



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.	R2108A0686-R2V1
Issue Date	December 8, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2020)/ FCC CFR 47 Part 24E (2020)**. 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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TABLE OF CONTENT

1. Test Laboratory	4
1.1. Notes of the test report	4
1.2. Testing Location	4
2. General Description of Equipment under Test	5
2.1. Applicant and Manufacturer Information	5
2.2. General information	5
3. Applied Standards	7
4. Test Configuration	8
5. Test Case Results	10
5.1. RF Power Output	10
5.2. Effective Isotropic Radiated Power	19
5.3. Occupied Bandwidth	30
5.4. Band Edge Compliance	48
5.5. Peak-to-Average Power Ratio (PAPR)	108
5.6. Frequency Stability	111
5.7. Spurious Emissions at Antenna Terminals	118
5.8. Radiates Spurious Emission	210
6. Main Test Instruments	216
ANNEX A: The EUT Appearance	218
ANNEX B: Test Setup Photos	219
ANNEX C: Verify data	220
ANNEX D: Product Change Description	221

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
Date of Testing: (Original) August 19, 2019 ~October 10, 2019 (Variant) September 28, 2021~ December 1, 2021			
Note: PASS: The EUT complies with the essential requirements in the standard.			

EC21-AUX, EC21-AUX MINIPCIE (Report No.: R2108A0686-R2V1) is a variant model of EC21-AUX MINIPCIE (Report No.: R1908A0502-R2). There is only changed the Power Amplifier and Software Version of product.

Tested cases refer to the following table. Please refer to Appendix C for Verify data

Test Case	Original	Variant
RF Power Output and Effective Radiated Power	PASS	Retest(GSM1900/WCDMA Band II/LTE Band 2)
Occupied Bandwidth	PASS	Verify the worst combination of each frequency band(GSM1900/WCDMA Band II/LTE Band 2)
Band Edge Compliance	PASS	Verify the worst combination of each frequency band(GSM1900/WCDMA Band II/LTE Band 2)
Peak-to-Average Power Ratio	PASS	Retest(GSM1900/WCDMA Band II/LTE Band 2)
Frequency Stability	PASS	Refer to the Original
Spurious Emissions at Antenna Terminals	PASS	Verify the worst combination of each frequency band(GSM1900/WCDMA Band II/LTE Band 2)
Radiates Spurious Emission	PASS	Retest(GSM1900/WCDMA Band II/LTE Band 2)

The detailed product change description please refers to the Difference Declaration Letter.



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
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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	R2.0		
Software Version	EC21AUXGAR08A03M1G		
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

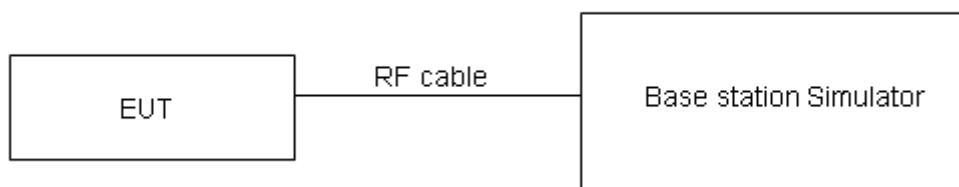
Ambient condition

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



WCDMA Band II	9538	HSDPA_Sub3	21.98	33	PASS
Band	Channel	SubTest	Power(dBm)	Limit(dBm)	Verdict
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

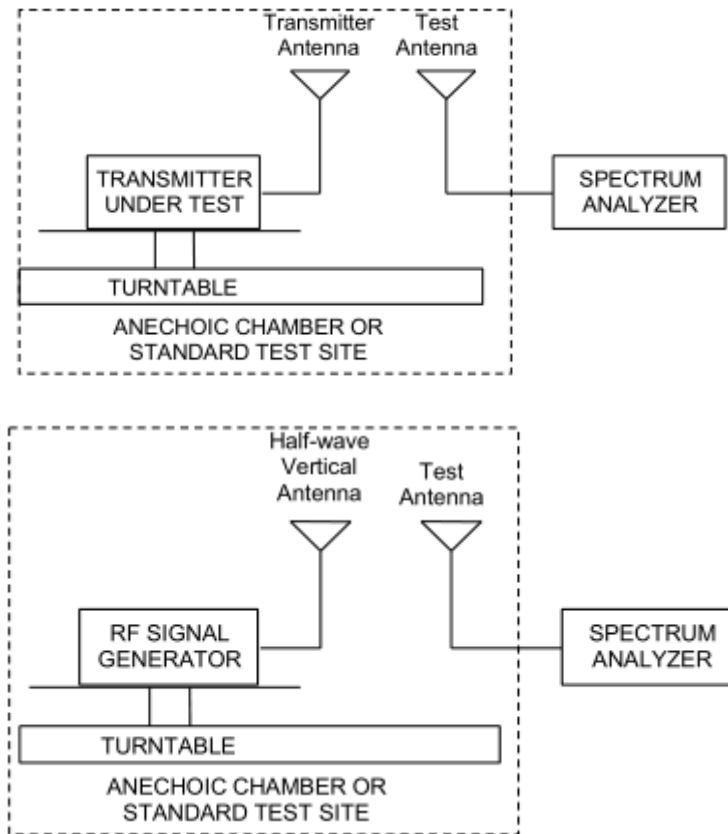
Methods of Measurement

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

- 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



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
LTE Band 2	10MHz	16QAM	18900	1RB#0	23.98	33
LTE Band 2	10MHz	QPSK	18900	1RB#24	24.88	33
LTE Band 2	10MHz	16QAM	18900	1RB#24	23.75	33
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LTE Band 2	10MHz	16QAM	18900	1RB#49	23.89	33
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LTE Band 2	10MHz	QPSK	19150	25RB#12	23.92	33
LTE Band 2	10MHz	16QAM	19150	25RB#12	22.91	33



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LTE Band 2	10MHz	16QAM	19150	50RB#0	23.91	33
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LTE Band 2	15MHz	16QAM	18675	1RB#38	23.79	33
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LTE Band 2	15MHz	16QAM	18675	1RB#74	23.76	33
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LTE Band 2	15MHz	QPSK	19125	1RB#0	24.71	33
LTE Band 2	15MHz	16QAM	19125	1RB#0	23.88	33
LTE Band 2	15MHz	QPSK	19125	1RB#38	24.77	33
LTE Band 2	15MHz	16QAM	19125	1RB#38	23.63	33
LTE Band 2	15MHz	QPSK	19125	1RB#74	24.53	33
LTE Band 2	15MHz	16QAM	19125	1RB#74	23.73	33
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LTE Band 2	15MHz	QPSK	19125	38RB#18	23.56	33
LTE Band 2	15MHz	16QAM	19125	38RB#18	23.55	33



LTE Band 2	15MHz	QPSK	19125	38RB#37	23.03	33
LTE Band 2	15MHz	16QAM	19125	38RB#37	23.14	33
LTE Band 2	15MHz	QPSK	19125	75RB#0	23.68	33
LTE Band 2	15MHz	16QAM	19125	75RB#0	23.79	33
LTE Band 2	20MHz	QPSK	18700	1RB#0	24.67	33
LTE Band 2	20MHz	16QAM	18700	1RB#0	23.86	33
LTE Band 2	20MHz	QPSK	18700	1RB#49	25.13	33
LTE Band 2	20MHz	16QAM	18700	1RB#49	24.10	33
LTE Band 2	20MHz	QPSK	18700	1RB#99	24.74	33
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LTE Band 2	20MHz	QPSK	18700	50RB#0	23.75	33
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
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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
LTE Band 2	20MHz	16QAM	18900	50RB#25	23.89	33
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LTE Band 2	20MHz	16QAM	19100	50RB#0	23.84	33
LTE Band 2	20MHz	QPSK	19100	50RB#25	23.84	33
LTE Band 2	20MHz	16QAM	19100	50RB#25	23.83	33



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,

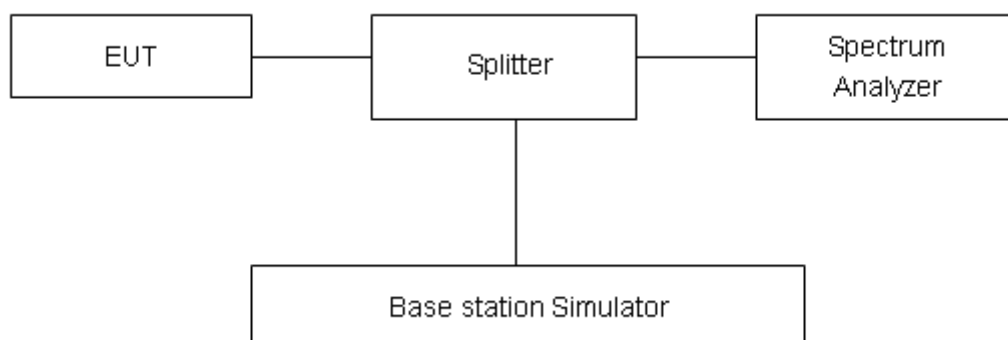
RBW is set to 100kHz, VBW is set to 300kHz for WCDMA Band II,

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



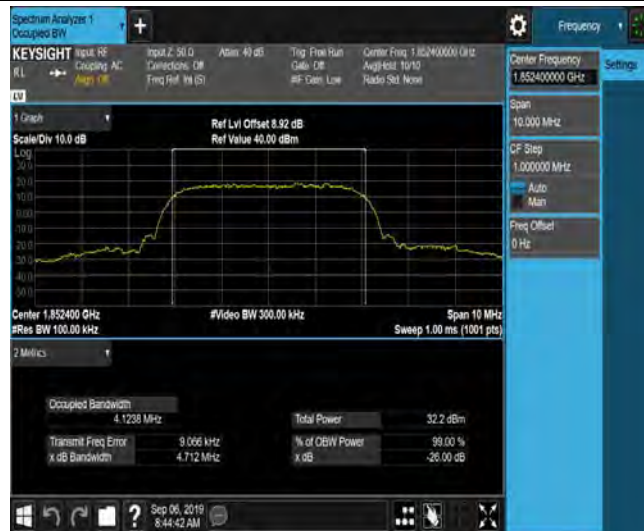
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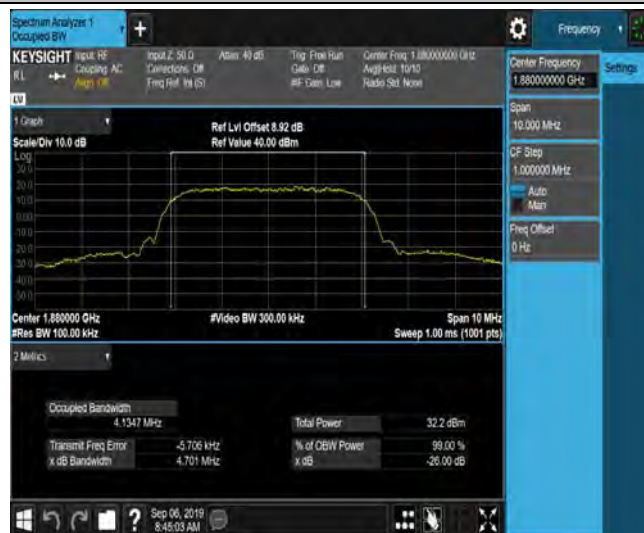
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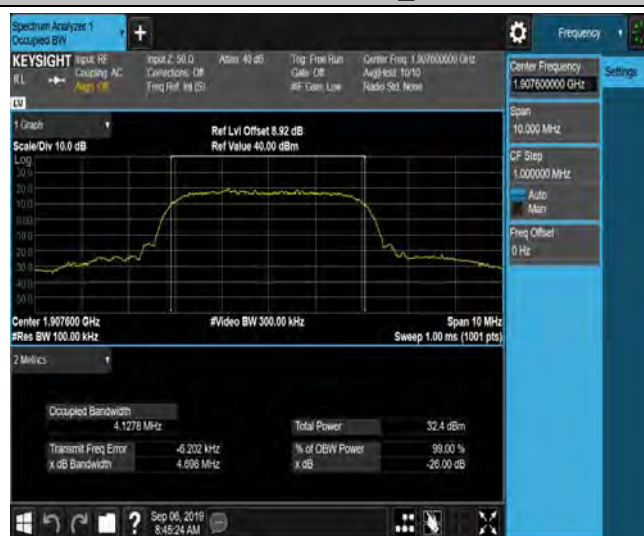
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WCDMA Band II_9262

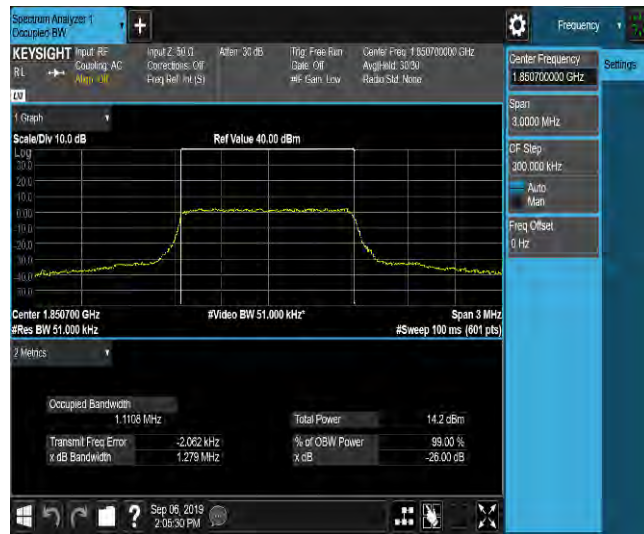


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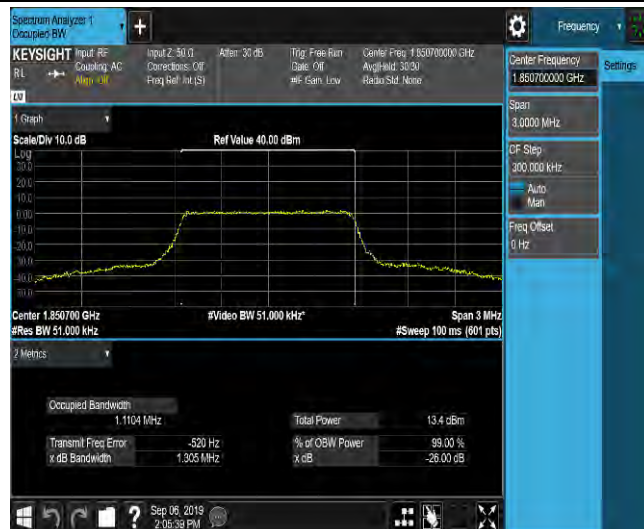


