



FCC PART 27
FCC PART 22H, PART 24E
TEST REPORT

For

SWAGTEK

10205 NW 19th Street, STE 101, Miami, FL33172, United States

FCC ID: O55502117

Report Type: Original Report	Product Type: 4G SMART Phone
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The SWAGTEK's product, model number: *LOGIC L5D (FCC ID: O55502117, Brand: LOGIC)* or the "EUT" in this report was a *4G SMART Phone*, which was measured approximately: 14.2 cm (L) × 7.0 cm (W) × 1.0 cm (H), rated with input voltage: DC 3.7V rechargeable Li-ion battery or DC 5.0V from adapter.

Adapter Information:

Model: DCS10-0501000F

Input: AC100-240V, 50/60Hz, 0.3 A

Output: DC5.0V, 1A

Notes: This series products model: iSWAG VISION, UNONU UL5003 and LOGIC L5D are identical; they have the identical schematics, only named differently. Model LOGIC L5D was selected for fully testing, the detailed information can be referred to the declaration which was stated and guaranteed by the applicant.

**All measurement and test data in this report was gathered from production sample serial number: 1701368 (Assigned by BACL, Kunshan). The EUT supplied by the applicant was received on 2017-06-16.*

Objective

This test report is prepared on behalf of *SWAGTEK* in accordance with Part 2-Subpart J, Part 22-Subpart H and Part 24-Subpart E and Part 27 of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DTS & DSS and Part 15B JBP submissions with FCC ID: O55502117.

Test Methodology

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

Part 22 Subpart H - Public Mobile Services

Part 24 Subpart E - Personal Communication Services

Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA/EIA 603-D.

All emissions measurement was 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		$\pm 0.9\text{dB}$
RF Output Power with Power meter		$\pm 0.5\text{dB}$
Radiated emission	30MHz~1GHz	$\pm 5.91\text{dB}$
	Above 1G	$\pm 4.92\text{dB}$
Occupied Bandwidth		$\pm 0.5\text{kHz}$
Temperature		$\pm 1.0^{\circ}\text{C}$
Humidity		$\pm 6\%$

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) has been accredited to ISO/IEC 17025 by CNAS(Lab code: L9963). And accredited to ISO/IEC 17025 by A2LA(Lab code: 4323.01), the FCC Designation No. CN1185 under the KDB 974614 D01.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Bay Area Compliance Laboratories Corp. (Kunshan) was registered with ISED Canada under ISED Canada Registration Number 3062E.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

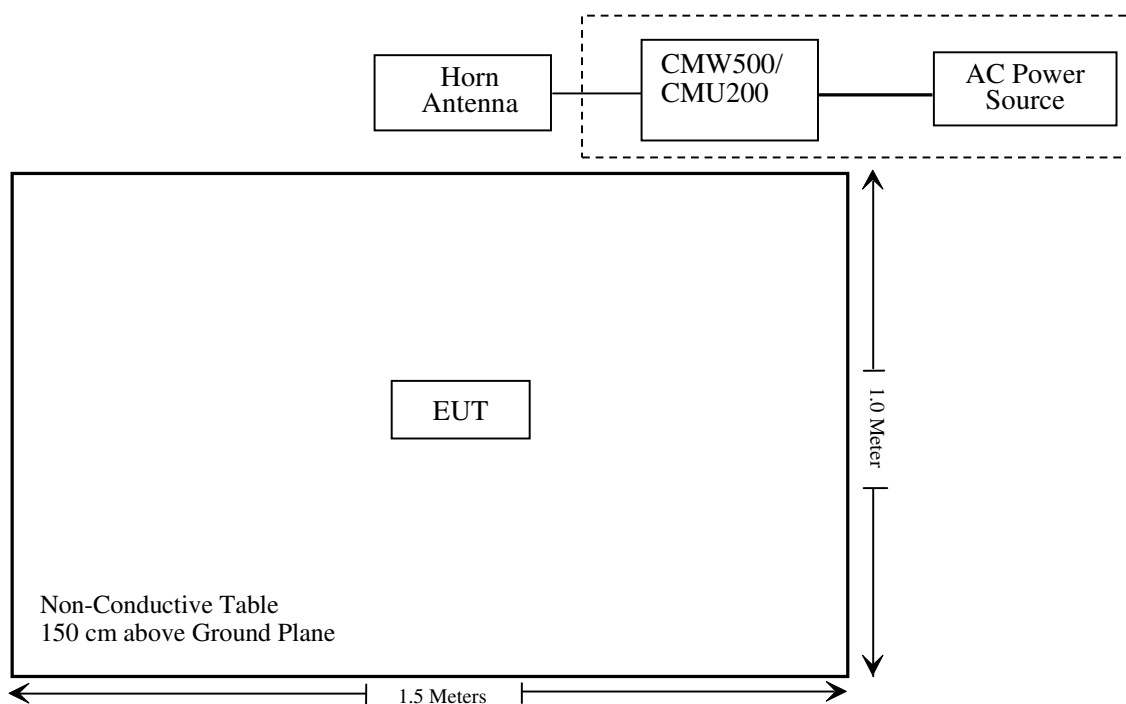
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-116218-UY
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	110605

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307, §2.1093	RF Exposure (SAR)	Compliance
§2.1046; § 22.913 (a); § 24.232 (c); §27.50(d) (h)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235; §27.54;	Frequency stability	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sonoma Instrument	Amplifier	330	171377	2016-12-12	2017-12-12
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-25
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2016-01-09	2019-01-08
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-09-08	2017-09-08
EMCO	Horn Antenna	3116	9510-2384	2015-11-07	2018-11-06
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-25
ETS	Horn Antenna	3115	6229	2016-01-11	2017-01-10
ETS	Horn Antenna	3115	9311-4159	2016-01-11	2017-01-10
R&S	Auto test Software	EMC32	V 09.10.0	NCR	NCR
haojintech	Coaxial Cable	Cable-1	001	2016-12-12	2017-12-12
haojintech	Coaxial Cable	Cable-2	002	2016-12-12	2017-12-12
haojintech	Coaxial Cable	Cable-3	003	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-7	007	2016-12-12	2017-12-12
HP	Signal Generator	8341B	2624A00116	2016-08-29	2017-08-29
RF Conducted test					
BACL	TS 8997 Cable-01	T-KS-EMC086	T-KS-EMC086	2016-12-09	2017-12-08
BACL	RF cable	KS-LAB-012	KS-LAB-012	2016-12-15	2017-12-14
WEINSCHEL	3dB Attenuator	5326	N/A	2017-06-18	2018-06-18
Rohde & Schwarz	OSP120 BASE UNIT	OSP120	101247	2017-07-04	2018-07-03
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2016-09-21	2017-09-21
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	110605	2016-11-25	2017-11-25
R&S	Wideband Radio Communication tester	CMW500	1201.002K50-116218-UY	2016-10-08	2017-10-08
HONOVA	Power Splitter	ZFRSC-14-S+	019411452	2017-06-12	2018-06-12

* **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 §1.1307 & §2.1093 - RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ170616002-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H, 24E & Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 22.913 (a) & § 24.232 (c); §27.50 (d) (h) - RF OUTPUT POWER

Applicable Standard

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

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.

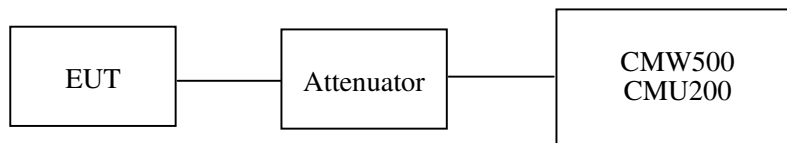
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz. The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

According to §27.50(h), the maximum EIRP must not exceed 2Watts (33dBm) for 2500-2570MHz.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the CMW500/CMU200 through sufficient attenuation.



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Echo Wu on 2017-06-22.

Conducted Power**Cellular Band (Part 22H)**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	31.94	38.45
	190	836.6	31.97	38.45
	251	848.8	32.00	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	31.37	30.62	28.93	27.70	38.45
	190	836.6	31.30	30.58	28.85	27.61	38.45
	251	848.8	31.28	30.60	28.79	27.53	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	24.23	23.95	22.79	20.98	38.45
	190	836.6	24.14	23.90	22.69	20.93	38.45
	251	848.8	24.15	23.95	22.67	20.53	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	RMC12.2k		22.17	22.26	22.27
		HSDPA	1	21.05	20.84	20.63
			2	20.67	20.68	20.65
			3	20.54	20.59	20.57
			4	20.56	20.57	20.58
		HSUPA	1	20.76	20.28	20.55
			2	20.65	20.35	20.65
			3	20.64	20.24	20.63
			4	20.66	20.29	20.61
			5	20.59	20.28	20.58
		HSPA+	1	21.05	21.18	21.21

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.69	33
	661	1880.0	28.38	33
	810	1909.8	28.30	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.32	27.73	26.08	24.91	33
	661	1880.0	28.17	27.58	25.90	24.75	33
	810	1909.8	28.25	27.66	26.03	24.90	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	23.75	23.70	22.07	19.89	33
	661	1880.0	24.33	24.26	21.98	19.76	33
	810	1909.8	23.31	23.26	20.91	18.70	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		21.99	21.85	22.13
		HSDPA	1	21.49	21.19	21.18
			2	21.21	21.03	20.98
			3	21.16	21.02	21.03
			4	21.19	21.02	21.05
		HSUPA	1	21.13	20.81	20.81
			2	21.04	20.95	20.82
			3	21.06	20.89	20.79
			4	21.07	20.91	20.78
			5	21.01	20.88	20.87
		HSPA+	1	21.58	21.11	21.16

Peak-to-average ratio (PAR)**Cellular Band**

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.14	13
	Middle	0.15	13
	High	0.13	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.19	13
	Middle	0.19	13
	High	0.18	13

Mode	Channel	PAR (dB)	Limit (dBm)
WCDMA (BPSK)	Low	2.61	13
	Middle	2.51	13
	High	2.75	13
HSDPA (16QAM)	Low	2.22	13
	Middle	2.26	13
	High	2.45	13
HSUPA (BPSK)	Low	2.26	13
	Middle	2.29	13
	High	2.55	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.15	13
	Middle	0.16	13
	High	0.17	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.19	13
	Middle	0.19	13
	High	0.21	13

Mode	Channel	PAR (dB)	Limit (dBm)
WCDMA (BPSK)	Low	1.98	13
	Middle	2.10	13
	High	3.04	13
HSDPA (16QAM)	Low	1.84	13
	Middle	1.89	13
	High	2.56	13
HSUPA (BPSK)	Low	1.85	13
	Middle	2.00	13
	High	2.59	13

Radiated Power**GSM Mode:**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	88.38	257	1.5	H	18.7	0.26	4.75	23.19	38.45	15.26
836.6	99.51	250	2.2	V	25.8	0.26	4.75	30.29	38.45	8.16
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	88.38	157	2.1	H	18.4	0.45	8.84	26.79	33	6.21
1880.00	99.51	232	1.5	V	18.8	0.45	8.84	27.19	33	5.81

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	86.21	20	1.2	H	16.5	0.26	4.75	20.99	38.45	17.46
836.6	95.53	274	2.1	V	21.8	0.26	4.75	26.29	38.45	12.16
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	73.99	281	2.3	H	12.5	0.45	8.84	20.89	33	12.11
1880.00	80.92	139	2.3	V	17.2	0.45	8.84	25.59	33	7.41

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	80.42	70	2.1	H	10.7	0.26	4.75	15.19	38.45	23.26
836.6	92.29	173	1.0	V	18.6	0.26	4.75	23.09	38.45	15.36
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	72.59	295	1.5	H	11.1	0.45	8.84	19.49	33	13.51
1880.00	78.82	44	2.0	V	15.1	0.45	8.84	23.49	33	9.51

Note:

All above data were tested with no amplifier.

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

LTE Band 2**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.26	22.21	22.15
		RB Size=1, RB Offset=2	22.25	21.21	22.22
		RB Size=1, RB Offset=5	22.15	22.54	22.19
		RB Size=3, RB Offset=0	22.16	21.79	22.25
		RB Size=3, RB Offset=1	22.23	21.97	22.21
		RB Size=3, RB Offset=2	22.35	21.22	22.40
		RB Size=6, RB Offset=0	22.37	22.33	22.20
	16QAM	RB Size=1, RB Offset=0	22.39	22.86	22.31
		RB Size=1, RB Offset=2	22.36	22.72	22.42
		RB Size=1, RB Offset=5	22.27	21.90	22.13
		RB Size=3, RB Offset=0	22.23	21.59	22.11
		RB Size=3, RB Offset=1	22.43	21.76	22.16
		RB Size=3, RB Offset=2	22.23	21.55	22.04
		RB Size=6, RB Offset=0	22.42	22.81	22.16
3.0	QPSK	RB Size=1, RB Offset=0	22.32	22.00	22.45
		RB Size=1, RB Offset=7	22.13	21.91	22.45
		RB Size=1, RB Offset=14	22.26	21.87	22.44
		RB Size=8, RB Offset=0	22.00	21.44	22.40
		RB Size=8, RB Offset=4	22.30	21.89	22.20
		RB Size=8, RB Offset=7	22.21	22.84	22.25
		RB Size=15, RB Offset=0	22.26	21.31	22.21
	16QAM	RB Size=1, RB Offset=0	22.32	21.05	22.46
		RB Size=1, RB Offset=7	22.02	21.09	22.28
		RB Size=1, RB Offset=14	22.18	22.81	22.24
		RB Size=8, RB Offset=0	22.04	22.17	22.05
		RB Size=8, RB Offset=4	22.06	21.05	22.46
		RB Size=8, RB Offset=7	22.06	22.70	22.11
		RB Size=15, RB Offset=0	22.02	21.95	22.06

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.23	22.51	22.31
		RB Size=1, RB Offset=12	22.01	21.07	22.04
		RB Size=1, RB Offset=24	22.45	21.09	22.36
		RB Size=12, RB Offset=0	22.07	21.09	22.08
		RB Size=12, RB Offset=6	22.48	22.55	22.22
		RB Size=12, RB Offset=11	22.15	21.45	22.22
		RB Size=25, RB Offset=0	22.02	22.98	22.17
	16QAM	RB Size=1, RB Offset=0	22.21	21.08	22.3
		RB Size=1, RB Offset=12	22.25	22.69	22.25
		RB Size=1, RB Offset=24	22.17	21.47	22.25
		RB Size=12, RB Offset=0	22.25	22.41	22.3
		RB Size=12, RB Offset=6	22.26	21.30	22.28
		RB Size=12, RB Offset=11	22.56	21.49	22.23
		RB Size=25, RB Offset=0	22.28	21.35	22.08
10.0	QPSK	RB Size=1, RB Offset=0	22.25	21.16	22.28
		RB Size=1, RB Offset=24	22.14	22.41	22.32
		RB Size=1, RB Offset=49	22.18	22.76	22.18
		RB Size=25, RB Offset=0	22.22	22.33	22.29
		RB Size=25, RB Offset=12	22.35	21.46	22.49
		RB Size=25, RB Offset=24	22.36	22.86	22.32
		RB Size=50, RB Offset=0	22.40	21.76	22.09
	16QAM	RB Size=1, RB Offset=0	22.40	21.07	22.16
		RB Size=1, RB Offset=24	22.25	22.85	22.13
		RB Size=1, RB Offset=49	22.24	21.77	22.33
		RB Size=25, RB Offset=0	22.33	21.04	22.29
		RB Size=25, RB Offset=12	22.21	22.73	22.39
		RB Size=25, RB Offset=24	22.04	21.49	22.16
		RB Size=50, RB Offset=0	22.20	22.08	22.23

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.21	21.51	22.09
		RB Size=1, RB Offset=37	22.27	21.51	22.38
		RB Size=1, RB Offset=74	22.00	21.16	22.04
		RB Size=36, RB Offset=0	22.16	21.53	22.36
		RB Size=36, RB Offset=18	22.14	22.02	22.39
		RB Size=36, RB Offset=37	22.32	22.62	22.04
		RB Size=75, RB Offset=0	22.26	21.93	22.03
	16QAM	RB Size=1, RB Offset=0	22.45	21.14	22.19
		RB Size=1, RB Offset=37	22.32	21.98	22.11
		RB Size=1, RB Offset=74	22.29	21.52	22.1
		RB Size=36, RB Offset=0	22.25	21.47	22.13
		RB Size=36, RB Offset=18	22.02	22.78	22.24
		RB Size=36, RB Offset=37	22.32	21.89	22.01
		RB Size=75, RB Offset=0	22.03	21.47	22.05
20.0	QPSK	RB Size=1, RB Offset=0	22.32	22.61	22.37
		RB Size=1, RB Offset=49	22.24	21.41	22.03
		RB Size=1, RB Offset=99	22.34	21.82	22.45
		RB Size=50, RB Offset=0	22.14	22.55	22.26
		RB Size=50, RB Offset=24	22.21	22.91	22.47
		RB Size=50, RB Offset=49	22.25	21.13	22.24
		RB Size=100, RB Offset=0	22.31	21.06	22.03
	16QAM	RB Size=1, RB Offset=0	22.51	22.43	22.1
		RB Size=1, RB Offset=49	22.15	22.46	22.07
		RB Size=1, RB Offset=99	22.03	22.62	22.15
		RB Size=50, RB Offset=0	22.42	21.39	22.38
		RB Size=50, RB Offset=24	22.37	21.98	22.36
		RB Size=50, RB Offset=49	22.24	21.13	22.21
		RB Size=100, RB Offset=0	22.27	22.02	22.18

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	4.65	13	Pass
16QAM (100%RB Size)	6.65	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	78.49	121	1.7	H	17.0	0.45	8.84	25.39	33
1880.00	75.02	278	2.3	V	11.3	0.45	8.84	19.69	33
3 MHz Bandwidth									
1880.00	77.09	255	1.3	H	15.6	0.45	8.84	23.99	33
1880.00	72.82	182	1.2	V	9.1	0.45	8.84	17.49	33
5 MHz Bandwidth									
1880.00	76.19	243	1.8	H	14.7	0.45	8.84	23.09	33
1880.00	71.52	35	2.0	V	7.8	0.45	8.84	16.19	33
10 MHz Bandwidth									
1880.00	75.89	292	1.9	H	14.4	0.45	8.84	22.79	33
1880.00	72.22	281	2.2	V	8.5	0.45	8.84	16.89	33
15 MHz Bandwidth									
1880.00	76.39	125	1.8	H	14.9	0.45	8.84	23.29	33
1880.00	73.22	199	1.3	V	9.5	0.45	8.84	17.89	33
20 MHz Bandwidth									
1880.00	76.09	66	1.6	H	14.6	0.45	8.84	22.99	33
1880.00	72.62	90	1.5	V	8.9	0.45	8.84	17.29	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	78.49	125	2.1	H	17.0	0.45	8.84	25.39	33
1880.00	74.62	343	1.3	V	10.9	0.45	8.84	19.29	33
3 MHz Bandwidth									
1880.00	77.59	181	1.4	H	16.1	0.45	8.84	24.49	33
1880.00	73.52	57	1.4	V	9.8	0.45	8.84	18.19	33
5 MHz Bandwidth									
1880.00	76.19	48	2.0	H	14.7	0.45	8.84	23.09	33
1880.00	72.52	225	1.9	V	8.8	0.45	8.84	17.19	33
10 MHz Bandwidth									
1880.00	74.69	183	1.6	H	13.2	0.45	8.84	21.59	33
1880.00	72.82	162	1.3	V	9.1	0.45	8.84	17.49	33
15 MHz Bandwidth									
1880.00	75.39	258	2.3	H	13.9	0.45	8.84	22.29	33
1880.00	71.62	325	2.2	V	7.9	0.45	8.84	16.29	33
20 MHz Bandwidth									
1880.00	74.99	105	2.5	H	13.5	0.45	8.84	21.89	33
1880.00	71.42	162	2.4	V	7.7	0.45	8.84	16.09	33

LTE Band 4:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	RB Size=1, RB Offset=0	22.25	21.87	21.77
		RB Size=1, RB Offset=2	22.14	21.17	22.01
		RB Size=1, RB Offset=5	22.12	22.26	22.32
		RB Size=3, RB Offset=0	22.44	21.14	22.36
		RB Size=3, RB Offset=1	22.48	22.97	22.45
		RB Size=3, RB Offset=2	22.14	22.81	22.25
		RB Size=6, RB Offset=0	22.39	22.83	22.22
	16QAM	RB Size=1, RB Offset=0	22.10	21.97	22.31
		RB Size=1, RB Offset=2	22.30	21.89	22.21
		RB Size=1, RB Offset=5	22.21	21.32	22.19
		RB Size=3, RB Offset=0	22.26	21.55	22.15
		RB Size=3, RB Offset=1	22.21	21.44	22.24
		RB Size=3, RB Offset=2	22.05	22.6	22.34
		RB Size=6, RB Offset=0	22.15	21.43	22.11
3M	QPSK	RB Size=1, RB Offset=0	22.15	22.78	22.11
		RB Size=1, RB Offset=7	22.35	22.37	22.45
		RB Size=1, RB Offset=14	22.33	22.75	22.44
		RB Size=8, RB Offset=0	22.21	22.21	22.17
		RB Size=8, RB Offset=4	22.54	22.38	22.21
		RB Size=8, RB Offset=7	22.17	21.18	22.44
		RB Size=15, RB Offset=0	22.05	21.36	22.47
	16QAM	RB Size=1, RB Offset=0	22.17	21.52	22.11
		RB Size=1, RB Offset=7	22.05	21.12	22.49
		RB Size=1, RB Offset=14	22.17	21.26	22.26
		RB Size=8, RB Offset=0	22.1	21.99	22.24
		RB Size=8, RB Offset=4	22.15	21.77	22.3
		RB Size=8, RB Offset=7	22.50	22.64	22.32
		RB Size=15, RB Offset=0	22.04	22.18	22.12

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.11	22.38	22.16
		RB Size=1, RB Offset=12	22.11	21.46	22.48
		RB Size=1, RB Offset=24	22.38	21.41	22.06
		RB Size=12, RB Offset=0	22.43	21.45	22.21
		RB Size=12, RB Offset=6	22.41	21.16	22.24
		RB Size=12, RB Offset=11	22.25	22.72	22.14
		RB Size=25, RB Offset=0	22.46	21.54	22.45
	16QAM	RB Size=1, RB Offset=0	22.03	22.41	22.31
		RB Size=1, RB Offset=12	22.03	22.03	22.38
		RB Size=1, RB Offset=24	22.12	21.62	22.34
		RB Size=12, RB Offset=0	22.22	21.24	22.41
		RB Size=12, RB Offset=6	22.19	22.51	22.06
		RB Size=12, RB Offset=11	22.17	22.23	22.49
		RB Size=25, RB Offset=0	22.35	22.75	22.48
10.0	QPSK	RB Size=1, RB Offset=0	22.02	21.35	22.22
		RB Size=1, RB Offset=24	22.12	21.68	22.49
		RB Size=1, RB Offset=49	22.17	21.52	22.26
		RB Size=25, RB Offset=0	22.37	21.78	22.2
		RB Size=25, RB Offset=12	22.19	22.11	22.28
		RB Size=25, RB Offset=24	22.19	22.75	22.12
		RB Size=50, RB Offset=0	22.41	22.42	22.49
	16QAM	RB Size=1, RB Offset=0	22.31	22.14	22.21
		RB Size=1, RB Offset=24	22.23	21.47	22.11
		RB Size=1, RB Offset=49	22.32	22.33	22.08
		RB Size=25, RB Offset=0	22.06	21.78	22.19
		RB Size=25, RB Offset=12	22.23	22.62	22.08
		RB Size=25, RB Offset=24	22.06	21.42	22.27
		RB Size=50, RB Offset=0	22.43	22.79	22.39

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.03	21.64	22.08
		RB Size=1, RB Offset=37	22.31	21.89	22.23
		RB Size=1, RB Offset=74	22.15	21.42	22.27
		RB Size=36, RB Offset=0	22.34	21.38	22.31
		RB Size=36, RB Offset=18	22.38	21.63	22.42
		RB Size=36, RB Offset=37	22.25	22.06	22.07
		RB Size=75, RB Offset=0	22.08	21.41	22.25
	16QAM	RB Size=1, RB Offset=0	22.42	21.87	22.23
		RB Size=1, RB Offset=37	22.26	21.18	22.05
		RB Size=1, RB Offset=74	22.45	22.72	22.25
		RB Size=36, RB Offset=0	22.05	21.64	22.31
		RB Size=36, RB Offset=18	22.08	21.35	22.16
		RB Size=36, RB Offset=37	22.09	22.83	22.09
		RB Size=75, RB Offset=0	22.13	22.85	22.45
20.0	QPSK	RB Size=1, RB Offset=0	22.03	21.89	22.04
		RB Size=1, RB Offset=49	22.45	21.68	22.4
		RB Size=1, RB Offset=99	22.11	23.25	22.45
		RB Size=50, RB Offset=0	22.04	22.95	22.25
		RB Size=50, RB Offset=24	22.25	22.38	22.24
		RB Size=50, RB Offset=49	22.33	22.31	22.23
		RB Size=100, RB Offset=0	22.01	22.58	22.06
	16QAM	RB Size=1, RB Offset=0	22.01	22.57	22.19
		RB Size=1, RB Offset=49	22.62	21.89	22.42
		RB Size=1, RB Offset=99	22.47	21.89	22.26
		RB Size=50, RB Offset=0	22.45	22.65	22.17
		RB Size=50, RB Offset=24	22.49	22.57	22.05
		RB Size=50, RB Offset=49	22.25	22.86	22.39
		RB Size=100, RB Offset=0	22.41	22.14	22.27

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	4.61	13	Pass
16QAM (100%RB Size)	5.64	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	80.77	121	2.3	H	17.2	0.40	8.52	25.32	30
1732.50	75.34	301	2.2	V	9.8	0.40	8.52	17.92	30
3 MHz Bandwidth									
1732.50	78.77	66	1.8	H	15.2	0.40	8.52	23.32	30
1732.50	73.74	77	1.7	V	8.2	0.40	8.52	16.32	30
5 MHz Bandwidth									
1732.50	78.27	55	1.8	H	14.7	0.40	8.52	22.82	30
1732.50	72.04	201	2.5	V	6.5	0.40	8.52	14.62	30
10 MHz Bandwidth									
1732.50	76.87	83	2.0	H	13.3	0.40	8.52	21.42	30
1732.50	72.04	313	1.5	V	6.5	0.40	8.52	14.62	30
15 MHz Bandwidth									
1732.50	75.17	120	1.9	H	11.6	0.40	8.52	19.72	30
1732.50	71.44	334	1.5	V	5.9	0.40	8.52	14.02	30
20 MHz Bandwidth									
1732.50	75.27	33	1.5	H	11.7	0.40	8.52	19.82	30
1732.50	70.94	233	1.5	V	5.4	0.40	8.52	13.52	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	79.17	92	2.2	H	15.6	0.40	8.52	23.72	30
1732.50	74.24	309	1.5	V	8.7	0.40	8.52	16.82	30
3 MHz Bandwidth									
1732.50	76.67	214	2.3	H	13.1	0.40	8.52	21.22	30
1732.50	74.04	173	1.9	V	8.5	0.40	8.52	16.62	30
5 MHz Bandwidth									
1732.50	77.37	147	1.8	H	13.8	0.40	8.52	21.92	30
1732.50	74.24	286	1.0	V	8.7	0.40	8.52	16.82	30
10 MHz Bandwidth									
1732.50	75.27	282	2.0	H	11.7	0.40	8.52	19.82	30
1732.50	72.84	347	1.3	V	7.3	0.40	8.52	15.42	30
15 MHz Bandwidth									
1732.50	75.37	52	1.2	H	11.8	0.40	8.52	19.92	30
1732.50	72.44	174	2.1	V	6.9	0.40	8.52	15.02	30
20 MHz Bandwidth									
1732.50	74.77	294	1.1	H	11.2	0.40	8.52	19.32	30
1732.50	71.84	174	1.1	V	6.3	0.40	8.52	14.42	30

LTE Band 5:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	RB Size=1, RB Offset=0	22.25	22.16	22.15
		RB Size=1, RB Offset=2	22.13	22.05	22.08
		RB Size=1, RB Offset=5	22.17	22.68	22.49
		RB Size=3, RB Offset=0	22.13	22.05	22.02
		RB Size=3, RB Offset=1	22.54	22.63	22.22
		RB Size=3, RB Offset=2	22.42	22.54	22.03
		RB Size=6, RB Offset=0	22.44	21.61	22.12
	16QAM	RB Size=1, RB Offset=0	22.42	22.76	22.47
		RB Size=1, RB Offset=2	22.35	22.62	22.11
		RB Size=1, RB Offset=5	22.38	23.12	22.25
		RB Size=3, RB Offset=0	22.12	21.89	22.22
		RB Size=3, RB Offset=1	22.13	22.69	22.24
		RB Size=3, RB Offset=2	22.24	21.42	22.4
		RB Size=6, RB Offset=0	22.07	21.25	22.03
3M	QPSK	RB Size=1, RB Offset=0	22.31	22.72	22.4
		RB Size=1, RB Offset=7	22.49	22.93	22.14
		RB Size=1, RB Offset=14	22.15	22.85	22.27
		RB Size=8, RB Offset=0	22.32	21.74	22.12
		RB Size=8, RB Offset=4	22.07	22.32	22.49
		RB Size=8, RB Offset=7	22.25	22.83	22.46
		RB Size=15, RB Offset=0	22.35	21.64	22.46
	16QAM	RB Size=1, RB Offset=0	22.53	21.54	22.12
		RB Size=1, RB Offset=7	22.17	21.54	22.05
		RB Size=1, RB Offset=14	22.23	21.87	22.07
		RB Size=8, RB Offset=0	22.17	21.67	22.23
		RB Size=8, RB Offset=4	22.17	21.36	22.01
		RB Size=8, RB Offset=7	22.37	22.11	22.22
		RB Size=15, RB Offset=0	22.21	21.65	22.24

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.21	22.35	22.38
		RB Size=1, RB Offset=12	22.16	21.97	22.03
		RB Size=1, RB Offset=24	22.04	22.86	22.19
		RB Size=12, RB Offset=0	22.03	21.52	22.02
		RB Size=12, RB Offset=6	22.21	21.24	22.04
		RB Size=12, RB Offset=11	22.56	21.65	22.01
		RB Size=25, RB Offset=0	22.42	22.35	22.35
	16QAM	RB Size=1, RB Offset=0	22.41	22.92	22.23
		RB Size=1, RB Offset=12	22.44	22.01	22.21
		RB Size=1, RB Offset=24	22.22	21.02	22.47
		RB Size=12, RB Offset=0	22.27	22.41	22.05
		RB Size=12, RB Offset=6	22.56	21.35	22.05
		RB Size=12, RB Offset=11	22.02	22.92	22.03
		RB Size=25, RB Offset=0	22.55	21.72	22.15
10.0	QPSK	RB Size=1, RB Offset=0	22.44	21.87	22.41
		RB Size=1, RB Offset=24	22.17	21.68	22.15
		RB Size=1, RB Offset=49	22.27	22.48	22.47
		RB Size=25, RB Offset=0	22.08	22.48	22.29
		RB Size=25, RB Offset=12	22.43	21.54	22.21
		RB Size=25, RB Offset=24	22.49	21.13	22.17
		RB Size=50, RB Offset=0	22.21	21.34	22.19
	16QAM	RB Size=1, RB Offset=0	22.32	22.25	22.49
		RB Size=1, RB Offset=24	22.12	22.31	22.01
		RB Size=1, RB Offset=49	22.11	21.64	22.13
		RB Size=25, RB Offset=0	22.26	21.92	22.44
		RB Size=25, RB Offset=12	22.12	22.14	22.33
		RB Size=25, RB Offset=24	22.06	22.99	22.36
		RB Size=50, RB Offset=0	22.14	21.81	22.38

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	4.12	13	Pass
16QAM (100%RB Size)	5.36	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	80.19	114	1.0	H	10.5	0.26	4.75	14.99	38.45
836.5	92.16	328	1.6	V	18.4	0.26	4.75	22.89	38.45
3 MHz Bandwidth									
836.5	82.36	81	1.0	H	12.7	0.26	4.75	17.19	38.45
836.5	94.06	89	2.3	V	20.3	0.26	4.75	24.79	38.45
5 MHz Bandwidth									
836.5	77.02	33	1.1	H	7.3	0.26	4.75	11.79	38.45
836.5	91.54	247	1.4	V	17.8	0.26	4.75	22.29	38.45
10 MHz Bandwidth									
836.5	77.86	40	1.1	H	8.2	0.26	4.75	12.69	38.45
836.5	90.19	143	1.4	V	16.5	0.26	4.75	20.99	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	81.86	218	1.5	H	12.2	0.26	4.75	16.69	38.45
836.5	93.29	35	1.2	V	19.6	0.26	4.75	24.09	38.45
3 MHz Bandwidth									
836.5	82.33	266	1.6	H	12.6	0.26	4.75	17.09	38.45
836.5	94.49	52	1.0	V	20.8	0.26	4.75	25.29	38.45
5 MHz Bandwidth									
836.5	79.83	75	2.1	H	10.1	0.26	4.75	14.59	38.45
836.5	92.06	309	1.5	V	18.3	0.26	4.75	22.79	38.45
10 MHz Bandwidth									
836.5	78.86	174	1.7	H	9.2	0.26	4.75	13.69	38.45
836.5	91.65	128	1.7	V	17.9	0.26	4.75	22.39	38.45

LTE Band 7**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.39	22.23	22.29
		RB Size=1, RB Offset=12	22.45	22.38	22.44
		RB Size=1, RB Offset=24	22.45	22.18	22.03
		RB Size=12, RB Offset=0	22.44	21.99	22.47
		RB Size=12, RB Offset=6	22.25	21.84	22.48
		RB Size=12, RB Offset=11	22.06	22.14	22.23
		RB Size=25, RB Offset=0	22.42	22.87	22.55
	16QAM	RB Size=1, RB Offset=0	22.35	22.89	22.19
		RB Size=1, RB Offset=12	22.35	21.58	22.26
		RB Size=1, RB Offset=24	22.15	21.65	22.11
		RB Size=12, RB Offset=0	22.21	21.52	22.36
		RB Size=12, RB Offset=6	22.42	22.32	22.09
		RB Size=12, RB Offset=11	22.33	22.39	22.13
		RB Size=25, RB Offset=0	22.03	22.67	22.23
10.0	QPSK	RB Size=1, RB Offset=0	22.18	22.85	22.1
		RB Size=1, RB Offset=24	22.09	21.59	22.41
		RB Size=1, RB Offset=49	22.22	22.57	22.16
		RB Size=25, RB Offset=0	22.05	22.01	22.44
		RB Size=25, RB Offset=12	22.37	22.85	22.4
		RB Size=25, RB Offset=24	22.29	21.38	22.25
		RB Size=50, RB Offset=0	22.47	21.58	22.13
	16QAM	RB Size=1, RB Offset=0	22.47	21.93	22.02
		RB Size=1, RB Offset=24	22.12	22.59	22.04
		RB Size=1, RB Offset=49	22.34	21.56	22.21
		RB Size=25, RB Offset=0	22.41	21.59	22.21
		RB Size=25, RB Offset=12	22.57	22.54	22.26
		RB Size=25, RB Offset=24	22.12	21.68	22.29
		RB Size=50, RB Offset=0	22.28	22.48	22.29

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.35	21.56	22.42
		RB Size=1, RB Offset=37	22.29	22.19	22.23
		RB Size=1, RB Offset=74	22.15	21.11	22.47
		RB Size=36, RB Offset=0	22.14	21.39	22.52
		RB Size=36, RB Offset=18	22.32	22.51	22.18
		RB Size=36, RB Offset=37	22.18	22.82	22.23
		RB Size=75, RB Offset=0	22.15	21.91	22.24
	16QAM	RB Size=1, RB Offset=0	22.06	21.46	22.12
		RB Size=1, RB Offset=37	22.03	21.81	22.27
		RB Size=1, RB Offset=74	22.45	22.54	22.22
		RB Size=36, RB Offset=0	22.44	22.12	22.48
		RB Size=36, RB Offset=18	22.12	22.93	22.24
		RB Size=36, RB Offset=37	22.01	21.45	22.43
		RB Size=75, RB Offset=0	22.08	21.59	22.48
20.0	QPSK	RB Size=1, RB Offset=0	22.08	21.45	22.36
		RB Size=1, RB Offset=49	22.26	22.52	22.35
		RB Size=1, RB Offset=99	22.25	21.26	22.18
		RB Size=50, RB Offset=0	22.43	22.47	22.21
		RB Size=50, RB Offset=24	22.04	22.81	22.11
		RB Size=50, RB Offset=49	22.41	21.42	22.32
		RB Size=100, RB Offset=0	22.41	21.85	22.49
	16QAM	RB Size=1, RB Offset=0	22.46	21.69	22.23
		RB Size=1, RB Offset=49	22.25	22.31	22.37
		RB Size=1, RB Offset=99	22.23	21.34	22.28
		RB Size=50, RB Offset=0	22.09	21.35	22.65
		RB Size=50, RB Offset=24	22.04	22.98	22.26
		RB Size=50, RB Offset=49	22.02	21.37	22.44
		RB Size=100, RB Offset=0	22.14	21.89	22.52

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	4.39	13	Pass
16QAM (100%RB Size)	6.46	13	Pass

EIRP:**QPSK:**

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
2535.00	72.66	3	1.7	H	10.1	0.49	10.10	19.71	33
2535.00	72.47	58	2.3	V	9.2	0.49	10.10	18.81	33
10 MHz Bandwidth									
2535.00	72.26	163	1.3	H	9.7	0.49	10.10	19.31	33
2535.00	71.37	261	1.8	V	8.1	0.49	10.10	17.71	33
15 MHz Bandwidth									
2535.00	72.36	332	2.2	H	9.8	0.49	10.10	19.41	33
2535.00	70.87	3	2.4	V	7.6	0.49	10.10	17.21	33
20 MHz Bandwidth									
2535.00	72.26	253	1.2	H	9.7	0.49	10.10	19.31	33
2535.00	70.37	212	1.8	V	7.1	0.49	10.10	16.71	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
2535.00	73.06	246	1.2	H	10.5	0.49	10.10	20.11	33
2535.00	70.07	185	2.4	V	6.8	0.49	10.10	16.41	33
10 MHz Bandwidth									
2535.00	72.56	63	1.5	H	10.0	0.49	10.10	19.61	33
2535.00	70.37	164	1.9	V	7.1	0.49	10.10	16.71	33
15 MHz Bandwidth									
2535.00	71.96	229	2.3	H	9.4	0.49	10.10	19.01	33
2535.00	70.07	341	1.2	V	6.8	0.49	10.10	16.41	33
20 MHz Bandwidth									
2535.00	71.26	226	1.5	H	8.7	0.49	10.10	18.31	33
2535.00	69.67	153	1.5	V	6.4	0.49	10.10	16.01	33

Note:

All above data were tested with no amplifier

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53 - OCCUPIED BANDWIDTH

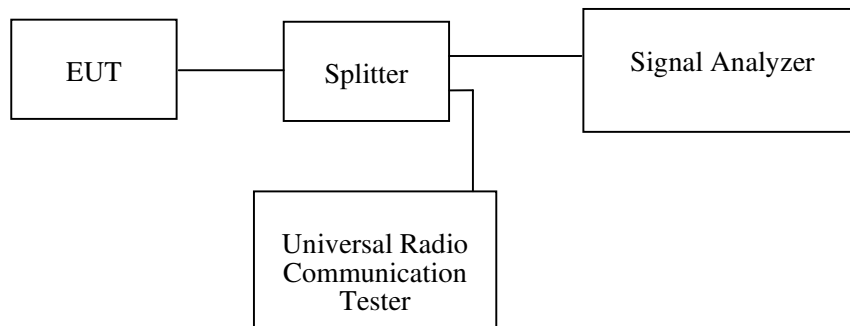
Applicable Standard

FCC 47 §2.1049, §22.917, §22.905, §24.238 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:	23~25 °C
Relative Humidity:	45~50 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Echo Wu on 2017-06-22 and 2017-06-28.

EUT operation mode: transmitting

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

Cellular Band (Part 22H)

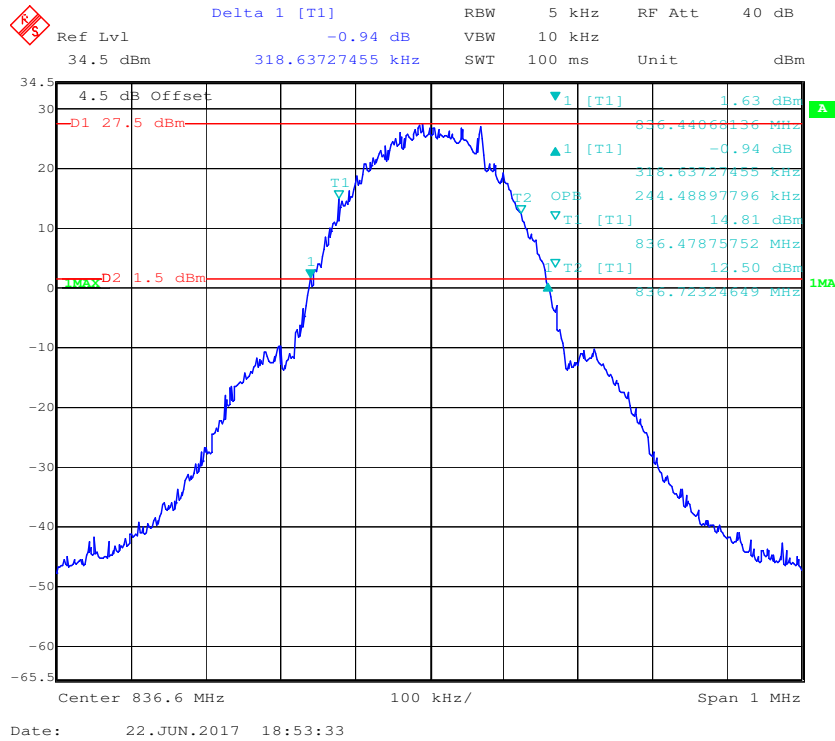
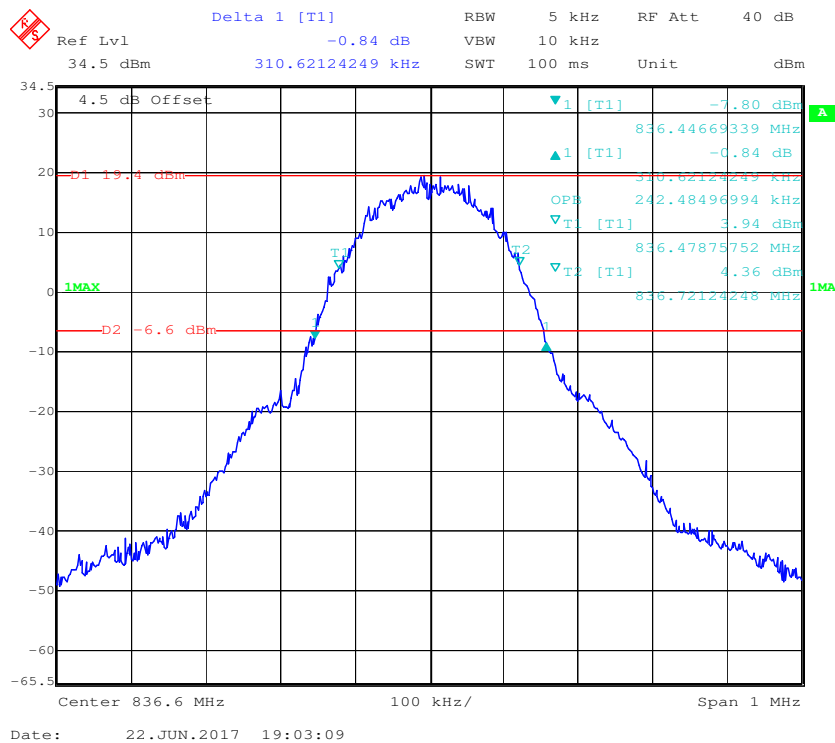
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	244.5	318.6
EGPRS(8PSK)	836.6	242.5	310.6

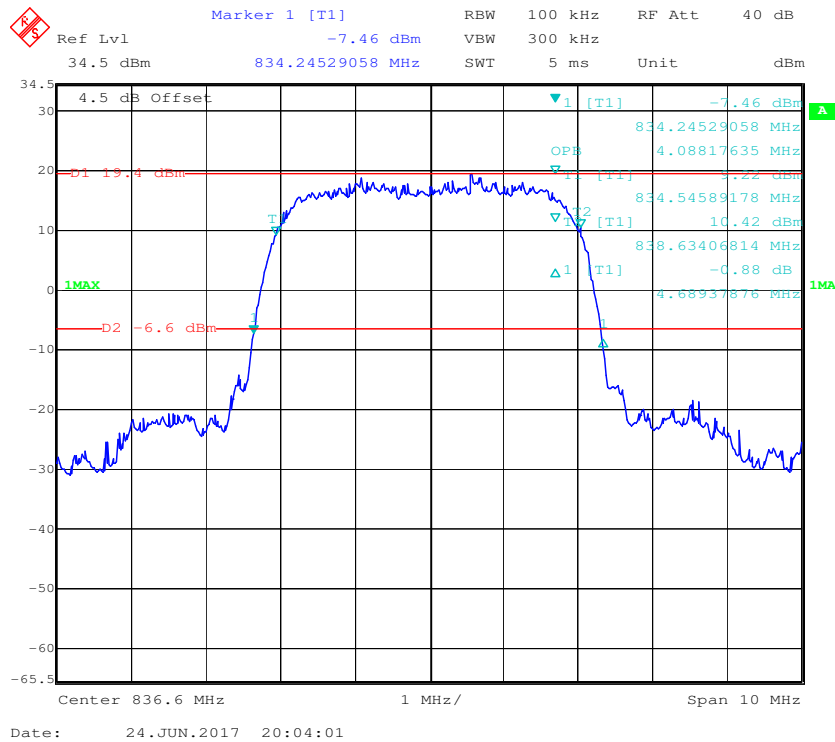
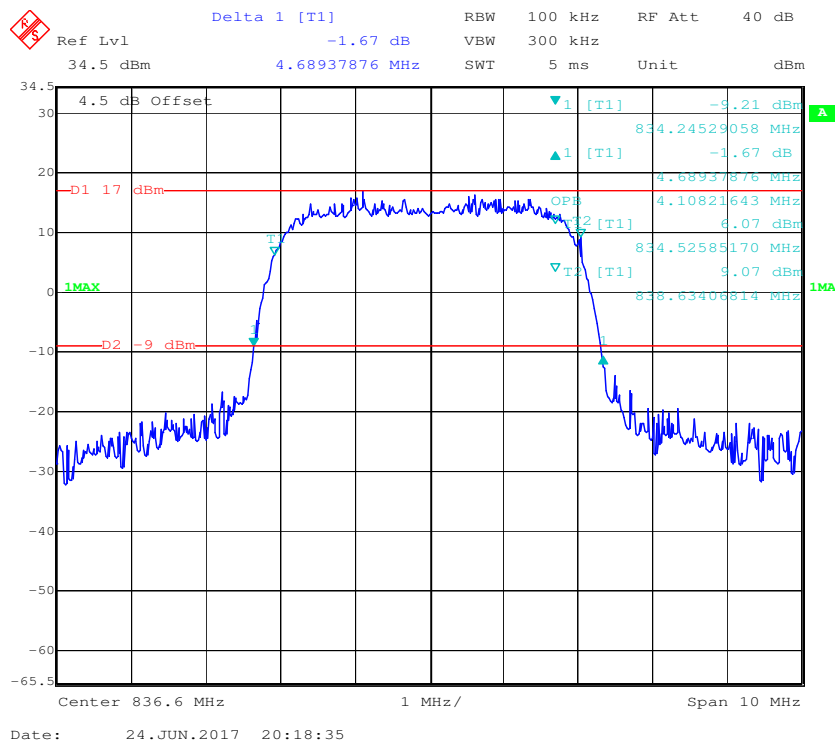
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.09	4.69
HSUPA (BPSK)	836.6	4.11	4.69
HSDPA (16QAM)	836.6	4.09	4.69

PCS Band (Part 24E)

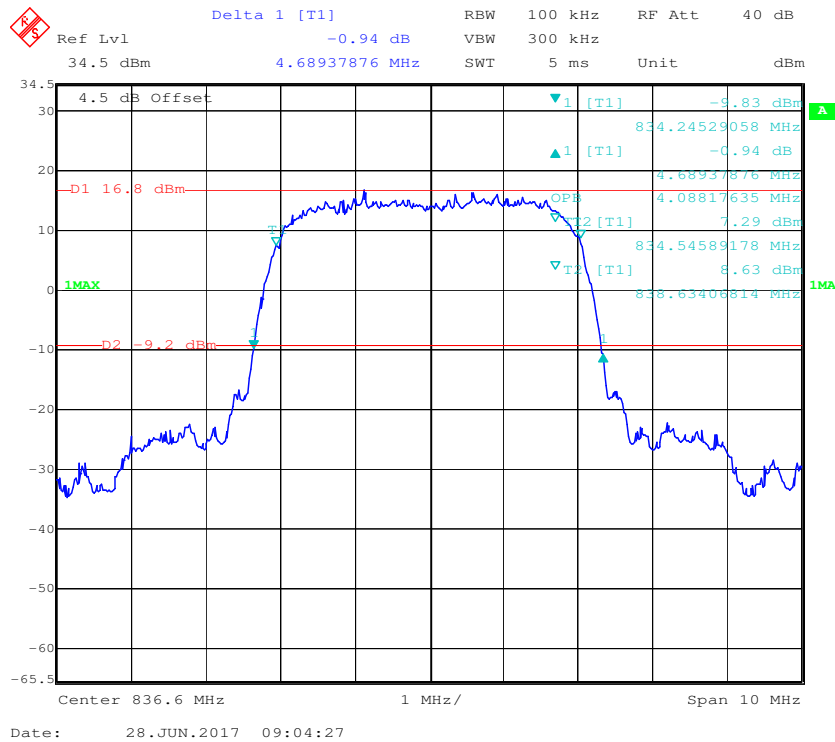
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	242.5	314.6
EGPRS(8PSK)	1880.0	234.5	300.6

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.11	4.67
HSUPA (BPSK)	1880.0	4.11	4.69
HSDPA (16QAM)	1880.0	4.11	4.67

Cellular Band (Part 22H)**26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode****26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode**

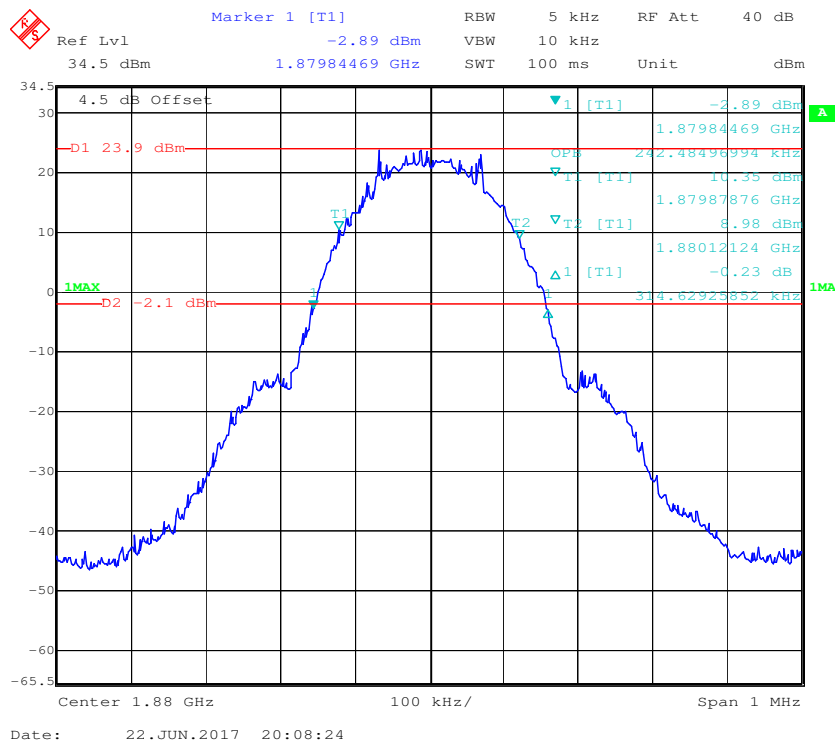
26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode**26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode**

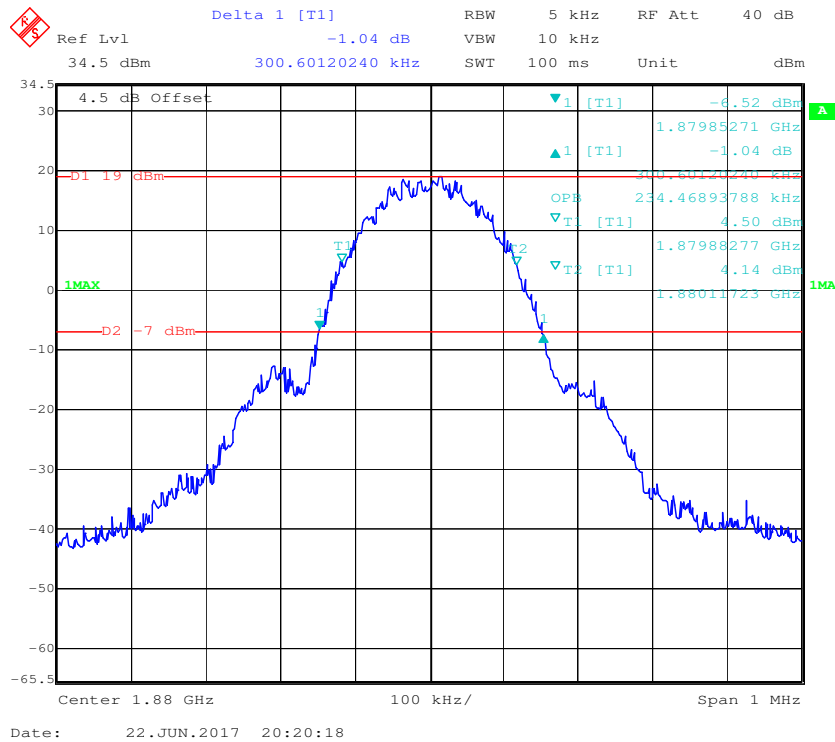
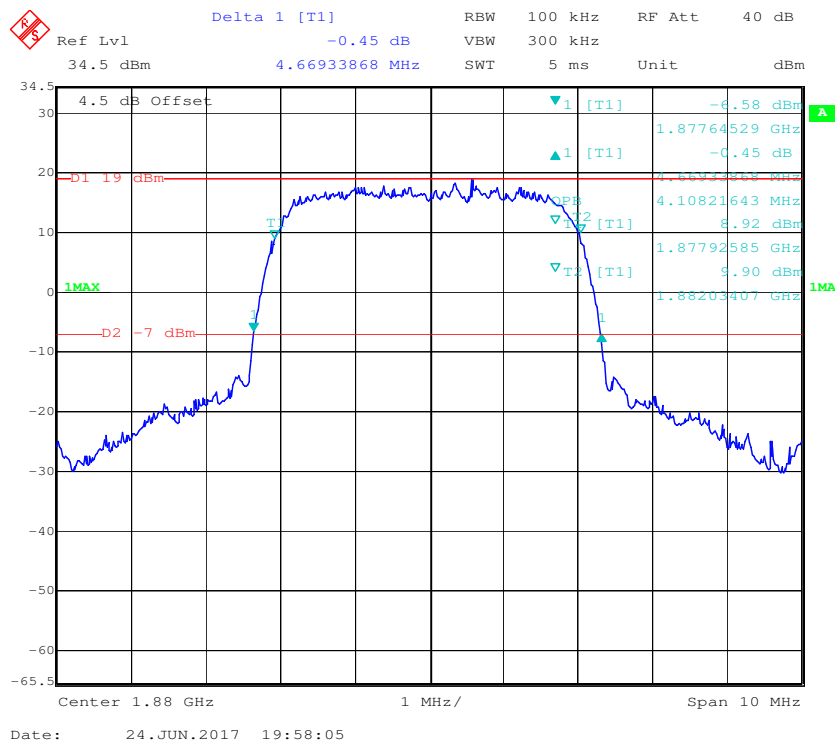
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode

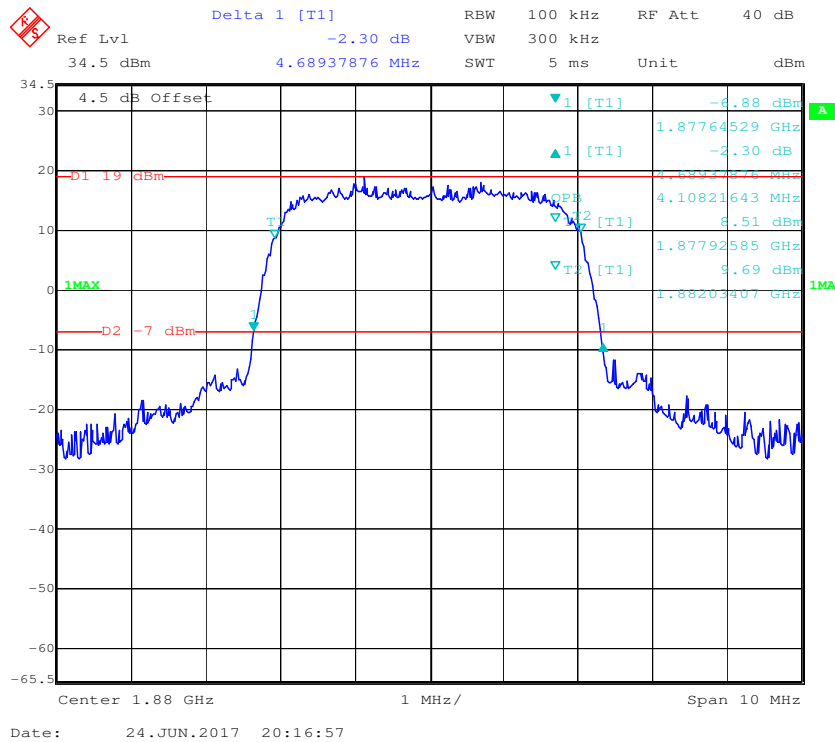
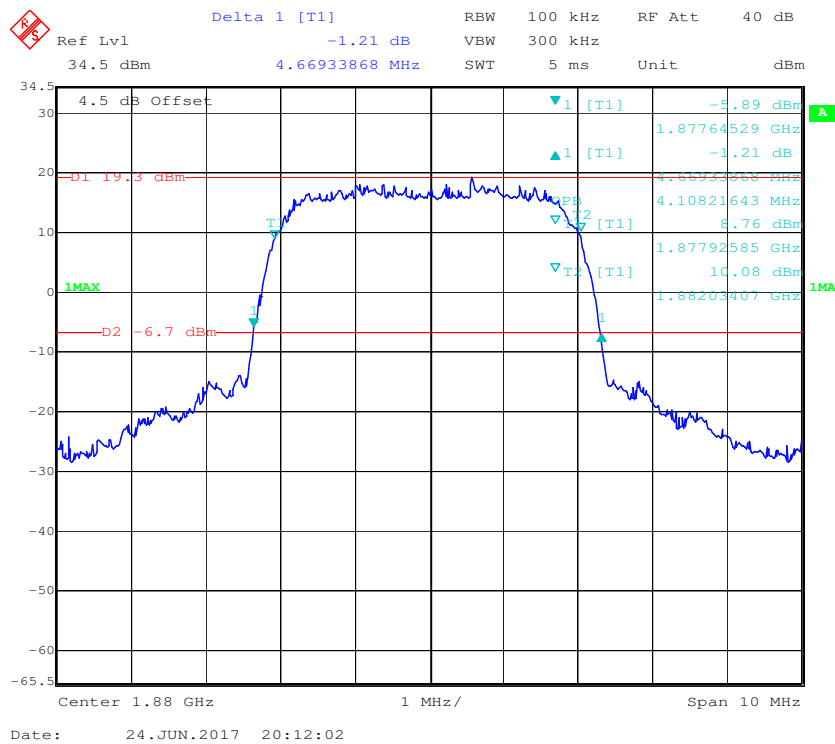


