FCC/IC Test Report

Manufacturer: 3M
Model Number: X1044V
FCC ID: DGF-TSSDX1044VXU
IC CERTIFICATION NUMBER: 458A-TSSDX1044VX

47 CFR Part 2, 22, 24

RSS-132 Issue 3

RSS-133 Issue 6

TEST REPORT #: EMC_3MMMM_003_13001_FCC22_24
DATE: 2014-05-02

FCC: Accredited

IC recognized # 3462B-1

***CETECOM* Inc.**
411 Dixon Landing Road ◆ Milpitas, CA 95035 ◆ U.S.A.
Phone: + 1 (408) 586 6200 ◆ Fax: + 1 (408) 586 6299 ◆ E-mail: info@cetecomusa.com ◆ http://www.cetecom.com
CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

Table of Contents

1 Assessment

The following device was tested against the applicable criteria specified in FCC rules parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and Industry Canada Standards RSS 132 and RSS 133.
No deviations were ascertained during the course of the tests performed.

Company	Description	Model #
3M	Tracking Device	X1044V

Responsible for Testing Laboratory:

Date	Section	Name	Signature
2014-05-02	Compliance	Franz Engert (Manager Compliance)	Digitally signed by Franz Engert DN: cn=Franz Engert, c=US, o=CETECOM, ou=Compliance, email=franz.engert@cetecom.com Date: 2014.05.02 19:17:54 -07'00'

Responsible for the Report:

Date	Section	Name	Signature
2014-05-02	Compliance	Josie Sabado (EMC Lab Manager)	

The test results of this test report relate exclusively to the test item specified in Section3.
CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Test Lab Manager:	Josie Sabado
Responsible Project Leader:	Yadvinder Garcha

2.2 Identification of the Client

Applicant's Name:	3M Electronic Monitoring
Street Address:	3M Center, Building 235-03-A-09
City/Zip Code	St. Paul, MN 55144
Country	USA
Contact Person:	Chris Defant
Phone No.	(651) 733-2990
Fax:	
e-mail:	jcdefant@mmm.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	3M Electronic Monitoring
Manufacturers Address:	2 Habarzel St.
City/Zip Code	Tel Aviv/61131
Country	Israel

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Product Type:	Portable
Prototype/Production:	Pre-Production
RF Exposure Environment:	General / Uncontrolled
Dimensions:	67 x 112 x 21 mm
Exposure Conditions:	Held next to the ear Body worn
Marketing Name:	Smart XT
Model No:	X1044V
FCC ID:	DGF-TSSDX1044VXU
IC Certification Number:	458A-TSSDX1044VX
Antenna Type:	Internal
Operating Voltage Range:	Vmin: 3.5V/ Vnom: 3.6V/ Vmax: 4.2V
Operating Temperature Range:	Tmin: 0°C/Tnom: 24°C Tmax: 50°C
Supported Radios:	CDMA UHF GPS receiver at 1.575 MHz
Power Back-Off Modes:	None
Date of Testing:	November 15, 2013 – November 18, 2013, April 10, 2014 – April 11, 2014

3.2 Technical Specification of Supported Radios

Signal Type	Duty Cycle	Type(s) of Modulation	Band	Transmit Frequency Range (MHz)	Measured Maximum Conducted Output Power (dBm)
CDMA	100%	QPSK, HPSK	Band Class 0	824.7 – 848.31	23.12
			Band Class 1	1851.25 – 1908.75	23.05
UHF[2]	100%	FM	N/A	433	-29.3
GPS[1]	N/A	N/A	L1	N/A	N/A

NOTES:
1. Bands are supported by the EUT, but outside of the scope of this test report.
2. Output power is an ERP value.

3.3 Identification of the Equipment under Test (EUT)

EUT #	Serial Number	HW Version	SW Version	Comment
1	35437702	5.0	V5.1.6.0	Radiated Unit 1
2	35437696	5.0	V5.1.6.0	Radiated Unit 2
3		5.0	V5.1.6.0	Conducted Unit

3.4 Identification of Accessory equipment

AE #	Type	Manufacturer	Serial No.	Cetecom ID
1	AC Adaptor	Samcon P/N 70067	N/A	N/A

3.5 Environmental conditions during Test:

The following environmental conditions were maintained during the course of testing:
Ambient Temperature: 20°C - 25°C
Relative humidity: 25% - 27%

3.6 Dates of Testing:

11/20/2013 – 12/04/2013

4 Subject of Investigation

The objective of the measurements applied by CETECOM Inc. was to establish compliance of the EUT as described under Ch. 3 of this Test Report, with the applicable criteria specified in

- 47 CFR Part 2: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission Frequency allocations and radio treaty matters; general rules and regulations.
- 47 CFR Part 22: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission subchapter B- common carrier services; Part 22- Public mobile services
- 47 CFR Part 24: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission subchapter B- common carrier services; Part 24- Personal communication services
- RSS 132- Issue 3: Spectrum management and telecommunication policy- Radio Standards Specifications Cellular telephones employing new technologies operating in the bands 824-849MHz and 869-894MHz
- RSS 133- Issue 6: Spectrum management and telecommunication policy- Radio Standards Specifications- 2GHz personal communication services

This test report is to support a request for new equipment authorization under the

FCC ID: DGF-TSSDX1044VXU
IC ID: 458A-TSSDX1044VX

All testing was performed on the product referred to in Section 3 as EUT.

Per guidelines from KDB 996369, conducted signal test results from module certification is re-used for this certification as the output power has been verified to be within the specified production tolerances and measurement uncertainties..

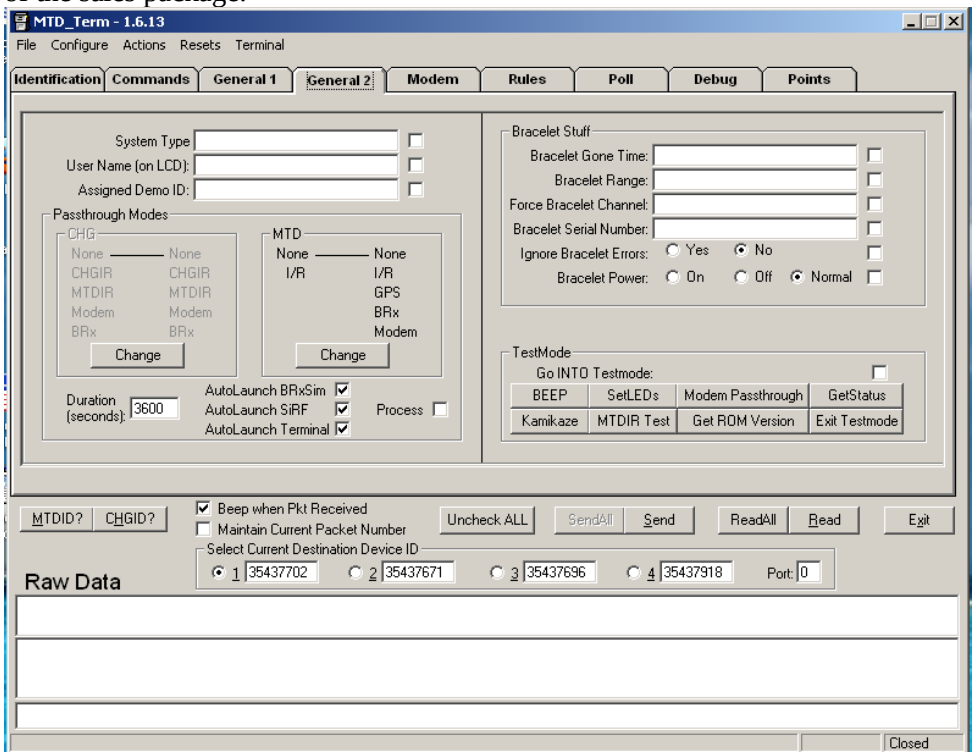
The module test data can be obtained under the FCC Filing ID: R5Q-LISAC200A

5 Modes of operation:

Normal mode of operation is when EUT is connected to cargo and transmitting position via packet switched connection at interval of > 1min.

For the purpose of accuracy of testing a continuous transmission on both CDMA bands was used for test of power and spurious emissions..

In order to connect the product to the CMU callbox the tool MTD_TERM was used along with a chain of commands supplied by the manufacturer. According to the manufacturer this chain of commands corresponds to the way the product will be configured and operated by the embedded SW when taken out of the sales package.



6 Testing Notes

Charger was changed to version listed above because initial charger was causing emission fails in 30MHz – 1GHz range. With current charger these emissions disappeared.

7 Summary of Measurement Results

CDMA 850MHz Band:

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046 §22.913 (a) RSS132 5.4	RF Output Power	Nominal	CDMA 850	■	☐	☐	☐	Complies
			1xRTT 850	☐	☐	☐	■	Note 1
§2.1055 §22.355 RSS132 5.3	Frequency Stability	Nominal	CDMA 850	☐	☐	☐	■	Note 1
			1xRTT 850	☐	☐	☐	■	Note 1
§2.1049 §22.917(b) RSS132 5.2	Occupied Bandwidth	Nominal	CDMA 850	☐	☐	☐	■	Note 1
			1xRTT 850	☐	☐	☐	■	Note 1
§2.1051 §22.917 RSS132 5.5	Band Edge Compliance	Nominal	CDMA 850	☐	☐	☐	■	Note 1
			1xRTT 850	☐	☐	☐	■	Note 1
§2.1051 §22.917 RSS132 5.5	Conducted Spurious Emissions	Nominal	CDMA 850	☐	☐	☐	■	Note 1
			1xRTT 850	☐	☐	☐	■	Note 1
§2.1053 §22.917 RSS132 5.5	Radiated Spurious Emissions	Nominal	CDMA 850	■	☐	☐	☐	Complies
			1xRTT 850	☐	☐	☐	■	Note 1

Note: NA= Not Applicable; NP= Not Performed.
Note 1: Leveraged from module certification.

CDMA 1900MHz Band:

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046 §24.232 (a) RSS133 6.4	RF Output Power	Nominal	CDMA 1900	■	☐	☐	☐	Complies
			1xRTT 1900	☐	☐	☐	■	Note 1
§2.1055 §24.235 RSS133 6.3	Frequency Stability	Nominal	CDMA 1900	☐	☐	☐	■	Note 1
			1xRTT 1900	☐	☐	☐	■	Note 1
§2.1049 §24.238(b) RSS133 6.2	Occupied Bandwidth	Nominal	CDMA 1900	☐	☐	☐	■	Note 1
			1xRTT 1900	☐	☐	☐	■	Note 1
§2.1051 §24.238 RSS133 6.5	Band Edge Compliance	Nominal	CDMA 1900	☐	☐	☐	■	Note 1
			1xRTT 1900	☐	☐	☐	■	Note 1
§2.1051 §24.238 RSS133 6.5	Conducted Spurious Emissions	Nominal	CDMA 1900	☐	☐	☐	■	Note 1
			1xRTT 1900	☐	☐	☐	■	Note 1
§2.1053 §24.238 RSS133 6.5	Radiated Spurious Emissions	Nominal	CDMA 1900	■	☐	☐	☐	Complies
			1xRTT 1900	☐	☐	☐	■	Note 1

Note: NA= Not Applicable; NP= Not Performed.
Note 1: Leveraged from module certification.

8 Measurements

8.1 Measurement Uncertainty

	Uncertainty in dB radiated <30MHz	Uncertainty in in dB radiated 30MHz - 1GHz	Uncertainty in dB radiated > 1GHz	Uncertainty in dB Conducted measurement
standard deviation k=1	2.48	1.93	2.16	0.63
95% confidence interval in dB	4.86	3.79	4.23	1.24
95% confidence interval in dB in delta to Result	+-2.5 dB	+-2.0 dB	+- 2.3dB	+-0.7dB

8.2 Test Conditions

Tnom: 24°C; Vnom: 3.6 V

8.3 RF Power Output Conducted

8.3.1 References

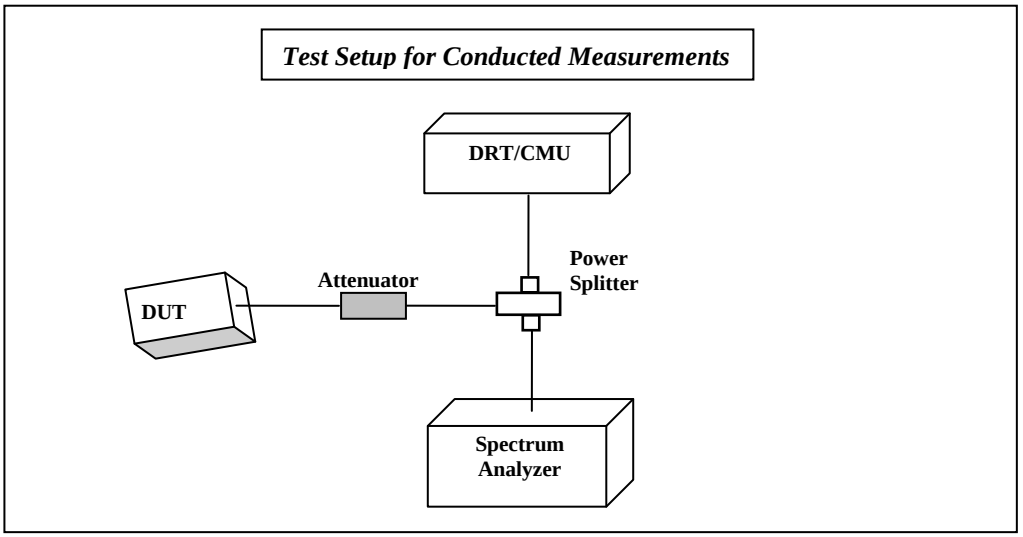
KDB 996369

8.3.2 Limits

The difference in conducted output power between EUT and module data is determined by the additional path losses on the PCB between output ports of module and the connector on the final product. An additional influence is imperfect matching. CETECOM INC has established that the module output power shall range from power of module to power of module -2.0dB.

8.3.3 Conducted Output Power Measurement procedure

Ref: TIA-603C 2004 2.2.1



1. Connect the equipment as shown in the above diagram. A Digital Radio Communication Tester (DRT: R&S CMU200 here) is used to enable the EUT to transmit and to measure the output power.
2. Adjust the settings of the CMU200 to set the EUT to its maximum power at the required channel.
3. Record the Peak and Average Output power level measured by the CMU200.
4. Correct the measured level for all losses in the RF path.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band and for all types of modulation schemes.
    a. GMSK mode measurements are performed in GSM 1 uplink slot configuration.
    b. UMTS mode measurements are performed in RMC 12.2K configuration
    c. CDMA mode measurements performed in 1xRTT and EVDO- Rel A configurations.

