Lab Code: 200707-0

FCC PART 27

MEASUREMENT AND TEST REPORT

For

Beijing Telestone Technology Co., Ltd.

6F, Saiou Scientific Building, No. 5 Haiying Road,

Fengtai Science Park, Beijing, China

FCC ID: U5TU-DAS-RAM2241

Report Type:	**Product Type:**
Original Report	Remote Unit for U-DAS

Test Engineer:	Jimmy Xiao
Report Number:	RSZ120425005-00B
Report Date:	2012-06-27
Reviewed By:	Sula Huang EMC Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, or any agency of the Federal Government.
* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Beijing Telestone Technology Co., Ltd*'s product, model number: *RAM2241 (FCC ID:U5TU-DAS-RAM2241*) or the "EUT" as referred to in this report is a *Remote Unit for U-DAS*, which measures approximately: 41.5 cm (L) x 35.0 cm (W) x 16.2 cm (H), rated input voltage: DC 48V.

Frequency Range:

LTE700: 698-716/776-787MHz (Uplink)
728-746/746-757MHz (Downlink)
LTE2100: 1710-1755MHz (Uplink)
2110-2155MHz (Downlink)
UMTS2100: 1710-1755MHz (Uplink)
2110-2155MHz (Downlink)

Modulation Type:
LTE700 MHz: LTE
AWS2100 MHz: UMTS, LTE

** All measurement and test data in this report was gathered from production sample serial number: 12010040 (Assigned by applicant). The EUT was received on 2011-04-25.*

Objective

This type approval report is prepared on behalf of *Beijing Telestone Technology Co., Ltd* in accordance with Part 2, Part 27 of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

None.

Test Methodology

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

Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA-1037, TIA/EIA 603-D.

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

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Justification

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

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

Equipment Modifications

No modifications were made to the EUT.

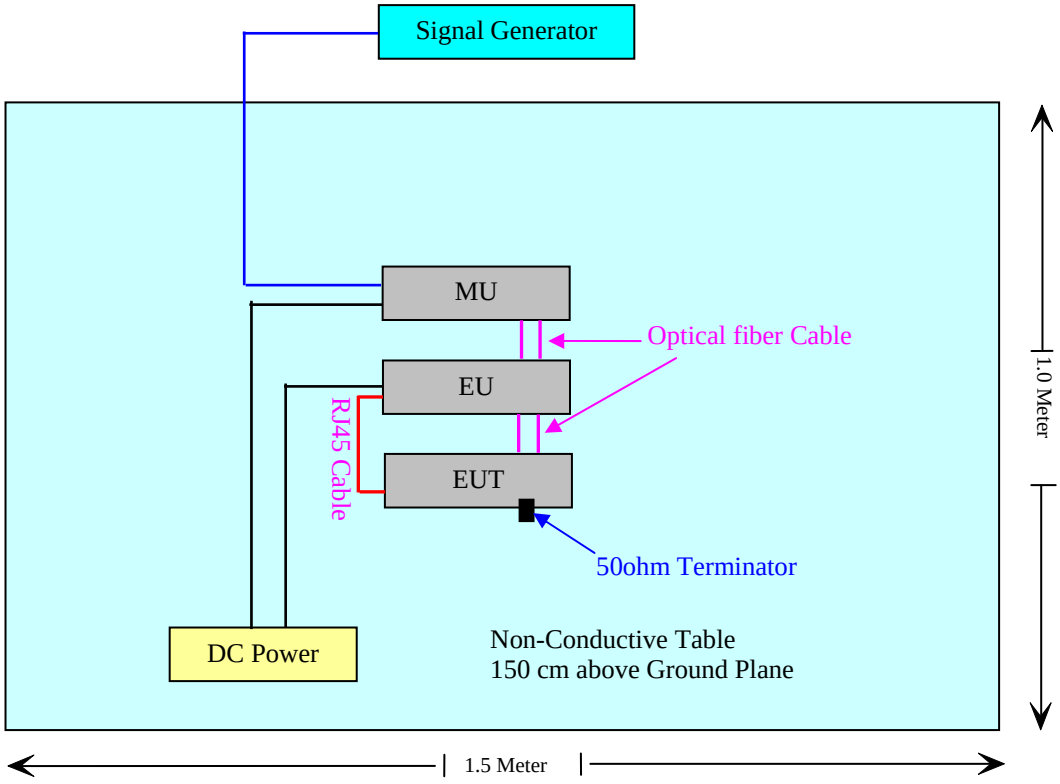
Local Support Equipment List and Details

Manufacturer	Device Name	Model	Serial Number
R&S	Vector Signal Generator	SMU200A	GB40051862
R&S	Universal Radio Communication Tester	CMU200	109038
LONGWEI	DC Power supply	TPR-64200	0398363
Beijing Telestone Technology Co., Ltd	U-DAS2200 system (Expansion Unit)	RD2200	12010062
Beijing Telestone Technology Co., Ltd	U-DAS2200 system (Main Unit)	RS2200	12010044

External I/O Cable

Cable Description	Length (m)	From/Port	To
Fiber cables	3.0	EU/MU	EUT (Remote Unit)
DC Power Cable	1.5	EU/MU	DC Power
AC Power Cable	2.0	EU/MU	AC Power
RJ45 Cable	3.0	EU	EUT (Remote Unit)

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b)(1), §2.1091, §27.52	RF Exposure Information	Compliance
§2.1046; §27.50 (d) (i)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	N/A
§ 2.1049; §27.53 (c)	Occupied Bandwidth	Compliance
§ 2.1051; §27.53(c) (g)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; §27.53 (c) (g)	Spurious Radiated Emissions	Compliance
§27.53 (c) (g)	Band Edge	Compliance
§ 2.1055; §27.54	Frequency stability	Compliance

FCC §1.1307(b), §27.52 & §2.1091 - RF EXPOSURE INFORMATION

Applicable Standard

According to §1.1307 (b)(1) and §2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

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

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

Test Data

Predication of MPE limit at a given distance, Equation from OET 65, Edition97-01

$$S = PG/4\pi R^2$$

Where:
S = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Cellular Band:

Band	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
LTE700	730	5	3.16	21.74	149.3	20	0.0939	0.4867
LTE700	748	5	3.16	21.92	155.59	20	0.09786	0.4987
LTE2100	2150	5	3.16	21.84	152.76	20	0.096	1.0
UMTS2100	2112.4	5	3.16	20.86	121.90	20	0.077	1.0

Result: The device meets FCC MPE limit at 20 cm distance.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

FCC §2.1046 & §27.50 - RF OUTPUT POWER

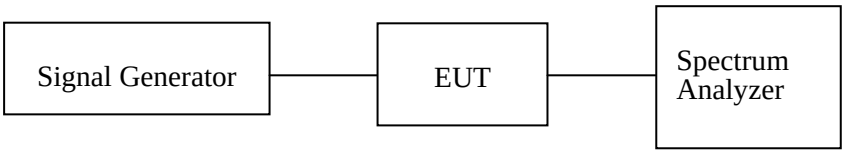
Applicable Standards

According to FCC §27.50, the maximum effective radiated power (ERP) of fixed and base station must not exceed 1000 Watts.

Test Procedure

Conducted method:

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
Rohde & Schwarz	Vector Signal Generator	SMU200A	GB40051862	2011-08-06	2012-08-05
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2011-12-16	2012-12-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Jimmy Xiao from 2012-05-13 to 2012-06-26.

Conducted Power:

Maximum Output Power (LTE700)

Mode	Modulation	Frequency (MHz)	Output Power Peak (dBm)	Output Power RMS (dBm)	Peak/RMS
Downlink 728-746 MHz	QPSK (1.4 MHz)	729	23.14	21.53	1.075
	QPSK (1.4 MHz)	737	24.35	21.32	1.142
	QPSK (1.4 MHz)	745	23.14	20.14	1.149
	16QAM (1.4 MHz)	729	23.87	21.25	1.123
	16QAM (1.4 MHz)	737	24.09	21.54	1.118
	16QAM (1.4 MHz)	745	23.36	20.73	1.127
	64QAM (1.4MHz)	729	23.27	21.36	1.089
	64QAM (1.4MHz)	737	24.31	21.26	1.143
	64QAM (1.4MHz)	745	23.39	20.75	1.127
	QPSK (3 MHz)	730	23.14	21.64	1.069
	QPSK (3 MHz)	737	23.72	21.29	1.114
	QPSK (3 MHz)	744	23.35	21.16	1.103
	16QAM (3 MHz)	730	23.47	21.28	1.103
	16QAM (3 MHz)	737	24.03	21.16	1.136
	16QAM (3 MHz)	744	23.14	20.62	1.122
	64QAM (3 MHz)	730	23.92	21.74	1.100
	64QAM (3 MHz)	737	23.46	21.46	1.093
	64QAM (3 MHz)	744	23.74	20.54	1.156
	QPSK (5 MHz)	731	23.84	21.17	1.126
	QPSK (5 MHz)	737	23.34	21.38	1.092
	QPSK (5 MHz)	743	23.71	20.65	1.148
	16QAM (5 MHz)	731	24.36	21.14	1.152
	16QAM (5 MHz)	737	23.79	21.27	1.118
	16QAM (5 MHz)	743	23.58	21.09	1.118
	64QAM (5 MHz)	731	24.47	21.47	1.140
	64QAM (5 MHz)	737	23.25	21.16	1.099
	64QAM (5 MHz)	743	23.38	21.25	1.100
	QPSK (10 MHz)	733	24.72	21.42	1.154
	QPSK (10 MHz)	737	23.25	20.75	1.120
	QPSK (10 MHz)	741	23.36	21.14	1.105
	16QAM (10 MHz)	733	24.49	21.52	1.138
	16QAM (10 MHz)	737	23.79	21.24	1.120
	16QAM (10 MHz)	741	23.75	21.31	1.115
	64QAM (10 MHz)	733	24.64	21.46	1.148
	64QAM (10 MHz)	737	23.82	21.37	1.115
	64QAM (10 MHz)	741	23.73	21.45	1.106

Mode	Modulation	Frequency (MHz)	Output Power Peak (dBm)	Output Power RMS (dBm)	Peak/RMS
Downlink 746-757 MHz	QPSK (1.4 MHz)	747	23.36	21.16	1.10397
	QPSK (1.4 MHz)	752	24.10	21.45	1.12354
	QPSK (1.4 MHz)	756	23.36	20.13	1.16046
	16QAM (1.4 MHz)	747	23.14	21.37	1.08283
	16QAM (1.4 MHz)	752	24.16	21.68	1.11439
	16QAM (1.4 MHz)	756	23.71	20.91	1.13391
	64QAM (1.4MHz)	747	23.38	21.56	1.08442
	64QAM (1.4MHz)	752	24.45	21.47	1.13880
	64QAM (1.4MHz)	756	23.53	20.82	1.13016
	QPSK (3 MHz)	748	23.62	21.92	1.07755
	QPSK (3 MHz)	752	23.47	21.34	1.09981
	QPSK (3 MHz)	755	23.36	21.12	1.10606
	16QAM (3 MHz)	748	23.52	21.22	1.10839
	16QAM (3 MHz)	752	24.14	21.42	1.12698
	16QAM (3 MHz)	755	23.74	20.86	1.13806
	64QAM (3 MHz)	748	23.38	21.02	1.11227
	64QAM (3 MHz)	752	23.57	21.46	1.09832
	64QAM (3 MHz)	755	23.16	20.17	1.14824
	QPSK (5 MHz)	749	23.24	21.32	1.09006
	QPSK (5 MHz)	752	23.19	21.31	1.08822
	QPSK (5 MHz)	754	23.36	20.74	1.12633
	16QAM (5 MHz)	749	24.82	21.52	1.15335
	16QAM (5 MHz)	752	23.70	21.43	1.10593
	16QAM (5 MHz)	754	23.51	21.14	1.11211
	64QAM (5 MHz)	749	24.36	21.42	1.13725
	64QAM (5 MHz)	752	23.42	21.10	1.10995
	64QAM (5 MHz)	754	23.42	21.31	1.09901
	QPSK (10 MHz)	751	24.67	21.57	1.14372
	QPSK (10 MHz)	752	23.38	20.46	1.14272
	16QAM (10 MHz)	751	24.52	21.45	1.14312
	16QAM (10 MHz)	752	23.82	21.36	1.11517
	64QAM (10 MHz)	751	24.36	21.52	1.13197
	64QAM (10 MHz)	752	23.47	21.64	1.08457

Maximum Output Power (LTE2100)

Mode	Modulation	Frequency (MHz)	Output Power Peak (dBm)	Output Power RMS (dBm)	Peak/RMS
Downlink 2110-2155 MHz	QPSK (1.4 MHz)	2111	23.44	21.13	1.11
	QPSK (1.4 MHz)	2132	24.63	21.77	1.13
	QPSK (1.4 MHz)	2154	24.09	21.46	1.12
	16QAM (1.4 MHz)	2111	23.83	21.37	1.12
	16QAM (1.4 MHz)	2132	23.38	20.78	1.13
	16QAM (1.4 MHz)	2154	23.97	21.19	1.13
	64QAM (1.4MHz)	2111	23.99	21.20	1.13
	64QAM (1.4MHz)	2132	23.37	20.97	1.11
	64QAM (1.4MHz)	2154	23.96	21.35	1.12
	QPSK (3 MHz)	2112	23.95	20.91	1.15
	QPSK (3 MHz)	2132	24.01	21.04	1.14
	QPSK (3 MHz)	2153	24.05	21.05	1.14
	16QAM (3 MHz)	2112	24.32	21.28	1.14
	16QAM (3 MHz)	2132	24.02	21.01	1.14
	16QAM (3 MHz)	2153	24.28	21.23	1.14
	64QAM (3 MHz)	2112	24.65	21.40	1.15
	64QAM (3 MHz)	2132	24.36	21.23	1.15
	64QAM (3 MHz)	2153	23.89	20.91	1.14
	QPSK (5 MHz)	2113	23.56	20.79	1.13
	QPSK (5 MHz)	2132	24.06	21.02	1.14
	QPSK (5 MHz)	2152	23.41	20.50	1.14
	16QAM (5 MHz)	2113	24.05	21.08	1.14
	16QAM (5 MHz)	2132	23.29	20.28	1.15
	16QAM (5 MHz)	2152	23.46	20.51	1.14
	64QAM (5 MHz)	2113	23.79	20.83	1.14
	64QAM (5 MHz)	2132	24.12	21.34	1.13
	64QAM (5 MHz)	2152	23.99	21.00	1.14
	QPSK (10 MHz)	2115	23.45	20.96	1.12
	QPSK (10 MHz)	2132	23.32	20.95	1.11
	QPSK (10 MHz)	2150	23.35	21.14	1.10
	16QAM (10 MHz)	2115	23.46	20.99	1.12
	16QAM (10 MHz)	2132	23.45	21.14	1.11
	16QAM (10 MHz)	2150	24.67	21.84	1.13
	64QAM (10 MHz)	2115	23.51	20.84	1.13
	64QAM (10 MHz)	2132	23.52	21.01	1.12
	64QAM (10 MHz)	2150	23.24	20.78	1.12

Maximum Output Power (UMTS2100)

Mode	Channel	Frequency (MHz)	Output Power (dBm)
Downlink	Low	2112.4	20.86
	Middle	2132.4	20.80
	High	2152.6	20.17

FCC §2.1049 & §27.53 - OCCUPIED BANDWIDTH

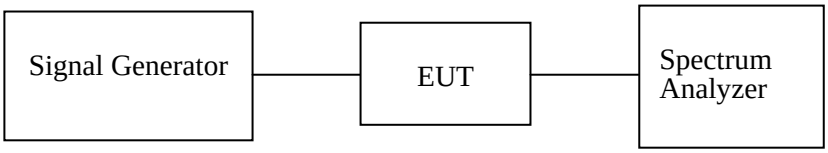
Applicable Standards

FCC 47 §2.1049 and §27.53.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 100 kHz and the 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
Rohde & Schwarz	Vector Signal Generator	SMU200A	GB40051862	2011-08-06	2012-08-05
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2011-12-16	2012-12-15
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

The testing was performed by Jimmy Xiao from 2012-05-13 to 2012-06-26.

LTE700 Mode (728-746 MHz):

Input Signal:

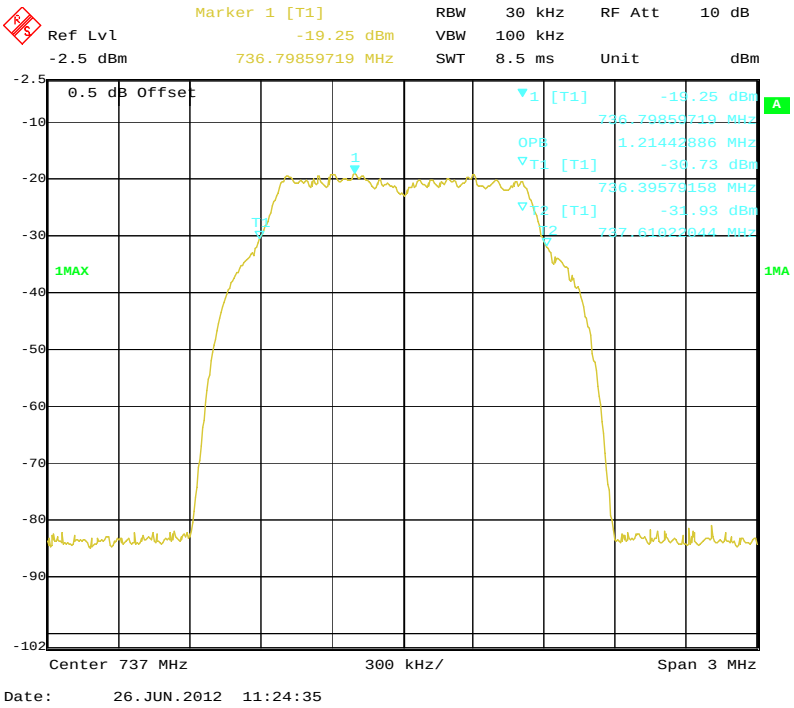
Mode	Modulation	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Downlink 728-746 MHz	QPSK (1.4 MHz)	737	1.2144	1.5631
	16QAM (1.4 MHz)	737	1.1964	1.5451
	64QAM (1.4 MHz)	737	1.1964	1.5451
	QPSK (3 MHz)	737	2.7154	3.0862
	16QAM (3 MHz)	737	2.7054	3.0862
	64QAM (3 MHz)	737	2.7154	3.0862
	QPSK (5 MHz)	737	4.5852	6.0120
	16QAM (5 MHz)	737	4.6333	5.9960
	64QAM (5 MHz)	737	4.6172	6.0601
	QPSK (10 MHz)	737	9.0481	11.0922
	16QAM (10 MHz)	737	9.0481	11.1523
	64QAM (10 MHz)	737	9.0180	11.2425

Output Signal:

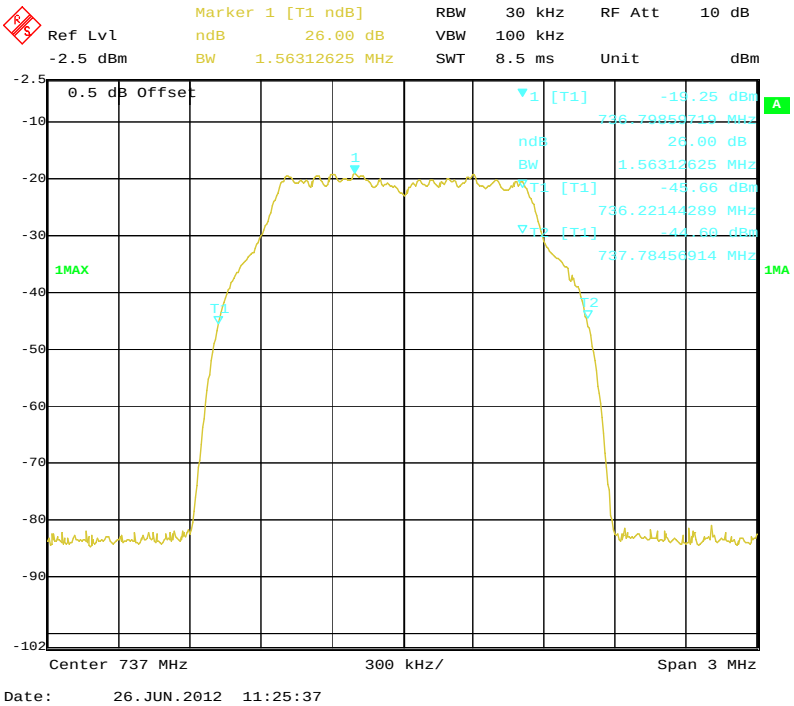
Mode	Modulation	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Downlink 728-746 MHz	QPSK (1.4 MHz)	737	1.2565	1.5932
	16QAM (1.4 MHz)	737	1.2385	1.5752
	64QAM (1.4 MHz)	737	1.2565	1.5872
	QPSK (3 MHz)	737	2.7154	3.0661
	16QAM (3 MHz)	737	2.7054	3.0962
	64QAM (3 MHz)	737	2.7255	3.1062
	QPSK (5 MHz)	737	4.6172	5.9960
	16QAM (5 MHz)	737	4.6333	5.9960
	64QAM (5 MHz)	737	4.6012	6.0120
	QPSK (10 MHz)	737	9.0481	11.2725
	16QAM (10 MHz)	737	9.0481	11.3026
	64QAM (10 MHz)	737	9.0481	11.2725

LTE700-QPSK (1.4 MHz), Frequency: 737 MHz

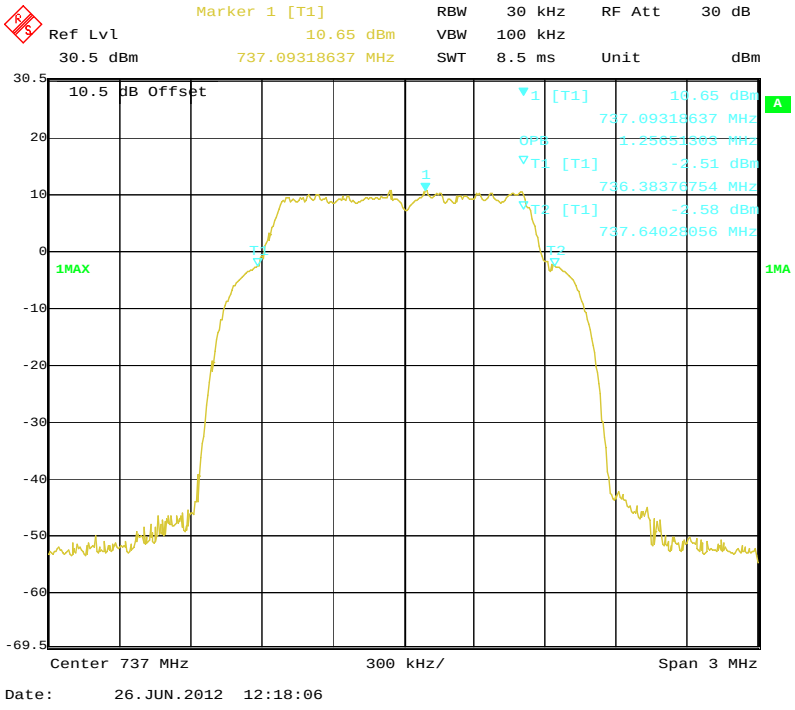
99% Occupied Bandwidth: Input Signal



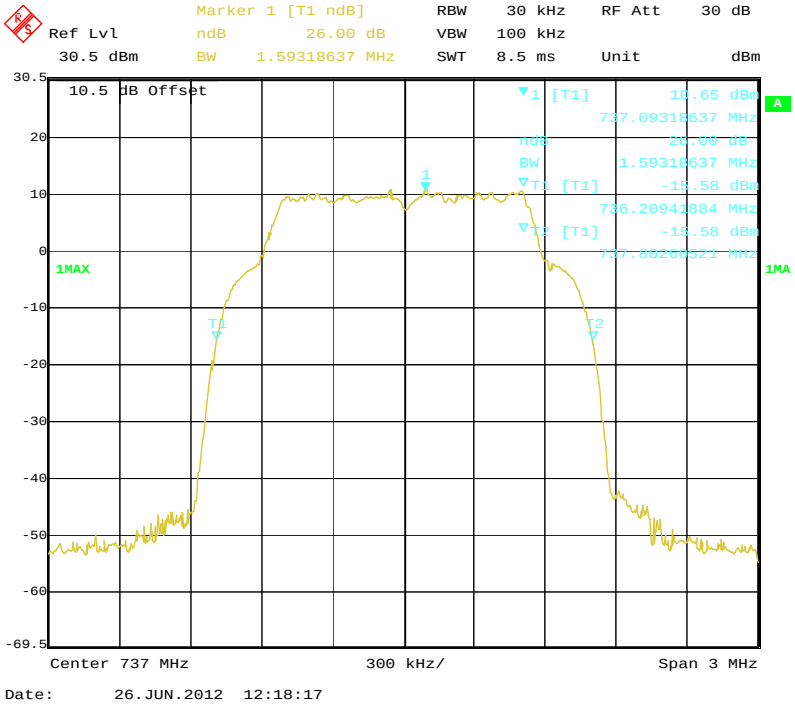
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

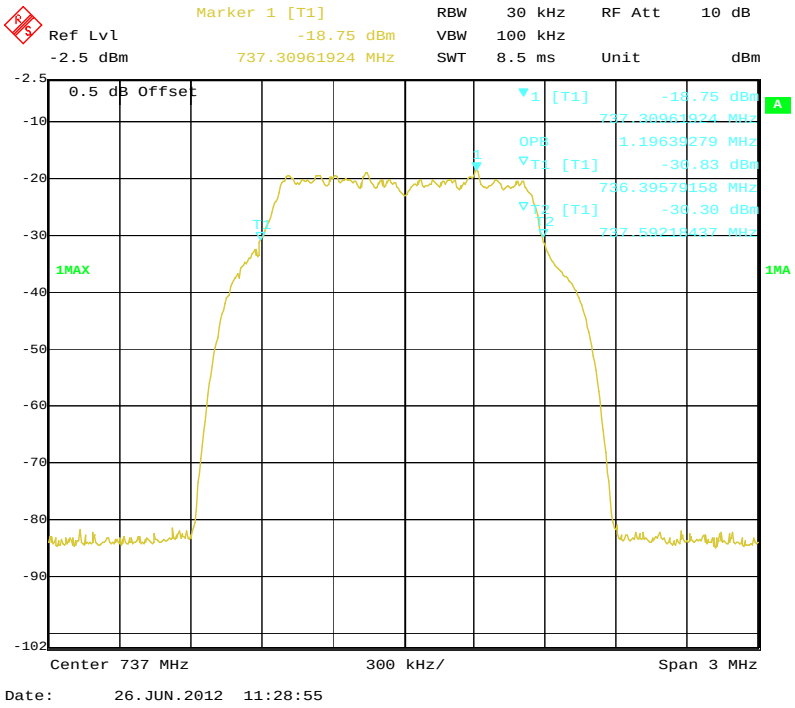


26 dB Bandwidth: Output Signal

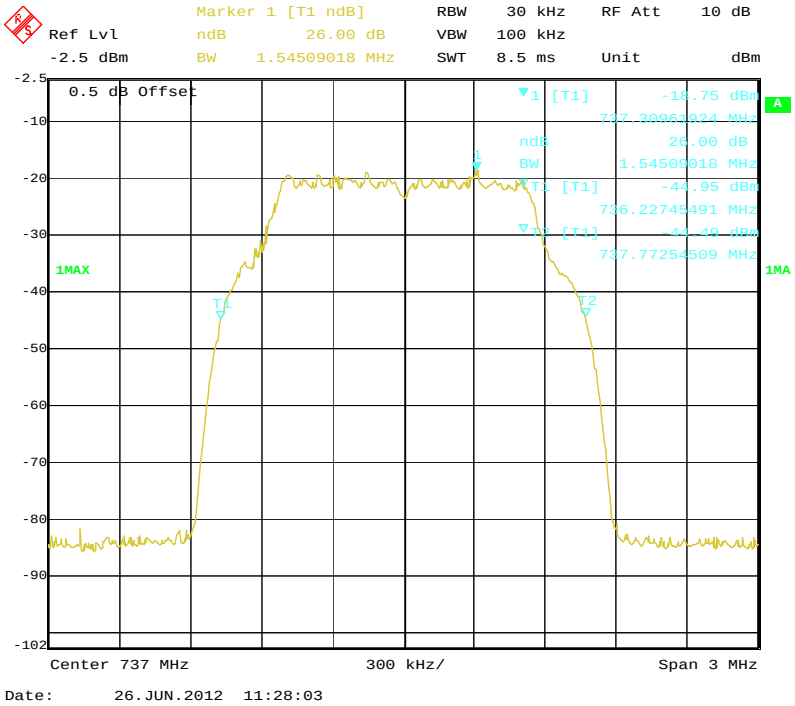


LTE700-16QAM (1.4 MHz), Frequency: 737 MHz

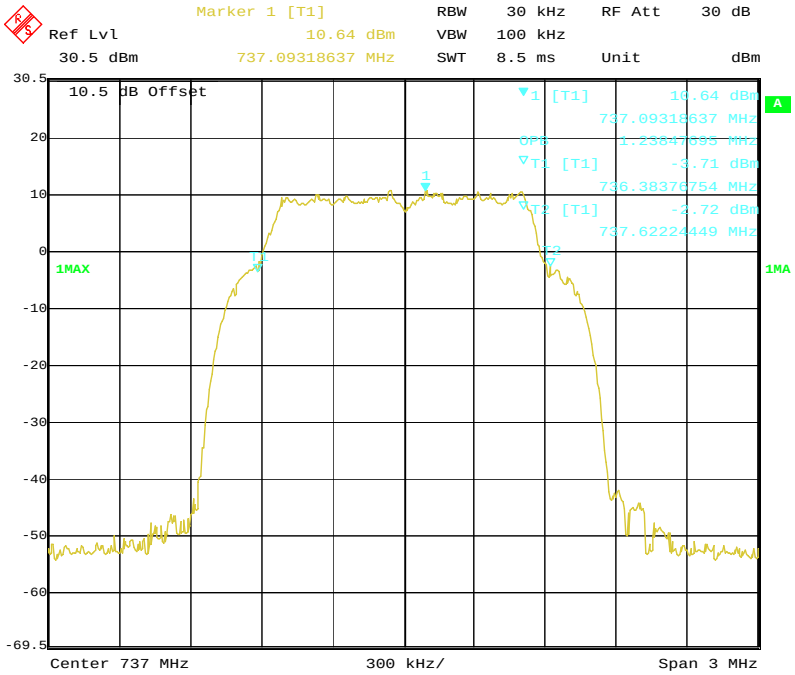
99% Occupied Bandwidth: Input Signal



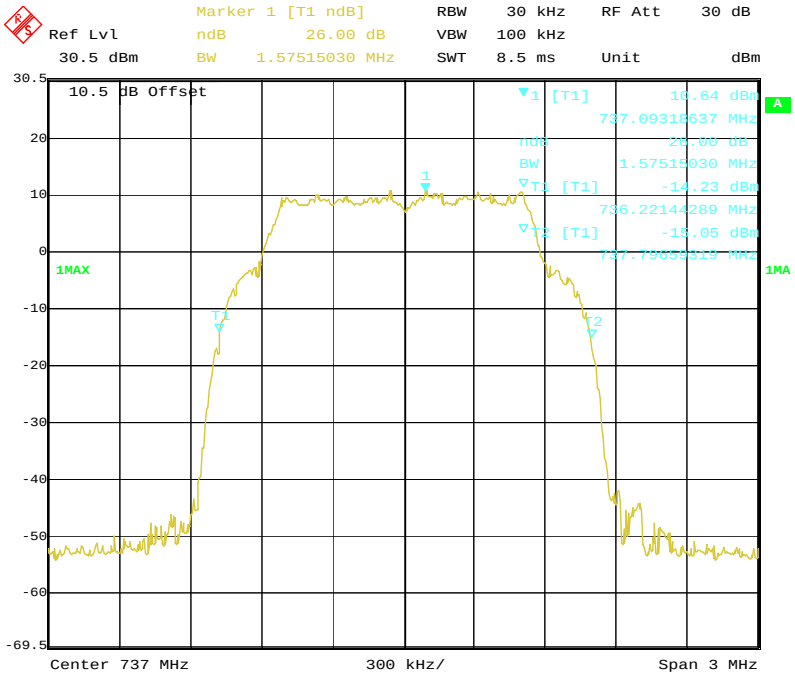
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

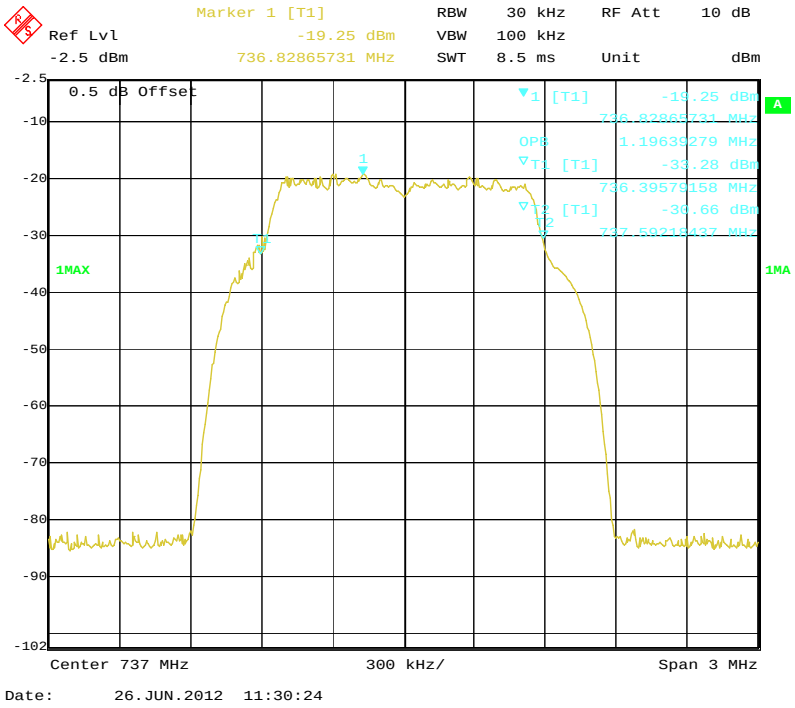


26 dB Bandwidth: Output Signal

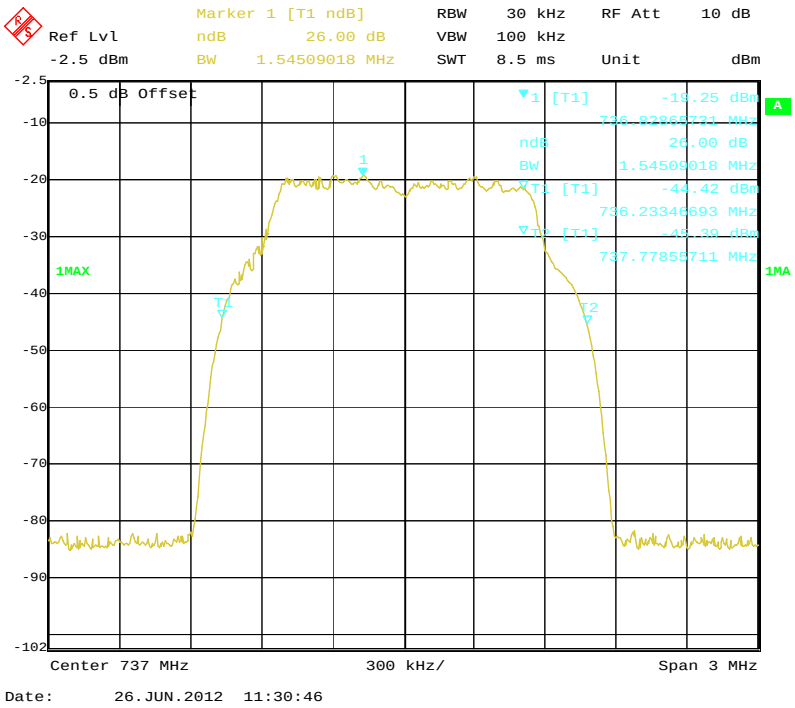


LTE700-64QAM (1.4 MHz), Frequency: 737 MHz

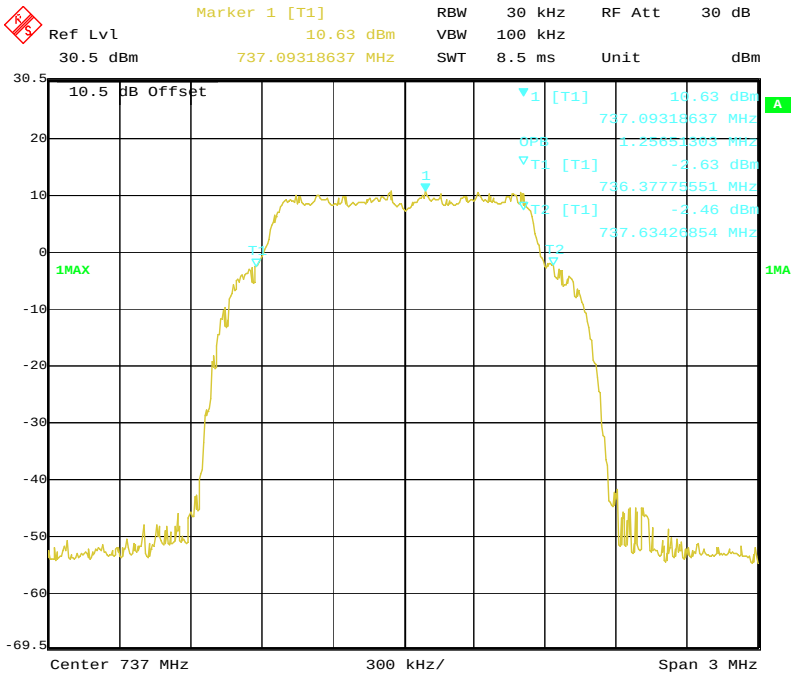
99% Occupied Bandwidth: Input Signal



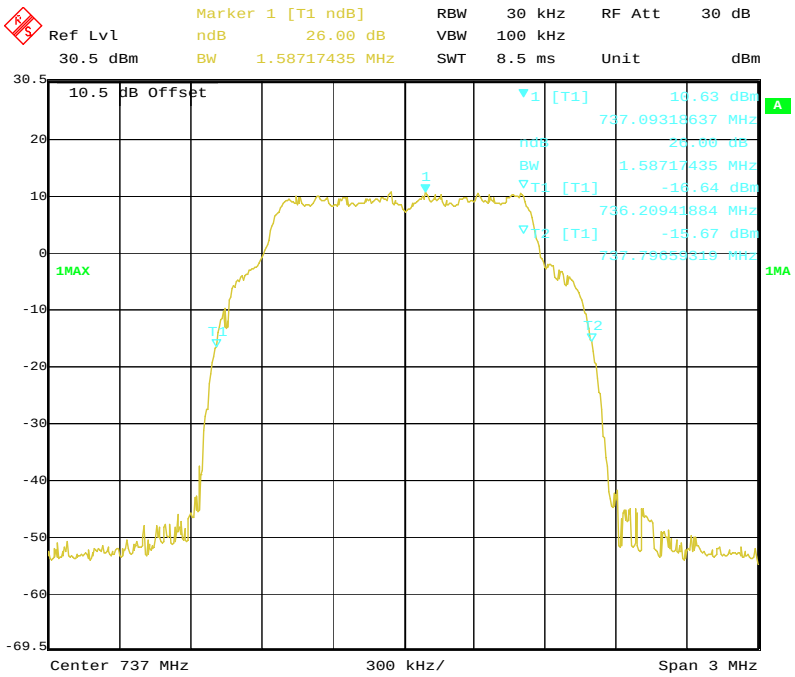
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

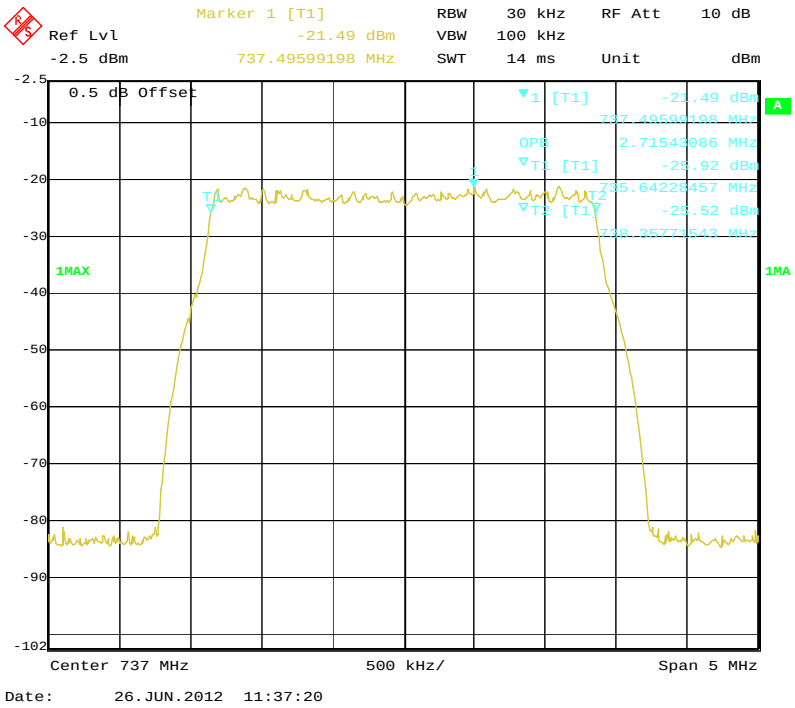


26 dB Bandwidth: Output Signal

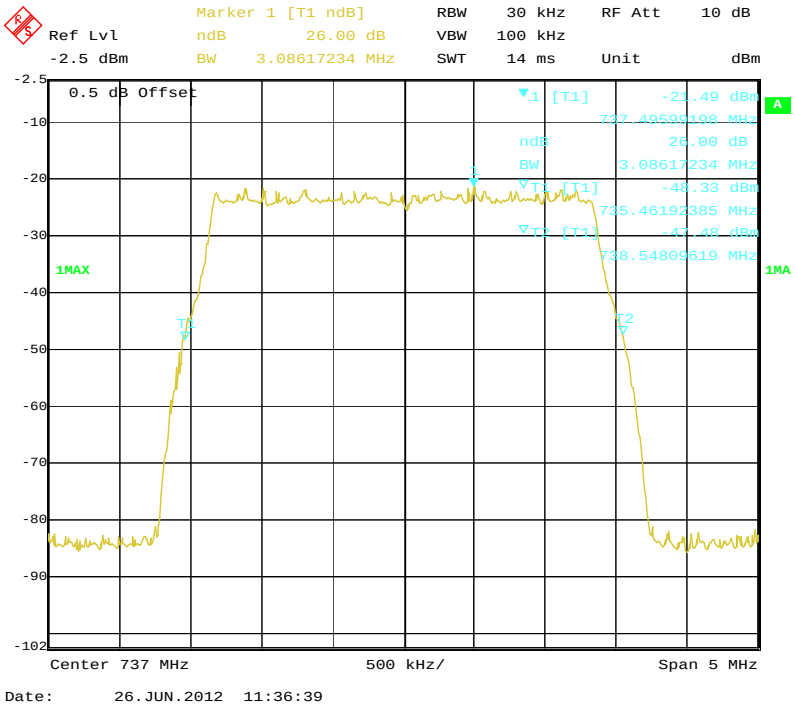


LTE700-QPSK (3 MHz), Frequency: 737 MHz

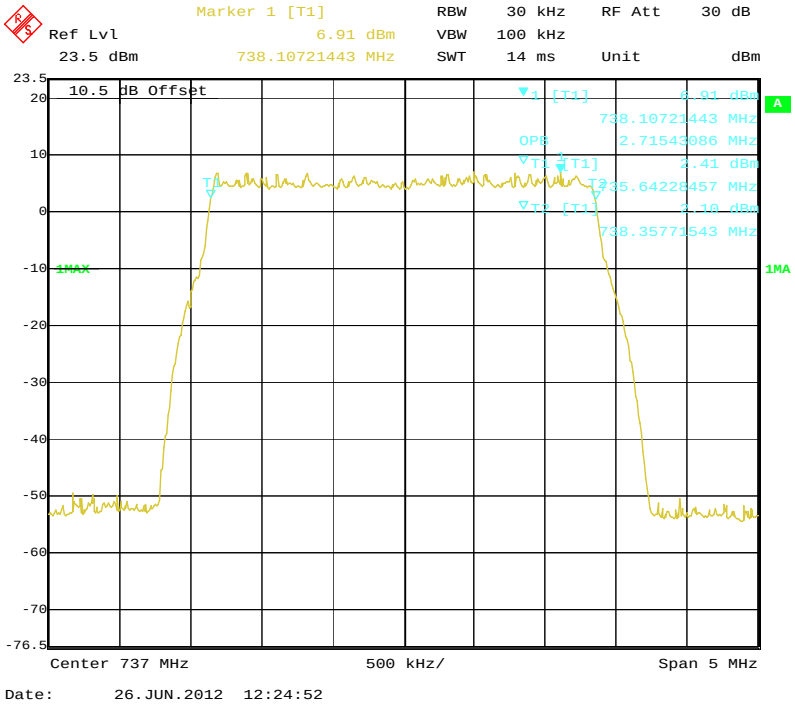
99% Occupied Bandwidth: Input Signal



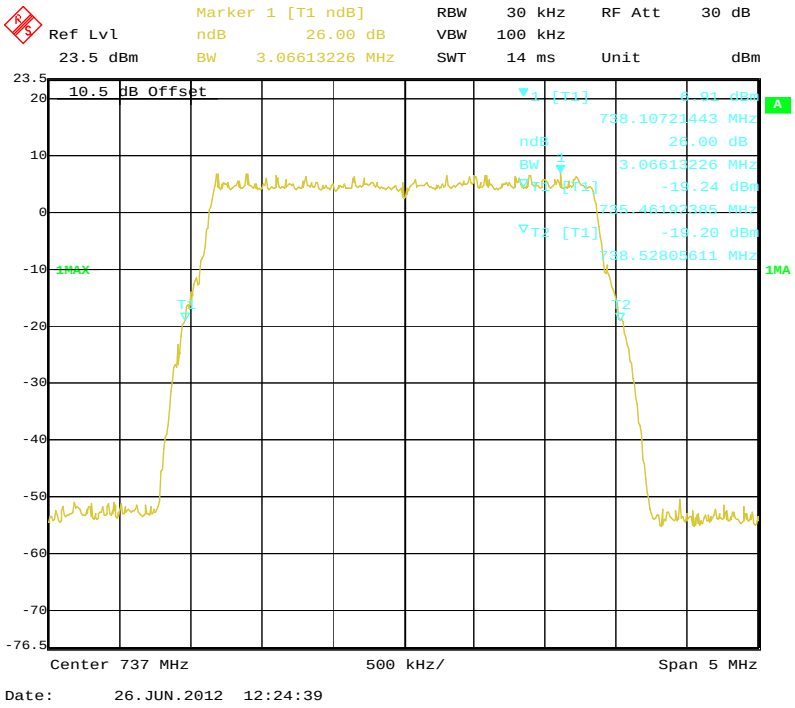
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

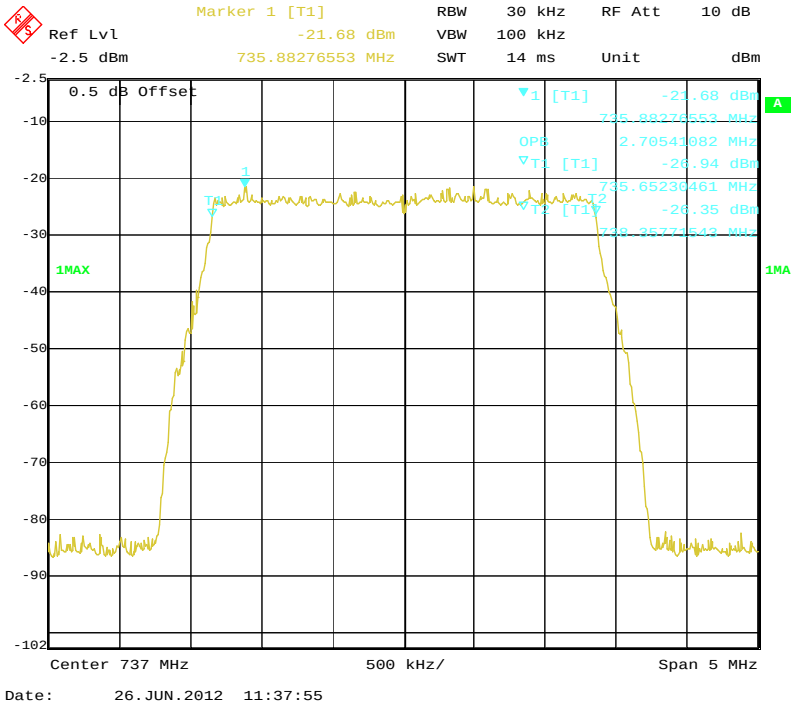


26 dB Bandwidth: Output Signal

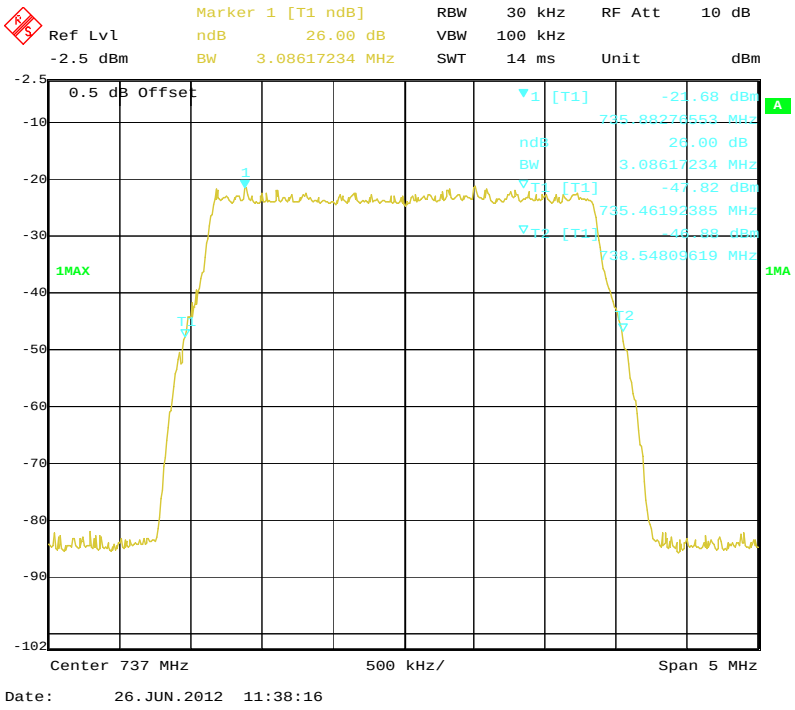


LTE700-16QAM (3 MHz), Frequency: 737 MHz

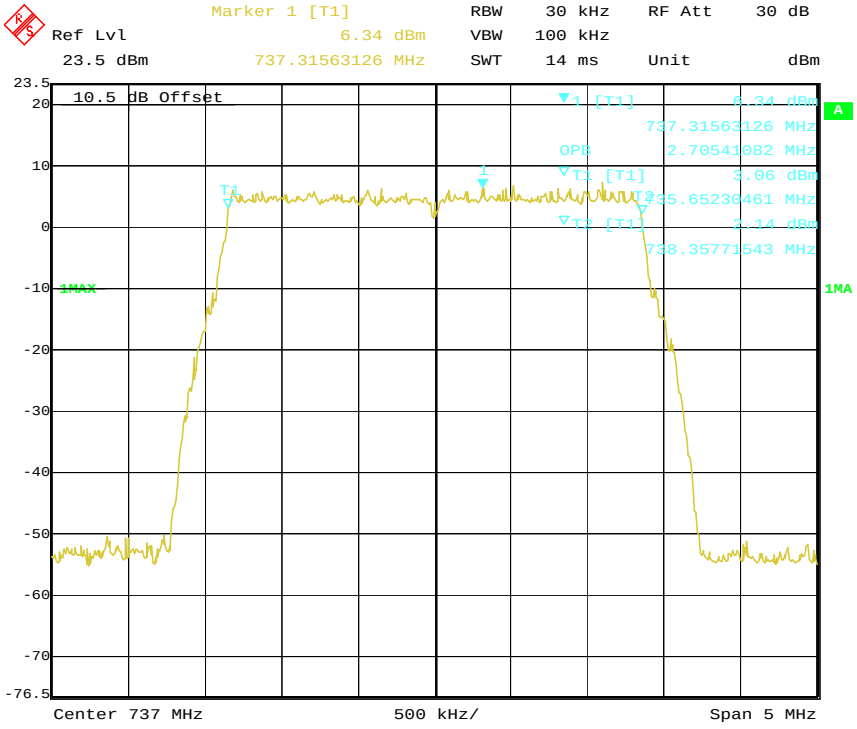
99% Occupied Bandwidth: Input Signal



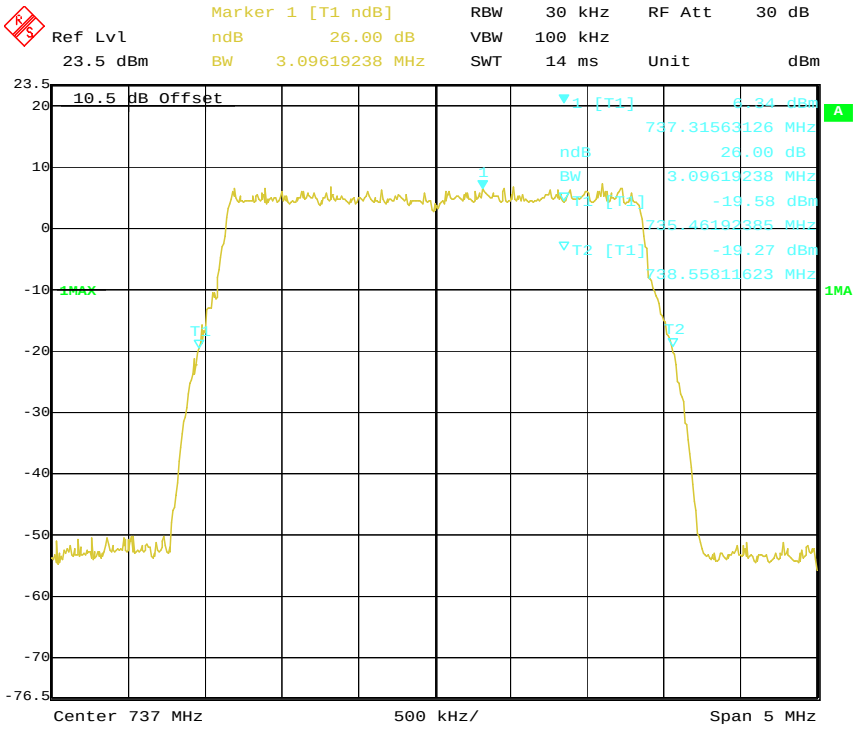
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

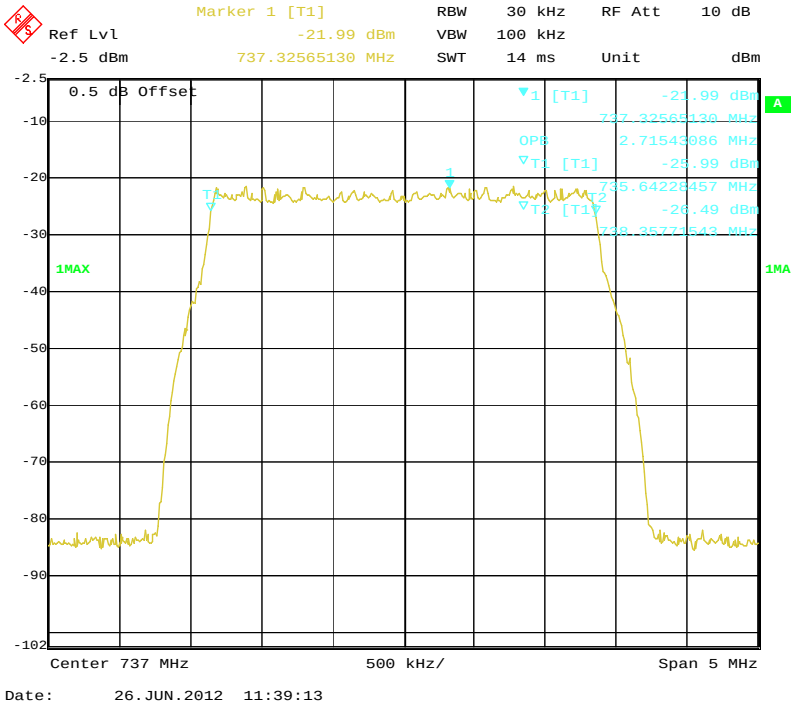


26 dB Bandwidth: Output Signal

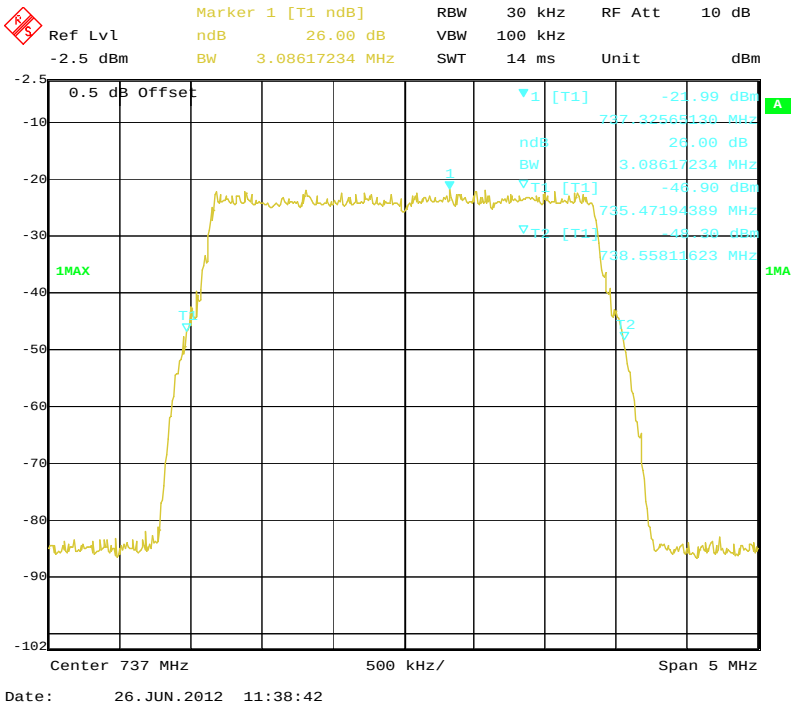


LTE700-64QAM (3 MHz), Frequency: 737 MHz

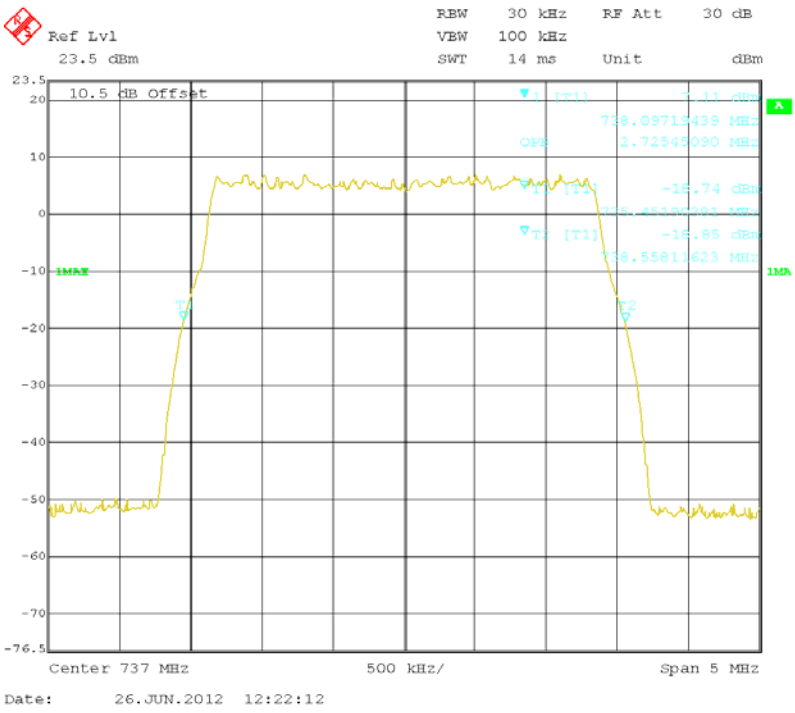
99% Occupied Bandwidth: Input Signal



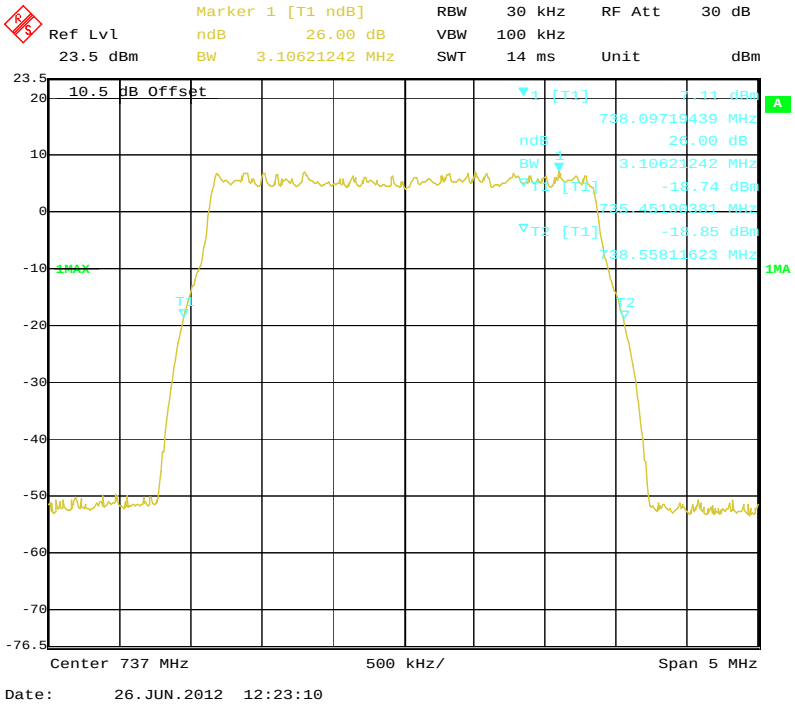
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

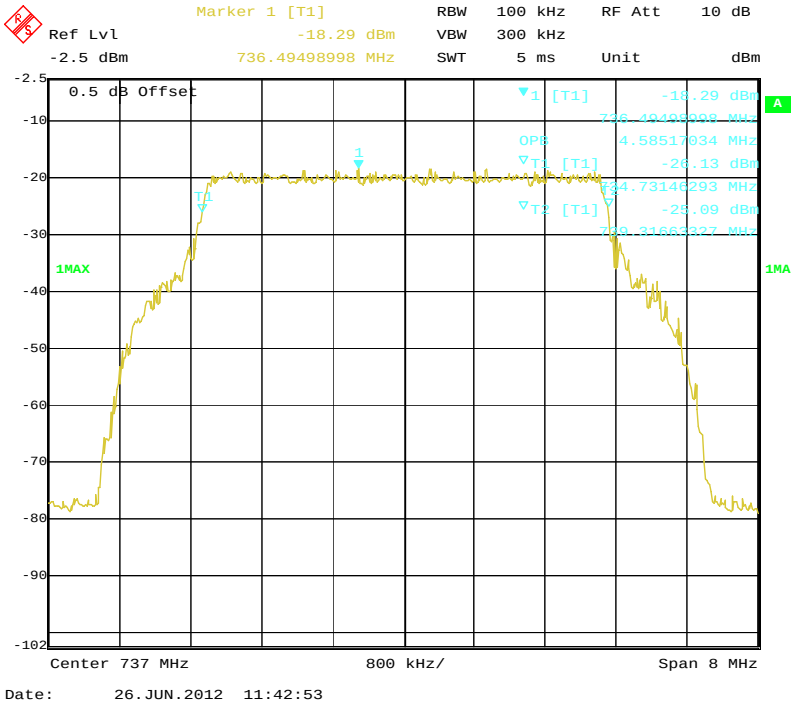


26 dB Bandwidth: Output Signal

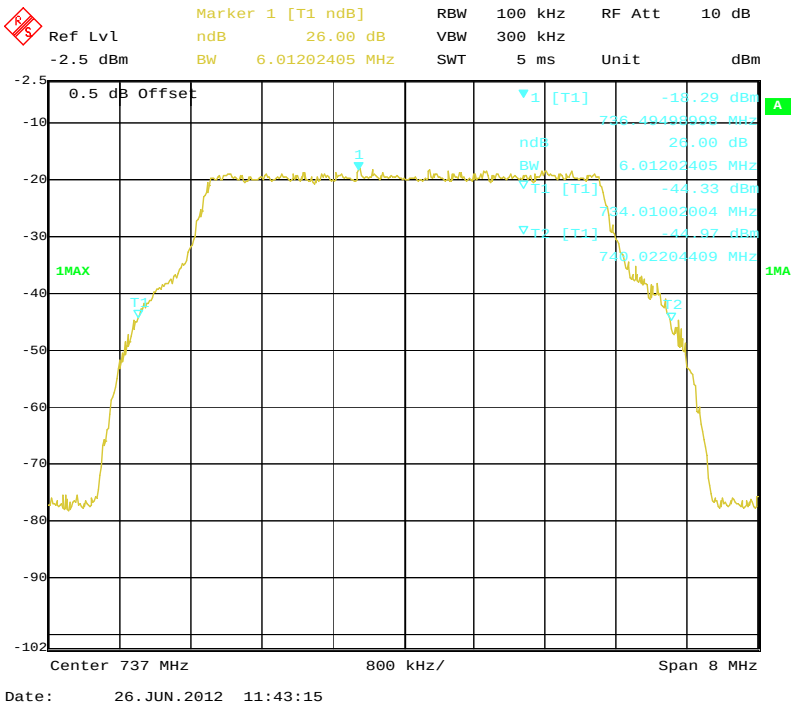


LTE700-QPSK (5 MHz), Frequency: 737 MHz

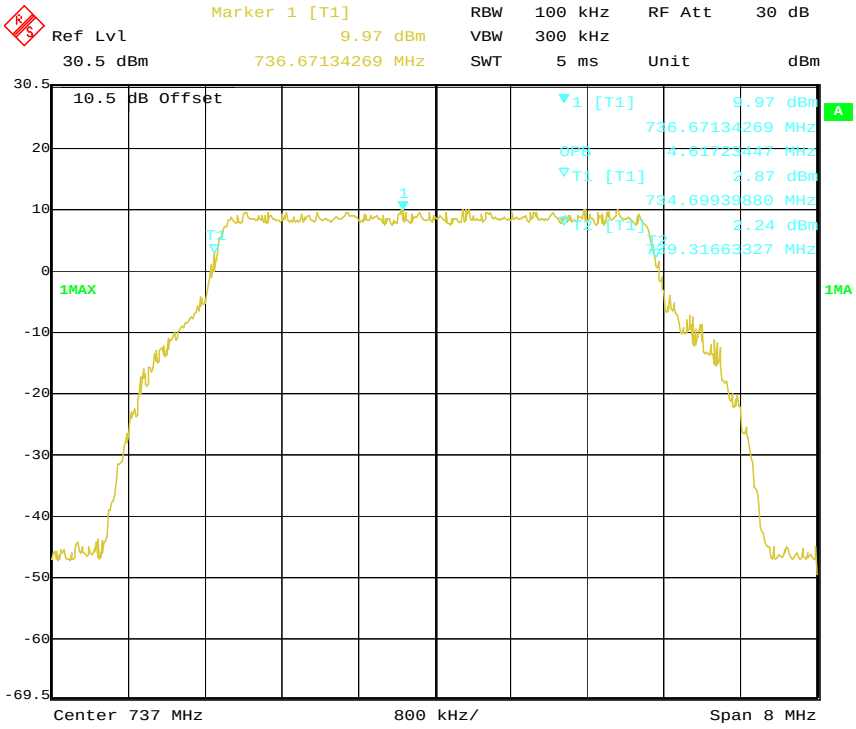
99% Occupied Bandwidth: Input Signal



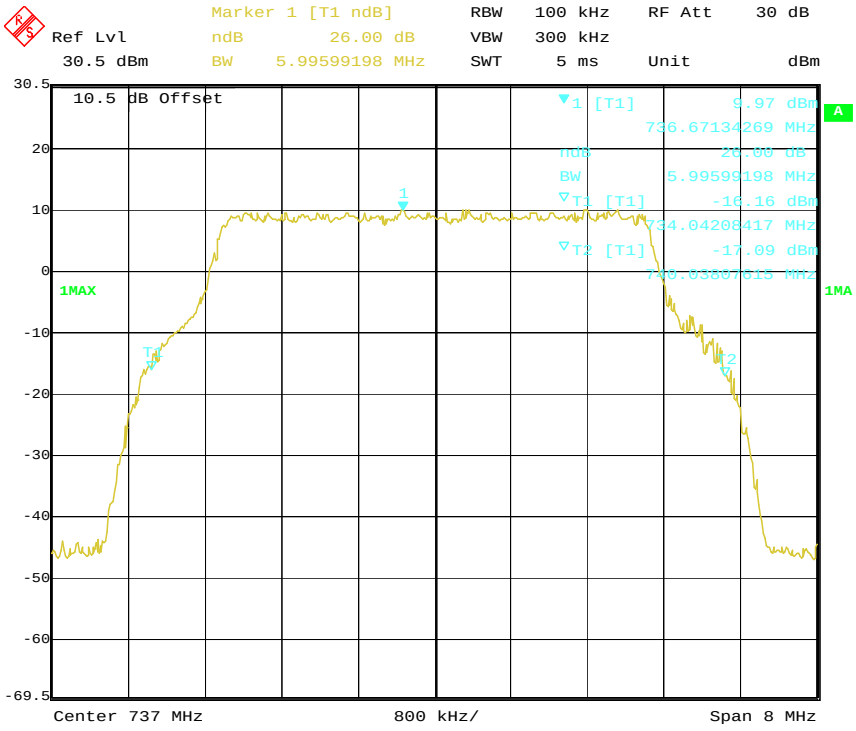
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

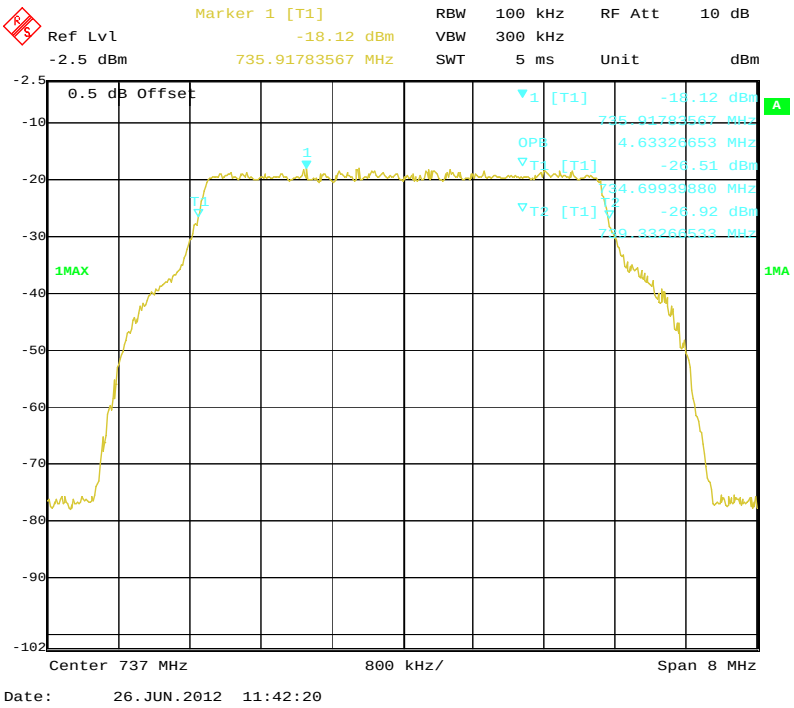


26 dB Bandwidth: Output Signal

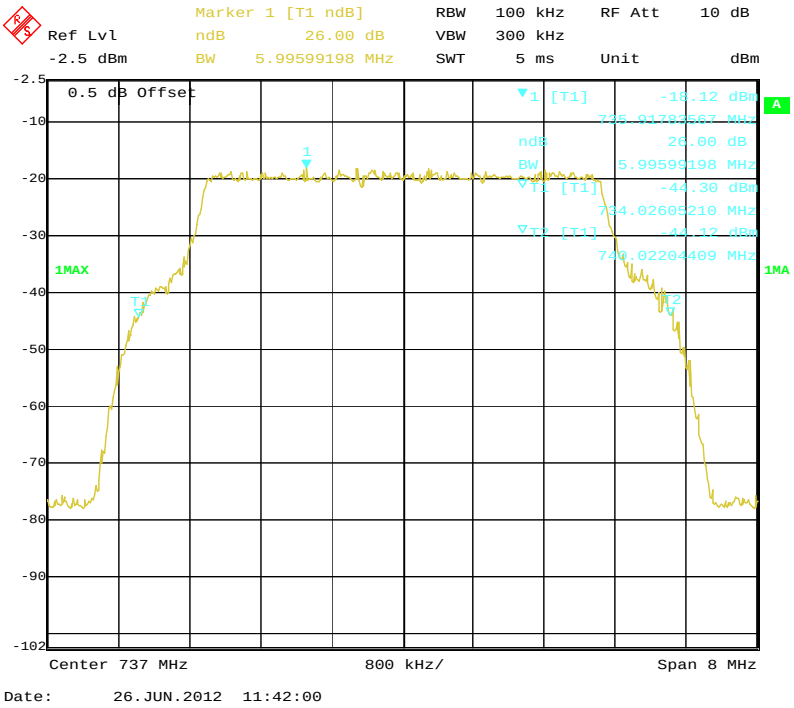


LTE700-16QAM (5 MHz), Frequency: 737 MHz

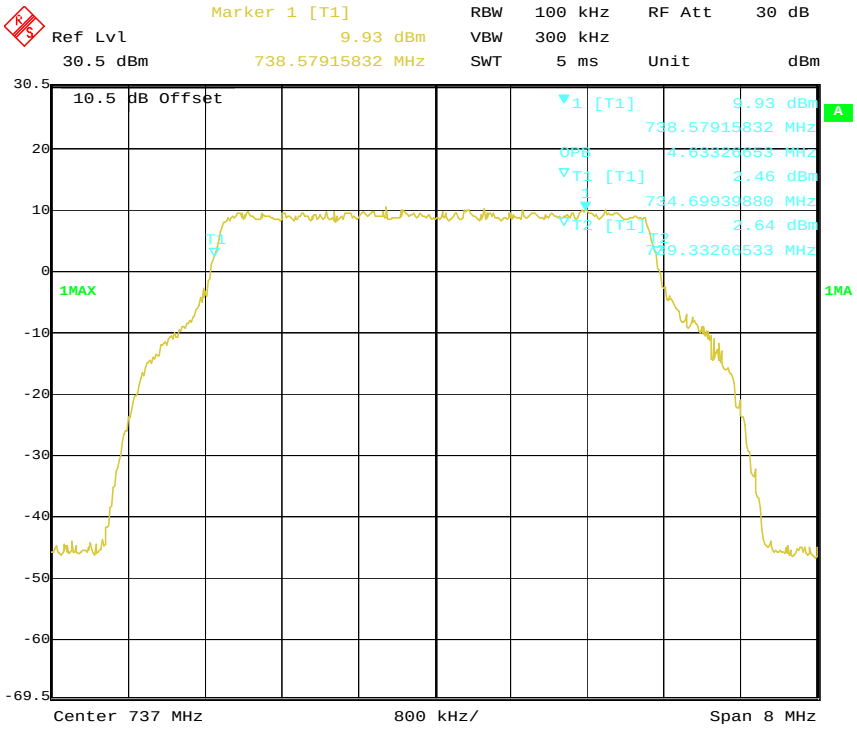
99% Occupied Bandwidth: Input Signal



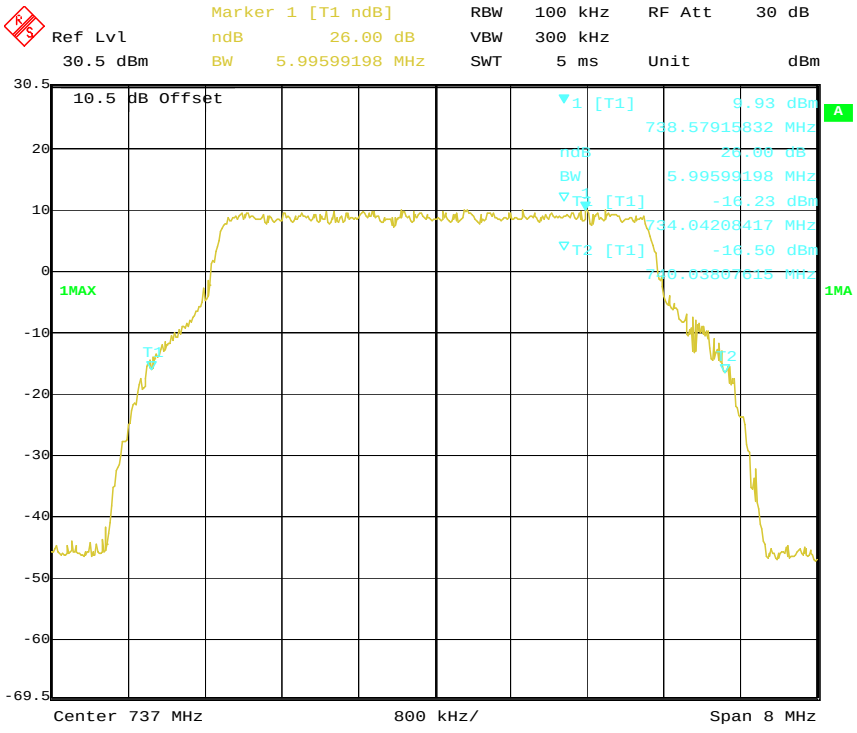
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

