



FCC Test Report

FCC Part 22, 24 / RSS 129, 133

Sony Corporation

Personal Computer

Model Number: PCG-31113L

FCC ID: AK8PCG31113L

IC-ID: 409B-PCG31113L

TEST REPORT #: EMC_SONYE_034_09002_FCC22_24_GSM_PCG-31113L_rev1
DATE: 2010-03-16



FCC listed
A2LA Accredited
IC recognized #
3462B

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Table of Contents

1	ASSESSMENT	4
	<i>Compliance</i>	<i>4</i>
	<i>Compliance</i>	<i>4</i>
2	ADMINISTRATIVE DATA.....	5
2.1	IDENTIFICATION OF THE TESTING LABORATORY ISSUING THE REPORT	5
2.2	IDENTIFICATION OF THE CLIENT	5
2.3	IDENTIFICATION OF THE MANUFACTURER.....	5
3	EQUIPMENT UNDER TEST (EUT).....	6
3.1	SPECIFICATION OF THE EQUIPMENT UNDER TEST.....	6
3.2	IDENTIFICATION OF THE EQUIPMENT UNDER TEST (EUT).....	6
3.3	IDENTIFICATION OF ACCESSORY EQUIPMENT	6
4	SUBJECT OF INVESTIGATION.....	7
5	MEASUREMENTS.....	8
5.1	RF POWER OUTPUT	8
5.1.1	FCC 2.1046 Measurements required: RF power output.....	8
5.1.2	Limits:	8
5.1.2.1	FCC 22.913 (a) Effective radiated power limits.	8
5.1.2.2	FCC 24.232 (b)(c) Power limits.	8
5.1.3	Radiated Output Power measurement procedure:	8
5.1.4	ERP Results 850 MHz band:	10
5.1.5	EIRP Results 1900 MHz band:.....	10
6	SPURIOUS EMISSIONS RADIATED	29
6.1.1	FCC 2.1053 Measurements required: Field strength of spurious radiation.....	29
6.1.2	Limits:	29
6.1.2.1	FCC 22.917 Emission limitations for cellular equipment.	29
6.1.2.2	FCC 24.238 Emission limitations for Broadband PCS equipment.	29
6.1.3	Radiated out of band measurement procedure:	30
6.1.4	Radiated out of band emissions results on EUT:	32
6.1.4.1	RESULTS OF RADIATED TESTS GSM 850 MHz BAND:	32
6.1.4.2	RADIATED SPURIOUS EMISSIONS (850MHz band GSM).....	33
6.1.4.3	RESULTS OF RADIATED TESTS UMTS FDD5	39
6.1.4.4	Radiated Spurious Emissions (UMTS FDD5)	40
6.1.4.5	RESULTS OF RADIATED TESTS PCS-1900:.....	46
6.1.4.6	RADIATED SPURIOUS EMISSIONS (PCS 1900) GSM.....	47
6.1.4.7	RESULTS OF RADIATED TESTS UMTS FDD2:	54
6.2	RECEIVER RADIATED EMISSIONS § 2.1053 / RSS-129 & 133	62
6.2.1.1	References	62
6.2.1.2	§15.109 Radiated emission limits- Unintentional Radiators:.....	62
6.2.1.3	Results	62
6.2.2	Receiver Radiated Spurious Emissions Results.....	62
6.3	AC POWER LINE CONDUCTED EMISSIONS § 15.107/207.....	67



6.3.1	LIMITS	67
6.3.2	RESULTS TX FDD 2:	68
7	TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS	70
8	REFERENCES	71
9	BLOCK DIAGRAMS	72
10	REVISION HISTORY.....	73

1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and in compliance with the applicable criteria specified in Industry Canada rules RSS129 and RSS133.

Company	Description	Model #
Sony Corporation	Personal Computer	PCG-31113L

This report is reviewed by:

Marc Douat

2010-03-16 Compliance (Test Lab Manager)

Date	Section	Name	Signature
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This report is prepared by:

Satya Radhakrishna

2010-03-16 Compliance (EMC Project Engineer)

Date	Section	Name	Signature
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The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The 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 the CETECOM Inc USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Report

Company Name:	CETECOM Inc.
Department:	EMC
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Responsible Test Lab Manager:	Marc Douat

2.2 Identification of the Client

Applicant's Name:	Sony Corporation
Address:	1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan
Contact Person:	Ryui Tatsumi
Phone No.	+81-263-72-5696
Fax:	+81-263-72-9755
e-mail:	Ryui.Tatsumi @jp.sony.com

2.3 Identification of the Manufacturer

MANUFACTURER (If different from Applicant)	
Applicant (Firm Name):	Sony EMCS Corporation
Contact Person:	Ryui Tatsumi
Telephone:	+81-263-72-5696
Fax:	+81-263-72-9755
Address Line 1:	5432 Toyoshima,
City:	Azumino-shi, Nagano
Postal Code:	399-8282,
Country:	Japan
e-mail:	Ryui.Tatsumi @jp.sony.com

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Product Type	Personal Computer
Marketing Name:	PCG-31113L
Model No:	PCG-31113L
FCC-ID:	AK8PCG31113L
IC-ID :	409B-PCG31113L
Frequency Range:	GSM 850: 824.2-848.8MHz; PCS 1900: 1850.2-1909.8MHz FDD 5: 826.4-846.6MHz; FDD 2: 1852.4-1907.6MHz
Type(s) of Modulation:	GMSK; 8-PSK; QPSK; 16QAM
Antenna Type:	PIFA, 824.7-848.31 MHz (+0.42 dBi Peak Gain) 1851.25-1908.75 MHz(+1.76 dBi Peak Gain)
	Radiated:
	Radiated GSM850 GMSK: 27.888dBm @ 824.2 MHz
	Radiated GSM850 8PSK: 27.114dBm @ 824.2 MHz
Output Power:	Radiated UMTS FDD5: 22.951dBm @ 836.0 MHz
	Radiated GSM1900 GMSK: 32.343dBm @ 1880 MHz
	Radiated GSM1900 8PSK: 30.398dBm @ 1909.8 MHz
	Radiated UMTS FDD2: 30.883dBm @ 1880 MHz

3.2 Identification of the Equipment under Test (EUT)

EUT #	TYPE	MANF.	MODEL	SERIAL #
1	EUT	Sony Corporation	PCG-31113L	DVT 14920 1100004 IMEI: 980004000203030

3.3 Identification of Accessory equipment

AE #	TYPE	MANF.	MODEL	SERIAL #
1	AC/DC ADAPTER	Sony Corporation	VGP-AC19V32	1480955310064148

4 Subject of Investigation

All testing was performed on the EUT listed in Section 3. The EUT was maximized in the X, Y, Z positions, all data in this report shows the worst case between horizontal and vertical polarization for above 1GHz.

This device contains a FCC pre certified WWAN module with FCC ID: J9CGOBI2000 and IC ID: 2723A-GOBI2000. All conducted tests were performed on this module. The results are available in the conducted test report 80-VN379-203 Rev. A. This report contains only radiated results.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations. The maximization of portable equipment is conducted in accordance with ANSI C63.4.

This report replaces report# EMC_SONYE_034_09002_FCC22_24_GSM_PCG-31113L.

5 Measurements

5.1 RF Power Output

5.1.1 FCC 2.1046 Measurements required: RF power output.

Power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on circuit elements as specified. The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

5.1.2 Limits:

5.1.2.1 FCC 22.913 (a) Effective radiated power limits.

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

5.1.2.2 FCC 24.232 (b)(c) Power limits.

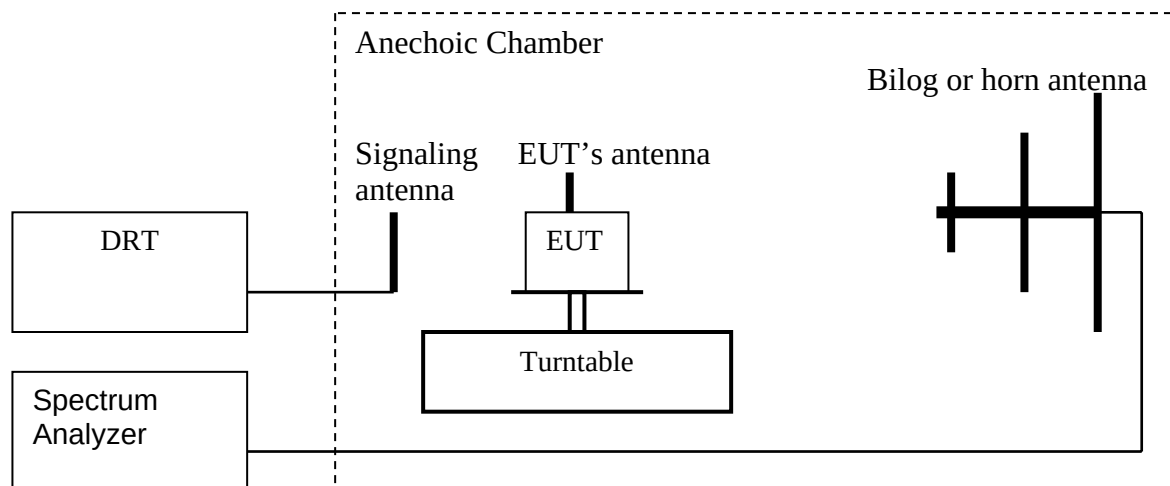
(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP).

(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.

5.1.3 Radiated Output Power measurement procedure:

Based on 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 a vertical orientation.

2. Adjust the settings of the Digital Radiocommunication 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. **Spectrum analyzer settings = rbw=vbw=3MHz**
- (note: Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4, 7 and 8 above are performed with test software.)

5.1.4 ERP Results 850 MHz band:

Frequency (MHz)	Burst Peak ERP	
	≤38.45dBm (7W)	
	Effective Radiated Power (dBm)	
	GPRS	EGPRS
824.2	27.888	27.114
836.6	27.673	26.238
848.8	25.322	23.942

Frequency (MHz)	Effective Radiated Power (dBm)
	UMTS FDD 5
826.4	22.84
836.0	22.951
846.6	22.451

5.1.5 EIRP Results 1900 MHz band:

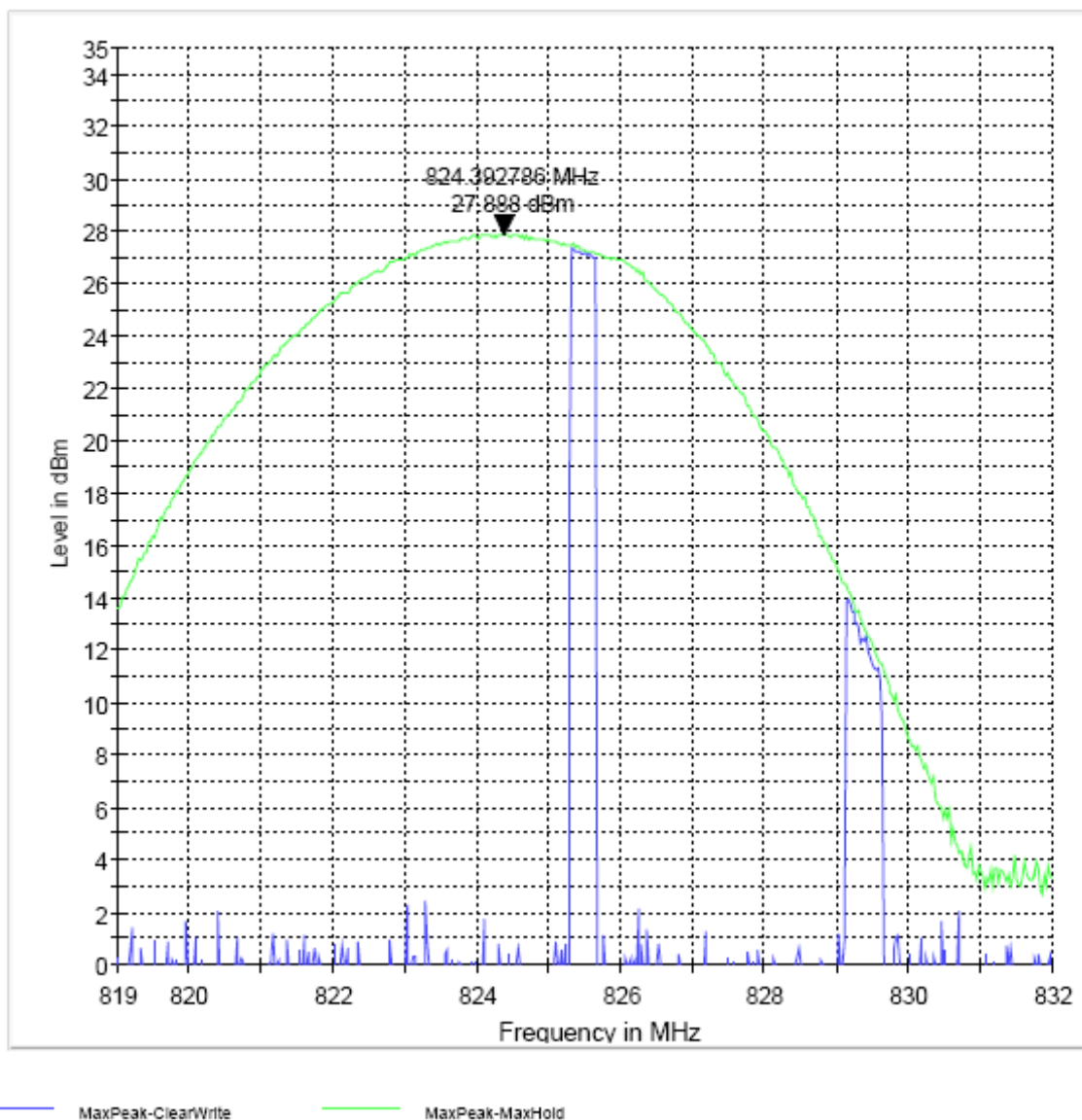
Frequency (MHz)	Burst Peak EIRP	
	≤33dBm (2W)	
	Equivalent Isotropic Radiated Power (dBm)	
	GPRS	EGPRS
1850.2	31.516	30.196
1880.0	32.343	30.041
1909.8	32.021	30.398

Frequency (MHz)	Effective Isotropic Radiated Power (dBm)
	UMTS FDD 2
1852.4	30.635
1880.0	30.883
1907.6	30.264

**ERP (GPRS 850)
CHANNEL 128**

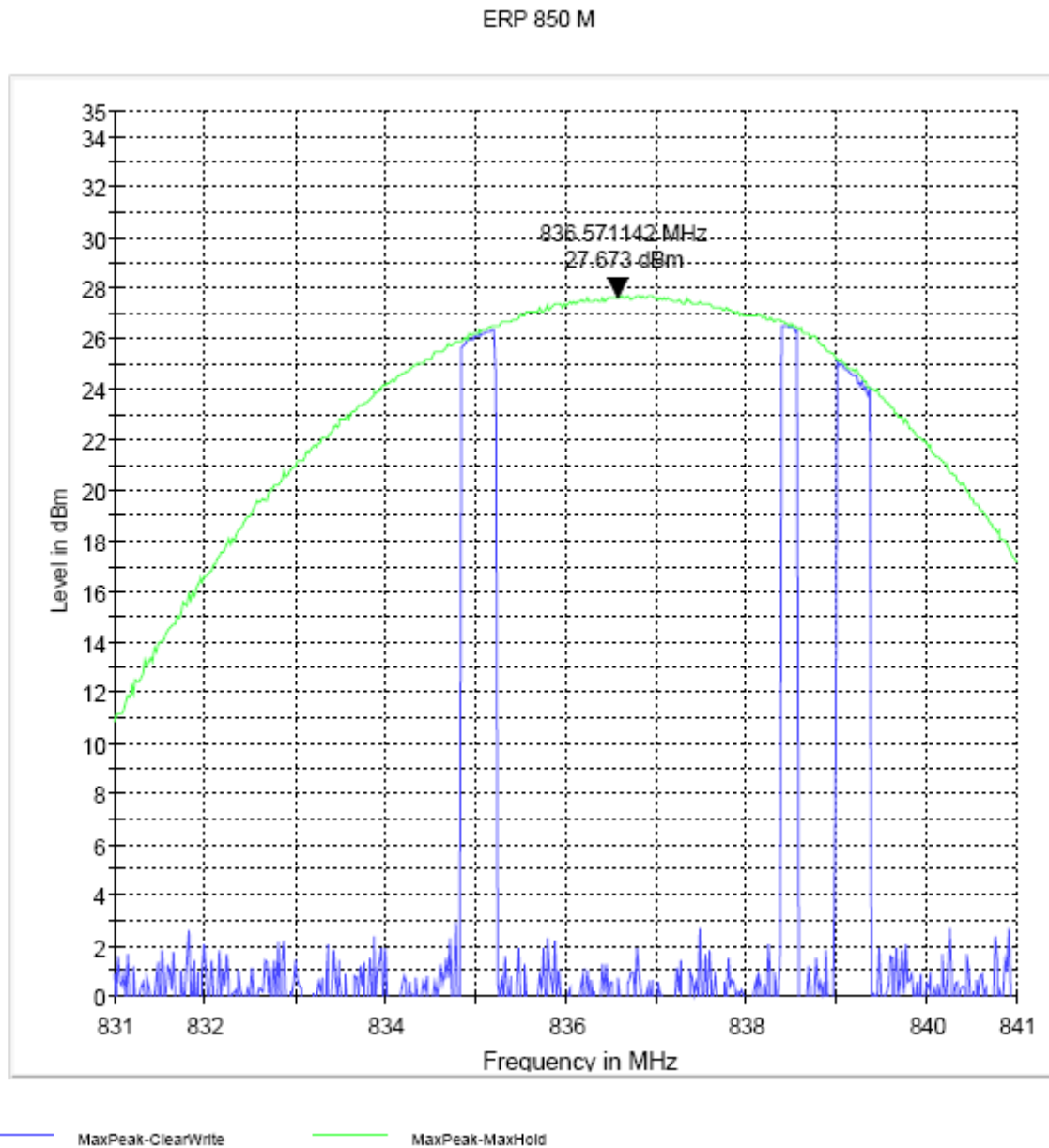
§22.913(a)

ERP 850 L



ERP (GPRS 850)
CHANNEL 190

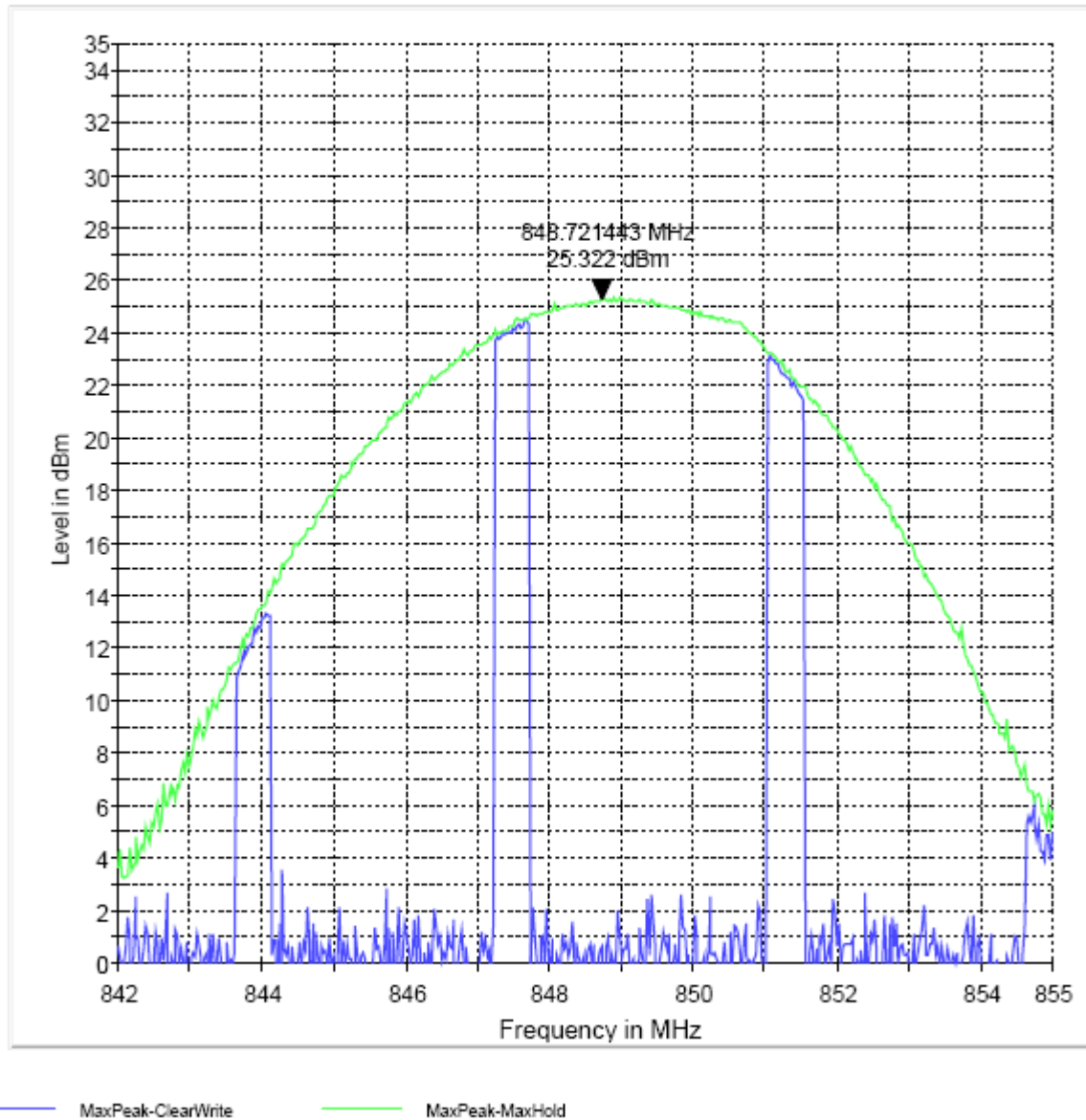
§22.913(a)



**ERP (GPRS 850)
CHANNEL 251**

§22.913(a)

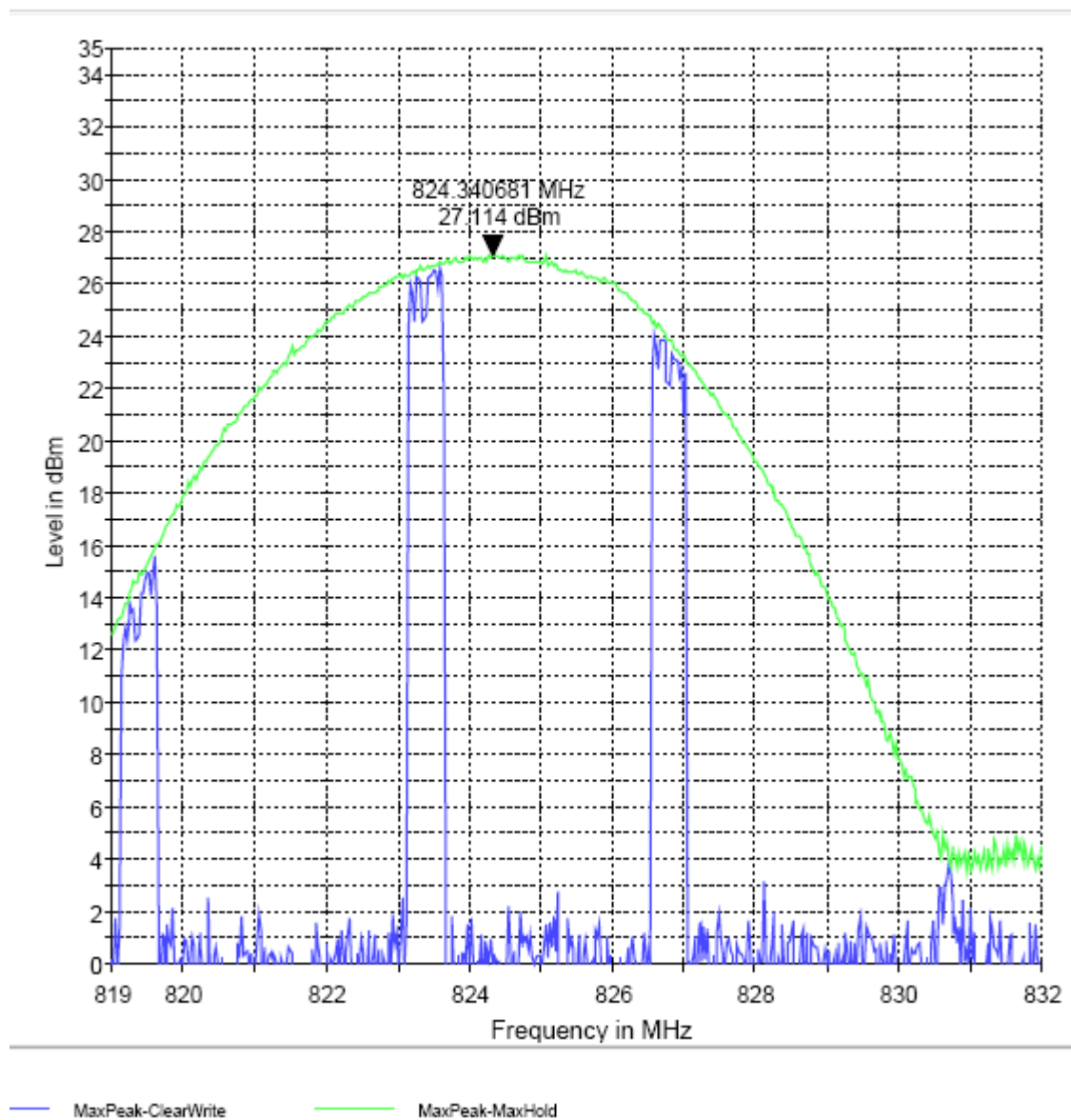
ERP 850 H



**ERP (EGPRS 850)
CHANNEL 128**

§22.913(a)