8.3.4 Results

850MHz Band:

Channel	Frequency (MHz)	Pre-Certified Module	Conducted Output Power Measurement Verification	Delta Between product and module
		Average (dBm)	Average (dBm)	(dBm)
1013	824.70	24.49	22.85	-1.64
384	836.52	24.45	23.12	-1.33
777	848.31	24.33	22.55	-1.78

1900MHz Band:

Channel	Frequency (MHz)	Pre-Certified Module	Conducted Output Power Measurement Verification	Delta Between product and module
		Average (dBm)	Average (dBm)	(dBm)
1013	1851.25	23.53	22.41	-1.12
384	1880	23.50	23.05	-0.45
777	1908.75	23.58	22.65	-0.93

8.3.5 Verdict

PASS

8.4 RF Power Output radiated

8.4.1 References

FCC: CFR Part 2.1046, CFR Part 22.913, CFR Part 24.232
IC: RSS-Gen Section 4.8; RSS 132 Section 5.4; RSS 133 Section 6.4

8.4.2 Limits

8.4.2.1 FCC 22.913 (a) Effective radiated power limits.

The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.

8.4.2.2 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.

8.4.2.3 RSS-132, Issue 3

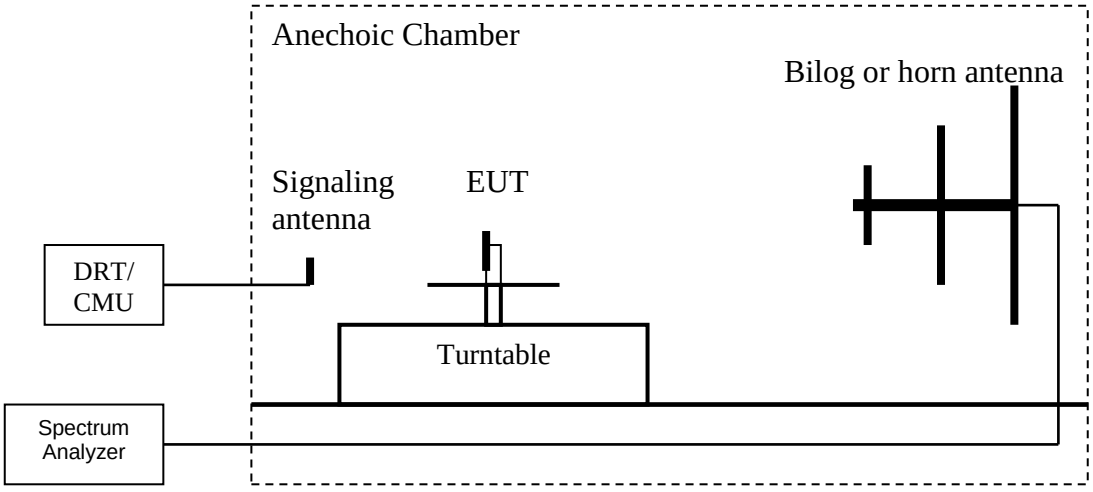
The transmitter output power shall be measured in terms of average power. The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts.
In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

8.4.2.4 RSS-133, Issue 6

The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed 2 watts maximum e.i.r.p.
In addition, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

8.4.3 Radiated Output Power Measurement procedure

Ref: TIA-603C 2004 -2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic Radiated Power (EIRP)



1. Connect the equipment as shown in the above diagram with the EUT's antenna in center of the turn table.
2. Adjust the settings of the Digital Radio Communication Tester (DRT) 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) + 2.14 (dB)
9. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
10. Radiated emission measurements were made in GMSK (1 uplink slot), UMTS RMC 12.2k and CDMA 1xRTT modes.

8.4.4 Test Results

8.4.4.1 RF Power Output 850MHz band

Limits:
FCC: Nominal Peak Output Power < 38.45 dBm (7W)
IC: Nominal Peak Output Power < 40.60 dBm (11.5W)

CDMA 850: 1x-RTT Mode	
Frequency (MHz)	**Radiated Power Peak**
	ERP (Peak) (dBm)
824.70	22.7
836.52	25.0
848.31	21.6

8.4.4.2 RF Power Output 1900MHz band

Limits:
Nominal Peak Output Power < 33 dBm (2W)

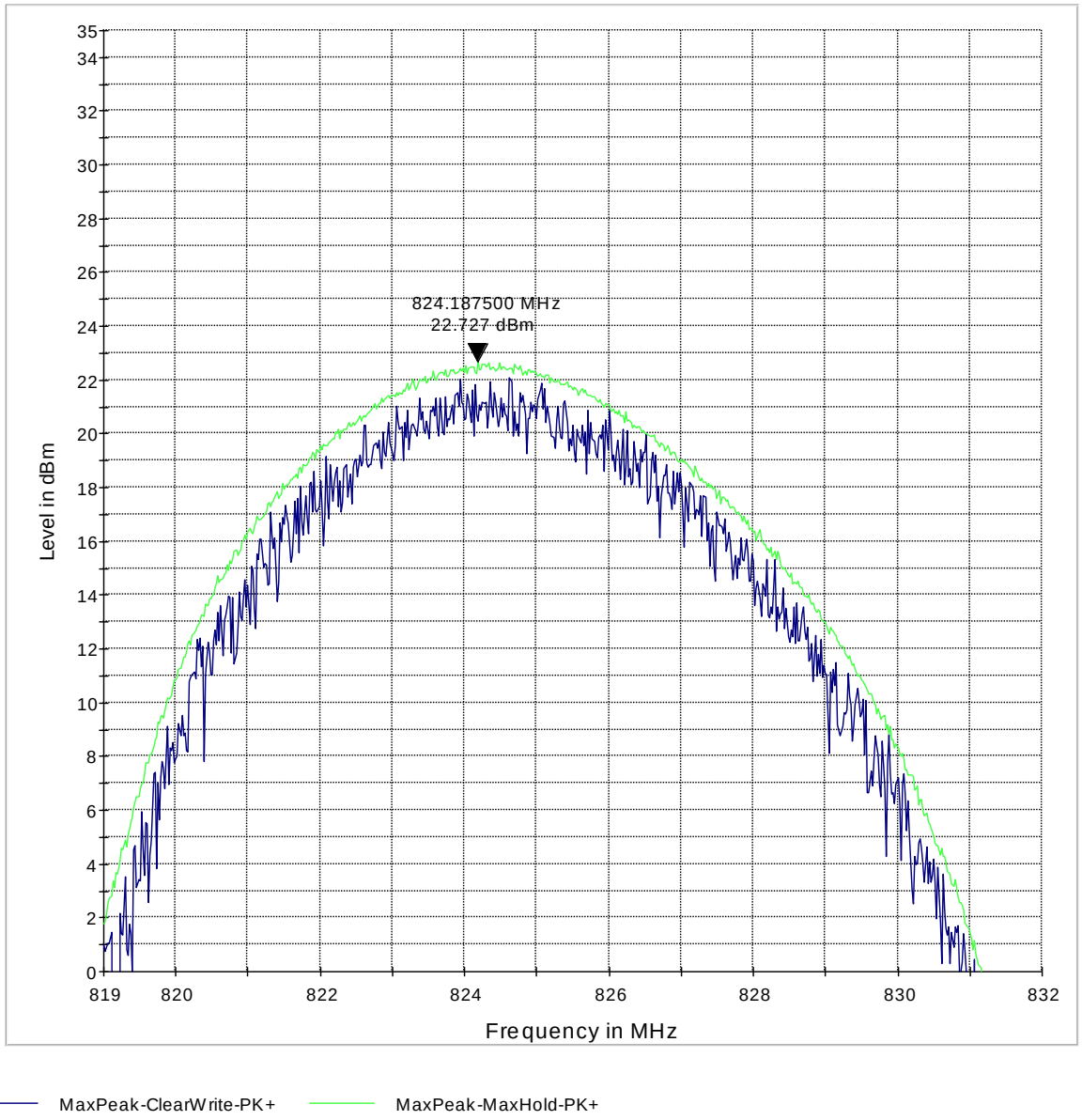
CDMA 1900: 1x-RTT Mode	
Frequency (MHz)	**Radiated Power Peak**
	EIRP (Peak) (dBm)
1851.25	18.4
1880	21.2
1908.75	21.0

8.4.5 Test Verdict

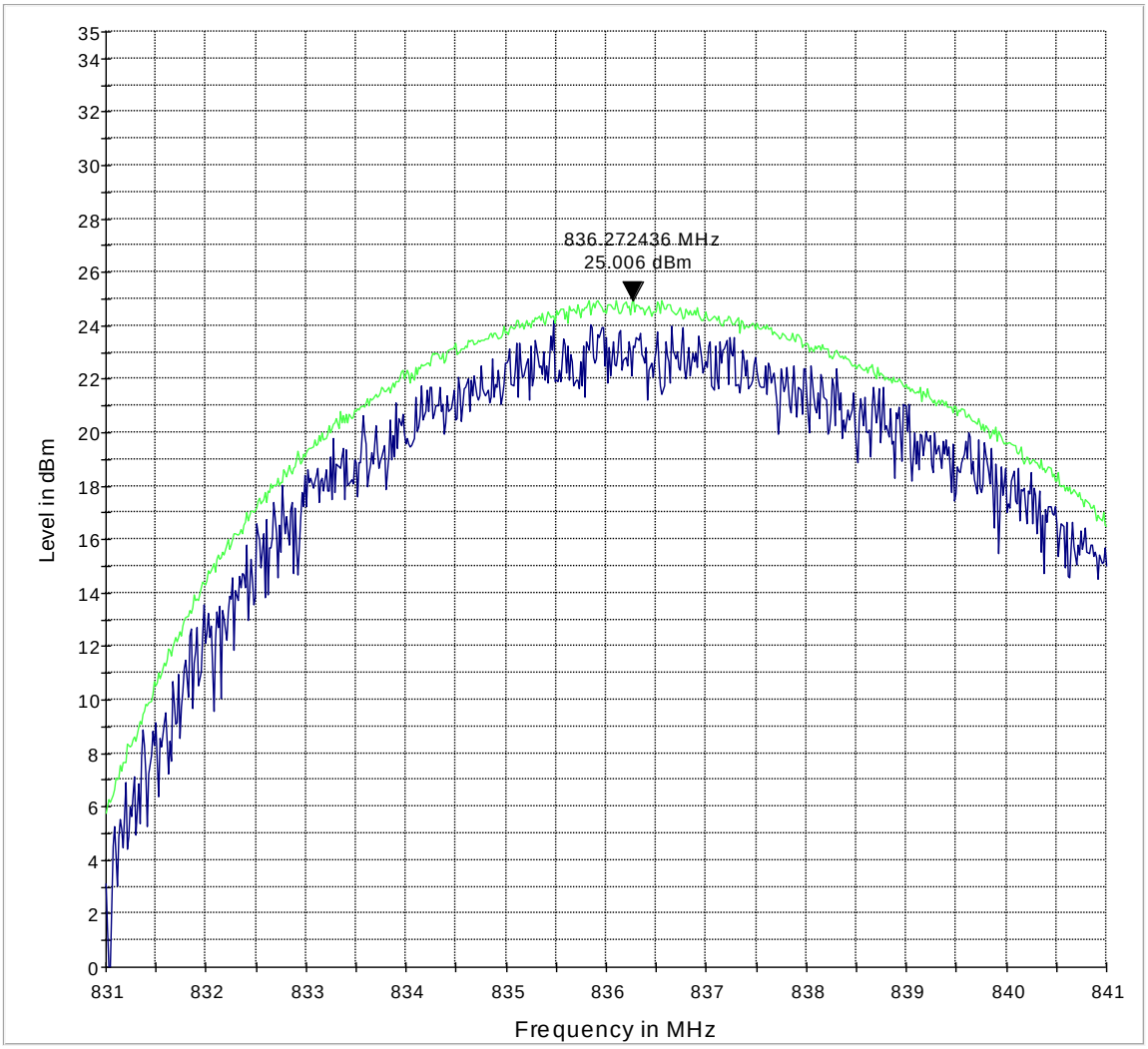
Pass.

