



RF TEST REPORT

Applicant Quectel Wireless Solutions Co., Ltd
FCC ID XMR201909EC21AUX
Product LTE Module
Brand Quectel
Model EC21-AUX, EC21-AUX MINIPCIE
Report No. R1908A0502-R2
Issue Date October 23, 2019

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2018)/ FCC CFR 47 Part 24E (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Peng Tao

Approved by: Kai Xu

TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000



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Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Isotropic Radiated power	24.232(c)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	2.1051 /24.238(a)	PASS
5	Peak-to-Average Power Ratio	24.232/KDB 971168 D01(5.7)	PASS
6	Frequency Stability	2.1055 / 24.235	PASS
7	Spurious Emissions at Antenna Terminals	2.1051 / 24.238(a)	PASS
8	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: August 19, 2019 ~October 10, 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
Telephone: +86-021-50791141/2/3
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	Quectel Wireless Solutions Co., Ltd
Applicant address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer	Quectel Wireless Solutions Co., Ltd
Manufacturer address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

2.2. General information

EUT Description			
Model	EC21-AUX, EC21-AUX MINIPCIE		
IMEI	868450040001099		
Hardware Version	R1.0		
Software Version	EC21AUXGAR08A01M1G		
Power Supply	External power supply		
Antenna Type	The EUT don't have standard Antenna, The Antenna used for testing in this report is the after-market accessory (Dipole Antenna)		
Antenna Gain	4dBi		
Test Mode(s)	GSM1900; WCDMA Band II; LTE Band 2;		
Test Modulation	(GSM)GMSK,8PSK; (WCDMA) BPSK, QPSK,16QAM; (LTE)QPSK,16QAM		
GPRS Multislot Class	33		
EGPRS Multislot Class	33		
HSDPA UE Category	24		
HSUPA UE Category	6		
DC-HSDPA UE Category	24		
HSPA+ UE Category	6		
LTE Category	1		
Maximum E.I.R.P	GSM 1900:	31.49	
	WCDMA Band II:	25.35	
	LTE Band 2:	25.39	
Rated Power Supply Voltage	3.8V		
Extreme Voltage	Minimum: 3.3V Maximum: 4.3V		
Extreme Temperature	Lowest: -40°C Highest: +85°C		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM1900	1850 ~ 1910	1930 ~ 1990



	WCDMA Band II	1850 ~ 1910	1930 ~ 1990
	LTE Band 2	1850 ~ 1910	1930 ~ 1990
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:

FCC CFR47 Part 2 (2018)

FCC CFR 47 Part 24E (2018)

ANSI C63.26 (2015)

KDB 971168 D01 Power Meas License Digital Systems v03r01

4. Test Configuration

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, vertical 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 GSM/WCDMA/LTE is set based on the maximum RF Output Power.

Test modes are chosen to be reported as the worst case configuration below:

Test items	Modes/Modulation	
	GSM 1900	WCDMA Band II
RF power output	GPRS EGPRS	RMC HSDPA/HSUPA DC-HSDPA
Effective Isotropic Radiated power	GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Occupied Bandwidth	GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Band Edge Compliance	GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Peak-to-Average Power Ratio	GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Frequency Stability	GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Spurious Emissions at Antenna Terminals	GPRS(1Tx slot)	RMC
Radiates Spurious Emission	GPRS(1Tx slot)	RMC



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

Test items	Bandwidth (MHz)						Modulation		RB			Test Channel		
	1.4	3	5	10	15	20	QPSK	16QAM	1	50%	100%	L	M	H
RF power output	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
Occupied Bandwidth	O	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	O
Frequency Stability	O	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	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

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.

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.

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**

Band	Channel	PCL	Slot	Power(dBm)	Limit(dBm)	Verdict
GPRS1900	512	0	1	29.89	33	PASS
GPRS1900	512	0	2	28.76	33	PASS
GPRS1900	512	0	3	26.73	33	PASS
GPRS1900	512	0	4	25.65	33	PASS
GPRS1900	661	0	1	29.82	33	PASS
GPRS1900	661	0	2	28.76	33	PASS
GPRS1900	661	0	3	26.77	33	PASS
GPRS1900	661	0	4	25.68	33	PASS
GPRS1900	810	0	1	29.67	33	PASS
GPRS1900	810	0	2	28.65	33	PASS
GPRS1900	810	0	3	26.72	33	PASS
GPRS1900	810	0	4	25.65	33	PASS
EGPRS1900	512	2	1	25.86	33	PASS
EGPRS1900	512	2	2	25.65	33	PASS
EGPRS1900	512	2	3	23.51	33	PASS
EGPRS1900	512	2	4	22.43	33	PASS
EGPRS1900	661	2	1	25.96	33	PASS
EGPRS1900	661	2	2	25.71	33	PASS
EGPRS1900	661	2	3	23.58	33	PASS
EGPRS1900	661	2	4	22.42	33	PASS
EGPRS1900	810	2	1	26.05	33	PASS
EGPRS1900	810	2	2	25.86	33	PASS
EGPRS1900	810	2	3	23.56	33	PASS
EGPRS1900	810	2	4	23.23	33	PASS

Band	Channel	SubTest	Power(dBm)	Limit(dBm)	Verdict
WCDMA Band II	9262	-	23.57	33	PASS
WCDMA Band II	9400	-	23.75	33	PASS
WCDMA Band II	9538	-	23.57	33	PASS
WCDMA Band II	9262	HSDPA_Sub0	22.57	33	PASS
WCDMA Band II	9262	HSDPA_Sub1	22.17	33	PASS
WCDMA Band II	9262	HSDPA_Sub2	22.13	33	PASS
WCDMA Band II	9262	HSDPA_Sub3	22.09	33	PASS
WCDMA Band II	9400	HSDPA_Sub0	22.80	33	PASS
WCDMA Band II	9400	HSDPA_Sub1	22.43	33	PASS
WCDMA Band II	9400	HSDPA_Sub2	22.42	33	PASS
WCDMA Band II	9400	HSDPA_Sub3	22.41	33	PASS
WCDMA Band II	9538	HSDPA_Sub0	22.39	33	PASS
WCDMA Band II	9538	HSDPA_Sub1	21.91	33	PASS
WCDMA Band II	9538	HSDPA_Sub2	22.00	33	PASS



Band	Channel	SubTest	Power(dBm)	Limit(dBm)	Verdict
WCDMA Band II	9538	HSDPA_Sub3	21.98	33	PASS
WCDMA Band II	9262	HSUPA_Sub1	22.14	33	PASS
WCDMA Band II	9262	HSUPA_Sub2	21.60	33	PASS
WCDMA Band II	9262	HSUPA_Sub3	21.45	33	PASS
WCDMA Band II	9262	HSUPA_Sub4	21.91	33	PASS
WCDMA Band II	9262	HSUPA_Sub5	22.25	33	PASS
WCDMA Band II	9400	HSUPA_Sub1	22.56	33	PASS
WCDMA Band II	9400	HSUPA_Sub2	21.54	33	PASS
WCDMA Band II	9400	HSUPA_Sub3	20.58	33	PASS
WCDMA Band II	9400	HSUPA_Sub4	21.52	33	PASS
WCDMA Band II	9400	HSUPA_Sub5	22.49	33	PASS
WCDMA Band II	9538	HSUPA_Sub1	22.19	33	PASS
WCDMA Band II	9538	HSUPA_Sub2	21.61	33	PASS
WCDMA Band II	9538	HSUPA_Sub3	21.48	33	PASS
WCDMA Band II	9538	HSUPA_Sub4	21.95	33	PASS
WCDMA Band II	9538	HSUPA_Sub5	22.51	33	PASS

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dBm)	Verdict
LTE Band 2	1.4MHz	QPSK	18607	1RB#0	23.79	PASS
LTE Band 2	1.4MHz	16QAM	18607	1RB#0	23.00	PASS
LTE Band 2	1.4MHz	QPSK	18607	1RB#2	23.70	PASS
LTE Band 2	1.4MHz	16QAM	18607	1RB#2	22.67	PASS
LTE Band 2	1.4MHz	QPSK	18607	1RB#5	23.50	PASS
LTE Band 2	1.4MHz	16QAM	18607	1RB#5	22.52	PASS
LTE Band 2	1.4MHz	QPSK	18607	3RB#0	23.26	PASS
LTE Band 2	1.4MHz	16QAM	18607	3RB#0	21.93	PASS
LTE Band 2	1.4MHz	QPSK	18607	3RB#1	23.41	PASS
LTE Band 2	1.4MHz	16QAM	18607	3RB#1	22.10	PASS
LTE Band 2	1.4MHz	QPSK	18607	3RB#3	23.24	PASS
LTE Band 2	1.4MHz	16QAM	18607	3RB#3	22.13	PASS
LTE Band 2	1.4MHz	QPSK	18607	6RB#0	22.18	PASS
LTE Band 2	1.4MHz	16QAM	18607	6RB#0	21.43	PASS
LTE Band 2	1.4MHz	QPSK	18900	1RB#0	23.72	PASS
LTE Band 2	1.4MHz	16QAM	18900	1RB#0	22.38	PASS
LTE Band 2	1.4MHz	QPSK	18900	1RB#2	23.28	PASS
LTE Band 2	1.4MHz	16QAM	18900	1RB#2	22.36	PASS
LTE Band 2	1.4MHz	QPSK	18900	1RB#5	23.23	PASS
LTE Band 2	1.4MHz	16QAM	18900	1RB#5	22.59	PASS
LTE Band 2	1.4MHz	QPSK	18900	3RB#0	23.24	PASS
LTE Band 2	1.4MHz	16QAM	18900	3RB#0	22.18	PASS



LTE Band 2	1.4MHz	QPSK	18900	3RB#1	23.22	PASS
LTE Band 2	1.4MHz	16QAM	18900	3RB#1	22.28	PASS
LTE Band 2	1.4MHz	QPSK	18900	3RB#3	23.19	PASS
LTE Band 2	1.4MHz	16QAM	18900	3RB#3	22.20	PASS
LTE Band 2	1.4MHz	QPSK	18900	6RB#0	22.28	PASS
LTE Band 2	1.4MHz	16QAM	18900	6RB#0	21.29	PASS
LTE Band 2	1.4MHz	QPSK	19193	1RB#0	23.49	PASS
LTE Band 2	1.4MHz	16QAM	19193	1RB#0	22.43	PASS
LTE Band 2	1.4MHz	QPSK	19193	1RB#2	23.53	PASS
LTE Band 2	1.4MHz	16QAM	19193	1RB#2	22.72	PASS
LTE Band 2	1.4MHz	QPSK	19193	1RB#5	23.44	PASS
LTE Band 2	1.4MHz	16QAM	19193	1RB#5	22.45	PASS
LTE Band 2	1.4MHz	QPSK	19193	3RB#0	23.24	PASS
LTE Band 2	1.4MHz	16QAM	19193	3RB#0	22.14	PASS
LTE Band 2	1.4MHz	QPSK	19193	3RB#1	23.26	PASS
LTE Band 2	1.4MHz	16QAM	19193	3RB#1	22.23	PASS
LTE Band 2	1.4MHz	QPSK	19193	3RB#3	23.09	PASS
LTE Band 2	1.4MHz	16QAM	19193	3RB#3	22.08	PASS
LTE Band 2	1.4MHz	QPSK	19193	6RB#0	22.21	PASS
LTE Band 2	1.4MHz	16QAM	19193	6RB#0	21.23	PASS
LTE Band 2	3MHz	QPSK	18615	1RB#0	23.29	PASS
LTE Band 2	3MHz	16QAM	18615	1RB#0	22.21	PASS
LTE Band 2	3MHz	QPSK	18615	1RB#8	23.17	PASS
LTE Band 2	3MHz	16QAM	18615	1RB#8	22.16	PASS
LTE Band 2	3MHz	QPSK	18615	1RB#14	23.20	PASS
LTE Band 2	3MHz	16QAM	18615	1RB#14	22.04	PASS
LTE Band 2	3MHz	QPSK	18615	8RB#0	22.18	PASS
LTE Band 2	3MHz	16QAM	18615	8RB#0	21.31	PASS
LTE Band 2	3MHz	QPSK	18615	8RB#4	22.18	PASS
LTE Band 2	3MHz	16QAM	18615	8RB#4	21.29	PASS
LTE Band 2	3MHz	QPSK	18615	8RB#7	22.23	PASS
LTE Band 2	3MHz	16QAM	18615	8RB#7	21.35	PASS
LTE Band 2	3MHz	QPSK	18615	15RB#0	22.29	PASS
LTE Band 2	3MHz	16QAM	18615	15RB#0	21.39	PASS
LTE Band 2	3MHz	QPSK	18900	1RB#0	23.12	PASS
LTE Band 2	3MHz	16QAM	18900	1RB#0	22.20	PASS
LTE Band 2	3MHz	QPSK	18900	1RB#8	23.00	PASS
LTE Band 2	3MHz	16QAM	18900	1RB#8	22.19	PASS
LTE Band 2	3MHz	QPSK	18900	1RB#14	23.19	PASS
LTE Band 2	3MHz	16QAM	18900	1RB#14	22.12	PASS
LTE Band 2	3MHz	QPSK	18900	8RB#0	22.16	PASS
LTE Band 2	3MHz	16QAM	18900	8RB#0	21.12	PASS



LTE Band 2	3MHz	QPSK	18900	8RB#4	22.16	PASS
LTE Band 2	3MHz	16QAM	18900	8RB#4	21.17	PASS
LTE Band 2	3MHz	QPSK	18900	8RB#7	22.13	PASS
LTE Band 2	3MHz	16QAM	18900	8RB#7	21.35	PASS
LTE Band 2	3MHz	QPSK	18900	15RB#0	22.25	PASS
LTE Band 2	3MHz	16QAM	18900	15RB#0	21.24	PASS
LTE Band 2	3MHz	QPSK	19185	1RB#0	23.68	PASS
LTE Band 2	3MHz	16QAM	19185	1RB#0	22.32	PASS
LTE Band 2	3MHz	QPSK	19185	1RB#8	23.16	PASS
LTE Band 2	3MHz	16QAM	19185	1RB#8	22.24	PASS
LTE Band 2	3MHz	QPSK	19185	1RB#14	23.18	PASS
LTE Band 2	3MHz	16QAM	19185	1RB#14	22.26	PASS
LTE Band 2	3MHz	QPSK	19185	8RB#0	22.41	PASS
LTE Band 2	3MHz	16QAM	19185	8RB#0	21.28	PASS
LTE Band 2	3MHz	QPSK	19185	8RB#4	22.18	PASS
LTE Band 2	3MHz	16QAM	19185	8RB#4	21.29	PASS
LTE Band 2	3MHz	QPSK	19185	8RB#7	22.10	PASS
LTE Band 2	3MHz	16QAM	19185	8RB#7	21.18	PASS
LTE Band 2	3MHz	QPSK	19185	15RB#0	22.17	PASS
LTE Band 2	3MHz	16QAM	19185	15RB#0	21.15	PASS
LTE Band 2	5MHz	QPSK	18625	1RB#0	23.19	PASS
LTE Band 2	5MHz	16QAM	18625	1RB#0	22.35	PASS
LTE Band 2	5MHz	QPSK	18625	1RB#12	23.12	PASS
LTE Band 2	5MHz	16QAM	18625	1RB#12	21.97	PASS
LTE Band 2	5MHz	QPSK	18625	1RB#24	23.19	PASS
LTE Band 2	5MHz	16QAM	18625	1RB#24	21.93	PASS
LTE Band 2	5MHz	QPSK	18625	12RB#0	22.07	PASS
LTE Band 2	5MHz	16QAM	18625	12RB#0	21.17	PASS
LTE Band 2	5MHz	QPSK	18625	12RB#6	22.16	PASS
LTE Band 2	5MHz	16QAM	18625	12RB#6	21.14	PASS
LTE Band 2	5MHz	QPSK	18625	12RB#13	22.13	PASS
LTE Band 2	5MHz	16QAM	18625	12RB#13	21.11	PASS
LTE Band 2	5MHz	QPSK	18625	25RB#0	22.18	PASS
LTE Band 2	5MHz	16QAM	18625	25RB#0	21.37	PASS
LTE Band 2	5MHz	QPSK	18900	1RB#0	23.15	PASS
LTE Band 2	5MHz	16QAM	18900	1RB#0	22.27	PASS
LTE Band 2	5MHz	QPSK	18900	1RB#12	23.28	PASS
LTE Band 2	5MHz	16QAM	18900	1RB#12	22.45	PASS
LTE Band 2	5MHz	QPSK	18900	1RB#24	23.38	PASS
LTE Band 2	5MHz	16QAM	18900	1RB#24	22.14	PASS
LTE Band 2	5MHz	QPSK	18900	12RB#0	22.10	PASS
LTE Band 2	5MHz	16QAM	18900	12RB#0	21.17	PASS