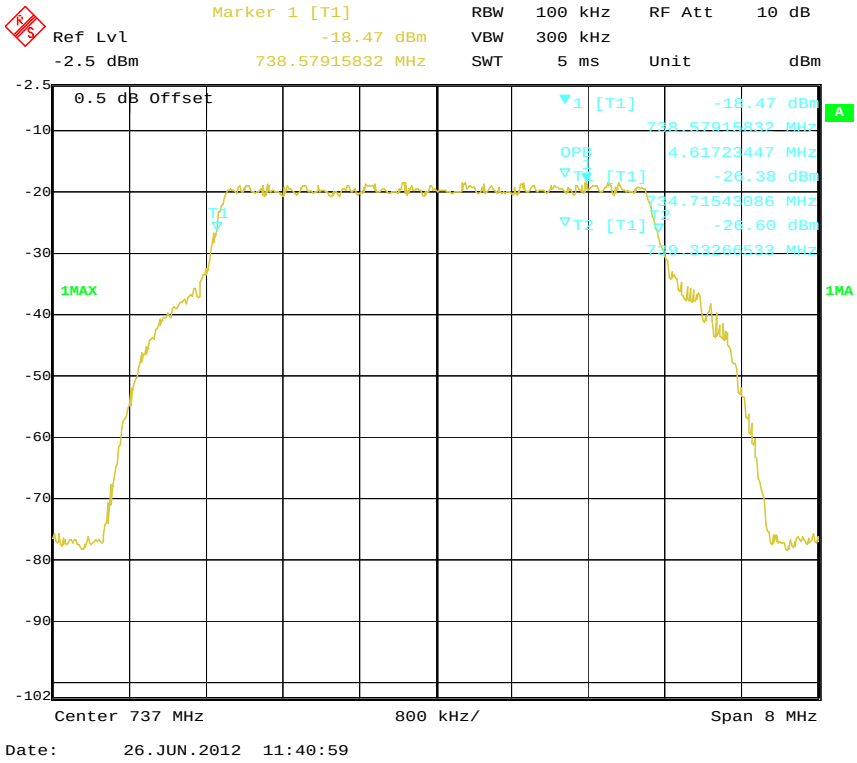


26 dB Bandwidth: Output Signal

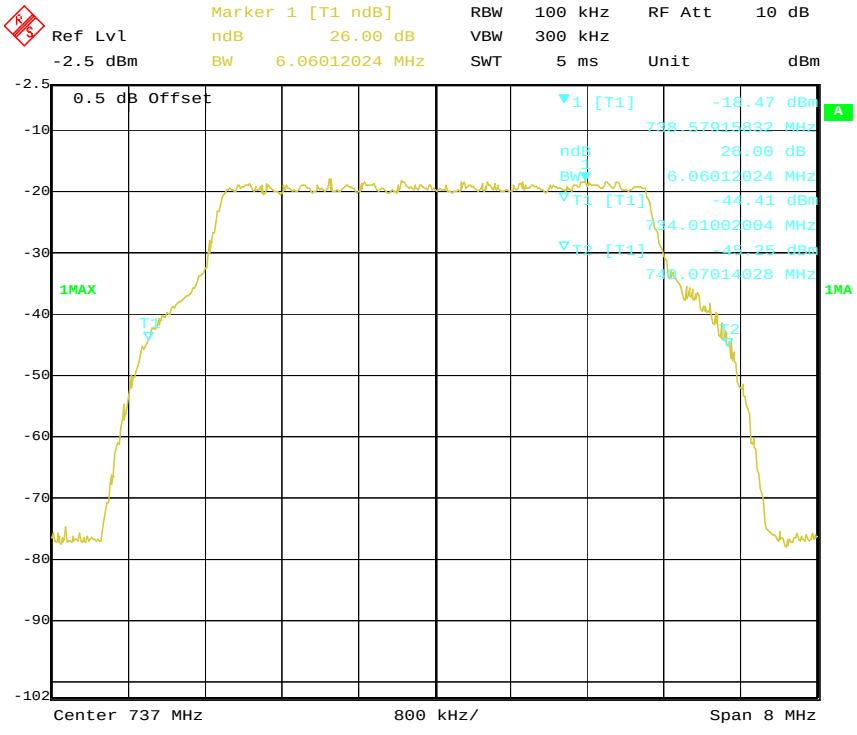


LTE700-64QAM (5 MHz), Frequency: 737 MHz

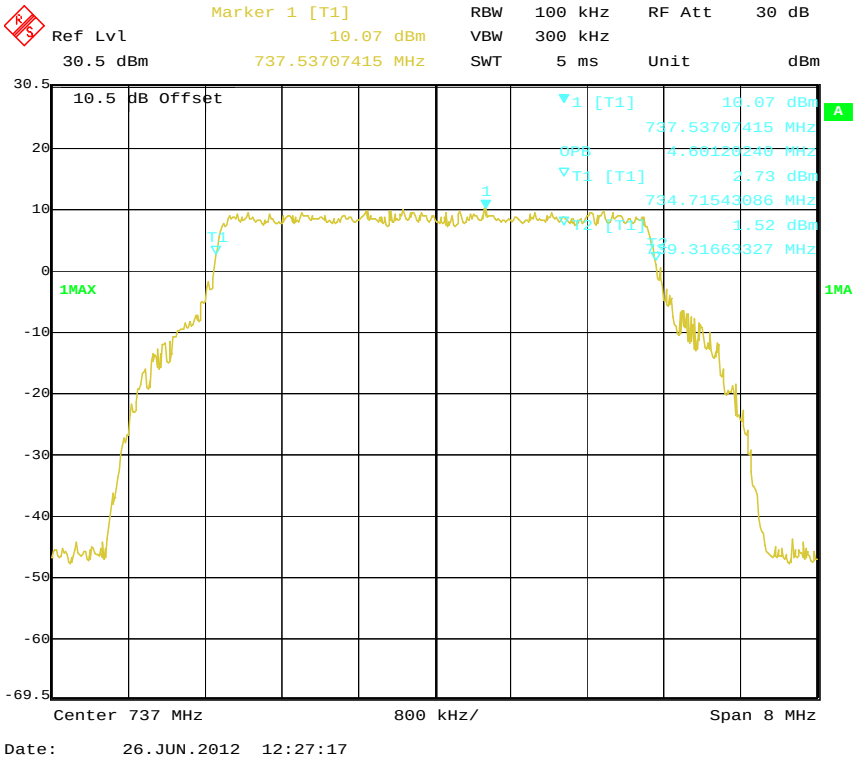
99% Occupied Bandwidth: Input Signal



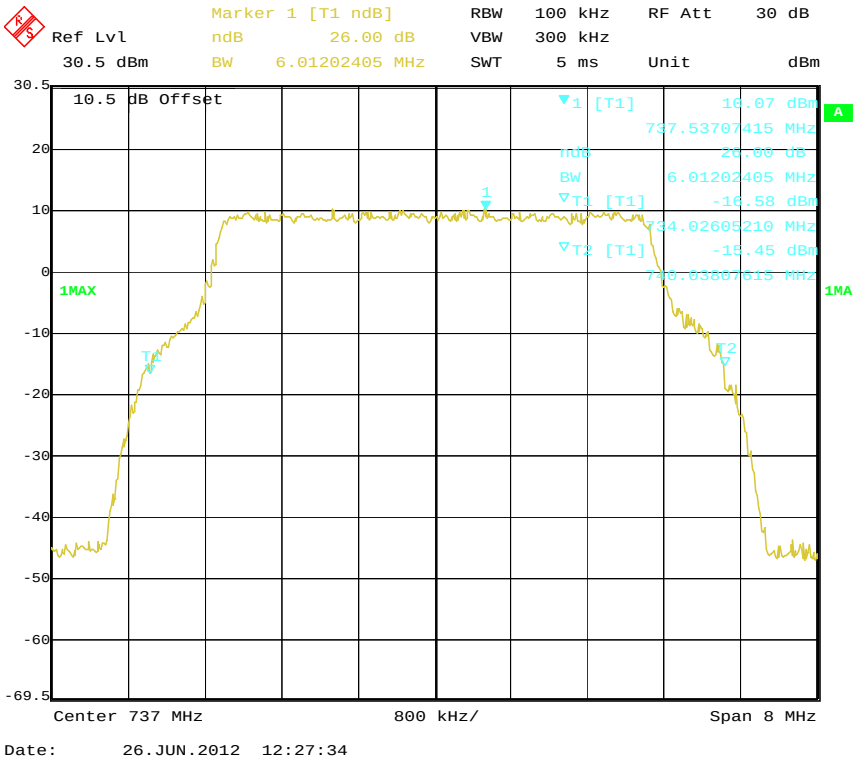
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

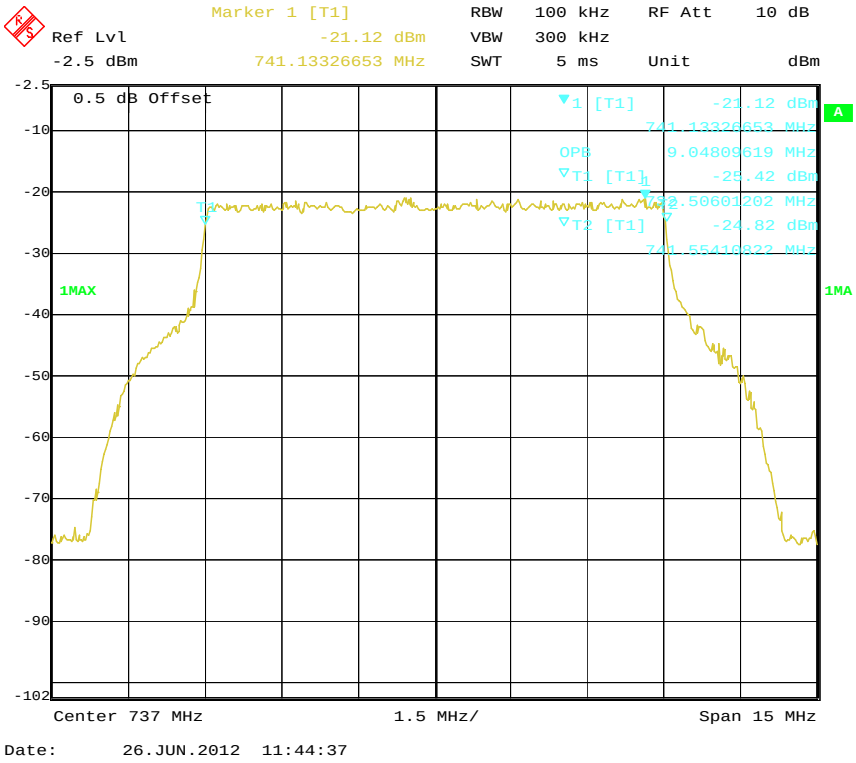


26 dB Bandwidth: Output Signal

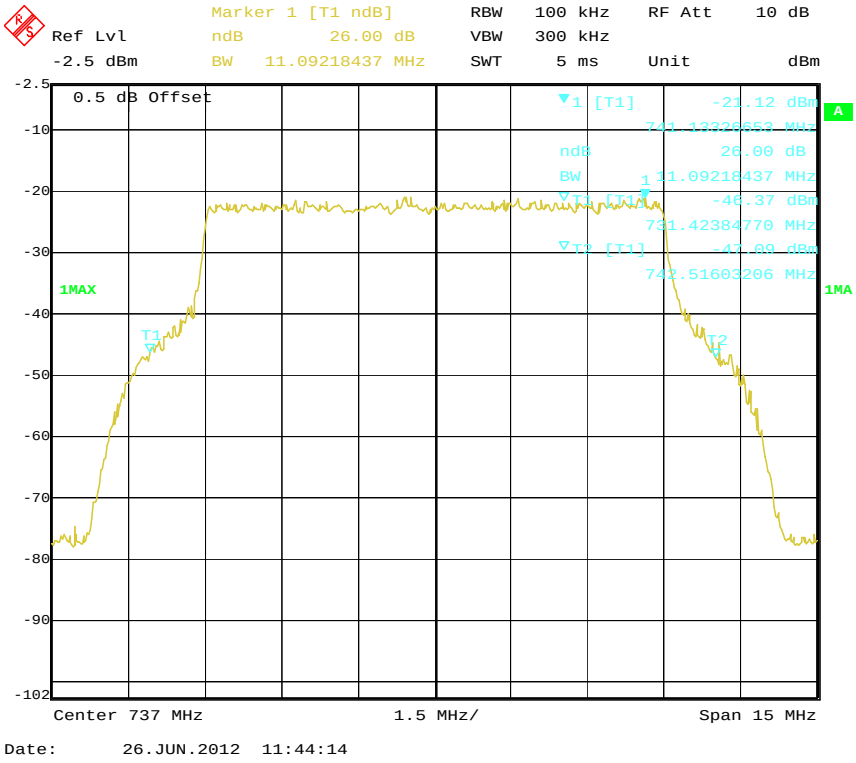


LTE700-QPSK (10 MHz), Frequency: 737 MHz

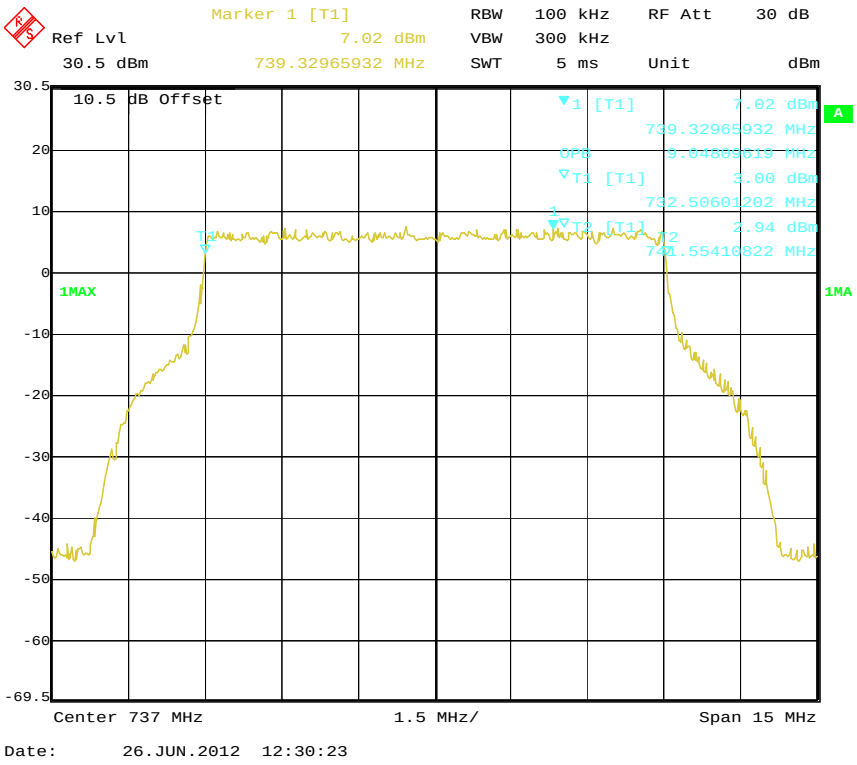
99% Occupied Bandwidth: Input Signal



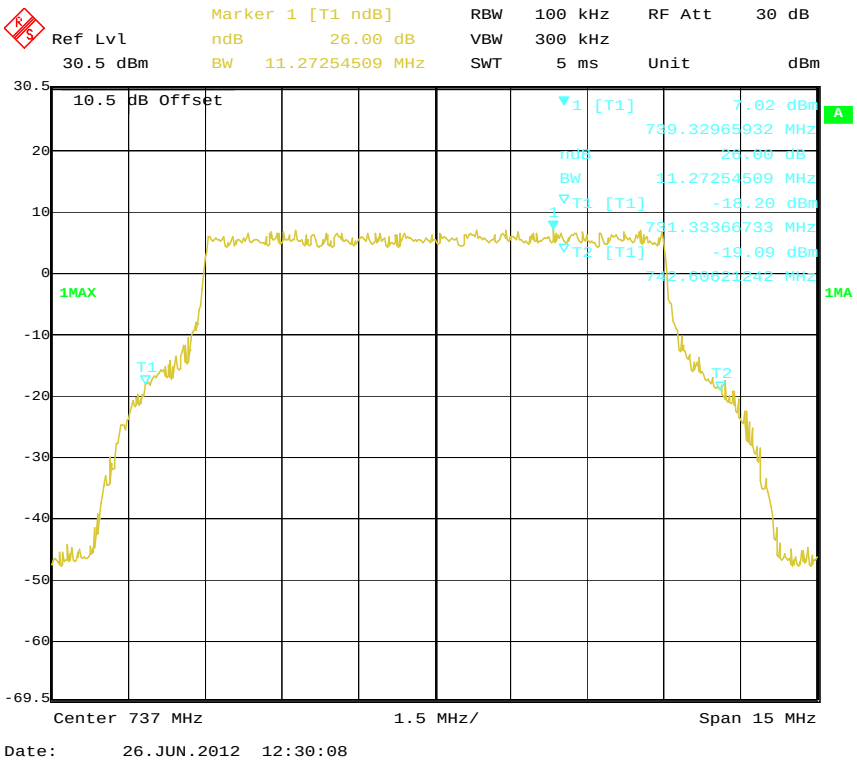
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

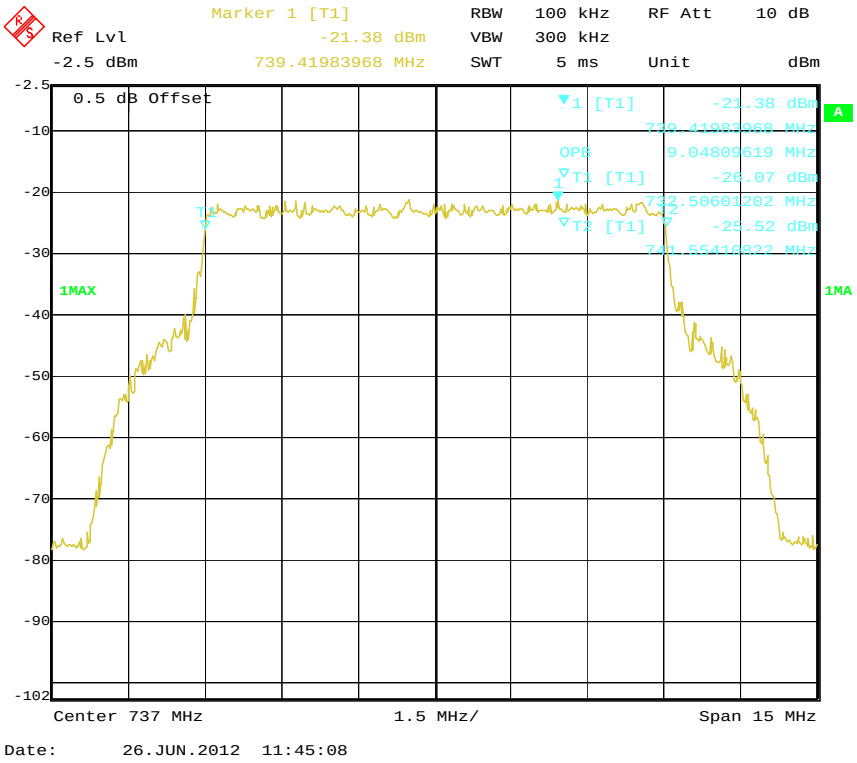


26 dB Bandwidth: Output Signal

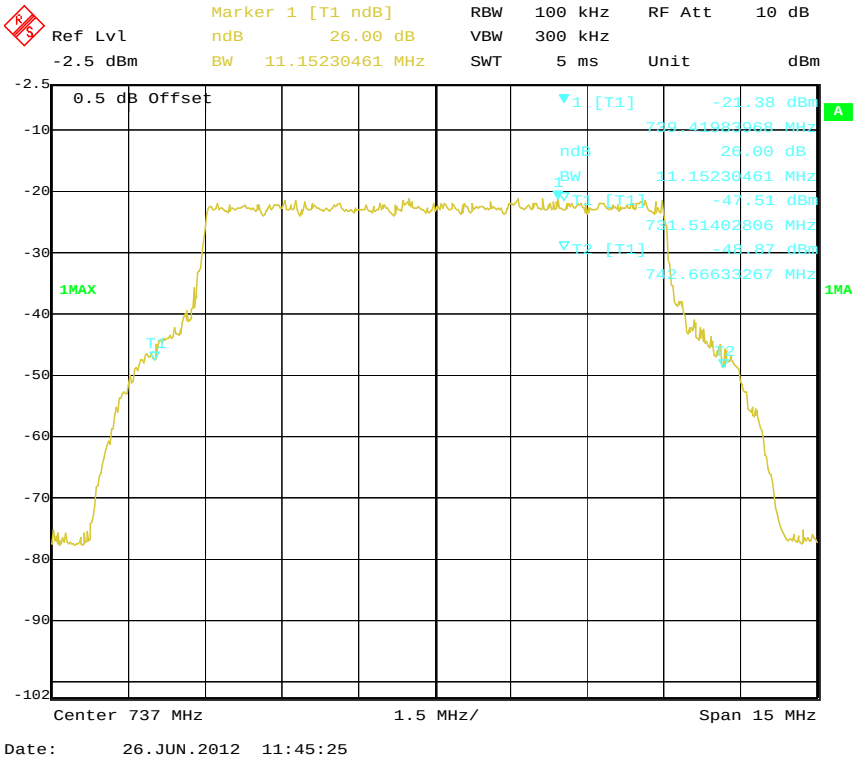


LTE700-16QAM (10 MHz), Frequency: 737 MHz

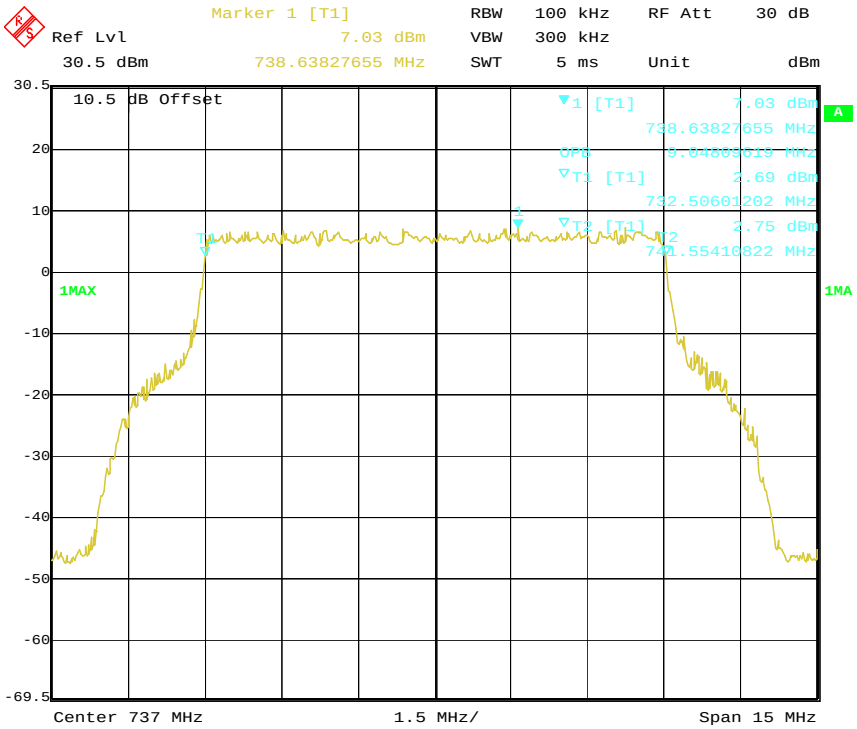
99% Occupied Bandwidth: Input Signal



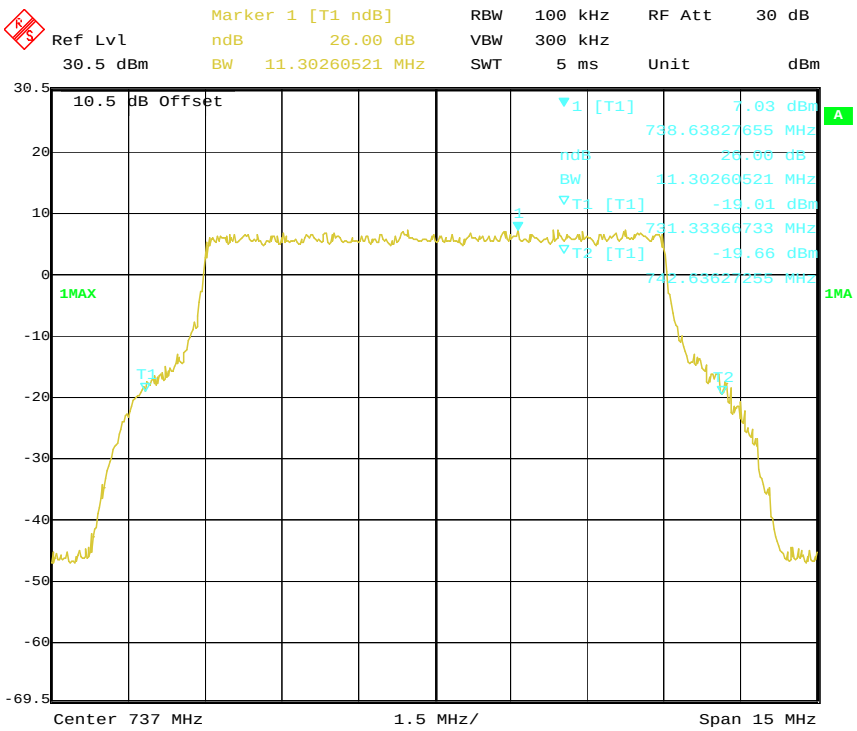
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

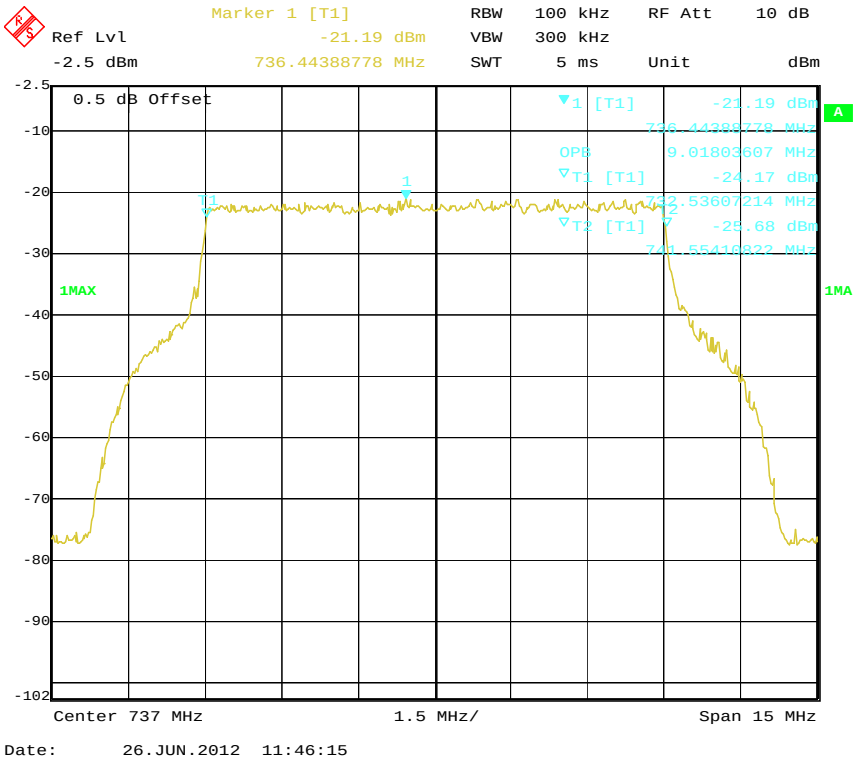


26 dB Bandwidth: Output Signal

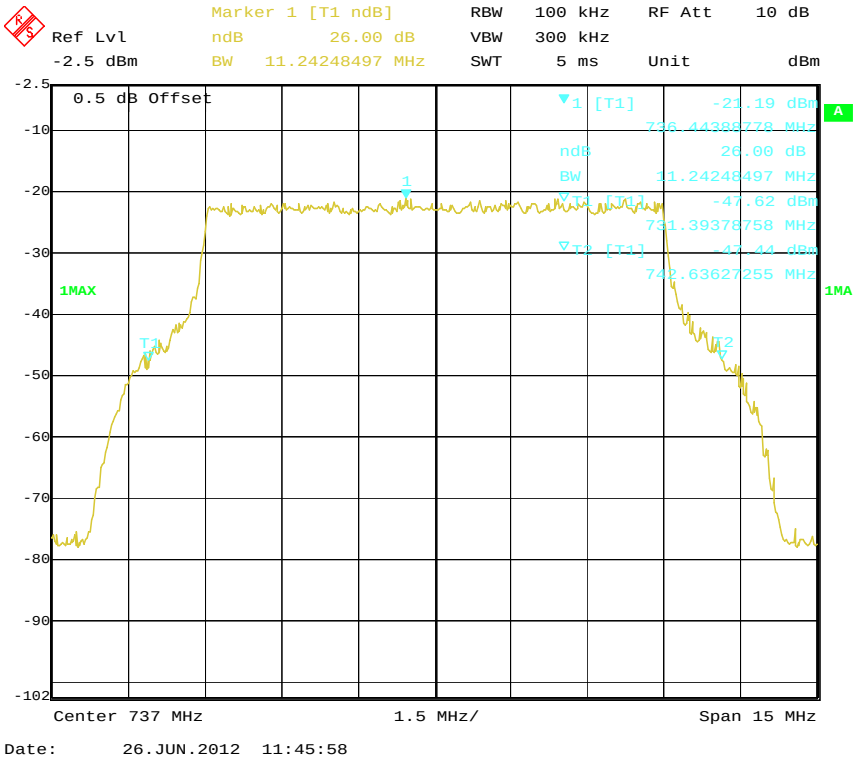


LTE700-64QAM (10 MHz), Frequency: 737 MHz

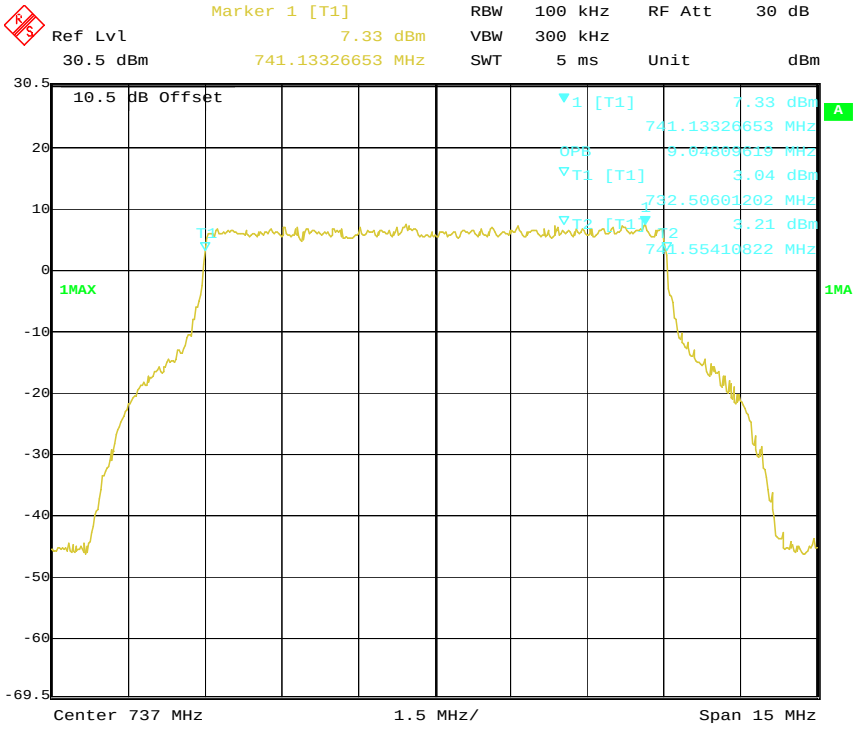
99% Occupied Bandwidth: Input Signal



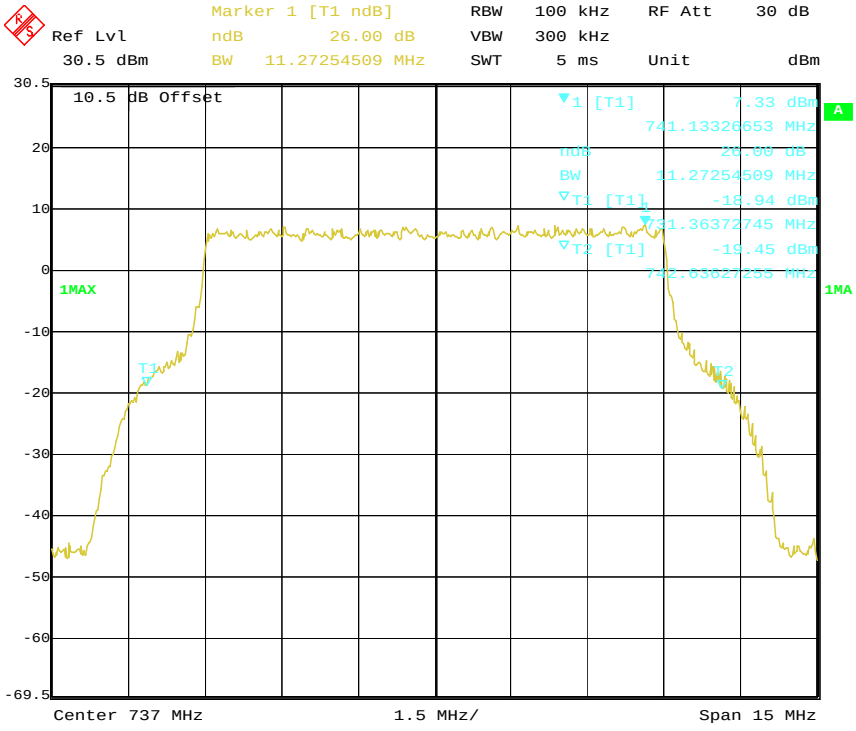
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal



26 dB Bandwidth: Output Signal



LTE700 Mode (746-757 MHz):

Input Signal:

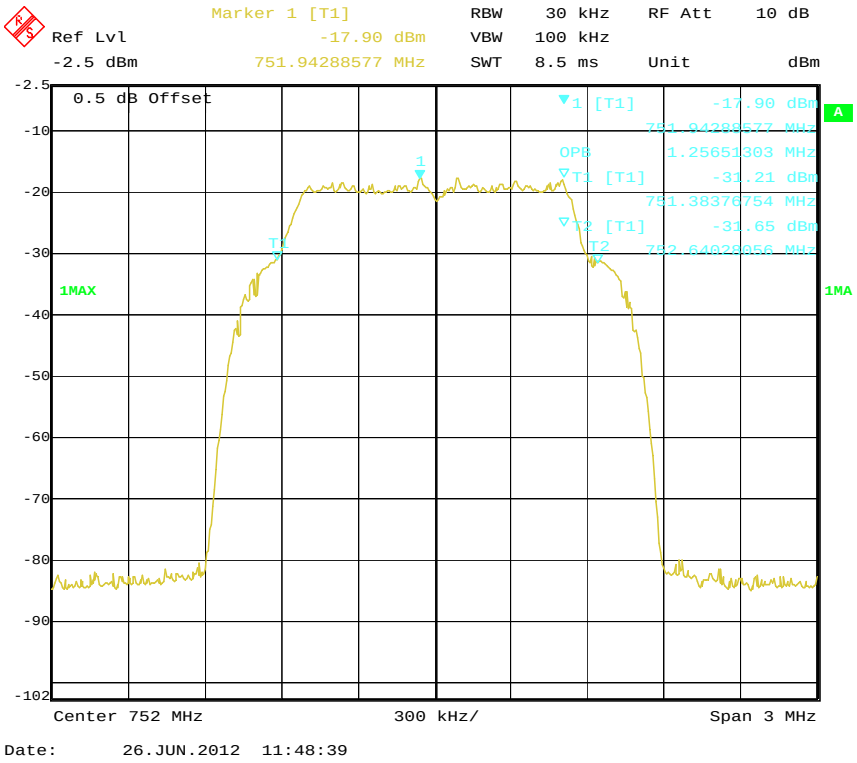
Mode	Modulation	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Downlink 746-757 MHz	QPSK (1.4 MHz)	752	1.2565	1.5932
	16QAM (1.4 MHz)	752	1.2385	1.5812
	64QAM (1.4 MHz)	752	1.2565	1.5932
	QPSK (3 MHz)	752	2.7154	3.0862
	16QAM (3 MHz)	752	2.7054	3.0962
	64QAM (3 MHz)	752	2.7154	3.0862
	QPSK (5 MHz)	752	4.6332	5.9960
	16QAM (5 MHz)	752	4.6333	6.0922
	64QAM (5 MHz)	752	4.6172	6.0441
	QPSK (10 MHz)	752	9.0481	11.0621
	16QAM (10 MHz)	752	9.0481	11.2425
	64QAM (10 MHz)	752	9.0481	11.1824

Output Signal:

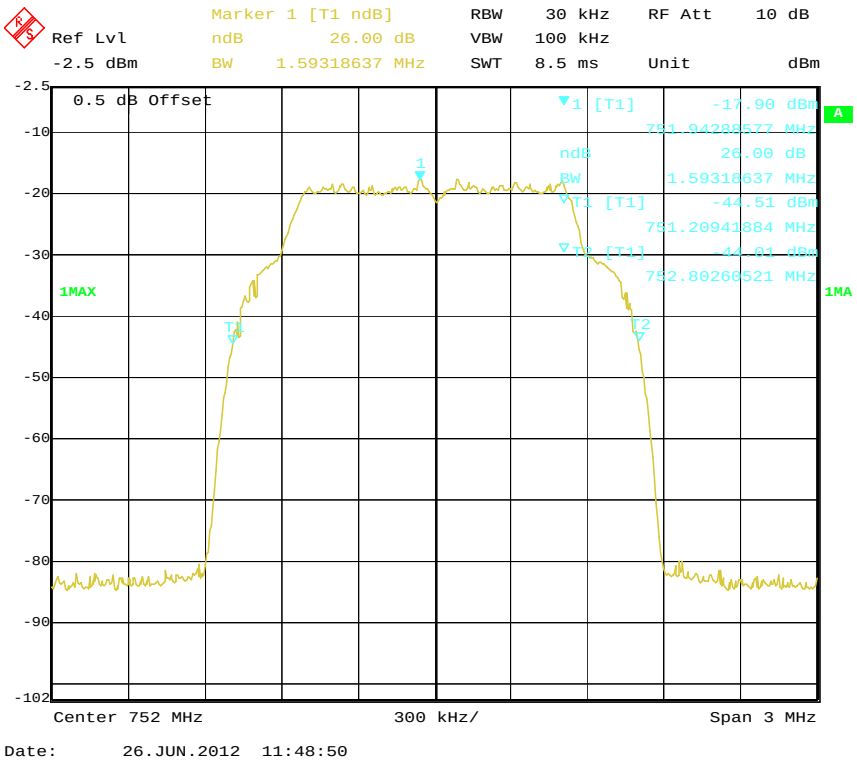
Mode	Modulation	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Downlink 746-757 MHz	QPSK (1.4 MHz)	752	1.2325	1.5752
	16QAM (1.4 MHz)	752	1.2325	1.5691
	64QAM (1.4 MHz)	752	1.2505	1.5872
	QPSK (3 MHz)	752	2.7154	3.0661
	16QAM (3 MHz)	752	2.7154	3.0962
	64QAM (3 MHz)	752	2.7154	3.0962
	QPSK (5 MHz)	752	4.6172	5.9479
	16QAM (5 MHz)	752	4.6333	5.9319
	64QAM (5 MHz)	752	4.6012	6.0762
	QPSK (10 MHz)	752	9.0481	10.8517
	16QAM (10 MHz)	752	9.0481	11.2425
	64QAM (10 MHz)	752	9.0481	11.1222

LTE700-QPSK (1.4 MHz), Frequency: 752 MHz

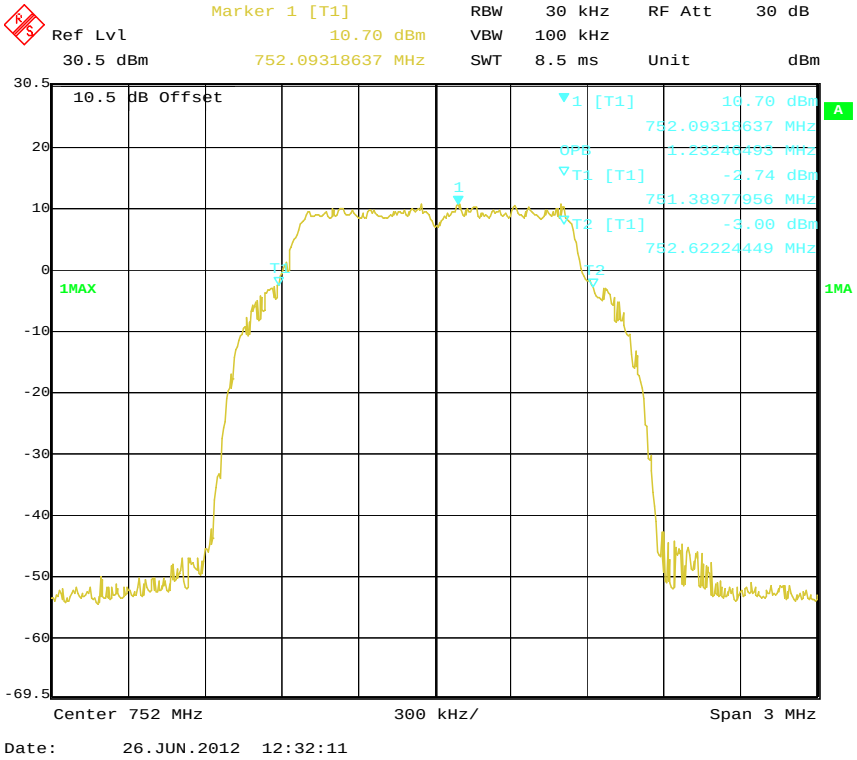
99% Occupied Bandwidth: Input Signal



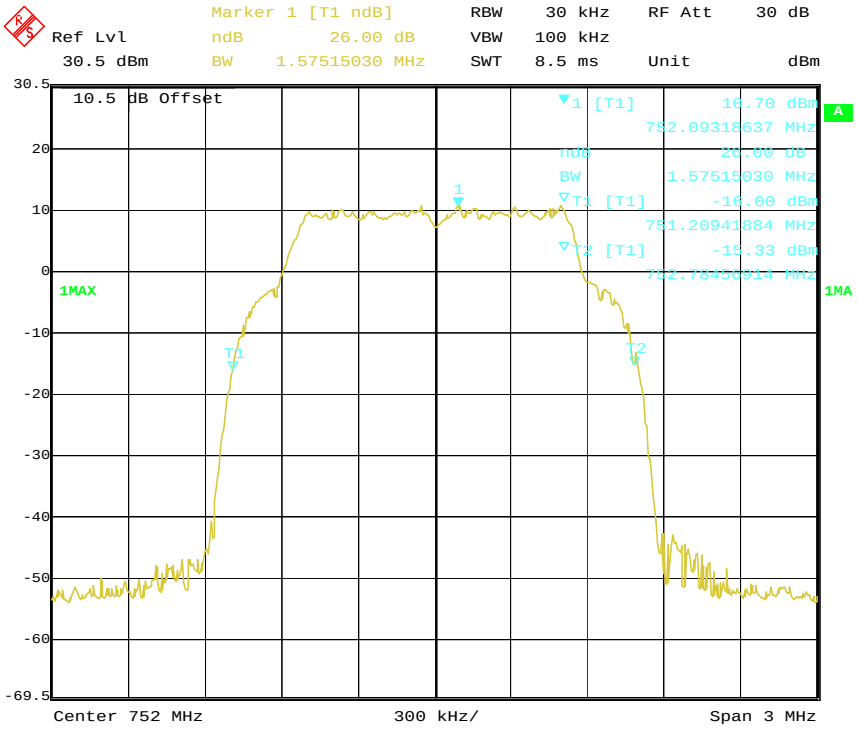
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

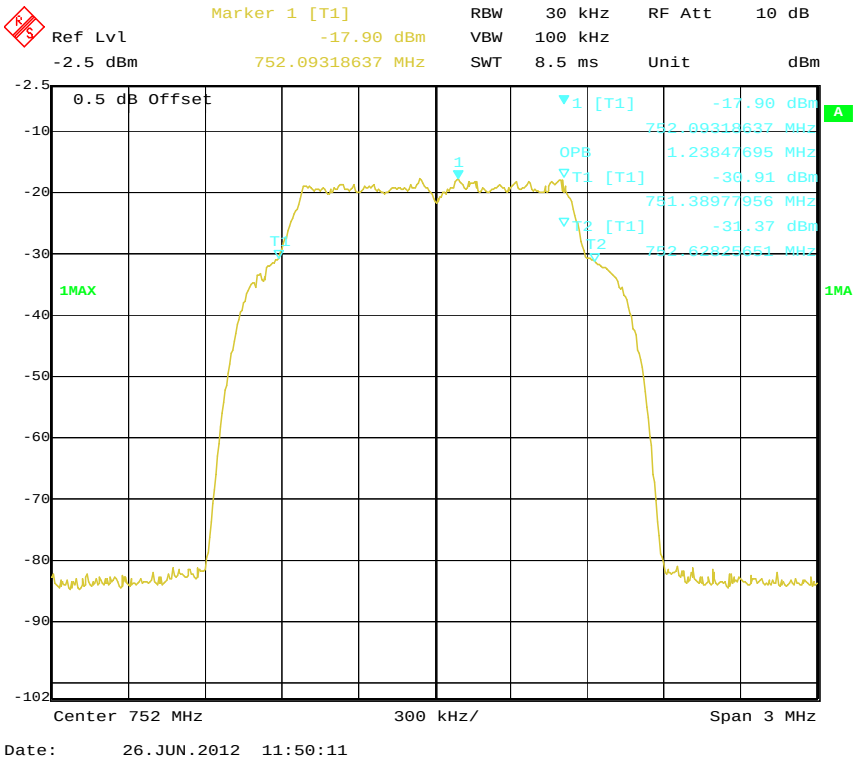


26 dB Bandwidth: Output Signal

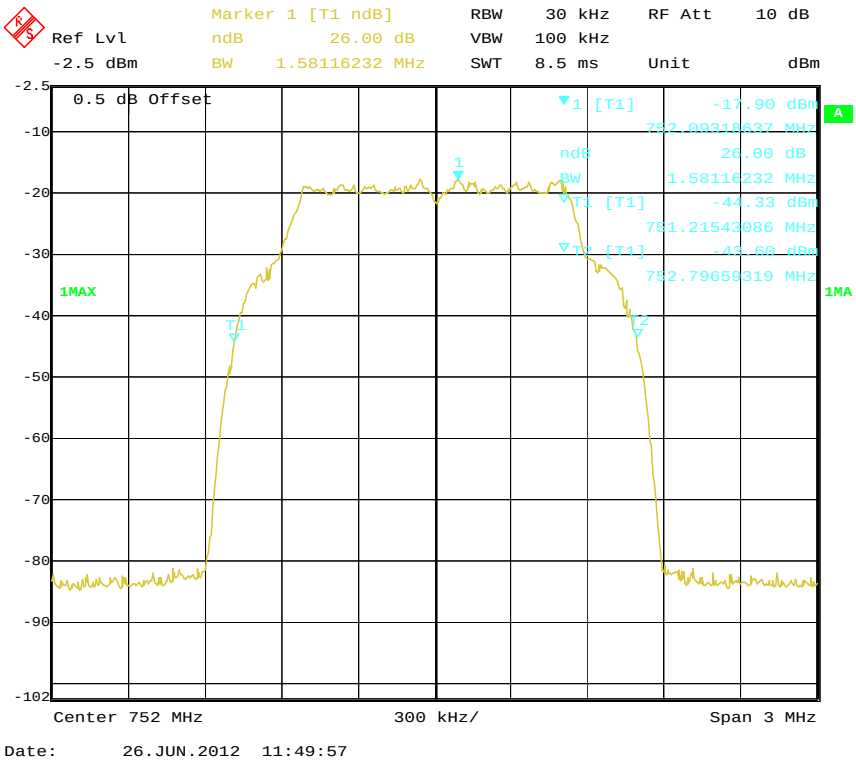


LTE700-16QAM (1.4 MHz), Frequency: 752 MHz

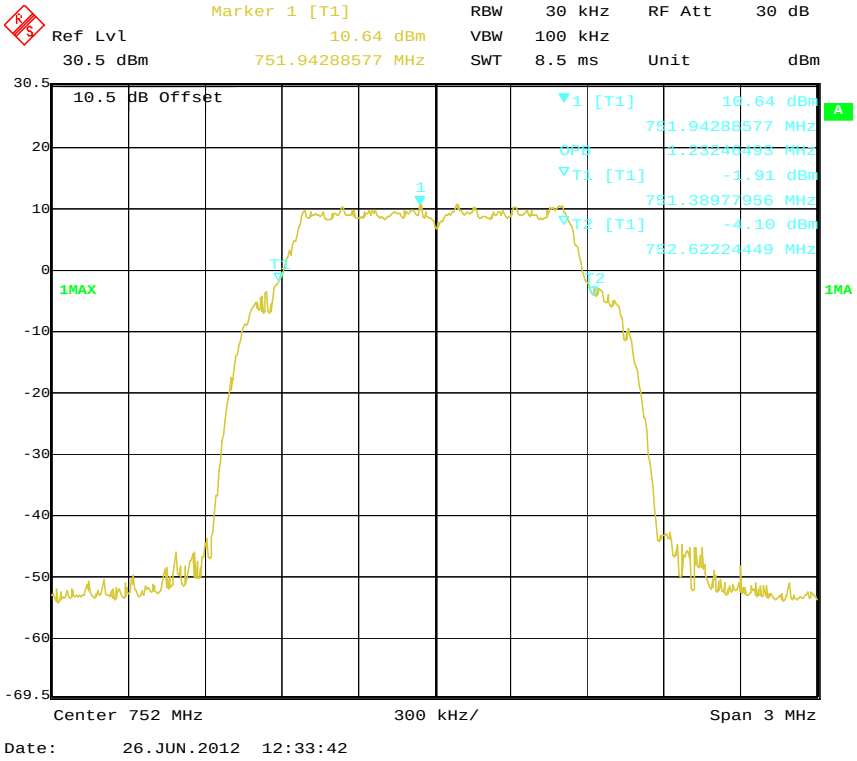
99% Occupied Bandwidth: Input Signal



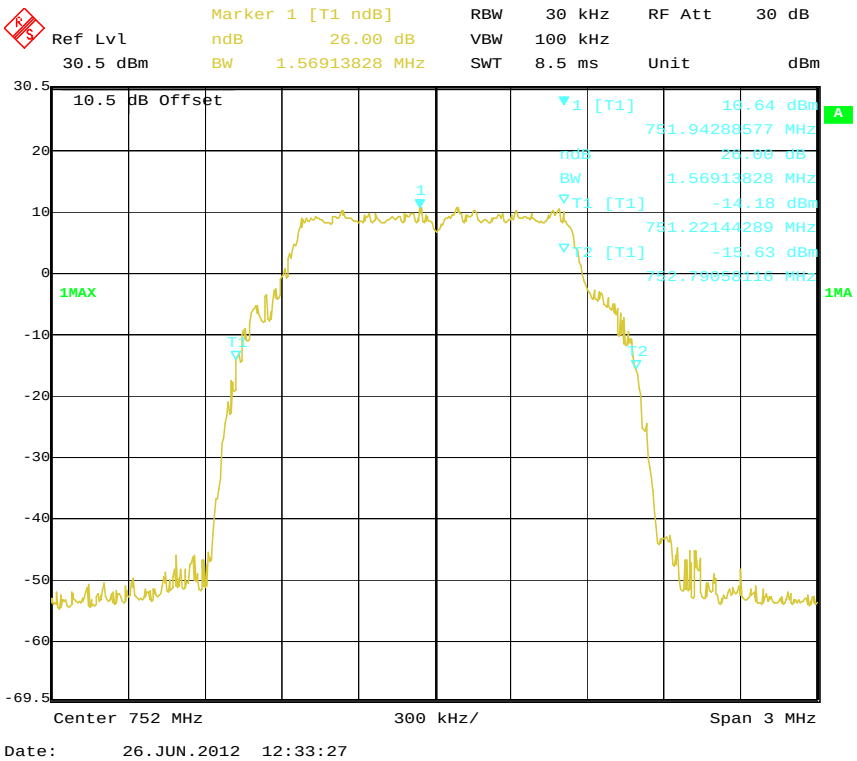
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

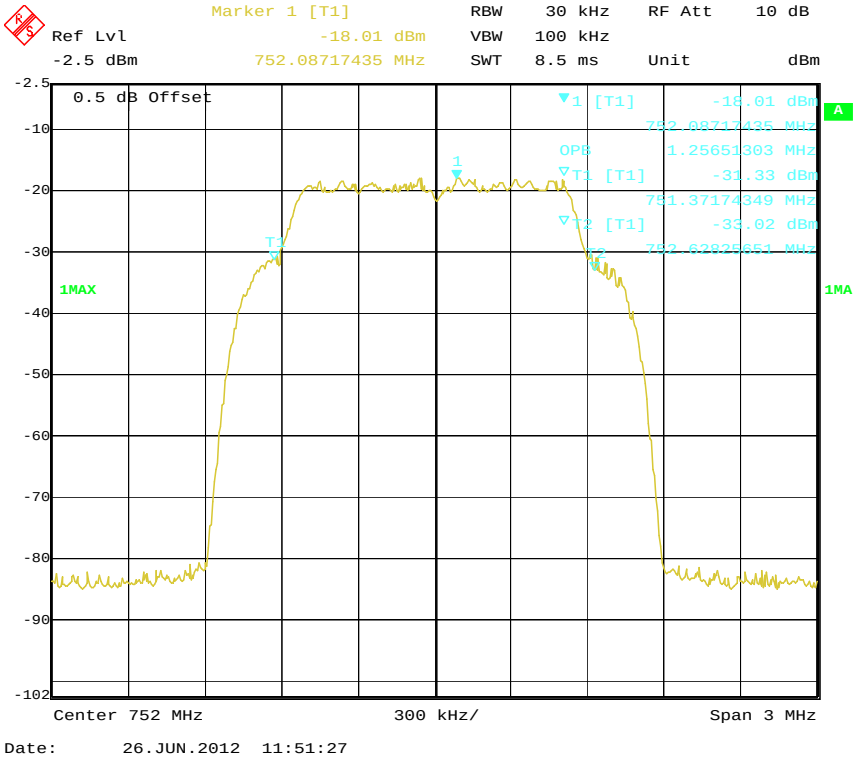


26 dB Bandwidth: Output Signal

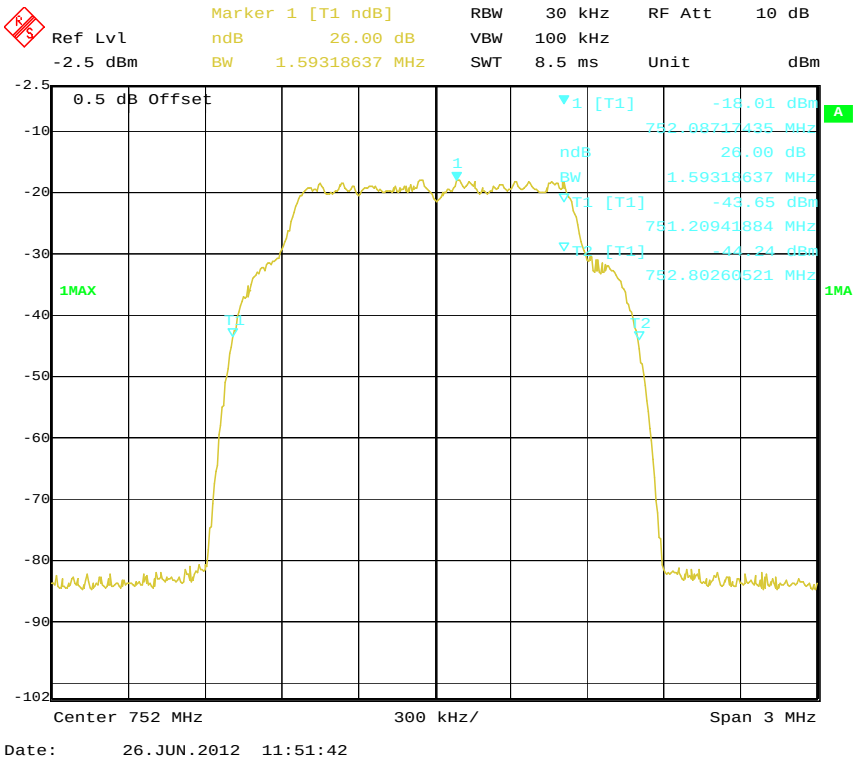


LTE700-64QAM (1.4 MHz), Frequency: 752 MHz

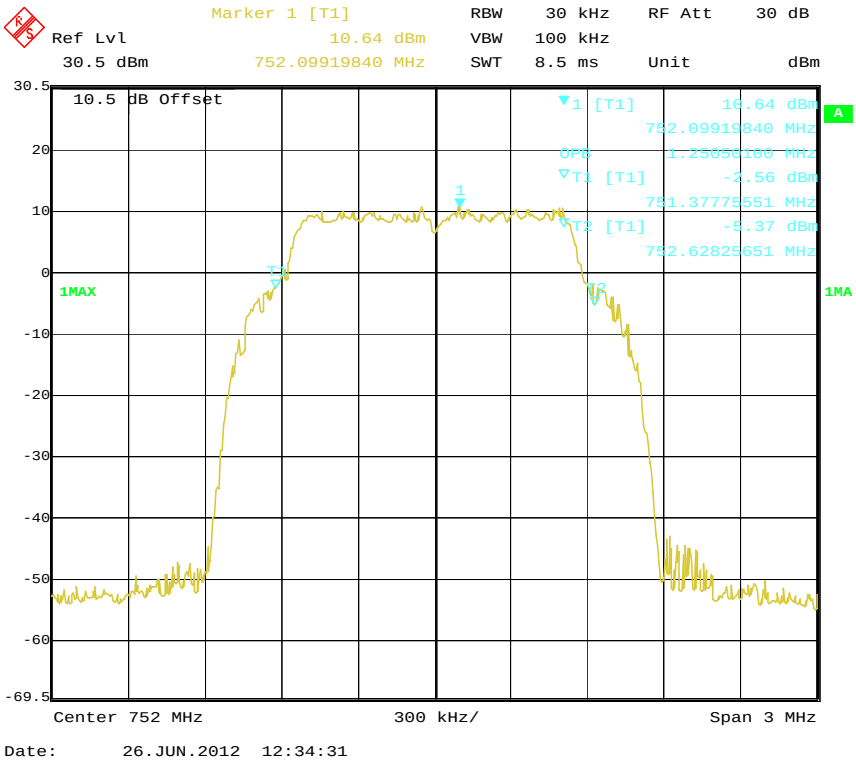
99% Occupied Bandwidth: Input Signal



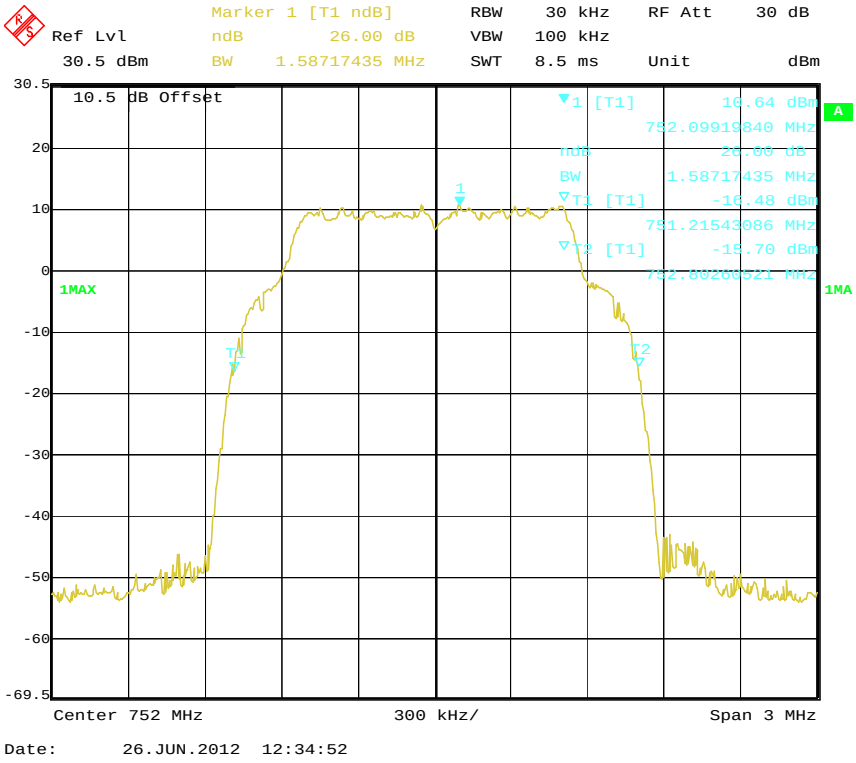
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

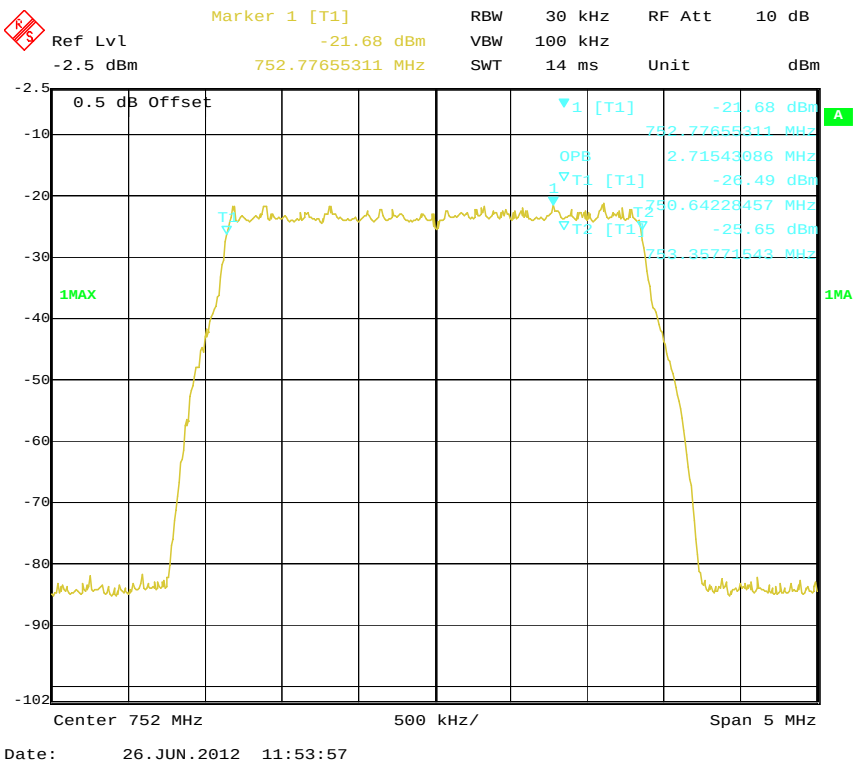


26 dB Bandwidth: Output Signal

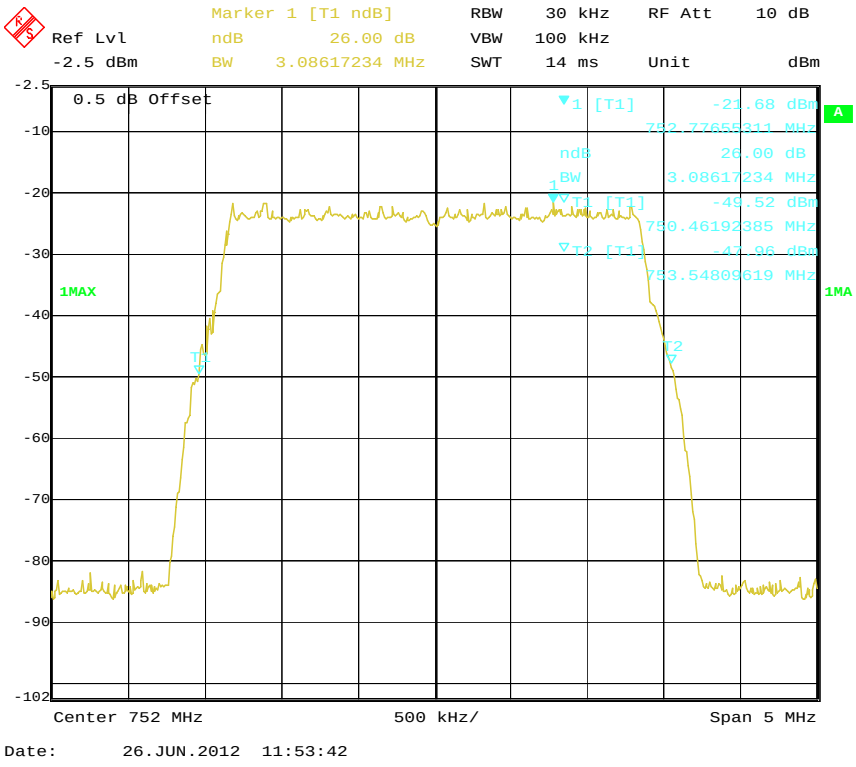


LTE700-QPSK (3 MHz), Frequency: 752 MHz

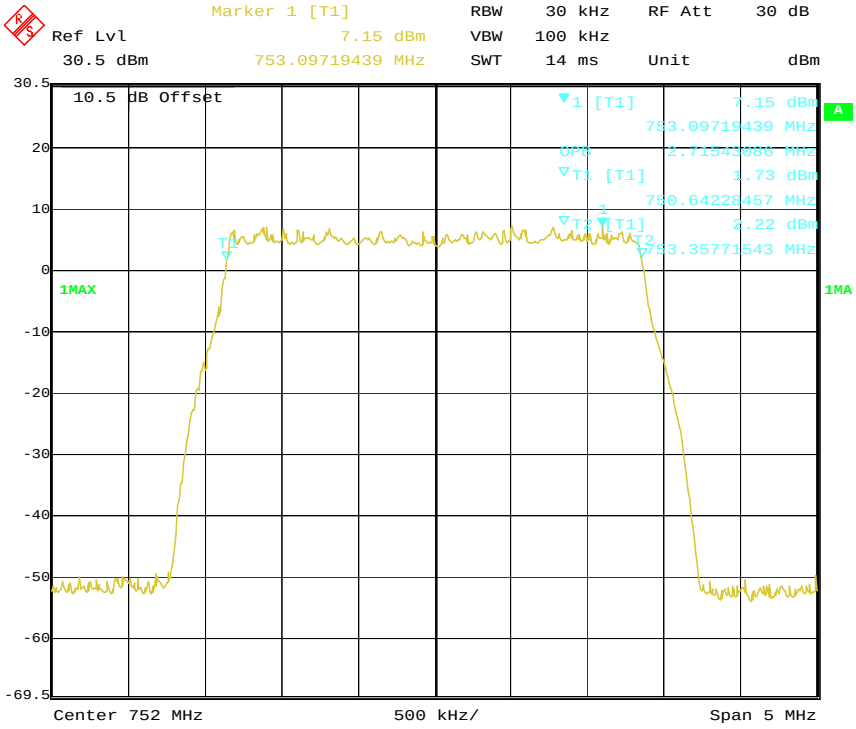
99% Occupied Bandwidth: Input Signal



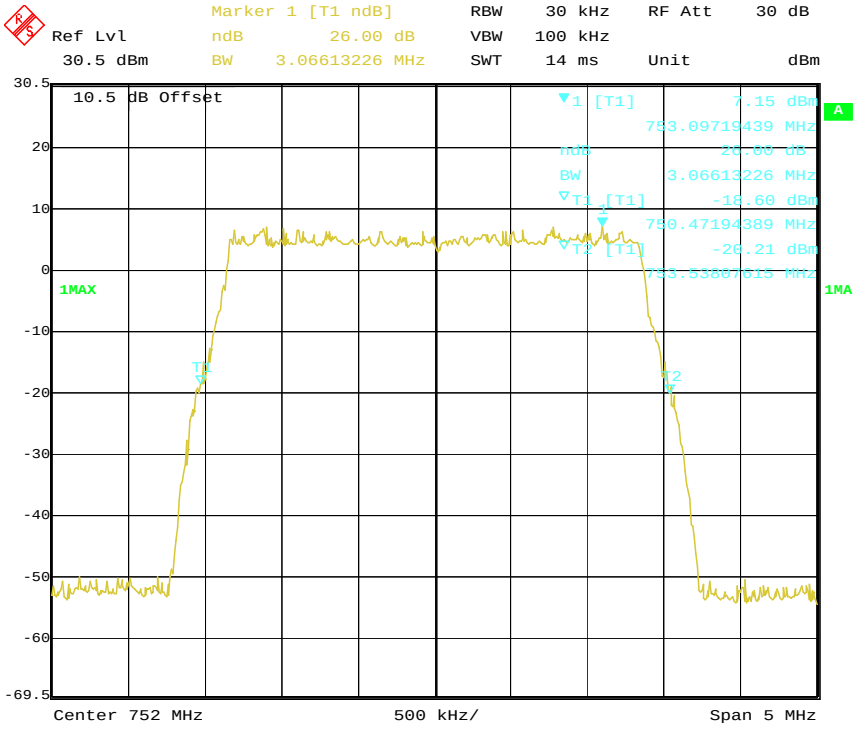
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

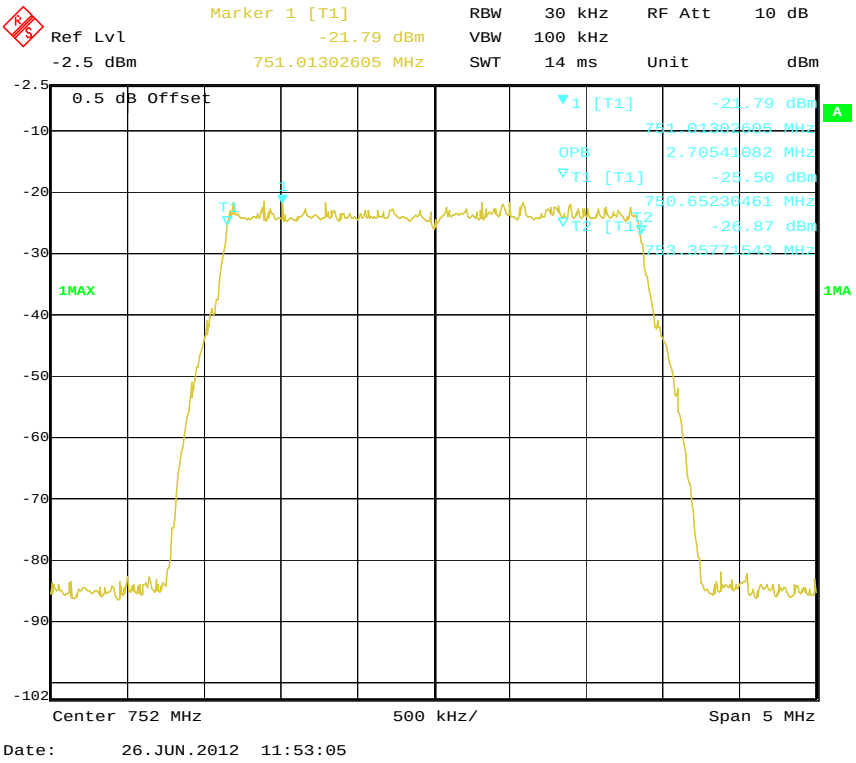


26 dB Bandwidth: Output Signal

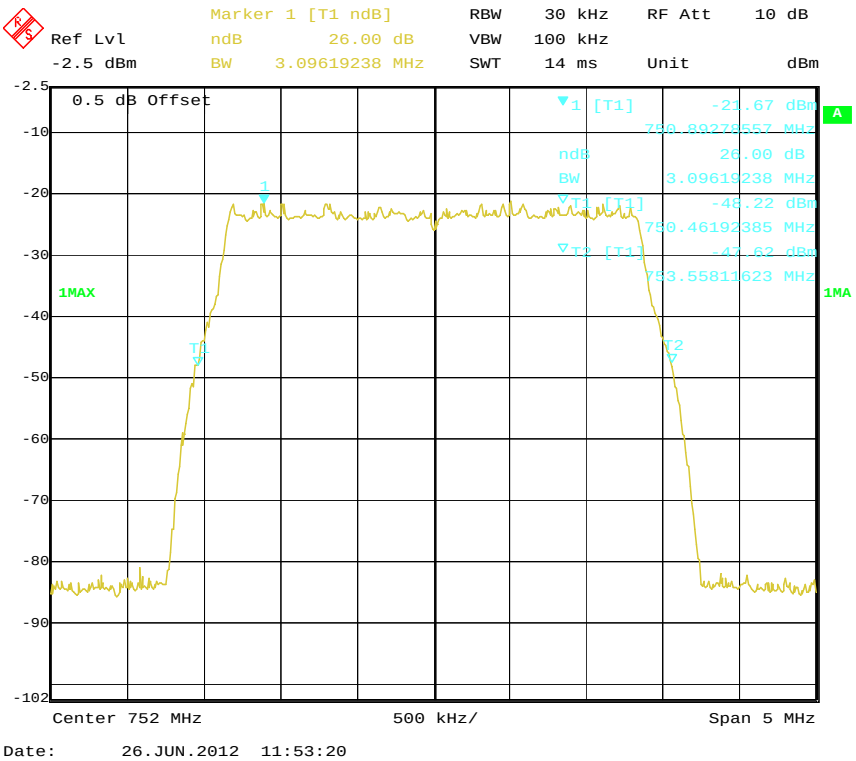


LTE700-16QAM (3 MHz), Frequency: 752 MHz

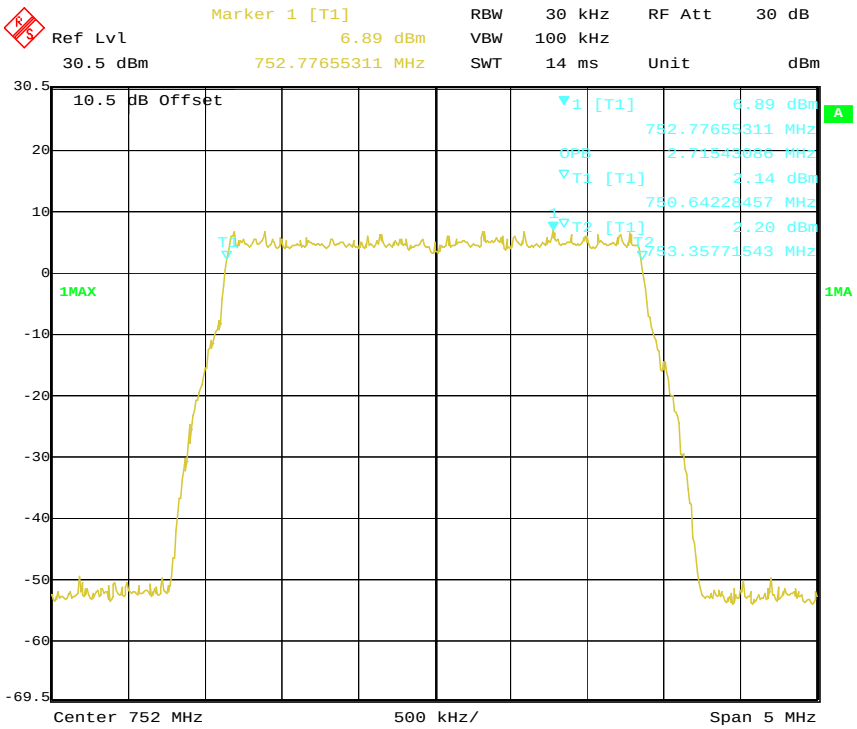
99% Occupied Bandwidth: Input Signal



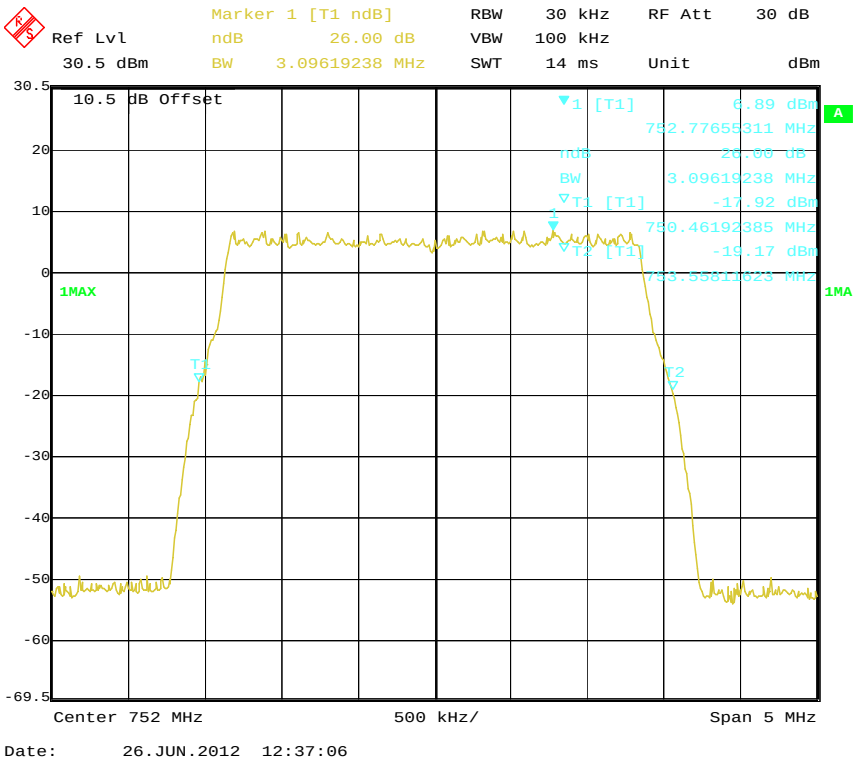
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

