



RF TEST REPORT

Applicant Shanghai Smawave Technology Co. ,Ltd
FCC ID 2AU8HMGL6201A
Product LTE Module
Brand Smawave
Model MGL6201A
Report No. R2001A0002-R2V1
Issue Date February 20, 2020

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2019)/ FCC CFR 47 Part 24E (2019)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Approved by: Kai Xu

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Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF power output and Effective Radiated Power	2.1046 24.232(c)	PASS
2	Occupied Bandwidth	2.1049	PASS
3	Band Edge Compliance	2.1051 /24.238(a)	PASS
4	Peak-to-Average Power Ratio	24.232/KDB 971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 24.235	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 24.238(a)	PASS
7	Radiates Spurious Emission	2.1053 / 24.238(a)	PASS
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard.			
Date of Testing: October 1, 2019~ November 7, 2019 and December 31, 2019			



1. Test Laboratory

1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Xu Kai
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Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Shanghai Smawave Technology Co. ,Ltd
Applicant address	3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China
Manufacturer	Shanghai Smawave Technology Co. ,Ltd
Manufacturer address	3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China

2.2. General information

EUT Description			
Model	MGL6201A		
IMEI	860524031979550		
Hardware Version	V2.0		
Software Version	CAT12-A		
Power Supply	External Power Supply		
Antenna Type	External Antenna		
Antenna Gain	2.15dBi		
Test Mode(s)	LTE Band 2/25;		
Test Modulation	(LTE)QPSK, 16QAM, 64QAM;		
LTE Category	12		
Maximum E.I.R.P	LTE Band 2:	24.74dBm	
	LTE Band 25:	25.92dBm	
Rated Power Supply Voltage	3.3V		
Extreme Voltage	Minimum: 3V Maximum: 3.6V		
Extreme Temperature	Lowest: -40°C Highest: +70°C		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	LTE Band 2	1850 ~ 1910	1930 ~ 1990
	LTE Band 25	1850 ~ 1915	1930 ~ 1995
Note: 1. The information of the EUT is declared by the manufacturer.			



3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC CFR 47 Part 24E (2019)

ANSI C63.26 (2015)

Reference standard:

FCC CFR47 Part 2 (2019)

KDB 971168 D01 Power Meas License Digital Systems v03r01

4. Test Configuration

The main board of the product (product name: SGL4010) is the same as the module(module name:MGL6201A), including the PCB layout and the BOM list , without any change.

The conducted test results will reference to SGL4010 (report No.: R1909A0578-R2).

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (X axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated.

Subsequently, only the worst case emissions are reported.

The following testing in LTE is set based on the maximum RF Output Power.

Test modes are chosen to be reported as the worst case configuration below for LTE Band 2/25:

Test items	Bandwidth (MHz)						Modulation			RB			Test Channel		
	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	50%	100%	L	M	H
RF power output	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Effective Isotropic Radiated power	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Occupied Bandwidth	O	O	O	O	O	O	O	O	O	-	-	O	O	O	O
Band Edge Compliance	O	O	O	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	O	O	O	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	O	O	O	O	O	O	O	O	O	O	O	O	-	O	-
Conducted Spurious Emissions	O	O	O	O	O	O	O	-	-	O	-	-	-	O	-
Radiates Spurious Emission	O	-	O	-	-	O	O	-	-	O	-	-	-	O	-
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.														

5. Test Case Results

5.1.RF Power Output and Effective Radiated Power

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

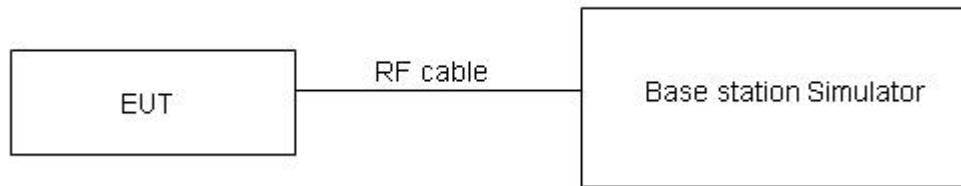
During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).

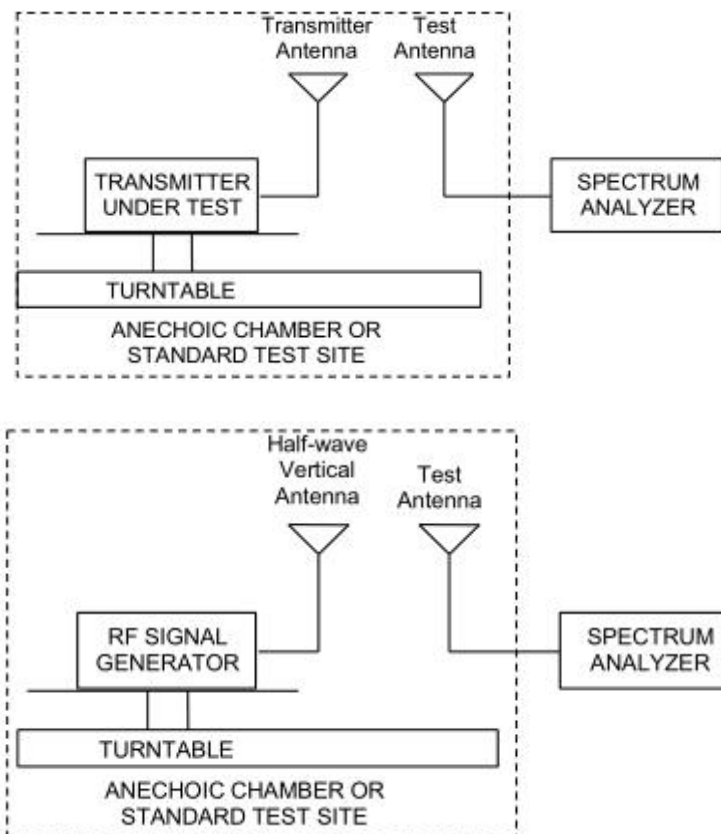
- Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
- Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).
- Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
- Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading. $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$
- Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation: $ERP \text{ (dBm)} = LVL \text{ (dBm)} + LOSS \text{ (dB)}$
- The maximum ERP is the maximum value determined in the preceding step.
- When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g.transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:
 $EIRP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$
where:dBd refers to gain relative to an ideal dipole.
 $EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$

The RB allocation refers to section 5.1, using the maximum output power configuration.

Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.



Limits

No specific RF power output requirements in part 2.1046.

Rule Part 24.232(c) Mobile and portable stations are limited to 2 watts EIRP.

Rule Part 24.232(e) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

Limit	$\leq 2 \text{ W}$ (33 dBm)
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4 \text{ dB}$ for RF power output, $k = 2$, $U = 1.19 \text{ dB}$ for EIRP.

**Test Results**

BAND	Bandwidth	Modulation	Channel	RB Configuration	Conducted Power(dBm)	EIRP(dBm)
Band2	1.4M	QPSK	18607	1RB#0	22.37	24.52
Band2	1.4M	QPSK	18607	1RB#2	20.13	22.28
Band2	1.4M	QPSK	18607	1RB#5	20.87	23.02
Band2	1.4M	QPSK	18607	3RB#0	20.70	22.85
Band2	1.4M	QPSK	18607	3RB#2	20.60	22.75
Band2	1.4M	QPSK	18607	3RB#3	20.05	22.20
Band2	1.4M	QPSK	18607	6RB#0	20.38	22.53
Band2	1.4M	QPSK	18900	1RB#0	21.36	23.51
Band2	1.4M	QPSK	18900	1RB#2	21.17	23.32
Band2	1.4M	QPSK	18900	1RB#5	20.90	23.05
Band2	1.4M	QPSK	18900	3RB#0	21.02	23.17
Band2	1.4M	QPSK	18900	3RB#2	20.99	23.14
Band2	1.4M	QPSK	18900	3RB#3	20.96	23.11
Band2	1.4M	QPSK	18900	6RB#0	21.10	23.25
Band2	1.4M	QPSK	19193	1RB#0	20.18	22.33
Band2	1.4M	QPSK	19193	1RB#2	19.43	21.58
Band2	1.4M	QPSK	19193	1RB#5	21.24	23.39
Band2	1.4M	QPSK	19193	3RB#0	19.18	21.33
Band2	1.4M	QPSK	19193	3RB#2	19.16	21.31
Band2	1.4M	QPSK	19193	3RB#3	20.55	22.70
Band2	1.4M	QPSK	19193	6RB#0	20.01	22.16
Band2	1.4M	16QAM	18607	1RB#0	22.54	24.69
Band2	1.4M	16QAM	18607	1RB#2	20.32	22.47
Band2	1.4M	16QAM	18607	1RB#5	21.11	23.26
Band2	1.4M	16QAM	18607	3RB#0	20.77	22.92
Band2	1.4M	16QAM	18607	3RB#2	20.75	22.90
Band2	1.4M	16QAM	18607	3RB#3	20.11	22.26
Band2	1.4M	16QAM	18607	6RB#0	20.34	22.49
Band2	1.4M	16QAM	18900	1RB#0	21.54	23.69
Band2	1.4M	16QAM	18900	1RB#2	21.49	23.64
Band2	1.4M	16QAM	18900	1RB#5	21.19	23.34
Band2	1.4M	16QAM	18900	3RB#0	20.99	23.14
Band2	1.4M	16QAM	18900	3RB#2	20.97	23.12
Band2	1.4M	16QAM	18900	3RB#3	21.03	23.18
Band2	1.4M	16QAM	18900	6RB#0	21.18	23.33
Band2	1.4M	16QAM	19193	1RB#0	20.78	22.93
Band2	1.4M	16QAM	19193	1RB#2	20.02	22.17



Band2	1.4M	16QAM	19193	1RB#5	21.80	23.95
Band2	1.4M	16QAM	19193	3RB#0	19.20	21.35
Band2	1.4M	16QAM	19193	3RB#2	19.18	21.33
Band2	1.4M	16QAM	19193	3RB#3	20.59	22.74
Band2	1.4M	16QAM	19193	6RB#0	20.05	22.20
Band2	1.4M	64QAM	18607	1RB#0	21.74	23.89
Band2	1.4M	64QAM	18607	1RB#2	21.81	23.96
Band2	1.4M	64QAM	18607	1RB#5	21.68	23.83
Band2	1.4M	64QAM	18607	3RB#0	21.81	23.96
Band2	1.4M	64QAM	18607	3RB#2	21.81	23.96
Band2	1.4M	64QAM	18607	3RB#3	21.79	23.94
Band2	1.4M	64QAM	18607	6RB#0	21.65	23.80
Band2	1.4M	64QAM	18900	1RB#0	21.11	23.26
Band2	1.4M	64QAM	18900	1RB#2	21.23	23.38
Band2	1.4M	64QAM	18900	1RB#5	21.07	23.22
Band2	1.4M	64QAM	18900	3RB#0	20.94	23.09
Band2	1.4M	64QAM	18900	3RB#2	20.95	23.10
Band2	1.4M	64QAM	18900	3RB#3	20.93	23.08
Band2	1.4M	64QAM	18900	6RB#0	20.93	23.08
Band2	1.4M	64QAM	19193	1RB#0	20.62	22.77
Band2	1.4M	64QAM	19193	1RB#2	20.84	22.99
Band2	1.4M	64QAM	19193	1RB#5	20.71	22.86
Band2	1.4M	64QAM	19193	3RB#0	20.58	22.73
Band2	1.4M	64QAM	19193	3RB#2	20.61	22.76
Band2	1.4M	64QAM	19193	3RB#3	20.83	22.98
Band2	1.4M	64QAM	19193	6RB#0	20.99	23.14
Band2	3M	QPSK	18615	1RB#0	22.39	24.54
Band2	3M	QPSK	18615	1RB#7	20.16	22.31
Band2	3M	QPSK	18615	1RB#14	20.90	23.05
Band2	3M	QPSK	18615	8RB#0	20.78	22.93
Band2	3M	QPSK	18615	8RB#4	20.70	22.85
Band2	3M	QPSK	18615	8RB#7	20.13	22.28
Band2	3M	QPSK	18615	15RB#0	20.41	22.56
Band2	3M	QPSK	18900	1RB#0	21.40	23.55
Band2	3M	QPSK	18900	1RB#7	21.22	23.37
Band2	3M	QPSK	18900	1RB#14	20.95	23.10
Band2	3M	QPSK	18900	8RB#0	21.12	23.27
Band2	3M	QPSK	18900	8RB#4	21.07	23.22
Band2	3M	QPSK	18900	8RB#7	21.05	23.20
Band2	3M	QPSK	18900	15RB#0	21.14	23.29
Band2	3M	QPSK	19185	1RB#0	20.21	22.36



Band2	3M	QPSK	19185	1RB#7	19.47	21.62
Band2	3M	QPSK	19185	1RB#14	21.28	23.43
Band2	3M	QPSK	19185	8RB#0	19.29	21.44
Band2	3M	QPSK	19185	8RB#4	19.26	21.41
Band2	3M	QPSK	19185	8RB#7	20.63	22.78
Band2	3M	QPSK	19185	15RB#0	20.04	22.19
Band2	3M	16QAM	18615	1RB#0	22.57	24.72
Band2	3M	16QAM	18615	1RB#7	20.35	22.50
Band2	3M	16QAM	18615	1RB#14	21.13	23.28
Band2	3M	16QAM	18615	8RB#0	20.86	23.01
Band2	3M	16QAM	18615	8RB#4	20.84	22.99
Band2	3M	16QAM	18615	8RB#7	20.19	22.34
Band2	3M	16QAM	18615	15RB#0	20.37	22.52
Band2	3M	16QAM	18900	1RB#0	21.56	23.71
Band2	3M	16QAM	18900	1RB#7	21.54	23.69
Band2	3M	16QAM	18900	1RB#14	21.23	23.38
Band2	3M	16QAM	18900	8RB#0	21.10	23.25
Band2	3M	16QAM	18900	8RB#4	21.08	23.23
Band2	3M	16QAM	18900	8RB#7	21.13	23.28
Band2	3M	16QAM	18900	15RB#0	21.22	23.37
Band2	3M	16QAM	19185	1RB#0	20.81	22.96
Band2	3M	16QAM	19185	1RB#7	20.06	22.21
Band2	3M	16QAM	19185	1RB#14	21.83	23.98
Band2	3M	16QAM	19185	8RB#0	19.30	21.45
Band2	3M	16QAM	19185	8RB#4	19.28	21.43
Band2	3M	16QAM	19185	8RB#7	20.70	22.85
Band2	3M	16QAM	19185	15RB#0	20.08	22.23
Band2	3M	64QAM	18615	1RB#0	21.93	24.08
Band2	3M	64QAM	18615	1RB#7	21.74	23.89
Band2	3M	64QAM	18615	1RB#14	21.27	23.42
Band2	3M	64QAM	18615	8RB#0	22.04	24.19
Band2	3M	64QAM	18615	8RB#4	22.03	24.18
Band2	3M	64QAM	18615	8RB#7	21.34	23.49
Band2	3M	64QAM	18615	15RB#0	21.36	23.51
Band2	3M	64QAM	18900	1RB#0	21.08	23.23
Band2	3M	64QAM	18900	1RB#7	21.05	23.20
Band2	3M	64QAM	18900	1RB#14	21.07	23.22
Band2	3M	64QAM	18900	8RB#0	21.37	23.52
Band2	3M	64QAM	18900	8RB#4	21.38	23.53
Band2	3M	64QAM	18900	8RB#7	20.86	23.01
Band2	3M	64QAM	18900	15RB#0	20.85	23.00



Band2	3M	64QAM	19185	1RB#0	20.69	22.84
Band2	3M	64QAM	19185	1RB#7	20.65	22.80
Band2	3M	64QAM	19185	1RB#14	20.79	22.94
Band2	3M	64QAM	19185	8RB#0	21.05	23.20
Band2	3M	64QAM	19185	8RB#4	21.17	23.32
Band2	3M	64QAM	19185	8RB#7	20.81	22.96
Band2	3M	64QAM	19185	15RB#0	20.92	23.07
Band2	5M	QPSK	18625	1RB#0	22.43	24.58
Band2	5M	QPSK	18625	1RB#13	20.23	22.38
Band2	5M	QPSK	18625	1RB#24	20.96	23.11
Band2	5M	QPSK	18625	12RB#0	20.85	23.00
Band2	5M	QPSK	18625	12RB#6	20.75	22.90
Band2	5M	QPSK	18625	12RB#13	20.20	22.35
Band2	5M	QPSK	18625	25RB#0	20.49	22.64
Band2	5M	QPSK	18900	1RB#0	21.52	23.67
Band2	5M	QPSK	18900	1RB#13	21.27	23.42
Band2	5M	QPSK	18900	1RB#24	21.02	23.17
Band2	5M	QPSK	18900	12RB#0	21.16	23.31
Band2	5M	QPSK	18900	12RB#6	21.12	23.27
Band2	5M	QPSK	18900	12RB#13	21.15	23.30
Band2	5M	QPSK	18900	25RB#0	21.23	23.38
Band2	5M	QPSK	19175	1RB#0	20.26	22.41
Band2	5M	QPSK	19175	1RB#13	19.54	21.69
Band2	5M	QPSK	19175	1RB#24	21.37	23.52
Band2	5M	QPSK	19175	12RB#0	19.35	21.50
Band2	5M	QPSK	19175	12RB#6	19.30	21.45
Band2	5M	QPSK	19175	12RB#13	20.63	22.78
Band2	5M	QPSK	19175	25RB#0	20.05	22.20
Band2	5M	16QAM	18625	1RB#0	22.59	24.74
Band2	5M	16QAM	18625	1RB#13	20.37	22.52
Band2	5M	16QAM	18625	1RB#24	21.15	23.30
Band2	5M	16QAM	18625	12RB#0	20.90	23.05
Band2	5M	16QAM	18625	12RB#6	20.86	23.01
Band2	5M	16QAM	18625	12RB#13	20.24	22.39
Band2	5M	16QAM	18625	25RB#0	20.40	22.55
Band2	5M	16QAM	18900	1RB#0	21.58	23.73
Band2	5M	16QAM	18900	1RB#13	21.61	23.76
Band2	5M	16QAM	18900	1RB#24	21.30	23.45
Band2	5M	16QAM	18900	12RB#0	21.14	23.29
Band2	5M	16QAM	18900	12RB#6	21.12	23.27
Band2	5M	16QAM	18900	12RB#13	21.13	23.28



Band2	5M	16QAM	18900	25RB#0	21.23	23.38
Band2	5M	16QAM	19175	1RB#0	20.85	23.00
Band2	5M	16QAM	19175	1RB#13	20.10	22.25
Band2	5M	16QAM	19175	1RB#24	21.86	24.01
Band2	5M	16QAM	19175	12RB#0	19.35	21.50
Band2	5M	16QAM	19175	12RB#6	19.33	21.48
Band2	5M	16QAM	19175	12RB#13	20.73	22.88
Band2	5M	16QAM	19175	25RB#0	20.09	22.24
Band2	5M	64QAM	18625	1RB#0	21.53	23.68
Band2	5M	64QAM	18625	1RB#13	21.24	23.39
Band2	5M	64QAM	18625	1RB#24	20.50	22.65
Band2	5M	64QAM	18625	12RB#0	21.66	23.81
Band2	5M	64QAM	18625	12RB#6	21.65	23.80
Band2	5M	64QAM	18625	12RB#13	20.48	22.63
Band2	5M	64QAM	18625	25RB#0	20.78	22.93
Band2	5M	64QAM	18900	1RB#0	20.73	22.88
Band2	5M	64QAM	18900	1RB#13	20.88	23.03
Band2	5M	64QAM	18900	1RB#24	20.74	22.89
Band2	5M	64QAM	18900	12RB#0	21.10	23.25
Band2	5M	64QAM	18900	12RB#6	21.10	23.25
Band2	5M	64QAM	18900	12RB#13	20.56	22.71
Band2	5M	64QAM	18900	25RB#0	20.54	22.69
Band2	5M	64QAM	19175	1RB#0	21.00	23.15
Band2	5M	64QAM	19175	1RB#13	20.81	22.96
Band2	5M	64QAM	19175	1RB#24	20.62	22.77
Band2	5M	64QAM	19175	12RB#0	20.94	23.09
Band2	5M	64QAM	19175	12RB#6	20.95	23.10
Band2	5M	64QAM	19175	12RB#13	20.45	22.60
Band2	5M	64QAM	19175	25RB#0	20.64	22.79
Band2	10M	QPSK	18650	1RB#0	22.38	24.53
Band2	10M	QPSK	18650	1RB#25	20.17	22.32
Band2	10M	QPSK	18650	1RB#49	20.89	23.04
Band2	10M	QPSK	18650	25RB#0	20.78	22.93
Band2	10M	QPSK	18650	25RB#13	20.71	22.86
Band2	10M	QPSK	18650	25RB#25	20.13	22.28
Band2	10M	QPSK	18650	50RB#0	20.47	22.62
Band2	10M	QPSK	18900	1RB#0	21.39	23.54
Band2	10M	QPSK	18900	1RB#25	21.23	23.38
Band2	10M	QPSK	18900	1RB#49	20.94	23.09
Band2	10M	QPSK	18900	25RB#0	21.12	23.27
Band2	10M	QPSK	18900	25RB#13	21.08	23.23



Band2	10M	QPSK	18900	25RB#25	21.07	23.22
Band2	10M	QPSK	18900	50RB#0	21.15	23.30
Band2	10M	QPSK	19150	1RB#0	20.20	22.35
Band2	10M	QPSK	19150	1RB#25	19.48	21.63
Band2	10M	QPSK	19150	1RB#49	21.27	23.42
Band2	10M	QPSK	19150	25RB#0	19.29	21.44
Band2	10M	QPSK	19150	25RB#13	19.25	21.40
Band2	10M	QPSK	19150	25RB#25	20.64	22.79
Band2	10M	QPSK	19150	50RB#0	20.06	22.21
Band2	10M	16QAM	18650	1RB#0	22.56	24.71
Band2	10M	16QAM	18650	1RB#25	20.35	22.50
Band2	10M	16QAM	18650	1RB#49	21.13	23.28
Band2	10M	16QAM	18650	25RB#0	20.87	23.02
Band2	10M	16QAM	18650	25RB#13	20.83	22.98
Band2	10M	16QAM	18650	25RB#25	20.19	22.34
Band2	10M	16QAM	18650	50RB#0	20.38	22.53
Band2	10M	16QAM	18900	1RB#0	21.55	23.70
Band2	10M	16QAM	18900	1RB#25	21.56	23.71
Band2	10M	16QAM	18900	1RB#49	21.23	23.38
Band2	10M	16QAM	18900	25RB#0	21.11	23.26
Band2	10M	16QAM	18900	25RB#13	21.07	23.22
Band2	10M	16QAM	18900	25RB#25	21.13	23.28
Band2	10M	16QAM	18900	50RB#0	21.23	23.38
Band2	10M	16QAM	19150	1RB#0	20.80	22.95
Band2	10M	16QAM	19150	1RB#25	20.06	22.21
Band2	10M	16QAM	19150	1RB#49	21.82	23.97
Band2	10M	16QAM	19150	25RB#0	19.31	21.46
Band2	10M	16QAM	19150	25RB#13	19.27	21.42
Band2	10M	16QAM	19150	25RB#25	20.70	22.85
Band2	10M	16QAM	19150	50RB#0	20.07	22.22
Band2	10M	64QAM	18650	1RB#0	21.89	24.04
Band2	10M	64QAM	18650	1RB#25	20.48	22.63
Band2	10M	64QAM	18650	1RB#49	20.24	22.39
Band2	10M	64QAM	18650	25RB#0	20.95	23.10
Band2	10M	64QAM	18650	25RB#13	20.95	23.10
Band2	10M	64QAM	18650	25RB#25	20.08	22.23
Band2	10M	64QAM	18650	50RB#0	20.56	22.71
Band2	10M	64QAM	18900	1RB#0	21.18	23.33
Band2	10M	64QAM	18900	1RB#25	20.76	22.91
Band2	10M	64QAM	18900	1RB#49	21.10	23.25
Band2	10M	64QAM	18900	25RB#0	20.79	22.94



Band2	10M	64QAM	18900	25RB#13	20.80	22.95
Band2	10M	64QAM	18900	25RB#25	20.89	23.04
Band2	10M	64QAM	18900	50RB#0	20.92	23.07
Band2	10M	64QAM	19150	1RB#0	19.44	21.59
Band2	10M	64QAM	19150	1RB#25	20.68	22.83
Band2	10M	64QAM	19150	1RB#49	20.90	23.05
Band2	10M	64QAM	19150	25RB#0	20.11	22.26
Band2	10M	64QAM	19150	25RB#13	20.12	22.27
Band2	10M	64QAM	19150	25RB#25	20.69	22.84
Band2	10M	64QAM	19150	50RB#0	20.68	22.83
Band2	15M	QPSK	18675	1RB#0	22.37	24.52
Band2	15M	QPSK	18675	1RB#38	20.15	22.30
Band2	15M	QPSK	18675	1RB#74	20.86	23.01
Band2	15M	QPSK	18675	36RB#0	20.76	22.91
Band2	15M	QPSK	18675	36RB#18	20.68	22.83
Band2	15M	QPSK	18675	36RB#39	20.10	22.25
Band2	15M	QPSK	18675	75RB#0	20.45	22.60
Band2	15M	QPSK	18900	1RB#0	21.35	23.50
Band2	15M	QPSK	18900	1RB#38	21.22	23.37
Band2	15M	QPSK	18900	1RB#74	20.89	23.04
Band2	15M	QPSK	18900	36RB#0	21.08	23.23
Band2	15M	QPSK	18900	36RB#18	21.03	23.18
Band2	15M	QPSK	18900	36RB#39	21.04	23.19
Band2	15M	QPSK	18900	75RB#0	21.11	23.26
Band2	15M	QPSK	19125	1RB#0	20.18	22.33
Band2	15M	QPSK	19125	1RB#38	19.45	21.60
Band2	15M	QPSK	19125	1RB#74	21.23	23.38
Band2	15M	QPSK	19125	36RB#0	19.26	21.41
Band2	15M	QPSK	19125	36RB#18	19.21	21.36
Band2	15M	QPSK	19125	36RB#39	20.60	22.75
Band2	15M	QPSK	19125	75RB#0	20.01	22.16
Band2	15M	16QAM	18675	1RB#0	22.51	24.66
Band2	15M	16QAM	18675	1RB#38	20.33	22.48
Band2	15M	16QAM	18675	1RB#74	21.10	23.25
Band2	15M	16QAM	18675	36RB#0	20.84	22.99
Band2	15M	16QAM	18675	36RB#18	20.80	22.95
Band2	15M	16QAM	18675	36RB#39	20.17	22.32
Band2	15M	16QAM	18675	75RB#0	20.35	22.50
Band2	15M	16QAM	18900	1RB#0	21.53	23.68
Band2	15M	16QAM	18900	1RB#38	21.53	23.68
Band2	15M	16QAM	18900	1RB#74	21.19	23.34



Band2	15M	16QAM	18900	36RB#0	21.09	23.24
Band2	15M	16QAM	18900	36RB#18	21.02	23.17
Band2	15M	16QAM	18900	36RB#39	21.09	23.24
Band2	15M	16QAM	18900	75RB#0	21.18	23.33
Band2	15M	16QAM	19125	1RB#0	20.78	22.93
Band2	15M	16QAM	19125	1RB#38	20.04	22.19
Band2	15M	16QAM	19125	1RB#74	21.79	23.94
Band2	15M	16QAM	19125	36RB#0	19.28	21.43
Band2	15M	16QAM	19125	36RB#18	19.23	21.38
Band2	15M	16QAM	19125	36RB#39	20.67	22.82
Band2	15M	16QAM	19125	75RB#0	20.03	22.18
Band2	15M	64QAM	18675	1RB#0	22.02	24.17
Band2	15M	64QAM	18675	1RB#38	20.20	22.35
Band2	15M	64QAM	18675	1RB#74	19.83	21.98
Band2	15M	64QAM	18675	36RB#0	20.74	22.89
Band2	15M	64QAM	18675	36RB#18	20.74	22.89
Band2	15M	64QAM	18675	36RB#39	19.45	21.60
Band2	15M	64QAM	18675	75RB#0	20.17	22.32
Band2	15M	64QAM	18900	1RB#0	21.26	23.41
Band2	15M	64QAM	18900	1RB#38	21.02	23.17
Band2	15M	64QAM	18900	1RB#74	21.08	23.23
Band2	15M	64QAM	18900	36RB#0	20.87	23.02
Band2	15M	64QAM	18900	36RB#18	20.88	23.03
Band2	15M	64QAM	18900	36RB#39	20.89	23.04
Band2	15M	64QAM	18900	75RB#0	20.95	23.10
Band2	15M	64QAM	19125	1RB#0	19.34	21.49
Band2	15M	64QAM	19125	1RB#38	20.14	22.29
Band2	15M	64QAM	19125	1RB#74	21.10	23.25
Band2	15M	64QAM	19125	36RB#0	19.35	21.50
Band2	15M	64QAM	19125	36RB#18	19.36	21.51
Band2	15M	64QAM	19125	36RB#39	20.75	22.90
Band2	15M	64QAM	19125	75RB#0	20.23	22.38
Band2	20M	QPSK	18700	1RB#0	22.34	24.49
Band2	20M	QPSK	18700	1RB#50	20.14	22.29
Band2	20M	QPSK	18700	1RB#99	20.84	22.99
Band2	20M	QPSK	18700	50RB#0	20.73	22.88
Band2	20M	QPSK	18700	50RB#25	20.66	22.81
Band2	20M	QPSK	18700	50RB#50	20.07	22.22
Band2	20M	QPSK	18700	100RB#0	20.42	22.57
Band2	20M	QPSK	18900	1RB#0	21.31	23.46
Band2	20M	QPSK	18900	1RB#50	21.18	23.33



Band2	20M	QPSK	18900	1RB#99	20.88	23.03
Band2	20M	QPSK	18900	50RB#0	21.03	23.18
Band2	20M	QPSK	18900	50RB#25	20.99	23.14
Band2	20M	QPSK	18900	50RB#50	20.99	23.14
Band2	20M	QPSK	18900	100RB#0	21.06	23.21
Band2	20M	QPSK	19100	1RB#0	20.15	22.30
Band2	20M	QPSK	19100	1RB#50	19.43	21.58
Band2	20M	QPSK	19100	1RB#99	21.20	23.35
Band2	20M	QPSK	19100	50RB#0	19.22	21.37
Band2	20M	QPSK	19100	50RB#25	19.18	21.33
Band2	20M	QPSK	19100	50RB#50	20.56	22.71
Band2	20M	QPSK	19100	100RB#0	19.97	22.12
Band2	20M	16QAM	18700	1RB#0	22.49	24.64
Band2	20M	16QAM	18700	1RB#50	20.29	22.44
Band2	20M	16QAM	18700	1RB#99	21.08	23.23
Band2	20M	16QAM	18700	50RB#0	20.81	22.96
Band2	20M	16QAM	18700	50RB#25	20.77	22.92
Band2	20M	16QAM	18700	50RB#50	20.14	22.29
Band2	20M	16QAM	18700	100RB#0	20.33	22.48
Band2	20M	16QAM	18900	1RB#0	21.49	23.64
Band2	20M	16QAM	18900	1RB#50	21.51	23.66
Band2	20M	16QAM	18900	1RB#99	21.16	23.31
Band2	20M	16QAM	18900	50RB#0	21.05	23.20
Band2	20M	16QAM	18900	50RB#25	21.00	23.15
Band2	20M	16QAM	18900	50RB#50	21.04	23.19
Band2	20M	16QAM	18900	100RB#0	21.14	23.29
Band2	20M	16QAM	19100	1RB#0	20.73	22.88
Band2	20M	16QAM	19100	1RB#50	20.00	22.15
Band2	20M	16QAM	19100	1RB#99	21.77	23.92
Band2	20M	16QAM	19100	50RB#0	19.25	21.40
Band2	20M	16QAM	19100	50RB#25	19.20	21.35
Band2	20M	16QAM	19100	50RB#50	20.63	22.78
Band2	20M	16QAM	19100	100RB#0	20.00	22.15
Band2	20M	64QAM	18700	1RB#0	22.20	24.35
Band2	20M	64QAM	18700	1RB#50	19.91	22.06
Band2	20M	64QAM	18700	1RB#99	20.78	22.93
Band2	20M	64QAM	18700	50RB#0	20.52	22.67
Band2	20M	64QAM	18700	50RB#25	20.55	22.70
Band2	20M	64QAM	18700	50RB#50	19.77	21.92
Band2	20M	64QAM	18700	100RB#0	20.09	22.24
Band2	20M	64QAM	18900	1RB#0	20.97	23.12



Band2	20M	64QAM	18900	1RB#50	20.85	23.00
Band2	20M	64QAM	18900	1RB#99	20.61	22.76
Band2	20M	64QAM	18900	50RB#0	21.01	23.16
Band2	20M	64QAM	18900	50RB#25	21.03	23.18
Band2	20M	64QAM	18900	50RB#50	20.83	22.98
Band2	20M	64QAM	18900	100RB#0	21.02	23.17
Band2	20M	64QAM	19100	1RB#0	20.07	22.22
Band2	20M	64QAM	19100	1RB#50	19.30	21.45
Band2	20M	64QAM	19100	1RB#99	21.00	23.15
Band2	20M	64QAM	19100	50RB#0	19.58	21.73
Band2	20M	64QAM	19100	50RB#25	19.58	21.73
Band2	20M	64QAM	19100	50RB#50	20.59	22.74
Band2	20M	64QAM	19100	100RB#0	19.94	22.09



BAND	Bandwidth	Modulation	Channel	RB Configuration	Conducted Power(dBm)	EIRP(dBm)
Band25	1.4M	QPSK	26047	1RB#0	23.43	25.58
Band25	1.4M	QPSK	26047	1RB#2	21.23	23.38
Band25	1.4M	QPSK	26047	1RB#5	21.86	24.01
Band25	1.4M	QPSK	26047	3RB#0	21.84	23.99
Band25	1.4M	QPSK	26047	3RB#2	21.75	23.90
Band25	1.4M	QPSK	26047	3RB#3	21.17	23.32
Band25	1.4M	QPSK	26047	6RB#0	21.41	23.56
Band25	1.4M	QPSK	26365	1RB#0	22.46	24.61
Band25	1.4M	QPSK	26365	1RB#2	22.39	24.54
Band25	1.4M	QPSK	26365	1RB#5	21.26	23.41
Band25	1.4M	QPSK	26365	3RB#0	22.18	24.33
Band25	1.4M	QPSK	26365	3RB#2	22.12	24.27
Band25	1.4M	QPSK	26365	3RB#3	21.65	23.80
Band25	1.4M	QPSK	26365	6RB#0	22.01	24.16
Band25	1.4M	QPSK	26683	1RB#0	20.66	22.81
Band25	1.4M	QPSK	26683	1RB#2	22.14	24.29
Band25	1.4M	QPSK	26683	1RB#5	22.33	24.48
Band25	1.4M	QPSK	26683	3RB#0	20.69	22.84
Band25	1.4M	QPSK	26683	3RB#2	20.65	22.80
Band25	1.4M	QPSK	26683	3RB#3	22.13	24.28
Band25	1.4M	QPSK	26683	6RB#0	21.58	23.73
Band25	1.4M	16QAM	26047	1RB#0	23.72	25.87
Band25	1.4M	16QAM	26047	1RB#2	21.46	23.61
Band25	1.4M	16QAM	26047	1RB#5	22.12	24.27
Band25	1.4M	16QAM	26047	3RB#0	21.79	23.94
Band25	1.4M	16QAM	26047	3RB#2	21.76	23.91
Band25	1.4M	16QAM	26047	3RB#3	21.11	23.26
Band25	1.4M	16QAM	26047	6RB#0	21.40	23.55
Band25	1.4M	16QAM	26365	1RB#0	22.66	24.81
Band25	1.4M	16QAM	26365	1RB#2	22.63	24.78
Band25	1.4M	16QAM	26365	1RB#5	21.59	23.74
Band25	1.4M	16QAM	26365	3RB#0	22.06	24.21
Band25	1.4M	16QAM	26365	3RB#2	22.04	24.19
Band25	1.4M	16QAM	26365	3RB#3	21.76	23.91
Band25	1.4M	16QAM	26365	6RB#0	22.00	24.15
Band25	1.4M	16QAM	26683	1RB#0	21.21	23.36
Band25	1.4M	16QAM	26683	1RB#2	22.65	24.80
Band25	1.4M	16QAM	26683	1RB#5	22.81	24.96
Band25	1.4M	16QAM	26683	3RB#0	20.67	22.82
Band25	1.4M	16QAM	26683	3RB#2	20.64	22.79



Band25	1.4M	16QAM	26683	3RB#3	22.08	24.23
Band25	1.4M	16QAM	26683	6RB#0	21.60	23.75
Band25	1.4M	64QAM	26047	1RB#0	21.84	23.99
Band25	1.4M	64QAM	26047	1RB#2	21.82	23.97
Band25	1.4M	64QAM	26047	1RB#5	21.78	23.93
Band25	1.4M	64QAM	26047	3RB#0	21.86	24.01
Band25	1.4M	64QAM	26047	3RB#2	21.89	24.04
Band25	1.4M	64QAM	26047	3RB#3	21.87	24.02
Band25	1.4M	64QAM	26047	6RB#0	21.73	23.88
Band25	1.4M	64QAM	26365	1RB#0	21.26	23.41
Band25	1.4M	64QAM	26365	1RB#2	21.40	23.55
Band25	1.4M	64QAM	26365	1RB#5	21.23	23.38
Band25	1.4M	64QAM	26365	3RB#0	21.08	23.23
Band25	1.4M	64QAM	26365	3RB#2	21.09	23.24
Band25	1.4M	64QAM	26365	3RB#3	21.10	23.25
Band25	1.4M	64QAM	26365	6RB#0	21.08	23.23
Band25	1.4M	64QAM	26683	1RB#0	20.76	22.91
Band25	1.4M	64QAM	26683	1RB#2	20.95	23.10
Band25	1.4M	64QAM	26683	1RB#5	20.88	23.03
Band25	1.4M	64QAM	26683	3RB#0	20.82	22.97
Band25	1.4M	64QAM	26683	3RB#2	20.81	22.96
Band25	1.4M	64QAM	26683	3RB#3	21.02	23.17
Band25	1.4M	64QAM	26683	6RB#0	21.06	23.21
Band25	3M	QPSK	26055	1RB#0	23.45	25.60
Band25	3M	QPSK	26055	1RB#7	21.26	23.41
Band25	3M	QPSK	26055	1RB#14	21.89	24.04
Band25	3M	QPSK	26055	8RB#0	21.92	24.07
Band25	3M	QPSK	26055	8RB#4	21.85	24.00
Band25	3M	QPSK	26055	8RB#7	21.25	23.40
Band25	3M	QPSK	26055	15RB#0	21.44	23.59
Band25	3M	QPSK	26365	1RB#0	22.50	24.65
Band25	3M	QPSK	26365	1RB#7	22.44	24.59
Band25	3M	QPSK	26365	1RB#14	21.31	23.46
Band25	3M	QPSK	26365	8RB#0	22.28	24.43
Band25	3M	QPSK	26365	8RB#4	22.20	24.35
Band25	3M	QPSK	26365	8RB#7	21.74	23.89
Band25	3M	QPSK	26365	15RB#0	22.05	24.20
Band25	3M	QPSK	26675	1RB#0	20.69	22.84
Band25	3M	QPSK	26675	1RB#7	22.18	24.33
Band25	3M	QPSK	26675	1RB#14	22.37	24.52
Band25	3M	QPSK	26675	8RB#0	20.80	22.95
Band25	3M	QPSK	26675	8RB#4	20.75	22.90
Band25	3M	QPSK	26675	8RB#7	22.21	24.36



