



RF TEST REPORT

Applicant	Smawave Technology Co., Ltd
FCC ID	2AU8HSRM310
Product	Outdoor CPE
Brand	Smawave
Model	SRM310, SRT011
Report No.	R2109A0783-R2
Issue Date	October 26, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2020)/ FCC CFR47 Part 27C (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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Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Isotropic Radiated Power	2.1046 /27.50(d)(4)	PASS
2	Occupied Bandwidth	2.1049	PASS
3	Band Edge Compliance	27.53(h)	PASS
4	Peak-to-Average Power Ratio	27.50(d)/KDB971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 27.54	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 /27.53(h)	PASS
7	Radiates Spurious Emission	2.1053 /27.53(h)	PASS
Date of Testing: September 7, 2021 ~ September 29, 2021			
Date of Sample Received: September 2, 2021			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard. All indications of Pass/Fail in this report are opinions expressed by 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.			



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. Test facility

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

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

A2LA (Certificate Number: 3857.01)

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

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
Post code: 201201
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Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Applicant and Manufacturer Information

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

2.2 General information

EUT Description			
Model	SRM310, SRT011		
SN	R2109A0783/S01		
Hardware Version	V1.0		
Software Version	MG56_BYPASS		
Power Supply	External power supply		
Antenna Type	Dipole Antenna		
Antenna Gain	8.0dBi		
Test Mode(s)	LTE Band 4		
Test Modulation	(LTE)QPSK,16QAM, 64QAM		
LTE Category	6		
Maximum E.I.R.P.	LTE Band 4:	29.72dBm	
Rated Power Supply Voltage	24V		
Operating Voltage	Minimum: 19V Maximum: 30V		
Operating Temperature	Lowest: -30°C Highest: +70°C		
Extreme Temperature	Lowest: -30°C Highest: +70°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.			



3 Applied Standards

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

Test standards:

FCC CFR47 Part 27C (2020)

ANSI C63.26 (2015)

Reference standard:

FCC CFR47 Part 2 (2020)

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, horizontal polarization) and the worst case was recorded.

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

Subsequently, only the worst case emissions are reported.

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

The following testing in different Bandwidth is set to detail in the following table:

Test modes are chosen to be reported as the worst case configuration below for LTE Band 4:

Test items	Mode s	Bandwidth (MHz)						Modulation			RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	50%	100%	L	M	H
RF Power Output and Effective Isotropic Radiated Power	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Occupied Bandwidth	LTE 4	O	O	O	O	O	O	O	O	O	-	-	O	O	O	O
Band Edge Compliance	LTE 4	O	O	O	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	LTE 4	O	O	O	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	LTE 4	O	O	O	O	O	O	O	O	O	O	-	-	-	O	-
Spurious Emissions at Antenna Terminals	LTE 4	O	O	O	O	O	O	O	-	-	O	-	-	O	O	O
Radiates Spurious Emission	LTE 4	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 Isotropic 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.

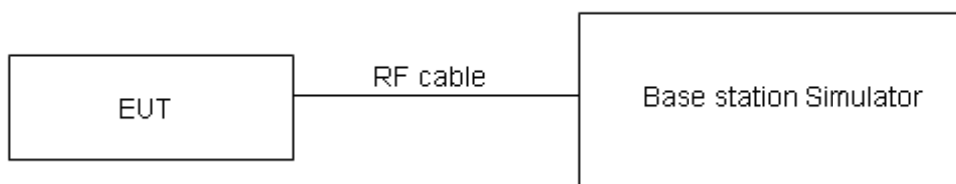
ERP can then be calculated as follows:

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

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

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

Test Setup



Limits

No specific RF power output requirements in part 2.1046.

Rule Part 27.50(d) (4) specifies that “Fixed, mobile and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP”

Part 27.50(d)(4)Limit	$\leq 1 \text{ W}$ (30 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/EIRP.



Test Results

Band	Bandwidth (MHz)	UL Channel	RB Size	RB Position	Modulation	Power (dBm)	EIRP (dBm)
LTE Band 4	1.4	19957	1	#0	QPSK	20.72	28.72
LTE Band 4	1.4	19957	1	#Mid	QPSK	20.63	28.63
LTE Band 4	1.4	19957	1	#Max	QPSK	20.67	28.67
LTE Band 4	1.4	19957	3	#0	QPSK	20.68	28.68
LTE Band 4	1.4	19957	3	#Mid	QPSK	20.68	28.68
LTE Band 4	1.4	19957	3	#Max	QPSK	20.54	28.54
LTE Band 4	1.4	19957	6	#0	QPSK	20.64	28.64
LTE Band 4	1.4	19957	1	#0	QAM16	20.74	28.74
LTE Band 4	1.4	19957	1	#Mid	QAM16	20.69	28.69
LTE Band 4	1.4	19957	1	#Max	QAM16	20.72	28.72
LTE Band 4	1.4	19957	3	#0	QAM16	20.81	28.81
LTE Band 4	1.4	19957	3	#Mid	QAM16	20.81	28.81
LTE Band 4	1.4	19957	3	#Max	QAM16	20.81	28.81
LTE Band 4	1.4	19957	6	#0	QAM16	20.64	28.64
LTE Band 4	1.4	20175	1	#0	QPSK	19.42	27.42
LTE Band 4	1.4	20175	1	#Mid	QPSK	19.54	27.54
LTE Band 4	1.4	20175	1	#Max	QPSK	19.57	27.57
LTE Band 4	1.4	20175	3	#0	QPSK	19.54	27.54
LTE Band 4	1.4	20175	3	#Mid	QPSK	19.54	27.54
LTE Band 4	1.4	20175	3	#Max	QPSK	19.48	27.48
LTE Band 4	1.4	20175	6	#0	QPSK	19.55	27.55
LTE Band 4	1.4	20175	1	#0	QAM16	19.61	27.61
LTE Band 4	1.4	20175	1	#Mid	QAM16	19.65	27.65
LTE Band 4	1.4	20175	1	#Max	QAM16	19.68	27.68
LTE Band 4	1.4	20175	3	#0	QAM16	19.52	27.52
LTE Band 4	1.4	20175	3	#Mid	QAM16	19.52	27.52
LTE Band 4	1.4	20175	3	#Max	QAM16	19.48	27.48
LTE Band 4	1.4	20175	6	#0	QAM16	19.42	27.42
LTE Band 4	1.4	20393	1	#0	QPSK	20.82	28.82
LTE Band 4	1.4	20393	1	#Mid	QPSK	20.61	28.61
LTE Band 4	1.4	20393	1	#Max	QPSK	20.55	28.55
LTE Band 4	1.4	20393	3	#0	QPSK	20.71	28.71
LTE Band 4	1.4	20393	3	#Mid	QPSK	20.72	28.72
LTE Band 4	1.4	20393	3	#Max	QPSK	20.56	28.56
LTE Band 4	1.4	20393	6	#0	QPSK	20.66	28.66
LTE Band 4	1.4	20393	1	#0	QAM16	20.69	28.69
LTE Band 4	1.4	20393	1	#Mid	QAM16	20.46	28.46
LTE Band 4	1.4	20393	1	#Max	QAM16	20.42	28.42
LTE Band 4	1.4	20393	3	#0	QAM16	20.67	28.67



LTE Band 4	1.4	20393	3	#Mid	QAM16	20.68	28.68
LTE Band 4	1.4	20393	3	#Max	QAM16	20.53	28.53
LTE Band 4	1.4	20393	6	#0	QAM16	20.65	28.65
LTE Band 4	3	19965	1	#0	QPSK	20.64	28.64
LTE Band 4	3	19965	1	#Mid	QPSK	20.25	28.25
LTE Band 4	3	19965	1	#Max	QPSK	20.43	28.43
LTE Band 4	3	19965	8	#0	QPSK	21.01	29.01
LTE Band 4	3	19965	8	#Mid	QPSK	21.00	29.00
LTE Band 4	3	19965	8	#Max	QPSK	20.55	28.55
LTE Band 4	3	19965	15	#0	QPSK	20.56	28.56
LTE Band 4	3	19965	1	#0	QAM16	20.86	28.86
LTE Band 4	3	19965	1	#Mid	QAM16	20.61	28.61
LTE Band 4	3	19965	1	#Max	QAM16	20.67	28.67
LTE Band 4	3	19965	8	#0	QAM16	20.99	28.99
LTE Band 4	3	19965	8	#Mid	QAM16	20.99	28.99
LTE Band 4	3	19965	8	#Max	QAM16	20.55	28.55
LTE Band 4	3	19965	15	#0	QAM16	20.51	28.51
LTE Band 4	3	20175	1	#0	QPSK	19.40	27.40
LTE Band 4	3	20175	1	#Mid	QPSK	19.34	27.34
LTE Band 4	3	20175	1	#Max	QPSK	19.78	27.78
LTE Band 4	3	20175	8	#0	QPSK	19.71	27.71
LTE Band 4	3	20175	8	#Mid	QPSK	19.70	27.70
LTE Band 4	3	20175	8	#Max	QPSK	19.61	27.61
LTE Band 4	3	20175	15	#0	QPSK	19.66	27.66
LTE Band 4	3	20175	1	#0	QAM16	19.61	27.61
LTE Band 4	3	20175	1	#Mid	QAM16	19.56	27.56
LTE Band 4	3	20175	1	#Max	QAM16	19.88	27.88
LTE Band 4	3	20175	8	#0	QAM16	19.62	27.62
LTE Band 4	3	20175	8	#Mid	QAM16	19.61	27.61
LTE Band 4	3	20175	8	#Max	QAM16	19.54	27.54
LTE Band 4	3	20175	15	#0	QAM16	19.53	27.53
LTE Band 4	3	20385	1	#0	QPSK	21.07	29.07
LTE Band 4	3	20385	1	#Mid	QPSK	20.48	28.48
LTE Band 4	3	20385	1	#Max	QPSK	20.52	28.52
LTE Band 4	3	20385	8	#0	QPSK	21.17	29.17
LTE Band 4	3	20385	8	#Mid	QPSK	21.17	29.17
LTE Band 4	3	20385	8	#Max	QPSK	20.64	28.64
LTE Band 4	3	20385	15	#0	QPSK	20.64	28.64
LTE Band 4	3	20385	1	#0	QAM16	20.82	28.82
LTE Band 4	3	20385	1	#Mid	QAM16	20.34	28.34
LTE Band 4	3	20385	1	#Max	QAM16	20.39	28.39
LTE Band 4	3	20385	8	#0	QAM16	21.18	29.18
LTE Band 4	3	20385	8	#Mid	QAM16	21.18	29.18



LTE Band 4	3	20385	8	#Max	QAM16	20.65	28.65
LTE Band 4	3	20385	15	#0	QAM16	20.66	28.66
LTE Band 4	5	19975	1	#0	QPSK	20.57	28.57
LTE Band 4	5	19975	1	#Mid	QPSK	20.25	28.25
LTE Band 4	5	19975	1	#Max	QPSK	20.09	28.09
LTE Band 4	5	19975	12	#0	QPSK	20.80	28.80
LTE Band 4	5	19975	12	#Mid	QPSK	20.79	28.79
LTE Band 4	5	19975	12	#Max	QPSK	20.25	28.25
LTE Band 4	5	19975	25	#0	QPSK	20.40	28.40
LTE Band 4	5	19975	1	#0	QAM16	20.82	28.82
LTE Band 4	5	19975	1	#Mid	QAM16	20.54	28.54
LTE Band 4	5	19975	1	#Max	QAM16	20.39	28.39
LTE Band 4	5	19975	12	#0	QAM16	20.76	28.76
LTE Band 4	5	19975	12	#Mid	QAM16	20.76	28.76
LTE Band 4	5	19975	12	#Max	QAM16	20.22	28.22
LTE Band 4	5	19975	25	#0	QAM16	20.40	28.40
LTE Band 4	5	20175	1	#0	QPSK	19.30	27.30
LTE Band 4	5	20175	1	#Mid	QPSK	19.35	27.35
LTE Band 4	5	20175	1	#Max	QPSK	19.69	27.69
LTE Band 4	5	20175	12	#0	QPSK	19.53	27.53
LTE Band 4	5	20175	12	#Mid	QPSK	19.52	27.52
LTE Band 4	5	20175	12	#Max	QPSK	19.52	27.52
LTE Band 4	5	20175	25	#0	QPSK	19.54	27.54
LTE Band 4	5	20175	1	#0	QAM16	19.56	27.56
LTE Band 4	5	20175	1	#Mid	QAM16	19.61	27.61
LTE Band 4	5	20175	1	#Max	QAM16	19.86	27.86
LTE Band 4	5	20175	12	#0	QAM16	19.56	27.56
LTE Band 4	5	20175	12	#Mid	QAM16	19.56	27.56
LTE Band 4	5	20175	12	#Max	QAM16	19.51	27.51
LTE Band 4	5	20175	25	#0	QAM16	19.47	27.47
LTE Band 4	5	20375	1	#0	QPSK	21.05	29.05
LTE Band 4	5	20375	1	#Mid	QPSK	20.62	28.62
LTE Band 4	5	20375	1	#Max	QPSK	20.40	28.40
LTE Band 4	5	20375	12	#0	QPSK	21.17	29.17
LTE Band 4	5	20375	12	#Mid	QPSK	21.17	29.17
LTE Band 4	5	20375	12	#Max	QPSK	20.60	28.60
LTE Band 4	5	20375	25	#0	QPSK	20.83	28.83
LTE Band 4	5	20375	1	#0	QAM16	21.22	29.22
LTE Band 4	5	20375	1	#Mid	QAM16	20.88	28.88
LTE Band 4	5	20375	1	#Max	QAM16	20.70	28.70
LTE Band 4	5	20375	12	#0	QAM16	21.21	29.21
LTE Band 4	5	20375	12	#Mid	QAM16	21.22	29.22
LTE Band 4	5	20375	12	#Max	QAM16	20.65	28.65



LTE Band 4	5	20375	25	#0	QAM16	20.84	28.84
LTE Band 4	10	20000	1	#0	QPSK	20.65	28.65
LTE Band 4	10	20000	1	#Mid	QPSK	20.02	28.02
LTE Band 4	10	20000	1	#Max	QPSK	19.15	27.15
LTE Band 4	10	20000	25	#0	QPSK	20.43	28.43
LTE Band 4	10	20000	25	#Mid	QPSK	20.42	28.42
LTE Band 4	10	20000	25	#Max	QPSK	19.43	27.43
LTE Band 4	10	20000	50	#0	QPSK	19.92	27.92
LTE Band 4	10	20000	1	#0	QAM16	20.87	28.87
LTE Band 4	10	20000	1	#Mid	QAM16	20.27	28.27
LTE Band 4	10	20000	1	#Max	QAM16	19.41	27.41
LTE Band 4	10	20000	25	#0	QAM16	20.47	28.47
LTE Band 4	10	20000	25	#Mid	QAM16	20.47	28.47
LTE Band 4	10	20000	25	#Max	QAM16	19.49	27.49
LTE Band 4	10	20000	50	#0	QAM16	19.91	27.91
LTE Band 4	10	20175	1	#0	QPSK	19.18	27.18
LTE Band 4	10	20175	1	#Mid	QPSK	19.55	27.55
LTE Band 4	10	20175	1	#Max	QPSK	19.98	27.98
LTE Band 4	10	20175	25	#0	QPSK	19.25	27.25
LTE Band 4	10	20175	25	#Mid	QPSK	19.38	27.38
LTE Band 4	10	20175	25	#Max	QPSK	19.77	27.77
LTE Band 4	10	20175	50	#0	QPSK	19.46	27.46
LTE Band 4	10	20175	1	#0	QAM16	19.39	27.39
LTE Band 4	10	20175	1	#Mid	QAM16	19.78	27.78
LTE Band 4	10	20175	1	#Max	QAM16	20.23	28.23
LTE Band 4	10	20175	25	#0	QAM16	19.35	27.35
LTE Band 4	10	20175	25	#Mid	QAM16	19.36	27.36
LTE Band 4	10	20175	25	#Max	QAM16	19.76	27.76
LTE Band 4	10	20175	50	#0	QAM16	19.41	27.41
LTE Band 4	10	20350	1	#0	QPSK	21.53	29.53
LTE Band 4	10	20350	1	#Mid	QPSK	21.18	29.18
LTE Band 4	10	20350	1	#Max	QPSK	20.90	28.90
LTE Band 4	10	20350	25	#0	QPSK	21.32	29.32
LTE Band 4	10	20350	25	#Mid	QPSK	21.33	29.33
LTE Band 4	10	20350	25	#Max	QPSK	20.92	28.92
LTE Band 4	10	20350	50	#0	QPSK	21.19	29.19
LTE Band 4	10	20350	1	#0	QAM16	21.39	29.39
LTE Band 4	10	20350	1	#Mid	QAM16	20.97	28.97
LTE Band 4	10	20350	1	#Max	QAM16	20.66	28.66
LTE Band 4	10	20350	25	#0	QAM16	21.32	29.32
LTE Band 4	10	20350	25	#Mid	QAM16	21.32	29.32
LTE Band 4	10	20350	25	#Max	QAM16	20.90	28.90
LTE Band 4	10	20350	50	#0	QAM16	21.20	29.20



LTE Band 4	15	20025	1	#0	QPSK	20.90	28.90
LTE Band 4	15	20025	1	#Mid	QPSK	19.25	27.25
LTE Band 4	15	20025	1	#Max	QPSK	19.22	27.22
LTE Band 4	15	20025	36	#0	QPSK	20.22	28.22
LTE Band 4	15	20025	36	#Mid	QPSK	20.24	28.24
LTE Band 4	15	20025	36	#Max	QPSK	18.92	26.92
LTE Band 4	15	20025	75	#0	QPSK	19.66	27.66
LTE Band 4	15	20025	1	#0	QAM16	21.10	29.10
LTE Band 4	15	20025	1	#Mid	QAM16	19.66	27.66
LTE Band 4	15	20025	1	#Max	QAM16	19.47	27.47
LTE Band 4	15	20025	36	#0	QAM16	20.22	28.22
LTE Band 4	15	20025	36	#Mid	QAM16	20.24	28.24
LTE Band 4	15	20025	36	#Max	QAM16	18.93	26.93
LTE Band 4	15	20025	75	#0	QAM16	19.67	27.67
LTE Band 4	15	20175	1	#0	QPSK	19.37	27.37
LTE Band 4	15	20175	1	#Mid	QPSK	19.51	27.51
LTE Band 4	15	20175	1	#Max	QPSK	20.82	28.82
LTE Band 4	15	20175	36	#0	QPSK	19.23	27.23
LTE Band 4	15	20175	36	#Mid	QPSK	19.24	27.24
LTE Band 4	15	20175	36	#Max	QPSK	19.99	27.99
LTE Band 4	15	20175	75	#0	QPSK	19.50	27.50
LTE Band 4	15	20175	1	#0	QAM16	19.45	27.45
LTE Band 4	15	20175	1	#Mid	QAM16	19.72	27.72
LTE Band 4	15	20175	1	#Max	QAM16	20.94	28.94
LTE Band 4	15	20175	36	#0	QAM16	19.20	27.20
LTE Band 4	15	20175	36	#Mid	QAM16	19.21	27.21
LTE Band 4	15	20175	36	#Max	QAM16	19.97	27.97
LTE Band 4	15	20175	75	#0	QAM16	19.48	27.48
LTE Band 4	15	20325	1	#0	QPSK	21.09	29.09
LTE Band 4	15	20325	1	#Mid	QPSK	21.53	29.53
LTE Band 4	15	20325	1	#Max	QPSK	21.22	29.22
LTE Band 4	15	20325	36	#0	QPSK	21.09	29.09
LTE Band 4	15	20325	36	#Mid	QPSK	21.20	29.20
LTE Band 4	15	20325	36	#Max	QPSK	21.09	29.09
LTE Band 4	15	20325	75	#0	QPSK	21.20	29.20
LTE Band 4	15	20325	1	#0	QAM16	21.12	29.12
LTE Band 4	15	20325	1	#Mid	QAM16	21.54	29.54
LTE Band 4	15	20325	1	#Max	QAM16	21.23	29.23
LTE Band 4	15	20325	36	#0	QAM16	21.04	29.04
LTE Band 4	15	20325	36	#Mid	QAM16	21.04	29.04
LTE Band 4	15	20325	36	#Max	QAM16	21.08	29.08
LTE Band 4	15	20325	75	#0	QAM16	21.20	29.20
LTE Band 4	20	20050	1	#0	QPSK	21.18	29.18



LTE Band 4	20	20050	1	#Mid	QPSK	19.43	27.43
LTE Band 4	20	20050	1	#Max	QPSK	19.79	27.79
LTE Band 4	20	20050	50	#0	QPSK	20.35	28.35
LTE Band 4	20	20050	50	#Mid	QPSK	20.37	28.37
LTE Band 4	20	20050	50	#Max	QPSK	19.54	27.54
LTE Band 4	20	20050	100	#0	QPSK	19.91	27.91
LTE Band 4	20	20050	1	#0	QAM16	21.48	29.48
LTE Band 4	20	20050	1	#Mid	QAM16	19.62	27.62
LTE Band 4	20	20050	1	#Max	QAM16	20.01	28.01
LTE Band 4	20	20050	50	#0	QAM16	20.34	28.34
LTE Band 4	20	20050	50	#Mid	QAM16	20.37	28.37
LTE Band 4	20	20050	50	#Max	QAM16	19.55	27.55
LTE Band 4	20	20050	100	#0	QAM16	19.89	27.89
LTE Band 4	20	20175	1	#0	QPSK	19.70	27.70
LTE Band 4	20	20175	1	#Mid	QPSK	19.92	27.92
LTE Band 4	20	20175	1	#Max	QPSK	21.72	29.72
LTE Band 4	20	20175	50	#0	QPSK	19.63	27.63
LTE Band 4	20	20175	50	#Mid	QPSK	19.64	27.64
LTE Band 4	20	20175	50	#Max	QPSK	20.60	28.60
LTE Band 4	20	20175	100	#0	QPSK	20.10	28.10
LTE Band 4	20	20175	1	#0	QAM16	19.49	27.49
LTE Band 4	20	20175	1	#Mid	QAM16	19.72	27.72
LTE Band 4	20	20175	1	#Max	QAM16	21.53	29.53
LTE Band 4	20	20175	50	#0	QAM16	19.57	27.57
LTE Band 4	20	20175	50	#Mid	QAM16	19.59	27.59
LTE Band 4	20	20175	50	#Max	QAM16	20.56	28.56
LTE Band 4	20	20175	100	#0	QAM16	20.09	28.09
LTE Band 4	20	20300	1	#0	QPSK	20.62	28.62
LTE Band 4	20	20300	1	#Mid	QPSK	21.65	29.65
LTE Band 4	20	20300	1	#Max	QPSK	21.58	29.58
LTE Band 4	20	20300	50	#0	QPSK	21.10	29.10
LTE Band 4	20	20300	50	#Mid	QPSK	21.07	29.07
LTE Band 4	20	20300	50	#Max	QPSK	21.61	29.61
LTE Band 4	20	20300	100	#0	QPSK	21.51	29.51
LTE Band 4	20	20300	1	#0	QAM16	20.40	28.40
LTE Band 4	20	20300	1	#Mid	QAM16	21.42	29.42
LTE Band 4	20	20300	1	#Max	QAM16	21.34	29.34
LTE Band 4	20	20300	50	#0	QAM16	21.14	29.14
LTE Band 4	20	20300	50	#Mid	QAM16	21.11	29.11
LTE Band 4	20	20300	50	#Max	QAM16	21.64	29.64
LTE Band 4	20	20300	100	#0	QAM16	21.42	29.42



