FCC TEST REPORT

For

Mobile Phone

Model Number: HY1-5237

FCC ID: 2AFWFHY1-5237

Report Number : WT158004124

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection National Digital Electronic Product Testing Center
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Test report declaration

Applicant	:	Gionee Communication Equipment Co.,Ltd.
Address	:	21/F,Times Technology Building,No. 7028,Shennan Avenue, Futian District,Shenzhen,China
Manufacturer	:	Gionee Communication Equipment Co.,Ltd.
Address	:	21/F,Times Technology Building,No. 7028,Shennan Avenue, Futian District,Shenzhen,China
EUT Description	:	Mobile Phone
Model No	:	HY1-5237
Trade mark	:	HYUNDAI
Serial Number	:	/
FCC ID	:	2AFWFHY1-5237

Test Standards:

FCC PART 22H , 24E AND 27 (2014)

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI/TIA-603-D (2010) & KDB971168 and the energy emitted by the sample EUT tested as described in this report is in compliance with FCC Rules Part 22H , 24E AND 27.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	(Chen Silin 陈司林)	Date:	Sep.14, 2015
Checked by:	(Lin Yixiang 林奕翔)	Date:	Sep.14, 2015
Approved by:	(Lin Bin 林斌)	Date:	Sep.14, 2015

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TEST Results SUmmary

Table 1 Test Results Summary

FCC Measurement Specification	FCC Limits Part(s)	Description	Result
2.1046	22.913 24.232 27.50(c) 27.50 (d)	Effective Radiated Power of Transmitter	PASS
2.1046	22.913 24.232(b) 27.50(c) 27.50 (d)	Conducted Power of Transmitter	PASS
2.1046	24.232(d) 27.50(d)	Peak to Average Radio	PASS
2.1049	22.917(b) 24.238(b) 27.53	Occupied Bandwidth	PASS
2.1051	22.917 24.238 27.53	Spurious Emission at Antenna Terminal	PASS
2.1053	22.917 24.238 27.53	Radiated Spurious Emissions	PASS
2.1055	22.355 24.235 27.54	Frequency Stability	PASS

CFR 47 (FCC) part 22 subpart H, part 24 subpart E and part 27 .

Remark: “N/A” means “Not applicable.”
The tests documented in this report were performed in accordance with ANSI/TIA-603-D (2010) & KDB971168, FCC CFR 47 Part 2, Part 22 ,Part 24 and Part 27.

1. GENERAL INFORMATION

1.1. Report information

1.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

1.1.2. The samples mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

1.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

1.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.
The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number are 446246 806614 994606(semi anechoic chamber).

The Laboratory is listed in Voluntary Control Council for Interference by Information Technology Equipment (VCCI), and the registration number are R-1974(open area test site) , R-1966(semi anechoic chamber),C-2117(mains ports conducted interference measurement) and T-180(telecommunication ports conducted interference measurement).

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is IC4174.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is E2024086Z02.

1.3. Measurement Uncertainty

For a 95% confidence level (k = 2), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:
Radiated Emission
30MHz~1000MHz 4.5dB
1GHz~26.5GHz 4.6dB

2. PRODUCT DESCRIPTION

2.1. EUT Description

Table 2 Specification of the Equipment under Test

Product Type:	Mobile Phone		
Hardware Version:	HY1-5237_Mainboard_P3		
Software Version :	HY1-5237_0303_V5647		
FCC-ID:	2AFWFHY1-5237		
Frequency Range	GSM850: TX 824MHz~849MHz RX 869MHz~894MHz PCS1900: TX 1850MHZ~1910MHz RX 1930MHz~1990MHz WCDMA 850: TX 824MHz~849MHz RX 869MHz~894MHz WCDMA 1900: TX 1850MHZ~1910MHz RX 1930MHz~1990MHz LTE Band 4: TX: 1710MHz~1755MHz RX 2110MHz~2155MHz LTE Band 17: TX 704MHz~716MHz RX 734MHz~746MHz		
Type(s) of Modulation:	GSM850/PCS1900 :GMSK 8PSK WCDMA850/ WCDMA1900:QPSK LTE Band 4/LTE Band 17:QPSK 16QAM		
LTE Supported Channel Bandwidth:	Band 4:	1.4 MHz	Supported
		3 MHz	Supported
		5 MHz	Supported
		10 MHz	Supported
		15 MHz	Supported
		20 MHz	Supported
	Band 17:	5 MHz	Supported
		10 MHz	Supported
Antenna Designation:	Fixed Antenna 704MHz~716MHz: 0.4dBi 824MHz~849MHz: 0.4dBi 1710MHz~1755MHz: 0.65dBi 1850MHZ~1910MHz: 0.5dBi		
Operating voltage:	Internal battery, 120V AC Adapter; 3.5V (Low)/3.7V (Nominal)/ 4.2V (Max)		

Remark: --

Table 3 Identification of the Equipment Under Test (EUT)

EUT	Serial Number/IMEI	HW Version	SW Version	Notes
1	354147042018540	Ultra Latitude_MB_P3	Ultra Latitude_0204_V5452	Conducted testing sample.
2	354147042018532	Ultra Latitude_MB_P3	Ultra Latitude_0204_V5452	Radiated testing sample.

Table 4 Identification of Accessory equipment

Name	Model No	S/N	Manufacturer
Li-polymer Battery	Ultra Latitude	---	Gionee Communication Equipment Co.,Ltd
Adaptor for EUT	DDC-0001	---	Gionee Communication Equipment Co.,Ltd

2.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **2AFWFHY1-5237** filing to comply with FCC PART 22H,24E AND 27.

2.3. Operating Condition of EUT

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission (X plane).

TM1: GSM/GPRS Mode with GMSK Modulation
TM2: EDGE Mode with 8PSK Modulation
TM3: WCDMA Mode with QPSK Modulation
TM4: LTE Mode with QPSK Modulation
TM5: LTE Mode with 16QAM Modulation

The maximum power levels are GSM/GPRS mode for GMSK link, Edge mode for 8PSK link, WCDMA mode for QPSK link, LTE Mode for QPSK link , LTE mode for 16QAM link.only these modes were used for all tests.
The conducted power tables are as follows:

Band: GSM850	**Average Power [dBm]**		
Channel	**128**	**190**	**251**
Frequency (MHz)	**824.2**	**836.6**	**848.8**
GSM (GMSK, 1 Tx slot)	**33.22**	**33.01**	**32.75**
GPRS (GMSK, 1 Tx slot)	33.21	33.03	32.72
GPRS (GMSK, 2 Tx slots)	32.40	32.22	31.88
GPRS (GMSK, 3 Tx slots)	30.61	30.42	30.08
GPRS (GMSK, 4 Tx slots)	29.78	29.57	29.20
EDGE (8PSK, 1 Tx slot)	26.86	27.08	27.12
EDGE (8PSK, 2 Tx slot)	25.76	25.68	25.89
EDGE (8PSK, 3 Tx slot)	23.58	24.57	23.80
EDGE (8PSK, 4 Tx slot)	23.32	23.41	22.97

Band: GSM1900	**Average Power [dBm]**		
Channel	**512**	**661**	**810**
Frequency (MHz)	**1850.2**	**1880**	**1909.8**
GSM (GMSK, 1 Tx slot)	**29.21**	**29.57**	**29.33**
GPRS (GMSK, 1 Tx slot)	29.22	29.57	29.32
GPRS (GMSK, 2 Tx slots)	28.47	29.00	28.72
GPRS (GMSK, 3 Tx slots)	26.28	27.22	26.86
GPRS (GMSK, 4 Tx slots)	24.85	25.90	25.57
EDGE (8PSK, 1 Tx slot)	25.49	25.99	25.95
EDGE (8PSK, 2 Tx slot)	24.79	25.48	25.02
EDGE (8PSK, 3 Tx slot)	23.38	23.36	23.37
EDGE (8PSK, 4 Tx slot)	22.30	21.92	22.87

Band :WCDMA Band V	Average Power [dBm]		
Channel	**4,132**	**4,182**	**4,233**
Frequency (MHz)	**826.4**	**836.4**	**846.6**
RMC 12.2K	**23.00**	**22.78**	**22.64**
HSDPA Subtest-1	21.92	21.69	21.53
HSDPA Subtest-2	21.94	21.71	21.54
HSDPA Subtest-3	21.47	21.23	21.07
HSDPA Subtest-4	21.46	21.21	21.05
HSUPA Subtest-1	19.98	19.95	19.82
HSUPA Subtest-2	19.90	19.71	19.79
HSUPA Subtest-3	19.18	19.10	19.16
HSUPA Subtest-4	19.38	19.29	19.25
HSUPA Subtest-5	21.36	21.33	21.30

Band: WCDMA Band II	Average Power [dBm]		
Channel	**9262**	**9400**	**9538**
Frequency (MHz)	**1852.4**	**1880.0**	**1907.6**
RMC 12.2K	**22.61**	**22.71**	**22.28**
HSDPA Subtest-1	21.17	21.17	21.31
HSDPA Subtest-2	21.06	21.17	21.30
HSDPA Subtest-3	20.63	20.75	20.89
HSDPA Subtest-4	20.61	20.73	20.88
HSUPA Subtest-1	19.69	19.59	19.77
HSUPA Subtest-2	19.61	19.80	19.82
HSUPA Subtest-3	20.59	20.67	20.82
HSUPA Subtest-4	19.20	19.20	19.28
HSUPA Subtest-5	21.10	21.21	21.33

LTE Band 4(1.4MHz)

	Channel Bandwidth: 1.4 MHz				
Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power [dBm]
			Size	Offset	
QPSK	19957	1710.7	1	0	22.67
			1	3	22.71
			1	5	22.64
			3	0	22.68
			3	2	22.68
			3	3	22.69
			6	0	21.69
	20175	1732.5	1	0	21.57
			1	3	21.67
			1	5	21.60
			3	0	21.71
			3	2	21.65
			3	3	21.72
			6	0	20.60
	20393	1754.3	1	0	22.06
			1	3	22.14
			1	5	22.07
			3	0	22.17
			3	2	22.13
			3	3	22.18
			6	0	21.14
16QAM	19957	1710.7	1	0	21.81
			1	3	21.93
			1	5	21.80
			3	0	21.79
			3	2	21.75
			3	3	21.77
			6	0	20.63
	20175	1732.5	1	0	21.00
			1	3	21.11
			1	5	20.99
			3	0	20.73
			3	2	20.71
			3	3	20.75
			6	0	20.60
	20393	1754.3	1	0	21.32
			1	3	21.42
			1	5	21.32
			3	0	21.25
			3	2	21.19
			3	3	21.25
			6	0	20.13

LTE Band 4 (3MHz)

	Channel Bandwidth: 3 MHz				
Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power [dBm]
			Size	Offset	
QPSK	19965	1711.5	1	0	22.61
			1	7	22.47
			1	14	22.56
			8	0	21.71
			8	4	21.69
			8	7	21.67
			15	0	21.79
	20175	1732.5	1	0	21.52
			1	7	21.81
			1	14	21.64
			8	0	20.64
			8	4	20.66
			8	7	20.67
			15	0	20.65
	20385	1753.5	1	0	22.15
			1	7	22.01
			1	14	21.85
			8	0	21.51
			8	4	21.30
			8	7	21.12
			15	0	21.22
16QAM	19965	1711.5	1	0	21.80
			1	7	21.94
			1	14	21.83
			8	0	20.76
			8	4	20.73
			8	7	20.71
			15	0	20.68
	20175	1732.5	1	0	20.82
			1	7	20.95
			1	14	20.83
			8	0	20.63
			8	4	20.53
			8	7	20.61
			15	0	20.48
	20385	1753.5	1	0	21.68
			1	7	21.78
			1	14	21.68
			8	0	20.77
			8	4	20.75
			8	7	20.69
			15	0	20.65

LTE Band 4 (5MHz)

	Channel Bandwidth: 3 MHz				
Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power [dBm]
			Size	Offset	
QPSK	19975	1712.5	1	0	22.69
			1	12	22.59
			1	24	22.45
			12	0	21.39
			12	6	21.70
			12	13	21.71
			25	0	21.60
	20175	1732.5	1	0	21.92
			1	12	21.68
			1	24	21.37
			12	0	20.70
			12	6	20.72
			12	13	20.94
			25	0	20.66
	20375	1752.5	1	0	22.24
			1	12	22.30
			1	24	22.12
			12	0	21.44
			12	6	21.42
			12	13	21.28
			25	0	21.08
16QAM	19975	1712.5	1	0	21.71
			1	12	21.79
			1	24	22.00
			12	0	21.04
			12	6	20.94
			12	13	20.97
			25	0	20.99
	20175	1732.5	1	0	21.25
			1	12	21.09
			1	24	21.47
			12	0	20.87
			12	6	20.76
			12	13	20.78
			25	0	20.48
	20375	1752.5	1	0	21.03
			1	12	21.09
			1	24	21.01
			12	0	20.44
			12	6	20.48
			12	13	20.52
			25	0	20.61

LTE Band 4 (10MHz)

	Channel Bandwidth: 3 MHz				
Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power [dBm]
			Size	Offset	
QPSK	20000	1715	1	0	22.65
			1	24	22.46
			1	49	22.11
			25	0	21.55
			25	12	21.28
			25	25	21.58
			50	0	21.35
	20175	1732.5	1	0	21.49
			1	24	21.46
			1	49	21.63
			25	0	20.70
			25	12	20.65
			25	25	20.90
			50	0	20.82
	20350	1750	1	0	22.01
			1	24	22.08
			1	49	22.04
			25	0	20.97
			25	12	21.15
			25	25	21.35
			50	0	21.56
16QAM	20000	1715	1	0	21.79
			1	24	21.62
			1	49	21.44
			25	0	20.78
			25	12	20.47
			25	25	20.41
			50	0	20.35
	20175	1732.5	1	0	20.69
			1	24	21.00
			1	49	20.92
			25	0	20.71
			25	12	20.44
			25	25	20.39
			50	0	20.45
	20350	1750	1	0	21.29
			1	24	21.07
			1	49	21.43
			25	0	20.79
			25	12	20.49
			25	25	20.45
			50	0	20.61

LTE Band 4 (15MHz)

	Channel Bandwidth: 3 MHz				
Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power [dBm]
			Size	Offset	
QPSK	20025	1717.5	1	0	22.68
			1	37	22.38
			1	74	21.84
			37	0	21.65
			37	18	21.44
			37	38	21.18
			75	0	21.43
	20175	1732.5	1	0	21.72
			1	37	21.67
			1	74	21.72
			37	0	20.72
			37	18	20.74
			37	38	20.81
			75	0	20.79
	20325	1747.5	1	0	21.84
			1	37	22.14
			1	74	22.09
			37	0	21.04
			37	18	21.17
			37	38	21.12
			75	0	21.14
16QAM	20025	1717.5	1	0	21.90
			1	37	21.64
			1	74	21.13
			37	0	20.52
			37	18	20.42
			37	38	20.33
			75	0	20.35
	20175	1732.5	1	0	21.03
			1	37	20.97
			1	74	20.99
			37	0	20.51
			37	18	20.41
			37	38	20.31
			75	0	20.29
	20325	1747.5	1	0	21.13
			1	37	21.42
			1	74	21.35
			37	0	20.62
			37	18	20.51
			37	38	20.41
			75	0	20.45

LTE Band 4 (20MHz)

	Channel Bandwidth: 3 MHz				
Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power [dBm]
			Size	Offset	
QPSK	20050	1720	1	0	22.73
			1	49	22.28
			1	99	21.94
			50	0	21.40
			50	25	21.20
			50	50	20.95
			100	0	21.16
	20175	1732.5	1	0	22.02
			1	49	21.82
			1	99	22.18
			50	0	21.34
			50	25	20.55
			50	50	21.06
			100	0	20.92
	20300	1745	1	0	21.72
			1	49	21.92
			1	99	21.98
			50	0	20.83
			50	25	20.91
			50	50	20.95
			100	0	20.90
16QAM	20050	1720	1	0	21.86
			1	49	21.45
			1	99	21.12
			50	0	20.35
			50	25	20.13
			50	50	20.14
			100	0	20.05
	20175	1732.5	1	0	21.23
			1	49	21.01
			1	99	21.08
			50	0	20.36
			50	25	20.15
			50	50	20.14
			100	0	20.06
	20300	1745	1	0	21.15
			1	49	21.27
			1	99	21.19
			50	0	20.37
			50	25	20.16
			50	50	20.17
			100	0	20.07

LTE Band 17(5MHz)

	Channel Bandwidth: 3 MHz				
Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power [dBm]
			Size	Offset	
QPSK	23755	706.5	1	0	22.04
			1	12	22.09
			1	24	22.01
			12	0	21.03
			12	6	21.03
			12	13	21.02
			25	0	20.98
	23790	710	1	0	22.19
			1	12	22.17
			1	24	22.04
			12	0	21.14
			12	6	21.10
			12	13	21.09
			25	0	21.03
	23825	713.5	1	0	22.06
			1	12	22.03
			1	24	21.81
			12	0	21.05
			12	6	21.00
			12	13	20.87
			25	0	20.97
16QAM	23755	706.5	1	0	21.34
			1	12	21.30
			1	24	21.27
			12	0	20.17
			12	6	20.30
			12	13	19.99
			25	0	20.01
	23790	710	1	0	21.34
			1	12	21.48
			1	24	21.36
			12	0	20.22
			12	6	20.23
			12	13	20.25
			25	0	20.08
	23825	713.5	1	0	21.44
			1	12	21.38
			1	24	21.03
			12	0	20.02
			12	6	20.07
			12	13	20.24
			25	0	19.85

LTE Band 17(10MHz)

	Channel Bandwidth: 3 MHz				
Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power [dBm]
			Size	Offset	
QPSK	23780	709	1	0	21.94
			1	24	21.95
			1	49	21.81
			25	0	20.92
			25	12	20.94
			25	25	20.93
			50	0	20.95
	23790	710	1	0	22.08
			1	24	22.04
			1	49	21.89
			25	0	21.04
			25	12	21.06
			25	25	21.03
			50	0	21.03
	23800	711	1	0	22.06
			1	24	22.04
			1	49	21.84
			25	0	21.06
			25	12	21.08
			25	25	21.00
			50	0	21.01
16QAM	23780	709	1	0	21.17
			1	24	21.13
			1	49	21.06
			25	0	19.85
			25	12	19.93
			25	25	20.00
			50	0	19.95
	23790	710	1	0	21.31
			1	24	21.27
			1	49	21.00
			25	0	20.07
			25	12	20.07
			25	25	20.16
			50	0	20.08
	23800	711	1	0	21.23
			1	24	21.34
			1	49	21.01
			25	0	20.07
			25	12	20.07
			25	25	20.02
			50	0	20.01

2.4. Support Equipment List

Table 5 Support Equipment List

Name	Model No	S/N	Manufacturer
N/A	---	---	---

2.5. Test Conditions

Date of test：Aug 20,2015-Sep 13 , 2015
Date of EUT Receive：Aug 20,2015
Temperature: -30-50 ℃
Relative Humidity: 44-52%

2.6. Special Accessories

Not available for this EUT intended for grant.

2.7. Equipment Modifications

Not available for this EUT intended for grant.

3. TEST EQUIPMENT USED

Table 6 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB8501/09	EMI Test Receiver	Rohde & Schwarz	ESU40	Mar.27, 2015	1 Year
SB9721/04	Signal Generator	Agilent	E8257D	Jan. 05, 2015	1 Year
SB8501/04	Bilog Antenna	Schwarzbeck	VULB9163	May 12, 2015	1 Year
SB5472/02	Bilog Antenna	Schwarzbeck	VULB9163	Jan.19, 2015	1 Year
SB3435	Horn Antenna	Rohde & Schwarz	HF906	Jan.19, 2015	1 Year
SB3434	Horn Antenna	Rohde & Schwarz	HF906	Jan.19, 2015	1 Year
SB3435/01	Amplifier(1-18GHz)	Rohde & Schwarz	---	Jan.19, 2015	1 Year
SB3435/02	Amplifier(18-40GHz)	Rohde & Schwarz	---	May.15, 2015	1 Year
SB8501/16	Horn Antenna	Rohde & Schwarz	SCU-26	Mar.23, 2015	1 Year
SB3450/01	3m Semi-anechoic chamber	Albatross Projects	9X6X6	Oct.11, 2014	2 Years
SB8501/02	Communication Test Unit	Rohde & Schwarz	CMU200	Jun.05, 2015	1 Year
SB9054/02	Wideband Radio communication Tester	Rohde & Schwarz	CMW500	Oct.26, 2015	1 Year
SB9721/02	Signal Analyzer	Agilent	N9020A	Jan. 05, 2015	1 Year
SB3611	DC Power Supply	KENWOOD	PDS36-10	May.15, 2015	1 Year
SB6691	Climatic Chamber	NANYA	DW-0150	Apr.12, 2015	1 Year
SB9060	Signal Analyzer	Rohde & Schwarz	FSQ40	May.13,2015	1 Year
SB9721/01	Universal Radio Communication Tester	Agilent	E5515C	Jan. 05, 2015	1year

4. TEST RESULTS

4.1. RF Power Output

4.1.1.Test Standard

FCC: CFR Part 2.1046, CFR Part 22.913, CFR Part 24.232 CFR Part 27

4.1.2.Test Limit

FCC 22.913 (a) Effective radiated power limits.
The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.
FCC 24.232 (b)(c) Power limits.
(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP). (c) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement over the full bandwidth of the channel.
27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.
27.50 (c) (10) Portable stations (hand-held de-vices) are limited to 3 watts ERP

4.1.3.Test Procedure

Radiated Output Power Measurement procedure
Ref: ANSI/TIA-603-D (2010) & KDB971168-2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic
1. Connect the equipment as shown in the above diagram with the EUT's antenna in a vertical orientation.
2. Adjust the settings of the Universal Radio Communication Tester (CMU) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to the channel frequency. Set the analyzer to measure peak hold with the required settings.
4. Rotate the EUT 360 . Record the peak level in dBm (LVL).
5. Replace the EUT with a vertically polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (LOSS). LOSS = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the ERP using the following equation:
ERP (dBm) = LVL (dBm) + LOSS (dB)
8. Determine the EIRP using the following equation:
EIRP (dBm) = ERP (dBm) + 2.15 (dB)
9. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

4.1.4.Test Data

Table 7 Substitution Results

Test Mode	Freq. [MHz]	SG. Level [dBm]	Cable Loss [dB]	Antenna Gain [dBd]	Substitution Level (ERP) [dBm]	H/V	Limit [dBm]	Result
TM1	824.2	23.27	0.5	5.28	28.05	V	38.5	Pass
	836.6	24.51	0.5	5.28	29.29	V	38.5	Pass
	848.8	25	0.5	5.28	**29.78**	V	38.5	Pass
TM2	824.2	19.25	0.5	5.28	24.03	V	38.5	Pass
	836.6	20.04	0.5	5.28	24.82	V	38.5	Pass
	848.8	20.31	0.5	5.28	**25.09**	V	38.5	Pass
TM3	826.4	15.75	0.5	5.28	20.53	V	38.5	Pass
	836.4	16.16	0.5	5.28	**20.94**	V	38.5	Pass
	846.6	15.84	0.5	5.28	20.62	V	38.5	Pass

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Table 8 Substitution Results

Test Mode	Freq. [MHz]	SG. Level [dBm]	Cable Loss [dB]	Antenna Gain [dBi]	Substitution Level (EIRP) [dBm]	H/V	Limit [dBm]	Result
TM1	1850.2	19.23	0.97	8.92	27.18	V	33	Pass
	1880	19.8	0.97	8.92	**27.75**	V	33	Pass
	1909.8	19.74	0.97	8.92	27.69	V	33	Pass
TM2	1850.2	15.81	0.97	8.92	23.76	V	33	Pass
	1880	16.08	0.97	8.92	24.03	V	33	Pass
	1909.8	16.42	0.97	8.92	**24.37**	V	33	Pass
TM3	1852.4	12.98	0.97	8.92	**20.93**	V	33	Pass
	1880	12.97	0.97	8.92	20.92	V	33	Pass
	1907.6	12.86	0.97	8.92	20.81	V	33	Pass

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Table 9 Substitution Results (LTE Band 4)

Test Mode	Band width (MHz)	RB Size	Freq. [MHz]	SG. Level [dBm]	Cable Loss [dB]	Antenna Gain [dBi]	Substitution Level (EIRP) [dBm]	H/V	Limit [dBm]	Result
TM4	1.4	1RB	1710.7	14.15	0.91	6.83	20.07	H	30	Pass
	1.4		1732.5	15.26	0.91	6.83	21.18	H	30	Pass
	1.4		1754.3	15.29	0.91	6.83	**21.21**	H	30	Pass
	3		1711.5	14.76	0.91	6.83	20.68	H	30	Pass
	3		1732.5	15.5	0.91	6.83	**21.42**	H	30	Pass
	3		1753.5	15.14	0.91	6.83	21.06	H	30	Pass
	5		1712.5	13.82	0.91	6.83	19.74	H	30	Pass
	5		1732.5	15.35	0.91	6.83	21.27	H	30	Pass
	5		1752.5	15.48	0.91	6.83	**21.40**	H	30	Pass
	10		1715	14.4	0.91	6.83	20.32	H	30	Pass
	10		1732.5	15.32	0.91	6.83	21.24	H	30	Pass
	10		1750	15.49	0.91	6.83	**21.41**	H	30	Pass
	15		1717.5	13.06	0.91	6.83	18.98	H	30	Pass
	15		1732.5	13.88	0.91	6.83	19.80	H	30	Pass
	15		1747.5	14.11	0.91	6.83	**20.03**	H	30	Pass
	20		1720	14.37	0.91	6.83	20.29	H	30	Pass
	20		1732.5	14.97	0.91	6.83	**20.89**	H	30	Pass
	20		1745	14.76	0.91	6.83	20.68	H	30	Pass

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Table 10 Substitution Results (LTE Band 4)

Test Mode	Band width (MHz)	RB Size	Freq. [MHz]	SG. Level [dBm]	Cable Loss [dB]	Antenna Gain [dBi]	Substitution Level (EIRP) [dBm]	H/V	Limit [dBm]	Result
TM5	1.4	1RB	1710.7	12.94	0.91	6.83	18.86	H	30	Pass
	1.4		1732.5	13.11	0.91	6.83	19.03	H	30	Pass
	1.4		1754.3	13.44	0.91	6.83	**19.36**	H	30	Pass
	3		1711.5	12.99	0.91	6.83	18.91	H	30	Pass
	3		1732.5	13.21	0.91	6.83	**19.13**	H	30	Pass
	3		1753.5	13.05	0.91	6.83	18.97	H	30	Pass
	5		1712.5	12.79	0.91	6.83	18.71	H	30	Pass
	5		1732.5	12.6	0.91	6.83	18.52	H	30	Pass
	5		1752.5	12.98	0.91	6.83	**18.90**	H	30	Pass
	10		1715	12.81	0.91	6.83	18.73	H	30	Pass
	10		1732.5	13.34	0.91	6.83	**19.26**	H	30	Pass
	10		1750	13.27	0.91	6.83	19.19	H	30	Pass
	15		1717.5	12.33	0.91	6.83	18.25	H	30	Pass
	15		1732.5	12.86	0.91	6.83	**18.78**	H	30	Pass
	15		1747.5	12.74	0.91	6.83	18.66	H	30	Pass
	20		1720	13.1	0.91	6.83	19.02	H	30	Pass
	20		1732.5	13.43	0.91	6.83	**19.35**	H	30	Pass
	20		1745	13.16	0.91	6.83	19.08	H	30	Pass

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Table 11 Substitution Results (LTE Band 17)

Test Mode	Band width (MHz)	RB Size	Freq. [MHz]	SG. Level [dBm]	Cable Loss [dB]	Antenna Gain [dBd]	Substitution Level (EIRP) [dBm]	H/V	Limit [dBm]	Result
TM4	5	1RB	706.5	15.53	0.5	5.21	20.24	V	34.77	Pass
	5		710	15.82	0.5	5.21	**20.53**	V	34.77	Pass
	5		713.5	15.6	0.5	5.21	20.31	V	34.77	Pass
	10		709	15.16	0.5	5.21	19.87	V	34.77	Pass
	10		710	15.38	0.5	5.21	20.09	V	34.77	Pass
	10		711	15.61	0.5	5.21	**20.32**	V	34.77	Pass
TM5	5	1RB	706.5	13.82	0.5	5.21	18.53	V	34.77	Pass
	5		710	14.12	0.5	5.21	**18.83**	V	34.77	Pass
	5		713.5	13.55	0.5	5.21	18.26	V	34.77	Pass
	10		709	14.05	0.5	5.21	**18.76**	V	34.77	Pass
	10		710	13.52	0.5	5.21	18.23	V	34.77	Pass
	10		711	13.91	0.5	5.21	18.62	V	34.77	Pass

4.2. Peak to Average Ratio

4.2.1. Test Standard

CFR 47 (FCC) part 24 subpart E, part 27

4.2.2. Test Limit

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.2.3. Test Procedure

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode. For LTE operating mode: a. The EUT was connected to spectrum and system simulator via a power divider. b. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer. c. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%. d. Record the deviation as Peak to Average Ratio.

4.2.4. Test Data

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM1900	GSM/TM1	1850.2	0.42	<13	PASS
		1880	0.57	<13	PASS
		1909.8	0.38	<13	PASS
GSM1900	EDGE/TM2	1850.2	2.36	<13	PASS
		1880	2.05	<13	PASS
		1909.8	2.44	<13	PASS

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA1900	UMTS/TM3	1852.4	2.81	<13	PASS
		1880	3.25	<13	PASS
		1907.6	2.97	<13	PASS

LTE Band 4:

Channel Bandwidth: 1.4 MHz						
Modulation	Test Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	1710.7	1	0	3.65	<13	PASS
	1732.5	1	0	4.34	<13	PASS
	1754.3	1	0	3.96	<13	PASS
16QAM	1710.7	1	0	4.61	<13	PASS
	1732.5	1	0	5.29	<13	PASS
	1754.3	1	0	4.89	<13	PASS

Channel Bandwidth: 3MHz						
Modulation	Test Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	1711.5	1	0	3.65	<13	PASS
	1732.5	1	0	4.43	<13	PASS
	1753.5	1	0	3.89	<13	PASS
16QAM	1711.5	1	0	4.56	<13	PASS
	1732.5	1	0	5.35	<13	PASS
	1753.5	1	0	4.83	<13	PASS

Channel Bandwidth: 5MHz						
Modulation	Test Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	1712.5	1	0	3.5	<13	PASS
	1732.5	1	0	4.27	<13	PASS
	1752.5	1	0	3.91	<13	PASS
16QAM	1712.5	1	0	4.52	<13	PASS
	1732.5	1	0	5.21	<13	PASS
	1752.5	1	0	4.63	<13	PASS

Channel Bandwidth: 10MHz						
Modulation	Test Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	1715	1	0	3.58	<13	PASS
	1732.5	1	0	4.5	<13	PASS
	1750	1	0	3.91	<13	PASS
16QAM	1715	1	0	4.49	<13	PASS
	1732.5	1	0	5.35	<13	PASS
	1750	1	0	4.85	<13	PASS

Channel Bandwidth: 15MHz						
Modulation	Test Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	1717.5	1	0	3.94	<13	PASS
	1732.5	1	0	4.27	<13	PASS
	1747.5	1	0	3.99	<13	PASS
16QAM	1717.5	1	0	4.8	<13	PASS
	1732.5	1	0	5.19	<13	PASS
	1747.5	1	0	4.93	<13	PASS

Channel Bandwidth: 20MHz						
Modulation	Test Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	1720	1	0	4.11	<13	PASS
	1732.5	1	0	4.26	<13	PASS
	1745	1	0	4.07	<13	PASS
16QAM	1720	1	0	4.96	<13	PASS
	1732.5	1	0	5.12	<13	PASS
	1745	1	0	4.81	<13	PASS

LTE Band 17:

Channel Bandwidth: 5MHz						
Modulation	Test Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	706.5	1	0	3.93	<13	PASS
	710.0	1	0	3.33	<13	PASS
	713.5	1	0	4.6	<13	PASS
16QAM	706.5	1	0	4.94	<13	PASS
	710.0	1	0	4.28	<13	PASS
	713.5	1	0	5.48	<13	PASS

Channel Bandwidth: 10MHz						
Modulation	Test Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	709.0	1	0	3.86	<13	PASS
	710.0	1	0	3.6	<13	PASS
	711.0	1	0	3.39	<13	PASS
16QAM	709.0	1	0	4.92	<13	PASS
	710.0	1	0	4.53	<13	PASS
	711.0	1	0	4.33	<13	PASS

4.3. Occupied Bandwidth/Emission Bandwidth

4.3.1. Test Standard

FCC: CFR Part 2.1049, CFR Part 22.917, CFR Part 24.238, CRF Part 27

4.3.2. Test Limit

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable.

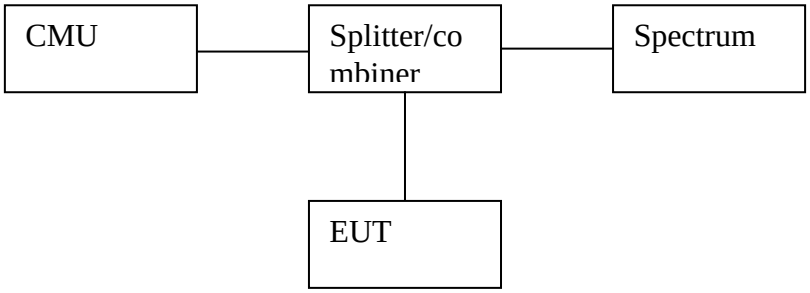
(h) Transmitters employing digital modulation techniques-when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated.

4.3.3. Test Procedure

1. Connect the equipment as shown in the above diagram.
2. Adjust the settings of the Universal Radio Communication Tester (CMU) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure the 99% occupied bandwidth. Record the value.
4. Set the spectrum analyzer to measure the -26 dB emission bandwidth. Record the value.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

Spectrum analyzer settings: Measurement bandwidth of at least 1% of the occupied bandwidth.