8.4.6 Plots

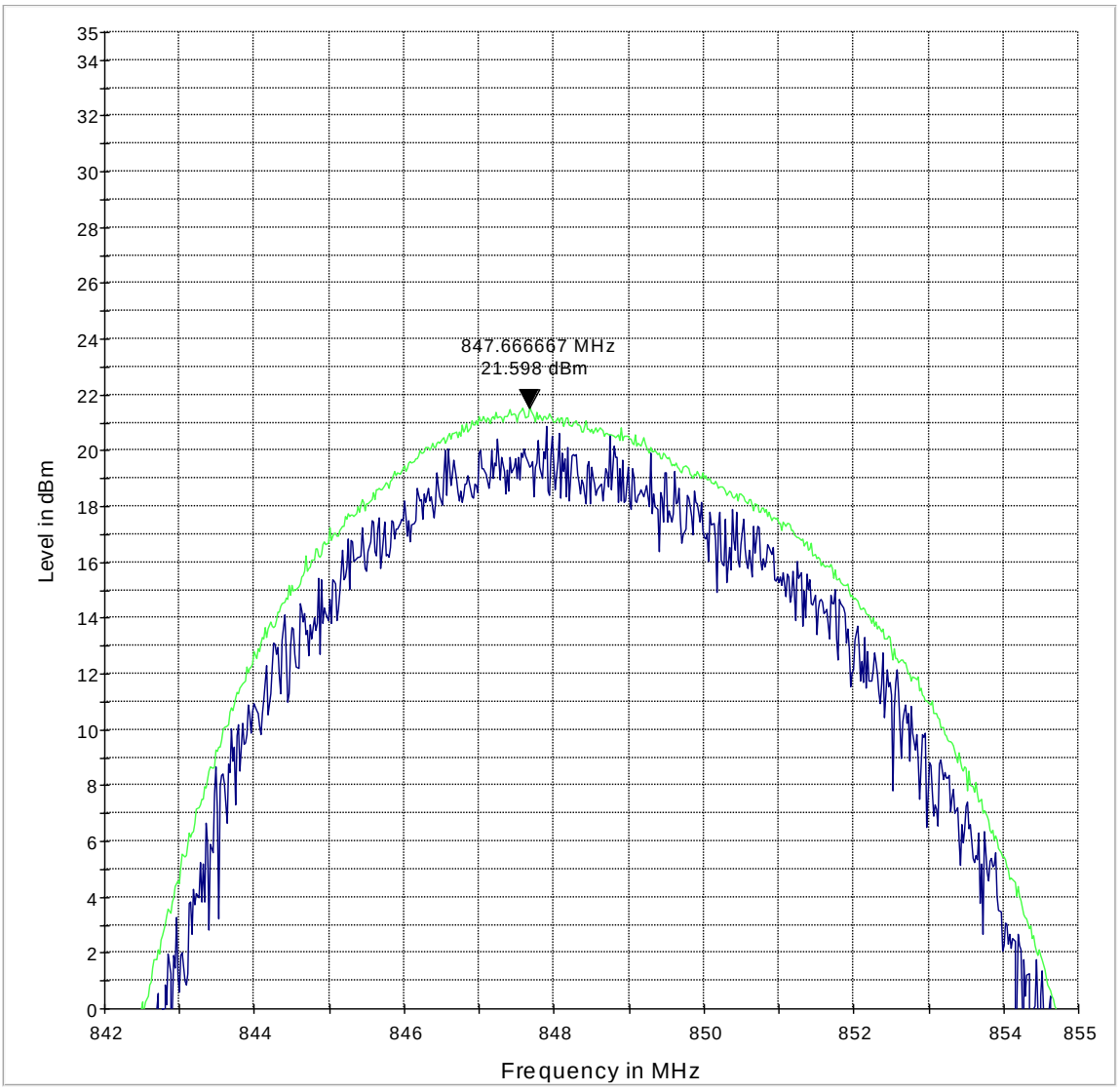
ERP (CDMA) CHANNEL 1013 Unit #1



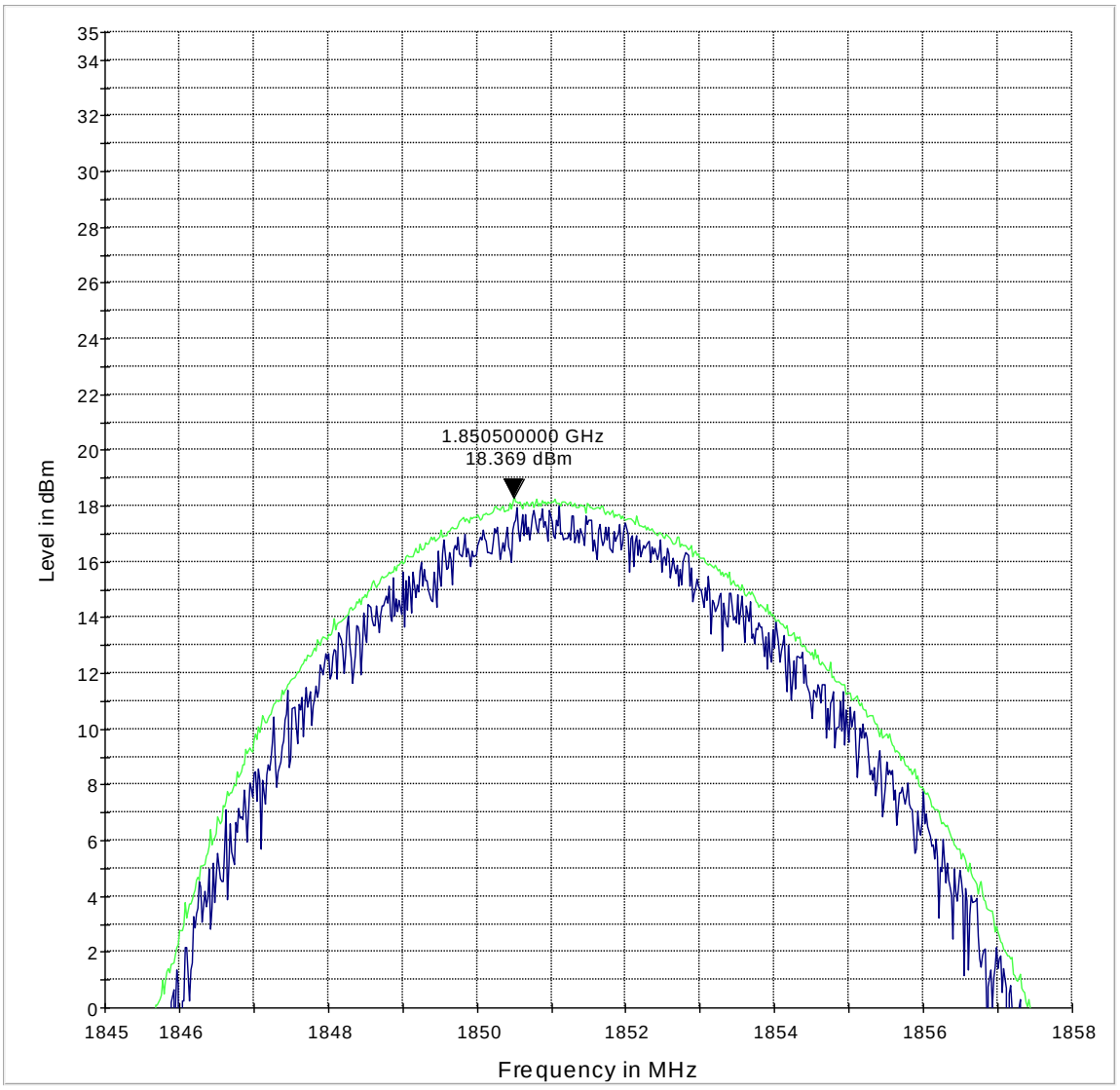
ERP (CDMA 1x-RTT 850) CHANNEL 384



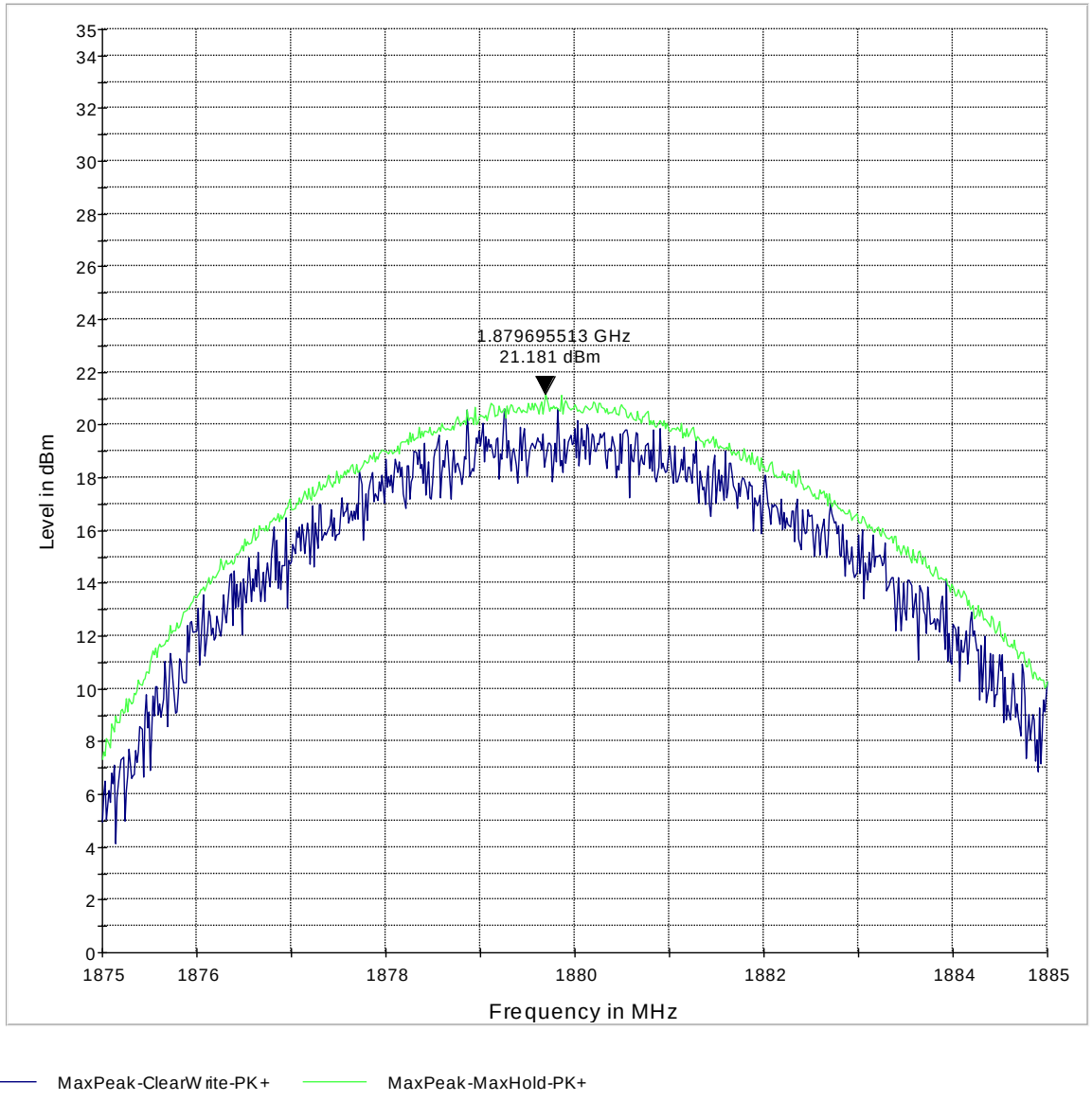
ERP (CDMA 1x-RTT 850) CHANNEL 777



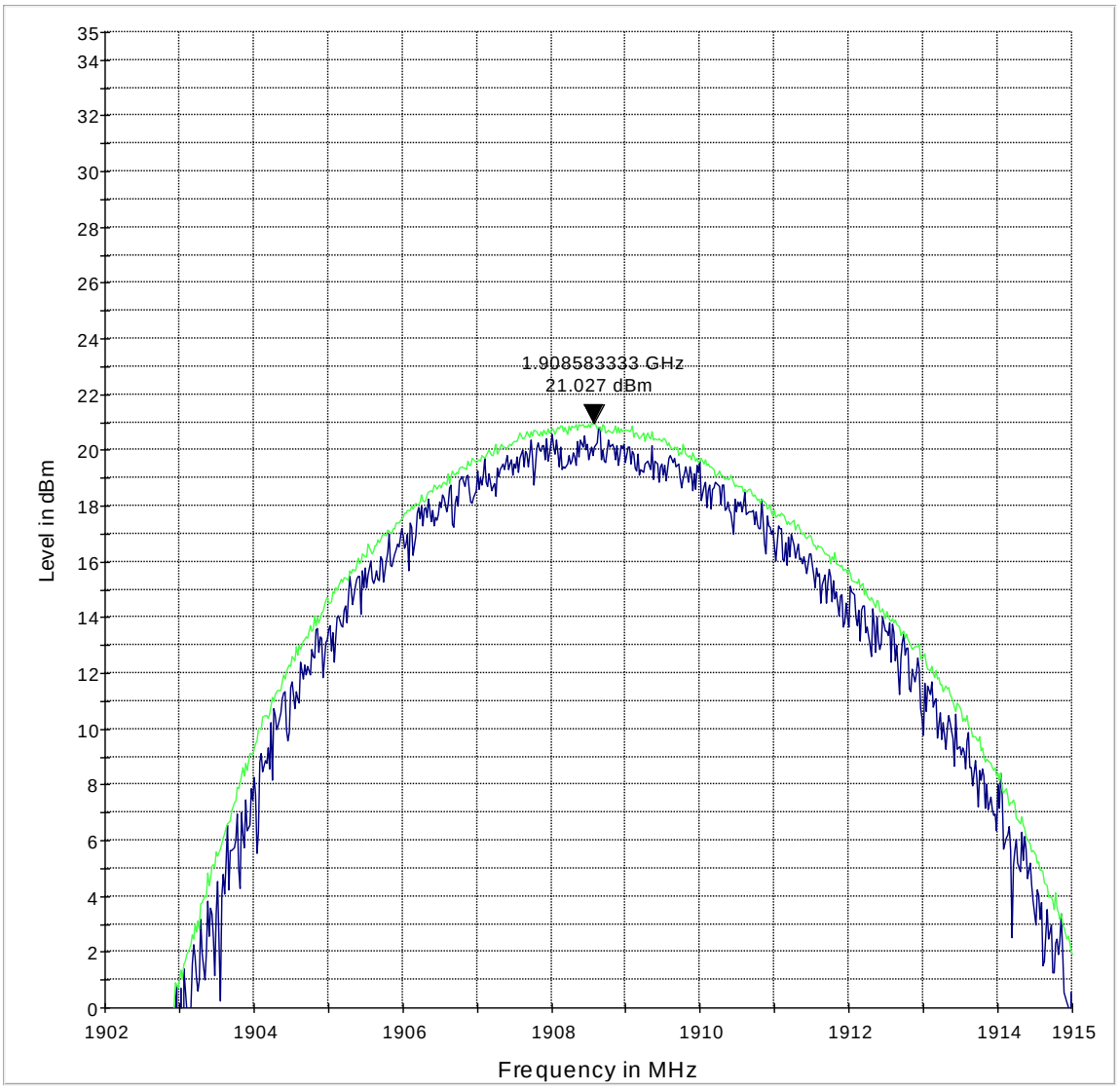
EIRP (CDMA 1x-RTT 1900) CHANNEL 25



EIRP (CDMA 1x-RTT 1900) CHANNEL 600



EIRP (CDMA 1x-RTT 1900) CHANNEL 1175



8.5 Spurious Emissions Radiated

8.5.1 References

FCC: CFR Part 2.1053, CFR Part 22.917, CFR Part 24.238
IC: RSS-Gen Section 4.9; RSS 132 Section 5.5; RSS 133 Section 6.5

8.5.2 Measurement requirements:

8.5.2.1 FCC 2.1053: Field strength of spurious radiation.

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission.

8.5.2.2 RSS-Gen 4.9: Transmitter unwanted spurious emissions

The same parameter, peak power or average power, used for the transmitter output power measurement shall be used for unwanted emission measurements.
The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate or carrier frequency), or from 30 MHz, whichever is the lower, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

8.5.3 Limits

(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.

8.5.3.1 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 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.