Band25	3M	QPSK	26675	15RB#0	21.61	23.76
Band25	3M	16QAM	26055	1RB#0	23.75	25.90
Band25	3M	16QAM	26055	1RB#7	21.49	23.64
Band25	3M	16QAM	26055	1RB#14	22.14	24.29
Band25	3M	16QAM	26055	8RB#0	21.88	24.03
Band25	3M	16QAM	26055	8RB#4	21.85	24.00
Band25	3M	16QAM	26055	8RB#7	21.19	23.34
Band25	3M	16QAM	26055	15RB#0	21.43	23.58
Band25	3M	16QAM	26365	1RB#0	22.68	24.83
Band25	3M	16QAM	26365	1RB#7	22.68	24.83
Band25	3M	16QAM	26365	1RB#14	21.63	23.78
Band25	3M	16QAM	26365	8RB#0	22.17	24.32
Band25	3M	16QAM	26365	8RB#4	22.15	24.30
Band25	3M	16QAM	26365	8RB#7	21.86	24.01
Band25	3M	16QAM	26365	15RB#0	22.04	24.19
Band25	3M	16QAM	26675	1RB#0	21.24	23.39
Band25	3M	16QAM	26675	1RB#7	22.69	24.84
Band25	3M	16QAM	26675	1RB#14	22.84	24.99
Band25	3M	16QAM	26675	8RB#0	20.77	22.92
Band25	3M	16QAM	26675	8RB#4	20.74	22.89
Band25	3M	16QAM	26675	8RB#7	22.19	24.34
Band25	3M	16QAM	26675	15RB#0	21.63	23.78
Band25	3M	64QAM	26055	1RB#0	21.97	24.12
Band25	3M	64QAM	26055	1RB#7	21.77	23.92
Band25	3M	64QAM	26055	1RB#14	21.43	23.58
Band25	3M	64QAM	26055	8RB#0	22.07	24.22
Band25	3M	64QAM	26055	8RB#4	22.06	24.21
Band25	3M	64QAM	26055	8RB#7	21.39	23.54
Band25	3M	64QAM	26055	15RB#0	21.41	23.56
Band25	3M	64QAM	26365	1RB#0	21.23	23.38
Band25	3M	64QAM	26365	1RB#7	21.23	23.38
Band25	3M	64QAM	26365	1RB#14	21.13	23.28
Band25	3M	64QAM	26365	8RB#0	21.58	23.73
Band25	3M	64QAM	26365	8RB#4	21.57	23.72
Band25	3M	64QAM	26365	8RB#7	21.15	23.30
Band25	3M	64QAM	26365	15RB#0	21.10	23.25
Band25	3M	64QAM	26675	1RB#0	20.61	22.76
Band25	3M	64QAM	26675	1RB#7	20.81	22.96
Band25	3M	64QAM	26675	1RB#14	20.81	22.96
Band25	3M	64QAM	26675	8RB#0	21.33	23.48
Band25	3M	64QAM	26675	8RB#4	21.31	23.46
Band25	3M	64QAM	26675	8RB#7	20.94	23.09
Band25	3M	64QAM	26675	15RB#0	21.03	23.18



Band25	5M	QPSK	26065	1RB#0	23.49	25.64
Band25	5M	QPSK	26065	1RB#13	21.33	23.48
Band25	5M	QPSK	26065	1RB#24	21.95	24.10
Band25	5M	QPSK	26065	12RB#0	21.99	24.14
Band25	5M	QPSK	26065	12RB#6	21.90	24.05
Band25	5M	QPSK	26065	12RB#13	21.32	23.47
Band25	5M	QPSK	26065	25RB#0	21.52	23.67
Band25	5M	QPSK	26365	1RB#0	22.62	24.77
Band25	5M	QPSK	26365	1RB#13	22.49	24.64
Band25	5M	QPSK	26365	1RB#24	21.38	23.53
Band25	5M	QPSK	26365	12RB#0	22.32	24.47
Band25	5M	QPSK	26365	12RB#6	22.25	24.40
Band25	5M	QPSK	26365	12RB#13	21.84	23.99
Band25	5M	QPSK	26365	25RB#0	22.14	24.29
Band25	5M	QPSK	26665	1RB#0	20.74	22.89
Band25	5M	QPSK	26665	1RB#13	22.25	24.40
Band25	5M	QPSK	26665	1RB#24	22.46	24.61
Band25	5M	QPSK	26665	12RB#0	20.86	23.01
Band25	5M	QPSK	26665	12RB#6	20.79	22.94
Band25	5M	QPSK	26665	12RB#13	22.21	24.36
Band25	5M	QPSK	26665	25RB#0	21.62	23.77
Band25	5M	16QAM	26065	1RB#0	23.77	25.92
Band25	5M	16QAM	26065	1RB#13	21.51	23.66
Band25	5M	16QAM	26065	1RB#24	22.16	24.31
Band25	5M	16QAM	26065	12RB#0	21.92	24.07
Band25	5M	16QAM	26065	12RB#6	21.87	24.02
Band25	5M	16QAM	26065	12RB#13	21.24	23.39
Band25	5M	16QAM	26065	25RB#0	21.46	23.61
Band25	5M	16QAM	26365	1RB#0	22.70	24.85
Band25	5M	16QAM	26365	1RB#13	22.75	24.90
Band25	5M	16QAM	26365	1RB#24	21.70	23.85
Band25	5M	16QAM	26365	12RB#0	22.21	24.36
Band25	5M	16QAM	26365	12RB#6	22.19	24.34
Band25	5M	16QAM	26365	12RB#13	21.86	24.01
Band25	5M	16QAM	26365	25RB#0	22.05	24.20
Band25	5M	16QAM	26665	1RB#0	21.28	23.43
Band25	5M	16QAM	26665	1RB#13	22.73	24.88
Band25	5M	16QAM	26665	1RB#24	22.87	25.02
Band25	5M	16QAM	26665	12RB#0	20.82	22.97
Band25	5M	16QAM	26665	12RB#6	20.79	22.94
Band25	5M	16QAM	26665	12RB#13	22.22	24.37
Band25	5M	16QAM	26665	25RB#0	21.64	23.79
Band25	5M	64QAM	26065	1RB#0	21.54	23.69



Band25	5M	64QAM	26065	1RB#13	21.38	23.53
Band25	5M	64QAM	26065	1RB#24	20.68	22.83
Band25	5M	64QAM	26065	12RB#0	21.69	23.84
Band25	5M	64QAM	26065	12RB#6	21.81	23.96
Band25	5M	64QAM	26065	12RB#13	20.66	22.81
Band25	5M	64QAM	26065	25RB#0	20.94	23.09
Band25	5M	64QAM	26365	1RB#0	20.80	22.95
Band25	5M	64QAM	26365	1RB#13	21.05	23.20
Band25	5M	64QAM	26365	1RB#24	20.57	22.72
Band25	5M	64QAM	26365	12RB#0	21.31	23.46
Band25	5M	64QAM	26365	12RB#6	21.31	23.46
Band25	5M	64QAM	26365	12RB#13	20.58	22.73
Band25	5M	64QAM	26365	25RB#0	20.69	22.84
Band25	5M	64QAM	26665	1RB#0	20.98	23.13
Band25	5M	64QAM	26665	1RB#13	20.92	23.07
Band25	5M	64QAM	26665	1RB#24	20.77	22.92
Band25	5M	64QAM	26665	12RB#0	21.11	23.26
Band25	5M	64QAM	26665	12RB#6	21.09	23.24
Band25	5M	64QAM	26665	12RB#13	20.65	22.80
Band25	5M	64QAM	26665	25RB#0	20.51	22.66
Band25	10M	QPSK	26090	1RB#0	23.44	25.59
Band25	10M	QPSK	26090	1RB#25	21.27	23.42
Band25	10M	QPSK	26090	1RB#49	21.88	24.03
Band25	10M	QPSK	26090	25RB#0	21.92	24.07
Band25	10M	QPSK	26090	25RB#13	21.86	24.01
Band25	10M	QPSK	26090	25RB#25	21.25	23.40
Band25	10M	QPSK	26090	50RB#0	21.50	23.65
Band25	10M	QPSK	26365	1RB#0	22.49	24.64
Band25	10M	QPSK	26365	1RB#25	22.45	24.60
Band25	10M	QPSK	26365	1RB#49	21.30	23.45
Band25	10M	QPSK	26365	25RB#0	22.28	24.43
Band25	10M	QPSK	26365	25RB#13	22.21	24.36
Band25	10M	QPSK	26365	25RB#25	21.76	23.91
Band25	10M	QPSK	26365	50RB#0	22.06	24.21
Band25	10M	QPSK	26640	1RB#0	20.68	22.83
Band25	10M	QPSK	26640	1RB#25	22.19	24.34
Band25	10M	QPSK	26640	1RB#49	22.36	24.51
Band25	10M	QPSK	26640	25RB#0	20.80	22.95
Band25	10M	QPSK	26640	25RB#13	20.74	22.89
Band25	10M	QPSK	26640	25RB#25	22.22	24.37
Band25	10M	QPSK	26640	50RB#0	21.63	23.78
Band25	10M	16QAM	26090	1RB#0	23.74	25.89
Band25	10M	16QAM	26090	1RB#25	21.49	23.64



Band25	10M	16QAM	26090	1RB#49	22.14	24.29
Band25	10M	16QAM	26090	25RB#0	21.89	24.04
Band25	10M	16QAM	26090	25RB#13	21.84	23.99
Band25	10M	16QAM	26090	25RB#25	21.19	23.34
Band25	10M	16QAM	26090	50RB#0	21.44	23.59
Band25	10M	16QAM	26365	1RB#0	22.67	24.82
Band25	10M	16QAM	26365	1RB#25	22.70	24.85
Band25	10M	16QAM	26365	1RB#49	21.63	23.78
Band25	10M	16QAM	26365	25RB#0	22.18	24.33
Band25	10M	16QAM	26365	25RB#13	22.14	24.29
Band25	10M	16QAM	26365	25RB#25	21.86	24.01
Band25	10M	16QAM	26365	50RB#0	22.05	24.20
Band25	10M	16QAM	26640	1RB#0	21.23	23.38
Band25	10M	16QAM	26640	1RB#25	22.69	24.84
Band25	10M	16QAM	26640	1RB#49	22.83	24.98
Band25	10M	16QAM	26640	25RB#0	20.78	22.93
Band25	10M	16QAM	26640	25RB#13	20.73	22.88
Band25	10M	16QAM	26640	25RB#25	22.19	24.34
Band25	10M	16QAM	26640	50RB#0	21.62	23.77
Band25	10M	64QAM	26090	1RB#0	21.88	24.03
Band25	10M	64QAM	26090	1RB#25	20.66	22.81
Band25	10M	64QAM	26090	1RB#49	20.47	22.62
Band25	10M	64QAM	26090	25RB#0	21.12	23.27
Band25	10M	64QAM	26090	25RB#13	21.12	23.27
Band25	10M	64QAM	26090	25RB#25	20.17	22.32
Band25	10M	64QAM	26090	50RB#0	20.63	22.78
Band25	10M	64QAM	26365	1RB#0	21.25	23.40
Band25	10M	64QAM	26365	1RB#25	20.94	23.09
Band25	10M	64QAM	26365	1RB#49	20.97	23.12
Band25	10M	64QAM	26365	25RB#0	20.95	23.10
Band25	10M	64QAM	26365	25RB#13	20.96	23.11
Band25	10M	64QAM	26365	25RB#25	20.80	22.95
Band25	10M	64QAM	26365	50RB#0	20.89	23.04
Band25	10M	64QAM	26640	1RB#0	21.00	23.15
Band25	10M	64QAM	26640	1RB#25	20.64	22.79
Band25	10M	64QAM	26640	1RB#49	21.04	23.19
Band25	10M	64QAM	26640	25RB#0	20.80	22.95
Band25	10M	64QAM	26640	25RB#13	20.68	22.83
Band25	10M	64QAM	26640	25RB#25	20.67	22.82
Band25	10M	64QAM	26640	50RB#0	20.98	23.13
Band25	15M	QPSK	26115	1RB#0	23.43	25.58
Band25	15M	QPSK	26115	1RB#38	21.25	23.40
Band25	15M	QPSK	26115	1RB#74	21.85	24.00



Band25	15M	QPSK	26115	36RB#0	21.90	24.05
Band25	15M	QPSK	26115	36RB#18	21.83	23.98
Band25	15M	QPSK	26115	36RB#39	21.22	23.37
Band25	15M	QPSK	26115	75RB#0	21.48	23.63
Band25	15M	QPSK	26365	1RB#0	22.45	24.60
Band25	15M	QPSK	26365	1RB#38	22.44	24.59
Band25	15M	QPSK	26365	1RB#74	21.25	23.40
Band25	15M	QPSK	26365	36RB#0	22.24	24.39
Band25	15M	QPSK	26365	36RB#18	22.16	24.31
Band25	15M	QPSK	26365	36RB#39	21.73	23.88
Band25	15M	QPSK	26365	75RB#0	22.02	24.17
Band25	15M	QPSK	26615	1RB#0	20.66	22.81
Band25	15M	QPSK	26615	1RB#38	22.16	24.31
Band25	15M	QPSK	26615	1RB#74	22.32	24.47
Band25	15M	QPSK	26615	36RB#0	20.77	22.92
Band25	15M	QPSK	26615	36RB#18	20.70	22.85
Band25	15M	QPSK	26615	36RB#39	22.18	24.33
Band25	15M	QPSK	26615	75RB#0	21.58	23.73
Band25	15M	16QAM	26115	1RB#0	23.69	25.84
Band25	15M	16QAM	26115	1RB#38	21.47	23.62
Band25	15M	16QAM	26115	1RB#74	22.11	24.26
Band25	15M	16QAM	26115	36RB#0	21.86	24.01
Band25	15M	16QAM	26115	36RB#18	21.81	23.96
Band25	15M	16QAM	26115	36RB#39	21.17	23.32
Band25	15M	16QAM	26115	75RB#0	21.41	23.56
Band25	15M	16QAM	26365	1RB#0	22.65	24.80
Band25	15M	16QAM	26365	1RB#38	22.67	24.82
Band25	15M	16QAM	26365	1RB#74	21.59	23.74
Band25	15M	16QAM	26365	36RB#0	22.16	24.31
Band25	15M	16QAM	26365	36RB#18	22.09	24.24
Band25	15M	16QAM	26365	36RB#39	21.82	23.97
Band25	15M	16QAM	26365	75RB#0	22.00	24.15
Band25	15M	16QAM	26615	1RB#0	21.21	23.36
Band25	15M	16QAM	26615	1RB#38	22.67	24.82
Band25	15M	16QAM	26615	1RB#74	22.80	24.95
Band25	15M	16QAM	26615	36RB#0	20.75	22.90
Band25	15M	16QAM	26615	36RB#18	20.69	22.84
Band25	15M	16QAM	26615	36RB#39	22.16	24.31
Band25	15M	16QAM	26615	75RB#0	21.55	23.70
Band25	15M	64QAM	26115	1RB#0	22.04	24.19
Band25	15M	64QAM	26115	1RB#38	20.31	22.46
Band25	15M	64QAM	26115	1RB#74	19.98	22.13
Band25	15M	64QAM	26115	36RB#0	20.81	22.96



Band25	15M	64QAM	26115	36RB#18	20.80	22.95
Band25	15M	64QAM	26115	36RB#39	19.59	21.74
Band25	15M	64QAM	26115	75RB#0	20.28	22.43
Band25	15M	64QAM	26365	1RB#0	21.28	23.43
Band25	15M	64QAM	26365	1RB#38	21.08	23.23
Band25	15M	64QAM	26365	1RB#74	20.57	22.72
Band25	15M	64QAM	26365	36RB#0	20.85	23.00
Band25	15M	64QAM	26365	36RB#18	20.86	23.01
Band25	15M	64QAM	26365	36RB#39	20.67	22.82
Band25	15M	64QAM	26365	75RB#0	20.84	22.99
Band25	15M	64QAM	26615	1RB#0	20.02	22.17
Band25	15M	64QAM	26615	1RB#38	20.85	23.00
Band25	15M	64QAM	26615	1RB#74	21.13	23.28
Band25	15M	64QAM	26615	36RB#0	20.55	22.70
Band25	15M	64QAM	26615	36RB#18	20.44	22.59
Band25	15M	64QAM	26615	36RB#39	20.72	22.87
Band25	15M	64QAM	26615	75RB#0	20.94	23.09
Band25	20M	QPSK	26140	1RB#0	23.40	25.55
Band25	20M	QPSK	26140	1RB#50	21.24	23.39
Band25	20M	QPSK	26140	1RB#99	21.83	23.98
Band25	20M	QPSK	26140	50RB#0	21.87	24.02
Band25	20M	QPSK	26140	50RB#25	21.81	23.96
Band25	20M	QPSK	26140	50RB#50	21.19	23.34
Band25	20M	QPSK	26140	100RB#0	21.45	23.60
Band25	20M	QPSK	26365	1RB#0	22.41	24.56
Band25	20M	QPSK	26365	1RB#50	22.40	24.55
Band25	20M	QPSK	26365	1RB#99	21.24	23.39
Band25	20M	QPSK	26365	50RB#0	22.19	24.34
Band25	20M	QPSK	26365	50RB#25	22.12	24.27
Band25	20M	QPSK	26365	50RB#50	21.68	23.83
Band25	20M	QPSK	26365	100RB#0	21.97	24.12
Band25	20M	QPSK	26590	1RB#0	20.63	22.78
Band25	20M	QPSK	26590	1RB#50	22.14	24.29
Band25	20M	QPSK	26590	1RB#99	22.29	24.44
Band25	20M	QPSK	26590	50RB#0	20.73	22.88
Band25	20M	QPSK	26590	50RB#25	20.67	22.82
Band25	20M	QPSK	26590	50RB#50	22.14	24.29
Band25	20M	QPSK	26590	100RB#0	21.54	23.69
Band25	20M	16QAM	26140	1RB#0	23.67	25.82
Band25	20M	16QAM	26140	1RB#50	21.43	23.58
Band25	20M	16QAM	26140	1RB#99	22.09	24.24
Band25	20M	16QAM	26140	50RB#0	21.83	23.98
Band25	20M	16QAM	26140	50RB#25	21.78	23.93



Band25	20M	16QAM	26140	50RB#50	21.14	23.29
Band25	20M	16QAM	26140	100RB#0	21.39	23.54
Band25	20M	16QAM	26365	1RB#0	22.61	24.76
Band25	20M	16QAM	26365	1RB#50	22.65	24.80
Band25	20M	16QAM	26365	1RB#99	21.56	23.71
Band25	20M	16QAM	26365	50RB#0	22.12	24.27
Band25	20M	16QAM	26365	50RB#25	22.07	24.22
Band25	20M	16QAM	26365	50RB#50	21.77	23.92
Band25	20M	16QAM	26365	100RB#0	21.96	24.11
Band25	20M	16QAM	26590	1RB#0	21.16	23.31
Band25	20M	16QAM	26590	1RB#50	22.63	24.78
Band25	20M	16QAM	26590	1RB#99	22.78	24.93
Band25	20M	16QAM	26590	50RB#0	20.72	22.87
Band25	20M	16QAM	26590	50RB#25	20.66	22.81
Band25	20M	16QAM	26590	50RB#50	22.12	24.27
Band25	20M	16QAM	26590	100RB#0	21.55	23.70
Band25	20M	64QAM	26140	1RB#0	22.19	24.34
Band25	20M	64QAM	26140	1RB#50	20.07	22.22
Band25	20M	64QAM	26140	1RB#99	20.93	23.08
Band25	20M	64QAM	26140	50RB#0	20.64	22.79
Band25	20M	64QAM	26140	50RB#25	20.64	22.79
Band25	20M	64QAM	26140	50RB#50	19.95	22.10
Band25	20M	64QAM	26140	100RB#0	20.24	22.39
Band25	20M	64QAM	26365	1RB#0	21.25	23.40
Band25	20M	64QAM	26365	1RB#50	20.91	23.06
Band25	20M	64QAM	26365	1RB#99	20.28	22.43
Band25	20M	64QAM	26365	50RB#0	21.05	23.20
Band25	20M	64QAM	26365	50RB#25	21.06	23.21
Band25	20M	64QAM	26365	50RB#50	20.49	22.64
Band25	20M	64QAM	26365	100RB#0	20.94	23.09
Band25	20M	64QAM	26590	1RB#0	19.34	21.49
Band25	20M	64QAM	26590	1RB#50	21.02	23.17
Band25	20M	64QAM	26590	1RB#99	21.09	23.24
Band25	20M	64QAM	26590	50RB#0	19.90	22.05
Band25	20M	64QAM	26590	50RB#25	19.90	22.05
Band25	20M	64QAM	26590	50RB#50	21.09	23.24
Band25	20M	64QAM	26590	100RB#0	20.51	22.66

5.2.Occupied Bandwidth

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

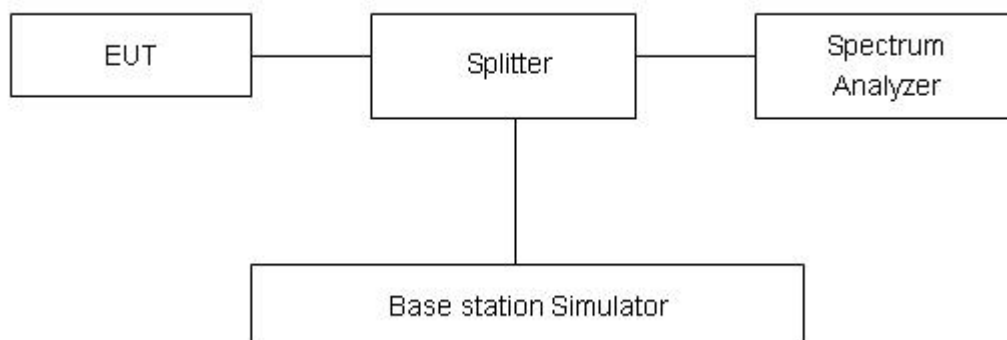
RBW is set to 51kHz, VBW is set to 160kHz for LTE Band 2/25(1.4MHz),

RBW is set to 100kHz,VBW is set to 300kHz for LTE Band 2/25 (3MHz/5MHz),

RBW is set to 300kHz,VBW is set to 1MHz for LTE Band 2/25(10MHz/15MHz/20MHz).

99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 624\text{Hz}$.

Test Result

LTE Band 2					
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
QPSK	1.4	18607	1850.7	1.1688	1.604
		18900	1880.0	1.1589	1.556
		19193	1909.3	1.1573	1.584
	3	18615	1851.5	2.7929	3.498
		18900	1880	2.7780	3.494
		19185	1908.5	2.7928	3.505
	5	18625	1852.5	4.5374	5.333
		18900	1880	4.5379	5.295
		19175	1907.5	4.5516	5.304
	10	18650	1855	9.0437	10.190
		18900	1880	9.0534	10.200
		19150	1905	9.0245	10.110
	15	18675	1857.5	13.4690	14.660
		18900	1880	13.4660	14.600
		19125	1902.5	13.4300	14.690
	20	18700	1860	17.9370	19.350
		18900	1880	17.8810	19.120
		19100	1900	17.8330	18.990
16QAM	1.4	18607	1850.7	1.1495	1.614
		18900	1880.0	1.1653	1.623
		19193	1909.3	1.1781	1.556
	3	18615	1851.5	2.7935	3.605
		18900	1880	2.8013	3.566
		19185	1908.5	2.8564	3.559
	5	18625	1852.5	4.5570	5.415
		18900	1880	4.5793	5.440
		19175	1907.5	4.5553	5.343
	10	18650	1855	9.0582	10.210
		18900	1880	9.0724	10.180
		19150	1905	9.0598	10.100



	15	18675	1857.5	13.5190	14.750
		18900	1880	13.4850	14.670
		19125	1902.5	13.4370	14.630
	20	18700	1860	17.9390	19.160
		18900	1880	17.8540	19.080
		19100	1900	17.8760	19.080
64QAM	1.4	18607	1850.7	1.1268	1.502
		18900	1880.0	1.1000	1.434
		19193	1909.3	1.1166	1.464
	3	18615	1851.5	2.7522	3.212
		18900	1880	2.7248	3.471
		19185	1908.5	2.7325	3.352
	5	18625	1852.5	4.5244	5.218
		18900	1880	4.5367	5.327
		19175	1907.5	4.5467	5.301
	10	18650	1855	8.9902	9.934
		18900	1880	8.9828	9.906
		19150	1905	8.9439	9.787
	15	18675	1857.5	13.4760	14.600
		18900	1880	13.4590	14.470
		19125	1902.5	13.4240	14.590
	20	18700	1860	17.9380	19.210
		18900	1880	17.9070	19.100
		19100	1900	17.8790	19.230

LTE Band 25					
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
QPSK	1.4	26047	1850.7	1.1652	1.611
		26365	1882.5	1.1632	1.539
		26683	1914.3	1.1638	1.650
	3	26055	1851.5	2.7894	3.491
		26365	1882.5	2.7792	3.461



	5	26675	1913.5	2.7889	3.588
		26065	1852.5	4.5290	5.334
		26365	1882.5	4.5331	5.344
		26665	1912.5	4.5674	5.425
	10	26090	1855	9.0590	10.180
		26365	1882.5	9.0471	10.180
		26640	1910	9.1068	10.230
	15	26115	1857.5	13.4800	14.810
		26365	1882.5	13.4590	14.690
		26615	1907.5	13.4950	14.750
	20	26140	1860	17.9340	19.250
		26365	1882.5	17.9000	19.170
		26590	1905	17.8750	19.030
16QAM	1.4	26047	1850.7	1.1481	1.635
		26365	1882.5	1.1609	1.557
		26683	1914.3	1.1921	1.708
	3	26055	1851.5	2.7967	3.561
		26365	1882.5	2.8086	3.550
		26675	1913.5	2.8678	3.705
	5	26065	1852.5	4.5466	5.383
		26365	1882.5	4.5780	5.405
		26665	1912.5	4.5647	5.370
	10	26090	1855	9.0472	10.130
		26365	1882.5	9.0550	10.170
		26640	1910	9.1093	10.180
	15	26115	1857.5	13.5180	14.620
		26365	1882.5	13.4950	14.770
		26615	1907.5	13.5130	14.650
	20	26140	1860	17.9850	19.240
		26365	1882.5	17.9000	19.080
		26590	1905	17.8830	18.980
64QAM	1.4	26047	1850.7	1.1220	1.508
		26365	1882.5	1.1032	1.452
		26683	1914.3	1.1121	1.452



	3	26055	1851.5	2.7240	3.444
		26365	1882.5	2.7165	3.400
		26675	1913.5	2.7232	3.318
	5	26065	1852.5	4.5258	5.238
		26365	1882.5	4.5558	5.251
		26665	1912.5	4.5408	5.284
	10	26090	1855	8.9856	9.890
		26365	1882.5	8.9819	9.806
		26640	1910	9.0182	9.992
	15	26115	1857.5	13.4950	14.720
		26365	1882.5	13.4600	14.580
		26615	1907.5	13.4690	14.550
	20	26140	1860	17.9870	19.330
		26365	1882.5	17.9100	19.160
		26590	1905	17.9150	18.970



