TESTING LABORATORY
CERTIFICATE#4323.01

FCC PART 27

MEASUREMENT AND TEST REPORT

For

Nokia Shanghai Bell Co. Ltd.

No. 388, Ningqiao Rd. Pilot Free Trade Zone, Shanghai, China 201206

FCC ID: 2ADZR23002690FM20

Report Type:	**Product Type:**
Original Report	FastMile Compact

Test Engineer:	Hope Zhang
Report Number:	RSHA181008001-00C
Report Date:	2018-12-12
Reviewed By:	Oscar Ye RF Leader
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road,Kunshan,Jiangsu province,China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Nokia Shanghai Bell Co. Ltd.
Tested Model	3FE75113ACAA
Product Type	FastMile Compact
Dimension	220.0 mm (L)* 220.0 mm (W)*50.5mm(H)
Power Supply	DC 53V from POE Adapter

Adapter Information:
Model: G0545-530-060-PSE1000
Input: AC100-240 V 50/60Hz 0.75A
Output: DC53V,0.6A

**All measurement and test data in this report was gathered from production sample serial number: 20181008001. (Assigned by the BACL. The EUT supplied by the applicant was received on 2018-10-08)*

Objective

This type approval report is prepared on behalf of *Nokia Shanghai Bell Co. Ltd.* in accordance with Part 27 of the Federal Communication Commission's rules.

The objective is to determine the compliance of 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 submissions with FCC ID: 2ADZR23002690FM20.

Test Methodology

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

Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA/EIA 603-D.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Uncertainty
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.05dB
	1GHz~6GHz	4.48dB
	6GHz~18GHz	5.22dB
Occupied Bandwidth		0.5kHz
Frequency Stability		1Hz
Temperature		1.0℃
Humidity		6%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Justification

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.

Channel List

Mode		Channel		Frequency (MHz)
LTE Band 7	5M	Low	20775	2502.5
		Middle	21100	2535.0
		High	21425	2567.5
	10M	Low	20800	2505.0
		Middle	21100	2535.0
		High	21400	2565.0
	15M	Low	20825	2507.5
		Middle	21100	2535.0
		High	21375	2562.5
	20M	Low	20850	2510.0
		Middle	21100	2535.0
		High	21350	2560.0
LTE Band 41	5M	Low	39675	2498.5
		Middle	40620	2593.0
		High	41565	2687.5
	10M	Low	39700	2501.0
		Middle	40620	2593.0
		High	41540	2685.0
	15M	Low	39725	2503.5
		Middle	40620	2593.0
		High	41515	2682.5
	20M	Low	39750	2506.0
		Middle	40620	2593.0
		High	41490	2680.0

Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

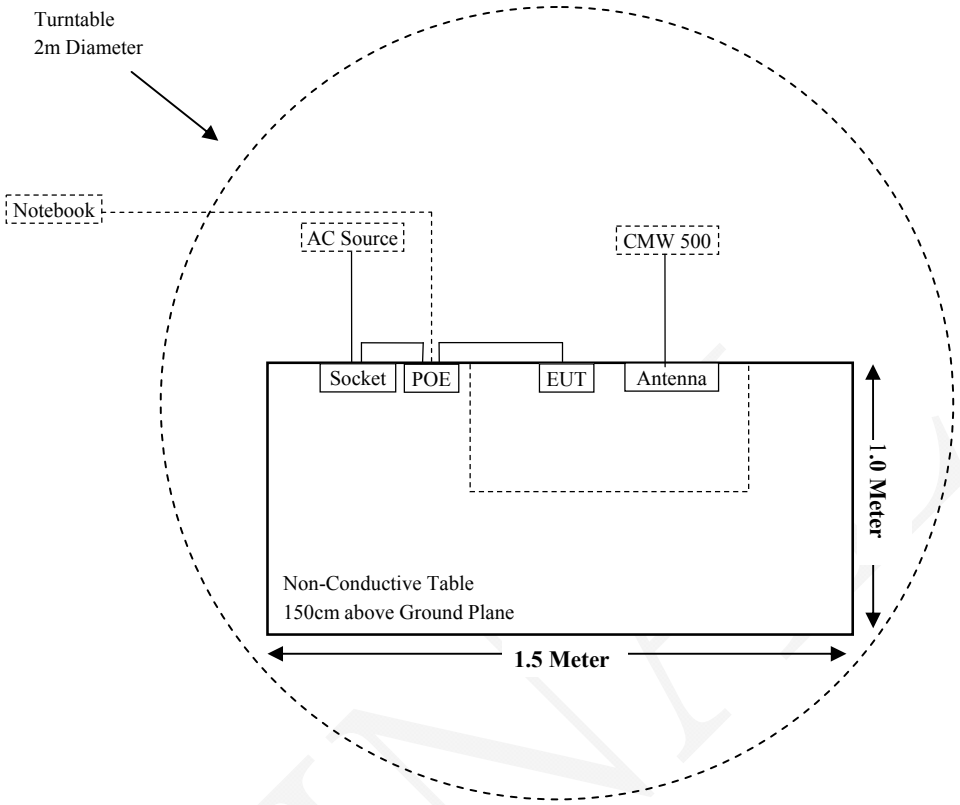
Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	104478
SHENZHEN GOSPELL	POE Input: AC 100-240V, 50/60Hz, 0.75A Max Output: DC 53V, 0.6A	G0545-530-060-PSE1000	/
DELL	Notebook	GX620	D65874152
Aihuaxin Technology	Antenna	/	/

External Cable List and Details

Cable Description	Length (m)	From Port	To
RJ45 Cable-1	3.0	EUT	POE
RJ45 Cable-2	15.0	POE	Notebook
Power Cable	1.0	POE	AC Source/Socket
Antenna Cable	1.8	Antenna	CMW500

Block Diagram of Test Setup

For Radiated Emissions



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1310& §2.1091	RF Exposure Information	Compliance
§2.1046; §27.50 (h)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; §27.53 (m)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; §27.53 (m)	Spurious Radiated Emissions	Compliance
§27.53 (m)	Band Edge	Compliance
§ 2.1055; §27.54;	Frequency stability	Compliance

Note 1:
The device is a fixed customer premises equipment.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test（Chamber 1#）					
HP	Signal Generator	HP 8341B	2624A00116	2017-11-12	2018-11-11
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2017-11-12	2018-11-11
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
Sonoma Instrunent	Pre-amplifier	310N	171205	2018-08-15	2019-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-8	008	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2018-08-15	2019-08-14
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20
Radiated Emission Test（Chamber 2#）					
HP	Signal Generator	HP 8341B	2624A00116	2017-11-12	2018-11-11
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2018-08-27	2019-08-26
ETS-LINDGREN	Horn Antenna	3115	9311-4159	2016-01-11	2019-01-10
ETS-LINDGREN	Horn Antenna	3115	6229	2016-01-11	2019-01-10
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-10-18	2019-10-17
ETS-LINDGREN	Horn Antenna	3116	2516	2016-12-12	2019-12-12
A.H.Systems, inc	Amplifier	2641-1	466	2018-09-11	2019-09-10
EM Electronics Corporation	Amplifier	EM18G40G	060726	2018-03-22	2019-03-21
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-16	016	2018-08-15	2019-08-14
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2017-11-12	2018-11-11
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2018-11-12	2019-11-11
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20
BACL	Temperature & Humidity Chamber	BTH-150	30023	2018-10-10	2019-10-09
ZHAOXIN	DC Power Supply	RXN-605D	DC002	2018-10-10	2019-10-09
Fastmile	RF Cable	Fastmile01	C01	Each	/

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

FCC §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

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

Calculated Formulary:

Predication of MPE limit at a given distance

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

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

Calculated Data:

Mode	ANT	Frequency Range (MHz)	Max Antenna Gain		Target Output Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
			(dBi)	(numeric)	(dBm)	(mW)			
Bluetooth	ANT2	2402-2480	0.00	1.00	7	5.01	50	0.0002	1.00
LTE Band 7	ANT0	2500-2570	12.50	17.78	23	199.53	50	0.1129	1.00
LTE Band 7	ANT1	2500-2570	12.50	17.78	23	199.53	50	0.1129	1.00
LTE Band 41	ANT0	2496-2690	12.50	17.78	22	158.49	50	0.0897	1.00
LTE Band 41	ANT1	2496-2690	12.50	17.78	22	158.49	50	0.0897	1.00

Note: Bluetooth and LTE can transmit simultaneously; the worst condition is Bluetooth & LTE Band 7 ANT1 + LTE Band 7 ANT0, as below:

$$\sum_i \frac{S_i}{S_{Limit,i}} = 0.0002+0.1129+0.1129=0.2260 < 1.0$$

Result: The device meet FCC MPE at 50 cm distance.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

§2.1046; §27.50 (h) - RF OUTPUT POWER

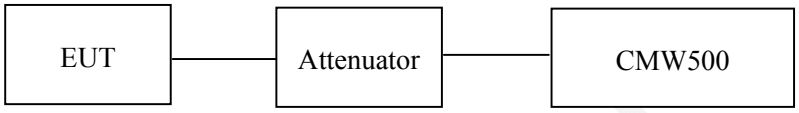
Applicable Standards

According to §27.50(h), the maximum transmitter output power not exceed 2Watts (33dBm)
The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Test Procedure

Conducted method:

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



Test Data

Environmental Conditions

Temperature:	23.4℃
Relative Humidity:	50 %
ATM Pressure:	101.2kPa

The testing was performed by Hope Zhang on 2018-10-25.

Conducted Power:

LTE Band 7

Chain0：

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
5M	QPSK	1#0	22.31	22.49	22.41	33
		1#12	22.30	22.56	22.49	
		1#24	22.31	22.52	22.55	
		12#0	22.34	22.49	22.59	
		12#6	22.35	22.47	22.65	
		12#11	22.36	22.46	22.64	
		25#0	22.34	22.45	22.67	
	16-QAM	1#0	22.34	22.46	22.66	
		1#12	22.36	22.49	22.73	
		1#24	22.36	22.49	22.82	
		12#0	22.35	22.46	22.77	
		12#6	22.34	22.43	22.75	
		12#11	22.32	22.41	22.75	
		25#0	22.32	22.51	22.73	
10M	QPSK	1#0	22.34	22.48	22.77	33
		1#24	22.36	22.43	22.83	
		1#49	22.34	22.41	22.80	
		25#0	22.36	22.42	22.79	
		25#12	22.36	22.44	22.74	
		25#24	22.36	22.51	22.66	
		50#0	22.37	22.51	22.68	
	16-QAM	1#0	22.36	22.45	22.69	
		1#24	22.37	22.37	22.74	
		1#49	22.37	22.39	22.74	
		25#0	22.38	22.45	22.83	
		25#12	22.39	22.38	22.78	
		25#24	22.41	22.25	22.75	
		50#0	22.41	22.26	22.70	

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
15M	QPSK	1#0	22.39	22.23	22.72	33
		1#37	22.37	22.24	22.70	
		1#74	22.36	22.26	22.63	
		36#0	22.37	22.27	22.64	
		36#17	22.37	22.23	22.64	
		36#35	22.37	22.24	22.67	
		75#0	22.39	22.26	22.57	
	16-QAM	1#0	22.38	22.32	22.52	
		1#37	22.39	22.32	22.56	
		1#74	22.40	22.33	22.56	
		36#0	22.42	22.28	22.49	
		36#17	22.42	22.30	22.51	
		36#35	22.44	22.22	22.51	
		75#0	22.44	22.31	22.49	
20M	QPSK	1#0	22.43	22.26	22.58	33
		1#49	22.42	22.31	22.57	
		1#99	22.41	22.38	22.59	
		50#0	22.41	22.42	22.65	
		50#24	22.38	22.45	22.65	
		50#49	22.39	22.41	22.70	
		100#0	22.40	22.40	22.79	
	16-QAM	1#0	22.42	22.50	22.71	
		1#49	22.43	22.48	22.69	
		1#99	22.41	22.46	22.75	
		50#0	22.40	22.40	22.68	
		50#24	22.40	22.47	22.69	
		50#49	22.38	22.52	22.71	
		100#0	22.37	22.45	22.77	

Chain1：

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
5M	QPSK	1#0	22.61	22.52	22.47	33
		1#12	22.12	22.68	22.22	
		1#24	22.41	22.67	22.52	
		12#0	22.28	22.79	22.72	
		12#6	22.26	22.52	22.81	
		12#11	22.47	22.72	22.84	
		25#0	22.41	22.38	22.88	
	16-QAM	1#0	22.49	22.29	22.66	
		1#12	22.23	22.28	22.82	
		1#24	22.10	22.57	22.67	
		12#0	22.55	22.40	22.65	
		12#6	22.37	22.62	22.94	
		12#11	22.59	22.37	22.64	
		25#0	22.19	22.26	22.65	
10M	QPSK	1#0	22.63	22.47	22.65	33
		1#24	22.47	22.41	22.55	
		1#49	22.20	22.63	23.09	
		25#0	22.45	22.31	22.79	
		25#12	22.20	22.16	22.80	
		25#24	22.15	22.58	22.96	
		50#0	22.30	22.77	22.90	
	16-QAM	1#0	22.56	22.29	22.63	
		1#24	22.39	22.62	22.71	
		1#49	22.32	22.63	22.71	
		25#0	22.14	22.59	22.59	
		25#12	22.32	22.15	22.82	
		25#24	22.48	22.07	22.86	
		50#0	22.69	22.42	22.57	

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
15M	QPSK	1#0	22.62	21.96	22.99	33
		1#37	22.20	21.96	22.50	
		1#74	22.58	22.49	22.85	
		36#0	22.25	22.51	22.92	
		36#17	22.64	22.36	22.49	
		36#35	22.17	22.52	22.71	
		75#0	22.30	22.39	22.77	
	16-QAM	1#0	22.61	22.32	22.65	
		1#37	22.39	22.15	22.50	
		1#74	22.67	22.31	22.52	
		36#0	22.48	22.20	22.75	
		36#17	22.44	22.01	22.33	
		36#35	22.71	22.18	22.42	
		75#0	22.74	22.50	22.70	
20M	QPSK	1#0	22.27	22.55	22.78	33
		1#49	22.25	22.36	22.46	
		1#99	22.20	22.12	22.71	
		50#0	22.36	22.71	22.69	
		50#24	22.59	22.19	22.37	
		50#49	22.30	22.58	22.63	
		100#0	22.58	22.26	22.84	
	16-QAM	1#0	22.49	22.35	22.65	
		1#49	22.55	22.70	22.47	
		1#99	22.47	22.58	22.62	
		50#0	22.30	22.21	22.57	
		50#24	22.54	22.62	22.68	
		50#49	22.21	22.38	22.85	
		100#0	22.53	22.64	22.65	

MIMO Chain0+Chain1：

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
5M	QPSK	1#0	25.47	25.52	25.45	33
		1#12	25.22	25.63	25.37	
		1#24	25.37	25.61	25.55	
		12#0	25.32	25.65	25.67	
		12#6	25.32	25.51	25.74	
		12#11	25.43	25.60	25.75	
		25#0	25.39	25.43	25.79	
	16-QAM	1#0	25.43	25.39	25.67	
		1#12	25.31	25.40	25.79	
		1#24	25.24	25.54	25.76	
		12#0	25.46	25.44	25.72	
		12#6	25.37	25.54	25.86	
		12#11	25.47	25.40	25.71	
		25#0	25.27	25.40	25.70	
10M	QPSK	1#0	25.50	25.49	25.72	33
		1#24	25.43	25.43	25.70	
		1#49	25.28	25.53	25.96	
		25#0	25.42	25.38	25.80	
		25#12	25.29	25.31	25.78	
		25#24	25.27	25.56	25.82	
		50#0	25.35	25.65	25.80	
	16-QAM	1#0	25.47	25.38	25.67	
		1#24	25.39	25.51	25.74	
		1#49	25.36	25.52	25.74	
		25#0	25.27	25.53	25.72	
		25#12	25.37	25.28	25.81	
		25#24	25.46	25.17	25.82	
		50#0	25.56	25.35	25.65	

Note: The power for MIMO mode is calculated by the follow formula

MIMO Power = 10Log10 (10^ (Chain 0/10) +10^ (Chain 1/10))

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
15M	QPSK	1#0	25.52	25.11	25.87	33
		1#37	25.30	25.11	25.61	
		1#74	25.48	25.39	25.75	
		36#0	25.32	25.40	25.79	
		36#17	25.52	25.31	25.58	
		36#35	25.28	25.39	25.70	
		75#0	25.36	25.34	25.68	
	16-QAM	1#0	25.51	25.33	25.60	
		1#37	25.40	25.25	25.54	
		1#74	25.55	25.33	25.55	
		36#0	25.46	25.25	25.63	
		36#17	25.44	25.17	25.43	
		36#35	25.59	25.21	25.48	
		75#0	25.60	25.42	25.61	
20M	QPSK	1#0	25.36	25.42	25.69	33
		1#49	25.35	25.35	25.53	
		1#99	25.32	25.26	25.66	
		50#0	25.40	25.58	25.68	
		50#24	25.50	25.33	25.52	
		50#49	25.36	25.51	25.68	
		100#0	25.50	25.34	25.83	
	16-QAM	1#0	25.47	25.44	25.69	
		1#49	25.50	25.60	25.59	
		1#99	25.45	25.53	25.70	
		50#0	25.36	25.32	25.64	
		50#24	25.48	25.56	25.70	
		50#49	25.31	25.46	25.79	
		100#0	25.46	25.56	25.72	

Note: The power for MIMO mode is calculated by the follow formula

MIMO Power = 10Log10 (10^ (Chain 0/10) +10^ (Chain 1/10))

LTE Band 41

Chain0：

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
5M	QPSK	1#0	21.23	21.54	21.39	33
		1#12	21.23	21.52	21.43	
		1#24	21.24	21.62	21.35	
		12#0	21.27	21.60	21.35	
		12#6	21.32	21.54	21.26	
		12#11	21.26	21.58	21.37	
		25#0	21.19	21.55	21.34	
	16-QAM	1#0	21.11	21.53	21.28	
		1#12	21.14	21.42	21.22	
		1#24	21.08	21.42	21.17	
		12#0	21.12	21.34	21.11	
		12#6	21.10	21.33	21.19	
		12#11	21.08	21.24	21.18	
		25#0	21.10	21.23	21.20	
10M	QPSK	1#0	21.12	21.27	21.24	33
		1#24	21.08	21.27	21.29	
		1#49	21.06	21.31	21.26	
		25#0	21.04	21.30	21.37	
		25#12	20.93	21.33	21.42	
		25#24	20.85	21.30	21.39	
		50#0	20.85	21.33	21.38	
	16-QAM	1#0	20.81	21.24	21.36	
		1#24	20.84	21.35	21.33	
		1#49	20.87	21.37	21.34	
		25#0	20.82	21.43	21.32	
		25#12	20.83	21.38	21.31	
		25#24	20.77	21.32	21.27	
		50#0	20.77	21.43	21.29	

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
15M	QPSK	1#0	20.81	21.41	21.30	33
		1#37	20.78	21.39	21.32	
		1#74	20.86	21.43	21.43	
		36#0	20.86	21.41	21.36	
		36#17	20.89	21.40	21.32	
		36#35	20.90	21.39	21.31	
		75#0	20.92	21.36	21.36	
	16-QAM	1#0	20.97	21.45	21.31	
		1#37	21.01	21.51	21.30	
		1#74	21.11	21.52	21.36	
		36#0	21.18	21.51	21.44	
		36#17	21.12	21.55	21.39	
		36#35	21.10	21.46	21.39	
		75#0	21.11	21.50	21.36	
20M	QPSK	1#0	21.14	21.50	21.39	33
		1#49	21.11	21.41	21.47	
		1#99	21.11	21.44	21.41	
		50#0	21.12	21.40	21.52	
		50#24	21.22	21.33	21.50	
		50#49	21.21	21.32	21.54	
		100#0	21.24	21.22	21.56	
	16-QAM	1#0	21.30	21.15	21.57	
		1#49	21.25	21.08	21.55	
		1#99	21.17	21.06	21.46	
		50#0	21.18	21.04	21.48	
		50#24	21.28	20.98	21.48	
		50#49	21.27	20.87	21.50	
		100#0	21.27	20.85	21.40	

Chain1：

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
5M	QPSK	1#0	21.05	21.33	21.14	33
		1#12	21.52	21.31	21.47	
		1#24	21.53	21.77	21.59	
		12#0	21.53	21.51	21.38	
		12#6	21.36	21.51	21.38	
		12#11	21.43	21.68	21.41	
		25#0	21.27	21.42	21.06	
	16-QAM	1#0	21.20	21.40	21.43	
		1#12	20.85	21.40	21.34	
		1#24	21.05	21.45	20.92	
		12#0	20.84	21.61	21.14	
		12#6	21.05	21.30	20.91	
		12#11	21.28	21.46	21.03	
		25#0	21.08	21.12	21.30	
10M	QPSK	1#0	20.82	21.02	21.53	33
		1#24	21.11	21.30	21.35	
		1#49	21.16	21.56	21.38	
		25#0	20.82	21.45	21.43	
		25#12	21.12	21.04	21.66	
		25#24	21.02	21.44	21.60	
		50#0	20.68	21.60	21.52	
	16-QAM	1#0	20.68	21.34	21.12	
		1#24	20.94	21.08	21.48	
		1#49	20.91	21.64	21.58	
		25#0	21.07	21.25	21.60	
		25#12	20.82	21.64	21.44	
		25#24	21.00	21.23	21.49	
		50#0	20.83	21.24	21.16	

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
15M	QPSK	1#0	20.84	21.29	21.49	33
		1#37	20.61	21.10	21.03	
		1#74	20.78	21.28	21.36	
		36#0	21.02	21.38	21.06	
		36#17	20.91	21.29	21.45	
		36#35	20.72	21.47	21.10	
		75#0	20.77	21.53	21.31	
	16-QAM	1#0	20.83	21.47	21.18	
		1#37	21.18	21.66	21.57	
		1#74	21.09	21.53	21.13	
		36#0	21.27	21.54	21.18	
		36#17	21.23	21.26	21.13	
		36#35	21.03	21.24	21.13	
		75#0	21.09	21.22	21.52	
20M	QPSK	1#0	21.26	21.65	21.22	33
		1#49	21.26	21.24	21.57	
		1#99	20.81	21.64	21.71	
		50#0	21.35	21.23	21.27	
		50#24	21.14	21.22	21.51	
		50#49	21.48	21.08	21.39	
		100#0	21.35	21.09	21.83	
	16-QAM	1#0	21.04	21.42	21.81	
		1#49	21.17	20.95	21.50	
		1#99	21.27	20.77	21.46	
		50#0	21.26	21.08	21.60	
		50#24	21.18	21.13	21.48	
		50#49	21.48	21.14	21.46	
		100#0	21.17	21.01	21.37	

MIMO Chain0+Chain1：

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
5M	QPSK	1#0	24.15	24.45	24.28	33
		1#12	24.39	24.43	24.46	
		1#24	24.40	24.71	24.48	
		12#0	24.41	24.57	24.38	
		12#6	24.35	24.54	24.33	
		12#11	24.36	24.64	24.40	
		25#0	24.24	24.50	24.21	
	16-QAM	1#0	24.17	24.48	24.37	
		1#12	24.01	24.42	24.29	
		1#24	24.08	24.45	24.06	
		12#0	23.99	24.49	24.14	
		12#6	24.09	24.33	24.06	
		12#11	24.19	24.36	24.12	
		25#0	24.10	24.19	24.26	
10M	QPSK	1#0	23.98	24.16	24.40	33
		1#24	24.11	24.30	24.33	
		1#49	24.12	24.45	24.33	
		25#0	23.94	24.39	24.41	
		25#12	24.04	24.20	24.55	
		25#24	23.95	24.38	24.51	
		50#0	23.78	24.48	24.46	
	16-QAM	1#0	23.76	24.30	24.25	
		1#24	23.90	24.23	24.42	
		1#49	23.90	24.52	24.47	
		25#0	23.96	24.35	24.47	
		25#12	23.84	24.52	24.39	
		25#24	23.90	24.29	24.39	
		50#0	23.81	24.35	24.24	

Note: The power for MIMO mode is calculated by the follow formula:

MIMO Power = 10Log10 (10^ (Chain 0/10) +10^ (Chain 1/10))

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Limit (dBm)
15M	QPSK	1#0	23.84	24.36	24.41	33
		1#37	23.71	24.26	24.19	
		1#74	23.83	24.37	24.41	
		36#0	23.95	24.41	24.22	
		36#17	23.91	24.36	24.40	
		36#35	23.82	24.44	24.22	
		75#0	23.86	24.46	24.35	
	16-QAM	1#0	23.91	24.47	24.26	
		1#37	24.11	24.60	24.45	
		1#74	24.11	24.54	24.26	
		36#0	24.24	24.54	24.32	
		36#17	24.19	24.42	24.27	
		36#35	24.08	24.36	24.27	
		75#0	24.11	24.37	24.45	
20M	QPSK	1#0	24.21	24.59	24.32	33
		1#49	24.20	24.34	24.53	
		1#99	23.97	24.55	24.57	
		50#0	24.25	24.33	24.41	
		50#24	24.19	24.29	24.52	
		50#49	24.36	24.21	24.48	
		100#0	24.31	24.17	24.71	
	16-QAM	1#0	24.18	24.30	24.70	
		1#49	24.22	24.03	24.54	
		1#99	24.23	23.93	24.47	
		50#0	24.23	24.07	24.55	
		50#24	24.24	24.07	24.49	
		50#49	24.39	24.02	24.49	
		100#0	24.23	23.94	24.40	

Note: The power for MIMO mode is calculated by the follow formula:

MIMO Power = 10Log10 (10^ (Chain 0/10) +10^ (Chain 1/10))

FCC §2.1049 & §27.53 - OCCUPIED BANDWIDTH

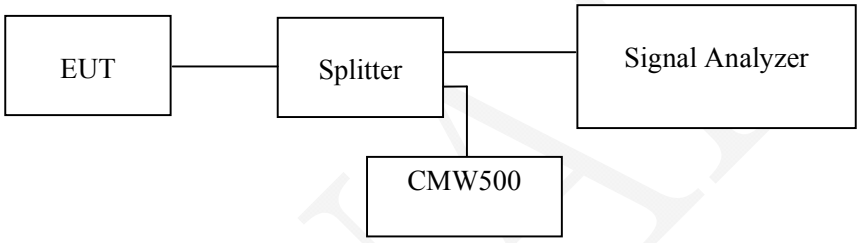
Applicable Standards

FCC 47 §2.1049 and §27.53.

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:	23 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Hope Zhang from 2018-10-20 to 2018-11-20.

EUT operation mode: SISO Transmitting

Test Result: Compliance.