8.5.3.2 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

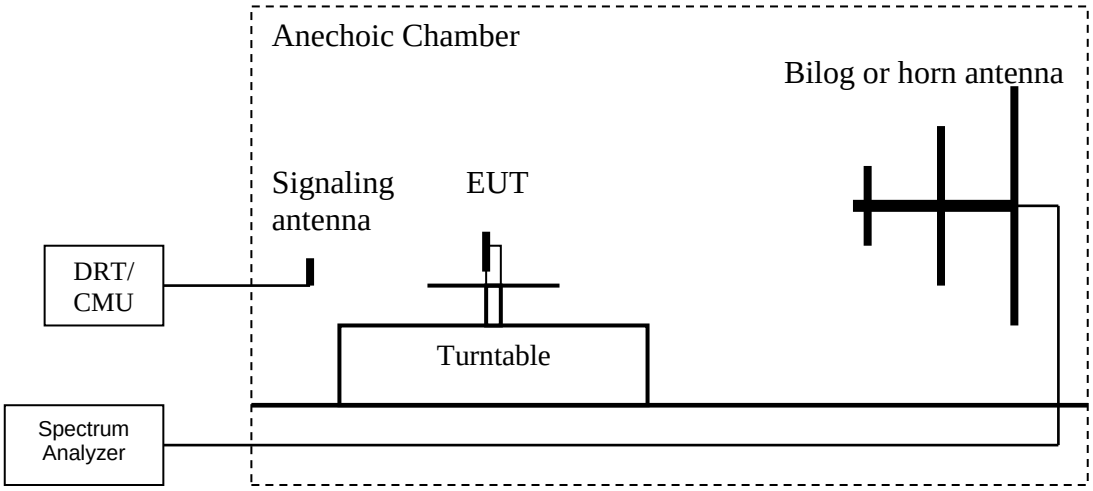
improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

8.5.3.3 RSS-132 Section 5.5.1.1 and RSS-133 Section 6.5.1

In the first 1.0 MHz band immediately outside and adjacent to the licensee's frequency block, the power of emissions per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in watts) by at least $43 + 10 \log_{10}(P)$, dB. After the first 1.0 MHz, the power of emissions shall be attenuated below the transmitter output power by at least $43 + 10 \log_{10}(P)$, dB, in any 100 kHz bandwidth.
After the first 1.5 MHz, the power of emissions shall be attenuated below the transmitter output power by at least $43 + 10 \log_{10}(P)$, dB, in any MHz of bandwidth.

8.5.4 Radiated out of band measurement procedure:

Ref: TIA-603C 2004- 2.2.12 Unwanted emissions: Radiated Spurious



1. Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
2. Adjust the settings of the Digital Radio Communication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure peak hold with the required settings.
4. Place the measurement antenna in a horizontal orientation. Rotate the EUT 360°. Raise the measurement antenna up to 4 meters in 0.5 meters increments and rotate the EUT 360° at each height to maximize all emissions. Measure and record all spurious emissions (**LVL**) up to the tenth harmonic of the carrier frequency.
5. Replace the EUT with a horizontally 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 level of spurious emissions using the following equation: **Spurious** (dBm) = **LVL** (dBm) + **LOSS** (dB):
8. Repeat steps 4, 5 and 6 with all antennas vertically polarized.
9. Determine the level of spurious emissions using the following equation: **Spurious** (dBm) = **LVL** (dBm) + **LOSS** (dB):
10. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

(N**ote:** Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4 and 7 above are performed with test software.)

8.5.5 Sample Calculations for Radiated Measurements

8.5.5.1 Power Measurements using Substitution Procedure:

The measurement on the Spectrum Analyzer is used as a basis for the Substitution procedure.
The EUT is replaced with a Signal Generator and an antenna. The setting on the Signal Generator is varied until the Spectrum Analyzer displays the original reading. EIRP is calculated as-

EIRP (dBm)= Signal Generator setting (dBm)- Cable Loss (dB)+ Antenna Gain (dBi)

Example:

Frequency (MHz)	Measured SA (dBµV)	Signal Generator setting (dBm)	Antenna Gain (dBi)	Dipole Gain (dBd)	Cable Loss (dB)	EIRP (dBm)
1000	95.5	24.5	6.5	0	3.5	27.5

8.5.6 Measurement Survey

The site is constructed in accordance with ANSI C63.4 requirements and is recognized by the FCC to be in compliance for a 3m site. The spectrum is scanned from 30MHz to the 10th harmonic of the highest frequency generated by the EUT.
Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the 850 MHz and 1900 MHz bands of operation.
It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the GSM-850 MHz and the PCS-1900 MHz band into any of the other blocks respectively. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

Radiated emission measurements were made in GMSK (1 uplink slot), UMTS RMC 12.2k and CDMA 1xRTT modes.
Additional spot checks in mid channel of operation for all modes were performed with the slimmer battery option of the device.

For radiated measurements, all data in this report shows the worst case emissions data between H/V antenna polarizations and for all 3 orthogonal orientations of the EUT.

Unless mentioned otherwise, the emission signals above the limit line in the plots are from the carrier.

8.5.7 Test Results

Test Results Transmitter Spurious Emission CDMA 850:

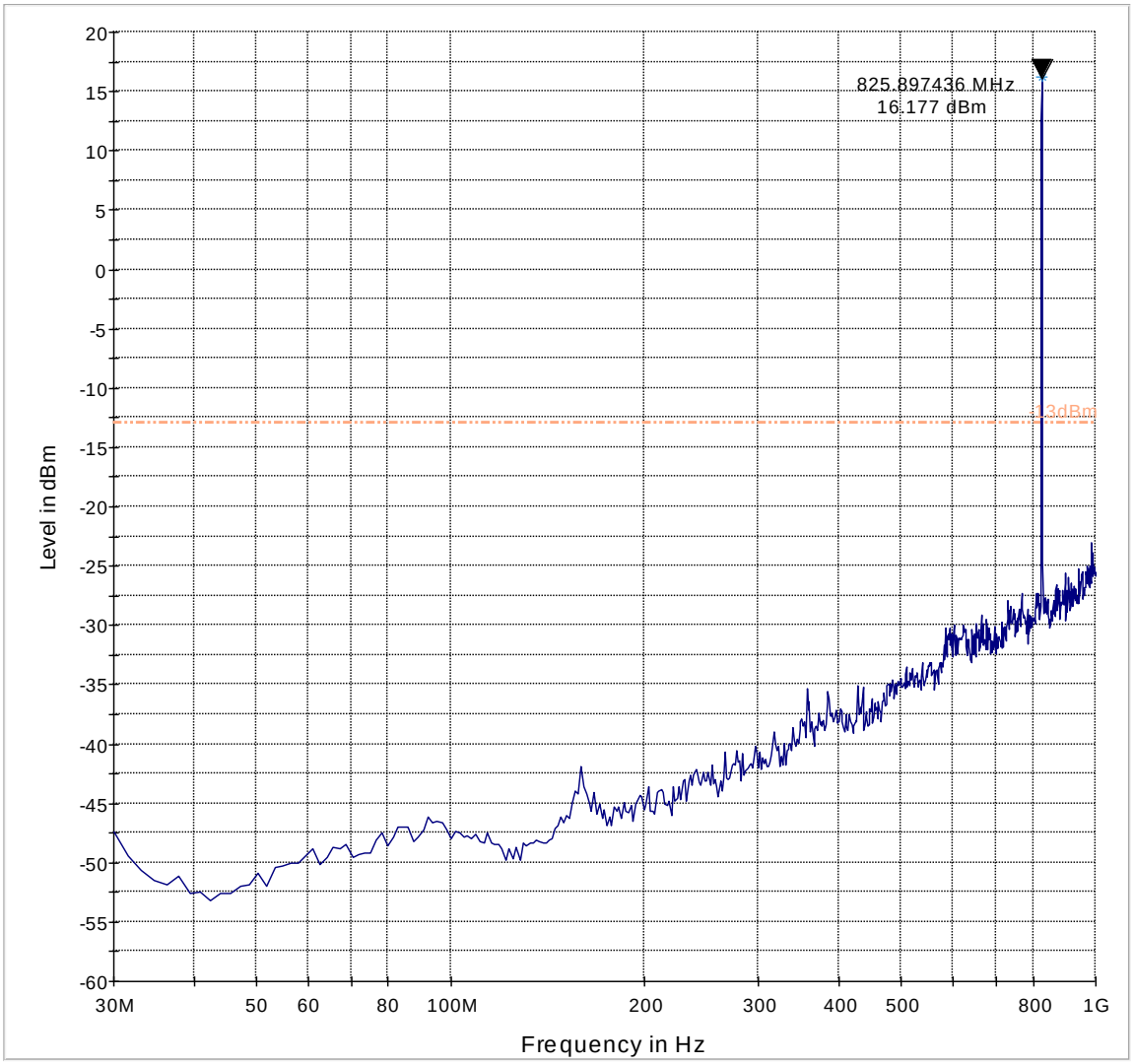
Harmonic	Tx ch-1013 Freq. (MHz)	Level (dBm)	Tx ch-384 Freq. (MHz)	Level (dBm)	Tx ch-777 Freq. (MHz)	Level (dBm)
1	**1649.4**	-37	**1673.04**	-42	**1696.62**	-46
2	**2474.1**	-53	**2509.56**	-50	**2544.93**	-52
3	**3298.8**	NF	**3346.08**	NF	**3393.24**	NF
4	**4123.5**	-47	**4182.6**	-48	**4241.55**	-49
5	**4948.2**	-38	**5019.12**	-35	**5089.86**	-38
6	**5772.9**	-37	**5855.64**	-36	**5938.17**	-44
NF = Noise Floor						

Test Results Transmitter Spurious Emission CDMA-1900:

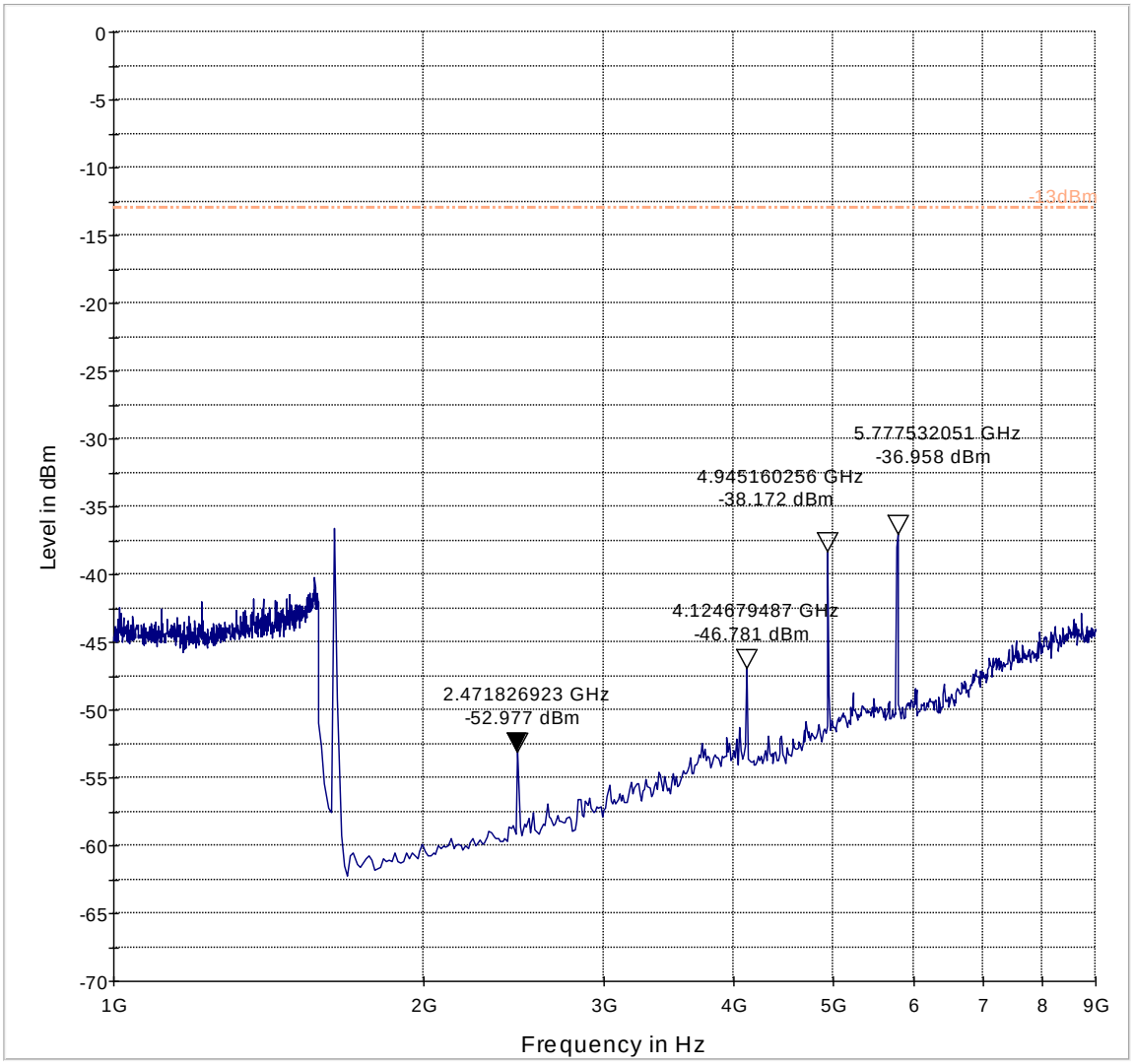
Harmonic	Tx ch-25 Freq.(MHz)	Level (dBm)	Tx ch-600 Freq. (MHz)	Level (dBm)	Tx ch-1175 Freq. (MHz)	Level (dBm)
1	**3702.5**	NF	**3760**	-50	**3817.5**	-47
2	**5553.75**	-39	**5640**	-37	**5726.25**	-35
3	**7405**	NF	**7520**	NF	**7635**	NF
NF = Noise Floor						

