



FCC RF Test Report

Product Name: CDMA 1X Mobile Phone

Model Number: HUAWEI M570

Report No: SYBH(Z-RF)006052012-2002

FCC ID: QISM570

Reliability Laboratory of Huawei Technologies Co., Ltd.

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China

Tel: +86 755 28780808 Fax: +86 755 89652518

Notice

1. The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L0310.
2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
3. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
4. The test report is invalid if not marked with "exclusive stamp for the test report".
5. The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.
8. Normally, the test report is only responsible for the samples that have undergone the test.
9. Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the laboratory.



Applicant: Huawei Technologies Co., Ltd.
Address: Huawei Base, Bantian, Longgang District, Shenzhen
518129, P.R. China
Date of Receipt Test Item: May.14, 2012
Start Date of Test: May.14, 2012
End Date of Test: May.24, 2012

Test Result: Pass

Approved By Senior Engineer

May.25, 2012
Date

Dai Linjun
Name

Dai Linjun
Signature

Reviewed By

May.25, 2012
Date

Cousy Xu
Name

Cousy XU
Signature

Operator

May.25, 2012
Date

Huang Qiuliang
Name

Huang Qiuliang
Signature

Contents

1.1	APPLIED STANDARD.....	5
1.2	TEST LOCATION.....	5
1.3	TEST ENVIRONMENT CONDITION	5
1	<u>Summary</u>	6
2	<u>Product Description</u>	7
2.1	PRODUCTION INFORMATION	7
3	<u>Test Description</u>	8
3.1	SUPPORTED FREQUENCY RANGE	8
3.2	TRANSMITTER / RECEIVER CHARACTERISTICS.....	8
3.3	ANTENNA GAIN.....	8
3.4	POWER SUPPLY	8
4	<u>General Test Conditions / Configurations</u>	9
4.1	RF CHANNELS UNDER TEST.....	9
4.2	TEST MODES.....	9
4.3	TEST ENVIRONMENTS	9
4.4	TEST SETUPS.....	10
4.5	TEST CONDITIONS	12
5	<u>Main Test Instruments</u>	14
6	<u>Test Results</u>	15
7	<u>Measurement Uncertainty</u>	16

GENERAL INFORMATION

1.1 Applied Standard	
Applied Rules:	47 CFR FCC Part 2, 2011. Subpart J 47 CFR FCC Part 27, 2011.Subpart C&L ANSI/TIA 603C:2004
1.2 Test Location	
Test Location 1:	Reliability Laboratory of Huawei Technologies Co., Ltd.
Address:	Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China
1.3 Test Environment Condition	
Ambient Temperature:	20 – 25 °C
Ambient Relative Humidity:	45 – 55 %
Atmospheric Pressure:	101 kPa

1 Summary

Table 1 Summary of results

AWS Band			
Test Case	FCC Part No.	Requirements	Result
Transmitter Output Power	2.1046 & 27.50(d)	Peak EIRP not exceed 1 W	Pass
Modulation Characteristics	2.1047	Digital modulation	Pass
Occupied Bandwidth	2.1049	(Not specified)	Pass
Band Edges Compliance	2.1051 & 27.53(h)	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 27.53(h)	Below -13 dBm/1 kHz, 9 kHz to 150 kHz Below -13 dBm/10 kHz, 150 kHz to 30 MHz Below -13 dBm/1 MHz, 30 MHz to 10 th harmonics	Pass
Field Strength of Spurious Radiation	2.1053 & 27.53(h)	Below -13 dBm/1 MHz	Pass
Frequency Stability	2.1055 & 27.54	Stay within the authorized bands of operation	Pass

2 Product Description

2.1 Production Information

2.1.1 General Description

CDMA 1X Mobile Phone HUAWEI M570 is subscriber equipment in the CDMA system. It is a stylish bar-type mobile phone with a 2.4-inch QVGA TFT display. Based on Qualcomm's QSC6055 platform, the M570 provides an extra-long standby time and supports CDMA 1X 800/1900 MHz and AWS band, but only CDMA AWS band test data in this report. Besides the basic voice, SMS, MMS, WAP, and BREW functions, the M570 also incorporates a camera, and supports applications such as Bluetooth, and weather forecast.

2.1.2 Board

Table 1 Board Information

CDMA 1X Mobile Phone	
HUAWEI M570	
Main board	
Software Version	Hardware Version
M570 V100R001C45B107	Ver.B

2.1.3 Adapter

AC/DCAdapter Model	HS-050040U5(02220120)
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V, 50/60Hz
Output Voltage	5V  400mA
Rated Power	2W
Serial Number	HKAC12670683, TPAC11248227

2.1.4 Battery Technical Data

Name	Description
Rechargeable Li-ion	Manufacturer: Huawei Technologies Co., Ltd. Battery Model: HB5A2H Rated capacity: 1150 mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V S/N: UNDC302X97700379 S/N: YACC301197702524

3 Test Description

3.1 Supported Frequency Range

Characteristics	Description
Downlink	2110 to 2155 MHz
Uplink	1710 to 1755 MHz

3.2 Transmitter / Receiver Characteristics

Characteristics	Description
System Type	CDMA
TX Output Power (per Antenna Port)	CDMA system: 24 dBm
Channel Spacing(s) / Bandwidth(s)	CDMA system: 1.23 MHz (Celluar band)
Designation of Emissions	CDMA system: 1M29F9W (Celluar band)

3.3 Antenna Gain

Antenna Gain(dBi)	3.5
-------------------	-----

3.4 Power Supply

Specification	Description
Power Supply Type	Directly Connected to DC /AC Power Supply
Input to EUT (DC power)	DC Voltage Nominal: $\approx$ +3.7V DC Voltage Range: $\approx$ +3.5 V to +4.2V
Input to EUT (AC power)	AC Voltage Nominal: ~ 220V (50/60 Hz) AC Voltage Range: ~ 100V-240V

4 General Test Conditions / Configurations

4.1 RF Channels under Test

Test Mode	TX / RX	RF Channel		
		Bottom (B)	Middle (M)	Top (T)
TM1/TM3	TX	Channel 25	Channel 450	Channel 875
		1711.25MHz	1732.5MHz	1753.75MHz
	RX	Channel 25	Channel 450	Channel 875
		2111.25MHz	2132.5MHz	2153.75MHz

4.2 Test Modes

Test Mode	Test Modes Description
TM1/TM3	CDMA2000 1x

4.3 Test Environments

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	3.5V
	VN	3.7V
	VH	4.2V

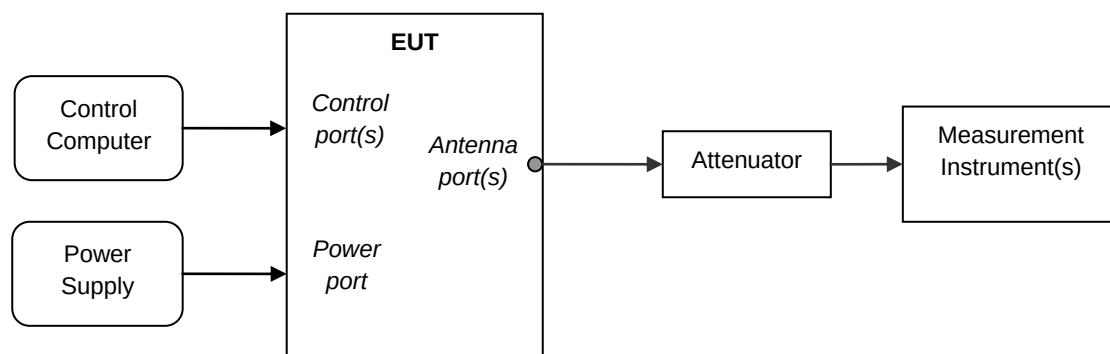
NOTE: VL= lower extreme test voltages
VN= nominal voltage
VH= upper extreme test voltage
TN= normal temperature

4.4 Test Setups

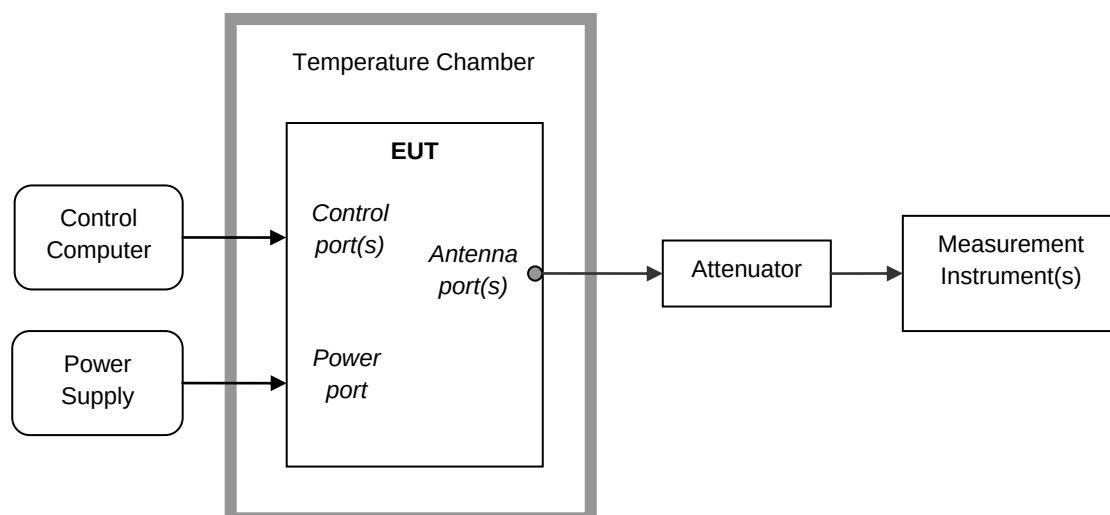
4.4.1 General Test Setup Configurations

Configuration	Description
Test Antenna Ports	Until otherwise declared, all TX tests are ONLY performed at the main Transmitter antenna port (e.g. TRXA, TXA and so on) of the EUT, and all RX tests are ONLY performed at the main Receiver antenna port (e.g. TRXA, RXA and so on) of the EUT.
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

4.4.2 Test Setup 1



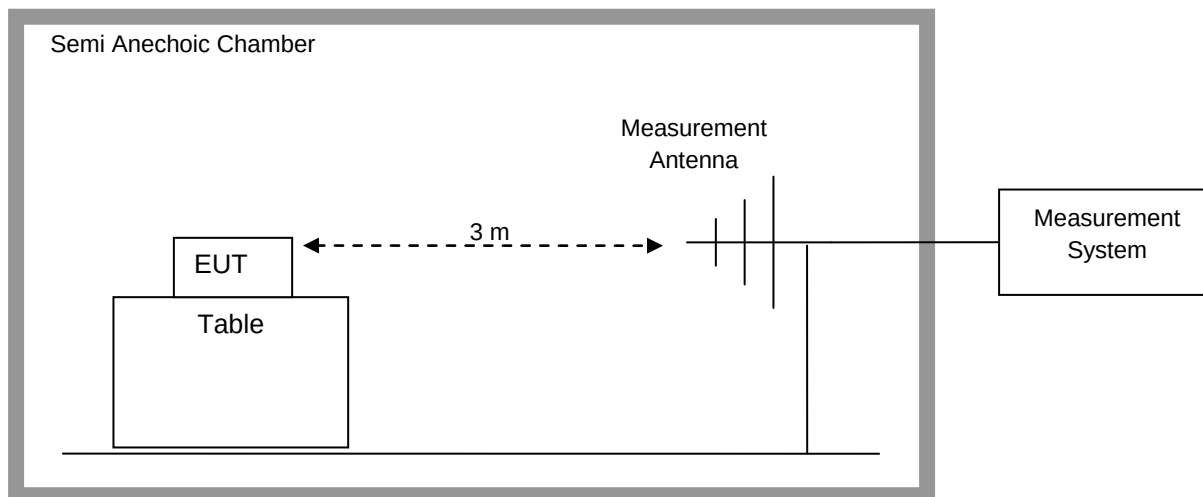
4.4.3 Test Setup 2



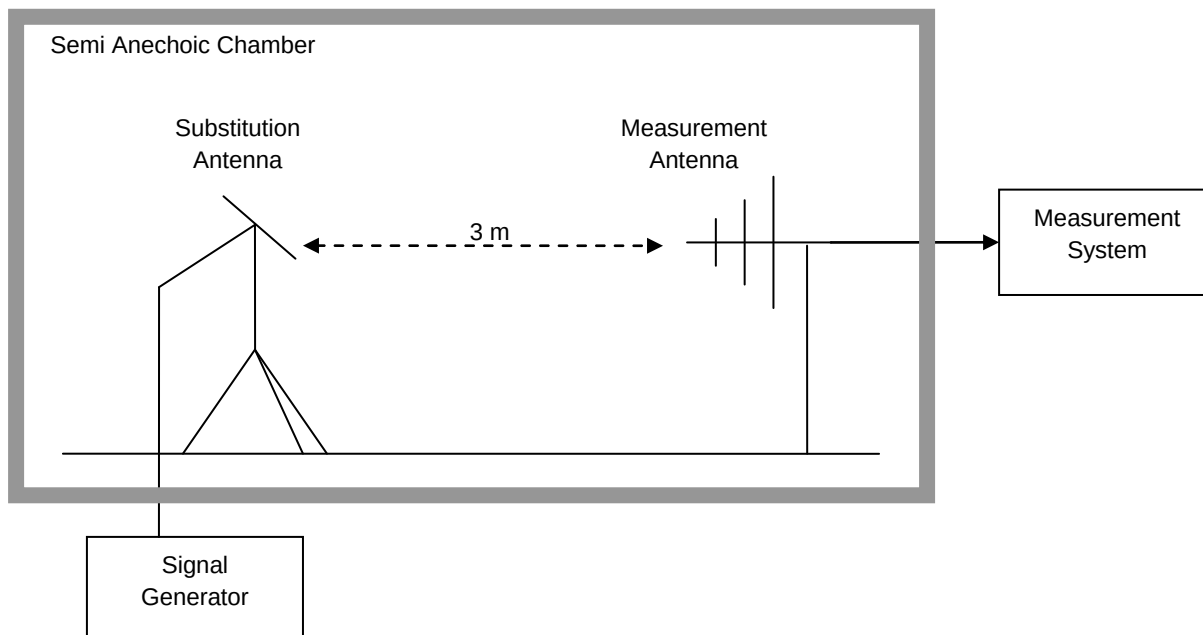
4.4.4 Test Setup 3

NOTE: Efficient Isotropic Radiated Power (EIRP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

Step 1: Pre-test



Step 2: Substitution method to verify the maximum EIRP



4.5 Test Conditions

Test Case	Test Conditions	
Transmitter Output Power	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1 & Test Setup 3
	Detector	RMS
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM3
Modulation Characteristics	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	RF Channels (TX)	M
	Test Mode	TM1/TM3
Occupied Bandwidth	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	PK
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM3
Band Edges Compliance	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	RMS
	RF Channels (TX)	B, T
	Test Mode	TM1/TM3
Spurious Emission at Antenna Terminals	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	PK
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM3
Field Strength of Spurious Radiation	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 3
	Detector	PK
	RF Channels (TX)	M
	Test Mode	TM1/TM3
Frequency Stability	Test Configuration	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) 85%, 100% and 115% of Rated Voltage at Ambient Temperature.
	Test Setup	Test Setup 2



Test Case	Test Conditions	
	RF Channels (TX)	M
	Test Mode	TM1/TM3

5 Main Test Instruments

Table 2 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sep.27,2012
Universal Radio Communication Tester	R&S	CMU200	117341	Jan.12.2013
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug.31,2012
Spectrum Analyzer	Agilent	E4440A	MY49420179	Jul.17,2012
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2012
Temperature Chamber	WEISS	WKL64	24600294	Feb.13,2013
Signal generator	Agilent	E8257D	MY49281095	Jul.09.2012
Test receiver	R&S	ESU26	100150	May.29.2012
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	919/1009	Jan.29.2013
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	Jan.29.2013
Horn Antenna	R & S	HF906	100683	May.14, 2013
Horn Antenna	R & S	HF906	100684	Jul.01, 2012
Broadband Antenna	Schwarzbeck	VULB 9163	9163-357	May.14, 2013
Broadband Antenna	Schwarzbeck	VULB 9163	9163-356	May.14, 2013

6 Test Results

No.	Test Item	Test Result
1	Transmitter Output Power	Appendix A
2	Modulation Characteristics	Appendix B
3	Occupied Bandwidth	Appendix C
4	Band Edges Compliance	Appendix D
5	Spurious Emission at Antenna Terminals	Appendix E
6	Field Strength of Spurious Radiation	Appendix F
7	Frequency Stability	Appendix G
8	Photos of Radiated Spurious Emissions	Appendix H

NOTE: The Appendix H only photos of Radiated Spurious Emissions, no test data.

