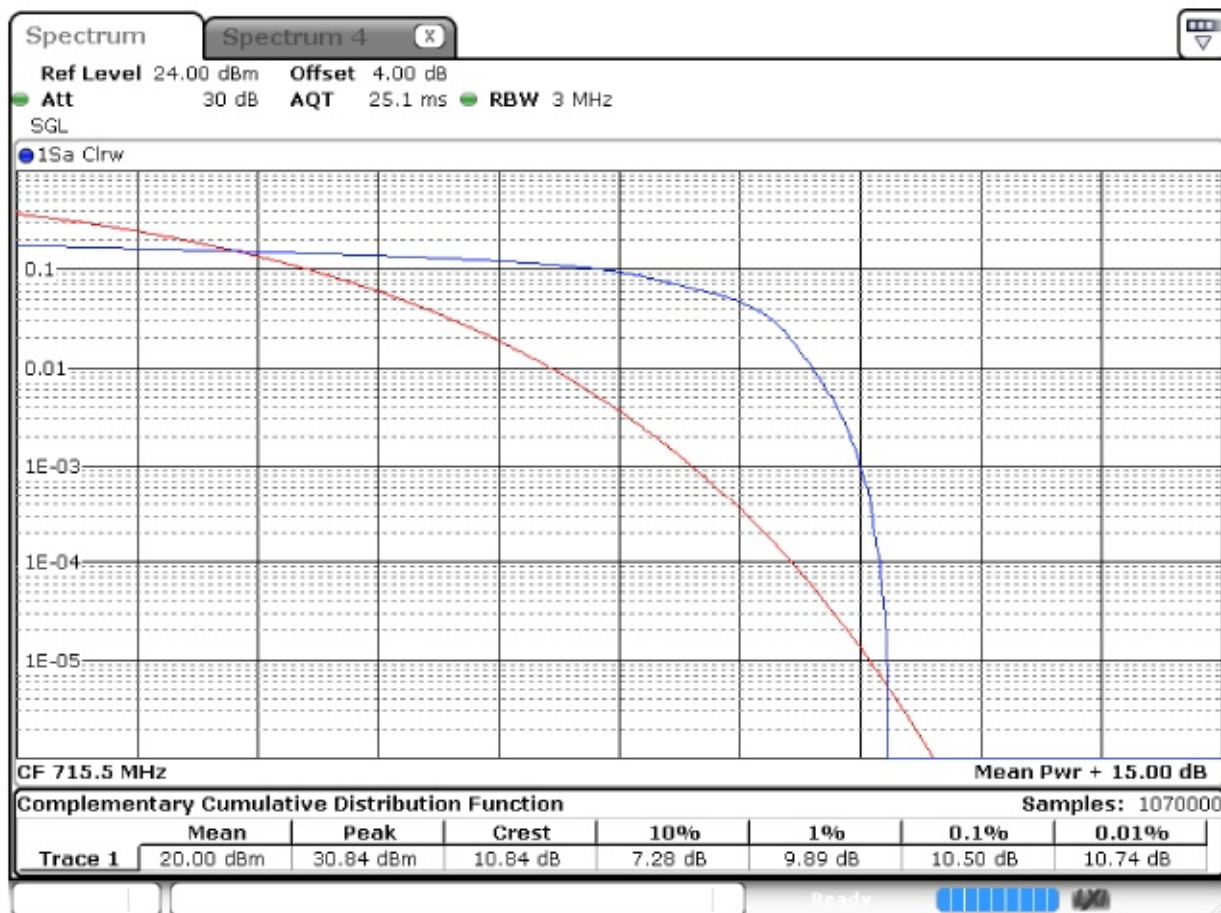
Date: 8.SEP.2017 19:53:03

705.7 MHz



Date: 8.SEP.2017 19:08:23

715.3 MHz



Date: 8.SEP.2017 19:05:53

6. Spurious Emissions

6.1. Test Equipment

Conducted Spurious Emission / SR10-H

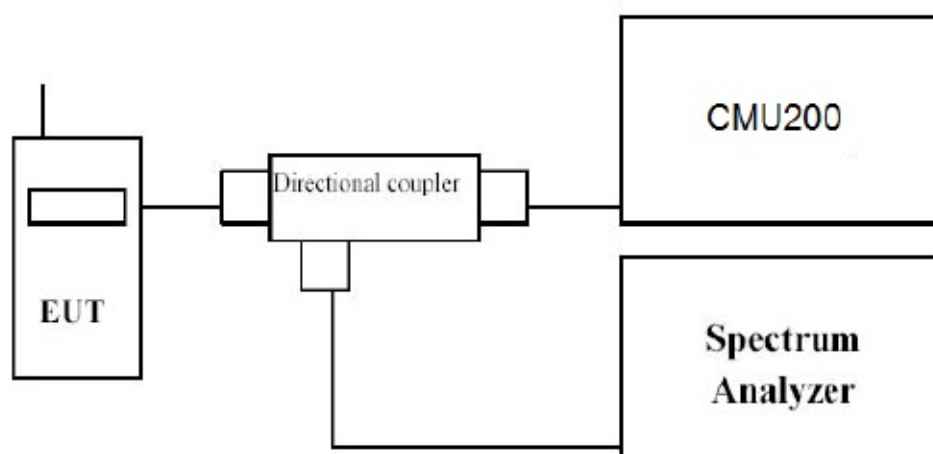
Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	R&S	FSVA40	101455	2016/11/28	2017/11/27
Wideband Radio Communication Tester	R&S	CMW500	150246	2017/04/19	2018/04/18
Directional Coupler	Agilent	778D	20402	2016/10/07	2017/10/06