Band	Bandwidth (MHz)	UL Channel	RB Size	RB Position	Modulation	Power (dBm)	EIRP (dBm)
LTE Band 4	1.4	19957	1	#0	QAM64	20.50	28.50
LTE Band 4	1.4	19957	1	#Mid	QAM64	20.37	28.37
LTE Band 4	1.4	19957	1	#Max	QAM64	20.40	28.40
LTE Band 4	1.4	19957	3	#0	QAM64	20.47	28.47
LTE Band 4	1.4	19957	3	#Mid	QAM64	20.46	28.46
LTE Band 4	1.4	19957	3	#Max	QAM64	20.47	28.47
LTE Band 4	1.4	19957	6	#0	QAM64	20.28	28.28
LTE Band 4	1.4	20175	1	#0	QAM64	19.47	27.47
LTE Band 4	1.4	20175	1	#Mid	QAM64	19.47	27.47
LTE Band 4	1.4	20175	1	#Max	QAM64	19.49	27.49
LTE Band 4	1.4	20175	3	#0	QAM64	19.30	27.30
LTE Band 4	1.4	20175	3	#Mid	QAM64	19.29	27.29
LTE Band 4	1.4	20175	3	#Max	QAM64	19.25	27.25
LTE Band 4	1.4	20175	6	#0	QAM64	19.19	27.19
LTE Band 4	1.4	20393	1	#0	QAM64	20.57	28.57
LTE Band 4	1.4	20393	1	#Mid	QAM64	20.38	28.38
LTE Band 4	1.4	20393	1	#Max	QAM64	20.33	28.33
LTE Band 4	1.4	20393	3	#0	QAM64	20.58	28.58
LTE Band 4	1.4	20393	3	#Mid	QAM64	20.58	28.58
LTE Band 4	1.4	20393	3	#Max	QAM64	20.43	28.43
LTE Band 4	1.4	20393	6	#0	QAM64	20.53	28.53
LTE Band 4	3	19965	1	#0	QAM64	20.55	28.55
LTE Band 4	3	19965	1	#Mid	QAM64	20.29	28.29
LTE Band 4	3	19965	1	#Max	QAM64	20.51	28.51
LTE Band 4	3	19965	8	#0	QAM64	20.64	28.64
LTE Band 4	3	19965	8	#Mid	QAM64	20.64	28.64
LTE Band 4	3	19965	8	#Max	QAM64	20.20	28.20
LTE Band 4	3	19965	15	#0	QAM64	20.17	28.17
LTE Band 4	3	20175	1	#0	QAM64	19.31	27.31
LTE Band 4	3	20175	1	#Mid	QAM64	19.36	27.36
LTE Band 4	3	20175	1	#Max	QAM64	19.66	27.66
LTE Band 4	3	20175	8	#0	QAM64	19.40	27.40
LTE Band 4	3	20175	8	#Mid	QAM64	19.39	27.39
LTE Band 4	3	20175	8	#Max	QAM64	19.32	27.32
LTE Band 4	3	20175	15	#0	QAM64	19.27	27.27
LTE Band 4	3	20385	1	#0	QAM64	20.65	28.65
LTE Band 4	3	20385	1	#Mid	QAM64	20.23	28.23
LTE Band 4	3	20385	1	#Max	QAM64	20.27	28.27
LTE Band 4	3	20385	8	#0	QAM64	21.05	29.05
LTE Band 4	3	20385	8	#Mid	QAM64	21.05	29.05
LTE Band 4	3	20385	8	#Max	QAM64	20.53	28.53



LTE Band 4	3	20385	15	#0	QAM64	20.50	28.50
LTE Band 4	5	19975	1	#0	QAM64	20.50	28.50
LTE Band 4	5	19975	1	#Mid	QAM64	20.34	28.34
LTE Band 4	5	19975	1	#Max	QAM64	20.21	28.21
LTE Band 4	5	19975	12	#0	QAM64	20.41	28.41
LTE Band 4	5	19975	12	#Mid	QAM64	20.40	28.40
LTE Band 4	5	19975	12	#Max	QAM64	20.02	28.02
LTE Band 4	5	19975	25	#0	QAM64	20.05	28.05
LTE Band 4	5	20175	1	#0	QAM64	19.39	27.39
LTE Band 4	5	20175	1	#Mid	QAM64	19.40	27.40
LTE Band 4	5	20175	1	#Max	QAM64	19.62	27.62
LTE Band 4	5	20175	12	#0	QAM64	19.34	27.34
LTE Band 4	5	20175	12	#Mid	QAM64	19.34	27.34
LTE Band 4	5	20175	12	#Max	QAM64	19.27	27.27
LTE Band 4	5	20175	25	#0	QAM64	19.22	27.22
LTE Band 4	5	20375	1	#0	QAM64	21.01	29.01
LTE Band 4	5	20375	1	#Mid	QAM64	20.76	28.76
LTE Band 4	5	20375	1	#Max	QAM64	20.60	28.60
LTE Band 4	5	20375	12	#0	QAM64	21.03	29.03
LTE Band 4	5	20375	12	#Mid	QAM64	21.03	29.03
LTE Band 4	5	20375	12	#Max	QAM64	20.54	28.54
LTE Band 4	5	20375	25	#0	QAM64	20.68	28.68
LTE Band 4	10	20000	1	#0	QAM64	20.53	28.53
LTE Band 4	10	20000	1	#Mid	QAM64	20.09	28.09
LTE Band 4	10	20000	1	#Max	QAM64	19.28	27.28
LTE Band 4	10	20000	25	#0	QAM64	20.11	28.11
LTE Band 4	10	20000	25	#Mid	QAM64	20.11	28.11
LTE Band 4	10	20000	25	#Max	QAM64	19.33	27.33
LTE Band 4	10	20000	50	#0	QAM64	19.70	27.70
LTE Band 4	10	20175	1	#0	QAM64	19.21	27.21
LTE Band 4	10	20175	1	#Mid	QAM64	19.56	27.56
LTE Band 4	10	20175	1	#Max	QAM64	19.97	27.97
LTE Band 4	10	20175	25	#0	QAM64	19.13	27.13
LTE Band 4	10	20175	25	#Mid	QAM64	19.13	27.13
LTE Band 4	10	20175	25	#Max	QAM64	19.50	27.50
LTE Band 4	10	20175	50	#0	QAM64	19.14	27.14
LTE Band 4	10	20350	1	#0	QAM64	21.12	29.12
LTE Band 4	10	20350	1	#Mid	QAM64	20.66	28.66
LTE Band 4	10	20350	1	#Max	QAM64	20.48	28.48
LTE Band 4	10	20350	25	#0	QAM64	20.91	28.91
LTE Band 4	10	20350	25	#Mid	QAM64	20.90	28.90
LTE Band 4	10	20350	25	#Max	QAM64	20.69	28.69
LTE Band 4	10	20350	50	#0	QAM64	20.80	28.80



LTE Band 4	15	20025	1	#0	QAM64	20.83	28.83
LTE Band 4	15	20025	1	#Mid	QAM64	19.36	27.36
LTE Band 4	15	20025	1	#Max	QAM64	19.34	27.34
LTE Band 4	15	20025	36	#0	QAM64	19.85	27.85
LTE Band 4	15	20025	36	#Mid	QAM64	19.86	27.86
LTE Band 4	15	20025	36	#Max	QAM64	18.64	26.64
LTE Band 4	15	20025	75	#0	QAM64	19.32	27.32
LTE Band 4	15	20175	1	#0	QAM64	19.23	27.23
LTE Band 4	15	20175	1	#Mid	QAM64	19.49	27.49
LTE Band 4	15	20175	1	#Max	QAM64	20.61	28.61
LTE Band 4	15	20175	36	#0	QAM64	18.94	26.94
LTE Band 4	15	20175	36	#Mid	QAM64	18.94	26.94
LTE Band 4	15	20175	36	#Max	QAM64	19.66	27.66
LTE Band 4	15	20175	75	#0	QAM64	19.30	27.30
LTE Band 4	15	20325	1	#0	QAM64	20.74	28.74
LTE Band 4	15	20325	1	#Mid	QAM64	21.25	29.25
LTE Band 4	15	20325	1	#Max	QAM64	20.92	28.92
LTE Band 4	15	20325	36	#0	QAM64	20.77	28.77
LTE Band 4	15	20325	36	#Mid	QAM64	20.75	28.75
LTE Band 4	15	20325	36	#Max	QAM64	20.70	28.70
LTE Band 4	15	20325	75	#0	QAM64	20.95	28.95
LTE Band 4	20	20050	1	#0	QAM64	21.12	29.12
LTE Band 4	20	20050	1	#Mid	QAM64	19.34	27.34
LTE Band 4	20	20050	1	#Max	QAM64	19.78	27.78
LTE Band 4	20	20050	50	#0	QAM64	19.99	27.99
LTE Band 4	20	20050	50	#Mid	QAM64	20.01	28.01
LTE Band 4	20	20050	50	#Max	QAM64	19.26	27.26
LTE Band 4	20	20050	100	#0	QAM64	19.70	27.70
LTE Band 4	20	20175	1	#0	QAM64	19.24	27.24
LTE Band 4	20	20175	1	#Mid	QAM64	19.45	27.45
LTE Band 4	20	20175	1	#Max	QAM64	21.28	29.28
LTE Band 4	20	20175	50	#0	QAM64	19.30	27.30
LTE Band 4	20	20175	50	#Mid	QAM64	19.31	27.31
LTE Band 4	20	20175	50	#Max	QAM64	20.37	28.37
LTE Band 4	20	20175	100	#0	QAM64	19.91	27.91
LTE Band 4	20	20300	1	#0	QAM64	20.21	28.21
LTE Band 4	20	20300	1	#Mid	QAM64	21.00	29.00
LTE Band 4	20	20300	1	#Max	QAM64	21.07	29.07
LTE Band 4	20	20300	50	#0	QAM64	20.75	28.75
LTE Band 4	20	20300	50	#Mid	QAM64	20.85	28.85
LTE Band 4	20	20300	50	#Max	QAM64	21.38	29.38
LTE Band 4	20	20300	100	#0	QAM64	21.13	29.13

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 30 kHz, VBW is set to 91kHz for LTE Band 4 (1.4MHz).

RBW is set to 62 kHz, VBW is set to 180 kHz for LTE Band 4 (3MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4 (5MHz).

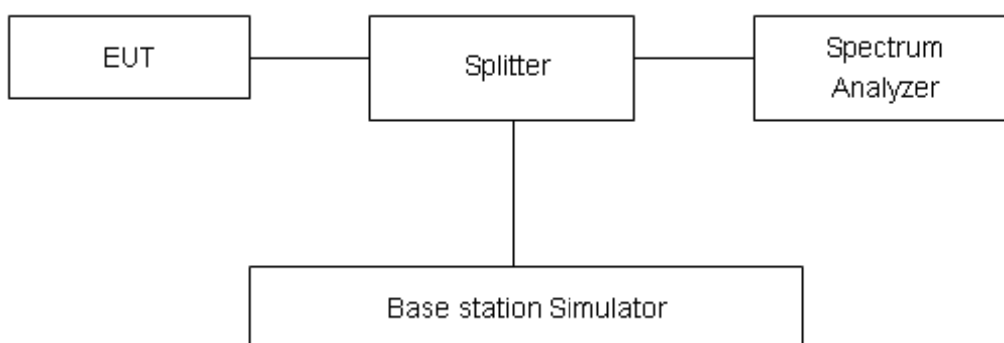
RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4 (10MHz).

RBW is set to 300 kHz, VBW is set to 910 kHz for LTE Band 4 (15MHz).

RBW is set to 430 kHz, VBW is set to 1.2MHz for LTE Band 4 (20MHz).

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

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

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



Test Result

LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.115	1.477
			20175	1732.5	1.121	1.527
			20393	1754.3	1.107	1.456
		3	19965	1711.5	2.719	3.263
			20175	1732.5	2.721	3.287
			20385	1753.5	2.733	3.283
		5	19975	1712.5	4.546	5.292
			20175	1732.5	4.526	5.250
			20375	1752.5	4.510	5.276
		10	20000	1715	8.985	9.939
			20175	1732.5	8.991	10.010
			20350	1750	8.974	9.868
		15	20025	1717.5	13.462	14.566
			20175	1732.5	13.464	14.581
			20325	1747.5	13.449	14.428
		20	20050	1720	17.948	19.198
			20175	1732.5	17.976	19.363
			20300	1745	17.909	19.286
	16QAM	1.4	19957	1710.7	1.120	1.465
			20175	1732.5	1.106	1.458
			20393	1754.3	1.115	1.454
		3	19965	1711.5	2.758	3.392
			20175	1732.5	2.713	3.393
			20385	1753.5	2.736	3.373
		5	19975	1712.5	4.532	5.220
			20175	1732.5	4.535	5.193
			20375	1752.5	4.548	5.350
		10	20000	1715	8.967	9.998
			20175	1732.5	8.971	10.117
			20350	1750	8.982	9.850
		15	20025	1717.5	13.477	14.549
			20175	1732.5	13.481	14.577
			20325	1747.5	13.422	14.535
		20	20050	1720	17.952	19.202
			20175	1732.5	17.940	19.380
			20300	1745	17.937	19.270



	64QAM	1.4	19957	1710.7	1.124	1.529
			20175	1732.5	1.106	1.448
			20393	1754.3	1.118	1.470
		3	19965	1711.5	2.718	3.374
			20175	1732.5	2.714	3.358
			20385	1753.5	2.735	3.333
		5	19975	1712.5	4.522	5.235
			20175	1732.5	4.551	5.343
			20375	1752.5	4.538	5.420
		10	20000	1715	8.986	9.852
			20175	1732.5	8.964	9.943
			20350	1750	8.965	9.890
		15	20025	1717.5	13.457	14.594
			20175	1732.5	13.491	14.624
			20325	1747.5	13.423	14.539
		20	20050	1720	17.918	19.233
			20175	1732.5	17.950	19.444
			20300	1745	17.973	19.293