LTE Band 2	5MHz	QPSK	18900	12RB#6	22.11	PASS
LTE Band 2	5MHz	16QAM	18900	12RB#6	21.28	PASS
LTE Band 2	5MHz	QPSK	18900	12RB#13	22.34	PASS
LTE Band 2	5MHz	16QAM	18900	12RB#13	21.28	PASS
LTE Band 2	5MHz	QPSK	18900	25RB#0	22.15	PASS
LTE Band 2	5MHz	16QAM	18900	25RB#0	21.12	PASS
LTE Band 2	5MHz	QPSK	19175	1RB#0	23.34	PASS
LTE Band 2	5MHz	16QAM	19175	1RB#0	22.11	PASS
LTE Band 2	5MHz	QPSK	19175	1RB#12	23.17	PASS
LTE Band 2	5MHz	16QAM	19175	1RB#12	22.32	PASS
LTE Band 2	5MHz	QPSK	19175	1RB#24	23.03	PASS
LTE Band 2	5MHz	16QAM	19175	1RB#24	22.43	PASS
LTE Band 2	5MHz	QPSK	19175	12RB#0	22.23	PASS
LTE Band 2	5MHz	16QAM	19175	12RB#0	21.23	PASS
LTE Band 2	5MHz	QPSK	19175	12RB#6	22.17	PASS
LTE Band 2	5MHz	16QAM	19175	12RB#6	21.22	PASS
LTE Band 2	5MHz	QPSK	19175	12RB#13	22.13	PASS
LTE Band 2	5MHz	16QAM	19175	12RB#13	21.30	PASS
LTE Band 2	5MHz	QPSK	19175	25RB#0	22.28	PASS
LTE Band 2	5MHz	16QAM	19175	25RB#0	21.35	PASS
LTE Band 2	10MHz	QPSK	18650	1RB#0	23.29	PASS
LTE Band 2	10MHz	16QAM	18650	1RB#0	22.71	PASS
LTE Band 2	10MHz	QPSK	18650	1RB#24	23.48	PASS
LTE Band 2	10MHz	16QAM	18650	1RB#24	22.71	PASS
LTE Band 2	10MHz	QPSK	18650	1RB#49	23.05	PASS
LTE Band 2	10MHz	16QAM	18650	1RB#49	22.04	PASS
LTE Band 2	10MHz	QPSK	18650	25RB#0	22.32	PASS
LTE Band 2	10MHz	16QAM	18650	25RB#0	21.26	PASS
LTE Band 2	10MHz	QPSK	18650	25RB#12	22.29	PASS
LTE Band 2	10MHz	16QAM	18650	25RB#12	21.23	PASS
LTE Band 2	10MHz	QPSK	18650	25RB#25	22.17	PASS
LTE Band 2	10MHz	16QAM	18650	25RB#25	21.22	PASS
LTE Band 2	10MHz	QPSK	18650	50RB#0	22.23	PASS
LTE Band 2	10MHz	16QAM	18650	50RB#0	22.25	PASS
LTE Band 2	10MHz	QPSK	18900	1RB#0	23.35	PASS
LTE Band 2	10MHz	16QAM	18900	1RB#0	22.38	PASS
LTE Band 2	10MHz	QPSK	18900	1RB#24	23.28	PASS
LTE Band 2	10MHz	16QAM	18900	1RB#24	22.15	PASS
LTE Band 2	10MHz	QPSK	18900	1RB#49	23.55	PASS
LTE Band 2	10MHz	16QAM	18900	1RB#49	22.29	PASS
LTE Band 2	10MHz	QPSK	18900	25RB#0	22.24	PASS
LTE Band 2	10MHz	16QAM	18900	25RB#0	21.33	PASS



LTE Band 2	10MHz	QPSK	18900	25RB#12	22.31	PASS
LTE Band 2	10MHz	16QAM	18900	25RB#12	21.62	PASS
LTE Band 2	10MHz	QPSK	18900	25RB#25	22.20	PASS
LTE Band 2	10MHz	16QAM	18900	25RB#25	21.20	PASS
LTE Band 2	10MHz	QPSK	18900	50RB#0	22.12	PASS
LTE Band 2	10MHz	16QAM	18900	50RB#0	22.44	PASS
LTE Band 2	10MHz	QPSK	19150	1RB#0	23.51	PASS
LTE Band 2	10MHz	16QAM	19150	1RB#0	22.41	PASS
LTE Band 2	10MHz	QPSK	19150	1RB#24	23.57	PASS
LTE Band 2	10MHz	16QAM	19150	1RB#24	22.10	PASS
LTE Band 2	10MHz	QPSK	19150	1RB#49	23.00	PASS
LTE Band 2	10MHz	16QAM	19150	1RB#49	21.99	PASS
LTE Band 2	10MHz	QPSK	19150	25RB#0	22.33	PASS
LTE Band 2	10MHz	16QAM	19150	25RB#0	21.34	PASS
LTE Band 2	10MHz	QPSK	19150	25RB#12	22.32	PASS
LTE Band 2	10MHz	16QAM	19150	25RB#12	21.31	PASS
LTE Band 2	10MHz	QPSK	19150	25RB#25	22.33	PASS
LTE Band 2	10MHz	16QAM	19150	25RB#25	21.60	PASS
LTE Band 2	10MHz	QPSK	19150	50RB#0	22.18	PASS
LTE Band 2	10MHz	16QAM	19150	50RB#0	22.31	PASS
LTE Band 2	15MHz	QPSK	18675	1RB#0	23.45	PASS
LTE Band 2	15MHz	16QAM	18675	1RB#0	22.42	PASS
LTE Band 2	15MHz	QPSK	18675	1RB#38	23.40	PASS
LTE Band 2	15MHz	16QAM	18675	1RB#38	22.19	PASS
LTE Band 2	15MHz	QPSK	18675	1RB#74	23.12	PASS
LTE Band 2	15MHz	16QAM	18675	1RB#74	22.16	PASS
LTE Band 2	15MHz	QPSK	18675	38RB#0	22.29	PASS
LTE Band 2	15MHz	16QAM	18675	38RB#0	22.22	PASS
LTE Band 2	15MHz	QPSK	18675	38RB#18	22.20	PASS
LTE Band 2	15MHz	16QAM	18675	38RB#18	21.97	PASS
LTE Band 2	15MHz	QPSK	18675	38RB#37	22.06	PASS
LTE Band 2	15MHz	16QAM	18675	38RB#37	22.09	PASS
LTE Band 2	15MHz	QPSK	18675	75RB#0	22.10	PASS
LTE Band 2	15MHz	16QAM	18675	75RB#0	22.17	PASS
LTE Band 2	15MHz	QPSK	18900	1RB#0	23.32	PASS
LTE Band 2	15MHz	16QAM	18900	1RB#0	22.27	PASS
LTE Band 2	15MHz	QPSK	18900	1RB#38	23.23	PASS
LTE Band 2	15MHz	16QAM	18900	1RB#38	22.15	PASS
LTE Band 2	15MHz	QPSK	18900	1RB#74	23.04	PASS
LTE Band 2	15MHz	16QAM	18900	1RB#74	21.98	PASS
LTE Band 2	15MHz	QPSK	18900	38RB#0	21.82	PASS
LTE Band 2	15MHz	16QAM	18900	38RB#0	21.85	PASS



LTE Band 2	15MHz	QPSK	18900	38RB#18	22.06	PASS
LTE Band 2	15MHz	16QAM	18900	38RB#18	21.99	PASS
LTE Band 2	15MHz	QPSK	18900	38RB#37	21.82	PASS
LTE Band 2	15MHz	16QAM	18900	38RB#37	21.79	PASS
LTE Band 2	15MHz	QPSK	18900	75RB#0	22.11	PASS
LTE Band 2	15MHz	16QAM	18900	75RB#0	22.15	PASS
LTE Band 2	15MHz	QPSK	19125	1RB#0	23.11	PASS
LTE Band 2	15MHz	16QAM	19125	1RB#0	22.28	PASS
LTE Band 2	15MHz	QPSK	19125	1RB#38	23.17	PASS
LTE Band 2	15MHz	16QAM	19125	1RB#38	22.03	PASS
LTE Band 2	15MHz	QPSK	19125	1RB#74	22.93	PASS
LTE Band 2	15MHz	16QAM	19125	1RB#74	22.13	PASS
LTE Band 2	15MHz	QPSK	19125	38RB#0	21.99	PASS
LTE Band 2	15MHz	16QAM	19125	38RB#0	21.86	PASS
LTE Band 2	15MHz	QPSK	19125	38RB#18	21.96	PASS
LTE Band 2	15MHz	16QAM	19125	38RB#18	21.95	PASS
LTE Band 2	15MHz	QPSK	19125	38RB#37	21.43	PASS
LTE Band 2	15MHz	16QAM	19125	38RB#37	21.54	PASS
LTE Band 2	15MHz	QPSK	19125	75RB#0	22.08	PASS
LTE Band 2	15MHz	16QAM	19125	75RB#0	22.19	PASS
LTE Band 2	20MHz	QPSK	18700	1RB#0	23.07	PASS
LTE Band 2	20MHz	16QAM	18700	1RB#0	22.26	PASS
LTE Band 2	20MHz	QPSK	18700	1RB#49	23.53	PASS
LTE Band 2	20MHz	16QAM	18700	1RB#49	22.50	PASS
LTE Band 2	20MHz	QPSK	18700	1RB#99	23.14	PASS
LTE Band 2	20MHz	16QAM	18700	1RB#99	22.47	PASS
LTE Band 2	20MHz	QPSK	18700	50RB#0	22.15	PASS
LTE Band 2	20MHz	16QAM	18700	50RB#0	22.19	PASS
LTE Band 2	20MHz	QPSK	18700	50RB#25	22.14	PASS
LTE Band 2	20MHz	16QAM	18700	50RB#25	22.27	PASS
LTE Band 2	20MHz	QPSK	18700	50RB#50	22.08	PASS
LTE Band 2	20MHz	16QAM	18700	50RB#50	22.22	PASS
LTE Band 2	20MHz	QPSK	18700	100RB#0	22.33	PASS
LTE Band 2	20MHz	16QAM	18700	100RB#0	22.28	PASS
LTE Band 2	20MHz	QPSK	18900	1RB#0	23.22	PASS
LTE Band 2	20MHz	16QAM	18900	1RB#0	22.53	PASS
LTE Band 2	20MHz	QPSK	18900	1RB#49	23.55	PASS
LTE Band 2	20MHz	16QAM	18900	1RB#49	22.94	PASS
LTE Band 2	20MHz	QPSK	18900	1RB#99	23.48	PASS
LTE Band 2	20MHz	16QAM	18900	1RB#99	22.82	PASS
LTE Band 2	20MHz	QPSK	18900	50RB#0	22.23	PASS
LTE Band 2	20MHz	16QAM	18900	50RB#0	22.40	PASS



LTE Band 2	20MHz	QPSK	18900	50RB#25	22.35	PASS
LTE Band 2	20MHz	16QAM	18900	50RB#25	22.29	PASS
LTE Band 2	20MHz	QPSK	18900	50RB#50	22.37	PASS
LTE Band 2	20MHz	16QAM	18900	50RB#50	22.19	PASS
LTE Band 2	20MHz	QPSK	18900	100RB#0	22.21	PASS
LTE Band 2	20MHz	16QAM	18900	100RB#0	22.26	PASS
LTE Band 2	20MHz	QPSK	19100	1RB#0	23.33	PASS
LTE Band 2	20MHz	16QAM	19100	1RB#0	22.70	PASS
LTE Band 2	20MHz	QPSK	19100	1RB#49	23.53	PASS
LTE Band 2	20MHz	16QAM	19100	1RB#49	22.94	PASS
LTE Band 2	20MHz	QPSK	19100	1RB#99	23.06	PASS
LTE Band 2	20MHz	16QAM	19100	1RB#99	22.45	PASS
LTE Band 2	20MHz	QPSK	19100	50RB#0	22.22	PASS
LTE Band 2	20MHz	16QAM	19100	50RB#0	22.24	PASS
LTE Band 2	20MHz	QPSK	19100	50RB#25	22.24	PASS
LTE Band 2	20MHz	16QAM	19100	50RB#25	22.23	PASS
LTE Band 2	20MHz	QPSK	19100	50RB#50	22.30	PASS
LTE Band 2	20MHz	16QAM	19100	50RB#50	22.22	PASS
LTE Band 2	20MHz	QPSK	19100	100RB#0	22.15	PASS
LTE Band 2	20MHz	16QAM	19100	100RB#0	22.26	PASS

5.2. Effective Isotropic Radiated Power

Ambient condition

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

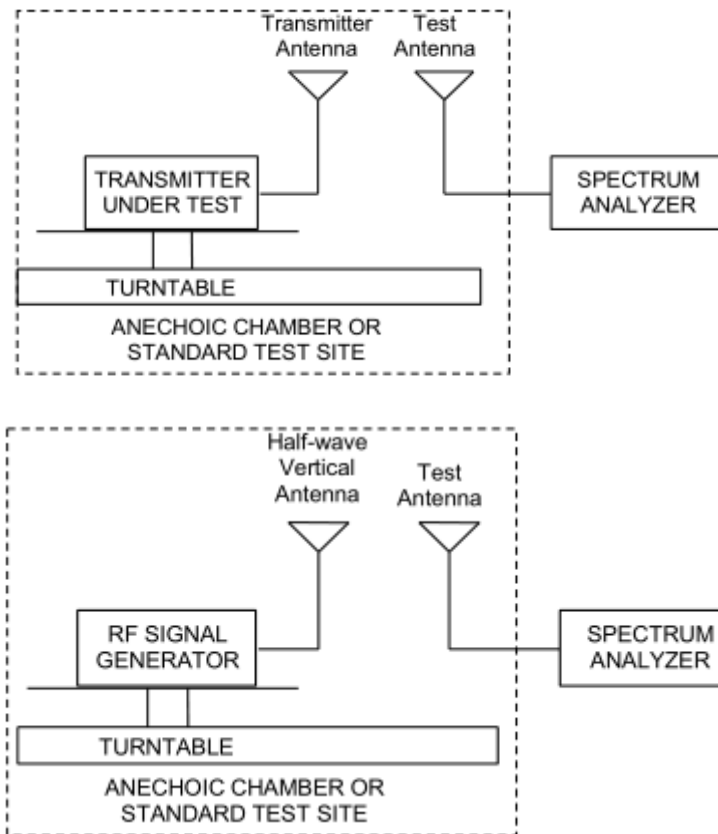
Methods of Measurement

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

- a) 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.
- b) 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).
- c) 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.
- d) 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. $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$
- e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation: $ERP \text{ (dBm)} = \text{LVL (dBm)} + \text{LOSS (dB)}$
- f) The maximum ERP is the maximum value determined in the preceding step.
- g) 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



Limits

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 $k = 2$, $U = 1.19\text{ dB}$

Test Results:

The measurement is performed for both of horizontal and vertical antenna Polarization, and only the data of worst mode is recorded in this report.