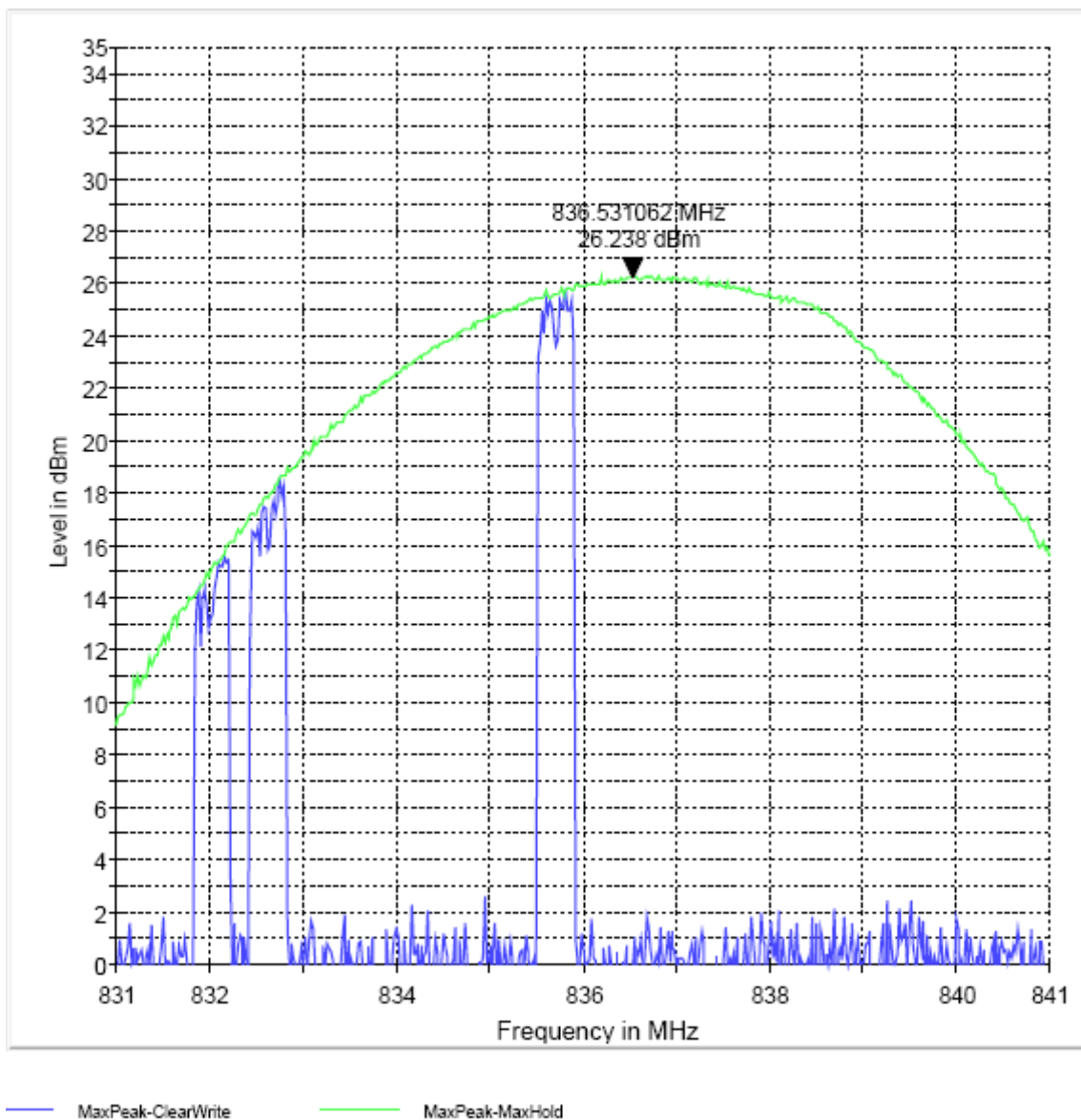
ERP 850 L



**ERP (EGPRS 850)
CHANNEL 190**

§22.913(a)

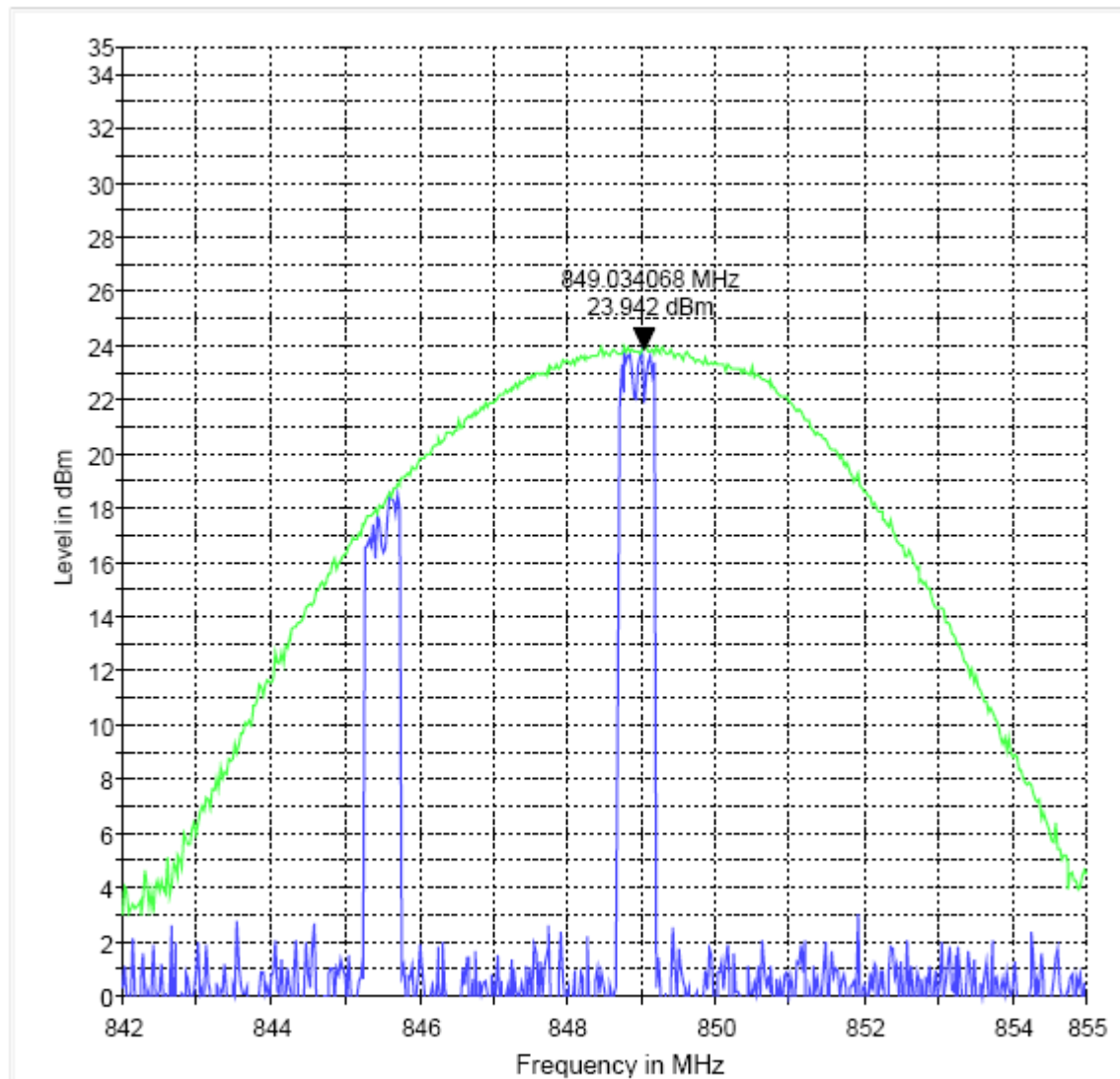
ERP 850 M



**ERP (EGPRS 850)
CHANNEL 251**

§22.913(a)

ERP 850 H

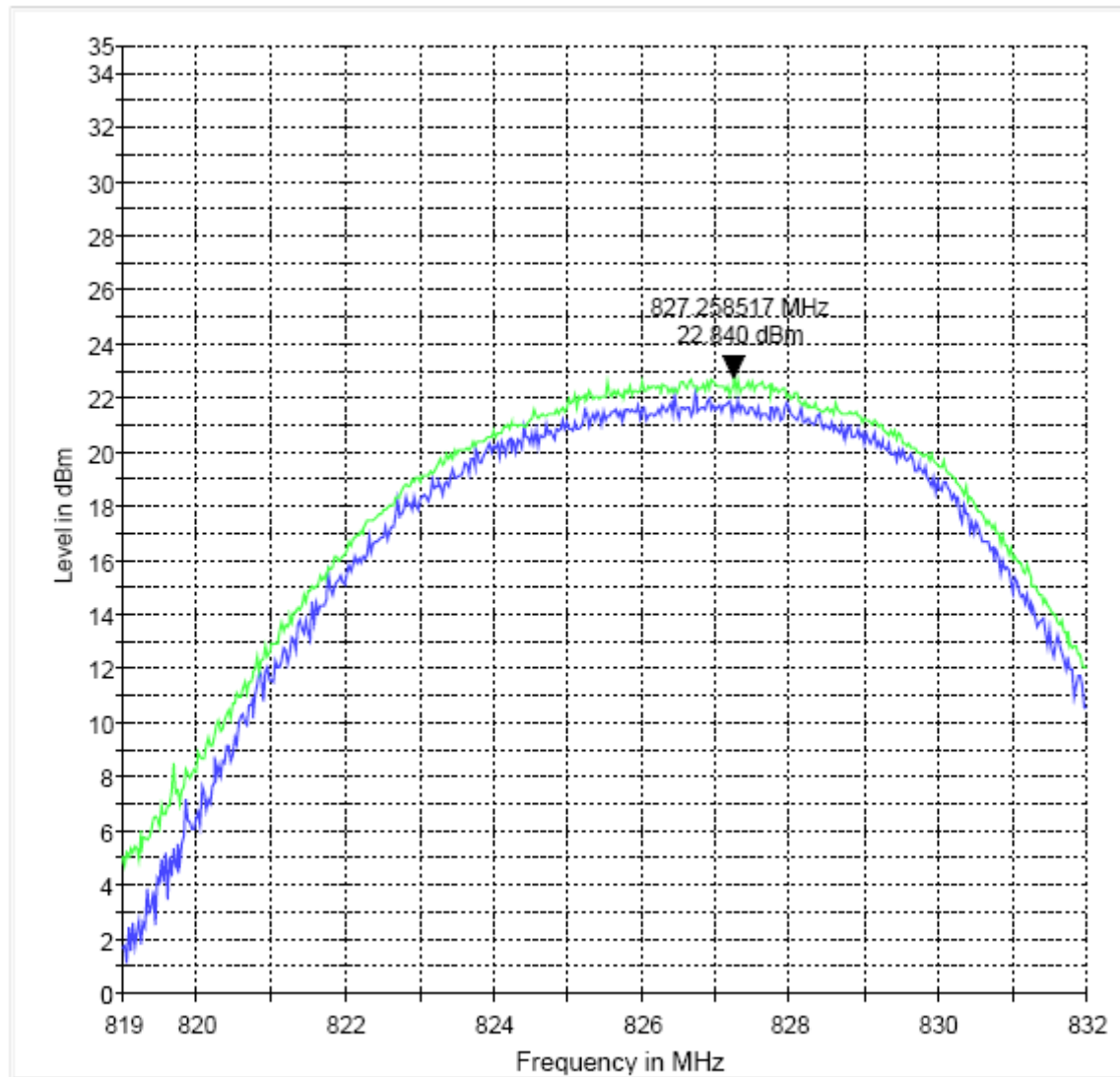


— MaxPeak-ClearWrite — MaxPeak-MaxHold

**EIRP (UMTS FDD5)
CHANNEL 4132**

§22.913(a)

ERP 850 L

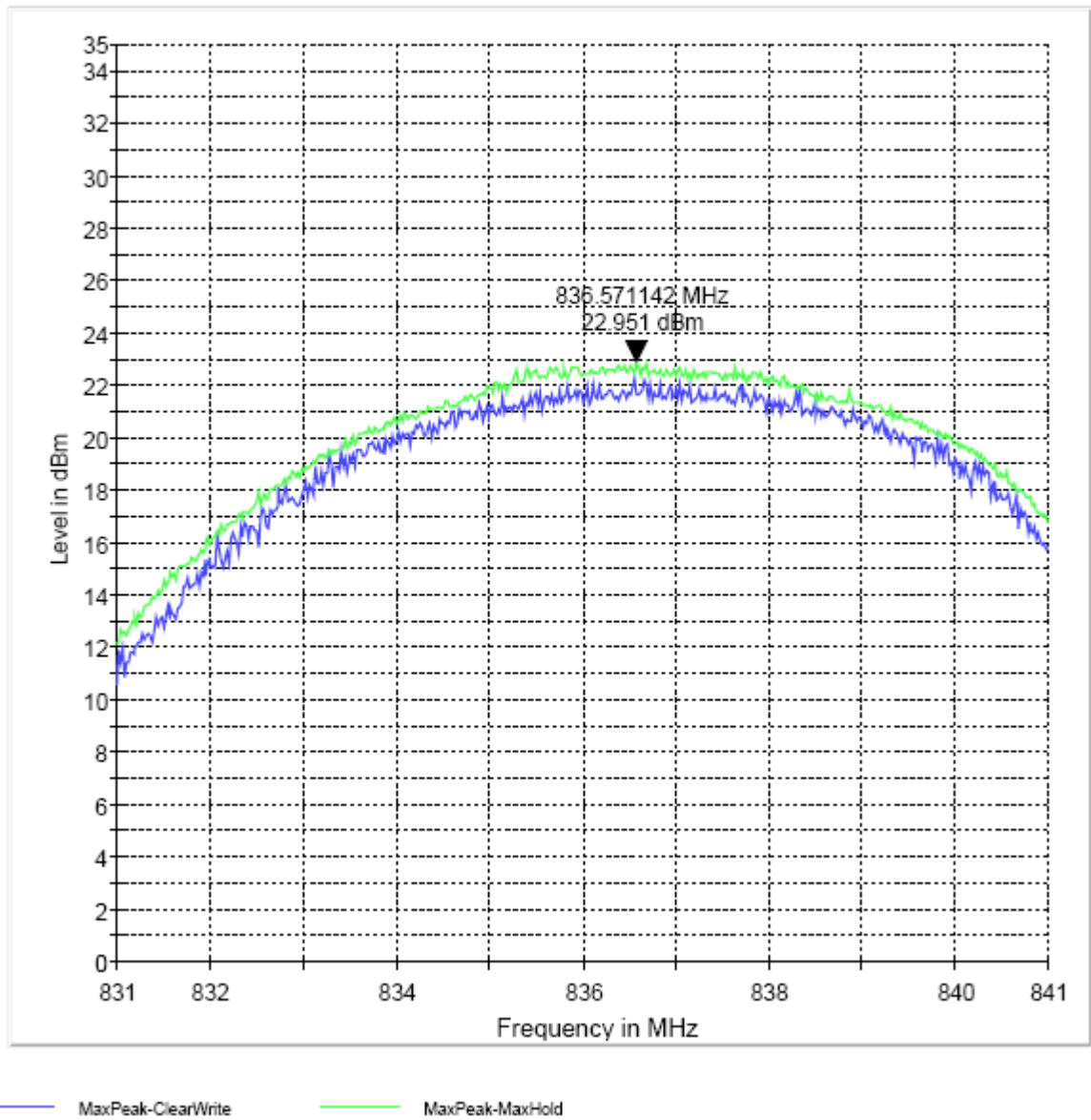


— MaxPeak-ClearWrite — MaxPeak-MaxHold

**EIRP (UMTS FDD5)
CHANNEL 4183**

§22.913(a)

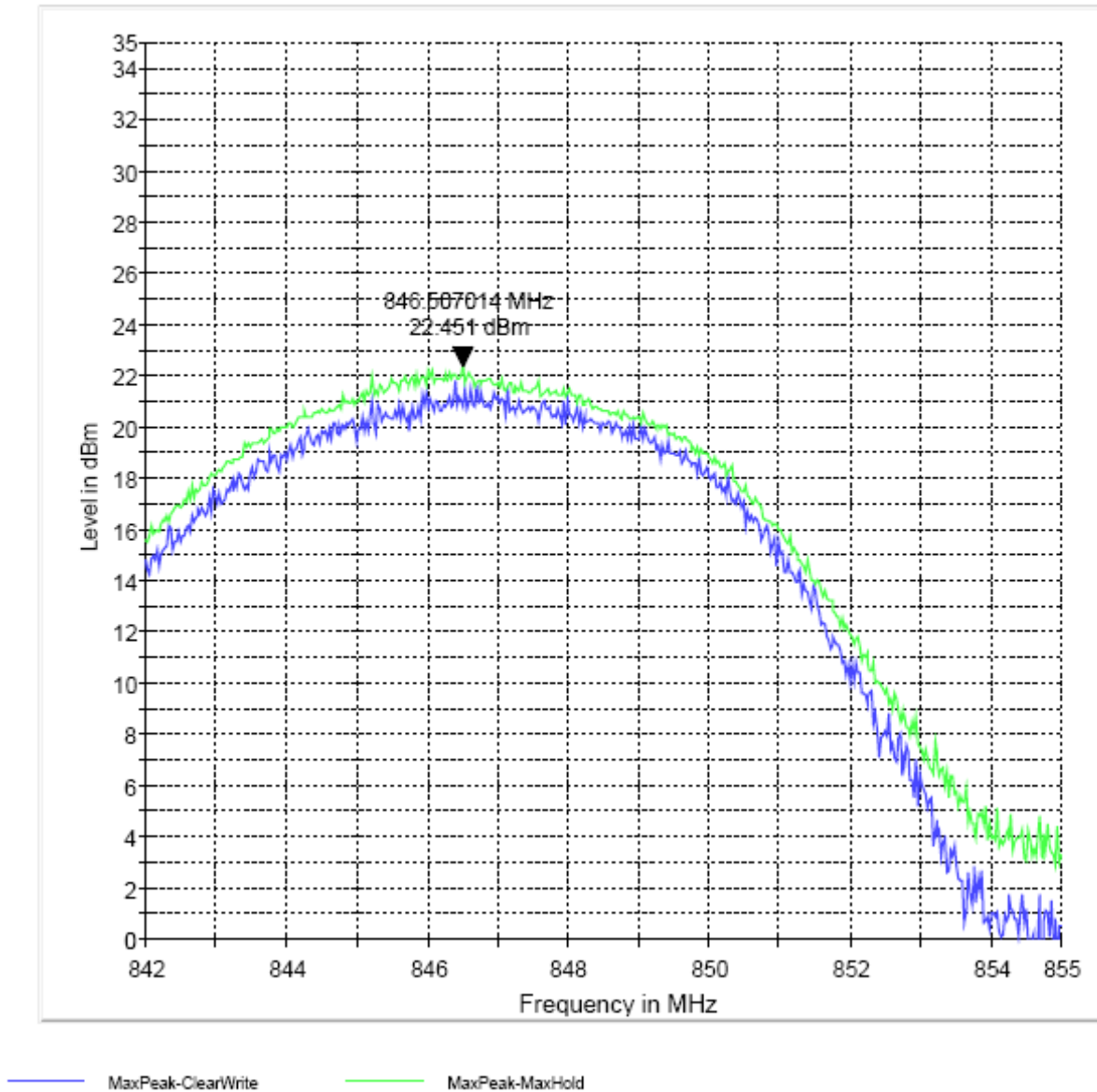
ERP 850 M



**EIRP (UMTS FDD5)
CHANNEL 4233**

§22.913(a)

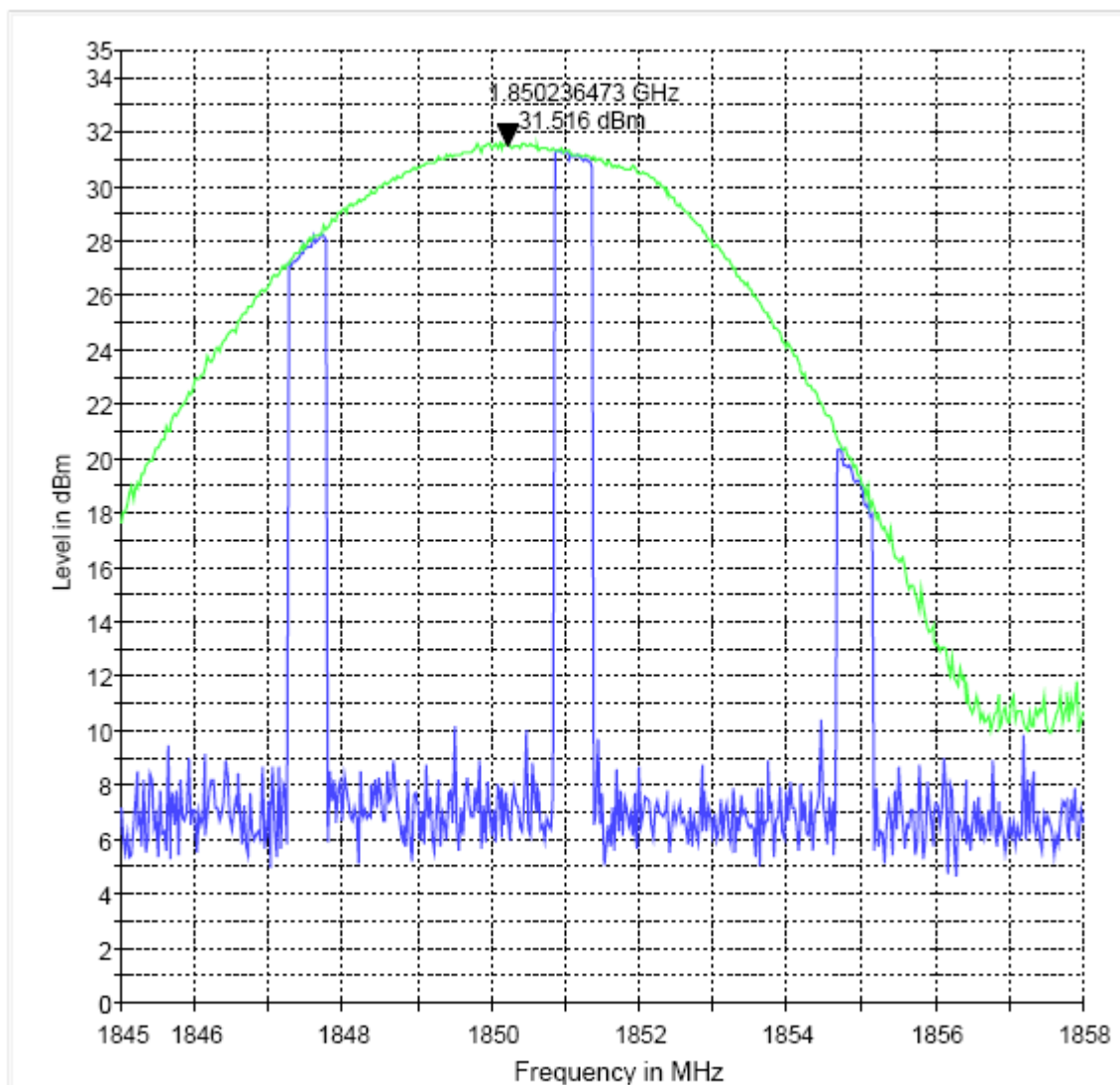
ERP 850 H



**ERP (GPRS 1900)
CHANNEL 512**

§24.232(b)

EIRP 1900 L

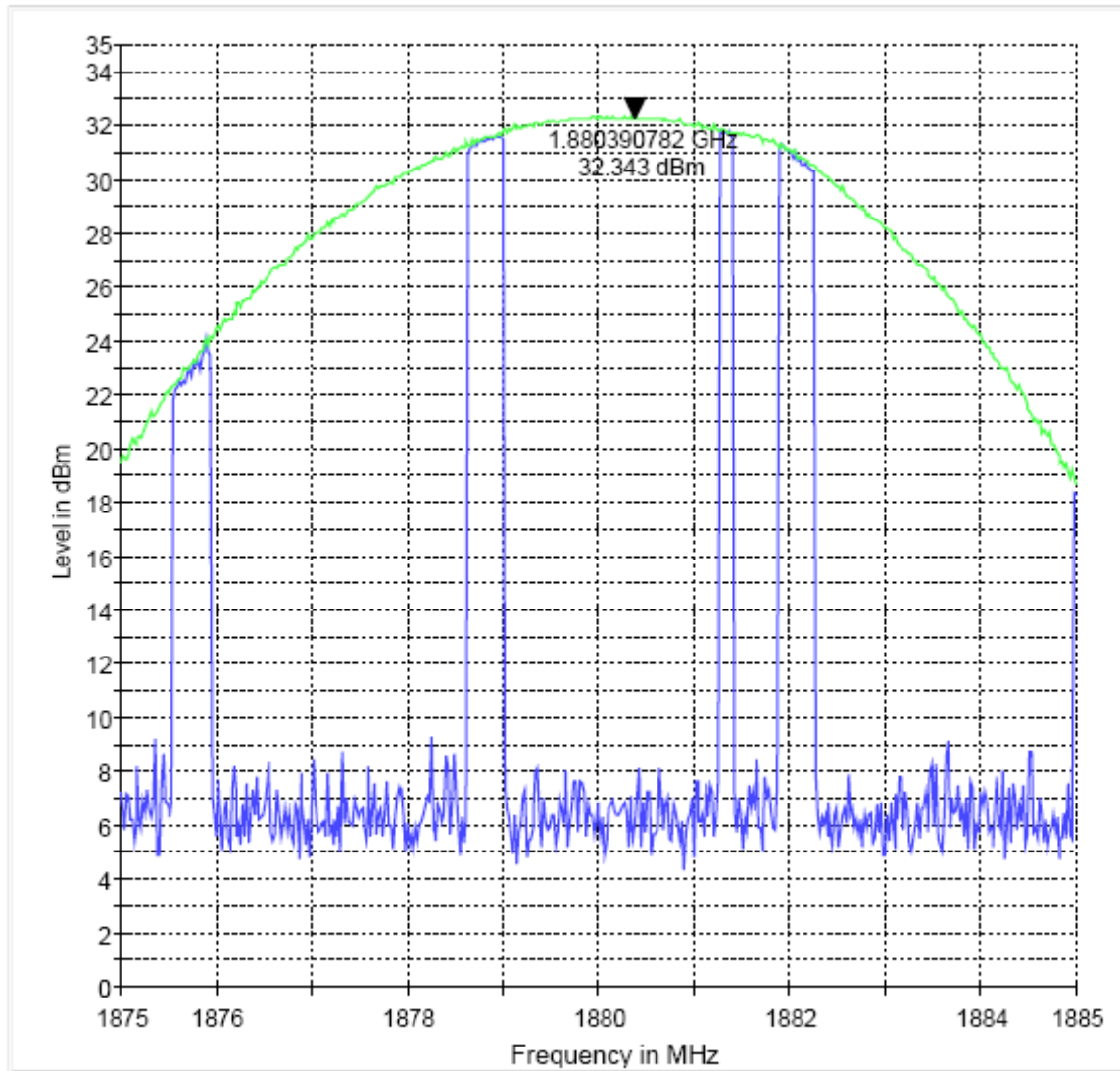


— MaxPeak-ClearWrite — MaxPeak-MaxHold

**ERP (GPRS 1900)
CHANNEL 661**

§24.232(b)