Radiated Spurious Emission / CB4-H

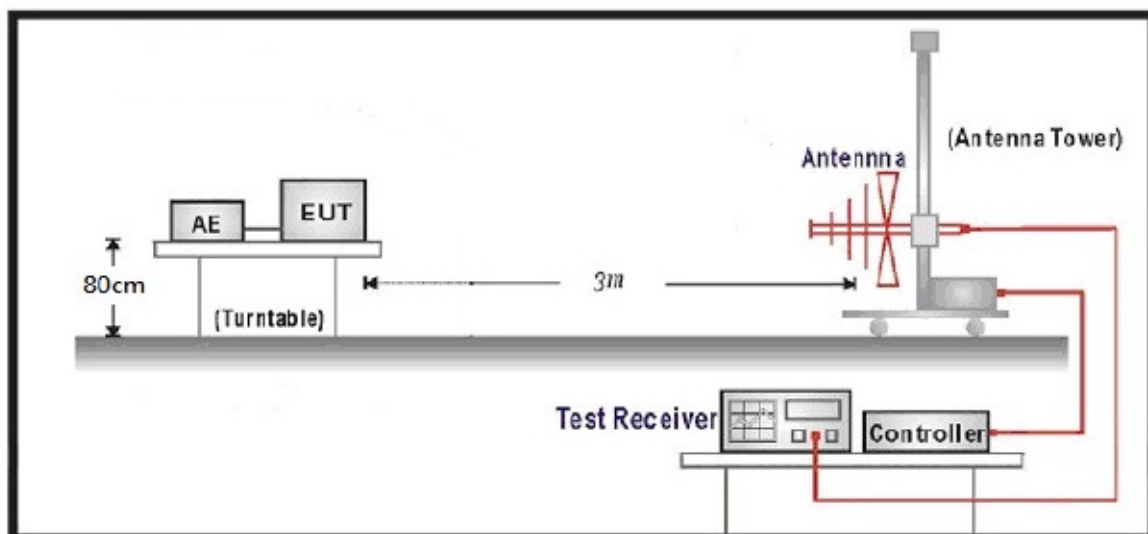
Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	R&S	FSVA40	101455	2016/11/28	2017/11/27
Signal & Spectrum Analyzer	R&S	FSV40	101049	2017/01/23	2018/01/22
EXA Spectrum Analyzer	Keysight	N9010A	MY51440132	2017/03/13	2018/03/12
Bilog Antenna	Teseq	CBL6112D	23191	2017/06/28	2018/06/27
Horn Antenna	Schwarzbeck	BBHA 9120D	639	2017/06/14	2018/06/13
Horn Antenna	Schwarzbeck	BBHA 9170	202	2017/02/15	2018/02/14
Pre-Amplifier	RF Bay Inc.	LNA-1330	12162511	2017/03/09	2018/03/08
Pre-Amplifier	EMCI	EMCI 1830I	980366	2017/01/23	2018/01/22
Pre-Amplifier	MITEQ	JS44-45-8P	2014754	2016/12/26	2017/12/25

6.2. Test Setup

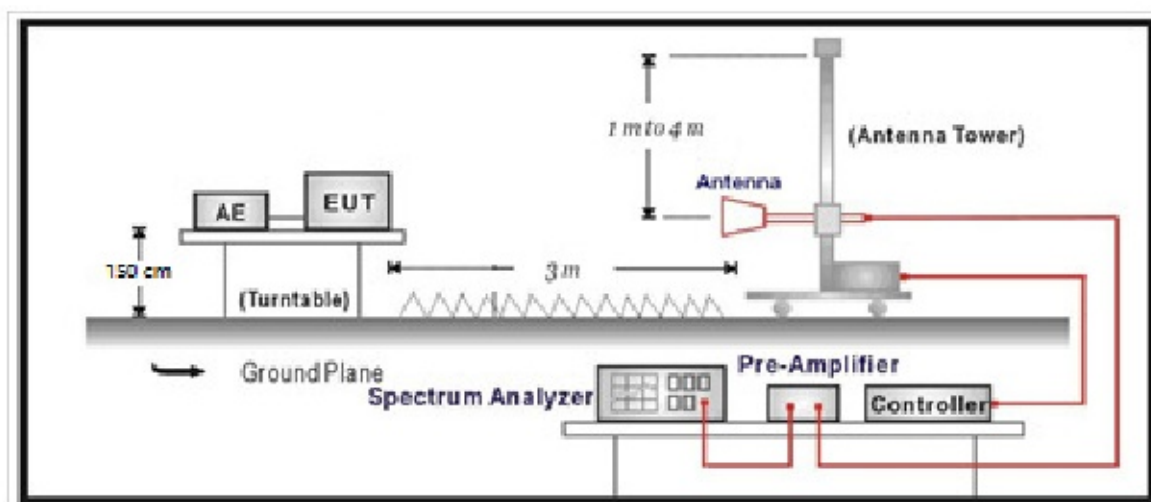
Conducted Spurious Measurement: below 1GHz



Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



6.3. Test Procedure

Conducted Spurious Measurement:

- a) Place the EUT on a bench and set it in transmitting mode.
- b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- c) EUT Communicate with CMW500, then select a channel for testing.
- d) Add a correction factor to the display of spectrum, and then test.
- e) The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

Radiated Spurious Measurement:

- a) The EUT was placed on a rotatable wooden table with 1.5 meter above ground.
- b) The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
- c) The table was rotated 360 degrees to determine the position of the highest spurious emission.
- d) 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.
- e) Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 1MHz, Sweep 500ms, Taking the record of maximum spurious emission.
- f) A horn antenna was substituted in place of the EUT and was driven by a signal generator.
- g) Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- h) Taking the record of output power at antenna port
- i) Repeat step 7 to step 8 for another polarization.
- j) $EIRP = SG - \text{Cable loss} + \text{Antenna Gain}$

6.4. Test Method

Conducted Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause6.1
ANSI C63.26-2015 Sub-clause 5.7

Radiated Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause5.8
ANSI C63.26-2015 Sub-clause 5.5.3.2

6.5. Uncertainty

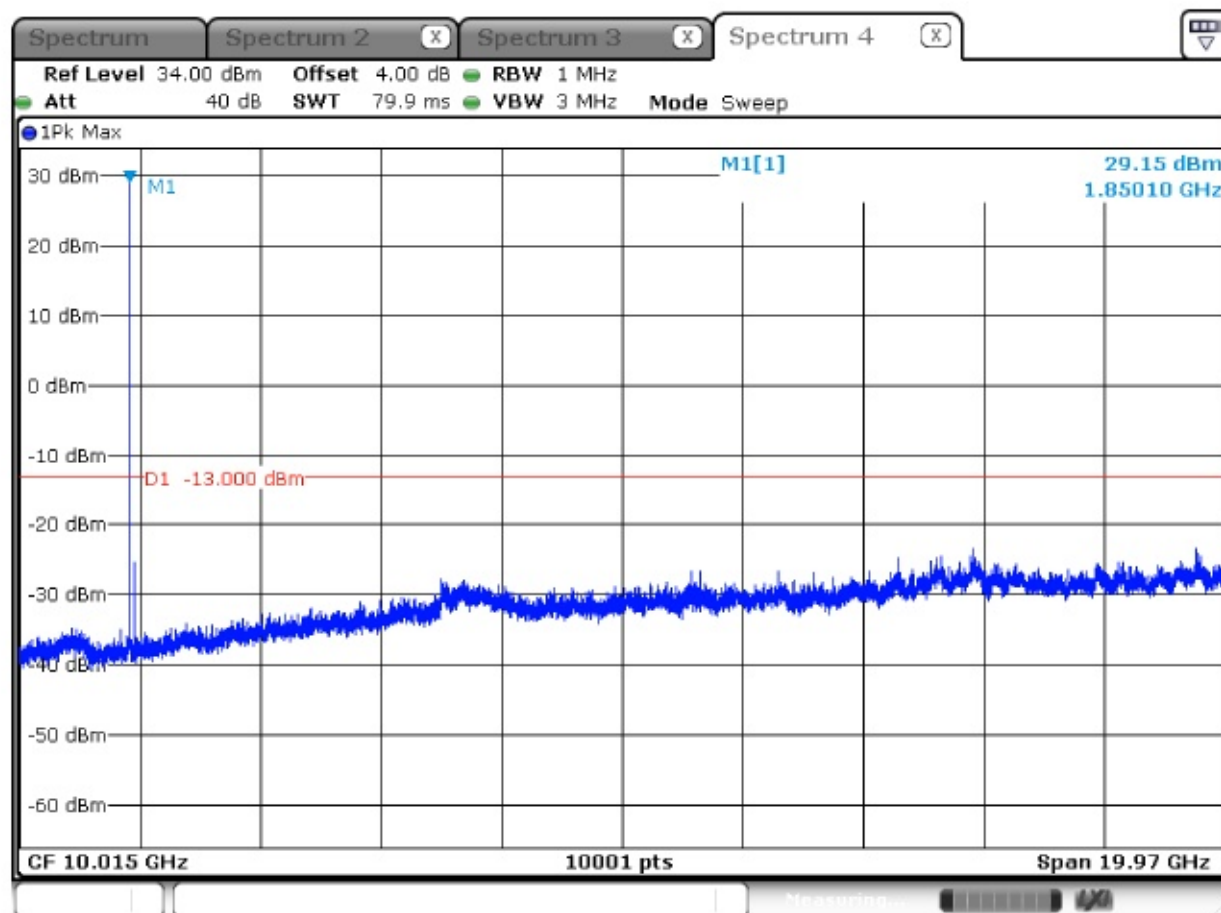
The measurement uncertainty is defined as ± 1.27 dB for Conducted Measurement.