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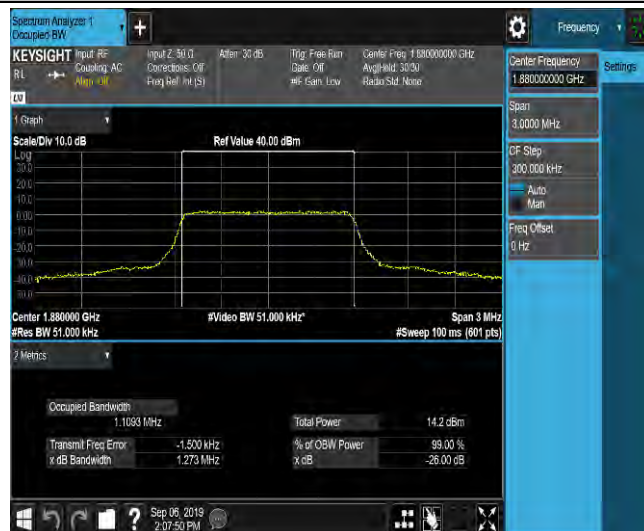
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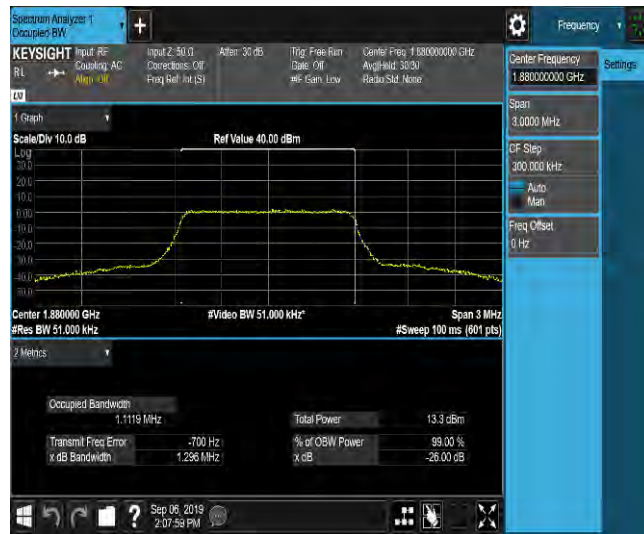
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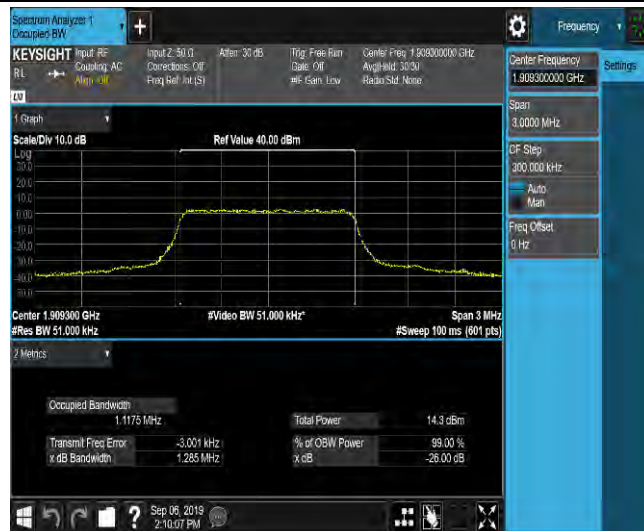
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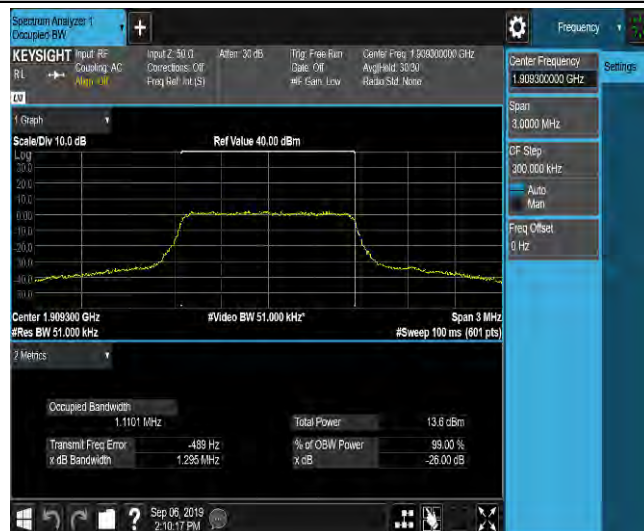
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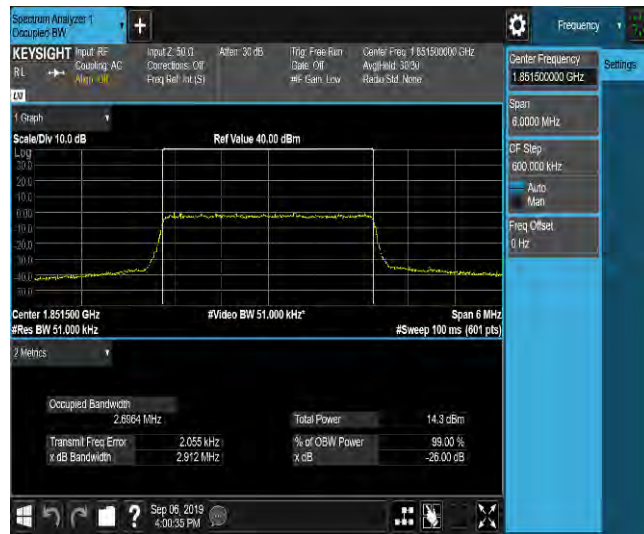
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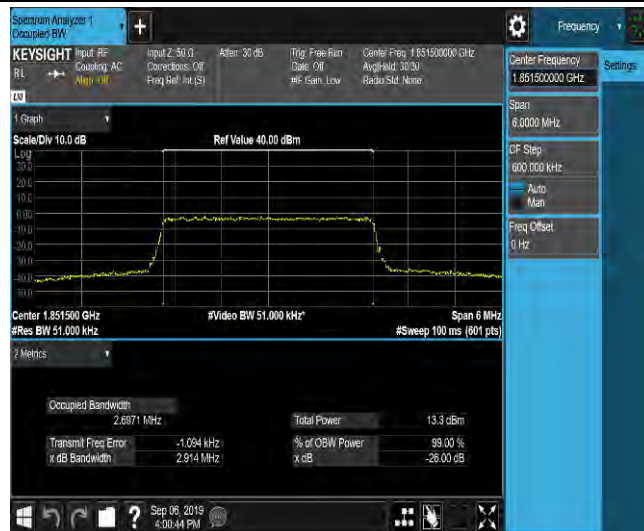
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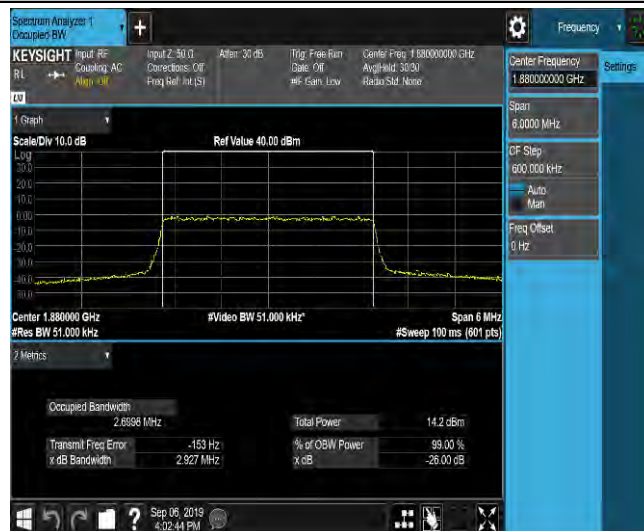
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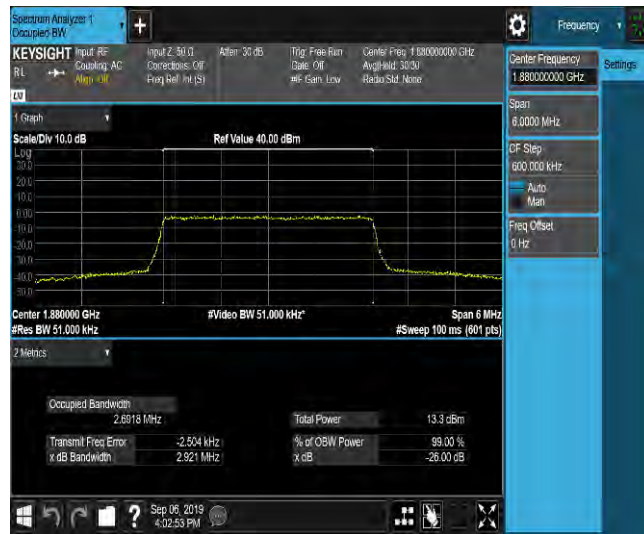
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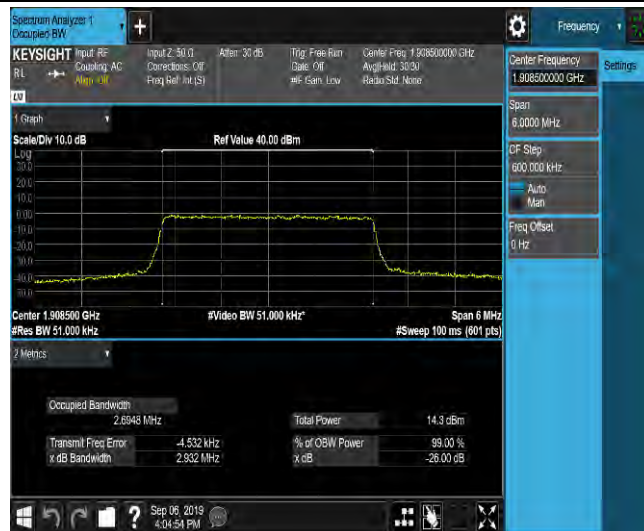
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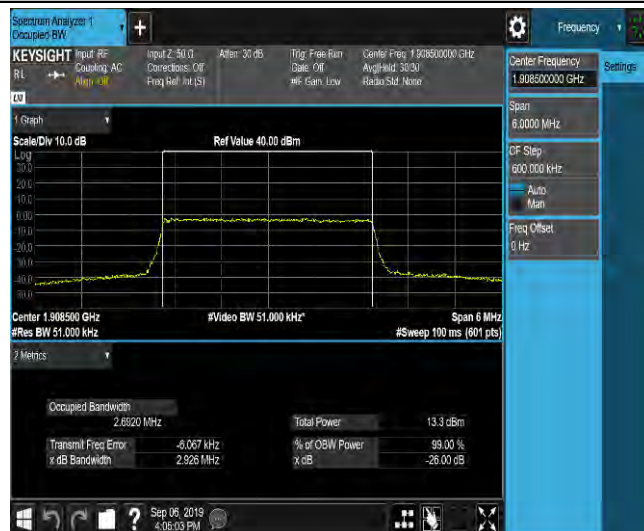
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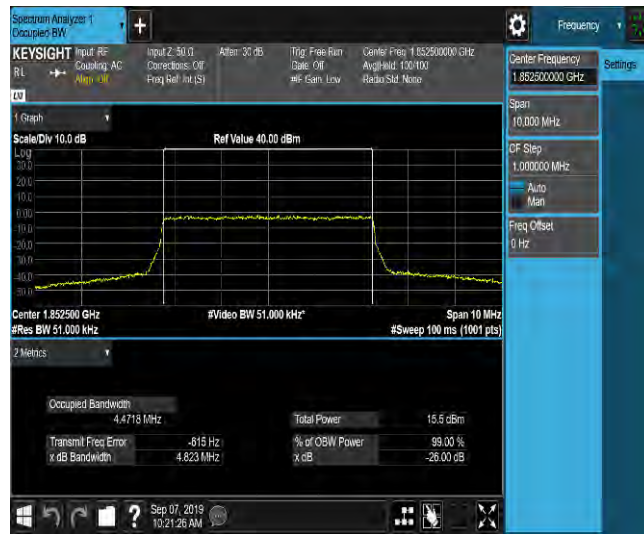
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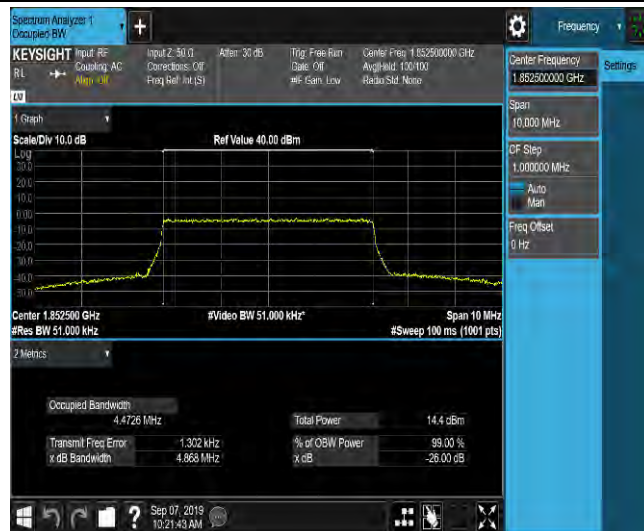
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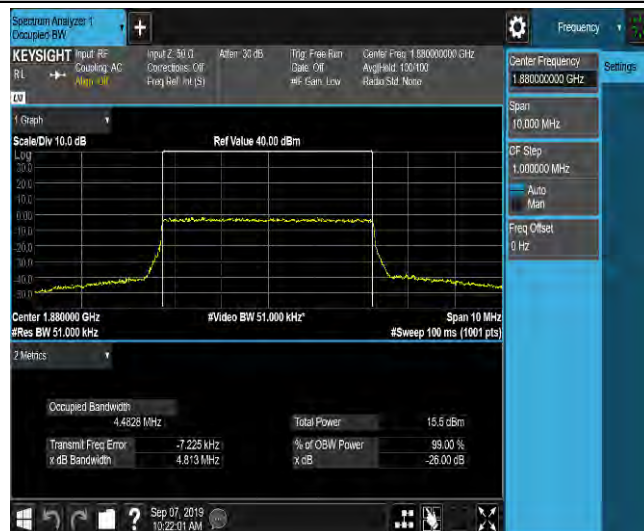
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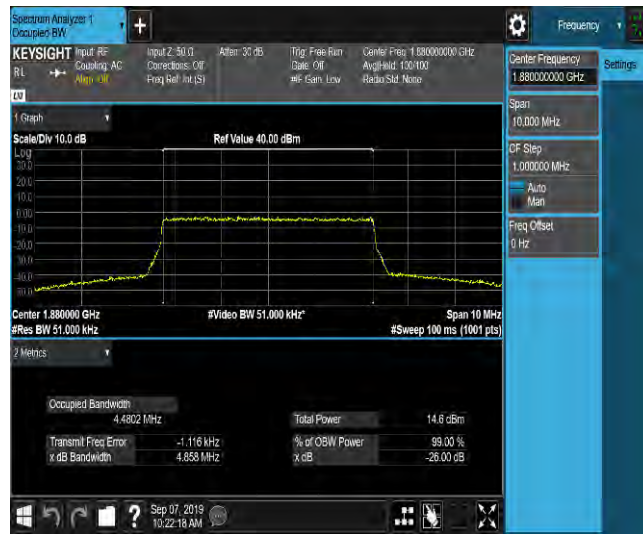
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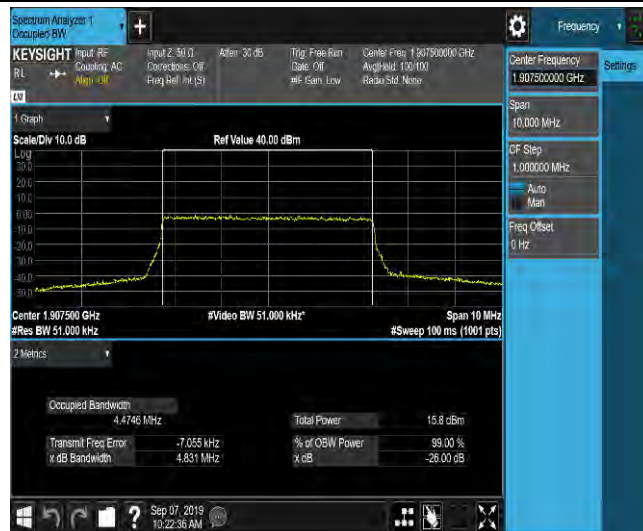
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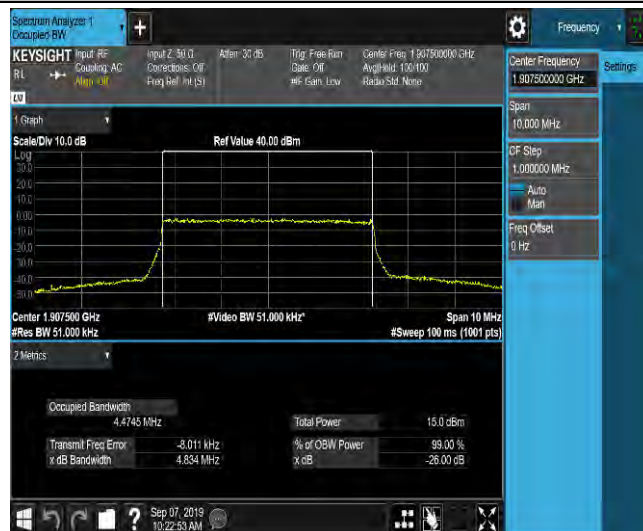
LTE Band 2_5MHz_16QAM_18900_25RB#0_4.4802_4.858_PASS