7 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:

Test Item		Extended Uncertainty
Transmitter Output Power	Power (dBm)	U =0.39 dB
Occupied Bandwidth	Magnitude (%)	U=0.2%
Band Edge Compliance	Disturbance Power (dBm)	U=2.0 dB
Conducted Spurious Emissions	Disturbance Power (dBm)	U=2.0 dB
Field Strength of Spurious Radiation	ERP (dBm)	U=4.6 dB (30 MHz – 1GHz) U=3.0 dB (above 1 GHz)
Frequency Stability	Frequency Accuracy (ppm)	U=0.21 ppm

-----The END-----



Appendix A

Transmitter Output Power According to FCC Part 2.1046 & Part 27.50



Conducted Power of Transmitter

Measurement Results

TEST CONDITIONS (TN/VN)	RF Output Power(Conducted)					
	Channel 25(B) 1711.25MHz		Channel 450(M) 1732.50MHz		Channel 875(T) 1753.75MHz	
	dBm		dBm		dBm	
	Measured	Limit	Measured	Limit	Measured	Limit
TM1	24.76	30.0	25.03	30.0	25.06	30.0
TM3	24.82	30.0	24.97	30.0	25.01	30.0

Peak-to-Average Ratio

Measurement Results(CDMA)

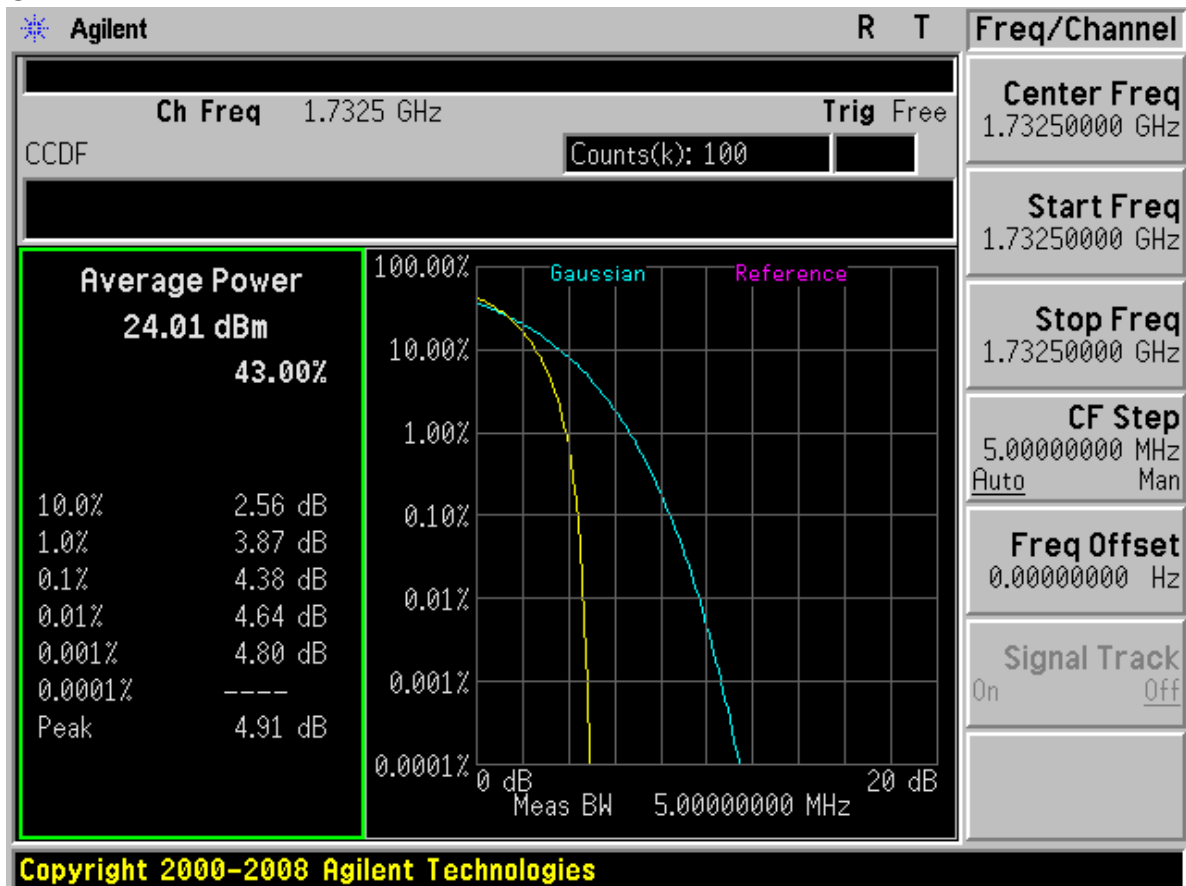
TEST CONDITIONS (TN/VN)						
	Channel 25(B) 1711.25MHz		Channel 450(M) 1732.50MHz		Channel 875(T) 1753.75MHz	
	dB		dB		dB	
	Measure d	Limit	Measure d	Limit	Measure d	Limit
TM1	4.58	13.0	4.61	13.0	4.33	13.0
TM3	4.56	13.0	4.64	13.0	4.51	13.0



Test Plot of Peak-to-Average Ratio

Note: All relevant operation modes have been tested, and the worst case Plot is included in this report.

CDMA





Effective Isotropic Radiated Power of Transmitter (EIRP)

Substitution Results

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP) [dBm]	FCC limit [dBm]	Result
TM1	1711.25	28.26	Horn Ant.	24.81	4.5	1	28.31	30	Pass
TM1	1732.5	28.53	Horn Ant.	25.05	4.5	1	28.55	30	Pass
TM1	1753.75	28.56	Horn Ant.	21.82	4.8	1	25.62	30	Pass
TM3	1711.25	28.32	Horn Ant.	24.93	4.5	1	28.43	30	Pass
TM3	1732.5	28.47	Horn Ant.	21.06	4.5	1	24.56	30	Pass
TM3	1753.75	28.51	Horn Ant.	24.74	4.8	1	28.54	30	Pass

Note: a, For getting the EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should take to calculate it,

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b, SGP=Signal Generator Level

-----The END-----



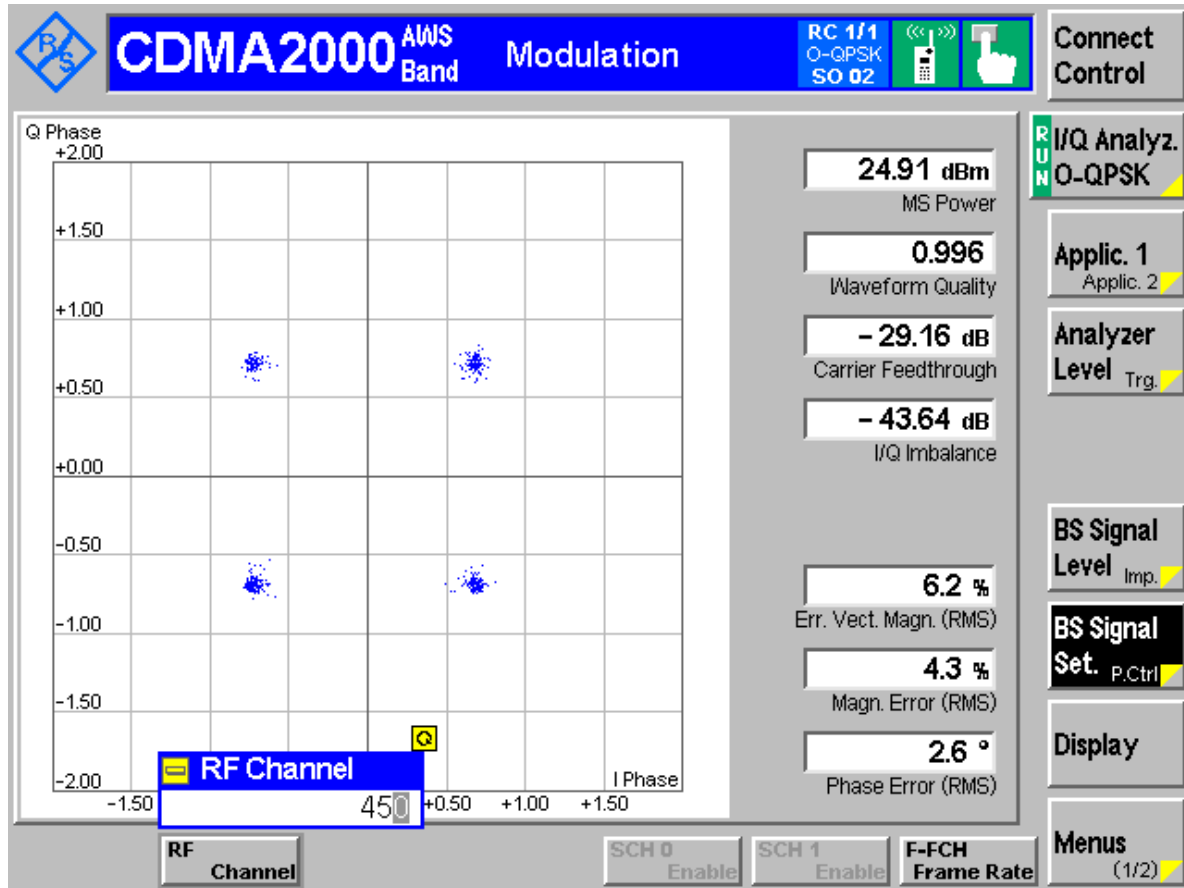
Appendix B

Modulation Characteristics

According to FCC Part 2.1047& Part 27 Subpart E

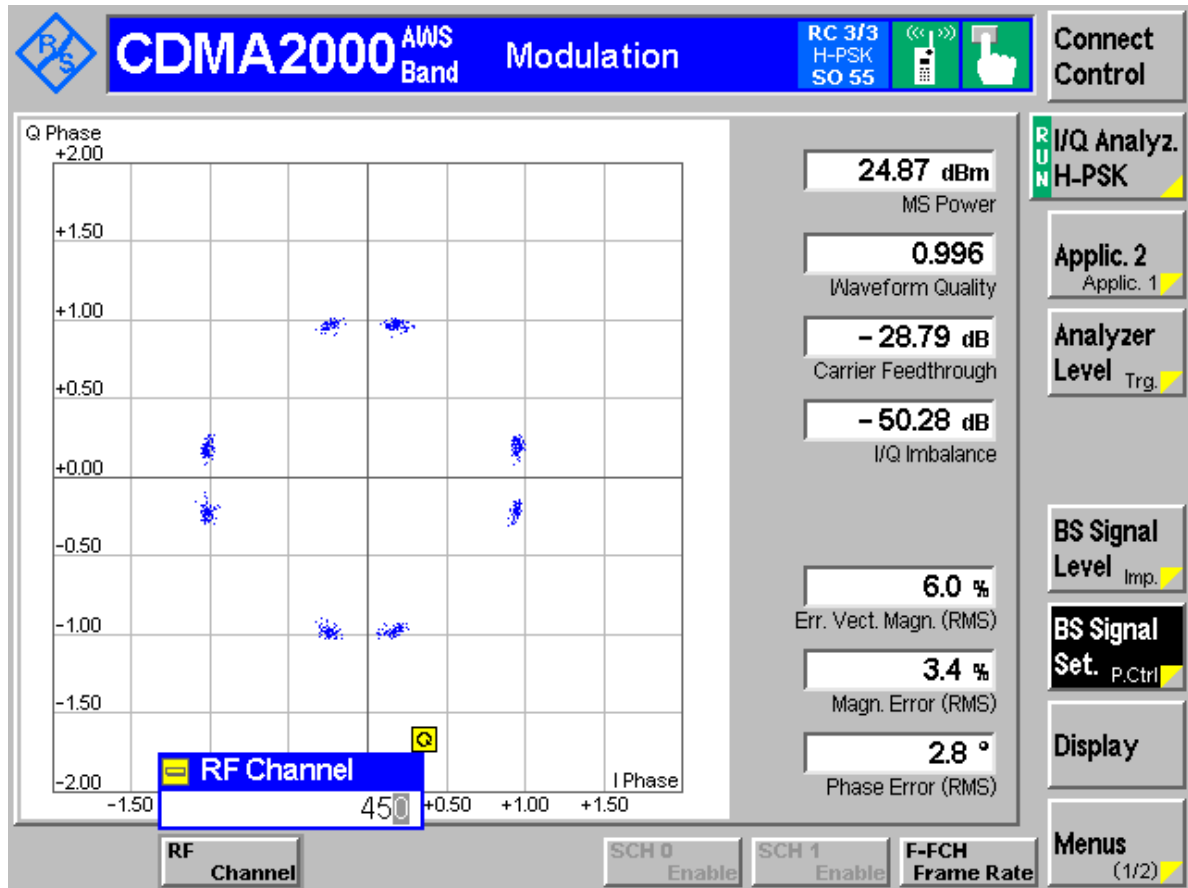


Channel 450 (TM1)





Channel 450 (TM3)