The measurement uncertainty is defined as ± 3.2 dB for Radiated Measurement.

6.6. Test Result

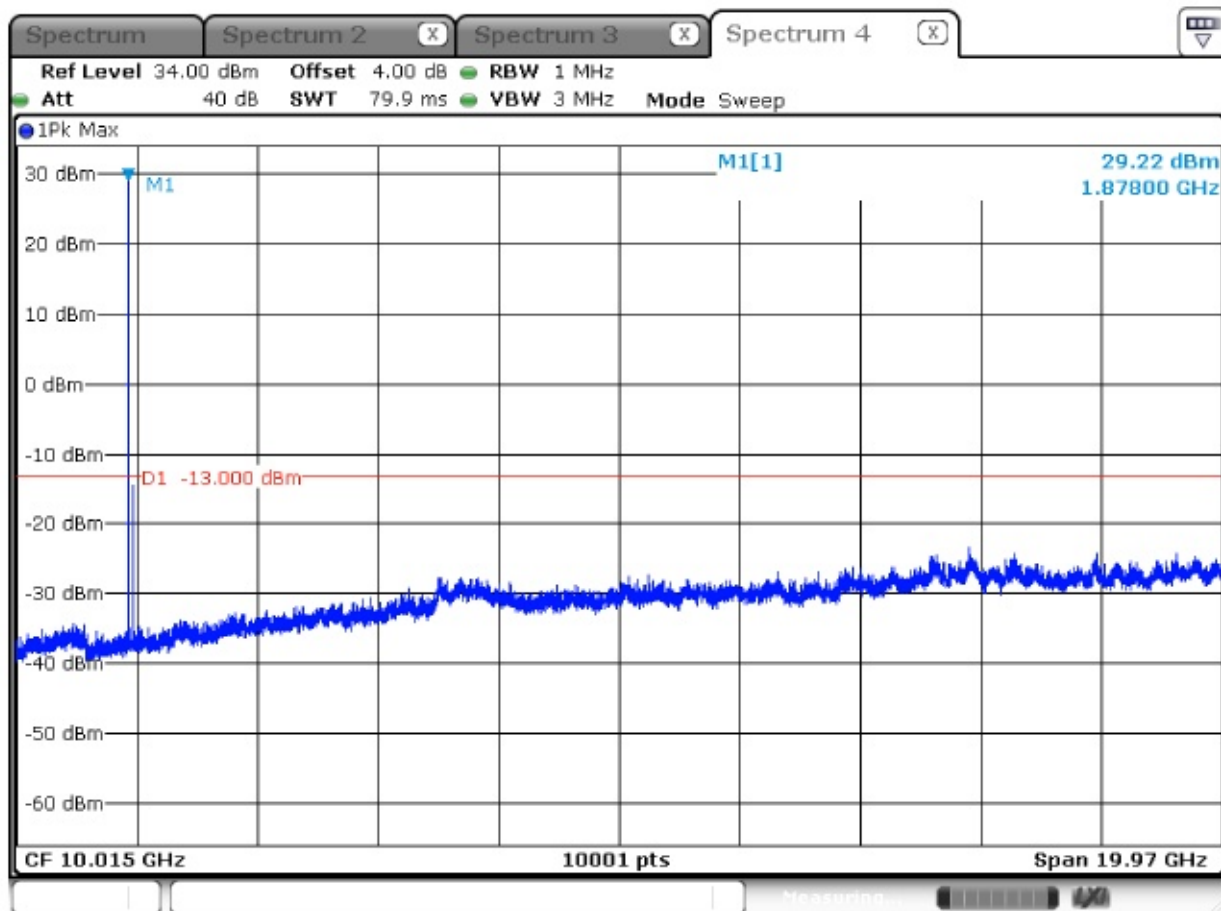
Product	Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: LTE_CAT-M1_Band 2_QPSK_Link		
Date of Test	2017/09/08	Test Site	SR10-H

