ACCREDITED
TESTING LABORATORY
CERTIFICATE # 4821.01

BACL
Bay Area Compliance Labs Corp.

FCC PART 22H

TEST REPORT

For

LAVA International Limited

A-56, Sector 64, Noida 201301, U.P.,India

FCC ID: 2ARTXZ612GB

Report Type:	**Product Type:**
Original Report	Mobile Phone

Report Number: RSZ181113001-00D

Report Date: 2018-11-20

Reviewed By: Rocky Kang, RF Engineer

Prepared By: Bay Area Compliance Laboratories Corp. (Shenzhen)
6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China
Tel: +86-755-33320018
Fax: +86-755-33320008
www.baclcorp.com.cn

Note: This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA* or any agency of the Federal Government. * This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "*".

TABLE OF CONTENTS

GENERAL INFORMATION **4**
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 4
OBJECTIVE 4
RELATED SUBMITTAL(S)/GRANT(S) 4
TEST METHODOLOGY 4
MEASUREMENT UNCERTAINTY 5
TEST FACILITY 5
SYSTEM TEST CONFIGURATION **6**
DESCRIPTION OF TEST CONFIGURATION 6
EQUIPMENT MODIFICATIONS 6
SUPPORT EQUIPMENT LIST AND DETAILS 6
BLOCK DIAGRAM OF TEST SETUP 6
SUMMARY OF TEST RESULTS **7**
TEST EQUIPMENT LIST **8**
FCC §1.1307(B) & §2.1093 - RF EXPOSURE INFORMATION **9**
APPLICABLE STANDARD 9
TEST RESULT 9
FCC §2.1047 - MODULATION CHARACTERISTIC **10**
FCC § 2.1046, § 22.913 (A) - RF OUTPUT POWER **11**
APPLICABLE STANDARD 11
TEST PROCEDURE 11
TEST DATA 11
FCC §2.1049, §22.917, §22.905 - OCCUPIED BANDWIDTH **16**
APPLICABLE STANDARD 16
TEST PROCEDURE 16
TEST DATA 16
FCC §2.1051, §22.917(A) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS **22**
APPLICABLE STANDARD 22
TEST PROCEDURE 22
TEST DATA 22
FCC § 2.1053; § 22.917 (A) SPURIOUS RADIATED EMISSIONS **27**
APPLICABLE STANDARD 27
TEST PROCEDURE 27
TEST DATA 27
FCC § 22.917 (A)- BAND EDGES **29**
APPLICABLE STANDARD 29
TEST PROCEDURE 29
TEST DATA 29
FCC § 2.1055; § 22.355 - FREQUENCY STABILITY **38**
APPLICABLE STANDARD 38

TEST PROCEDURE 38
TEST DATA 39

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *LAVA International Limited's* product, model number: *Z61_2GB (FCC ID: 2ARTXZ612GB)* or the "EUT" in this report was a *Mobile Phone*, which was measured approximately: 14.5 cm (L) * 6.9 cm (W) *0.9 cm (H), rated with input voltage: DC 3.85 V battery.

**All measurement and test data in this report was gathered from production sample serial number: 181113001. (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2018-11-13.*

Objective

This test report is prepared on behalf of *LAVA International Limited* in accordance with Part 2-Subpart J, Part 22-Subpart H of the Federal Communication Commissions rules.

The objective is to determine the compliance of the EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability and band edge.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS & DTS submissions with FCC ID: 2ARTXZ612GB.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2-Subpart J as well as the following parts:

Part 22 Subpart H - Public Mobile Services

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF output power, conducted		±1.5dB
Unwanted Emission, conducted		±1.5dB
Emissions, radiated	Below 1GHz	±4.70dB
	Above 1GHz	±4.80dB
Temperature		±1℃
Supply voltages		±0.4%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing according to TIA/EIA-603-D.

The final qualification test was performed with the EUT operating at normal mode.

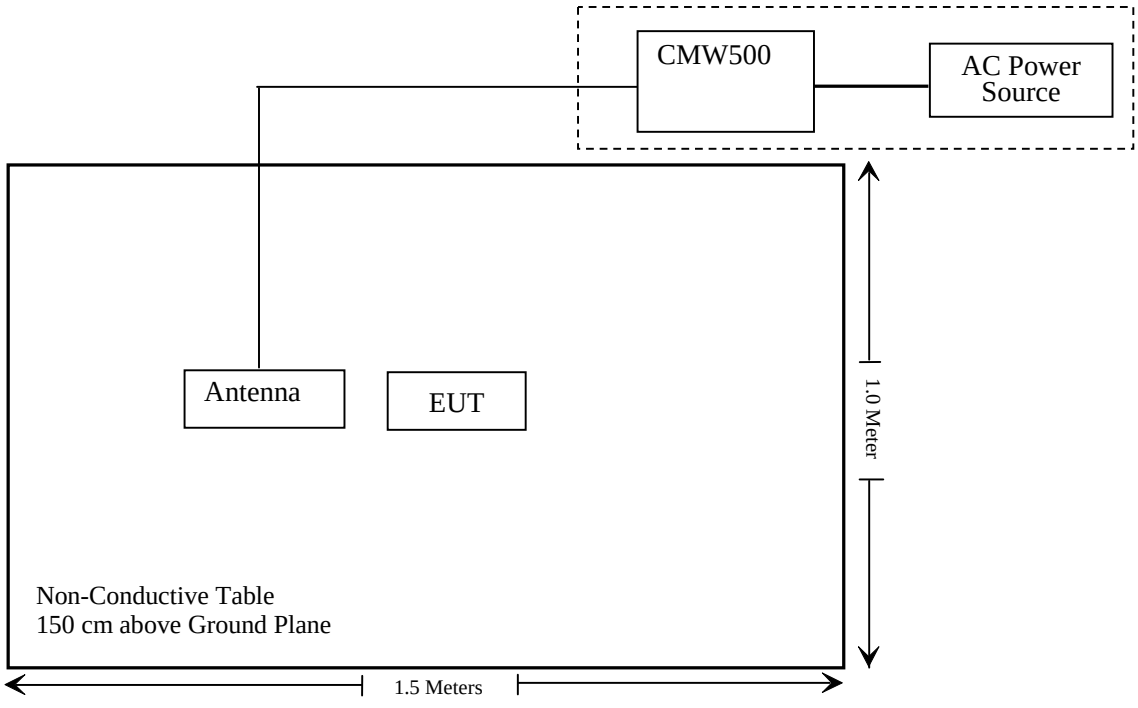
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-116218-UY

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a);	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917;	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a);	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a);	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a);	Band Edge	Compliance
§ 2.1055; § 22.355;	Frequency stability	Compliance

Note: * Please refer to SAR report released by BACL, report number: RSZ181113001-SA.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017-12-22	2020-12-21
Rohde & Schwarz	Signal Analyzer	FSEM	845987/005	2018-06-23	2019-06-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
COM-POWER	Pre-amplifier	PA-122	181919	2018-05-22	2018-11-22
Sonoma instrument	Amplifier	310N	186238	2018-11-12	2019-11-12
Anritsu	Signal Generator	68369B	004114	2017-12-24	2018-12-24
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2018-01-11	2019-01-11
COM POWER	Dipole Antenna	AD-100	41000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2018-09-01	2021-08-31
Ducommun technologies	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-08-01	2019-02-01
Ducommun technologies	RF Cable	104PEA	218124002	2018-05-21	2018-11-21
Ducommun technologies	RF Cable	RG-214	1	2018-05-21	2018-11-19
Ducommun technologies	RF Cable	RG-214	2	2018-05-22	2018-11-22
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200120	2017-12-24	2018-12-24
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2017-12-21	2018-12-21
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2017-12-14	2018-12-14
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1316.3003K03-101746-zn	2018-08-19	2019-08-19
Ducommun technologies	RF Cable	RG-214	3	Each Time	
WEINSCHEL	3dB Attenuator	6231	666	Each Time	
Un-known	Power Splitter	1620	129	Each Time	

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ181113001-SA.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 22.913 (a) - RF OUTPUT POWER

Applicable Standard

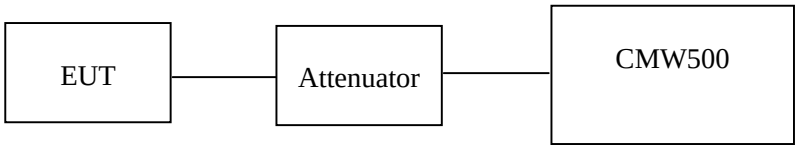
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the CMW500 through sufficient attenuation.



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Nancy Wang on 2018-11-19.