-----The END-----

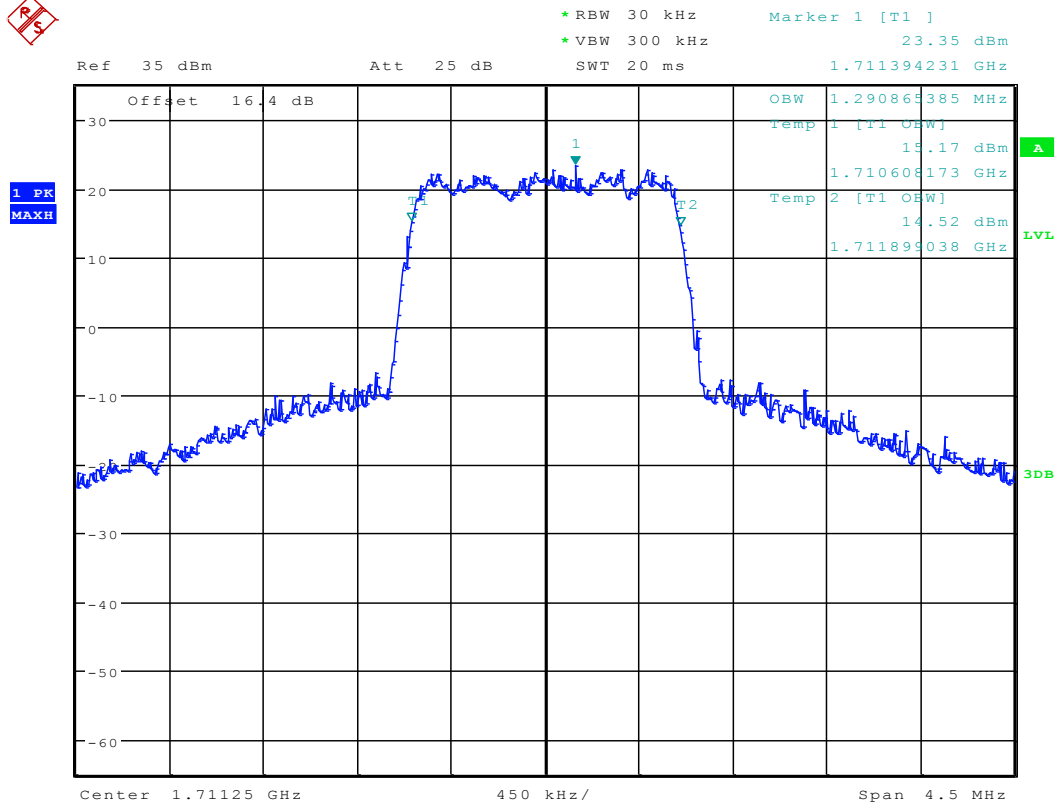


Appendix C

Occupied Bandwidth According to FCC part 2.1049 & Part 27 Subpart E



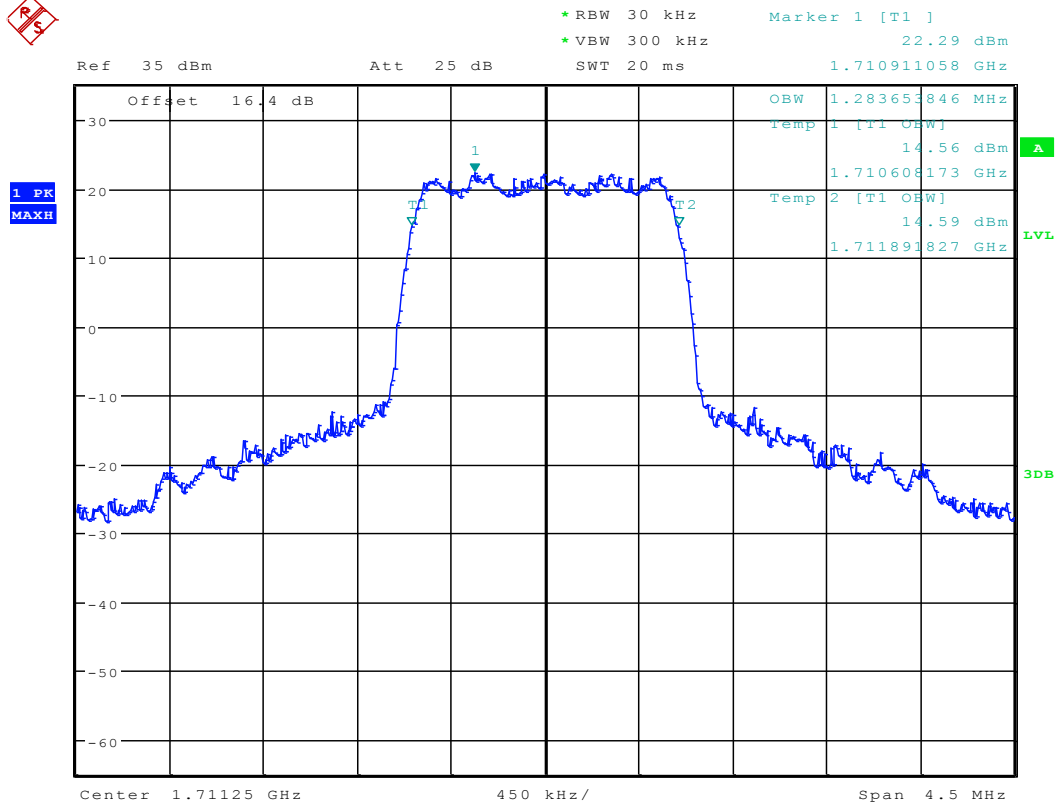
Channel 25 (TM1)



Date: 10.MAY.2012 11:59:29



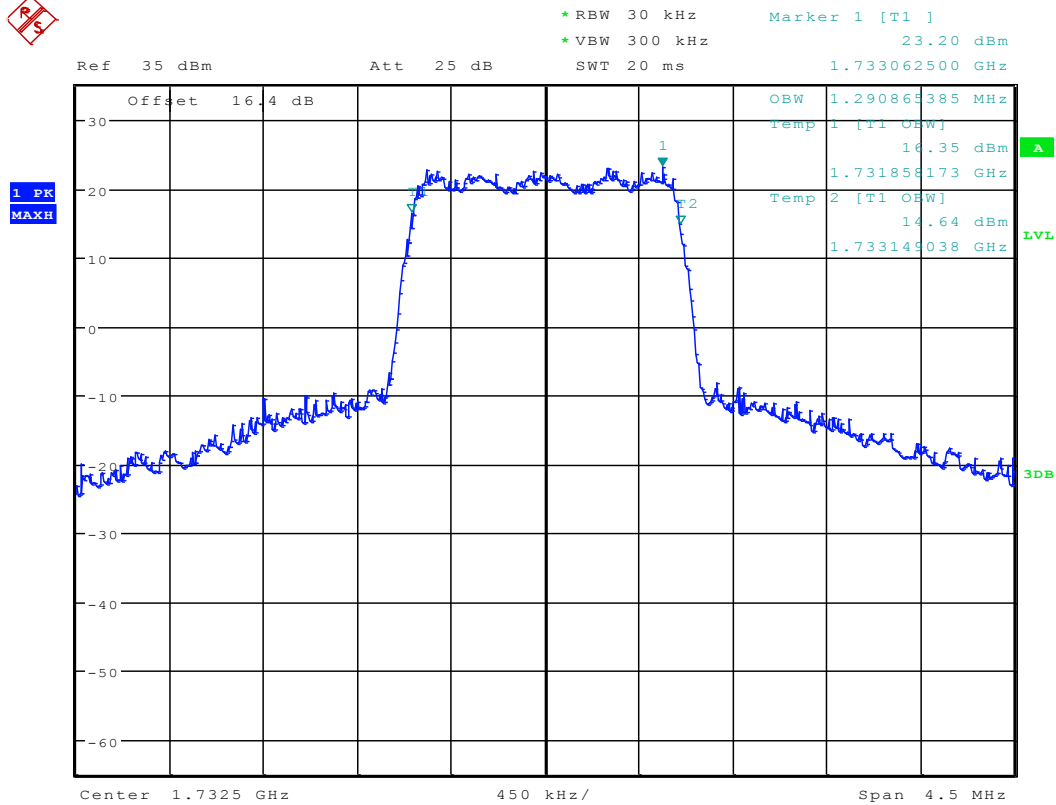
Channel 25 (TM3)



Date: 10.MAY.2012 12:00:12



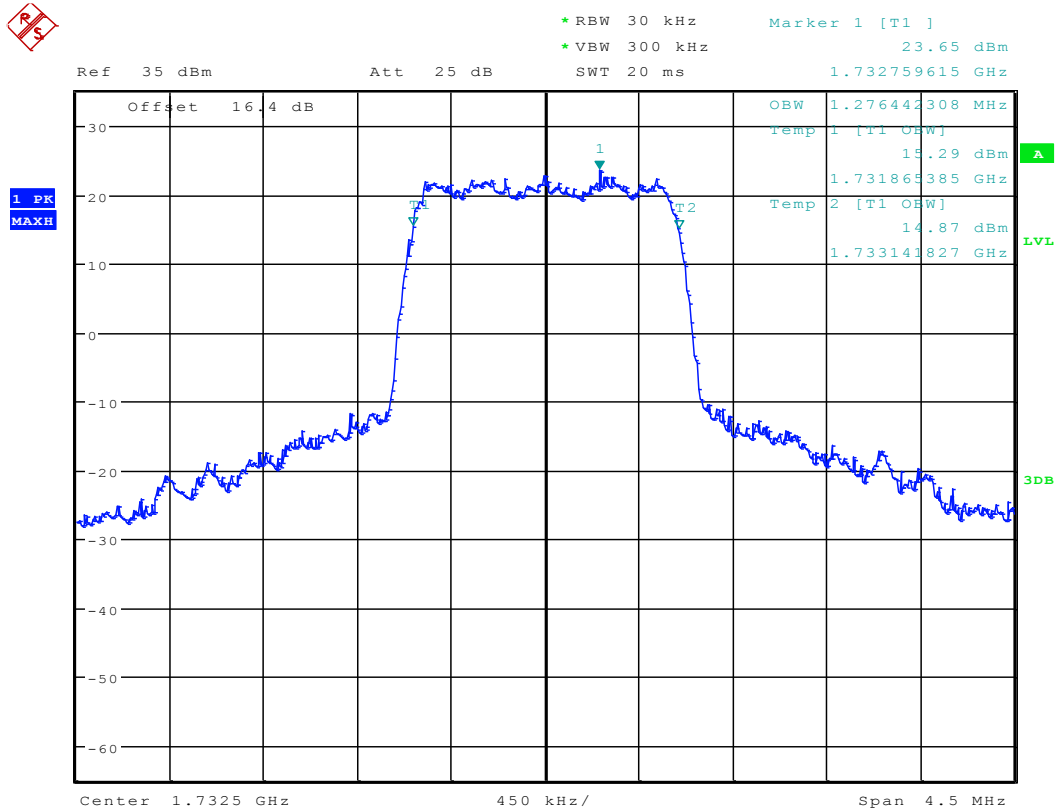
Channel 450(TM1)



Date: 10.MAY.2012 11:59:43



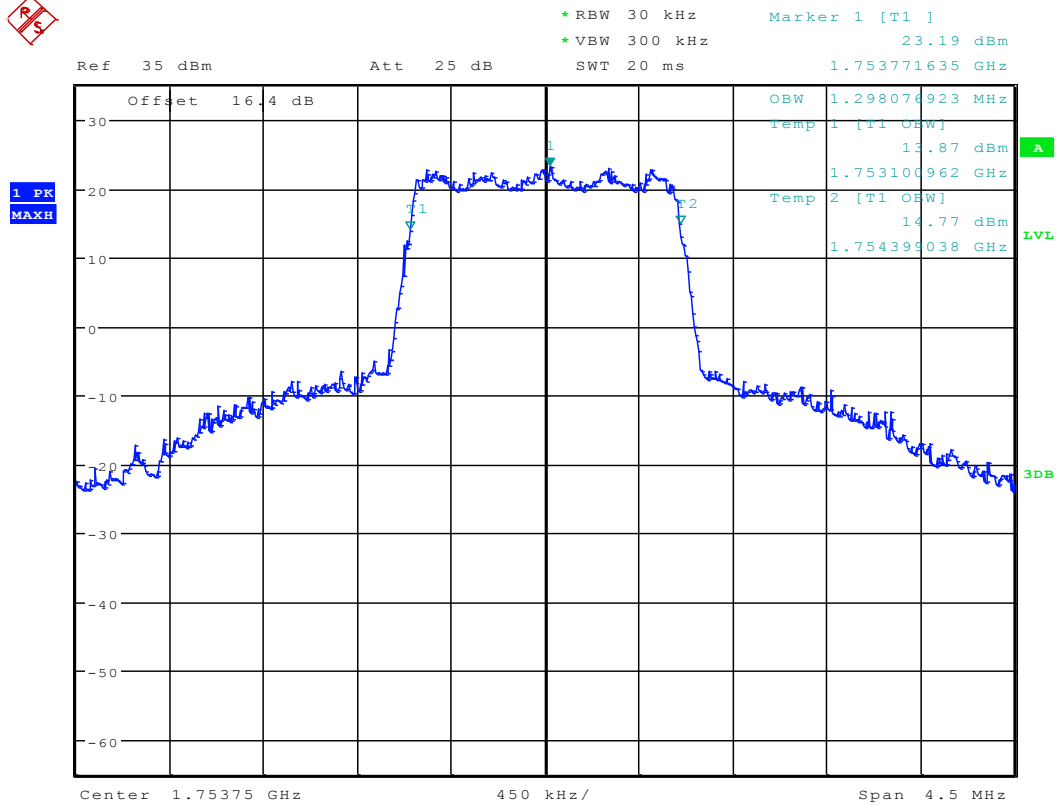
Channel 450(TM3)