1850.7 MHz



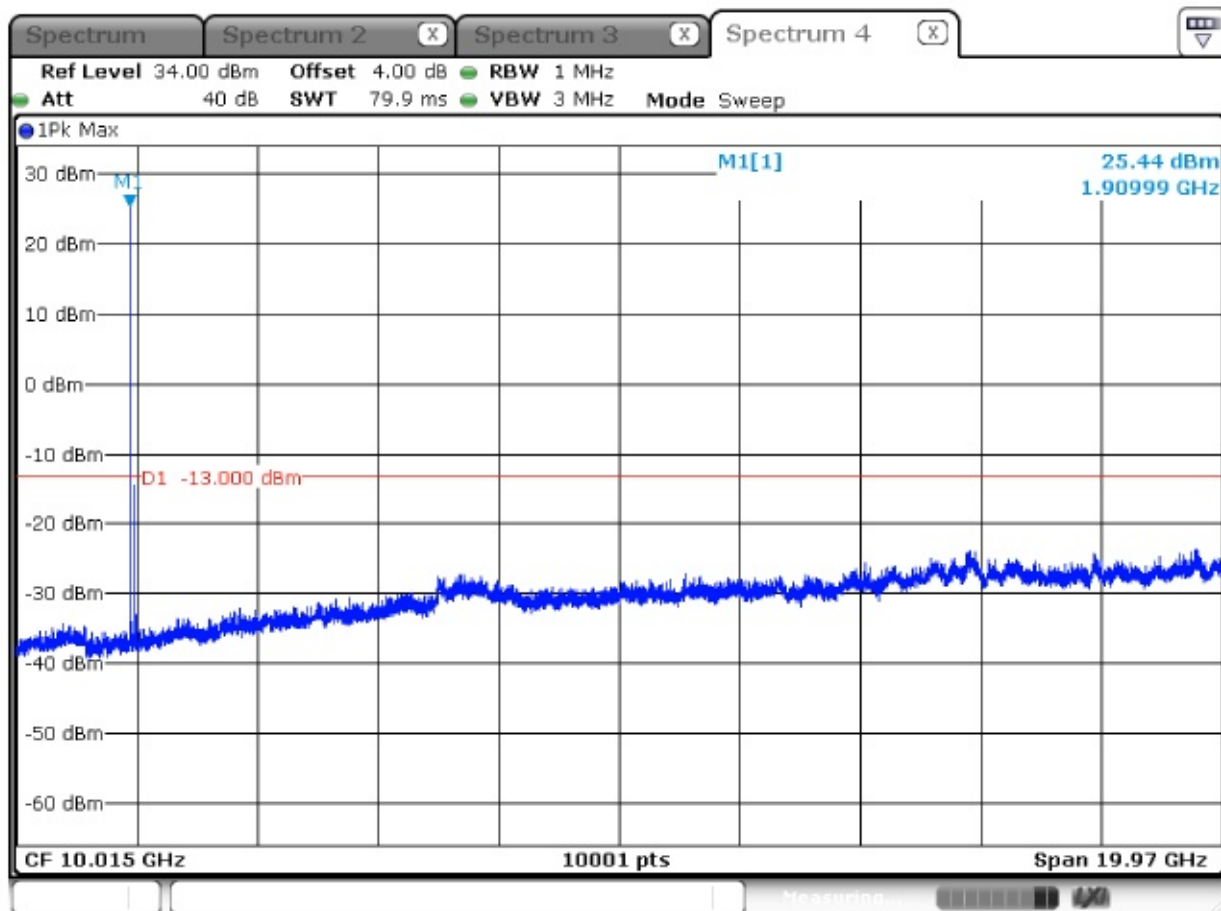
Date: 8.SEP.2017 14:50:59

1878.3 MHz



Date: 8.SEP.2017 15:06:40

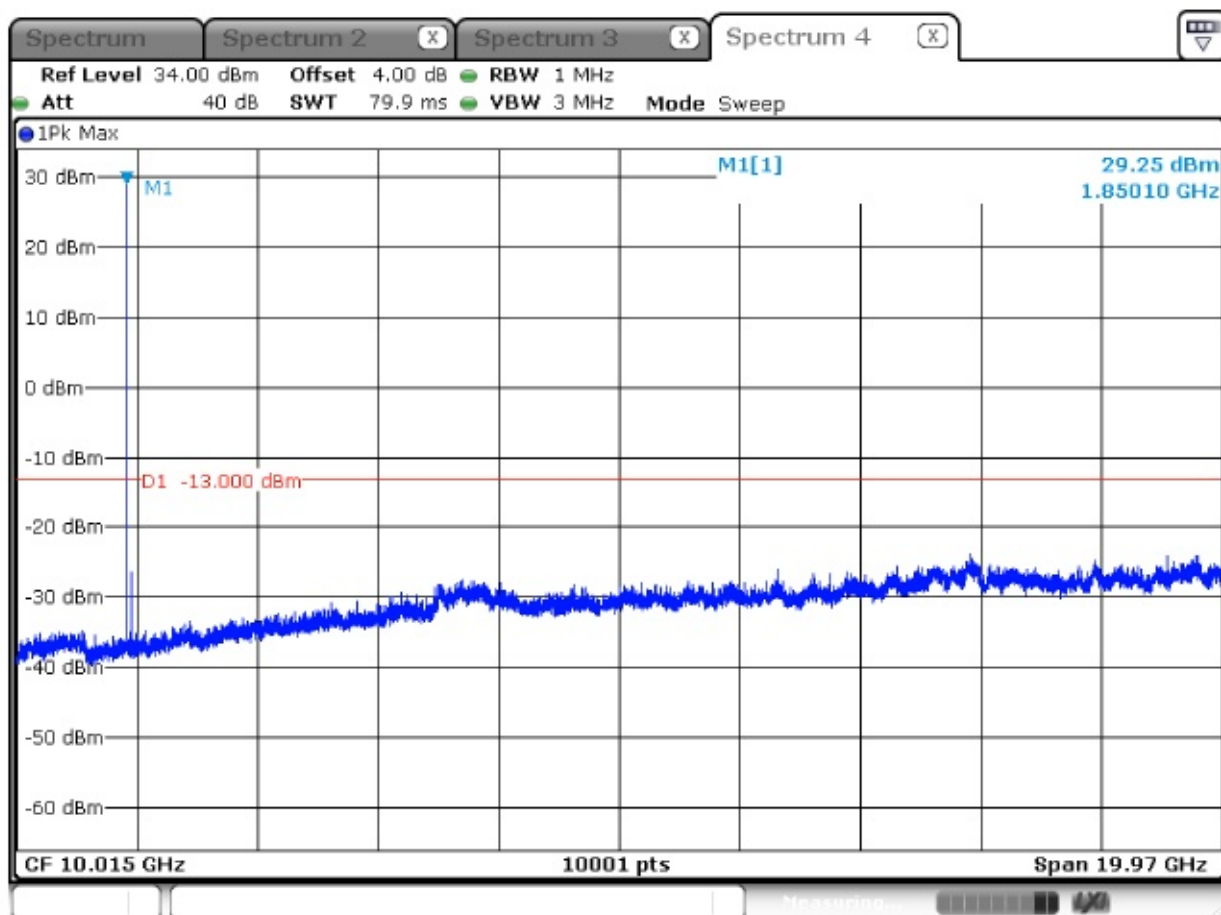
1909.3MHz



Date: 8.SEP.2017 15:20:21