LTE Band 4 QPSK 1.4MHz CH-Low



LTE Band 4 QPSK 3MHz CH-Low



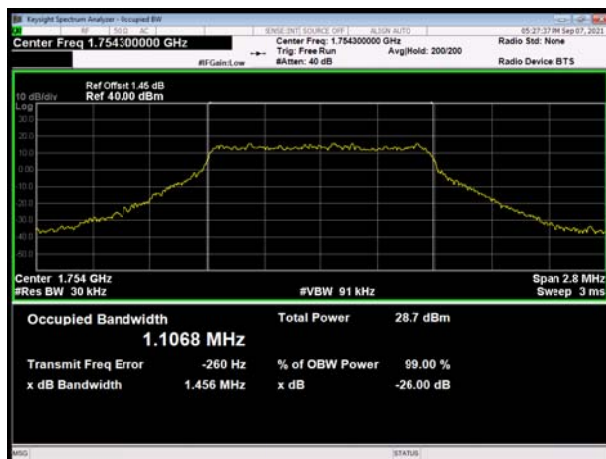
LTE Band 4 QPSK 1.4MHz CH-Middle



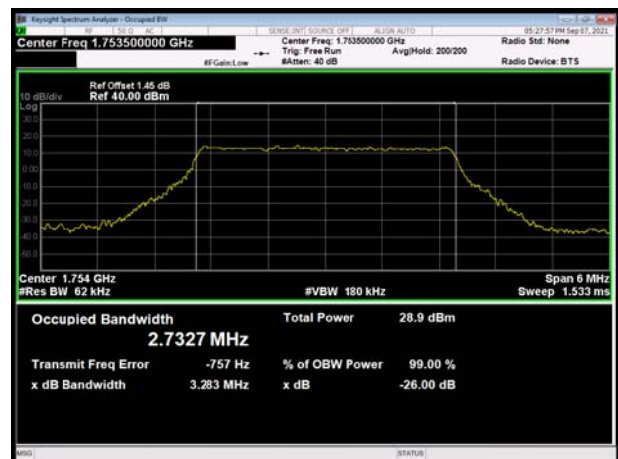
LTE Band 4 QPSK 3MHz CH-Middle



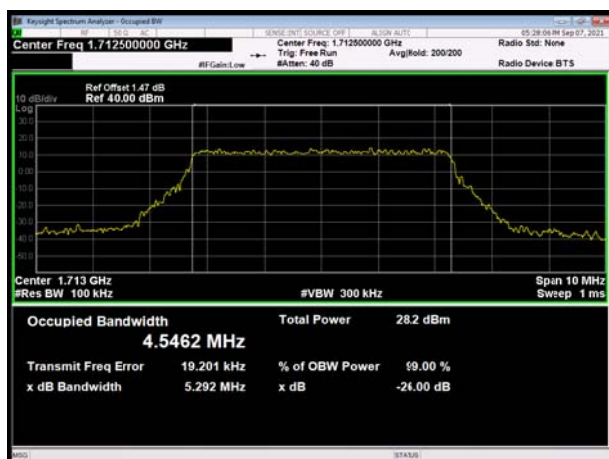
LTE Band 4 QPSK 1.4MHz CH-High



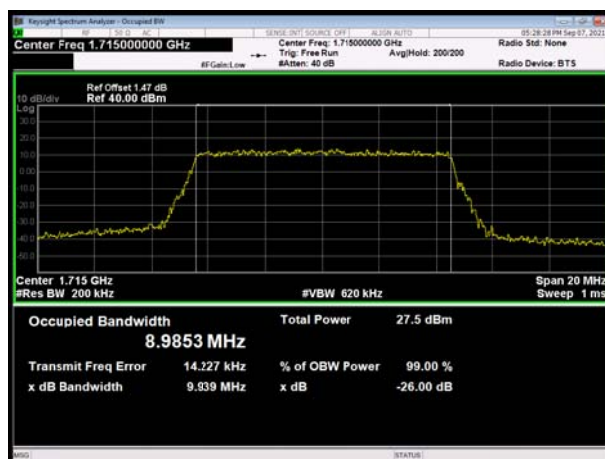
LTE Band 4 QPSK 3MHz CH-High



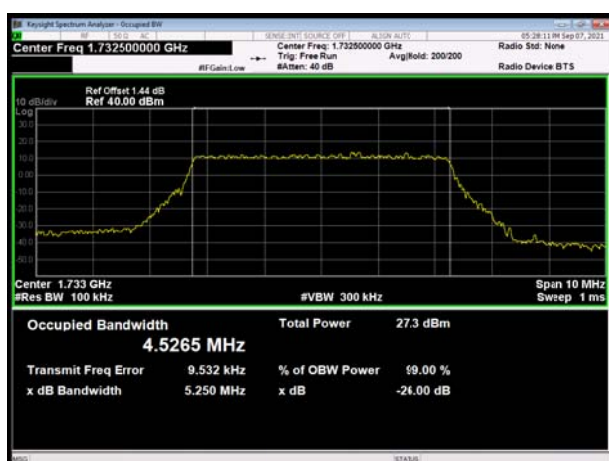
LTE Band 4 QPSK 5MHz CH-Low



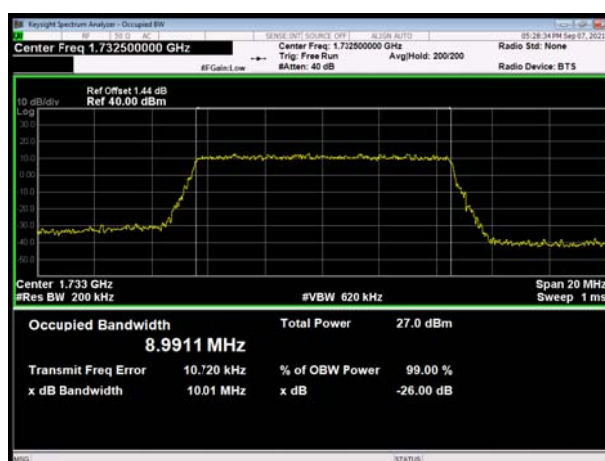
LTE Band 4 QPSK 10MHz CH-Low



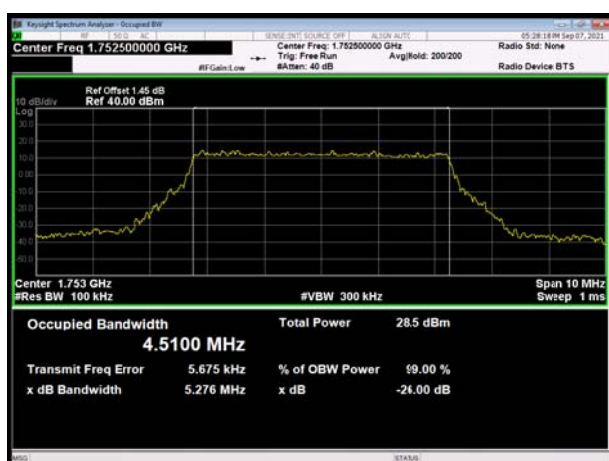
LTE Band 4 QPSK 5MHz CH-Middle



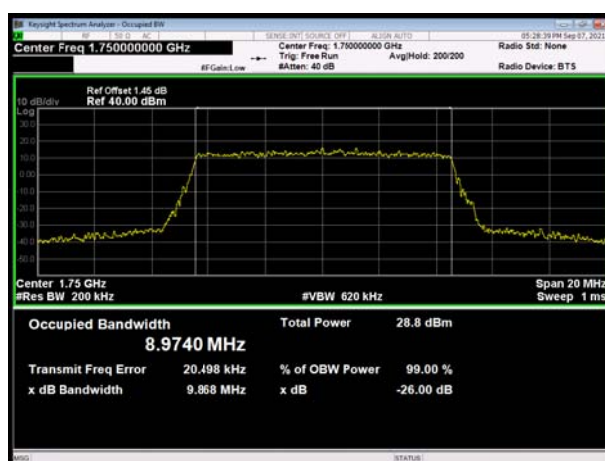
LTE Band 4 QPSK 10MHz CH-Middle



LTE Band 4 QPSK 5MHz CH-High

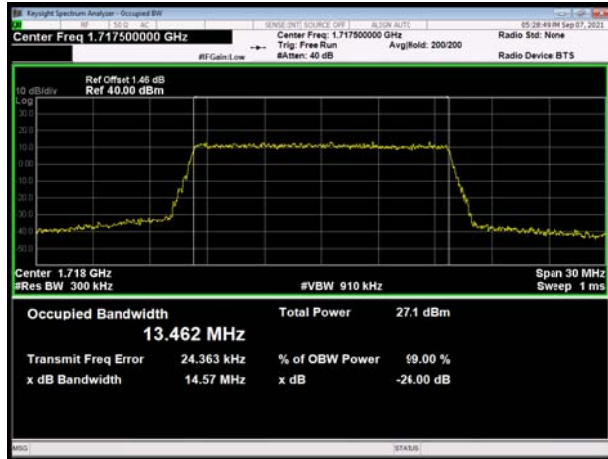


LTE Band 4 QPSK 10MHz CH-High





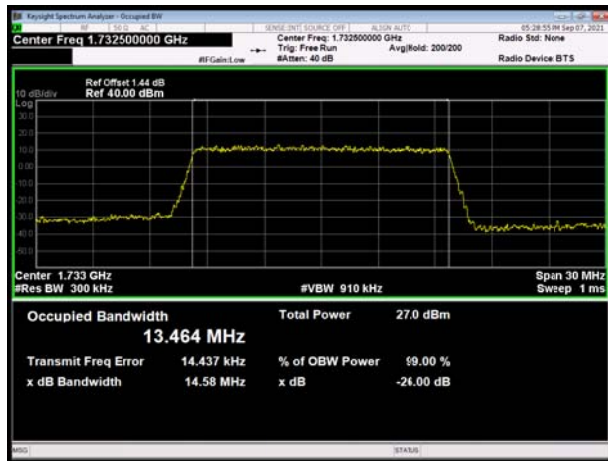
LTE Band 4 QPSK 15MHz CH-Low



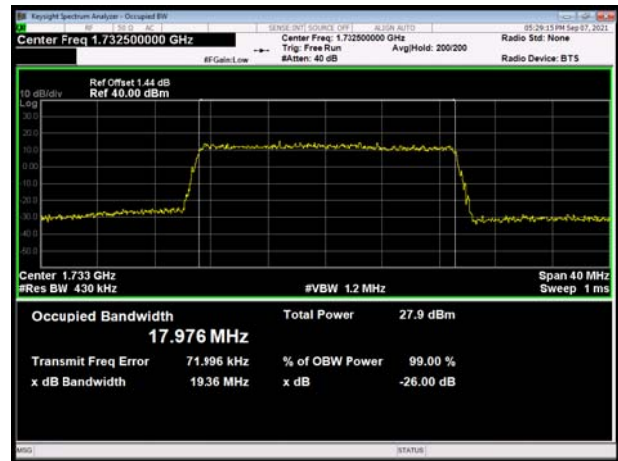
LTE Band 4 QPSK 20MHz CH-Low



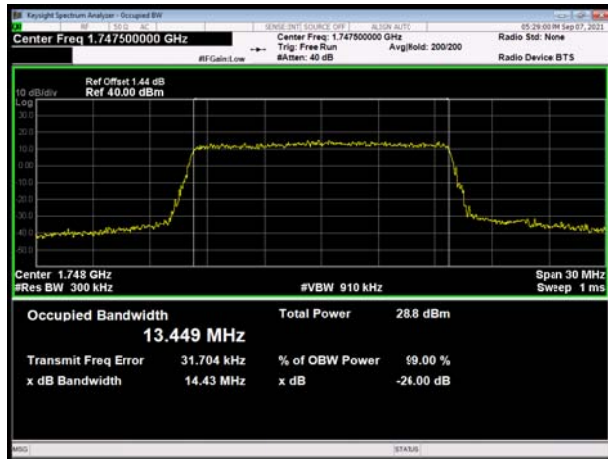
LTE Band 4 QPSK 15MHz CH-Middle



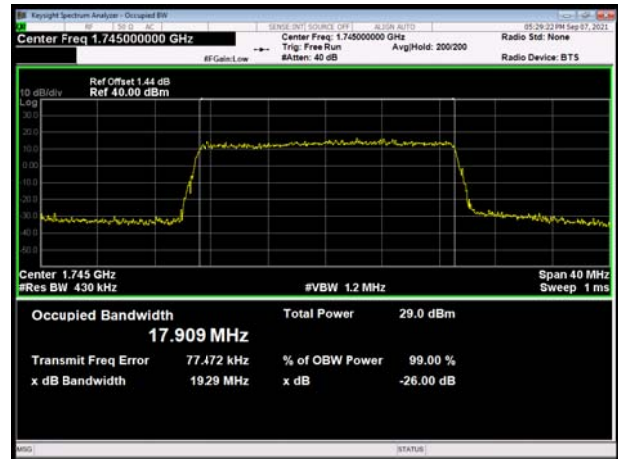
LTE Band 4 QPSK 20MHz CH-Middle



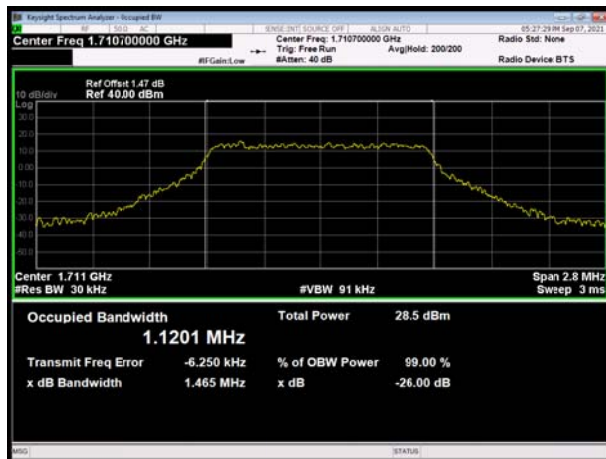
LTE Band 4 QPSK 15MHz CH-High



LTE Band 4 QPSK 20MHz CH-High



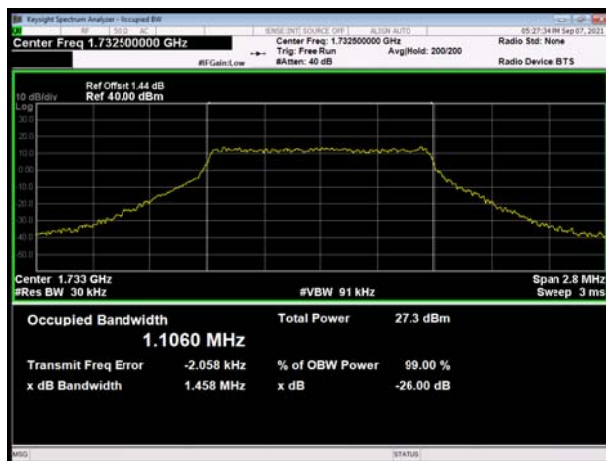
LTE Band 4 16QAM 1.4MHz CH-Low



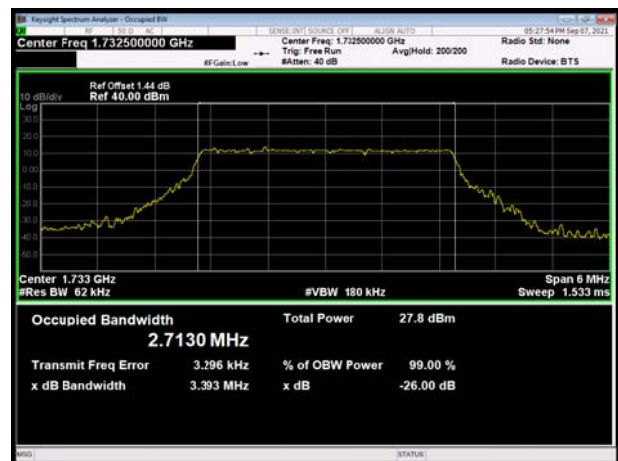
LTE Band 4 16QAM 3MHz CH-Low



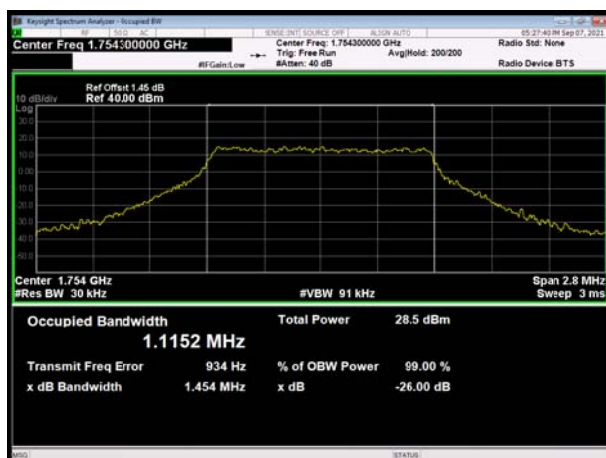
LTE Band 4 16QAM 1.4MHz CH-Middle



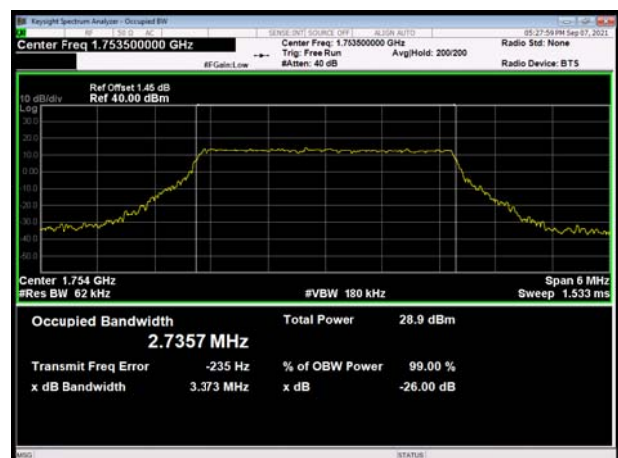
LTE Band 4 16QAM 3MHz CH-Middle



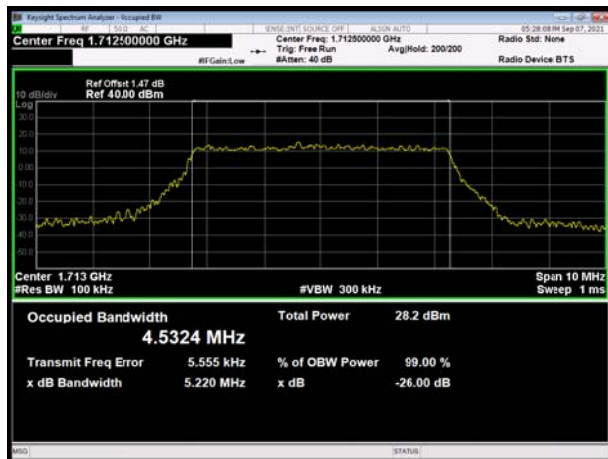
LTE Band 4 16QAM 1.4MHz CH-High



LTE Band 4 16QAM 3MHz CH-High



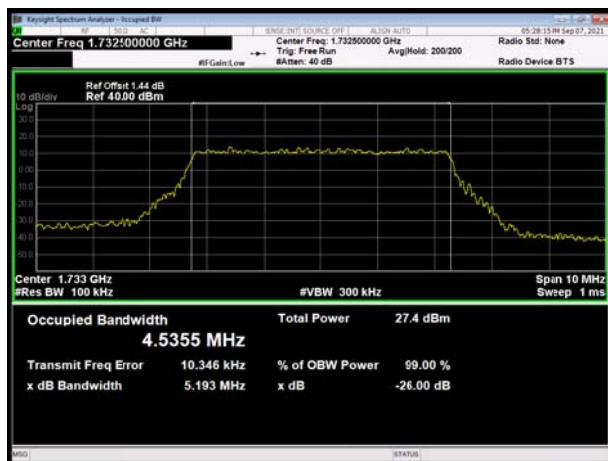
LTE Band 4 16QAM 5MHz CH-Low



LTE Band 4 16QAM 10MHz CH-Low



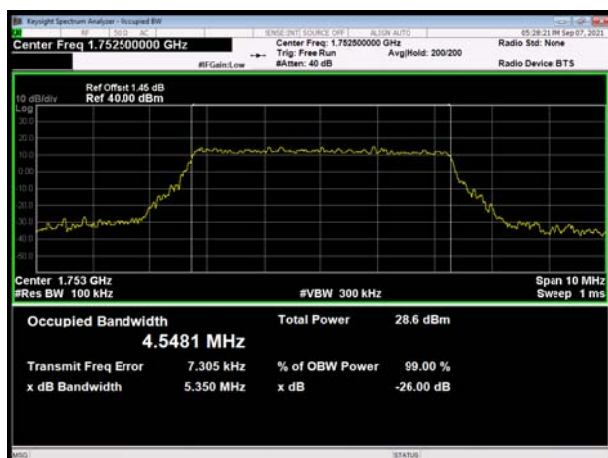
LTE Band 4 16QAM 5MHz CH-Middle



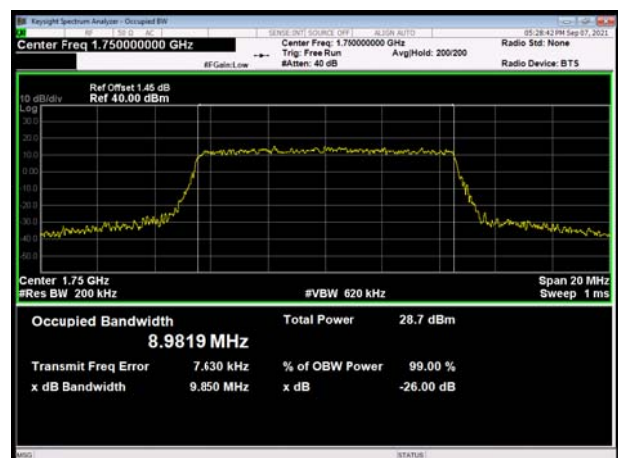
LTE Band 4 16QAM 10MHz CH-Middle



LTE Band 4 16QAM 5MHz CH-High

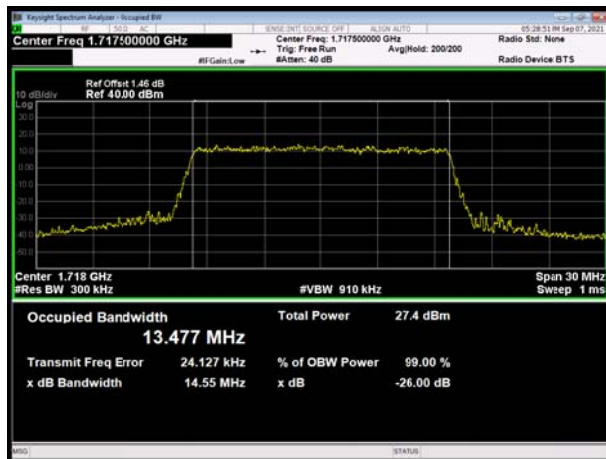


LTE Band 4 16QAM 10MHz CH-High





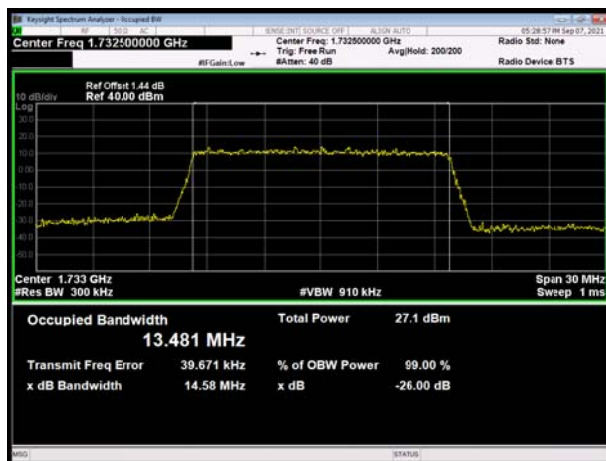
LTE Band 4 16QAM 15MHz CH-Low



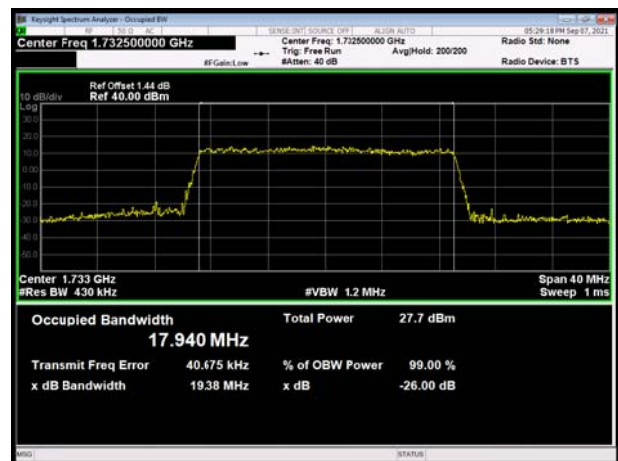
LTE Band 4 16QAM 20MHz CH-Low



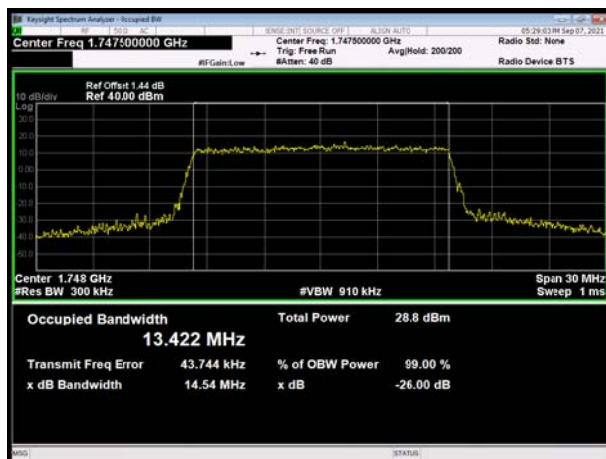
LTE Band 4 16QAM 15MHz CH-Middle



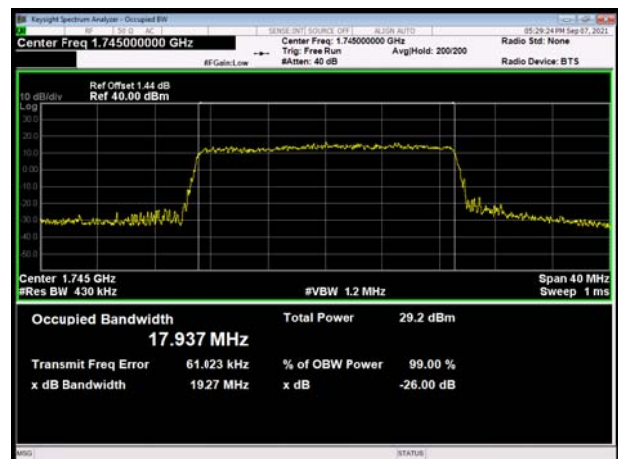
LTE Band 4 16QAM 20MHz CH-Middle



LTE Band 4 16QAM 15MHz CH-High

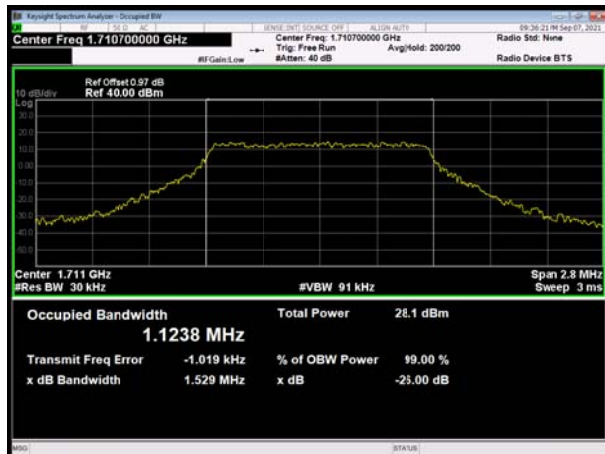


LTE Band 4 16QAM 20MHz CH-High

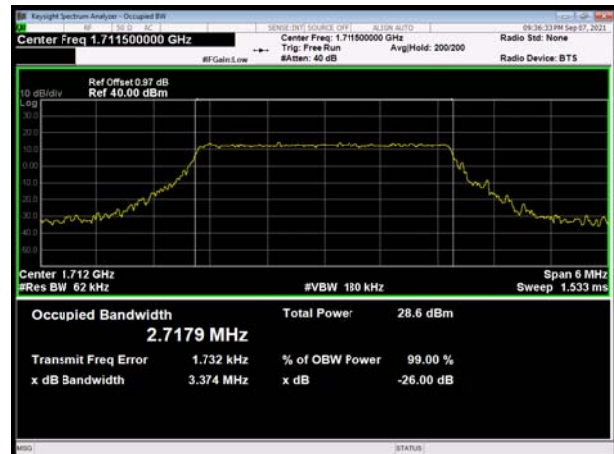




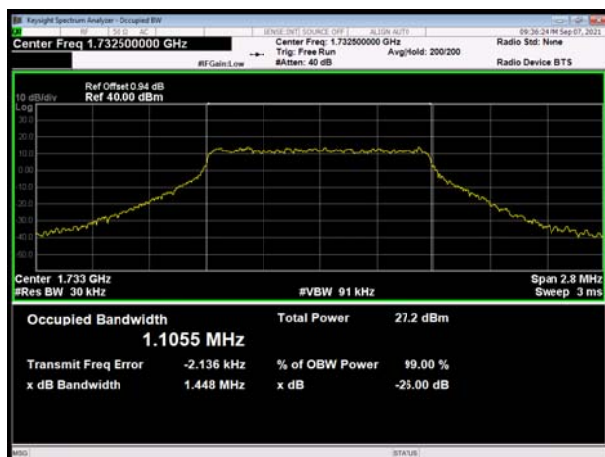
LTE Band 4 1.4MHz 64QAM CH-Low



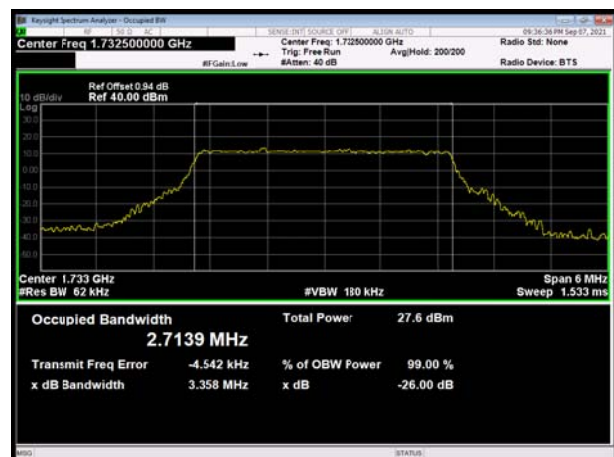
LTE Band 4 3MHz 64QAM CH-Low