LTE Band 2 1.4MHz QPSK CH-Low



LTE Band 2 3MHz QPSK CH-Low



LTE Band 2 1.4MHz QPSK CH-Middle



LTE Band 2 3MHz QPSK CH-Middle



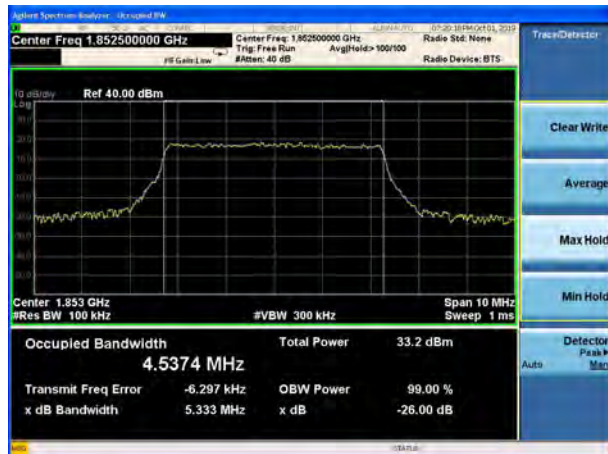
LTE Band 2 1.4MHz QPSK CH-High



LTE Band 2 3MHz QPSK CH-High



LTE Band 2 5MHz QPSK CH-Low



LTE Band 2 10MHz QPSK CH-Low



LTE Band 2 5MHz QPSK CH-Middle



LTE Band 2 10MHz QPSK CH-Middle



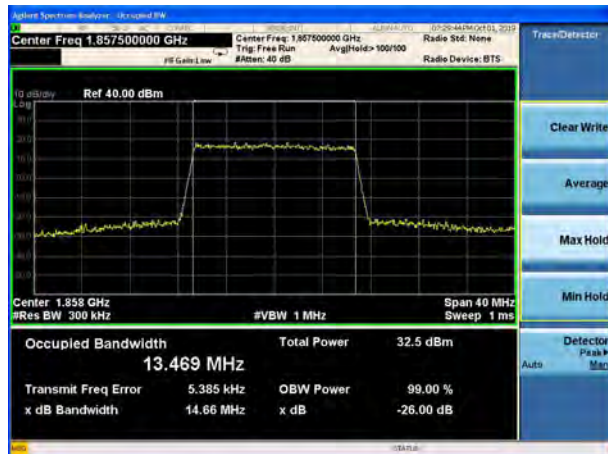
LTE Band 2 5MHz QPSK CH-High



LTE Band 2 10MHz QPSK CH-High



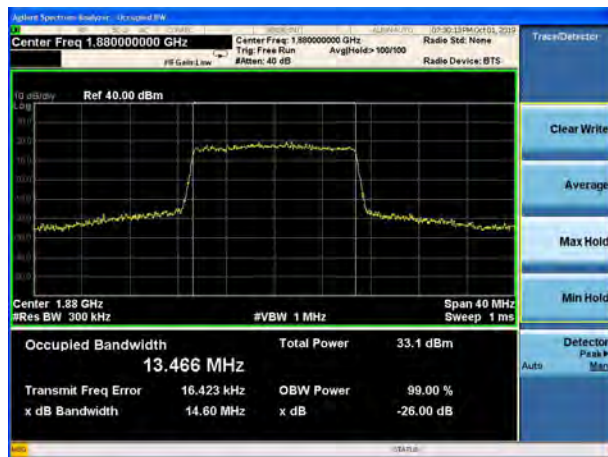
LTE Band 2 15MHz QPSK CH-Low



LTE Band 2 20MHz QPSK CH-Low



LTE Band 2 15MHz QPSK CH-Middle



LTE Band 2 20MHz QPSK CH-Middle



LTE Band 2 15MHz QPSK CH-High



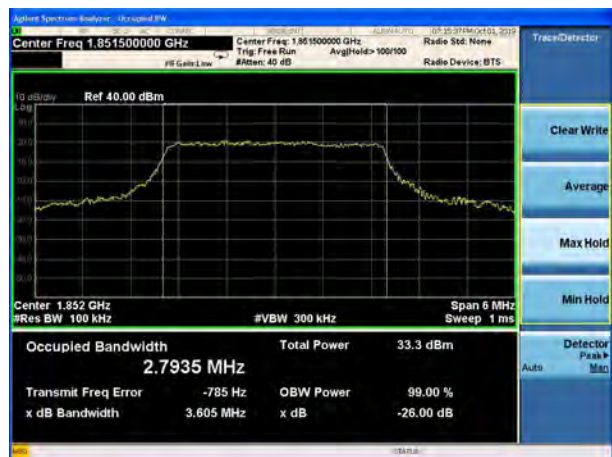
LTE Band 2 20MHz QPSK CH-High



LTE Band 2 1.4MHz 16QAM CH-Low



LTE Band 2 3MHz 16QAM CH-Low



LTE Band 2 1.4MHz 16QAM CH-Middle



LTE Band 2 3MHz 16QAM CH-Middle



LTE Band 2 1.4MHz 16QAM CH-High



LTE Band 2 3MHz 16QAM CH-High



LTE Band 2 5MHz 16QAM CH-Low



LTE Band 2 10MHz 16QAM CH-Low



LTE Band 2 5MHz 16QAM CH-Middle



LTE Band 2 10MHz 16QAM CH-Middle



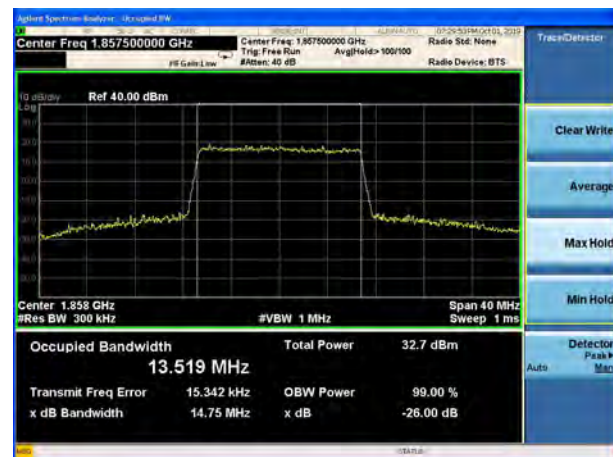
LTE Band 2 5MHz 16QAM CH-High



LTE Band 2 10MHz 16QAM CH-High



LTE Band 2 15MHz 16QAM CH-Low



LTE Band 2 20MHz 16QAM CH-Low



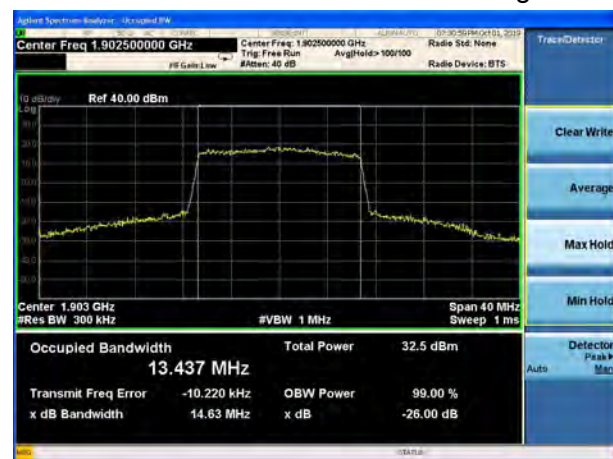
LTE Band 2 15MHz 16QAM CH-Middle



LTE Band 2 20MHz 16QAM CH-Middle



LTE Band 2 15MHz 16QAM CH-High



LTE Band 2 20MHz 16QAM CH-High





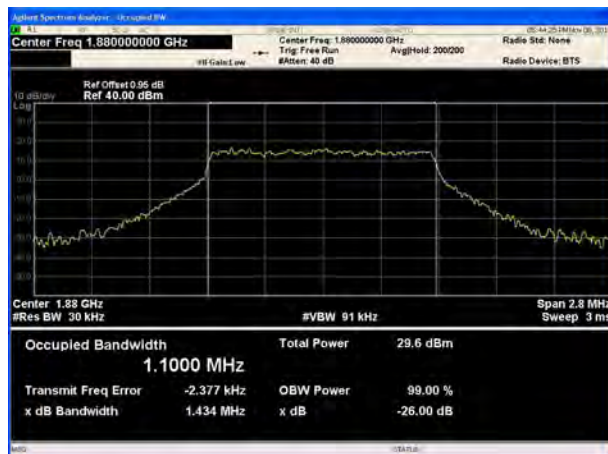
LTE Band 2 1.4MHz 64QAM CH-Low



LTE Band 2 3MHz 64QAM CH-Low



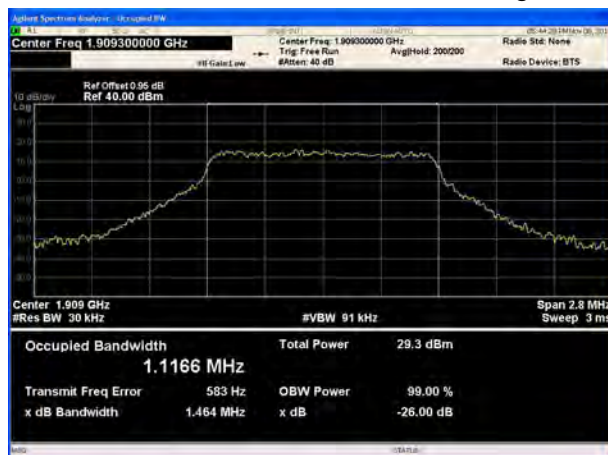
LTE Band 2 1.4MHz 64QAM CH-Middle



LTE Band 2 3MHz 64QAM CH-Middle



LTE Band 2 1.4MHz 64QAM CH-High

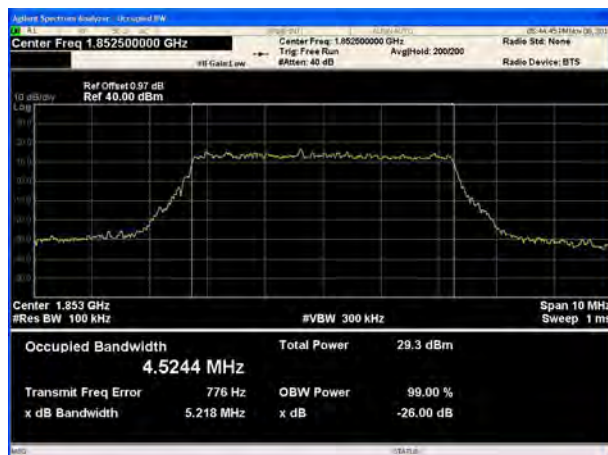


LTE Band 2 3MHz 64QAM CH-High

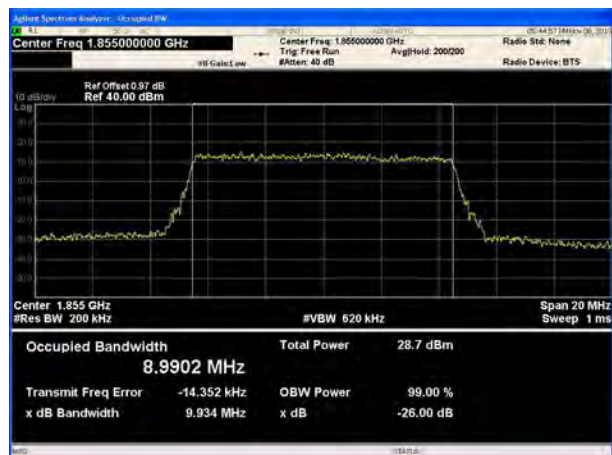




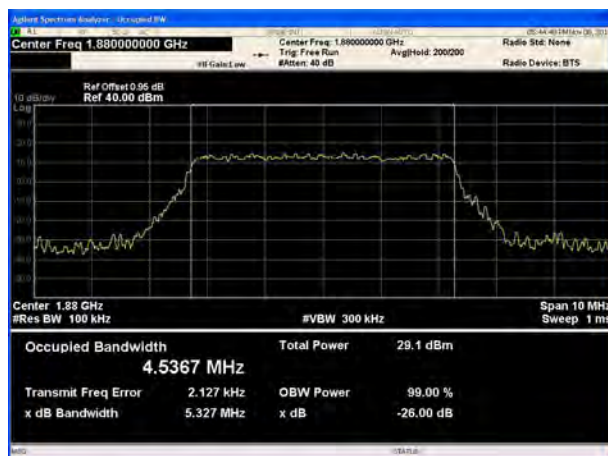
LTE Band 2 5MHz 64QAM CH-Low



LTE Band 2 10MHz 64QAM CH-Low



LTE Band 2 5MHz 64QAM CH-Middle



LTE Band 2 10MHz 64QAM CH-Middle



LTE Band 2 5MHz 64QAM CH-High

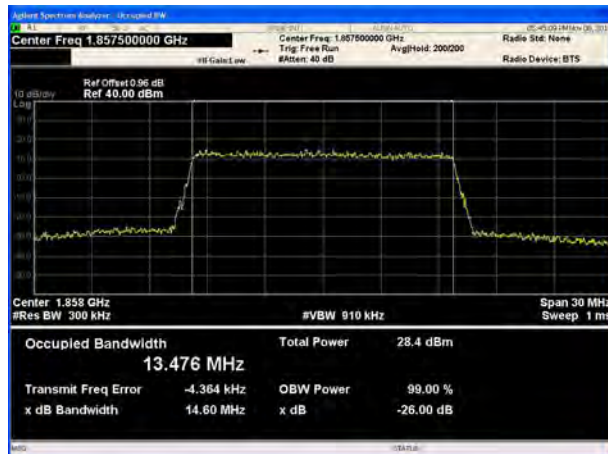


LTE Band 2 10MHz 64QAM CH-High





LTE Band 2 15MHz 64QAM CH-Low



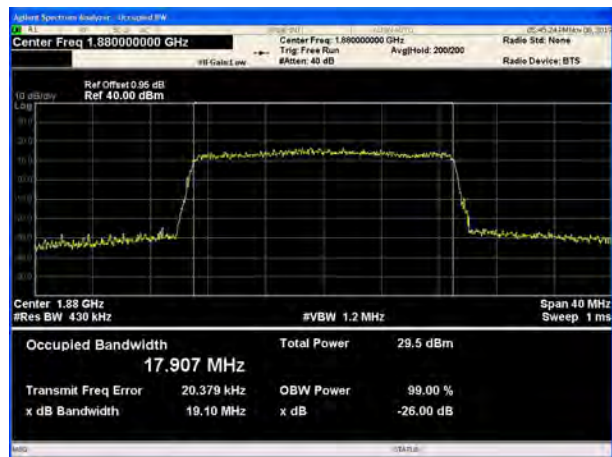
LTE Band 2 20MHz 64QAM CH-Low



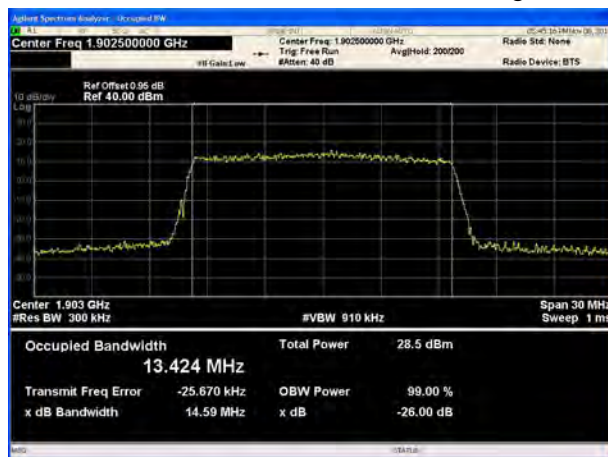
LTE Band 2 15MHz 64QAM CH-Middle



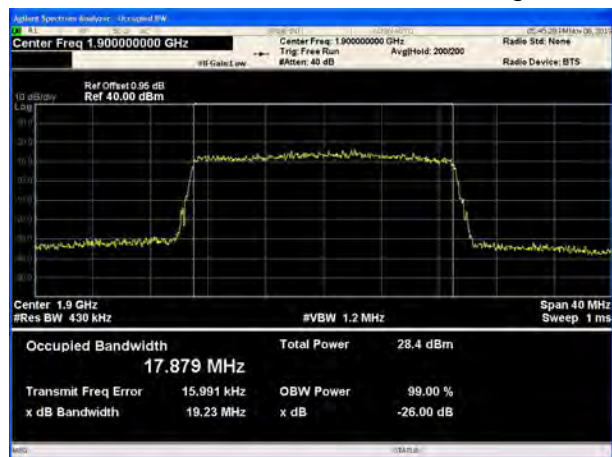
LTE Band 2 20MHz 64QAM CH-Middle



LTE Band 2 15MHz 64QAM CH-High



LTE Band 2 20MHz 64QAM CH-High





LTE Band 25 1.4MHz QPSK CH-Low



LTE Band 25 3MHz QPSK CH-Low



LTE Band 25 1.4MHz QPSK CH-Middle



LTE Band 25 3MHz QPSK CH-Middle



LTE Band 25 1.4MHz QPSK CH-High



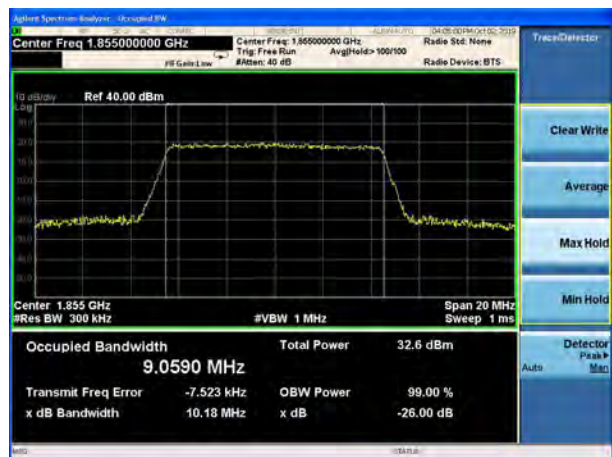
LTE Band 25 3MHz QPSK CH-High



LTE Band 25 5MHz QPSK CH-Low



LTE Band 25 10MHz QPSK CH-Low



LTE Band 25 5MHz QPSK CH-Middle



LTE Band 25 10MHz QPSK CH-Middle



LTE Band 25 5MHz QPSK CH-High



LTE Band 25 10MHz QPSK CH-High



LTE Band 25 15MHz QPSK CH-Low



LTE Band 25 20MHz QPSK CH-Low



LTE Band 25 15MHz QPSK CH-Middle



LTE Band 25 20MHz QPSK CH-Middle



LTE Band 25 15MHz QPSK CH-High



LTE Band 25 20MHz QPSK CH-High



LTE Band 25 1.4MHz 16QAM CH-Low



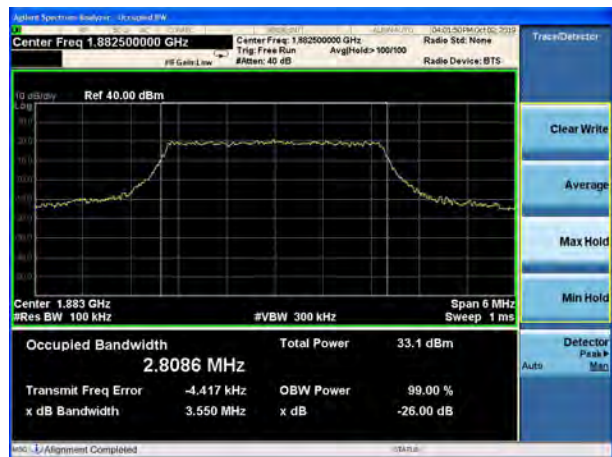
LTE Band 25 3MHz 16QAM CH-Low



LTE Band 25 1.4MHz 16QAM CH-Middle



LTE Band 25 3MHz 16QAM CH-Middle



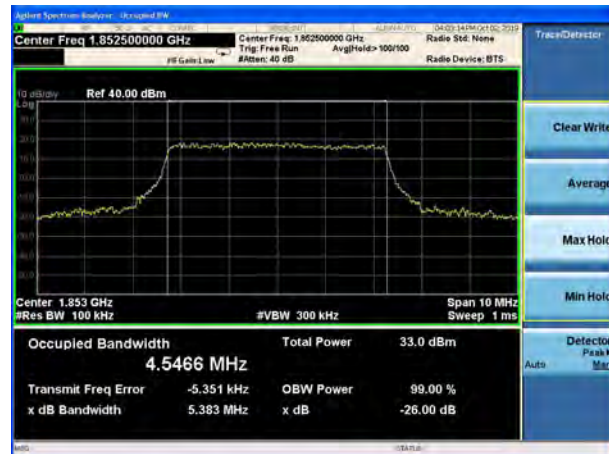
LTE Band 25 1.4MHz 16QAM CH-High



LTE Band 25 3MHz 16QAM CH-High



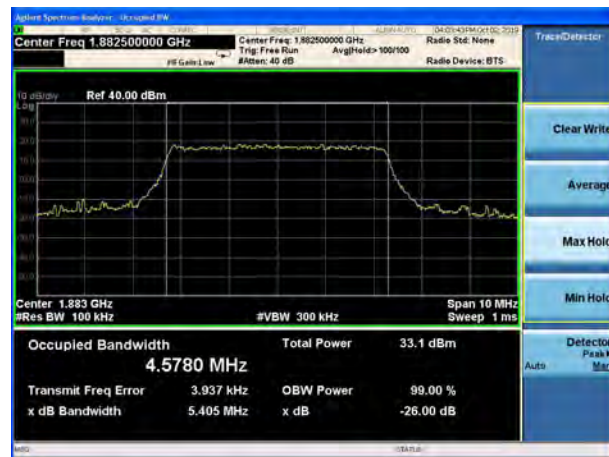
LTE Band 25 5MHz 16QAM CH-Low



LTE Band 25 10MHz 16QAM CH-Low



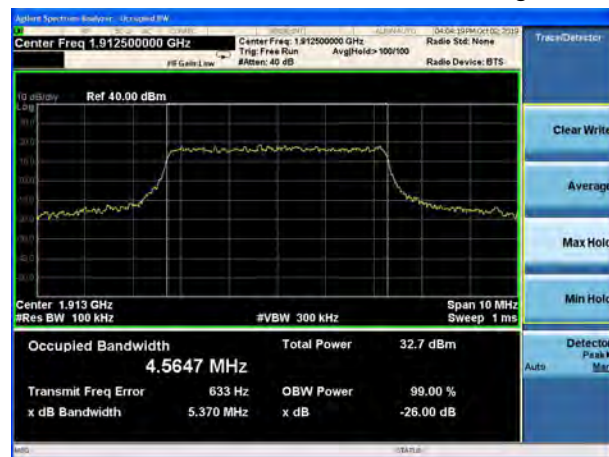
LTE Band 25 5MHz 16QAM CH-Middle



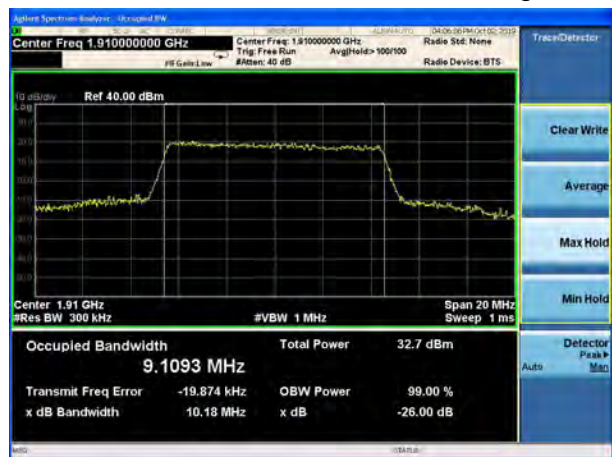
LTE Band 25 10MHz 16QAM CH-Middle



LTE Band 25 5MHz 16QAM CH-High



LTE Band 25 10MHz 16QAM CH-High





LTE Band 25 15MHz 16QAM CH-Low



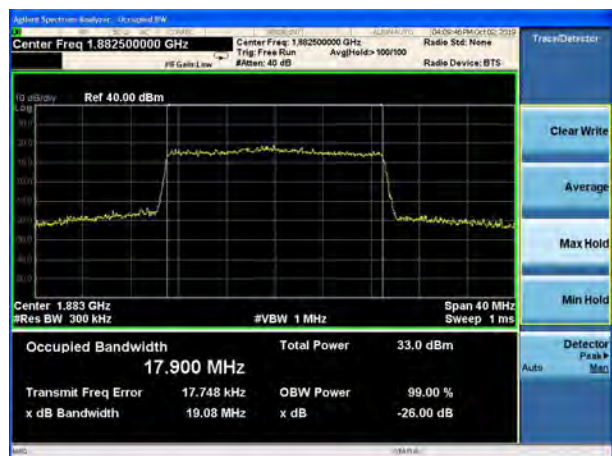
LTE Band 25 20MHz 16QAM CH-Low



LTE Band 25 15MHz 16QAM CH-Middle



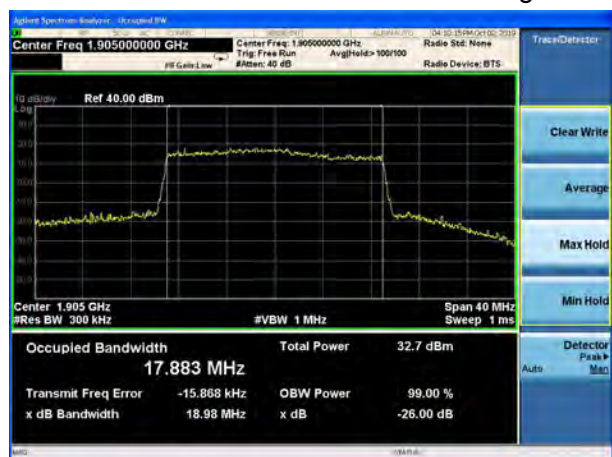
LTE Band 25 20MHz 16QAM CH-Middle



LTE Band 25 15MHz 16QAM CH-High



LTE Band 25 20MHz 16QAM CH-High

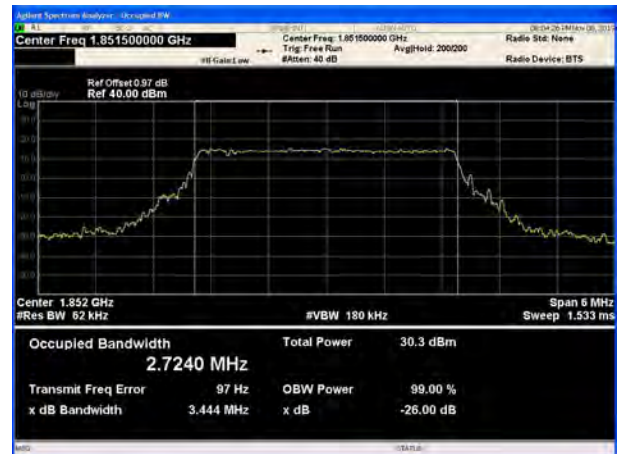




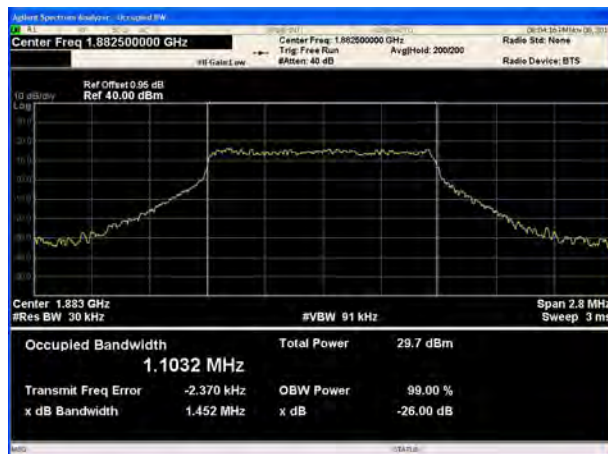
LTE Band 25 1.4MHz 64QAM CH-Low



LTE Band 25 3MHz 64QAM CH-Low



LTE Band 25 1.4MHz 64QAM CH-Middle



LTE Band 25 3MHz 64QAM CH-Middle



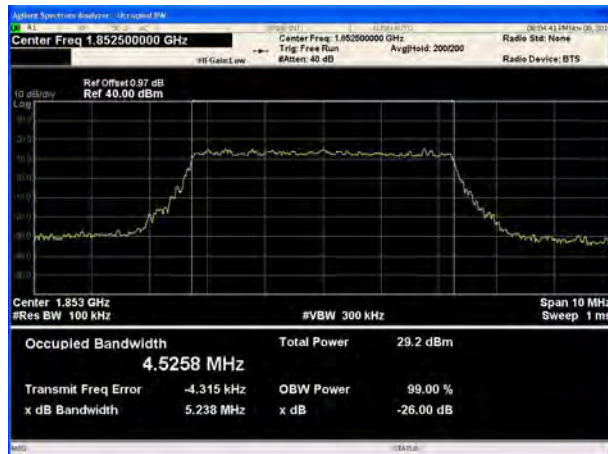
LTE Band 25 1.4MHz 64QAM CH-High



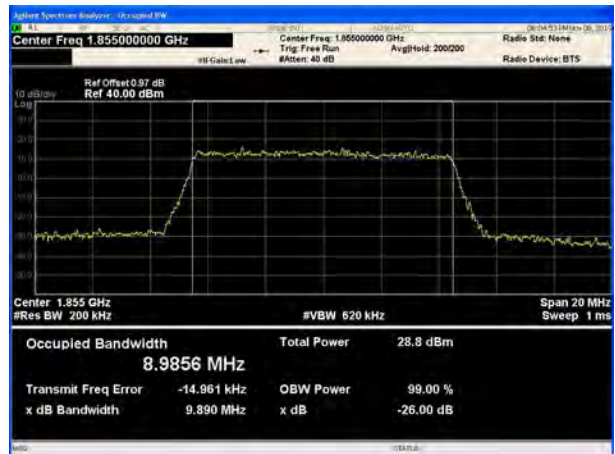
LTE Band 25 3MHz 64QAM CH-High



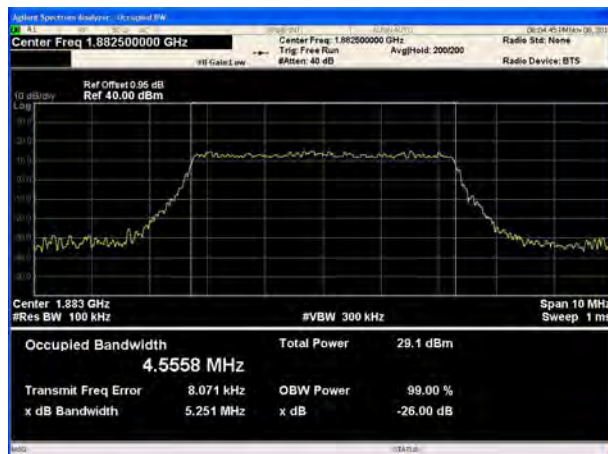
LTE Band 25 5MHz 64QAM CH-Low



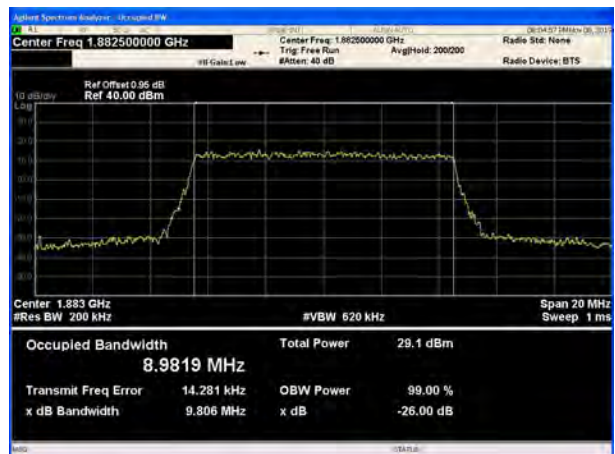
LTE Band 25 10MHz 64QAM CH-Low



LTE Band 25 5MHz 64QAM CH-Middle



LTE Band 25 10MHz 64QAM CH-Middle



LTE Band 25 5MHz 64QAM CH-High

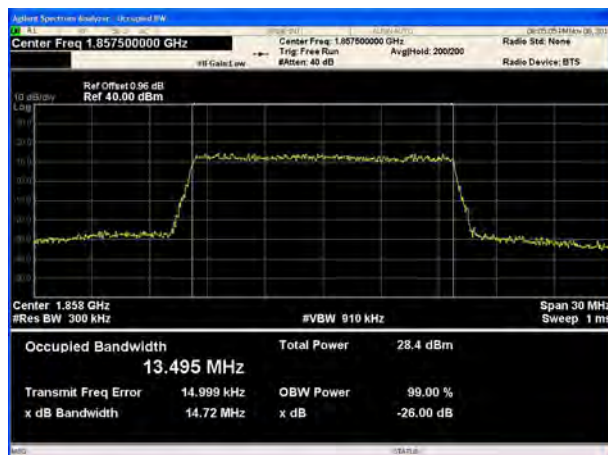


LTE Band 25 10MHz 64QAM CH-High

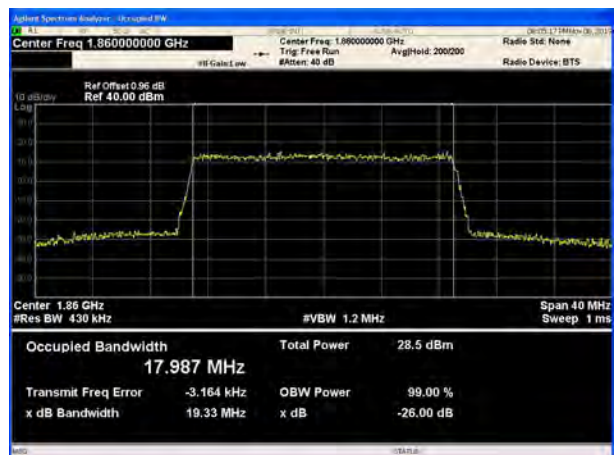




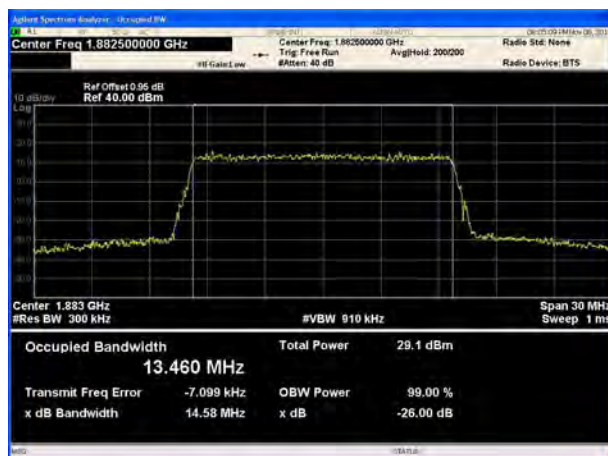
LTE Band 25 15MHz 64QAM CH-Low



LTE Band 25 20MHz 64QAM CH-Low



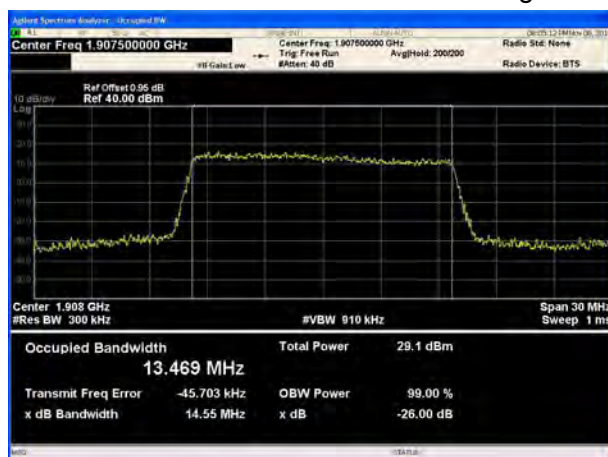
LTE Band 25 15MHz 64QAM CH-Middle



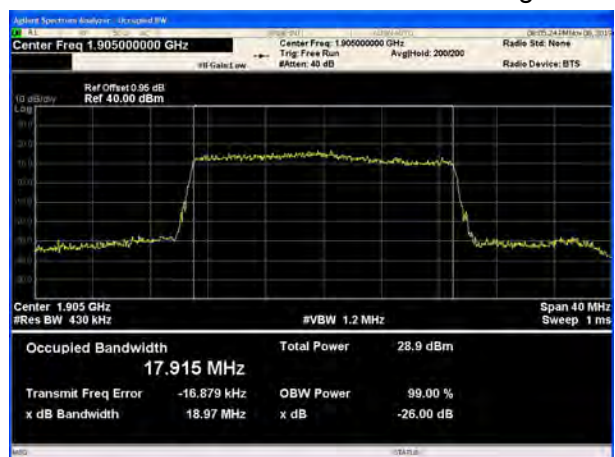
LTE Band 25 20MHz 64QAM CH-Middle



LTE Band 25 15MHz 64QAM CH-High



LTE Band 25 20MHz 64QAM CH-High



5.3.Band Edge Compliance

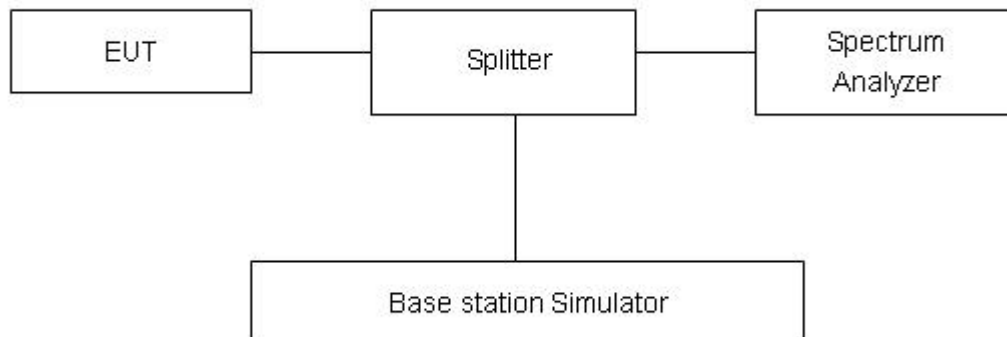
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The Average detector is used and RBW is set to 15kHz, VBW is set to 51kHz for LTE Band 2/25(1.4MHz), RBW is set to 30kHz,VBW is set to 100kHz for LTE Band 2/25 (3MHz), RBW is set to 51kHz,VBW is set to 160kHz for LTE Band 2/25 (5MHz), RBW is set to 100kHz,VBW is set to 300kHz for LTE Band 2/25(10MHz), RBW is set to 150kHz,VBW is set to 510kHz for LTE Band 2/25(15MHz), RBW is set to 200kHz,VBW is set to 620kHz for LTE Band 2/25(20MHz). Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10} (P)$ dB.”

Limit	-13 dBm
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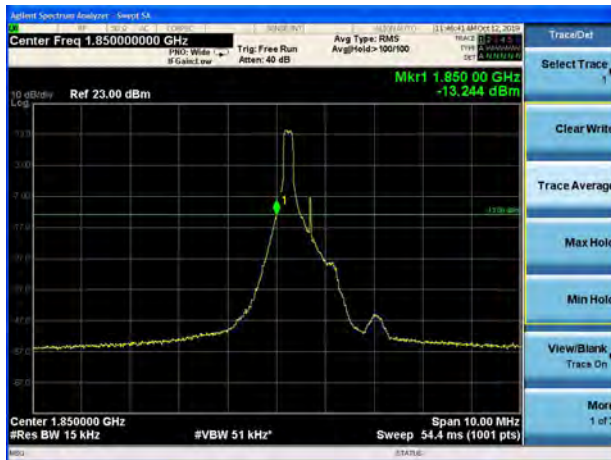
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=0.684$ dB.

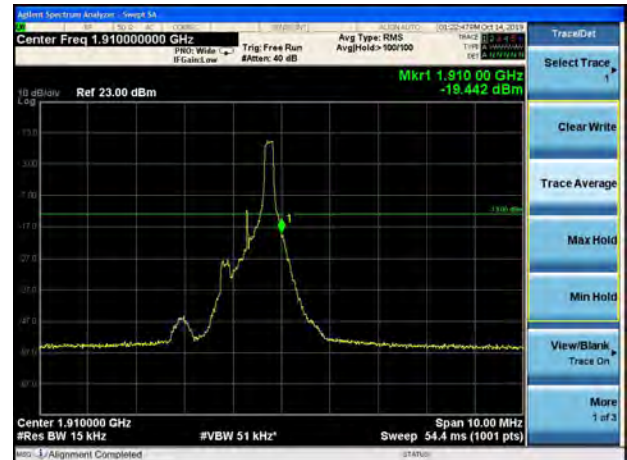


Test Result:

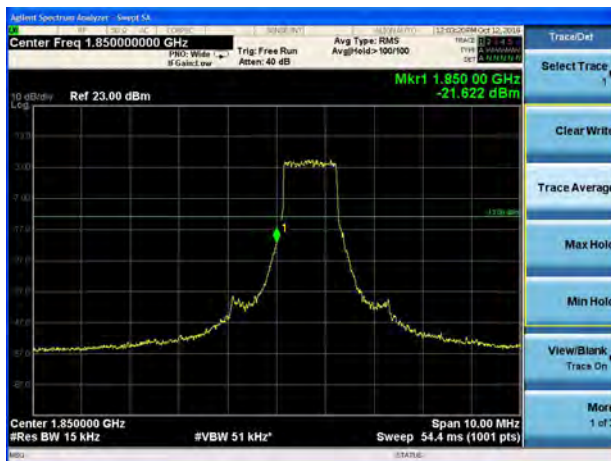
LTE Band 2 1.4MHz QPSK 1RB CH-Low



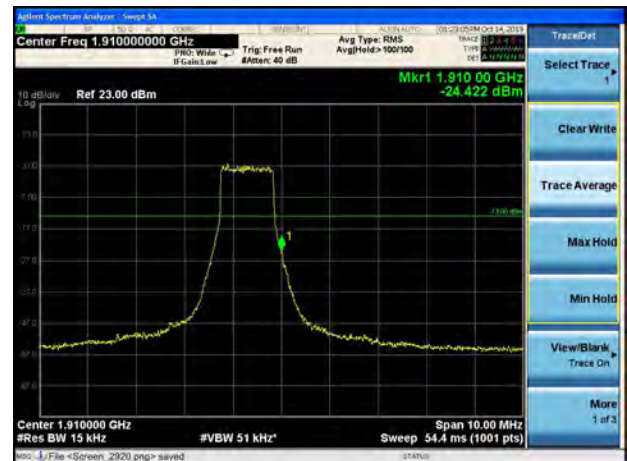
LTE Band 2 1.4MHz QPSK 1RB CH-High



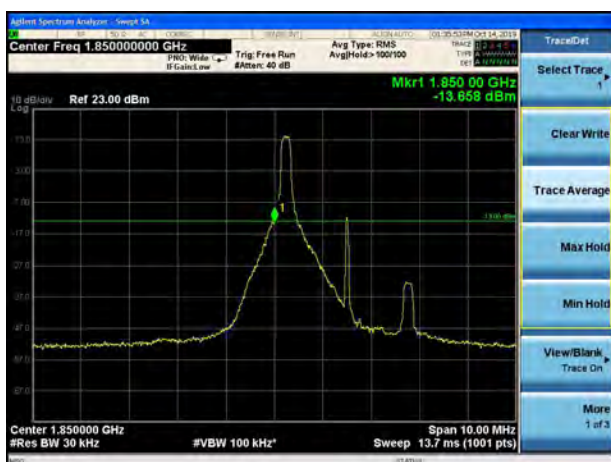
LTE Band 2 1.4MHz QPSK 100%RB CH-Low



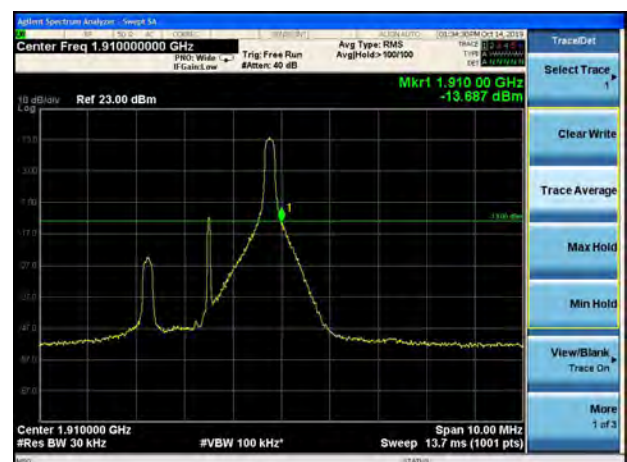
LTE Band 2 1.4MHz QPSK 100%RB CH-High



LTE Band 2 3MHz QPSK 1RB CH-Low



LTE Band 2 3MHz QPSK 1RB CH-High

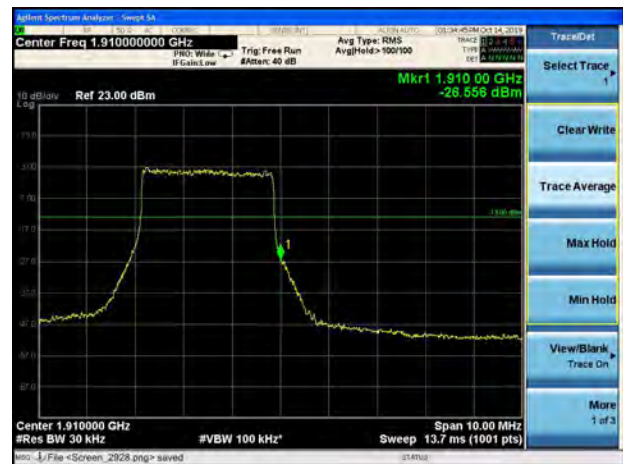




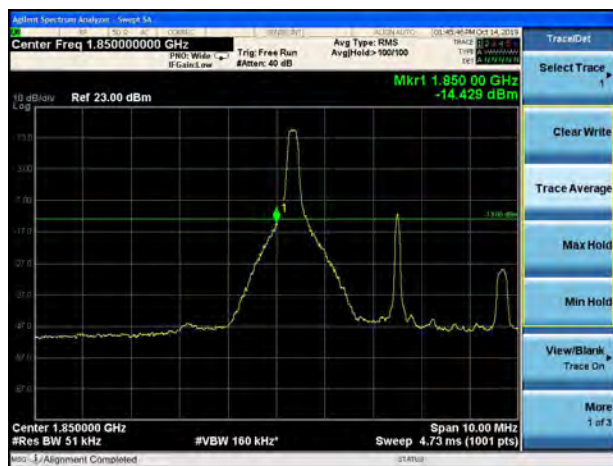
LTE Band 2 3MHz QPSK 100%RB CH-Low



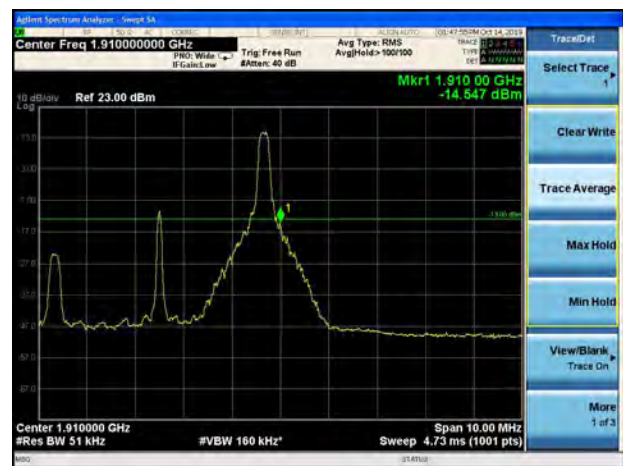
LTE Band 2 3MHz QPSK 100%RB CH-High



LTE Band 2 5MHz QPSK 1RB CH-Low



LTE Band 2 5MHz QPSK 1RB CH-High



LTE Band 2 5MHz QPSK 100%RB CH-Low

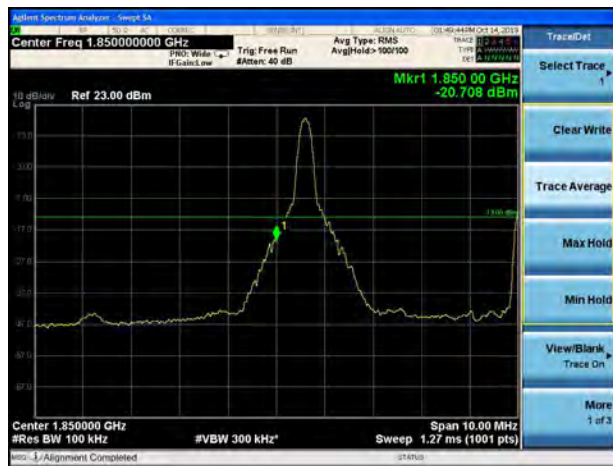


LTE Band 2 5MHz QPSK 100%RB CH-High





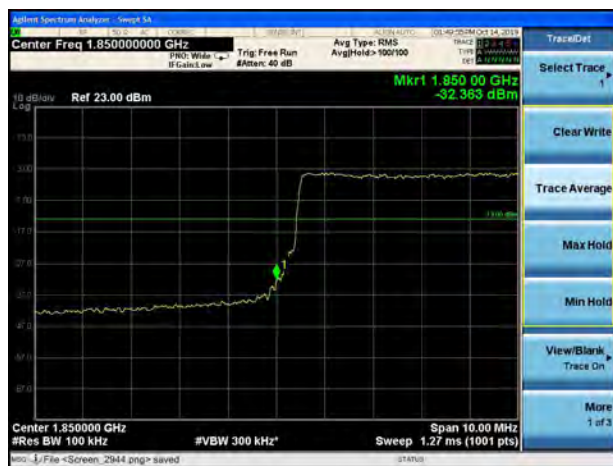
LTE Band 2 10MHz QPSK 1RB CH-Low



LTE Band 2 10MHz QPSK 1RB CH-High



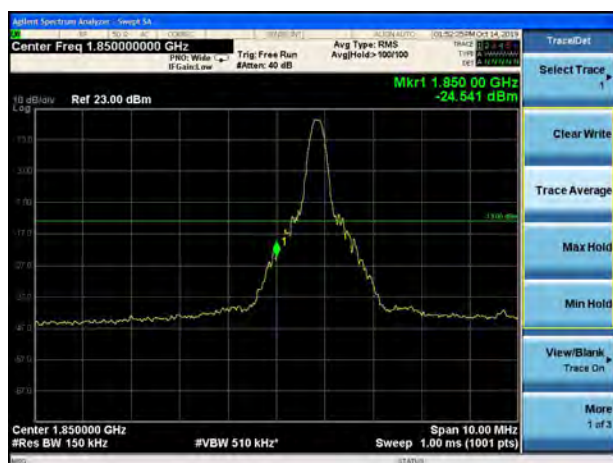
LTE Band 2 10MHz QPSK 100%RB CH-Low



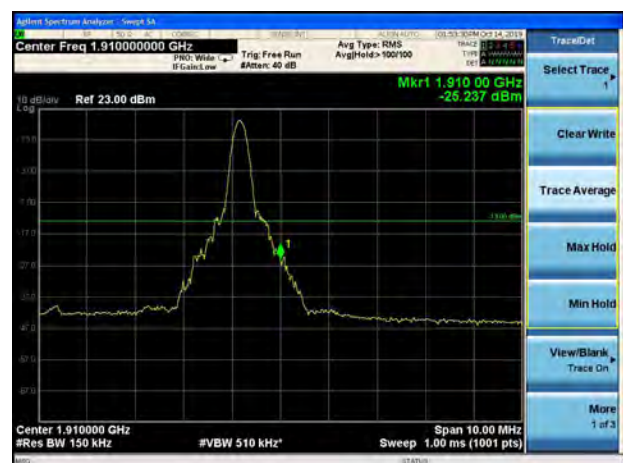
LTE Band 2 10MHz QPSK 100%RB CH-High



LTE Band 2 15MHz QPSK 1RB CH-Low



LTE Band 2 15MHz QPSK 1RB CH-High



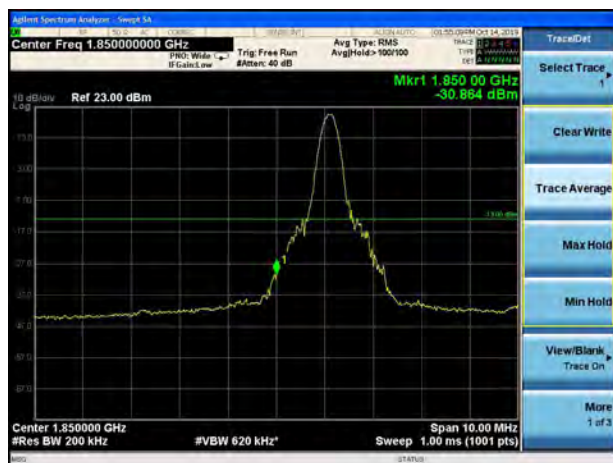
LTE Band 2 15MHz QPSK 100%RB CH-Low



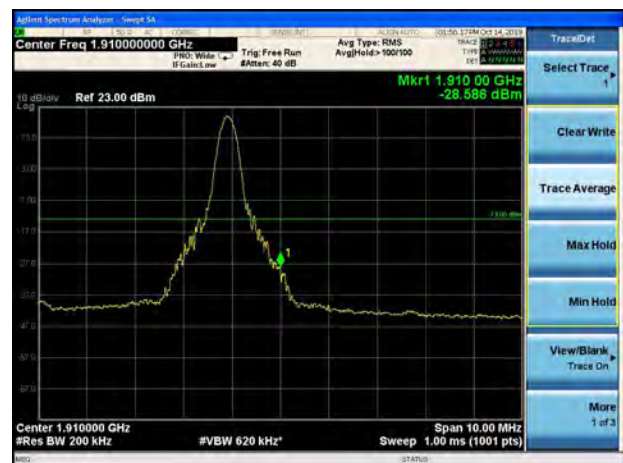
LTE Band 2 15MHz QPSK 100%RB CH-High



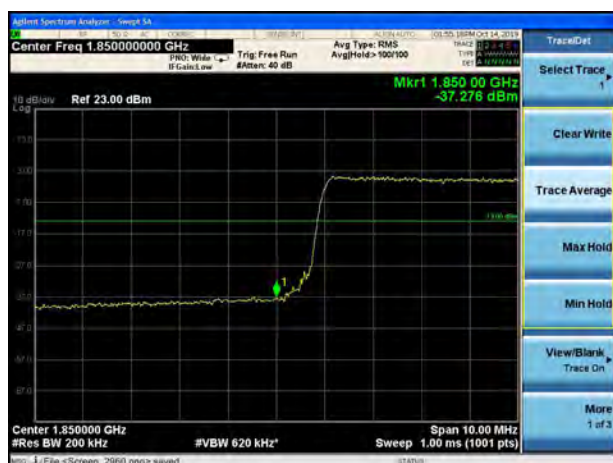
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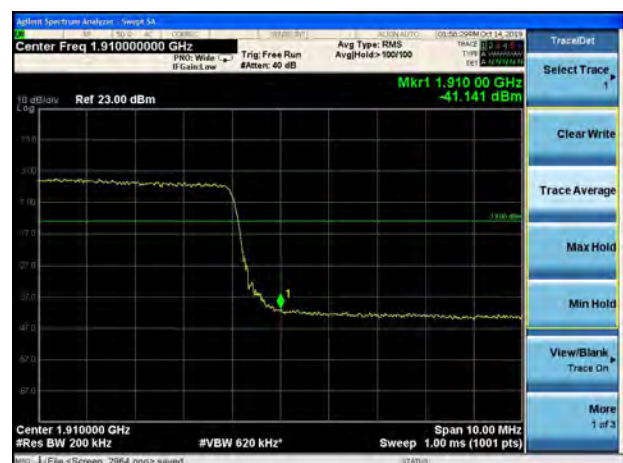
LTE Band 2 20MHz QPSK 1RB CH-High