8.5.7.1 Plots:

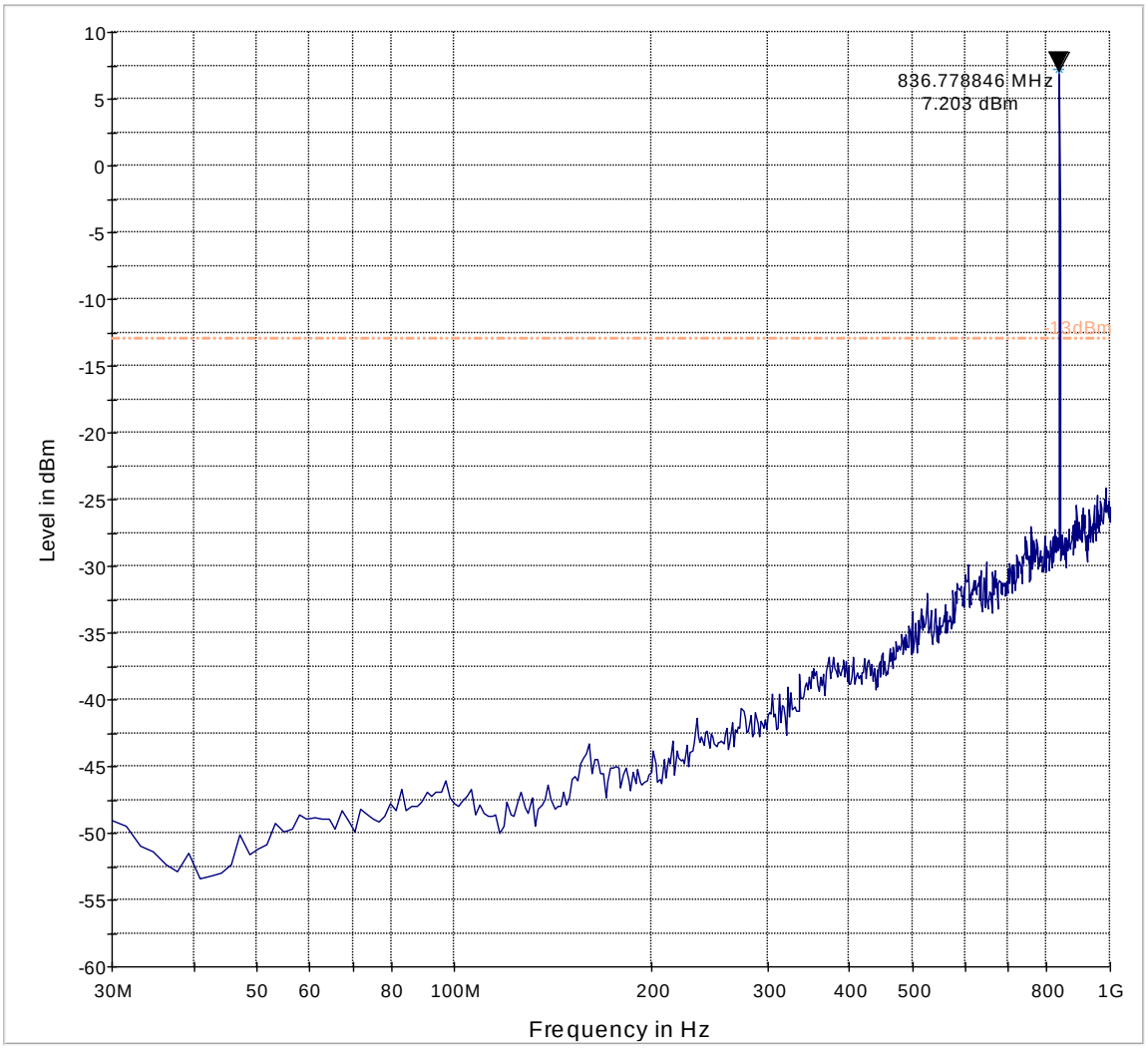
Radiated Spurious Emissions (CDMA-850) Tx: Low Channel
Test results 30MHz-1GHz



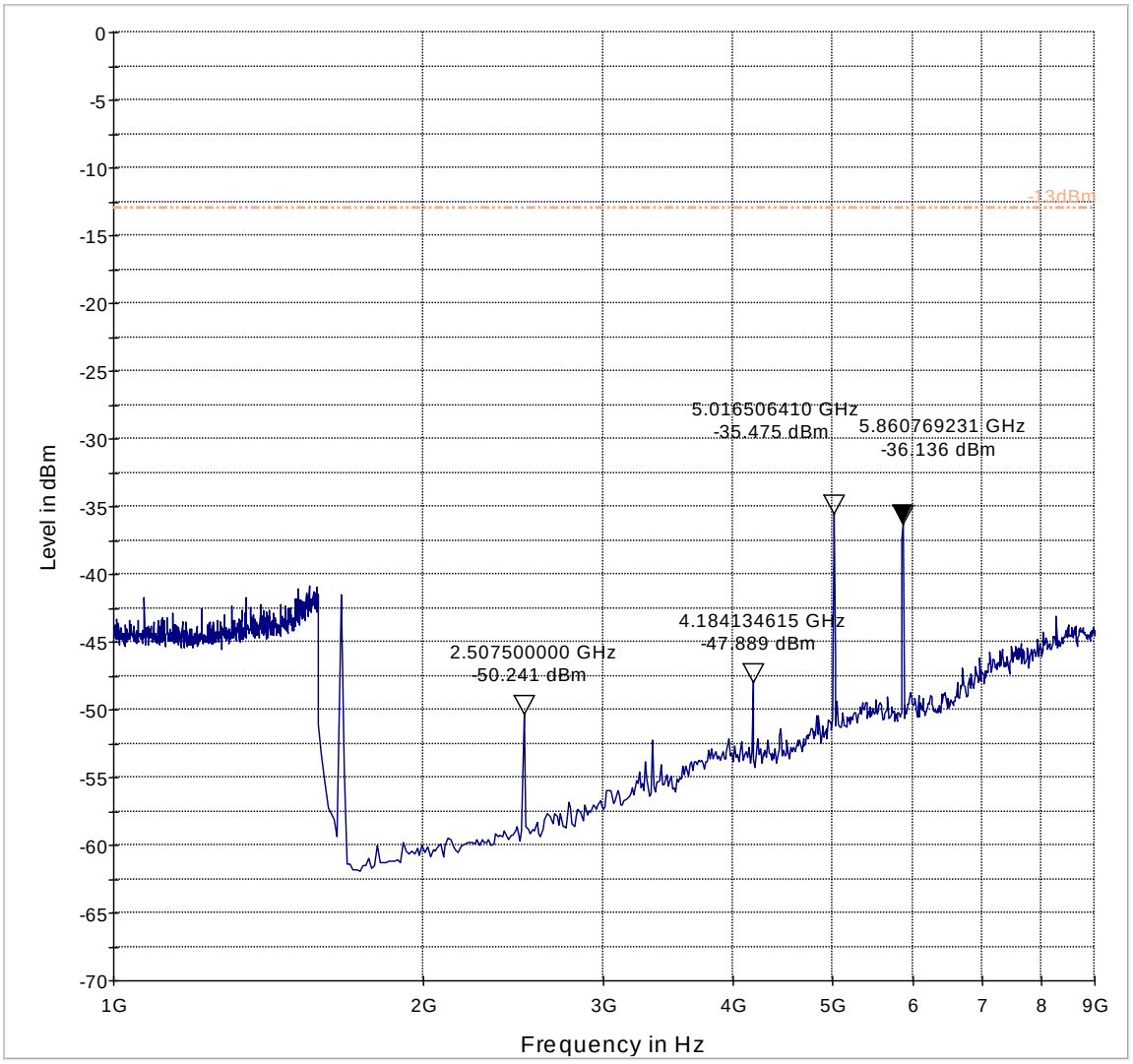
Test results 1GHz-9GHz



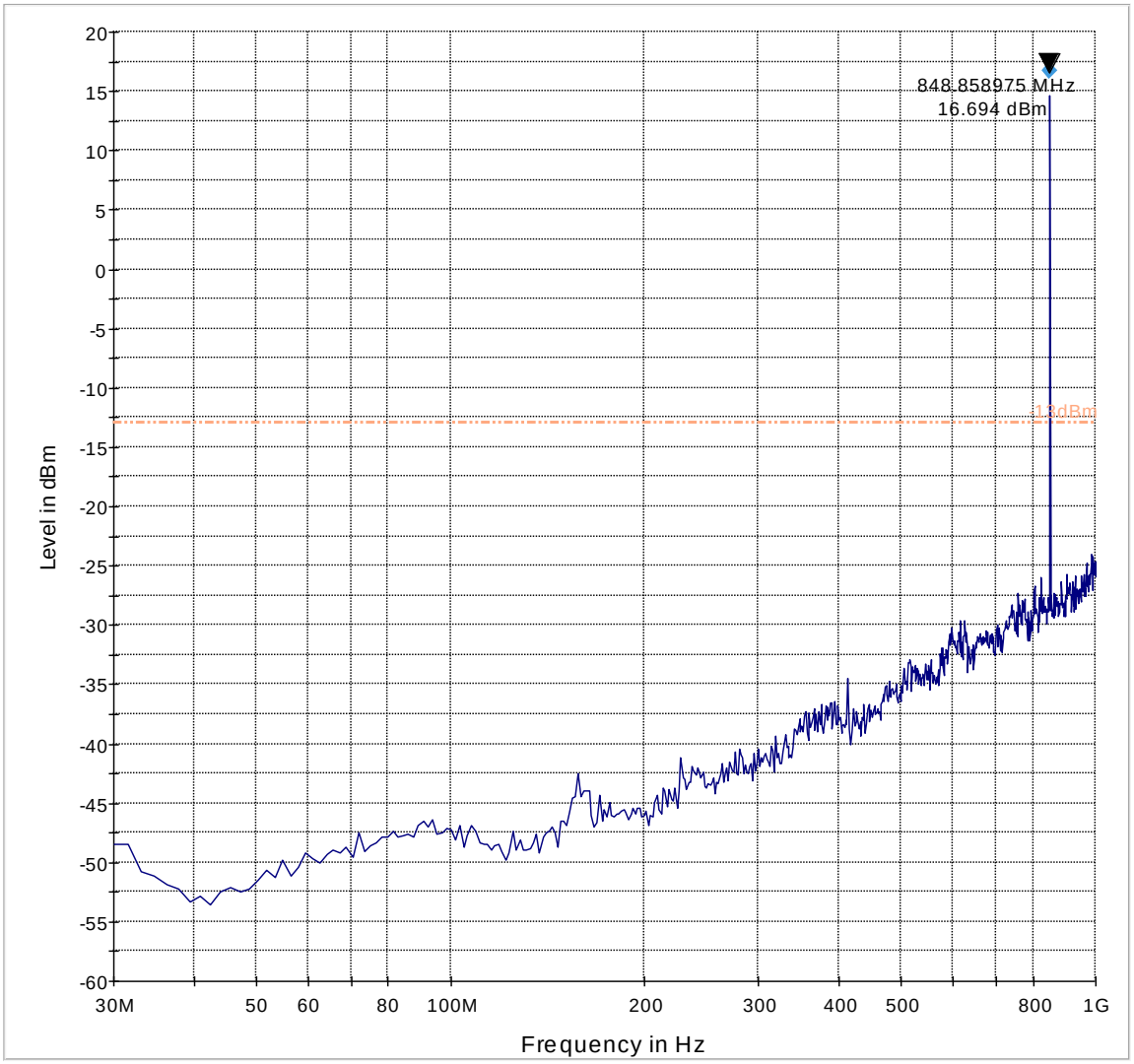
Radiated Spurious Emissions (CDMA-850) Tx: Mid Channel
Test results 30MHz-1GHz