LTE Band 5:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.73	22.81	22.07
		RB Size=1, RB Offset=2	22.40	22.44	21.97
		RB Size=1, RB Offset=5	21.99	22.37	21.89
		RB Size=3, RB Offset=0	22.63	21.73	22.10
		RB Size=3, RB Offset=1	21.69	22.58	21.84
		RB Size=3, RB Offset=2	21.89	21.46	21.80
		RB Size=6, RB Offset=0	22.21	21.63	22.03
	16QAM	RB Size=1, RB Offset=0	22.16	21.53	21.84
		RB Size=1, RB Offset=2	22.06	22.07	21.98
		RB Size=1, RB Offset=5	22.03	21.96	23.03
		RB Size=3, RB Offset=0	21.78	21.75	22.94
		RB Size=3, RB Offset=1	21.84	21.90	21.85
		RB Size=3, RB Offset=2	21.81	21.84	21.78
		RB Size=6, RB Offset=0	21.76	21.70	21.79
3.0	QPSK	RB Size=1, RB Offset=0	22.86	22.27	22.40
		RB Size=1, RB Offset=7	22.50	22.63	22.72
		RB Size=1, RB Offset=14	22.24	22.41	22.72
		RB Size=8, RB Offset=0	21.71	21.81	21.87
		RB Size=8, RB Offset=4	21.42	21.66	21.29
		RB Size=8, RB Offset=7	21.21	21.28	21.72
		RB Size=15, RB Offset=0	21.55	21.05	21.60
	16QAM	RB Size=1, RB Offset=0	22.43	22.07	21.85
		RB Size=1, RB Offset=7	22.13	22.03	22.06
		RB Size=1, RB Offset=14	22.20	21.86	21.94
		RB Size=8, RB Offset=0	20.89	20.83	20.94
		RB Size=8, RB Offset=4	20.66	20.79	20.94
		RB Size=8, RB Offset=7	20.42	20.61	20.82
		RB Size=15, RB Offset=0	20.75	20.75	20.83

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.81	22.35	22.67
		RB Size=1, RB Offset=12	22.34	22.74	22.73
		RB Size=1, RB Offset=24	22.26	22.44	22.25
		RB Size=12, RB Offset=0	21.72	22.01	21.56
		RB Size=12, RB Offset=6	21.63	21.66	21.19
		RB Size=12, RB Offset=11	21.28	21.42	21.67
		RB Size=25, RB Offset=0	21.91	21.61	21.83
	16QAM	RB Size=1, RB Offset=0	22.02	21.68	21.89
		RB Size=1, RB Offset=12	22.10	21.98	22.07
		RB Size=1, RB Offset=24	22.23	21.82	21.94
		RB Size=12, RB Offset=0	20.88	20.84	20.93
		RB Size=12, RB Offset=6	20.64	20.81	20.93
		RB Size=12, RB Offset=11	20.45	20.66	20.82
		RB Size=25, RB Offset=0	20.79	20.77	20.82
10.0	QPSK	RB Size=1, RB Offset=0	22.77	22.71	22.85
		RB Size=1, RB Offset=24	22.62	22.88	22.62
		RB Size=1, RB Offset=49	21.95	22.42	22.51
		RB Size=25, RB Offset=0	21.95	21.94	21.51
		RB Size=25, RB Offset=12	21.71	21.34	21.80
		RB Size=25, RB Offset=24	21.70	21.03	21.65
		RB Size=50, RB Offset=0	21.26	21.26	21.40
	16QAM	RB Size=1, RB Offset=0	22.17	22.11	22.26
		RB Size=1, RB Offset=24	22.14	22.00	22.07
		RB Size=1, RB Offset=49	22.23	21.81	21.95
		RB Size=25, RB Offset=0	20.91	20.81	20.95
		RB Size=25, RB Offset=12	20.68	20.81	20.95
		RB Size=25, RB Offset=24	20.41	20.62	20.85
		RB Size=50, RB Offset=0	20.77	20.79	20.79

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.08	13	Pass
QPSK (50RB Size)	6.09	13	Pass
16QAM (1RB Size)	7.28	13	Pass
16QAM (50RB Size)	7.30	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	84.02	116	1.5	H	21.6	0.7	0.0	20.90	38.45
836.5	77.28	326	2.2	V	16.8	0.7	0.0	16.10	38.45
3 MHz Bandwidth									
836.5	83.81	27	1.1	H	21.4	0.7	0.0	20.70	38.45
836.5	78.52	109	1.7	V	18.1	0.7	0.0	17.40	38.45
5 MHz Bandwidth									
836.5	83.51	339	1.7	H	21.1	0.7	0.0	20.40	38.45
836.5	77.68	80	1.6	V	17.2	0.7	0.0	16.50	38.45
10 MHz Bandwidth									
836.5	83.20	192	1.1	H	20.8	0.7	0.0	20.10	38.45
836.5	77.21	80	1.9	V	16.8	0.7	0.0	16.10	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	83.87	253	2.5	H	21.5	0.7	0.0	20.80	38.45
836.5	78.93	313	1.2	V	18.5	0.7	0.0	17.80	38.45
3 MHz Bandwidth									
836.5	83.62	252	1.5	H	21.2	0.7	0.0	20.50	38.45
836.5	78.27	173	1.3	V	17.8	0.7	0.0	17.10	38.45
5 MHz Bandwidth									
836.5	83.51	137	2.3	H	21.1	0.7	0.0	20.40	38.45
836.5	78.33	333	1.9	V	17.9	0.7	0.0	17.20	38.45
10 MHz Bandwidth									
836.5	83.17	17	1.1	H	20.8	0.7	0.0	20.10	38.45
836.5	78.63	258	1.4	V	18.2	0.7	0.0	17.50	38.45

Note:
All above data were tested with no amplifier
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

FCC §2.1049, §22.917, §22.905 - OCCUPIED BANDWIDTH

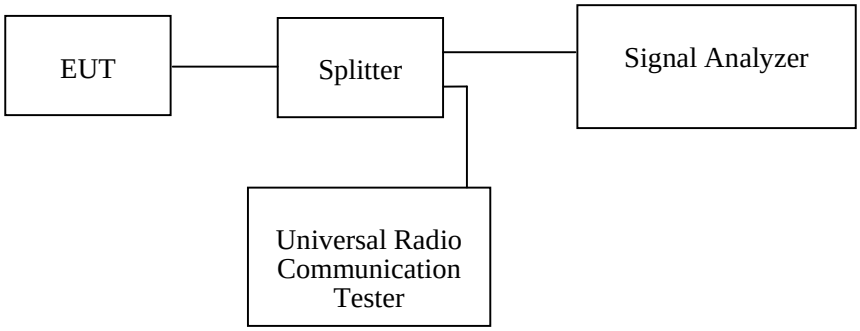
Applicable Standard

FCC 47 §2.1049, §22.917, §22.905.

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.



Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Nancy Wang on 2018-11-16.

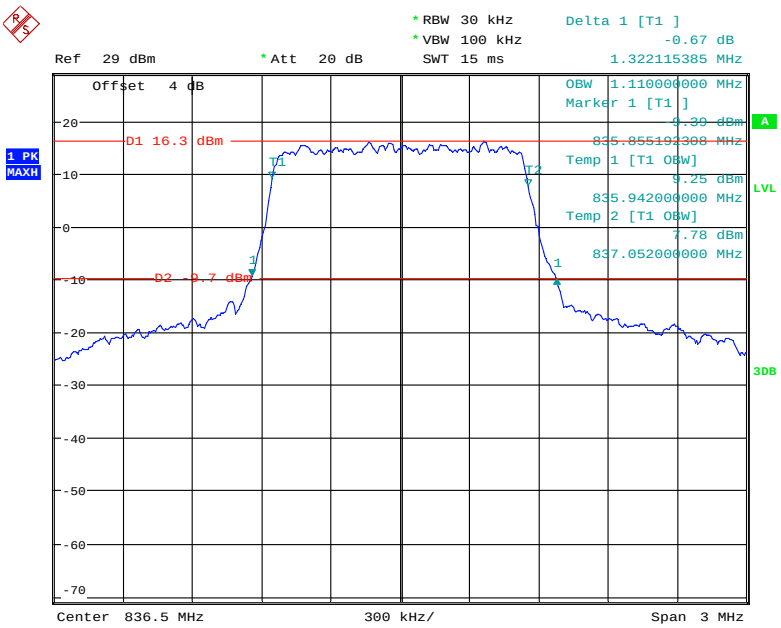
EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables and plots.

LTE Band 5: (Middle Channel)

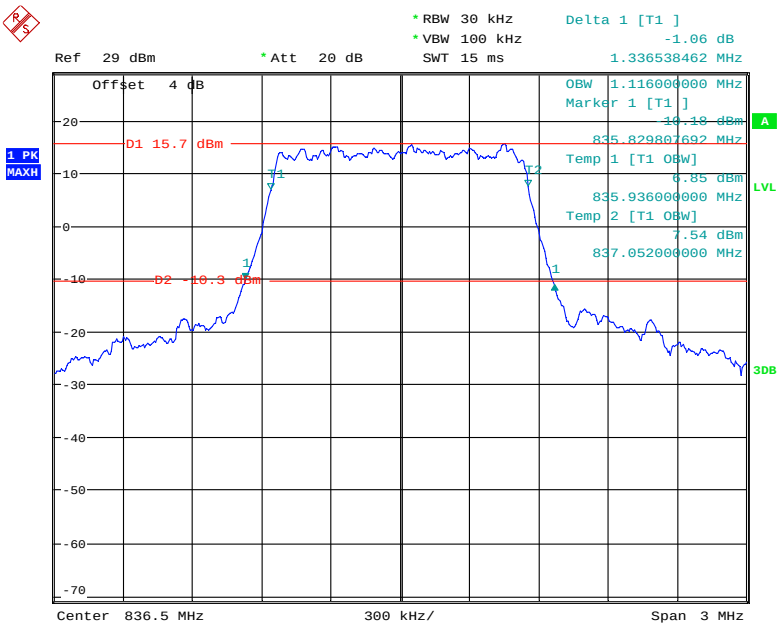
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.110	1.322
	16QAM	1.116	1.337
3.0	QPSK	2.700	2.894
	16QAM	2.688	2.904
5.0	QPSK	4.540	5.622
	16QAM	4.540	6.026
10.0	QPSK	9.000	10.064
	16QAM	9.000	9.953

QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



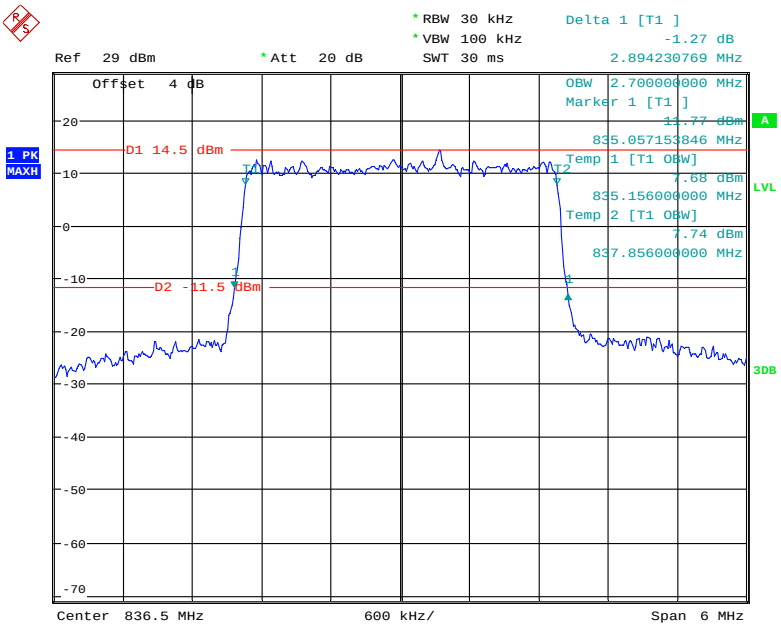
Date: 16.NOV.2018 19:26:31

16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



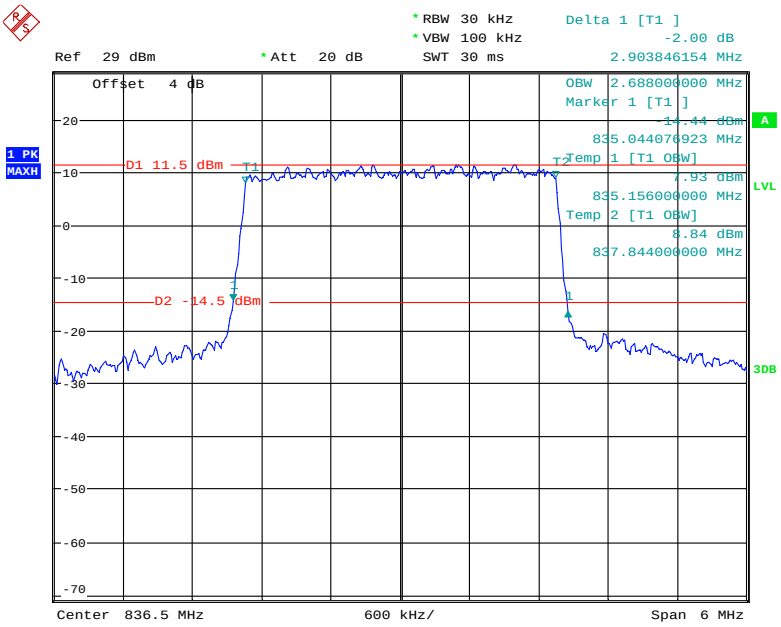
Date: 16.NOV.2018 19:28:24

QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



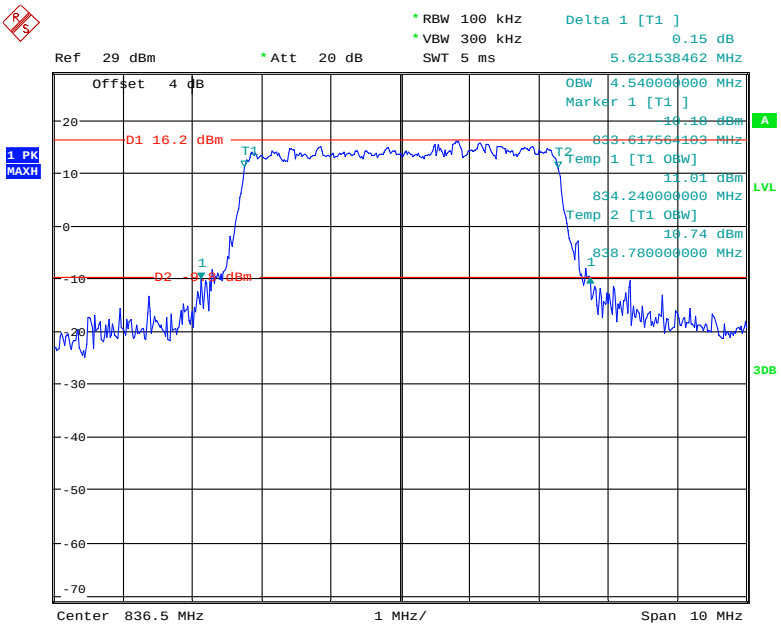
Date: 16.NOV.2018 19:29:59

16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



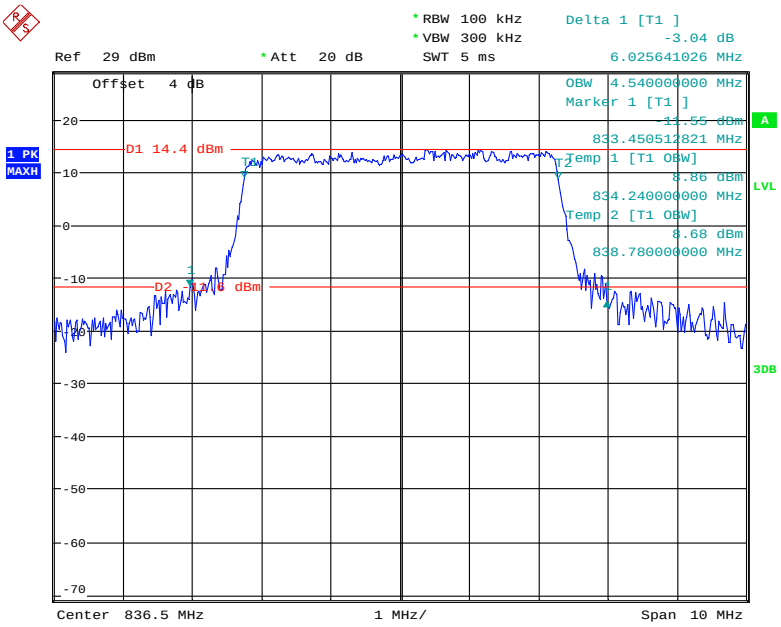
Date: 16.NOV.2018 19:31:36

QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



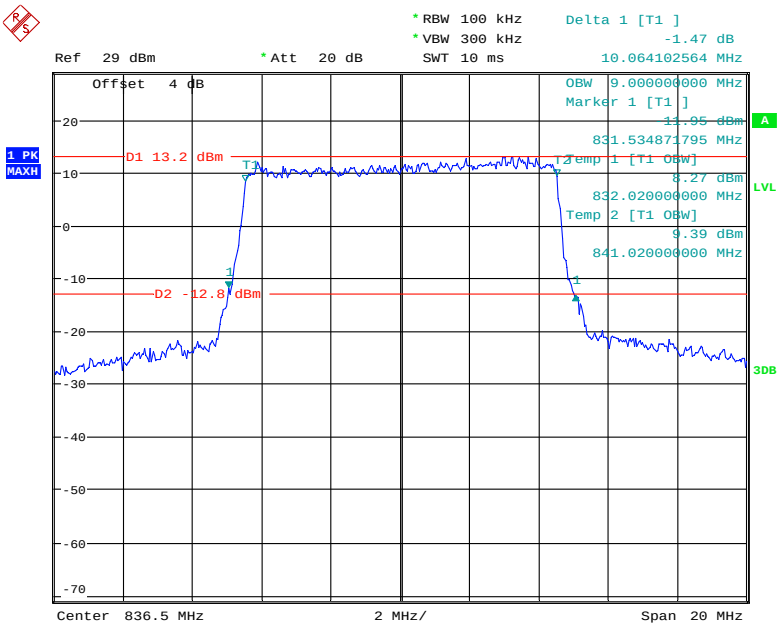
Date: 16.NOV.2018 19:35:41

16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



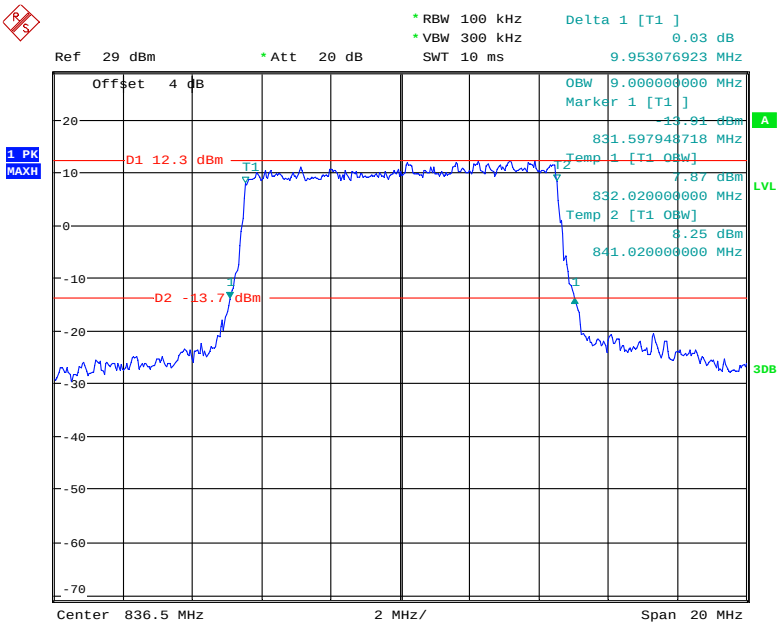
Date: 16.NOV.2018 19:37:49

QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 16.NOV.2018 19:40:13

16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 16.NOV.2018 19:42:17

FCC §2.1051, §22.917(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

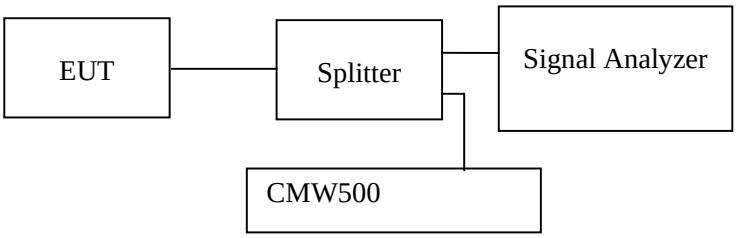
Applicable Standard

FCC §2.1051, §22.917(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Nancy Wang on 2018-11-16.