LTE Band 4 1.4MHz 64QAM CH-Middle



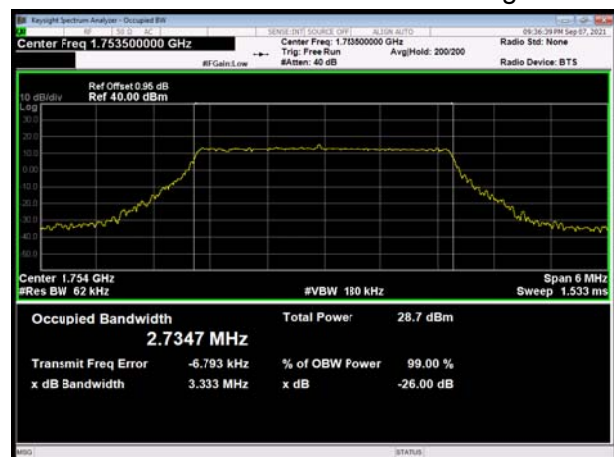
LTE Band 4 3MHz 64QAM CH-Middle



LTE Band 4 1.4MHz 64QAM CH-High

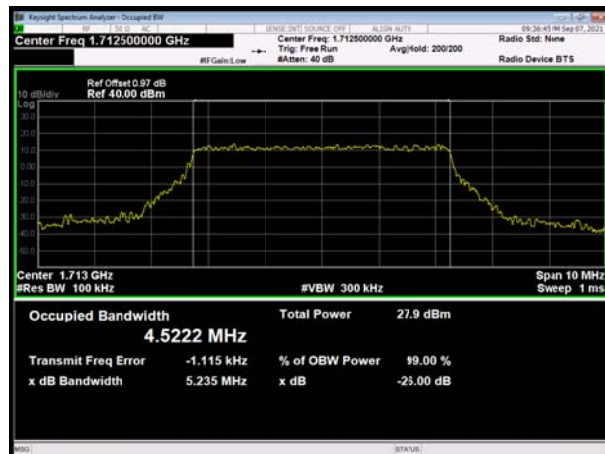


LTE Band 4 3MHz 64QAM CH-High

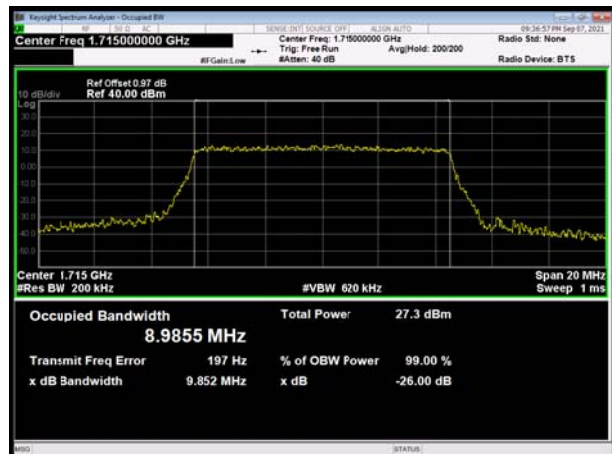




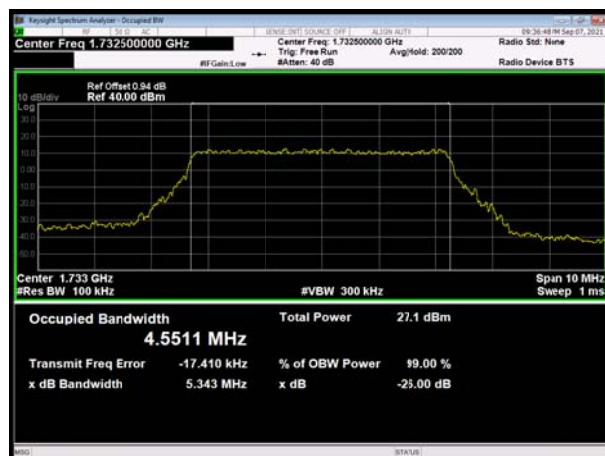
LTE Band 4 5MHz 64QAM CH-Low



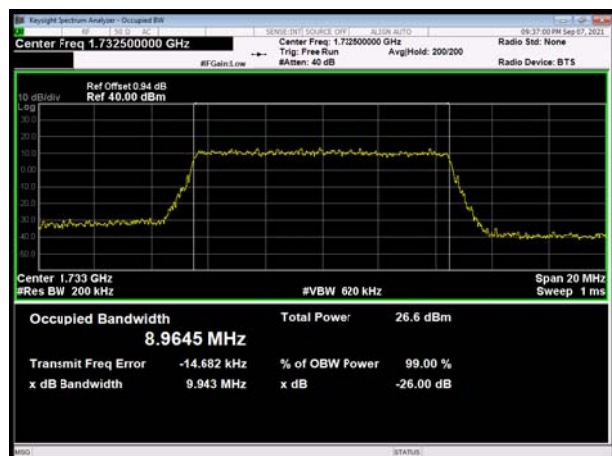
LTE Band 4 10MHz 64QAM CH-Low



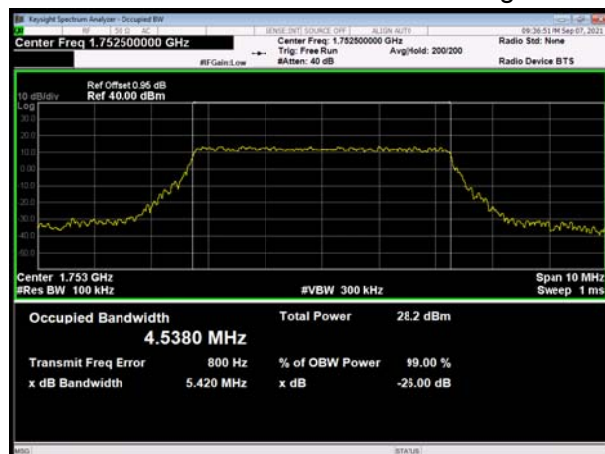
LTE Band 4 5MHz 64QAM CH-Middle



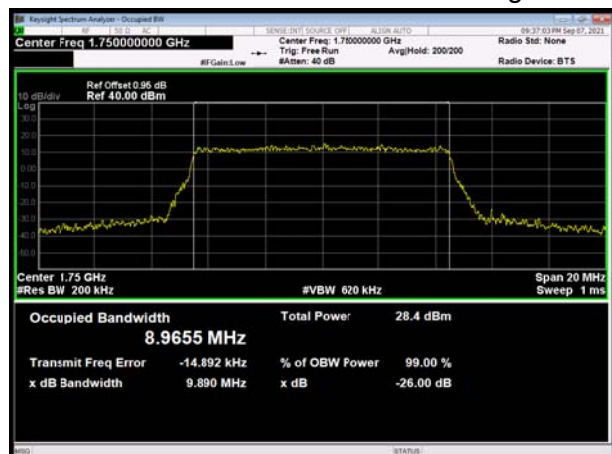
LTE Band 4 10MHz 64QAM CH-Middle



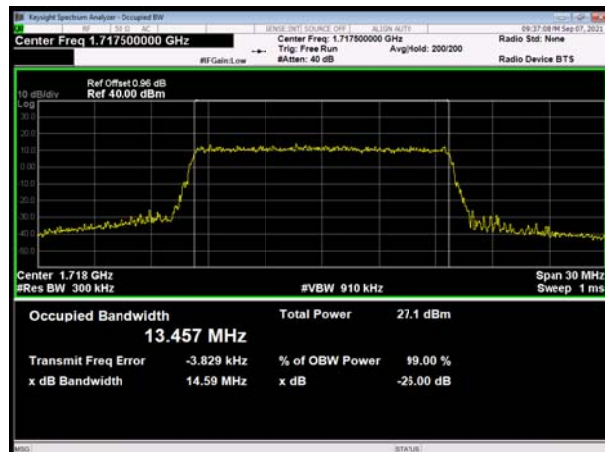
LTE Band 4 5MHz 64QAM CH-High



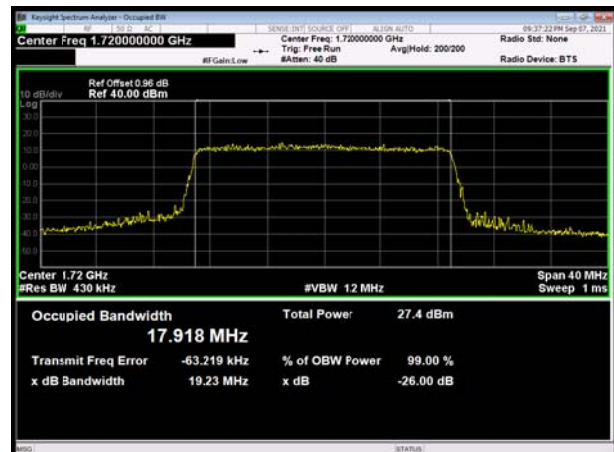
LTE Band 4 10MHz 64QAM CH-High



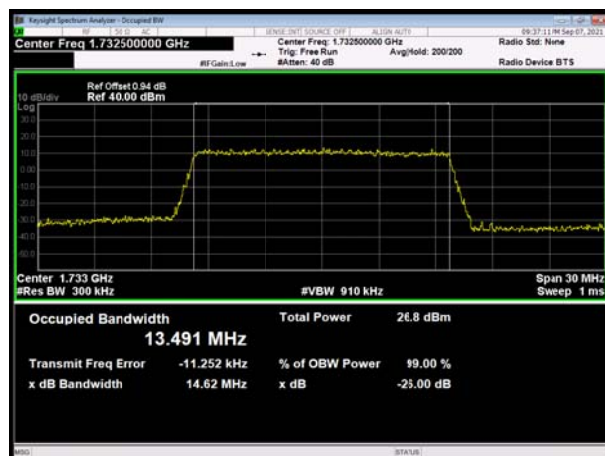
LTE Band 4 15MHz 64QAM CH-Low



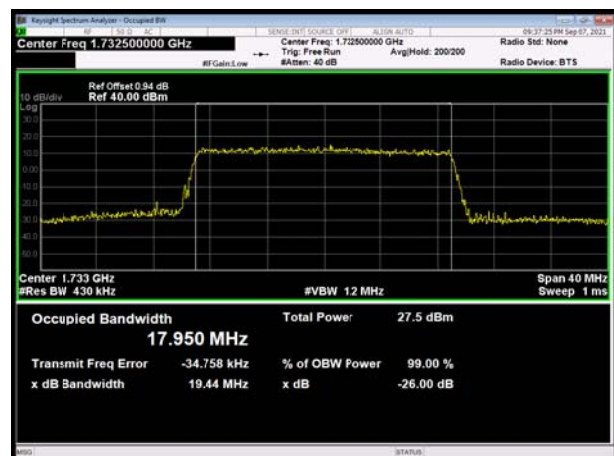
LTE Band 4 20MHz 64QAM CH-Low



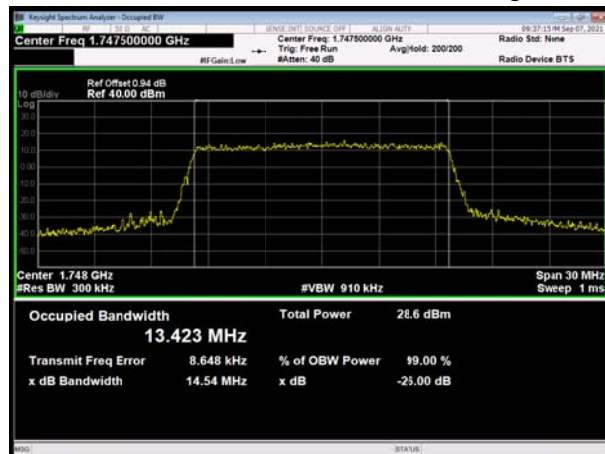
LTE Band 4 15MHz 64QAM CH-Middle



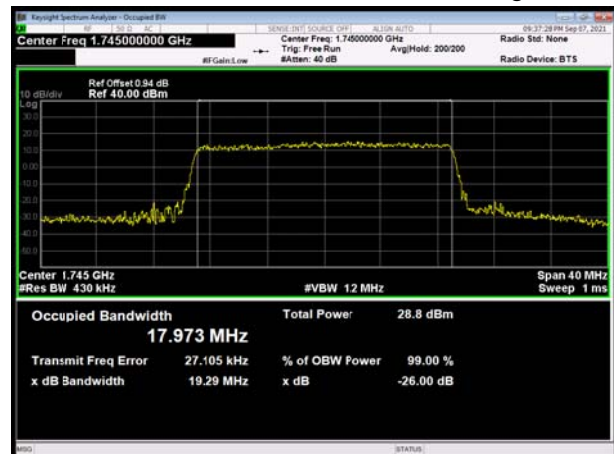
LTE Band 4 20MHz 64QAM CH-Middle



LTE Band 4 15MHz 64QAM CH-High



LTE Band 4 20MHz 64QAM CH-High



5.3 Band Edge Compliance

Ambient condition

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

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured.

The testing follows KDB 971168 D01 v03r01 Section 6.0

The EUT was connected to spectrum analyzer and system simulator via a power divider.

The band edges of low and high channels for the highest RF powers were measured.

RBW is set to 15 kHz, VBW is set to 43 kHz for LTE Band 4(1.4MHz).

RBW is set to 33kHz, VBW is set to 100 kHz for LTE Band 4(3MHz).

RBW is set to 51 kHz, VBW is set to 150 kHz for LTE Band 4(5MHz).

RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4 (10MHz).

RBW is set to 150 kHz, VBW is set to 470 kHz for LTE Band 4(15MHz).

RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4 (20MHz)

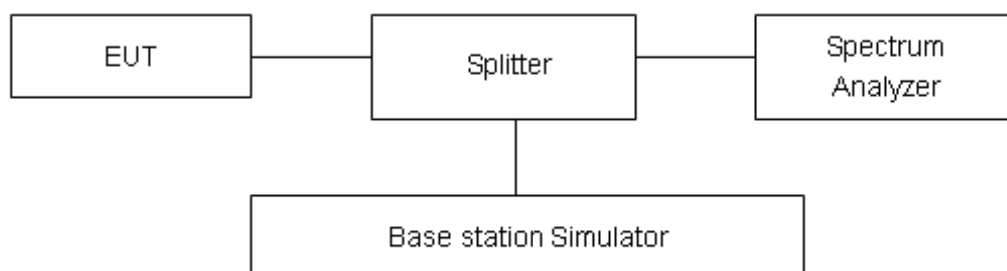
on spectrum analyzer.

Set spectrum analyzer with RMS detector.

The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Checked that all the results comply with the emission limit line.

Test Setup



Limits

Rule Part 27.53(i) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz.

Rule Part 27.53(h) specifies that “ for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB”



Measurement Uncertainty

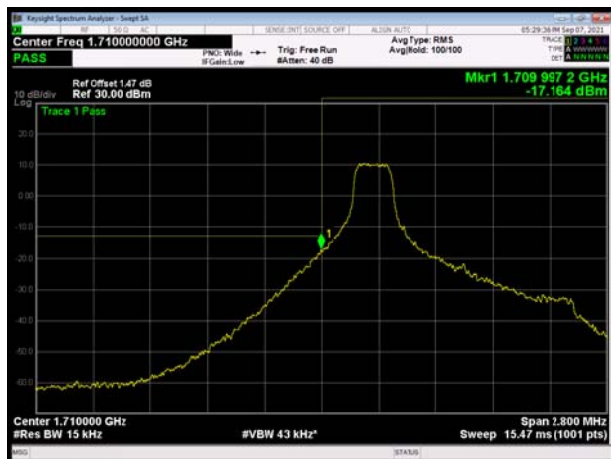
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=0.684\text{dB}$.



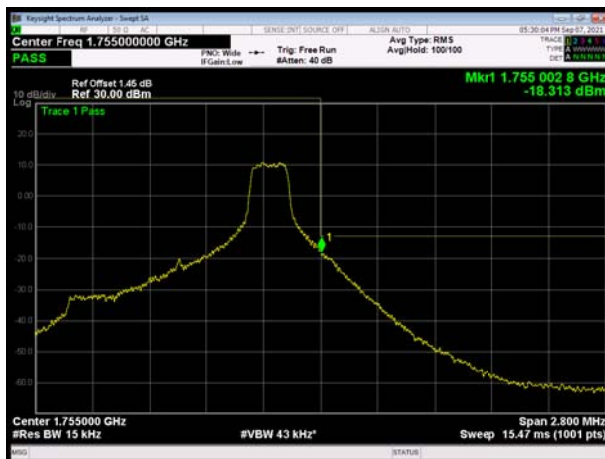
Test Result

All the test traces in the plots shows the test results clearly.