PCS Band (Part 24E)

26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode

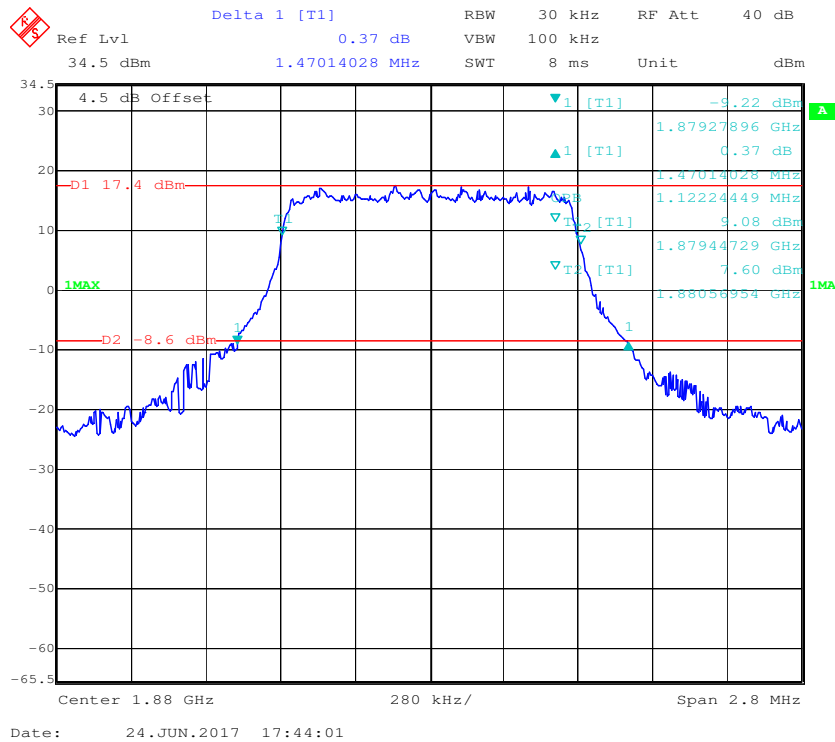
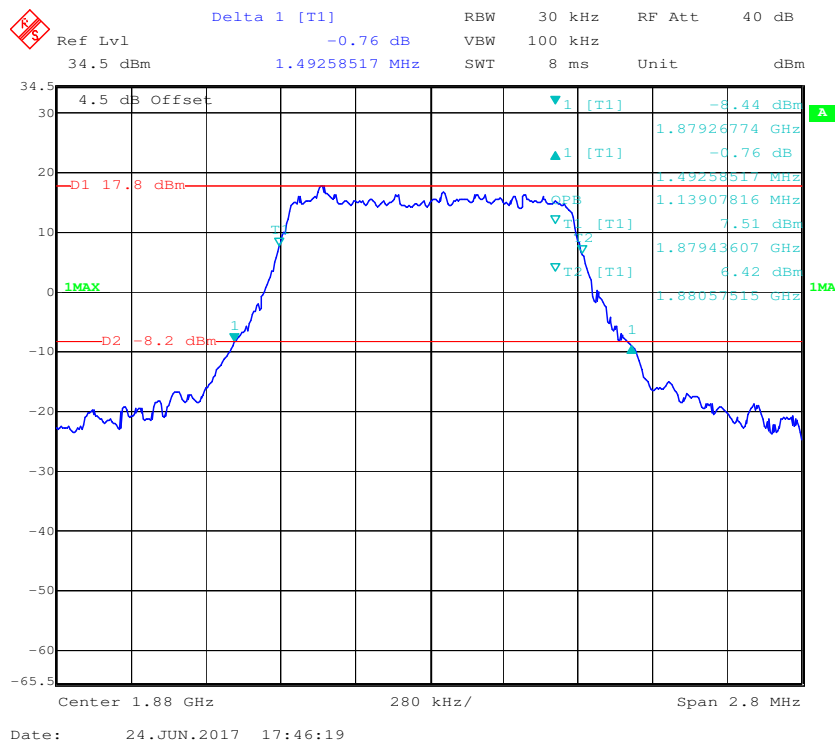


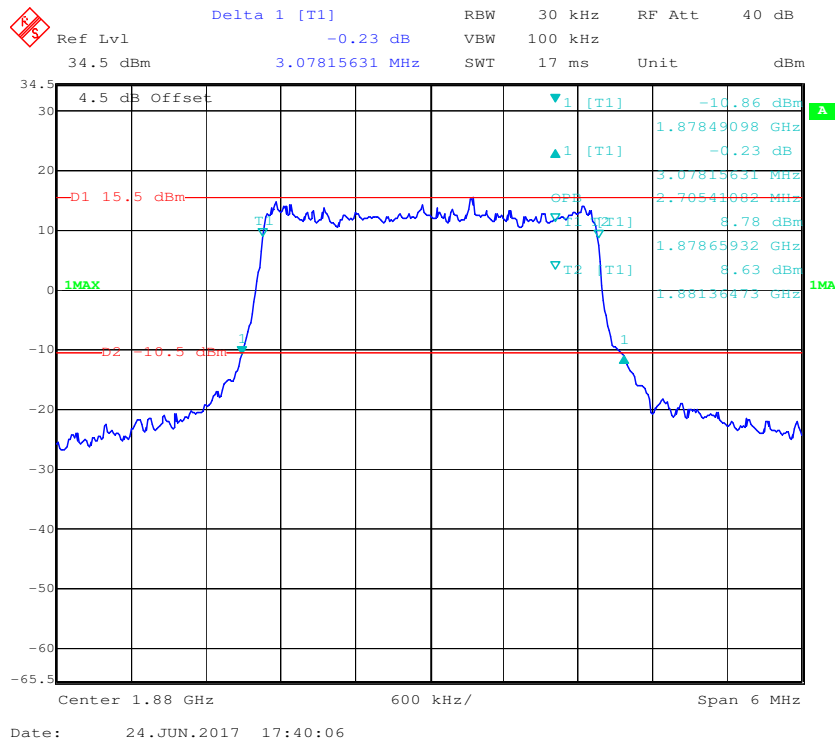
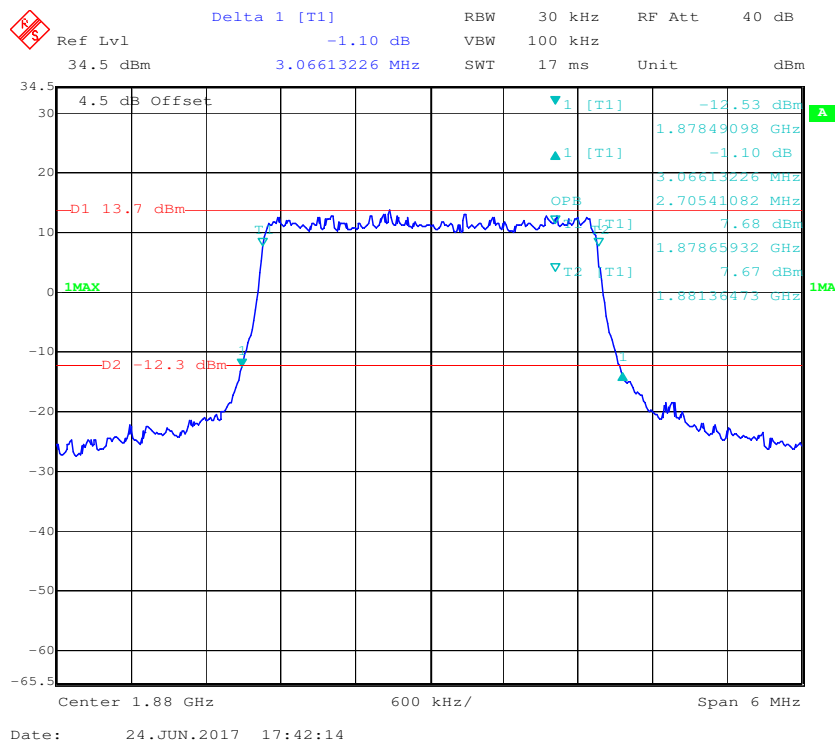
26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode**26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode**

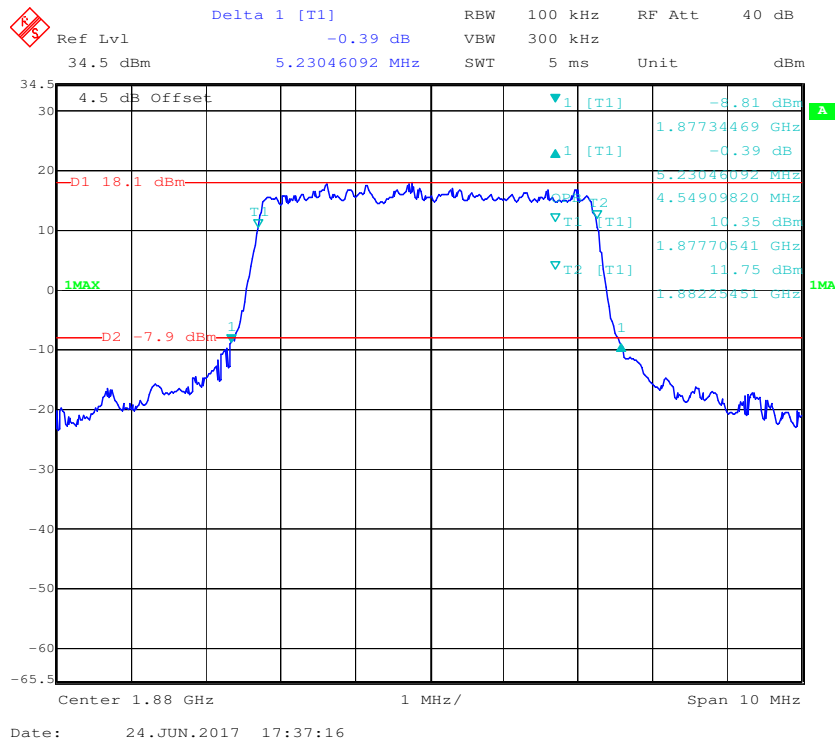
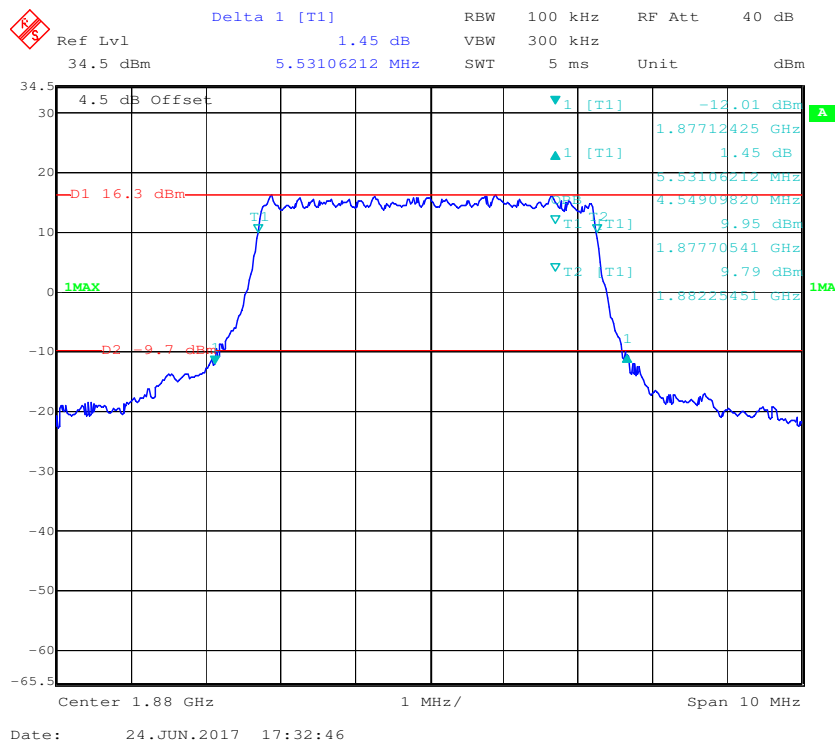
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode**26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode**

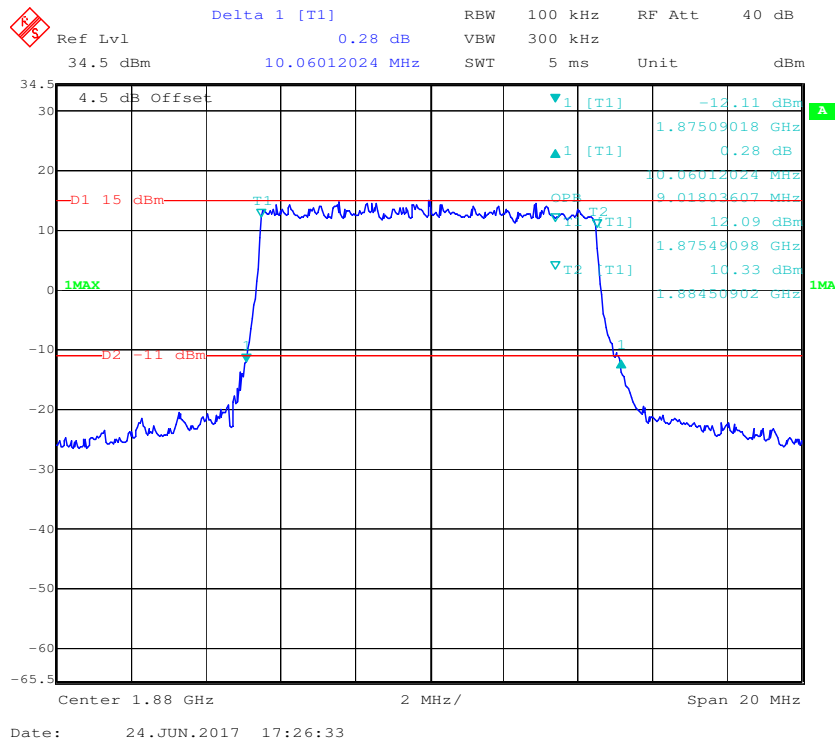
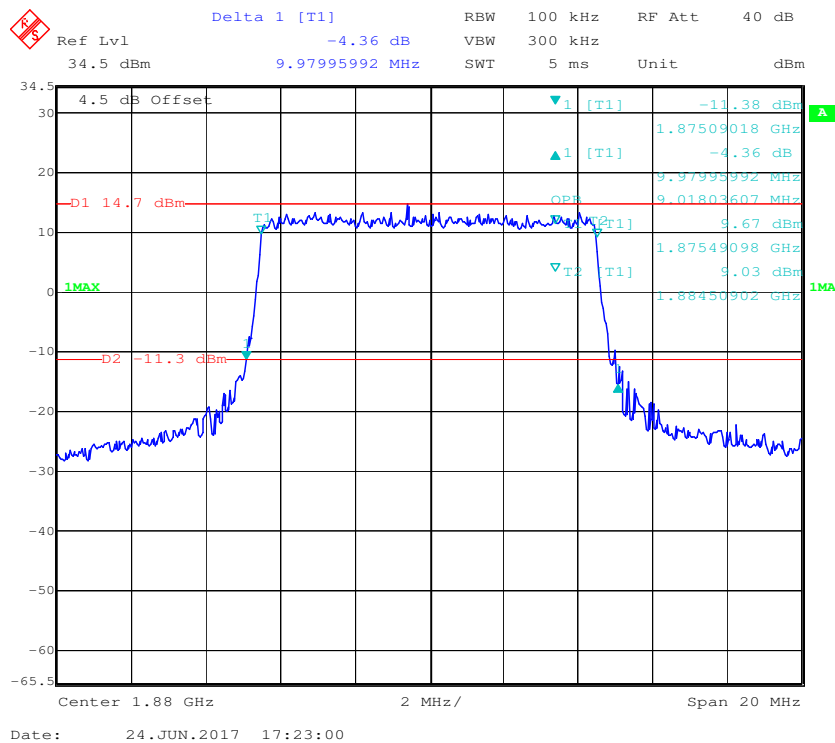
LTE Band 2: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.122	1.470
	16QAM	1.139	1.493
3.0	QPSK	2.705	3.078
	16QAM	2.705	3.066
5.0	QPSK	4.549	5.230
	16QAM	4.549	5.531
10.0	QPSK	9.018	10.060
	16QAM	9.018	9.980
15.0	QPSK	13.647	15.391
	16QAM	13.527	15.210
20.0	QPSK	18.036	20.040
	16QAM	18.036	20.441

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

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

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

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

Delta 1 [T1] -0.88 dB

Ref Lvl 34.5 dBm 15.39078156 MHz

RBW 300 kHz VBW 1 MHz RF Att 40 dB

SWT 5 ms Unit dBm

4.5 dB Offset

D1 17.3 dBm

D2 -8.7 dBm

1MAX

1MA

Center 1.88 GHz 3 MHz/ Span 30 MHz

34.5
30
20
10
0
-10
-20
-30
-40
-50
-60
-65.5

1.87221443 GHz
15.39078156 MHz
13.64729459 MHz
10.87 dBm
1.87317635 GHz
10.86 dBm
1.88682365 GHz

1 [T1] -8.99 dBm
1 [T1] -0.88 dB
T1 [T1]
T2 [T1]
T2 [T1]

Ref Lvl 34.5 dBm Delta 1 [T1] -1.46 dB RBW 300 kHz RF Att 40 dB

34.5 dBm 15.21042084 MHz SWT 5 ms Unit dBm

4.5 dB Offset

D1 16.4 dBm

D2 -9.6 dBm

1MAX

1 [T1] -5.78 dBm

1.87245491 GHz

1.46 dB

15.21042084 MHz

13.52705411 MHz

12.30 dBm

1.87323647 GHz

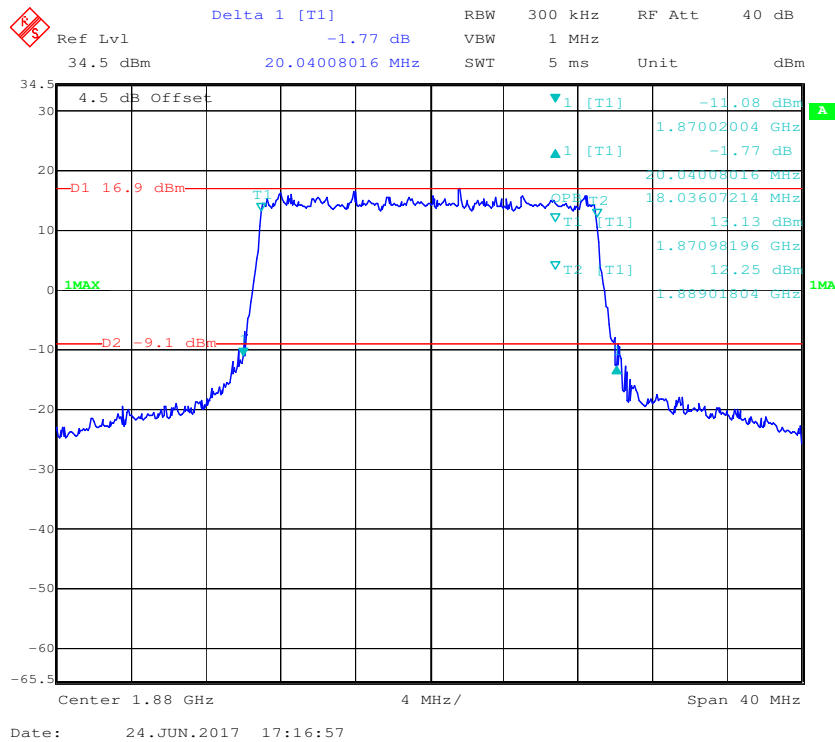
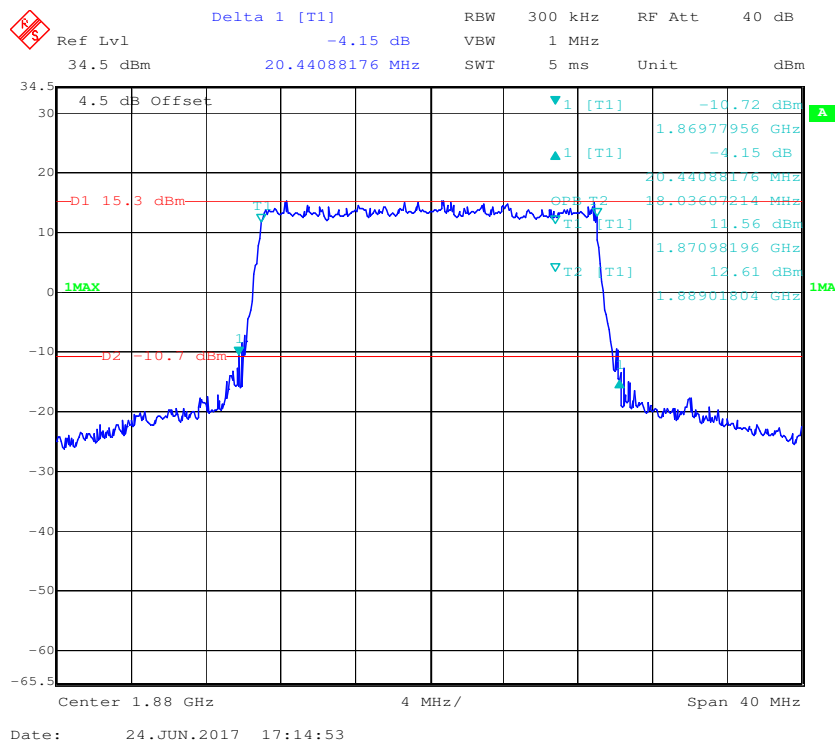
13.15 dBm

1.88676353 GHz

1MAX

Center 1.88 GHz 3 MHz/ Span 30 MHz

Date: 24.JUN.2017 17:18:47

QPSK (20.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**16-QAM (20.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**

LTE Band 4: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.117	1.487
	16QAM	1.139	1.465
3.0	QPSK	2.705	3.090
	16QAM	2.705	3.054
5.0	QPSK	4.549	5.371
	16QAM	4.549	5.471
10.0	QPSK	9.018	9.900
	16QAM	8.978	9.980
15.0	QPSK	13.527	15.331
	16QAM	13.527	15.210
20.0	QPSK	17.956	19.800
	16QAM	18.036	19.960

Delta 1 [T1]

Ref Lvl	-1.08 dB	RBW	30 kHz	RF Att	40 dB
34.5 dBm	1.48697395 MHz	SWT	8 ms	Unit	dBm

4.5 dB Offset

D1 16.8 dBm

D2 -9.2 dBm

T1 [T1] -8.30 dBm
1.73176212 GHz

T2 [T1] -1.08 dB
1.48697395 MHz

T3 [T1] 1.11663327 MHz

T4 [T1] 7.68 dBm
1.73194729 GHz

T5 [T1] 7.75 dBm
1.73306393 GHz

Center 1.7325 GHz 280 kHz/ Span 2.8 MHz

Date: 23.JUN.2017 20:24:57

Delta 1 [T1] -0.27 dB

Ref Lvl 34.5 dBm 1.46452906 MHz

RBW 30 kHz RF Att 40 dB

VBW 100 kHz

SWT 8 ms Unit dBm

4.5 dB Offset

D1 17.2 dBm

D2 -8.8 dBm

1MAX

1 [T1] -6.87 dBm

1 [T1] 1.73177896 GHz

1 [T1] -0.27 dBm

1 [T1] 1.46452906 MHz

1 [T1] 1.13907816 MHz

1 [T1] 6.61 dBm

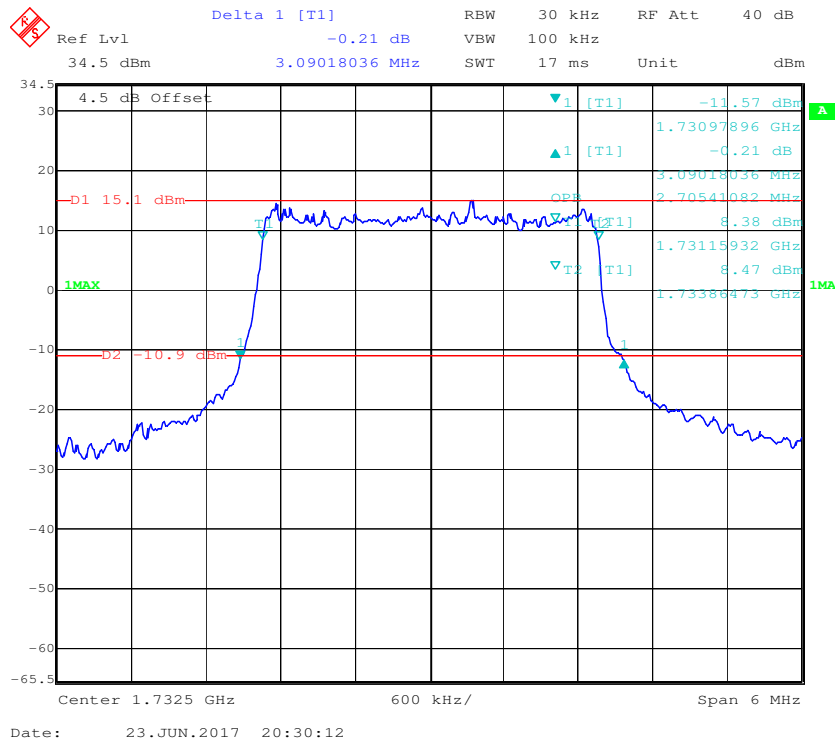
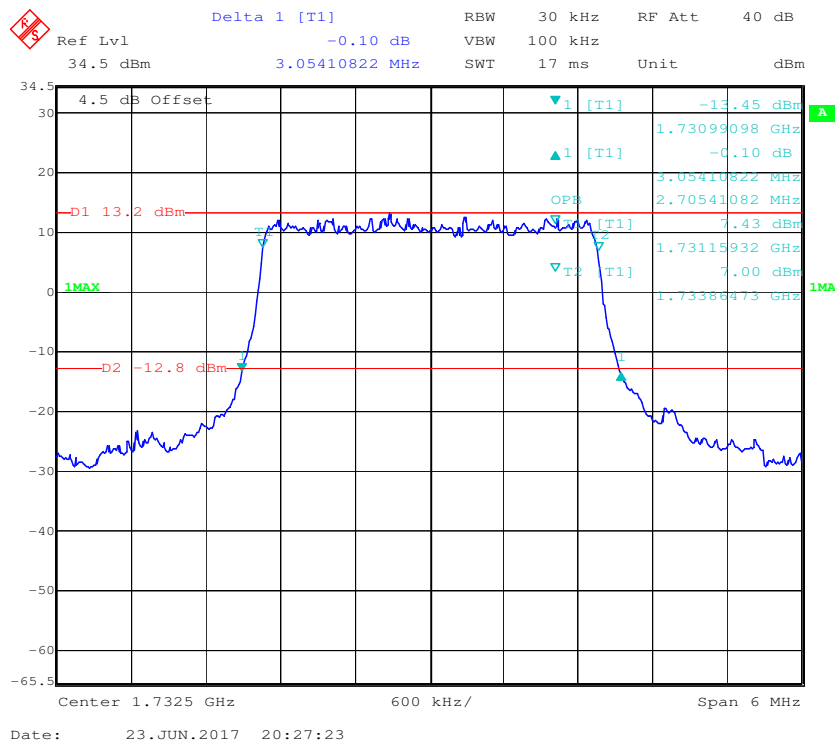
1 [T1] 1.73193607 GHz

1 [T1] 6.32 dBm

1 [T1] 1.73307515 GHz

Center 1.7325 GHz 280 kHz/ Span 2.8 MHz

Date: 23.JUN.2017 20:23:04

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

Delta 1 [T1]

Ref Lvl -1.47 dB

RBW 100 kHz

RF Att 40 dB

34.5 dBm

5.37074148 MHz

SWT 5 ms

Unit dBm

4.5 dB Offset

D1 17.3 dBm

D2 -8.7 dBm

1MAX

1MA

Center 1.7325 GHz

1 MHz/

Span 10 MHz

Date: 23.JUN.2017 20:33:17

Delta 1 [T1]

Ref Lvl -0.57 dB

34.5 dBm 5.47094188 MHz

RBW 100 kHz RF Att 40 dB

VBW 300 kHz

SWT 5 ms Unit dBm

4.5 dB Offset

D1 15.3 dBm

D2 -10.7 dBm

1MAX

1 [T1]

2 [T1]

1.72968437 GHz -16.50 dBm

1.72968437 GHz -6.57 dBm

5.47094188 MHz 5.47094188 MHz

4.54909820 MHz 9.29 dBm

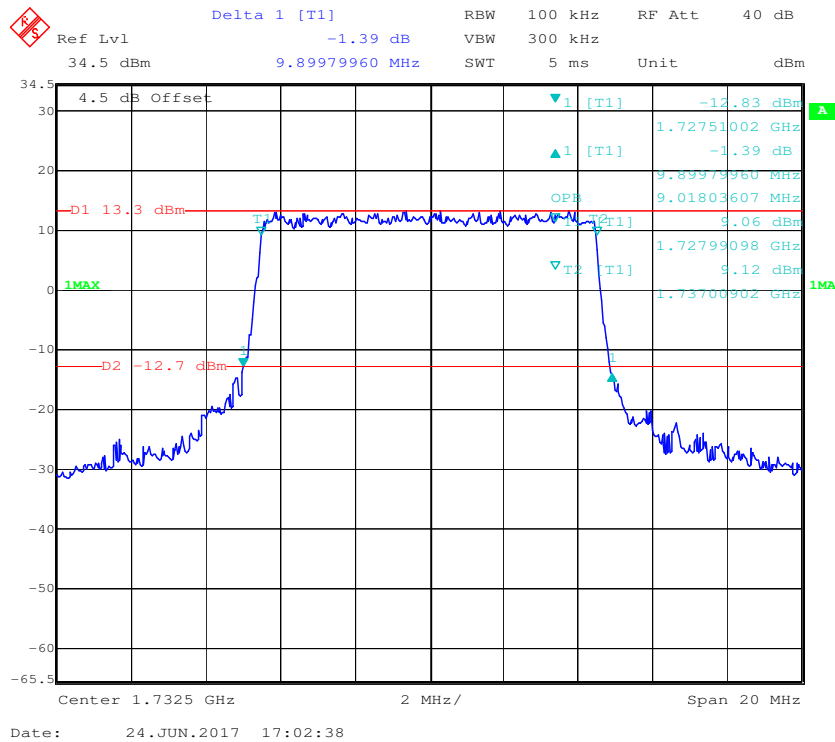
1.73020541 GHz 9.75 dBm

1.73475451 GHz

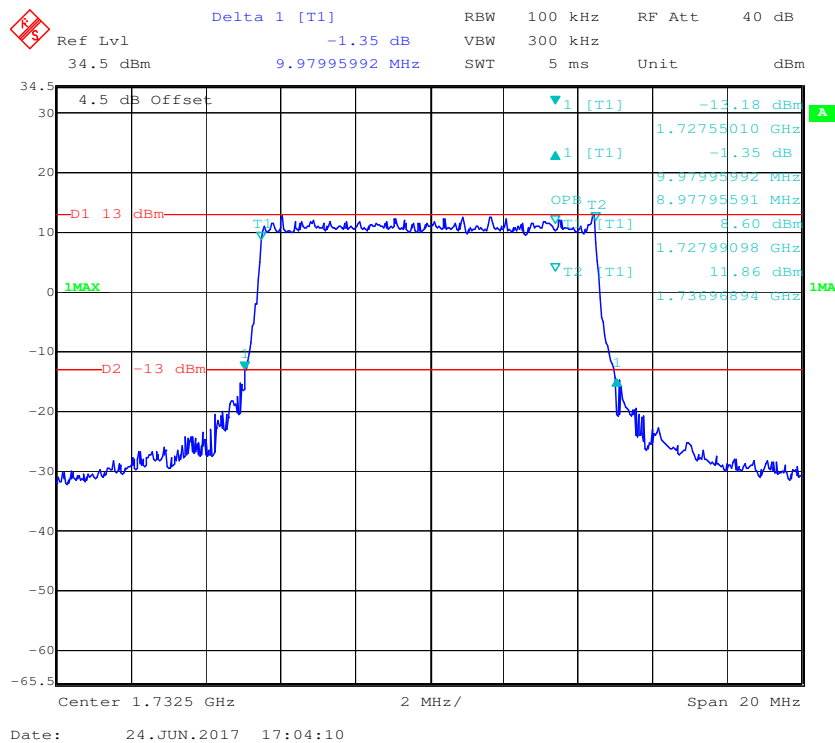
Center 1.7325 GHz 1 MHz/ Span 10 MHz

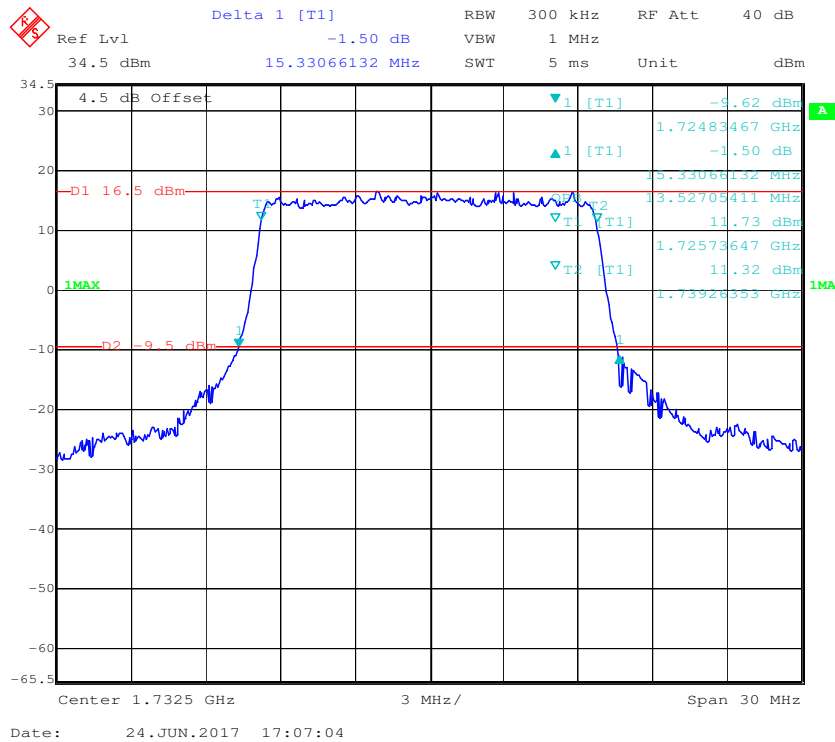
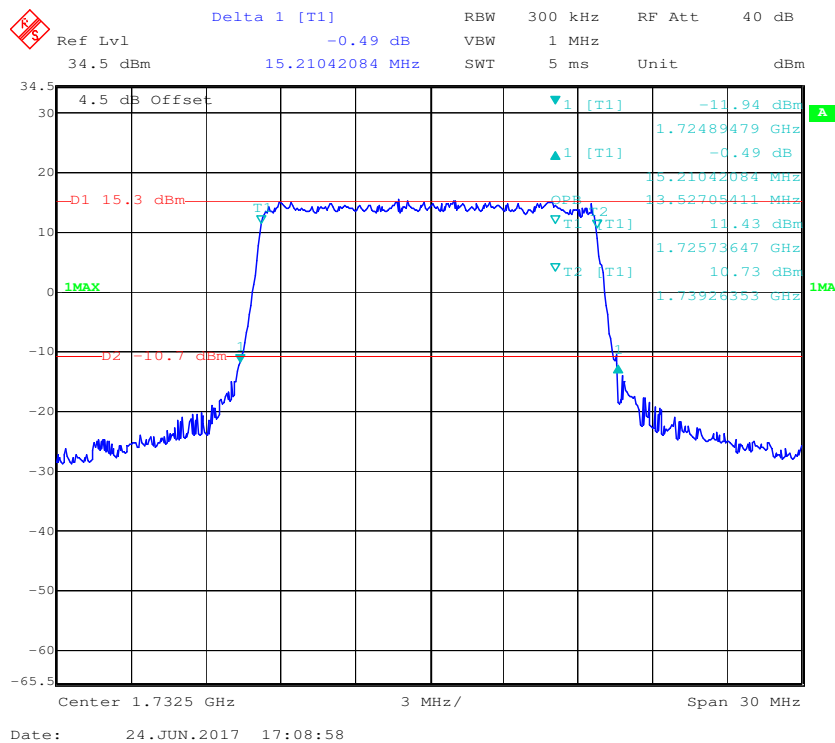
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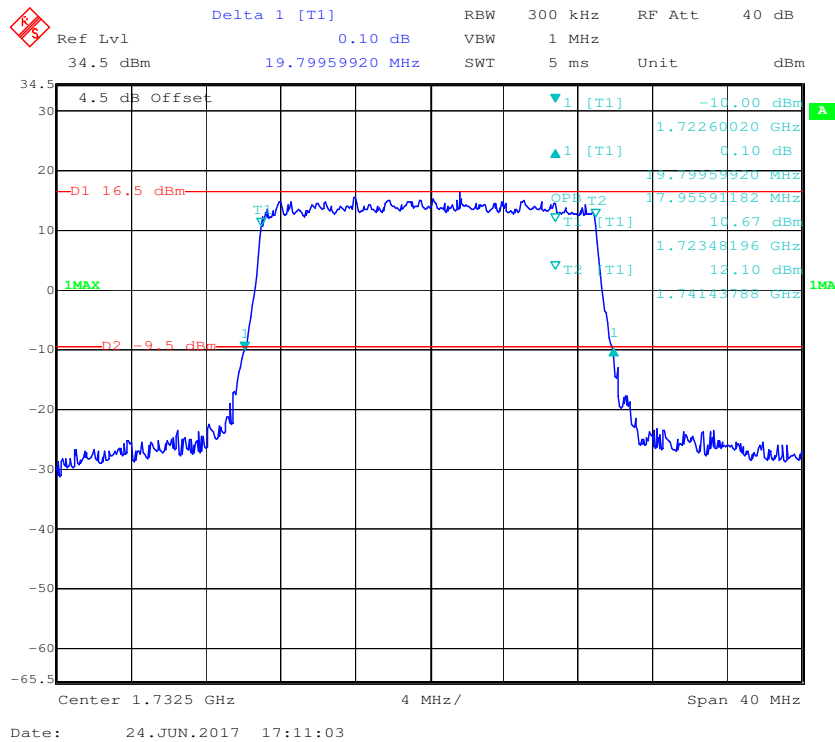
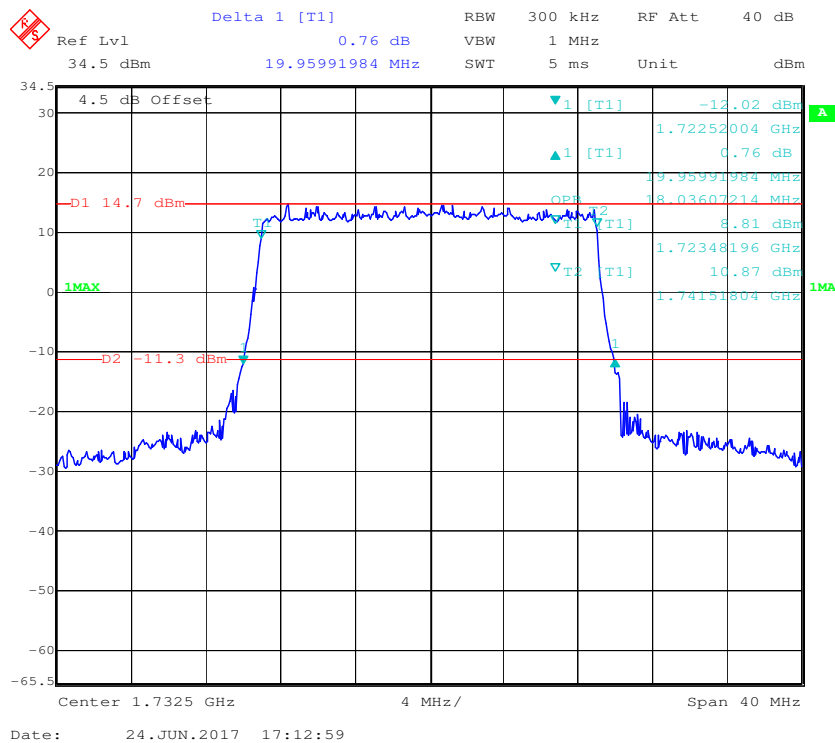
QPSK (10.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel



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

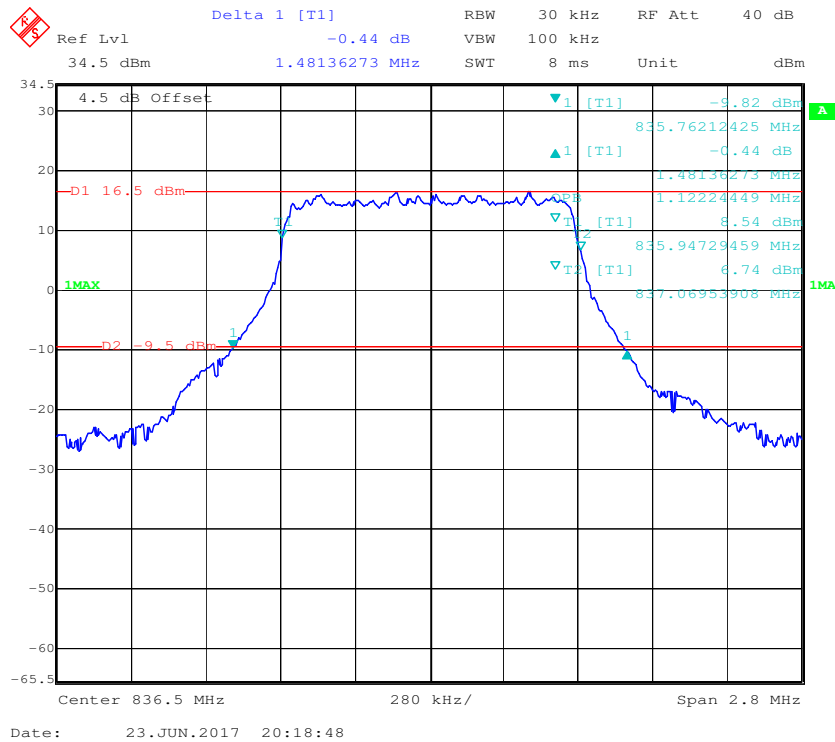
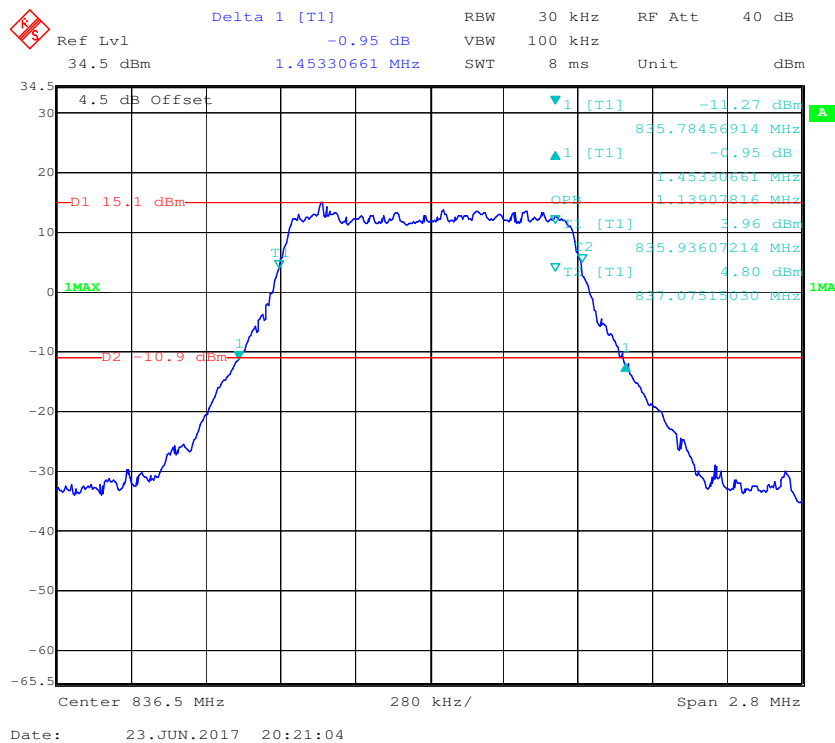


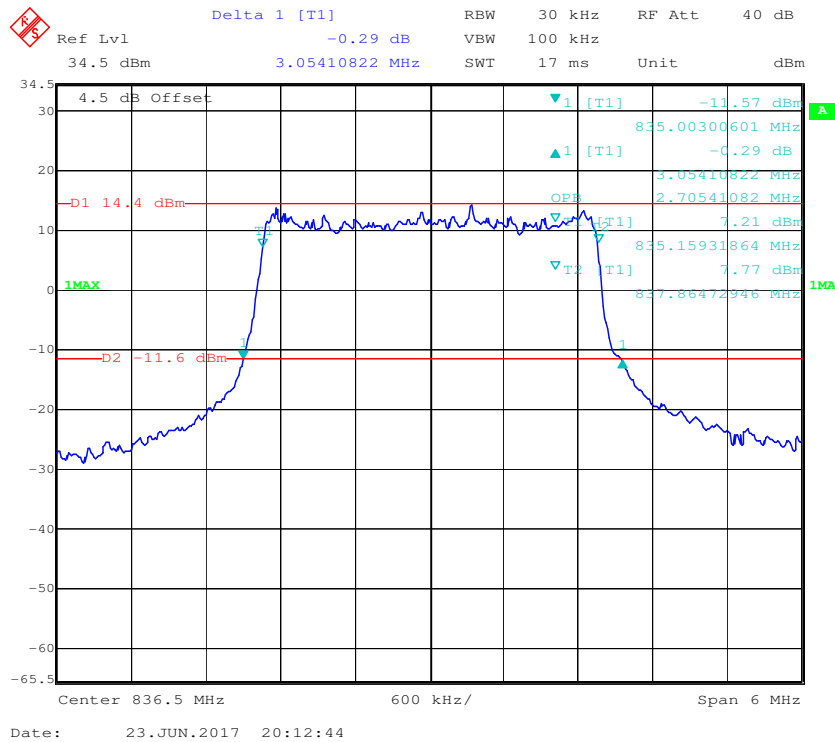
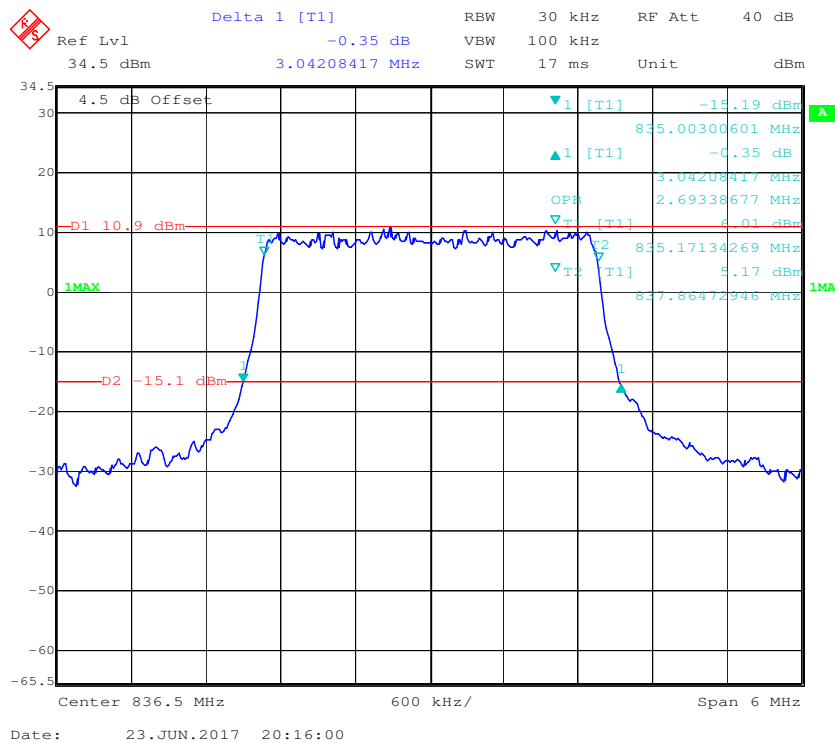
QPSK (15.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**16-QAM (15.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**

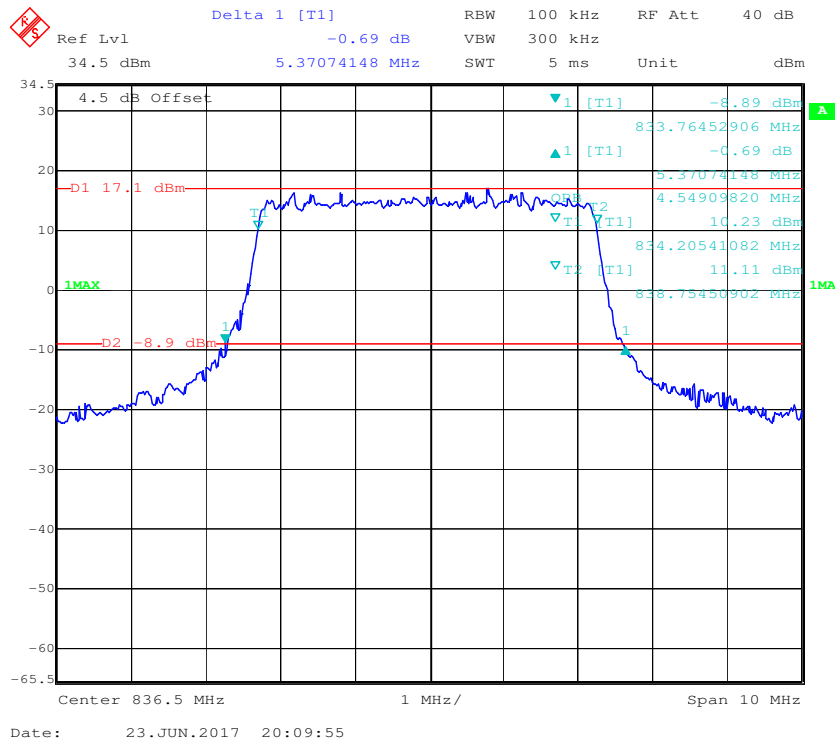
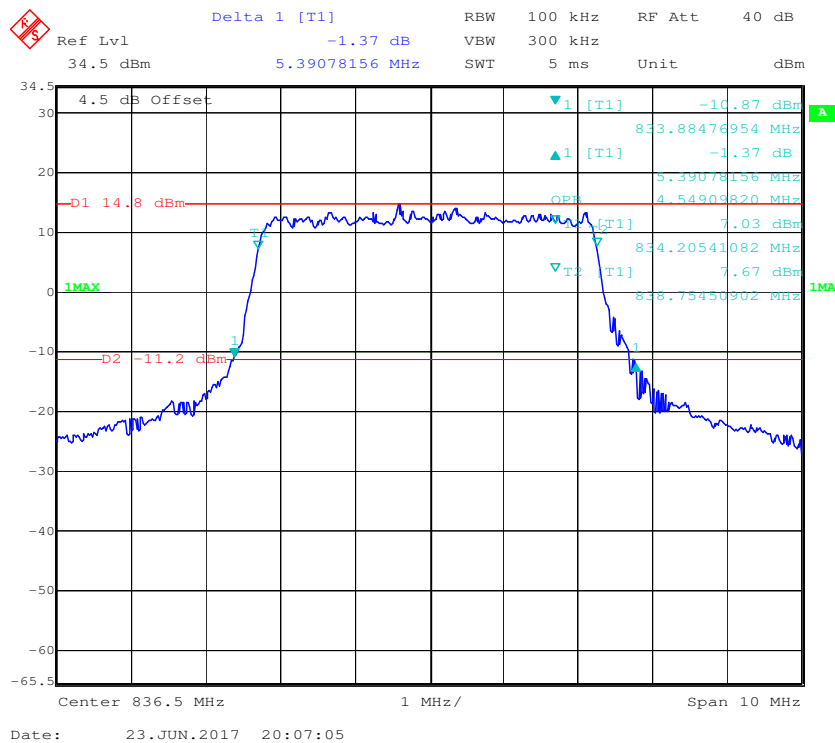
QPSK (20.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**16-QAM (20.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**

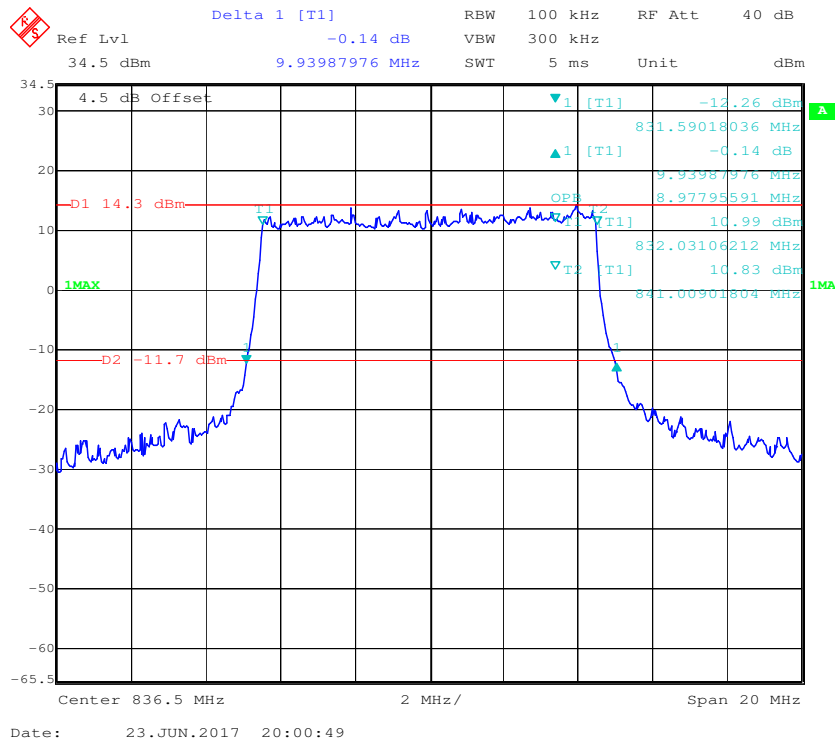
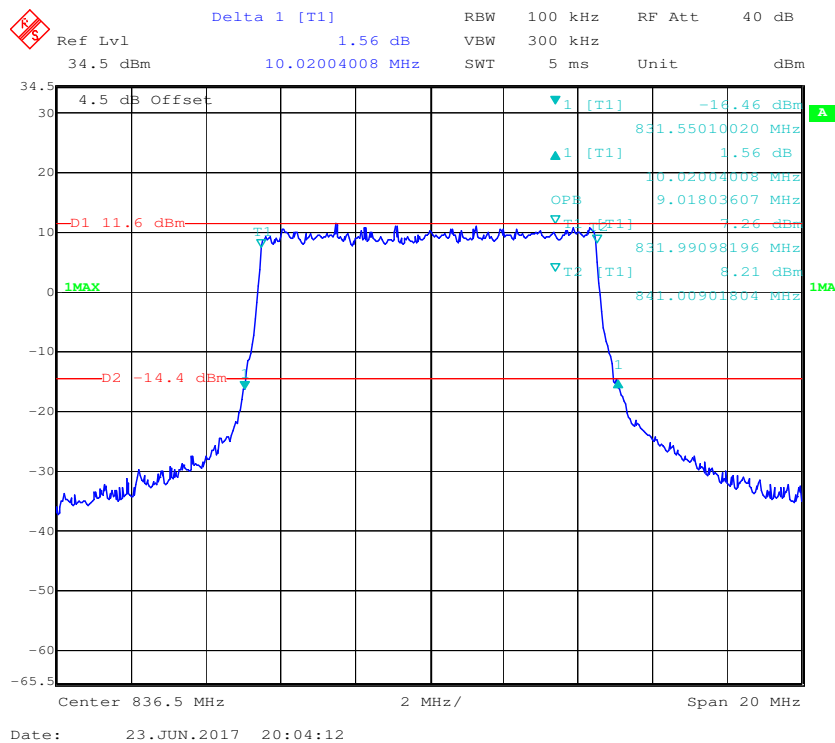
LTE Band 5: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.122	1.481
	16QAM	1.139	1.453
3.0	QPSK	2.705	3.054
	16QAM	2.693	3.042
5.0	QPSK	4.549	5.371
	16QAM	4.549	5.391
10.0	QPSK	8.978	9.940
	16QAM	9.018	10.020

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

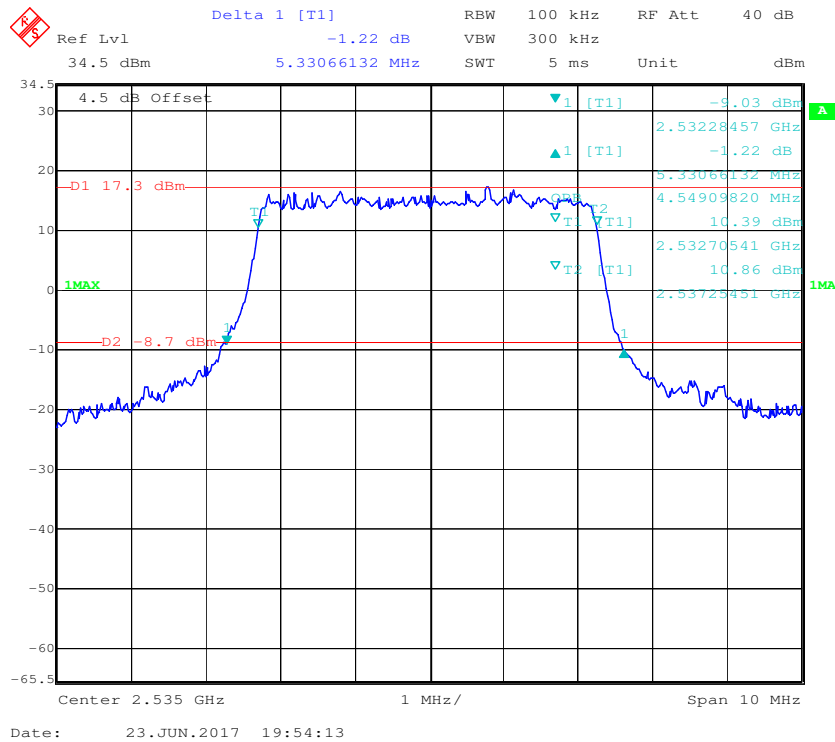
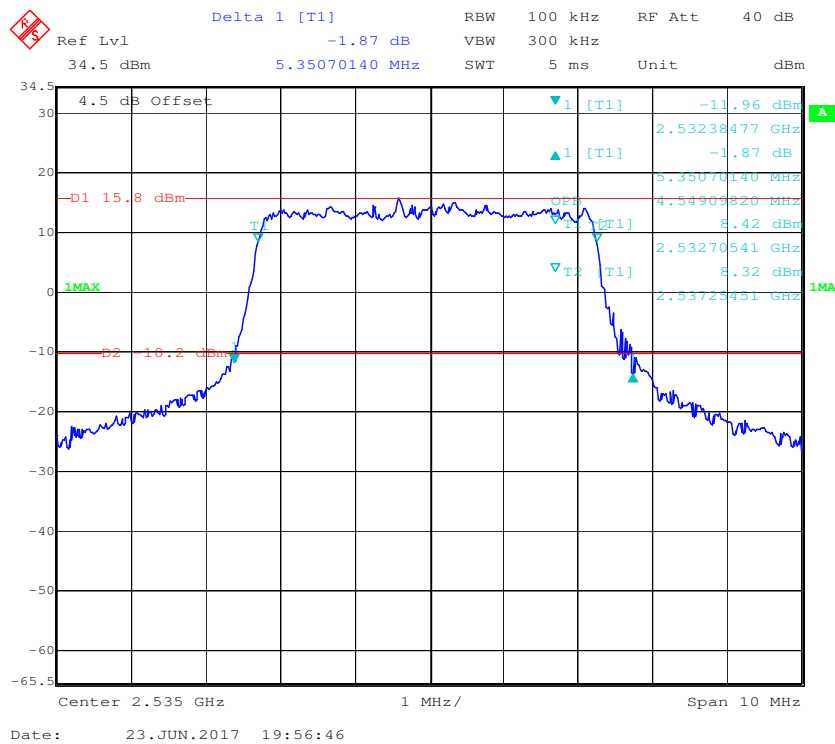
QPSK (3.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**16-QAM (3.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**

