

RF TEST REPORT

Applicant	Quectel Wireless Solutions Company Limited
FCC ID	XMR2020AG525RGL
Product	LTE Module
Brand	Quectel
Model	AG525R-GL
Report No.	R2410A1542-R1
Issue Date	December 6, 2024

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2023)/ FCC CFR 47 Part 22H (2023)**. 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. Test facility	4
1.3. Testing Location	4
2. General Description of Equipment under Test	5
2.3. Applicant and Manufacturer Information	5
2.4. General Information	5
3. Applied Standards	7
4. Test Configuration	8
5. Test Case Results	10
5.1. RF Power Output and Effective Radiated Power	10
5.2. Occupied Bandwidth	19
5.3. Band Edge Compliance	32
5.4. Peak-to-Average Power Ratio (PAPR)	46
5.5. Frequency Stability	49
5.6. Spurious Emissions at Antenna Terminals	55
5.7. Radiates Spurious Emission	62
6. Main Test Instruments	68
ANNEX A: The EUT Appearance	69
ANNEX B: Test Setup Photos	70
ANNEX C: Product Change Description	71

Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Radiated Power	2.1046 22.913(a)(5)	PASS
2	Occupied Bandwidth	2.1049	PASS
3	Band Edge Compliance	2.1051 / 22.917(a)	PASS
4	Peak-to-Average Power Ratio	22.913(d) KDB 971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 22.355	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 22.917(a)	PASS
7	Radiates Spurious Emission	2.1053 / 22.917 (a)	PASS
Date of Testing: (Original) August 24, 2020 ~ October 21, 2020 and November 10, 2020 ~ November 11, 2020			
Date of Sample Received: (Original) August 24, 2020			
Note: All indications of Pass/Fail in this report are opinions expressed by Eurofins TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

AG525R-GL (Report No.: R2410A1542-R1) is a variant model of AG525R-GL (Report No.: R2008A0573-R1V2).

The customer declares that AG525R-GL's new version shares the same software and hardware design with original version. They support the same bands. The new version just changed some RF alternative materials.

Considering to the difference, after technical assessment, this product only tested Radiates Spurious Emission based on the worst case of one of the bands in the original report, and the data did not worsen, so they were not recorded in the report.

This report also verifies Transmitter Output Power, powers of new variant are varied due to measurement uncertainty, and sample tolerance of the acceptance range, so they were not recorded in the report.

Other test data please refer to the original report.

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 **Eurofins 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. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA (Certificate Number: 3857.01)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3. Testing Location

Company: Eurofins TA Technology (Shanghai) Co., Ltd.
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2. General Description of Equipment under Test

2.3. Applicant and Manufacturer Information

Applicant	Quectel Wireless Solutions Company Limited
Applicant address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Manufacturer	Quectel Wireless Solutions Company Limited
Manufacturer address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

2.4. General Information

EUT Description		
Model	AG525R-GL	
IMEI	(Original) 864228040006472	
Hardware Version	R1.1	
Software Version	AG525RGLAAR01A16M4G_OCPU	
Power Supply	External Power Supply	
Antenna Type	External Antenna	
Antenna Gain	Frequency (MHz)	Gain (dBi)
	830	2.71
	840	2.72
	850	3.10
Test Mode(s)	WCDMA Band V; LTE Band 5; CA_5B;	
Test Modulation	(WCDMA) BPSK, QPSK, 16QAM; (LTE) QPSK 16QAM 64QAM;	
HSDPA UE Category	24	
HSUPA UE Category	6	
DC-HSDPA UE Category	24	
HSPA+ UE Category	6	
LTE Category	12	
Maximum E.R.P.	WCDMA Band V:	24.19dBm
	LTE Band 5:	24.13dBm
	CA_5B:	24.78dBm
Rated Power Supply Voltage	3.8V	
Extreme Voltage	Minimum: 3.3V Maximum: 4.3V	

Extreme Temperature	Lowest: -30°C Highest: +50°C		
Operating Voltage	Minimum: 3.3V Maximum: 4.3V		
Operating Temperature	Lowest: -40°C Highest: +85°C		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	WCDMA Band V	824 ~ 849	869 ~ 894
	LTE Band 5	824 ~ 849	869 ~ 894
Note: 1. The EUT is sent from the applicant to Eurofins TA and the information of the EUT is declared by the applicant.			

DL 2CA		
CA		note
DLCA comb	ULCA comb	TX
CA_5B	CA_5B	5B
		5A

3. Applied Standards

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

Test standards:

FCC CFR 47 Part 22H (2023)

FCC CFR47 Part 2 (2023)

Reference standard:

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 (Z axis, vertical polarization) and the worst case was recorded.

All mode and data rates and positions were investigated. Subsequently, only the worst case emissions are reported.

The following testing in 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
	WCDMA Band V
RF Power Output and Effective Radiated power	RMC HSDPA/HSUPA DC-HSDPA/HSPA+
Occupied Bandwidth	RMC
Band Edge Compliance	RMC
Peak-to-Average Power Ratio	RMC
Frequency Stability	RMC
Spurious Emissions at Antenna Terminals	RMC
Radiates Spurious Emission	RMC

Test modes are chosen as the worst case configuration below for LTE Band 5.

Test items	Bandwidth (MHz)				Modulation		RB			Test Channel		
	1.4	3	5	10	QPSK	16QAM	1	50%	100%	L	M	H
RF power output and Effective Radiated power	O	O	O	O	O	O	O	O	O	O	O	O
Occupied Bandwidth	O	O	O	O	O	O	-	-	O	-	O	-
Band Edge Compliance	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
Frequency Stability	O	O	O	O	O	O	O	O	O	O	O	O
Spurious Emissions at	O	O	O	O	O	-	O	-	-	O	O	O

Antenna Terminals												
Radiates Spurious Emission	O	-	O	O	O	-	O	-	-	-	O	-
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.											

5. Test Case Results

5.1. RF Power Output and Effective Radiated Power

Ambient condition

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

Methods of Measurement

During the process of the testing, The EUT was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

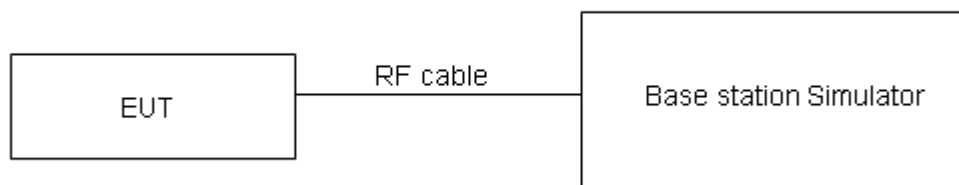
ERP can then be calculated as follows:

$\text{EIRP (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$

where: dBd refers to gain relative to an ideal dipole.