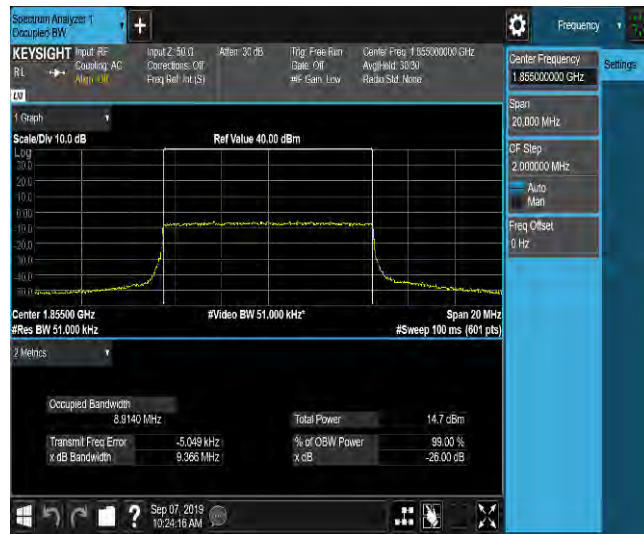
LTE Band 2_5MHz_QPSK_19175_25RB#0_4.4746_4.831_PASS



LTE Band 2_5MHz_16QAM_19175_25RB#0_4.4745_4.834_PASS



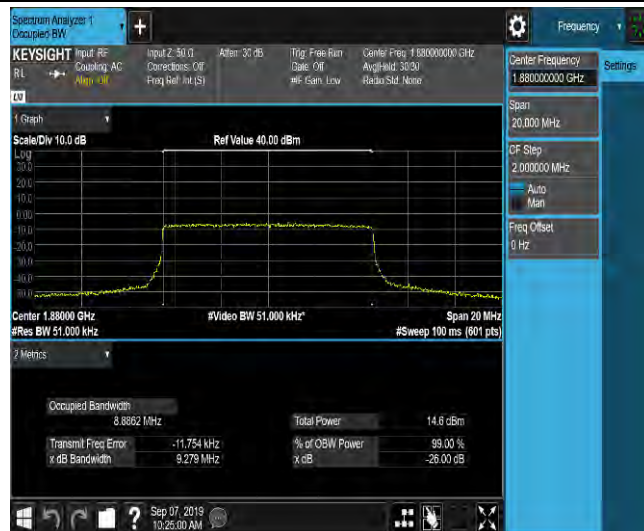
LTE Band 2_10MHz_QPSK_18650_50RB#0_8.9140_9.366_PASS



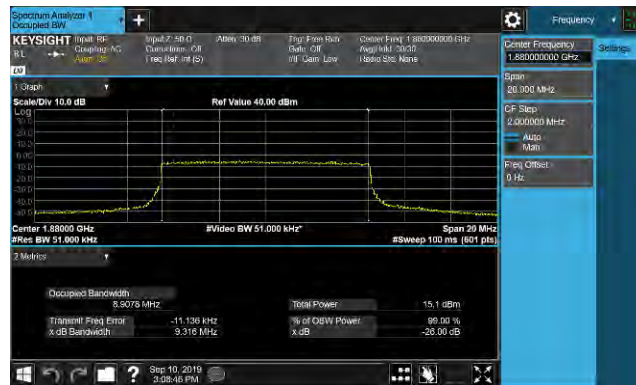
LTE Band 2_10MHz_16QAM_18650_50RB#0_8.9256_9.351_PASS



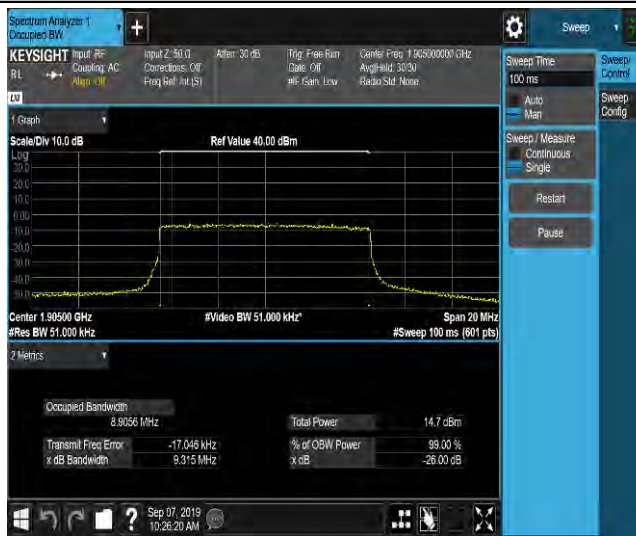
LTE Band 2_10MHz_QPSK_18900_50RB#0_8.8862_9.279_PASS



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



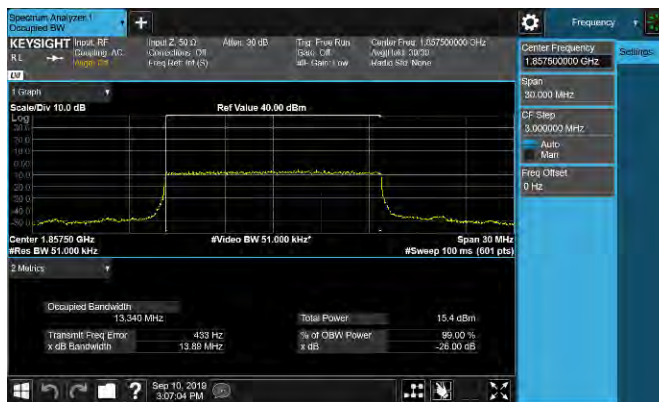
LTE Band 2_10MHz_16QAM_19150_50RB#0_8.9026_9.290_PASS



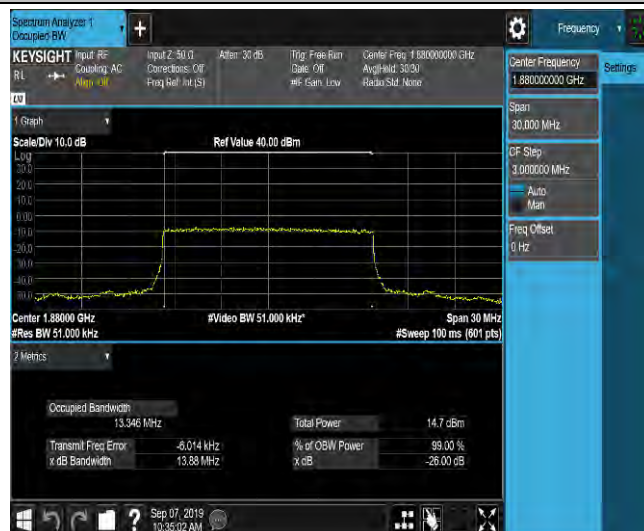
LTE Band 2_15MHz_QPSK_18675_75RB#0_13.354_13.88_PASS



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



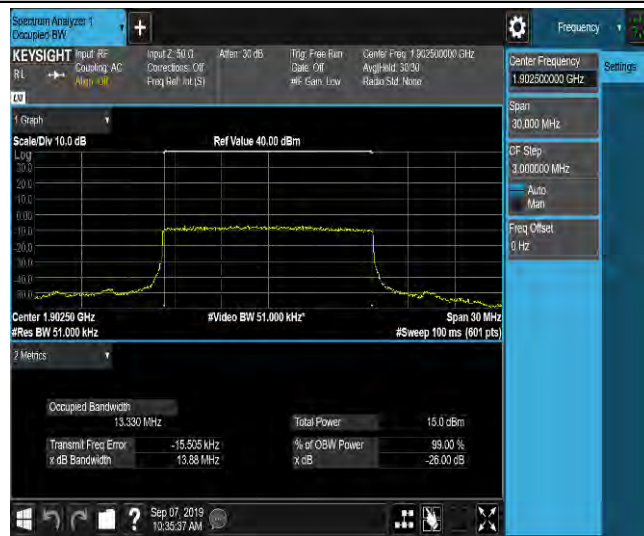
LTE Band 2_15MHz_QPSK_18900_75RB#0_13.346_13.88_PASS



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



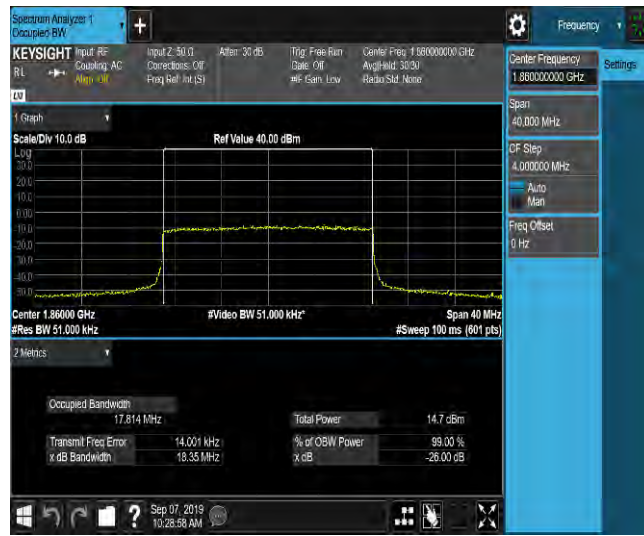
LTE Band 2_15MHz_QPSK_19125_75RB#0_13.330_13.88_PASS



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



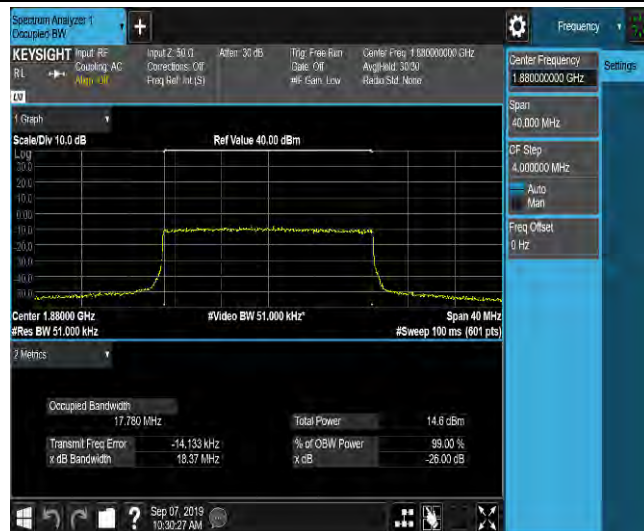
LTE Band 2_20MHz_QPSK_18700_100RB#0_17.814_18.35_PASS