LTE Band 7:

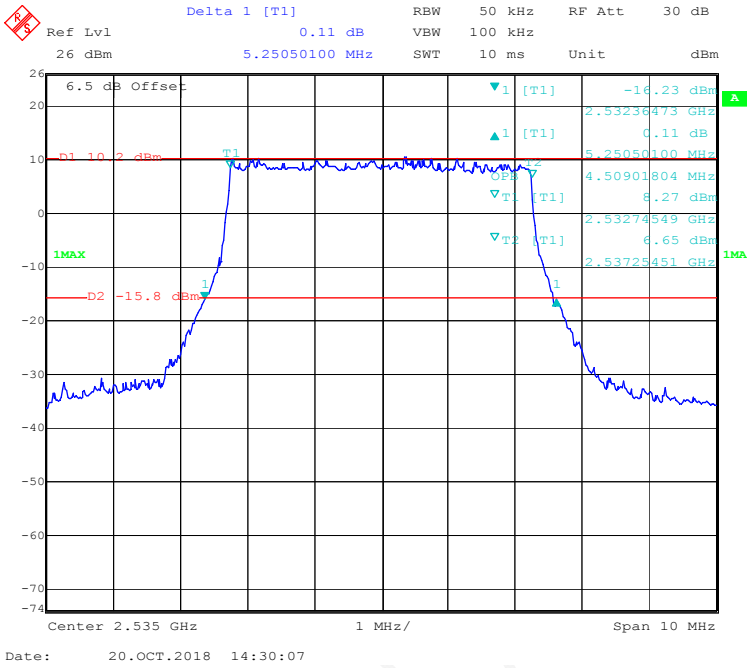
Chain	Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
Chain0	QPSK	5M	Middle	5.25	4.51
		10M		9.86	9.02
		15M		14.79	13.53
		20M		19.16	18.04
	16-QAM	5M	Middle	5.19	4.49
		10M		9.86	9.02
		15M		14.79	13.53
		20M		19.08	17.96
Chain1	QPSK	5M	Middle	5.07	4.51
		10M		9.98	9.02
		15M		14.73	13.53
		20M		19.08	17.88
	16-QAM	5M	Middle	5.13	4.51
		10M		9.90	9.02
		15M		14.73	13.53
		20M		19.08	17.96

LTE Band 41:

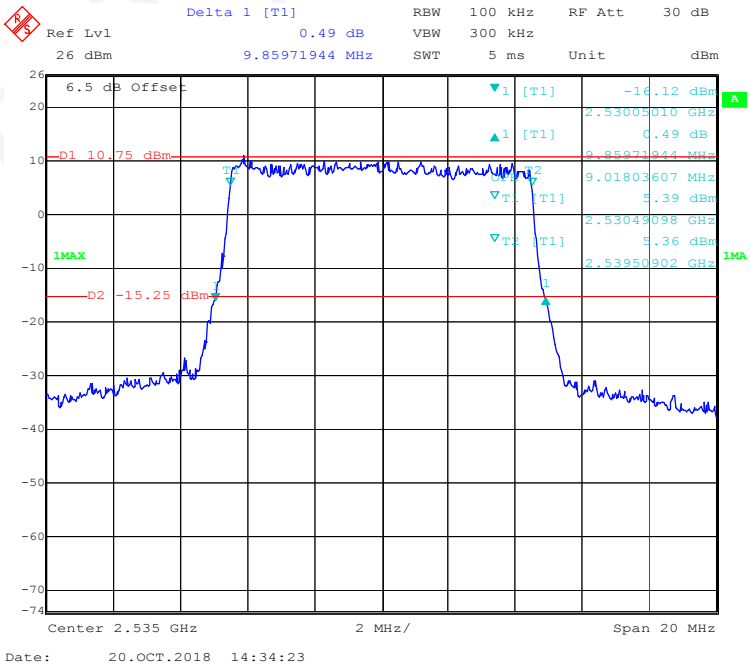
Chain	Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
Chain0	QPSK	5M	Middle	5.15	4.51
		10M		9.94	8.98
		15M		14.79	13.47
		20M		19.00	17.96
	16-QAM	5M	Middle	5.19	4.51
		10M		9.94	8.98
		15M		14.85	13.47
		20M		19.00	17.88
Chain1	QPSK	5M	Middle	5.15	4.49
		10M		9.70	8.98
		15M		14.73	13.53
		20M		19.24	17.96
	16-QAM	5M	Middle	5.17	4.49
		10M		9.74	8.98
		15M		14.85	13.47
		20M		19.24	17.96

