FCC / IC Test Report

FOR:

Smith & Nephew Inc.

Model Name:

RENASYS TOUCH / NPWT System

FCC ID: 2AEAJ-66801791
IC ID: 20634-66801791

47 CFR Part 22, 24
RSS-132 Issue 3
RSS-133 Issue 2

REPORT #: EMC-SMITH-001-14001_FCC_22_24_REV_3
DATE: August 26, 2016

FCC: Accredited

IC recognized # 3462B-1

***CETECOM* Inc.**
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CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

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1 Assessment

The following equipment as further described in section 3 of this test report was evaluated against the applicable criteria specified in FCC CFR47 Parts 22 and 24 and Industry Canada Radio Standard Specifications RSS-132 Issue 3 and RSS-133 Issue 2. No deviations were ascertained during the course of the tests performed.

Company	Description	Model #
Smith & Nephew Inc.	Negative Pressure Wound Therapy suction device with GSM, UMTS, and GPS Radio	66801280

Report reviewed by:

Date	Section	Name	Signature
August 26, 2016	Compliance	Franz Engert (Manager Compliance)	Digitally signed by Franz Engert DN: cn=Franz Engert, c=US, o=CETECOM, ou=Complience, email=franz.engert@cetecom.com

Responsible for the Report:

Date	Section	Name	Signature
August 26, 2016	Compliance	Yu-Chien Ho (EMC Engineer)	Yu-Chien Ho

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Address:	CETECOM Inc. 411 Dixon Landing Rd Milpitas, CA 95035
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Compliance Manager:	Franz Engert
Test Engineer:	Yu-Chien Ho

2.2 Identification of the Client

Client Firm/Name:	Smith & Nephew Inc.
Street Address:	970 Lake Carillon Drive, Suite 110
City/Zip Code	St. Petersburg, FL 33716
Country	USA
Contact Person:	Bill Gregory
Phone No.	727-399-3489
e-mail:	bill.gregrory@smith-nephew.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	Smith and Nephew, Inc.
Manufacturers Address:	76 South Meridian Avenue
City/Zip Code	Oklahoma City, 73107
Country	USA

2.4 Dates of Testing:

September 15, 2015 – September 30, 2015

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name:	RENASYS TOUCH / NPWT System
Model Number:	66801280
FCC-ID :	2AEAJ 66801791
IC-ID:	20634 66801791
Product Description:	Negative Pressure Wound Therapy suction device with GSM, UMTS, and GPS Radio
Integrated Module Information:	Manufacturer: Gemalto; Module: Cinterion PHS8-P; FCC-ID: QIPPHS8-P; IC: 7830A-PHS8P;
Technology / Type(s) of Modulation:	GSM 850, 1900 WCDMA /UMTS FDD II V GPS
Operating Frequency Ranges (MHz) / Channels:	GSM 850: 824-849; 123 channels GSM 1900: 185;0-1910; 298 channels WCDMA /UMTS 850: 826.4 - 846.6; 799 channels WCDMA /UMTS 1900: 1852.4-1907.6; 1199 channels
Antenna info:	PCB antenna. Peak gain: 1 dBi@850, 2.77 dBi@1900
Rated Operating Voltage Range:	Input: 100-240 VAC, 50-60 Hz, 1.5 A. Output: +19.5 VDC, 2.6 A.
Rated Operating Temperature Range:	T min: -40° C/ T max: 95° C
Test Sample Status:	Production

3.2 Identification of the Equipment under Test (EUT)

EUT #	Serial Number	Sample	HW / SW Version
1	DVRT140024	Radiated	25SN-0370 Rev A / 03.02.00

3.3 Identification of Accessory equipment

AE #	Type	Model	Manufacturer	Serial Number
1	Medical Power Supply	MENB1050A1900N02	SL Power and AULT	LA03970A

4 Summary of Measurement Results

GSM / CDMA:

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046 §22.913 (a) RSS-132 5.4	RF Output Power Radiated	Nominal	GSM / WCDMA	■	☐	☐	☐	Complies
§2.1055 §22.355 RSS-132 5.3	Frequency Stability	Nominal	GSM / WCDMA	☐	☐	☐	■	Note 1
§2.1049 §22.917(b) RSS-132 5.2	Occupied Bandwidth	Nominal	GSM / WCDMA	☐	☐	☐	■	Note 1
§2.1051 §22.917 RSS-132 5.5	Band Edge Compliance	Nominal	GSM / WCDMA	☐	☐	☐	■	Note 1
§2.1051 §22.917 RSS-132 5.5	Conducted Spurious Emissions	Nominal	GSM / WCDMA	☐	☐	☐	■	Note 1
§2.1053 §22.917 RSS-132 5.5	Radiated Spurious Emissions	Nominal	GSM / WCDMA	■	☐	☐	☐	Complies

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

5 Measurements

5.1 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	1.94	2.16	0.64
95% confidence interval in dB	4.86	3.79	4.24	1.25
95% confidence interval in dB in delta to Result	+-2.5 dB	+-2.0 dB	+- 2.3dB	+-0.7dB

5.2 Nominal Environmental Conditions

- Ambient Temperature: 20-25 °C
- Relative humidity: 40-60%

5.3 Nominal Environmental Test Conditions

- Test Temperature: 20°C (nominal);
- Test Voltage: 3.7 VDC(nominal);

Deviating test conditions are indicated at individual test description where applicable.

5.4 Inheriting Test Results from Incorporated Module Certification:

The EUT integrates the certified module Gemalto PHS8-P (details see EUT spec in section 3.1). EGPRS mode was not tested, because GSM mode is the worst case mode according to Gemalto PHS8-P module report.

Taking into account guidance from FCC KDB 996369 (modular approval) and where relevant test procedures did not change conducted test results are leveraged.

This test report contains full radiated testing as per FCC 22/24 and RSS-132 issue 3 / RSS-133 issue 6

5.5 Nominal Cellular Test Conditions

1. The different cellular operation modes of the EUT as required for testing are controlled through the link with the Digital Radio Communication Tester (R&S CMU200).
2. The EUT is tested on the low, mid and high channel of each of the supported cellular operation modes.

5.6 Additional Test Information.

Testing is performed according to the guidelines provided in FCC publication (KDB) 971168 D01 v02r02, *Measurement Guidance for Certification of Licensed Digital Transmitters* and according to relevant parts of TIA-603C 2004 as detailed below.

6 RF Power Output verification radiated

6.1 References

FCC: CFR Part 2.1046, CFR Part 22.913, CFR Part 24.232
IC: RSS-Gen issue 4, section 6.12; RSS-132 issue 3, section 5.4; RSS-133 issue 6, section 6.4

6.2 Limits:

ERP (850 MHz Band)

FCC Part 22.913 (a) & RSS-132 Section 5.4

FCC: ERP < 38.45 dBm (7W)
The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.

IC: ERP < 40.60 dBm (11.5W)
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.

EIRP (1900 MHz Band)

FCC Part 24.232 (c) (e) & RSS-133 Section 6.4/SRSP-510 Section 5.1.2

FCC: EIRP < 33 dBm (2W)
(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.

IC: EIRP < 33 dBm (2W)
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 2 watts.

6.3 Measured Radiated Output Power

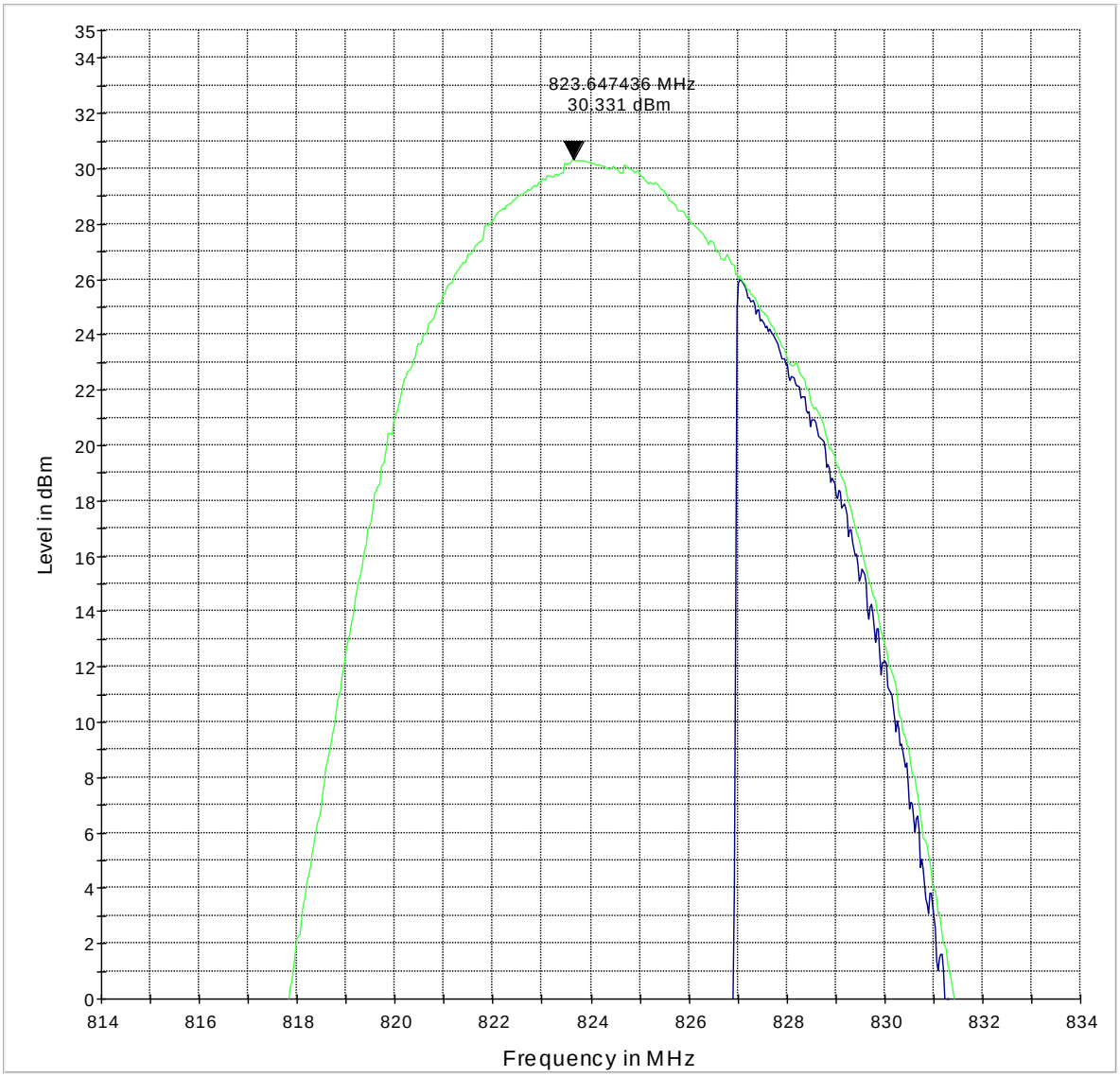
Mode	Peak Radiated Output power (ERP/EIRP)
GSM 850, Ch. Low	30.331 dBm ERP
GSM 850, Ch. Mid	30.234 dBm ERP
GSM 850, Ch. High	29.309 dBm ERP
GSM 1900, Ch. Low	29.218 dBm EIRP
GSM 1900, Ch. Mid	28.74 dBm EIRP
GSM 1900, Ch. High	28.077 dBm EIRP
EGPRS 850, Ch. Low	26.056 dBm ERP
EGPRS 850, Ch. Mid	26.292 dBm ERP
EGPRS 850, Ch. High	26.056 dBm ERP
EGPRS 1900, Ch. Low	25.754 dBm EIRP
EGPRS 1900, Ch. Mid	26.251 dBm EIRP
EGPRS 1900, Ch. High	24.037 dBm EIRP
FDD II, Ch. Low	24.423 dBm EIRP
FDD II, Ch. Mid	24.379 dBm EIRP
FDD II, Ch. High	22.474 dBm EIRP
FDD V, Ch. Low	20.061 dBm ERP
FDD V, Ch. Mid	19.641 dBm ERP
FDD V, Ch. High	21.553 dBm ERP

6.4 Measurement Result:

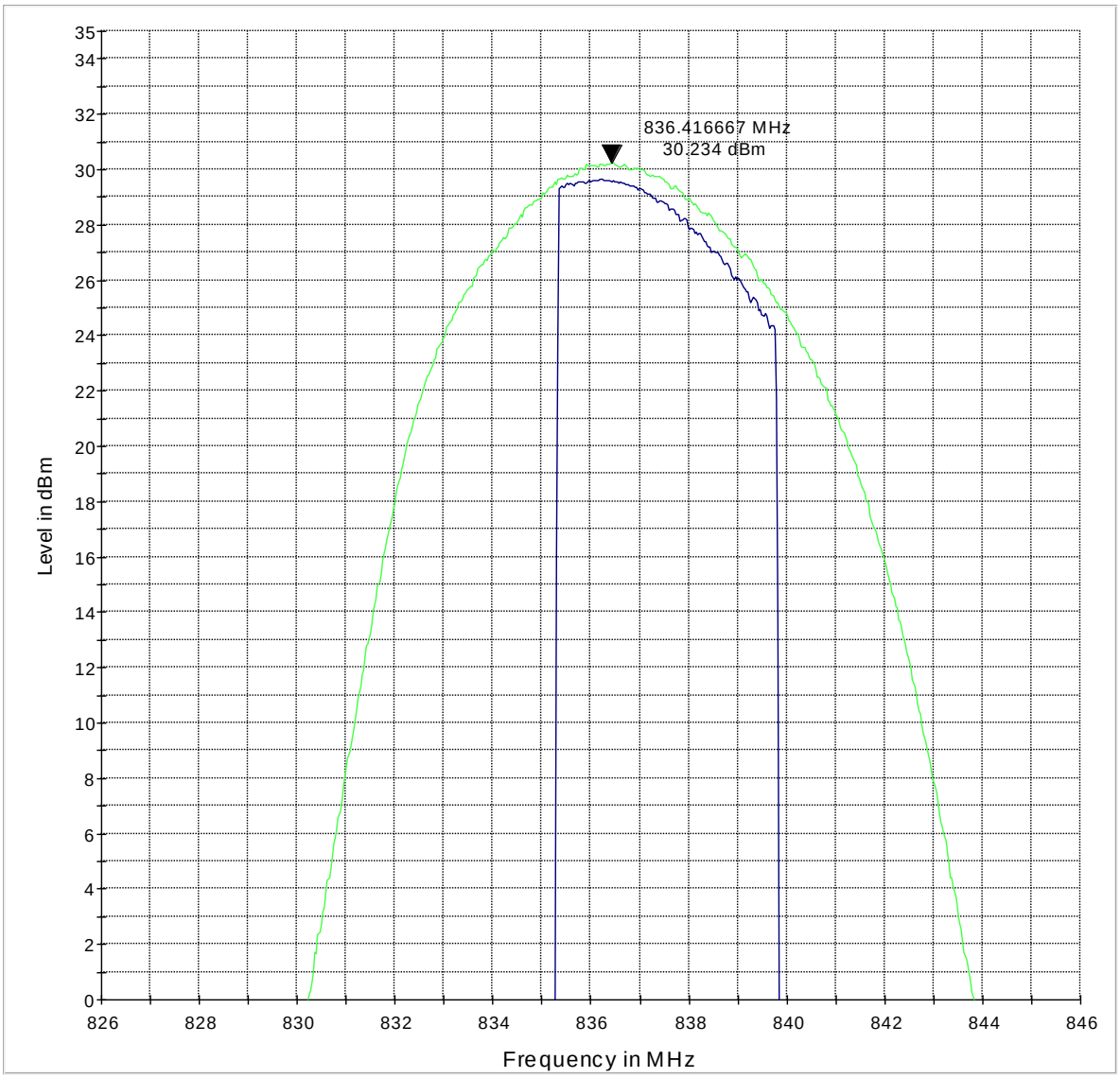
All ERP/EIRP are within the regulatory limits