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



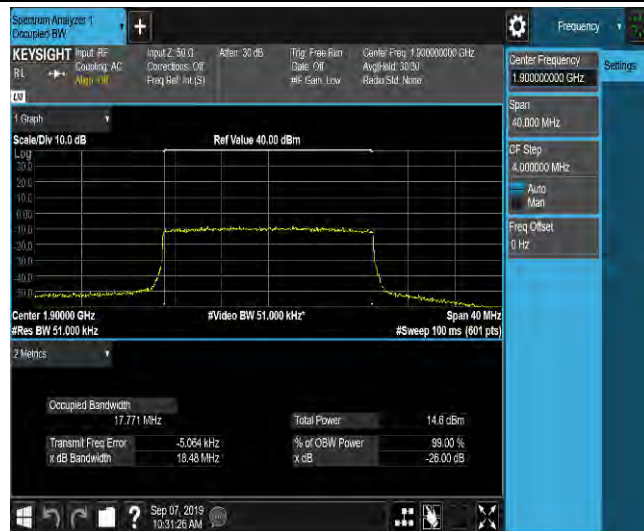
LTE Band 2_20MHz_QPSK_18900_100RB#0_17.780_18.37_PASS



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

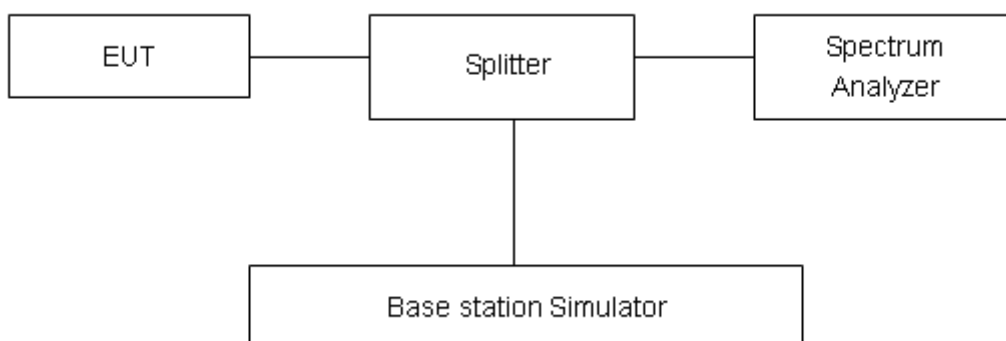
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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



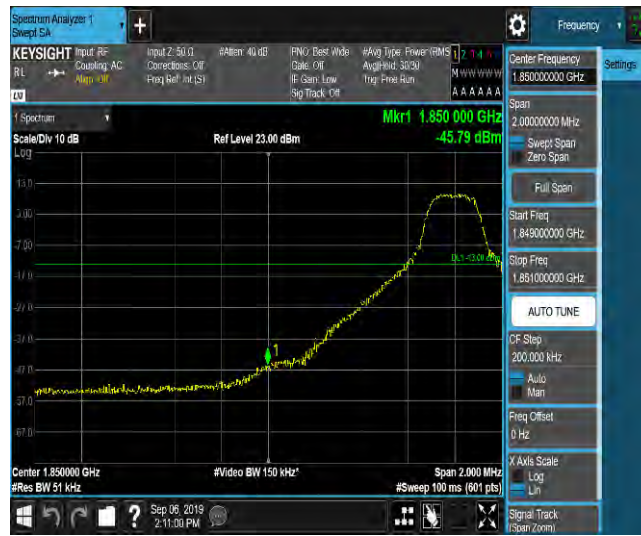
LTE Band 2_1.4MHz_16QAM_18607_1RB#0_-25.53_PASS



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_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



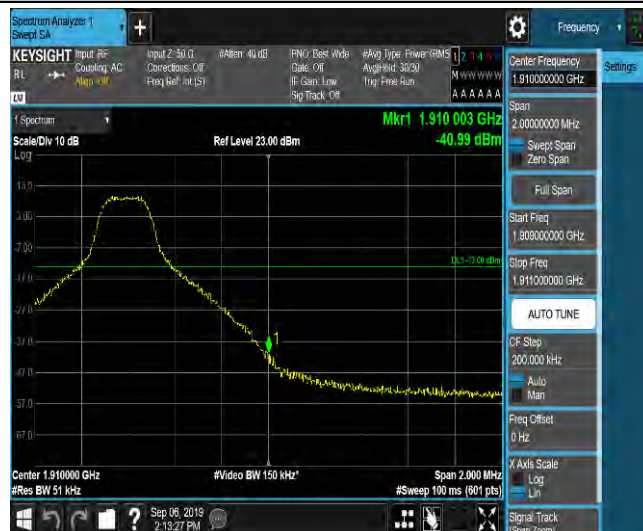
LTE Band 2_1.4MHz_16QAM_19193_1RB#0_-37.01_PASS



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



LTE Band 2_1.4MHz_QPSK_19193_3RB#1_-37.13_PASS



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



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



LTE Band 2_1.4MHz_16QAM_19193_3RB#3_-27.12_PASS



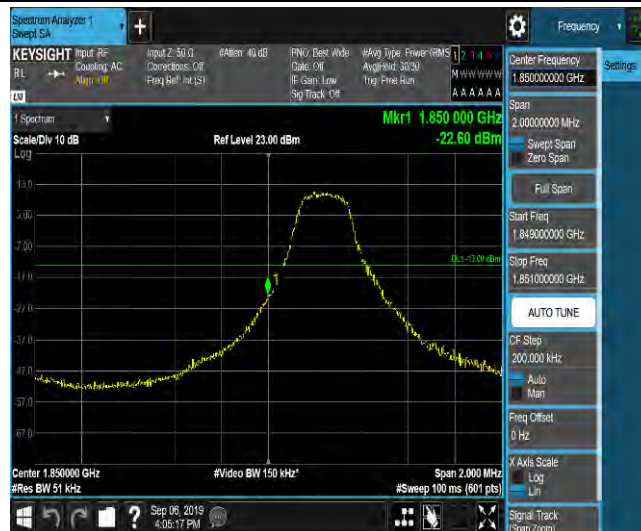
LTE Band 2_1.4MHz_QPSK_19193_6RB#0_-29.79_PASS



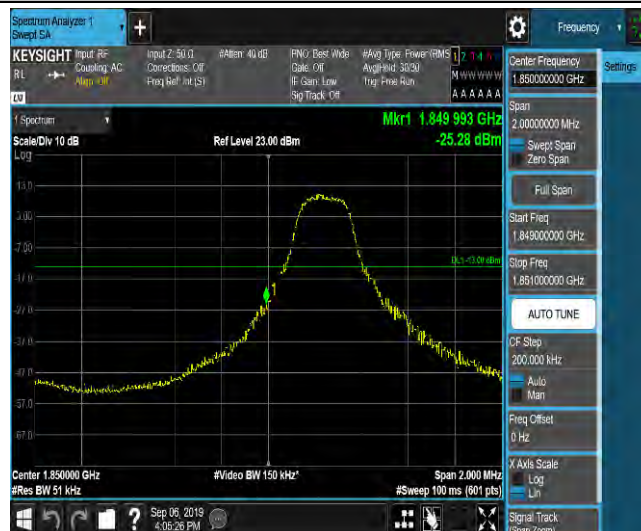
LTE Band 2_1.4MHz_16QAM_19193_6RB#0_-30.44_PASS



LTE Band 2_3MHz_QPSK_18615_1RB#0_-22.60_PASS



LTE Band 2_3MHz_16QAM_18615_1RB#0_-25.28_PASS



The screenshot displays the Keysight Spectrum Analyzer software interface. The main window shows a spectrum plot with a signal at 1.849 GHz. The plot has a scale of 10 dB, a span of 2.000 MHz, and a resolution bandwidth of 150 kHz. The signal is labeled 'Mkr1 1.849 967 GHz' and '-50.51 dBm'. The interface includes various control panels for input, corrections, and settings, as well as a status bar at the bottom showing the date and time.

Top Panel:

- Spectrum Analyzer 1:** Sweep SA
- Input:** Input RF, Coupling AC, Att'n 3 dB
- Corrections:** Input Z: 50.0 Ohm, #Att'n: 40 dB, FNO: Best Wide, Gate: Off, #F Gain: Low, Sig Track: Off
- Avg Type:** Power (MMS), Aged: 100, Trg: Free Run
- Frequency:** 1.849 GHz, A A A A A A

Plot Area:

- Scale:** 10 dB
- Ref Level:** 23.00 dBm
- Log**
- Span:** 2.00000000 MHz
- Sweep Span:** Zero Span
- Full Span**
- Start Freq:** 1.849000000 GHz
- Stop Freq:** 1.851000000 GHz
- AUTO TUNE**
- CF Step:** 200.000 kHz
- Freq Offset:** 0 Hz
- X Axis Scale:** Log, Lin
- Span:** 2.000 MHz
- #Sweep:** 100 ms (601 pts)

Bottom Panel:

- Center:** 1.850000 GHz
- #Video BW:** 150 kHz
- Res BW:** 51 kHz
- Status Bar:** Sep 06, 2019, 4:05:34 PM

The screenshot displays the Keysight Spectrum Analyzer software interface. The main window shows a spectrum plot with a signal at 1.849 GHz. The plot is labeled "Mkr1 1.849 987 GHz" and "-52.23 dBm". The center frequency is 1.850000 GHz, and the span is 2.000 MHz. The resolution bandwidth (RBW) is 51 kHz, and the video bandwidth (VBW) is 150 kHz. The scale is 10 dB, and the reference level is 23.00 dBm. The plot shows a noisy signal with a peak at 1.849 GHz. The interface includes various control panels for input, settings, and measurement.

Spectrum Analyzer 1
Sweep SA

KEYSIGHT Input RF
Coupling AC
Align 0 dB

Input Z 50.0 Ω
Corrections Off
Freq Ref Int (S)

Attain 40 dB
FNO Best Wide
Gate Off
IF Gain Low
Sig Track Off

AVG Type Power (MS)
Averaging 3030
Trig Free Run
M 1 2 3 4 5 6
A A A A A A

Center Frequency
1.850000000 GHz

Span
2.000000000 MHz

Sweep Span
Zero Span

Full Span

Start Freq
1.849000000 GHz

Stop Freq
1.851000000 GHz

AUTO TUNE

CF Step
200.000 kHz

Auto
Man

Freq Offset
0 Hz

X Axis Scale
Log

Signal Track

Spectrum
Scale/Div 10 dB
Ref Level 23.00 dBm
Mkr1 1.849 003 GHz
-50.16 dBm

Log

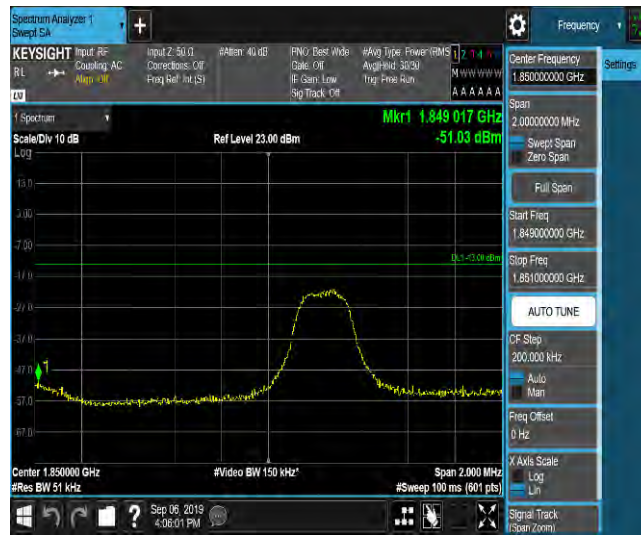
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0

Center 1.850000 GHz
#Res BW 51 kHz

#Video BW 150 kHz

Span 2.000 MHz
#Sweep 100 ms (601 pts)

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



The screenshot displays a Spectrum Analyzer interface. At the top, the title bar reads "Spectrum Analyzer 1 Sweep SA". Below this, a control bar includes a "+" button, a "KEYSIGHT" logo, and various input/output settings: "Input: Z-50 Ω", "Coupling: AC", "Attenuation: 40 dB", "IFBW: Best Wide", "Calc: Off", "Ave Type: Power (RMS)", "Ave Hold: 30/30", "Trig: Free Run", "Marker: 1.850 GHz", "Marker: -28.38 dBm", "Marker: 1.850 GHz", "Marker: -28.38 dBm", "Marker: 1.850 GHz", "Marker: -28.38 dBm".

The main display area shows a spectrum plot with a yellow trace. The x-axis is labeled "Center 1.850000 GHz" and "Span 2.000 MHz". The y-axis is labeled "Scale/Div 10 dB" and "Ref Level 23.00 dBm". The plot shows a signal trace with a peak at 1.850 GHz and -28.38 dBm. The plot is labeled "Mkr1 1.850 000 GHz" and "-28.38 dBm".

On the right side, there is a "Settings" panel with various controls: "Span" (2.00000000 MHz), "Sweep Span" (Zero Span), "Full Span", "Start Freq" (1.849000000 GHz), "Stop Freq" (1.851000000 GHz), "AUTO TUNE", "CF Step" (200.000 kHz), "Auto" (Man), "Freq Offset" (0 Hz), "X Axis Scale" (Log), "Lin", "Signal Track" (Spectrum).

At the bottom, there is a status bar with the date and time "Sep 06 2019 4:06:28 PM", a question mark icon, and a "Signal Track" section with "Spectrum" and "Marker" options.

The screenshot displays a Spectrum Analyzer interface. At the top, the title bar reads "Spectrum Analyzer 1" and "Sweep SA". Below this, the "KEYSIGHT" logo is visible. The main display area shows a frequency spectrum plot with a green trace. A prominent peak is labeled "Mkr 1.849 990 GHz" with a level of "-29.21 dBm". The plot has a scale of "Div 10 dB" and a reference level of "Ref Level 23.00 dBm". The frequency range is centered at "Center 1.850000 GHz" with a span of "Span 2.000 MHz". The resolution bandwidth is set to "#Res BW 51 kHz" and the video bandwidth is "#Video BW 150 kHz". The plot shows a relatively flat baseline with a sharp rise and a small peak at the marked frequency. The right side of the interface contains various control panels for settings like "Center Frequency", "Span", "Sweep Span", "Start Freq", "Stop Freq", "CF Step", "Freq Offset", "X Axis Scale", and "Signal Track". The bottom status bar shows the date and time as "Sep 06 2011 4:06:37 PM".