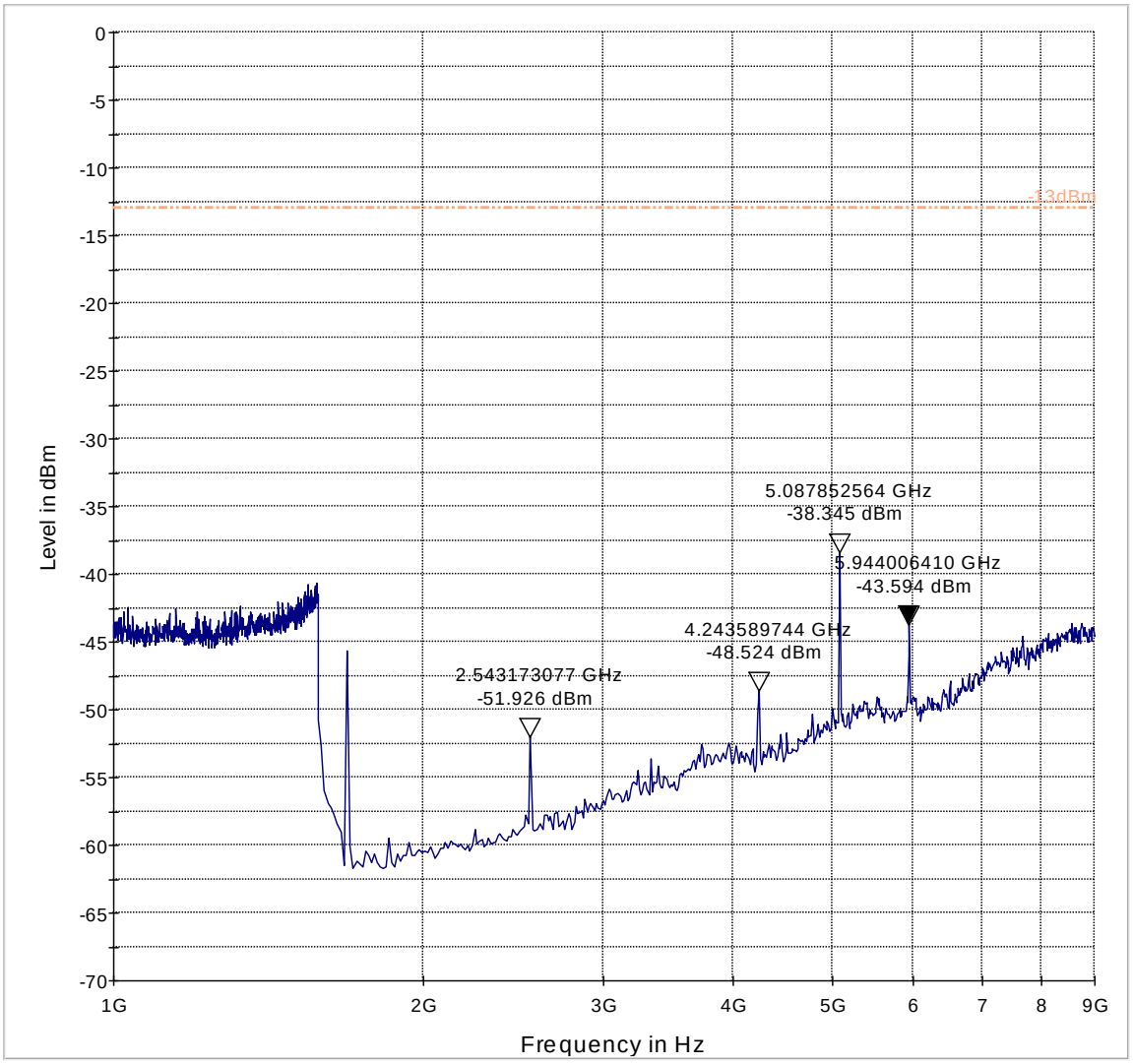
Test results 1GHz-9GHz



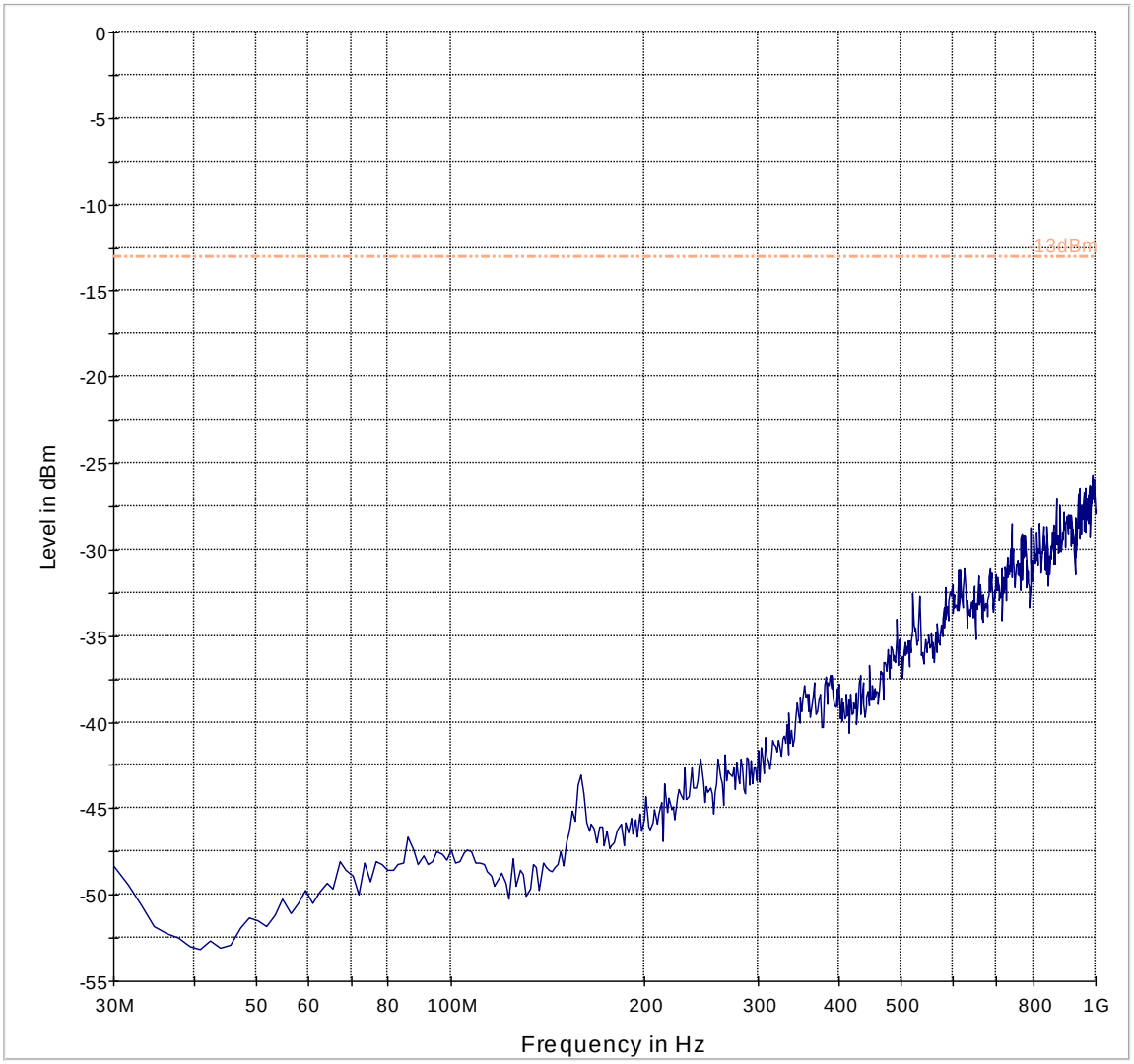
Radiated Spurious Emissions (CDMA-850) Tx: High Channel
Test results 30MHz-1GHz



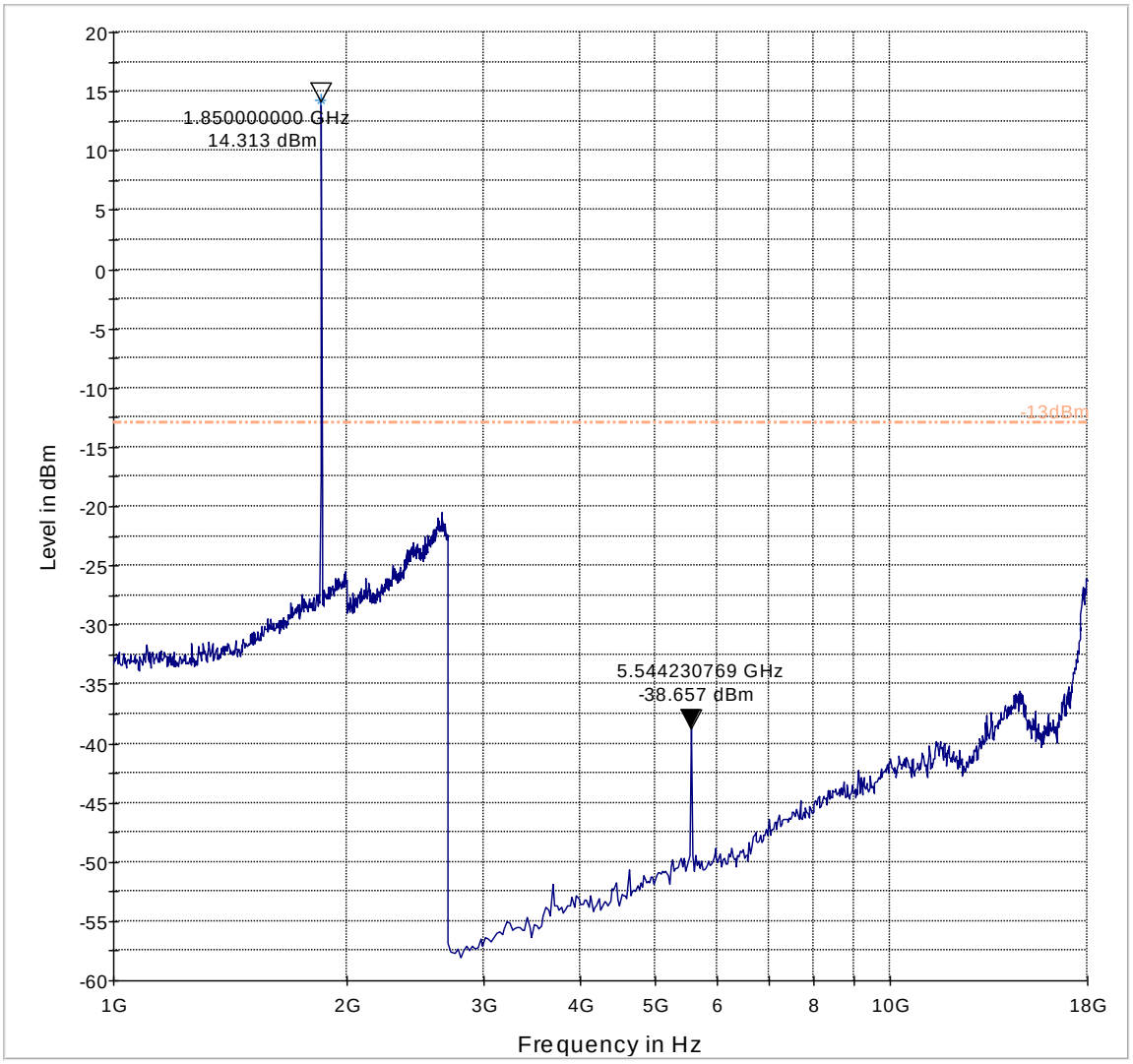
Test results 1GHz-9GHz



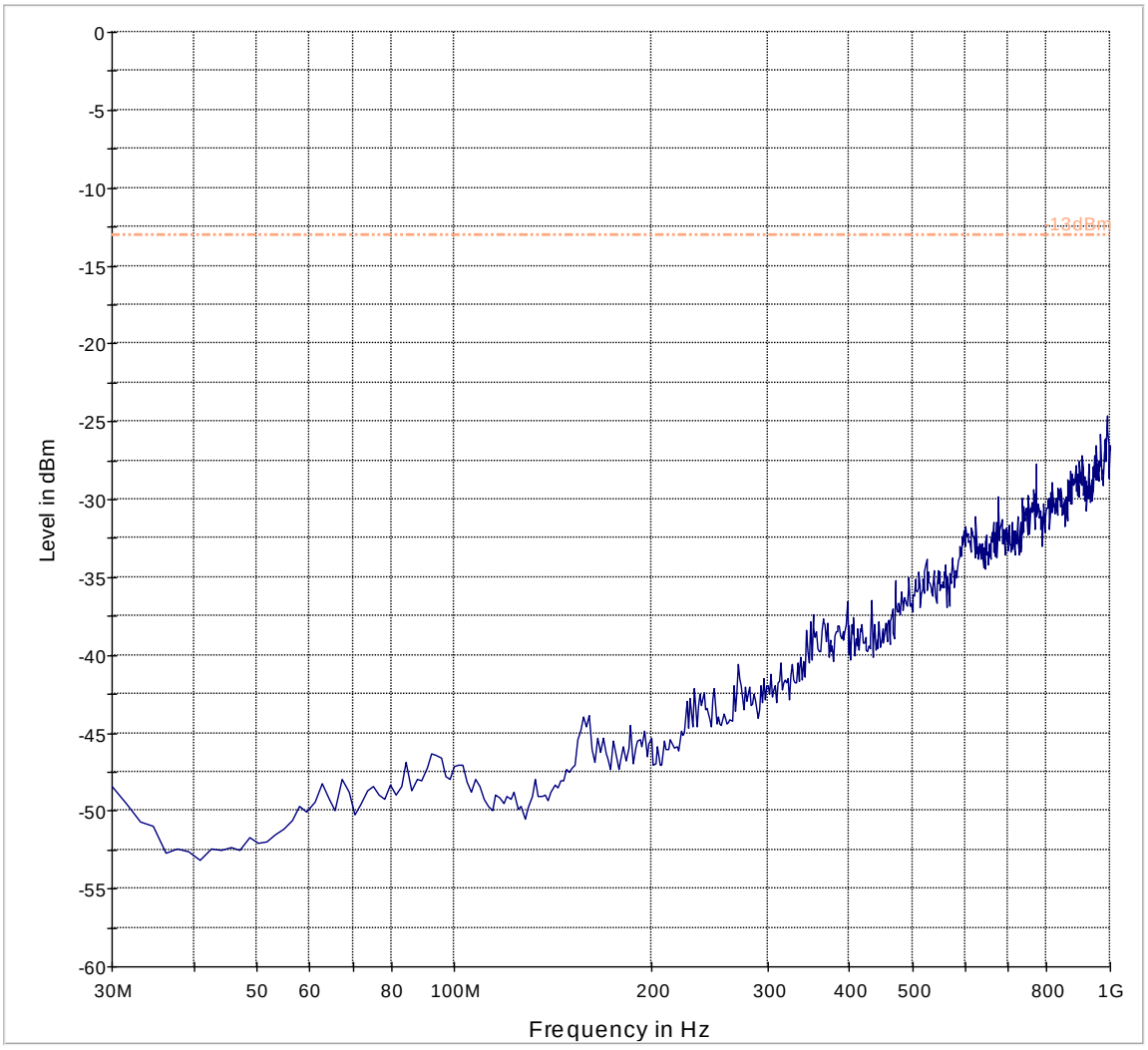
Radiated Spurious Emissions (CDMA-1900) Tx: Low Channel
Test results 30MHz-1GHz