6.5 Measurement Plots:

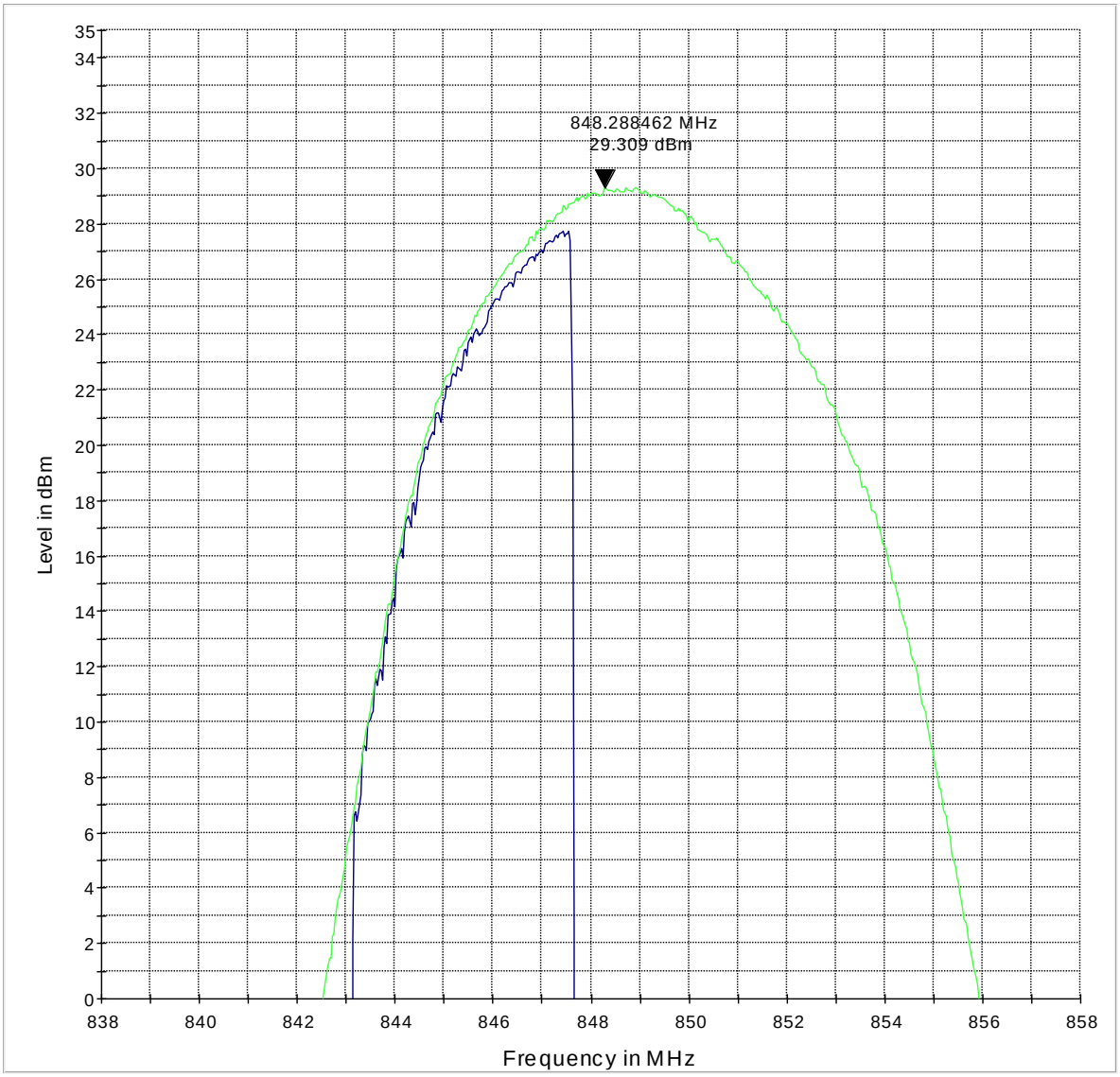
6.5.1 ERP, GSM 850, Tx: Ch. Low



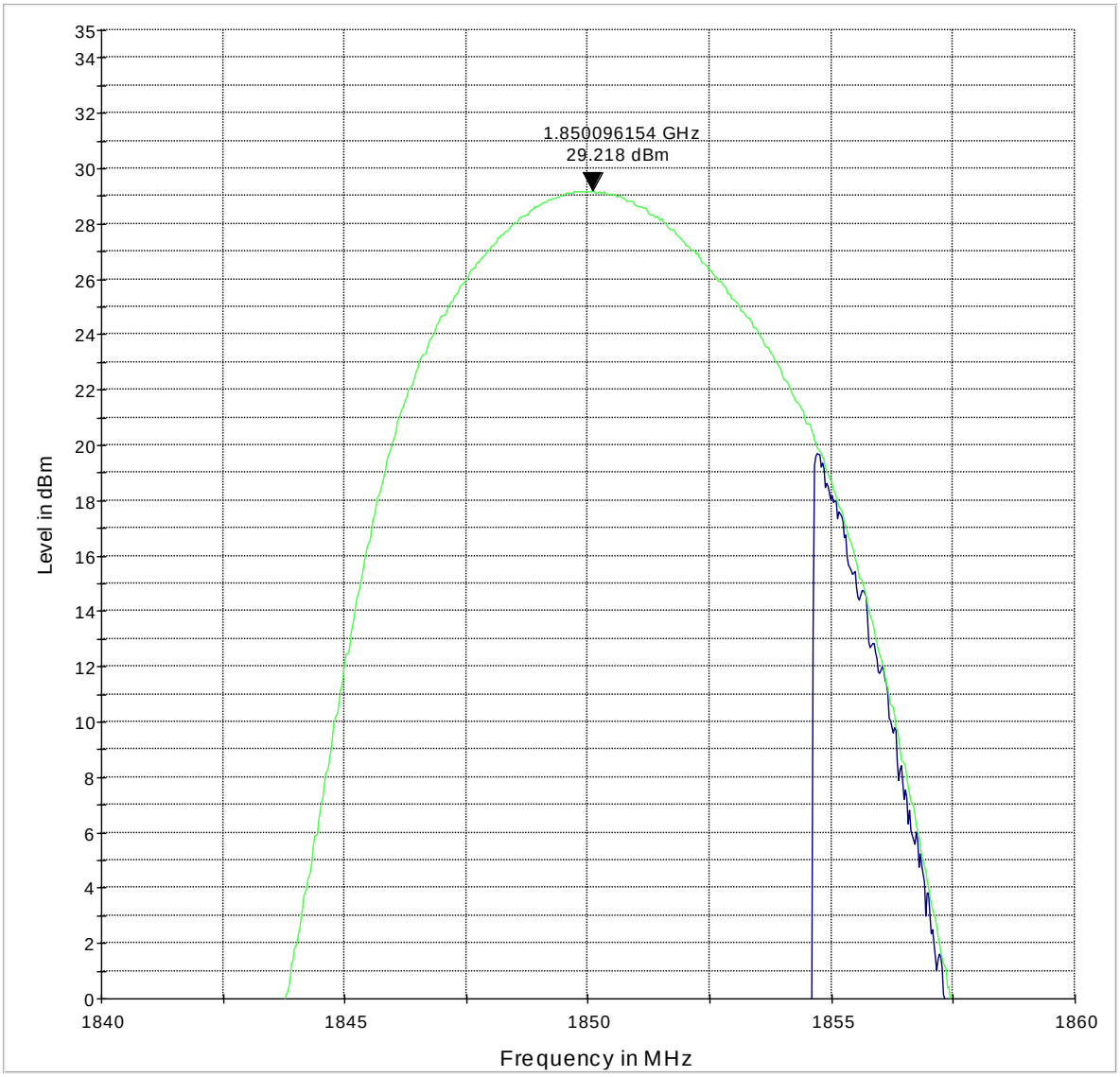
6.5.2 ERP, GSM 850, Tx: Ch. Mid



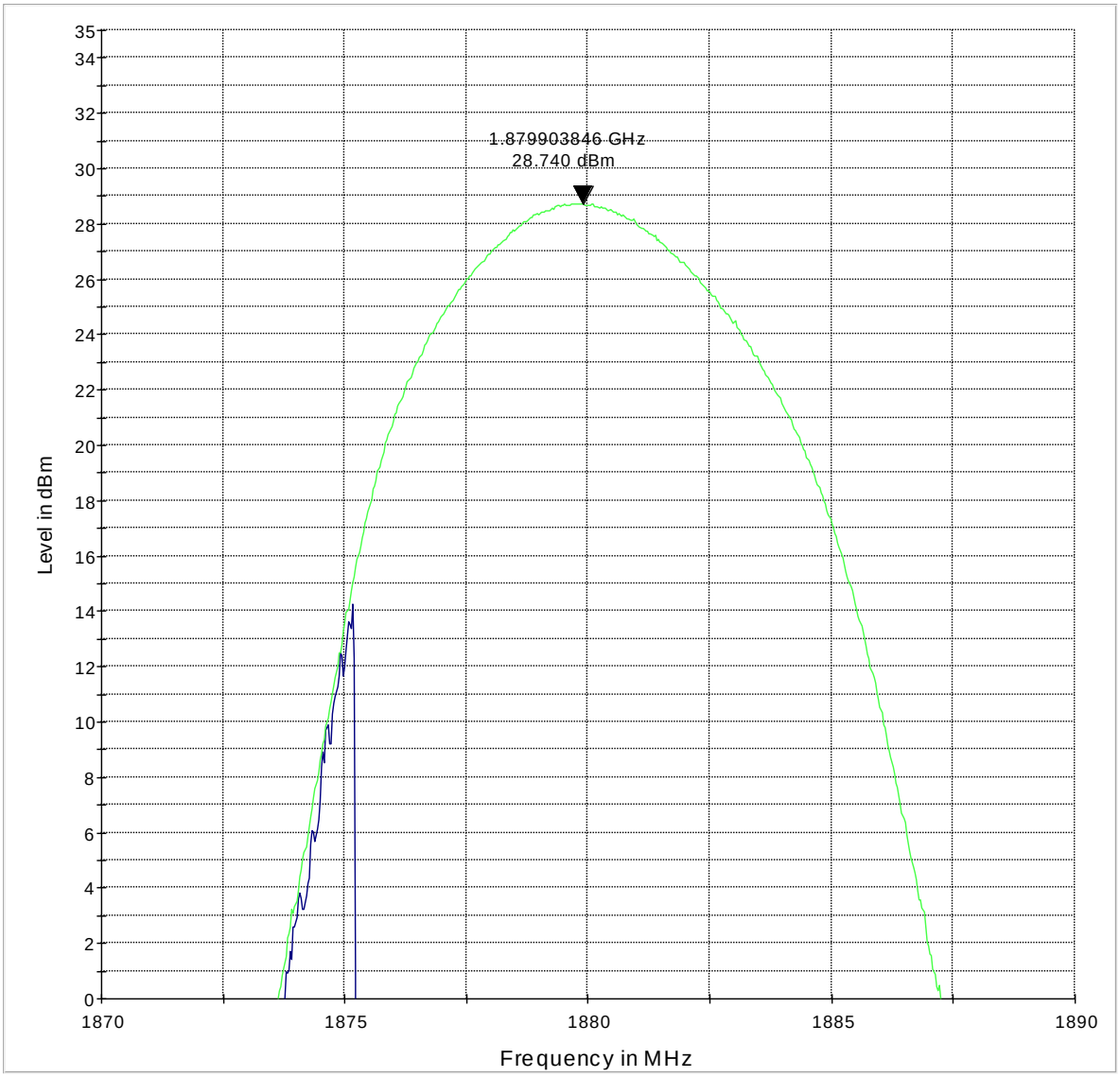
6.5.3 ERP, GSM 850, Tx: Ch. High



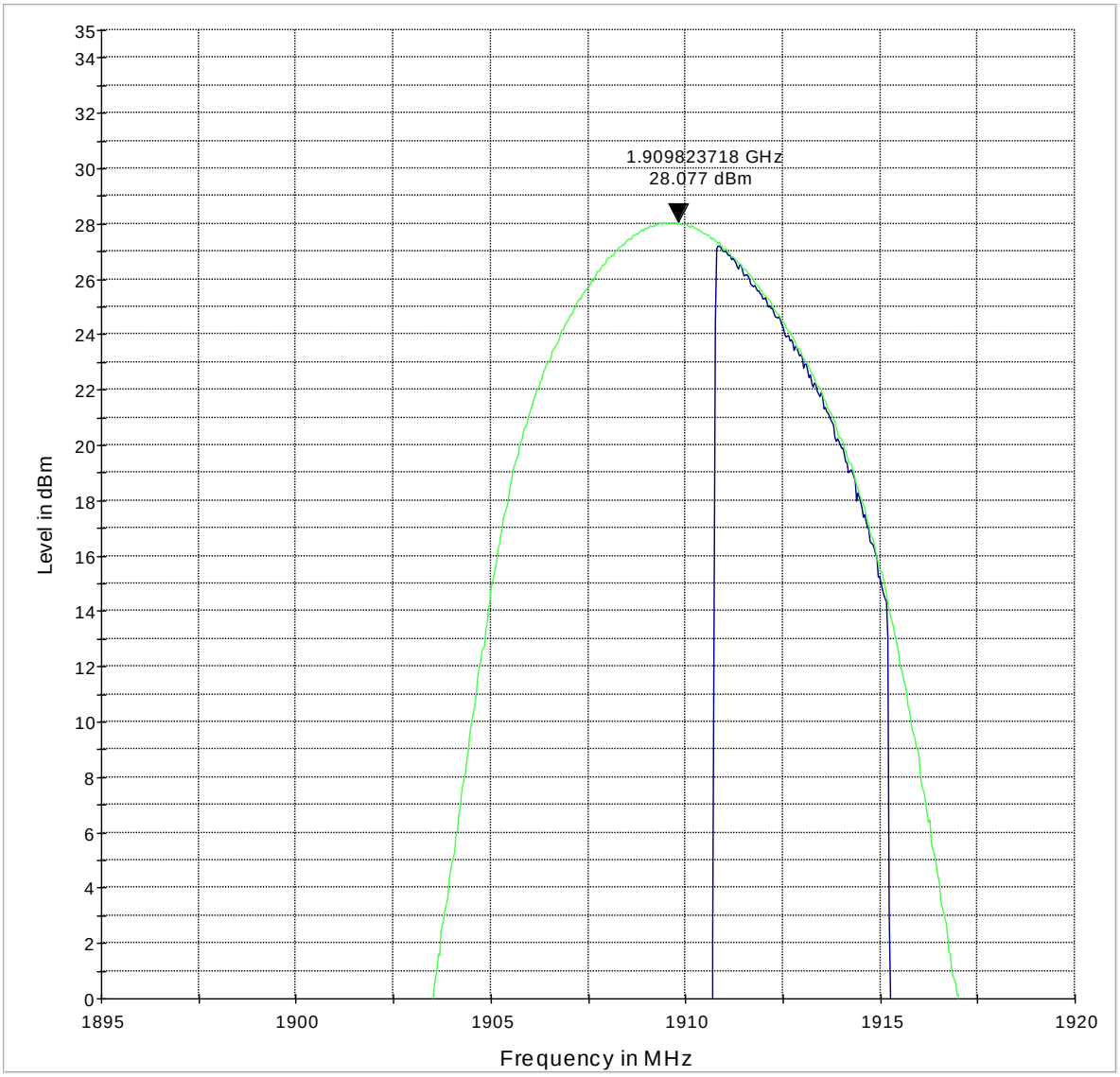
6.5.4 EIRP, GSM 1900, Tx: Ch. Low



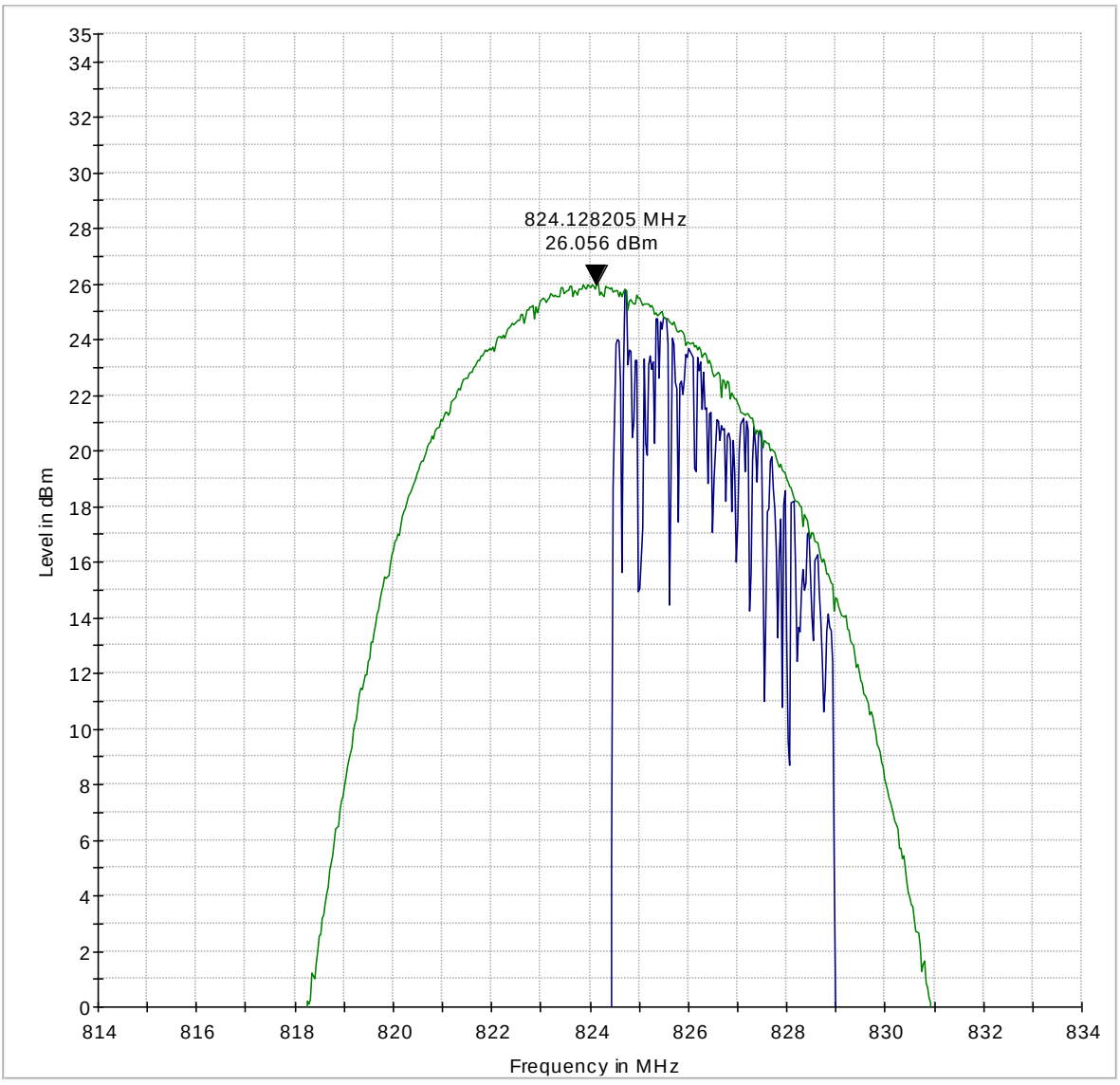
6.5.5 EIRP, GSM 1900, Tx: Ch. Mid



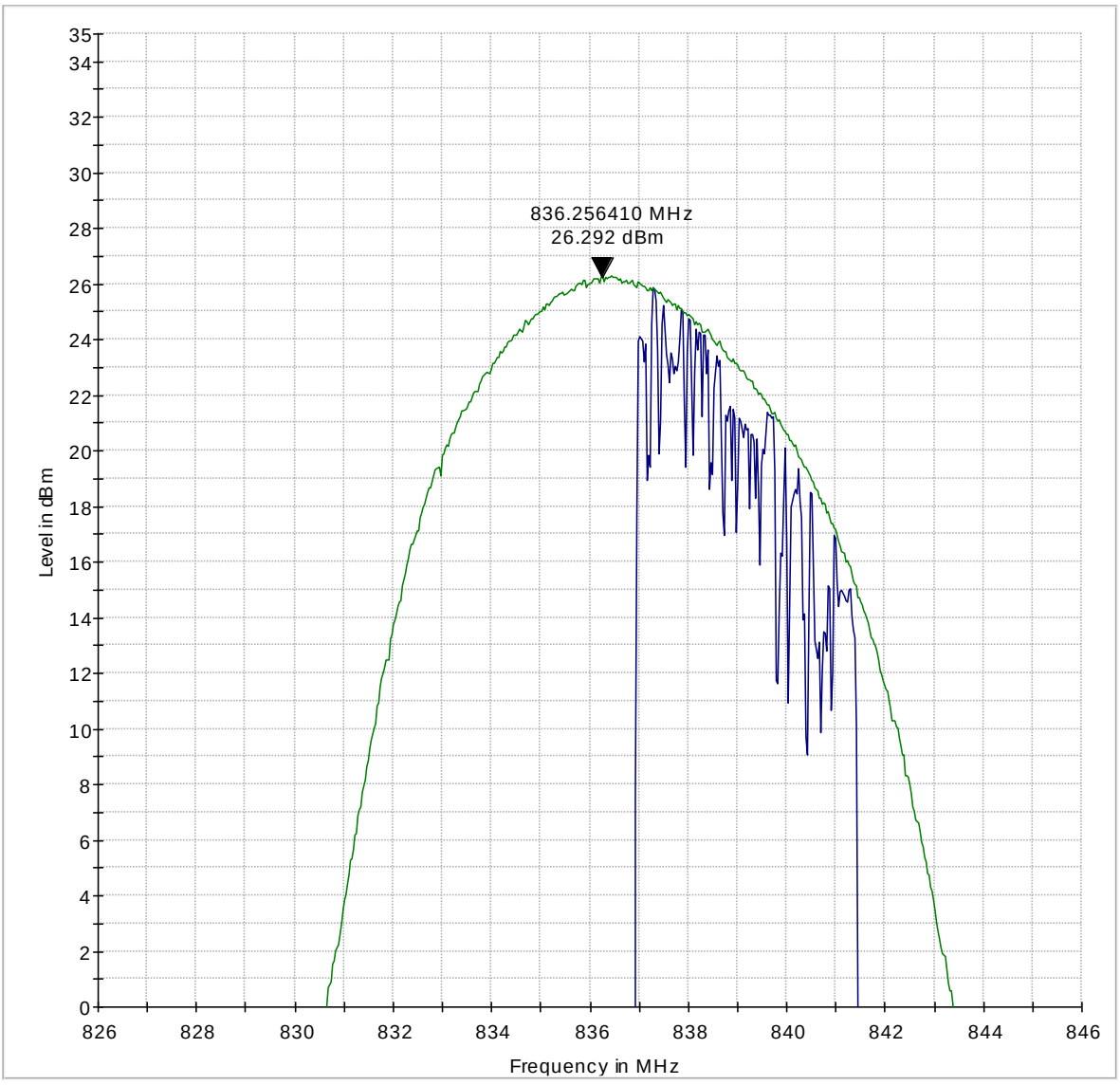
6.5.6 EIRP, GSM 1900, Tx: Ch. High



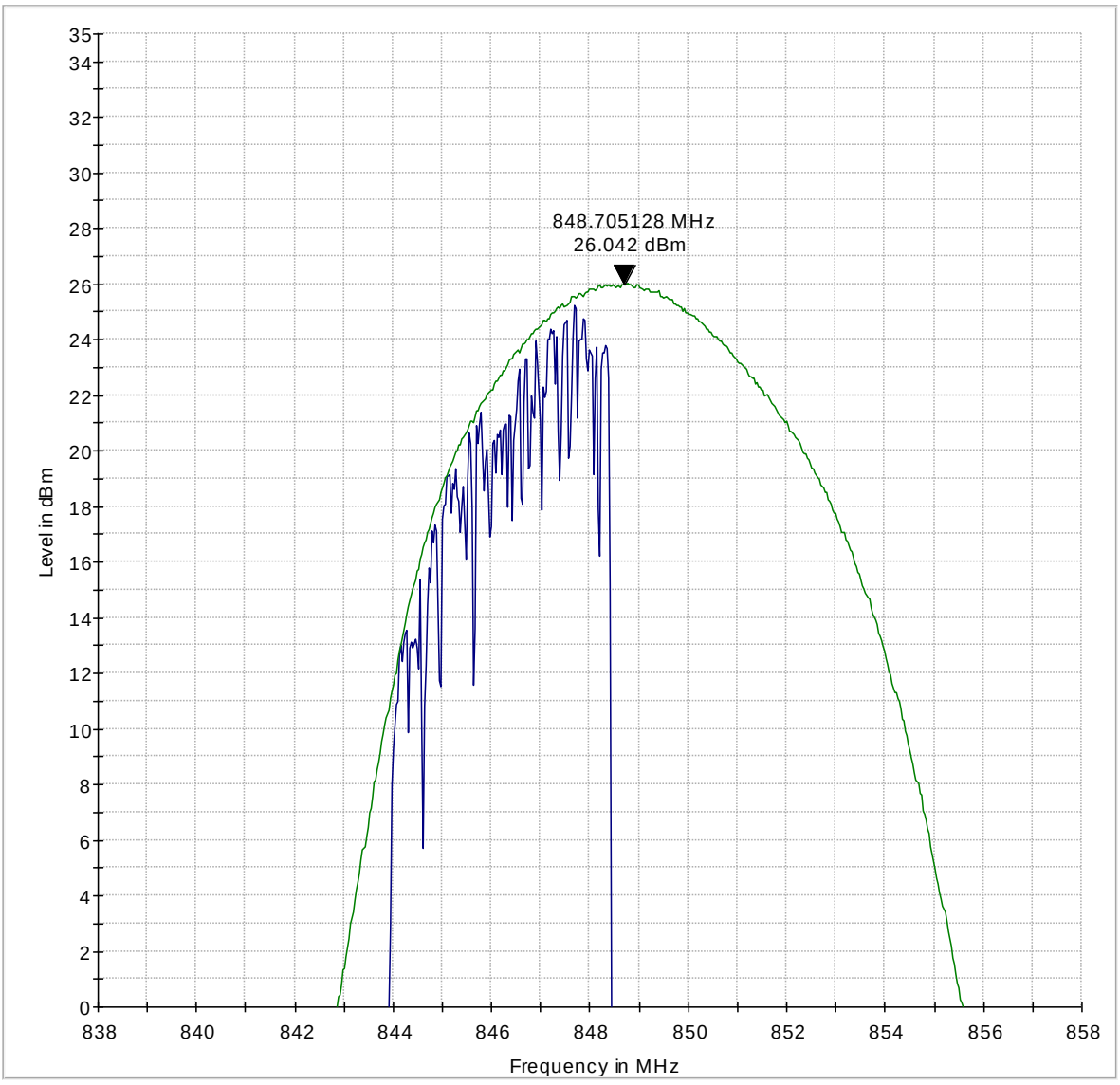
6.5.7 ERP, EGPRS 850, Tx: Ch. Low



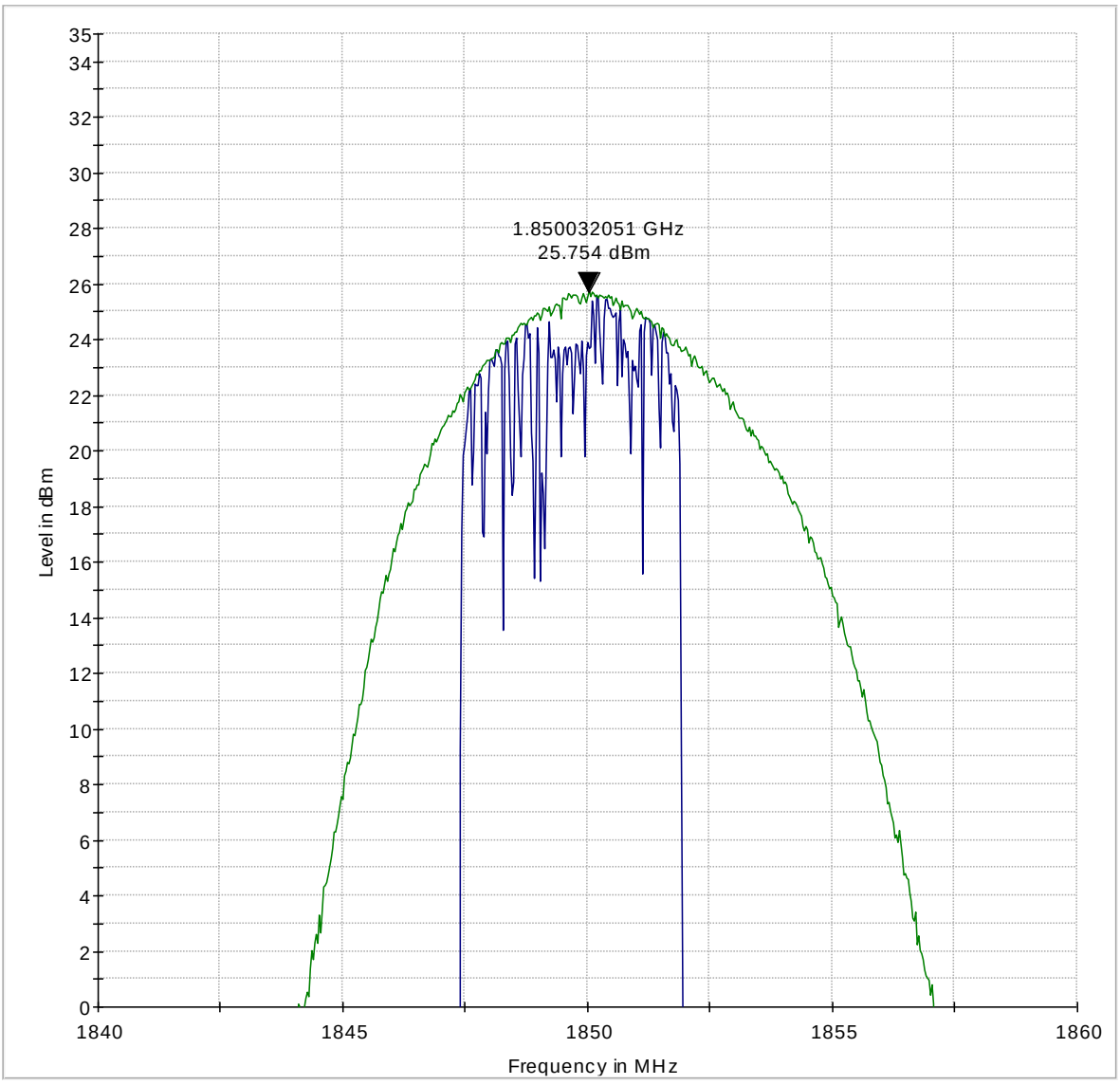
6.5.8 ERP, EGPRS 850, Tx: Ch. Mid



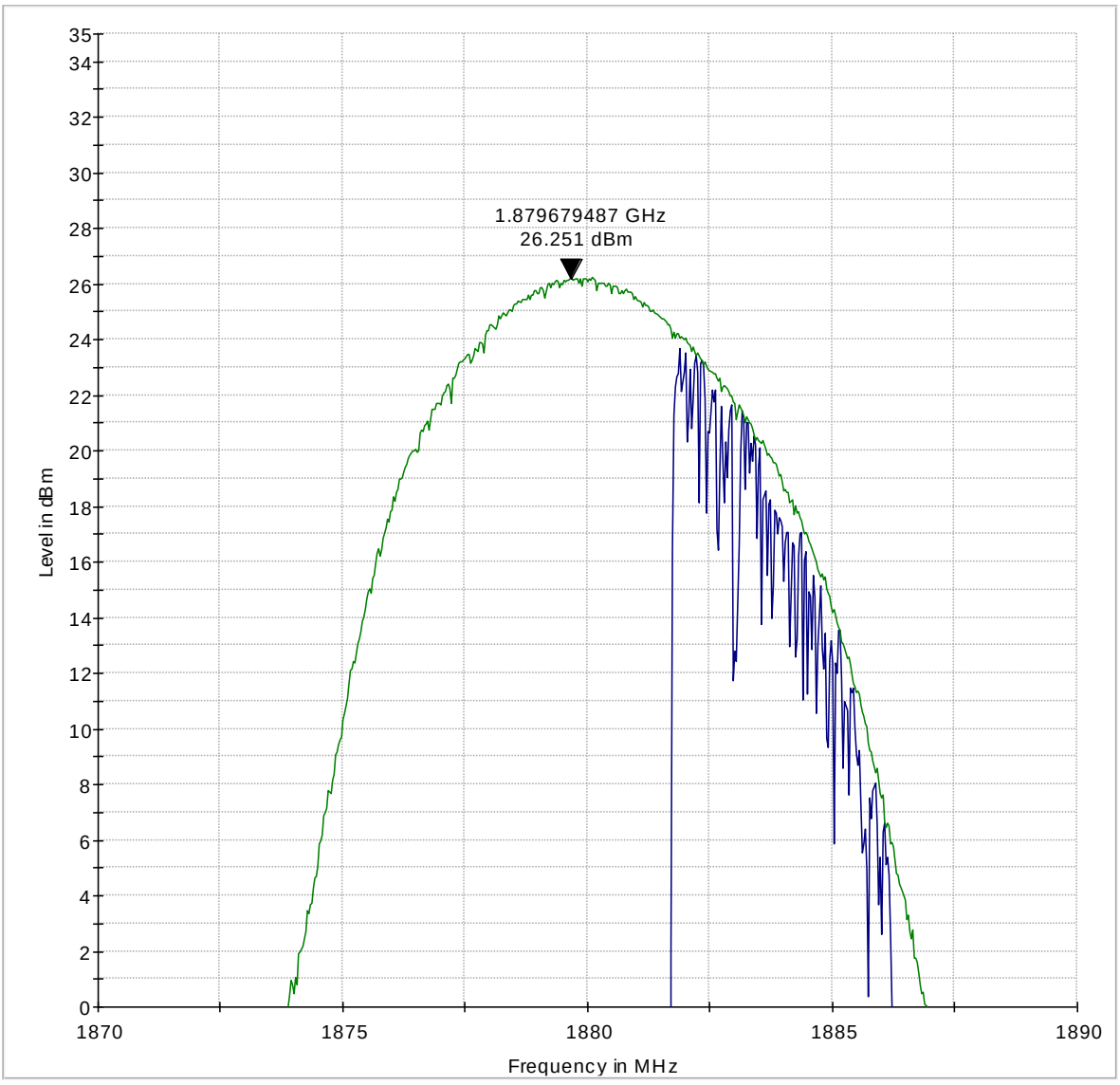
6.5.9 ERP, EGPRS 850, Tx: Ch. High



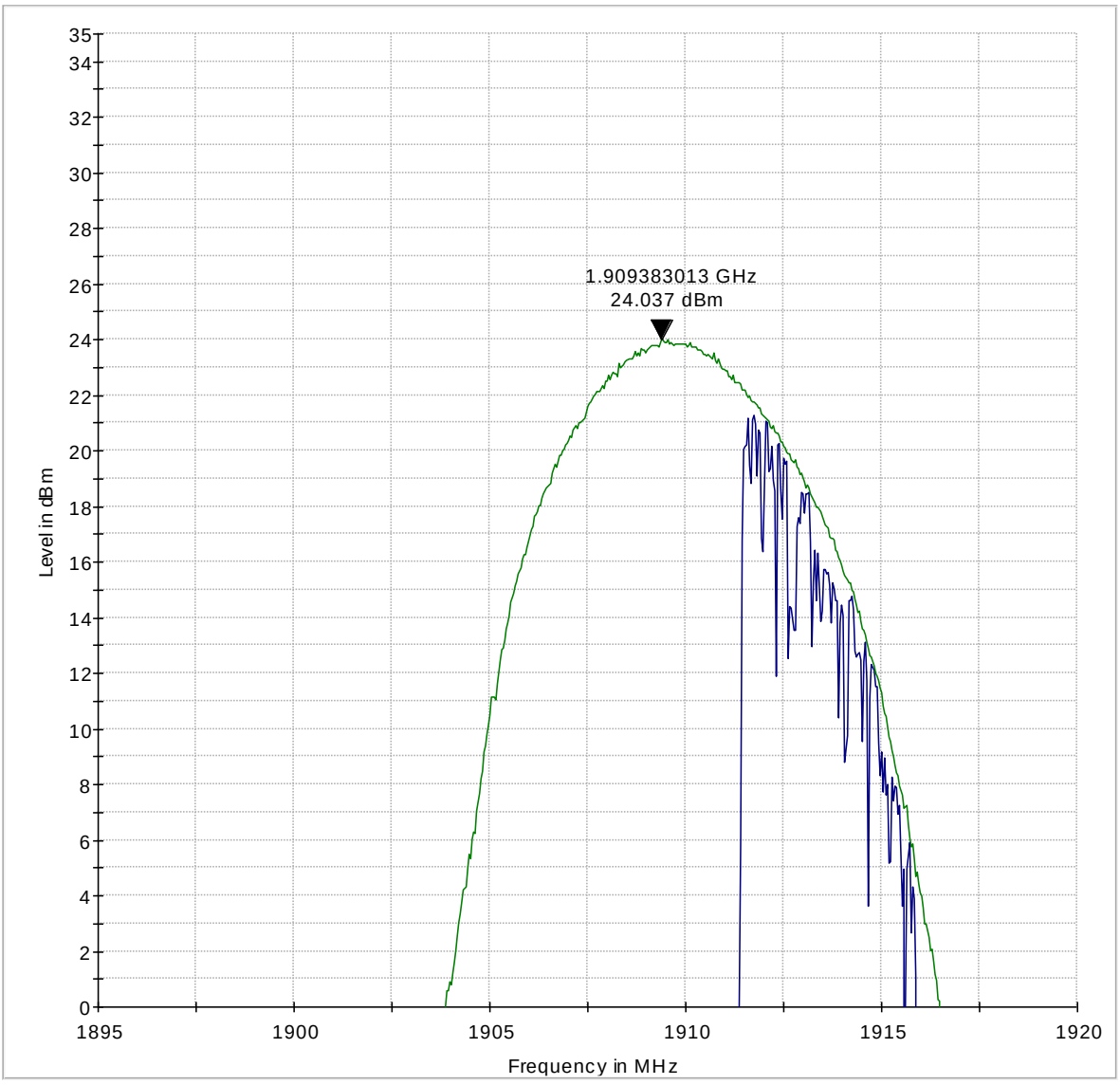
6.5.10 EIRP, EGPRS 1900, Tx: Ch. Low



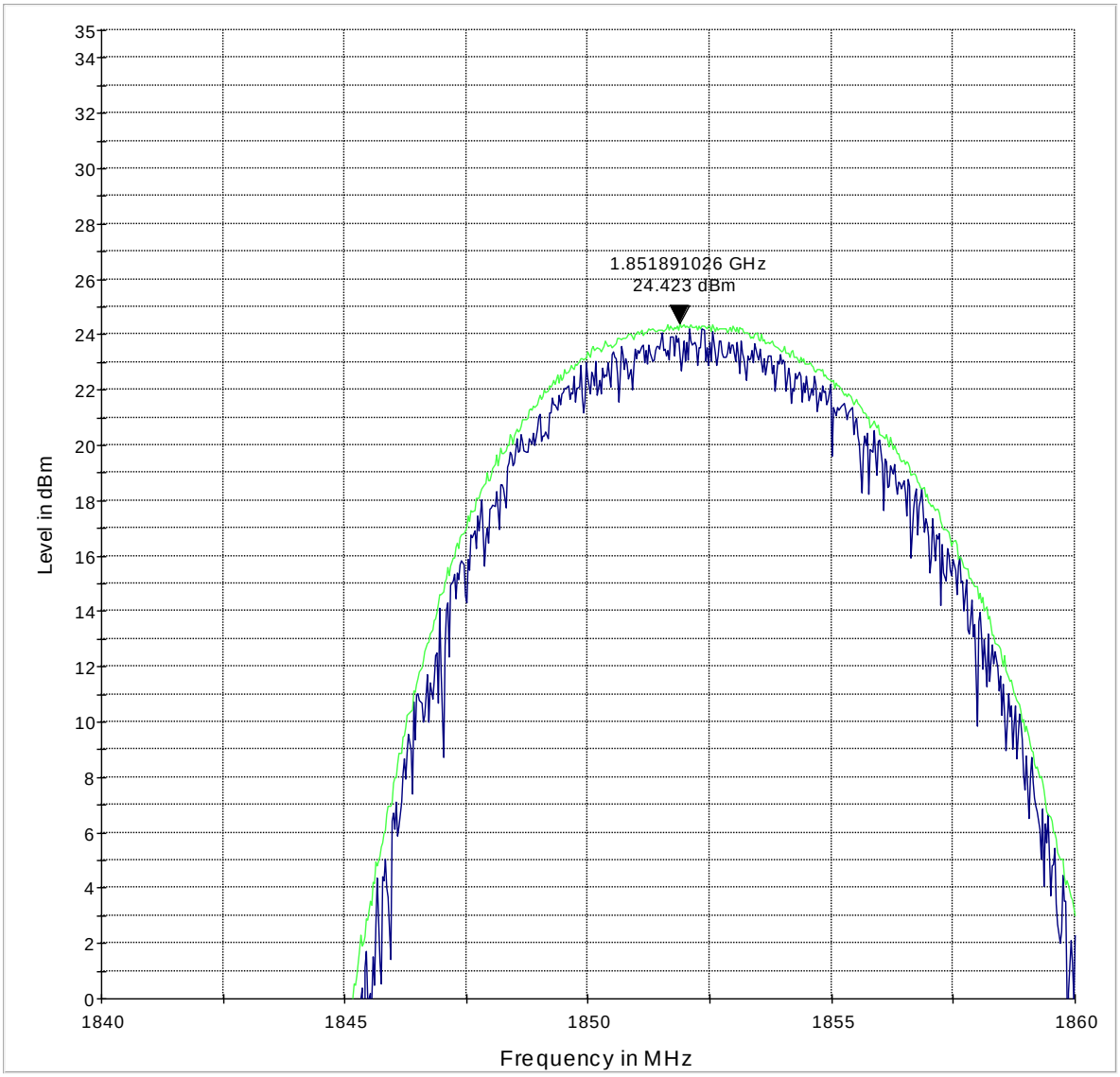
6.5.11 EIRP, EGPRS 1900, Tx: Ch. Mid



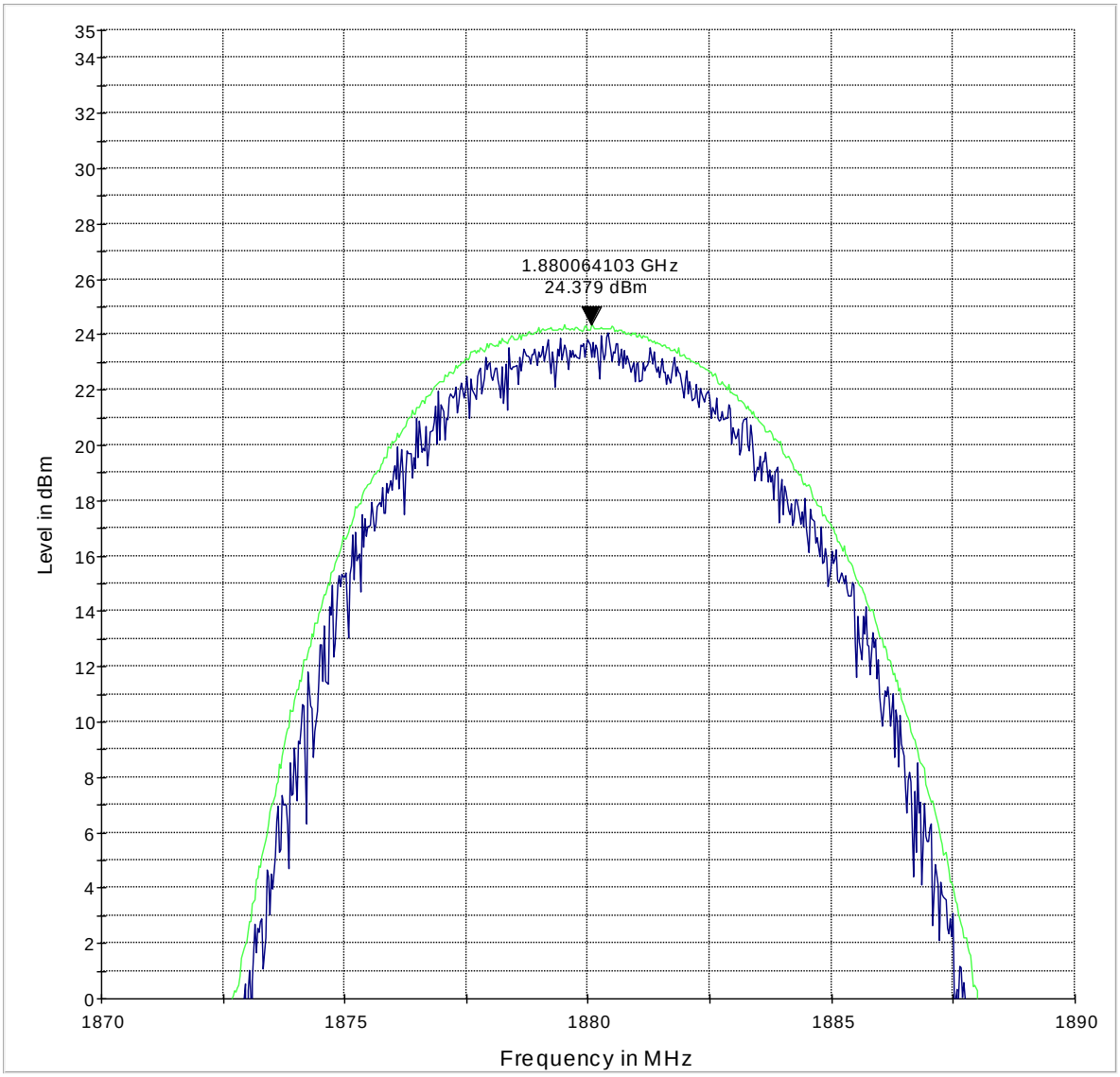
6.5.12 EIRP, EGPRS 1900, Tx: Ch. High



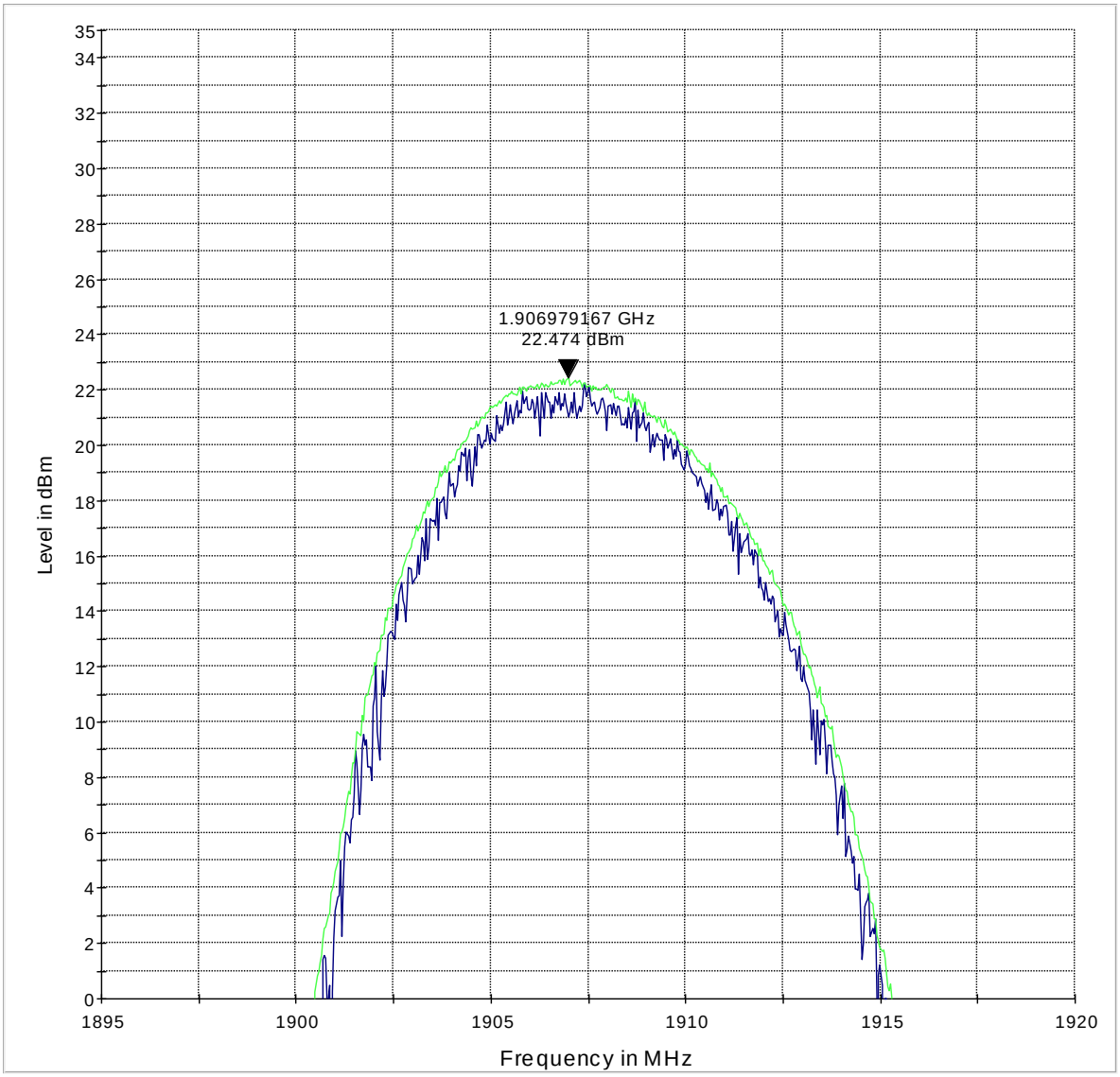
6.5.13 EIRP, UMTS FDD II, Tx: Ch. Low