EIRP 1900 M

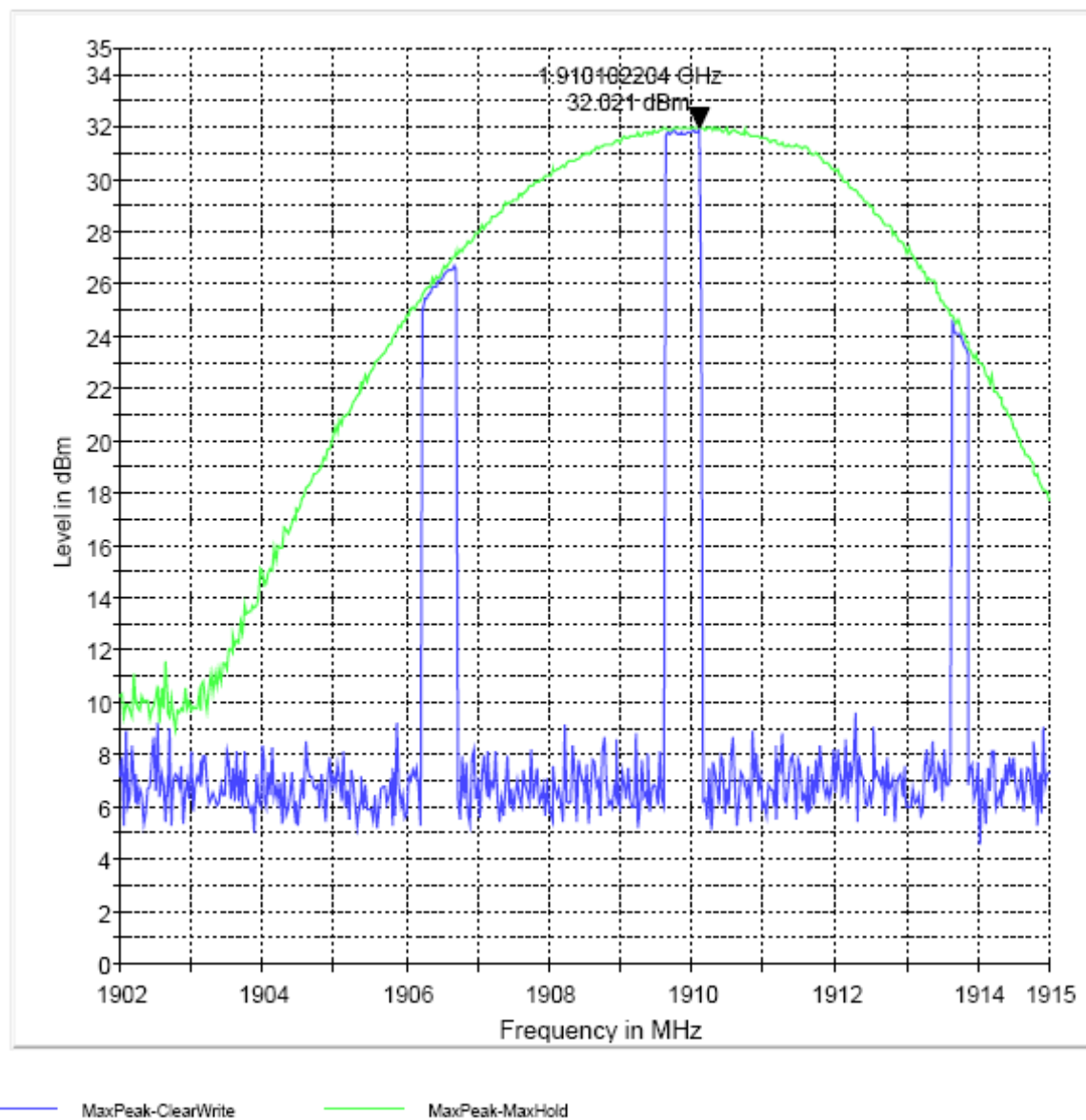


— MaxPeak-ClearWrite — MaxPeak-MaxHold

**ERP (GPRS 1900)
CHANNEL 810**

§24.232(b)

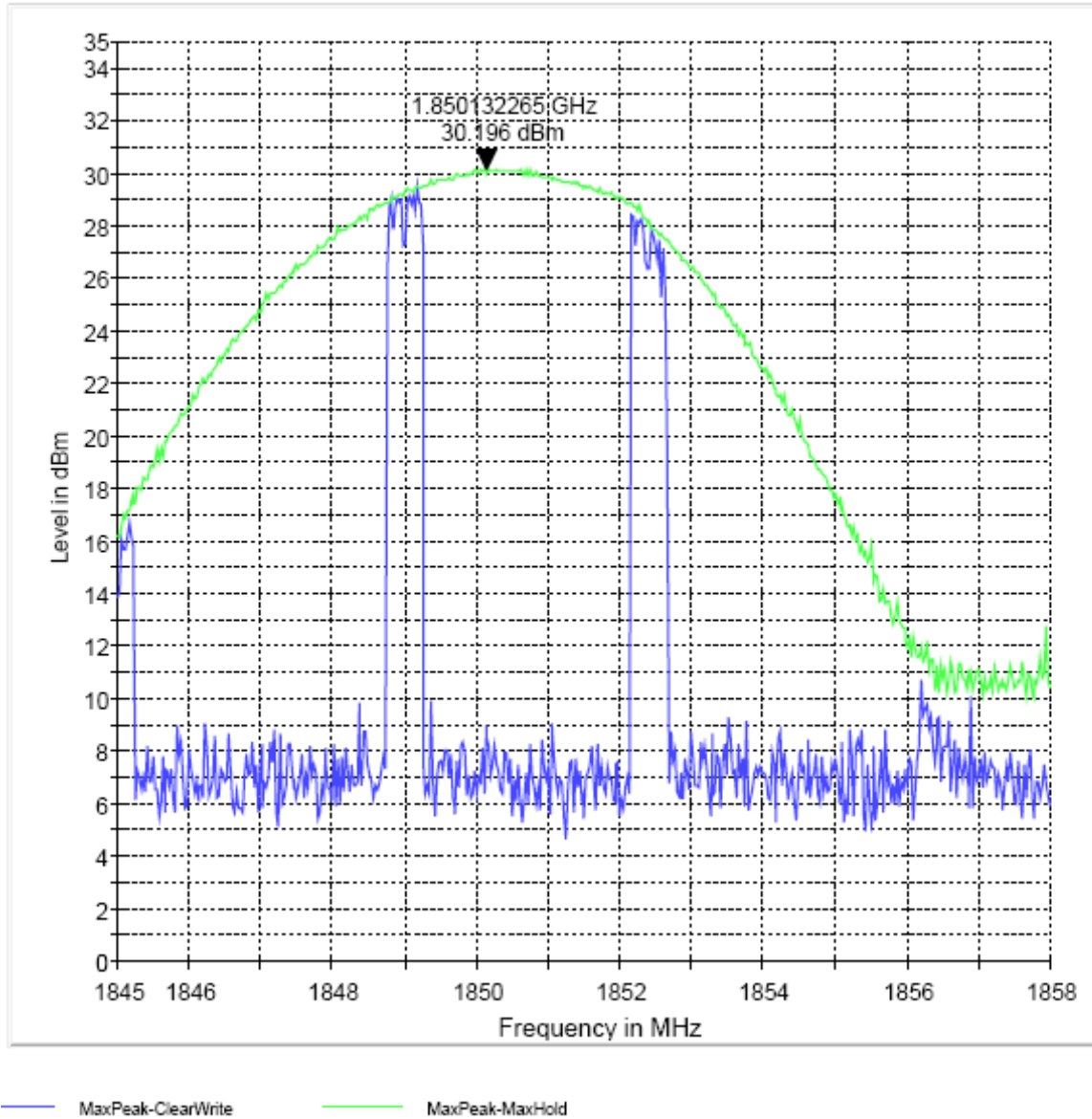
EIRP 1900 H



**ERP (EGPRS 1900)
CHANNEL 512**

§24.232(b)

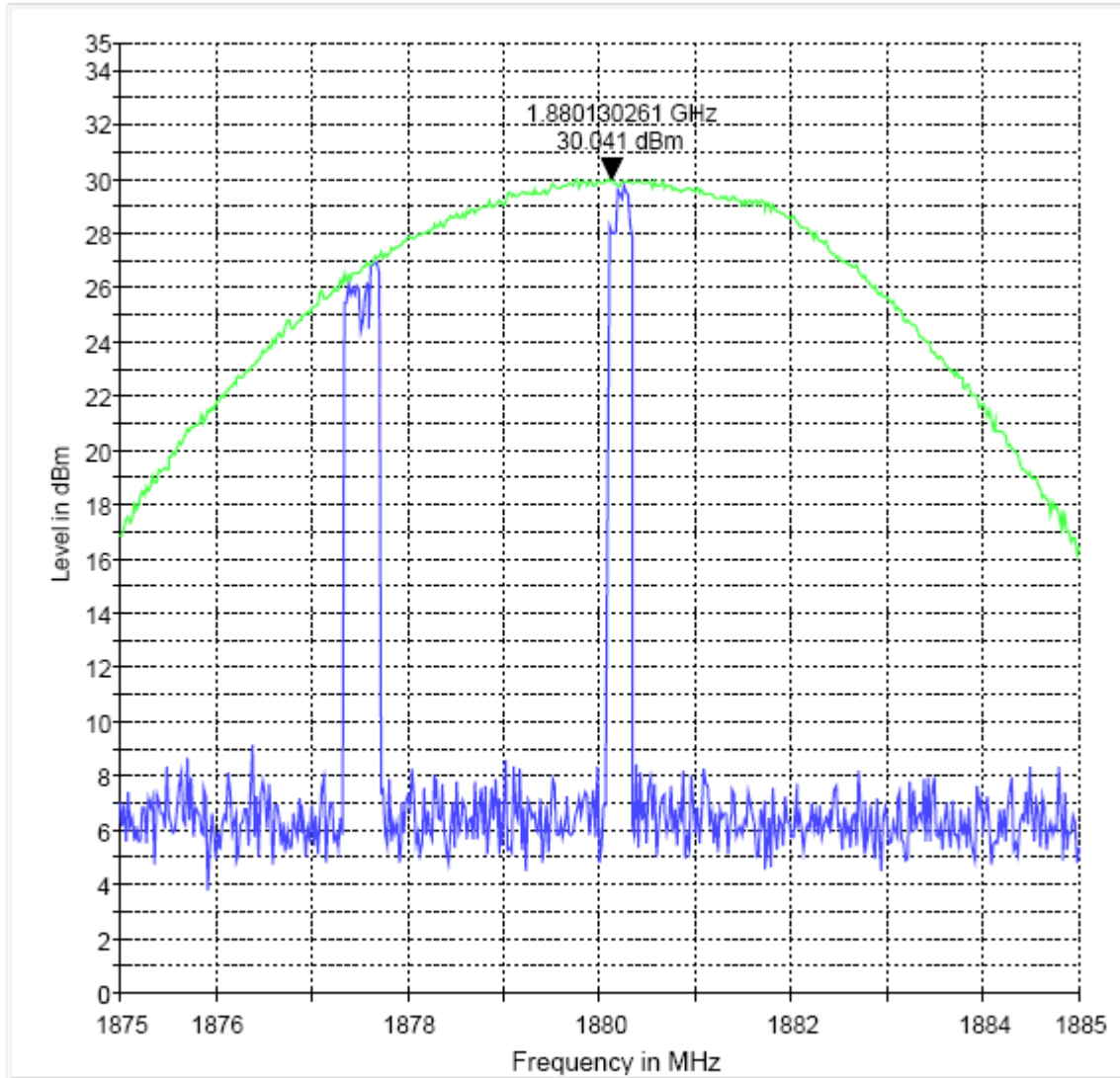
EIRP 1900 L



**ERP (EGPRS 1900)
CHANNEL 661**

§24.232(b)

EIRP 1900 M

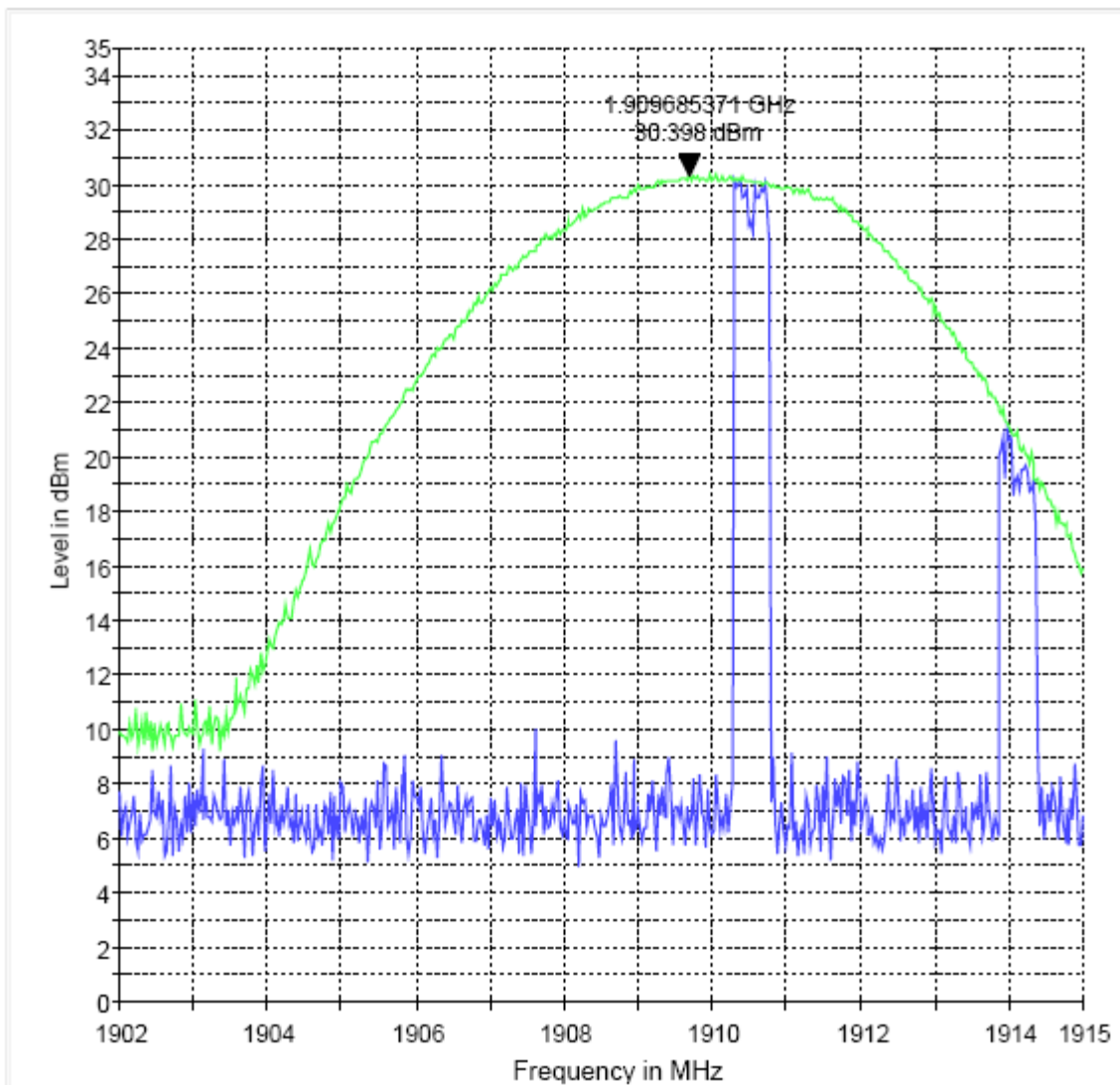


— MaxPeak-ClearWrite — MaxPeak-MaxHold

**ERP (EGPRS 1900)
CHANNEL 810**

§24.232(b)

EIRP 1900 H

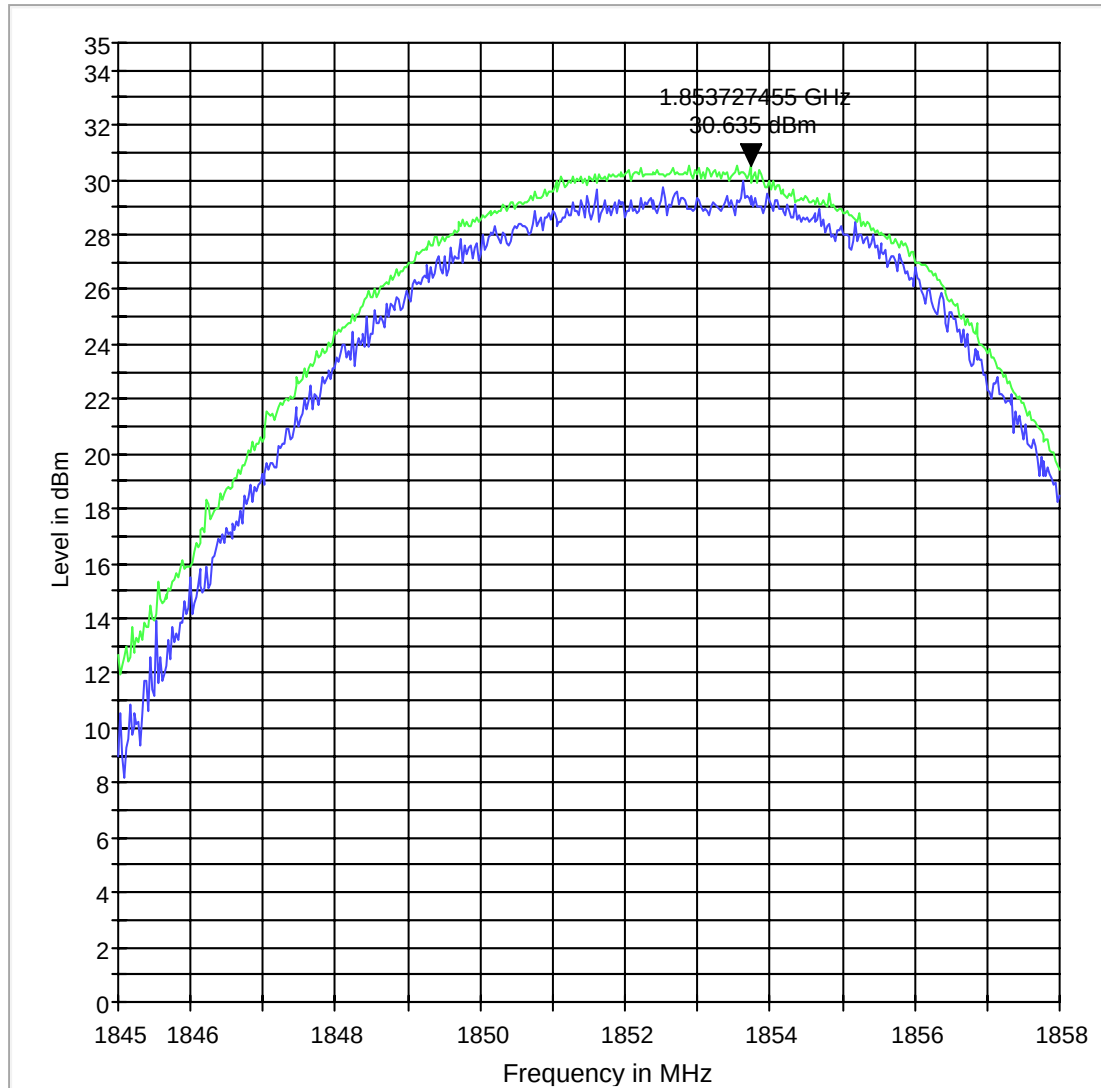


EIRP (UMTS FDD2)

§22.913(a)

CHANNEL 9262

EIRP 1900 L



— MaxPeak-ClearWrite

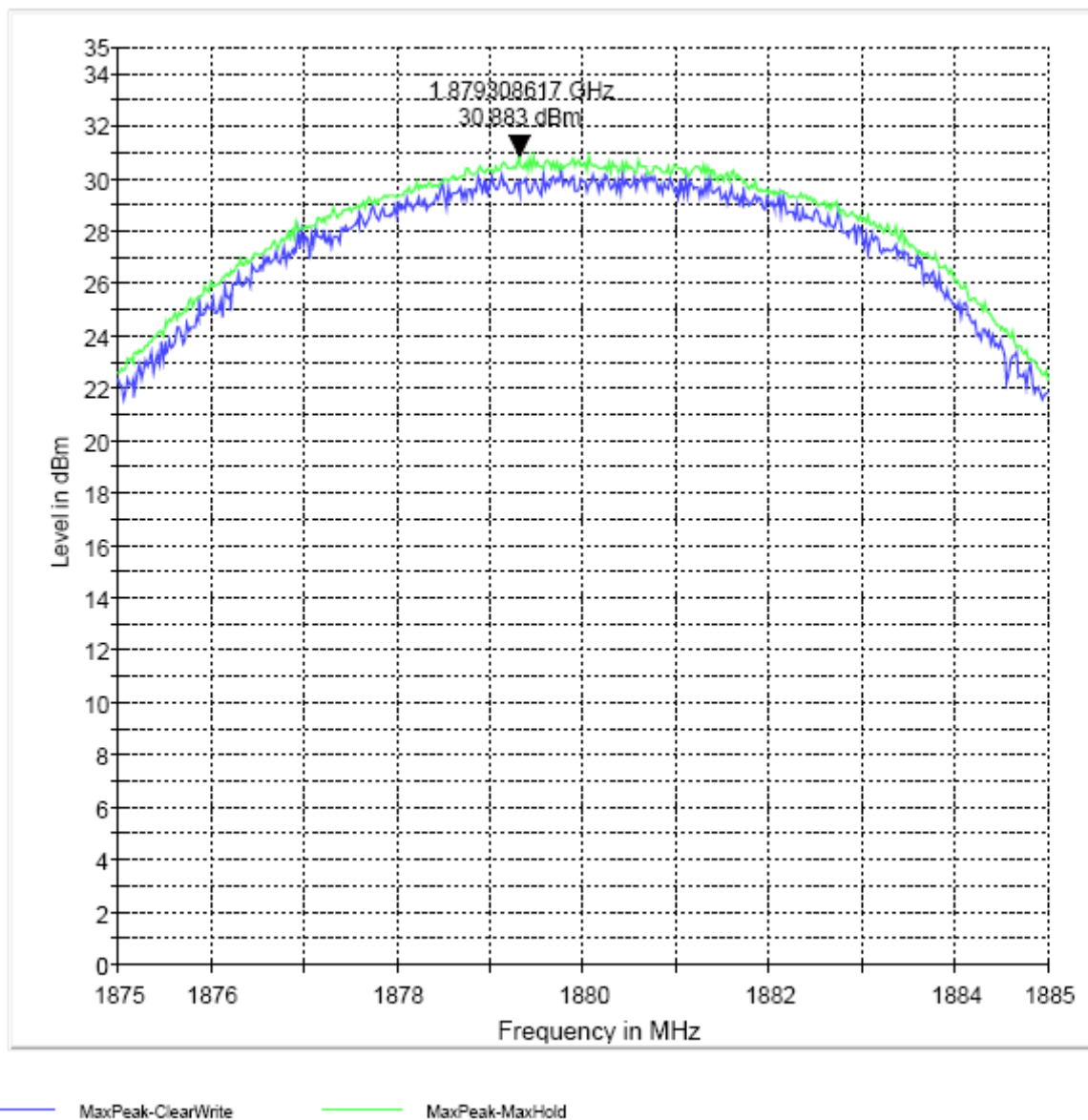
— MaxPeak-MaxHold

EIRP (UMTS FDD2)

§22.913(a)

CHANNEL 9400

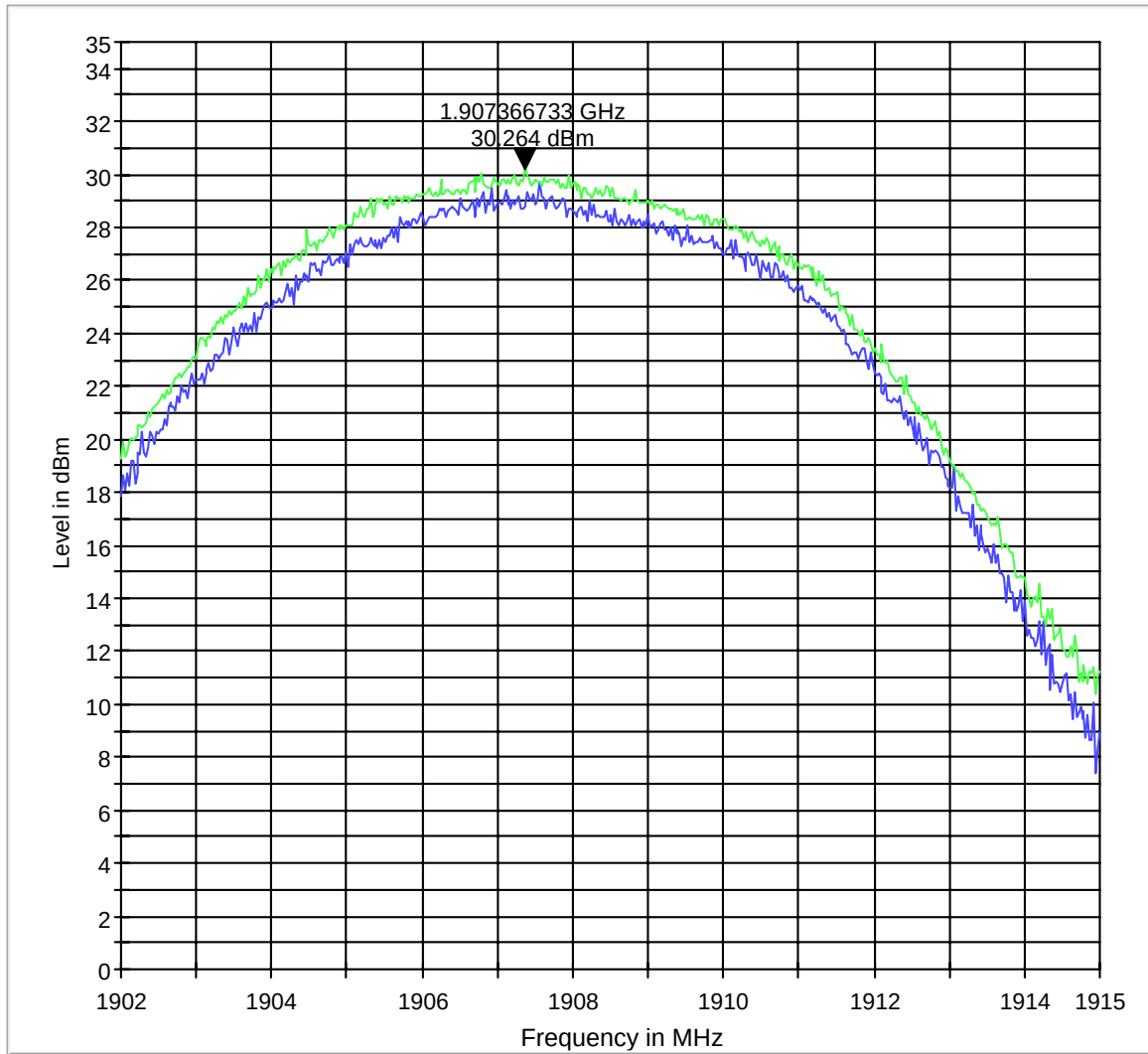
EIRP 1900 M



**EIRP (UMTS FDD2)
CHANNEL 9538**

§22.913(a)

EIRP 1900 H



— MaxPeak-ClearWrite — MaxPeak-MaxHold

6 Spurious Emissions Radiated

6.1.1 FCC 2.1053 Measurements required: Field strength of spurious radiation.

- (a) 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.

6.1.2 Limits:

6.1.2.1 FCC 22.917 Emission limitations for cellular equipment.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

- (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.

- (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.

6.1.2.2 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.

- (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.

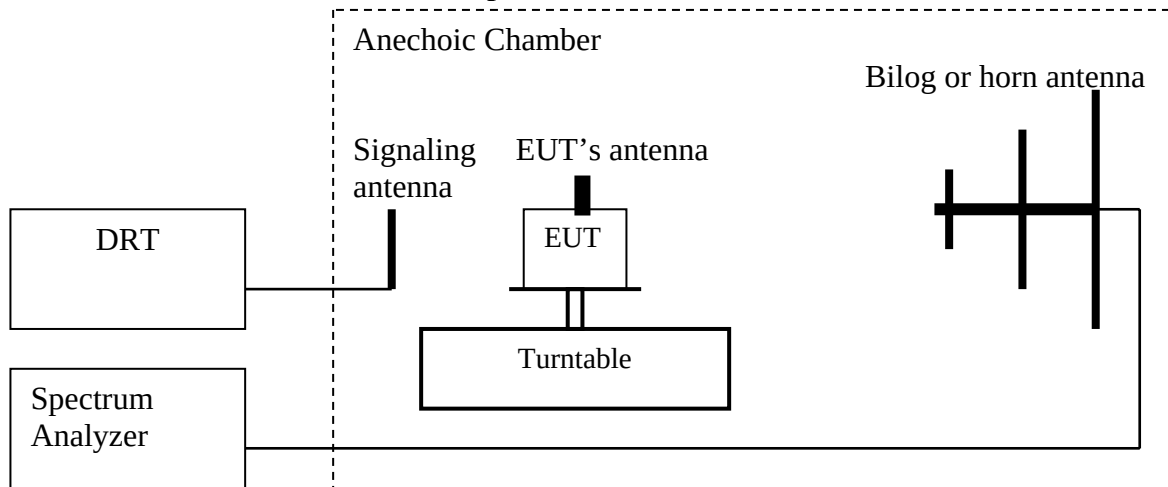
- (b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of 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.