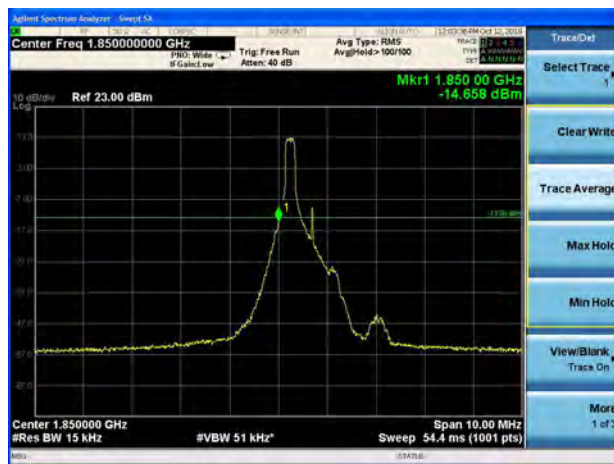
LTE Band 2 20MHz QPSK 100%RB CH-Low



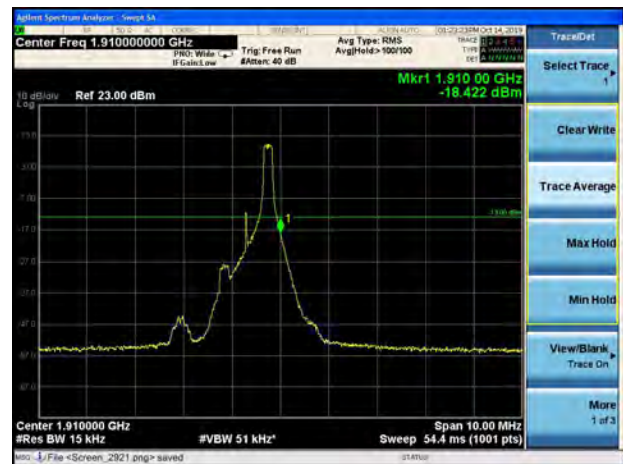
LTE Band 2 20MHz QPSK 100%RB CH-High



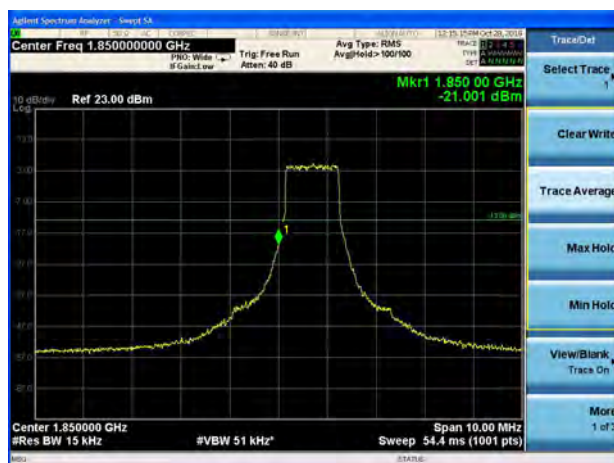
LTE Band 2 1.4MHz 16QAM 1RB CH-Low



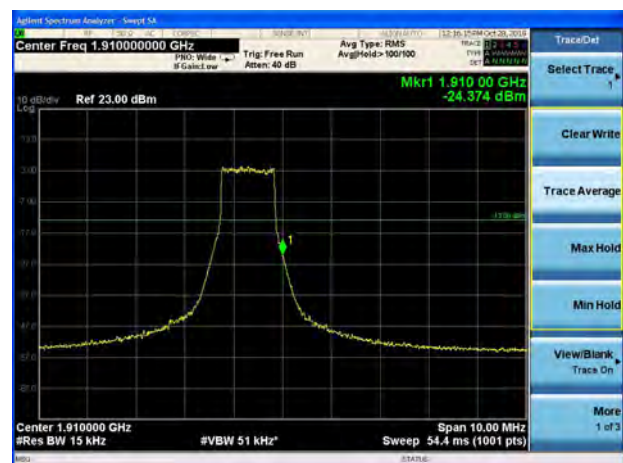
LTE Band 2 1.4MHz 16QAM 1RB CH-High



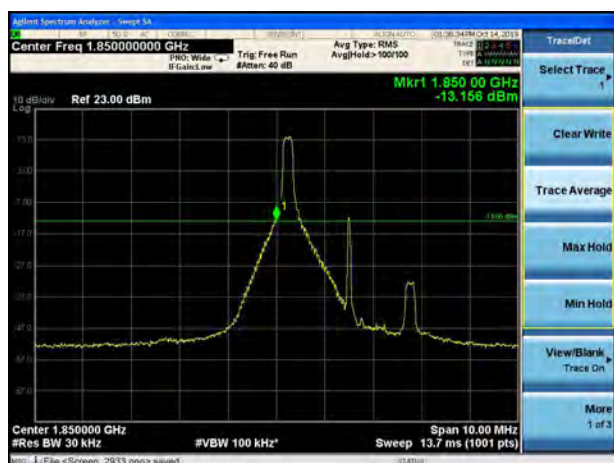
LTE Band 2 1.4MHz 16QAM 100%RB CH-Low



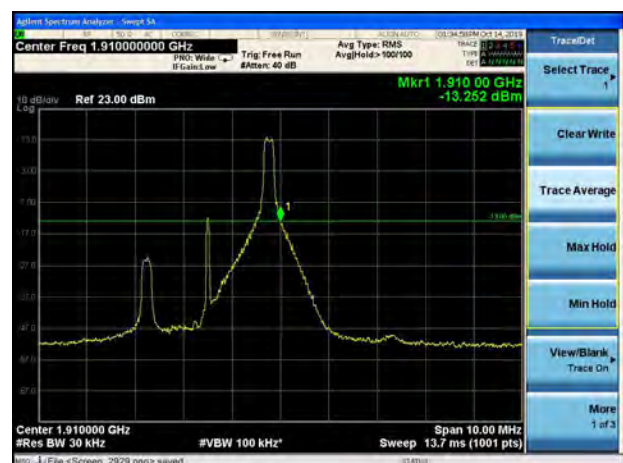
LTE Band 2 1.4MHz 16QAM 100%RB CH-High



LTE Band 2 3MHz 16QAM 1RB CH-Low

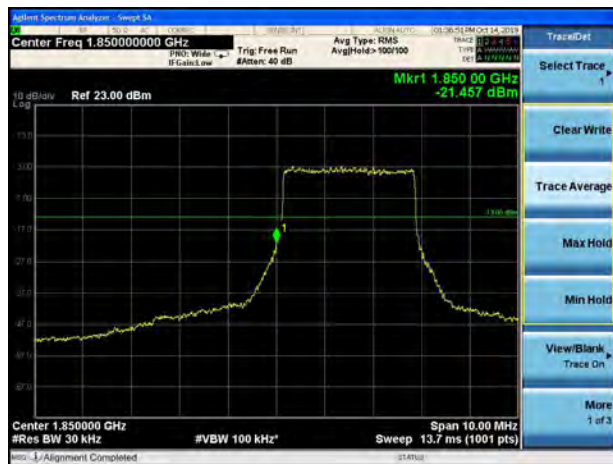


LTE Band 2 3MHz 16QAM 1RB CH-High

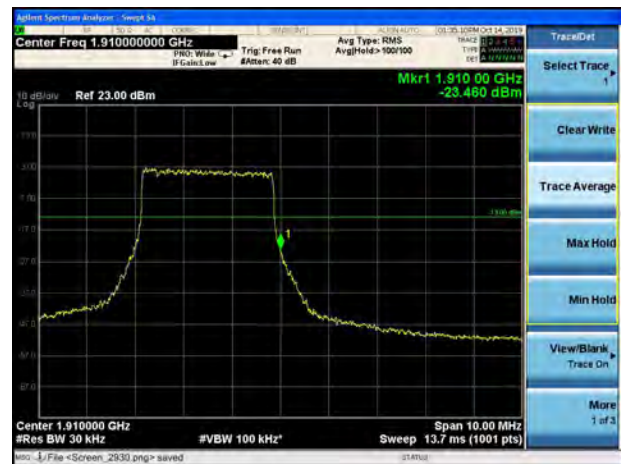




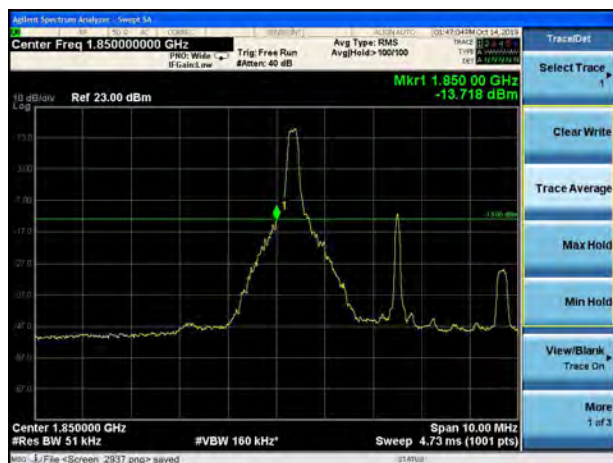
LTE Band 2 3MHz 16QAM 100%RB CH-Low



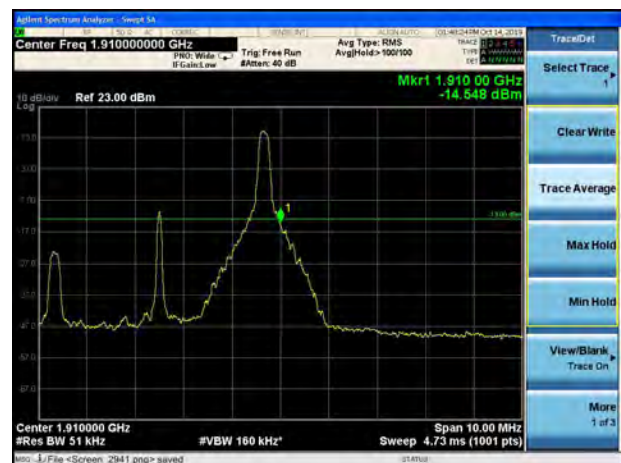
LTE Band 2 3MHz 16QAM 100%RB CH-High



LTE Band 2 5MHz 16QAM 1RB CH-Low



LTE Band 2 5MHz 16QAM 1RB CH-High



LTE Band 2 5MHz 16QAM 100%RB CH-Low

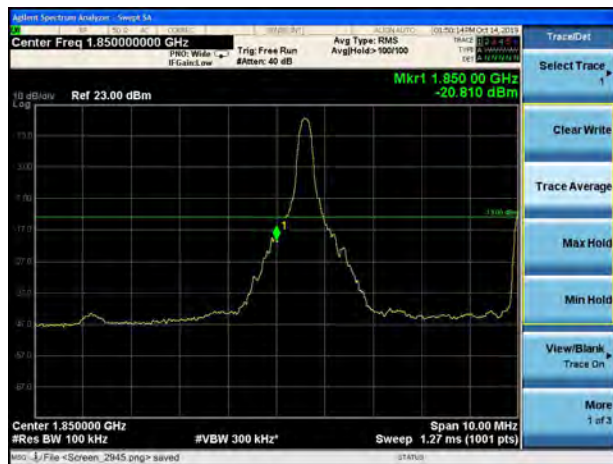


LTE Band 2 5MHz 16QAM 100%RB CH-High





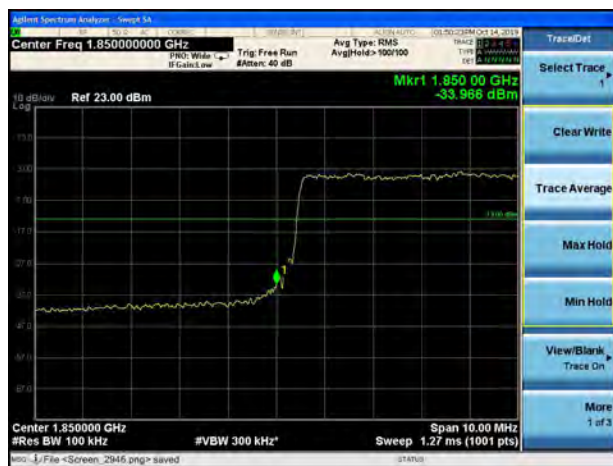
LTE Band 2 10MHz 16QAM 1RB CH-Low



LTE Band 2 10MHz 16QAM 1RB CH-High



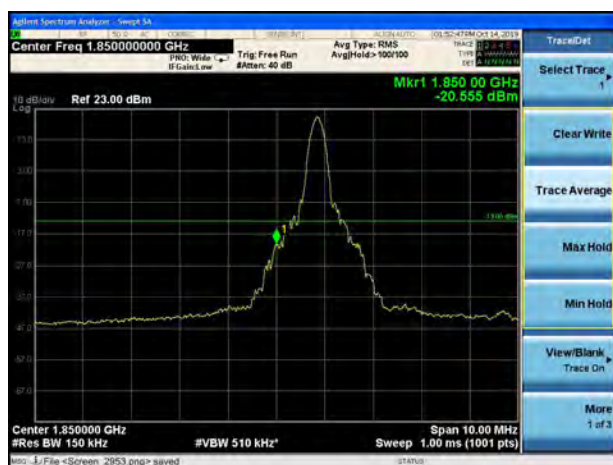
LTE Band 2 10MHz 16QAM 100%RB CH-Low



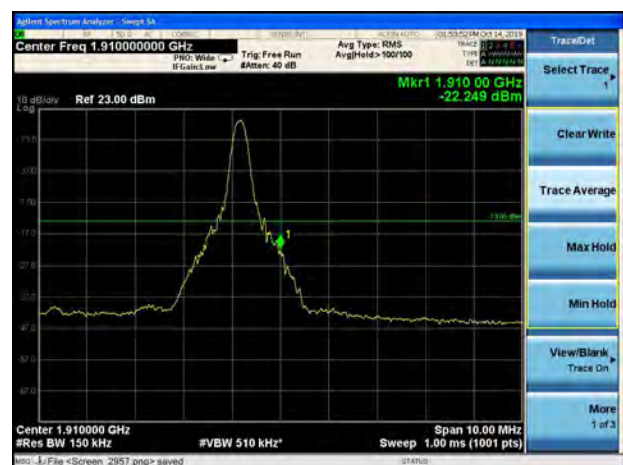
LTE Band 2 10MHz 16QAM 100%RB CH-High



LTE Band 2 15MHz 16QAM 1RB CH-Low



LTE Band 2 15MHz 16QAM 1RB CH-High





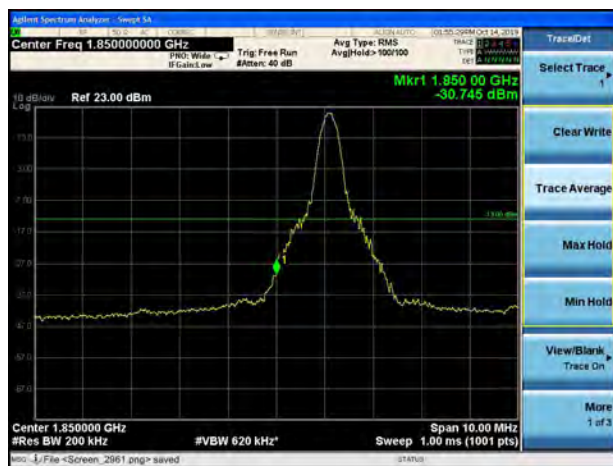
LTE Band 2 15MHz 16QAM 100%RB CH-Low



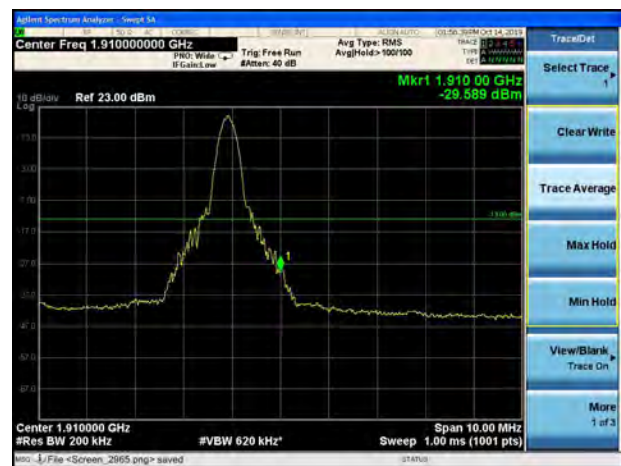
LTE Band 2 15MHz 16QAM 100%RB CH-High



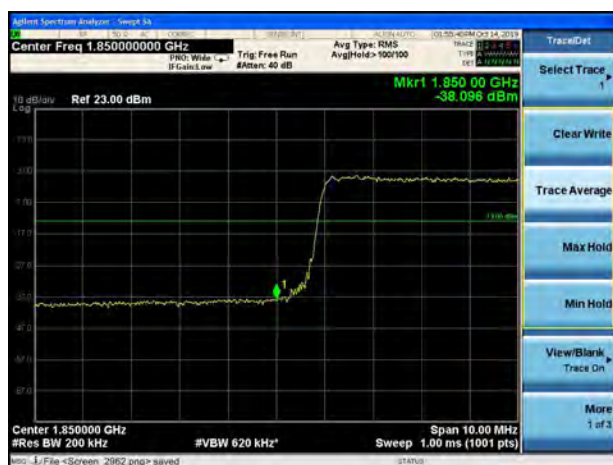
LTE Band 2 20MHz 16QAM 1RB CH-Low



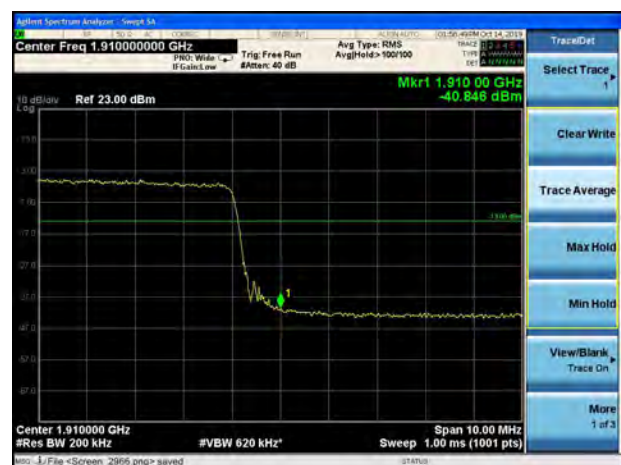
LTE Band 2 20MHz 16QAM 1RB CH-High



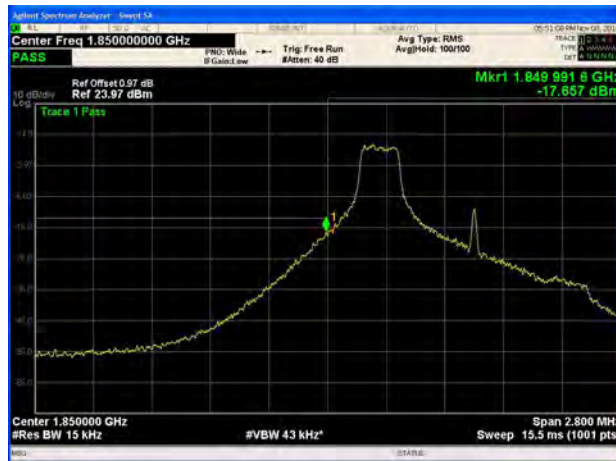
LTE Band 2 20MHz 16QAM 100%RB CH-Low



LTE Band 2 20MHz 16QAM 100%RB CH-High



LTE Band 2 1.4MHz 64QAM 1RB CH-Low



LTE Band 2 1.4MHz 64QAM 1RB CH-High



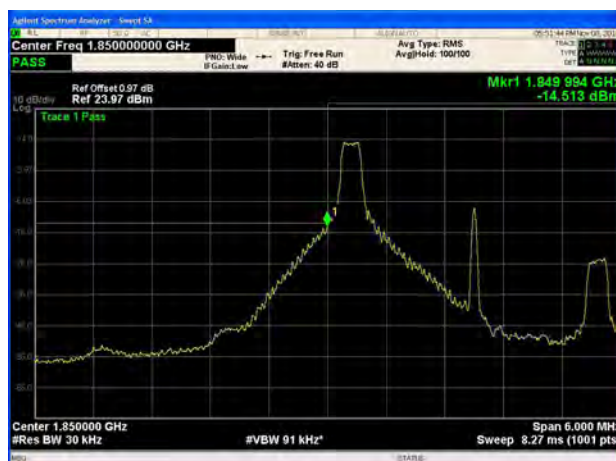
LTE Band 2 1.4MHz 64QAM 100%RB CH-Low



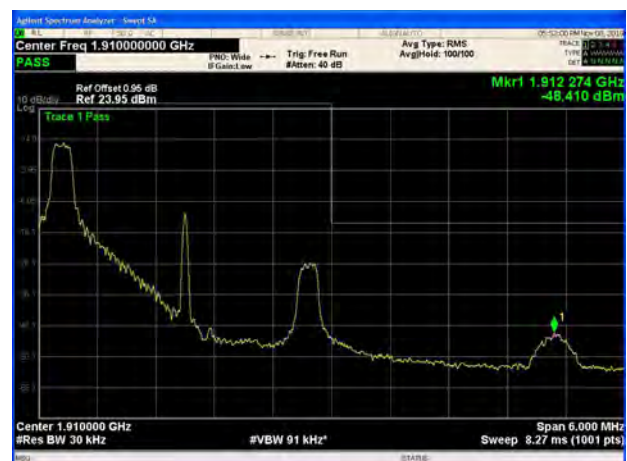
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LTE Band 2 3MHz 64QAM 1RB CH-Low



LTE Band 2 3MHz 64QAM 1RB CH-High

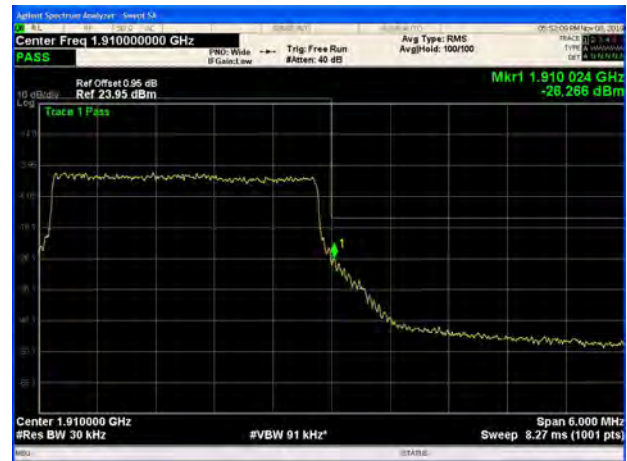




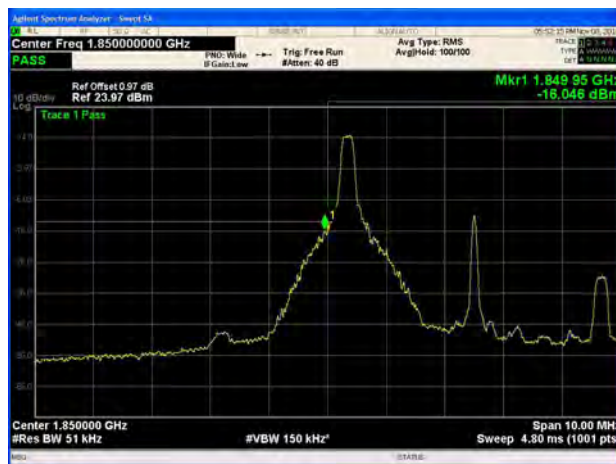
LTE Band 2 3MHz 64QAM 100%RB CH-Low



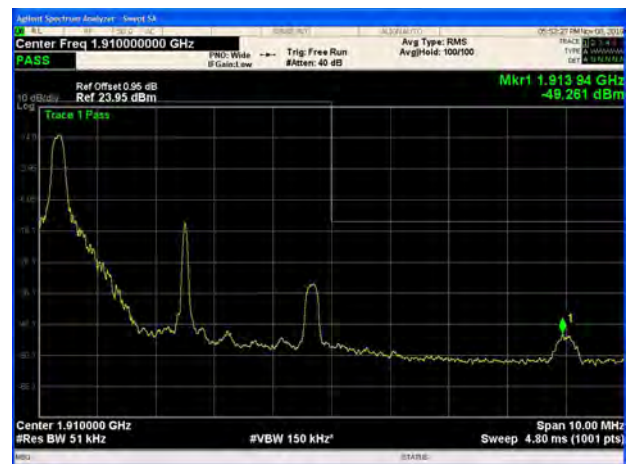
LTE Band 2 3MHz 64QAM 100%RB CH-High



LTE Band 2 5MHz 64QAM 1RB CH-Low



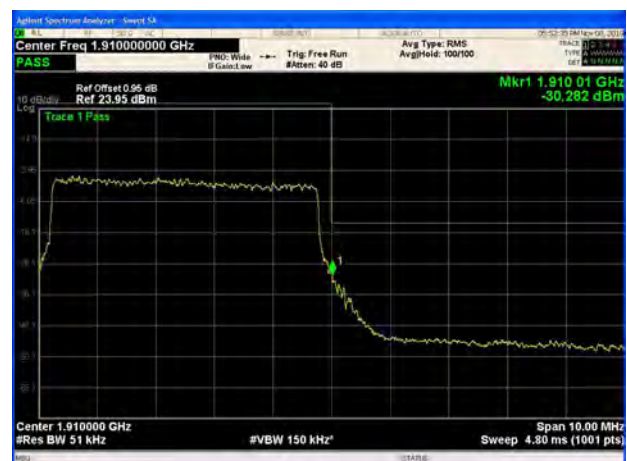
LTE Band 2 5MHz 64QAM 1RB CH-High



LTE Band 2 5MHz 64QAM 100%RB CH-Low

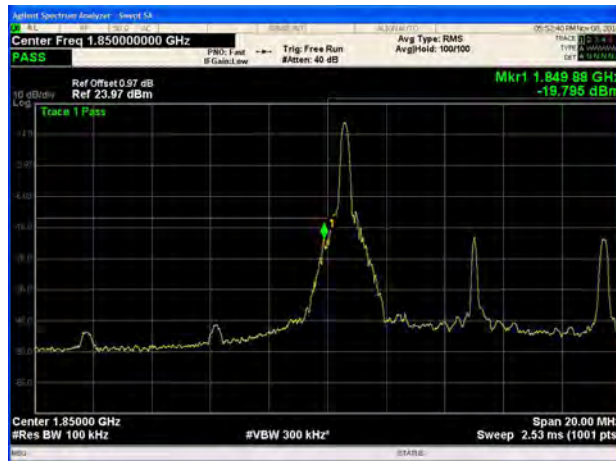


LTE Band 2 5MHz 64QAM 100%RB CH-High





LTE Band 2 10MHz 64QAM 1RB CH-Low



LTE Band 2 10MHz 64QAM 1RB CH-High



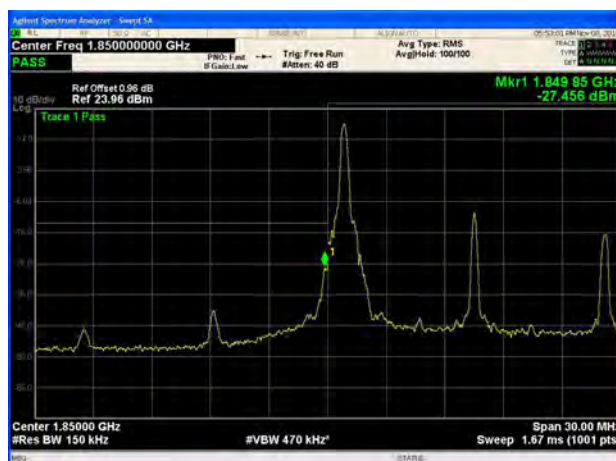
LTE Band 2 10MHz 64QAM 100%RB CH-Low



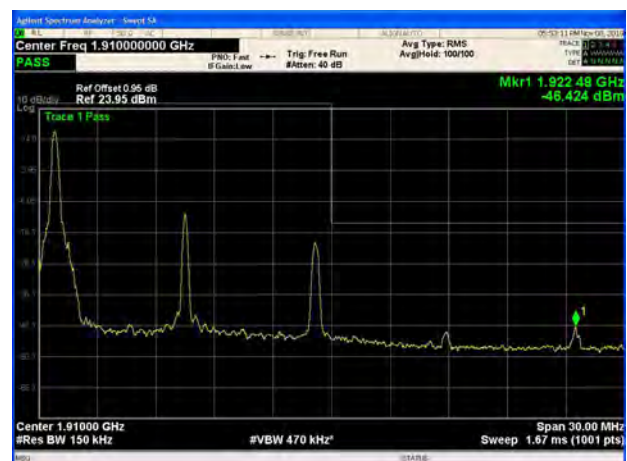
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LTE Band 2 15MHz 64QAM 1RB CH-Low



LTE Band 2 15MHz 64QAM 1RB CH-High





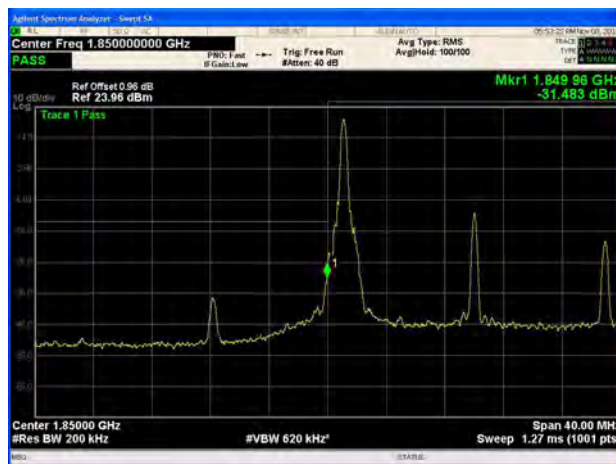
LTE Band 2 15MHz 64QAM 100%RB CH-Low



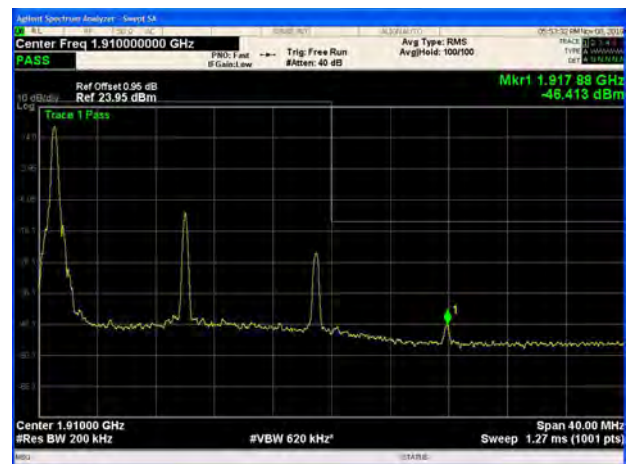
LTE Band 2 15MHz 64QAM 100%RB CH-High



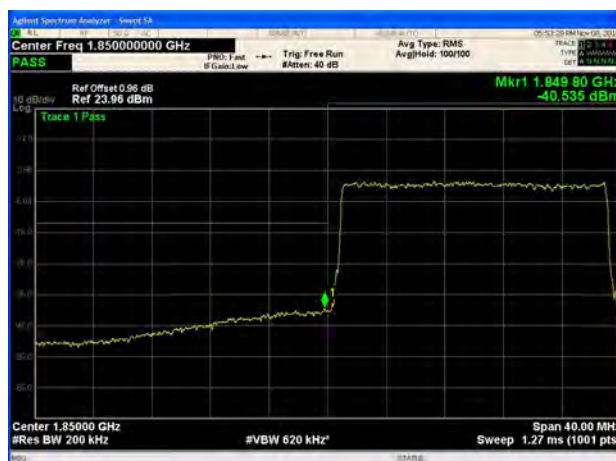
LTE Band 2 20MHz 64QAM 1RB CH-Low



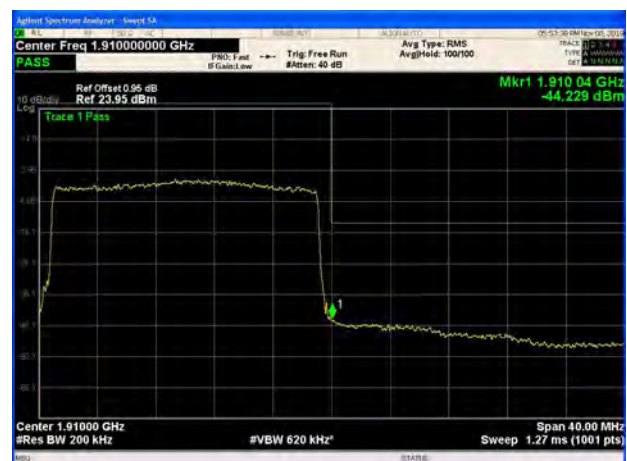
LTE Band 2 20MHz 64QAM 1RB CH-High



LTE Band 2 20MHz 64QAM 100%RB CH-Low

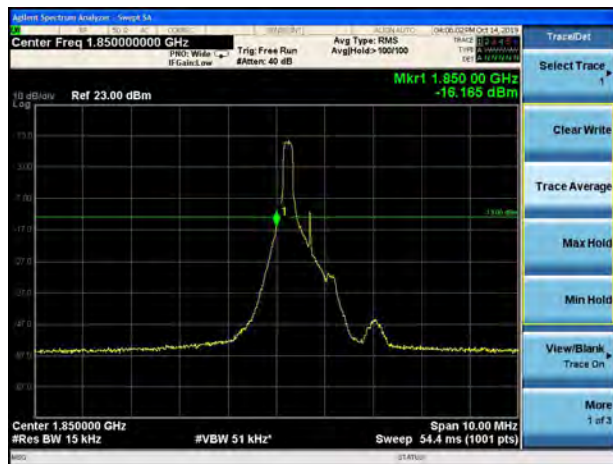


LTE Band 2 20MHz 64QAM 100%RB CH-High

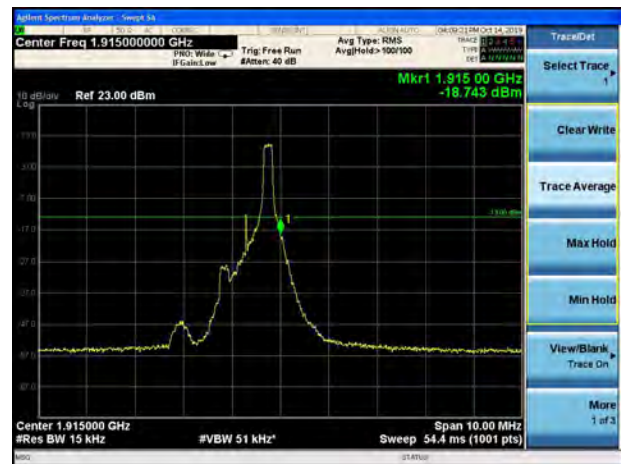




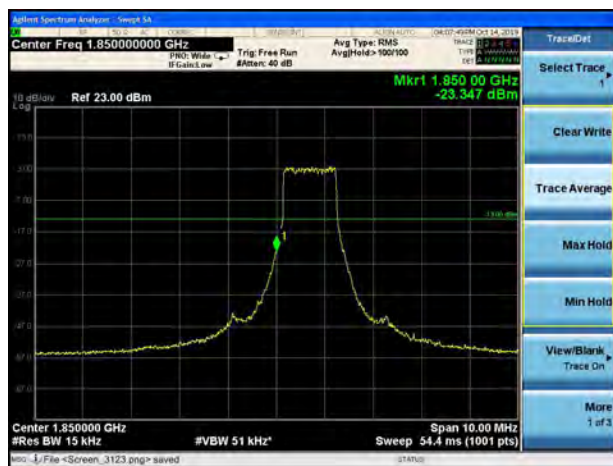
LTE Band 25 1.4MHz QPSK 1RB CH-Low



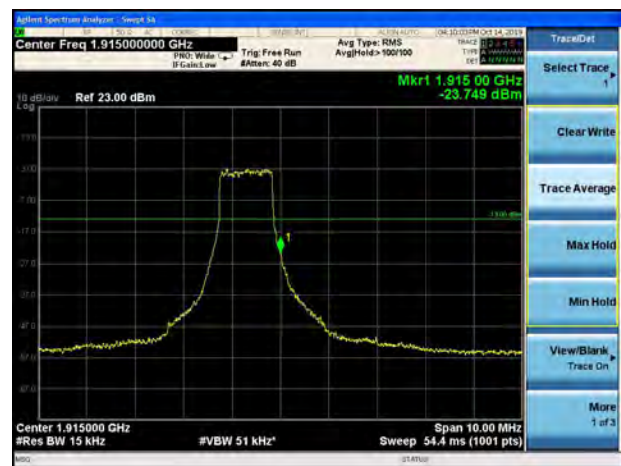
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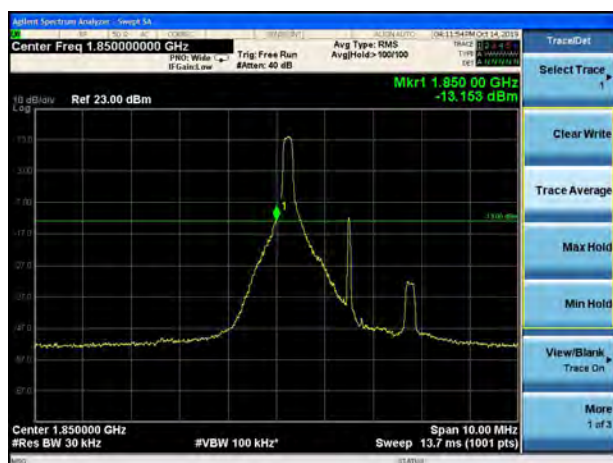
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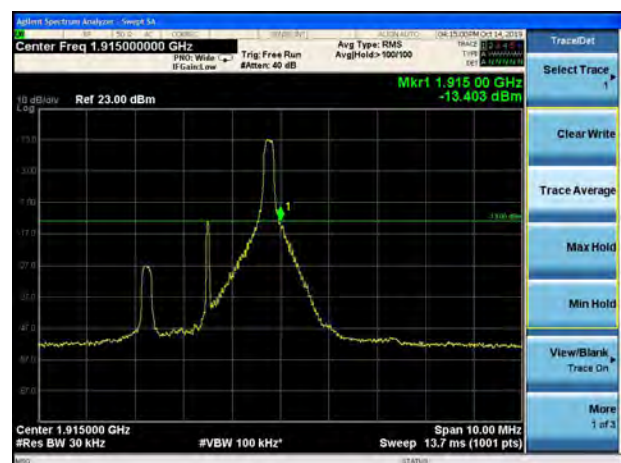
LTE Band 25 1.4MHz QPSK 100%RB CH-High