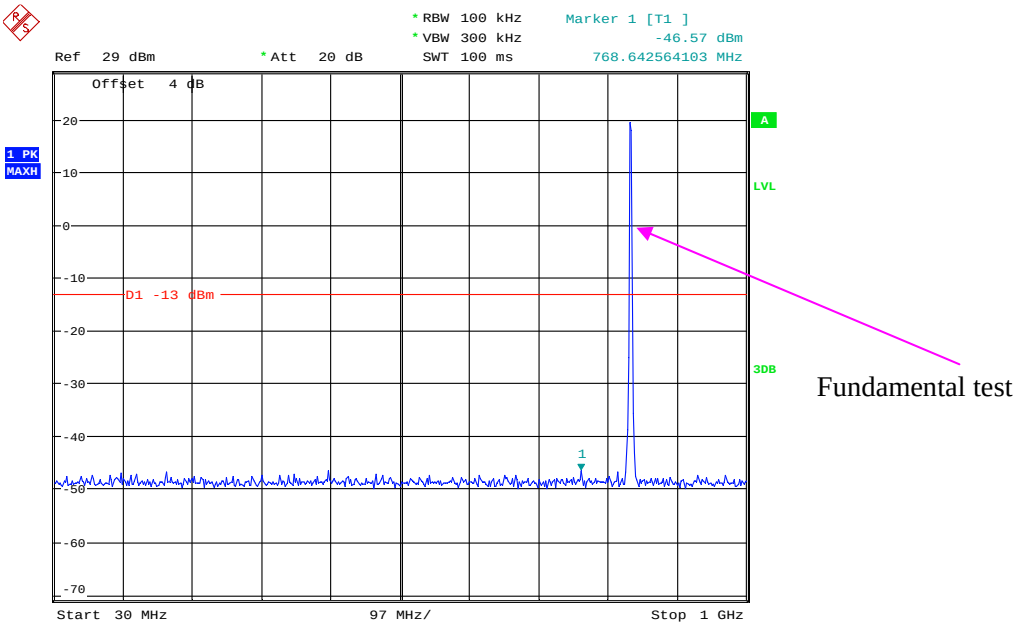
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

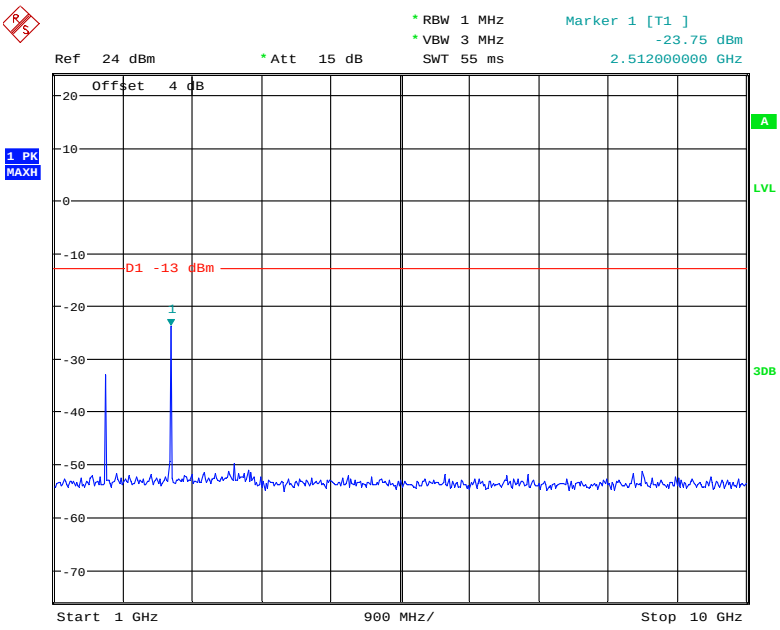
LTE Band 5(QPSK):