Date: 10.MAY.2012 12:00:26



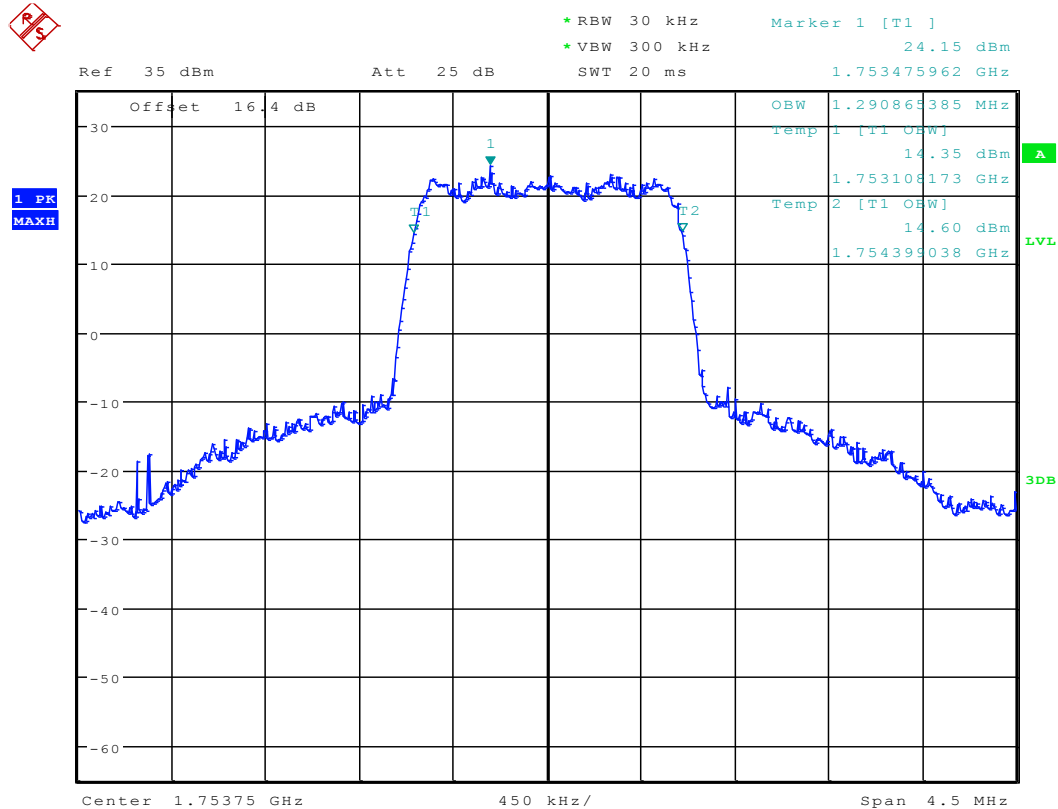
Channel 875(TM1)



Date: 10.MAY.2012 11:59:57



Channel 875(TM3)



Date: 10.MAY.2012 12:00:40

-----The END-----



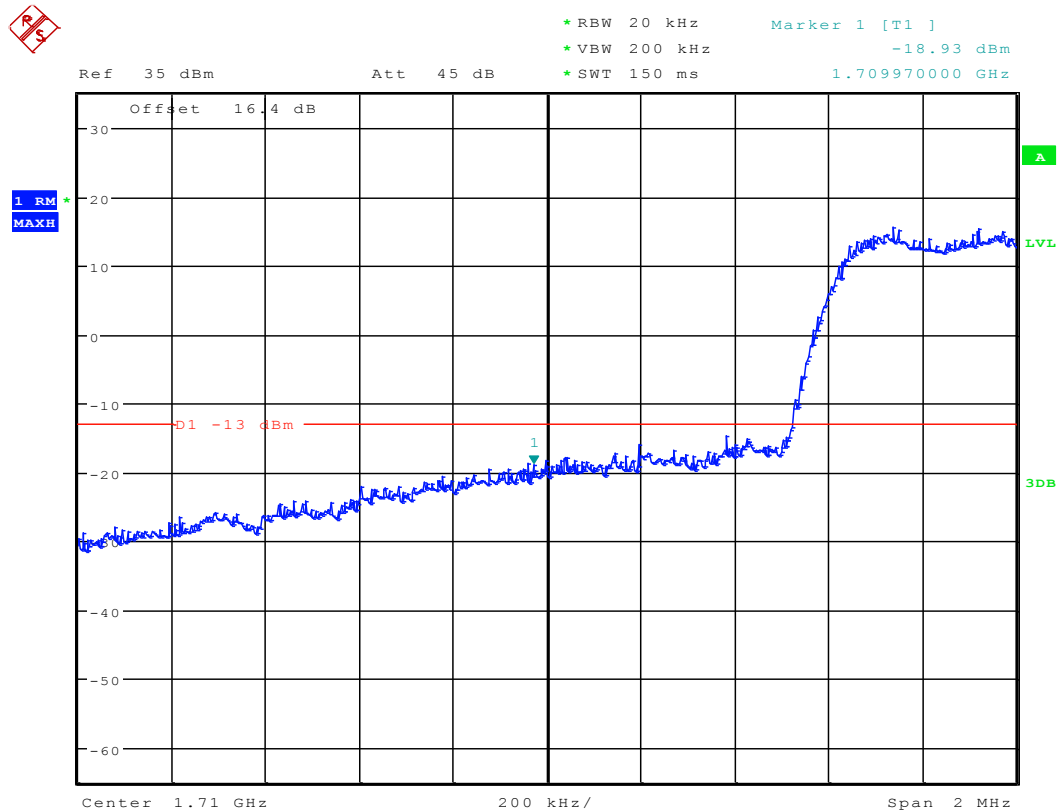
Appendix D

Band Edges Compliance According to FCC Part 2.1051 & 27.53(g)



TM1

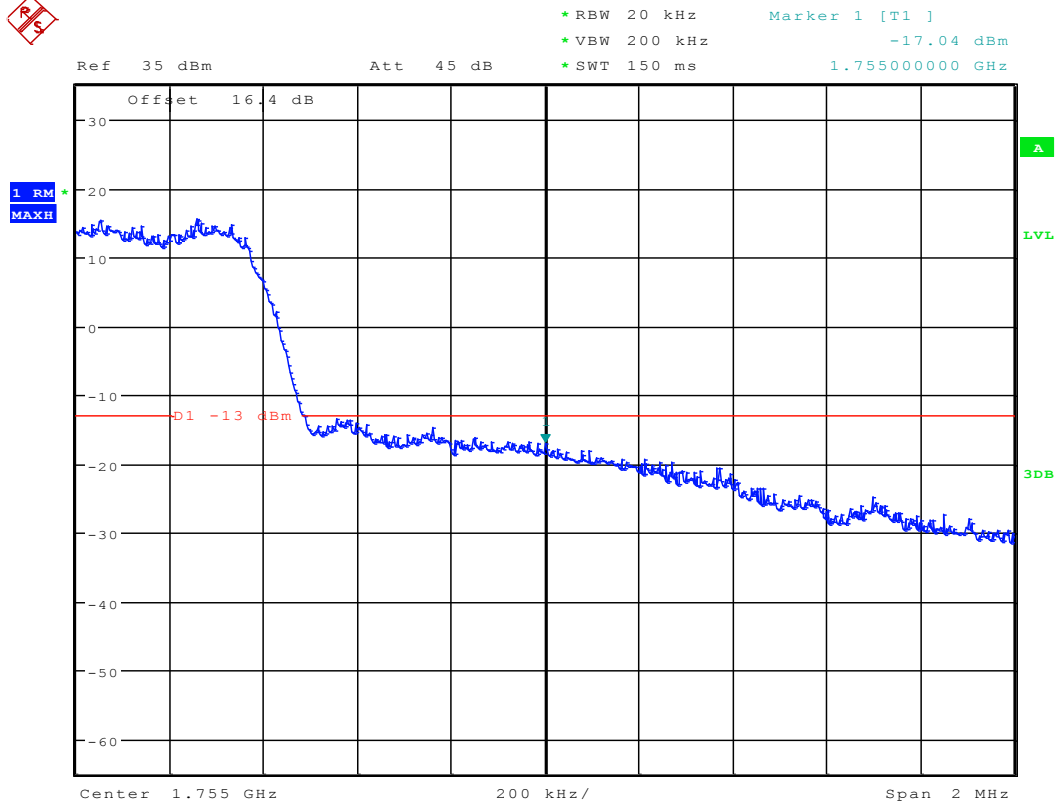
Left Edge (1710 MHz) Channel 25



Date: 10.MAY.2012 12:08:25



Right Edge (1755MHz) Channel 875

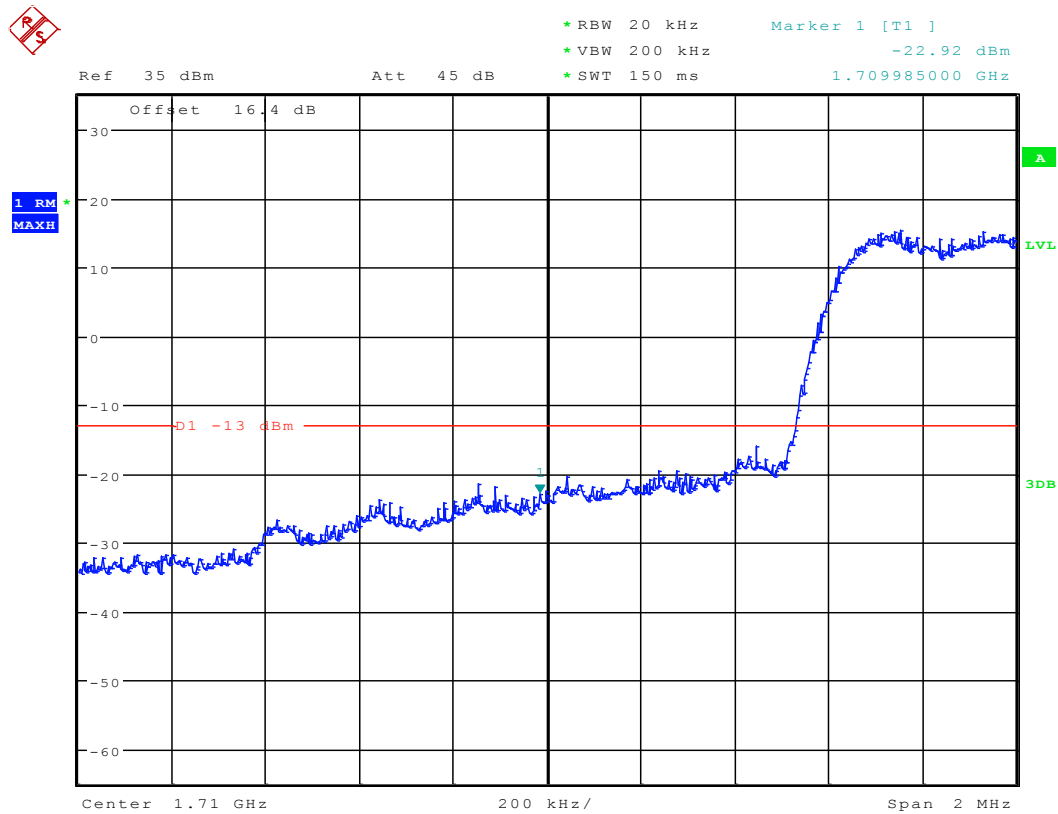


Date: 10.MAY.2012 12:08:39



TM3

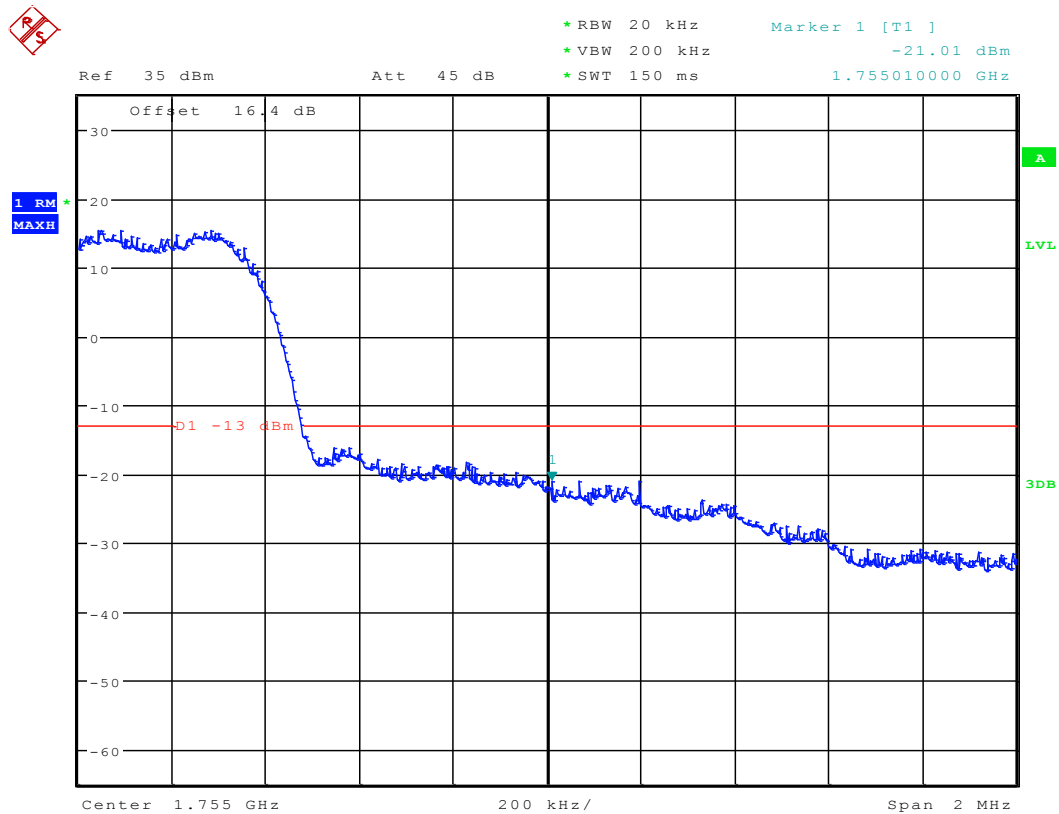
Left Edge (1710 MHz) Channel 25



Date: 10.MAY.2012 12:08:55



Right Edge (1755MHz) Channel 875



Date: 10.MAY.2012 12:09:09

-----The END-----



Appendix E

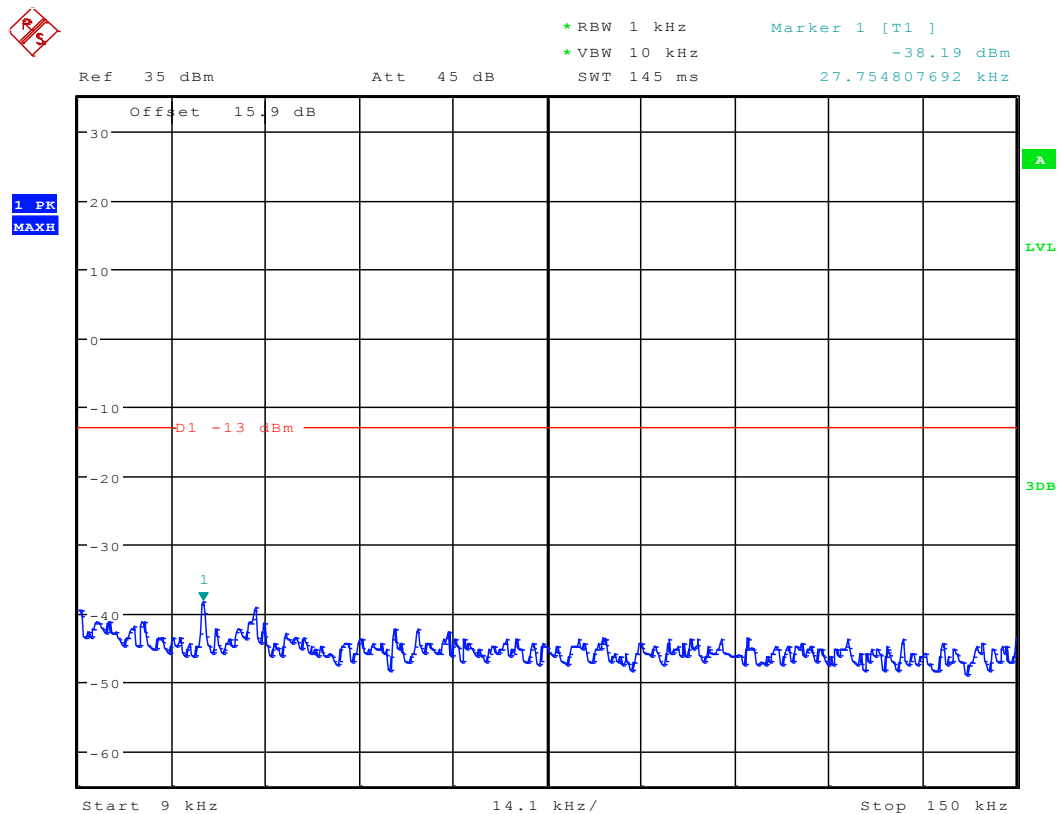
Spurious Emission at Antenna Terminal

According to FCC Part 2.1051 & 27.53(g)