6.1.3 Radiated out of band measurement procedure:

Based on 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 Radiocommunication 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.

(**note:** 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.)

Spectrum analyzer settings:

Res B/W: 1 MHz

Vid B/W: 1 MHz

Measurement Survey:

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the GSM-850 & PCS-1900 bands. 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 & PCS-1900 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.

6.1.4 Radiated out of band emissions results on EUT:**6.1.4.1 RESULTS OF RADIATED TESTS GSM 850 MHz BAND:**

Harmonics	Tx ch-1013 Freq. (MHz)	Level (dBm)	Tx ch-600 Freq. (MHz)	Level (dBm)	Tx ch-777 Freq. (MHz)	Level (dBm)
2	1648.4	NF	1673.2	NF	1697.6	NF
3	2472.6	NF	2509.8	NF	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						

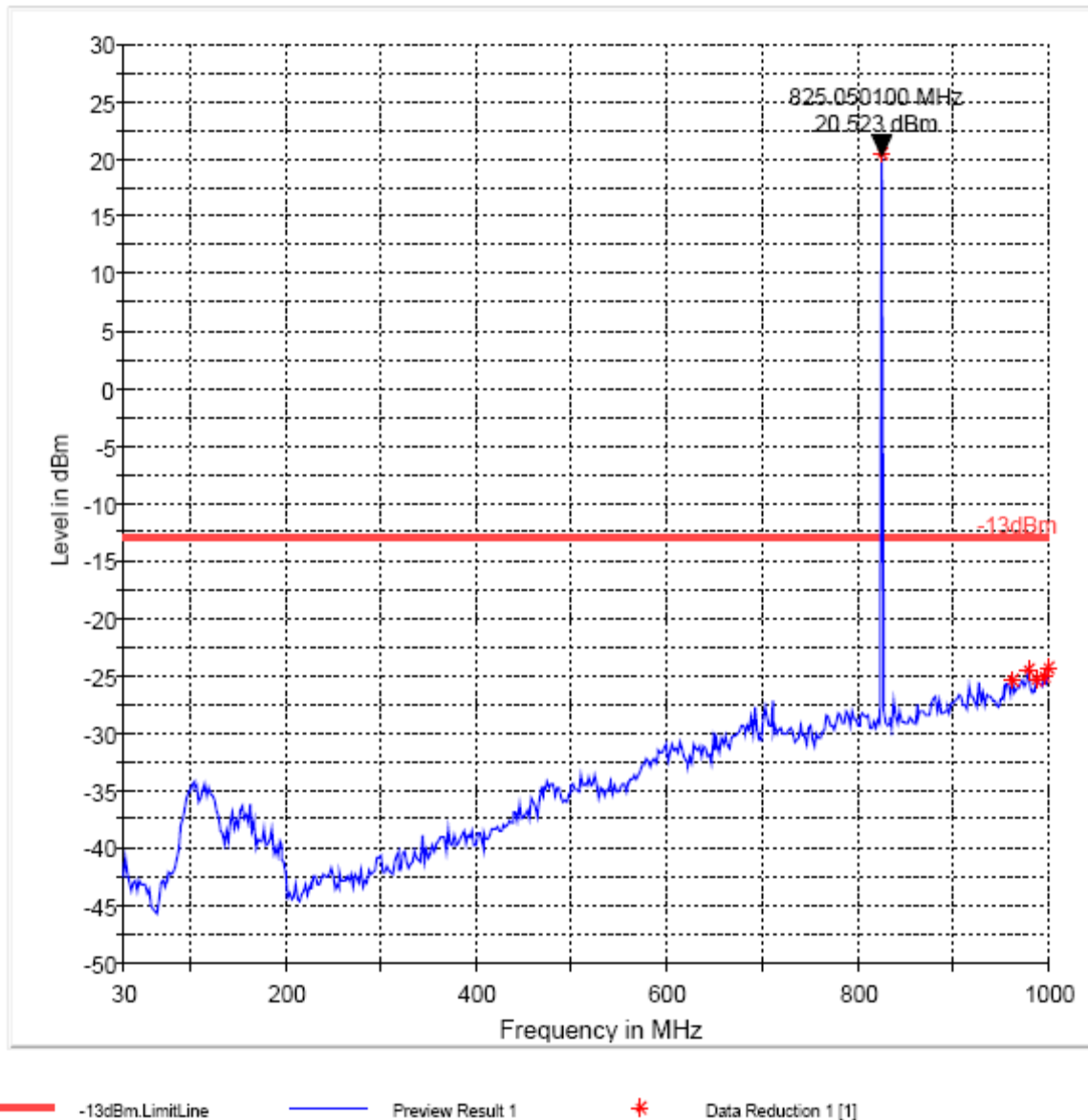
6.1.4.2 RADIATED SPURIOUS EMISSIONS (850MHz band GSM)**TX: 30MHz - 1GHz**

Spurious emission limit -13dBm

Note: The peak above the limit line is the carrier freq.

FCC 22 30-1000MHz Low Channel

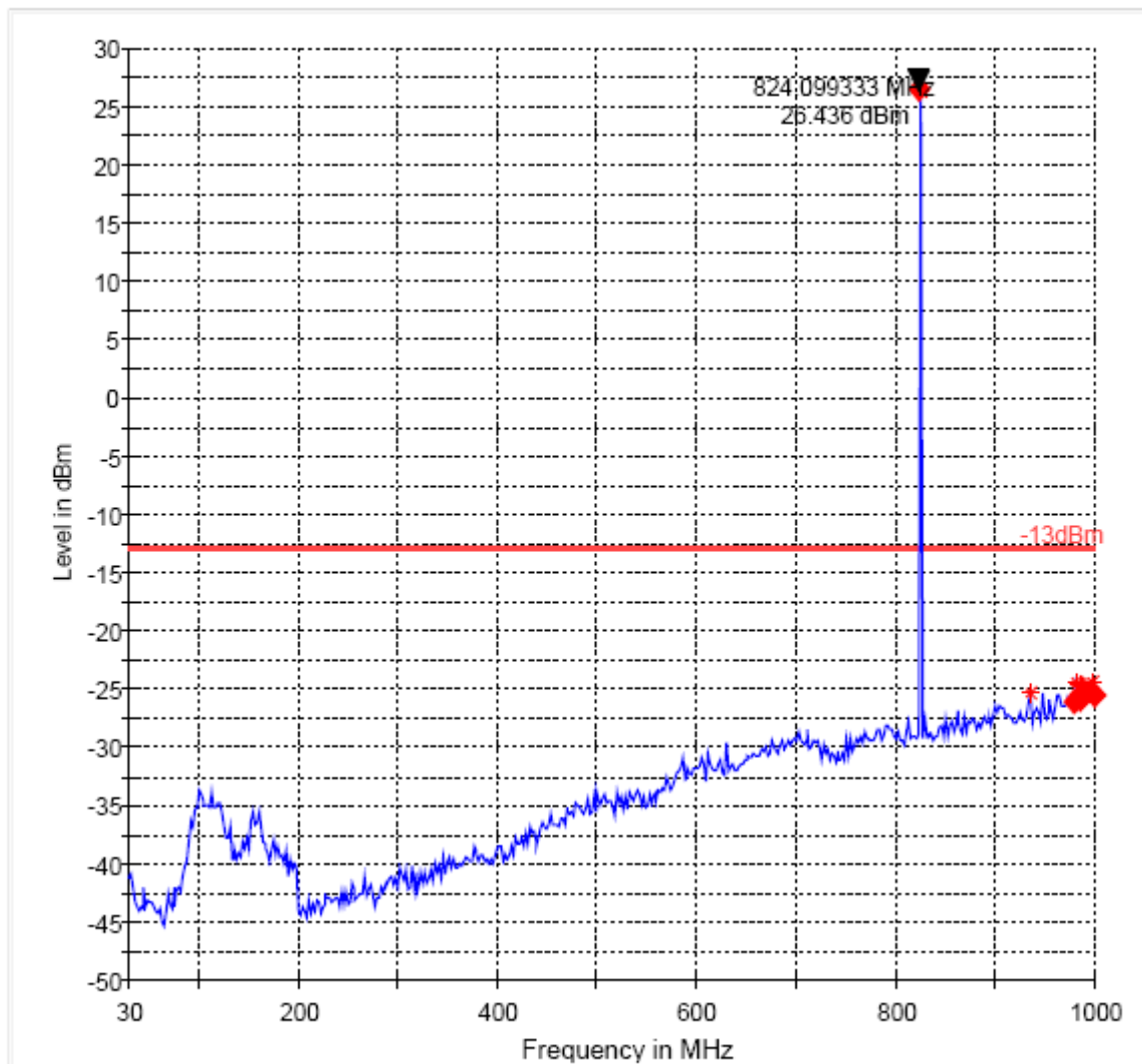
FCC 22 30-1000MHz



FCC 22 30-1000MHz Mid Channel

Note: The peak above the limit line is the carrier freq.

FCC 22 30-1000MHz



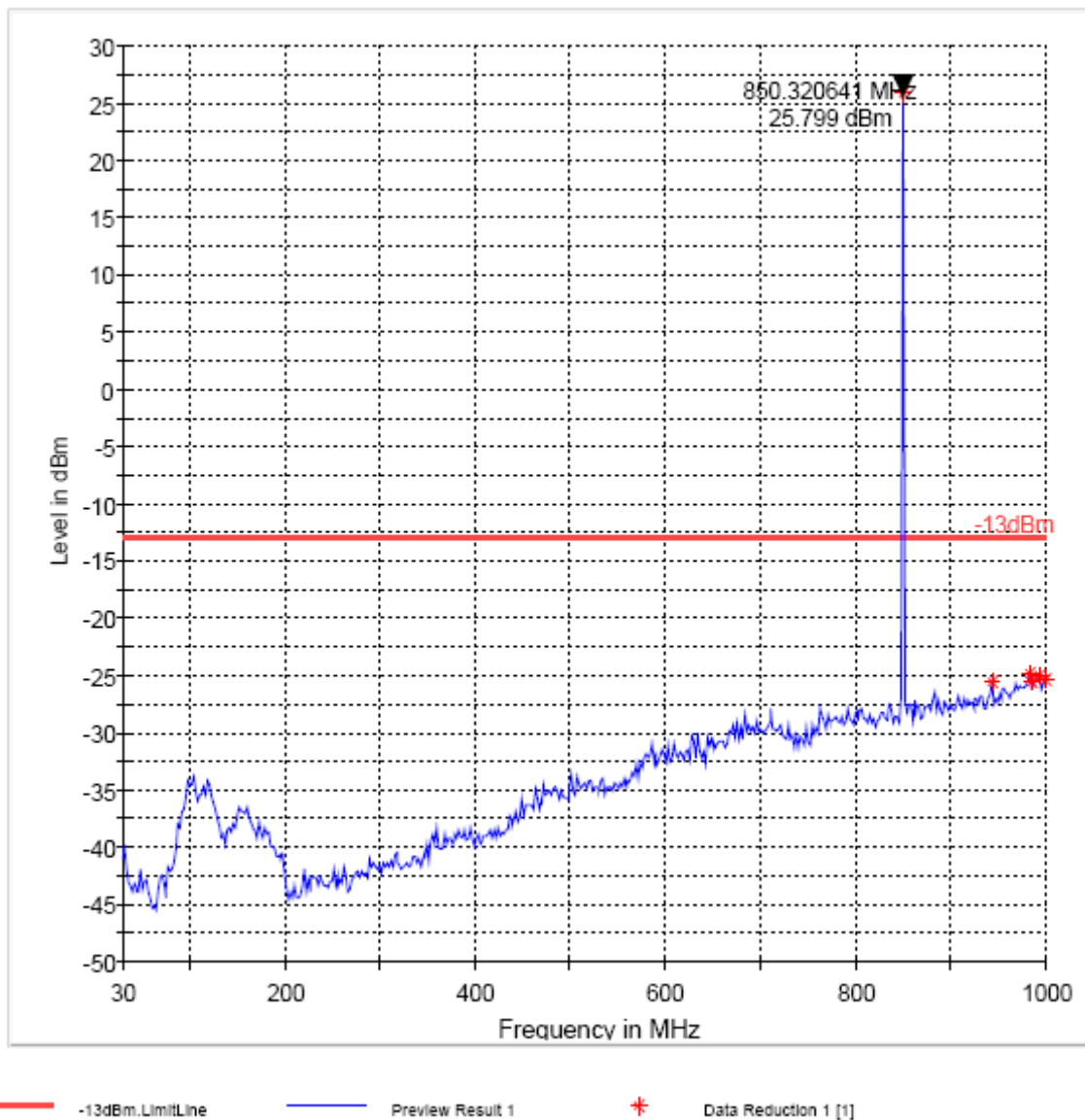
— -13dBm.LimitLine
* Data Reduction 1 [1]

— Preview Result 1
◆ Final Measurement Result 1

FCC 22 30-1000MHz High Channel

Note: The peak above the limit line is the carrier freq.

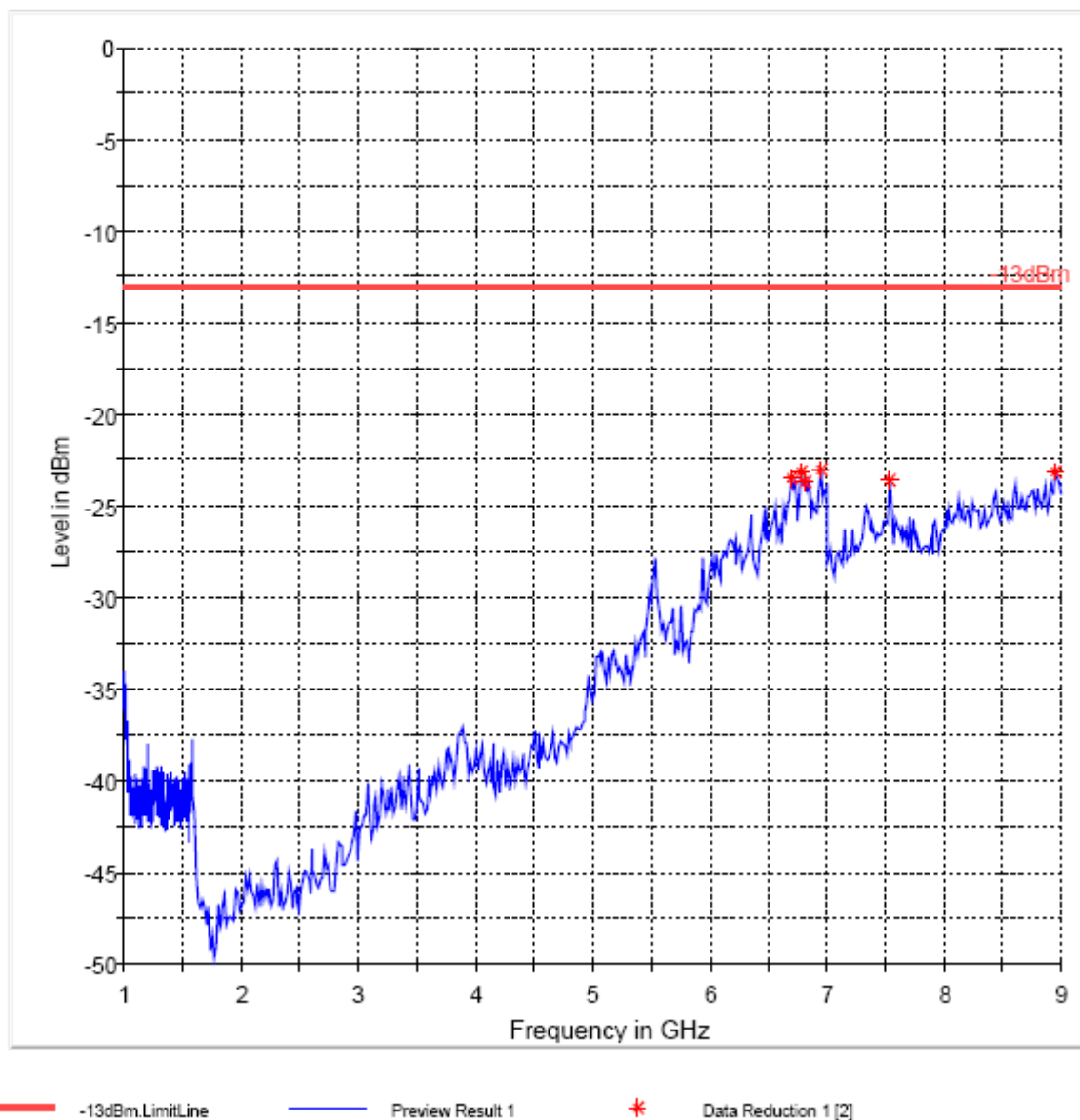
FCC 22 30-1000MHz



RADIATED SPURIOUS EMISSIONS (850 MHz band GSM)**Ch 128****1GHz – 9GHz**

Spurious emission limit –13dBm

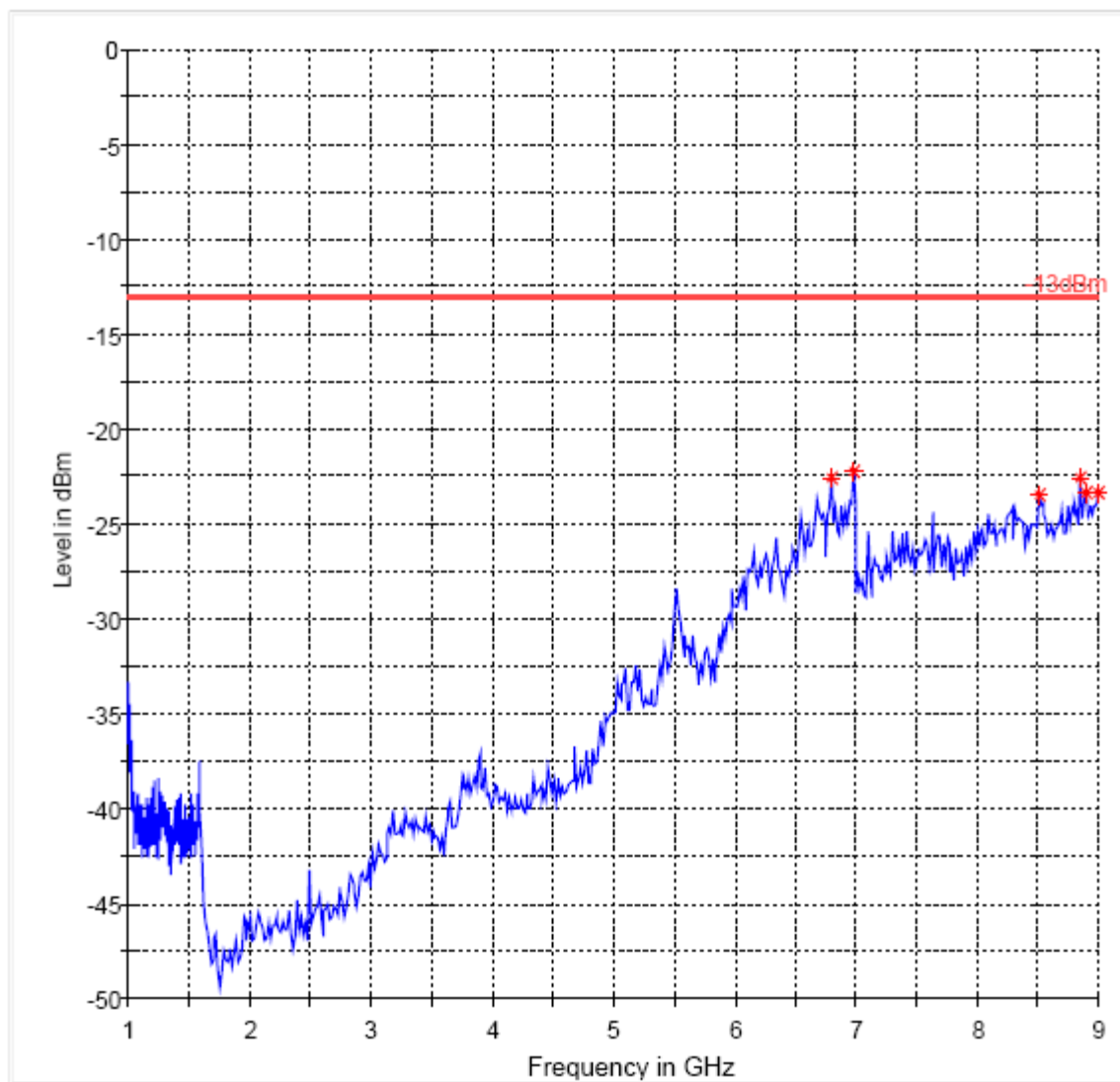
FCC 22 1-9GHz



RADIATED SPURIOUS EMISSIONS (850 MHz band GSM)**Ch 190****1GHz – 9GHz**

Spurious emission limit –13dBm

FCC 22 1-9GHz



— -13dBm.LimitLine — Preview Result 1 * Data Reduction 1 [2]

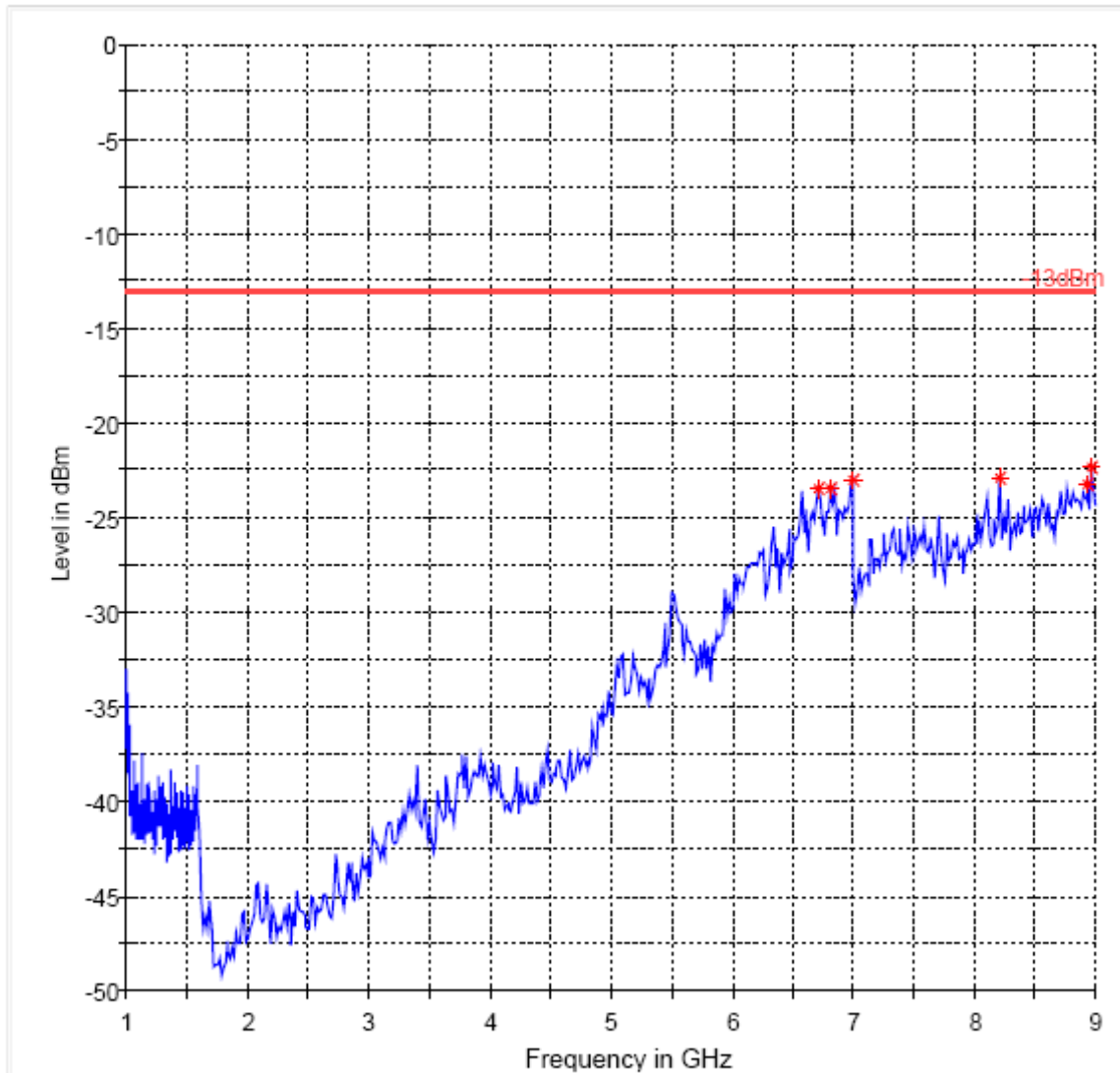
RADIATED SPURIOUS EMISSIONS (850 MHz band GSM)

Ch 251

1GHz – 9GHz

Spurious emission limit –13dBm

FCC 22 1-9GHz



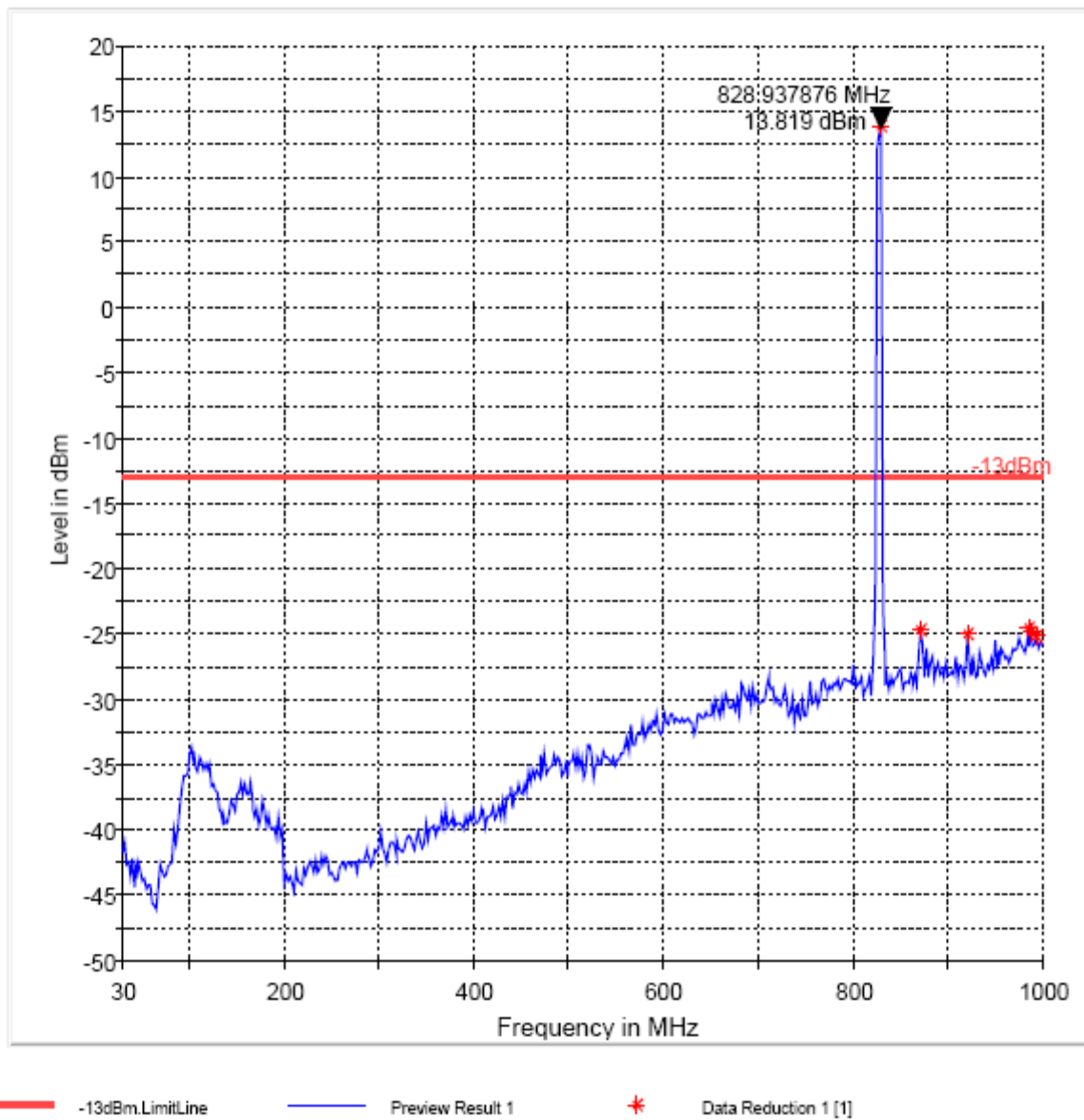
— -13dBm.LimitLine — Preview Result 1 * Data Reduction 1 [2]