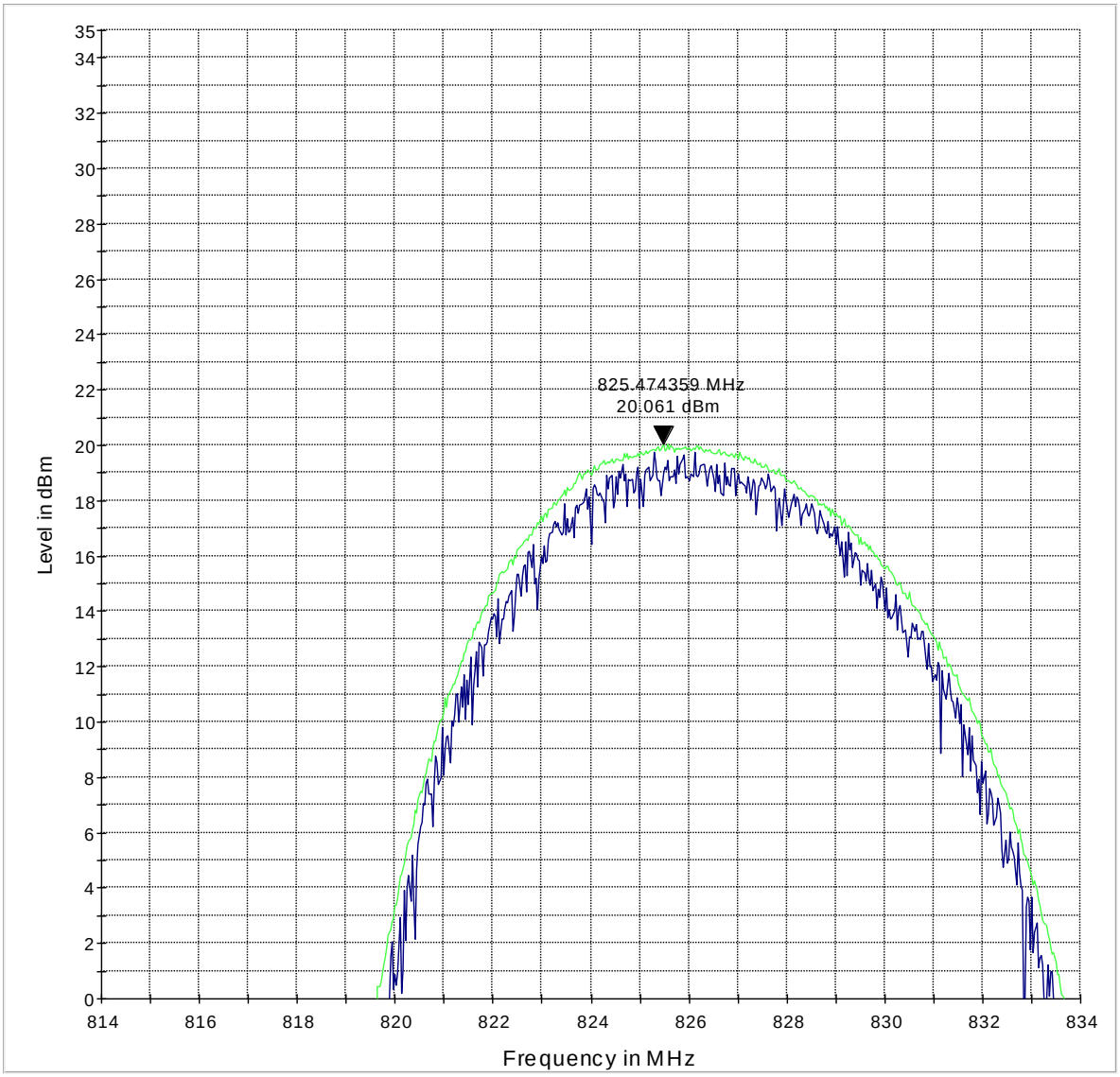
6.5.14 EIRP, UMTS FDD II, Tx: Ch. Mid



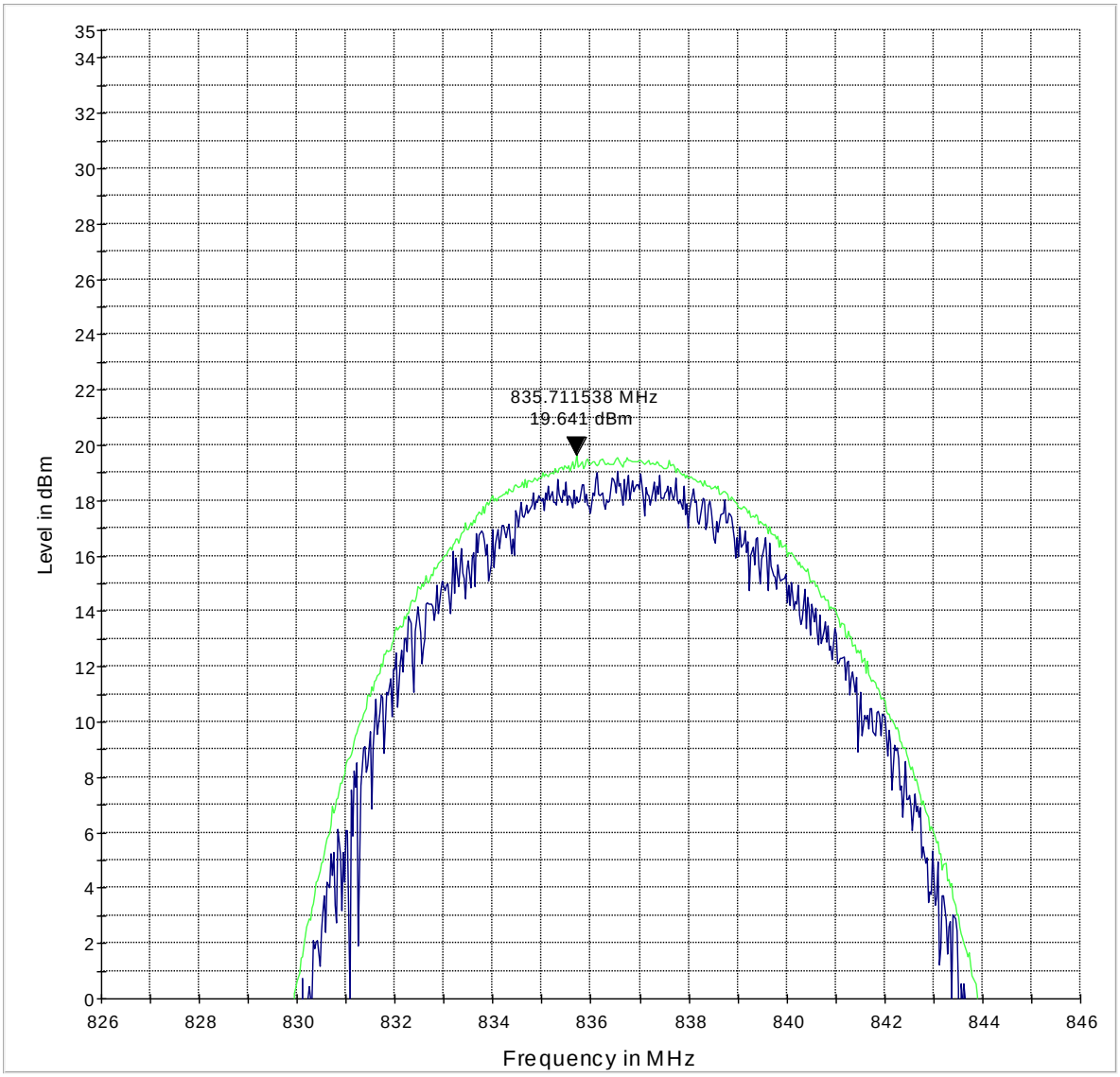
6.5.15 EIRP, UMTS FDD II, Tx: Ch. High



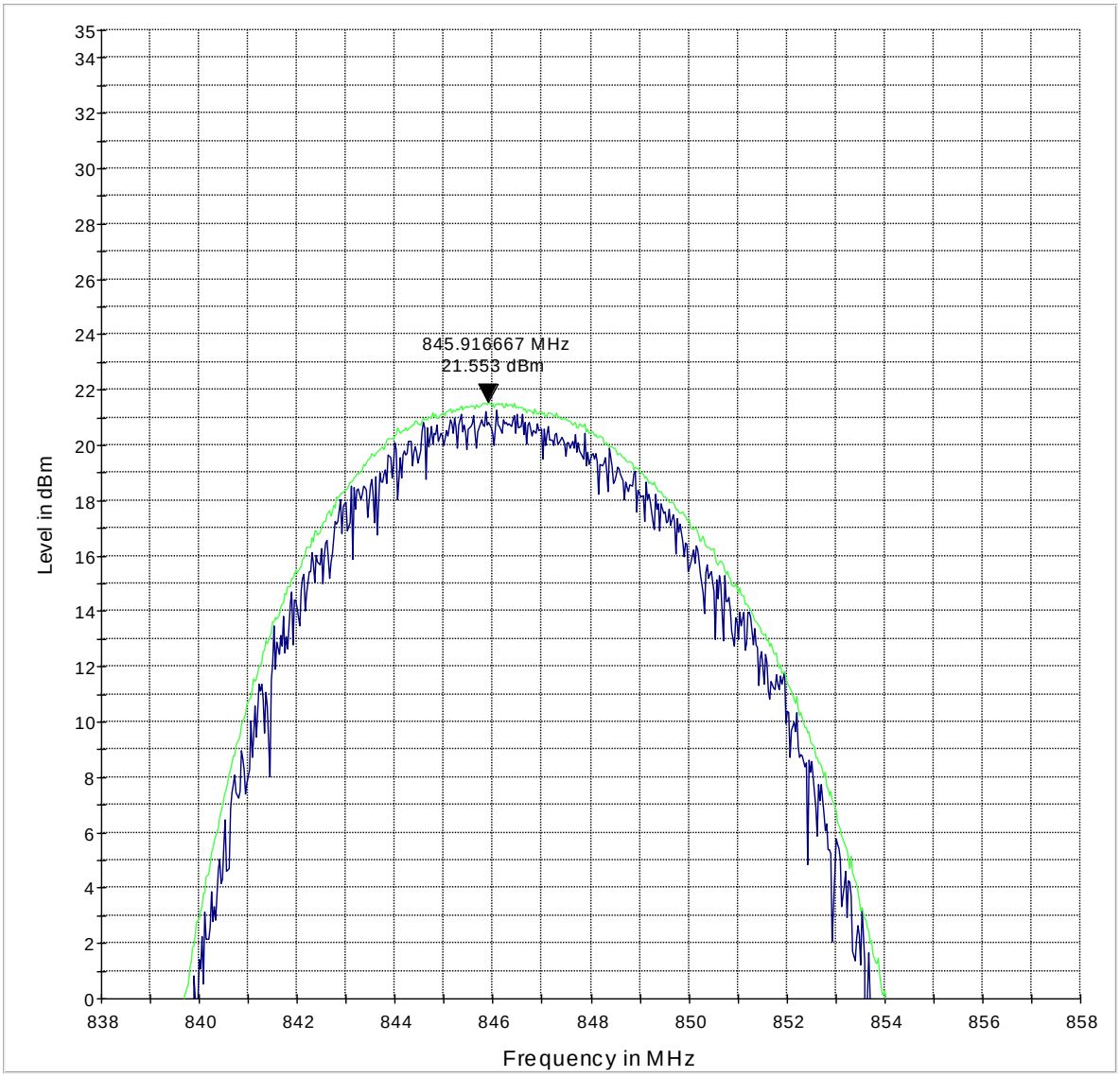
6.5.16 ERP, UMTS FDD V, Tx: Ch. Low



6.5.17 ERP, UMTS FDD V, Tx: Ch. Mid



6.5.18 ERP, UMTS FDD V, Tx: Ch. High



7 Spurious Emissions Radiated

7.1 References:

FCC: CFR Part 2.1053, CFR Part 22.917, CFR Part 24.238,
IC: RSS-Gen issue 4, section 6.13; RSS-132 issue 3, section 5.5; RSS-133 issue 6, section 6.5

7.2 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.

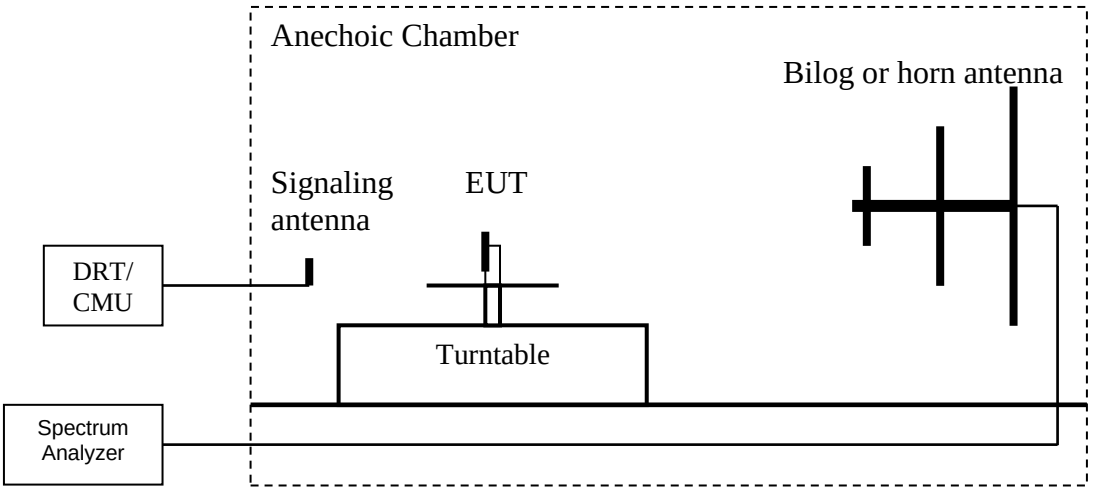
7.2.1 **FCC 22.917 Emission limitations for cellular equipment.**
The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.
(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing 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.

7.2.2 **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.

7.2.3 **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 log10(P), dB, in any MHz of bandwidth.

7.3 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.)