$\text{EIRP (dBm)} = \text{ERP (dBm)} + 2.15 \text{ (dB)}$.

Test Setup



Limits

No specific RF power output requirements in part 2.1046.

Rule Part 22.913(a)(5) specifies that "Mobile/portable stations are limited to 7 watts ERP".

Limit	$\leq 7 \text{ W}$ (38.45 dBm)
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Measurement Uncertainty

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

Test Results

WCDMA Band V		Maximum Output Power (dBm)			ERP (dBm)		
		Channel 4132	Channel 4183	Channel 4233	Channel 4132	Channel 4183	Channel 4233
		826.4 (MHz)	836.6 (MHz)	846.6 (MHz)	826.4 (MHz)	836.6 (MHz)	846.6 (MHz)
RMC		23.11	23.20	23.24	23.67	23.77	24.19
HSDPA	Sub - Test 1	22.57	22.62	22.68	23.13	23.19	23.63
	Sub - Test 2	22.56	22.64	22.65	23.12	23.21	23.60
	Sub - Test 3	22.03	22.14	22.17	22.59	22.71	23.12
	Sub - Test 4	22.04	22.15	22.15	22.60	22.72	23.10
HSUPA	Sub - Test 1	22.53	22.61	22.63	23.09	23.18	23.58
	Sub - Test 2	21.52	21.59	21.62	22.08	22.16	22.57
	Sub - Test 3	21.99	22.07	22.11	22.55	22.64	23.06
	Sub - Test 4	21.45	21.56	21.59	22.01	22.13	22.54
	Sub - Test 5	22.46	22.54	22.57	23.02	23.11	23.52
DC-HSDPA	Sub - Test 1	22.45	22.56	22.58	23.01	23.13	23.53
	Sub - Test 2	22.44	22.55	22.57	23.00	23.12	23.52
	Sub - Test 3	22.02	22.04	22.08	22.58	22.61	23.03
	Sub - Test 4	22.01	22.03	22.07	22.57	22.60	23.02
HSPA+	16QAM	22.00	22.11	22.14	22.56	22.68	23.09

Band	Bandwidth (MHz)	UL Channel	RB Size	RB Position	Modulation	Power (dBm)	ERP (dBm)	Verdict
LTE Band5	1.4	20407	1	#0	QPSK	23.06	23.62	PASS
LTE Band5	1.4	20407	1	#Mid	QPSK	23.20	23.76	PASS
LTE Band5	1.4	20407	1	#Max	QPSK	23.11	23.67	PASS
LTE Band5	1.4	20407	3	#0	QPSK	23.02	23.58	PASS
LTE Band5	1.4	20407	3	#Mid	QPSK	23.03	23.59	PASS
LTE Band5	1.4	20407	3	#Max	QPSK	23.10	23.66	PASS
LTE Band5	1.4	20407	6	#0	QPSK	22.13	22.69	PASS
LTE Band5	1.4	20407	1	#0	QAM16	21.98	22.54	PASS
LTE Band5	1.4	20407	1	#Mid	QAM16	22.12	22.68	PASS
LTE Band5	1.4	20407	1	#Max	QAM16	22.08	22.64	PASS
LTE Band5	1.4	20407	3	#0	QAM16	22.12	22.68	PASS
LTE Band5	1.4	20407	3	#Mid	QAM16	22.11	22.67	PASS
LTE Band5	1.4	20407	3	#Max	QAM16	22.21	22.77	PASS
LTE Band5	1.4	20407	6	#0	QAM16	21.18	21.74	PASS
LTE Band5	1.4	20407	1	#0	QAM64	21.13	21.69	PASS
LTE Band5	1.4	20407	1	#Mid	QAM64	21.00	21.56	PASS
LTE Band5	1.4	20407	1	#Max	QAM64	21.19	21.75	PASS
LTE Band5	1.4	20407	3	#0	QAM64	19.84	20.40	PASS
LTE Band5	1.4	20407	3	#Mid	QAM64	19.74	20.30	PASS
LTE Band5	1.4	20407	3	#Max	QAM64	19.75	20.31	PASS
LTE Band5	1.4	20407	6	#0	QAM64	19.84	20.40	PASS
LTE Band5	1.4	20525	1	#0	QPSK	22.98	23.55	PASS
LTE Band5	1.4	20525	1	#Mid	QPSK	23.19	23.76	PASS
LTE Band5	1.4	20525	1	#Max	QPSK	23.10	23.67	PASS
LTE Band5	1.4	20525	3	#0	QPSK	22.99	23.56	PASS
LTE Band5	1.4	20525	3	#Mid	QPSK	23.00	23.57	PASS
LTE Band5	1.4	20525	3	#Max	QPSK	23.06	23.63	PASS
LTE Band5	1.4	20525	6	#0	QPSK	22.10	22.67	PASS
LTE Band5	1.4	20525	1	#0	QAM16	22.07	22.64	PASS
LTE Band5	1.4	20525	1	#Mid	QAM16	22.28	22.85	PASS
LTE Band5	1.4	20525	1	#Max	QAM16	22.20	22.77	PASS
LTE Band5	1.4	20525	3	#0	QAM16	22.27	22.84	PASS
LTE Band5	1.4	20525	3	#Mid	QAM16	22.29	22.86	PASS
LTE Band5	1.4	20525	3	#Max	QAM16	22.35	22.92	PASS
LTE Band5	1.4	20525	6	#0	QAM16	21.18	21.75	PASS
LTE Band5	1.4	20525	1	#0	QAM64	21.19	21.76	PASS
LTE Band5	1.4	20525	1	#Mid	QAM64	21.00	21.57	PASS
LTE Band5	1.4	20525	1	#Max	QAM64	21.04	21.61	PASS
LTE Band5	1.4	20525	3	#0	QAM64	19.84	20.41	PASS
LTE Band5	1.4	20525	3	#Mid	QAM64	19.80	20.37	PASS