Band	Channel	PCL	Slot	EIRP	Limit (dBm)
GPRS1900	512	0	1	31.49	33
GPRS1900	512	0	2	30.36	33
GPRS1900	512	0	3	28.33	33
GPRS1900	512	0	4	27.25	33
GPRS1900	661	0	1	31.42	33
GPRS1900	661	0	2	30.36	33
GPRS1900	661	0	3	28.37	33
GPRS1900	661	0	4	27.28	33
GPRS1900	810	0	1	31.27	33
GPRS1900	810	0	2	30.25	33
GPRS1900	810	0	3	28.32	33
GPRS1900	810	0	4	27.25	33
EGPRS1900	512	2	1	27.46	33
EGPRS1900	512	2	2	27.25	33
EGPRS1900	512	2	3	25.11	33
EGPRS1900	512	2	4	24.03	33
EGPRS1900	661	2	1	27.56	33
EGPRS1900	661	2	2	27.31	33
EGPRS1900	661	2	3	25.18	33
EGPRS1900	661	2	4	24.02	33
EGPRS1900	810	2	1	27.65	33
EGPRS1900	810	2	2	27.46	33
EGPRS1900	810	2	3	25.16	33
EGPRS1900	810	2	4	24.83	33



Band	Channel	SubTest	EIRP	Limit(dBm)
WCDMA Band II	9262	-	25.17	33
WCDMA Band II	9400	-	25.35	33
WCDMA Band II	9538	-	25.17	33
WCDMA Band II	9262	HSDPA_Sub0	24.17	33
WCDMA Band II	9262	HSDPA_Sub1	23.77	33
WCDMA Band II	9262	HSDPA_Sub2	23.73	33
WCDMA Band II	9262	HSDPA_Sub3	23.69	33
WCDMA Band II	9400	HSDPA_Sub0	24.40	33
WCDMA Band II	9400	HSDPA_Sub1	24.03	33
WCDMA Band II	9400	HSDPA_Sub2	24.02	33
WCDMA Band II	9400	HSDPA_Sub3	24.01	33
WCDMA Band II	9538	HSDPA_Sub0	23.99	33
WCDMA Band II	9538	HSDPA_Sub1	23.51	33
WCDMA Band II	9538	HSDPA_Sub2	23.60	33
WCDMA Band II	9538	HSDPA_Sub3	23.58	33
WCDMA Band II	9262	HSUPA_Sub1	23.74	33
WCDMA Band II	9262	HSUPA_Sub2	23.20	33
WCDMA Band II	9262	HSUPA_Sub3	23.05	33
WCDMA Band II	9262	HSUPA_Sub4	23.51	33
WCDMA Band II	9262	HSUPA_Sub5	23.85	33
WCDMA Band II	9400	HSUPA_Sub1	24.16	33
WCDMA Band II	9400	HSUPA_Sub2	23.14	33
WCDMA Band II	9400	HSUPA_Sub3	22.18	33
WCDMA Band II	9400	HSUPA_Sub4	23.12	33
WCDMA Band II	9400	HSUPA_Sub5	24.09	33
WCDMA Band II	9538	HSUPA_Sub1	23.79	33
WCDMA Band II	9538	HSUPA_Sub2	23.21	33
WCDMA Band II	9538	HSUPA_Sub3	23.08	33
WCDMA Band II	9538	HSUPA_Sub4	23.55	33
WCDMA Band II	9538	HSUPA_Sub5	24.11	33



Band	Bandwidth	Modulation	Channel	RB Configuration	EIRP	Limit (dBm)
LTE Band 2	1.4MHz	QPSK	18607	1RB#0	25.39	33
LTE Band 2	1.4MHz	16QAM	18607	1RB#0	24.60	33
LTE Band 2	1.4MHz	QPSK	18607	1RB#2	25.30	33
LTE Band 2	1.4MHz	16QAM	18607	1RB#2	24.27	33
LTE Band 2	1.4MHz	QPSK	18607	1RB#5	25.10	33
LTE Band 2	1.4MHz	16QAM	18607	1RB#5	24.12	33
LTE Band 2	1.4MHz	QPSK	18607	3RB#0	24.86	33
LTE Band 2	1.4MHz	16QAM	18607	3RB#0	23.53	33
LTE Band 2	1.4MHz	QPSK	18607	3RB#1	25.01	33
LTE Band 2	1.4MHz	16QAM	18607	3RB#1	23.70	33
LTE Band 2	1.4MHz	QPSK	18607	3RB#3	24.84	33
LTE Band 2	1.4MHz	16QAM	18607	3RB#3	23.73	33
LTE Band 2	1.4MHz	QPSK	18607	6RB#0	23.78	33
LTE Band 2	1.4MHz	16QAM	18607	6RB#0	23.03	33
LTE Band 2	1.4MHz	QPSK	18900	1RB#0	25.32	33
LTE Band 2	1.4MHz	16QAM	18900	1RB#0	23.98	33
LTE Band 2	1.4MHz	QPSK	18900	1RB#2	24.88	33
LTE Band 2	1.4MHz	16QAM	18900	1RB#2	23.96	33
LTE Band 2	1.4MHz	QPSK	18900	1RB#5	24.83	33
LTE Band 2	1.4MHz	16QAM	18900	1RB#5	24.19	33
LTE Band 2	1.4MHz	QPSK	18900	3RB#0	24.84	33
LTE Band 2	1.4MHz	16QAM	18900	3RB#0	23.78	33
LTE Band 2	1.4MHz	QPSK	18900	3RB#1	24.82	33
LTE Band 2	1.4MHz	16QAM	18900	3RB#1	23.88	33
LTE Band 2	1.4MHz	QPSK	18900	3RB#3	24.79	33
LTE Band 2	1.4MHz	16QAM	18900	3RB#3	23.80	33
LTE Band 2	1.4MHz	QPSK	18900	6RB#0	23.88	33
LTE Band 2	1.4MHz	16QAM	18900	6RB#0	22.89	33
LTE Band 2	1.4MHz	QPSK	19193	1RB#0	25.09	33
LTE Band 2	1.4MHz	16QAM	19193	1RB#0	24.03	33
LTE Band 2	1.4MHz	QPSK	19193	1RB#2	25.13	33
LTE Band 2	1.4MHz	16QAM	19193	1RB#2	24.32	33
LTE Band 2	1.4MHz	QPSK	19193	1RB#5	25.04	33
LTE Band 2	1.4MHz	16QAM	19193	1RB#5	24.05	33
LTE Band 2	1.4MHz	QPSK	19193	3RB#0	24.84	33
LTE Band 2	1.4MHz	16QAM	19193	3RB#0	23.74	33
LTE Band 2	1.4MHz	QPSK	19193	3RB#1	24.86	33
LTE Band 2	1.4MHz	16QAM	19193	3RB#1	23.83	33



LTE Band 2	1.4MHz	QPSK	19193	3RB#3	24.69	33
LTE Band 2	1.4MHz	16QAM	19193	3RB#3	23.68	33
LTE Band 2	1.4MHz	QPSK	19193	6RB#0	23.81	33
LTE Band 2	1.4MHz	16QAM	19193	6RB#0	22.83	33
LTE Band 2	3MHz	QPSK	18615	1RB#0	24.89	33
LTE Band 2	3MHz	16QAM	18615	1RB#0	23.81	33
LTE Band 2	3MHz	QPSK	18615	1RB#8	24.77	33
LTE Band 2	3MHz	16QAM	18615	1RB#8	23.76	33
LTE Band 2	3MHz	QPSK	18615	1RB#14	24.80	33
LTE Band 2	3MHz	16QAM	18615	1RB#14	23.64	33
LTE Band 2	3MHz	QPSK	18615	8RB#0	23.78	33
LTE Band 2	3MHz	16QAM	18615	8RB#0	22.91	33
LTE Band 2	3MHz	QPSK	18615	8RB#4	23.78	33
LTE Band 2	3MHz	16QAM	18615	8RB#4	22.89	33
LTE Band 2	3MHz	QPSK	18615	8RB#7	23.83	33
LTE Band 2	3MHz	16QAM	18615	8RB#7	22.95	33
LTE Band 2	3MHz	QPSK	18615	15RB#0	23.89	33
LTE Band 2	3MHz	16QAM	18615	15RB#0	22.99	33
LTE Band 2	3MHz	QPSK	18900	1RB#0	24.72	33
LTE Band 2	3MHz	16QAM	18900	1RB#0	23.80	33
LTE Band 2	3MHz	QPSK	18900	1RB#8	24.60	33
LTE Band 2	3MHz	16QAM	18900	1RB#8	23.79	33
LTE Band 2	3MHz	QPSK	18900	1RB#14	24.79	33
LTE Band 2	3MHz	16QAM	18900	1RB#14	23.72	33
LTE Band 2	3MHz	QPSK	18900	8RB#0	23.76	33
LTE Band 2	3MHz	16QAM	18900	8RB#0	22.72	33
LTE Band 2	3MHz	QPSK	18900	8RB#4	23.76	33
LTE Band 2	3MHz	16QAM	18900	8RB#4	22.77	33
LTE Band 2	3MHz	QPSK	18900	8RB#7	23.73	33
LTE Band 2	3MHz	16QAM	18900	8RB#7	22.95	33
LTE Band 2	3MHz	QPSK	18900	15RB#0	23.85	33
LTE Band 2	3MHz	16QAM	18900	15RB#0	22.84	33
LTE Band 2	3MHz	QPSK	19185	1RB#0	25.28	33
LTE Band 2	3MHz	16QAM	19185	1RB#0	23.92	33
LTE Band 2	3MHz	QPSK	19185	1RB#8	24.76	33
LTE Band 2	3MHz	16QAM	19185	1RB#8	23.84	33
LTE Band 2	3MHz	QPSK	19185	1RB#14	24.78	33
LTE Band 2	3MHz	16QAM	19185	1RB#14	23.86	33
LTE Band 2	3MHz	QPSK	19185	8RB#0	24.01	33
LTE Band 2	3MHz	16QAM	19185	8RB#0	22.88	33
LTE Band 2	3MHz	QPSK	19185	8RB#4	23.78	33



LTE Band 2	3MHz	16QAM	19185	8RB#4	22.89	33
LTE Band 2	3MHz	QPSK	19185	8RB#7	23.70	33
LTE Band 2	3MHz	16QAM	19185	8RB#7	22.78	33
LTE Band 2	3MHz	QPSK	19185	15RB#0	23.77	33
LTE Band 2	3MHz	16QAM	19185	15RB#0	22.75	33
LTE Band 2	5MHz	QPSK	18625	1RB#0	24.79	33
LTE Band 2	5MHz	16QAM	18625	1RB#0	23.95	33
LTE Band 2	5MHz	QPSK	18625	1RB#12	24.72	33
LTE Band 2	5MHz	16QAM	18625	1RB#12	23.57	33
LTE Band 2	5MHz	QPSK	18625	1RB#24	24.79	33
LTE Band 2	5MHz	16QAM	18625	1RB#24	23.53	33
LTE Band 2	5MHz	QPSK	18625	12RB#0	23.67	33
LTE Band 2	5MHz	16QAM	18625	12RB#0	22.77	33
LTE Band 2	5MHz	QPSK	18625	12RB#6	23.76	33
LTE Band 2	5MHz	16QAM	18625	12RB#6	22.74	33
LTE Band 2	5MHz	QPSK	18625	12RB#13	23.73	33
LTE Band 2	5MHz	16QAM	18625	12RB#13	22.71	33
LTE Band 2	5MHz	QPSK	18625	25RB#0	23.78	33
LTE Band 2	5MHz	16QAM	18625	25RB#0	22.97	33
LTE Band 2	5MHz	QPSK	18900	1RB#0	24.75	33
LTE Band 2	5MHz	16QAM	18900	1RB#0	23.87	33
LTE Band 2	5MHz	QPSK	18900	1RB#12	24.88	33
LTE Band 2	5MHz	16QAM	18900	1RB#12	24.05	33
LTE Band 2	5MHz	QPSK	18900	1RB#24	24.98	33
LTE Band 2	5MHz	16QAM	18900	1RB#24	23.74	33
LTE Band 2	5MHz	QPSK	18900	12RB#0	23.70	33
LTE Band 2	5MHz	16QAM	18900	12RB#0	22.77	33
LTE Band 2	5MHz	QPSK	18900	12RB#6	23.71	33
LTE Band 2	5MHz	16QAM	18900	12RB#6	22.88	33
LTE Band 2	5MHz	QPSK	18900	12RB#13	23.94	33
LTE Band 2	5MHz	16QAM	18900	12RB#13	22.88	33
LTE Band 2	5MHz	QPSK	18900	25RB#0	23.75	33
LTE Band 2	5MHz	16QAM	18900	25RB#0	22.72	33
LTE Band 2	5MHz	QPSK	19175	1RB#0	24.94	33
LTE Band 2	5MHz	16QAM	19175	1RB#0	23.71	33
LTE Band 2	5MHz	QPSK	19175	1RB#12	24.77	33
LTE Band 2	5MHz	16QAM	19175	1RB#12	23.92	33
LTE Band 2	5MHz	QPSK	19175	1RB#24	24.63	33
LTE Band 2	5MHz	16QAM	19175	1RB#24	24.03	33
LTE Band 2	5MHz	QPSK	19175	12RB#0	23.83	33
LTE Band 2	5MHz	16QAM	19175	12RB#0	22.83	33



LTE Band 2	5MHz	QPSK	19175	12RB#6	23.77	33
LTE Band 2	5MHz	16QAM	19175	12RB#6	22.82	33
LTE Band 2	5MHz	QPSK	19175	12RB#13	23.73	33
LTE Band 2	5MHz	16QAM	19175	12RB#13	22.90	33
LTE Band 2	5MHz	QPSK	19175	25RB#0	23.88	33
LTE Band 2	5MHz	16QAM	19175	25RB#0	22.95	33
LTE Band 2	10MHz	QPSK	18650	1RB#0	24.89	33
LTE Band 2	10MHz	16QAM	18650	1RB#0	24.31	33
LTE Band 2	10MHz	QPSK	18650	1RB#24	25.08	33
LTE Band 2	10MHz	16QAM	18650	1RB#24	24.31	33
LTE Band 2	10MHz	QPSK	18650	1RB#49	24.65	33
LTE Band 2	10MHz	16QAM	18650	1RB#49	23.64	33
LTE Band 2	10MHz	QPSK	18650	25RB#0	23.92	33
LTE Band 2	10MHz	16QAM	18650	25RB#0	22.86	33
LTE Band 2	10MHz	QPSK	18650	25RB#12	23.89	33
LTE Band 2	10MHz	16QAM	18650	25RB#12	22.83	33
LTE Band 2	10MHz	QPSK	18650	25RB#25	23.77	33
LTE Band 2	10MHz	16QAM	18650	25RB#25	22.82	33
LTE Band 2	10MHz	QPSK	18650	50RB#0	23.83	33
LTE Band 2	10MHz	16QAM	18650	50RB#0	23.85	33
LTE Band 2	10MHz	QPSK	18900	1RB#0	24.95	33
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LTE Band 2	10MHz	QPSK	18900	1RB#24	24.88	33
LTE Band 2	10MHz	16QAM	18900	1RB#24	23.75	33
LTE Band 2	10MHz	QPSK	18900	1RB#49	25.15	33
LTE Band 2	10MHz	16QAM	18900	1RB#49	23.89	33
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LTE Band 2	10MHz	QPSK	19150	25RB#0	23.93	33



LTE Band 2	10MHz	16QAM	19150	25RB#0	22.94	33
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LTE Band 2	15MHz	QPSK	19125	1RB#38	24.77	33
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LTE Band 2	15MHz	QPSK	19125	38RB#18	23.56	33
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LTE Band 2	20MHz	16QAM	18700	50RB#0	23.79	33
LTE Band 2	20MHz	QPSK	18700	50RB#25	23.74	33
LTE Band 2	20MHz	16QAM	18700	50RB#25	23.87	33
LTE Band 2	20MHz	QPSK	18700	50RB#50	23.68	33
LTE Band 2	20MHz	16QAM	18700	50RB#50	23.82	33
LTE Band 2	20MHz	QPSK	18700	100RB#0	23.93	33
LTE Band 2	20MHz	16QAM	18700	100RB#0	23.88	33
LTE Band 2	20MHz	QPSK	18900	1RB#0	24.82	33
LTE Band 2	20MHz	16QAM	18900	1RB#0	24.13	33
LTE Band 2	20MHz	QPSK	18900	1RB#49	25.15	33
LTE Band 2	20MHz	16QAM	18900	1RB#49	24.54	33
LTE Band 2	20MHz	QPSK	18900	1RB#99	25.08	33
LTE Band 2	20MHz	16QAM	18900	1RB#99	24.42	33
LTE Band 2	20MHz	QPSK	18900	50RB#0	23.83	33
LTE Band 2	20MHz	16QAM	18900	50RB#0	24.00	33
LTE Band 2	20MHz	QPSK	18900	50RB#25	23.95	33
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LTE Band 2	20MHz	QPSK	19100	1RB#49	25.13	33
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LTE Band 2	20MHz	QPSK	19100	50RB#50	23.90	33
LTE Band 2	20MHz	16QAM	19100	50RB#50	23.82	33
LTE Band 2	20MHz	QPSK	19100	100RB#0	23.75	33
LTE Band 2	20MHz	16QAM	19100	100RB#0	23.86	33