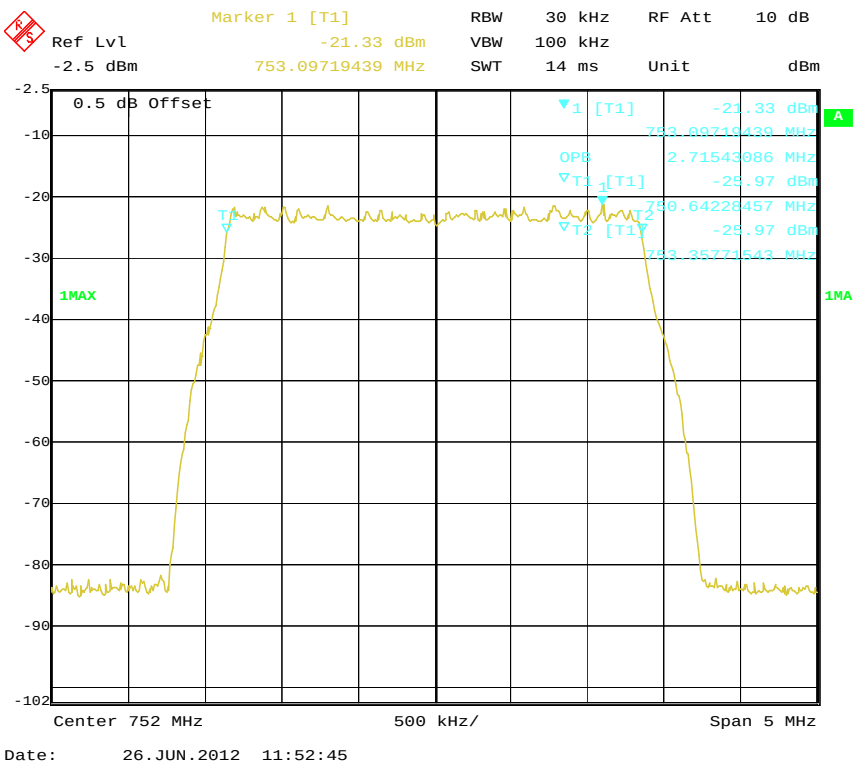


26 dB Bandwidth: Output Signal

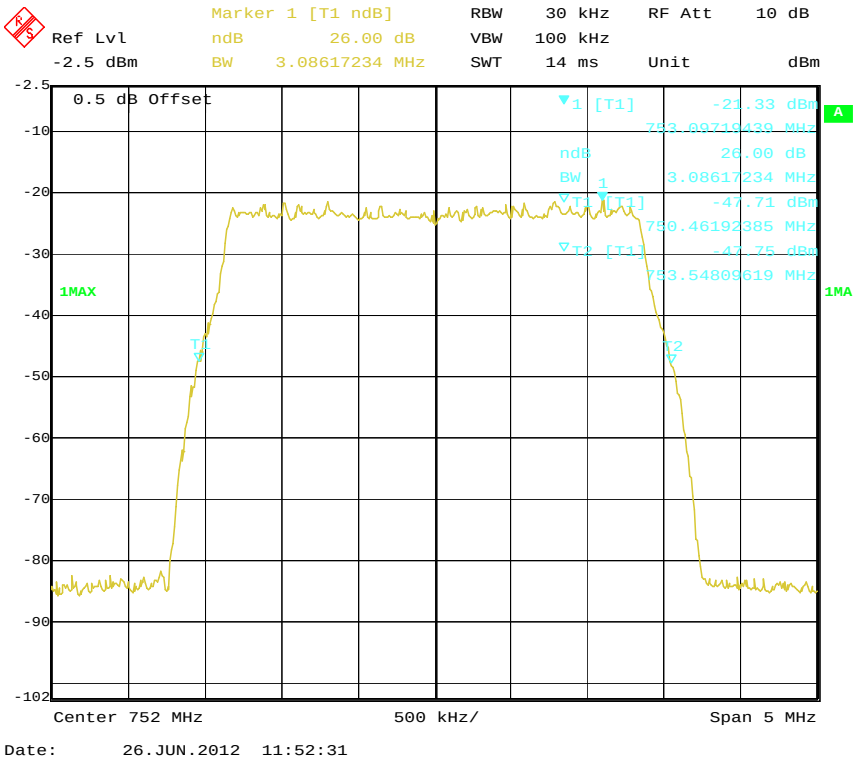


LTE700-64QAM (3 MHz), Frequency: 752 MHz

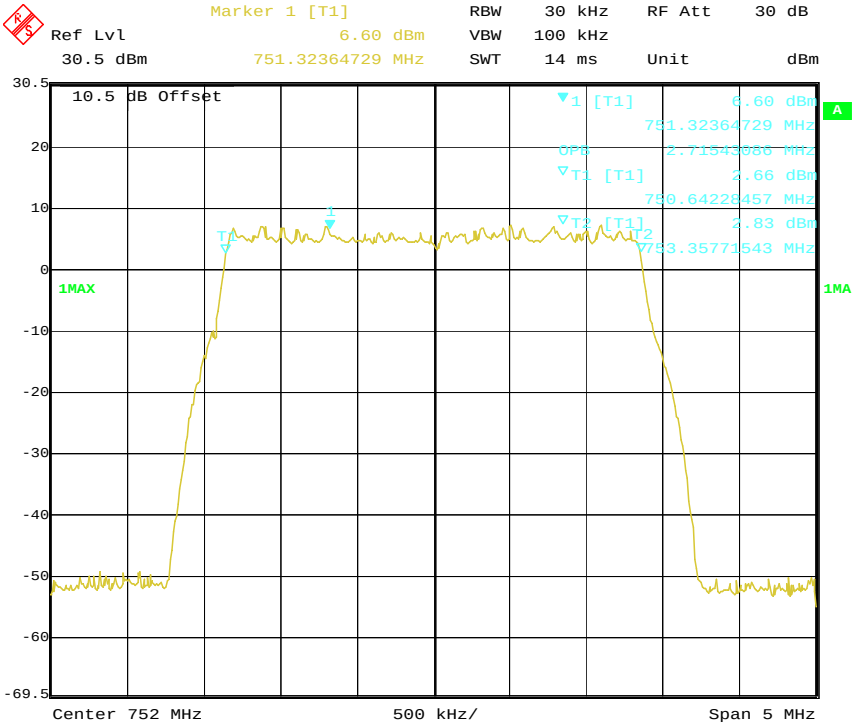
99% Occupied Bandwidth: Input Signal



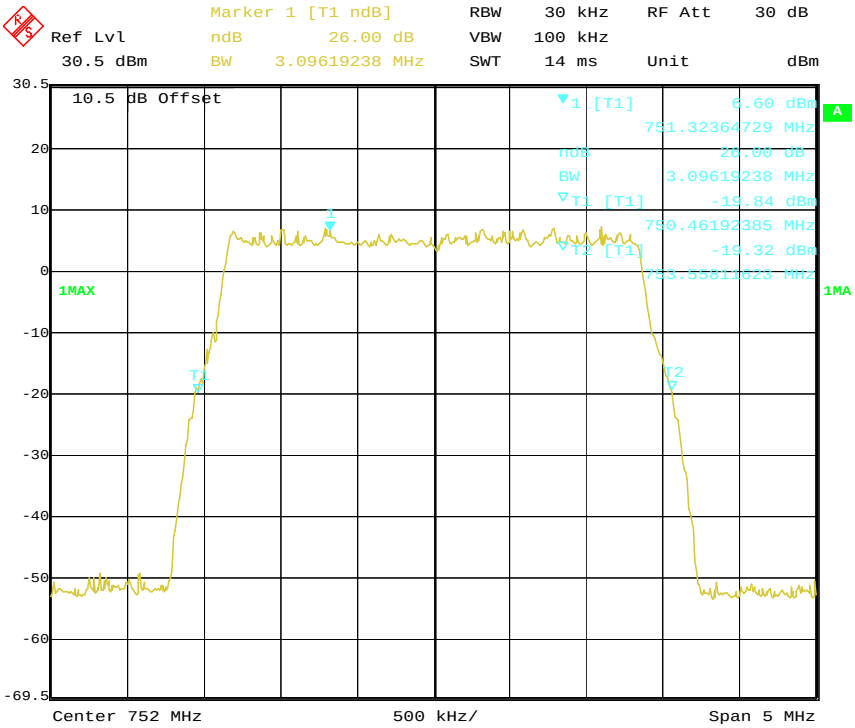
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

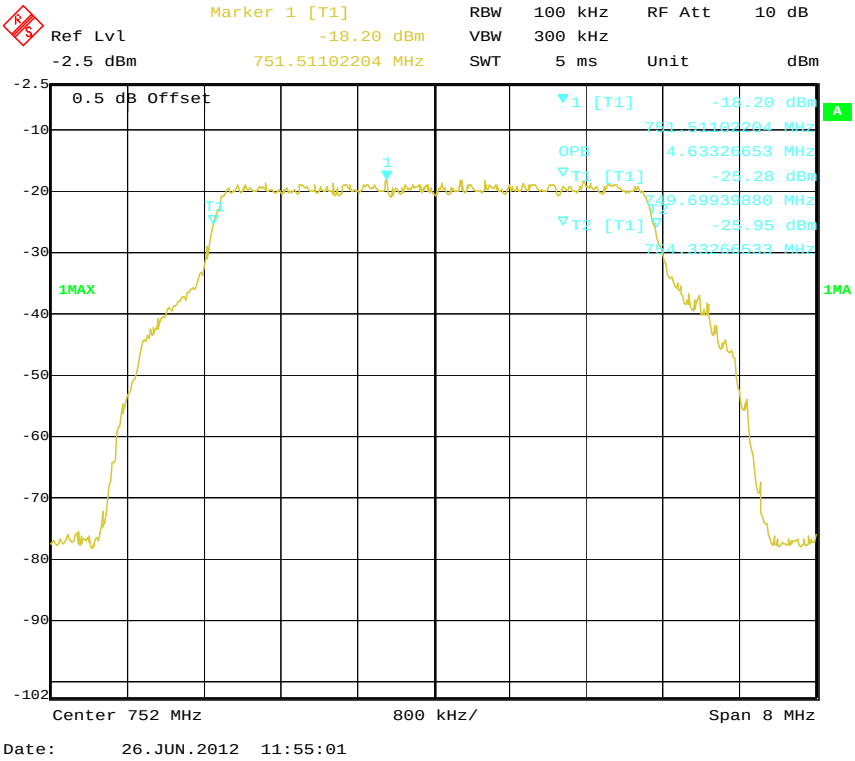


26 dB Bandwidth: Output Signal

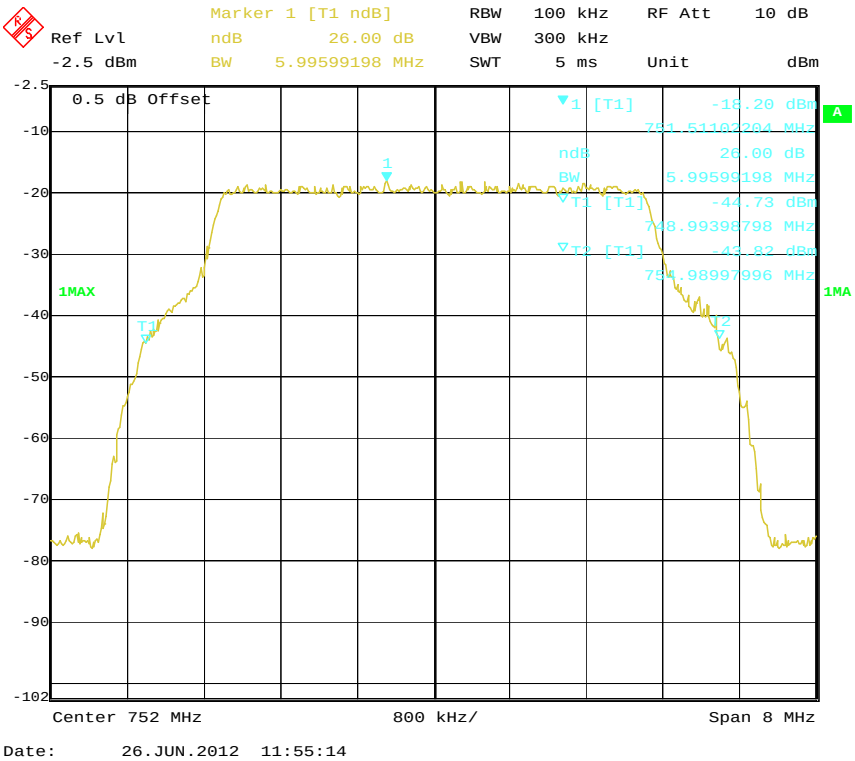


LTE700-QPSK (5 MHz), Frequency: 752 MHz

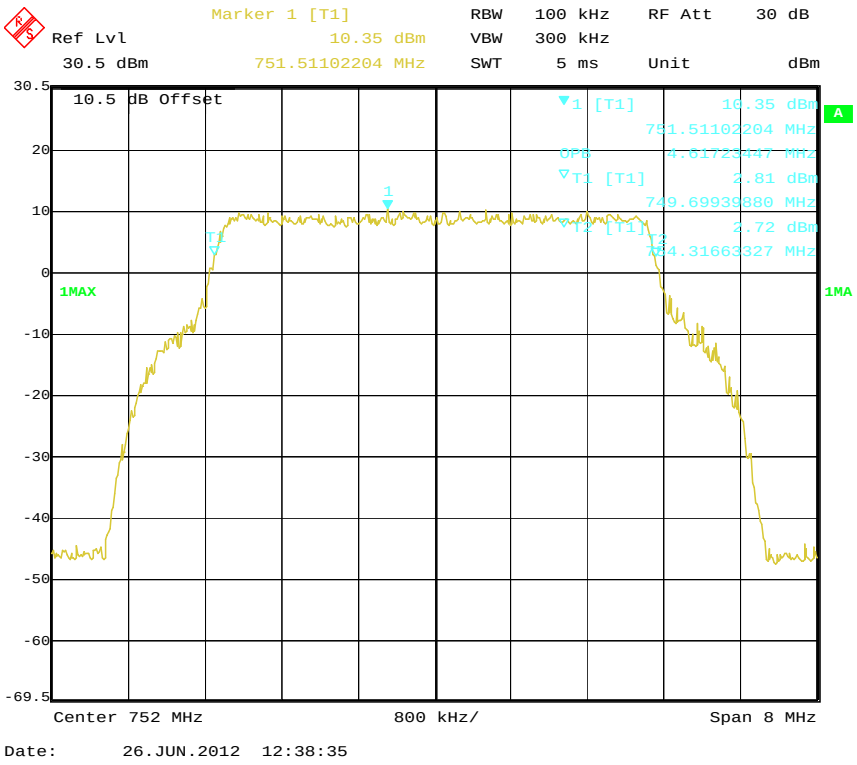
99% Occupied Bandwidth: Input Signal



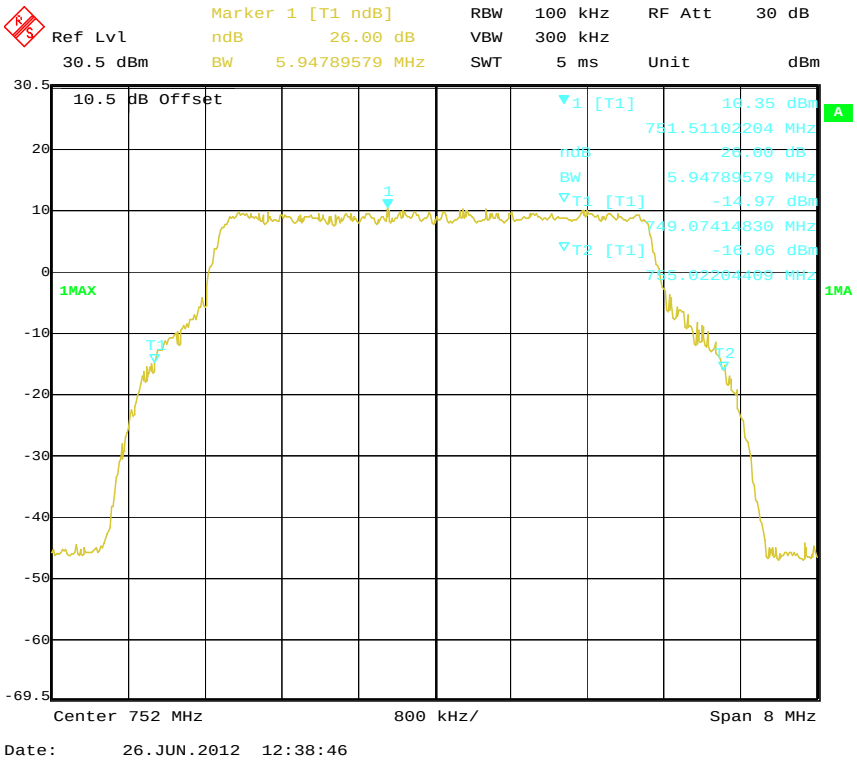
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

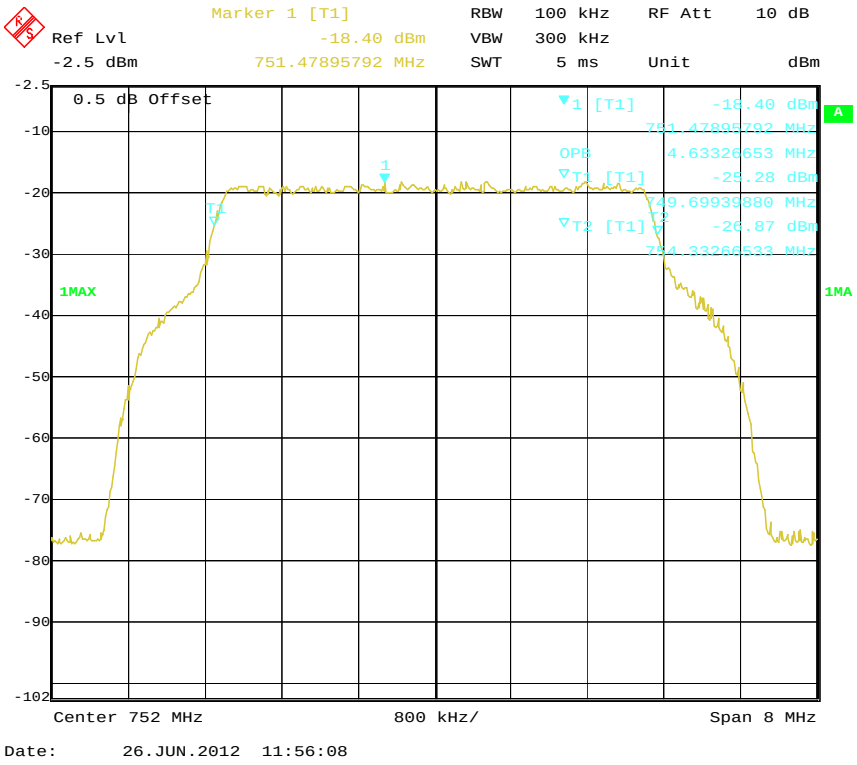


26 dB Bandwidth: Output Signal

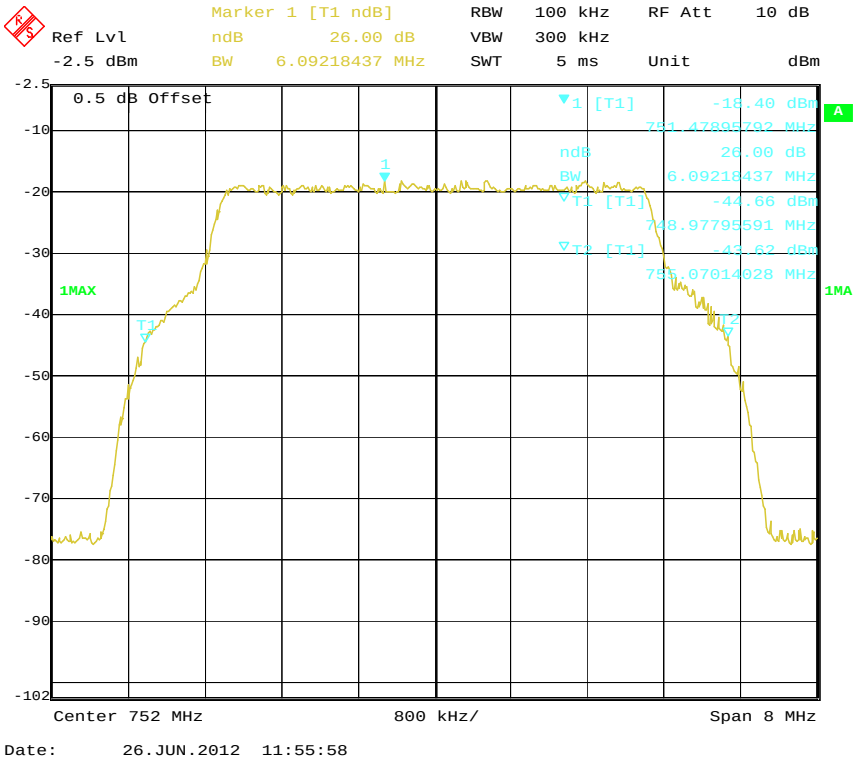


LTE700-16QAM (5 MHz), Frequency: 752 MHz

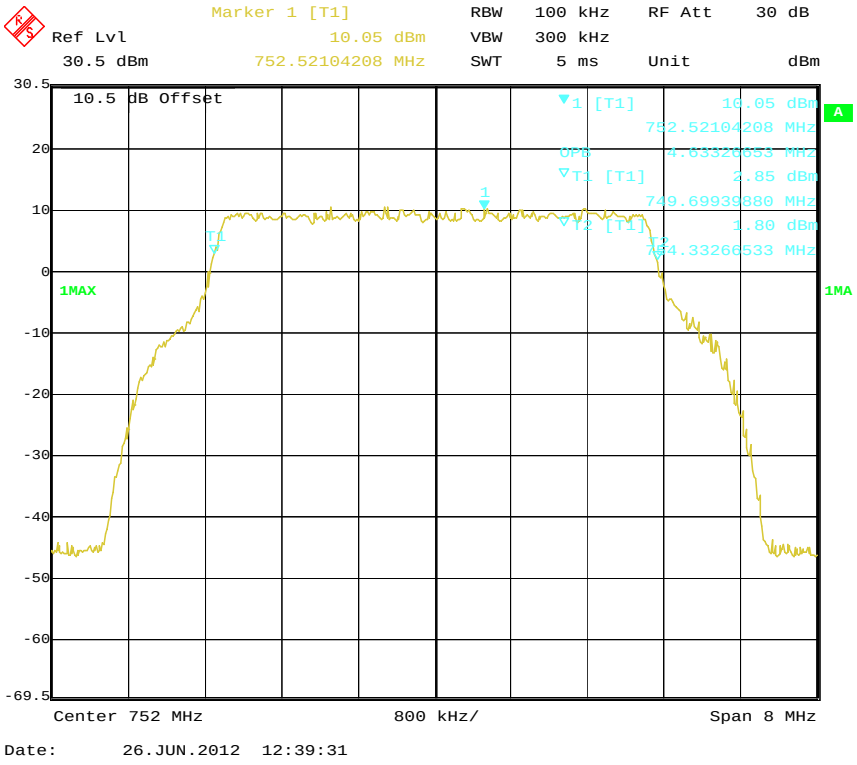
99% Occupied Bandwidth: Input Signal



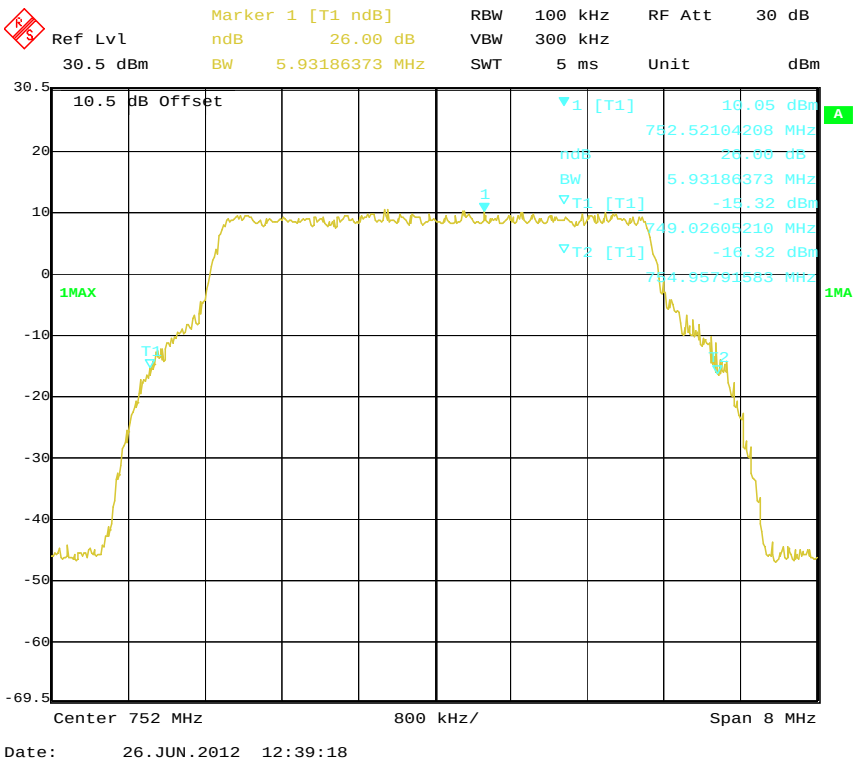
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

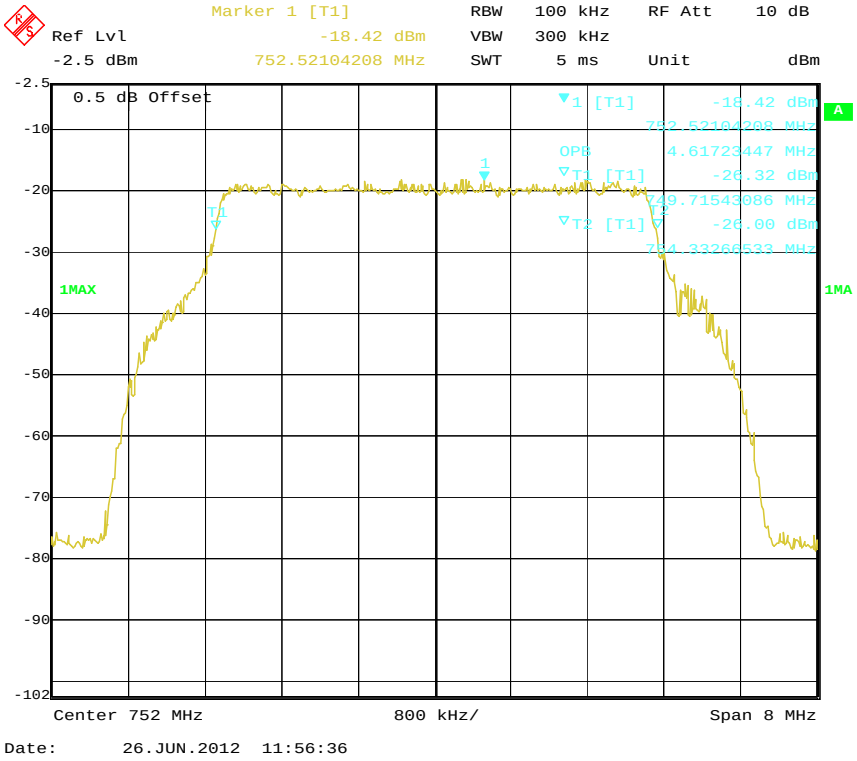


26 dB Bandwidth: Output Signal

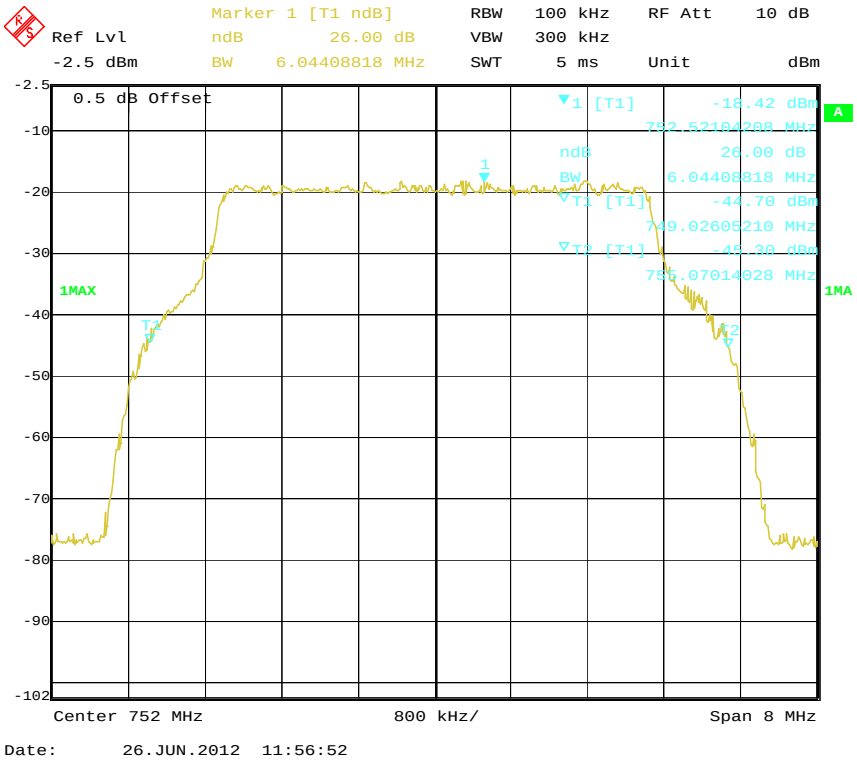


LTE700-64QAM (5 MHz), Frequency: 752 MHz

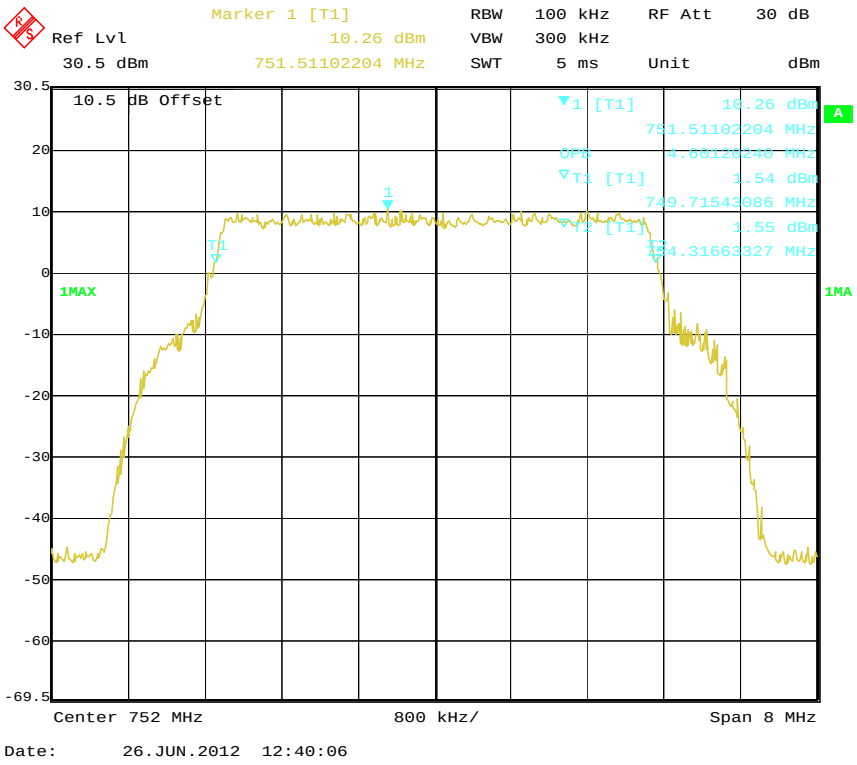
99% Occupied Bandwidth: Input Signal



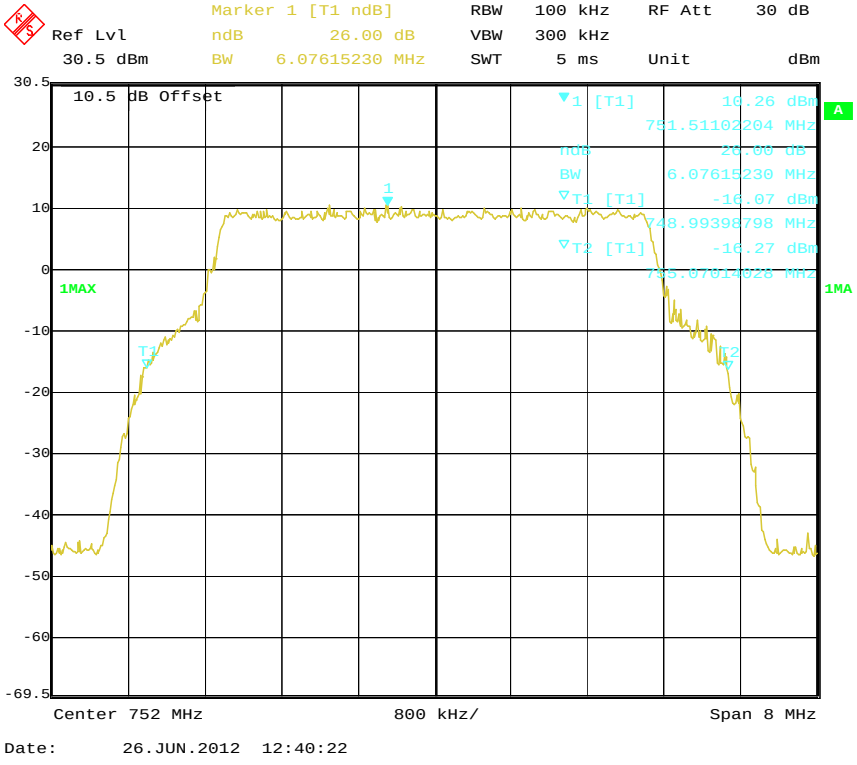
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

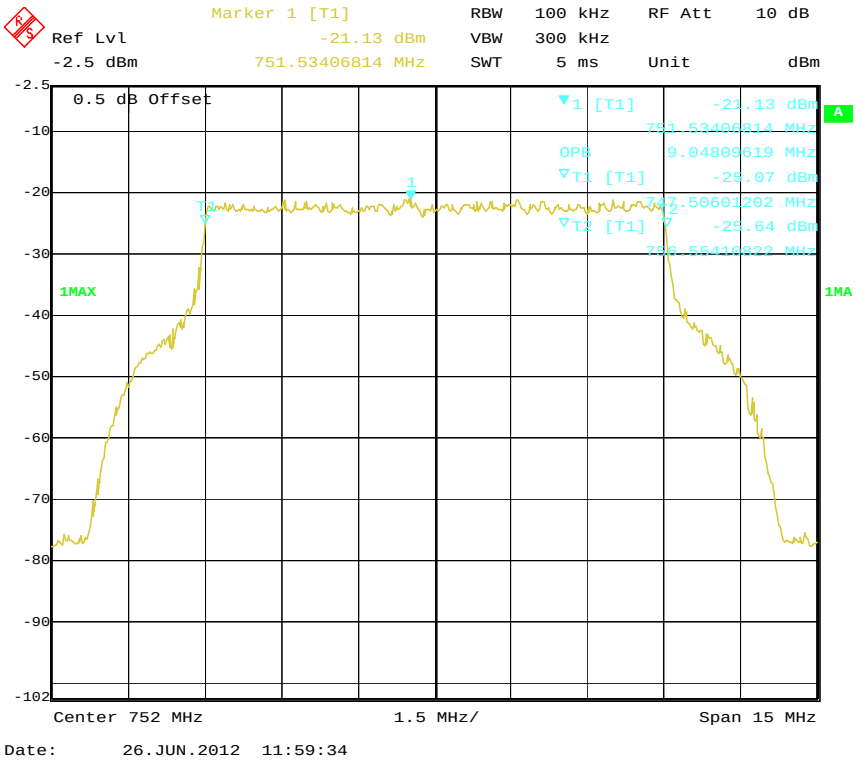


26 dB Bandwidth: Output Signal

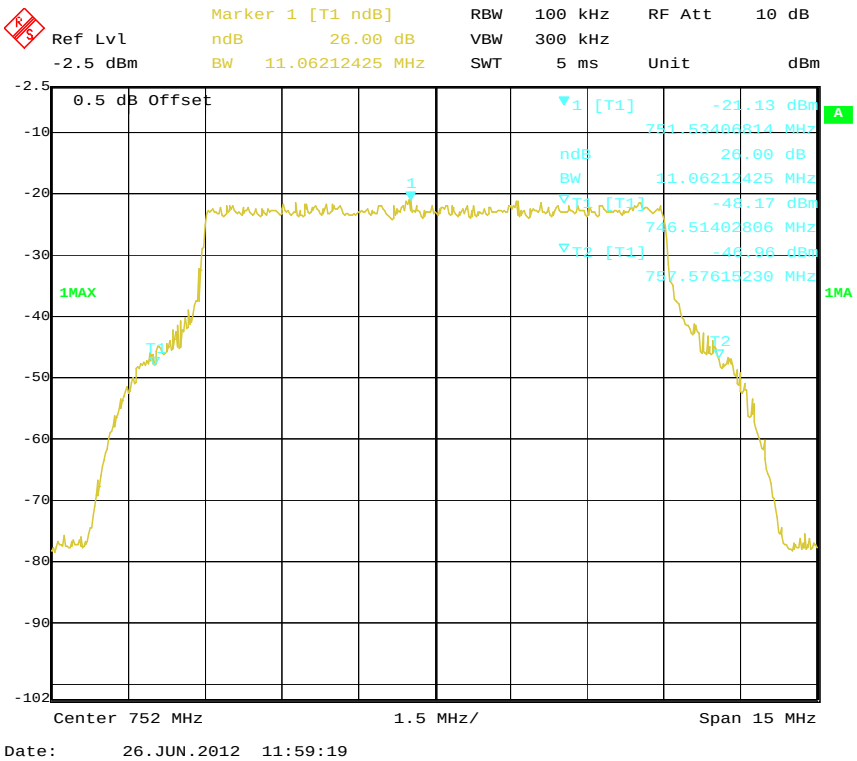


LTE700-QPSK (10 MHz), Frequency: 752 MHz

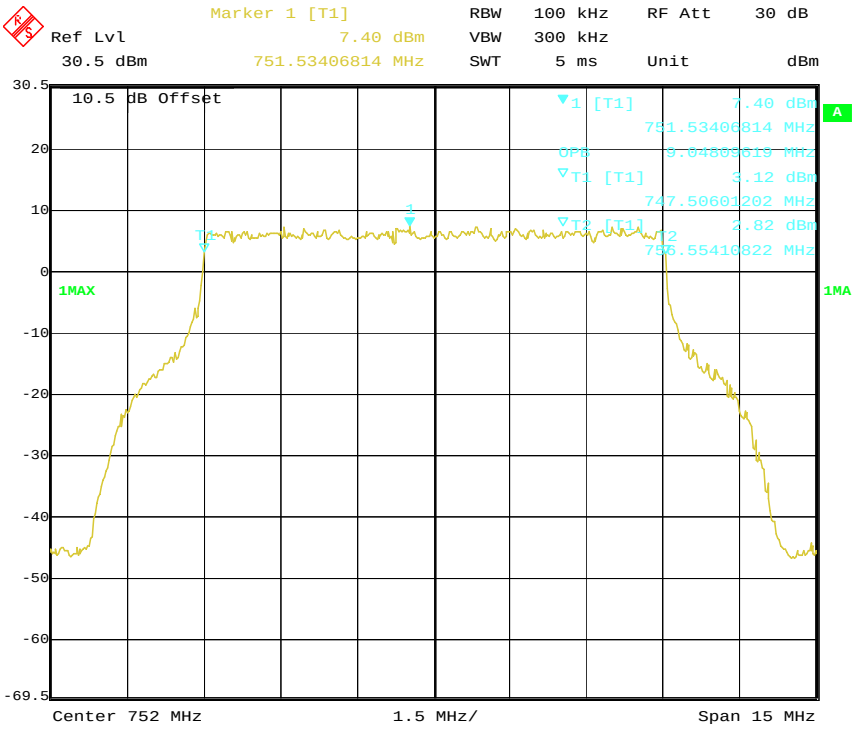
99% Occupied Bandwidth: Input Signal



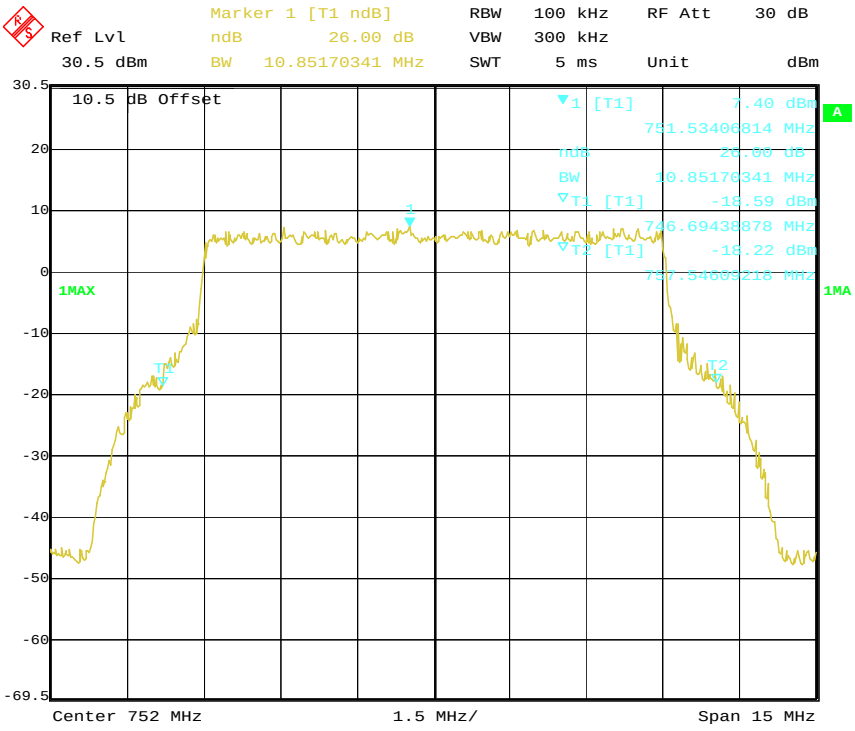
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

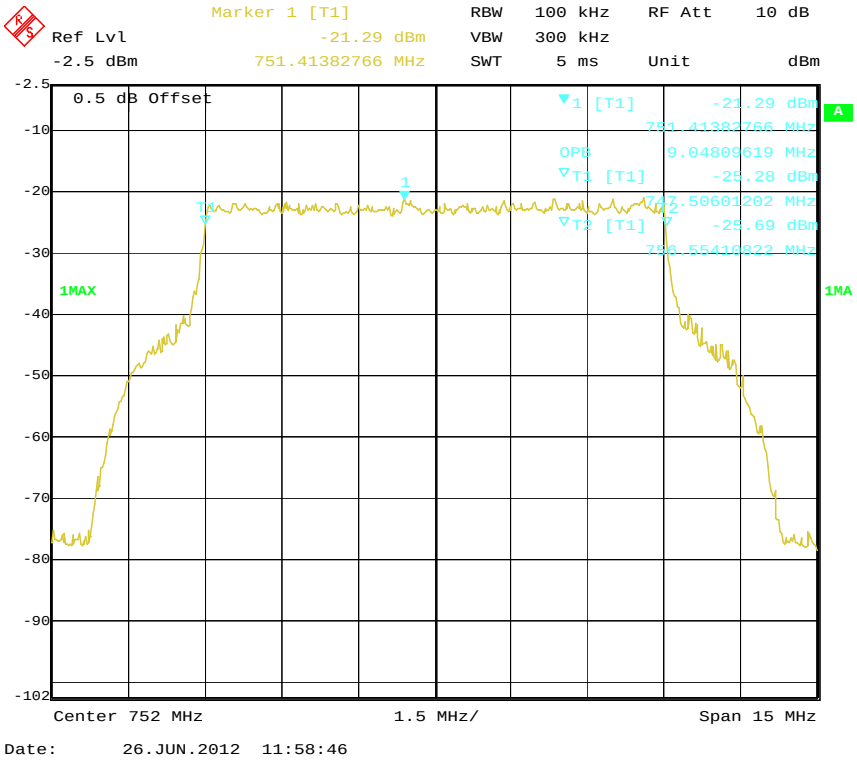


26 dB Bandwidth: Output Signal

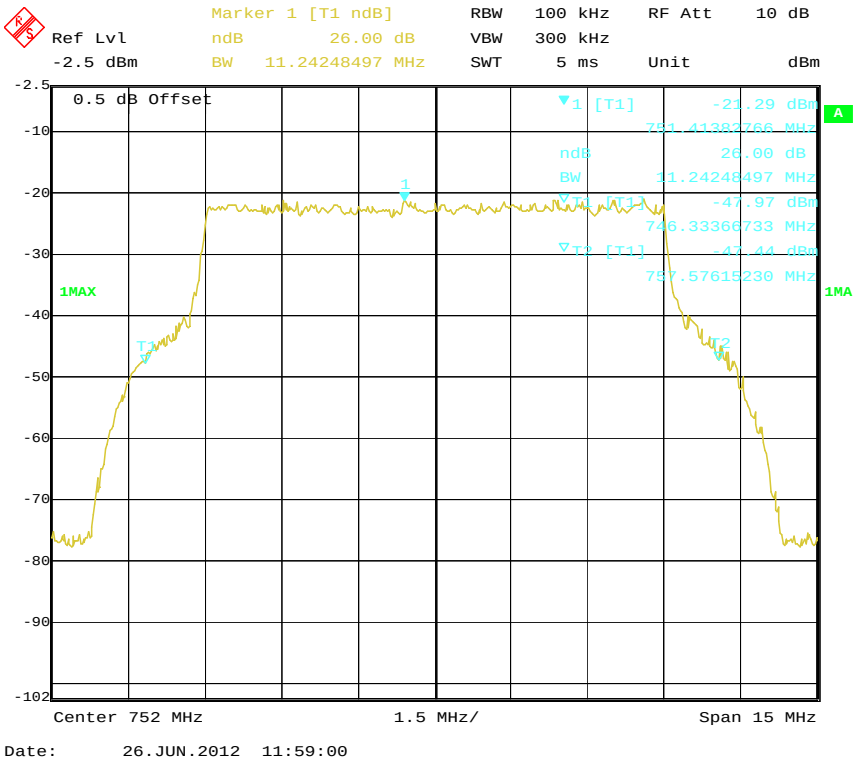


LTE700-16QAM (10 MHz), Frequency: 752 MHz

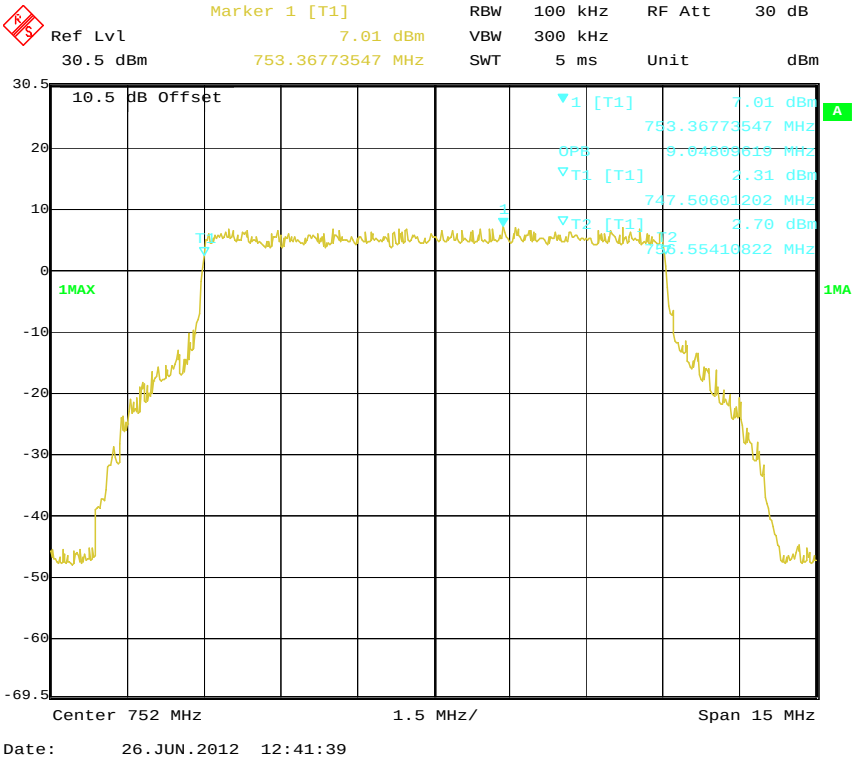
99% Occupied Bandwidth: Input Signal



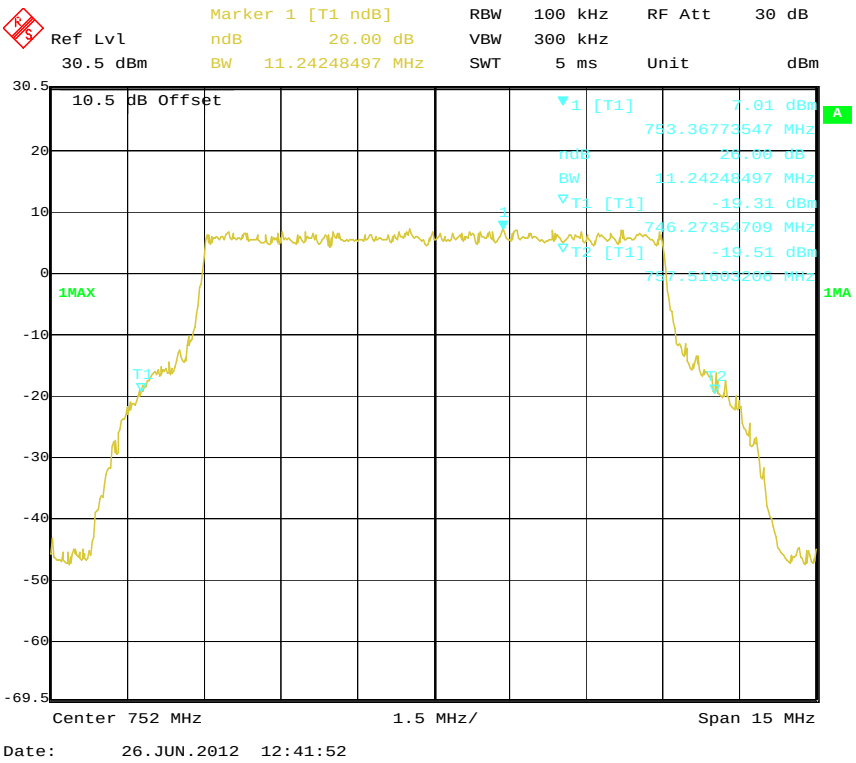
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

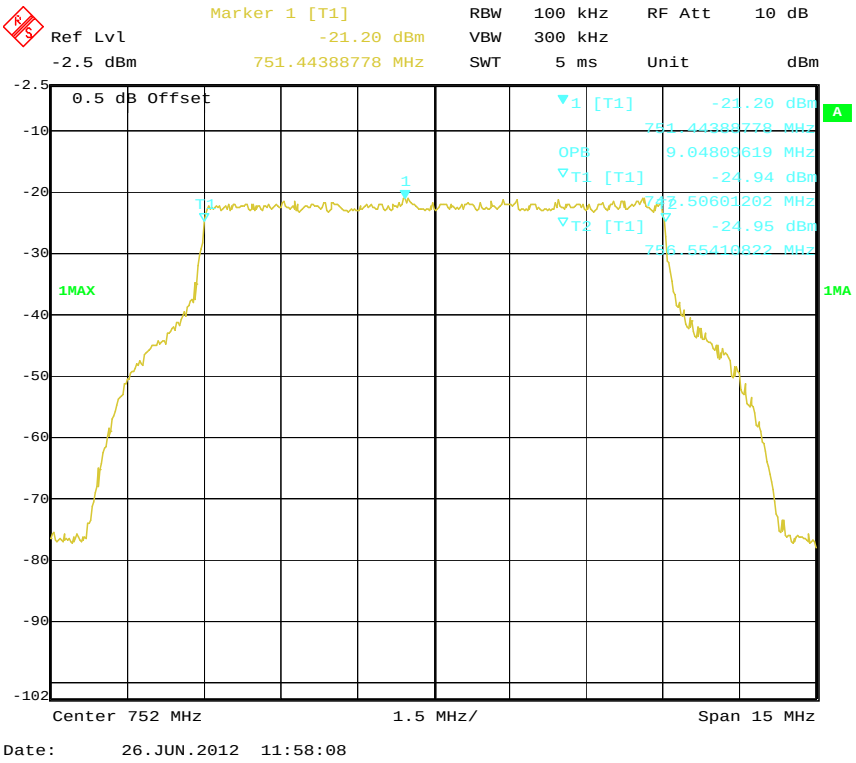


26 dB Bandwidth: Output Signal

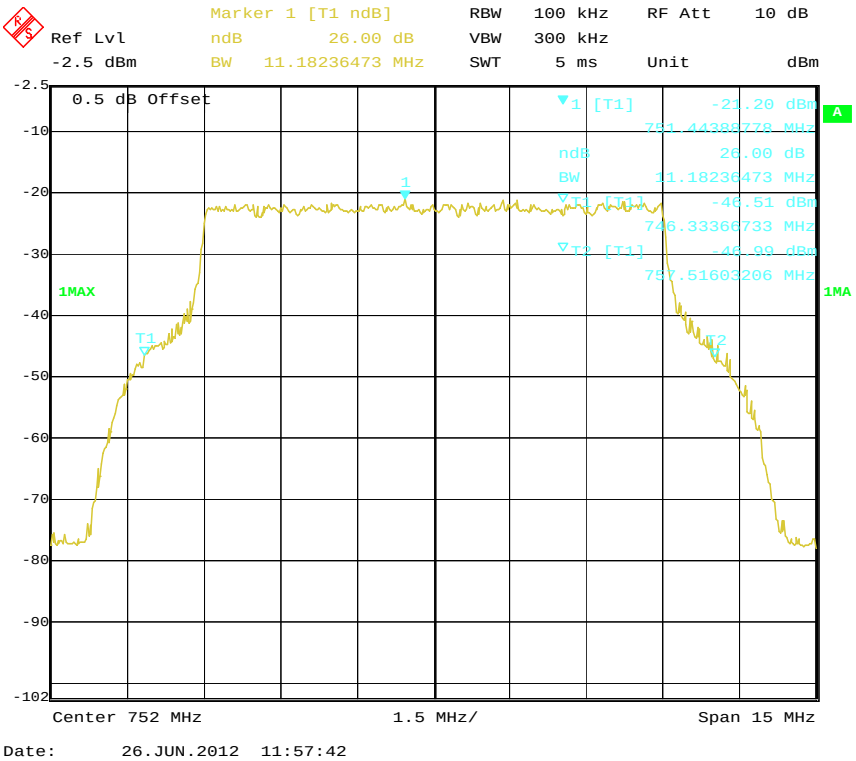


LTE700-64QAM (10 MHz), Frequency: 752 MHz

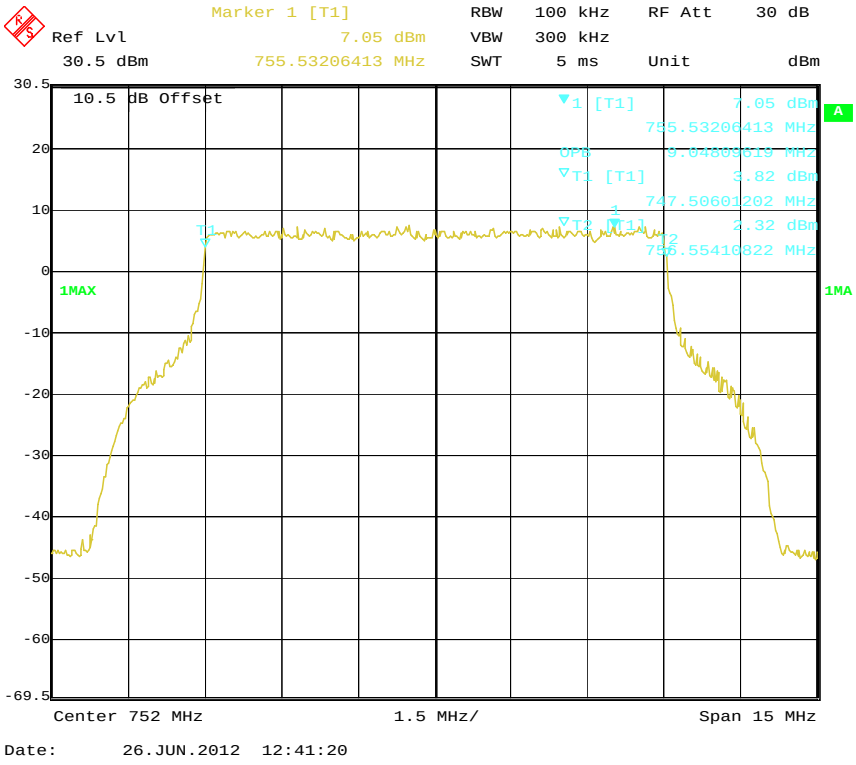
99% Occupied Bandwidth: Input Signal



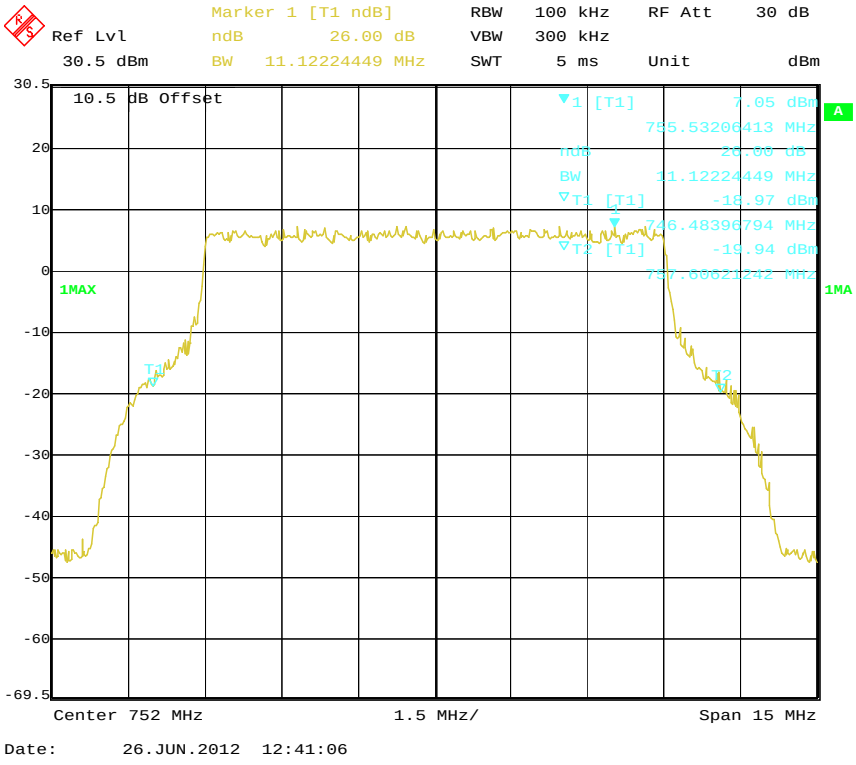
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal



26 dB Bandwidth: Output Signal



LTE2100 Mode:

Input Signal:

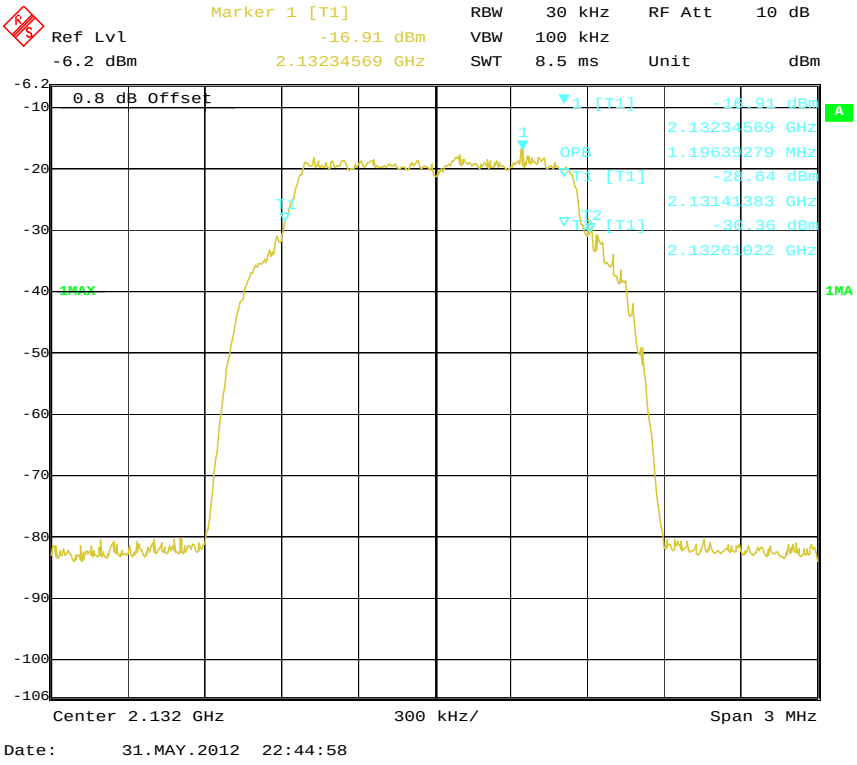
Mode	Modulation	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Downlink 2110-2155 MHz	QPSK (1.4 MHz)	2132	1.1964	1.5511
	16QAM (1.4 MHz)	2132	1.2264	1.5571
	64QAM (1.4 MHz)	2132	1.1844	1.5511
	QPSK (3 MHz)	2132	2.7254	3.1162
	16QAM (3 MHz)	2132	2.7254	3.0862
	64QAM (3 MHz)	2132	2.7254	3.0962
	QPSK (5 MHz)	2132	4.6292	6.0321
	16QAM (5 MHz)	2132	4.5892	5.9920
	64QAM (5 MHz)	2132	4.6092	6.0120
	QPSK (10 MHz)	2132	9.0481	10.7916
	16QAM (10 MHz)	2132	9.0481	11.0922
	64QAM (10 MHz)	2132	9.0180	11.0922

Output Signal:

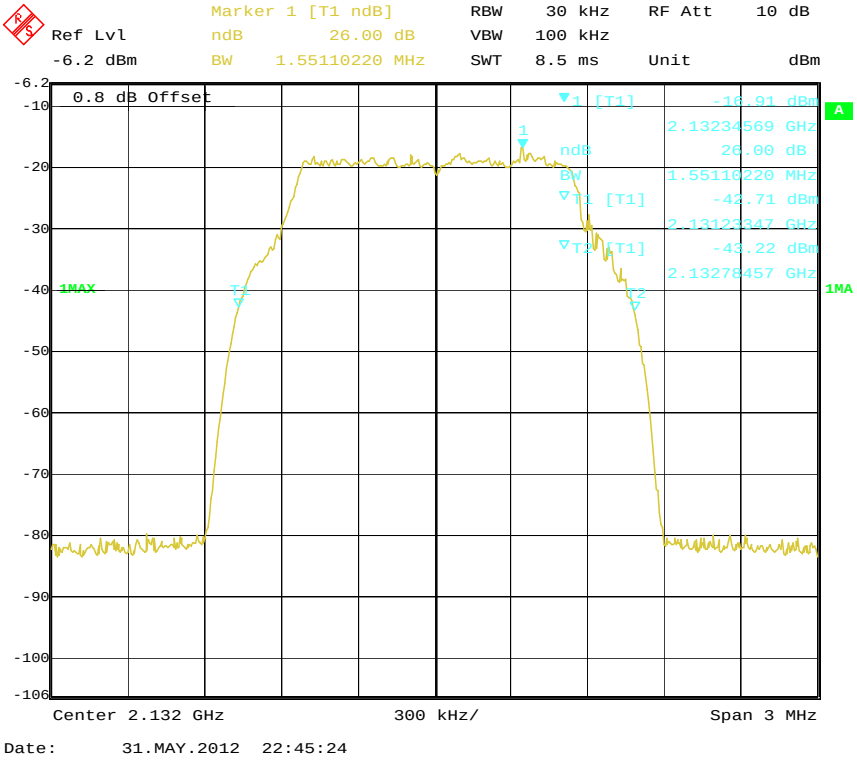
Mode	Modulation	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Downlink 2110-2155 MHz	QPSK (1.4 MHz)	2132	1.1904	1.5511
	16QAM (1.4 MHz)	2132	1.1964	1.5511
	64QAM (1.4 MHz)	2132	1.1844	1.5451
	QPSK (3 MHz)	2132	2.7174	3.0902
	16QAM (3 MHz)	2132	2.7174	3.0782
	64QAM (3 MHz)	2132	2.7174	3.0902
	QPSK (5 MHz)	2132	4.6693	6.1122
	16QAM (5 MHz)	2132	4.6693	5.9319
	64QAM (5 MHz)	2132	4.6493	5.8918
	QPSK (10 MHz)	2132	9.0180	11.3026
	16QAM (10 MHz)	2132	9.0481	11.4228
	64QAM (10 MHz)	2132	9.0180	11.3327

LTE2100-QPSK (1.4 MHz), Frequency: 2132 MHz

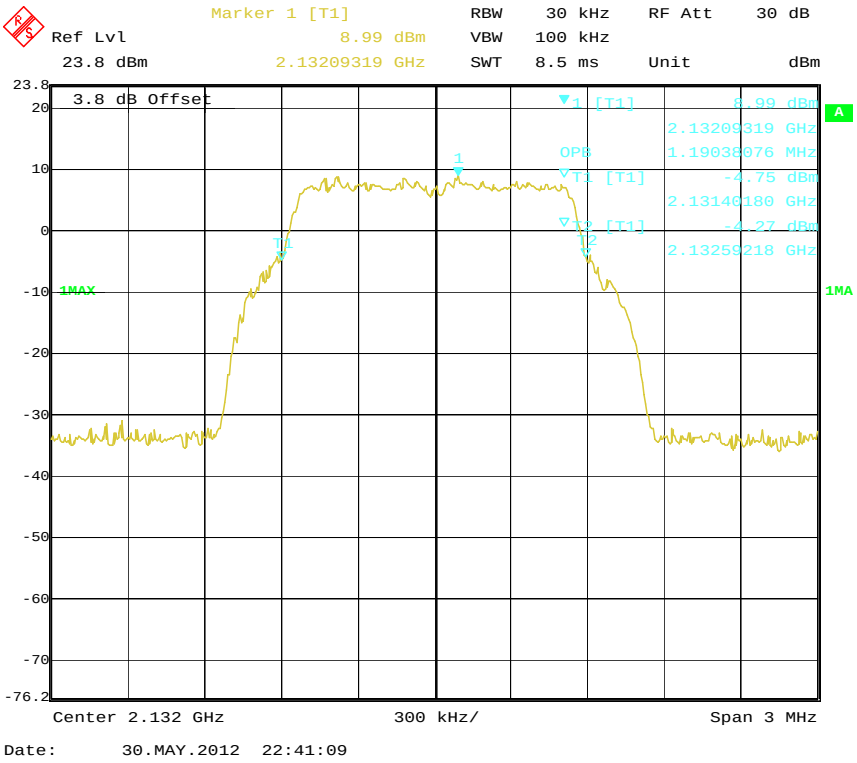
99% Occupied Bandwidth: Input Signal



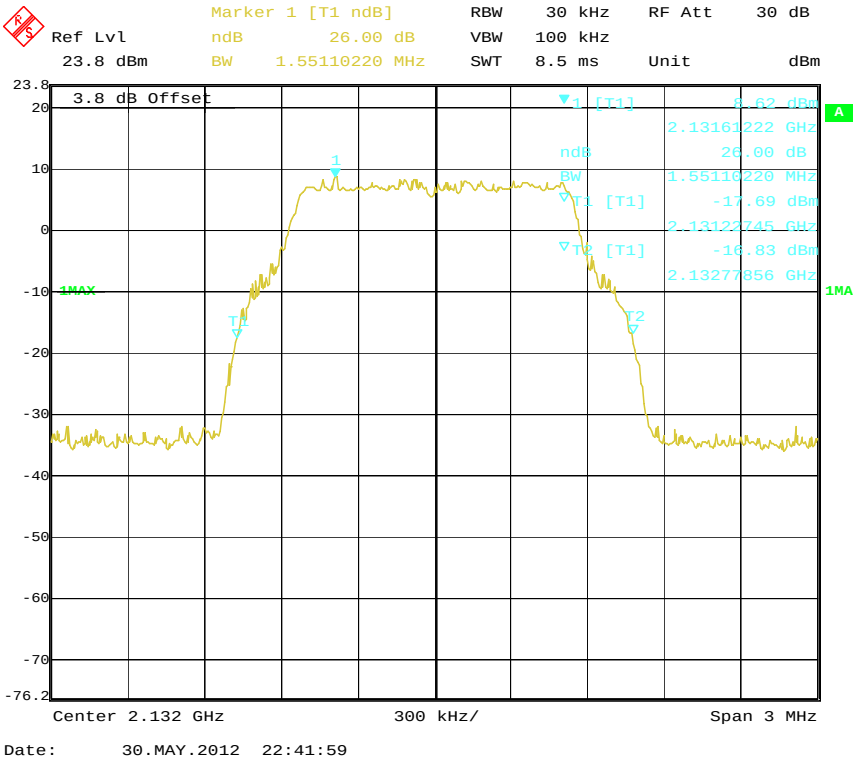
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

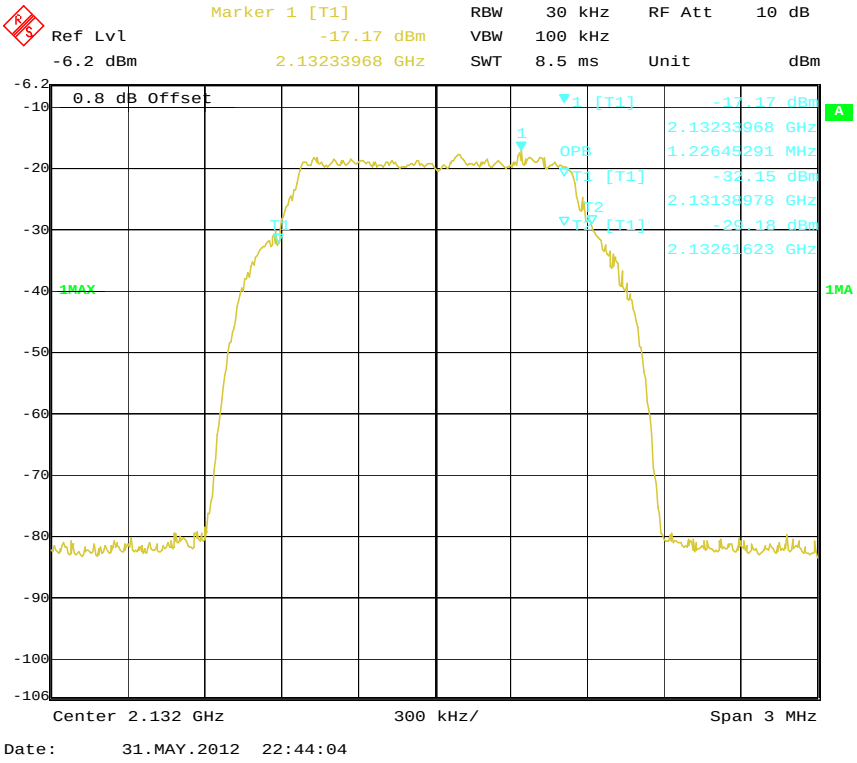


26 dB Bandwidth: Output Signal

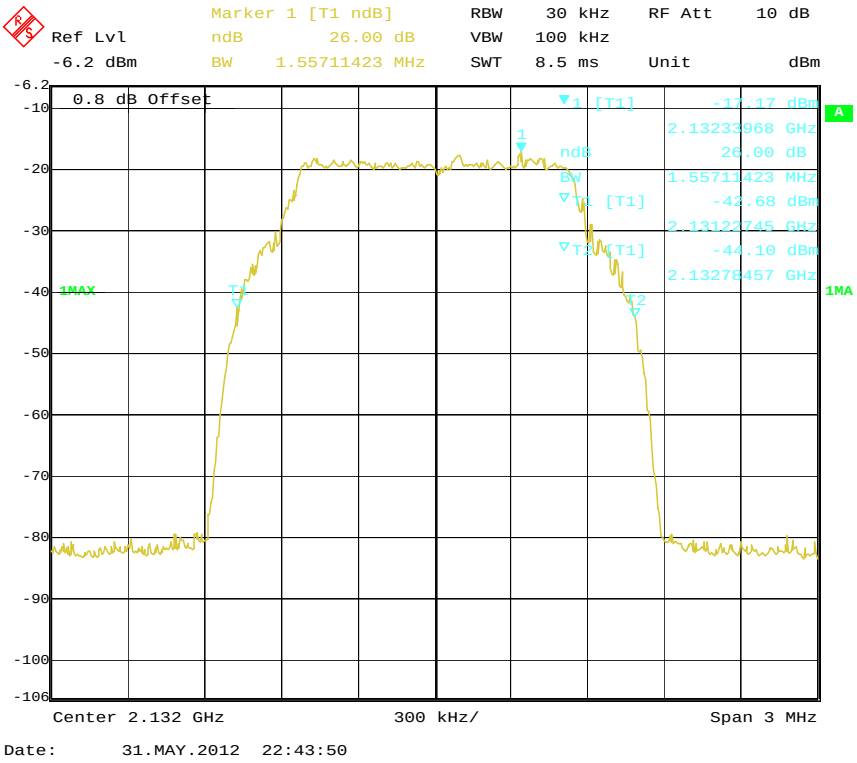


LTE2100-16QAM (1.4 MHz), Frequency: 2132 MHz

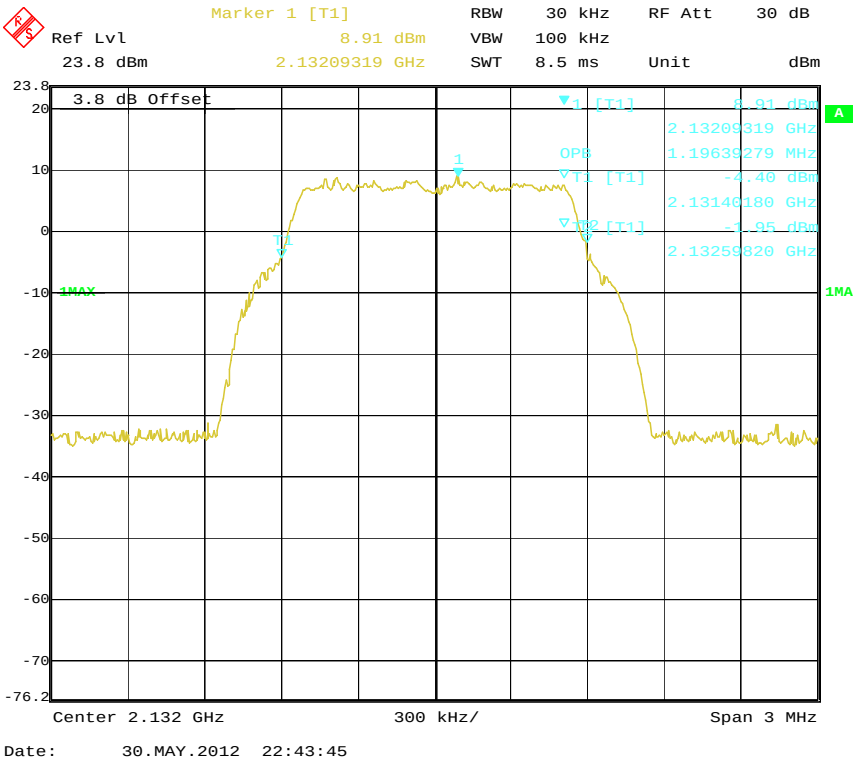
99% Occupied Bandwidth: Input Signal



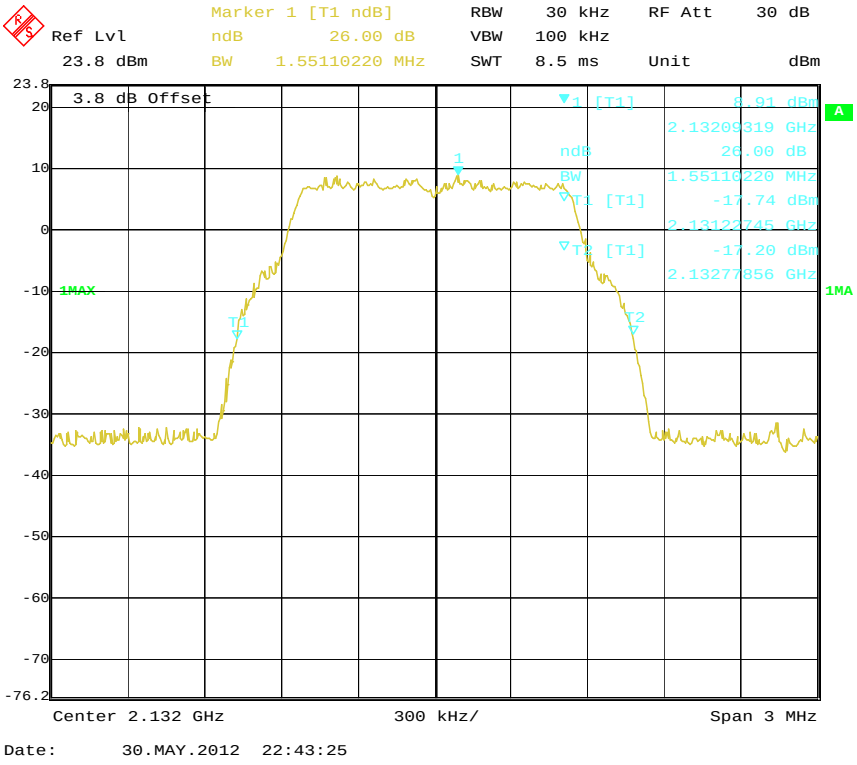
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

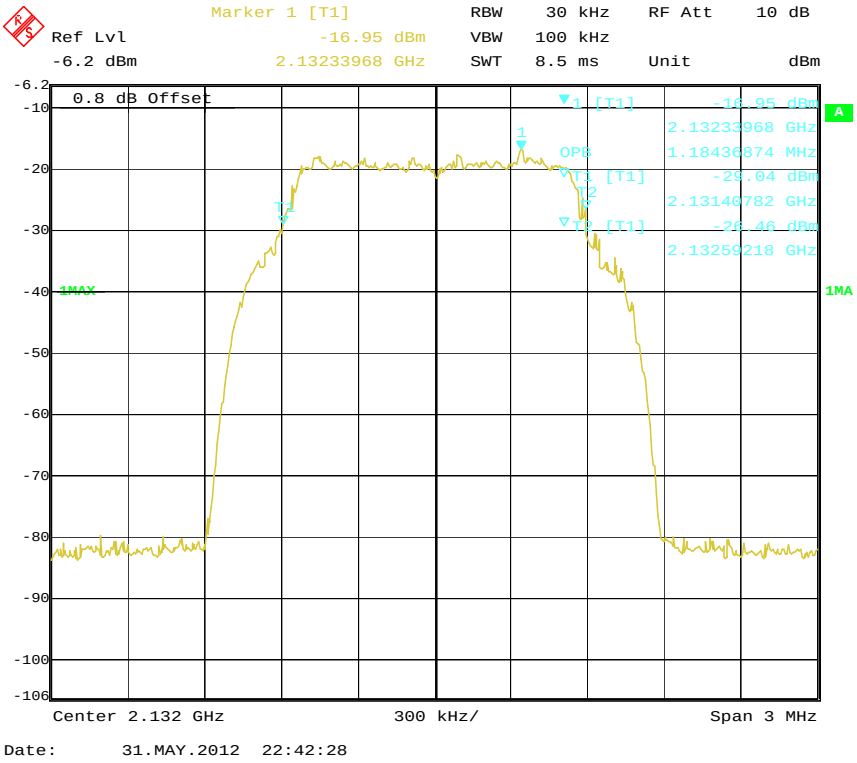


26 dB Bandwidth: Output Signal

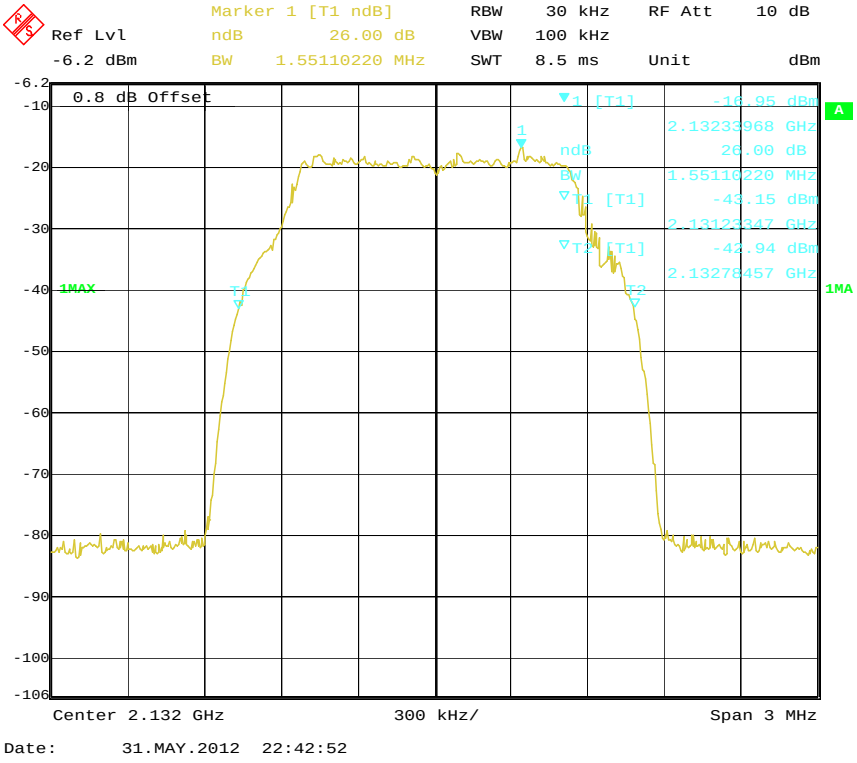


LTE2100-64QAM (1.4 MHz), Frequency: 2132 MHz

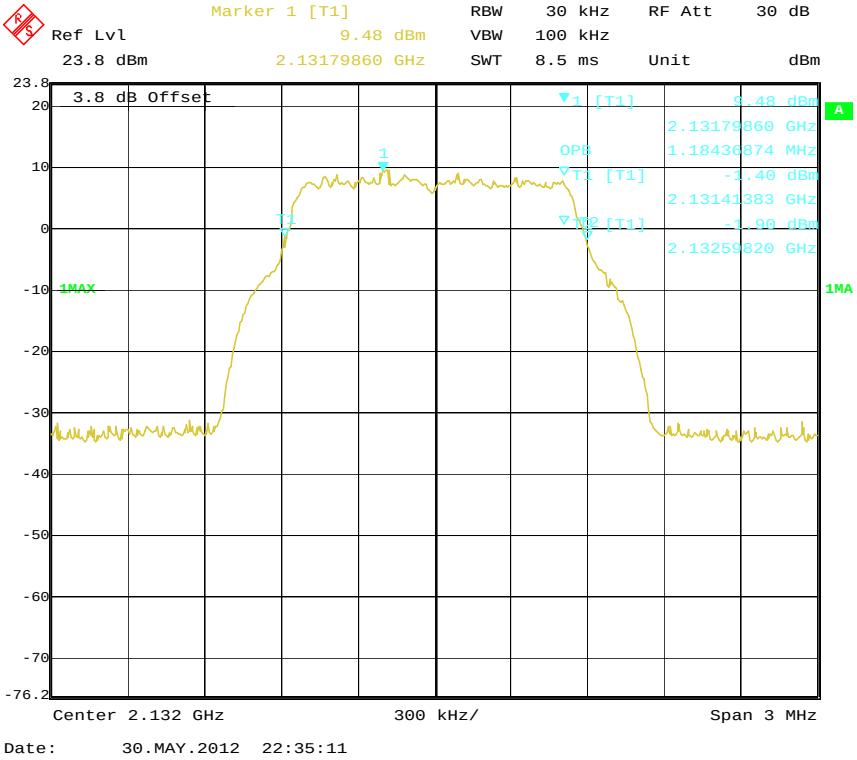
99% Occupied Bandwidth: Input Signal



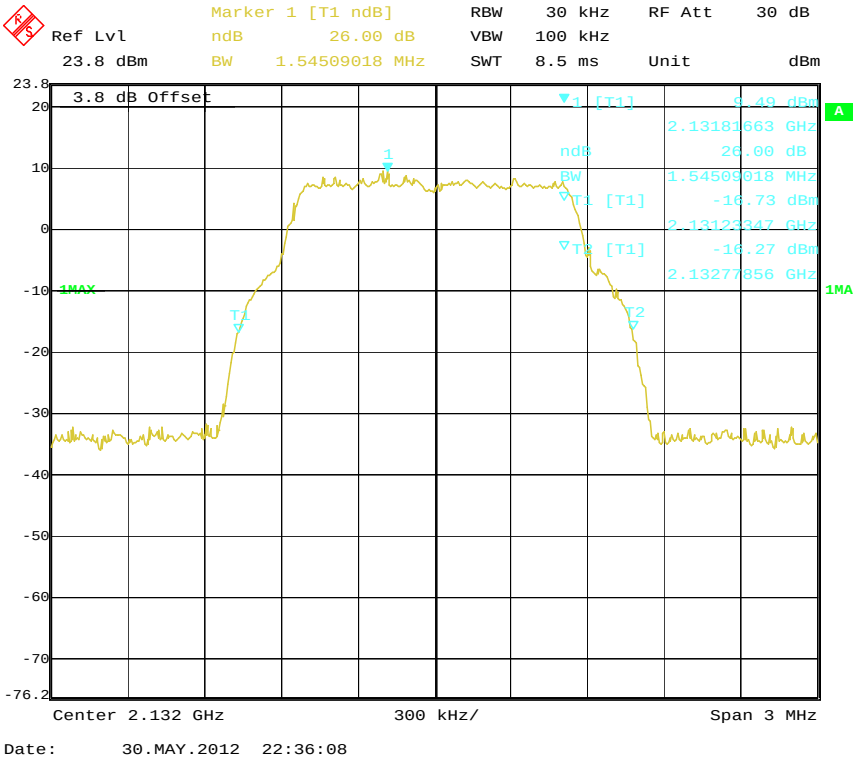
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