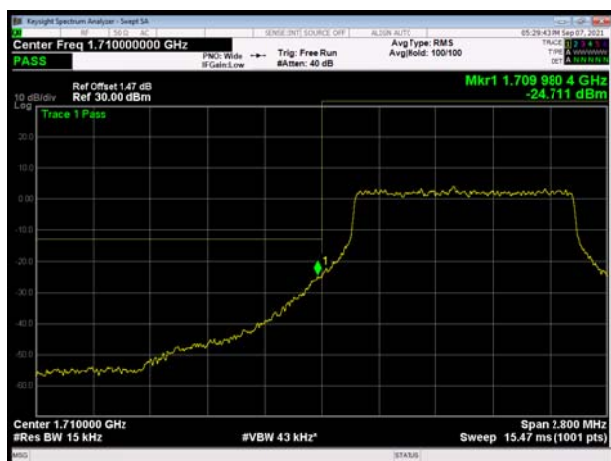
LTE Band 4 QPSK 1.4MHz CH-Low, 1 RB



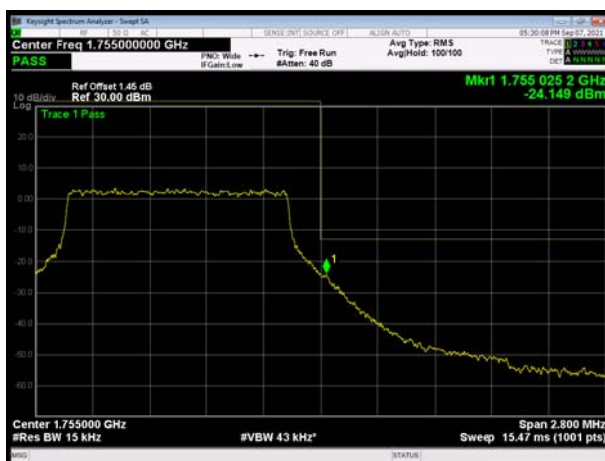
LTE Band 4 QPSK 1.4MHz CH-High, 1 RB



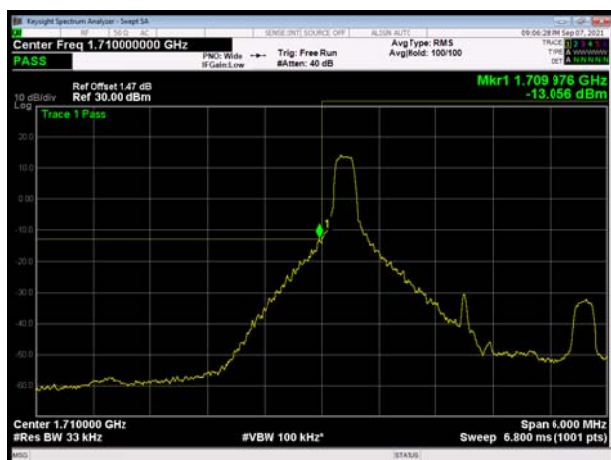
LTE Band 4 QPSK 1.4MHz CH-Low, 100%RB



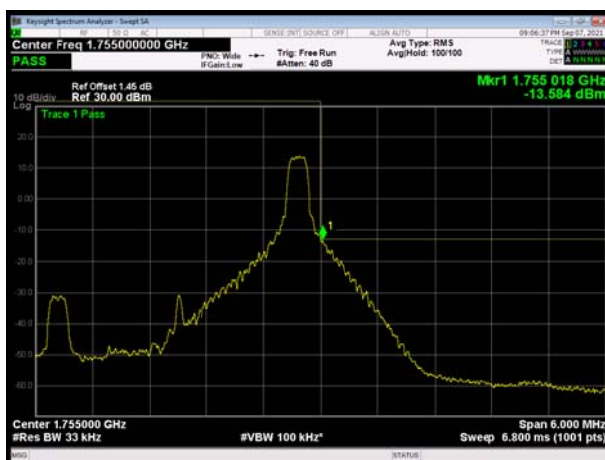
LTE Band 4 QPSK 1.4MHz CH-High, 100%RB



LTE Band 4 QPSK 3MHz CH-Low, 1 RB

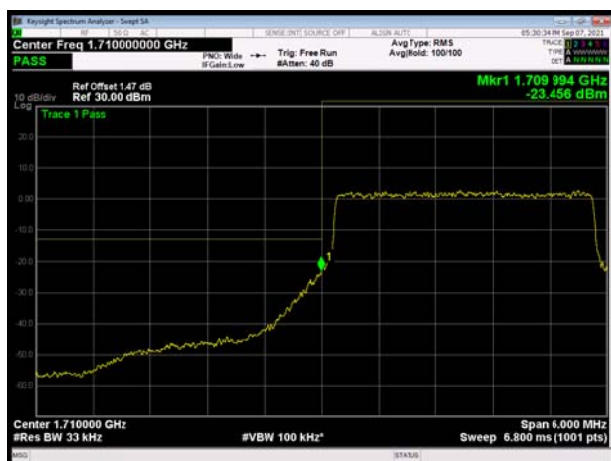


LTE Band 4 QPSK 3MHz CH-High, 1 RB

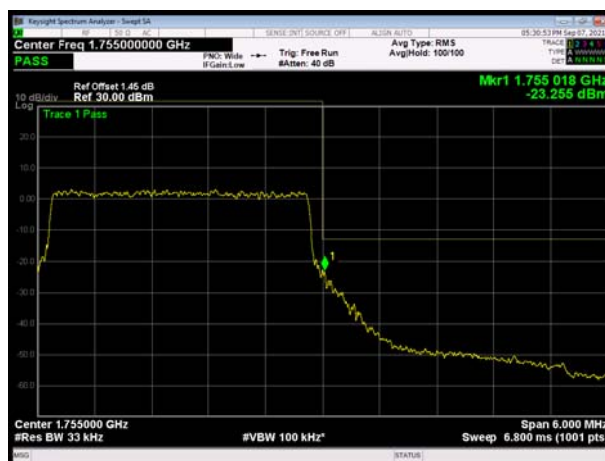




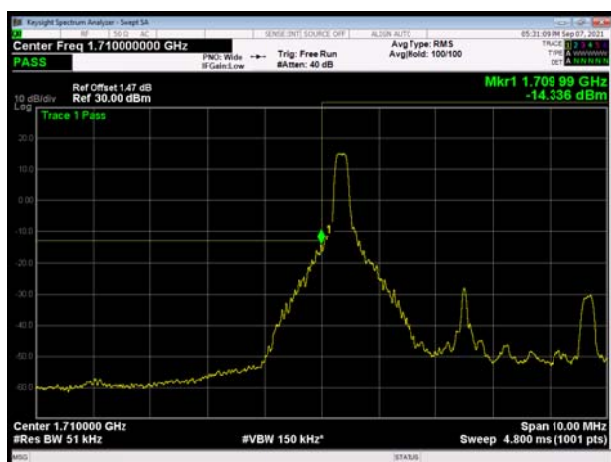
LTE Band 4 QPSK 3MHz CH-Low, 100%RB



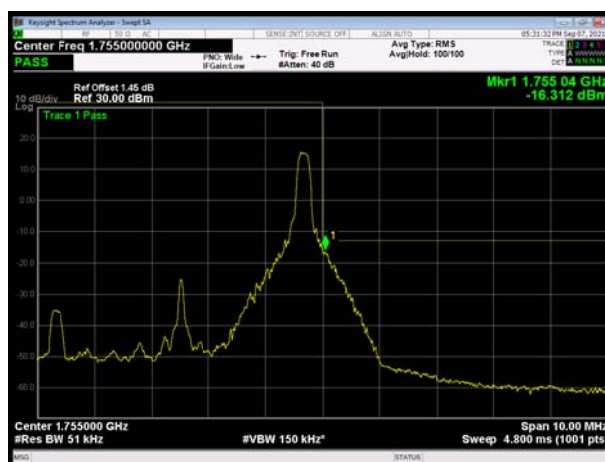
LTE Band 4 QPSK 3MHz CH-High, 100%RB



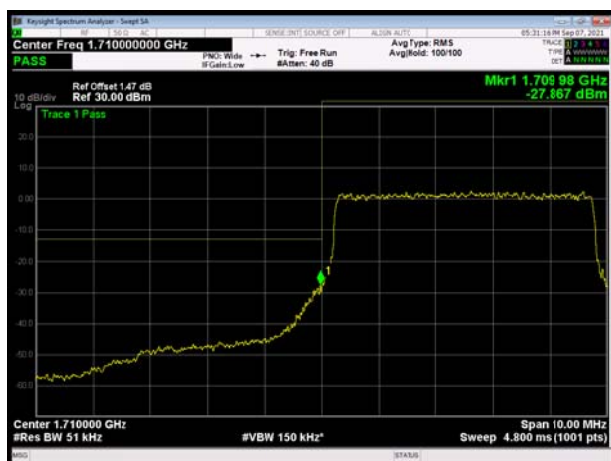
LTE Band 4 QPSK 5MHz CH-Low, 1 RB



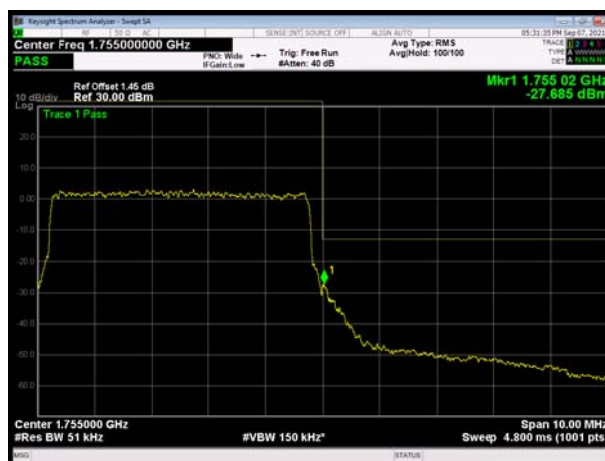
LTE Band 4 QPSK 5MHz CH-High, 1 RB



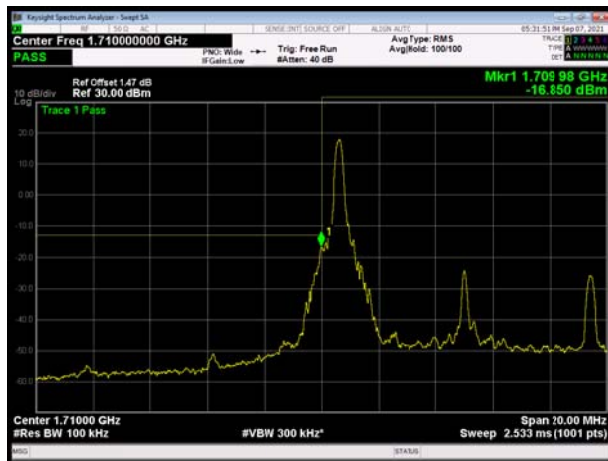
LTE Band 4 QPSK 5MHz CH-Low, 100%RB



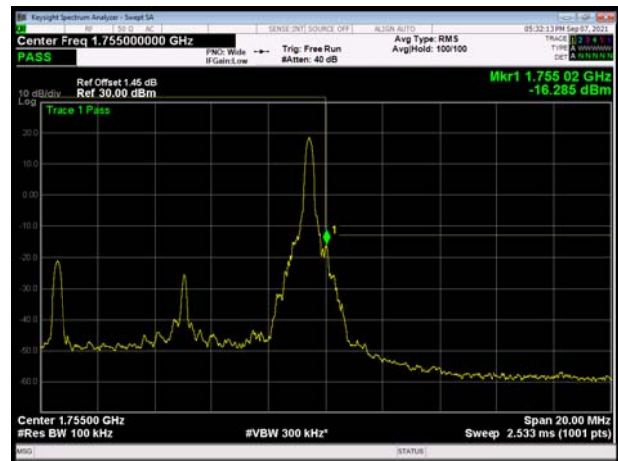
LTE Band 4 QPSK 5MHz CH-High, 100%RB



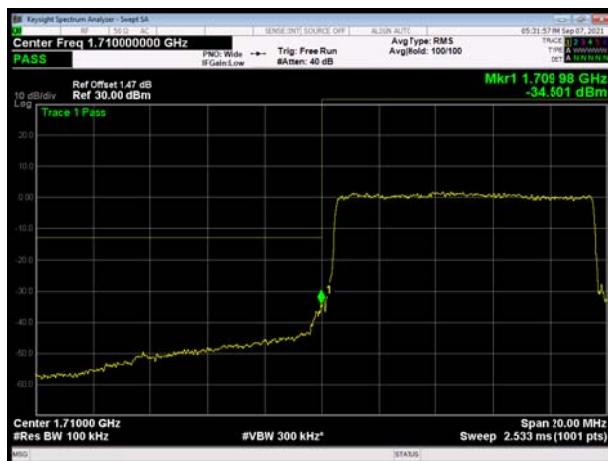
LTE Band 4 QPSK 10MHz CH-Low, 1 RB



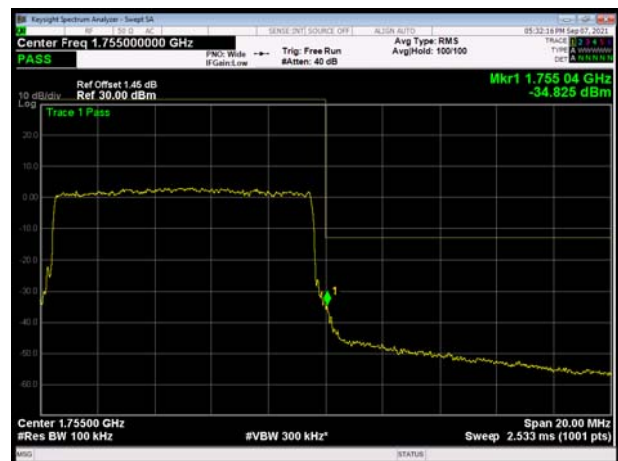
LTE Band 4 QPSK 10MHz CH-High, 1 RB



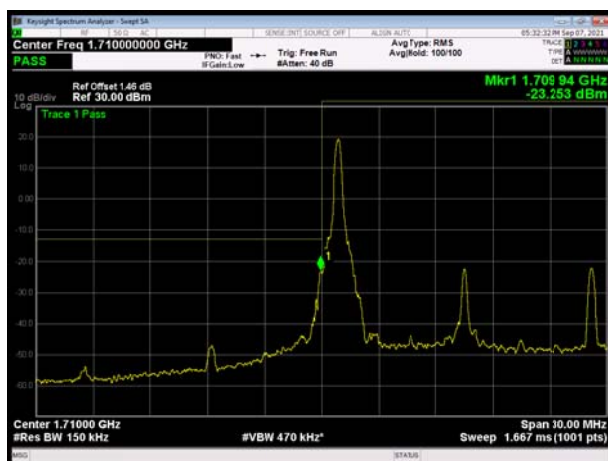
LTE Band 4 QPSK 10MHz CH-Low, 100%RB



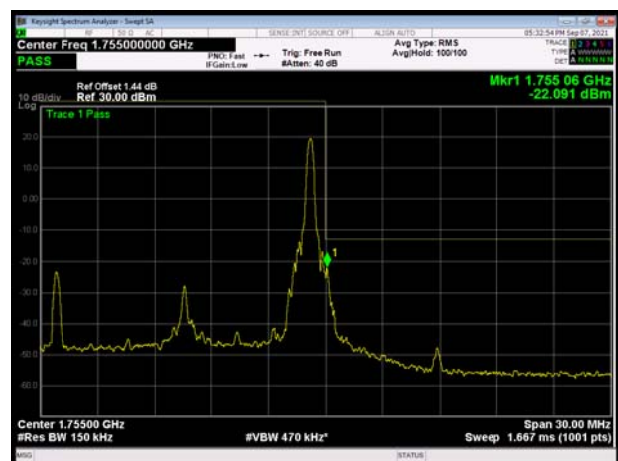
LTE Band 4 QPSK 10MHz CH-High, 100%RB



LTE Band 4 QPSK 15MHz CH-Low, 1 RB

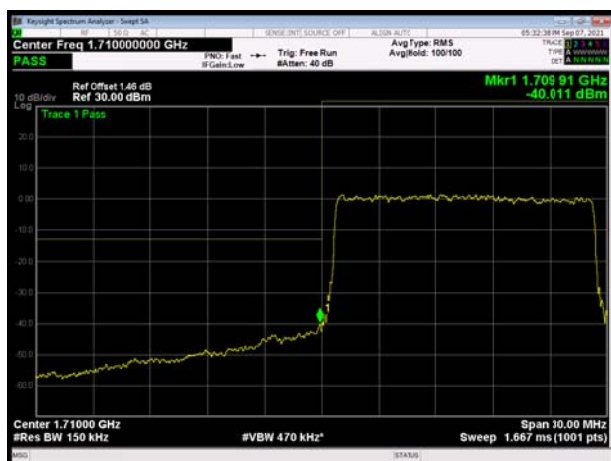


LTE Band 4 QPSK 15MHz CH-High, 1 RB

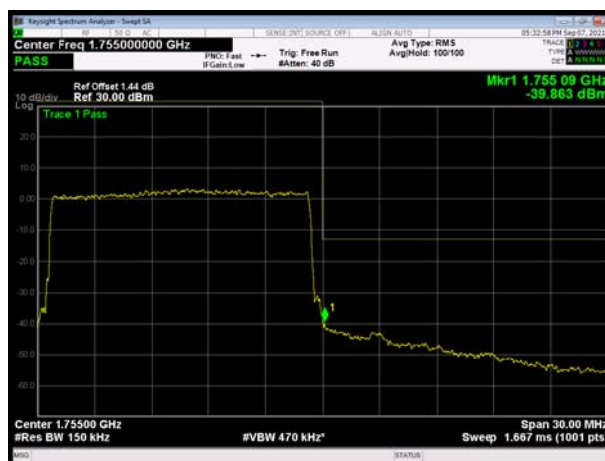




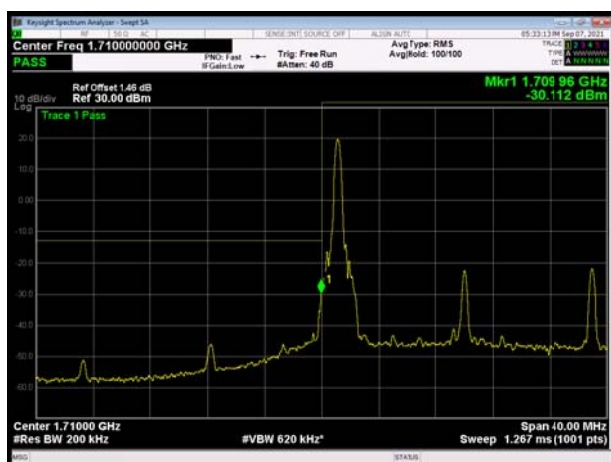
LTE Band 4 QPSK 15MHz CH-Low, 100%RB



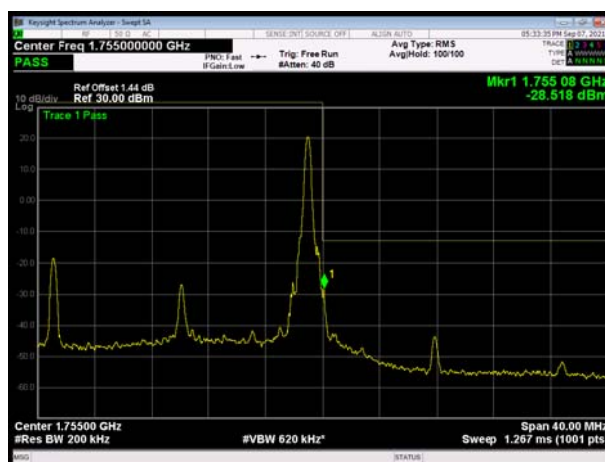
LTE Band 4 QPSK 15MHz CH-High, 100%RB



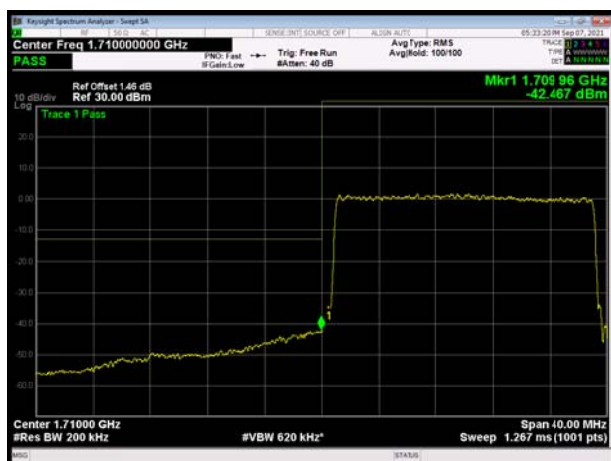
LTE Band 4 QPSK 20MHz CH-Low, 1 RB



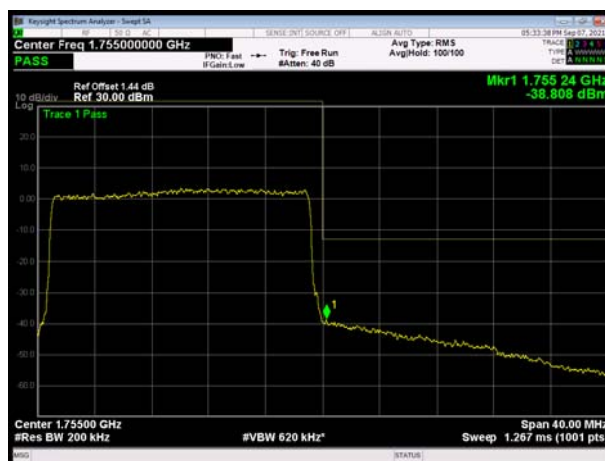
LTE Band 4 QPSK 20MHz CH-High, 1 RB



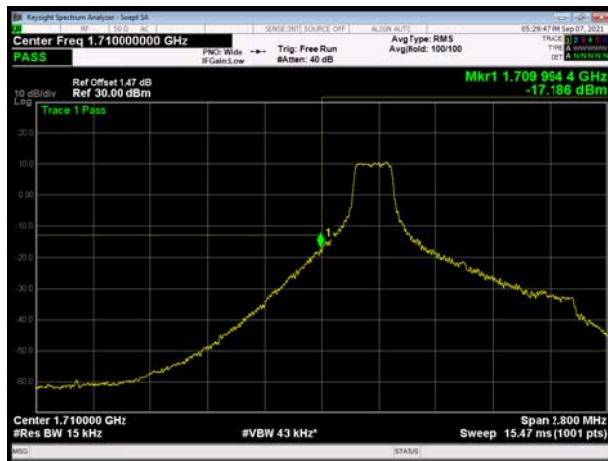
LTE Band 4 QPSK 20MHz CH-Low, 100%RB



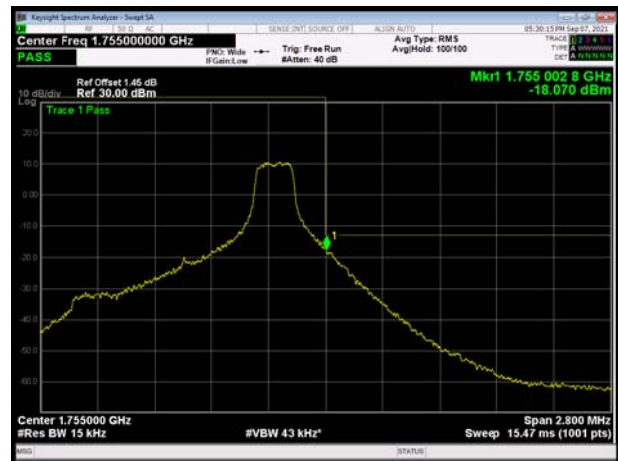
LTE Band 4 QPSK 20MHz CH-High, 100%RB



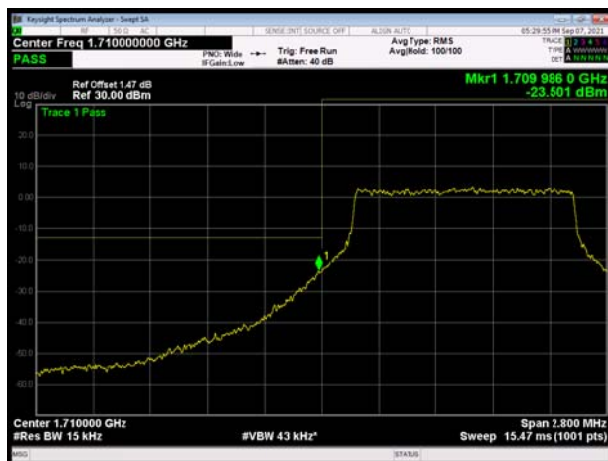
LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB



LTE Band 4 16QAM 1.4MHz CH-High, 1 RB



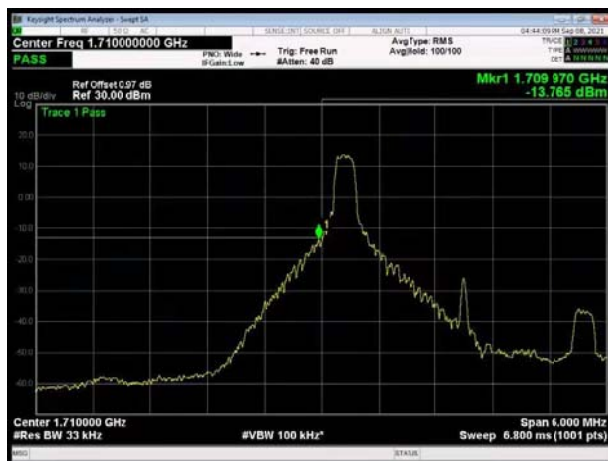
LTE Band 4 16QAM 1.4MHz CH-Low, 100%RB



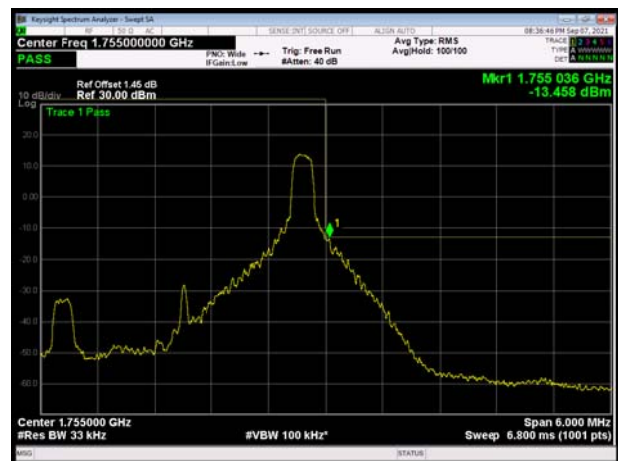
LTE Band 4 16QAM 1.4MHz CH-High, 100%RB



LTE Band 4 16QAM 3MHz CH-Low, 1 RB



LTE Band 4 16QAM 3MHz CH-High, 1 RB





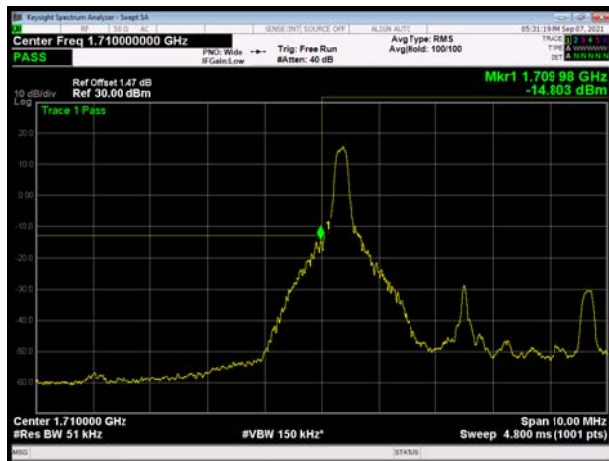
LTE Band 4 16QAM 3MHz CH-Low, 100%RB



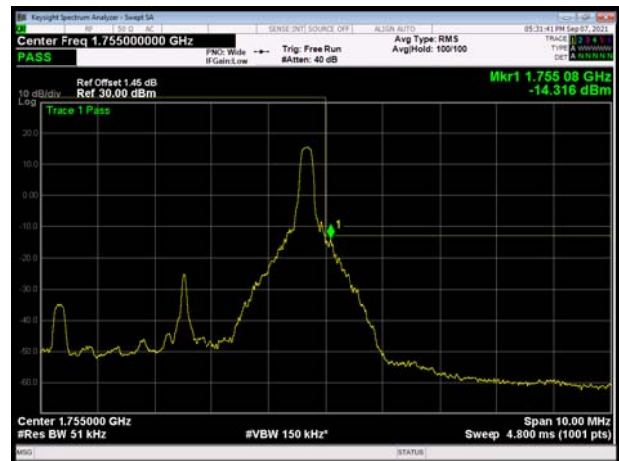
LTE Band 4 16QAM 3MHz CH-High, 100%RB



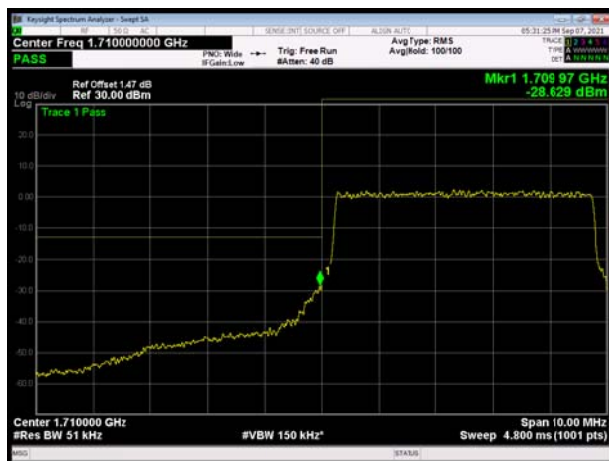
LTE Band 4 16QAM 5MHz CH-Low, 1 RB



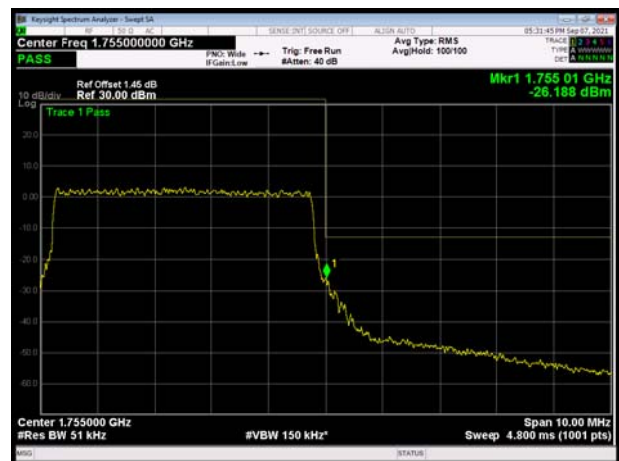
LTE Band 4 16QAM 5MHz CH-High, 1 RB



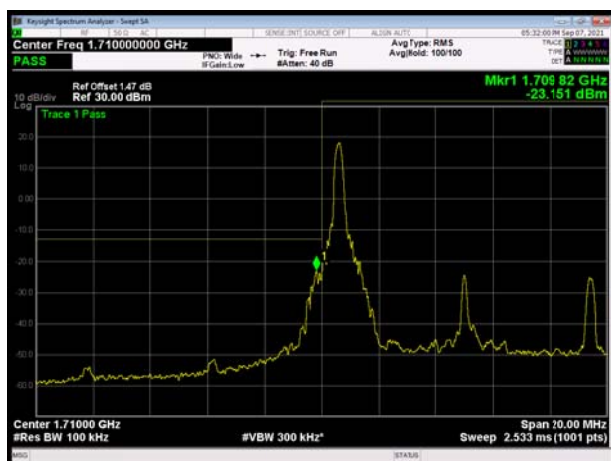
LTE Band 4 16QAM 5MHz CH-Low, 100%RB



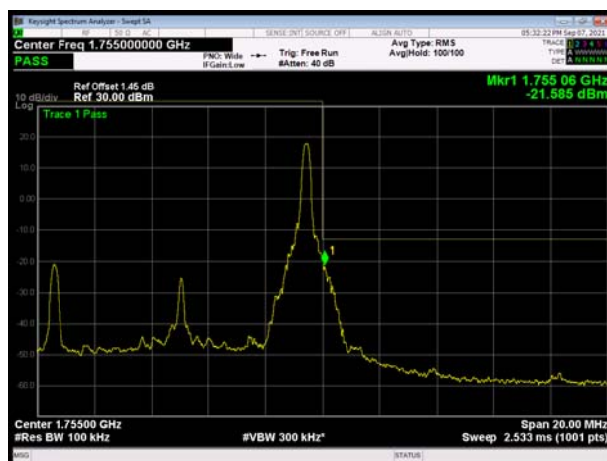
LTE Band 4 16QAM 5MHz CH-High, 100%RB



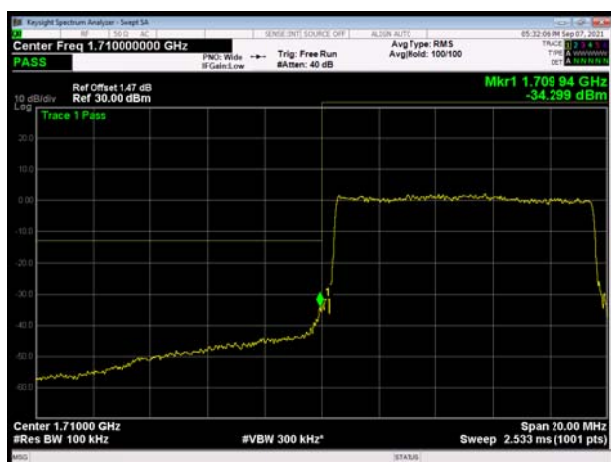
LTE Band 4 16QAM 10MHz CH-Low, 1 RB



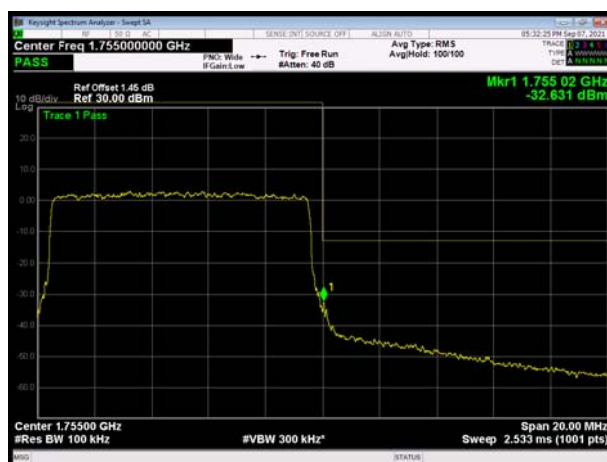
LTE Band 4 16QAM 10MHz CH-High, 1 RB



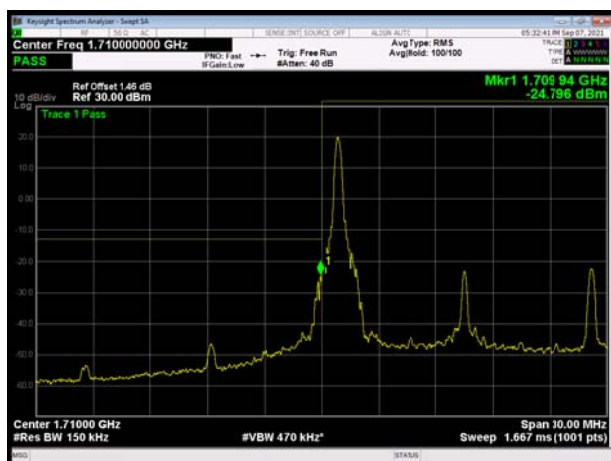
LTE Band 4 16QAM 10MHz CH-Low, 100%RB



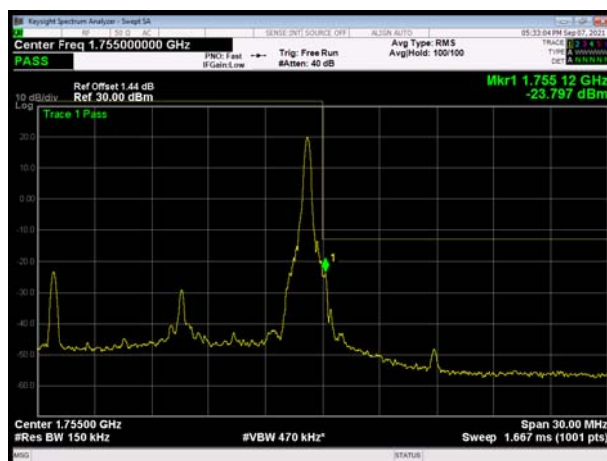
LTE Band 4 16QAM 10MHz CH-High, 100%RB



LTE Band 4 16QAM 15MHz CH-Low, 1 RB



LTE Band 4 16QAM 15MHz CH-High, 1 RB





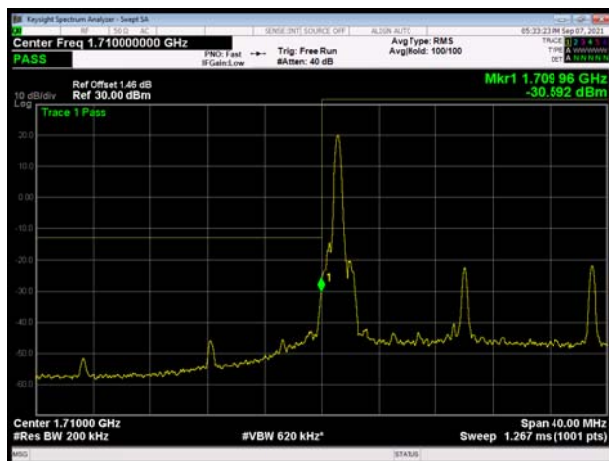
LTE Band 4 16QAM 15MHz CH-Low, 100%RB



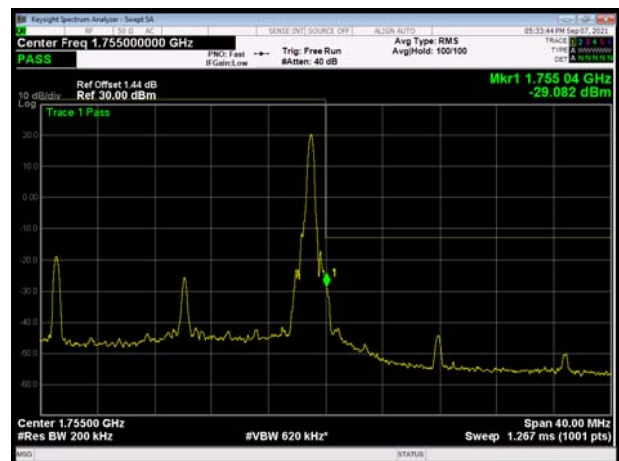
LTE Band 4 16QAM 15MHz CH-High, 100%RB



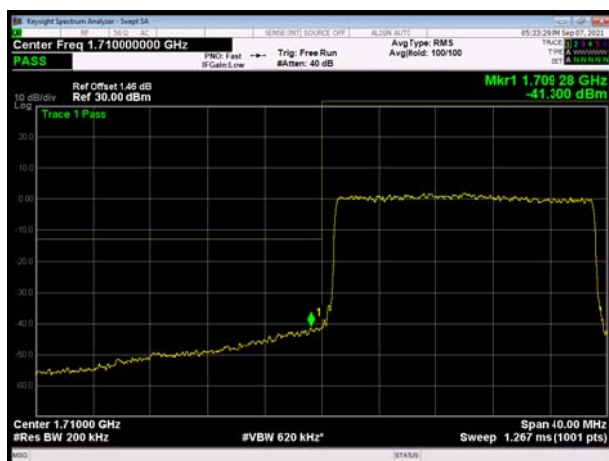
LTE Band 4 16QAM 20MHz CH-Low, 1 RB



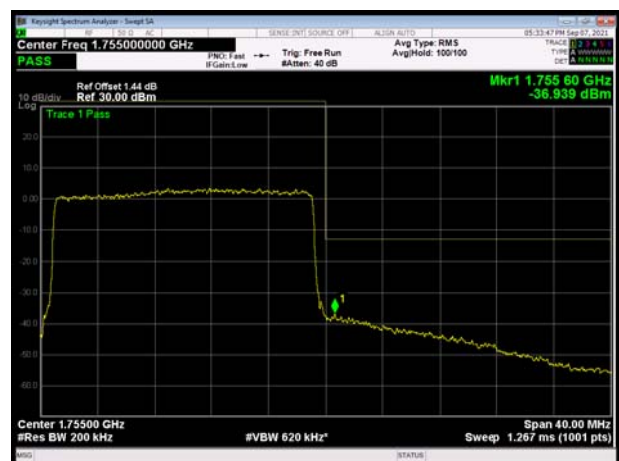
LTE Band 4 16QAM 20MHz CH-High, 1 RB



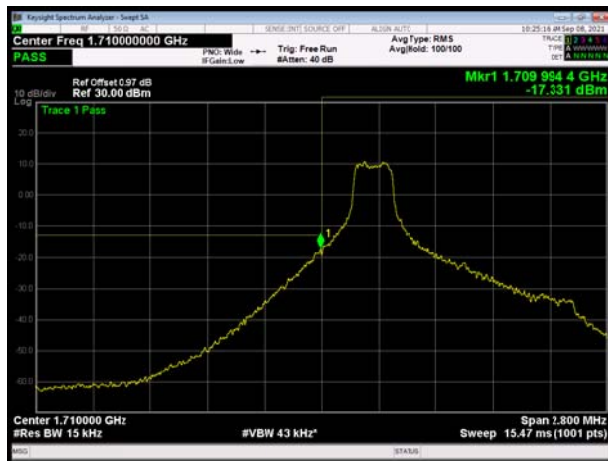
LTE Band 4 16QAM 20MHz CH-Low, 100%RB



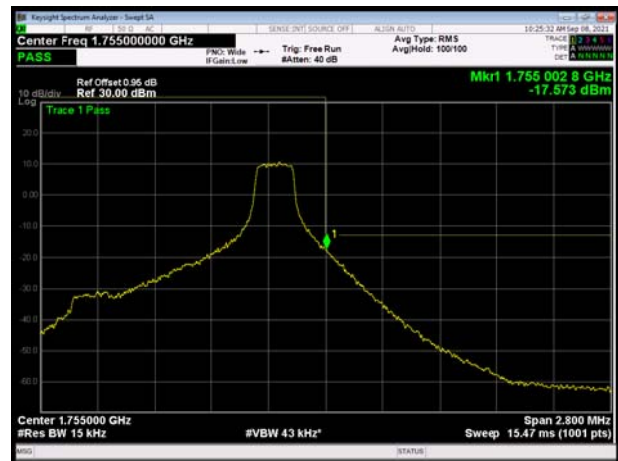
LTE Band 4 16QAM 20MHz CH-High, 100%RB



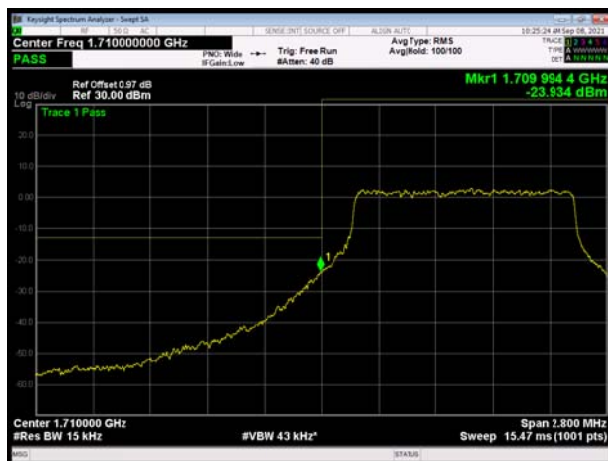
LTE Band 4 64QAM 1.4MHz CH-Low, 1 RB



LTE Band 4 64QAM 1.4MHz CH-High, 1 RB



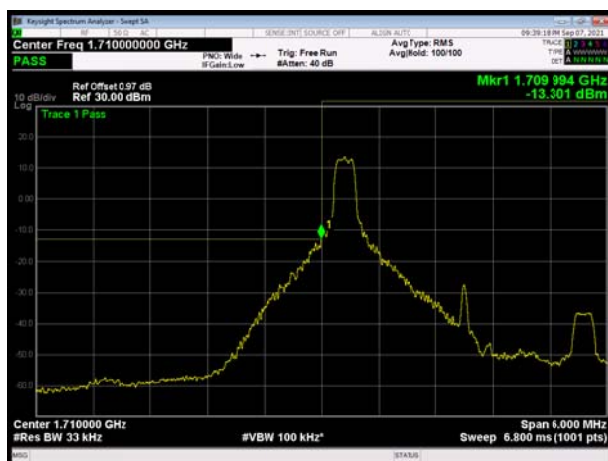
LTE Band 4 64QAM 1.4MHz CH-Low, 100%RB



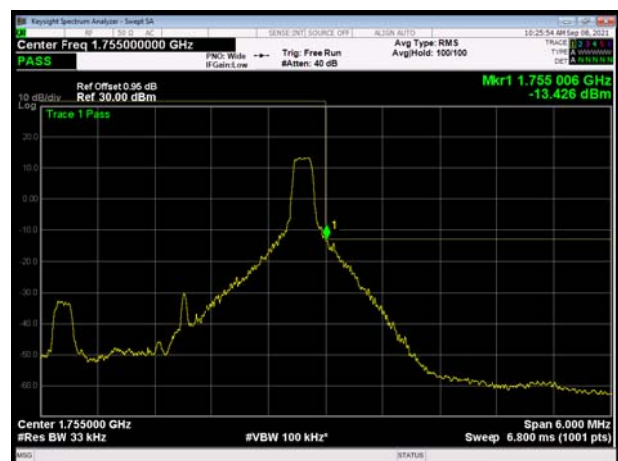
LTE Band 4 64QAM 1.4MHz CH-High, 100%RB



LTE Band 4 64QAM 3MHz CH-Low, 1 RB

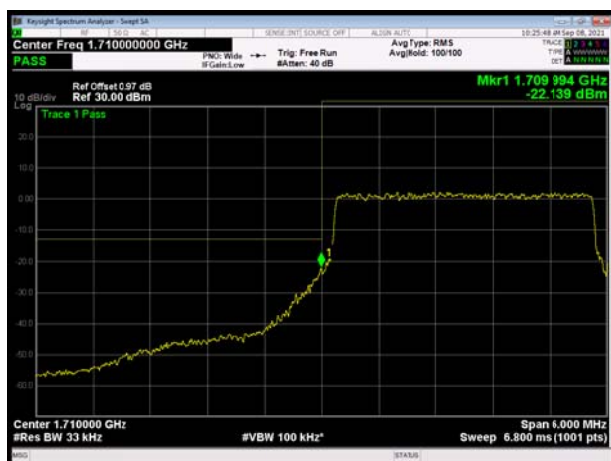


LTE Band 4 64QAM 3MHz CH-High, 1 RB





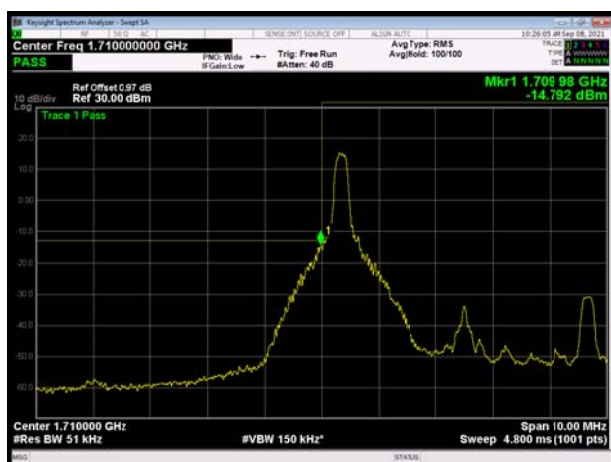
LTE Band 4 64QAM 3MHz CH-Low, 100%RB



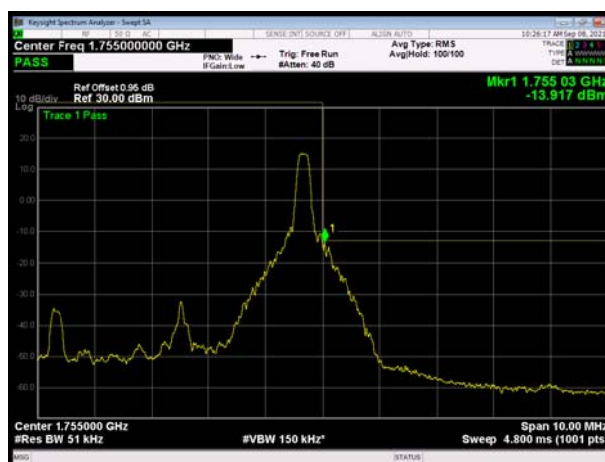
LTE Band 4 64QAM 3MHz CH-High, 100%RB



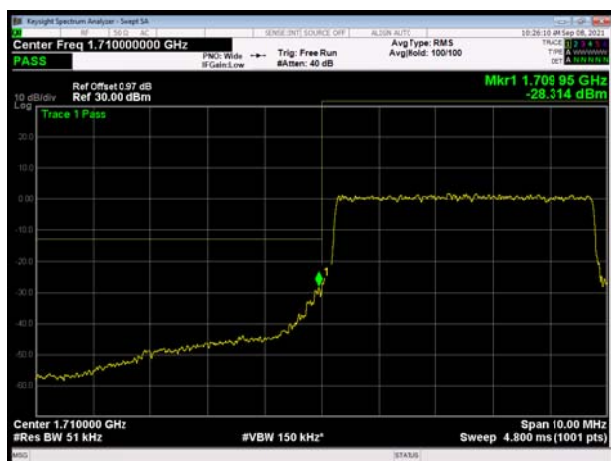
LTE Band 4 64QAM 5MHz CH-Low, 1 RB



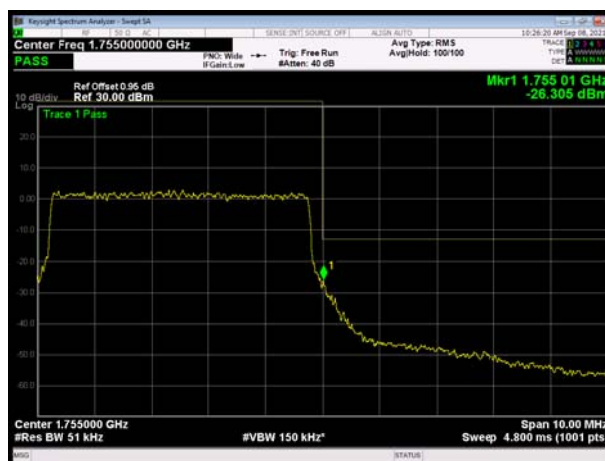
LTE Band 4 64QAM 5MHz CH-High, 1 RB



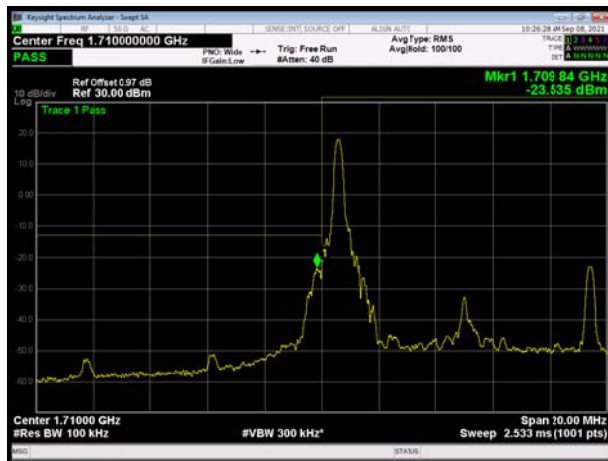
LTE Band 4 64QAM 5MHz CH-Low, 100%RB



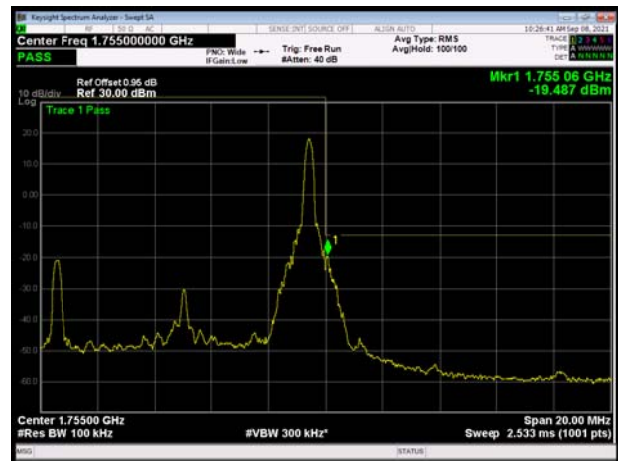
LTE Band 4 64QAM 5MHz CH-High, 100%RB



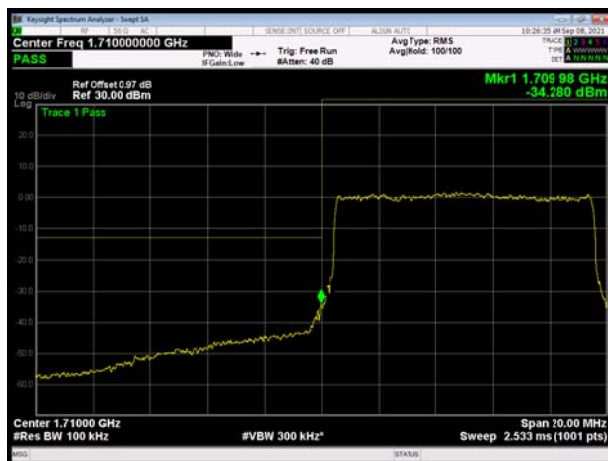
LTE Band 4 64QAM 10MHz CH-Low, 1 RB



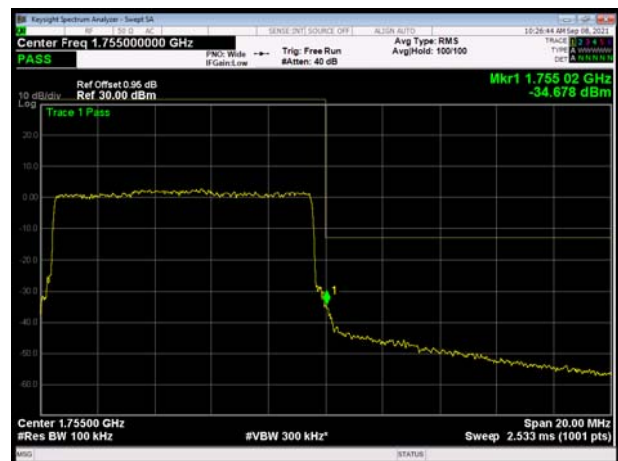
LTE Band 4 64QAM 10MHz CH-High, 1 RB



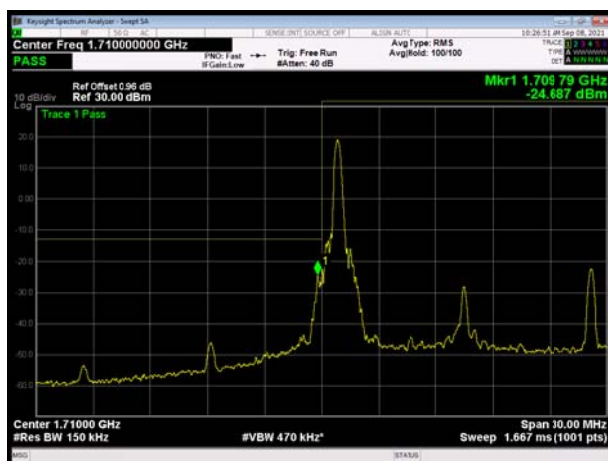
LTE Band 4 64QAM 10MHz CH-Low, 100%RB



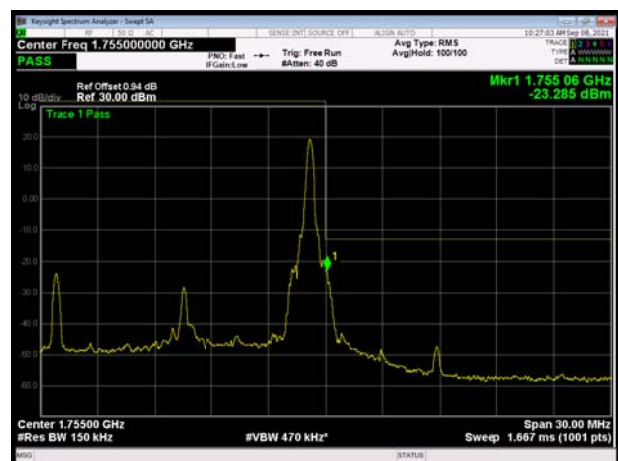
LTE Band 4 64QAM 10MHz CH-High, 100%RB



LTE Band 4 64QAM 15MHz CH-Low, 1 RB

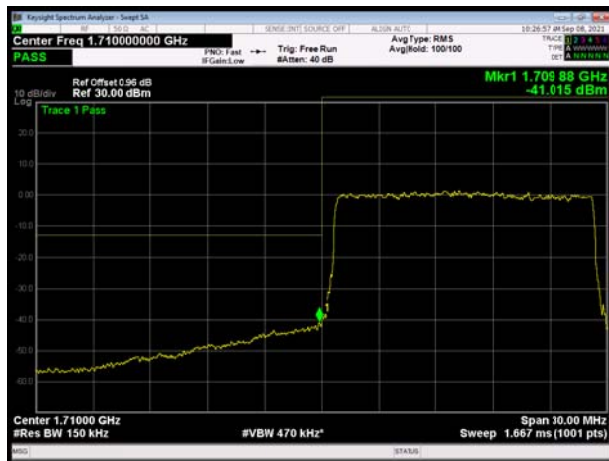


LTE Band 4 64QAM 15MHz CH-High, 1 RB





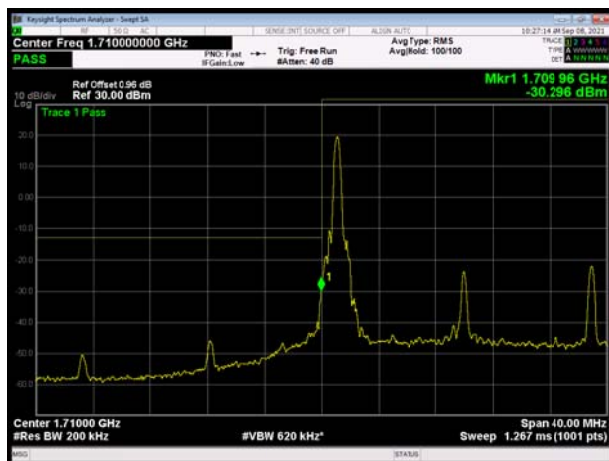
LTE Band 4 64QAM 15MHz CH-Low, 100%RB



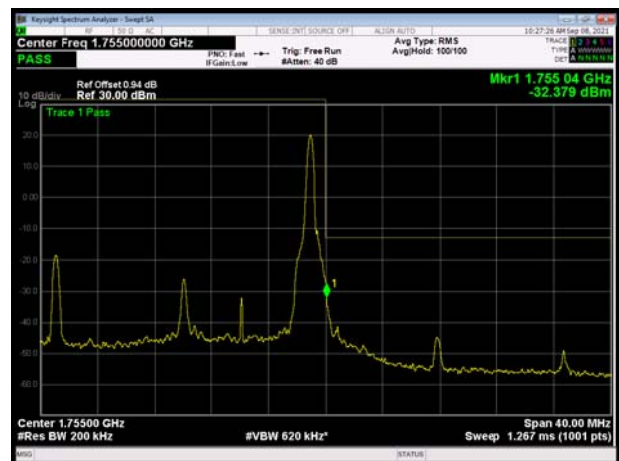
LTE Band 4 64QAM 15MHz CH-High, 100%RB



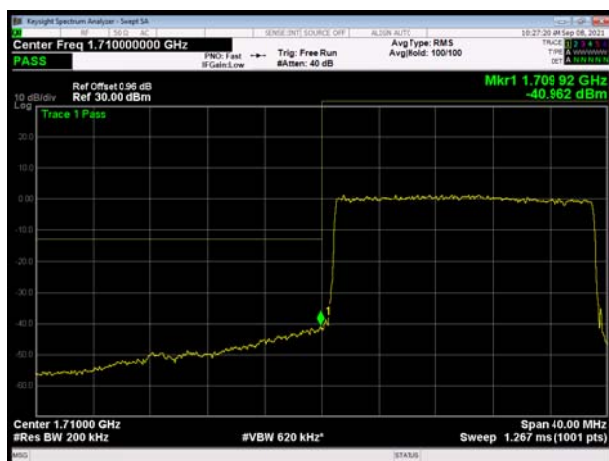
LTE Band 4 64QAM 20MHz CH-Low, 1 RB



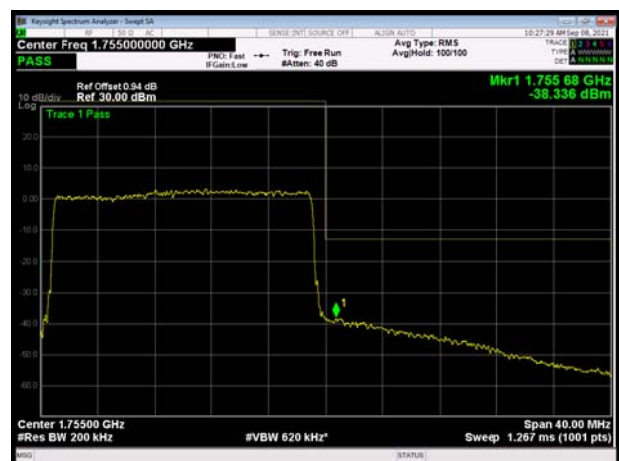
LTE Band 4 64QAM 20MHz CH-High, 1 RB



LTE Band 4 64QAM 20MHz CH-Low, 100%RB



LTE Band 4 64QAM 20MHz CH-High, 100%RB



5.4 Peak-to-Average Power Ratio (PAPR)

Ambient condition

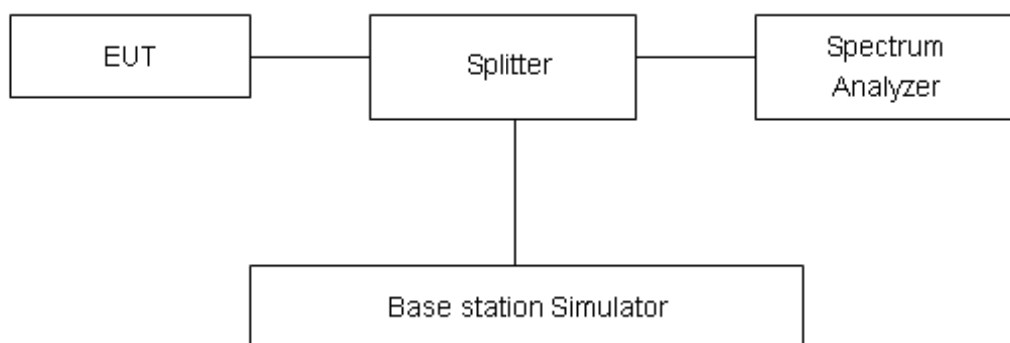
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

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

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

Test Setup



Limits

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. 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.

Measurement Uncertainty

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



Test Results

LTE Band 4								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	19957	1710.7	25.92	20.33	5.59	≤13	PASS
		20175	1732.5	24.76	19.24	5.52	≤13	PASS
		20393	1754.3	26.13	20.49	5.64	≤13	PASS
	3	19965	1711.5	25.86	20.26	5.60	≤13	PASS
		20175	1732.5	24.91	19.29	5.62	≤13	PASS
		20385	1753.5	26.10	20.51	5.59	≤13	PASS
	5	19975	1712.5	25.77	20.14	5.63	≤13	PASS
		20175	1732.5	25.03	19.35	5.68	≤13	PASS
		20375	1752.5	26.25	20.70	5.55	≤13	PASS
	10	20000	1715	25.24	19.66	5.58	≤13	PASS
		20175	1732.5	24.64	19.10	5.54	≤13	PASS
		20350	1750	26.37	20.95	5.42	≤13	PASS
	15	20025	1717.5	25.28	19.38	5.90	≤13	PASS
		20175	1732.5	25.03	19.13	5.90	≤13	PASS
		20325	1747.5	26.70	20.94	5.76	≤13	PASS
	20	20050	1720	25.19	19.68	5.51	≤13	PASS
		20175	1732.5	25.29	19.76	5.53	≤13	PASS
		20300	1745	26.70	21.19	5.51	≤13	PASS
16QAM	1.4	19957	1710.7	26.54	20.42	6.12	≤13	PASS
		20175	1732.5	25.66	19.22	6.44	≤13	PASS
		20393	1754.3	26.70	20.49	6.21	≤13	PASS
	3	19965	1711.5	26.47	20.23	6.24	≤13	PASS
		20175	1732.5	25.70	19.38	6.32	≤13	PASS
		20385	1753.5	26.70	20.42	6.28	≤13	PASS
	5	19975	1712.5	26.25	20.10	6.15	≤13	PASS
		20175	1732.5	25.56	19.30	6.26	≤13	PASS
		20375	1752.5	26.82	20.60	6.22	≤13	PASS
	10	20000	1715	25.81	19.62	6.19	≤13	PASS
		20175	1732.5	25.35	19.07	6.28	≤13	PASS
		20350	1750	27.05	20.95	6.10	≤13	PASS
	15	20025	1717.5	25.64	19.35	6.29	≤13	PASS
		20175	1732.5	25.53	19.22	6.31	≤13	PASS
		20325	1747.5	27.11	20.94	6.17	≤13	PASS
	20	20050	1720	25.87	19.63	6.24	≤13	PASS
		20175	1732.5	25.95	19.72	6.23	≤13	PASS
		20300	1745	27.38	21.19	6.19	≤13	PASS



64QAM	1.4	19957	1710.7	26.15	20.03	6.12	≤13	PASS
		20175	1732.5	25.42	18.97	6.45	≤13	PASS
		20393	1754.3	26.37	20.17	6.20	≤13	PASS
	3	19965	1711.5	26.18	19.95	6.23	≤13	PASS
		20175	1732.5	25.43	19.10	6.33	≤13	PASS
		20385	1753.5	26.57	20.26	6.31	≤13	PASS
	5	19975	1712.5	25.95	19.74	6.21	≤13	PASS
		20175	1732.5	25.51	19.21	6.30	≤13	PASS
		20375	1752.5	26.62	20.37	6.25	≤13	PASS
	10	20000	1715	25.59	19.38	6.21	≤13	PASS
		20175	1732.5	25.23	18.92	6.31	≤13	PASS
		20350	1750	26.64	20.51	6.13	≤13	PASS
	15	20025	1717.5	25.32	19.03	6.29	≤13	PASS
		20175	1732.5	25.22	18.92	6.30	≤13	PASS
		20325	1747.5	26.82	20.63	6.19	≤13	PASS
	20	20050	1720	25.67	19.44	6.23	≤13	PASS
		20175	1732.5	25.77	19.54	6.23	≤13	PASS
		20300	1745	27.10	20.88	6.22	≤13	PASS

5.5 Frequency Stability

Ambient condition

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

Method of Measurement

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +70°C in 10°C step size.

(1) With all power removed, the temperature was decreased to -10°C and permitted to stabilize for three hours.

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