LTE Band5	1.4	20525	3	#Max	QAM64	19.76	20.33	PASS
LTE Band5	1.4	20525	6	#0	QAM64	19.84	20.41	PASS
LTE Band5	1.4	20643	1	#0	QPSK	22.88	23.83	PASS
LTE Band5	1.4	20643	1	#Mid	QPSK	23.00	23.95	PASS
LTE Band5	1.4	20643	1	#Max	QPSK	22.94	23.89	PASS
LTE Band5	1.4	20643	3	#0	QPSK	22.94	23.89	PASS
LTE Band5	1.4	20643	3	#Mid	QPSK	22.94	23.89	PASS
LTE Band5	1.4	20643	3	#Max	QPSK	22.95	23.90	PASS
LTE Band5	1.4	20643	6	#0	QPSK	22.07	23.02	PASS
LTE Band5	1.4	20643	1	#0	QAM16	22.20	23.15	PASS
LTE Band5	1.4	20643	1	#Mid	QAM16	22.25	23.20	PASS
LTE Band5	1.4	20643	1	#Max	QAM16	22.24	23.19	PASS
LTE Band5	1.4	20643	3	#0	QAM16	22.07	23.02	PASS
LTE Band5	1.4	20643	3	#Mid	QAM16	22.07	23.02	PASS
LTE Band5	1.4	20643	3	#Max	QAM16	22.12	23.07	PASS
LTE Band5	1.4	20643	6	#0	QAM16	21.04	21.99	PASS
LTE Band5	1.4	20643	1	#0	QAM64	21.12	22.07	PASS
LTE Band5	1.4	20643	1	#Mid	QAM64	20.87	21.82	PASS
LTE Band5	1.4	20643	1	#Max	QAM64	20.84	21.79	PASS
LTE Band5	1.4	20643	3	#0	QAM64	19.82	20.77	PASS
LTE Band5	1.4	20643	3	#Mid	QAM64	19.72	20.67	PASS
LTE Band5	1.4	20643	3	#Max	QAM64	19.65	20.60	PASS
LTE Band5	1.4	20643	6	#0	QAM64	19.79	20.74	PASS
LTE Band5	3	20415	1	#0	QPSK	22.96	23.52	PASS
LTE Band5	3	20415	1	#Mid	QPSK	23.14	23.70	PASS
LTE Band5	3	20415	1	#Max	QPSK	23.08	23.64	PASS
LTE Band5	3	20415	8	#0	QPSK	22.16	22.72	PASS
LTE Band5	3	20415	8	#Mid	QPSK	22.16	22.72	PASS
LTE Band5	3	20415	8	#Max	QPSK	22.28	22.84	PASS
LTE Band5	3	20415	15	#0	QPSK	22.22	22.78	PASS
LTE Band5	3	20415	1	#0	QAM16	22.38	22.94	PASS
LTE Band5	3	20415	1	#Mid	QAM16	22.59	23.15	PASS
LTE Band5	3	20415	1	#Max	QAM16	22.50	23.06	PASS
LTE Band5	3	20415	8	#0	QAM16	21.20	21.76	PASS
LTE Band5	3	20415	8	#Mid	QAM16	21.20	21.76	PASS
LTE Band5	3	20415	8	#Max	QAM16	21.31	21.87	PASS
LTE Band5	3	20415	15	#0	QAM16	21.22	21.78	PASS
LTE Band5	3	20415	1	#0	QAM64	21.15	21.71	PASS
LTE Band5	3	20415	1	#Mid	QAM64	21.03	21.59	PASS
LTE Band5	3	20415	1	#Max	QAM64	21.22	21.78	PASS
LTE Band5	3	20415	8	#0	QAM64	19.92	20.48	PASS
LTE Band5	3	20415	8	#Mid	QAM64	19.84	20.40	PASS
LTE Band5	3	20415	8	#Max	QAM64	19.83	20.39	PASS

LTE Band5	3	20415	15	#0	QAM64	19.87	20.43	PASS
LTE Band5	3	20525	1	#0	QPSK	22.96	23.53	PASS
LTE Band5	3	20525	1	#Mid	QPSK	23.17	23.74	PASS
LTE Band5	3	20525	1	#Max	QPSK	23.06	23.63	PASS
LTE Band5	3	20525	8	#0	QPSK	22.14	22.71	PASS
LTE Band5	3	20525	8	#Mid	QPSK	22.11	22.68	PASS
LTE Band5	3	20525	8	#Max	QPSK	22.25	22.82	PASS
LTE Band5	3	20525	15	#0	QPSK	22.21	22.78	PASS
LTE Band5	3	20525	1	#0	QAM16	22.25	22.82	PASS
LTE Band5	3	20525	1	#Mid	QAM16	22.45	23.02	PASS
LTE Band5	3	20525	1	#Max	QAM16	22.34	22.91	PASS
LTE Band5	3	20525	8	#0	QAM16	21.13	21.70	PASS
LTE Band5	3	20525	8	#Mid	QAM16	21.13	21.70	PASS
LTE Band5	3	20525	8	#Max	QAM16	21.30	21.87	PASS
LTE Band5	3	20525	15	#0	QAM16	21.14	21.71	PASS
LTE Band5	3	20525	1	#0	QAM64	21.23	21.80	PASS
LTE Band5	3	20525	1	#Mid	QAM64	21.05	21.62	PASS
LTE Band5	3	20525	1	#Max	QAM64	21.09	21.66	PASS
LTE Band5	3	20525	8	#0	QAM64	19.94	20.51	PASS
LTE Band5	3	20525	8	#Mid	QAM64	19.88	20.45	PASS
LTE Band5	3	20525	8	#Max	QAM64	19.85	20.42	PASS
LTE Band5	3	20525	15	#0	QAM64	19.88	20.45	PASS
LTE Band5	3	20635	1	#0	QPSK	22.98	23.93	PASS
LTE Band5	3	20635	1	#Mid	QPSK	23.18	24.13	PASS
LTE Band5	3	20635	1	#Max	QPSK	23.13	24.08	PASS
LTE Band5	3	20635	8	#0	QPSK	22.09	23.04	PASS
LTE Band5	3	20635	8	#Mid	QPSK	22.09	23.04	PASS
LTE Band5	3	20635	8	#Max	QPSK	22.17	23.12	PASS
LTE Band5	3	20635	15	#0	QPSK	22.12	23.07	PASS
LTE Band5	3	20635	1	#0	QAM16	21.96	22.91	PASS
LTE Band5	3	20635	1	#Mid	QAM16	22.09	23.04	PASS
LTE Band5	3	20635	1	#Max	QAM16	22.08	23.03	PASS
LTE Band5	3	20635	8	#0	QAM16	21.12	22.07	PASS
LTE Band5	3	20635	8	#Mid	QAM16	21.12	22.07	PASS
LTE Band5	3	20635	8	#Max	QAM16	21.22	22.17	PASS
LTE Band5	3	20635	15	#0	QAM16	21.13	22.08	PASS
LTE Band5	3	20635	1	#0	QAM64	21.15	22.10	PASS
LTE Band5	3	20635	1	#Mid	QAM64	20.91	21.86	PASS
LTE Band5	3	20635	1	#Max	QAM64	20.88	21.83	PASS
LTE Band5	3	20635	8	#0	QAM64	19.93	20.88	PASS
LTE Band5	3	20635	8	#Mid	QAM64	19.82	20.77	PASS
LTE Band5	3	20635	8	#Max	QAM64	19.73	20.68	PASS
LTE Band5	3	20635	15	#0	QAM64	19.82	20.77	PASS