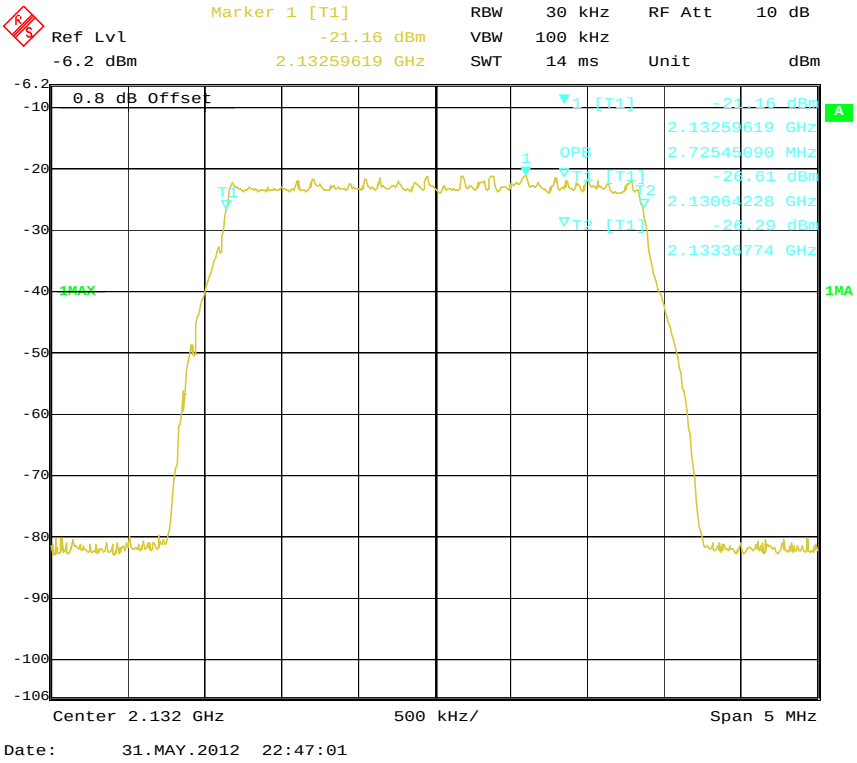


26 dB Bandwidth: Output Signal

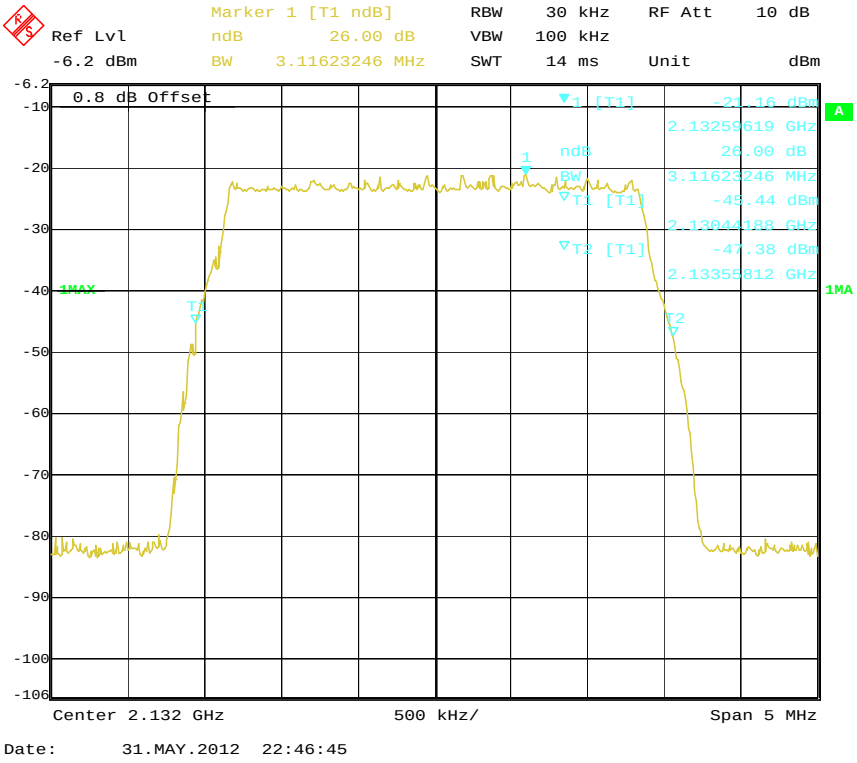


LTE2100-QPSK (3 MHz), Frequency: 2132 MHz

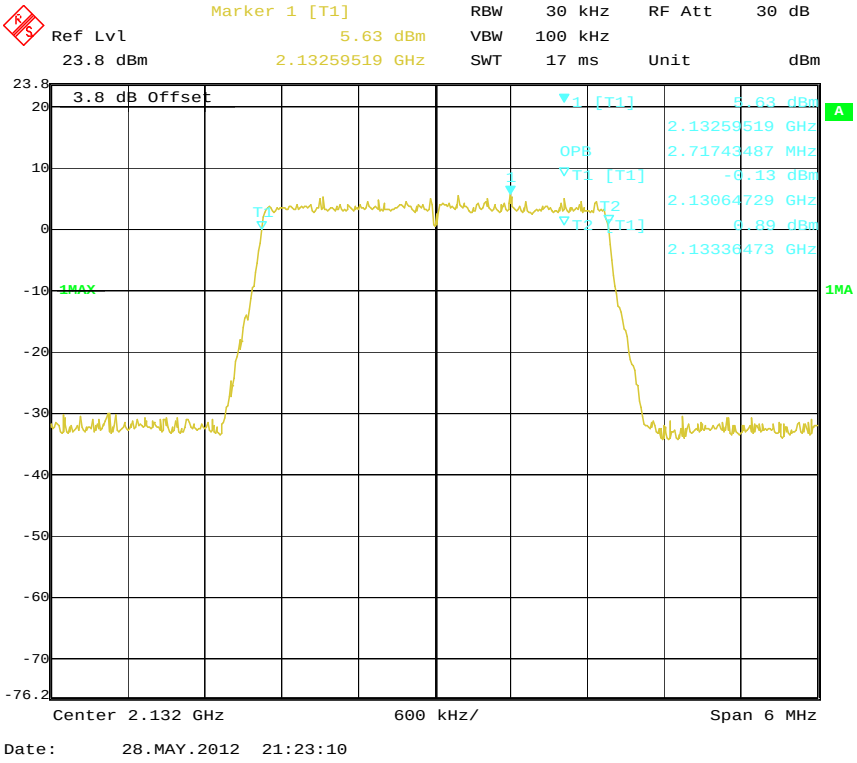
99% Occupied Bandwidth: Input Signal



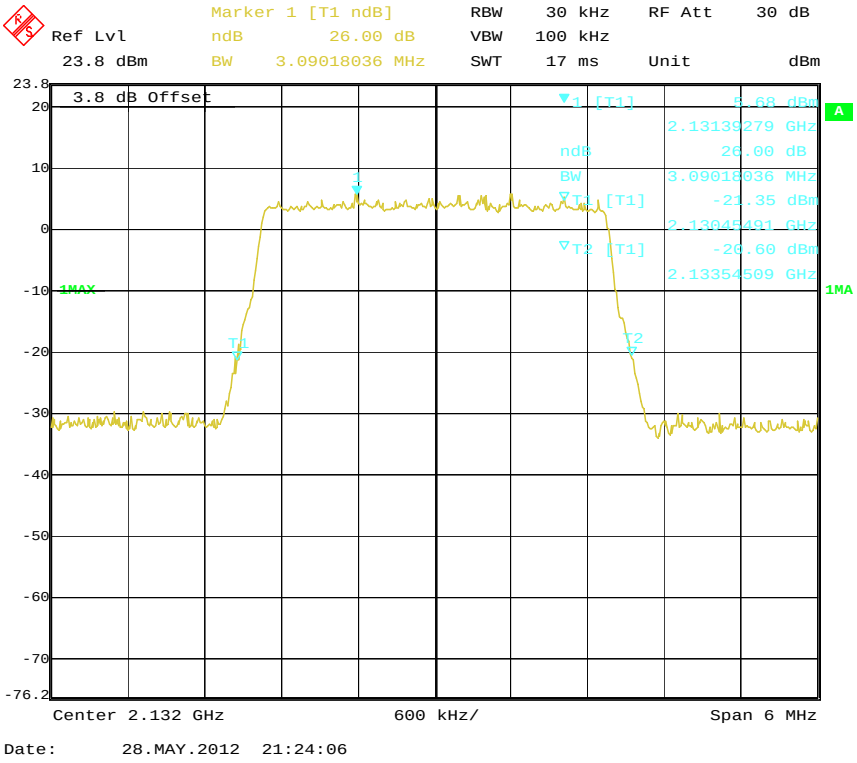
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

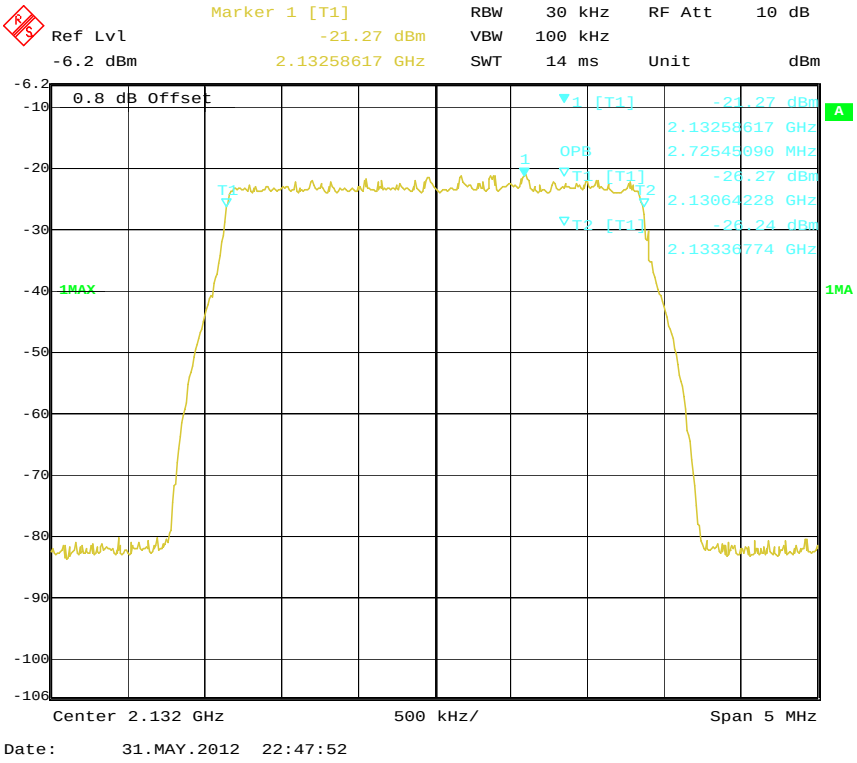


26 dB Bandwidth: Output Signal

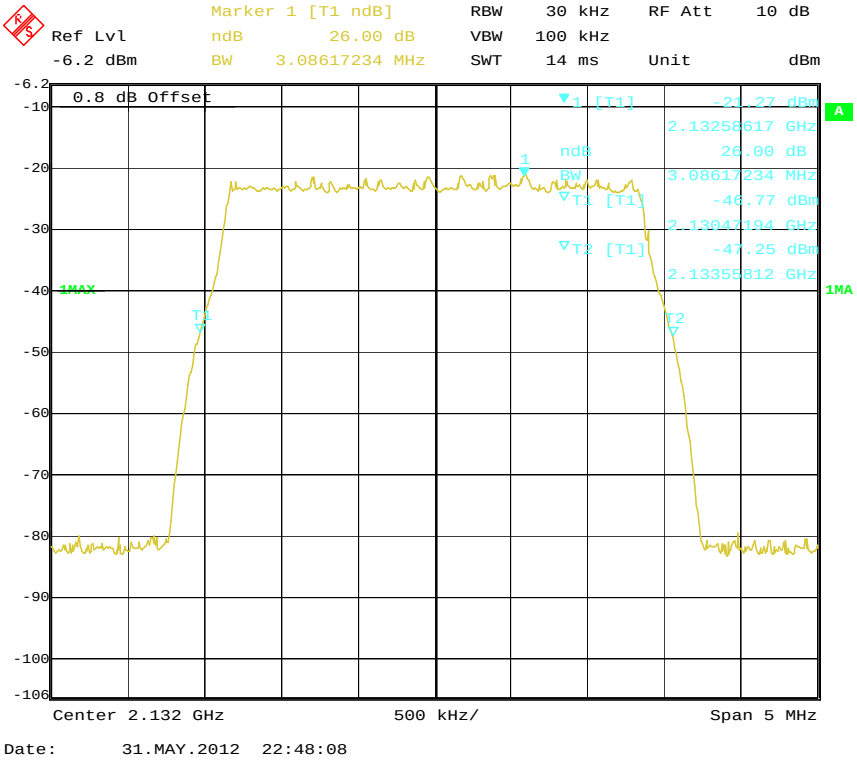


LTE2100-16QAM (3 MHz), Frequency: 2132 MHz

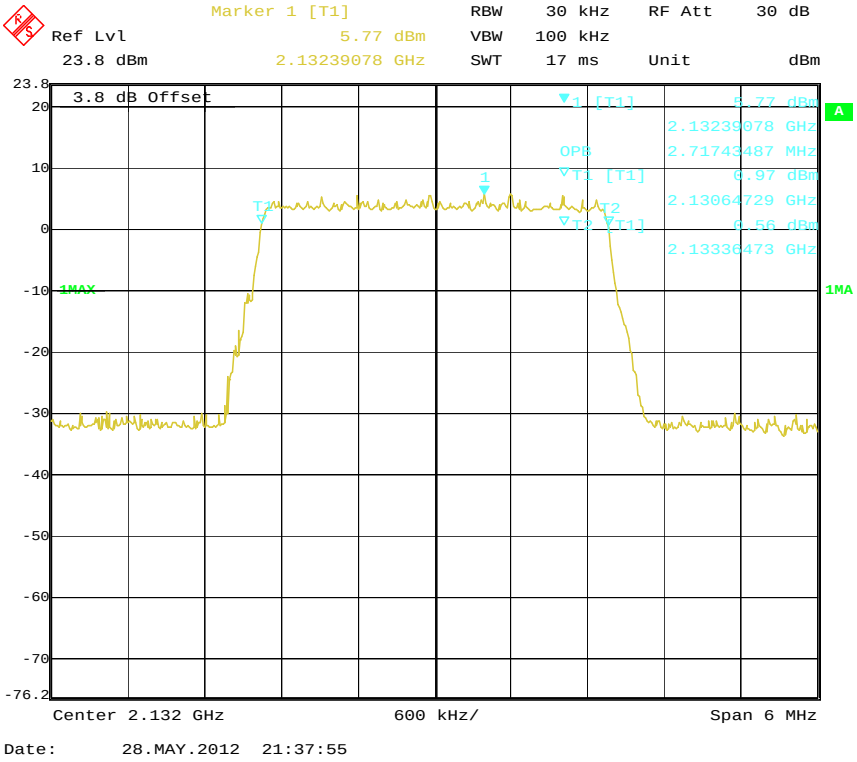
99% Occupied Bandwidth: Input Signal



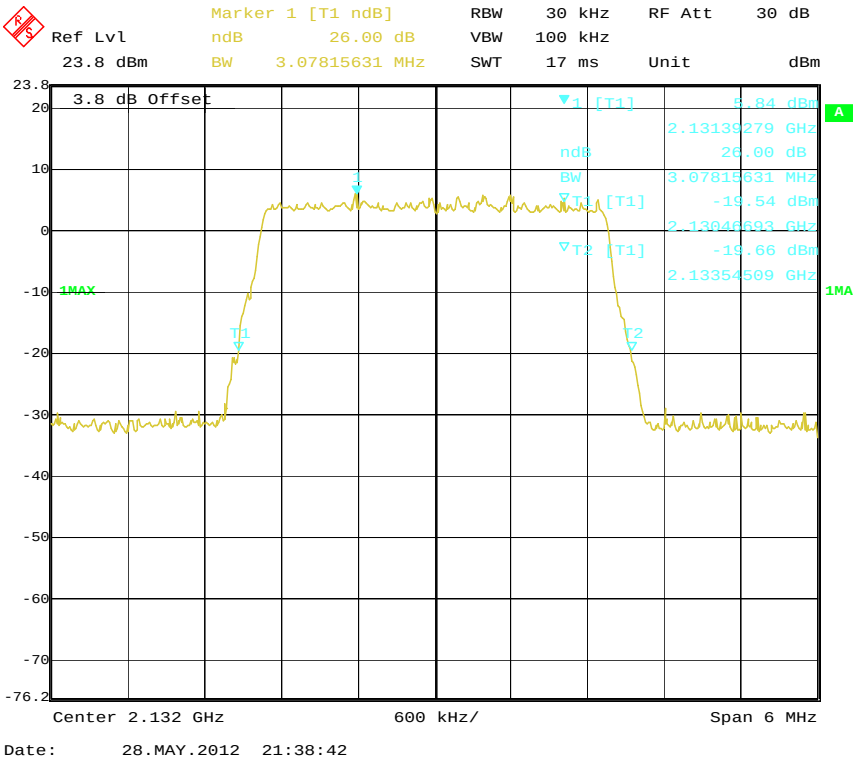
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

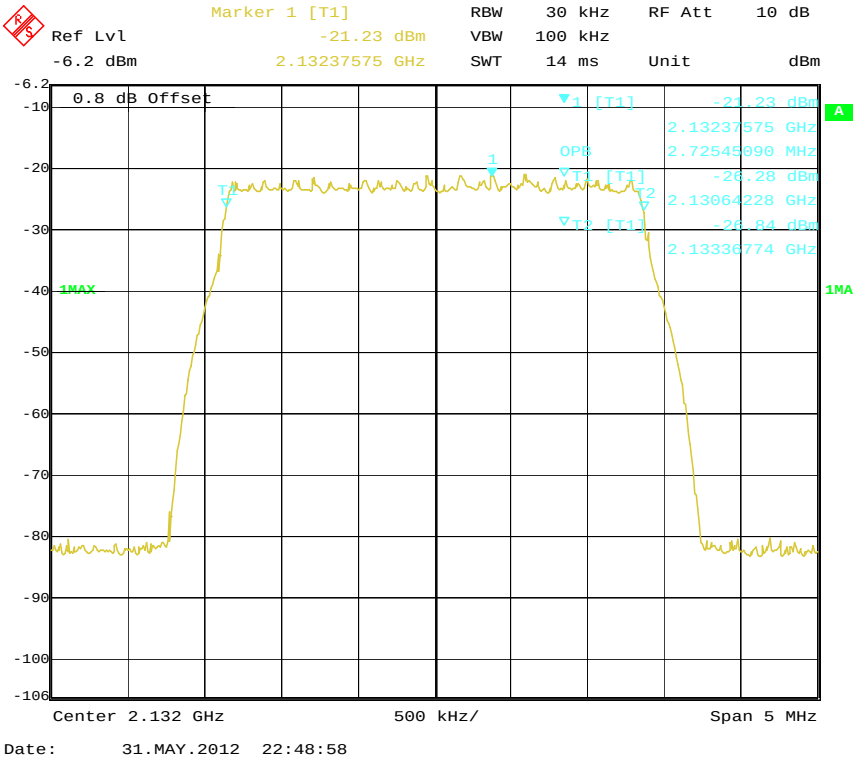


26 dB Bandwidth: Output Signal

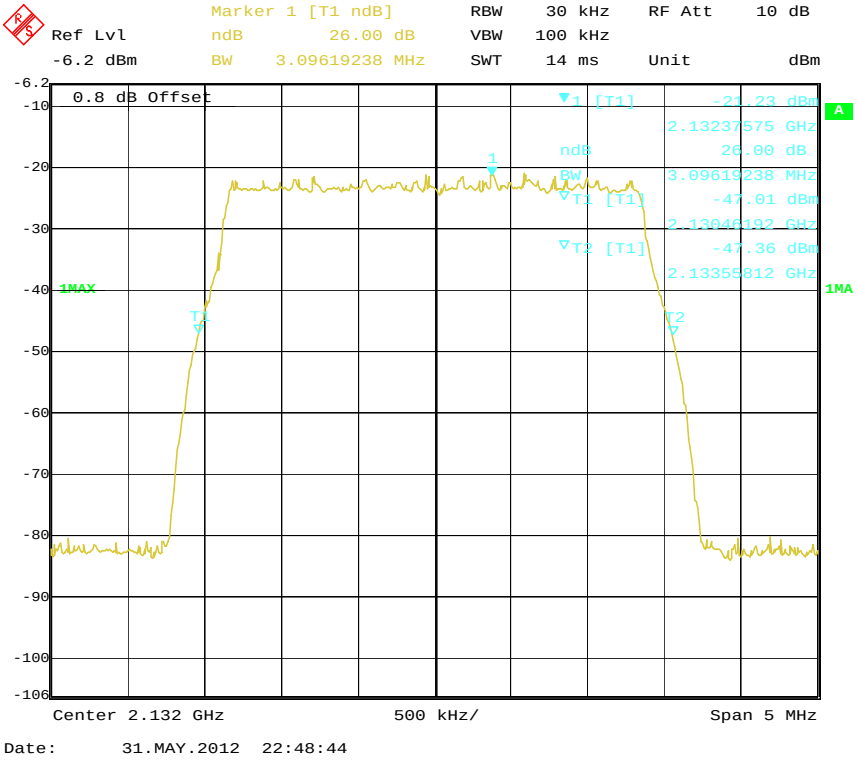


LTE2100-64QAM (3 MHz), Frequency: 2132 MHz

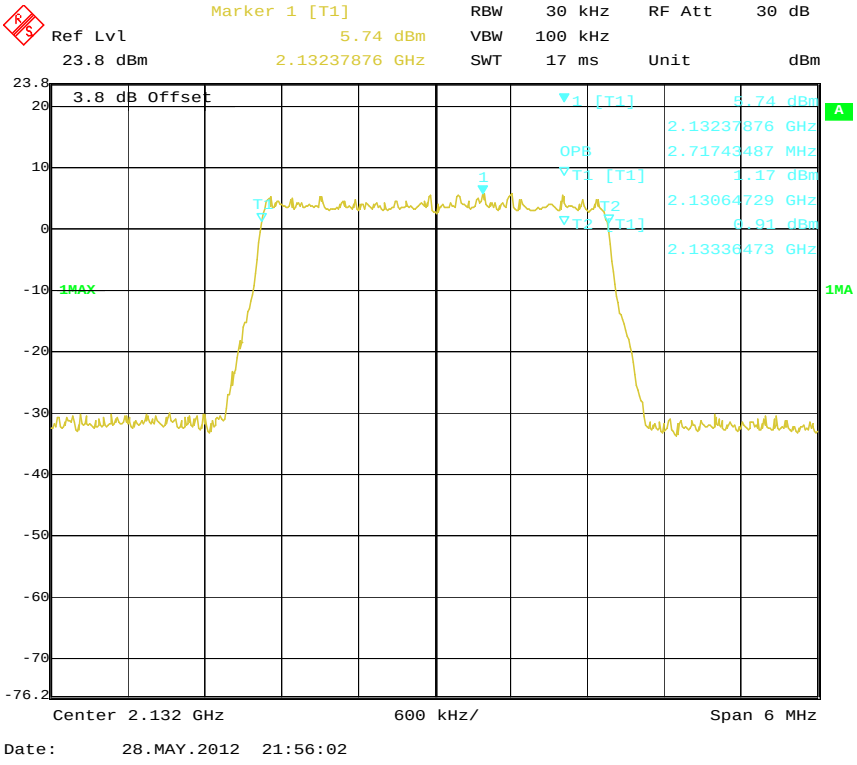
99% Occupied Bandwidth: Input Signal



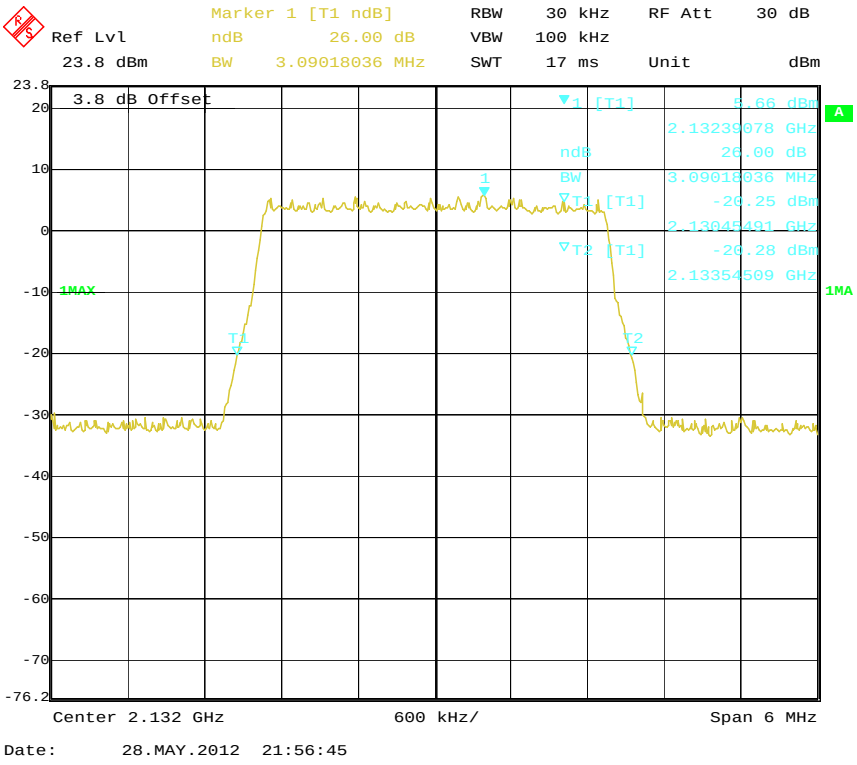
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

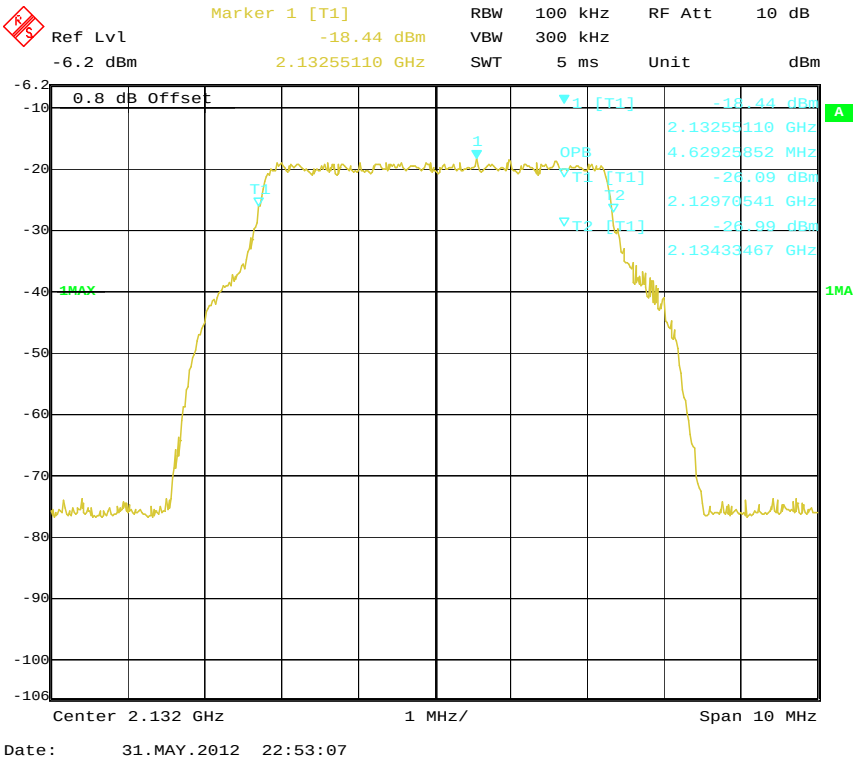


26 dB Bandwidth: Output Signal

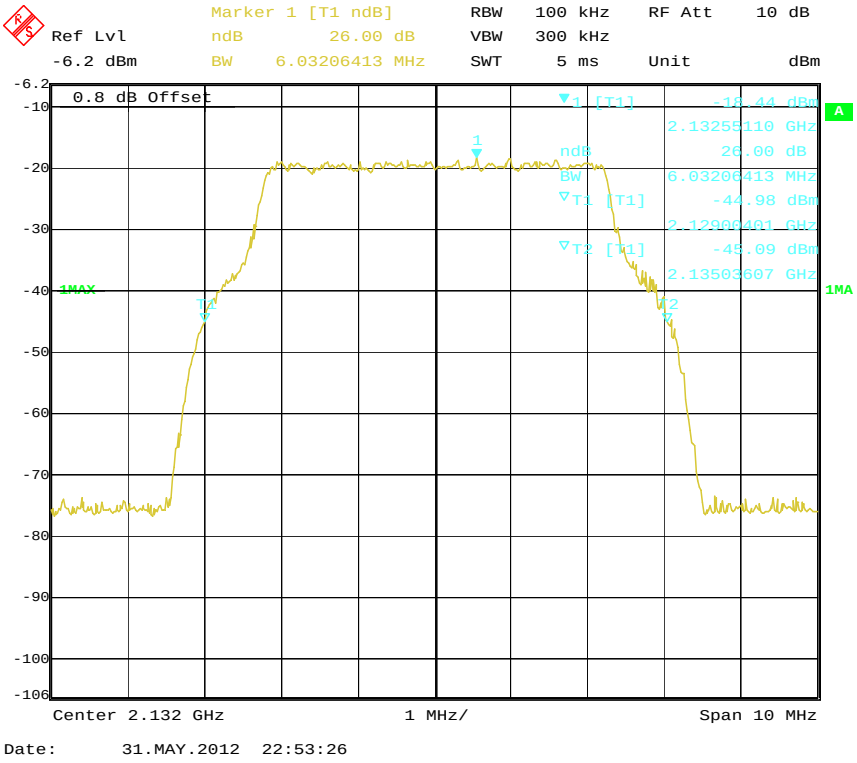


LTE2100-QPSK (5 MHz), Frequency: 2132 MHz

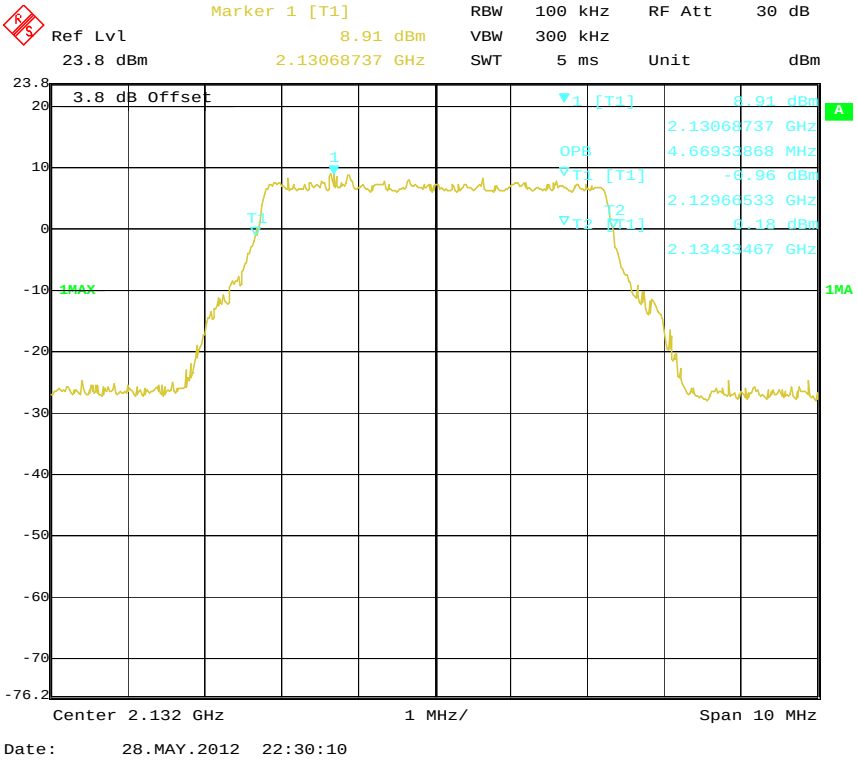
99% Occupied Bandwidth: Input Signal



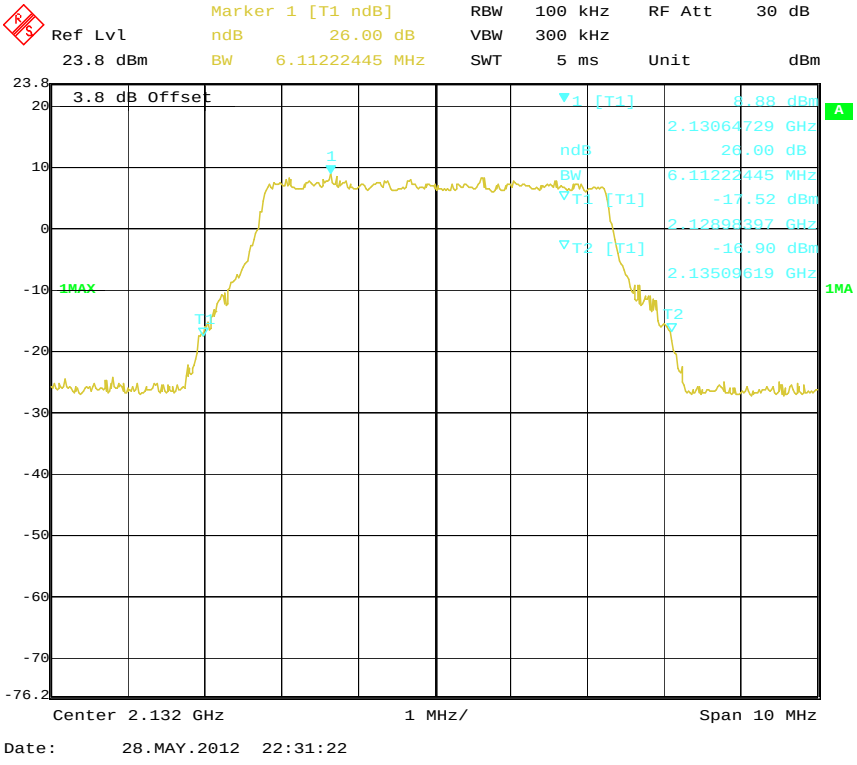
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

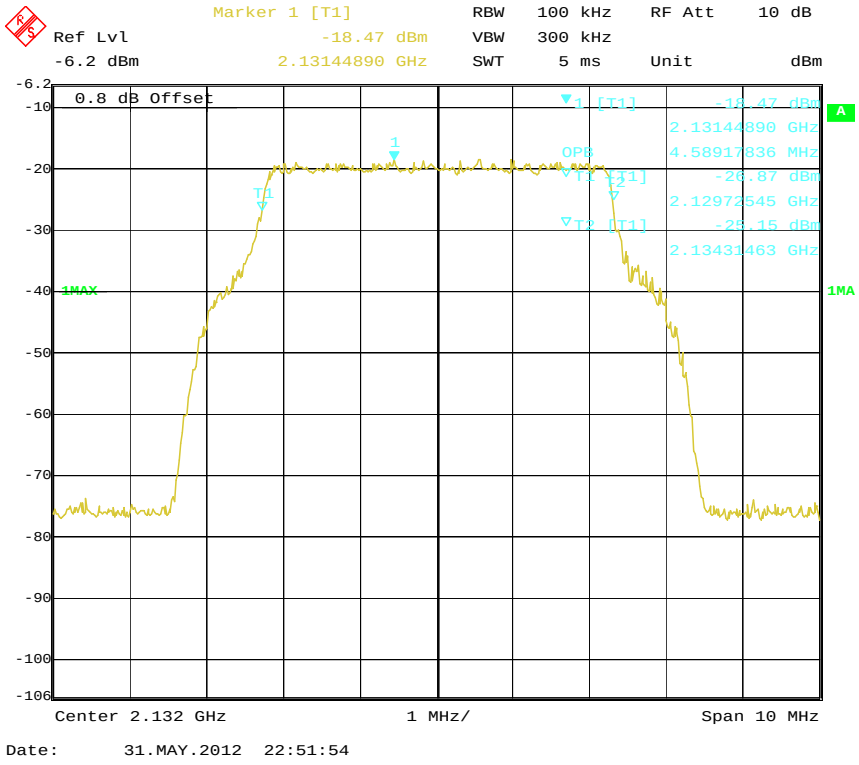


26 dB Bandwidth: Output Signal

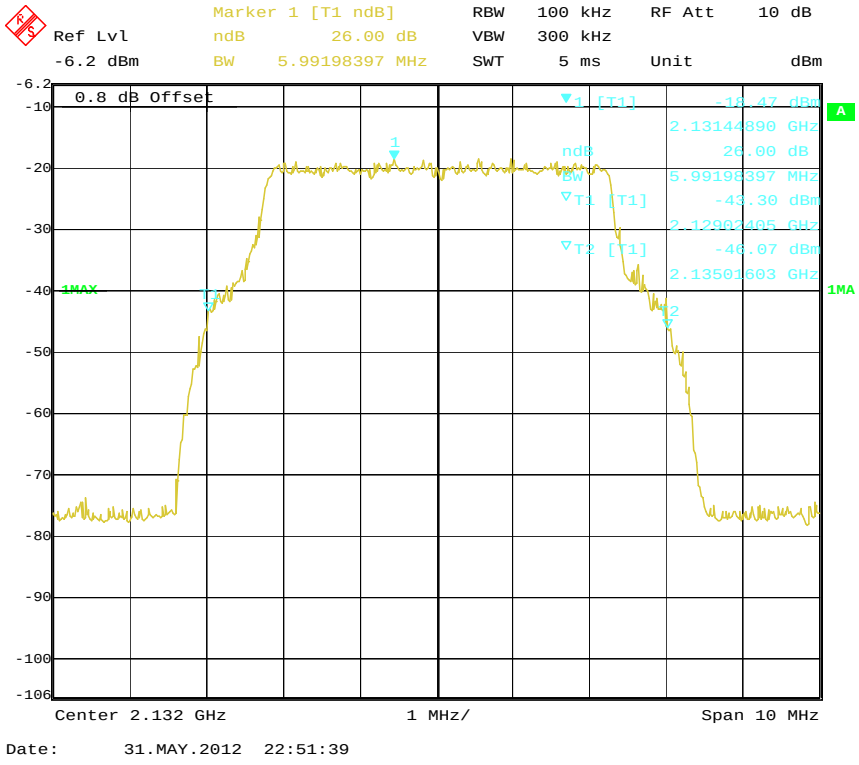


LTE2100-16QAM (5 MHz), Frequency: 2132 MHz

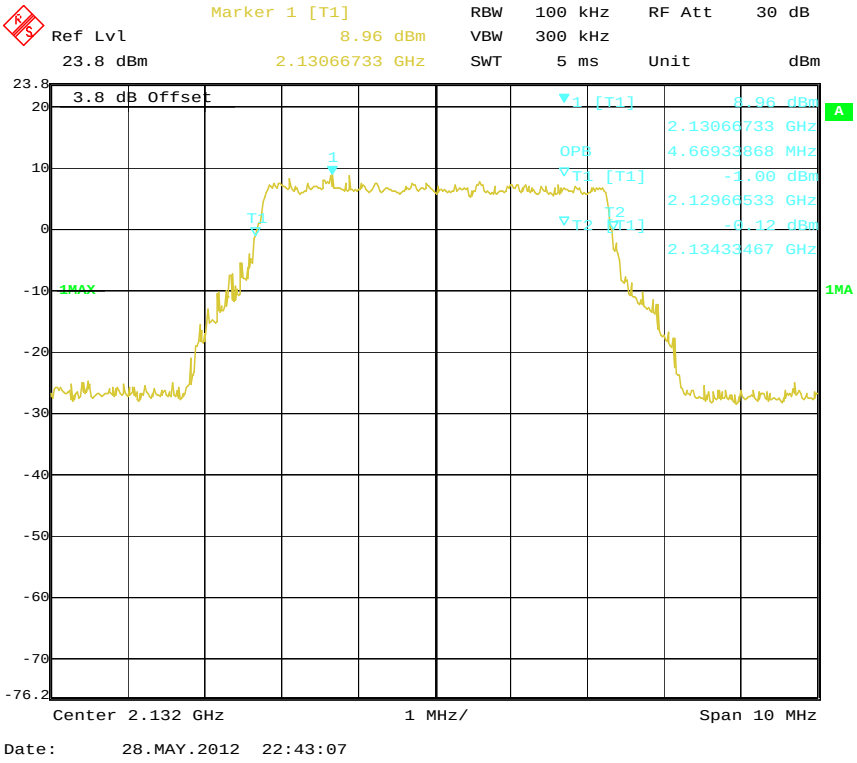
99% Occupied Bandwidth: Input Signal



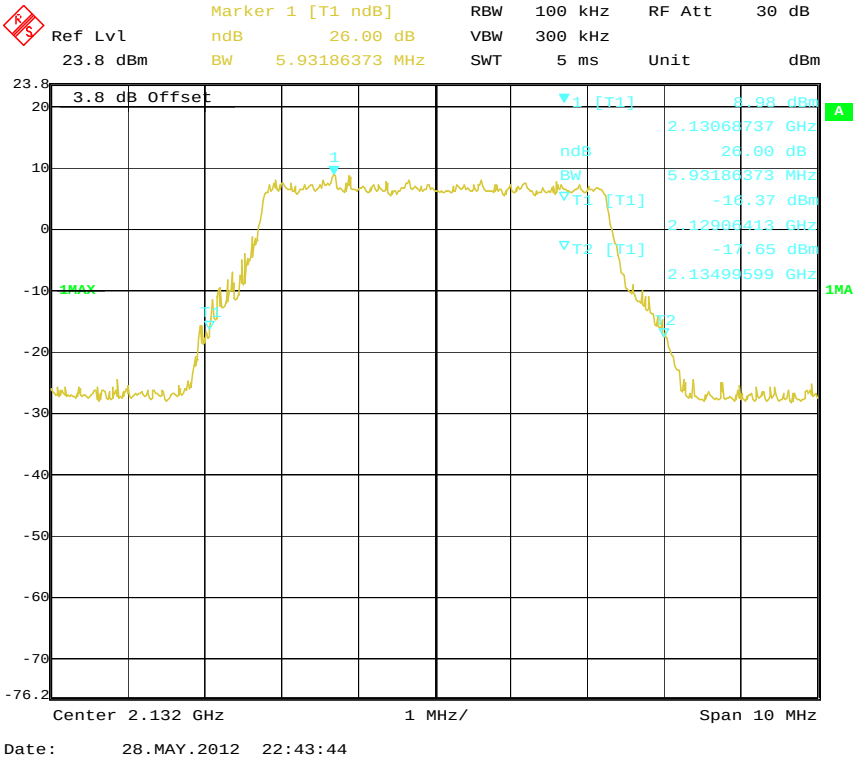
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

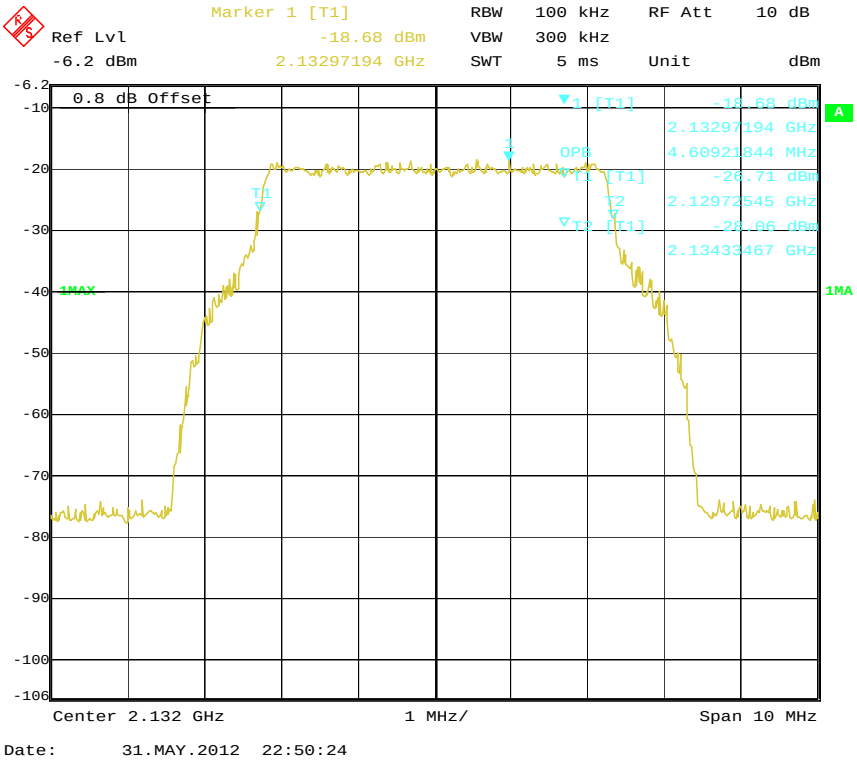


26 dB Bandwidth: Output Signal

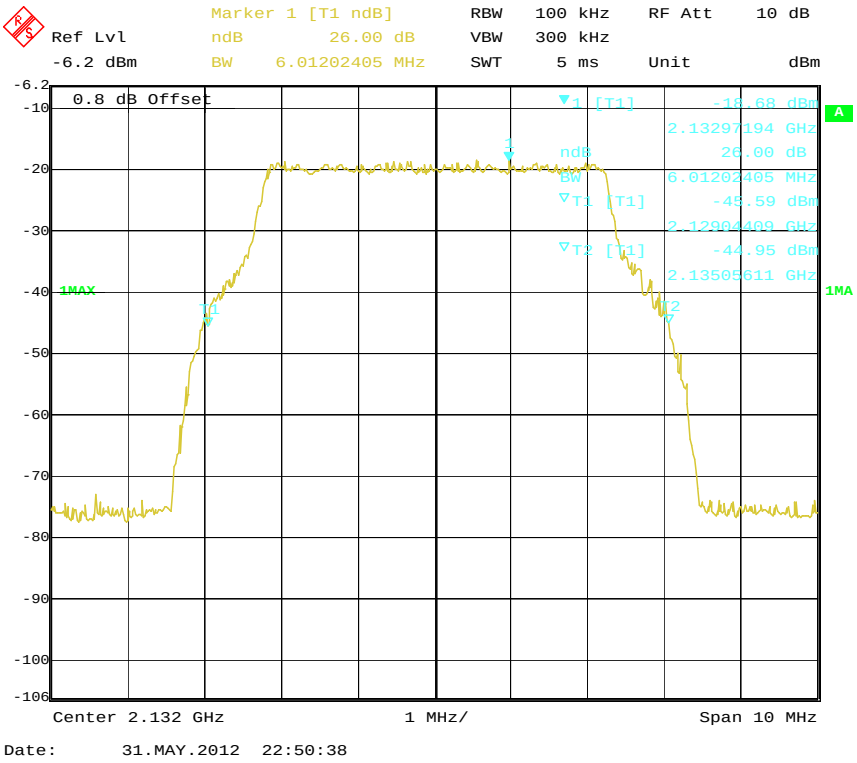


LTE2100-64QAM (5 MHz), Frequency: 2132 MHz

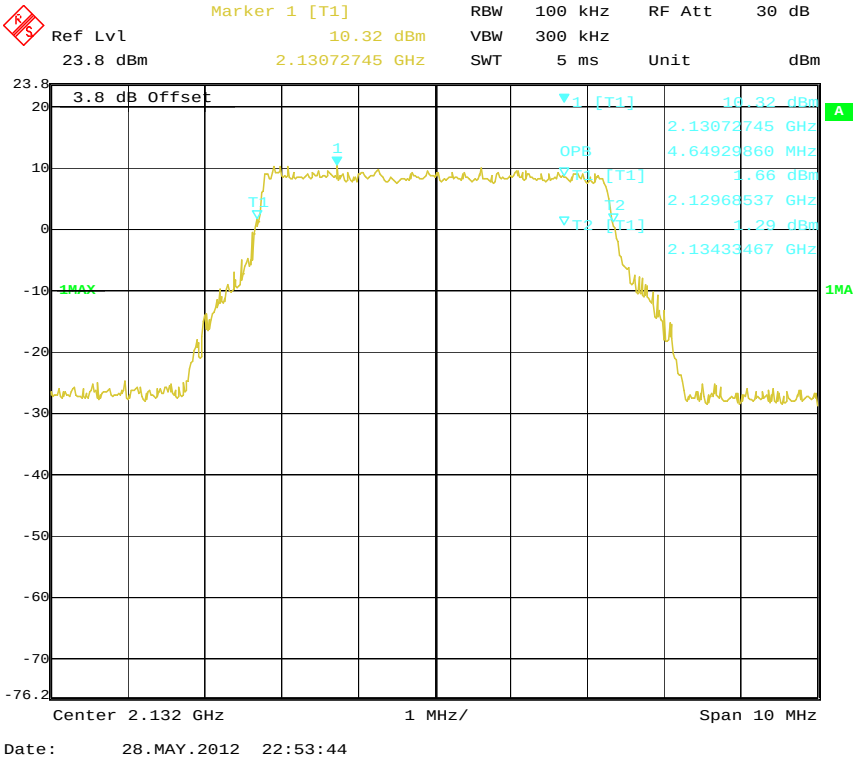
99% Occupied Bandwidth: Input Signal



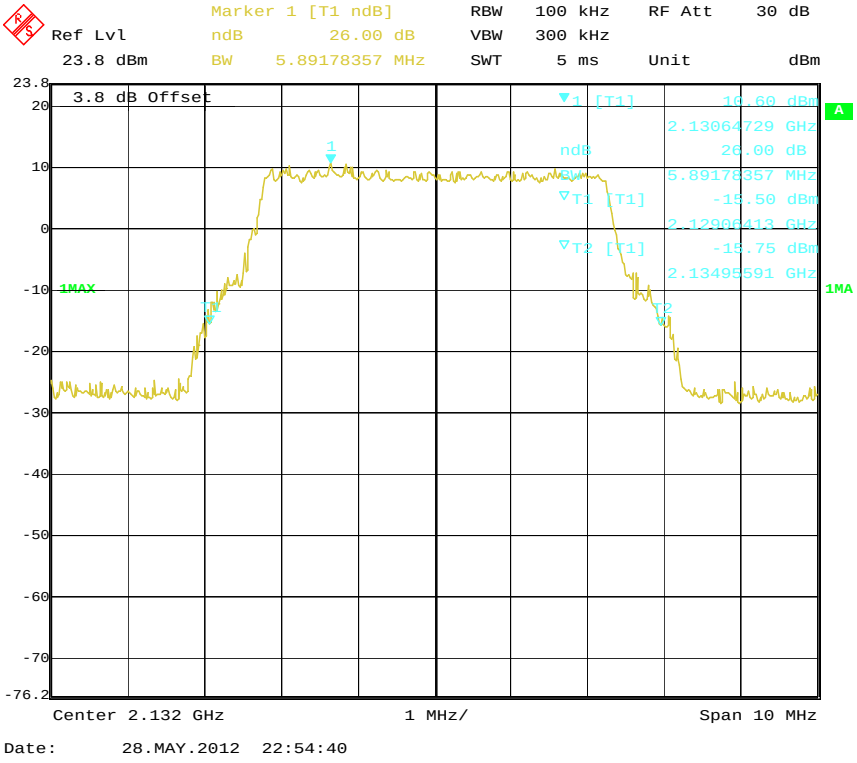
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

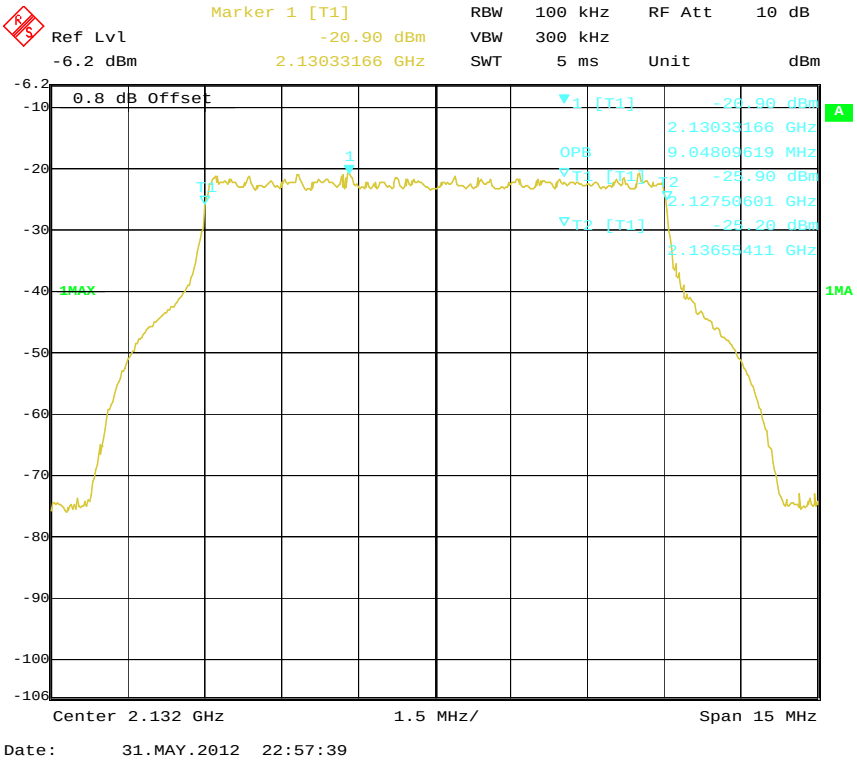


26 dB Bandwidth: Output Signal

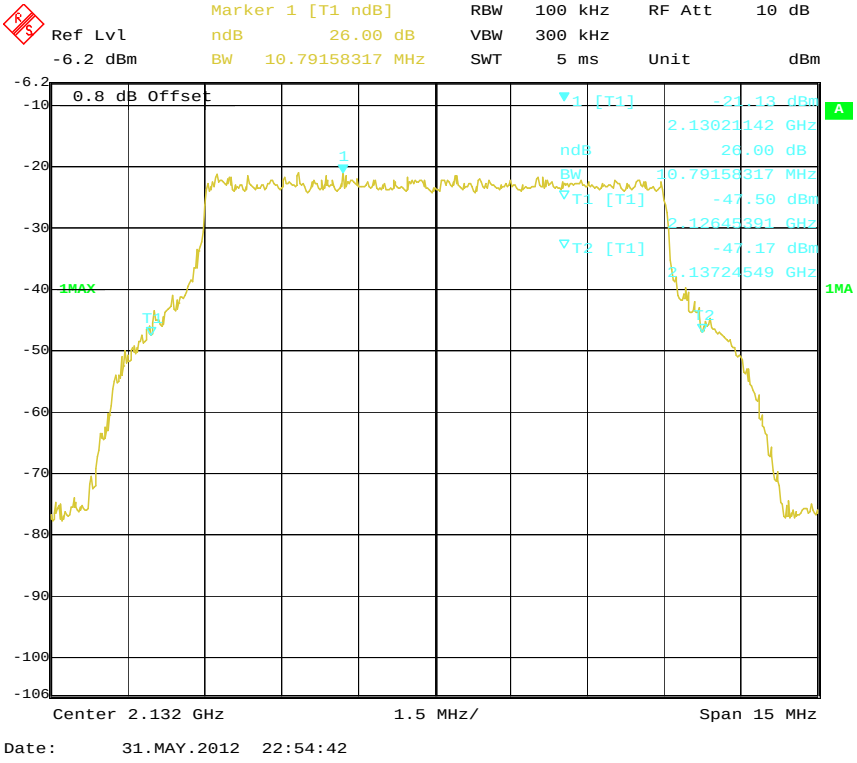


LTE2100-QPSK (10 MHz), Frequency: 2132 MHz

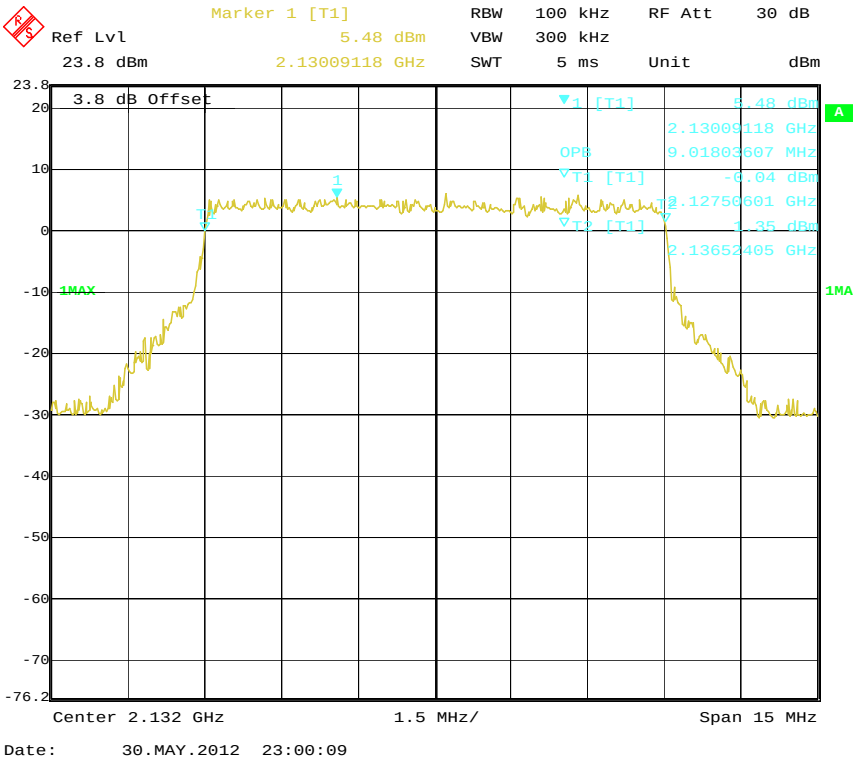
99% Occupied Bandwidth: Input Signal



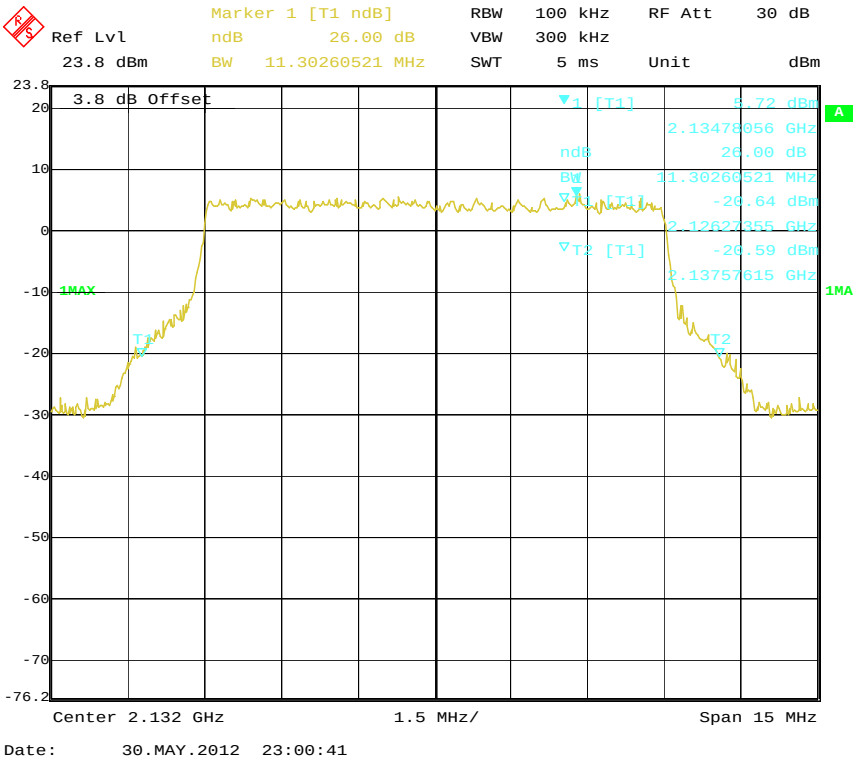
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

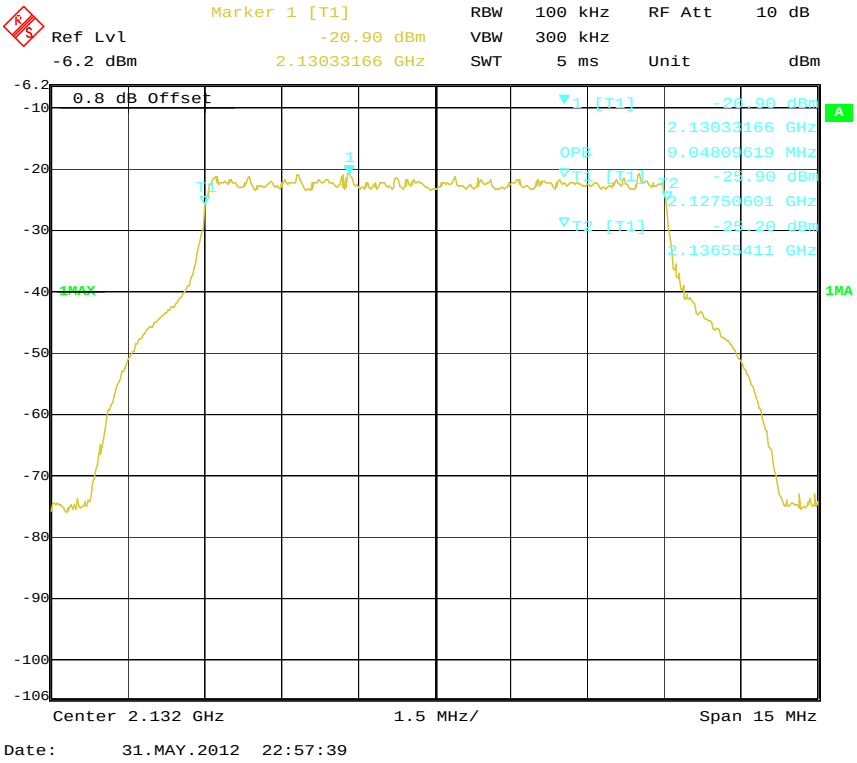


26 dB Bandwidth: Output Signal

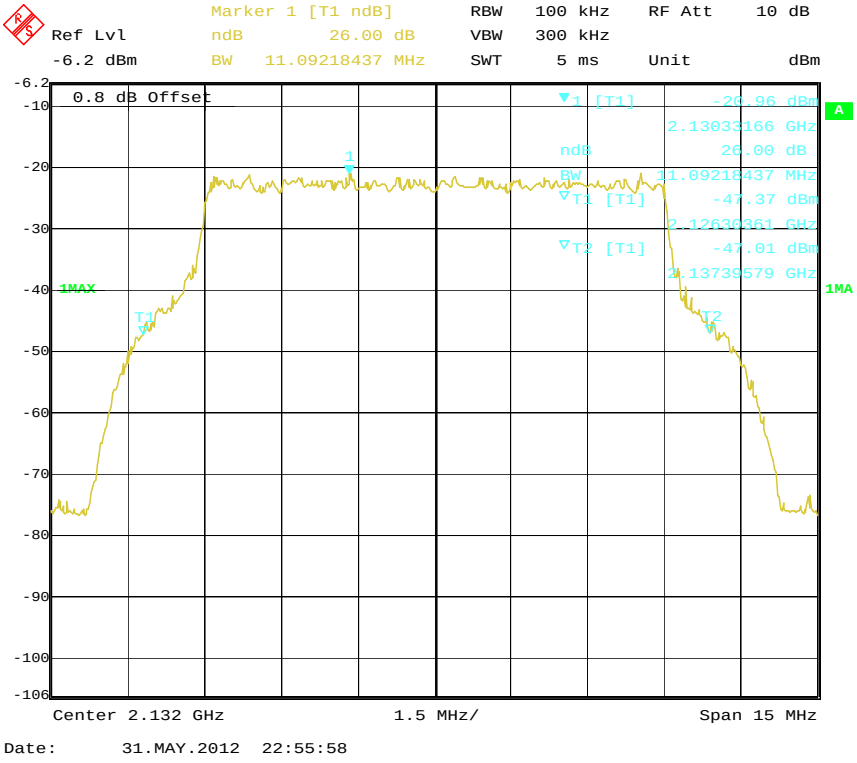


LTE2100-16QAM (10 MHz), Frequency: 2132 MHz

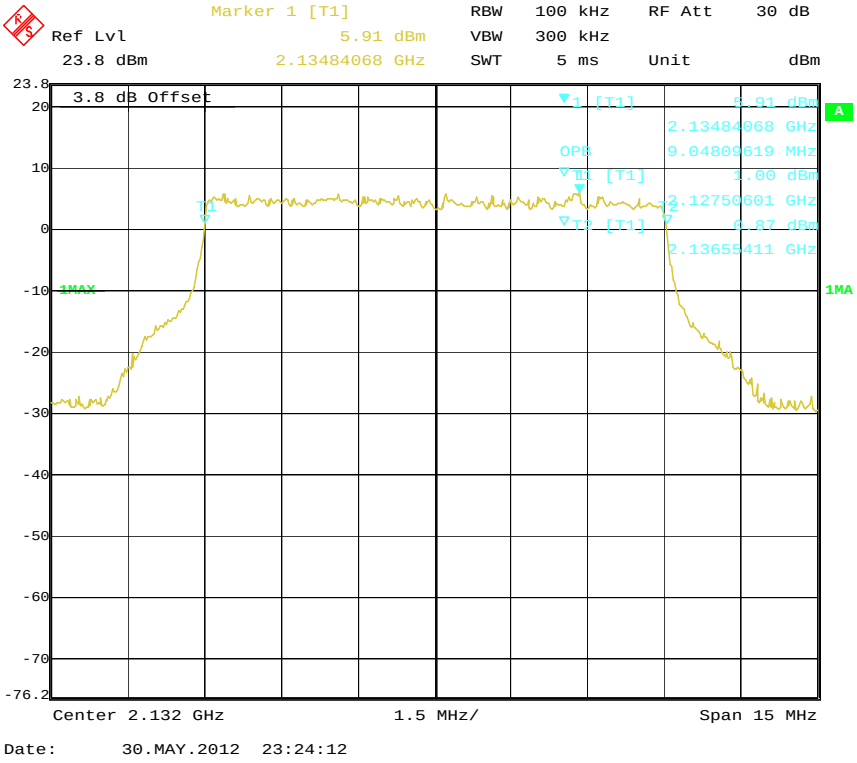
99% Occupied Bandwidth: Input Signal



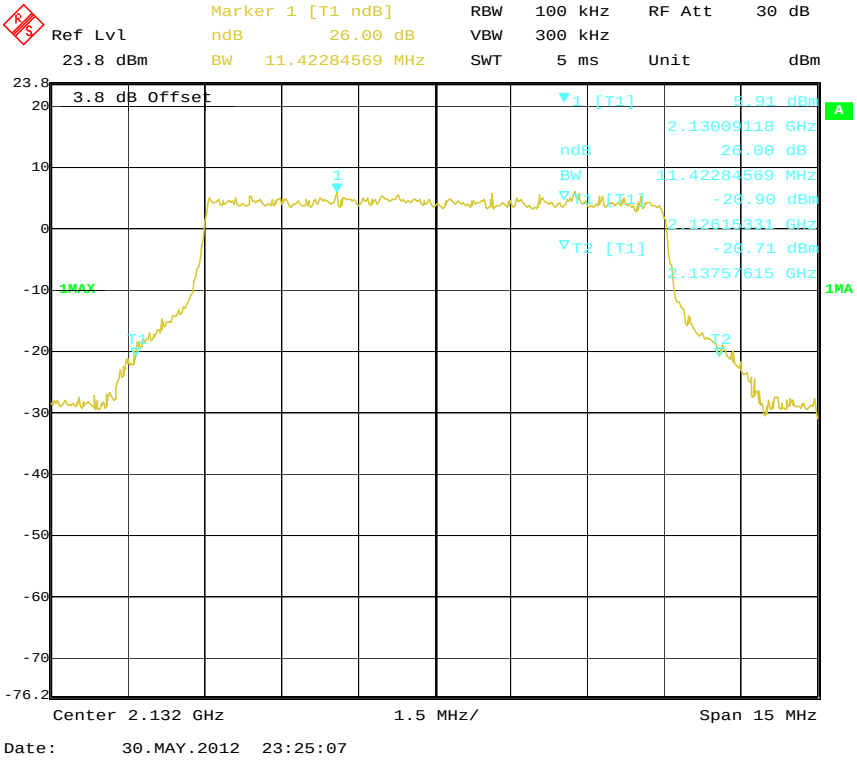
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal

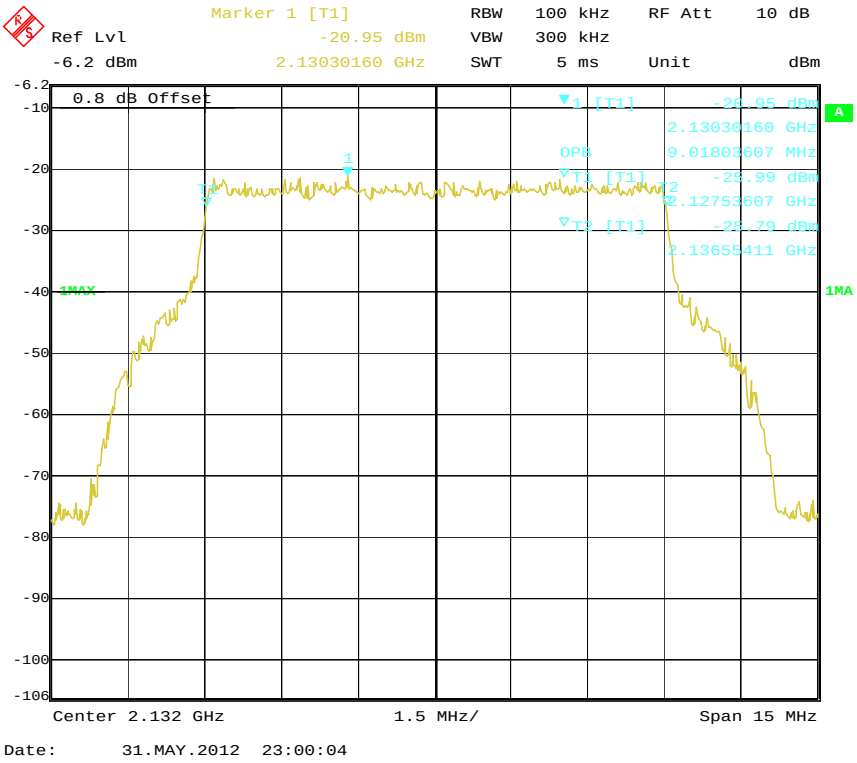


26 dB Bandwidth: Output Signal

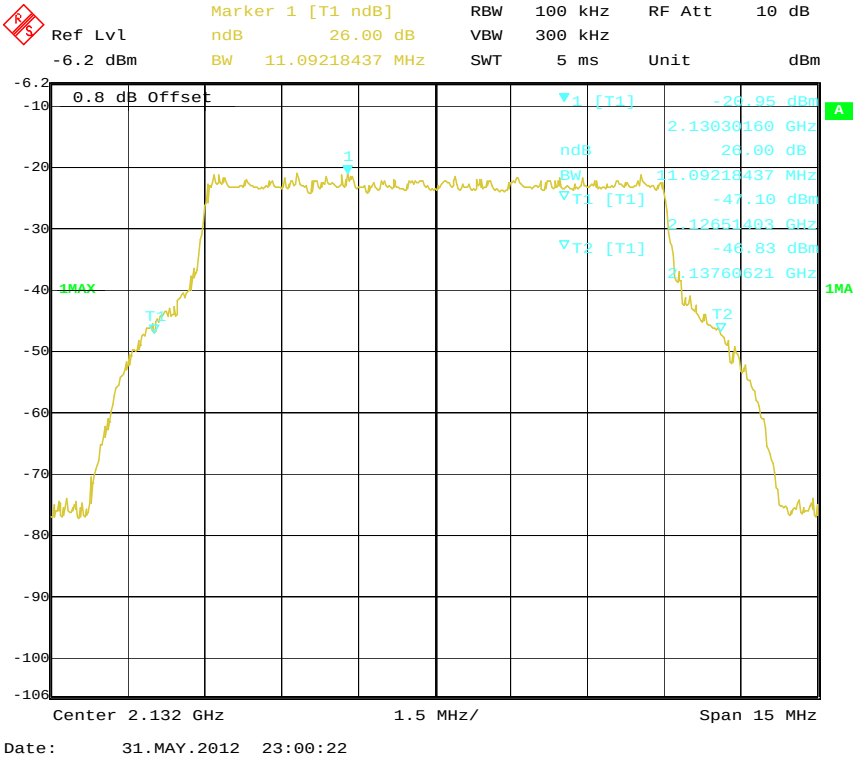


LTE2100-64QAM (10 MHz), Frequency: 2132 MHz

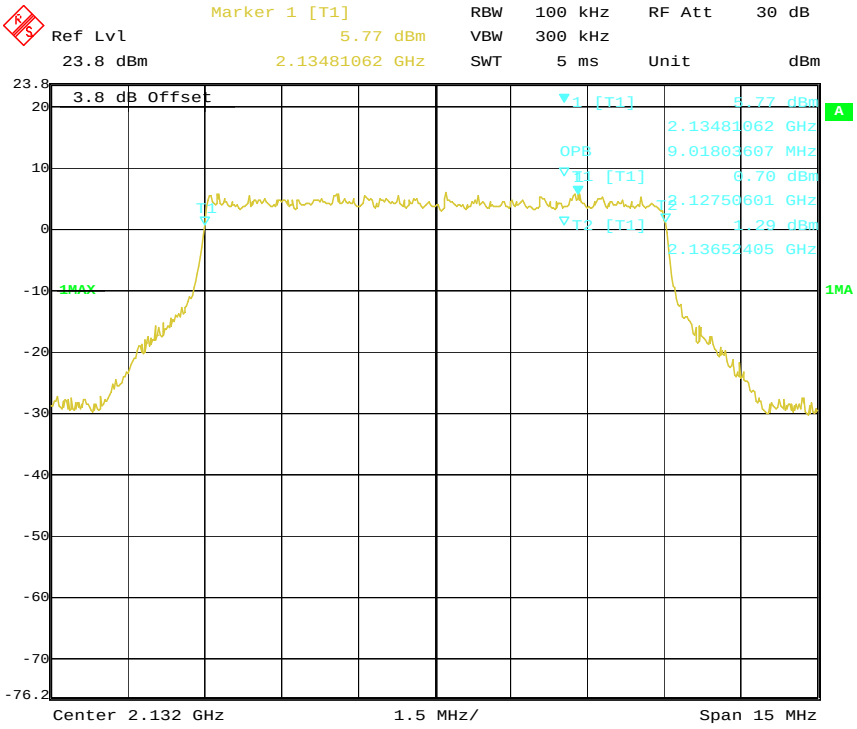
99% Occupied Bandwidth: Input Signal



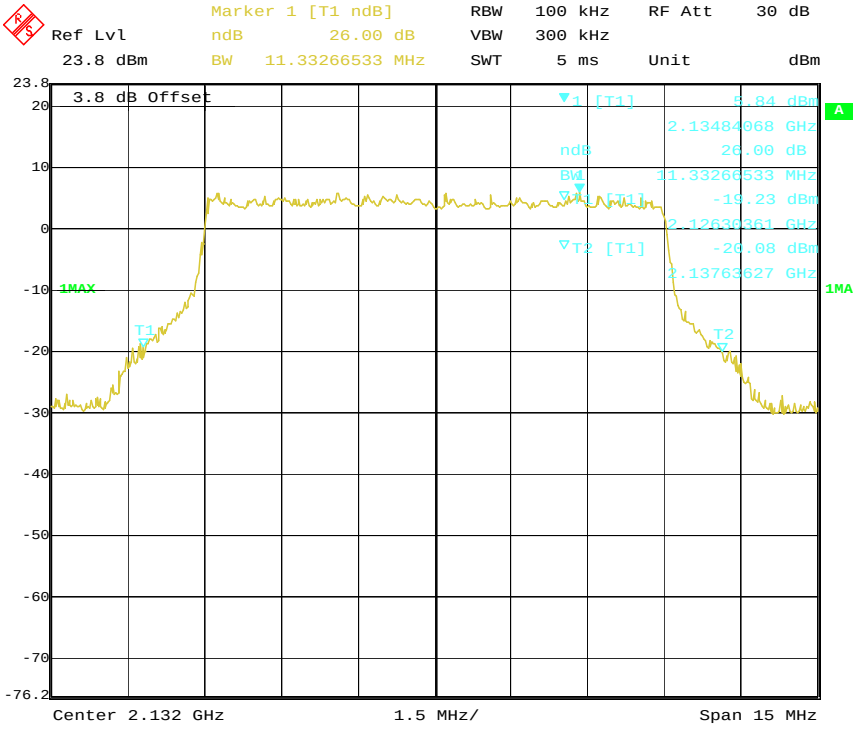
26 dB Bandwidth: Input Signal



99% Occupied Bandwidth: Output Signal



26 dB Bandwidth: Output Signal



UMTS2100 Mode:

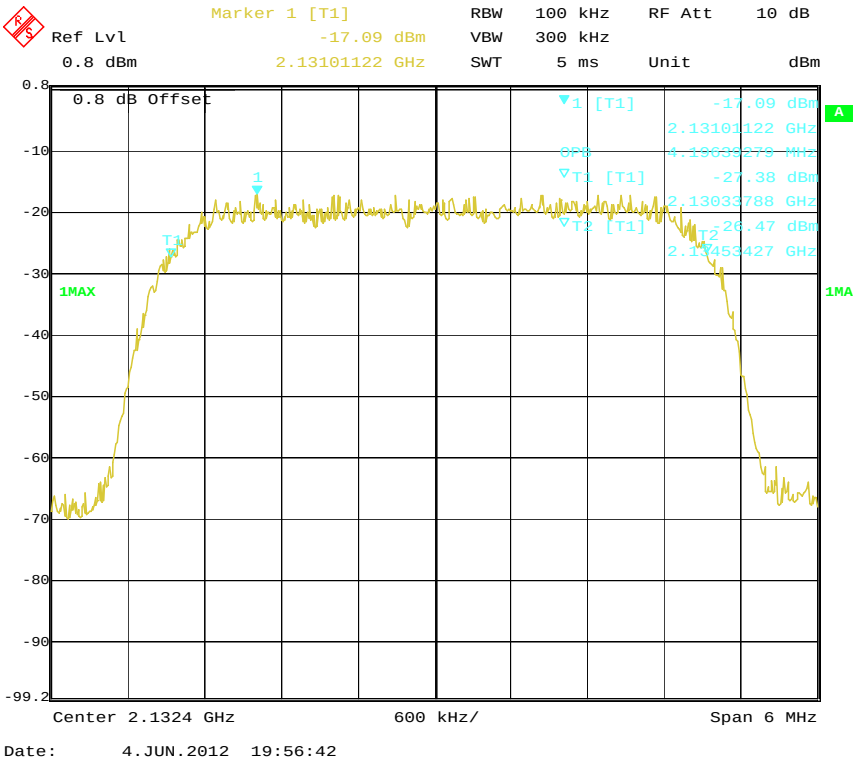
Input Signal:

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Downlink	Middle Channel	2132.4	4.1964	4.7495

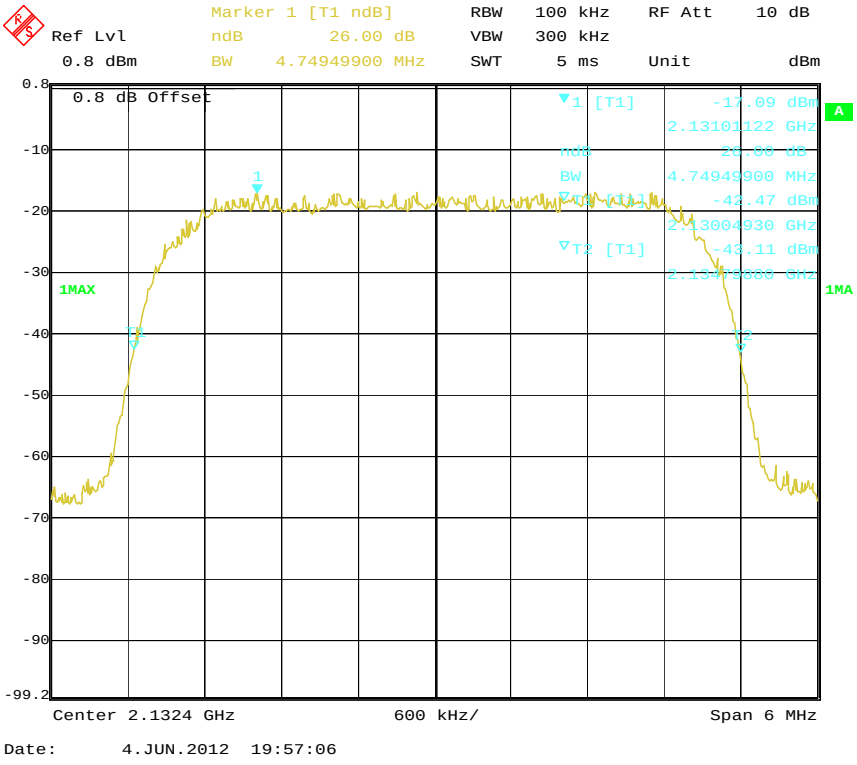
Output Signal:

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Downlink	Middle Channel	2132.4	4.1880	4.7400

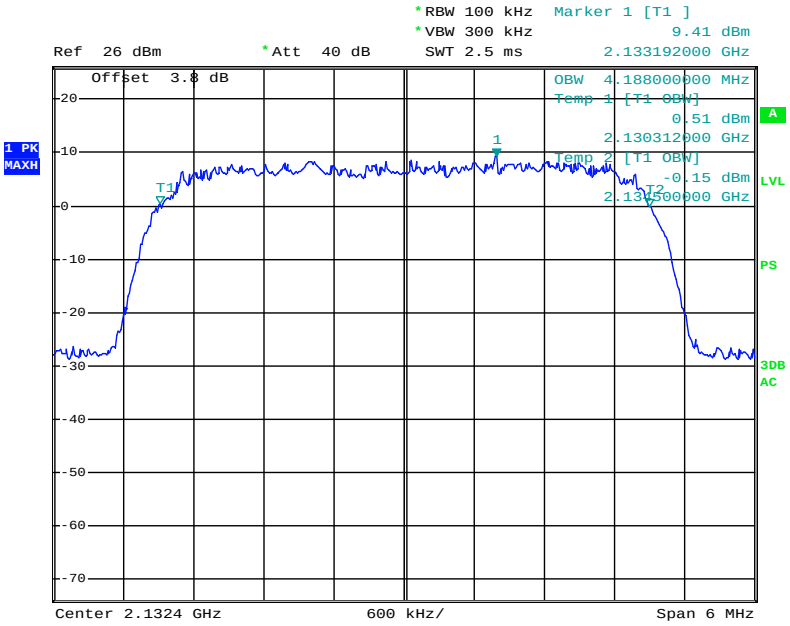
UMTS2100 - 99% Occupied Bandwidth: Input Signal



UMTS2100 - 26 dB Bandwidth: Input Signal

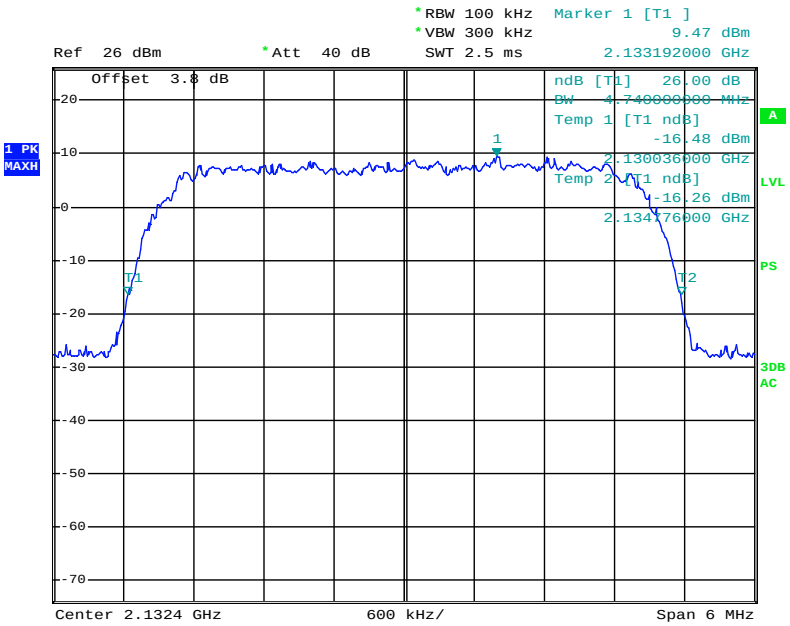


UMTS2100 - 99% Occupied Bandwidth: Output Signal



Date: 13.MAY.2012 16:12:31

UMTS2100 - 26 dB Bandwidth: Output Signal



Date: 13.MAY.2012 16:12:03

FCC §2.1051 & §27.53- SPURIOUS EMISSIONS AT ANTENNA TERMINALS

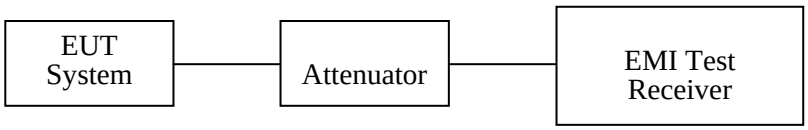
Applicable Standards

FCC §2.1051 and §27.53.