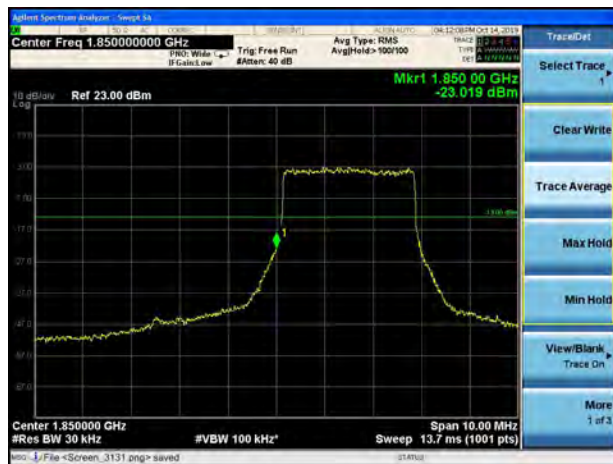
LTE Band 25 3MHz QPSK 1RB CH-Low



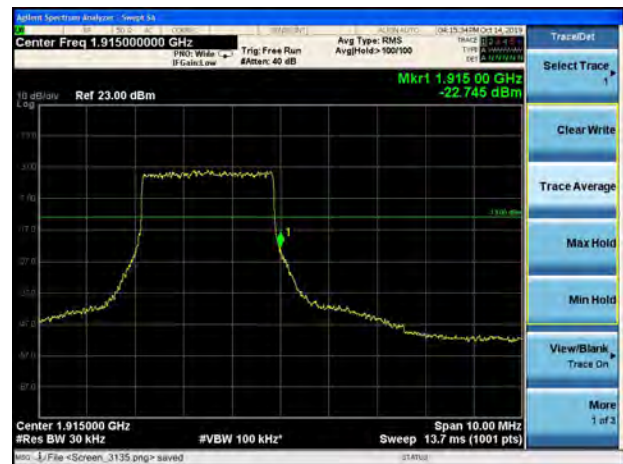
LTE Band 25 3MHz QPSK 1RB CH-High



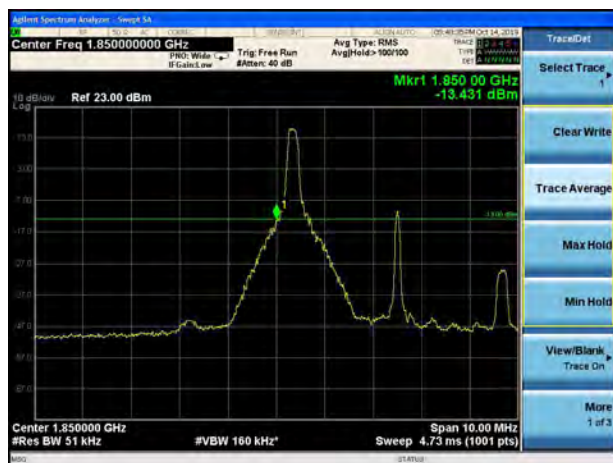
LTE Band 25 3MHz QPSK 100%RB CH-Low



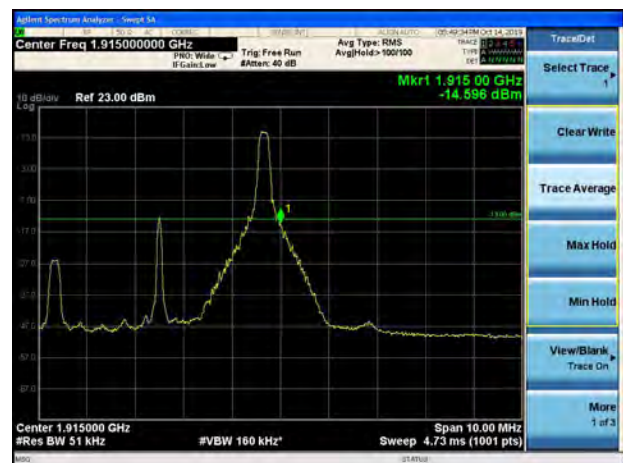
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LTE Band 25 5MHz QPSK 1RB CH-Low