LTE Band 7:
Chain0

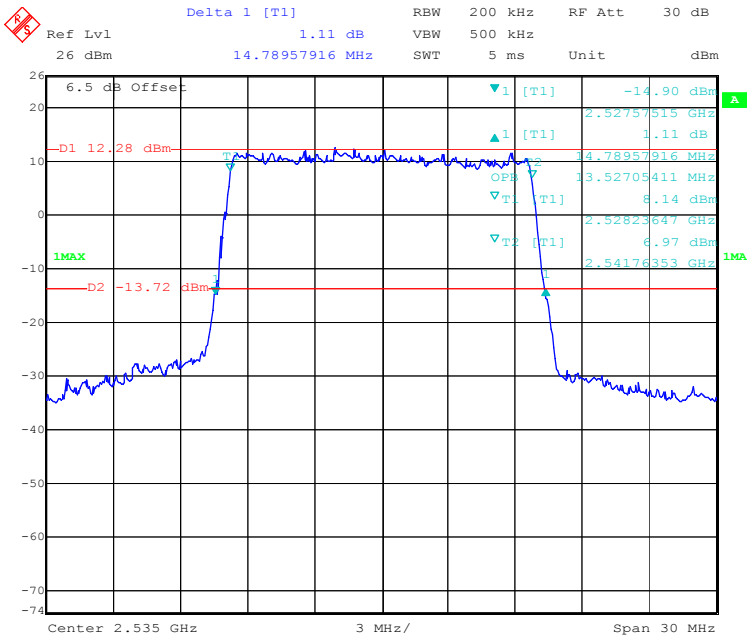
QPSK (5 MHz) - Middle channel



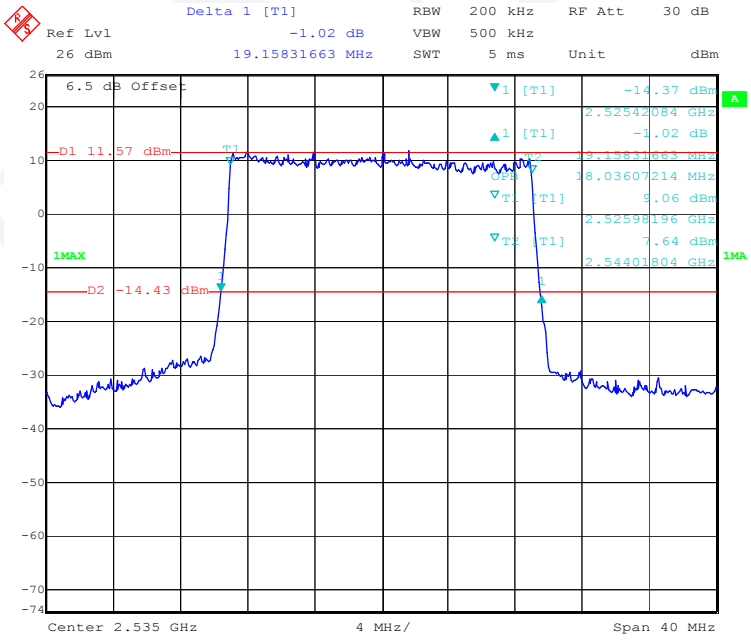
QPSK (10 MHz) - Middle channel



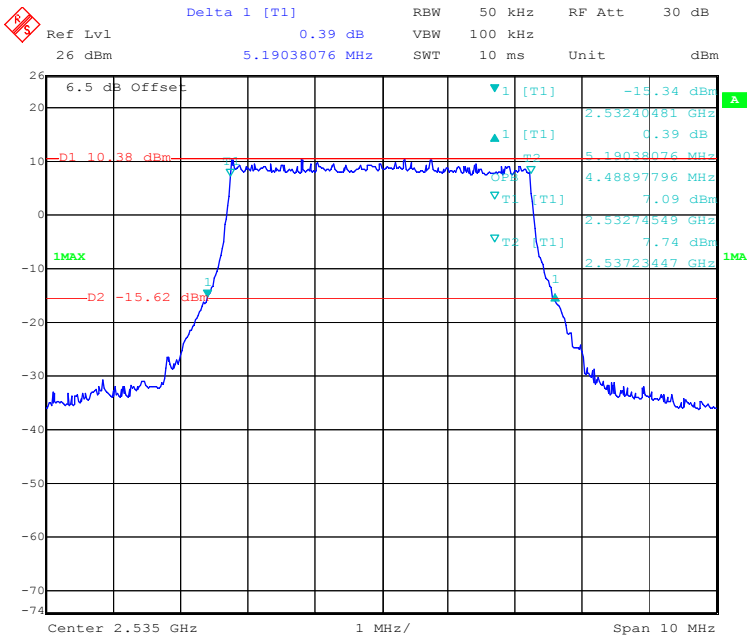
QPSK (15MHz) - Middle channel



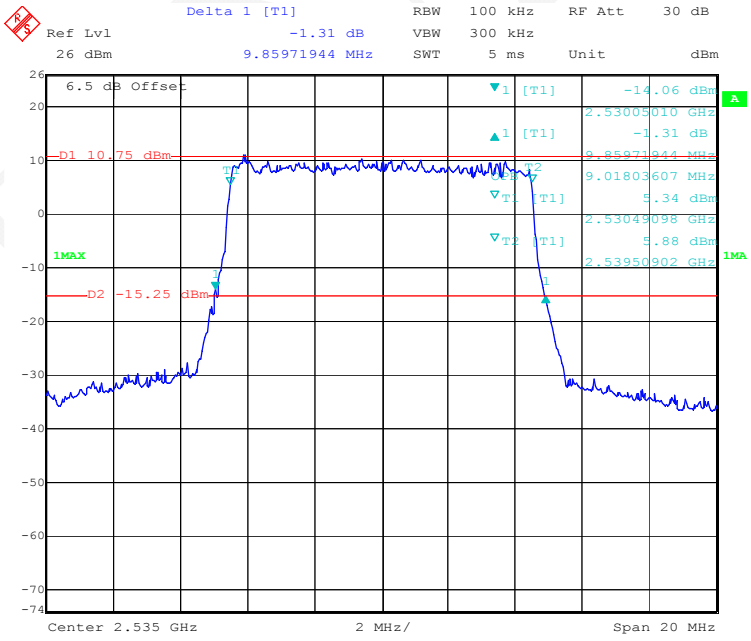
QPSK (20 MHz) - Middle channel



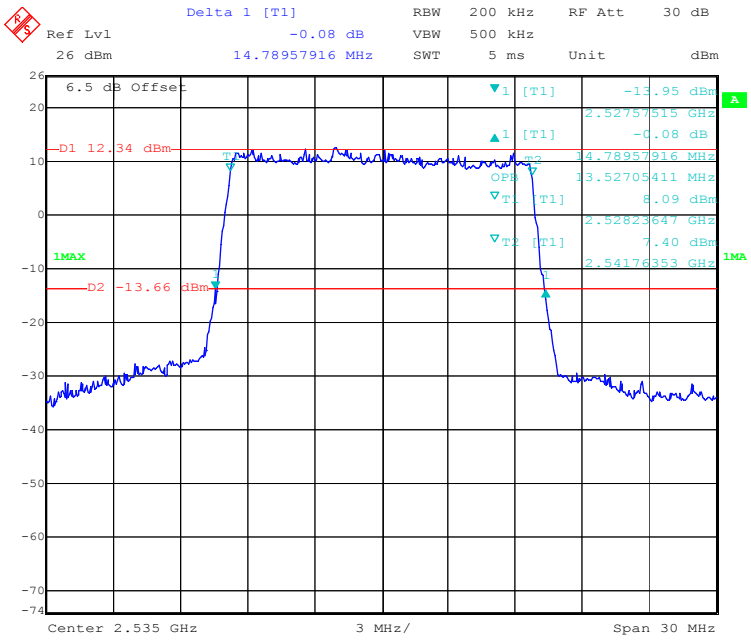
16-QAM (5 MHz) - Middle channel



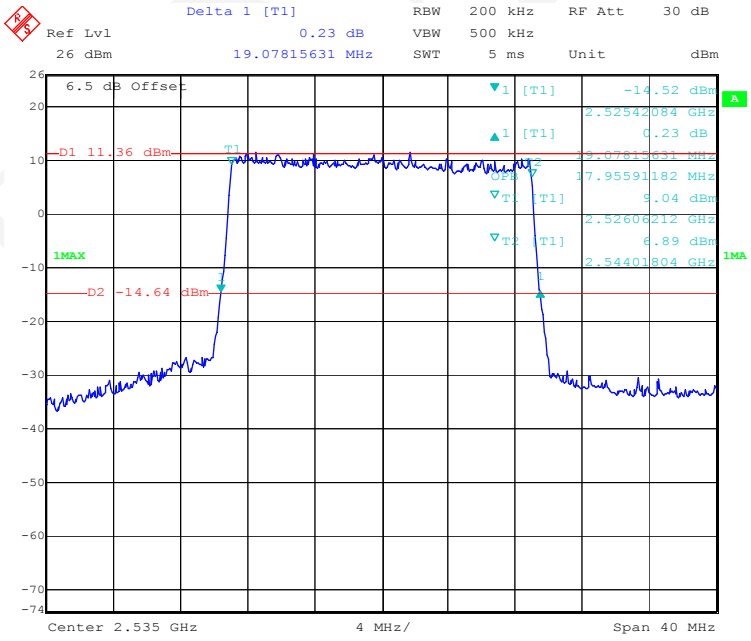
16-QAM (10 MHz) - Middle channel



16-QAM (15 MHz) - Middle channel

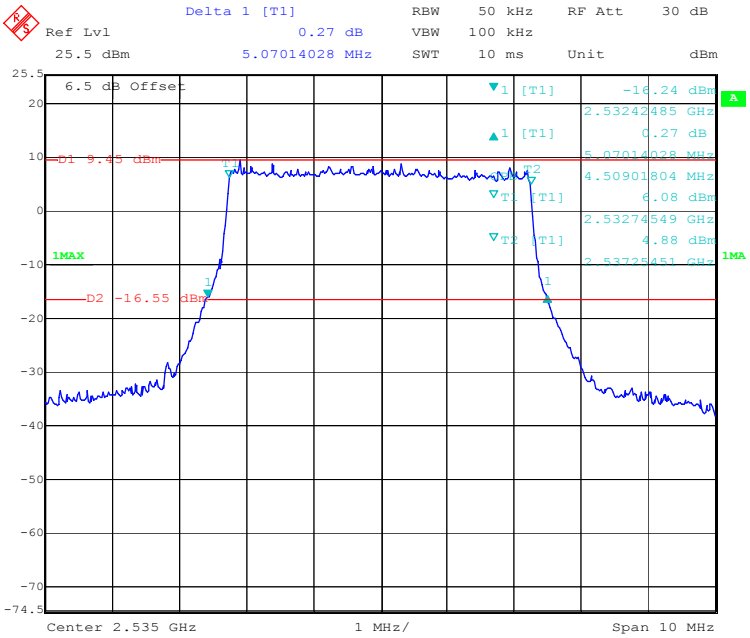


16-QAM (20 MHz) - Middle channel

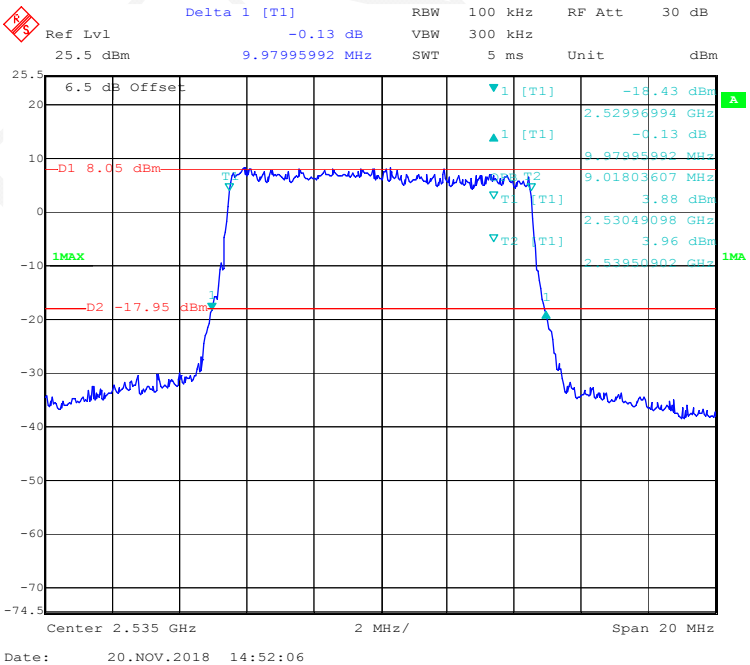


Chain1

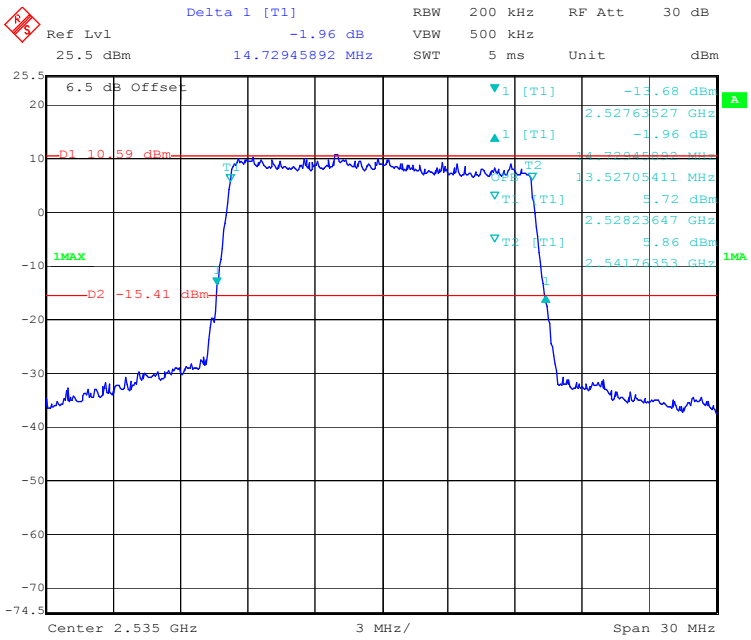
QPSK (5 MHz) - Middle channel



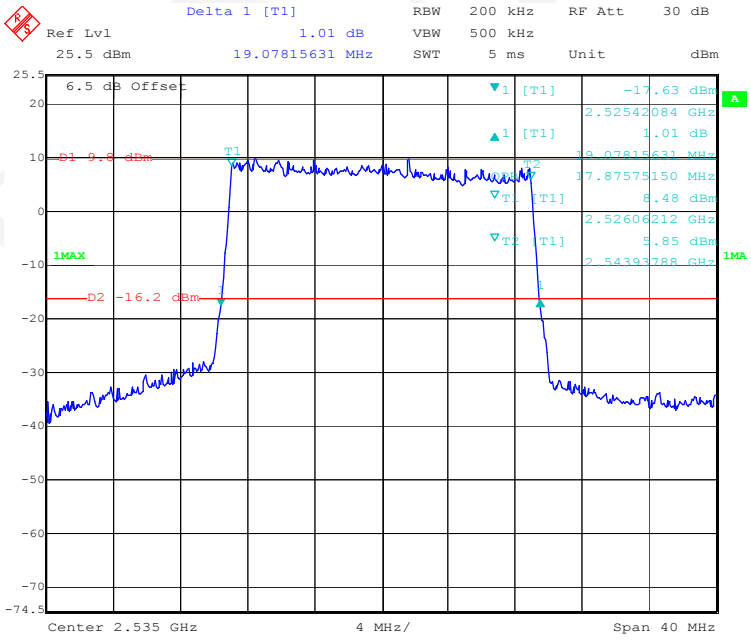
QPSK (10 MHz) - Middle channel



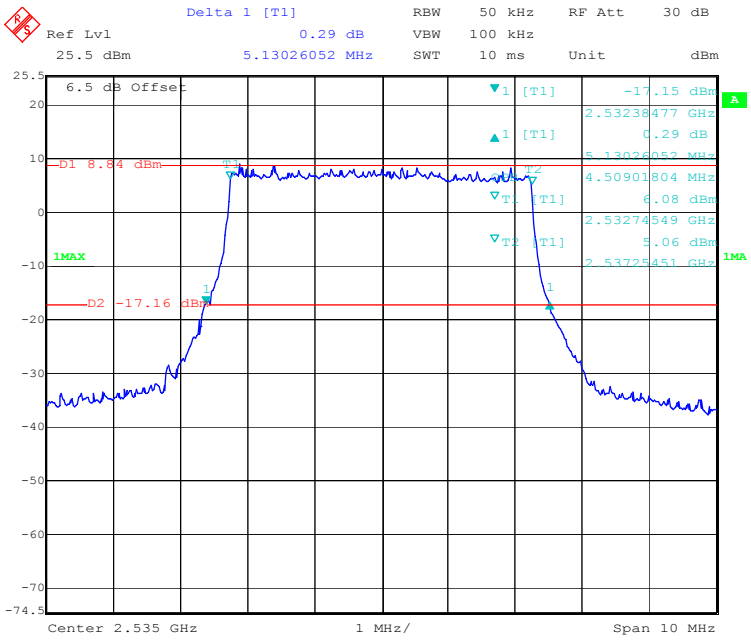
QPSK (15MHz) - Middle channel



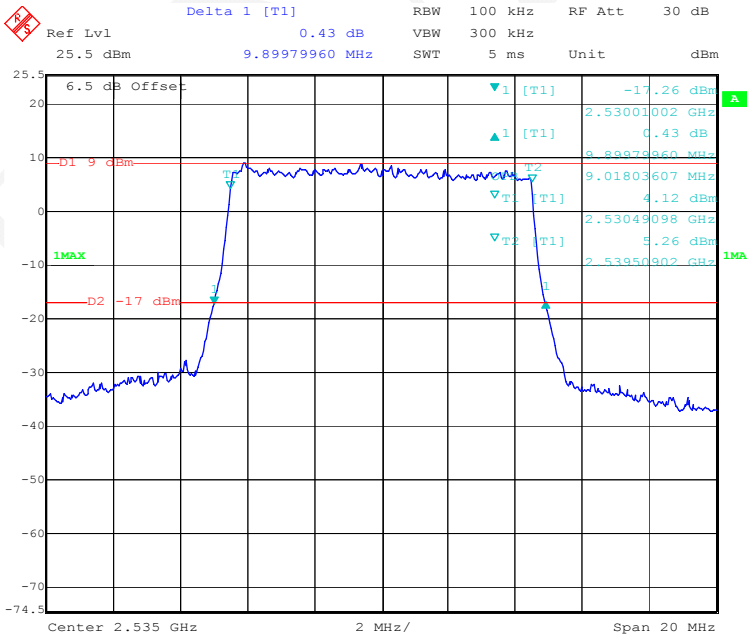
QPSK (20 MHz) - Middle channel



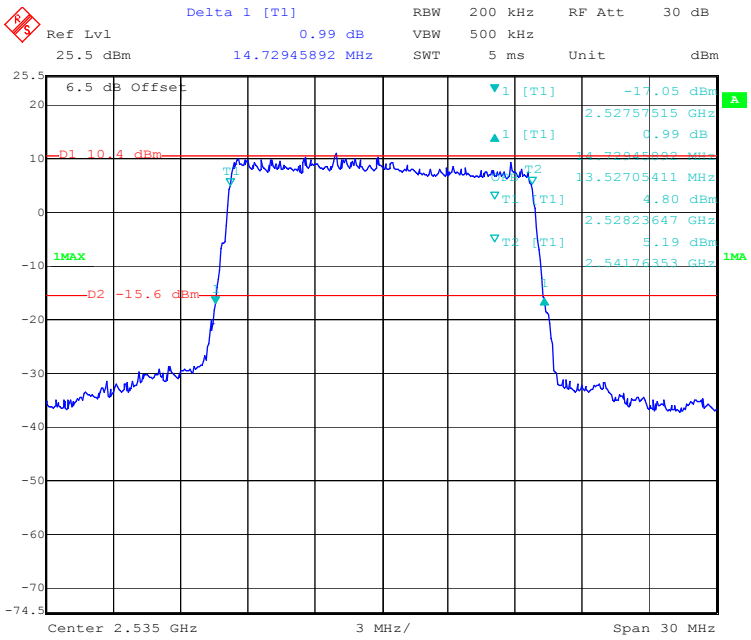
16-QAM (5 MHz) - Middle channel



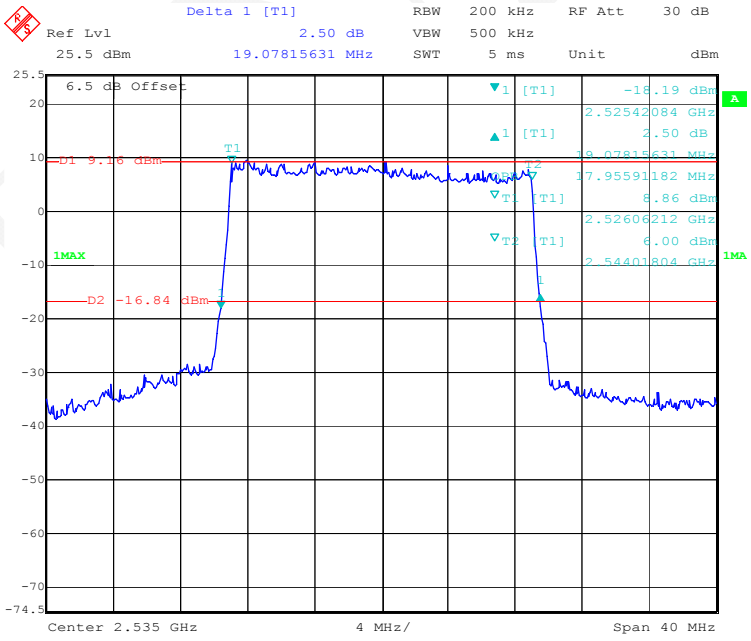
16-QAM (10 MHz) - Middle channel



16-QAM (15 MHz) - Middle channel

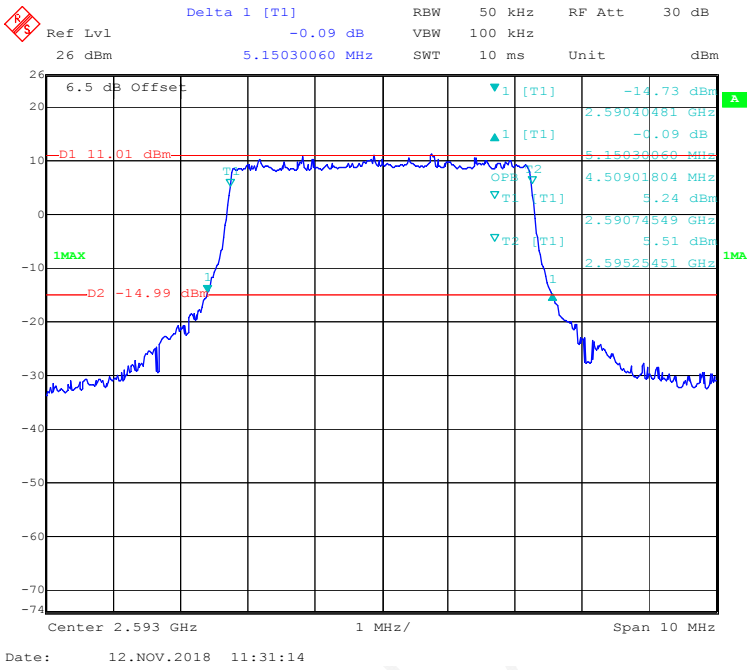


16-QAM (20 MHz) - Middle channel

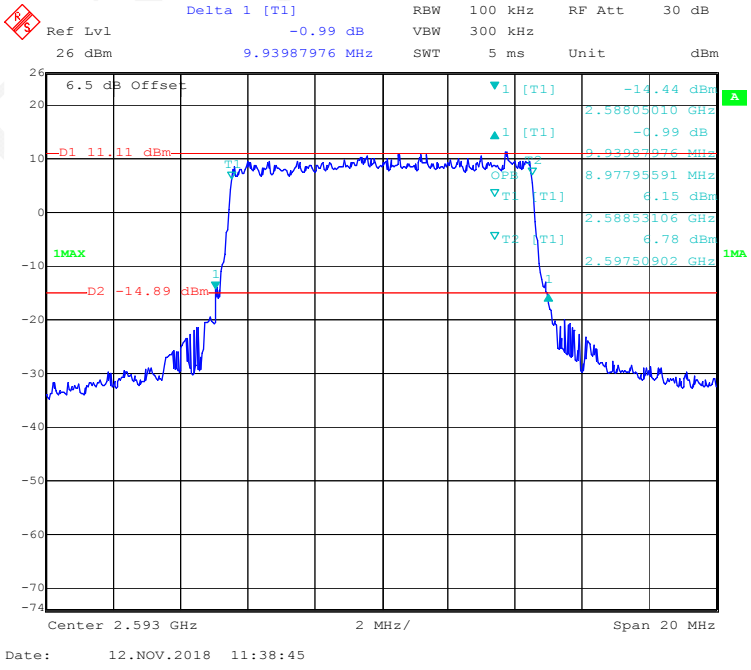


LTE Band 41
Chain0

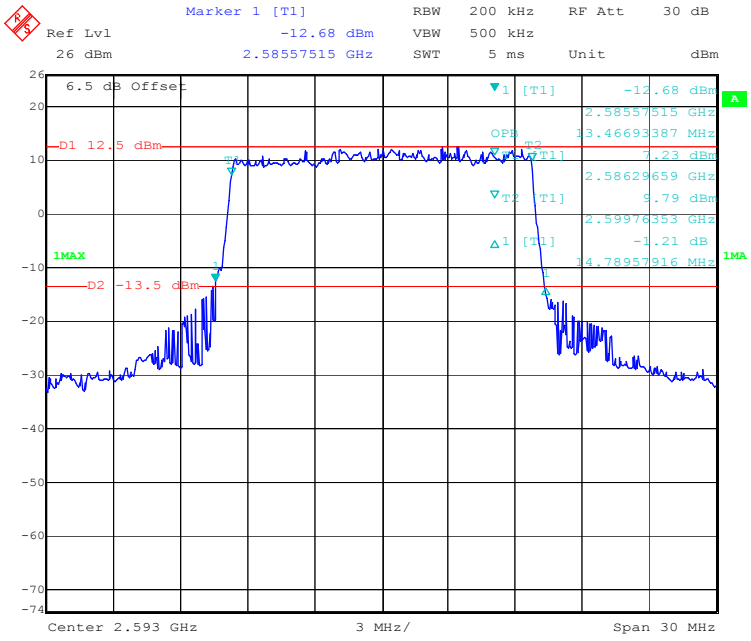
QPSK (5MHz) - Middle channel



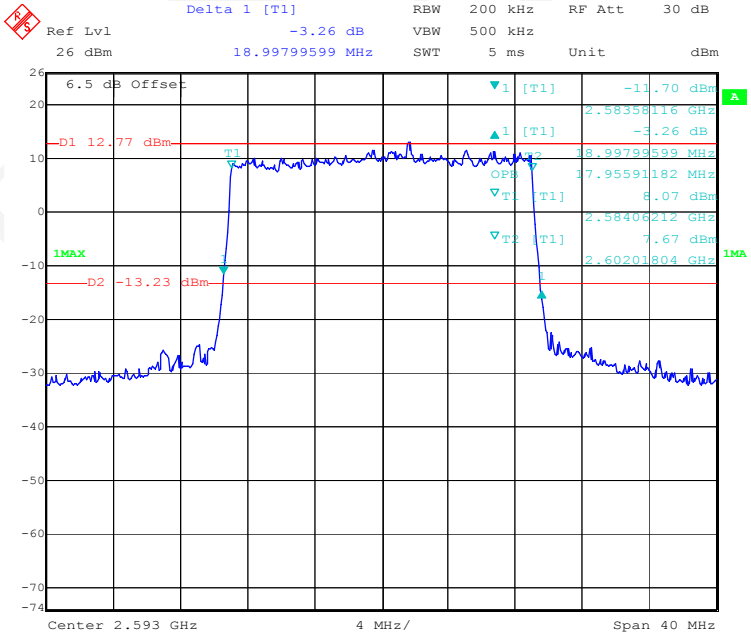
QPSK (10 MHz) - Middle channel



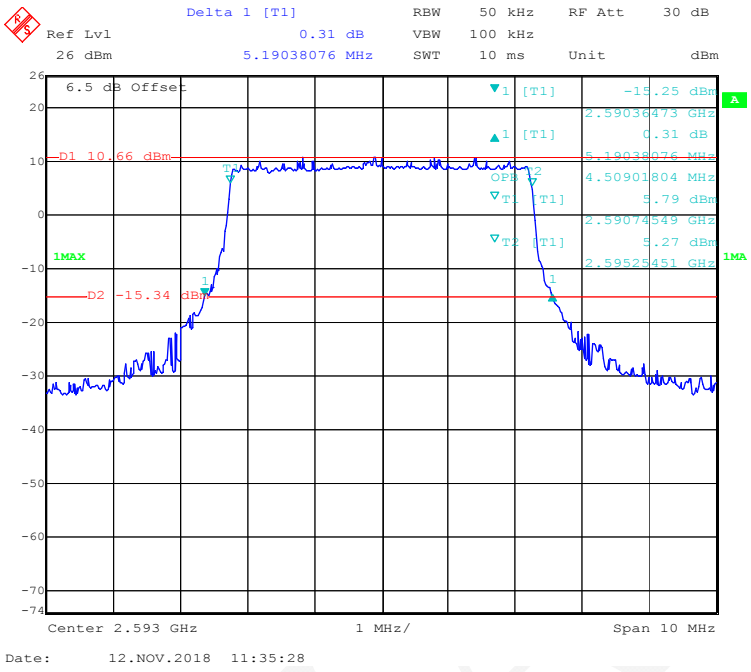
QPSK (15 MHz) - Middle channel



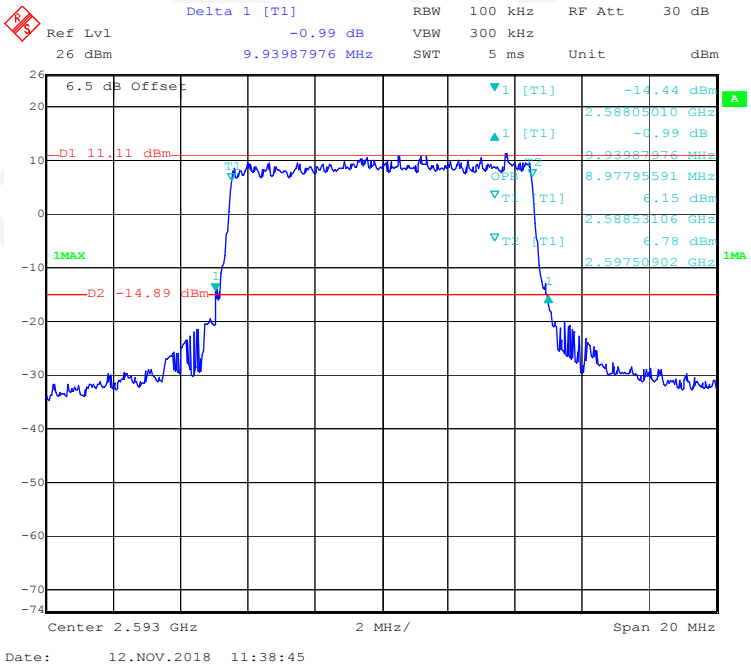
QPSK (20 MHz) - Middle channel



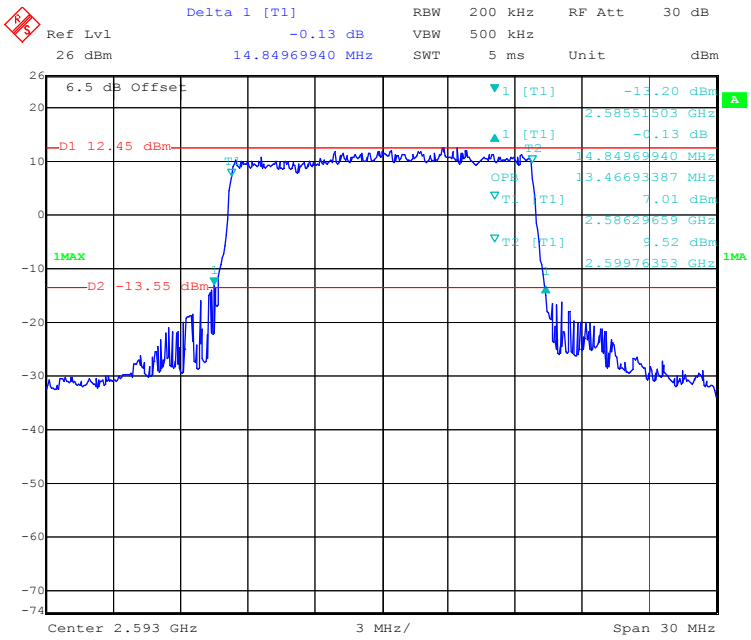
16-QAM (5 MHz) - Middle channel



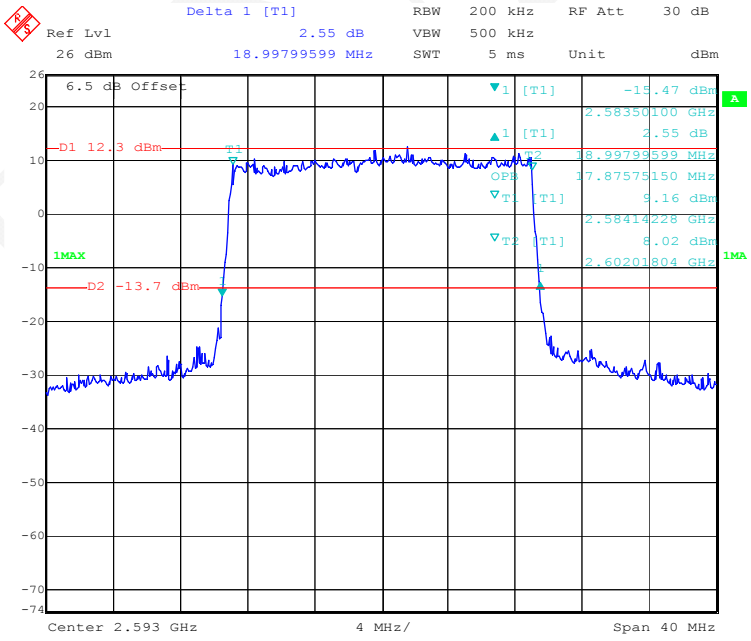
16-QAM (10 MHz) - Middle channel



16-QAM (15 MHz) - Middle channel

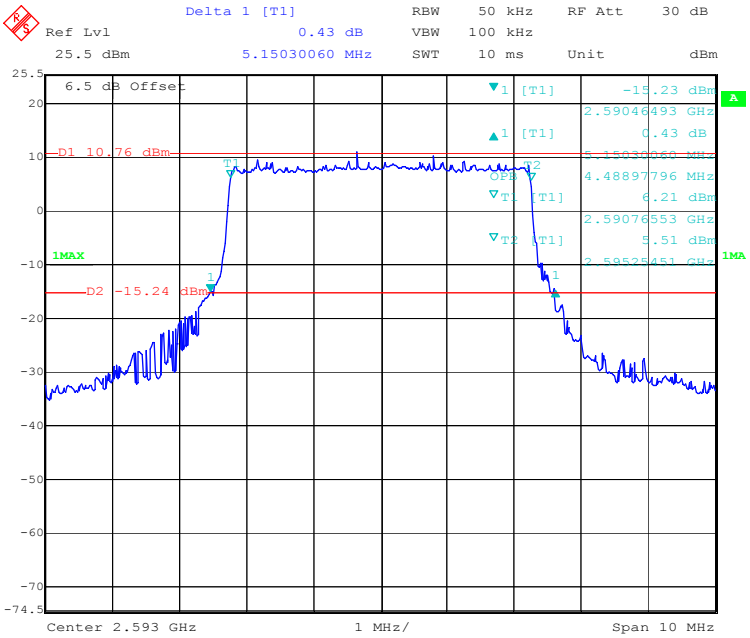


16-QAM (20 MHz) - Middle channel

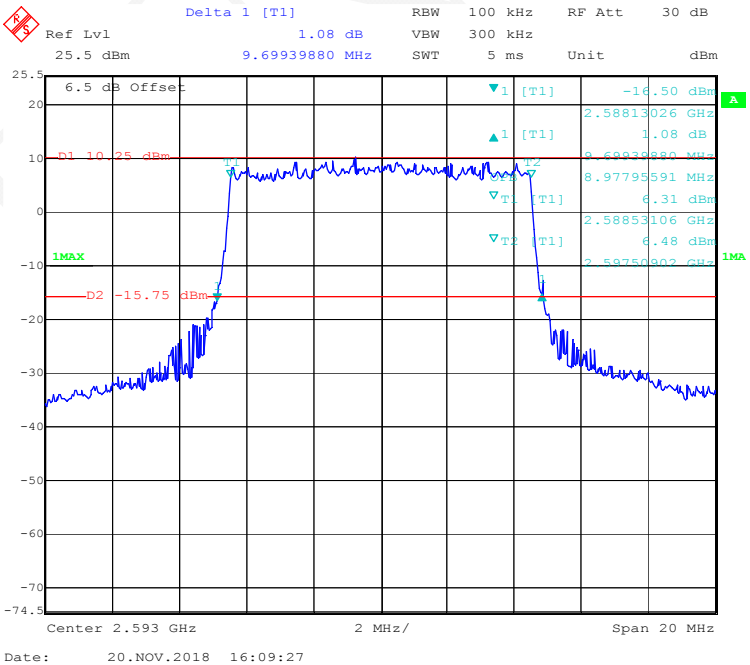


Chain1

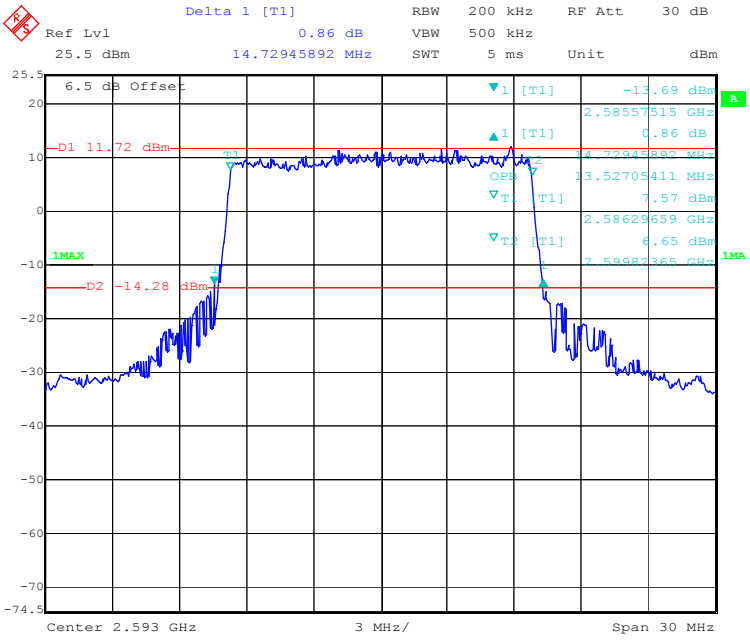
QPSK (5MHz) - Middle channel



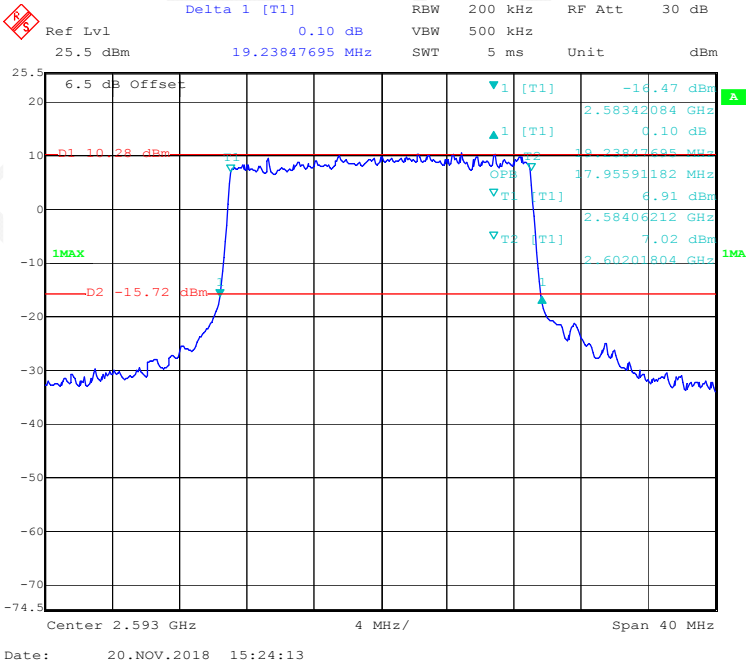
QPSK (10 MHz) - Middle channel



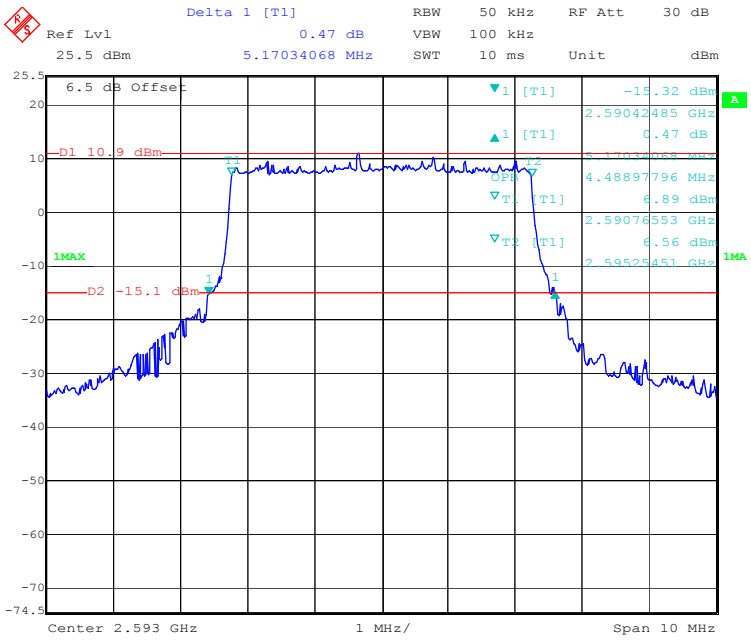
QPSK (15 MHz) - Middle channel



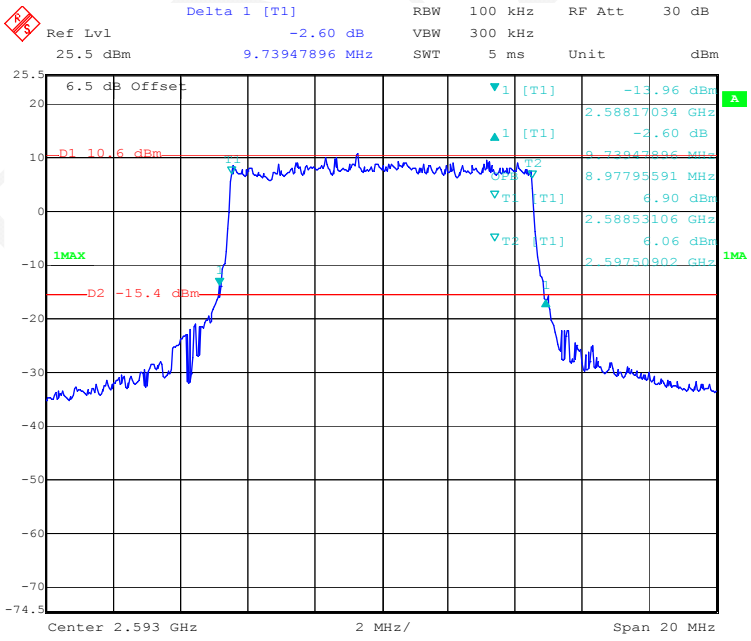
QPSK (20 MHz) - Middle channel



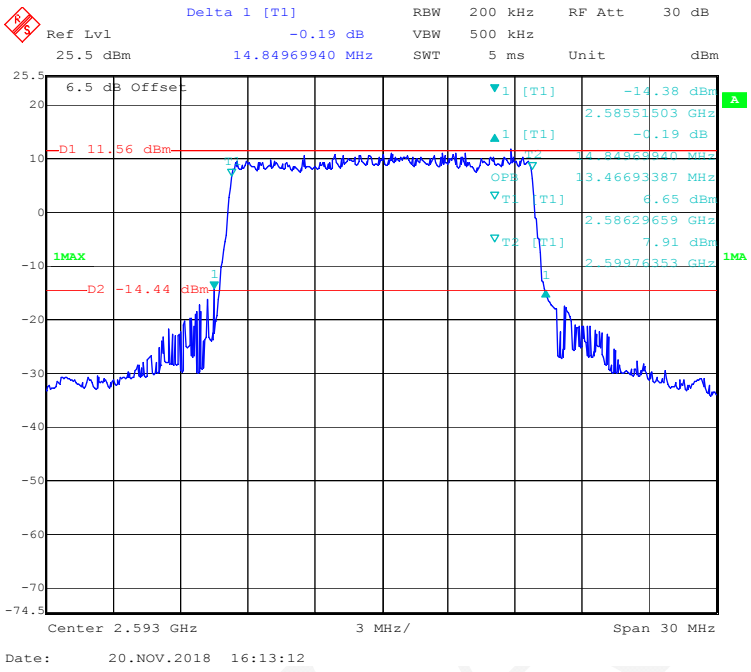
16-QAM (5 MHz) - Middle channel



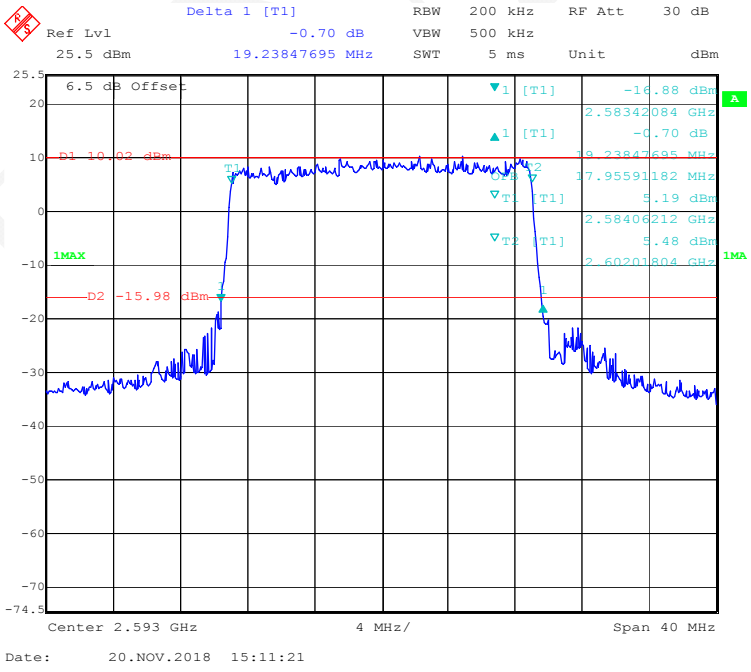
16-QAM (10 MHz) - Middle channel



16-QAM (15 MHz) - Middle channel



16-QAM (20 MHz) - Middle channel



§ 2.1051 & §27.53 (m) SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standards

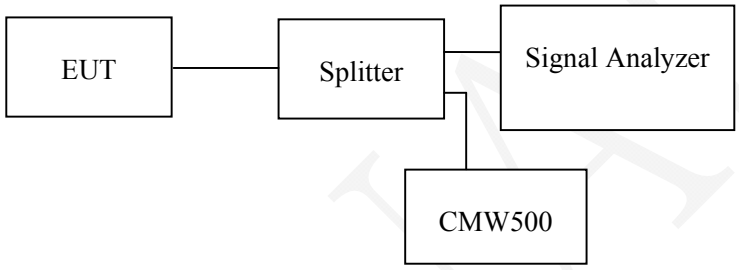
FCC §2.1051 and §27.53(m).

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

For fixed user stations, any emission 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 transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100kHz for below 1GHz & 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Data

Environmental Conditions

Temperature:	23.2 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2kPa

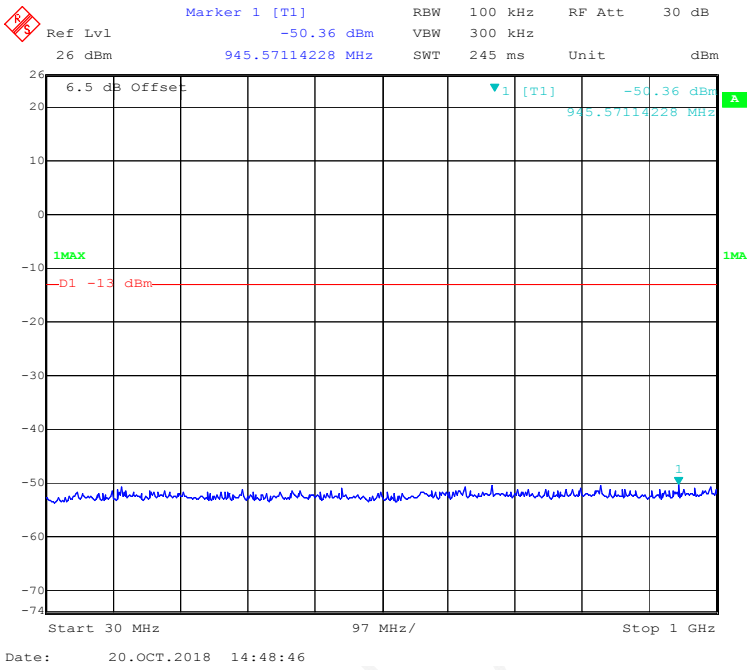
The testing was performed by Hope Zhang from 2018-10-20 to 2018-11-20.

EUT operation mode: SISO Transmitting

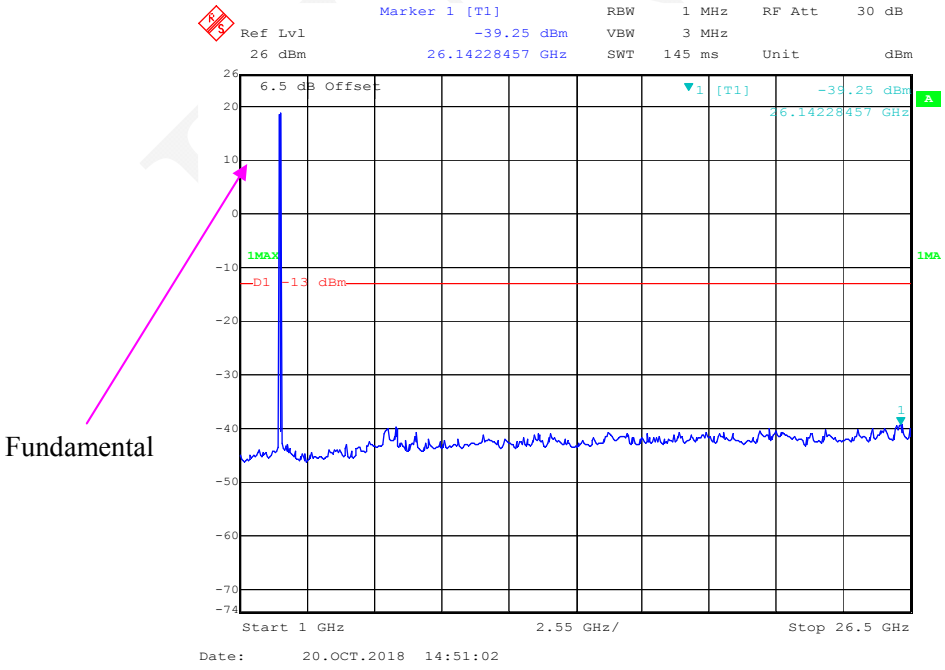
Note: All the emissions are under the limit 3dB, so the MIMO mode also compliance the limit.

LTE Band 7:
Chain0

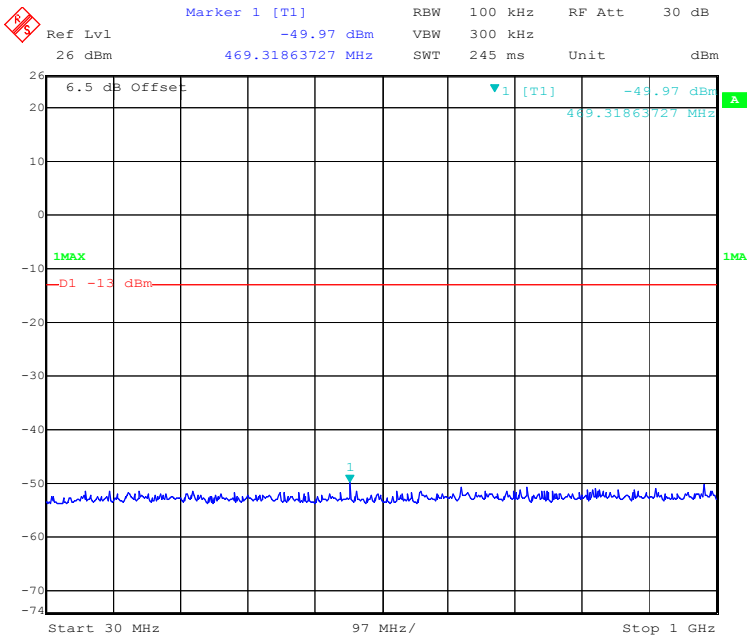
30 MHz - 1 GHz (5 MHz, Middle Channel)



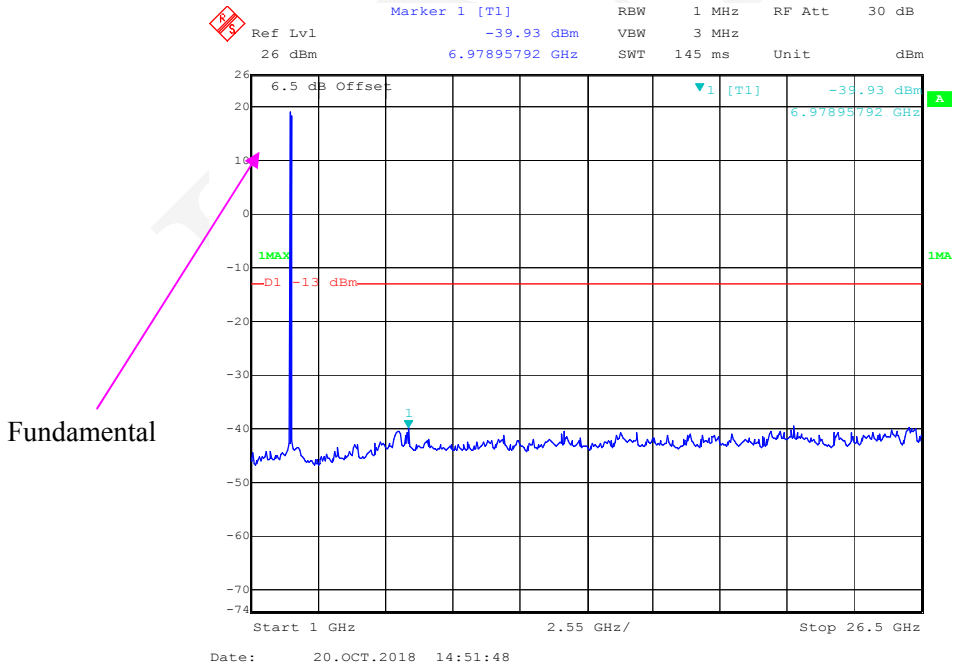
1 GHz – 26 GHz (5 MHz, Middle Channel)



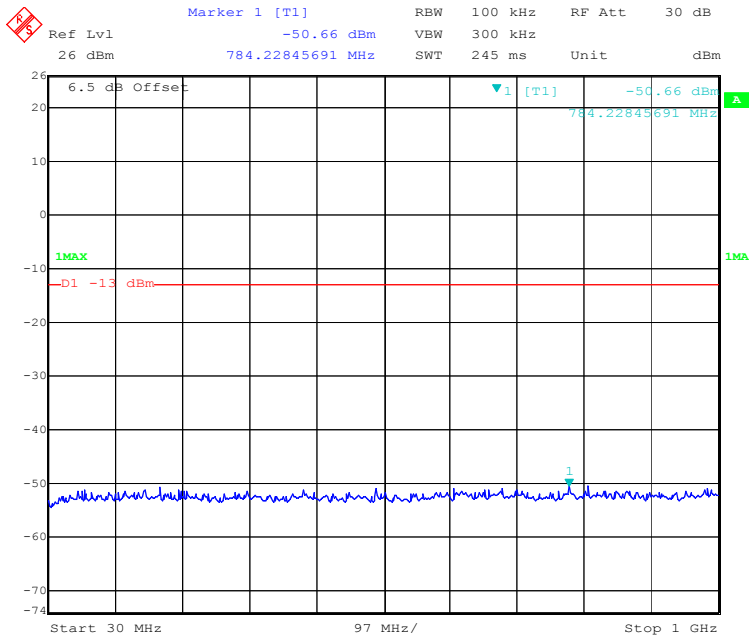
30 MHz - 1 GHz (10MHz, Middle Channel)



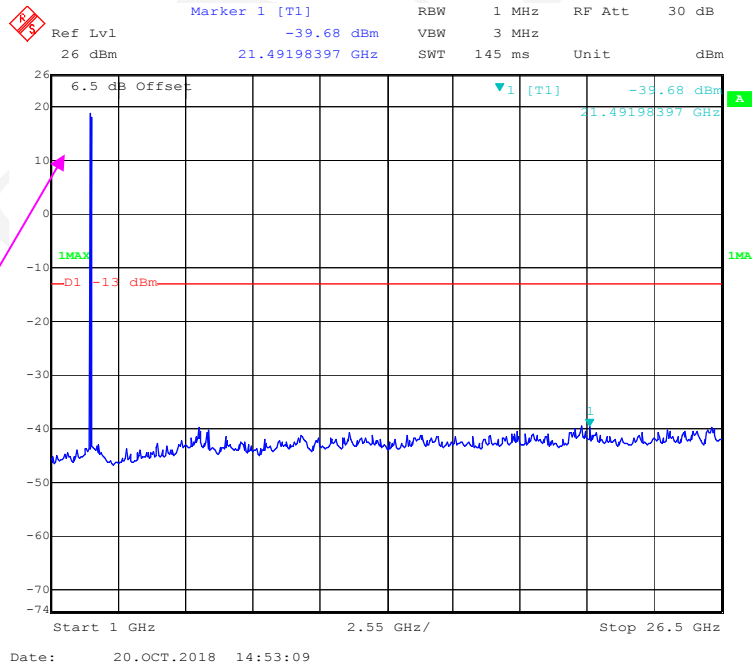
1 GHz – 26 GHz (10 MHz, Middle Channel)



