



FCC Part 27, Part 24E

TEST REPORT

For

Datahoist, Inc.

8920 Business Park Drive #250, AUSTIN, TX 78759 USA

FCC ID: 2AR8LSOTL5LTE

Report Type Original Report	Product Type: Elevator IOT Machine
Report Producer :	Himiko Chen <i>Himiko Chen</i>
Report Number :	RLK181206004-01-00D
Report Date :	2019/04/17
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Taiwan)

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Revision History

Revision	Report Number	Issue Date	Description	Author/Revised by
1.0	RLK181206004-01-00D	2019/04/17	Original Report	Himiko Chen

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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Applicant	Datahoist, Inc. 8920 Business Park Drive #250, AUSTIN, TX 78759 USA
Manufacturer	AAEON Technology Inc. 5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien Dist., New Taipei City 23145, Taiwan, R.O.C
Brand(Trade) Name	
Product (Equipment)	Elevator IOT Machine
Model Name	SOTL5-lte
Series Model Name	xSOTL5x (x - Where x may be any combination of alphanumeric characters or "-" or blank.)
EUT Function	LTE Band 2/Band 4/Band 12
Frequency Range	Band 2: 1850-1910 MHz Band 4: 1710-1755 MHz Band 12: 699-716 MHz
Output Power	Band 2: 22.67 dBm (0.1849 W) Band 4: 21.74 dBm (0.1493 W) Band 12: 23.52 dBm (0.2249 W)
Received Date	Dec. 06, 2018.
Date of Test	Jan. 19, 2019 ~ Apr. 17, 2019
Related Submittal(s)/Grant(s)	FCC Part 15.247 DSS with FCC ID : 2AR8LSOTL5LTE FCC Part 15.247 DTS with FCC ID : 2AR8LSOTL5LTE

*All measurement and test data in this report was gathered from production sample serial number: 181206004-01 (Assigned by BACL, Taiwan).

1.2 Operation Condition of EUT

Power Operation (Voltage Range)	☒ AC 120V/60Hz ☐ Adapter ☒ By Power Cord. Brand Name: MW Model: IRM-30-12 I/P: 100-240Vac,0.75A O/P: 12Vdc,2.5A
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1.3 Objective and Test Methodology

The Objective of this Test Report was to document the compliance of the Datahoist, Inc. Appliance (Model: SOTL5-lte; xSOTL5x (x - Where x may be any combination of alphanumeric characters or "-" or blank.)) to the requirements of the following Standards:

-Part 2, Subpart J, Part 24 Subparts E and Part 27 of the Federal Communication Commission's rules.

- ANSI TIA/EIA 603-E: 2016 of Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

1.4 Measurement Uncertainty

Parameter	Expanded Measurement uncertainty
RF output power with Power Meter	± 0.55 dB
Occupied Channel Bandwidth	± 4.45 %
RF Conducted test with Spectrum	± 1.45 dB
Radiated Below 1G	± 5.83 dB
Radiated Above 1G-18G	± 5.35 dB
Radiated Above 18G-40G	± 4.49 dB

1.5 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Taiwan) to collect test data is located on

☒ 70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

☒ 68-3, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

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. The FCC Registration No.: 974454. Designation No.: TW3180

2 System Test Configuration

2.1 Description of Test Configuration

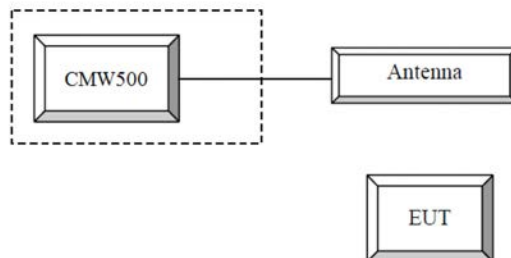
The system was configured for testing in testing mode which was provided by manufacturer.

No special accessory, No modification was made to the EUT and No special equipment used during test.

For LTE Band 2/Band 4/Band 12:

LTE Band	Bandwidth (MHz)	Frequency (MHz)		
		Low	Middle	High
Band 2	1.4	1850.7	1880	1909.3
	3	1851.5	1880	1908.5
	5	1852.5	1880	1907.5
	10	1855	1880	1905
	15	1857.5	1880	1902.5
	20	1860	1880	1900
Band 4	1.4	1710.7	1732.5	1754.3
	3	1711.5	1732.5	1753.5
	5	1712.5	1732.5	1752.5
	10	1715	1732.5	1750
	15	1717.5	1732.5	1747.5
	20	1720	1732.5	1745
Band 12	1.4	699.7	707.5	715.3
	3	700.5	707.5	714.5
	5	701.5	707.5	713.5
	10	704	707.5	711

2.2 Block Diagram of Test Setup



3 Summary of Test Results

FCC Rules	Description of Test	Result
§ 2.1047	Modulation Characteristics	Compliance
§1.1310, §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§ 2.1046, § 24.232(c), § 27.50	RF Output Power	Compliance
§ 2.1049, § 24.238, § 27.53	Occupied Bandwidth	Compliance
§ 2.1501, § 24.238(a), § 27.53	Spurious Emission at Antenna Terminal	Compliance
§ 2.1503, § 24.238(a), § 27.53	Field Strength of Spurious Radiation	Compliance
§ 24.238(a), § 27.53	Out of band emission, Band Edge	Compliance
§ 2.1055, § 24.235, § 27.54	Frequency Stability of Temperature and Voltage	Compliance

4 FCC §15.203 – Modulation Characteristic

4.1 Applicable Standard

According to § 2.1047 (d), Part 24E and Part 27

There is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

5 FCC §1.1310, § 2.1091- Maximum Permissible Exposure (MPE)

5.1 Applicable Standard

According to subpart 15.247(i) and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary: Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

5.2 RF Exposure Evaluation Result

MPE evaluation:

Mode	Frequency Range (MHz)	Antenna Gain		Target Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
LTE B2	1850-1910	2.58	1.811	23.00	199.526	20	0.0719	1
LTE B4	1710-1755	2.58	1.811	22.00	158.489	20	0.0571	1
LTE B12	699-716	1.15	1.303	24.00	251.189	20	0.0651	0.466
BR+EDR	2402-2480	4	2.512	-4.00	0.398	20	0.0002	1
BLE	2402-2480	4	2.512	6.00	3.981	20	0.0020	1
Wi-Fi 2.4G	2412-2462	4	2.512	23.00	199.526	20	0.0997	1

Wi-Fi 2.4G and LTE B2 can transmit simultaneously:

$$=S_{\text{Wi-Fi 2.4G}}/S_{\text{limit-Wi-Fi 2.4G}} + S_{\text{LTE B12}}/S_{\text{limit-LTE B12}} = (0.0997/1) + (0.0651/0.466) = 0.0997 + 0.1397 = 0.2394 < 1.0$$

Result: MPE evaluation meet 20 cm the requirement of standard.

6 FCC § 2.1046, § 24.232(c) & § 27.50 - RF Output Power

6.1 Applicable Standard

According to FCC §2.1046 and §24.232(c),

Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to FCC §24.232(d),

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 (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. 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.

According to FCC §27.50,

(b)(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

(c)(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

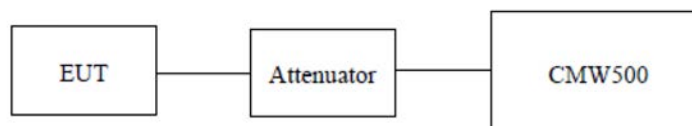
(d)(4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(h)(2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

6.2 Test Procedure

Radiated method: According to ANSI TIA-603-E: Sec 2.2.17.

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



6.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	149170	2018/05/11	2019/05/10
Cable	WOKEN	SFL402	S02-160323-07	2018/02/12	2019/02/11

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

6.4 Test Environmental Conditions

Temperature:	24~26 °C	Relative Humidity:	54~56 %
ATM Pressure:	1014hPa	Test Engineer:	Ian Tu
Test Date:	2019-01-02~2019-01-31	-	-

6.5 Test Data

Conducted Output Power:

LTE Band	Modulation	Bandwidth (MHz)	RB Size/ RB Offset	Frequency (MHz)		
				Low	Middle	High
Band 2	QPSK	1.4	1/0	22.47	21.44	21.89
			1/2	22.38	21.51	21.77
			1/5	22.19	21.35	21.65
			3/0	22.22	21.32	22.08
			3/2	22.11	21.21	22.01
			6/0	21.07	20.34	21.09
	16QAM	1.4	1/0	21.14	19.91	21.34
			1/2	21.33	20.05	21.30
			1/5	21.05	20.13	21.23
			3/0	20.75	20.39	20.61
			3/2	20.86	20.54	20.80
			6/0	20.30	19.66	19.67
	QPSK	3	1/0	22.46	22.20	22.06
			1/7	22.37	21.98	22.14
			1/14	22.54	22.07	22.28
			8/0	21.16	21.12	20.96
			8/7	21.23	21.07	21.04
			15/0	21.29	20.82	20.84
	16QAM	3	1/0	21.71	20.79	20.40
			1/7	21.43	20.84	20.58
			1/14	21.82	21.03	20.84
			8/0	20.20	20.25	19.98
			8/7	21.15	20.31	19.82
			15/0	20.23	20.19	19.76

LTE Band	Modulation	Bandwidth (MHz)	RB Size/ RB Offset	Frequency (MHz)		
				Low	Middle	High
Band 2	QPSK	5	1/0	22.19	22.19	21.82
			1/12	22.08	22.08	21.98
			1/24	22.11	22.11	21.91
			12/0	21.12	21.12	20.81
			12/11	21.08	21.08	20.92
			25/0	20.92	20.92	21.03
	16QAM	5	1/0	20.64	20.64	20.73
			1/12	20.11	20.11	20.69
			1/24	20.24	20.24	20.81
			12/0	20.25	20.25	19.77
			12/11	20.13	20.13	19.99
			25/0	20.28	20.28	20.09
	QPSK	10	1/0	22.49	22.48	21.94
			1/24	22.58	22.39	21.83
			1/49	22.67	22.26	22.11
			25/0	21.29	21.04	21.03
			25/24	21.38	21.08	21.00
			50/0	21.29	21.12	21.05
	16QAM	10	1/0	21.85	21.34	20.32
			1/24	21.69	21.56	20.41
			1/49	22.11	21.23	20.27
			25/0	20.48	20.32	20.09
			25/24	20.53	20.25	20.02
			50/0	20.33	20.14	20.03

LTE Band	Modulation	Bandwidth (MHz)	RB Size/ RB Offset	Frequency (MHz)		
				Low	Middle	High
Band 2	QPSK	15	1/0	22.07	22.00	21.91
			1/37	21.96	22.11	21.72
			1/74	22.27	22.01	21.68
			36/0	21.19	21.06	20.89
			36/35	21.08	20.98	20.78
			75/0	21.17	20.85	20.84
	16QAM	15	1/0	21.58	21.17	20.79
			1/37	21.64	21.20	20.53
			1/74	21.49	20.98	20.60
			36/0	20.14	20.19	19.98
			36/35	20.43	20.03	19.82
			75/0	20.10	19.96	19.87
	QPSK	20	1/0	22.15	22.18	22.08
			1/49	22.62	22.26	21.80
			1/99	22.55	22.01	21.77
			50/0	21.21	21.12	20.91
			50/49	21.26	20.98	21.07
			100/0	21.35	21.09	21.09
	16QAM	20	1/0	21.11	21.82	21.76
			1/49	21.33	21.77	21.85
			1/99	21.13	21.67	21.74
			50/0	20.41	20.25	19.83
			50/49	21.45	20.31	20.10
			100/0	20.38	20.19	19.99

LTE Band	Modulation	Bandwidth (MHz)	RB Size/ RB Offset	Frequency (MHz)		
				Low	Middle	High
Band 4	QPSK	1.4	1/0	21.07	21.44	21.45
			1/2	21.10	21.51	21.74
			1/5	21.21	21.35	21.60
			3/0	20.12	21.32	21.34
			3/2	20.16	21.21	21.41
			6/0	20.10	20.34	20.43
	16QAM	1.4	1/0	20.14	19.91	20.24
			1/2	20.25	20.05	20.31
			1/5	19.99	20.13	19.78
			3/0	20.46	20.39	20.13
			3/2	20.33	20.54	20.19
			6/0	19.64	19.66	19.45
	QPSK	3	1/0	20.96	21.39	21.39
			1/7	21.12	21.27	21.18
			1/14	20.92	21.06	21.21
			8/0	20.21	20.27	20.38
			8/7	20.36	20.16	20.21
			15/0	20.23	20.39	20.19
	16QAM	3	1/0	20.39	20.53	21.22
			1/7	19.98	20.12	20.86
			1/14	20.31	20.38	20.79
			8/0	19.40	19.64	19.34
			8/7	19.35	19.19	19.34
			15/0	19.25	19.34	19.49

LTE Band	Modulation	Bandwidth (MHz)	RB Size/ RB Offset	Frequency (MHz)		
				Low	Middle	High
Band 4	QPSK	5	1/0	21.09	21.41	21.21
			1/12	21.12	21.21	21.34
			1/24	21.16	21.11	21.42
			12/0	20.35	20.50	21.32
			12/11	20.30	20.36	20.44
			25/0	20.39	20.35	20.38
	16QAM	5	1/0	20.47	19.91	19.97
			1/12	20.59	19.74	20.35
			1/24	20.76	19.85	20.21
			12/0	19.03	19.11	19.27
			12/11	18.94	19.26	19.42
			25/0	19.14	19.44	19.15
	QPSK	10	1/0	21.48	21.63	21.36
			1/24	21.21	21.04	21.60
			1/49	21.16	21.35	21.43
			25/0	20.11	20.38	20.29
			25/24	20.45	20.25	20.32
			50/0	20.36	20.31	20.23
	16QAM	10	1/0	20.82	20.65	19.66
			1/24	20.67	20.44	20.00
			1/49	20.89	20.08	19.95
			25/0	19.11	19.06	19.07
			25/24	19.55	19.17	19.26
			50/0	19.17	19.05	19.19

LTE Band	Modulation	Bandwidth (MHz)	RB Size/ RB Offset	Frequency (MHz)		
				Low	Middle	High
Band 4	QPSK	15	1/0	21.33	21.50	20.90
			1/37	20.88	20.97	20.71
			1/74	21.00	21.12	20.85
			36/0	20.14	20.18	20.31
			36/35	20.38	20.12	20.12
			75/0	20.06	20.20	20.03
	16QAM	15	1/0	20.72	20.48	19.82
			1/37	21.09	19.77	19.91
			1/74	20.71	20.15	19.74
			36/0	19.32	19.09	19.41
			36/35	19.07	19.13	19.13
			75/0	18.91	18.93	19.06
	QPSK	20	1/0	21.25	21.23	20.91
			1/49	21.09	20.89	20.96
			1/99	20.92	20.84	21.17
			50/0	20.02	20.11	20.29
			50/49	20.11	20.06	20.09
			100/0	19.91	20.02	20.07
	16QAM	20	1/0	20.85	20.86	19.48
			1/49	20.76	20.97	20.02
			1/99	20.67	20.55	20.06
			50/0	19.14	19.06	19.40
			50/49	19.06	19.00	19.11
			100/0	19.02	19.08	19.01

LTE Band	Modulation	Bandwidth (MHz)	RB Size/ RB Offset	Frequency (MHz)		
				Low	Middle	High
Band 12	QPSK	1.4	1/0	23.34	23.14	23.09
			1/2	23.36	23.21	23.32
			1/5	23.42	23.35	23.21
			3/0	23.28	23.13	23.44
			3/2	23.52	23.09	23.23
			6/0	22.28	22.62	22.41
	16QAM		1/0	22.46	22.11	22.69
			1/2	22.68	22.21	22.83
			1/5	22.51	21.75	22.65
			3/0	22.27	21.96	22.54
			3/2	22.34	21.89	22.30
			6/0	21.62	21.51	21.39
	QPSK	3	1/0	23.26	23.27	23.24
			1/7	23.08	23.13	23.19
			1/14	23.23	23.05	23.45
			8/0	22.19	22.27	22.31
			8/7	22.25	22.22	22.21
			15/0	22.33	22.21	22.24
	16QAM		1/0	22.53	22.29	22.11
			1/7	22.63	22.30	21.98
			1/14	22.84	22.21	22.24
			8/0	21.43	21.76	21.17
			8/7	21.07	21.08	21.36
			15/0	21.24	21.33	21.22

LTE Band	Modulation	Bandwidth (MHz)	RB Size/ RB Offset	Frequency (MHz)		
				Low	Middle	High
Band 12	QPSK	5	1/0	23.22	23.23	23.04
			1/12	23.16	23.36	23.18
			1/24	23.29	23.01	23.21
			12/0	22.21	22.15	22.09
			12//	22.13	22.23	22.17
			25/0	22.19	22.18	22.19
	16QAM		1/0	22.71	21.55	21.91
			1/12	22.43	21.36	21.82
			1/24	22.61	21.24	21.56
			12/0	20.84	21.25	21.09
			12//	20.94	21.09	21.13
			25/0	20.81	21.18	21.21
	QPSK	10	1/0	23.17	23.34	23.12
			1/24	23.33	23.23	23.21
			1/49	23.06	23.16	23.15
			25/0	22.11	22.28	22.13
			25/24	22.35	22.22	22.22
			50/0	22.34	22.11	22.28
	16QAM		1/0	22.9	22.97	21.46
			1/24	22.79	22.16	21.66
			1/49	22.54	22.38	21.99
			25/0	21.17	21.47	21.24
			25/24	21.25	21.12	21.53
			50/0	21.29	21.34	21.3

Peak-to-average ratio (PAR):

LTE Band	Channel	Modulation	Bandwidth (MHz)	RB Size	PAR (dB)	Limit (dB)
Band 2	Middle	QPSK	20	1 RB	3.86	13
				100 RB	3.88	13
		16QAM		1 RB	5.57	13
				100 RB	5.59	13
Band 4	Middle	QPSK	20	1 RB	4.64	13
				100 RB	3.88	13
		16QAM		1 RB	4.52	13
				100 RB	5.62	13
Band 12	Middle	QPSK	10	1 RB	4.06	13
				100 RB	5.42	13
		16QAM		1 RB	4.93	13
				100 RB	6.52	13

ERP/EIRP**LTE Band 2: Antenna Gain = 2.58 dBi**

LTE Band	Modulation	Bandwidth (MHz)	Conducted Power (dBm)	EIRP (dBm)	EIRP (W)	EIRP Limit (W)
Band 2	QPSK	1.4	22.47	25.05	0.320	2
	16QAM		21.34	23.92	0.247	2
	QPSK	3	22.54	25.12	0.325	2
	16QAM		21.82	24.40	0.275	2
	QPSK	5	22.19	24.77	0.300	2
	16QAM		20.81	23.39	0.218	2
	QPSK	10	22.67	25.25	0.335	2
	16QAM		22.11	24.69	0.294	2
	QPSK	15	22.27	24.85	0.305	2
	16QAM		21.64	24.22	0.264	2
	QPSK	20	22.62	25.20	0.331	2
	16QAM		21.85	24.43	0.277	2

*EIRP = Conducted Power + Antenna Gain

LTE Band 4: Antenna Gain = 2.58 dBi

LTE Band	Modulation	Bandwidth (MHz)	Conducted Power (dBm)	EIRP (dBm)	EIRP (W)	EIRP Limit (W)
Band 4	QPSK	1.4	21.74	24.32	0.270	1
	16QAM		20.54	23.12	0.205	1
	QPSK	3	21.39	23.97	0.249	1
	16QAM		21.22	23.80	0.240	1
	QPSK	5	21.42	24.00	0.251	1
	16QAM		20.76	23.34	0.216	1
	QPSK	10	21.63	24.21	0.264	1
	16QAM		20.89	23.47	0.222	1
	QPSK	15	21.50	24.08	0.256	1
	16QAM		21.09	23.67	0.233	1
	QPSK	20	21.25	23.83	0.242	1
	16QAM		20.97	23.55	0.226	1

*EIRP = Conducted Power + Antenna Gain

LTE Band 12: Antenna Gain = 1.15 dBi

LTE Band	Modulation	Bandwidth (MHz)	Conducted Power (dBm)	ERP (dBm)	ERP (W)	ERP Limit (W)
Band 12	QPSK	1.4	23.52	22.52	0.179	3
	16QAM		22.83	21.83	0.152	3
	QPSK	3	23.45	22.45	0.176	3
	16QAM		22.84	21.84	0.152	3
	QPSK	5	23.36	22.36	0.172	3
	16QAM		22.71	21.71	0.148	3
	QPSK	10	23.34	22.34	0.171	3
	16QAM		22.97	21.97	0.157	3

*EIRP = Conducted Power + Antenna Gain

*ERP = EIRP – 2.15.

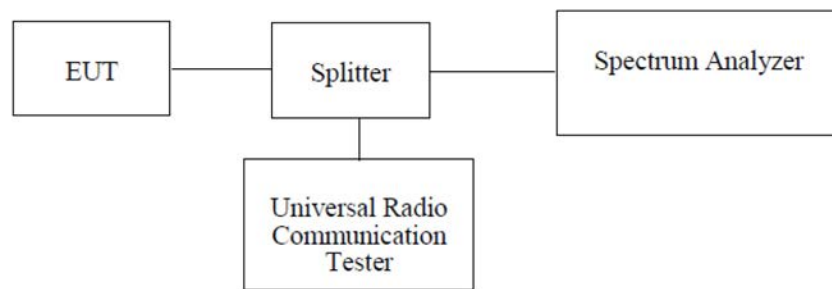
7 FCC § 2.1049, § 24.238 and § 27.53 - Occupied Bandwidth

7.1 Applicable Standard

According to FCC §2.1049, § 24.238 and § 27.53.

7.2 Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation. The 26 dB & 99% bandwidth was recorded.



7.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	149170	2018/05/11	2019/05/10
Spectrum Analyzer	Rohde & Schwarz	FSV40	101140	2018/11/22	2019/11/21
Cable	WOKEN	SFL402	S02-160323-07	2018/02/12	2019/02/11
Power Splitter	Mini Circuits	ZFRSC-183-S+	SF112701513	Each Use	/

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

7.4 Test Environmental Conditions

Temperature:	24~26 °C	Relative Humidity:	54~56 %
ATM Pressure:	1014hPa	Test Engineer:	Ian Tu
Test Date:	2018-12-21~2019-01-25	-	-

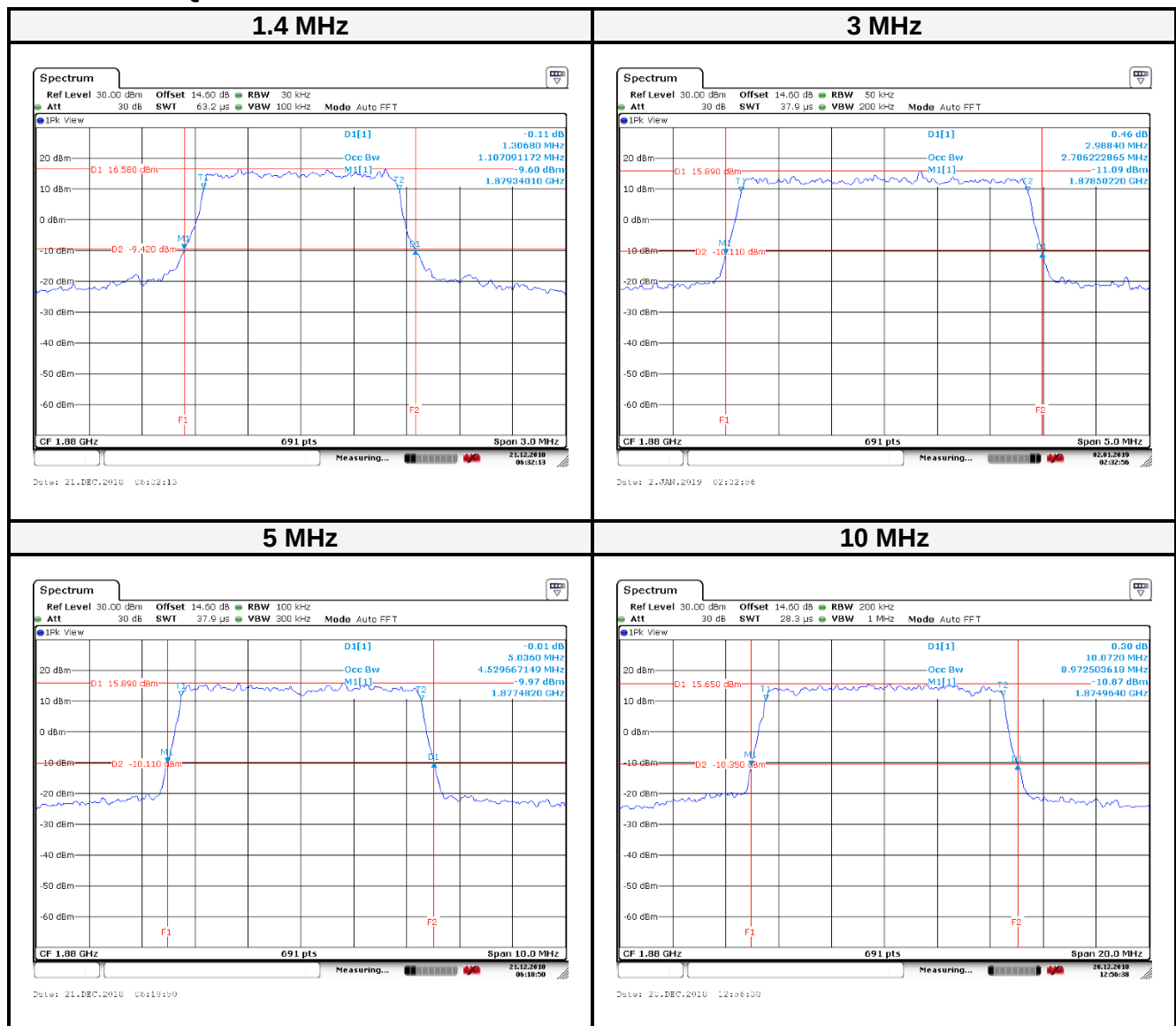
7.5 Test Data and Test Plot

LTE Band	Modulation	Bandwidth (MHz)	Channel	Occupied BW (MHz)	26 dB BW (MHz)
Band 2	QPSK	1.4	Middle	1.107	1.307
		3		2.706	2.988
		5		4.530	5.036
		10		8.973	10.072
		15		13.459	14.631
		20		17.945	19.682
	16QAM	1.4	Middle	1.103	1.333
		3		2.706	3.010
		5		4.515	5.007
		10		8.973	9.870
		15		13.459	14.631
		20		18.090	19.754

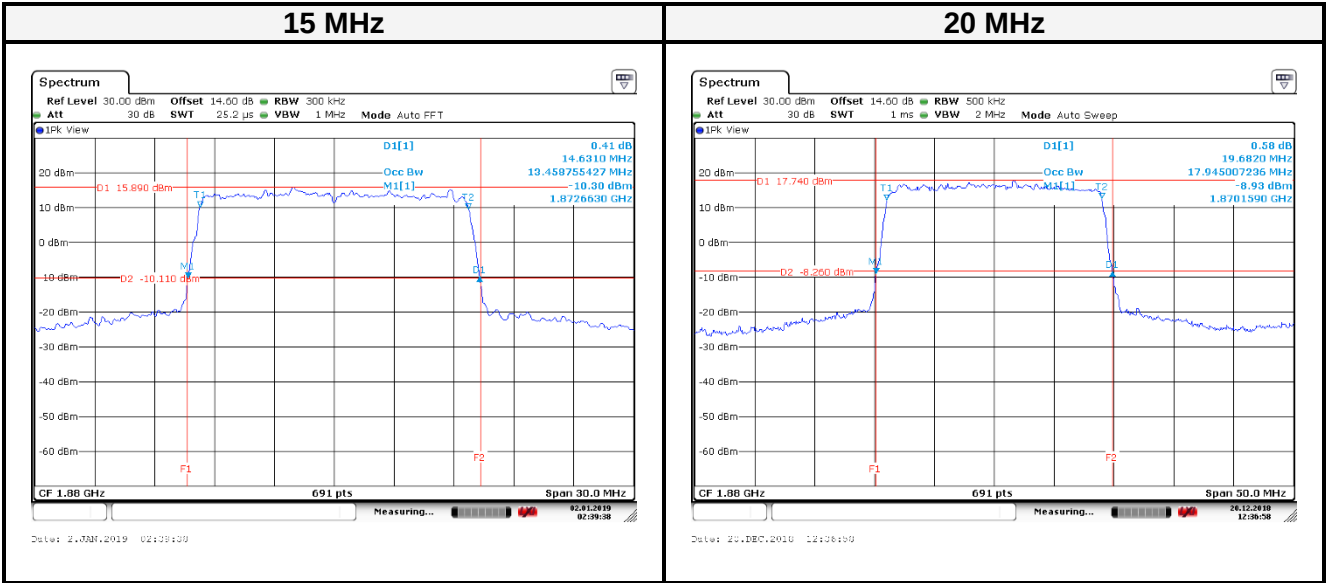
LTE Band	Modulation	Bandwidth (MHz)	Channel	Occupied BW (MHz)	26 dB BW (MHz)
Band 4	QPSK	1.4	Middle	1.098	1.320
		3		2.706	2.974
		5		4.530	5.051
		10		8.973	9.87
		15		13.415	14.588
		20		17.945	19.537
	16QAM	1.4	Middle	1.103	1.320
		3		2.706	3.003
		5		4.501	5.007
		10		8.973	9.841
		15		13.415	14.544
		20		18.017	19.682