30 MHz - 1 GHz (1.4 MHz, Middle Channel)



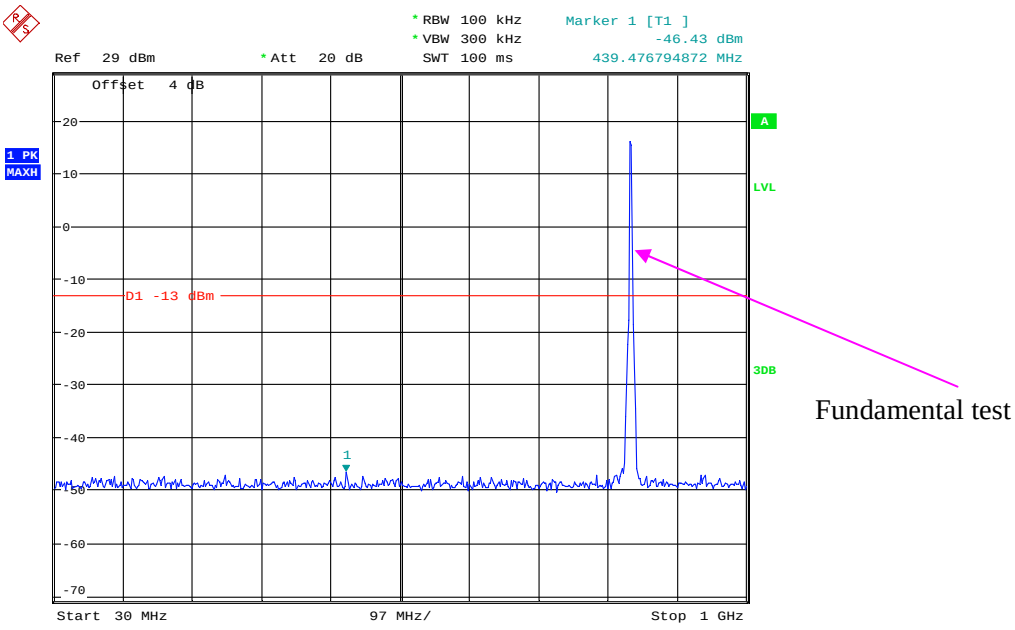
Date: 16.NOV.2018 19:53:06

1 GHz – 10 GHz (1.4 MHz, Middle Channel)



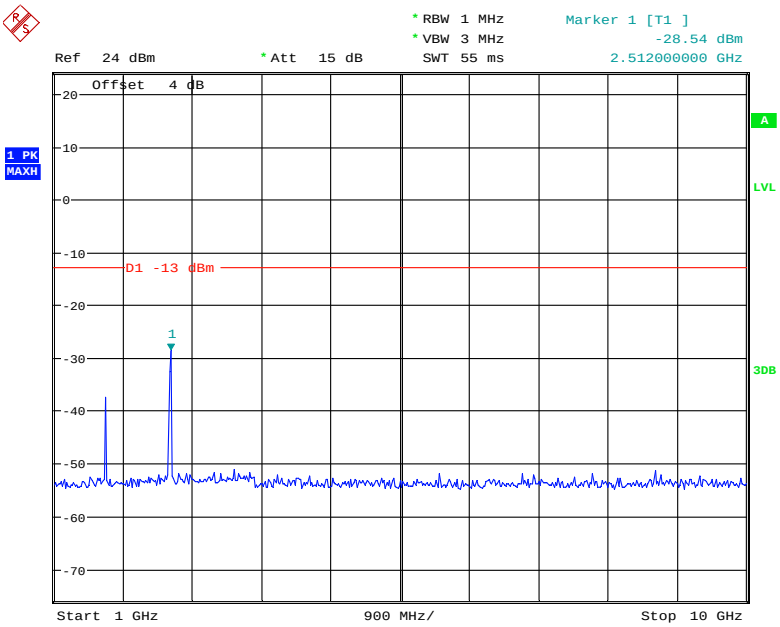
Date: 16.NOV.2018 19:57:40

30 MHz - 1 GHz (3.0 MHz, Middle Channel)



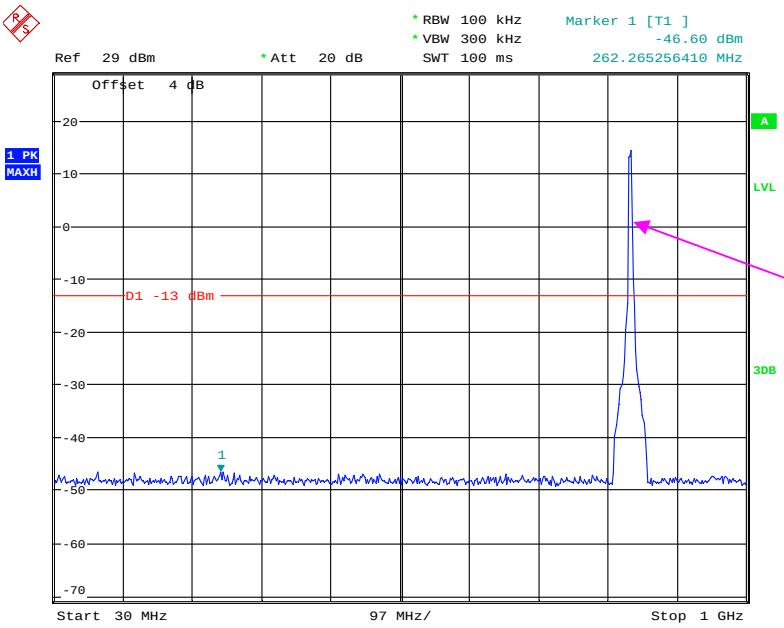
Date: 16.NOV.2018 19:50:55

1 GHz – 10 GHz (3.0 MHz, Middle Channel)



Date: 16.NOV.2018 19:58:11

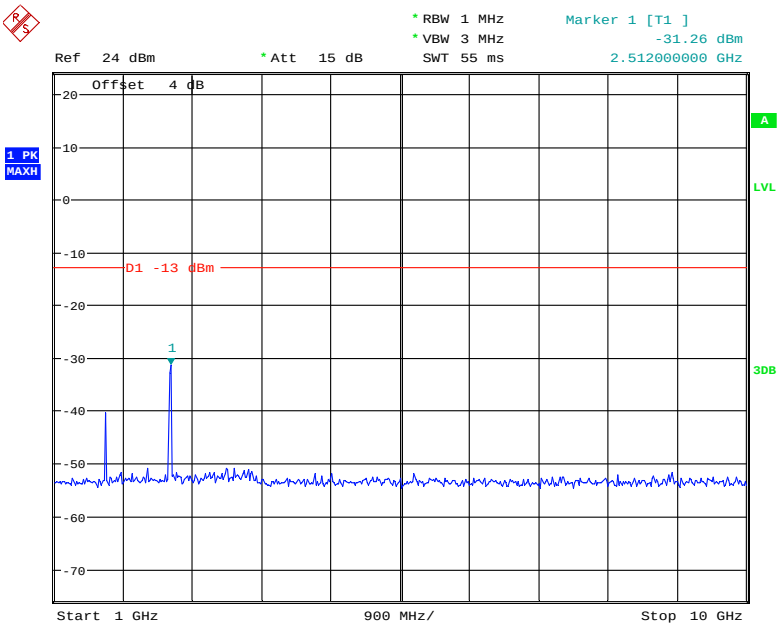
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

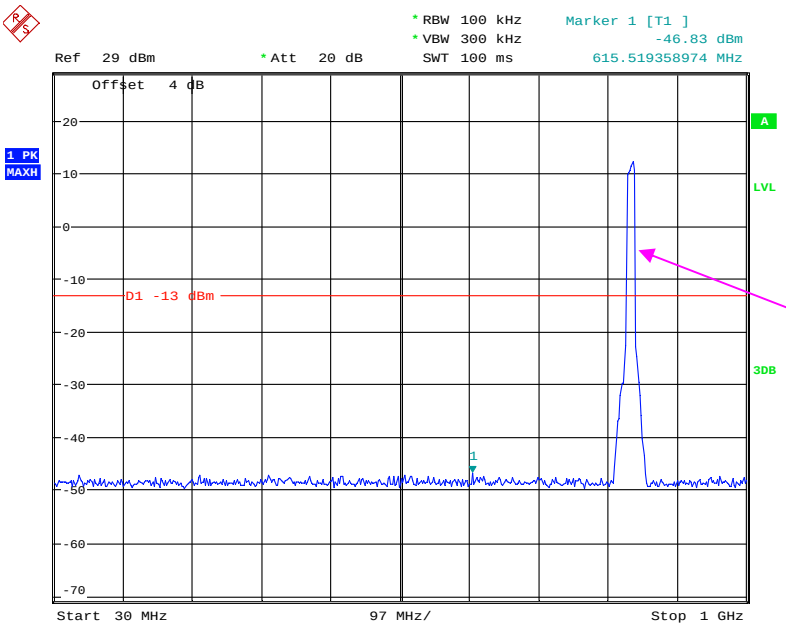
Date: 16.NOV.2018 19:50:10

1 GHz – 10 GHz (5.0 MHz, Middle Channel)



Date: 16.NOV.2018 19:58:40

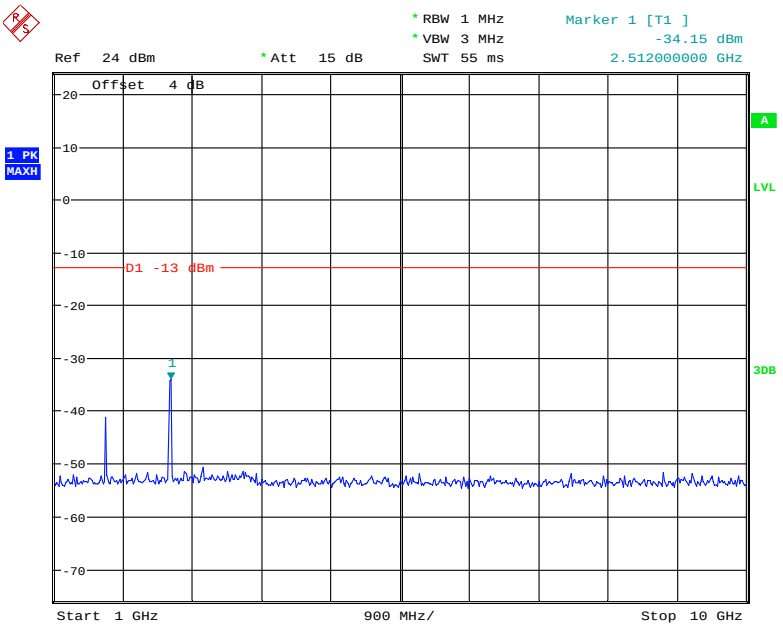
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 16.NOV.2018 19:44:06

1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 16.NOV.2018 19:59:11

FCC § 2.1053; § 22.917 (a) SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 2.1053, §22.917(a)

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the receiving antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Nancy Wang on 2018-11-15.

EUT operation mode: Transmitting

Pre-scan with Low, Middle and High channel, the worst case as below:

LTE Band: *(Pre-scan with all the bandwidth, and worse case as below)*

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
Band 5, QPSK 10MHz Middle channel										
Test frequency range:30 MHz ~ 10 GHz										
243.42	30.52	220	1.5	H	-66.5	0.31	0	-66.81	-13	53.81
243.42	31.94	27	2.1	V	-65.1	0.31	0	-65.41	-13	52.41
1673.00	44.51	322	1.5	H	-62.6	1.30	8.90	-55.00	-13	42.00
1673.00	43.7	182	1.3	V	-62.8	1.30	8.90	-55.20	-13	42.20
2509.50	44.5	319	1.1	H	-59.0	2.60	10.20	-51.40	-13	38.40
2509.50	45.82	242	1.2	V	-57.1	2.60	10.20	-49.50	-13	36.50
3346.00	43.26	314	2.4	H	-57.1	1.50	11.70	-46.90	-13	33.90
3346.00	43.76	149	1.3	V	-56.6	1.50	11.70	-46.40	-13	33.40

Note:
1) Absolute Level = Substituted Level - Cable loss + Antenna Gain
2) Margin = Limit- Absolute Level

FCC § 22.917 (a)- BAND EDGES

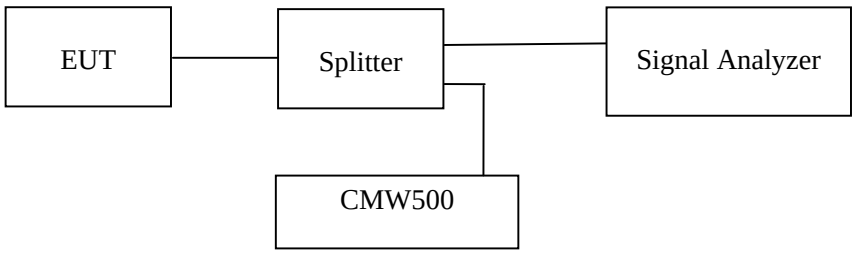
Applicable Standard

According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency



Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

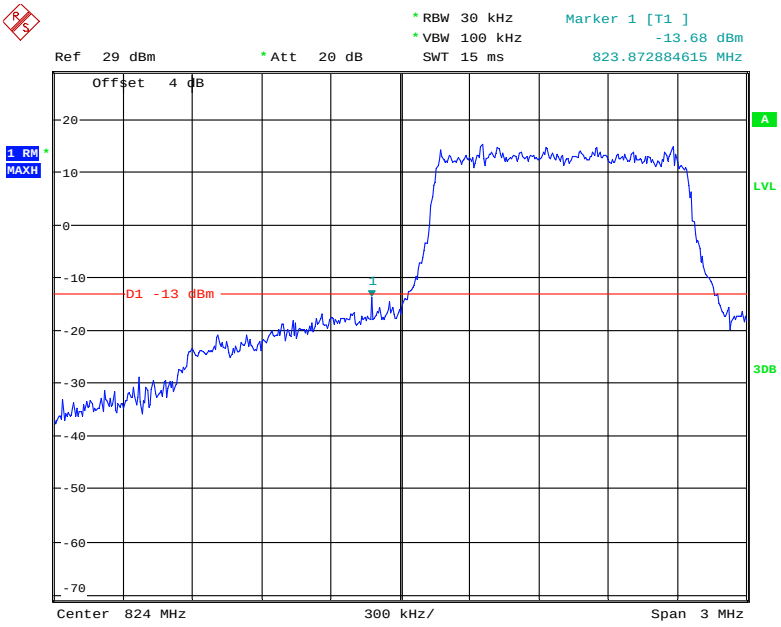
The testing was performed by Nancy Wang on 2018-11-16.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following plots.