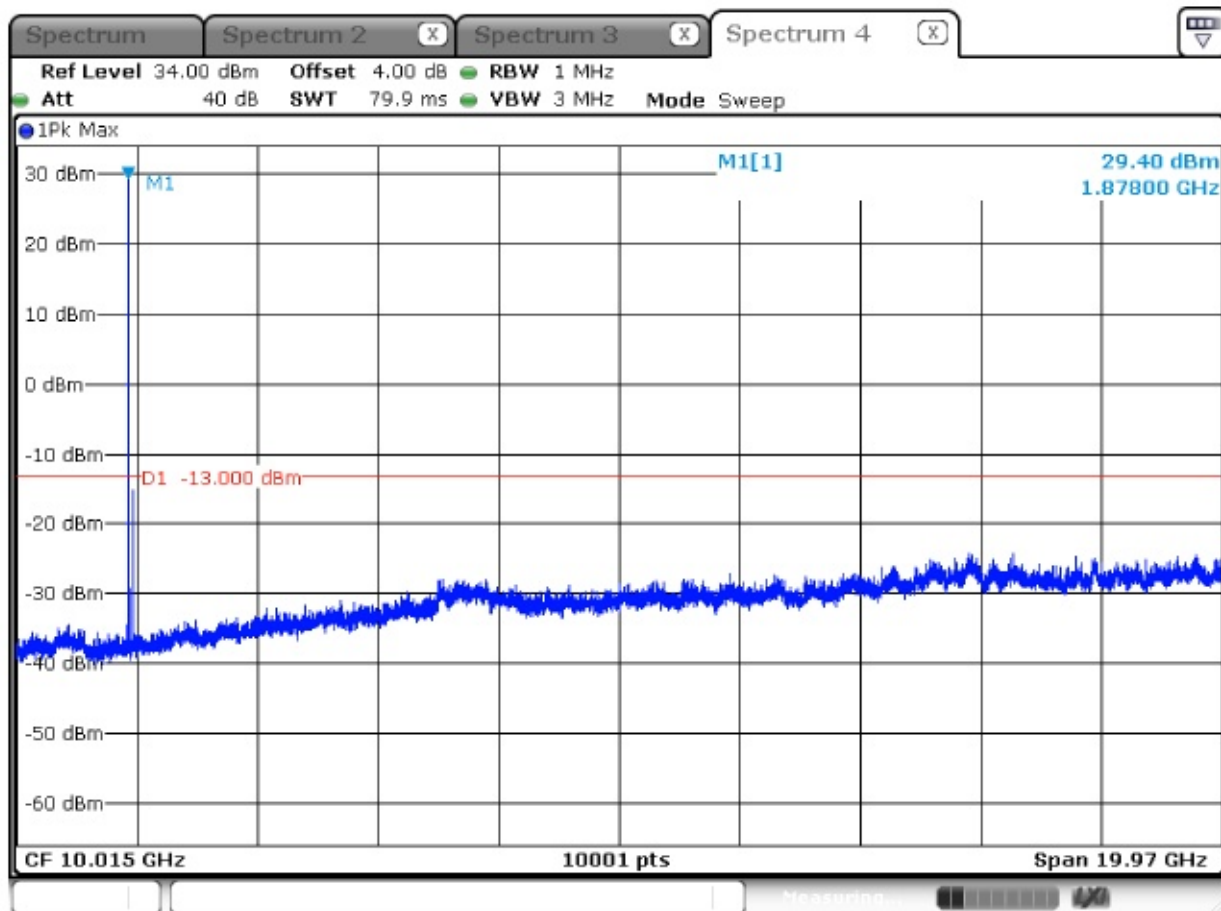
Product	Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 2: LTE_CAT-M1_Band 2_16-QAM_Link		
Date of Test	2017/09/08	Test Site	SR10-H