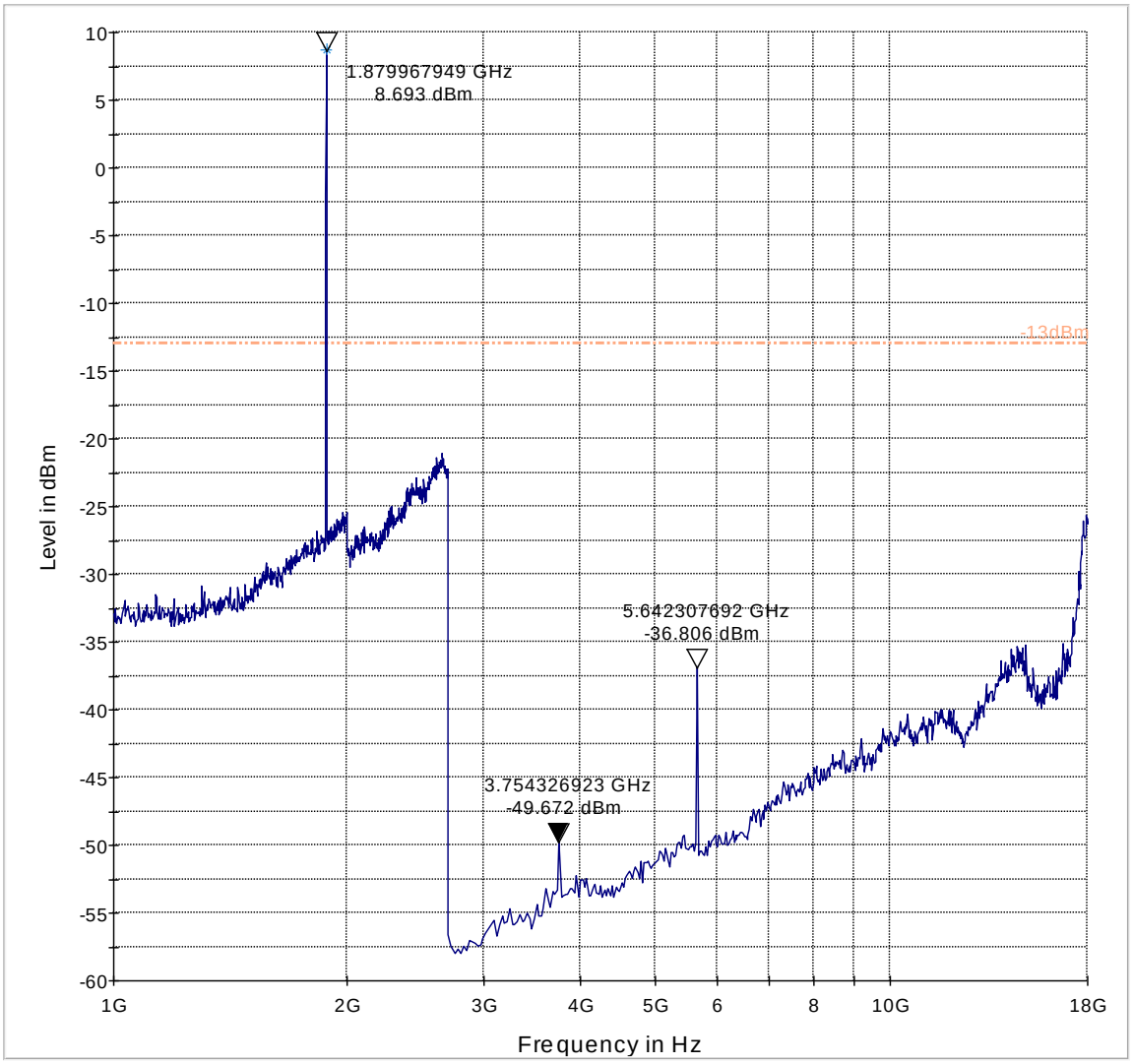
Test results 1GHz-18GHz



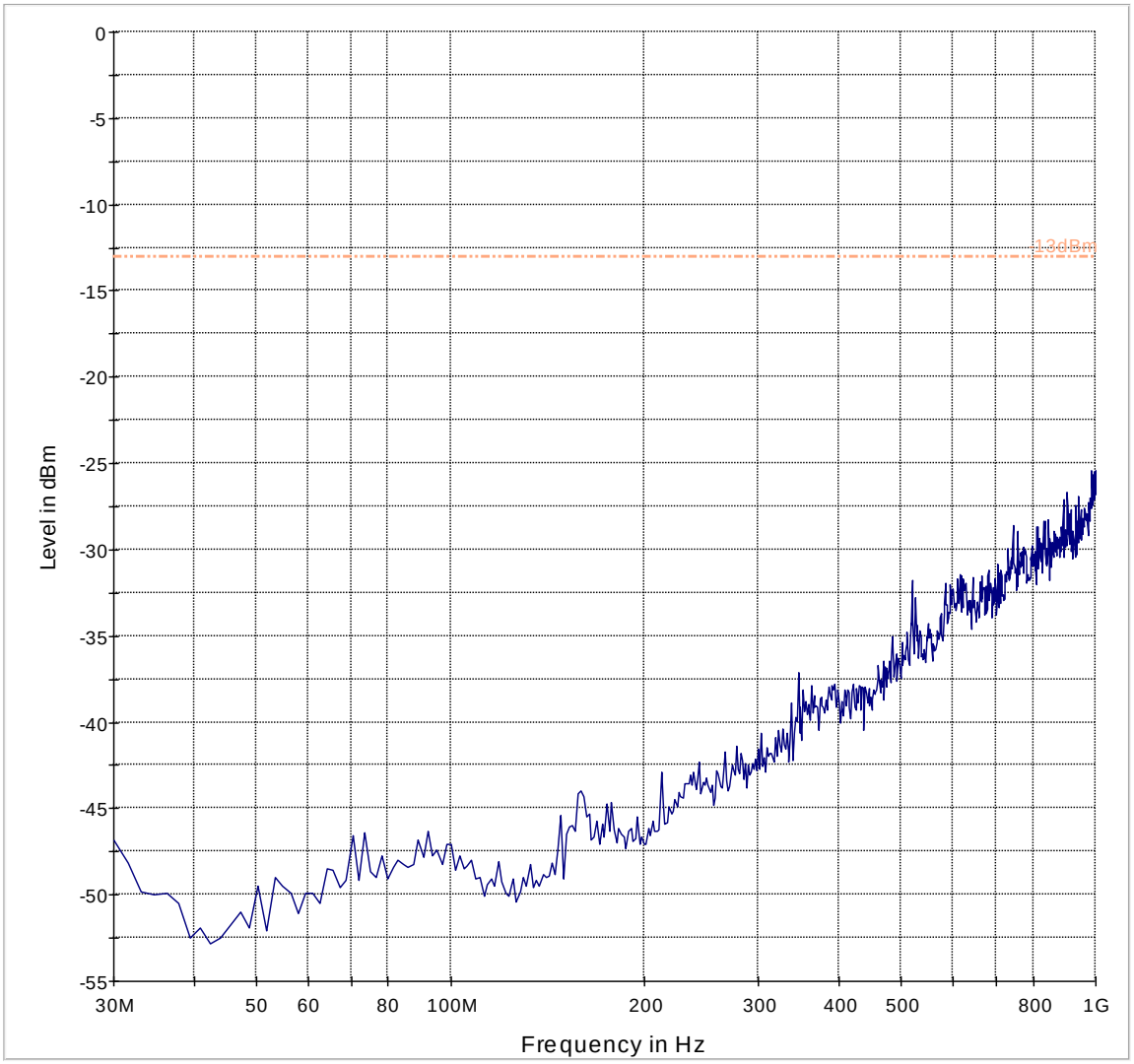
Radiated Spurious Emissions (CDMA-1900) Tx: Mid Channel
Test results 30MHz-1GHz



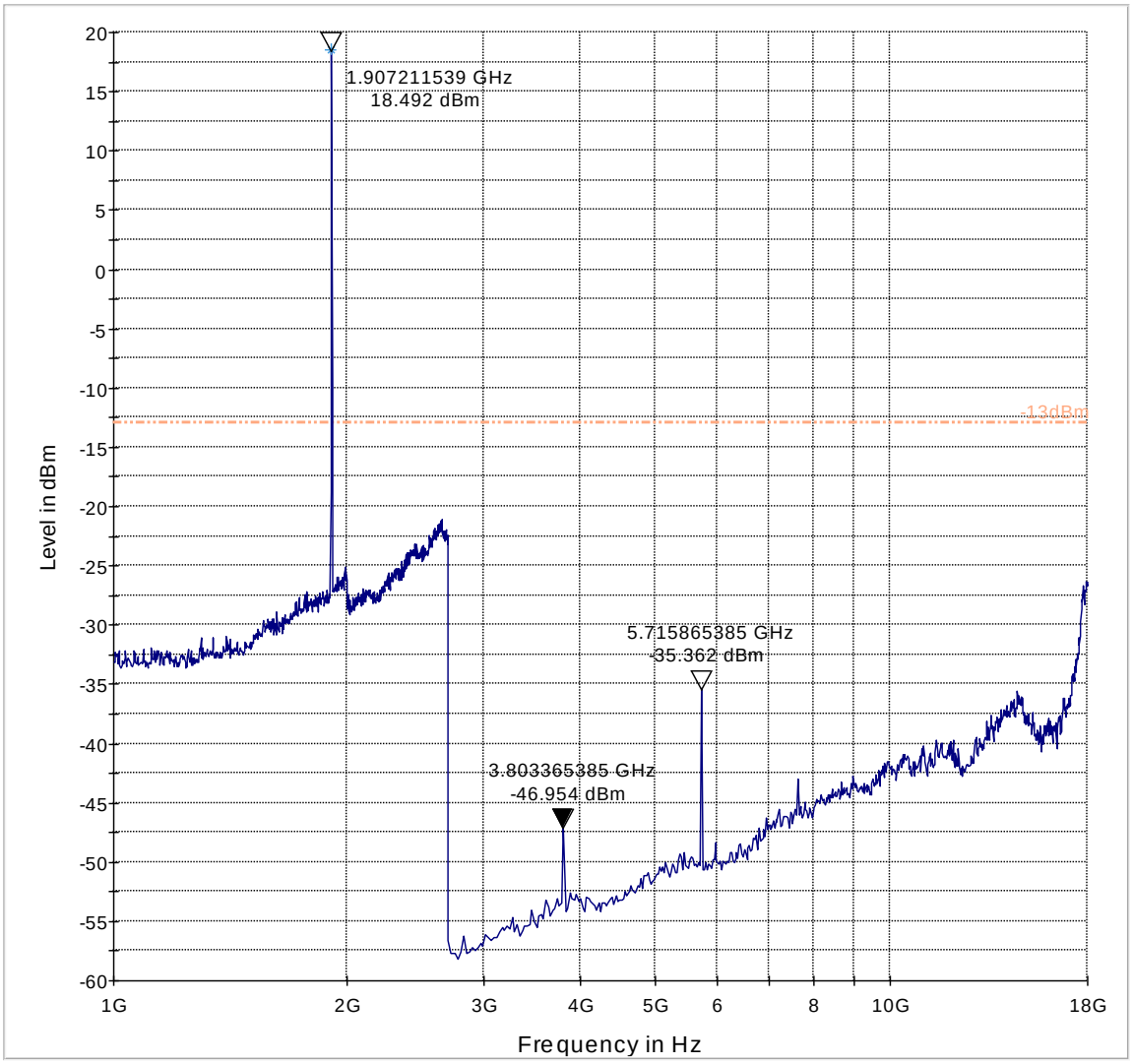
Test results 1GHz-18GHz



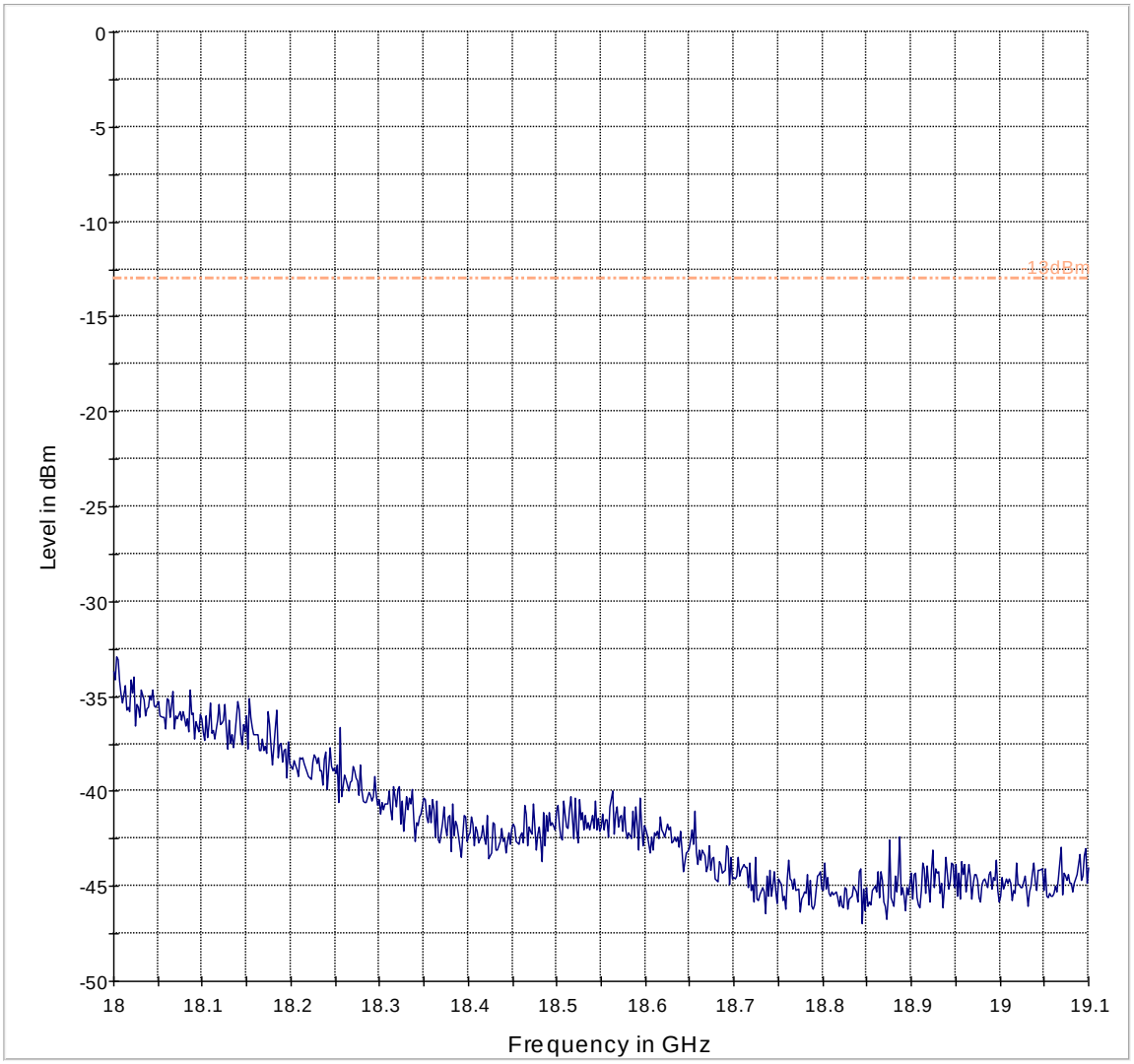
Radiated Spurious Emissions (CDMA-1900) Tx: High Channel
Test results 30MHz-1GHz