4.3.4. Test Setup



4.3.5.Test Data

Table 12 Occupied Bandwidth Test Data

Test Band	Test Mode	Test Channel	99% OBW (kHz)	26dBc BANDWIDTH (kHz)	Verdict
GSM850	GSM/TM1	LCH	**247.84**	305.72	PASS
		MCH	246.88	313.43	PASS
		HCH	244.79	311.70	PASS
	EDGE/TM2	LCH	**246.76**	312.94	PASS
		MCH	246.68	308.07	PASS
		HCH	245.02	310.66	PASS
GSM1900	GSM/TM1	LCH	247.03	316.12	PASS
		MCH	**250.27**	306.99	PASS
		HCH	248.67	313.55	PASS
	EDGE/TM2	LCH	248.66	303.53	PASS
		MCH	**249.47**	316.28	PASS
		HCH	249.25	316.91	PASS

Table 13 Occupied Bandwidth Test Data

Test Band	Test Mode	Test Channel	99% OBW (kHz)	26dBc BANDWIDTH (kHz)	Verdict
WCDMA850	UMTS/TM3	LCH	4220.5	4873	PASS
		MCH	**4232.1**	4889	PASS
		HCH	4206.0	4893	PASS
WCDMA1900	UMTS/TM3	LCH	4213.5	4896	PASS
		MCH	**4219.7**	4869	PASS
		HCH	4218.0	4883	PASS

LTE Band 4:

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	6	0	1.0770	1.225	PASS
	MCH	6	0	**1.0772**	1.223	PASS
	HCH	6	0	1.0768	1.222	PASS
16QAM	LCH	6	0	1.0811	1.218	PASS
	MCH	6	0	**1.0820**	1.223	PASS
	HCH	6	0	1.0798	1.227	PASS

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	15	0	2.6789	2.860	PASS
	MCH	15	0	**2.6848**	2.878	PASS
	HCH	15	0	2.6847	2.877	PASS
16QAM	LCH	15	0	2.6837	2.866	PASS
	MCH	15	0	2.6798	2.865	PASS
	HCH	15	0	**2.6843**	2.882	PASS

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	**4.4830**	4.862	PASS
	MCH	25	0	4.4828	4.795	PASS
	HCH	25	0	4.4791	4.841	PASS
16QAM	LCH	25	0	4.4814	4.829	PASS
	MCH	25	0	4.4833	4.828	PASS
	HCH	25	0	**4.4861**	4.869	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9326	9.444	PASS
	MCH	50	0	8.9313	9.480	PASS
	HCH	50	0	**8.9328**	9.486	PASS
16QAM	LCH	50	0	**8.9425**	9.472	PASS
	MCH	50	0	8.9377	9.417	PASS
	HCH	50	0	8.9357	9.471	PASS

Channel Bandwidth: 15 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	75	0	**13.420**	14.16	PASS
	MCH	75	0	13.412	14.10	PASS
	HCH	75	0	13.402	14.03	PASS
16QAM	LCH	75	0	13.405	14.08	PASS
	MCH	75	0	13.396	14.08	PASS
	HCH	75	0	**13.406**	14.05	PASS

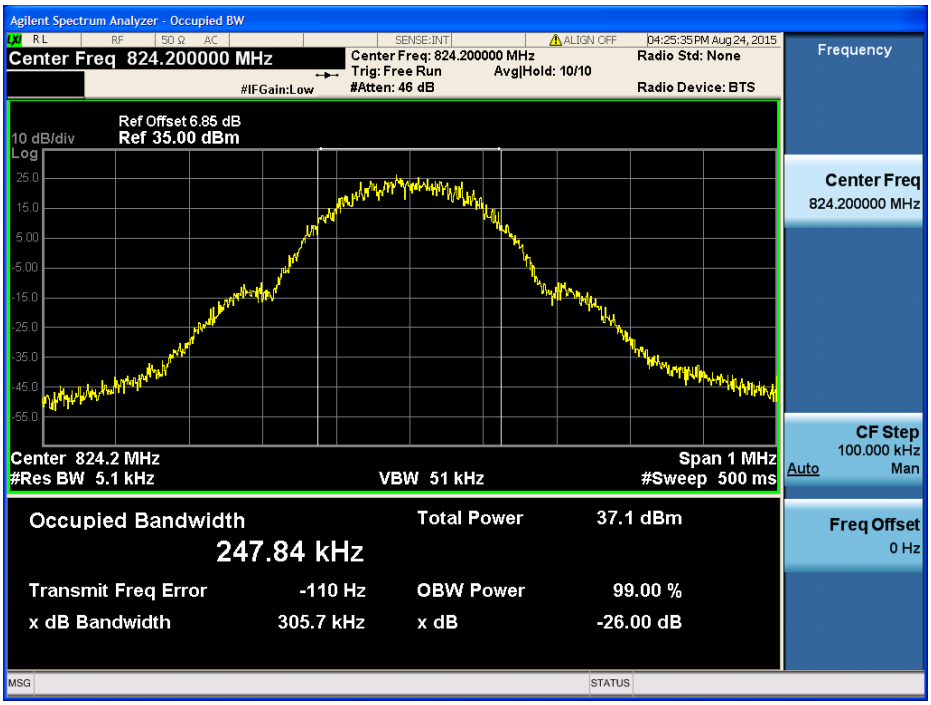
Channel Bandwidth: 20 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	100	0	**17.876**	18.68	PASS
	MCH	100	0	17.868	18.67	PASS
	HCH	100	0	17.862	18.59	PASS
16QAM	LCH	100	0	17.875	18.64	PASS
	MCH	100	0	**17.879**	18.62	PASS
	HCH	100	0	17.870	18.61	PASS

LTE Band 17:

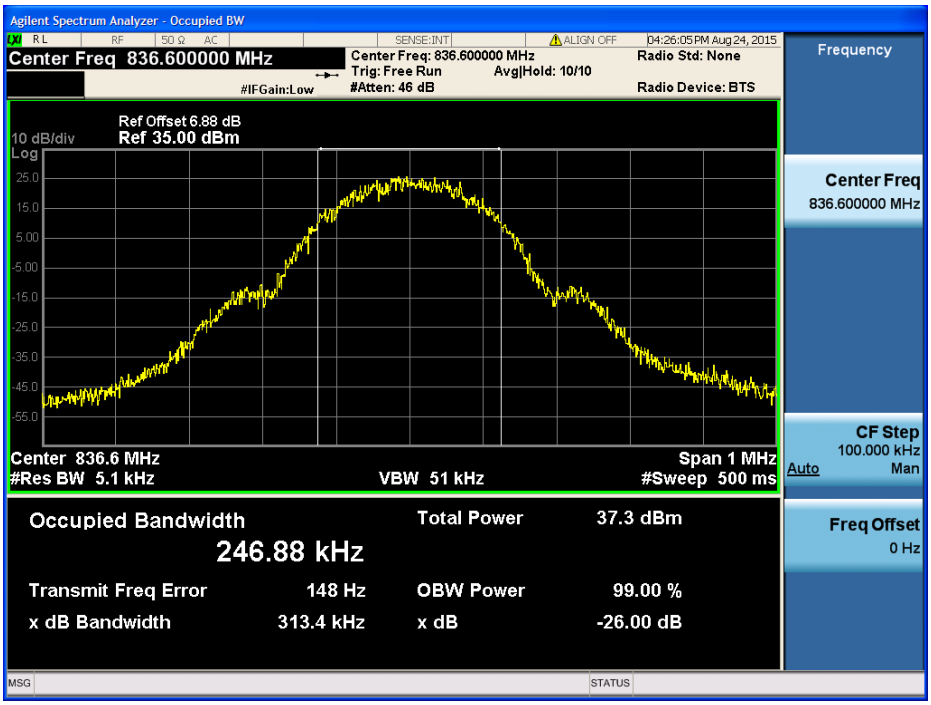
Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4791	4.864	PASS
	MCH	25	0	**4.4903**	4.837	PASS
	HCH	25	0	4.4756	4.807	PASS
16QAM	LCH	25	0	4.4734	4.838	PASS
	MCH	25	0	**4.4904**	4.812	PASS
	HCH	25	0	4.4748	4.772	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9762	9.688	PASS
	MCH	50	0	**8.9804**	9.535	PASS
	HCH	50	0	8.9683	9.543	PASS
16QAM	LCH	50	0	8.9651	9.530	PASS
	MCH	50	0	**8.9764**	9.485	PASS
	HCH	50	0	8.9638	9.549	PASS

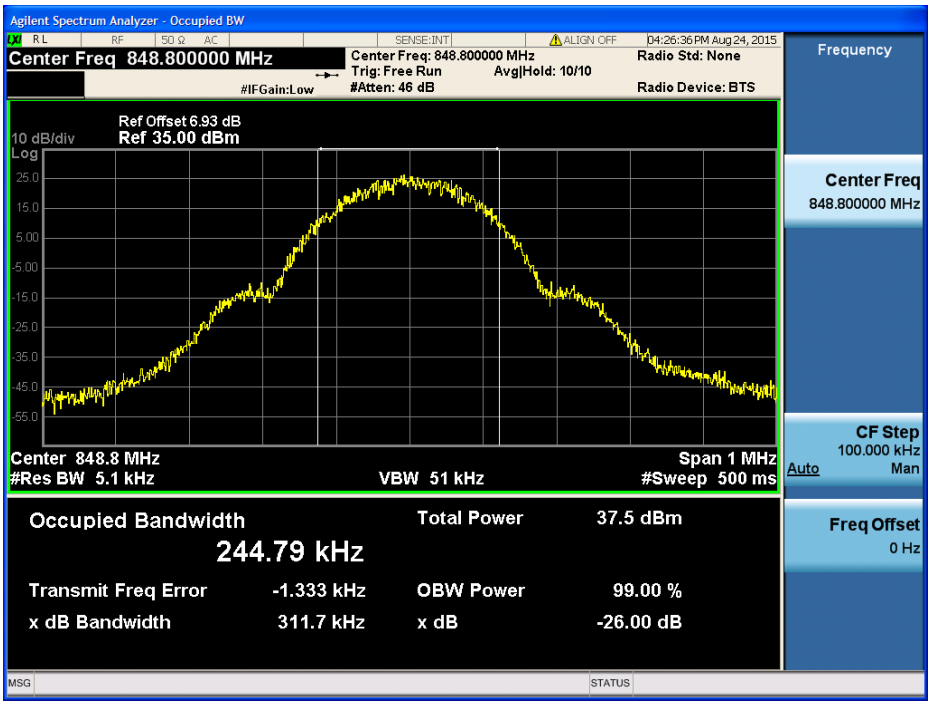
Test Band = GSM850
Test Mode = GSM/TM1
Test Channel = LCH



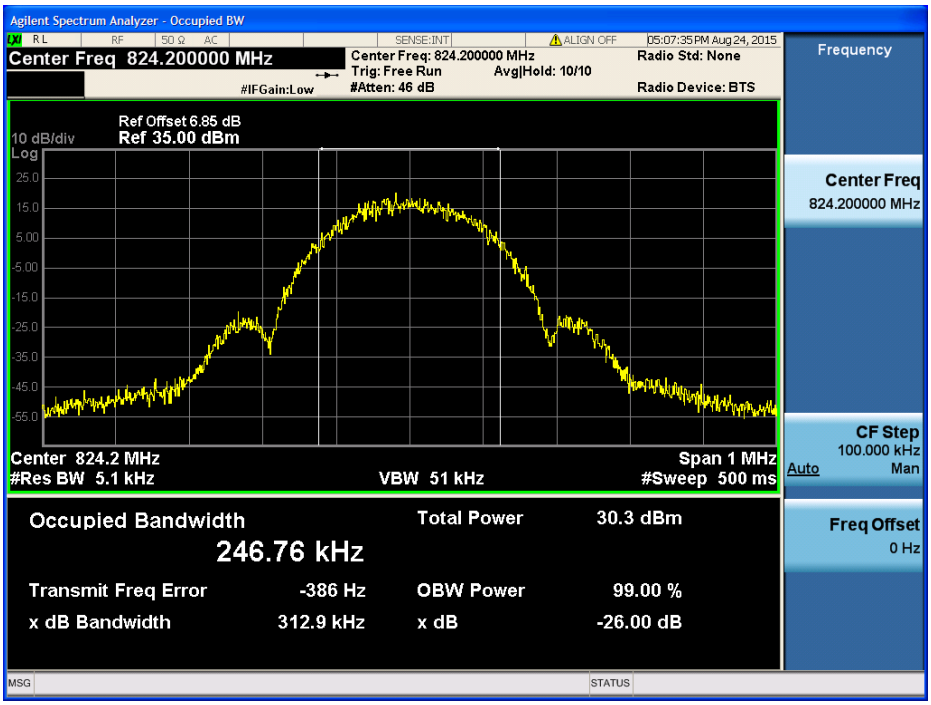
Test Band = GSM850
Test Mode = GSM/TM1
Test Channel = MCH



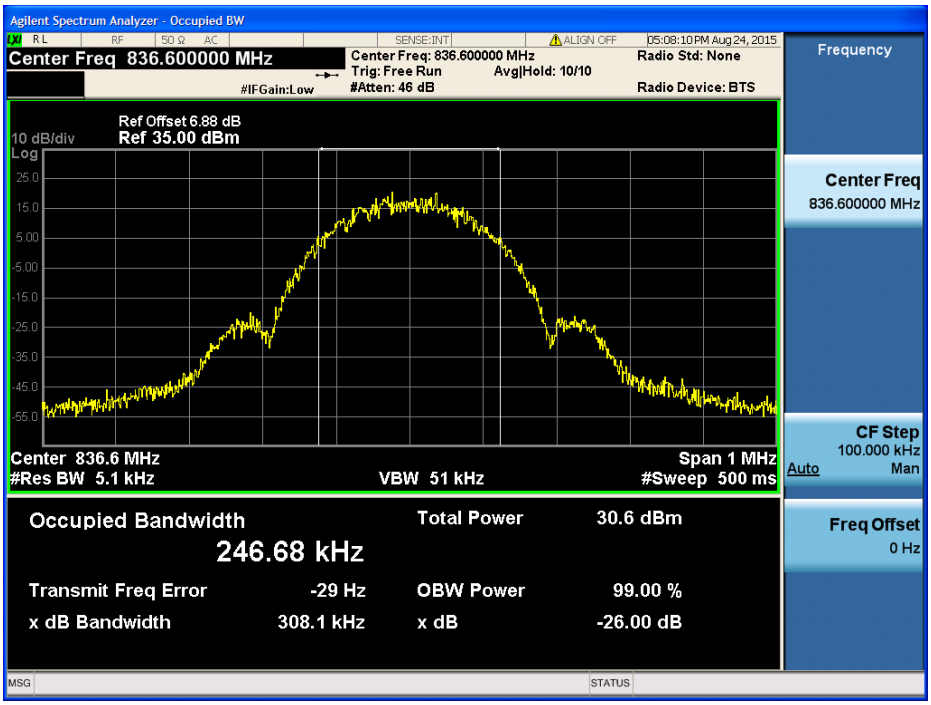
Test Band = GSM850
Test Mode = GSM/TM1
Test Channel = HCH



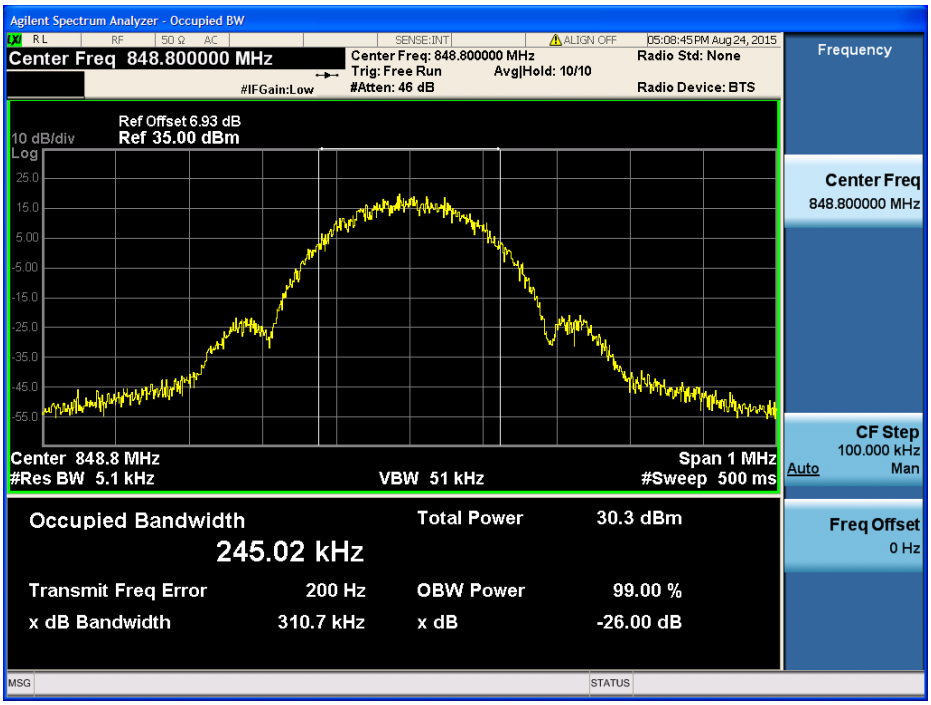
Test Band = GSM850
Test Mode = EDGE/TM2
Test Channel = LCH



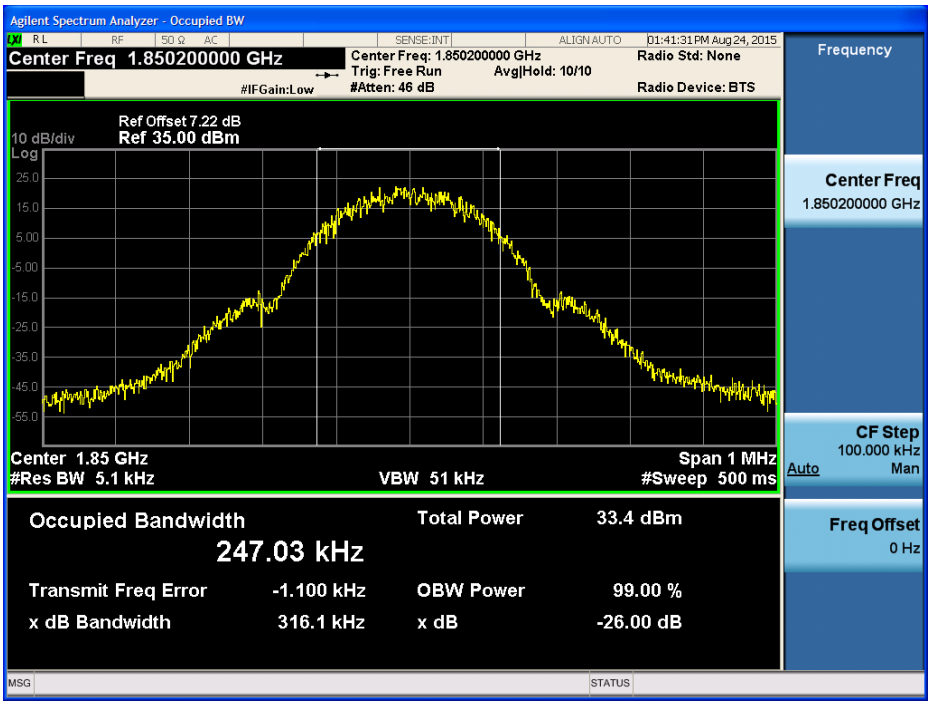
Test Band = GSM850
Test Mode = EDGE/TM2
Test Channel = MCH



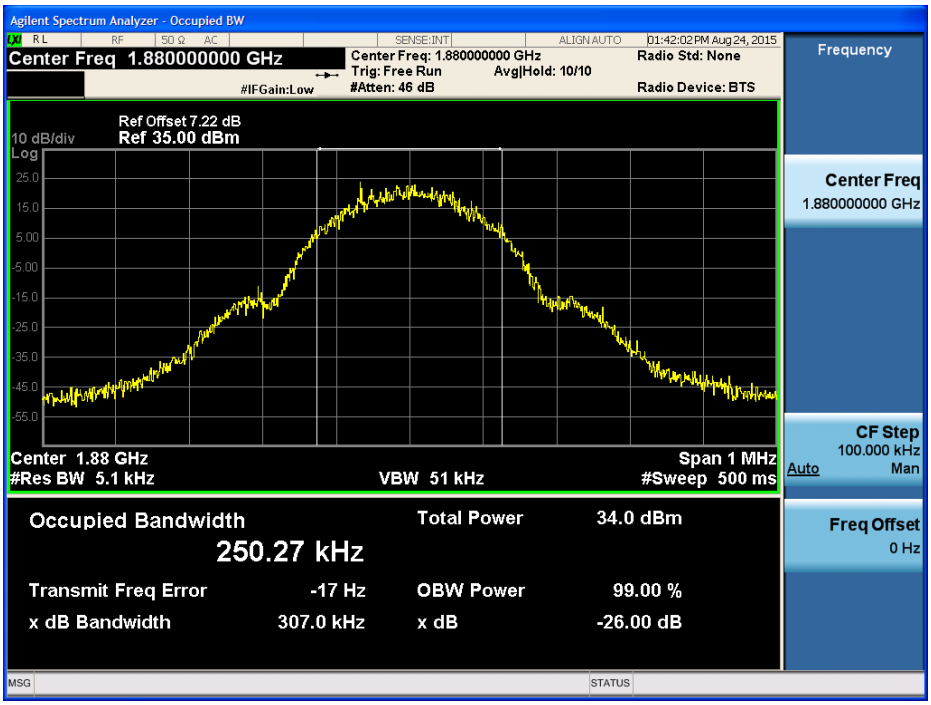
Test Band = GSM850
Test Mode = EDGE/TM2
Test Channel = HCH



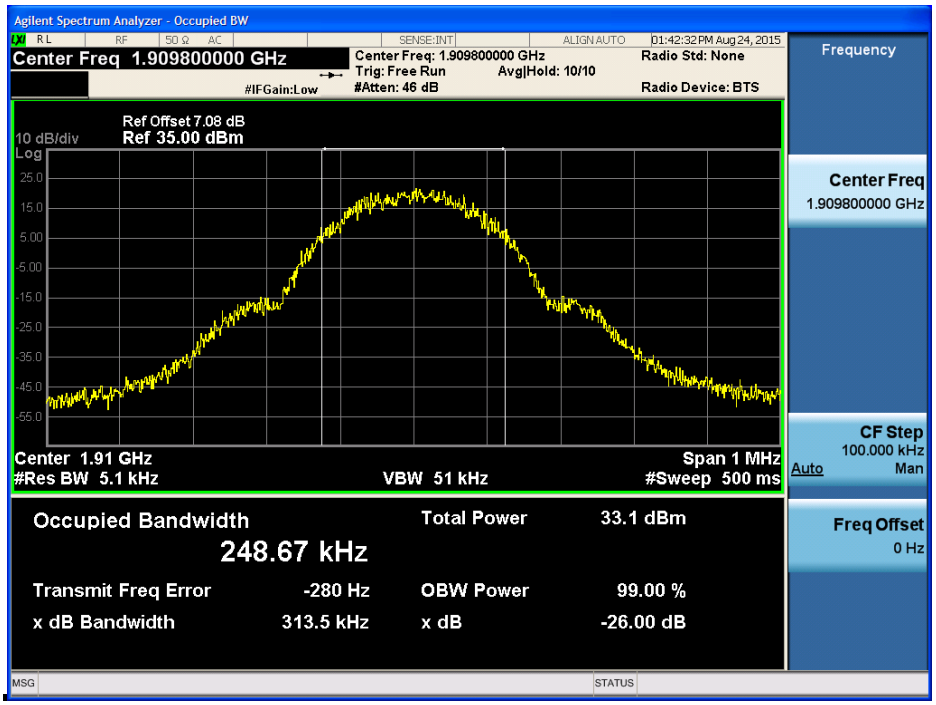
Test Band = GSM1900
Test Mode = GSM/TM1
Test Channel = LCH



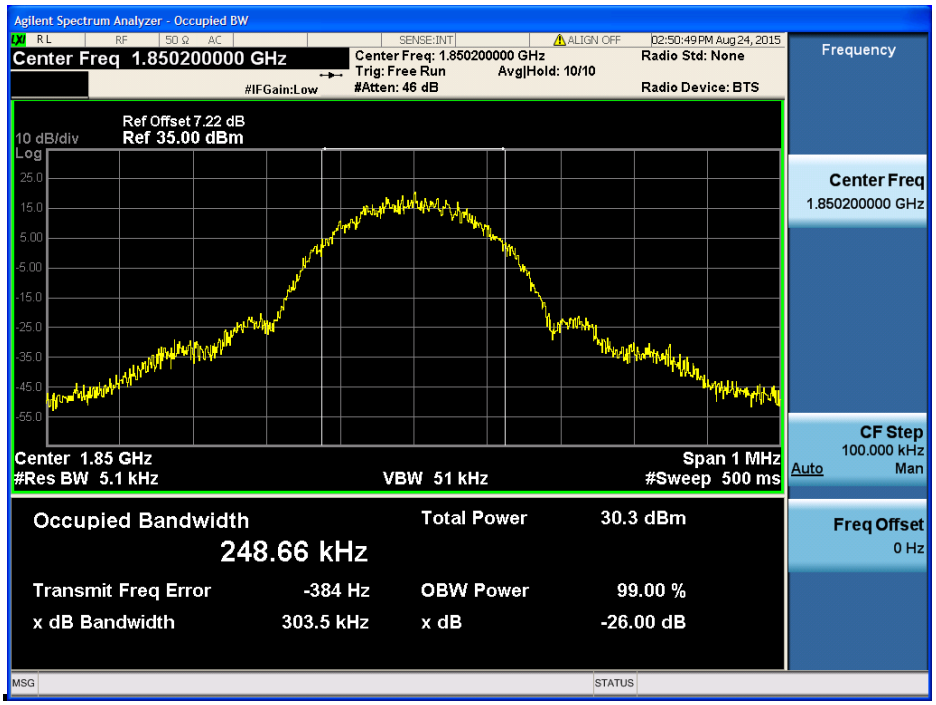
Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = MCH



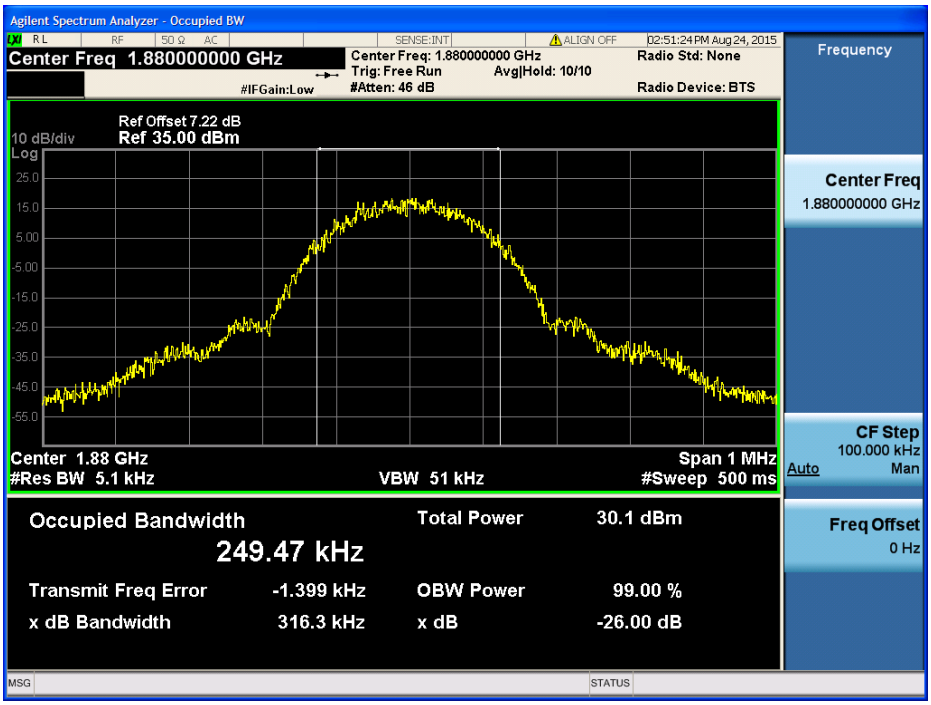
Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = HCH



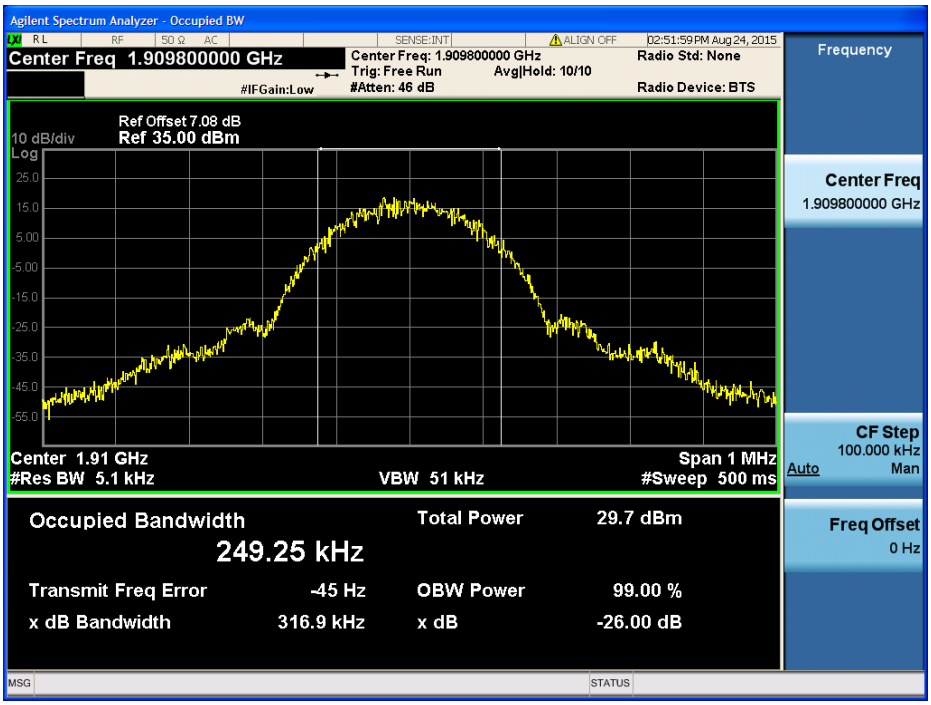
Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = LCH



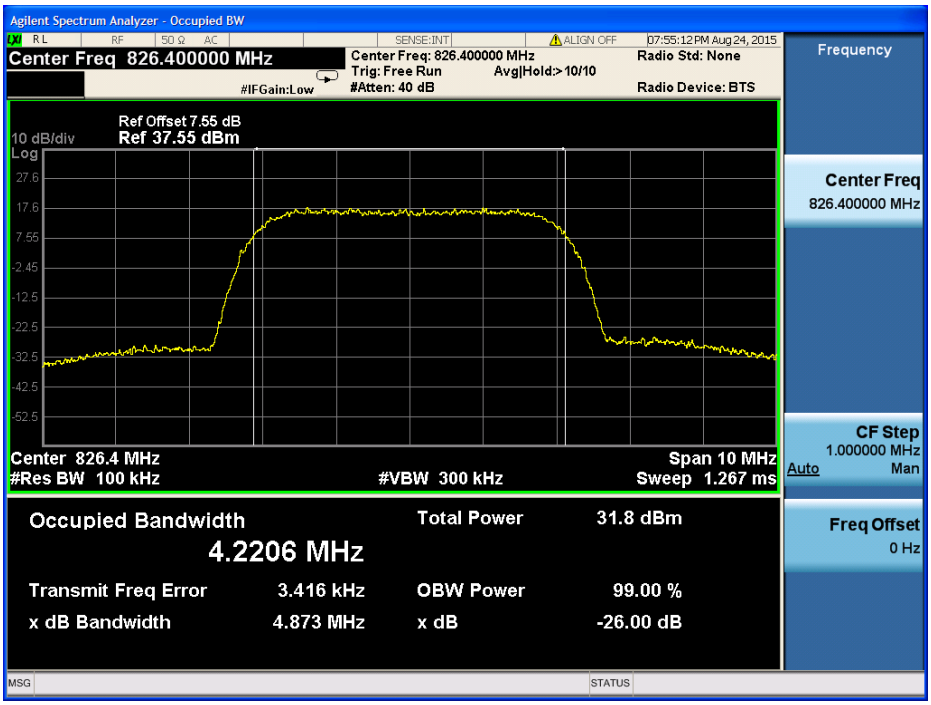
Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = MCH



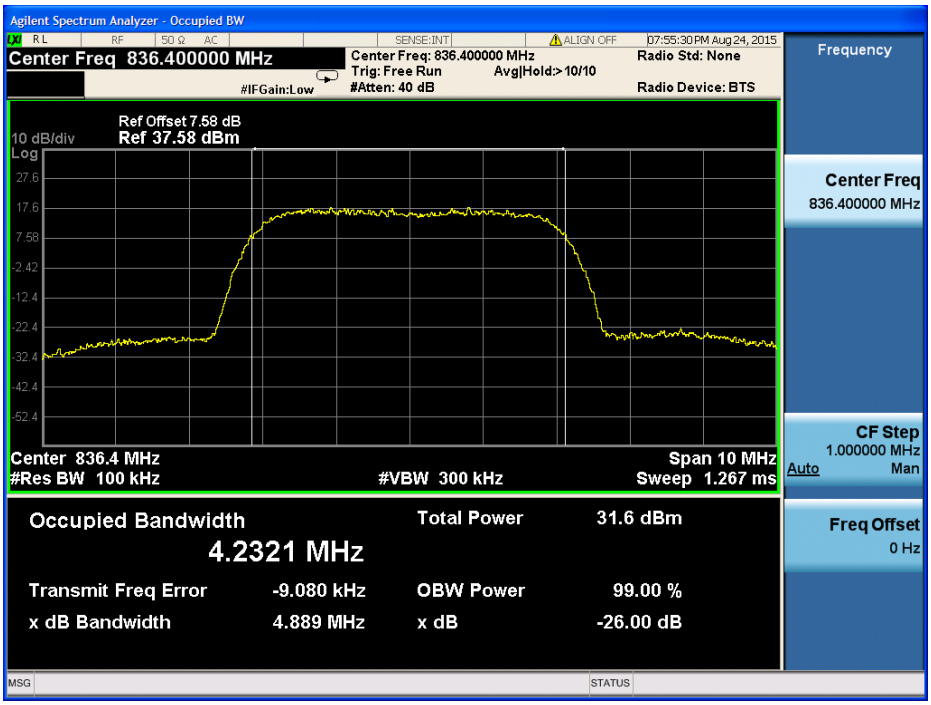
Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = HCH



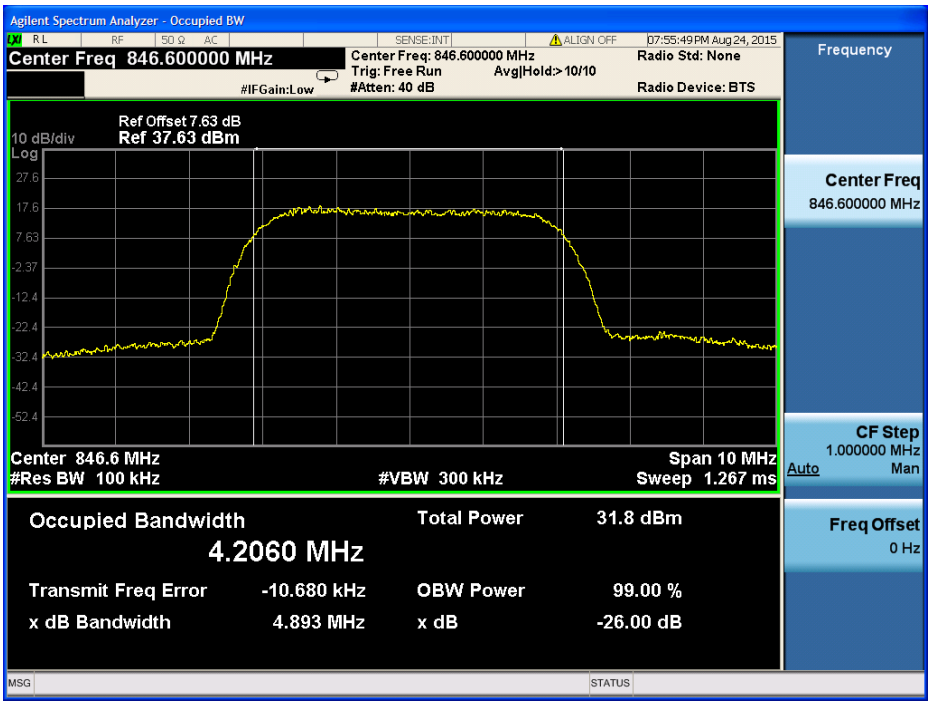
Test Band=WCDMA850
Test Mode=UMTS/TM3
Test Channel=LCH



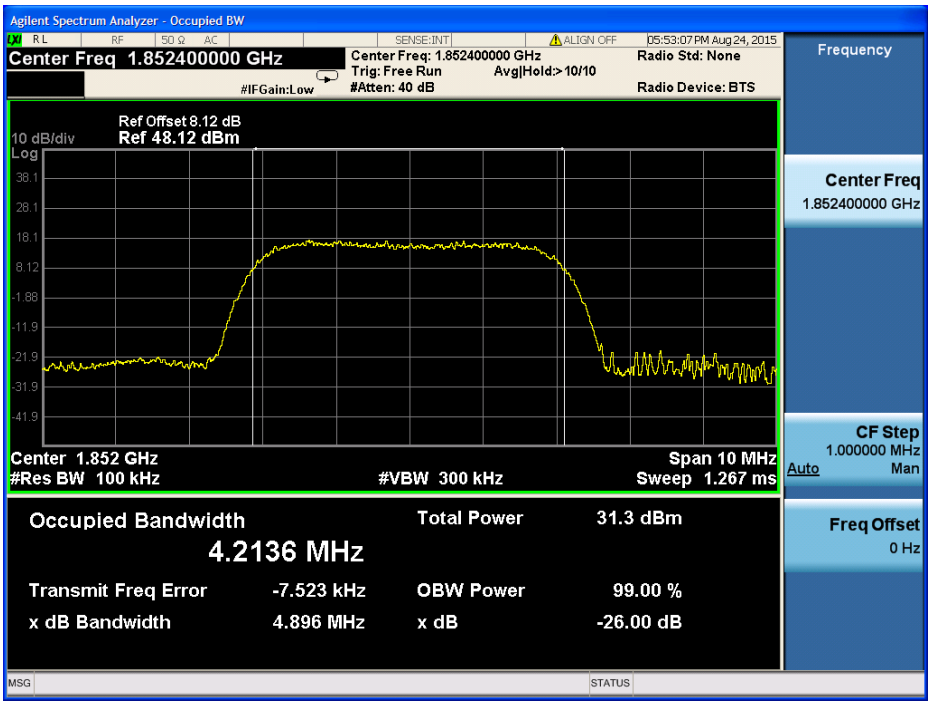
Test Band=WCDMA850
Test Mode=UMTS/TM3
Test Channel=MCH



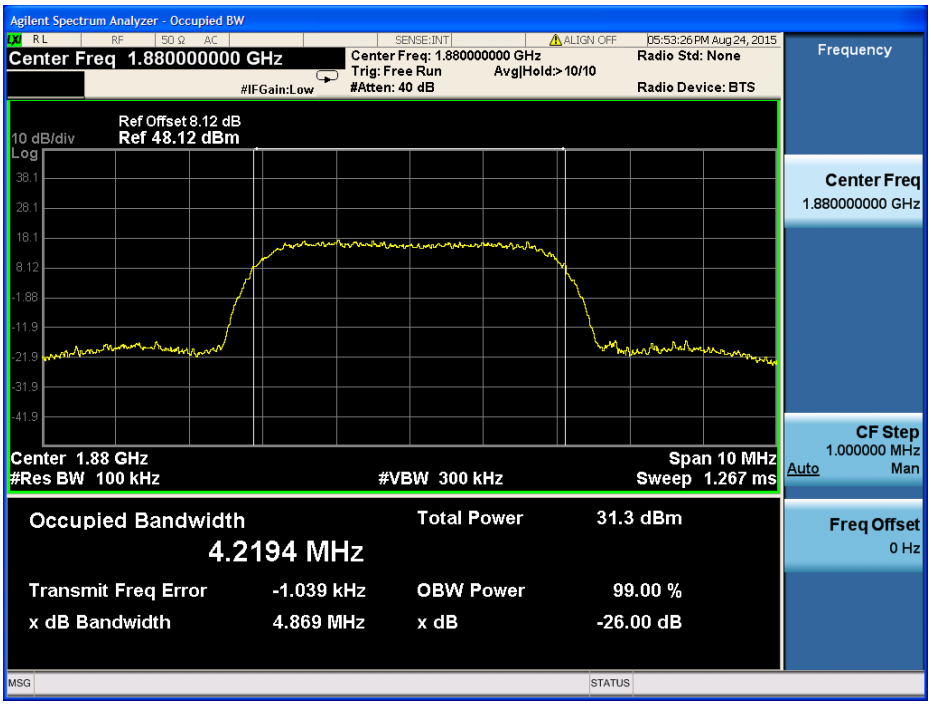
Test Band=WCDMA850
Test Mode=UMTS/TM3
Test Channel=HCH