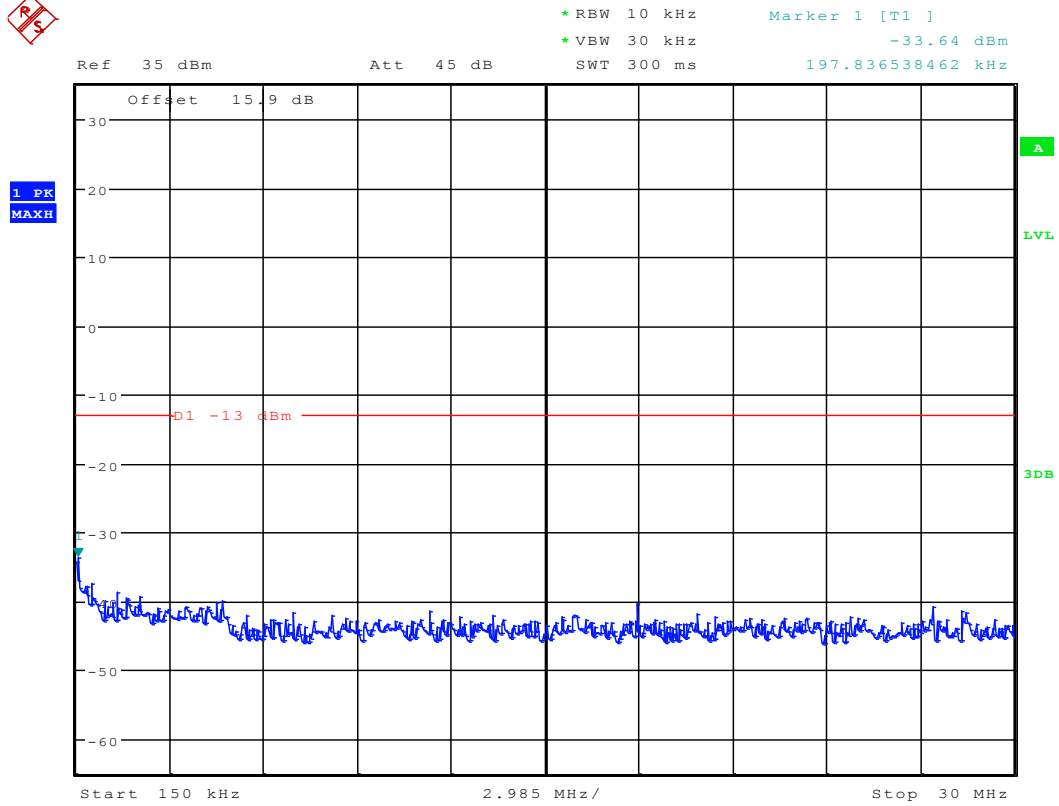


TM1

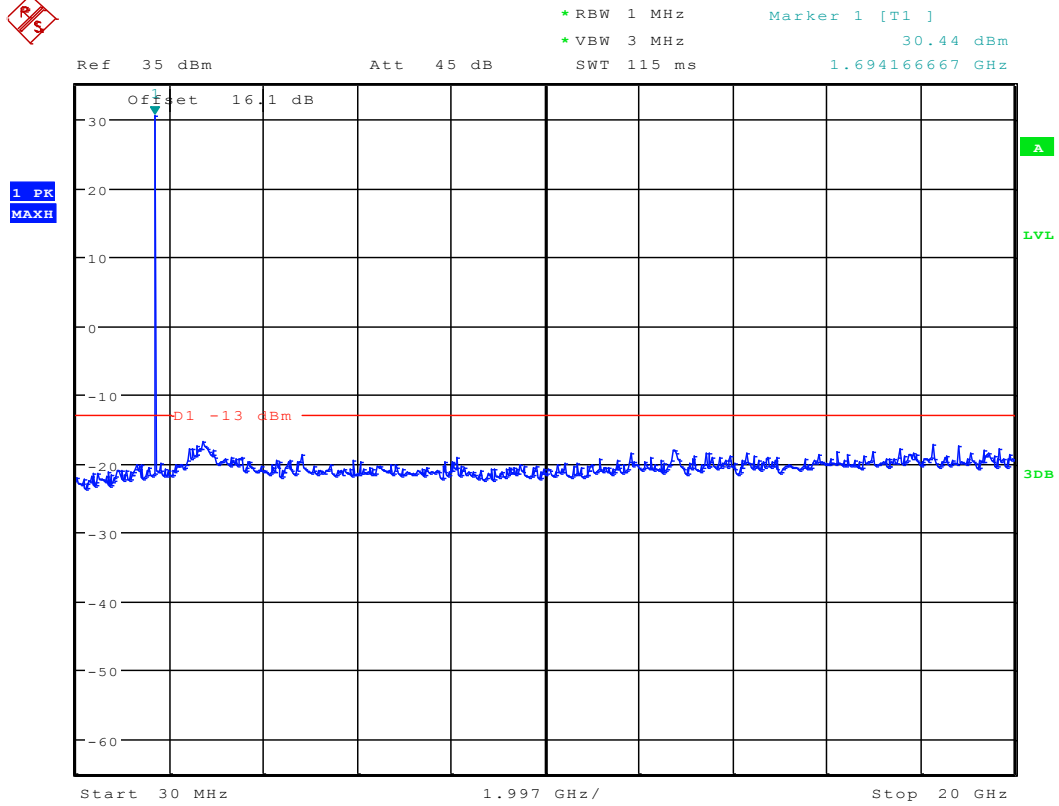
Channel 25



Date: 10.MAY.2012 12:00:50



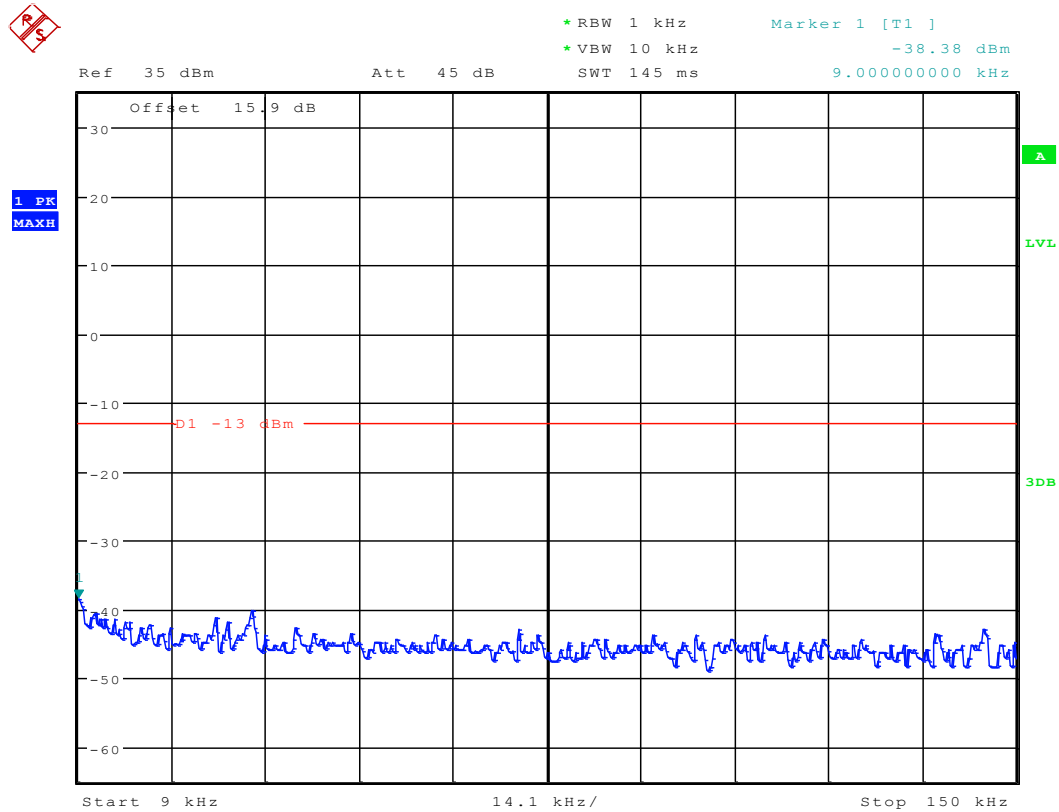
Date: 10.MAY.2012 12:01:16



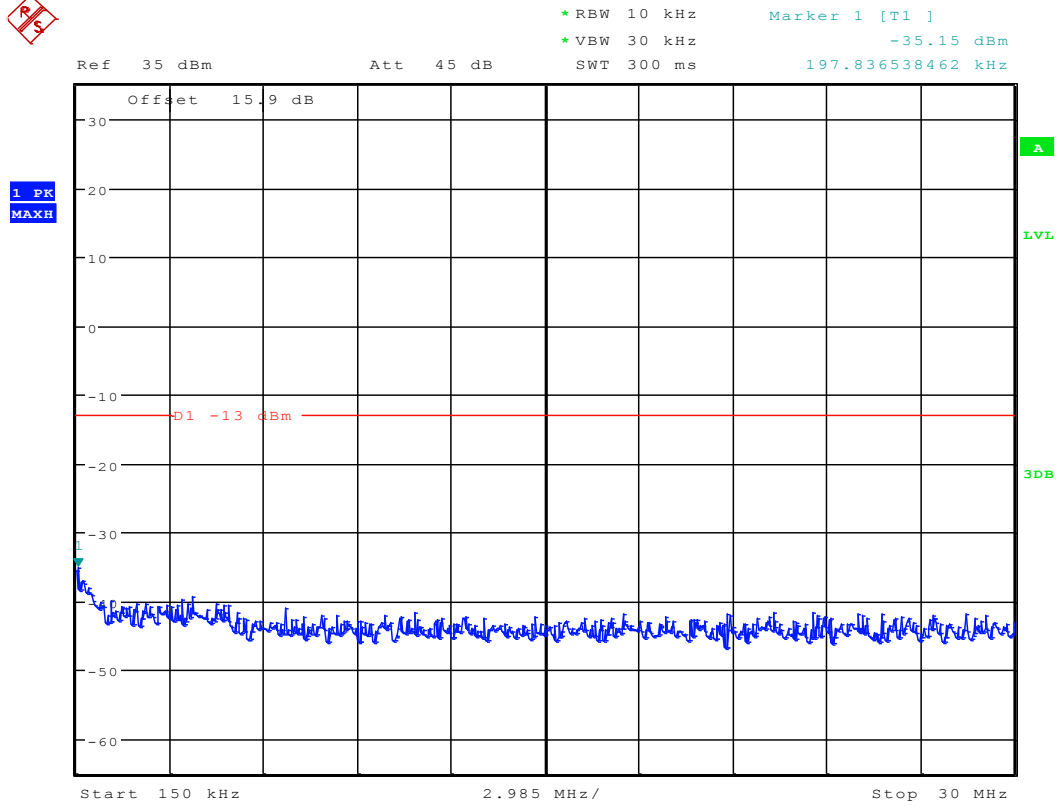
Date: 10.MAY.2012 12:01:42



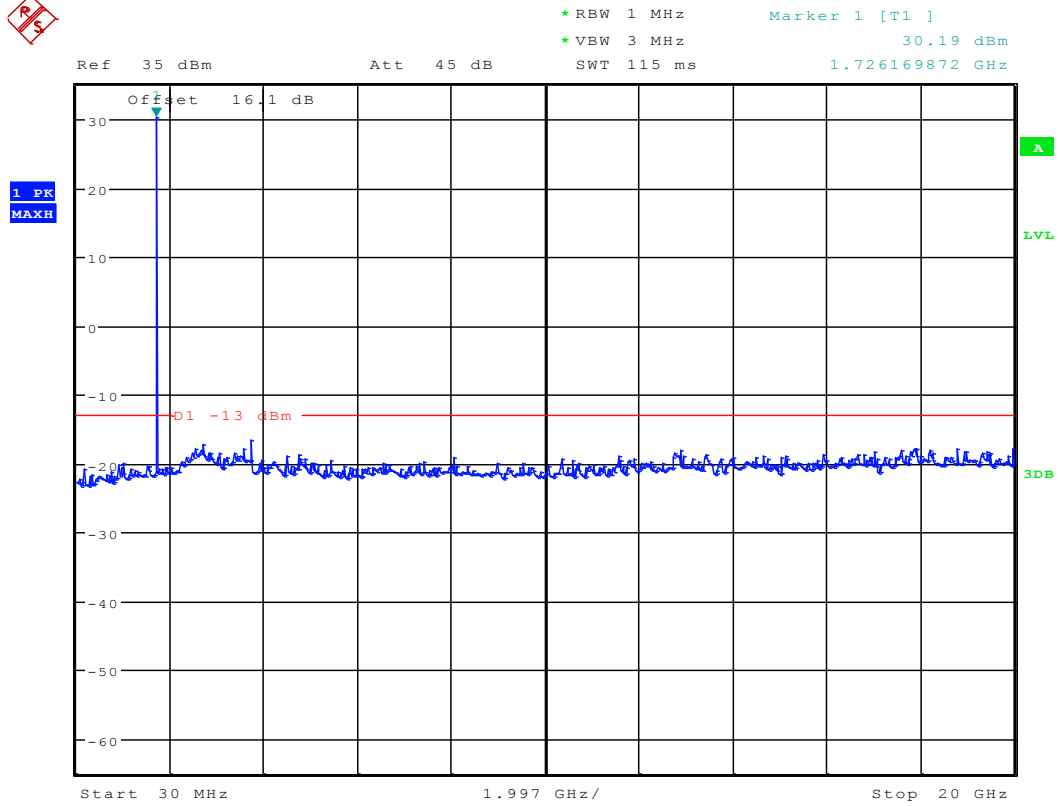
Channel 450



Date: 10.MAY.2012 12:00:59



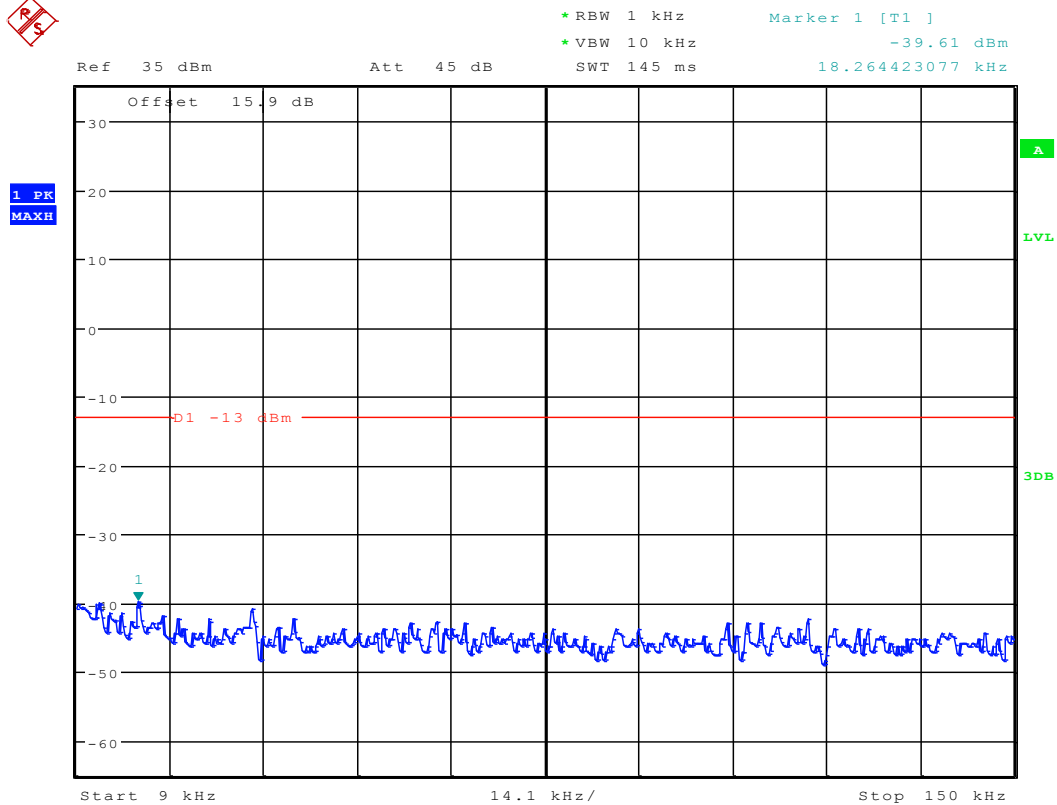
Date: 10.MAY.2012 12:01:24



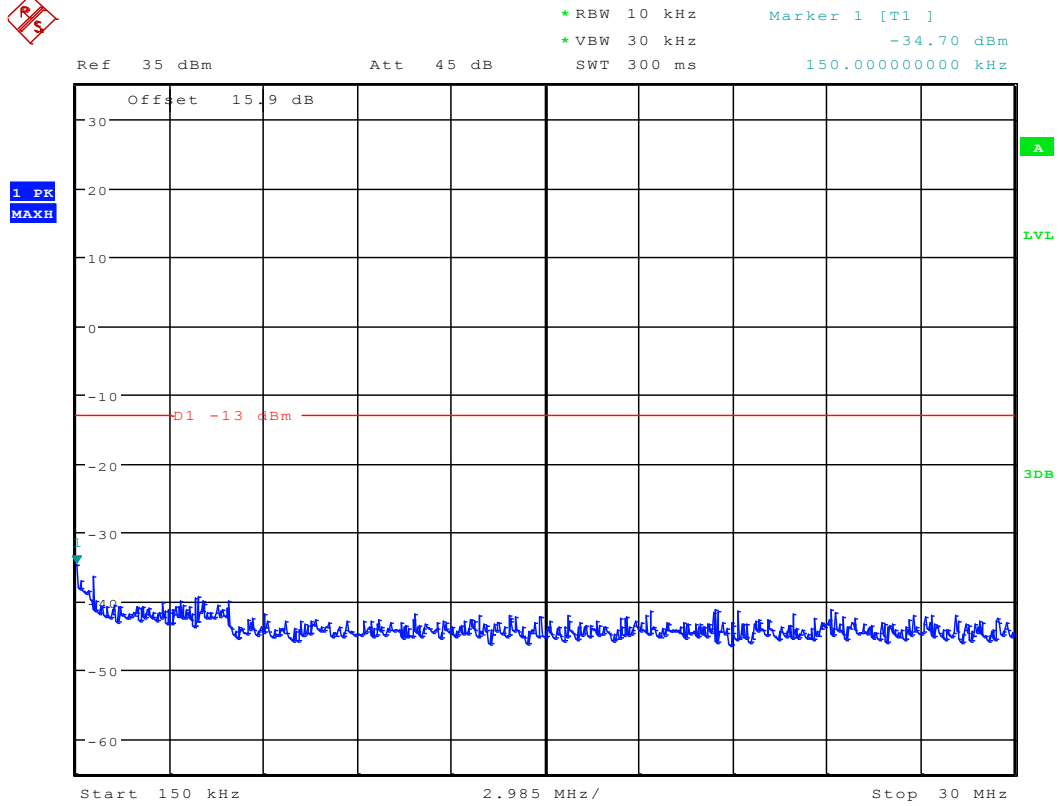
Date: 10.MAY.2012 12:01:50



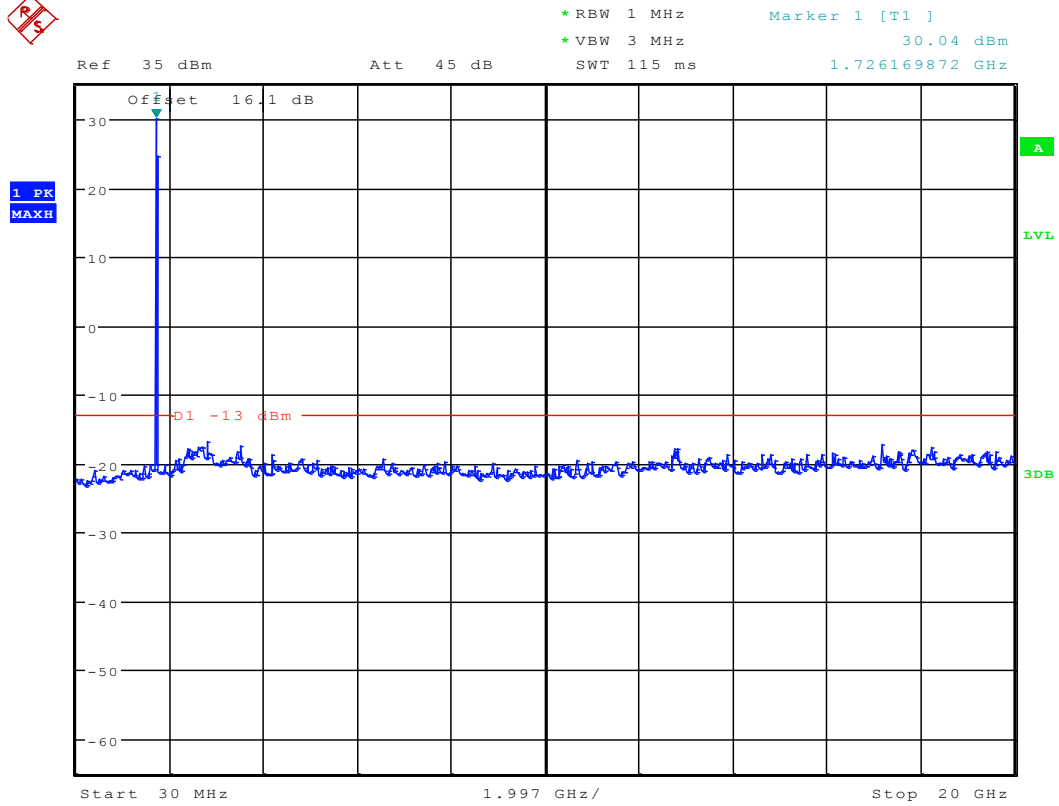
Channel 875



Date: 10.MAY.2012 12:01:07



Date: 10.MAY.2012 12:01:33

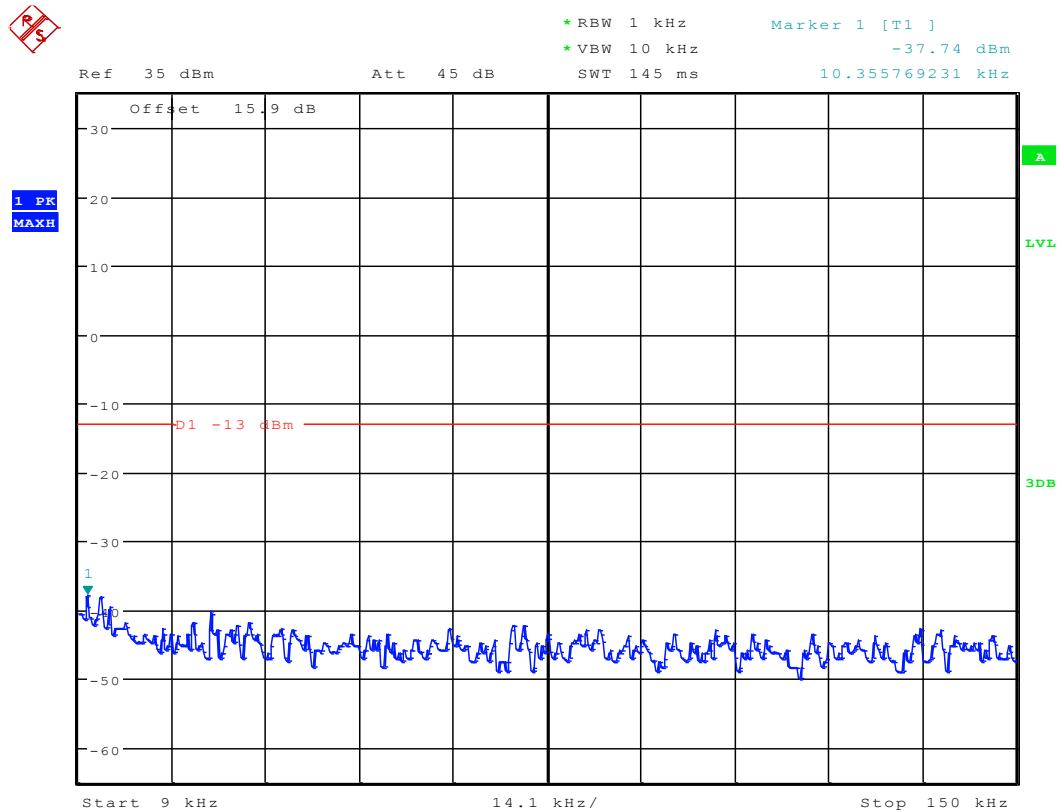


Date: 10.MAY.2012 12:01:59

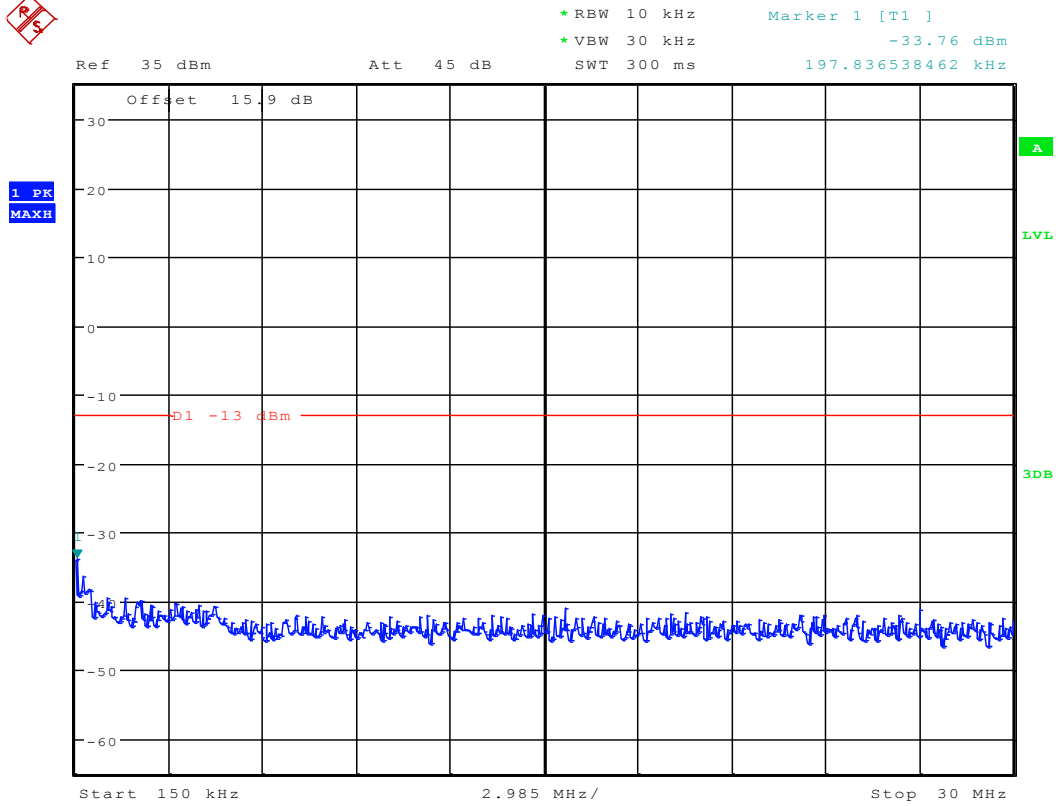


TM3

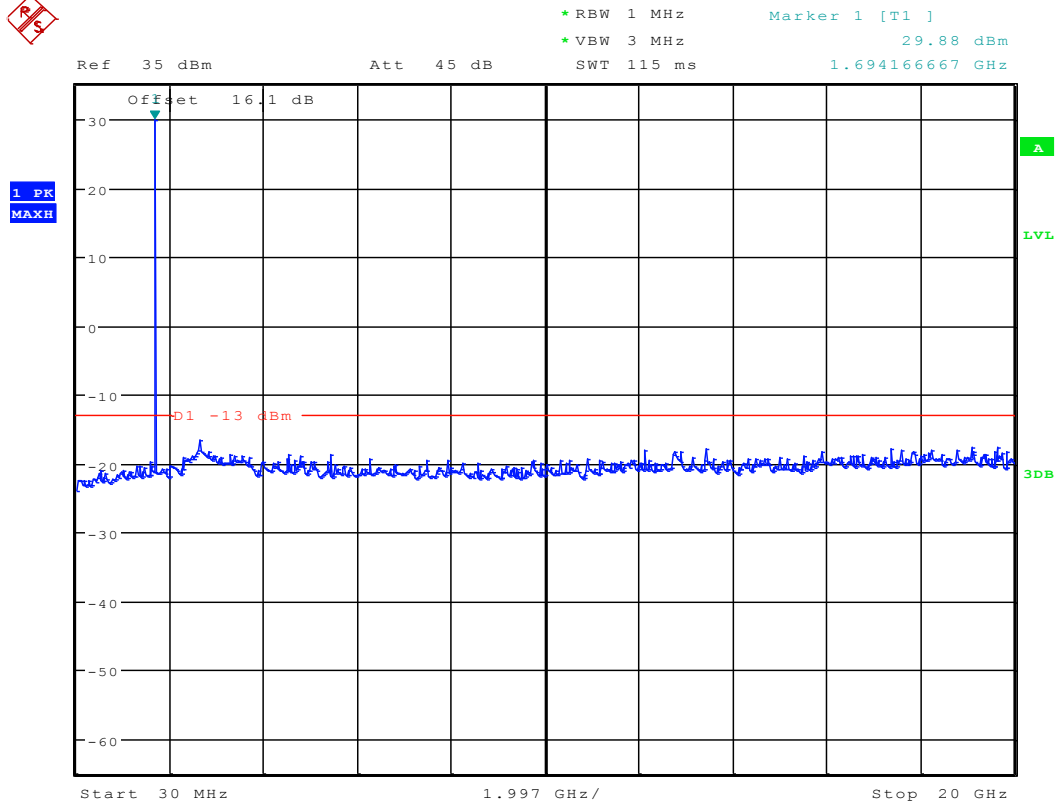