LTE Band	Modulation	Bandwidth (MHz)	Channel	Occupied BW (MHz)	26 dB BW (MHz)
Band 12	QPSK	1.4	Middle	1.107	1.289
		3		2.713	2.988
		5		4.544	5.065
		10		9.030	10.043
	16QAM	1.4	Middle	1.098	1.307
		3		2.706	2.988
		5		4.530	5.022
		10		9.030	9.899

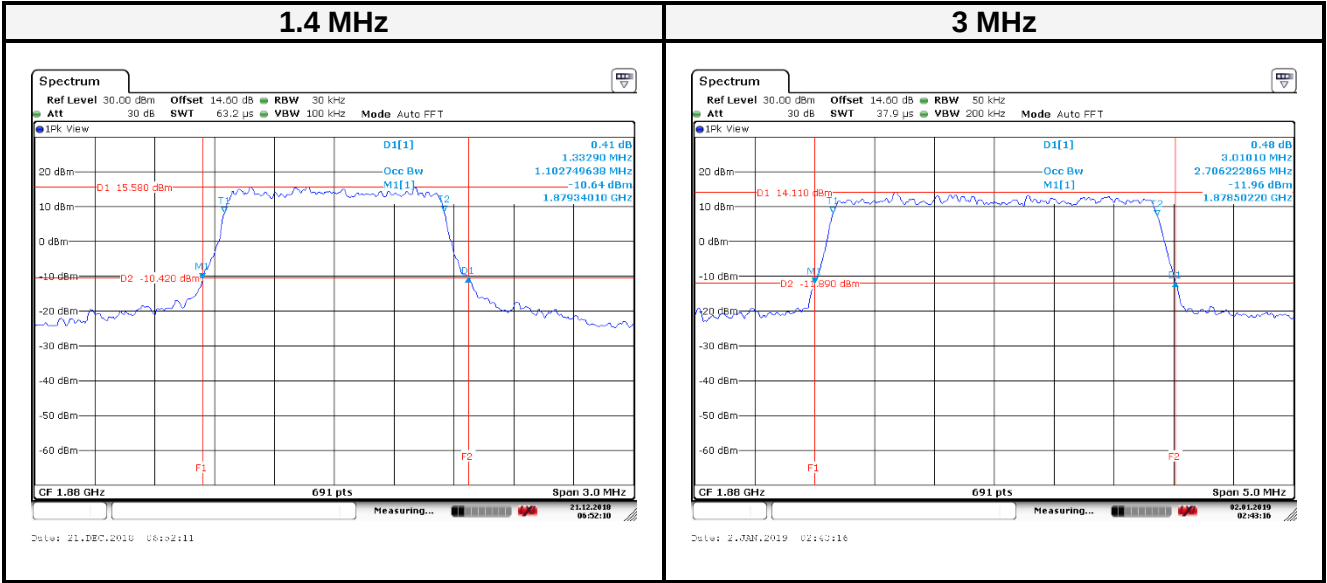
LTE Band 2: QPSK



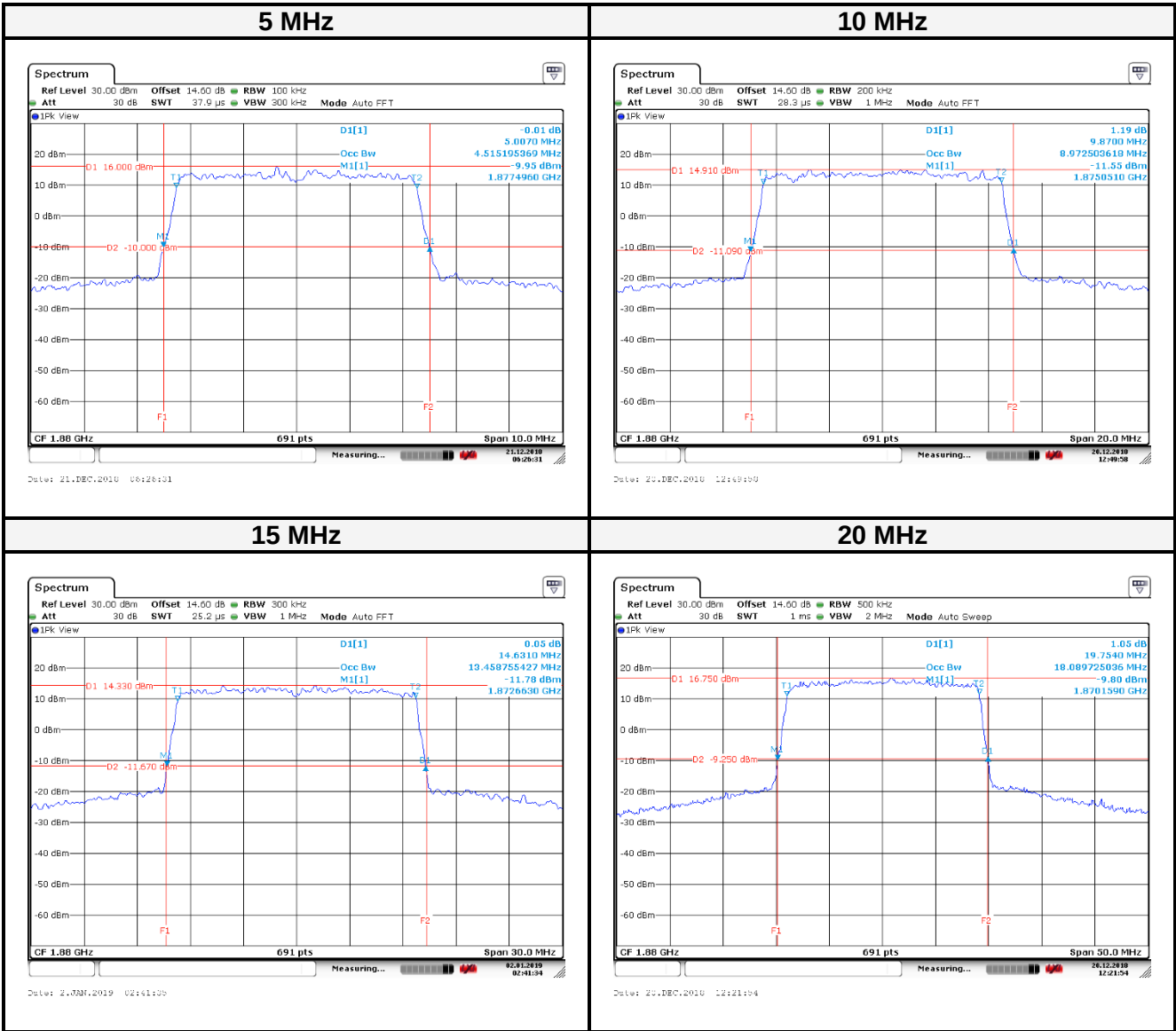
LTE Band 2: QPSK



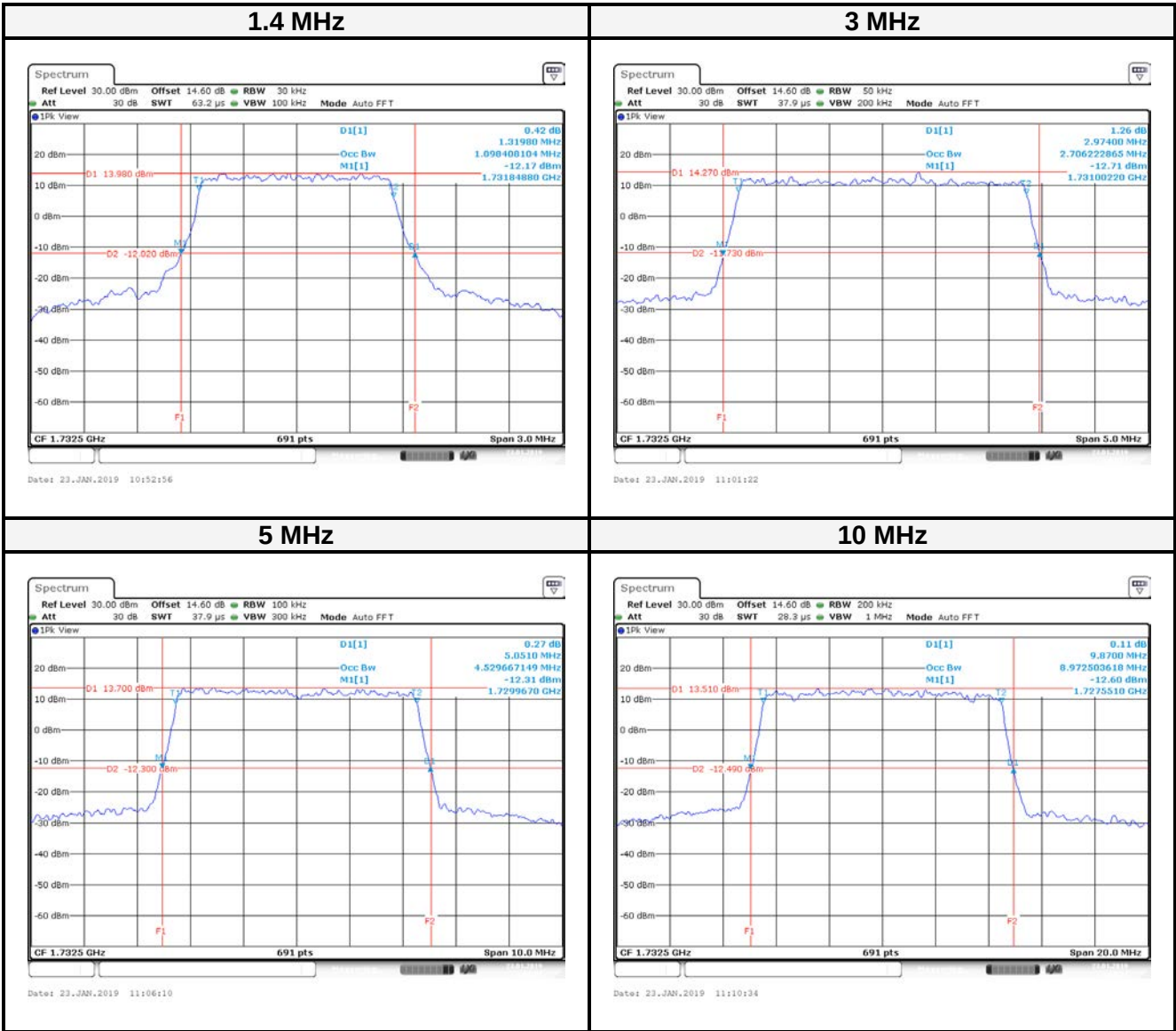
LTE Band 2: 16QAM



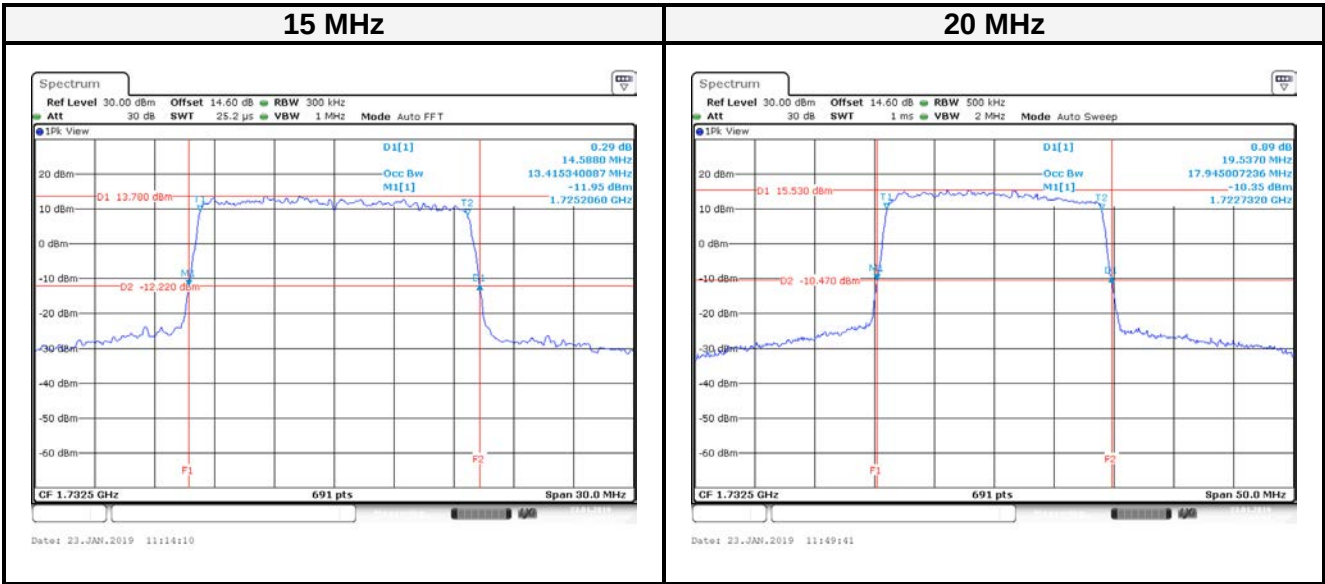
LTE Band 2: 16QAM



LTE Band 4: QPSK



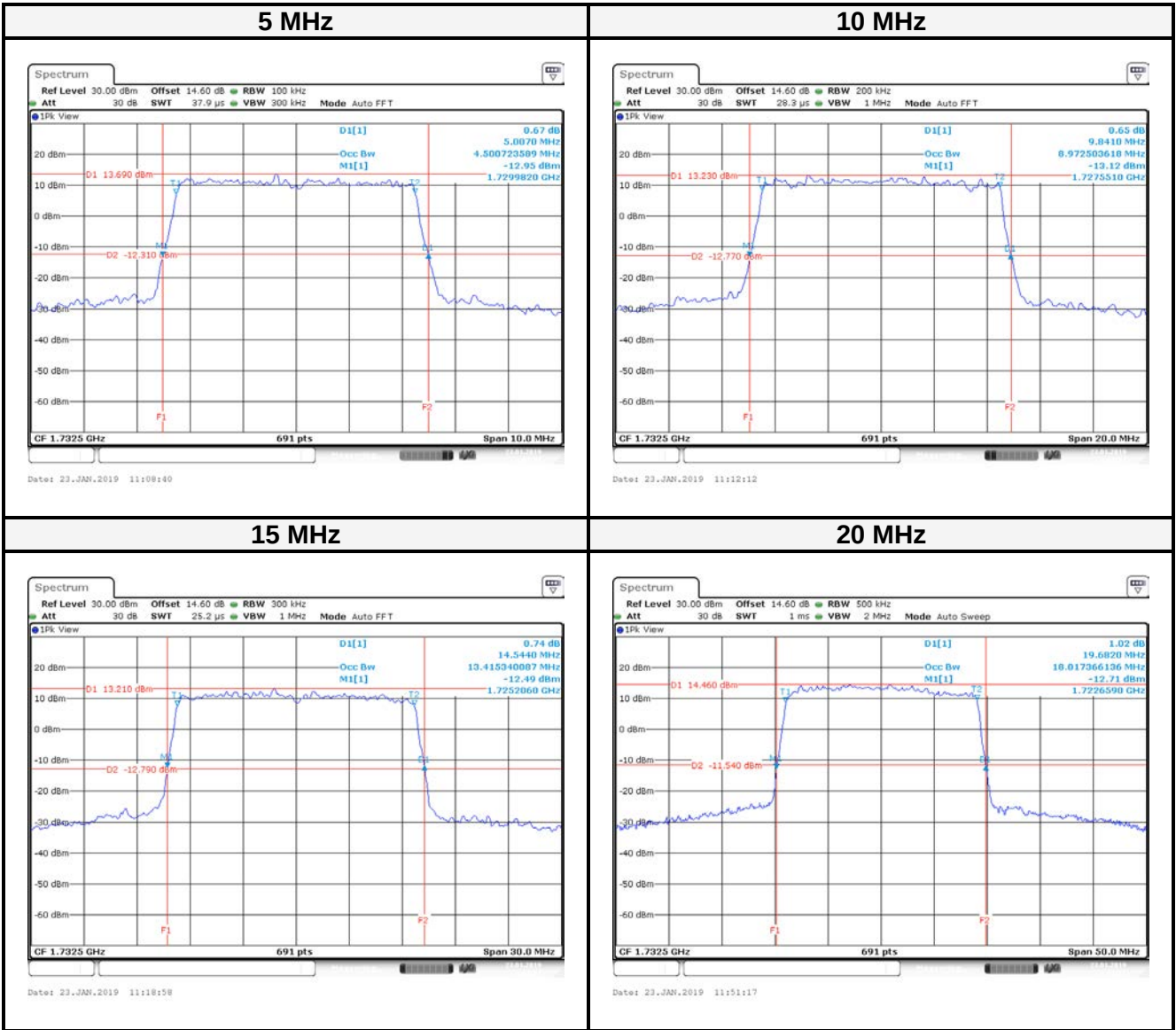
LTE Band 4: QPSK



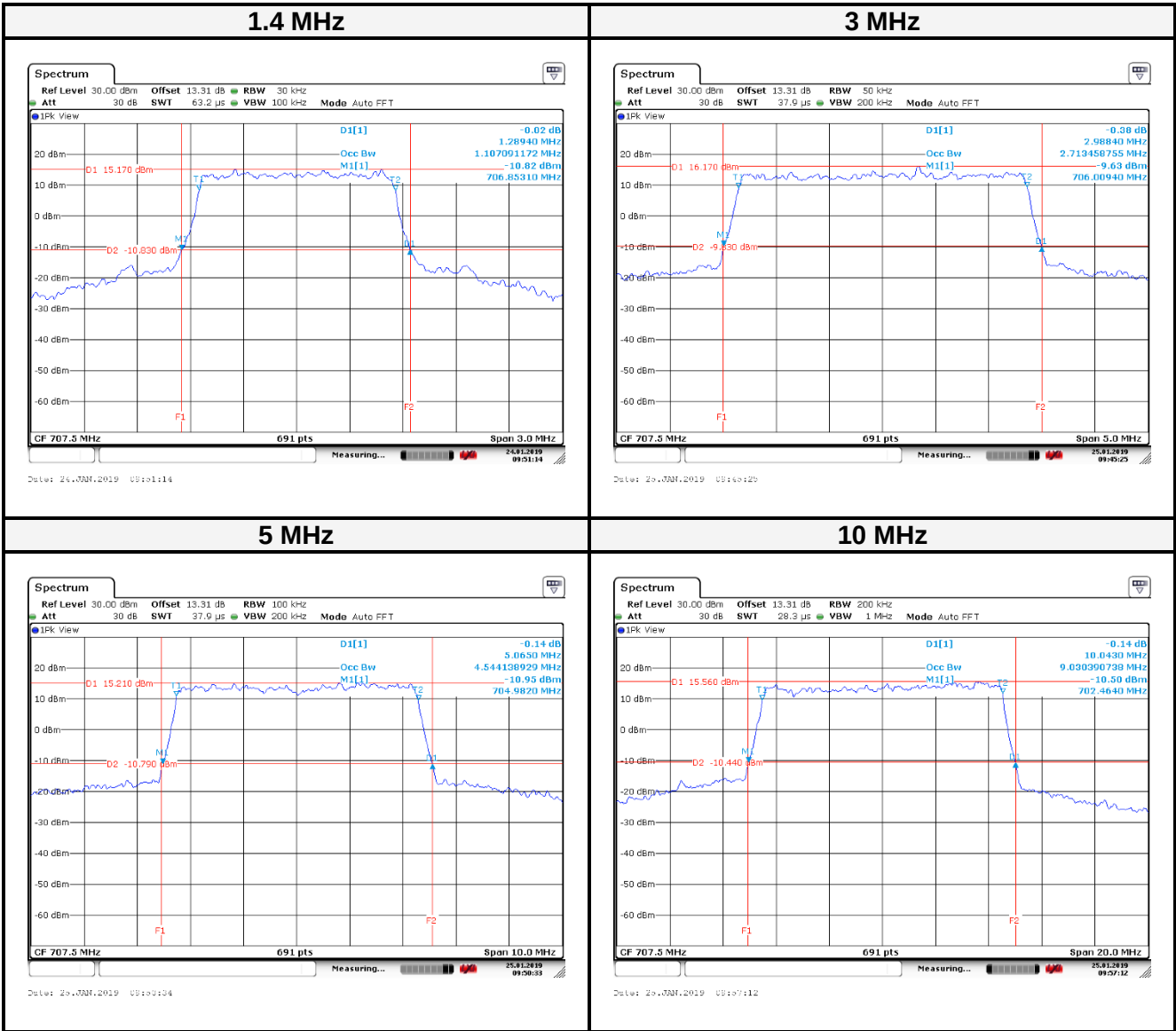
LTE Band 4: 16QAM



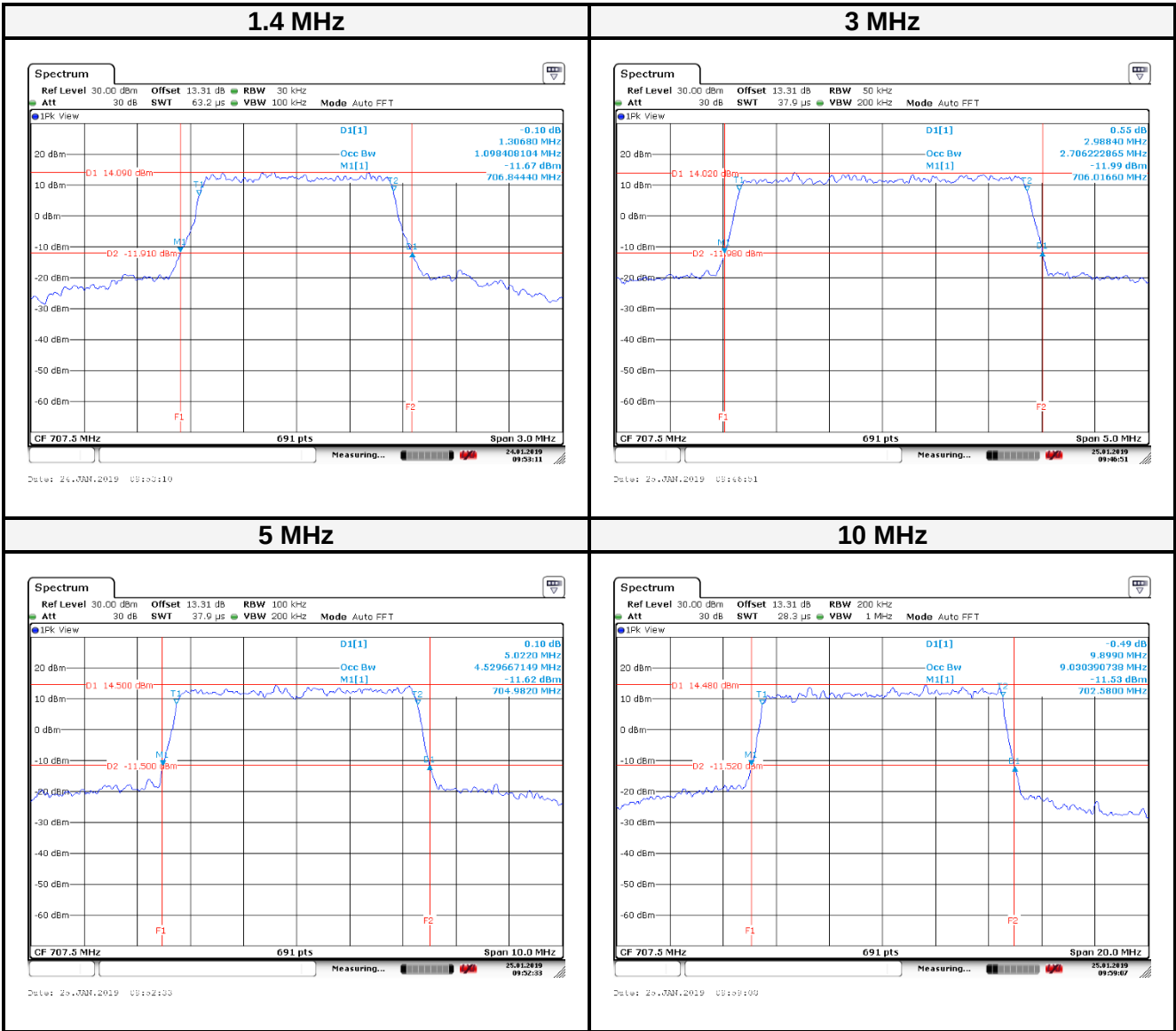
LTE Band 4: 16QAM



LTE Band 12: QPSK



LTE Band 12: 16QAM



8 FCC § 2.1051, § 24.238(a) and § 27.53 – Spurious Emission at Antenna Terminals

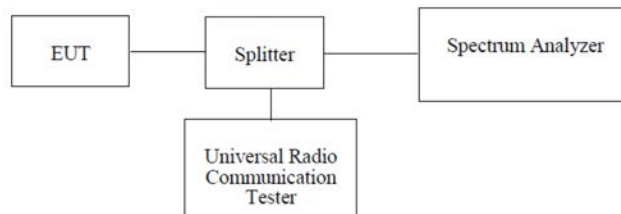
8.1 Applicable Standard

According to FCC § 2.1051, § 24.238(a) and § 27.53,.