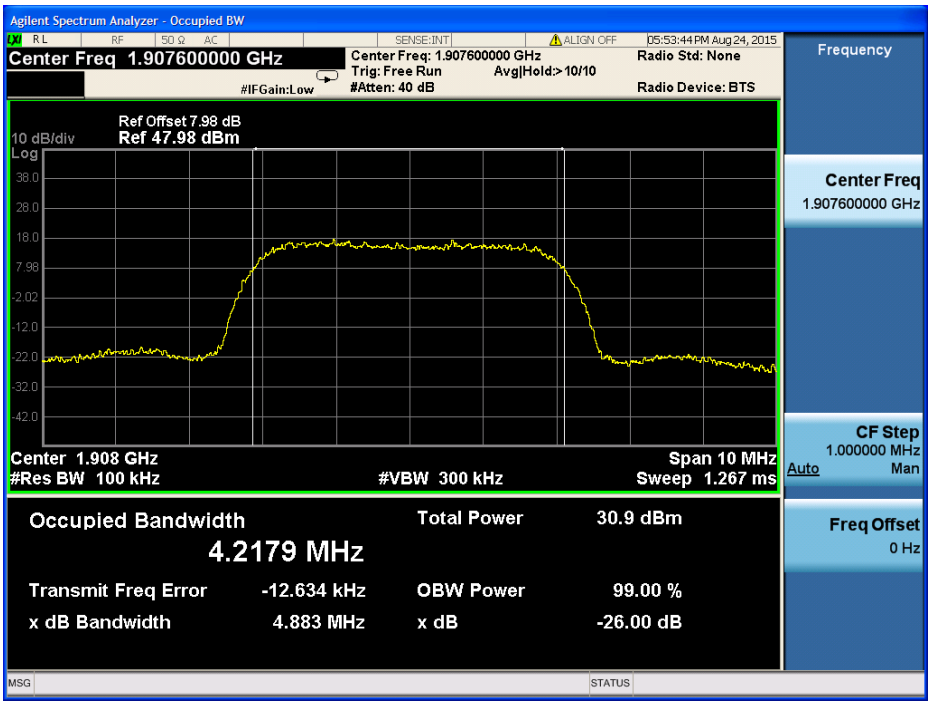
Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=LCH



Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=MCH

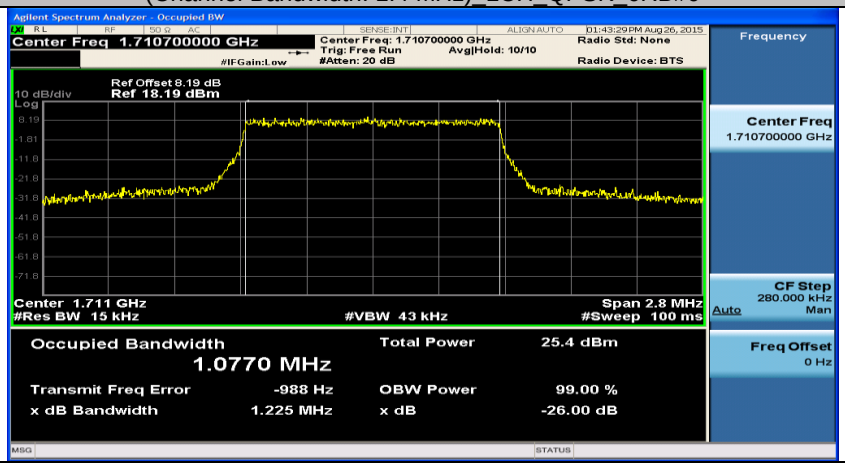


Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=HCH

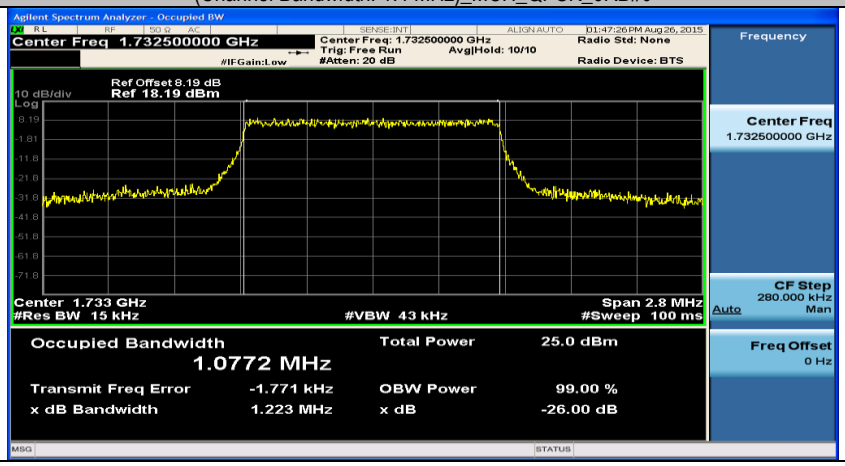


LTE Band 4
Channel Bandwidth: 1.4 MHz
Test Mode=QPSK/TM4

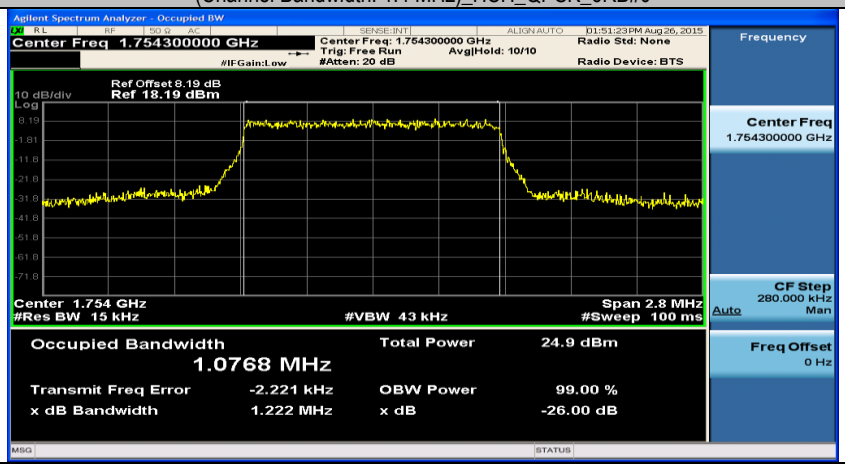
(Channel Bandwidth: 1.4 MHz)_LCH_QPSK_6RB#0



(Channel Bandwidth: 1.4 MHz)_MCH_QPSK_6RB#0

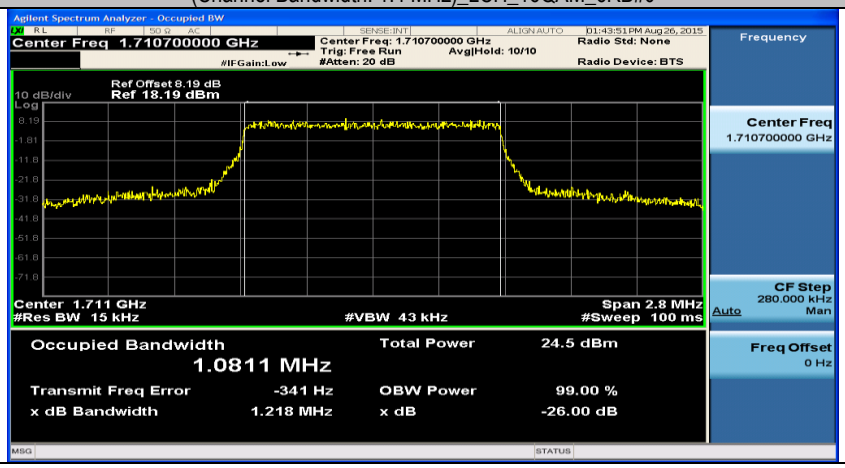


(Channel Bandwidth: 1.4 MHz)_HCH_QPSK_6RB#0

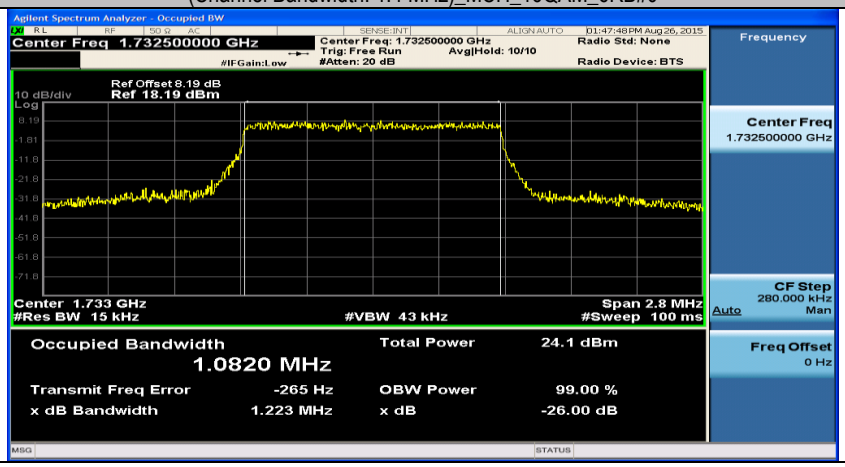


LTE Band 4
Channel Bandwidth: 1.4 MHz
Test Mode=16QAM/TM5

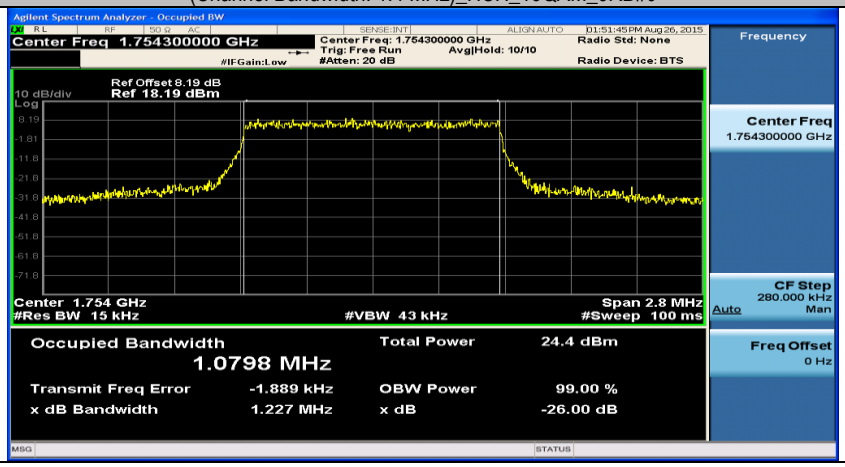
(Channel Bandwidth: 1.4 MHz)_LCH_16QAM_6RB#0



(Channel Bandwidth: 1.4 MHz)_MCH_16QAM_6RB#0

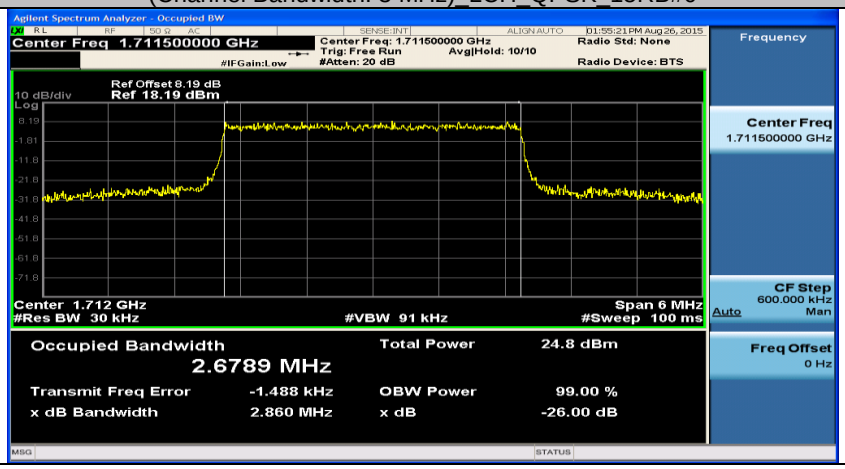


(Channel Bandwidth: 1.4 MHz)_HCH_16QAM_6RB#0

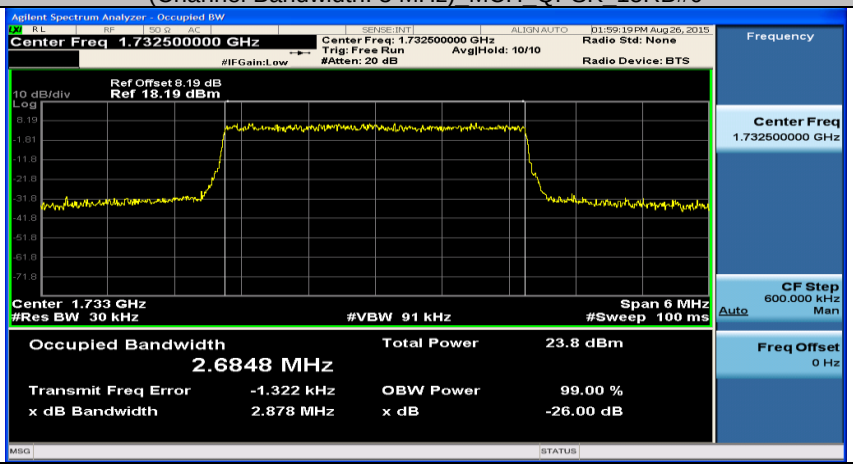


LTE Band 4
Channel Bandwidth: 3 MHz
Test Mode=QPSK/TM4

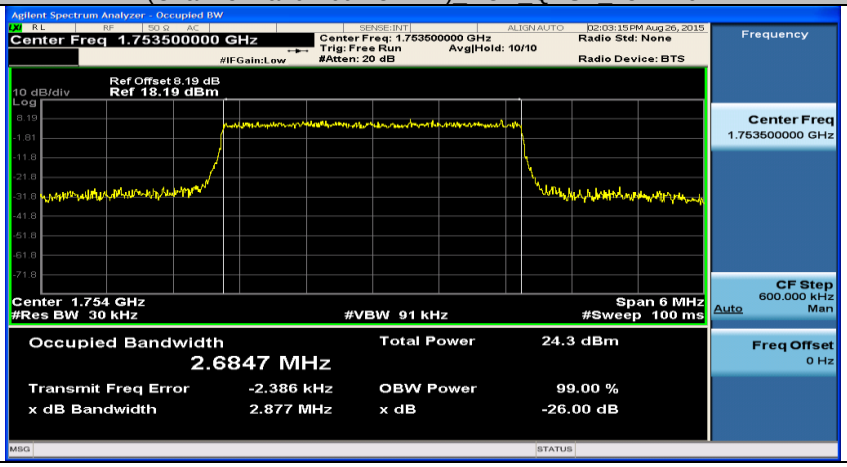
(Channel Bandwidth: 3 MHz)_LCH_QPSK_15RB#0



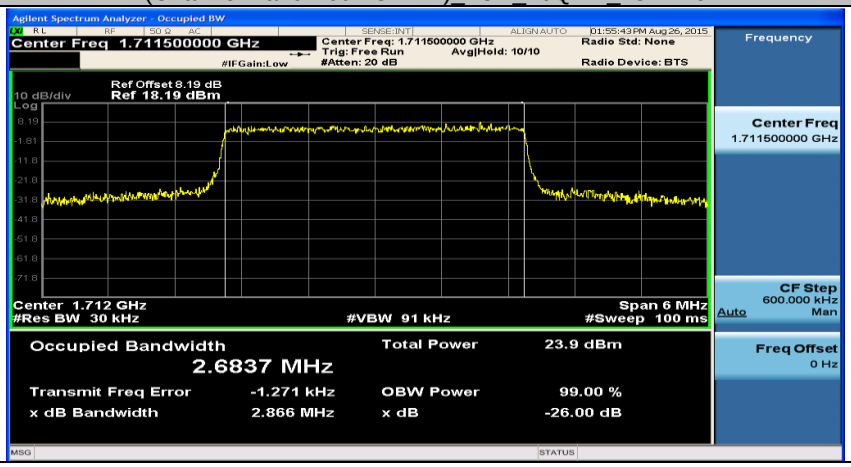
(Channel Bandwidth: 3 MHz)_MCH_QPSK_15RB#0

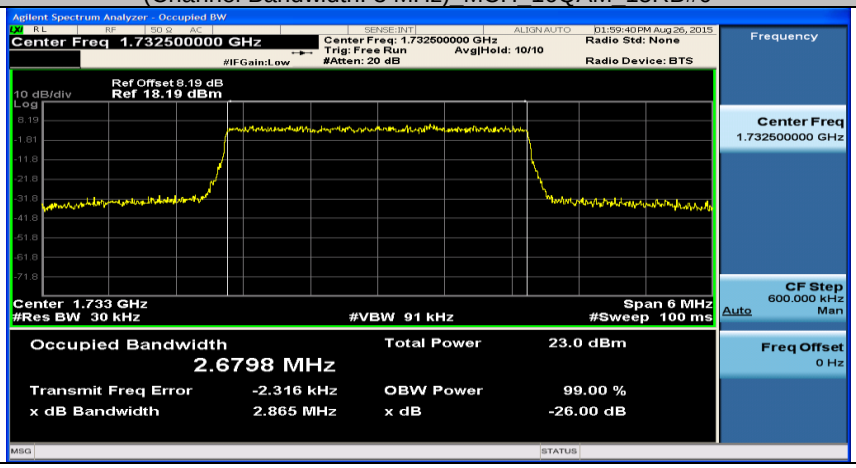


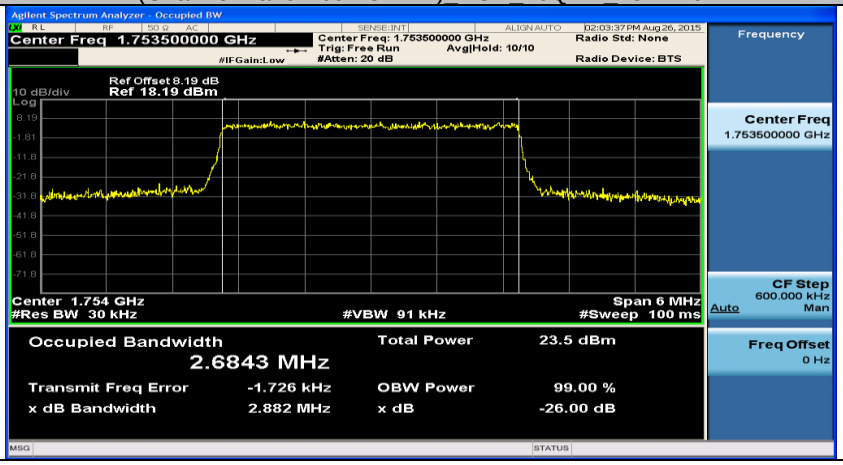
(Channel Bandwidth: 3 MHz)_HCH_QPSK_15RB#0



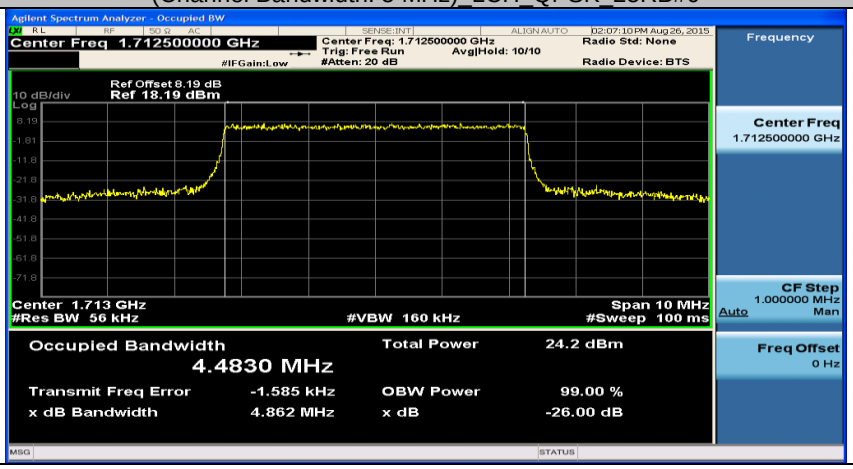
LTE Band 4
Channel Bandwidth: 3 MHz
Test Mode=16QAM/TM5

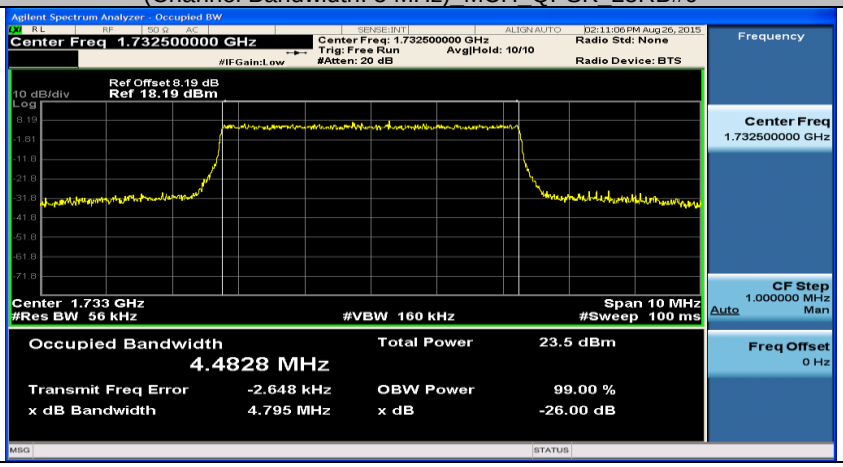
(Channel Bandwidth: 3 MHz)_LCH_16QAM_15RB#0


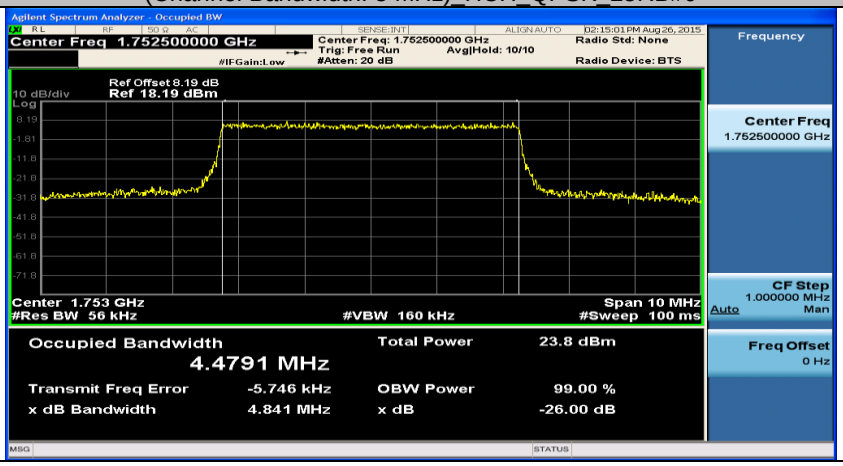
(Channel Bandwidth: 3 MHz)_MCH_16QAM_15RB#0


(Channel Bandwidth: 3 MHz)_HCH_16QAM_15RB#0


LTE Band 4
Channel Bandwidth: 5 MHz
Test Mode=QPSK/TM4

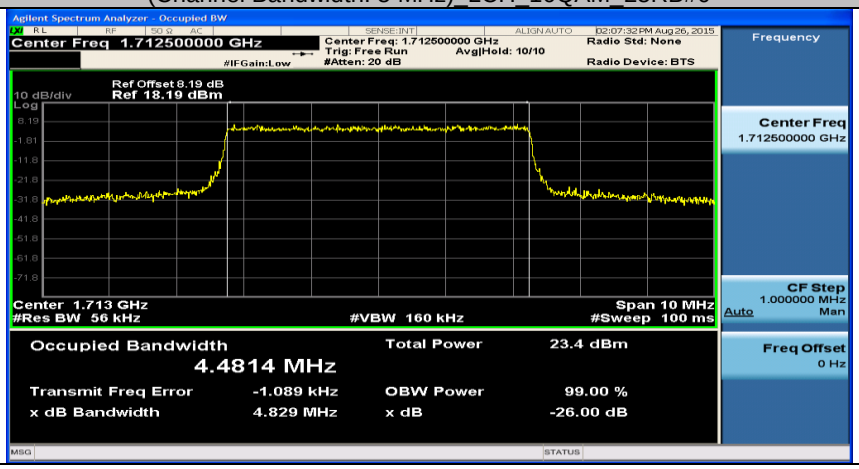
(Channel Bandwidth: 5 MHz)_LCH_QPSK_25RB#0


(Channel Bandwidth: 5 MHz)_MCH_QPSK_25RB#0


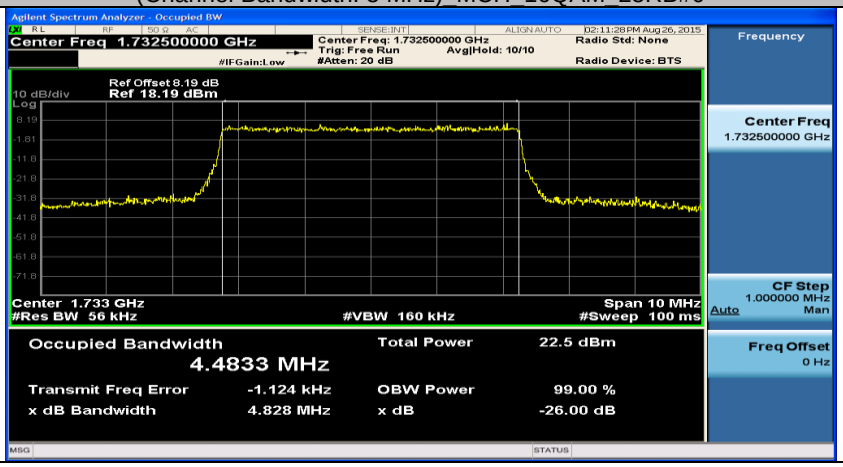
(Channel Bandwidth: 5 MHz)_HCH_QPSK_25RB#0


LTE Band 4
Channel Bandwidth: 5 MHz
Test Mode=16QAM/TM5

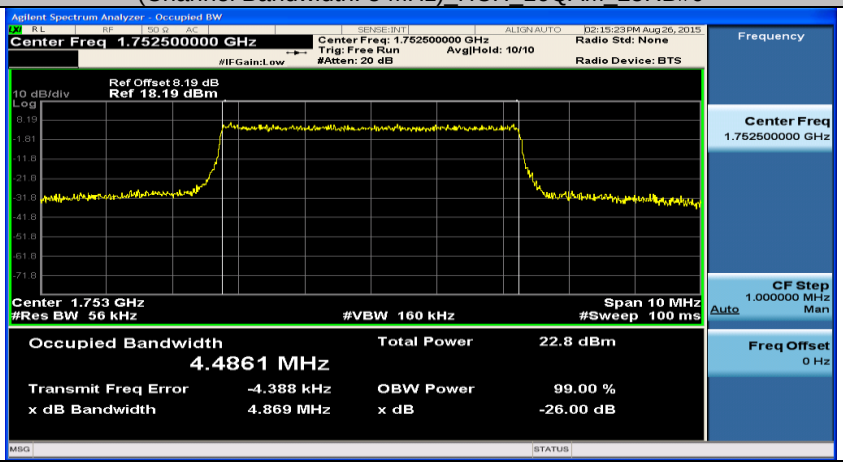
(Channel Bandwidth: 5 MHz)_LCH_16QAM_25RB#0



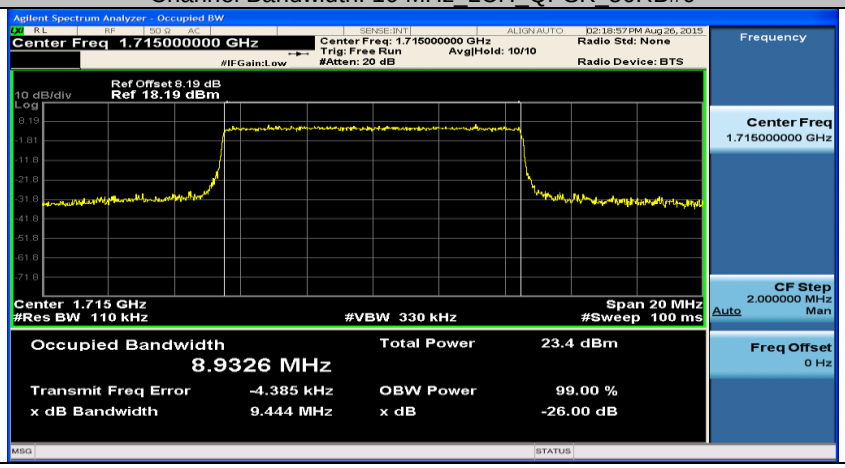
(Channel Bandwidth: 5 MHz)_MCH_16QAM_25RB#0

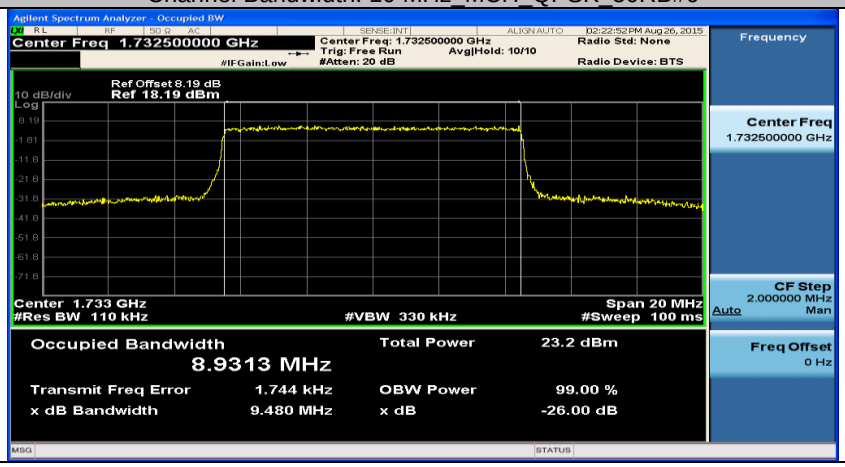


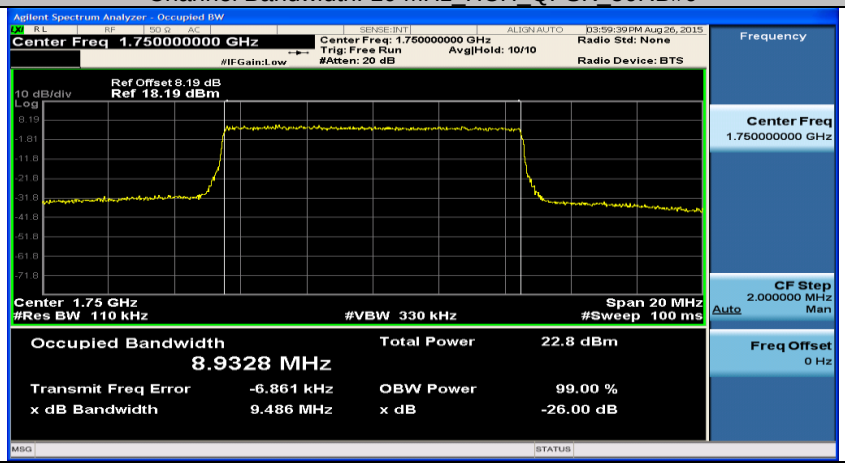
(Channel Bandwidth: 5 MHz)_HCH_16QAM_25RB#0



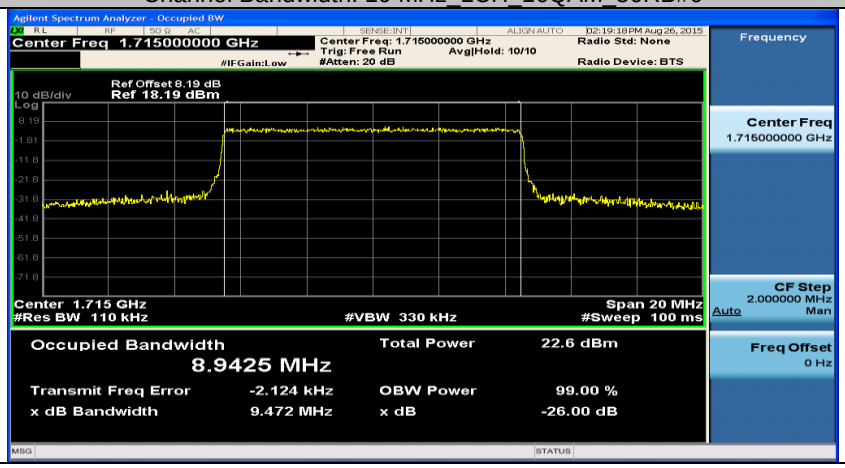
LTE Band 4
Channel Bandwidth: 10 MHz
Test Mode=QPSK/TM4

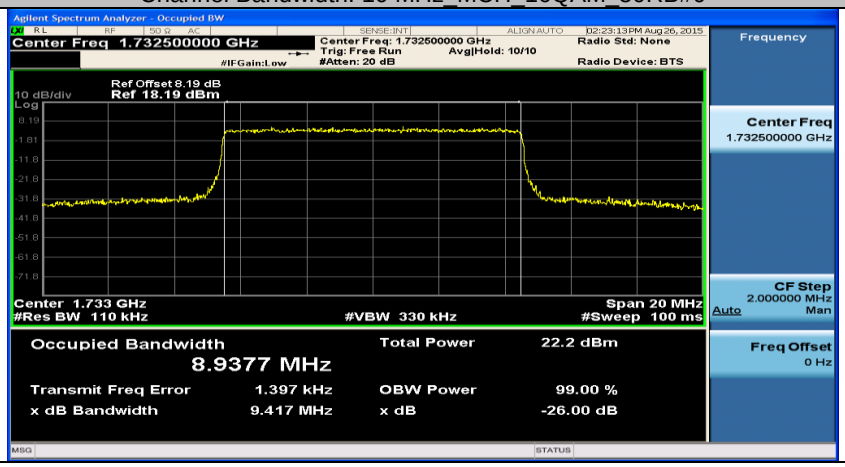
Channel Bandwidth: 10 MHz_LCH_QPSK_50RB#0


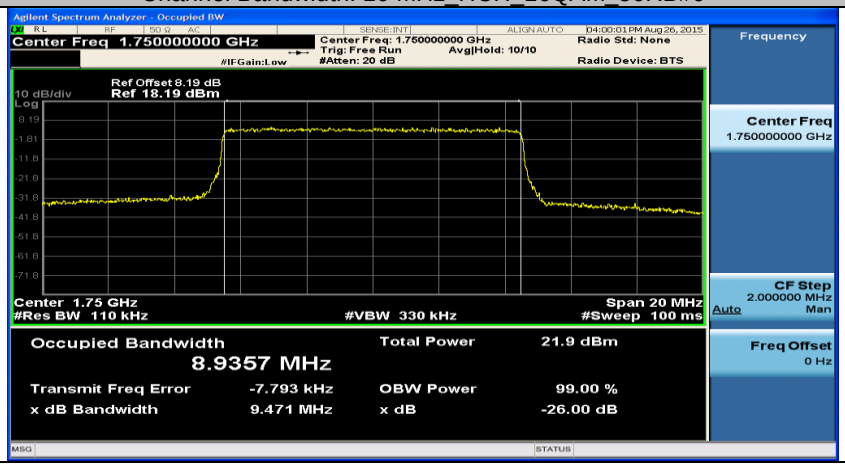
Channel Bandwidth: 10 MHz_MCH_QPSK_50RB#0


Channel Bandwidth: 10 MHz_HCH_QPSK_50RB#0


LTE Band 4
Channel Bandwidth: 10MHz
Test Mode=16QAM/TM5

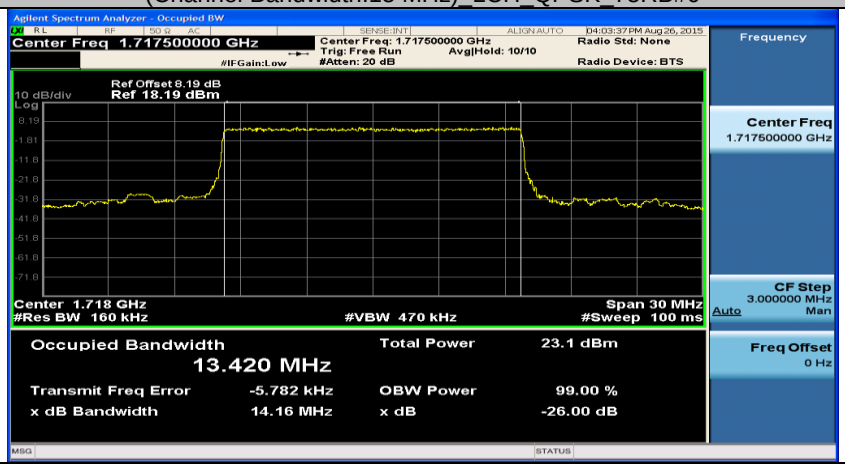
Channel Bandwidth: 10 MHz_LCH_16QAM_50RB#0


Channel Bandwidth: 10 MHz_MCH_16QAM_50RB#0


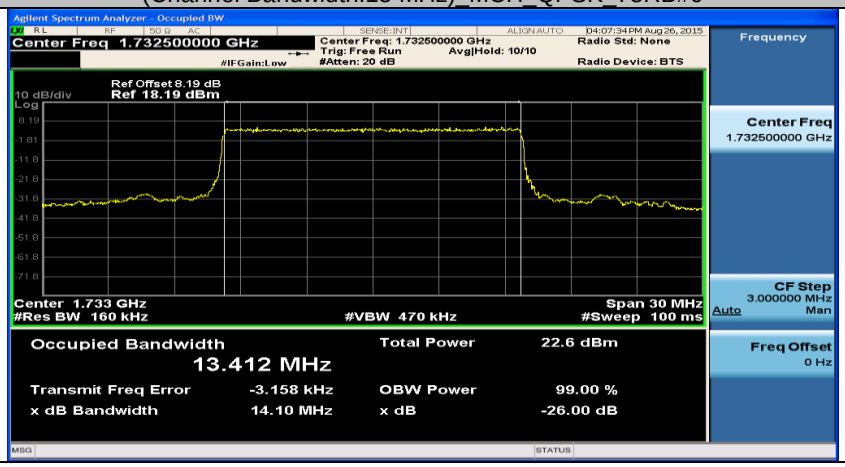
Channel Bandwidth: 10 MHz_HCH_16QAM_50RB#0


LTE Band 4
Channel Bandwidth: 15 MHz
Test Mode=QPSK/TM4

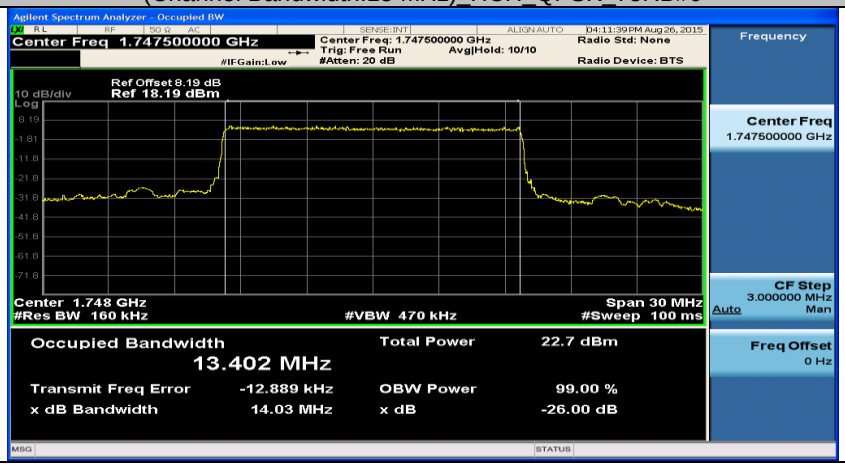
(Channel Bandwidth:15 MHz)_LCH_QPSK_75RB#0