LTE Band 25 5MHz QPSK 1RB CH-High



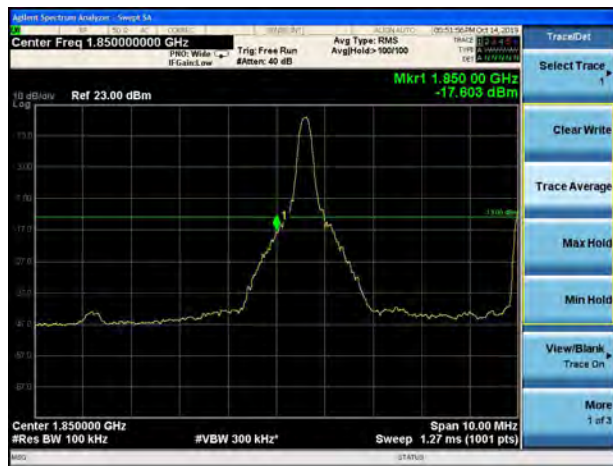
LTE Band 25 5MHz QPSK 100%RB CH-Low



LTE Band 25 5MHz QPSK 100%RB CH-High



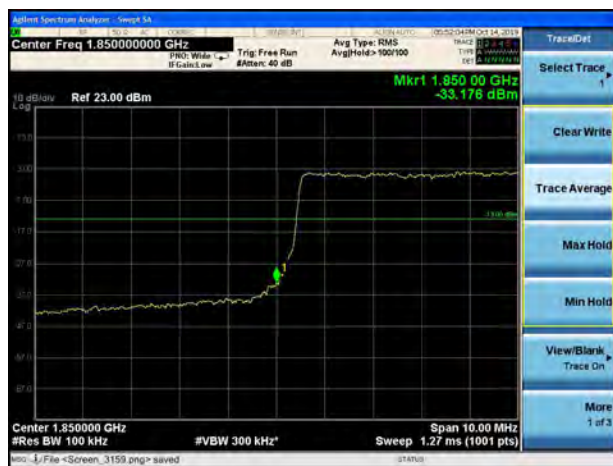
LTE Band 25 10MHz QPSK 1RB CH-Low



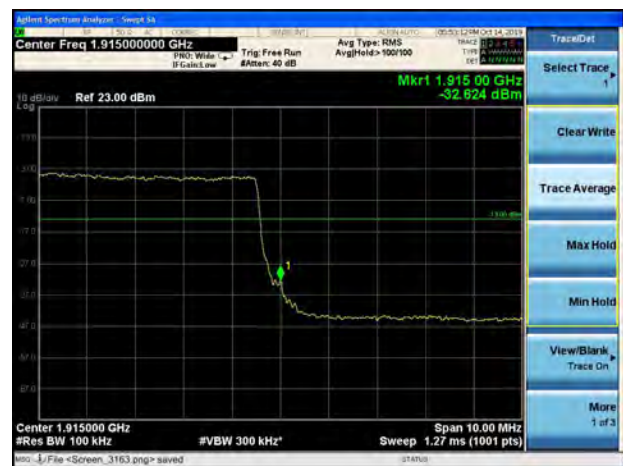
LTE Band 25 10MHz QPSK 1RB CH-High



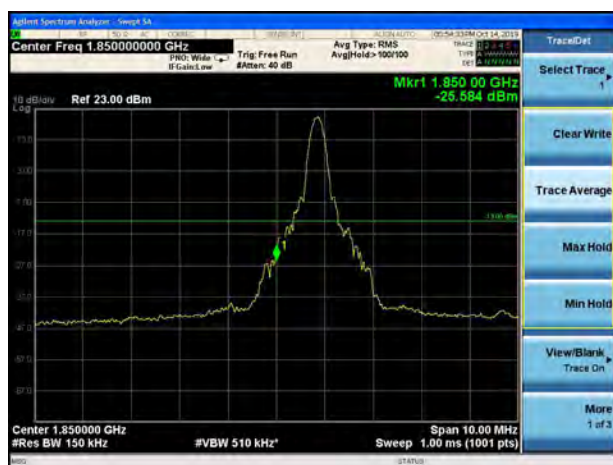
LTE Band 25 10MHz QPSK 100%RB CH-Low



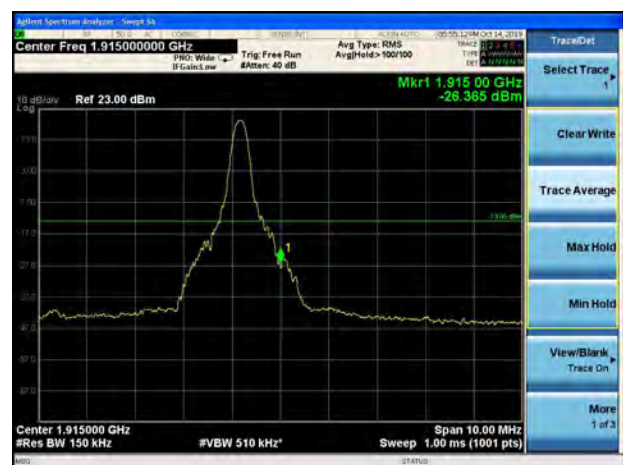
LTE Band 25 10MHz QPSK 100%RB CH-High



LTE Band 25 15MHz QPSK 1RB CH-Low



LTE Band 25 15MHz QPSK 1RB CH-High

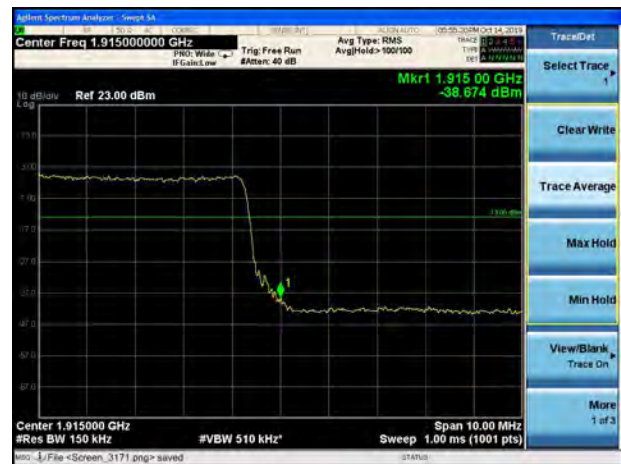




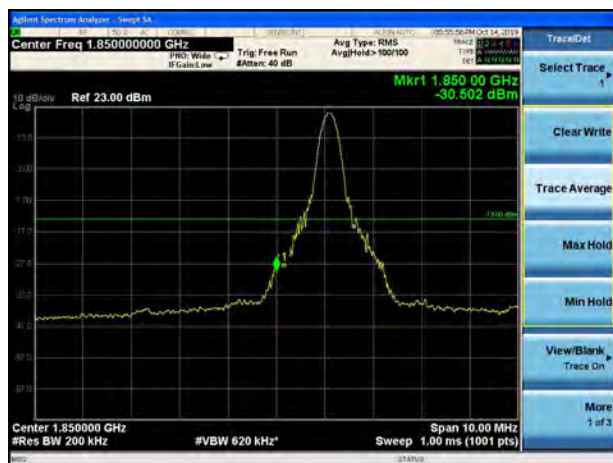
LTE Band 25 15MHz QPSK 100%RB CH-Low



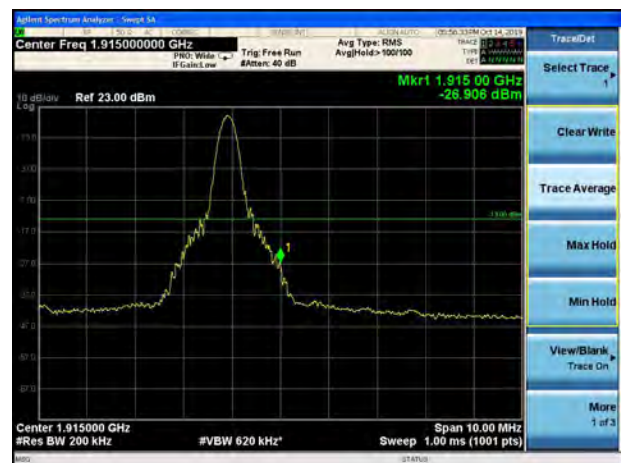
LTE Band 25 15MHz QPSK 100%RB CH-High



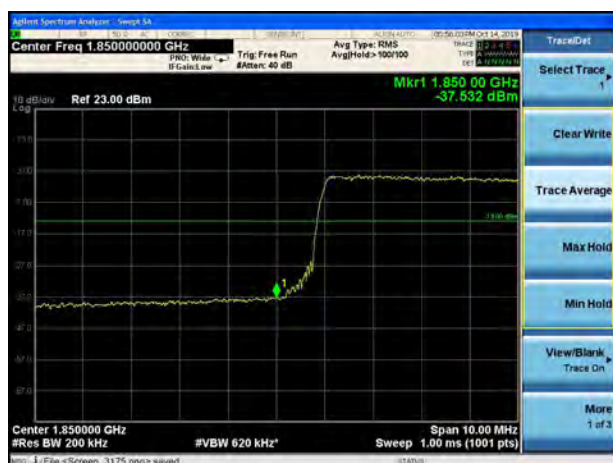
LTE Band 25 20MHz QPSK 1RB CH-Low



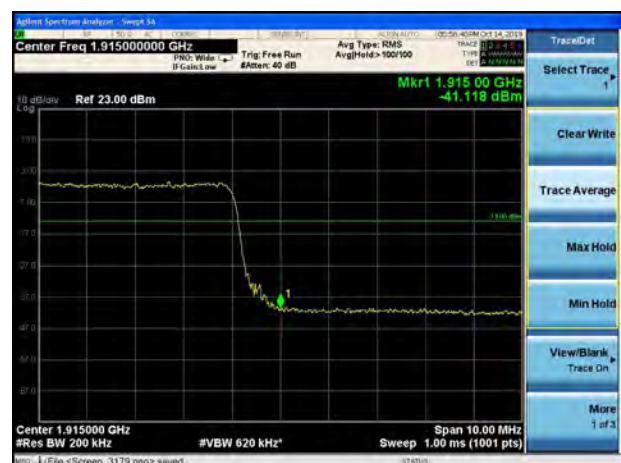
LTE Band 25 20MHz QPSK 1RB CH-High



LTE Band 25 20MHz QPSK 100%RB CH-Low

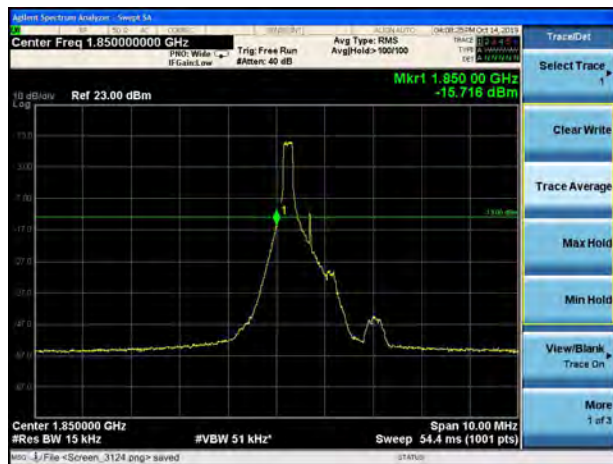


LTE Band 25 20MHz QPSK 100%RB CH-High

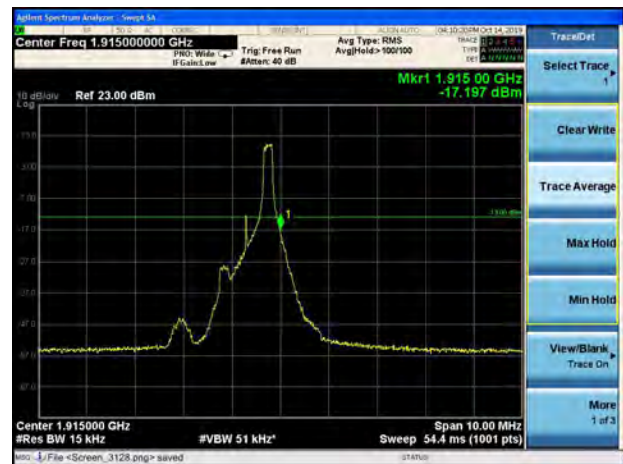




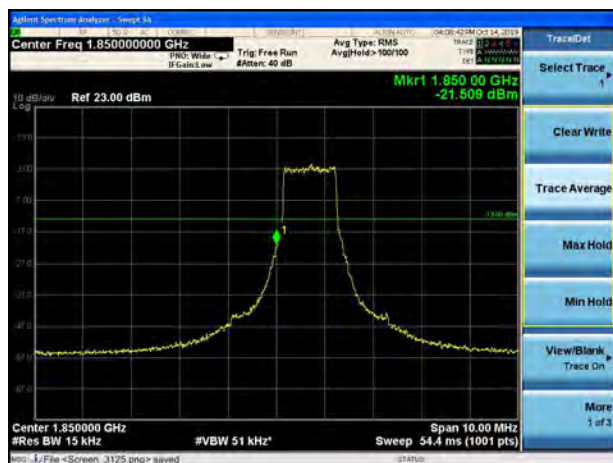
LTE Band 25 1.4MHz 16QAM 1RB CH-Low



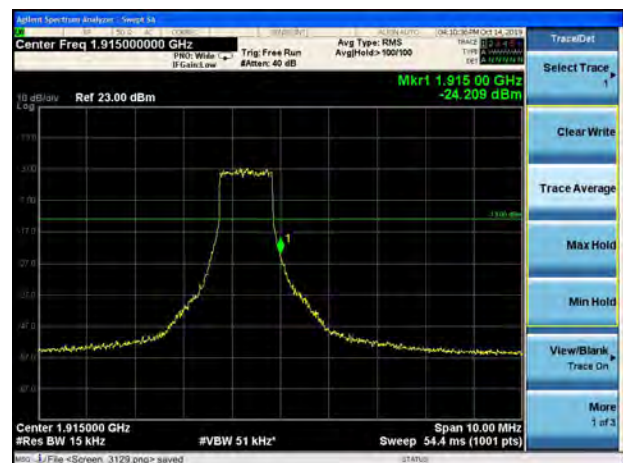
LTE Band 25 1.4MHz 16QAM 1RB CH-High



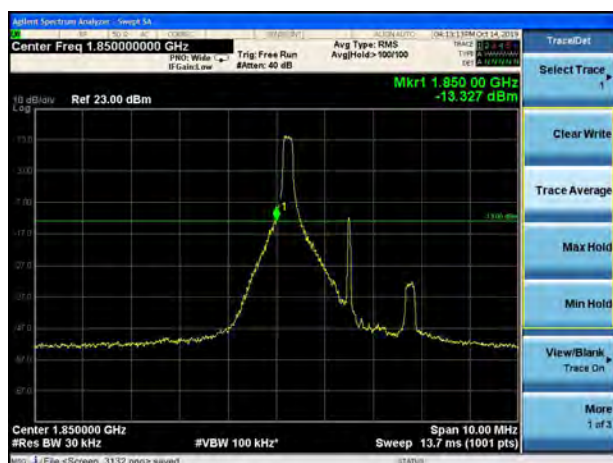
LTE Band 25 1.4MHz 16QAM 100%RB CH-Low



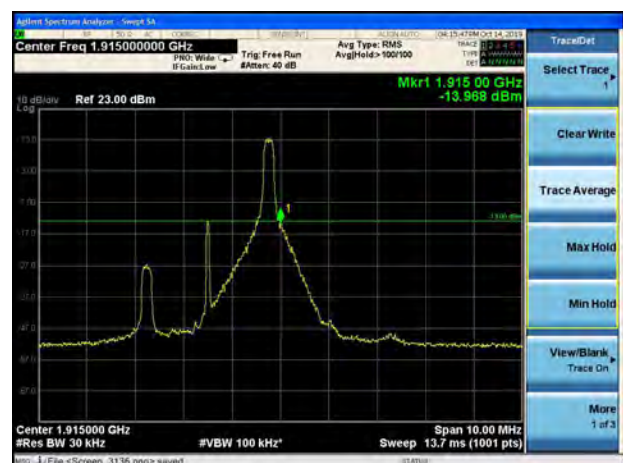
LTE Band 25 1.4MHz 16QAM 100%RB CH-High



LTE Band 25 3MHz 16QAM 1RB CH-Low

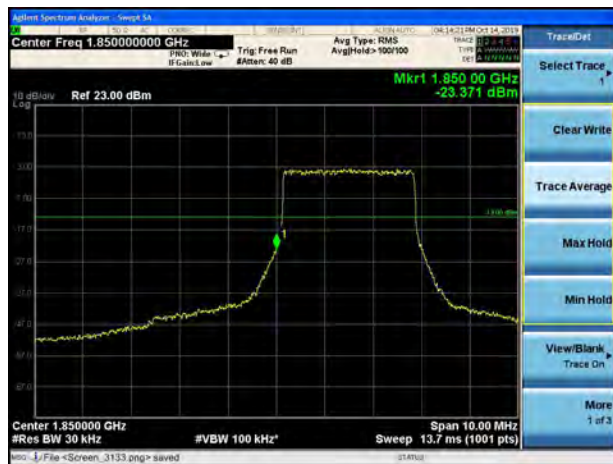


LTE Band 25 3MHz 16QAM 1RB CH-High

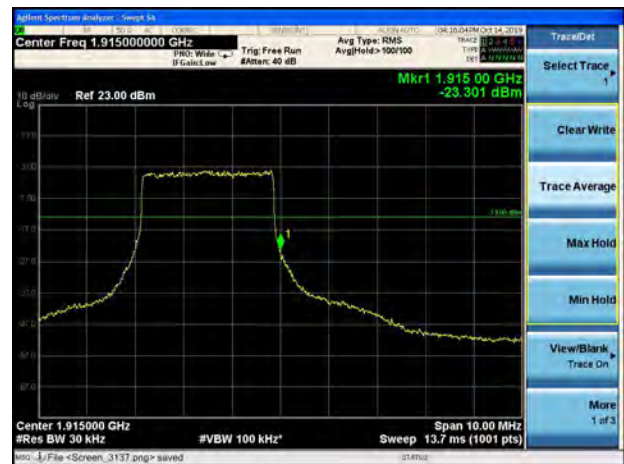




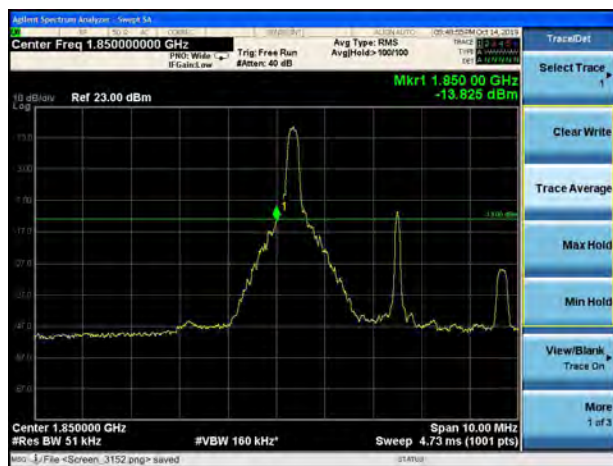
LTE Band 25 3MHz 16QAM 100%RB CH-Low



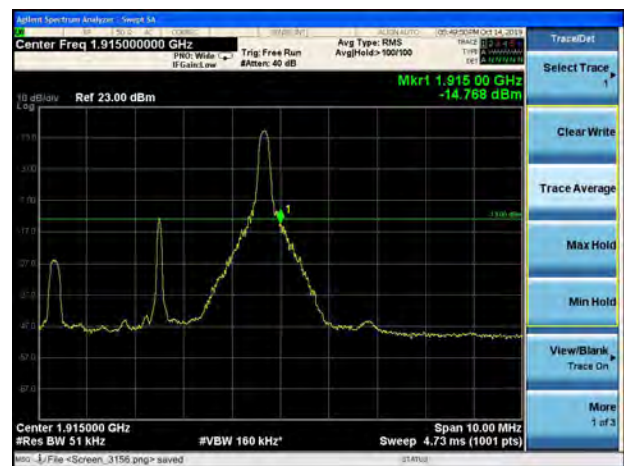
LTE Band 25 3MHz 16QAM 100%RB CH-High



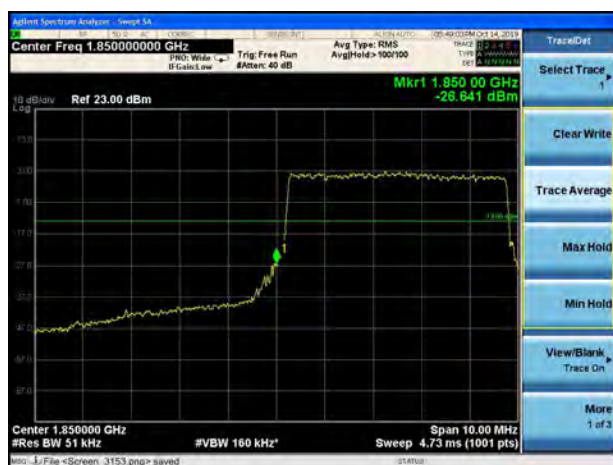
LTE Band 25 5MHz 16QAM 1RB CH-Low



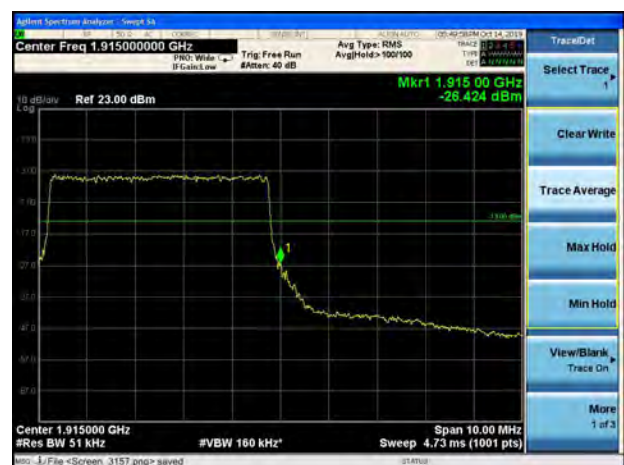
LTE Band 25 5MHz 16QAM 1RB CH-High



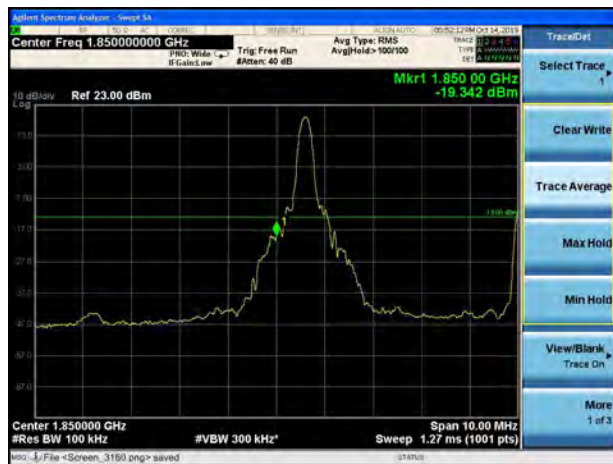
LTE Band 25 5MHz 16QAM 100%RB CH-Low



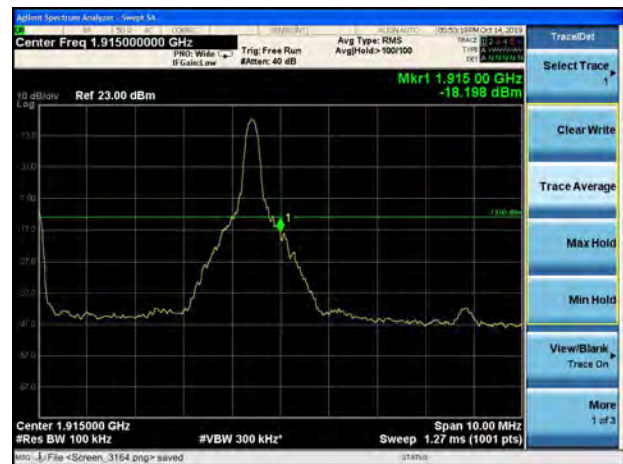
LTE Band 25 5MHz 16QAM 100%RB CH-High



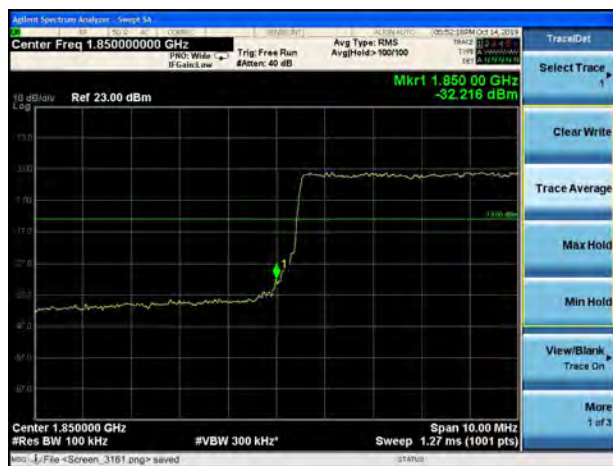
LTE Band 25 10MHz 16QAM 1RB CH-Low



LTE Band 25 10MHz 16QAM 1RB CH-High



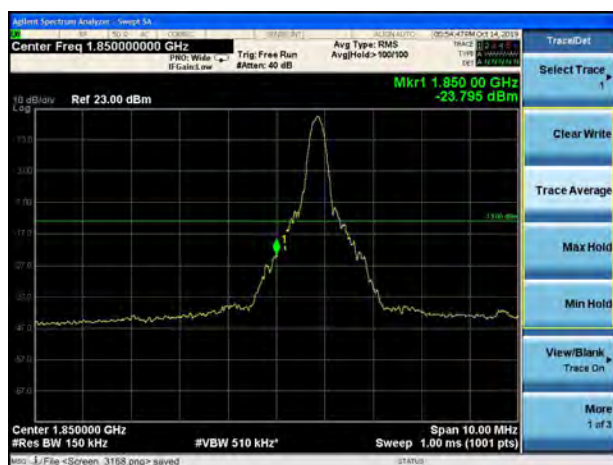
LTE Band 25 10MHz 16QAM 100%RB CH-Low



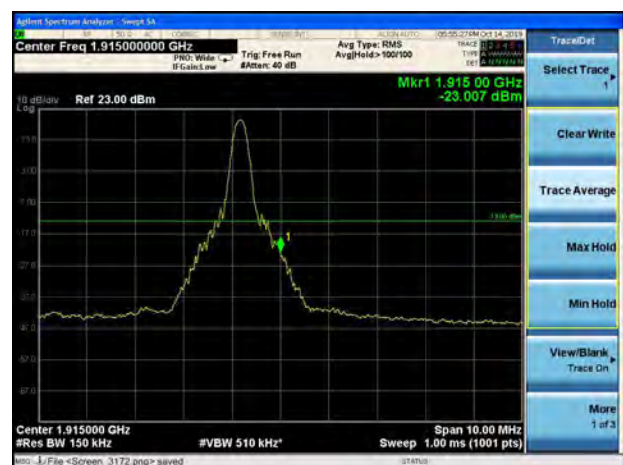
LTE Band 25 10MHz 16QAM 100%RB CH-High



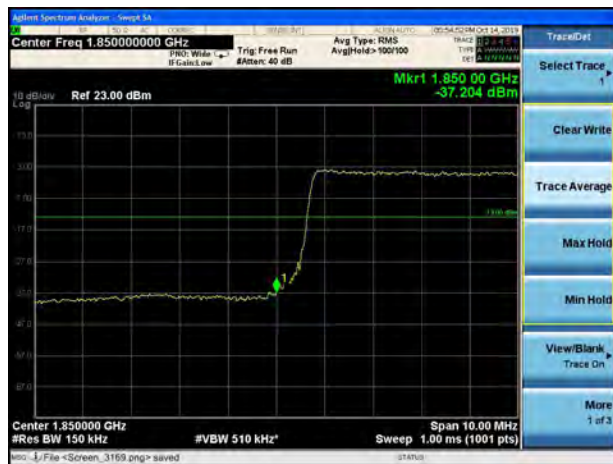
LTE Band 25 15MHz 16QAM 1RB CH-Low



LTE Band 25 15MHz 16QAM 1RB CH-High



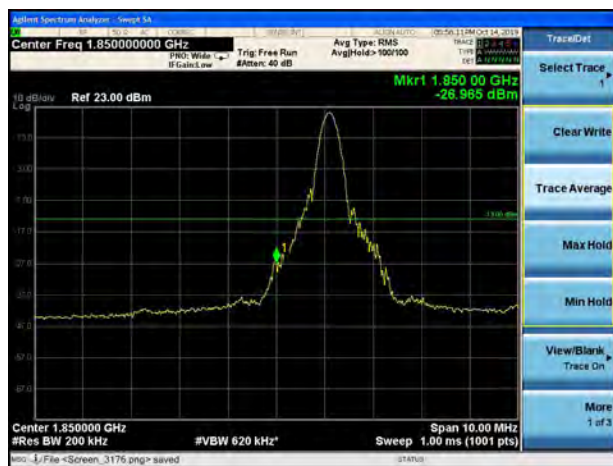
LTE Band 25 15MHz 16QAM 100%RB CH-Low



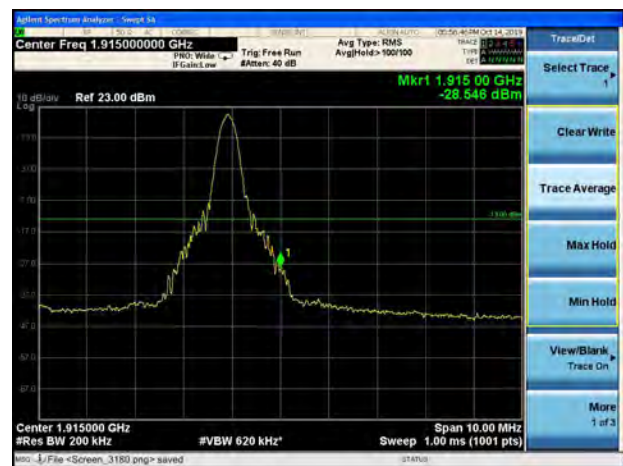
LTE Band 25 15MHz 16QAM 100%RB CH-High



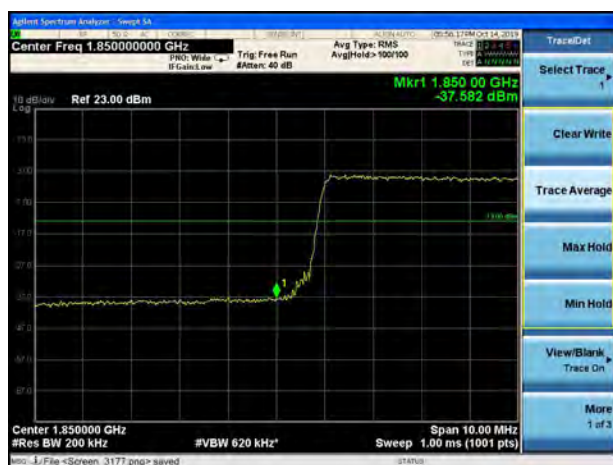
LTE Band 25 20MHz 16QAM 1RB CH-Low



LTE Band 25 20MHz 16QAM 1RB CH-High



LTE Band 25 20MHz 16QAM 100%RB CH-Low

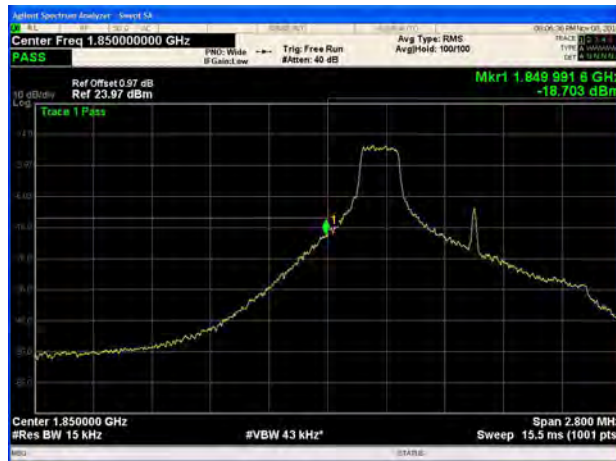


LTE Band 25 20MHz 16QAM 100%RB CH-High





LTE Band 25 1.4MHz 64QAM 1RB CH-Low



LTE Band 25 1.4MHz 64QAM 1RB CH-High



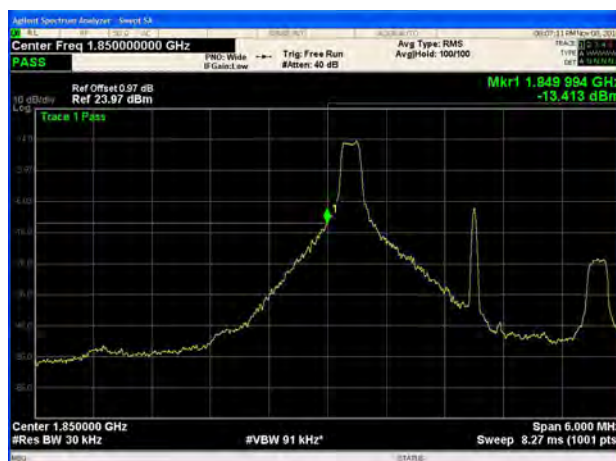
LTE Band 25 1.4MHz 64QAM 100%RB CH-Low



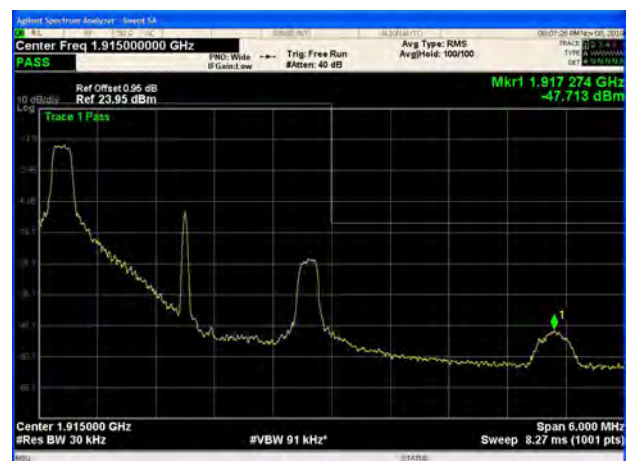
LTE Band 25 1.4MHz 64QAM 100%RB CH-High



LTE Band 25 3MHz 64QAM 1RB CH-Low



LTE Band 25 3MHz 64QAM 1RB CH-High





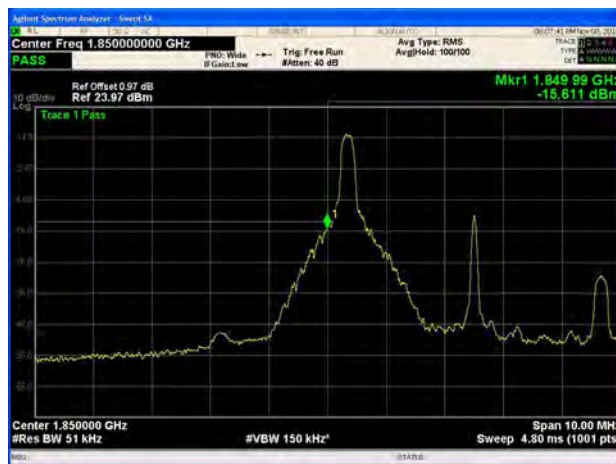
LTE Band 25 3MHz 64QAM 100%RB CH-Low



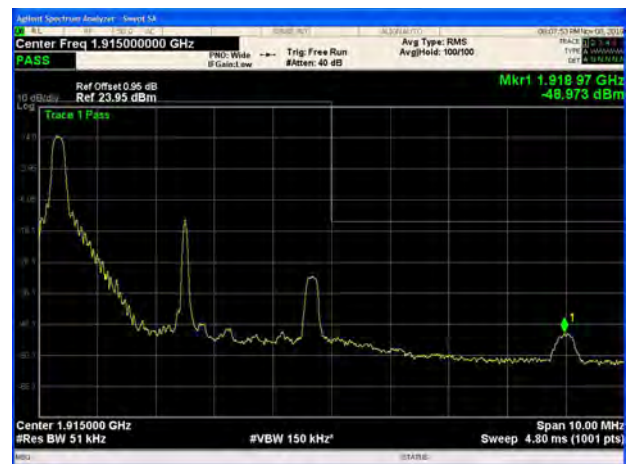
LTE Band 25 3MHz 64QAM 100%RB CH-High



LTE Band 25 5MHz 64QAM 1RB CH-Low



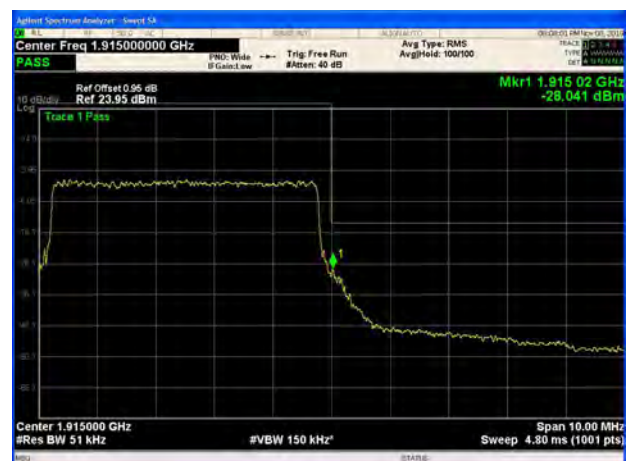
LTE Band 25 5MHz 64QAM 1RB CH-High



LTE Band 25 5MHz 64QAM 100%RB CH-Low



LTE Band 25 5MHz 64QAM 100%RB CH-High

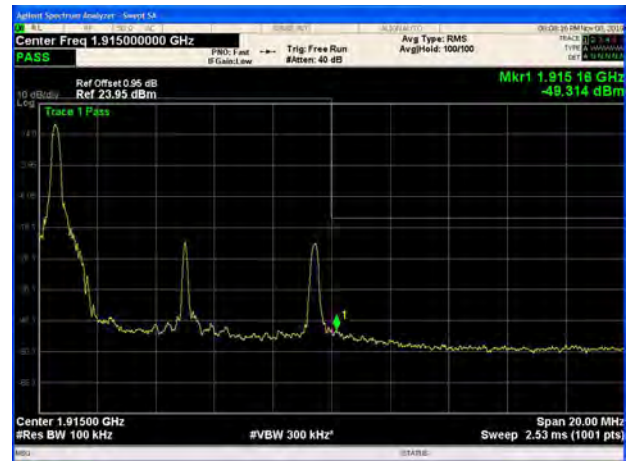




LTE Band 25 10MHz 64QAM 1RB CH-Low



LTE Band 25 10MHz 64QAM 1RB CH-High



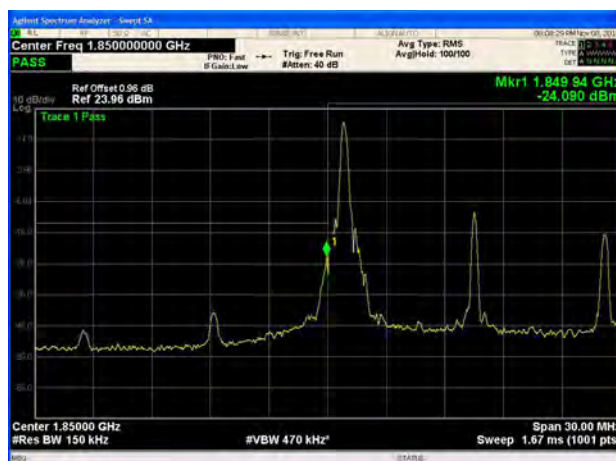
LTE Band 25 10MHz 64QAM 100%RB CH-Low



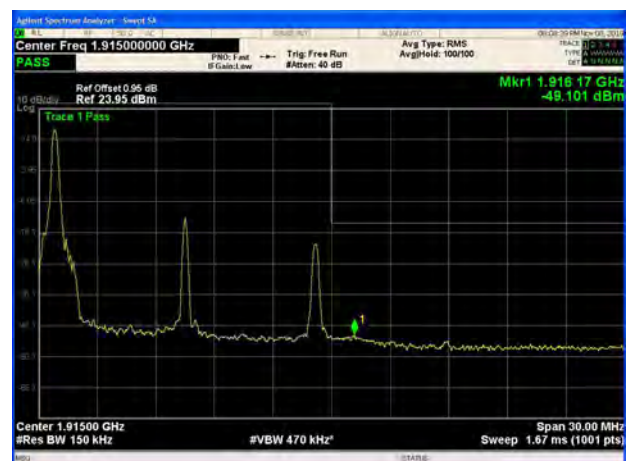
LTE Band 25 10MHz 64QAM 100%RB CH-High



LTE Band 25 15MHz 64QAM 1RB CH-Low

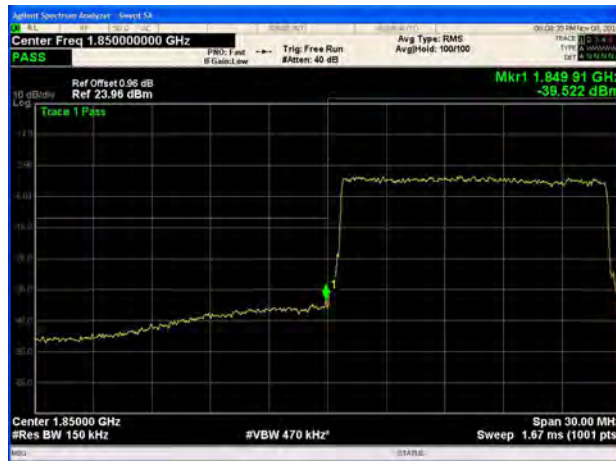


LTE Band 25 15MHz 64QAM 1RB CH-High





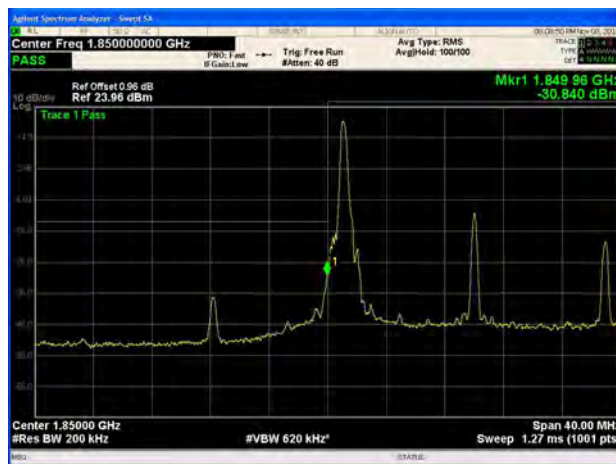
LTE Band 25 15MHz 64QAM 100%RB CH-Low



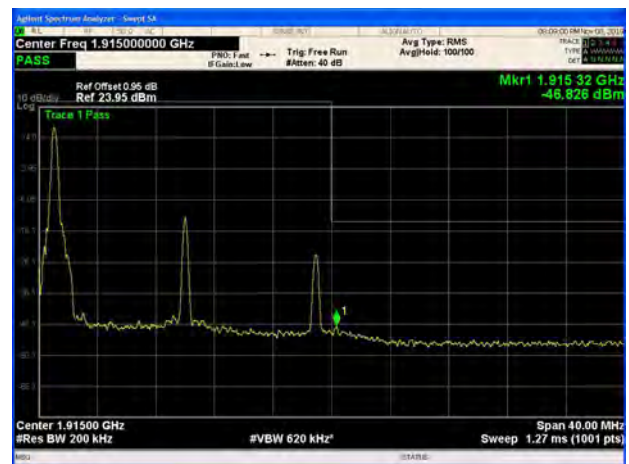
LTE Band 25 15MHz 64QAM 100%RB CH-High



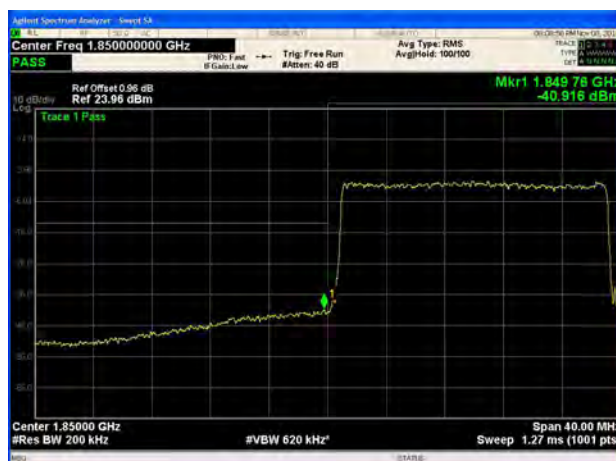
LTE Band 25 20MHz 64QAM 1RB CH-Low



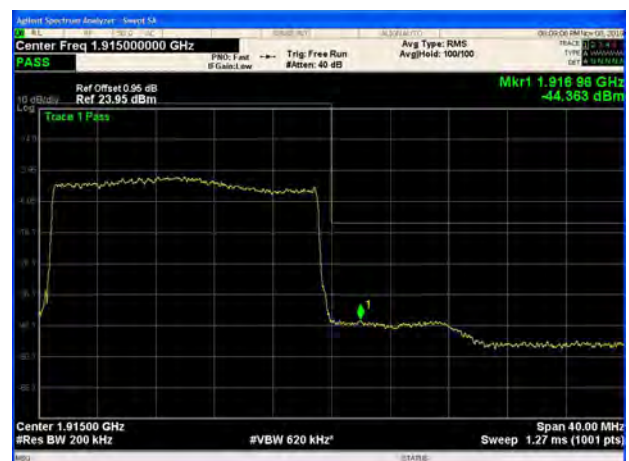
LTE Band 25 20MHz 64QAM 1RB CH-High



LTE Band 25 20MHz 64QAM 100%RB CH-Low



LTE Band 25 20MHz 64QAM 100%RB CH-High



5.4. Peak-to-Average Power Ratio (PAPR)

Ambient condition

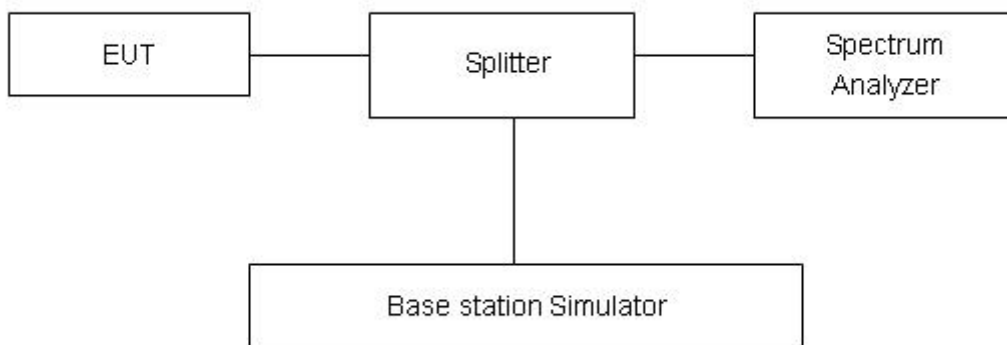
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

Measure the total peak power and record as PPk. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$\text{PAPR (dB)} = \text{PPk (dBm)} - \text{PAvg (dBm)}.$$

Test Setup



Limits

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 in 24.232(d).

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4$ dB.



Test Results

LTE Band 2								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	18607	1850.7	29.56	24.76	4.80	≤13	PASS
		18900	1880.0	29.21	24.53	4.68	≤13	PASS
		19193	1909.3	28.94	23.74	5.20	≤13	PASS
	3	18615	1851.5	29.60	24.56	5.04	≤13	PASS
		18900	1880	29.30	24.50	4.80	≤13	PASS
		19185	1908.5	29.03	23.83	5.20	≤13	PASS
	5	18625	1852.5	29.29	23.96	5.33	≤13	PASS
		18900	1880	29.06	24.05	5.01	≤13	PASS
		19175	1907.5	28.85	23.69	5.16	≤13	PASS
	10	18650	1855	29.05	23.65	5.40	≤13	PASS
		18900	1880	29.17	24.29	4.88	≤13	PASS
		19150	1905	28.52	23.61	4.91	≤13	PASS
	15	18675	1857.5	29.20	23.57	5.63	≤13	PASS
		18900	1880	29.13	24.20	4.93	≤13	PASS
		19125	1902.5	28.40	23.27	5.13	≤13	PASS
	20	18700	1860	28.89	23.43	5.46	≤13	PASS
		18900	1880	29.25	24.34	4.91	≤13	PASS
		19100	1900	28.19	23.03	5.16	≤13	PASS
16QAM	1.4	18607	1850.7	29.71	24.73	4.98	≤13	PASS
		18900	1880.0	29.47	24.48	4.99	≤13	PASS
		19193	1909.3	29.29	23.73	5.56	≤13	PASS
	3	18615	1851.5	29.91	24.50	5.41	≤13	PASS
		18900	1880	29.61	24.43	5.18	≤13	PASS
		19185	1908.5	29.41	23.77	5.64	≤13	PASS
	5	18625	1852.5	29.58	23.92	5.66	≤13	PASS
		18900	1880	29.33	24.02	5.31	≤13	PASS
		19175	1907.5	29.20	23.64	5.56	≤13	PASS
	10	18650	1855	29.58	23.69	5.89	≤13	PASS
		18900	1880	29.51	24.24	5.27	≤13	PASS
		19150	1905	28.92	23.53	5.39	≤13	PASS
	15	18675	1857.5	29.46	23.53	5.93	≤13	PASS
		18900	1880	26.30	21.14	5.16	≤13	PASS
		19125	1902.5	28.66	23.22	5.44	≤13	PASS
	20	18700	1860	29.37	23.39	5.98	≤13	PASS
		18900	1880	29.62	24.30	5.32	≤13	PASS
		19100	1900	28.73	23.01	5.72	≤13	PASS
64QAM	1.4	18607	1850.7	28.18	21.99	6.19	≤13	PASS
		18900	1880.0	27.58	21.56	6.02	≤13	PASS
		19193	1909.3	27.44	21.34	6.10	≤13	PASS



	3	18615	1851.5	28.15	21.85	6.30	≤13	PASS
		18900	1880	27.60	21.45	6.15	≤13	PASS
		19185	1908.5	27.50	21.29	6.21	≤13	PASS
	5	18625	1852.5	27.61	21.24	6.37	≤13	PASS
		18900	1880	27.35	21.12	6.23	≤13	PASS
		19175	1907.5	27.39	21.05	6.34	≤13	PASS
	10	18650	1855	27.31	20.94	6.37	≤13	PASS
		18900	1880	27.72	21.48	6.24	≤13	PASS
		19150	1905	27.12	21.08	6.04	≤13	PASS
	15	18675	1857.5	27.13	20.58	6.55	≤13	PASS
		18900	1880	27.72	21.37	6.35	≤13	PASS
		19125	1902.5	26.82	20.64	6.18	≤13	PASS
	20	18700	1860	27.01	20.57	6.44	≤13	PASS
		18900	1880	27.72	21.45	6.27	≤13	PASS
		19100	1900	26.63	20.42	6.21	≤13	PASS

LTE Band 25								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	26047	1850.7	29.58	24.90	4.68	≤13	PASS
		26365	1882.5	29.36	24.59	4.77	≤13	PASS
		26683	1914.3	28.44	23.95	4.49	≤13	PASS
	3	26055	1851.5	29.76	24.81	4.95	≤13	PASS
		26365	1882.5	29.59	24.67	4.92	≤13	PASS
		26675	1913.5	28.73	23.90	4.83	≤13	PASS
	5	26065	1852.5	29.40	24.19	5.21	≤13	PASS
		26365	1882.5	29.39	24.33	5.06	≤13	PASS
		26665	1912.5	28.69	23.53	5.16	≤13	PASS
	10	26090	1855	29.19	23.86	5.33	≤13	PASS
		26365	1882.5	29.28	24.25	5.03	≤13	PASS
		26640	1910	28.99	23.86	5.13	≤13	PASS
	15	26115	1857.5	29.22	23.66	5.56	≤13	PASS
		26365	1882.5	29.19	24.17	5.02	≤13	PASS
		26615	1907.5	28.94	24.07	4.87	≤13	PASS
	20	26140	1860	29.01	23.54	5.47	≤13	PASS
		26365	1882.5	29.07	24.14	4.93	≤13	PASS
		26590	1905	28.71	23.76	4.95	≤13	PASS
16QAM	1.4	26047	1850.7	29.68	24.83	4.85	≤13	PASS
		26365	1882.5	28.57	23.85	4.72	≤13	PASS
		26683	1914.3	29.65	24.58	5.07	≤13	PASS
	3	26055	1851.5	30.01	24.74	5.27	≤13	PASS
		26365	1882.5	29.87	24.60	5.27	≤13	PASS
		26675	1913.5	29.04	23.86	5.18	≤13	PASS



	5	26065	1852.5	29.72	24.15	5.57	≤13	PASS
		26365	1882.5	30.61	25.28	5.33	≤13	PASS
		26665	1912.5	28.99	23.45	5.54	≤13	PASS
	10	26090	1855	29.72	23.89	5.83	≤13	PASS
		26365	1882.5	29.62	24.21	5.41	≤13	PASS
		26640	1910	29.38	23.88	5.50	≤13	PASS
	15	26115	1857.5	29.50	23.65	5.85	≤13	PASS
		26365	1882.5	29.37	24.15	5.22	≤13	PASS
		26615	1907.5	29.13	23.99	5.14	≤13	PASS
	20	26140	1860	29.44	23.48	5.96	≤13	PASS
		26365	1882.5	29.47	24.03	5.44	≤13	PASS
		26590	1905	29.20	23.70	5.50	≤13	PASS
64QAM	1.4	26047	1850.7	28.03	21.96	6.07	≤13	PASS
		26365	1882.5	27.89	21.59	6.30	≤13	PASS
		26683	1914.3	27.18	21.35	5.83	≤13	PASS
	3	26055	1851.5	28.16	21.84	6.32	≤13	PASS
		26365	1882.5	27.81	21.49	6.32	≤13	PASS
		26675	1913.5	27.21	21.27	5.94	≤13	PASS
	5	26065	1852.5	27.47	21.19	6.28	≤13	PASS
		26365	1882.5	27.31	21.09	6.22	≤13	PASS
		26665	1912.5	26.97	20.92	6.05	≤13	PASS
	10	26090	1855	27.32	20.97	6.35	≤13	PASS
		26365	1882.5	27.54	21.24	6.30	≤13	PASS
		26640	1910	27.39	21.22	6.17	≤13	PASS
	15	26115	1857.5	26.97	20.47	6.50	≤13	PASS
		26365	1882.5	27.58	21.17	6.41	≤13	PASS
		26615	1907.5	27.42	21.18	6.24	≤13	PASS
	20	26140	1860	26.88	20.48	6.40	≤13	PASS
		26365	1882.5	27.58	21.27	6.31	≤13	PASS
		26590	1905	27.10	20.91	6.19	≤13	PASS

5.5.Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -40°C to +70°C in 10°C step size,

(1) With all power removed, the temperature was decreased to 0°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -40°C to +70°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

Frequency Stability (Voltage Variation)

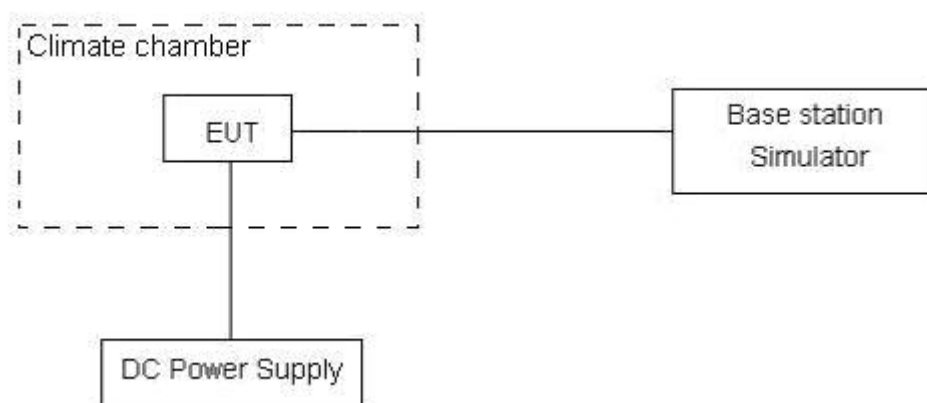
The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3V and 3.6V, with a nominal voltage of 3.3V.

Test setup



Limits

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

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 3$, $U = 0.01\text{ppm}$.



Test Result

LTE Band 2								
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz							
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	3.37	5.29	12.77	0.00179	0.00281	0.00679	PASS
Extreme (70℃)		14.52	13.38	17.15	0.00772	0.00712	0.00912	PASS
Extreme (60℃)		12.76	5.69	3.70	0.00679	0.00303	0.00197	PASS
Extreme (50℃)		9.36	12.20	13.37	0.00498	0.00649	0.00711	PASS
Extreme (40℃)		1.45	12.82	17.57	0.00077	0.00682	0.00935	PASS
Extreme (30℃)		8.79	5.76	14.53	0.00468	0.00307	0.00773	PASS
Extreme (20℃)		5.03	13.27	12.55	0.00268	0.00706	0.00667	PASS
Extreme (10℃)		11.61	11.85	9.91	0.00617	0.00630	0.00527	PASS
Extreme (0℃)		4.04	5.02	13.72	0.00215	0.00267	0.00730	PASS
Extreme (-10℃)		3.41	10.92	12.64	0.00181	0.00581	0.00672	PASS
Extreme (-20℃)		11.21	5.94	12.19	0.00596	0.00316	0.00649	PASS
Extreme (-30℃)		8.52	14.26	11.79	0.00453	0.00758	0.00627	PASS
Extreme (-40℃)		16.71	14.99	15.70	0.00889	0.00797	0.00835	PASS
25℃	LV	2.26	2.82	4.78	0.00120	0.00150	0.00254	PASS
	HV	5.40	7.07	17.71	0.00287	0.00376	0.00942	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz							
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	13.04	3.00	10.84	0.00693	0.00159	0.00577	PASS
Extreme (70℃)		14.70	6.59	8.82	0.00782	0.00350	0.00469	PASS
Extreme (60℃)		14.55	14.41	5.29	0.00774	0.00767	0.00282	PASS
Extreme (50℃)		5.03	4.81	10.87	0.00268	0.00256	0.00578	PASS
Extreme (40℃)		17.04	12.35	15.69	0.00906	0.00657	0.00835	PASS
Extreme (30℃)		15.50	1.20	5.95	0.00824	0.00064	0.00316	PASS
Extreme (20℃)		11.65	16.19	13.13	0.00620	0.00861	0.00699	PASS
Extreme (10℃)		7.76	7.19	5.22	0.00413	0.00383	0.00277	PASS
Extreme (0℃)		14.31	17.88	15.64	0.00761	0.00951	0.00832	PASS
Extreme (-10℃)		6.88	5.30	5.03	0.00366	0.00282	0.00267	PASS
Extreme (-20℃)		10.03	5.58	17.46	0.00533	0.00297	0.00929	PASS
Extreme (-30℃)		10.03	3.25	6.79	0.00534	0.00173	0.00361	PASS
Extreme (-40℃)		2.11	13.04	3.07	0.00112	0.00694	0.00163	PASS
25℃	LV	8.27	9.98	13.19	0.00440	0.00531	0.00702	PASS
	HV	8.07	7.29	12.46	0.00429	0.00388	0.00663	PASS



Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	10.01	4.28	10.61	0.00533	0.00227	0.00564	PASS
Extreme (70℃)		2.44	3.37	4.41	0.00130	0.00179	0.00234	PASS
Extreme (60℃)		7.48	10.78	3.14	0.00398	0.00573	0.00167	PASS
Extreme (50℃)		7.73	13.12	6.64	0.00411	0.00698	0.00353	PASS
Extreme (40℃)		7.67	8.67	10.11	0.00408	0.00461	0.00538	PASS
Extreme (30℃)		1.97	3.45	13.01	0.00105	0.00183	0.00692	PASS
Extreme (20℃)		8.96	16.72	14.67	0.00476	0.00889	0.00781	PASS
Extreme (10℃)		12.67	1.01	16.75	0.00674	0.00054	0.00891	PASS
Extreme (0℃)		9.81	5.49	5.93	0.00522	0.00292	0.00316	PASS
Extreme (-10℃)		7.10	8.18	16.28	0.00378	0.00435	0.00866	PASS
Extreme (-20℃)		15.16	13.24	3.55	0.00807	0.00704	0.00189	PASS
Extreme (-30℃)		9.73	9.83	6.55	0.00518	0.00523	0.00348	PASS
Extreme (-40℃)		15.65	1.63	9.90	0.00833	0.00087	0.00527	PASS
25℃	LV	3.68	14.70	8.29	0.00196	0.00782	0.00441	PASS
	HV	11.73	3.20	7.57	0.00624	0.00170	0.00402	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	12.62	8.32	10.54	0.00671	0.00443	0.00561	PASS
Extreme (70℃)		1.29	9.50	10.30	0.00068	0.00506	0.00548	PASS
Extreme (60℃)		8.60	11.94	10.67	0.00457	0.00635	0.00567	PASS
Extreme (50℃)		13.94	15.72	6.11	0.00742	0.00836	0.00325	PASS
Extreme (40℃)		8.27	16.34	12.03	0.00440	0.00869	0.00640	PASS
Extreme (30℃)		14.68	9.97	4.64	0.00781	0.00530	0.00247	PASS
Extreme (20℃)		6.28	3.07	16.91	0.00334	0.00163	0.00899	PASS
Extreme (10℃)		12.64	5.36	8.10	0.00672	0.00285	0.00431	PASS
Extreme (0℃)		4.23	12.80	10.60	0.00225	0.00681	0.00564	PASS
Extreme (-10℃)		14.09	16.18	15.46	0.00749	0.00861	0.00822	PASS
Extreme (-20℃)		1.95	4.09	14.24	0.00104	0.00218	0.00758	PASS
Extreme (-30℃)		16.36	2.06	3.57	0.00870	0.00110	0.00190	PASS
Extreme (-40℃)		17.73	9.75	9.35	0.00943	0.00519	0.00498	PASS
25℃	LV	4.58	13.98	7.66	0.00244	0.00744	0.00408	PASS
	HV	10.31	11.76	2.27	0.00548	0.00626	0.00121	PASS



Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	7.33	12.99	11.63	0.00390	0.00691	0.00619	PASS
Extreme (70℃)		16.73	12.75	3.77	0.00890	0.00678	0.00200	PASS
Extreme (60℃)		8.42	9.60	15.78	0.00448	0.00511	0.00839	PASS
Extreme (50℃)		12.72	11.41	4.99	0.00677	0.00607	0.00266	PASS
Extreme (40℃)		1.37	9.60	17.20	0.00073	0.00511	0.00915	PASS
Extreme (30℃)		10.32	16.85	10.19	0.00549	0.00896	0.00542	PASS
Extreme (20℃)		1.12	5.79	12.85	0.00059	0.00308	0.00684	PASS
Extreme (10℃)		12.62	12.13	4.20	0.00671	0.00645	0.00223	PASS
Extreme (0℃)		2.75	4.81	1.62	0.00146	0.00256	0.00086	PASS
Extreme (-10℃)		1.63	9.23	3.62	0.00087	0.00491	0.00193	PASS
Extreme (-20℃)		9.64	6.16	16.07	0.00513	0.00328	0.00855	PASS
Extreme (-30℃)		10.20	4.94	17.86	0.00542	0.00263	0.00950	PASS
Extreme (-40℃)		10.63	14.64	12.47	0.00565	0.00779	0.00663	PASS
25℃	LV	12.52	14.52	12.20	0.00666	0.00772	0.00649	PASS
	HV	12.97	1.22	7.00	0.00690	0.00065	0.00372	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	12.80	1.69	12.20	0.00681	0.00090	0.00649	PASS
Extreme (70℃)		8.47	8.58	3.15	0.00451	0.00456	0.00168	PASS
Extreme (60℃)		9.59	14.57	16.62	0.00510	0.00775	0.00884	PASS
Extreme (50℃)		10.35	10.08	16.82	0.00550	0.00536	0.00895	PASS
Extreme (40℃)		14.95	14.18	15.68	0.00795	0.00754	0.00834	PASS
Extreme (30℃)		10.82	10.53	4.84	0.00576	0.00560	0.00258	PASS
Extreme (20℃)		17.34	10.05	1.58	0.00923	0.00535	0.00084	PASS
Extreme (10℃)		12.55	12.51	9.33	0.00668	0.00666	0.00496	PASS
Extreme (0℃)		4.38	1.09	8.53	0.00233	0.00058	0.00453	PASS
Extreme (-10℃)		12.22	4.65	3.32	0.00650	0.00247	0.00177	PASS
Extreme (-20℃)		6.66	8.16	15.28	0.00354	0.00434	0.00813	PASS
Extreme (-30℃)		4.47	17.84	1.27	0.00238	0.00949	0.00067	PASS
Extreme (-40℃)		8.43	9.26	12.73	0.00449	0.00492	0.00677	PASS
25℃	LV	6.98	3.49	15.19	0.00371	0.00186	0.00808	PASS
	HV	4.88	11.49	7.51	0.00259	0.00611	0.00399	PASS



LTE Band 25								
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz							
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	9.03	16.38	15.12	0.00480	0.00871	0.00804	PASS
Extreme (70℃)		13.37	14.97	12.47	0.00711	0.00796	0.00663	PASS
Extreme (60℃)		2.49	5.97	10.17	0.00133	0.00318	0.00541	PASS
Extreme (50℃)		4.44	4.61	5.79	0.00236	0.00245	0.00308	PASS
Extreme (40℃)		2.08	13.73	5.01	0.00110	0.00730	0.00267	PASS
Extreme (30℃)		8.92	2.92	16.80	0.00474	0.00155	0.00894	PASS
Extreme (20℃)		8.63	11.86	16.45	0.00459	0.00631	0.00875	PASS
Extreme (10℃)		5.39	1.94	5.29	0.00287	0.00103	0.00281	PASS
Extreme (0℃)		3.62	4.52	8.56	0.00193	0.00240	0.00455	PASS
Extreme (-10℃)		11.90	13.61	14.32	0.00633	0.00724	0.00762	PASS
Extreme (-20℃)		13.84	16.18	7.93	0.00736	0.00861	0.00422	PASS
Extreme (-30℃)		1.97	5.86	1.79	0.00105	0.00312	0.00095	PASS
Extreme (-40℃)		17.88	11.74	12.39	0.00951	0.00625	0.00659	PASS
25℃	LV	17.39	14.00	1.44	0.00925	0.00745	0.00077	PASS
	HV	10.15	10.17	3.50	0.00540	0.00541	0.00186	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz							
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	14.86	16.83	2.78	0.00791	0.00895	0.00148	PASS
Extreme (70℃)		17.01	12.56	3.16	0.00905	0.00668	0.00168	PASS
Extreme (60℃)		10.15	16.04	4.17	0.00540	0.00853	0.00222	PASS
Extreme (50℃)		5.18	1.23	5.57	0.00275	0.00065	0.00296	PASS
Extreme (40℃)		15.08	15.24	7.27	0.00802	0.00811	0.00387	PASS
Extreme (30℃)		12.66	15.87	13.09	0.00673	0.00844	0.00696	PASS
Extreme (20℃)		17.51	3.50	15.69	0.00932	0.00186	0.00835	PASS
Extreme (10℃)		7.85	5.47	8.47	0.00417	0.00291	0.00451	PASS
Extreme (0℃)		4.65	3.57	10.65	0.00247	0.00190	0.00567	PASS
Extreme (-10℃)		9.92	16.25	16.94	0.00528	0.00864	0.00901	PASS
Extreme (-20℃)		6.36	7.47	4.60	0.00338	0.00397	0.00245	PASS
Extreme (-30℃)		17.96	3.56	5.39	0.00955	0.00189	0.00287	PASS
Extreme (-40℃)		10.69	5.86	15.74	0.00569	0.00312	0.00837	PASS
25℃	LV	8.75	6.37	17.52	0.00466	0.00339	0.00932	PASS
	HV	4.60	8.97	9.36	0.00245	0.00477	0.00498	PASS



Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	13.13	17.48	10.51	0.00699	0.00930	0.00559	PASS
Extreme (70℃)		14.15	3.88	15.64	0.00752	0.00206	0.00832	PASS
Extreme (60℃)		2.76	13.95	8.10	0.00147	0.00742	0.00431	PASS
Extreme (50℃)		15.11	6.89	1.37	0.00804	0.00367	0.00073	PASS
Extreme (40℃)		8.90	7.18	16.72	0.00473	0.00382	0.00889	PASS
Extreme (30℃)		17.15	11.54	15.80	0.00912	0.00614	0.00841	PASS
Extreme (20℃)		10.17	16.11	14.75	0.00541	0.00857	0.00785	PASS
Extreme (10℃)		7.30	12.15	13.18	0.00388	0.00646	0.00701	PASS
Extreme (0℃)		4.94	17.32	11.47	0.00263	0.00921	0.00610	PASS
Extreme (-10℃)		13.41	9.35	12.86	0.00713	0.00497	0.00684	PASS
Extreme (-20℃)		11.08	17.48	16.96	0.00589	0.00930	0.00902	PASS
Extreme (-30℃)		17.35	3.09	14.65	0.00923	0.00165	0.00779	PASS
Extreme (-40℃)		2.02	11.36	5.97	0.00108	0.00605	0.00318	PASS
25℃	LV	10.42	8.96	14.39	0.00554	0.00477	0.00765	PASS
	HV	9.36	9.67	9.96	0.00498	0.00515	0.00530	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	8.75	3.04	12.26	0.00465	0.00162	0.00652	PASS
Extreme (70℃)		12.87	1.81	16.56	0.00685	0.00096	0.00881	PASS
Extreme (60℃)		10.80	1.56	6.97	0.00575	0.00083	0.00371	PASS
Extreme (50℃)		3.42	1.15	15.16	0.00182	0.00061	0.00807	PASS
Extreme (40℃)		2.53	14.96	2.05	0.00135	0.00796	0.00109	PASS
Extreme (30℃)		1.34	11.03	14.35	0.00071	0.00587	0.00763	PASS
Extreme (20℃)		4.02	10.74	11.84	0.00214	0.00571	0.00630	PASS
Extreme (10℃)		13.38	15.01	12.53	0.00711	0.00798	0.00666	PASS
Extreme (0℃)		8.99	12.02	1.87	0.00478	0.00639	0.00100	PASS
Extreme (-10℃)		2.38	1.67	7.69	0.00126	0.00089	0.00409	PASS
Extreme (-20℃)		7.57	8.92	13.04	0.00403	0.00475	0.00693	PASS
Extreme (-30℃)		4.18	2.92	14.30	0.00222	0.00156	0.00761	PASS
Extreme (-40℃)		9.99	16.95	17.35	0.00531	0.00901	0.00923	PASS
25℃	LV	4.75	6.79	8.41	0.00253	0.00361	0.00448	PASS
	HV	6.98	5.25	3.12	0.00371	0.00279	0.00166	PASS



Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	11.54	10.36	15.09	0.00614	0.00551	0.00802	PASS
Extreme (70℃)		3.99	14.12	6.43	0.00212	0.00751	0.00342	PASS
Extreme (60℃)		1.85	11.19	6.55	0.00098	0.00595	0.00348	PASS
Extreme (50℃)		3.46	10.95	11.15	0.00184	0.00582	0.00593	PASS
Extreme (40℃)		7.75	14.27	10.45	0.00412	0.00759	0.00556	PASS
Extreme (30℃)		7.01	9.89	10.95	0.00373	0.00526	0.00582	PASS
Extreme (20℃)		15.67	17.99	9.47	0.00834	0.00957	0.00504	PASS
Extreme (10℃)		14.40	3.79	11.38	0.00766	0.00201	0.00606	PASS
Extreme (0℃)		10.71	5.99	3.52	0.00569	0.00318	0.00187	PASS
Extreme (-10℃)		1.20	5.12	7.19	0.00064	0.00272	0.00383	PASS
Extreme (-20℃)		5.89	14.98	9.37	0.00313	0.00797	0.00499	PASS
Extreme (-30℃)		17.28	3.77	7.95	0.00919	0.00200	0.00423	PASS
Extreme (-40℃)		8.43	13.82	17.06	0.00448	0.00735	0.00907	PASS
25℃	LV	7.86	7.27	15.14	0.00418	0.00387	0.00805	PASS
	HV	15.96	11.52	15.18	0.00849	0.00613	0.00807	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	16QAM	QPSK	64QAM	16QAM	QPSK	64QAM	
Normal (25℃)	Normal	4.60	14.00	8.38	0.00245	0.00745	0.00446	PASS
Extreme (70℃)		8.31	10.62	7.41	0.00442	0.00565	0.00394	PASS
Extreme (60℃)		13.74	2.47	7.55	0.00731	0.00131	0.00402	PASS
Extreme (50℃)		7.59	2.71	5.61	0.00404	0.00144	0.00299	PASS
Extreme (40℃)		17.58	2.26	17.96	0.00935	0.00120	0.00955	PASS
Extreme (30℃)		9.60	4.86	1.14	0.00511	0.00259	0.00061	PASS
Extreme (20℃)		13.42	8.38	9.09	0.00714	0.00446	0.00484	PASS
Extreme (10℃)		8.71	17.91	14.35	0.00463	0.00953	0.00763	PASS
Extreme (0℃)		17.34	12.33	6.14	0.00922	0.00656	0.00326	PASS
Extreme (-10℃)		13.54	17.46	13.11	0.00720	0.00928	0.00697	PASS
Extreme (-20℃)		13.07	12.62	10.75	0.00695	0.00671	0.00572	PASS
Extreme (-30℃)		10.19	5.42	14.07	0.00542	0.00288	0.00748	PASS
Extreme (-40℃)		13.49	2.22	3.72	0.00718	0.00118	0.00198	PASS
25℃	LV	6.01	3.45	11.33	0.00320	0.00183	0.00603	PASS
	HV	12.75	1.24	8.65	0.00678	0.00066	0.00460	PASS

5.6. Spurious Emissions at Antenna Terminals

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

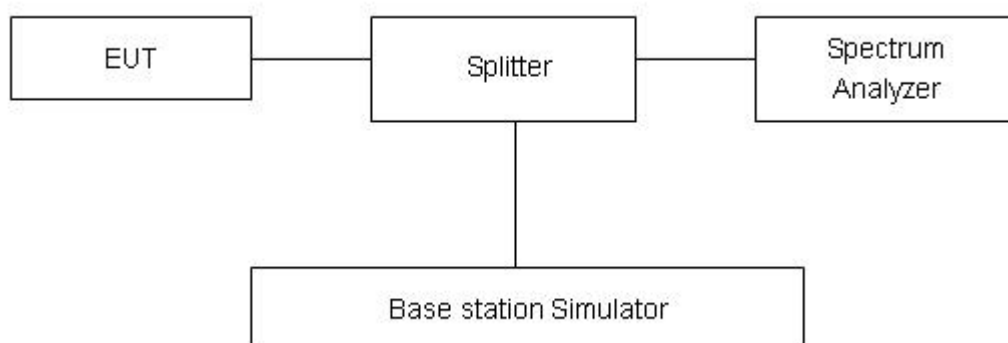
The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier. The peak detector is used.