30 MHz - 1 GHz (15 MHz, Middle Channel)

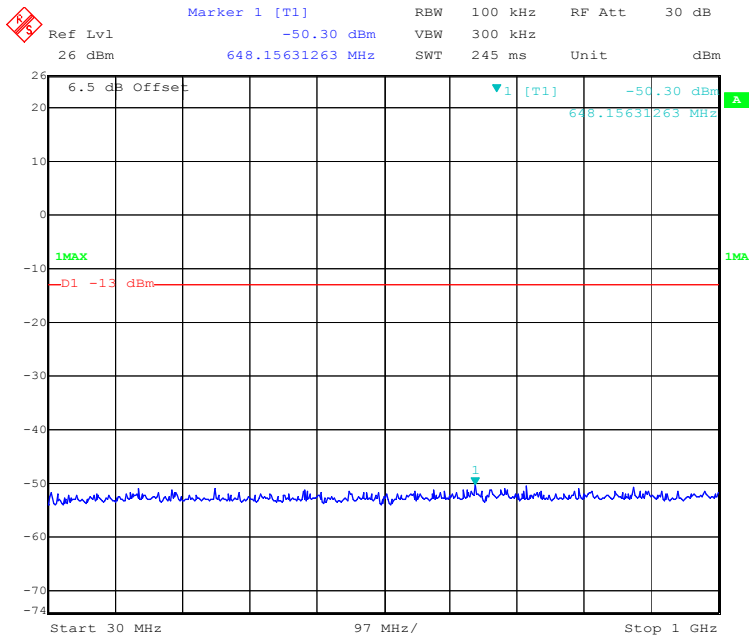


1 GHz – 26 GHz (15MHz, Middle Channel)

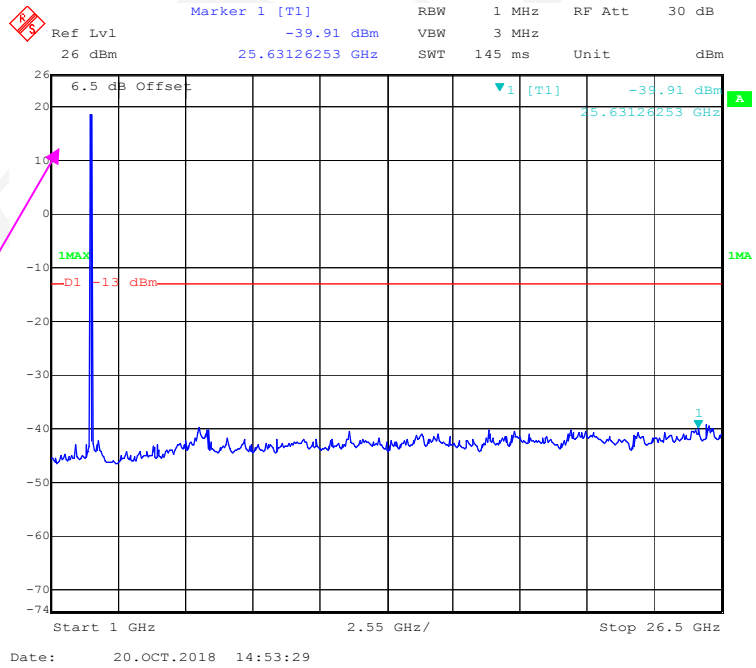


Fundamental

30 MHz - 1 GHz (20 MHz, Middle Channel)



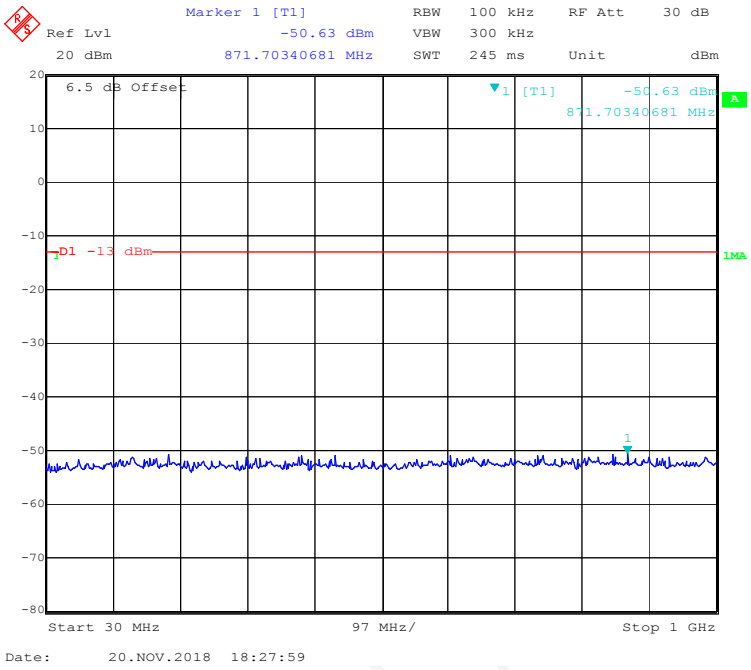
1 GHz – 26 GHz (20 MHz, Middle Channel)



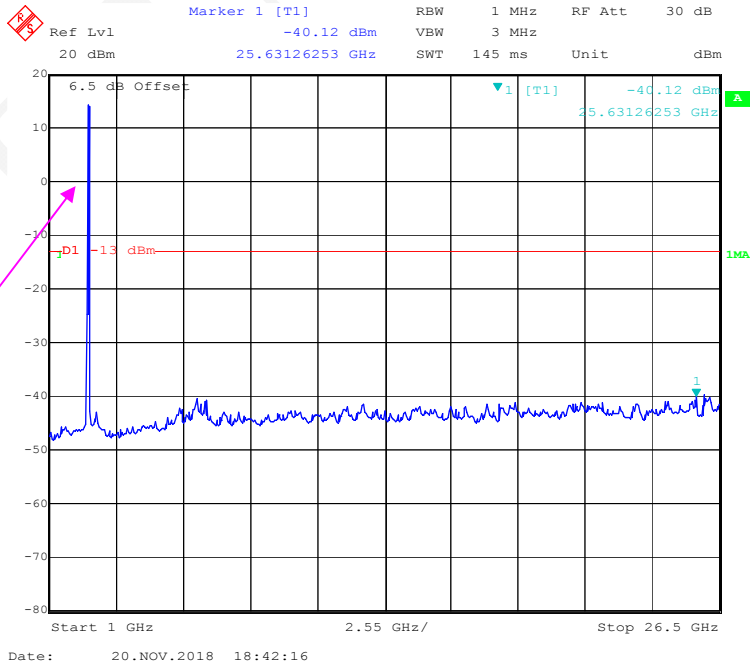
Fundamental

LTE Band 7:
Chain1

30 MHz - 1 GHz (5 MHz, Middle Channel)

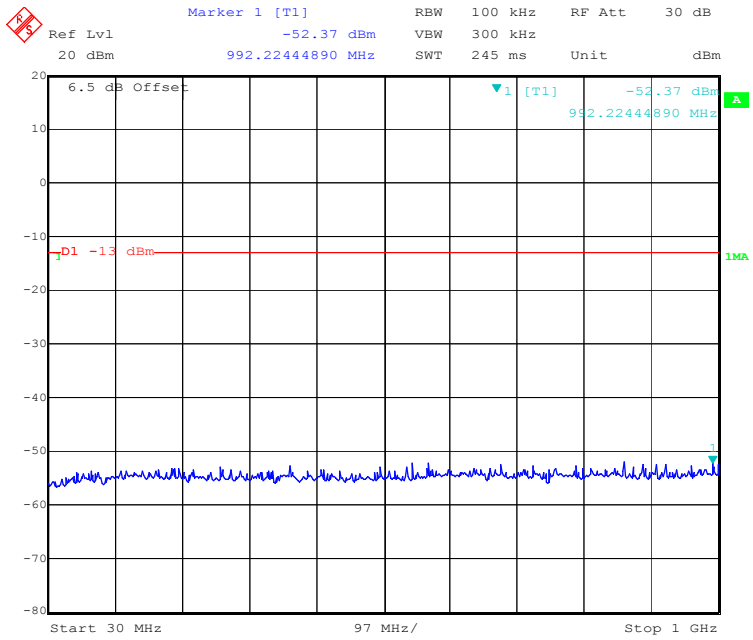


1 GHz – 26 GHz (5 MHz, Middle Channel)

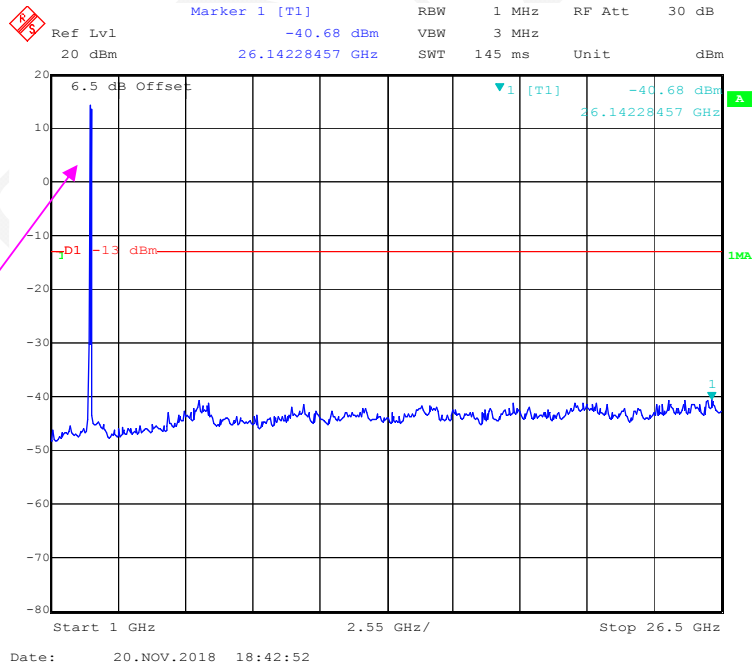


Fundamental

30 MHz - 1 GHz (10MHz, Middle Channel)

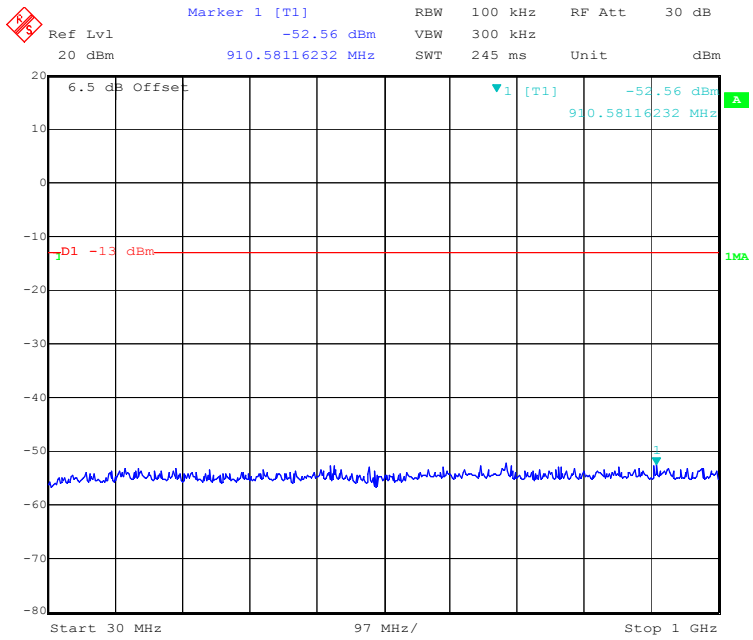


1 GHz – 26 GHz (10 MHz, Middle Channel)

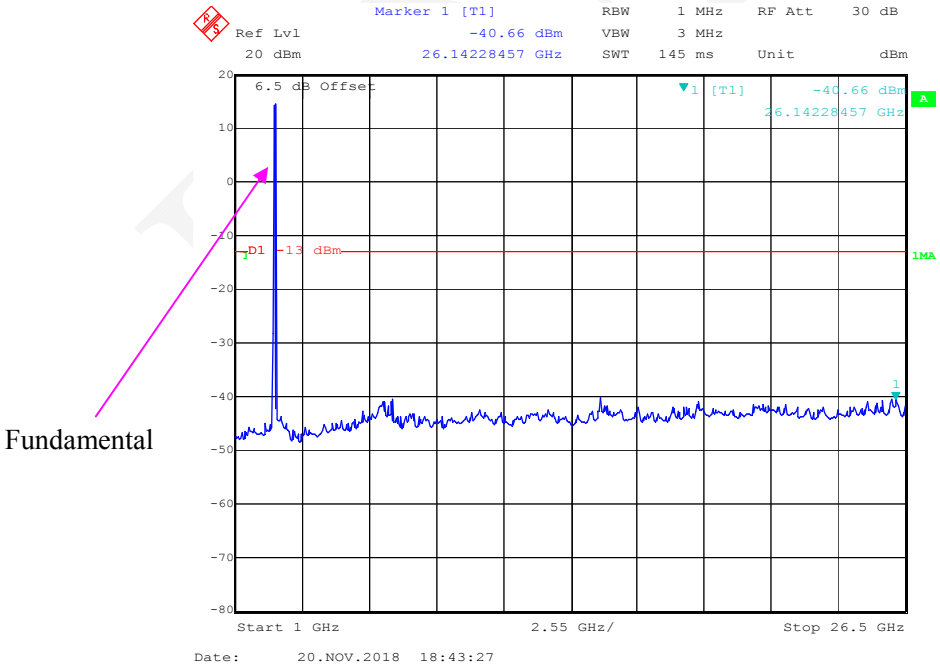


Fundamental

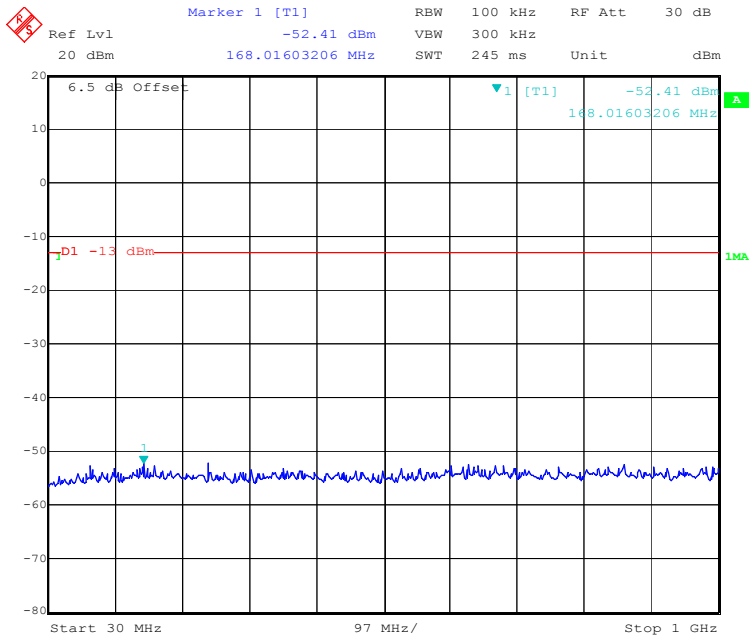
30 MHz - 1 GHz (15 MHz, Middle Channel)



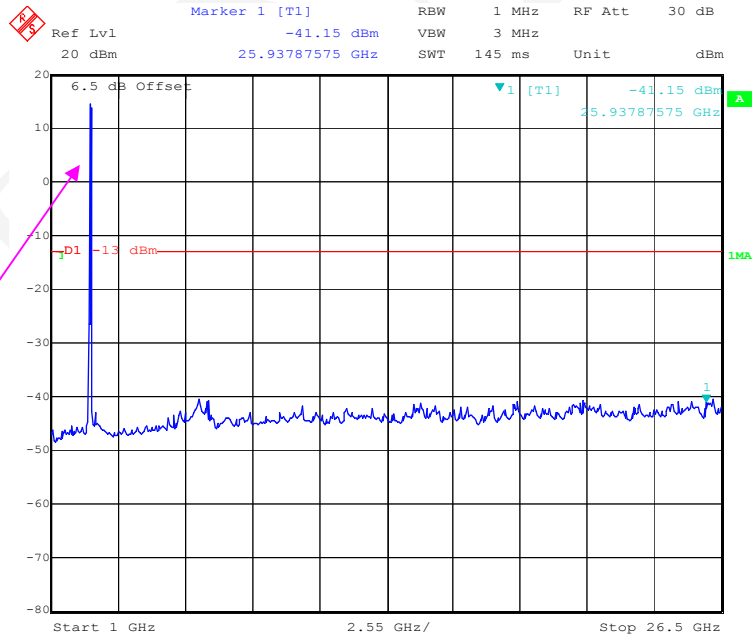
1 GHz – 26 GHz (15MHz, Middle Channel)



30 MHz - 1 GHz (20 MHz, Middle Channel)



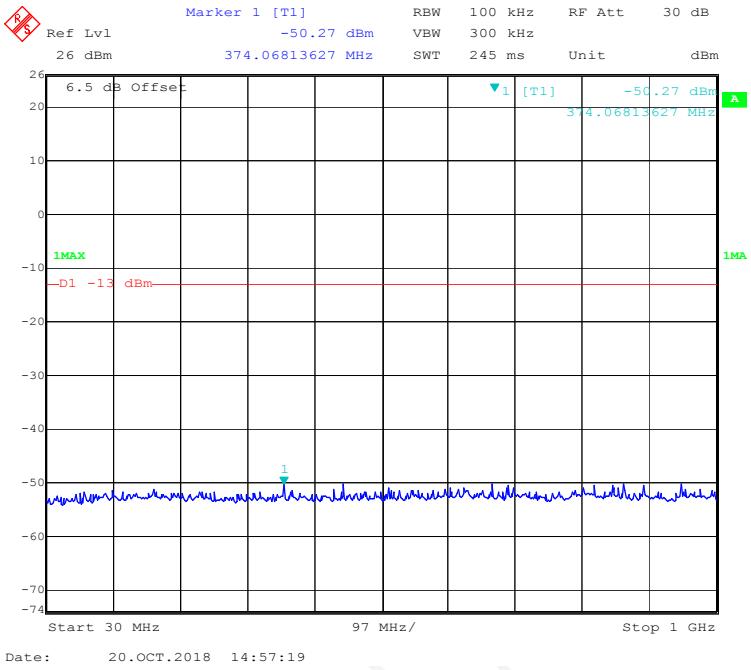
1 GHz – 26 GHz (20 MHz, Middle Channel)



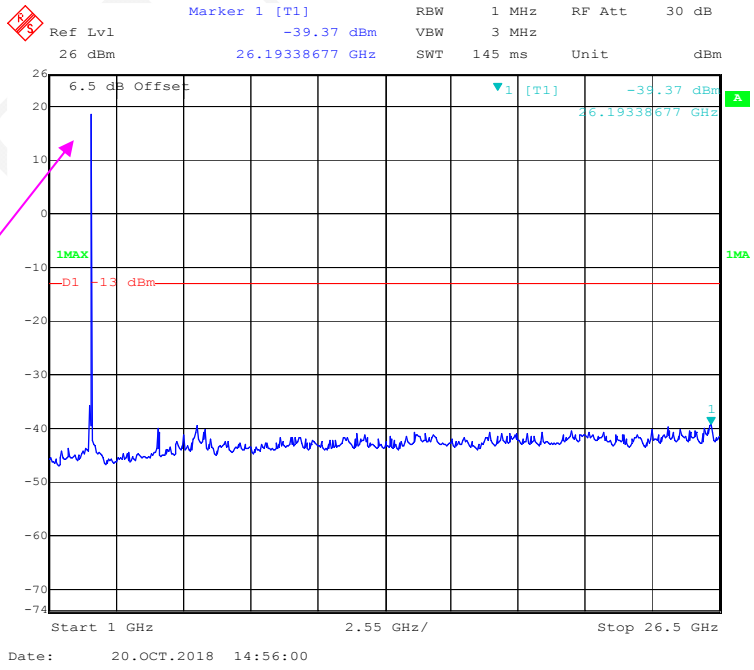
Fundamental

LTE Band 41:
Chain0

30 MHz - 1 GHz (5 MHz, Middle Channel)

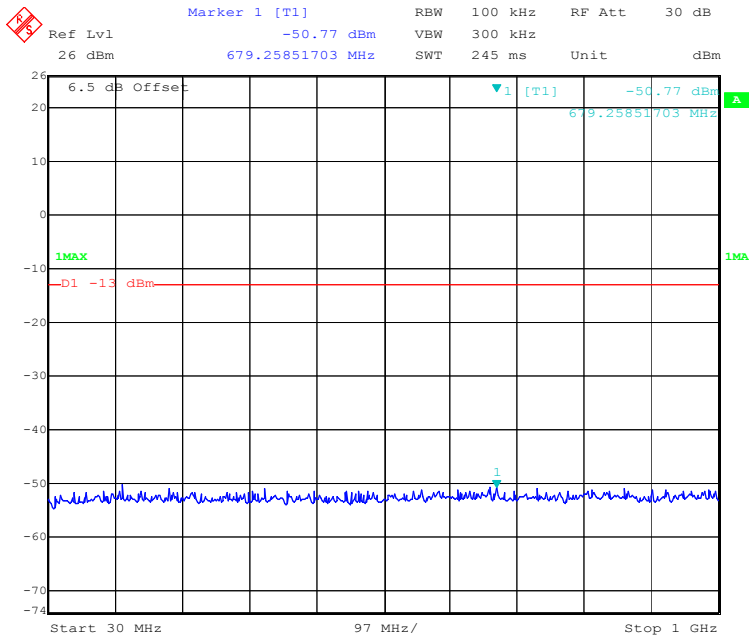


1 GHz – 26.5 GHz (5 MHz, Middle Channel)

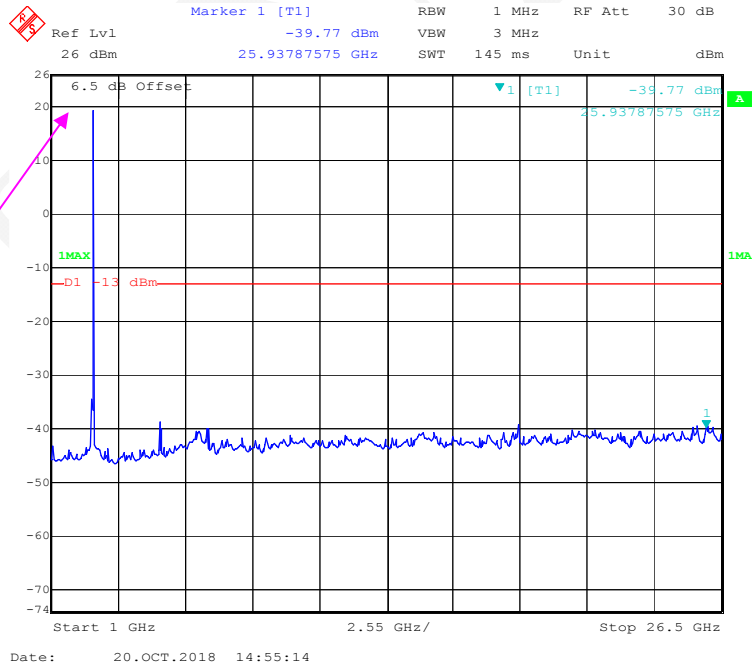


Fundamental

30 MHz - 1 GHz (10 MHz, Middle Channel)

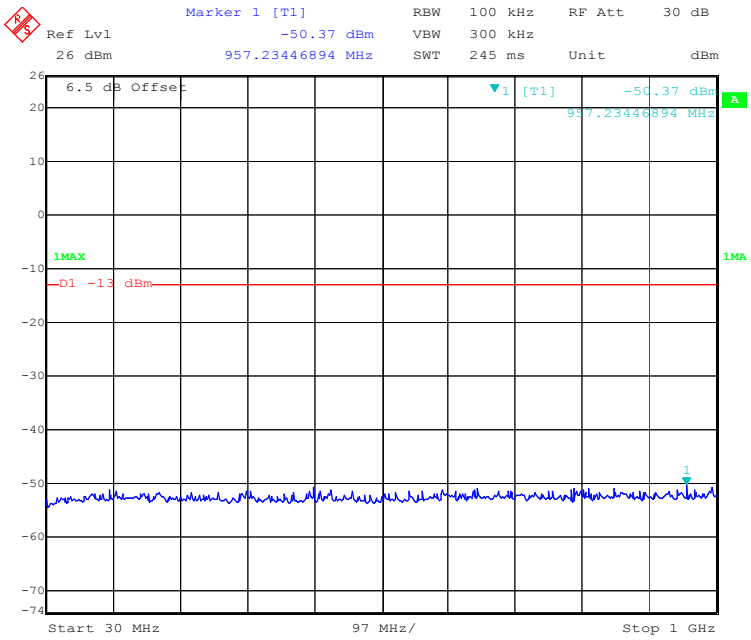


1 GHz –26.5 GHz (10 MHz, Middle Channel)

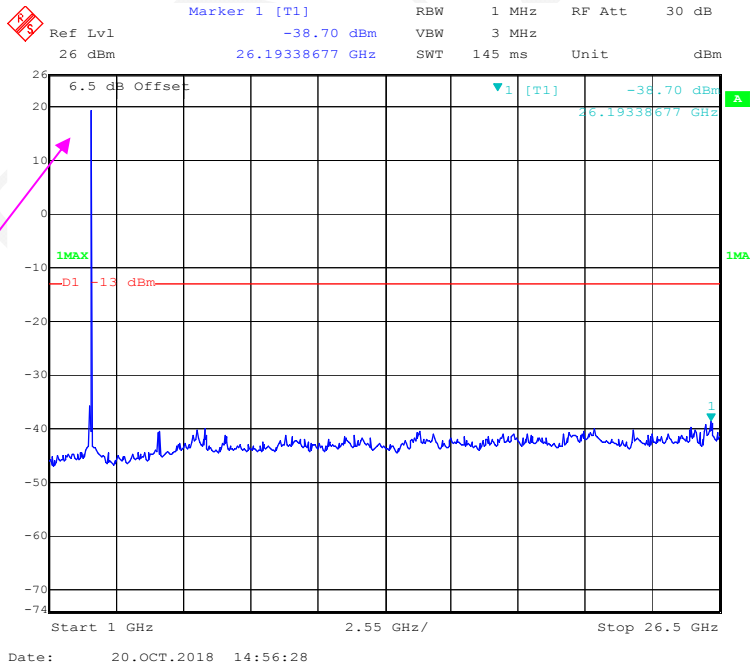


Fundamental

30 MHz - 1 GHz (15 MHz, Middle Channel)

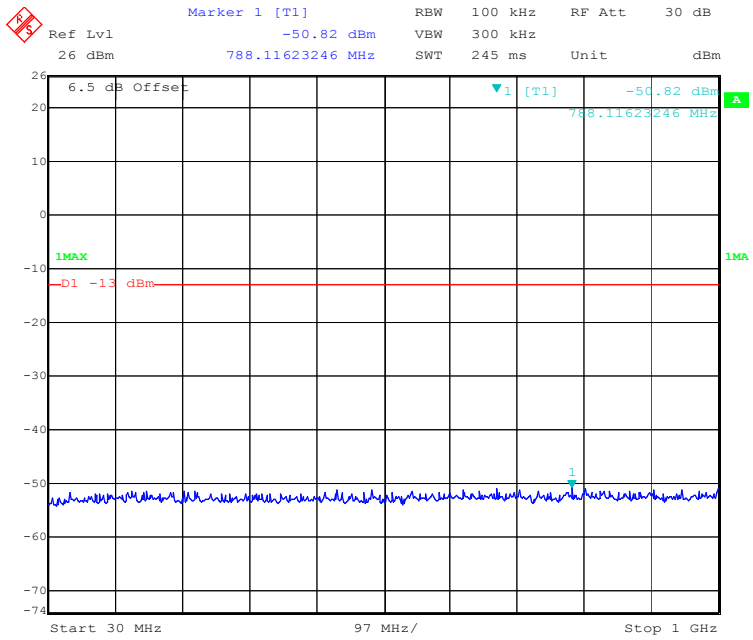


1 GHz – 26.5 GHz (15MHz, Middle Channel)

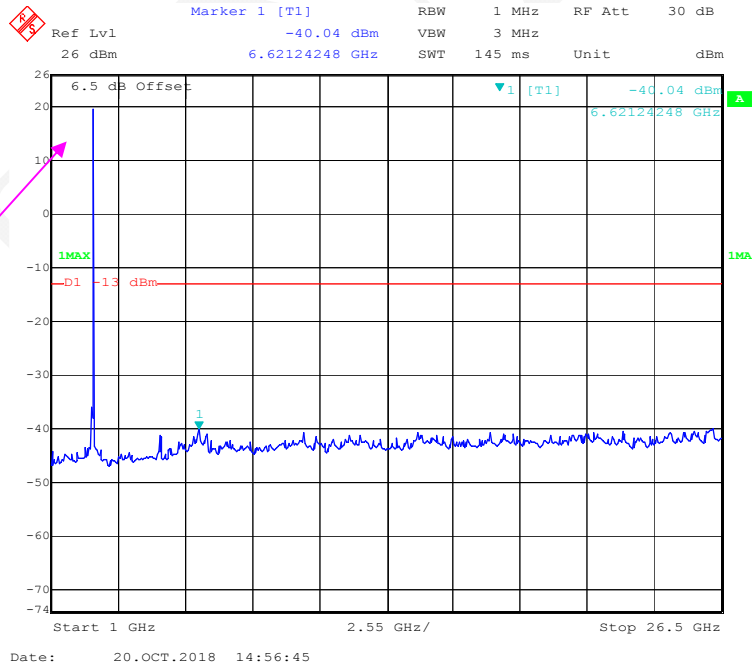


Fundamental

30 MHz - 1 GHz (20 MHz, Middle Channel)



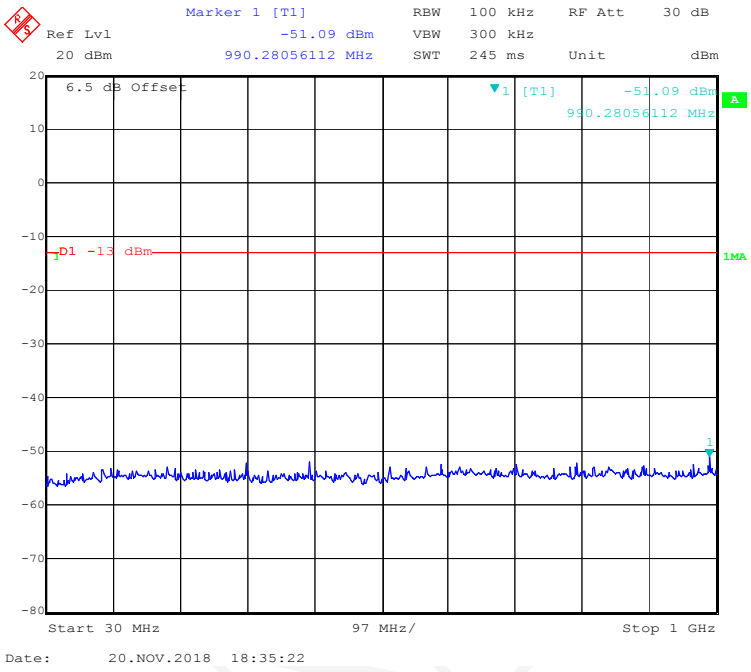
1 GHz – 26.5 GHz (20 MHz, Middle Channel)