LTE Band5	5	20425	1	#0	QPSK	23.06	23.62	PASS
LTE Band5	5	20425	1	#Mid	QPSK	23.19	23.75	PASS
LTE Band5	5	20425	1	#Max	QPSK	23.09	23.65	PASS
LTE Band5	5	20425	12	#0	QPSK	22.17	22.73	PASS
LTE Band5	5	20425	12	#Mid	QPSK	22.17	22.73	PASS
LTE Band5	5	20425	12	#Max	QPSK	22.26	22.82	PASS
LTE Band5	5	20425	25	#0	QPSK	22.23	22.79	PASS
LTE Band5	5	20425	1	#0	QAM16	22.46	23.02	PASS
LTE Band5	5	20425	1	#Mid	QAM16	22.60	23.16	PASS
LTE Band5	5	20425	1	#Max	QAM16	22.51	23.07	PASS
LTE Band5	5	20425	12	#0	QAM16	21.18	21.74	PASS
LTE Band5	5	20425	12	#Mid	QAM16	21.16	21.72	PASS
LTE Band5	5	20425	12	#Max	QAM16	21.28	21.84	PASS
LTE Band5	5	20425	25	#0	QAM16	21.29	21.85	PASS
LTE Band5	5	20425	1	#0	QAM64	21.19	21.75	PASS
LTE Band5	5	20425	1	#Mid	QAM64	21.10	21.66	PASS
LTE Band5	5	20425	1	#Max	QAM64	21.28	21.84	PASS
LTE Band5	5	20425	12	#0	QAM64	19.99	20.55	PASS
LTE Band5	5	20425	12	#Mid	QAM64	19.89	20.45	PASS
LTE Band5	5	20425	12	#Max	QAM64	19.90	20.46	PASS
LTE Band5	5	20425	25	#0	QAM64	19.95	20.51	PASS
LTE Band5	5	20525	1	#0	QPSK	23.07	23.64	PASS
LTE Band5	5	20525	1	#Mid	QPSK	23.18	23.75	PASS
LTE Band5	5	20525	1	#Max	QPSK	23.12	23.69	PASS
LTE Band5	5	20525	12	#0	QPSK	22.19	22.76	PASS
LTE Band5	5	20525	12	#Mid	QPSK	22.18	22.75	PASS
LTE Band5	5	20525	12	#Max	QPSK	22.25	22.82	PASS
LTE Band5	5	20525	25	#0	QPSK	22.24	22.81	PASS
LTE Band5	5	20525	1	#0	QAM16	22.36	22.93	PASS
LTE Band5	5	20525	1	#Mid	QAM16	22.47	23.04	PASS
LTE Band5	5	20525	1	#Max	QAM16	22.38	22.95	PASS
LTE Band5	5	20525	12	#0	QAM16	21.15	21.72	PASS
LTE Band5	5	20525	12	#Mid	QAM16	21.18	21.75	PASS
LTE Band5	5	20525	12	#Max	QAM16	21.25	21.82	PASS
LTE Band5	5	20525	25	#0	QAM16	21.22	21.79	PASS
LTE Band5	5	20525	1	#0	QAM64	21.35	21.92	PASS
LTE Band5	5	20525	1	#Mid	QAM64	21.10	21.67	PASS
LTE Band5	5	20525	1	#Max	QAM64	21.16	21.73	PASS
LTE Band5	5	20525	12	#0	QAM64	19.98	20.55	PASS
LTE Band5	5	20525	12	#Mid	QAM64	19.93	20.50	PASS
LTE Band5	5	20525	12	#Max	QAM64	19.95	20.52	PASS
LTE Band5	5	20525	25	#0	QAM64	19.97	20.54	PASS
LTE Band5	5	20625	1	#0	QPSK	22.95	23.90	PASS

LTE Band5	5	20625	1	#Mid	QPSK	23.10	24.05	PASS
LTE Band5	5	20625	1	#Max	QPSK	22.98	23.93	PASS
LTE Band5	5	20625	12	#0	QPSK	22.07	23.02	PASS
LTE Band5	5	20625	12	#Mid	QPSK	22.09	23.04	PASS
LTE Band5	5	20625	12	#Max	QPSK	22.20	23.15	PASS
LTE Band5	5	20625	25	#0	QPSK	22.11	23.06	PASS
LTE Band5	5	20625	1	#0	QAM16	22.36	23.31	PASS
LTE Band5	5	20625	1	#Mid	QAM16	22.48	23.43	PASS
LTE Band5	5	20625	1	#Max	QAM16	22.39	23.34	PASS
LTE Band5	5	20625	12	#0	QAM16	21.17	22.12	PASS
LTE Band5	5	20625	12	#Mid	QAM16	21.17	22.12	PASS
LTE Band5	5	20625	12	#Max	QAM16	21.23	22.18	PASS
LTE Band5	5	20625	25	#0	QAM16	21.16	22.11	PASS
LTE Band5	5	20625	1	#0	QAM64	21.20	22.15	PASS
LTE Band5	5	20625	1	#Mid	QAM64	20.98	21.93	PASS
LTE Band5	5	20625	1	#Max	QAM64	20.97	21.92	PASS
LTE Band5	5	20625	12	#0	QAM64	19.99	20.94	PASS
LTE Band5	5	20625	12	#Mid	QAM64	19.86	20.81	PASS
LTE Band5	5	20625	12	#Max	QAM64	19.73	20.68	PASS
LTE Band5	5	20625	25	#0	QAM64	19.83	20.78	PASS
LTE Band5	10	20450	1	#0	QPSK	23.06	23.62	PASS
LTE Band5	10	20450	1	#Mid	QPSK	22.87	23.43	PASS
LTE Band5	10	20450	1	#Max	QPSK	22.97	23.53	PASS
LTE Band5	10	20450	25	#0	QPSK	22.27	22.83	PASS
LTE Band5	10	20450	25	#Mid	QPSK	22.28	22.84	PASS
LTE Band5	10	20450	25	#Max	QPSK	22.18	22.74	PASS
LTE Band5	10	20450	50	#0	QPSK	22.23	22.79	PASS
LTE Band5	10	20450	1	#0	QAM16	22.41	22.97	PASS
LTE Band5	10	20450	1	#Mid	QAM16	22.30	22.86	PASS
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LTE Band5	10	20450	25	#0	QAM16	21.37	21.93	PASS
LTE Band5	10	20450	25	#Mid	QAM16	21.36	21.92	PASS
LTE Band5	10	20450	25	#Max	QAM16	21.28	21.84	PASS
LTE Band5	10	20450	50	#0	QAM16	21.25	21.81	PASS
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LTE Band5	10	20525	1	#Mid	QPSK	22.91	23.48	PASS