The screenshot displays a Spectrum Analyzer 1 interface. At the top, the title bar reads "Spectrum Analyzer 1" and "Sweep SA". Below this, the "KEYSIGHT" logo is visible. The main display area shows a spectrum plot with a yellow trace. A prominent peak is labeled "Mkr1 1.849 993 GHz" and "-37.11 dBm". The plot has a grid and a reference level of "Ref Level 23.00 dBm". The x-axis is labeled "Center 1.850000 GHz" and "Span 2.000 MHz". The y-axis is labeled "Scale/Div 10 dB". The bottom status bar shows "Sep 06 2019 4:08:46 PM" and "Signal Track (Spectrum) (mV)".

On the right side, there is a "Settings" panel with various controls:

- Center Frequency:** 1.850000000 GHz
- Span:** 2.000000000 MHz
- Sweep Span:** Zero Span
- Full Span:** (button)
- Start Freq:** 1.849000000 GHz
- Stop Freq:** 1.851000000 GHz
- AUTO TUNE:** (button)
- CF Step:** 200.0000 kHz
- Auto Man:** (radio buttons)
- Freq Offset:** 0 Hz
- X Axis Scale:** Log (radio button), Lin (radio button)
- Signal Track:** (Spectrum) (mV)

At the bottom, there is a Windows taskbar with icons for the Start menu, File Explorer, a question mark, and a clock showing "Sep 06 2019 4:08:46 PM".

LTE Band 2_3MHz_16QAM_18615_8RB#7_-38.21_PASS



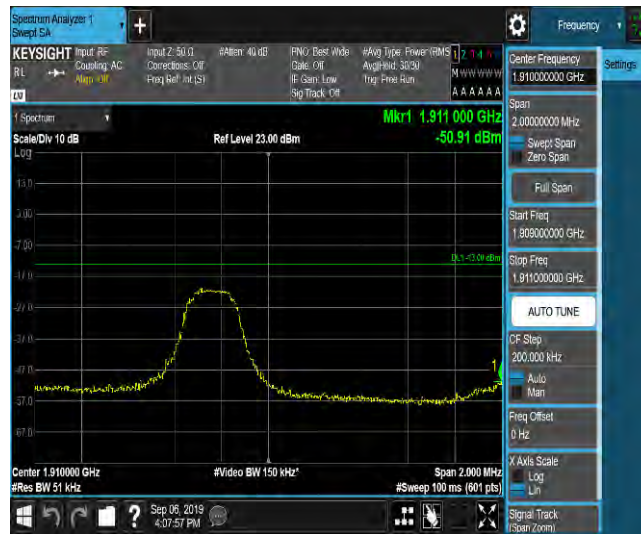
LTE Band 2_3MHz_QPSK_18615_15RB#0_-38.35_PASS



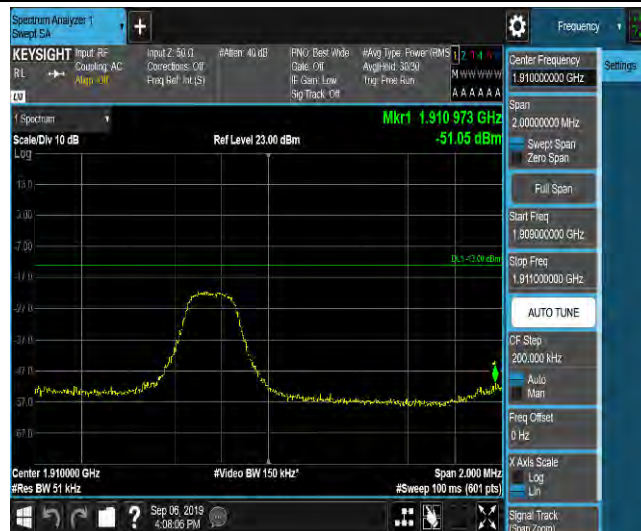
LTE Band 2_3MHz_16QAM_18615_15RB#0_-36.97_PASS



LTE Band 2_3MHz_QPSK_19185_1RB#0_-50.91_PASS



LTE Band 2_3MHz_16QAM_19185_1RB#0_-51.05_PASS



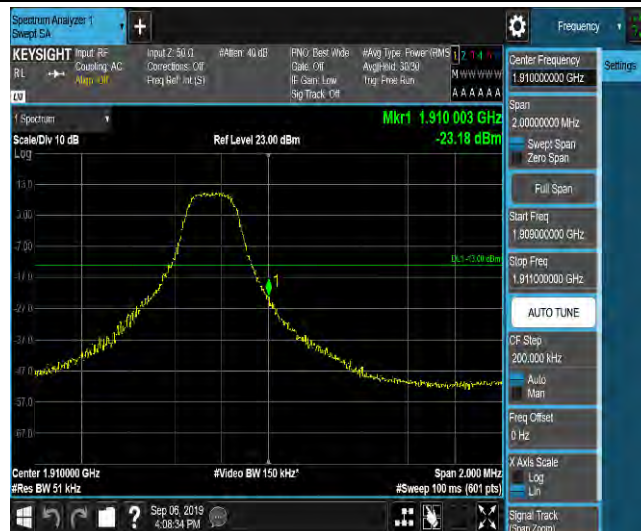
LTE Band 2_3MHz_QPSK_19185_1RB#8_-49.35_PASS



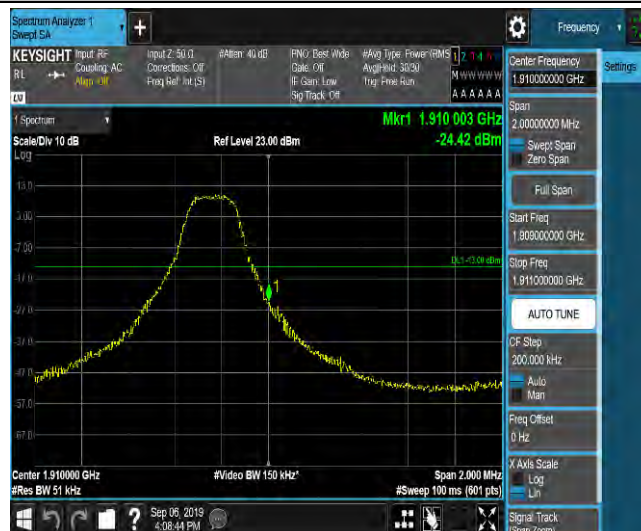
LTE Band 2_3MHz_16QAM_19185_1RB#8_-49.91_PASS



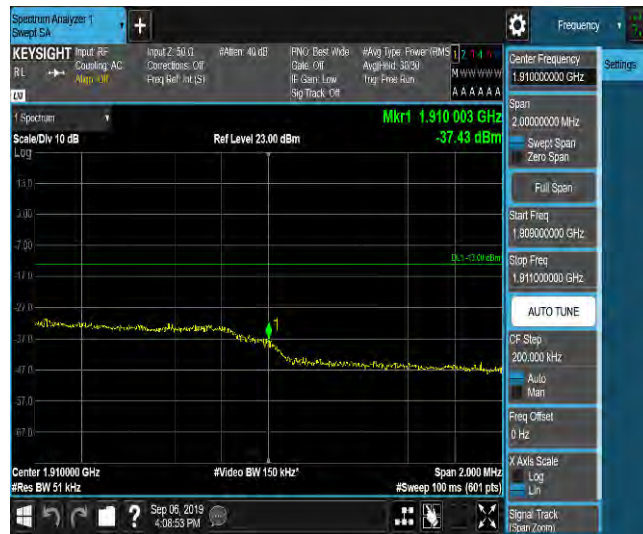
LTE Band 2_3MHz_QPSK_19185_1RB#14_-23.18_PASS



LTE Band 2_3MHz_16QAM_19185_1RB#14_-24.42_PASS



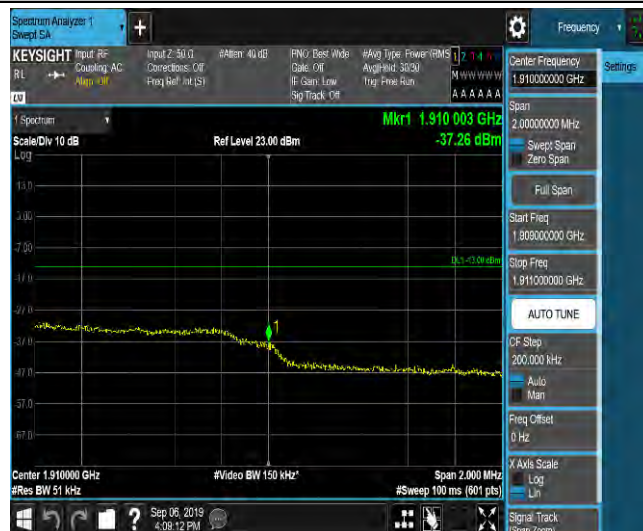
LTE Band 2_3MHz_QPSK_19185_8RB#0_-37.43_PASS



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



LTE Band 2_3MHz_QPSK_19185_8RB#7_-29.18_PASS



LTE Band 2_3MHz_16QAM_19185_8RB#7_-28.86_PASS



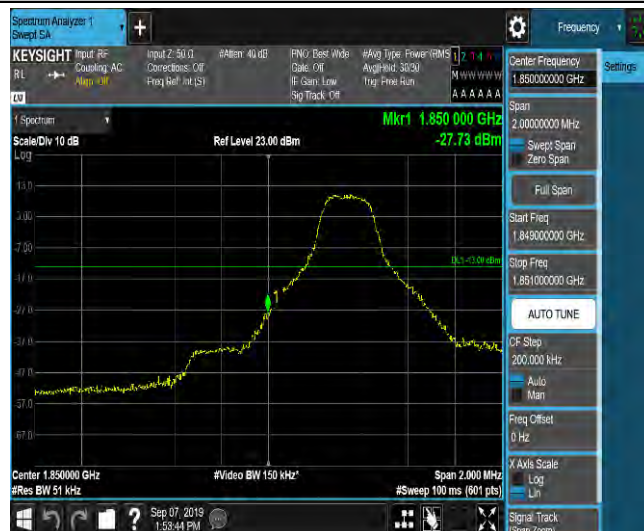
LTE Band 2_3MHz_QPSK_19185_15RB#0_-31.11_PASS



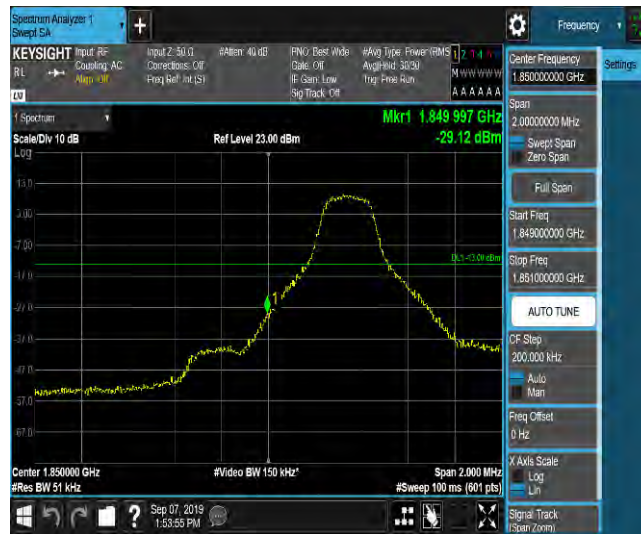
LTE Band 2_3MHz_16QAM_19185_15RB#0_-31.68_PASS



LTE Band 2_5MHz_QPSK_18625_1RB#0_-27.73_PASS



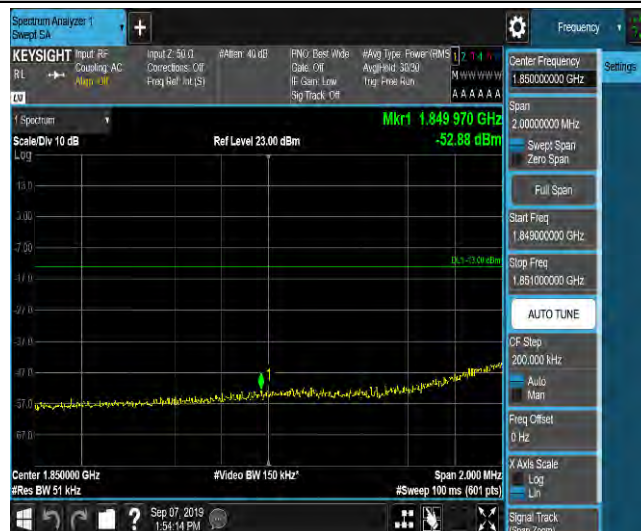
LTE Band 2_5MHz_16QAM_18625_1RB#0_-29.12_PASS



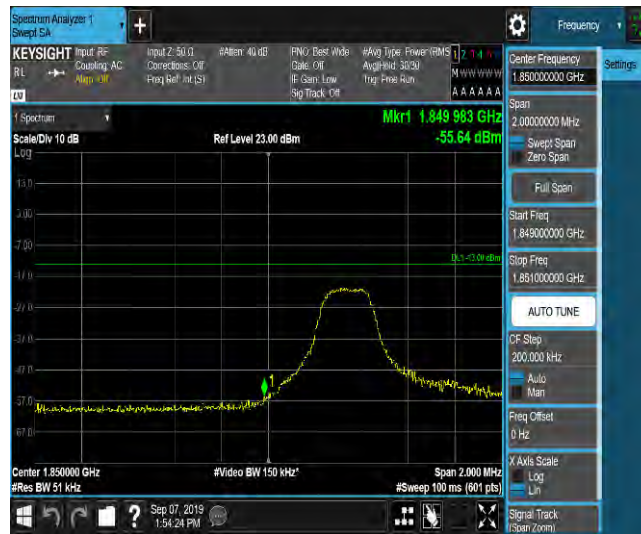
LTE Band 2_5MHz_QPSK_18625_1RB#12_-52.73_PASS