RBW is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz

RBW is set to 1MHz, VBW is set to 3MHz for above 1GHz, Sweep is set to ATUO.

The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup



Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10} (P)$ dB.”

Limit	-13 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

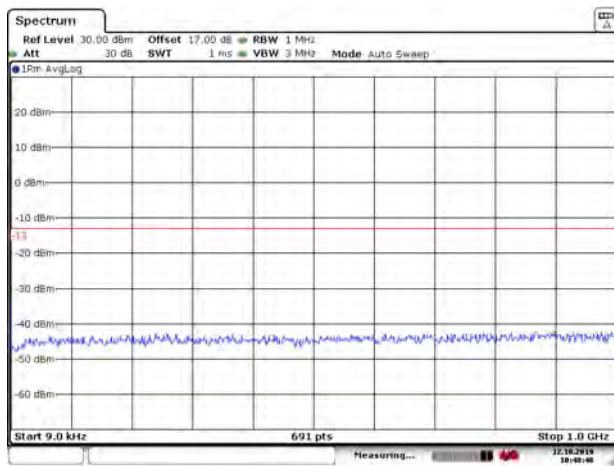
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-20GHz	1.407 dB

Test Result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

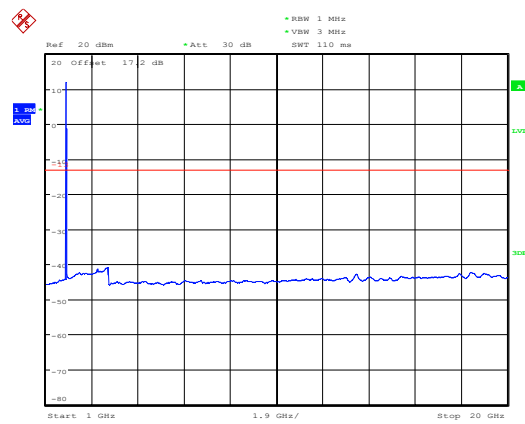
The signal beyond the limit is carrier.

LTE Band 2 1.4MHz CH-Low 9kHz~1GHz



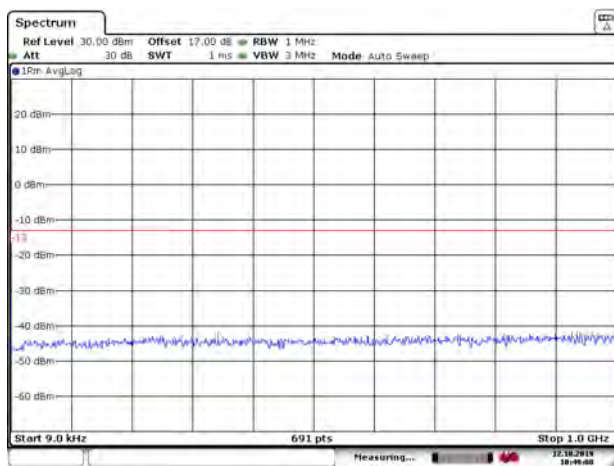
Date: 12.OCT.2019 10:48:48

LTE Band 2 1.4MHz CH-Low 1GHz~20GHz



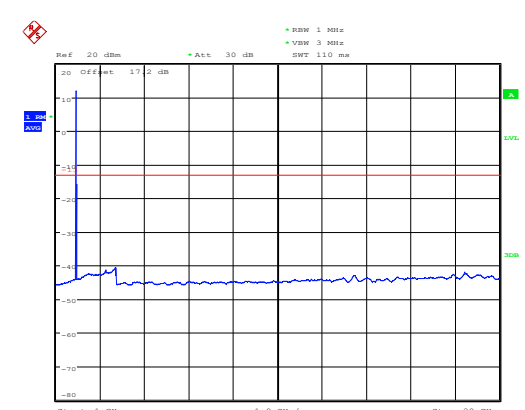
Date: 8.OCT.2019 11:43:20

LTE Band 2 1.4MHz CH-Middle 9kHz~1GHz



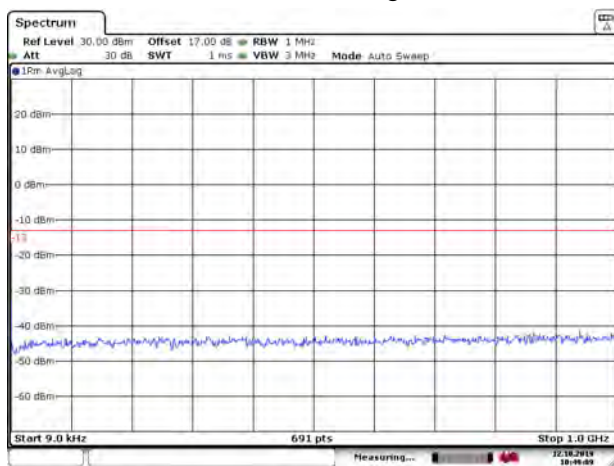
Date: 12.OCT.2019 10:49:00

LTE Band 2 1.4MHz CH-Middle 1GHz~20GHz



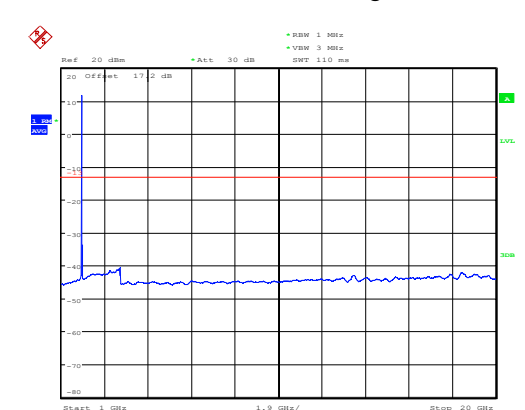
Date: 8.OCT.2019 11:43:34

LTE Band 2 1.4MHz CH-High 9kHz~1GHz



Date: 12.OCT.2019 10:49:09

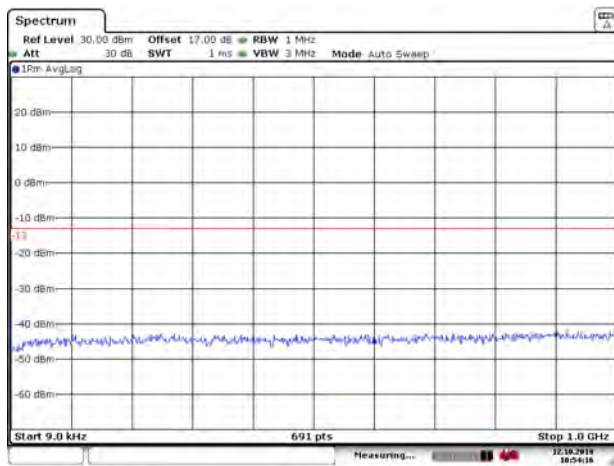
LTE Band 2 1.4MHz CH-High 1GHz~20GHz



Date: 8.OCT.2019 11:43:50

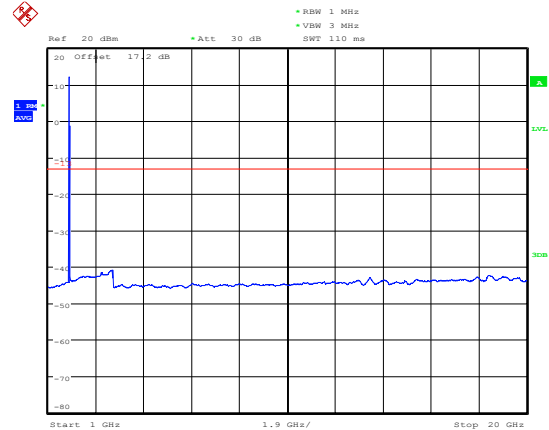


LTE Band 2 3MHz CH-Low 9kHz~1GHz



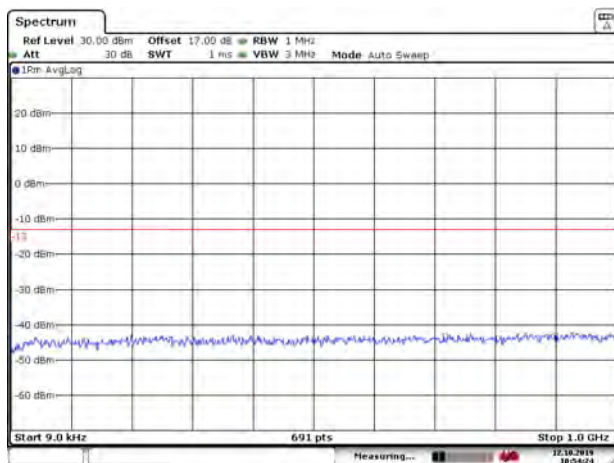
Date: 12.OCT.2019 10:54:16

LTE Band 2 3MHz CH-Low 1GHz~20GHz



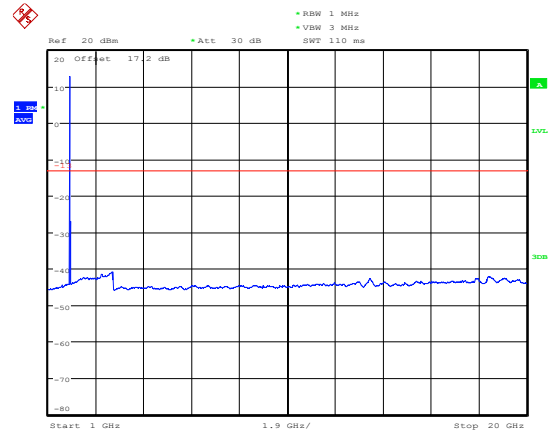
Date: 8.OCT.2019 11:44:12

LTE Band 2 3MHz CH-Middle 9kHz~1GHz



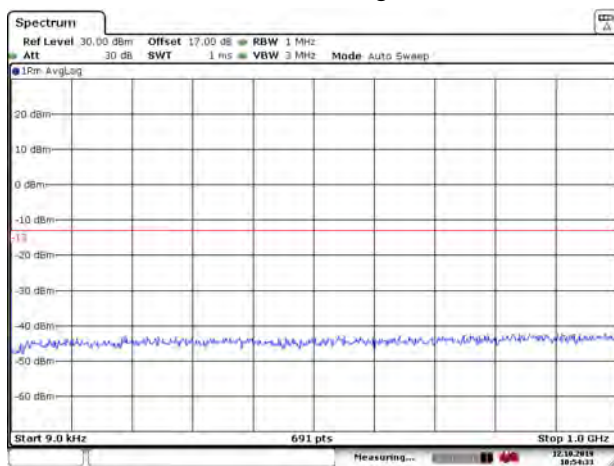
Date: 12.OCT.2019 10:54:25

LTE Band 2 3MHz CH-Middle 1GHz~20GHz



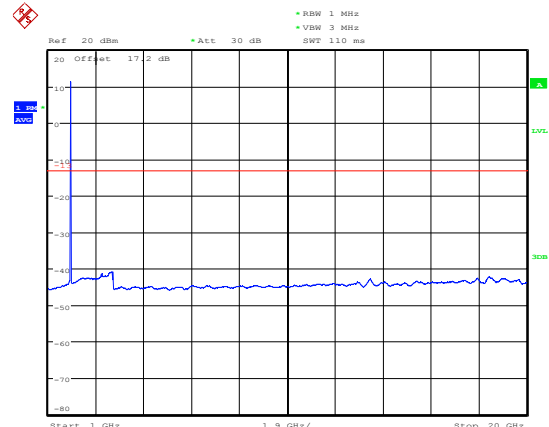
Date: 8.OCT.2019 11:44:27

LTE Band 2 3MHz CH-High 9kHz~1GHz



Date: 12.OCT.2019 10:54:34

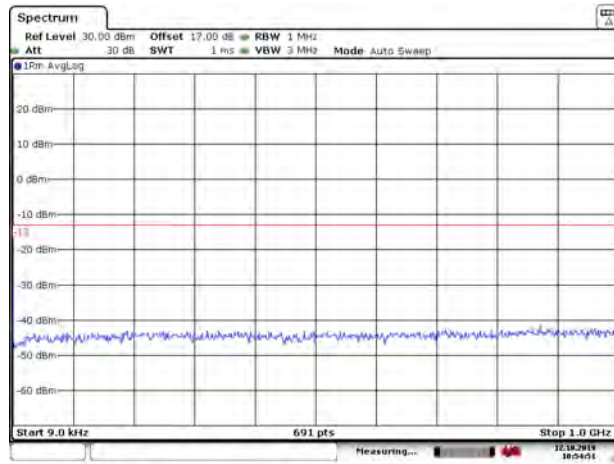
LTE Band 2 3MHz CH-High 1GHz~20GHz



Date: 8.OCT.2019 11:44:49

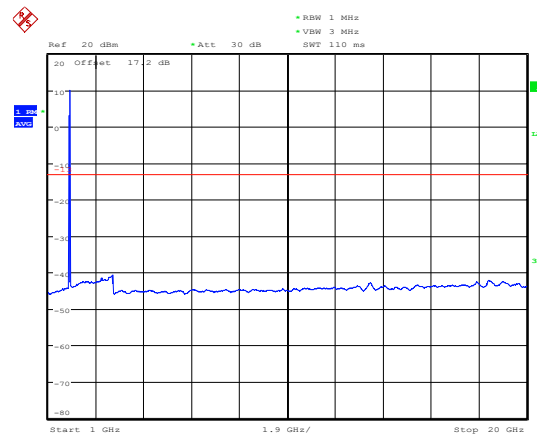


LTE Band 2 5MHz CH-Low 9kHz~1GHz



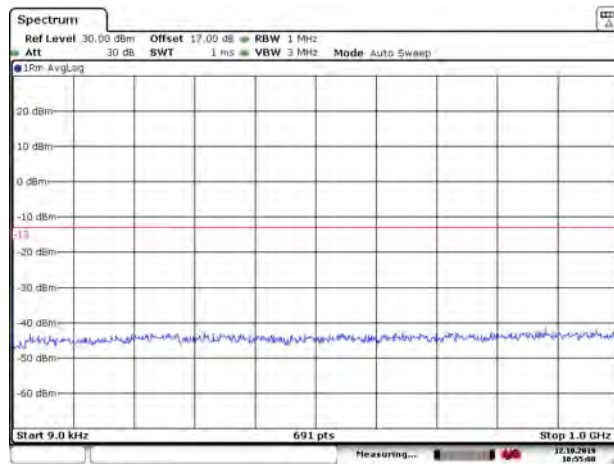
Date: 12 OCT 2019 10:54:52

LTE Band 2 5MHz CH-Low 1GHz~20GHz



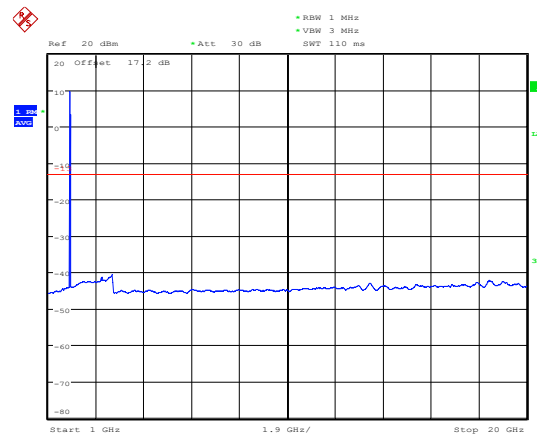
Date: 8.OCT.2019 11:45:13

LTE Band 2 5MHz CH-Middle 9kHz~1GHz



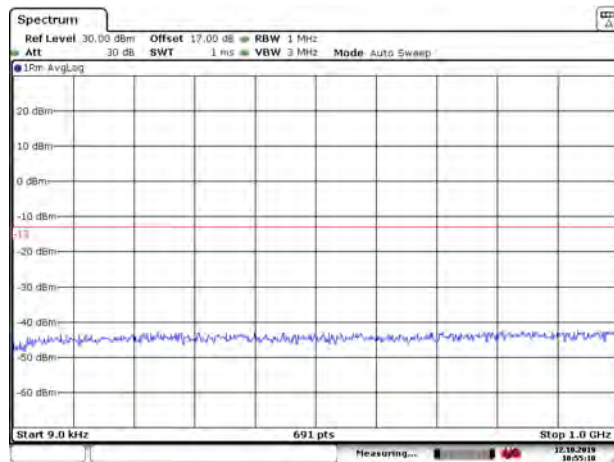
Date: 12 OCT 2019 10:55:01

LTE Band 2 5MHz CH-Middle 1GHz~20GHz



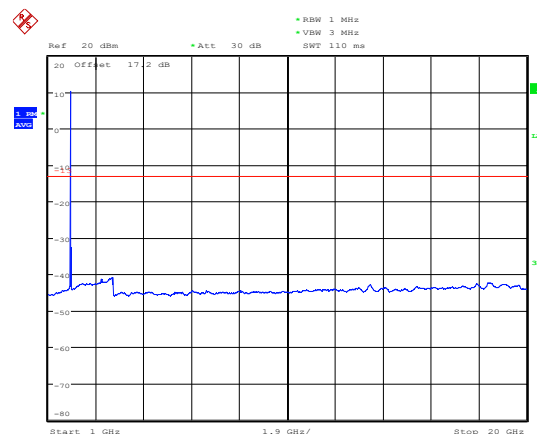
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LTE Band 2 5MHz CH-High 9kHz~1GHz



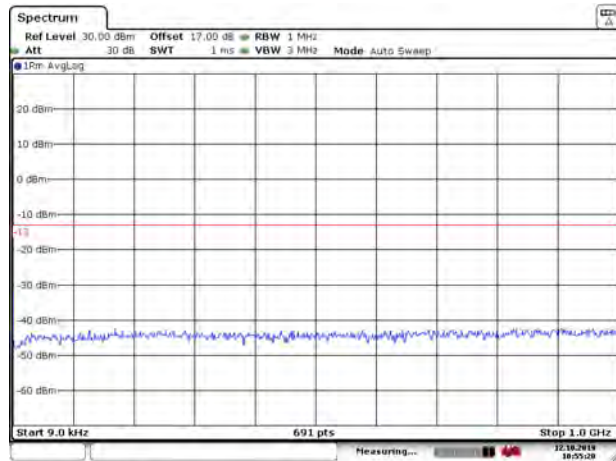
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LTE Band 2 5MHz CH-High 1GHz~20GHz



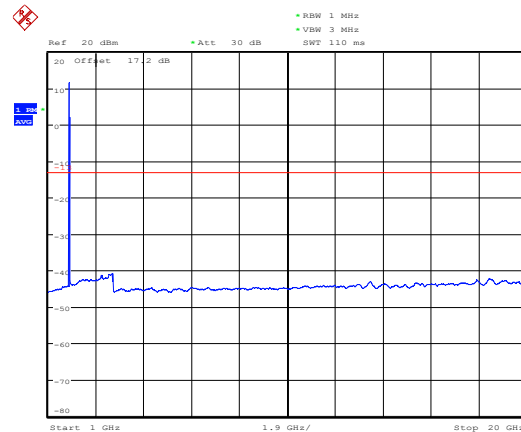
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LTE Band 2 10MHz CH-Low 9kHz~1GHz



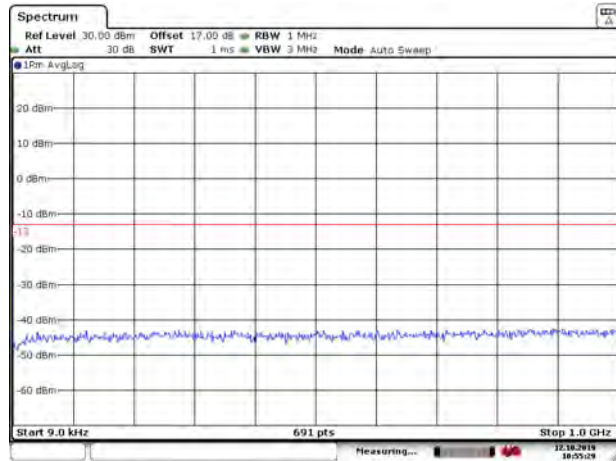
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LTE Band 2 10MHz CH-Low 1GHz~20GHz



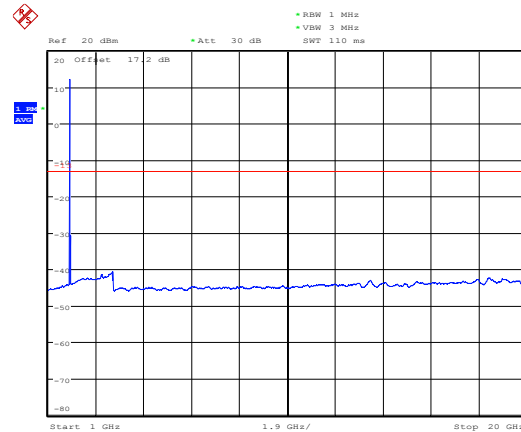
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LTE Band 2 10MHz CH-Middle 9kHz~1GHz



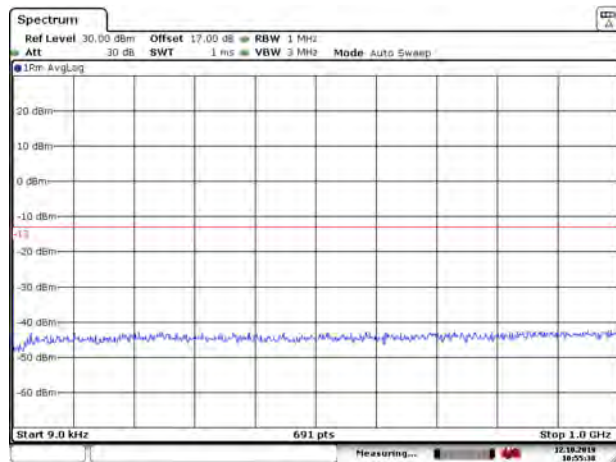
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LTE Band 2 10MHz CH-Middle 1GHz~20GHz



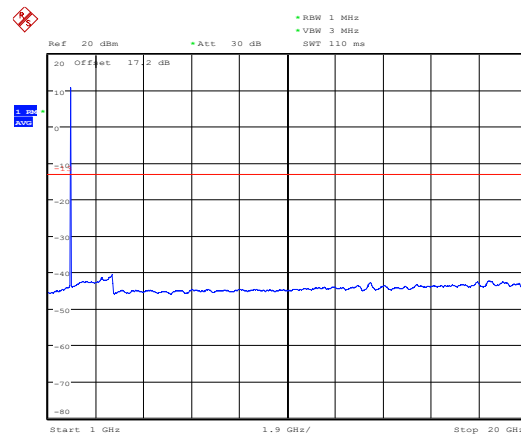
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LTE Band 2 10MHz CH-High 9kHz~1GHz



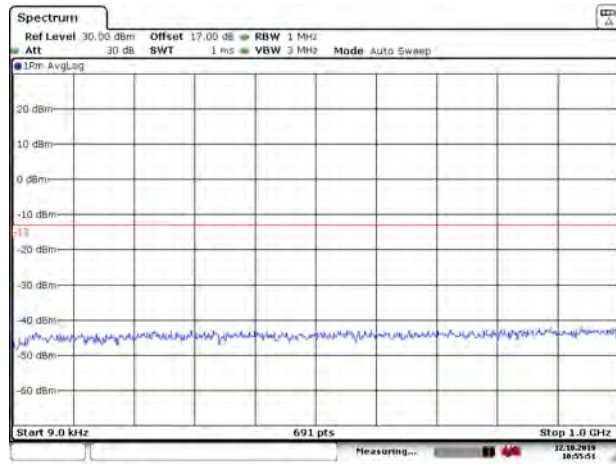
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LTE Band 2 10MHz CH-High 1GHz~20GHz



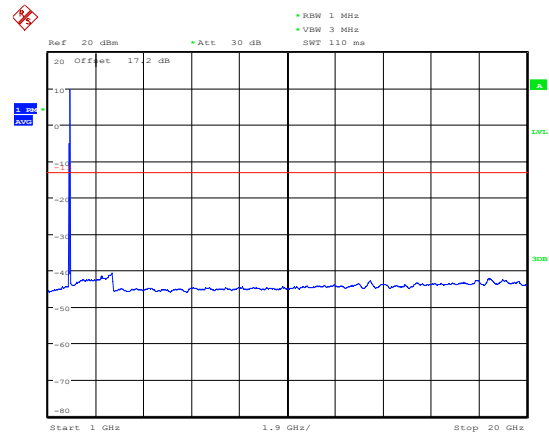
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LTE Band 2 15MHz CH-Low 9kHz~1GHz



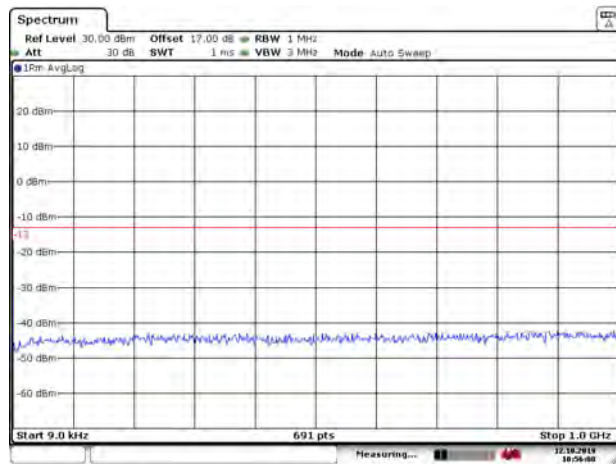
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LTE Band 2 15MHz CH-Low 1GHz~20GHz



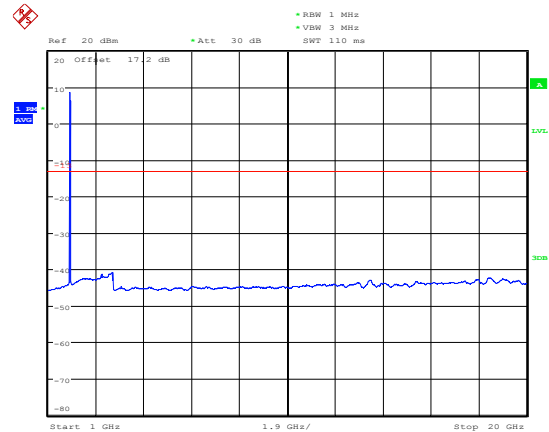
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LTE Band 2 15MHz CH-Middle 9kHz~1GHz



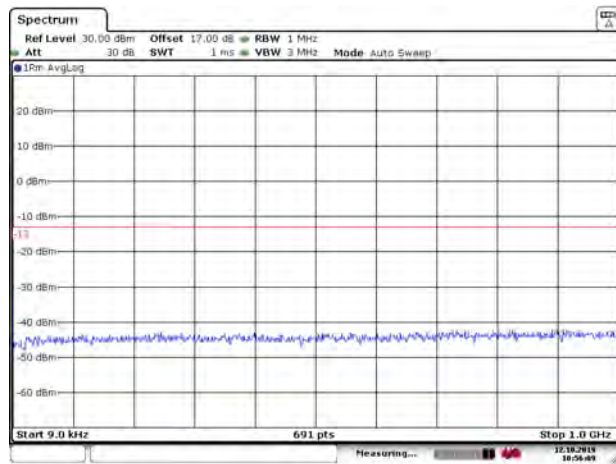
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LTE Band 2 15MHz CH-Middle 1GHz~20GHz



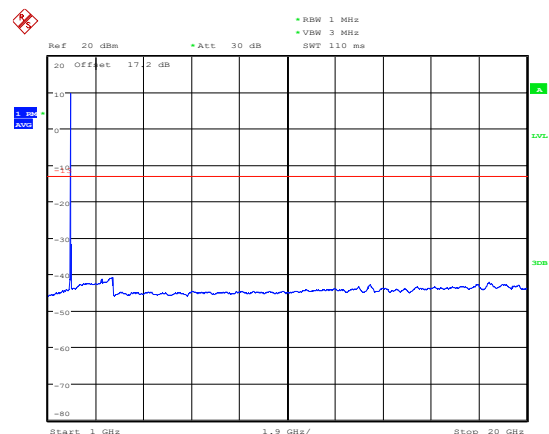
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LTE Band 2 15MHz CH-High 9kHz~1GHz



Date: 12.OCT.2019 10:56:09

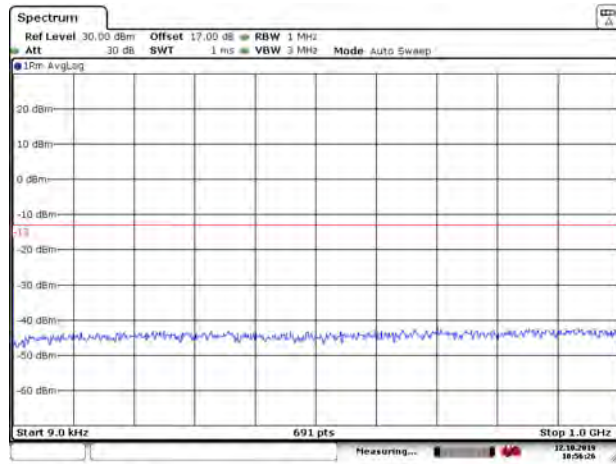
LTE Band 2 15MHz CH-High 1GHz~20GHz



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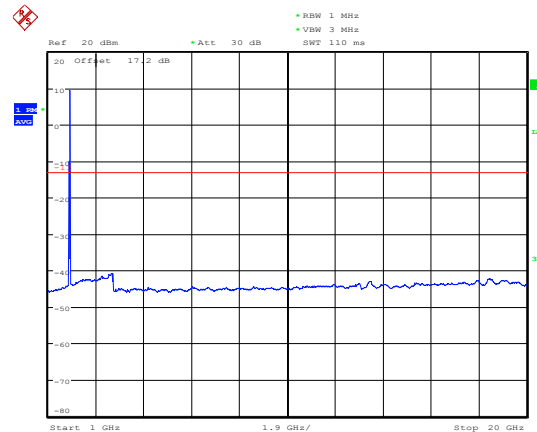


LTE Band 2 20MHz CH-Low 9kHz~1GHz



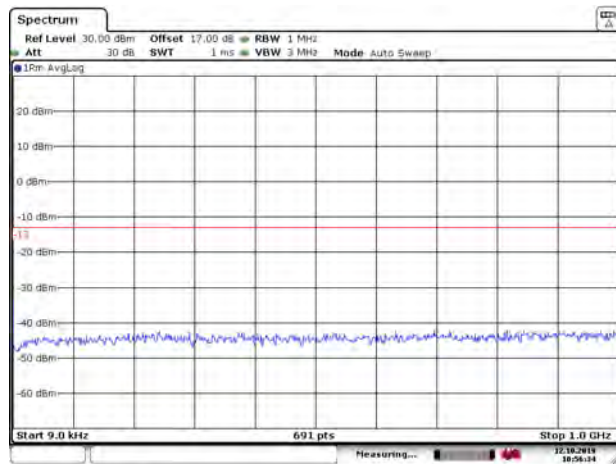
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LTE Band 2 20MHz CH-Low 1GHz~20GHz



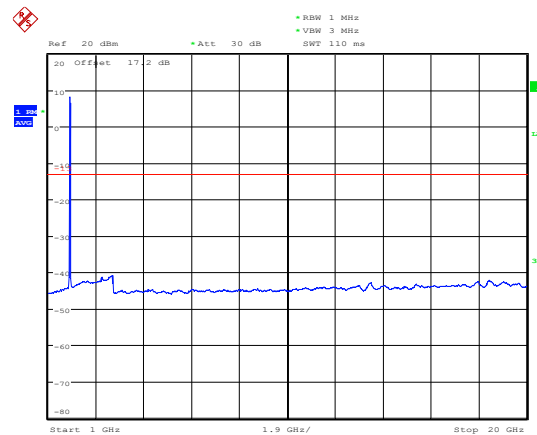
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LTE Band 2 20MHz CH-Middle 9kHz~1GHz



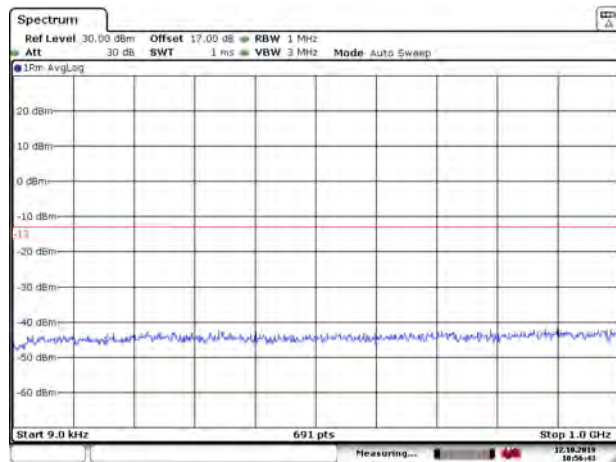
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LTE Band 2 20MHz CH-Middle 1GHz~20GHz



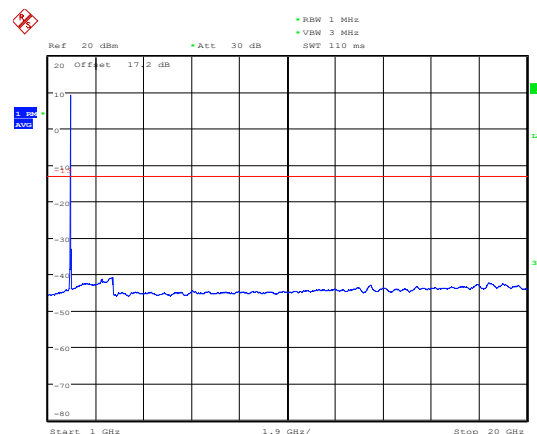
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LTE Band 2 20MHz CH-High 9kHz~1GHz



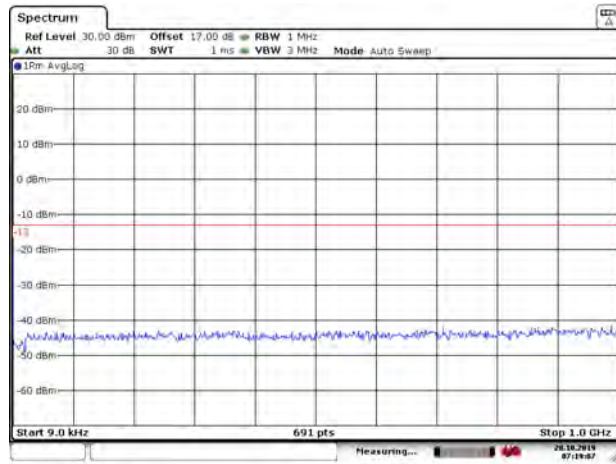
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LTE Band 2 20MHz CH-High 1GHz~20GHz

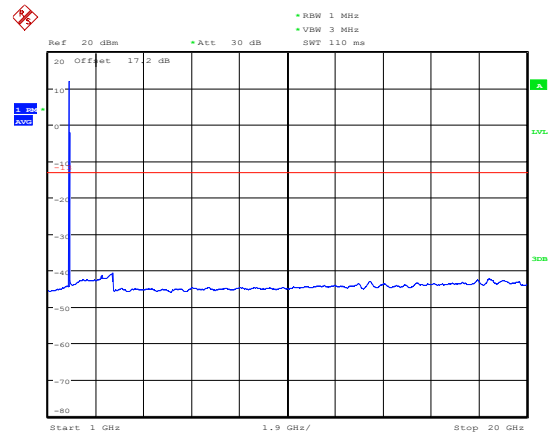


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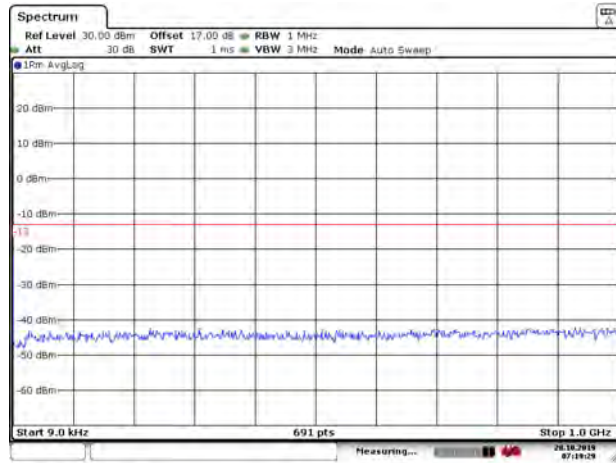
LTE Band 25 1.4MHz CH-Low 9kHz~1GHz