LTE Band5	10	20525	1	#Max	QPSK	22.96	23.53	PASS
LTE Band5	10	20525	25	#0	QPSK	22.26	22.83	PASS
LTE Band5	10	20525	25	#Mid	QPSK	22.29	22.86	PASS
LTE Band5	10	20525	25	#Max	QPSK	22.16	22.73	PASS
LTE Band5	10	20525	50	#0	QPSK	22.20	22.77	PASS
LTE Band5	10	20525	1	#0	QAM16	22.43	23.00	PASS
LTE Band5	10	20525	1	#Mid	QAM16	22.20	22.77	PASS
LTE Band5	10	20525	1	#Max	QAM16	22.19	22.76	PASS
LTE Band5	10	20525	25	#0	QAM16	21.29	21.86	PASS
LTE Band5	10	20525	25	#Mid	QAM16	21.27	21.84	PASS
LTE Band5	10	20525	25	#Max	QAM16	21.16	21.73	PASS
LTE Band5	10	20525	50	#0	QAM16	21.18	21.75	PASS
LTE Band5	10	20525	1	#0	QAM64	21.14	21.71	PASS
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LTE Band5	10	20525	1	#Max	QAM64	21.02	21.59	PASS
LTE Band5	10	20525	25	#0	QAM64	19.85	20.42	PASS
LTE Band5	10	20525	25	#Mid	QAM64	19.80	20.37	PASS
LTE Band5	10	20525	25	#Max	QAM64	19.79	20.36	PASS
LTE Band5	10	20525	50	#0	QAM64	19.80	20.37	PASS
LTE Band5	10	20600	1	#0	QPSK	23.18	23.75	PASS
LTE Band5	10	20600	1	#Mid	QPSK	22.98	23.55	PASS
LTE Band5	10	20600	1	#Max	QPSK	22.99	23.56	PASS
LTE Band5	10	20600	25	#0	QPSK	22.18	22.75	PASS
LTE Band5	10	20600	25	#Mid	QPSK	22.21	22.78	PASS
LTE Band5	10	20600	25	#Max	QPSK	22.09	22.66	PASS
LTE Band5	10	20600	50	#0	QPSK	22.16	22.73	PASS
LTE Band5	10	20600	1	#0	QAM16	22.07	22.64	PASS
LTE Band5	10	20600	1	#Mid	QAM16	21.91	22.48	PASS
LTE Band5	10	20600	1	#Max	QAM16	21.84	22.41	PASS
LTE Band5	10	20600	25	#0	QAM16	21.24	21.81	PASS
LTE Band5	10	20600	25	#Mid	QAM16	21.25	21.82	PASS
LTE Band5	10	20600	25	#Max	QAM16	21.12	21.69	PASS
LTE Band5	10	20600	50	#0	QAM16	21.18	21.75	PASS
LTE Band5	10	20600	1	#0	QAM64	21.09	21.66	PASS
LTE Band5	10	20600	1	#Mid	QAM64	20.87	21.44	PASS
LTE Band5	10	20600	1	#Max	QAM64	20.80	21.37	PASS
LTE Band5	10	20600	25	#0	QAM64	19.86	20.43	PASS
LTE Band5	10	20600	25	#Mid	QAM64	19.74	20.31	PASS
LTE Band5	10	20600	25	#Max	QAM64	19.66	20.23	PASS
LTE Band5	10	20600	50	#0	QAM64	19.75	20.32	PASS

CA_5B	PCC	SCC	PCC RB		SCC1 RB		Maximum Output Power (dBm)			ERP (dBm)		
	Frequency (MHz)	Frequency (MHz)	Size	Offset	Size	Offset	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
3MHz+5MHz	825.6	829.5	1	14	1	0	20.89	20.27	19.21	21.45	20.83	19.77
			15	0	25	0	20.97	20.02	20.12	21.53	20.58	20.68
	834.1	838	1	14	1	0	20.83	19.81	18.84	21.40	20.38	19.41
			15	0	25	0	21.02	20.04	19.93	21.59	20.61	20.50
	842.6	846.5	1	14	1	0	20.79	20.19	19.36	21.74	21.14	20.31
			15	0	25	0	20.91	20.03	19.93	21.86	20.98	20.88
5MHz+3MHz	835	838.9	1	24	1	0	21.54	21.09	20.01	22.10	21.65	20.57
			25	0	15	0	21.09	20.14	20.12	21.65	20.70	20.68
	843.5	847.4	1	24	1	0	21.55	20.89	19.76	22.50	21.84	20.71
			25	0	15	0	21.02	20.08	19.98	21.97	21.03	20.93
5MHz+10MHz	826.8	834	1	24	1	0	23.62	22.73	21.59	24.18	23.29	22.15
			25	0	50	0	20.94	20.23	19.92	21.50	20.79	20.48
	831.8	839	1	24	1	0	23.67	22.81	21.79	24.24	23.38	22.36
			25	0	50	0	20.95	20.03	19.94	21.52	20.60	20.51
	836.8	844	1	24	1	0	23.62	22.82	21.85	24.57	23.77	22.80
			25	0	50	0	20.89	19.98	19.91	21.84	20.93	20.86
10MHz+5MHz	829	836.2	1	49	1	0	23.84	23.16	21.91	24.40	23.72	22.47
			50	0	25	0	21.21	20.26	20.19	21.77	20.82	20.75
	834	841.2	1	49	1	0	23.87	23.13	22.32	24.44	23.70	22.89
			50	0	25	0	21.28	20.33	20.27	21.85	20.90	20.84
	839	846.2	1	49	1	0	23.83	23.08	22.01	24.78	24.03	22.96
			50	0	25	0	21.23	20.25	20.24	22.18	21.20	21.19
10MHz+10MHz	829	838.9	1	49	1	0	23.84	23.15	22.19	24.40	23.71	22.75
			50	0	50	0	20.92	19.96	19.89	21.48	20.52	20.45
	831.6	841.5	1	49	1	0	23.85	23.12	22.21	24.42	23.69	22.78
			50	0	50	0	20.93	19.97	19.91	21.50	20.54	20.48
	834.1	844	1	49	1	0	23.79	23.08	22.15	24.74	24.03	23.10
			50	0	50	0	20.97	19.96	19.87	21.92	20.91	20.82