5.3.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 5.1kHz, VBW is set to 51kHz for GSM 1900,

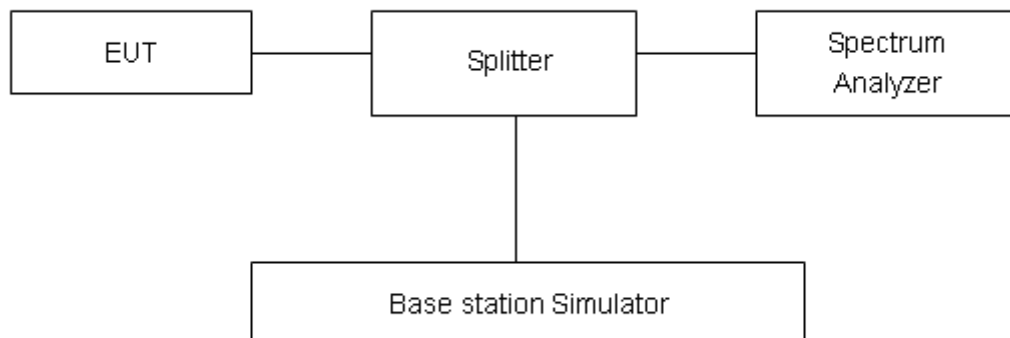
RBW is set to 100kHz, VBW is set to 300kHz for WCDMA Band II,

RBW is set to 51kHz, VBW is set to 51kHz for LTE Band 2(1.4MHz/3MHz/5MHz),

RBW is set to 51kHz,VBW is set to 51KHz for LTE Band 2(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**

Band	Channel	Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)	Limit(kHz)	Verdict
GPRS1900	512	242.09	318.0	---	PASS
GPRS1900	661	242.23	315.3	---	PASS
GPRS1900	810	246.64	314.6	---	PASS
EGPRS1900	512	248.27	307.3	---	PASS
EGPRS1900	661	248.42	305.1	---	PASS
EGPRS1900	810	243.28	309.2	---	PASS
Band	Channel	Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)	Limit(kHz)	Verdict
WCDMA Band II	9262	4123.8	4712	---	PASS
WCDMA Band II	9400	4134.7	4701	---	PASS
WCDMA Band II	9538	4127.8	4698	---	PASS

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
LTE Band 2	1.4MHz	QPSK	18607	6RB#0	1.1108	1.279	PASS
LTE Band 2	1.4MHz	16QAM	18607	6RB#0	1.1104	1.305	PASS
LTE Band 2	1.4MHz	QPSK	18900	6RB#0	1.1093	1.273	PASS
LTE Band 2	1.4MHz	16QAM	18900	6RB#0	1.1119	1.296	PASS
LTE Band 2	1.4MHz	QPSK	19193	6RB#0	1.1175	1.285	PASS
LTE Band 2	1.4MHz	16QAM	19193	6RB#0	1.1101	1.295	PASS
LTE Band 2	3MHz	QPSK	18615	15RB#0	2.6964	2.912	PASS
LTE Band 2	3MHz	16QAM	18615	15RB#0	2.6971	2.914	PASS
LTE Band 2	3MHz	QPSK	18900	15RB#0	2.6998	2.927	PASS
LTE Band 2	3MHz	16QAM	18900	15RB#0	2.6918	2.921	PASS
LTE Band 2	3MHz	QPSK	19185	15RB#0	2.6948	2.932	PASS
LTE Band 2	3MHz	16QAM	19185	15RB#0	2.6920	2.926	PASS
LTE Band 2	5MHz	QPSK	18625	25RB#0	4.4718	4.823	PASS
LTE Band 2	5MHz	16QAM	18625	25RB#0	4.4726	4.868	PASS
LTE Band 2	5MHz	QPSK	18900	25RB#0	4.4828	4.813	PASS
LTE Band 2	5MHz	16QAM	18900	25RB#0	4.4802	4.858	PASS
LTE Band 2	5MHz	QPSK	19175	25RB#0	4.4746	4.831	PASS
LTE Band 2	5MHz	16QAM	19175	25RB#0	4.4745	4.834	PASS
LTE Band 2	10MHz	QPSK	18650	50RB#0	8.9140	9.366	PASS
LTE Band 2	10MHz	16QAM	18650	50RB#0	8.9256	9.351	PASS
LTE Band 2	10MHz	QPSK	18900	50RB#0	8.8862	9.279	PASS
LTE Band 2	10MHz	16QAM	18900	50RB#0	8.9078	9.316	PASS



LTE Band 2	10MHz	QPSK	19150	50RB#0	8.9056	9.315	PASS
LTE Band 2	10MHz	16QAM	19150	50RB#0	8.9026	9.290	PASS
LTE Band 2	15MHz	QPSK	18675	75RB#0	13.354	13.880	PASS
LTE Band 2	15MHz	16QAM	18675	75RB#0	13.340	13.890	PASS
LTE Band 2	15MHz	QPSK	18900	75RB#0	13.346	13.880	PASS
LTE Band 2	15MHz	16QAM	18900	75RB#0	13.354	13.860	PASS
LTE Band 2	15MHz	QPSK	19125	75RB#0	13.330	13.880	PASS
LTE Band 2	15MHz	16QAM	19125	75RB#0	13.355	13.940	PASS
LTE Band 2	20MHz	QPSK	18700	100RB#0	17.814	18.350	PASS
LTE Band 2	20MHz	16QAM	18700	100RB#0	17.809	18.360	PASS
LTE Band 2	20MHz	QPSK	18900	100RB#0	17.780	18.370	PASS
LTE Band 2	20MHz	16QAM	18900	100RB#0	17.806	18.320	PASS
LTE Band 2	20MHz	QPSK	19100	100RB#0	17.771	18.480	PASS
LTE Band 2	20MHz	16QAM	19100	100RB#0	17.782	18.360	PASS



GPRS1900-512



GPRS1900-661



GPRS1900-810



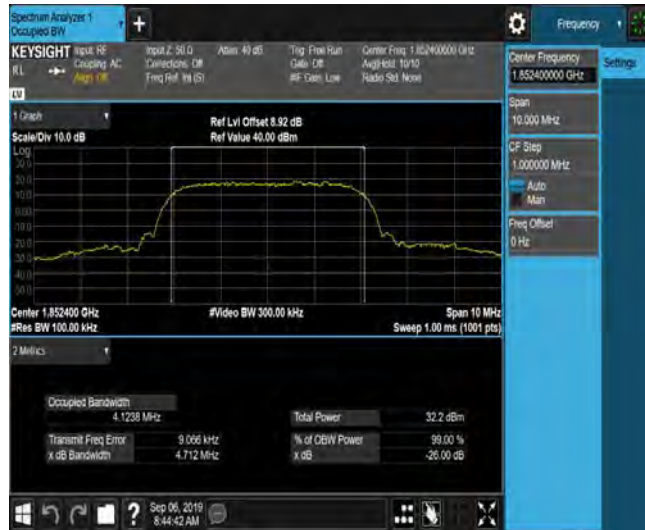
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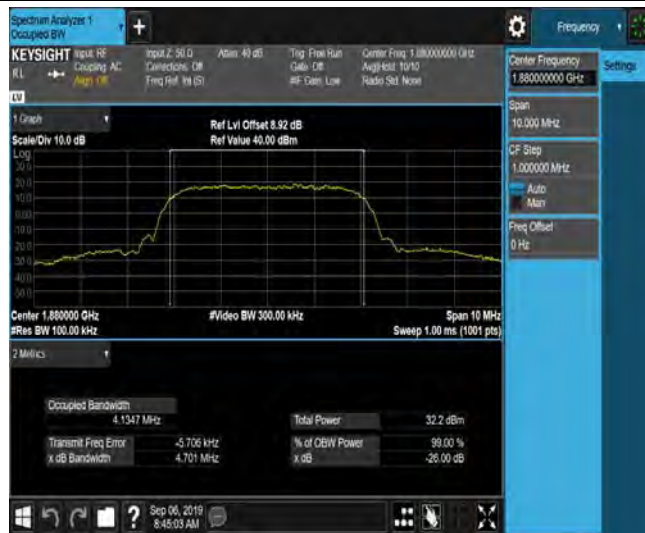
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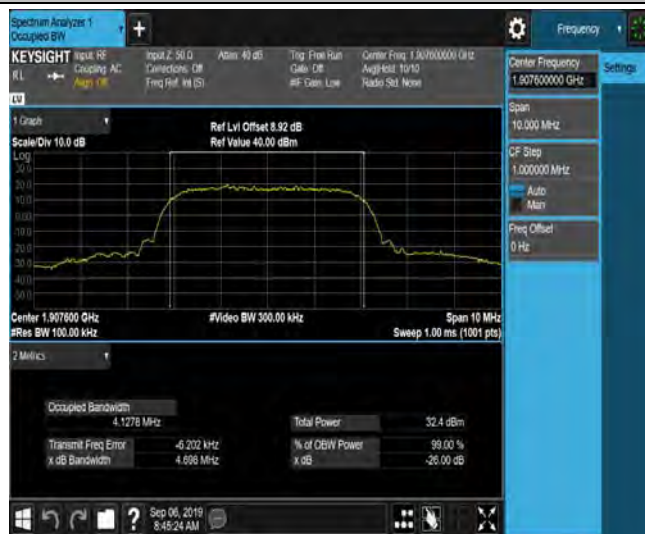
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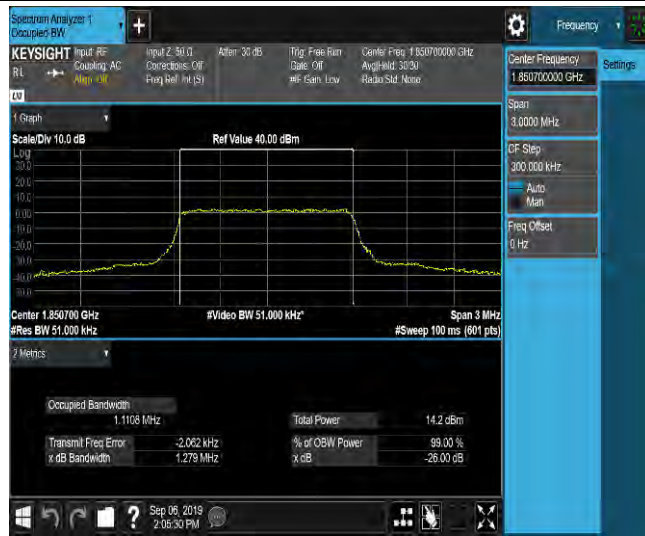


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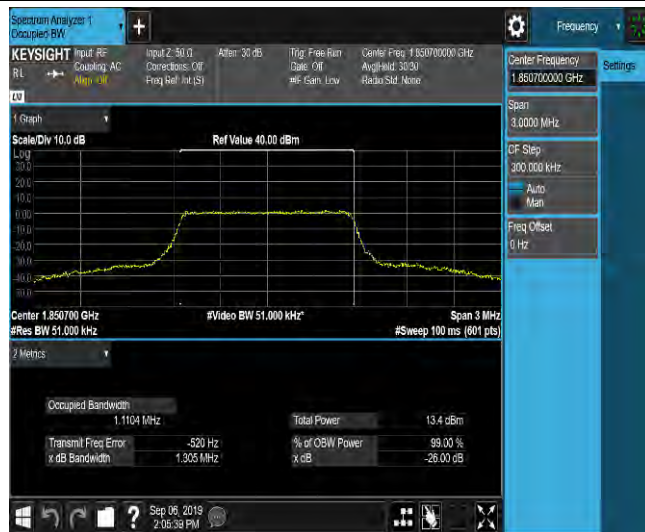