Channel 25



Date: 10.MAY.2012 12:02:09



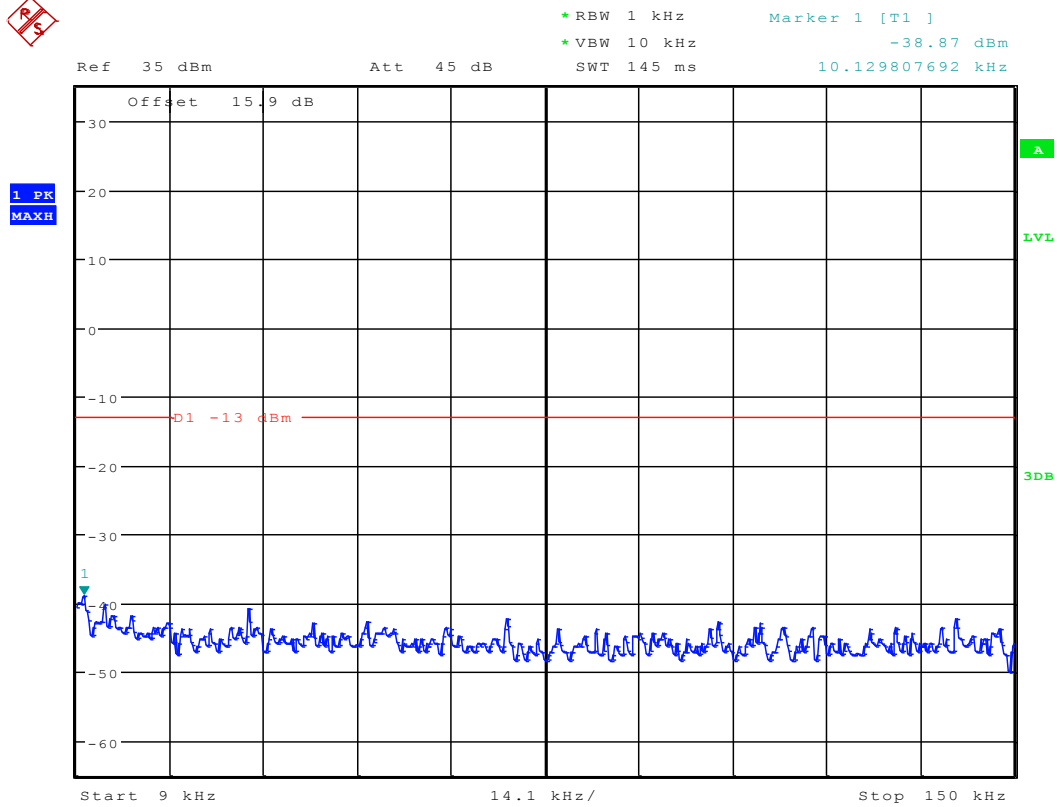
Date: 10.MAY.2012 12:02:34



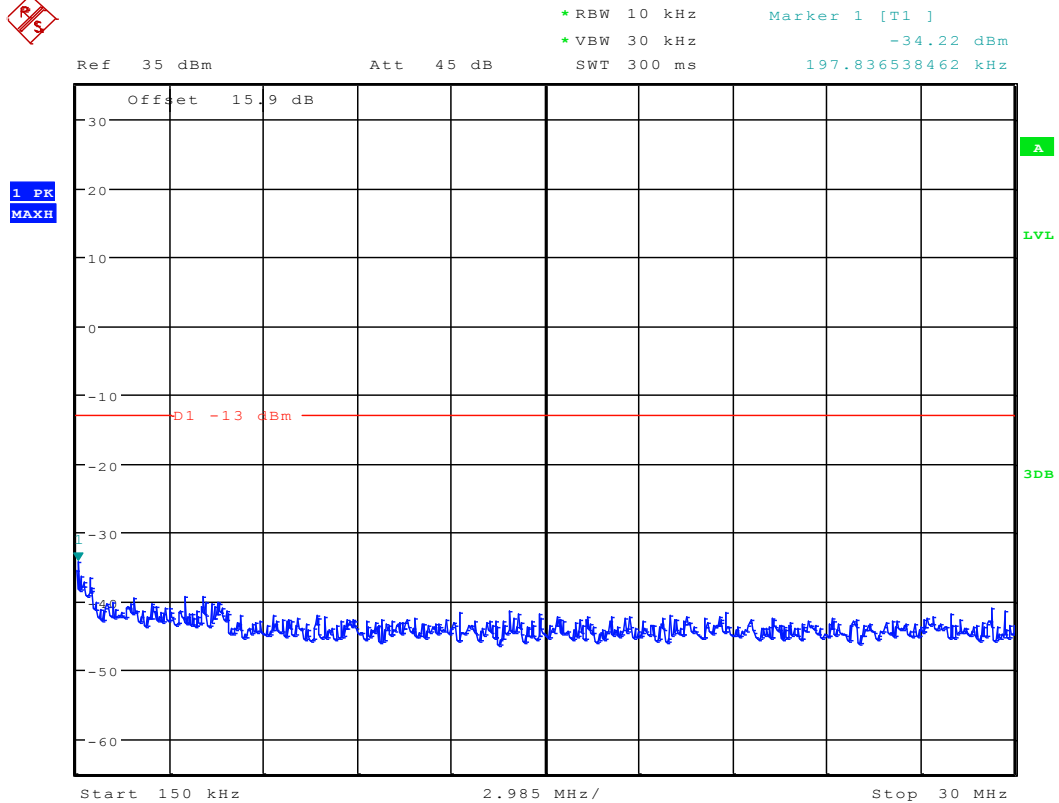
Date: 10.MAY.2012 12:03:00



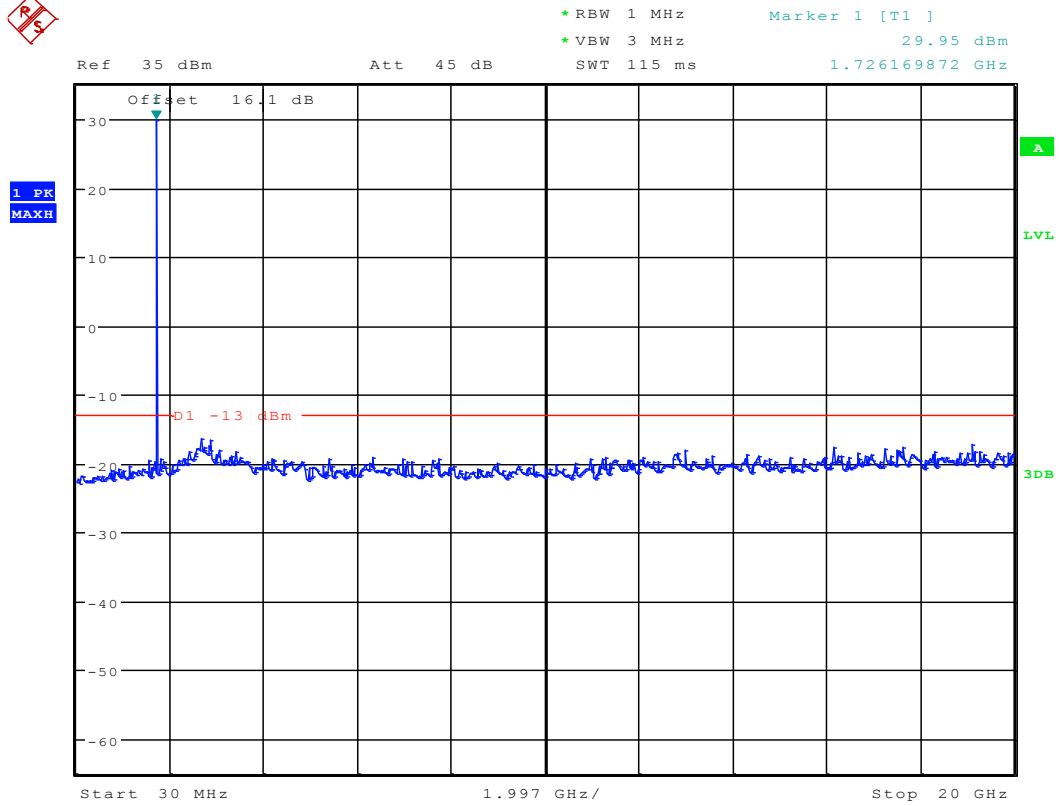
Channel 450



Date: 10.MAY.2012 12:02:17



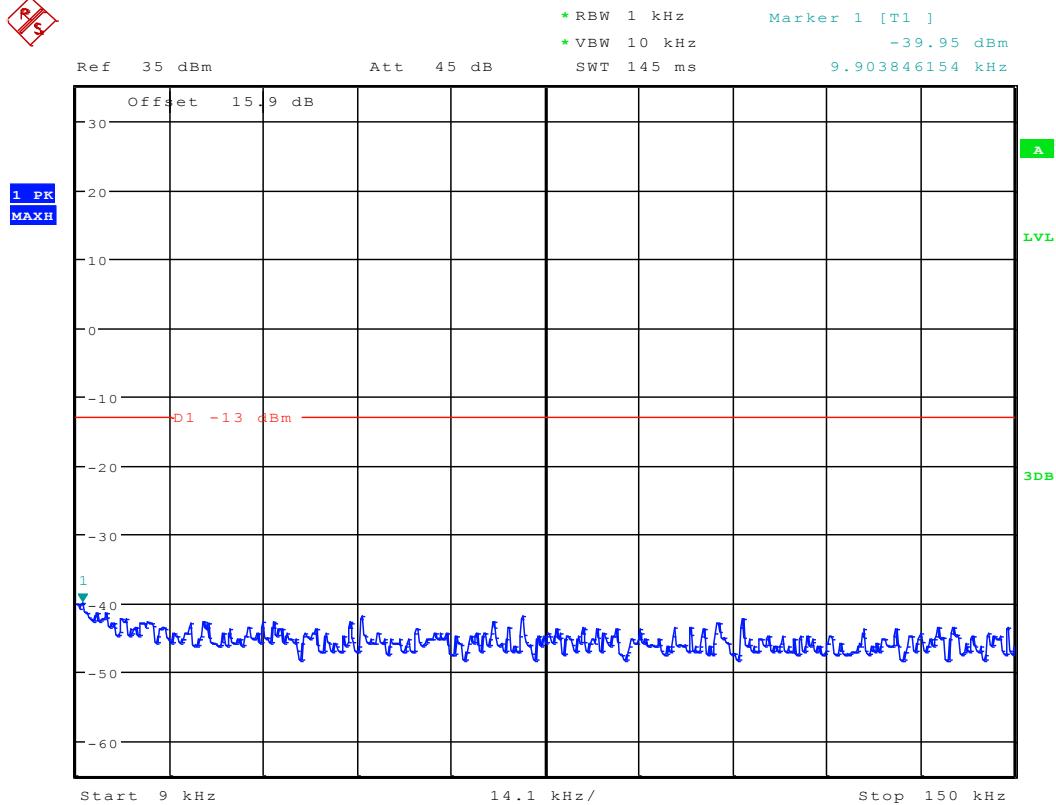
Date: 10.MAY.2012 12:02:43



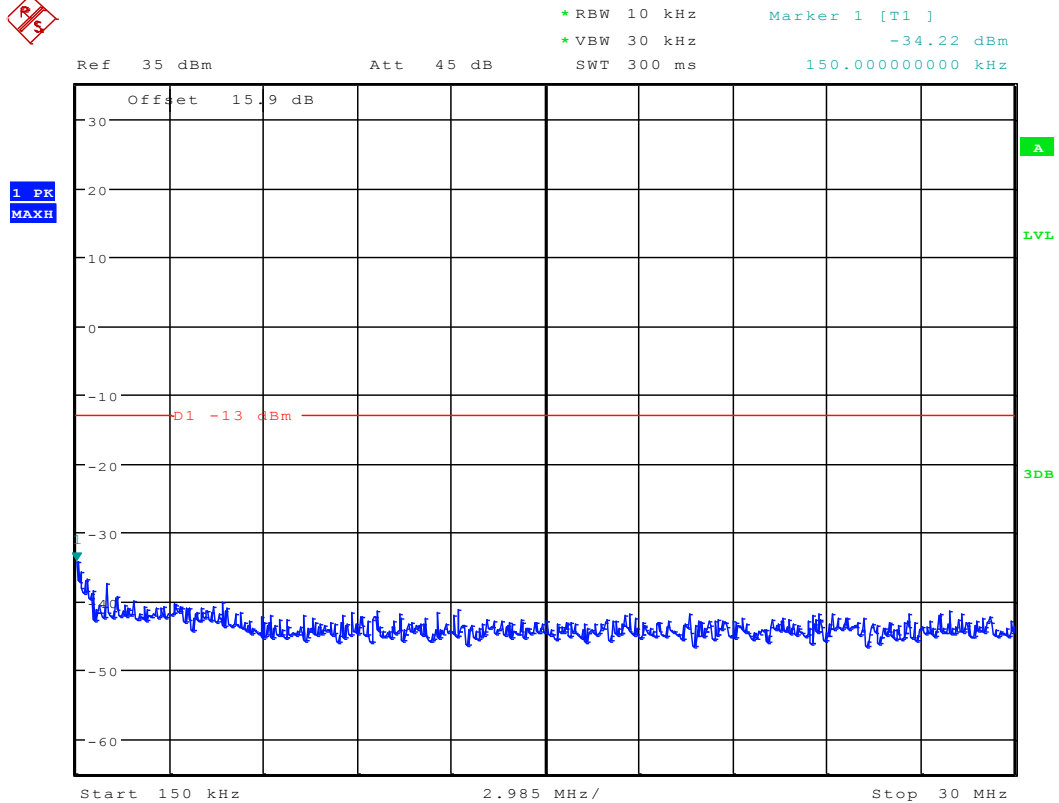
Date: 10.MAY.2012 12:03:09



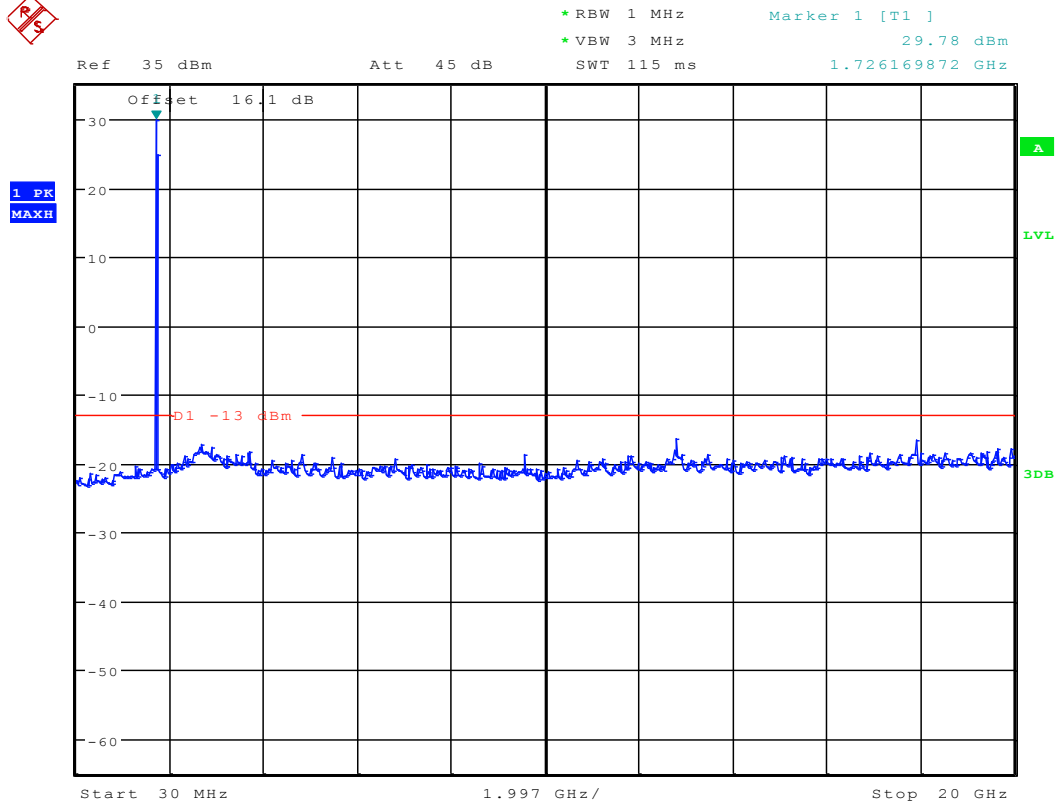
Channel 875



Date: 10.MAY.2012 12:02:26



Date: 10.MAY.2012 12:02:51



Date: 10.MAY.2012 12:03:17

-----The END-----

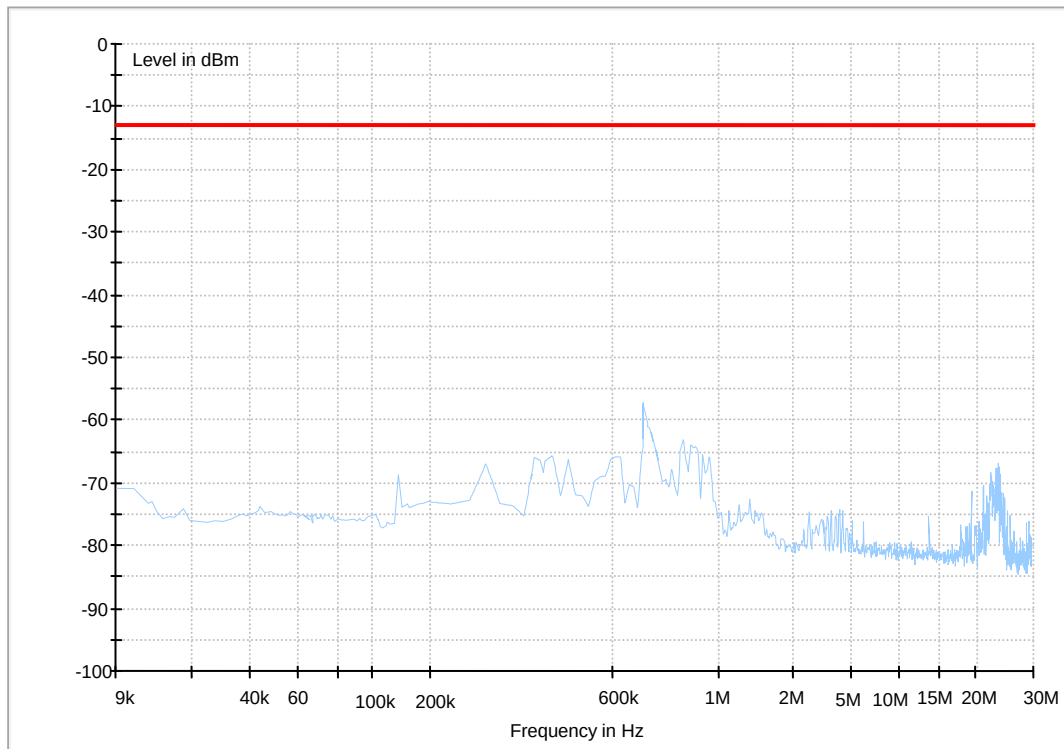


Appendix F

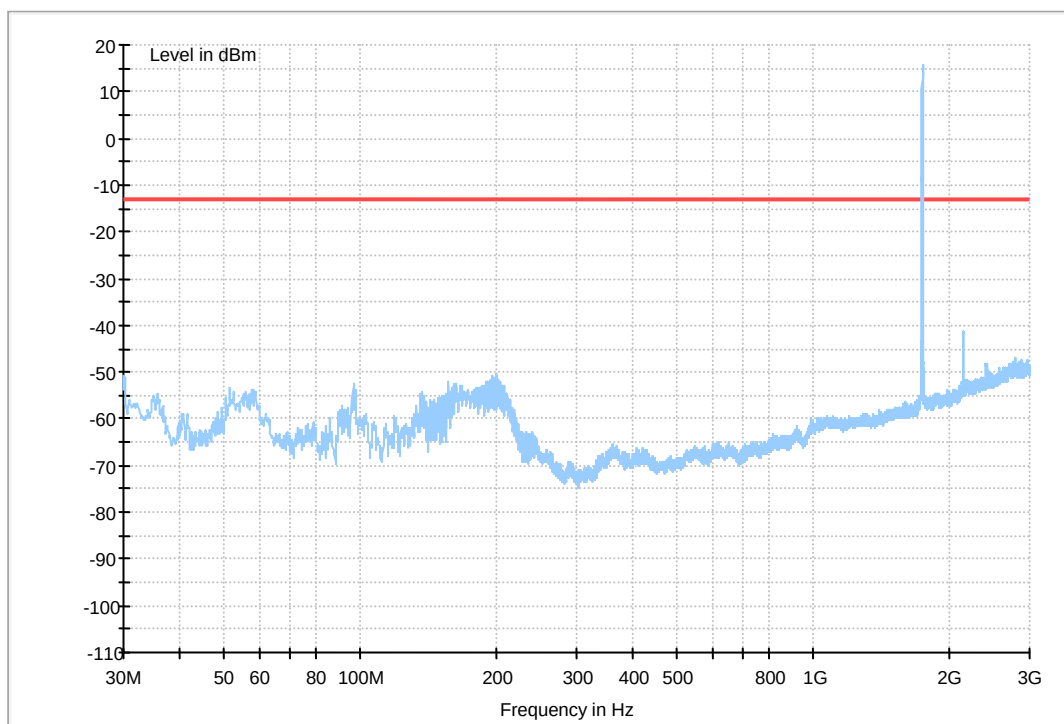
Radiated spurious emission

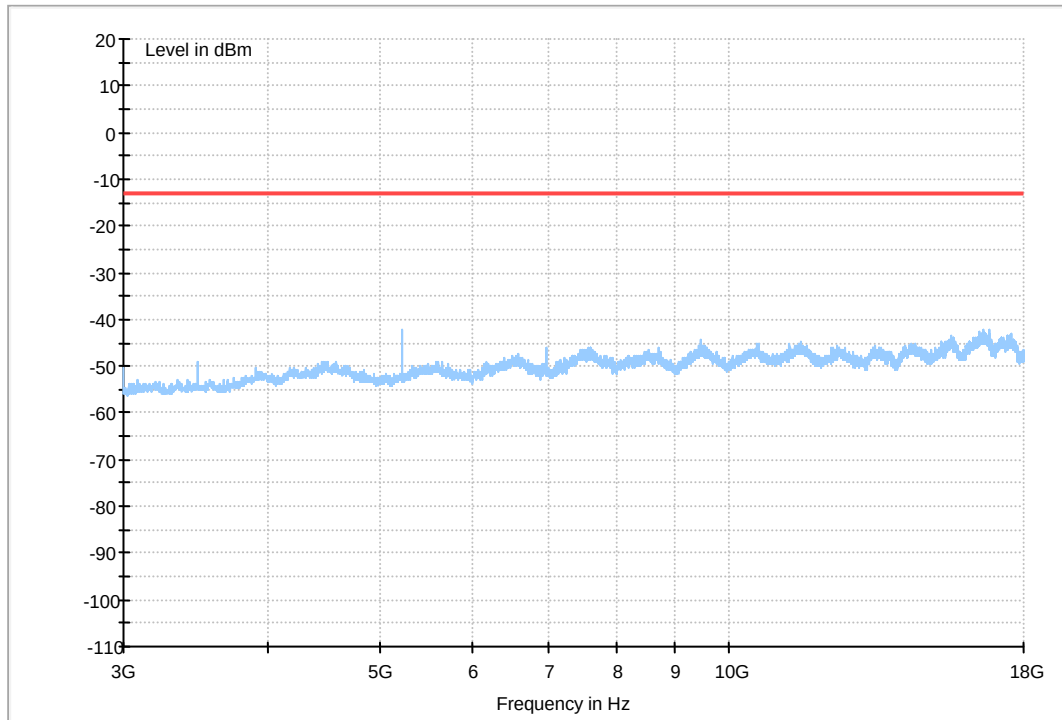