5.2. Occupied Bandwidth

Ambient condition

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

Method of Measurement

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

RBW is set to 51kHz, VBW is set to 160kHz for WCDMA Band V,

RBW is set to 30 kHz, VBW is set to 91kHz for LTE Band 5 (1.4MHz),

RBW is set to 62 kHz, VBW is set to 180kHz for LTE Band 5 (3MHz),

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

RBW is set to 200 kHz, VBW is set to 620kHz for LTE Band 5 (10MHz),

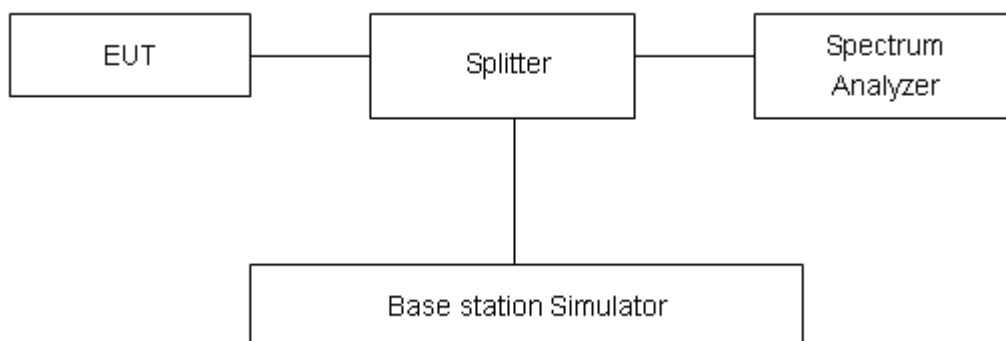
RBW is set to 150kHz, VBW is set to 470kHz for CA_5B (3MHz+5MHz, 5MHz+3MHz),

RBW is set to 300kHz, VBW is set to 910kHz for CA_5B (5MHz+10MHz, 10MHz+5MHz),

RBW is set to 390kHz, VBW is set to 1.2MHz for CA_5B (10MHz+10MHz)

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

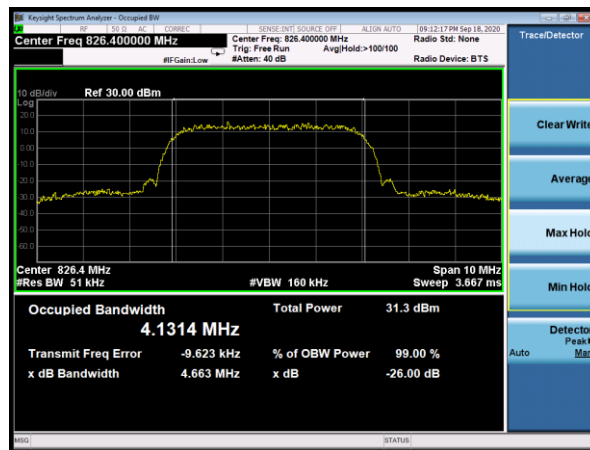
Mode	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
WCDMA Band V (RMC)	4132	826.4	4.1314	4.663
	4183	836.6	4.1401	4.665
	4233	846.6	4.1385	4.690

LTE Band 5						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	20407	824.7	1.0968	1.235
			20525	836.5	1.0946	1.236
			20643	848.3	1.0944	1.248
		3	20415	825.5	2.7023	2.997
			20525	836.5	2.7022	2.998
			20635	847.5	2.7103	2.958
		5	20425	826.5	4.5158	5.007
			20525	836.5	4.5160	4.929
			20625	846.5	4.5019	4.928
		10	20450	829	8.9932	9.801
			20525	836.5	8.9823	9.715
			20600	844	8.9720	9.779
	16QAM	1.4	20407	824.7	1.0953	1.242
			20525	836.5	1.0960	1.236
			20643	848.3	1.0884	1.216
		3	20415	825.5	2.7042	2.993
			20525	836.5	2.6971	2.988
			20635	847.5	2.6997	3.026
		5	20425	826.5	4.4968	4.922
			20525	836.5	4.5357	4.993
			20625	846.5	4.5105	4.925
		10	20450	829	9.0027	9.776
			20525	836.5	8.9902	9.600

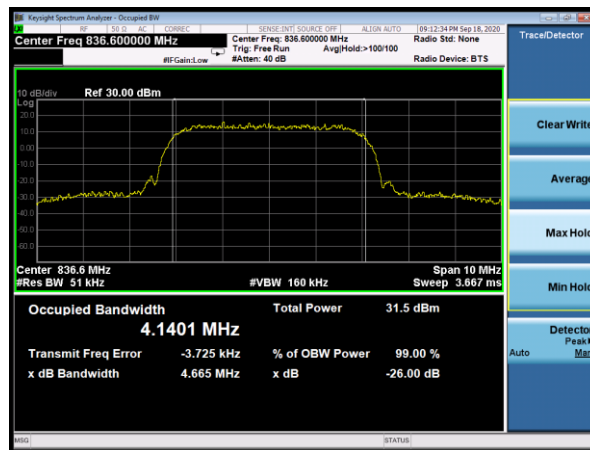
			20600	844	8.9695	9.717
	64QAM	1.4	20407	824.7	1.0937	1.245
			20525	836.5	1.0940	1.238
			20643	848.3	1.0937	1.215
		3	20415	825.5	2.7010	2.989
			20525	836.5	2.6996	3.016
			20635	847.5	2.7014	3.005
		5	20425	826.5	4.5044	4.906
			20525	836.5	4.5267	4.983
			20625	846.5	4.5092	4.931
		10	20450	829	8.9827	9.793
			20525	836.5	8.9761	9.761
			20600	844	8.9628	9.746