(Channel Bandwidth:15 MHz)_MCH_QPSK_75RB#0

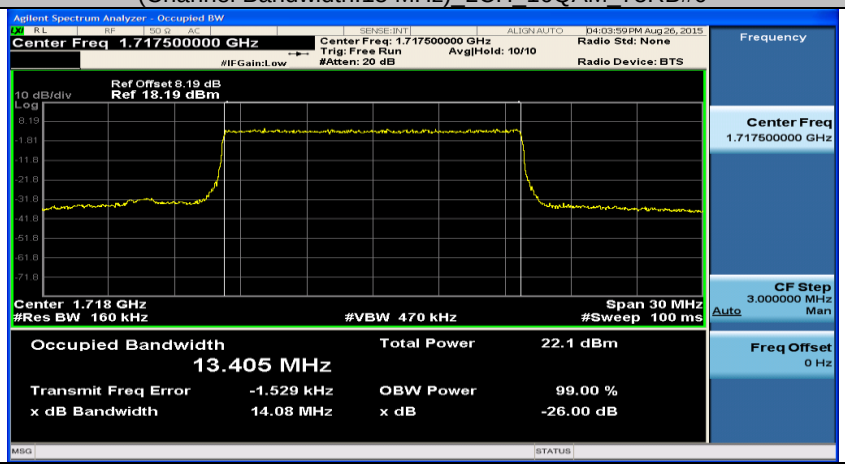


(Channel Bandwidth:15 MHz)_HCH_QPSK_75RB#0

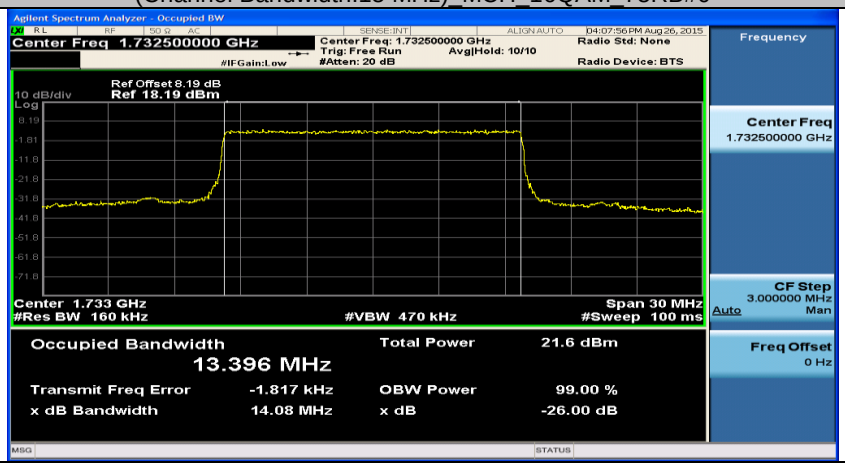


LTE Band 4
Channel Bandwidth: 15 MHz
Test Mode=16QAM/TM5

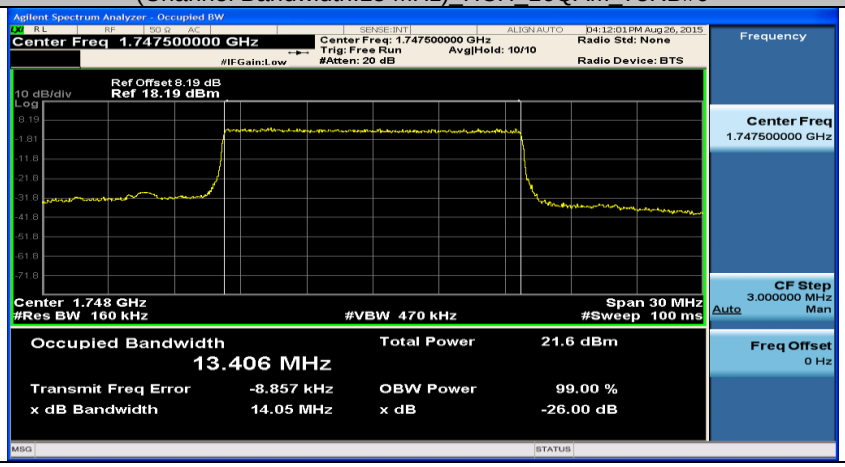
(Channel Bandwidth:15 MHz)_LCH_16QAM_75RB#0



(Channel Bandwidth:15 MHz)_MCH_16QAM_75RB#0

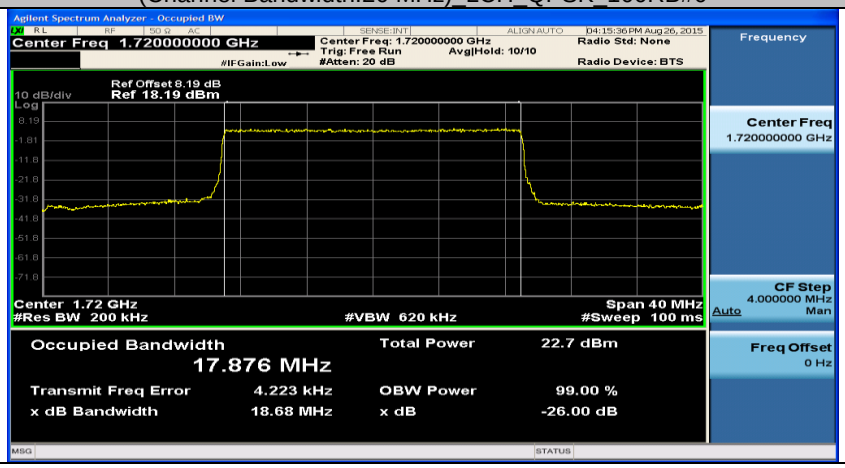


(Channel Bandwidth:15 MHz)_HCH_16QAM_75RB#0

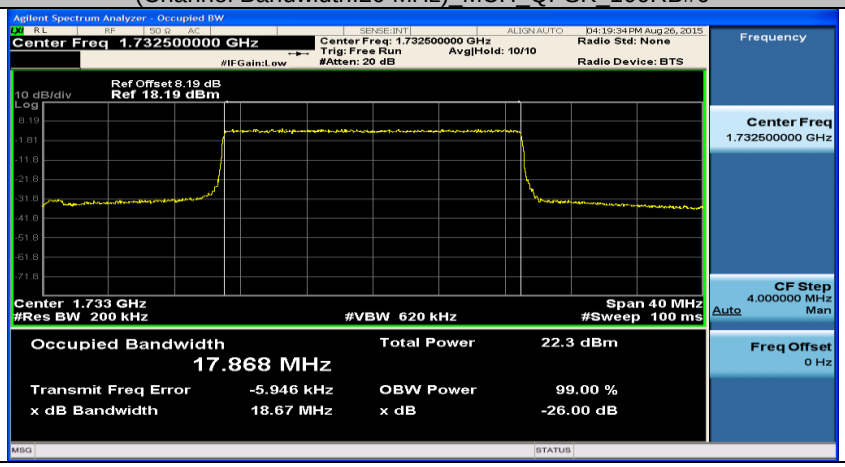


LTE Band 4
Channel Bandwidth: 20 MHz
Test Mode=QPSK/TM4

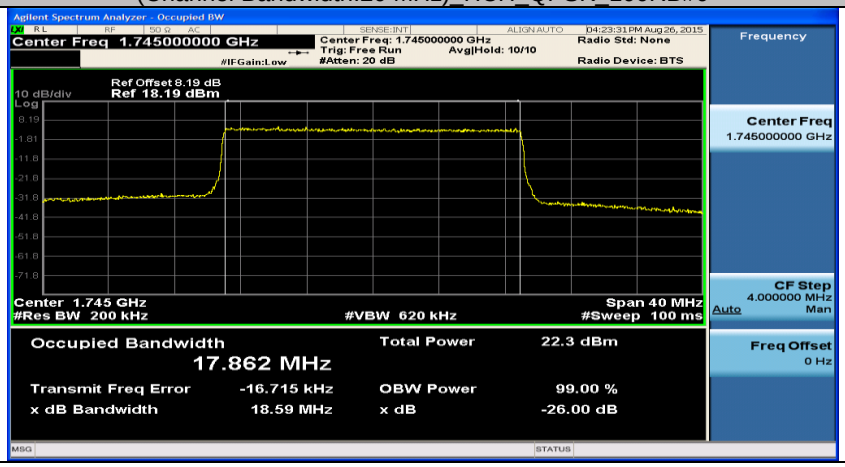
(Channel Bandwidth:20 MHz)_LCH_QPSK_100RB#0



(Channel Bandwidth:20 MHz)_MCH_QPSK_100RB#0

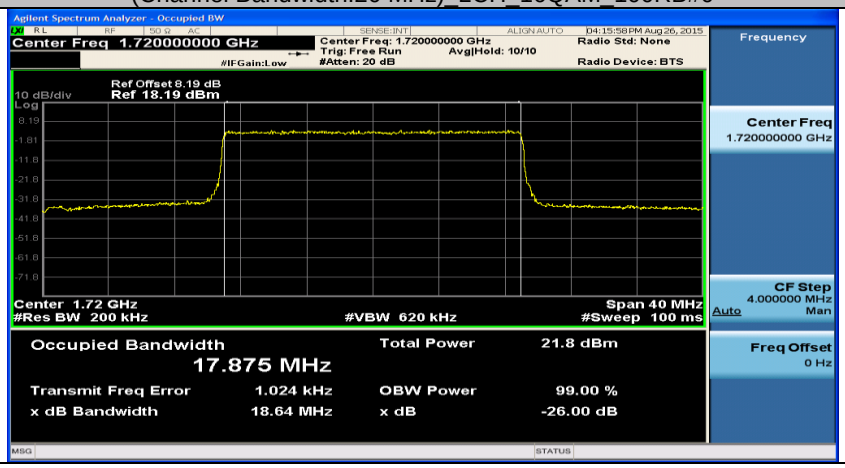


(Channel Bandwidth:20 MHz)_HCH_QPSK_100RB#0

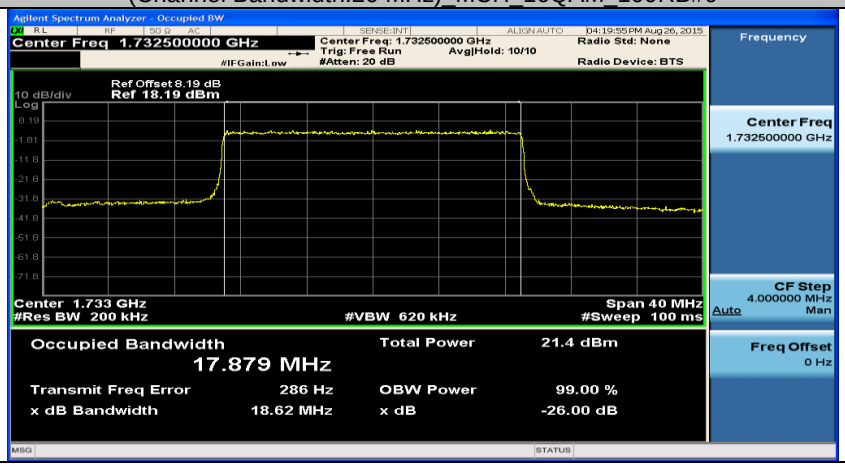


LTE Band 4
Channel Bandwidth: 20 MHz
Test Mode=16QAM/TM5

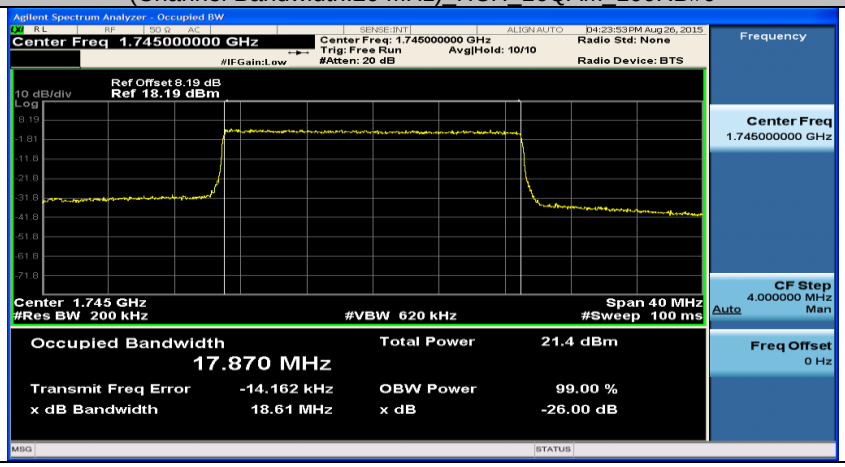
(Channel Bandwidth:20 MHz)_LCH_16QAM_100RB#0



(Channel Bandwidth:20 MHz)_MCH_16QAM_100RB#0

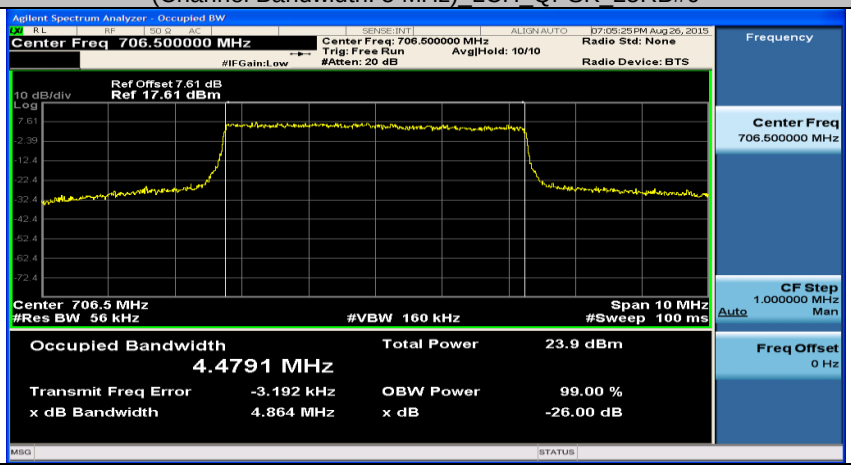


(Channel Bandwidth:20 MHz)_HCH_16QAM_100RB#0

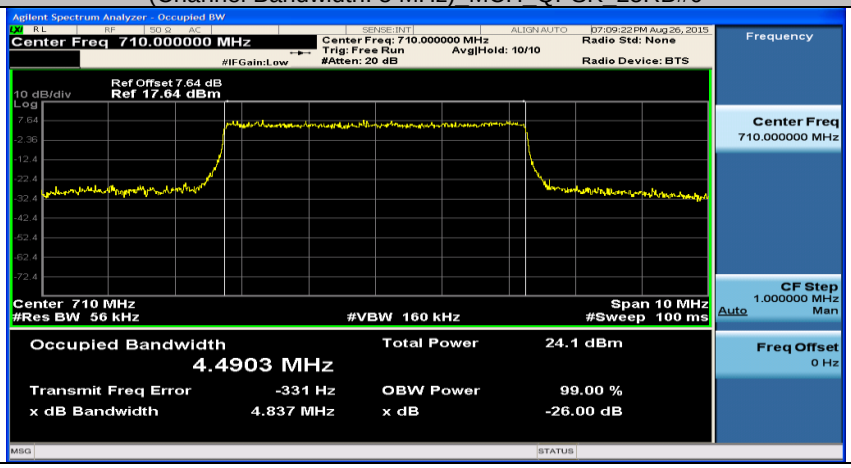


LTE Band 17
Channel Bandwidth: 5 MHz
Test Mode=QPSK/TM4

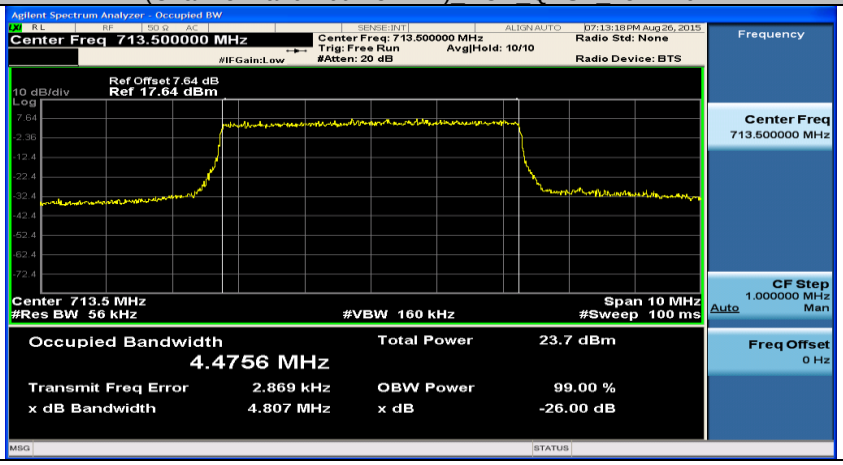
(Channel Bandwidth: 5 MHz)_LCH_QPSK_25RB#0



(Channel Bandwidth: 5 MHz)_MCH_QPSK_25RB#0

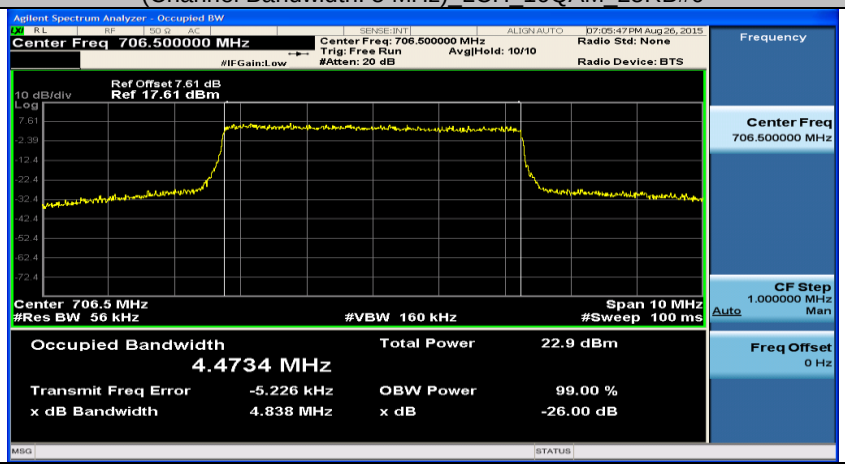


(Channel Bandwidth: 5 MHz)_HCH_QPSK_25RB#0

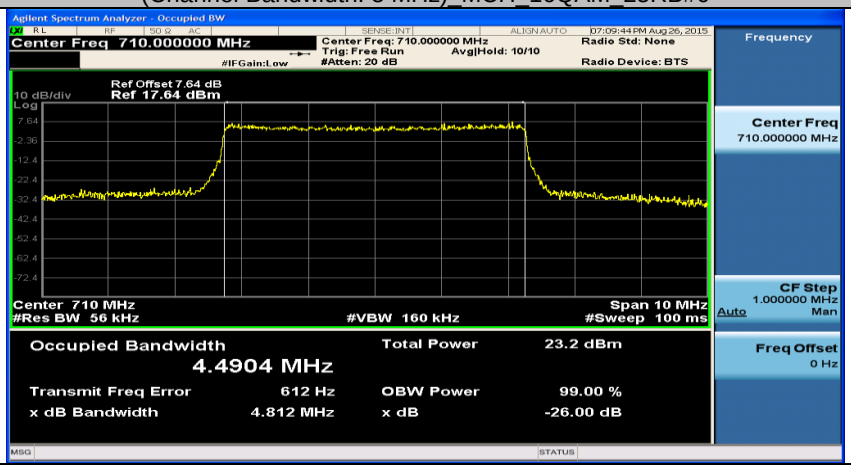


LTE Band 17
Channel Bandwidth: 5 MHz
Test Mode=16QAM/TM5

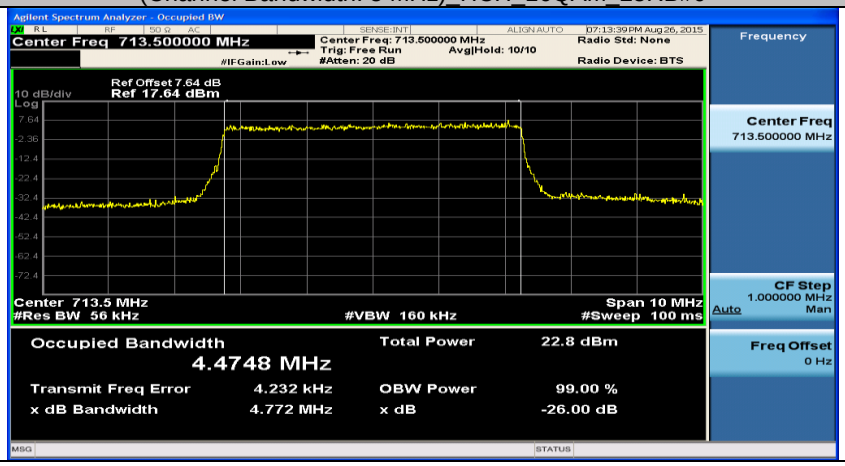
(Channel Bandwidth: 5 MHz)_LCH_16QAM_25RB#0



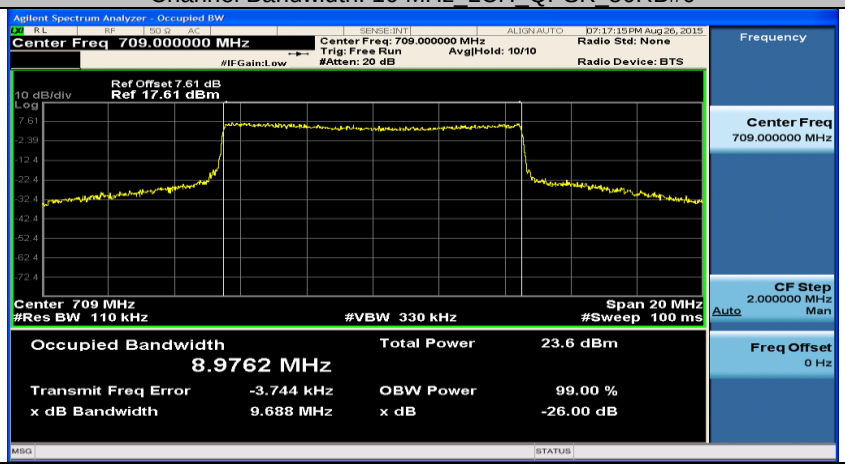
(Channel Bandwidth: 5 MHz)_MCH_16QAM_25RB#0

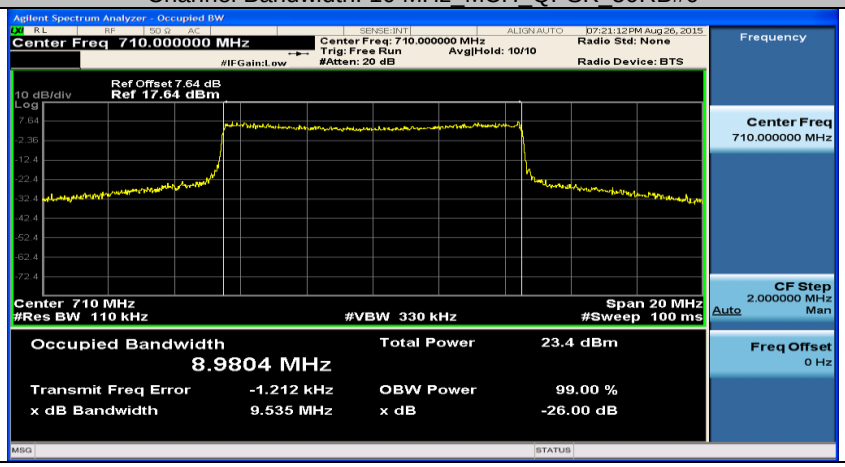


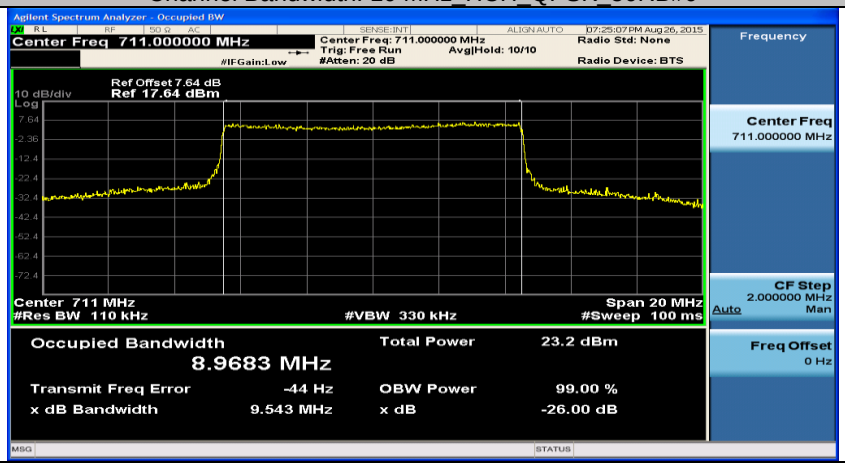
(Channel Bandwidth: 5 MHz)_HCH_16QAM_25RB#0



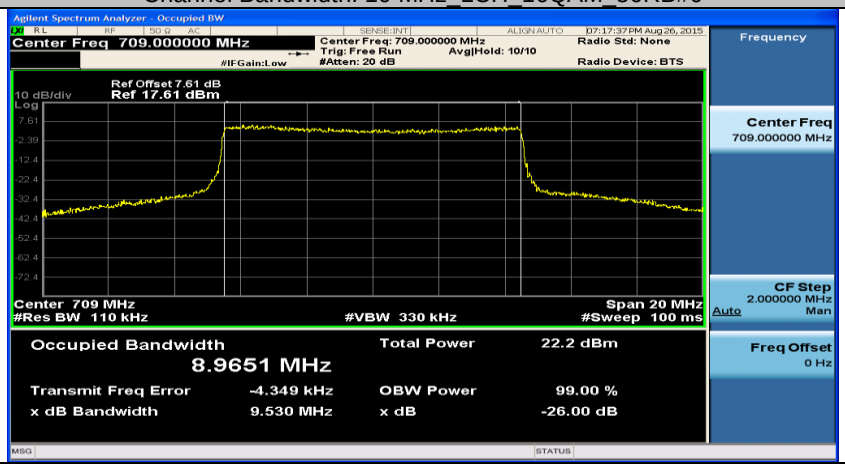
LTE Band 17
Channel Bandwidth: 10 MHz
Test Mode=QPSK/TM4

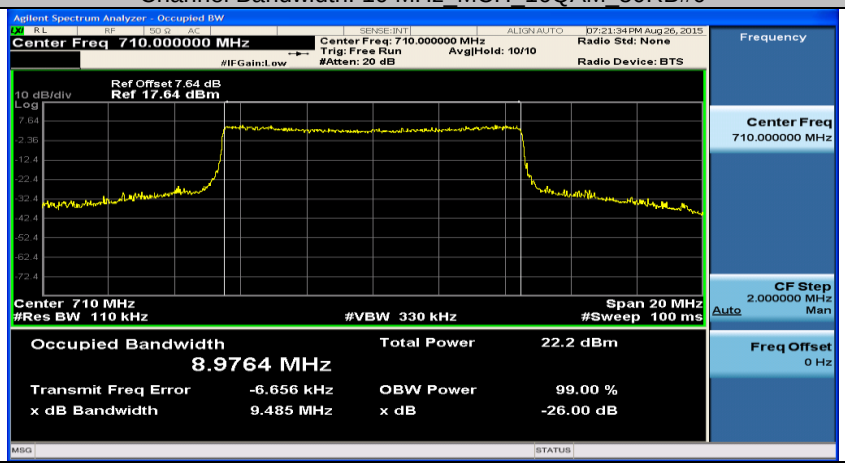
Channel Bandwidth: 10 MHz_LCH_QPSK_50RB#0


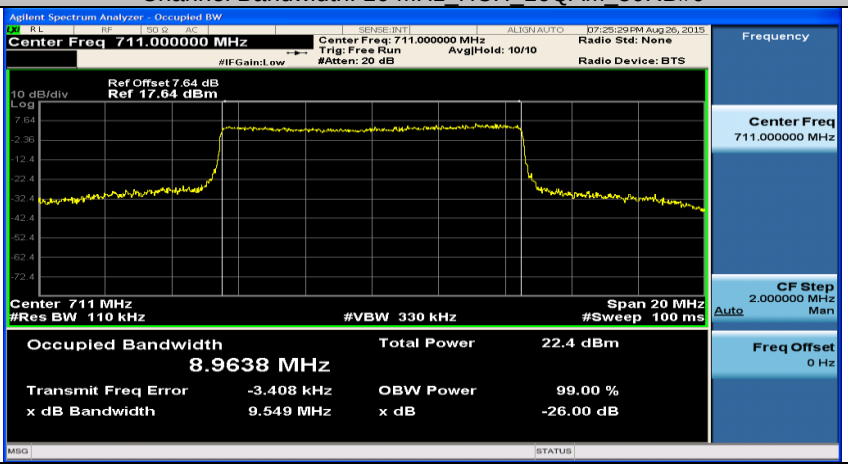
Channel Bandwidth: 10 MHz_MCH_QPSK_50RB#0


Channel Bandwidth: 10 MHz_HCH_QPSK_50RB#0


LTE Band 17
Channel Bandwidth: 10 MHz
Test Mode=16QAM/TM5

Channel Bandwidth: 10 MHz_LCH_16QAM_50RB#0


Channel Bandwidth: 10 MHz_MCH_16QAM_50RB#0


Channel Bandwidth: 10 MHz_HCH_16QAM_50RB#0


4.4. Spurious Emission at Antenna Terminal

4.4.1. Test Standard

FCC: CFR Part 2.1051, CFR Part 22.917, CFR Part 24.238, CFR Part 27.53

4.4.2. Test Limit

The radio frequency voltage or power generated within the equipment and appearing on a
spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in FCC 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.
(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. For all power levels +30dBm to 0dBm, this becomes a constant specification of -13dBm.

FCC 22.917 Emission limitations for cellular equipment.
The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC 24.238 Emission limitations for Broadband PCS equipment.
The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC: §27.53

(m)(4) For mobile digital stations, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge and 55 + 10 log (P) dB at 5.5 megahertz from the channel edges.(Channel edges are defined under §27.5 (i) Frequency assignment for the BRS/EBS band)

(m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However,in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.4.3.Test Procedure

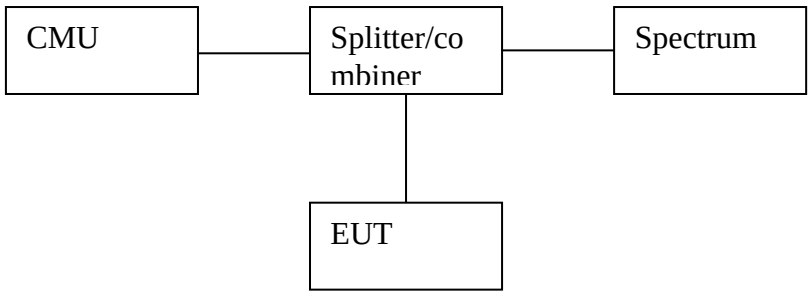
1. Connect the equipment as shown in the above diagram.
2. Set the spectrum analyzer to measure peak hold with the required settings.
3. Set the signal generator to a known output power and record the path loss in dB (LOSS) for frequencies up to the tenth harmonic of the EUT's carrier frequency.

LOSS = Generator Output Power (dBm) – Analyzer reading (dBm).

4. Replace the signal generator with the EUT.
5. Adjust the settings of the Universal Radio Communication Tester (CMU) to set the EUT to its maximum power at the required channel.
6. Set the spectrum analyzer to measure peak hold with the required settings. Offset the spectrum analyzer reference level by the path loss measured above.
7. Measure and record all spurious emissions up to the tenth harmonic of the carrier frequency.
8. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
9. If necessary steps 6 and 7 may be performed with the spectrum analyzer set to average detector.

(Note: Step 3 above is performed prior to testing and LOSS is recorded by test software. Steps 2, 6, and 7 above are performed with test software.)