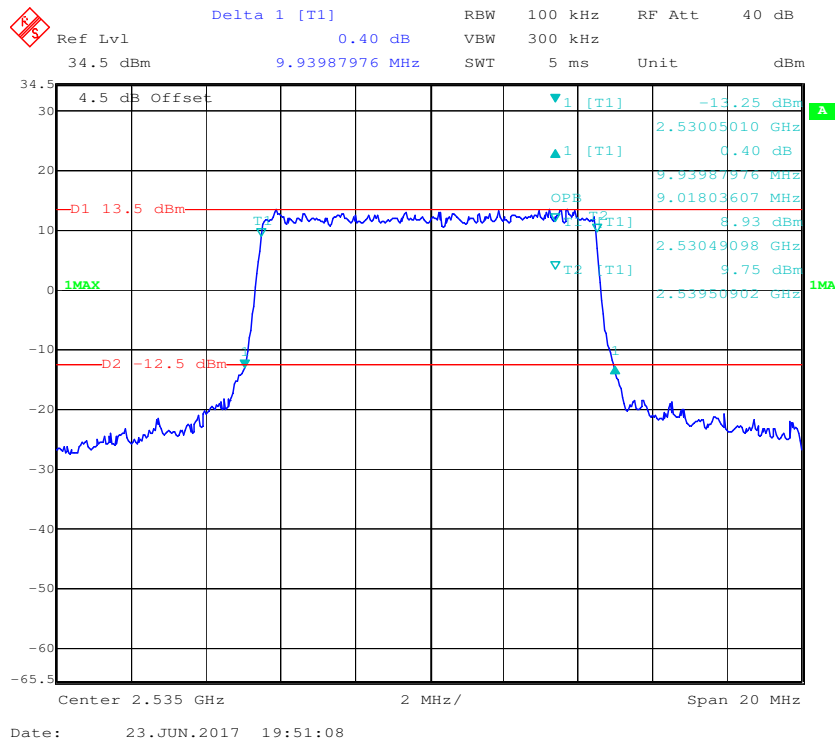
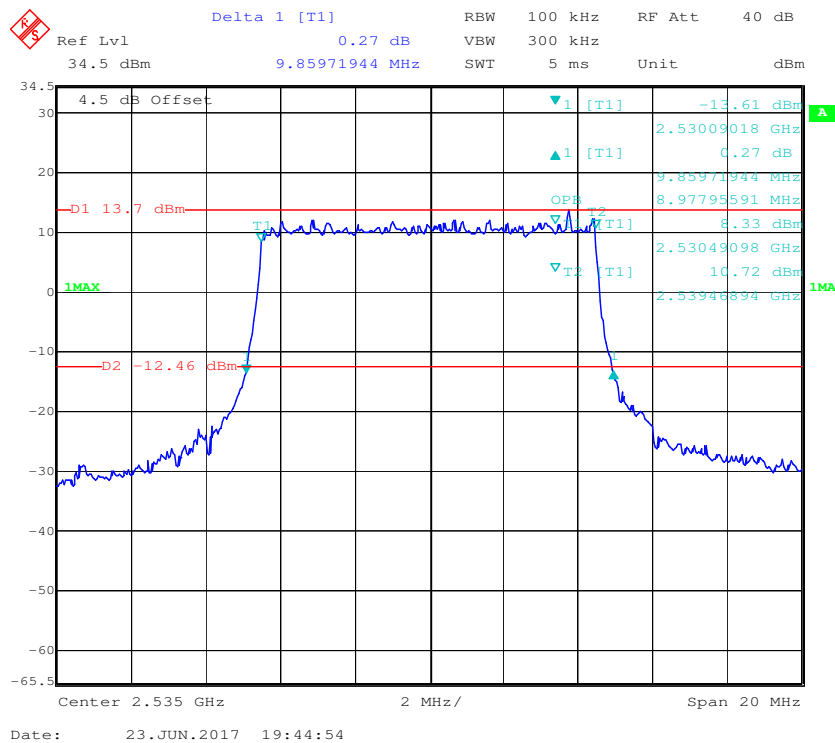
QPSK (5.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**16-QAM (5.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**

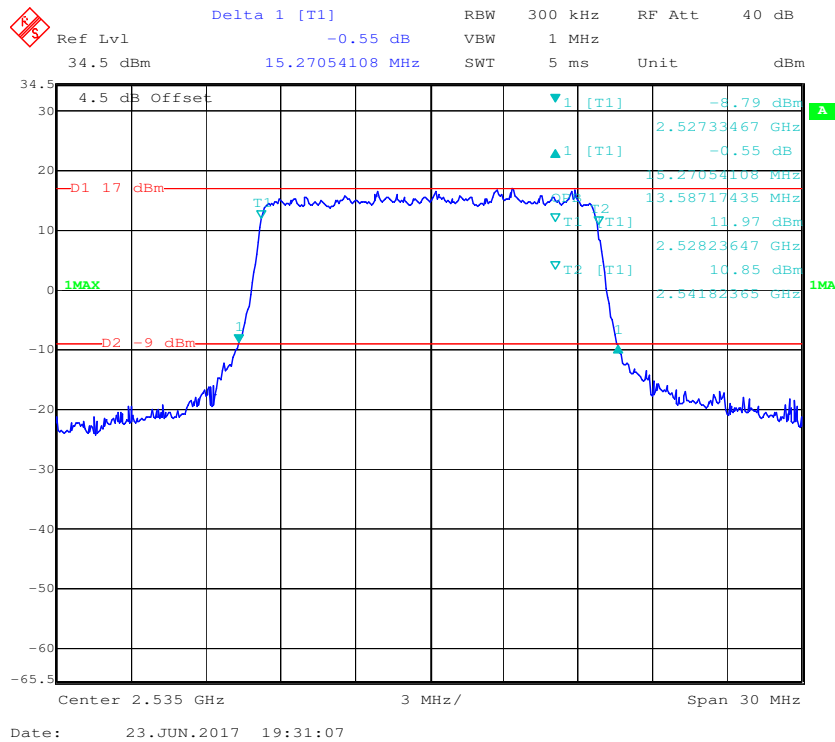
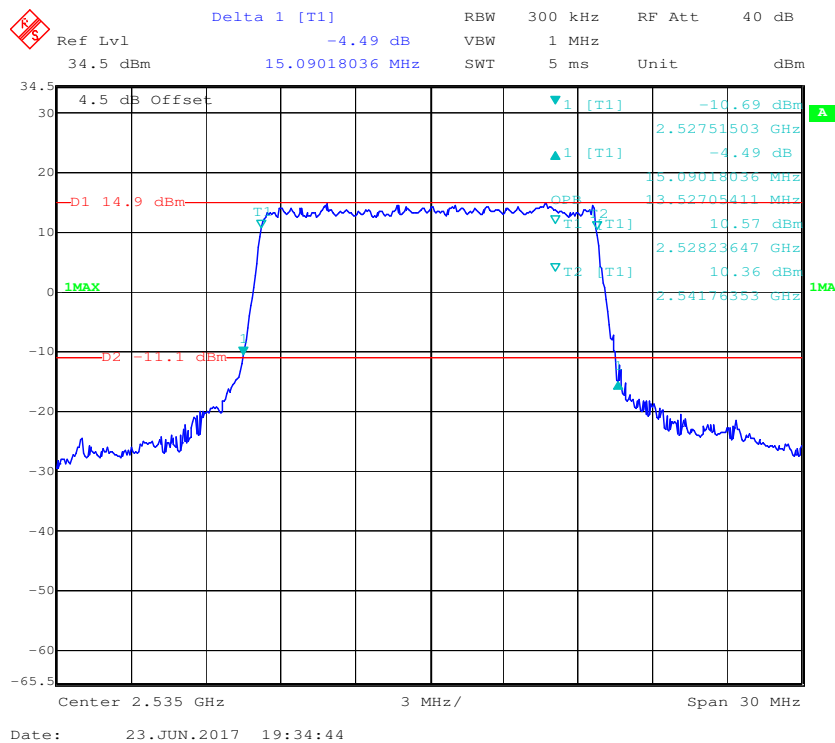
QPSK (10.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**16-QAM (10.0 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**

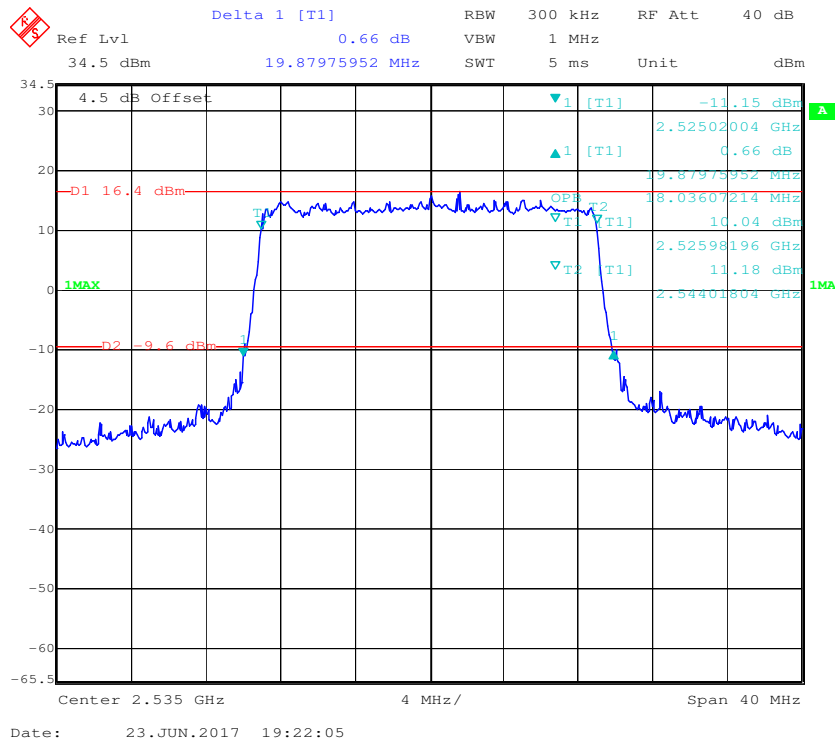
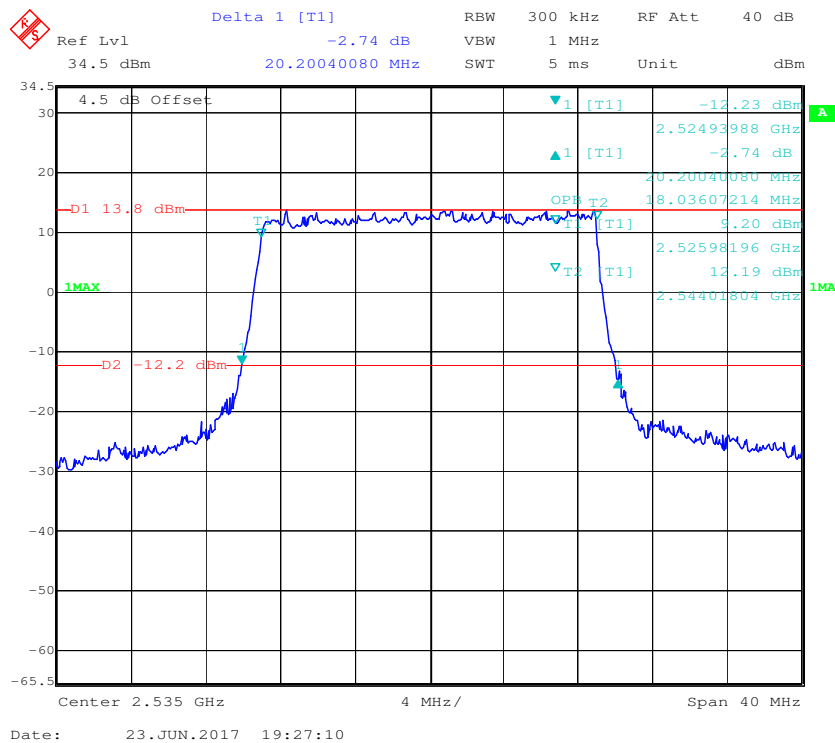
LTE Band 7

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.549	5.331
	16QAM	4.549	5.351
10.0	QPSK	9.018	9.940
	16QAM	8.978	9.860
15.0	QPSK	13.587	15.271
	16QAM	13.527	15.090
20.0	QPSK	18.036	19.880
	16QAM	18.036	20.200

QPSK (5 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**16-QAM (5 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**

QPSK (10 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**16-QAM (10MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**

QPSK (15 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**16-QAM (15 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**

QPSK (20 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**16-QAM (20 MHz) - 99% Occupied Bandwidth & 26 dB Bandwidth, Middle channel**

FCC §2.1051, §22.917(a) & §24.238(a); §27.53 (h) (m) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

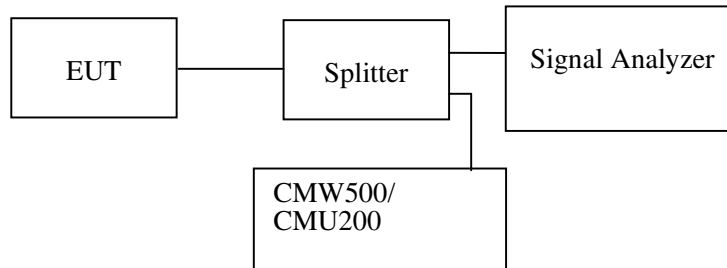
Applicable Standard

FCC §2.1051, §22.917(a) and §24.238(a) and §27.53(h) (m).

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

Test Procedure

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



Test Data

Environmental Conditions

Temperature:	25~27 °C
Relative Humidity:	50~53 %
ATM Pressure:	101.0~103.0 kPa

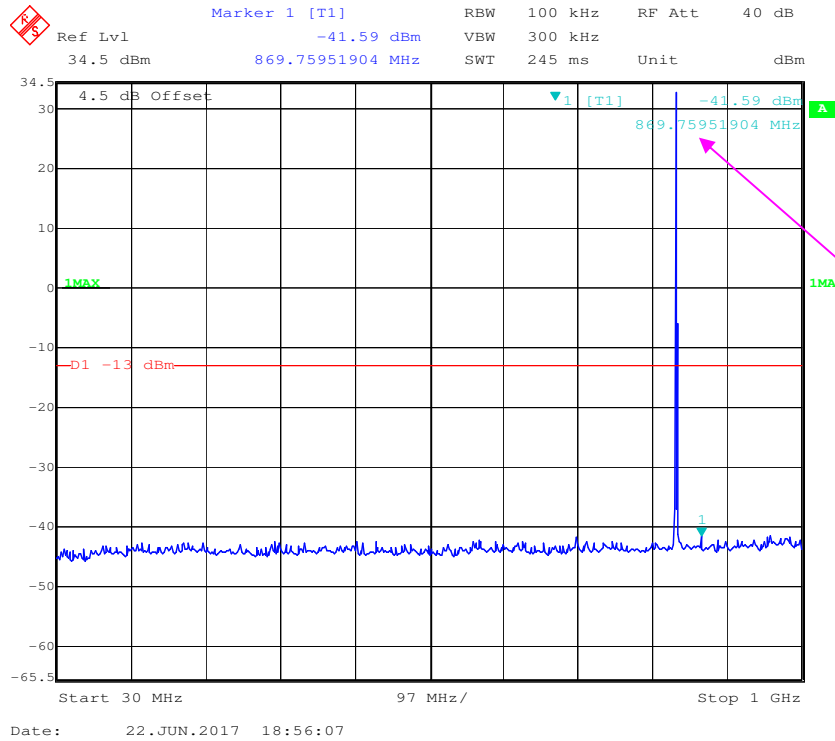
The testing was performed by Echo Wu on 2017-06-24 and 2017-06-29.

EUT operation mode: transmitting

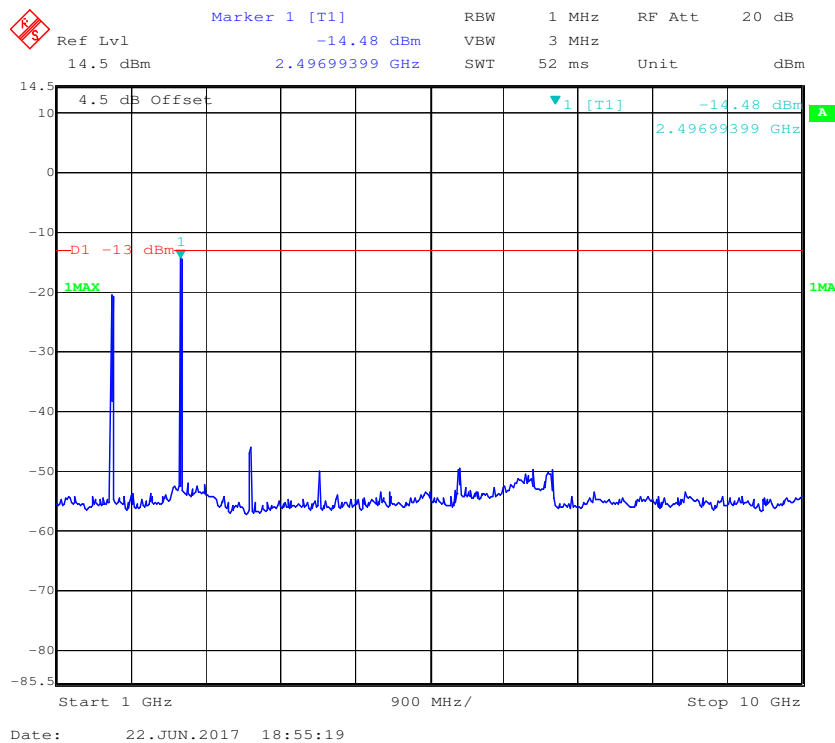
Test result: Compliance, please refer to the following plots.

Cellular Band (Part 22H)

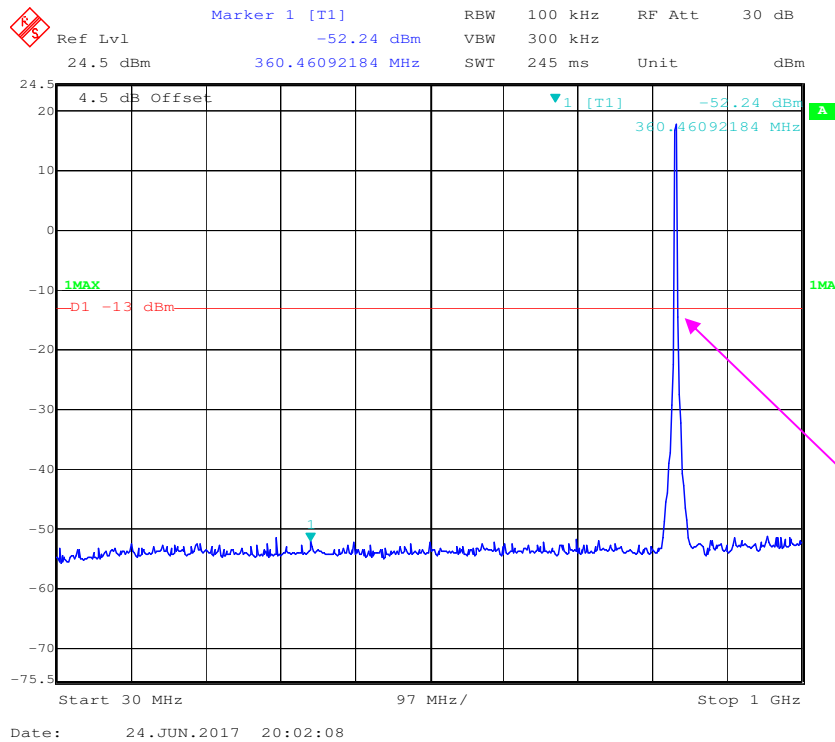
30 MHz – 1 GHz (GSM Mode)



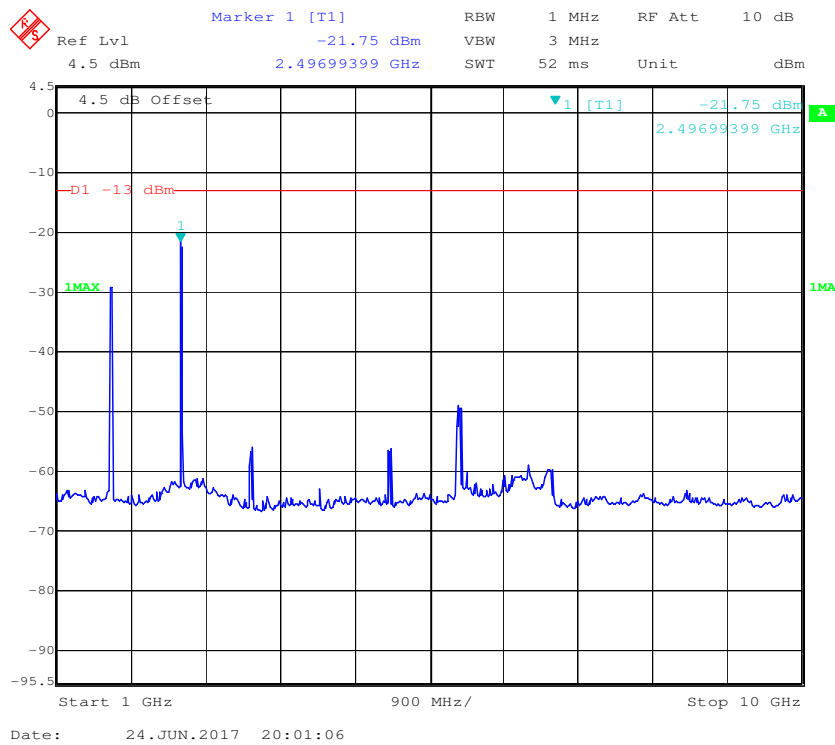
1 GHz – 10 GHz (GSM Mode)



30 MHz – 1 GHz (WCDMA Mode)

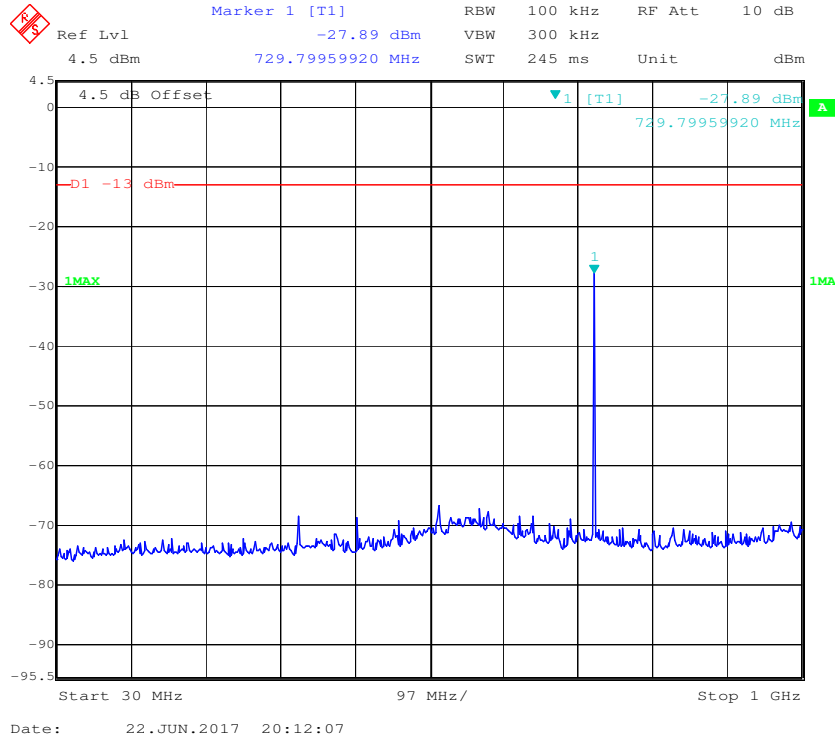


1 GHz – 10 GHz (WCDMA Mode)

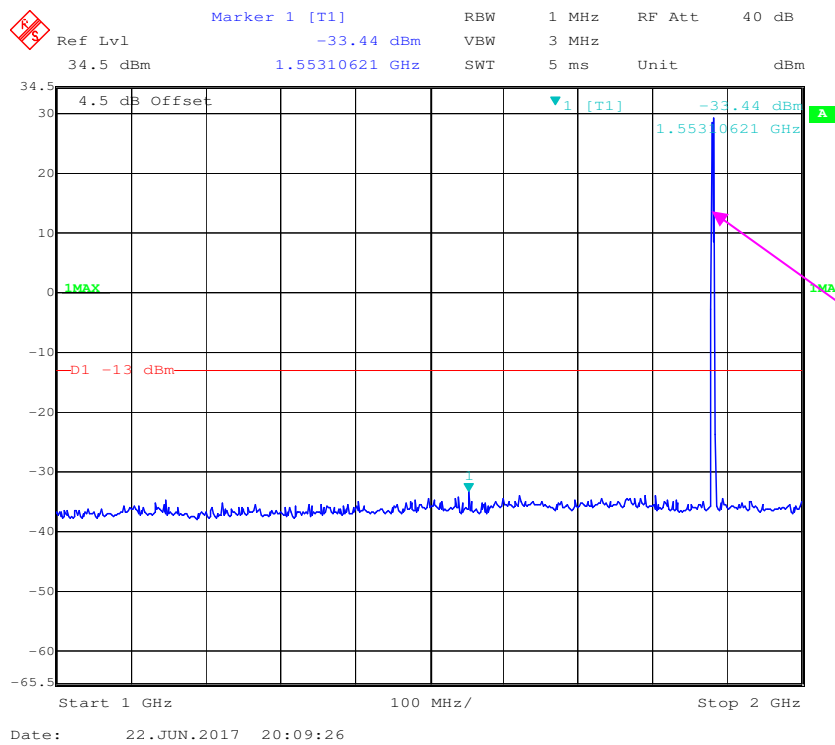


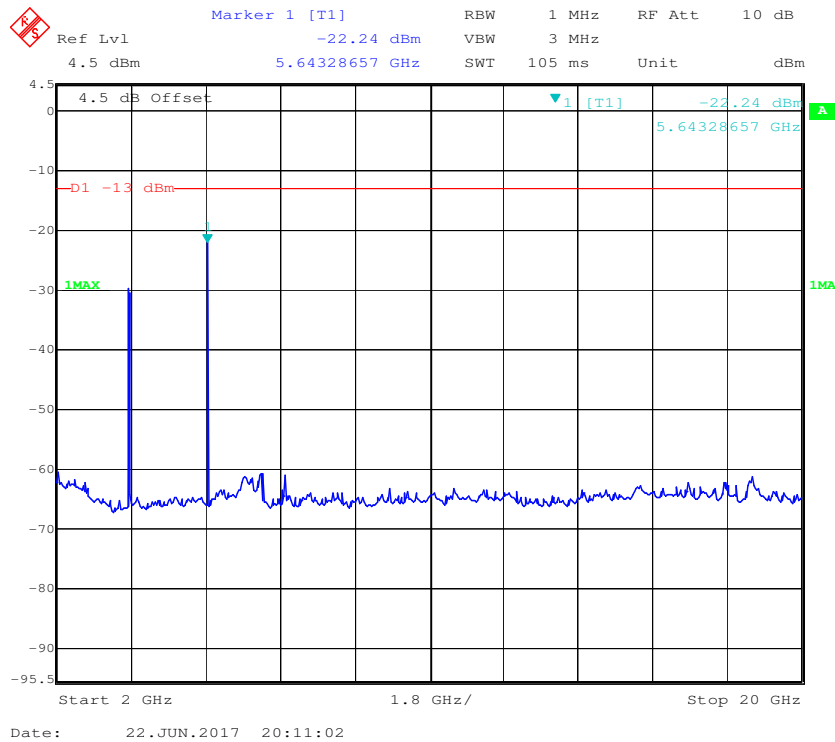
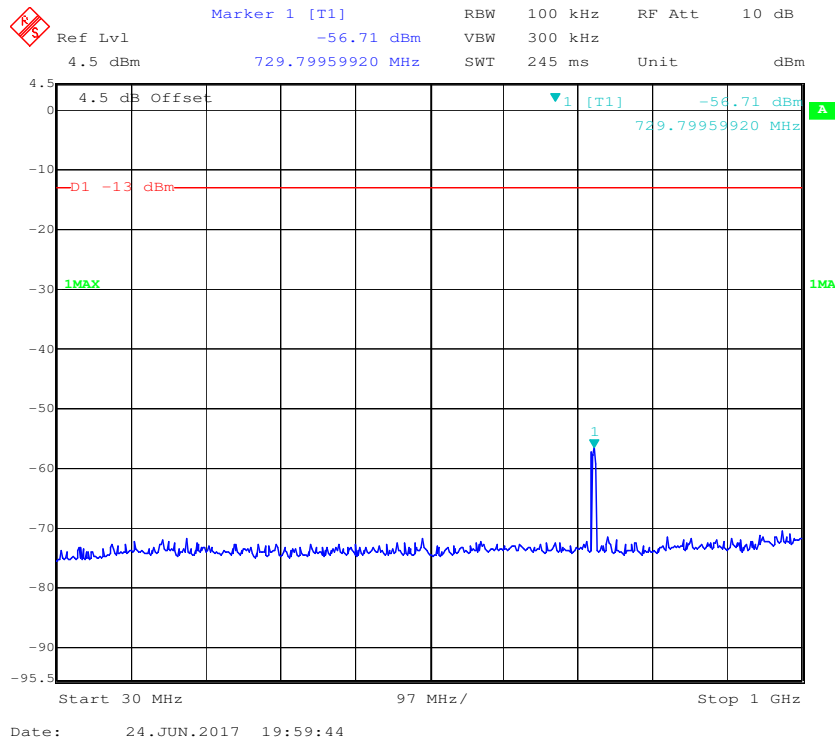
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)

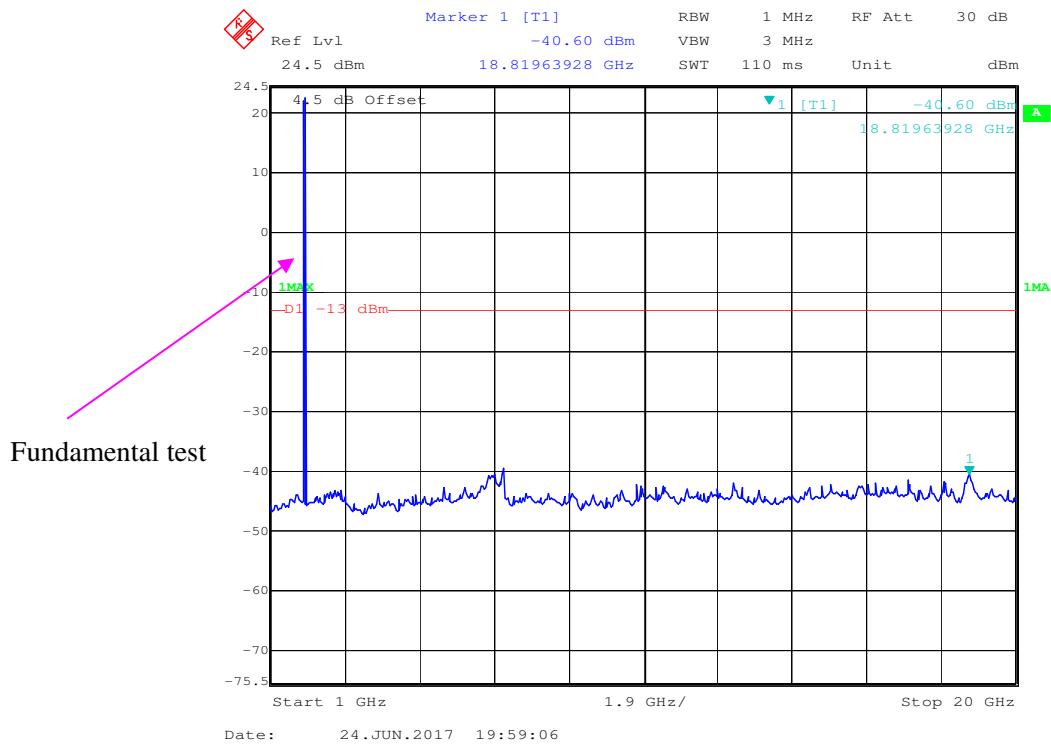


1 GHz – 2 GHz (GSM Mode)



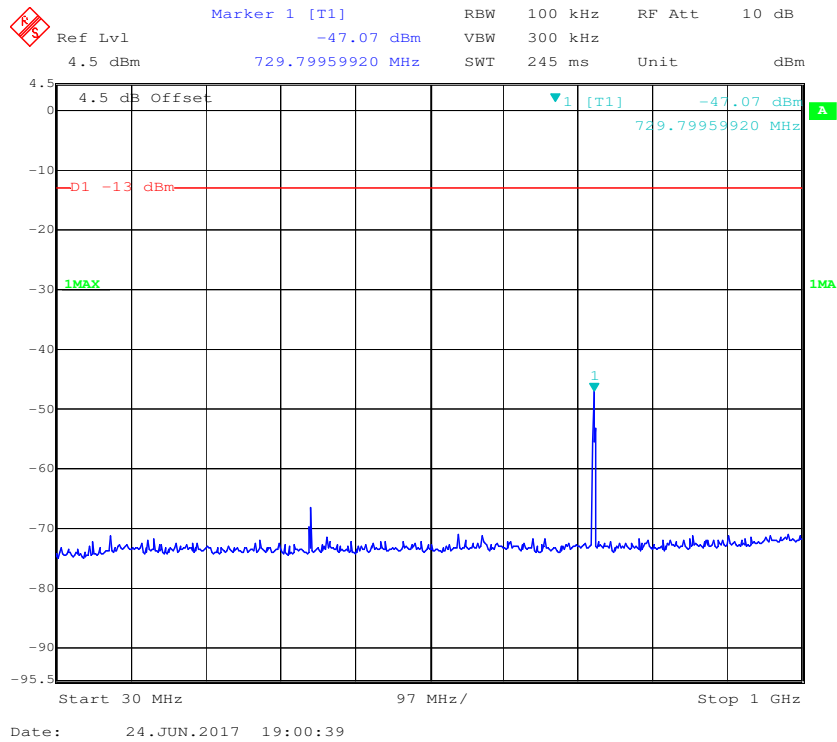
2 GHz – 20 GHz (GSM Mode)**30 MHz – 1 GHz (WCDMA Mode)**

1 GHz – 20 GHz (WCDMA Mode)

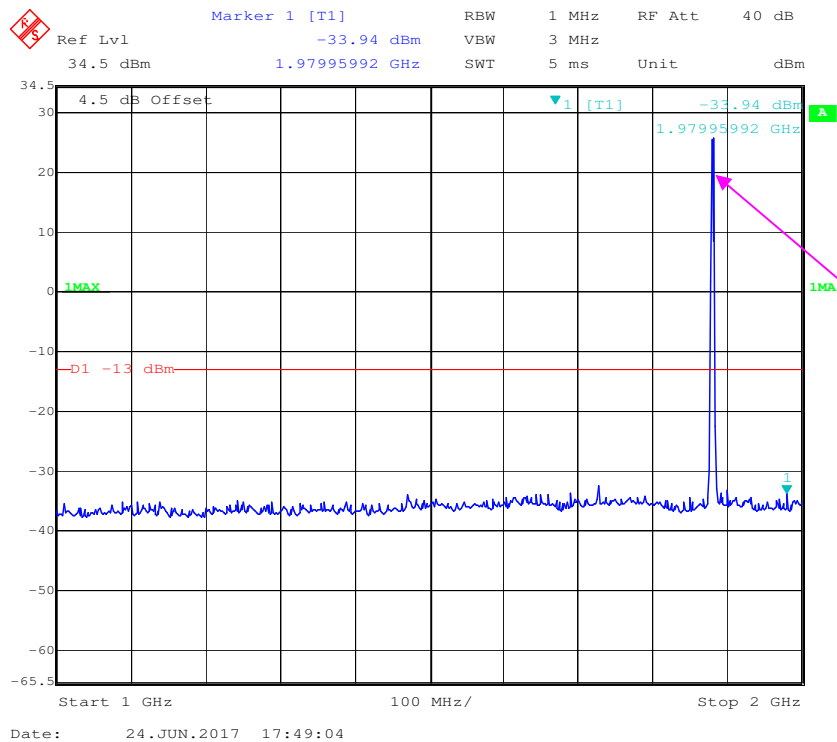


LTE Band 2:

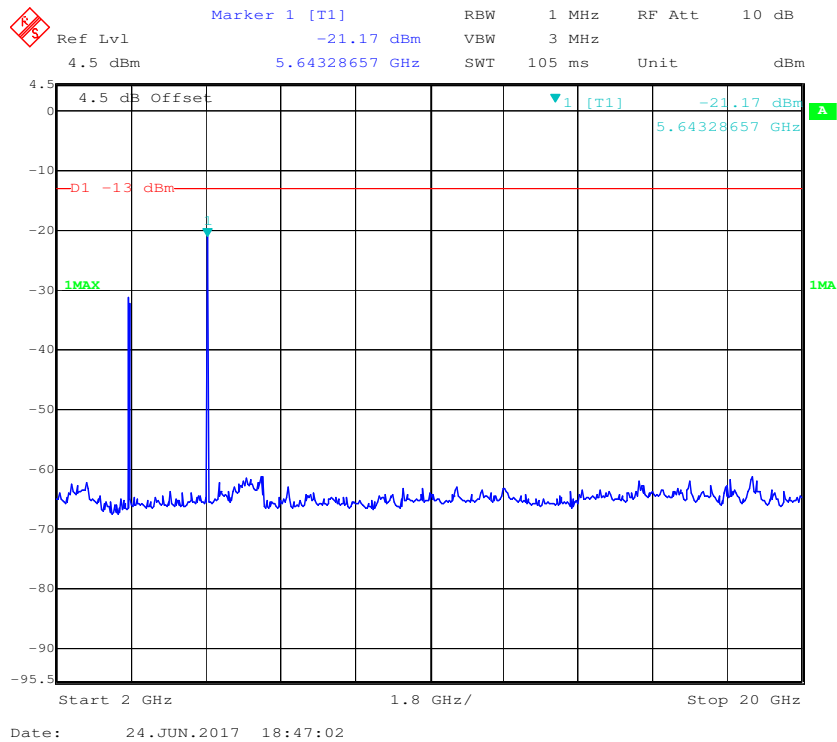
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



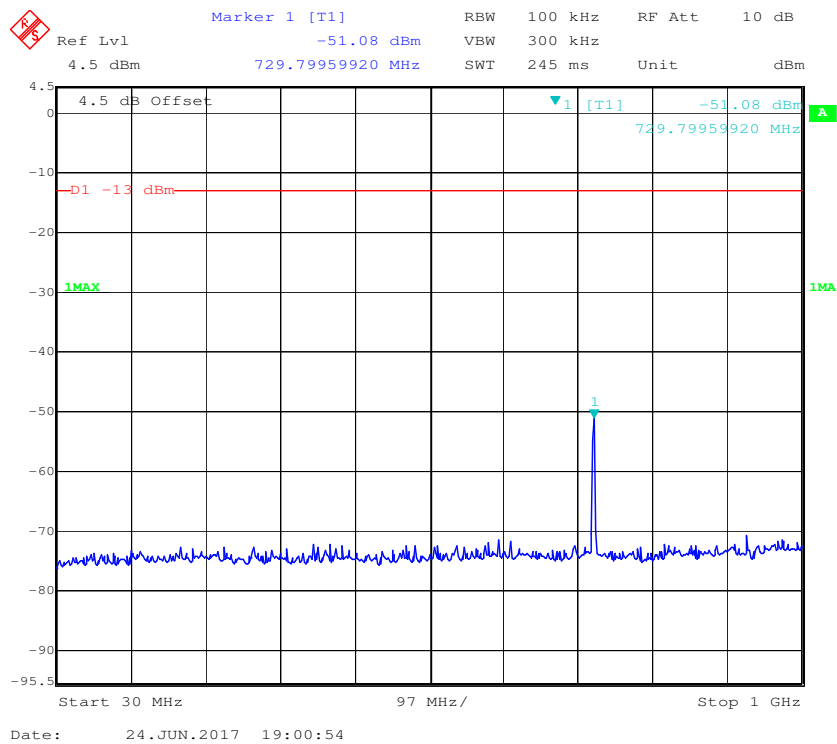
1 GHz - 2 GHz (1.4 MHz, Middle Channel)



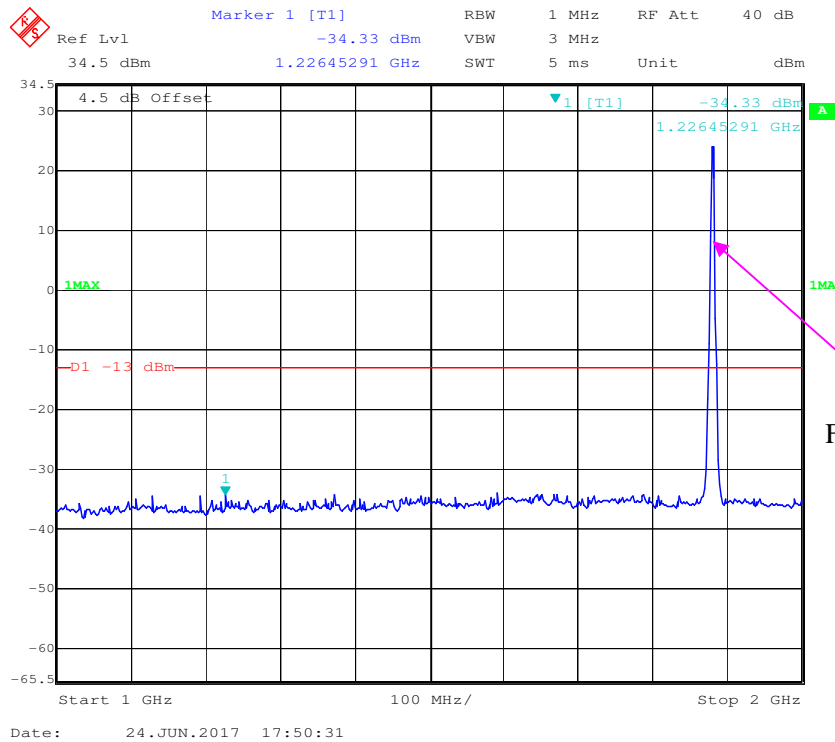
2 GHz – 20 GHz (1.4 MHz, Middle Channel)



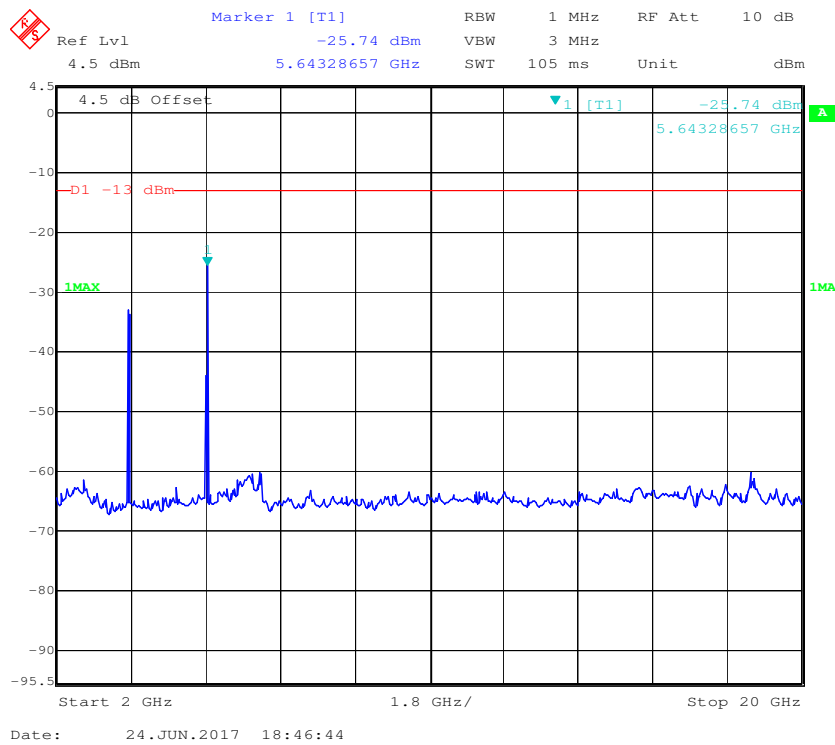
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



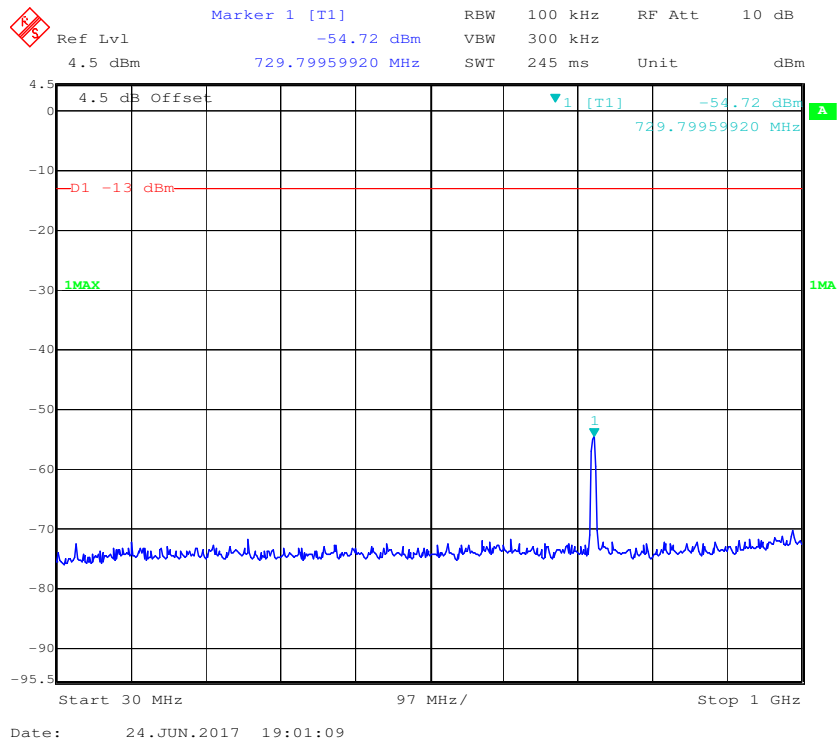
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



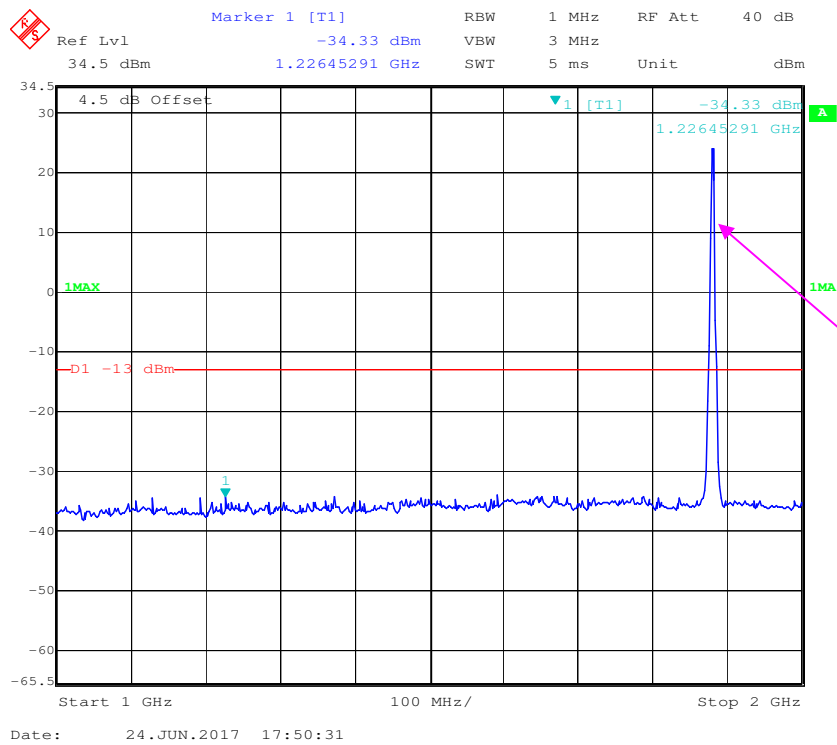
2 GHz – 20 GHz (3.0 MHz, Middle Channel)



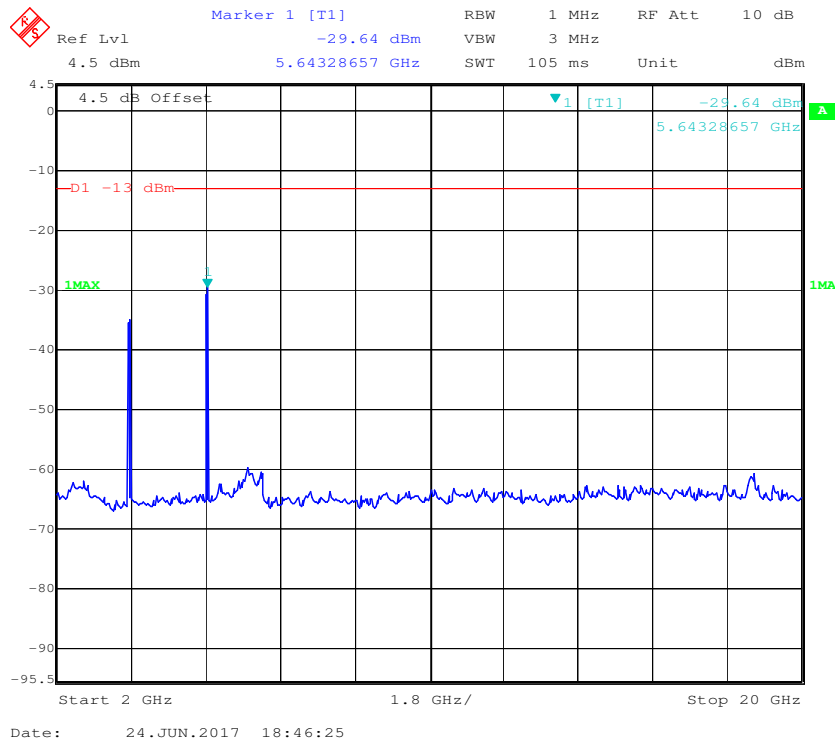
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



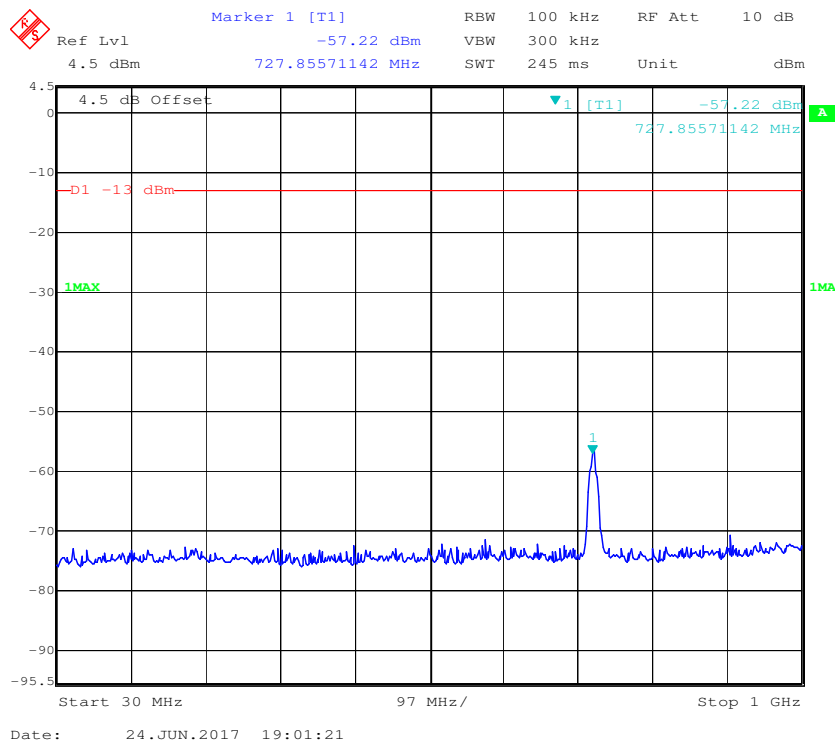
1 GHz - 2 GHz (5.0 MHz, Middle Channel)



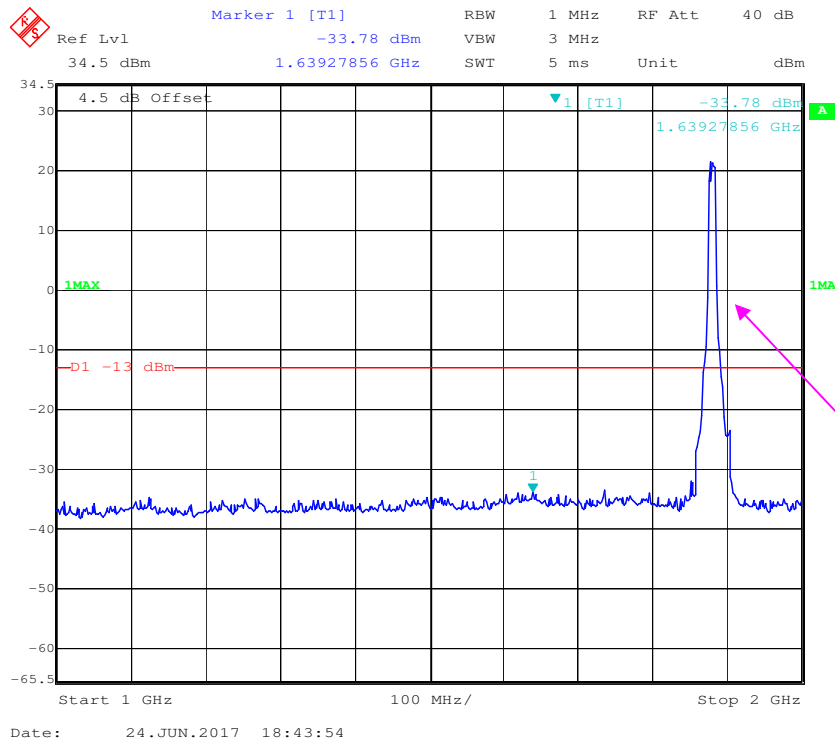
2 GHz – 20 GHz (5.0 MHz, Middle Channel)



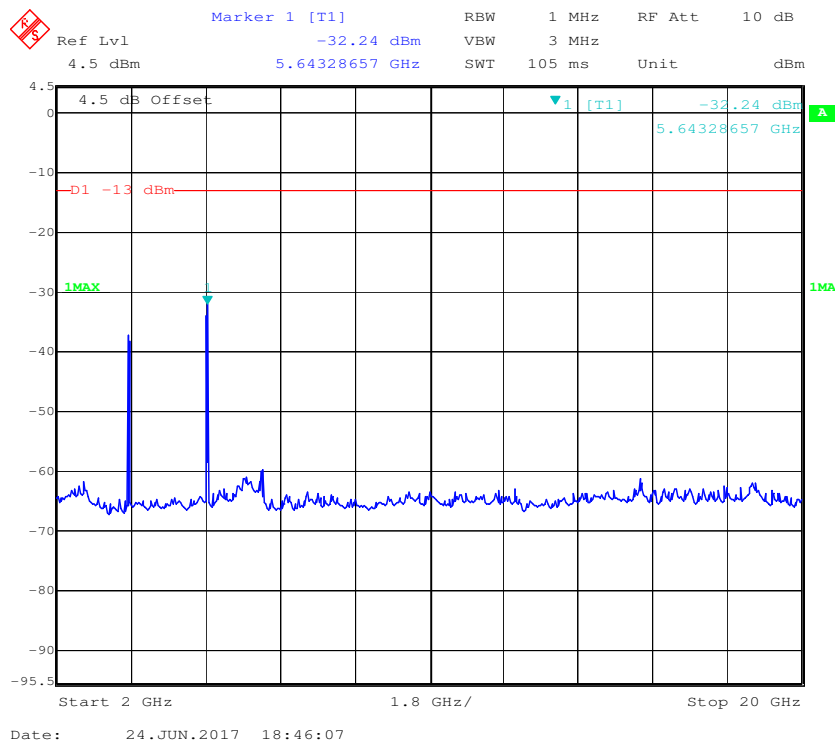
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



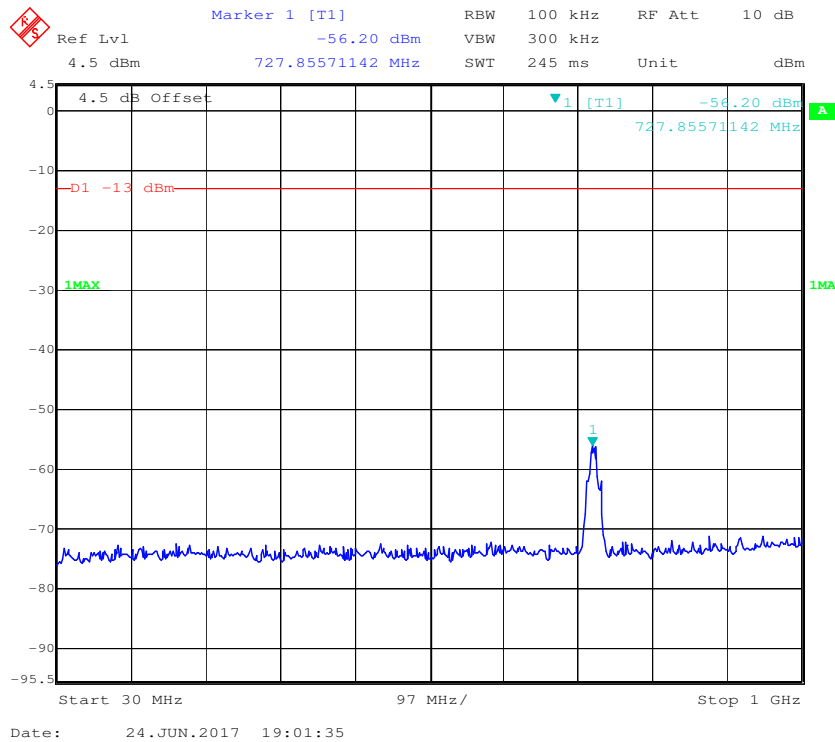
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