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 1 MHz. sufficient scans were taken to show any out of band emissions up to 10^{th} harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2011-12-16	2012-12-15
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
Rohde & Schwarz	Vector Signal Generator	SMU200A	GB40051862	2011-08-06	2012-08-05
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

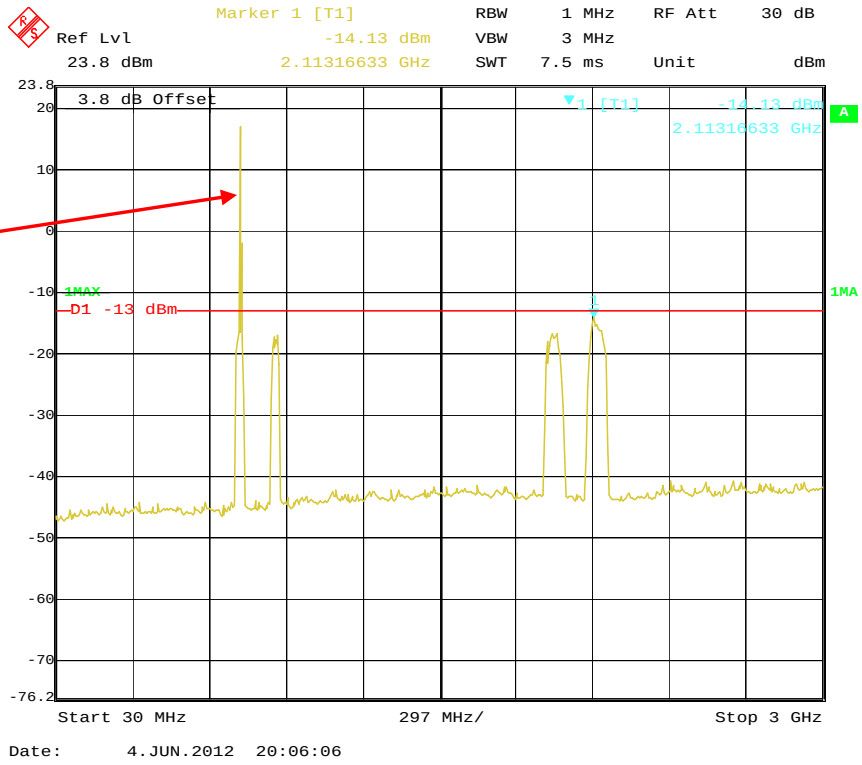
The testing was performed by Jimmy Xiao from 2012-05-13 to 2012-06-27.

Please refer to the following plots.

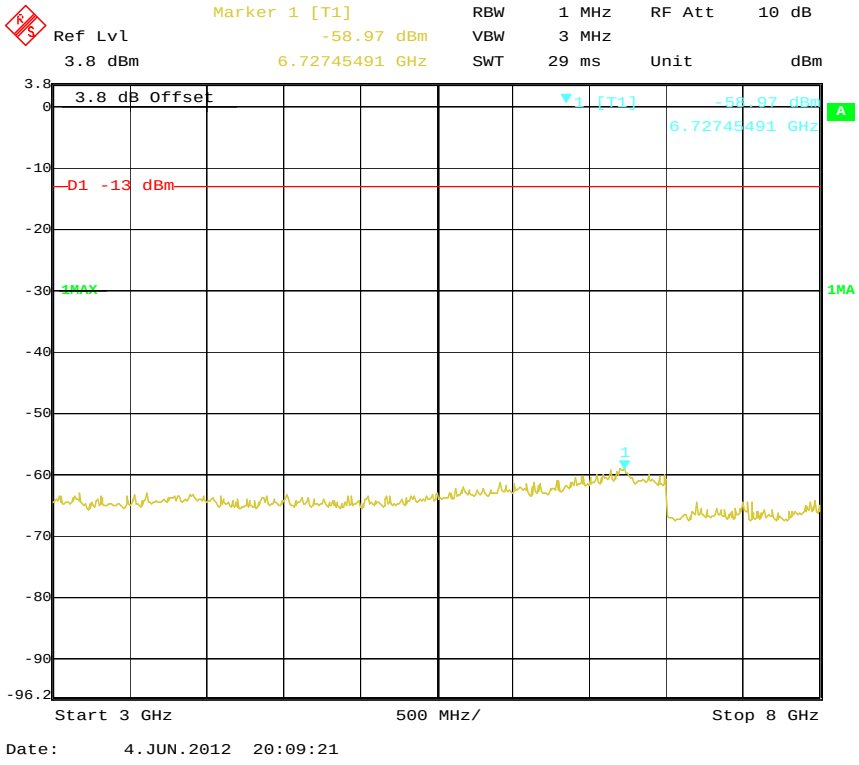
LTE700 (728-746MHz) Mode:

30 MHz - 3 GHz

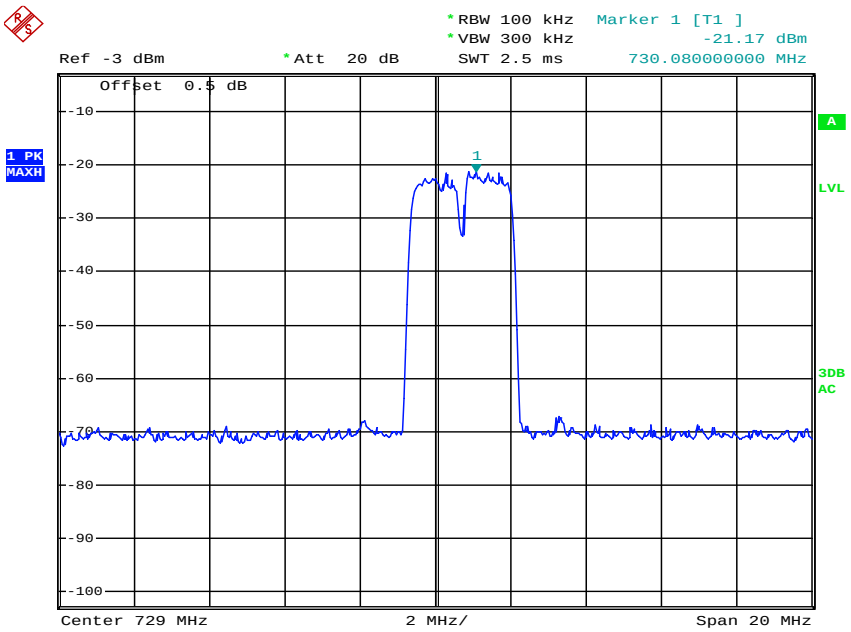
Fundamental



3 GHz - 8 GHz

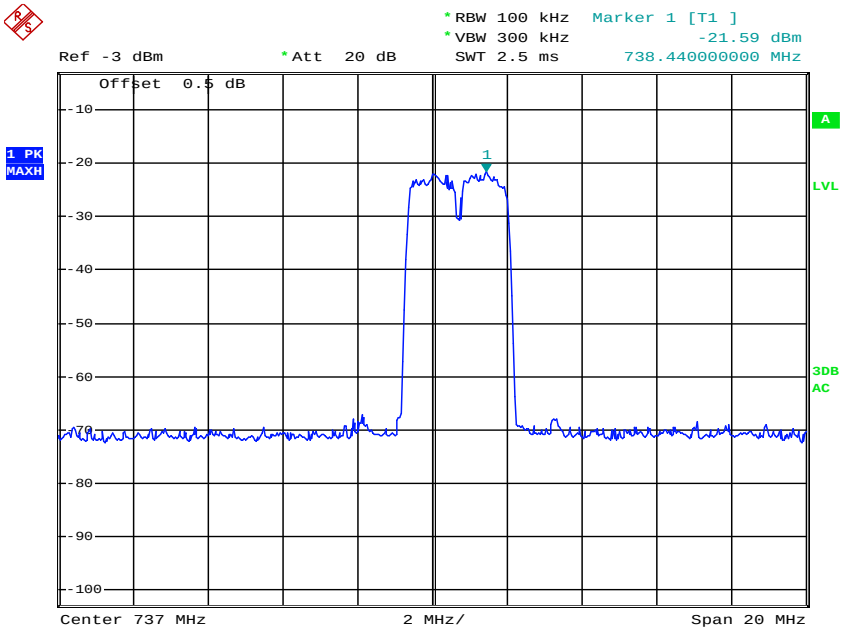


1.4 MHz Inter-modulation, Low Channel (Input Signal)



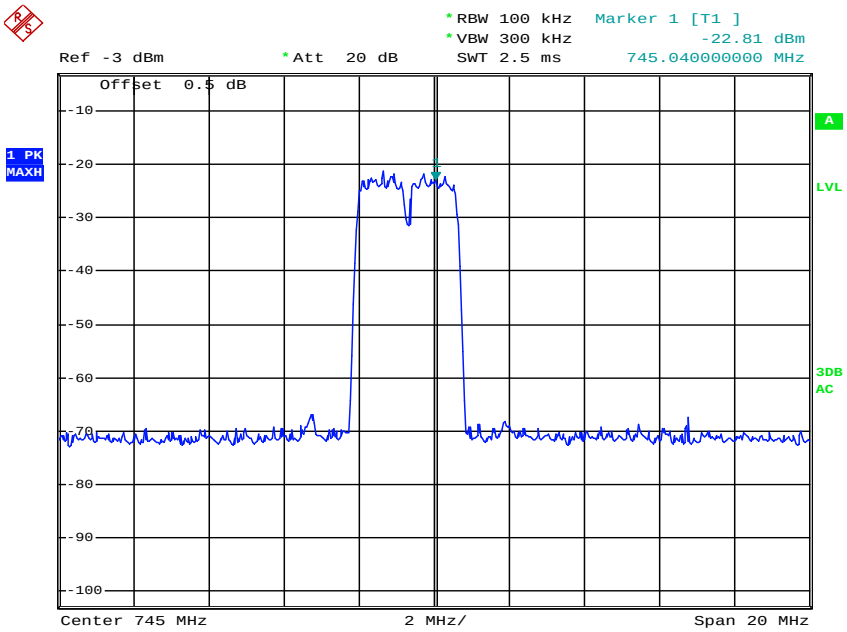
Date: 27.JUN.2012 09:07:11

1.4 MHz Inter-modulation, Middle Channel (Input Signal)



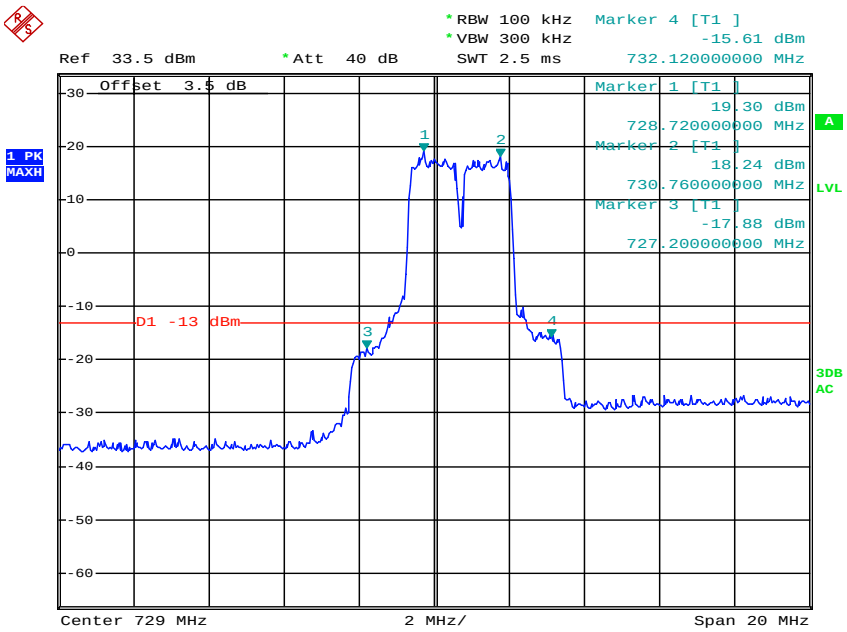
Date: 27.JUN.2012 09:08:24

1.4 MHz Inter-modulation, High Channel (Input Signal)



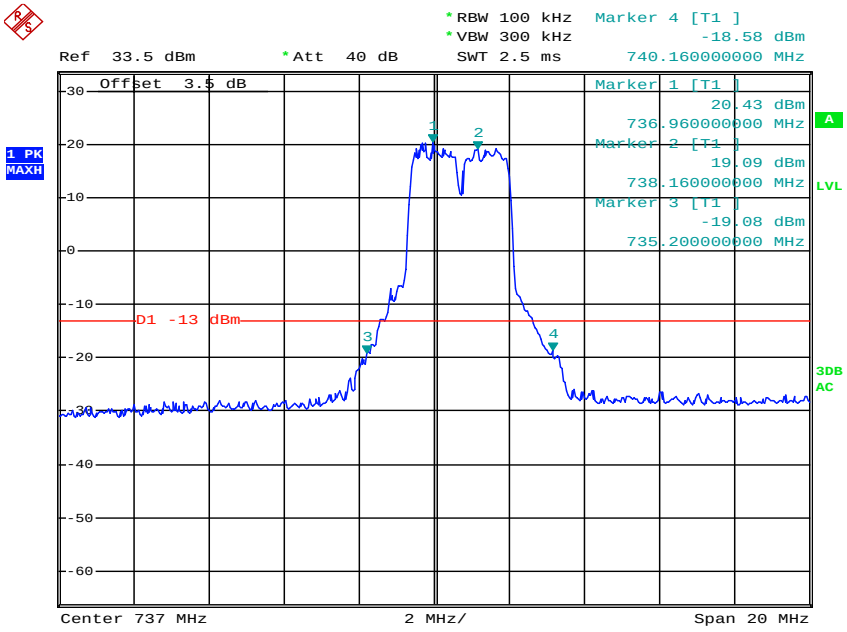
Date: 27.JUN.2012 09:10:31

1.4 MHz Inter-modulation, Low Channel (Output Signal)



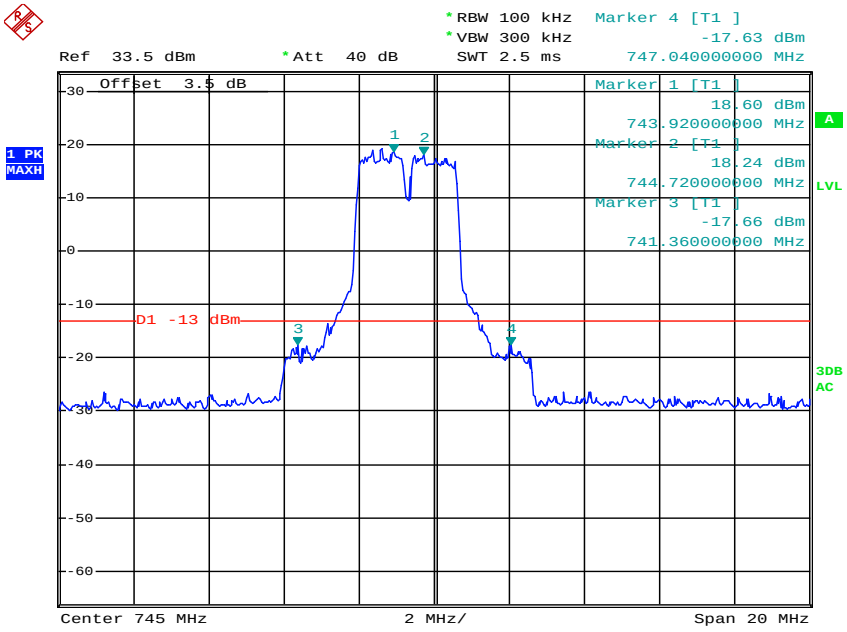
Date: 27.JUN.2012 12:21:04

1.4 MHz Inter-modulation, Middle Channel (Output Signal)



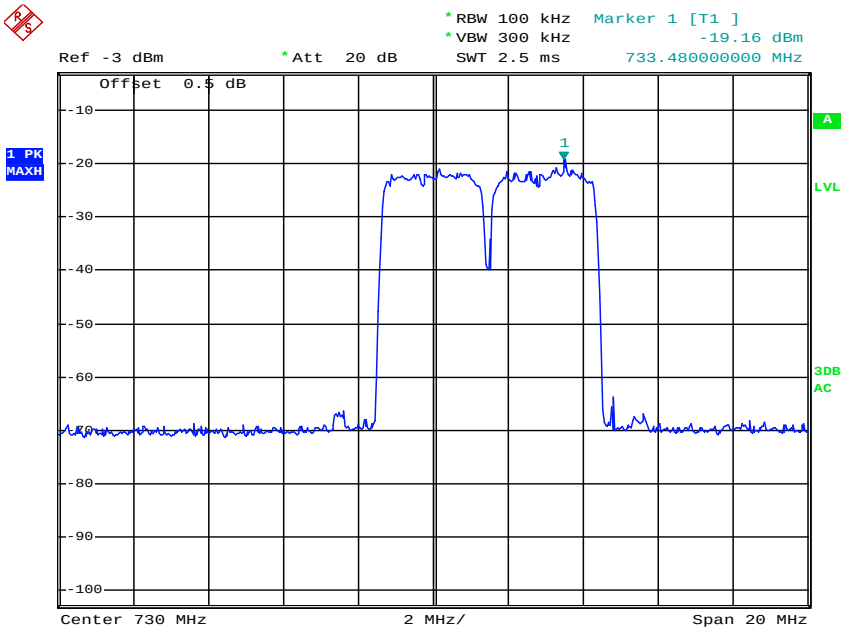
Date: 27.JUN.2012 12:24:09

1.4 MHz Inter-modulation, High Channel (Output Signal)



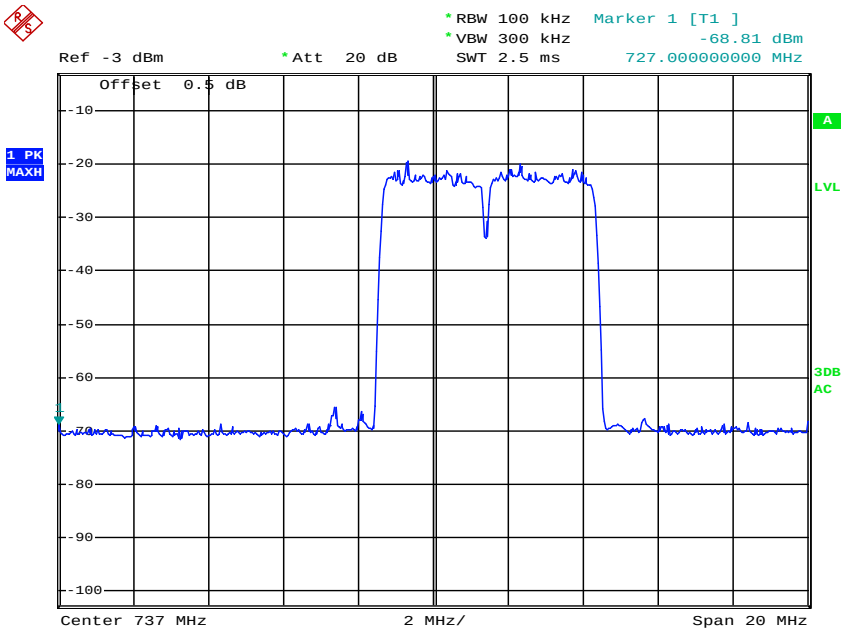
Date: 27.JUN.2012 12:29:24

3 MHz Inter-modulation, Low Channel (Input Signal)



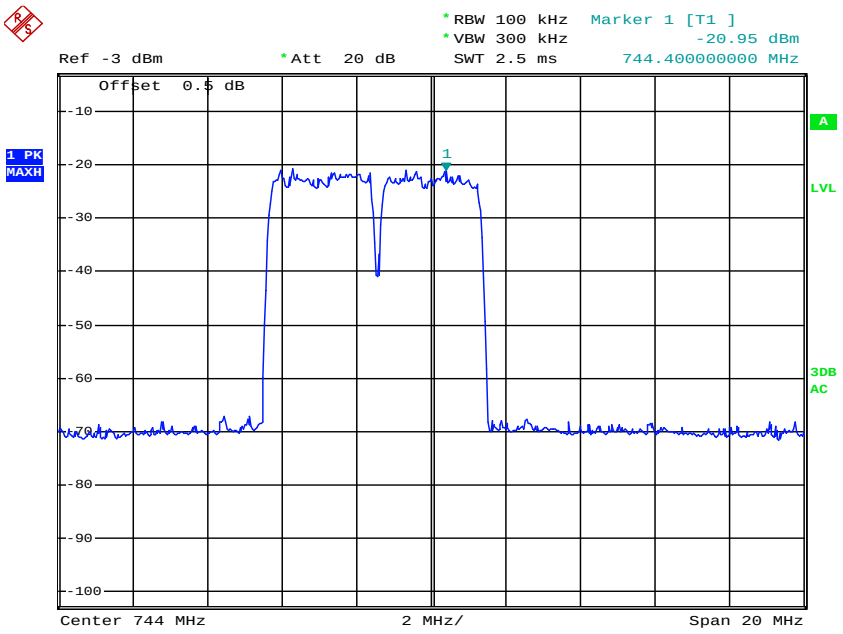
Date: 27.JUN.2012 09:18:34

3 MHz Inter-modulation, Middle Channel (Input Signal)



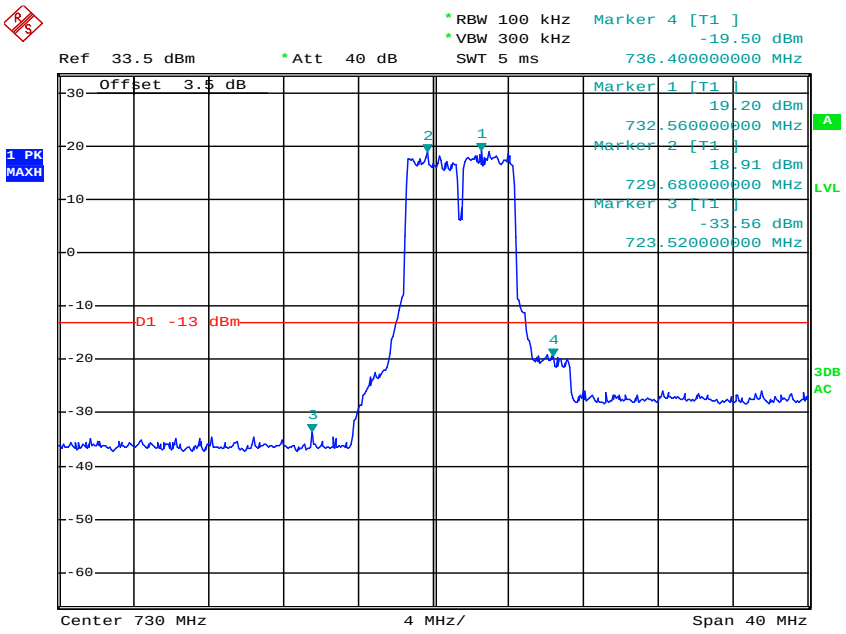
Date: 27.JUN.2012 09:20:35

3 MHz Inter-modulation, High Channel (Input Signal)



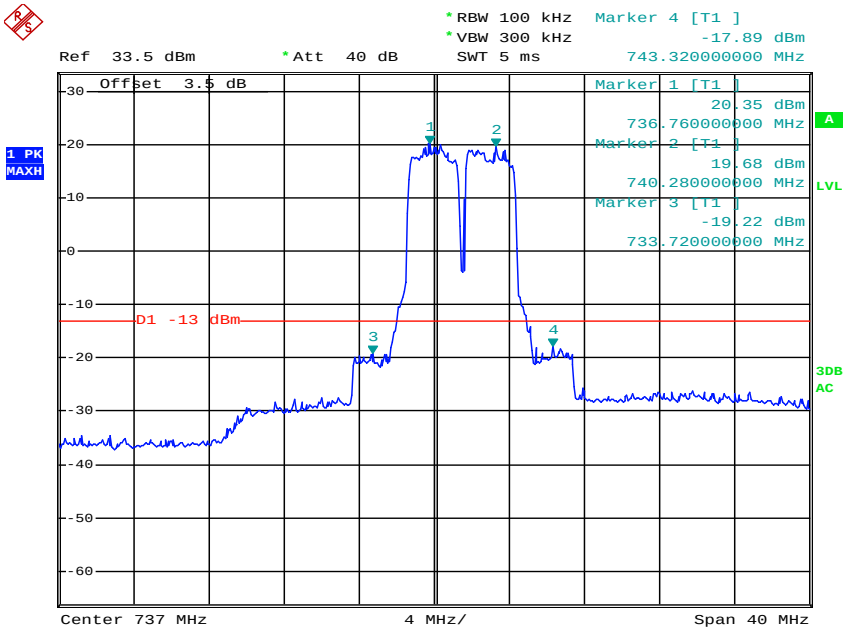
Date: 27.JUN.2012 09:25:55

3 MHz Inter-modulation, Low Channel (Output Signal)



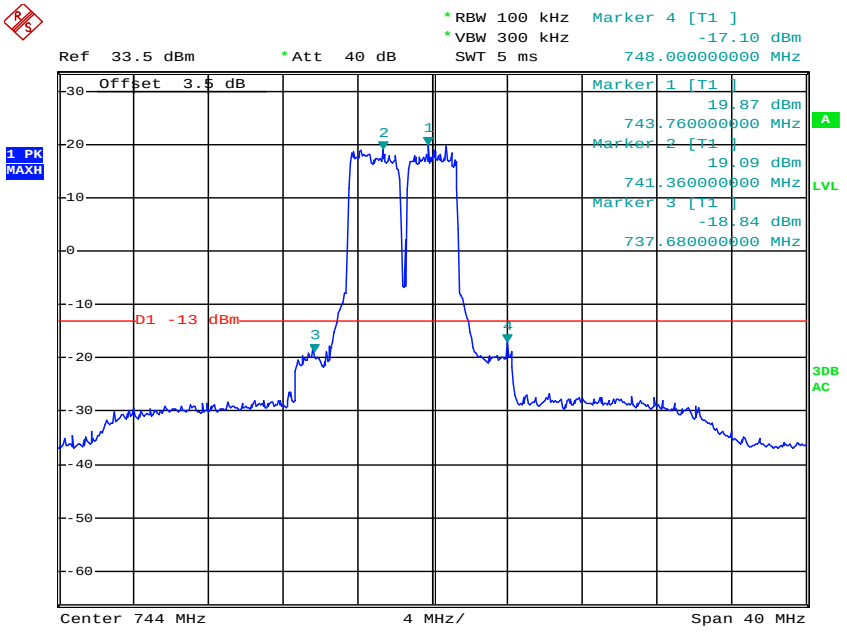
Date: 27.JUN.2012 14:32:45

3 MHz Inter-modulation, Middle Channel (Output Signal)



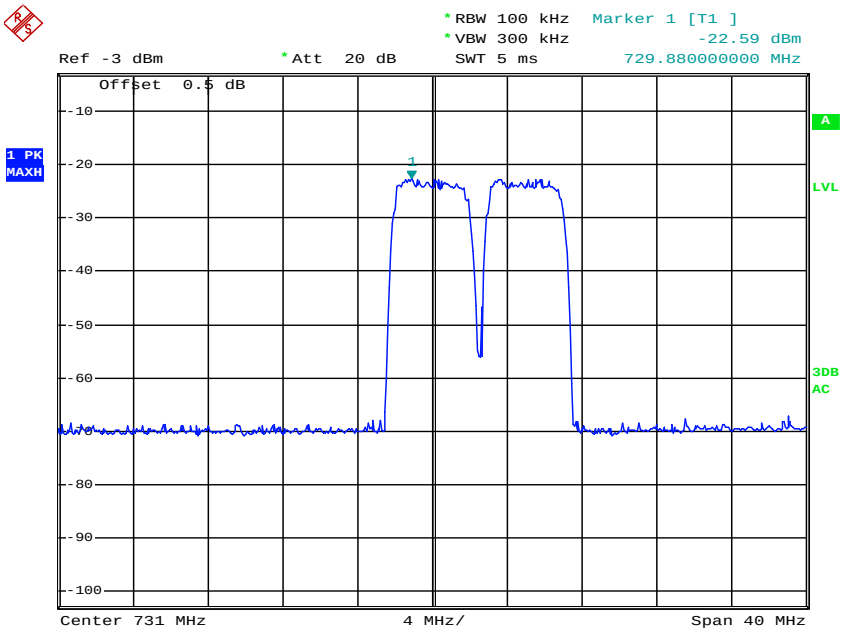
Date: 27.JUN.2012 14:36:06

3 MHz Inter-modulation, High Channel (Output Signal)



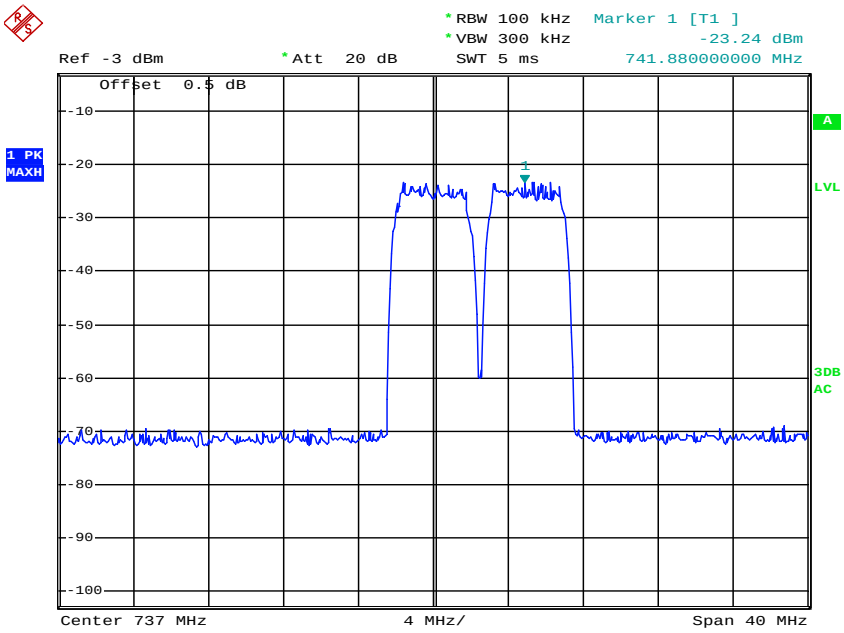
Date: 27.JUN.2012 14:38:26

5 MHz Inter-modulation, Low Channel (Input Signal)



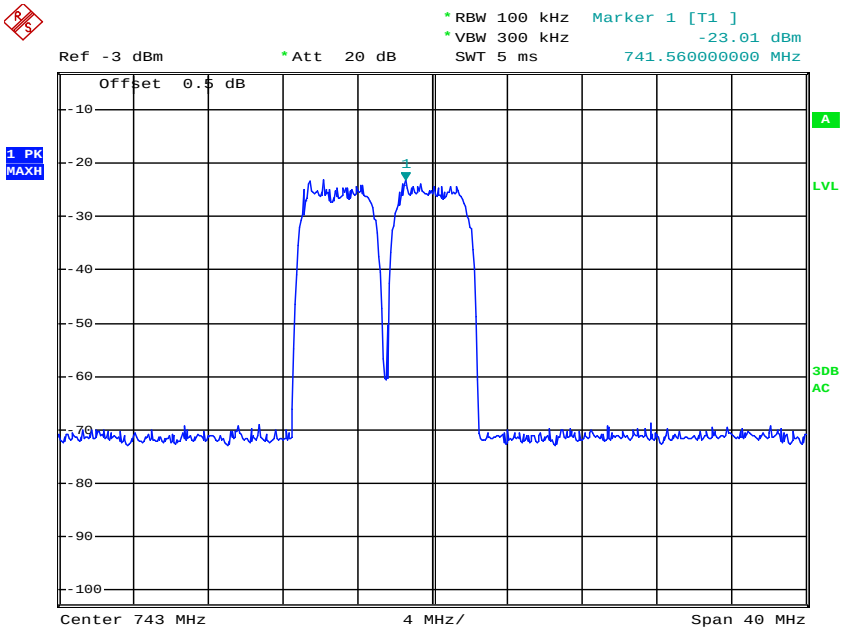
Date: 27.JUN.2012 09:39:49

5 MHz Inter-modulation, Middle Channel (Input Signal)



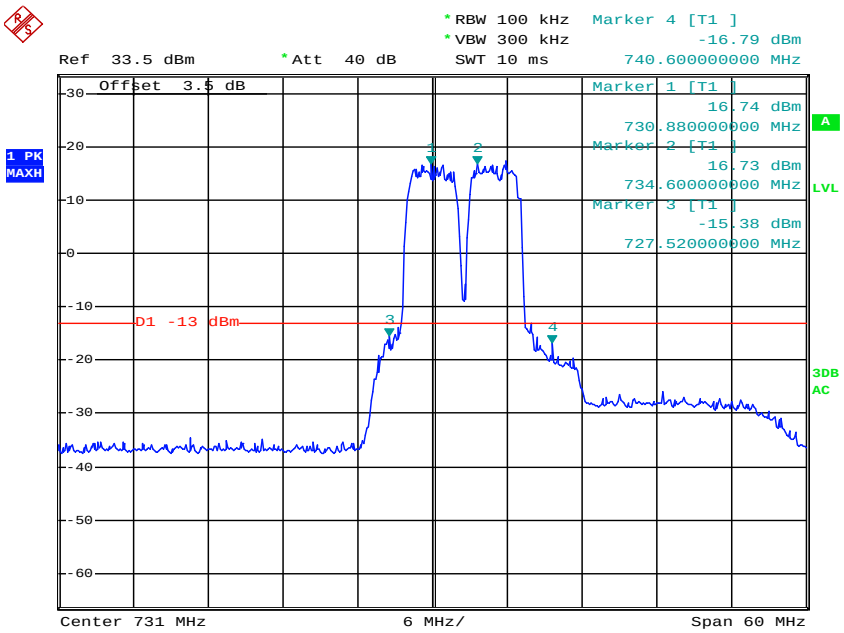
Date: 27.JUN.2012 09:41:09

5 MHz Inter-modulation, High Channel (Input Signal)



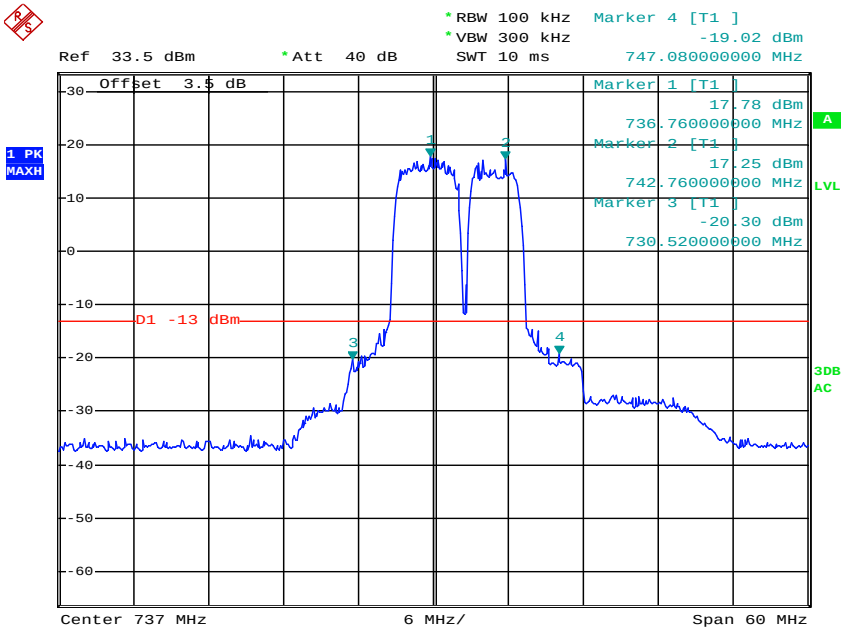
Date: 27.JUN.2012 09:42:02

5 MHz Inter-modulation, Low Channel (Output Signal)



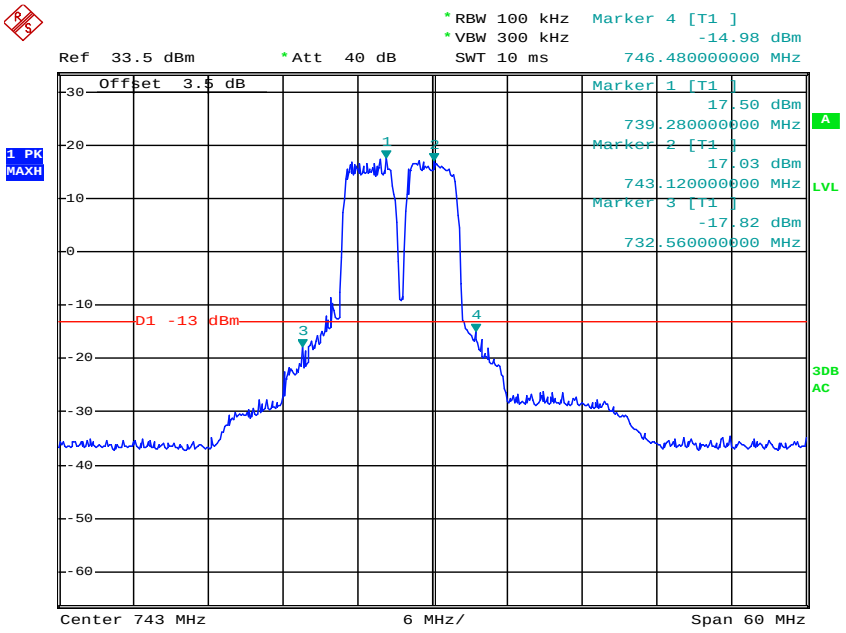
Date: 27.JUN.2012 14:16:02

5 MHz Inter-modulation, Middle Channel (Output Signal)



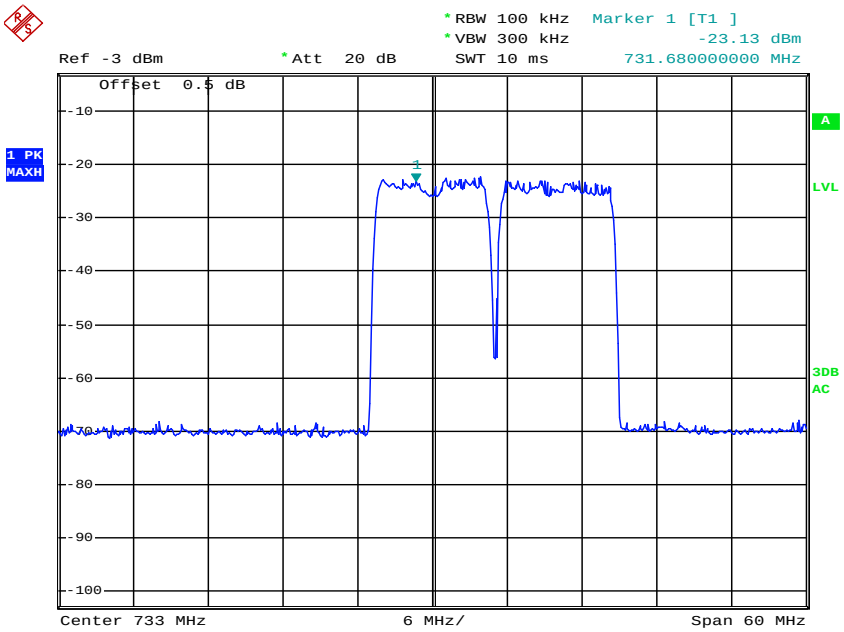
Date: 27.JUN.2012 14:17:22

5 MHz Inter-modulation, High Channel (Output Signal)



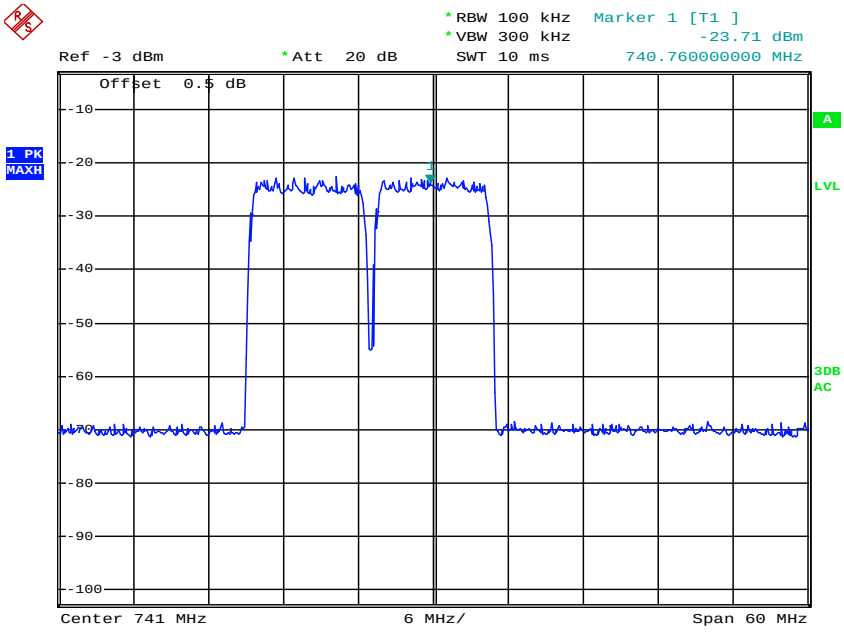
Date: 27.JUN.2012 14:19:18

10 MHz Inter-modulation, Low Channel (Input Signal)



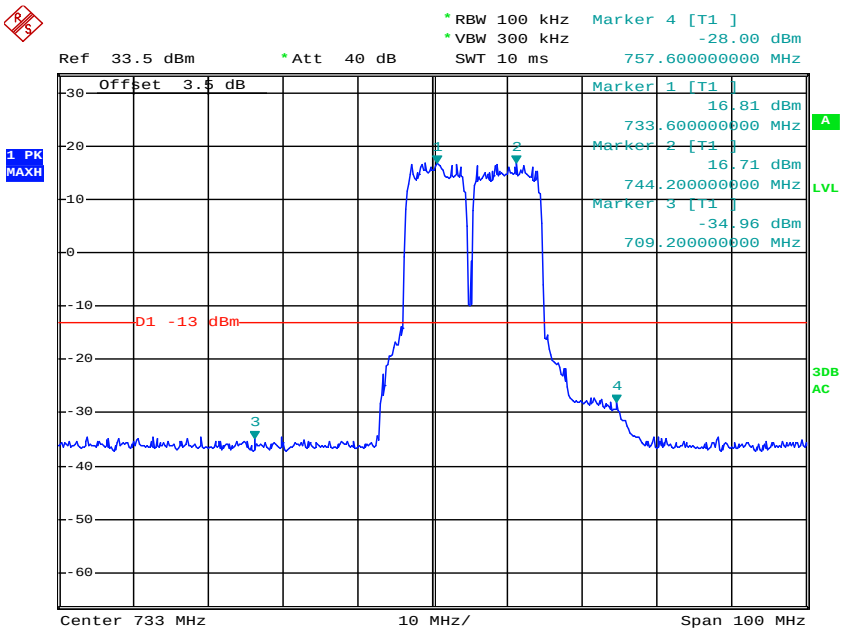
Date: 27.JUN.2012 09:46:35

10 MHz Inter-modulation, High Channel (Input Signal)



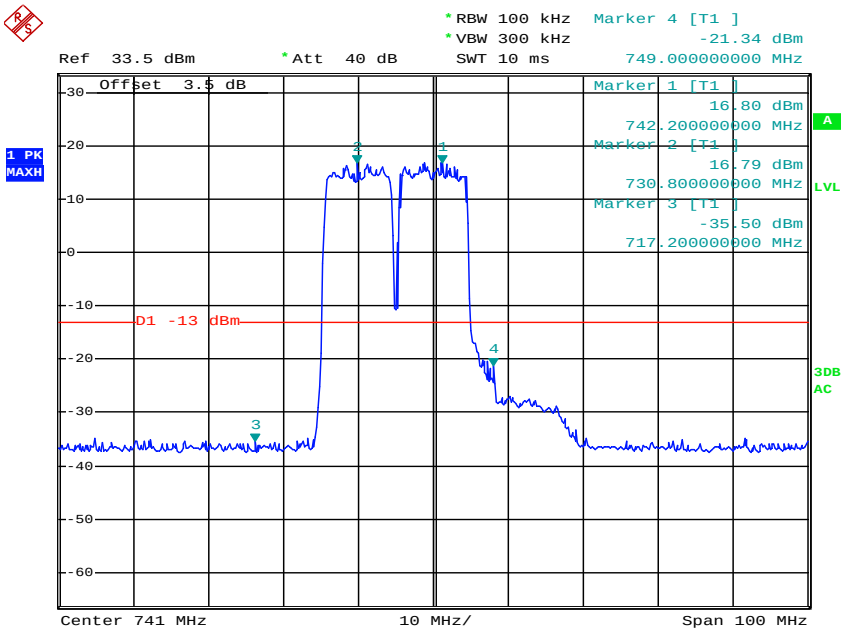
Date: 27.JUN.2012 09:47:50

10 MHz Inter-modulation, Low Channel (Output Signal)



Date: 27.JUN.2012 14:26:41

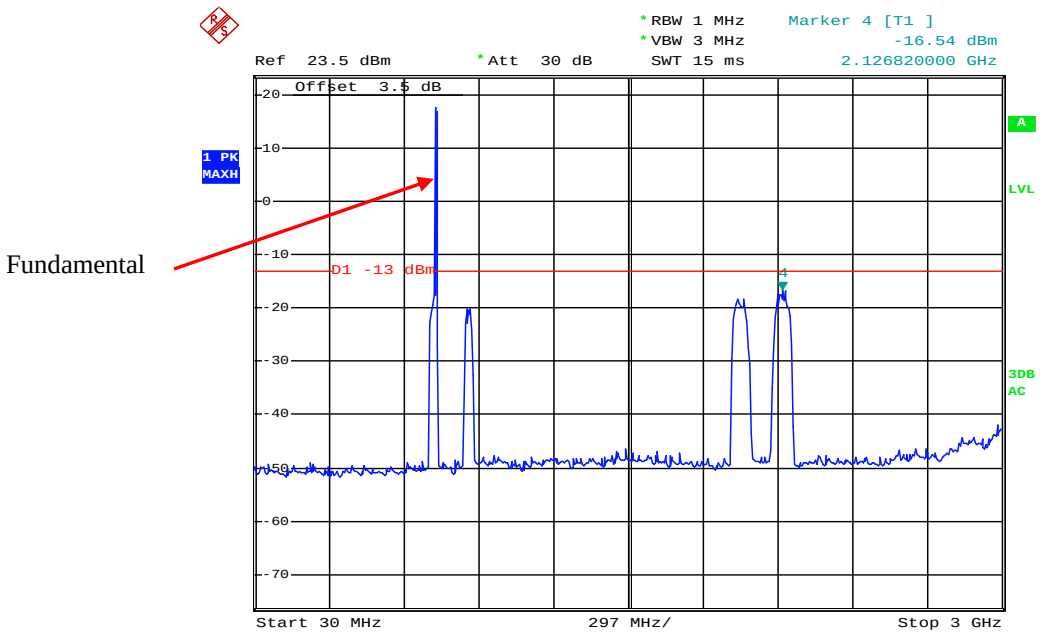
10 MHz Inter-modulation, High Channel (Output Signal)



Date: 27.JUN.2012 14:29:10

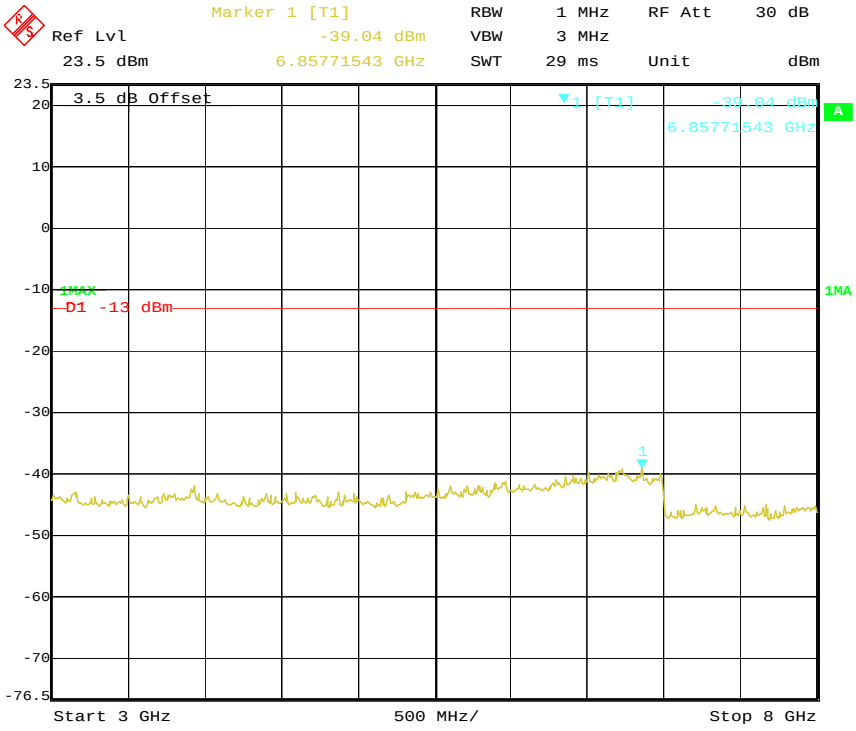
LTE700 (746-757MHz) Mode:

30 MHz - 3 GHz



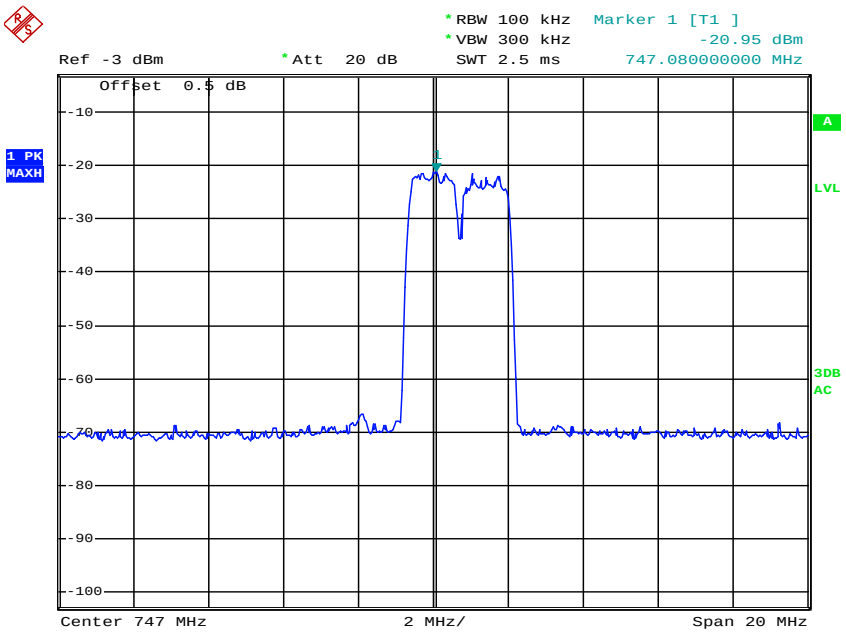
Date: 27.JUN.2012 15:59:41

3 GHz - 8 GHz



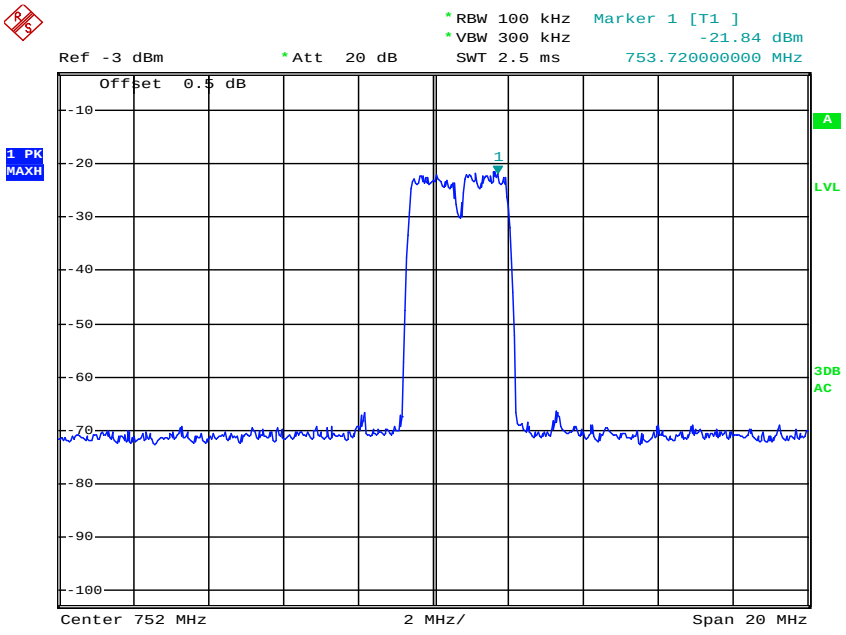
Date: 27.JUN.2012 21:22:59

1.4 MHz Inter-modulation, Low Channel (Input Signal)



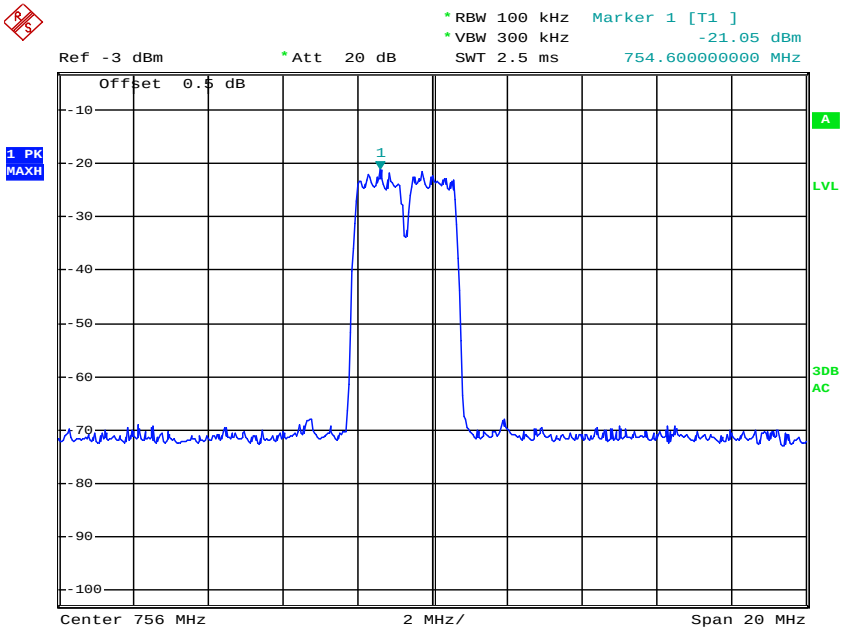
Date: 27.JUN.2012 10:08:31

1.4 MHz Inter-modulation, Middle Channel (Input Signal)



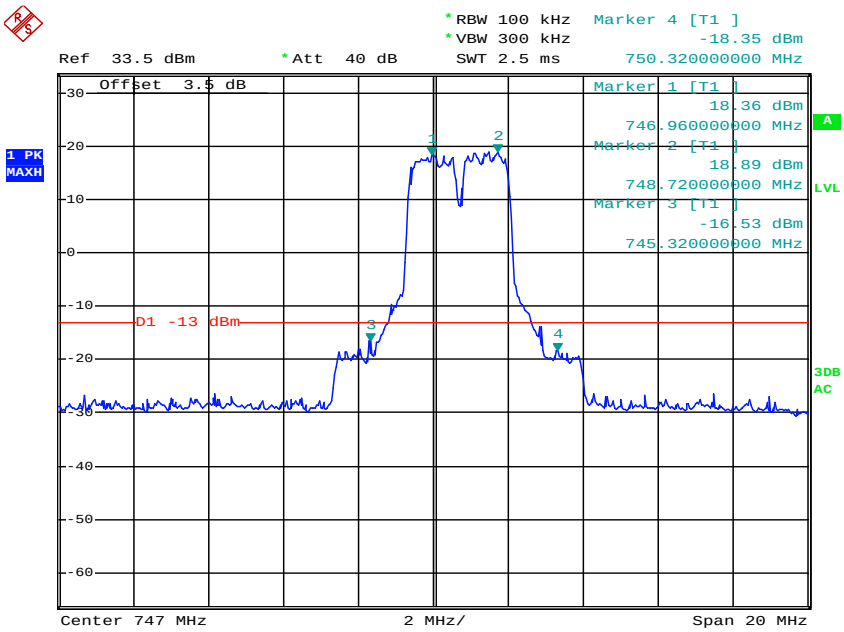
Date: 27.JUN.2012 10:09:21

1.4 MHz Inter-modulation, High Channel (Input Signal)



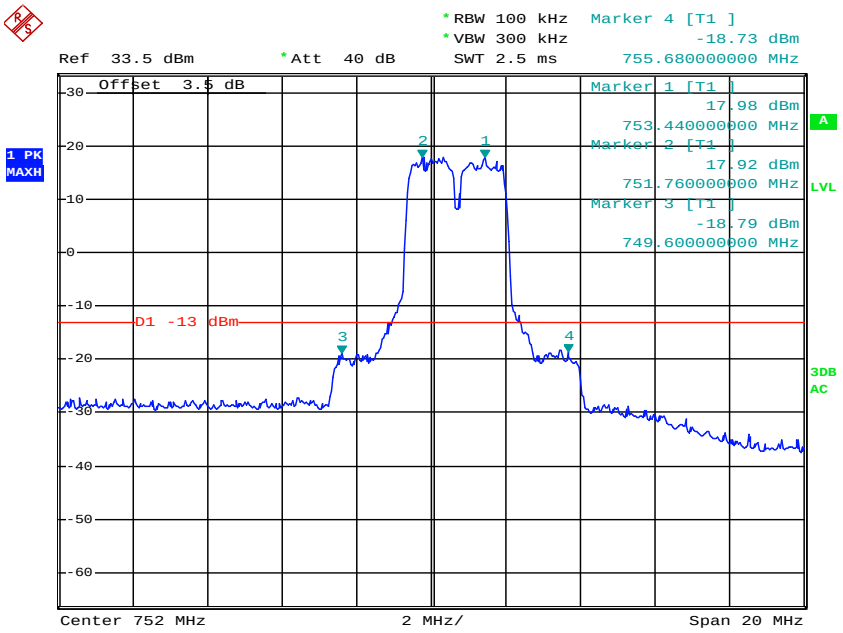
Date: 27.JUN.2012 10:09:50

1.4 MHz Inter-modulation, Low Channel (Output Signal)



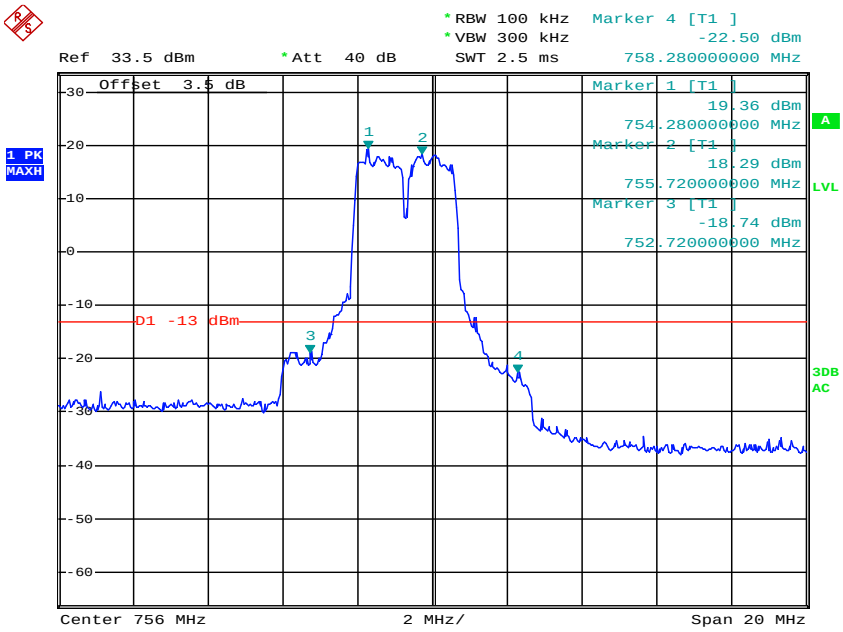
Date: 27.JUN.2012 12:31:04

1.4 MHz Inter-modulation, Middle Channel (Output Signal)



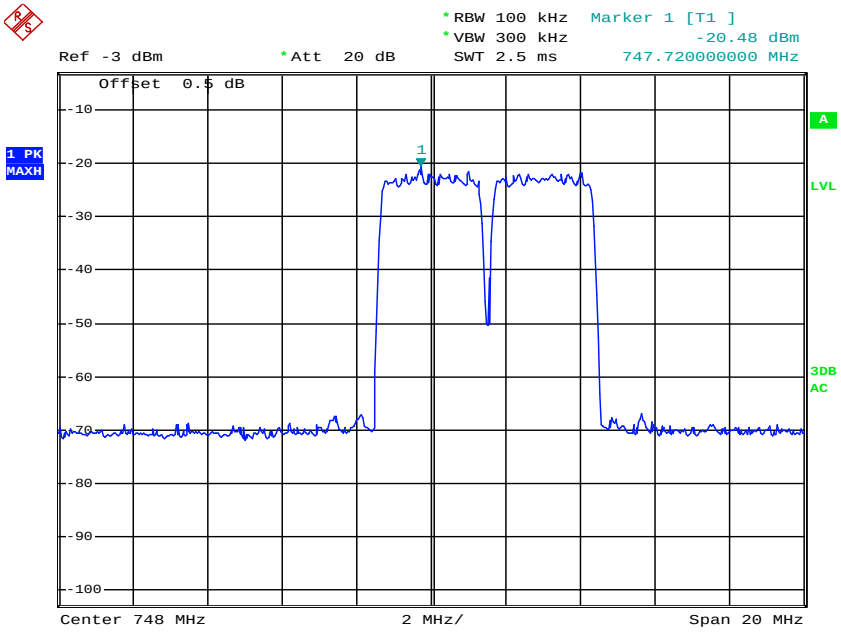
Date: 27.JUN.2012 12:32:42

1.4 MHz Inter-modulation, High Channel (Output Signal)



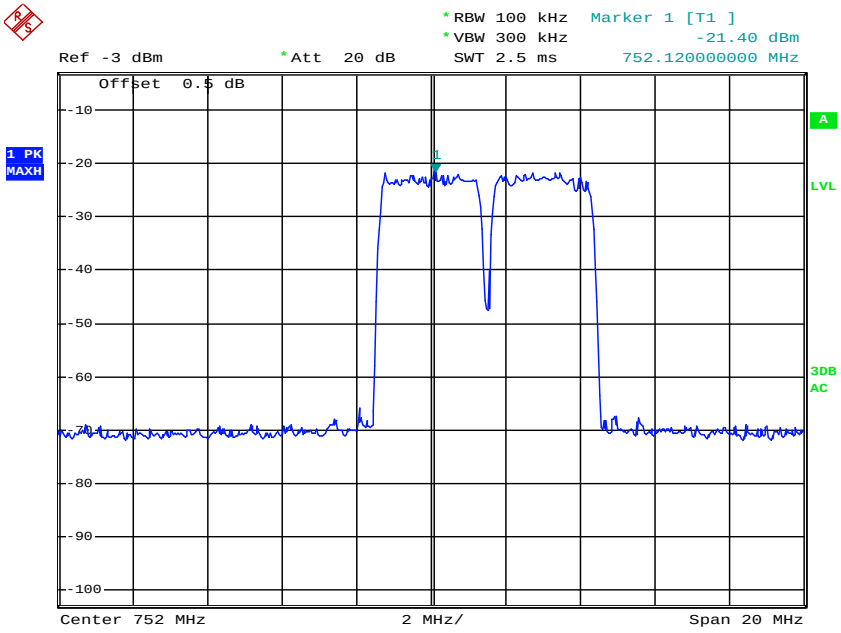
Date: 27.JUN.2012 12:34:04

3 MHz Inter-modulation, Low Channel (Input Signal)



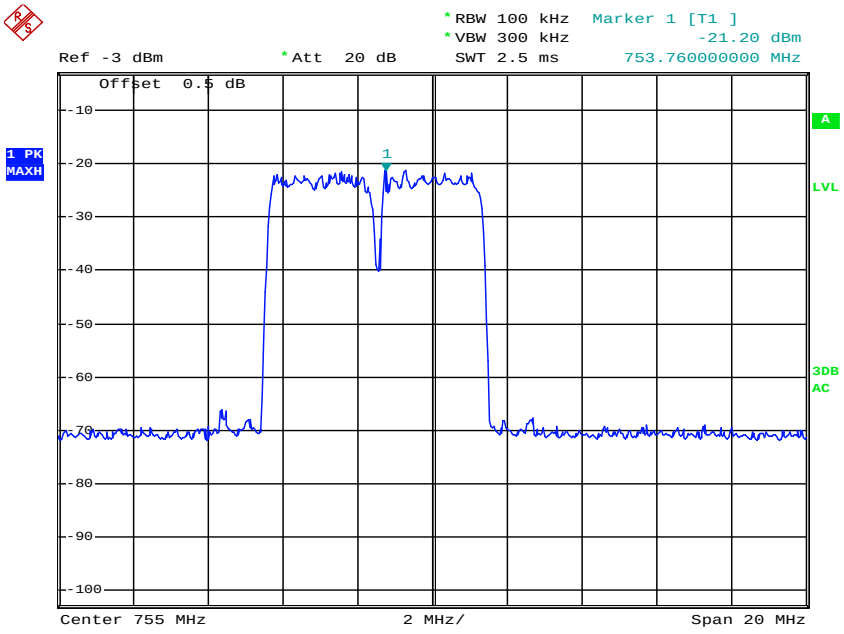
Date: 27.JUN.2012 10:12:42

3 MHz Inter-modulation, Middle Channel (Input Signal)



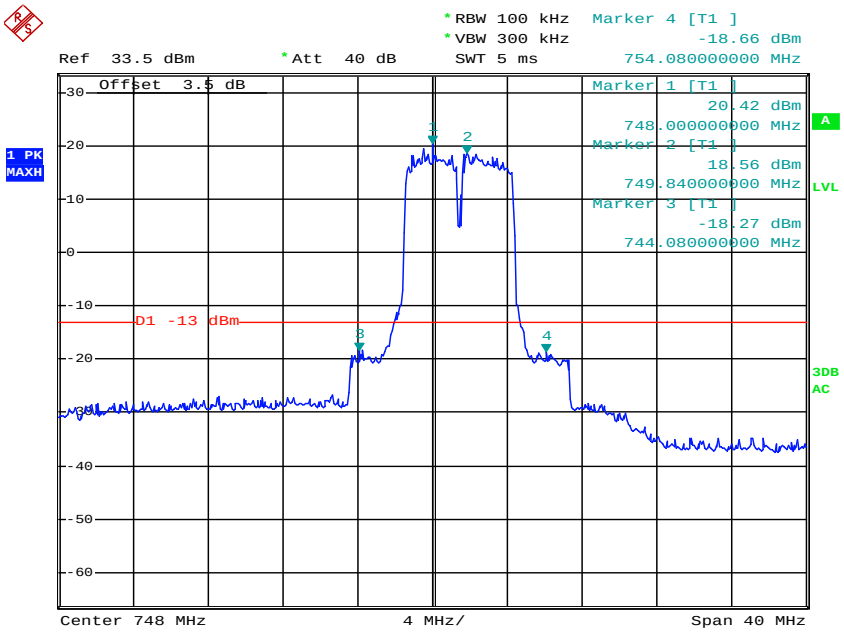
Date: 27.JUN.2012 10:14:34

3 MHz Inter-modulation, High Channel (Input Signal)



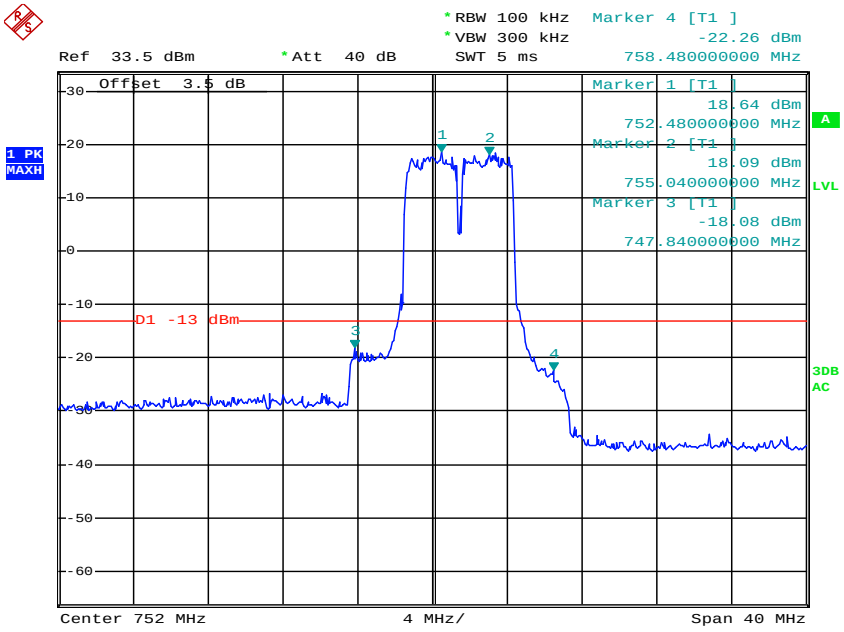
Date: 27.JUN.2012 10:17:19

3 MHz Inter-modulation, Low Channel (Output Signal)



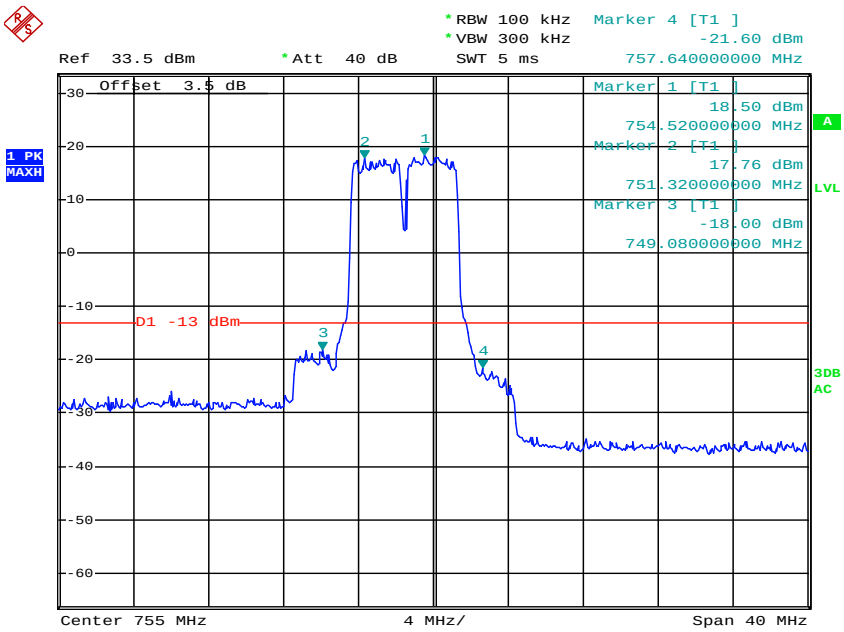
Date: 27.JUN.2012 14:40:15

3 MHz Inter-modulation, Middle Channel (Output Signal)



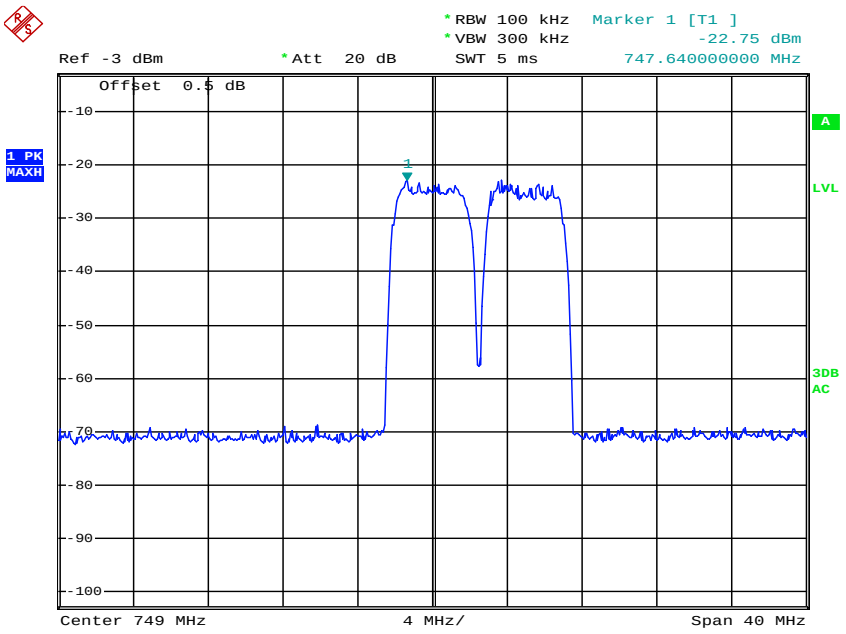
Date: 27.JUN.2012 14:41:57

3 MHz Inter-modulation, High Channel (Output Signal)



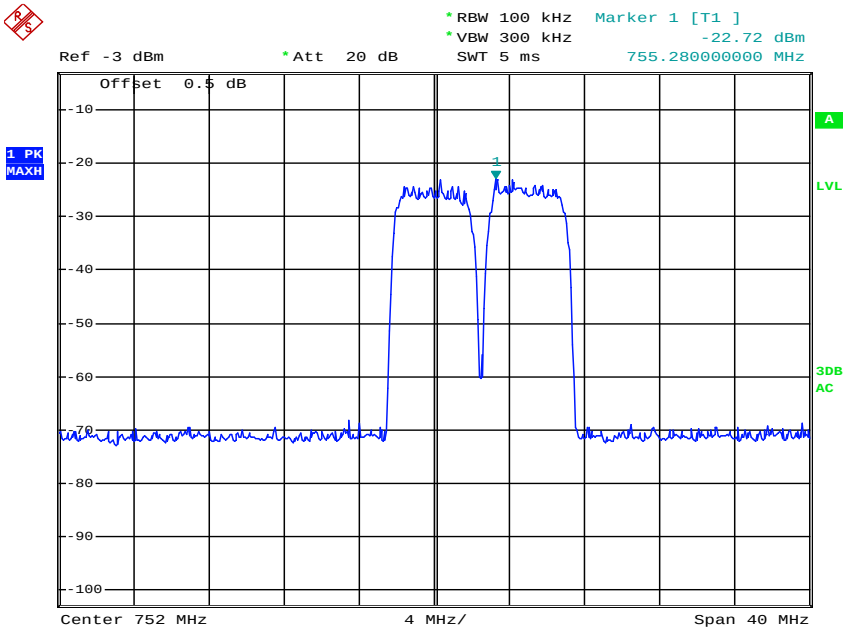
Date: 27.JUN.2012 14:43:19

5 MHz Inter-modulation, Low Channel (Input Signal)



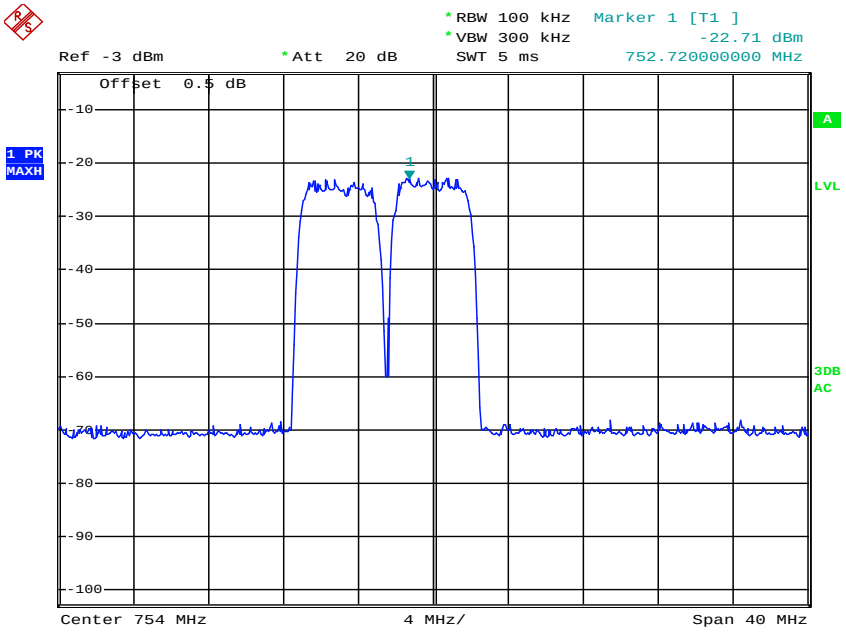
Date: 27.JUN.2012 09:58:00

5 MHz Inter-modulation, Middle Channel (Input Signal)



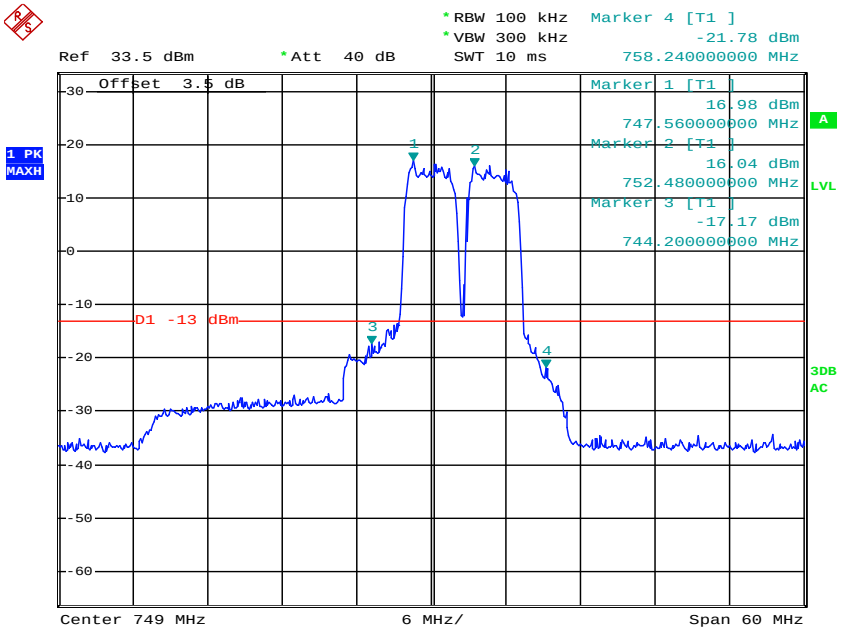
Date: 27.JUN.2012 09:59:26

5 MHz Inter-modulation, High Channel (Input Signal)



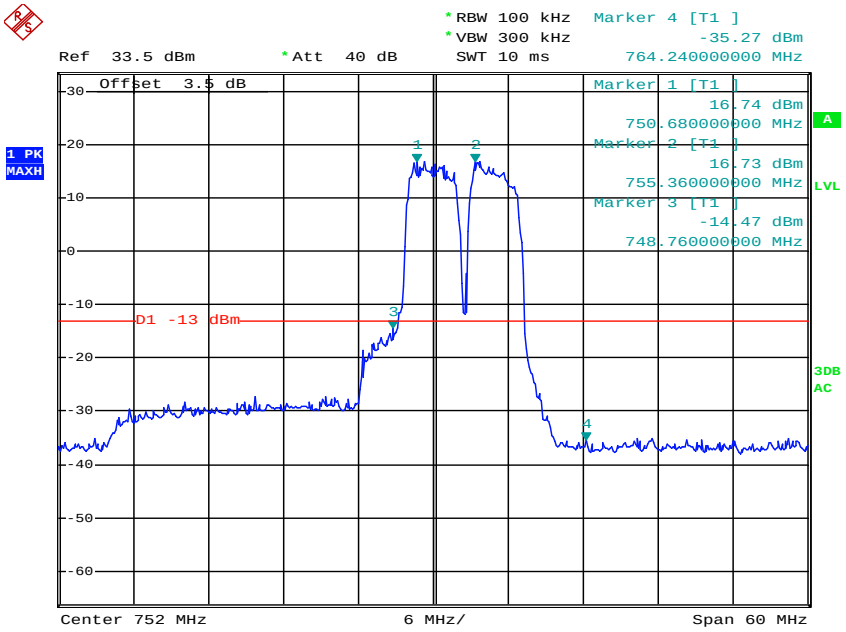
Date: 27.JUN.2012 10:01:15

5 MHz Inter-modulation, Low Channel (Output Signal)



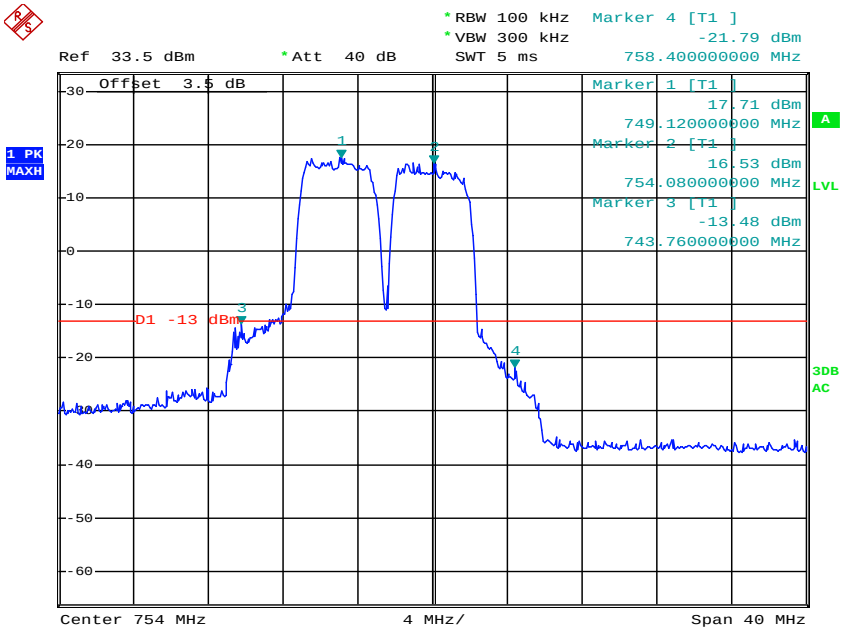
Date: 27.JUN.2012 14:20:45

5 MHz Inter-modulation, Middle Channel (Output Signal)



Date: 27.JUN.2012 14:23:04

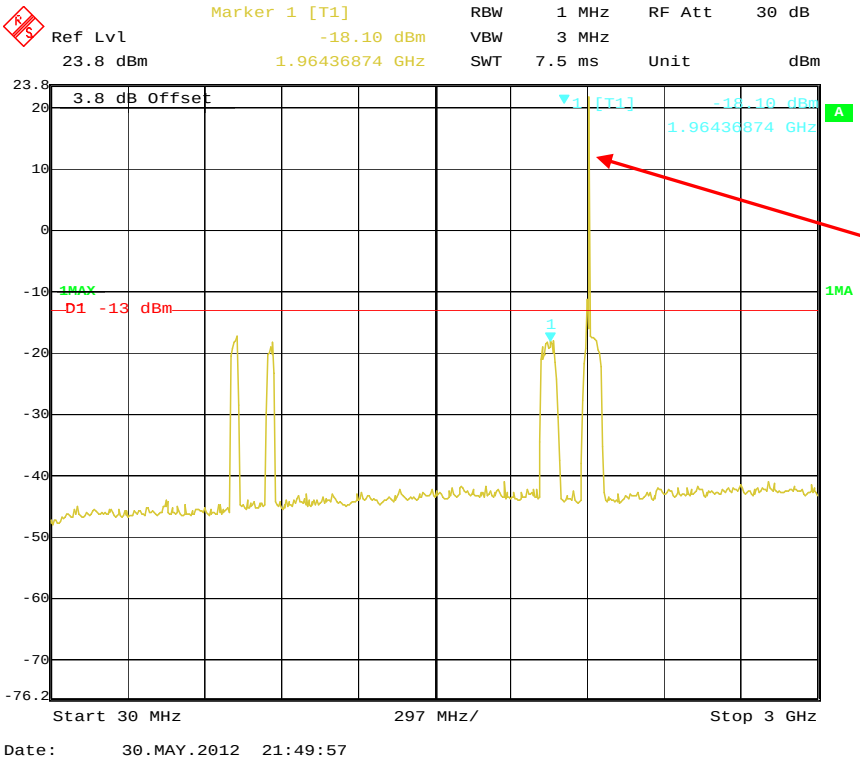
5 MHz Inter-modulation, High Channel (Output Signal)



Date: 27.JUN.2012 16:38:47

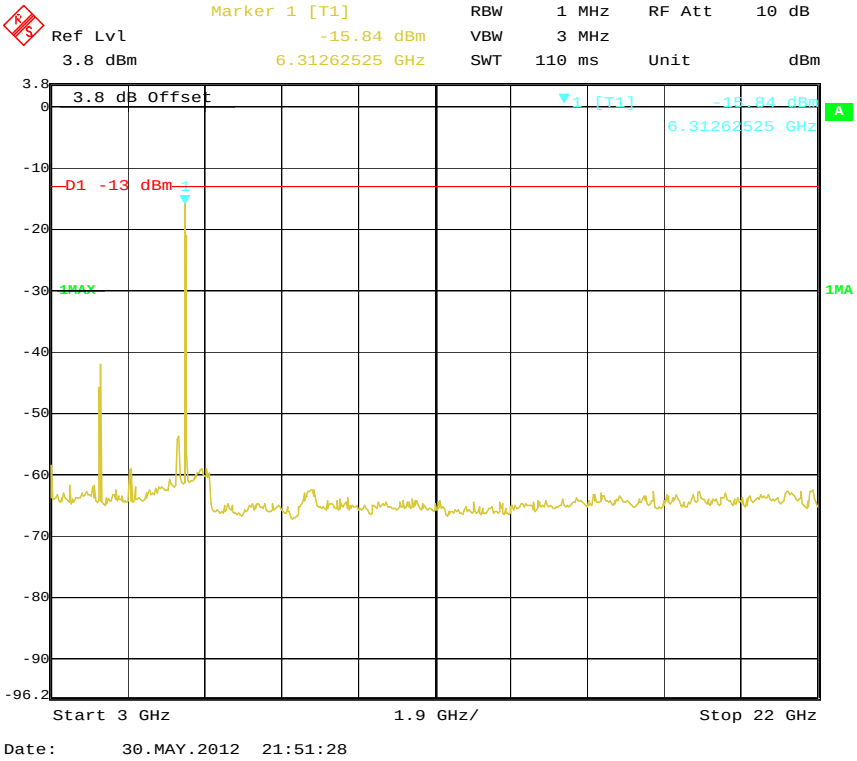
LTE2100 Mode:

30 MHz - 3 GHz

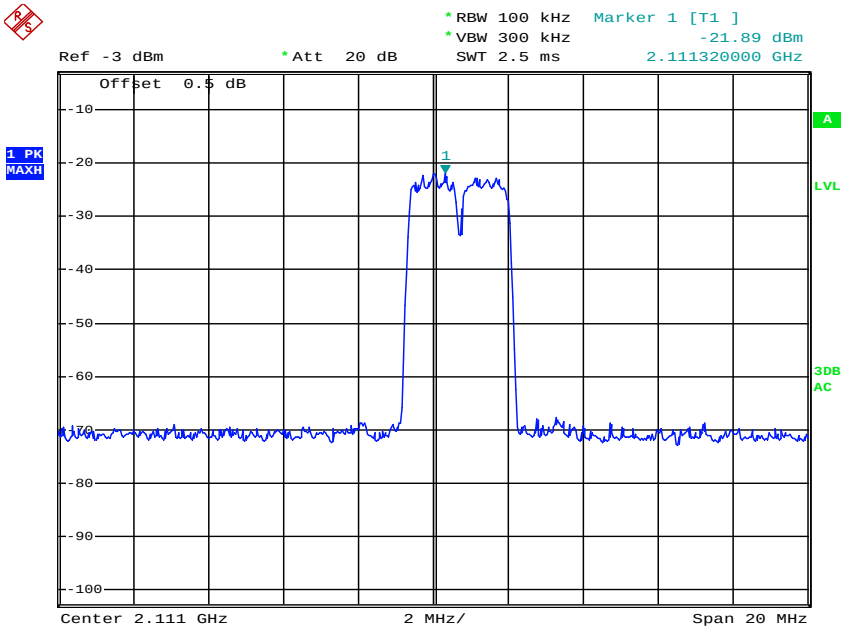


Fundamental

3 GHz - 22 GHz

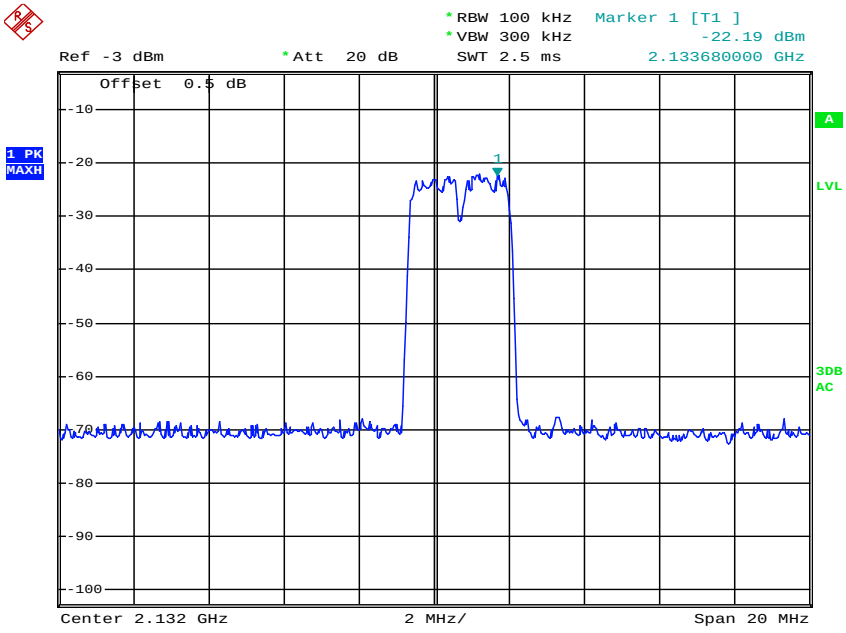


1.4 MHz Inter-modulation, Low Channel (Input Signal)



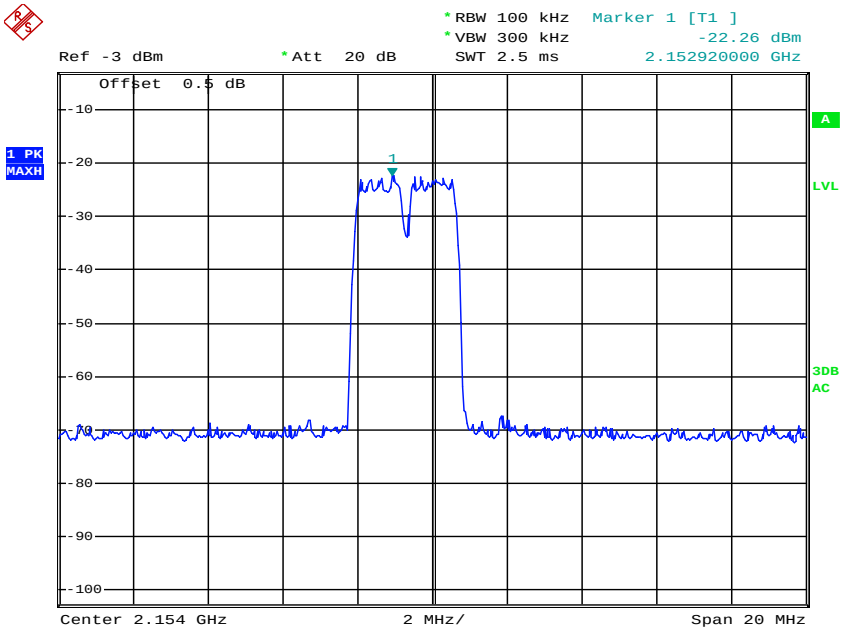
Date: 27.JUN.2012 10:22:16

1.4 MHz Inter-modulation, Middle Channel (Input Signal)



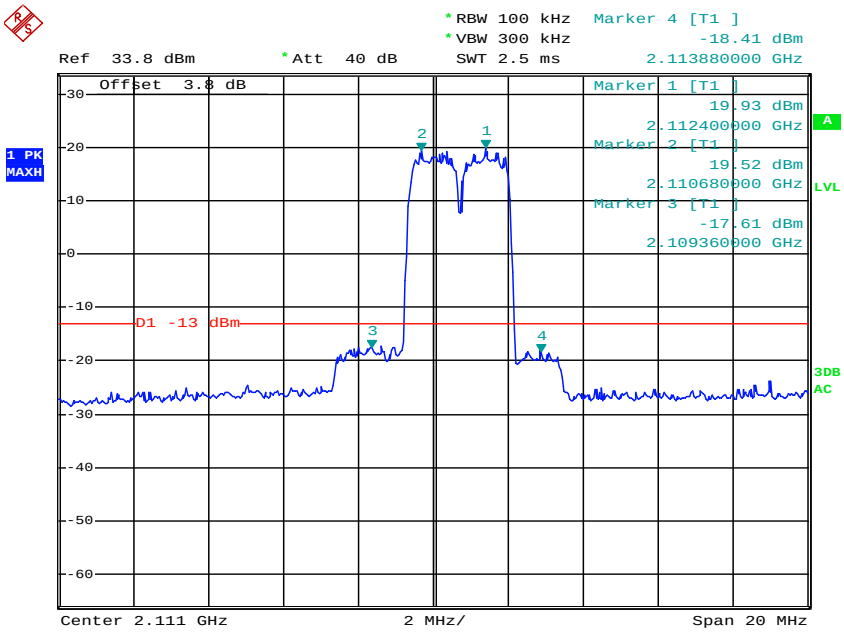
Date: 27.JUN.2012 10:20:45

1.4 MHz Inter-modulation, High Channel (Input Signal)



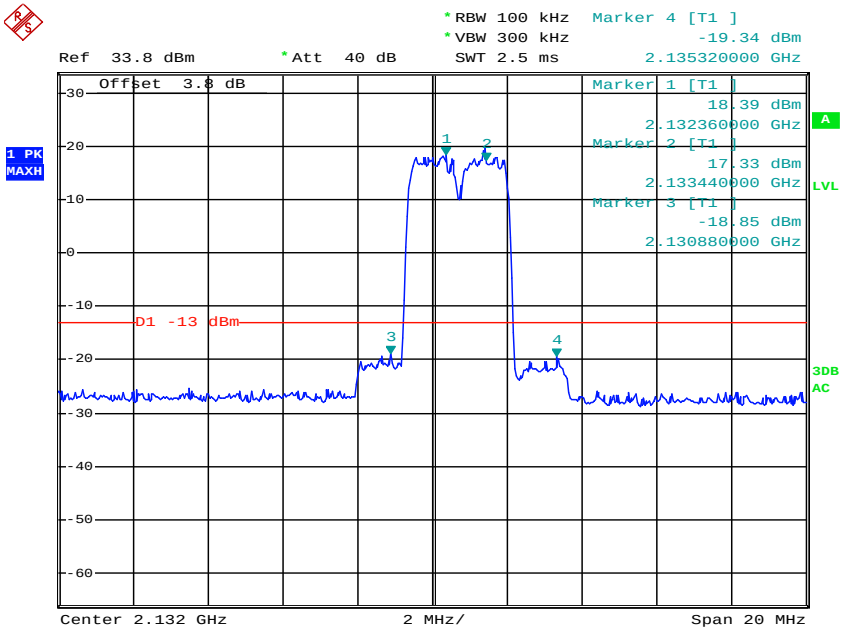
Date: 27.JUN.2012 10:21:13

1.4 MHz Inter-modulation, Low Channel (Output Signal)



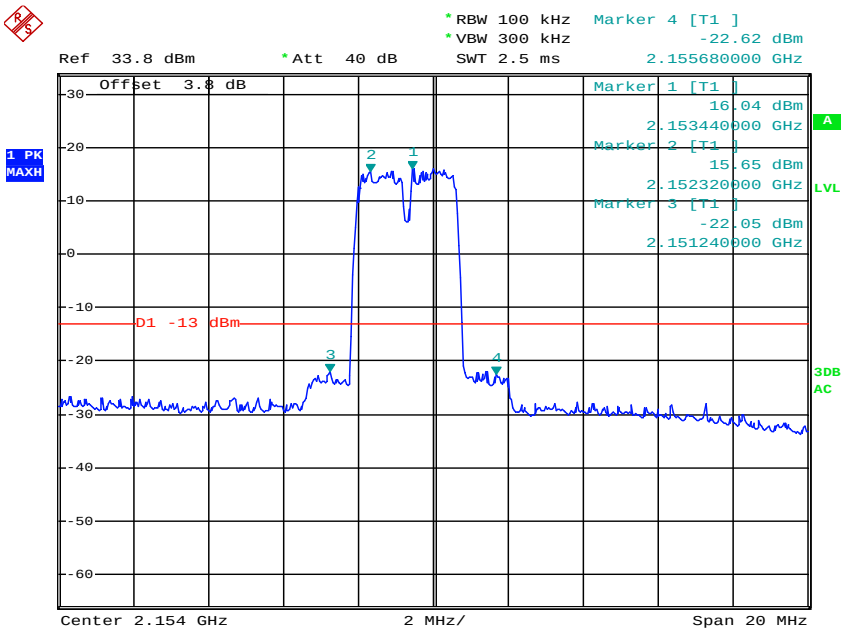
Date: 27.JUN.2012 12:37:39

1.4 MHz Inter-modulation, Middle Channel (Output Signal)



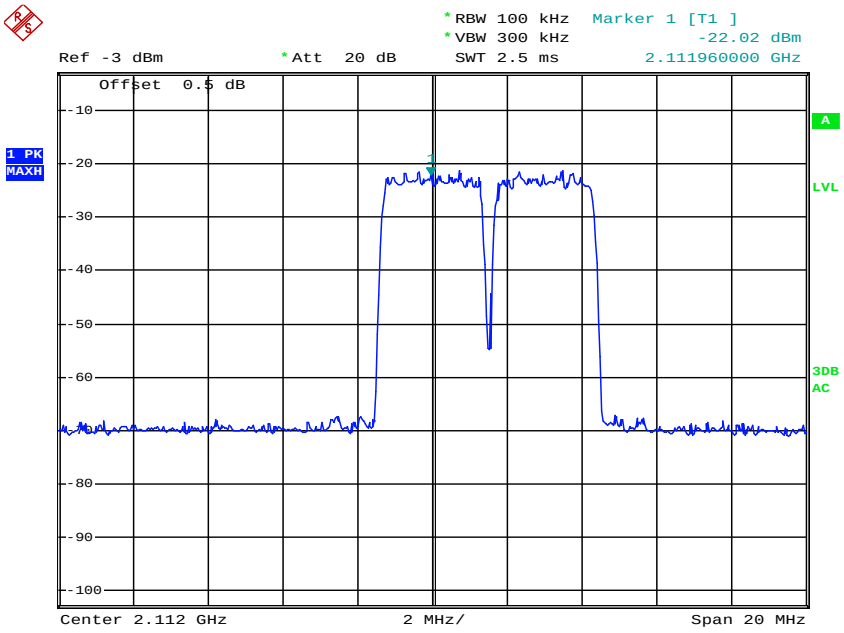
Date: 27.JUN.2012 12:39:20

1.4 MHz Inter-modulation, High Channel (Output Signal)



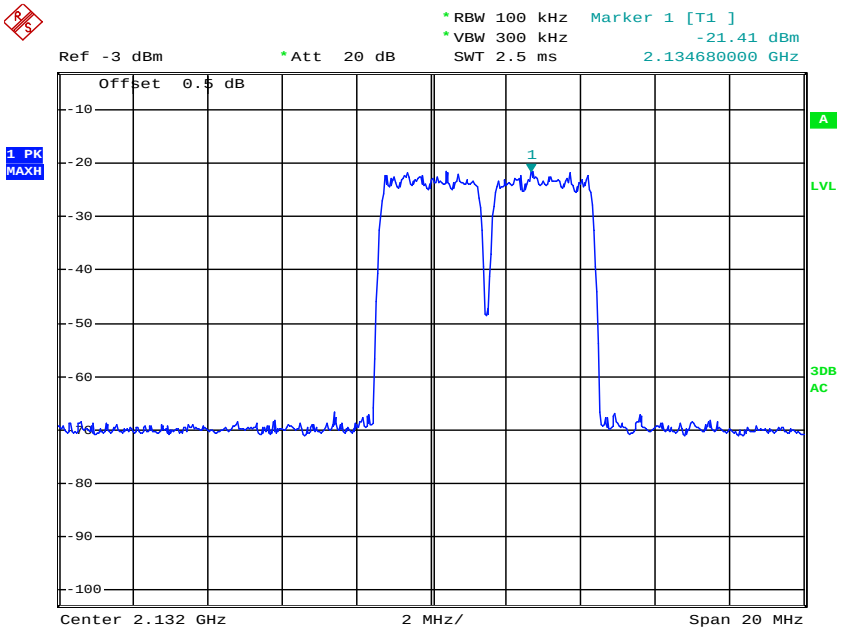
Date: 27.JUN.2012 12:40:38

3 MHz Inter-modulation, Low Channel (Input Signal)



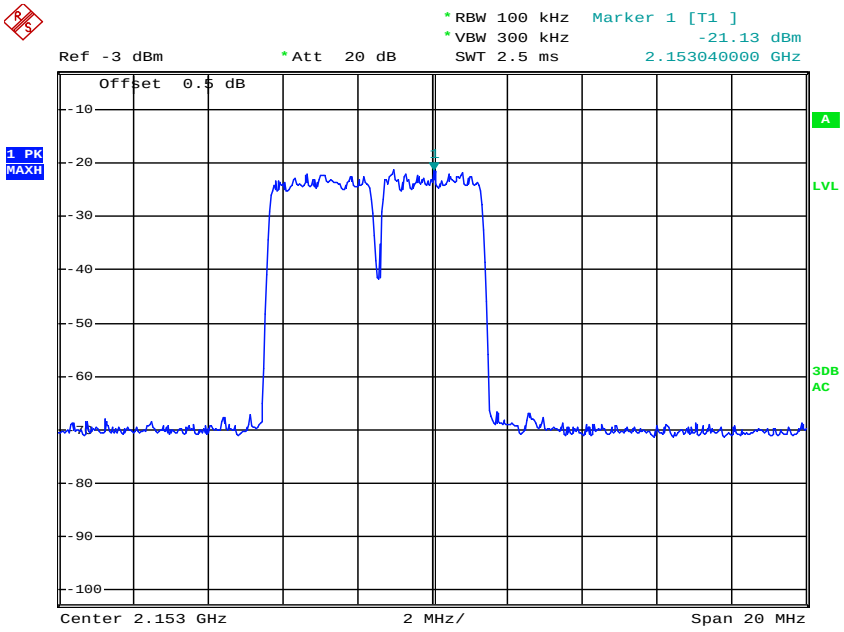
Date: 27.JUN.2012 10:24:06

3 MHz Inter-modulation, Middle Channel (Input Signal)



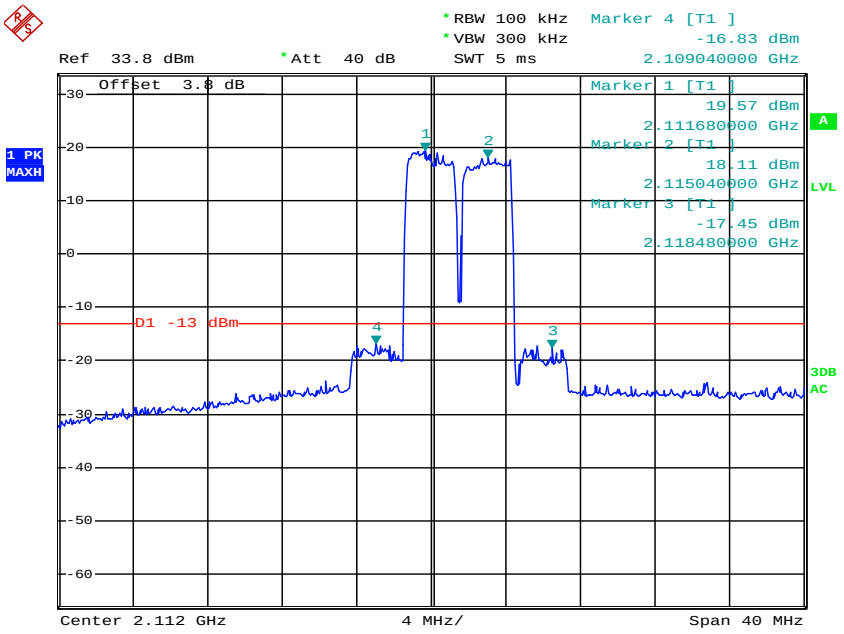
Date: 27.JUN.2012 10:25:09

3 MHz Inter-modulation, High Channel (Input Signal)



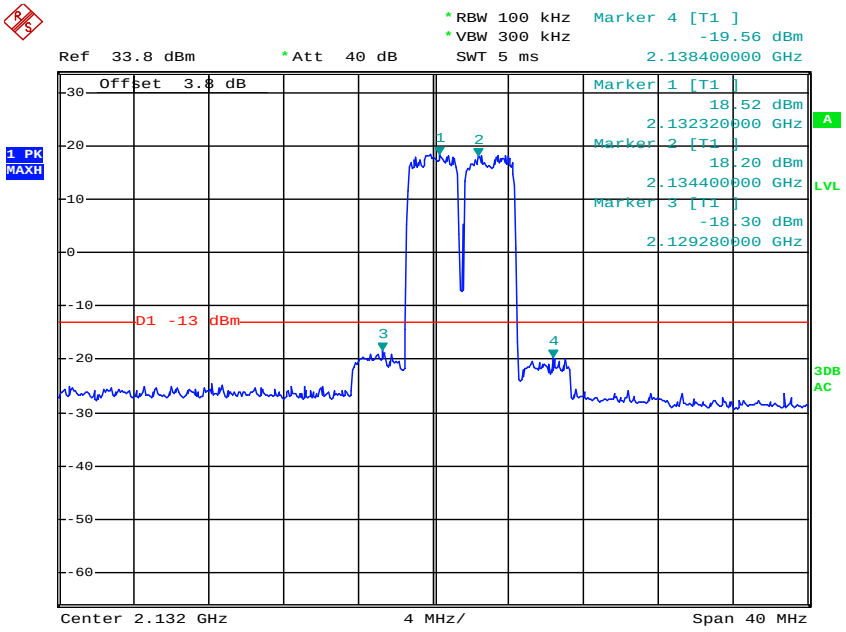
Date: 27.JUN.2012 10:26:12

3 MHz Inter-modulation, Low Channel (Output Signal)



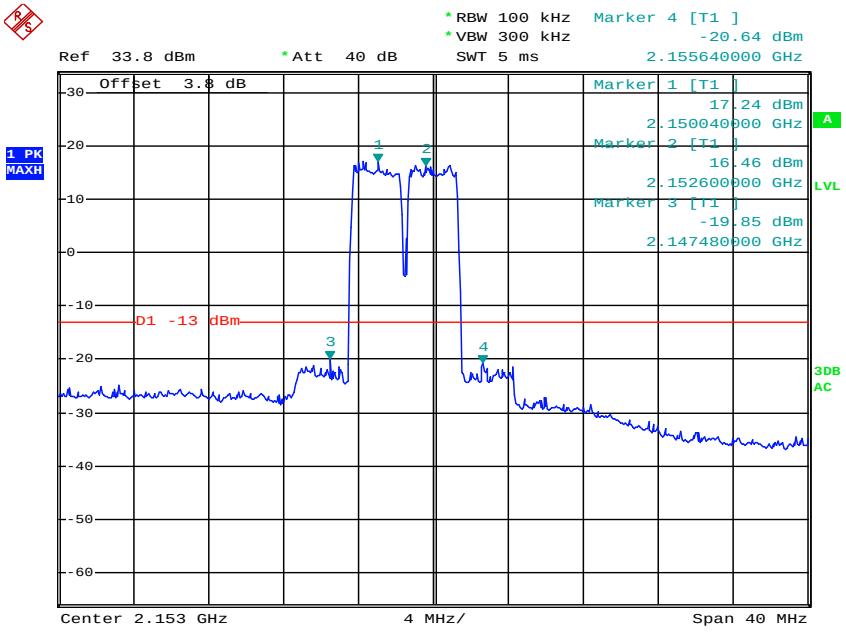
Date: 27.JUN.2012 13:49:41

3 MHz Inter-modulation, Middle Channel (Output Signal)



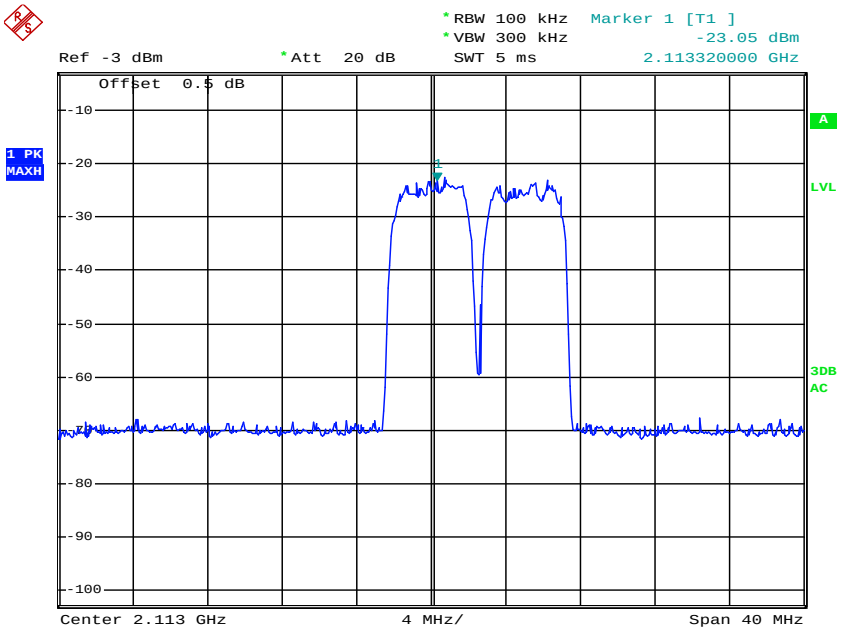
Date: 27.JUN.2012 13:51:43

3 MHz Inter-modulation, High Channel (Output Signal)



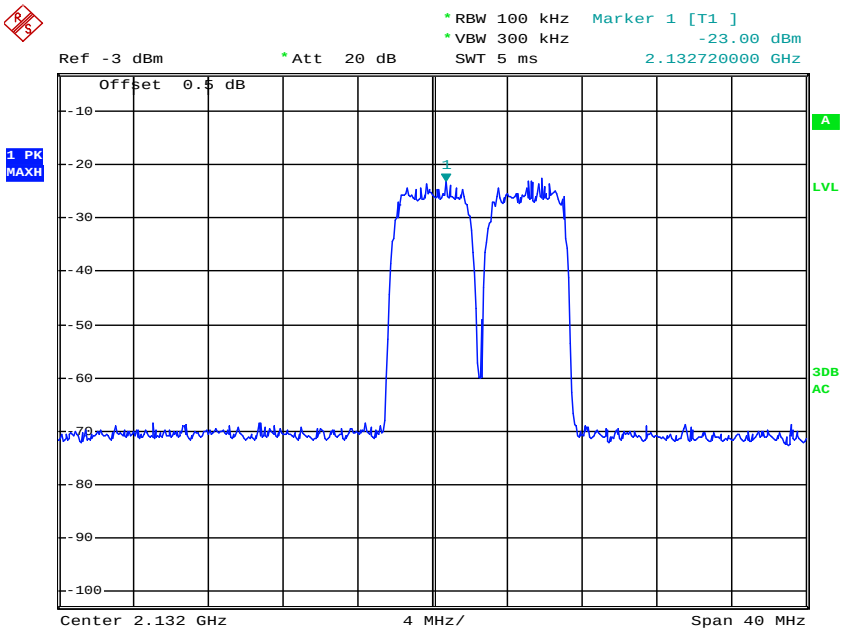
Date: 27.JUN.2012 13:54:04

5 MHz Inter-modulation, Low Channel (Input Signal)



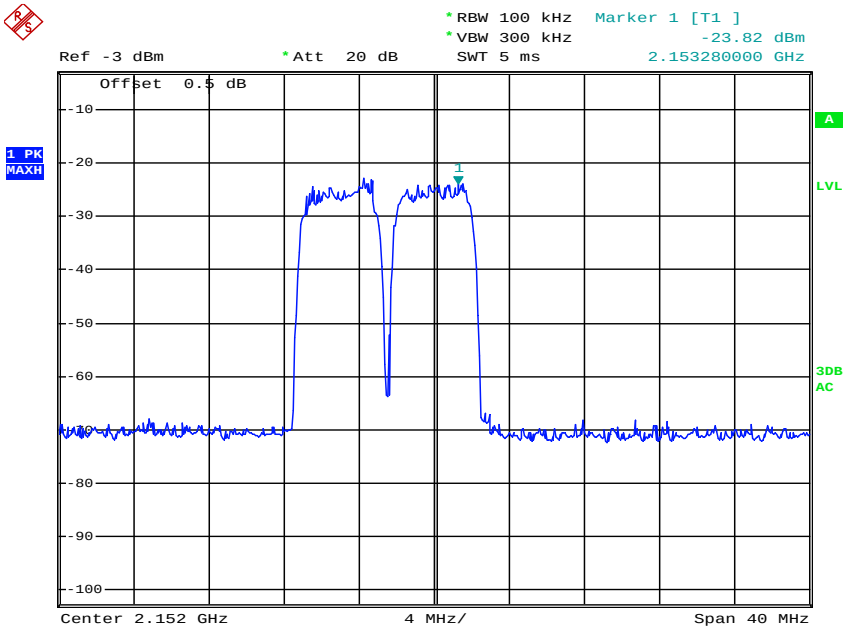
Date: 27.JUN.2012 10:28:40

5 MHz Inter-modulation, Middle Channel (Input Signal)



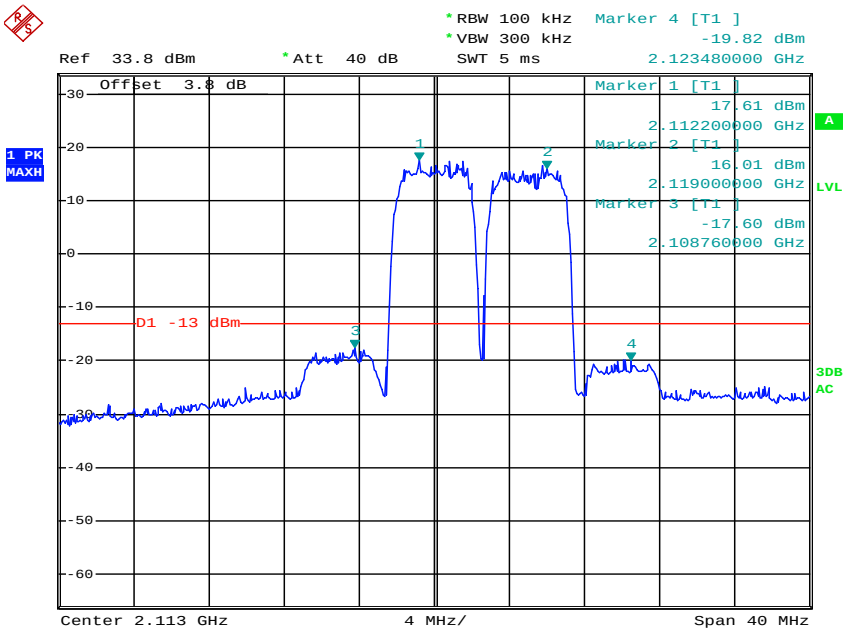
Date: 27.JUN.2012 10:29:09

5 MHz Inter-modulation, High Channel (Input Signal)



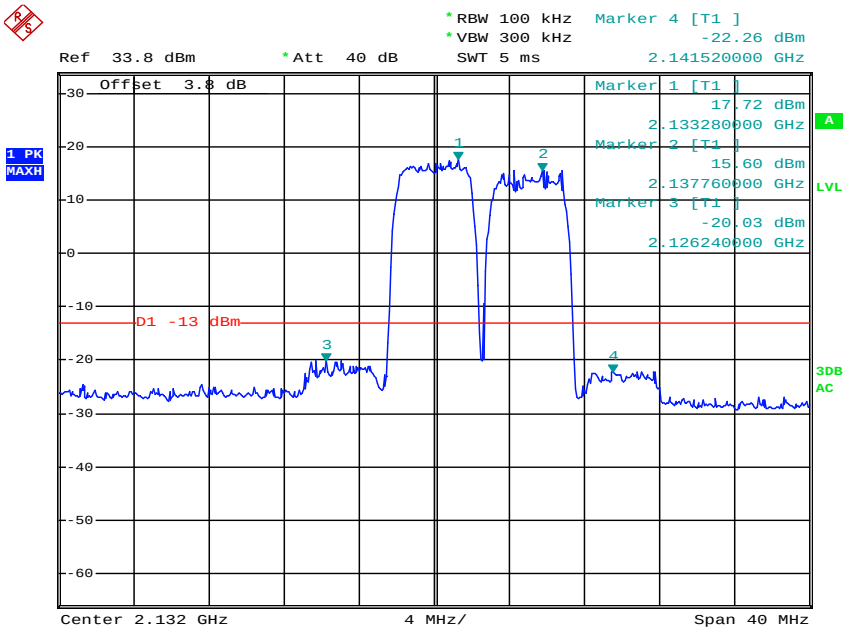
Date: 27.JUN.2012 10:29:35

5 MHz Inter-modulation, Low Channel (Output Signal)



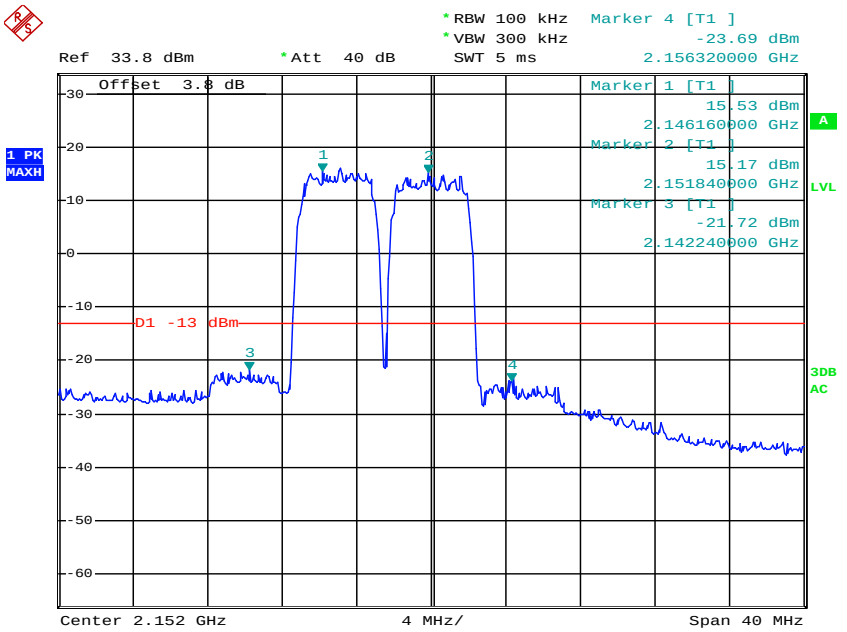
Date: 27.JUN.2012 13:57:40

5 MHz Inter-modulation, Middle Channel (Output Signal)



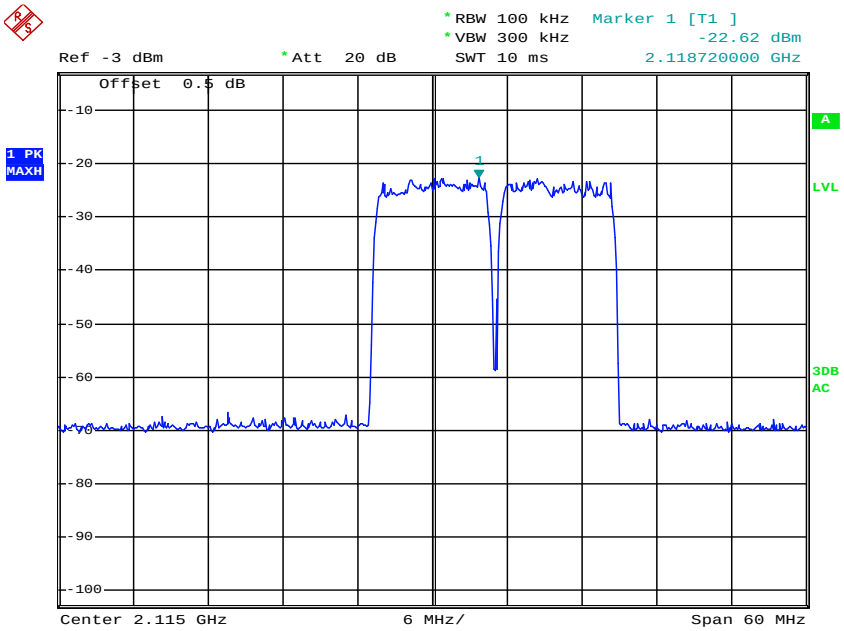
Date: 27.JUN.2012 14:02:25

5 MHz Inter-modulation, High Channel (Output Signal)



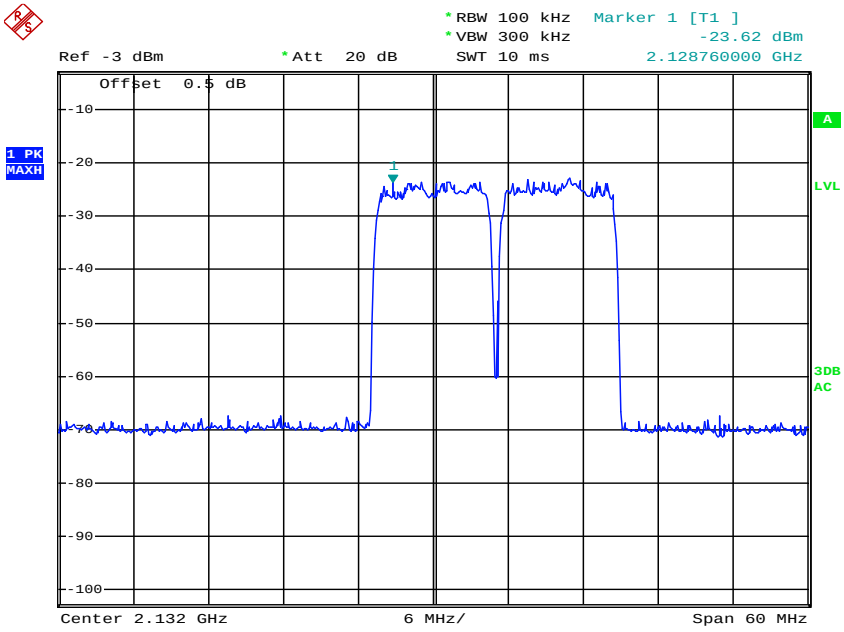
Date: 27.JUN.2012 14:03:47

10 MHz Inter-modulation, Low Channel (Input Signal)



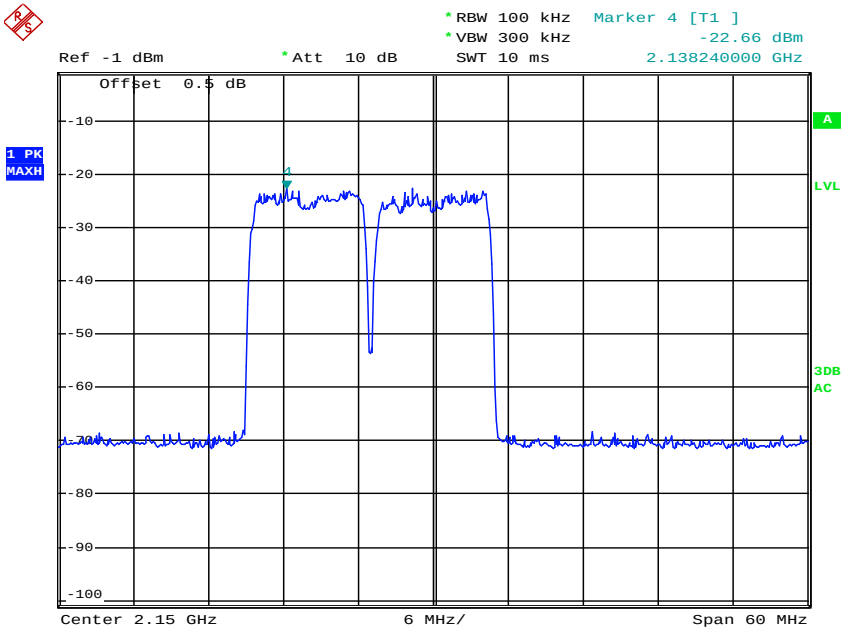
Date: 27.JUN.2012 10:32:20

10 MHz Inter-modulation, Middle Channel (Input Signal)



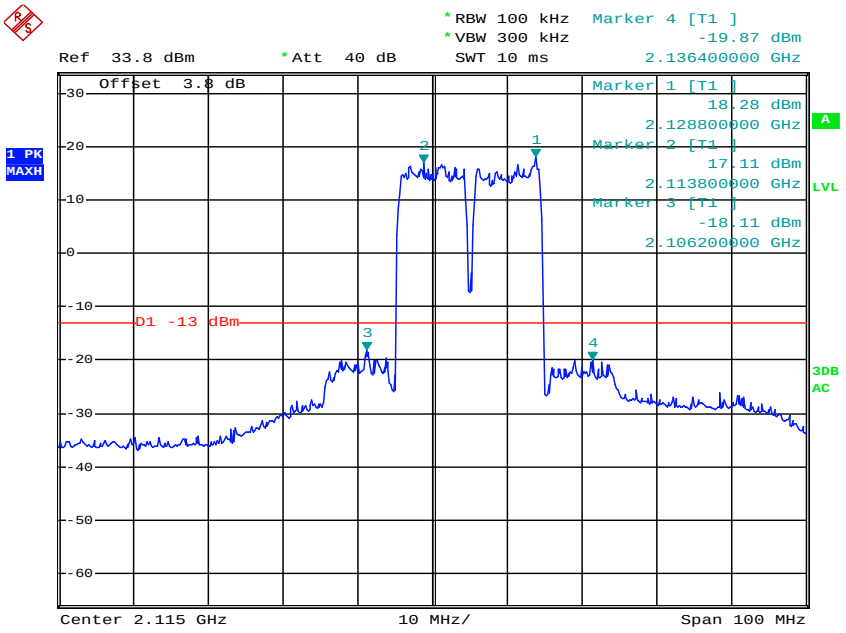
Date: 27.JUN.2012 10:33:24

10 MHz Inter-modulation, High Channel (Input Signal)



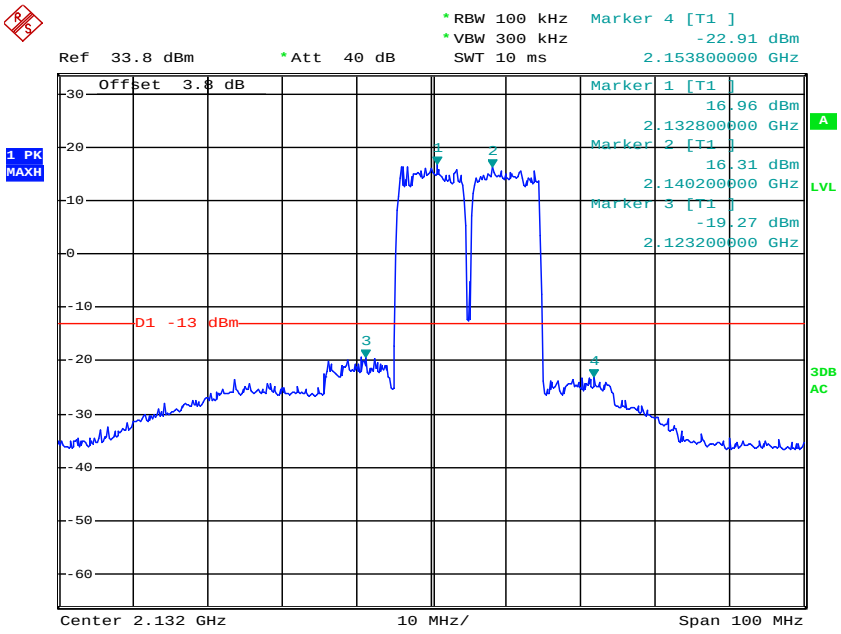
Date: 27.JUN.2012 15:17:37

10 MHz Inter-modulation, Low Channel (Output Signal)



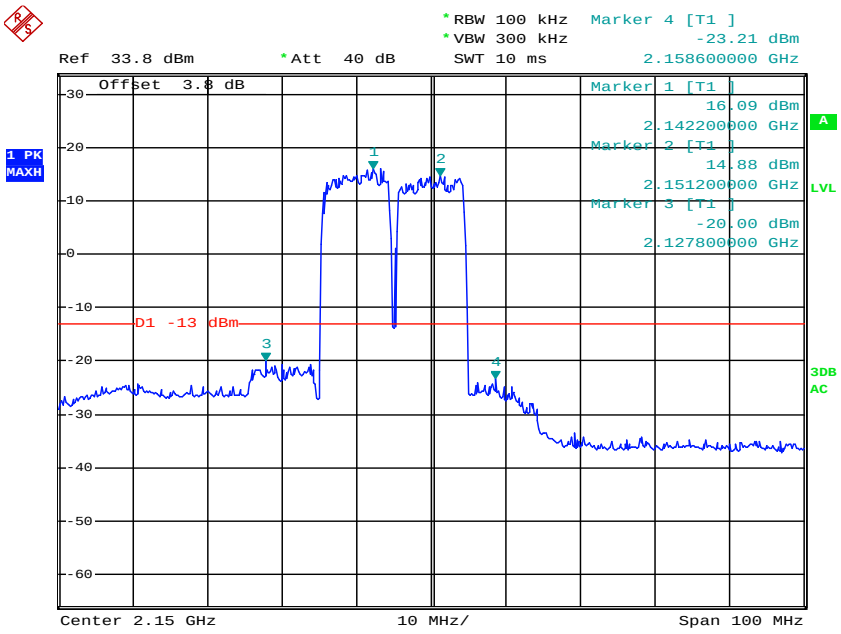
Date: 27.JUN.2012 14:07:05

10 MHz Inter-modulation, Middle Channel (Output Signal)



Date: 27.JUN.2012 14:09:19

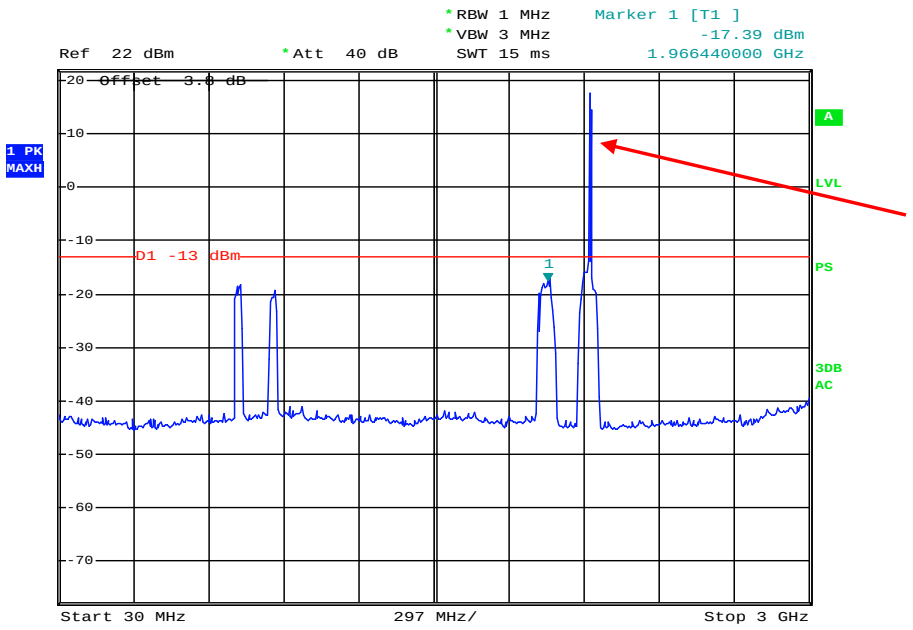
10 MHz Inter-modulation, High Channel (Output Signal)



Date: 27.JUN.2012 14:11:51

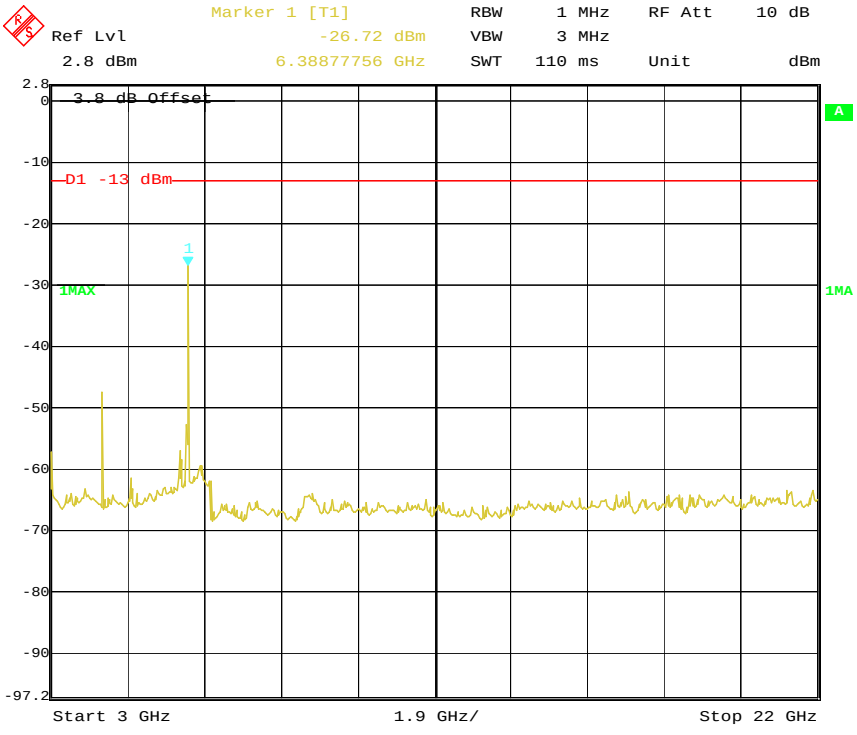
UMTS2100 Mode:

30 MHz - 3 GHz



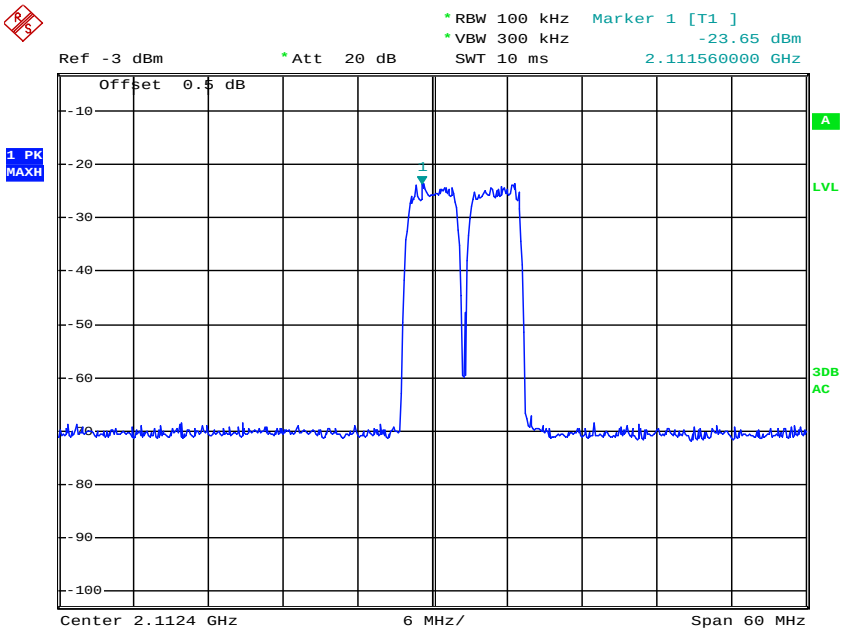
Date: 13.MAY.2012 16:17:56

3 GHz - 22 GHz



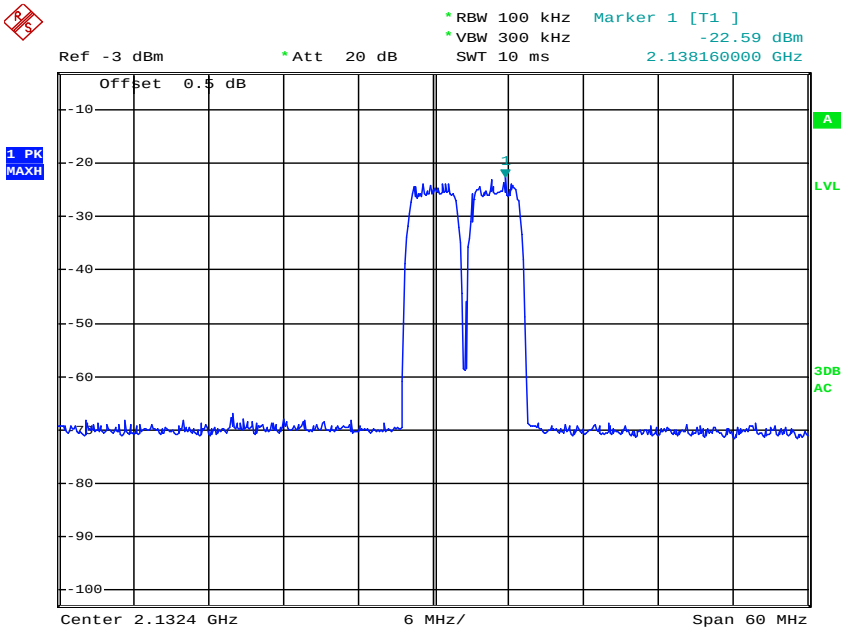
Date: 13.MAY.2012 15:50:54

Inter-modulation, Low Channel (Input Signal)



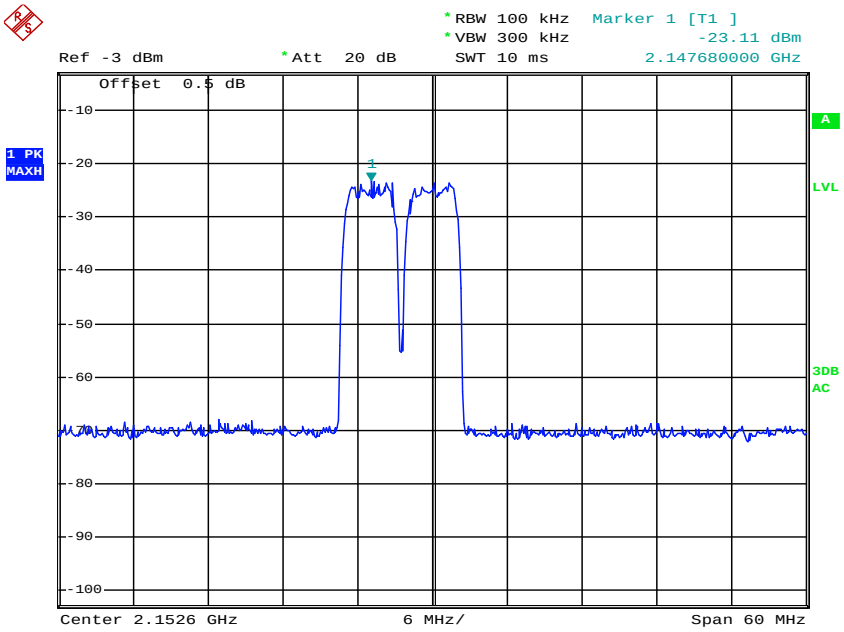
Date: 27.JUN.2012 08:42:58

Inter-modulation, Middle Channel (Input Signal)



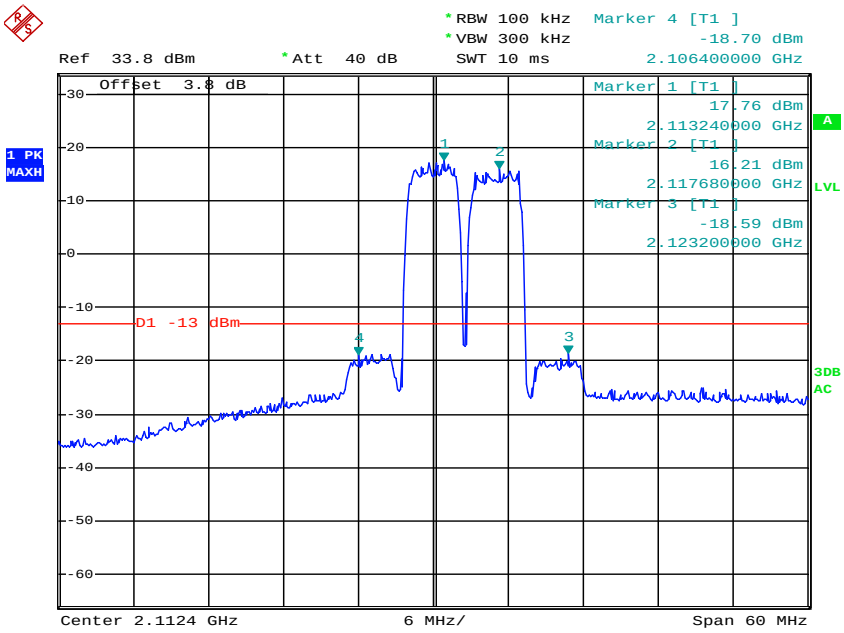
Date: 27.JUN.2012 08:43:45

Inter-modulation, High Channel (Input Signal)



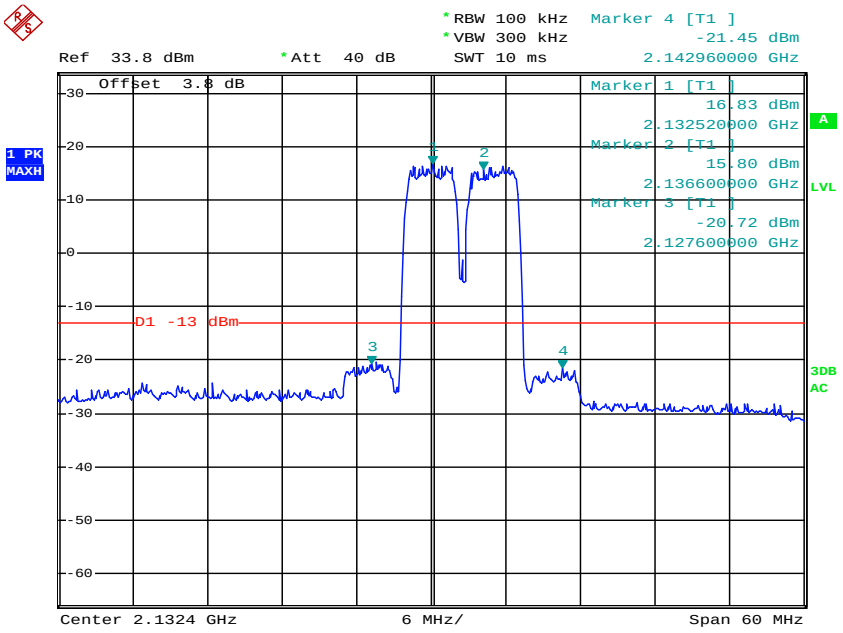
Date: 27.JUN.2012 08:44:47

Inter-modulation, Low Channel (Output Signal)



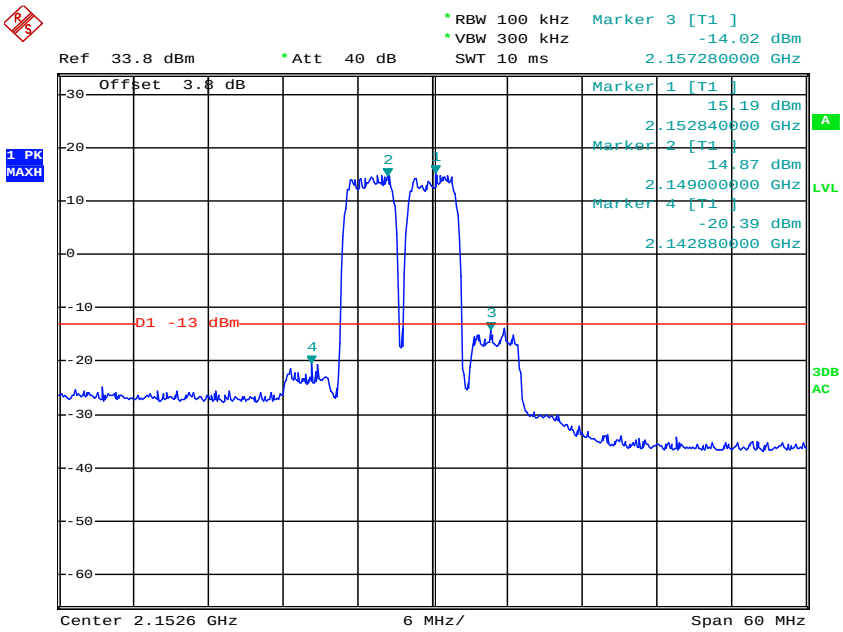
Date: 27.JUN.2012 11:57:39

Inter-modulation, Middle Channel (Output Signal)



Date: 27.JUN.2012 11:59:13

Inter-modulation, High Channel (Output Signal)



Date: 27.JUN.2012 12:00:41

FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053 and § 27.53.

Test Procedure

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

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

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

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

Spurious emissions in dB = 10 lg (TX pwr in Watts/0.001) – the absolute level

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2012-03-17	2013-03-16
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2012-03-08	2013-03-07
HP	Signal Generator	8657A	3217A04699	2011-12-19	2012-12-18
HP	Amplifier	HP8447D	2944A09795	2011-11-24	2012-11-23
HP	Synthesized Sweeper	8341B	2624A00116	2012-04-11	2013-04-10
COM POWER	Dipole Antenna	AD-100	041000	2012-04-25	2013-04-24
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2013-02-10
Rohde & Schwarz	Vector Signal Generator	SMU200A	GB40051862	2011-08-06	2012-08-05

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Jimmy Xiao on 2012-06-04 and 2012-06-26.

Test mode: Transmitting

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBµV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dB)	Cable Loss (dB)			
LTE700 (728-746 MHz) Mode											
893.4	50.83	250	1.8	H	893.4	-22.4	0	0.73	-23.13	-13	10.13
893.4	50.64	160	1.4	V	893.4	-22.7	0	0.73	-23.43	-13	10.43
1949.8	52.86	75	1.5	H	1949.8	-47.7	9.40	1.03	-39.33	-13	26.33
1949.8	42.91	120	1.2	V	1949.8	-49.3	9.40	1.03	-40.93	-13	27.93
1474	41.43	180	1.6	V	1474	-59.8	8.50	0.91	-52.21	-13	39.21
1474	37.89	230	2.1	H	1474	-64.4	8.50	0.91	-56.81	-13	43.81
LTE700 (746-757 MHz) Mode											
896.5	51.32	180	1.6	V	896.5	-22.0	0	0.74	-22.74	-13	9.74
896.5	49.65	160	1.8	H	896.5	-23.6	0	0.74	-24.34	-13	11.34
1982.6	52.10	230	1.2	H	1982.6	-48.4	9.40	1.05	-40.05	-13	27.05
1982.6	42.42	250	1.1	V	1982.6	-49.8	9.40	1.05	-41.45	-13	28.45
1504	40.21	160	2.1	V	1504	-60.3	8.50	0.93	-52.73	-13	39.73
1504	38.12	210	2.3	H	1504	-64.1	8.50	0.93	-56.53	-13	43.53
LTE2100 Mode											
735.7	45.48	36	2.1	H	735.7	-25.5	0	0.65	-26.15	-13	13.15
735.7	43.36	244	1.8	V	735.7	-27.6	0	0.65	-28.25	-13	15.25
1941.8	53.27	147	2.2	H	1941.8	-47.3	9.40	1.03	-38.93	-13	25.93
1941.8	43.42	169	1.8	V	1941.8	-48.7	9.40	1.03	-40.33	-13	27.33
4264.8	35.17	223	1.6	V	4264.8	-59.7	12.00	2.47	-50.17	-13	37.17
4264.8	34.51	25	1.9	H	4264.8	-61.3	12.00	2.47	-51.77	-13	38.77
UMTS2100 Mode											
730.2	45.85	36	1.8	H	730.2	-25.2	0	0.65	-25.85	-13	12.85
730.2	44.33	187	1.6	V	730.2	-26.7	0	0.65	-27.35	-13	14.35
1954.3	51.18	42	2.1	H	1954.3	-49.4	9.40	1.03	-41.03	-13	28.03
1954.3	40.39	12	2.3	V	1954.3	-51.7	9.40	1.03	-43.33	-13	30.33
4264.8	34.28	125	1.7	V	4264.8	-60.6	12.00	2.47	-51.07	-13	38.07
4264.8	33.74	111	1.8	H	4264.8	-62.1	12.00	2.47	-52.57	-13	39.57

Note: The spectrum was detected from 30 MHz to 10th harmonic.
For radiated spurious emission measurement, the EUT antenna connector was terminated by a 50 ohm shielded dummy load.

FCC §27.53 - BAND EDGES

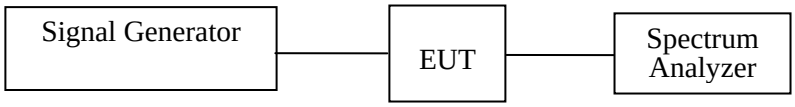
Applicable Standards

According to FCC §27.53, 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.