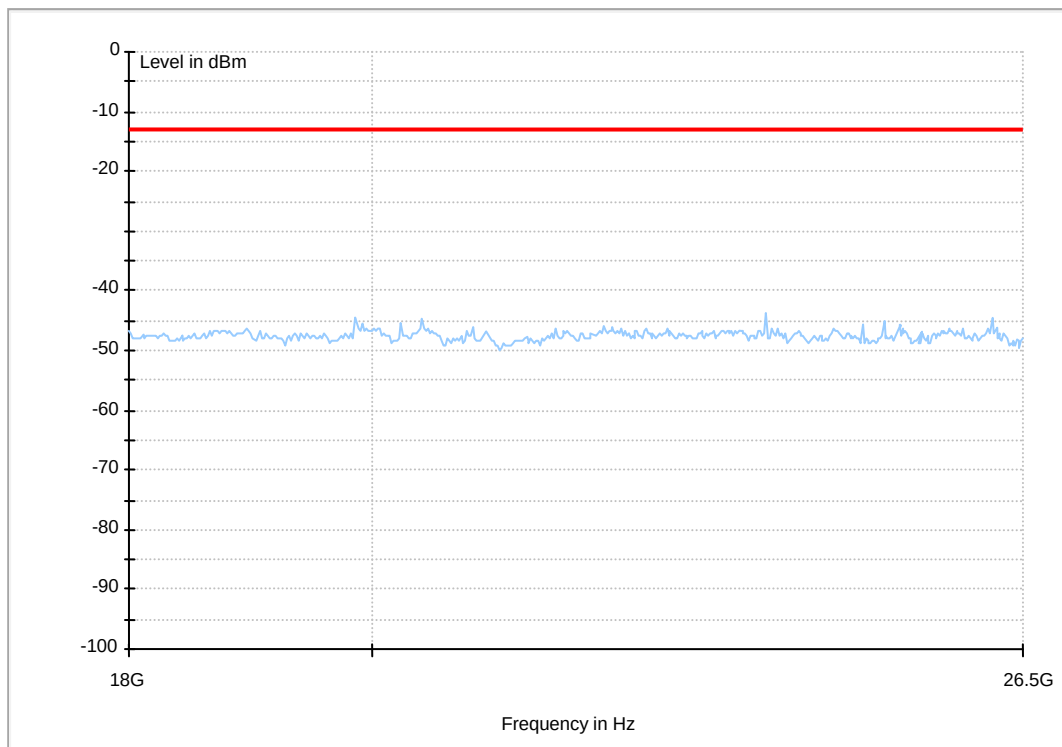
CDMA AWS

(9kHz-30MHz)



Traffic Mode (30MHz-3GHz)



Traffic Mode (3GHz-18GHz)**(18GHz-26.5GHz)**

-----The END-----



Appendix G

Frequency Stability According to FCC Part 2.1055& Part 27.54



Frequency Error vs. Temperature:

NOTE: All relevant operation modes have been tested, and the worst case data is included in this report.

Test Mode	RF Ch.	Volt.	Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Freq. vs. 20 °C [ppm]	Limit [ppm]	Verdict
TM 1	M	VN	-30 °C	19	0.01097	---	±2.5	Pass
			-20 °C	-18	-0.01039	---	±2.5	Pass
			-10 °C	22	0.01270	---	±2.5	Pass
			0 °C	13	0.00750	---	±2.5	Pass
			10 °C	-17	-0.00981	---	±2.5	Pass
			20 °C	21	0.01212	---	±2.5	Pass
			30 °C	23	0.01328	---	±2.5	Pass