Test results 1GHz-18GHz



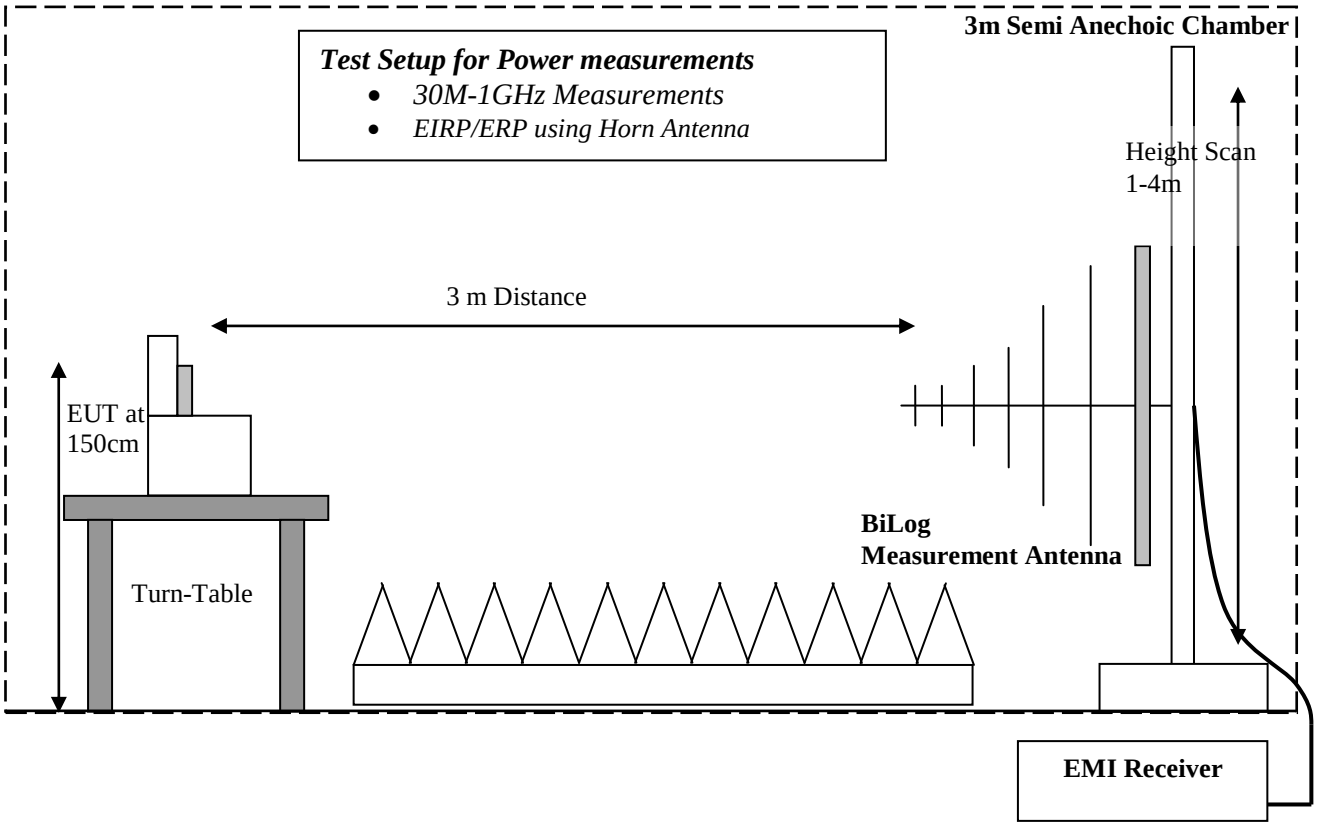
Test results 18GHz-19.1GHz
Note: Worst case representation of all channels

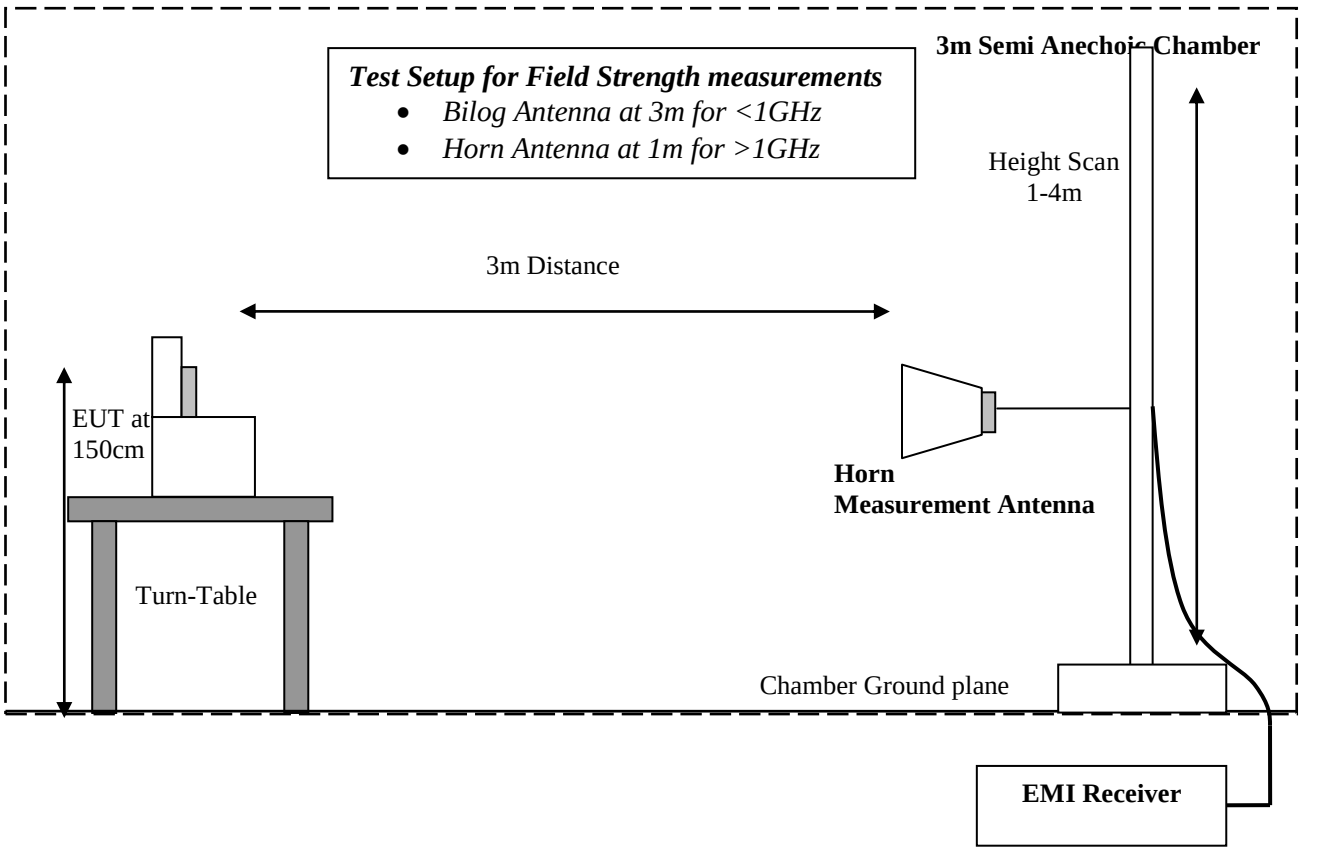


9 Test Equipment and Ancillaries used for tests

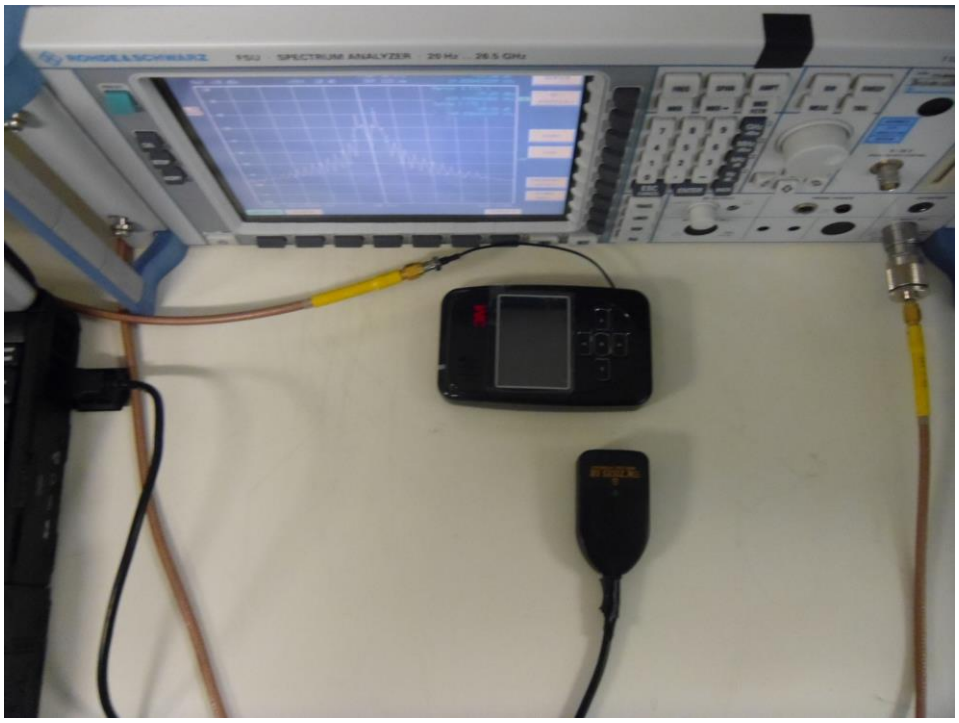
Item Name	Manufacturer	Equipment Type	Model	Serial #	Calibration Cycle	Last Calibration Date
Binconlog Antenna 3141	EMCO	Binconilog Antenna	3141	0005-1186	3 years	4/5/2012
Digital Radio Comm. Tester CMU 200# 4	R&S	Digital Radio Comm. Tester	CMU 200# 4	110229	2 Years	6/15/2013
Digital Radio Comm. Tester CMU 200 #1	R&S	Digital Radio Comm. Tester	CMU 200 #1	101821	2 Years	6/17/2013
Digital Radio Comm. Tester CMU 200 #2	R&S	Digital Radio Comm. Tester	CMU 200 #2	109879	2 Years	6/15/2013
Digital Radio Comm. Tester CMU 200 #3	R&S	Digital Radio Comm. Tester	CMU 200 #3	110759	2 Years	6/15/2013
ESU Receiver	R&S	EMI Receiver	ESU40	100251	2 Years	9/13/2013
Horn Antenna 3115	EMCO	Horn Antenna	3115	35114	3 years	3/6/2012
Horn Antenna 3116	EMCO	Horn Antenna	3116	70497	3 years	3/2/2012
LISN ESH3-Z5	R&S	LISN	ESH3-Z5	836679/003	2 Years	6/18/2013
LISN ESH3-Z6	R&S	LISN	ESH3-Z6	836154/011	2 Years	6/16/2013
LISN FCC-LISN-50-25-2-08	FCC	LISN	FCC-LISN-50-25-2-08	70497	2 Years	7/12/2012
Log Periodic Antenna 3149	ETS Lindgren	Log Periodic Antenna	3149	1186	3 years	8/23/2011
Loop Antenna 6512	ETS Lindgren	Loop Antenna	6512	49838	3 years	8/1/2011
Thermometer Humidity TM320	Dickson	Thermometer Humidity	TM320	5280063	1 Year	4/15/2013
Thermometer Humidity TM325	Dickson	Thermometer Humidity	TM325	5285354	2 Years	4/15/2013

10 Test Setup Diagrams and Setup pictures

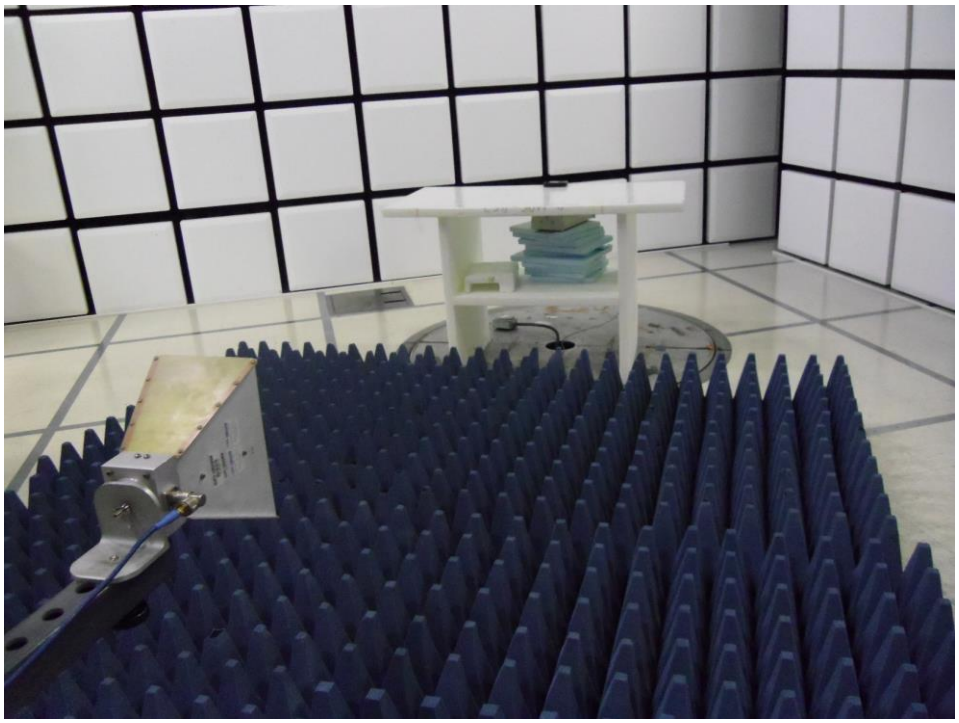




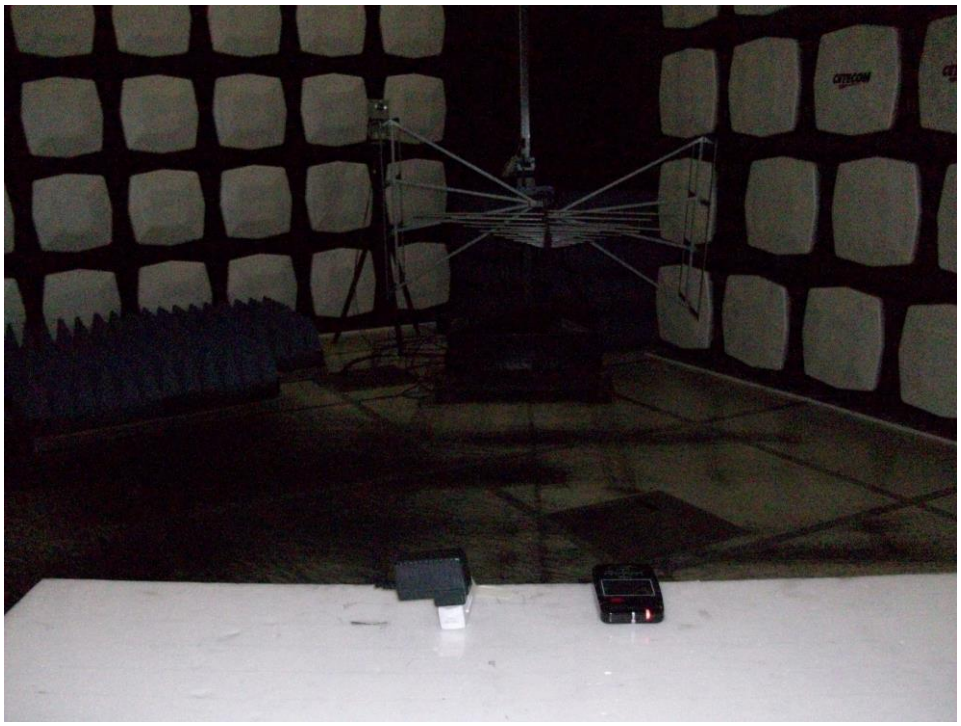
Conducted measurements:



Radiated >1GHz:



Radiated <1GHz



11 Revision History

Date	Report Name	Changes to report	Report prepared by
2014-05-02	EMC_3MMMM_003_13001_FCC22_24	First Version	Franz Engert