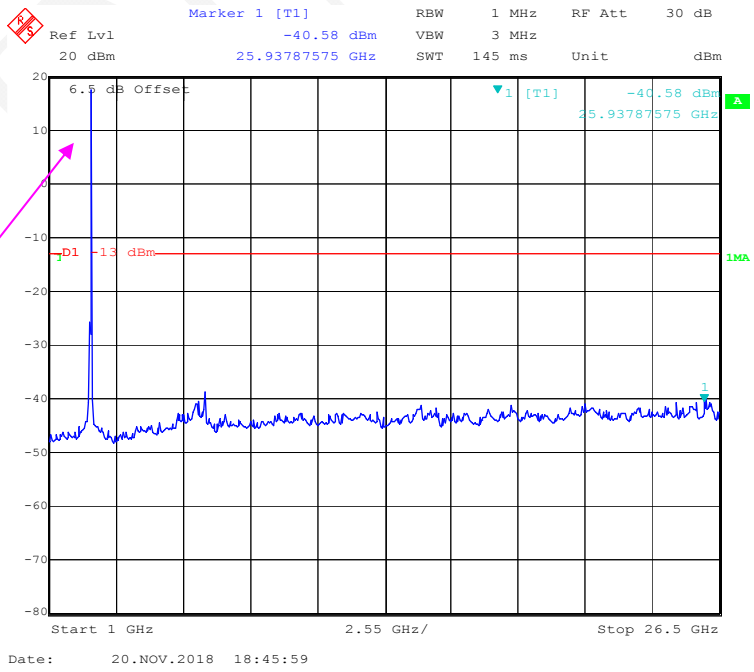
Fundamental

LTE Band 41:
Chain1

30 MHz - 1 GHz (5 MHz, Middle Channel)

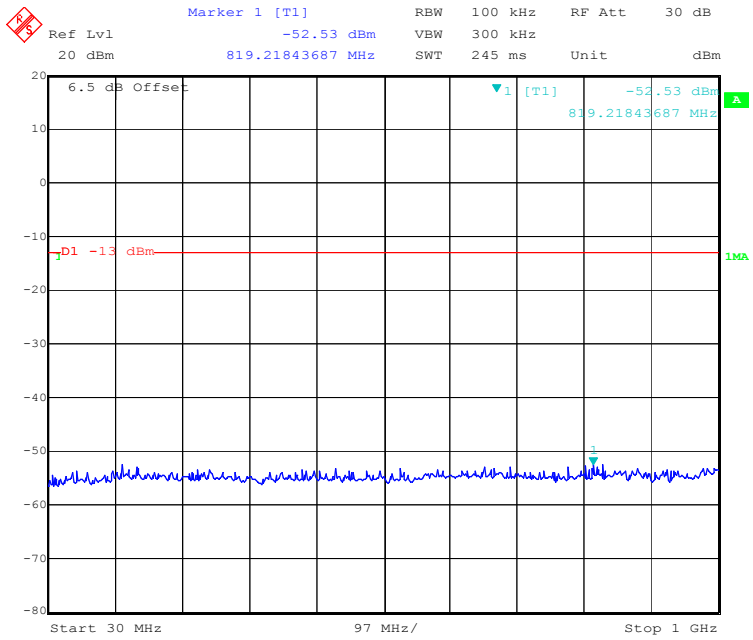


1 GHz – 26.5 GHz (5 MHz, Middle Channel)

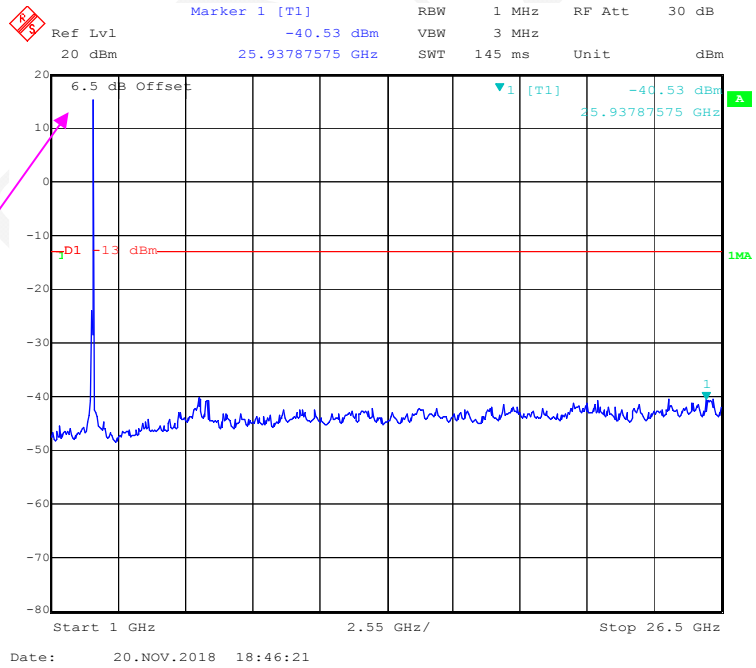


Fundamental

30 MHz - 1 GHz (10 MHz, Middle Channel)

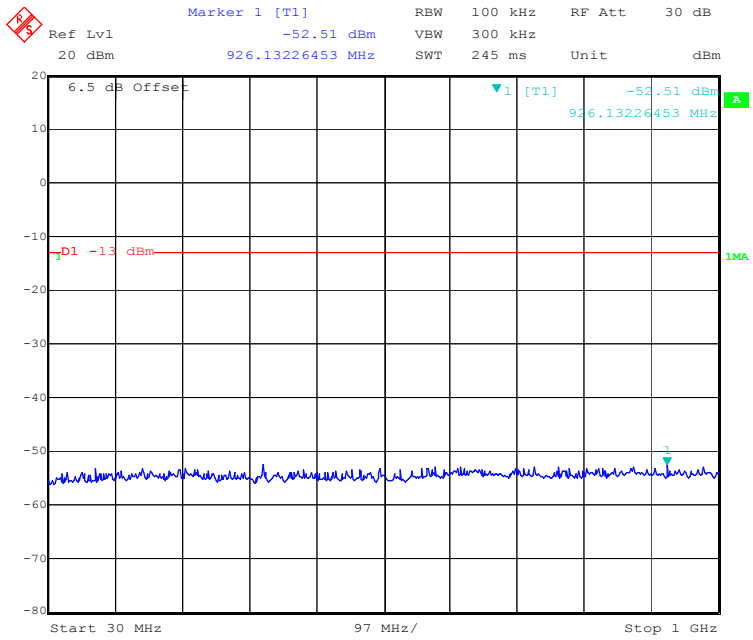


1 GHz –26.5 GHz (10 MHz, Middle Channel)

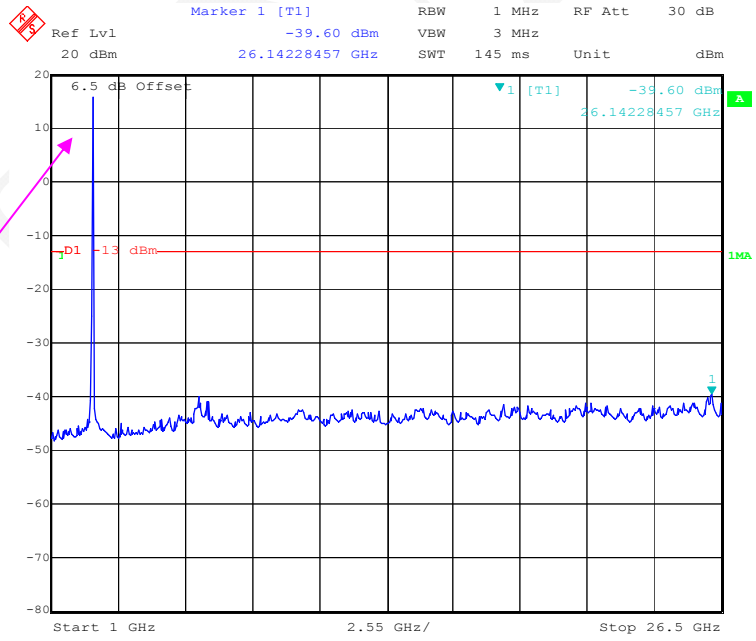


Fundamental

30 MHz - 1 GHz (15 MHz, Middle Channel)

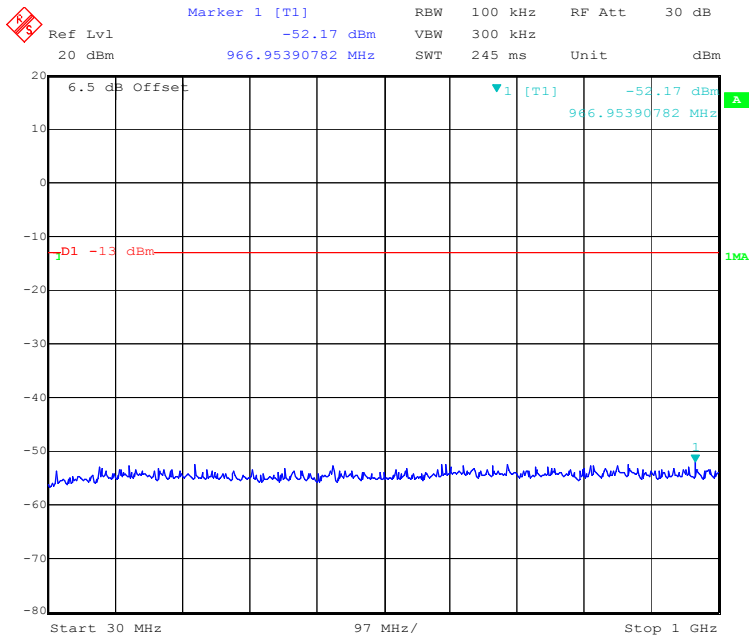


1 GHz – 26.5 GHz (15MHz, Middle Channel)

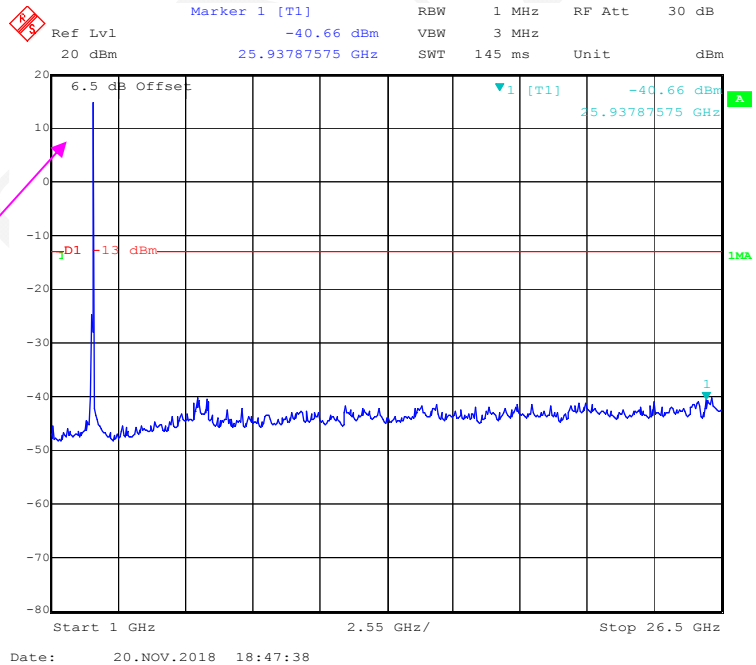


Fundamental

30 MHz - 1 GHz (20 MHz, Middle Channel)



1 GHz – 26.5 GHz (20 MHz, Middle Channel)



Fundamental

FCC § 2.1053 & §27.53 (m) - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053 and § 27.53(m)

For fixed user stations, any emission 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 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 (TX pwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Data

Environmental Conditions

Temperature:	23.3 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2kPa

The testing was performed by Hope Zhang on 2018-10-25.

Test mode: MIMO Transmitting (Pre-scan with Low, Middle, High channel, and the worse case data as below)

LTE Band 7 (30 MHz ~ 26.5 GHz):

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Middle Channel										
35.00	36.42	267	185	H	-44.91	0.19	-21.72	-66.82	-13	53.82
35.00	35.97	170	233	V	-53.13	0.19	-21.72	-75.04	-13	62.04
5070.00	43.45	13	221	H	-52.14	1.08	10.30	-42.92	-13	29.92
5070.00	43.03	179	116	V	-52.88	1.08	10.30	-43.66	-13	30.66
7605.00	42.69	360	222	H	-47.96	1.78	10.08	-39.66	-13	26.66
7605.00	42.87	223	216	V	-47.95	1.78	10.08	-39.65	-13	26.65
16-QAM 5MHz Bandwidth Middle Channel										
35.00	36.27	267	185	H	-45.06	0.19	-21.72	-66.97	-13	53.97
35.00	36.08	170	233	V	-53.02	0.19	-21.72	-74.93	-13	61.93
5070.00	43.45	252	159	H	-52.14	1.08	10.30	-42.92	-13	29.92
5070.00	43.03	333	150	V	-52.88	1.08	10.30	-43.66	-13	30.66
7605.00	42.69	296	159	H	-47.96	1.78	10.08	-39.66	-13	26.66
7605.00	42.87	321	146	V	-47.95	1.78	10.08	-39.65	-13	26.65

Note:
The limit is base on EIRP.

LTE Band 41 (30 MHz ~ 26.5 GHz):

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Middle Channel										
35.00	36.25	267	185	H	-45.08	0.19	-21.72	-66.99	-13	53.99
35.00	35.77	170	233	V	-53.33	0.19	-21.72	-75.24	-13	62.24
5186.00	43.45	13	221	H	-51.45	1.10	10.30	-42.25	-13	29.25
5186.00	43.03	179	116	V	-52.17	1.10	10.30	-42.97	-13	29.97
7779.00	42.69	360	222	H	-47.45	1.81	10.04	-39.22	-13	26.22
7779.00	42.87	223	216	V	-47.40	1.81	10.04	-39.17	-13	26.17
16-QAM 5MHz Bandwidth Middle Channel										
35.00	36.39	267	185	H	-44.94	0.19	-21.72	-66.85	-13	53.85
35.00	35.93	170	233	V	-53.17	0.19	-21.72	-75.08	-13	62.08
5186.00	43.45	252	159	H	-51.45	1.10	10.30	-42.25	-13	29.25
5186.00	43.03	333	150	V	-52.17	1.10	10.30	-42.97	-13	29.97
7779.00	42.69	296	159	H	-47.45	1.81	10.04	-39.22	-13	26.22
7779.00	42.87	321	146	V	-47.40	1.81	10.04	-39.17	-13	26.17

Note:
The limit is base on EIRP.

FCC §27.53 (m) - BAND EDGES

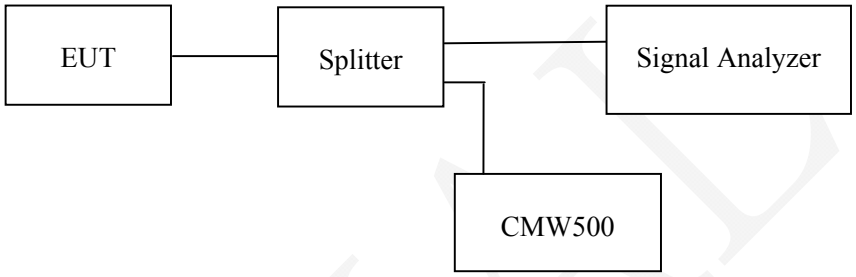
Applicable Standards

For fixed user stations, any emission 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:	23.3 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2kPa

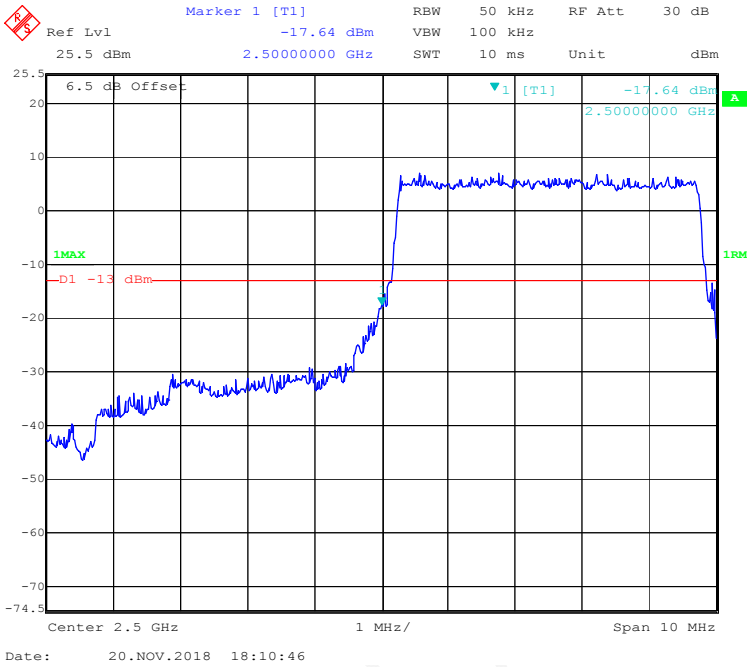
The testing was performed by Hope Zhang from 2018-10-20 to 2018-11-20.

EUT operation mode: SISO Transmitting

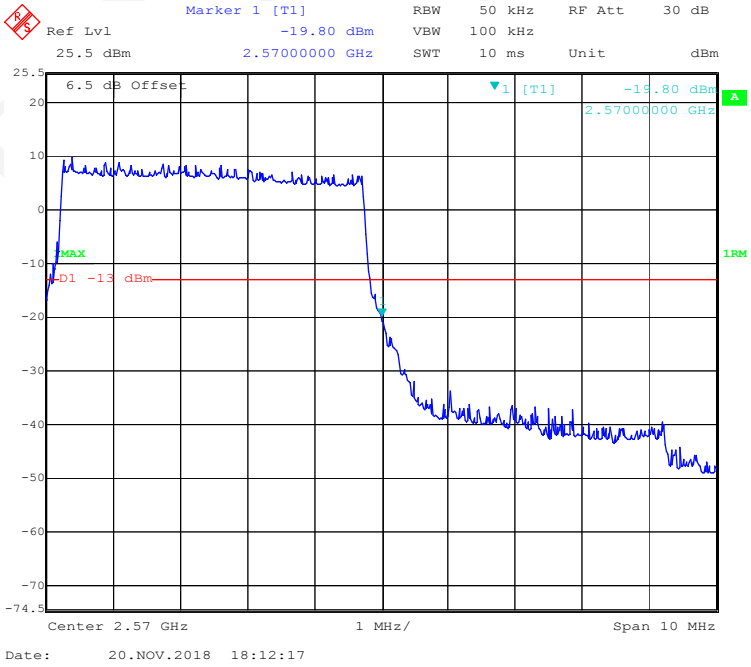
Note: All the emissions are under the limit 3dB, so the MIMO mode also compliance the limit.

LTE Band 7:
Chain0

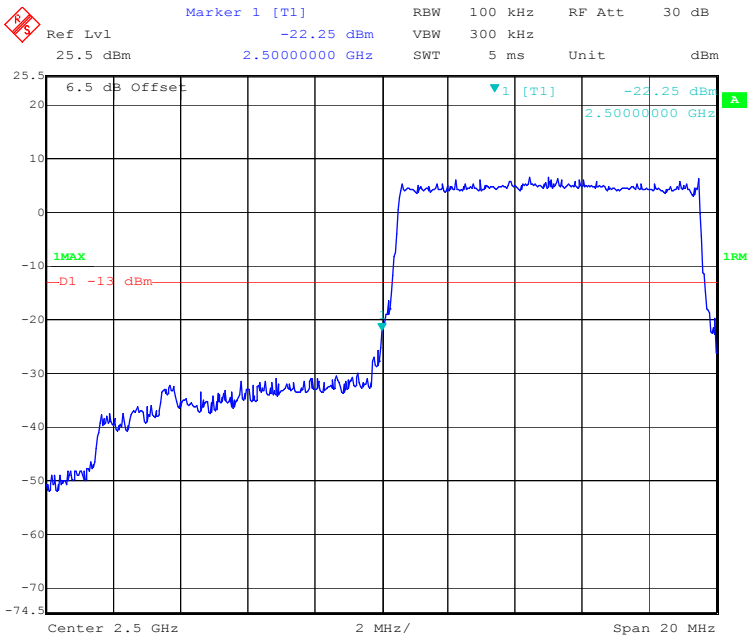
QPSK (5 MHz, FULL RB) - Left Band Edge



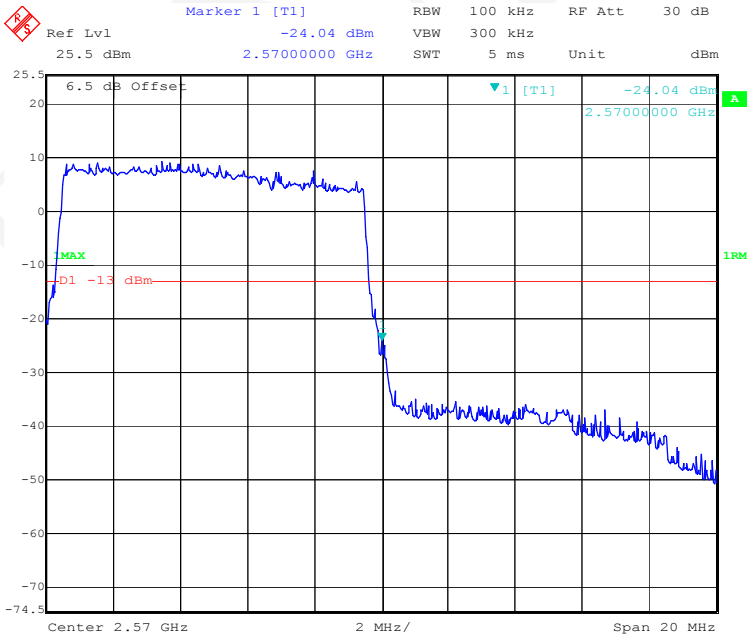
QPSK (5 MHz, FULL RB) - Right Band Edge



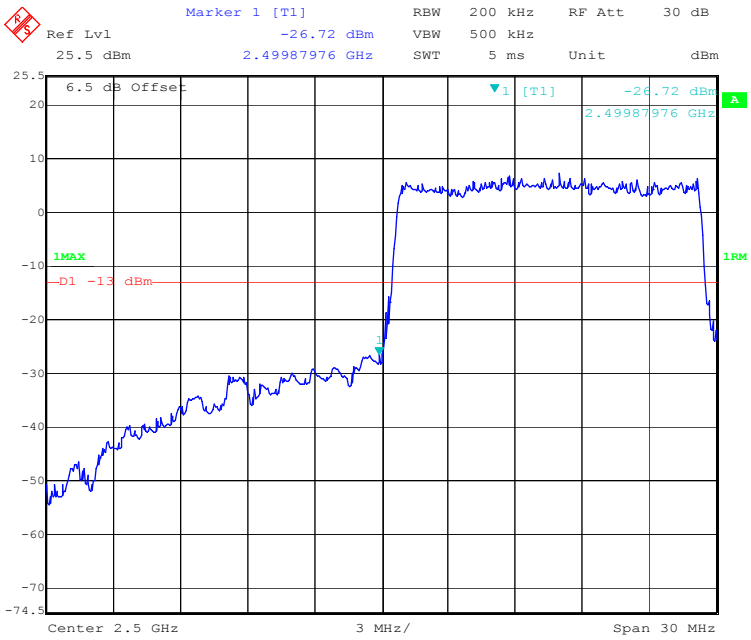
QPSK (10 MHz, FULL RB) - Left Band Edge



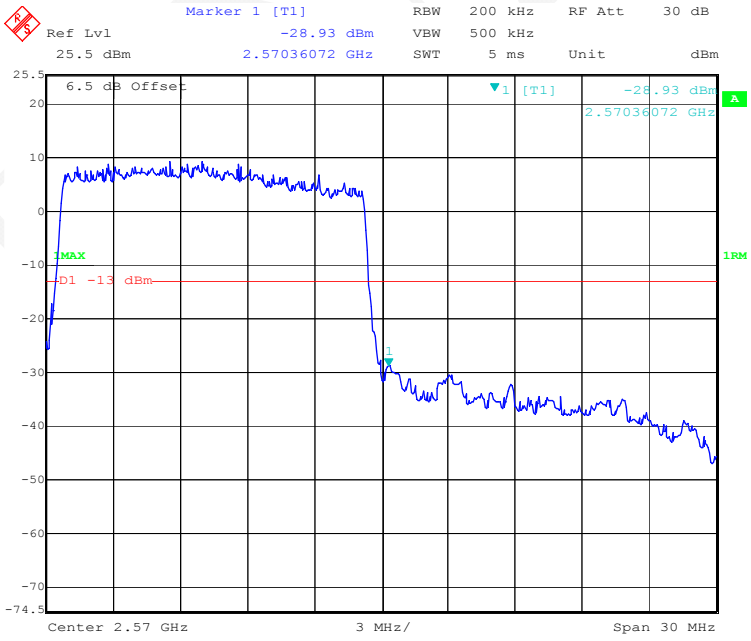
QPSK (10 MHz, FULL RB) - Right Band Edge



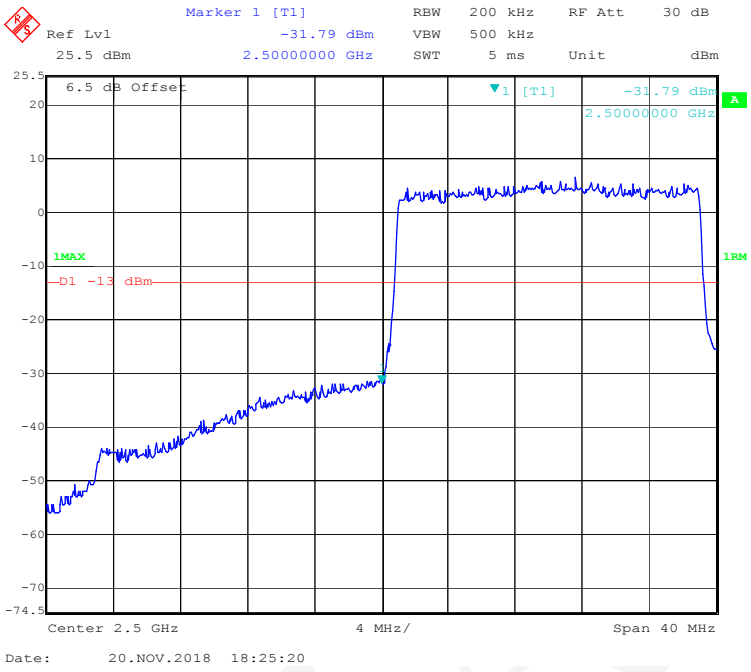
QPSK (15 MHz, FULL RB) - Left Band Edge



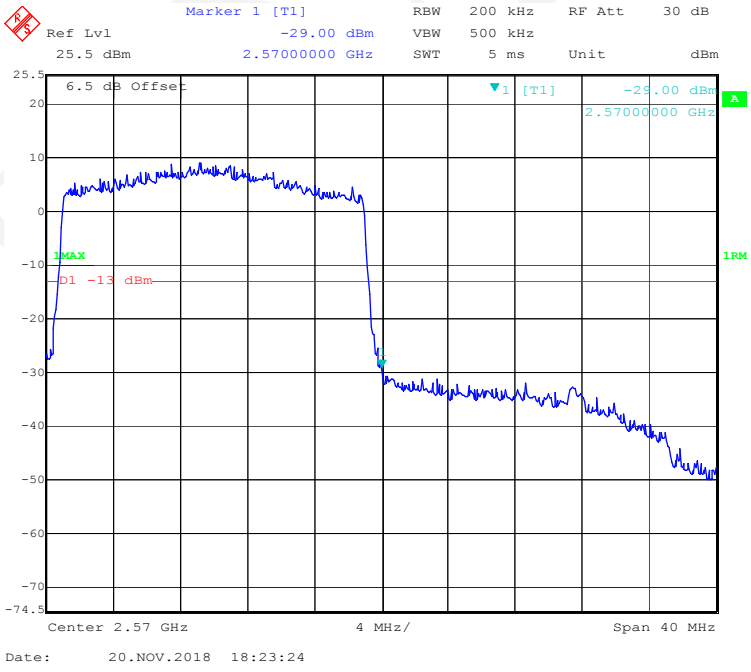
QPSK (15 MHz, FULL RB) - Right Band Edge



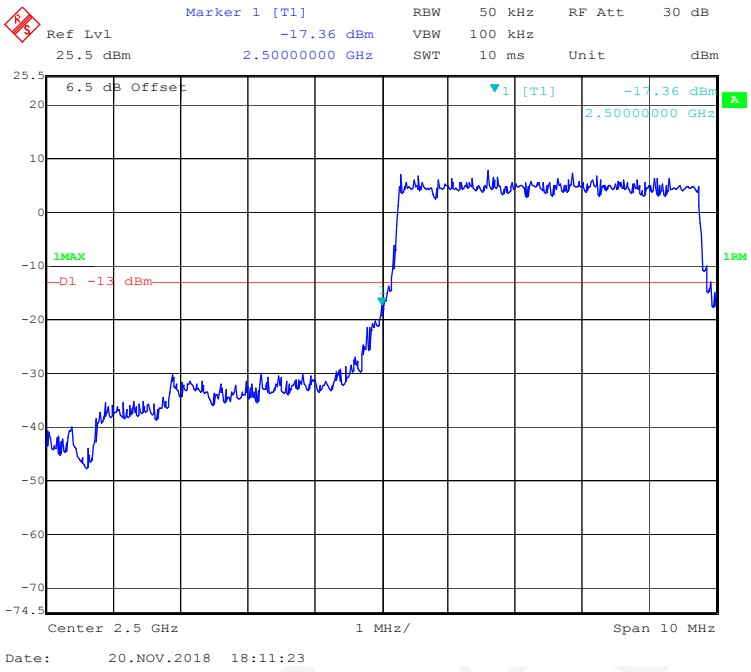
QPSK (20 MHz, FULL RB) - Left Band Edge



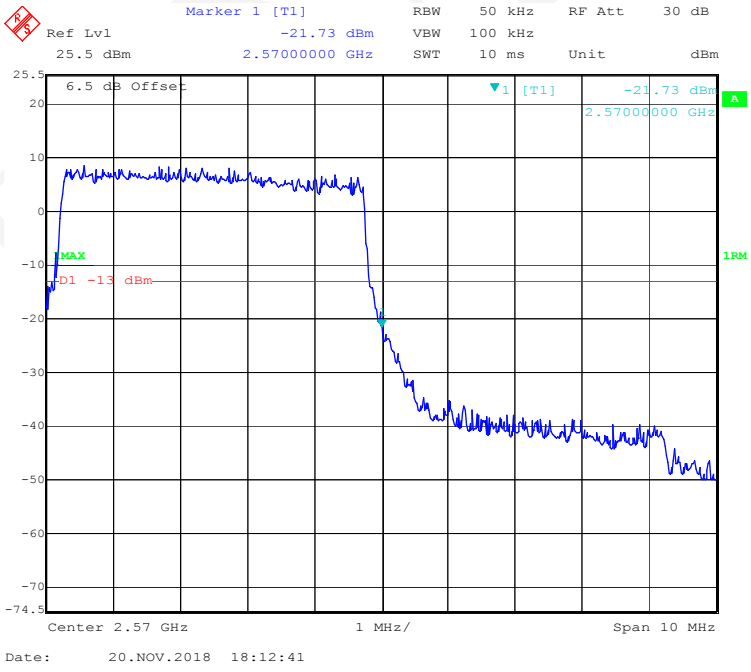
QPSK (20 MHz, FULL RB) - Right Band Edge



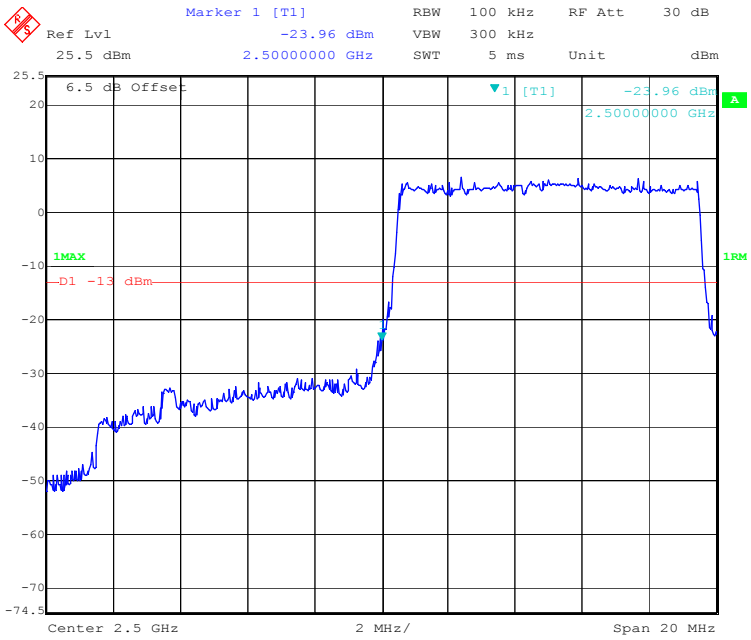
16-QAM (5 MHz, FULL RB) - Left Band Edge