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, RBW set to 100 kHz.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
Rohde & Schwarz	Vector Signal Generator	SMU200A	GB40051862	2011-08-06	2012-08-05
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2011-12-16	2012-12-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

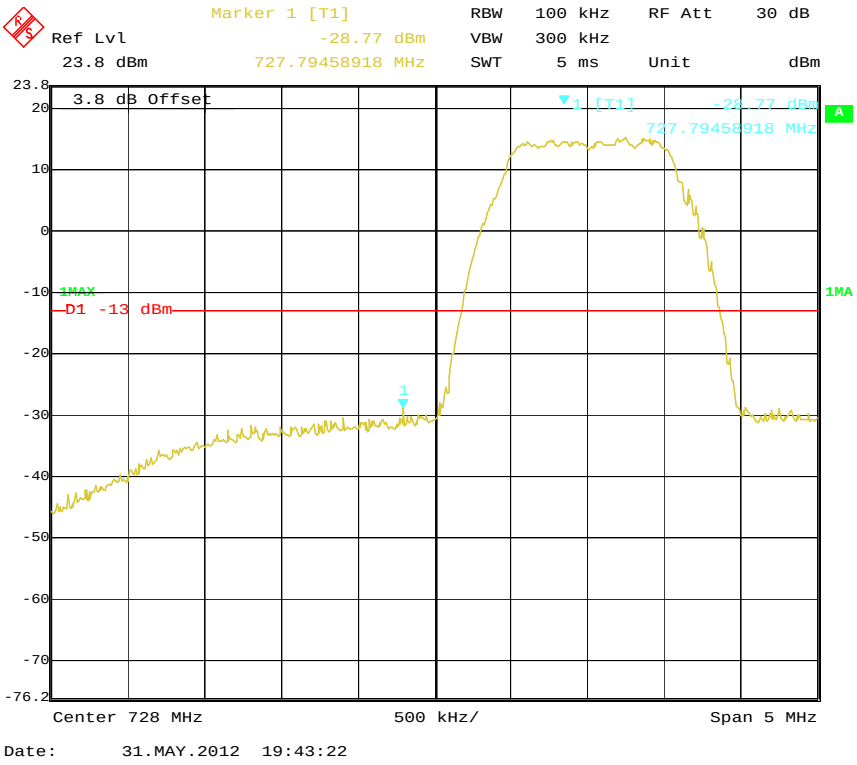
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

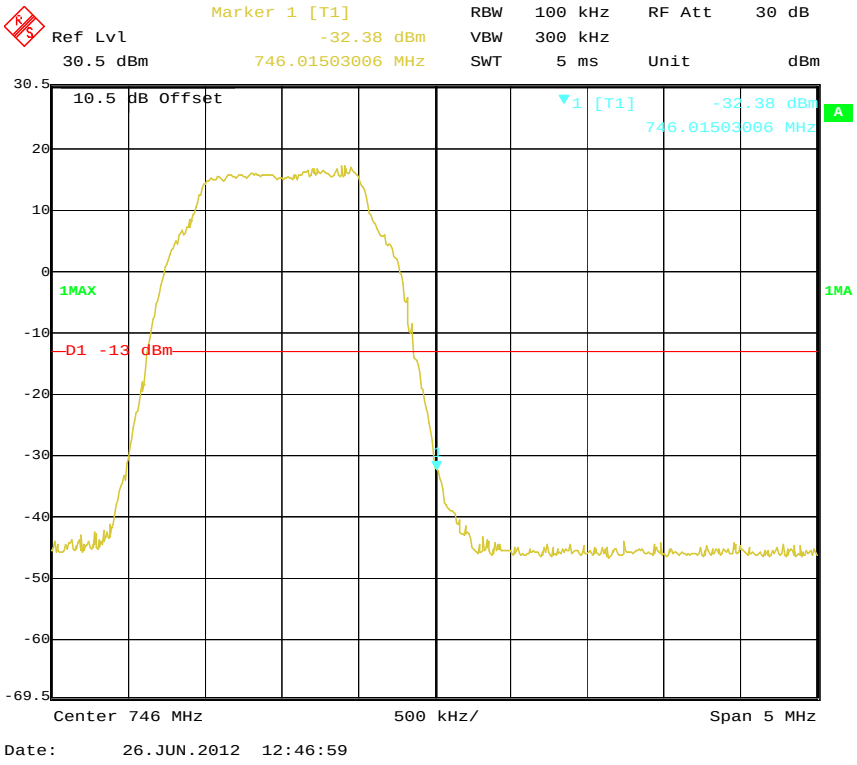
The testing was performed by Jimmy Xiao from 2012-05-13 to 2012-06-26.

Modulation: LTE700 (728-746MHz)-QPSK (1.4 MHz)

Lowest Channel

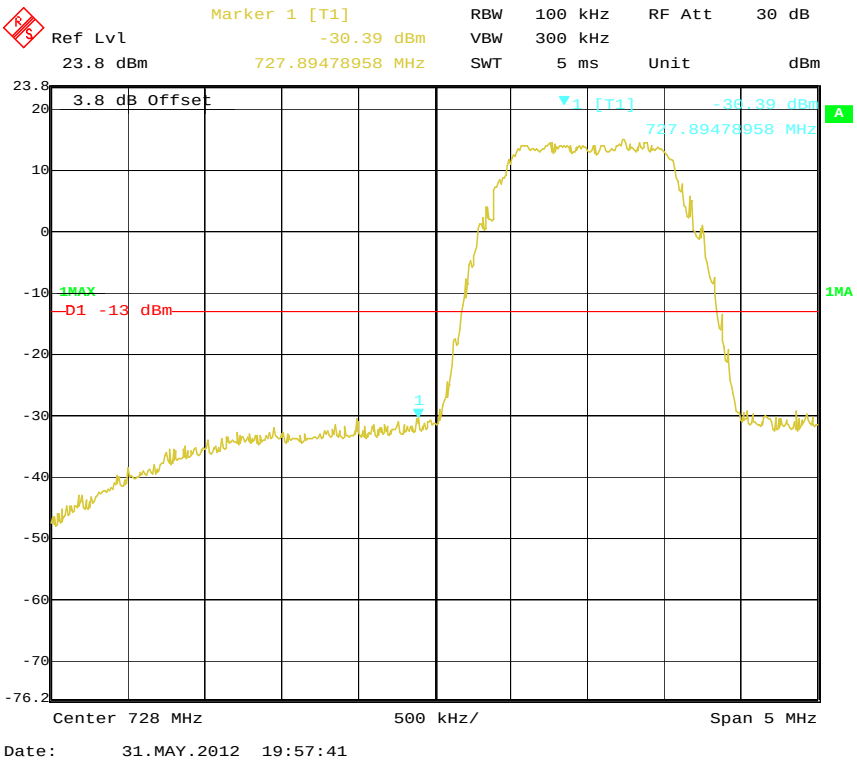


Highest Channel

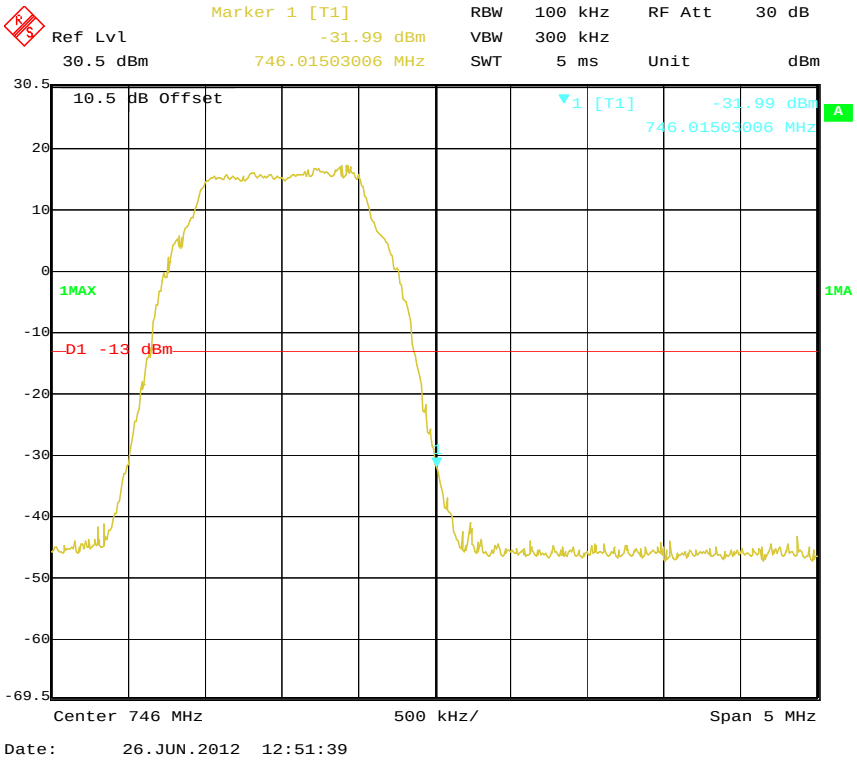


Modulation: LTE700 (728-746MHz)-16QAM (1.4 MHz)

Lowest Channel

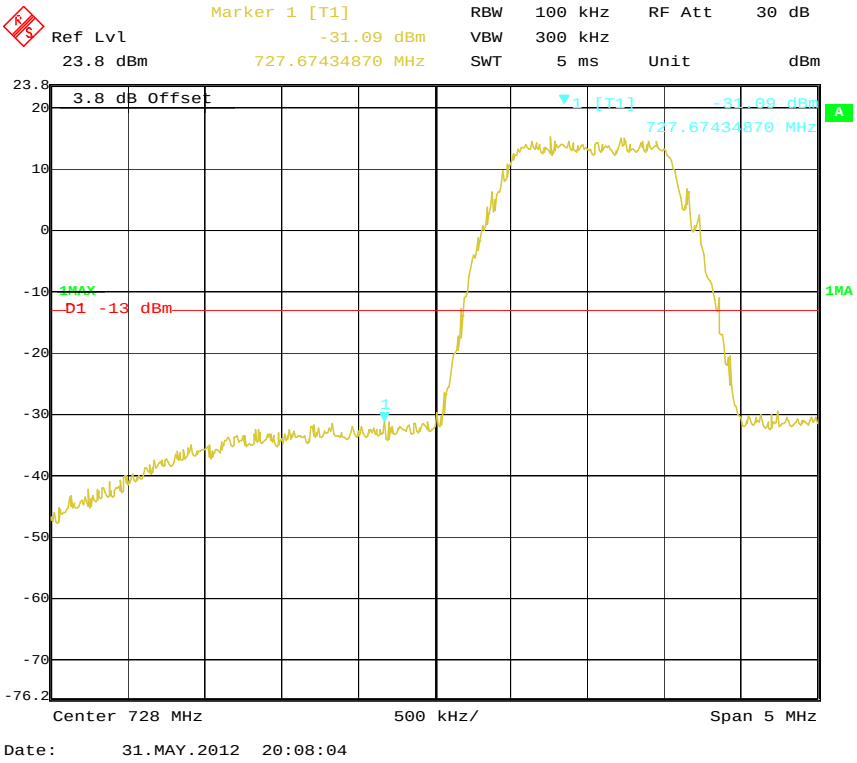


Highest Channel

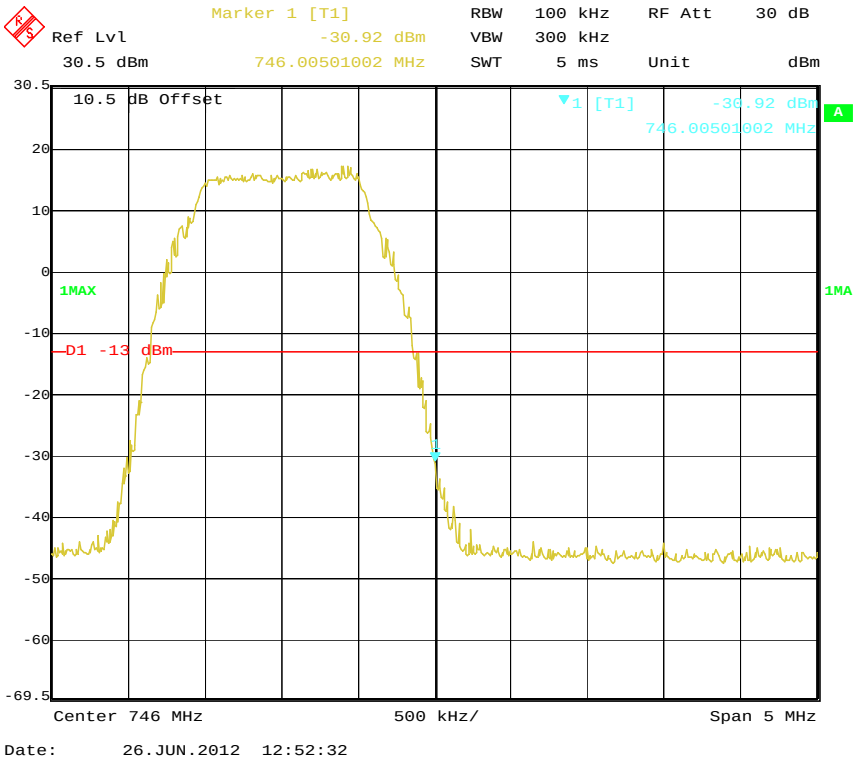


Modulation: LTE700 (728-746MHz)-64QAM (1.4 MHz)

Lowest Channel

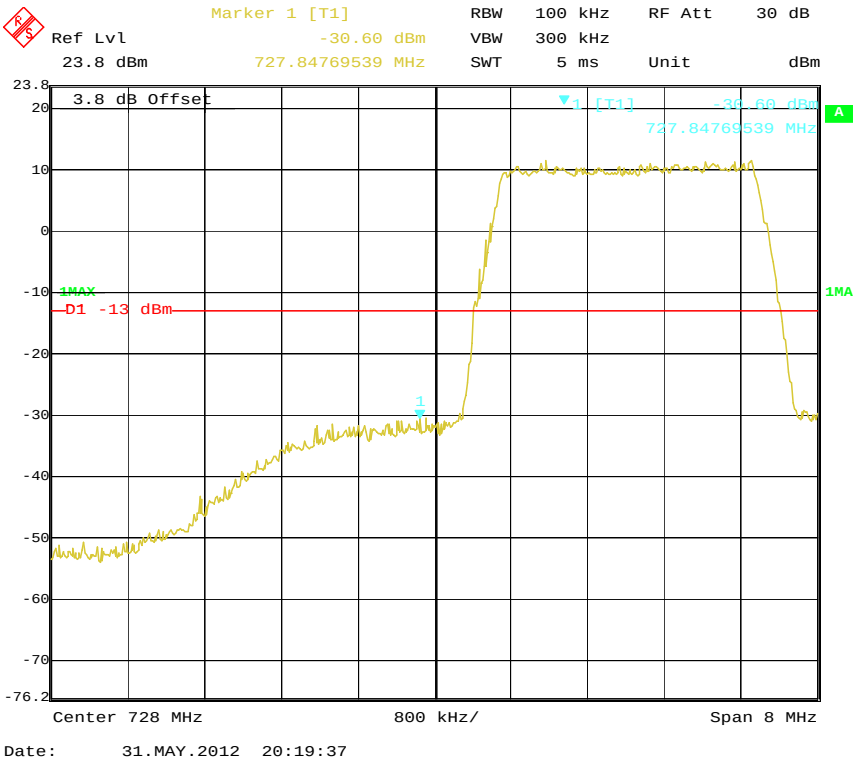


Highest Channel

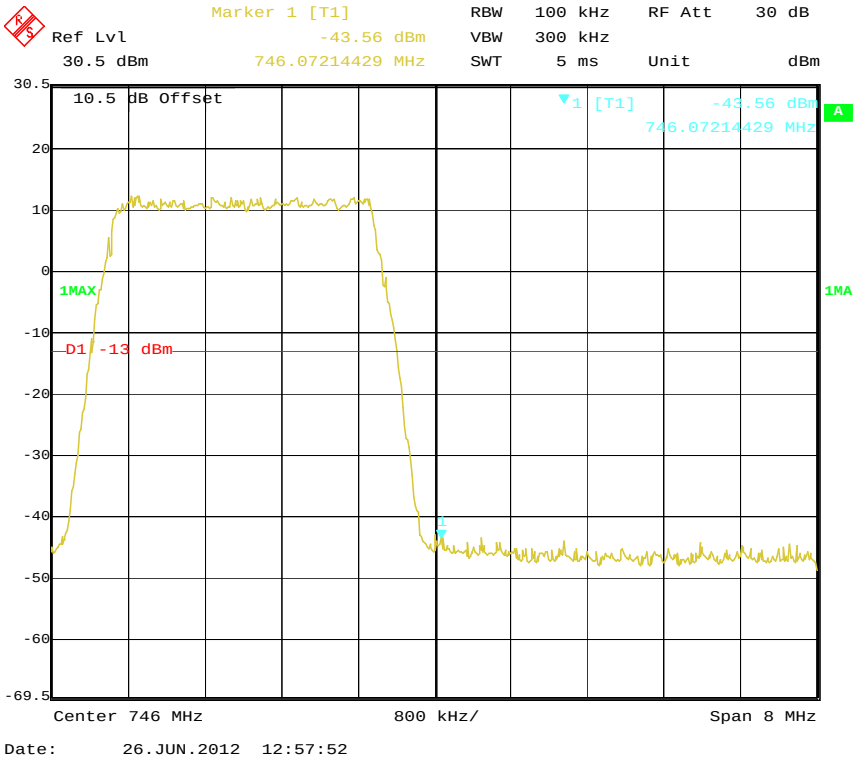


Modulation: LTE700 (728-746MHz)-QPSK (3 MHz)

Lowest Channel

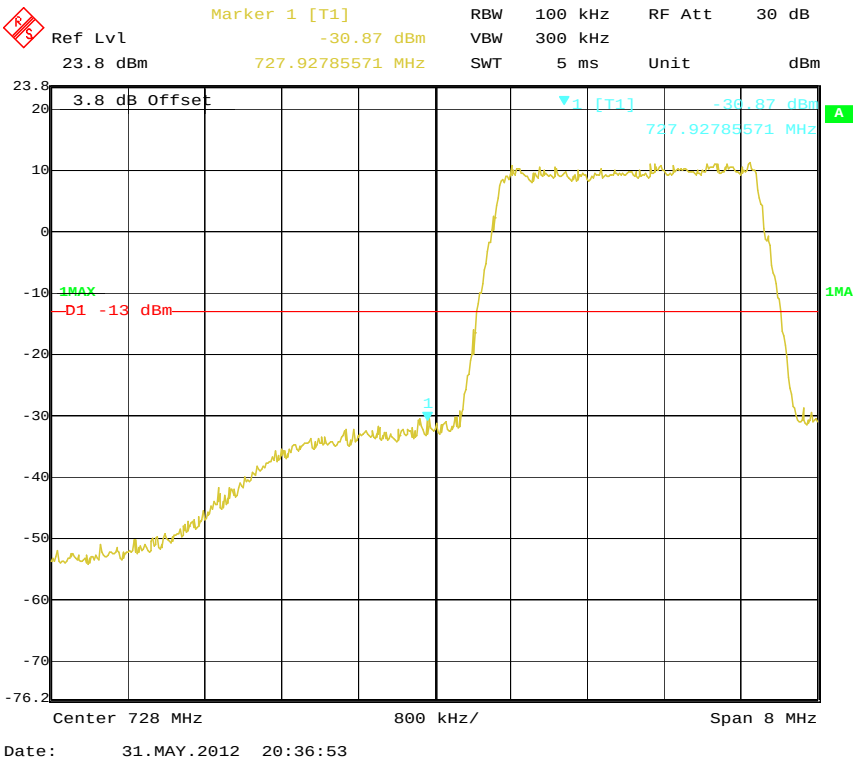


Highest Channel

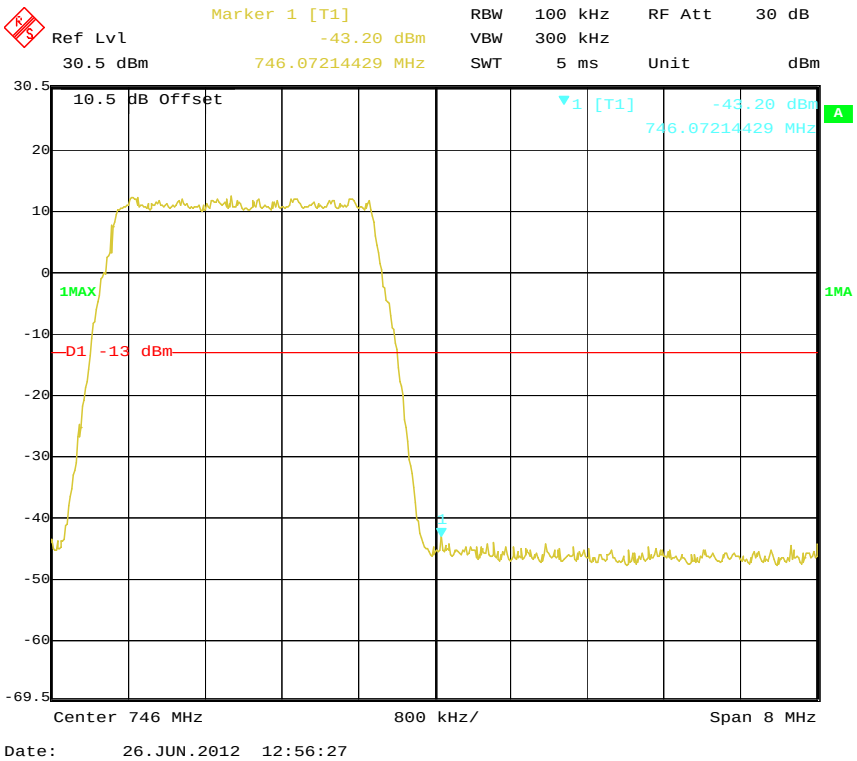


Modulation: LTE700 (728-746MHz)-16QAM (3 MHz)

Lowest Channel

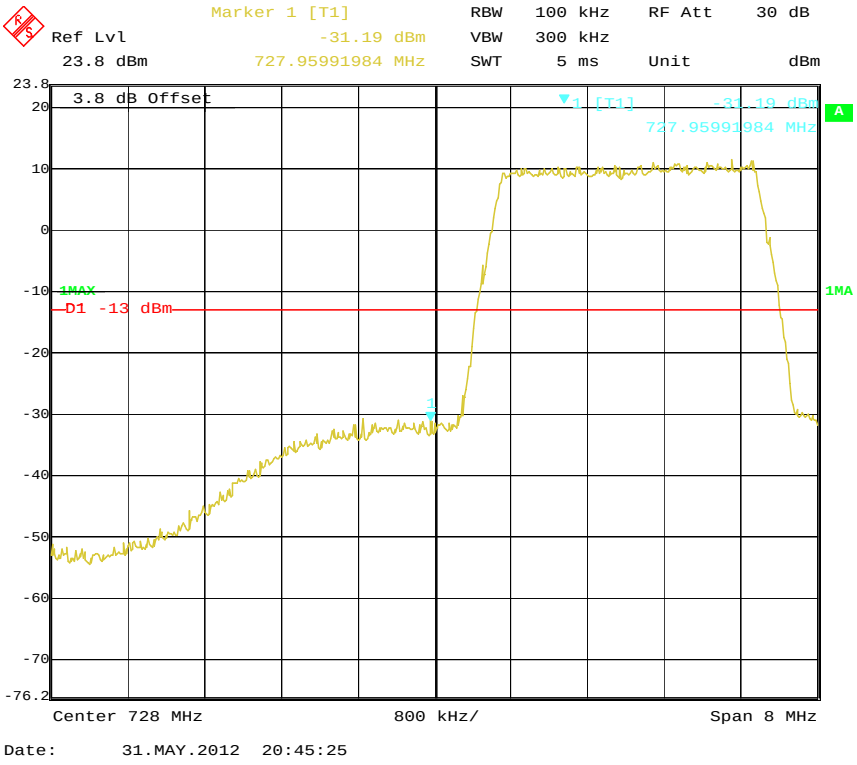


Highest Channel

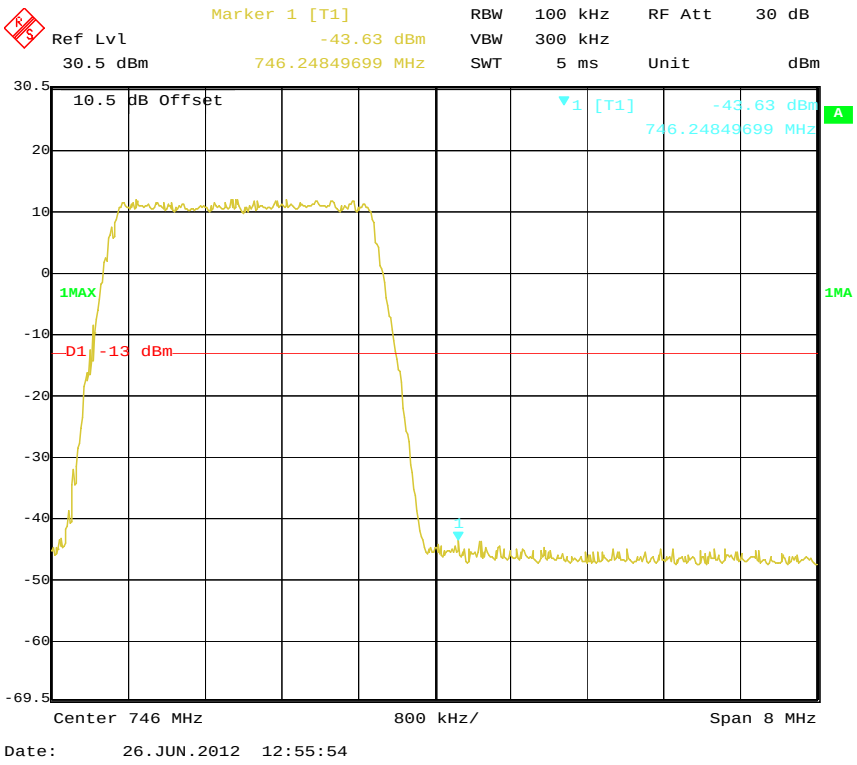


Modulation: LTE700 (728-746MHz)-64QAM (3 MHz)

Lowest Channel

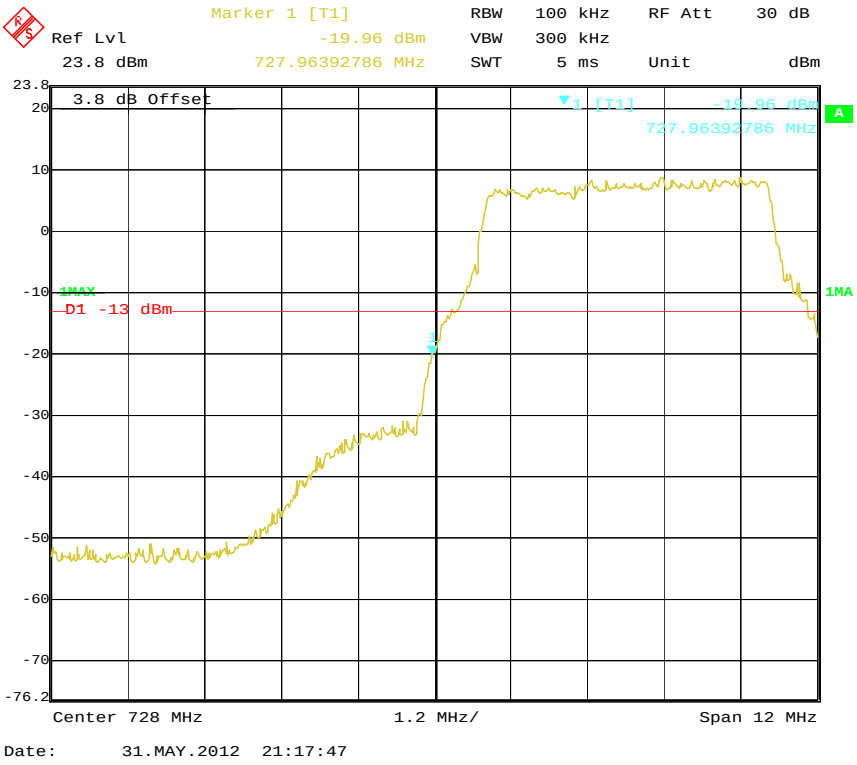


Highest Channel

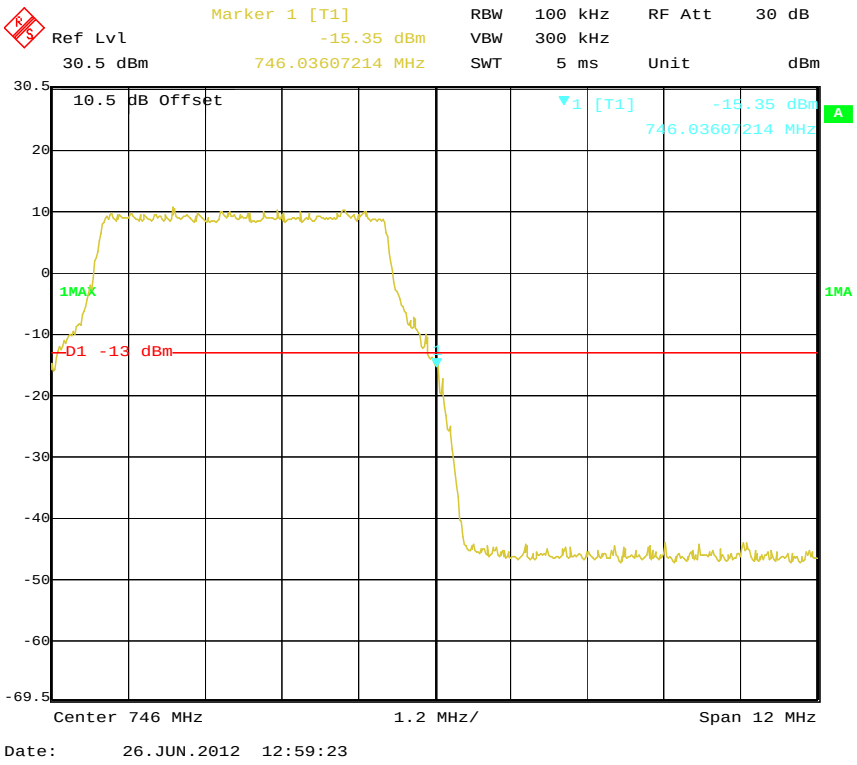


Modulation: LTE700 (728-746MHz)-QPSK (5 MHz)

Lowest Channel

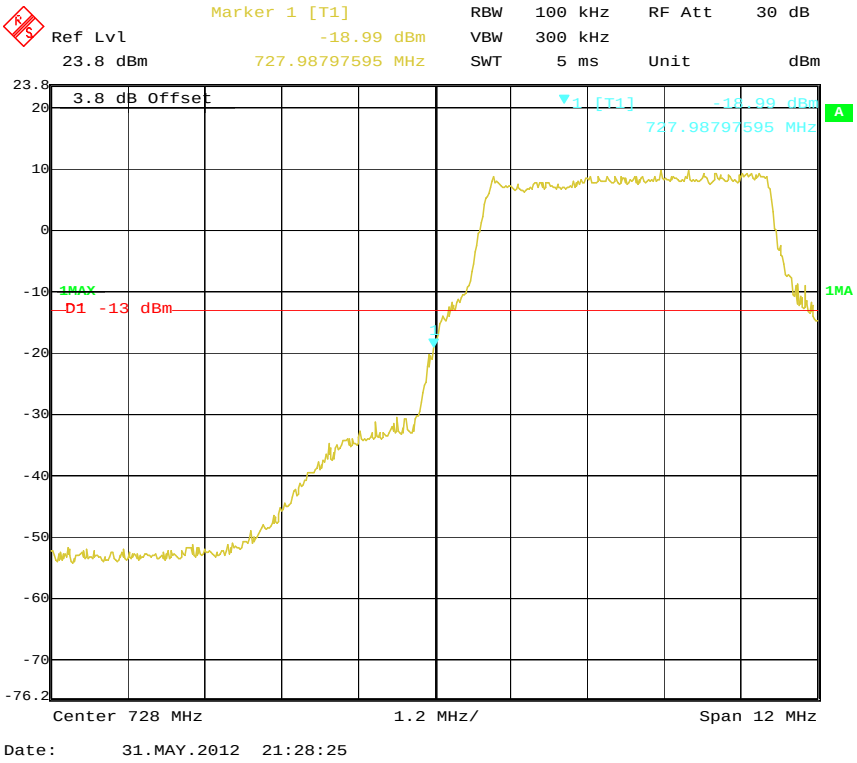


Highest Channel

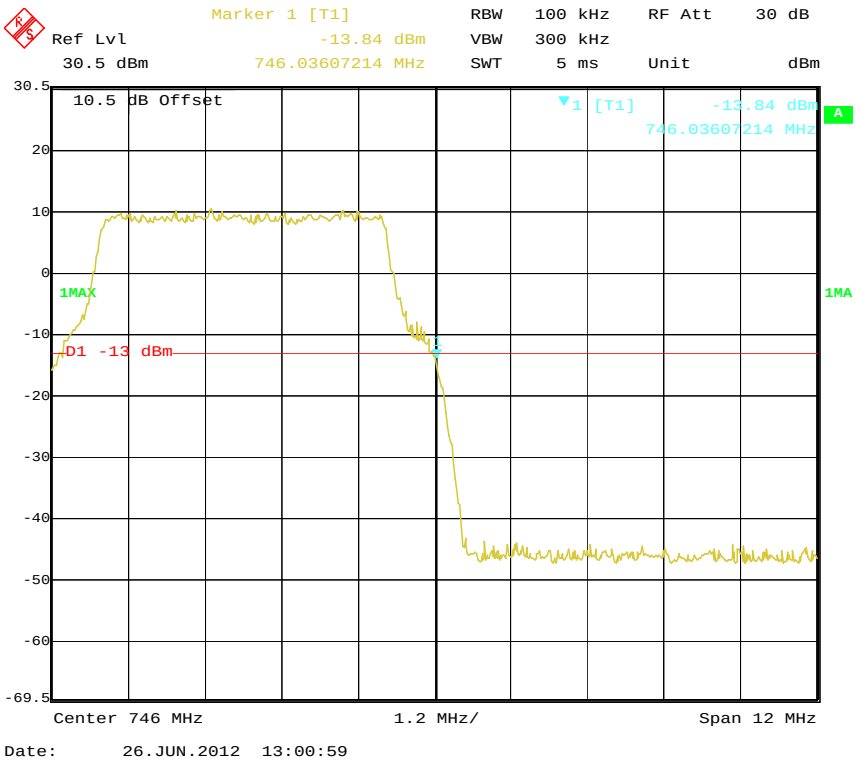


Modulation: LTE700 (728-746MHz)-16QAM (5 MHz)

Lowest Channel

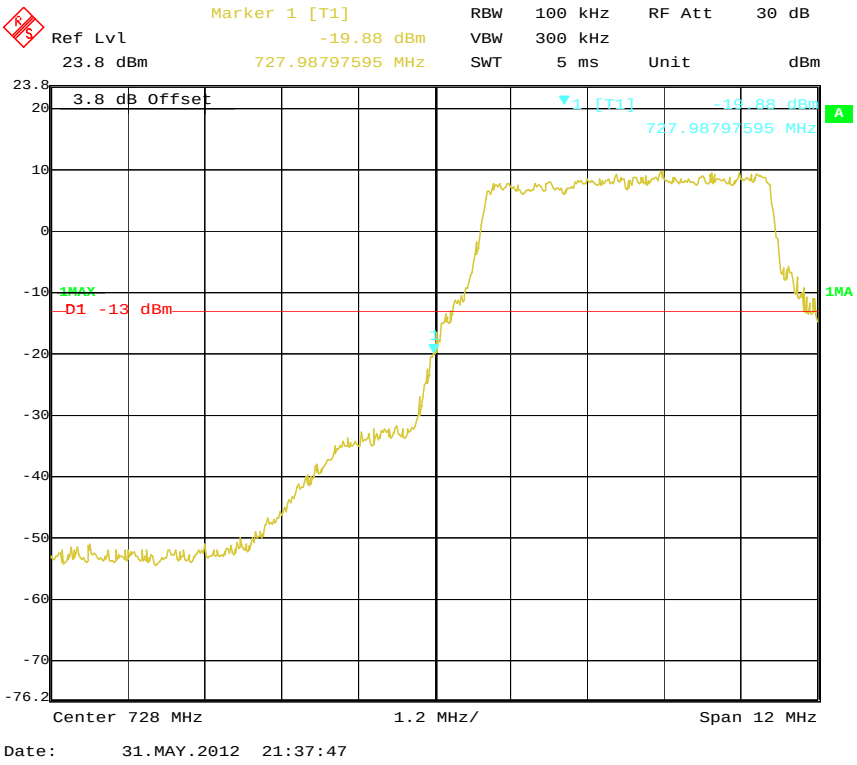


Highest Channel

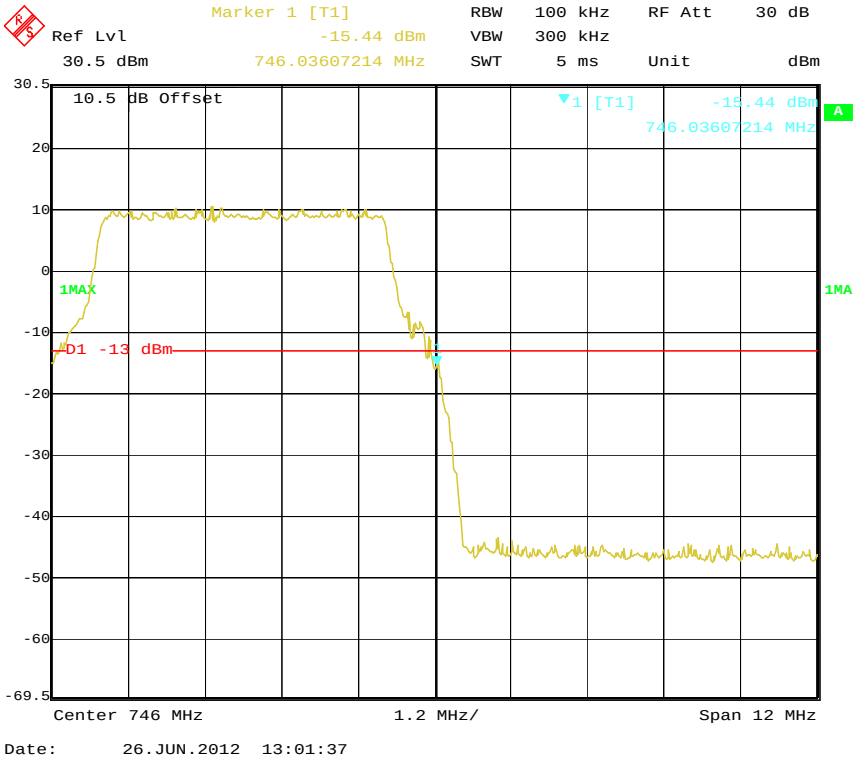


Modulation: LTE700 (728-746MHz)-64QAM (5 MHz)

Lowest Channel

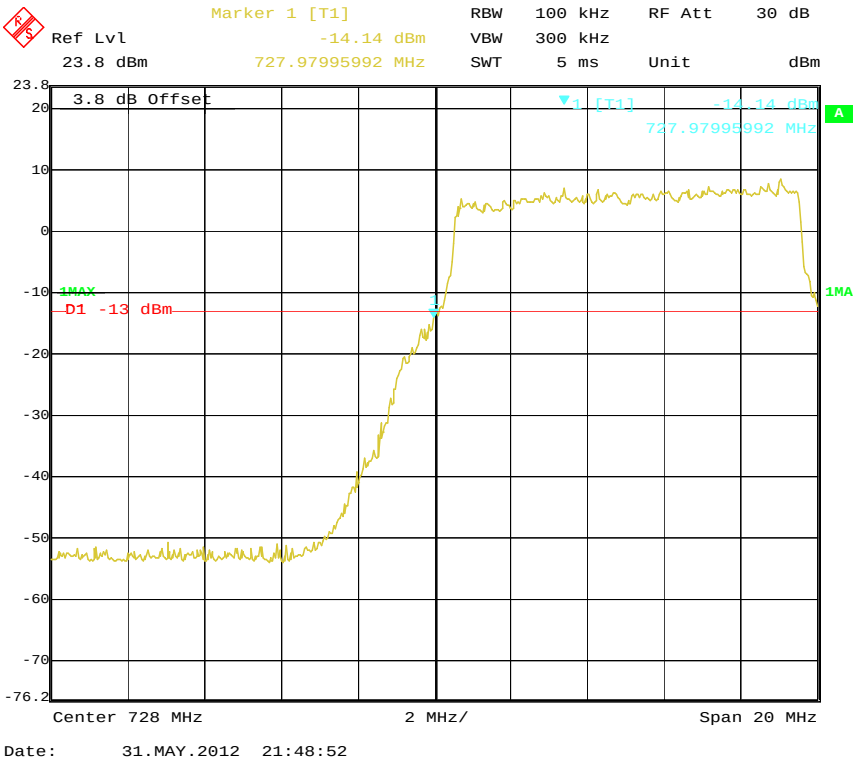


Highest Channel

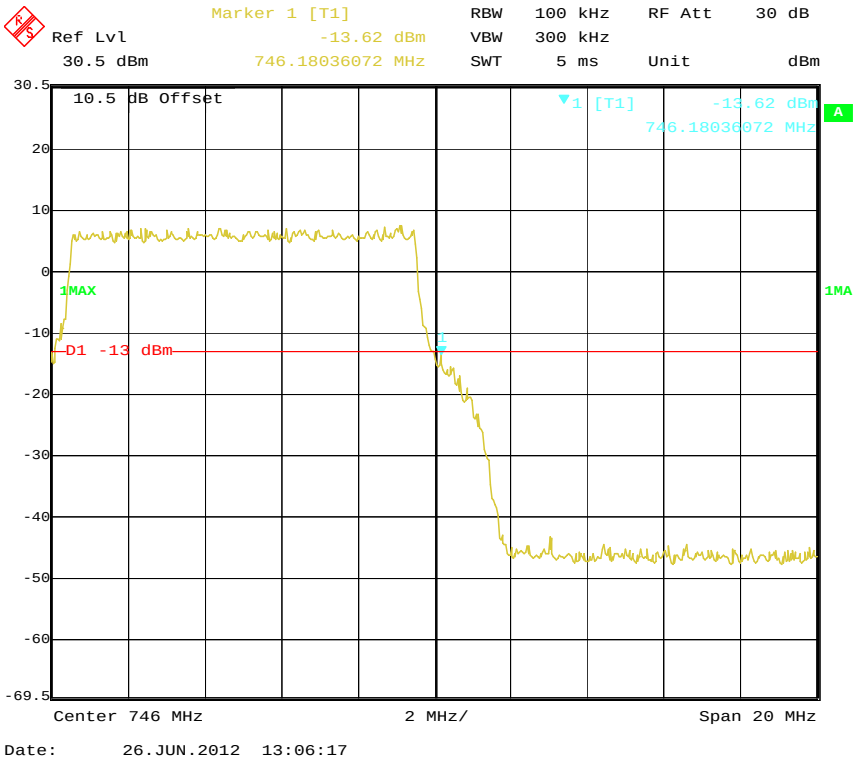


Modulation: LTE700 (728-746MHz)-QPSK (10 MHz)

Lowest Channel

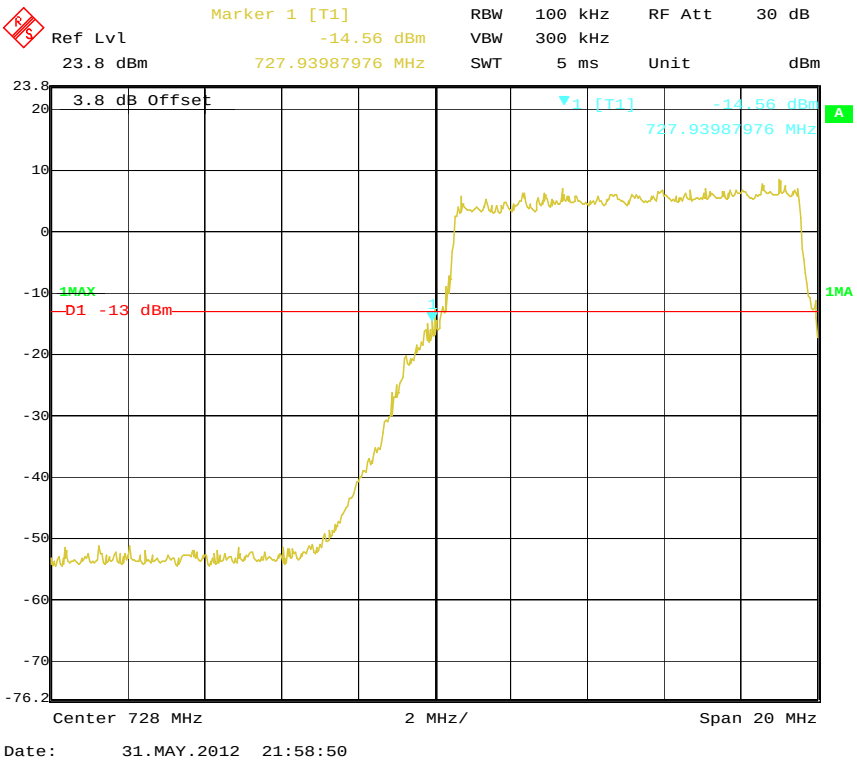


Highest Channel

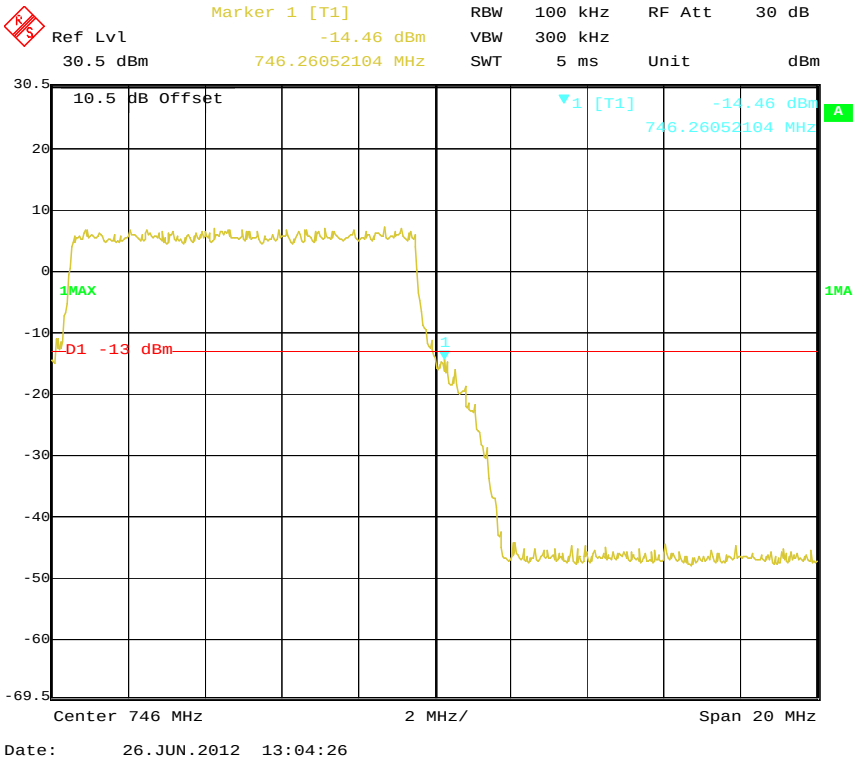


Modulation: LTE700 (728-746MHz)-16QAM (10 MHz)

Lowest Channel

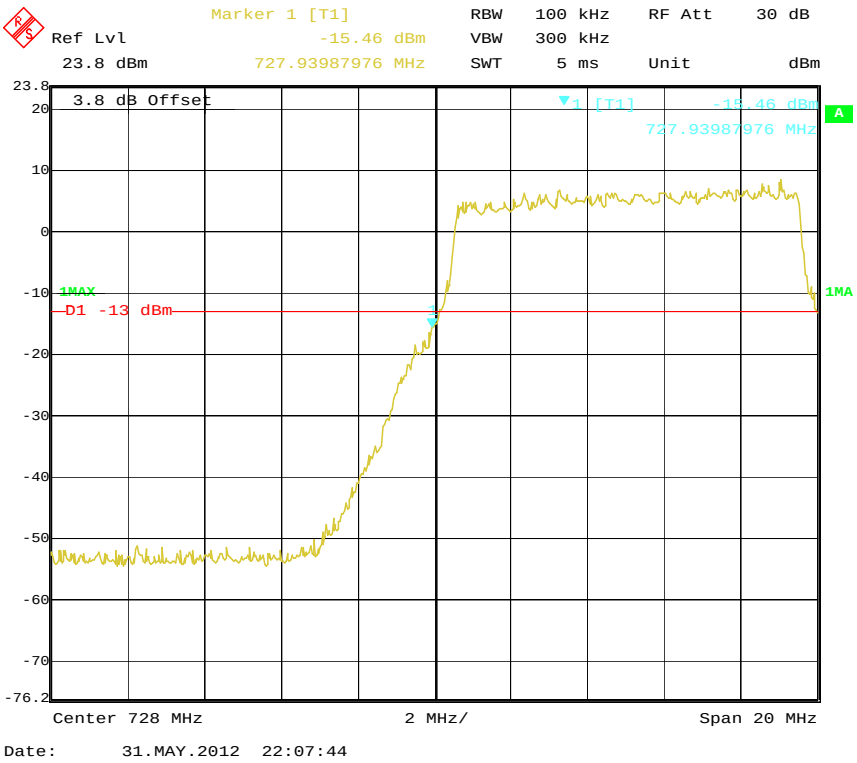


Highest Channel

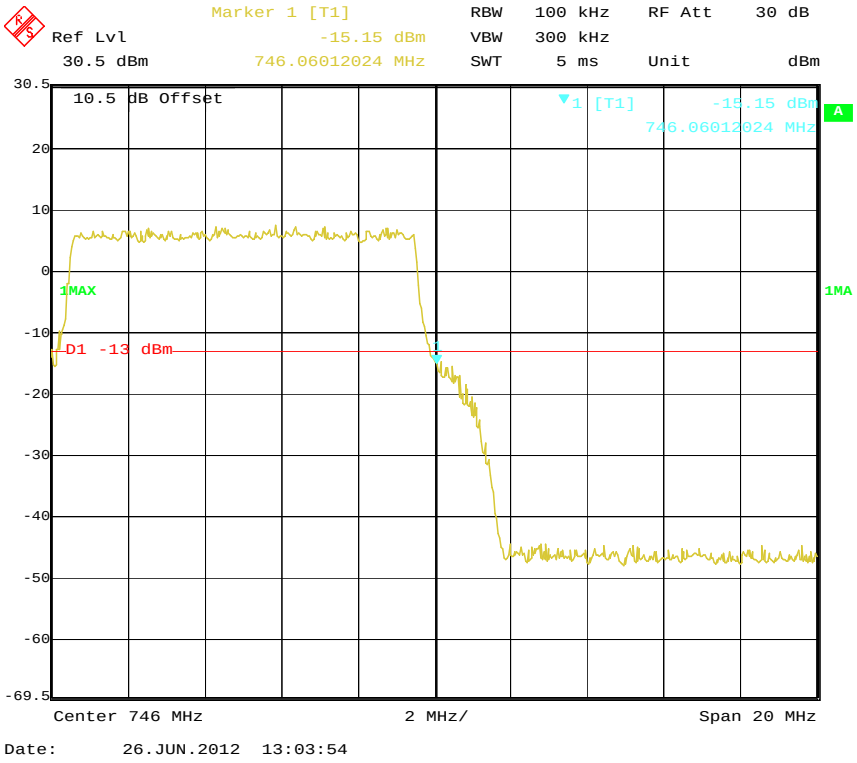


Modulation: LTE700 (728-746MHz)-64QAM (10 MHz)

Lowest Channel

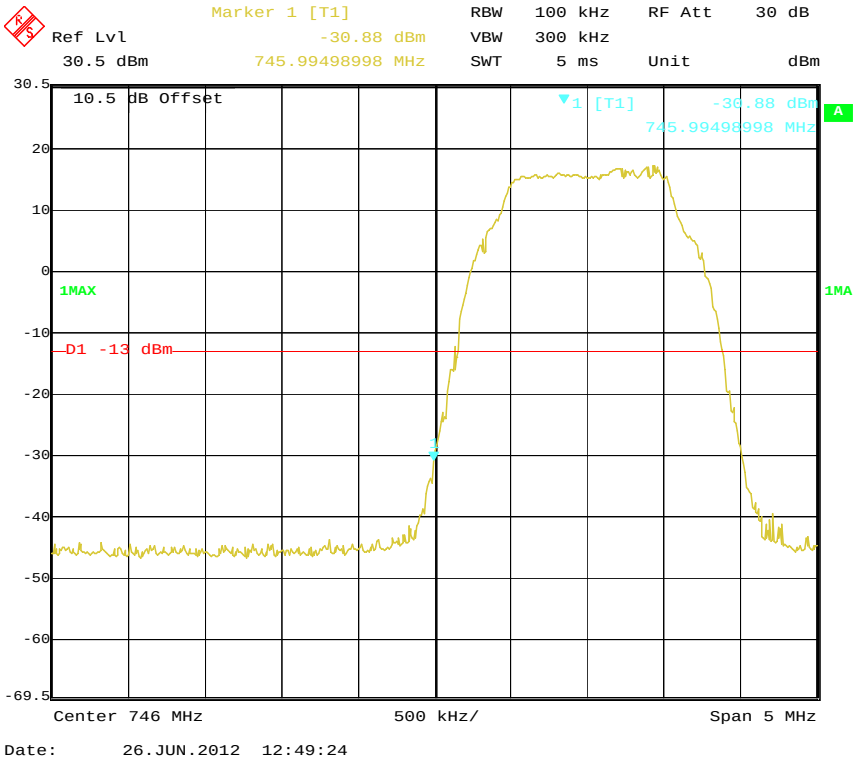


Highest Channel

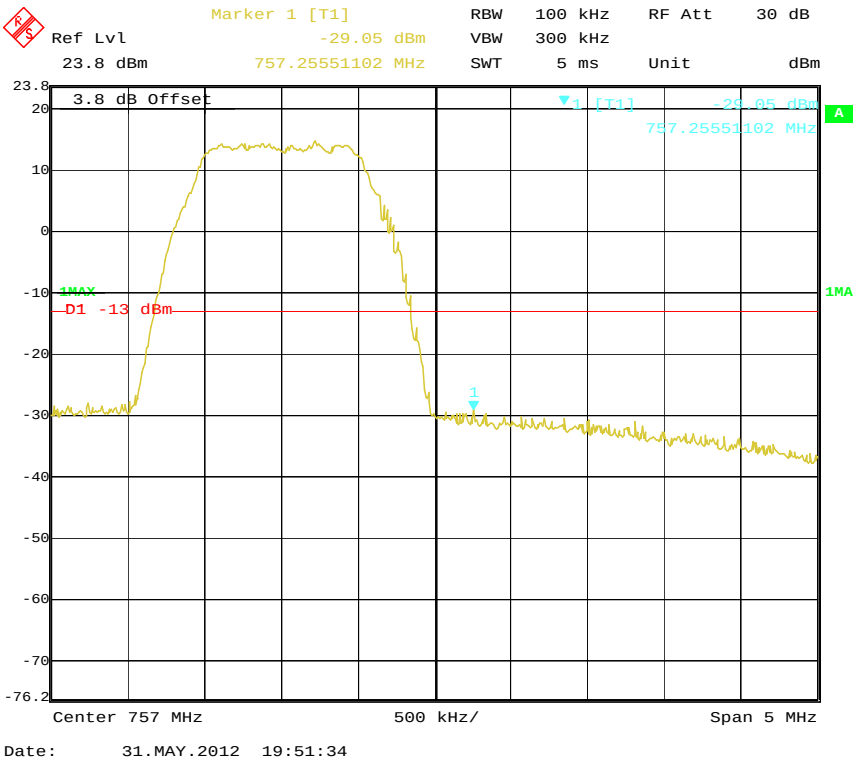


Modulation: LTE700 (746-757MHz)-QPSK (1.4 MHz)

Lowest Channel

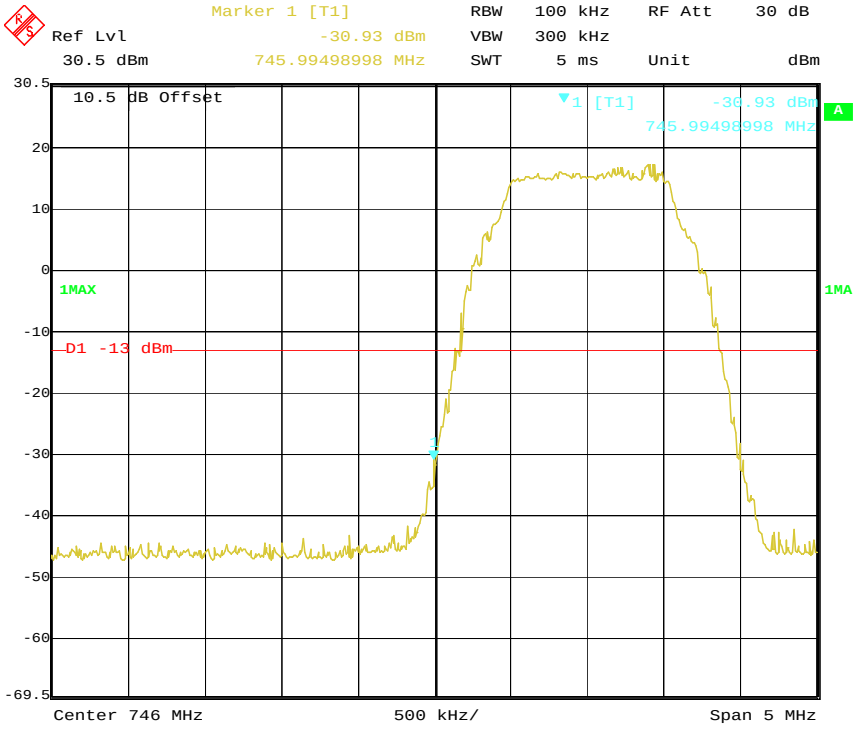


Highest Channel

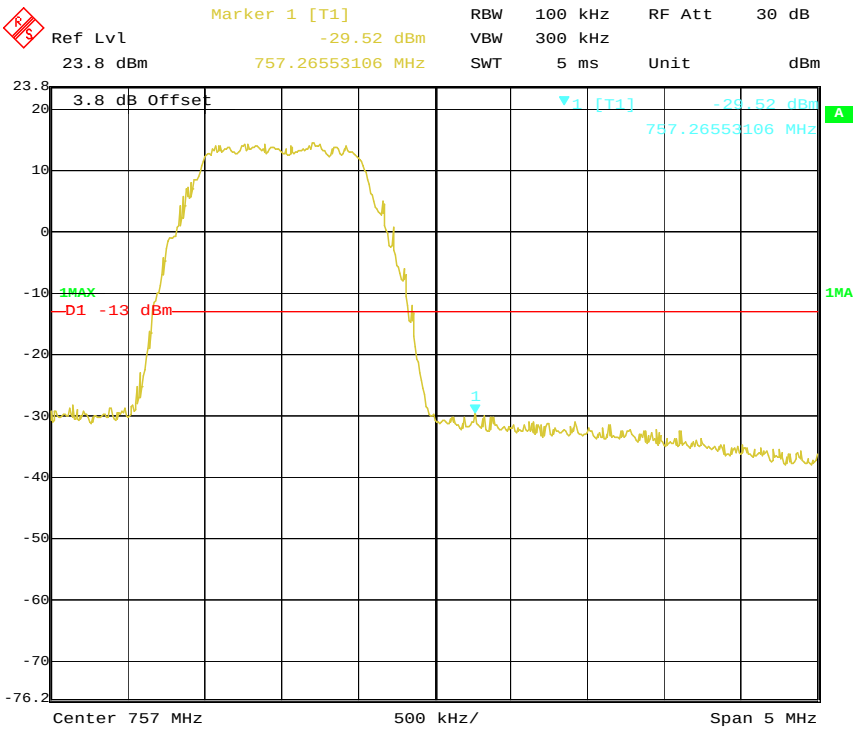


Modulation: LTE700 (746-757MHz)-16QAM (1.4 MHz)

Lowest Channel

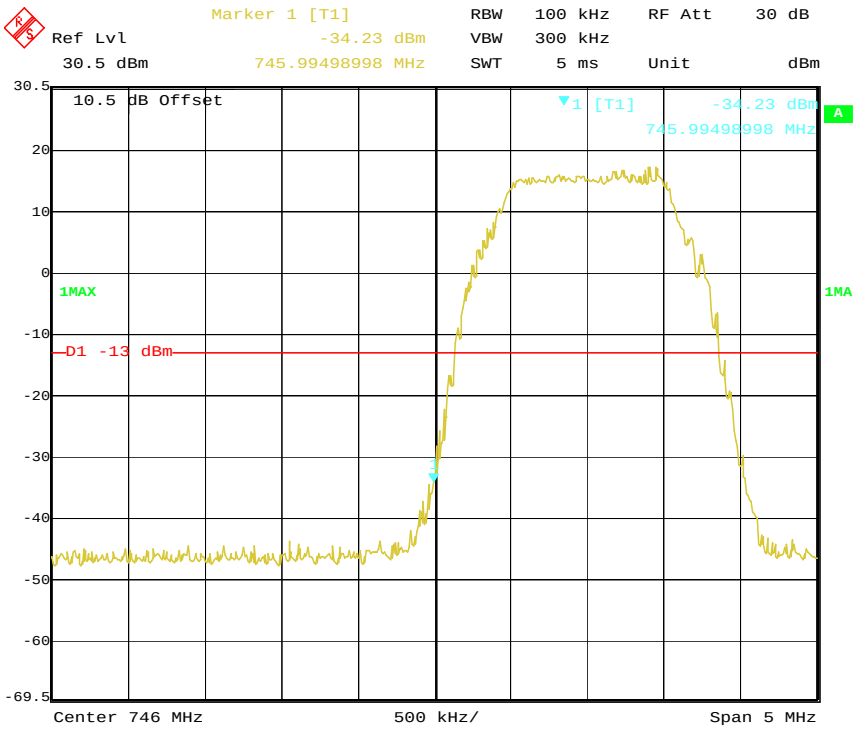


Highest Channel

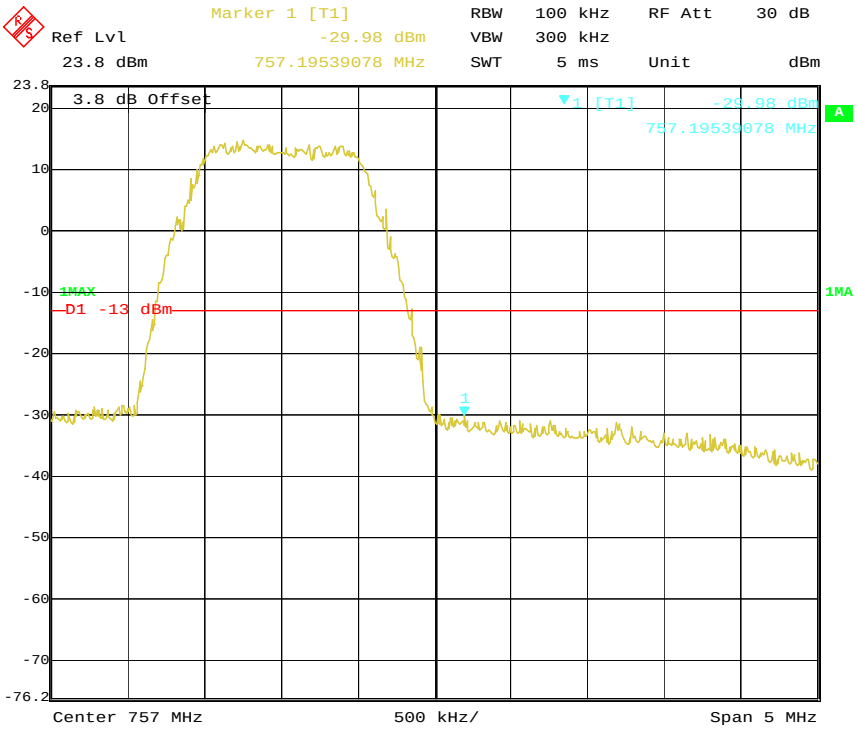


Modulation: LTE700 (746-757MHz)-64QAM (1.4 MHz)

Lowest Channel

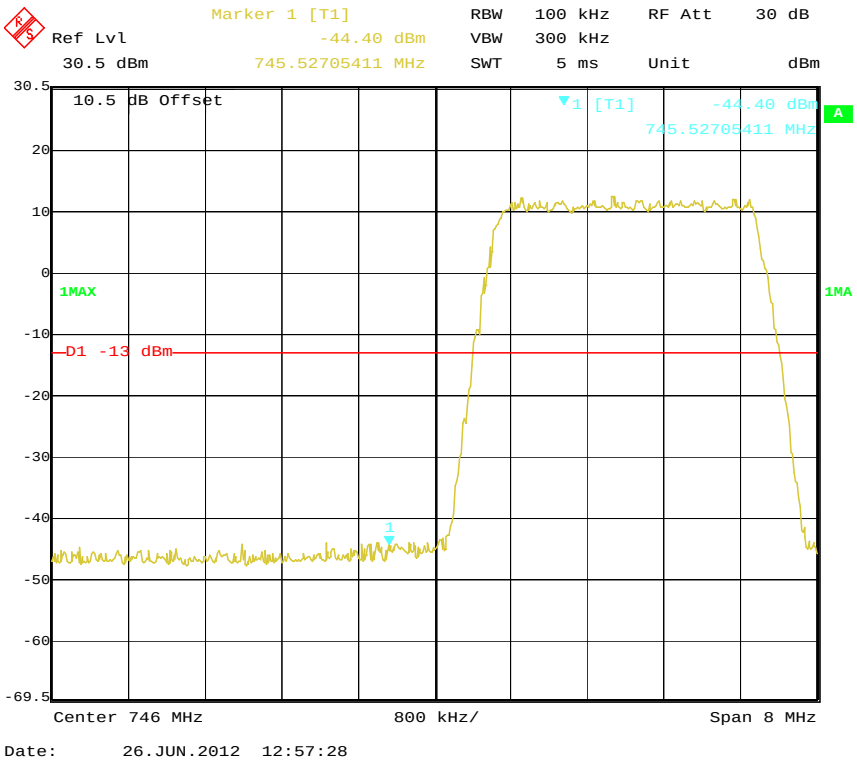


Highest Channel

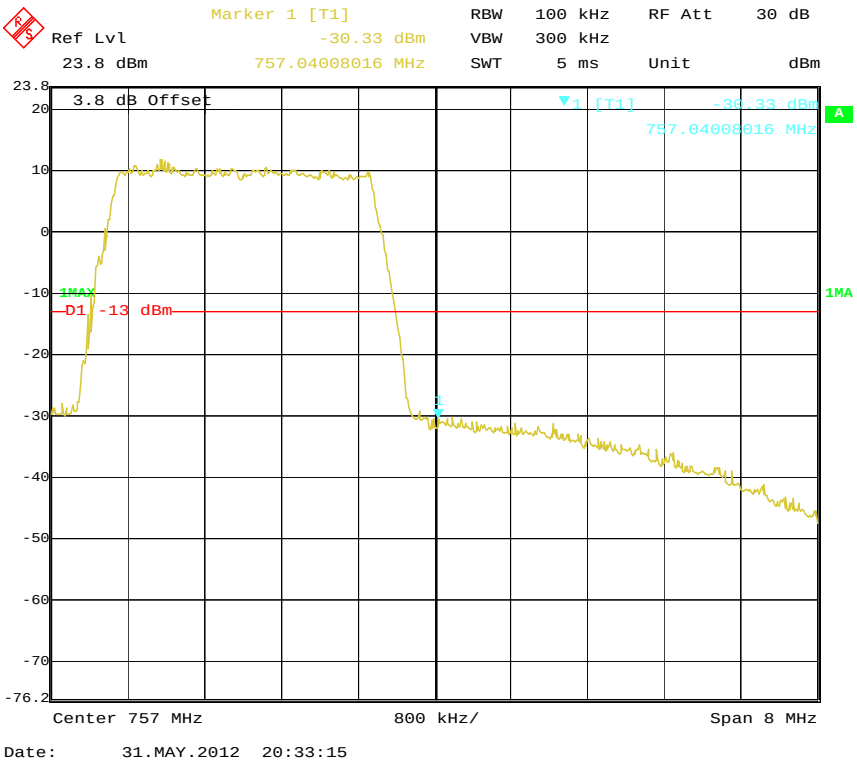


Modulation: LTE700 (746-757MHz)-QPSK (3 MHz)

Lowest Channel

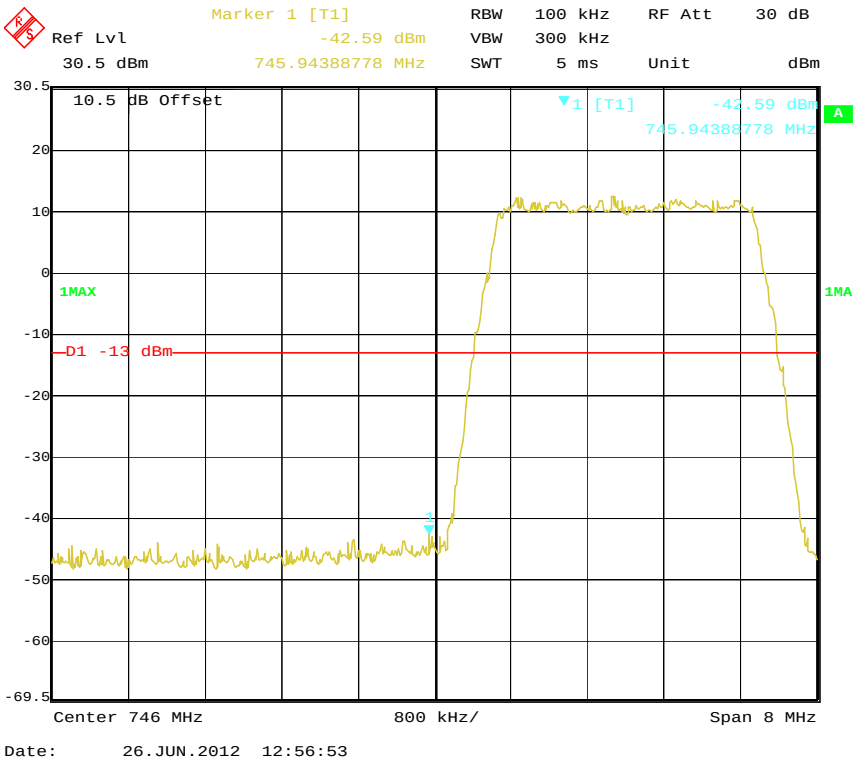


Highest Channel

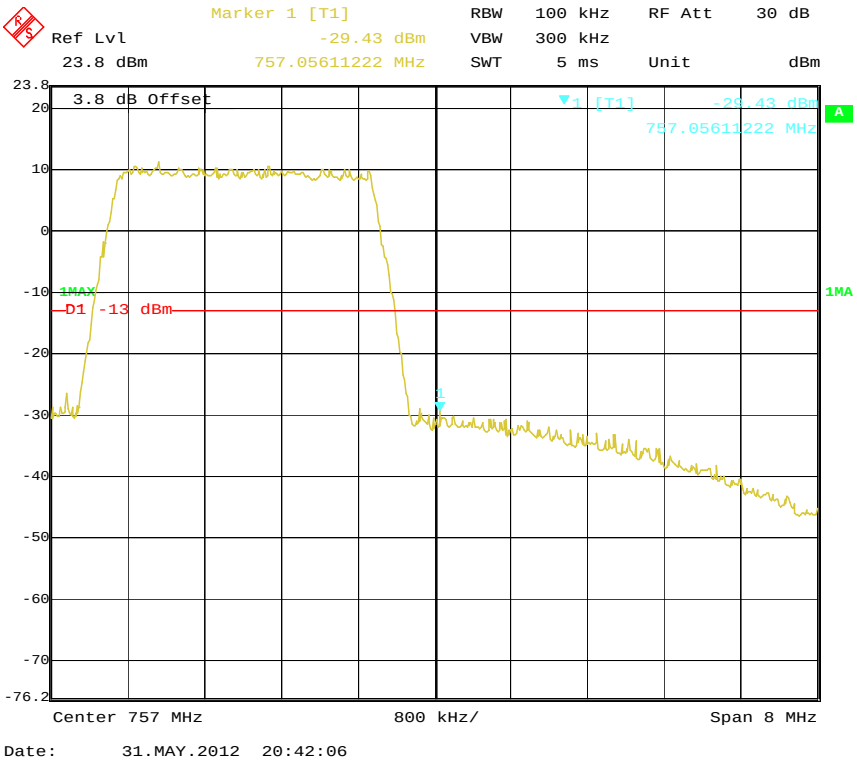


Modulation: LTE700 (746-757MHz)-16QAM (3 MHz)

Lowest Channel

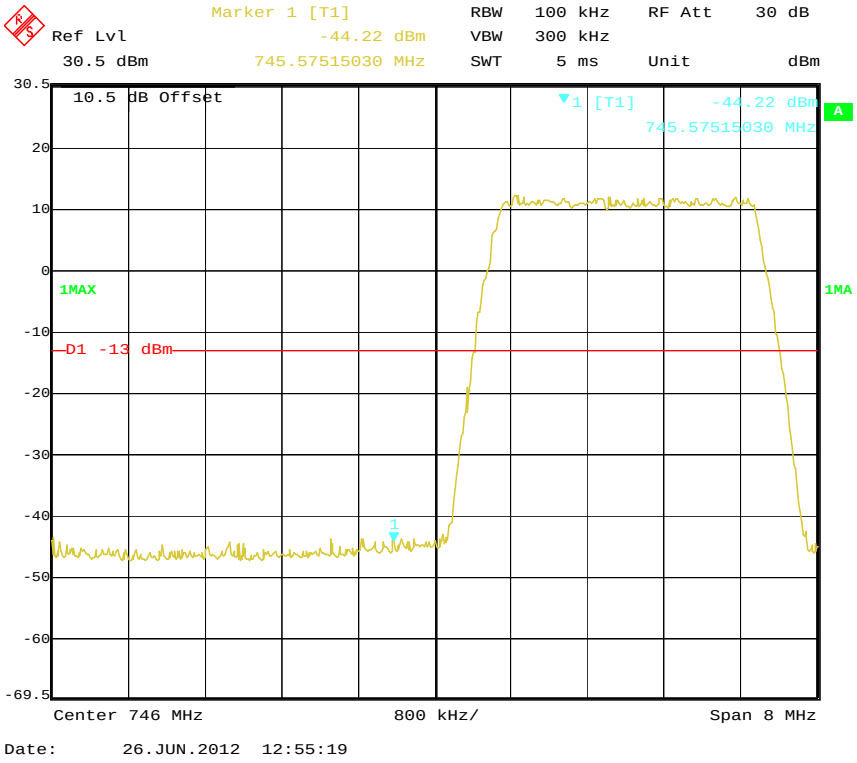


Highest Channel

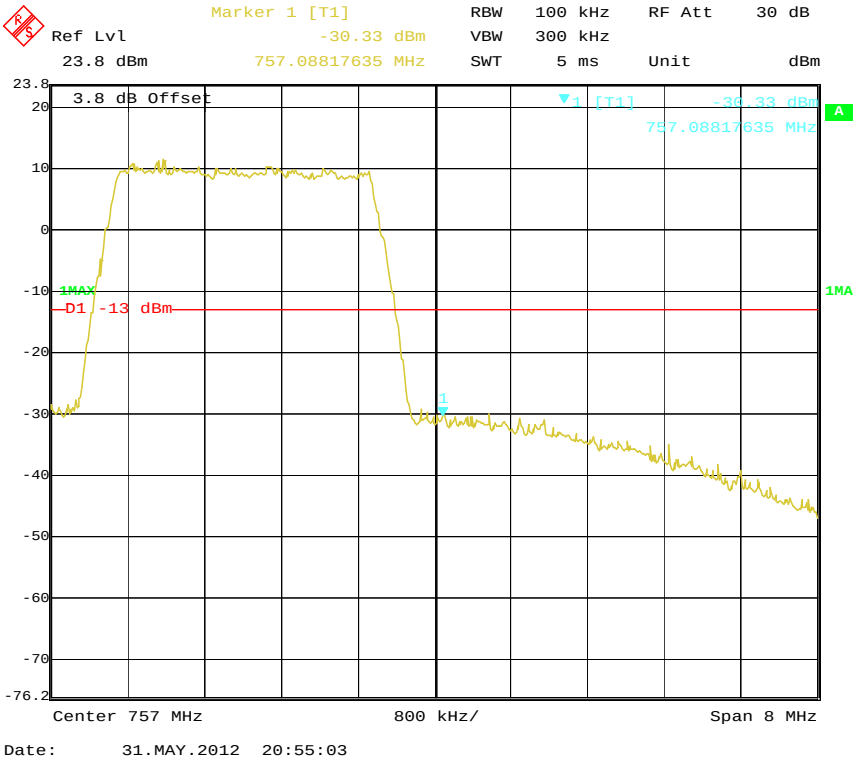


Modulation: LTE700 (746-757MHz)-64QAM (3 MHz)

Lowest Channel

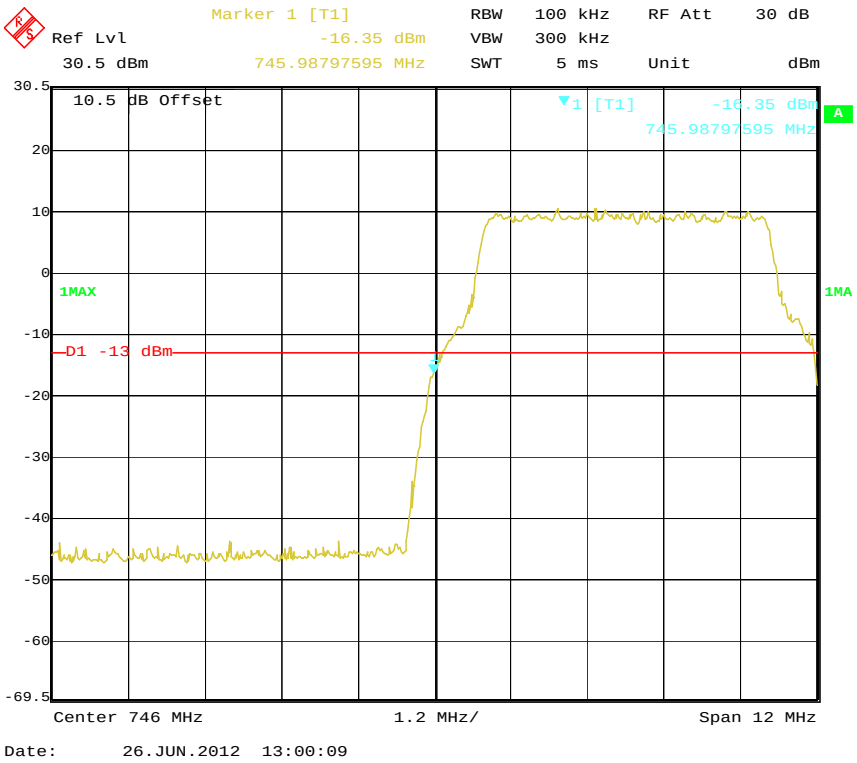


Highest Channel



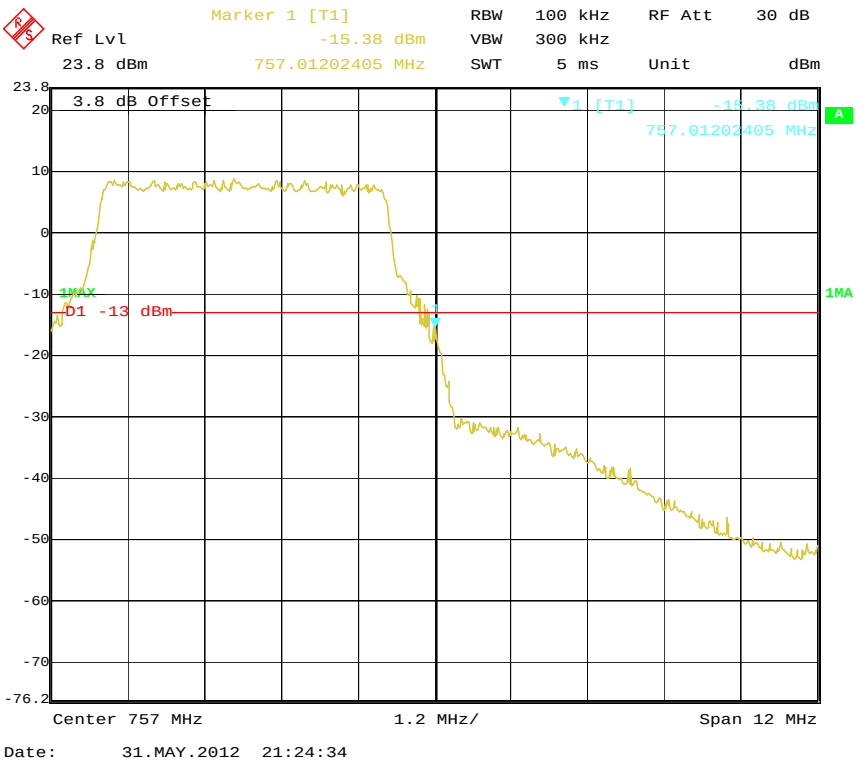
Modulation: LTE700 (746-757MHz)-QPSK (5 MHz)