1850.7 MHz



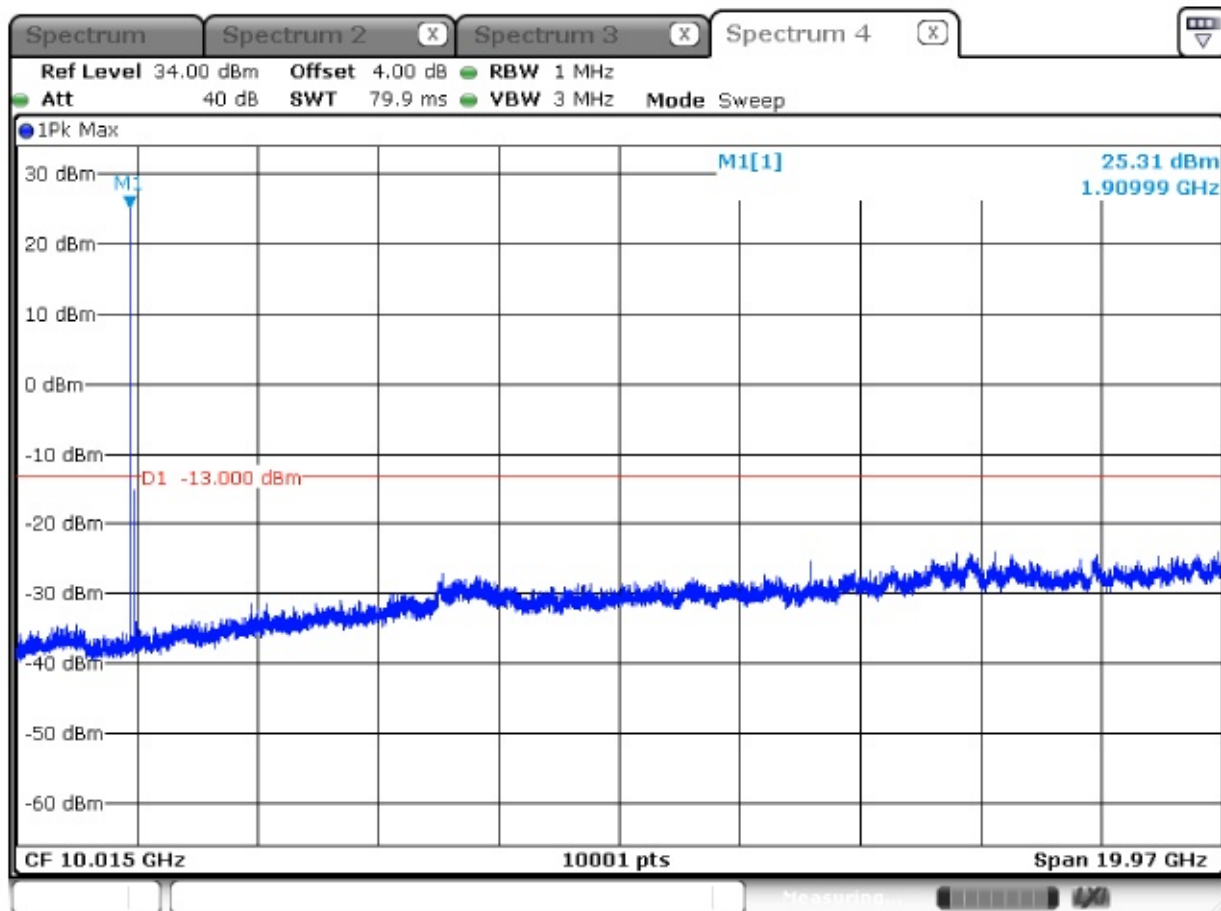
Date: 8.SEP.2017 14:51:38

1878.3 MHz



Date: 8.SEP.2017 15:07:15

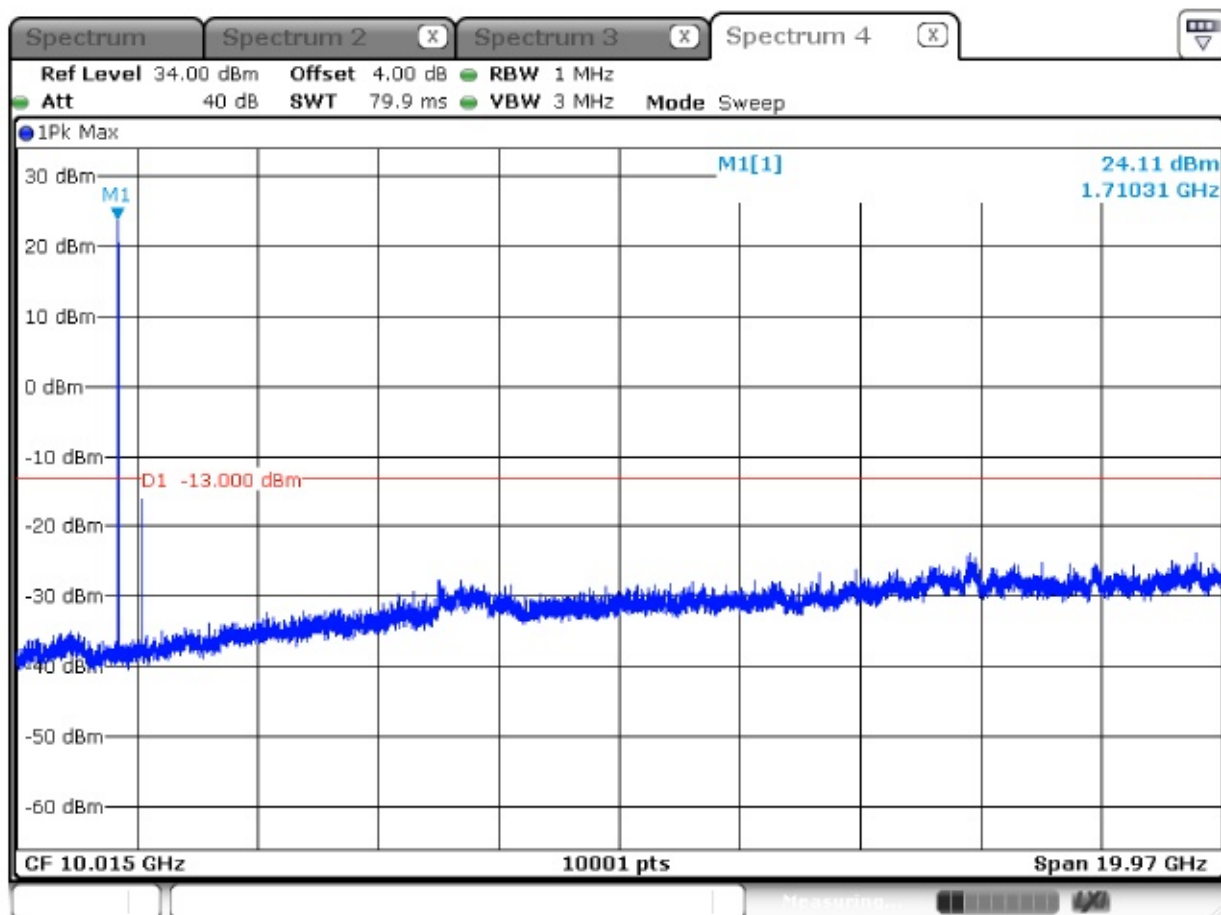
1909.3MHz



Date: 8.SEP.2017 15:21:03

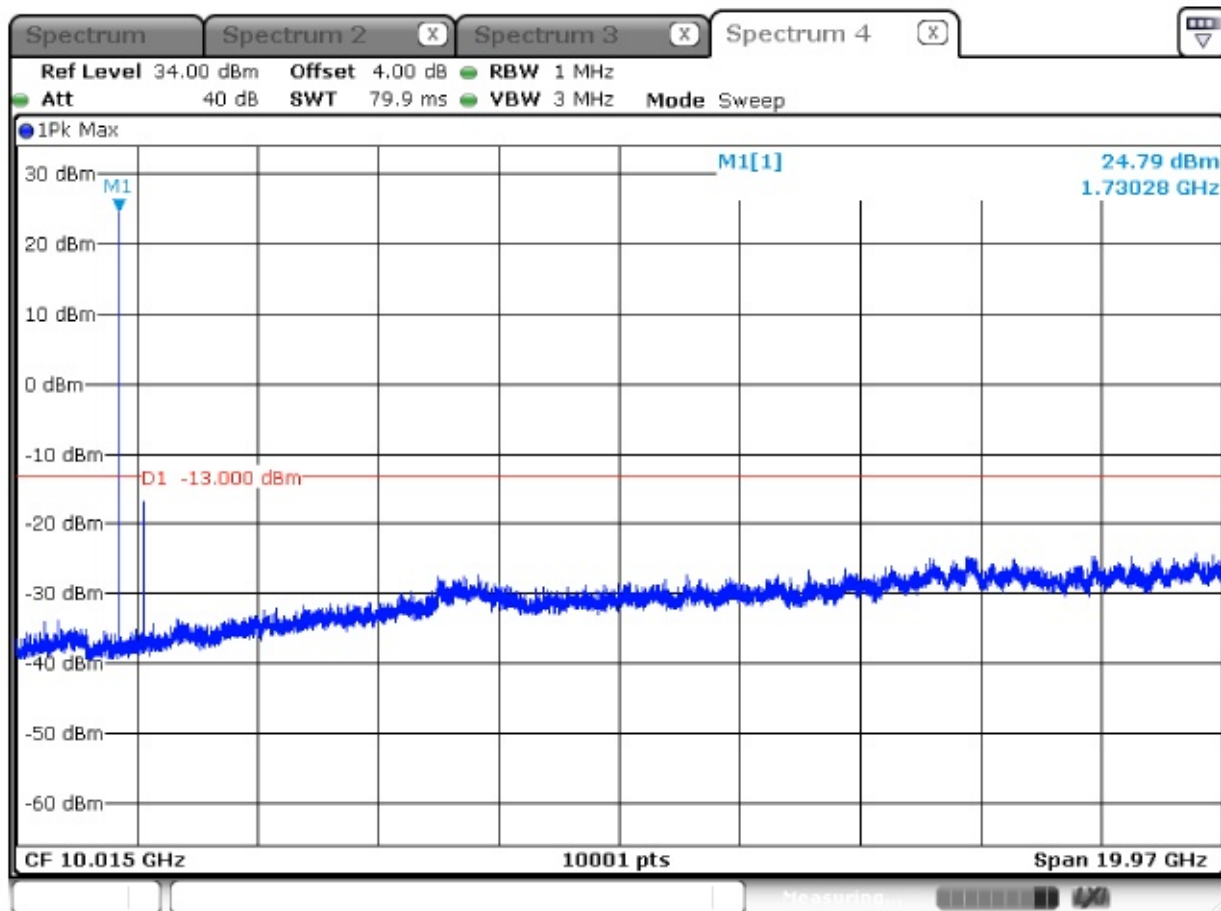
Product	Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 3: LTE_CAT-M1_Band 4_QPSK_Link		
Date of Test	2017/09/08	Test Site	SR10-H