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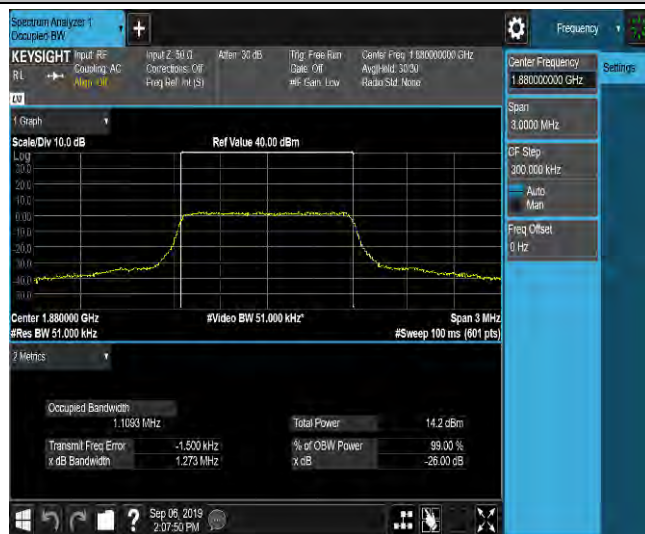
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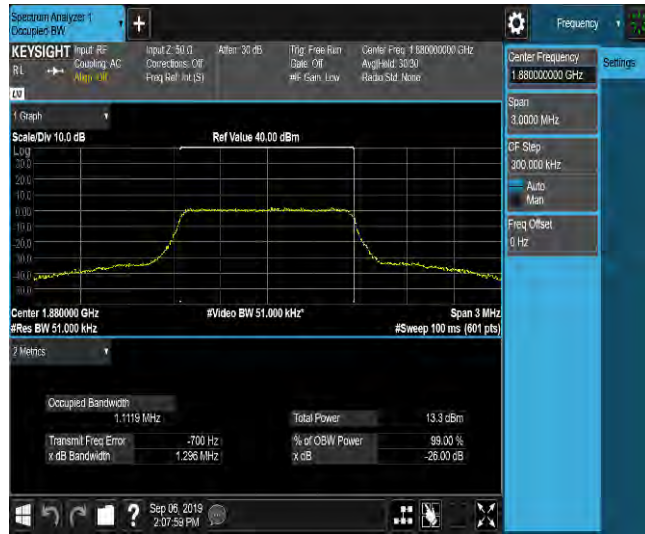
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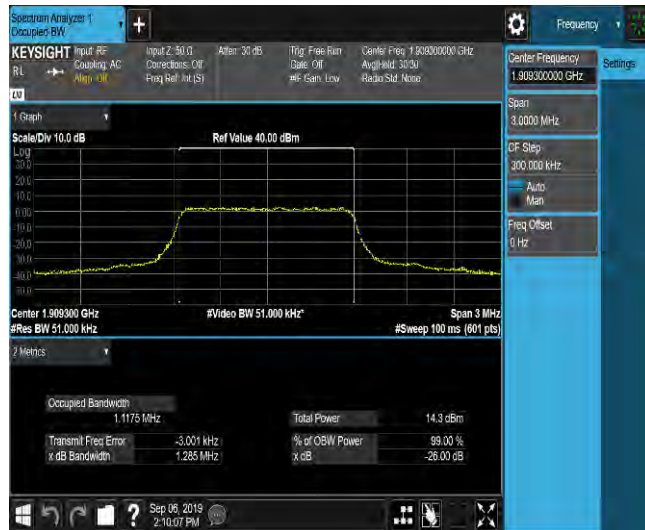
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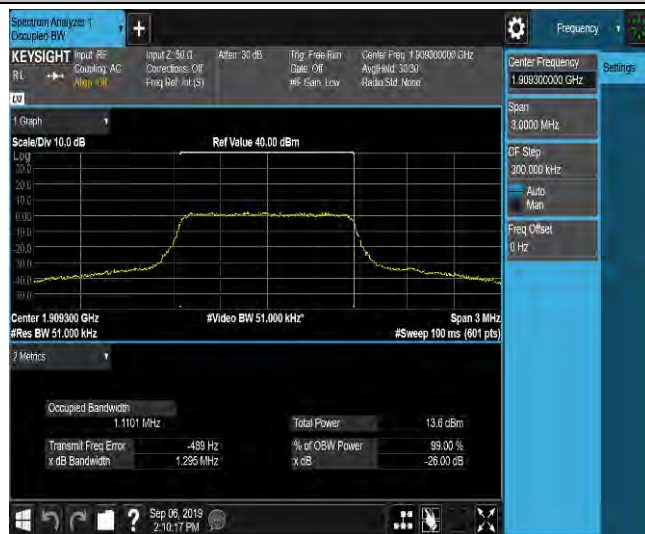
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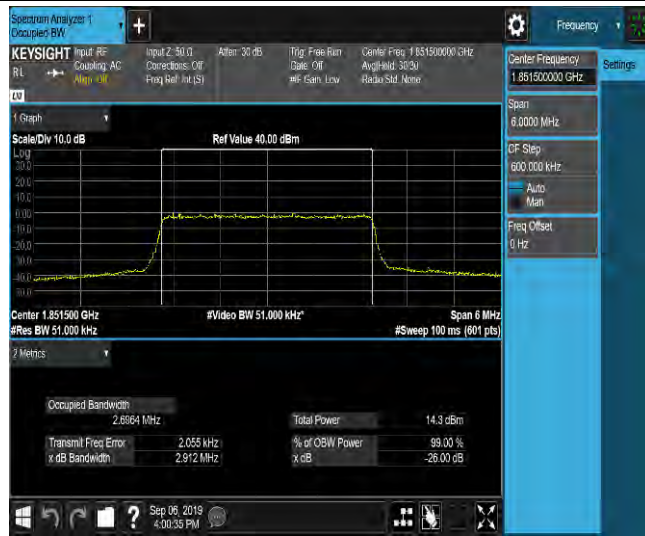
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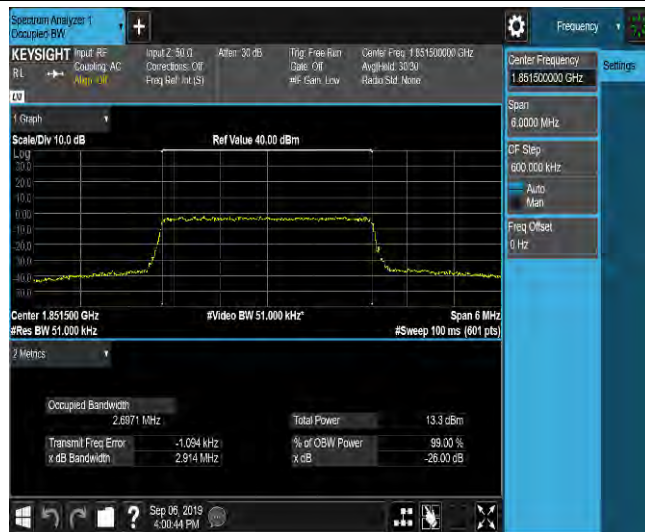
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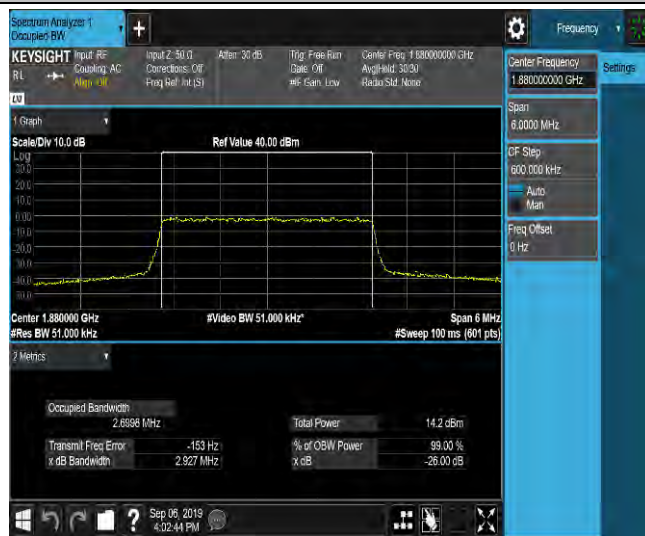
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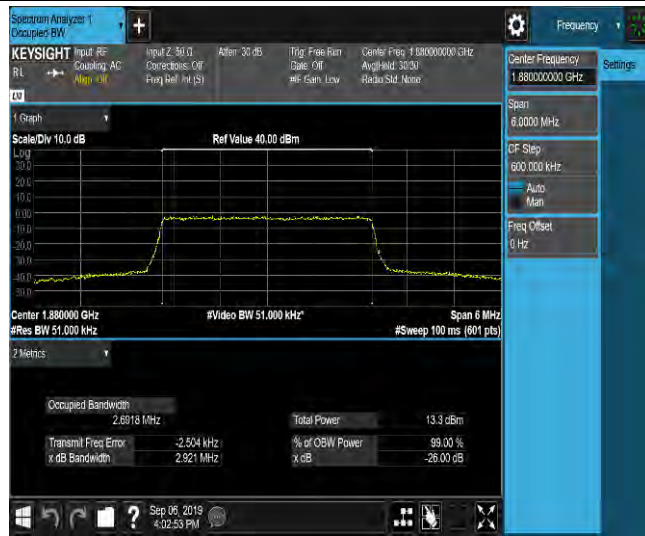
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LTE Band 2_3MHz_QPSK_18900_15RB#0_2.6998_2.927_PASS



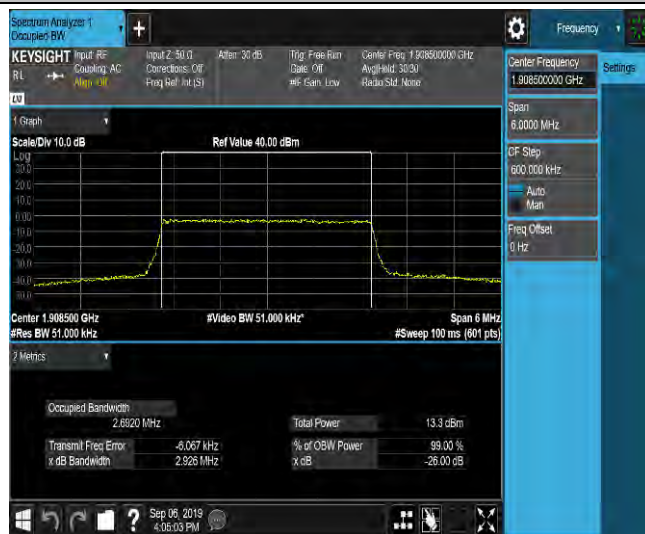
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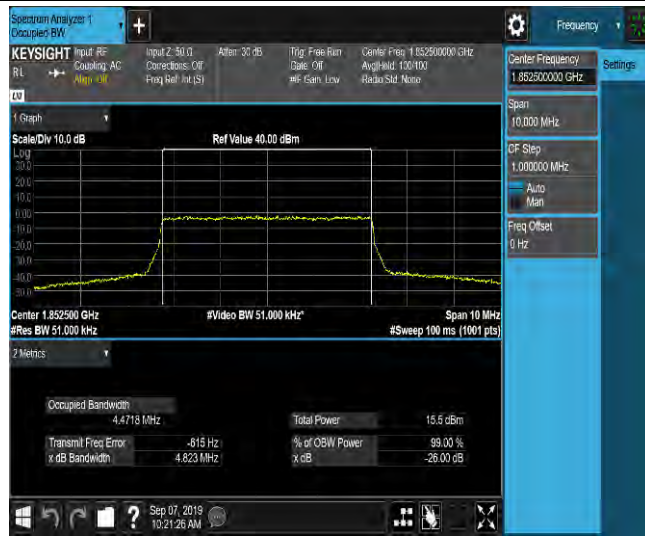
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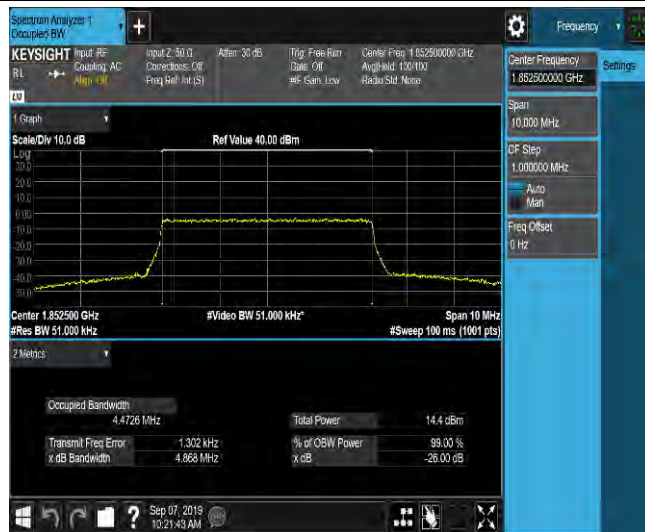
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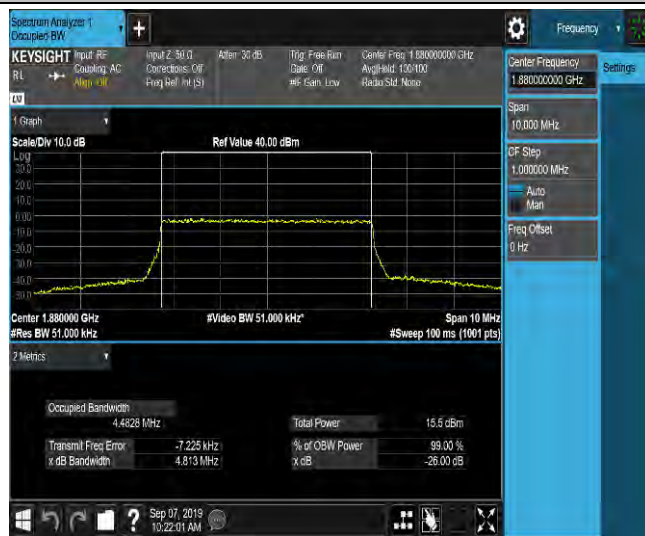
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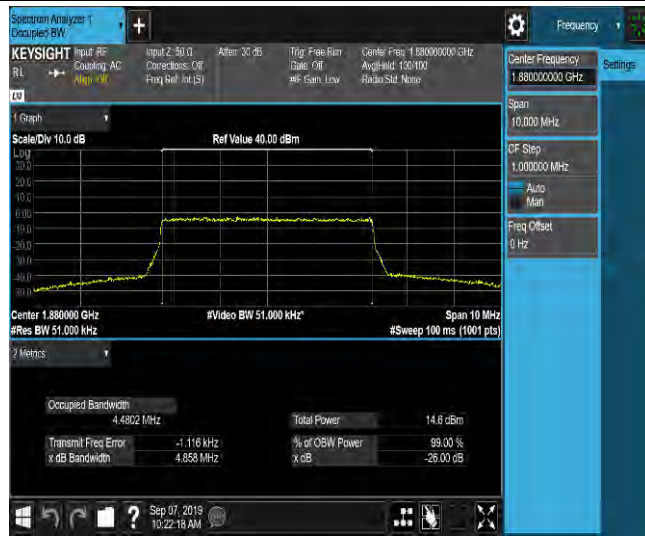
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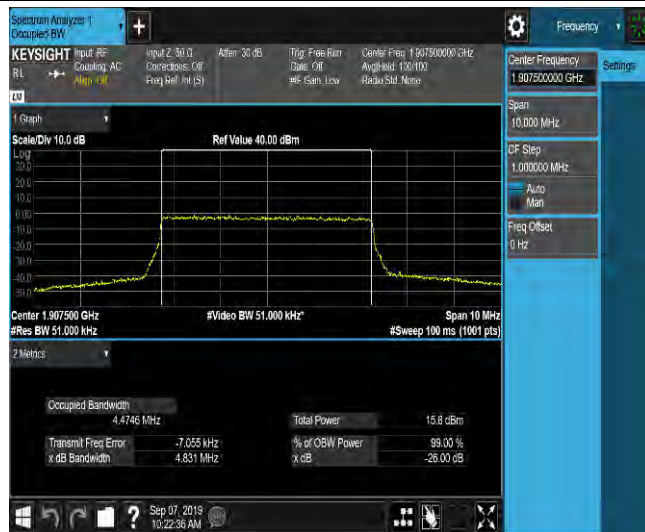
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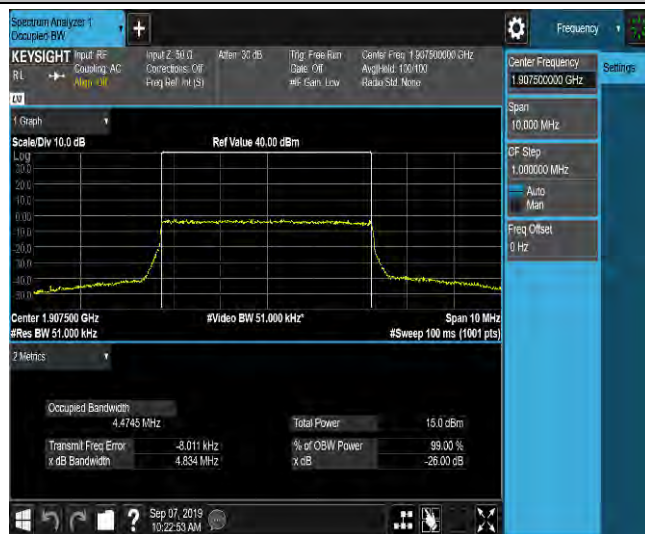
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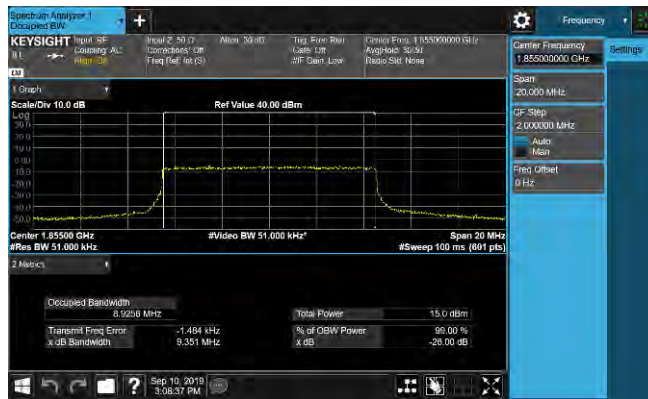
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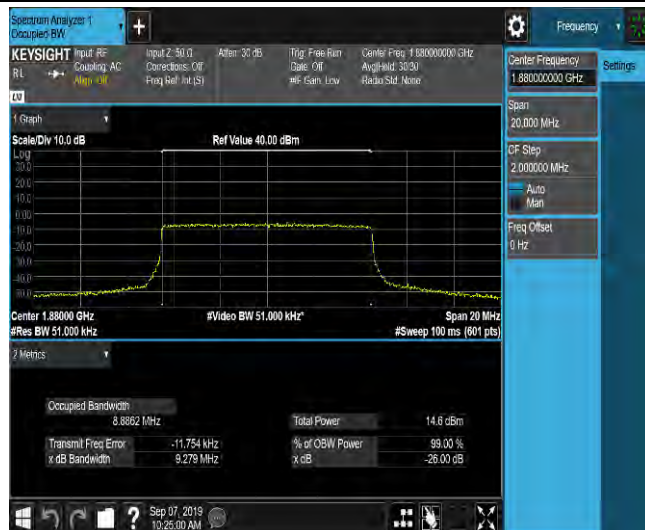
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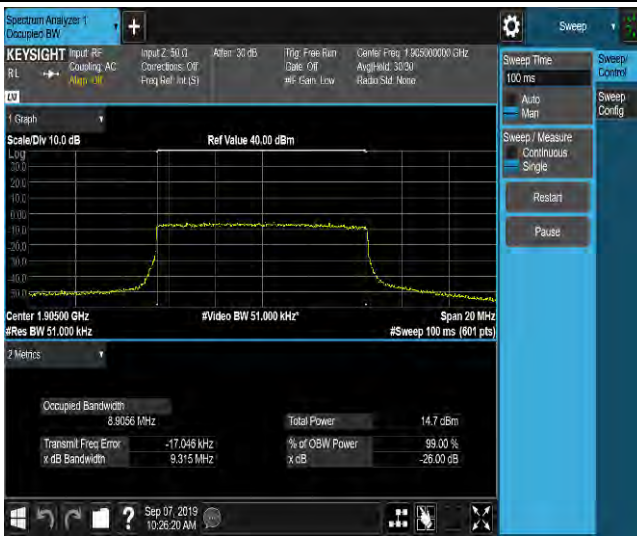
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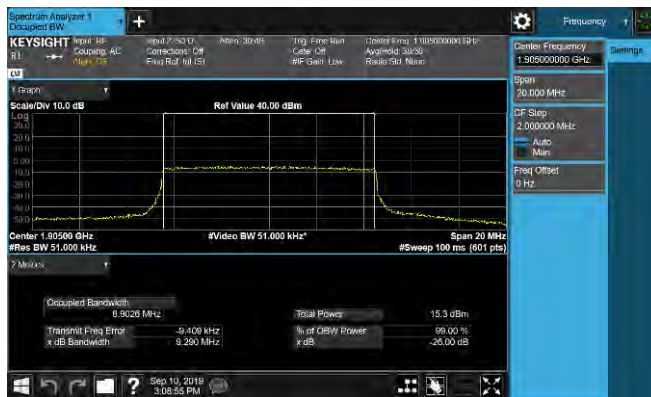
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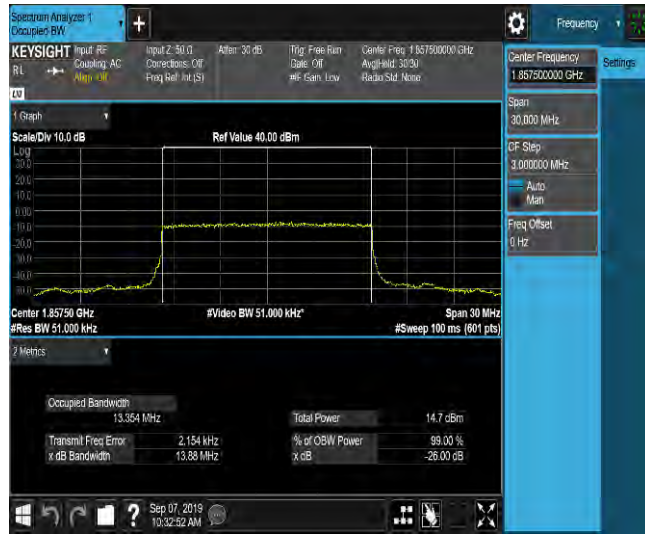
LTE Band 2_10MHz_QPSK_19150_50RB#0_8.9056_9.315_PASS