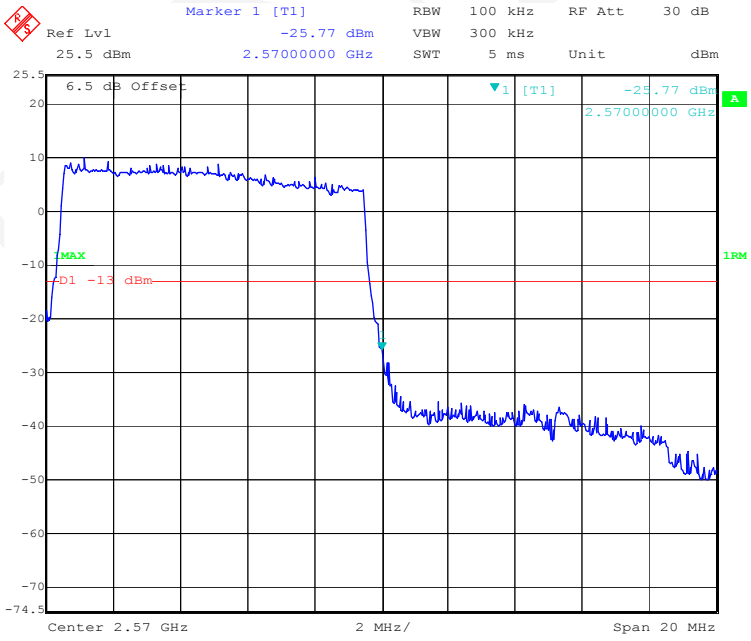
16-QAM (5 MHz, FULL RB) - Right Band Edge



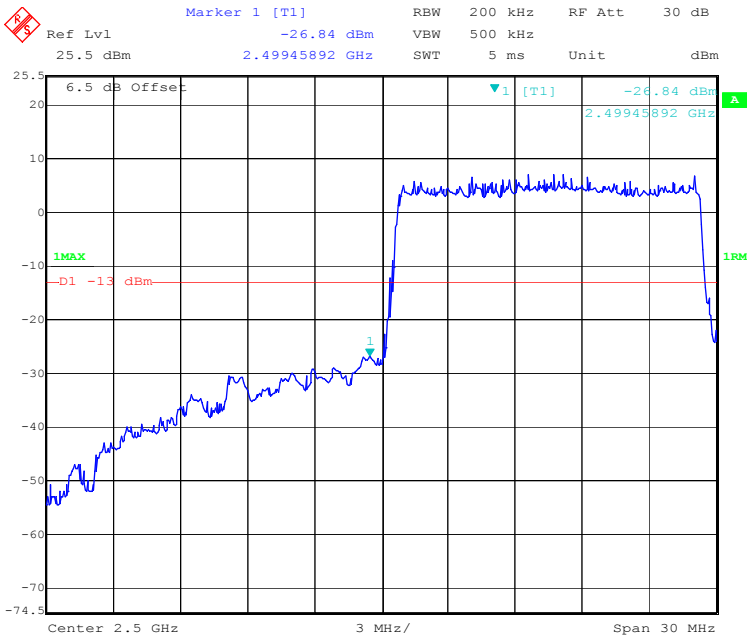
16-QAM (10 MHz, FULL RB) - Left Band Edge



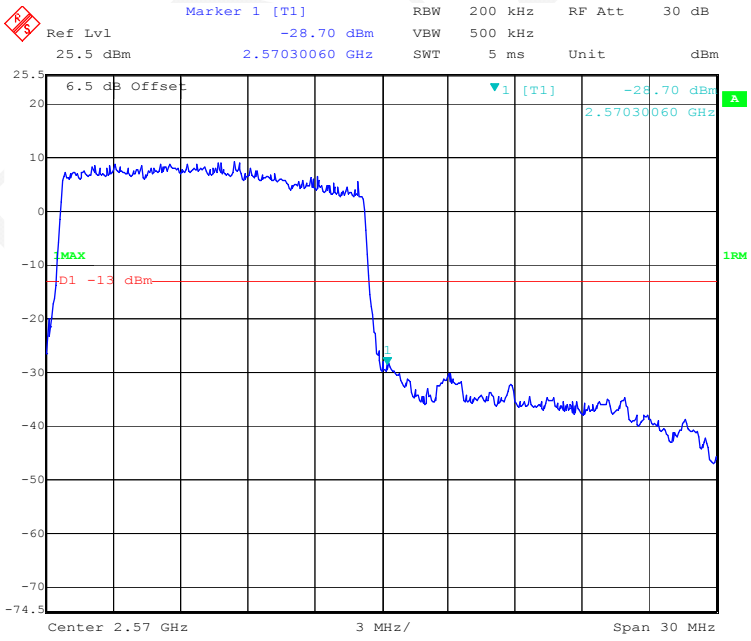
16-QAM (10 MHz, FULL RB) - Right Band Edge



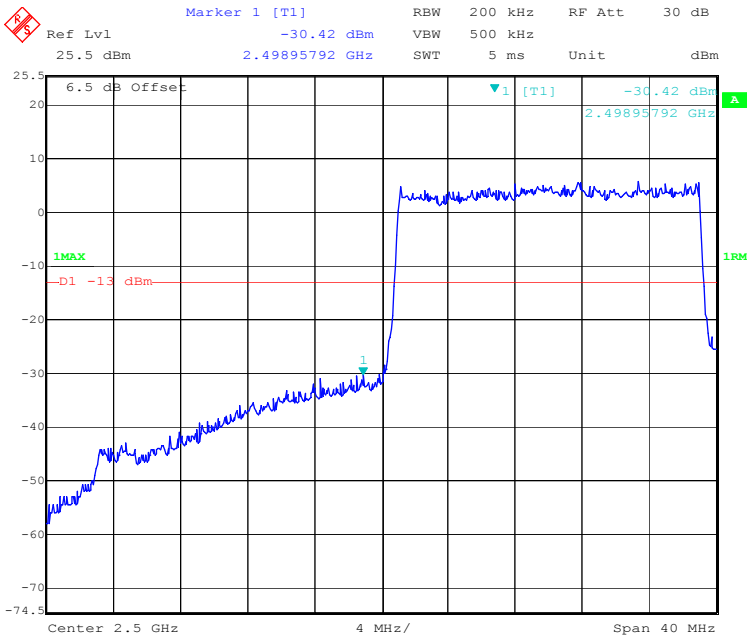
16-QAM (15 MHz, FULL RB) - Left Band Edge



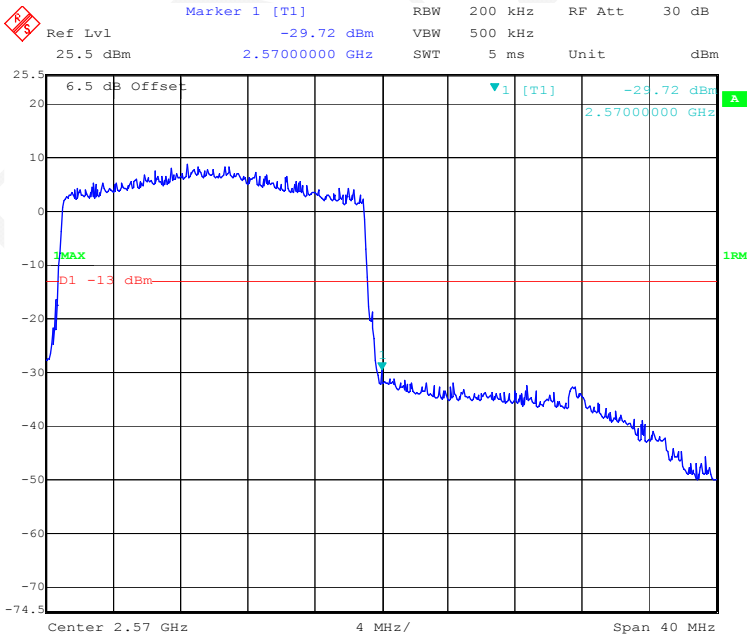
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge

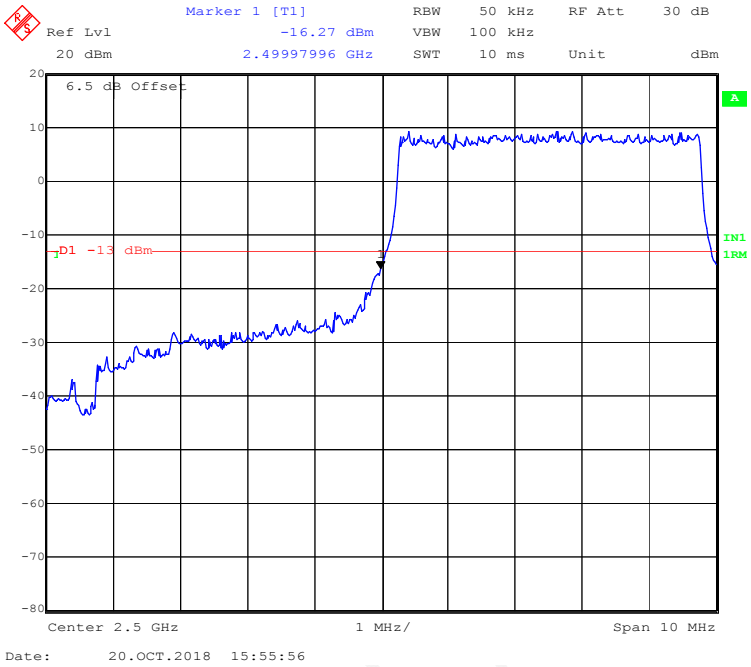


16-QAM (20 MHz, FULL RB) - Right Band Edge

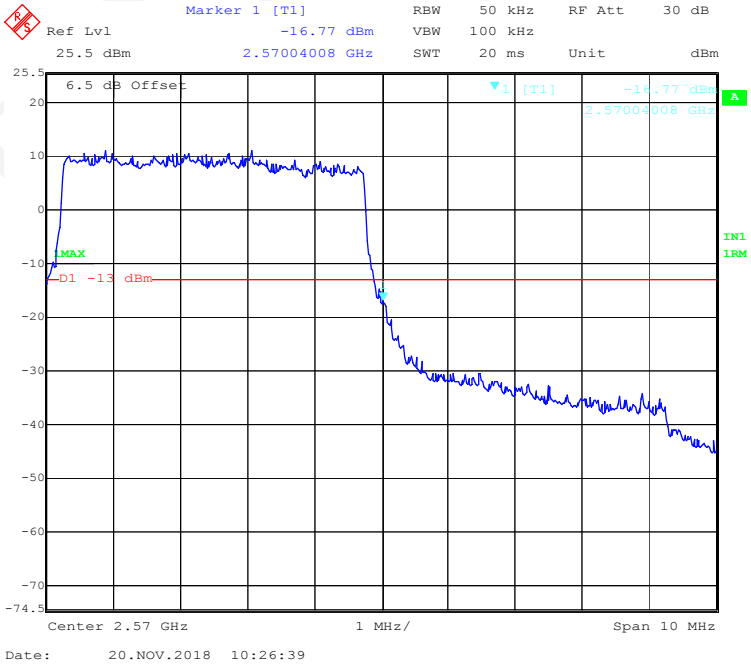


LTE Band 7:
Chain1

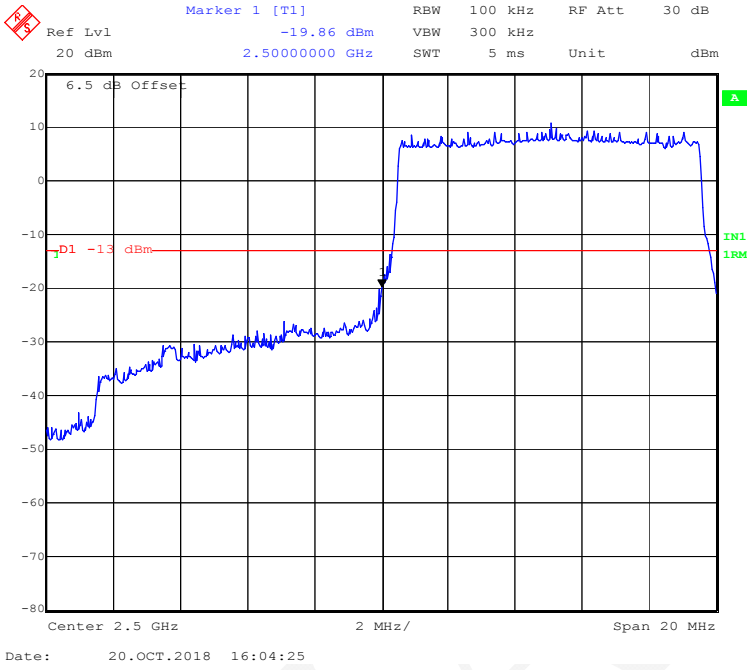
QPSK (5 MHz, FULL RB) - Left Band Edge



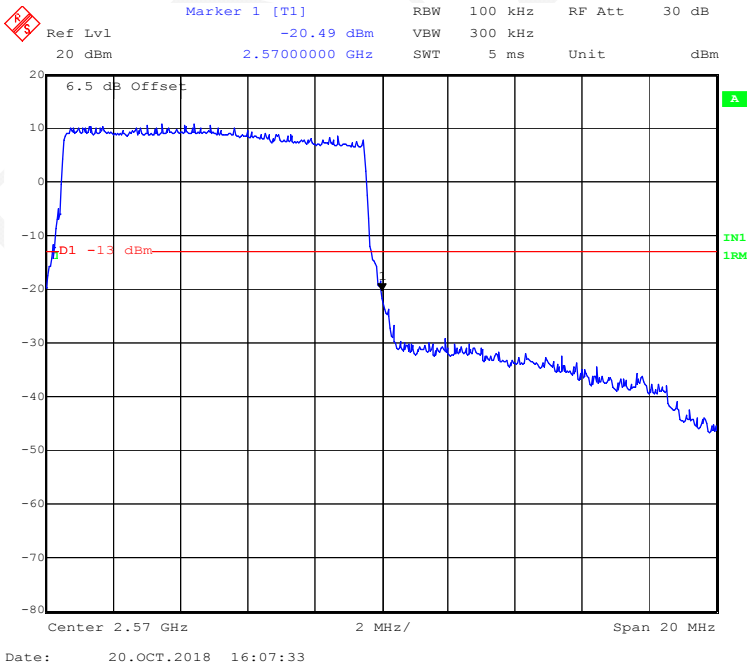
QPSK (5 MHz, FULL RB) - Right Band Edge



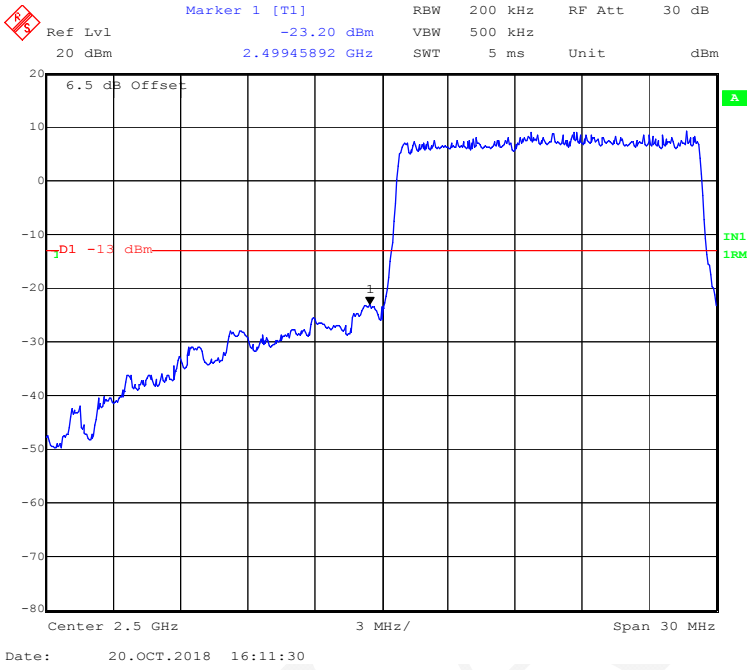
QPSK (10 MHz, FULL RB) - Left Band Edge



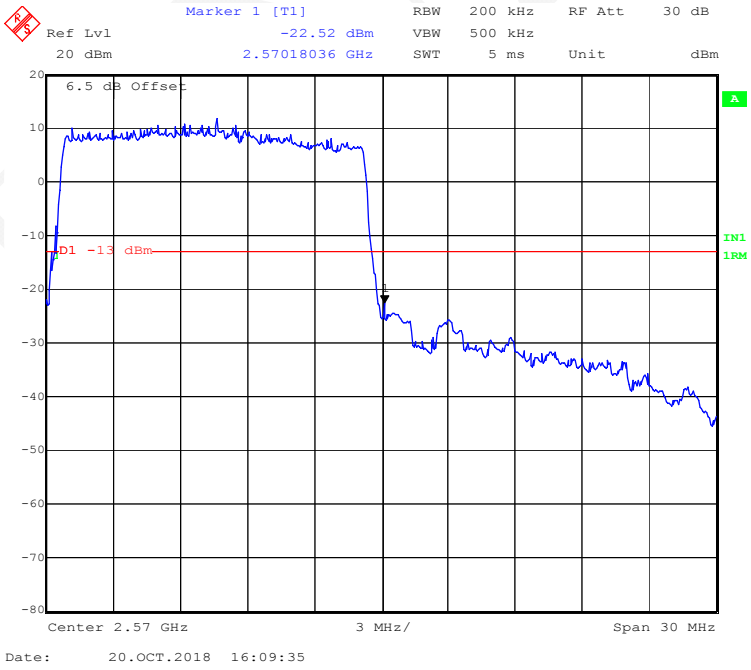
QPSK (10 MHz, FULL RB) - Right Band Edge



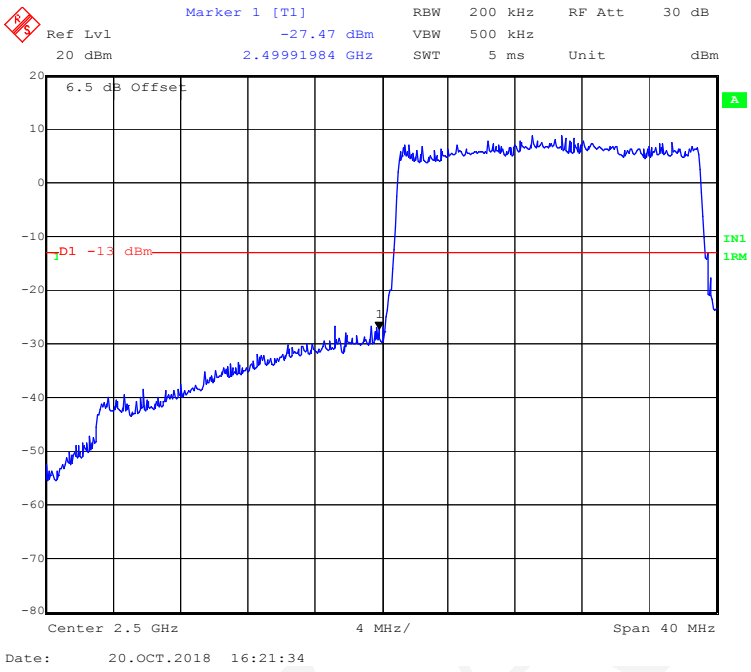
QPSK (15 MHz, FULL RB) - Left Band Edge



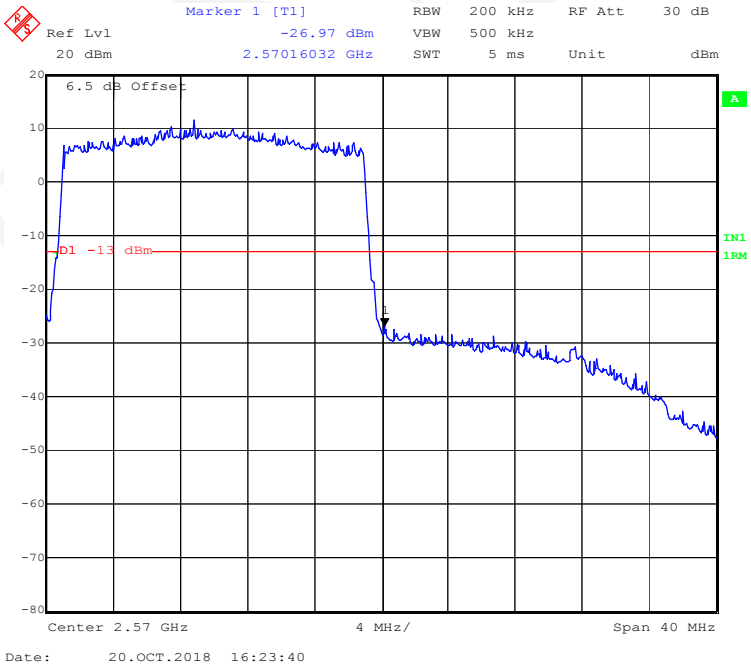
QPSK (15 MHz, FULL RB) - Right Band Edge



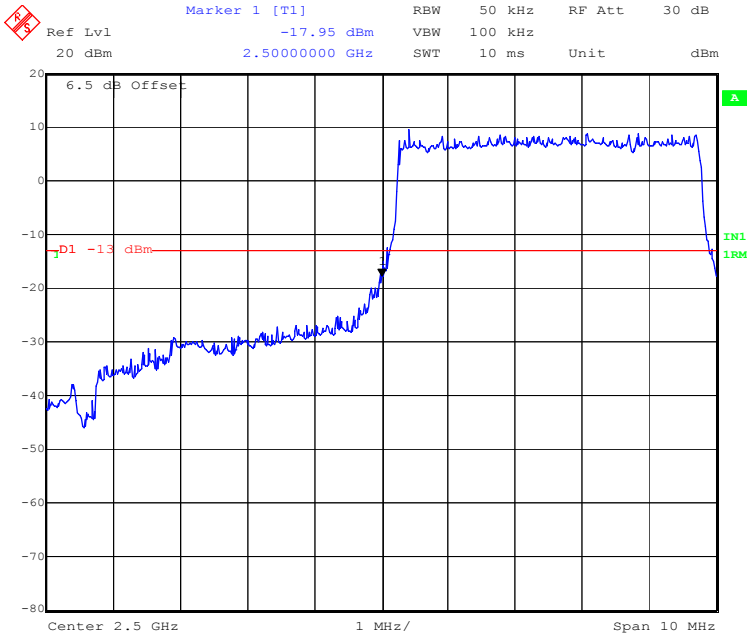
QPSK (20 MHz, FULL RB) - Left Band Edge



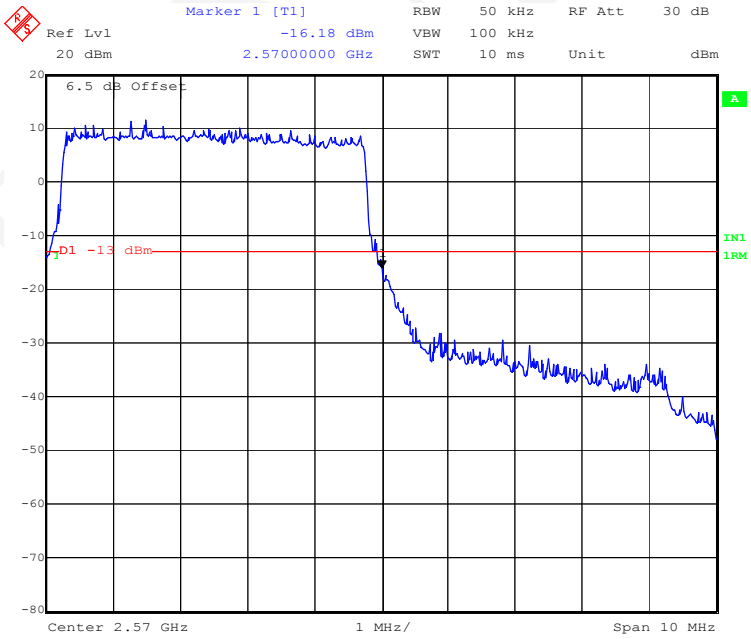
QPSK (20 MHz, FULL RB) - Right Band Edge



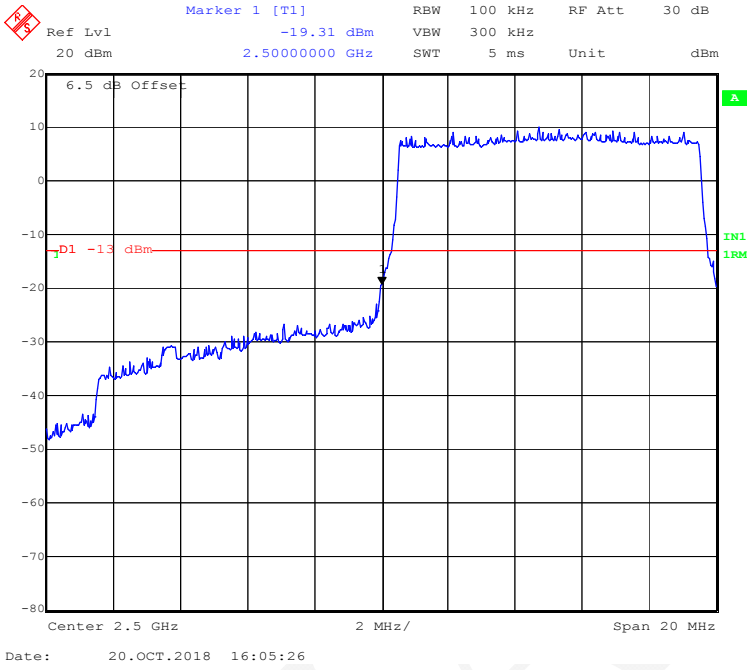
16-QAM (5 MHz, FULL RB) - Left Band Edge



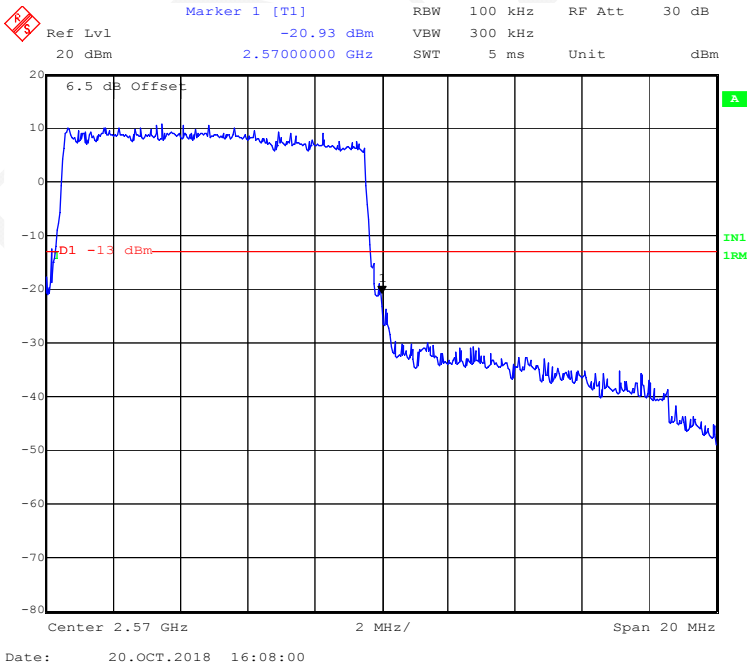
16-QAM (5 MHz, FULL RB) - Right Band Edge



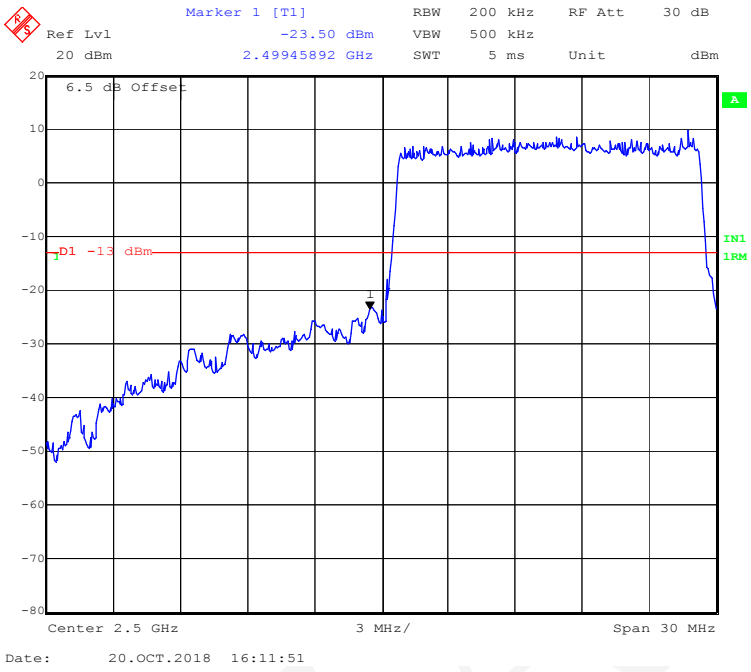
16-QAM (10 MHz, FULL RB) - Left Band Edge



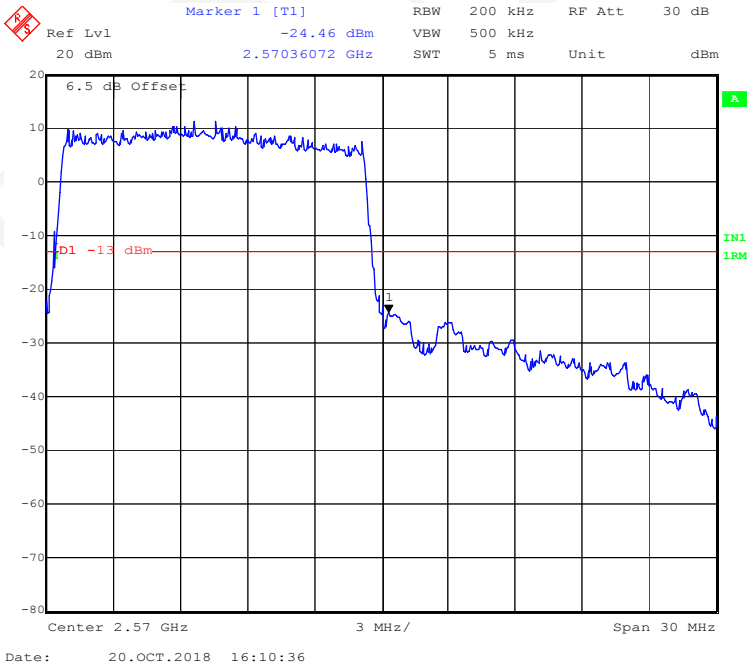
16-QAM (10 MHz, FULL RB) - Right Band Edge