6.1.4.3 RESULTS OF RADIATED TESTS UMTS FDD5

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	-	836.6	-	846.6	-
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						

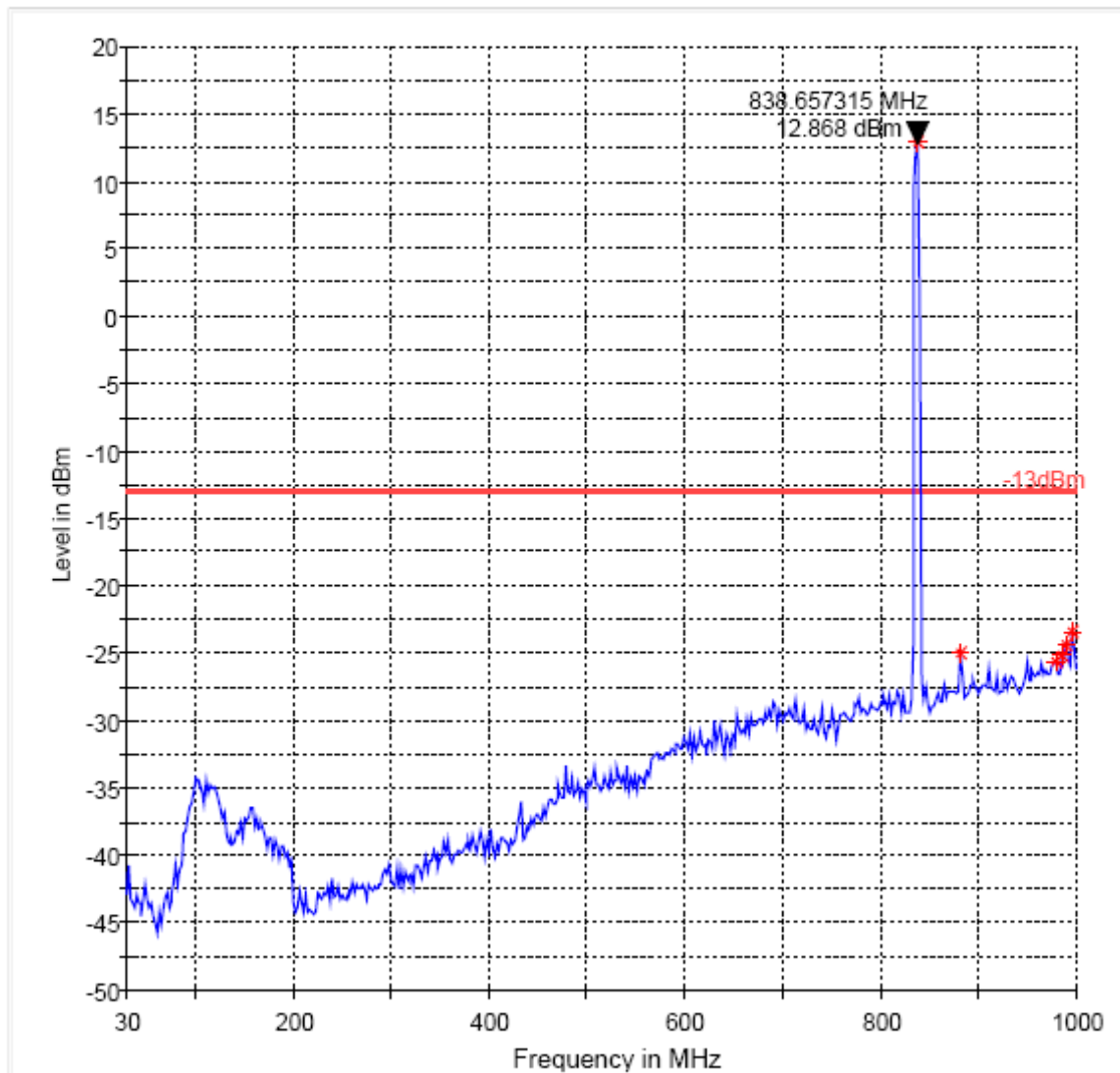
6.1.4.4 Radiated Spurious Emissions (UMTS FDD5)**Tx: 30MHz – 1GHz****Low Channel*****Peak over the limit is the carrier frequency****FDD5 Low ch 4132**

FCC 22 30-1000MHz



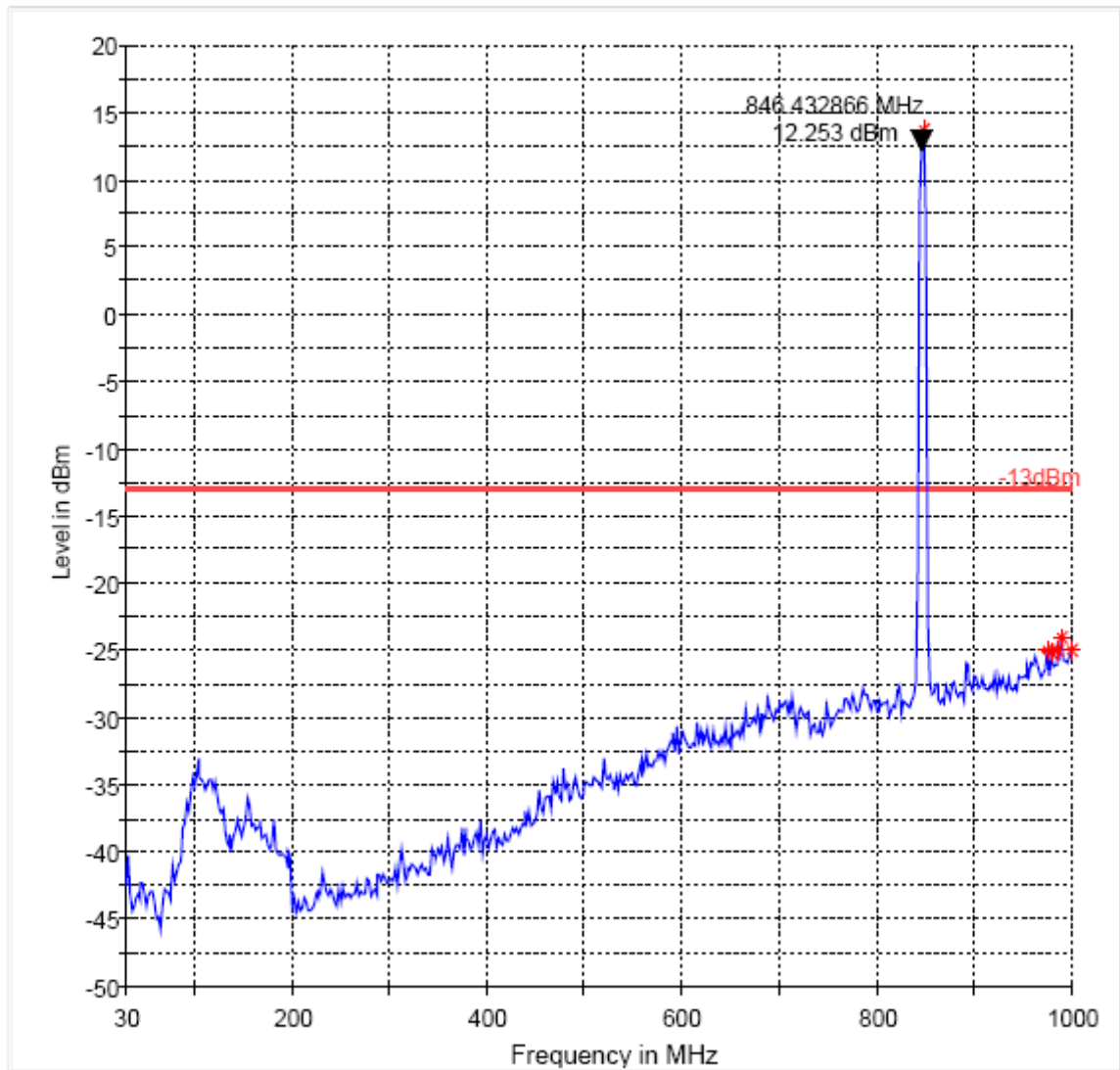
Radiated Spurious Emissions (UMTS FDD5) Tx: 30MHz – 1GHz**Mid Channel*****Peak over the limit is the carrier frequency****FDD5 Mid ch 4183**

FCC 22 30-1000MHz



Radiated Spurious Emissions (UMTS FDD5) Tx: 30MHz – 1GHz**High Channel*****Peak over the limit is the carrier frequency**

FCC 22 30-1000MHz



-13dBm.LimitLine

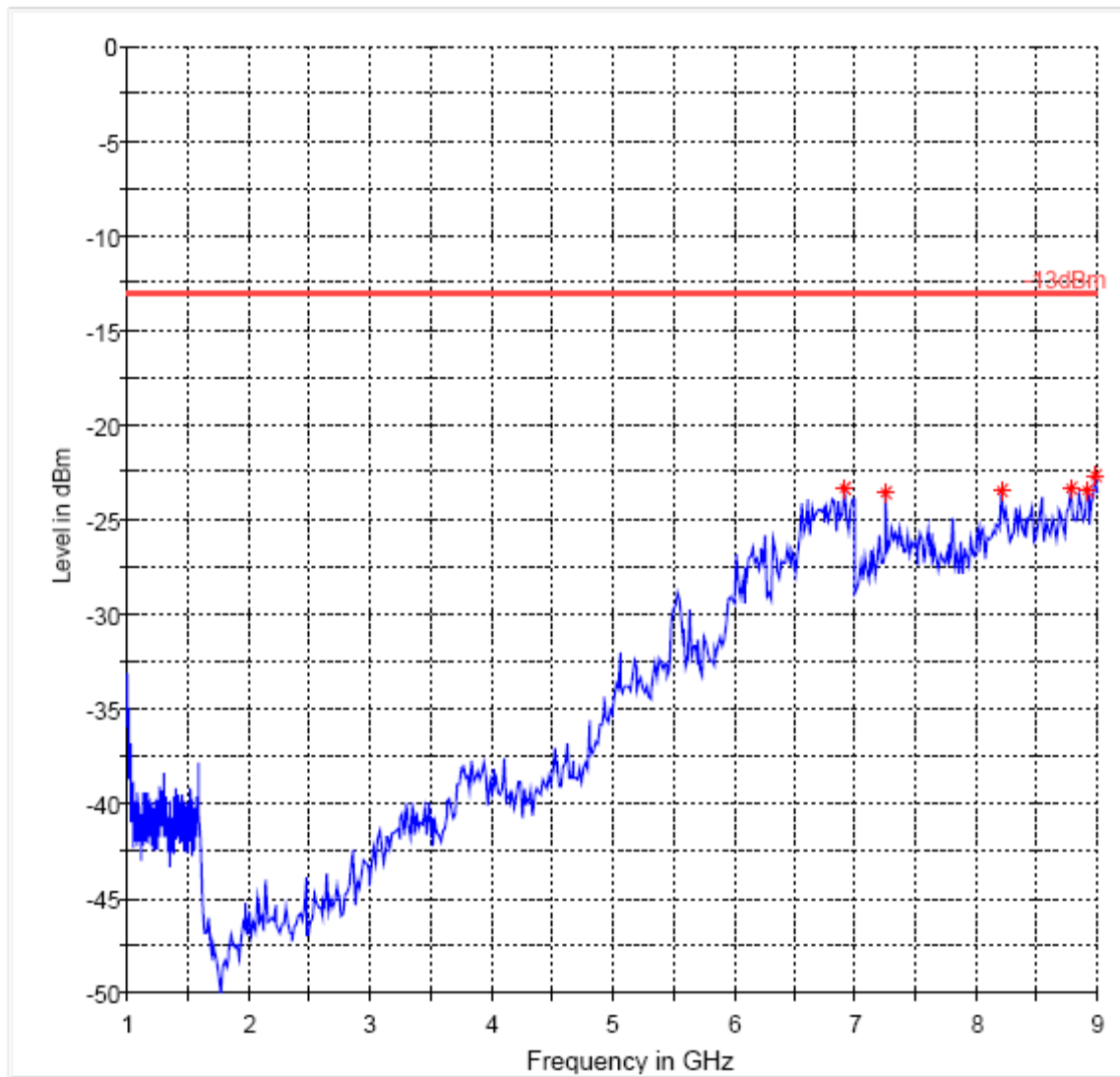
Preview Result 1

*

Data Reduction 1 [1]

Radiated Spurious Emissions (UMTS FDD5) Tx: 1GHz – 9GHz
Low Channel

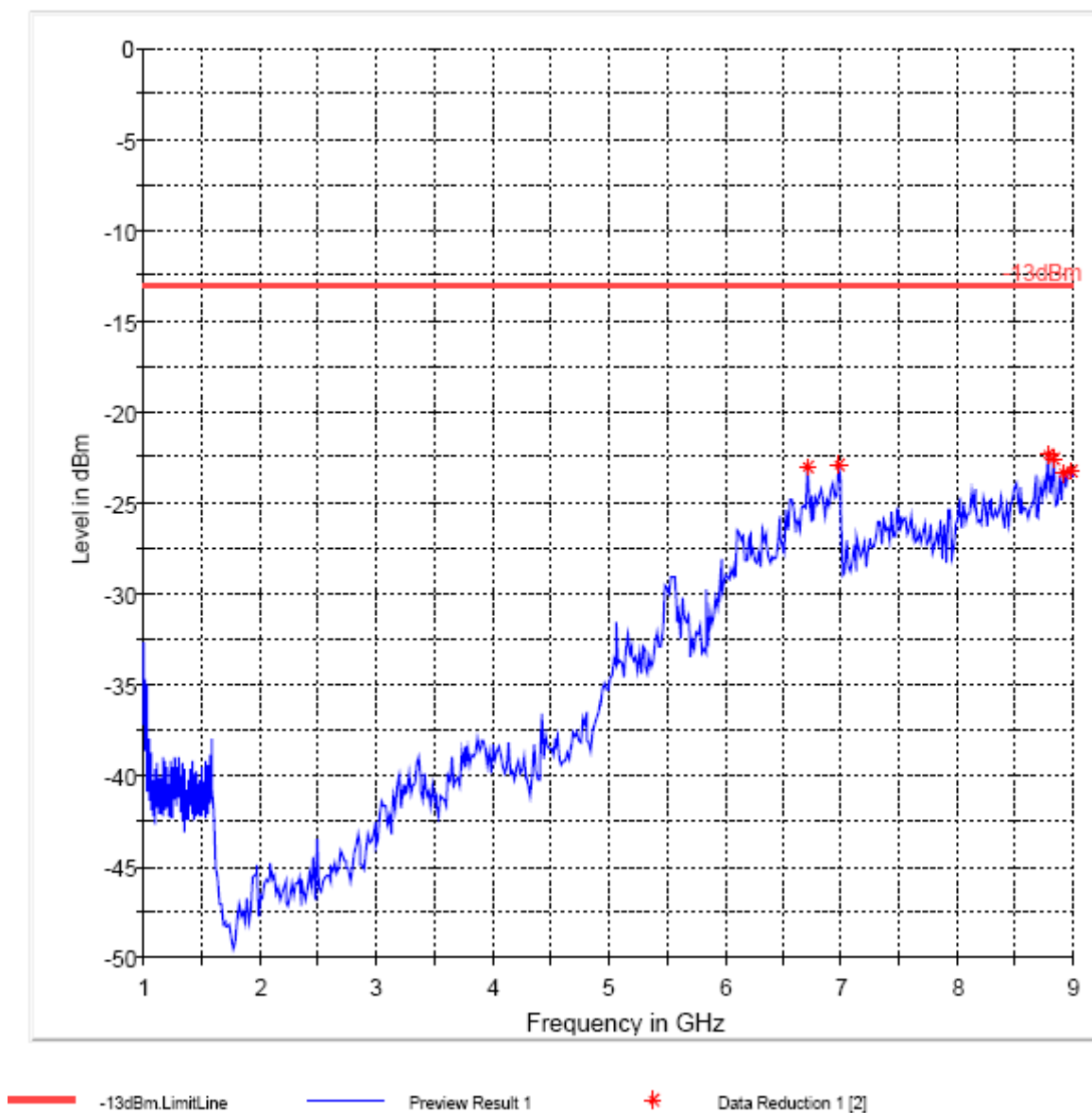
FCC 22 1-9GHz



— -13dBm.LimitLine — Preview Result 1 * Data Reduction 1 [2]

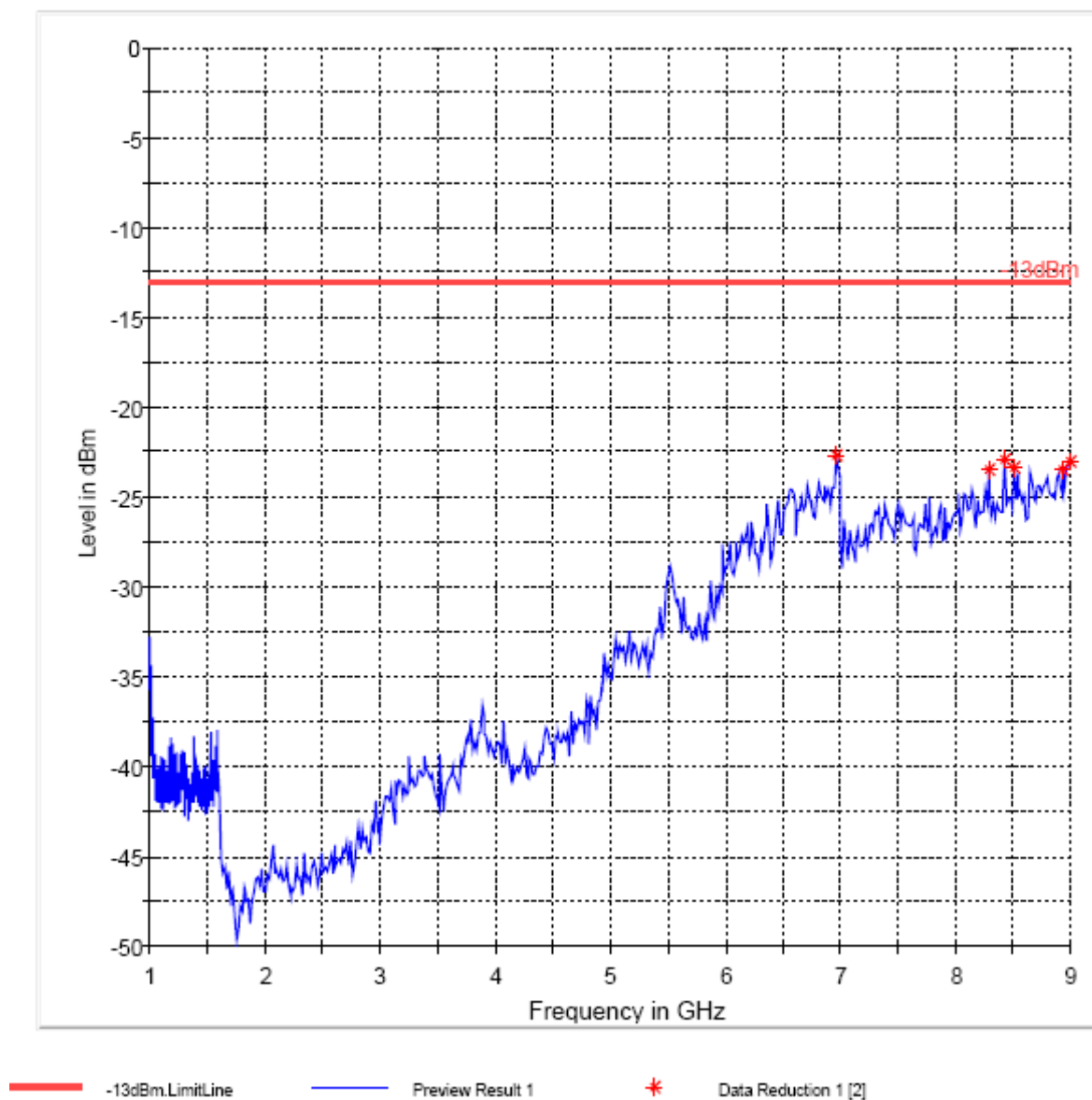
Radiated Spurious Emissions (UMTS FDD5) Tx: 1GHz – 9GHz
Mid Channel

FCC 22 1-9GHz



Radiated Spurious Emissions (UMTS FDD5) Tx: 1GHz – 9GHz
High Channel

FCC 22 1-9GHz

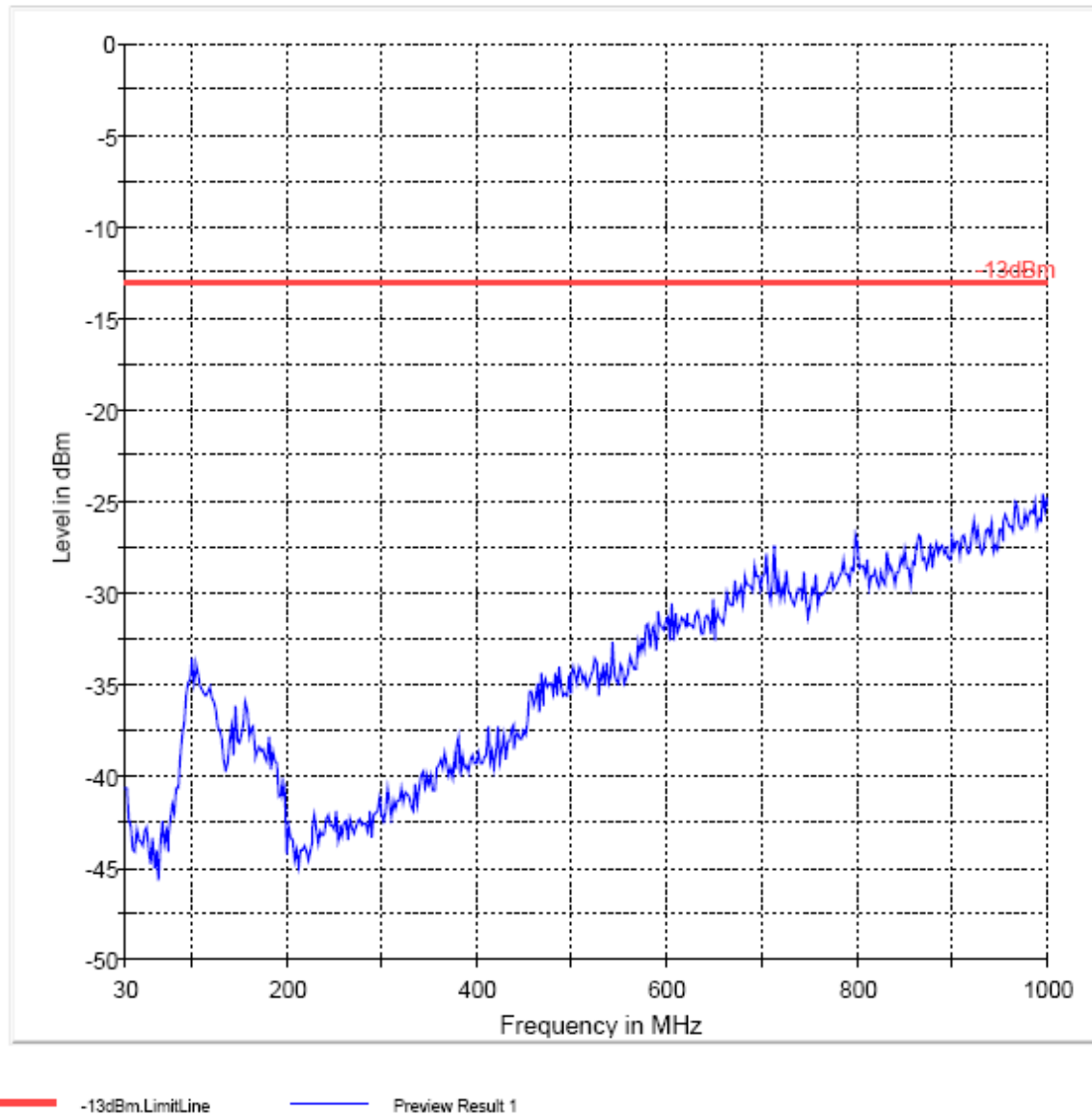


6.1.4.5 RESULTS OF RADIATED TESTS PCS-1900:

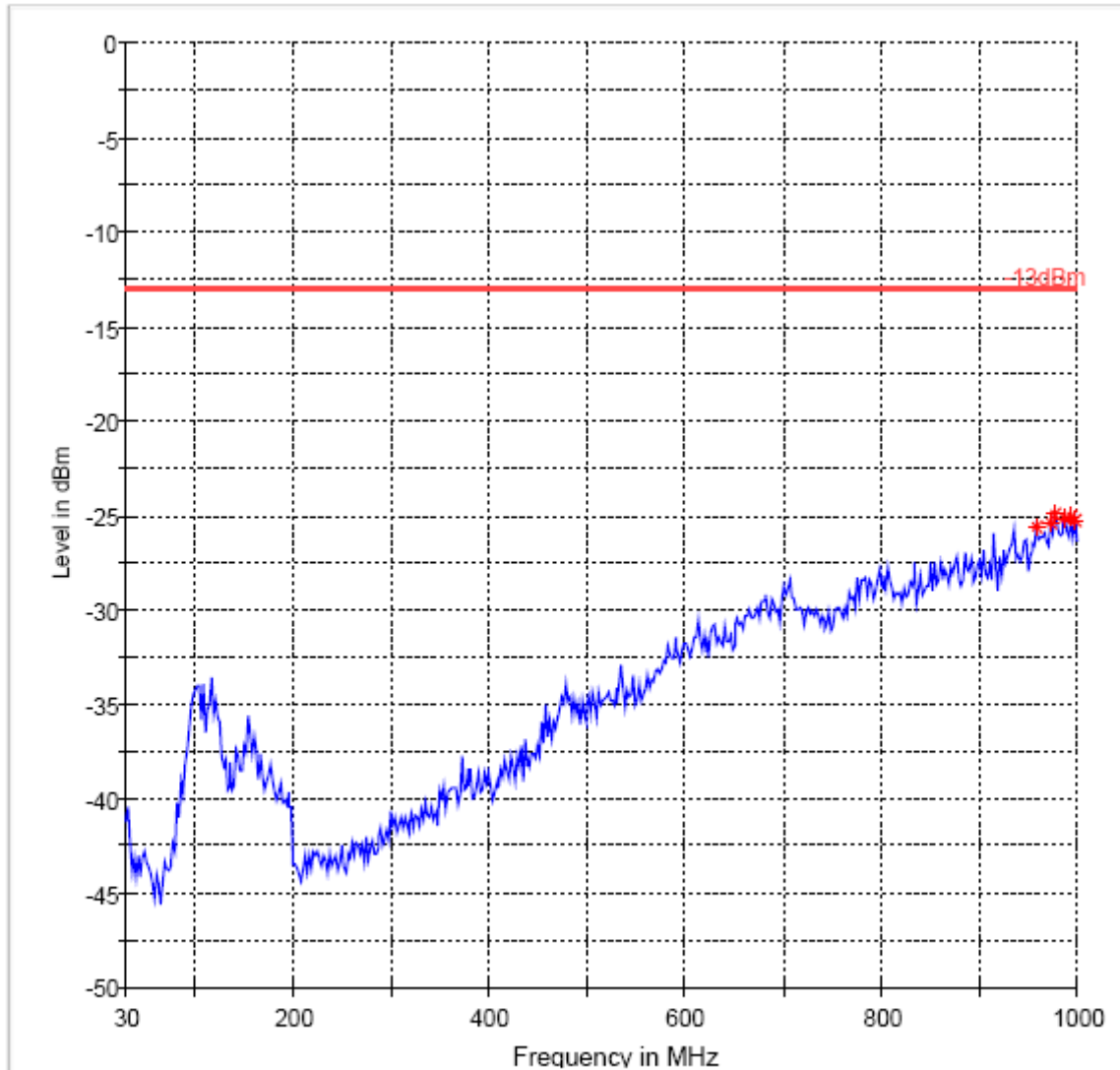
Harmonic	Tx ch-25 Freq.(MHz)	Level (dBm)	Tx ch-600 Freq. (MHz)	Level (dBm)	Tx ch-1175 Freq. (MHz)	Level (dBm)
2	3700.4	NF	3760	NF	3819.6	NF
3	5550.6	NF	5640	NF	5729.4	NF
4	7400.8	NF	7520	NF	7639.2	NF
5	9251	NF	9400	NF	9549	NF
6	11101.2	NF	11280	NF	11458.8	NF
7	12951.4	NF	13160	NF	13368.6	NF
8	14801.6	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						