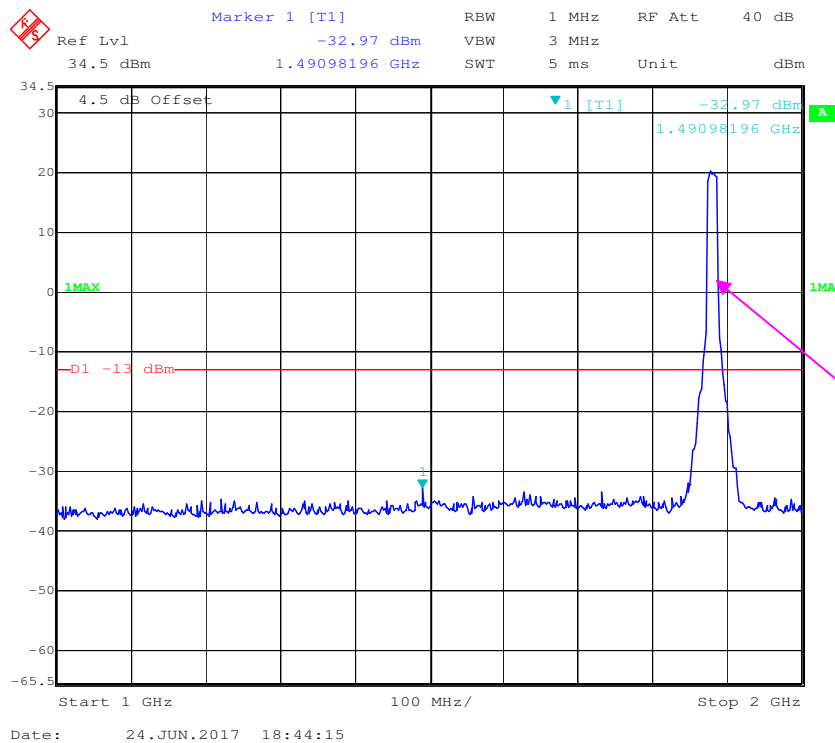
2 GHz – 20 GHz (10.0 MHz, Middle Channel)

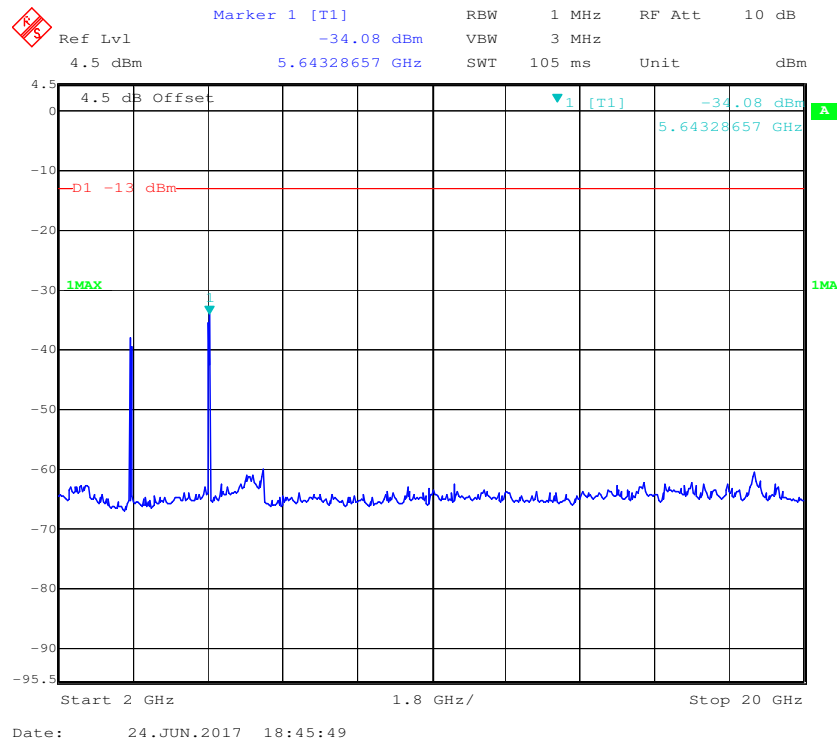
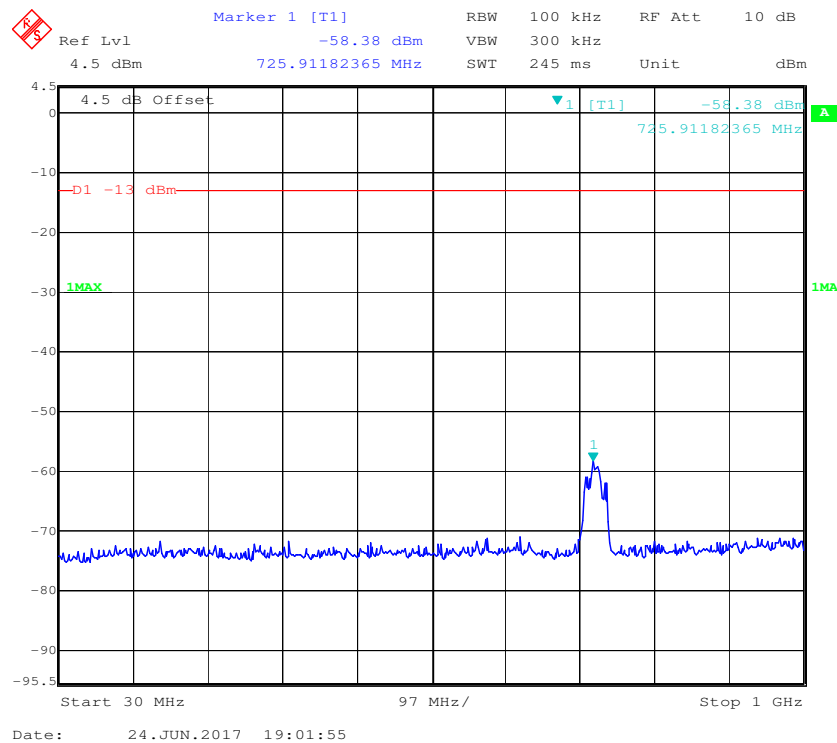


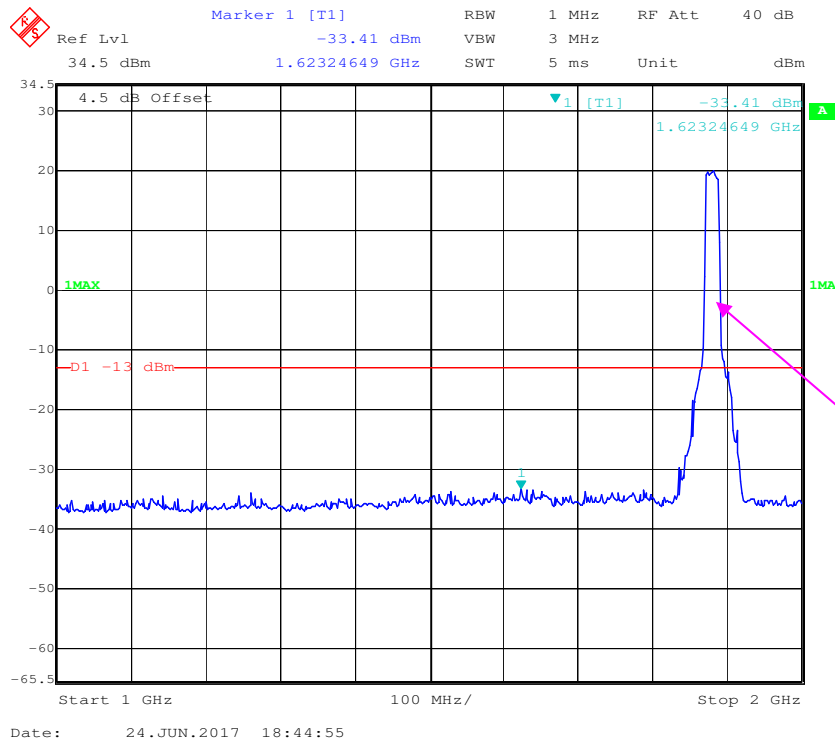
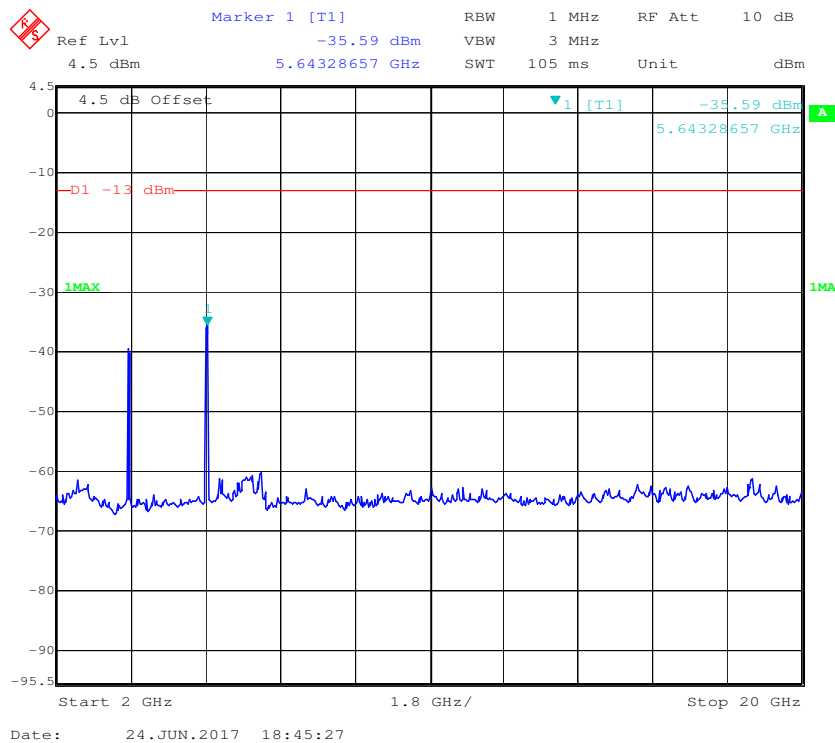
30 MHz - 1 GHz (15.0 MHz, Middle Channel)



1 GHz - 2 GHz (15.0 MHz, Middle Channel)

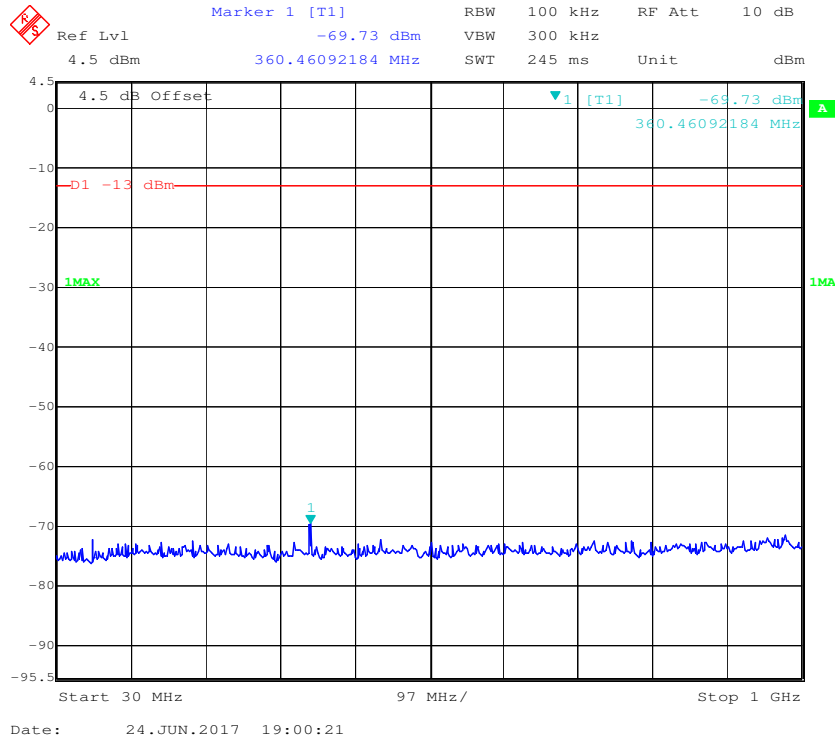


2 GHz – 20 GHz (15.0 MHz, Middle Channel)**30 MHz - 1 GHz (20.0 MHz, Middle Channel)**

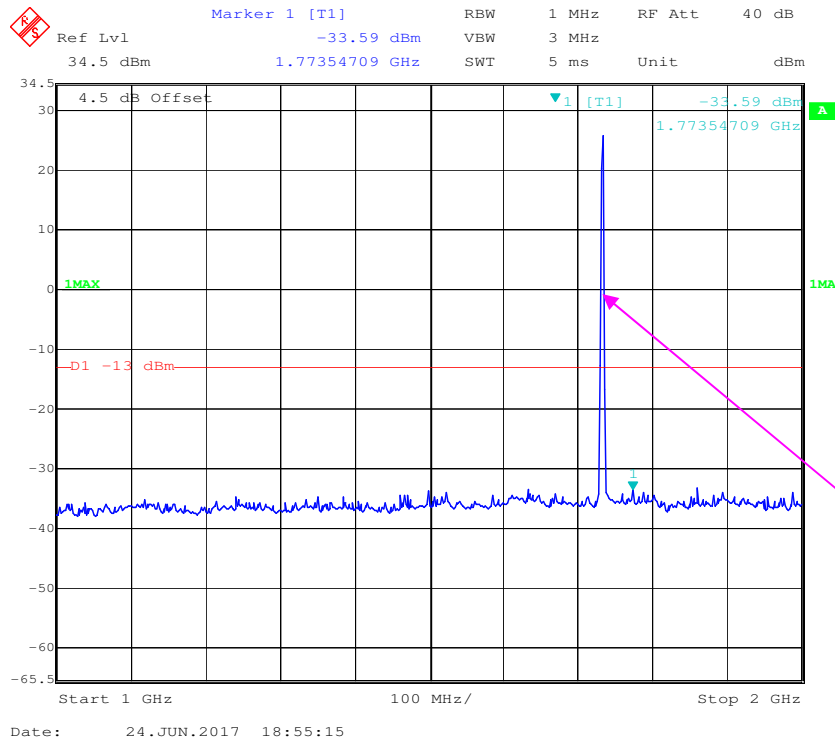
1 GHz – 2 GHz (20.0 MHz, Middle Channel)**2 GHz – 20 GHz (20.0 MHz, Middle Channel)**

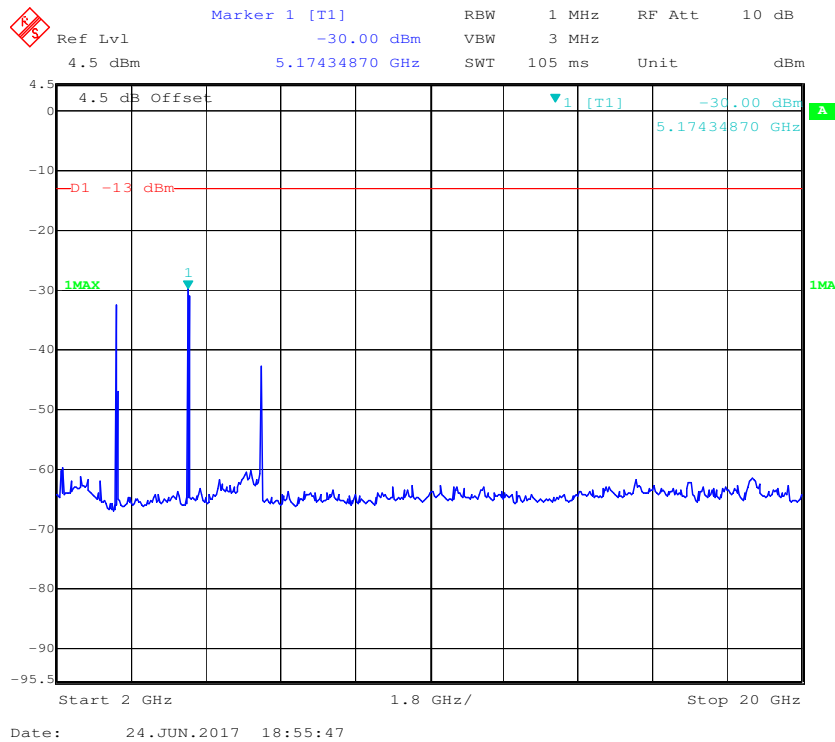
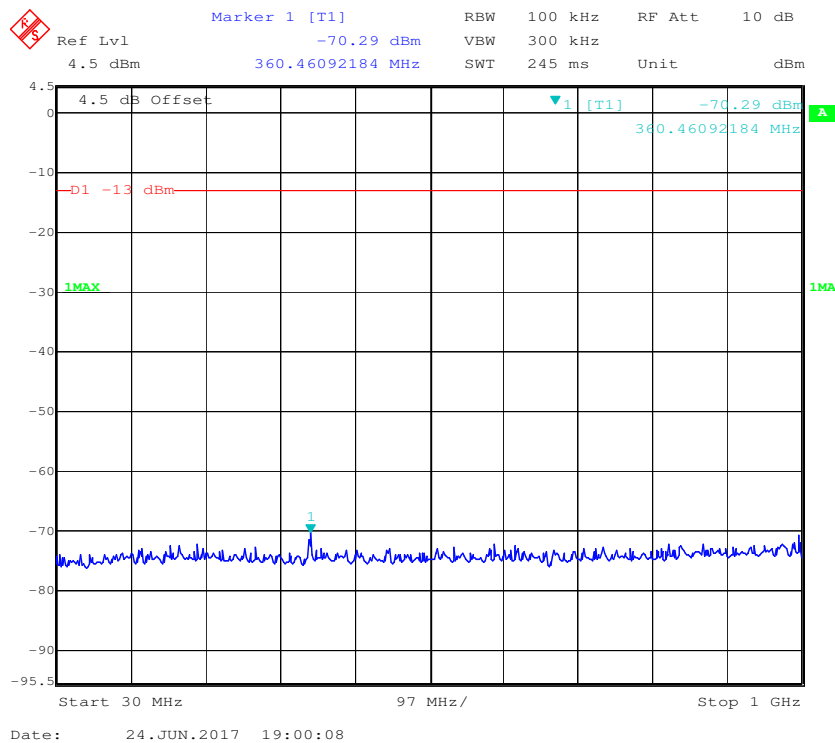
LTE Band 4:

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

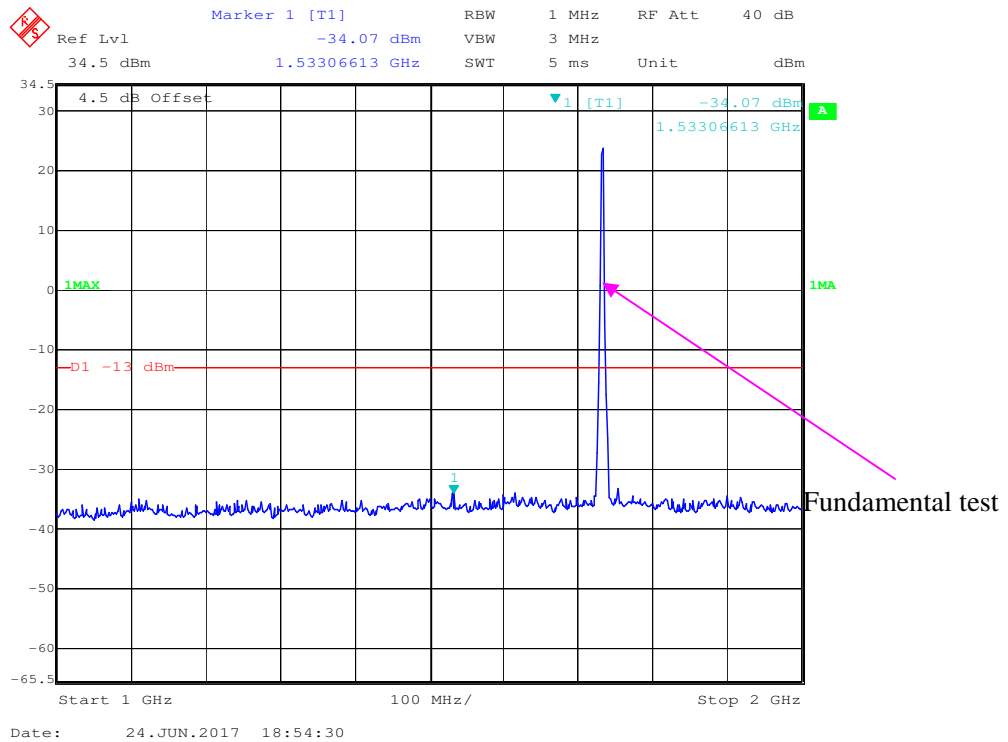


1 GHz - 2 GHz (1.4 MHz, Middle Channel)

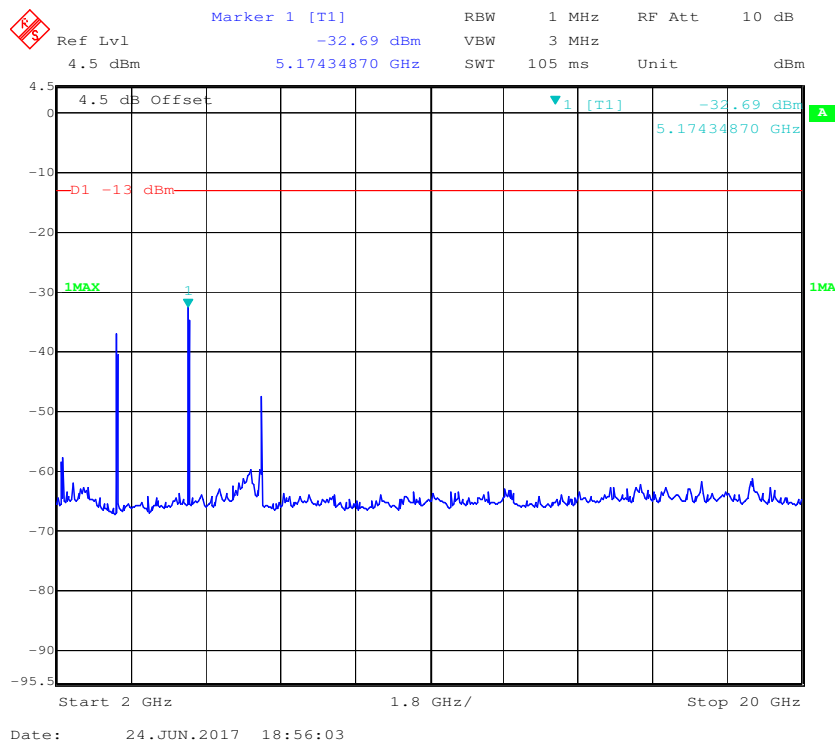


2 GHz – 20 GHz (1.4 MHz, Middle Channel)**30 MHz - 1 GHz (3.0 MHz, Middle Channel)**

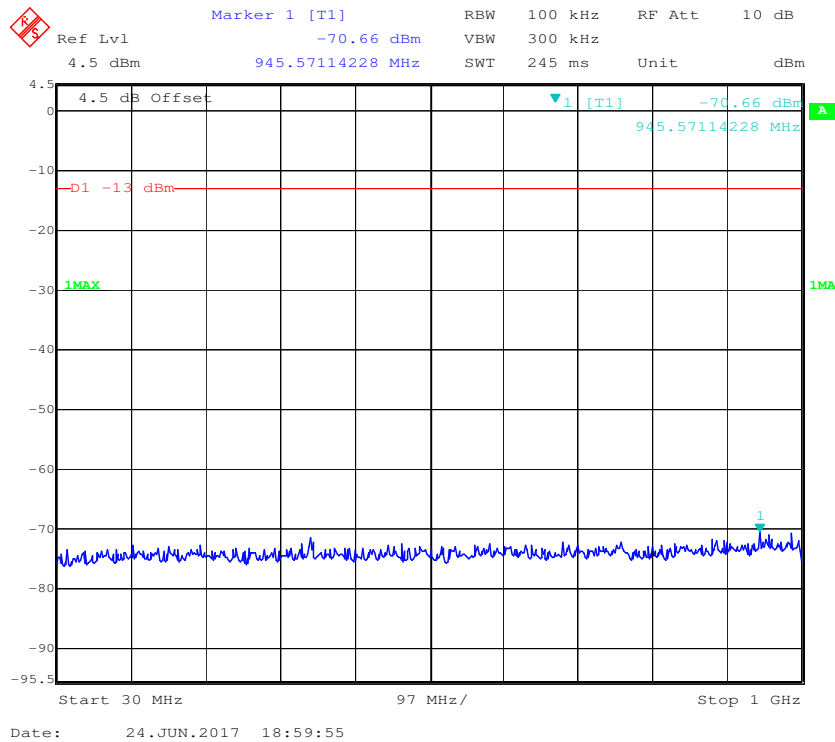
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



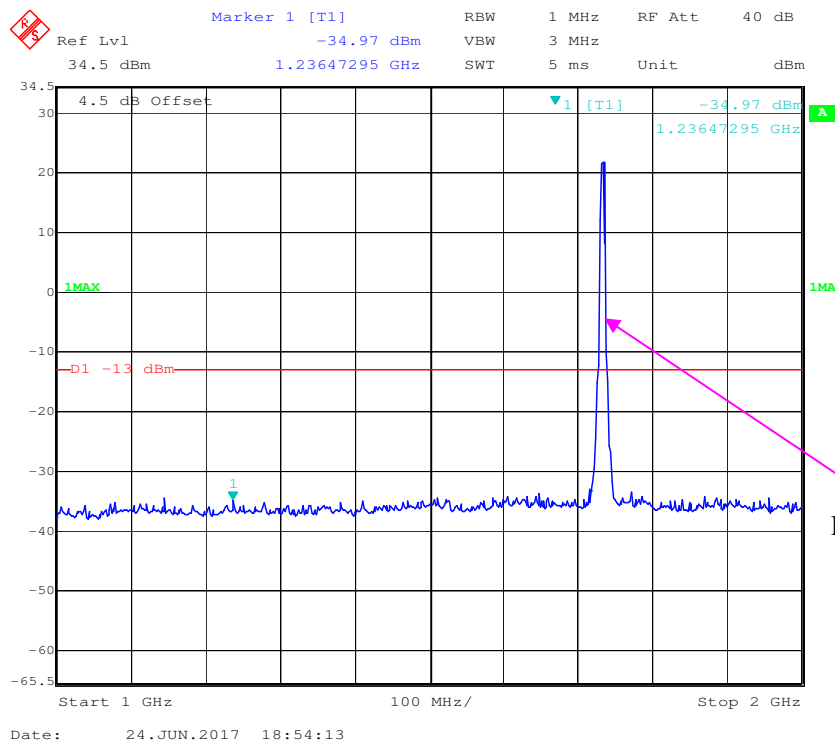
2 GHz – 20 GHz (3.0 MHz, Middle Channel)



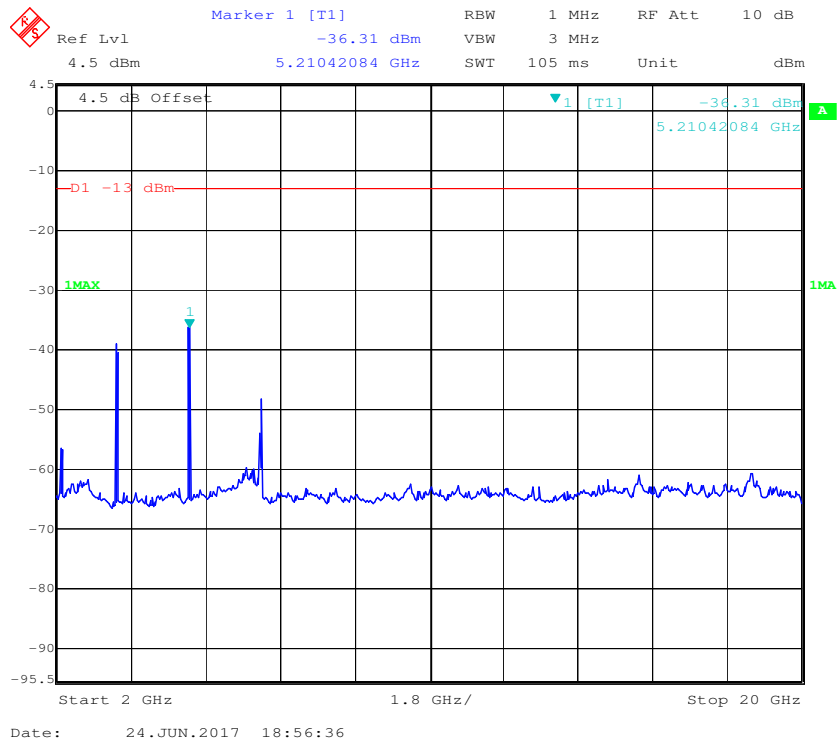
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



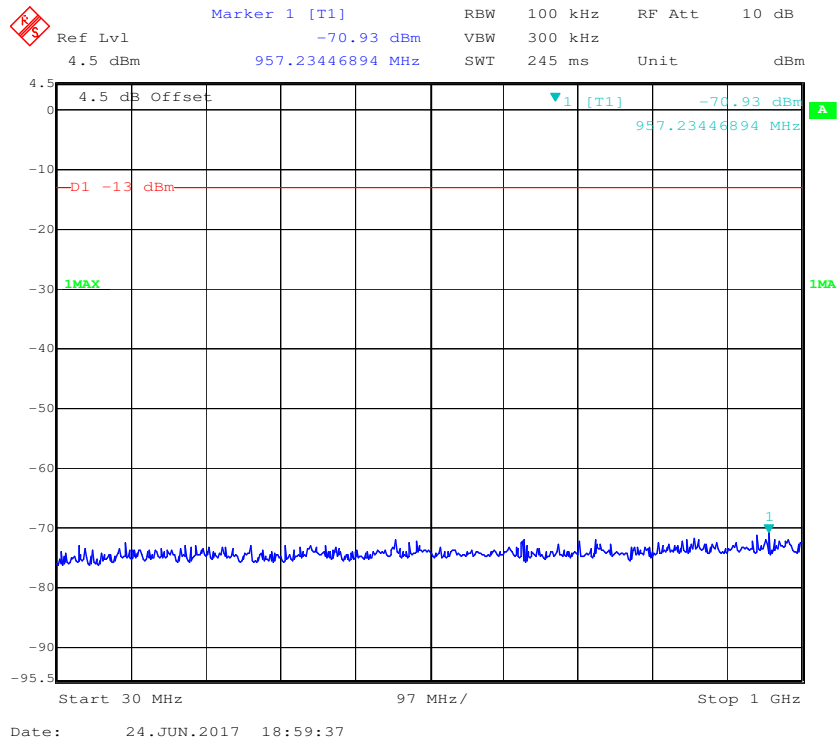
1 GHz - 2 GHz (5.0 MHz, Middle Channel)



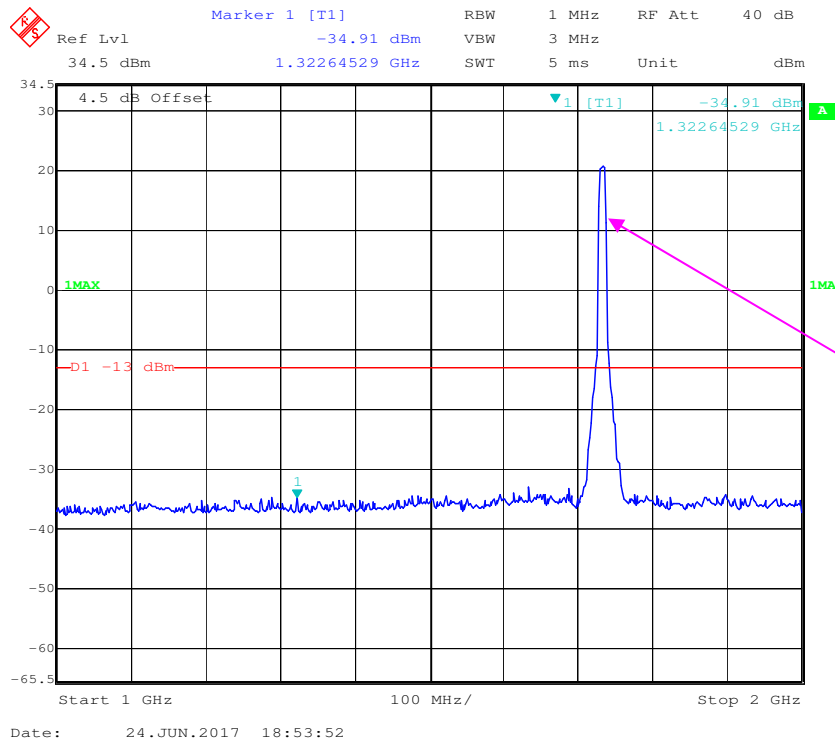
2 GHz – 20 GHz (5.0 MHz, Middle Channel)



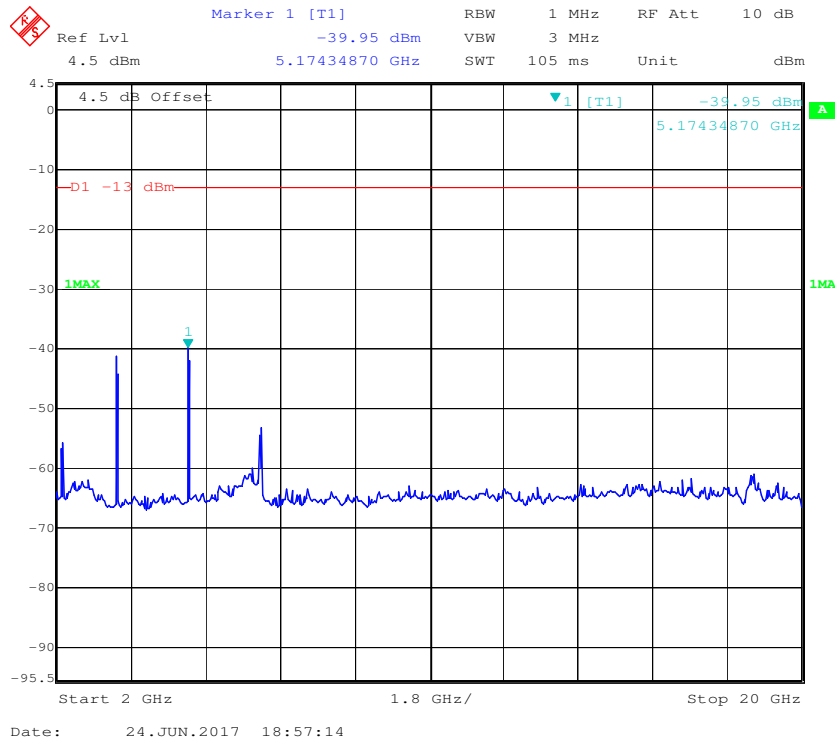
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



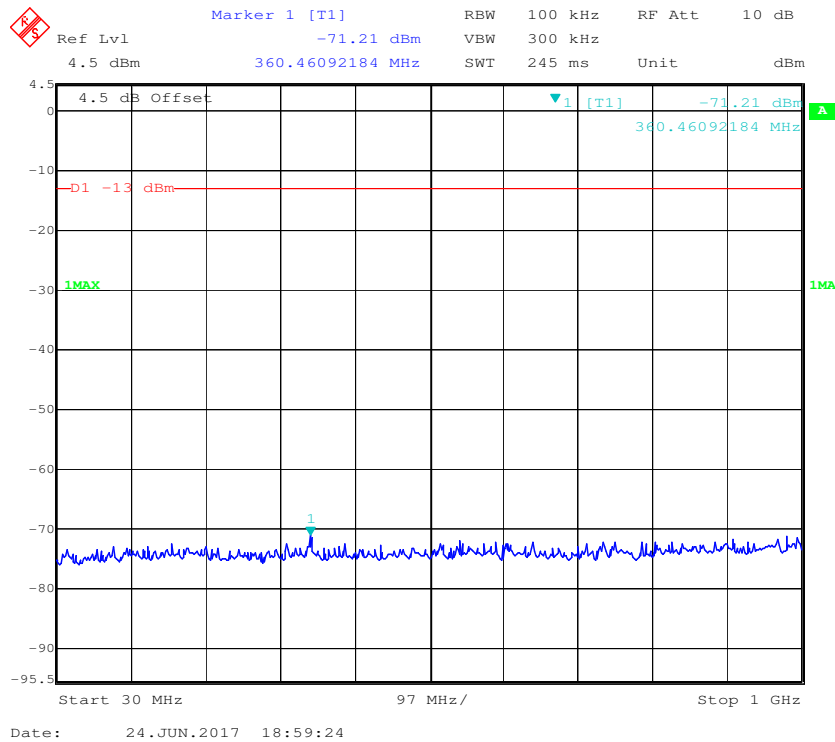
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



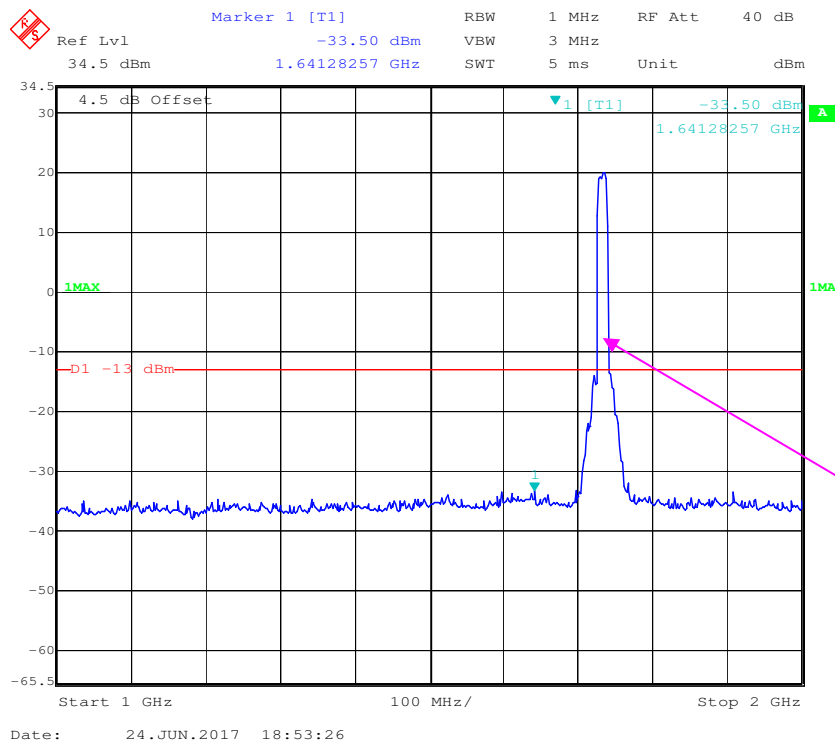
2 GHz – 20 GHz (10.0 MHz, Middle Channel)



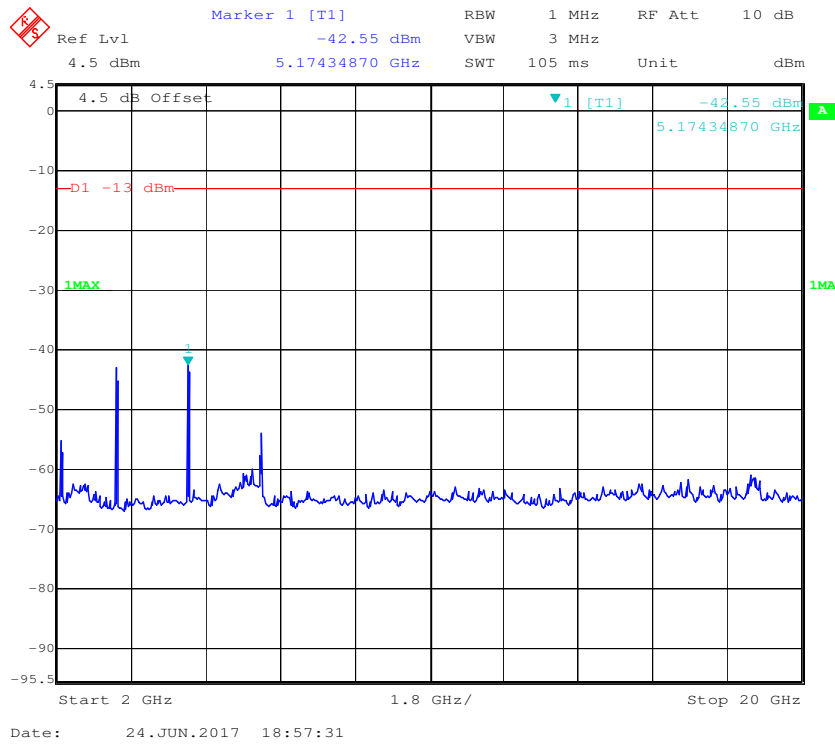
30 MHz - 1 GHz (15.0 MHz, Middle Channel)



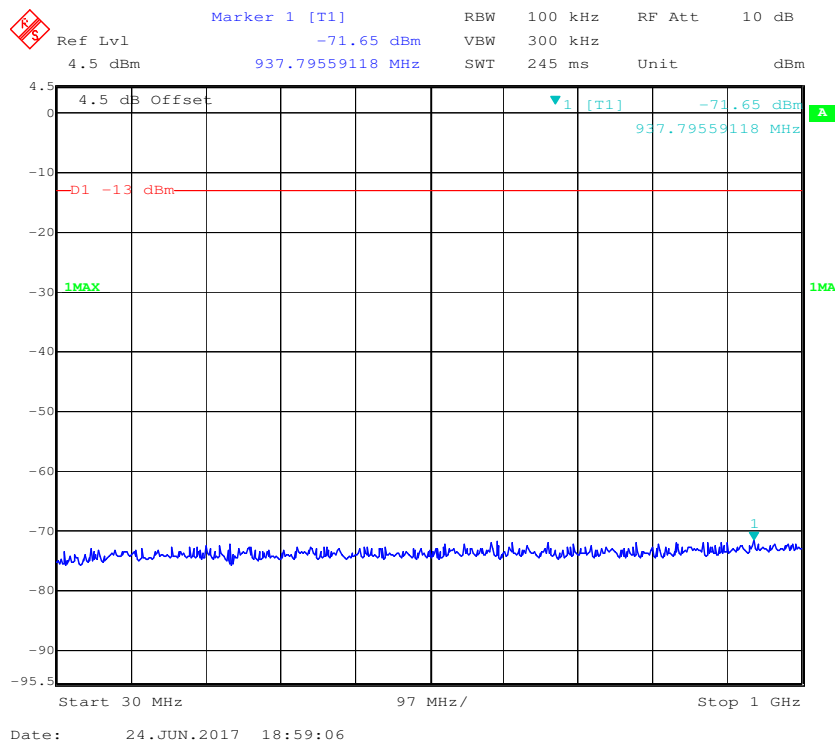
1 GHz - 2 GHz (15.0 MHz, Middle Channel)

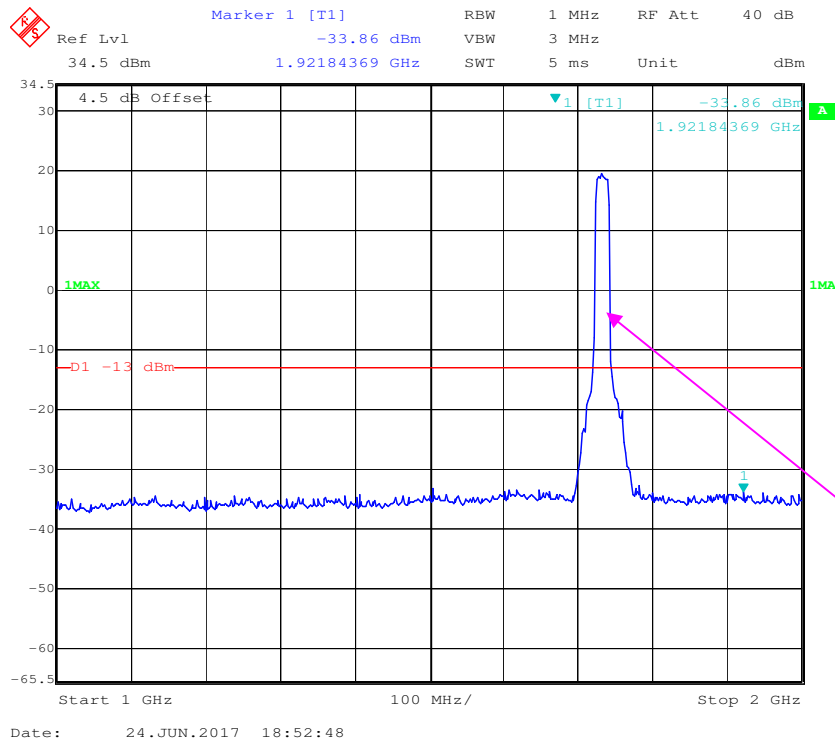


2 GHz – 20 GHz (15.0 MHz, Middle Channel)

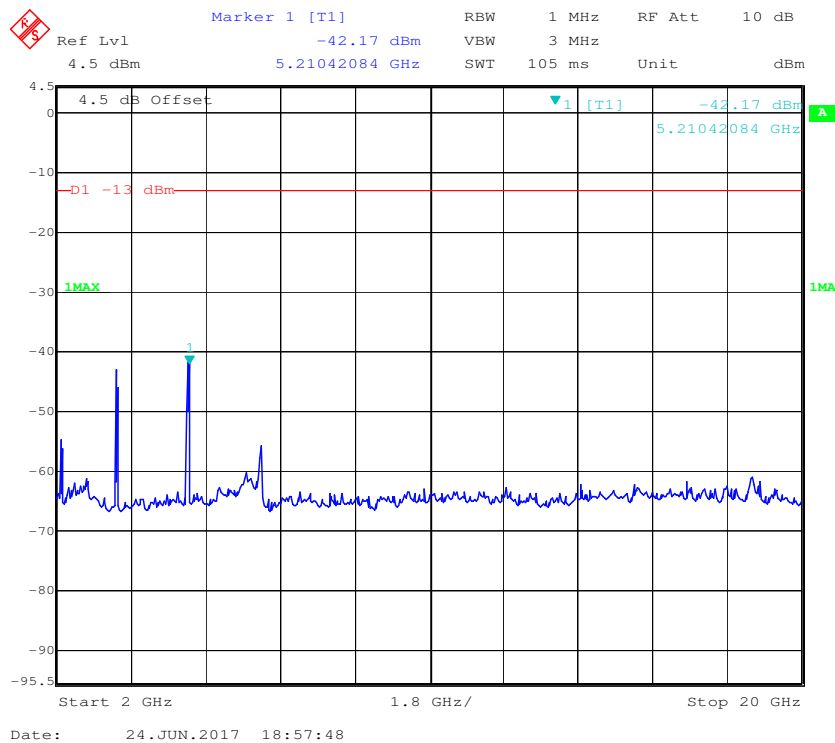


30 MHz - 1 GHz (20.0 MHz, Middle Channel)



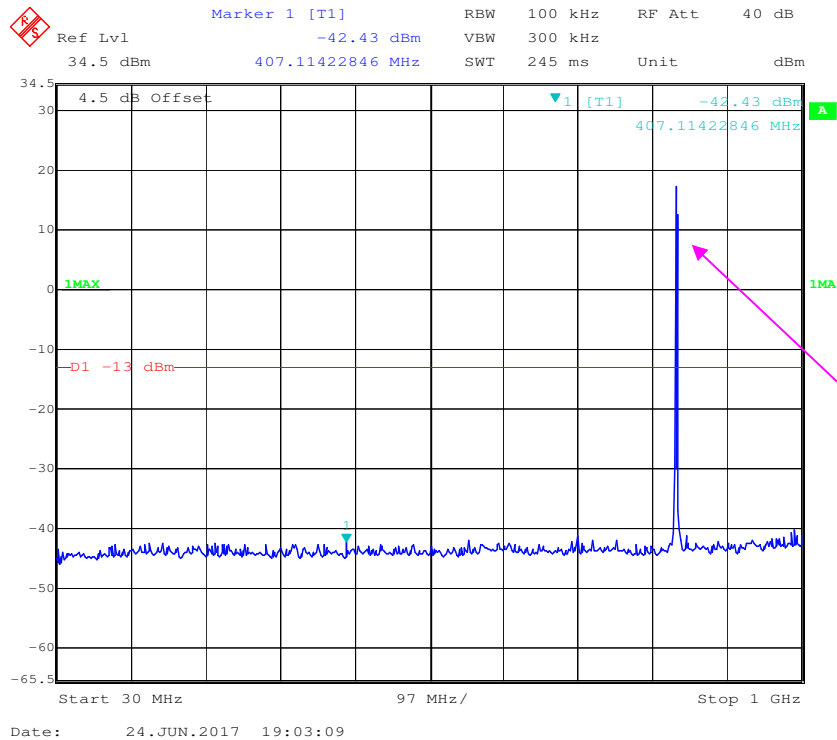
1 GHz – 2 GHz (20.0 MHz, Middle Channel)

Fundamental test

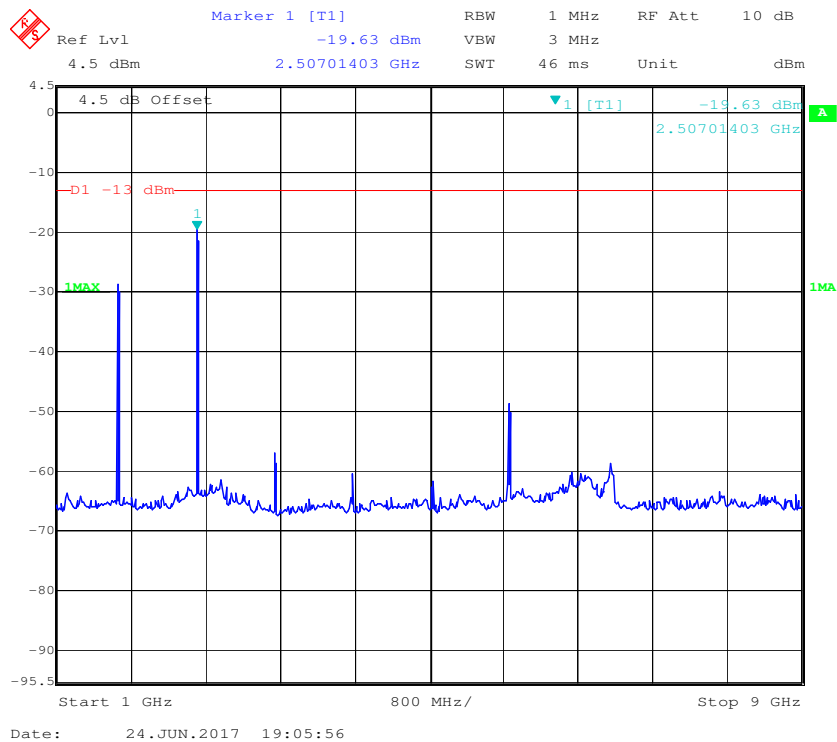
2 GHz – 20 GHz (20.0 MHz, Middle Channel)

LTE Band 5:

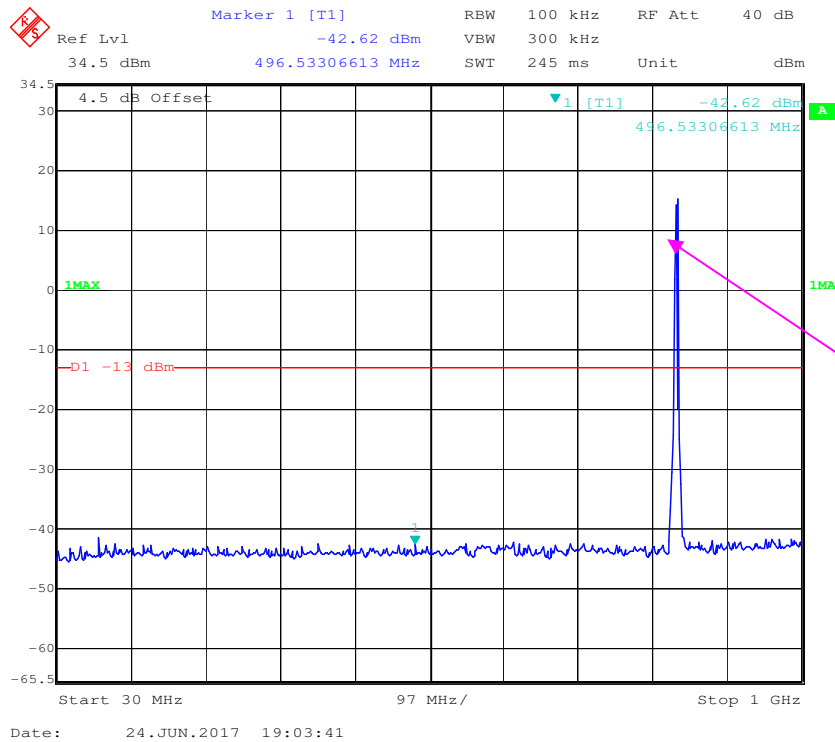
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



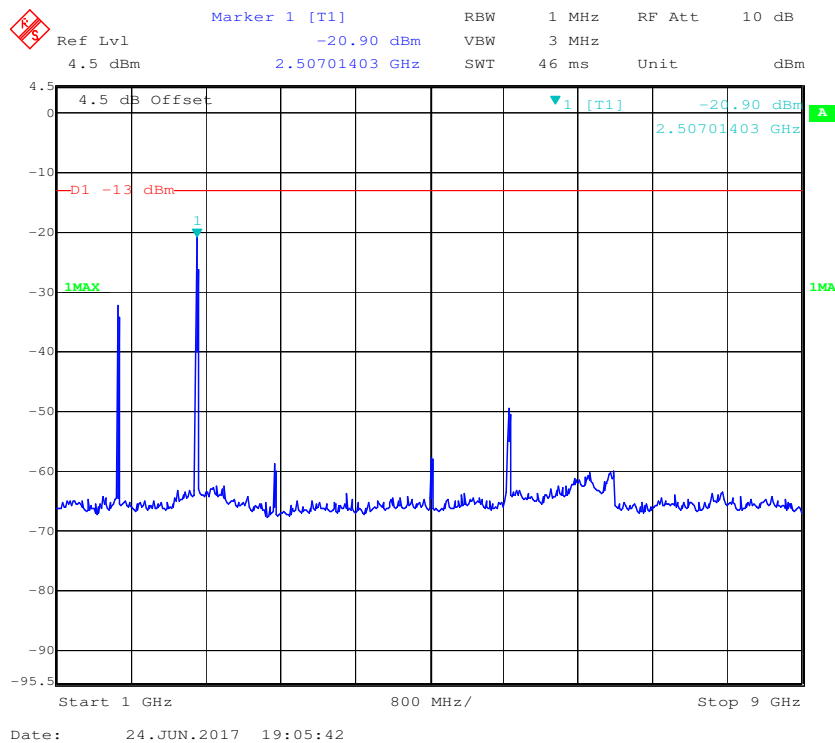
1 GHz - 9 GHz (1.4 MHz, Middle Channel)

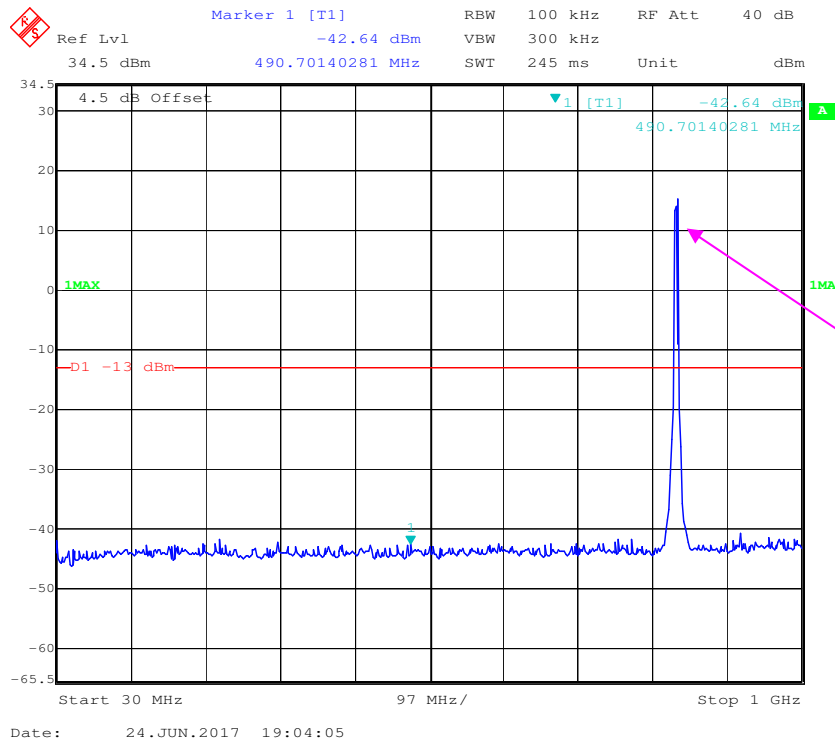
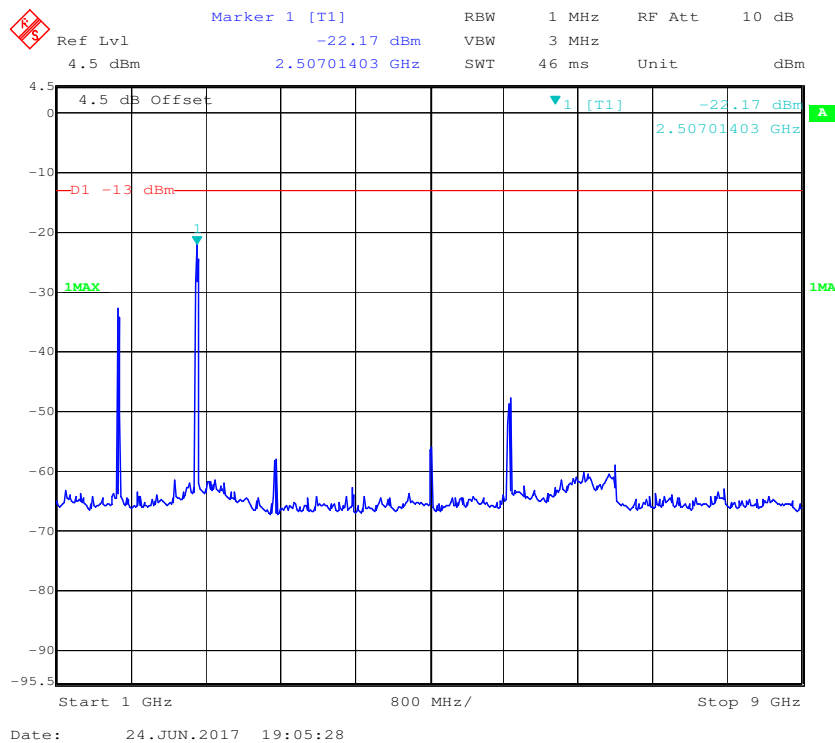