7.3.1 Sample Calculations for Radiated Measurements:
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 below.

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

7.3.2 Spectrum Analyzer Settings
Settings for FCC 22

	9 – 150 KHz	150 KHz – 30 MHz	30MHz – 1 GHz	1 – 1.58 GHz	1.58 – 9 GHz
Resolution Bandwidth	200 Hz	9 KHz	100 kHz	1 MHz	1 MHz
Video Bandwidth	100 KHz	100 KHz	100 kHz	1 MHz	1 MHz
Detector	Peak	Peak	Peak	Peak	Peak
Trace Mode	Max Hold	Max Hold	Max Hold	Max Hold	Max Hold
Sweep Time	Auto	Auto	Auto	Auto	Auto

Settings for FCC 24

	9 – 150 KHz	150 KHz – 30 MHz	30MHz – 1 GHz	1 – 2.7 GHz	2.7 – 18 GHz	18 – 19.1 GHz
Resolution Bandwidth	200 Hz	9 KHz	100 kHz	1 MHz	1 MHz	1 MHz
Video Bandwidth	100 KHz	100 KHz	100 kHz	1 MHz	1 MHz	1 MHz
Detector	Peak	Peak	Peak	Peak	Peak	Peak
Trace Mode	Max Hold	Max Hold	Max Hold	Max Hold	Max Hold	Max Hold
Sweep Time	Auto	Auto	Auto	Auto	Auto	Auto

7.4 Test Results

7.4.1 GSM 850

Harmonic	Tx ch-128 Freq. (MHz)	Level (dBm)	Tx ch-190 Freq. (MHz)	Level (dBm)	Tx ch-251 Freq. (MHz)	Level (dBm)
1	**824.2**	-14.5	**836.6**	-16	**848.8**	-16.4
2	**1648.4**	-38.6	**1673.2**	-34.3	**1697.6**	-36
3	**2472.6**	-33.87	**2509.8**	-27.7	**2546.4**	NF
4	**3296.8**	NF	**3346.4**	NF	**3395.2**	NF
5	**4121**	NF	**4183**	NF	**4244**	NF
6	**4945.2**	NF	**5019.6**	NF	**5092.8**	NF
7	**5769.4**	NF	**5856.2**	NF	**5941.6**	NF
8	**6593.6**	NF	**6692.8**	NF	**6790.4**	NF
9	**7417.8**	NF	**7529.4**	NF	**7639.2**	NF
10	**8242**	NF	**8366**	NF	**8488**	NF
NF = Noise Floor Measurement Uncertainty: ±3dB						

7.4.2 GSM 1900

Harmonic	Tx ch-512 Freq.(MHz)	Level (dBm)	Tx ch-661 Freq. (MHz)	Level (dBm)	Tx ch-810 Freq. (MHz)	Level (dBm)
1	**1850.2**	-19.3	**1880.0**	NF	**1909.8**	-19.5
2	**3700.4**	NF	**3760**	NF	**3819.6**	NF
3	**5550.6**	NF	**5640**	NF	**5729.4**	NF
4	**7400.8**	NF	**7520**	NF	**7639.2**	NF
5	**9251**	NF	**9400**	NF	**9549**	NF
6	**11101.2**	NF	**11280**	NF	**11458.8**	NF
7	**12951.4**	NF	**13160**	NF	**13368.6**	NF
8	**14801.6**	NF	**15040**	NF	**15278.4**	NF
9	**16651.8**	NF	**16920**	NF	**17188.2**	NF
10	**18502**	NF	**18800**	NF	**19098**	NF
NF = Noise Floor Measurement Uncertainty: ±3dB						

7.4.3 UMTS FDD II

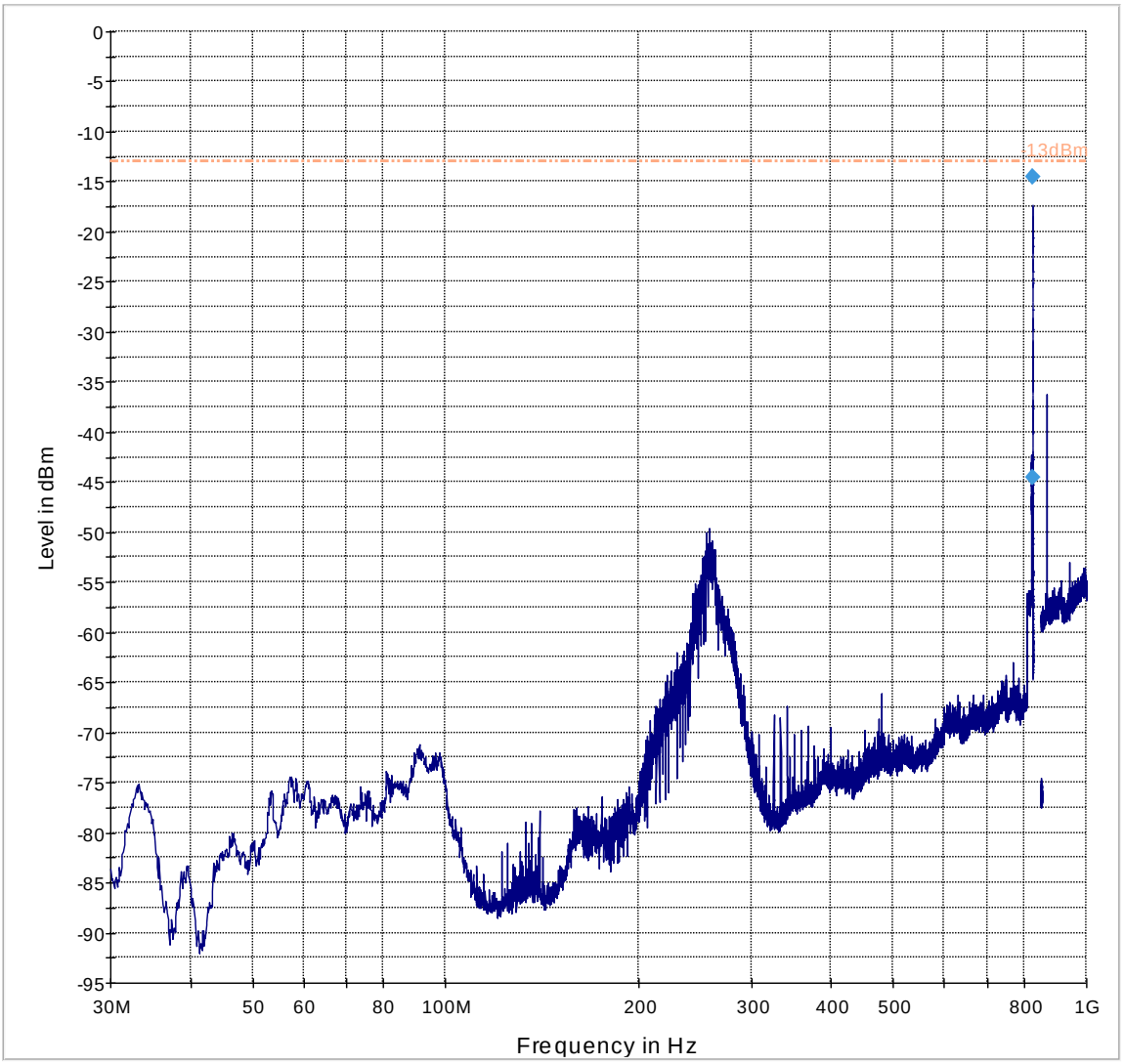
Harmonic	Tx ch-9262 Freq. (MHz)	Level (dBm)	Tx ch-9400 Freq. (MHz)	Level (dBm)	Tx ch-9538 Freq. (MHz)	Level (dBm)
1	**1852.4**	-20	**1880.0**	NF	**1907.6**	NF
2	**3704.8**	NF	**3760**	NF	**3815.2**	NF
3	**5557.2**	NF	**5640**	NF	**5722.8**	NF
4	**7409.6**	NF	**7520**	NF	**7630.4**	NF
5	**9262**	NF	**9400**	NF	**9538**	NF
6	**11114.4**	NF	**11280**	NF	**11445.6**	NF
7	**12966.8**	NF	**13160**	NF	**13353.2**	NF
8	**14819.2**	NF	**15040**	NF	**15260.8**	NF
9	**16671.6**	NF	**16920**	NF	**17168.4**	NF
10	**18524**	NF	**18800**	NF	**19076**	NF
NF= Noise Floor Measurement Uncertainty: ±3dB						

7.4.4 UMTS FDD V

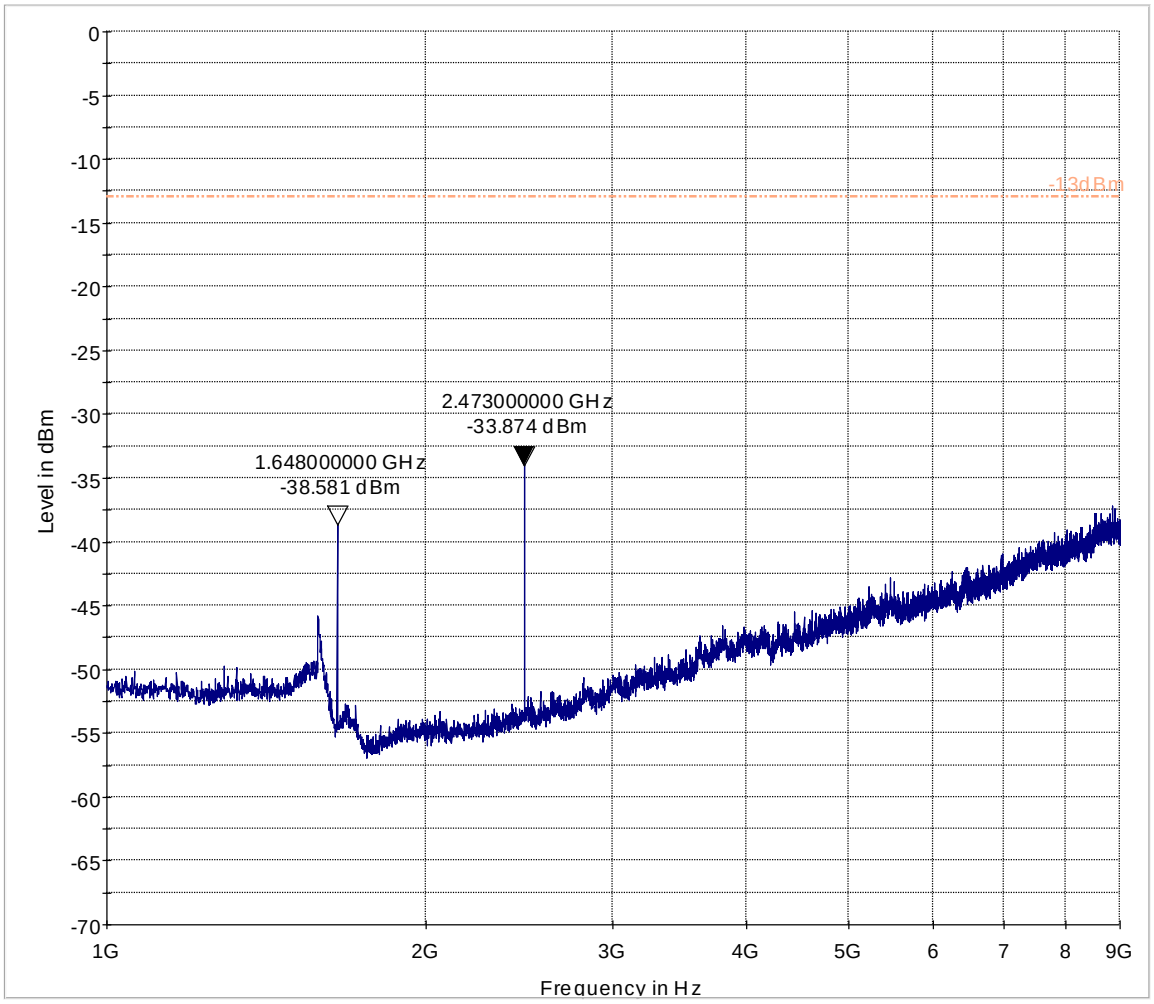
Harmonic	Tx ch-4132 Freq. (MHz)	Level (dBm)	Tx ch-4183 Freq. (MHz)	Level (dBm)	Tx ch-4233 Freq. (MHz)	Level (dBm)
1	**826.4**	-36	**836.6**	NF	**846.6**	-42
2	**1652.8**	NF	**1673.2**	NF	**1693.2**	NF
3	**2479.2**	NF	**2509.8**	NF	**2539.8**	NF
4	**3305.6**	NF	**3346.4**	NF	**3386.4**	NF
5	**4132**	NF	**4183**	NF	**4233**	NF
6	**4958.4**	NF	**5019.6**	NF	**5079.6**	NF
7	**5784.8**	NF	**5856.2**	NF	**5926.2**	NF
8	**6611.2**	NF	**6692.8**	NF	**6772.8**	NF
9	**7437.6**	NF	**7529.4**	NF	**7619.4**	NF
10	**8264**	NF	**8366**	NF	**8466**	NF
NF= Noise Floor Measurement Uncertainty: ±3dB						

7.5 Measurement Plots:

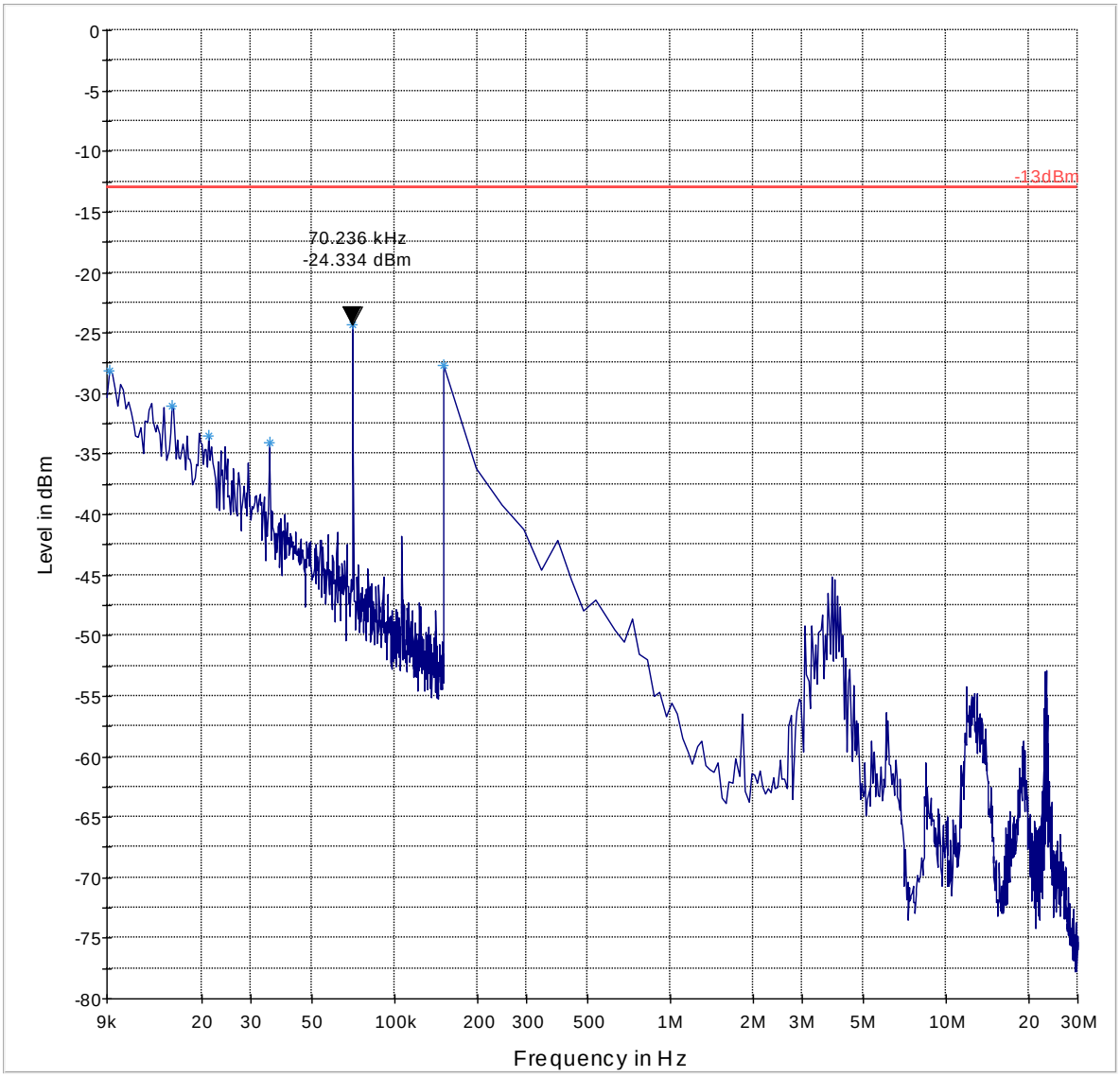
7.5.1 30 MHz – 1 GHz, GSM 850, Tx, Ch. Low



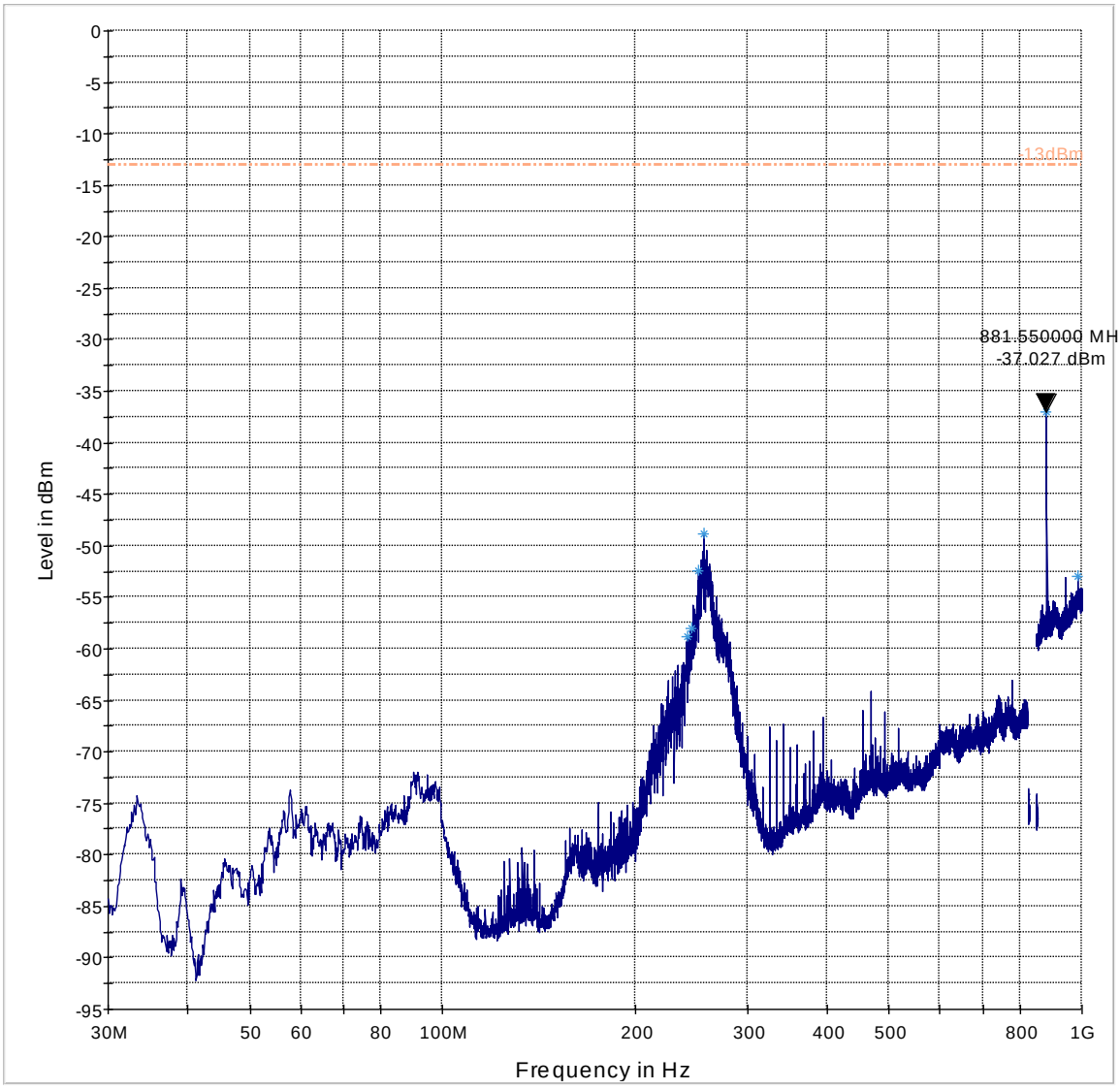
7.5.2 1 GHz – 9 GHz, GSM 850, Tx, Ch. Low



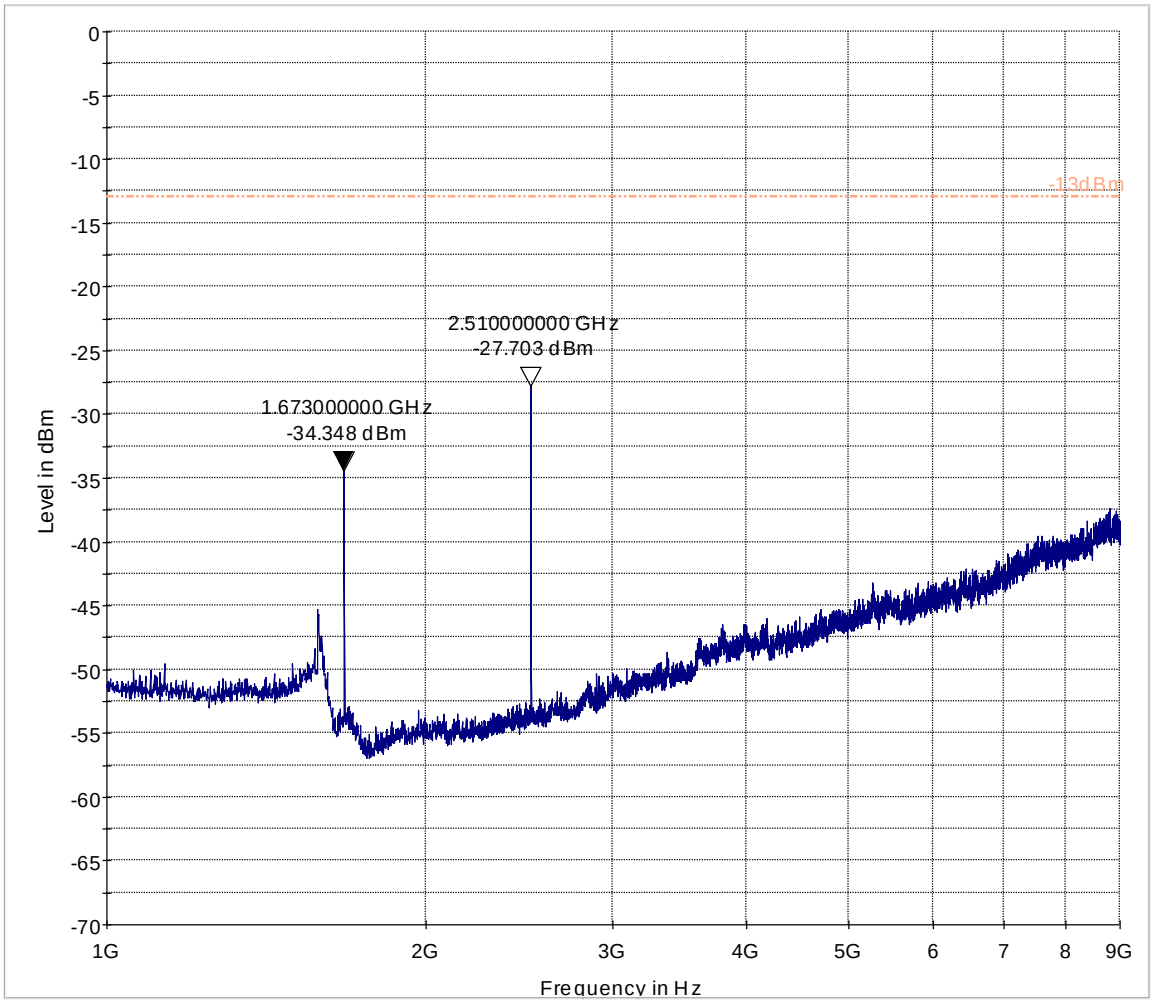
7.5.3 9 KHz – 30 MHz, GSM 850, Tx, Ch. Mid



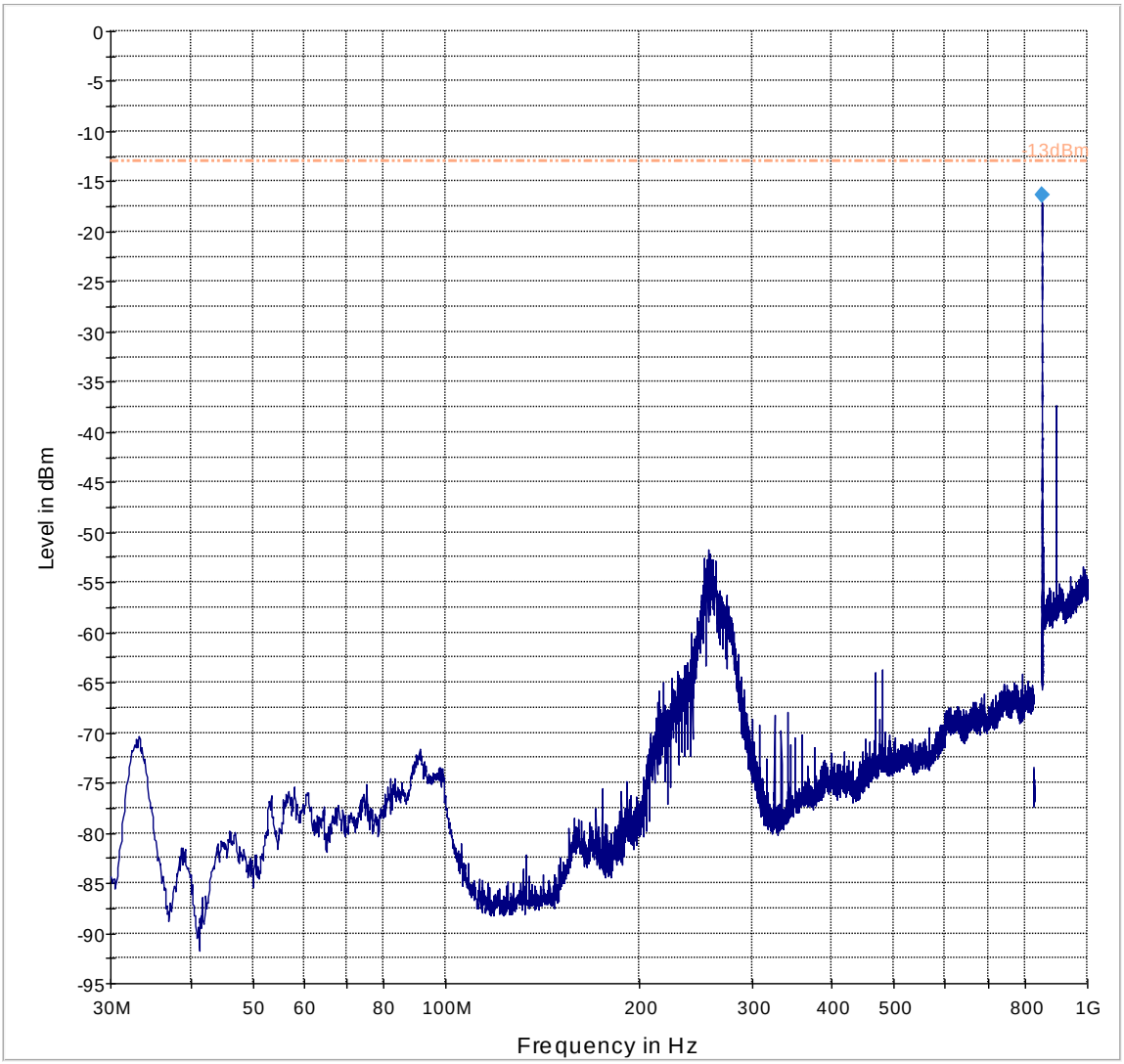
7.5.4 30 MHz – 1 GHz, GSM 850, Tx, Ch. Mid