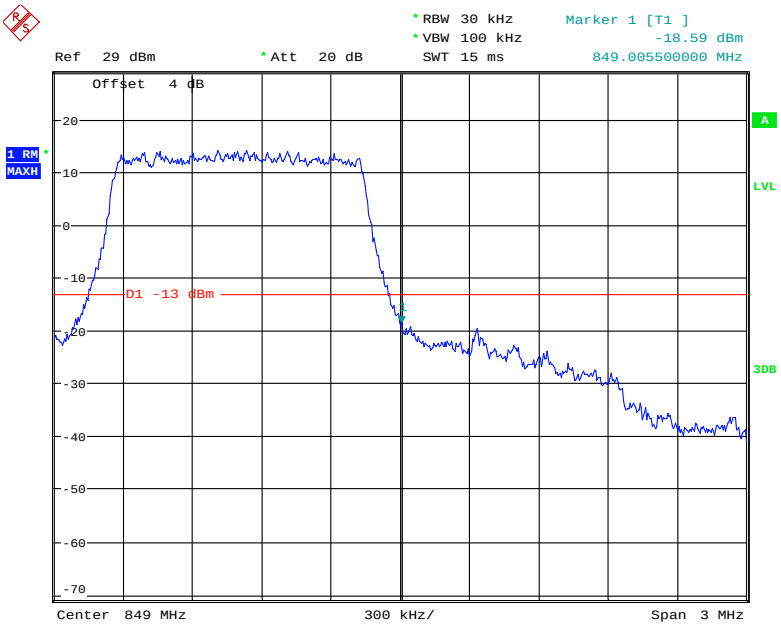
Band 5:

QPSK (1.4 MHz, FULL RB) - Left Band Edge



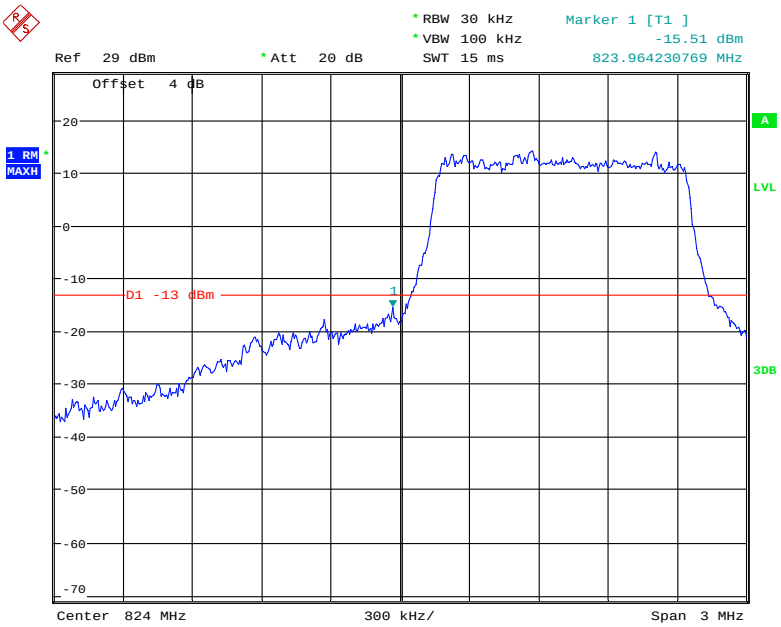
Date: 16.NOV.2018 20:21:41

QPSK (1.4 MHz, FULL RB) - Right Band Edge



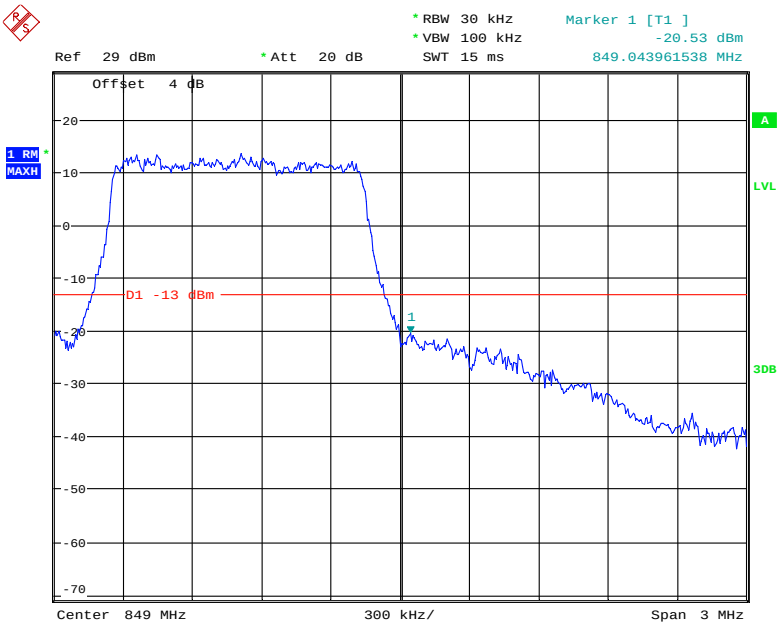
Date: 16.NOV.2018 20:19:10

16-QAM (1.4 MHz, FULL RB) - Left Band Edge



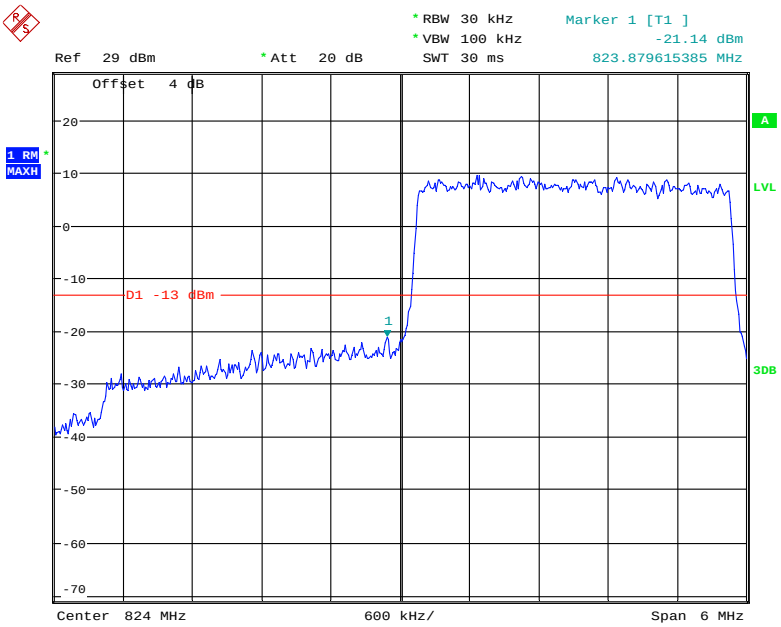
Date: 16.NOV.2018 20:21:03

16-QAM (1.4 MHz, FULL RB) - Right Band Edge



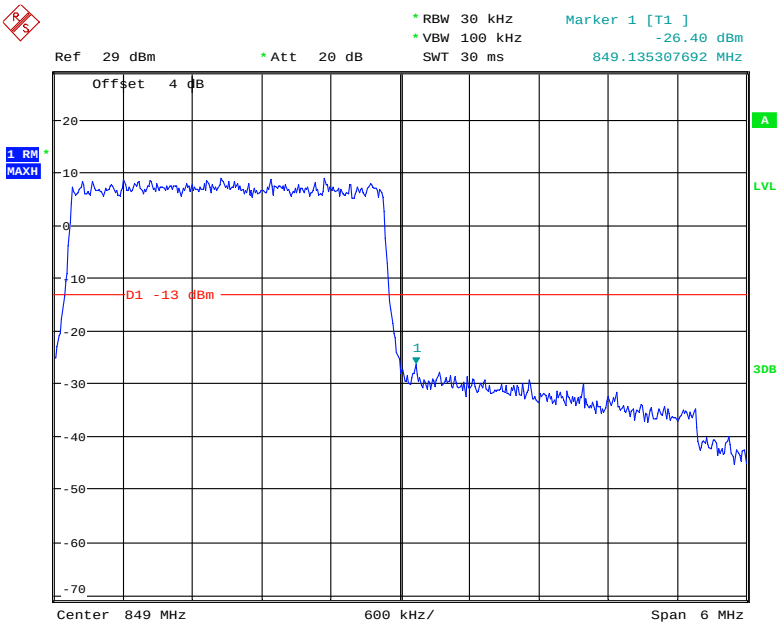
Date: 16.NOV.2018 20:20:09

QPSK (3.0 MHz, FULL RB) - Left Band Edge



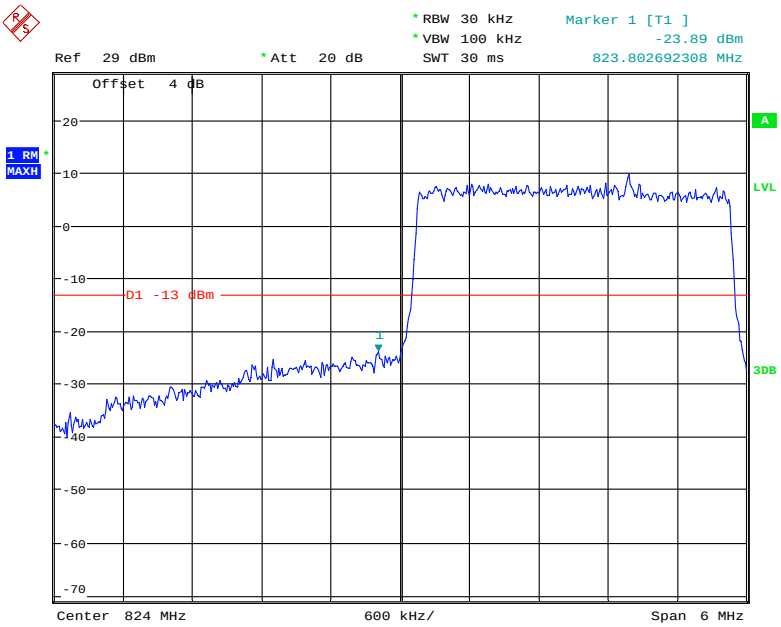
Date: 16.NOV.2018 20:12:58

QPSK (3.0 MHz, FULL RB) - Right Band Edge



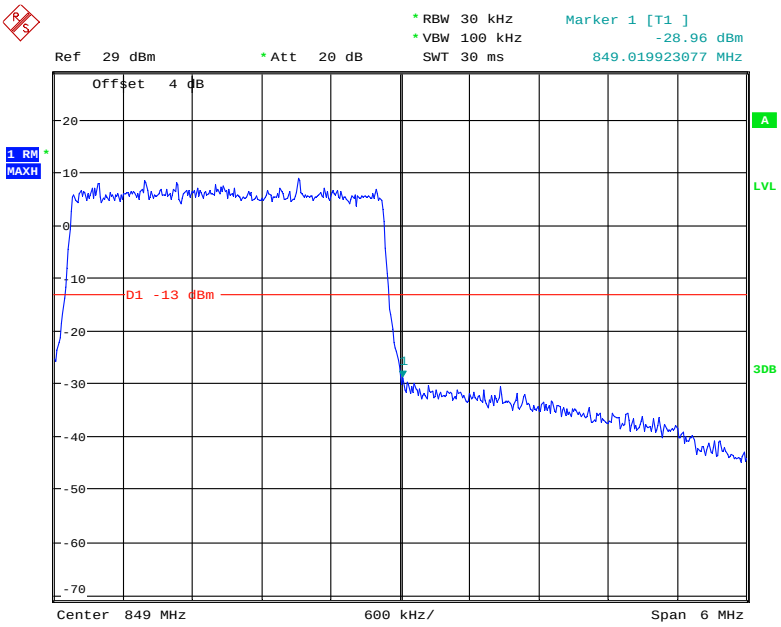
Date: 16.NOV.2018 20:16:52

16-QAM (3.0 MHz, FULL RB) - Left Band Edge



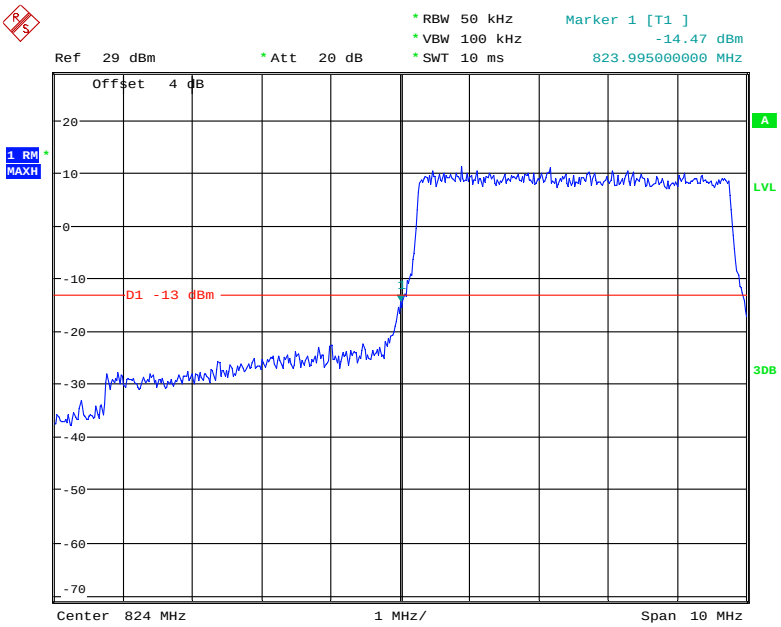
Date: 16.NOV.2018 20:13:42

16-QAM (3.0 MHz, FULL RB) - Right Band Edge



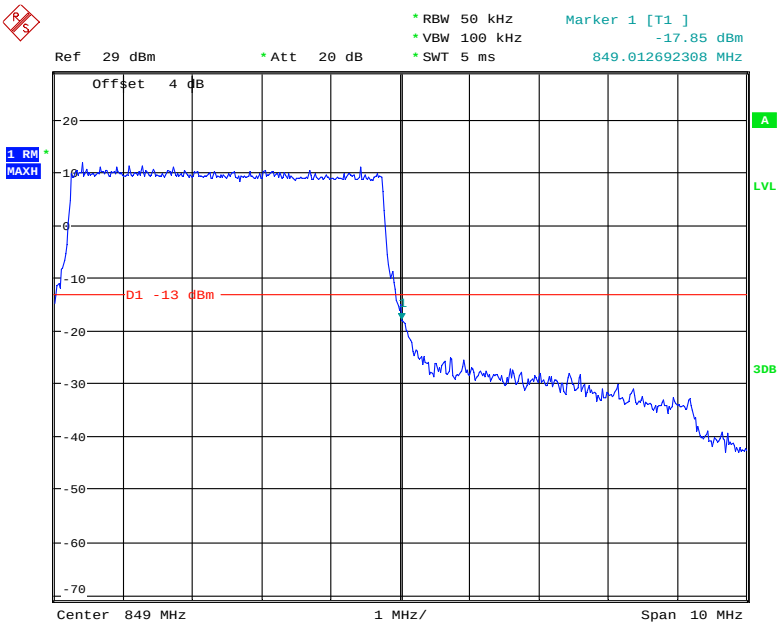
Date: 16.NOV.2018 20:15:54

QPSK (5.0 MHz, FULL RB) - Left Band Edge



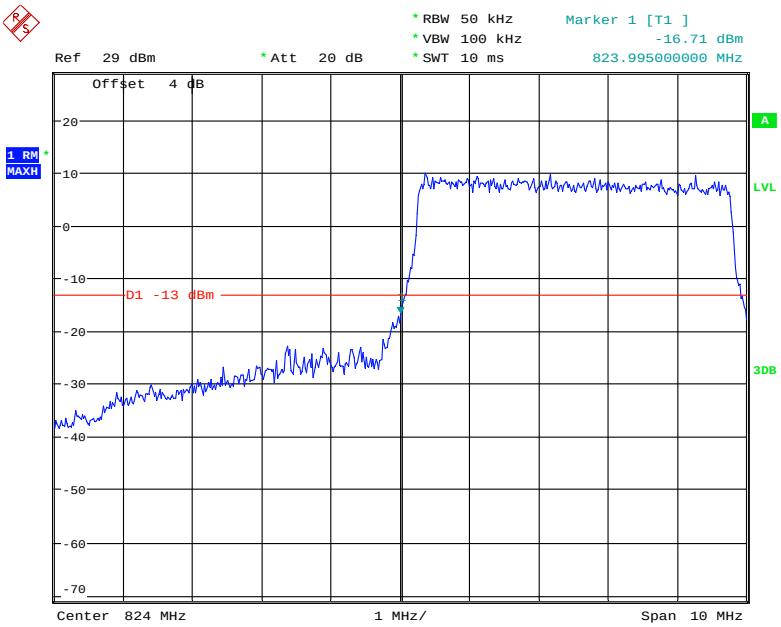
Date: 16.NOV.2018 20:10:53

QPSK (5.0 MHz, FULL RB) - Right Band Edge



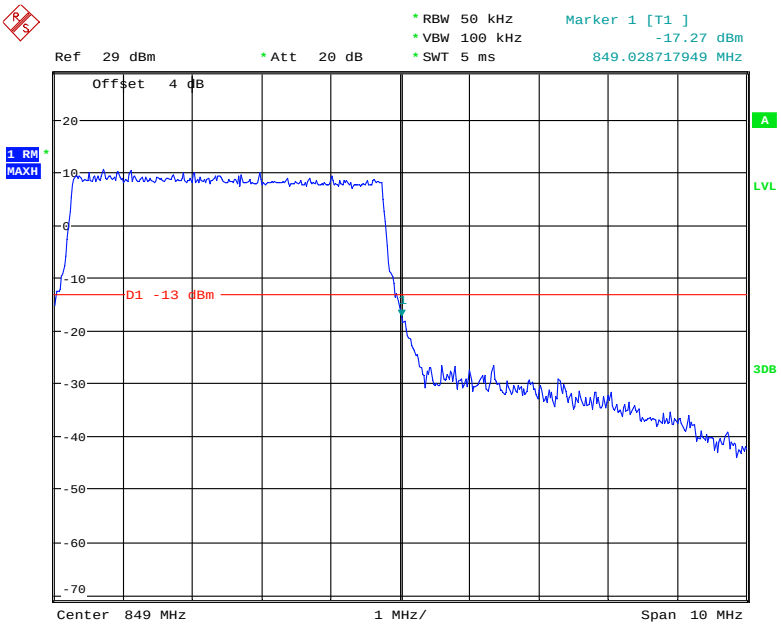
Date: 16.NOV.2018 20:08:05

16-QAM (5.0 MHz, FULL RB) - Left Band Edge



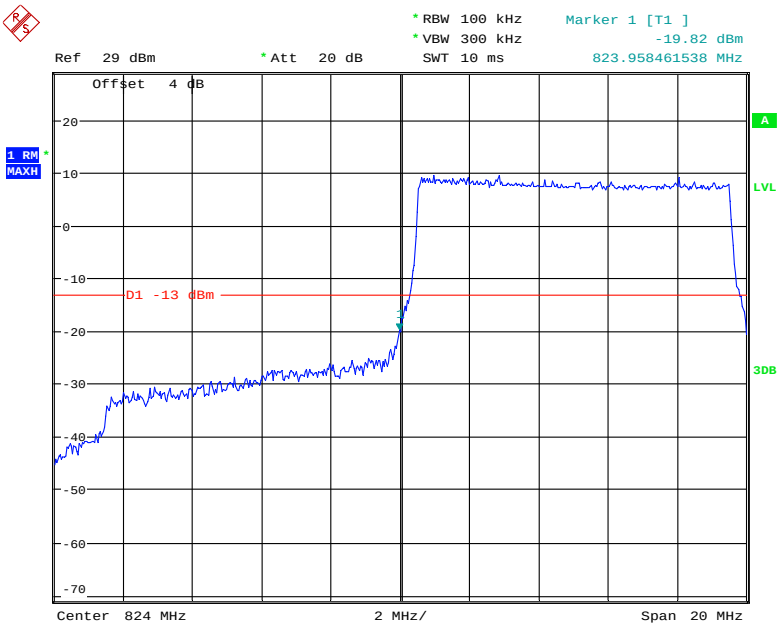
Date: 16.NOV.2018 20:10:21

16-QAM (5.0 MHz, FULL RB) - Right Band Edge



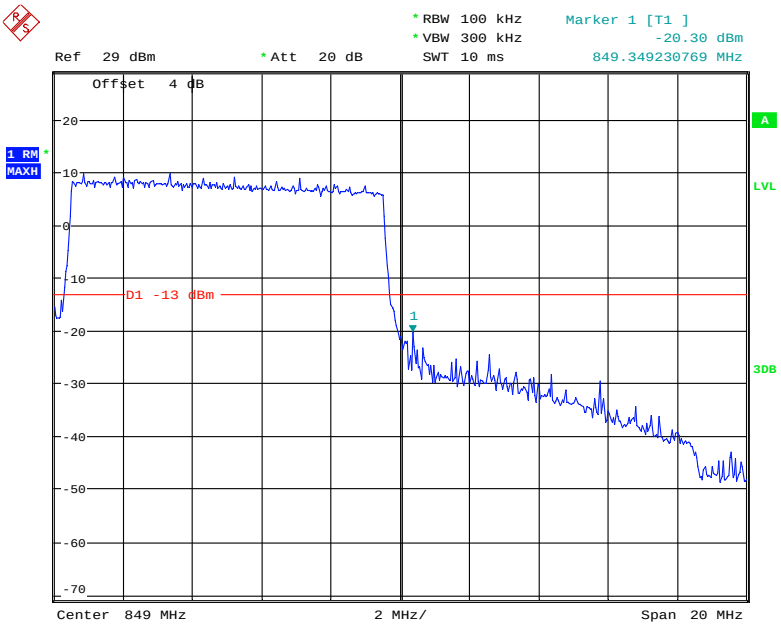
Date: 16.NOV.2018 20:09:07

QPSK (10.0 MHz, FULL RB) - Left Band Edge