LTE Band 2_10MHz_16QAM_19150_50RB#0_8.9026_9.290_PASS



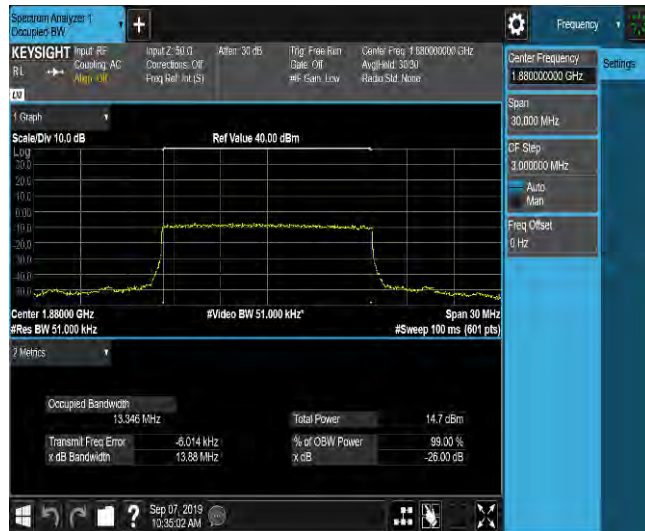
LTE Band 2_15MHz_QPSK_18675_75RB#0_13.354_13.88_PASS



LTE Band 2_15MHz_16QAM_18675_75RB#0_13.340_13.89_PASS



LTE Band 2_15MHz_QPSK_18900_75RB#0_13.346_13.88_PASS



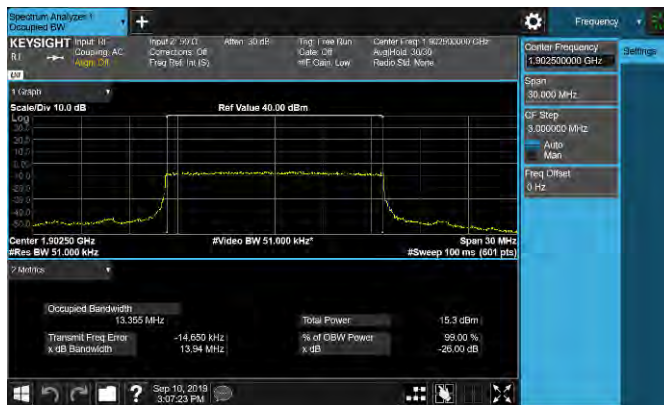
LTE Band 2_15MHz_16QAM_18900_75RB#0_13.354_13.85_PASS



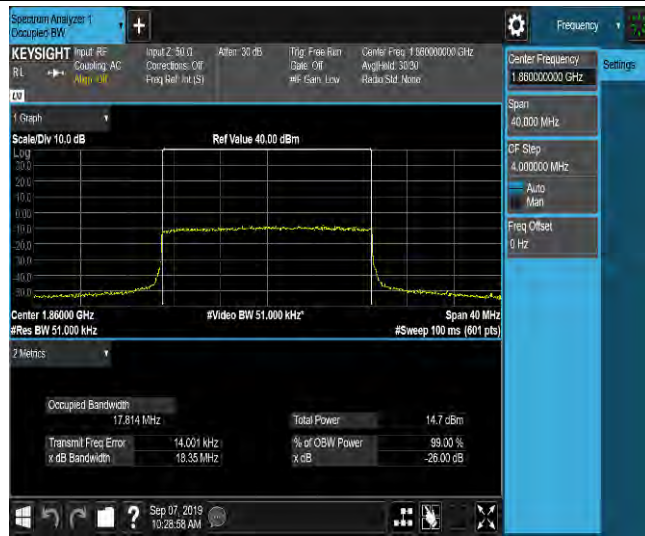
LTE Band 2_15MHz_QPSK_19125_75RB#0_13.330_13.88_PASS



LTE Band 2_15MHz_16QAM_19125_75RB#0_13.355_13.94_PASS



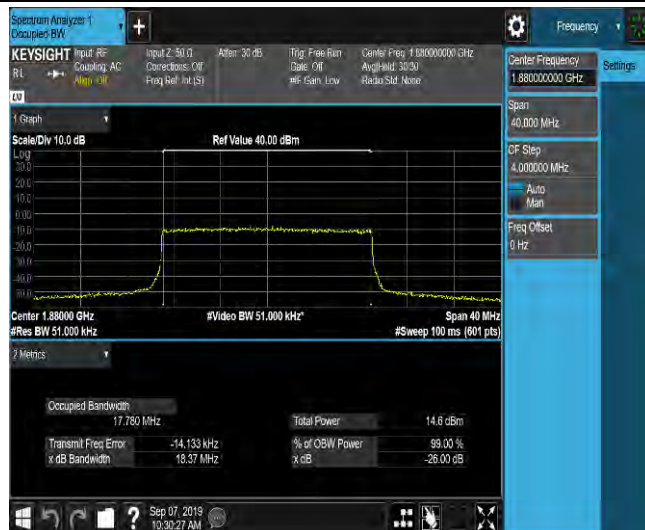
LTE Band 2_20MHz_QPSK_18700_100RB#0_17.814_18.35_PASS



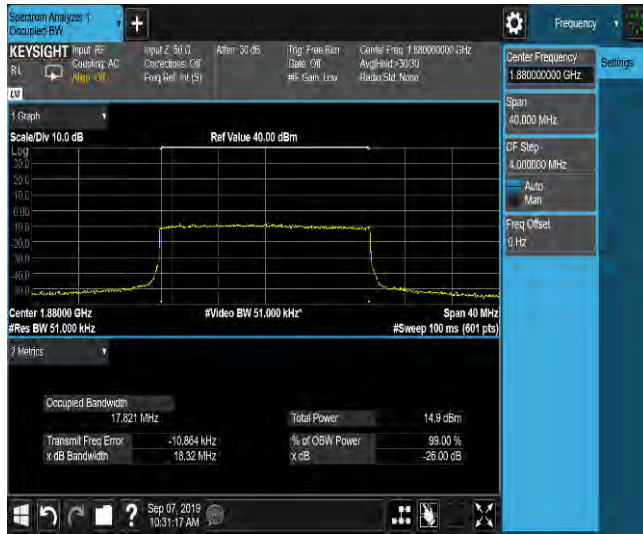
LTE Band 2_20MHz_16QAM_18700_100RB#0_17.809_18.36_PASS



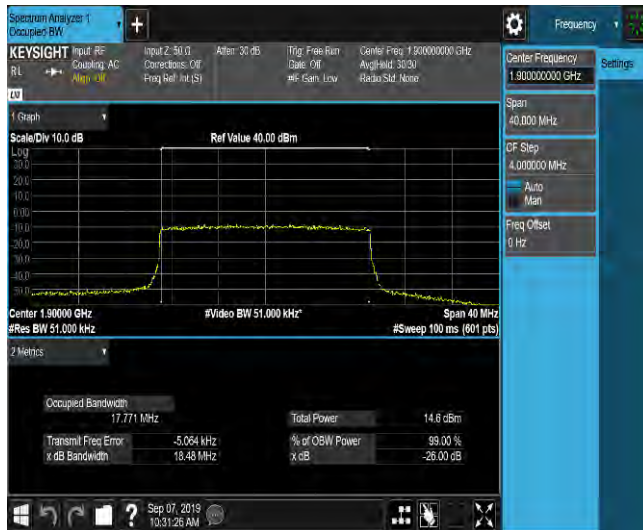
LTE Band 2_20MHz_QPSK_18900_100RB#0_17.780_18.37_PASS



LTE Band 2_20MHz_16QAM_18900_100RB#0_17.806_18.32_PASS



LTE Band 2_20MHz_QPSK_19100_100RB#0_17.771_18.48_PASS



LTE Band 2_20MHz_16QAM_19100_100RB#0_17.782_18.3.6_PASS



5.4. Band Edge Compliance

Ambient condition

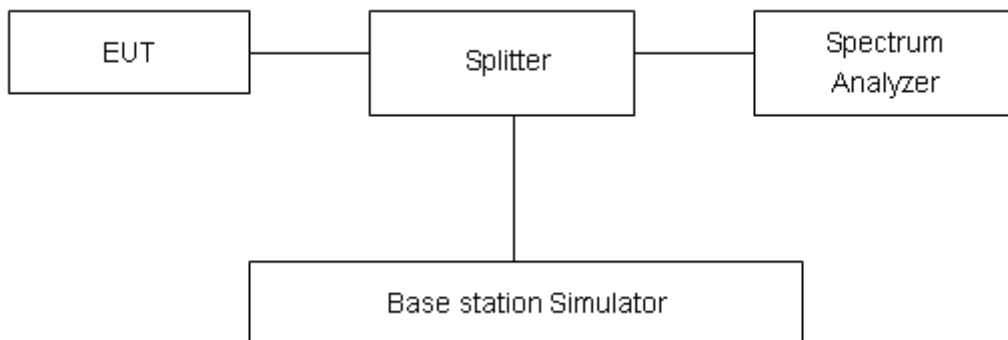
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 5.1kHz, VBW is set to 51kHz for GSM 1900, RBW is set to 51kHz, VBW is set to 200kHz for WCDMA Band II, RBW is set to 51kHz, VBW is set to 51kHz for LTE Band 2(1.4MHz/3MHz/5MHz), RBW is set to 51kHz, VBW is set to 51kHz for LTE Band 2(10MHz/15MHz/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:



GPRS1900-512



GPRS1900-810



EGPRS1900-512



EGPRS1900-810



WCDMA Band II_9262



WCDMA Band II_9538

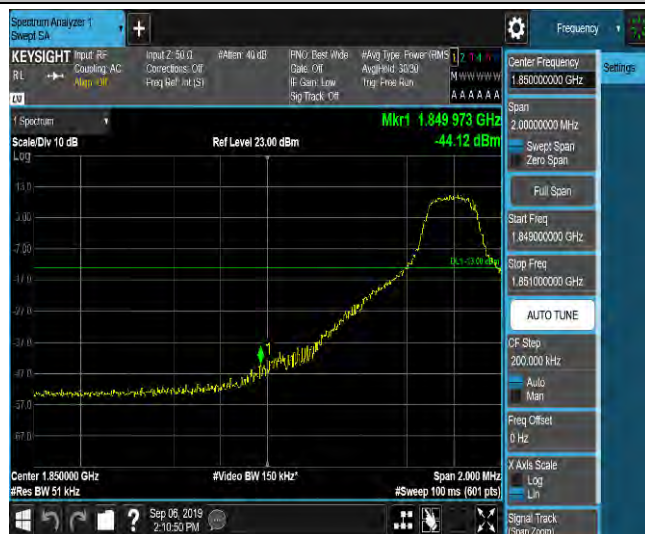
LTE Band 2_1.4MHz_QPSK_18607_1RB#0_-24.99_PASS



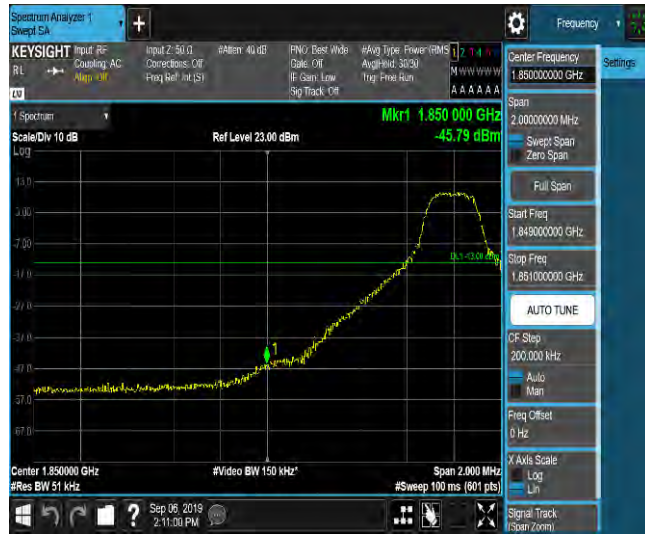
LTE Band 2_1.4MHz_16QAM_18607_1RB#0_-25.53_PASS



LTE Band 2_1.4MHz_QPSK_18607_1RB#2_-44.12_PASS



LTE Band 2_1.4MHz_16QAM_18607_1RB#2_-45.79_PASS



LTE Band 2_1.4MHz_QPSK_18607_1RB#5_-38.46_PASS



LTE Band 2_1.4MHz_16QAM_18607_1RB#5_-38.45_PASS



LTE Band 2_1.4MHz_QPSK_18607_3RB#0_-25.82_PASS



LTE Band 2_1.4MHz_16QAM_18607_3RB#0_-27.09_PASS



LTE Band 2_1.4MHz_QPSK_18607_3RB#1_-26.66_PASS



LTE Band 2_1.4MHz_16QAM_18607_3RB#1_-26.54_PASS



LTE Band 2_1.4MHz_QPSK_18607_3RB#3_-37.32_PASS



LTE Band 2_1.4MHz_16QAM_Wide_18607_3RB#3_-39.11_PASS



LTE Band 2_1.4MHz_QPSK_18607_6RB#0_-28.88_PASS



LTE Band 2_1.4MHz_16QAM_18607_6RB#0_-31.17_PASS



LTE Band 2_1.4MHz_QPSK_19193_1RB#0_-36.39_PASS



LTE Band 2_1.4MHz_16QAM_19193_1RB#0_-37.01_PASS



LTE Band 2_1.4MHz_QPSK_19193_1RB#2_-38.86_PASS



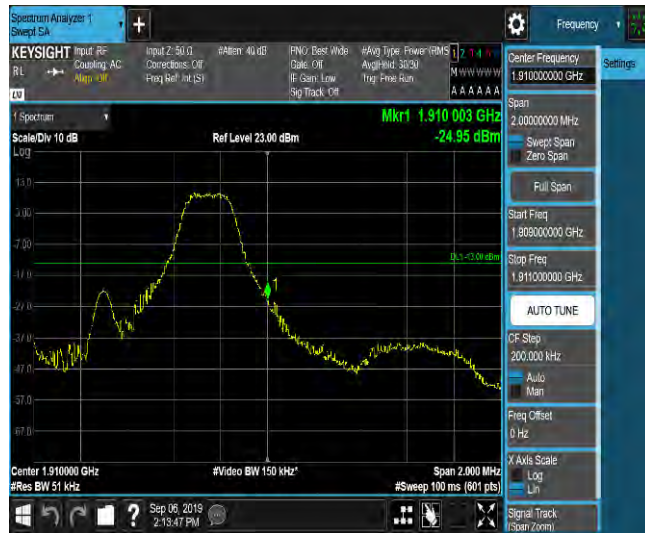
LTE Band 2_1.4MHz_16QAM_19193_1RB#2_-40.99_PASS