1710.7 MHz



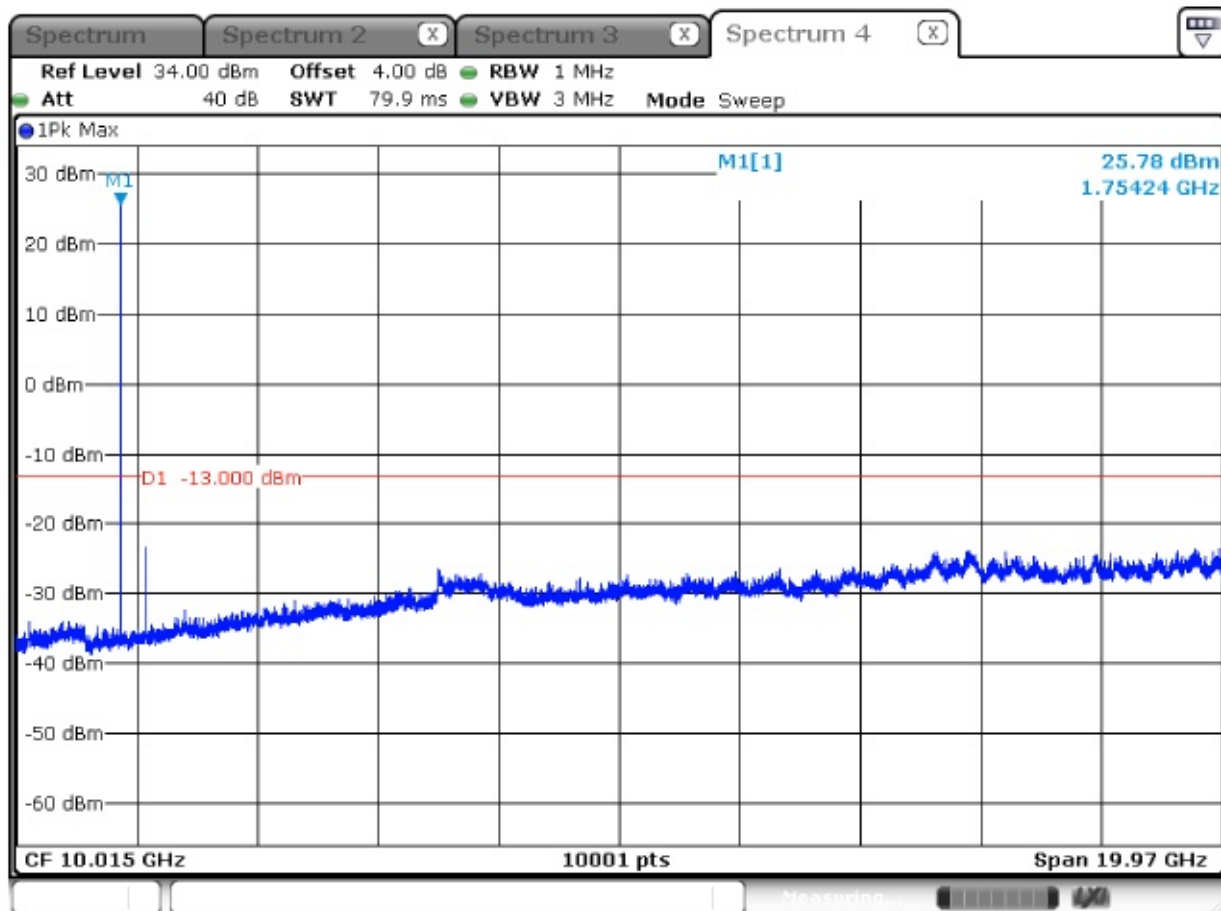
Date: 8.SEP.2017 15:35:54

1730.8 MHz



Date: 8.SEP.2017 15:45:10

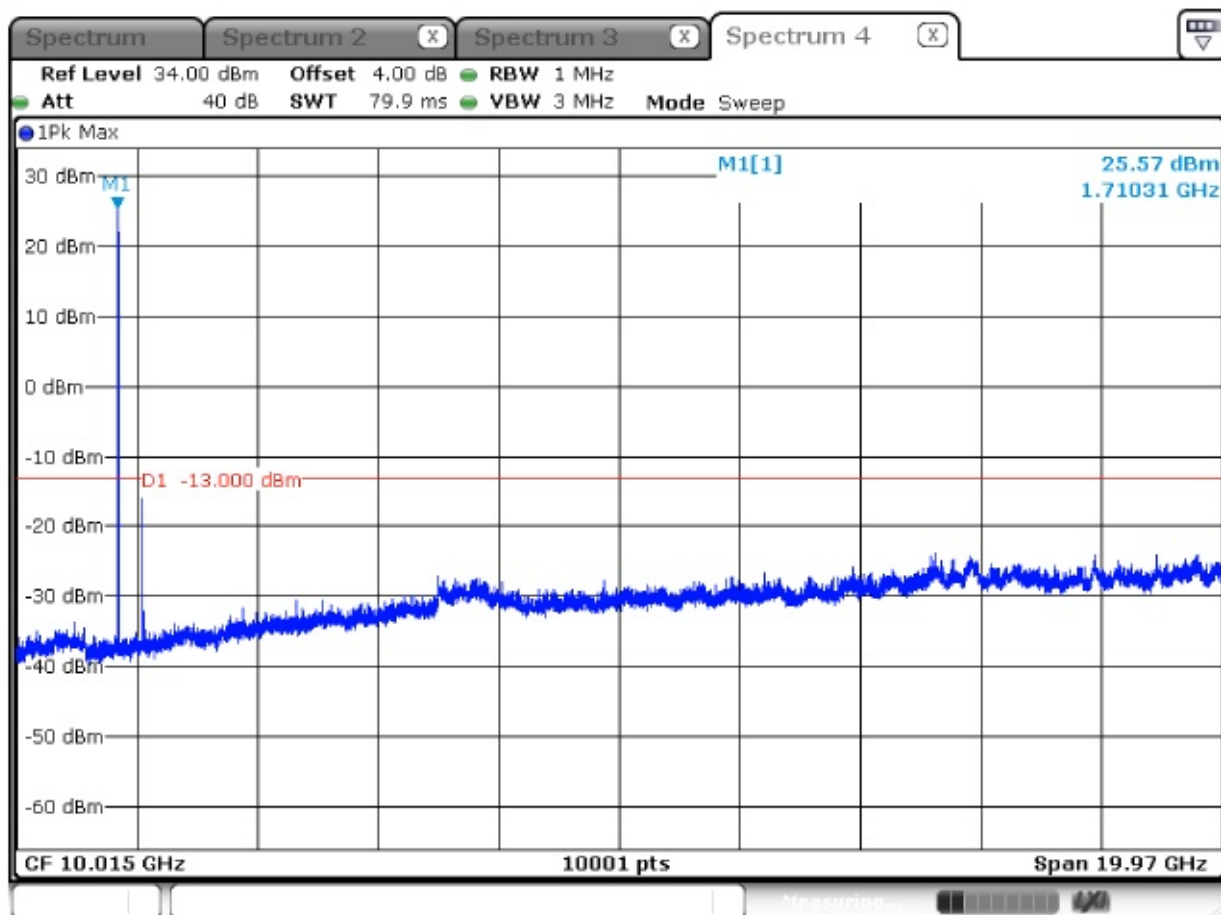
1754.3 MHz



Date: 8.SEP.2017 16:12:37

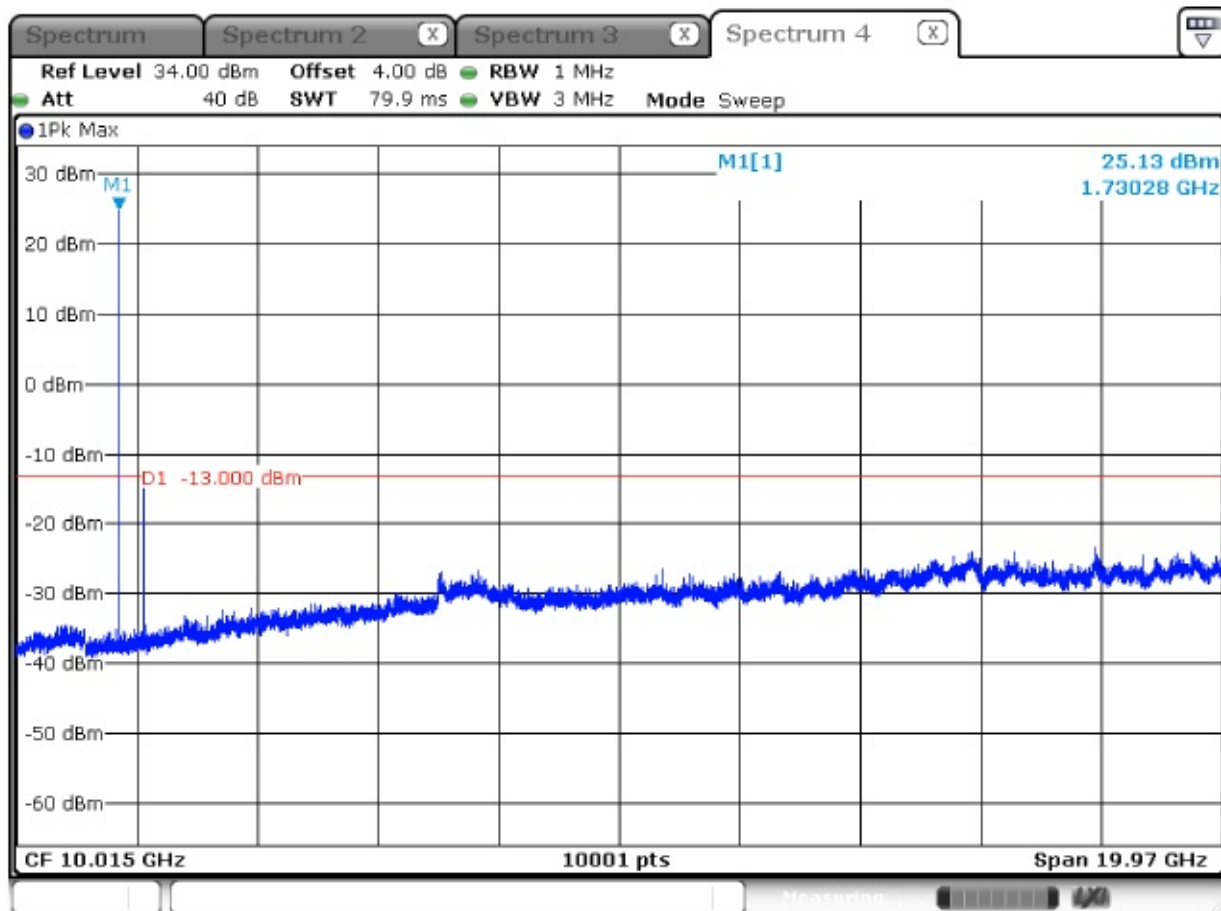