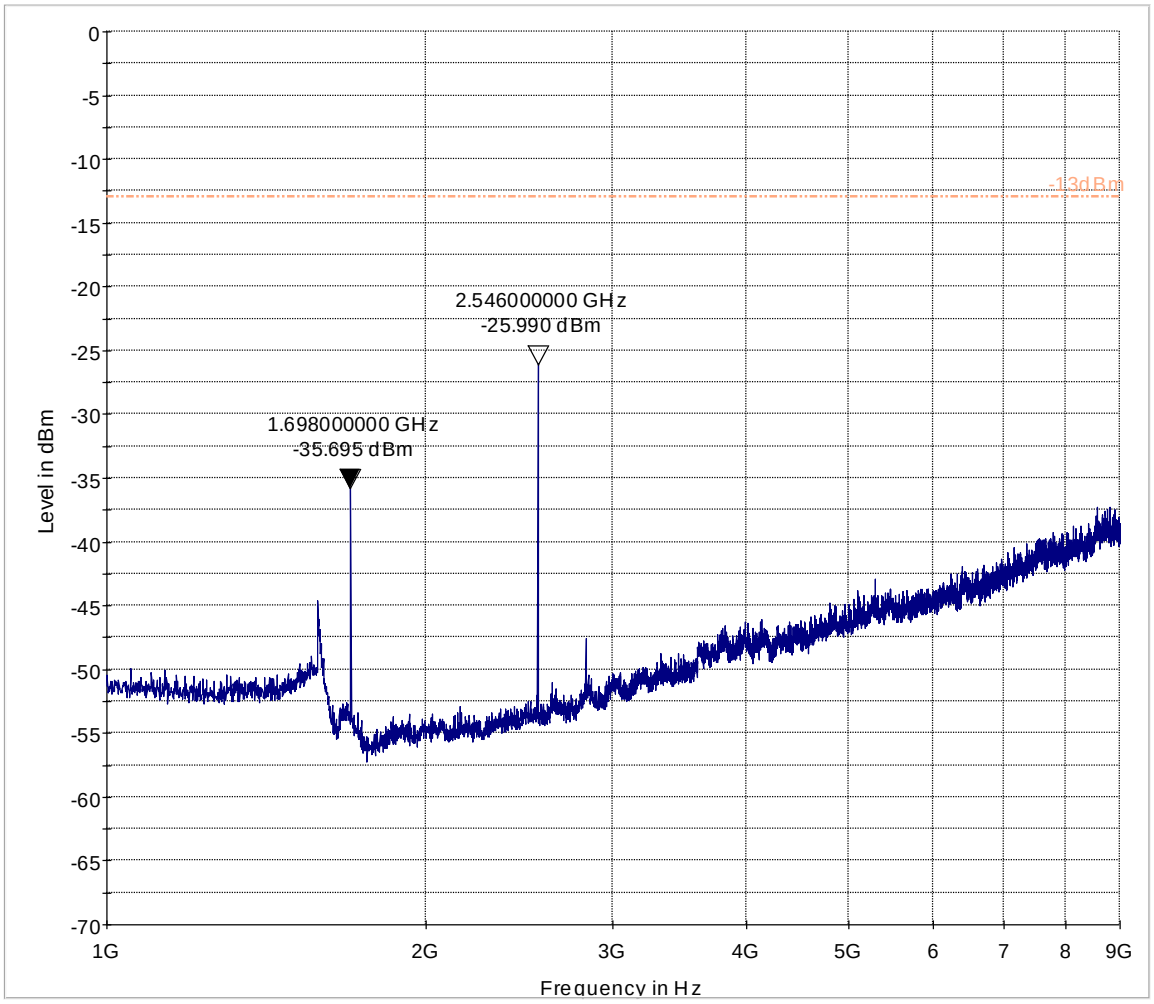
7.5.5 1 GHz – 9 GHz, GSM 850, Tx, Ch. Mid



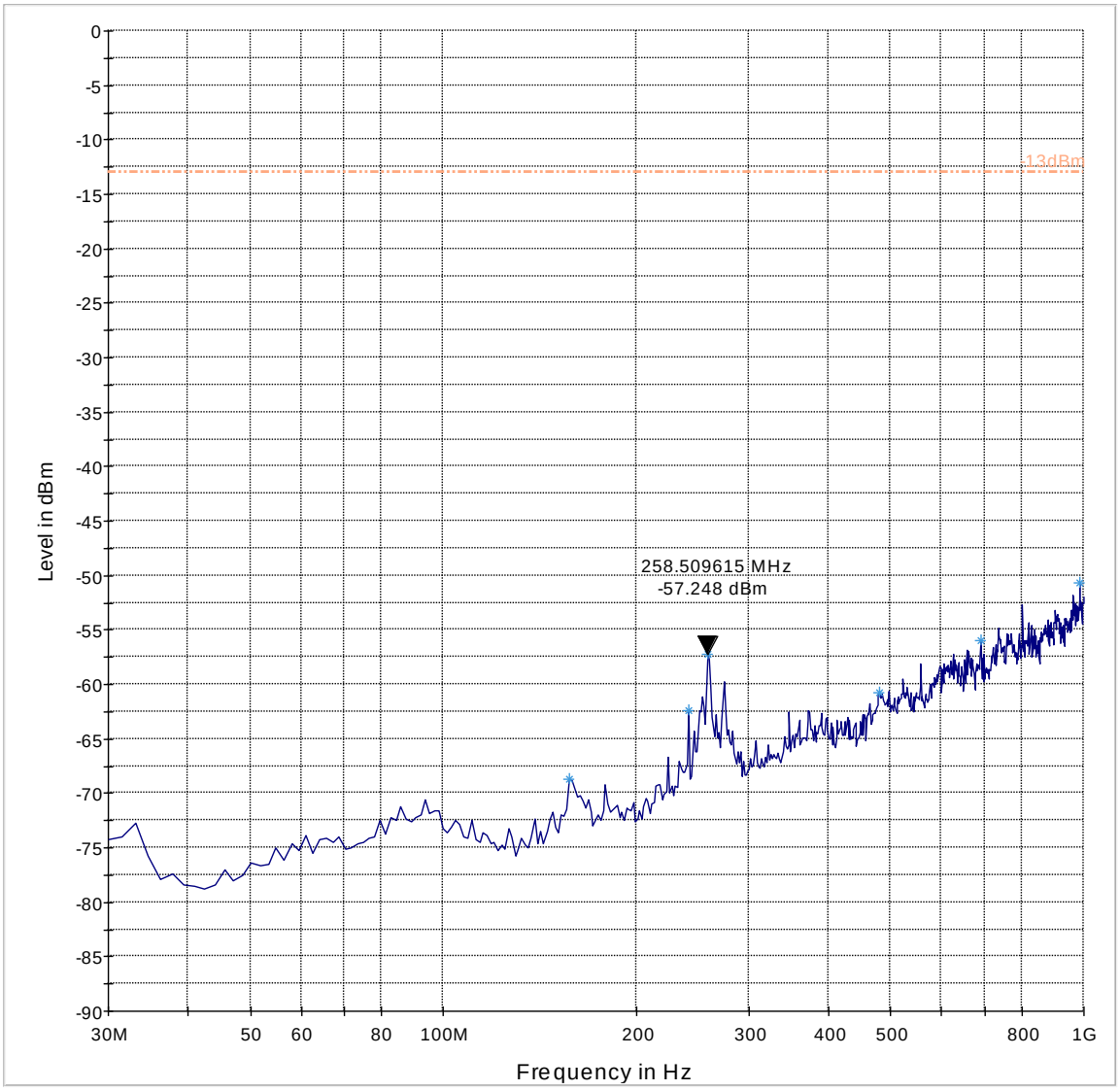
7.5.6 30 MHz – 1 GHz, GSM 850, Tx, Ch. High



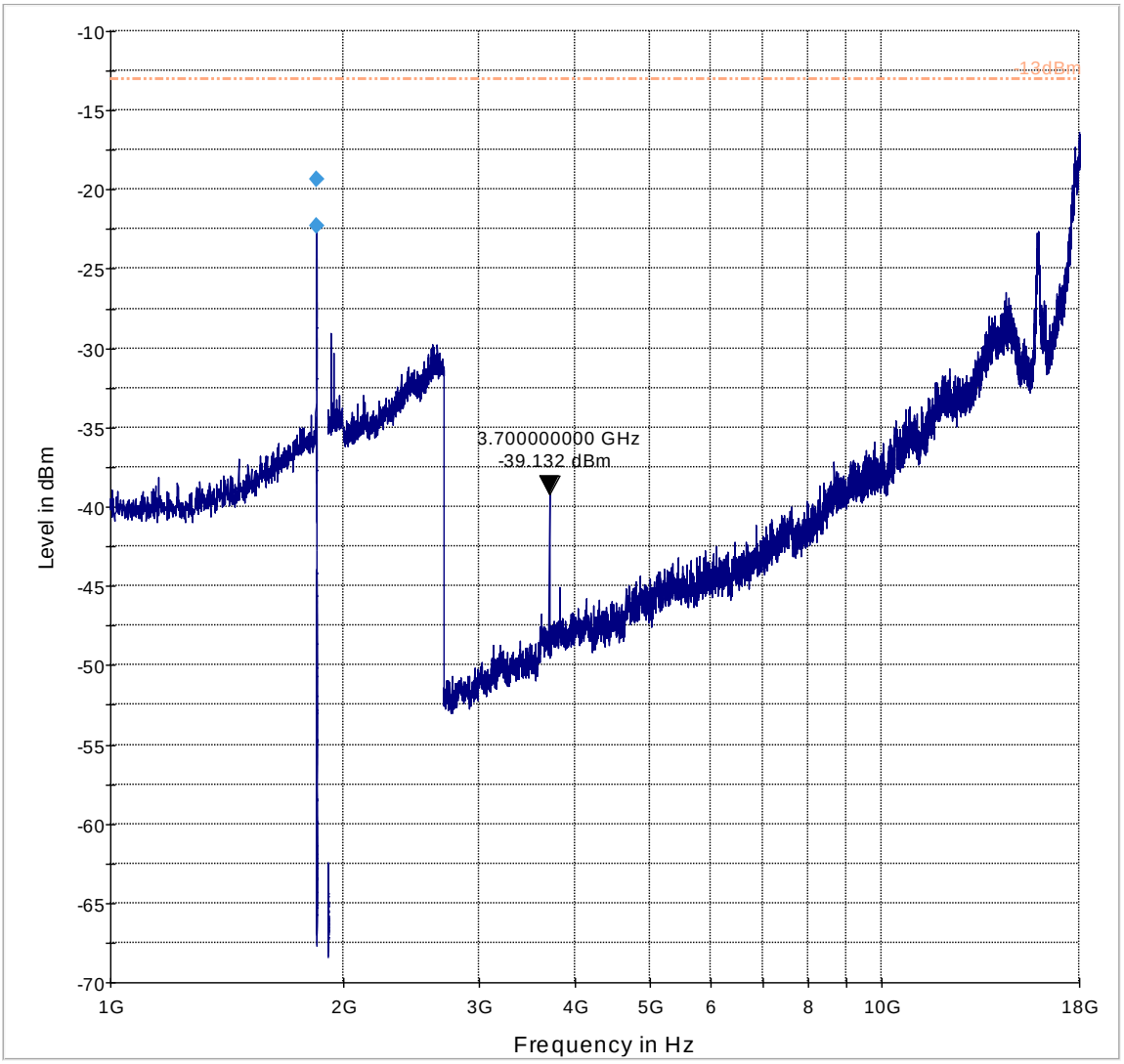
7.5.7 1 GHz – 9 GHz, GSM 850, Tx, Ch. High



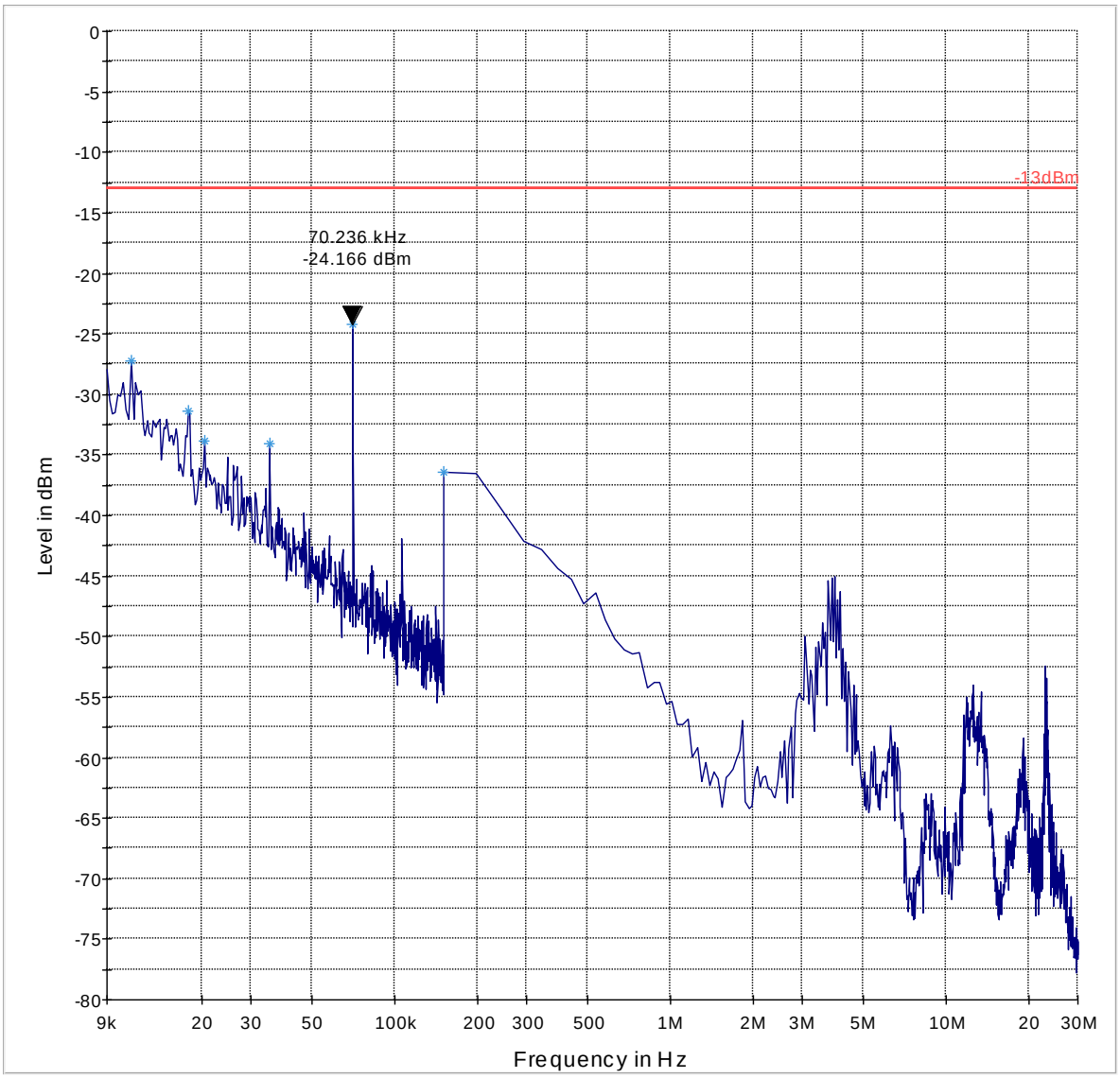
7.5.8 30 MHz – 1 GHz, GSM 1900, Tx, Ch. Low



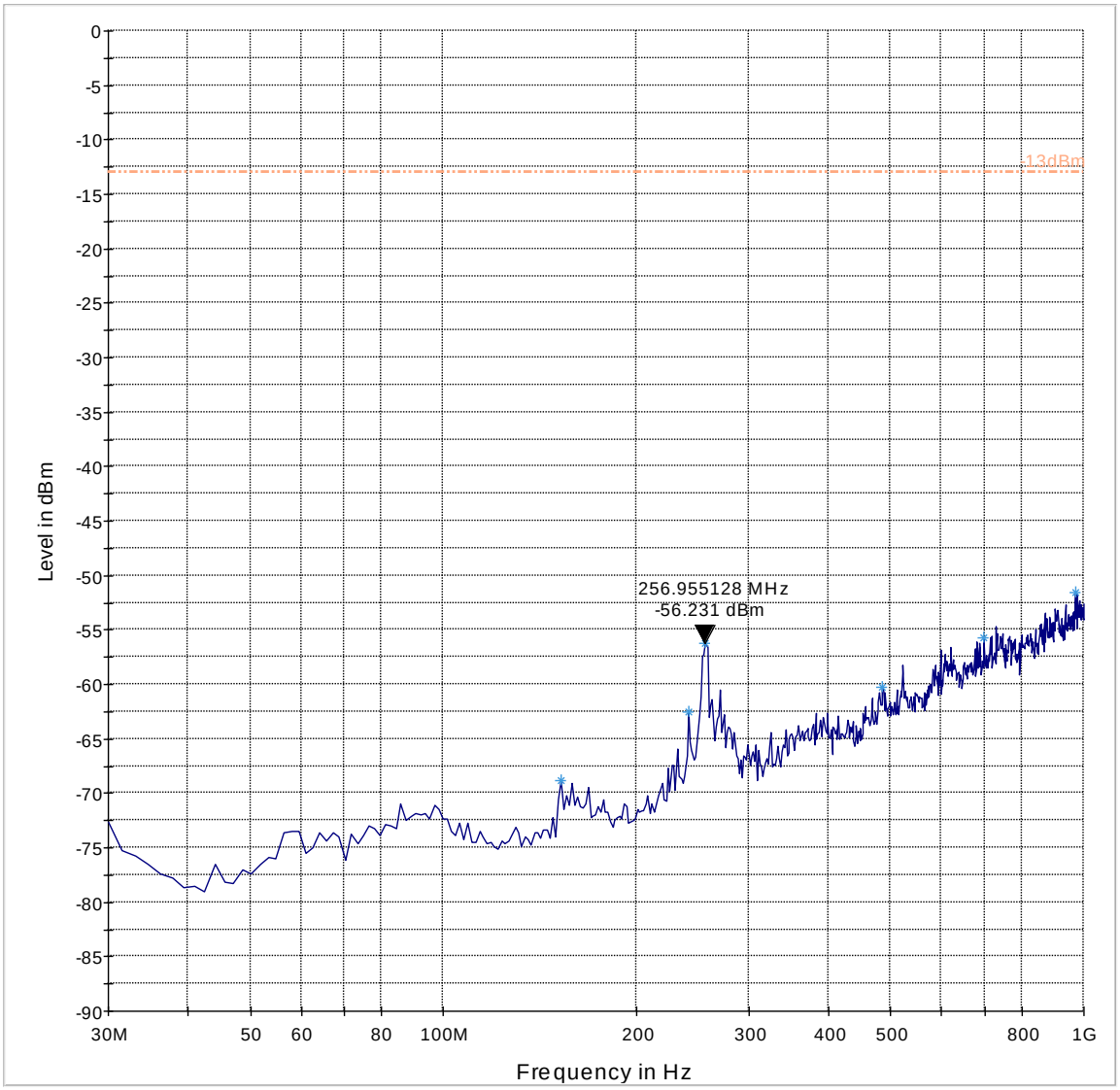
7.5.9 1 GHz – 18 GHz, GSM 1900, Tx, Ch. Low



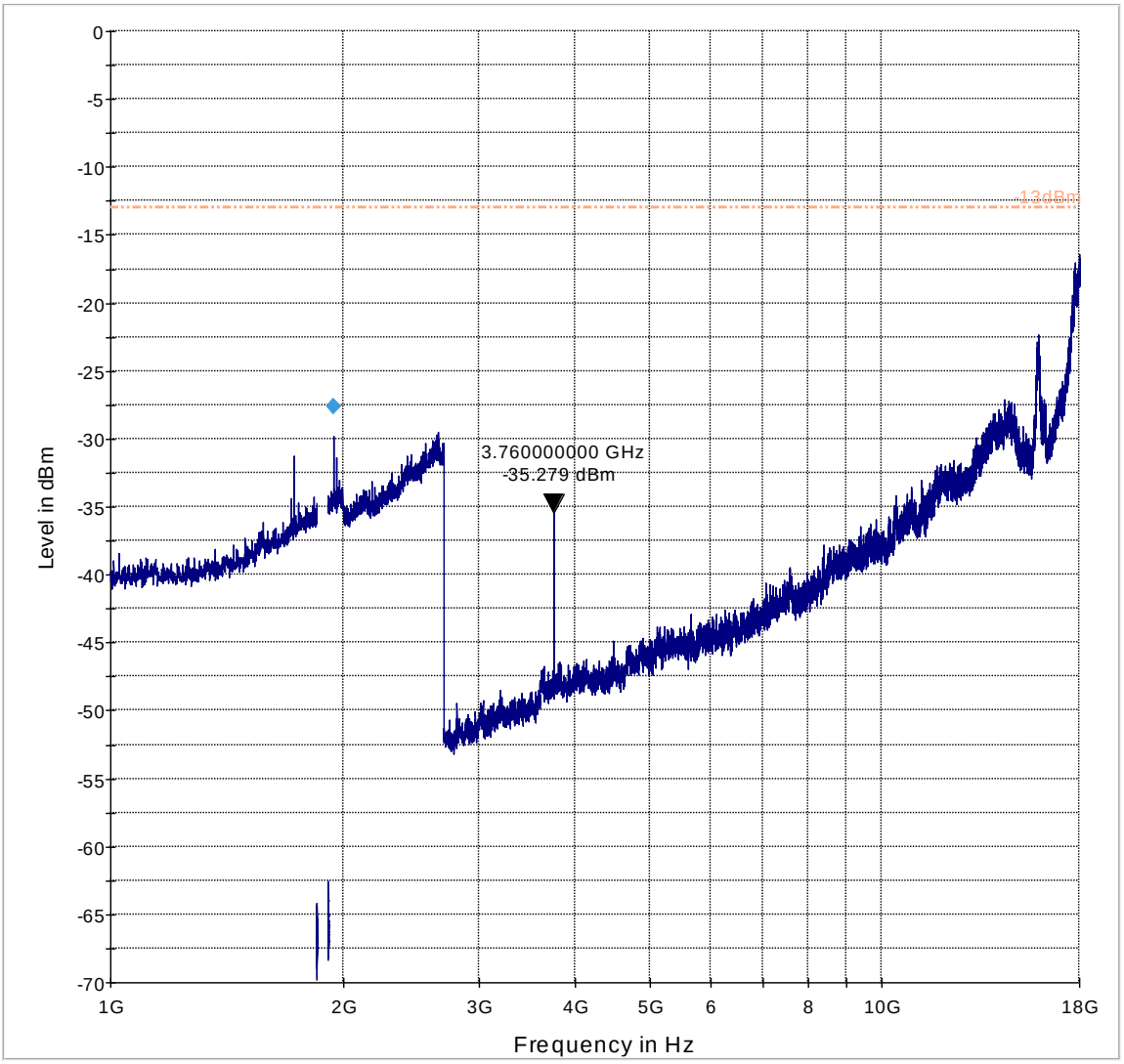
7.5.10 9 KHz – 30 MHz, GSM 1900, Tx, Ch. Mid



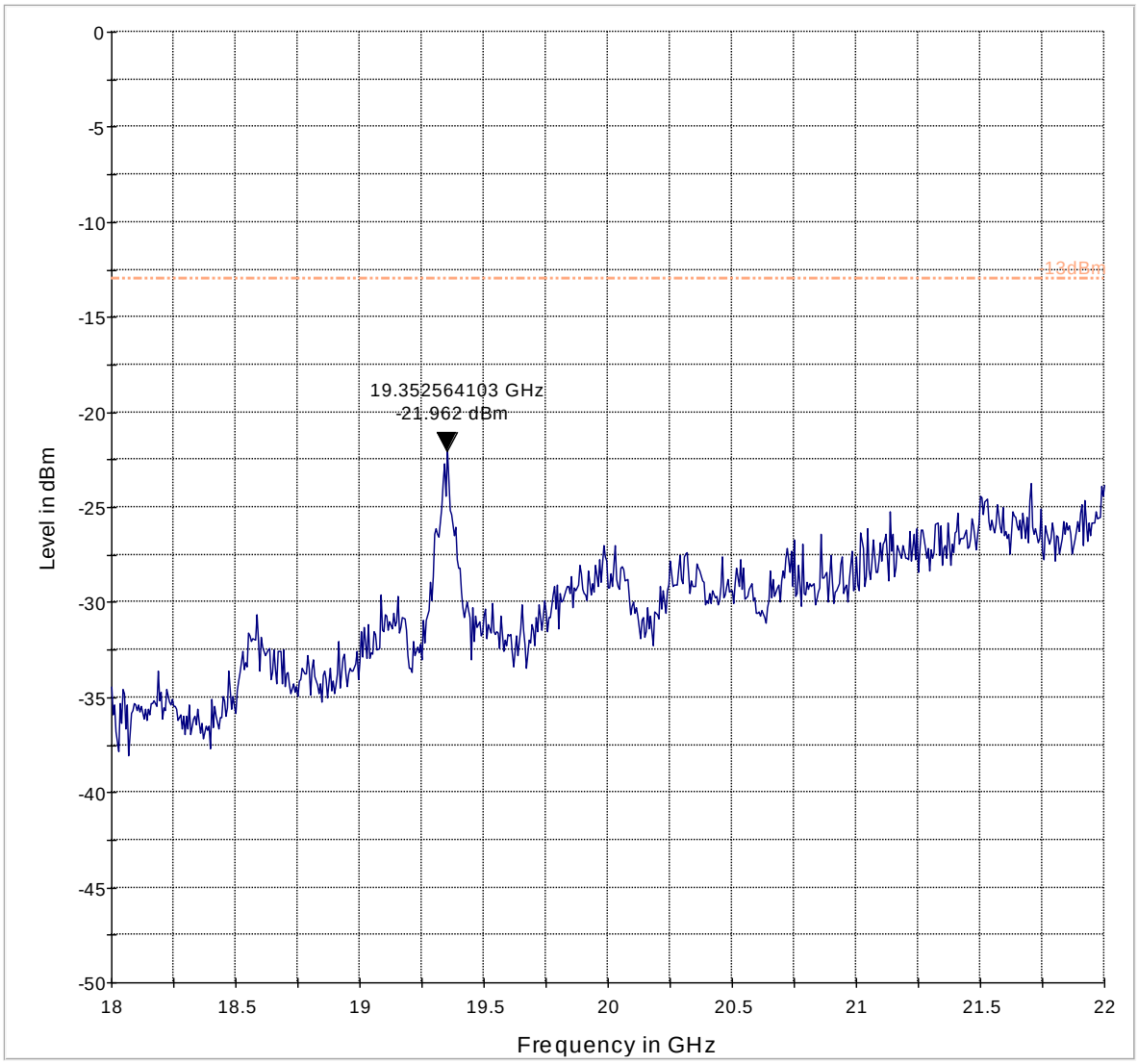
7.5.11 30 MHz – 1 GHz, GSM 1900, Tx, Ch. Mid