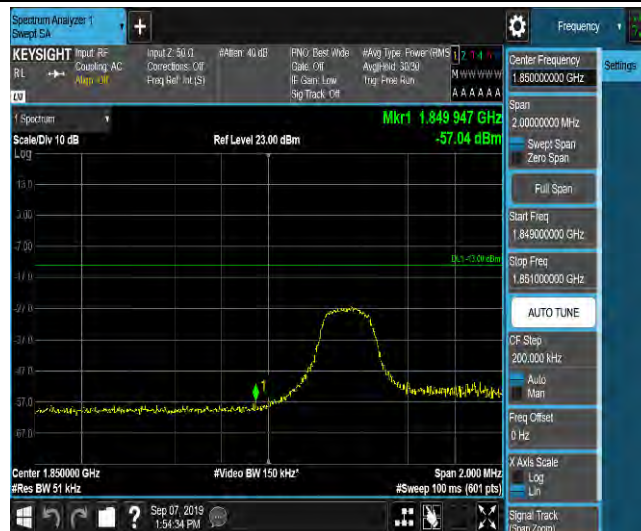
LTE Band 2_5MHz_16QAM_18625_1RB#12_-52.88_PASS



LTE Band 2_5MHz_QPSK_18625_1RB#24_-55.64_PASS



LTE Band 2_5MHz_16QAM_18625_1RB#24_-57.04_PASS



LTE Band 2_5MHz_QPSK_18625_12RB#0_-30.65_PASS



Spectrum Analyzer 1
SWP1 SA

KEYSIGHT Input RF
Coupling AC
Align 13f

Input Z 50.0 Ω
Corrections Off
Preay Ref Int (S)

#Attain -40 dB

RFN: Best Wide
Gate Off
IF Gain Low
Sig Track Off

#Avg Type: Power (RMS)
Avg Read 30.33
Trig Time Run

1 2 3 4 5 6
A A A A A A A

Center Frequency
1.850000000 GHz

Span
2.000000000 MHz

Sweep Span
Zero Span

Full Span

Start Freq
1.849000000 GHz

Stop Freq
1.851000000 GHz

AUTO TUNE

CF Step
200.000 kHz

Freq Offset
0 Hz

X Axis Scale
Log
Lin

Signal Track

Scale/Div 10 dB
Ref Level 23.00 dBm

Mkr1 1.850 000 GHz
-32.31 dBm

Center 1.850000 GHz
#Res BW 51 kHz

#Video BW 150 kHz

Span 2.000 MHz
#Sweep 100 ms (601 pts)

Windows Taskbar: Sep 07, 2019 1:54:52 PM

Keysight Spectrum Analyzer 1
Sweep SA

KEYSIGHT Input RF: Coupling AC, Att'n 1.0 dB, Input 2, 50 Ohm, Corrections Off, Preay Ref Int (S), FNO: Best Wdg, Gate Off, IF Gain: Low, Sig Track Off, Avg Type: Power (RMS), Averaged 30/30, Trigger: Free Run, M1: 1.849, M2: 1.849, M3: 1.849, M4: 1.849, M5: 1.849, M6: 1.849, M7: 1.849, M8: 1.849, M9: 1.849, M10: 1.849, M11: 1.849, M12: 1.849, M13: 1.849, M14: 1.849, M15: 1.849, M16: 1.849, M17: 1.849, M18: 1.849, M19: 1.849, M20: 1.849, M21: 1.849, M22: 1.849, M23: 1.849, M24: 1.849, M25: 1.849, M26: 1.849, M27: 1.849, M28: 1.849, M29: 1.849, M30: 1.849, M31: 1.849, M32: 1.849, M33: 1.849, M34: 1.849, M35: 1.849, M36: 1.849, M37: 1.849, M38: 1.849, M39: 1.849, M40: 1.849, M41: 1.849, M42: 1.849, M43: 1.849, M44: 1.849, M45: 1.849, M46: 1.849, M47: 1.849, M48: 1.849, M49: 1.849, M50: 1.849, M51: 1.849, M52: 1.849, M53: 1.849, M54: 1.849, M55: 1.849, M56: 1.849, M57: 1.849, M58: 1.849, M59: 1.849, M60: 1.849, M61: 1.849, M62: 1.849, M63: 1.849, M64: 1.849, M65: 1.849, M66: 1.849, M67: 1.849, M68: 1.849, M69: 1.849, M70: 1.849, M71: 1.849, M72: 1.849, M73: 1.849, M74: 1.849, M75: 1.849, M76: 1.849, M77: 1.849, M78: 1.849, M79: 1.849, M80: 1.849, M81: 1.849, M82: 1.849, M83: 1.849, M84: 1.849, M85: 1.849, M86: 1.849, M87: 1.849, M88: 1.849, M89: 1.849, M90: 1.849, M91: 1.849, M92: 1.849, M93: 1.849, M94: 1.849, M95: 1.849, M96: 1.849, M97: 1.849, M98: 1.849, M99: 1.849, M100: 1.849

Settings

Center Frequency
1.850000000 GHz

Span
2.000000000 MHz

Sweep Span
Zero Span

Full Span

Start Freq
1.849000000 GHz

Stop Freq
1.851000000 GHz

AUTO TUNE

CF Step
200.000 kHz

Freq Offset
0 Hz

X Axis Scale
Log Lin

Signal Track

Scale/Div 10 dB
Ref Level 23.00 dBm

Mkr1 1.849 993 GHz
-31.26 dBm

Log

Center 1.850000 GHz
#Res BW 51 kHz

#Video BW 150 kHz

Span 2.000 MHz
#Sweep 100 ms (601 pts)

Sep 07, 2019 1:59:02 PM

[illegible]

LTE Band 2_5MHz_QPSK_18625_12RB#13_-46.79_PASS



LTE Band 2_5MHz_16QAM_18625_12RB#13_-47.66_PASS



LTE Band 2_5MHz_QPSK_18625_25RB#0_-34.31_PASS



The screenshot displays the Keysight Spectrum Analyzer software interface. The main display area shows a frequency spectrum plot with a yellow trace. A green marker is positioned at 1.850 GHz with a level of -34.10 dBm. The plot has a logarithmic scale (Log) and a video bandwidth of 150 kHz. The center frequency is 1.850000 GHz, and the span is 2.000 MHz. The resolution bandwidth (Res BW) is 51 kHz. The interface includes various control panels on the left and right, such as 'Spectrum Analyzer 1', 'Sweep SA', 'Center Frequency', 'Span', 'Start Freq', 'Stop Freq', 'CF Step', 'Freq Offset', 'X Axis Scale', and 'Signal Track'. The bottom status bar shows the date and time as Sep 07, 2019, 1:56:50 PM.

[illegible]

Spectrum Analyzer 1
Sweep SA

KEYSIGHT Input RF
Coupling AC
Align +0

Input Z: 50 Ω
Directions: Off
Freq Ref: Int (S)

Attain: 40 dB
RNO: Best Wide
Gate: Off
Rf Gain: Low
Sig Track: Off

AVG Type: Power (RMS)
Averaging: 30 dB
Trig: Free Run

M 1.910 GHz
A A A A A A

Center Frequency
1.910000000 GHz

Span
2.000000000 MHz

Sweep Span
Zero Span

Full Span

Start Freq
1.808000000 GHz

Stop Freq
1.910000000 GHz

AUTO TUNE

CF Step
200.000 kHz

Auto
Man

Freq Offset
0 Hz

X Axis Scale
Log
Lin

Signal Track
Spectrum

Scale/Div 10 dB
Ref Level 23.00 dBm

Mkr1 1.910 000 GHz
-56.72 dBm

Center 1.910000 GHz
Res BW 51 kHz

#Video BW 150 kHz

Span 2.000 MHz
#Sweep 100 ms (601 pts)

Sep 07, 2019
1:56:14 PM

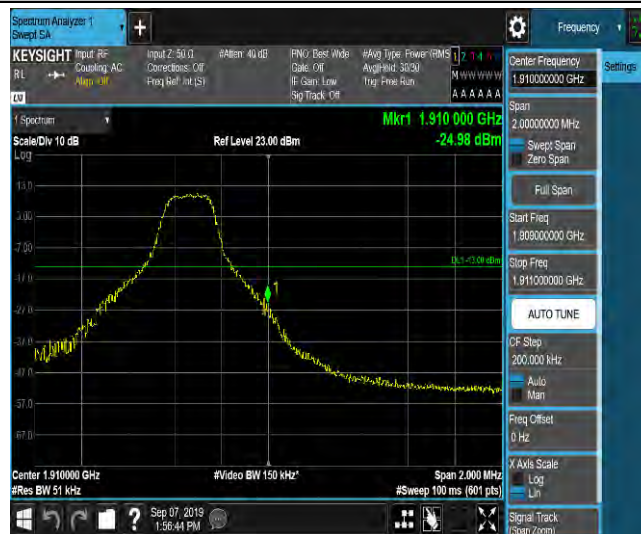
LTE Band 2_5MHz_QPSK_19175_1RB#12_-51.96_PASS



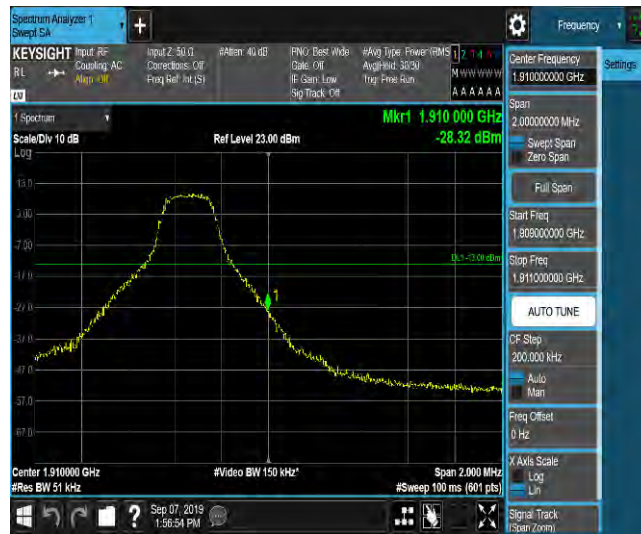
LTE Band 2_5MHz_16QAM_19175_1RB#12_-51.76_PASS



LTE Band 2_5MHz_QPSK_19175_1RB#24_-24.98_PASS



LTE Band 2_5MHz_16QAM_19175_1RB#24_-28.32_PASS



LTE Band 2_5MHz_QPSK_19175_12RB#0_-46.08_PASS



LTE Band 2_5MHz_16QAM_19175_12RB#0_-46.90_PASS





LTE Band 2_5MHz_QPSK_19175_12RB#6_-46.31_PASS



LTE Band 2_5MHz_16QAM_19175_12RB#6_-47.60_PASS



LTE Band 2_5MHz_QPSK_19175_12RB#13_-31.99_PASS



LTE Band 2_5MHz_16QAM_19175_12RB#13_-32.32_PASS



LTE Band 2_5MHz_QPSK_19175_25RB#0_-34.93_PASS



LTE Band 2 5MHz 16QAM 19175 25RB#0 -36.26 PASS





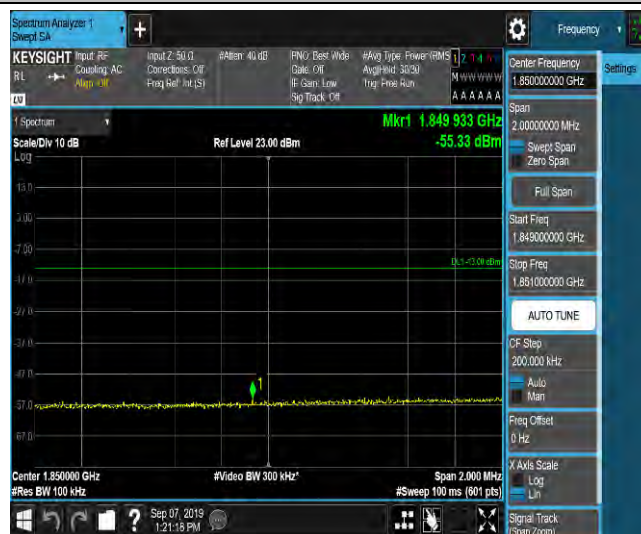
LTE Band 2_10MHz_QPSK_18650_1RB#0_-36.61_PASS



LTE Band 2_10MHz_16QAM_18650_1RB#0_-34.00_PASS



LTE Band 2_10MHz_QPSK_18650_1RB#24_-55.33_PASS





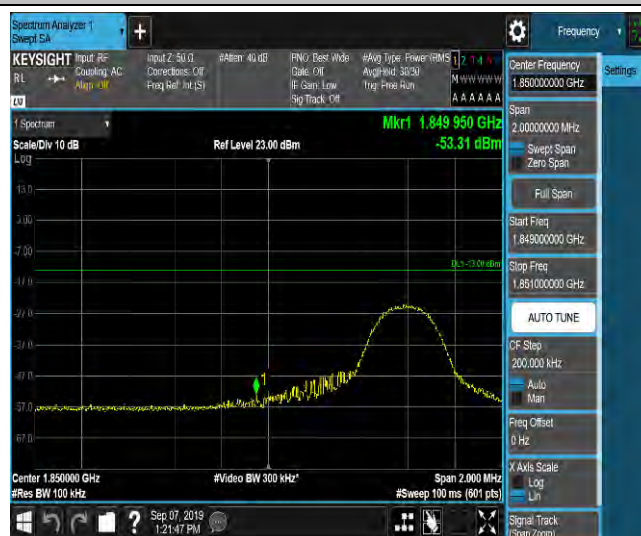
LTE Band 2_10MHz_16QAM_18650_1RB#24_-55.90_PASS