CA_5B	PCC		SCC1		PCC RB	SCC1 RB	Bandwidth(MHz)	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)			99% Power	-26dBc
CA_5B_3MHz+5MHz_QPSK	20501	834.1	20540	838	15#0	25#0	7.4902	7.996
CA_5B_3MHz+5MHz_16QAM	20501	834.1	20540	838	15#0	25#0	7.4724	8.579
CA_5B_3MHz+5MHz_64QAM	20501	834.1	20540	838	15#0	25#0	7.4772	7.955
CA_5B_5MHz+3MHz_QPSK	20510	835	20549	838.9	25#0	15#0	7.4681	7.954
CA_5B_5MHz+3MHz_16QAM	20510	835	20549	838.9	25#0	15#0	7.4878	7.993
CA_5B_5MHz+3MHz_64QAM	20510	835	20549	838.9	25#0	15#0	7.4901	7.979
CA_5B_5MHz+10MHz_QPSK	20478	831.8	20550	839	25#0	50#0	13.875	14.71
CA_5B_5MHz+10MHz_16QAM	20478	831.8	20550	839	25#0	50#0	13.855	14.72
CA_5B_5MHz+10MHz_64QAM	20478	831.8	20550	839	25#0	50#0	13.880	14.74
CA_5B_10MHz+5MHz_QPSK	20500	834	20572	841.2	50#0	25#0	13.941	14.72
CA_5B_10MHz+5MHz_16QAM	20500	834	20572	841.2	50#0	25#0	13.894	14.67
CA_5B_10MHz+5MHz_64QAM	20500	834	20572	841.2	50#0	25#0	13.871	14.70
CA_5B_10MHz+10MHz_QPSK	20476	831.6	20575	841.5	50#0	50#0	18.840	19.94
CA_5B_10MHz+10MHz_16QAM	20476	831.6	20575	841.5	50#0	50#0	18.804	20.00
CA_5B_10MHz+10MHz_64QAM	20476	831.6	20575	841.5	50#0	50#0	18.820	20.00