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

8.2 Test Procedure

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



8.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	149170	2018/05/11	2019/05/10
Spectrum Analyzer	Rohde & Schwarz	FSV40	101140	2018/11/22	2019/11/21
Cable	WOKEN	SFL402	S02-160323-07	2018/02/12	2019/02/11
Power Splitter	Mini Circuits	ZFRSC-183-S+	SF112701513	Each Use	/

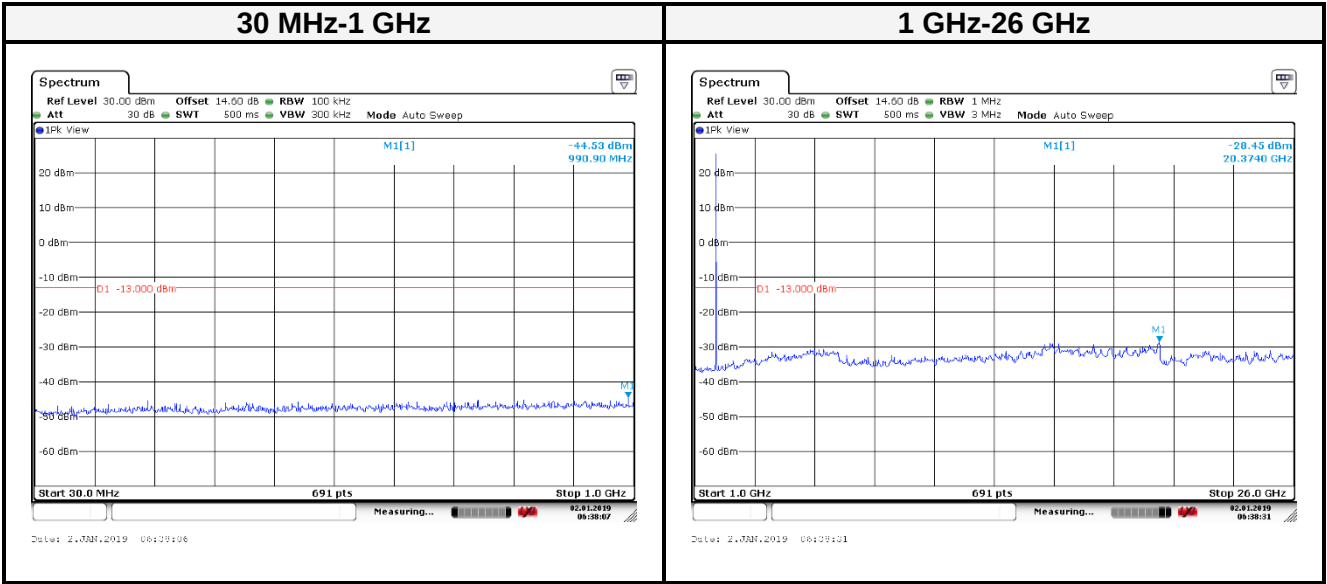
***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

8.4 Test Environmental Conditions

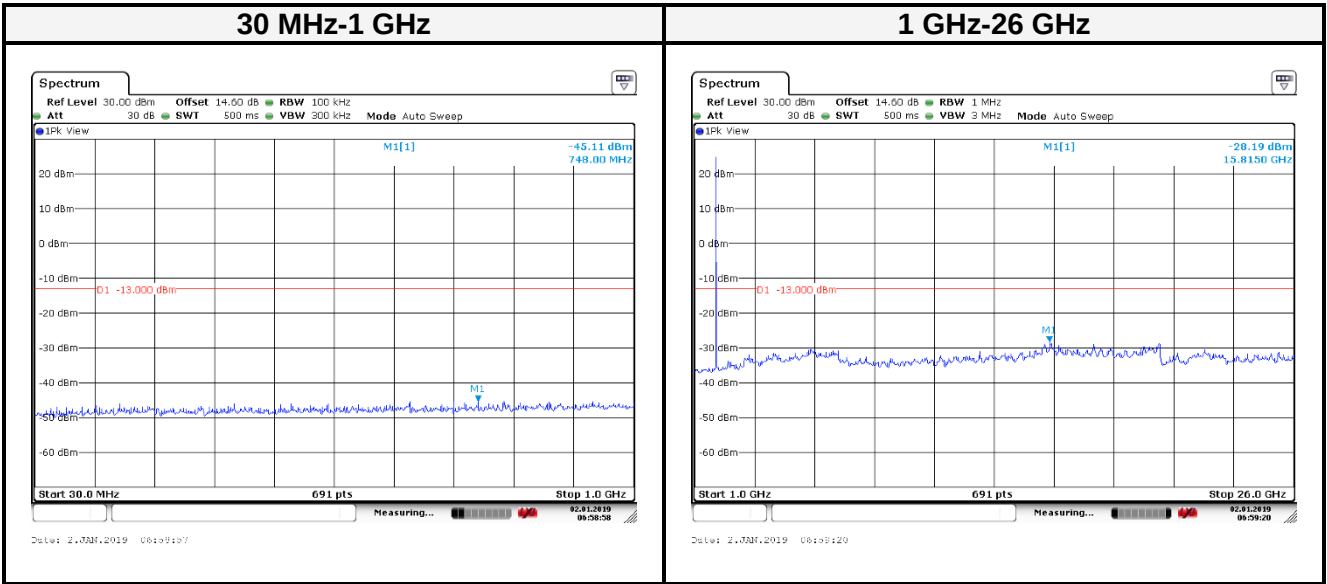
Temperature:	24~26 °C	Relative Humidity:	54~56 %
ATM Pressure:	1014hPa	Test Engineer:	Ian Tu
Test Date:	2019-01-02~2019-01-25	-	-

8.5 Test Data and Test Plot

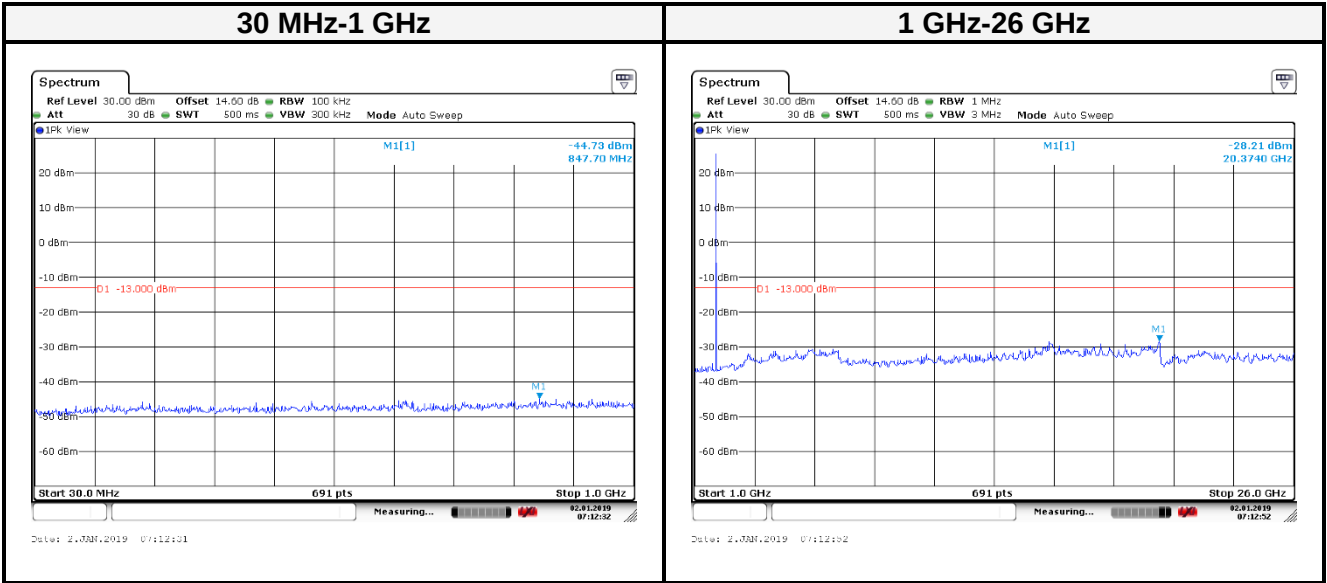
LTE Band 2 (Middle Channel) QPSK: 1.4 MHz



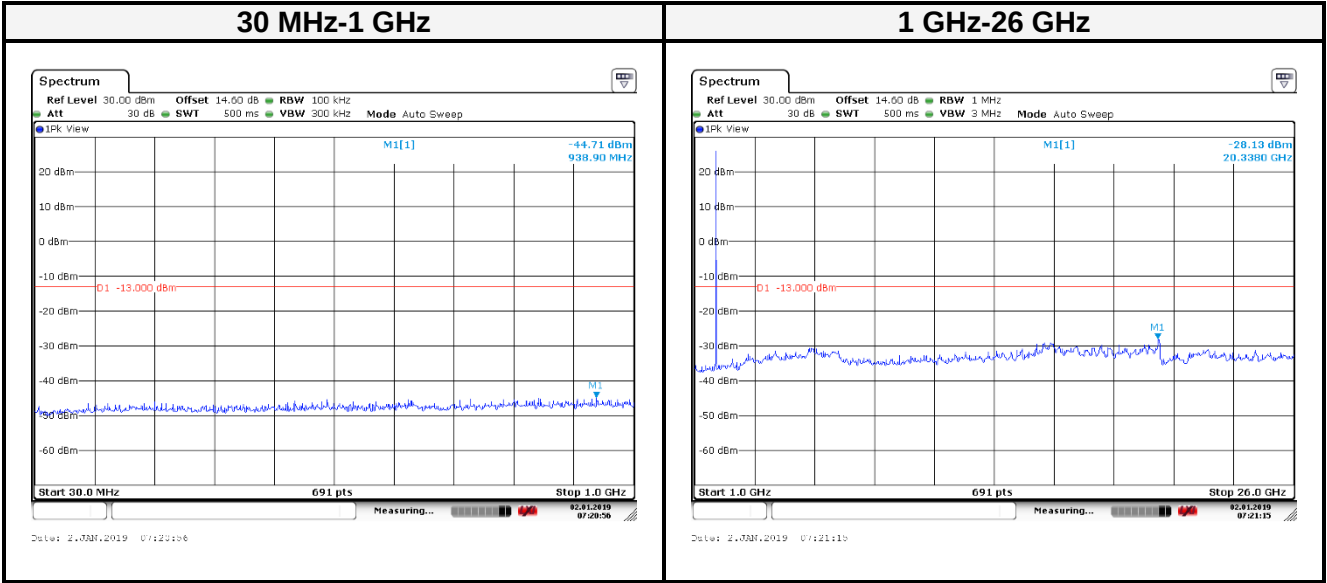
LTE Band 2 (Middle Channel) QPSK: 3 MHz



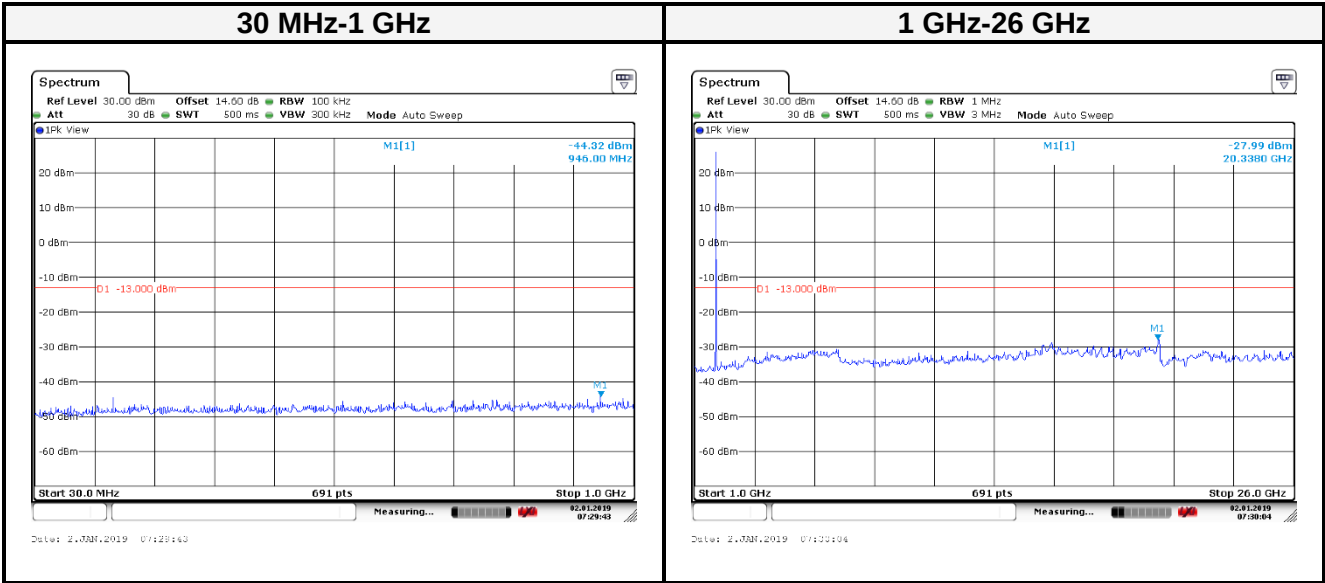
LTE Band 2 (Middle Channel) QPSK: 5 MHz



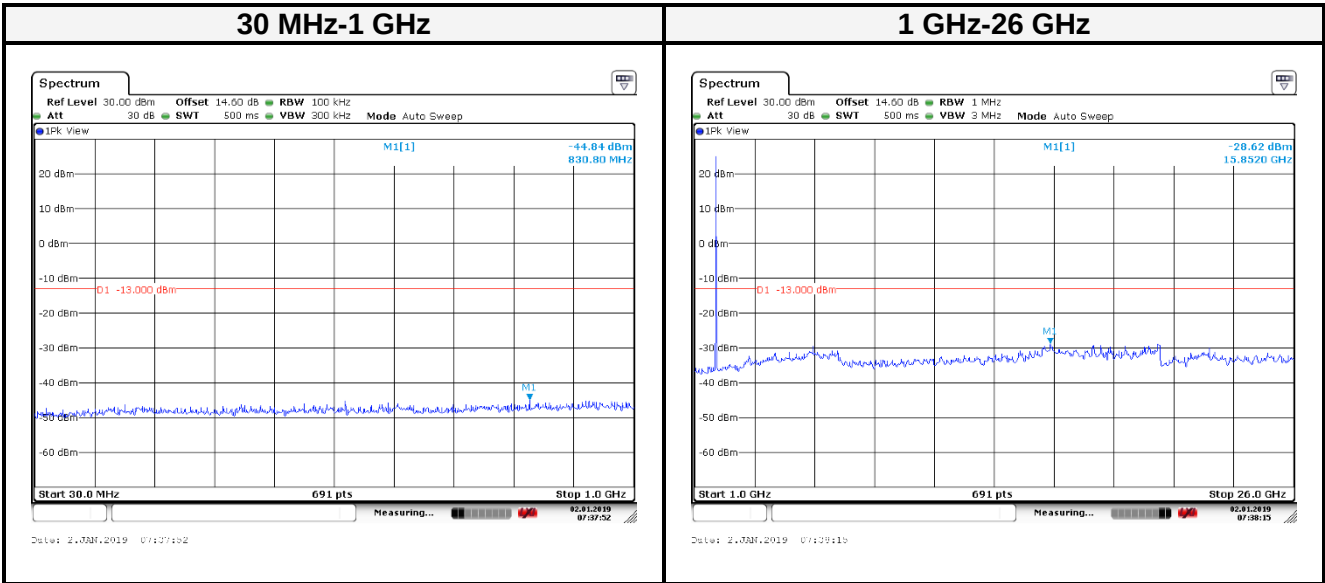
LTE Band 2 (Middle Channel) QPSK: 10 MHz



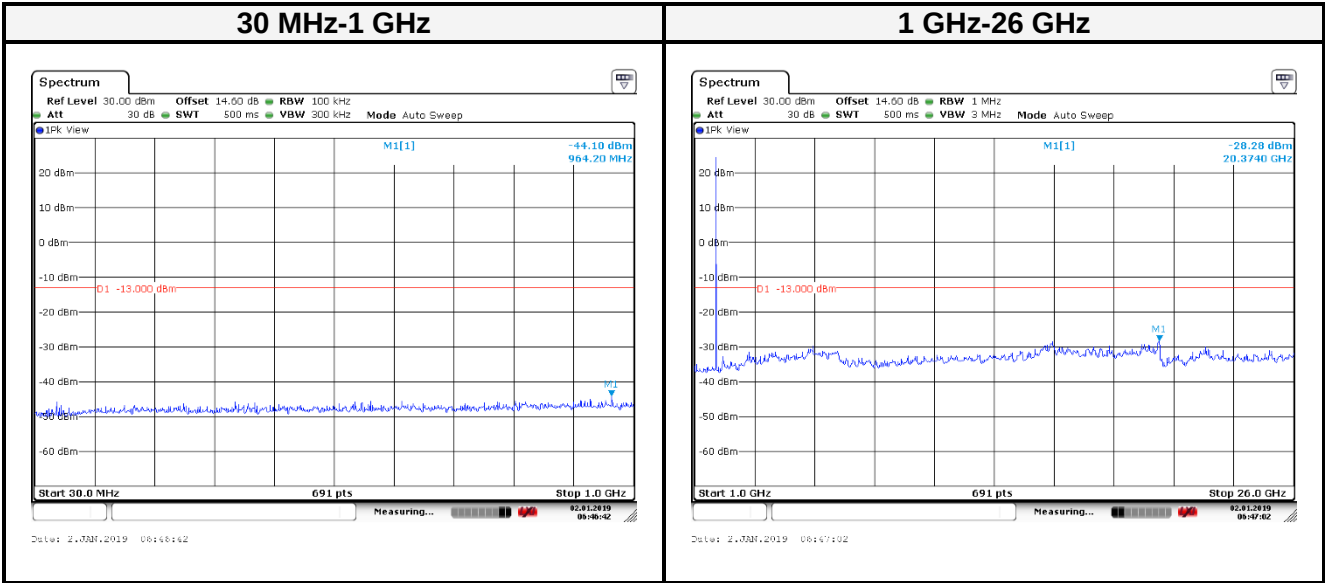
LTE Band 2 (Middle Channel) QPSK: 15 MHz



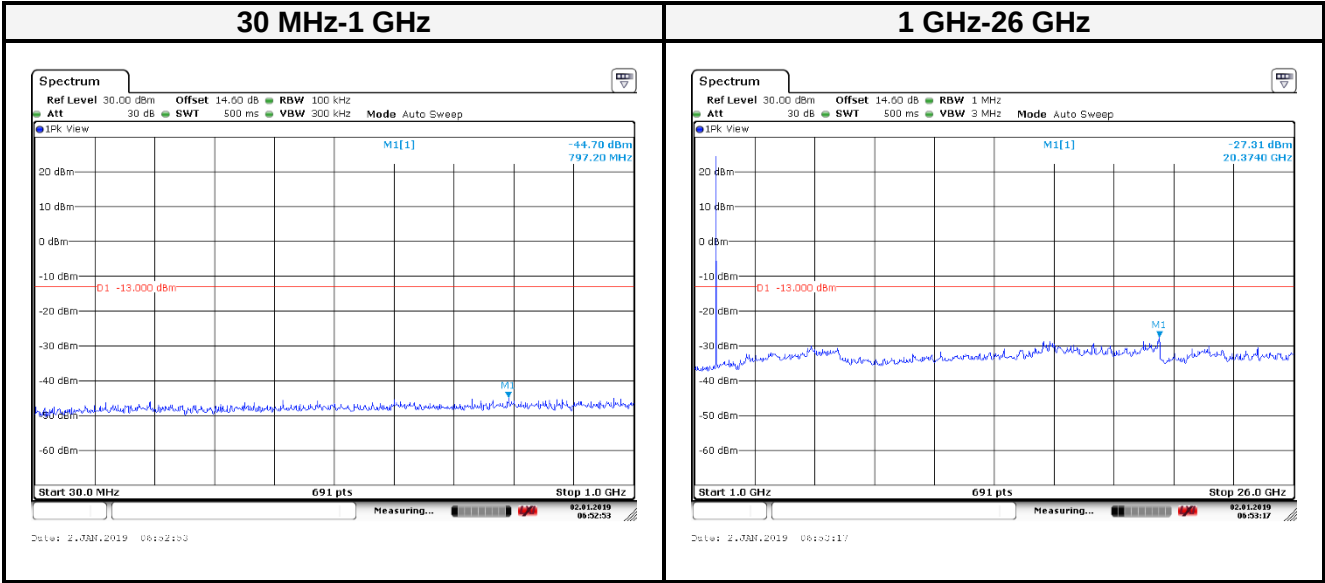
LTE Band 2 (Middle Channel) QPSK: 20 MHz



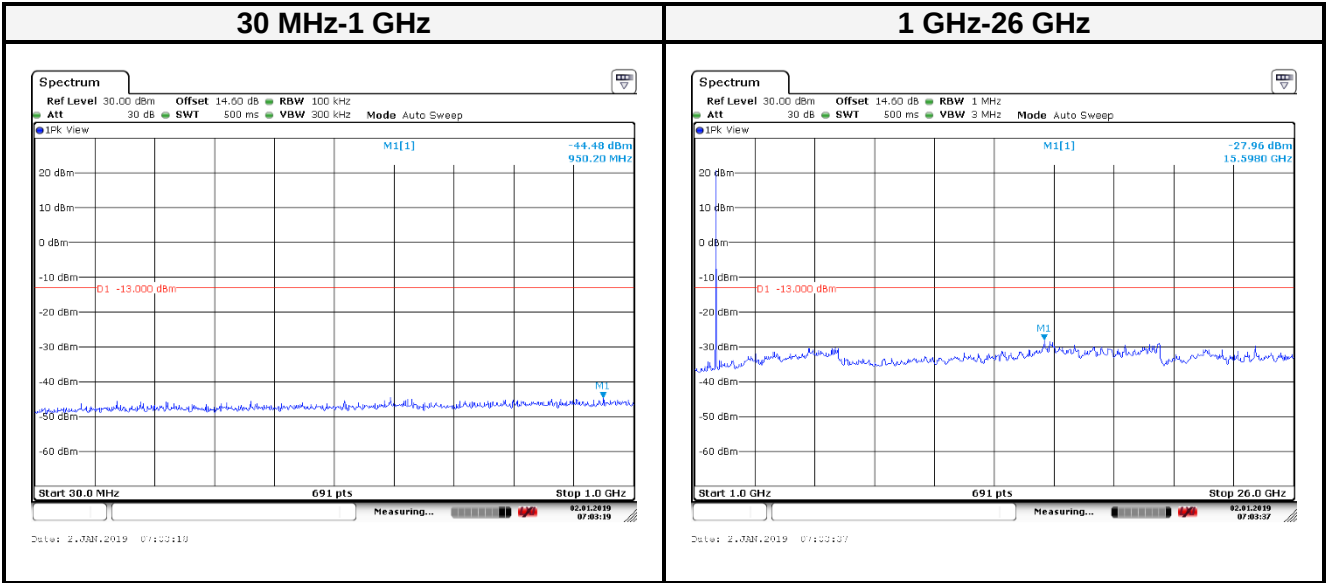
LTE Band 2 (Middle Channel) 16QAM: 1.4 MHz



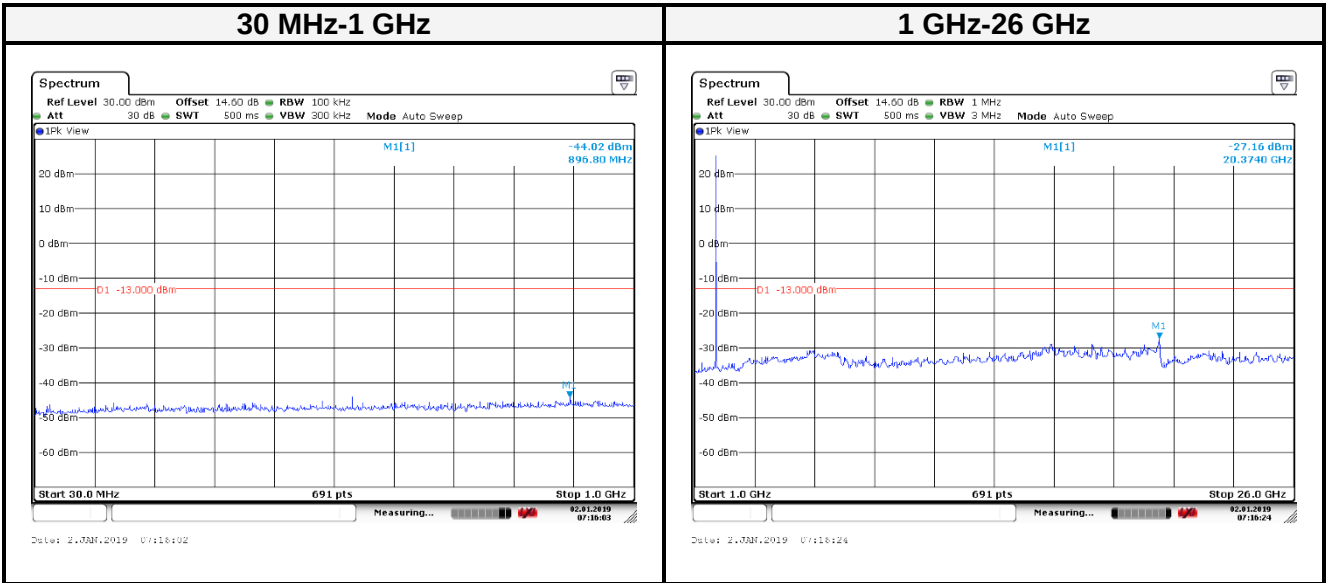
LTE Band 2 (Middle Channel) 16QAM: 3 MHz



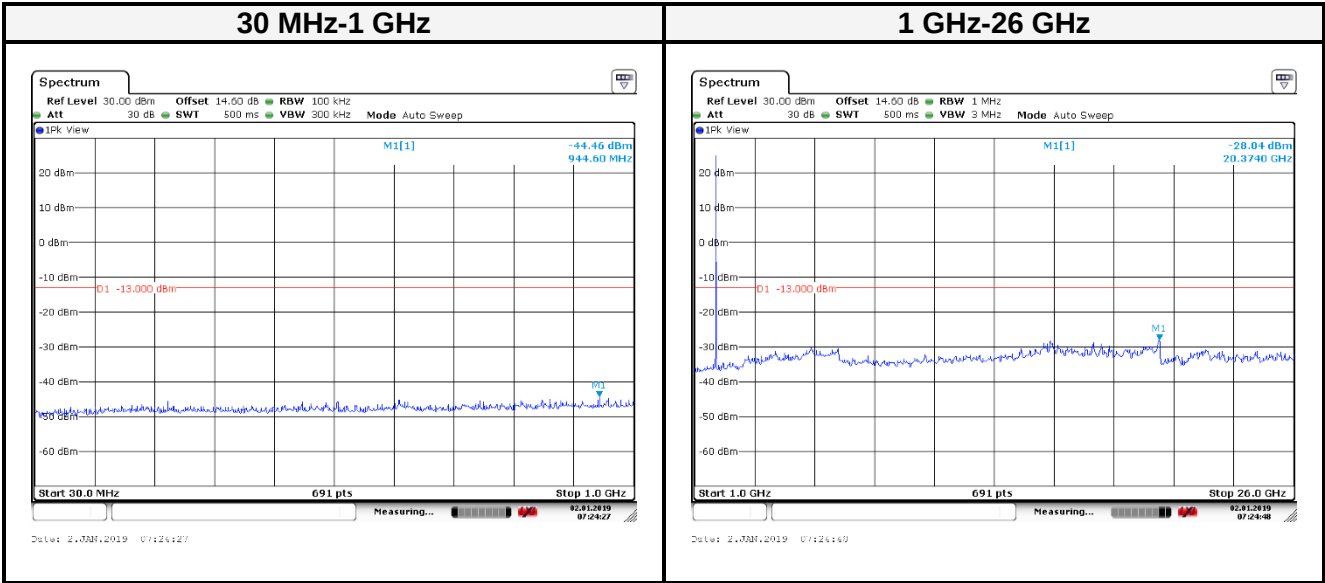
LTE Band 2 (Middle Channel) 16QAM: 5 MHz



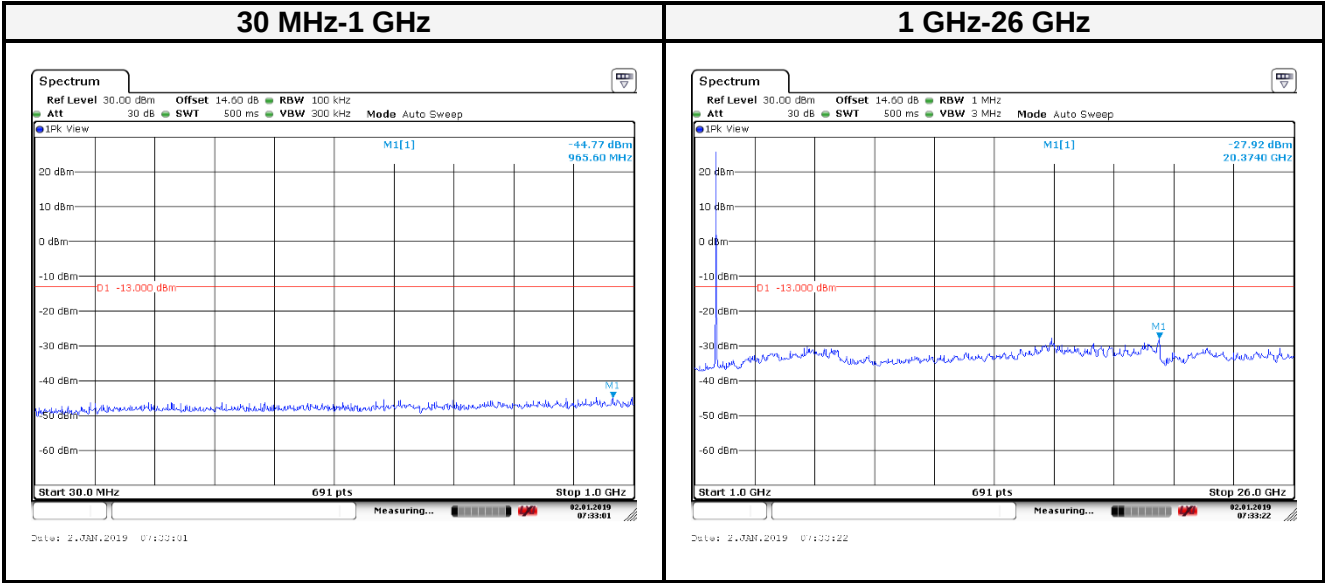
LTE Band 2 (Middle Channel) 16QAM: 10 MHz