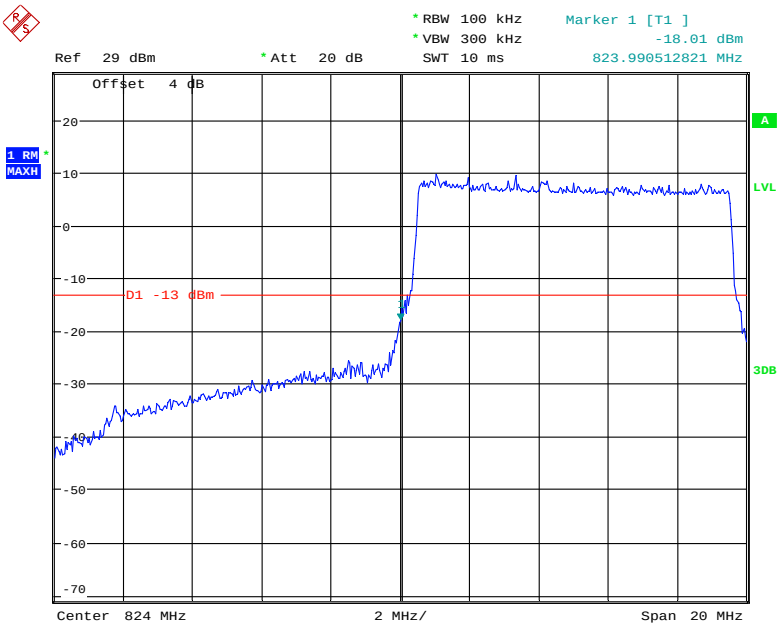
Date: 16.NOV.2018 20:03:10

QPSK (10.0 MHz, FULL RB) - Right Band Edge



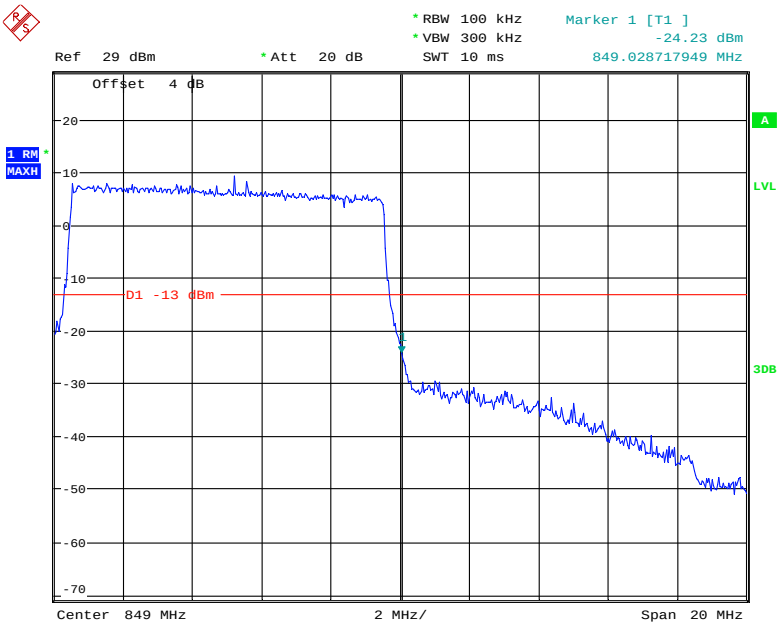
Date: 16.NOV.2018 20:04:30

16-QAM (10.0 MHz, FULL RB) - Left Band Edge



Date: 16.NOV.2018 20:01:58

16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 16.NOV.2018 20:06:19

FCC § 2.1055; § 22.355 - FREQUENCY STABILITY

Applicable Standard

FCC § 2.1055, §22.355.

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

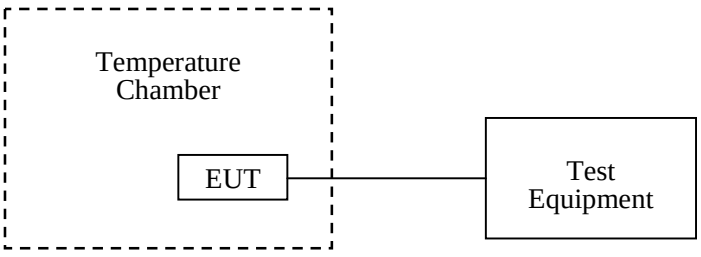
Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile > 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Nancy Wang on 2018-11-20.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables.

LTE:
QPSK:

Band 5:

10.0 MHz Middle Channel, f_o = 836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.85	-11	-0.0132	2.5
-20		-9	-0.0108	2.5
-10		-5	-0.0060	2.5
0		-7	-0.0084	2.5
10		-6	-0.0072	2.5
20		2	0.0024	2.5
30		-3	-0.0036	2.5
40		-1	-0.0012	2.5
50		2	0.0024	2.5
20	V min.= 3.6	4	0.0048	2.5
	V max.= 4.4	5	0.0060	2.5

16QAM:

Band 5:

10.0 MHz Middle Channel, f_o=836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.85	-10	-0.0120	2.5
-20		-13	-0.0155	2.5
-10		-11	-0.0132	2.5
0		-9	-0.0108	2.5
10		-7	-0.0084	2.5
20		-9	-0.0108	2.5
30		-4	-0.0048	2.5
40		-2	-0.0024	2.5
50		0	0.0000	2.5
20	V min.= 3.6	3	0.0036	2.5
	V max.= 4.4	5	0.0060	2.5

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