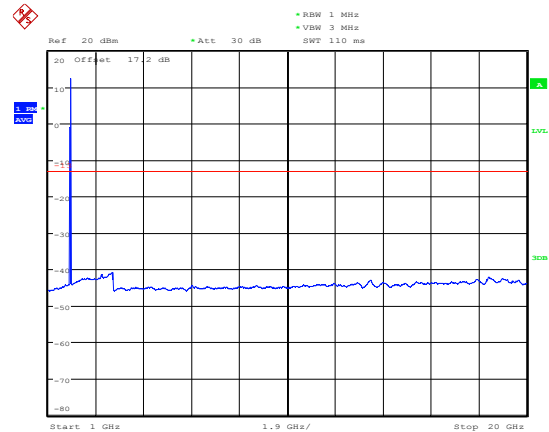
LTE Band 25 1.4MHz CH-Low 1GHz~20GHz



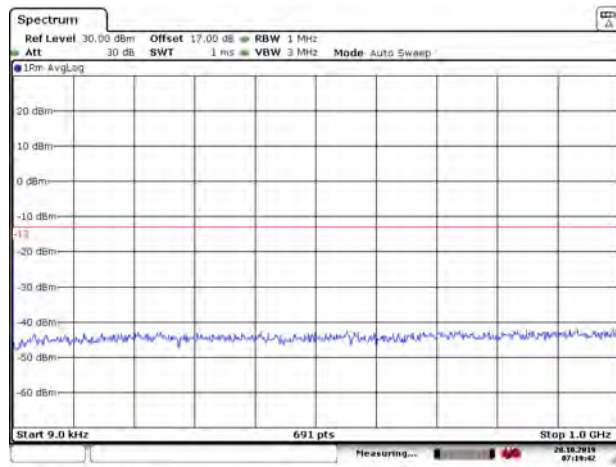
LTE Band 25 1.4MHz CH-Middle 9kHz~1GHz



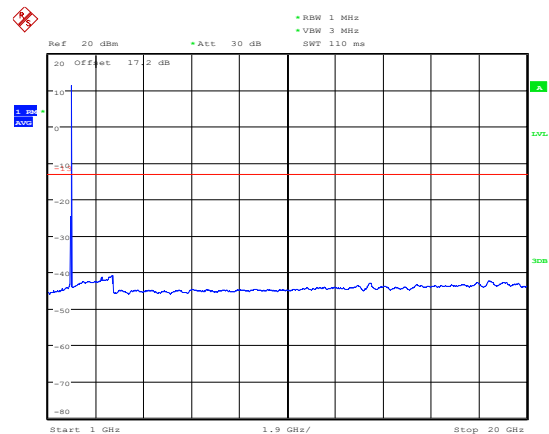
LTE Band 25 1.4MHz CH-Middle 1GHz~20GHz



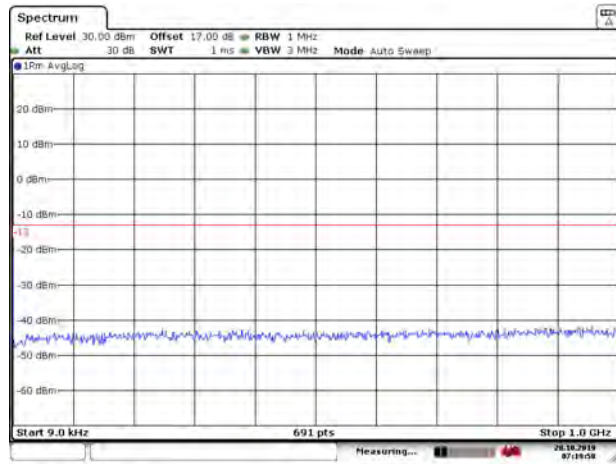
LTE Band 25 1.4MHz CH-High 9kHz~1GHz



LTE Band 25 1.4MHz CH-High 1GHz~20GHz

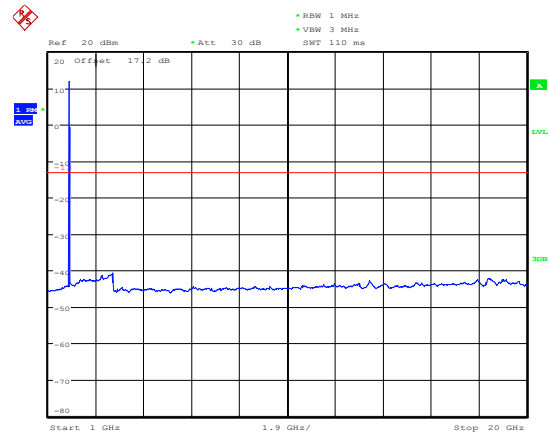


LTE Band 25 3MHz CH-Low 9kHz~1GHz



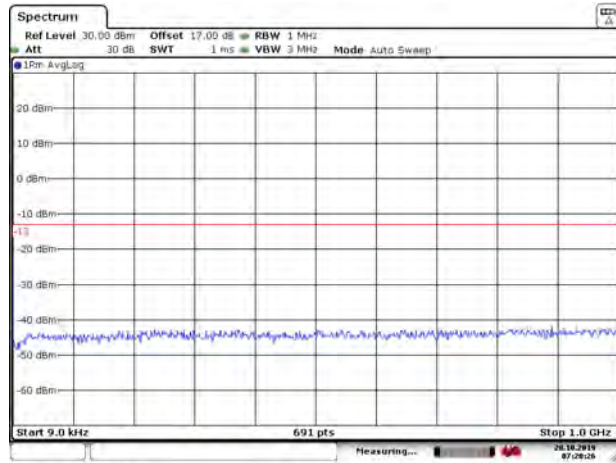
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LTE Band 25 3MHz CH-Low 1GHz~20GHz



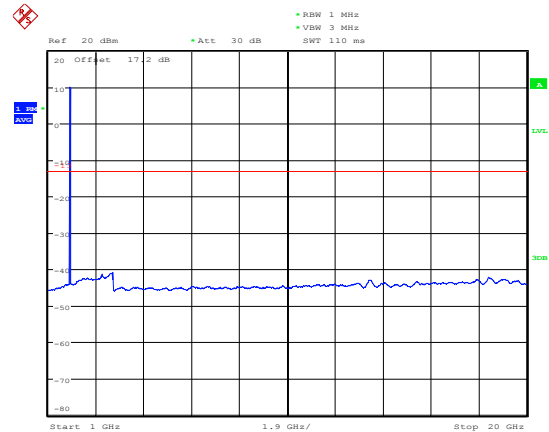
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LTE Band 25 3MHz CH-Middle 9kHz~1GHz



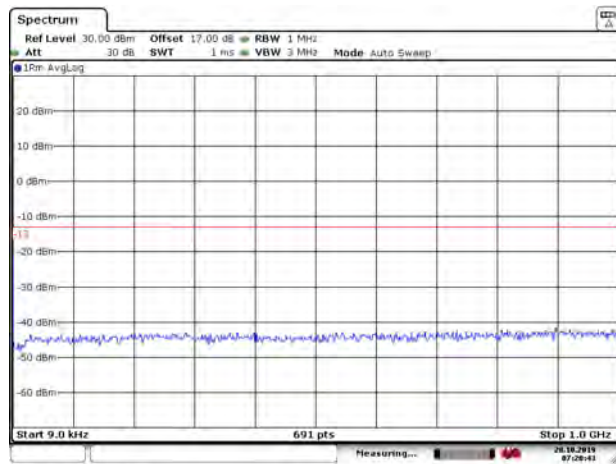
Date: 20.OCT.2019 07:20:26

LTE Band 25 3MHz CH-Middle 1GHz~20GHz



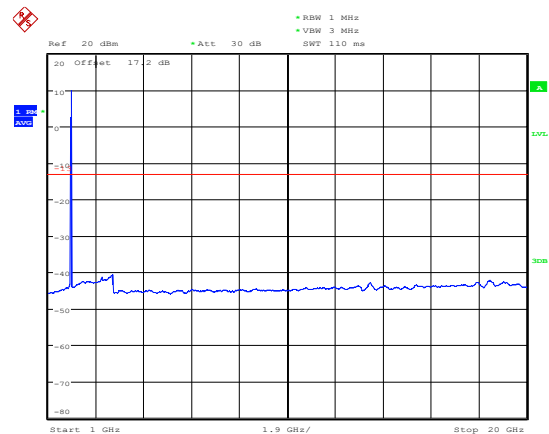
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LTE Band 25 3MHz CH-High 9kHz~1GHz



Date: 20.OCT.2019 07:20:44

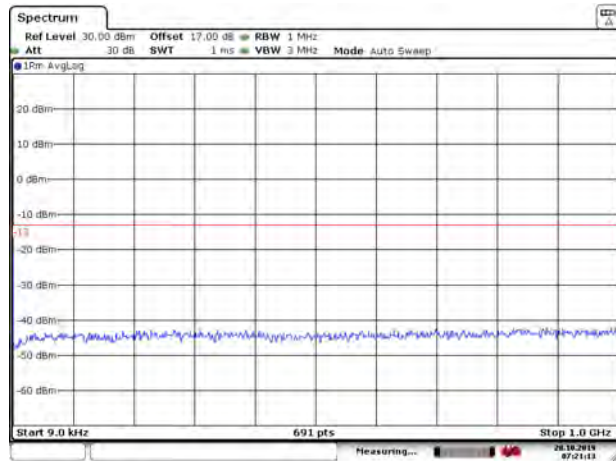
LTE Band 25 3MHz CH-High 1GHz~20GHz



Date: 8.OCT.2019 12:51:14

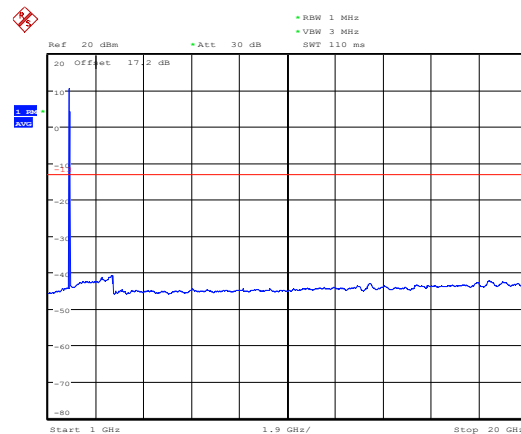


LTE Band 25 5MHz CH-Low 9kHz~1GHz



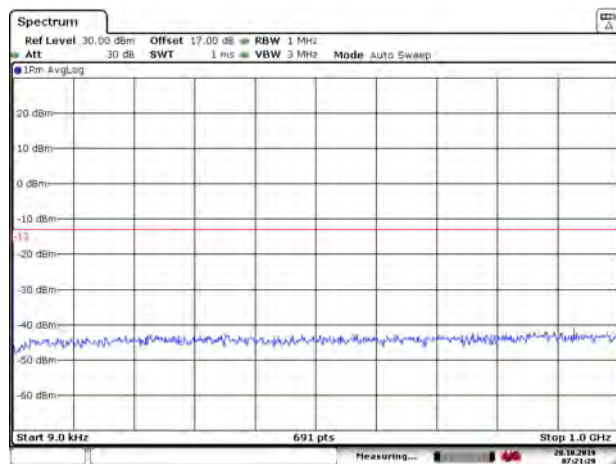
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LTE Band 25 5MHz CH-Low 1GHz~20GHz



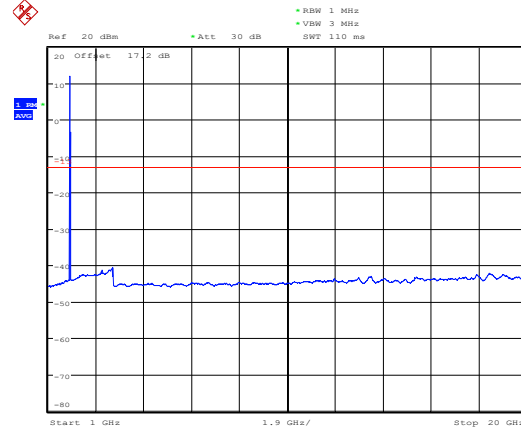
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LTE Band 25 5MHz CH-Middle 9kHz~1GHz



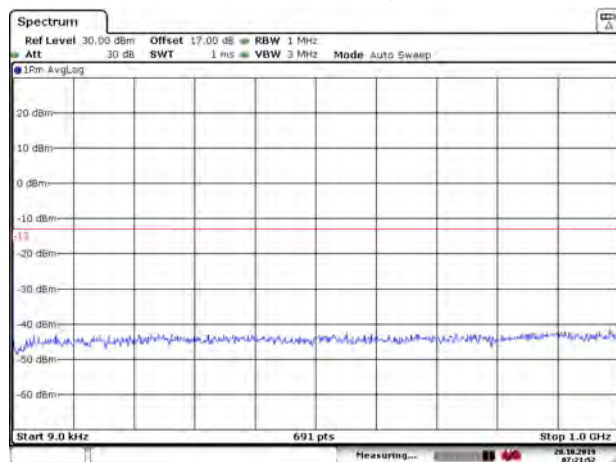
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LTE Band 25 5MHz CH-Middle 1GHz~20GHz



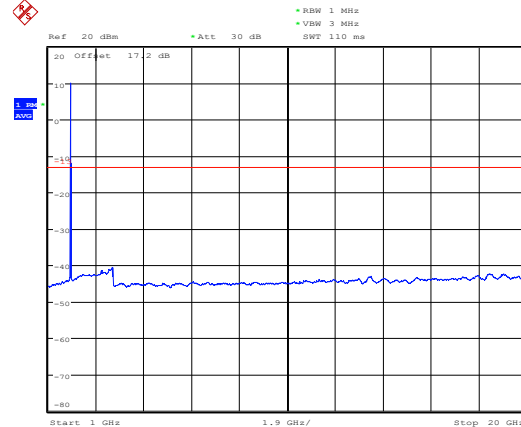
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LTE Band 25 5MHz CH-High 9kHz~1GHz



Date: 20.OCT.2019 07:21:52

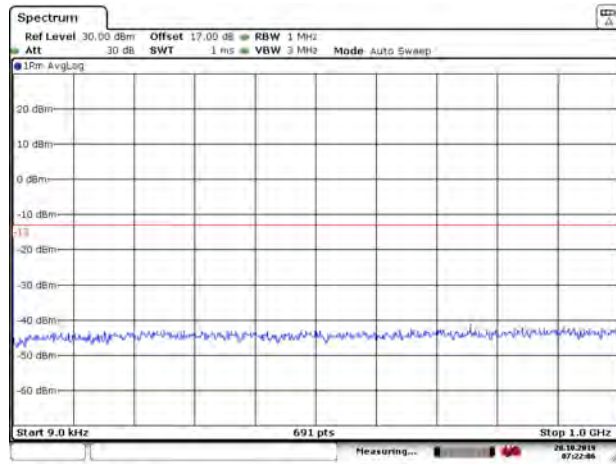
LTE Band 25 5MHz CH-High 1GHz~20GHz



Date: 8.OCT.2019 12:52:05

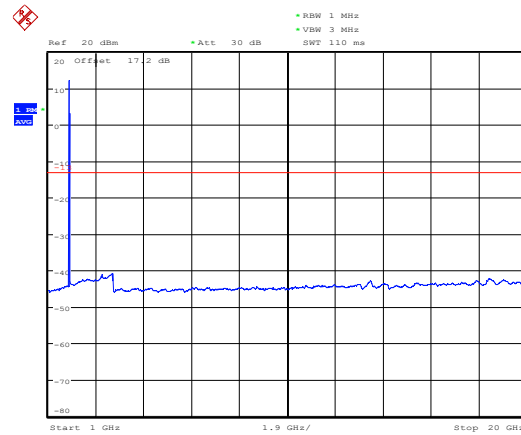


LTE Band 25 10MHz CH-Low 9kHz~1GHz



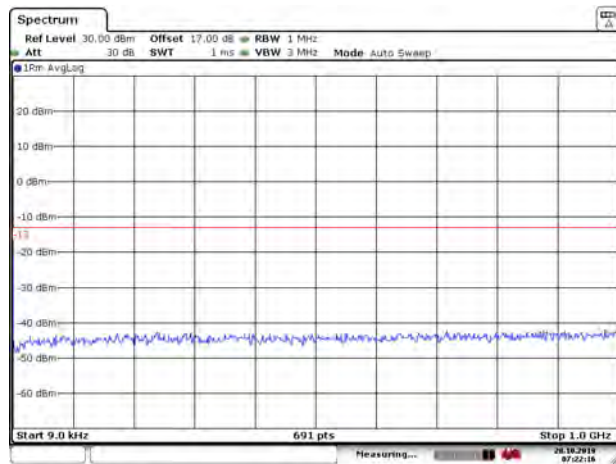
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LTE Band 25 10MHz CH-Low 1GHz~20GHz



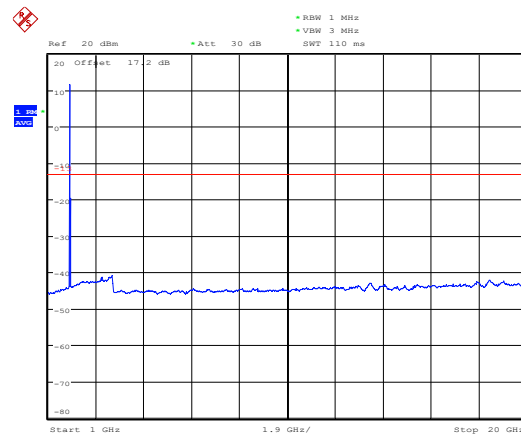
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LTE Band 25 10MHz CH-Middle 9kHz~1GHz



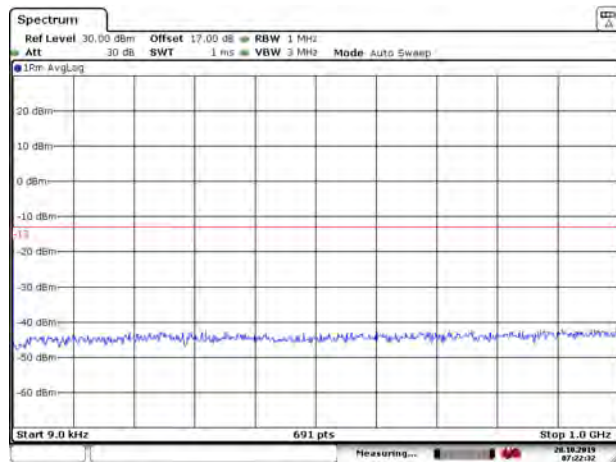
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LTE Band 25 10MHz CH-Middle 1GHz~20GHz



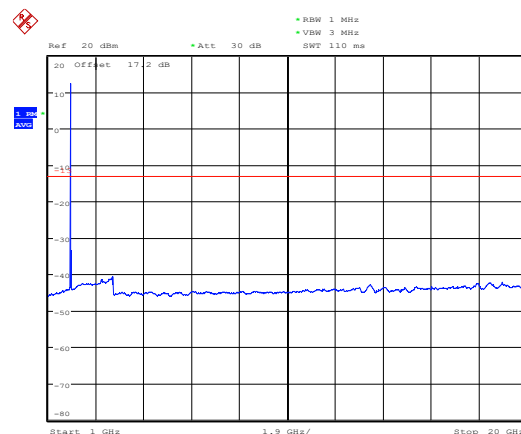
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LTE Band 25 10MHz CH-High 9kHz~1GHz



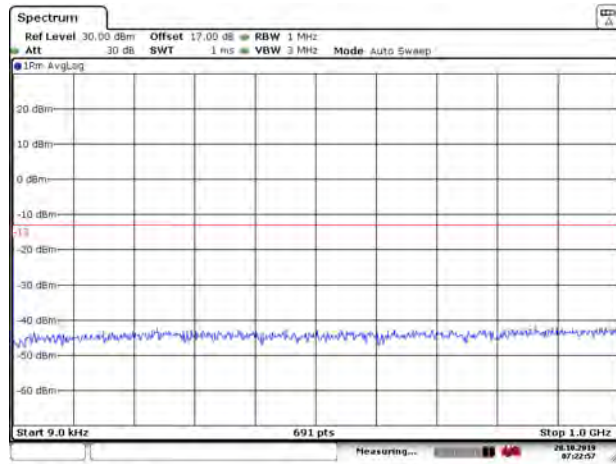
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LTE Band 25 10MHz CH-High 1GHz~20GHz



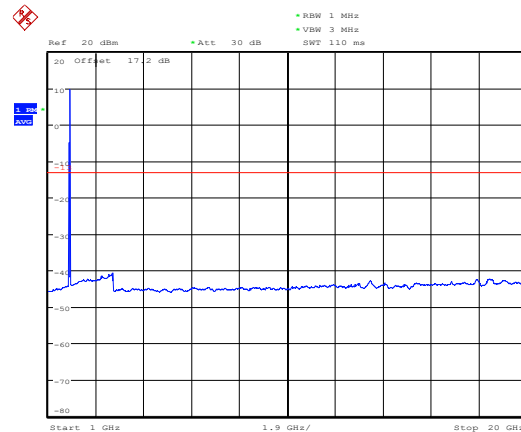
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LTE Band 25 15MHz CH-Low 9kHz~1GHz



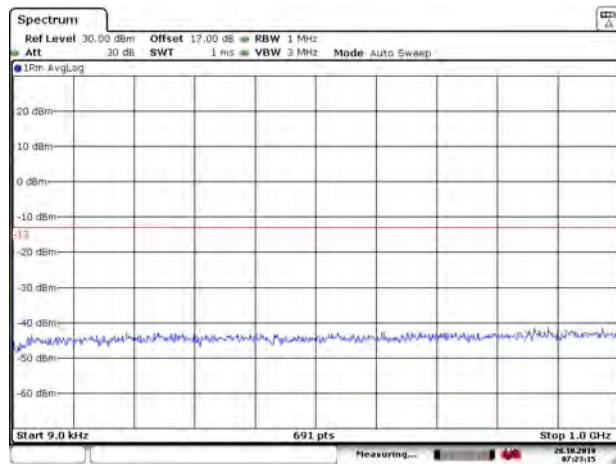
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LTE Band 25 15MHz CH-Low 1GHz~20GHz



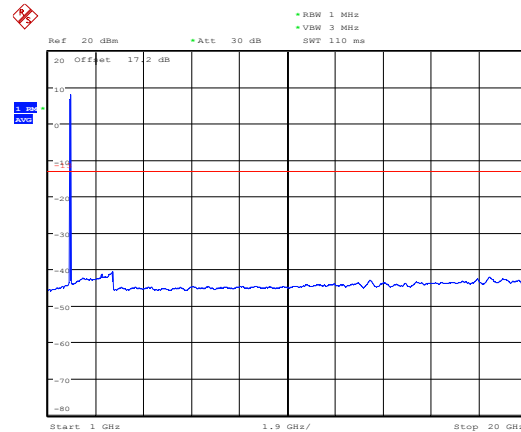
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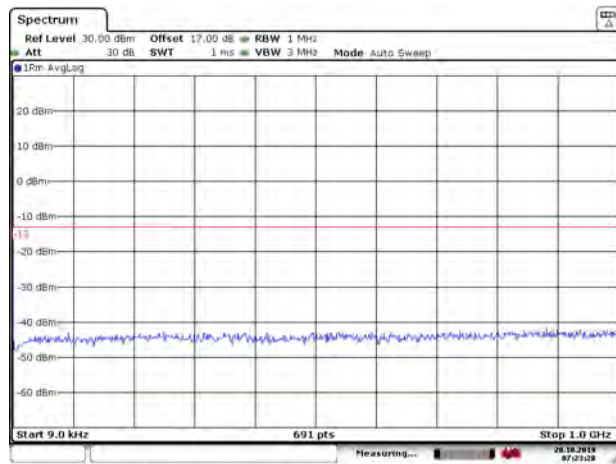
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LTE Band 25 15MHz CH-Middle 1GHz~20GHz



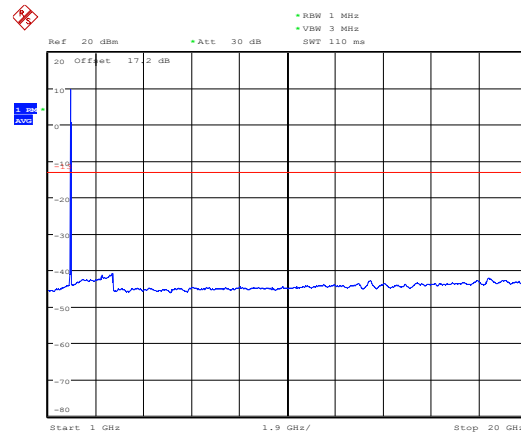
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LTE Band 25 15MHz CH-High 9kHz~1GHz



Date: 20.OCT.2019 07:23:29

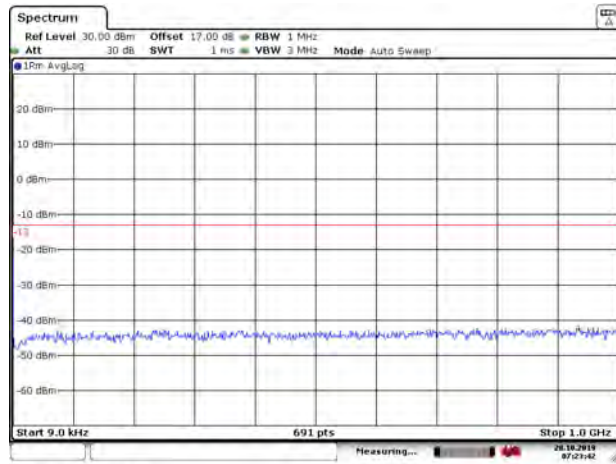
LTE Band 25 15MHz CH-High 1GHz~20GHz



Date: 8.OCT.2019 12:53:35

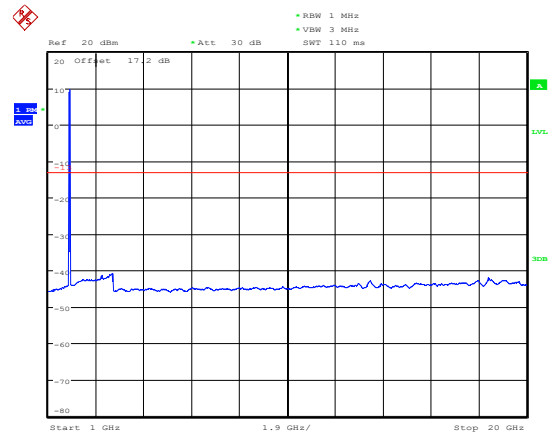


LTE Band 25 20MHz CH-Low 9kHz~1GHz



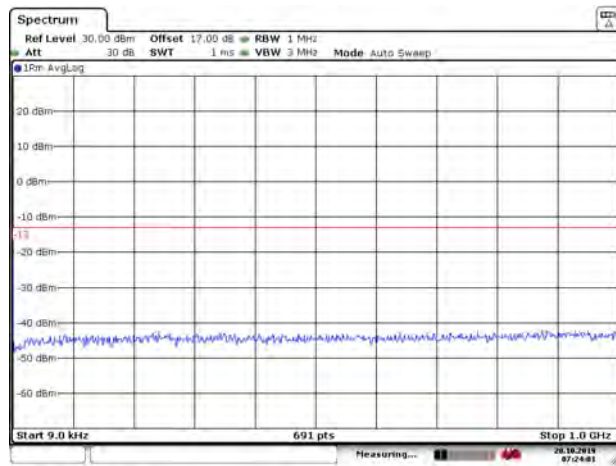
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LTE Band 25 20MHz CH-Low 1GHz~20GHz



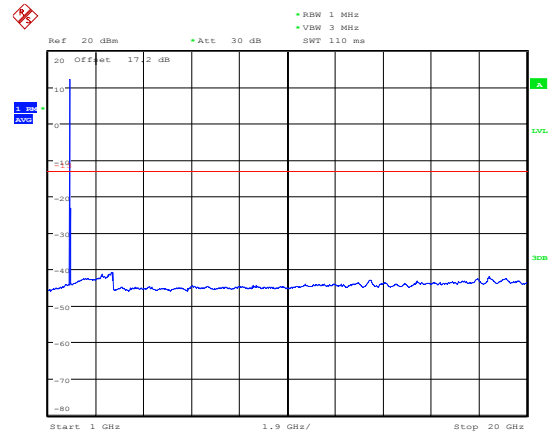
Date: 8.OCT.2019 12:53:52

LTE Band 25 20MHz CH-Middle 9kHz~1GHz



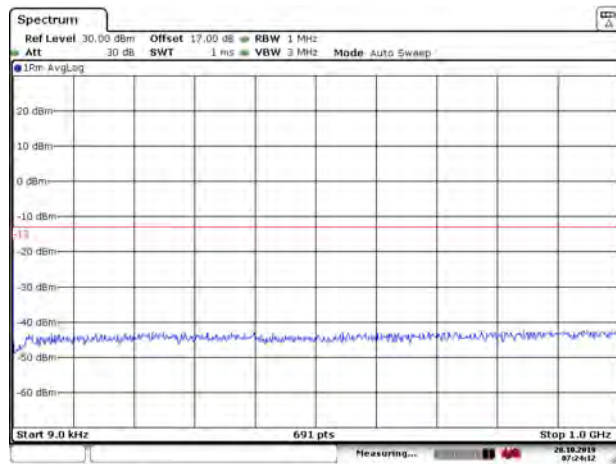
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LTE Band 25 20MHz CH-Middle 1GHz~20GHz



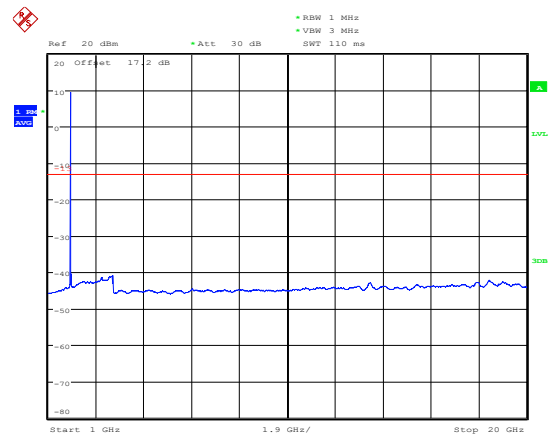
Date: 8.OCT.2019 12:54:04

LTE Band 25 20MHz CH-High 9kHz~1GHz



Date: 20.OCT.2019 07:24:13

LTE Band 25 20MHz CH-High 1GHz~20GHz



Date: 8.OCT.2019 12:54:14

5.7. Radiates Spurious Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=200Hz,VBW=600Hz for 9kHz150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz , RBW=100kHz,VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
The measurement results are amend as described below:

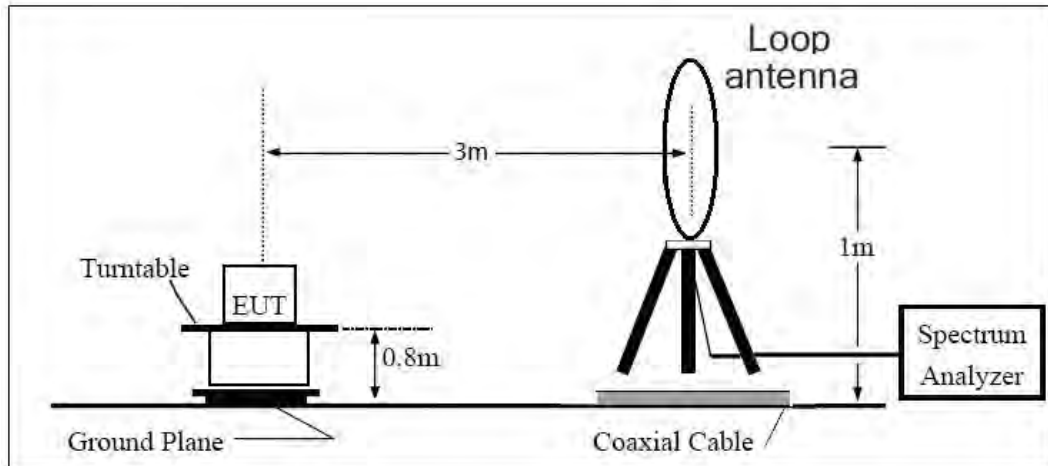
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi)

and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.

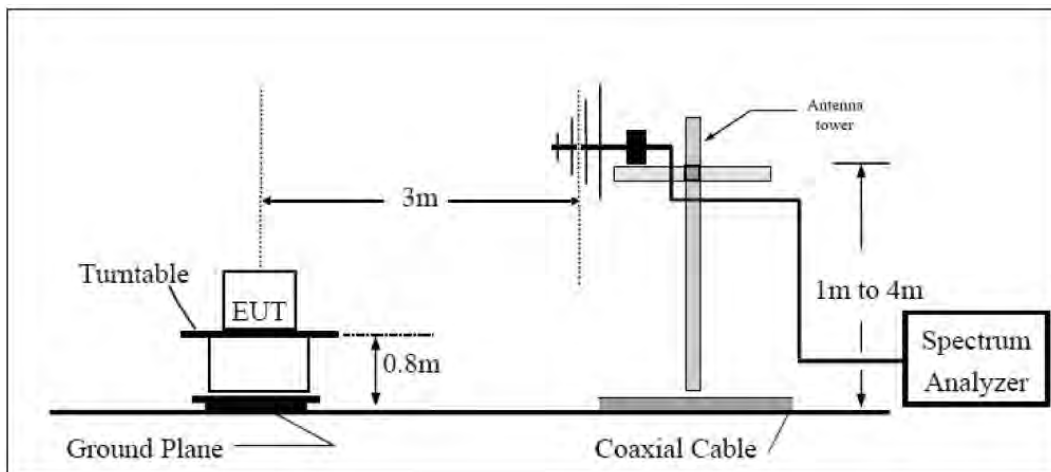
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

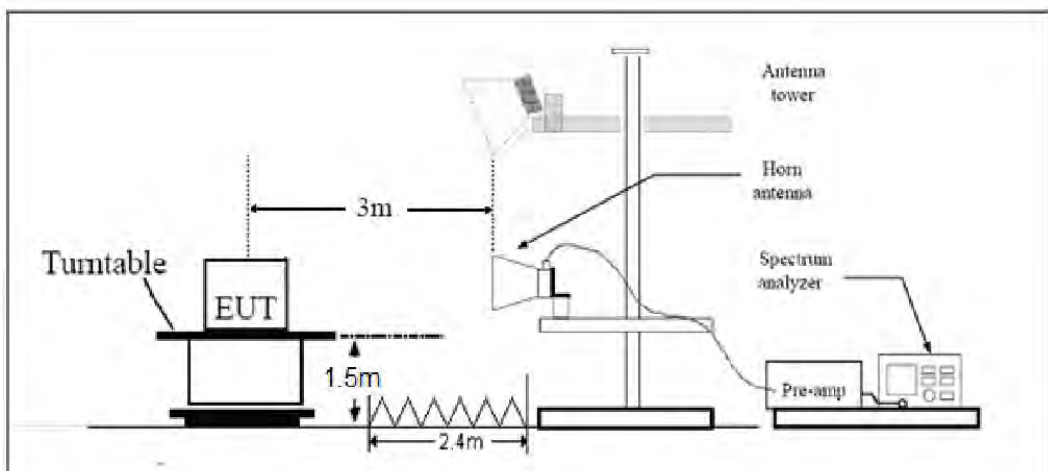
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz





Note: Area side: 2.4mX3.6m

Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10} (P)$ dB.”

Limit	-13 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 3.55$ dB.

Test Result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

LTE Band 2 1.4MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3759.0	-50.65	5.10	11.05	Horizontal	-44.70	-13.00	31.70	0
3	5638.9	-58.33	5.42	12.65	Horizontal	-51.10	-13.00	38.10	45
4	7520.0	-57.45	6.70	13.85	Horizontal	-50.30	-13.00	37.30	135
5	9400.0	-55.84	7.01	14.75	Horizontal	-48.10	-13.00	35.10	180
6	11280.0	-54.57	7.48	15.95	Horizontal	-46.10	-13.00	33.10	90
7	13160.0	-54.24	7.51	16.55	Horizontal	-45.20	-13.00	32.20	45
8	15040.0	-51.71	8.24	15.35	Horizontal	-44.60	-13.00	31.60	270
9	16920.0	-48.74	8.41	14.95	Horizontal	-42.20	-13.00	29.20	315
10	18800.0	-	-	-	-	-	-	-	-
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

LTE Band 2 5MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3755.6	-53.17	5.10	11.05	Horizontal	-47.22	-13.00	34.22	90
3	5633.6	-54.43	5.42	12.65	Horizontal	-47.20	-13.00	34.20	225
4	7520.0	-57.11	6.70	13.85	Horizontal	-49.96	-13.00	36.96	135
5	9400.0	-55.24	7.01	14.75	Horizontal	-47.50	-13.00	34.50	90
6	11280.0	-54.27	7.48	15.95	Horizontal	-45.80	-13.00	32.80	45
7	13160.0	-55.74	7.51	16.55	Horizontal	-46.70	-13.00	33.70	0
8	15040.0	-52.51	8.24	15.35	Horizontal	-45.40	-13.00	32.40	180
9	16920.0	-49.44	8.41	14.95	Horizontal	-42.90	-13.00	29.90	225
10	18800.0	-	-	-	-	-	-	-	-
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

LTE Band 2 20MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3742.1	-53.17	5.10	11.05	Horizontal	-47.22	-13.00	34.22	90
3	5613.4	-54.43	5.42	12.65	Horizontal	-47.20	-13.00	34.20	225
4	7484.6	-57.11	6.70	13.85	Horizontal	-49.96	-13.00	36.96	135
5	9400.0	-55.24	7.01	14.75	Horizontal	-47.50	-13.00	34.50	90
6	11280.0	-54.27	7.48	15.95	Horizontal	-45.80	-13.00	32.80	45
7	13160.0	-55.74	7.51	16.55	Horizontal	-46.70	-13.00	33.70	0
8	15040.0	-52.51	8.24	15.35	Horizontal	-45.40	-13.00	32.40	180
9	16920.0	-49.44	8.41	14.95	Horizontal	-42.90	-13.00	29.90	225
10	18800.0	-	-	-	-	-	-	-	-

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 25 1.4MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3765.0	-48.98	5.10	11.05	Horizontal	-43.03	-13.00	30.03	315
3	5647.5	-59.90	5.42	12.65	Horizontal	-52.67	-13.00	39.67	90
4	7530.0	-56.91	6.70	13.85	Horizontal	-49.76	-13.00	36.76	135
5	9412.5	-55.71	7.01	14.75	Horizontal	-47.97	-13.00	34.97	180
6	11295.0	-53.56	7.48	15.95	Horizontal	-45.09	-13.00	32.09	225
7	13177.5	-54.13	7.51	16.55	Horizontal	-45.09	-13.00	32.09	0
8	15060.0	-52.07	8.24	15.35	Horizontal	-44.96	-13.00	31.96	315
9	16942.5	-49.58	8.41	14.95	Horizontal	-43.04	-13.00	30.04	45
10	18825.0	-	-	-	-	-	-	-	-

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.



LTE Band 25 5MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3765.0	-52.32	5.10	11.05	Horizontal	-46.37	-13.00	33.37	135
3	5647.5	-61.03	5.42	12.65	Horizontal	-53.80	-13.00	40.80	315
4	7530.0	-56.85	6.70	13.85	Horizontal	-49.70	-13.00	36.70	225
5	9412.5	-55.94	7.01	14.75	Horizontal	-48.20	-13.00	35.20	270
6	11295.0	-53.27	7.48	15.95	Horizontal	-44.80	-13.00	31.80	0
7	13177.5	-53.94	7.51	16.55	Horizontal	-44.90	-13.00	31.90	45
8	15060.0	-51.91	8.24	15.35	Horizontal	-44.80	-13.00	31.80	90
9	16942.5	-49.54	8.41	14.95	Horizontal	-43.00	-13.00	30.00	225
10	18825.0	-	-	-	-	-	-	-	-

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 25 20MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3765.0	-55.02	5.10	11.05	Horizontal	-49.07	-13.00	36.07	45
3	5647.5	-62.42	5.42	12.65	Horizontal	-55.19	-13.00	42.19	0
4	7530.0	-58.08	6.70	13.85	Horizontal	-50.93	-13.00	37.93	315
5	9412.5	-56.08	7.01	14.75	Horizontal	-48.34	-13.00	35.34	135
6	11295.0	-55.03	7.48	15.95	Horizontal	-46.56	-13.00	33.56	45
7	13177.5	-55.63	7.51	16.55	Horizontal	-46.59	-13.00	33.59	90
8	15060.0	-53.13	8.24	15.35	Horizontal	-46.02	-13.00	33.02	315
9	16942.5	-51.14	8.41	14.95	Horizontal	-44.60	-13.00	31.60	135
10	18825.0	-	-	-	-	-	-	-	-

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMU200	118133	2019-05-19	2020-05-18
Base Station Simulator	R&S	CMW500	113824	2019-05-19	2020-05-18
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2019-05-19	2020-05-18
Universal Radio Communication Tester	Key sight	E5515C	MY48367192	2019-05-19	2020-05-18
Signal Analyzer	R&S	FSV30	100815	2019-12-16	2020-12-15
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2020-09-25
Trilog Antenna	SCHWARZBECK	VUBL 9163	01111	2019-09-12	2021-09-11
Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
Signal generator	R&S	SMB 100A	102594	2019-05-19	2020-05-18
Climatic Chamber	ESPEC	SU-242	93000506	2017-12-17	2020-12-16
Preamplifier	R&S	SCU18	102327	2019-05-19	2020-05-18
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2019-05-19	2020-05-18
RF Cable	Agilent	SMA 15cm	0001	2019-12-14	2020-13-15
Software	R&S	EMC32	9.26.0	/	/

*****END OF REPORT *****