6.1.4.6 RADIATED SPURIOUS EMISSIONS (PCS 1900) GSM**TX: 30MHz - 1GHz**

Spurious emission limit -13dBm

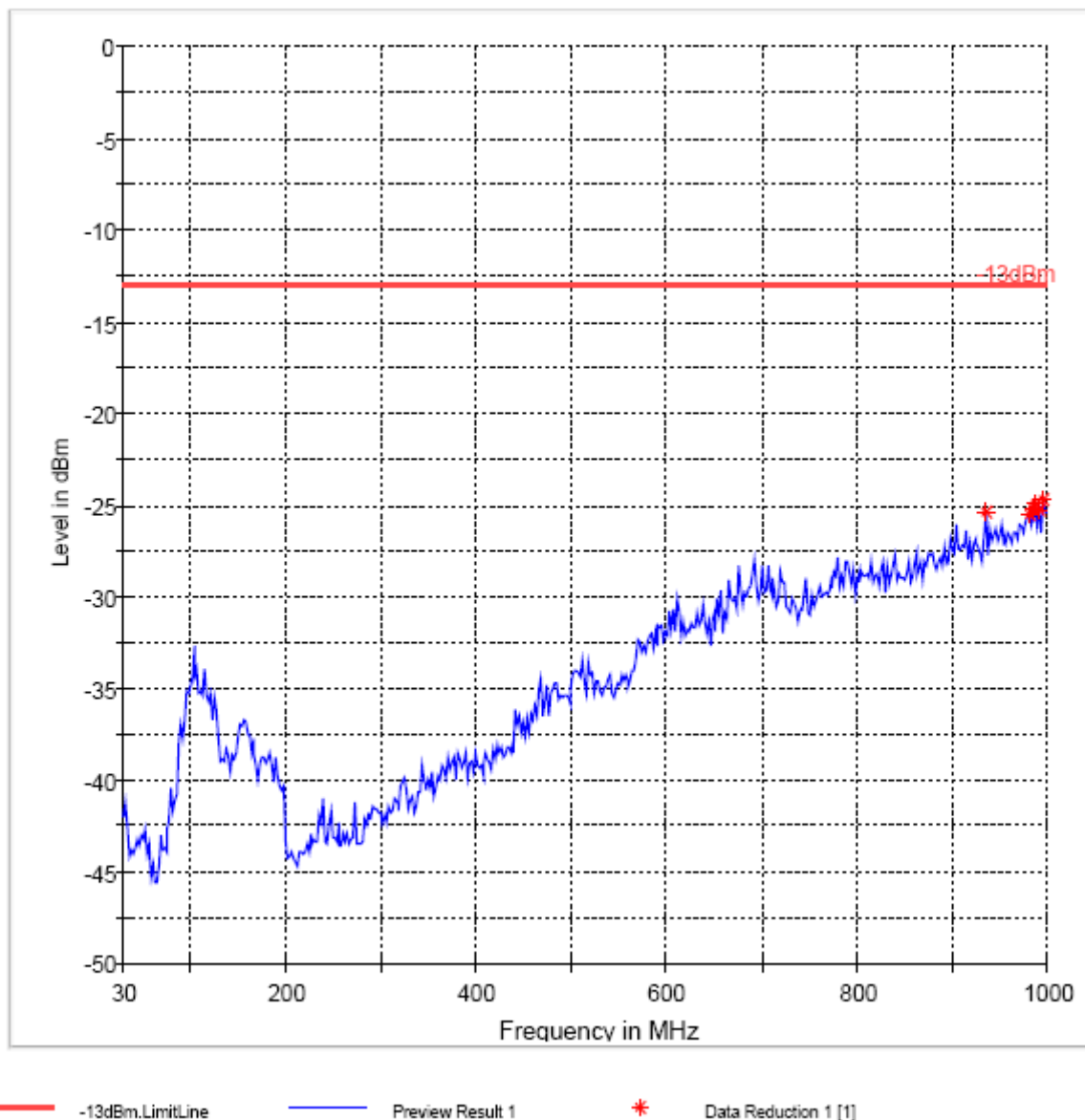
FCC 24 30-1000MHz Low Channel

FCC 24 30-1000MHz Mid Channel



— -13dBm.LimitLine — Preview Result 1 * Data Reduction 1 [1]

FCC 24 30-1000MHz High Channel

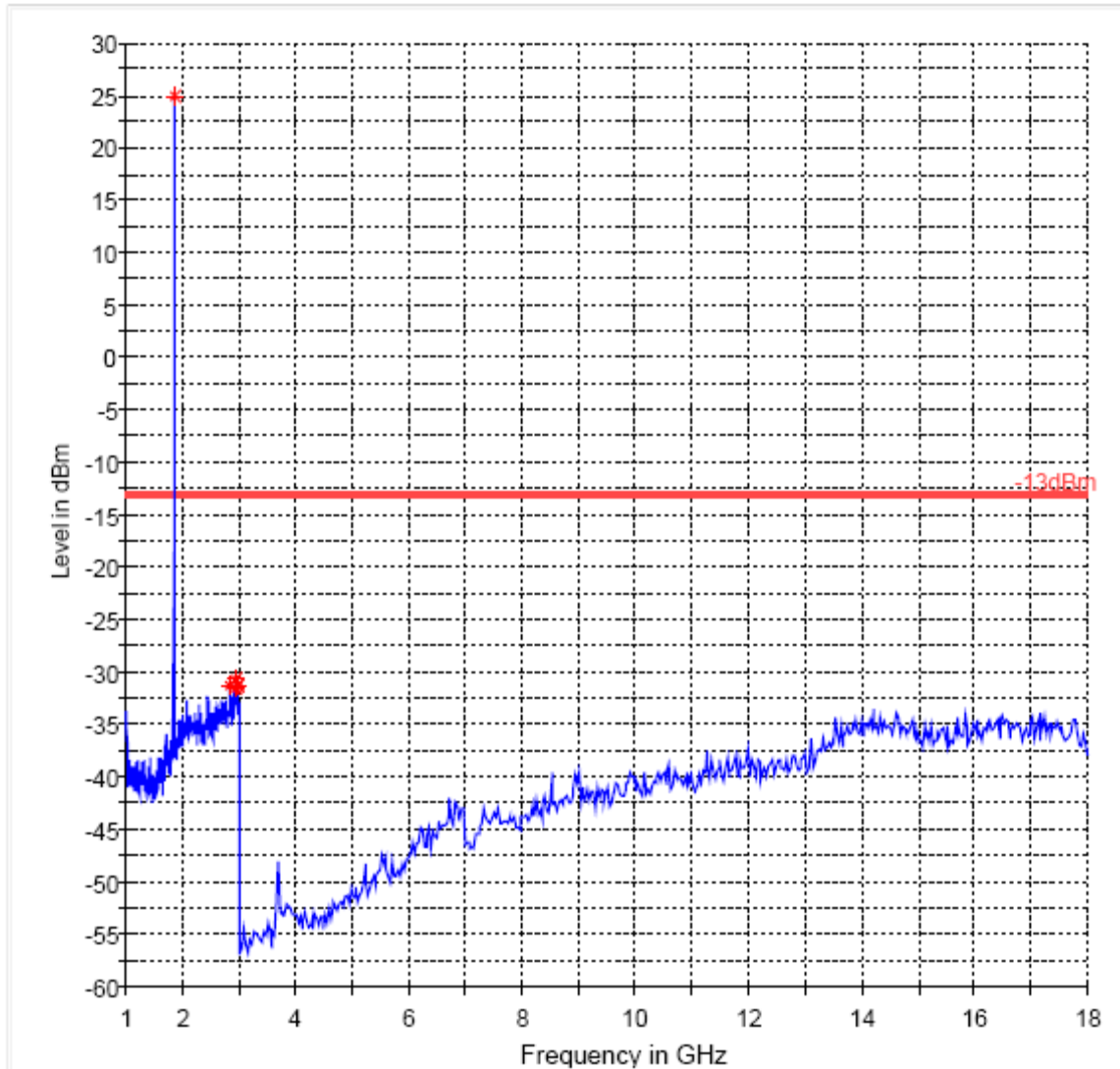


RADIATED SPURIOUS EMISSIONS (PCS 1900)**Ch 512****1GHz – 18GHz**

Spurious emission limit -13dBm

Note: The peak above the limit line is the carrier freq.

FCC 24 1-18GHz



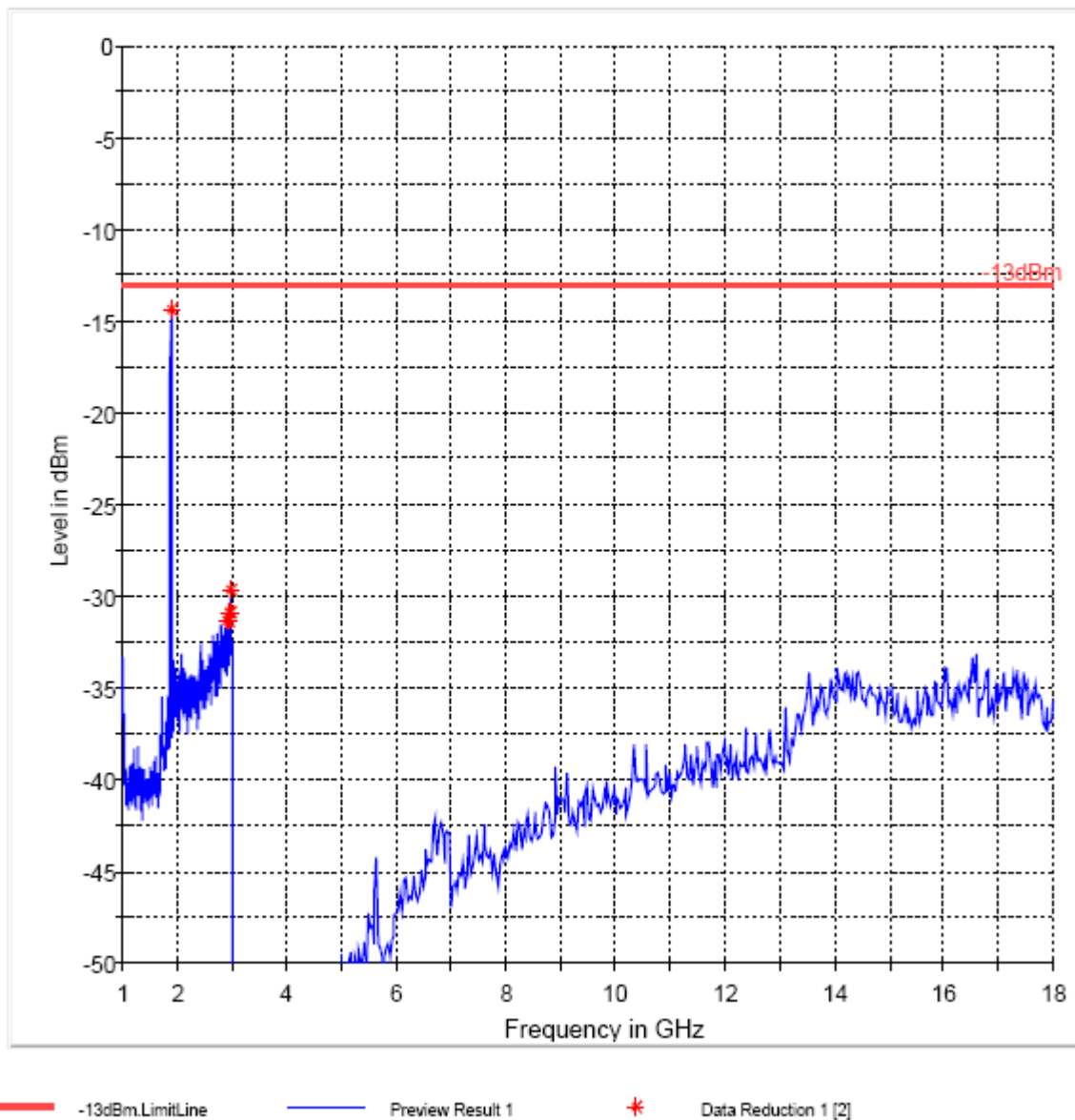
— -13dBm.LimitLine — Preview Result 1 * Data Reduction 1 [2]

RADIATED SPURIOUS EMISSIONS (PCS 1900)**Ch 661****1GHz – 18GHz**

Spurious emission limit -13dBm

Note: The peak above the limit line is the carrier freq.

FCC 24 1-18GHz

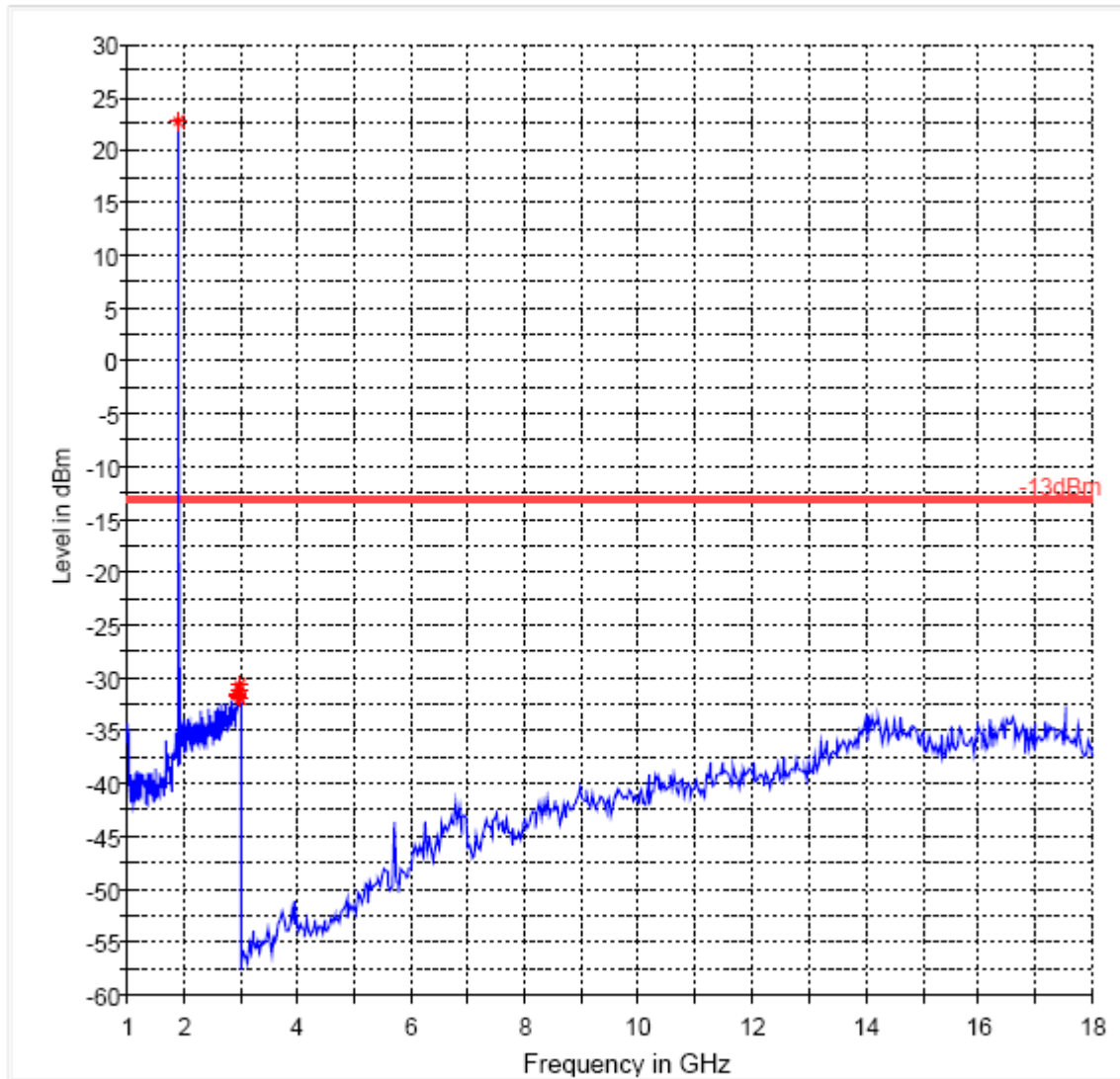


RADIATED SPURIOUS EMISSIONS(PCS 1900)**Ch 810****1GHz – 18GHz**

Spurious emission limit -13dBm

Note: The peak above the limit line is the carrier freq.

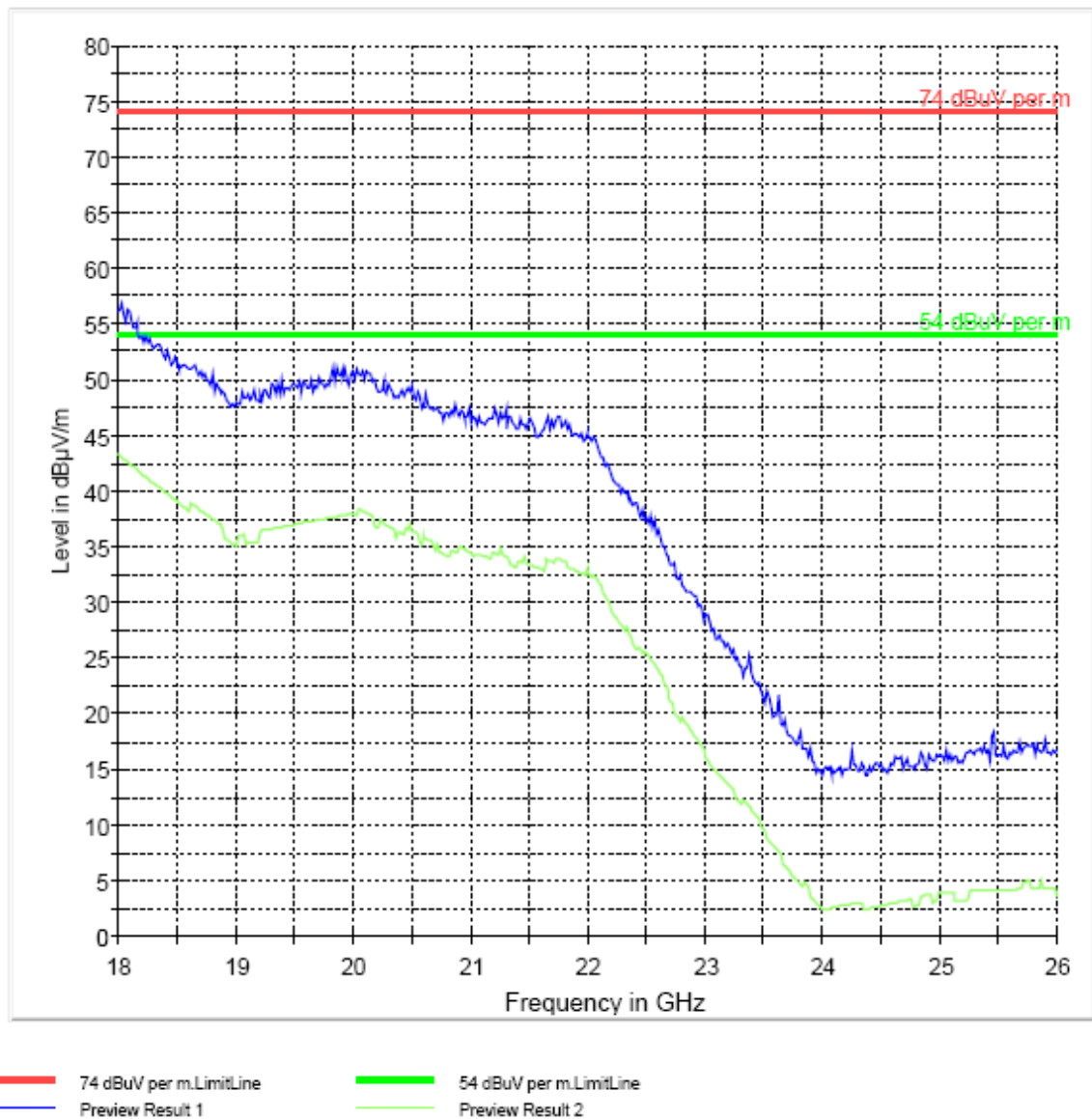
FCC 24 1-18GHz



— -13dBm.LimitLine — Preview Result 1 * Data Reduction 1 [2]

RADIATED SPURIOUS EMISSIONS (PCS 1900)**18GHz – 19.1 GHz Ch 25****Note: sweep is valid for low, mid and high channels (worst case)**

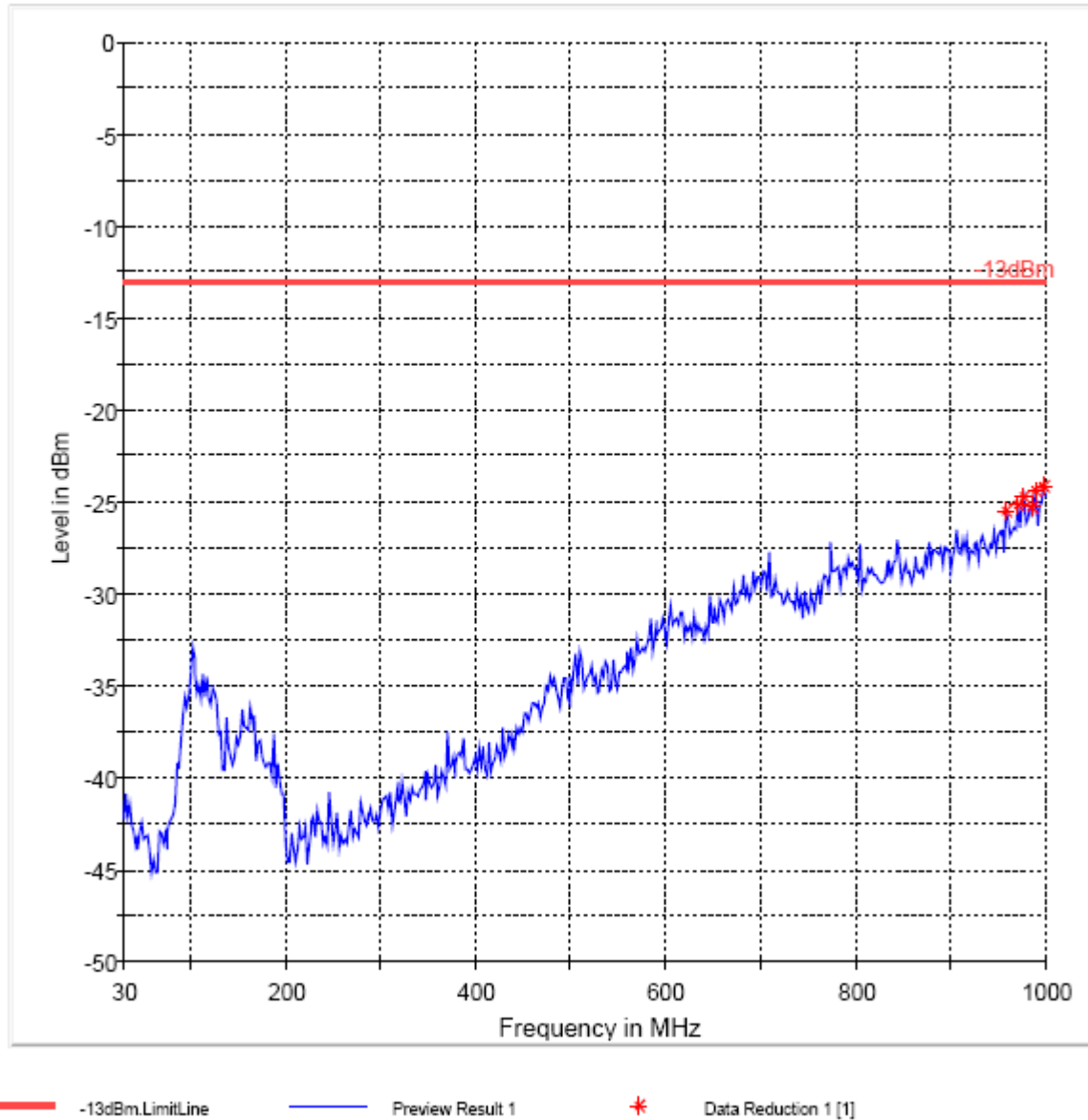
FCC 15 18-26GHz



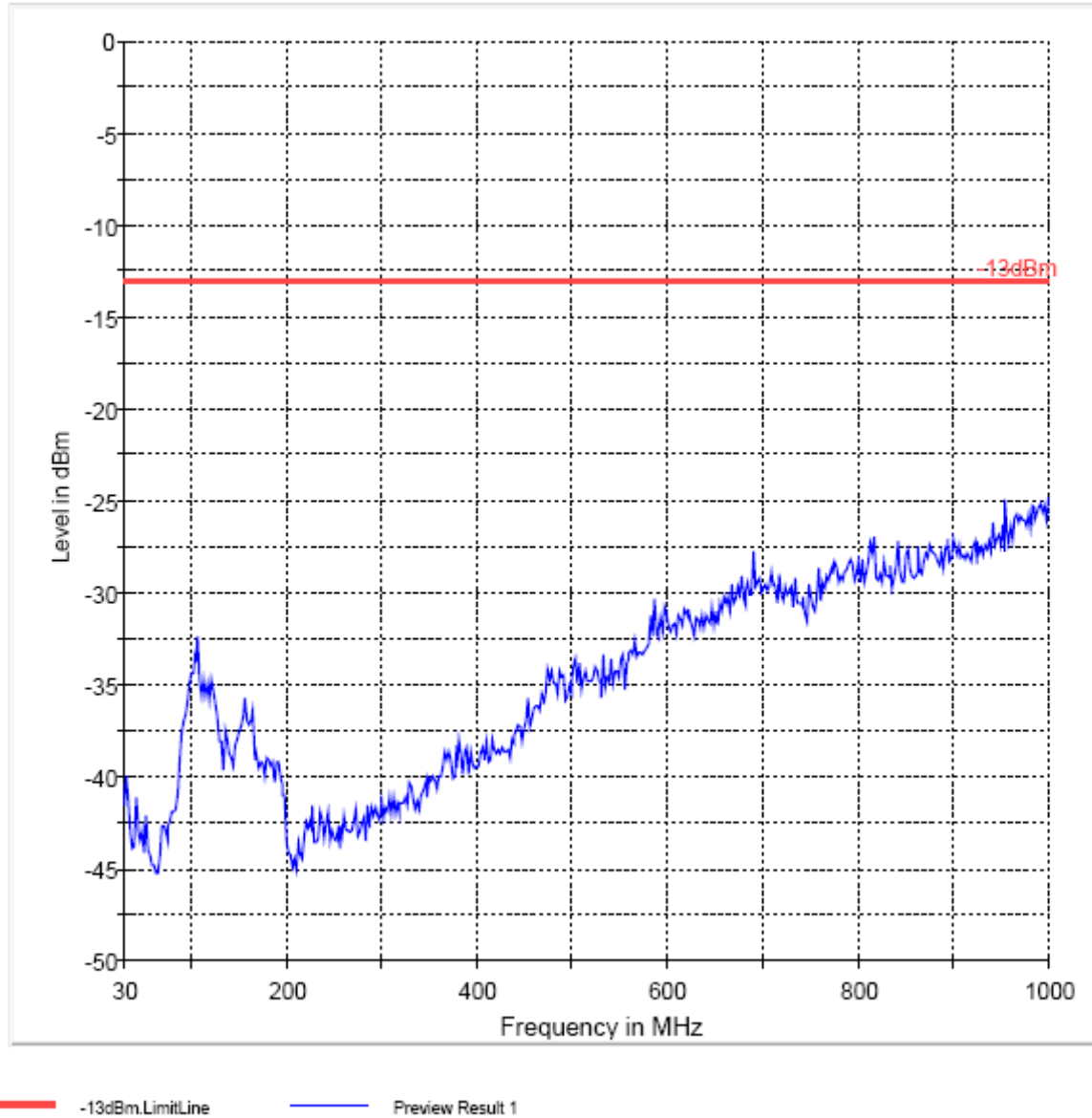
6.1.4.7 RESULTS OF RADIATED TESTS UMTS FDD2:

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	-	1880.0	-	1907.6	-
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						

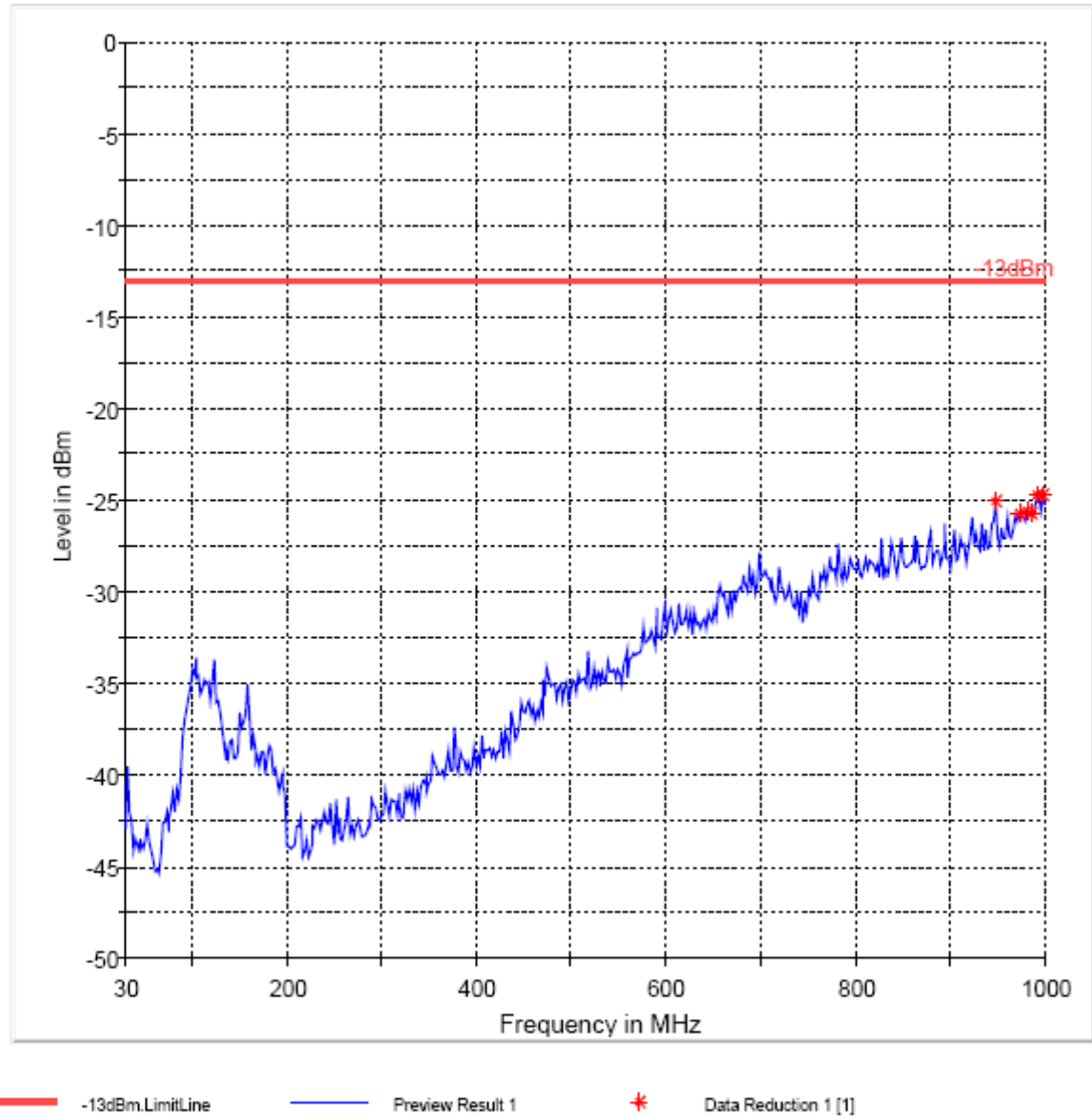
Radiated Spurious Emissions (UMTS FDD2) Tx: 30MHz – 1GHz
Low Channel



Radiated Spurious Emissions (UMTS FDD2) Tx: 30MHz – 1GHz
Mid Channel



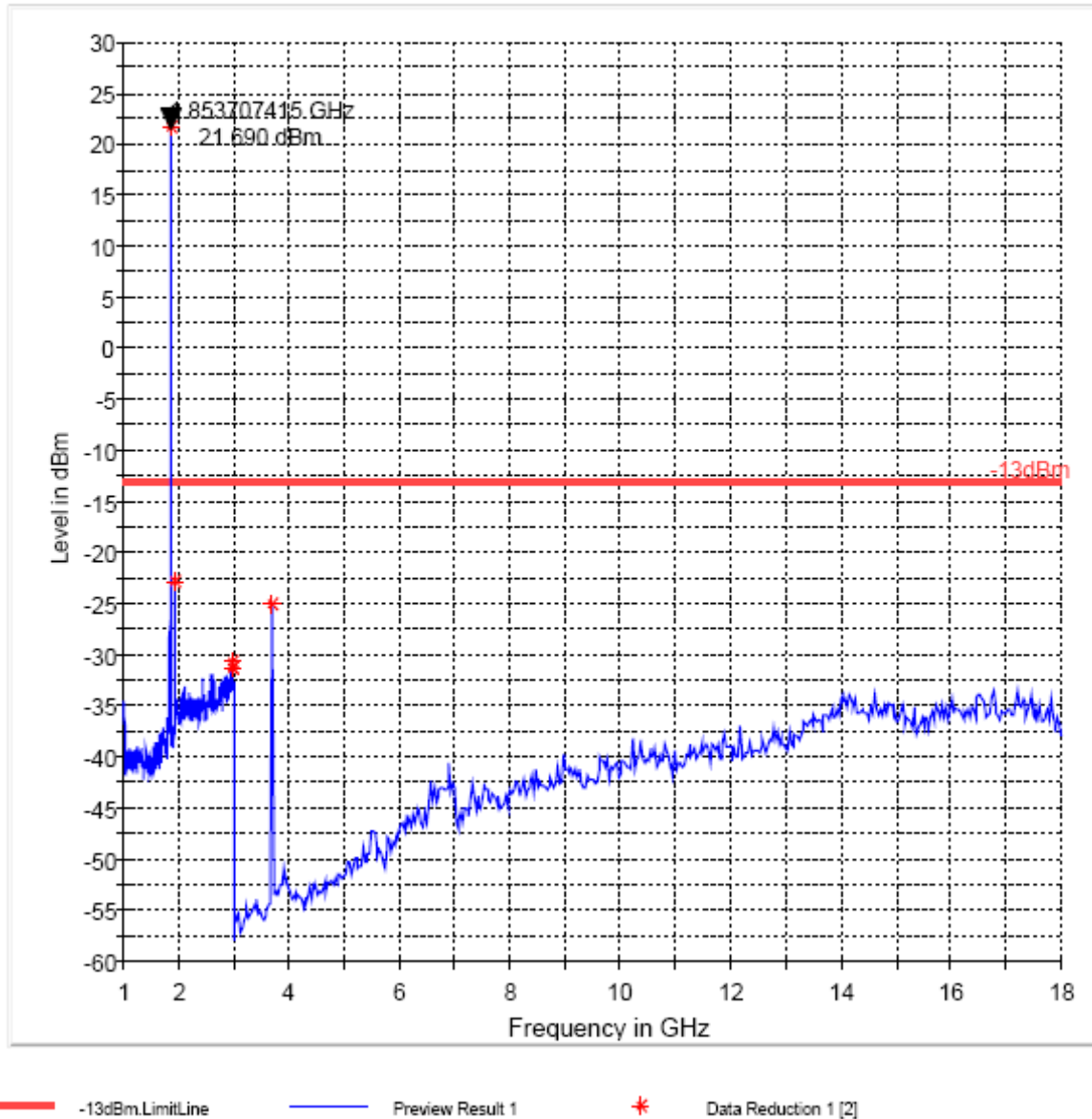
Radiated Spurious Emissions (UMTS FDD2) Tx: 30MHz – 1GHz
High Channel



Radiated Spurious Emissions (UMTS FDD2) Tx: 1GHz -18 GHz**Low Channel**

Note: Signal over the limit is the carrier frequency

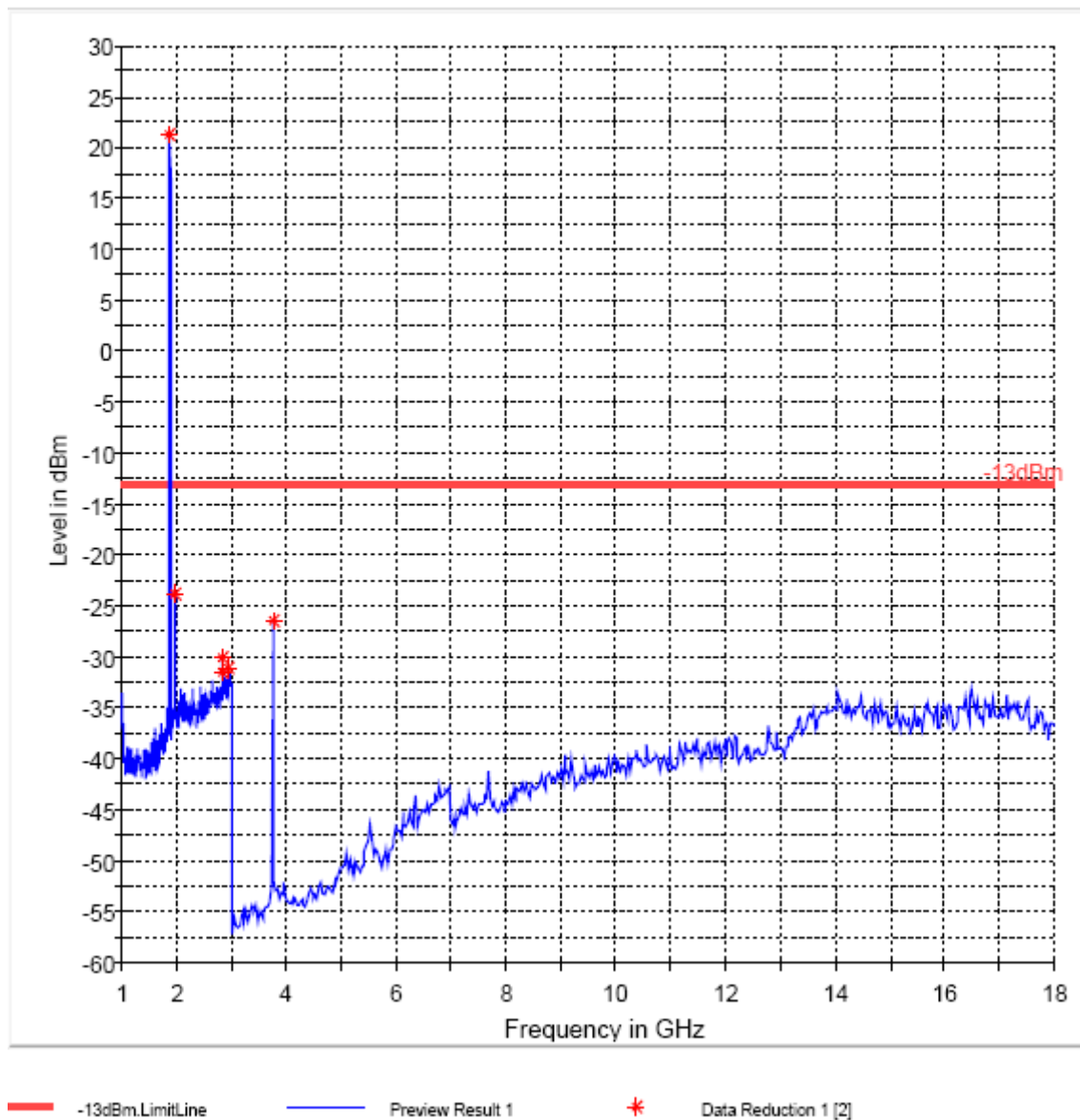
FCC 24 1-18GHz



Radiated Spurious Emissions (UMTS FDD2) Tx: 1GHz -18 GHz**Mid Channel**

Note: Signal over the limit is the carrier frequency

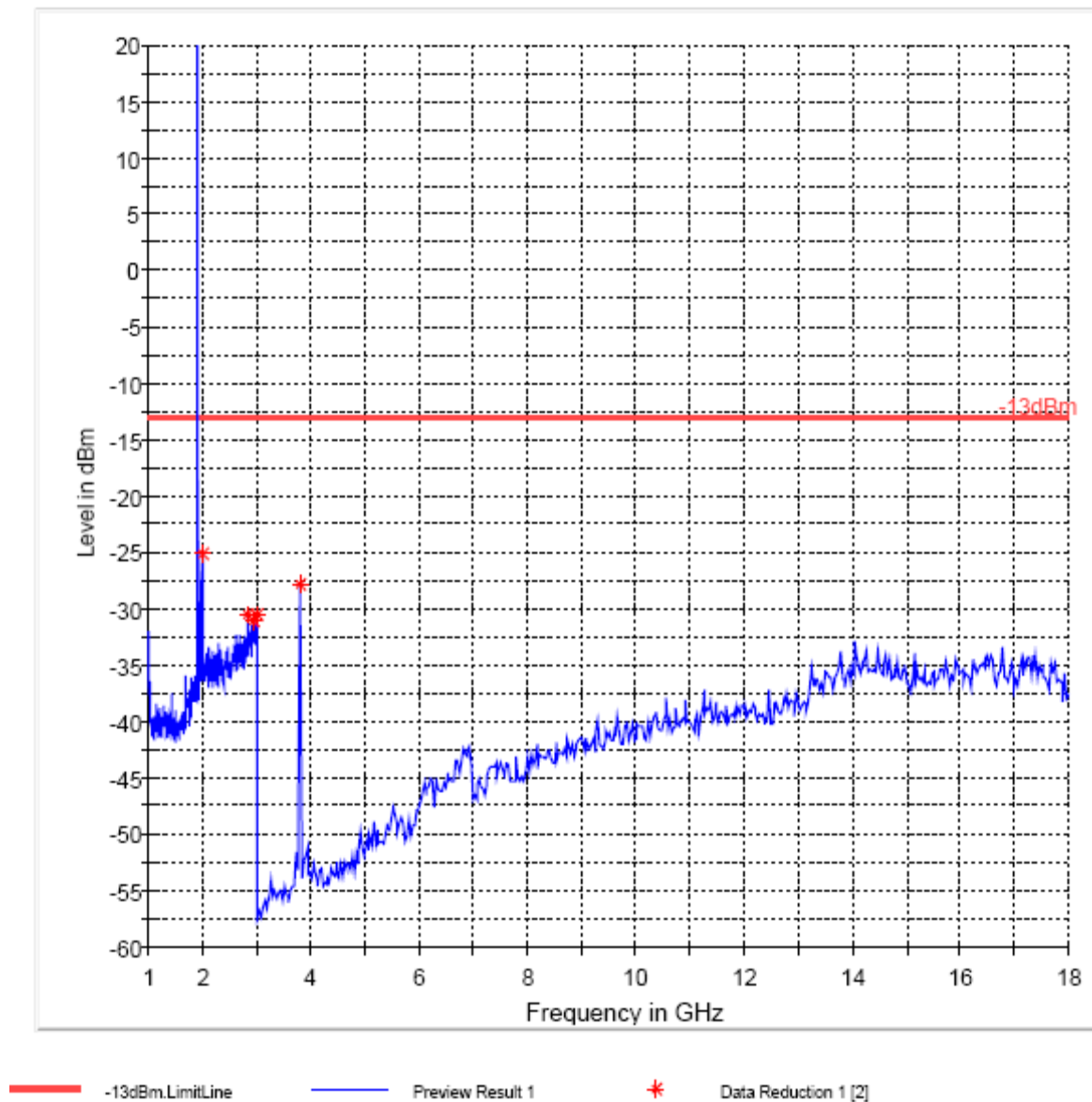
FCC 24 1-18GHz



**Radiated Spurious Emissions (UMTS FDD2) Tx: 1GHz -18 GHz
High Channel**

Note: Signal over the limit is the carrier frequency

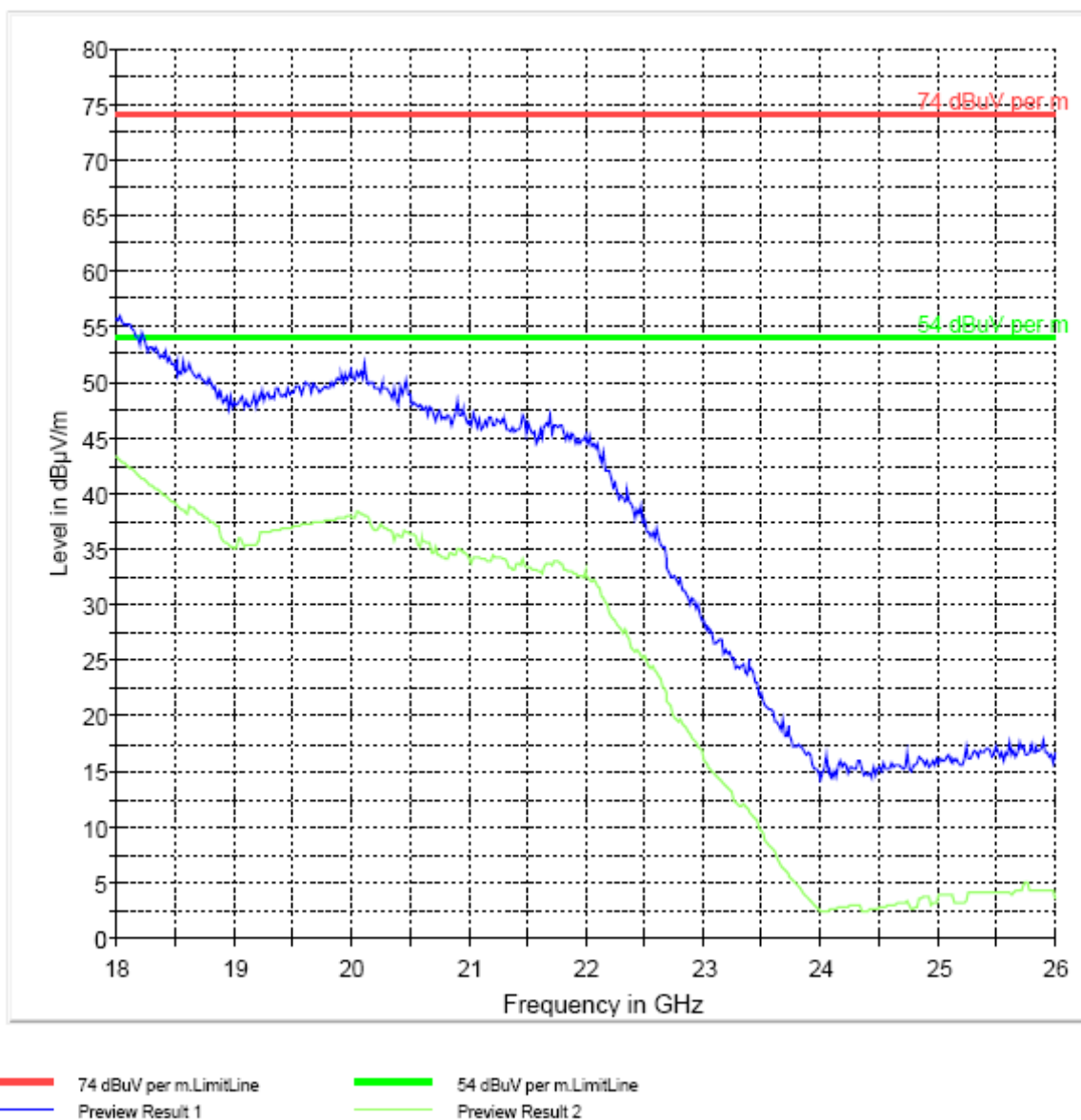
FCC 24 1-18GHz



Radiated Spurious Emissions (UMTS FDD2) Tx: 18GHz –19.1GHz

***Plot represents worst case of all channels**

FCC 15 18-26GHz



6.2 RECEIVER RADIATED EMISSIONS**§ 2.1053 / RSS-129 & 133****6.2.1.1 References**

FCC: CFR Part 15.109, 2.1053

IC: RSS 132 Section 4.6 and 6.6

6.2.1.2 §15.109 Radiated emission limits- Unintentional Radiators:

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of emission (MHz)	Field strength (μV/m)
30–88	100 (40dBμV/m)
88–216	150 (43.5 dBμV/m)
216–960	200 (46 dBμV/m)
Above 960	500 (54 dBμV/m)

(b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following:

Frequency of emission (MHz)	Field strength (μV/m)
30–88	90
88–216	150
216–960	210
Above 960	300

6.2.1.3 Results

No significant emissions measurable. Plots reported here represent the worse case emissions.

6.2.2 Receiver Radiated Spurious Emissions Results

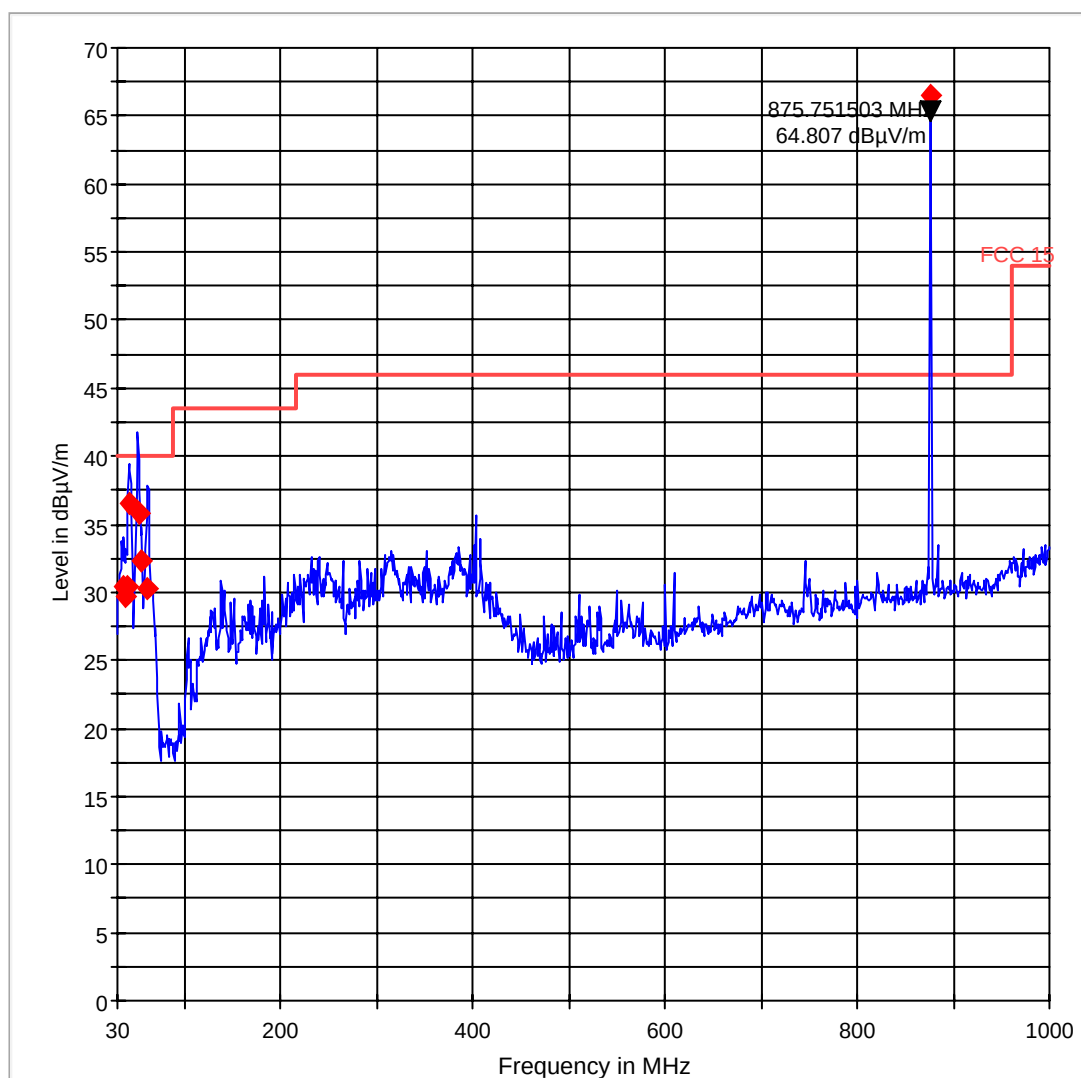
Measurements were performed with the EUT in X, Y and Z orientations with the measurement antenna in both horizontal and vertical polarity. The plots below show the results of the worst case orientation and polarity.