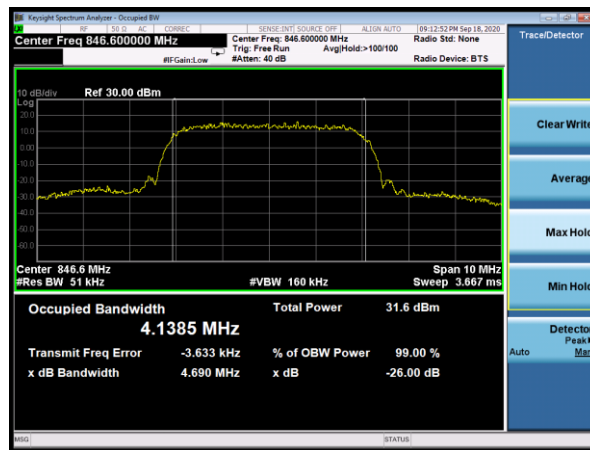
WCDMA Band V CH-Low



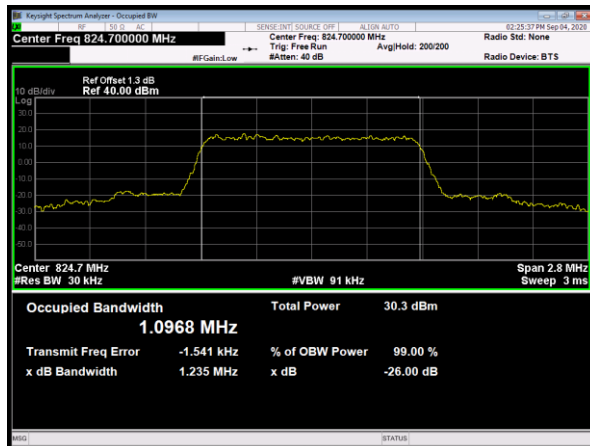
WCDMA Band V CH-Middle



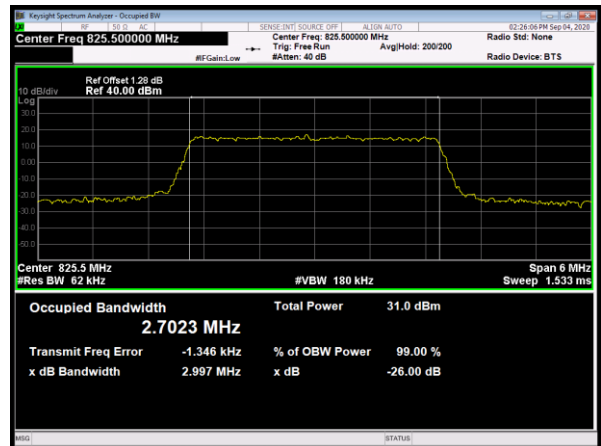
WCDMA Band V CH-High



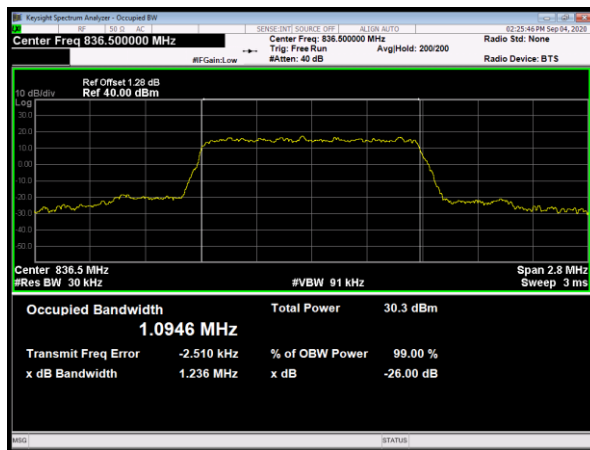
LTE Band 5 QPSK 1.4MHz CH-Low



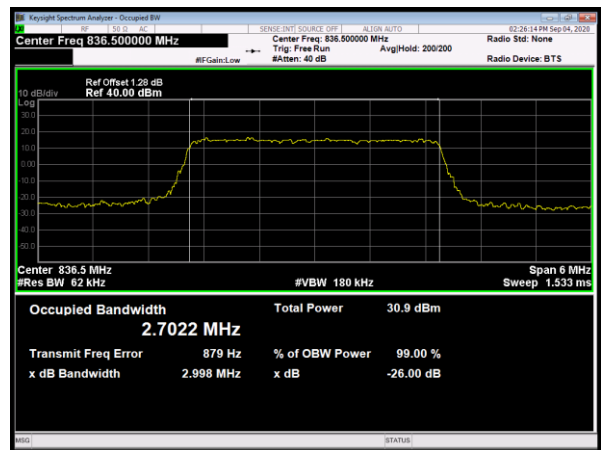
LTE Band 5 QPSK 3MHz CH-Low



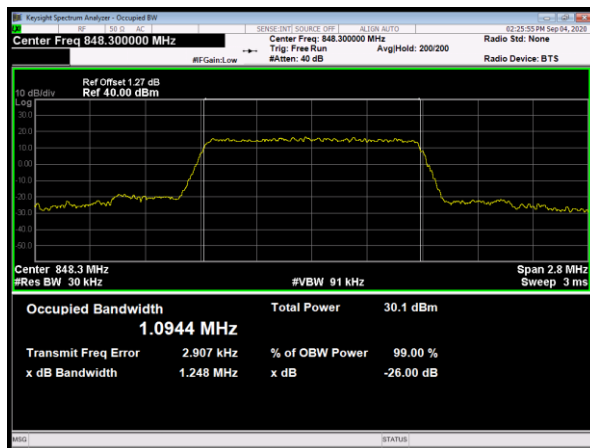
LTE Band 5 QPSK 1.4MHz CH-Middle



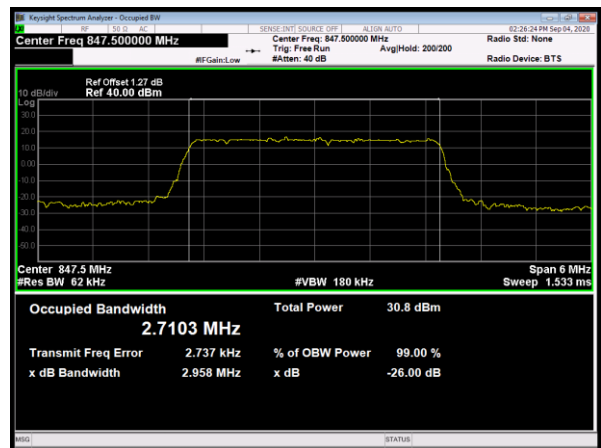
LTE Band 5 QPSK 3MHz CH-Middle



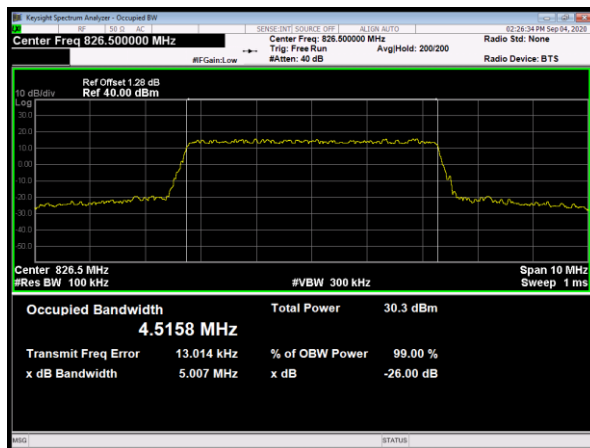
LTE Band 5 QPSK 1.4MHz CH-High



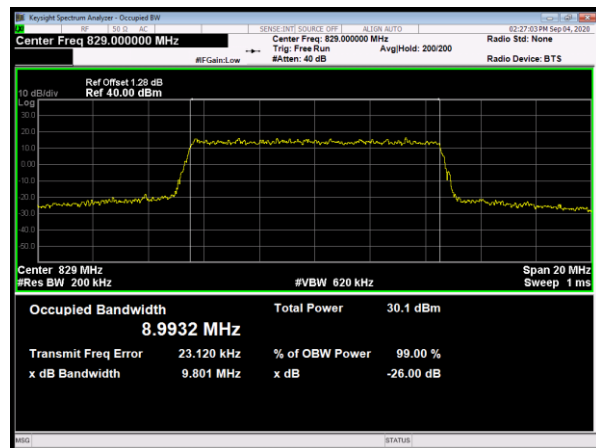
LTE Band 5 QPSK 3MHz CH-High



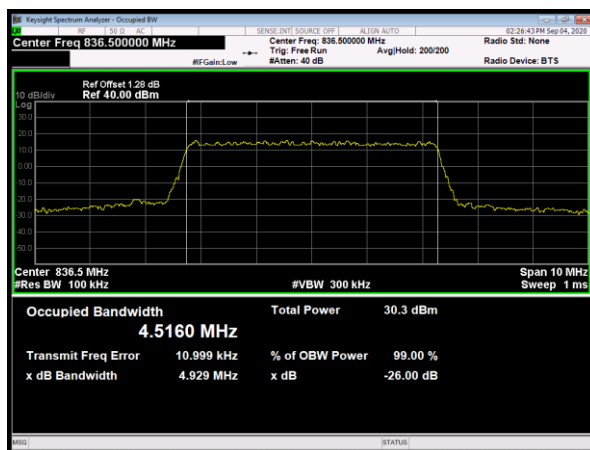
LTE Band 5 QPSK 5MHz CH-Low



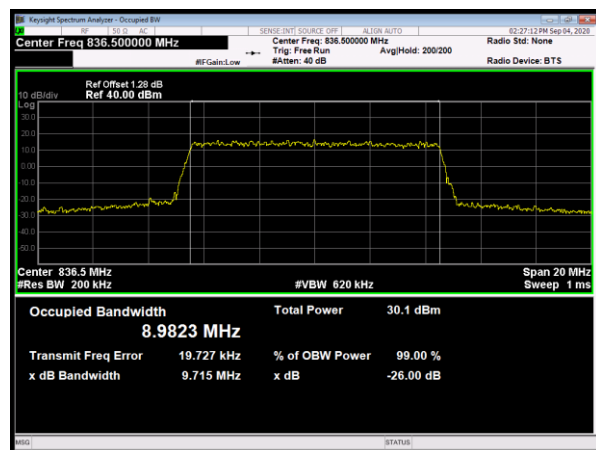
LTE Band 5 QPSK 10MHz CH-Low



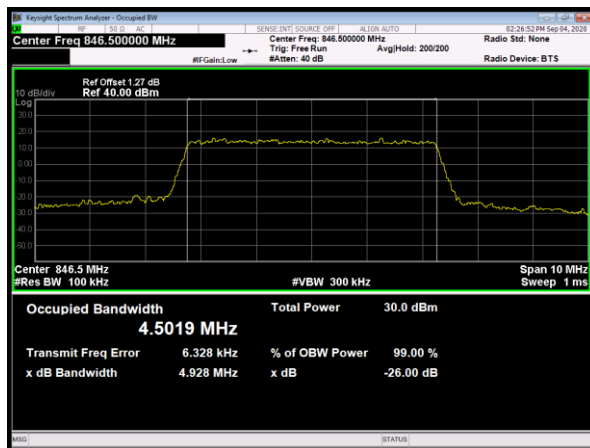
LTE Band 5 QPSK 5MHz CH-Middle



LTE Band 5 QPSK 10MHz CH-Middle



LTE Band 5 QPSK 5MHz CH-High



LTE Band 5 QPSK 10MHz CH-High