4.4.4.Test Setup



4.4.5.Test Data

Out of band measurement
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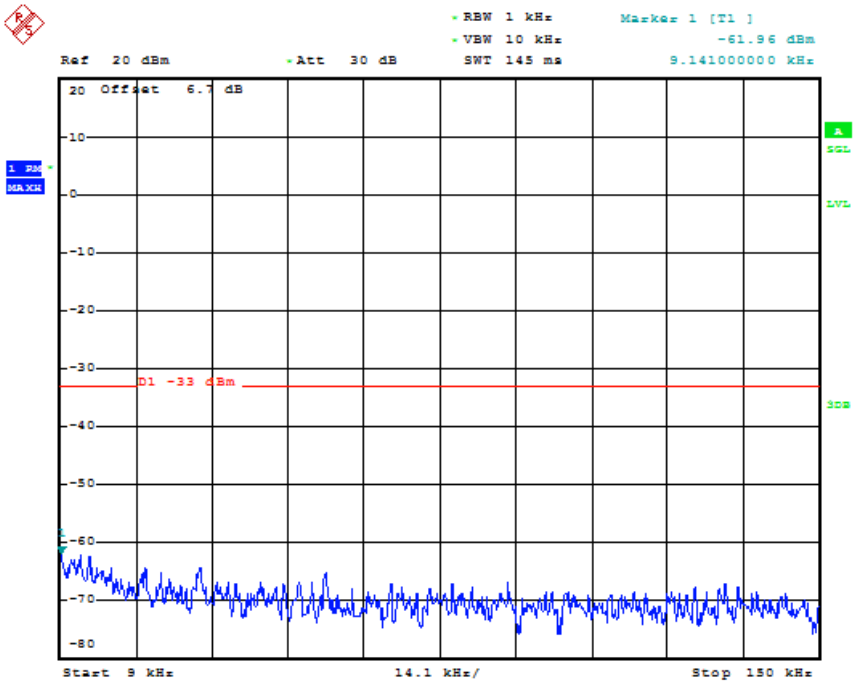
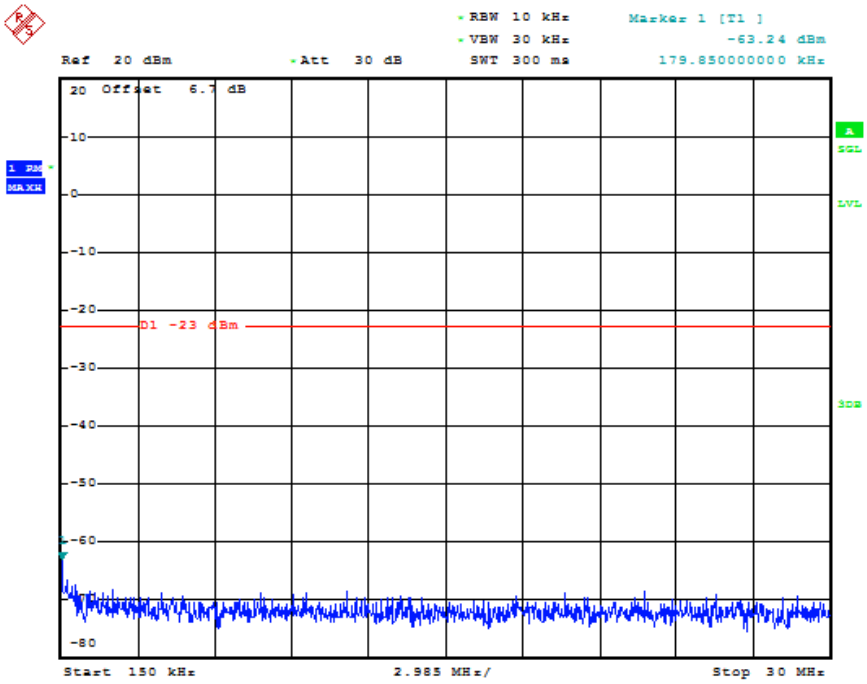
Test Mode = GSM /TM1
Test Channel = LCH



Date: 6.SEP.2015 09:13:43



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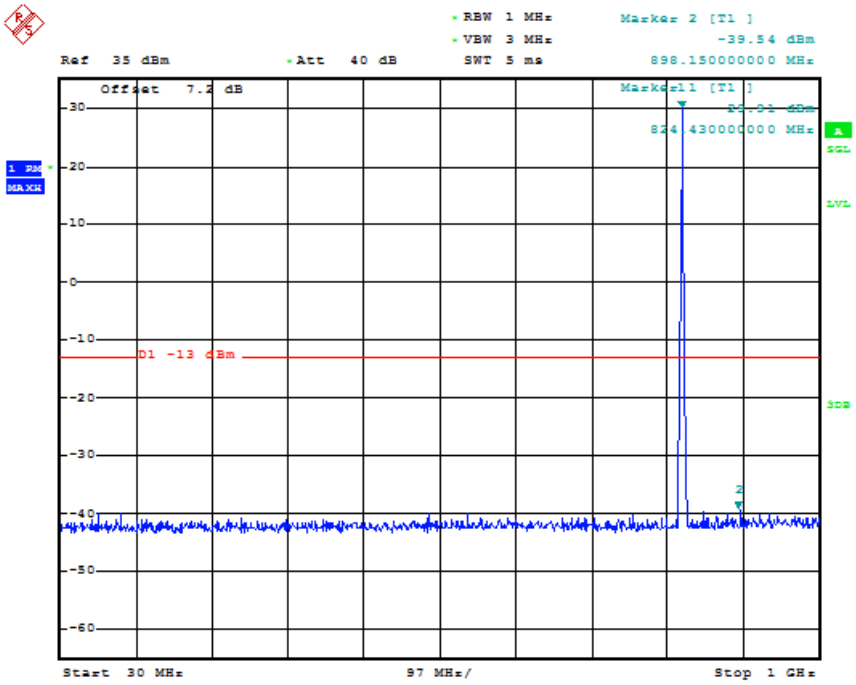
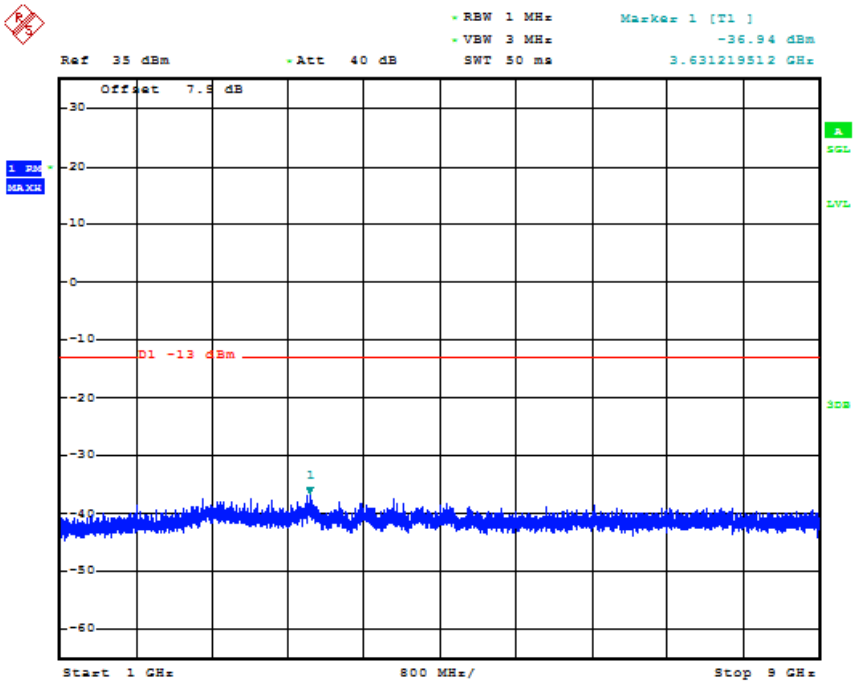
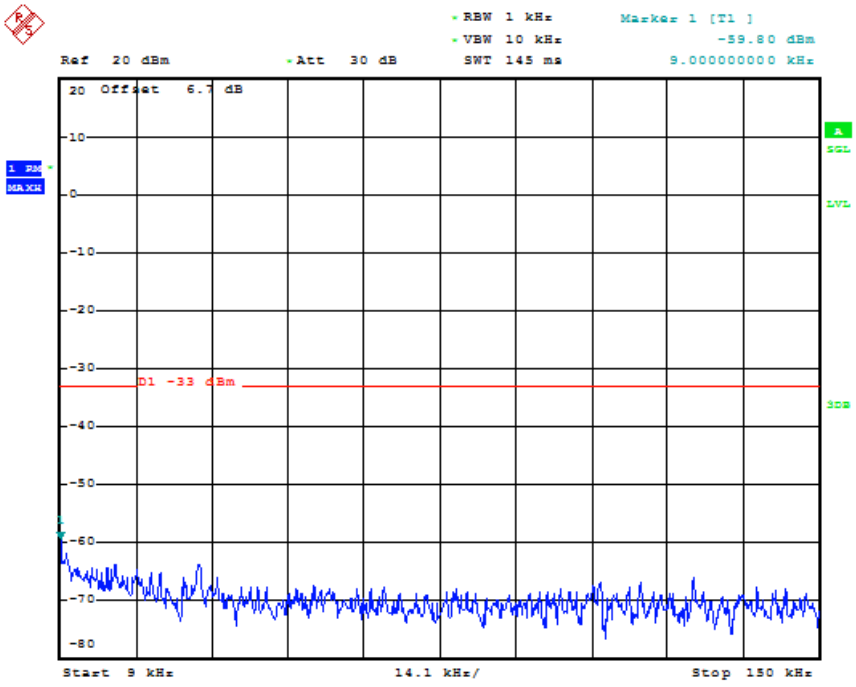


Date: 6.SEP.2015 09:14:03



Date: 6.SEP.2015 09:14:13

Out of band measurement
Test Band = GSM850
Test Mode = GSM /TM1
Test Channel = MCH



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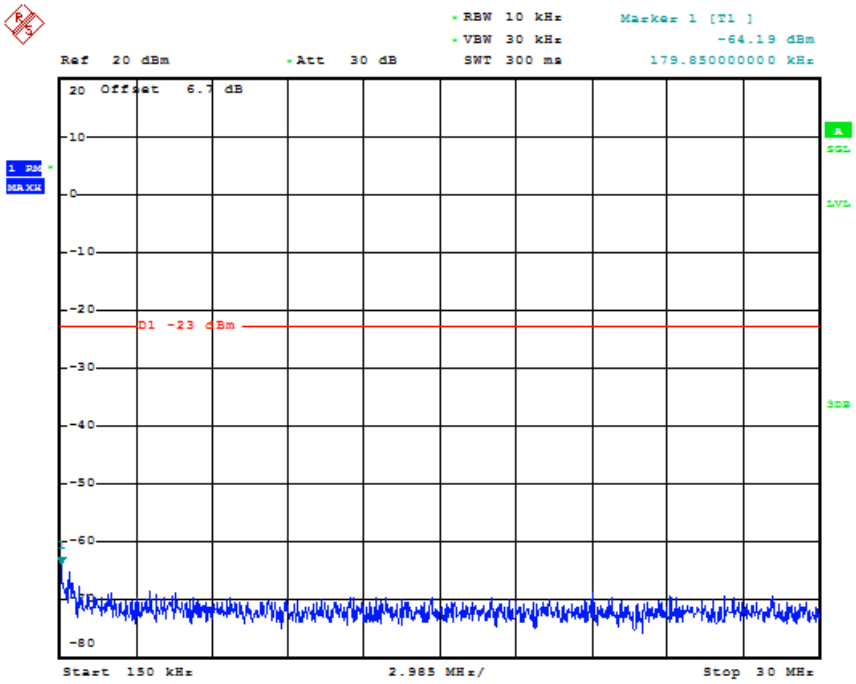

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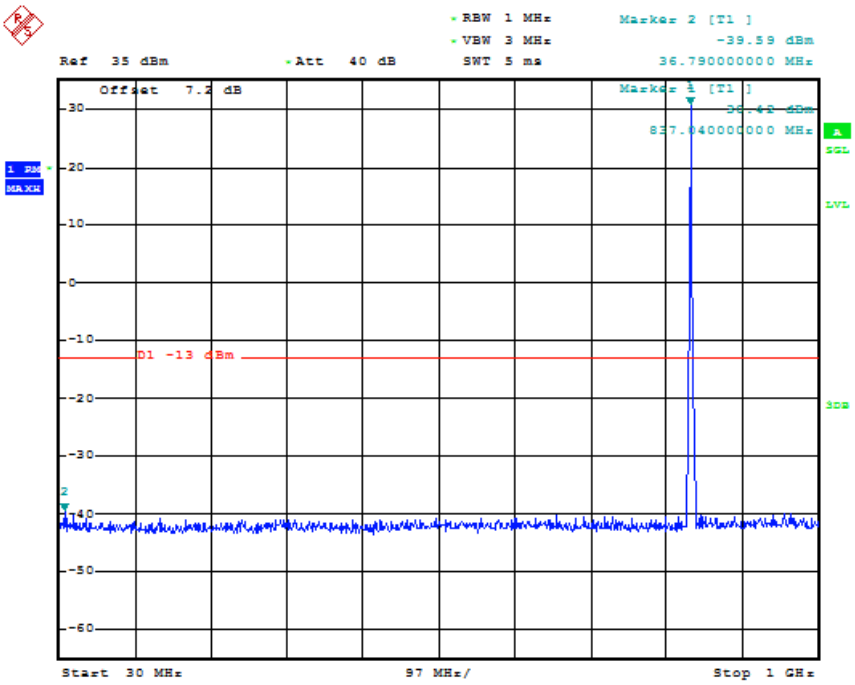

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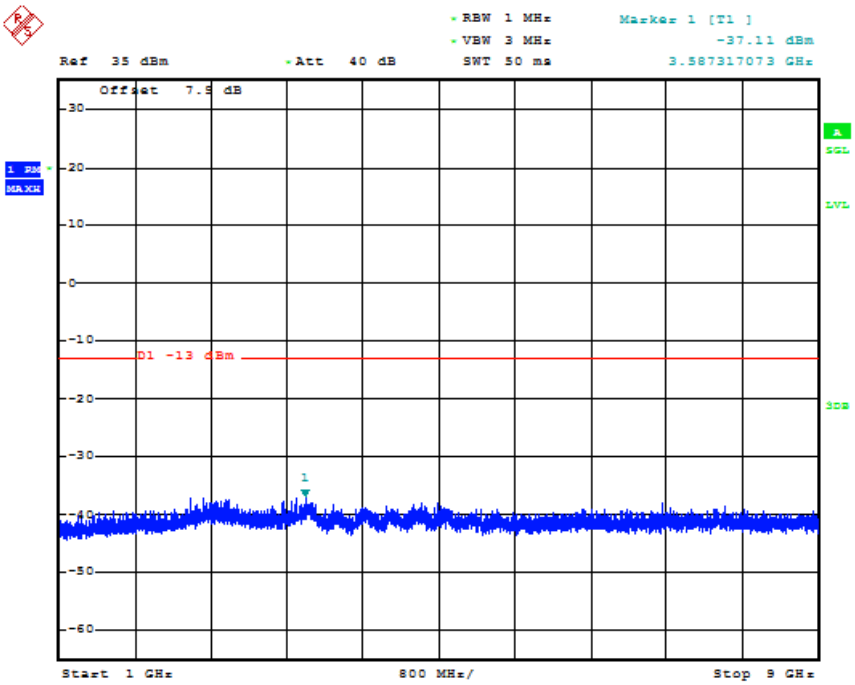

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Out of band measurement
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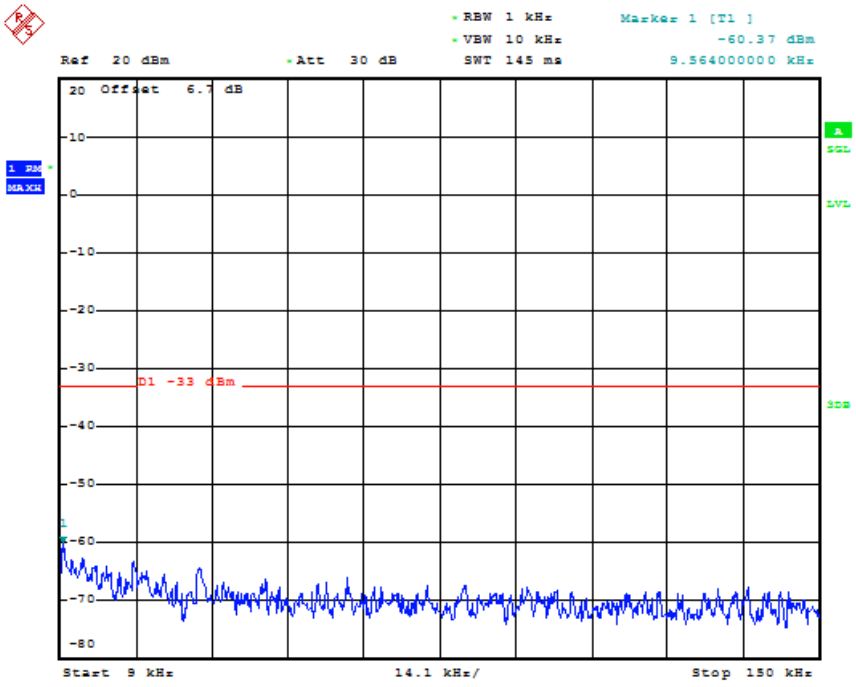
Test Mode = GSM /TM1
Test Channel = HCH



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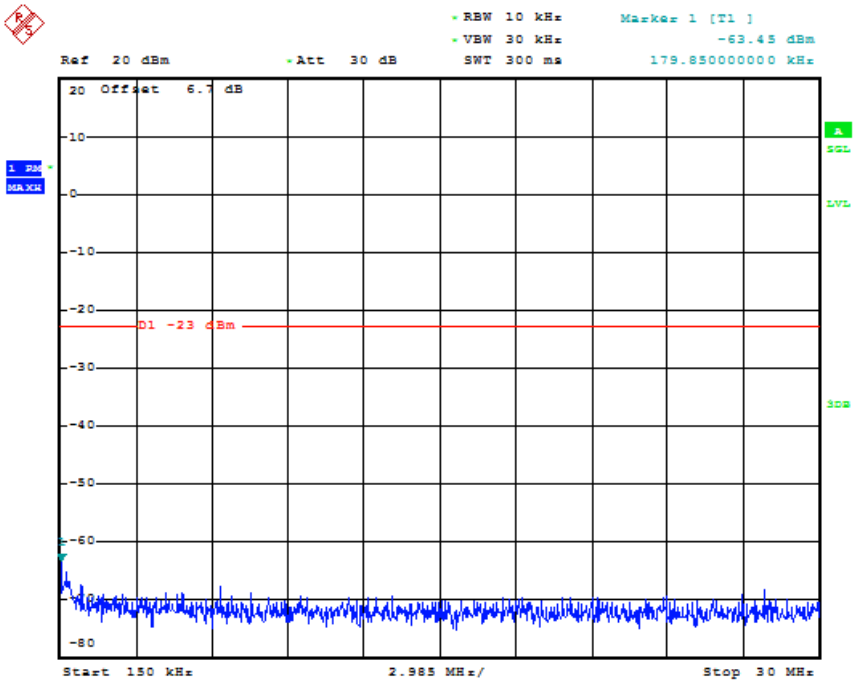

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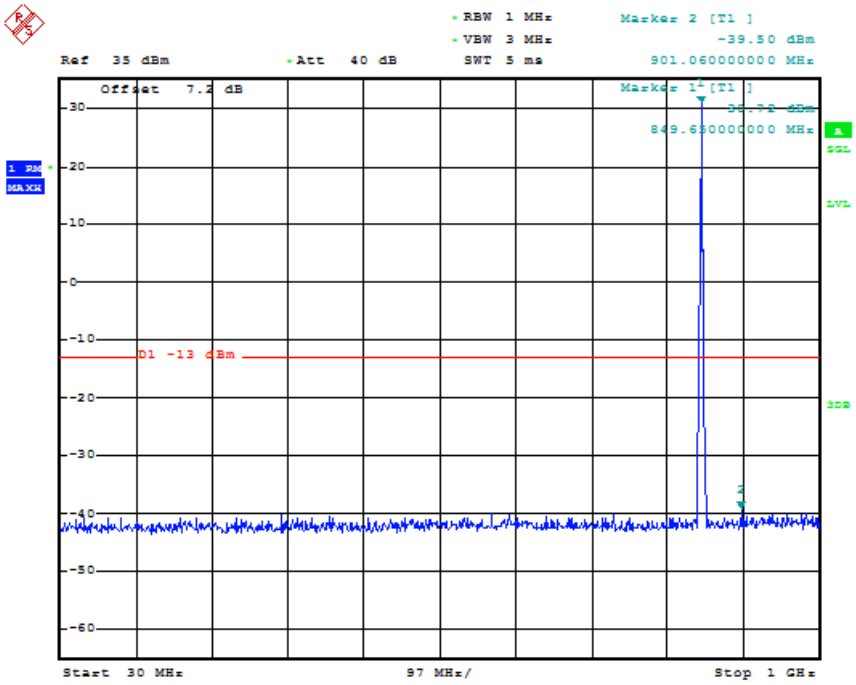

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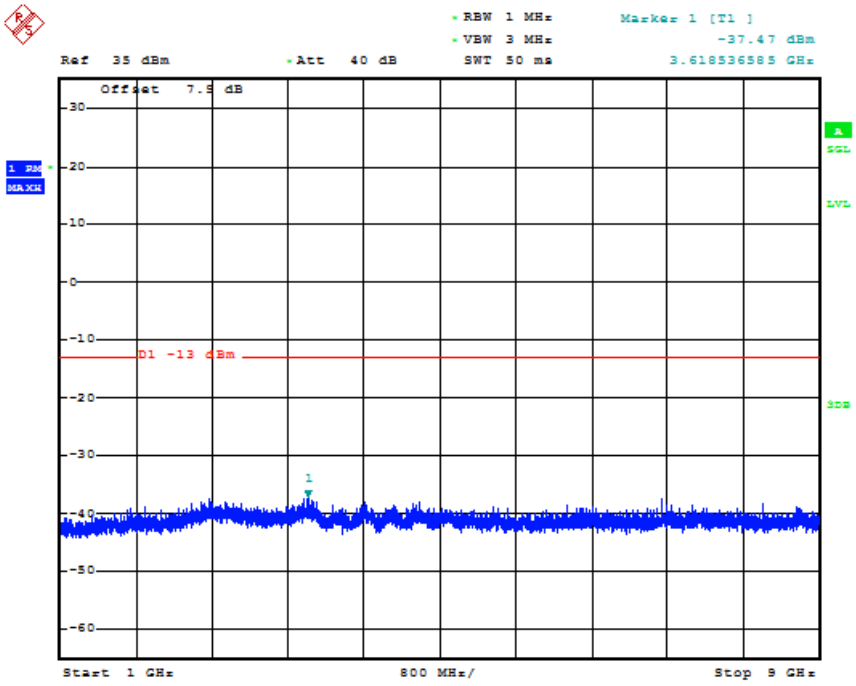

Date: 6.SEP.2015 09:15:47

Out of band measurement
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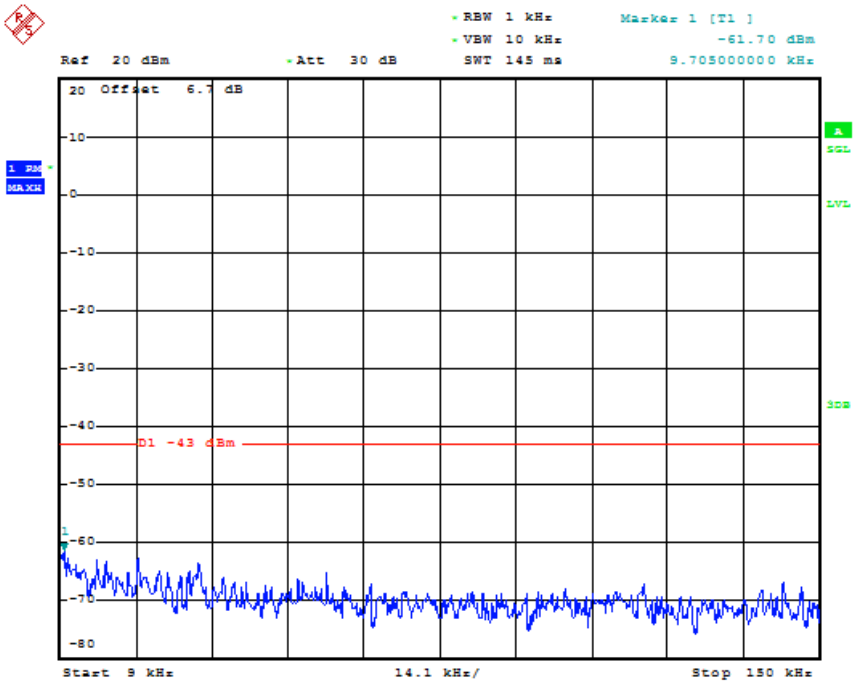
Test Mode = EDGE /TM2
Test Channel = LCH



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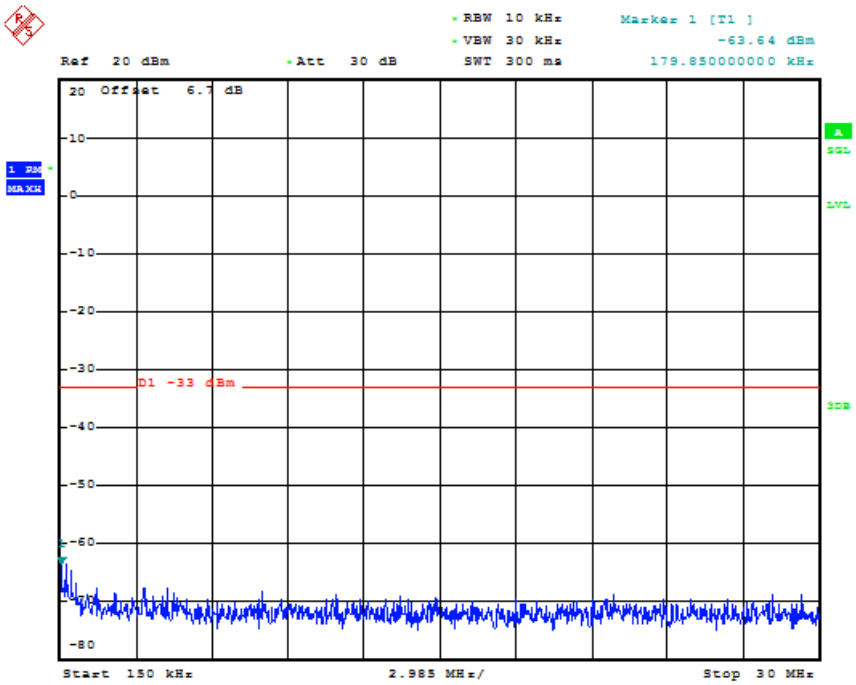

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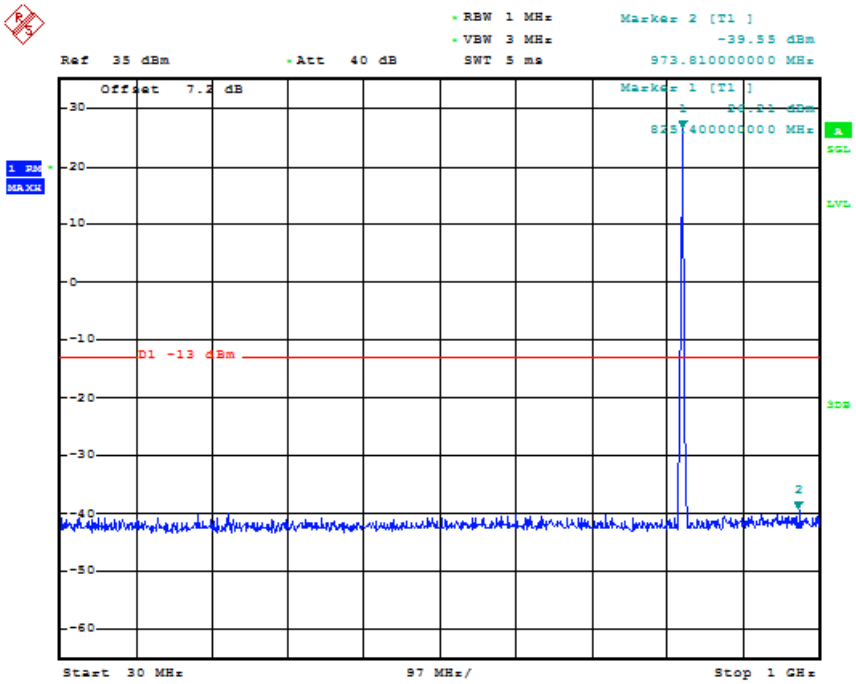

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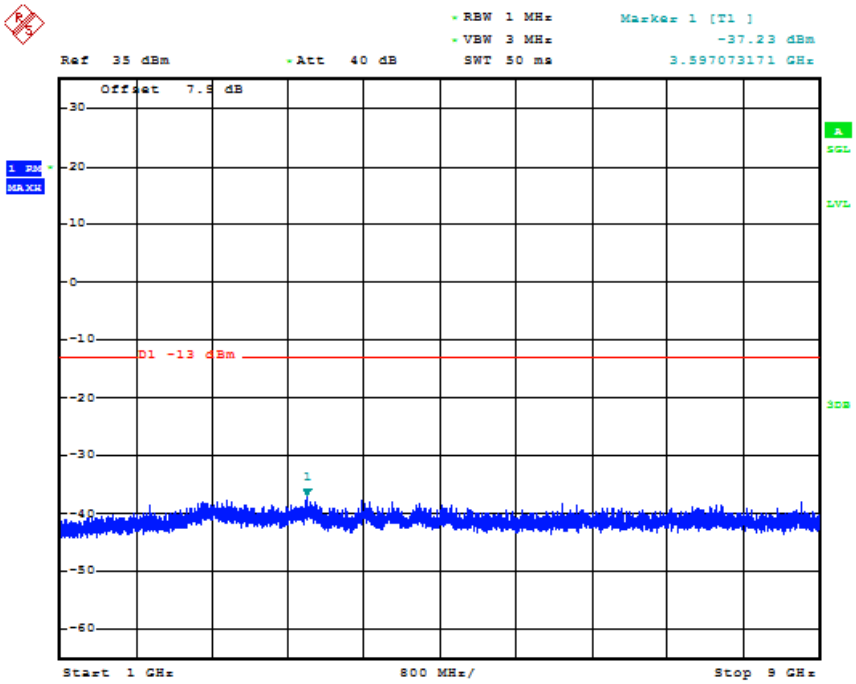

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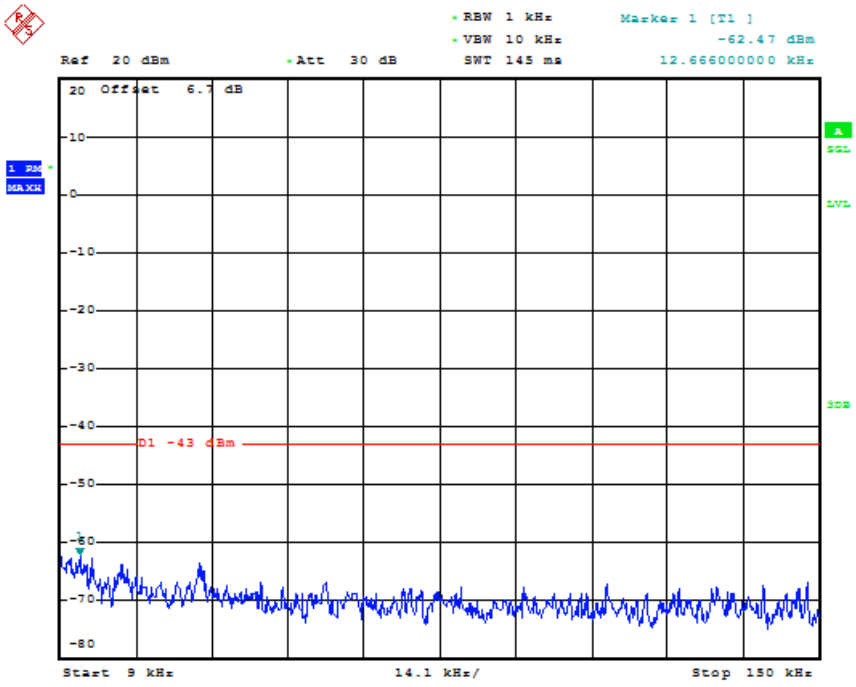
Out of band measurement
Test Band = GSM850
Test Mode = EDGE /TM2
Test Channel = MCH



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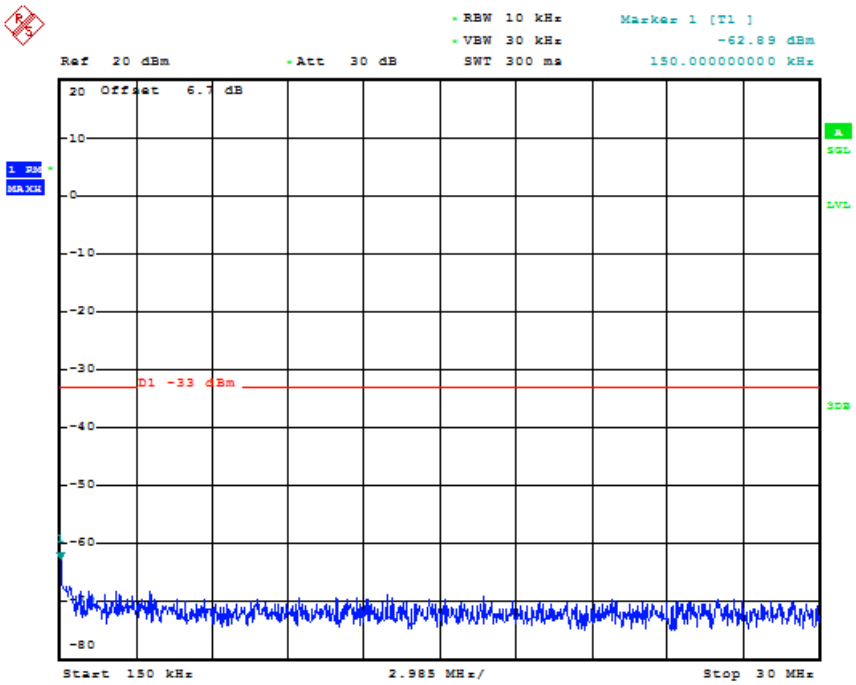

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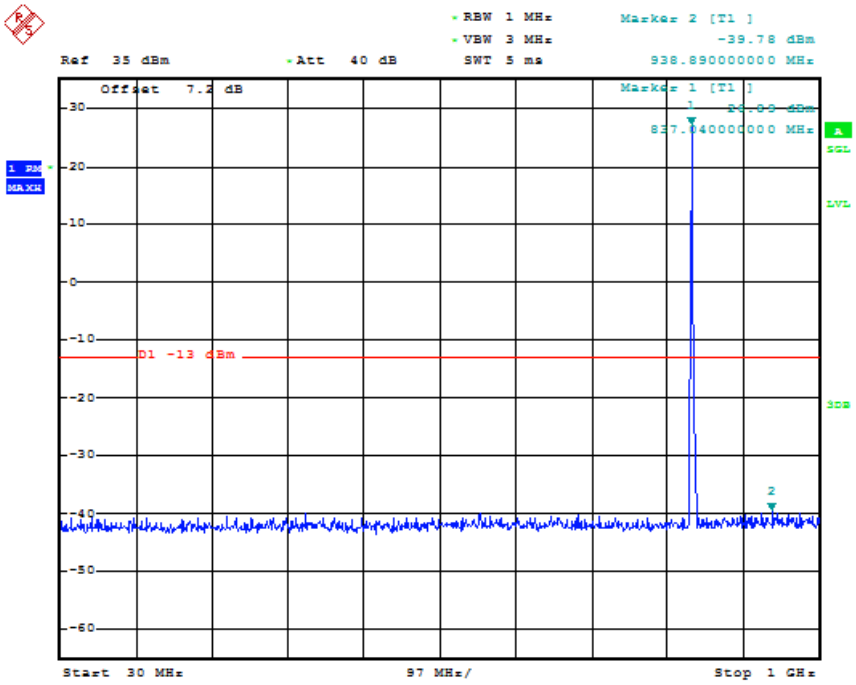

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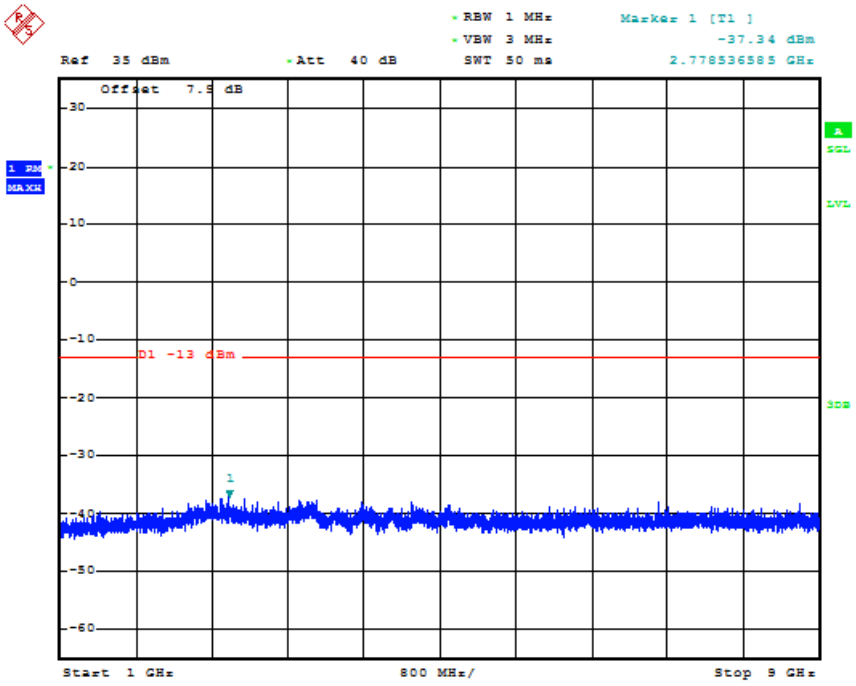
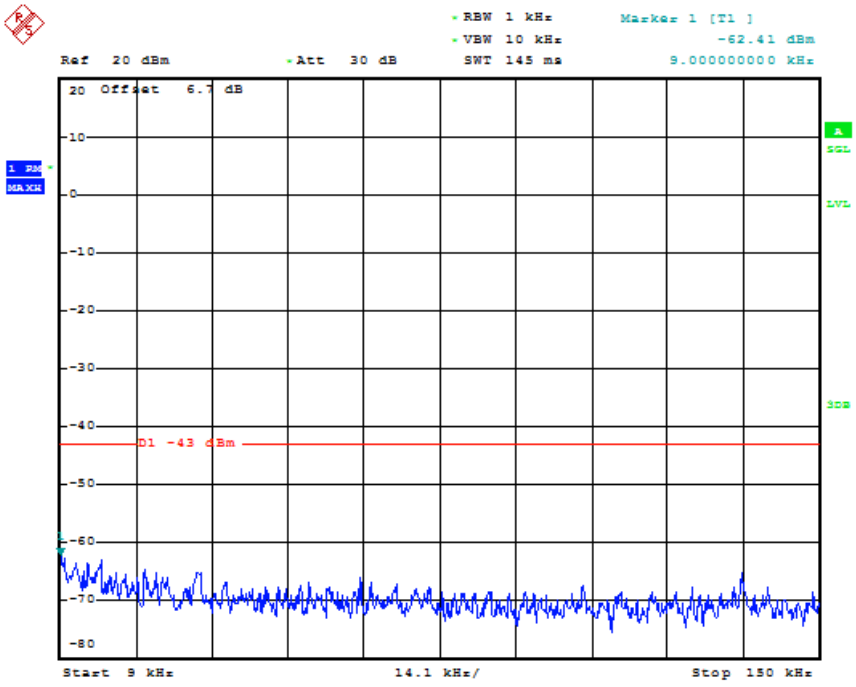


Date: 6.SEP.2015 09:17:55

Out of band measurement
Test Band = GSM850
Test Mode = EDGE /TM2
Test Channel = HCH



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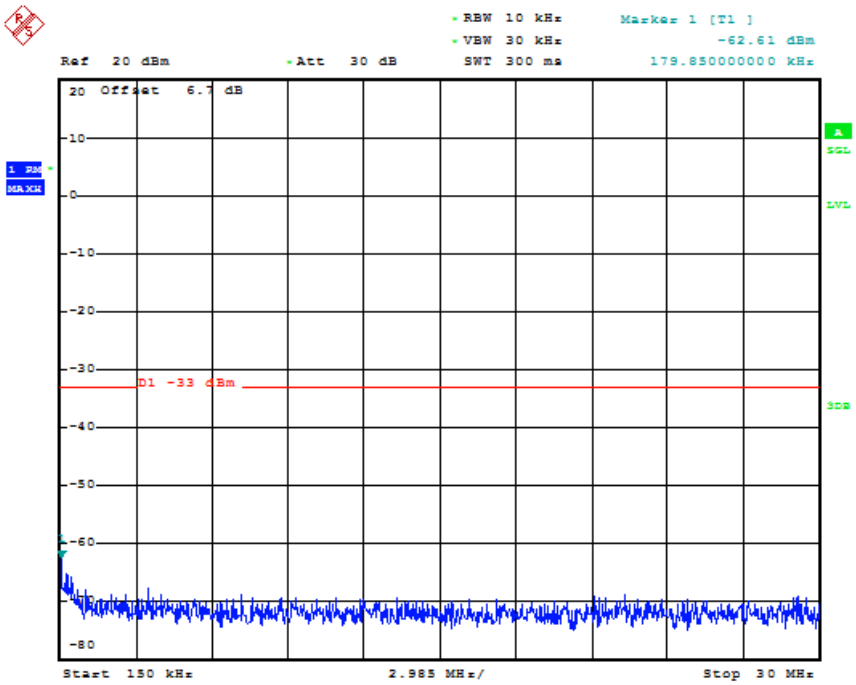

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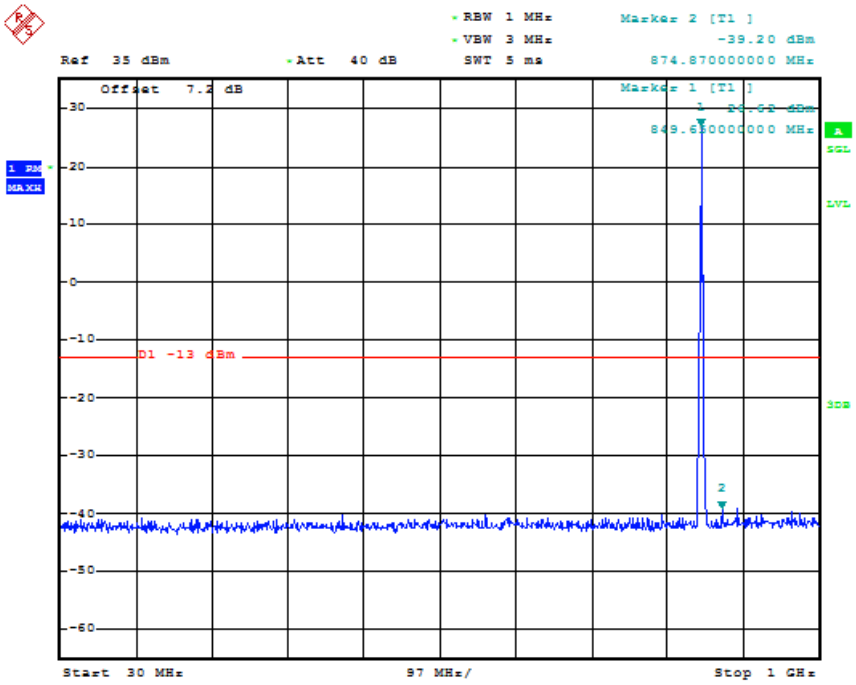