30 MHz - 1 GHz (3.0 MHz, Middle Channel)

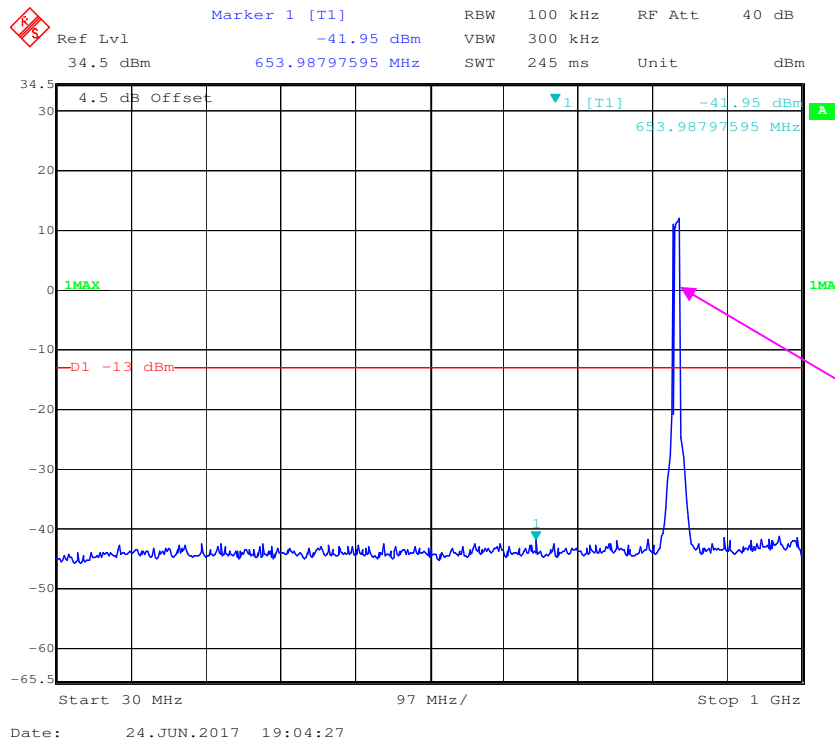


1 GHz - 9 GHz (3.0 MHz, Middle Channel)

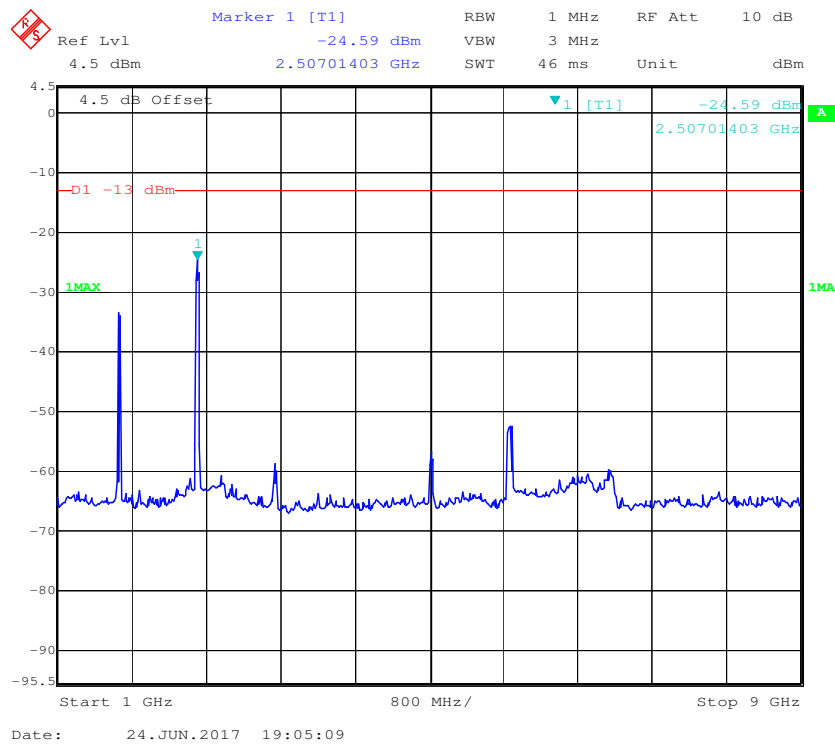


30 MHz - 1 GHz (5.0 MHz, Middle Channel)**1 GHz – 9 GHz (5.0 MHz, Middle Channel)**

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

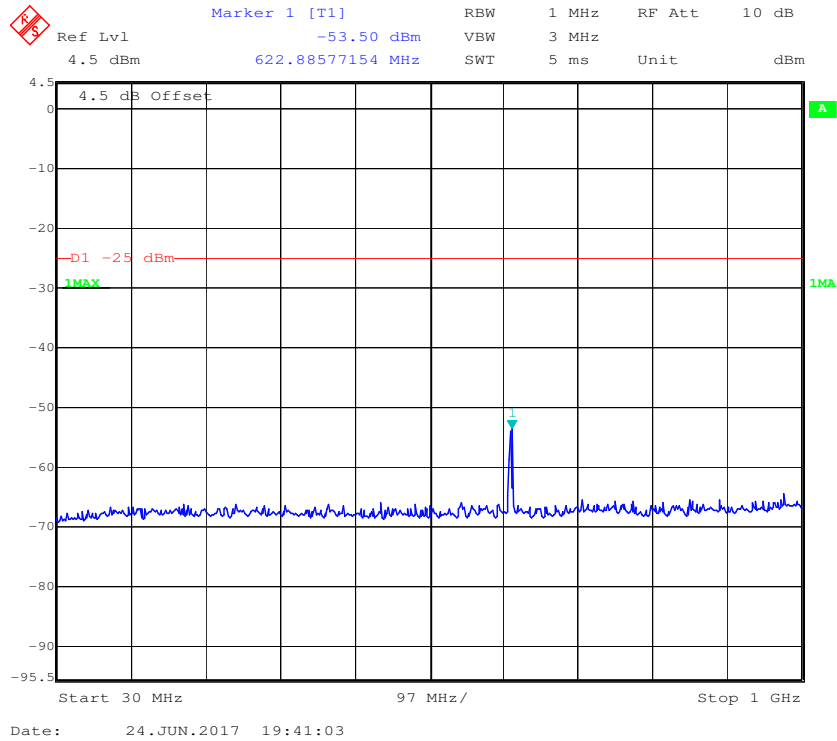


1 GHz – 9 GHz (10.0 MHz, Middle Channel)

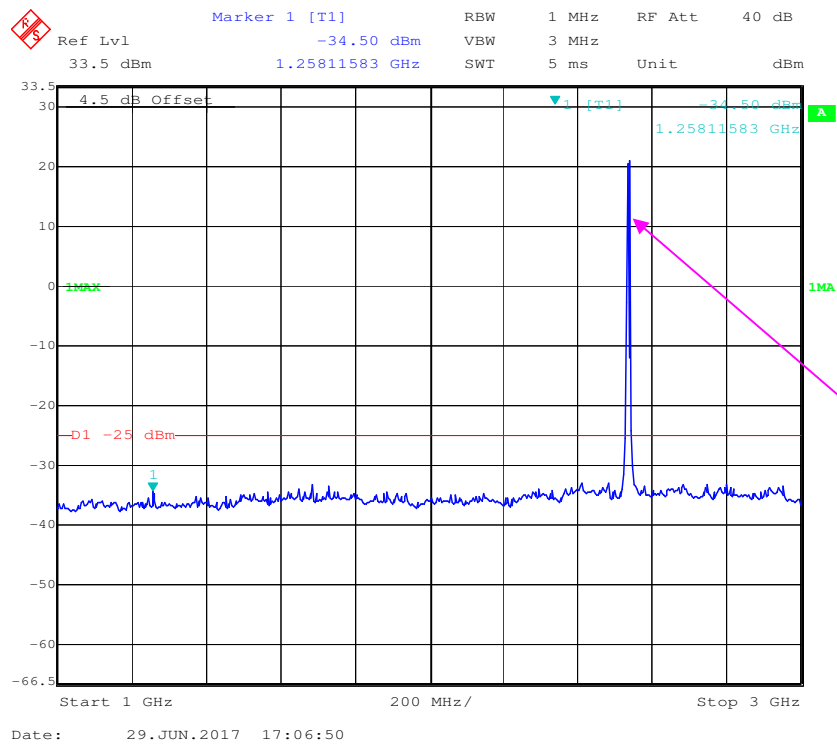


LTE Band 7:

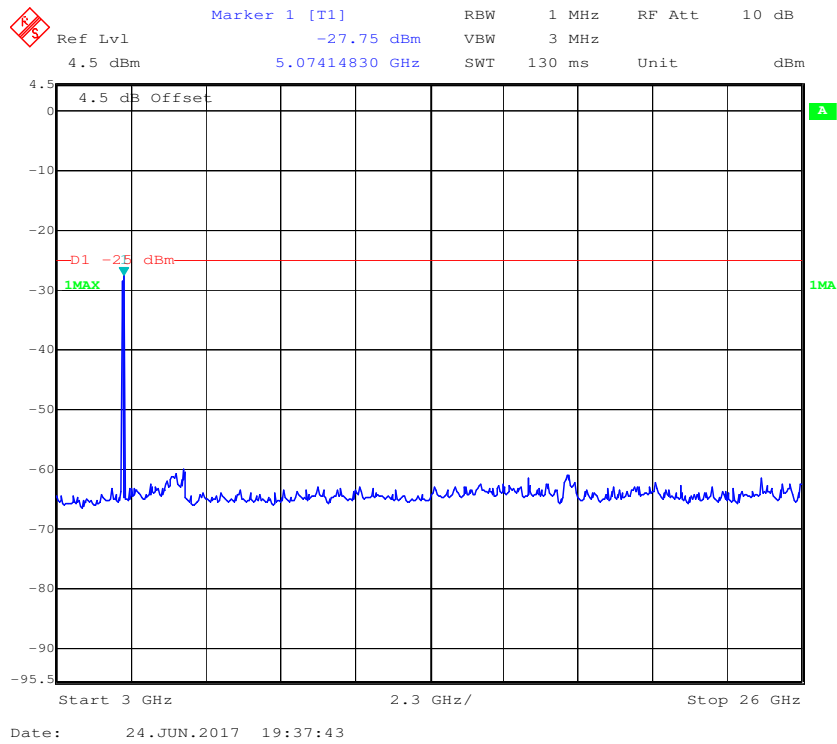
30 MHz – 1 GHz (5.0 MHz, Middle Channel)



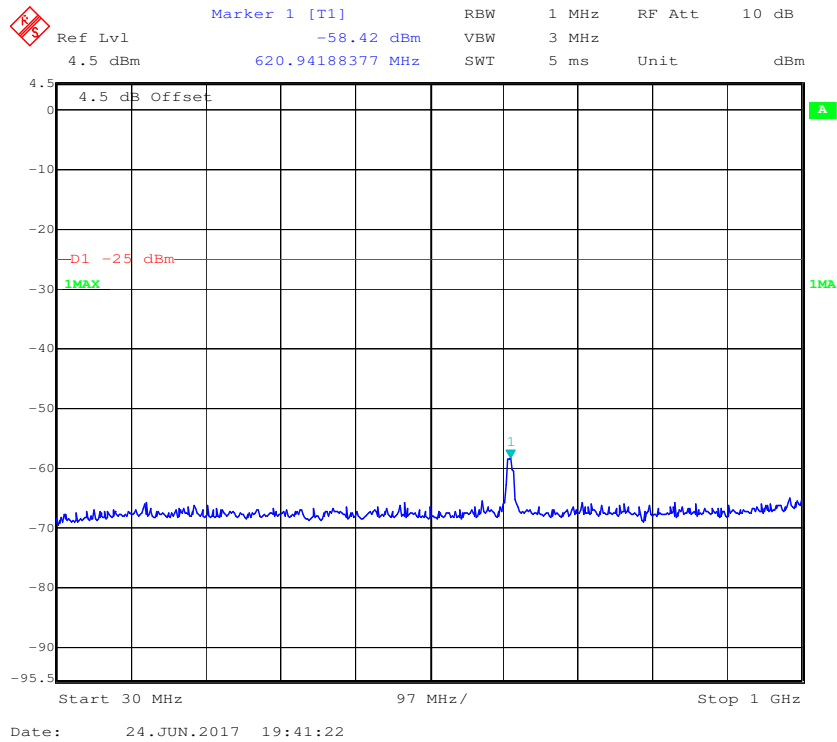
1 GHz – 3.0 GHz (5.0 MHz, Middle Channel)



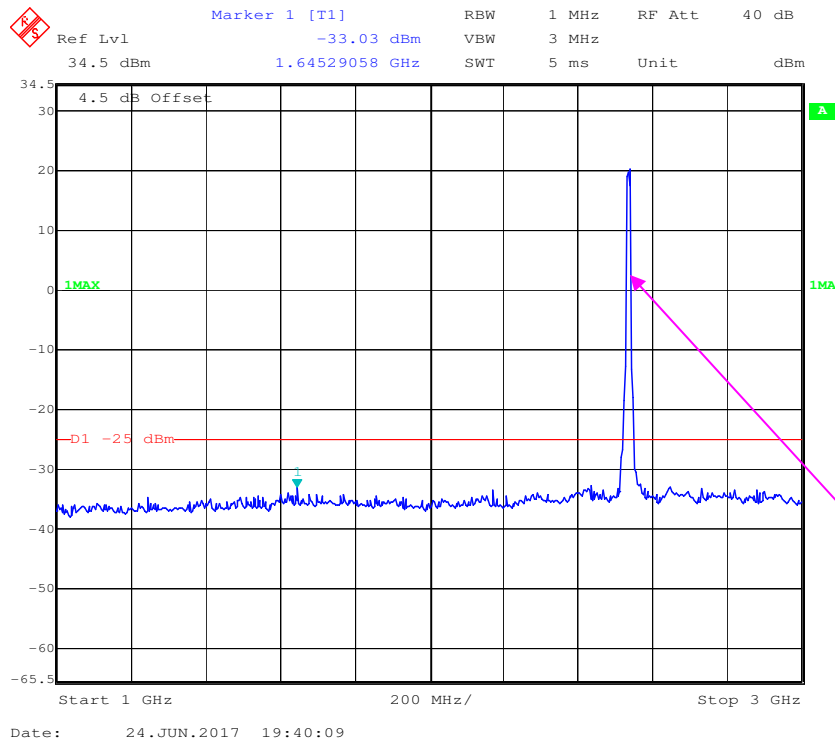
3.0 GHz – 26 GHz (5.0 MHz, Middle Channel)



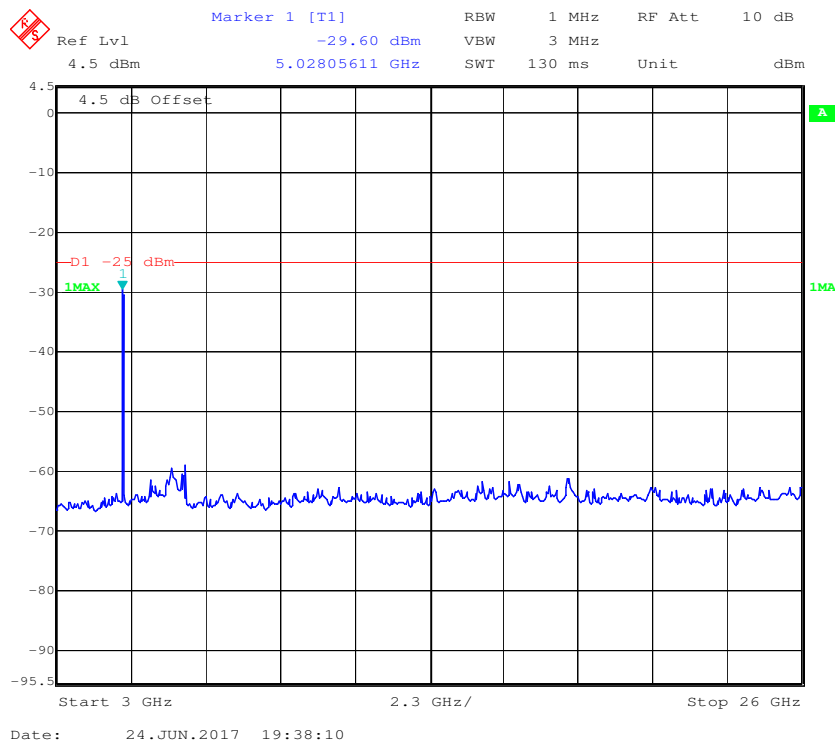
30 MHz – 1.0 GHz (10.0 MHz, Middle Channel)



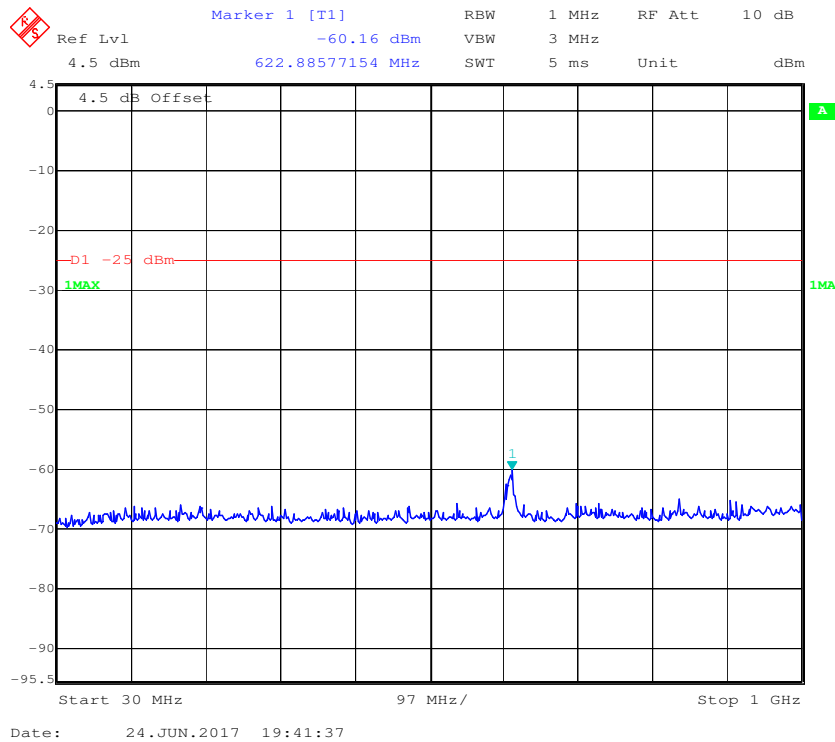
1 GHz – 3 GHz (10.0 MHz, Middle Channel)



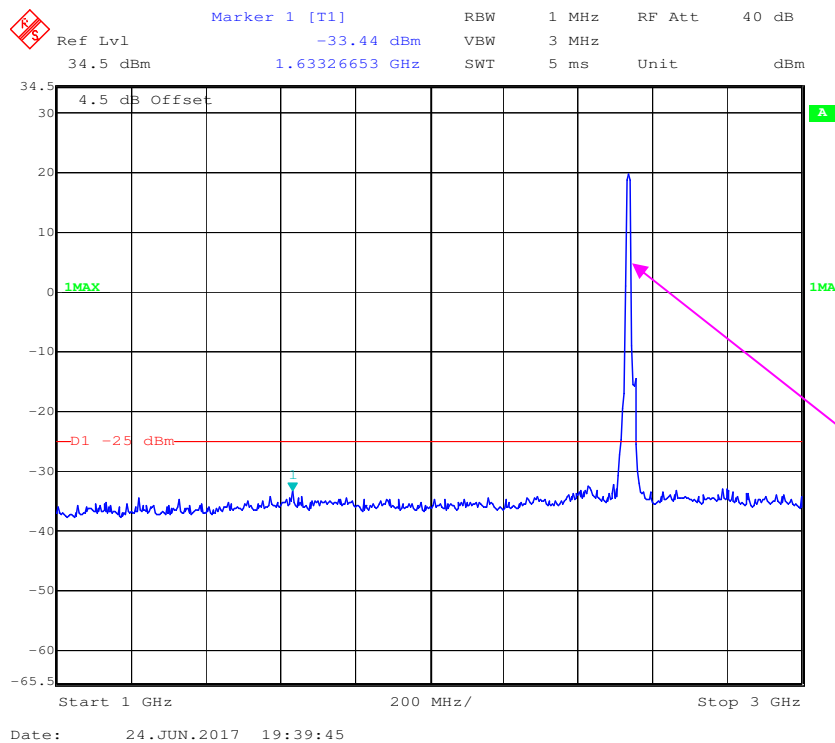
3 GHz – 26 GHz (10.0 MHz, Middle Channel)



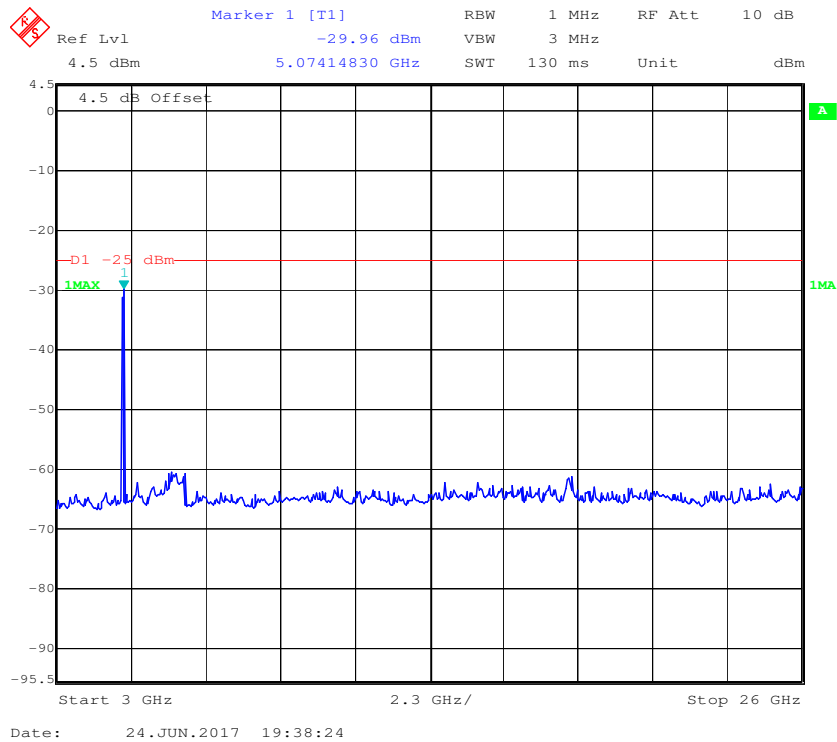
30 MHz – 1 GHz (15.0 MHz, Middle Channel)



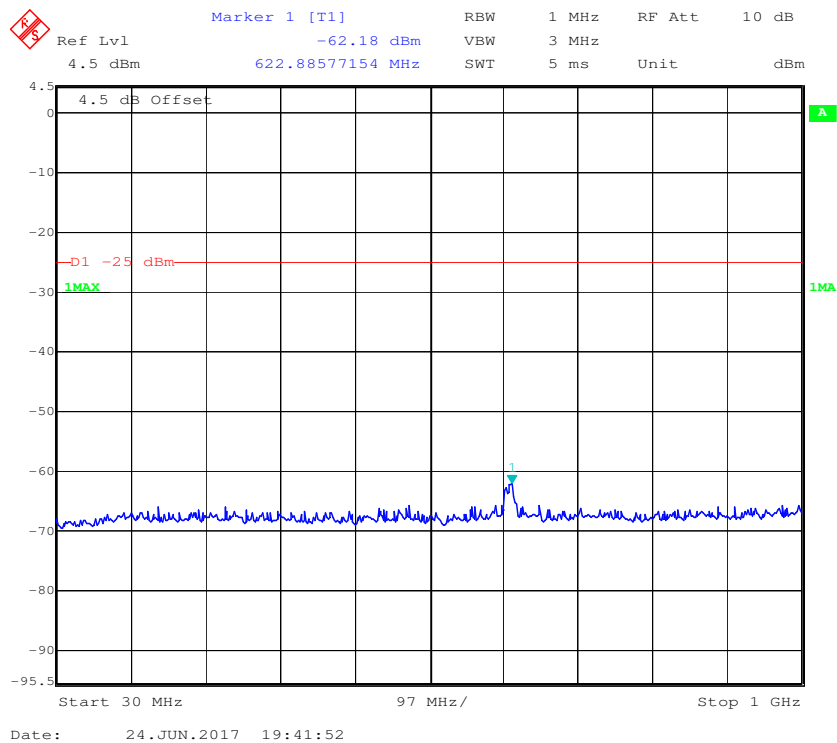
1 GHz – 3 GHz (15.0 MHz, Middle Channel)



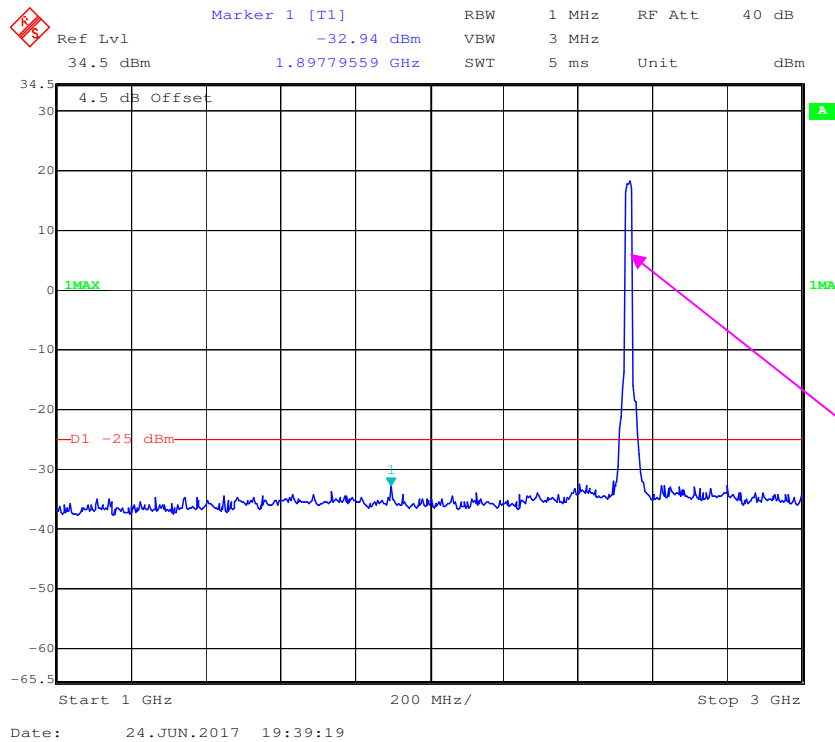
3 GHz – 26 GHz (15.0 MHz, Middle Channel)



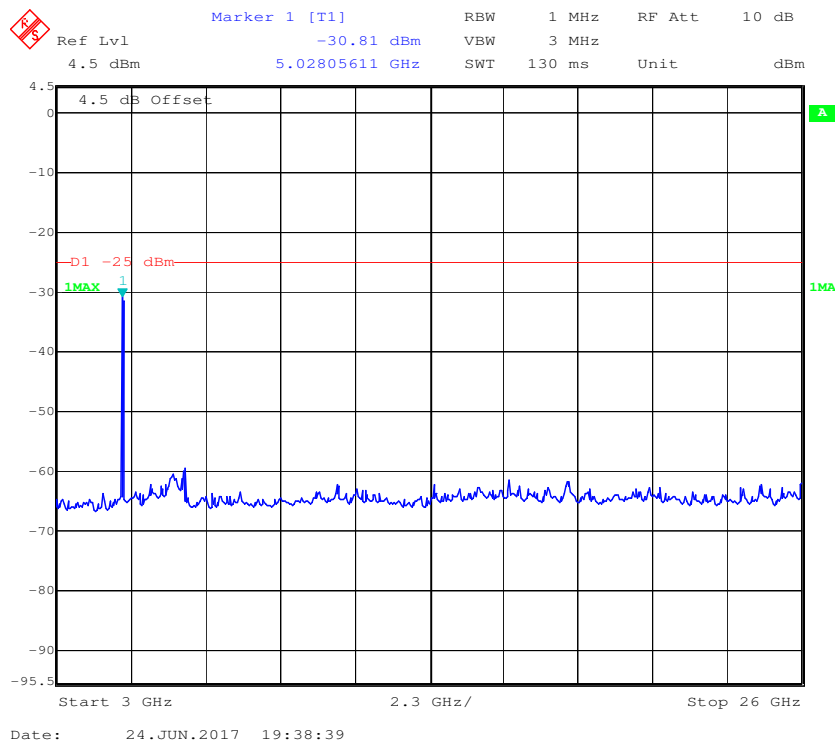
30 MHz – 1 GHz (20.0 MHz, Middle Channel)



1 GHz – 3 GHz (20.0 MHz, Middle Channel)



3 GHz – 26 GHz (20.0 MHz, Middle Channel)



FCC § 2.1053; § 22.917 (a); § 24.238 (a); § 27.53 (h)(m) SPURIOUS RADIATED EMISSIONS**Applicable Standard**

FCC § 2.1053, § 22.917(a) and § 24.238(a) and § 27.53(h)(m)

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Test Procedure

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

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

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

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 = $10 \lg (\text{TX pwr in Watts}/0.001)$ – the absolute level

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

Spurious attenuation limit in dB = $55 + 10 \log_{10} (\text{power out in Watts})$

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Echo Wu on 2017-06-24.

EUT operation mode: transmitting

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

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
GSM Mode, Middle channel										
399.88	61.28	30	2.4	H	-40.8	0.23	4.65	-36.38	-13	23.38
399.88	66.42	145	1.4	V	-38.8	0.23	4.65	-34.38	-13	21.38
1673.20	66.70	165	2.1	H	-35.1	0.40	8.52	-26.98	-13	13.98
1673.20	67.97	250	2.2	V	-35.8	0.40	8.52	-27.68	-13	14.68
WCDMA Mode, Middle channel										
399.88	62.98	334	1.4	H	-39.1	0.23	4.65	-34.68	-13	21.68
399.88	67.42	144	1.3	V	-37.8	0.23	4.65	-33.38	-13	20.38
1673.20	58.70	358	1.4	H	-43.1	0.40	8.52	-34.98	-13	21.98
1673.20	61.37	341	1.3	V	-42.4	0.40	8.52	-34.28	-13	21.28

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
GSM Mode, Middle channel										
399.88	60.98	286	1.6	H	-41.1	0.23	4.65	-36.68	-13	23.68
399.88	65.62	149	1.9	V	-39.6	0.23	4.65	-35.18	-13	22.18
3760.00	66.32	49	2.3	H	-29.7	0.59	9.72	-20.57	-13	7.57
3760.00	66.91	97	2.0	V	-30.2	0.59	9.72	-21.07	-13	8.07
WCDMA Mode, Middle channel										
399.88	64.98	56	1.2	H	-37.1	0.23	4.65	-32.68	-13	19.68
399.88	70.42	185	2.4	V	-34.8	0.23	4.65	-30.38	-13	17.38
3760.00	57.92	255	2.0	H	-38.1	0.59	9.72	-28.97	-13	15.97
3760.00	59.31	60	1.1	V	-37.8	0.59	9.72	-28.67	-13	15.67

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
Band 2										
Test frequency range:30 MHz ~ 20 GHz										
399.88	62.18	171	2.2	H	-39.9	0.23	4.65	-35.48	-13	22.48
399.88	67.82	264	2.2	V	-37.4	0.23	4.65	-32.98	-13	19.98
3760.00	57.22	118	1.3	H	-38.8	0.59	9.72	-29.67	-13	16.67
3760.00	58.71	1	2.3	V	-38.4	0.59	9.72	-29.27	-13	16.27
Band 4										
Test frequency range:30 MHz ~ 20 GHz										
399.88	63.38	8	2.0	H	-38.7	0.23	4.65	-34.28	-13	21.28
399.88	68.02	18	1.9	V	-37.2	0.23	4.65	-32.78	-13	19.78
3465.00	59.43	266	1.2	H	-37.6	0.54	9.90	-28.24	-13	15.24
3465.00	59.03	266	1.1	V	-39.3	0.54	9.90	-29.94	-13	16.94
Band 5										
Test frequency range:30 MHz ~ 10 GHz										
399.88	62.48	256	2.2	H	-39.6	0.23	4.65	-35.18	-13	22.18
399.88	67.42	234	1.6	V	-37.8	0.23	4.65	-33.38	-13	20.38
1673.00	55.90	266	1.3	H	-45.9	0.40	8.52	-37.78	-13	24.78
1673.00	57.87	92	1.8	V	-45.9	0.40	8.52	-37.78	-13	24.78
Band 7										
Test frequency range: 30 MHz ~ 26 GHz										
399.88	66.28	25	2.3	H	-35.8	0.23	4.65	-31.38	-25	6.38
399.88	70.42	102	2.3	V	-34.8	0.23	4.65	-30.38	-25	5.38
5070.00	48.94	321	1.2	H	-44.2	0.64	10.30	-34.54	-25	9.54
5070.00	51.17	295	1.5	V	-43.5	0.64	10.30	-33.84	-25	8.84

Note:

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

FCC § 22.917 (a); § 24.238 (a); § 27.53 (h)(m) - BAND EDGES

Applicable Standard

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

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.

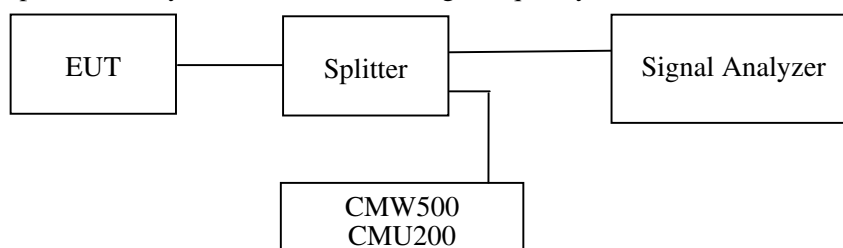
According to FCC § 27.53 (h)(m), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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

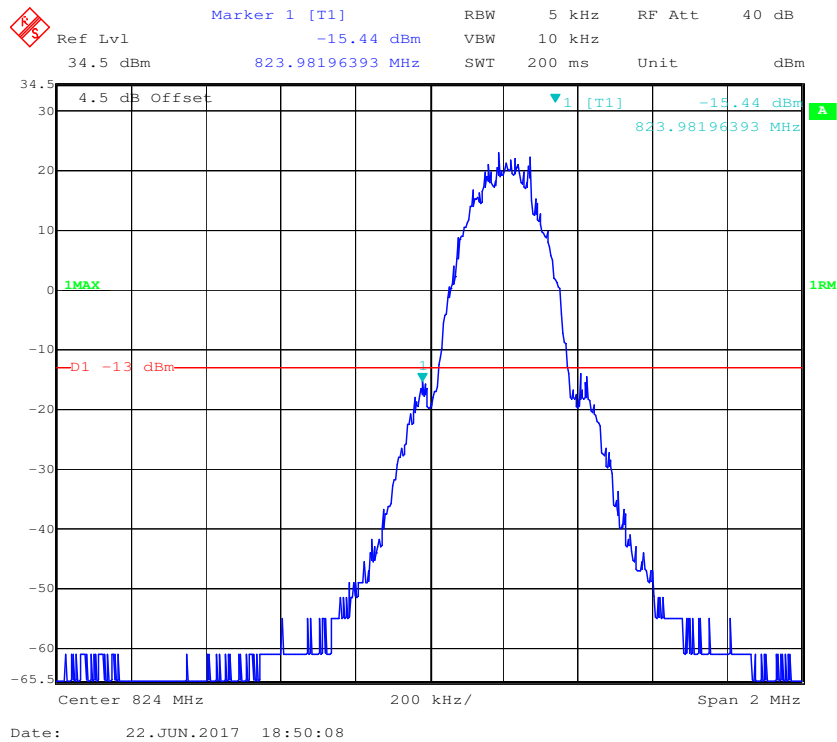
Temperature:	23~25 °C
Relative Humidity:	45~50 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Echo Wu from 2017-06-22 to 2017-08-04.

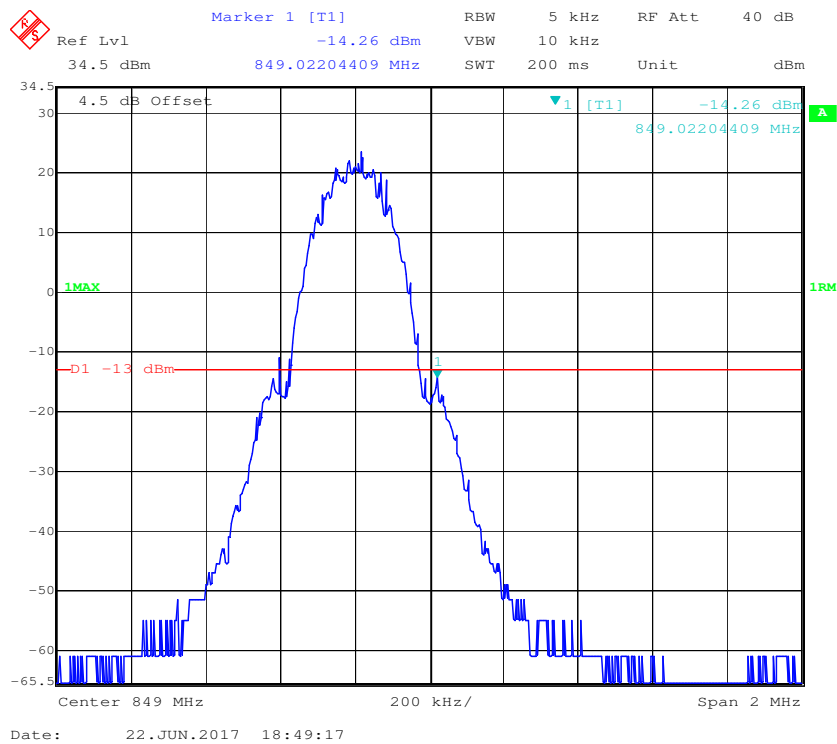
EUT operation mode: transmitting

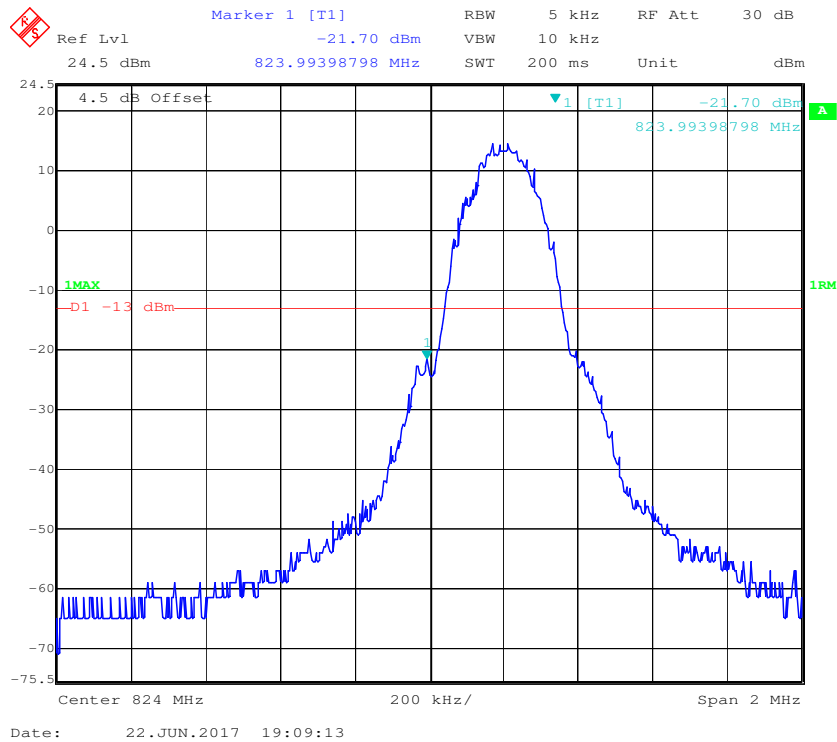
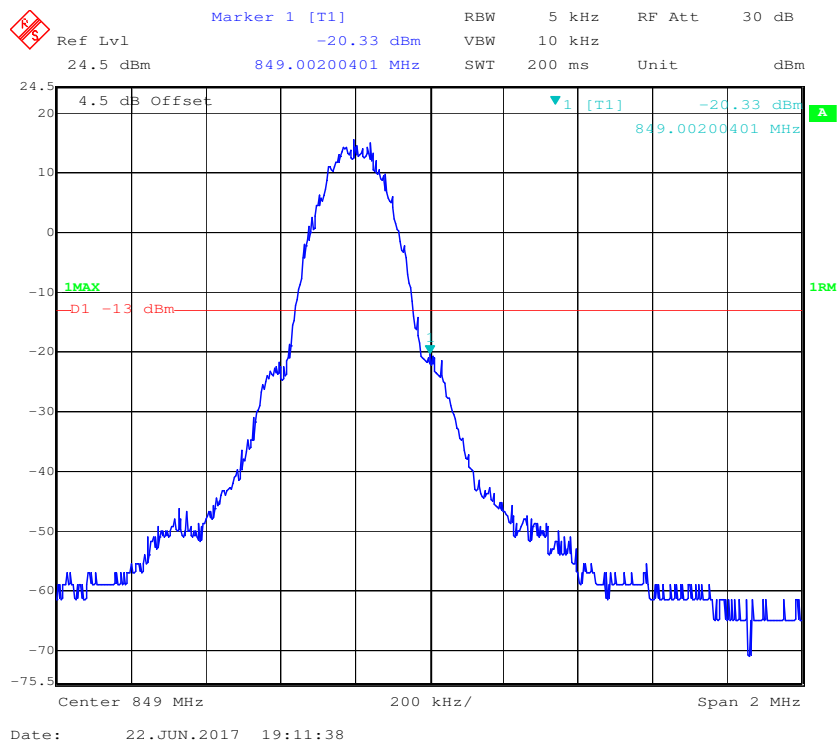
Test Result: Compliance. Please refer to the following plots.

Cellular Band, Left Band Edge for GSM (GMSK) Mode

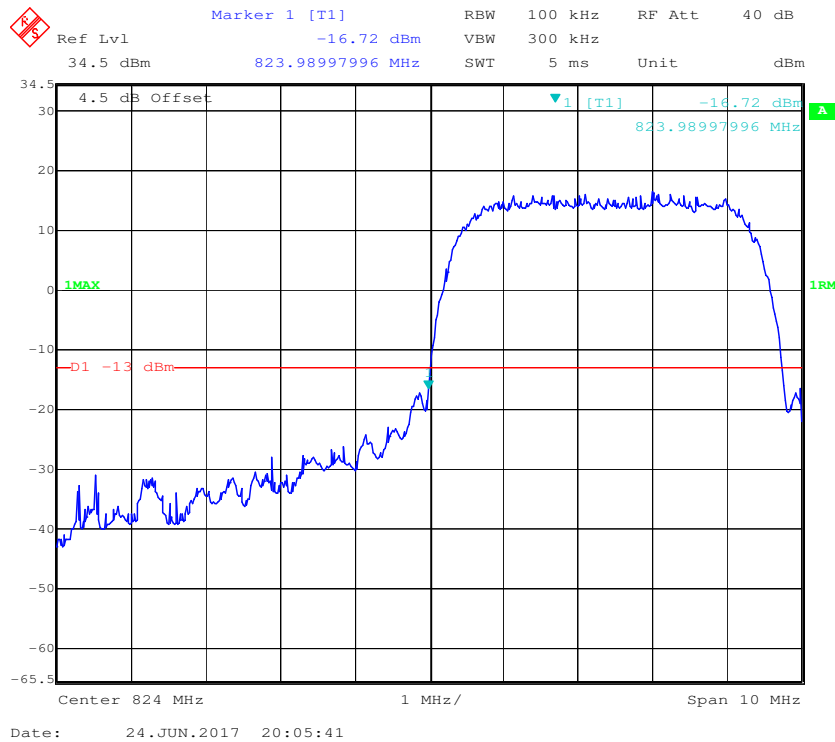


Cellular Band, Right Band Edge for GSM (GMSK) Mode

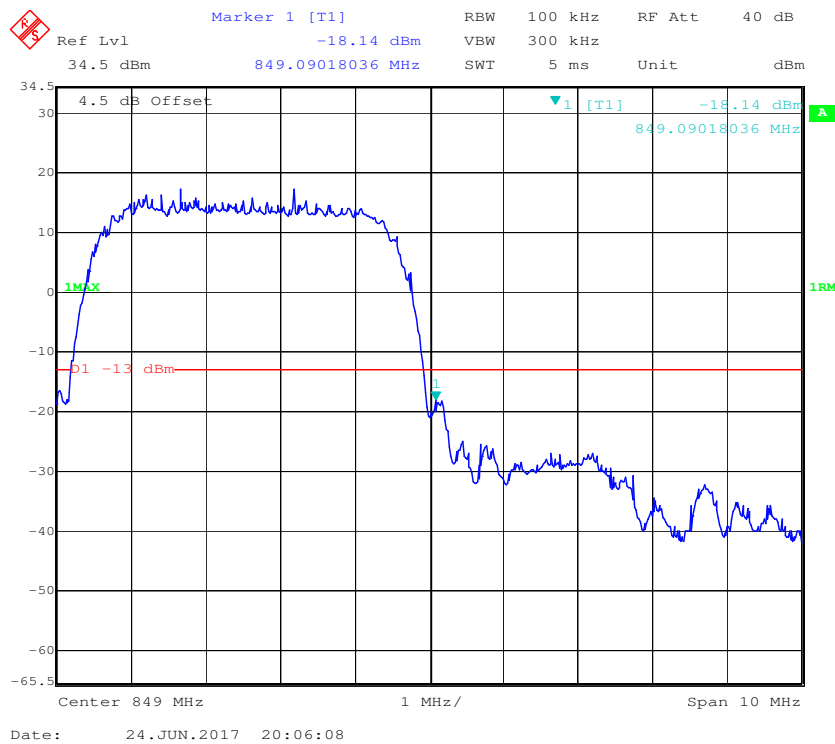


Cellular Band, Left Band Edge for EDGE Mode**Cellular Band, Right Band Edge for EDGE Mode**

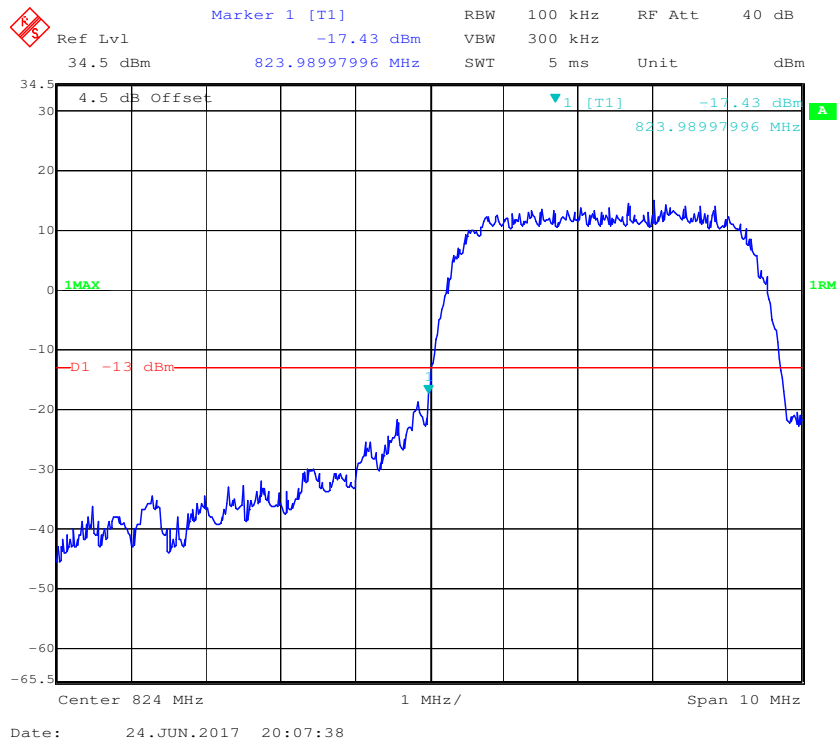
Cellular Band, Left Band Edge for WCDMA (BPSK) Mode



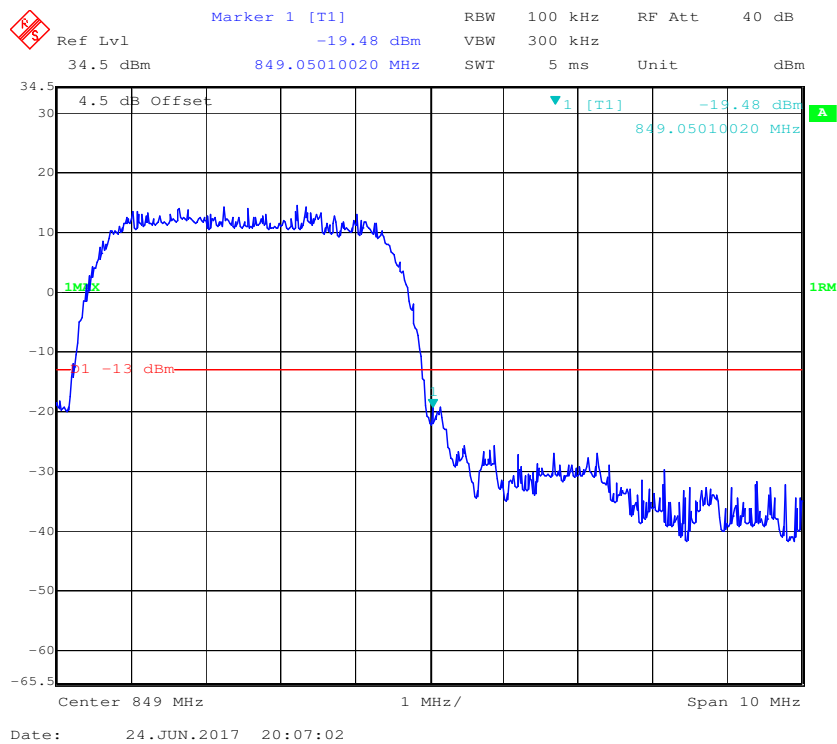
Cellular Band, Right Band Edge for WCDMA (BPSK) Mode

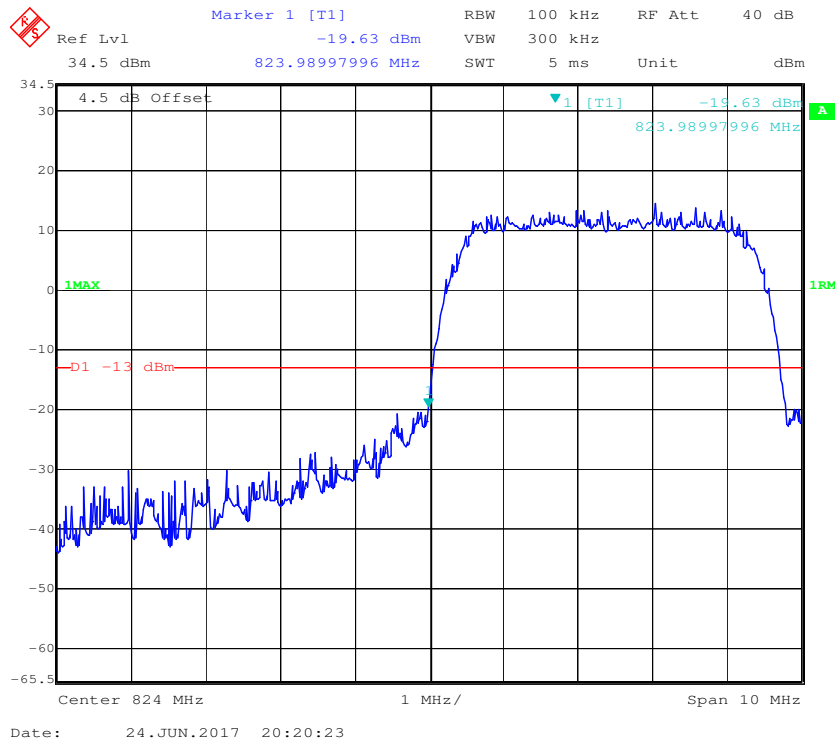
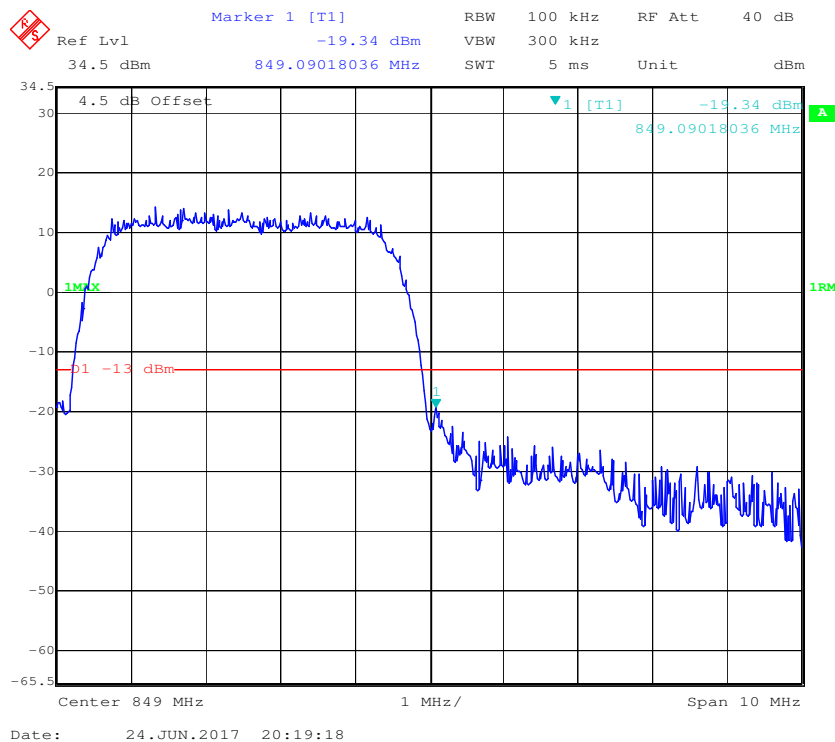


Cellular Band, Left Band Edge for HSDPA (16QAM) Mode

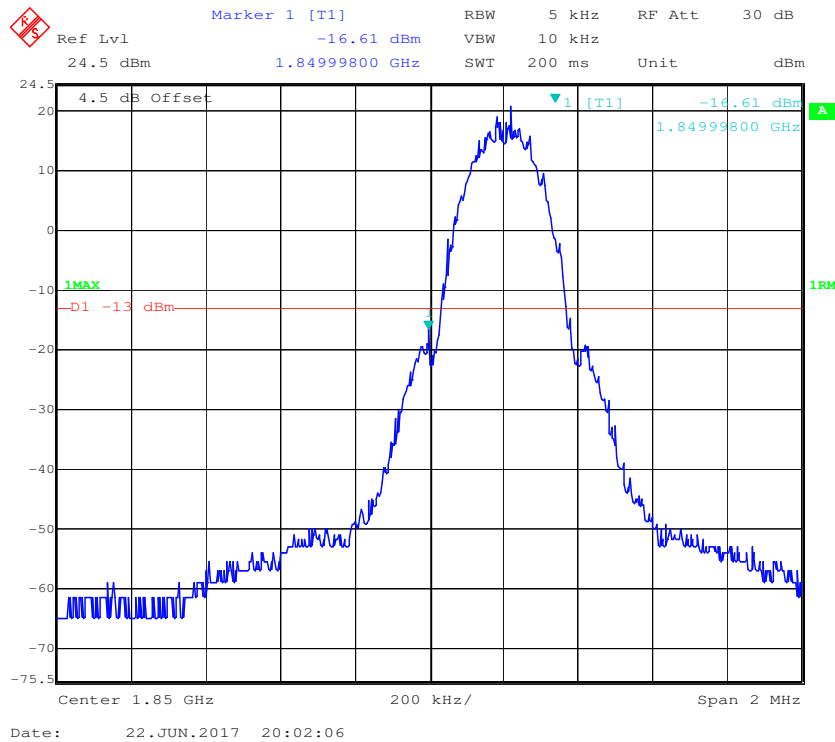


Cellular Band, Right Band Edge for HSDPA (16QAM) Mode

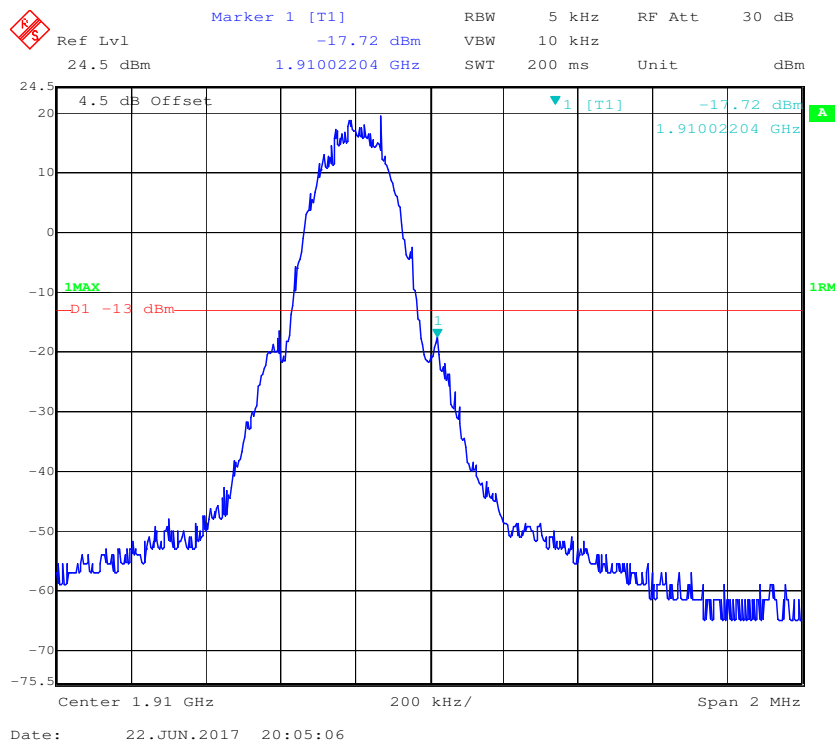


Cellular Band, Left Band Edge for HSUPA (BPSK) Mode**Cellular Band, Right Band Edge for HSUPA (BPSK) Mode**

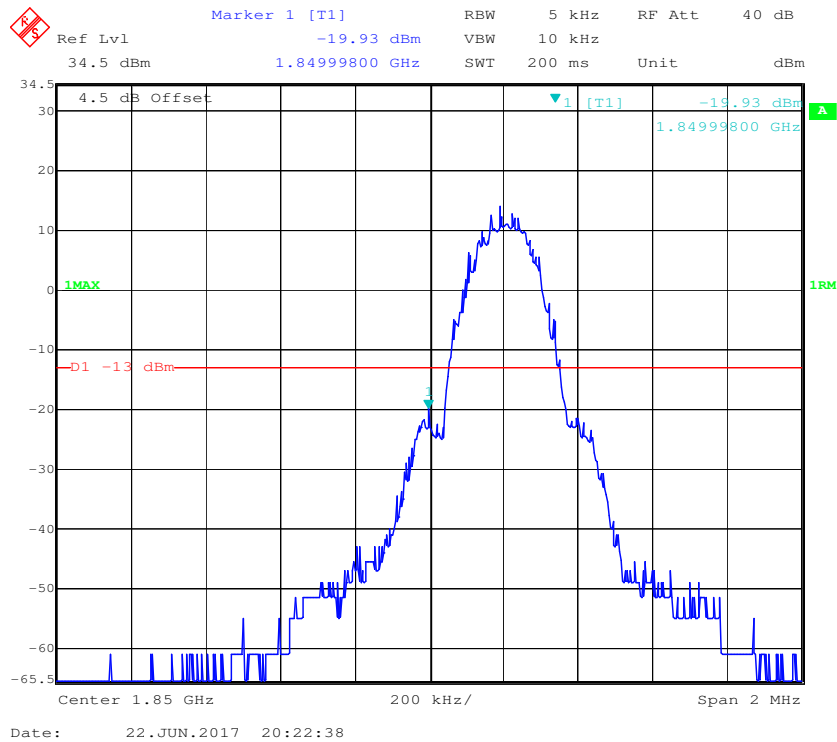
PCS Band, Left Band Edge for GSM (GMSK) Mode