Product	Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 4: LTE_CAT-M1_Band 4_16-QAM_Link		
Date of Test	2017/09/08	Test Site	SR10-H

1710.7 MHz



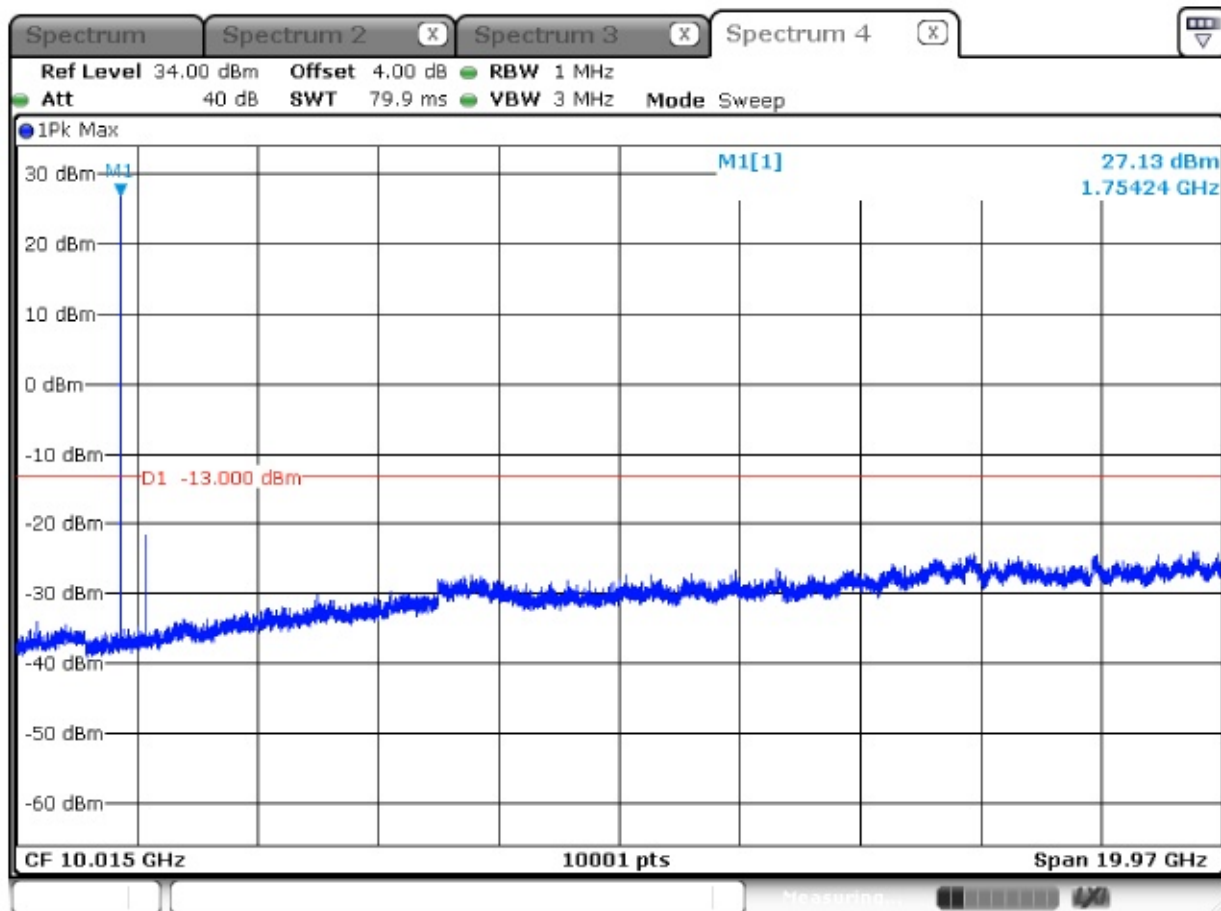
Date: 8.SEP.2017 15:36:47

1730.8 MHz



Date: 8.SEP.2017 15:44:32

1754.3 MHz



Date: 8.SEP.2017 16:13:41