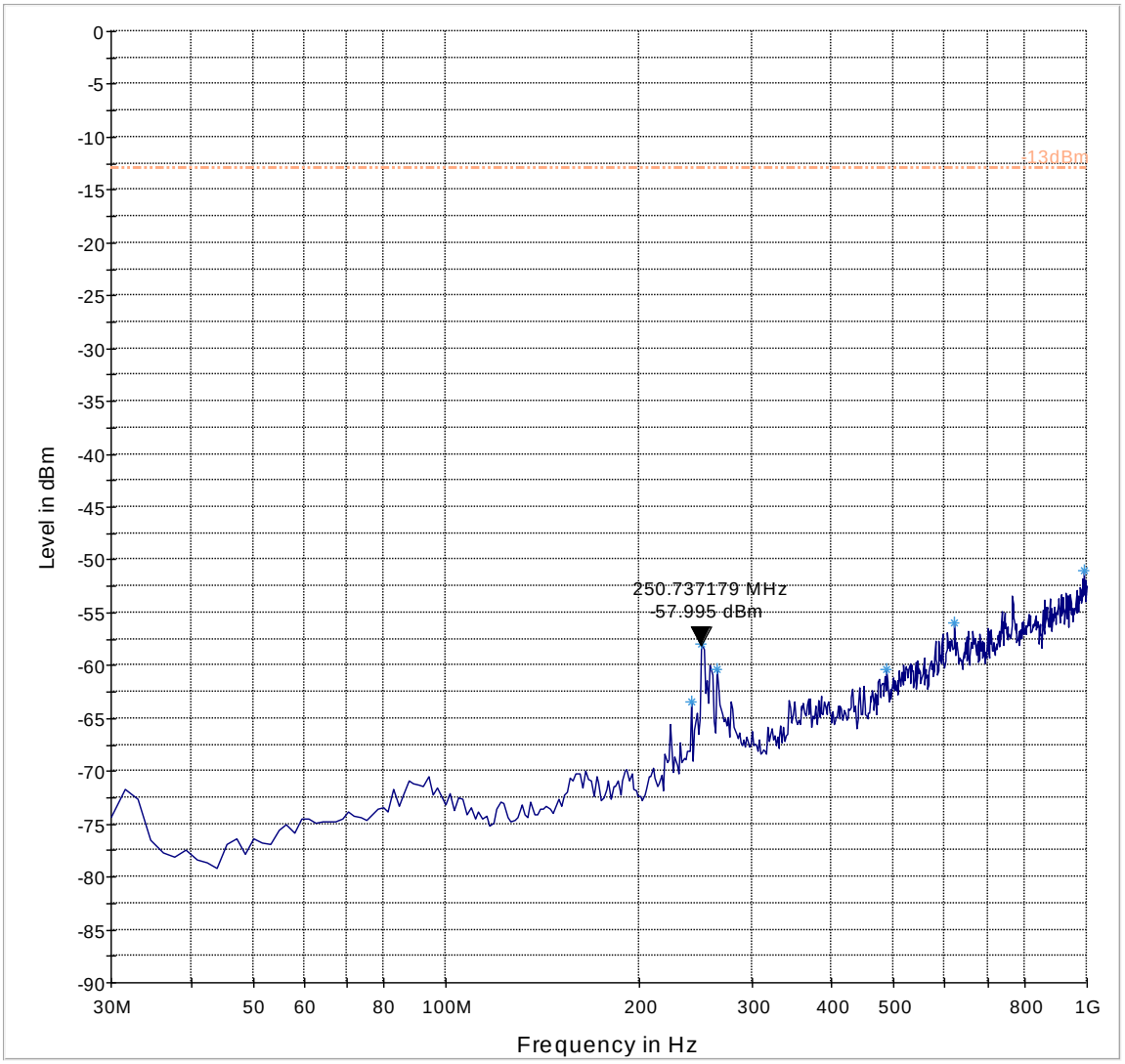
7.5.12 1 GHz – 18 GHz, GSM 1900, Tx, Ch. Mid



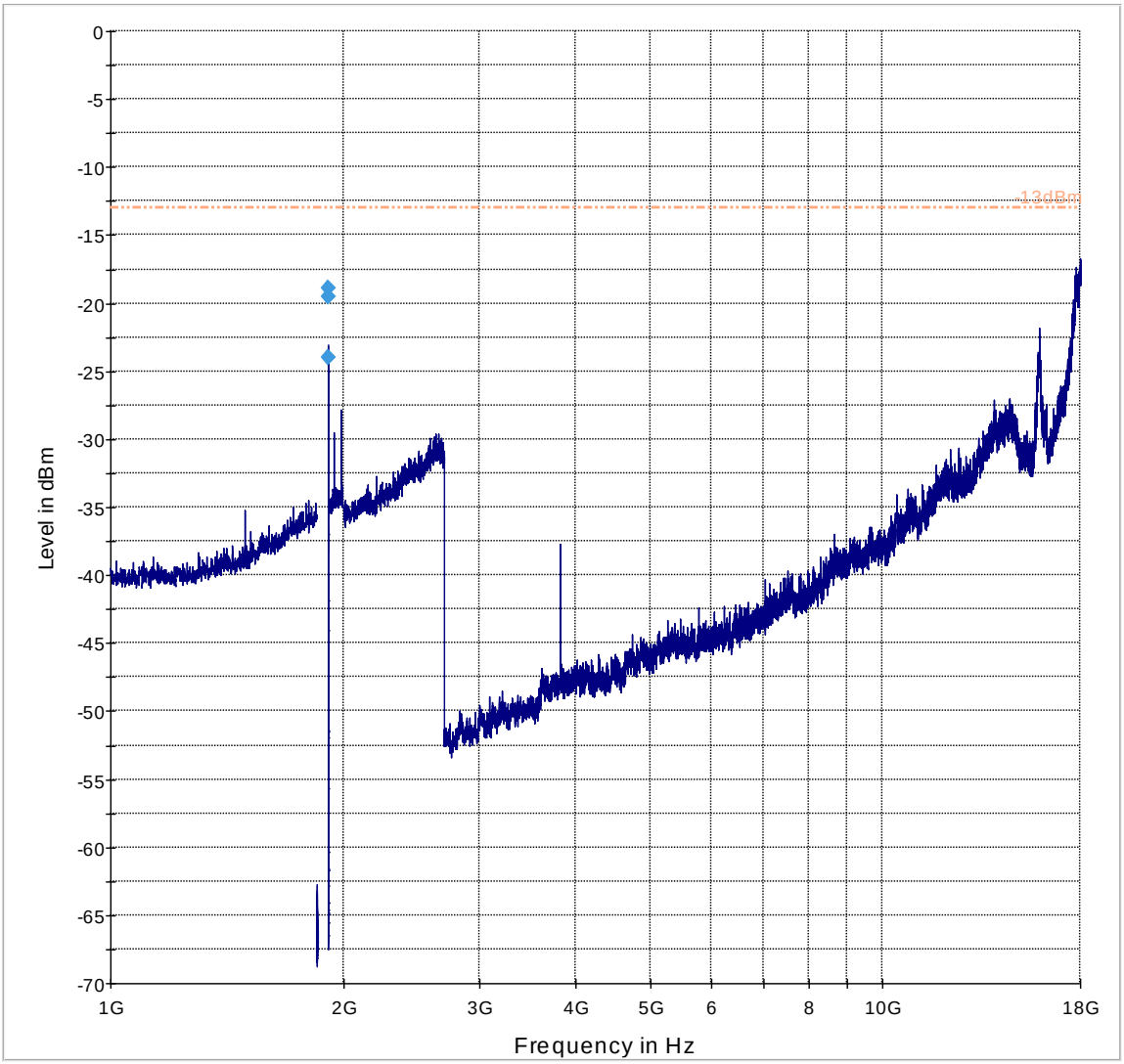
7.5.13 18 GHz - 22 GHz, GSM 1900, Tx, Ch. Mid



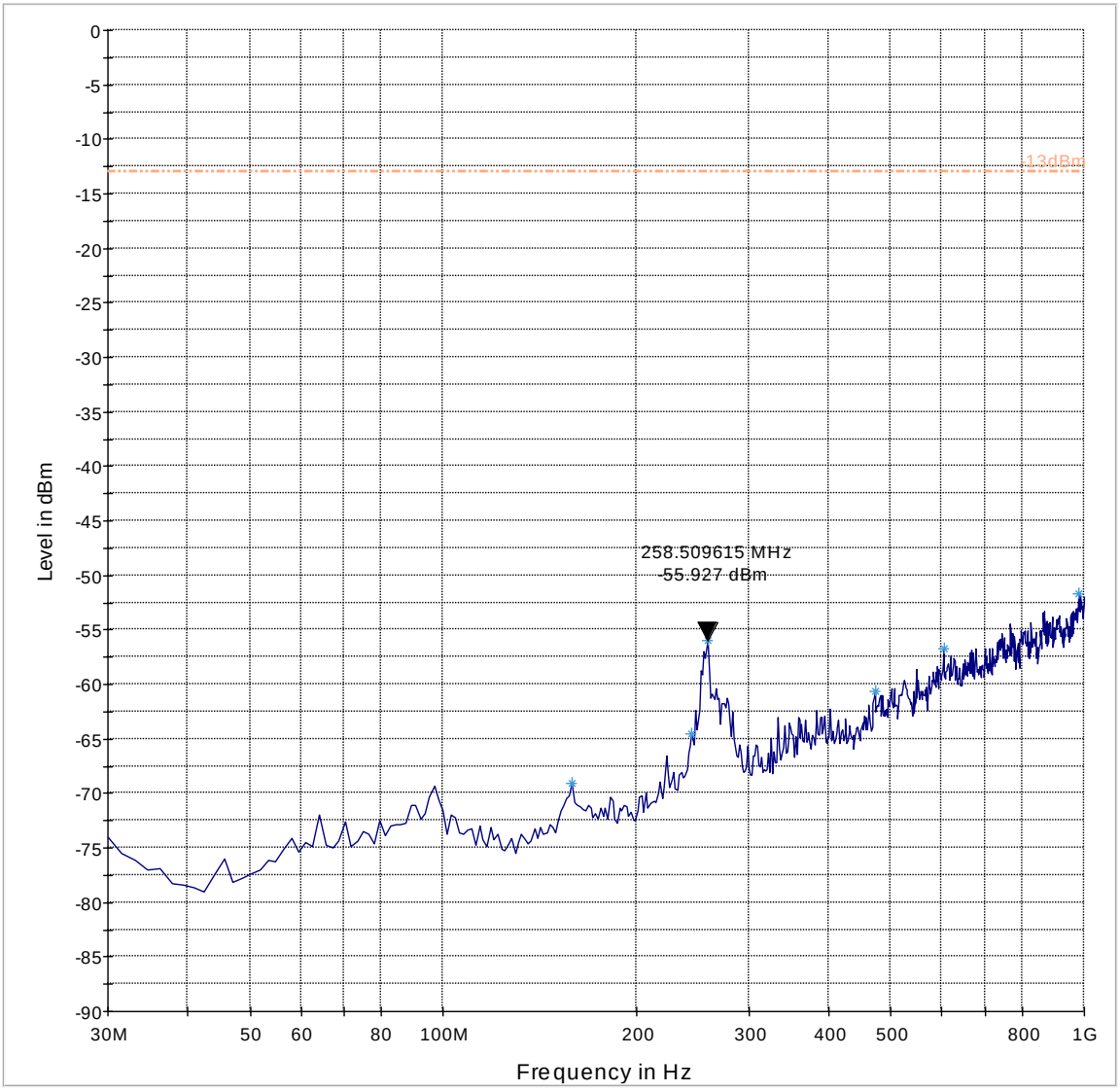
7.5.14 30 MHz – 1 GHz, GSM 1900, Tx, Ch. High



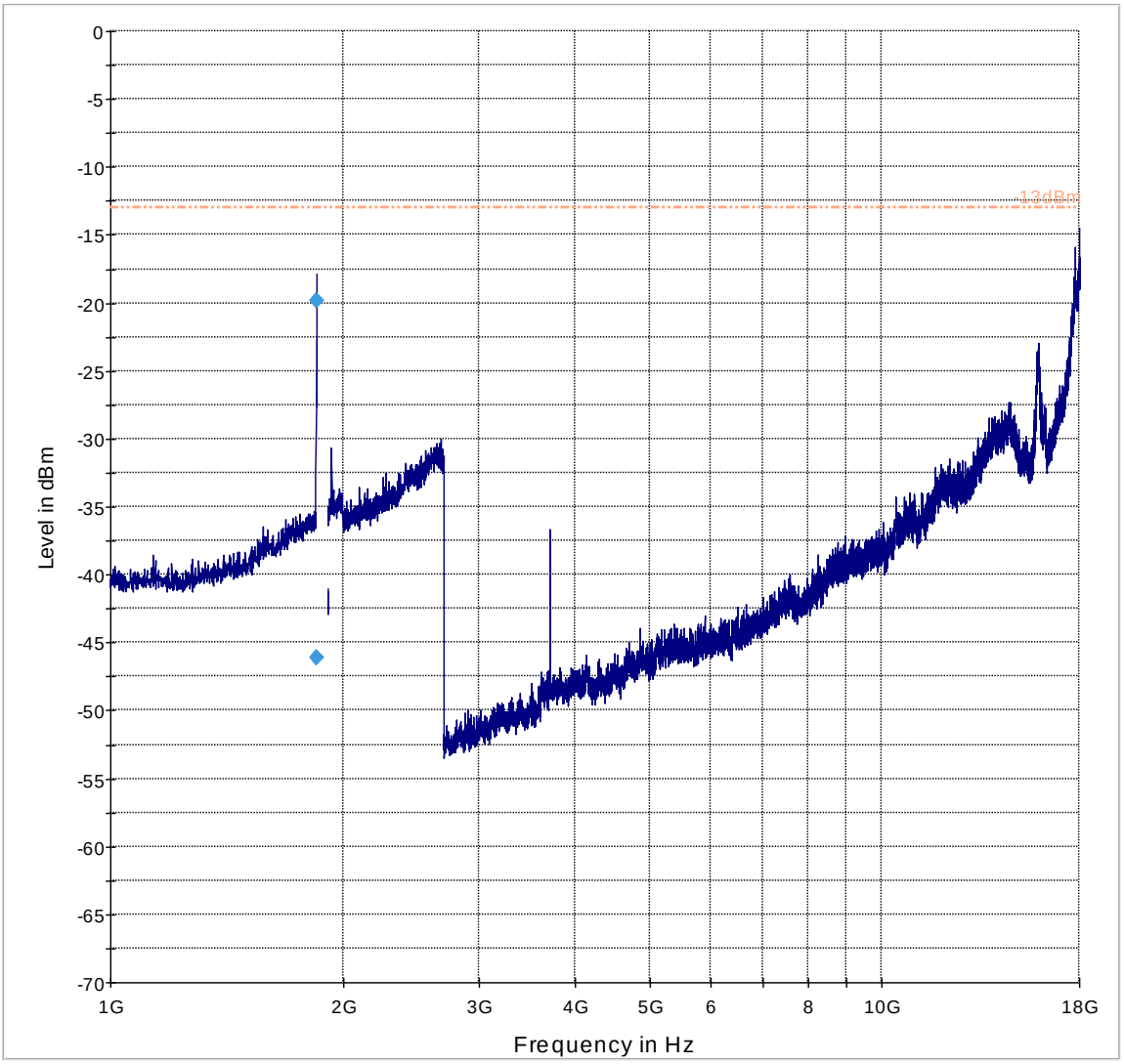
7.5.15 1 GHz – 18 GHz, GSM 1900, Tx, Ch. High



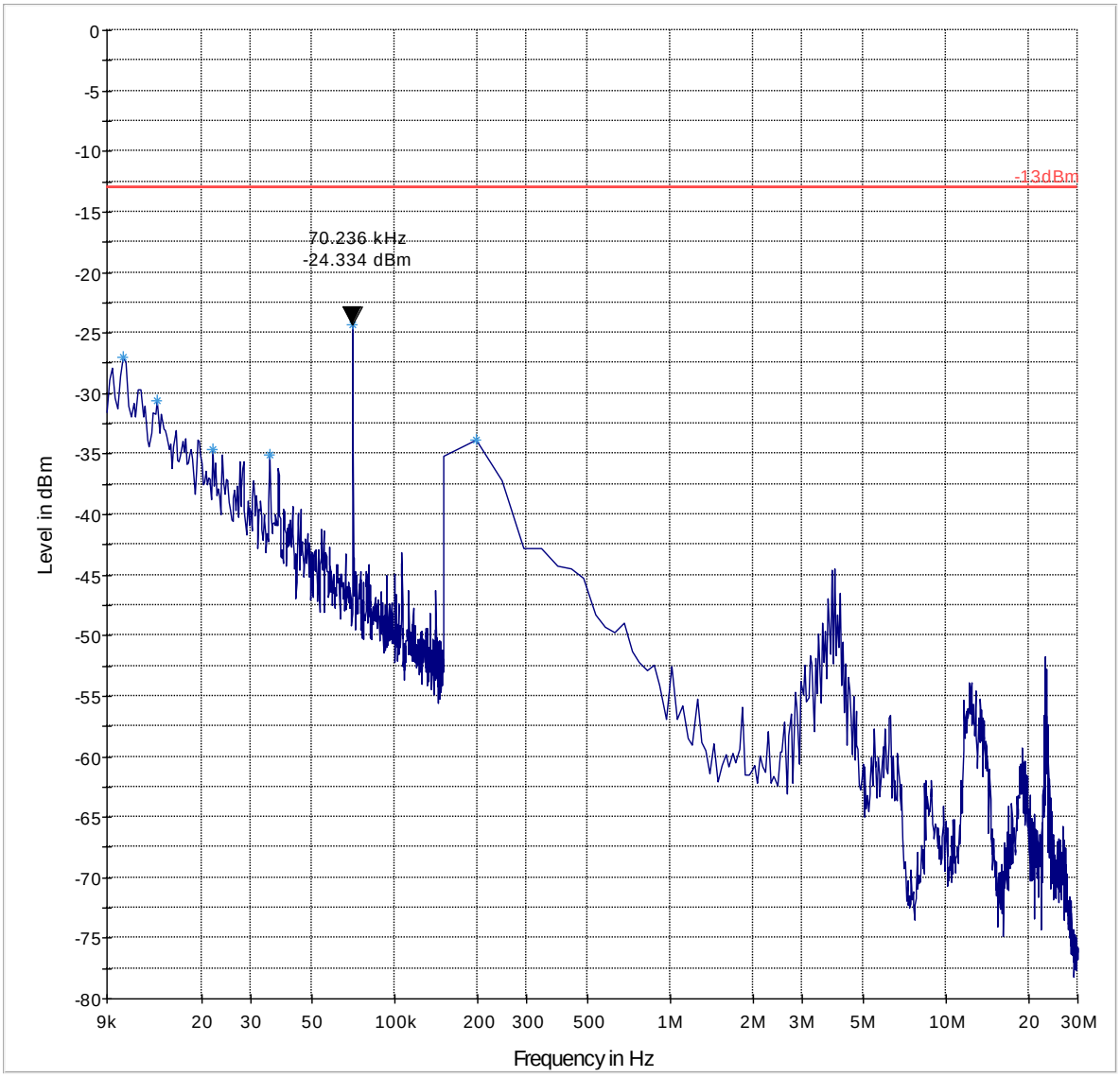
7.5.16 30 MHz – 1 GHz, UMTS FDDII , Tx, Ch. Low



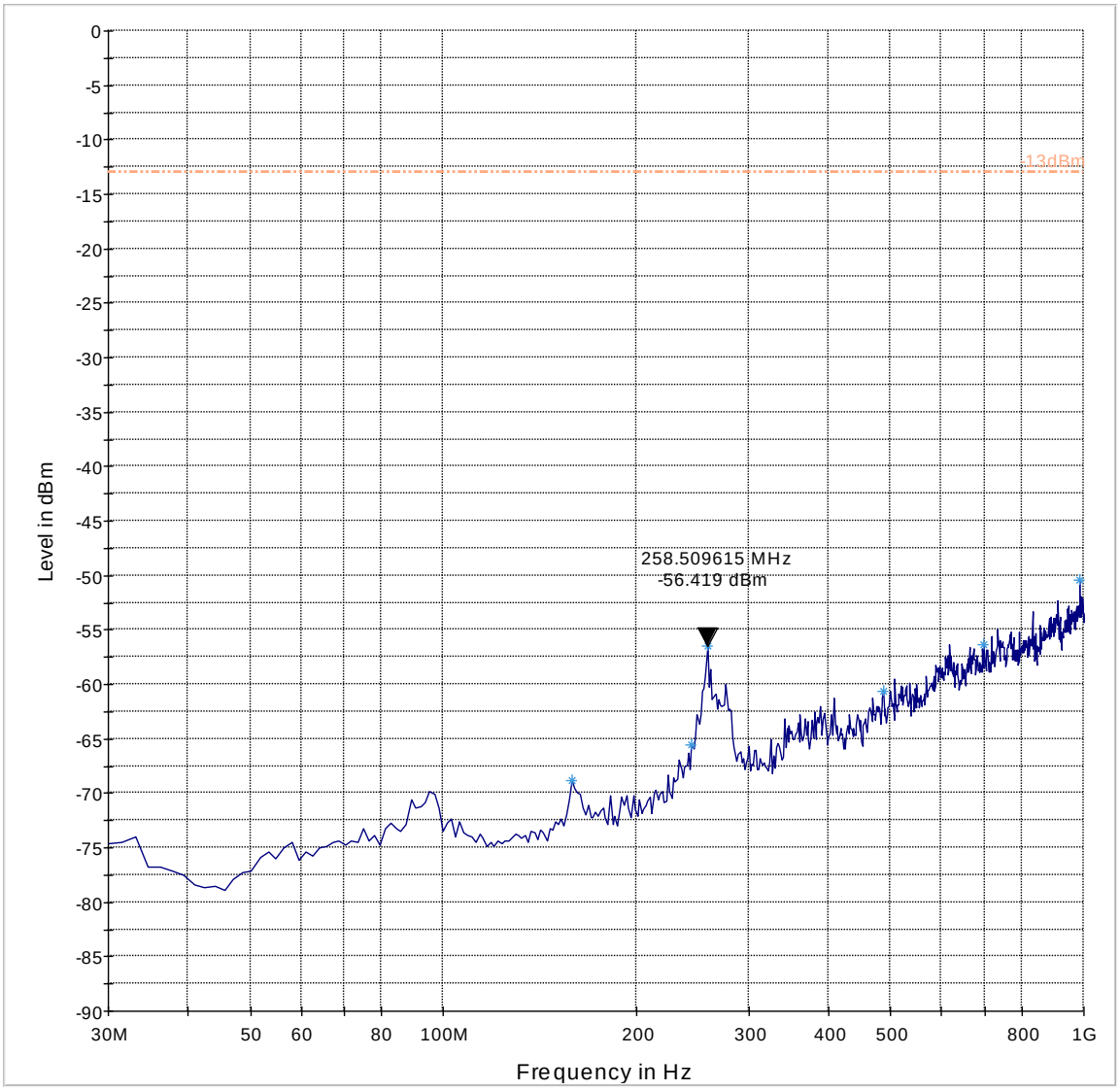
7.5.17 1 GHz – 18 GHz, UMTS FDDII, Tx, Ch. Low



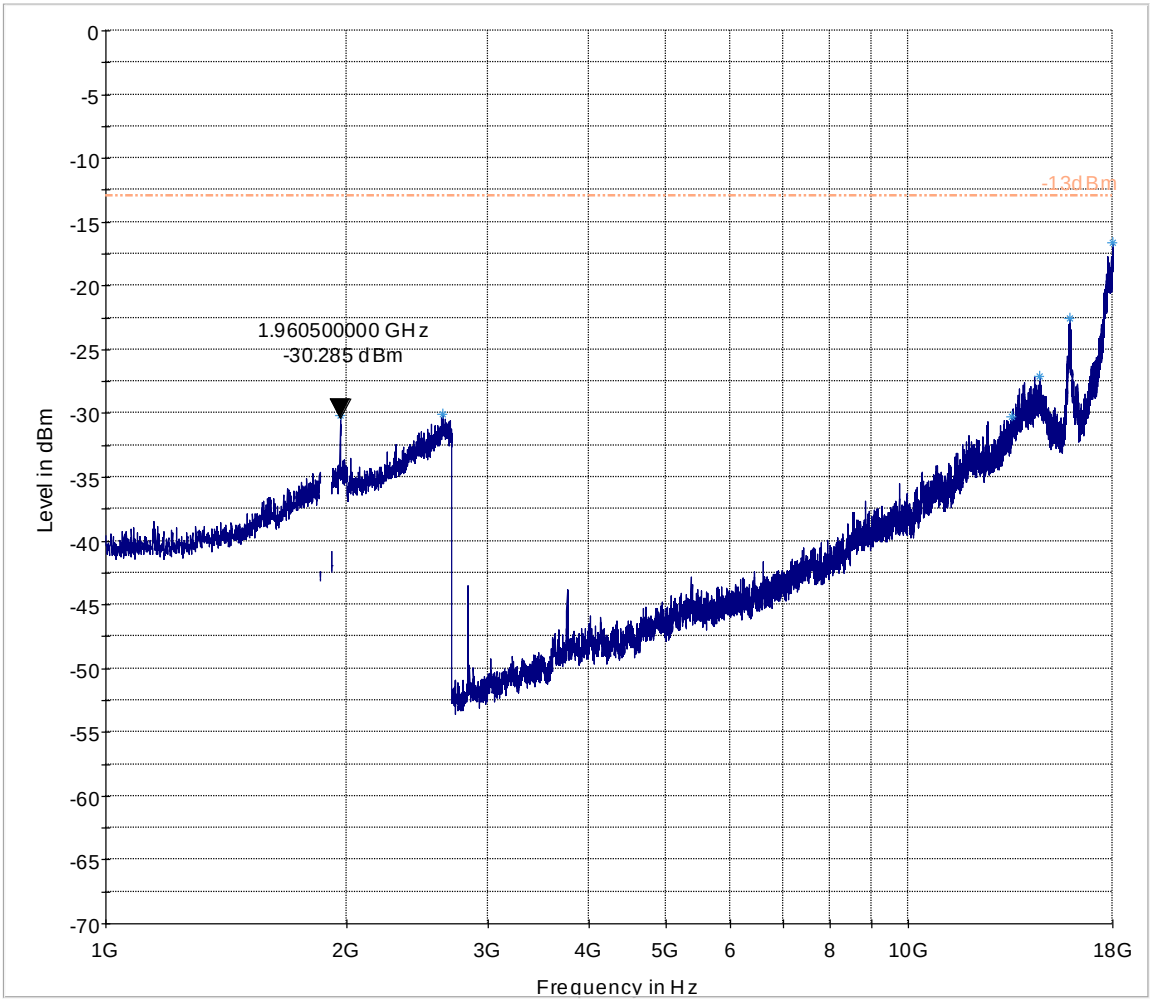
7.5.18 9 KHz – 30 MHz, UMTS FDDII, Tx, Ch. Mid