(3) Repeat the above measurements at 10°C increments from -30°C to +70°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

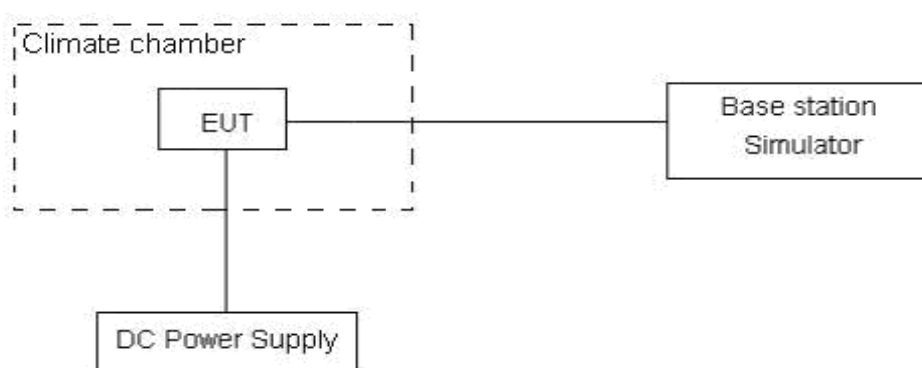
Frequency Stability (Voltage Variation)

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

Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 19 V and 24 V, with a nominal voltage of 30V.

Test setup



Limits

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Measurement Uncertainty

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



Test Result

Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	4.96	7.40	1.42	0.00286	0.00427	0.00082	PASS
Extreme (70℃)		16.19	8.07	13.34	0.00934	0.00466	0.00770	PASS
Extreme (60℃)		16.32	13.37	4.80	0.00942	0.00771	0.00277	PASS
Extreme (50℃)		16.31	9.44	4.08	0.00941	0.00545	0.00236	PASS
Extreme (40℃)		8.28	4.83	6.07	0.00478	0.00279	0.00350	PASS
Extreme (30℃)		9.22	6.41	9.01	0.00532	0.00370	0.00520	PASS
Extreme (20℃)		7.23	2.75	3.99	0.00417	0.00159	0.00230	PASS
Extreme (10℃)		12.99	13.08	2.05	0.00750	0.00755	0.00118	PASS
Extreme (0℃)		5.36	8.14	5.45	0.00309	0.00470	0.00314	PASS
Extreme (-10℃)		17.38	9.35	15.65	0.01003	0.00539	0.00903	PASS
Extreme (-20℃)		14.08	10.95	2.14	0.00813	0.00632	0.00124	PASS
Extreme (-30℃)		4.35	12.41	10.42	0.00251	0.00716	0.00601	PASS
25℃	LV	9.08	13.79	2.14	0.00524	0.00796	0.00124	PASS
	HV	10.86	8.41	7.98	0.00627	0.00485	0.00460	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	3.36	6.22	4.09	0.00194	0.00359	0.00236	PASS
Extreme (70℃)		11.44	17.49	12.60	0.00661	0.01010	0.00727	PASS
Extreme (60℃)		11.02	11.33	11.28	0.00636	0.00654	0.00651	PASS
Extreme (50℃)		14.30	8.37	11.60	0.00825	0.00483	0.00670	PASS
Extreme (40℃)		7.34	10.09	8.95	0.00424	0.00582	0.00516	PASS
Extreme (30℃)		17.51	7.07	11.81	0.01011	0.00408	0.00682	PASS
Extreme (20℃)		4.71	2.47	7.09	0.00272	0.00142	0.00409	PASS
Extreme (10℃)		1.65	12.53	4.36	0.00095	0.00723	0.00251	PASS
Extreme (0℃)		8.13	11.67	13.42	0.00469	0.00674	0.00774	PASS
Extreme (-10℃)		6.24	5.04	6.06	0.00360	0.00291	0.00350	PASS
Extreme (-20℃)		2.29	12.94	12.63	0.00132	0.00747	0.00729	PASS
Extreme (-30℃)		11.46	10.12	8.21	0.00661	0.00584	0.00474	PASS
25℃	LV	17.98	7.99	8.29	0.01038	0.00461	0.00478	PASS
	HV	13.88	17.88	10.27	0.00801	0.01032	0.00593	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							



Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	5.10	5.32	3.17	0.00295	0.00307	0.00183	PASS
Extreme (70℃)		11.50	7.73	5.68	0.00664	0.00446	0.00328	PASS
Extreme (60℃)		17.84	11.04	13.48	0.01030	0.00637	0.00778	PASS
Extreme (50℃)		12.65	3.57	6.30	0.00730	0.00206	0.00364	PASS
Extreme (40℃)		10.15	1.58	17.04	0.00586	0.00091	0.00983	PASS
Extreme (30℃)		3.51	9.03	11.41	0.00203	0.00521	0.00659	PASS
Extreme (20℃)		15.32	13.29	13.83	0.00884	0.00767	0.00798	PASS
Extreme (10℃)		6.28	2.39	14.03	0.00363	0.00138	0.00810	PASS
Extreme (0℃)		1.53	7.68	5.88	0.00088	0.00443	0.00339	PASS
Extreme (-10℃)		2.09	5.89	10.03	0.00121	0.00340	0.00579	PASS
Extreme (-20℃)		8.85	2.25	13.52	0.00511	0.00130	0.00780	PASS
Extreme (-30℃)		16.75	9.22	15.22	0.00967	0.00532	0.00878	PASS
25℃	LV	9.25	4.09	14.89	0.00534	0.00236	0.00860	PASS
	HV	15.48	1.95	15.99	0.00893	0.00113	0.00923	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	17.99	8.95	5.28	0.01038	0.00516	0.00305	PASS
Extreme (70℃)		15.67	17.76	14.34	0.00904	0.01025	0.00828	PASS
Extreme (60℃)		1.94	1.11	9.99	0.00112	0.00064	0.00577	PASS
Extreme (50℃)		12.71	5.70	3.18	0.00734	0.00329	0.00184	PASS
Extreme (40℃)		17.16	8.57	2.24	0.00991	0.00495	0.00129	PASS
Extreme (30℃)		3.18	16.15	9.28	0.00184	0.00932	0.00536	PASS
Extreme (20℃)		10.70	8.11	10.11	0.00618	0.00468	0.00583	PASS
Extreme (10℃)		15.04	2.57	15.11	0.00868	0.00148	0.00872	PASS
Extreme (0℃)		3.91	14.15	4.37	0.00226	0.00817	0.00253	PASS
Extreme (-10℃)		14.91	5.59	3.99	0.00861	0.00322	0.00230	PASS
Extreme (-20℃)		6.93	11.61	15.04	0.00400	0.00670	0.00868	PASS
Extreme (-30℃)		15.67	9.49	1.36	0.00904	0.00548	0.00078	PASS
25℃	LV	1.59	11.30	1.50	0.00092	0.00652	0.00086	PASS
	HV	11.04	6.89	8.76	0.00637	0.00398	0.00506	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	14.35	17.17	1.34	0.00828	0.00991	0.00077	PASS
Extreme (70℃)		6.71	16.60	17.90	0.00387	0.00958	0.01033	PASS
Extreme (60℃)		9.49	6.74	10.43	0.00548	0.00389	0.00602	PASS
Extreme (50℃)		11.68	8.52	5.56	0.00674	0.00492	0.00321	PASS



Extreme (40℃)		1.20	2.13	13.02	0.00069	0.00123	0.00751	PASS
Extreme (30℃)		7.23	11.99	15.44	0.00417	0.00692	0.00891	PASS
Extreme (20℃)		6.43	11.44	4.11	0.00371	0.00660	0.00237	PASS
Extreme (10℃)		9.29	5.45	1.34	0.00536	0.00315	0.00077	PASS
Extreme (0℃)		9.55	16.79	5.23	0.00551	0.00969	0.00302	PASS
Extreme (-10℃)		11.55	10.95	6.33	0.00667	0.00632	0.00365	PASS
Extreme (-20℃)		2.10	11.47	9.39	0.00121	0.00662	0.00542	PASS
Extreme (-30℃)		10.03	3.70	4.81	0.00579	0.00213	0.00278	PASS
25℃	LV	8.07	8.04	6.79	0.00466	0.00464	0.00392	PASS
	HV	15.62	8.02	5.87	0.00901	0.00463	0.00339	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	11.93	2.70	7.60	0.00689	0.00156	0.00439	PASS
Extreme (70℃)		5.73	5.48	4.40	0.00331	0.00316	0.00254	PASS
Extreme (60℃)		14.86	1.59	6.31	0.00858	0.00092	0.00364	PASS
Extreme (50℃)		14.24	8.41	16.38	0.00822	0.00486	0.00946	PASS
Extreme (40℃)		6.03	5.73	10.90	0.00348	0.00331	0.00629	PASS
Extreme (30℃)		12.66	1.01	5.82	0.00731	0.00058	0.00336	PASS
Extreme (20℃)		5.80	16.41	9.13	0.00335	0.00947	0.00527	PASS
Extreme (10℃)		5.52	17.66	16.66	0.00319	0.01020	0.00962	PASS
Extreme (0℃)		16.87	6.48	5.36	0.00974	0.00374	0.00309	PASS
Extreme (-10℃)		6.48	16.93	8.00	0.00374	0.00977	0.00462	PASS
Extreme (-20℃)		14.23	15.27	8.73	0.00821	0.00881	0.00504	PASS
Extreme (-30℃)		16.51	10.38	10.28	0.00953	0.00599	0.00593	PASS
25℃	LV	4.18	13.39	15.90	0.00241	0.00773	0.00918	PASS
	HV	9.20	7.79	12.12	0.00531	0.00449	0.00699	PASS

5.6 Spurious Emissions at Antenna Terminals

Ambient condition

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

Method of Measurement

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

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

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

RBW is set to 1 kHz (0.009MHz~ 0.15 MHz),

RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

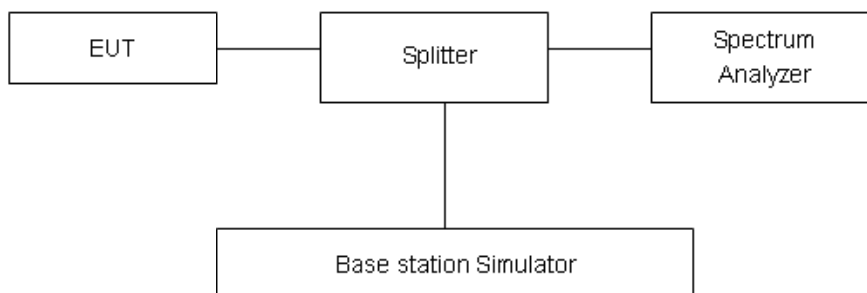
RBW is set to 100 kHz (30MHz~1000 MHz)

RBW is set to 1000 kHz (above 1000MHz)

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.

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

Test setup



Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB..”

Part 27.53(h) Limit	-13 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal



distribution is with the coverage factor $k = 1.96$.