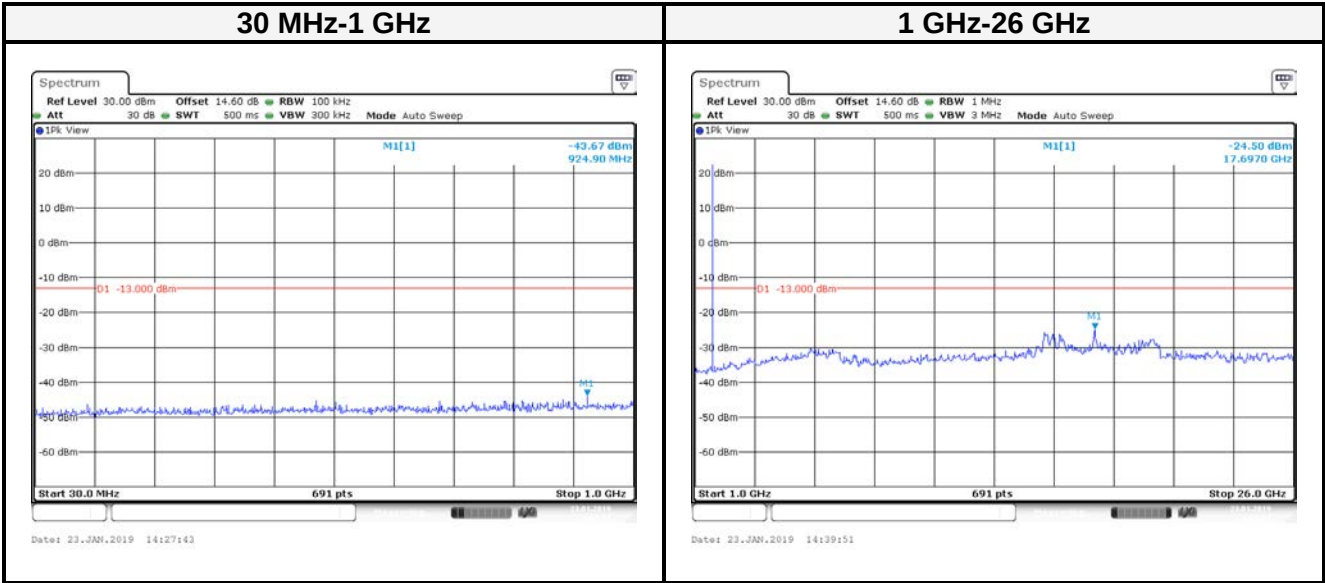
LTE Band 2 (Middle Channel) 16QAM: 15 MHz



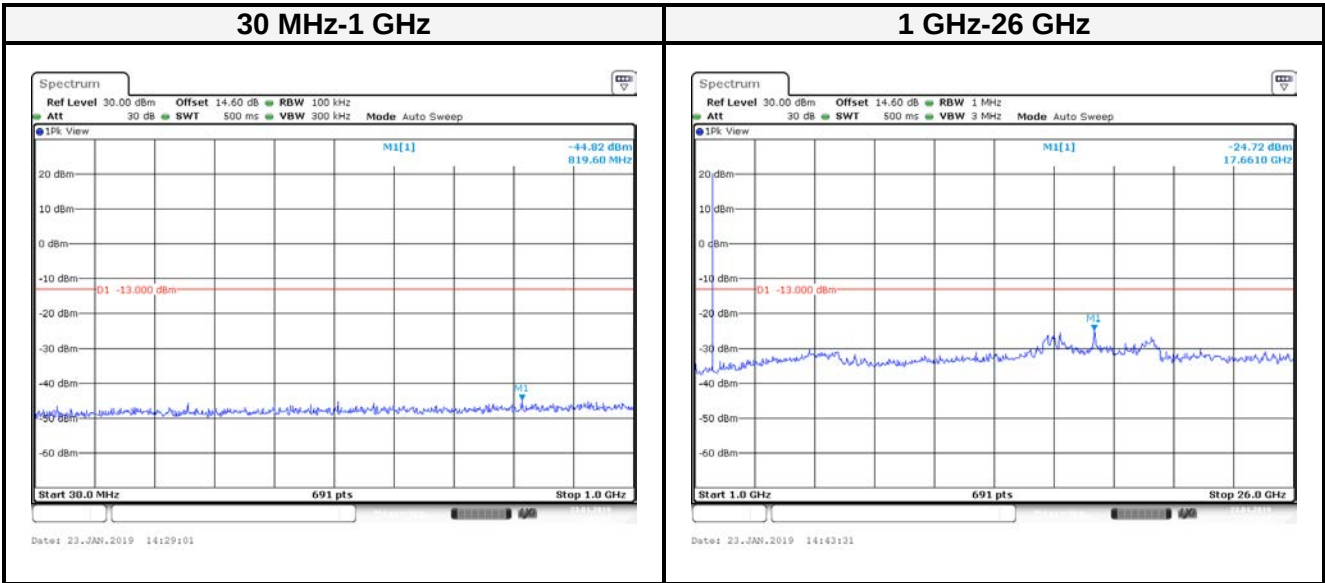
LTE Band 2 (Middle Channel) 16QAM: 20 MHz



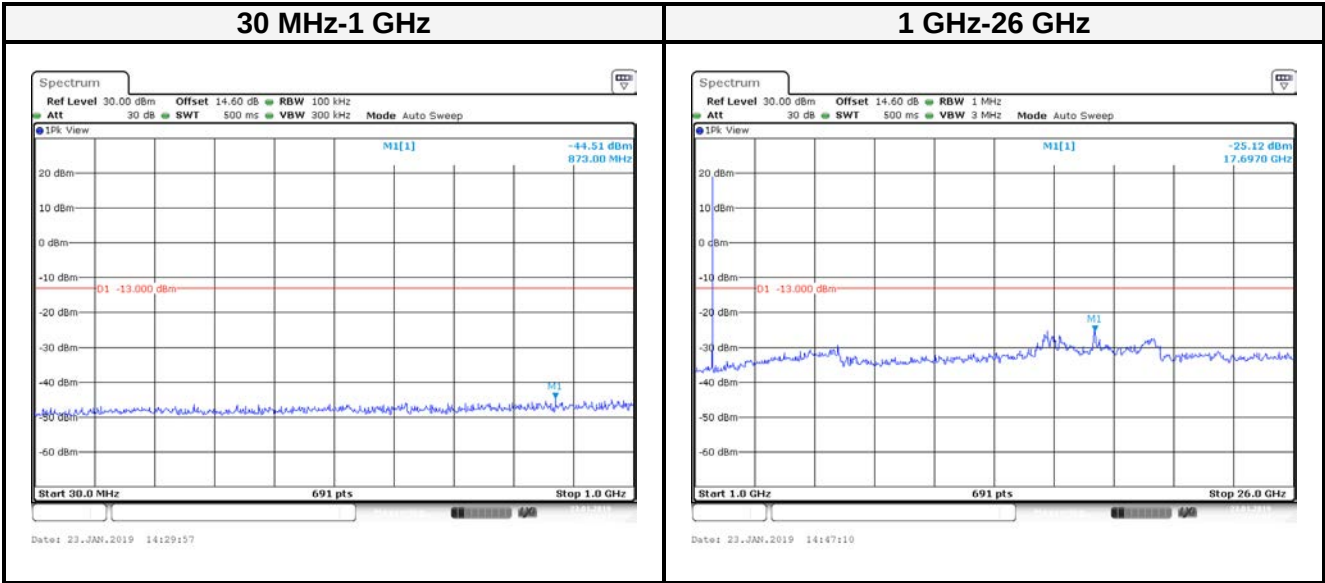
LTE Band 4 (Middle Channel) QPSK: 1.4 MHz



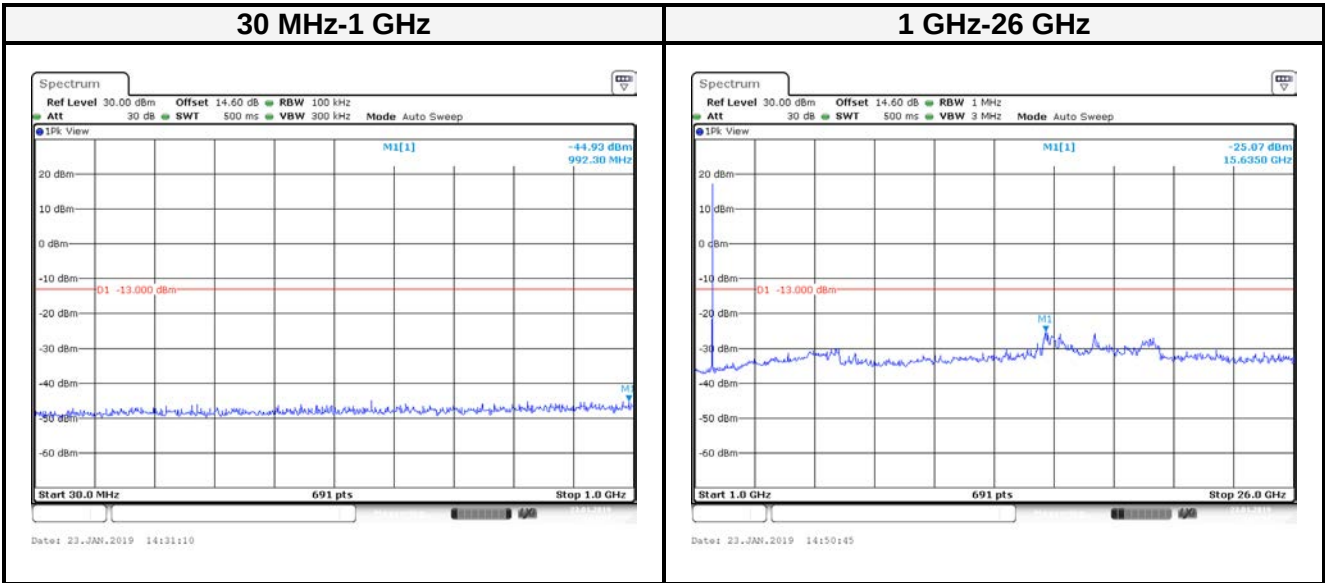
LTE Band 4 (Middle Channel) QPSK: 3 MHz



LTE Band 4 (Middle Channel) QPSK: 5 MHz



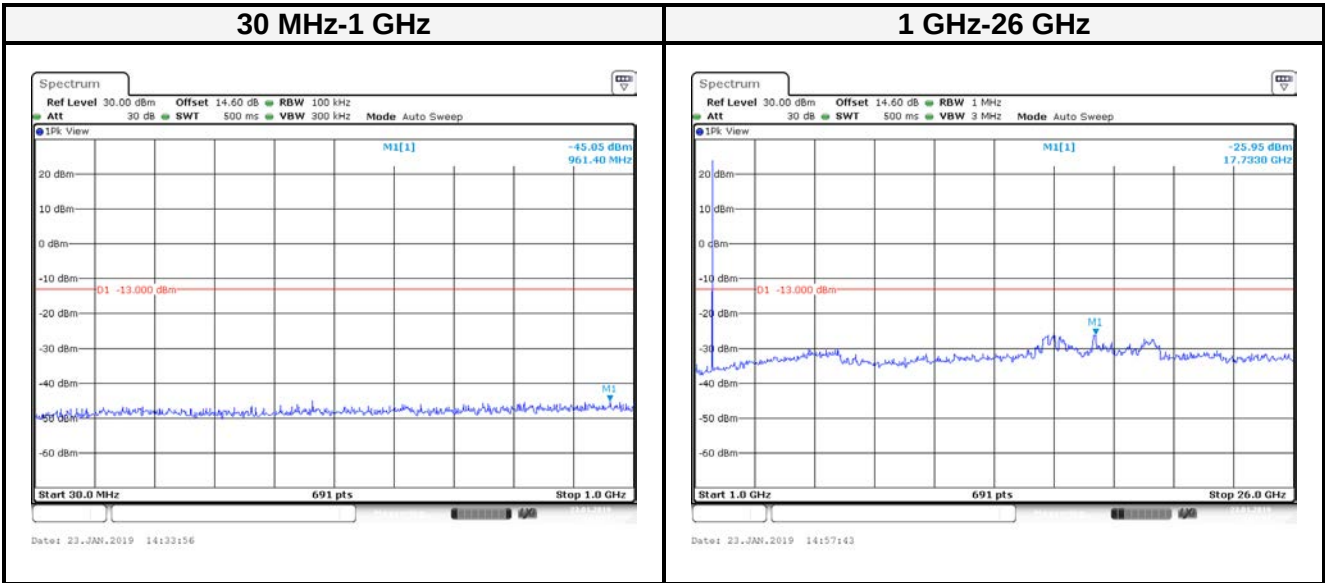
LTE Band 4 (Middle Channel) QPSK: 10 MHz



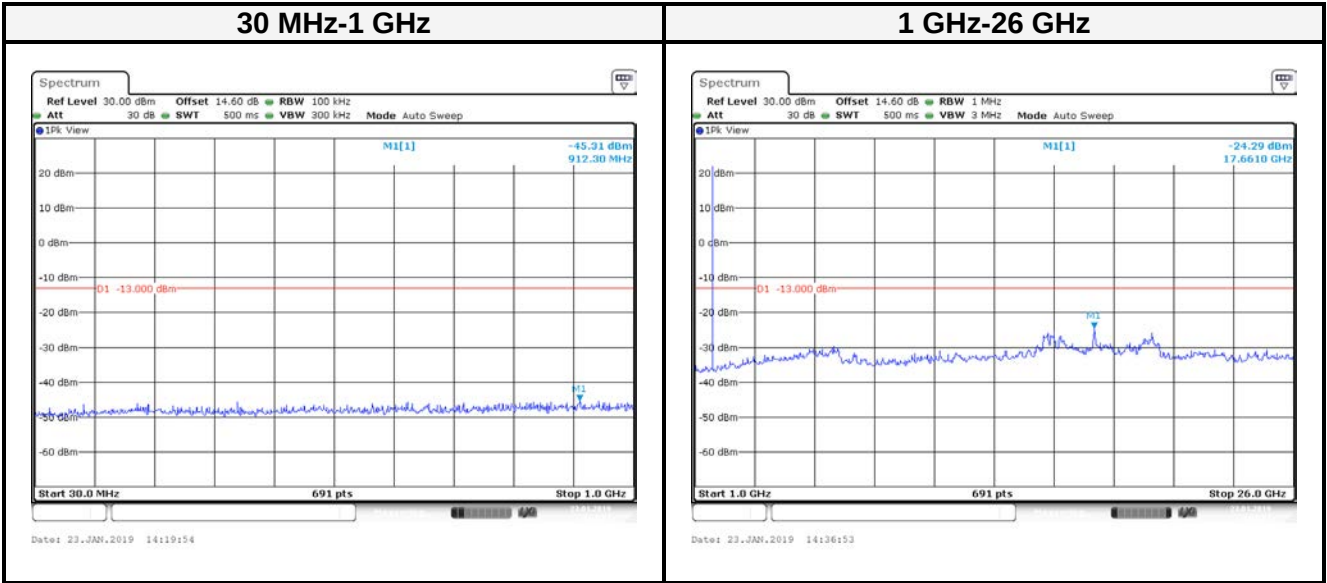
LTE Band 4 (Middle Channel) QPSK: 15 MHz



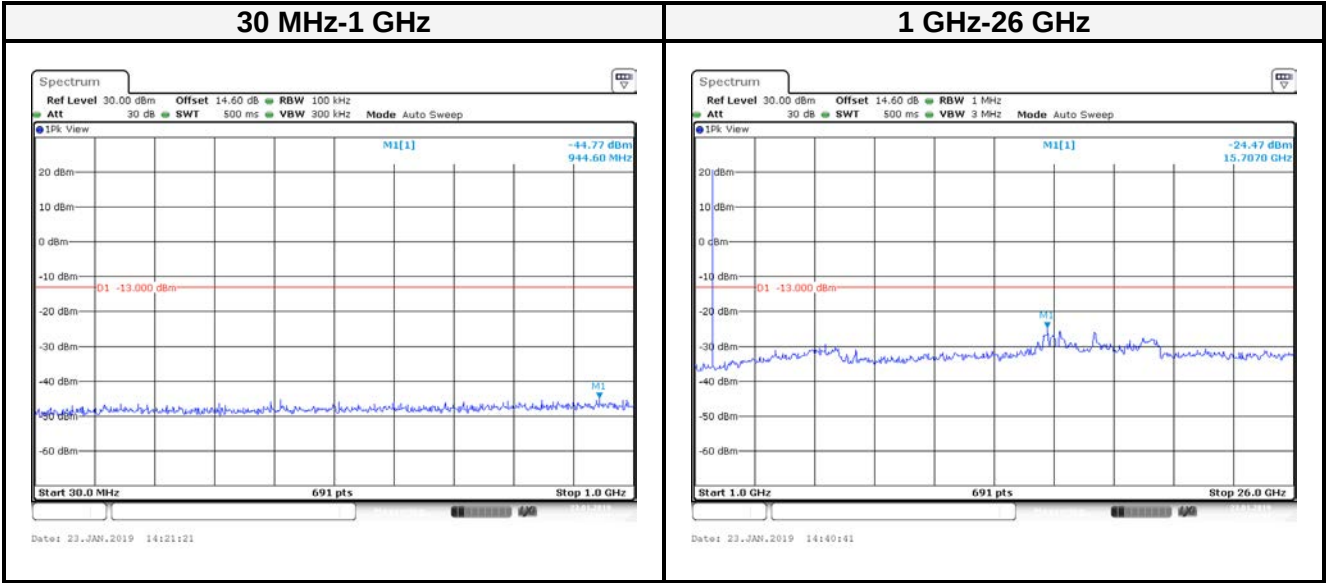
LTE Band 4 (Middle Channel) QPSK: 20 MHz



LTE Band 4 (Middle Channel) 16QAM: 1.4 MHz



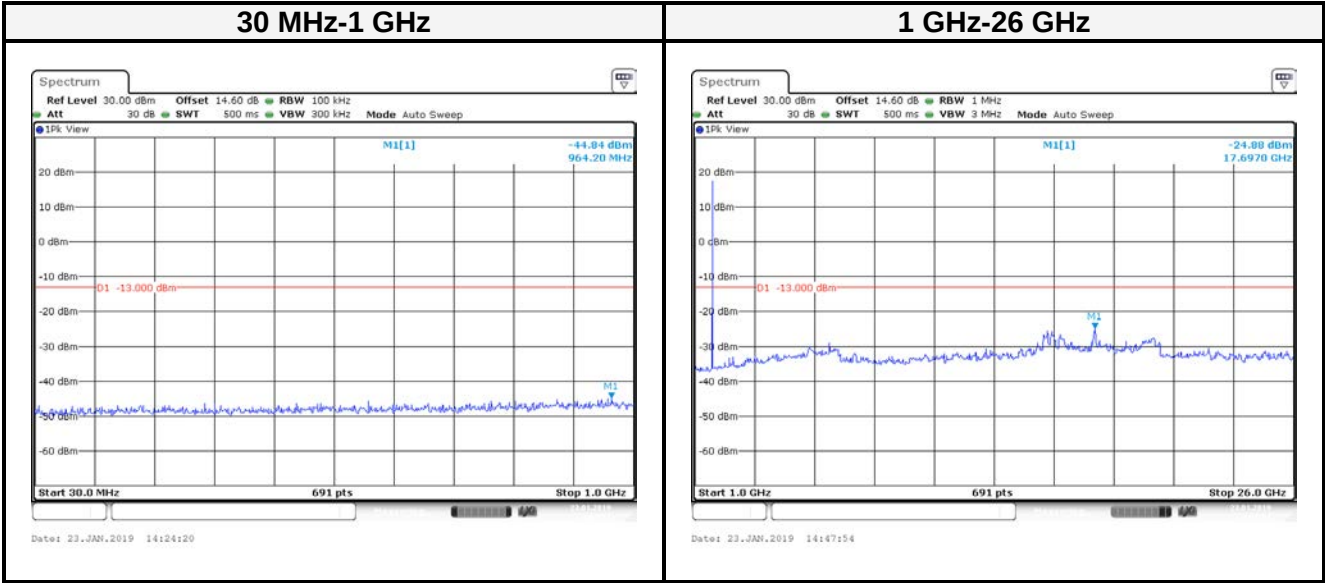
LTE Band 4 (Middle Channel) 16QAM: 3 MHz



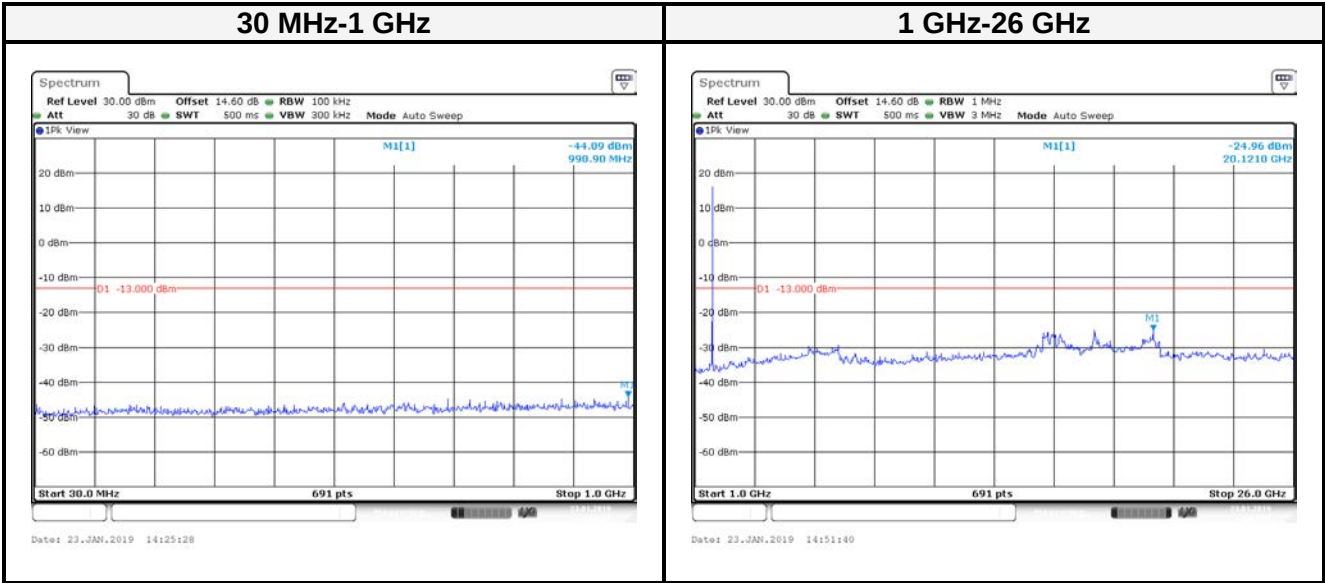
LTE Band 4 (Middle Channel) 16QAM: 5 MHz



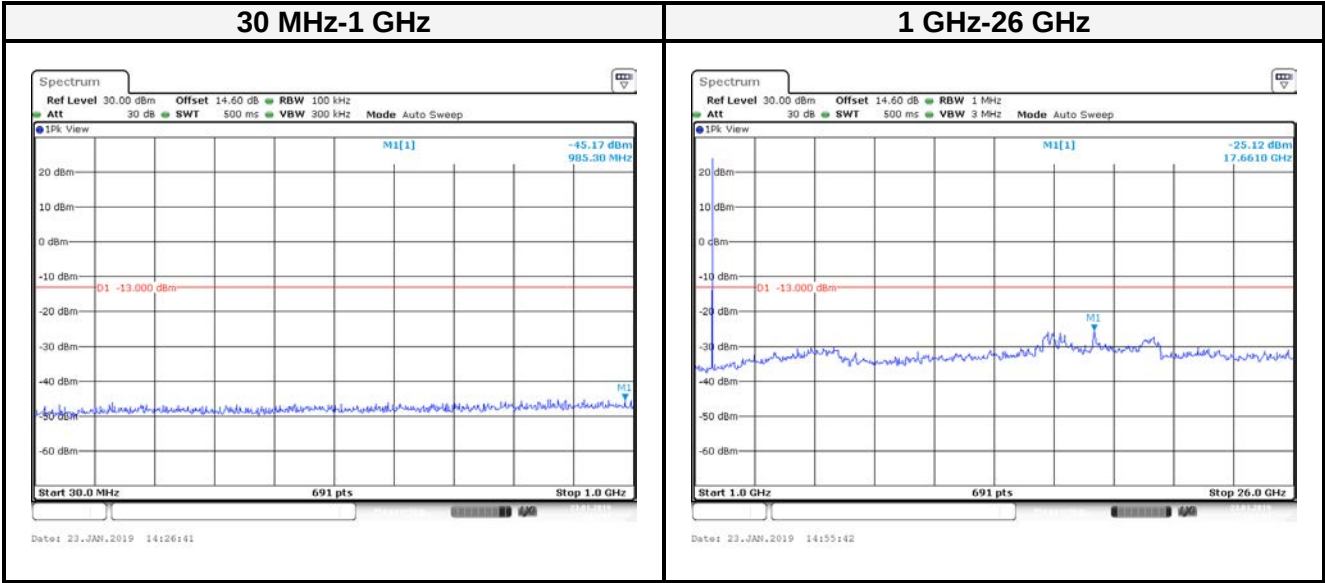
LTE Band 4 (Middle Channel) 16QAM: 10 MHz



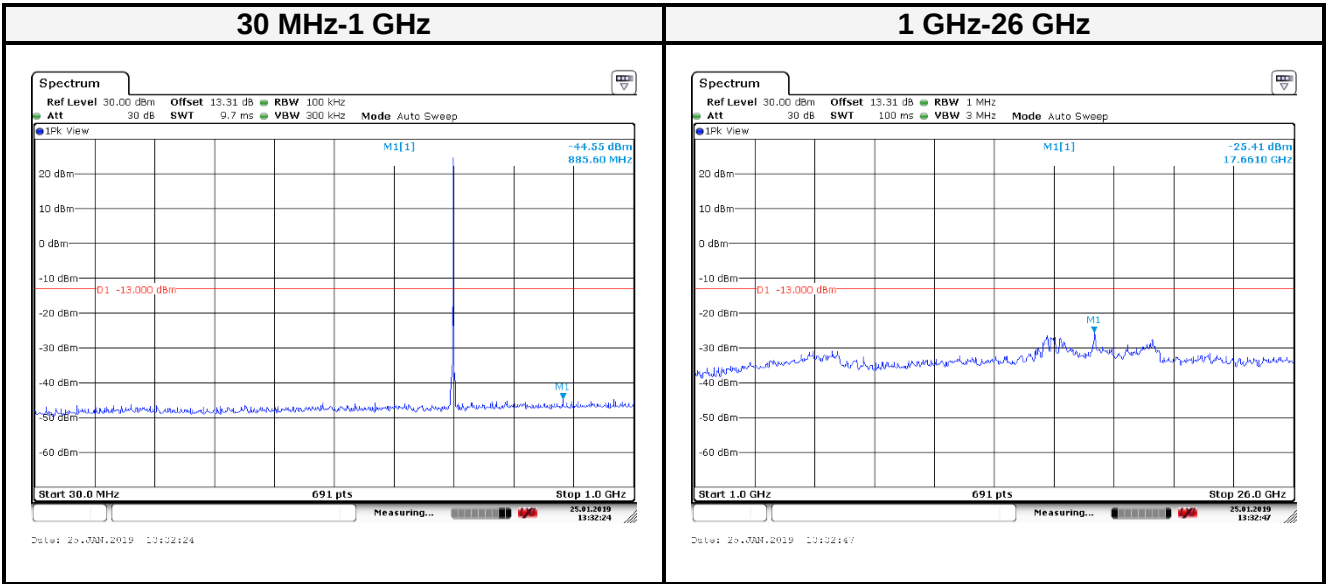
LTE Band 4 (Middle Channel) 16QAM: 15 MHz