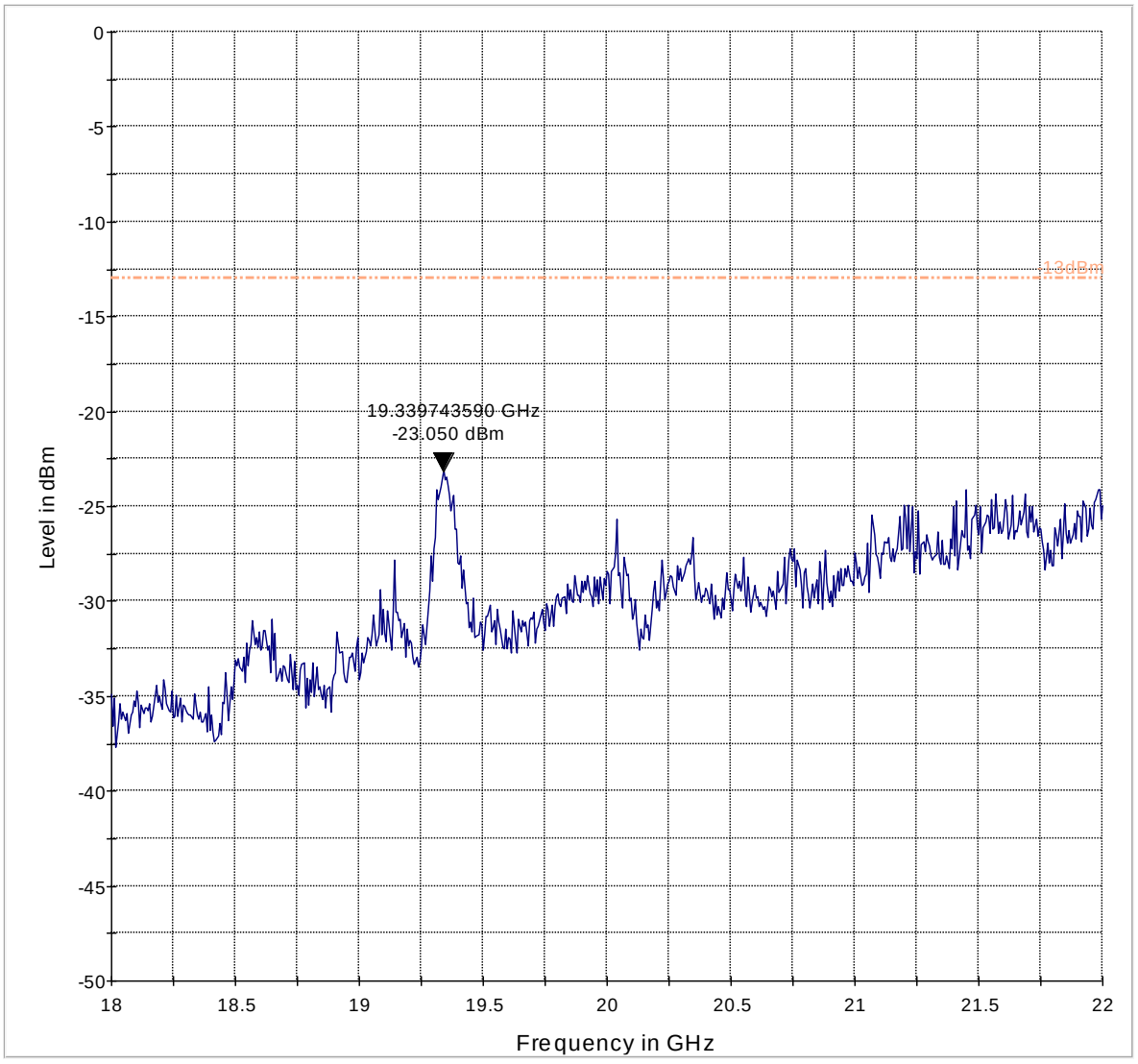
7.5.19 30 MHz – 1 GHz, UMTS FDDII, Tx, Ch. Mid



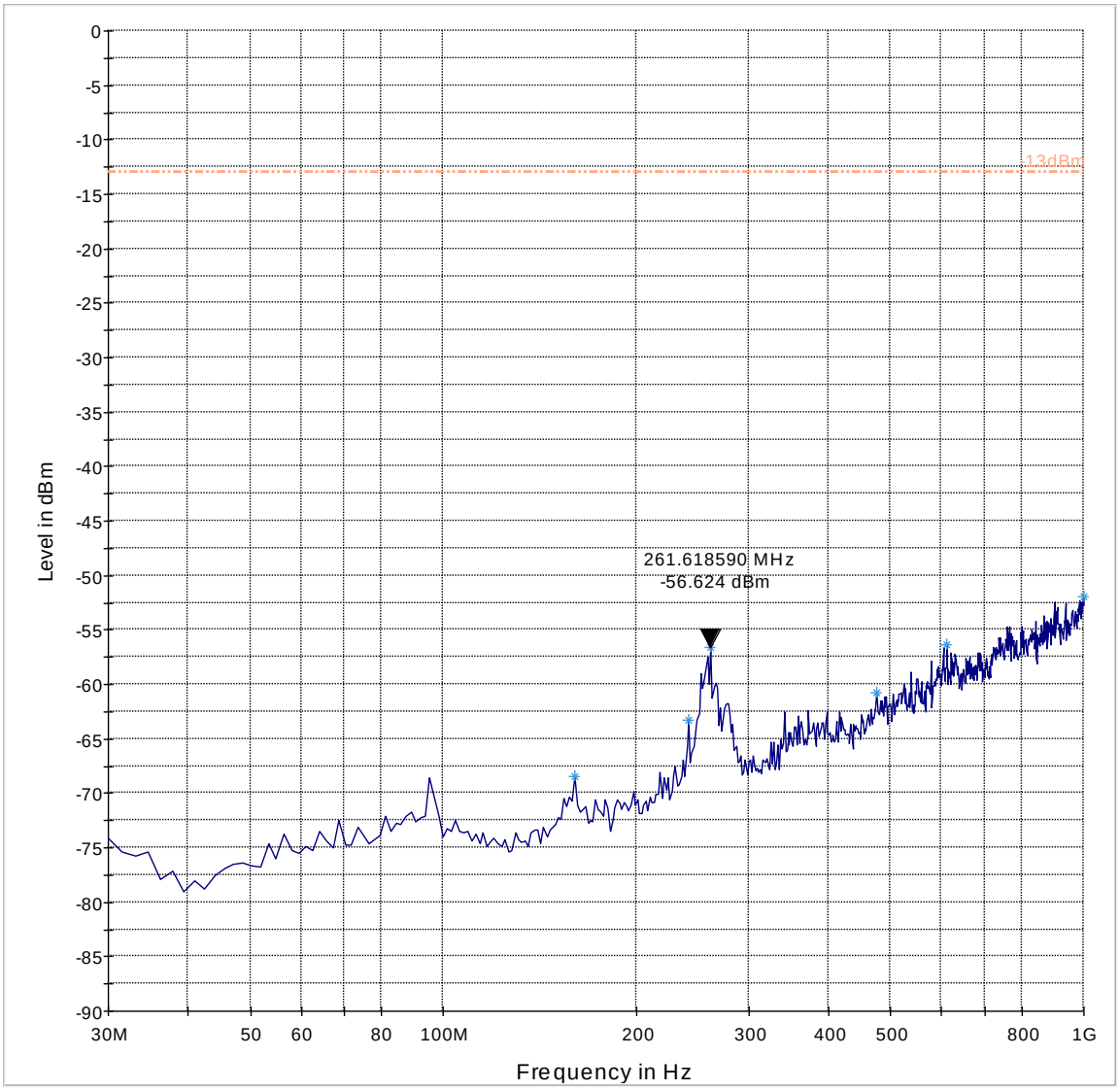
7.5.20 1 GHz – 18 GHz, UMTS FDDII, Tx, Ch. Mid



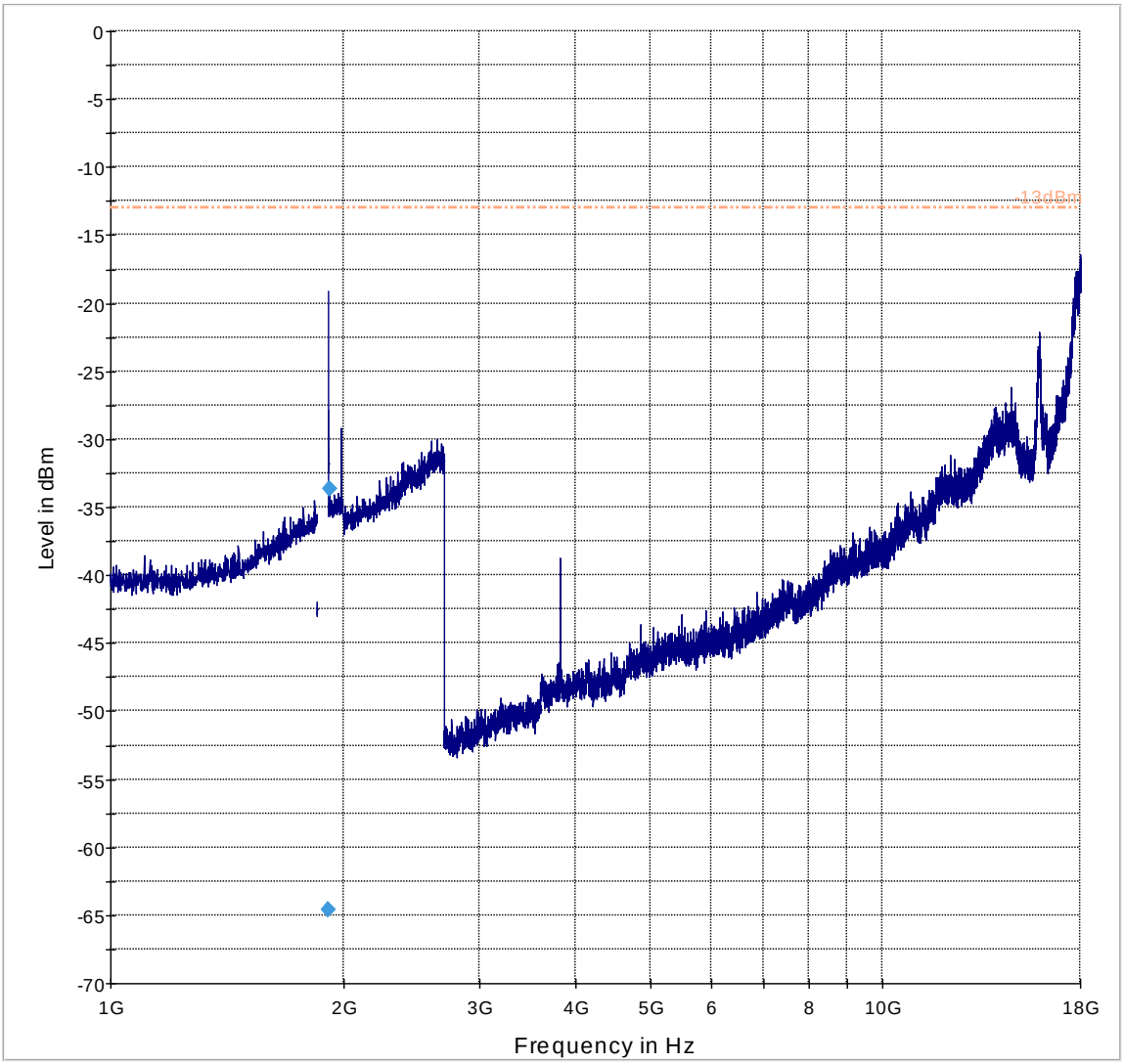
7.5.21 18 GHz – 22 GHz, UMTS FDD II, Tx, Ch. Mid



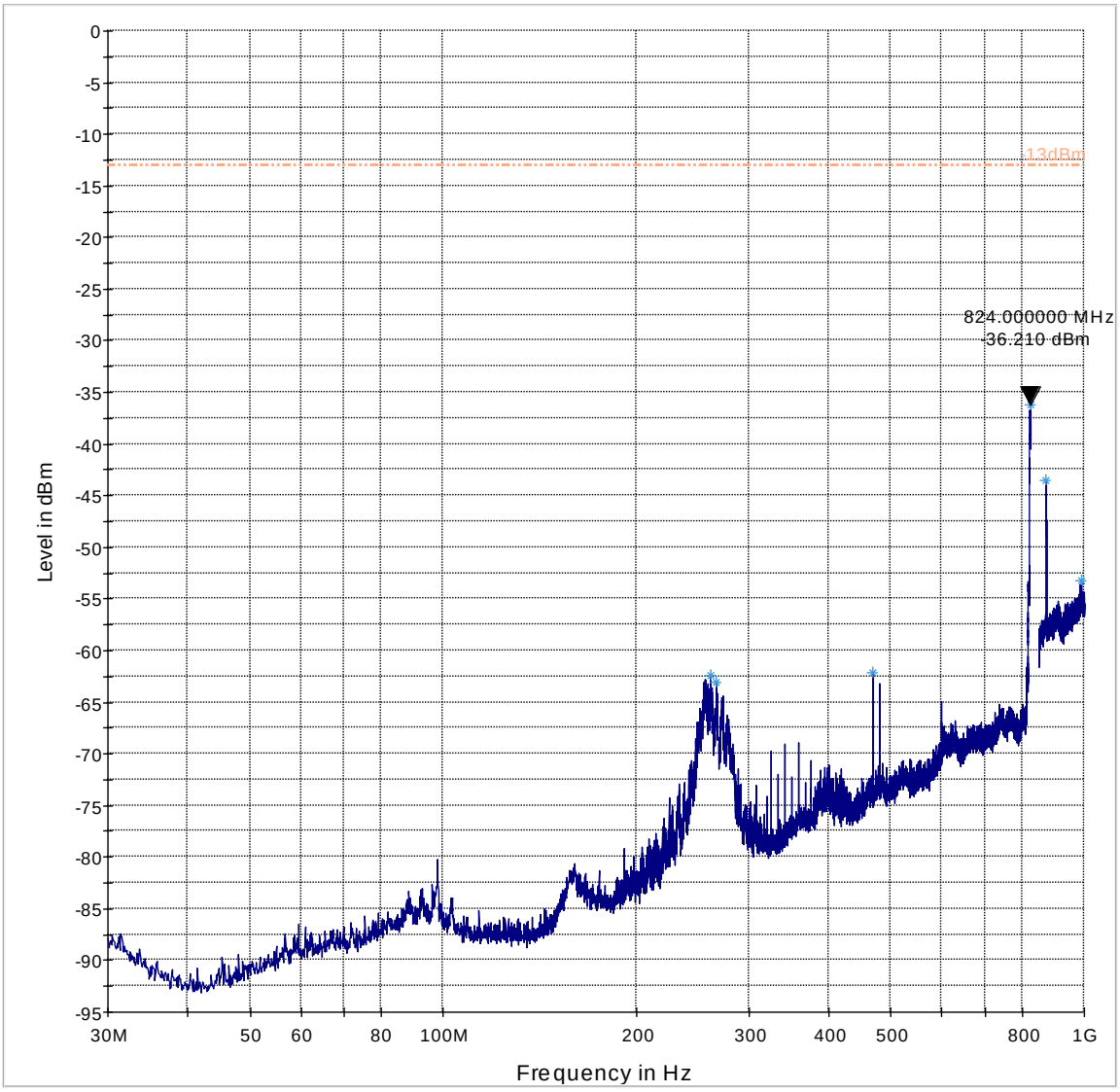
7.5.22 30 MHz – 1 GHz, UMTS FDD II, Tx, Ch. High



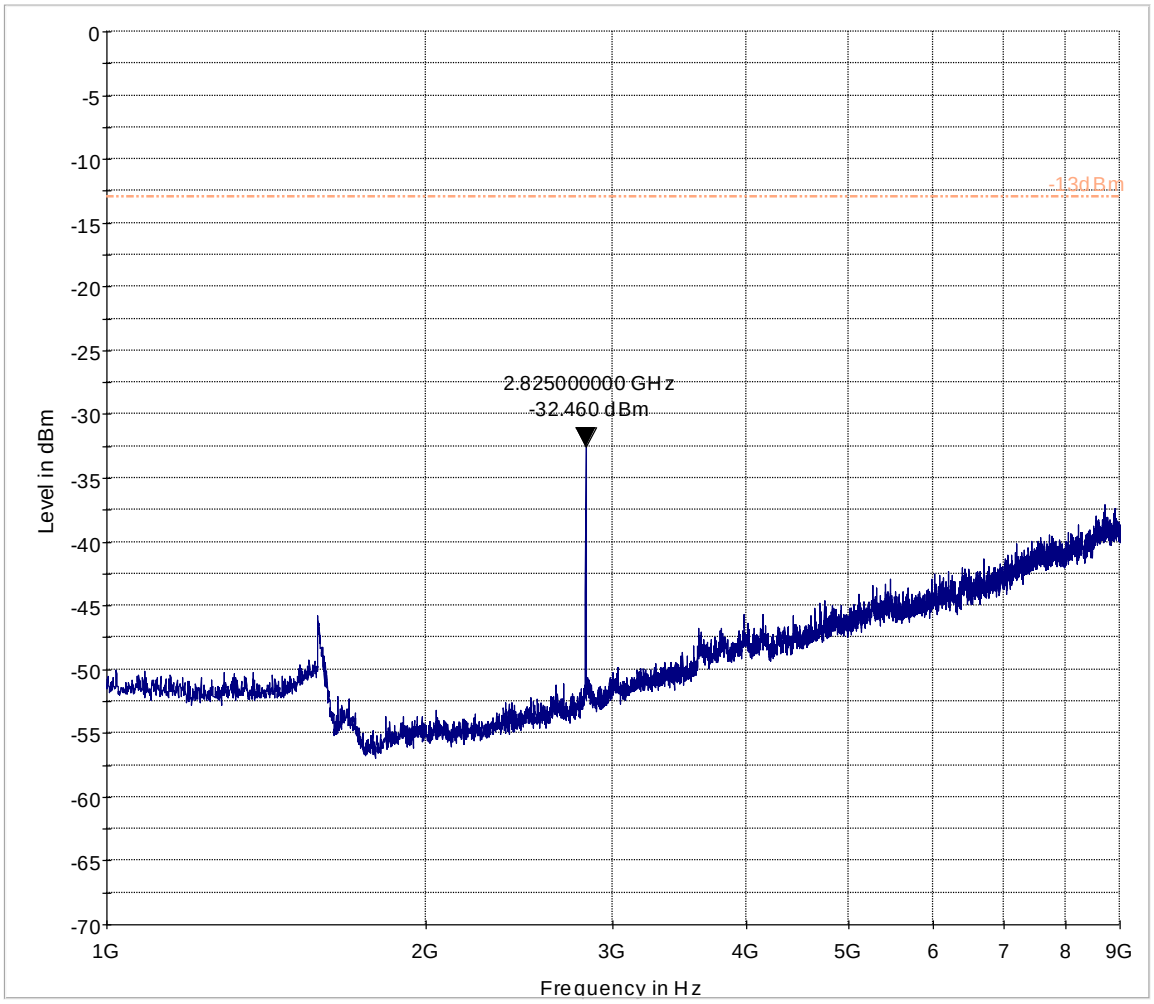
7.5.23 1 GHz – 18 GHz, UMTS FDD II, Tx, Ch. High



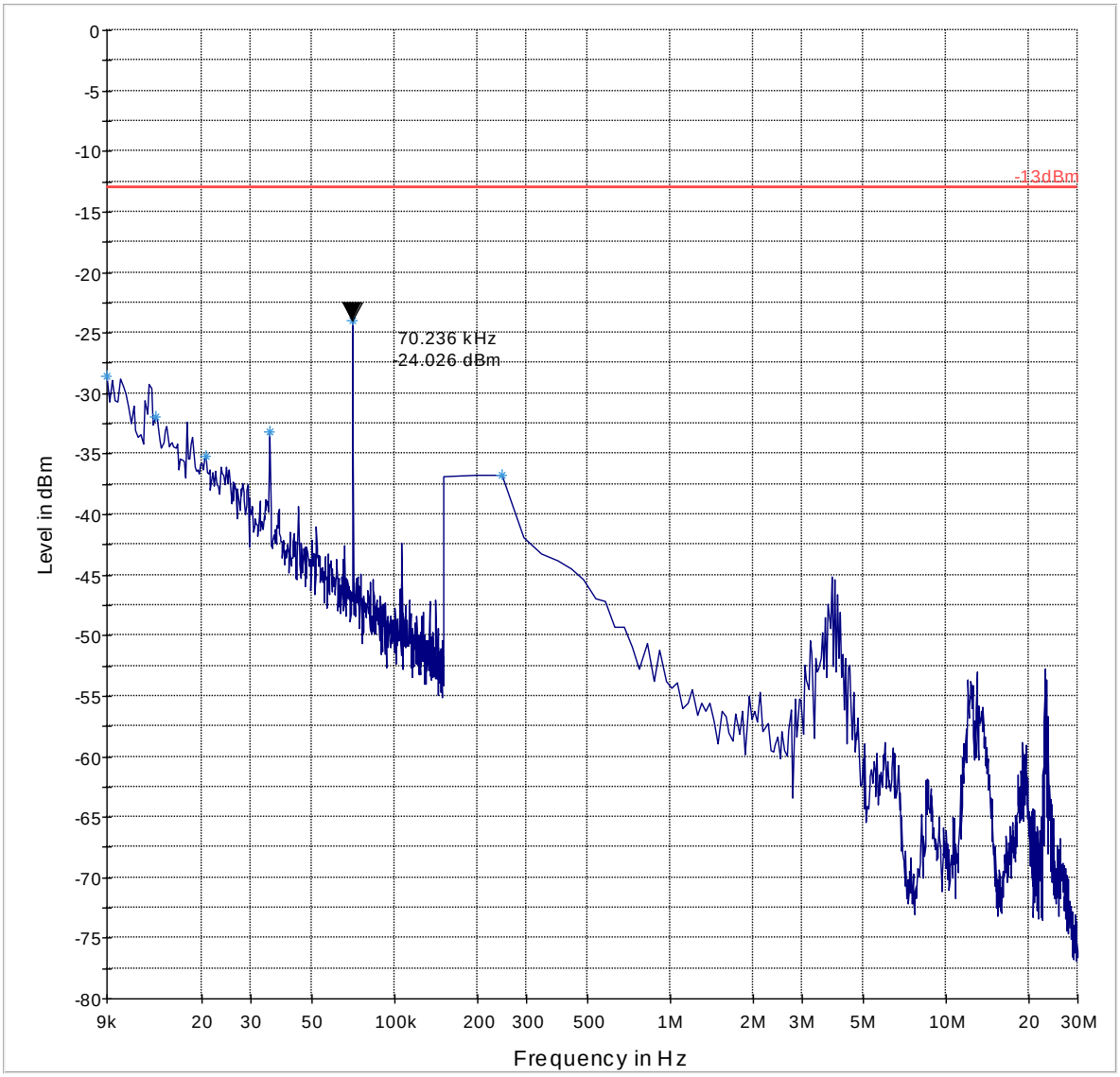
7.5.24 30 MHz – 1 GHz, UMTS FDD V, Tx, Ch. Low



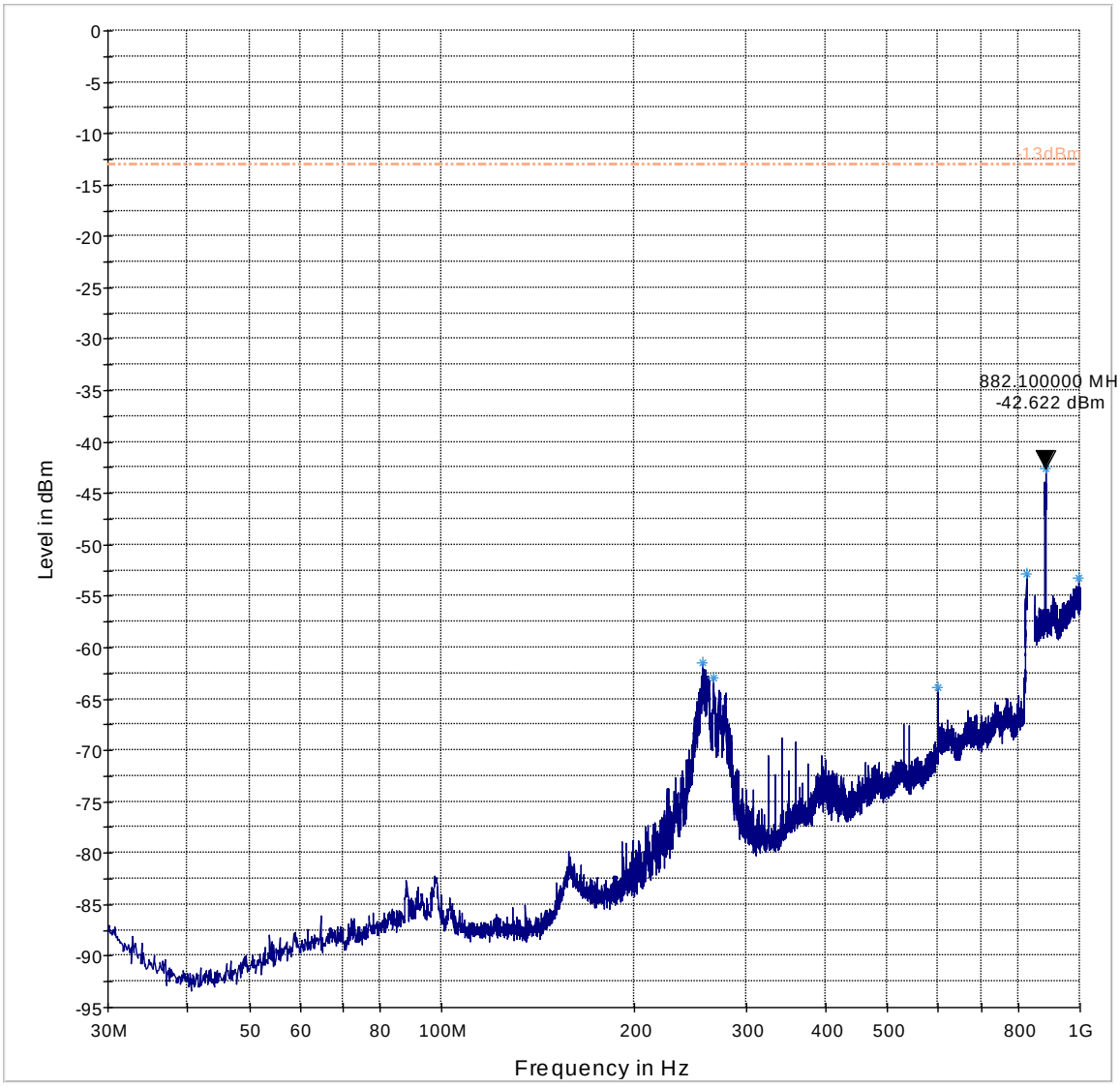
7.5.25 1 GHz – 9 GHz, UMTS FDD V, Ch. Low