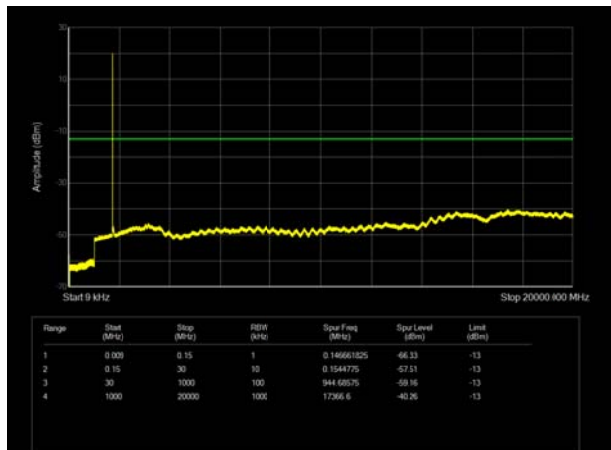
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-27GHz	1.407 dB

Test Result

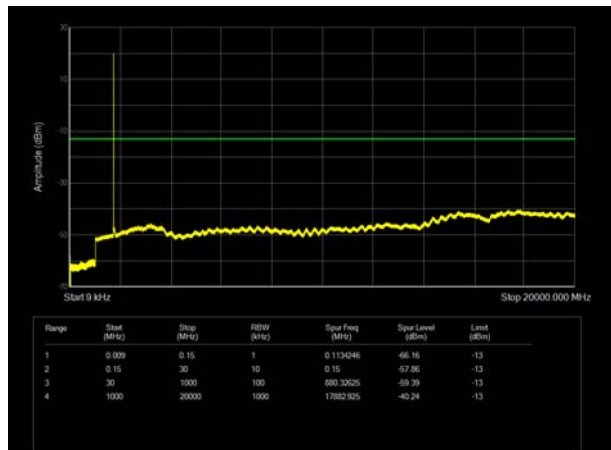
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

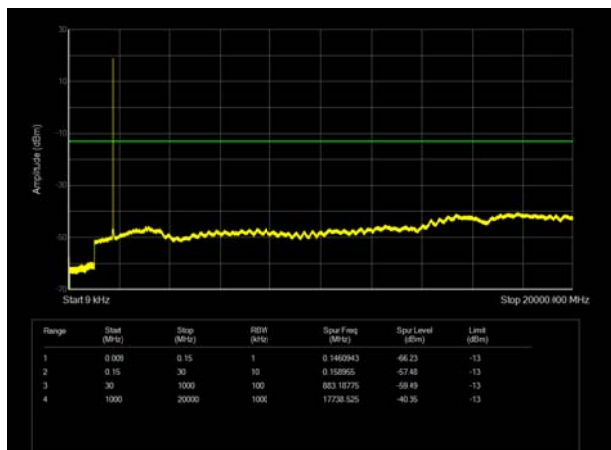
LTE Band 4 1.4MHz CH-Low 9kHz~20GHz



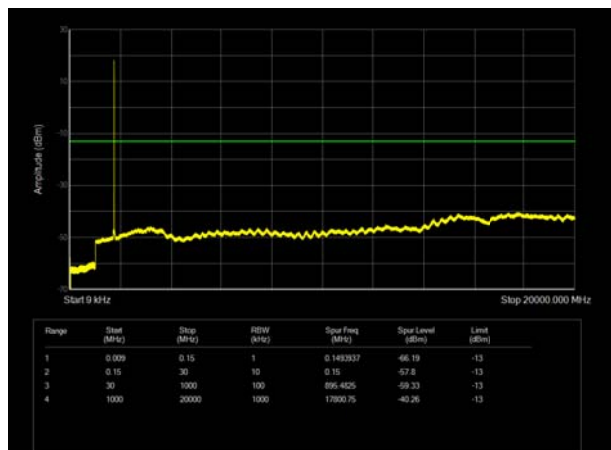
LTE Band 4 3MHz CH- Low 9kHz~20GHz



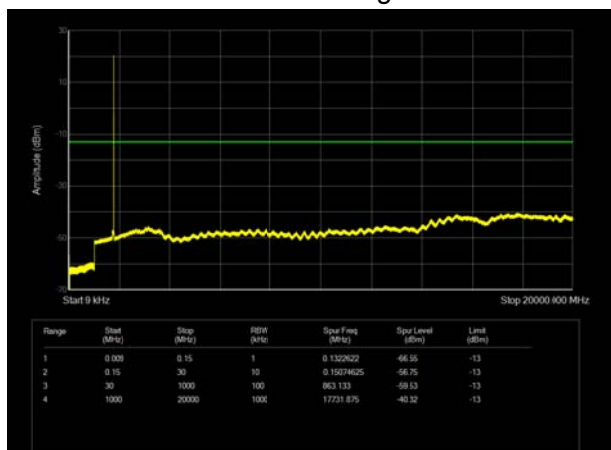
LTE Band 4 1.4MHz CH- Middle 9kHz~20GHz



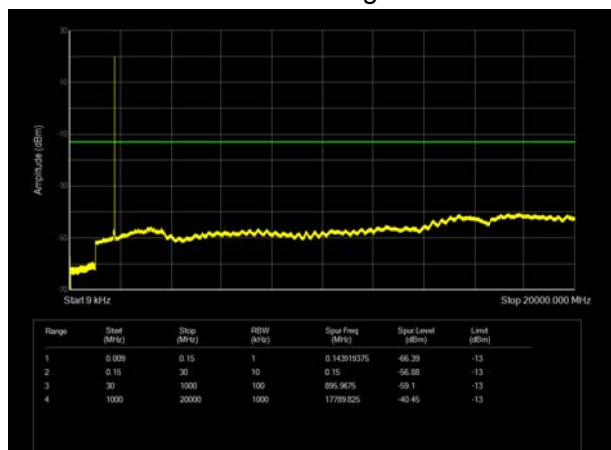
LTE Band 4 3MHz CH- Middle 9kHz~20GHz



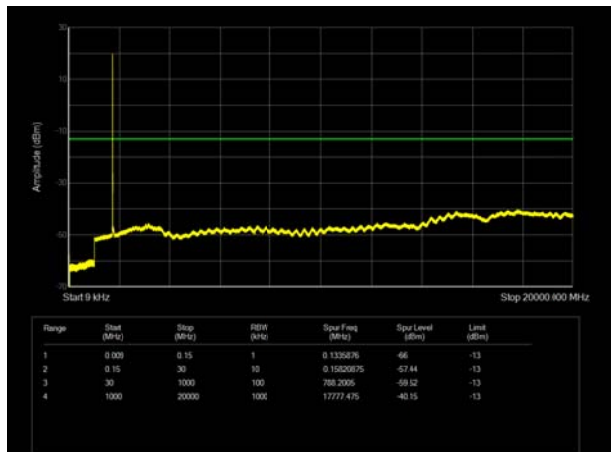
LTE Band 4 1.4MHz CH- High 9kHz~20GHz



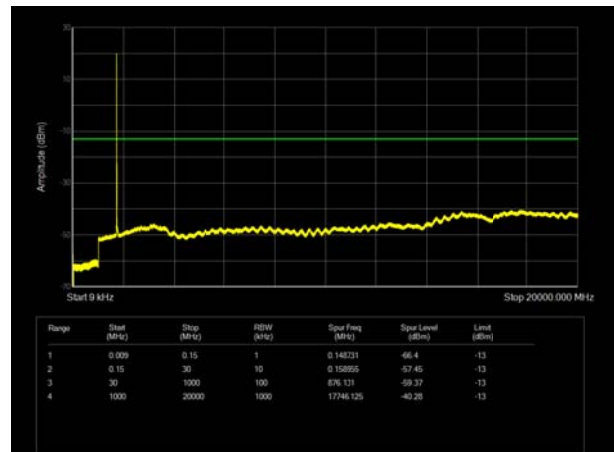
LTE Band 4 3MHz CH-High 9kHz~20GHz



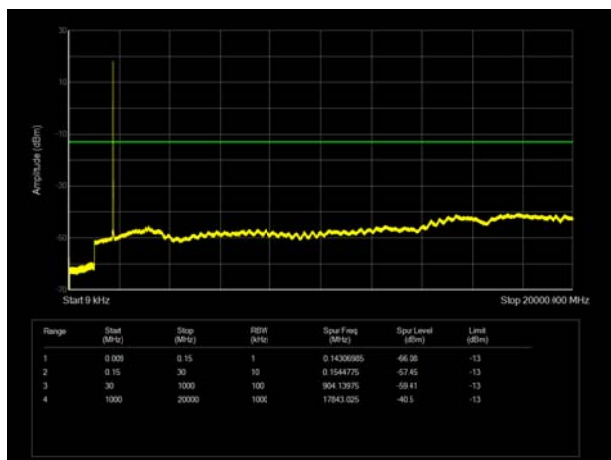
LTE Band 4 5MHz CH- Low 9kHz~20GHz



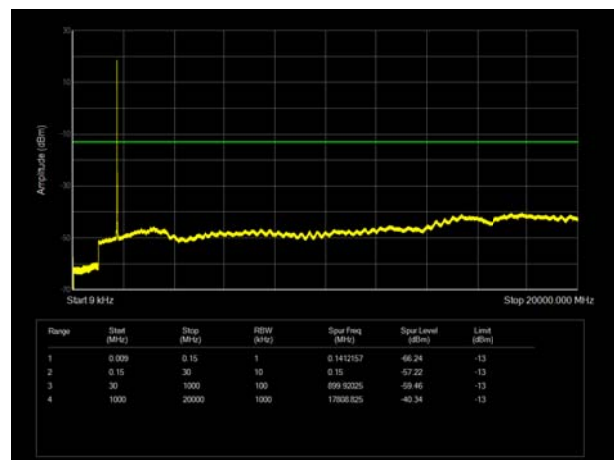
LTE Band 4 10MHz CH-Low 9kHz~20GHz



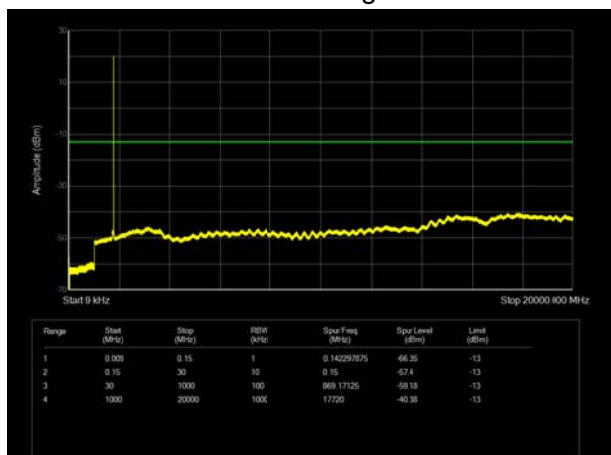
LTE Band 4 5MHz CH- Middle 9kHz~20GHz



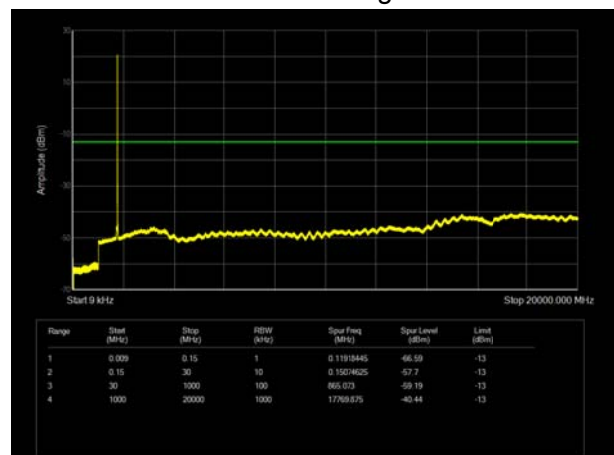
LTE Band 4 10MHz CH- Middle 9kHz~20GHz



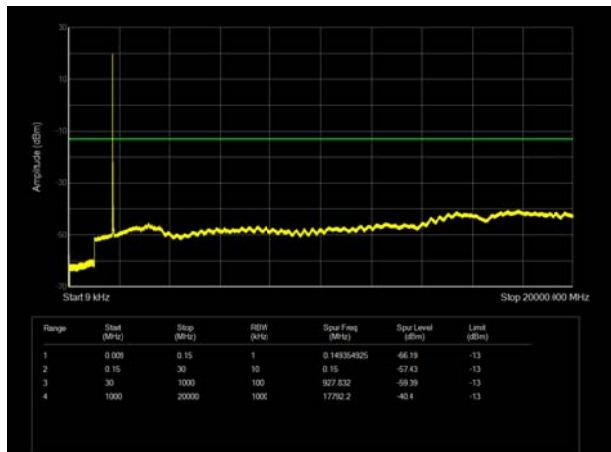
LTE Band 4 5MHz CH-High 9kHz~20GHz



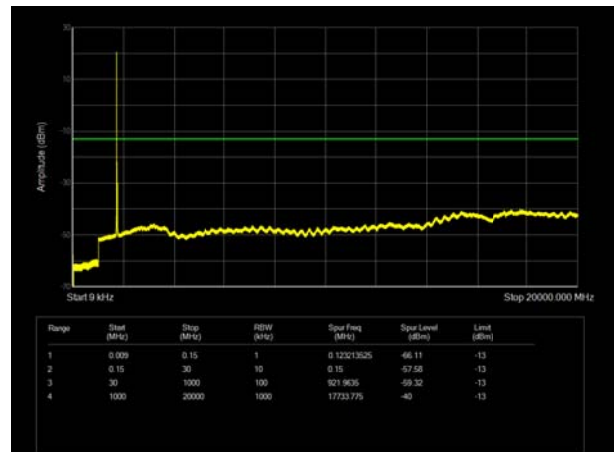
LTE Band 4 10MHz CH- High 9kHz~20GHz



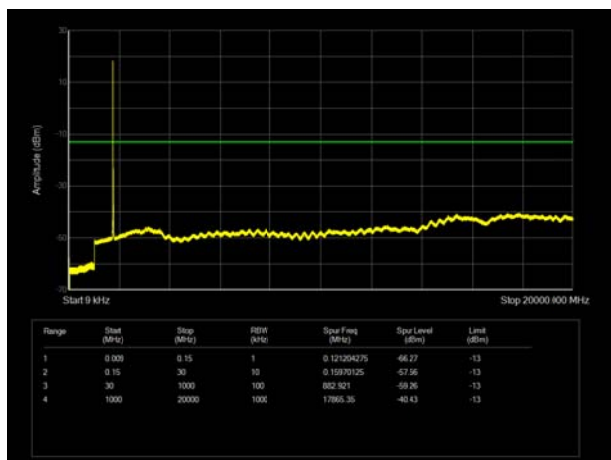
LTE Band 4 15MHz CH- Low 9kHz~20GHz



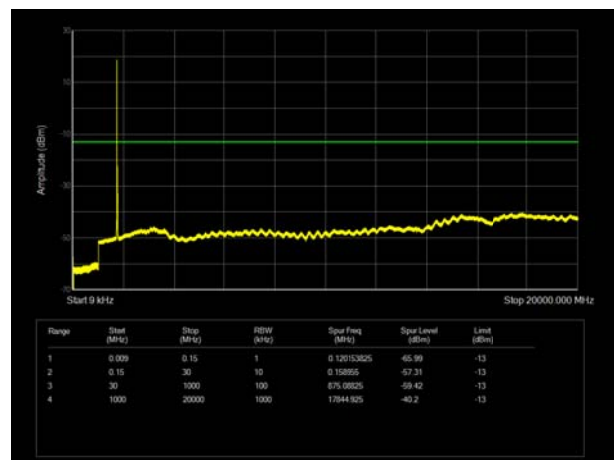
LTE Band 4 20MHz CH-Low 9kHz~20GHz



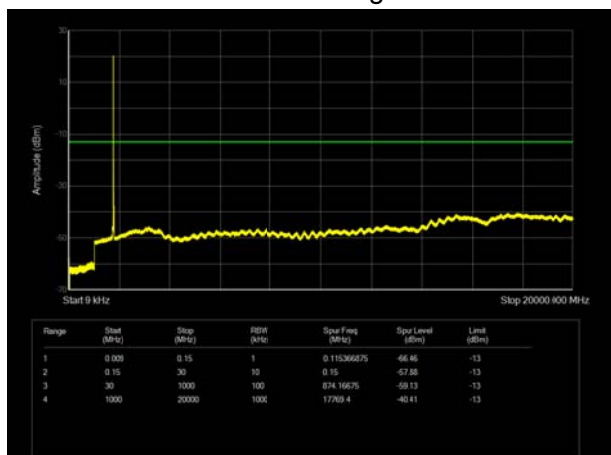
LTE Band 4 15MHz CH- Middle 9kHz~20GHz



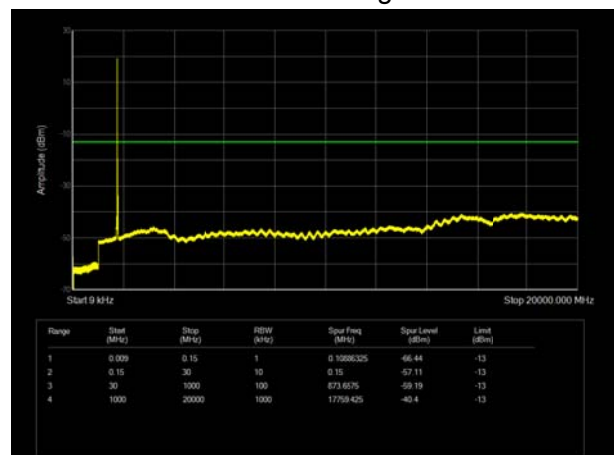
LTE Band 4 20MHz CH- Middle 9kHz~20GHz



LTE Band 4 15MHz CH-High 9kHz~20GHz



LTE Band 4 20MHz CH- High 9kHz~20GHz



5.7 Radiates Spurious Emission

Ambient condition

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

Method of Measurement

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=100kHz, VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, and the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:

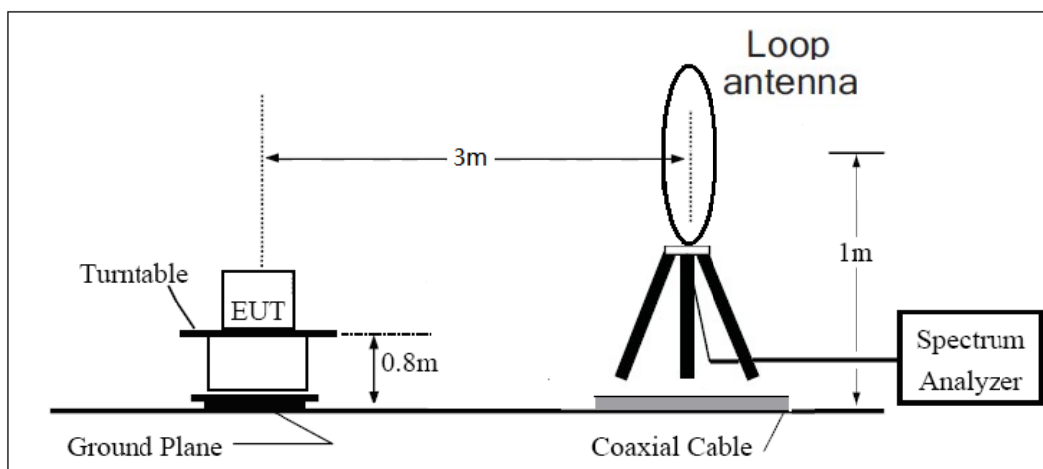
$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
The measurement results are amend as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.

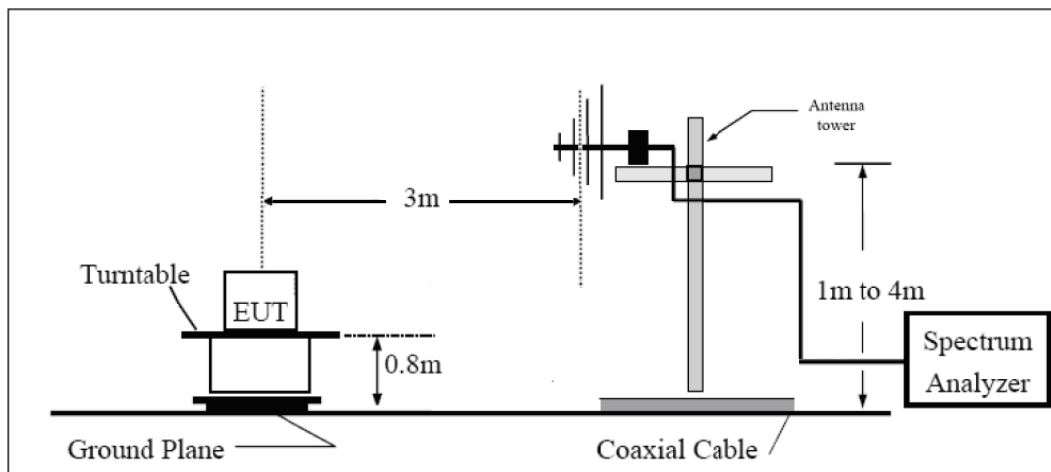
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

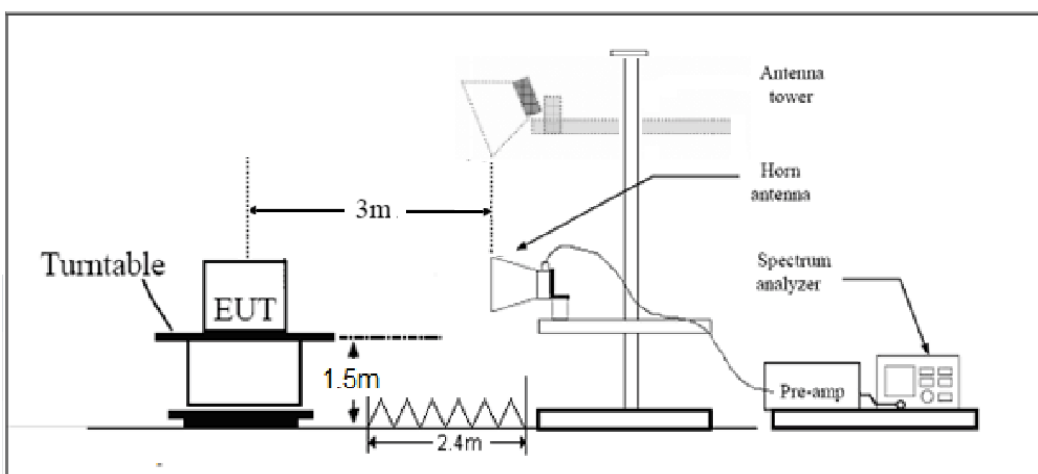
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Limits



Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.”

Part 27.53(h) 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 $k = \pm 1.96$, $U = \pm 3.55$ dB.

**Test Result**

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

LTE Band 4 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3463.90	-59.36	2.70	12.70	Horizontal	-49.36	-13.00	36.36	225
3	5196.20	-54.32	3.20	12.50	Horizontal	-45.02	-13.00	32.02	225
4	6928.00	-49.83	4.20	11.80	Horizontal	-42.23	-13.00	29.23	225
5	8660.00	-53.48	4.40	12.50	Horizontal	-45.38	-13.00	32.38	0
6	10395.00	-53.86	4.70	11.30	Horizontal	-47.26	-13.00	34.26	225
7	12127.50	-54.27	5.20	13.80	Horizontal	-45.67	-13.00	32.67	135
8	13860.00	-48.46	5.70	11.30	Horizontal	-42.86	-13.00	29.86	90
9	15592.50	-58.08	6.10	16.80	Horizontal	-47.38	-13.00	34.38	45
10	17325.00	-50.99	6.10	14.20	Horizontal	-42.89	-13.00	29.89	315

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

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

LTE Band 4 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3460.50	-60.63	2.70	12.70	Horizontal	-50.63	-13.00	37.63	315
3	5191.50	-52.07	3.20	12.50	Horizontal	-42.77	-13.00	29.77	0
4	6930.00	-50.47	4.20	11.80	Horizontal	-42.87	-13.00	29.87	225
5	8662.50	-53.22	4.40	12.50	Horizontal	-45.12	-13.00	32.12	315
6	10395.00	-53.62	4.70	11.30	Horizontal	-47.02	-13.00	34.02	45
7	12127.50	-55.14	5.20	13.80	Horizontal	-46.54	-13.00	33.54	135
8	13860.00	-48.79	5.70	11.30	Horizontal	-43.19	-13.00	30.19	90
9	15592.50	-57.33	6.10	16.80	Horizontal	-46.63	-13.00	33.63	315
10	17325.00	-50.88	6.10	14.20	Horizontal	-42.78	-13.00	29.78	0

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

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



LTE Band 4 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3465.00	-63.58	2.70	12.70	Horizontal	-53.58	-13.00	40.58	90
3	5170.88	-53.06	3.20	12.50	Horizontal	-43.76	-13.00	30.76	135
4	6930.00	-51.57	4.20	11.80	Horizontal	-43.97	-13.00	30.97	0
5	8662.50	-54.76	4.40	12.50	Horizontal	-46.66	-13.00	33.66	0
6	10395.00	-54.13	4.70	11.30	Horizontal	-47.53	-13.00	34.53	135
7	12127.50	-55.67	5.20	13.80	Horizontal	-47.07	-13.00	34.07	45
8	13860.00	-49.24	5.70	11.30	Horizontal	-43.64	-13.00	30.64	135
9	15592.50	-57.85	6.10	16.80	Horizontal	-47.15	-13.00	34.15	90
10	17325.00	-52.11	6.10	14.20	Horizontal	-44.01	-13.00	31.01	225

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

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



6 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMU200	118133	2021-05-15	2022-05-14
Base Station Simulator	R&S	CMW500	113824	2021-05-15	2022-05-14
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2021-05-15	2022-05-14
Universal Radio Communication Tester	Key sight	E5515C	MY48367192	2021-05-15	2022-05-14
Signal Analyzer	R&S	FSV3030	101411	2020-12-13	2021-12-12
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	391	2019-12-16	2022-12-15
Horn Antenna	R&S	HF907	102723	2020-08-11	2023-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2021-06-19	2023-06-18
Signal generator	R&S	SMB 100A	102594	2021-05-15	2022-05-14
Climatic Chamber	ESPEC	SU-242	93000506	2020-12-13	2021-12-12
Climatic Chamber	Weiss	VT4002	58226119450 010	2021-05-15	2022-05-14
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2021-06-09	2021-12-08
RF Cable	Agilent	SMA 15cm	0001	2021-06-09	2021-12-08
Software	R&S	EMC32	9.26.0	/	/

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



ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.