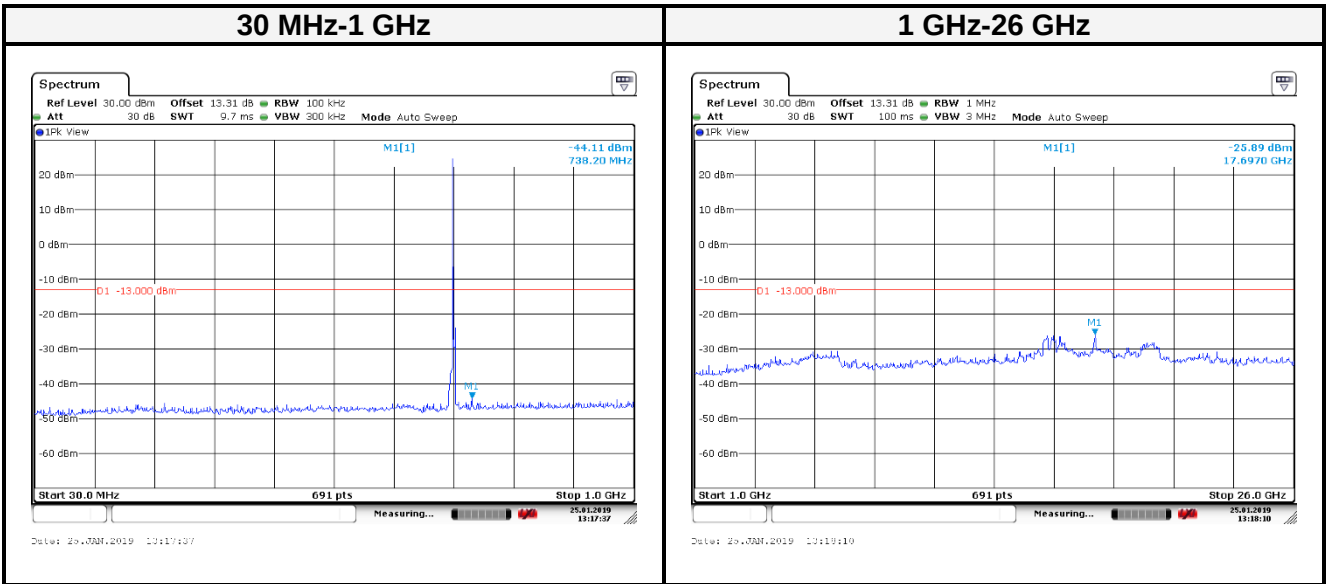
LTE Band 4 (Middle Channel) 16QAM: 20 MHz



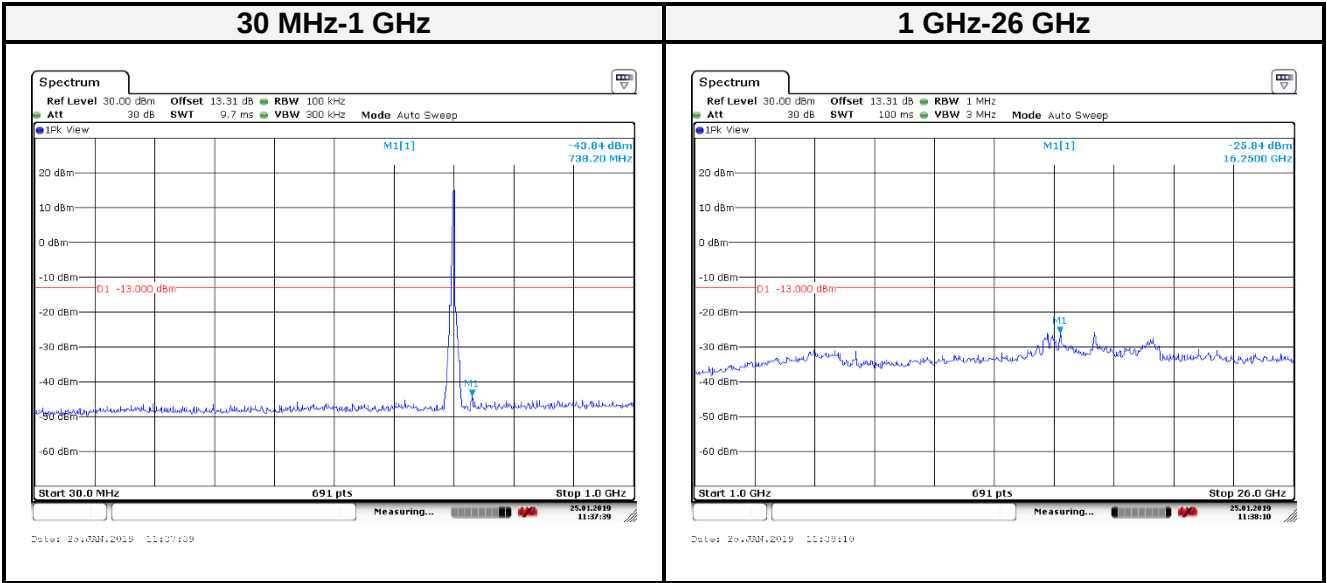
LTE Band 12 (Middle Channel) QPSK: 1.4 MHz



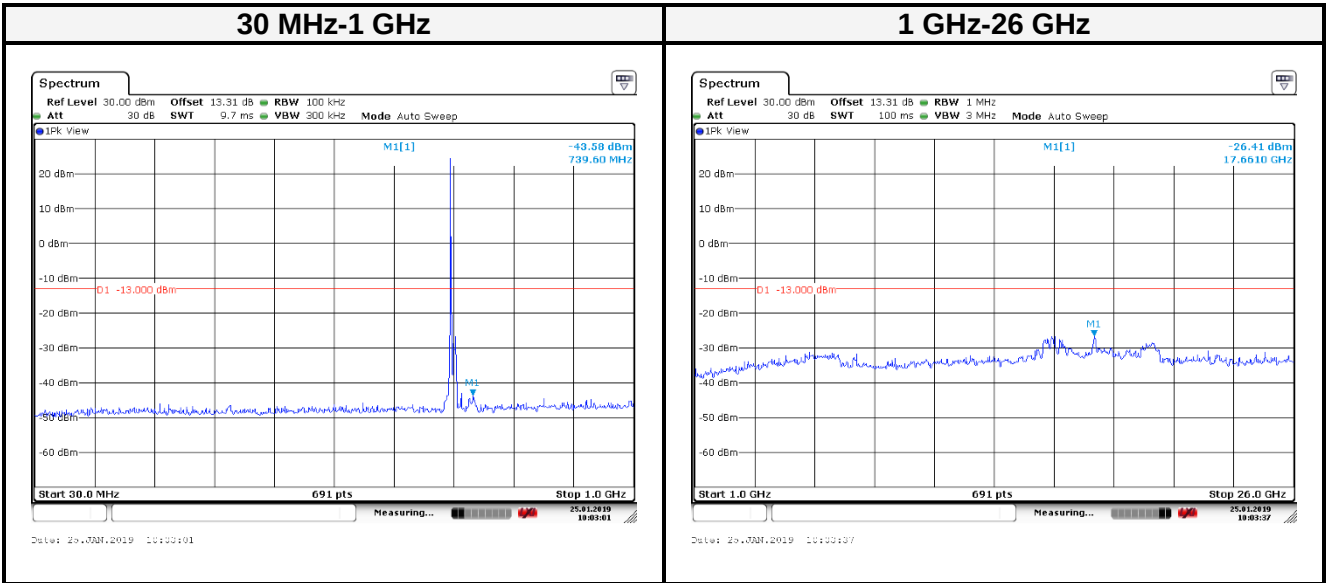
LTE Band 12 (Middle Channel) QPSK: 3 MHz



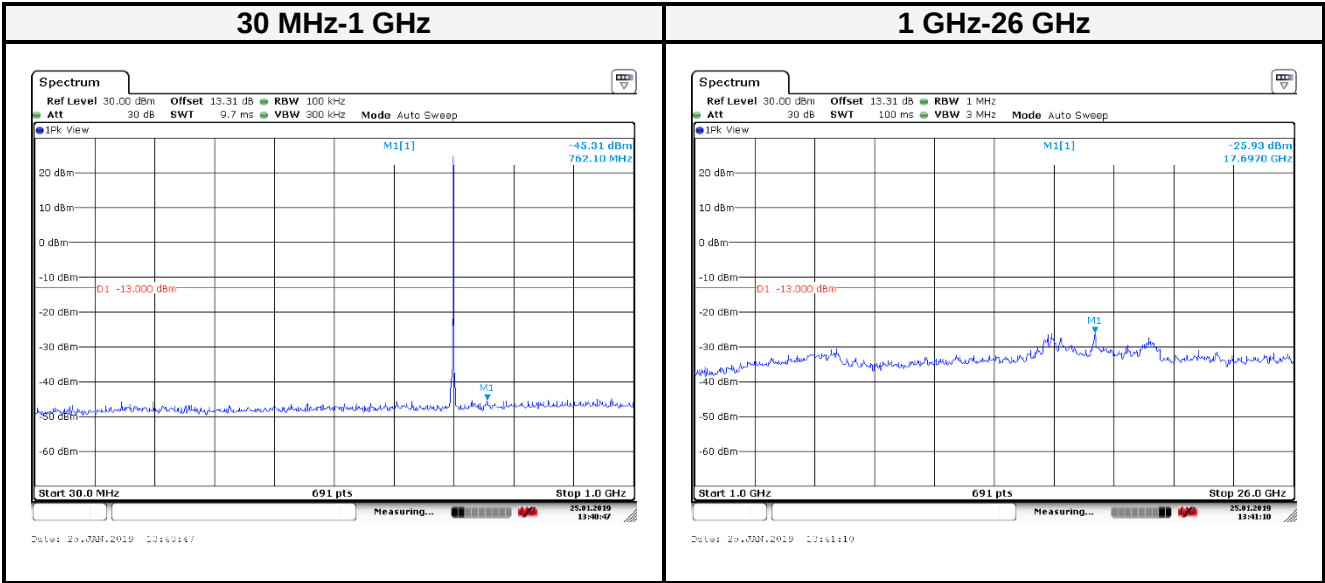
LTE Band 12 (Middle Channel) QPSK: 5 MHz



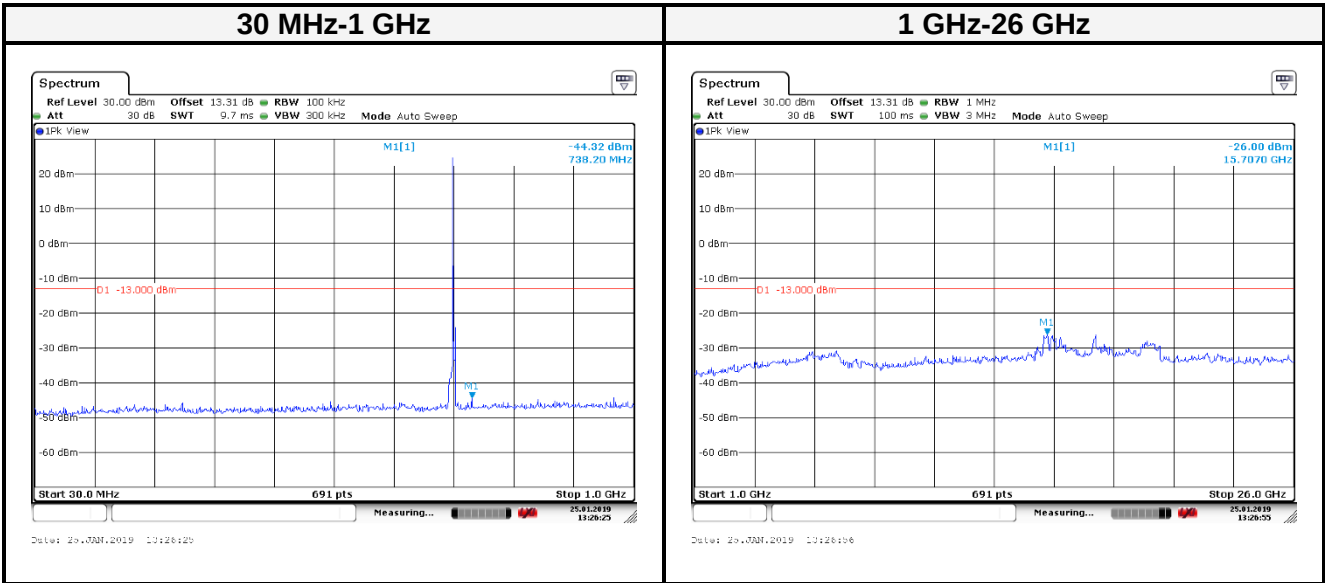
LTE Band 12 (Middle Channel) QPSK: 10 MHz



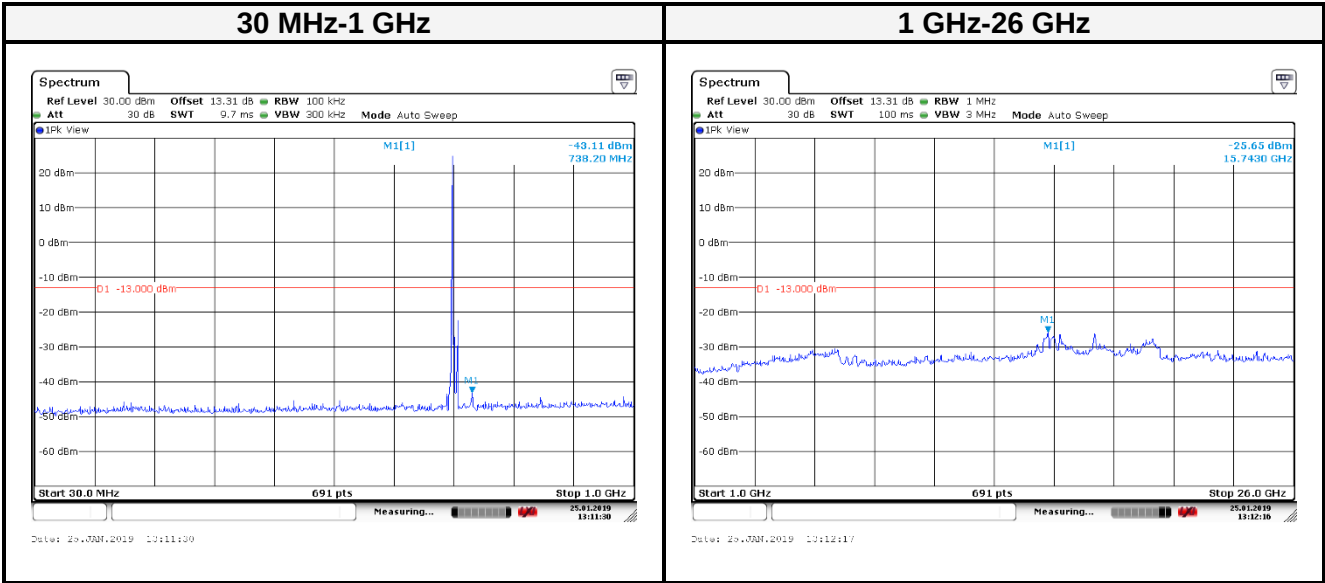
LTE Band 12 (Middle Channel) 16QAM: 1.4 MHz



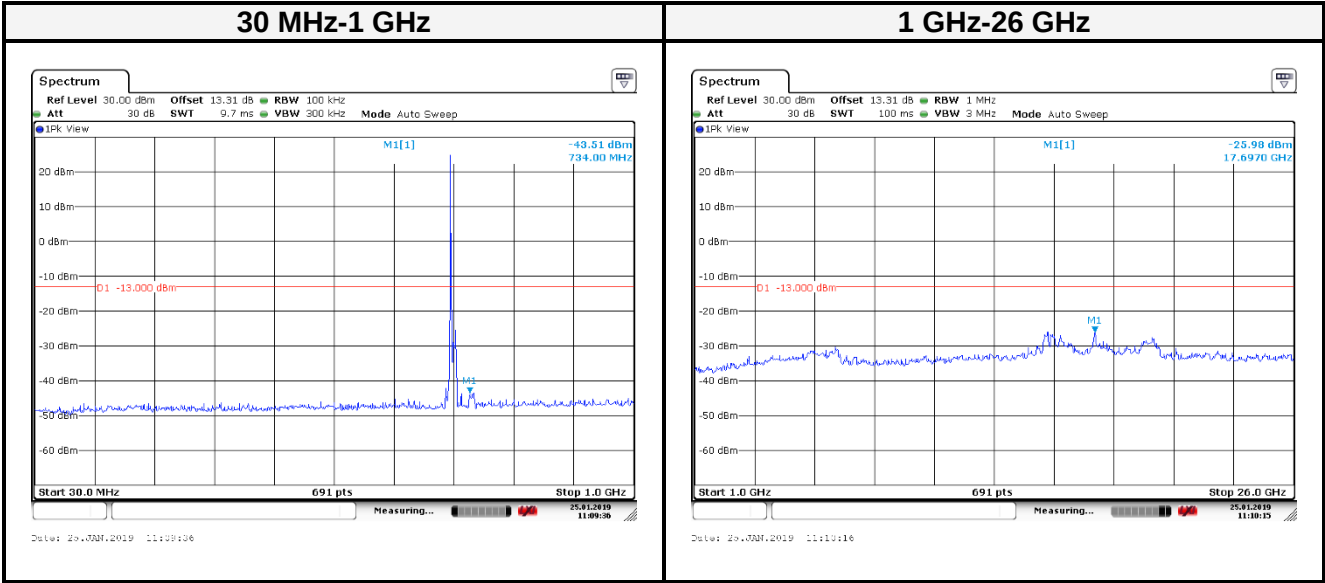
LTE Band 12 (Middle Channel) 16QAM: 3 MHz



LTE Band 12 (Middle Channel) 16QAM: 5 MHz



LTE Band 12 (Middle Channel) 16QAM: 10 MHz



9 FCC § 2.1053, § 24.238 and §27.53 – Spurious Radiated Emission

9.1 Applicable Standard

According to FCC § 2.1053, § 24.238 and § 27.53.

9.2 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 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.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \lg (\text{power out in Watts})$

9.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Bilog Antenna with 6 dB Attenuator	Sunol & Mini-Circuits	JB6/UNAT-6+	A050115/15542_01	2018/12/11	2019/12/10
Bilog Antenna with 6 dB Attenuator	Sunol Sciences & EMEC	JB3 &EM-ATT18-6-NN	A061204 /ATT-09-003	2018/11/16	2019/11/15
Horn Antenna	EMCO	3115	2171	2018/04/16	2019/04/15
Horn Antenna	EMCO	3115	9311-4158	2018/04/20	2019/04/19
Horn Antenna	ETS-Lindgren	3116	62638	2018/08/29	2019/08/28
Horn Antenna	ETS-Lindgren	3160-09	00123852	2018/06/29	2019/06/28
Horn Antenna	ETS-Lindgren	3160-10	00123855	2018/07/06	2019/07/05
Preamplifier	Sonoma	310N	130602	2018/07/04	2019/07/03
Preamplifier	EM Electronics Corp.	EM01G18G	060698	2018/04/13	2019/04/12
Microwave Preamplifier	EM Electronics Corporatino	EM18G40G	060656	2019/01/11	2020/01/10
Sweep Signal Generator	Agilent	83650B	3420A00581	2018/06/06	2019/06/05
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2018/10/23	2019/10/22
Spectrum Analyzer	Rohde & Schwarz	FSV40	101435	2019/02/13	2020/02/12
Microflex Cable	ROSNOL	K1K50-UP0264-K1K50-80CM	160309-2	2019/01/16	2020/01/15
Microflex Cable	ROSNOL	K1K50-UP0264-K1K50-450CM	160309-1	2018/03/05	2019/03/04
Mircoflex Cable	UTIFLEX	UFB197C-1-2362-70U-70U	225757-001	2018/07/02	2019/07/01
Microflex Cable	UTIFLEX	UFA210A-1-3149-300300	MFR64639 226389-001	2018/11/19	2019/11/18
Turn Table	Champro	TT-2000	060772-T	N.C.R	N.C.R
Antenna Tower	Champro	AM-BS-4500-B	060772-A	N.C.R	N.C.R
Controller	Champro	EM1000	60772	N.C.R	N.C.R
Software	Farad	EZ_EMC	BACL-03A1	N.C.R	N.C.R

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

9.4 Test Environmental Conditions

Temperature:	24~26 °C	Relative Humidity:	54~56 %
ATM Pressure:	1014hPa	Test Engineer:	Leo Cheng
Test Date:	2019-01-25	-	-

9.5 Test Data

Below 1G (30 MHz-1 GHz) test the output power worst mode: LTE Band 12 (Low Channel) QPSK

Horizontal							Vertical						
Freq	Level	Limit	Over	Read			Freq	Level	Limit	Over	Read		
		Line	Limit	Level	Factor	Remark			Line	Limit	Level	Factor	Remark
MHz	dBm	dBm	dB	dBm	dB		MHz	dBm	dBm	dB	dBm	dB	
101.780	-76.32	-13.00	-63.32	-62.61	-13.71	Peak	101.780	-69.77	-13.00	-56.77	-68.61	-1.16	Peak
154.160	-72.27	-13.00	-59.27	-60.40	-11.87	Peak	155.130	-76.28	-13.00	-63.28	-66.87	-9.41	Peak
274.440	-71.44	-13.00	-58.44	-64.57	-6.87	Peak	271.530	-72.59	-13.00	-59.59	-64.19	-8.40	Peak
395.690	-73.09	-13.00	-60.09	-66.38	-6.71	Peak	352.040	-73.12	-13.00	-60.12	-65.81	-7.31	Peak
692.510	-75.77	-13.00	-62.77	-72.97	-2.80	Peak	395.690	-74.38	-13.00	-61.38	-67.30	-7.08	Peak
988.360	-74.43	-13.00	-61.43	-76.30	1.87	Peak	692.510	-78.08	-13.00	-65.08	-76.03	-2.05	Peak

Above 1G (1G Hz-20 GHz):

LTE Band 2 (Middle Channel): QPSK

Horizontal							Vertical						
Freq	Level	Limit	Over	Read			Freq	Level	Limit	Over	Read		
		Line	Limit	Level	Factor	Remark			Line	Limit	Level	Factor	Remark
MHz	dBm	dBm	dB	dBm	dB		MHz	dBm	dBm	dB	dBm	dB	
1188.000	-45.31	-13.00	-32.31	-45.20	-0.11	Peak	1176.250	-45.01	-13.00	-32.01	-44.22	-0.79	Peak
1963.500	-43.92	-13.00	-30.92	-47.03	3.11	Peak	1975.250	-43.15	-13.00	-30.15	-46.61	3.46	Peak
2774.250	-43.66	-13.00	-30.66	-47.31	3.65	Peak	2762.500	-48.83	-13.00	-35.83	-52.71	3.88	Peak
3561.500	-48.93	-13.00	-35.93	-55.56	6.63	Peak	3561.500	-48.75	-13.00	-35.75	-55.34	6.59	Peak
3761.250	-40.67	-13.00	-27.67	-48.67	8.00	Peak	3761.250	-39.88	-13.00	-26.88	-47.61	7.73	Peak
5641.250	-44.15	-13.00	-31.15	-55.16	11.01	Peak	5136.000	-49.04	-13.00	-36.04	-59.85	10.81	Peak
							5641.250	-41.87	-13.00	-28.87	-53.53	11.66	Peak

LTE Band 4 (Middle Channel): QPSK

Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBm	dBm	dB	dBm	dB		MHz	dBm	dBm	dB	dBm	dB	
1188.000	-46.16	-13.00	-33.16	-46.05	-0.11	Peak	1176.250	-41.73	-13.00	-28.73	-40.94	-0.79	Peak
1987.000	-41.99	-13.00	-28.99	-45.42	3.43	Peak	1975.250	-41.99	-13.00	-28.99	-45.45	3.46	Peak
2762.500	-44.68	-13.00	-31.68	-48.41	3.73	Peak	2762.500	-46.98	-13.00	-33.98	-50.86	3.88	Peak
3455.750	-45.40	-13.00	-32.40	-52.58	7.18	Peak	3467.500	-41.48	-13.00	-28.48	-48.30	6.82	Peak
3561.500	-47.66	-13.00	-34.66	-54.29	6.63	Peak	3561.500	-48.27	-13.00	-35.27	-54.86	6.59	Peak
5194.750	-48.39	-13.00	-35.39	-58.19	9.80	Peak	5194.750	-41.93	-13.00	-28.93	-52.22	10.29	Peak

LTE Band 12 (Middle Channel): QPSK

Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBm	dBm	dB	dBm	dB		MHz	dBm	dBm	dB	dBm	dB	
1188.000	-43.54	-13.00	-30.54	-43.43	-0.11	Peak	1188.000	-43.78	-13.00	-30.78	-43.27	-0.51	Peak
1975.250	-45.04	-13.00	-32.04	-48.31	3.27	Peak	1975.250	-41.01	-13.00	-28.01	-44.47	3.46	Peak
2774.250	-46.92	-13.00	-33.92	-50.57	3.65	Peak	2762.500	-51.47	-13.00	-38.47	-55.35	3.88	Peak
3561.500	-48.10	-13.00	-35.10	-54.73	6.63	Peak	3561.500	-49.34	-13.00	-36.34	-55.93	6.59	Peak
5147.750	-50.25	-13.00	-37.25	-60.04	9.79	Peak	5147.750	-47.58	-13.00	-34.58	-58.18	10.60	Peak

10 FCC § 24.238(a) and § 27.53 – Band Edge

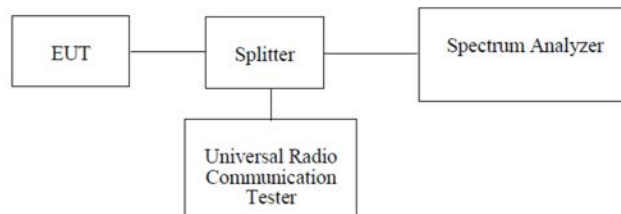
10.1 Applicable Standard

According to § 27.53, 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.

According to § 24.238(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.

10.2 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.