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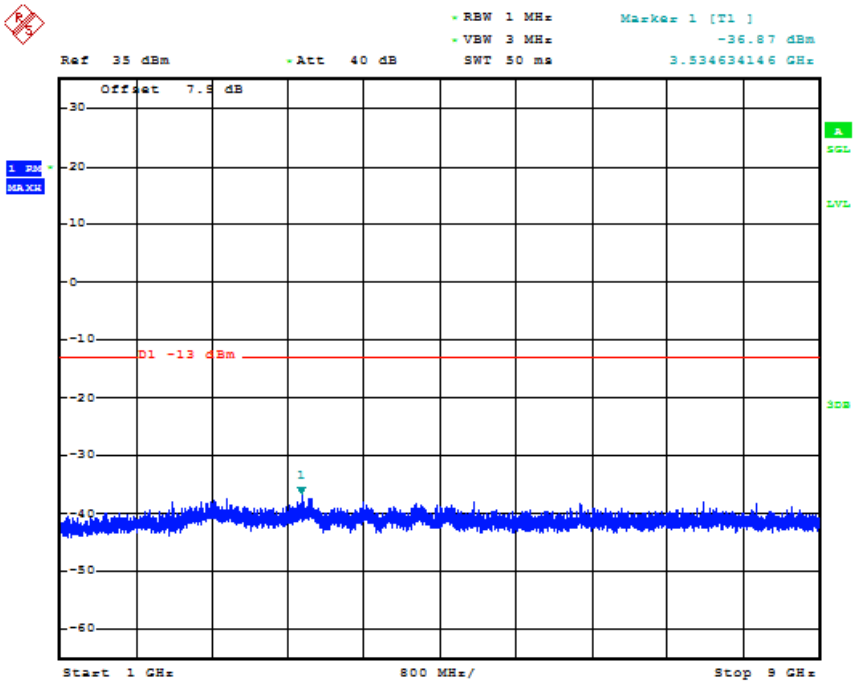
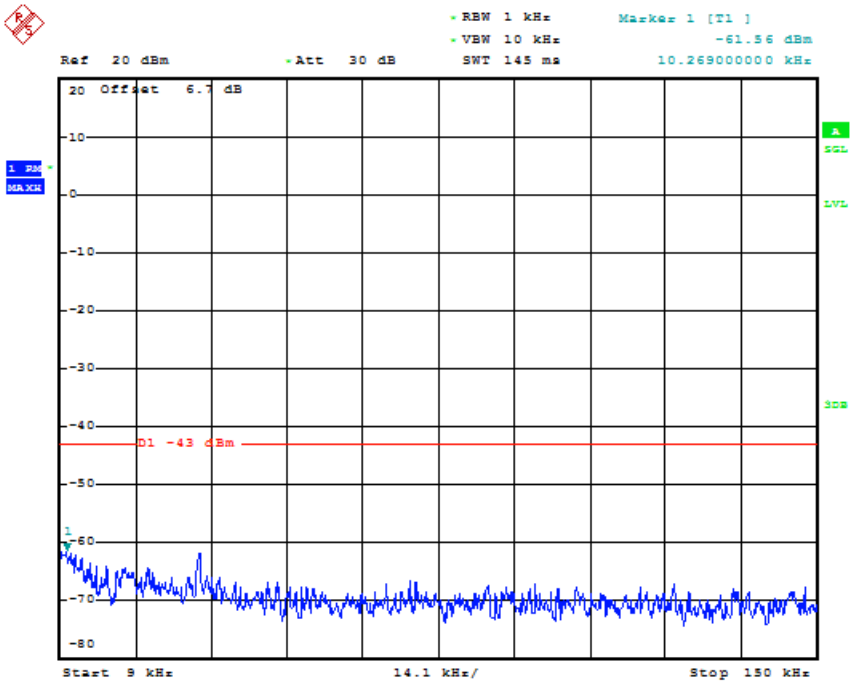


Date: 6.SEP.2015 09:18:41

Out of band measurement
Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = LCH



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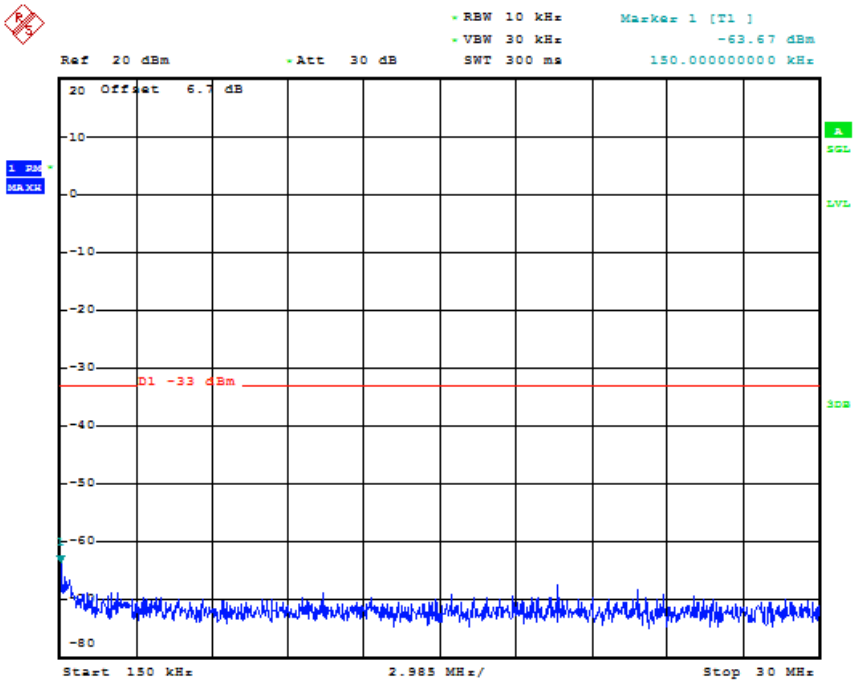

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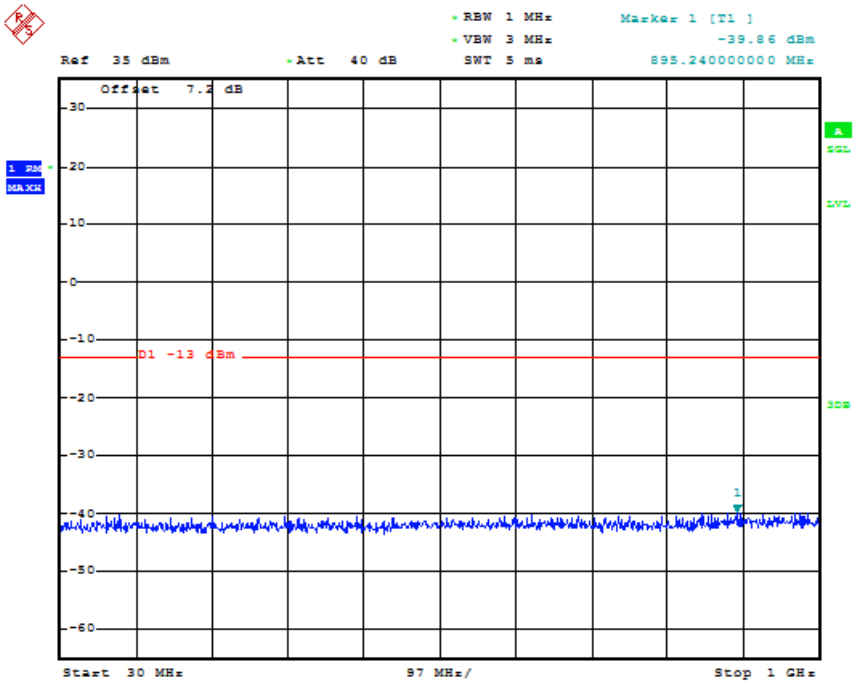

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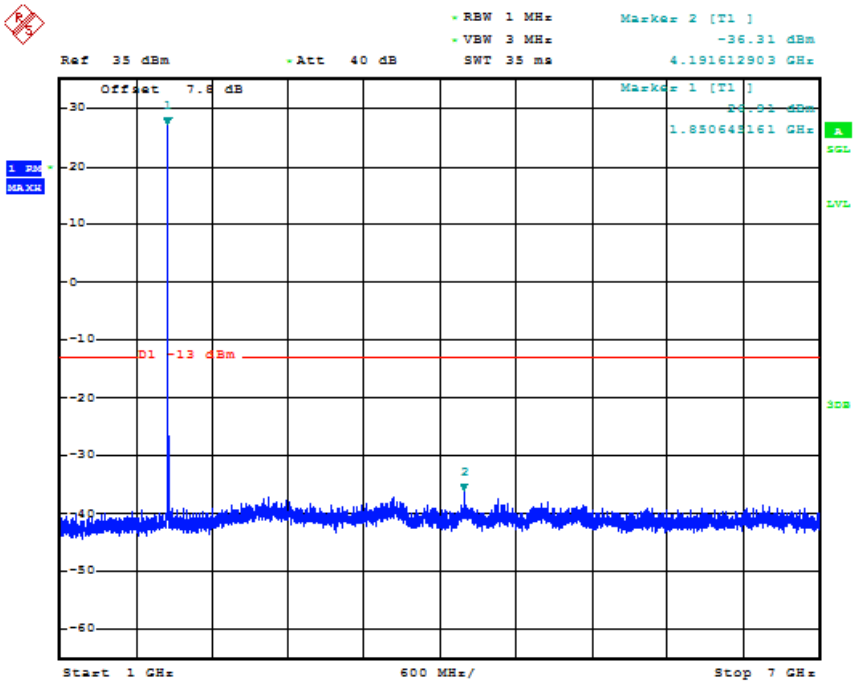
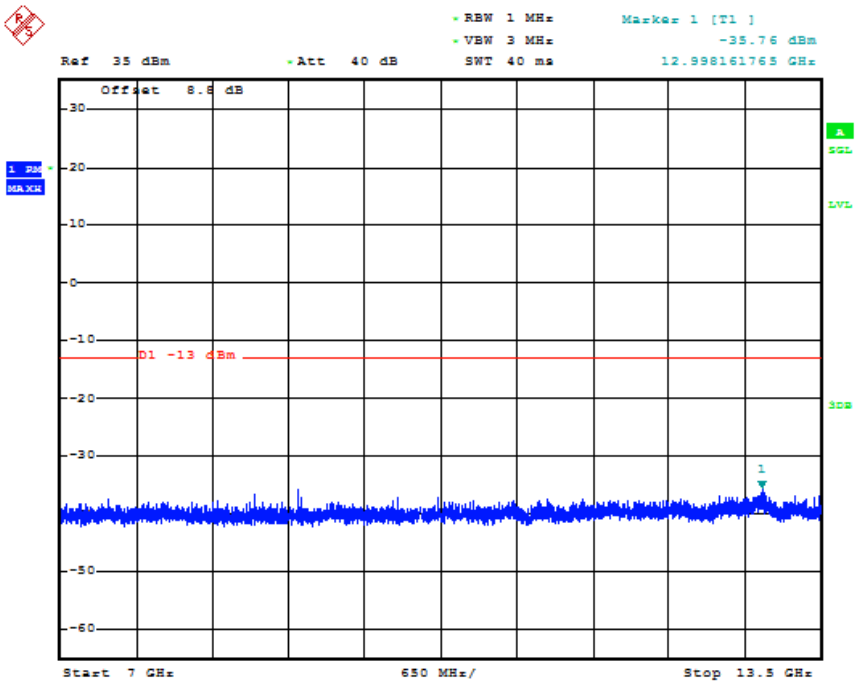
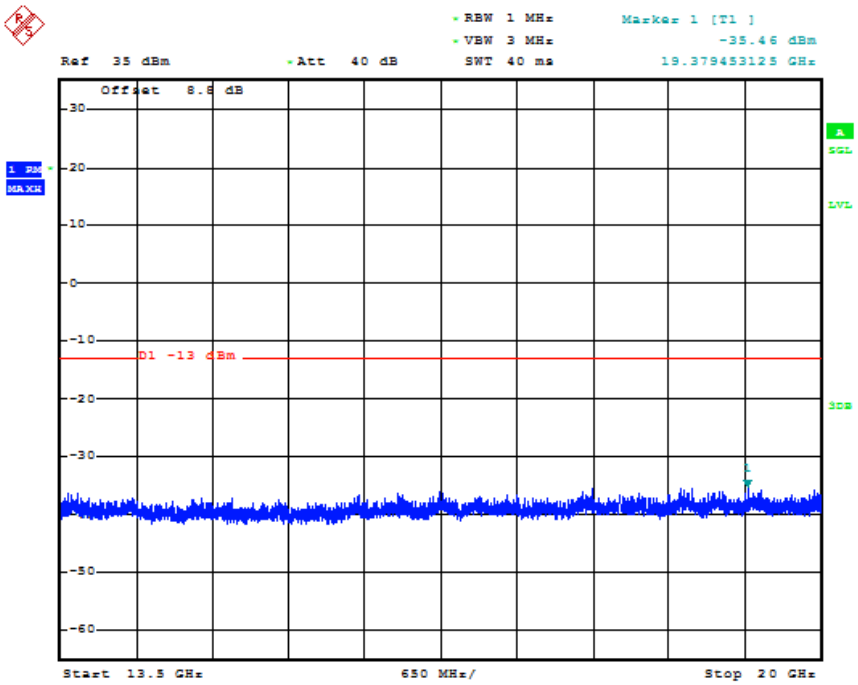


Date: 6.SEP.2015 09:21:44

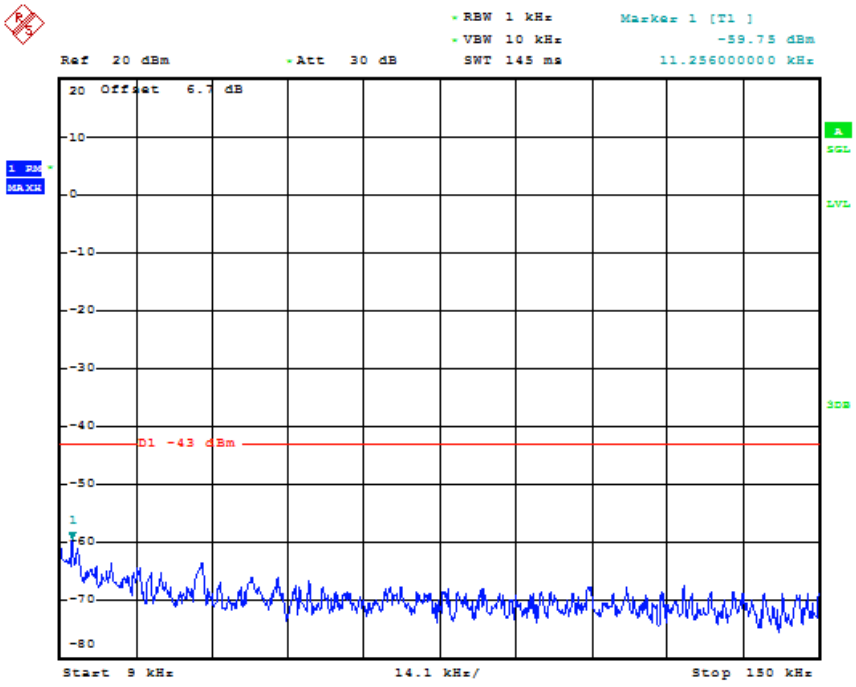


Date: 6.SEP.2015 09:21:54

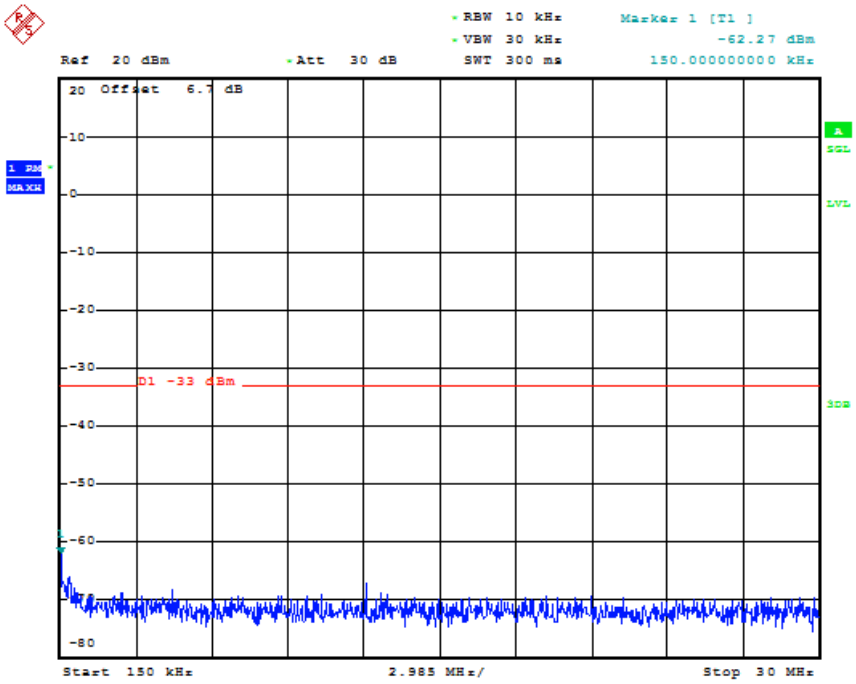


Date: 6.SEP.2015 09:22:04

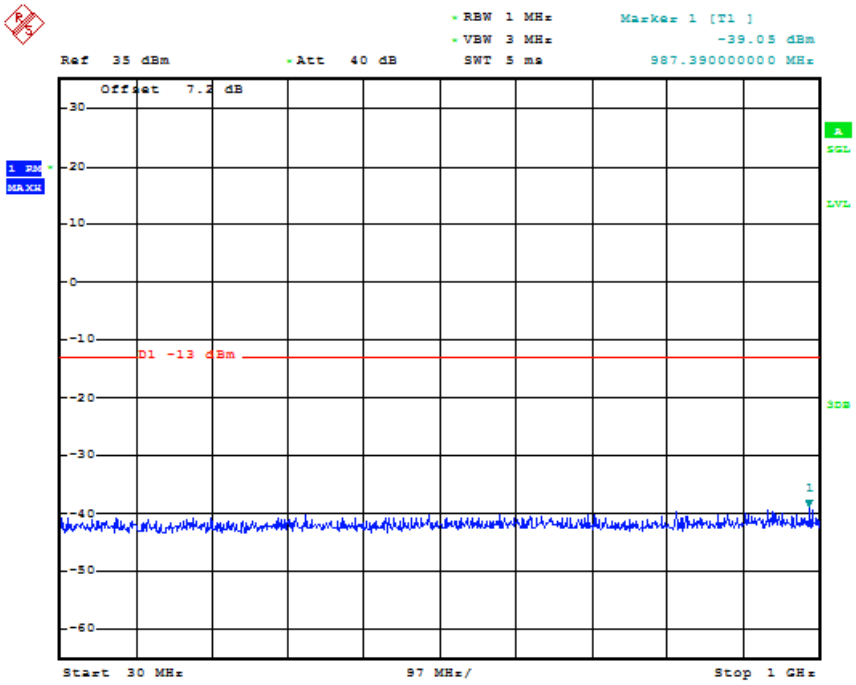
Out of band measurement
Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = MCH



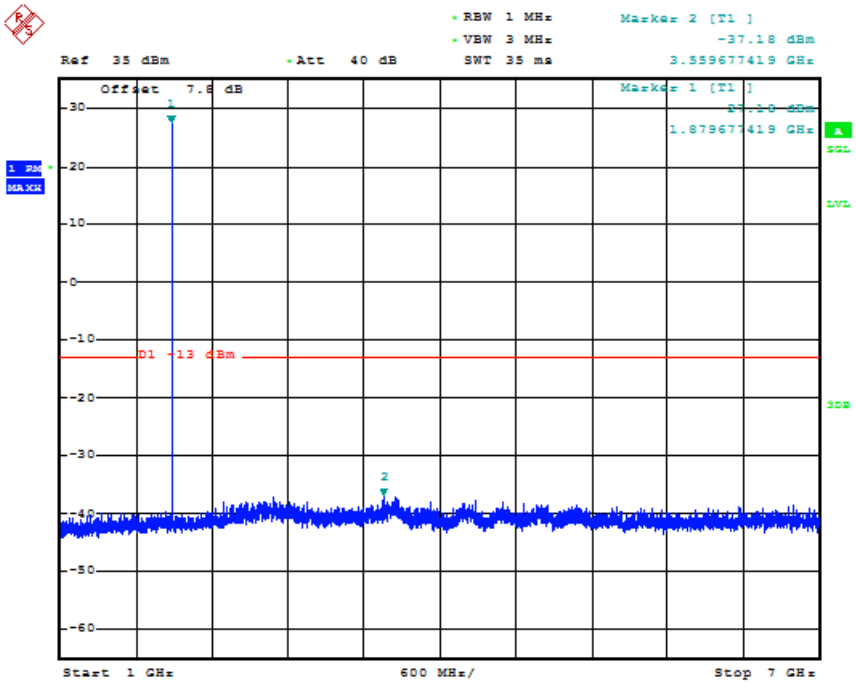
Date: 6.SEP.2015 09:22:21



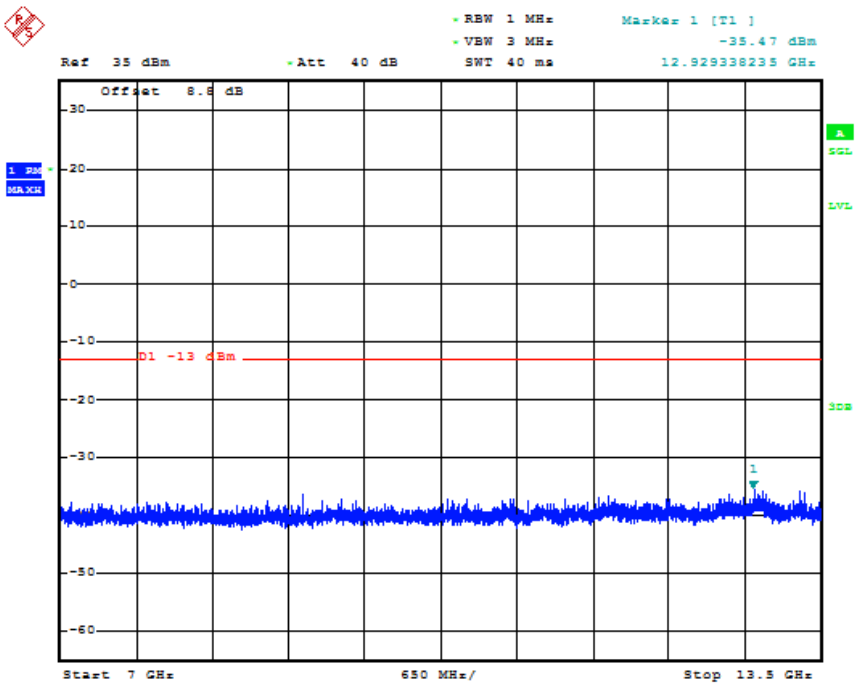
Date: 6.SEP.2015 09:22:30



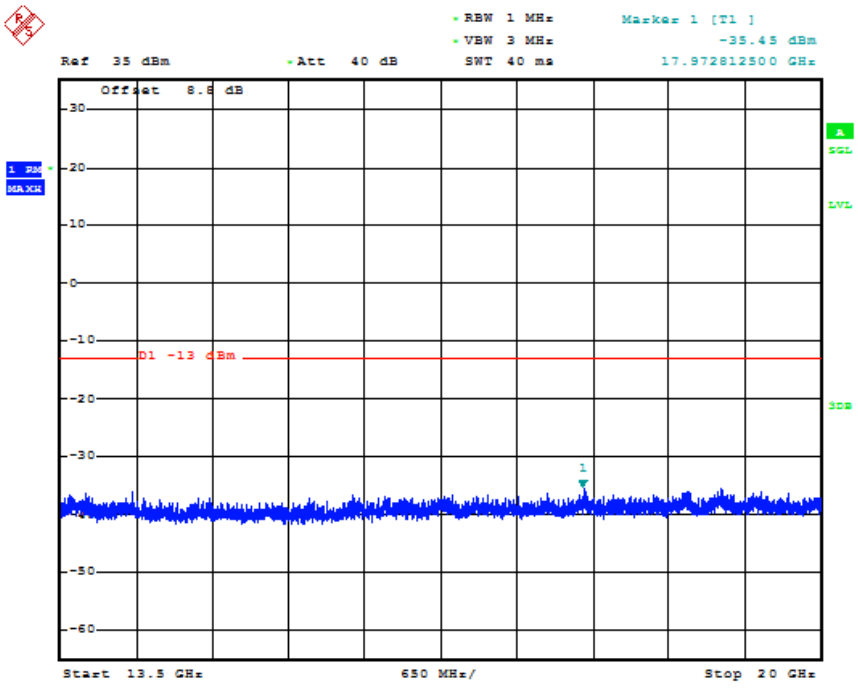
Date: 6.SEP.2015 09:22:40



Date: 6.SEP.2015 09:22:51

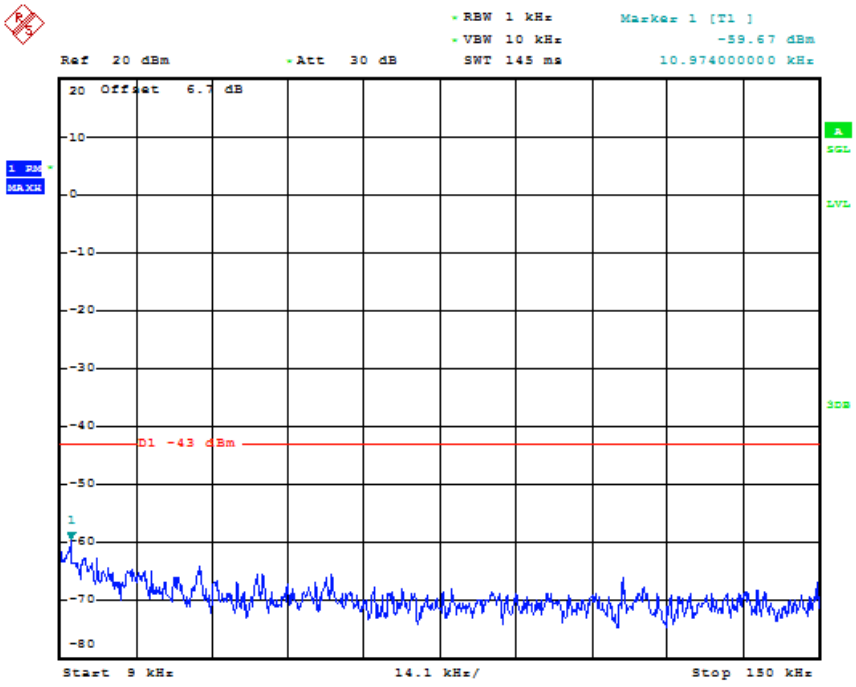


Date: 6.SEP.2015 09:23:00

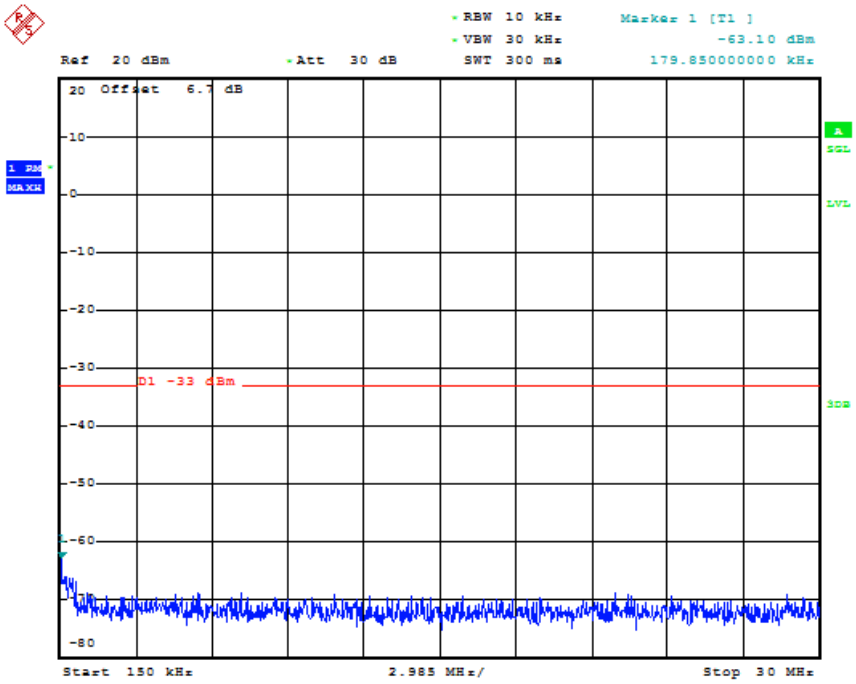


Date: 6.SEP.2015 09:23:10

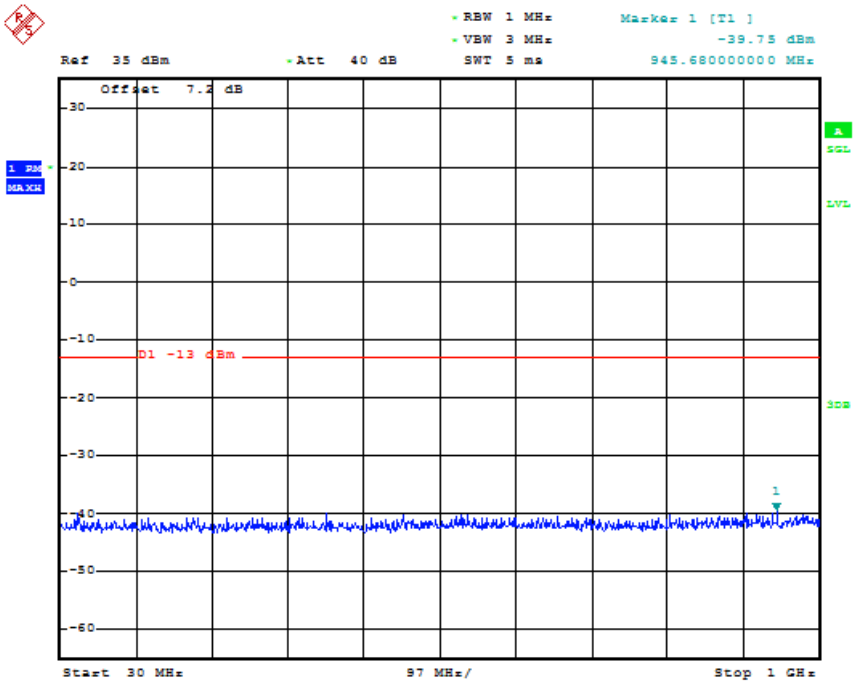
Out of band measurement
Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = HCH



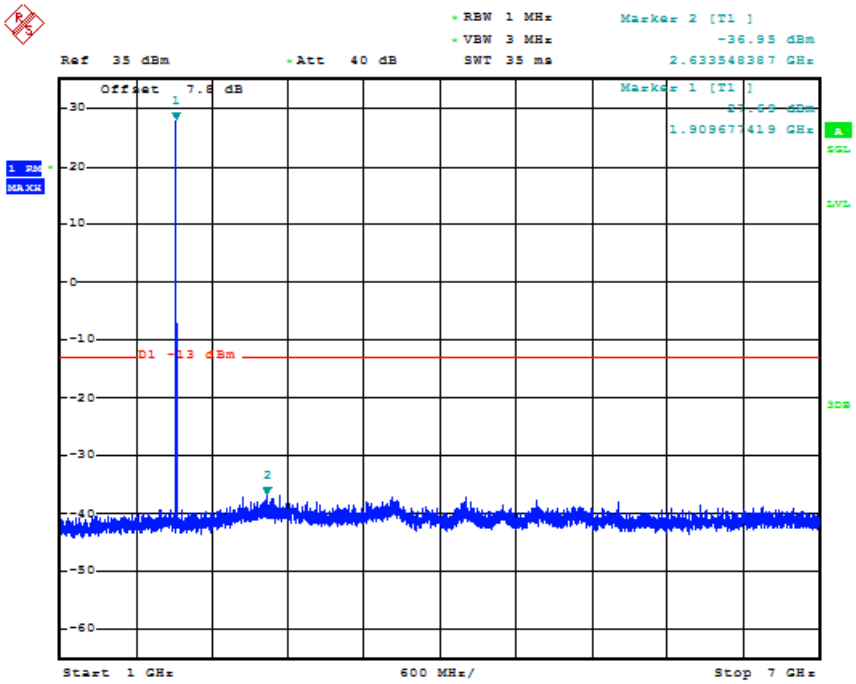
Date: 6.SEP.2015 09:23:27



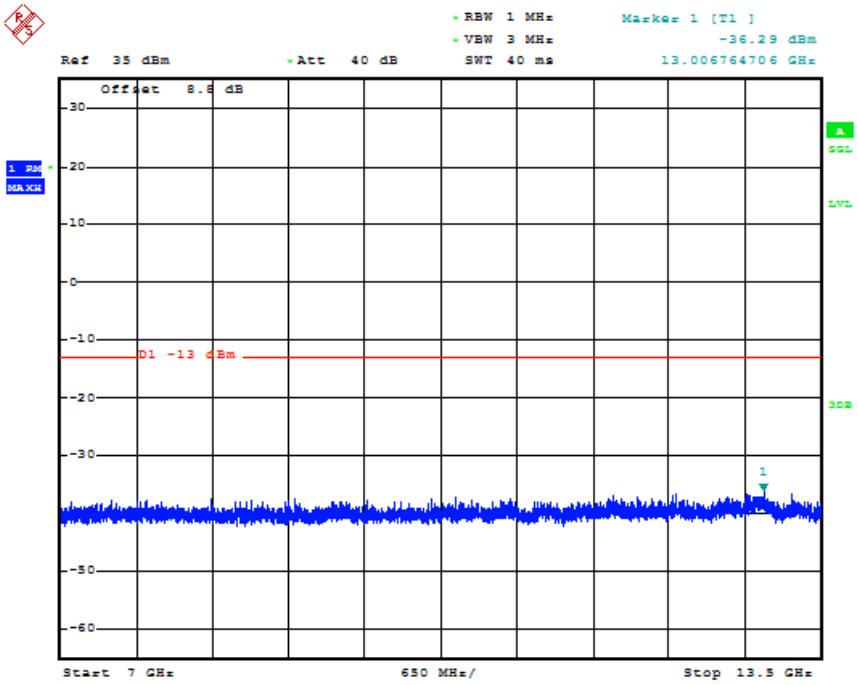
Date: 6.SEP.2015 09:23:36



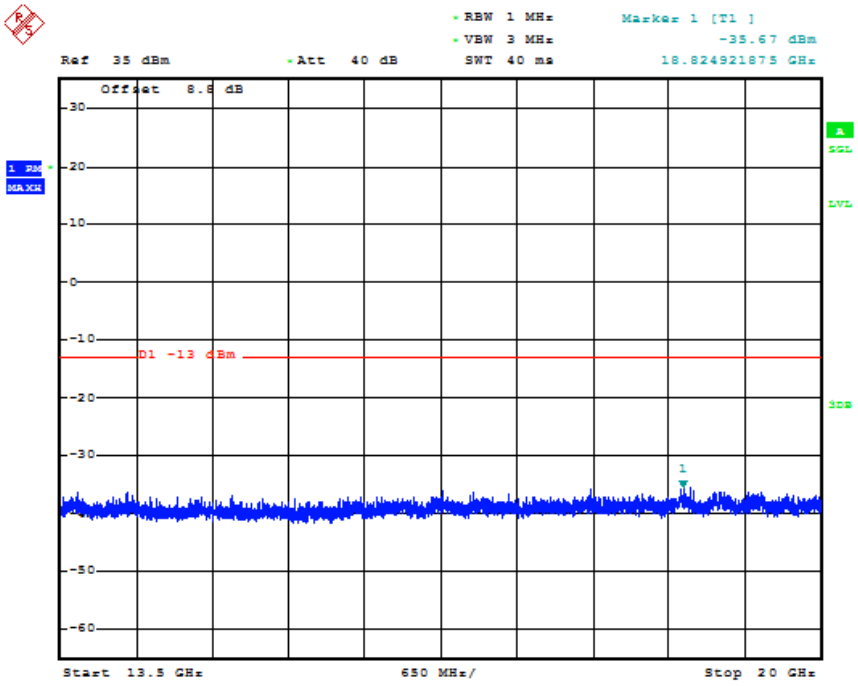
Date: 6.SEP.2015 09:23:46



Date: 6.SEP.2015 09:23:57

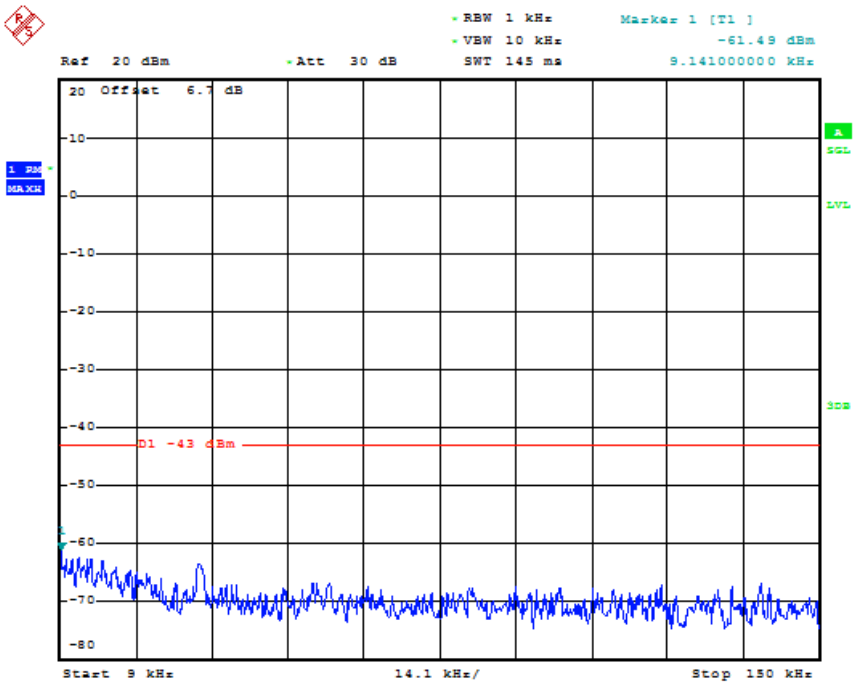


Date: 6.SEP.2015 09:24:07

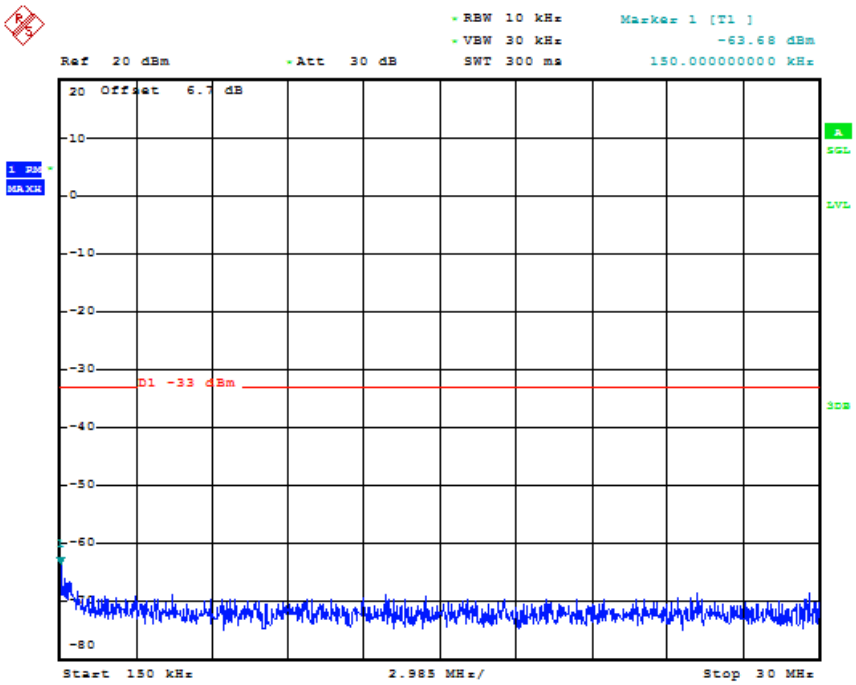


Date: 6.SEP.2015 09:24:17

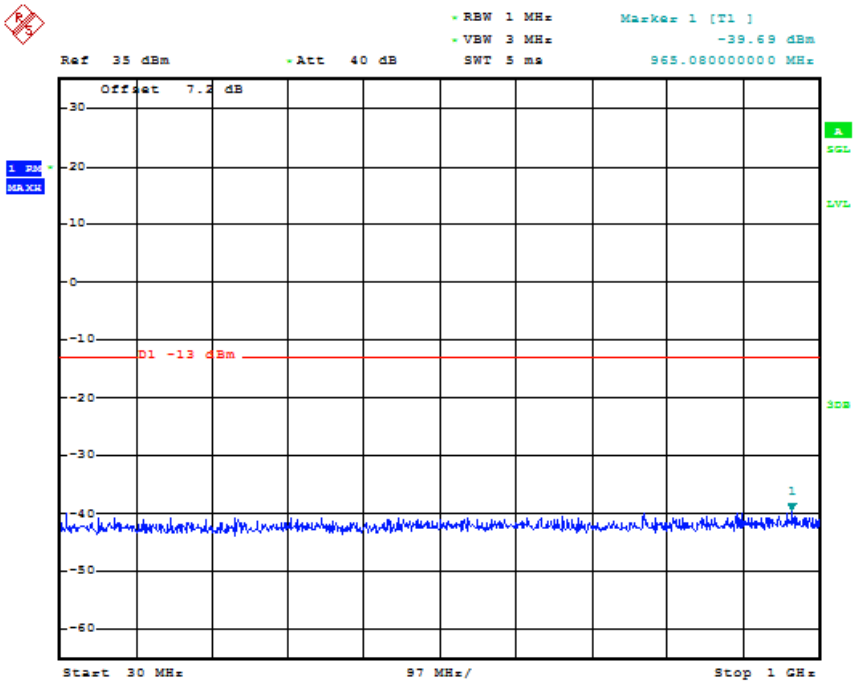
Out of band measurement
Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = LCH