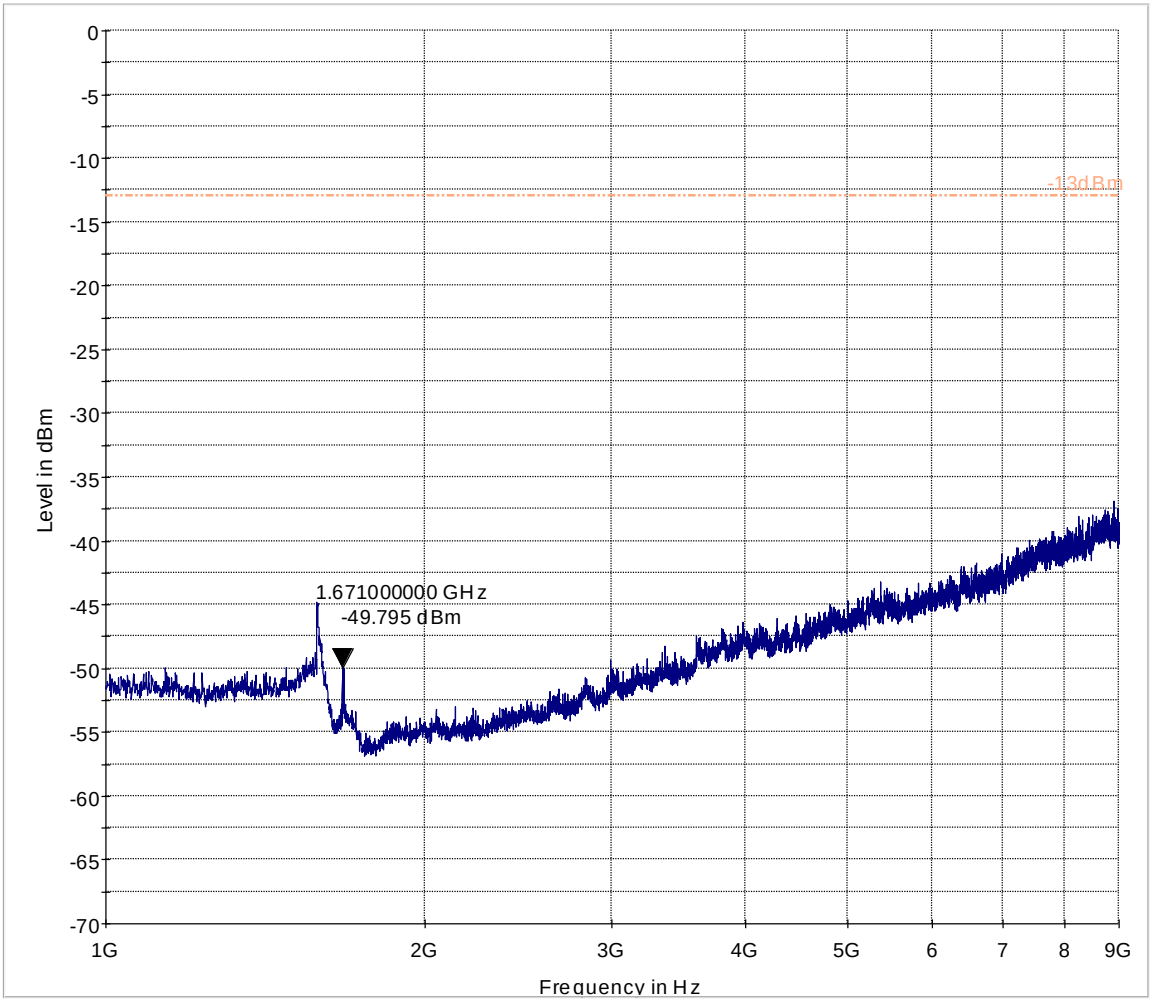
7.5.26 9 KHz – 30 MHz, UMTS FDD V, Tx, Ch. Mid



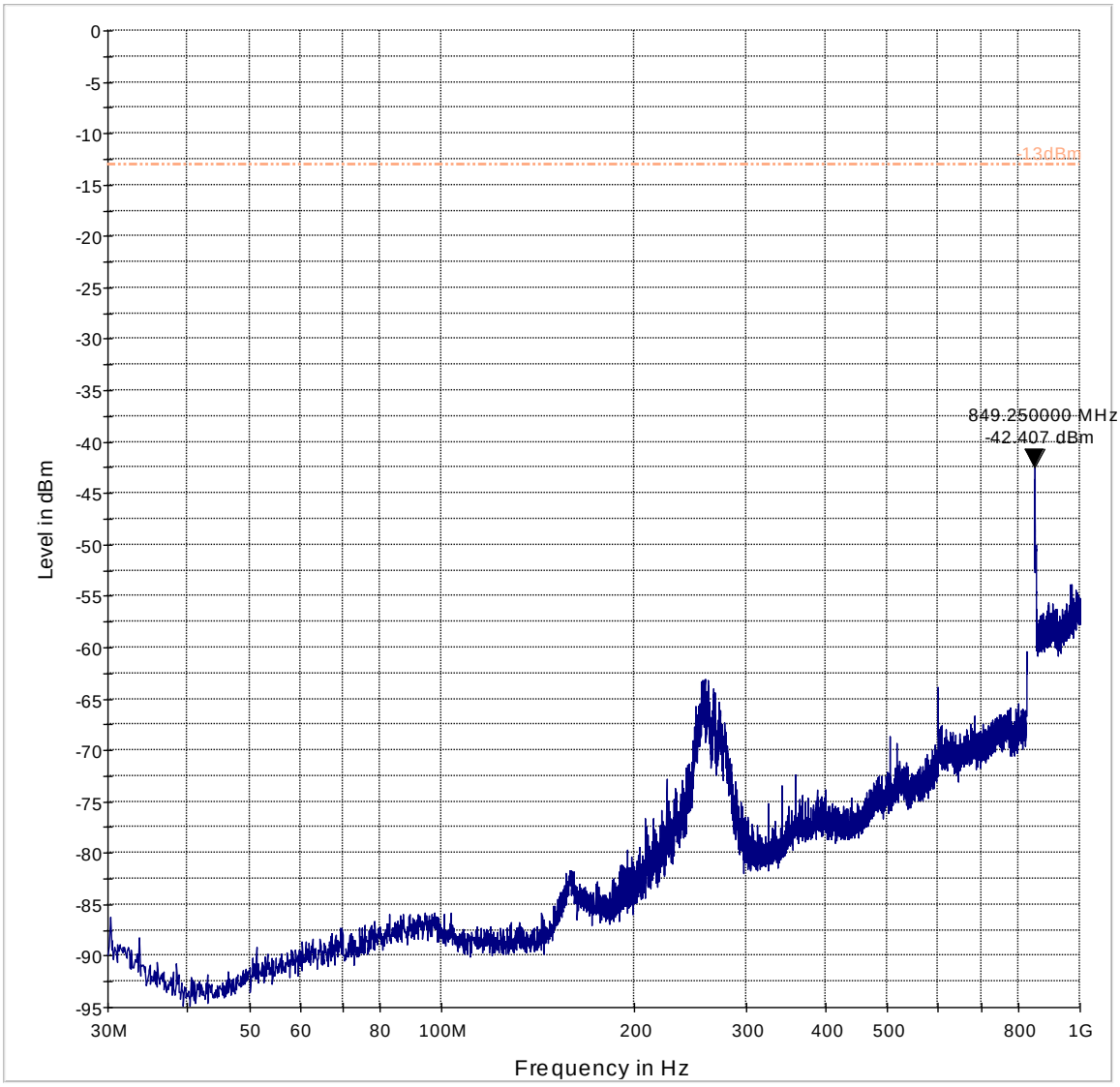
7.5.27 30 MHz – 1 GHz, UMTS FDD V, Tx, Ch. Mid



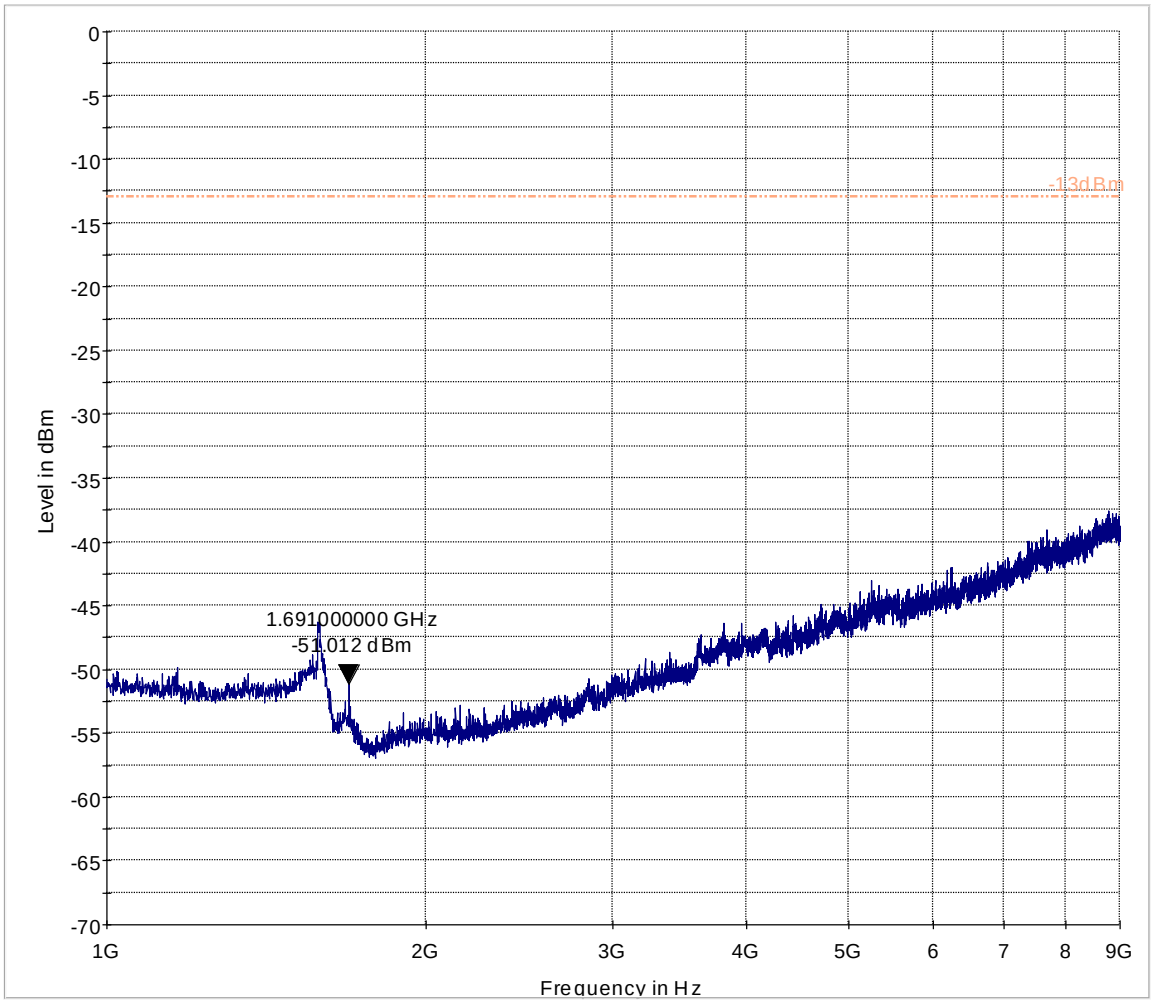
7.5.28 1 GHz – 9 GHz, UMTS FDD V, Tx: Ch. Mid



7.5.29 30 MHz – 1 GHz, UMTS FDD V, Tx, Ch. High



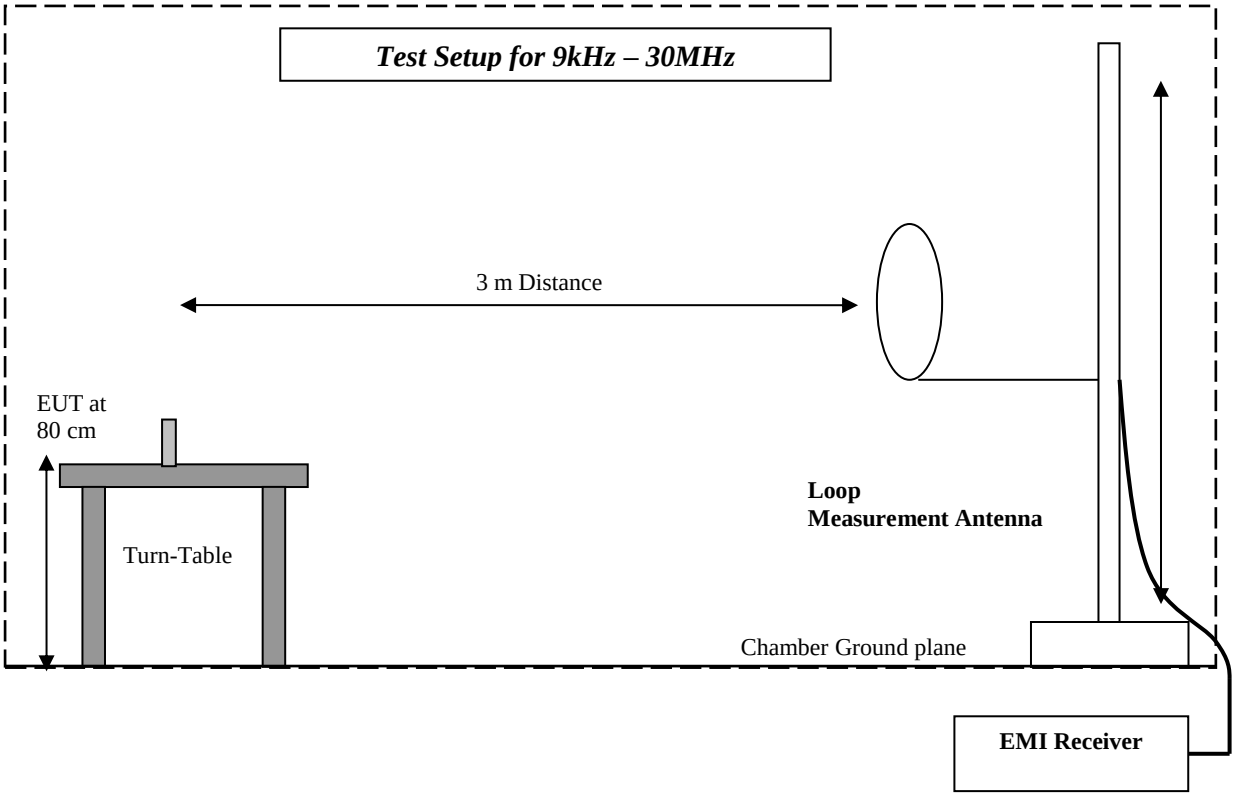
7.5.30 1 GHz – 9 GHz, UMTS FDD V, Tx, Ch. High

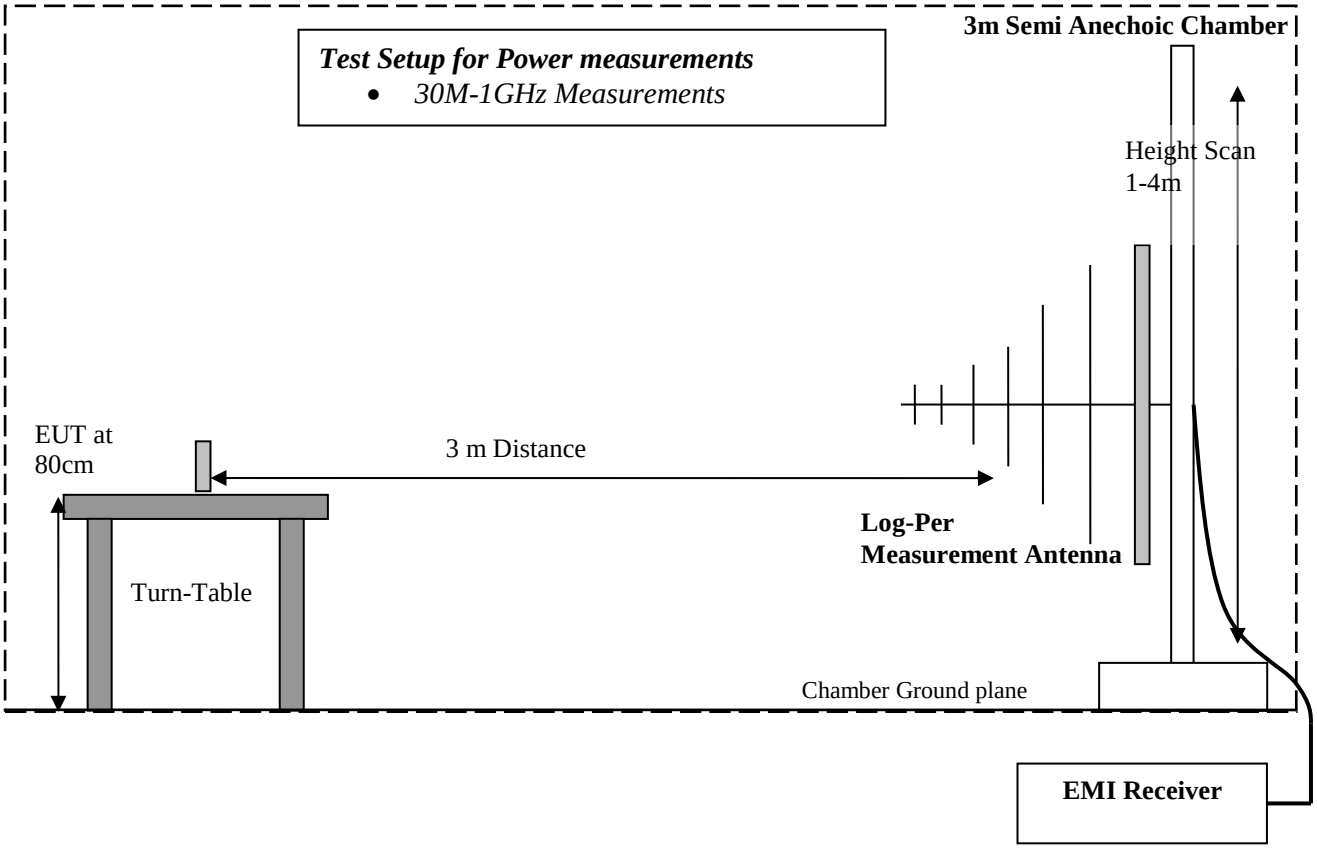


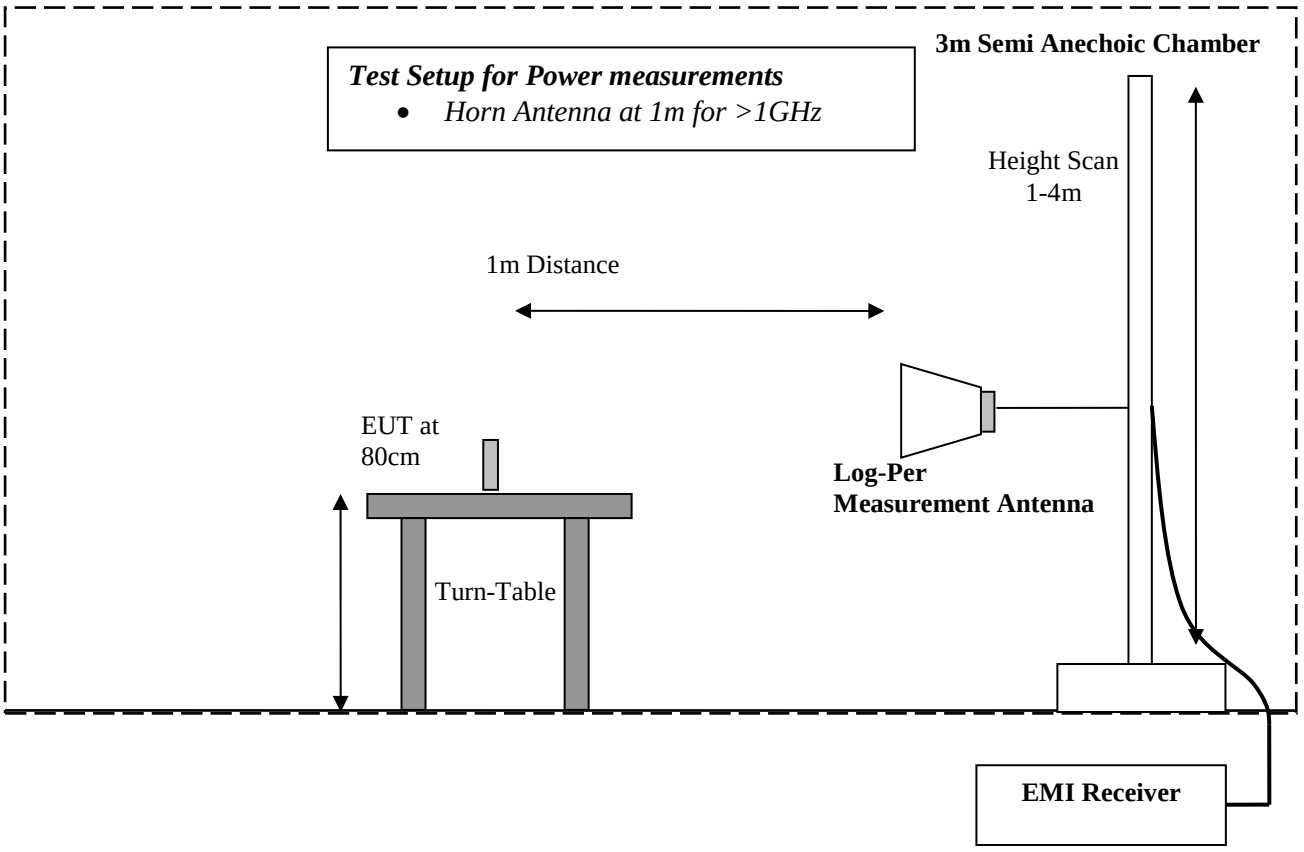
8 Test Equipment and Ancillaries used for tests.

Item Name	Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
Antenna Biconilog 3142E	Biconlog Antenna	EMCO	3142E	166067	3 years	6/14/2014
Antenna Biconilog 3149	Biconilog Antenna	EMCO	3149	63983	3 years	4/9/2014
Antenna Binconical 3110B SN 0004-3356	Binconical Antenna	EMCO	3110B	0004-3356	3 years	10/4/2014
Antenna Binconical 3110B SN 0004-3357	Binconical Antenna	EMCO	3110B	0004-3357	3 years	10/4/2014
Antenna Horn 3115 SN 35111	Horn Antenna	EMCO	3115	35111	3 years	7/24/2015
Antenna Horn 3116	Horn Antenna	ETS Lindgren	3116	70497	3 years	7/22/2015
Antenna Loop 6512	Loop Antenna	ETS Lindgren	6512	49838	3 years	3/13/2014
CDN Power line FCC-801-M2-32A	CDN Power line	FCC	FCC-801-M2-32A	2056	2 Years	2/24/2016
CDN Power line FCC-801-M3-32A	CDN Power line	FCC	FCC-801-M3-32	20100	2 Years	2/21/2016
CMW500	CMW 500	R&S	WIDEB. RADIO COMM. TESTER	127068	3 years	3/12/2015
Current Probe EZ-17 Immunity	RF Current Probe Conducted Emissions	R&S	EZ-17	834613/007	3 years	6/17/2016
Digital Barometer	Compact Digital Barometer	Control Company	35519-055	91119547	2 Years	4/7/2015
Digital Radio Comm. Tester CMU 200 #1	Digital Radio Comm. Tester	R&S	CMU 200 #1	101821	2 Years	7/4/2015
ESD Gun NSG 437	ESD Gun	Teseq Inc.	NSG 437	221	2 Years	2/14/2016
Harmonic Flicker Tester 300lix	AC Power Source	California Instruments	300lix	57222	2 Years	3/11/2016
Harmonic Flicker Tester PACS-1	Harmonic/Flicker Tester	California Instruments	PACS-1	72470	3 years	3/24/2014
Immunity Tester Generator UCS 500 M4	Immunity Tester Generator	Amplifier Research	UCS 500 M4	28256	2 Years	4/15/2016
LISN FCC-LISN-50-25-2-08	LISN	FCC	FCC-LISN-50-25-2-08	8014	2 Years	3/26/2015
Oscilloscope	Oscilloscope	R&S	RTO 1014	300087	3 years	7/24/2016
Power Meter NRVD	Power Meter	R&S	NRVD	836875/020	3 years	6/15/2016
Power Sensor Insertion URV5-Z2 SN 100727	Power Sensor / 10V Insertion	R&S	URV5-Z2	100727	3 years	6/15/2016
Power Sensor Insertion URV5-Z2 SN 836029	Power Sensor 10V Insertion	R&S	URV5-Z2	836029/035	3 years	6/15/2016
Power Sensor NRP - Z22	Power Sensor	R&S	NRP-Z22	100223	3 years	6/17/2016
Power Sensor NRP - Z81	Power Smart Sensor	R&S	NRP-Z81	100161	3 years	6/15/2016
Radiated Immunity Probe HI6005	Radiated Immunity Probe	ETS Lindgren	HI6005	105107	2 Years	3/21/2016
Receiver ESU40	EMI Receiver	R&S	ESU40	100251	3 years	6/29/2015
Signal Generator SME03	Signal Generator	Amplifier Research	SME 03	1038-6002-03	3 years	6/13/2016
Signal Generator SMP04	Signal Generator	R&S	SMP04	100151	3 years	6/17/2016
Spectrum Analyzer FSU08	Spectrum Analyzer	R&S	FSU-8	200256	2 Years	7/5/2015
Spectrum Analyzer FSU26 #1	FSU 26	Amplifier Research	FSU 26	100189	3 years	6/1/2016
Spectrum Analyzer FSU26 #2	Spectrum Analyzer	R&S	FSU26	200065	3 years	7/4/2015
Thermometer Humidity TM320	Thermometer Humidity	Dickson	TM320	5280063	1 Year	7/29/2016

9 Block Diagrams






3m Semi Anechoic Chamber
Test Setup for Power measurements
Horn Antenna at 1m for >1GHz
Height Scan
1-4m
1m Distance
EUT at
80cm
Log-Per
Measurement Antenna
Turn-Table
EMI Receiver

10 Revision History

Date	Report Name	Changes to Report	Report prepared by
October 28, 2015	EMC_SMITH-001-14001_FCC_22_24	Final	Yu-Chien Ho
August 11, 2016	EMC_SMITH-001-14001_FCC_22_24_REV_1	Updated intergrated module information. Add notes for mode not tested.	Yu-Chien Ho
August 16, 2016	EMC_SMITH-001-14001_FCC_22_24_REV_2	Updated WCDMA operating frequency range.	Yu-Chien Ho
August 26, 2016	EMC_SMITH-001-14001_FCC_22_24_REV_3	Added table for measured radiated output power.	Yu-Chien Ho