10.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	149170	2018/05/11	2019/05/10
Spectrum Analyzer	Rohde & Schwarz	FSV40	101140	2018/11/22	2019/11/21
Cable	WOKEN	SFL402	S02-160323-07	2018/02/12	2019/02/11
Cable	WOKEN	SFL402	S02-160323-07	2019/02/11	2020/02/10
Power Splitter	Mini Circuits	ZFRSC-183-S+	SF112701513	Each Use	/

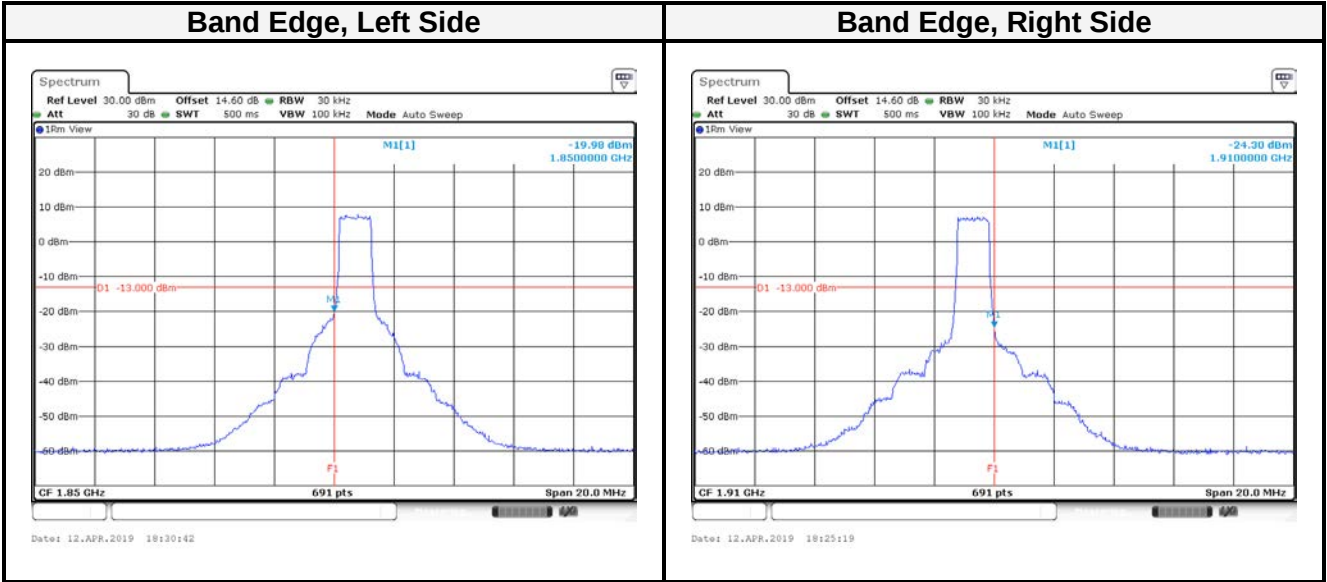
***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

10.4 Test Environmental Conditions

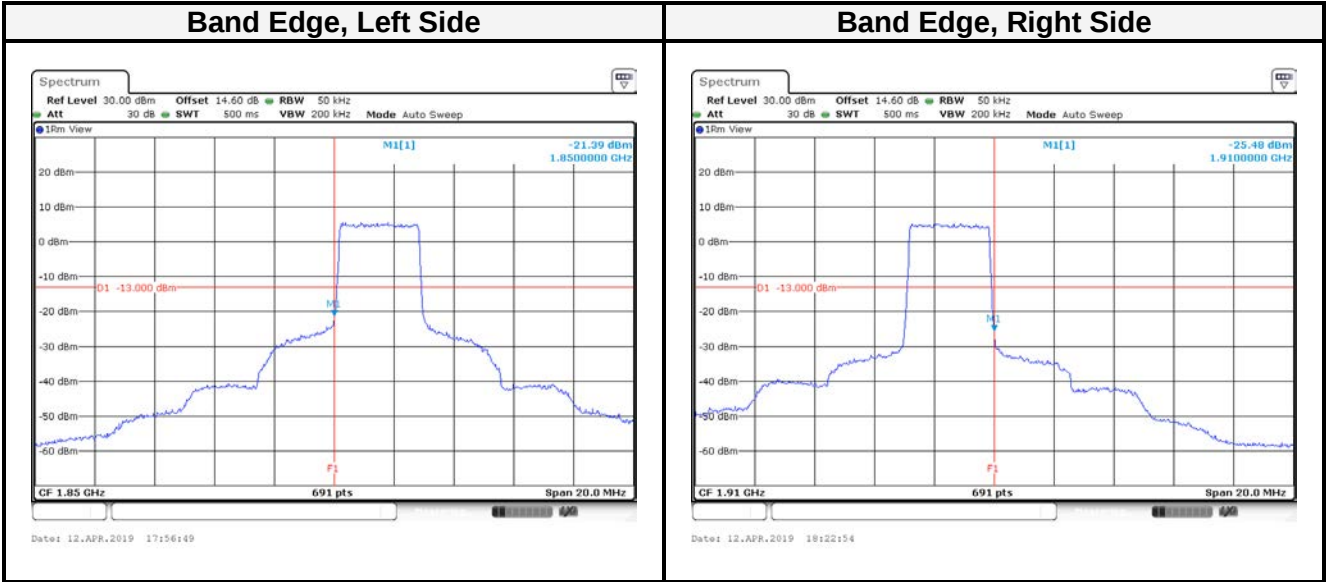
Temperature:	24~26 °C	Relative Humidity:	54~56 %
ATM Pressure:	1014hPa	Test Engineer:	Ian Tu
Test Date:	2019-01-02~2019-04-12	-	-