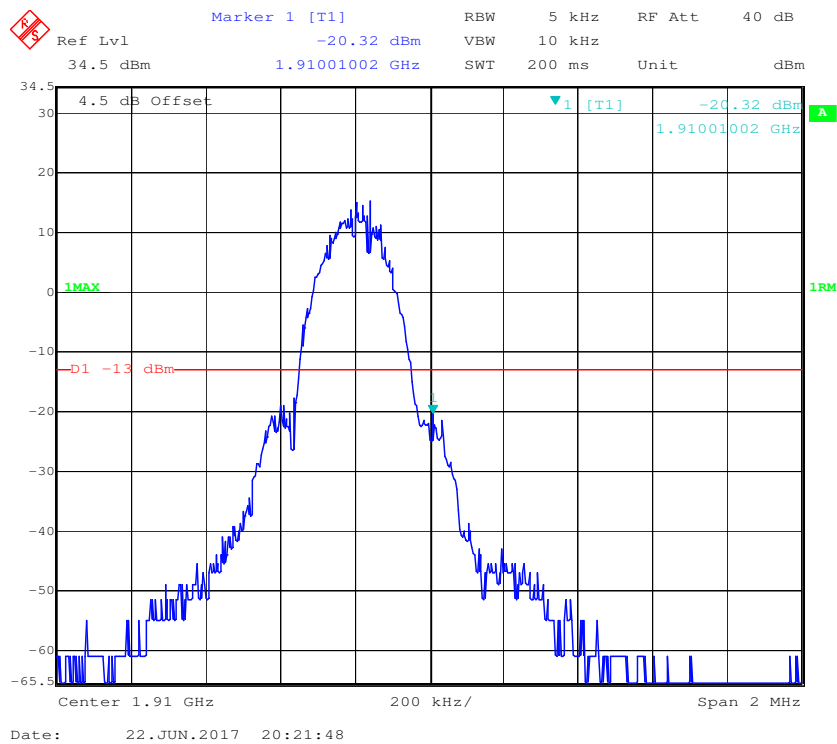
PCS Band, Right Band Edge for GSM (GMSK) Mode



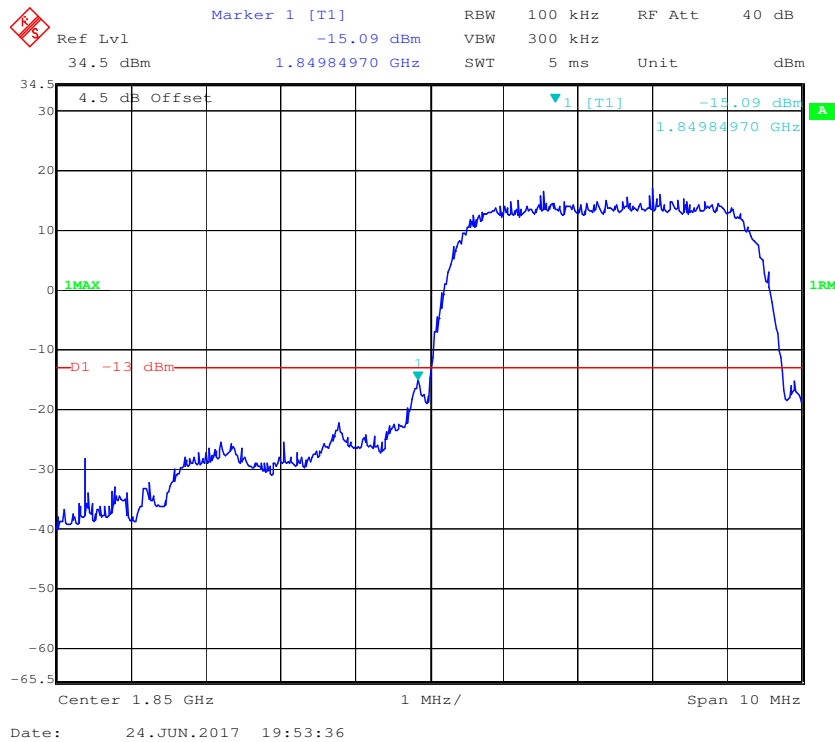
PCS Band, Left Band Edge for EDGE Mode



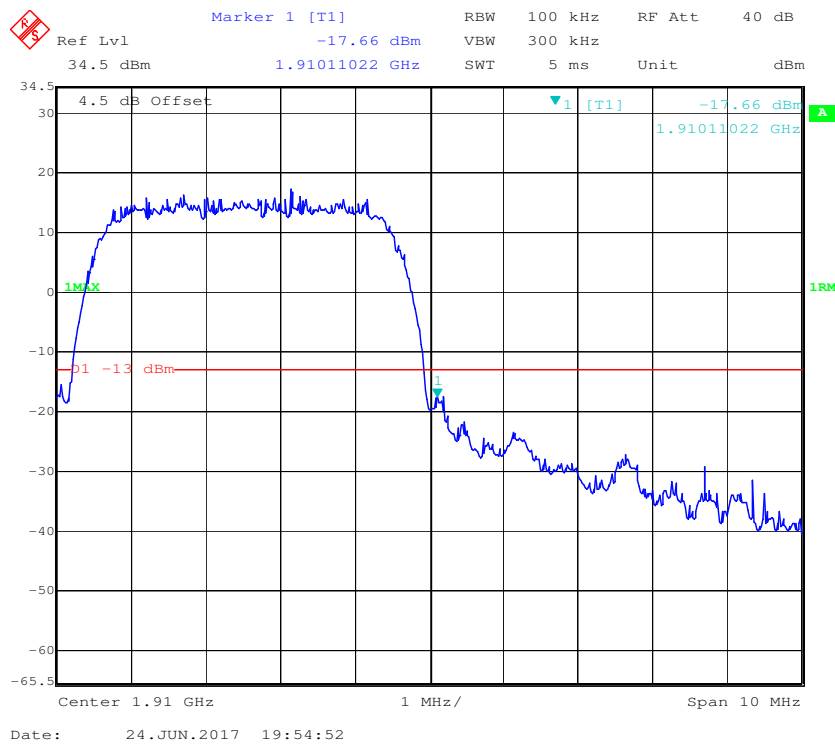
PCS Band, Right Band Edge for EDGE Mode

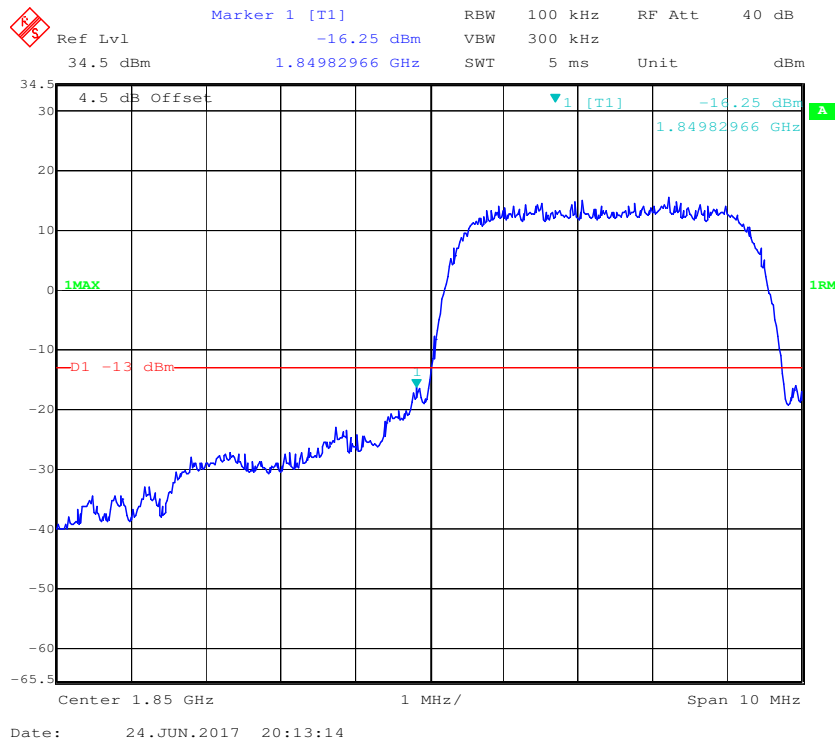
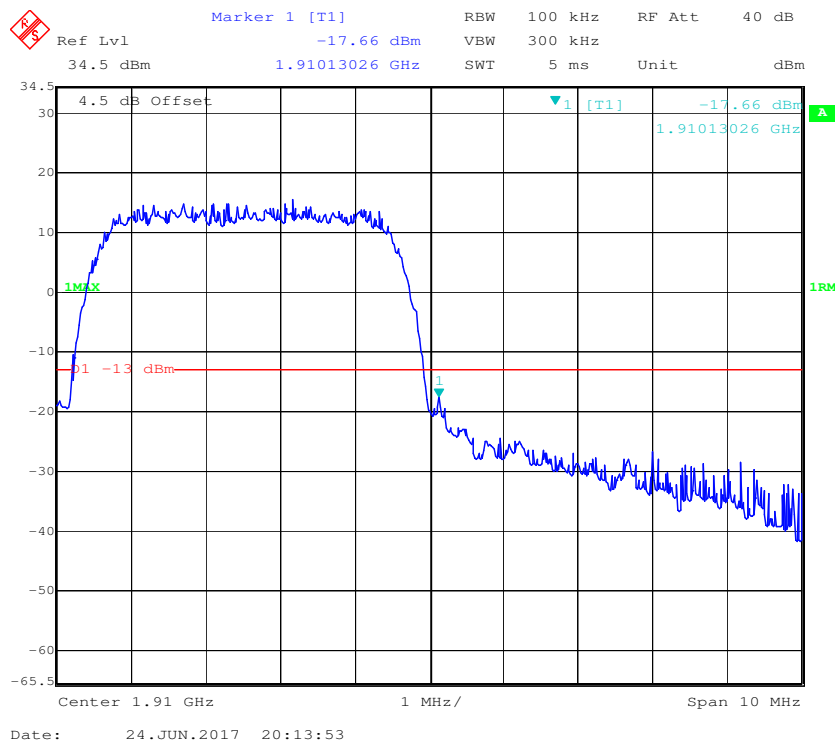


PCS Band, Left Band Edge for WCDMA (BPSK) Mode

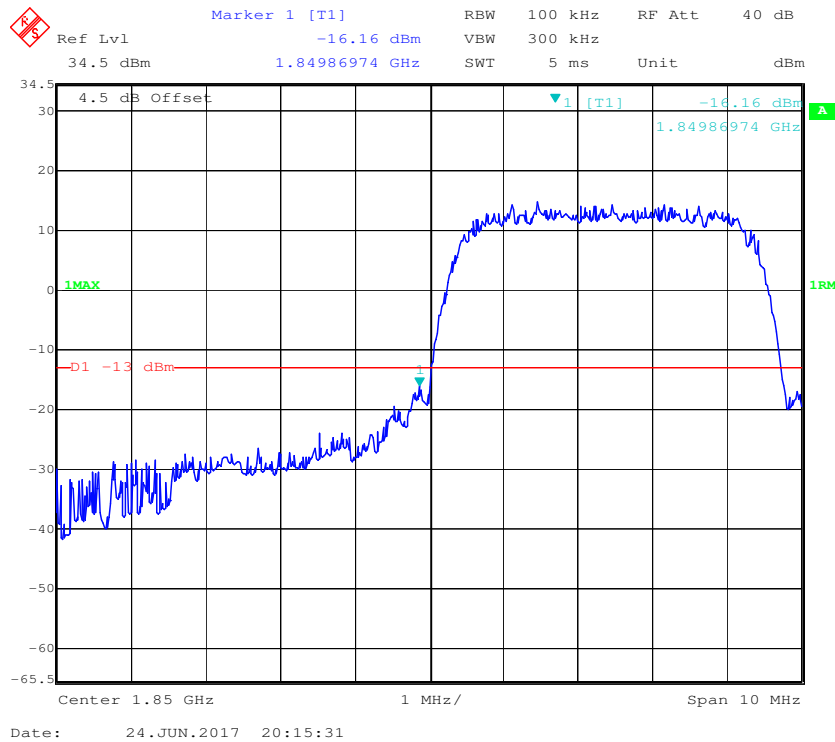


PCS Band, Right Band Edge for WCDMA (BPSK) Mode

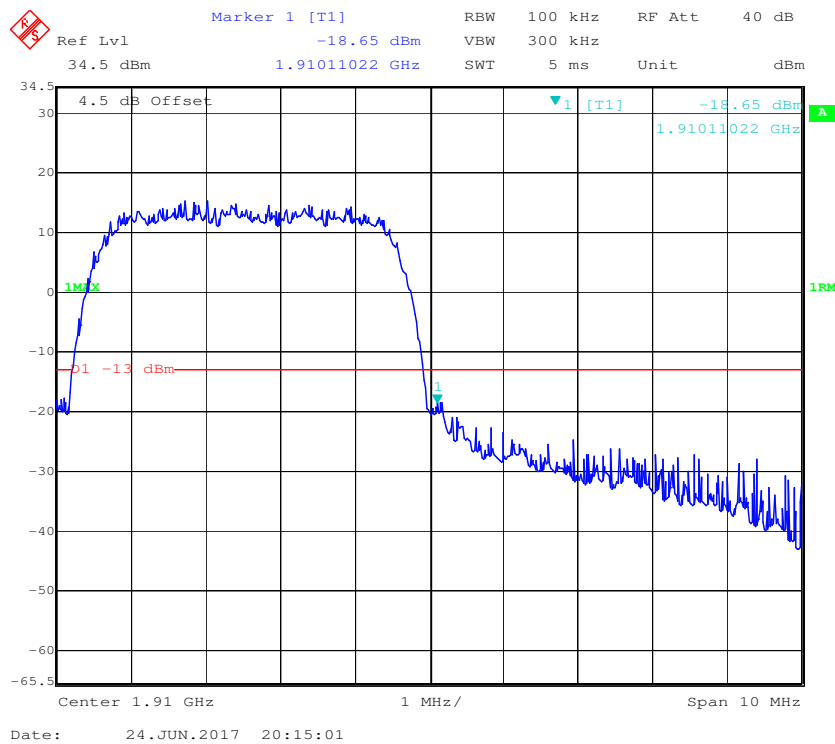


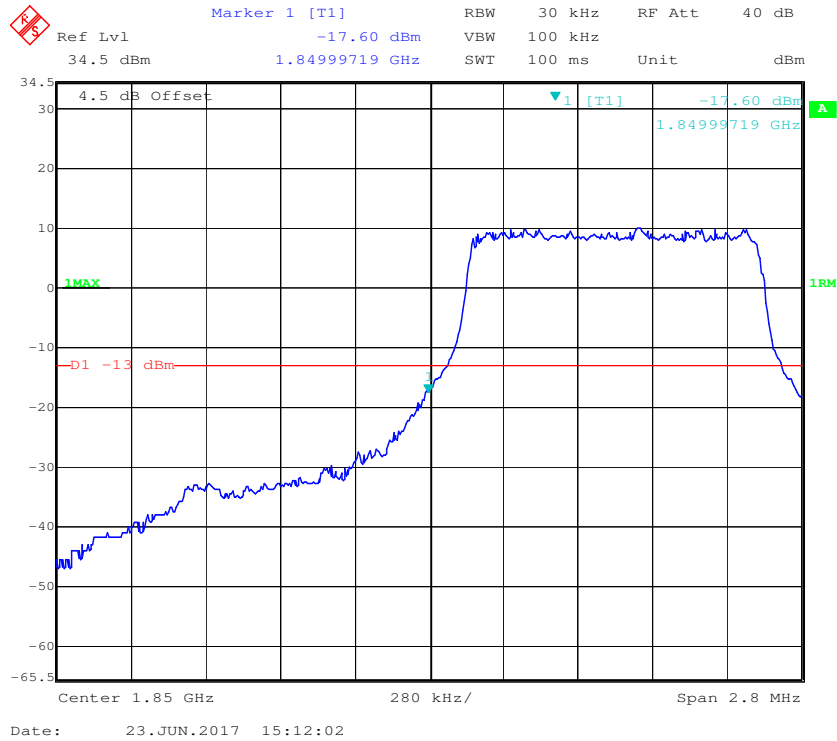
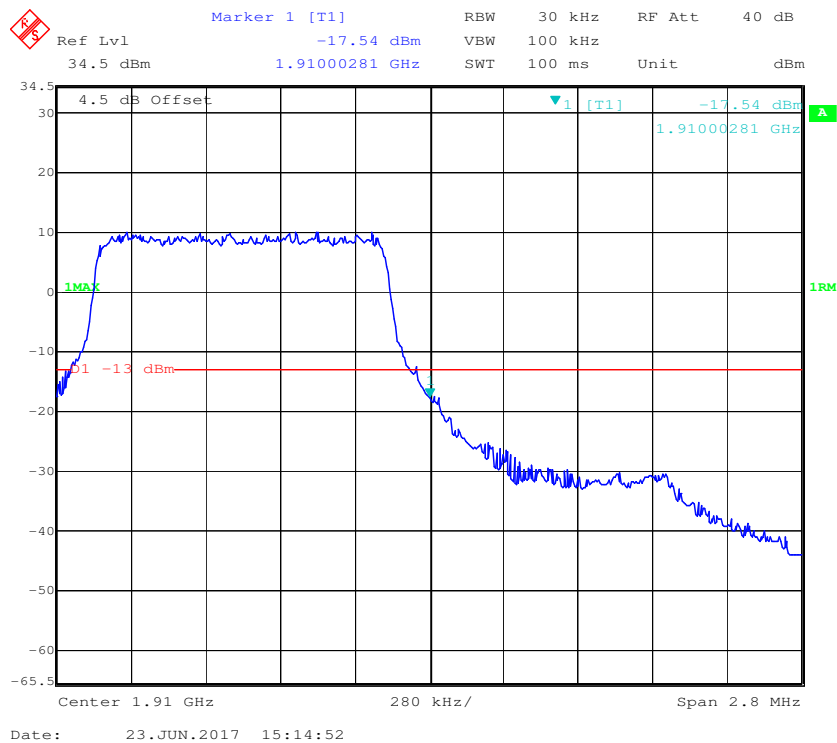
PCS Band, Left Band Edge for HSDPA (16QAM) Mode**PCS Band, Right Band Edge for HSDPA (16QAM) Mode**

PCS Band, Left Band Edge for HSUPA (BPSK) Mode



PCS Band, Right Band Edge for HSUPA (BPSK) Mode



LTE Band 2:**QPSK (1.4 MHz, FULL RB) - Left Band Edge****QPSK (1.4 MHz, FULL RB) - Right Band Edge**

Ref Lvl -16.82 dBm RBW 30 kHz RF Att 40 dB
 34.5 dBm 1.84999158 GHz SWT 100 ms Unit dBm
 Marker 1 [T1]

4.5 dB Offset

1MAX

D1 -13 dBm

Center 1.85 GHz 280 kHz/ Span 2.8 MHz

Date: 23.JUN.2017 15:13:09

Ref Lvl 34.5 dBm

Marker 1 [T1] -17.78 dBm

RBW 30 kHz

VBW 100 kHz

RF Att 40 dB

SWT 100 ms

Unit dBm

4.5 dB Offset

1 [T1] -17.78 dBm

1.91000281 GHz

1MAX

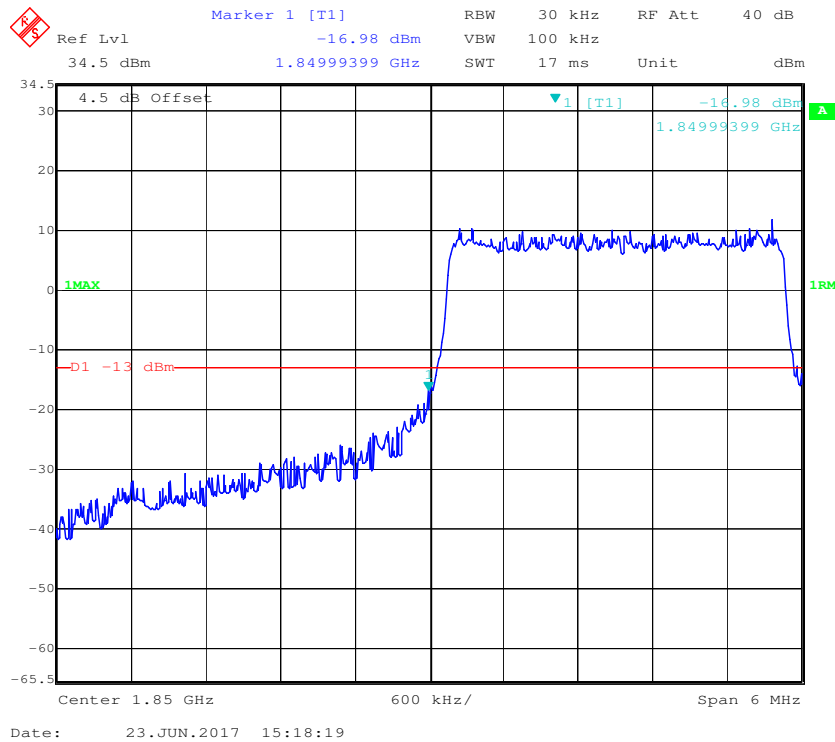
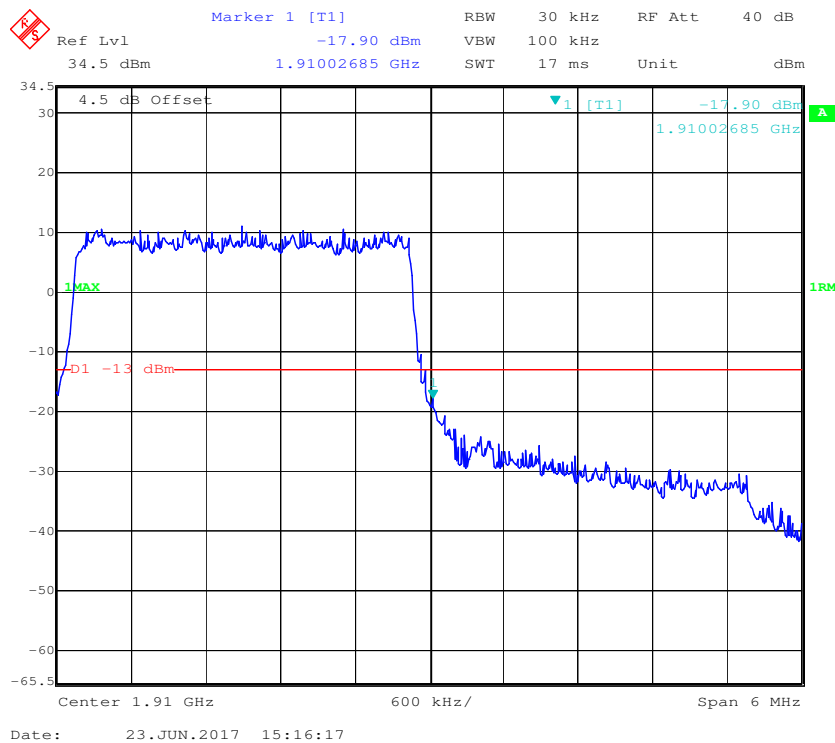
01 -13 dBm

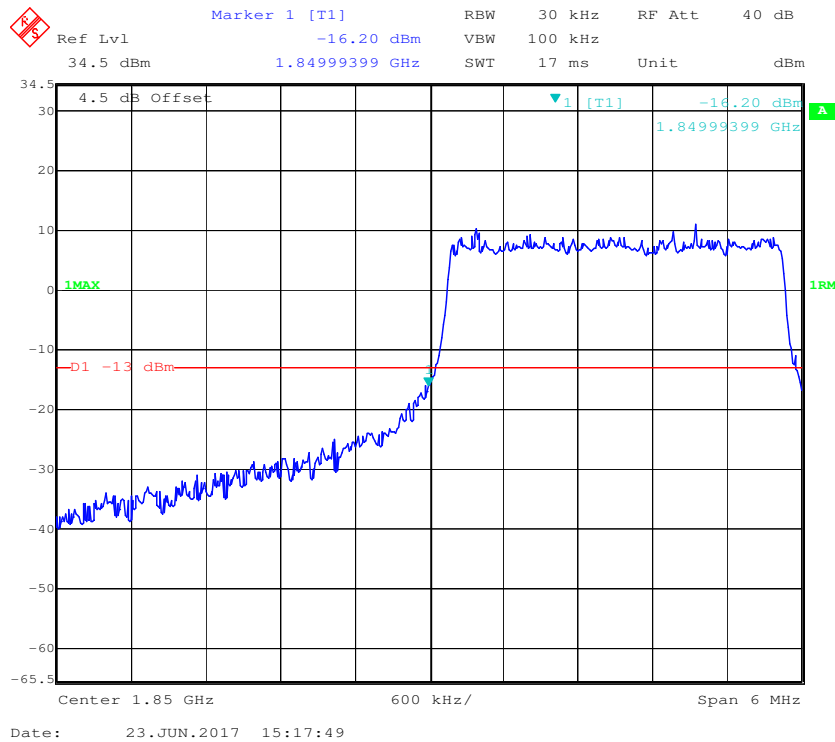
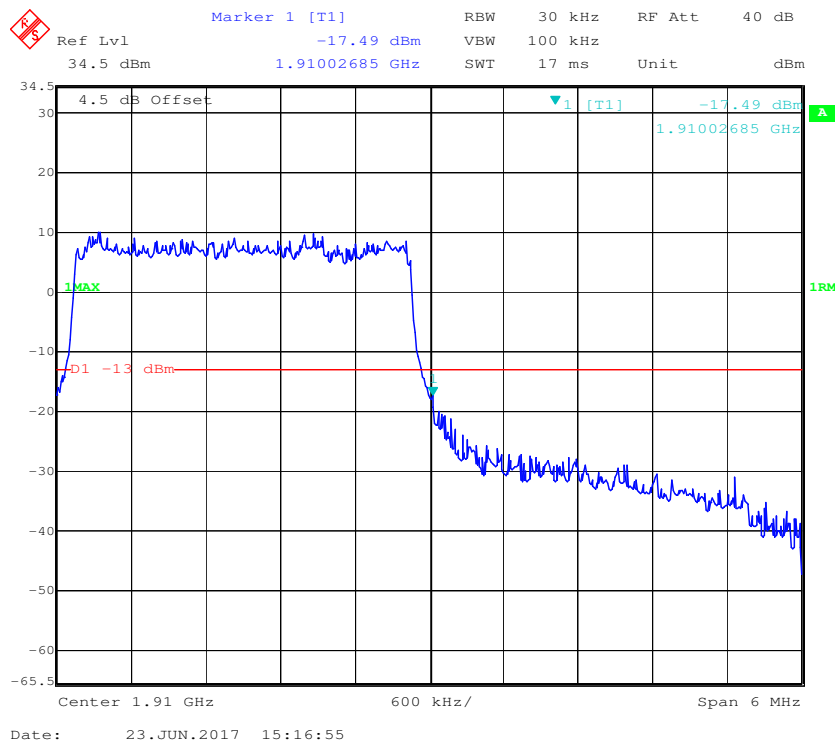
Center 1.91 GHz

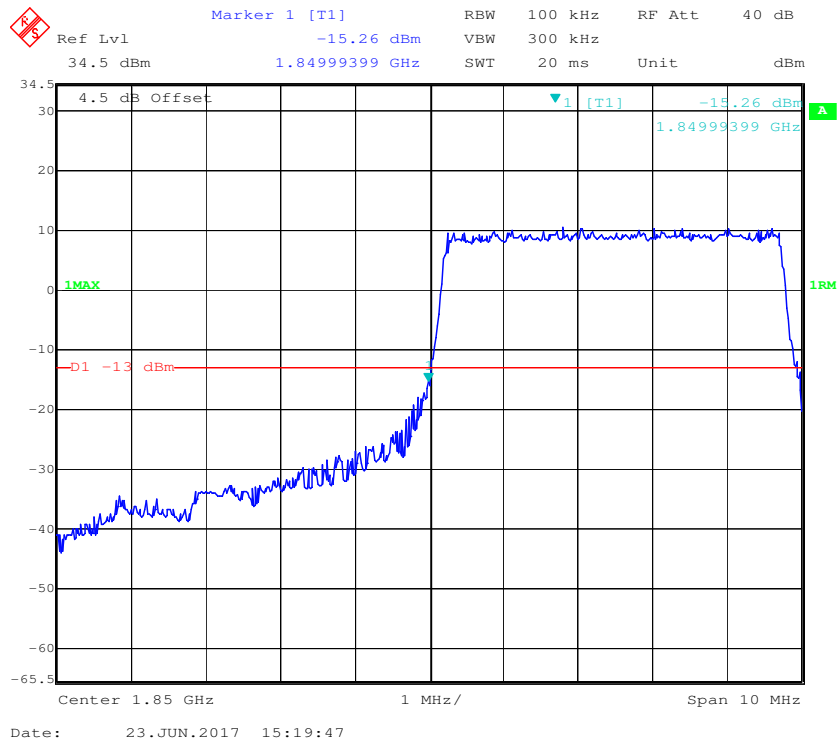
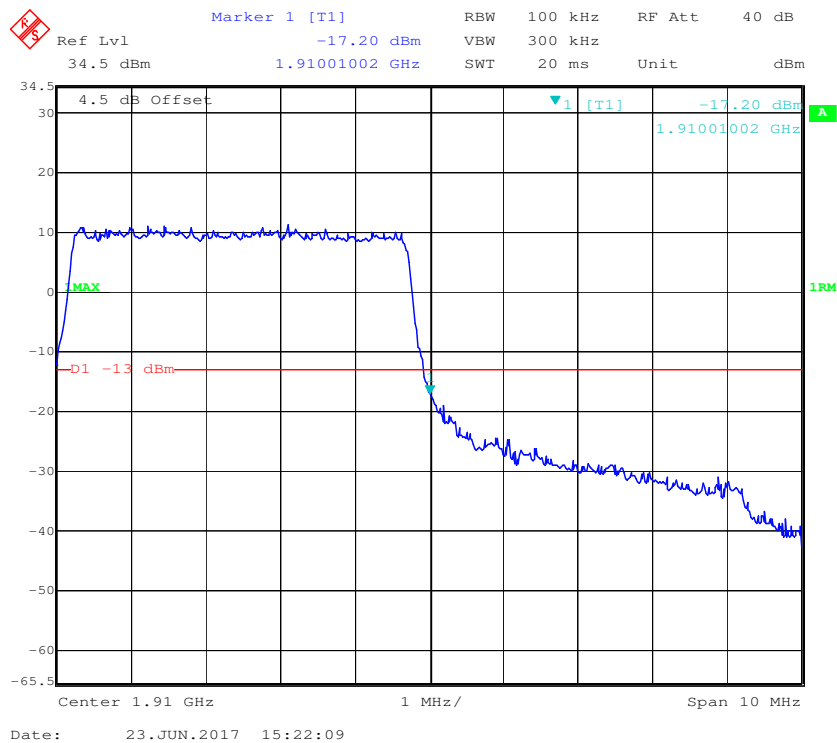
280 kHz/

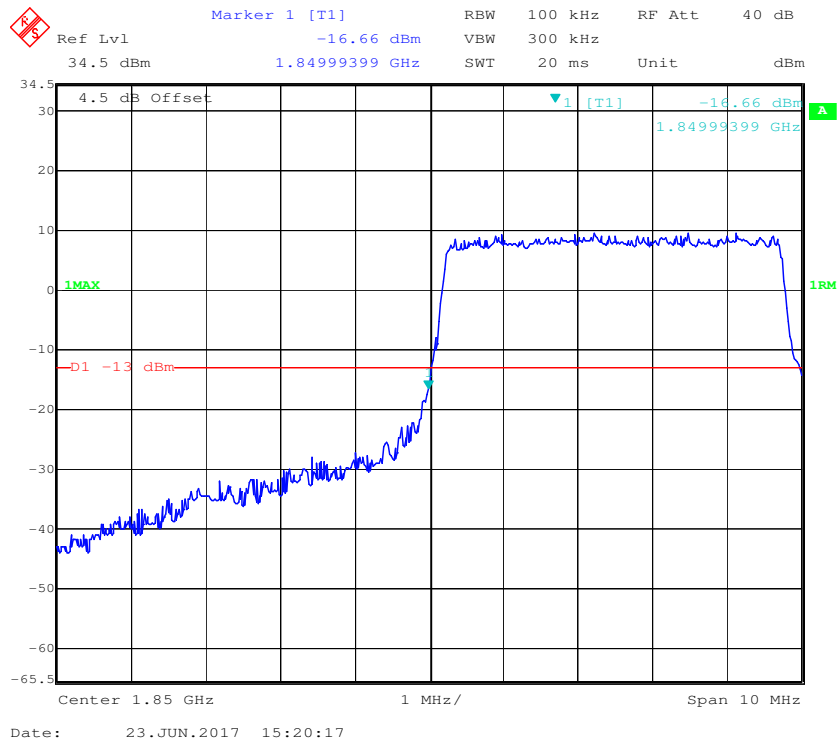
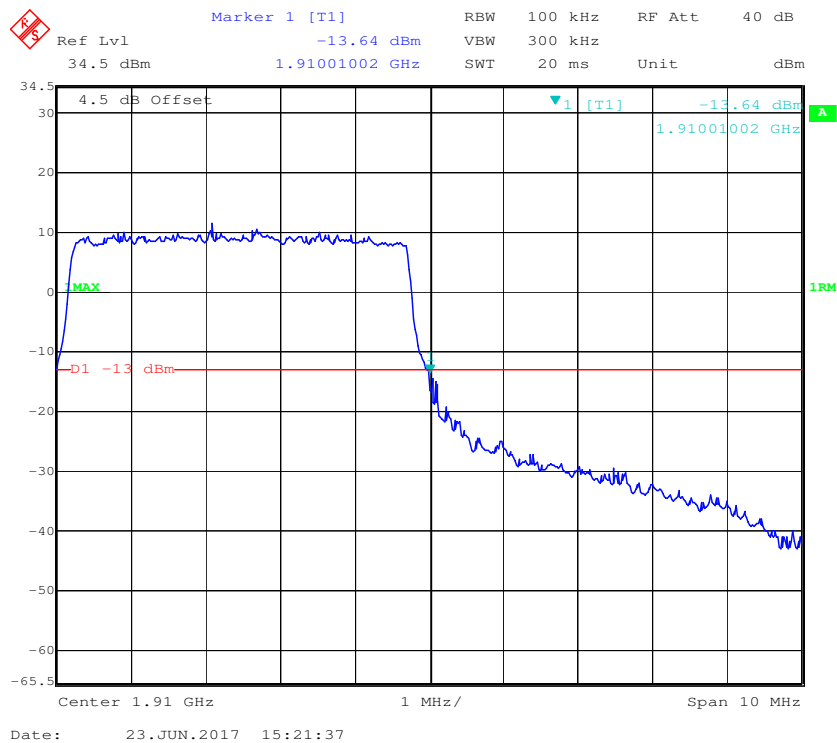
Span 2.8 MHz

Date: 23.JUN.2017 15:14:27

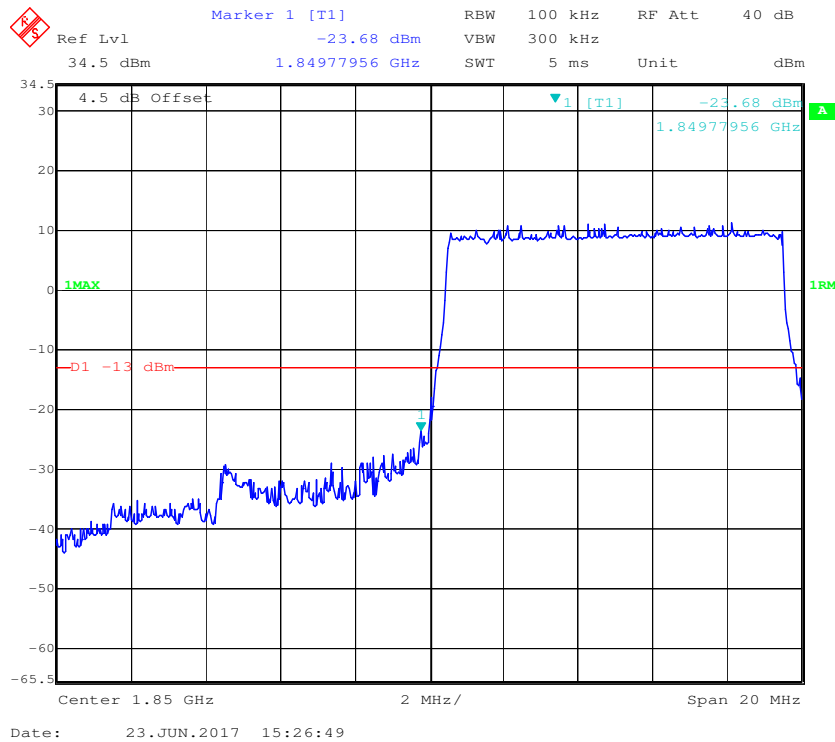
QPSK (3.0 MHz, FULL RB) - Left Band Edge**QPSK (3.0 MHz, FULL RB) - Right Band Edge**

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

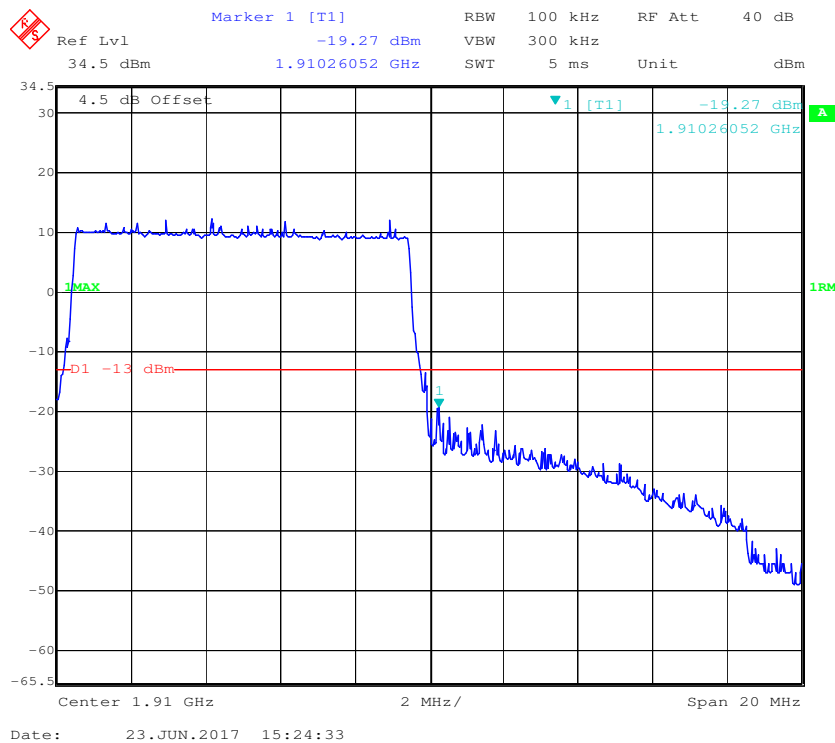
QPSK (5.0 MHz, FULL RB) - Left Band Edge**QPSK (5.0 MHz, FULL RB) - Right Band Edge**

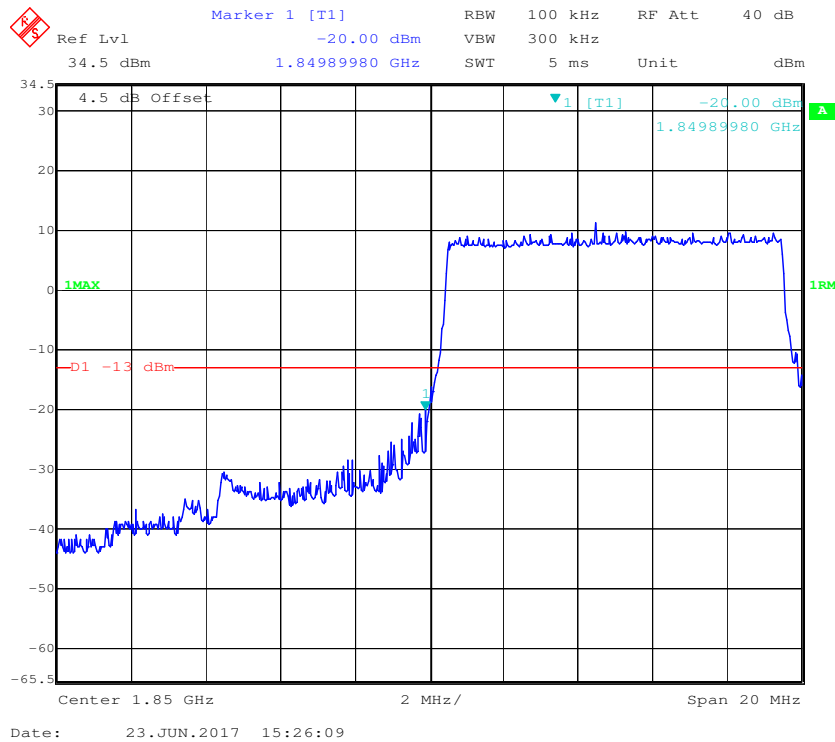
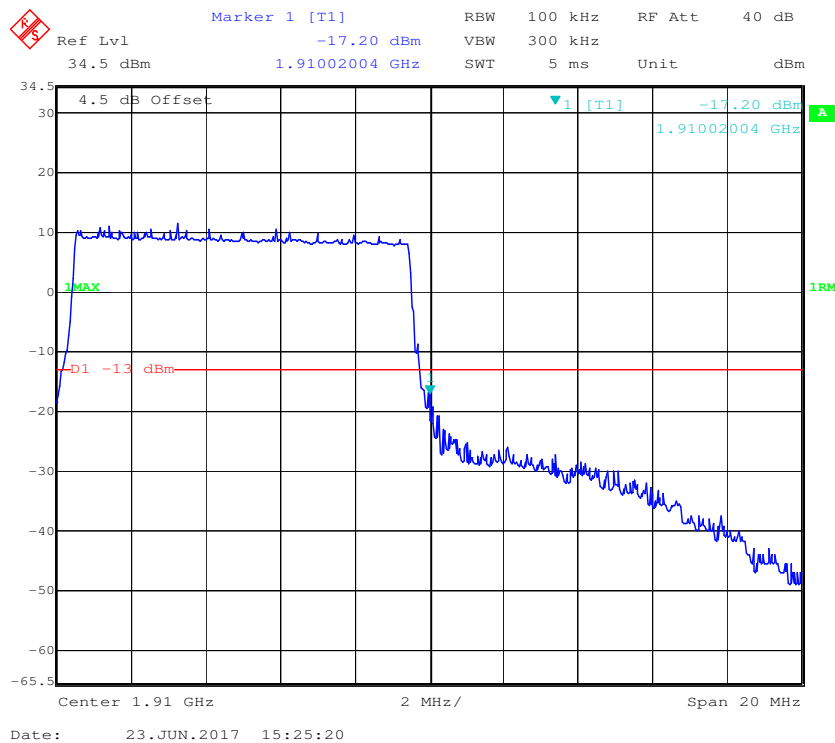
16-QAM (5.0 MHz, FULL RB) - Left Band Edge**16-QAM (5.0 MHz, FULL RB) - Right Band Edge**

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

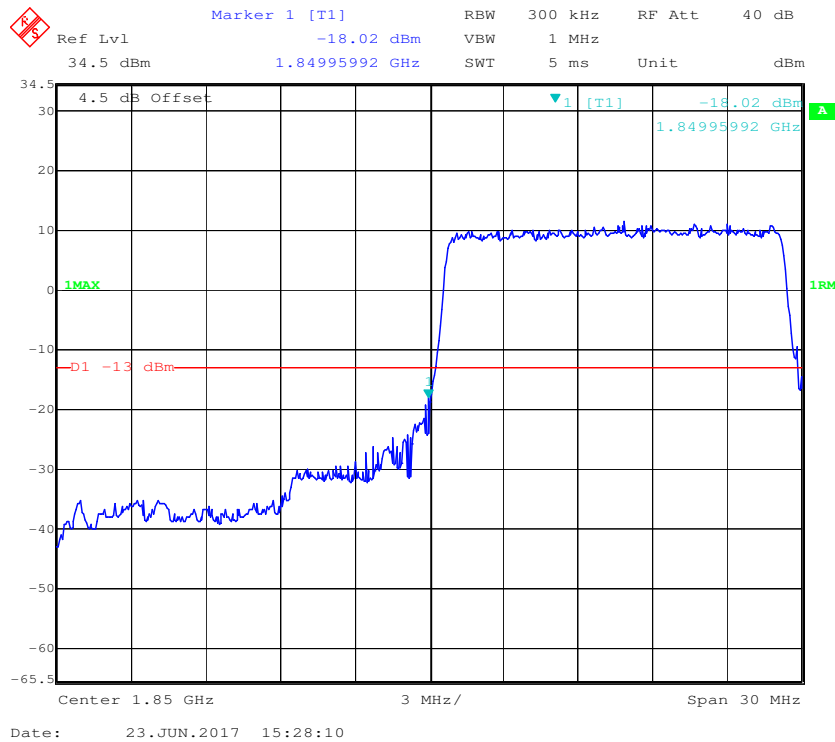


QPSK (10.0 MHz, FULL RB) - Right Band Edge

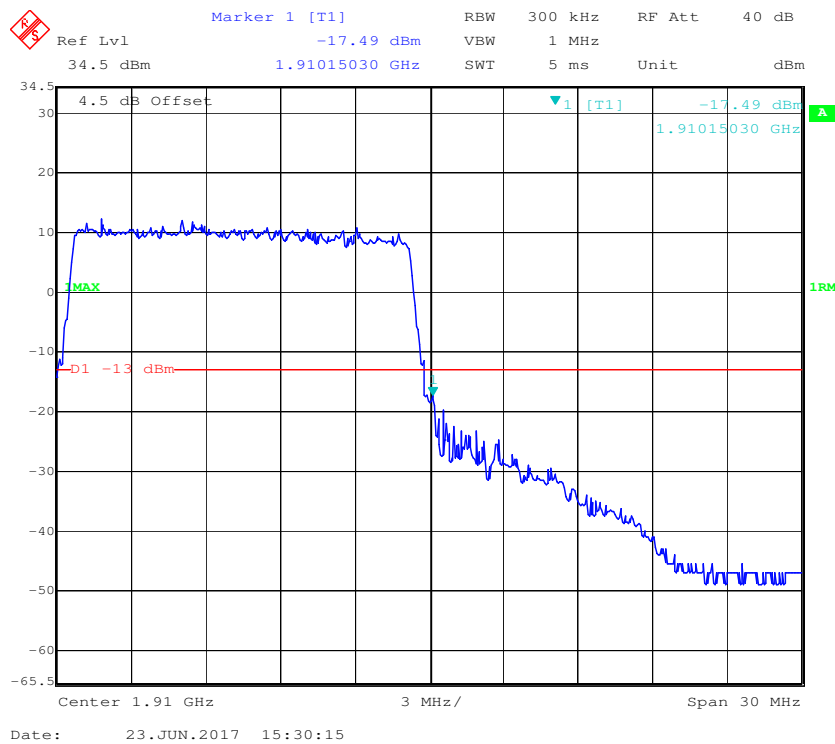


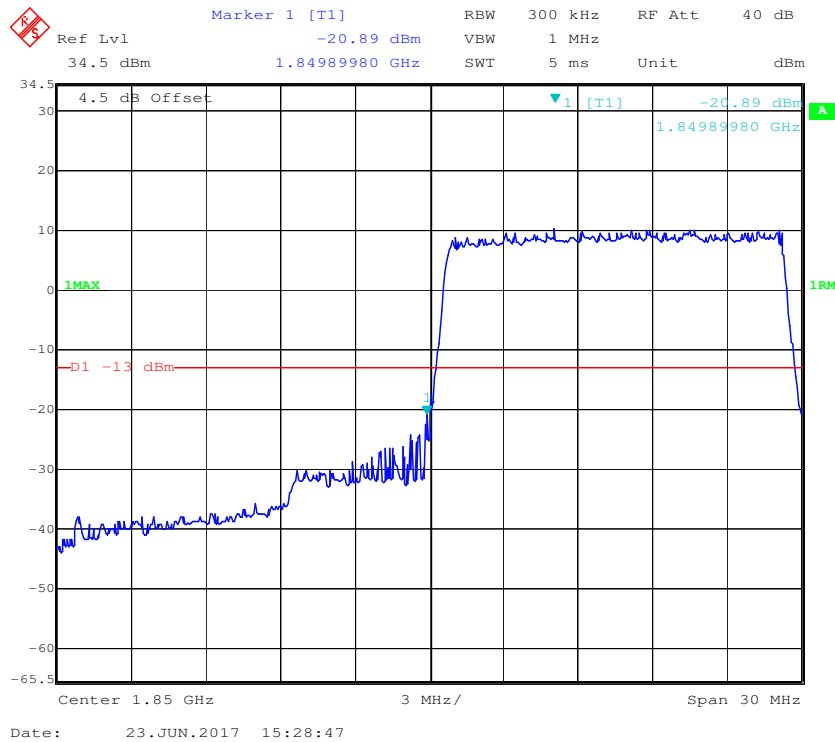
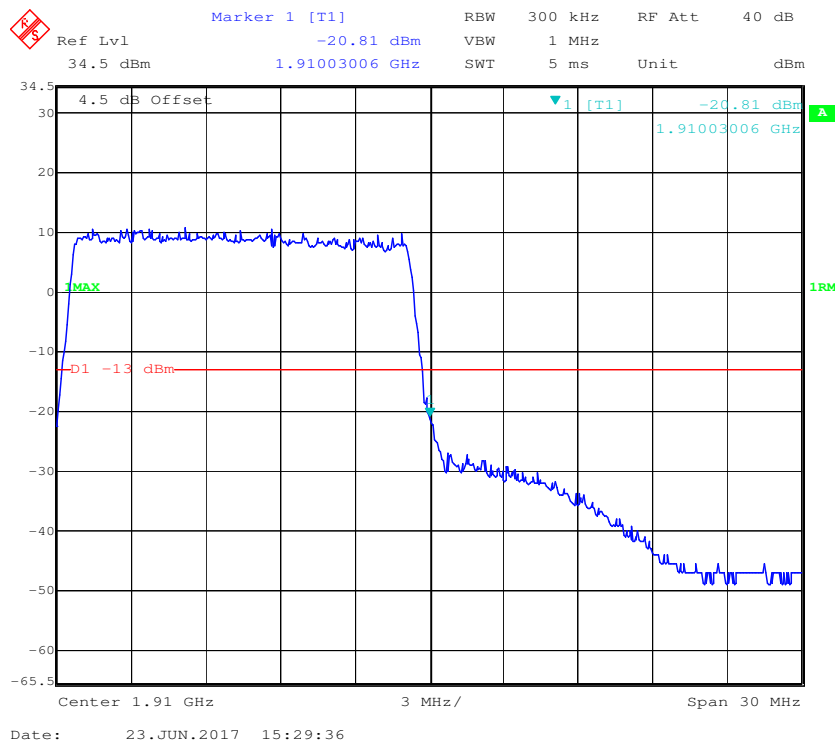
16-QAM (10.0 MHz, FULL RB) - Left Band Edge**16-QAM (10.0 MHz, FULL RB) - Right Band Edge**

QPSK (15.0 MHz, FULL RB) - Left Band Edge

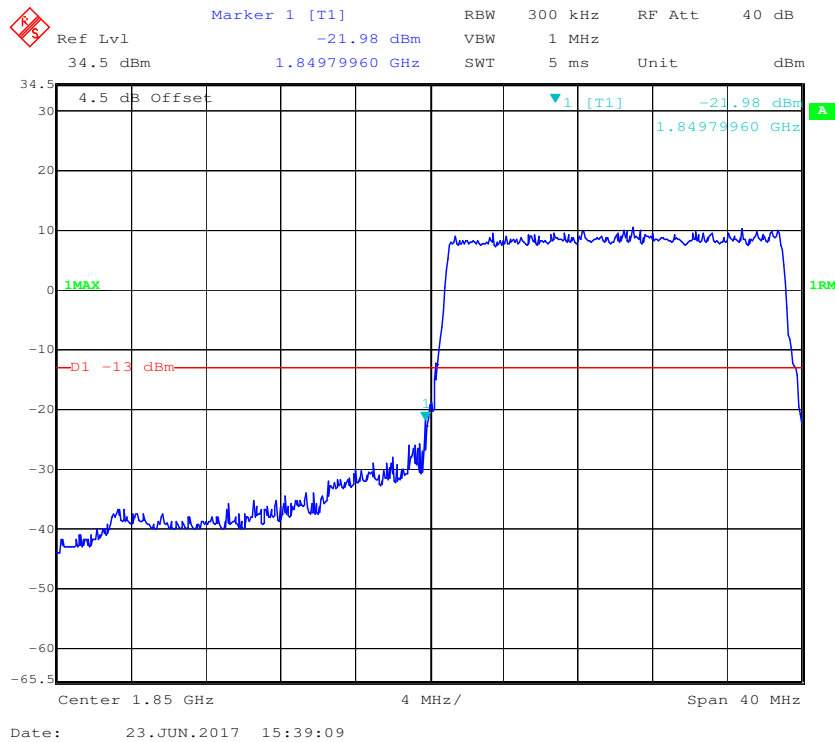


QPSK (15.0 MHz, FULL RB) - Right Band Edge

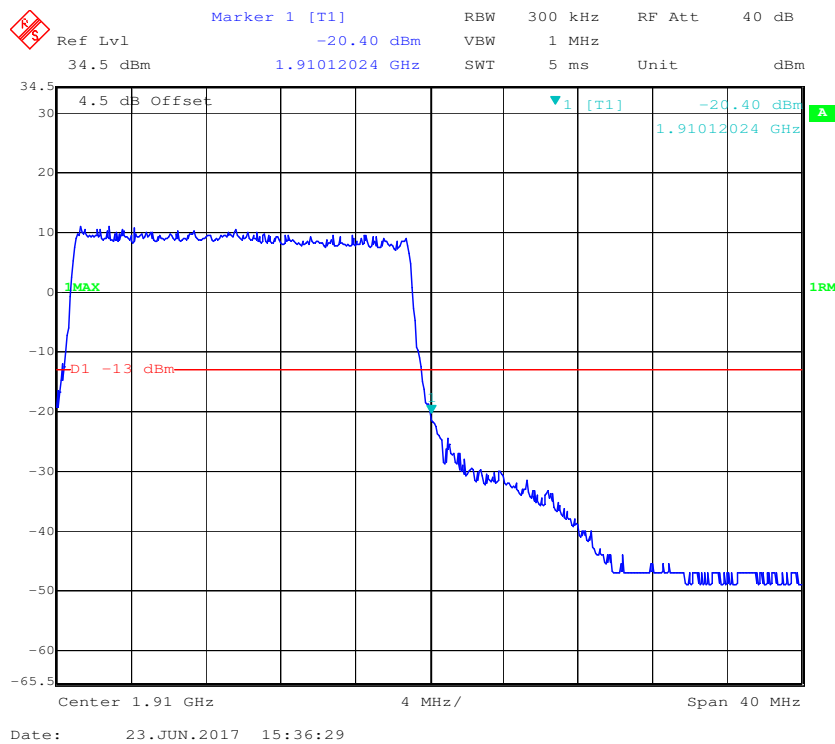


16-QAM (15.0 MHz, FULL RB) - Left Band Edge**16-QAM (15.0 MHz, FULL RB) - Right Band Edge**

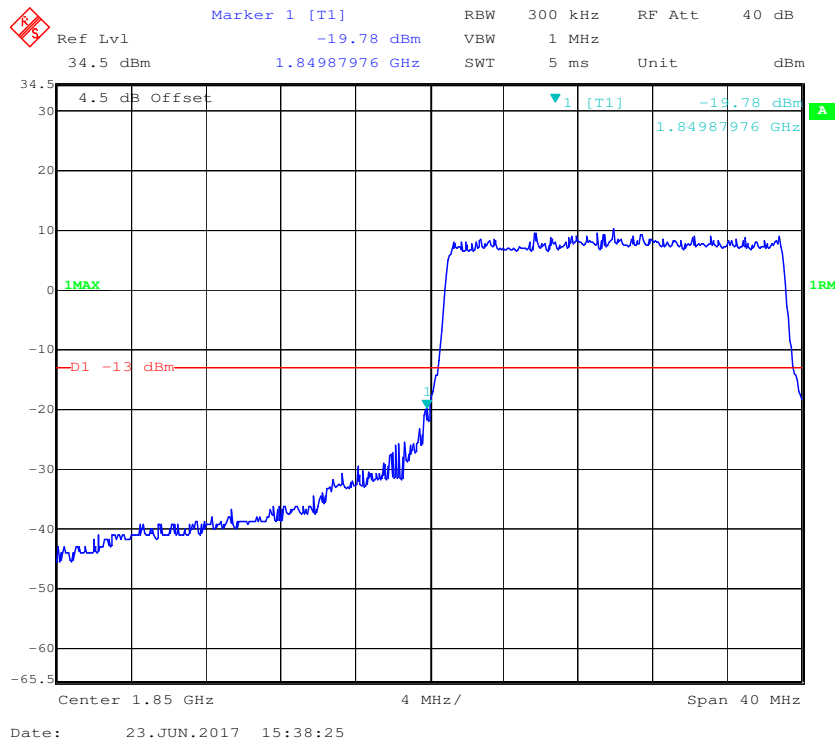
QPSK (20.0 MHz, FULL RB) - Left Band Edge



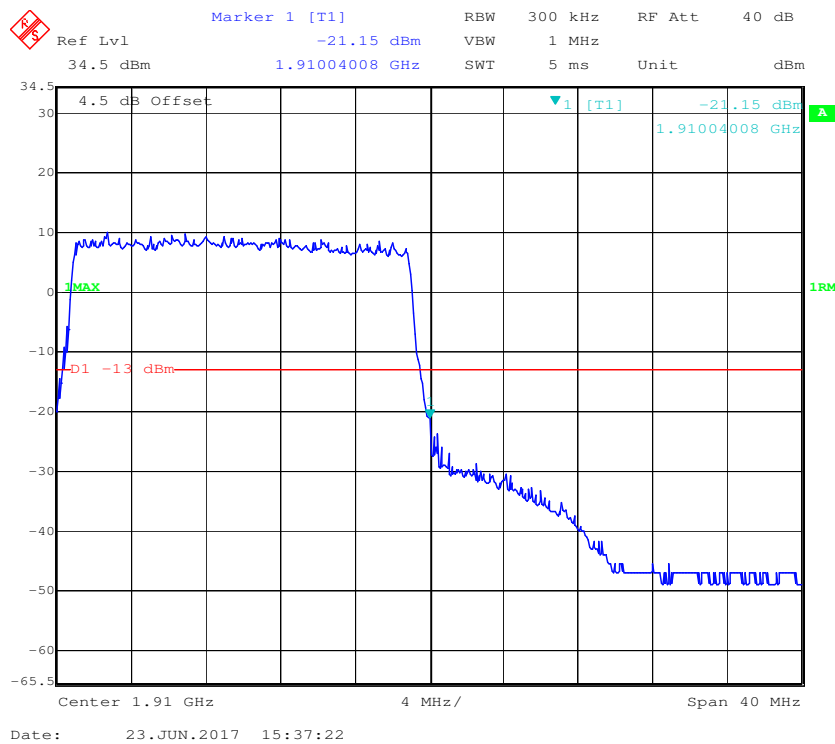
QPSK (20.0 MHz, FULL RB) - Right Band Edge