LTE Band 2_1.4MHz_QPSK_19193_1RB#5_-25.41_PASS



LTE Band 2_1.4MHz_16QAM_19193_1RB#5_-24.95_PASS



LTE Band 2_1.4MHz_QPSK_19193_3RB#0_-37.05_PASS



LTE Band 2_1.4MHz_16QAM_19193_3RB#0_-37.91_PASS



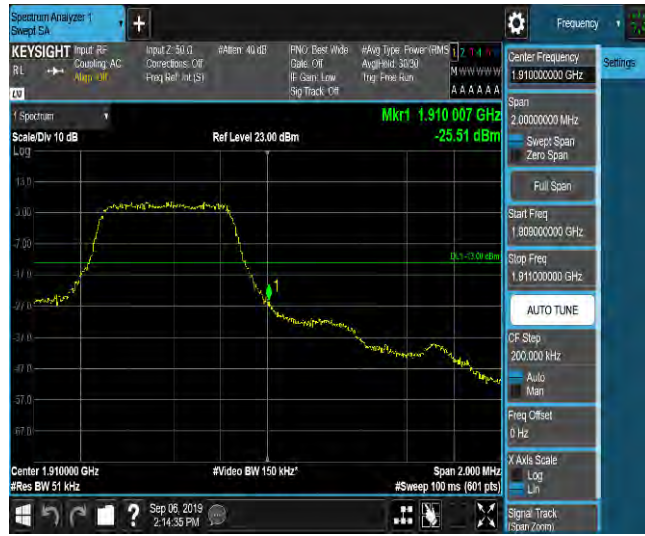
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LTE Band 2_1.4MHz_16QAM_19193_3RB#1_-37.75_PASS



LTE Band 2_1.4MHz_QPSK_19193_3RB#3_-25.51_PASS



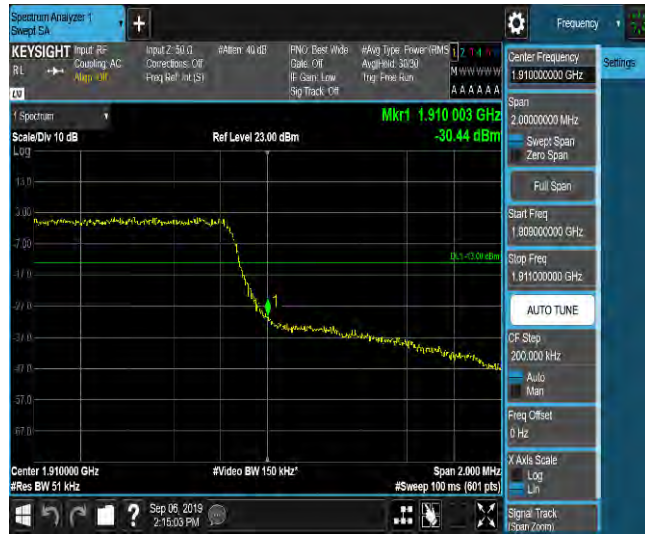
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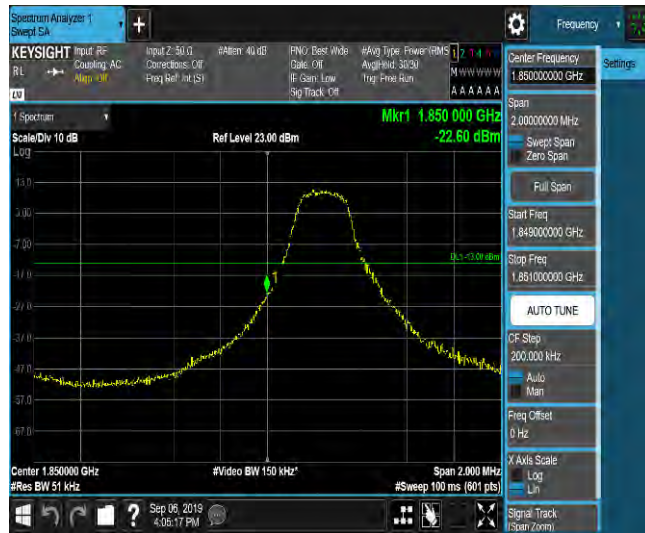
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LTE Band 2_1.4MHz_16QAM_19193_6RB#0_-30.44_PASS



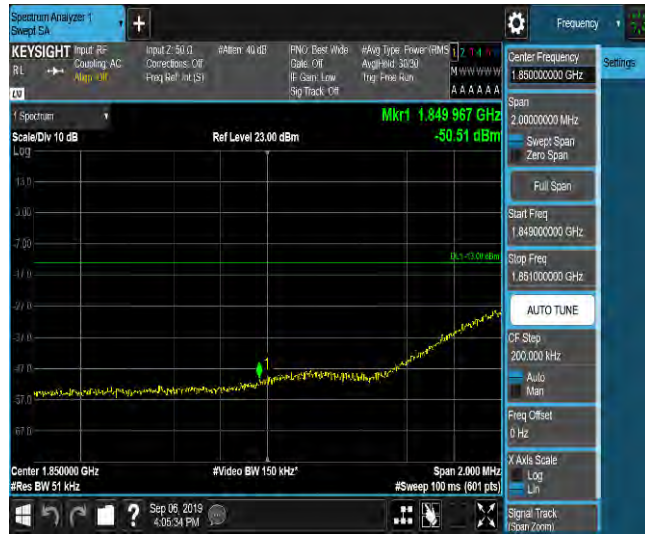
LTE Band 2_3MHz_QPSK_18615_1RB#0_-22.60_PASS



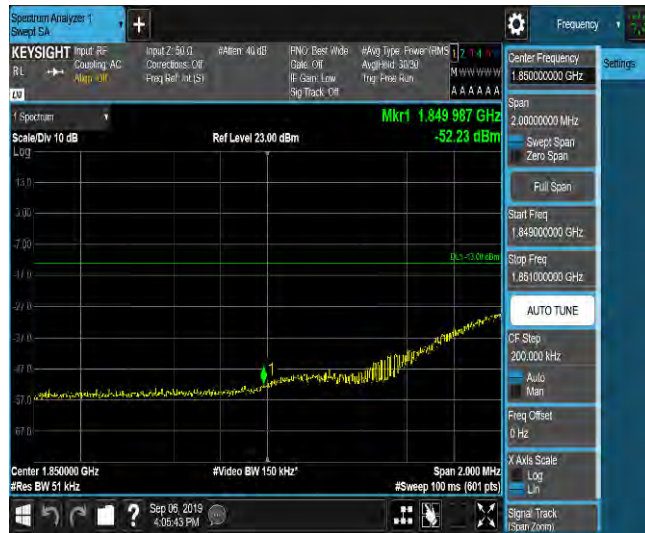
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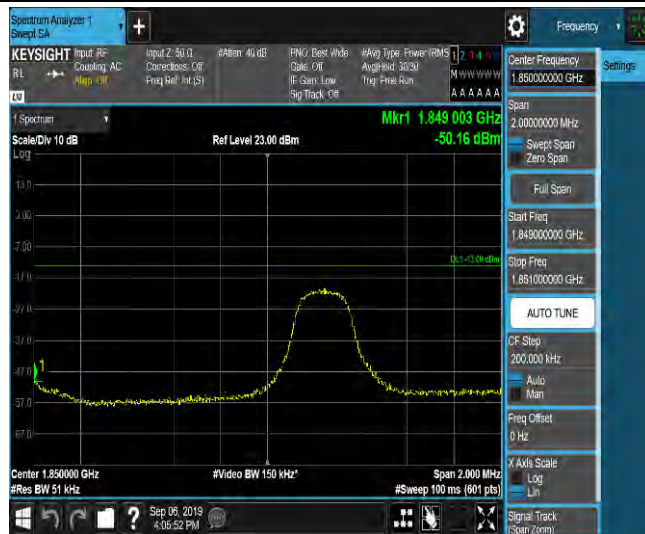
LTE Band 2_3MHz_QPSK_18615_1RB#8_-50.51_PASS



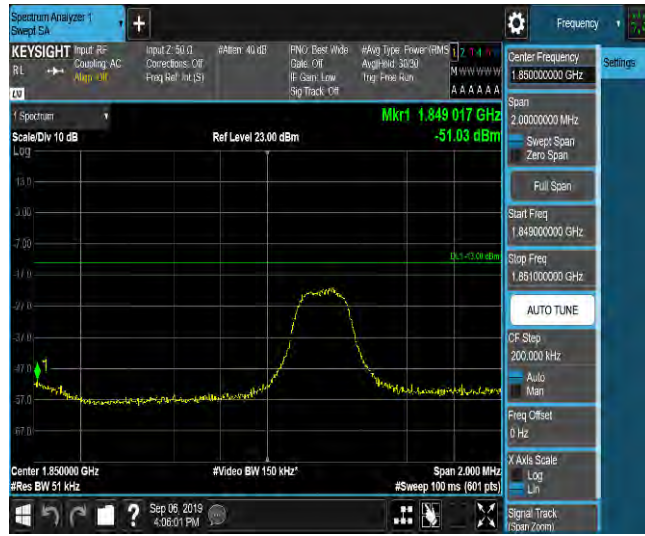
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LTE Band 2_3MHz_QPSK_18615_1RB#14_-50.16_PASS



LTE Band 2_3MHz_16QAM_18615_1RB#14_-51.03_PASS



LTE Band 2_3MHz_QPSK_18615_8RB#0_-28.74_PASS



LTE Band 2_3MHz_16QAM_18615_8RB#0_-29.95_PASS





LTE Band 2_3MHz_QPSK_18615_8RB#4_-28.38_PASS



LTE Band 2_3MHz_16QAM_18615_8RB#4_-29.21_PASS



LTE Band 2_3MHz_QPSK_18615_8RB#7_-37.11_PASS



LTE Band 2_3MHz_16QAM_18615_8RB#7_-38.21_PASS



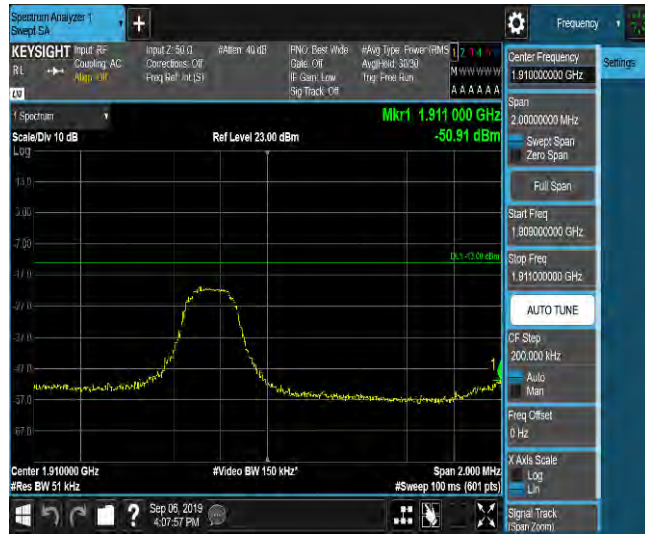
LTE Band 2_3MHz_QPSK_18615_15RB#0_-38.35_PASS



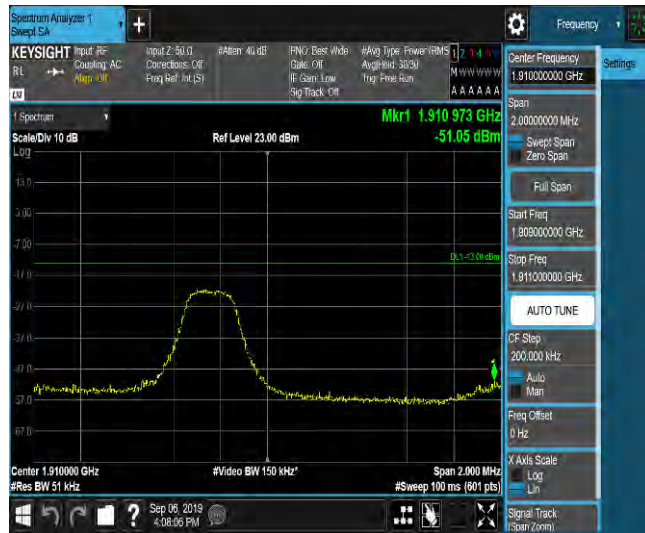
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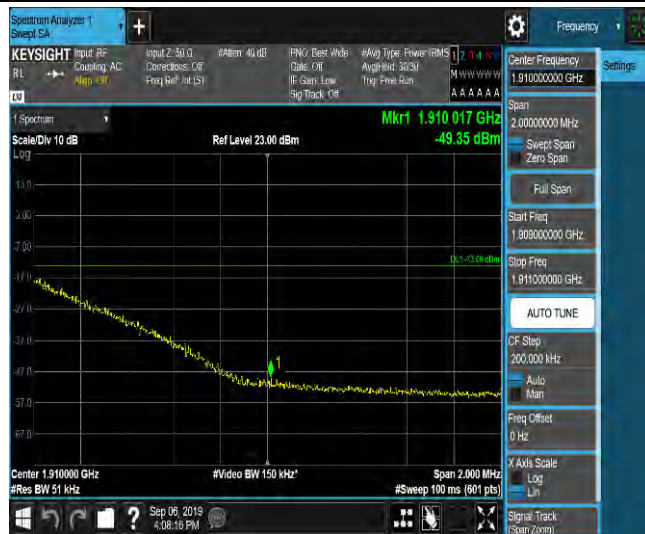
LTE Band 2_3MHz_QPSK_19185_1RB#0_-50.91_PASS