10.5 Test Data and Test Plot

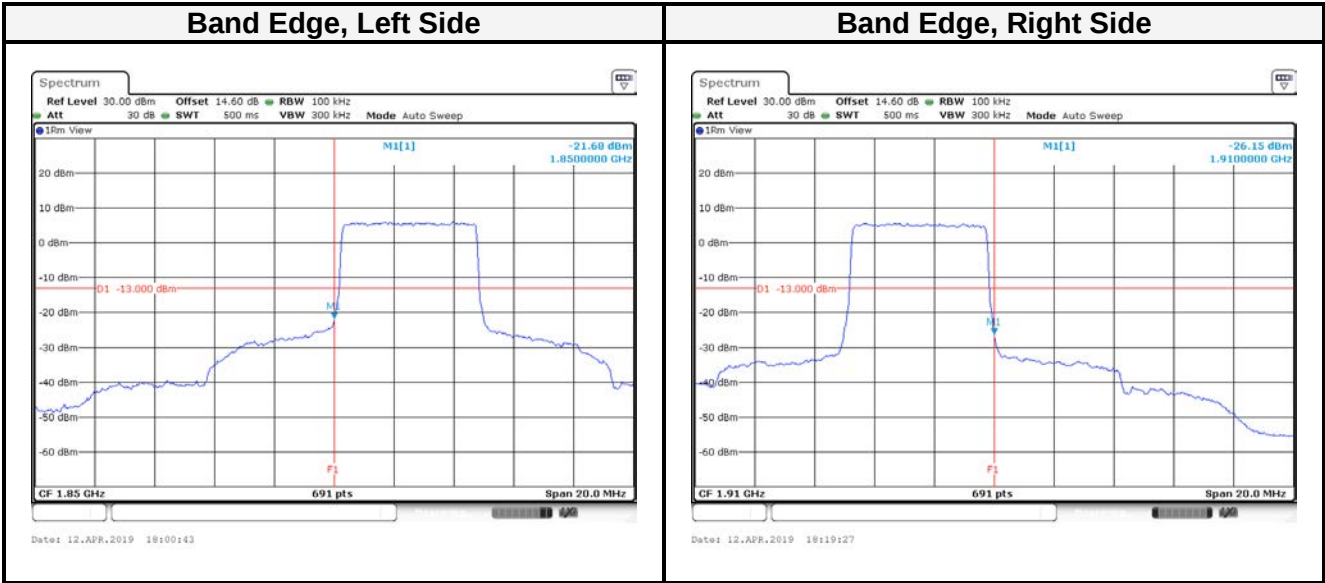
LTE Band 2 QPSK: 1.4 MHz Full RB



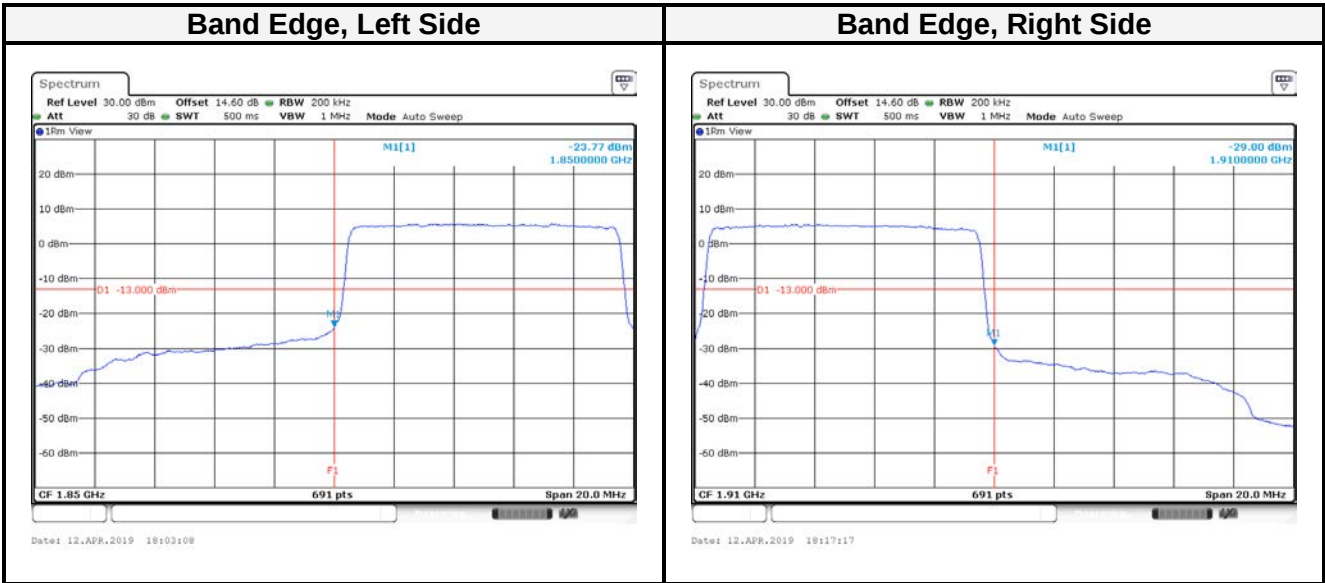
LTE Band 2 QPSK: 3 MHz Full RB



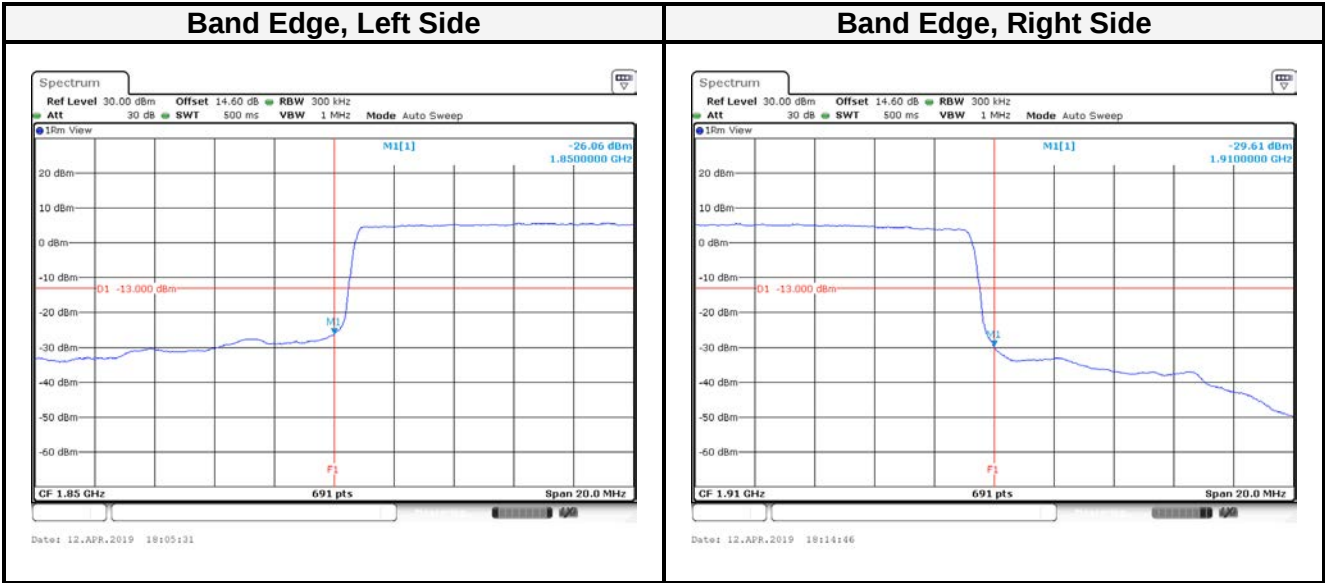
LTE Band 2 QPSK: 5 MHz Full RB



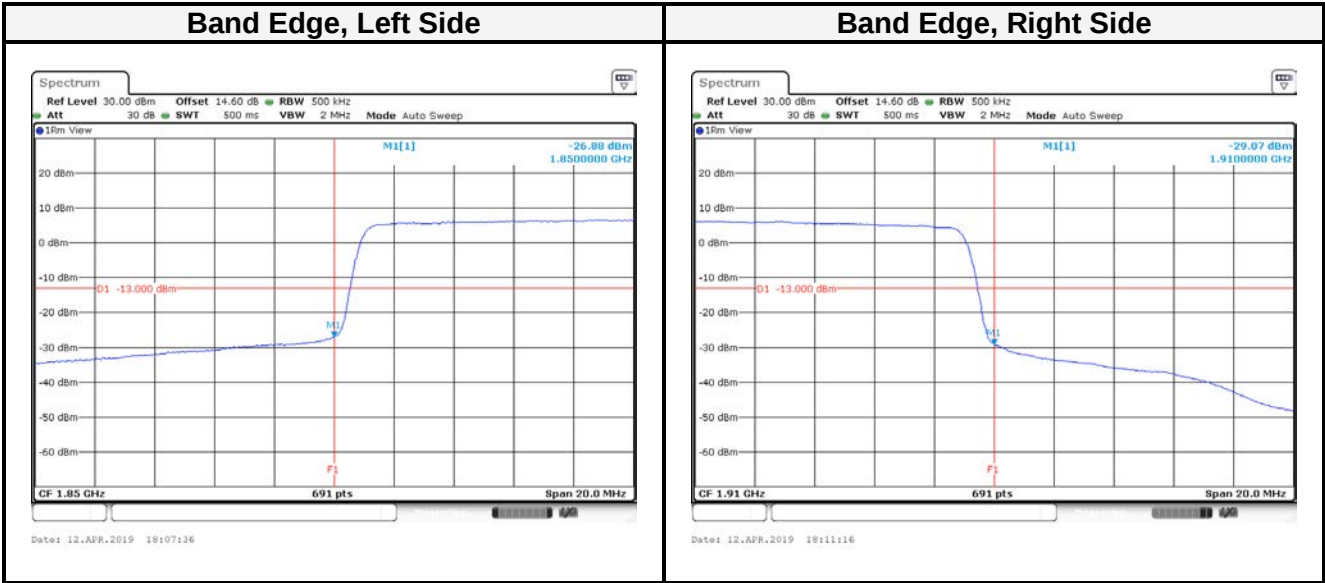
LTE Band 2 QPSK: 10 MHz Full RB



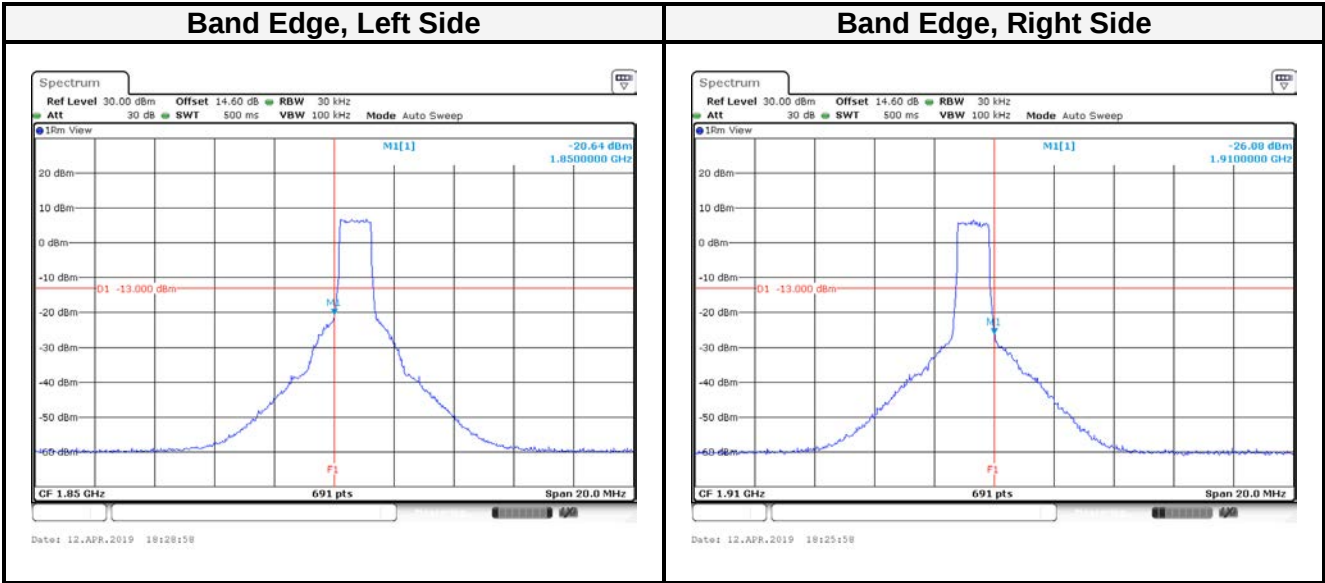
LTE Band 2 QPSK: 15 MHz Full RB



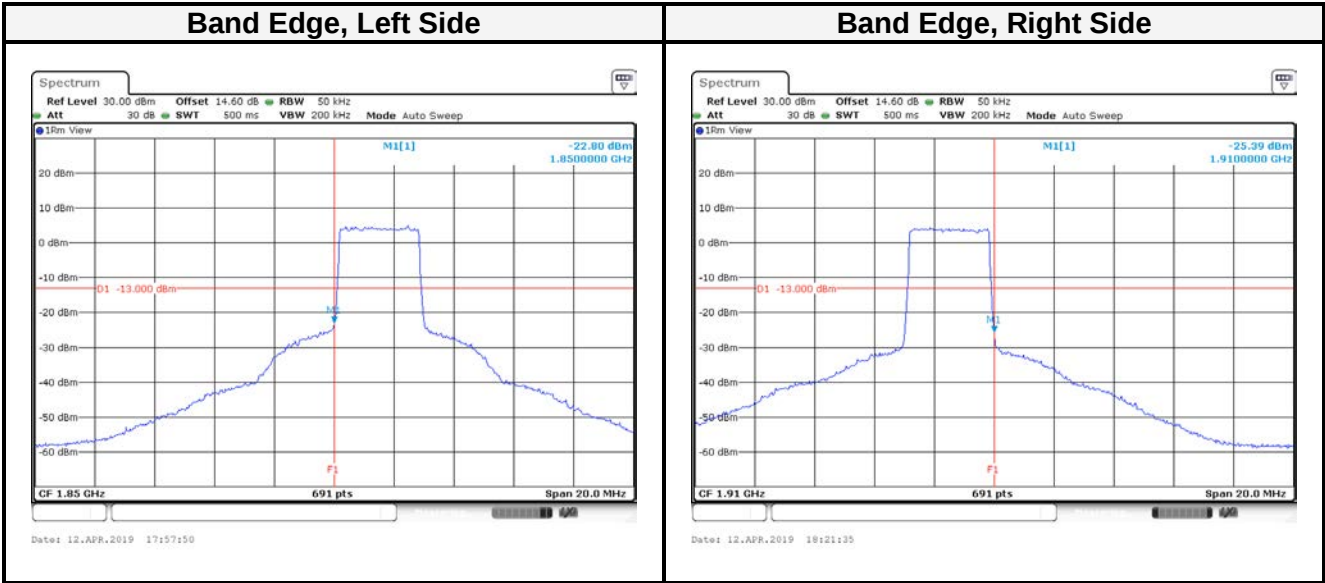
LTE Band 2 QPSK: 20 MHz Full RB



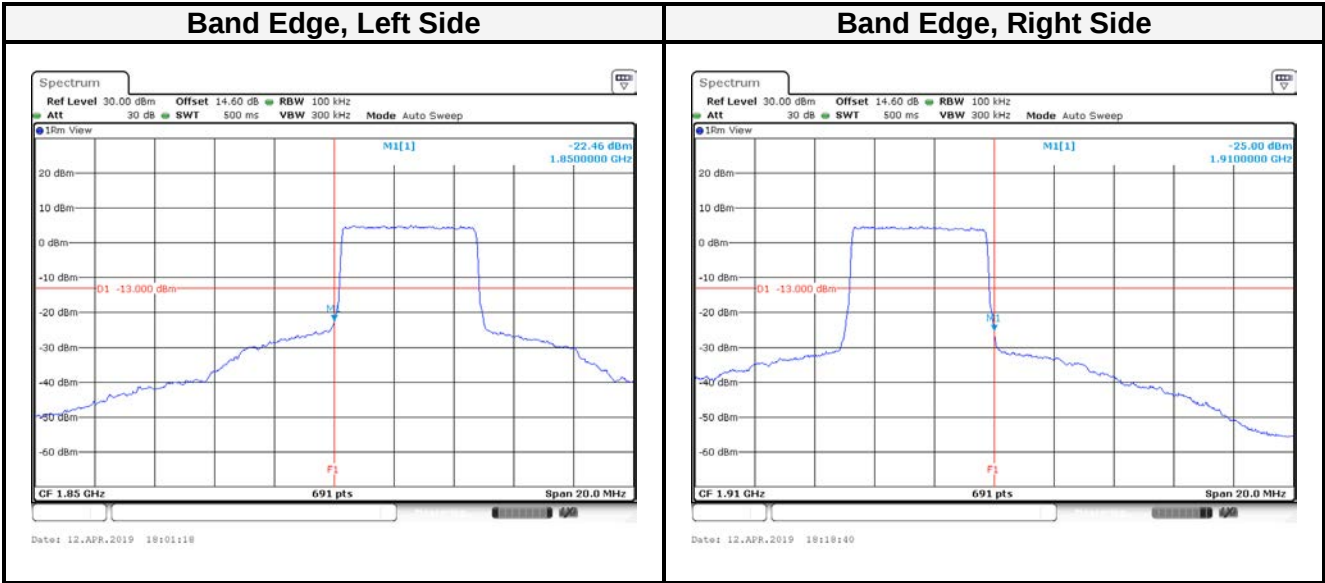
LTE Band 2 16QAM: 1.4 MHz Full RB



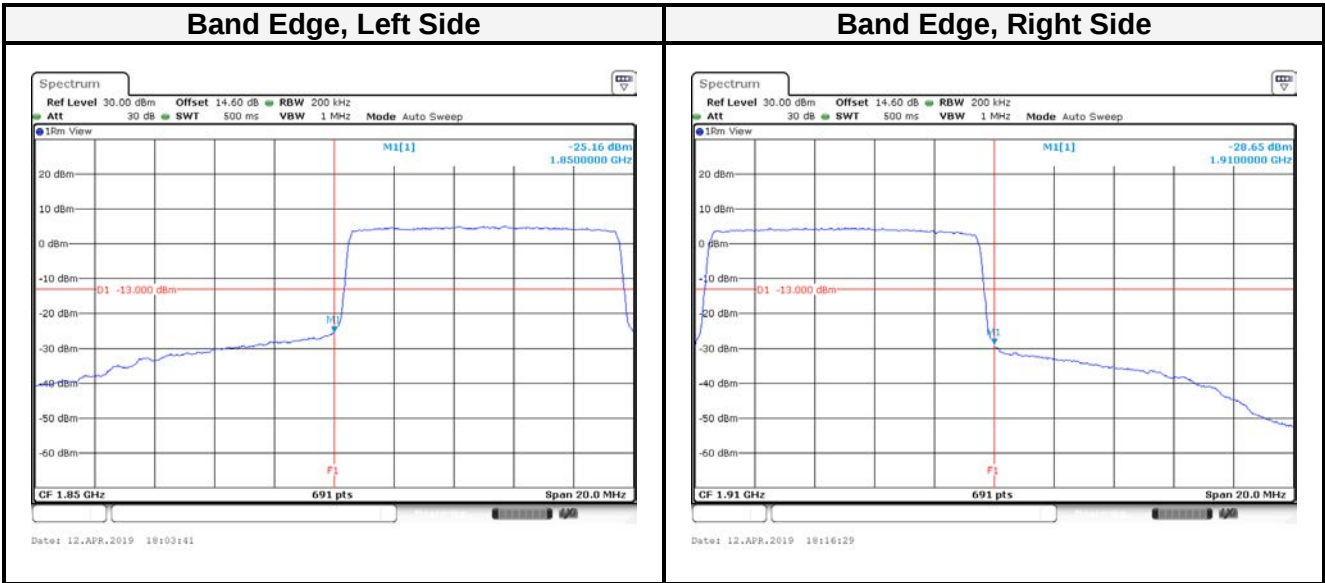
LTE Band 2 16QAM: 3 MHz Full RB



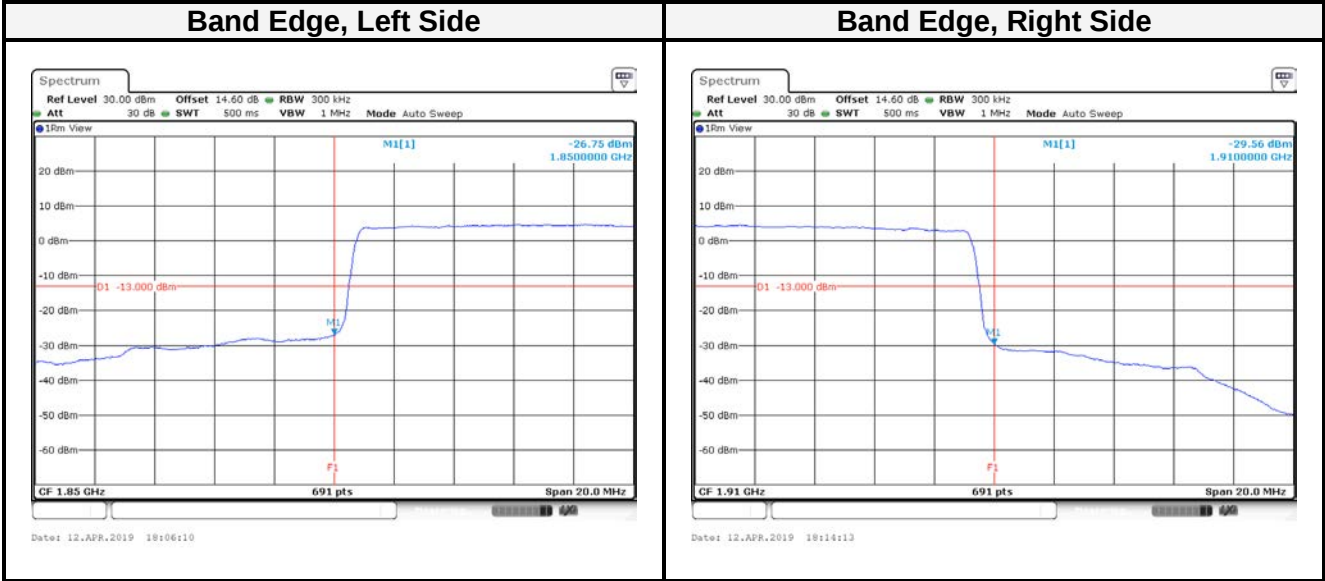
LTE Band 2 16QAM: 5 MHz Full RB



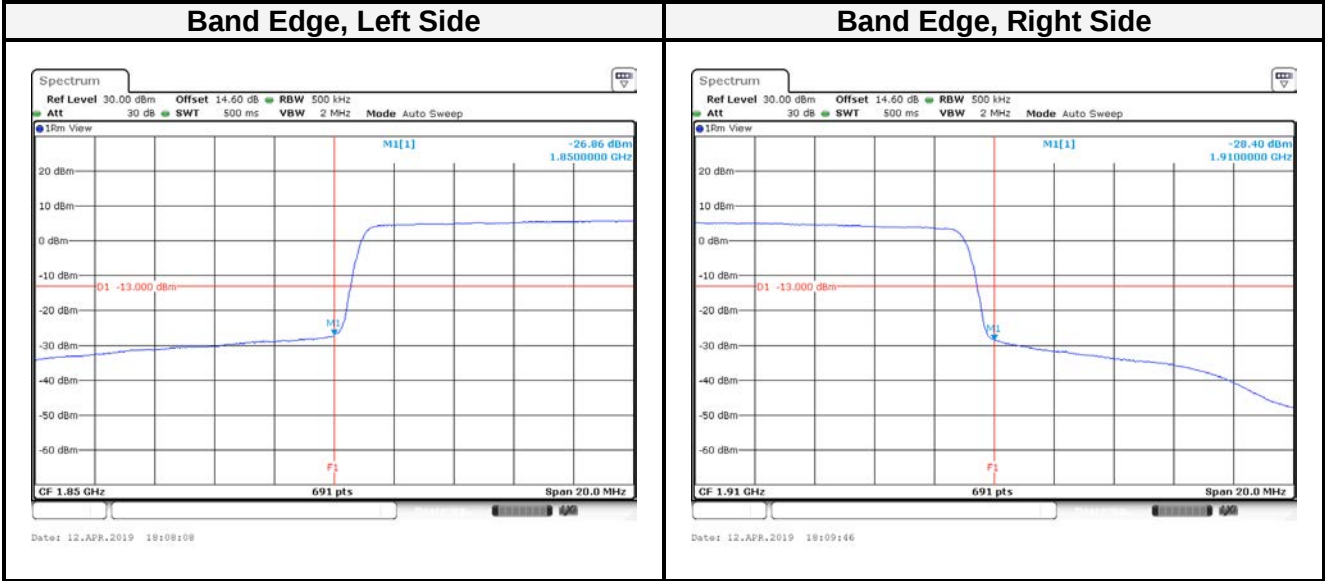
LTE Band 2 16QAM: 10 MHz Full RB



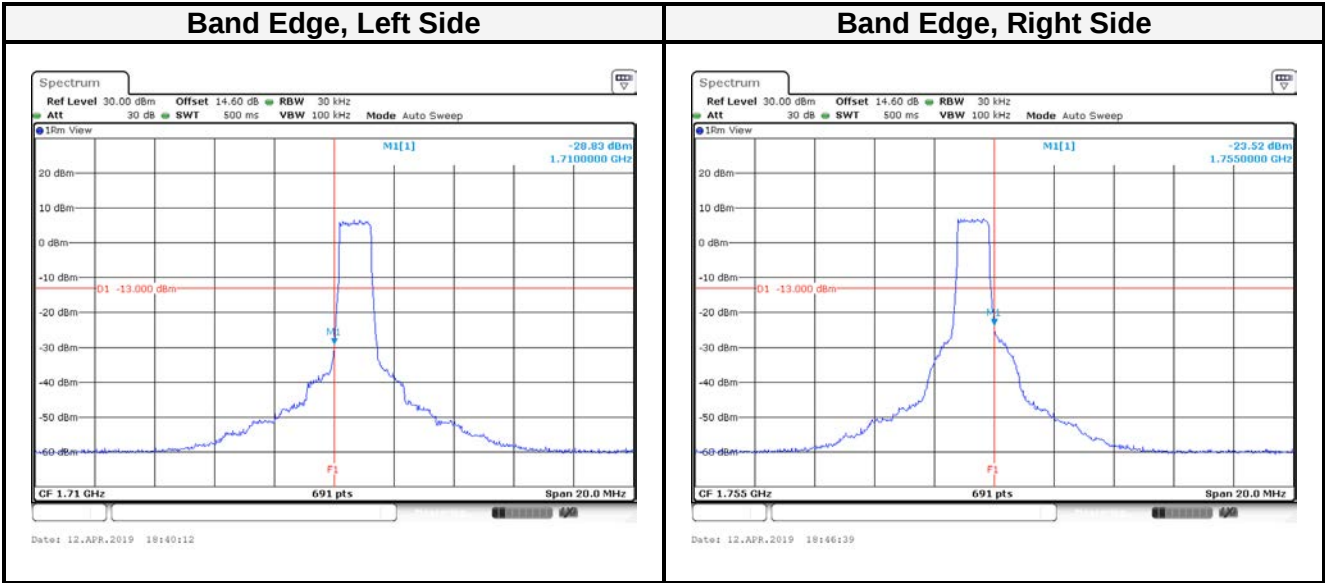
LTE Band 2 16QAM: 15 MHz Full RB



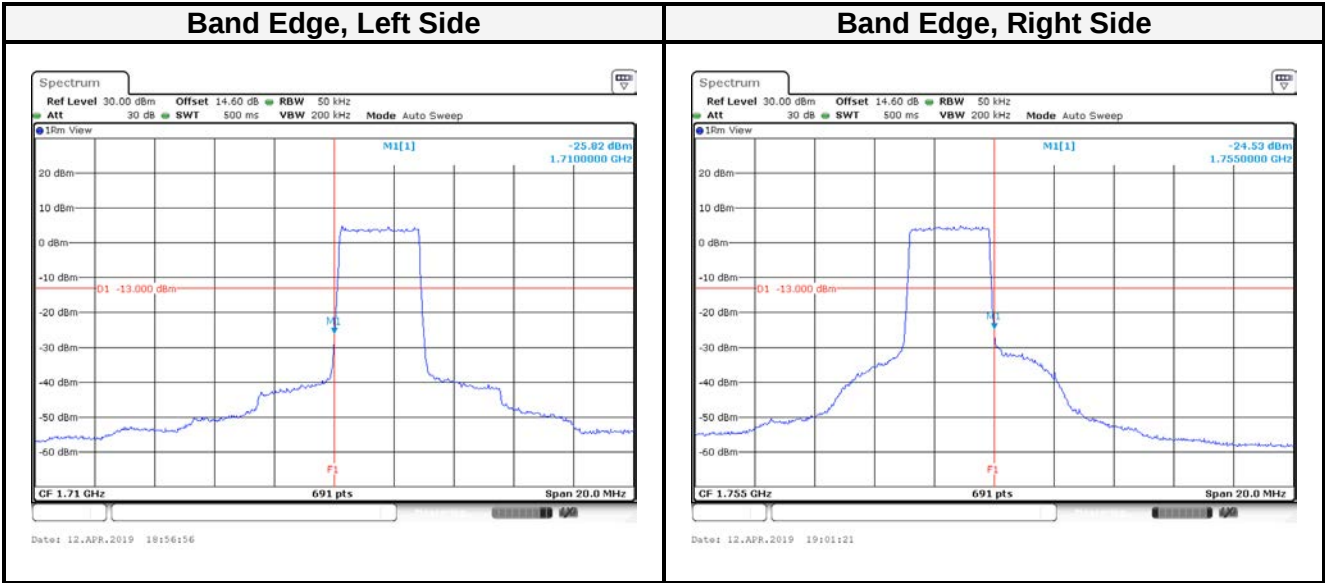
LTE Band 2 16QAM: 20 MHz Full RB



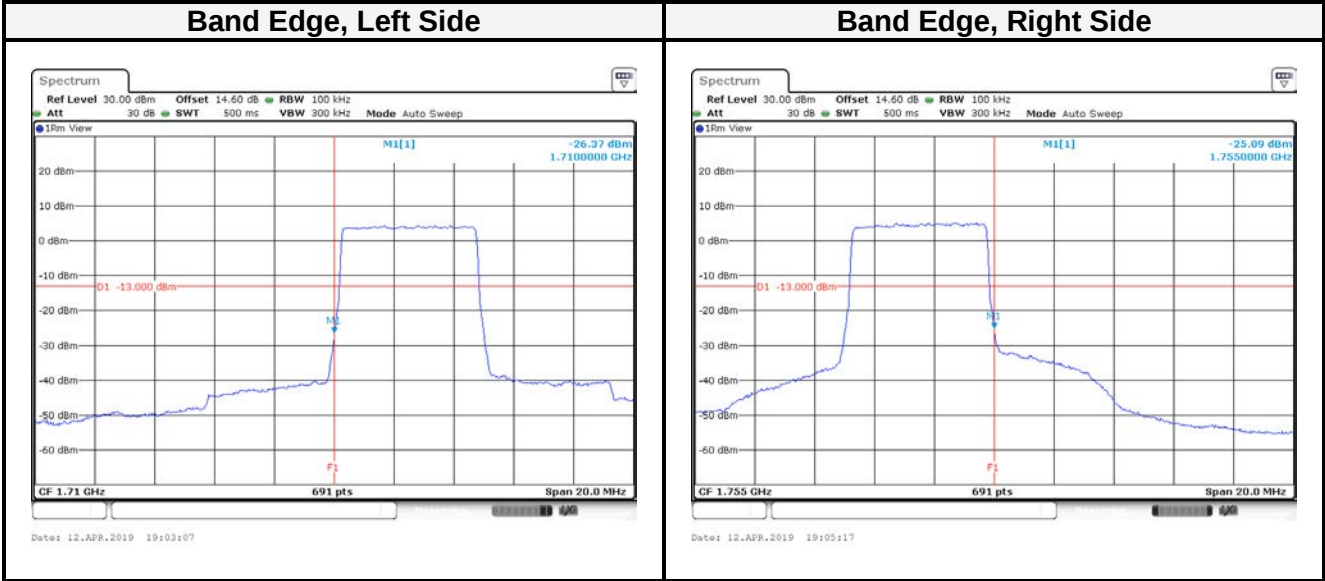
LTE Band 4 QPSK: 1.4 MHz Full RB



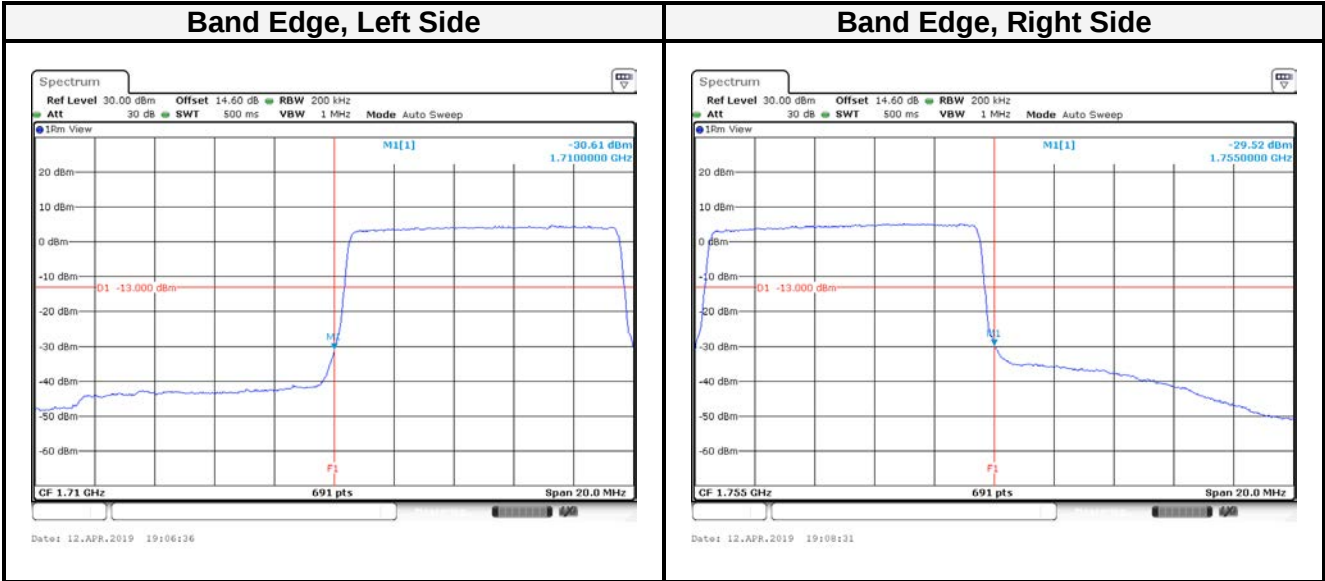
LTE Band 4 QPSK: 3 MHz Full RB



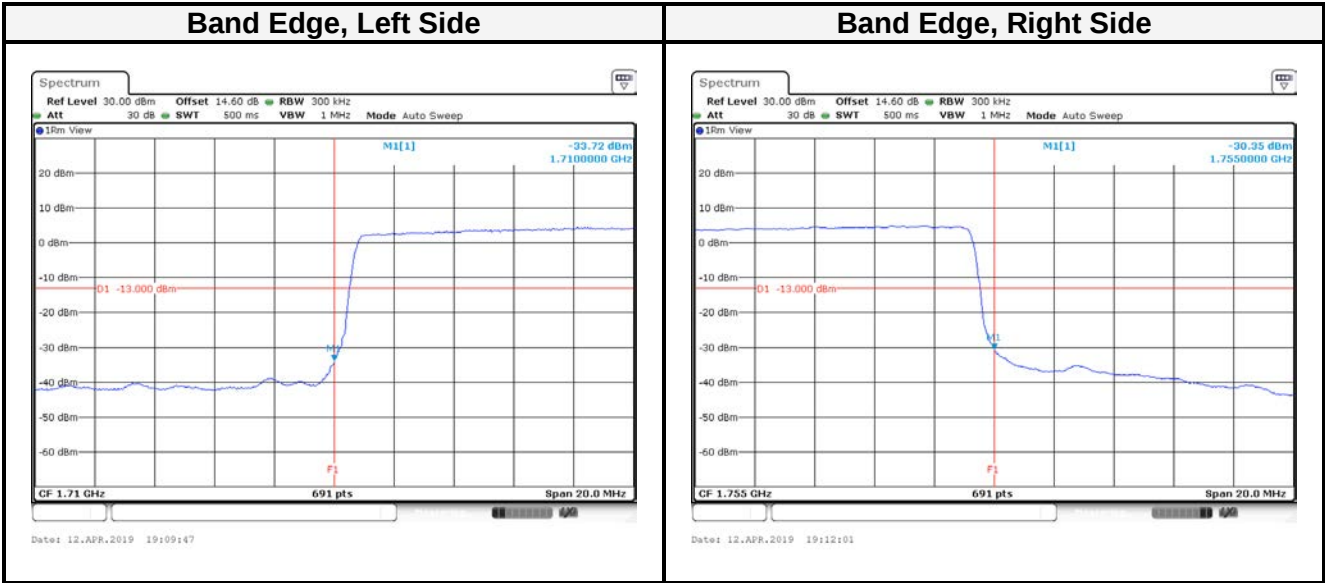
LTE Band 4 QPSK: 5 MHz Full RB



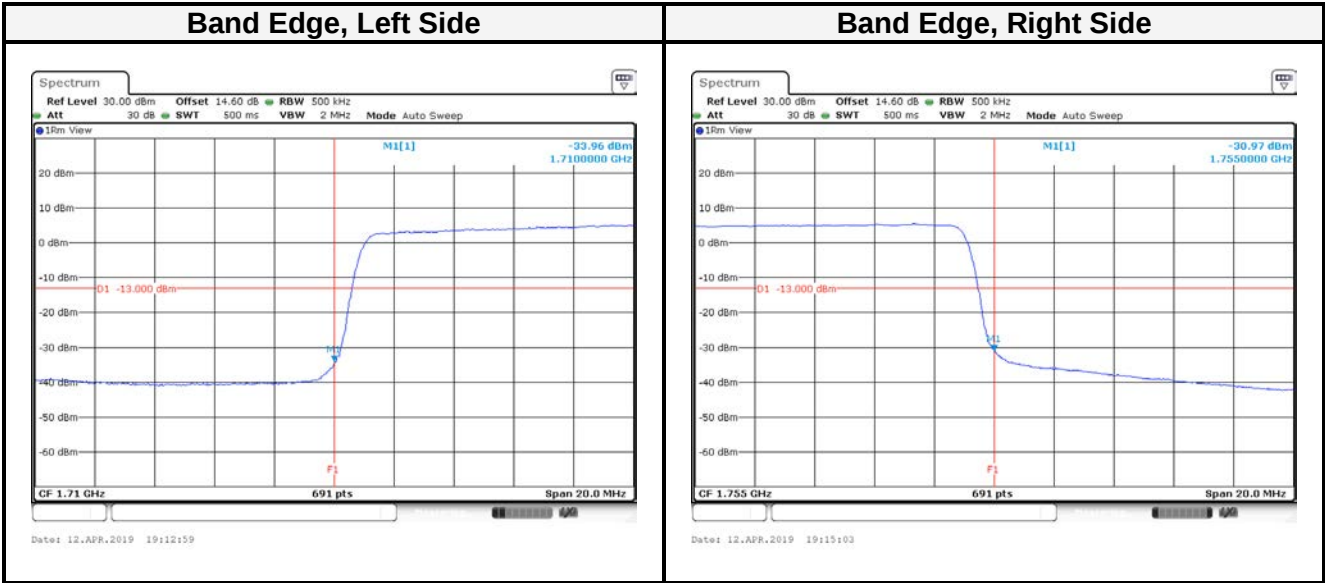
LTE Band 4 QPSK: 10 MHz Full RB



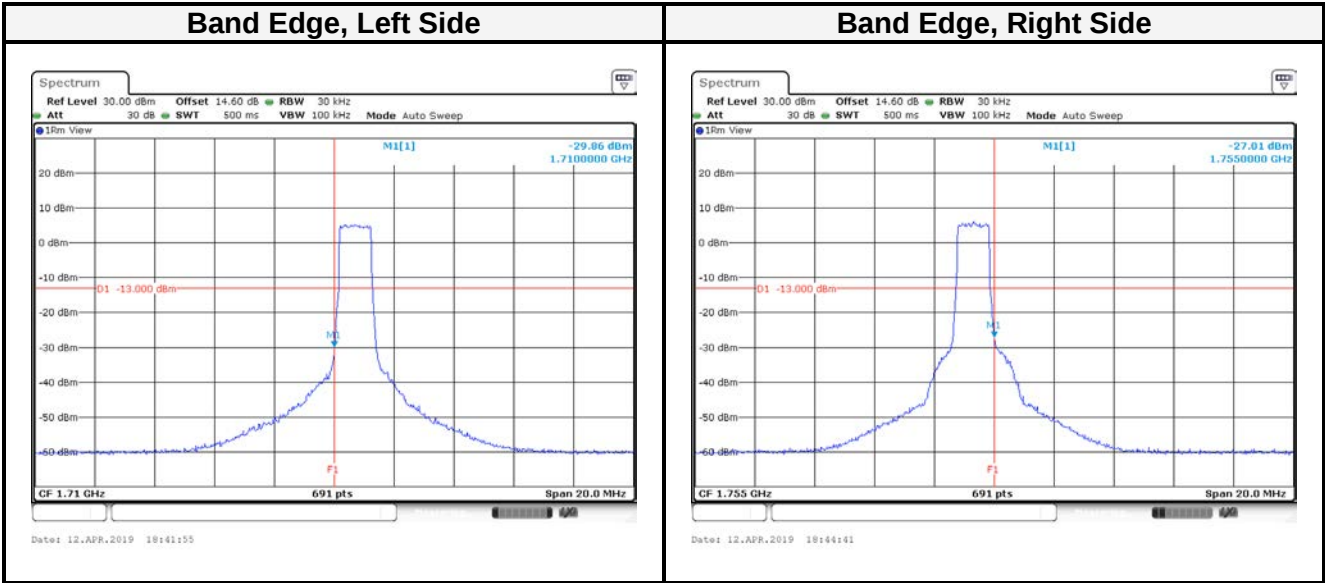
LTE Band 4 QPSK: 15 MHz Full RB



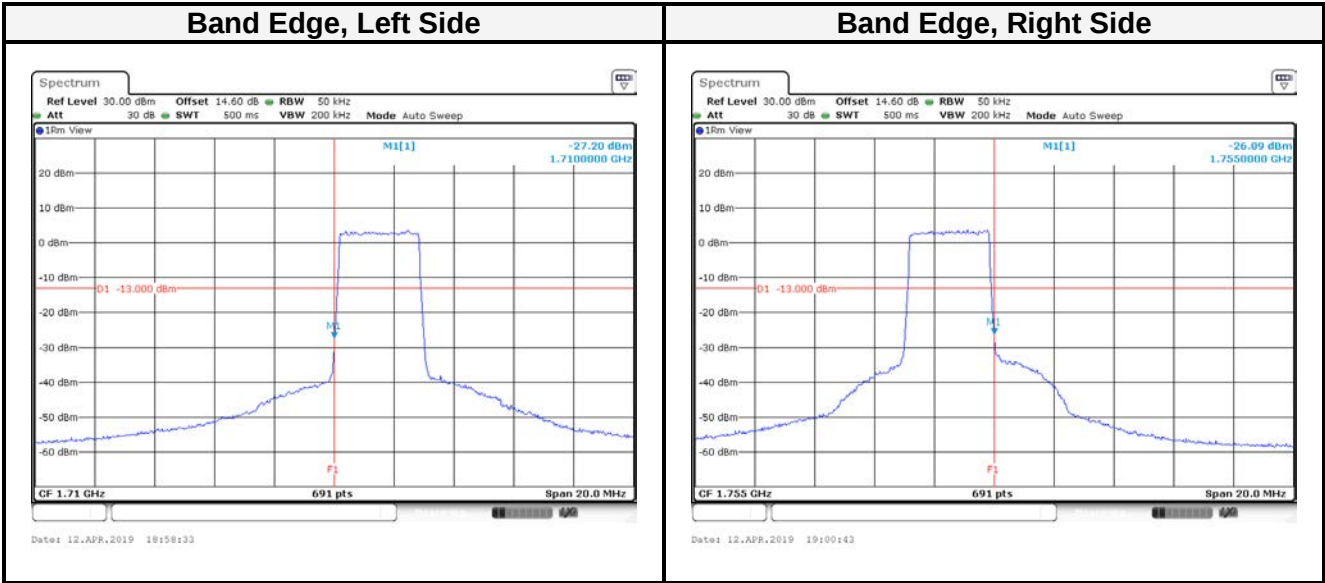
LTE Band 4 QPSK: 20 MHz Full RB



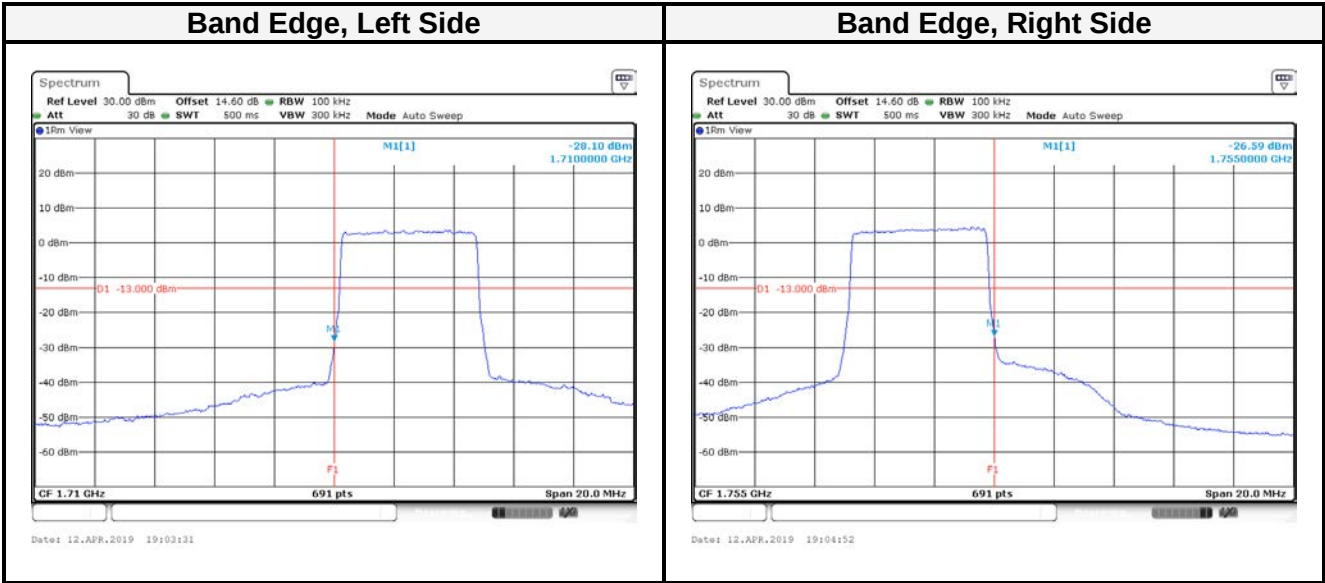
LTE Band 4 16QAM: 1.4 MHz Full RB



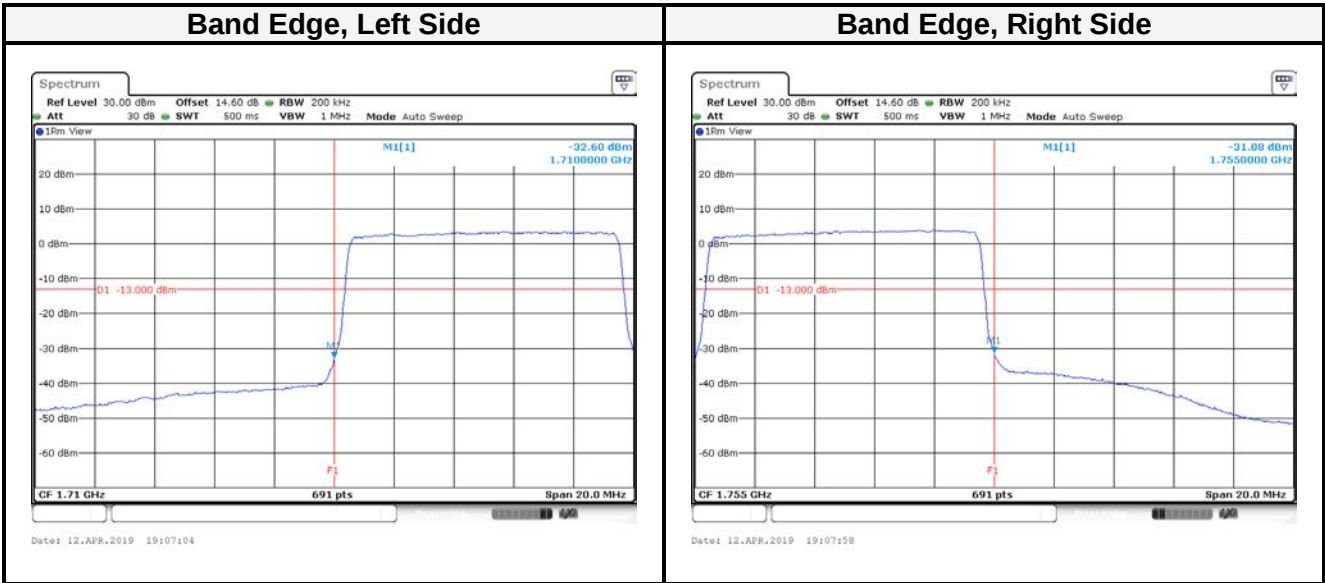
LTE Band 4 16QAM: 3 MHz Full RB



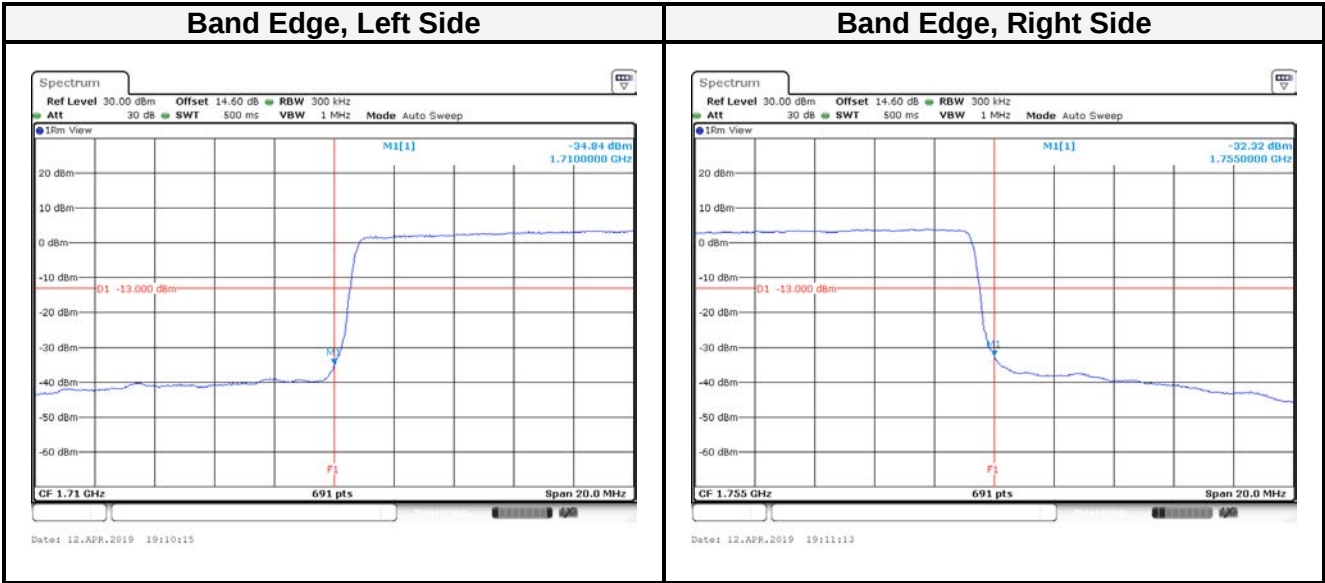
LTE Band 4 16QAM: 5 MHz Full RB



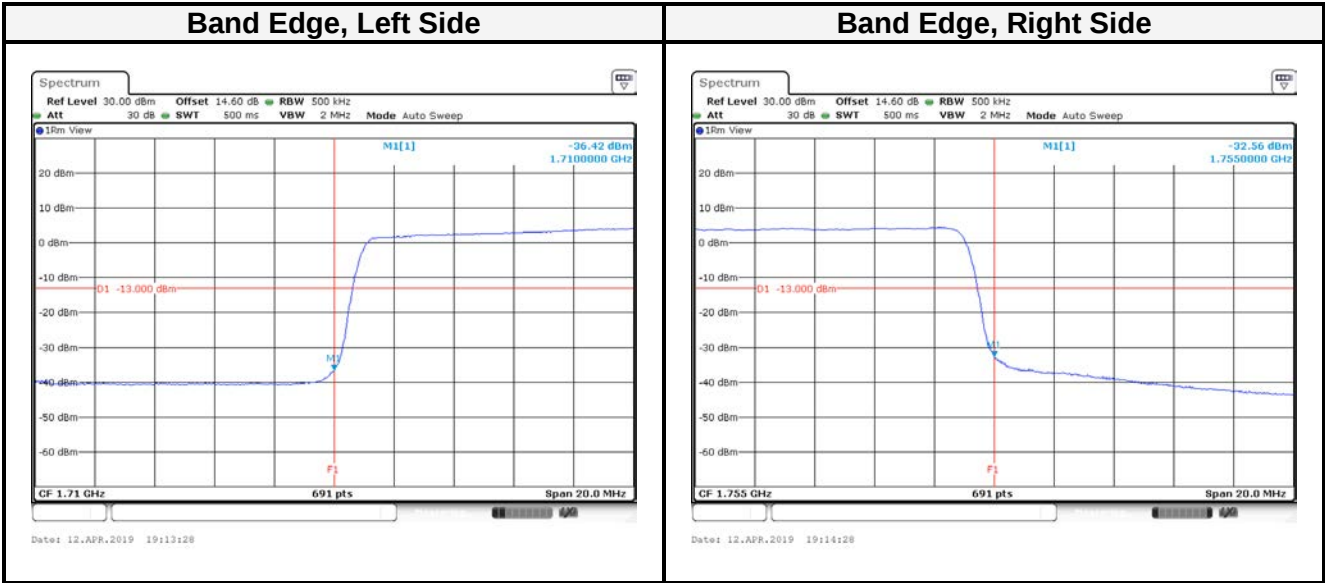
LTE Band 4 16QAM: 10 MHz Full RB



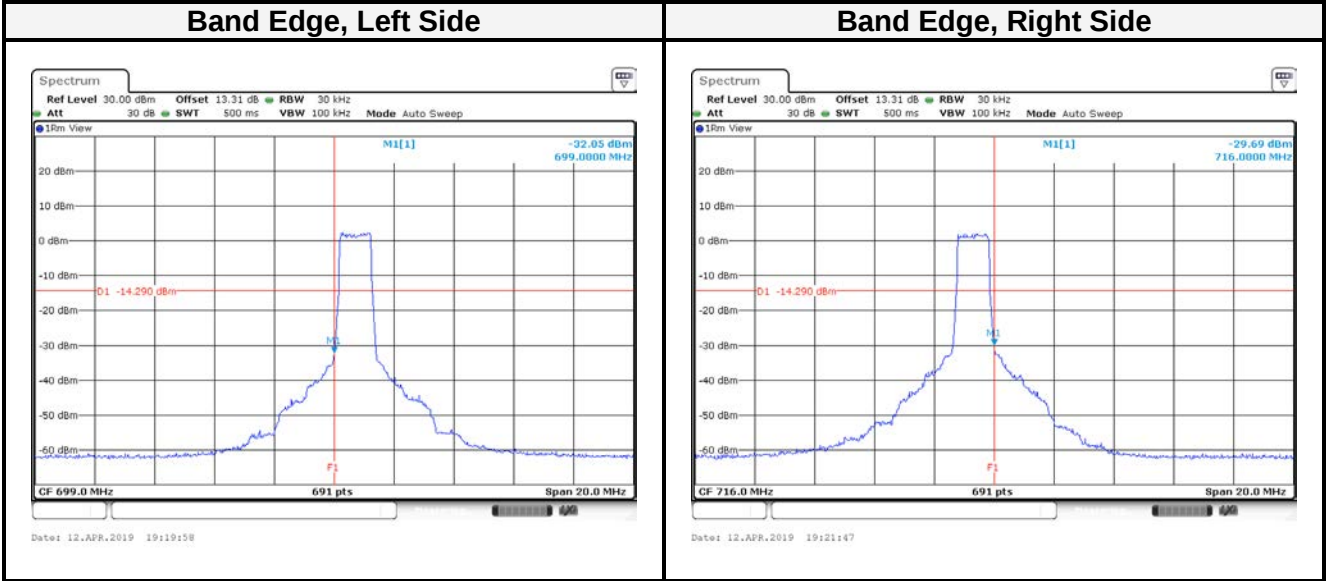
LTE Band 4 16QAM: 15 MHz Full RB



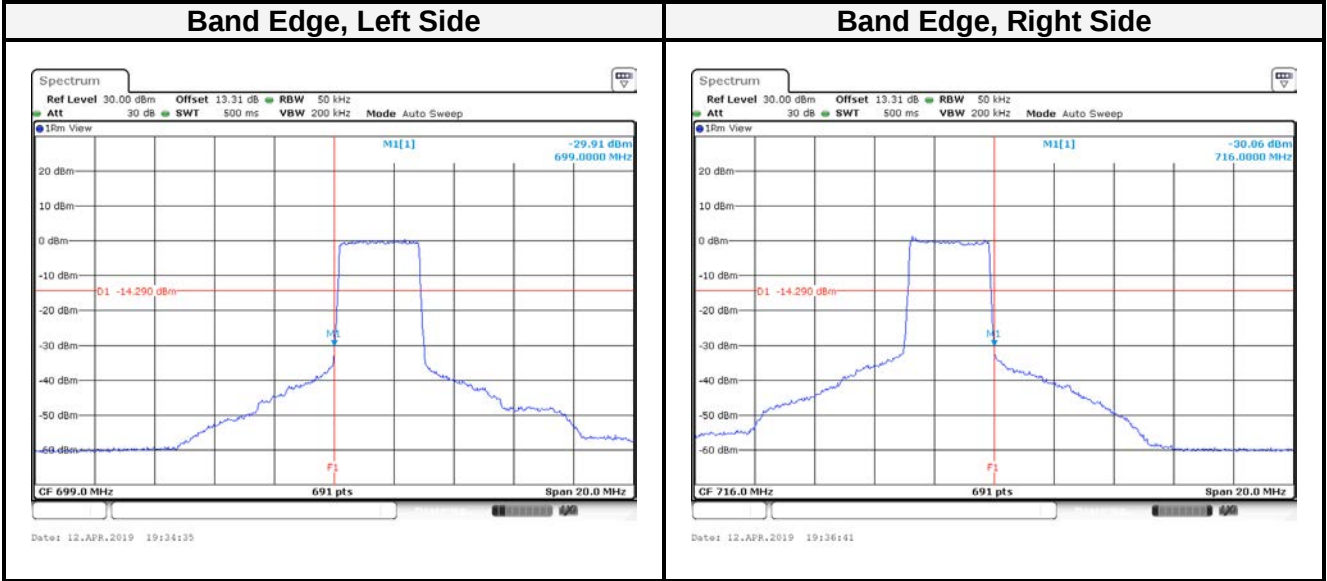
LTE Band 4 16QAM: 20 MHz Full RB



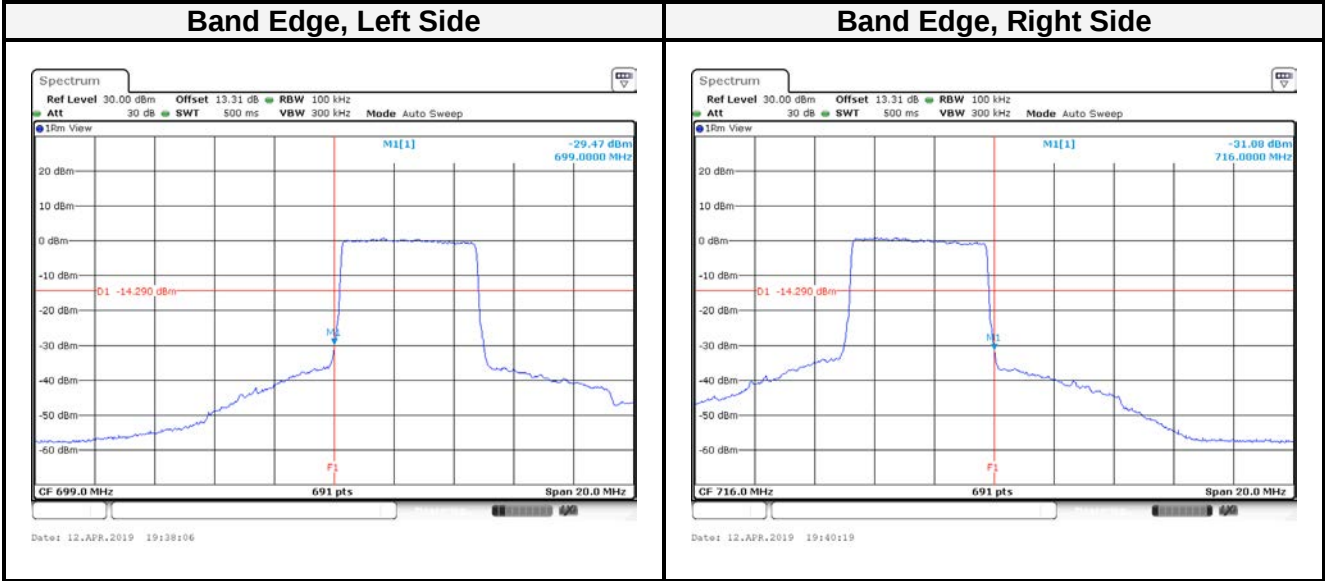
LTE Band 12 QPSK: 1.4 MHz Full RB



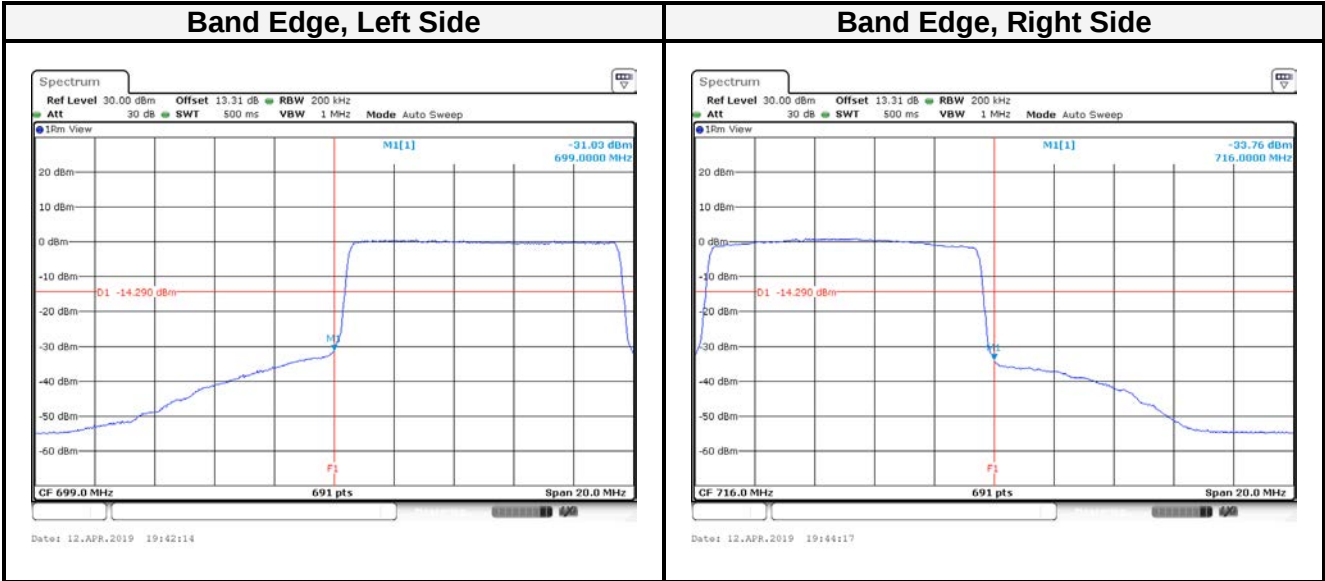
LTE Band 12 QPSK: 3 MHz Full RB



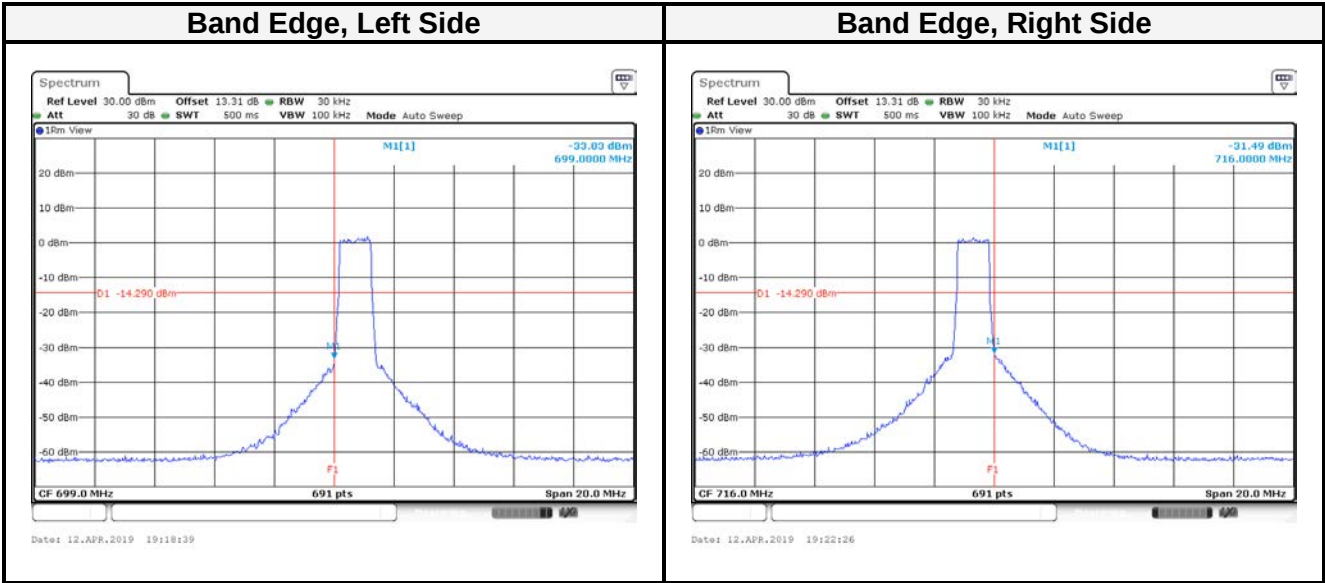
LTE Band 12 QPSK: 5 MHz Full RB



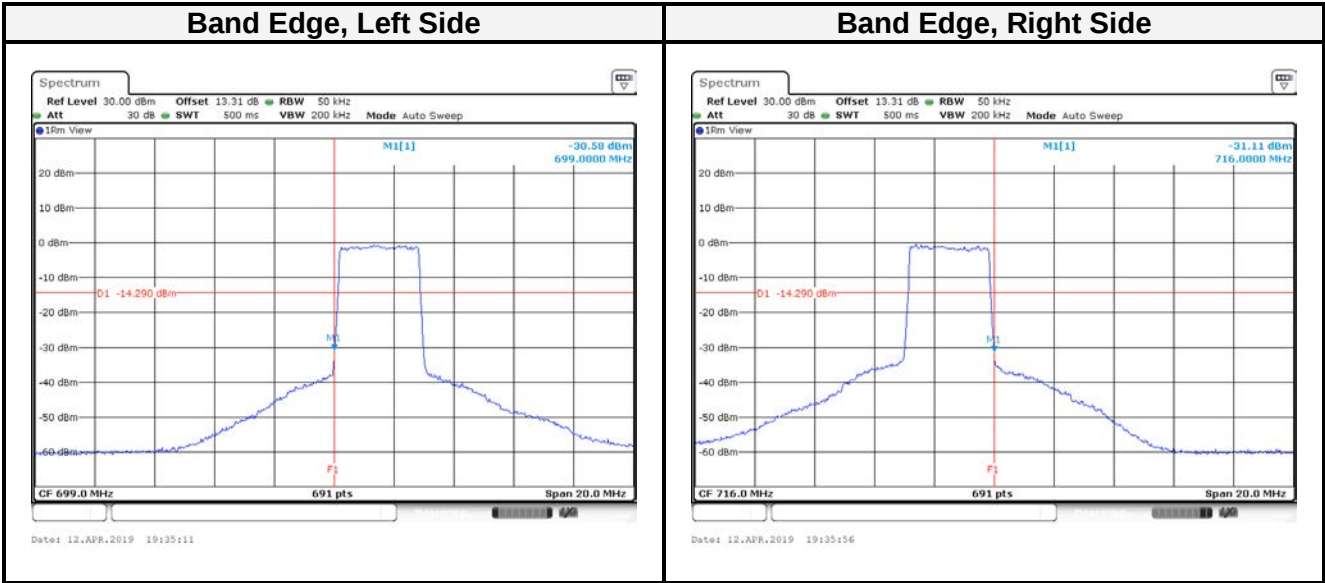
LTE Band 12 QPSK: 10 MHz Full RB



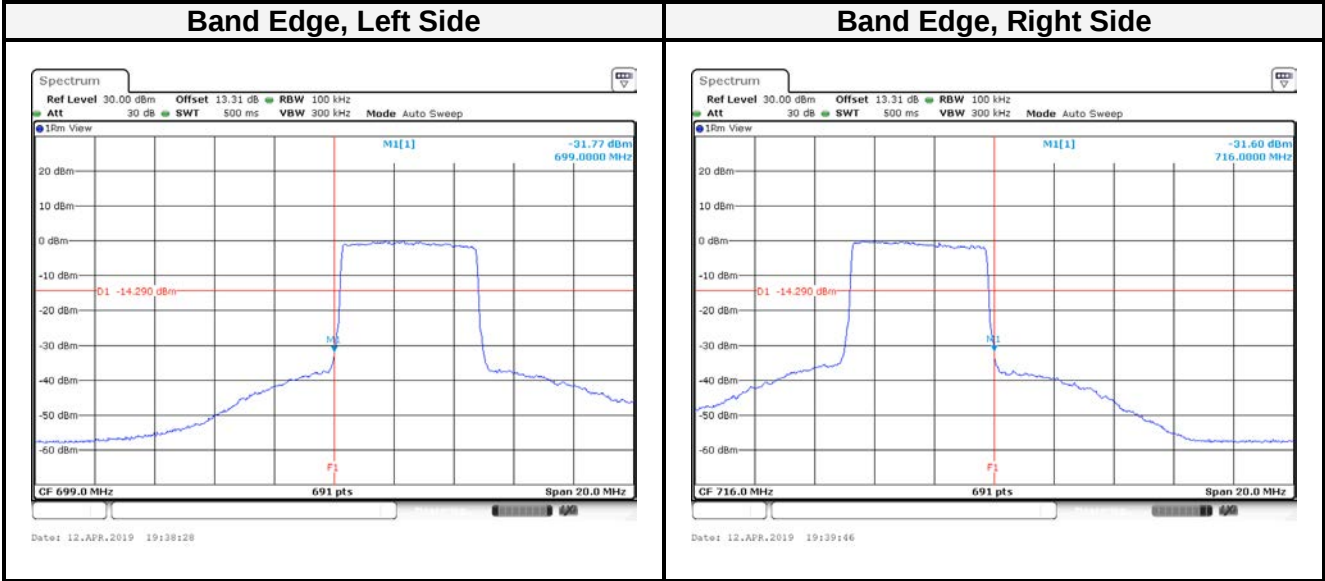
LTE Band 12 16QAM: 1.4 MHz Full RB



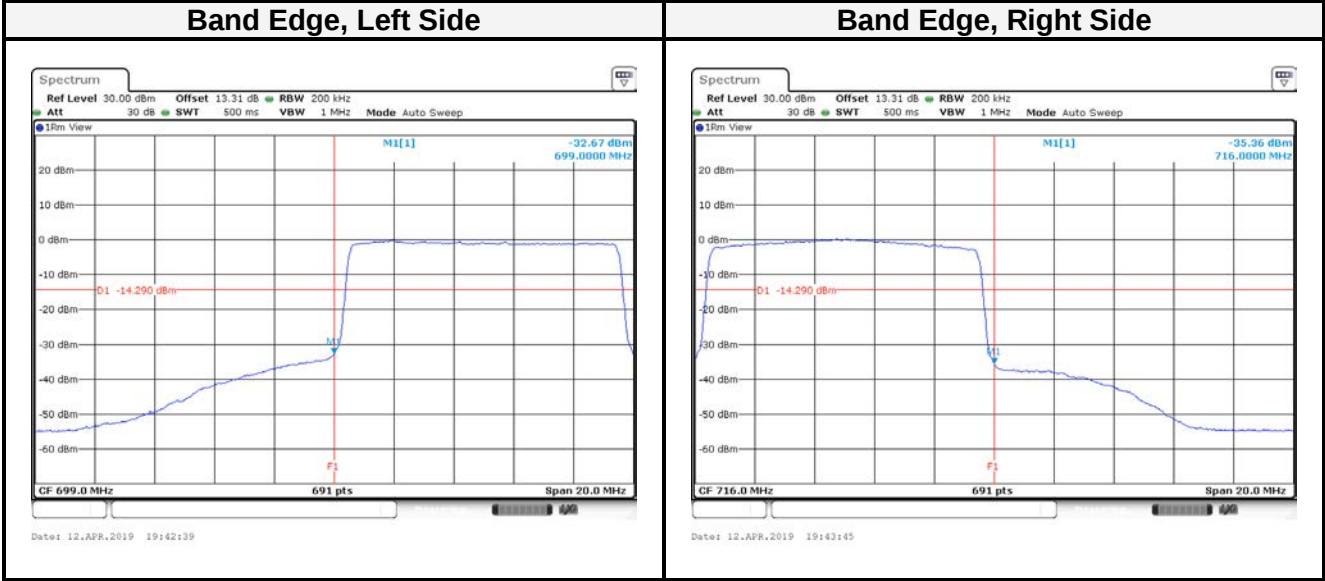
LTE Band 12 16QAM: 3 MHz Full RB



LTE Band 12 16QAM: 5 MHz Full RB



LTE Band 12 16QAM: 10 MHz Full RB



11 FCC § 2.1055, § 24.235 and § 27.54 – Frequency Stability

11.1 Applicable Standard

According to FCC § 2.1055 (a), § 2.1055 (d), § 24.235, § 27.54,
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	20	50
50 to 450	5	5	50
450 to 512	2.5	5	5
821 to 896	1.5	2.5	2.5
928 to 929.	5	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10	N/A	N/A

11.2 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: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set from 85% to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

11.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	149170	2018/05/11	2019/05/10
Spectrum Analyzer	Rohde & Schwarz	FSV40	101140	2018/11/22	2019/11/21
Cable	WOKEN	SFL402	S02-160323-07	2018/02/12	2019/02/11
AC Power Supply	Preen Power	AFC-11005G	LKAC-01	N.C.R	N.C.R
Multimeter	Fluke	114	28810152WS	2018/02/09	2019/02/08
Temp & Humidity Chamber	BACL	BTH-150	30028	2018/12/17	2019/12/16

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

11.4 Test Environmental Conditions

Temperature:	24~26 °C	Relative Humidity:	54~56 %
ATM Pressure:	1014hPa	Test Engineer:	Ian Tu
Test Date:	2019-01-31	-	-

11.5 Test Data

LTE Band 2:

Reference Frequency: LTE Band 2 QPSK Mid Channel 1880 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
120	50	1850.0564	1909.9729	1850	1910
120	40	1850.0271	1909.9861	1850	1910
120	30	1850.0304	1909.9773	1850	1910
120	20	1850.0271	1909.9825	1850	1910
120	10	1850.0478	1909.9861	1850	1910
120	0	1850.0304	1909.9773	1850	1910
120	-10	1850.0478	1909.9729	1850	1910
120	-20	1850.0564	1909.9825	1850	1910
120	-30	1850.0564	1909.9729	1850	1910

Reference Frequency: LTE Band 2 QPSK Mid Channel 1880 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