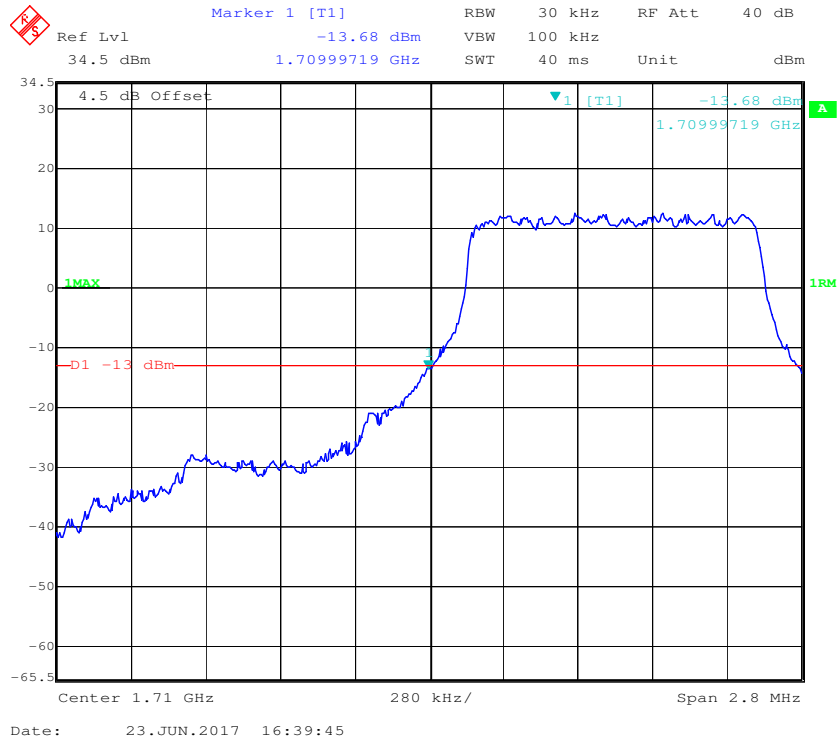
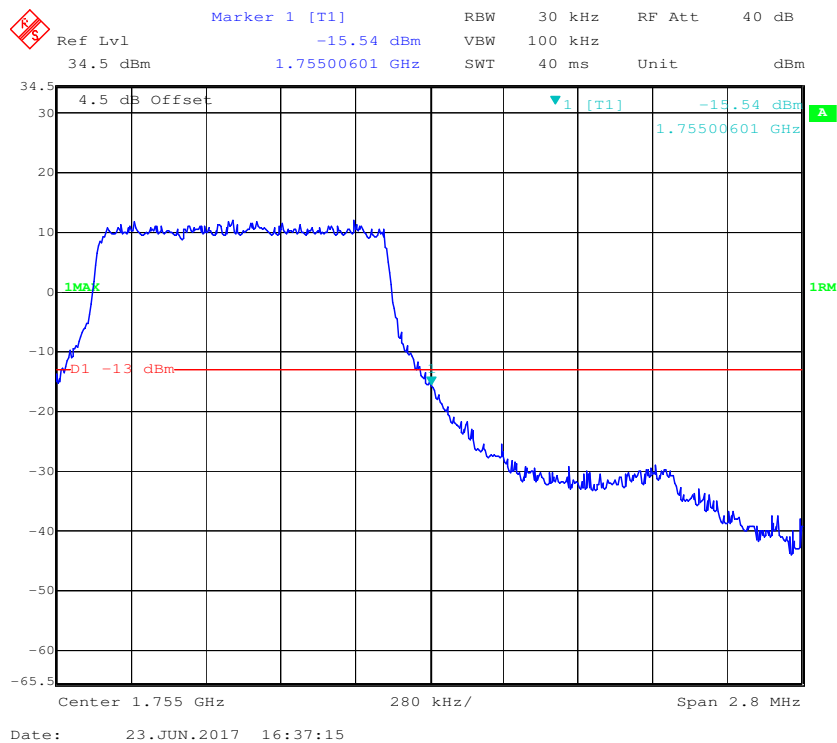


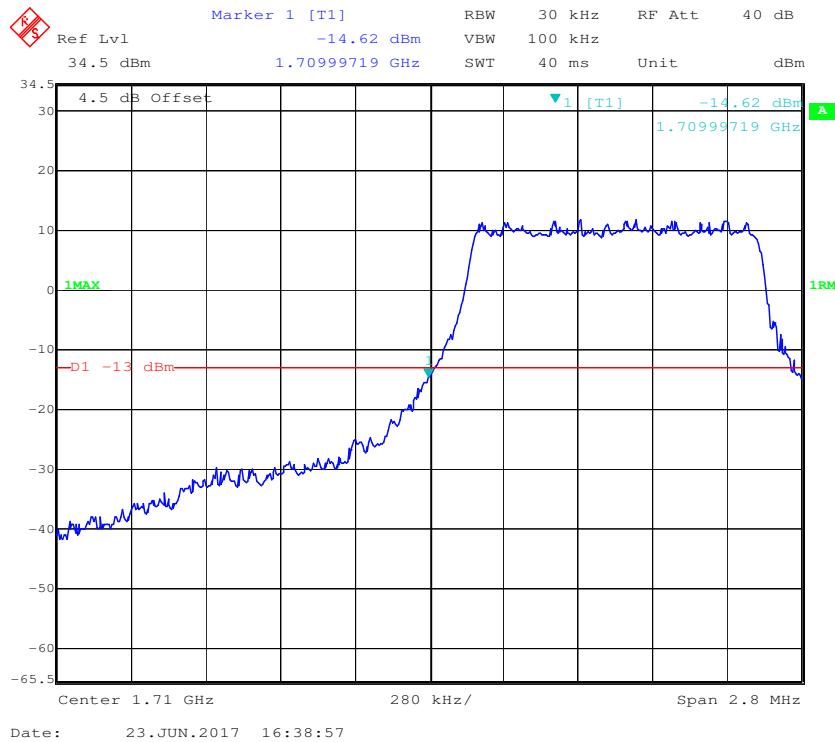
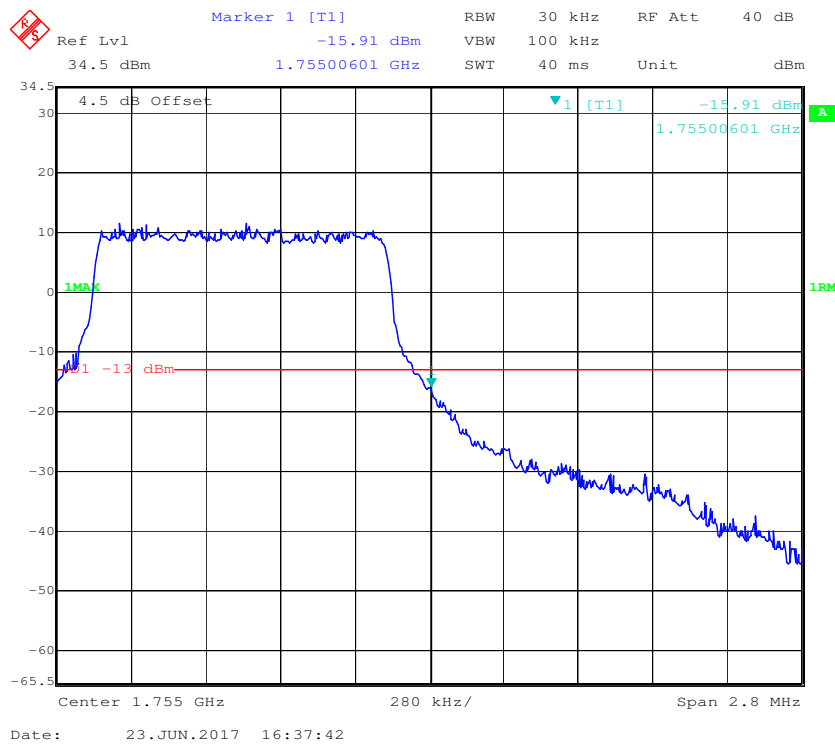
16-QAM (20.0 MHz, FULL RB) - Left Band Edge

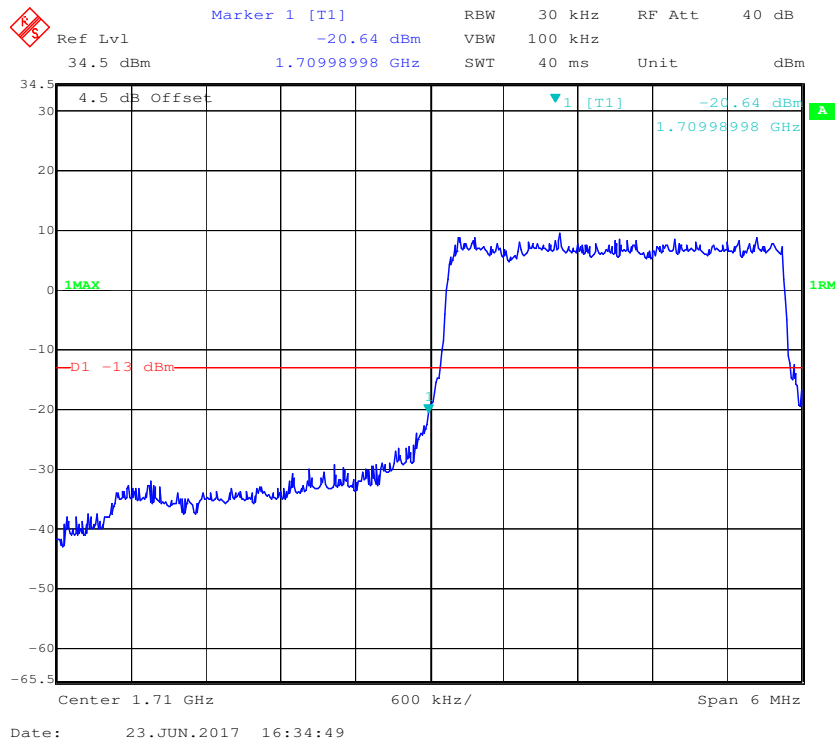
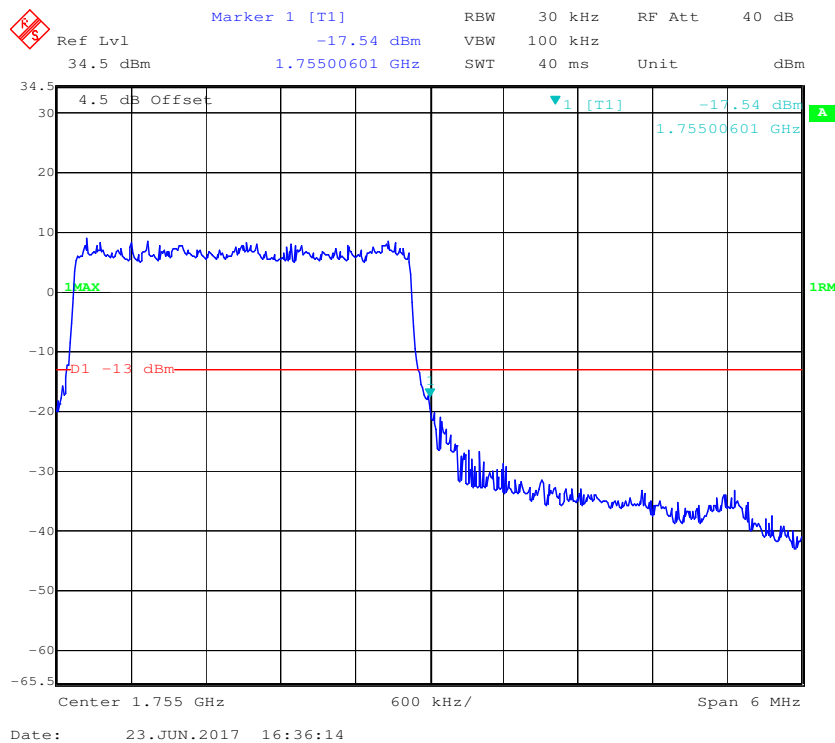


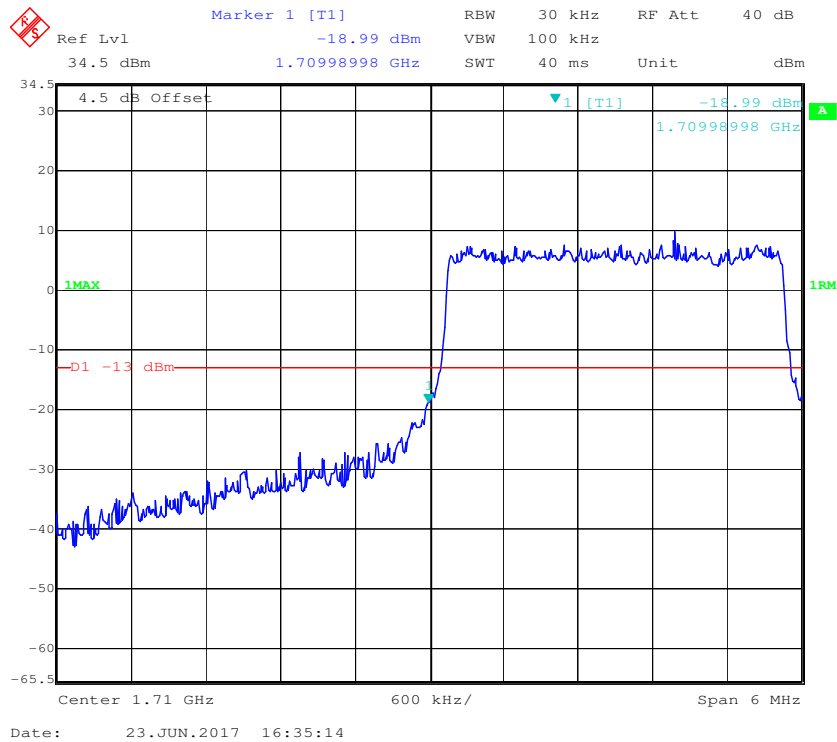
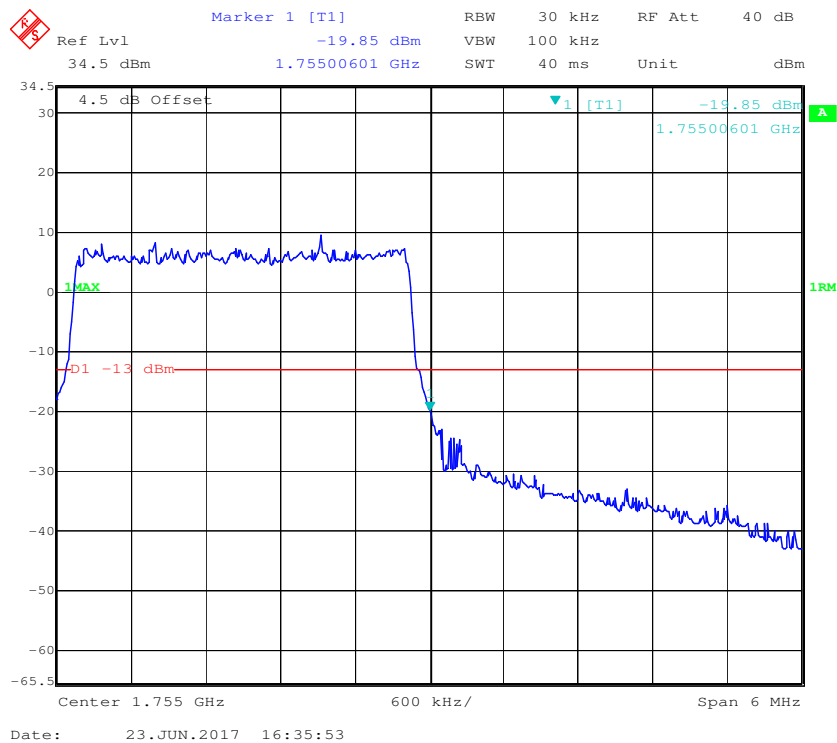
16-QAM (20.0 MHz, FULL RB) - Right Band Edge

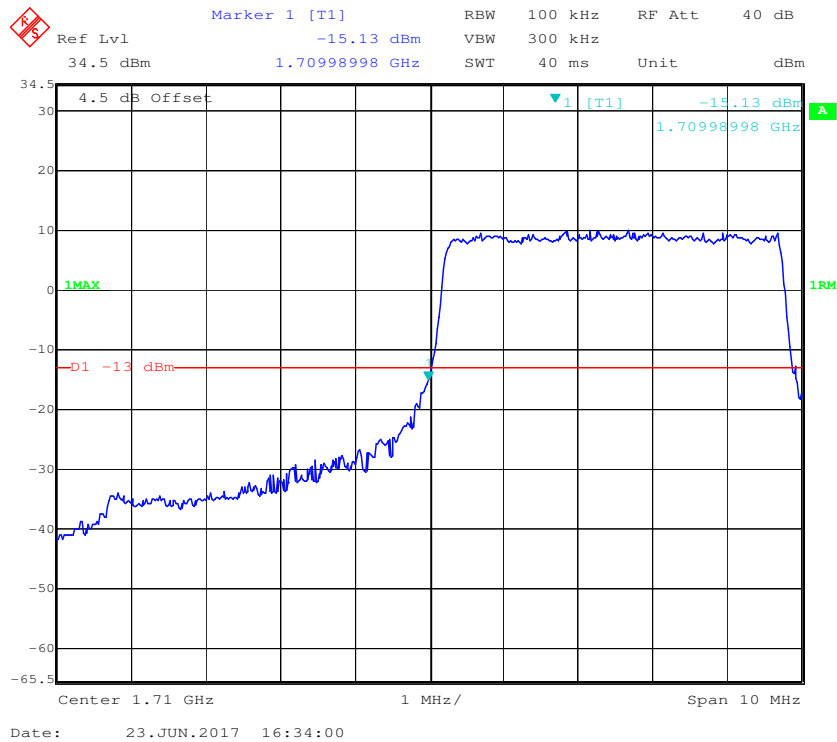
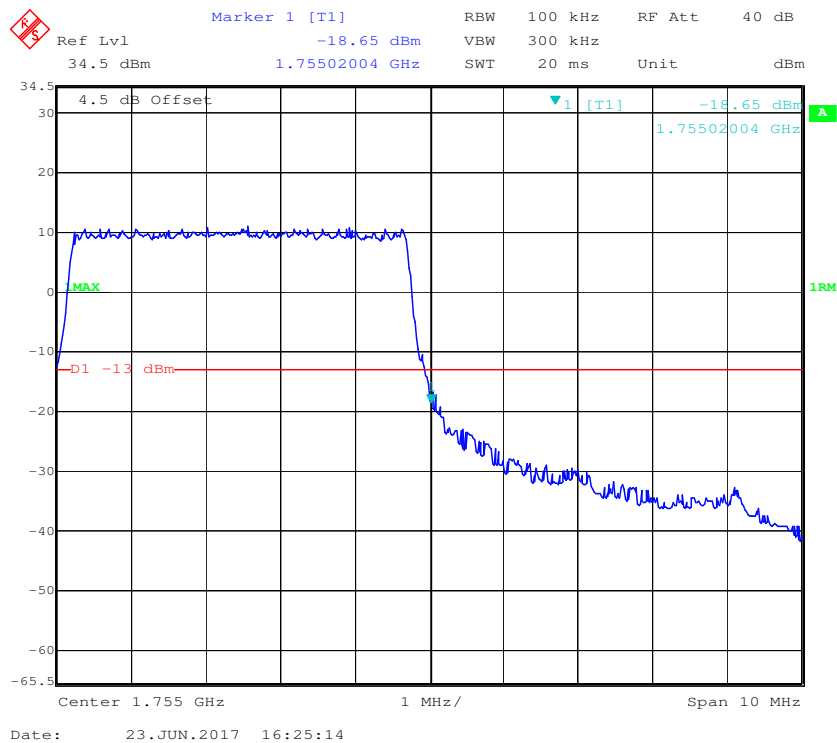


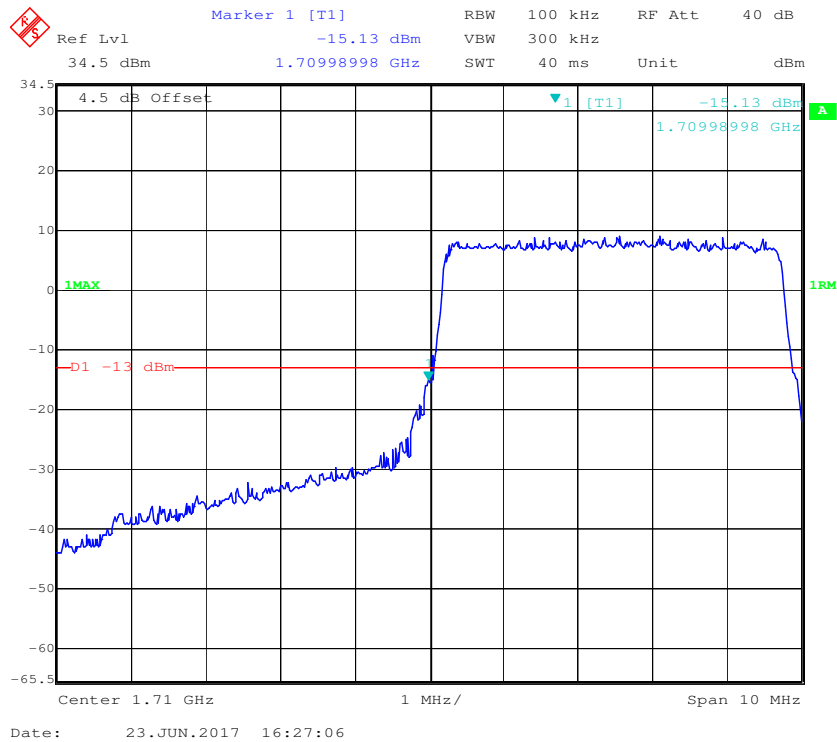
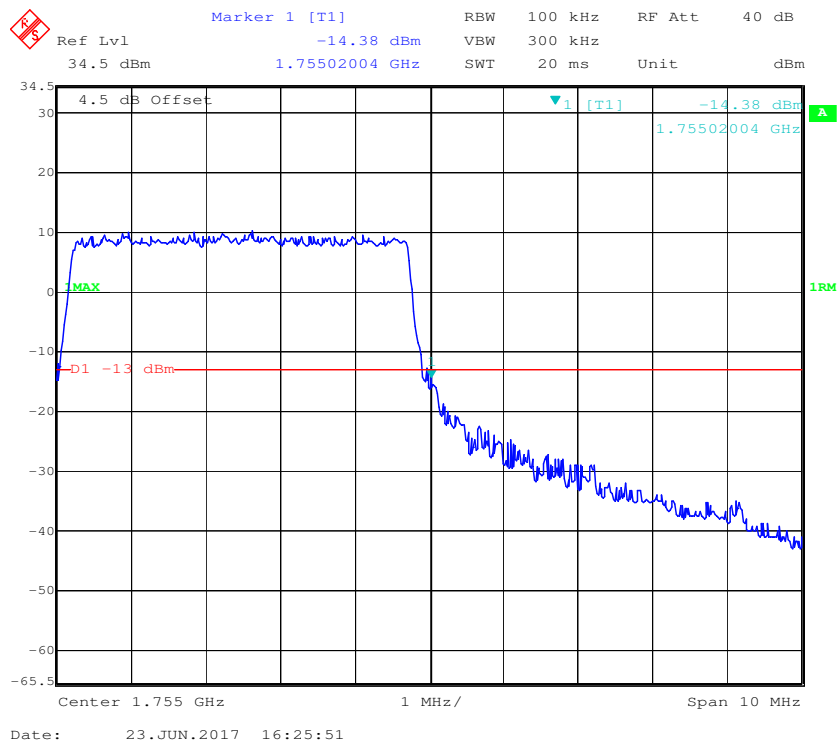
LTE Band 4:**QPSK (1.4 MHz, FULL RB) - Left Band Edge****QPSK (1.4 MHz, FULL RB) - Right Band Edge**

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

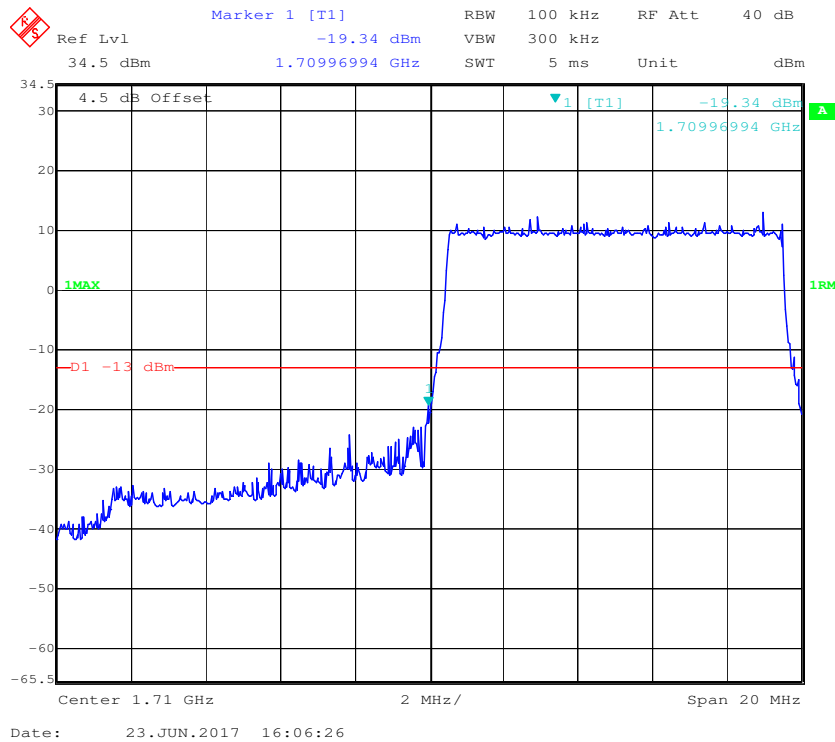
QPSK (3.0 MHz, FULL RB) - Left Band Edge**QPSK (3.0 MHz, FULL RB) - Right Band Edge**

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

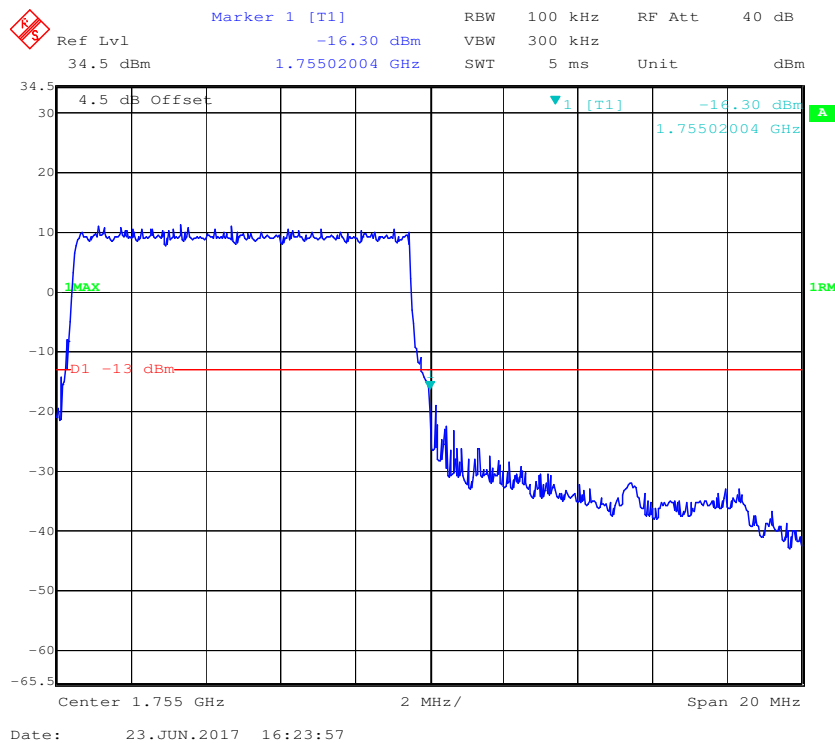
QPSK (5.0 MHz, FULL RB) - Left Band Edge**QPSK (5.0 MHz, FULL RB) - Right Band Edge**

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

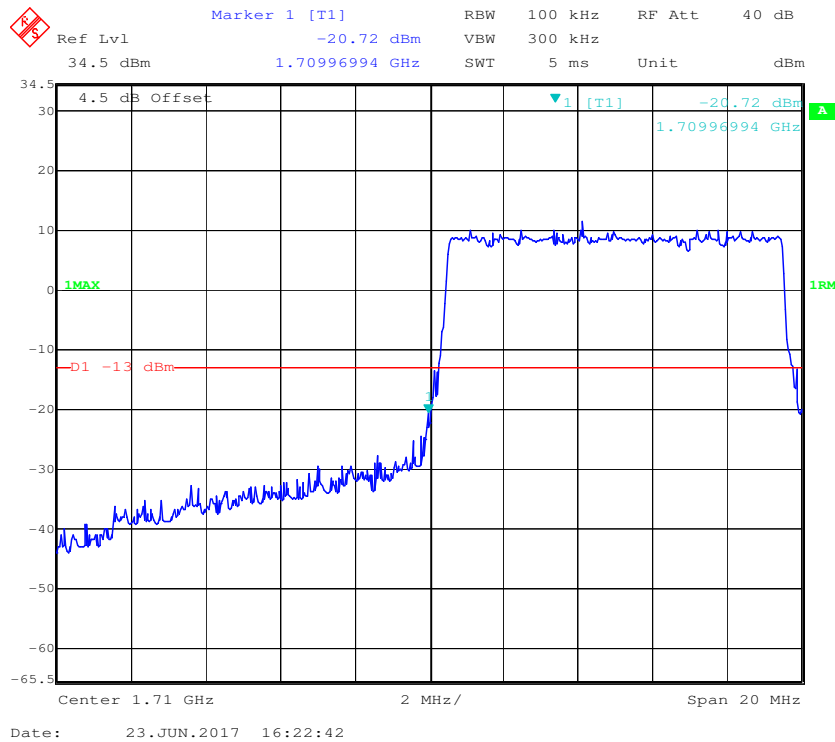
QPSK (10.0 MHz, FULL RB) - Left Band Edge



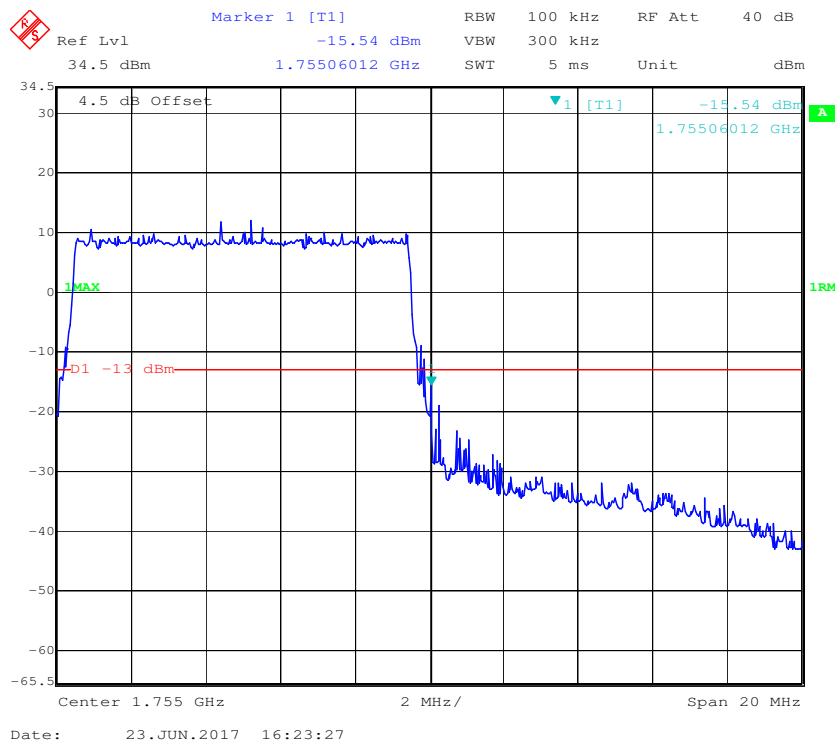
QPSK (10.0 MHz, FULL RB) - Right Band Edge

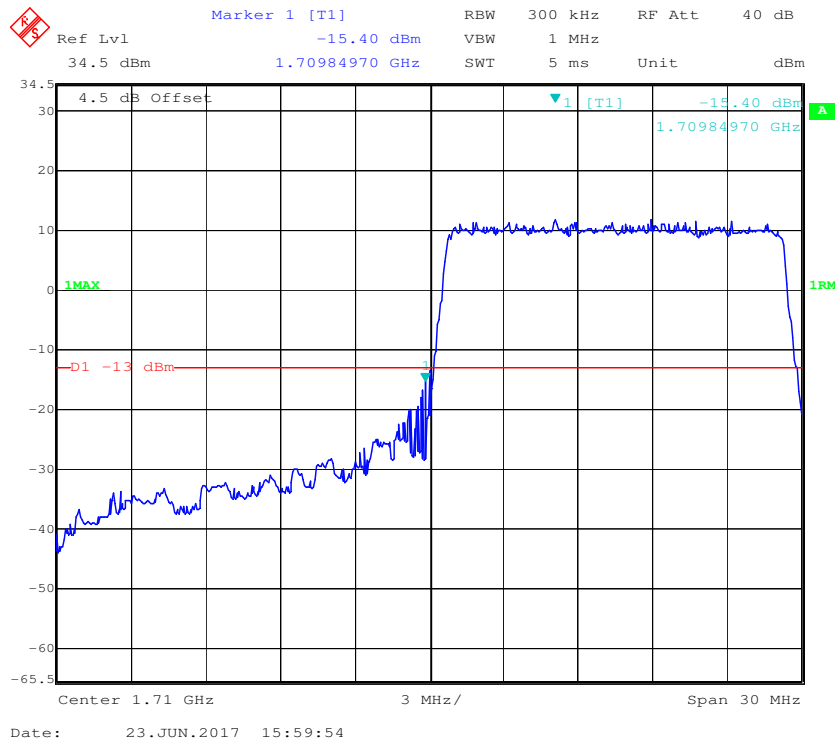
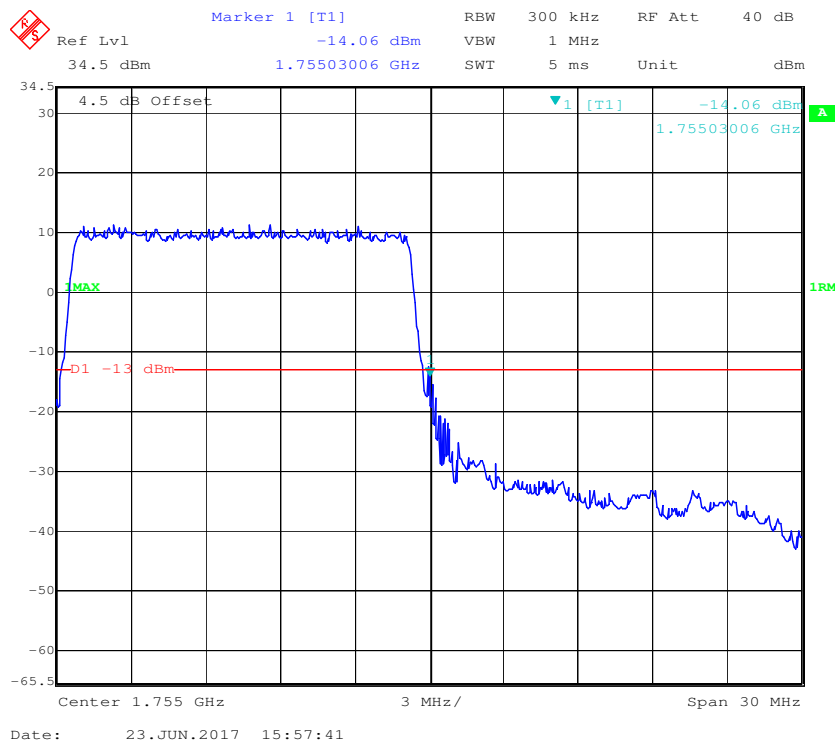


16-QAM (10.0 MHz, FULL RB) - Left Band Edge

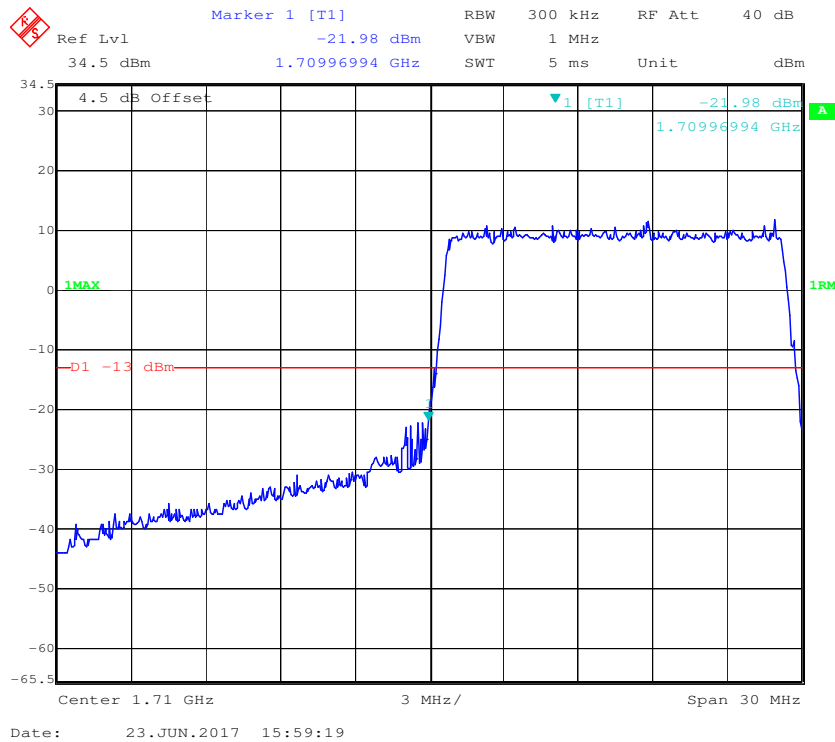


16-QAM (10.0 MHz, FULL RB) - Right Band Edge

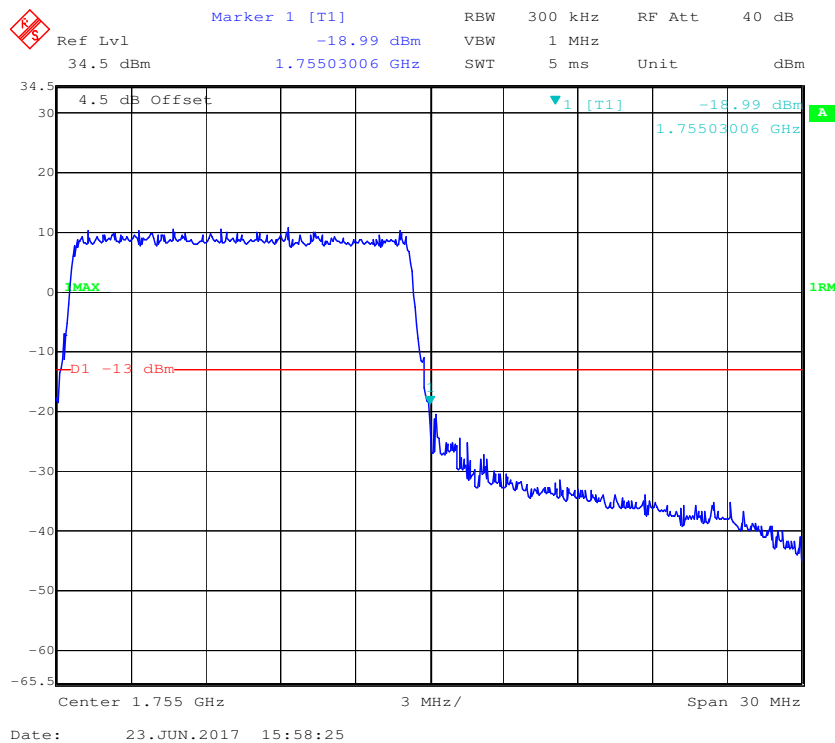


QPSK (15.0 MHz, FULL RB) - Left Band Edge**QPSK (15.0 MHz, FULL RB) - Right Band Edge**

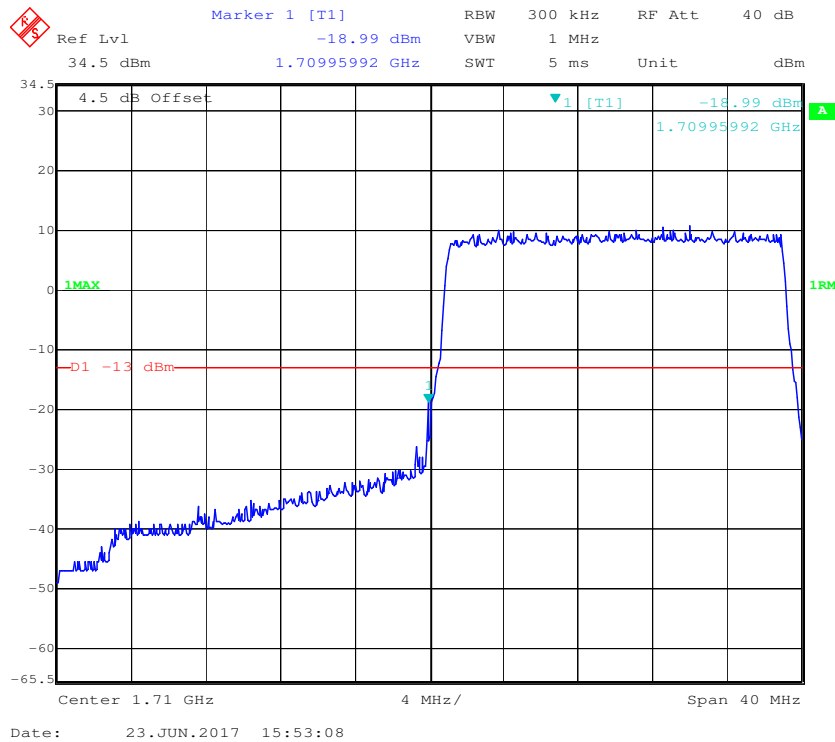
16-QAM (15.0 MHz, FULL RB) - Left Band Edge



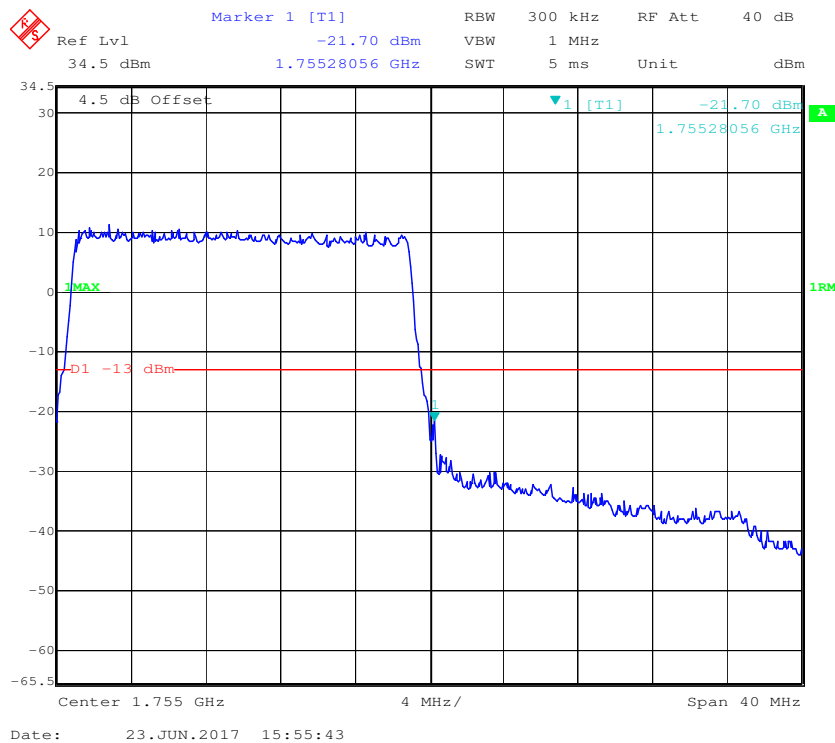
16-QAM (15.0 MHz, FULL RB) - Right Band Edge



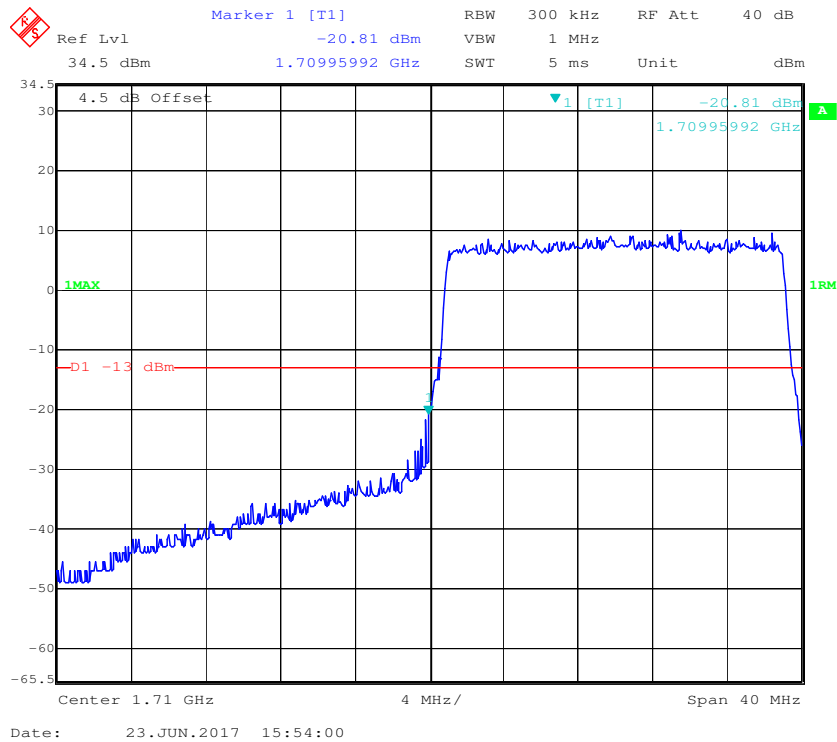
QPSK (20.0 MHz, FULL RB) - Left Band Edge



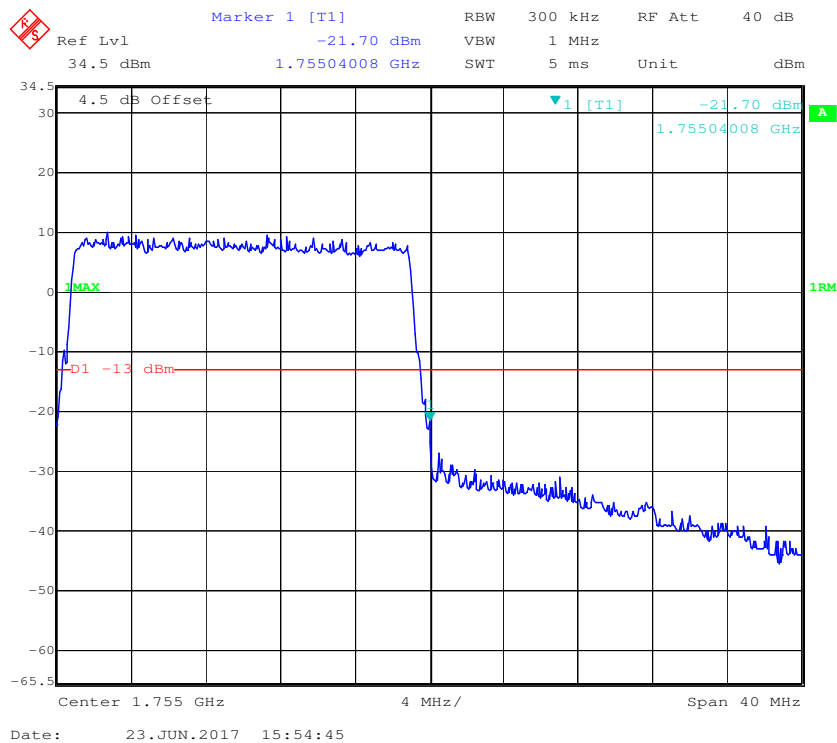
QPSK (20.0 MHz, FULL RB) - Right Band Edge



16-QAM (20.0 MHz, FULL RB) - Left Band Edge

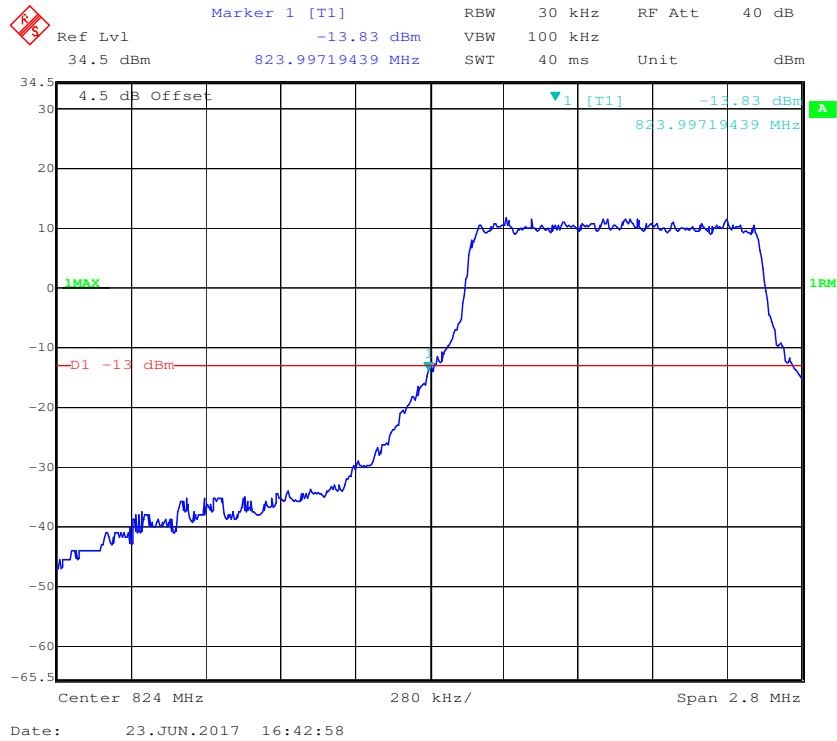


16-QAM (20.0 MHz, FULL RB) - Right Band Edge

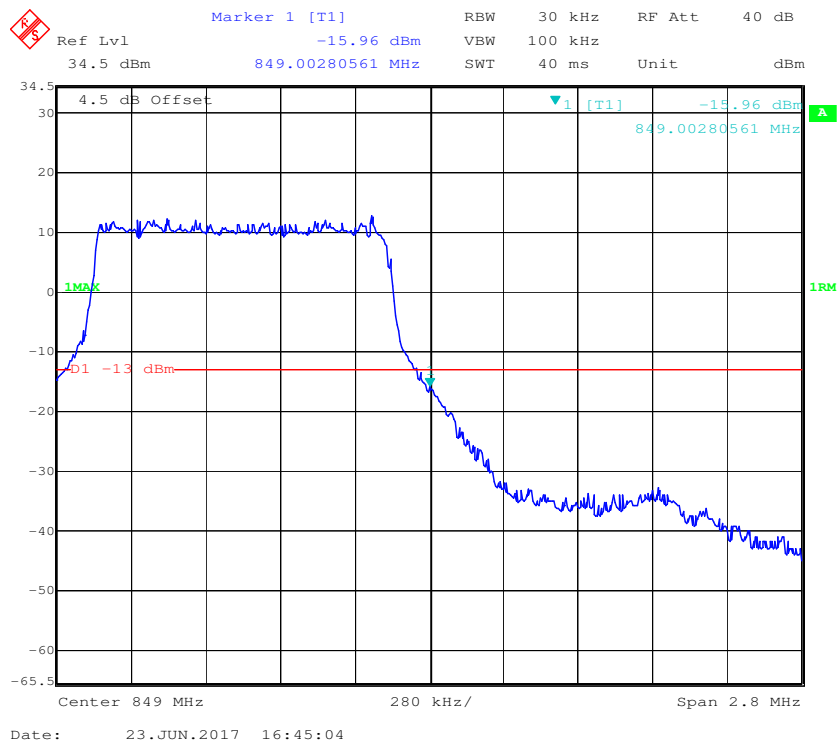


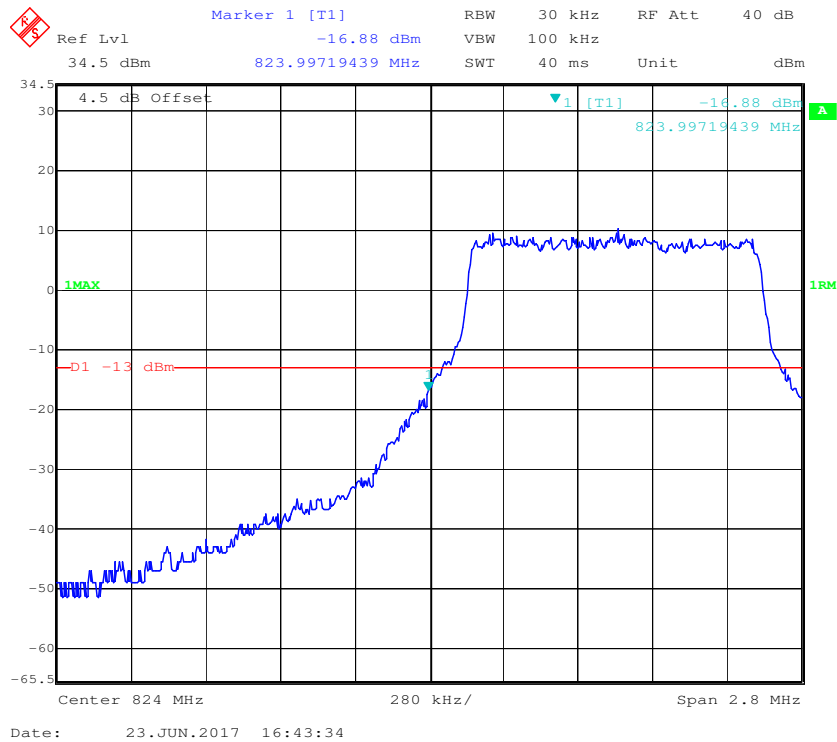
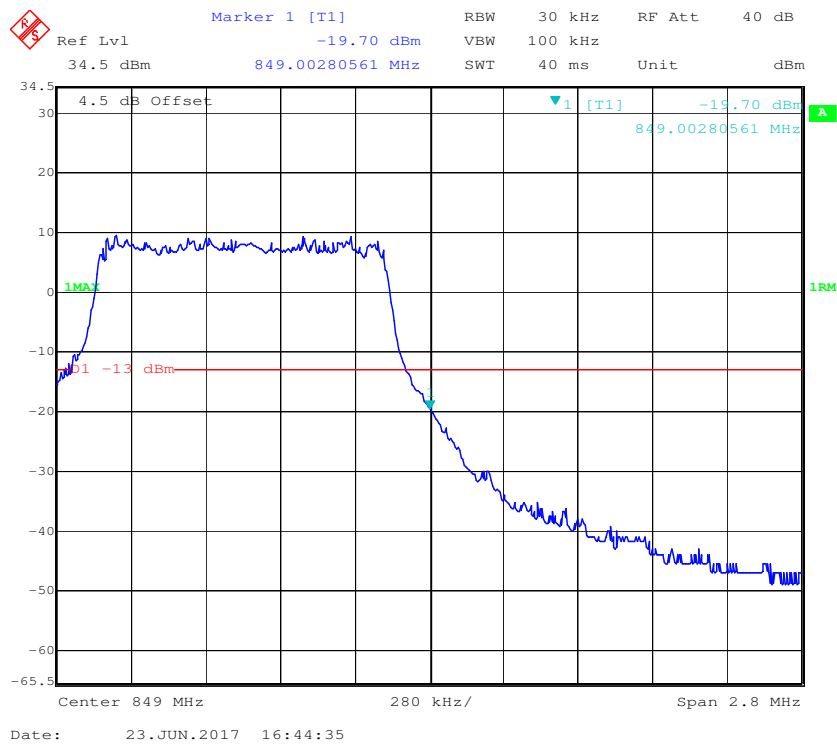
LTE Band 5:

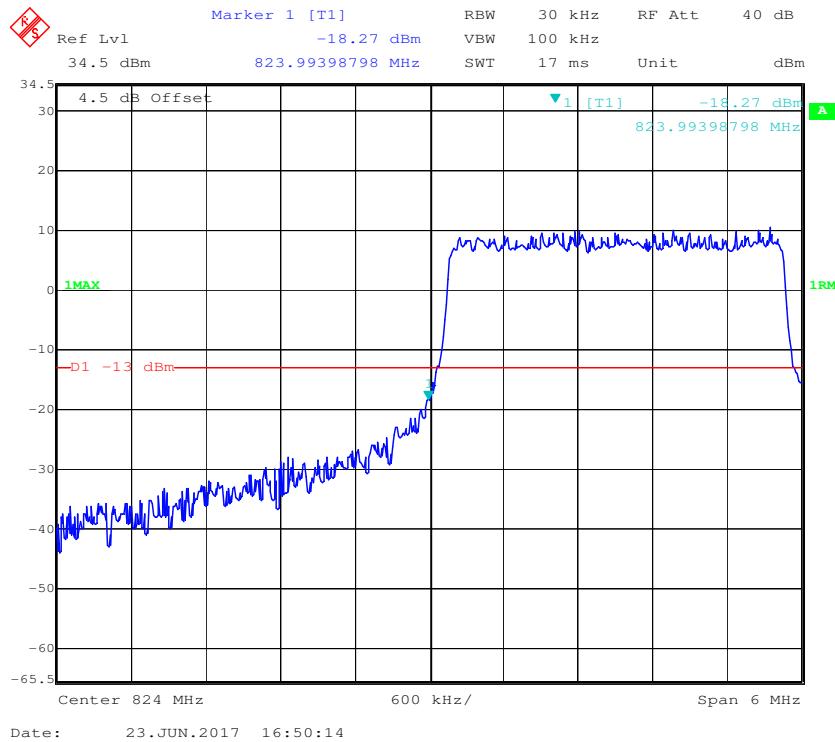
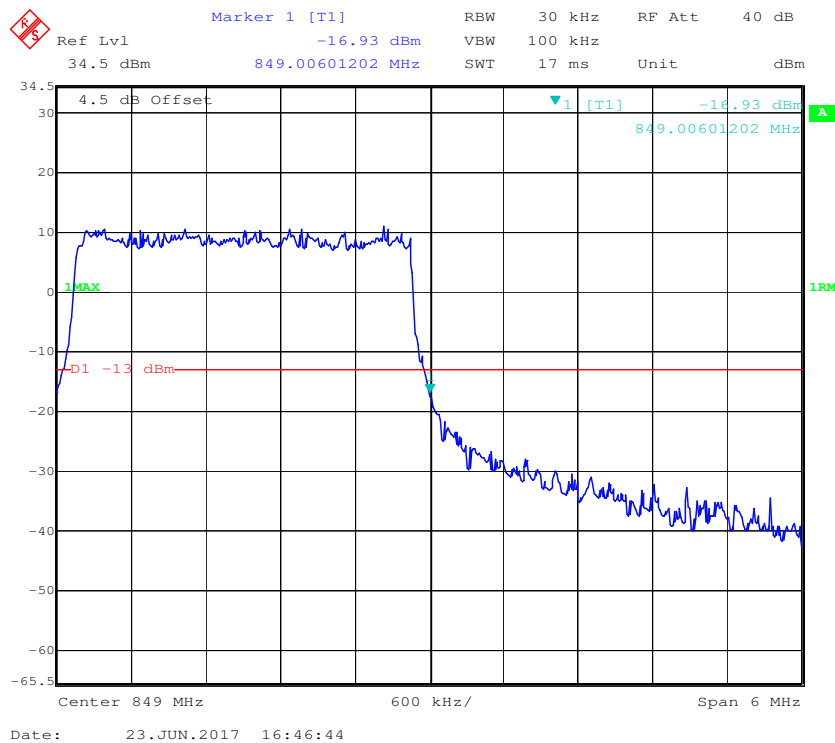
QPSK (1.4 MHz, FULL RB) - Left Band Edge