LTE Band 2_10MHz_QPSK_18650_1RB#49_-54.52_PASS



LTE Band 2_10MHz_16QAM_18650_1RB#49_-53.31_PASS



LTE Band 2_10MHz_QPSK_18650_25RB#0_-35.98_PASS



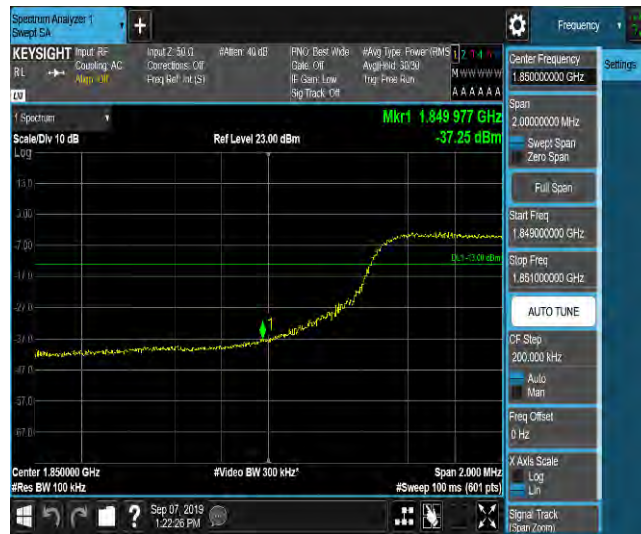
LTE Band 2_10MHz_16QAM_18650_25RB#0_-36.43_PASS



LTE Band 2_10MHz_QPSK_18650_25RB#12_-35.95_PASS



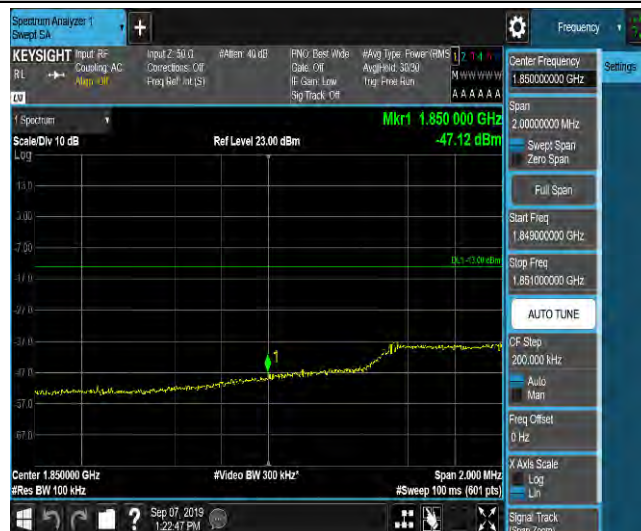
LTE Band 2_10MHz_16QAM_18650_25RB#12_-37.25_PASS



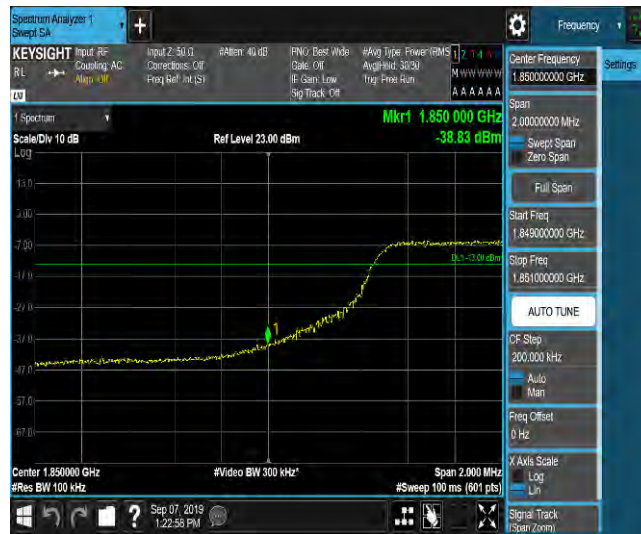
LTE Band 2_10MHz_QPSK_18650_25RB#25_-45.22_PASS



LTE Band 2_10MHz_16QAM_18650_25RB#25_-47.12_PASS



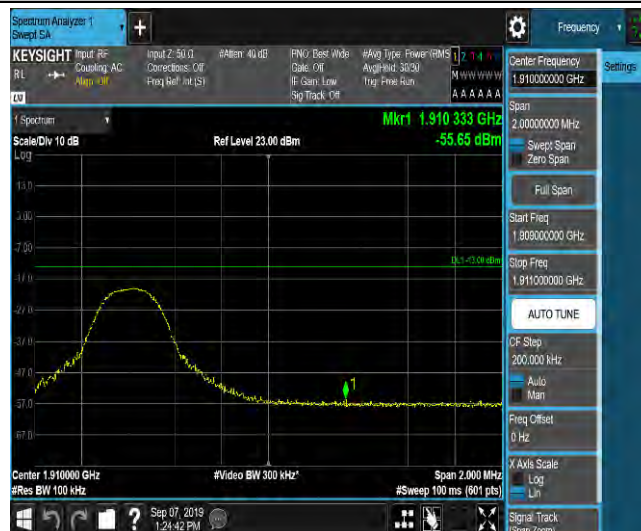
LTE Band 2_10MHz_QPSK_18650_50RB#0_-38.83_PASS



LTE Band 2_10MHz_16QAM_18650_50RB#0_-38.02_PASS



LTE Band 2_10MHz_QPSK_19150_1RB#0_-55.65_PASS



LTE Band 2_10MHz_16QAM_19150_1RB#0_-55.40_PASS



LTE Band 2_10MHz_QPSK_19150_1RB#24_-55.32_PASS



LTE Band 2_10MHz_16QAM_19150_1RB#24_-55.75_PASS



LTE Band 2_10MHz_QPSK_19150_1RB#49_-38.72_PASS



LTE Band 2_10MHz_16QAM_19150_1RB#49_-38.56_PASS



LTE Band 2_10MHz_QPSK_19150_25RB#0_-45.95_PASS



LTE Band 2_10MHz_16QAM_19150_25RB#0_-47.50_PASS



LTE Band 2_10MHz_QPSK_19150_25RB#12_-46.08_PASS



LTE Band 2_10MHz_16QAM_19150_25RB#12_-47.47_PASS



The screenshot displays the Keysight Spectrum Analyzer software interface. The main window shows a frequency spectrum plot with a yellow trace. The plot has a logarithmic scale (Log) on the y-axis and a linear scale on the x-axis. The center frequency is 1.910000 GHz, and the span is 2.000 MHz. A peak is labeled 'Mkr1 1.910 000 GHz -36.56 dBm'. The plot also shows a reference level of 23.00 dBm. The interface includes various control panels on the right for settings like Span, Start Freq, Stop Freq, and Auto Tune. The bottom status bar shows the date and time as Sep 07, 2019, 1:27:37 PM.

The screenshot displays the Keysight Spectrum Analyzer software interface. At the top, the title bar reads "Spectrum Analyzer 1" and "Sweep SA". Below this, the "KEYSIGHT" logo is visible, followed by input settings: "Input RF", "Coupling AC", and "Align 1dB". The main display area shows a spectrum plot with a yellow trace. The plot has a logarithmic scale (Log) and a reference level of 23.00 dBm. A peak is labeled "Mkr1 1.910 003 GHz" with a value of "-36.86 dBm". The plot also shows "Ref Level 23.00 dBm" and "BW 300 kHz". The bottom status bar indicates "Center 1.910000 GHz", "Res BW 100 kHz", "Span 2.000 MHz", and "#Sweep 100 ms (601 pts)". On the right side, there are several control panels. The "Frequency" panel shows "Center Frequency 1.910000000 GHz" and "Span 2.00000000 MHz". The "Sweep" panel shows "Sweep Span Zero Span" and "Full Span". The "Start Freq" panel shows "Start Freq 1.809000000 GHz" and "Stop Freq 1.911000000 GHz". The "AUTO TUNE" button is highlighted. The "CF Step" panel shows "CF Step 200.000 kHz" and "Auto Man". The "Freq Offset" panel shows "Freq Offset 0 Hz". The "X Axis Scale" panel shows "X Axis Scale Log Lin". The "Signal Track" panel shows "Signal Track".

Spectrum Analyzer 1
Sweep SA

Input RF
Coupling AC
Algo 1dB

Input 2: 50.0
Corrections: Off
Frey Ref: Int (S)

Attenu: 40 dB

FNO: Best Wide
Gate: Off
IF Gain: Low
Sig Track: Off

Avg Type: Power (dBMS)
Ave: Hold 30.0
Trig: Free Run

Mixer: 1.910033 GHz
A A A A A A A A

Center Frequency
1.910000000 GHz

Span
2.000000000 MHz

Sweep Span
Zero Span

Full Span

Start Freq
1.898000000 GHz

Stop Freq
1.912000000 GHz

AUTO TUNE

CF Step
200.000000 kHz

Preq Offset
0 Hz

X Axis Scale
Log

Signal Track

Spectrum

Ref Level 23.00 dBm

Mkr1 1.910 033 GHz
-39.01 dBm

Scale/Div 10 dB

Log

Center 1.9100000 GHz
Res BW 100 kHz

#Video BW 300 kHz

Span 2.000 MHz
#Sweep 100 ms (601 pts)

LTE Band 2_10MHz_16QAM_19150_50RB#0_-39.16_PASS



LTE Band 2_15MHz_QPSK_18675_1RB#0_-42.33_PASS



LTE Band 2_15MHz_16QAM_18675_1RB#0_-38.28_PASS



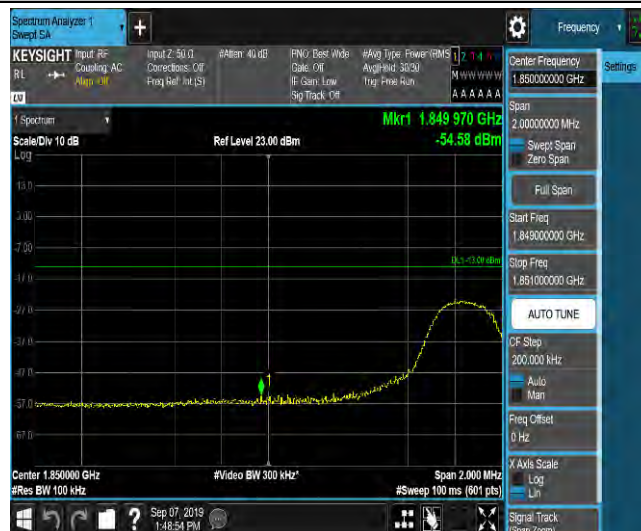
LTE Band 2_15MHz_QPSK_18675_1RB#38_-56.24_PASS



LTE Band 2_15MHz_16QAM_18675_1RB#38_-56.42_PASS



LTE Band 2_15MHz_QPSK_18675_1RB#74_-54.58_PASS



The screenshot displays the Keysight Spectrum Analyzer software interface. The main display area shows a spectrum plot with a logarithmic scale (Log). The plot has a center frequency of 1.850000 GHz and a span of 2.000 MHz. The resolution bandwidth (RBW) is 300 kHz, and the video bandwidth (VBW) is 100 kHz. The sweep time is 100 ms. The signal track is visible at the bottom.

Key parameters and settings visible on the right side of the interface include:

- Center Frequency:** 1.850000000 GHz
- Span:** 2.000000000 MHz
- Sweep Span:** Swept Span, Zero Span
- Start Freq:** 1.849000000 GHz
- Stop Freq:** 1.851000000 GHz
- AUTO TUNE:** Button
- CF Step:** 200.000 kHz
- Freq Offset:** 0 Hz
- X Axis Scale:** Log, Lin
- Signal Track:** Visible at the bottom

The main display area shows a spectrum plot with a green trace and a yellow trace. The green trace is labeled "Mkr1 1.849 903 GHz" and "-54.59 dBm". The yellow trace is labeled "Mkr2 2.000 000 GHz" and "-40.00 dBm". The plot has a logarithmic scale (Log) and a resolution bandwidth of 300 kHz. The center frequency is 1.850000 GHz. The span is 2.000 MHz. The resolution bandwidth is 300 kHz. The video bandwidth is 100 kHz. The sweep time is 100 ms. The signal track is visible at the bottom.

[illegible]

The image shows the Keysight Spectrum Analyzer software interface. The main display is a frequency spectrum plot with a signal peak at 1.849993 GHz, labeled 'Mkr1 1.849 993 GHz' and '-38.30 dBm'. The plot is set to a scale of 10 dB and a span of 2.000 MHz. The center frequency is 1.850000 GHz. The interface includes various control panels on the right for settings like Span, Start/Stop Freq, and Auto Tune. The bottom status bar shows the date and time as Sep 07, 2019, 1:49:24 PM.