102	20	1850.0271	1909.9729	1850	1910
138	20	1850.0271	1909.9729	1850	1910

*Normal Voltage = 120Vac, Voltage verify 85% to 115% of the nominal value => 102Vac to 138Vac.

*FCC no limit was specified.

Reference Frequency: LTE Band 2 16QAM Mid Channel 1880 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
120	50	1850.0304	1909.9570	1850	1910
120	40	1850.0391	1909.9513	1850	1910
120	30	1850.0218	1909.9526	1850	1910
120	20	1850.0314	1909.9513	1850	1910
120	10	1850.0314	1909.9547	1850	1910
120	0	1850.0304	1909.9526	1850	1910
120	-10	1850.0218	1909.9547	1850	1910
120	-20	1850.0391	1909.9570	1850	1910
120	-30	1850.0304	1909.9570	1850	1910

Reference Frequency: LTE Band 2 16QAM Mid Channel 1880 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
102	20	1850.0314	1909.9513	1850	1910
138	20	1850.0314	1909.9513	1850	1910

*Normal Voltage = 120Vac, Voltage verify 85% to 115% of the nominal value => 102Vac to 138Vac.

*FCC no limit was specified.

LTE Band 4:

Reference Frequency: LTE Band 4 QPSK Mid Channel 1732.5 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
120	50	1710.0293	1754.9491	1710	1755
120	40	1710.0228	1754.9674	1710	1755
120	30	1710.0385	1754.9525	1710	1755
120	20	1710.0349	1754.9491	1710	1755
120	10	1710.0293	1754.9387	1710	1755
120	0	1710.0385	1754.9674	1710	1755
120	-10	1710.0228	1754.9525	1710	1755
120	-20	1710.0349	1754.9387	1710	1755
120	-30	1710.0293	1754.9491	1710	1755

Reference Frequency: LTE Band 4 QPSK Mid Channel 1732.5 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
102	20	1710.0349	1754.9491	1710	1755
138	20	1710.0349	1754.9491	1710	1755

*Normal Voltage = 120Vac, Voltage verify 85% to 115% of the nominal value => 102Vac to 138Vac.

*FCC no limit was specified.

Reference Frequency: LTE Band 4 16QAM Mid Channel 1732.5 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
120	50	1710.0569	1754.9772	1710	1755
120	40	1710.0554	1754.9902	1710	1755
120	30	1710.0488	1754.9707	1710	1755
120	20	1710.0423	1754.9837	1710	1755
120	10	1710.0569	1754.9707	1710	1755
120	0	1710.0554	1754.9837	1710	1755
120	-10	1710.0488	1754.9772	1710	1755
120	-20	1710.0423	1754.9902	1710	1755
120	-30	1710.0569	1754.9772	1710	1755

Reference Frequency: LTE Band 4 16QAM Mid Channel 1732.5 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
102	20	1710.0423	1754.9837	1710	1755
138	20	1710.0423	1754.9837	1710	1755

*Normal Voltage = 120Vac, Voltage verify 85% to 115% of the nominal value => 102Vac to 138Vac.

*FCC no limit was specified.

LTE Band 12:

Reference Frequency: LTE Band 12 QPSK Mid Channel 707.5 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
120	50	699.0777	715.9512	699	716
120	40	699.0705	715.9440	699	716
120	30	699.0632	715.9512	699	716
120	20	699.0561	715.9441	699	716
120	10	699.0488	715.9512	699	716
120	0	699.0415	715.9440	699	716
120	-10	699.0343	715.9440	699	716
120	-20	699.0271	715.9441	699	716
120	-30	699.0777	715.9512	699	716

Reference Frequency: LTE Band 12 QPSK Mid Channel 707.5 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
102	20	699.0561	715.9441	699	716
138	20	699.0561	715.9441	699	716

*Normal Voltage = 120Vac, Voltage verify 85% to 115% of the nominal value => 102Vac to 138Vac.

*FCC no limit was specified.

Reference Frequency: LTE Band 12 16QAM Mid Channel 707.5 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
120	50	699.0488	715.9441	699	716
120	40	699.0561	715.9512	699	716
120	30	699.0488	715.9441	699	716
120	20	699.0632	715.9368	699	716
120	10	699.0561	715.9295	699	716
120	0	699.0705	715.9512	699	716
120	-10	699.0705	715.9368	699	716
120	-20	699.0488	715.9512	699	716
120	-30	699.0488	715.9441	699	716

Reference Frequency: LTE Band 12 16QAM Mid Channel 707.5 MHz					
Power Supply (Vac)	Environment Temperature (°C)	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
102	20	699.0632	715.9368	699	716
138	20	699.0632	715.9368	699	716

*Normal Voltage = 120Vac, Voltage verify 85% to 115% of the nominal value => 102Vac to 138Vac.

*FCC no limit was specified.

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