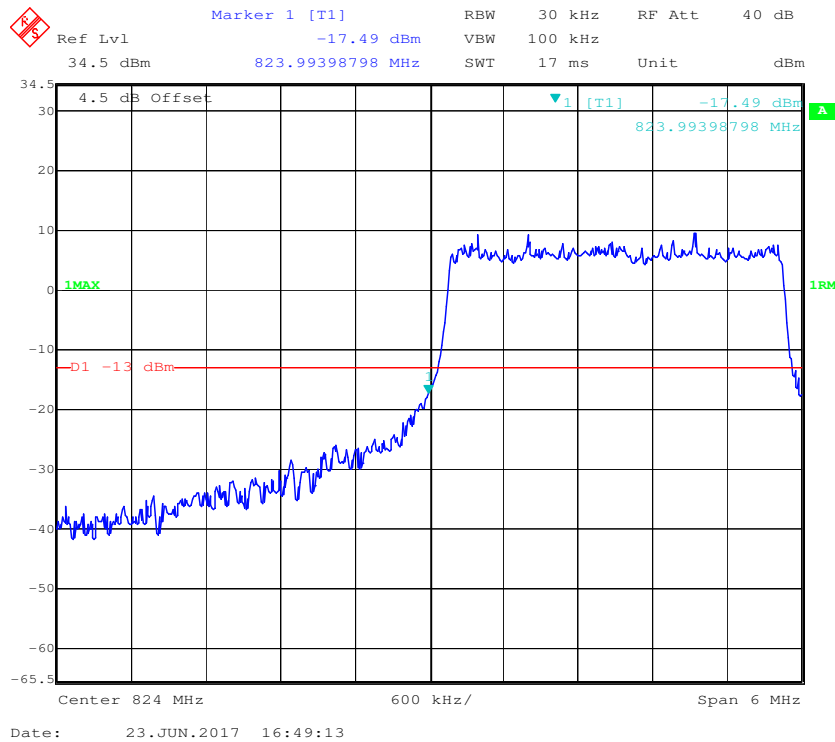
QPSK (1.4 MHz, FULL RB) - Right Band Edge



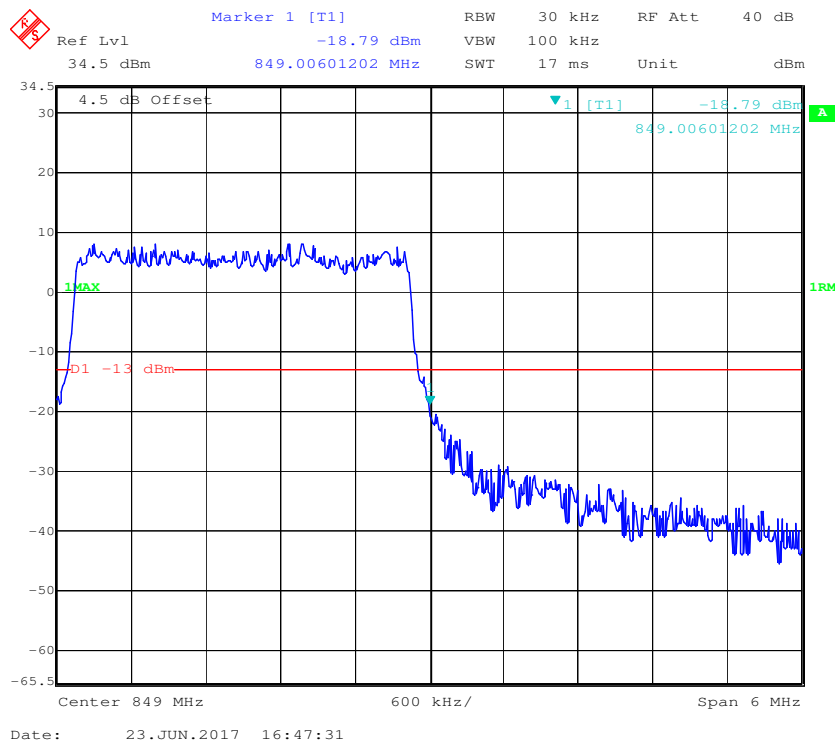
16-QAM (1.4 MHz, FULL RB) - Left Band Edge**16-QAM (1.4 MHz, FULL RB) - Right Band Edge**

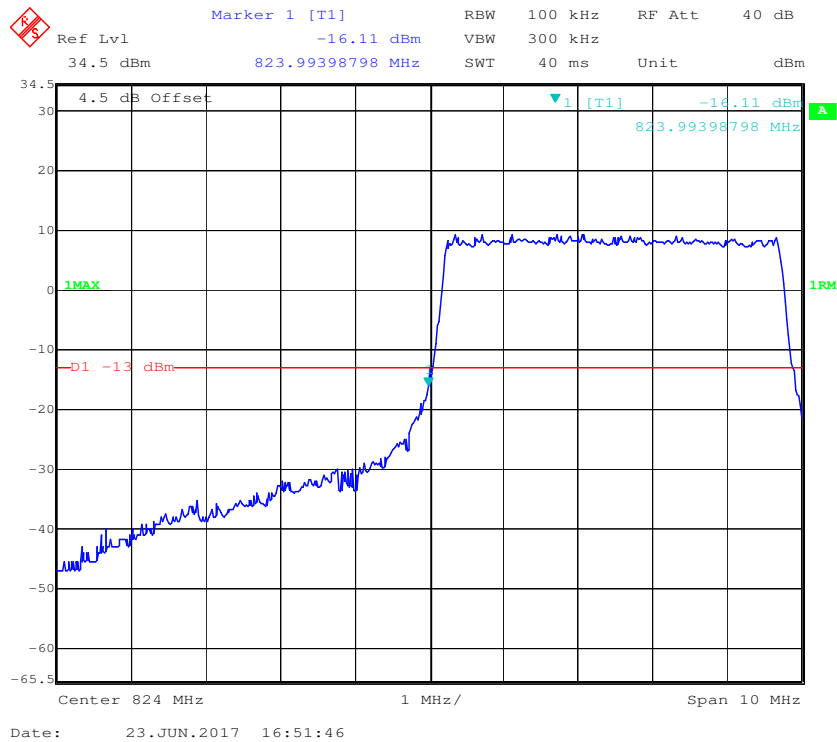
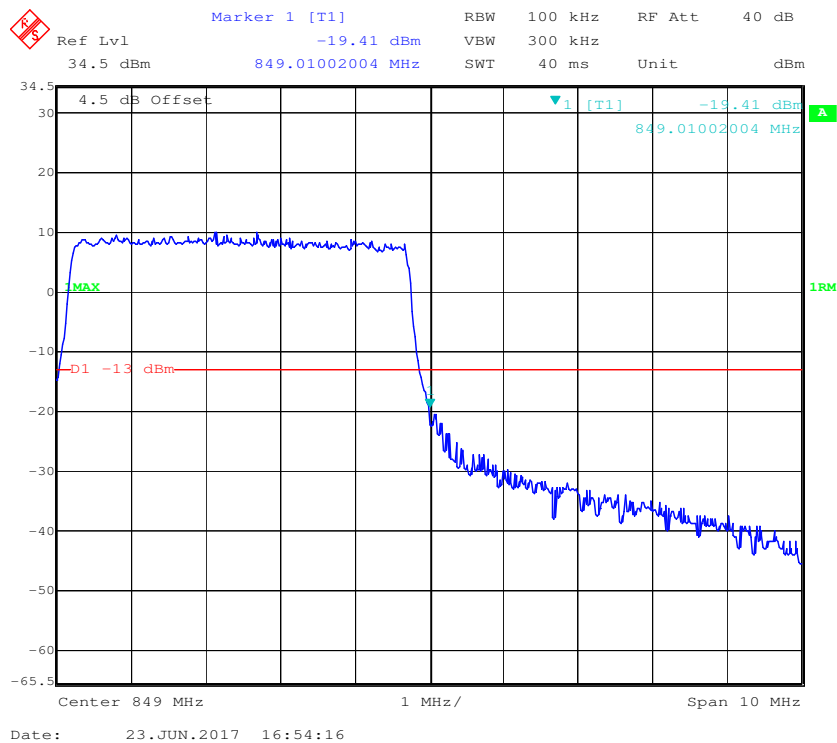
QPSK (3.0 MHz, FULL RB) - Left Band Edge**QPSK (3.0 MHz, FULL RB) - Right Band Edge**

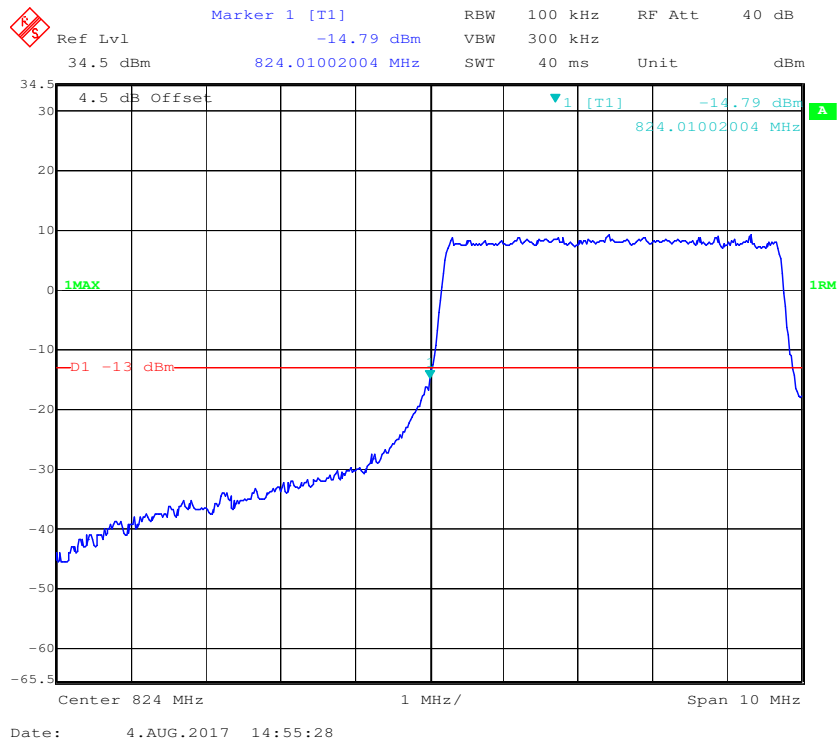
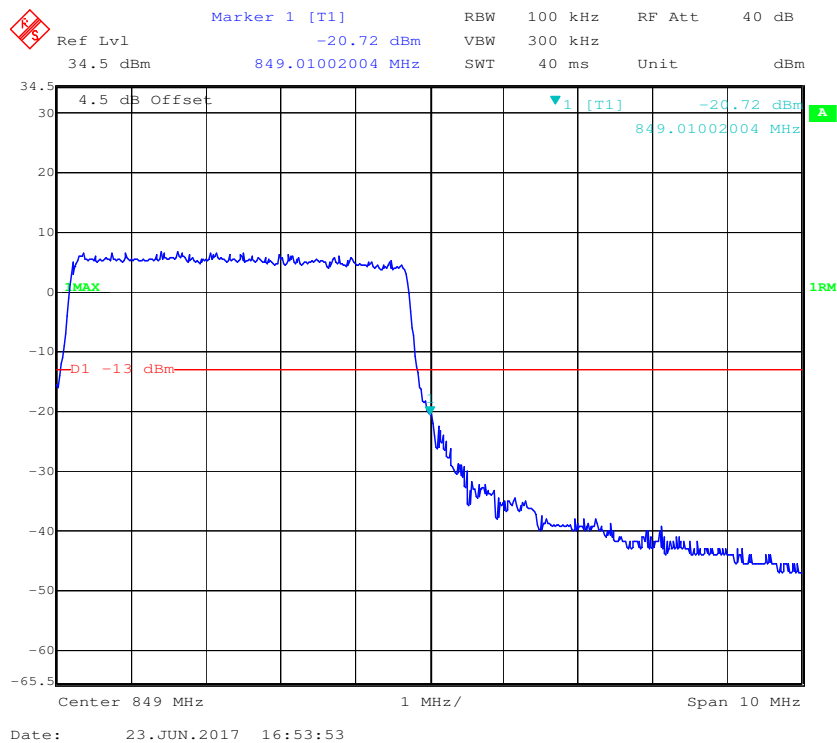
16-QAM (3.0 MHz, FULL RB) - Left Band Edge

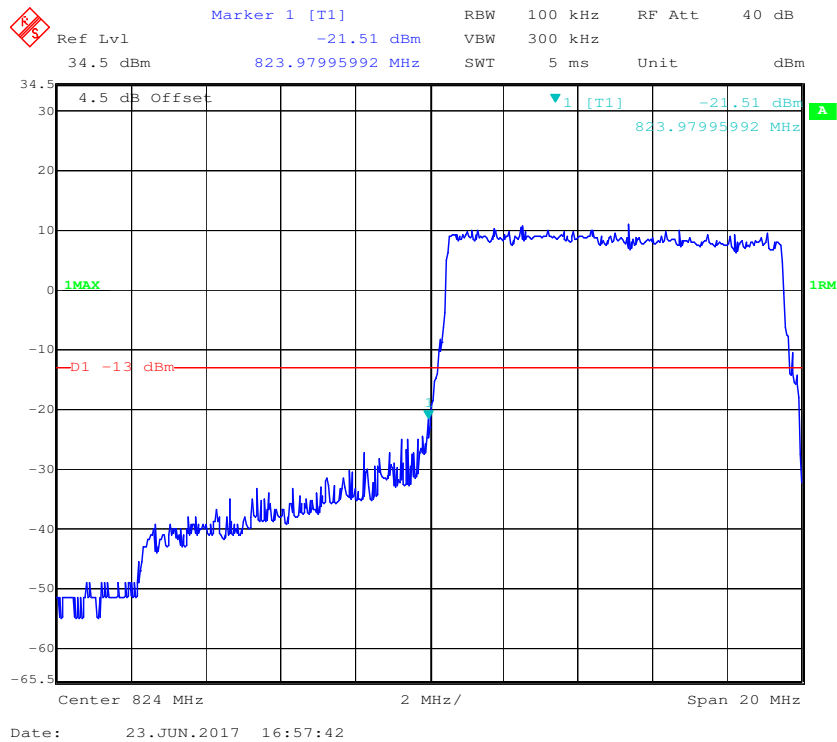
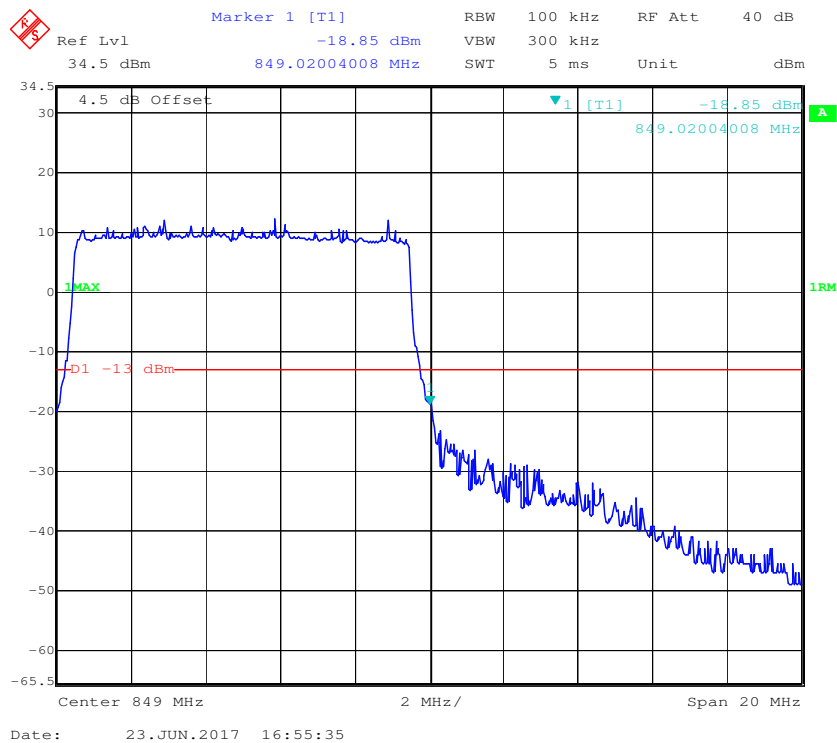


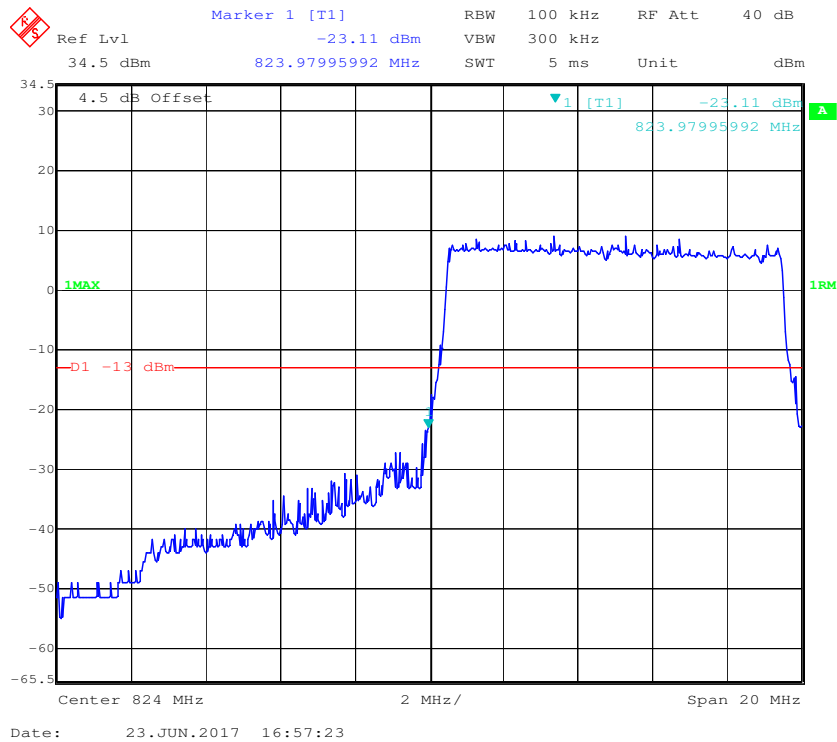
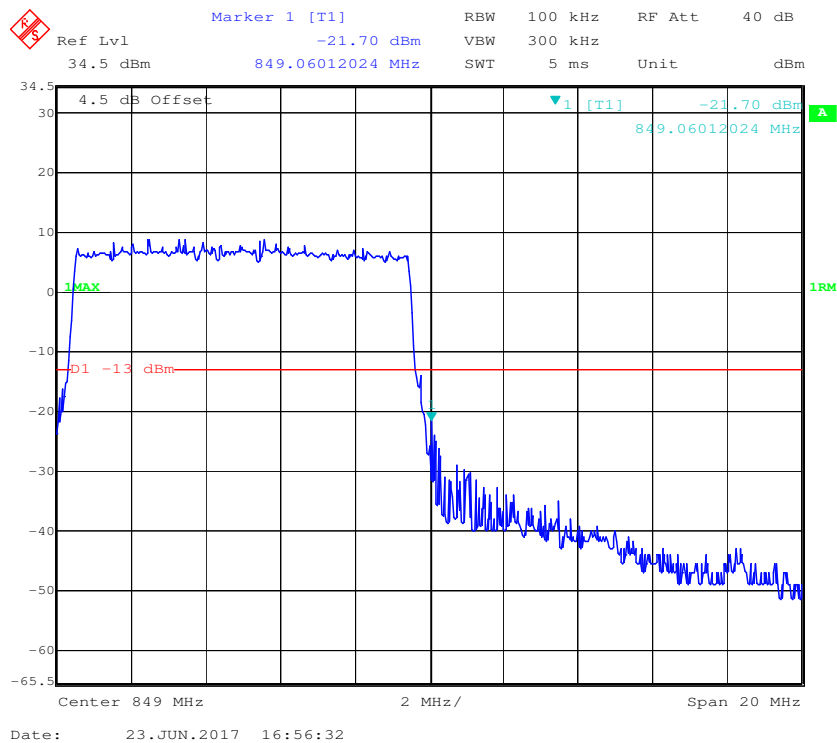
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



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

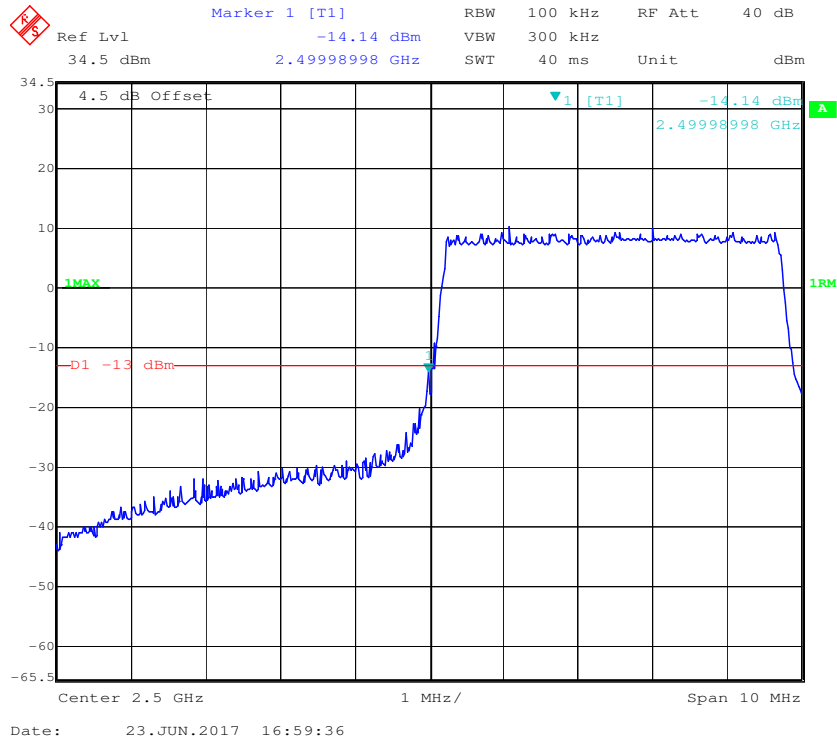
16-QAM (5.0 MHz, FULL RB) - Left Band Edge**16-QAM (5.0 MHz, FULL RB) - Right Band Edge**

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

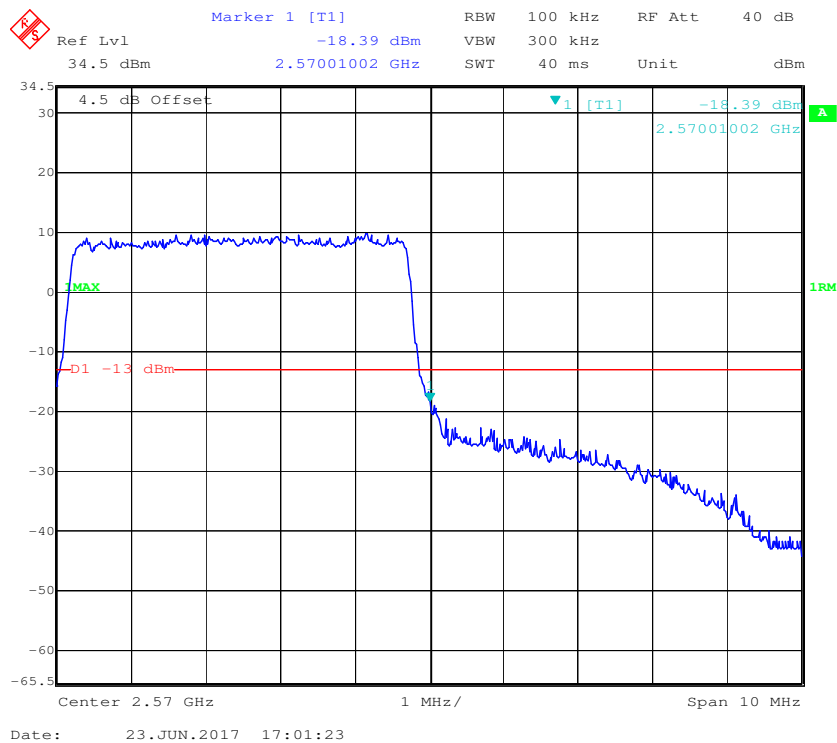
16-QAM (10.0 MHz, FULL RB) - Left Band Edge**16-QAM (10.0 MHz, FULL RB) - Right Band Edge**

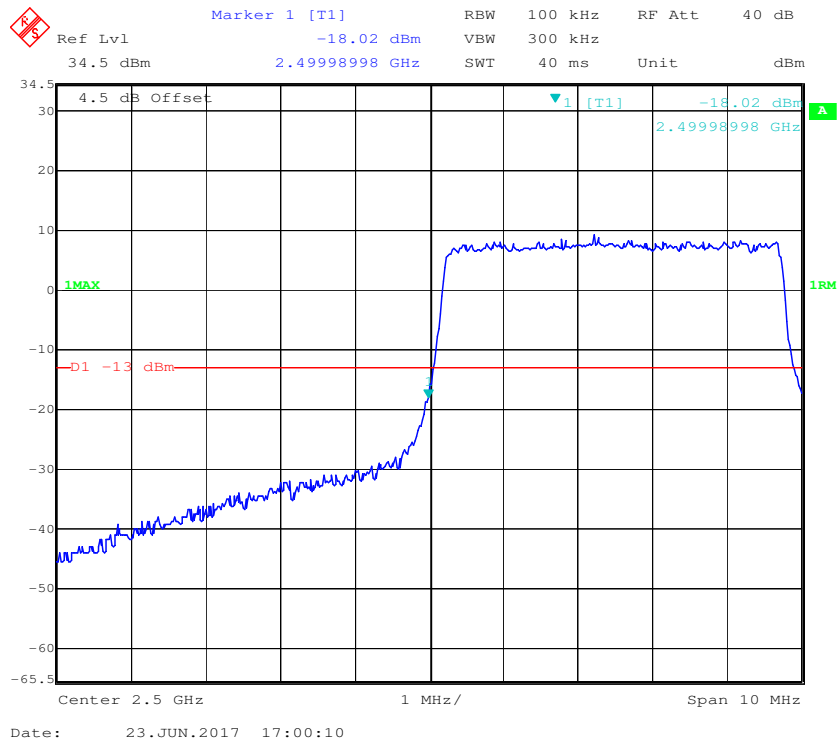
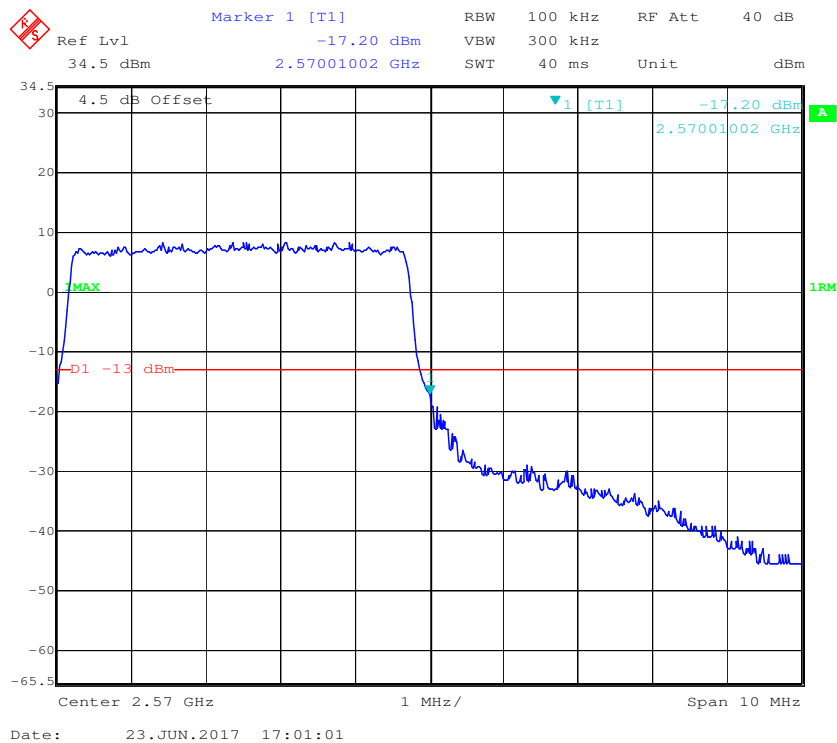
LTE Band 7:

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

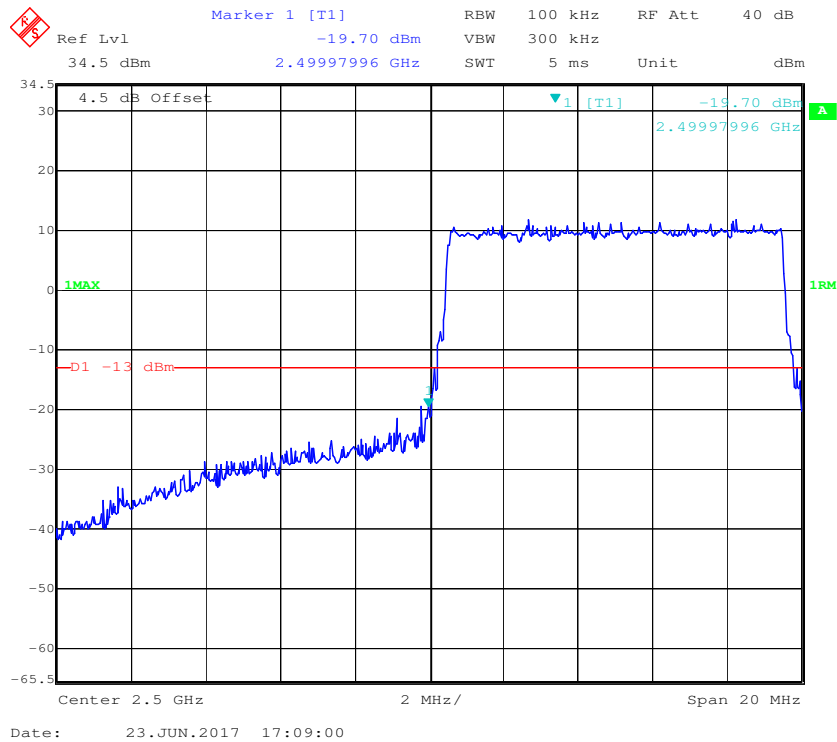


QPSK (5.0 MHz, FULL RB) - Right Band Edge

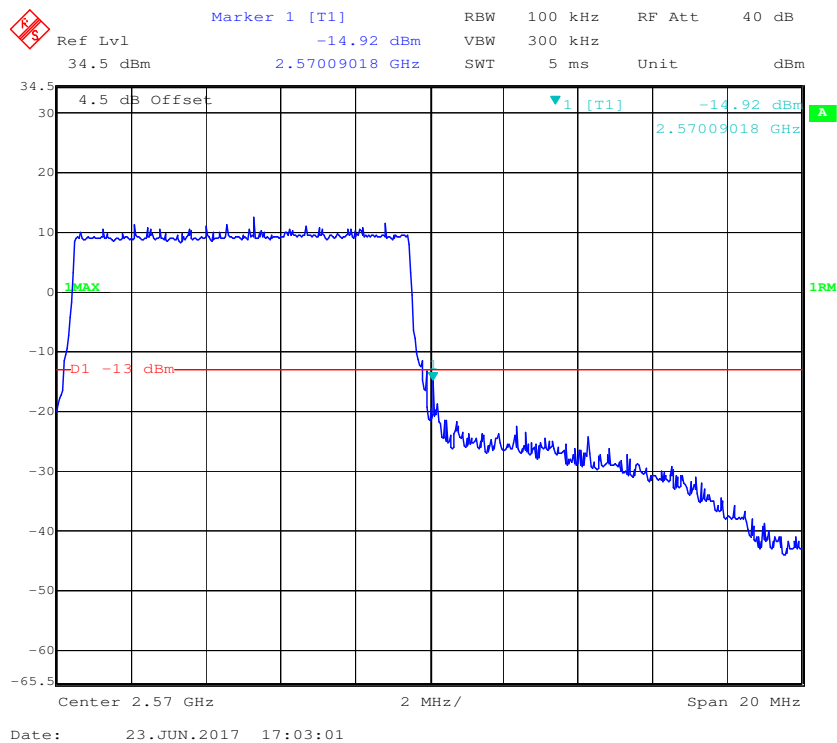


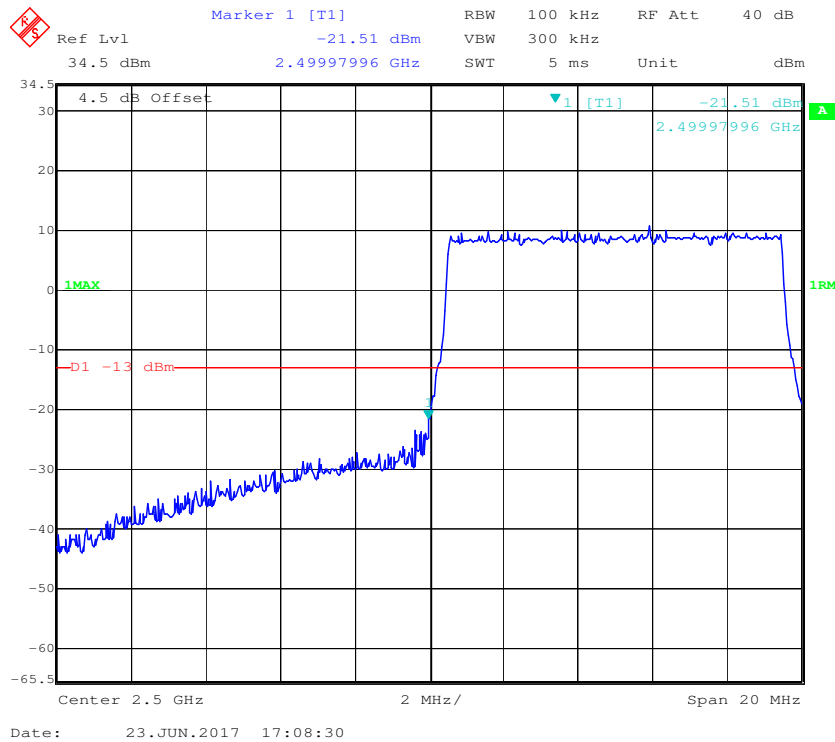
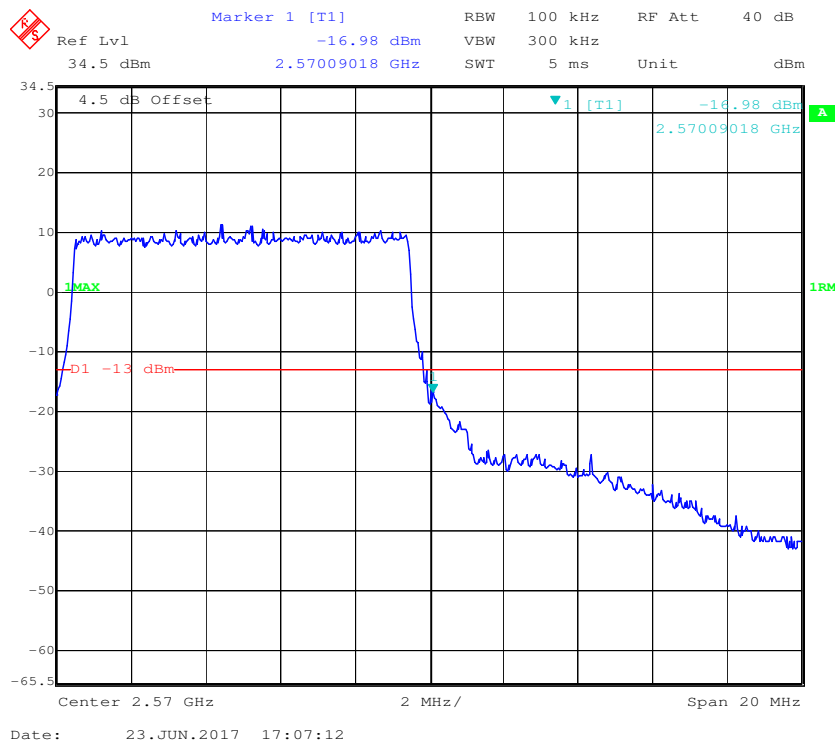
16-QAM (5.0 MHz, FULL RB) - Left Band Edge**16-QAM (5.0 MHz, FULL RB) - Right Band Edge**

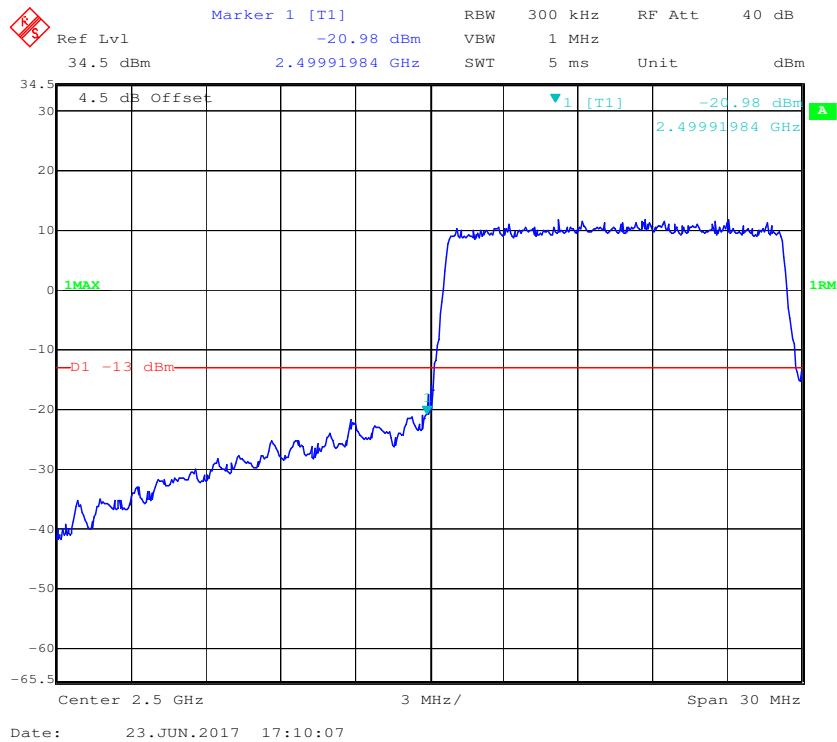
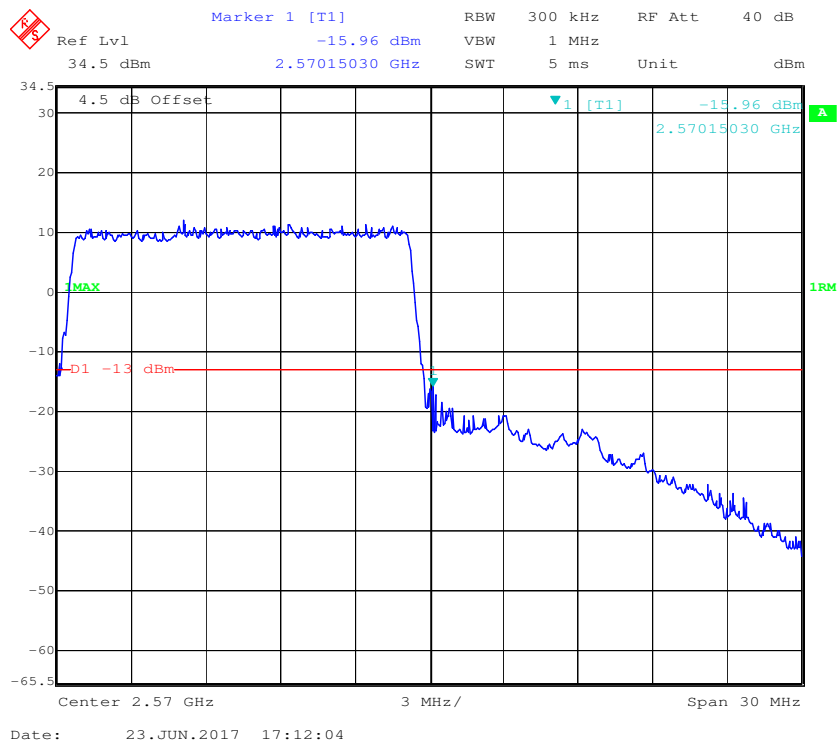
QPSK (10.0 MHz, FULL RB) - Left Band Edge

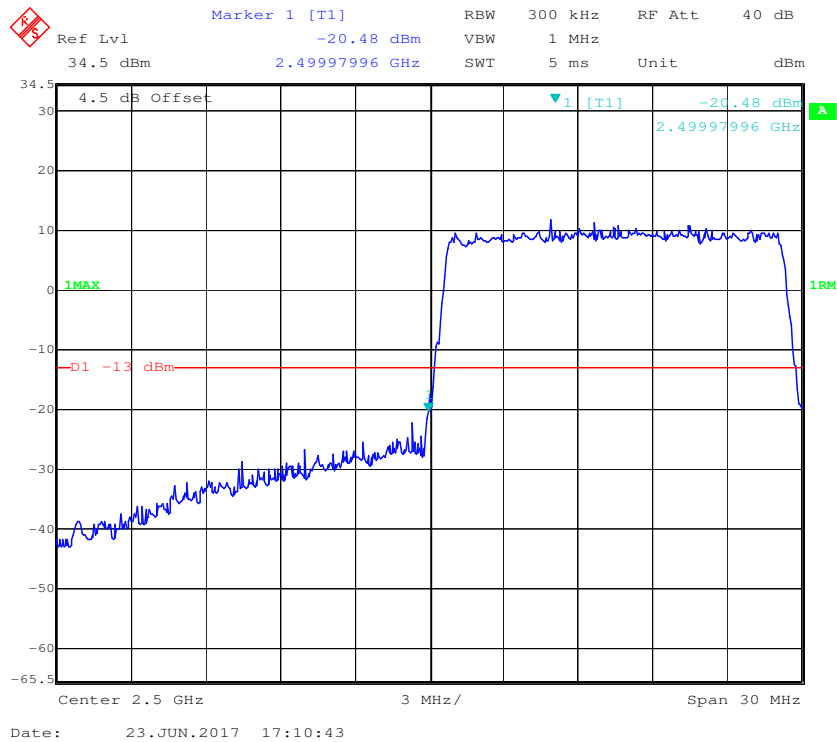
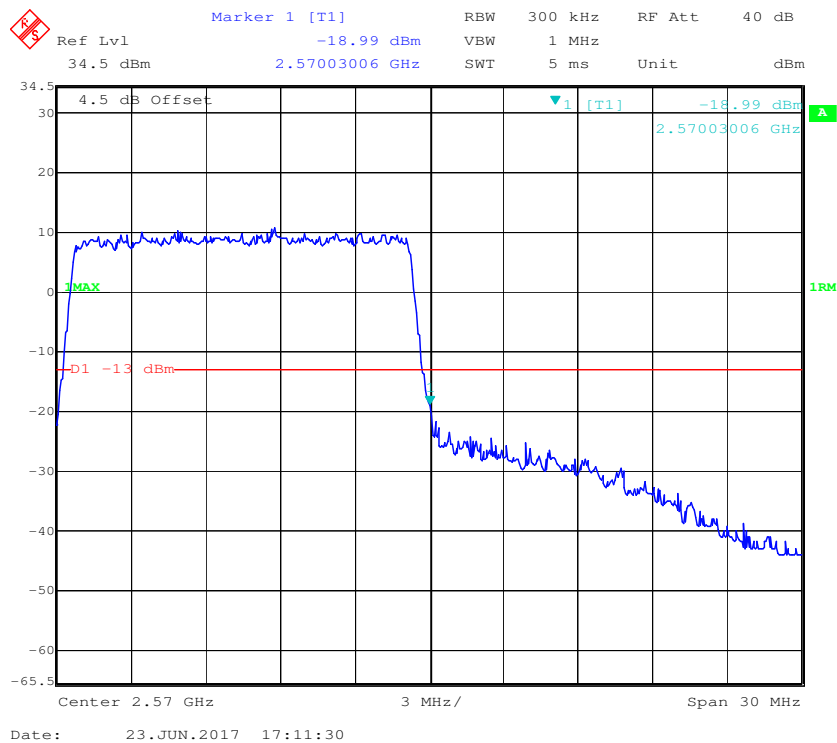


QPSK (10.0 MHz, FULL RB) - Right Band Edge

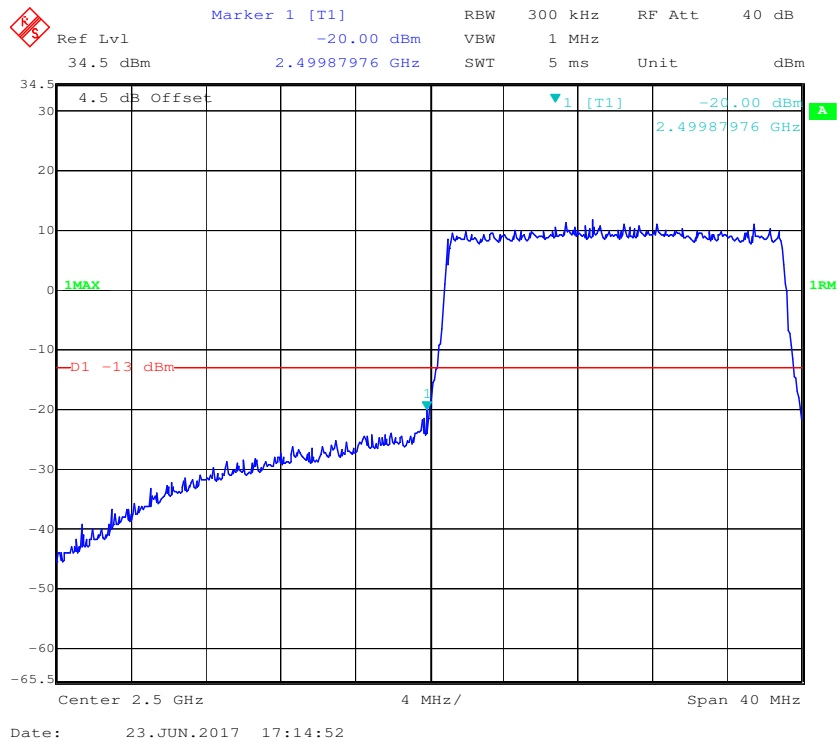


16-QAM (10.0 MHz, FULL RB) - Left Band Edge**16-QAM (10.0 MHz, FULL RB) - Right Band Edge**

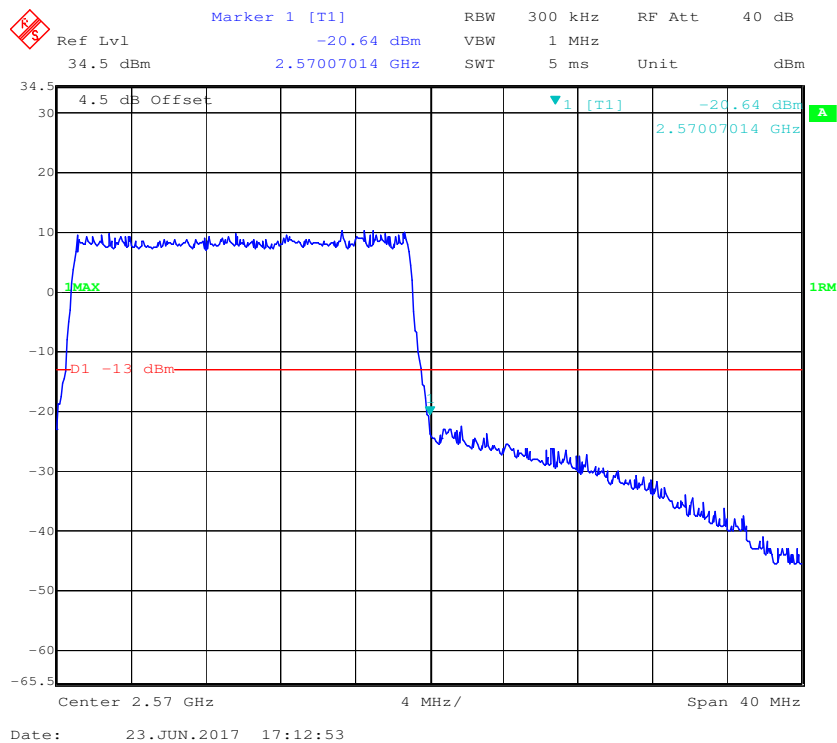
QPSK (15 MHz, FULL RB) - Left Band Edge**QPSK (15 MHz, FULL RB) - Right Band Edge**

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

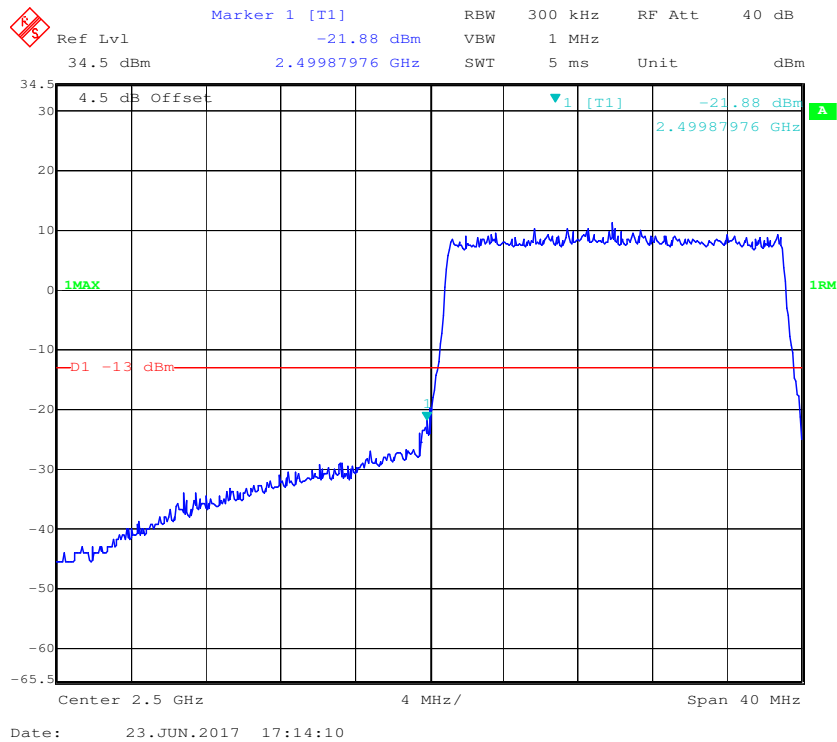
QPSK (20 MHz, FULL RB) - Left Band Edge



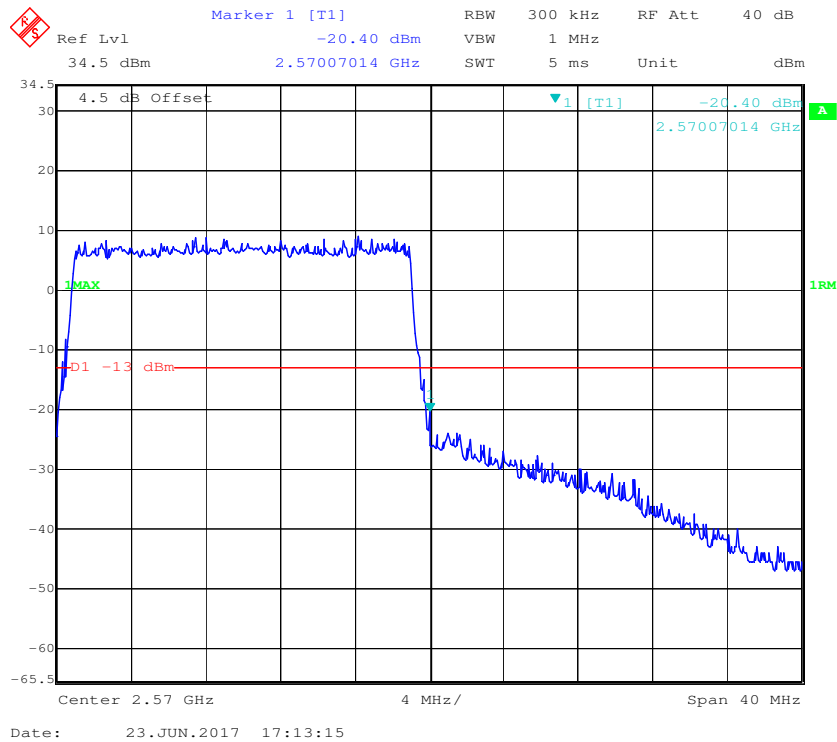
QPSK (20 MHz, FULL RB) - Right Band Edge



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



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



FCC § 2.1055; § 22.355; § 24.235; §27.54; - FREQUENCY STABILITY

Applicable Standard

FCC § 2.1055, §22.355, §24.235 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.

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

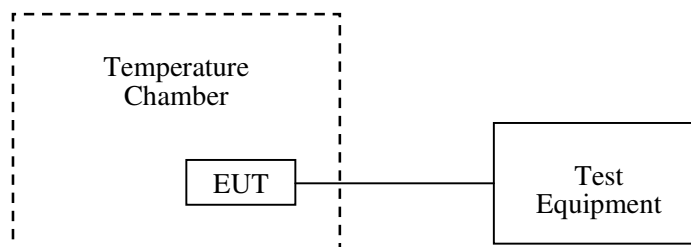
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Echo Wu on 2017-06-22.

EUT operation mode: transmitting

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

Cellular Band (Part 22H)**GSM Mode**

Middle Channel, $f_o = 836.6\text{MHz}$				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	-3	-0.0036	2.5
-20		-4	-0.0048	2.5
-10		-4	-0.0048	2.5
0		-5	-0.0060	2.5
10		-3	-0.0036	2.5
20		-4	-0.0048	2.5
30		-3	-0.0036	2.5
40		-1	-0.0012	2.5
50		5	0.0060	2.5
25	V min.= 3.6	2	0.0024	2.5
25	V max.= 4.2	3	0.0036	2.5

EDGE Mode

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	-10	-0.0120	2.5
-20		-8	-0.0096	2.5
-10		-6	-0.0072	2.5
0		-11	-0.0131	2.5
10		-9	-0.0108	2.5
20		-7	-0.0084	2.5
30		-10	-0.0120	2.5
40		3	0.0036	2.5
50		-2	-0.0024	2.5
25	V min.= 3.6	3	0.0036	2.5
25	V max.= 4.2	5	0.0060	2.5

WCDMA Mode

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	2	0.0024	2.5
-20		1	0.0012	2.5
-10		-3	-0.0036	2.5
0		-4	-0.0048	2.5
10		-2	-0.0024	2.5
20		-1	-0.0012	2.5
30		-2	-0.0024	2.5
40		-1	-0.0012	2.5
50		1	0.0012	2.5
25	V min.= 3.6	1	0.0012	2.5
25	V max.= 4.2	2	0.0024	2.5

PCS Band (Part 24E)**GSM Mode**

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-3	-0.0016	pass
-20		-4	-0.0021	pass
-10		-3	-0.0016	pass
0		-5	-0.0027	pass
10		-9	-0.0048	pass
20		-10	-0.0053	pass
30		-8	-0.0043	pass
40		-12	-0.0064	pass
50		-6	-0.0032	pass
25	V min.= 3.6	-3	-0.0016	pass
25	V max.= 4.2	-1	-0.0005	pass

EDGE Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-5	-0.0027	pass
-20		-8	-0.0043	pass
-10		-7	-0.0037	pass
0		-7	-0.0037	pass
10		-6	-0.0032	pass
20		-6	-0.0032	pass
30		-5	-0.0027	pass
40		-9	-0.0048	pass
50		2	0.0011	pass
25	V min.= 3.6	3	0.0016	pass
25	V max.= 4.2	5	0.0027	pass

WCDMA Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-4	-0.0021	pass
-20		-4	-0.0021	pass
-10		-3	-0.0016	pass
0		-3	-0.0016	pass
10		-3	-0.0016	pass
20		-1	-0.0005	pass
30		-1	-0.0005	pass
40		2	0.0011	pass
50		2	0.0011	pass
25	V min.= 3.6	1	0.0005	pass
25	V max.= 4.2	2	0.0011	pass

LTE Band 2:

20 MHz Middle Channel, $f_0=1880\text{MHz(QPSK)}$				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	2	0.001064	pass
-20		2	0.001064	pass
-10		3	0.001596	pass
0		1	0.000532	pass
10		2	0.001064	pass
20		1	0.000532	pass
30		2	0.001064	pass
40		5	0.002660	pass
50		3	0.001596	pass
20	V min.= 3.6	1	0.000532	pass
	V max.= 4.2	2	0.001064	pass

20 MHz Middle Channel, $f_0=1880\text{MHz(16-QAM)}$				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	1	0.000532	pass
-20		2	0.001064	pass
-10		-1	-0.000532	pass
0		1	0.000532	pass
10		-2	-0.001064	pass
20		-1	-0.000532	pass
30		2	0.001064	pass
40		-2	-0.001064	pass
50		-1	-0.000532	pass
20	V min.= 3.6	1	0.000532	pass
	V max.= 4.2	-1	-0.000532	pass

LTE Band 4:

20 MHz Middle Channel, $f_o=1732.5$ MHz(QPSK)				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	1	0.000577	pass
-20		2	0.001154	pass
-10		-2	-0.001154	pass
0		5	0.002886	pass
10		3	0.001732	pass
20		1	0.000577	pass
30		-1	-0.000577	pass
40		4	0.002309	pass
50		4	0.002309	pass
20	V min.= 3.6	3	0.001732	pass
	V max.= 4.2	6	0.003463	pass

20 MHz Middle Channel, $f_o=1732.5$ MHz(16-QAM)				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	1	0.000577	pass
-20		-1	-0.000577	pass
-10		-2	-0.001154	pass
0		-1	-0.000577	pass
10		2	0.001154	pass
20		1	0.000577	pass
30		-1	-0.000577	pass
40		2	0.001154	pass
50		-2	-0.001154	pass
20	V min.= 3.6	2	0.001154	pass
	V max.= 4.2	1	0.000577	pass

LTE Band 5:

10.0 MHz Middle Channel, $f_o = 836.5$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	3	0.003586	2.5
-20		4	0.004782	2.5
-10		3	0.003586	2.5
0		5	0.005977	2.5
10		5	0.005977	2.5
20		-1	-0.001195	2.5
30		-2	-0.002391	2.5
40		2	0.002391	2.5
50		3	0.003586	2.5
20	V min.= 3.6	5	0.005977	2.5
	V max.= 4.2	3	0.003586	2.5

10.0 MHz Middle Channel, $f_o = 836.5$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	2	0.002391	2.5
-20		1	0.001195	2.5
-10		-3	-0.003586	2.5
0		-4	-0.004782	2.5
10		-2	-0.002391	2.5
20		-1	-0.001195	2.5
30		-2	-0.002391	2.5
40		-1	-0.001195	2.5
50		2	0.002391	2.5
20	V min.= 3.6	1	0.001195	2.5
	V max.= 4.2	2	0.002391	2.5

LTE Band 7:

20 MHz Middle Channel, $f_0=2535$ MHz(QPSK)				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	2	0.000789	pass
-20		1	0.000394	pass
-10		5	0.001972	pass
0		6	0.002367	pass
10		2	0.000789	pass
20		8	0.003156	pass
30		2	0.000789	pass
40		2	0.000789	pass
50		3	0.001183	pass
20	V min.= 3.6	5	0.001972	pass
	V max.= 4.2	4	0.001578	pass

20 MHz Middle Channel, $f_0=2535$ MHz(16-QAM)				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	1	0.000394	pass
-20		3	0.001183	pass
-10		-1	-0.000394	pass
0		1	0.000394	pass
10		2	0.000789	pass
20		1	0.000394	pass
30		-2	-0.000789	pass
40		2	0.000789	pass
50		-1	-0.000394	pass
20	V min.= 3.6	1	0.000394	pass
	V max.= 4.2	2	0.000789	pass

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