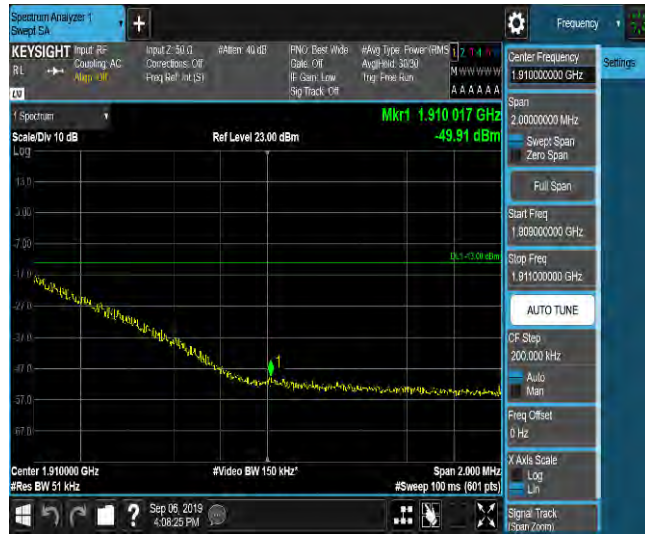
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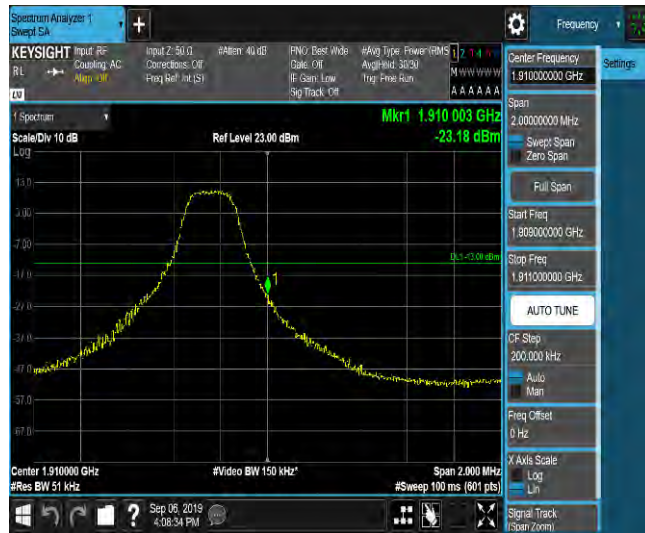
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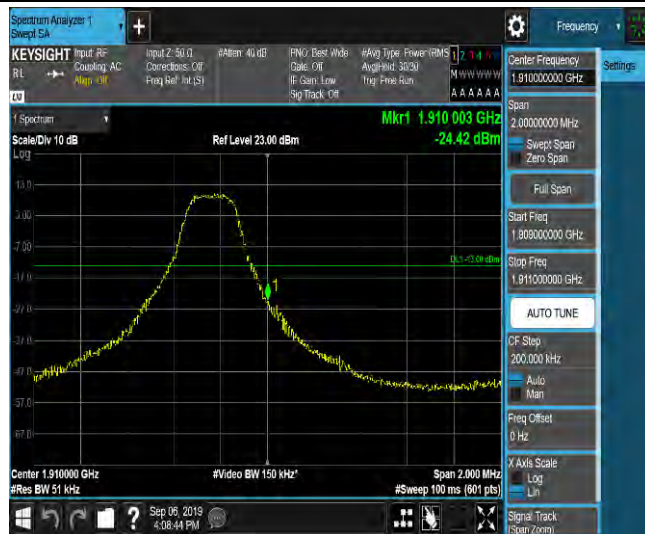
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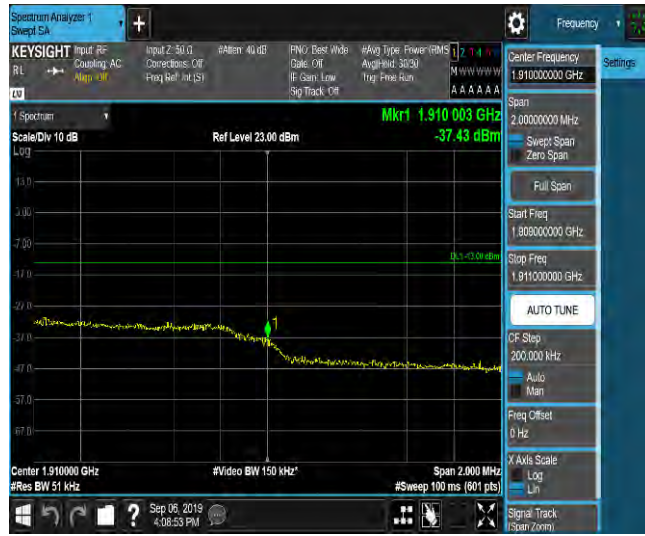
LTE Band 2_3MHz_QPSK_19185_1RB#14_-23.18_PASS



LTE Band 2_3MHz_16QAM_19185_1RB#14_-24.42_PASS



LTE Band 2_3MHz_QPSK_19185_8RB#0_-37.43_PASS



LTE Band 2_3MHz_16QAM_19185_8RB#0_-39.46_PASS



LTE Band 2_3MHz_QPSK_19185_8RB#4_-37.26_PASS



LTE Band 2_3MHz_16QAM_19185_8RB#4_-39.92_PASS



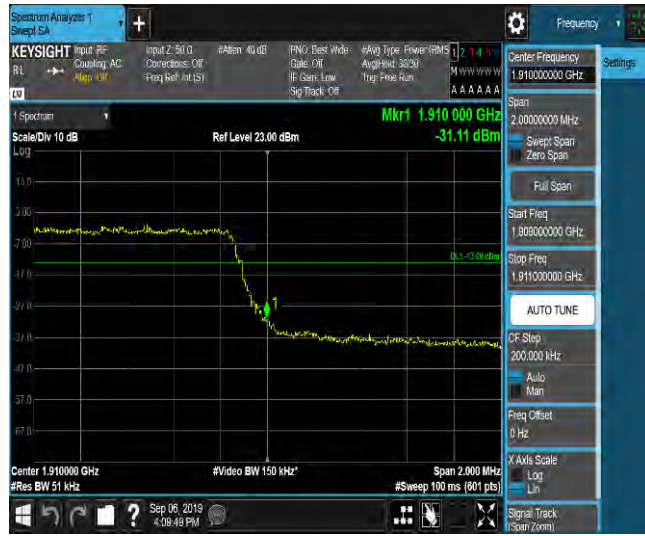
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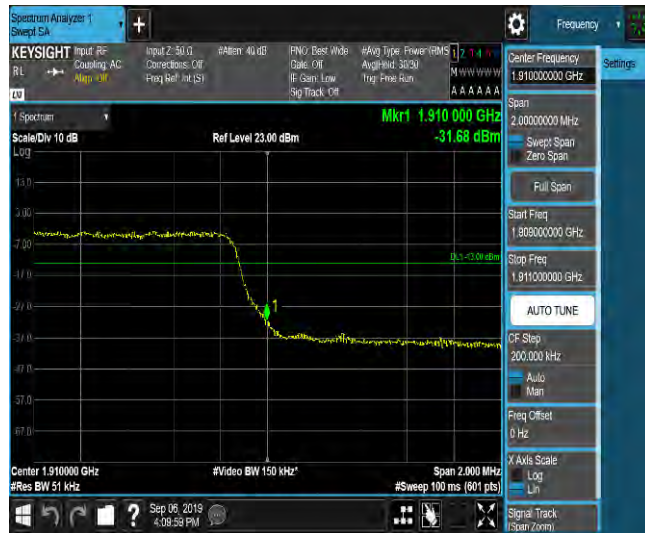
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LTE Band 2_3MHz_QPSK_19185_15RB#0_-31.11_PASS



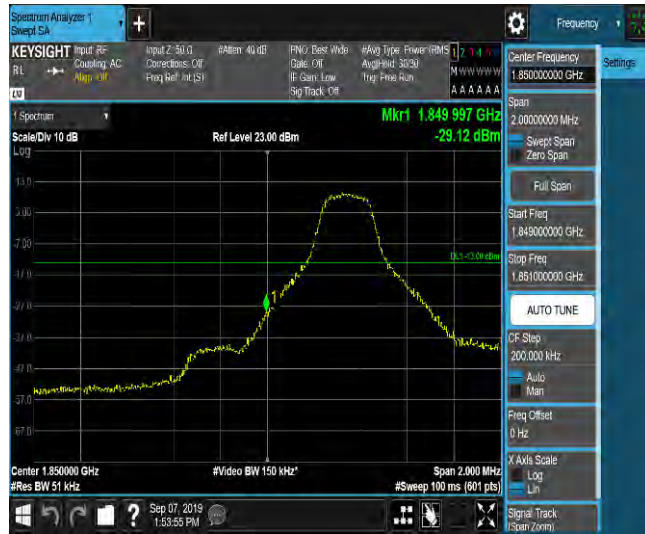
LTE Band 2_3MHz_16QAM_19185_15RB#0_-31.68_PASS



LTE Band 2_5MHz_QPSK_18625_1RB#0_-27.73_PASS



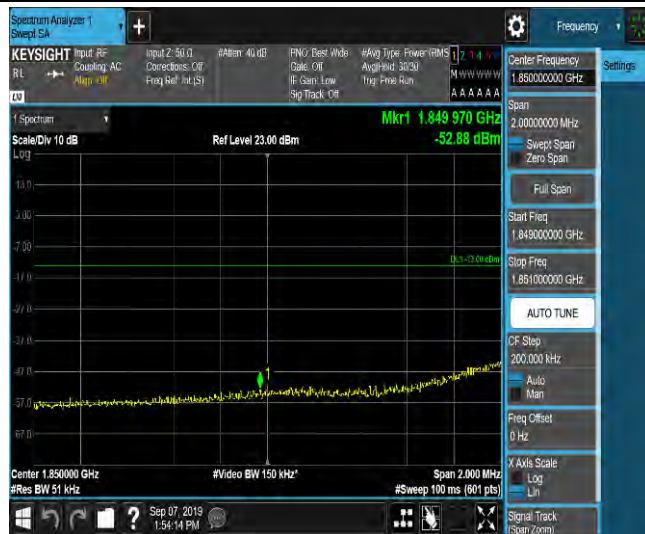
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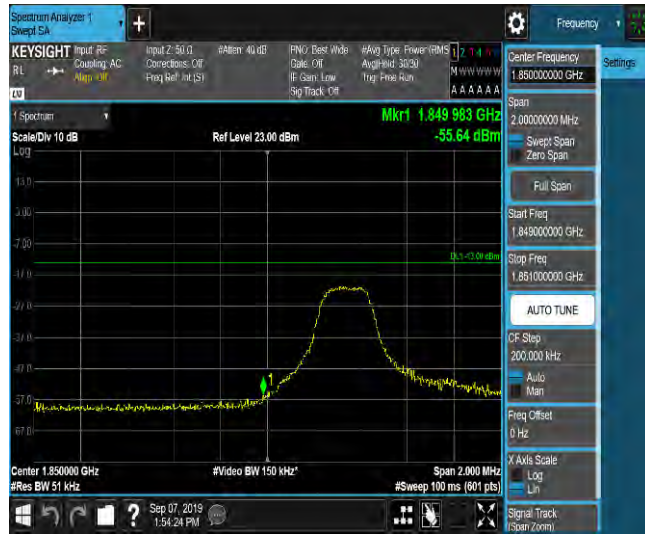
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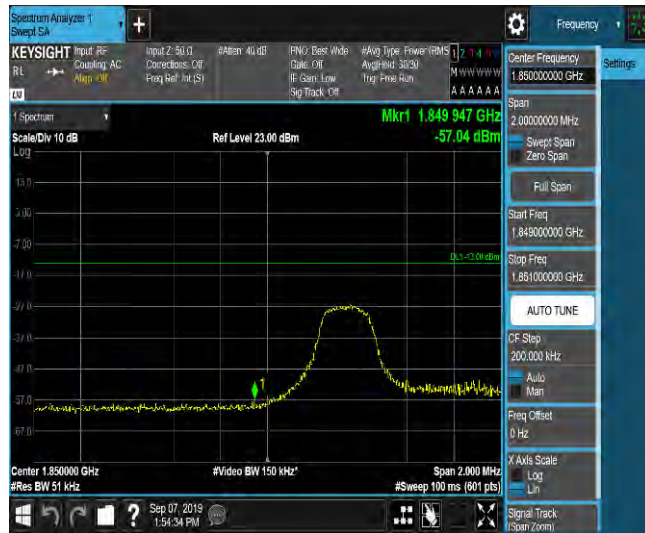
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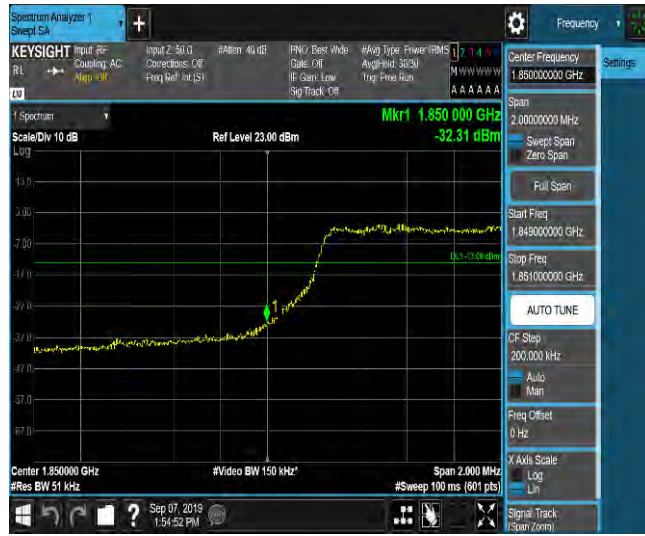
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LTE Band 2_5MHz_QPSK_18625_12RB#0_-30.65_PASS



LTE Band 2_5MHz_16QAM_18625_12RB#0_-32.31_PASS



LTE Band 2_5MHz_QPSK_18625_12RB#6_-31.26_PASS



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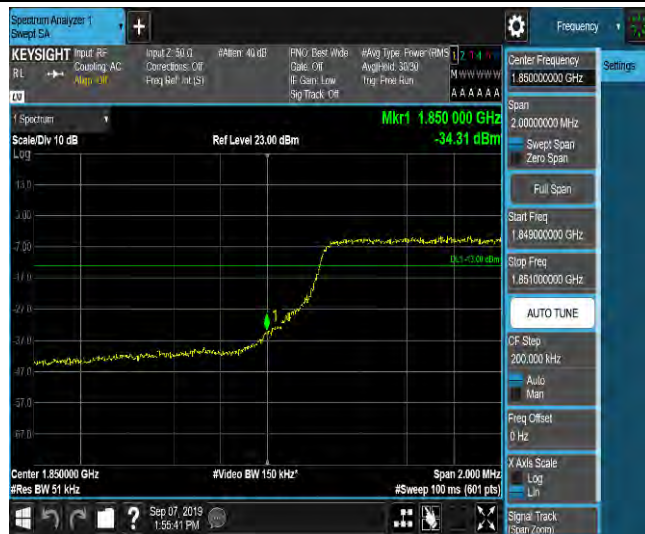
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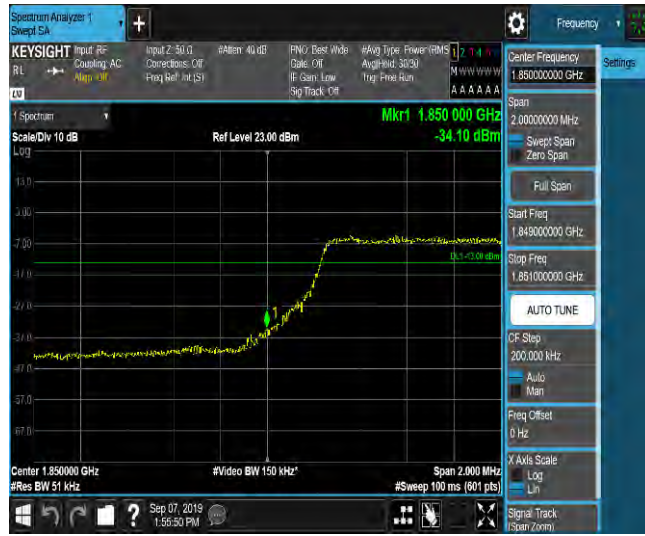
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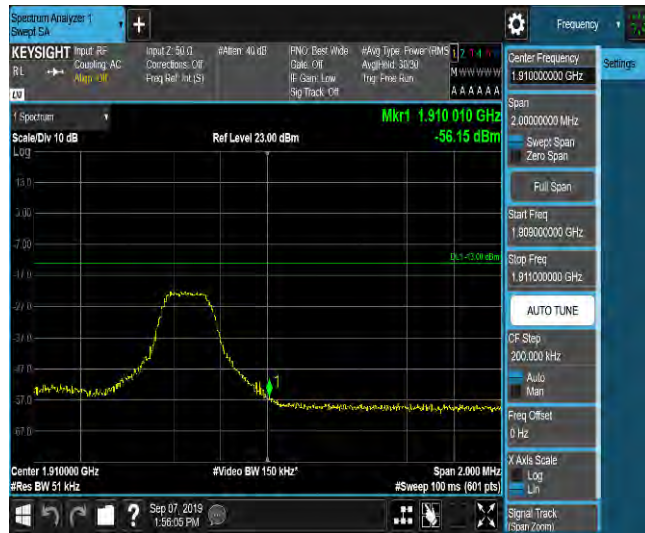
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LTE Band 2_5MHz_16QAM_18625_25RB#0_-34.10_PASS



LTE Band 2_5MHz_QPSK_19175_1RB#0_-56.15_PASS



LTE Band 2_5MHz_16QAM_19175_1RB#0_-56.72_PASS