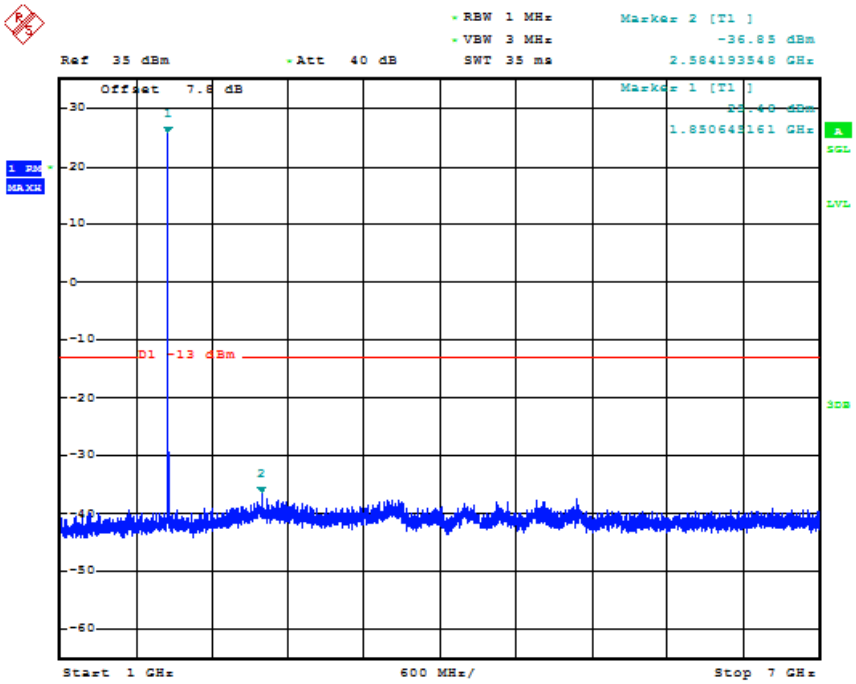
Date: 6.SEP.2015 09:09:06



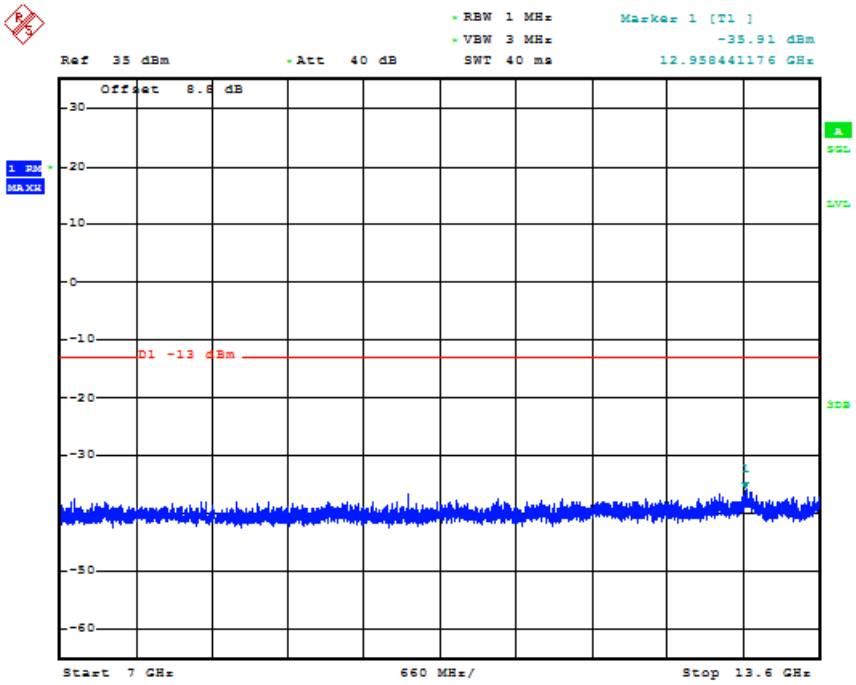
Date: 6.SEP.2015 09:09:15



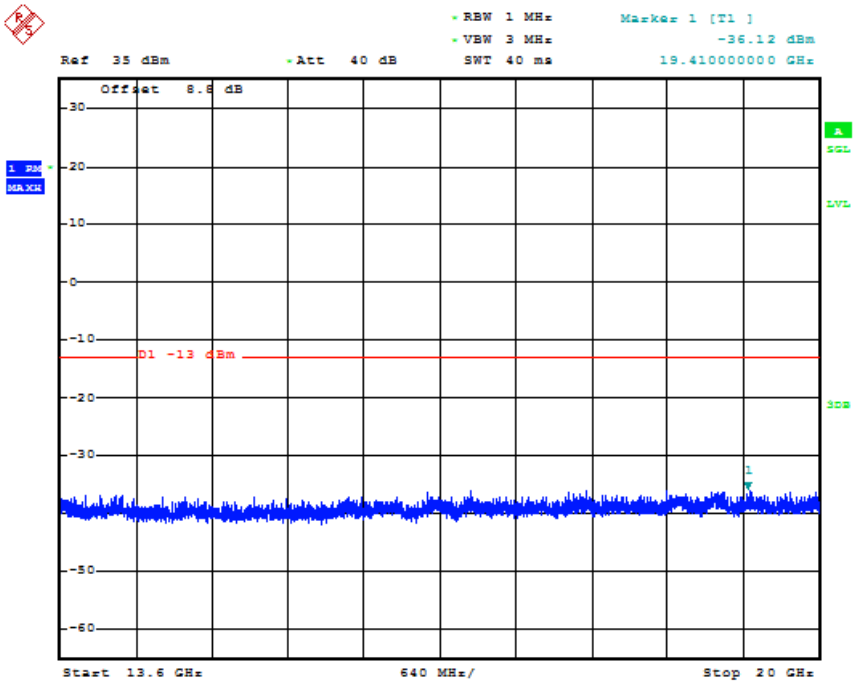
Date: 6.SEP.2015 09:09:23



Date: 6.SEP.2015 09:09:34

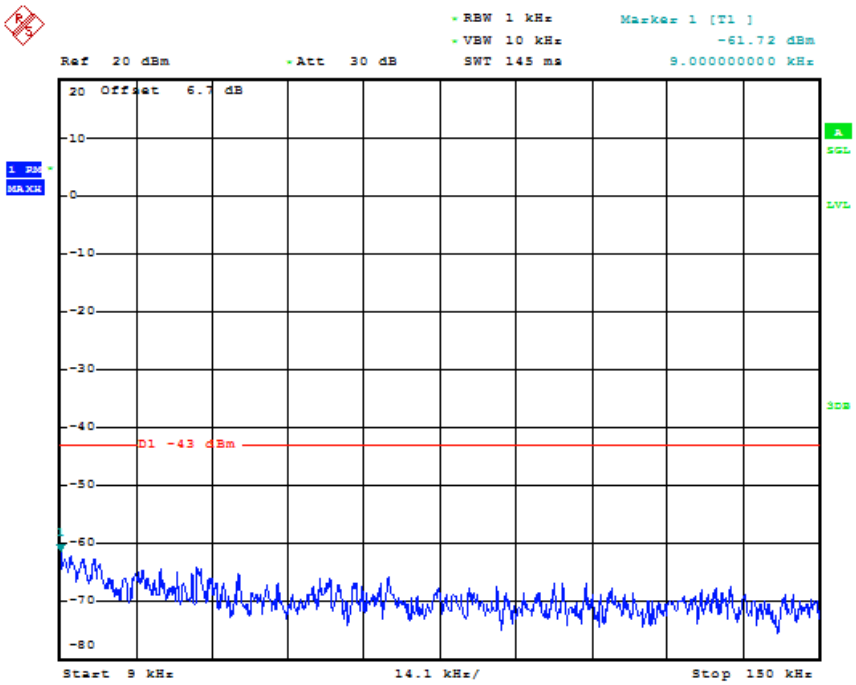


Date: 6.SEP.2015 09:09:43

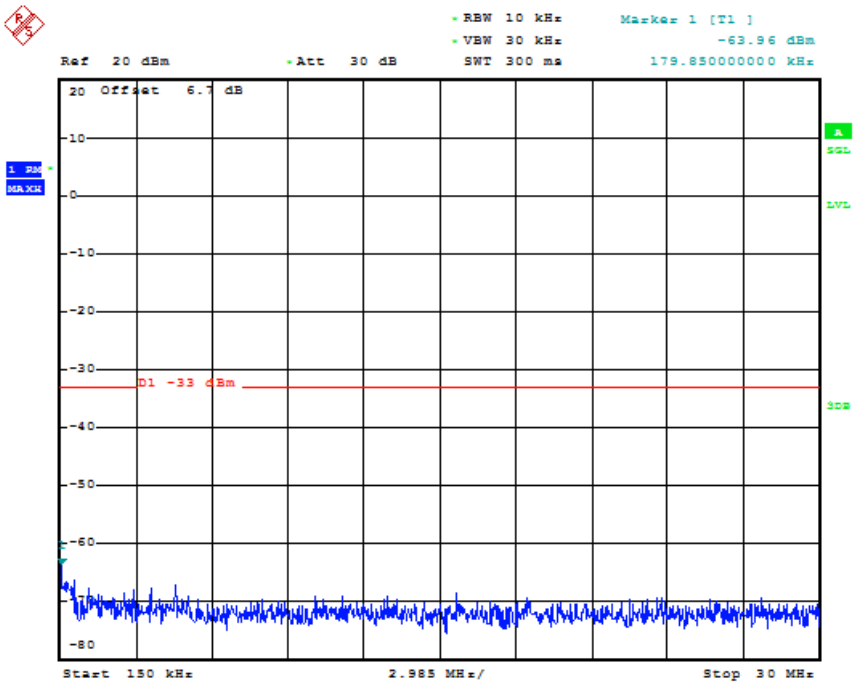


Date: 6.SEP.2015 09:09:52

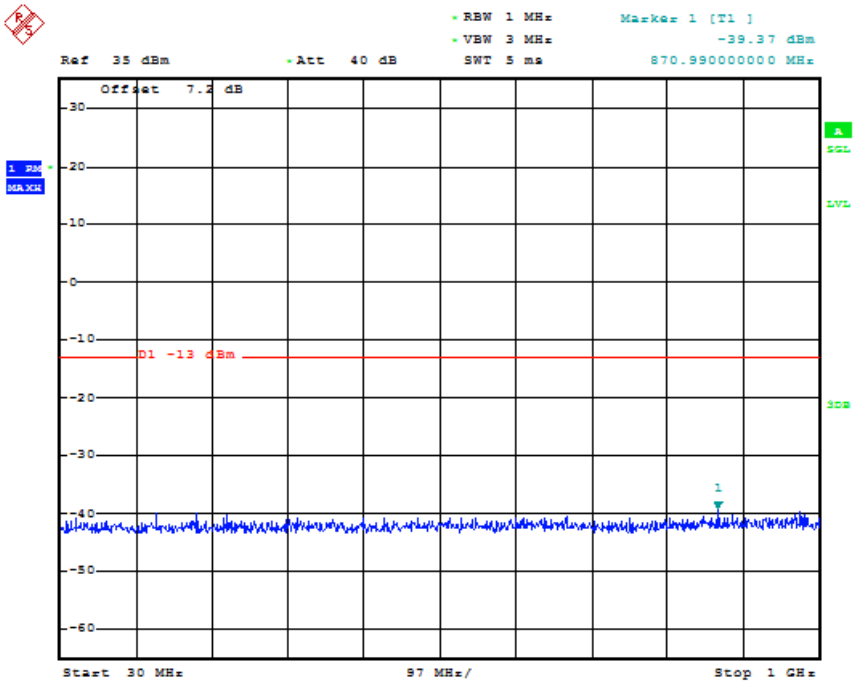
Out of band measurement
Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = MCH



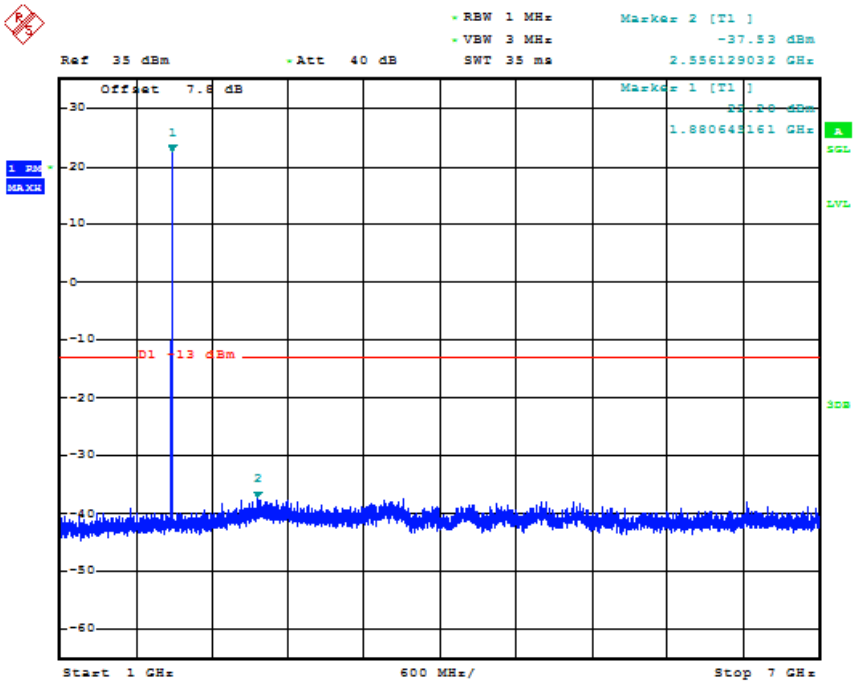
Date: 6.SEP.2015 09:10:10



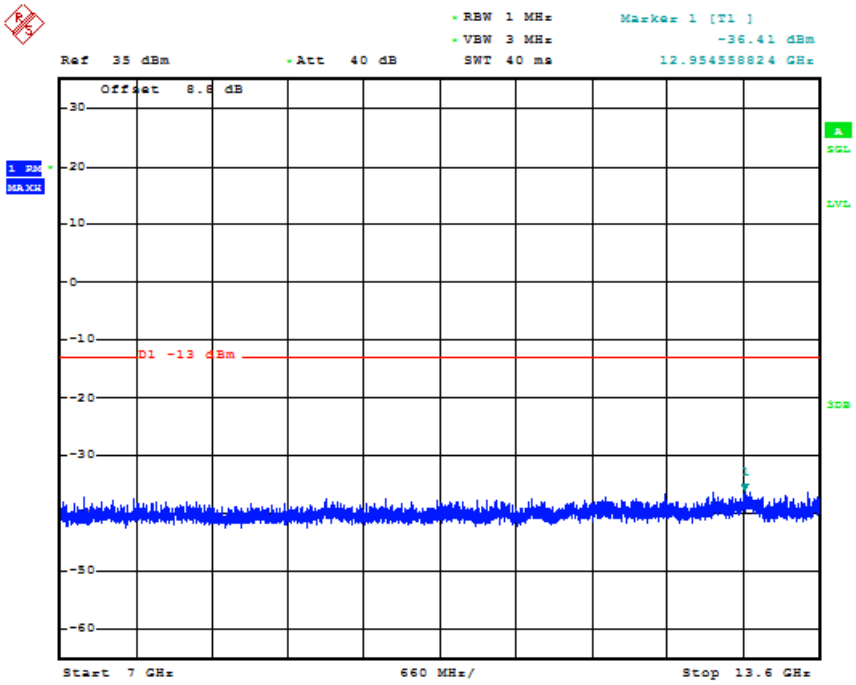
Date: 6.SEP.2015 09:10:19



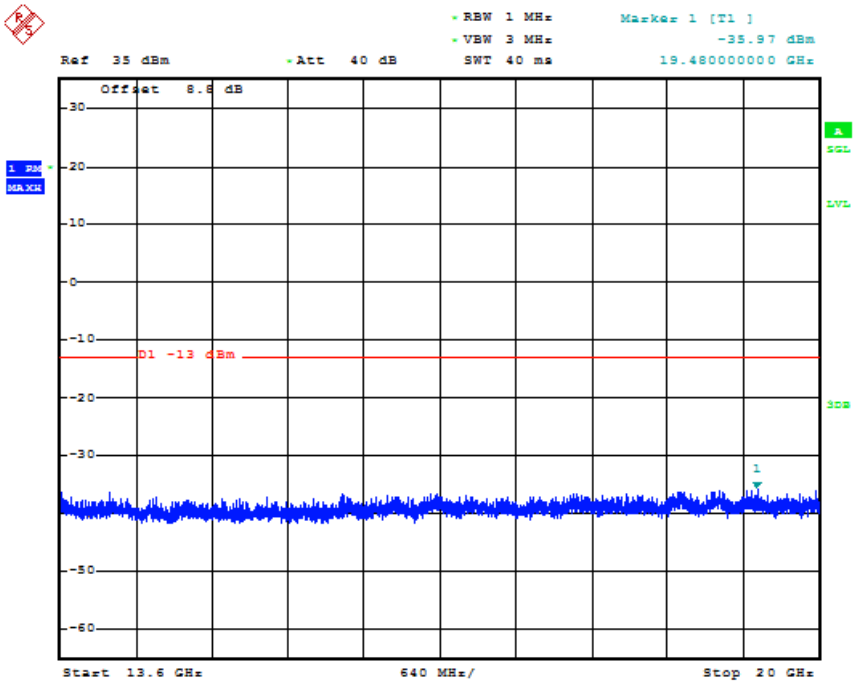
Date: 6.SEP.2015 09:10:27



Date: 6.SEP.2015 09:10:38

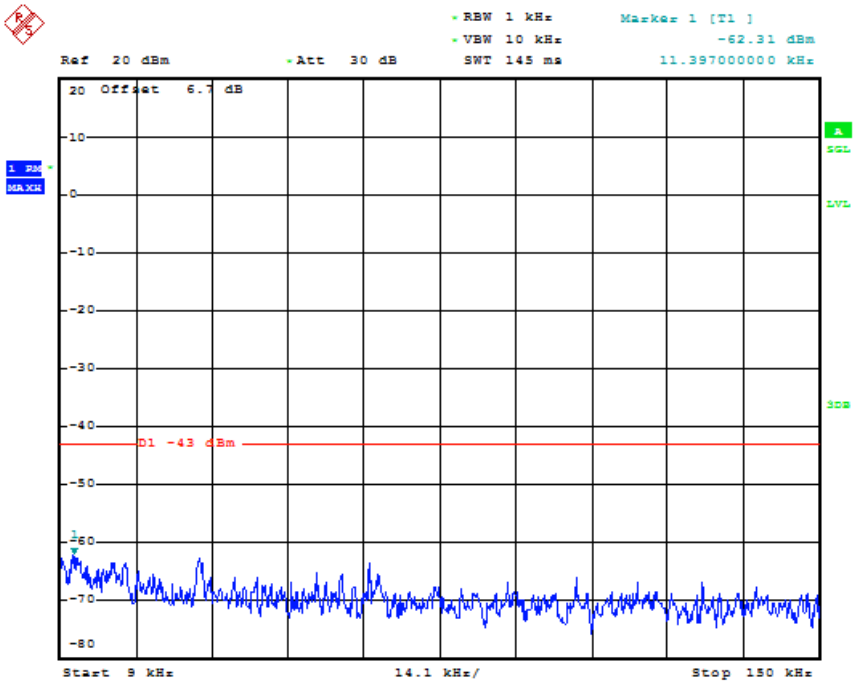


Date: 6.SEP.2015 09:10:47

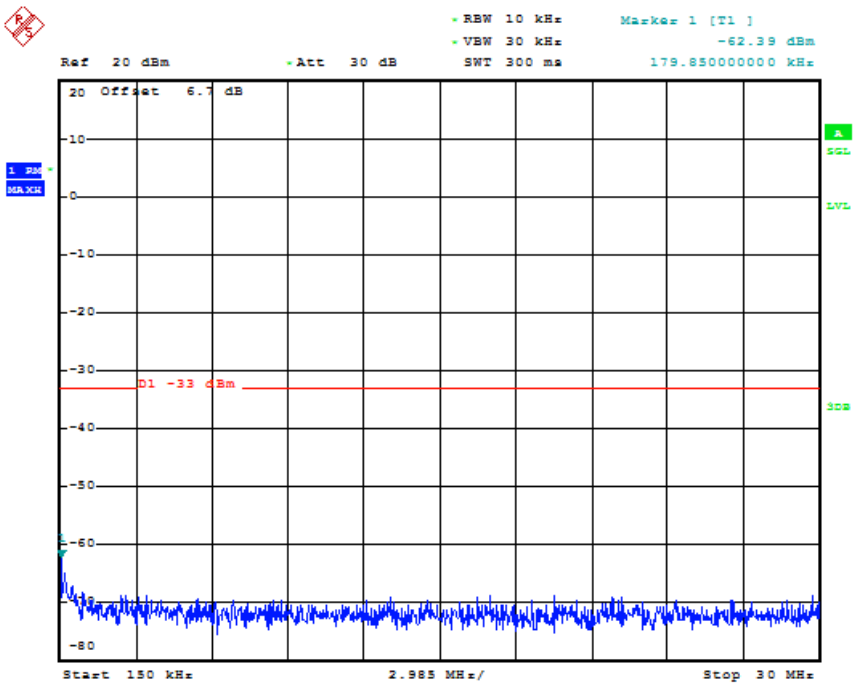


Date: 6.SEP.2015 09:10:56

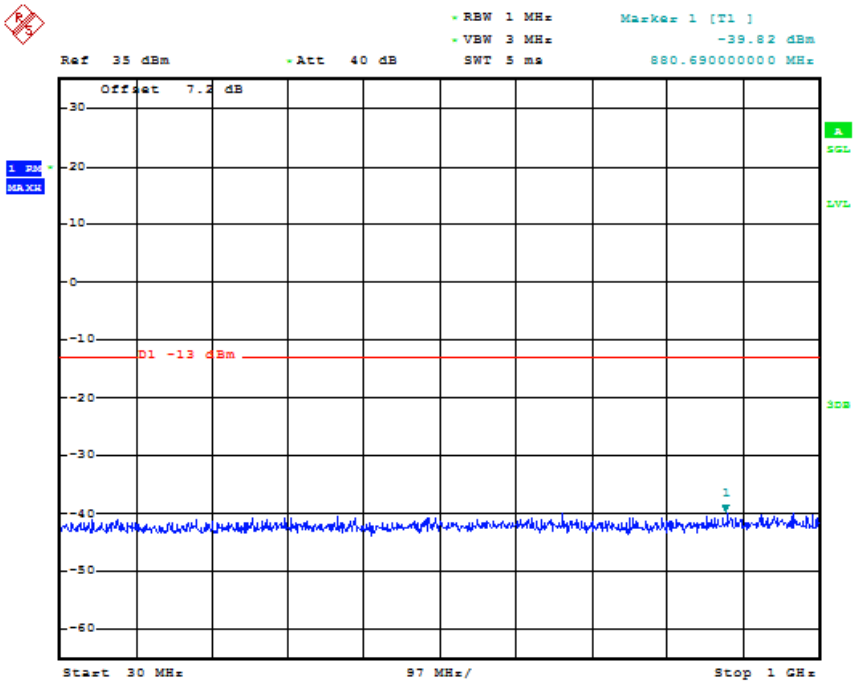
Out of band measurement
Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = HCH



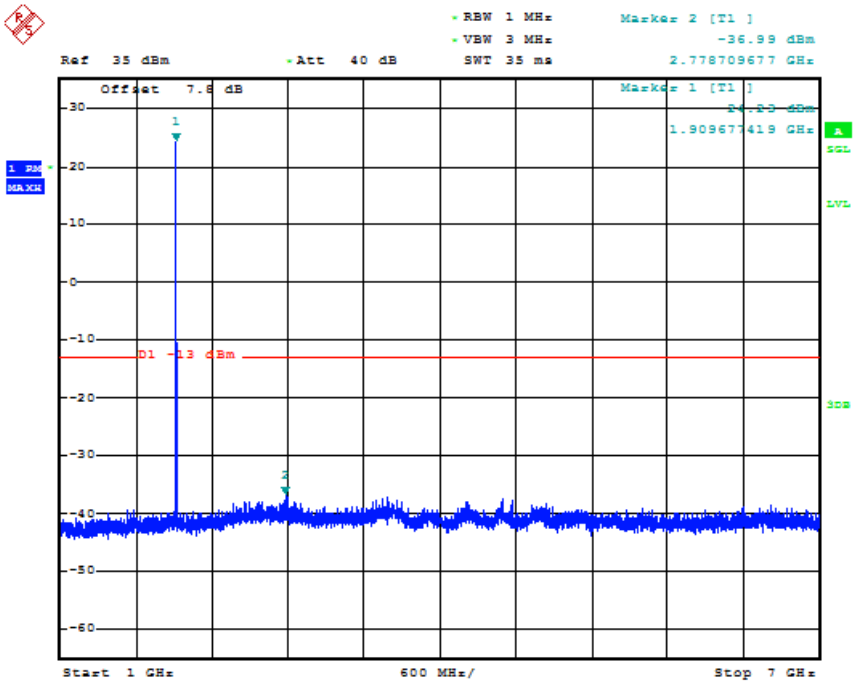
Date: 6.SEP.2015 09:11:14



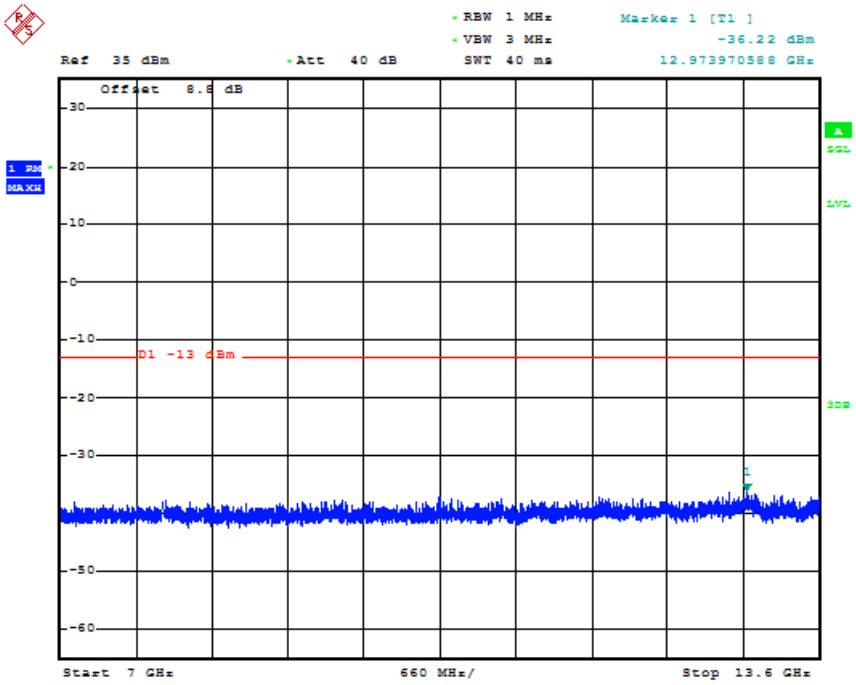
Date: 6.SEP.2015 09:11:23



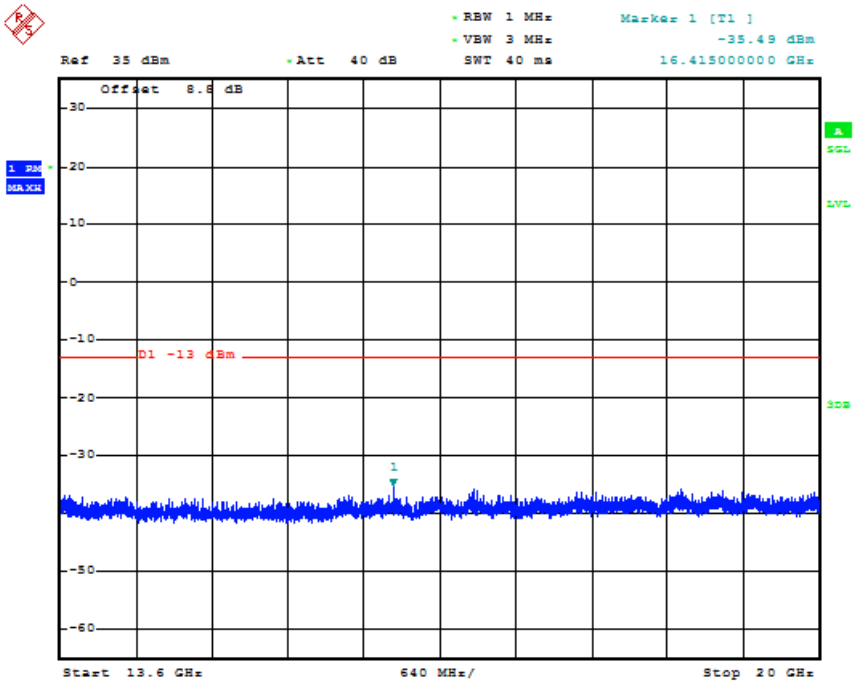
Date: 6.SEP.2015 09:11:32



Date: 6.SEP.2015 09:11:42

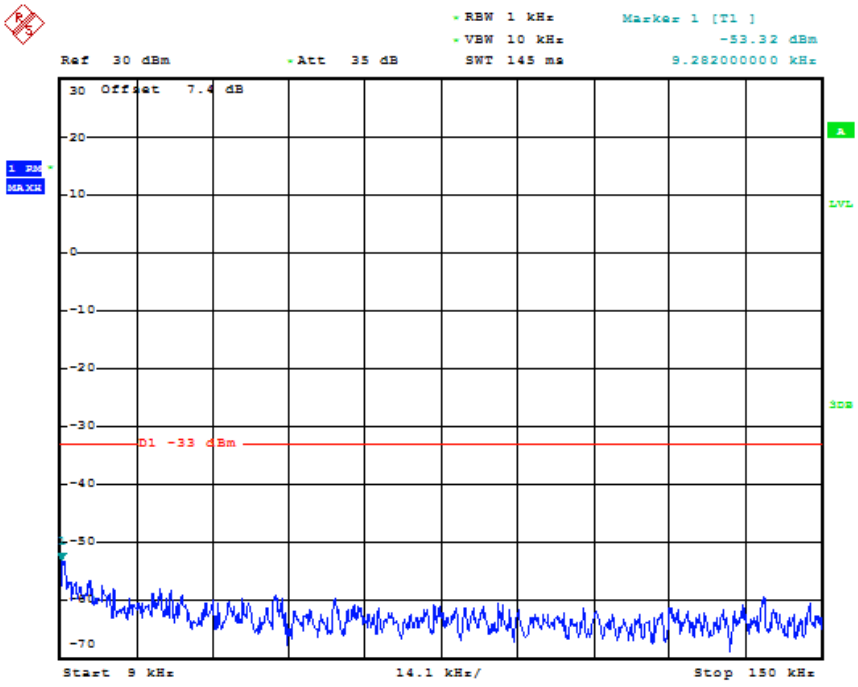


Date: 6.SEP.2015 09:11:51

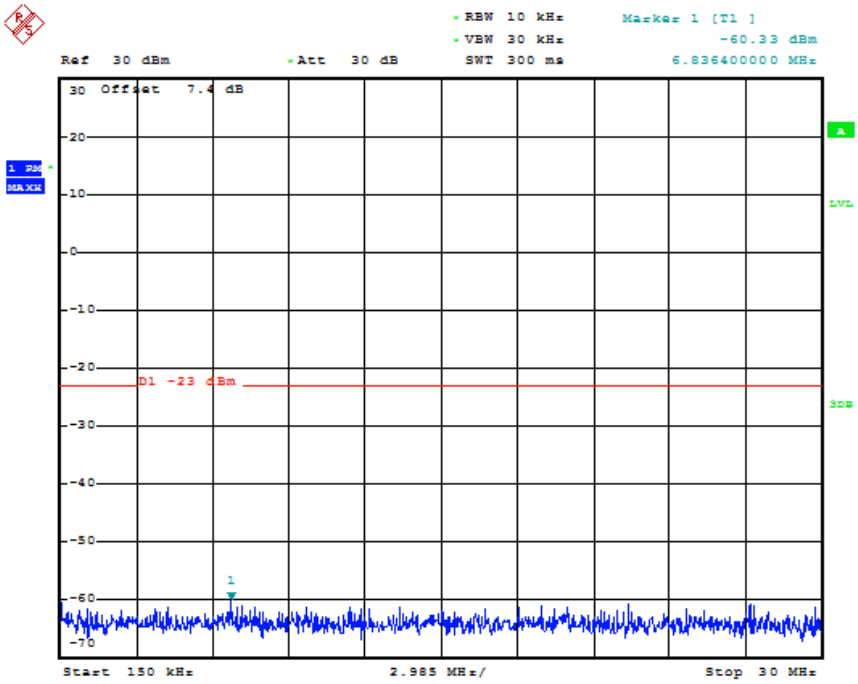


Date: 6.SEP.2015 09:12:00

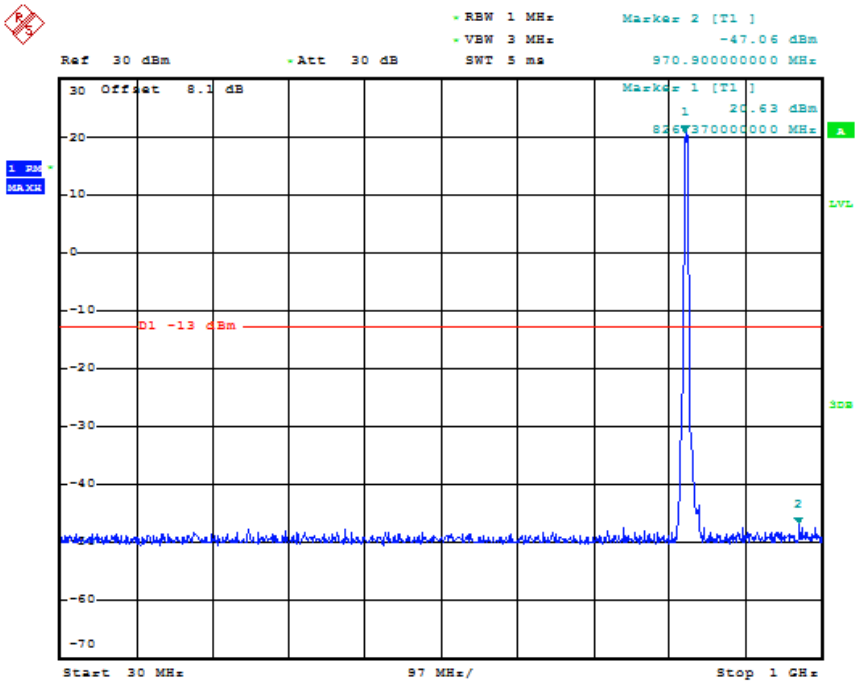
Out of band measurement
Test Band = WCDMA850
Test Mode = UMTS/TM3
Test Channel = LCH