RECEIVER RADIATED SPURIOUS EMISSIONS**RX: 30MHz - 1GHz: GSM 850 RX mode**

Note: Marker placed on downlink

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
35.225747	30.5	20.000	120.000	120.0	V	287.0	6.4	9.5	40.0
37.295481	29.7	20.000	120.000	120.0	V	45.0	6.0	10.3	40.0
39.411964	30.4	20.000	120.000	142.0	V	45.0	5.6	9.6	40.0
42.534413	36.6	20.000	120.000	120.0	V	315.0	5.8	3.4	40.0
52.162845	35.7	20.000	120.000	142.0	V	164.0	7.0	4.3	40.0
54.078193	32.4	20.000	120.000	144.0	V	40.0	7.2	7.6	40.0
60.797573	30.2	20.000	120.000	120.0	V	225.0	8.0	9.8	40.0
875.970882	66.5	20.000	120.000	164.0	H	1.0	26.4	-20.5	46.0

FCC 15 30-1000MHz



FCC 15.LimitLine

Preview Result 1

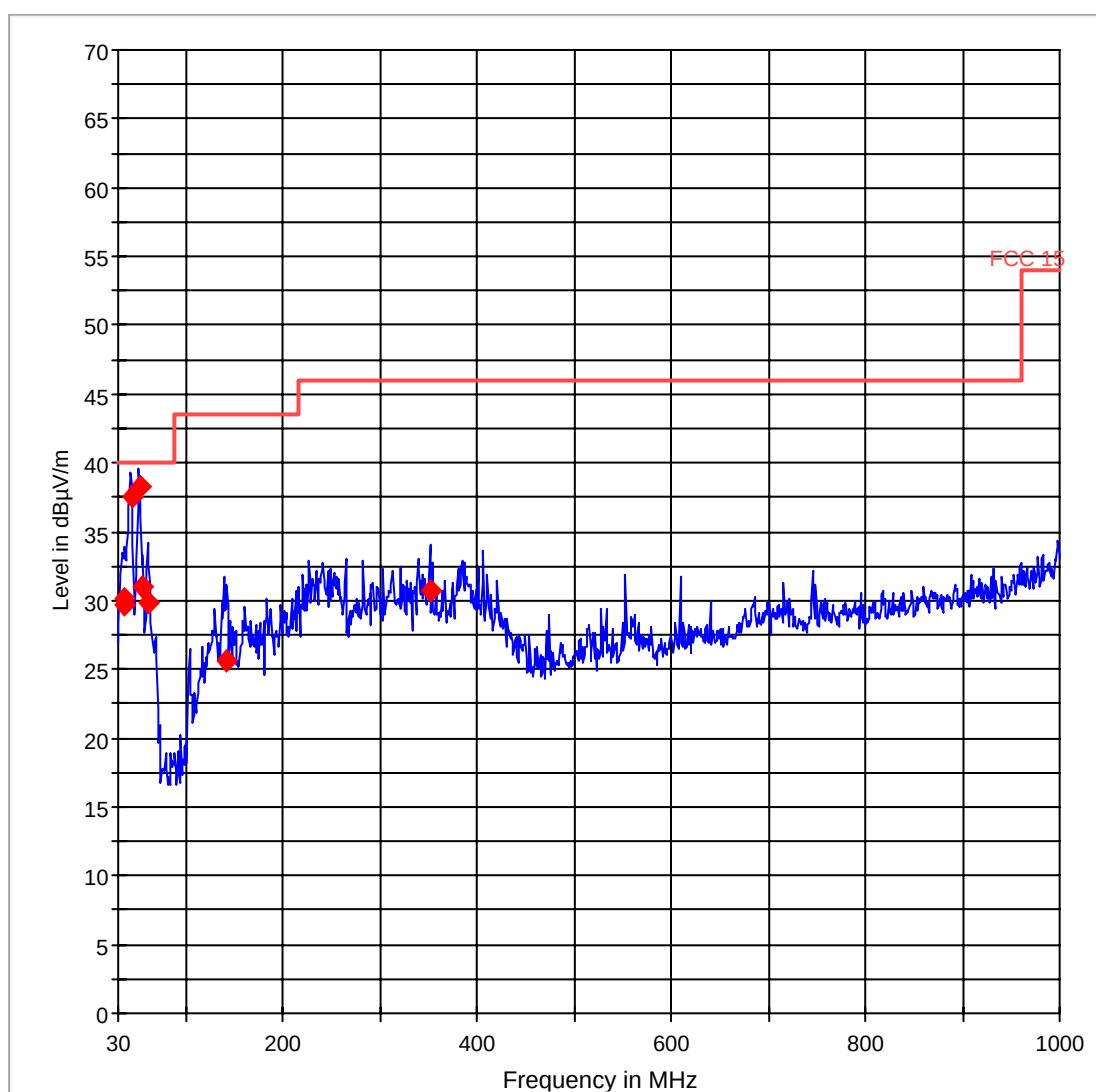


Final Result 1

RECEIVER RADIATED SPURIOUS EMISSIONS**RX: 30MHz - 1GHz: GSM 1900 RX mode**

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
35.378733	30.1	20.000	120.000	120.0	V	1.0	6.4	9.9	40.0
36.066923	29.8	20.000	120.000	120.0	V	45.0	6.2	10.2	40.0
44.205300	37.5	20.000	120.000	120.0	V	315.0	6.0	2.5	40.0
51.707326	38.3	20.000	120.000	120.0	V	76.0	6.9	1.7	40.0
54.044862	31.0	20.000	120.000	187.0	V	135.0	7.2	9.0	40.0
60.354206	29.9	20.000	120.000	120.0	V	45.0	7.9	10.1	40.0
140.967871	25.6	20.000	120.000	120.0	V	277.0	9.1	17.9	43.5
351.024017	30.8	20.000	120.000	152.0	H	0.0	17.6	15.2	46.0

FCC 15 30-1000MHz



— FCC 15.LimitLine

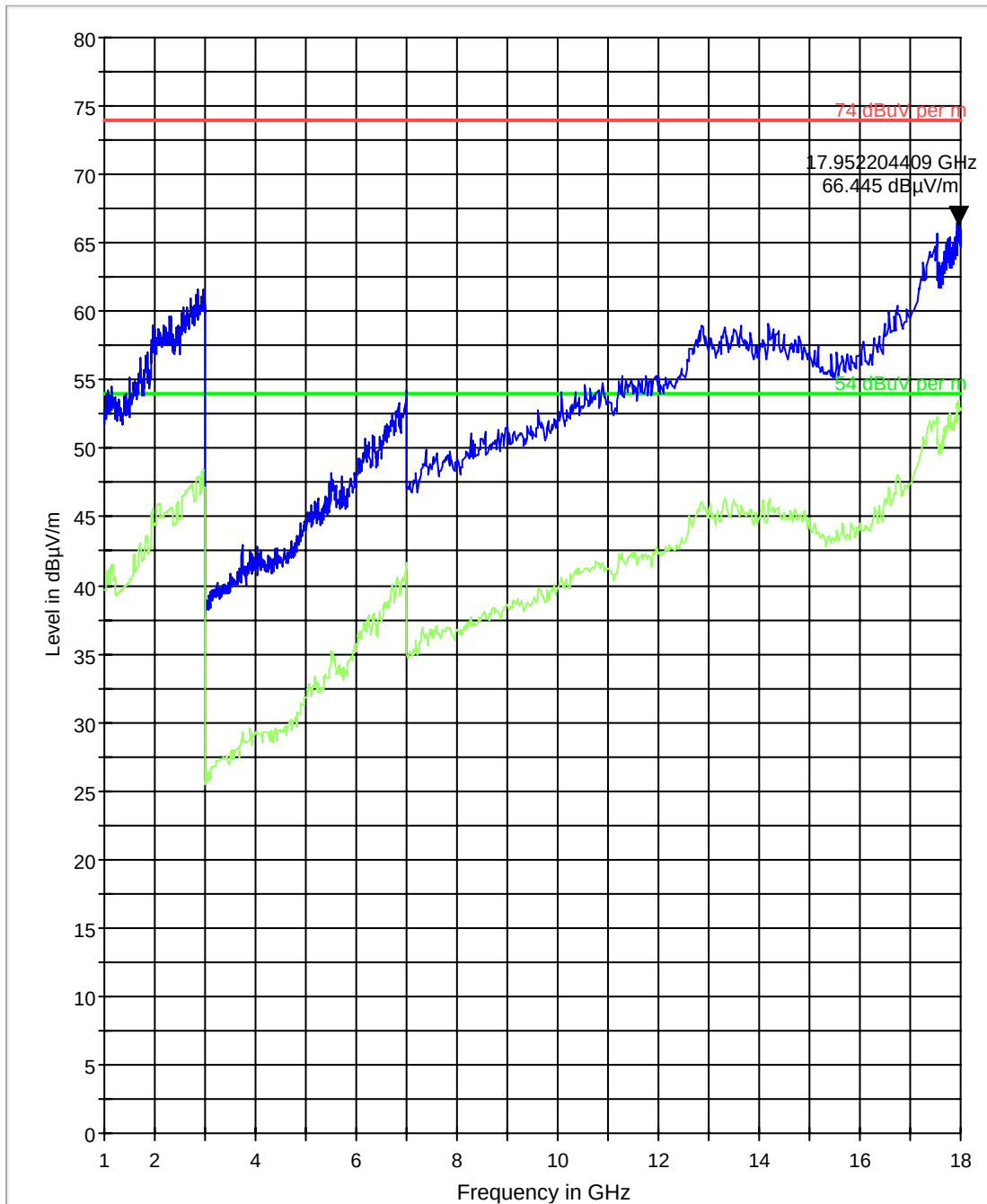
— Preview Result 1



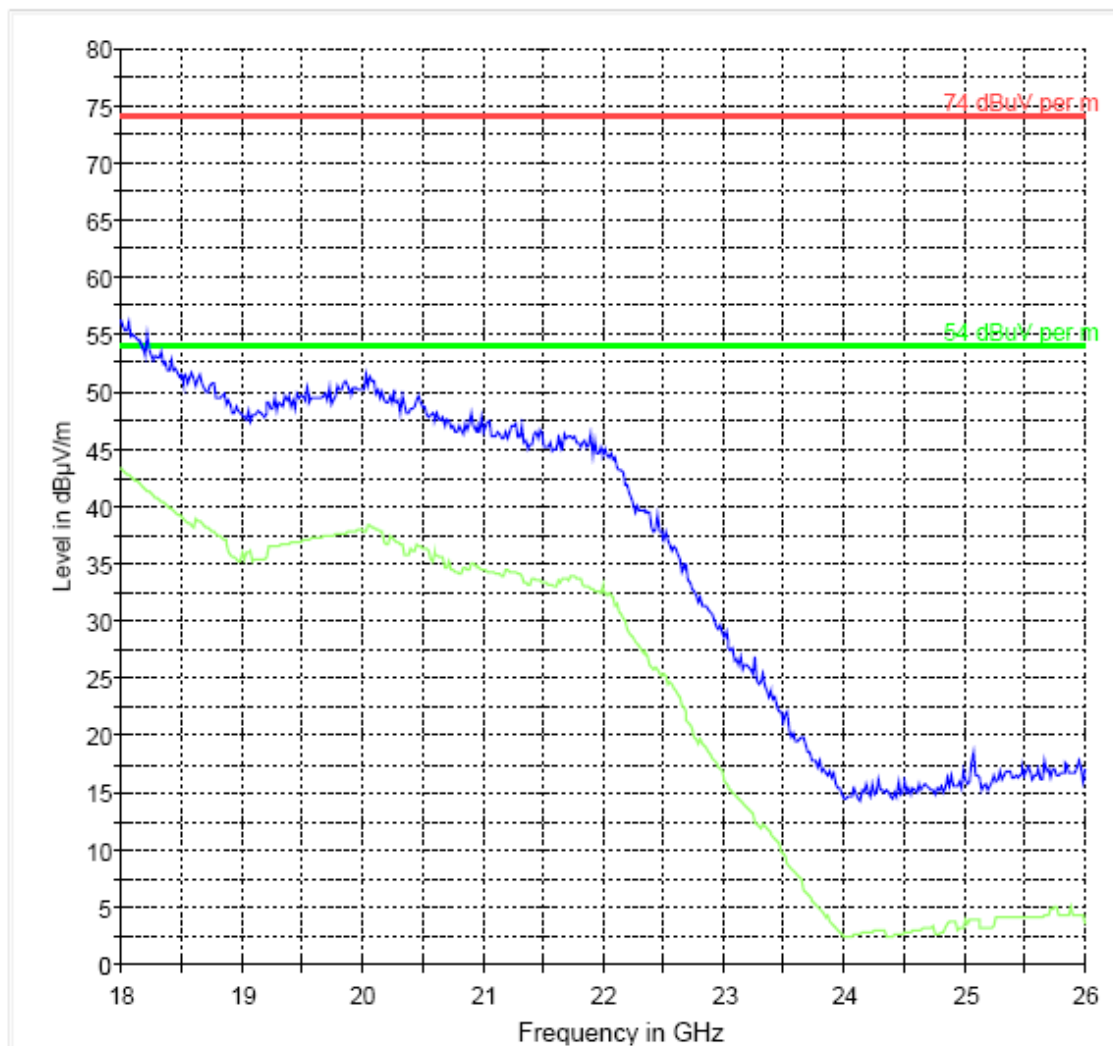
◆ Final Result 1

RECEIVER RADIATED SPURIOUS EMISSIONS
RX: 1GHz - 18GHz GSM 1900 Rx mode

FCC 15 1-18GHz



RECEIVER RADIATED SPURIOUS EMISSIONS
RX: 18-26GHz GSM 1900 Rx mode



— 74 dBμV per m.LimitLine
— Preview Result 1
— 54 dBμV per m.LimitLine
— Preview Result 2

6.3 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

6.3.1 LIMITS

Technical specification: 15.107 / 15.207 (Revised as of August 20, 2002)

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Limit

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

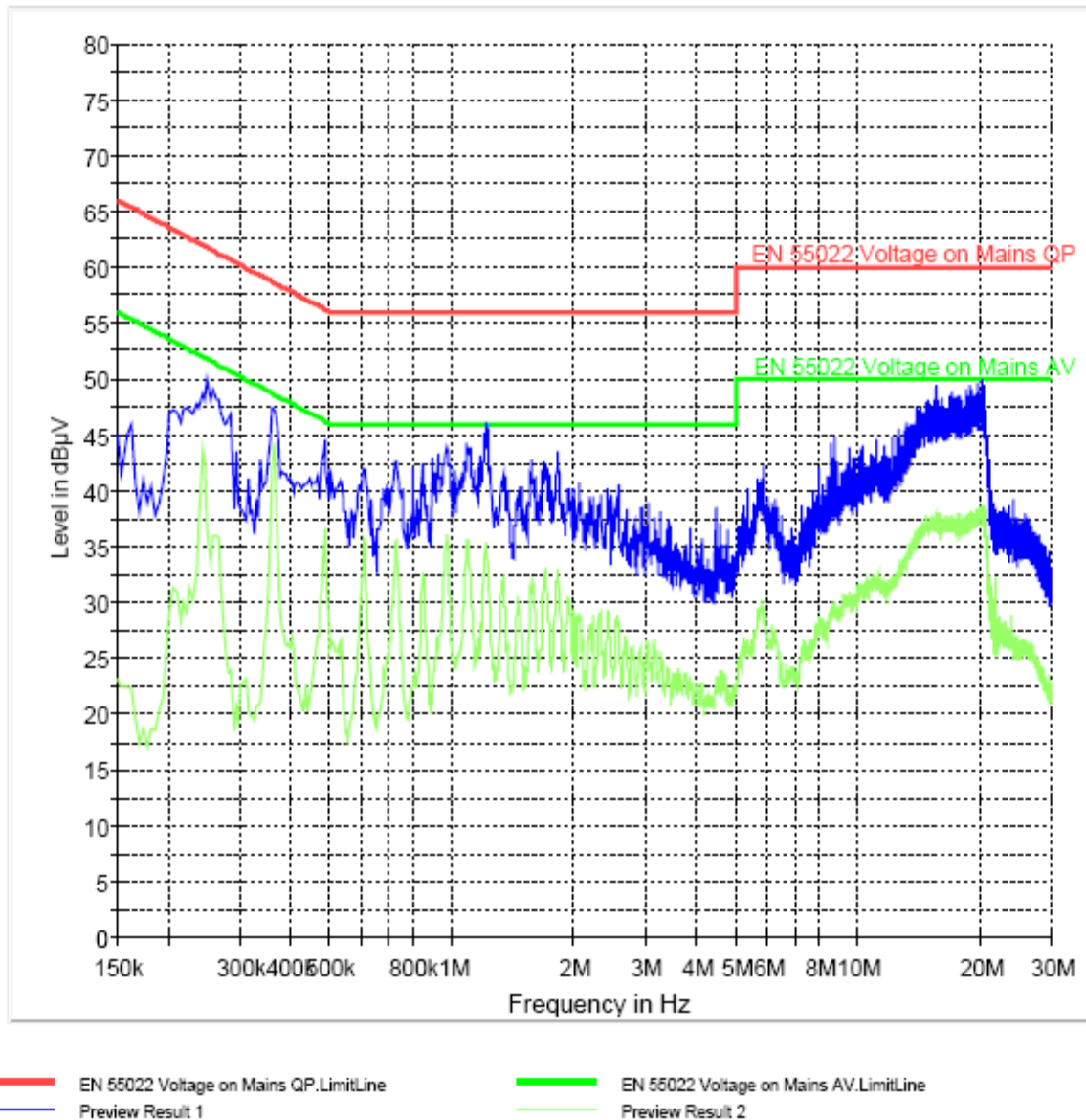
* Decreases with logarithm of the frequency

ANALYZER SETTINGS: RBW = 10KHz

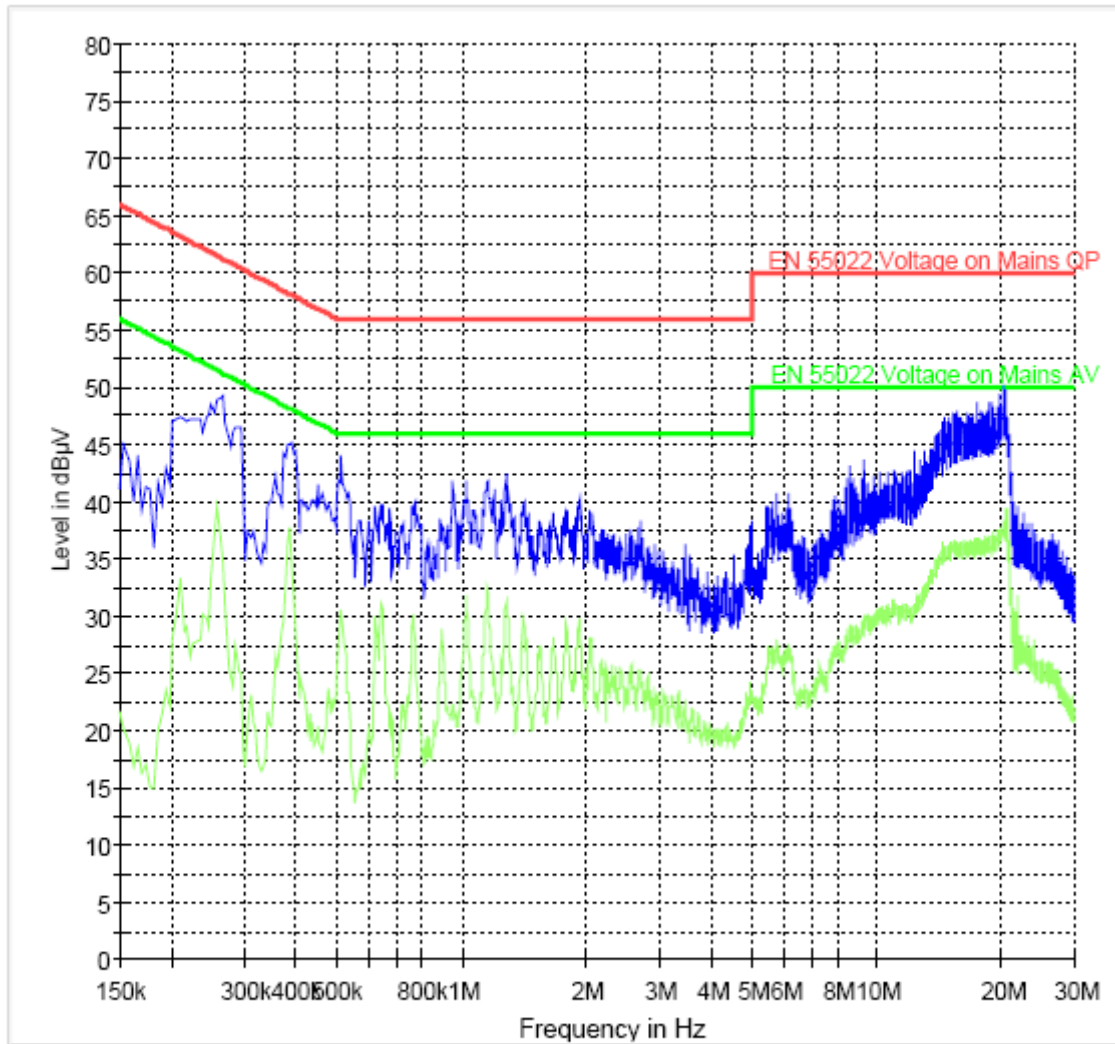
VBW = 10KHz

6.3.2 RESULTS TX FDD 2:

CISPR 22 Mains Conducted



RESULTS TX GSM 1900:



EN 55022 Voltage on Mains QP.LimitLine
Preview Result 1
EN 55022 Voltage on Mains AV.LimitLine
Preview Result 2

7 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2010	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	May 2010	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2010	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2010	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2011	2 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2011	2 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2011	2 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2010	1 year
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
12	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2010	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2010	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2010	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2010	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2010	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2011	2 years

8 References

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION,
PART 2--FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS October 1, 2001.

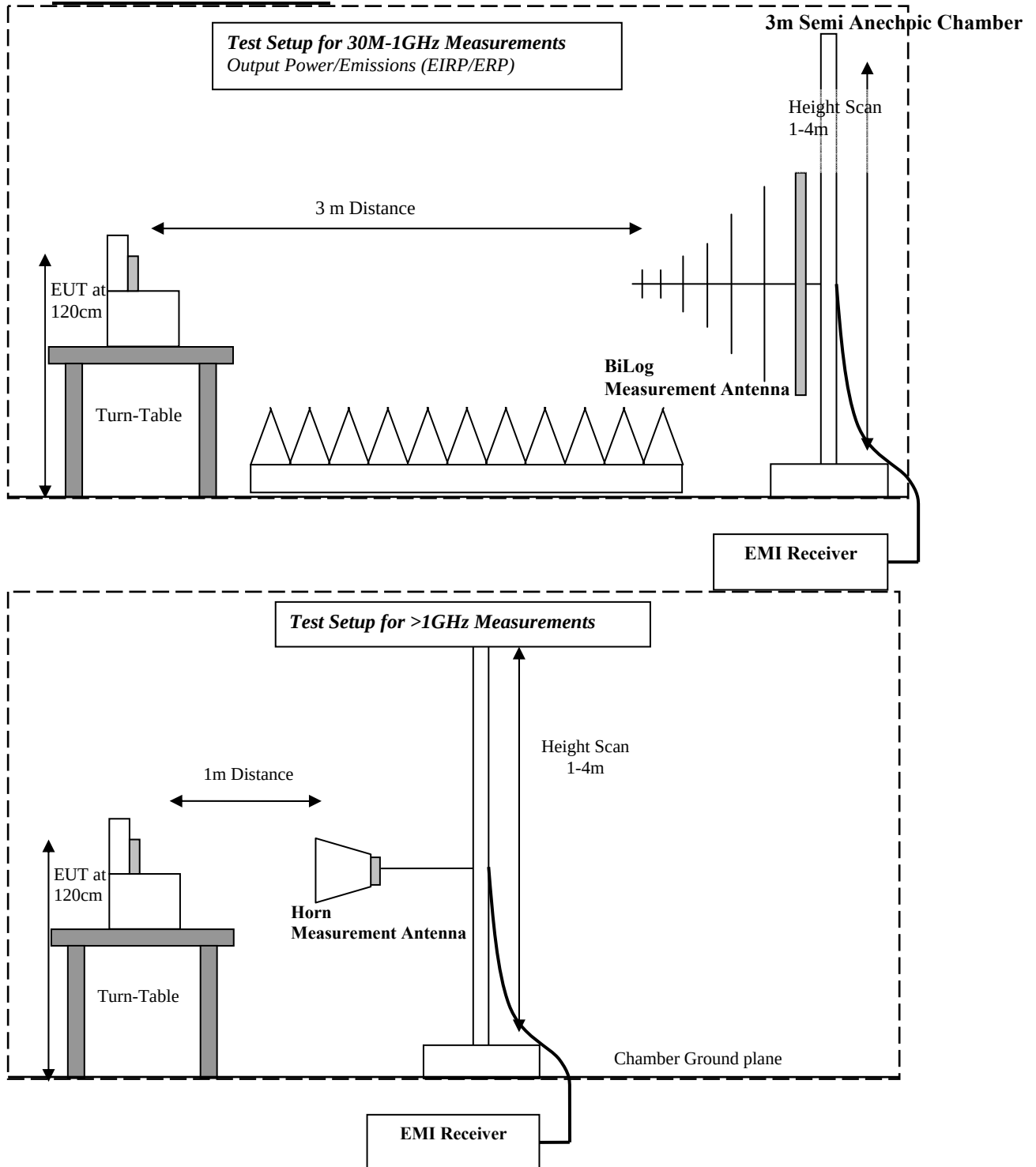
Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION,
PART 22 PUBLIC MOBILE SERVICES October 1, 1998.

FCC Report and order 02-229 September 24, 2002.

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION,
PART 24 PERSONAL COMMUNICATIONS SERVICES October 1, 1998.

ANSI / TIA-603-C-2004 Land Mobile FM or PM Communications Equipment Measurement and Performance Standard November 7, 2002.

9 BLOCK DIAGRAMS



10 Revision History

2010-02-26:

EMC_SONYE_034_09002_FCC22_24_GSM_PCG-31113L: Original report

2010-03-16:

EMC_SONYE_034_09002_FCC22_24_GSM_PCG-31113L_rev1: (replaces report#
EMC_SONYE_034_09002_FCC22_24_GSM_PCG-31113L)

1. Contact person and email information changed in sections 2.2 and 2.3.