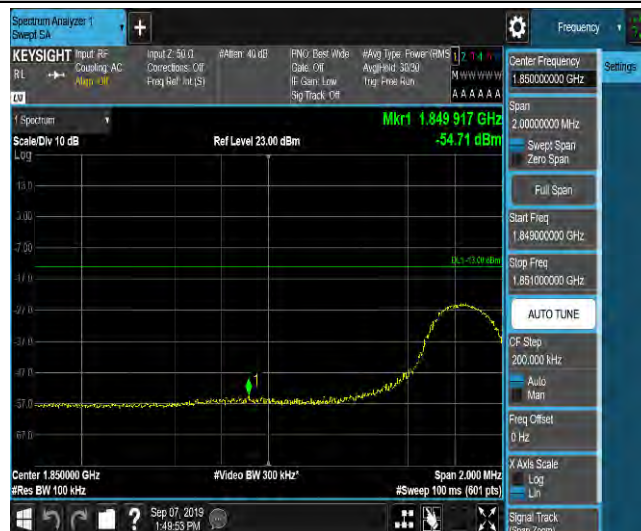
LTE Band 2_15MHz_QPSK_18675_38RB#18_-56.29_PASS



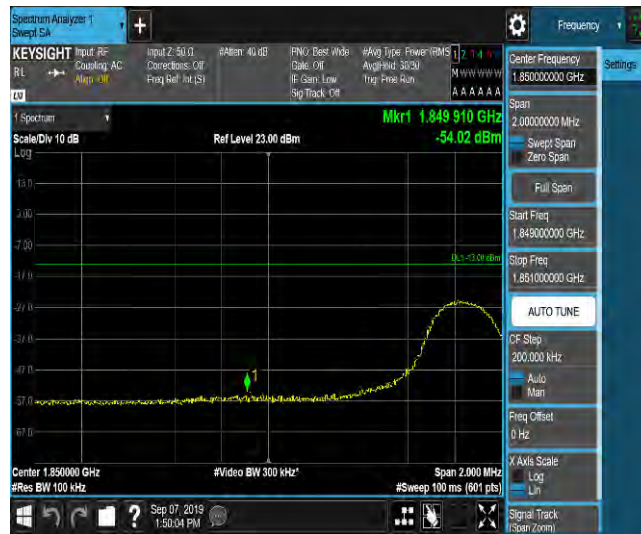
LTE Band 2_15MHz_16QAM_18675_38RB#18_-56.39_PASS



LTE Band 2_15MHz_QPSK_18675_38RB#37_-54.71_PASS



LTE Band 2_15MHz_16QAM_18675_38RB#37_-54.02_PASS



LTE Band 2_15MHz_QPSK_18675_75RB#0_-42.65_PASS



LTE Band 2_15MHz_16QAM_18675_75RB#0_-42.83_PASS



LTE Band 2_15MHz_QPSK_19125_1RB#0_-53.61_PASS



LTE Band 2_15MHz_16QAM_19125_1RB#0_-54.12_PASS



LTE Band 2_15MHz_QPSK_19125_1RB#38_-56.13_PASS



LTE Band 2_15MHz_16QAM_19125_1RB#38_-55.91_PASS



LTE Band 2_15MHz_QPSK_19125_1RB#74_-38.15_PASS



LTE Band 2_15MHz_16QAM_19125_1RB#74_-38.46_PASS



LTE Band 2_15MHz_QPSK_19125_38RB#0_-38.71_PASS



LTE Band 2_15MHz_16QAM_19125_38RB#0_-38.42_PASS



LTE Band 2_15MHz_QPSK_19125_38RB#18_-38.56_PASS



LTE Band 2_15MHz_16QAM_19125_38RB#18_-39.22_PASS



LTE Band 2_15MHz_QPSK_19125_38RB#37_-39.45_PASS



LTE Band 2_15MHz_16QAM_19125_38RB#37_-39.34_PASS





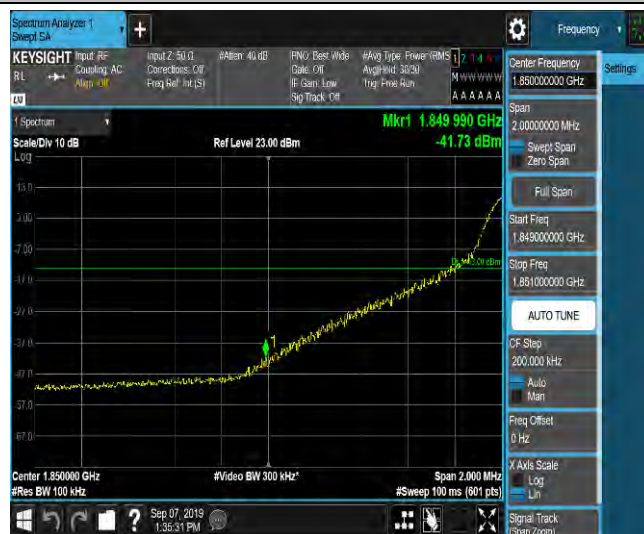
LTE Band 2_15MHz_QPSK_19125_75RB#0_-39.31_PASS



LTE Band 2_15MHz_16QAM_19125_75RB#0_-38.96_PASS



LTE Band 2_20MHz_QPSK_18700_1RB#0_-41.73_PASS



LTE Band 2_20MHz_16QAM_18700_1RB#0_-42.57_PASS



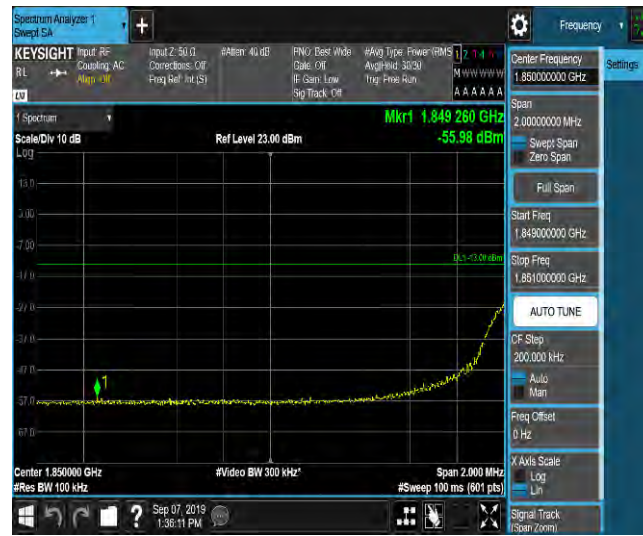
LTE Band 2_20MHz_QPSK_18700_1RB#49_-56.25_PASS



LTE Band 2_20MHz_16QAM_18700_1RB#49_-56.05_PASS



LTE Band 2_20MHz_QPSK_18700_1RB#99_-55.98_PASS



LTE Band 2_20MHz_16QAM_18700_1RB#99_-56.25_PASS



LTE Band 2_20MHz_QPSK_18700_50RB#0_-43.46_PASS



LTE Band 2_20MHz_16QAM_18700_50RB#0_-43.52_PASS



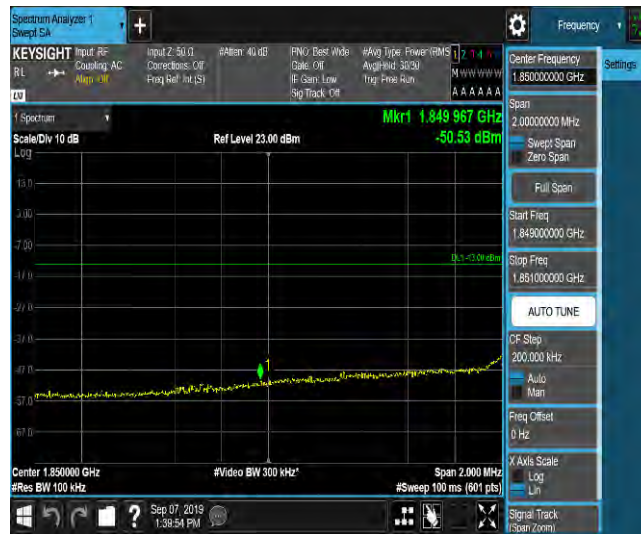
LTE Band 2_20MHz_QPSK_18700_50RB#25_-43.06_PASS



LTE Band 2_20MHz_16QAM_18700_50RB#25_-43.67_PASS



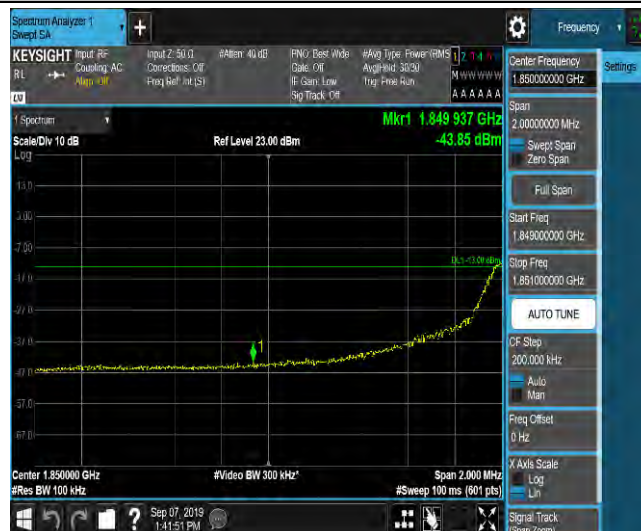
LTE Band 2_20MHz_QPSK_18700_50RB#50_-50.53_PASS



LTE Band 2_20MHz_16QAM_18700_50RB#50_-50.42_PASS



LTE Band 2_20MHz_QPSK_18700_100RB#0_-43.85_PASS



LTE Band 2_20MHz_16QAM_18700_100RB#0_-44.23_PASS



LTE Band 2_20MHz_QPSK_19100_1RB#0_-55.99_PASS



LTE Band 2_20MHz_16QAM_19100_1RB#0_-55.88_PASS



LTE Band 2_20MHz_QPSK_19100_1RB#49_-56.18_PASS



LTE Band 2_20MHz_16QAM_19100_1RB#49_-56.06_PASS



LTE Band 2_20MHz_QPSK_19100_1RB#99_-42.62_PASS



LTE Band 2_20MHz_16QAM_19100_1RB#99_-43.29_PASS



LTE Band 2_20MHz_QPSK_19100_50RB#0_-49.15_PASS



LTE Band 2_20MHz_16QAM_19100_50RB#0_-49.42_PASS



LTE Band 2_20MHz_QPSK_19100_50RB#25_-49.06_PASS



LTE Band 2_20MHz_16QAM_19100_50RB#25_-49.62_PASS



LTE Band 2_20MHz_QPSK_19100_50RB#50_-42.25_PASS



LTE Band 2_20MHz_16QAM_19100_50RB#50_-42.27_PASS



LTE Band 2_20MHz_QPSK_19100_100RB#0_-45.20_PASS



LTE Band 2_20MHz_16QAM_19100_100RB#0_-44.83_PASS



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

Ambient condition

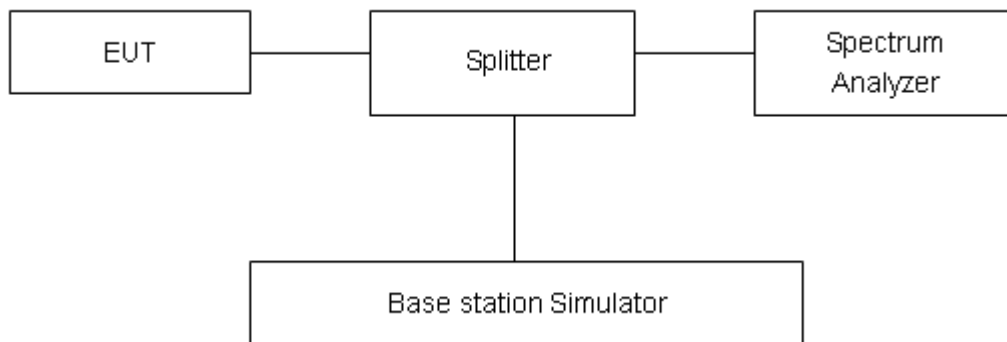
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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**

Band	Channel	Peak-to-Average Ratio(dB)	Limit(dBm)	Verdict
GPRS1900	512	2.70	13	PASS
GPRS1900	661	2.63	13	PASS
GPRS1900	810	2.63	13	PASS
EGPRS1900	512	5.88	13	PASS
EGPRS1900	661	5.76	13	PASS
EGPRS1900	810	5.68	13	PASS
Band	Channel	Peak-to-Average Ratio(dB)	Limit(dBm)	Verdict
WCDMA Band II	9262	3.20	13	PASS
WCDMA Band II	9400	3.17	13	PASS
WCDMA Band II	9538	3.11	13	PASS

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
LTE Band 2	1.4MHz	QPSK	18607	6RB#0	5.36	13	PASS
LTE Band 2	1.4MHz	16QAM	18607	6RB#0	5.37	13	PASS
LTE Band 2	1.4MHz	QPSK	18900	6RB#0	5.29	13	PASS
LTE Band 2	1.4MHz	16QAM	18900	6RB#0	5.32	13	PASS
LTE Band 2	1.4MHz	QPSK	19193	6RB#0	5.12	13	PASS
LTE Band 2	1.4MHz	16QAM	19193	6RB#0	5.13	13	PASS
LTE Band 2	3MHz	QPSK	18615	15RB#0	5.41	13	PASS
LTE Band 2	3MHz	16QAM	18615	15RB#0	5.43	13	PASS
LTE Band 2	3MHz	QPSK	18900	15RB#0	5.39	13	PASS
LTE Band 2	3MHz	16QAM	18900	15RB#0	5.39	13	PASS
LTE Band 2	3MHz	QPSK	19185	15RB#0	5.15	13	PASS
LTE Band 2	3MHz	16QAM	19185	15RB#0	5.13	13	PASS
LTE Band 2	5MHz	QPSK	18625	25RB#0	5.41	13	PASS
LTE Band 2	5MHz	16QAM	18625	25RB#0	5.40	13	PASS
LTE Band 2	5MHz	QPSK	18900	25RB#0	5.38	13	PASS
LTE Band 2	5MHz	16QAM	18900	25RB#0	5.40	13	PASS
LTE Band 2	5MHz	QPSK	19175	25RB#0	5.16	13	PASS
LTE Band 2	5MHz	16QAM	19175	25RB#0	5.17	13	PASS
LTE Band 2	10MHz	QPSK	18650	50RB#0	5.27	13	PASS
LTE Band 2	10MHz	16QAM	18650	50RB#0	5.26	13	PASS
LTE Band 2	10MHz	QPSK	18900	50RB#0	5.20	13	PASS
LTE Band 2	10MHz	16QAM	18900	50RB#0	5.20	13	PASS
LTE Band 2	10MHz	QPSK	19150	50RB#0	5.08	13	PASS
LTE Band 2	10MHz	16QAM	19150	50RB#0	5.10	13	PASS
LTE Band 2	15MHz	QPSK	18675	75RB#0	5.03	13	PASS
LTE Band 2	15MHz	16QAM	18675	75RB#0	5.02	13	PASS
LTE Band 2	15MHz	QPSK	18900	75RB#0	4.98	13	PASS



LTE Band 2	15MHz	16QAM	18900	75RB#0	4.98	13	PASS
LTE Band 2	15MHz	QPSK	19125	75RB#0	4.89	13	PASS
LTE Band 2	15MHz	16QAM	19125	75RB#0	4.90	13	PASS
LTE Band 2	20MHz	QPSK	18700	100RB#0	5.25	13	PASS
LTE Band 2	20MHz	16QAM	18700	100RB#0	5.25	13	PASS
LTE Band 2	20MHz	QPSK	18900	100RB#0	5.27	13	PASS
LTE Band 2	20MHz	16QAM	18900	100RB#0	5.28	13	PASS
LTE Band 2	20MHz	QPSK	19100	100RB#0	5.31	13	PASS
LTE Band 2	20MHz	16QAM	19100	100RB#0	5.27	13	PASS