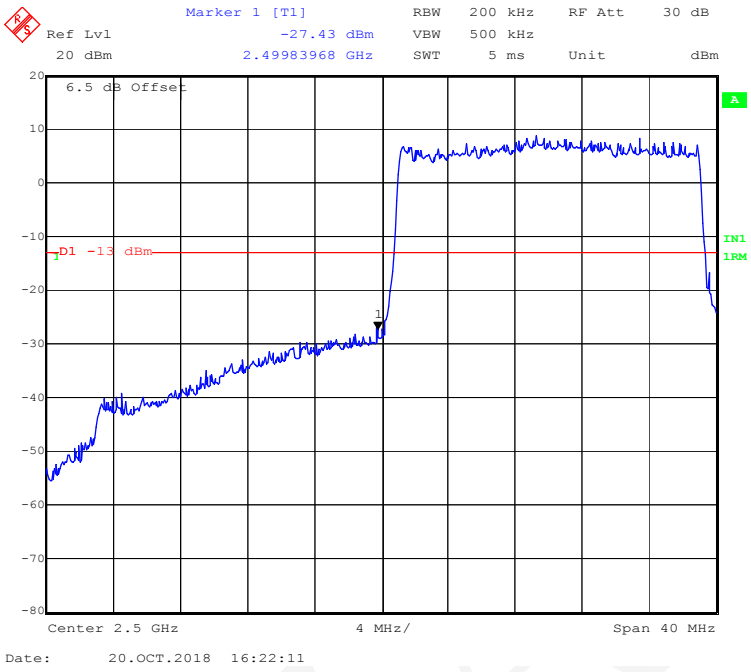
16-QAM (15 MHz, FULL RB) - Left Band Edge



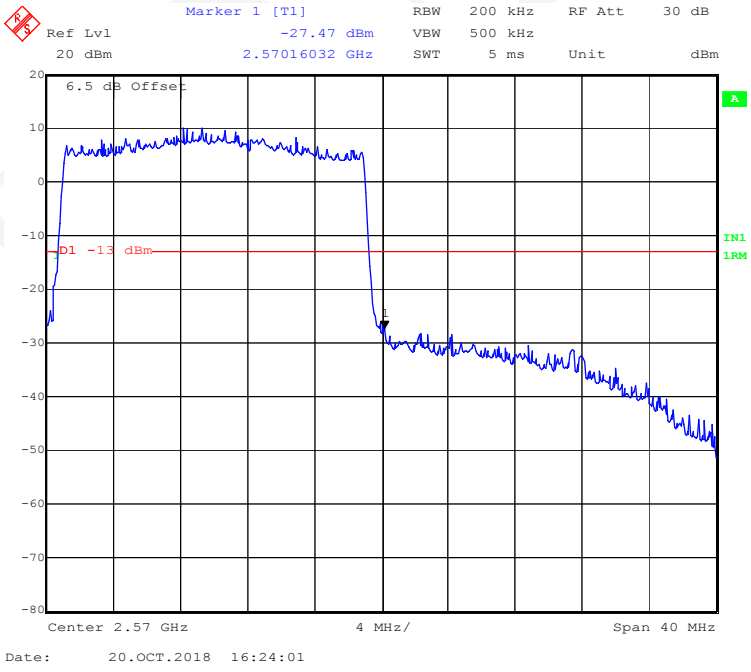
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge

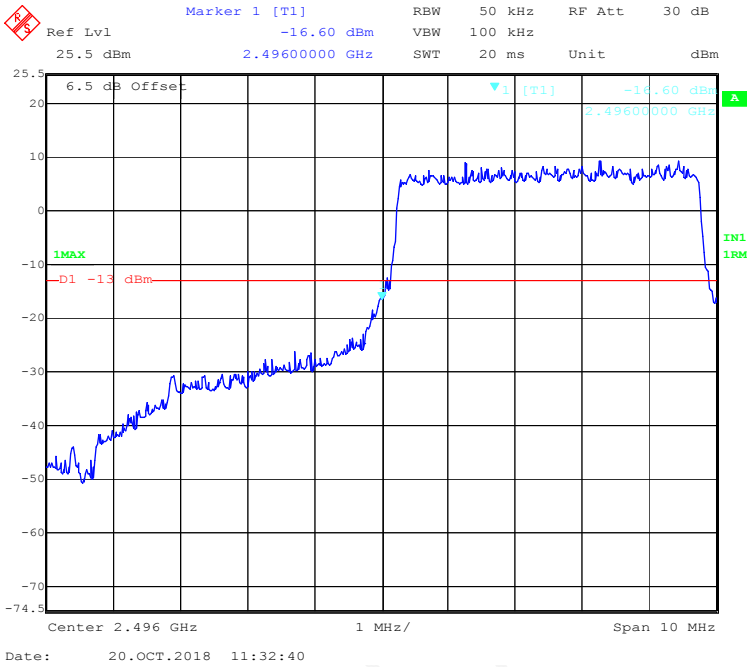


16-QAM (20 MHz, FULL RB) - Right Band Edge

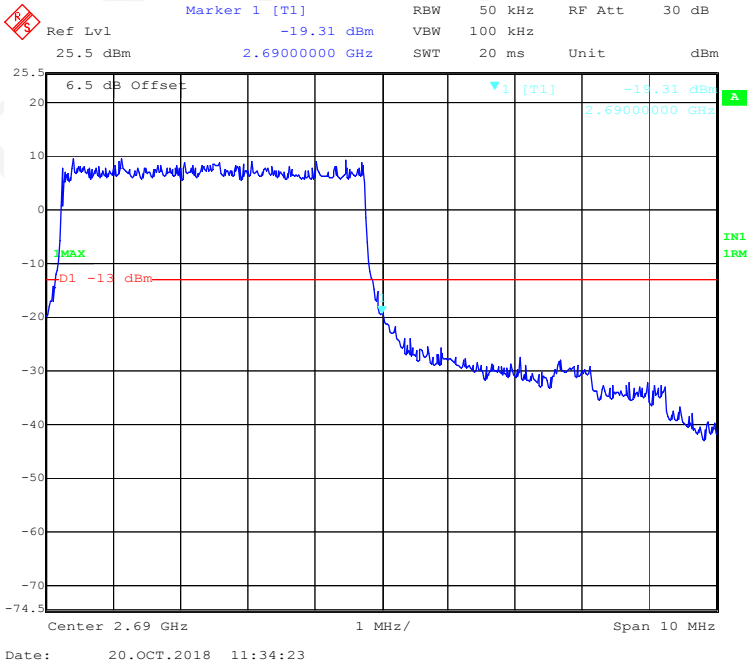


LTE Band 41:
Chain0

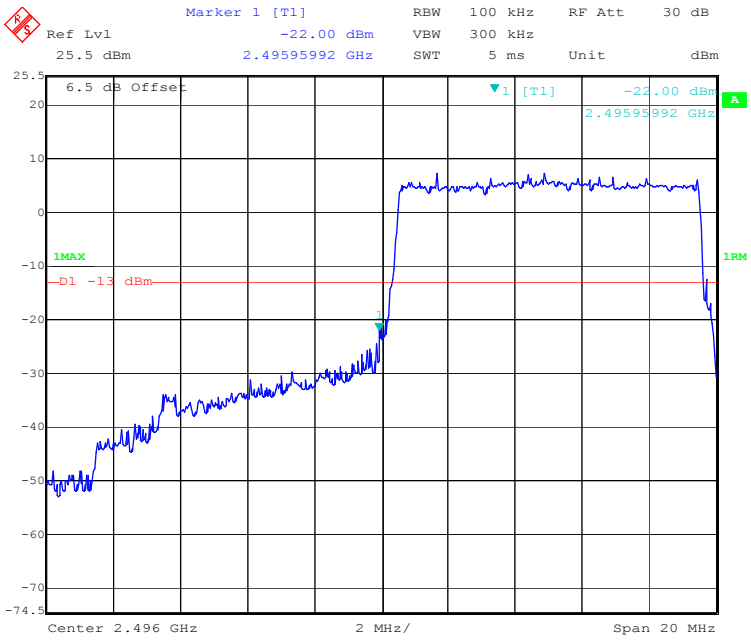
QPSK (5 MHz, FULL RB) - Left Band Edge



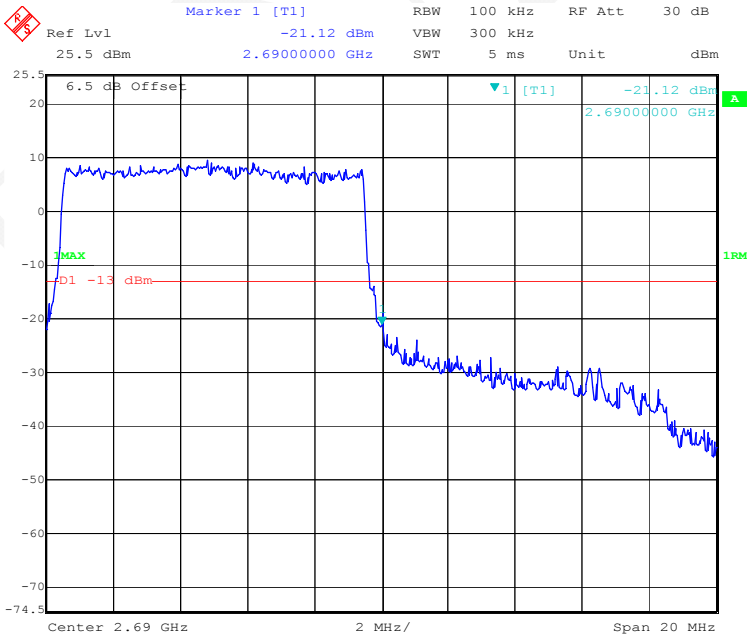
QPSK (5 MHz, FULL RB) - Right Band Edge



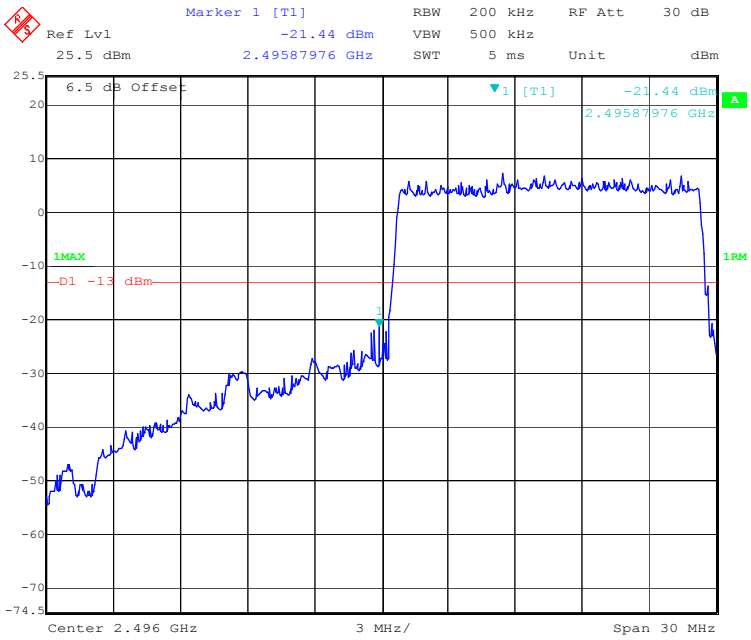
QPSK (10 MHz, FULL RB) - Left Band Edge



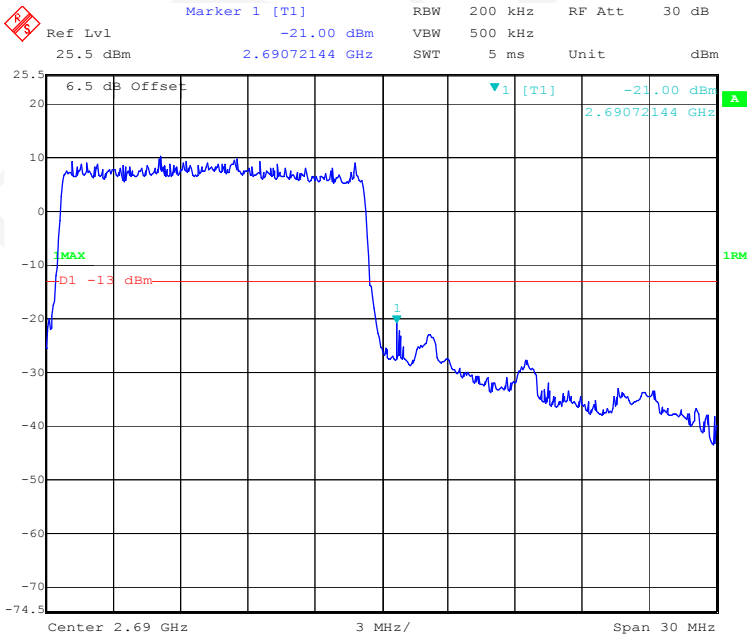
QPSK (10 MHz, FULL RB) - Right Band Edge



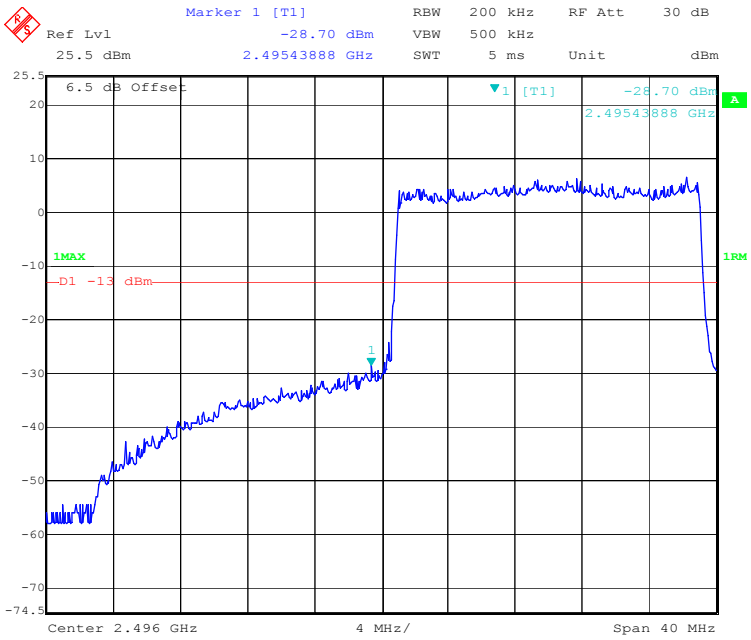
QPSK (15MHz, FULL RB) - Left Band Edge



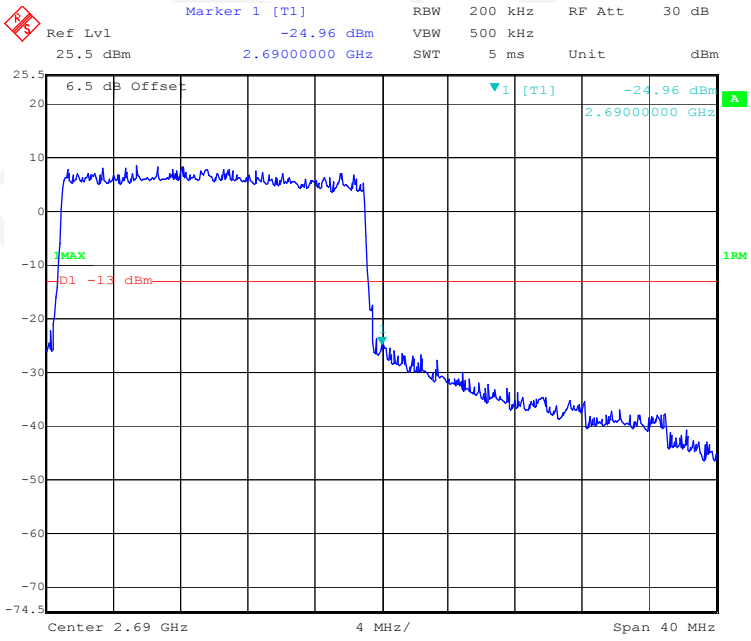
QPSK (15 MHz, FULL RB) - Right Band Edge



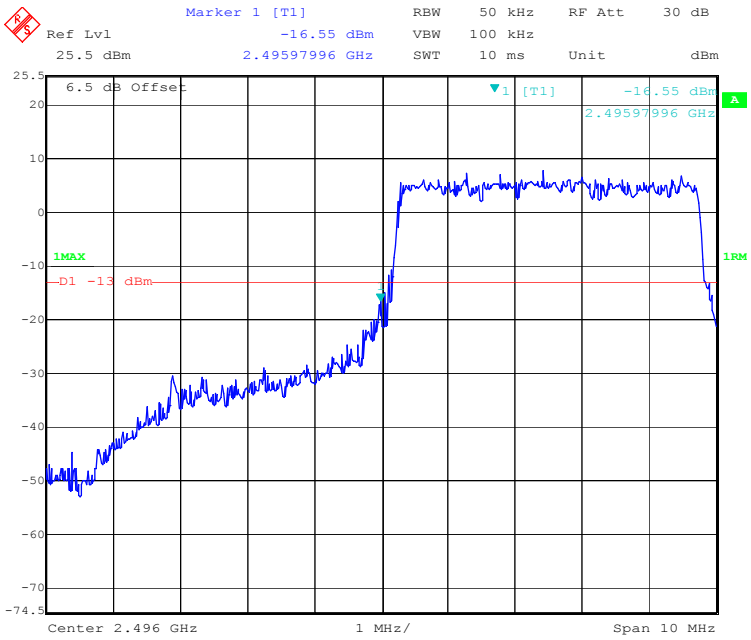
QPSK (20MHz, FULL RB) - Left Band Edge



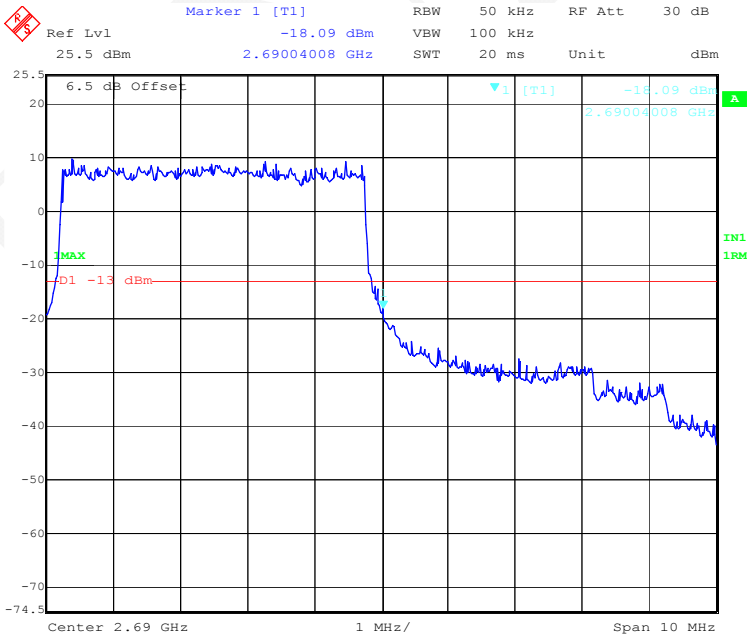
QPSK (20 MHz, FULL RB) - Right Band Edge



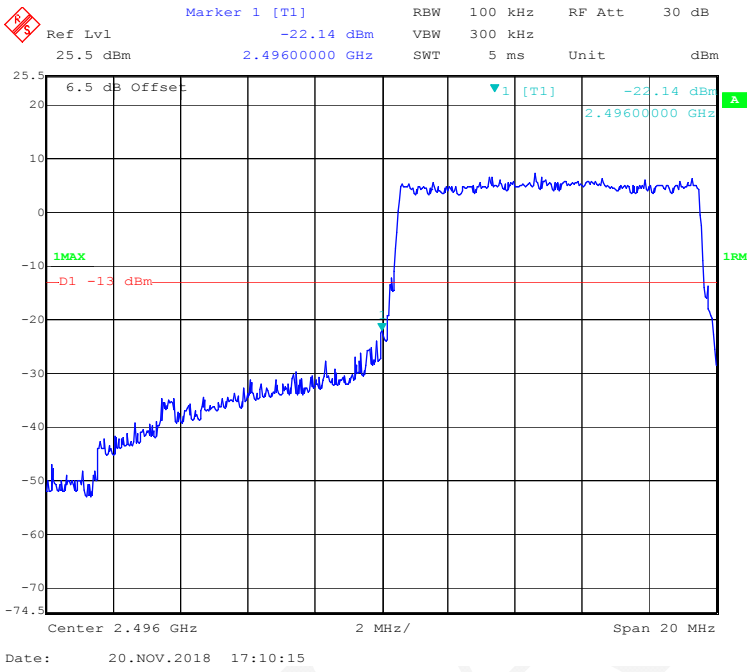
16-QAM (5MHz, FULL RB) - Left Band Edge



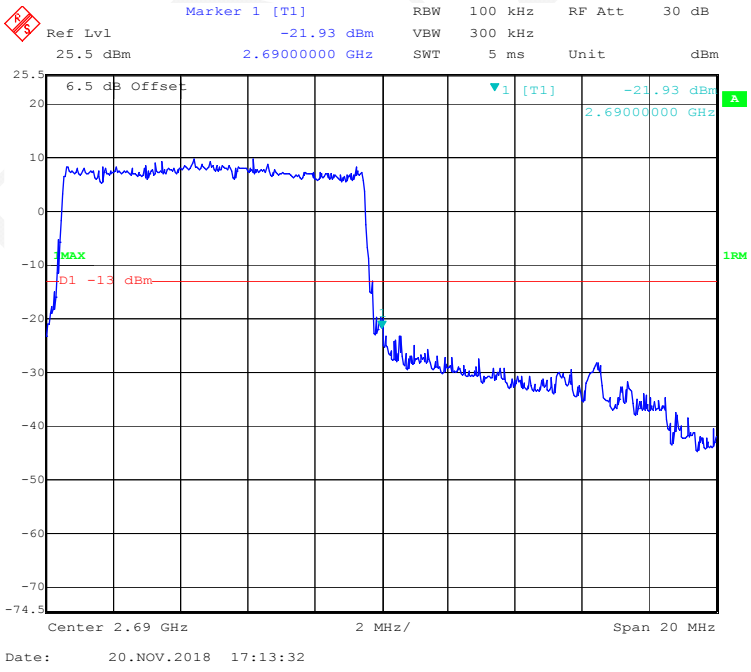
16-QAM (5MHz, FULL RB) - Right Band Edge



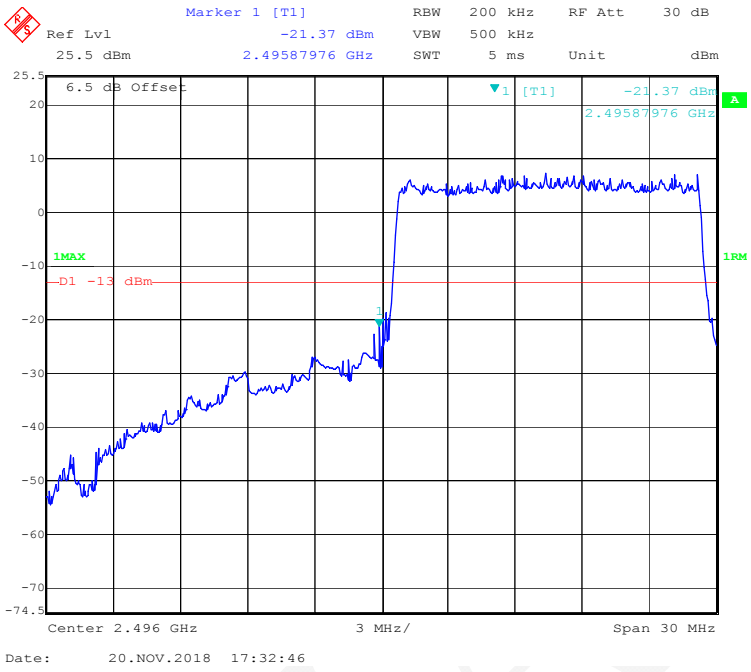
16-QAM (10 MHz, FULL RB) - Left Band Edge



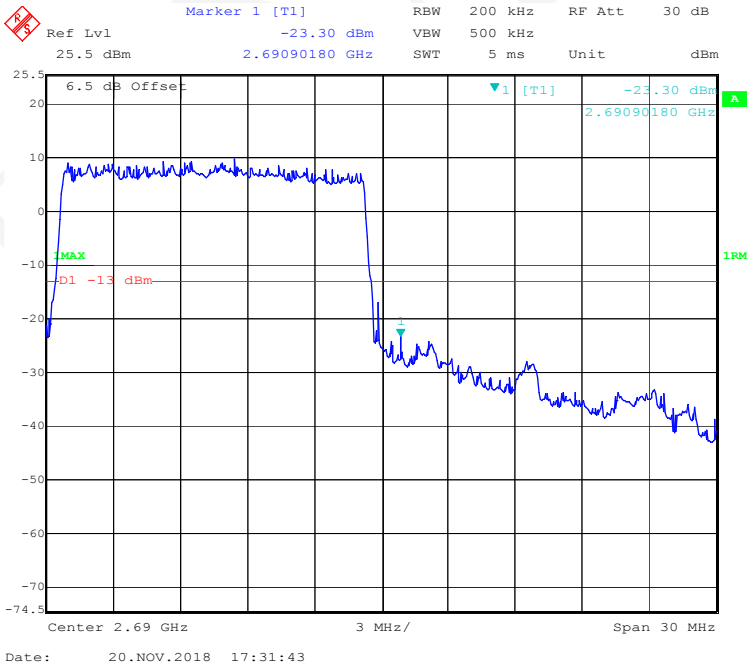
16-QAM (10 MHz, FULL RB) - Right Band Edge



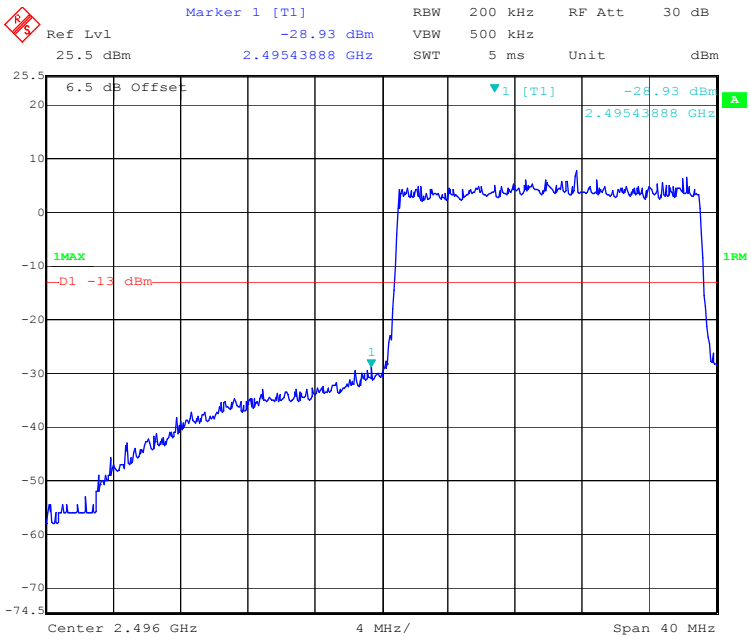
16-QAM (15 MHz, FULL RB) - Left Band Edge



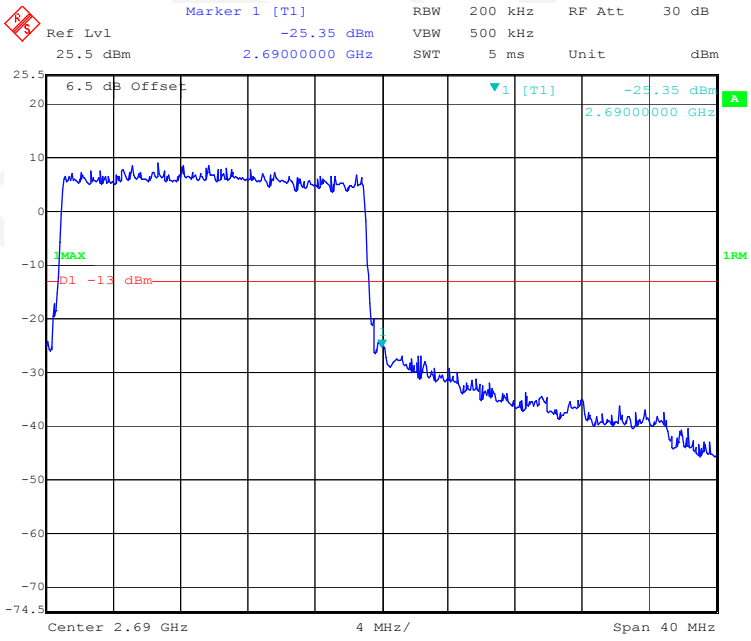
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge

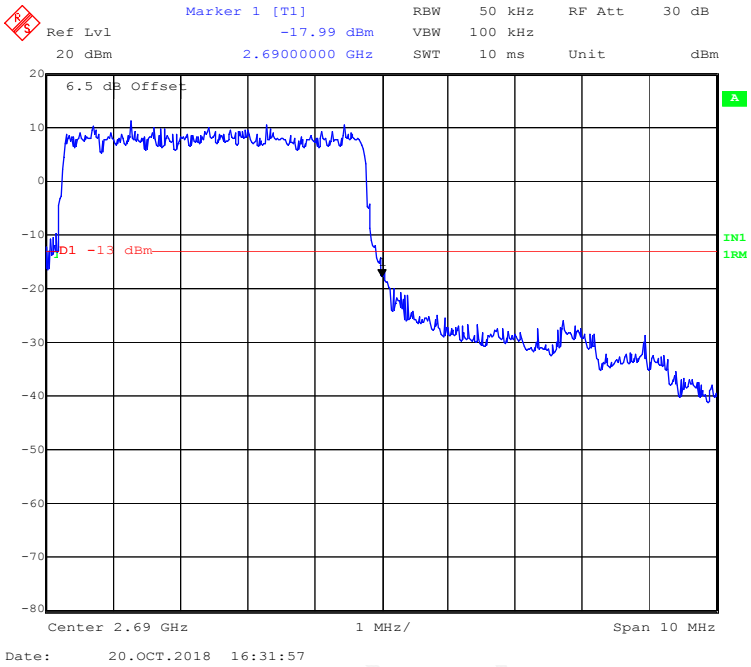


16-QAM (20 MHz, FULL RB) - Right Band Edge

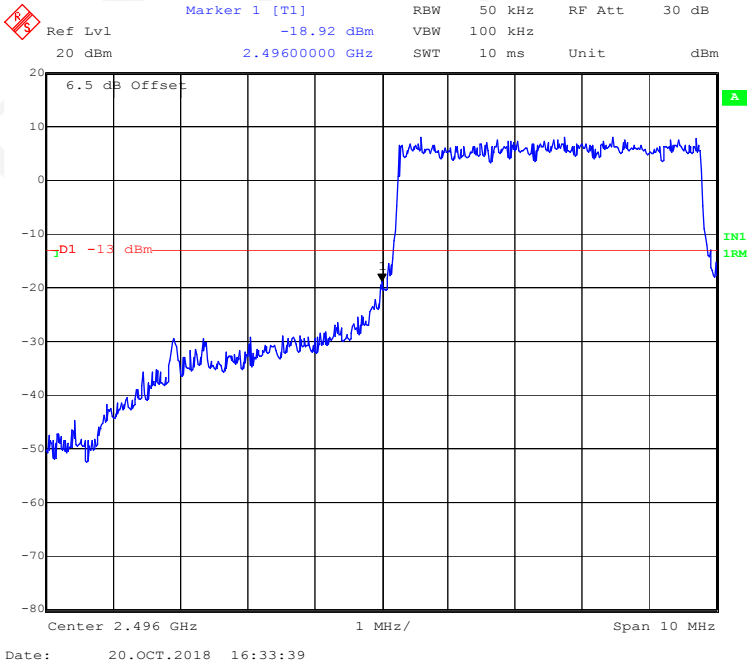


LTE Band 41:
Chain1

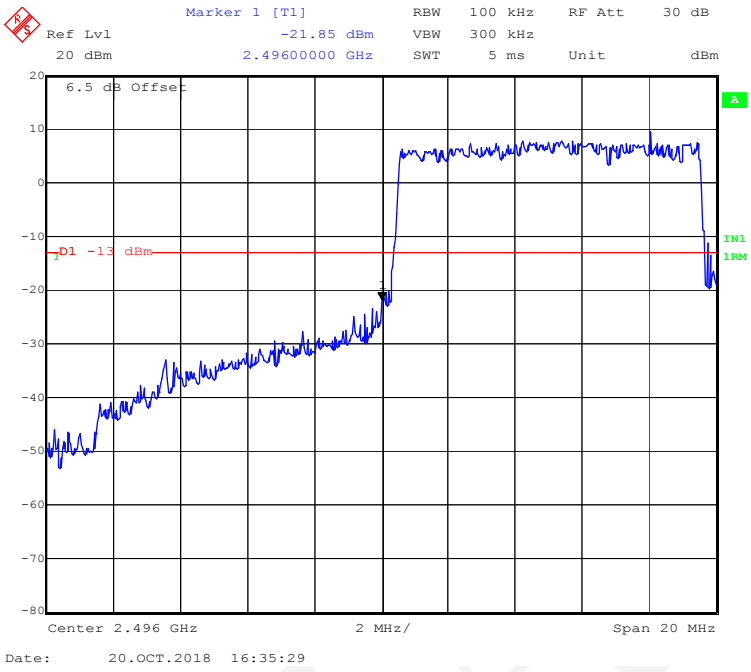
QPSK (5 MHz, FULL RB) - Left Band Edge



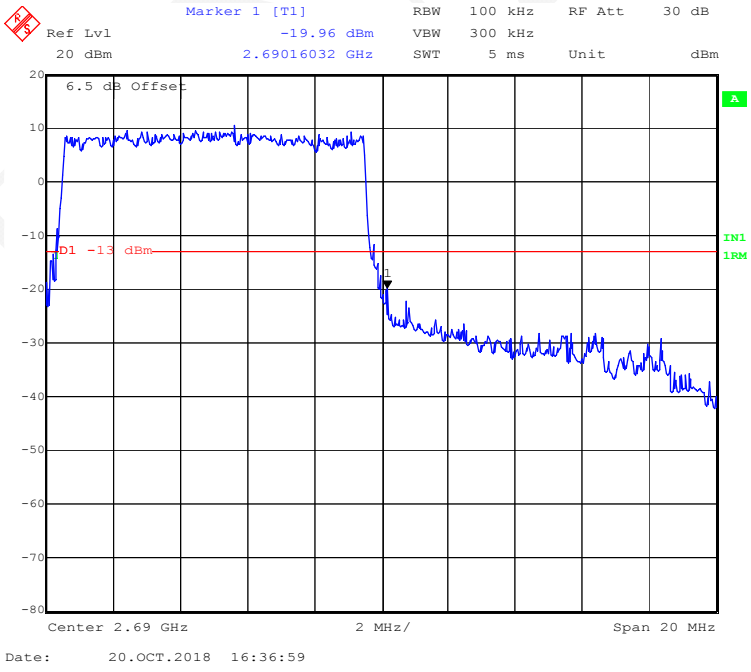
QPSK (5 MHz, FULL RB) - Right Band Edge



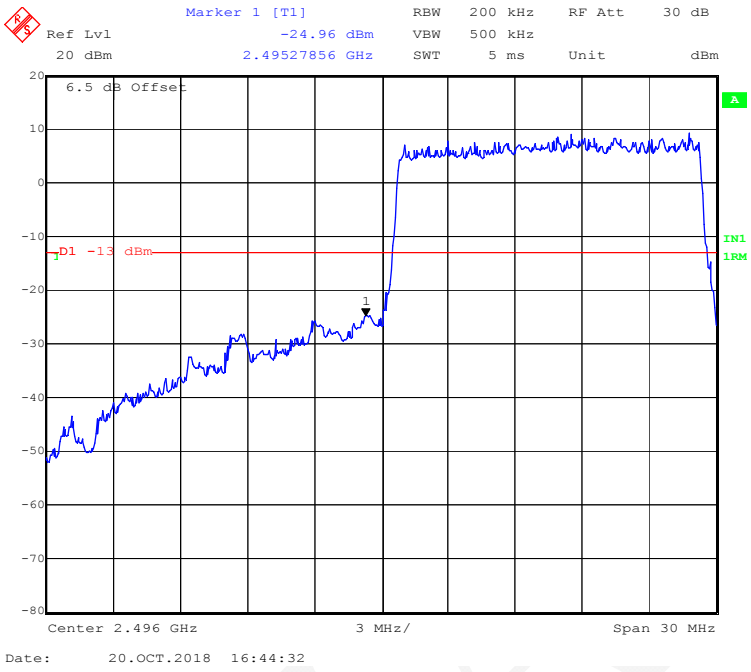
QPSK (10 MHz, FULL RB) - Left Band Edge



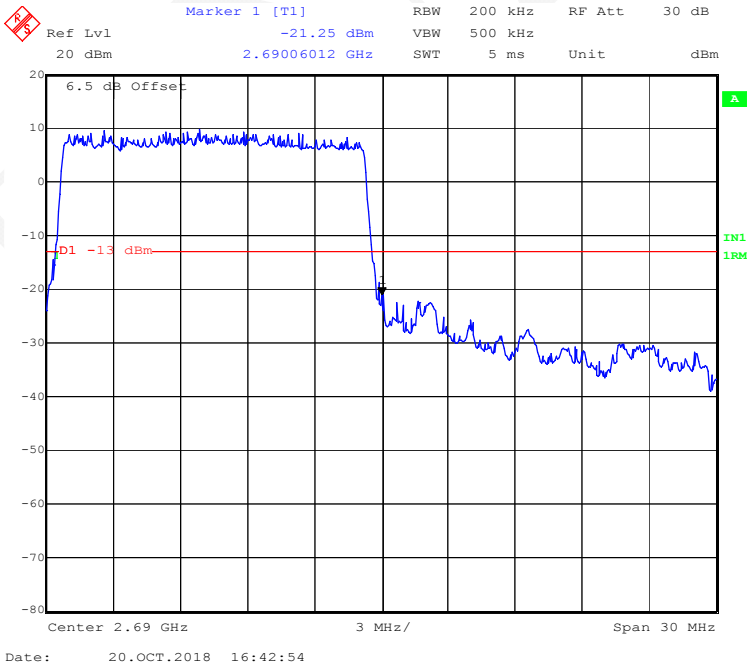
QPSK (10 MHz, FULL RB) - Right Band Edge



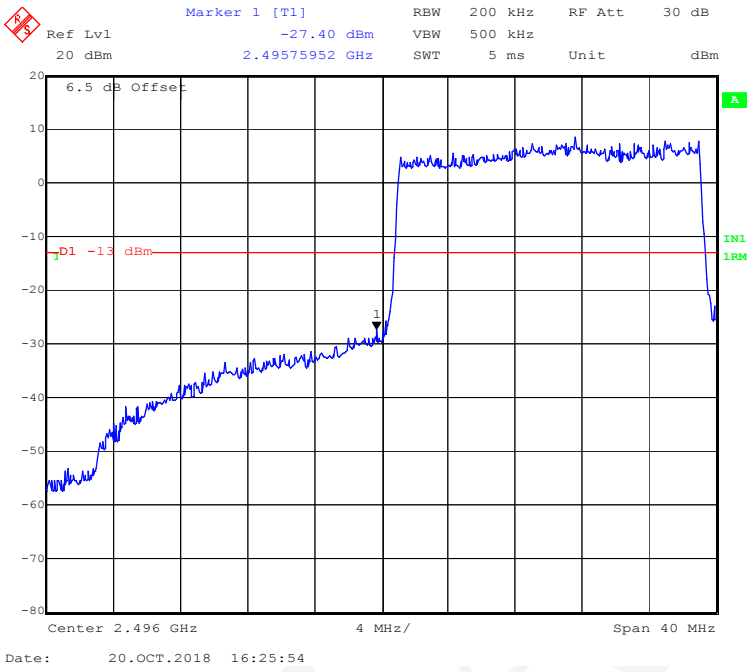
QPSK (15MHz, FULL RB) - Left Band Edge



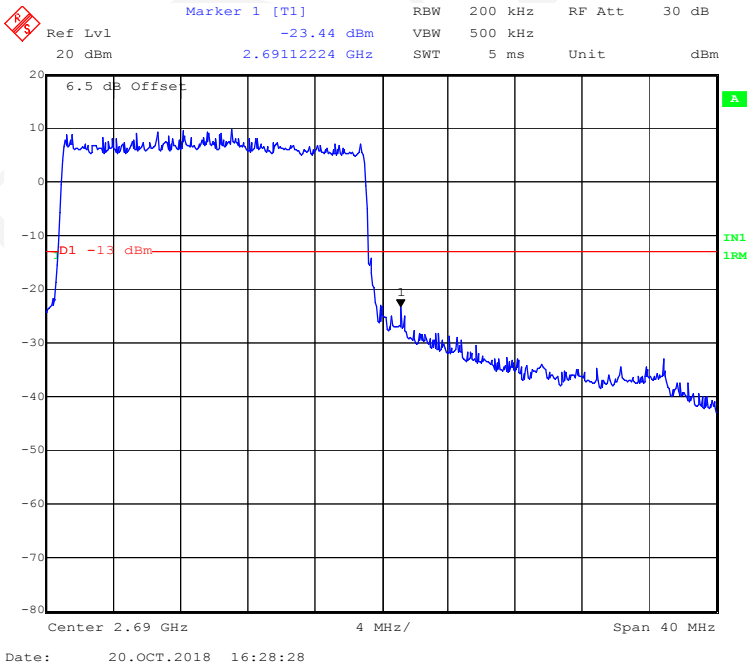
QPSK (15 MHz, FULL RB) - Right Band Edge



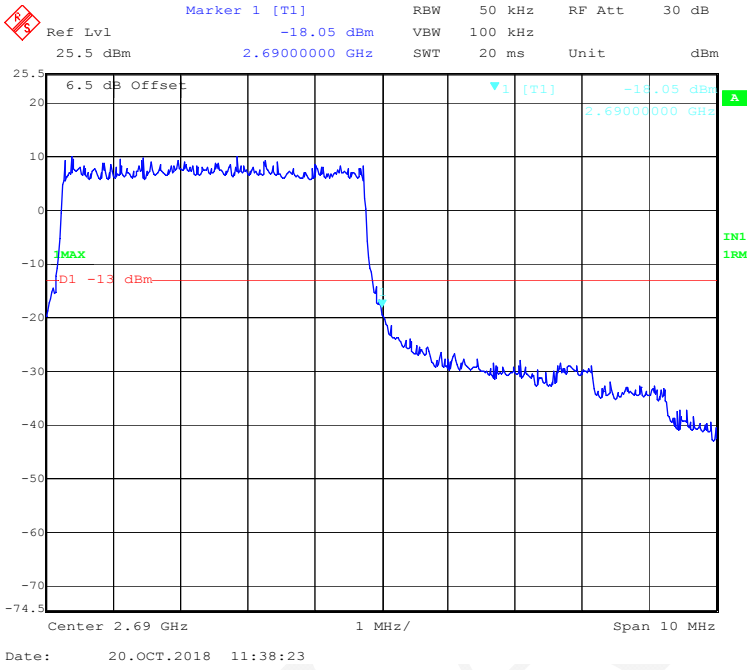
QPSK (20MHz, FULL RB) - Left Band Edge



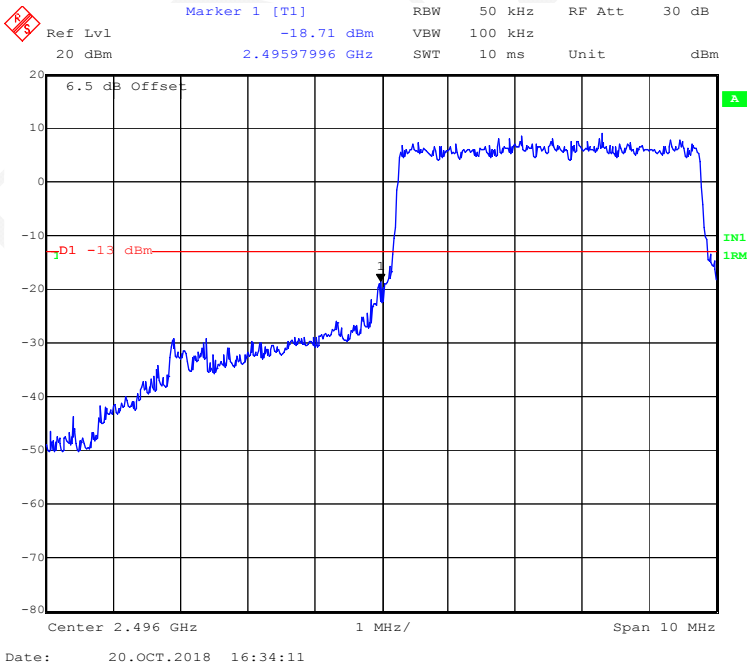
QPSK (20 MHz, FULL RB) - Right Band Edge



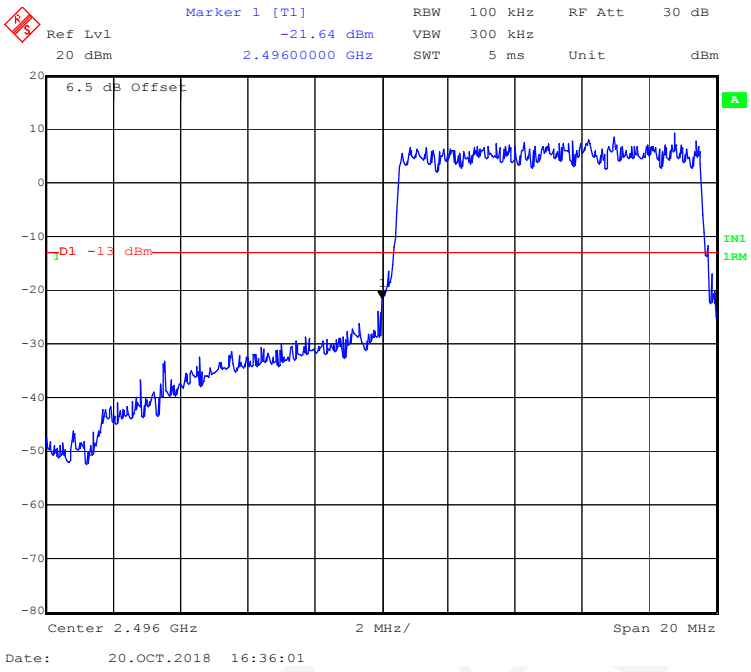
16-QAM (5MHz, FULL RB) - Left Band Edge



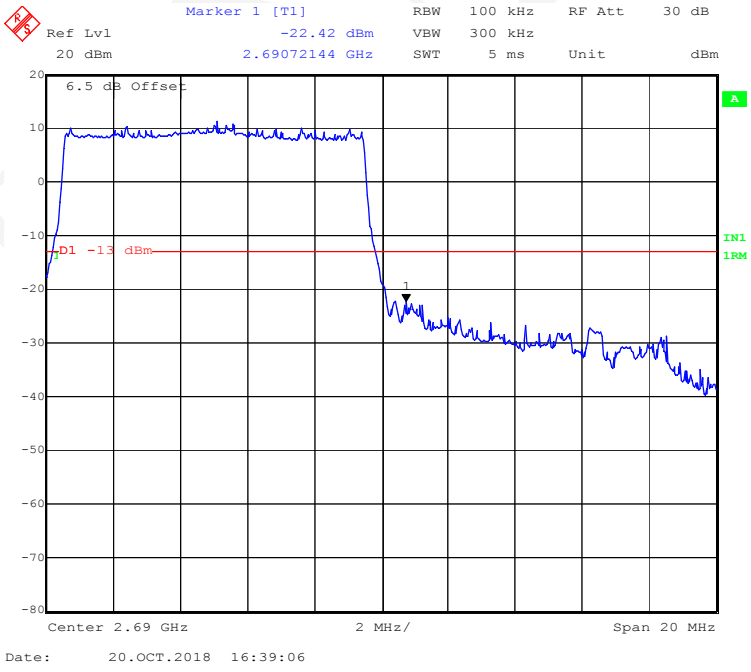
16-QAM (5MHz, FULL RB) - Right Band Edge



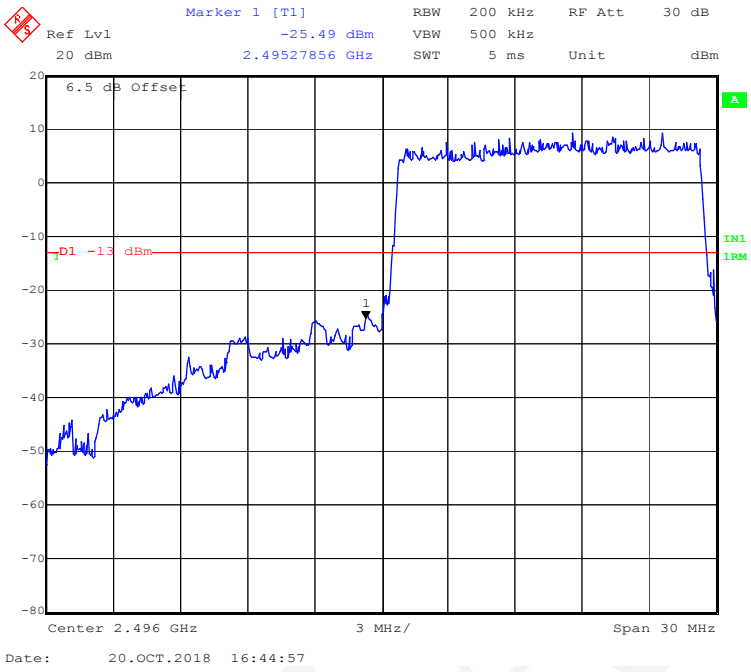
16-QAM (10 MHz, FULL RB) - Left Band Edge



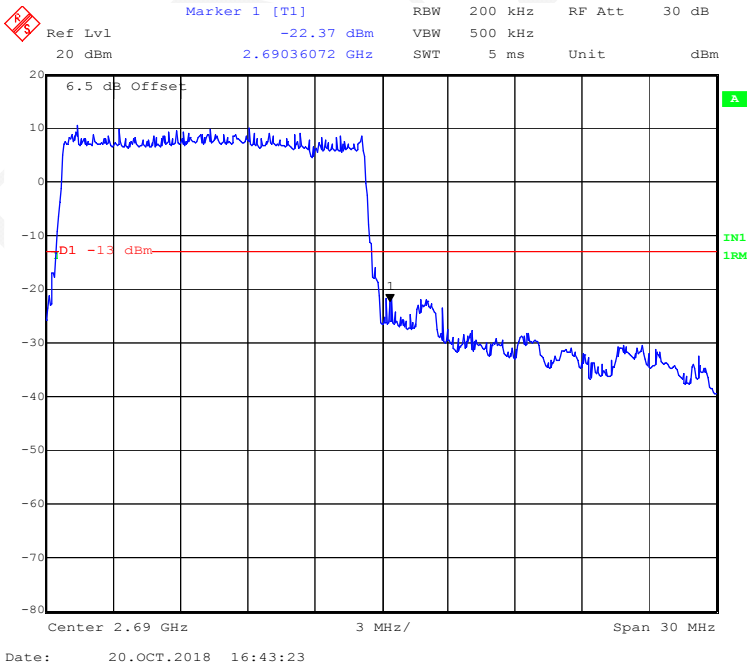
16-QAM (10 MHz, FULL RB) - Right Band Edge



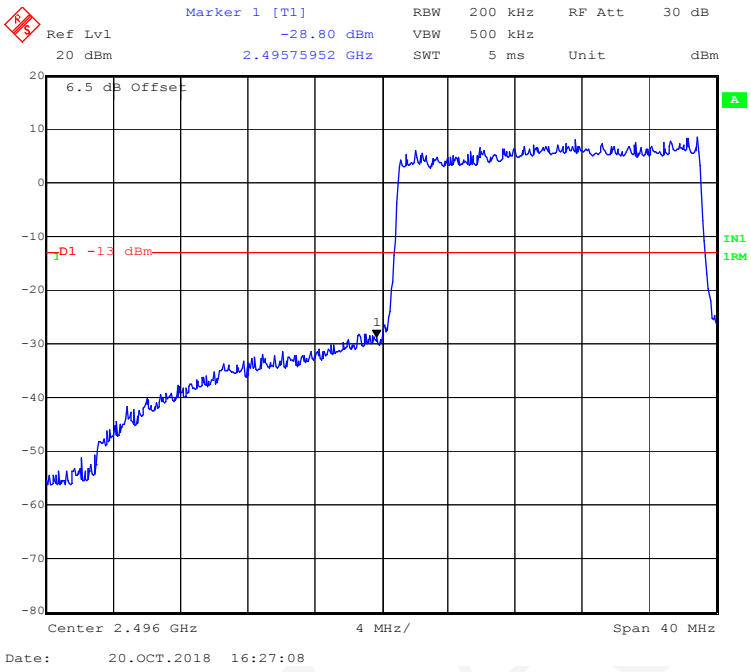
16-QAM (15 MHz, FULL RB) - Left Band Edge



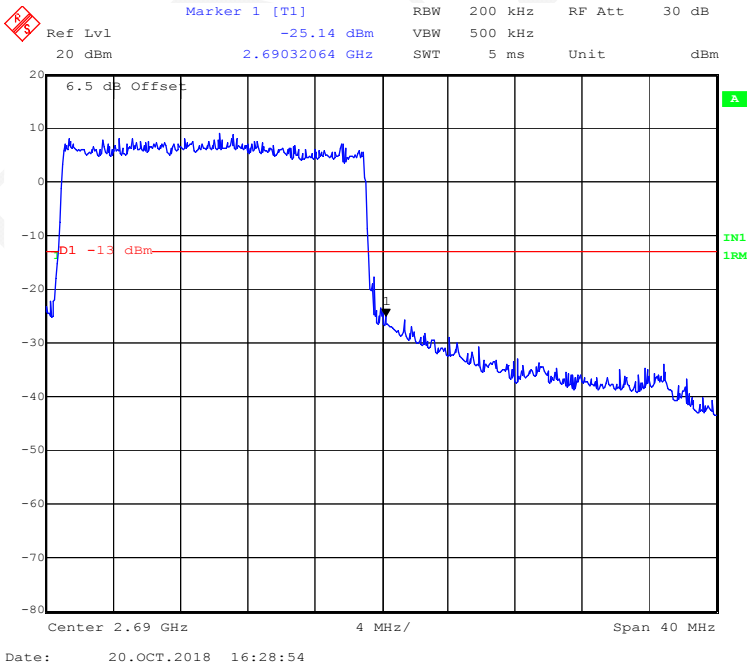
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge



16-QAM (20 MHz, FULL RB) - Right Band Edge



FCC § 2.1055 & §27.54 - FREQUENCY STABILITY

Applicable Standards

FCC § 2.1055 and §27.54.

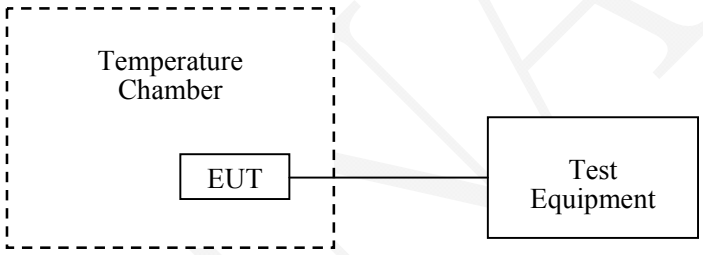
According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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:	23.2 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2kPa

The testing was performed by Hope Zhang on 2018-10-24.

EUT operation mode: Transmitting

Test Result: Compliance.

LTE Band 7:

Chain0:

5 MHz Low Channel & High Channel (QPSK)					
Temperature (℃)	**Power Supplied (V_{AC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	120	2500.22	2569.81	2500	2570
-20		2500.17	2569.81	2500	2570
-10		2500.19	2569.77	2500	2570
0		2500.18	2569.81	2500	2570
10		2500.23	2569.80	2500	2570
20		2500.22	2569.85	2500	2570
30		2500.17	2569.75	2500	2570
40		2500.21	2569.85	2500	2570
50		2500.19	2569.76	2500	2570
25	V min.= 102	2500.16	2569.76	2500	2570
25	V max.= 138	2500.19	2569.81	2500	2570

5 MHz Low Channel & High Channel (16QAM)					
Temperature (℃)	**Power Supplied (V_{AC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	120	2500.20	2569.82	2500	2570
-20		2500.23	2569.82	2500	2570
-10		2500.22	2569.79	2500	2570
0		2500.15	2569.83	2500	2570
10		2500.24	2569.82	2500	2570
20		2500.17	2569.78	2500	2570
30		2500.21	2569.79	2500	2570
40		2500.18	2569.75	2500	2570
50		2500.18	2569.78	2500	2570
25	V min.= 102	2500.18	2569.85	2500	2570
25	V max.= 138	2500.22	2569.77	2500	2570

Chain1:

5 MHz Low Channel & High Channel (QPSK)					
Temperature (℃)	**Power Supplied (V_{AC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	120	2500.18	2569.82	2500	2570
-20		2500.19	2569.79	2500	2570
-10		2500.18	2569.79	2500	2570
0		2500.20	2569.80	2500	2570
10		2500.18	2569.77	2500	2570
20		2500.21	2569.82	2500	2570
30		2500.19	2569.83	2500	2570
40		2500.18	2569.78	2500	2570
50		2500.21	2569.76	2500	2570
25	V min.= 102	2500.19	2569.79	2500	2570
25	V max.= 138	2500.23	2569.77	2500	2570

5 MHz Low Channel & High Channel (16QAM)					
Temperature (℃)	**Power Supplied (V_{AC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	120	2496.17	2689.82	2500	2570
-20		2496.16	2689.78	2500	2570
-10		2496.21	2689.81	2500	2570
0		2496.20	2689.79	2500	2570
10		2496.25	2689.85	2500	2570
20		2496.22	2689.77	2500	2570
30		2496.17	2689.85	2500	2570
40		2496.22	2689.77	2500	2570
50		2496.25	2689.78	2500	2570
25	V min.= 102	2496.16	2689.81	2500	2570
25	V max.= 138	2496.20	2689.79	2500	2570

LTE Band 41:

Chain0

5 MHz Low Channel & High Channel (QPSK)					
Temperature (℃)	**Power Supplied (V_{AC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	120	2496.21	2689.83	2496	2690
-20		2496.23	2689.78	2496	2690
-10		2496.21	2689.82	2496	2690
0		2496.19	2689.83	2496	2690
10		2496.17	2689.85	2496	2690
20		2496.20	2689.83	2496	2690
30		2496.18	2689.83	2496	2690
40		2496.16	2689.77	2496	2690
50		2496.24	2689.80	2496	2690
25	V min.= 102	2496.15	2689.81	2496	2690
25	V max.= 138	2496.16	2689.83	2496	2690

5 MHz Low Channel & High Channel (QPSK)					
Temperature (℃)	**Power Supplied (V_{AC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	120	2496.23	2689.81	2496	2690
-20		2496.18	2689.84	2496	2690
-10		2496.17	2689.82	2496	2690
0		2496.24	2689.75	2496	2690
10		2496.18	2689.77	2496	2690
20		2496.15	2689.81	2496	2690
30		2496.24	2689.79	2496	2690
40		2496.20	2689.84	2496	2690
50		2496.19	2689.82	2496	2690
25	V min.= 102	2496.18	2689.84	2496	2690
25	V max.= 138	2496.20	2689.84	2496	2690

Chain1

5 MHz Low Channel & High Channel (QPSK)					
Temperature (℃)	**Power Supplied (V_{AC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	120	2496.23	2689.75	2496	2690
-20		2496.23	2689.78	2496	2690
-10		2496.18	2689.81	2496	2690
0		2496.19	2689.82	2496	2690
10		2496.18	2689.81	2496	2690
20		2496.16	2689.80	2496	2690
30		2496.17	2689.83	2496	2690
40		2496.22	2689.76	2496	2690
50		2496.17	2689.77	2496	2690
25	V min.= 102	2496.19	2689.80	2496	2690
25	V max.= 138	2496.18	2689.79	2496	2690

5 MHz Low Channel & High Channel (QPSK)					
Temperature (℃)	**Power Supplied (V_{AC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	120	2496.24	2689.82	2496	2690
-20		2496.16	2689.76	2496	2690
-10		2496.18	2689.76	2496	2690
0		2496.16	2689.83	2496	2690
10		2496.15	2689.77	2496	2690
20		2496.17	2689.78	2496	2690
30		2496.24	2689.79	2496	2690
40		2496.16	2689.82	2496	2690
50		2496.22	2689.82	2496	2690
25	V min.= 102	2496.22	2689.79	2496	2690
25	V max.= 138	2496.19	2689.77	2496	2690

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