			40 °C	-22	--0.01270	---	±2.5	Pass
			50 °C	14	0.00808	---	±2.5	Pass
TM 3	M	VN	-30 °C	19	0.01097	---	±2.5	Pass
			-20 °C	12	0.00693	---	±2.5	Pass
			-10 °C	-20	-0.01154	---	±2.5	Pass
			0 °C	-14	-0.00808	---	±2.5	Pass
			10 °C	17	0.00981	---	±2.5	Pass
			20 °C	12	0.00693	---	±2.5	Pass
			30 °C	-19	-0.01097	---	±2.5	Pass
			40 °C	16	0.00924	---	±2.5	Pass
			50 °C	-20	-0.01154	---	±2.5	Pass



Frequency Error vs. Voltage:

Test Mode	RF Ch.	Temp.	Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Freq. vs. 20 °C [ppm]	Limit [ppm]	Verdict
TM 1	M	TN	VL	-21	-0.0121	---	±2.5	Pass
			VN	18	0.0104	---	±2.5	Pass
			VH	-17	-0.0098	---	±2.5	Pass
TM 3	M	TN	VL	19	0.0110	---	±2.5	Pass
			VN	-21	-0.0121	---	±2.5	Pass
			VH	18	0.0104	---	±2.5	Pass

-----The END-----