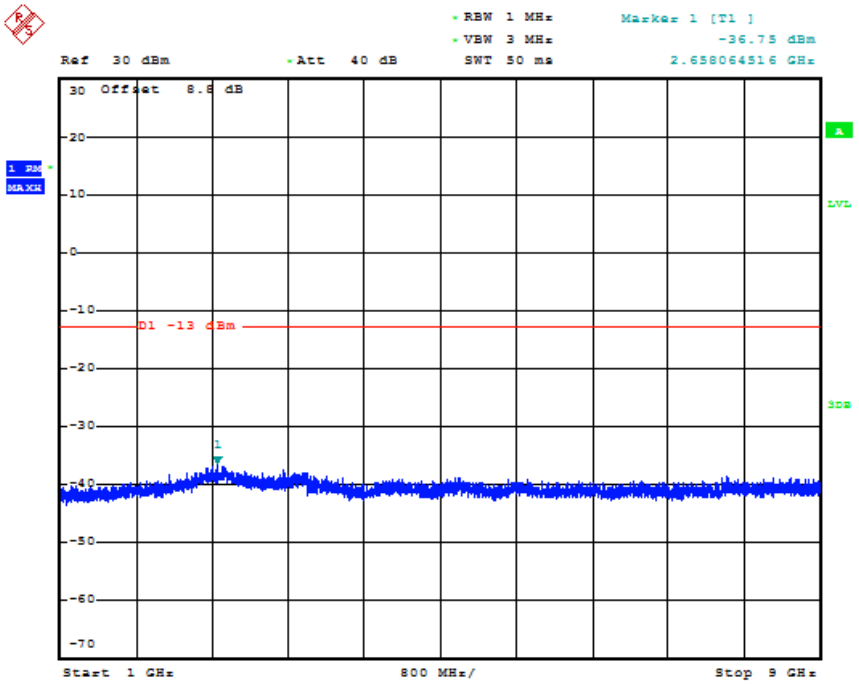
Date: 13.SEP.2015 09:11:40



Date: 13.SEP.2015 09:11:47

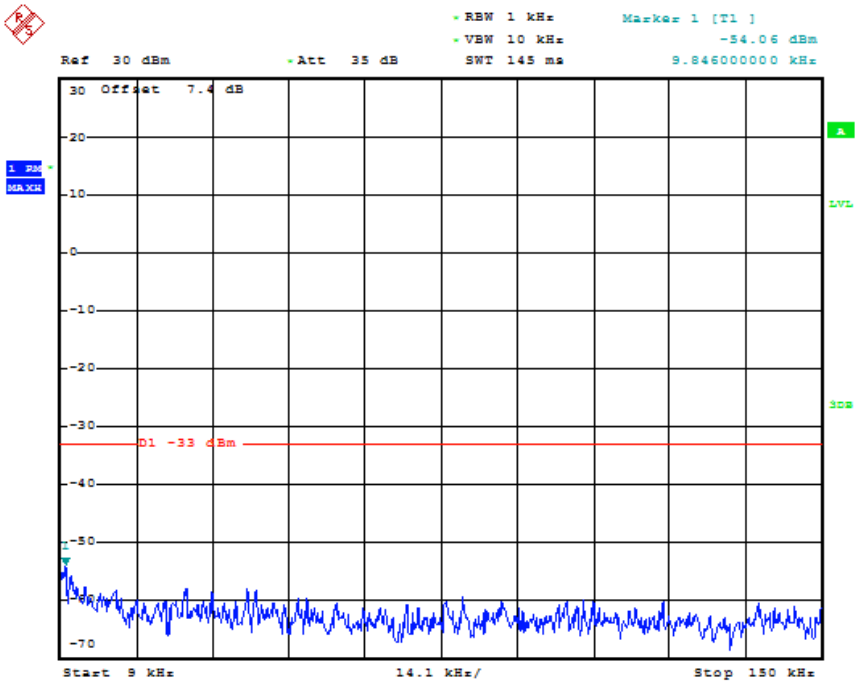


Date: 13.SEP.2015 09:11:57

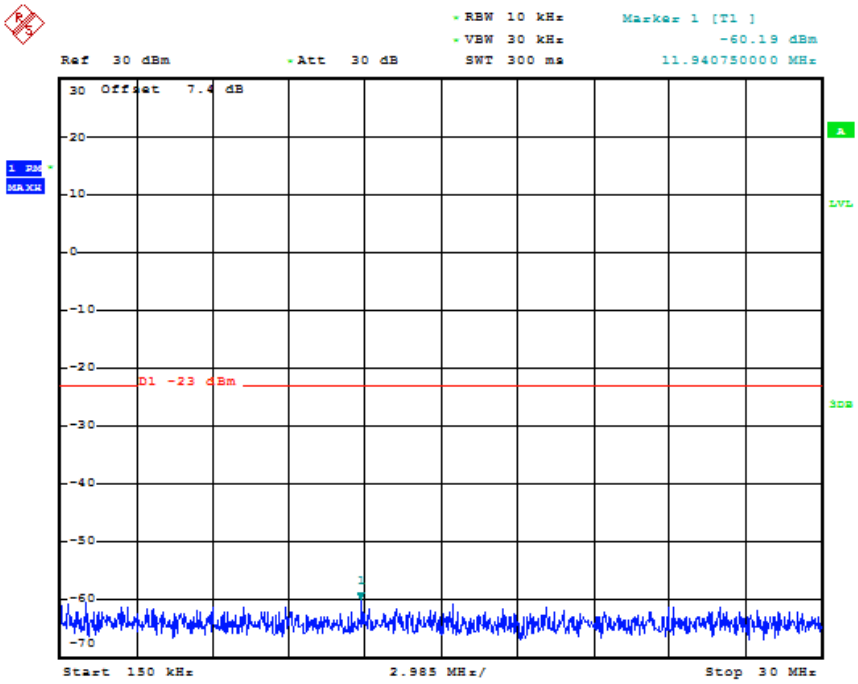


Date: 13.SEP.2015 09:13:32

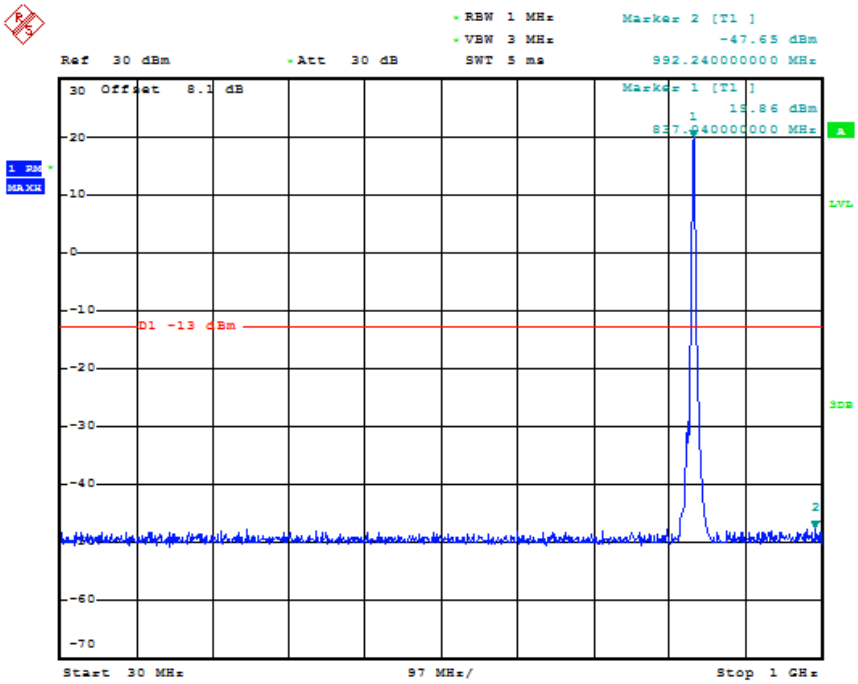
Out of band measurement
Test Band = WCDMA850
Test Mode = UMTS/TM3
Test Channel = MCH



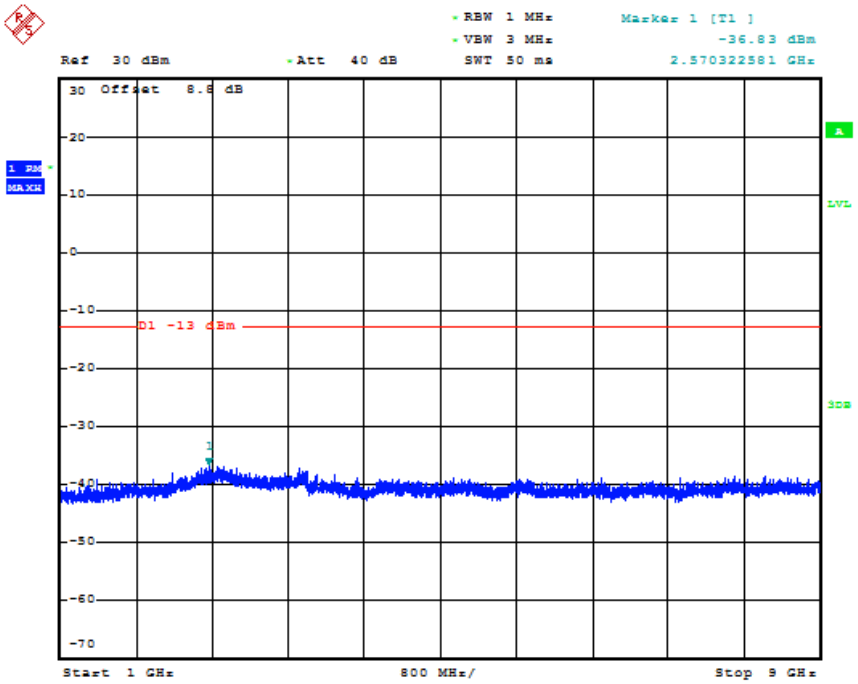
Date: 13.SEP.2015 09:12:23



Date: 13.SEP.2015 09:12:31

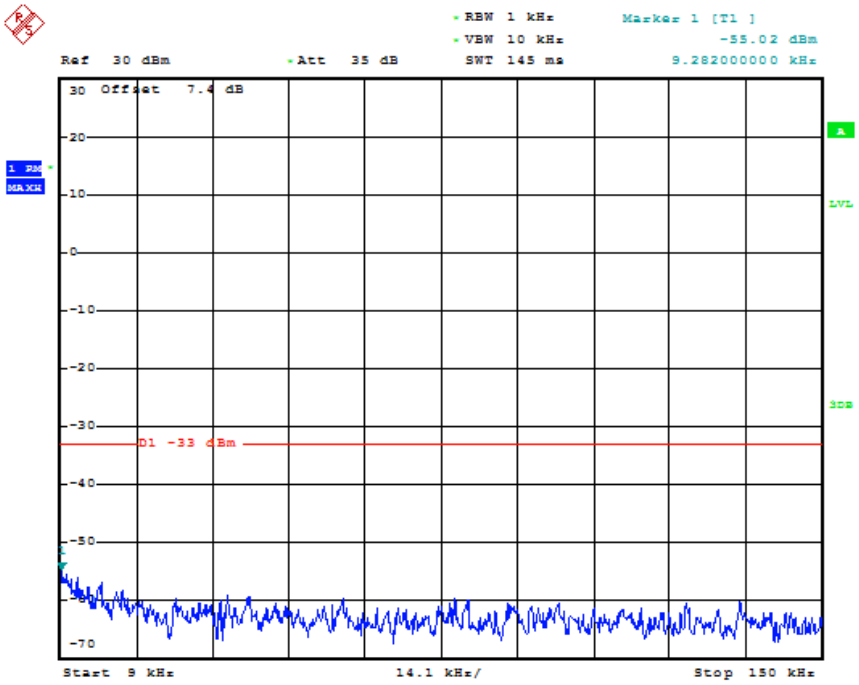


Date: 13.SEP.2015 09:12:40

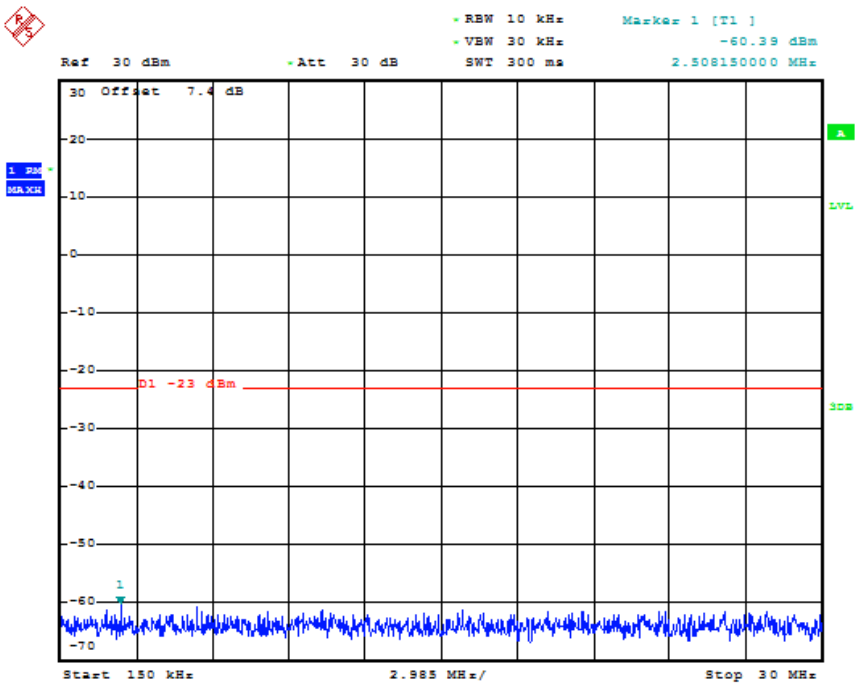


Date: 13.SEP.2015 09:12:05

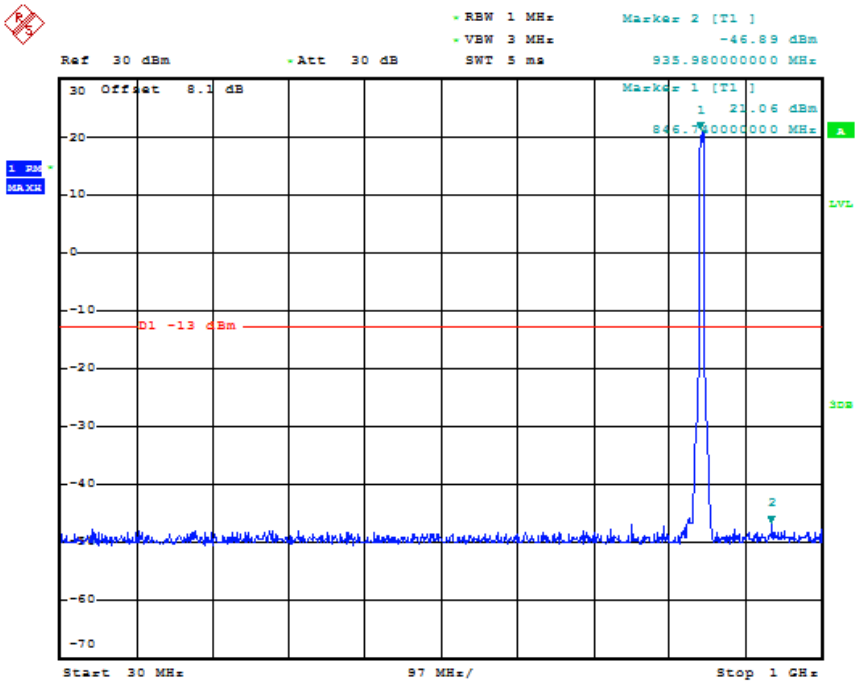
Out of band measurement
Test Band = WCDMA850
Test Mode = UMTS/TM3
Test Channel = HCH



Date: 13.SEP.2015 09:13:07



Date: 13.SEP.2015 09:13:15



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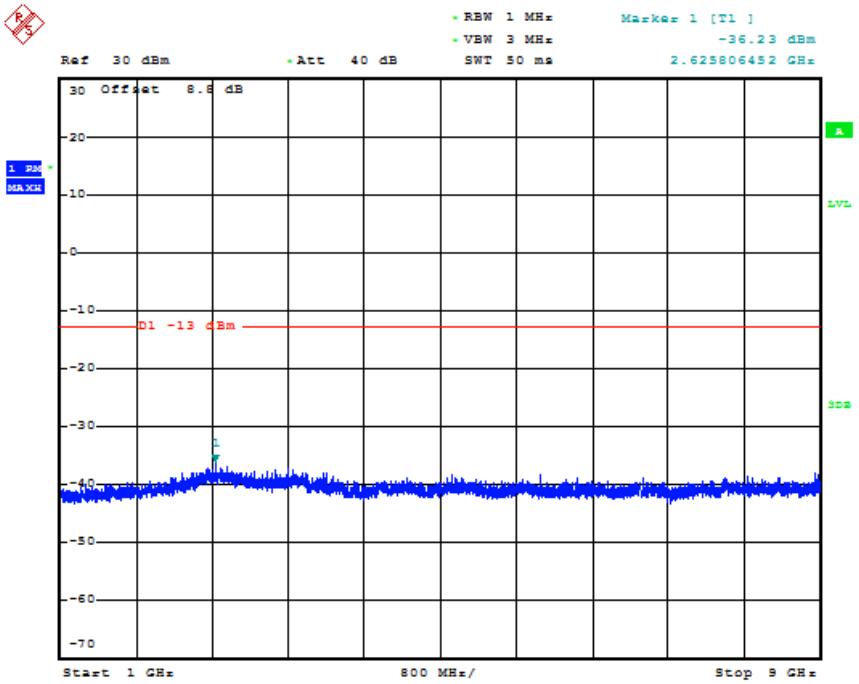
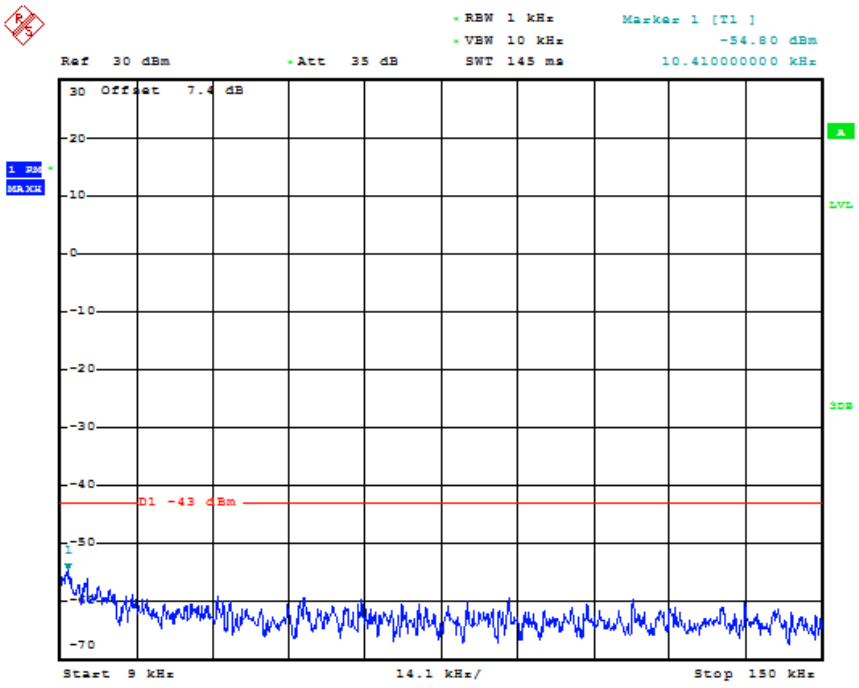
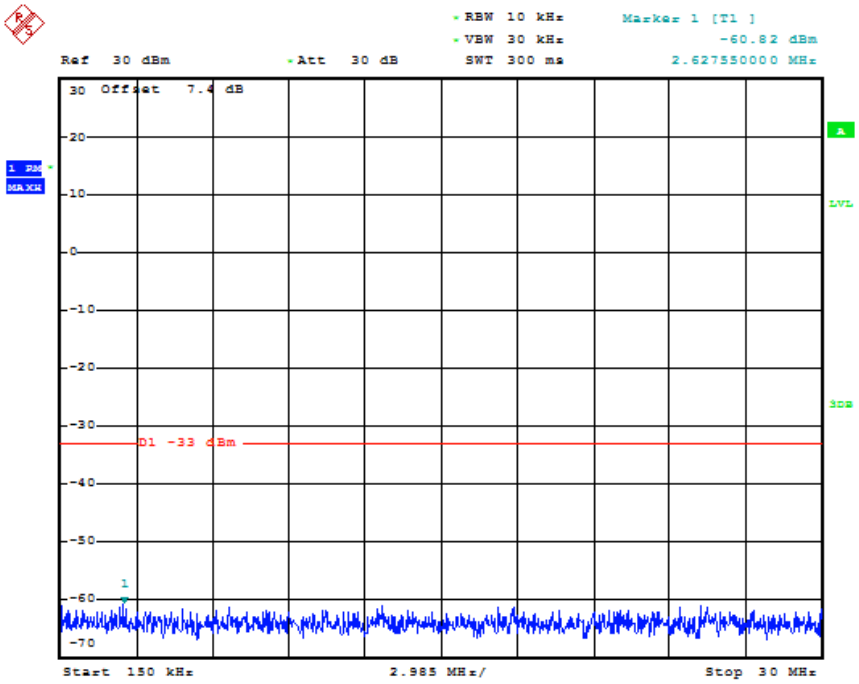


Date: 13.SEP.2015 09:12:48

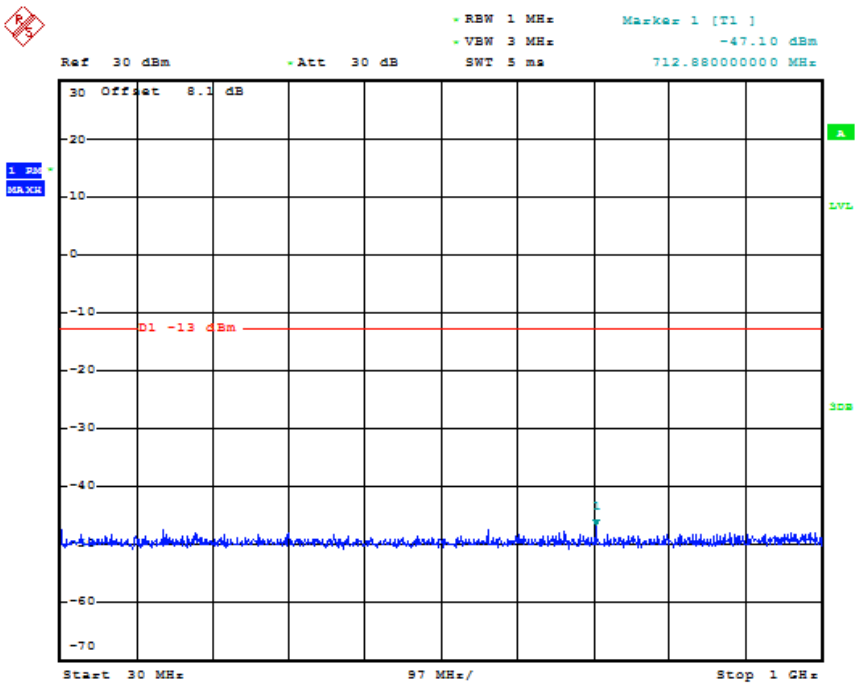
Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=LCH



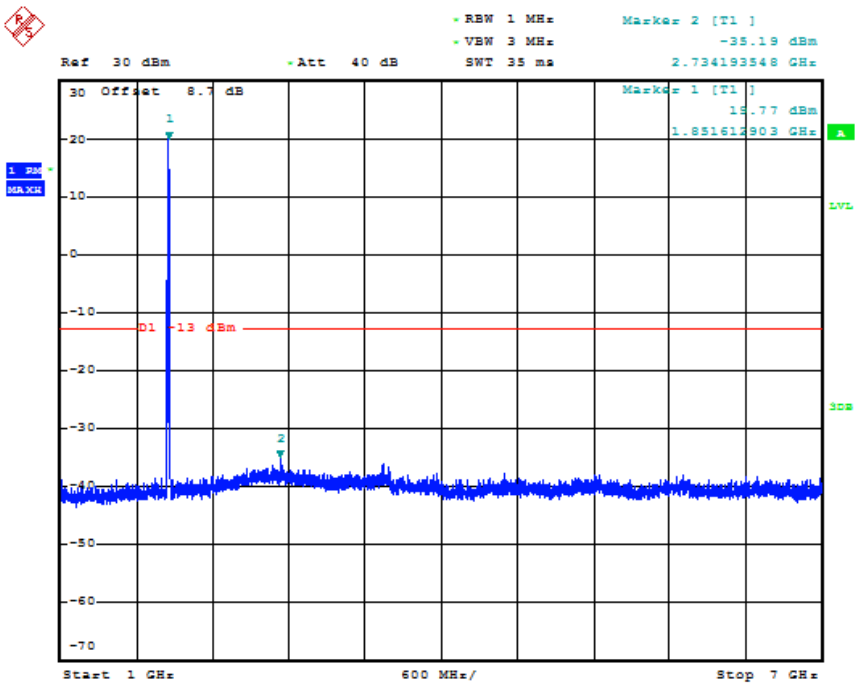
Date: 13.SEP.2015 09:06:32



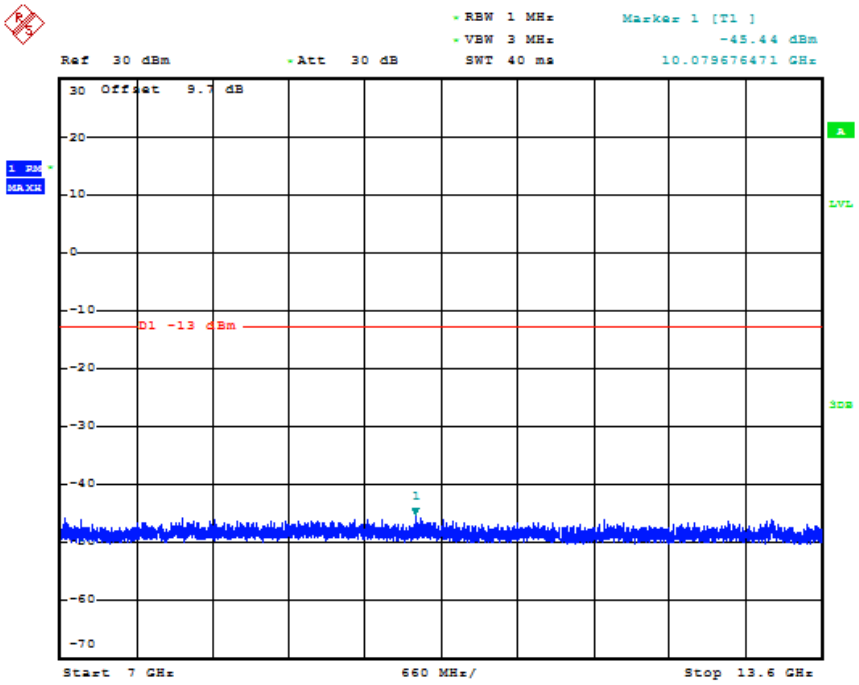
Date: 13.SEP.2015 09:06:40



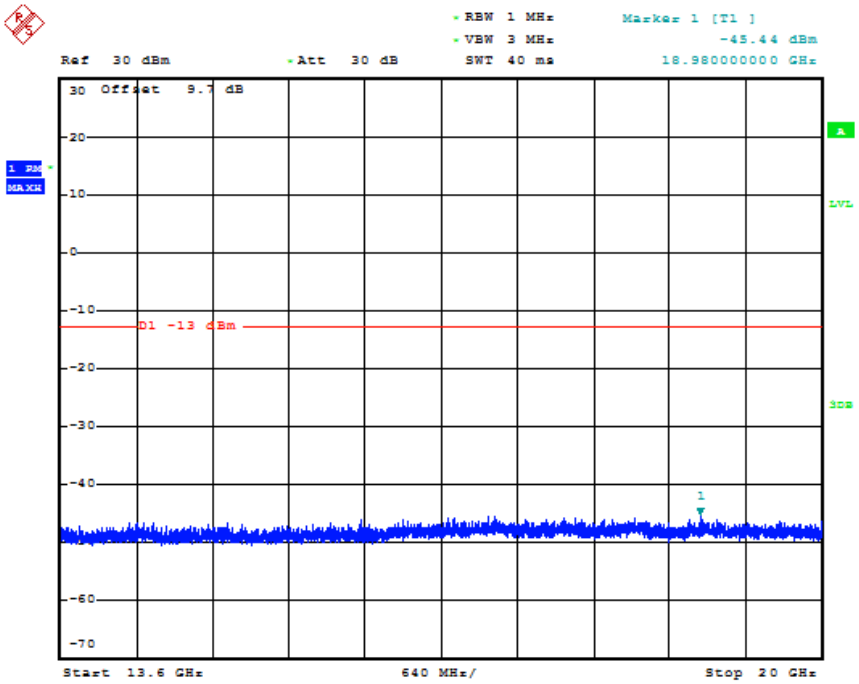
Date: 13.SEP.2015 09:06:48



Date: 13.SEP.2015 09:06:58

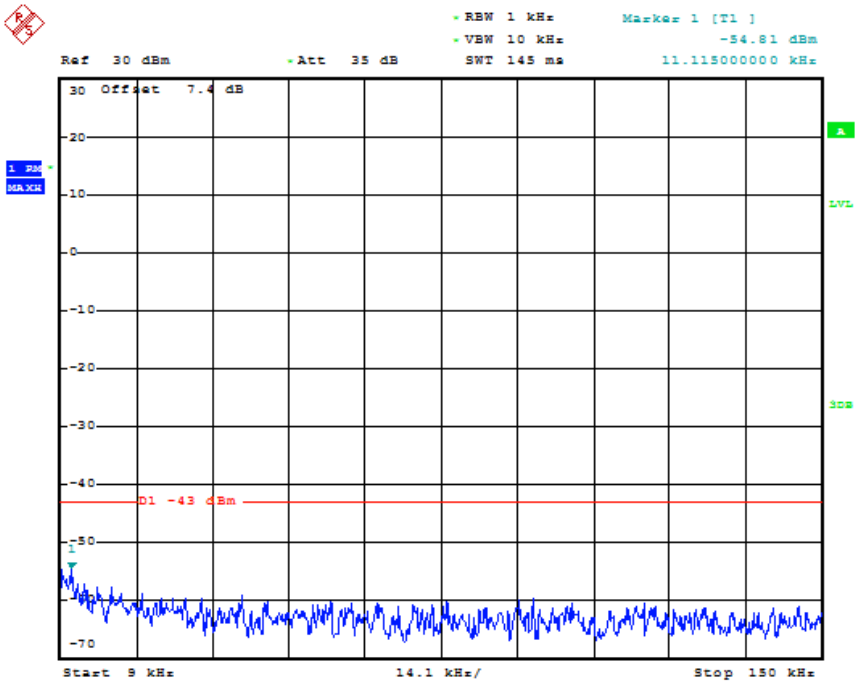


Date: 13.SEP.2015 09:07:06

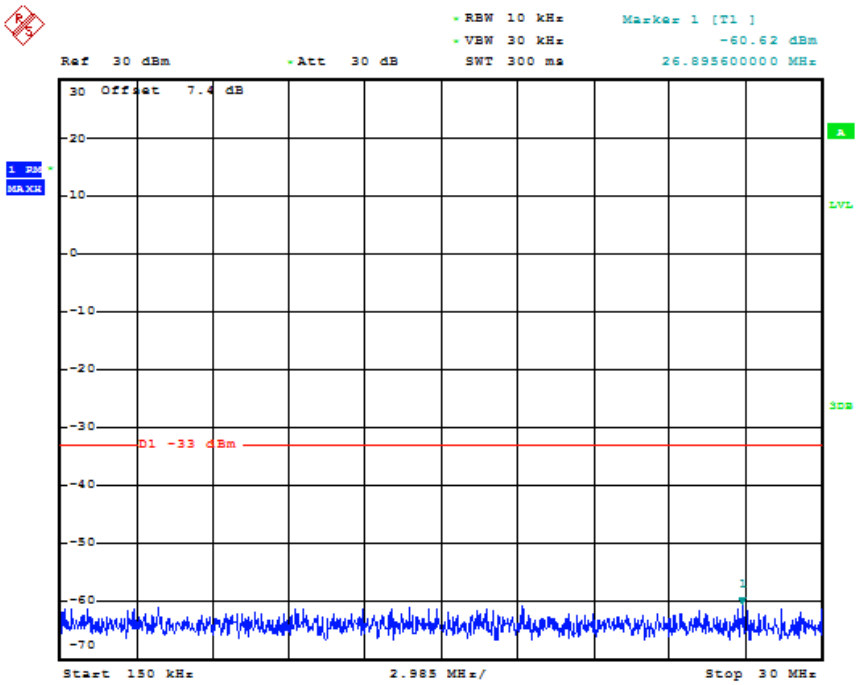


Date: 13.SEP.2015 09:07:15

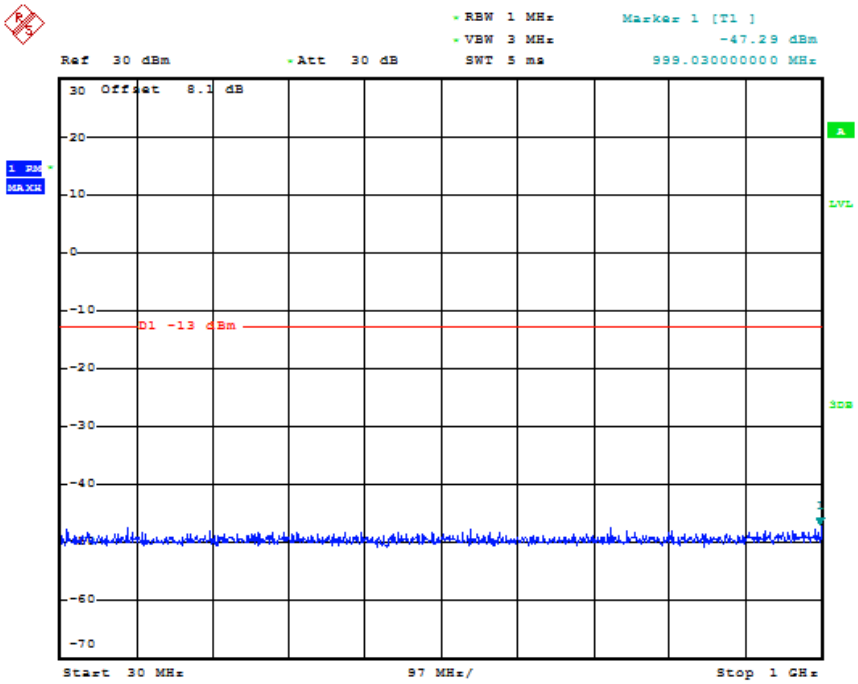
Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=MCH



Date: 13.SEP.2015 09:07:33



Date: 13.SEP.2015 09:07:41



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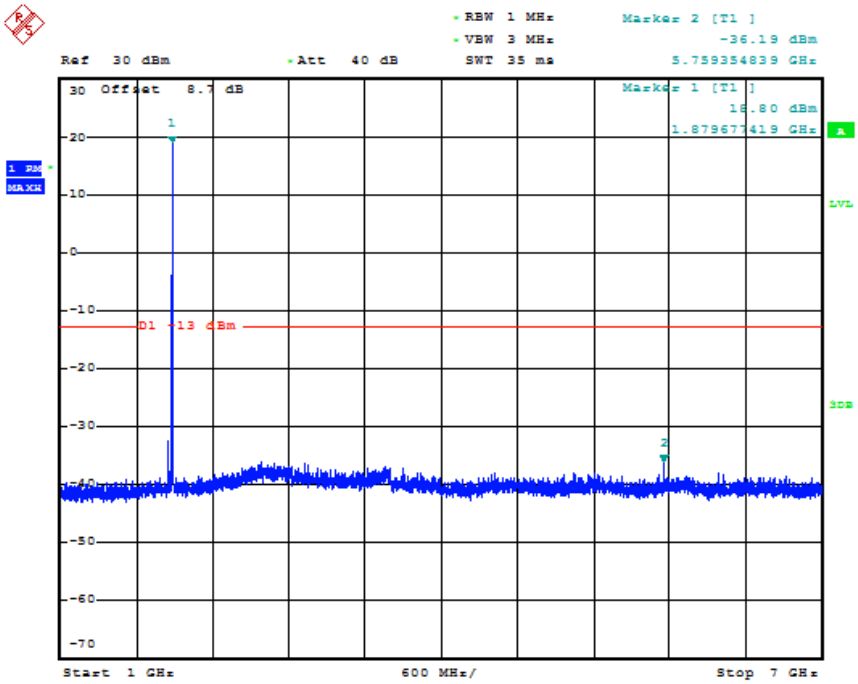

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