Lowest Channel



Date: 26.JUN.2012 13:00:09

Highest Channel



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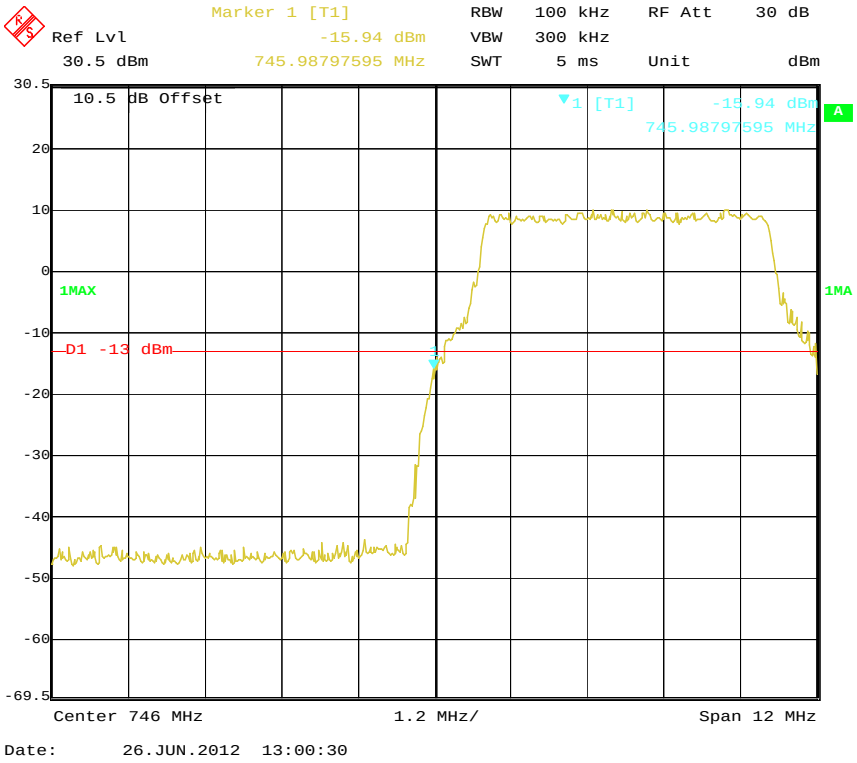
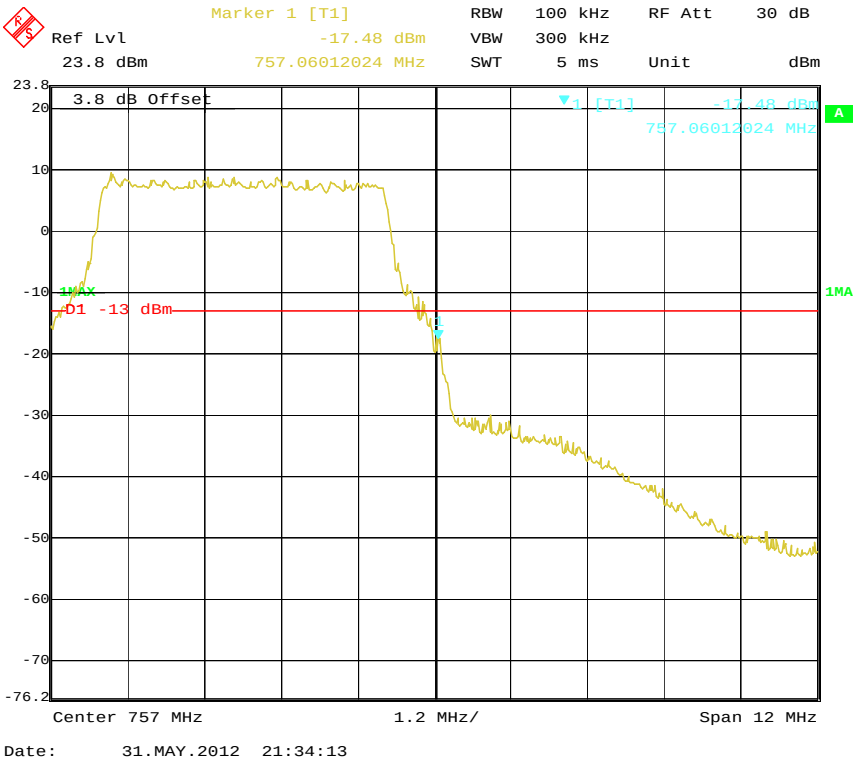
Modulation: LTE700 (746-757MHz)-16QAM (5 MHz)

Lowest Channel

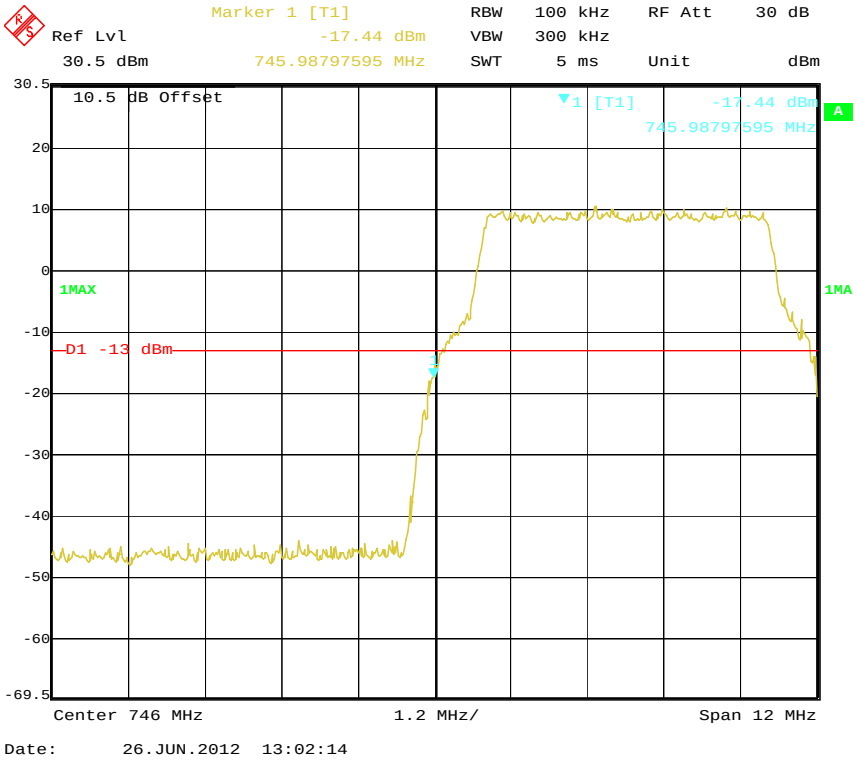


Highest Channel

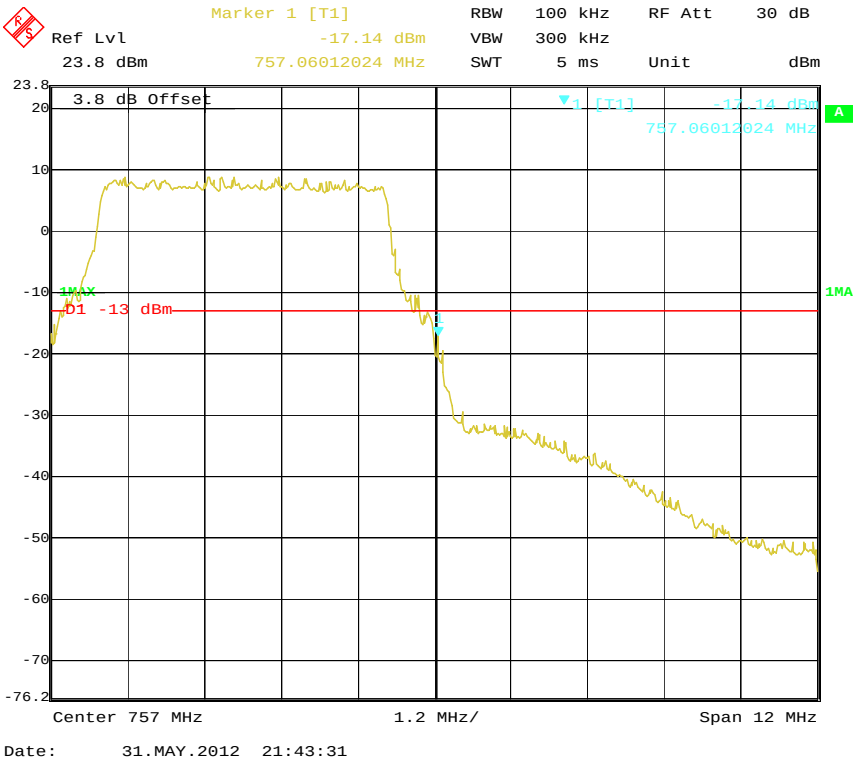


Modulation: LTE700 (746-757MHz)-64QAM (5 MHz)

Lowest Channel

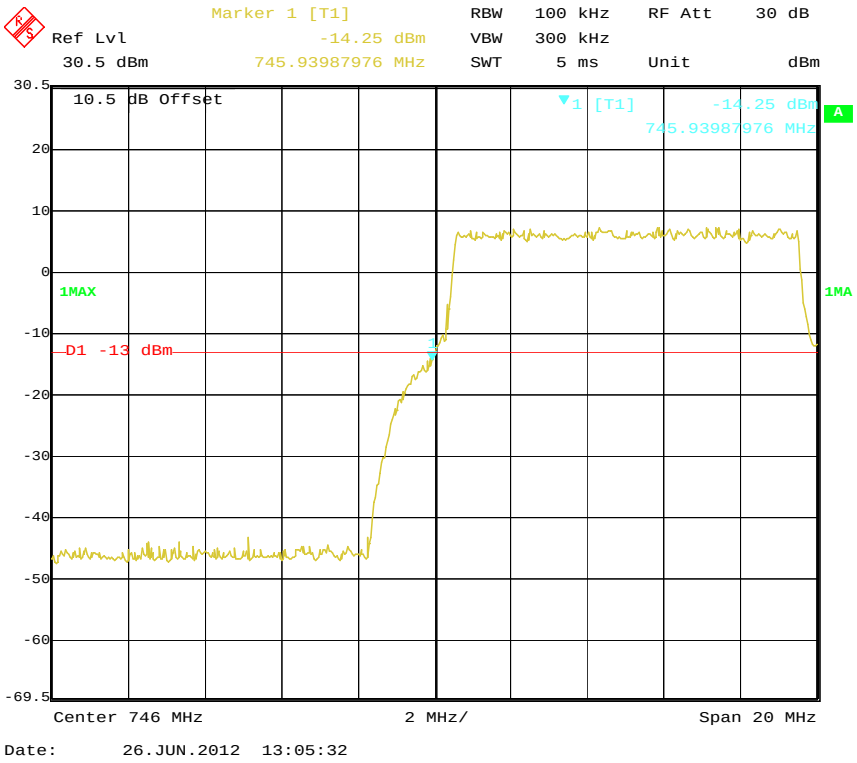


Highest Channel

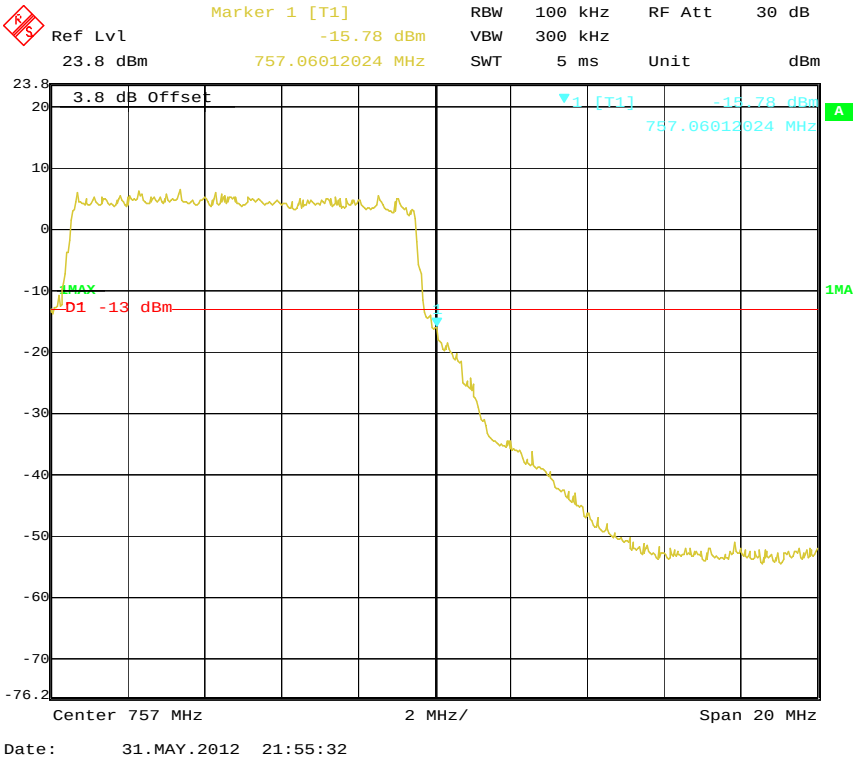


Modulation: LTE700 (746-757MHz)-QPSK (10 MHz)

Lowest Channel

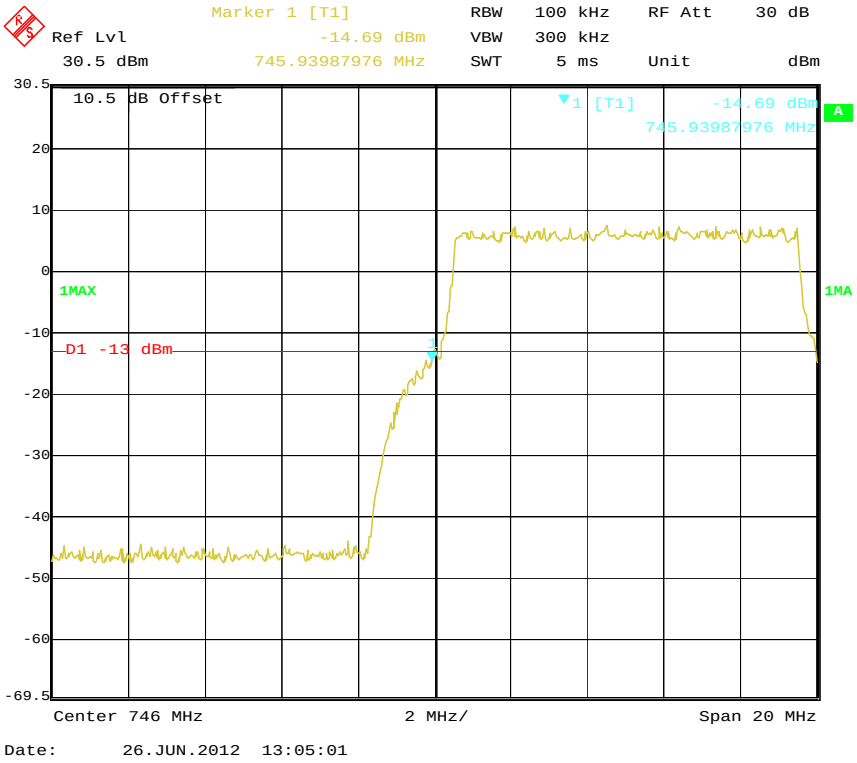


Highest Channel

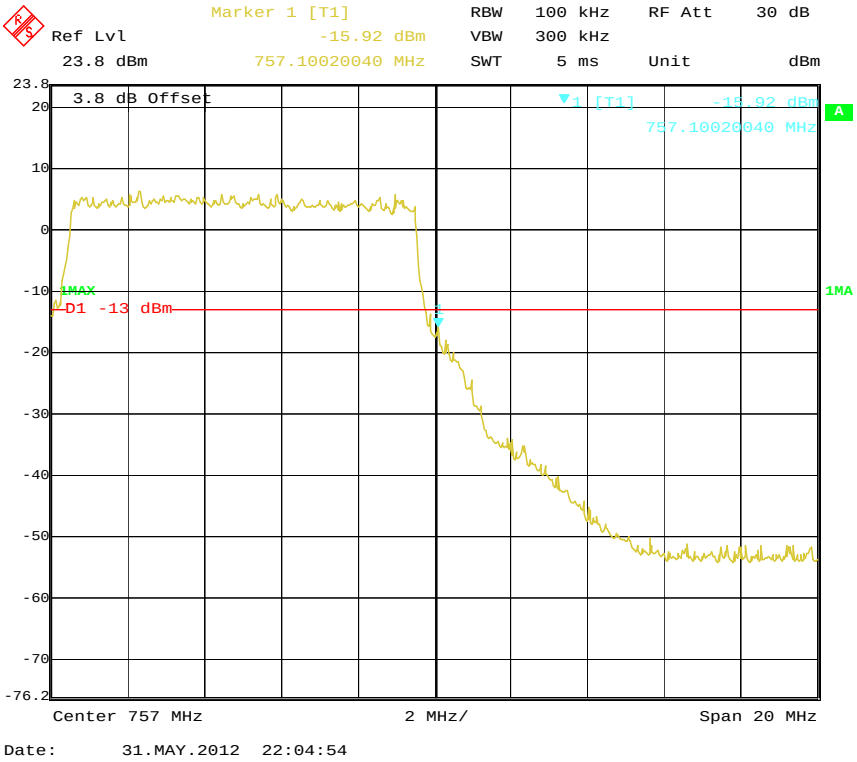


Modulation: LTE700 (746-757MHz)-16QAM (10 MHz)

Lowest Channel

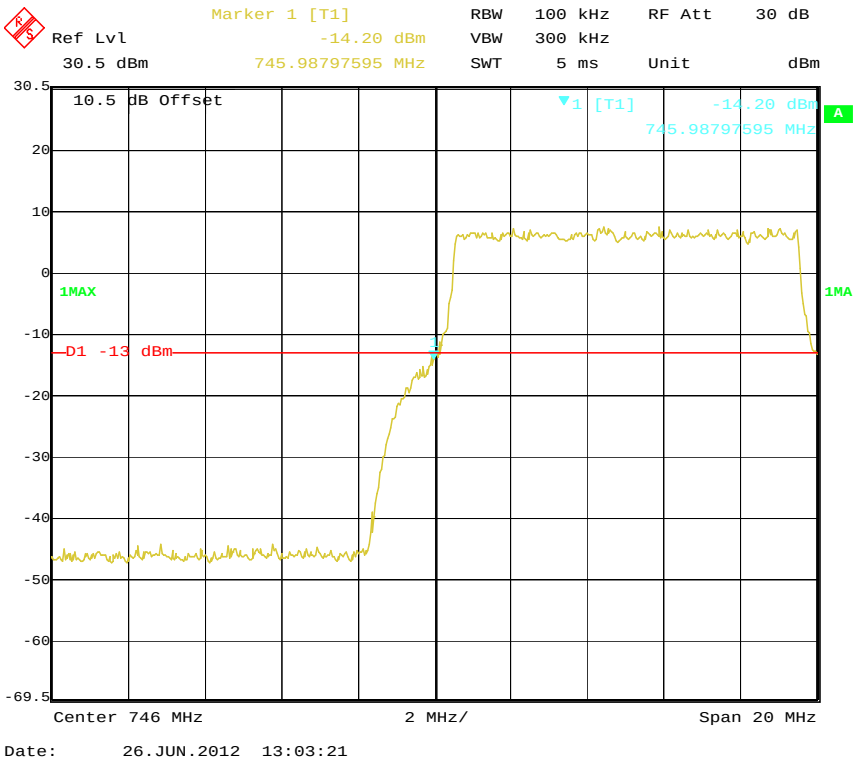


Highest Channel

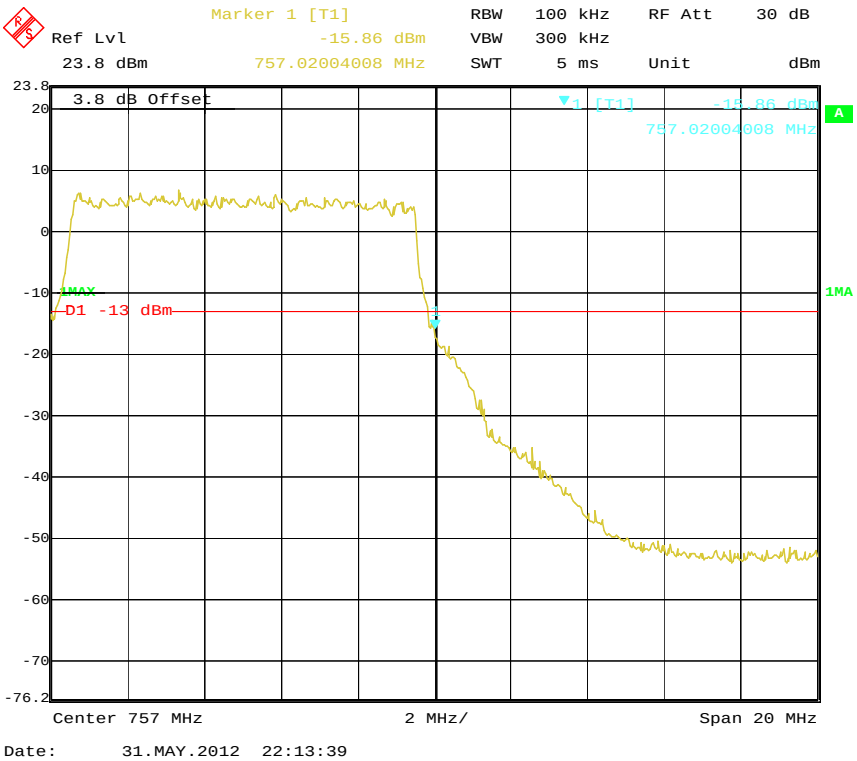


Modulation: LTE700 (746-757MHz)-64QAM (10 MHz)

Lowest Channel

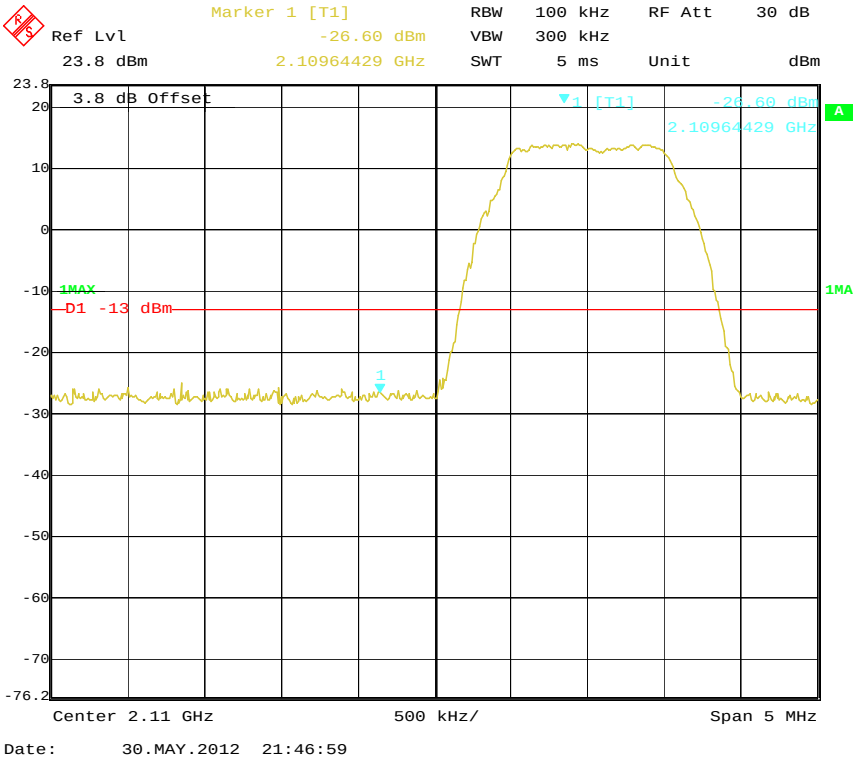


Highest Channel

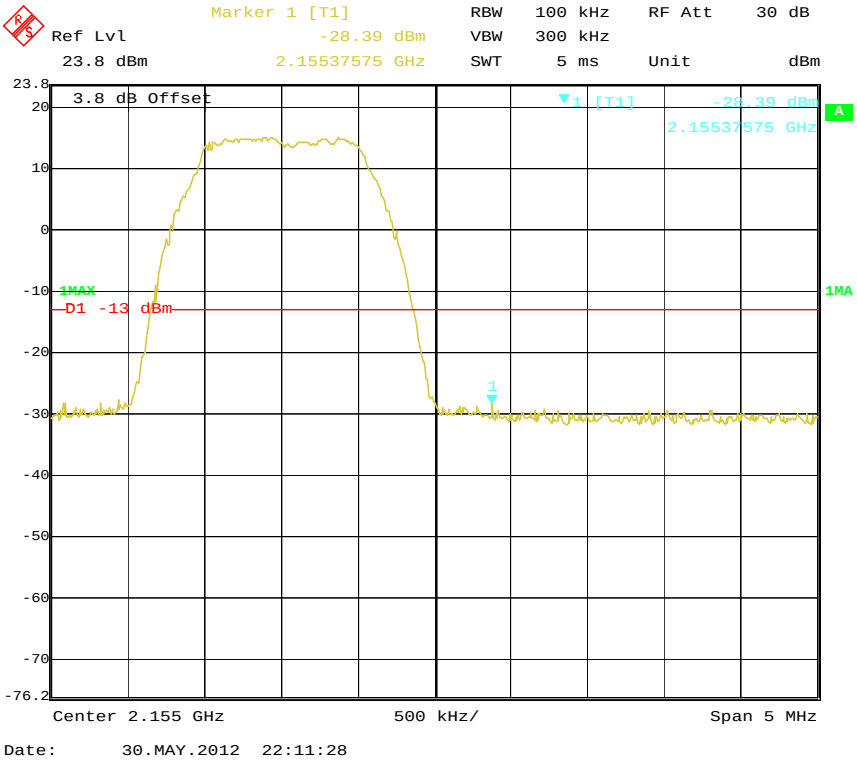


Modulation: LTE2100-QPSK (1.4 MHz)

Lowest Channel

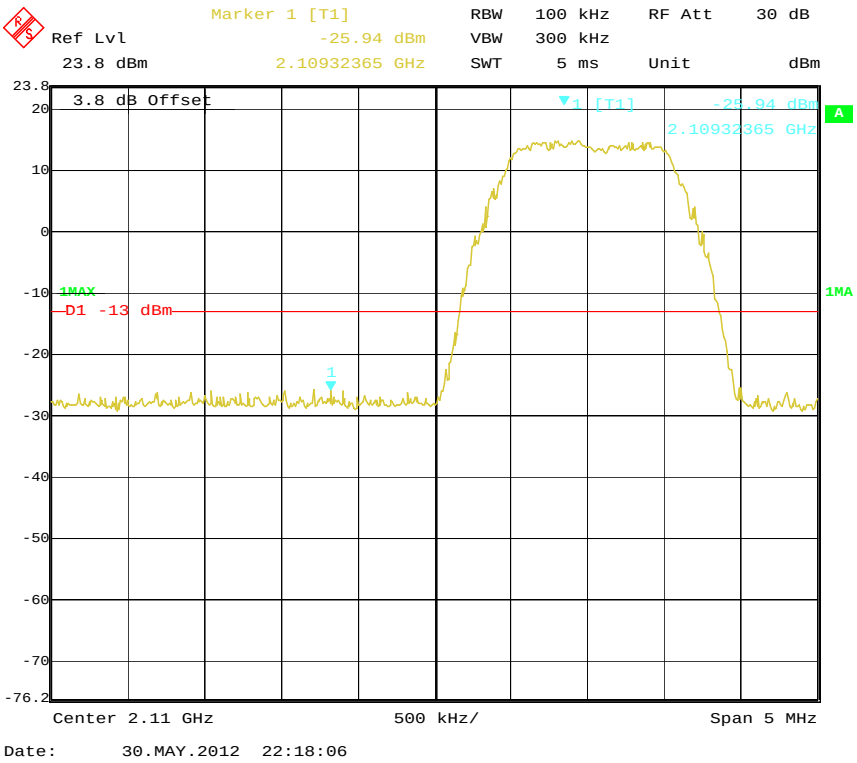


Highest Channel

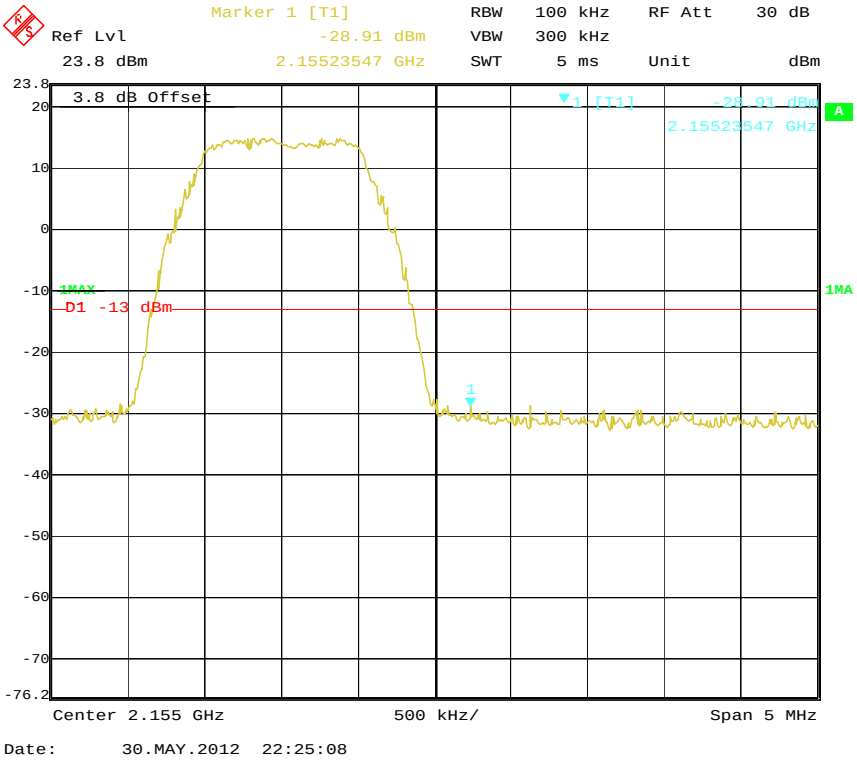


Modulation: LTE2100-16QAM (1.4 MHz)

Lowest Channel

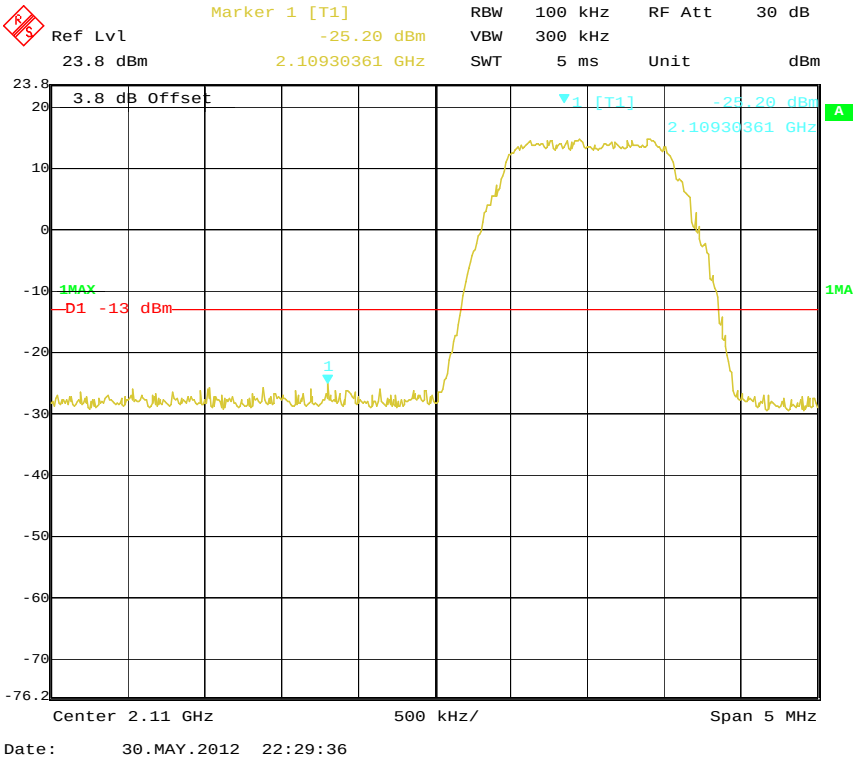


Highest Channel

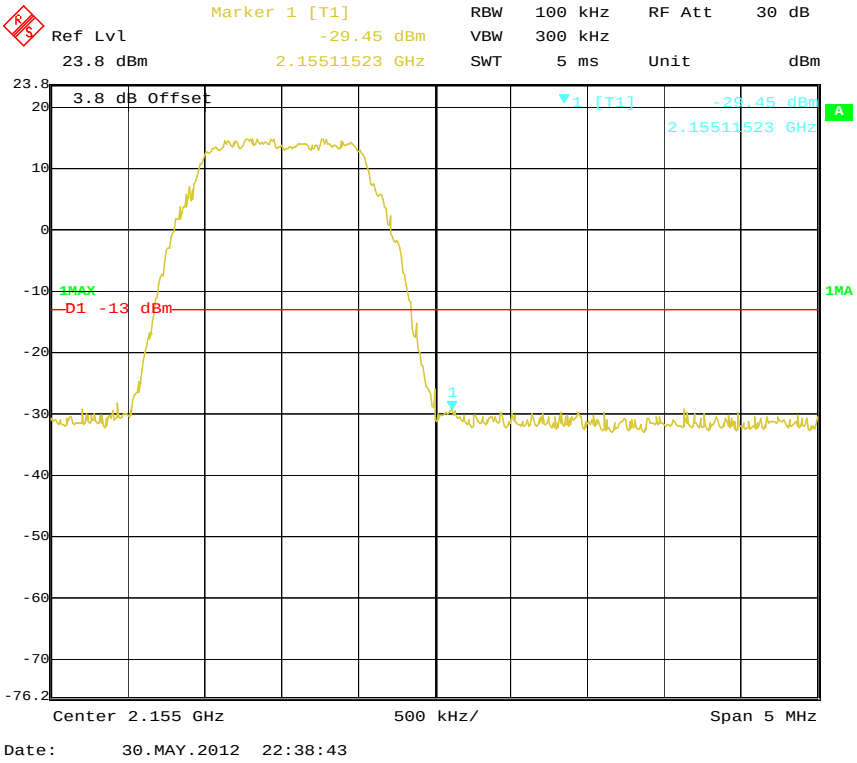


Modulation: LTE2100-64QAM (1.4 MHz)

Lowest Channel

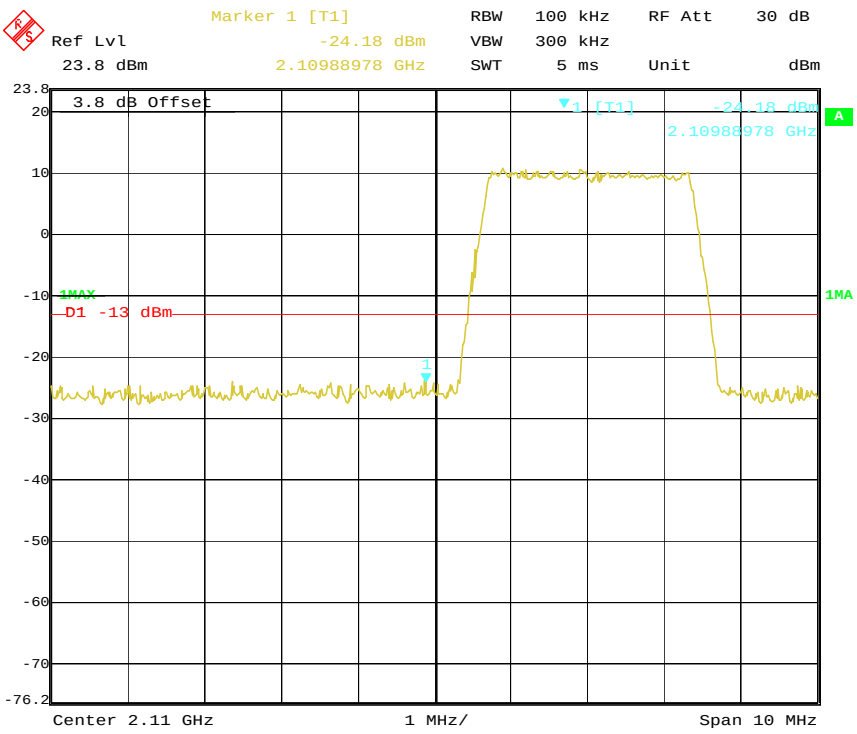


Highest Channel



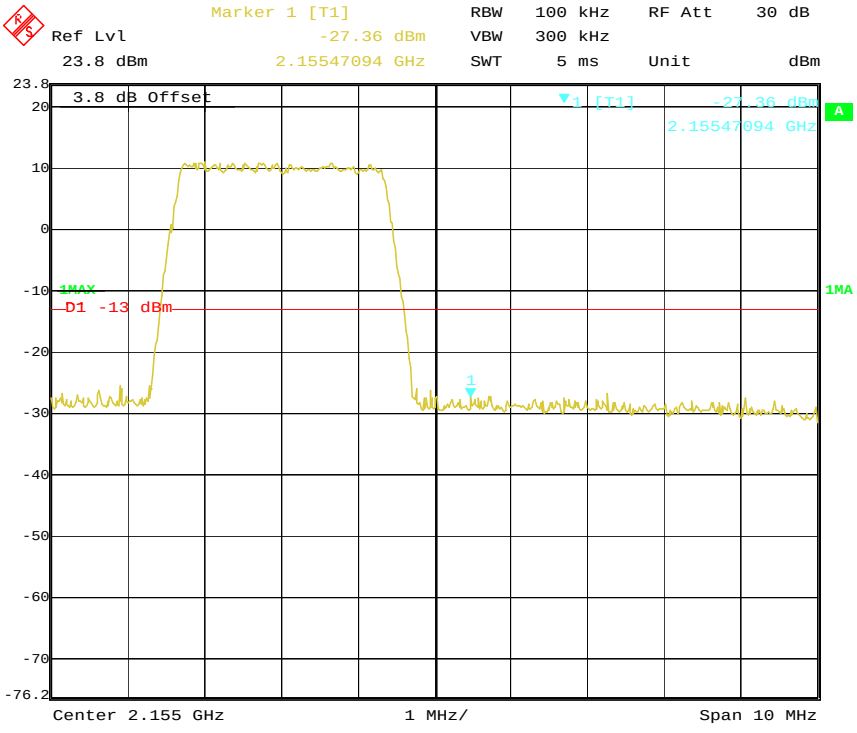
Modulation: LTE2100-QPSK (3 MHz)

Lowest Channel



Date: 28.MAY.2012 21:19:15

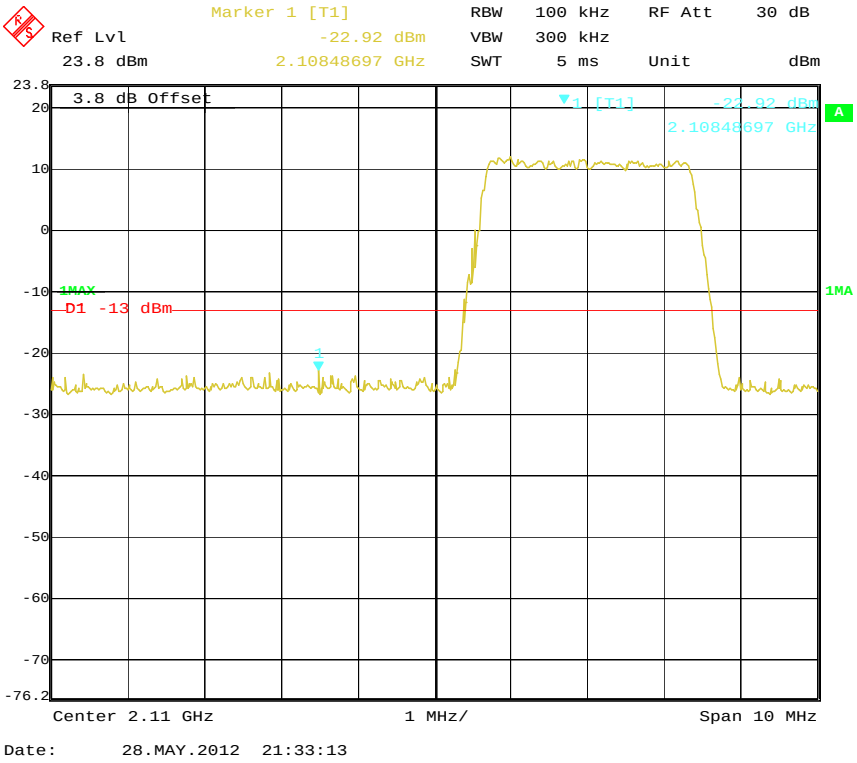
Highest Channel



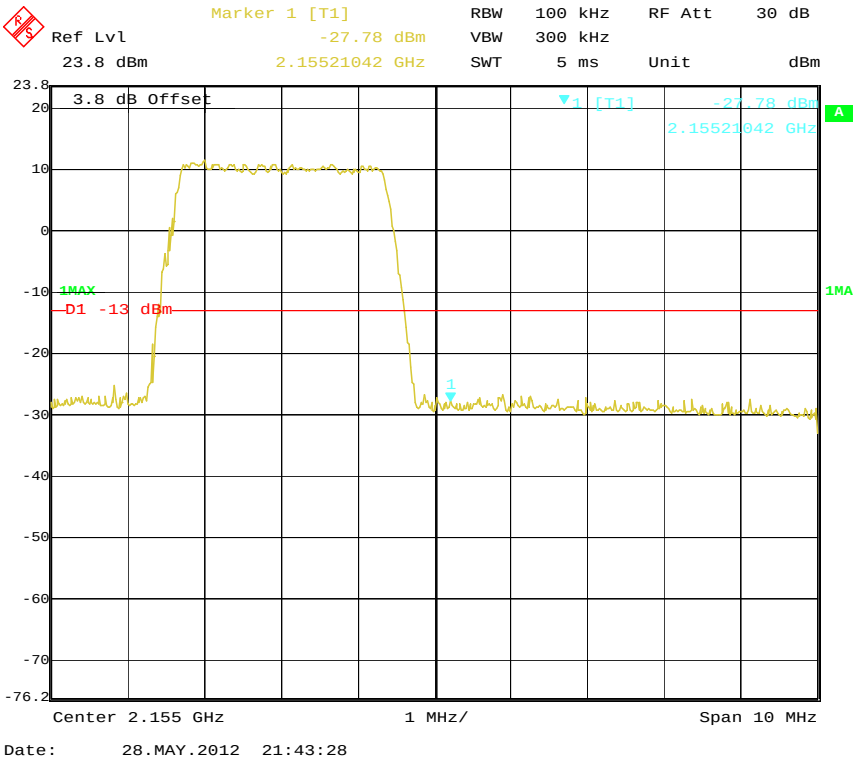
Date: 28.MAY.2012 21:29:25

Modulation: LTE2100-16QAM (3 MHz)

Lowest Channel

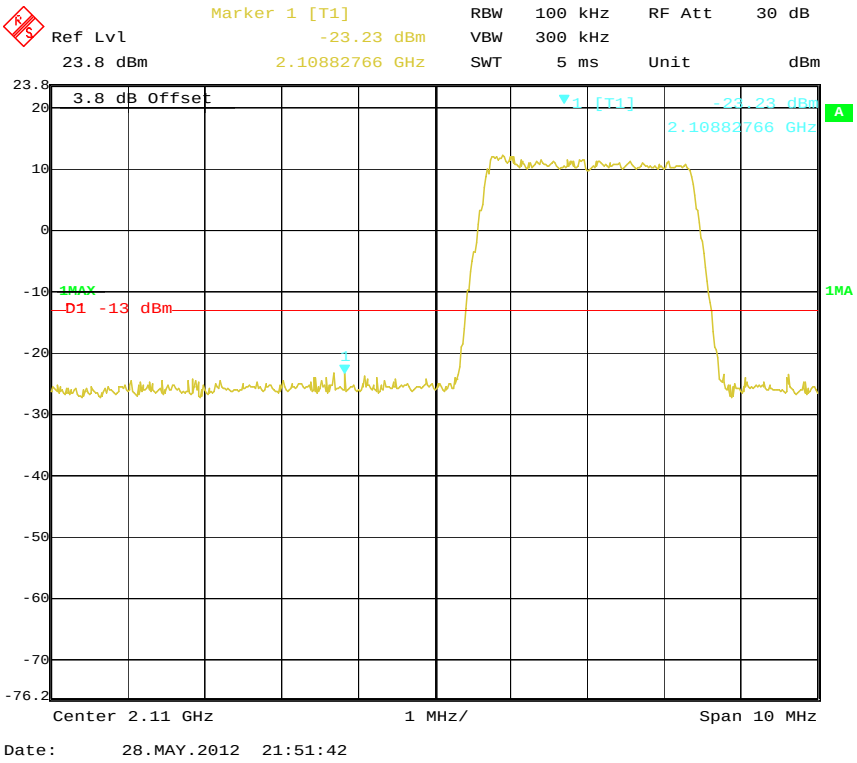


Highest Channel



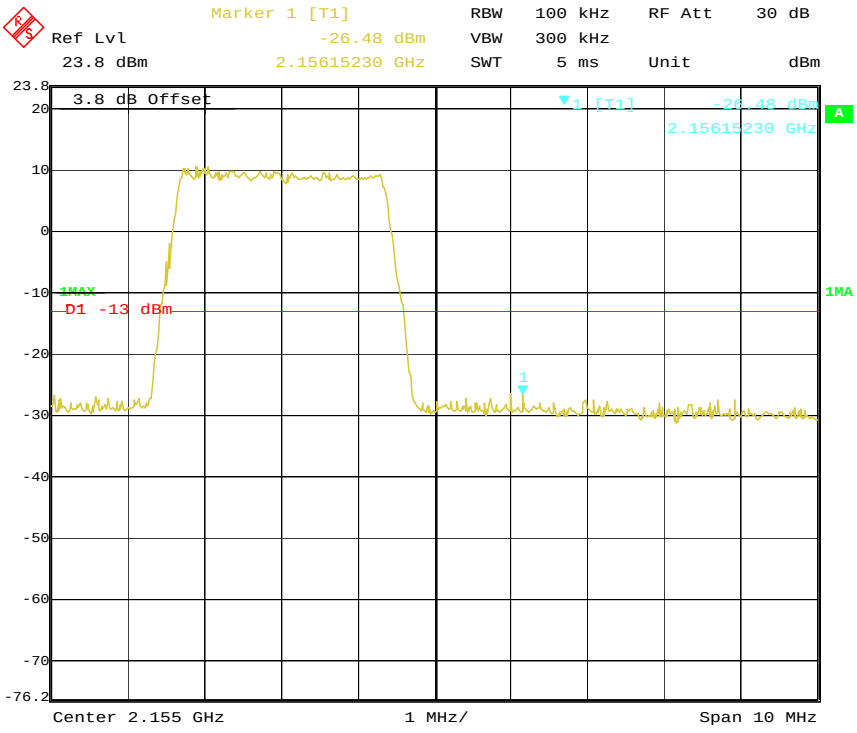
Modulation: LTE2100-64QAM (3 MHz)

Lowest Channel



Date: 28.MAY.2012 21:51:42

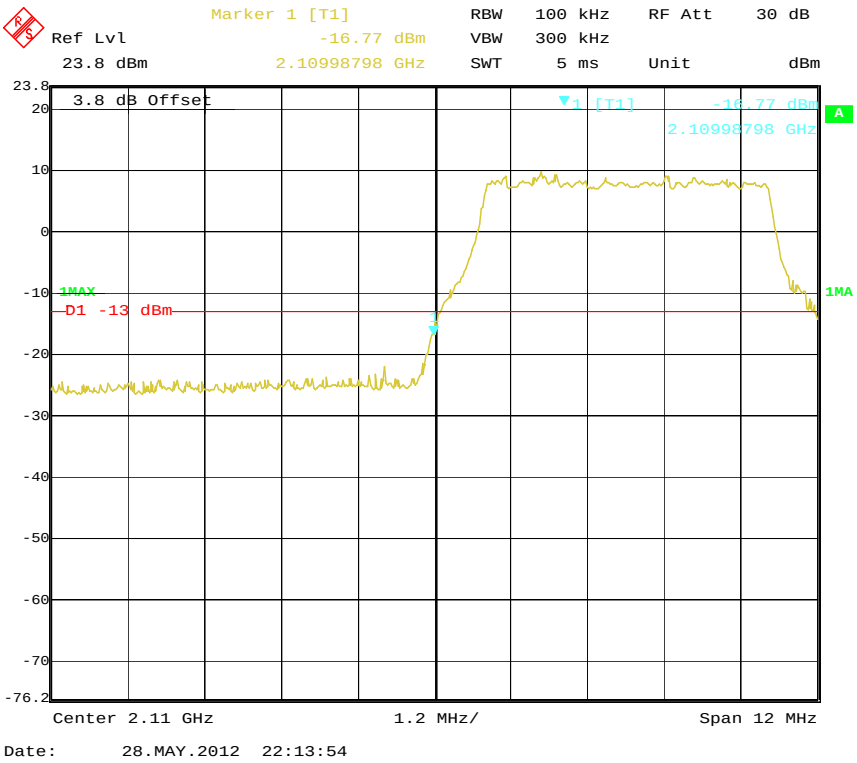
Highest Channel



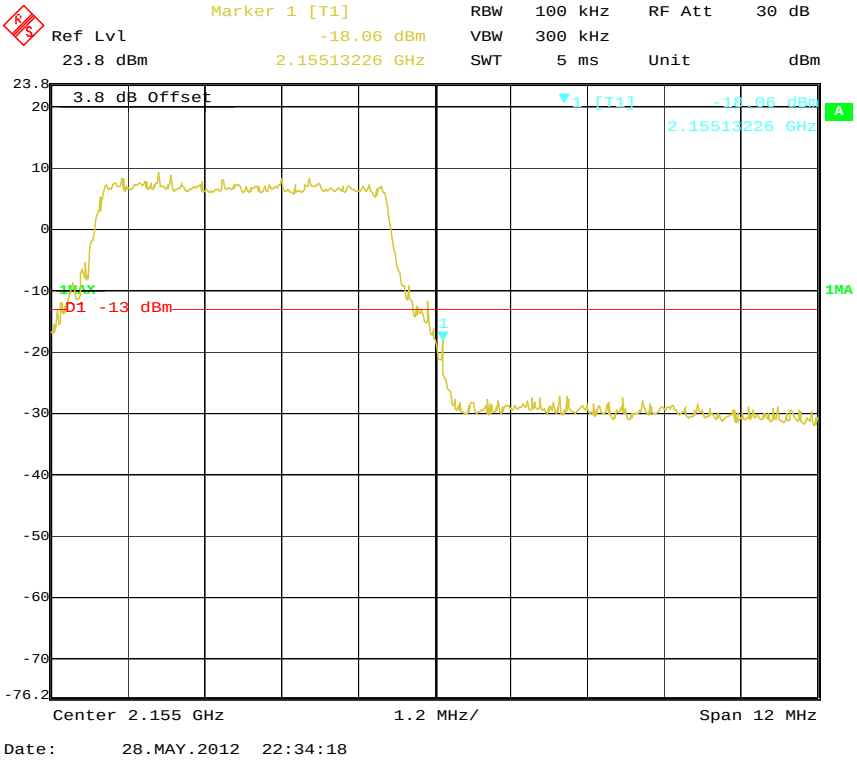
Date: 28.MAY.2012 22:05:03

Modulation: LTE2100-QPSK (5 MHz)

Lowest Channel

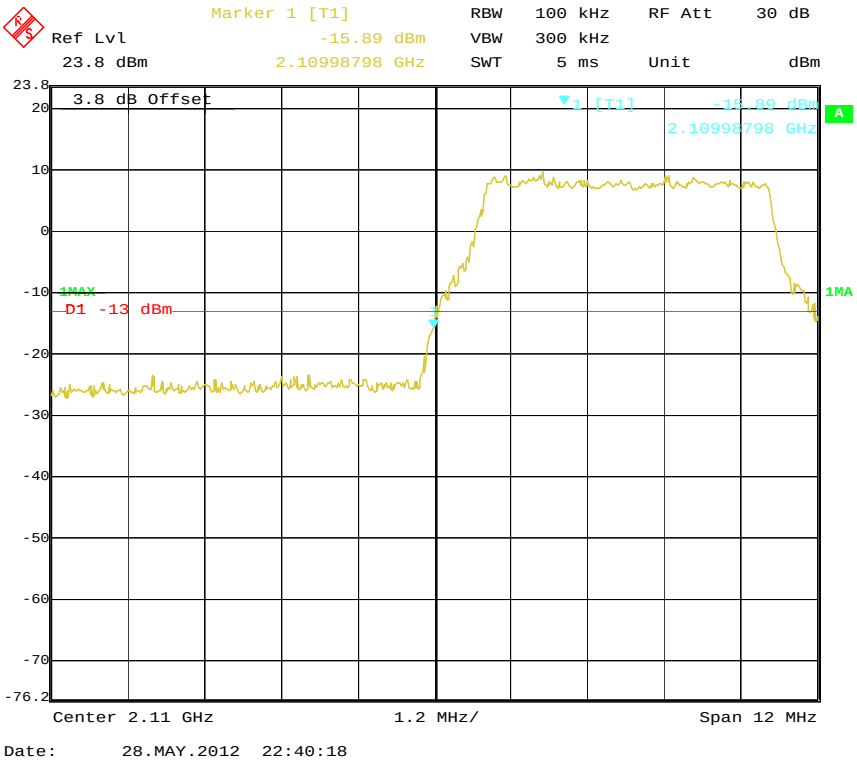


Highest Channel

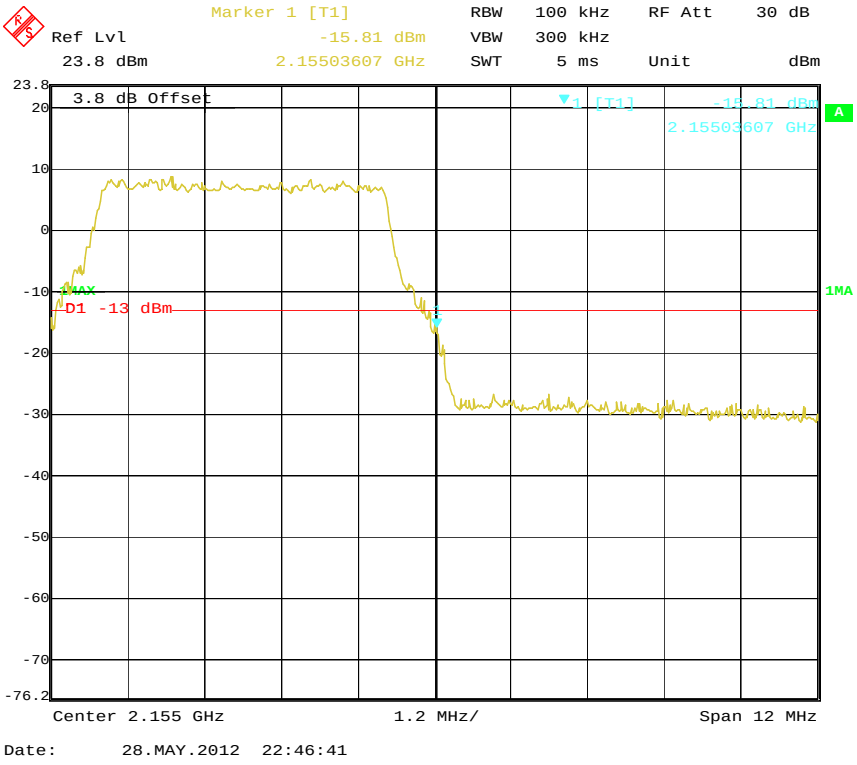


Modulation: LTE2100-16QAM (5 MHz)

Lowest Channel

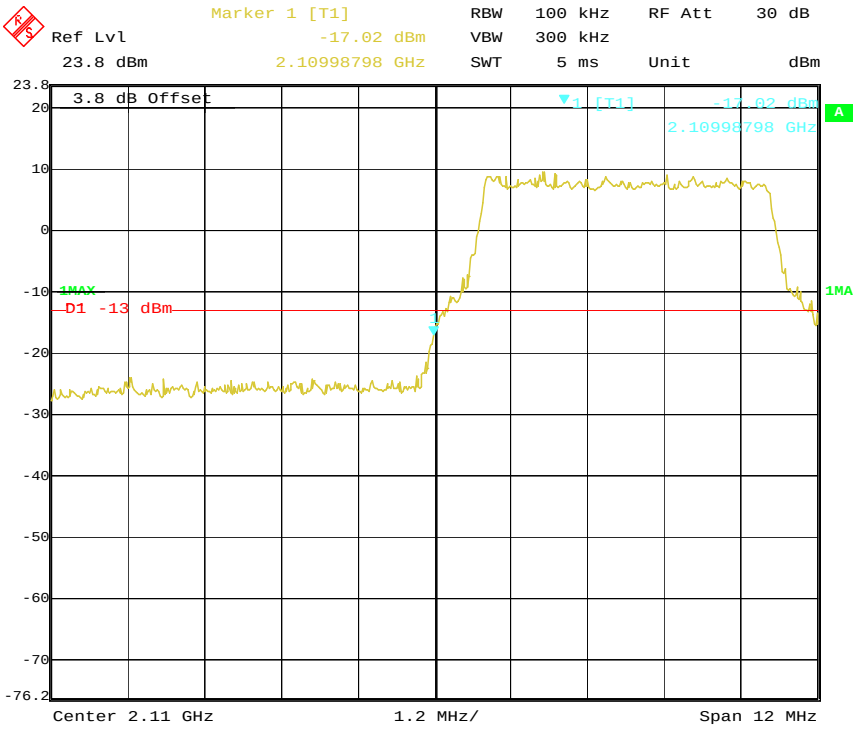


Highest Channel

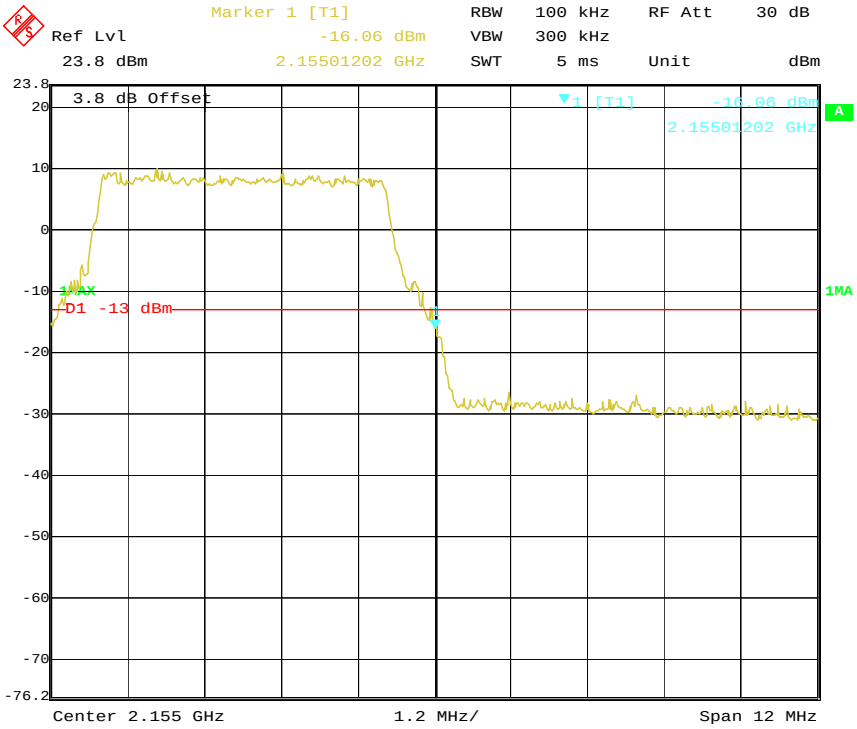


Modulation: LTE2100-64QAM (5 MHz)

Lowest Channel

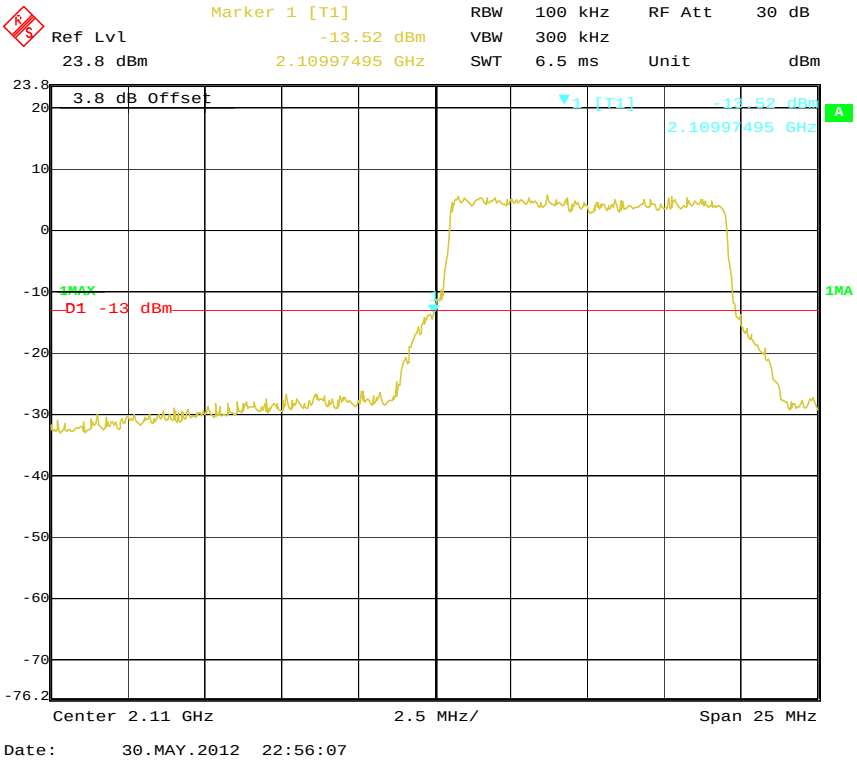


Highest Channel

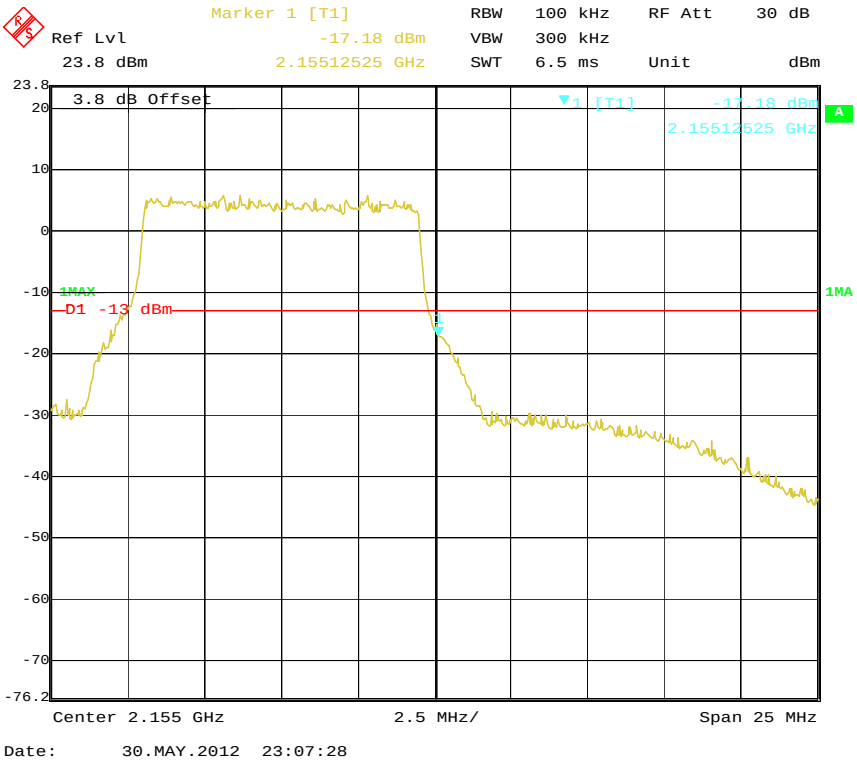


Modulation: LTE2100-QPSK (10 MHz)

Lowest Channel

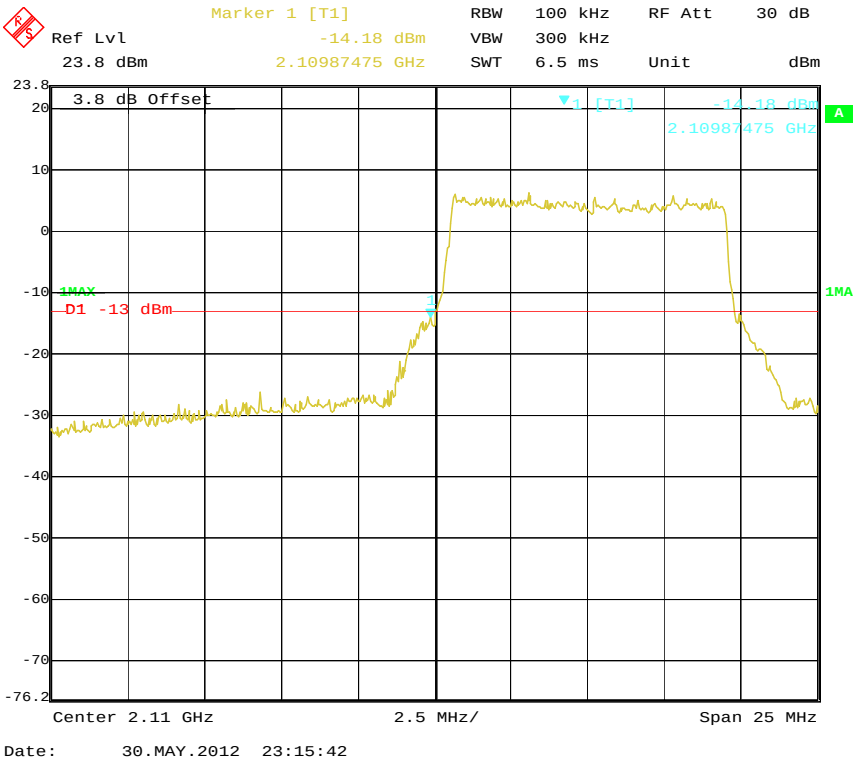


Highest Channel

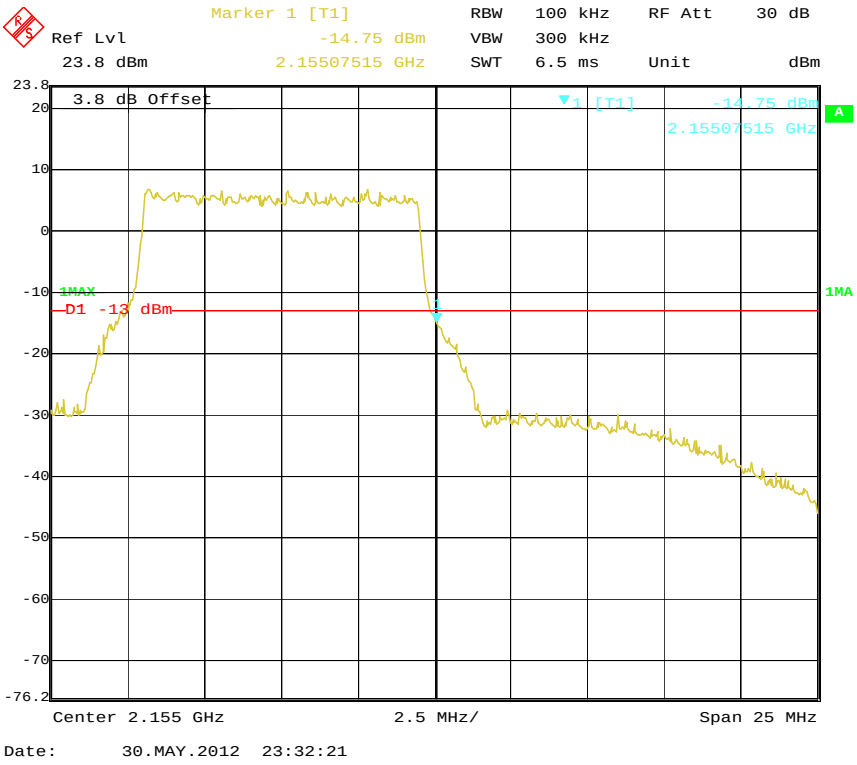


Modulation: LTE2100-16QAM (10 MHz)

Lowest Channel

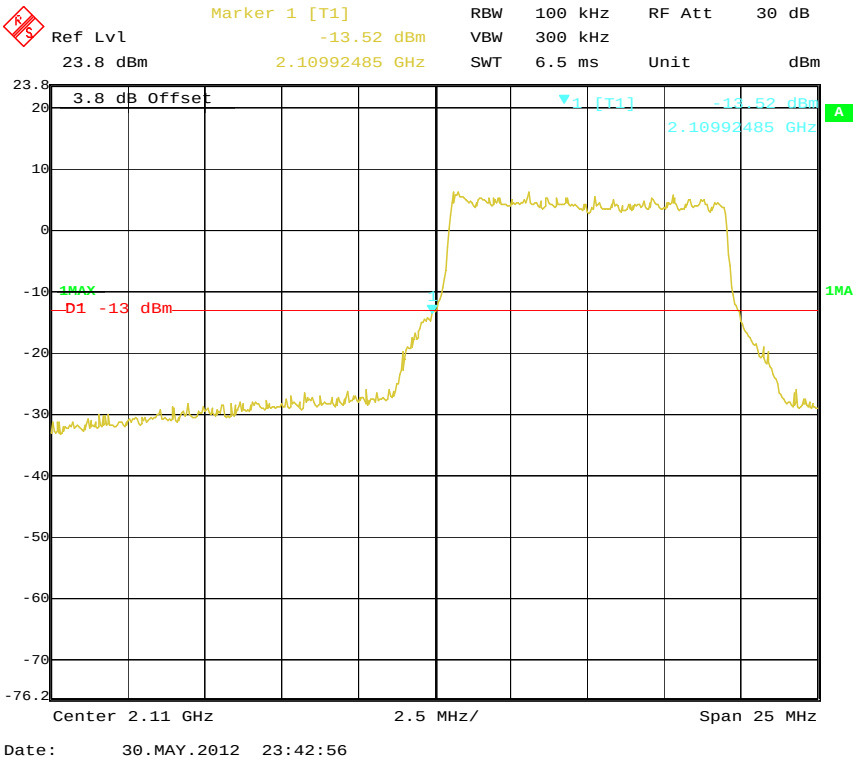


Highest Channel

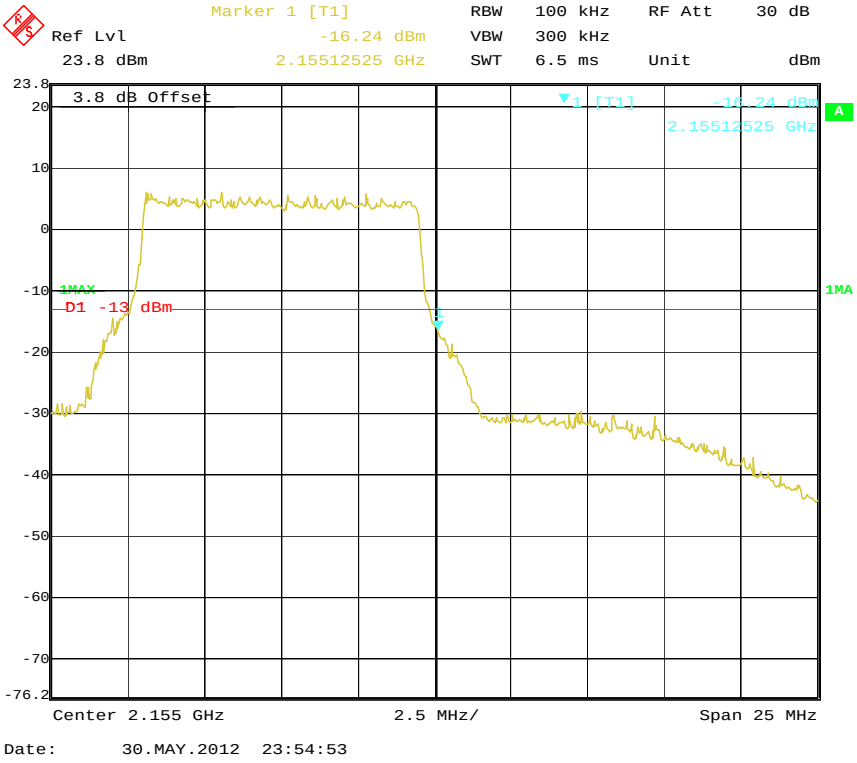


Modulation: LTE2100-64QAM (10 MHz)

Lowest Channel

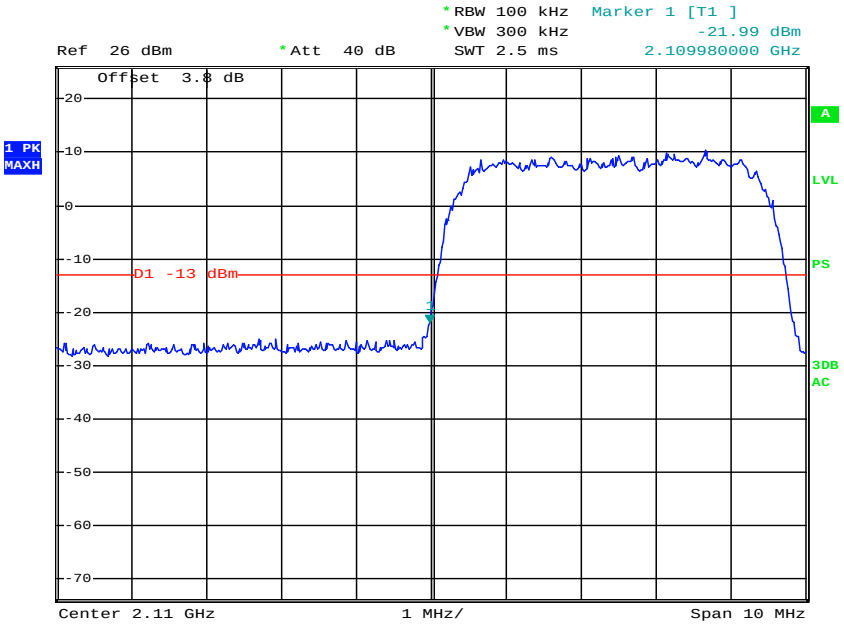


Highest Channel



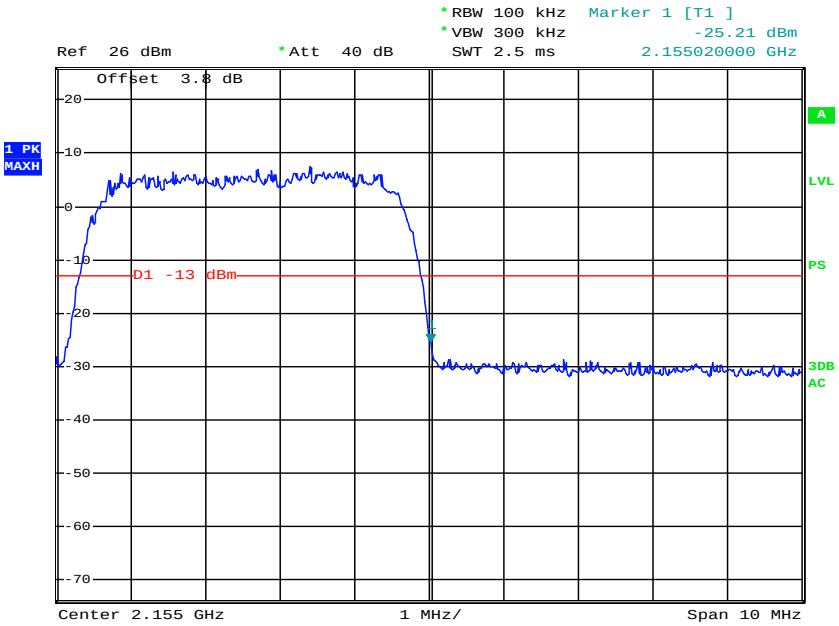
Modulation: UMTS2100

Lowest Channel



Date: 13.MAY.2012 16:14:03

Highest Channel



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FCC §2.1055 & §27.54 - FREQUENCY STABILITY

Applicable Standards

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

Test Procedure

The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.
b.) **Primary Supply Voltage:** The primary supply voltage is varied from battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification — the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ± 0.000 25%(± 2.5 ppm) of the center frequency.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
Rohde & Schwarz	Vector Signal Generator	SMU200A	GB40051862	2011-08-06	2012-08-05

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Jimmy Xiao on 2012-06-04 and 2012-06-26

LTE700 Band:

728-746 MHz Band: The EUT was tested at 737 MHz.

Frequency Drift with supply voltage variation		
Voltage (V_{DC})	**Frequency Error (Hz)**	**Frequency Error (ppm)**
40.8	118.2	0.160380
48.0	121.4	0.164722
53	136.4	0.185075

Frequency Drift with Supply Temperature Variation		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
50	102.3	0.138806
40	114.7	0.155631
30	121.6	0.164993
20	108.9	0.147761
10	104.3	0.141520
0	116.5	0.158073
-10	107.6	0.145997
-20	105.2	0.142741
-30	110.7	0.150204

746-757 MHz Band: The EUT was tested at 752 MHz.

Frequency Drift with supply voltage variation		
Voltage (V_{DC})	**Frequency Error (Hz)**	**Frequency Error (ppm)**
40.8	135.6	0.180319
48.0	128.4	0.170745
53	119.6	0.159043

Frequency Drift with Supply Temperature Variation		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
50	124.6	0.165691
40	141.7	0.188431
30	136.5	0.181516
20	137.8	0.183245
10	140.6	0.186968
0	145.7	0.193750
-10	139.8	0.185904
-20	137.4	0.182713
-30	152.6	0.202926

AWS2100 Band:

The EUT was tested at 2132 MHz.

Frequency Drift with supply voltage variation		
Voltage (V_{DC})	**Frequency Error (Hz)**	**Frequency Error (ppm)**
40.8	540.6	0.253565
48.0	552.4	0.259099
53	547.2	0.256660

Frequency Drift with Supply Temperature Variation		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
50	512.6	0.240432
40	562.1	0.263649
30	502.8	0.235835
20	536.4	0.251595
10	528.9	0.248077
0	547.2	0.256660
-10	535.4	0.251126
-20	519.8	0.243809
-30	532.4	0.249719

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