



FCC Test Report

FCC Part 22, 24 / RSS 129, 133

Sony Corporation

Personal Computer

Model Number: PCG-3111L

FCC ID: AK8PCG3111L

IC-ID: 409B-PCG3111L

TEST REPORT #: EMC_SONYE_034_09002_FCC22_24_CDMA_PCG-3111L
DATE: 2009-12-01



FCC listed
A2LA Accredited

IC recognized #
3462B

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: 2113686

Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

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 800 MHz band:	10
5.1.5	EIRP Results 1900 MHz band:.....	10
5.2	SPURIOUS EMISSIONS RADIATED	23
5.2.1	FCC 2.1053 Measurements required: Field strength of spurious radiation.....	23
5.2.2	Limits:	23
5.2.2.1	FCC 22.917 Emission limitations for cellular equipment.	23
5.2.2.2	FCC 24.238 Emission limitations for Broadband PCS equipment.	23
5.2.3	Radiated out of band measurement procedure:	24
5.2.4	Radiated out of band emissions results on EUT:	26
5.2.4.1	RESULTS OF RADIATED TESTS 800:	26
5.2.4.2	RADIATED SPURIOUS EMISSIONS (800 band CDMA).....	27
5.2.4.3	RESULTS OF RADIATED TESTS PCS-1900:.....	33
5.2.4.4	RADIATED SPURIOUS EMISSIONS(PCS 1900) CDMA	34
5.3	RECEIVER RADIATED EMISSIONS § 2.1053 / RSS-129 & 133	41
5.3.1	Receiver Radiated Spurious Emissions Results.....	41
5.4	AC POWER LINE CONDUCTED EMISSIONS § 15.107/207.....	45
5.4.1	LIMITS	45
5.4.2	RESULTS TX CDMA 800:	46
6	TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS	47
7	REFERENCES	48
8	BLOCK DIAGRAMS	49

9 REVISION HISTORY.....50

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-31111L

This report is reviewed by:

Marc Douat

2009-12-01 Compliance (Test Lab Manager)

Date	Section	Name	Signature
------	---------	------	-----------

This report is prepared by:

Satya Radhakrishna

2009-12-01 Compliance (EMC Project Engineer)

Date	Section	Name	Signature
------	---------	------	-----------

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:	Michio Kobayashi
Phone No.	+81-263-72-5696
Fax:	+81-263-72-9755
e-mail:	Michio.Kobayashi@jp.sony.com

2.3 Identification of the Manufacturer

MANUFACTURER (If different from Applicant)	
Applicant (Firm Name):	Sony EMCS Corporation
Contact Person:	Michio Kobayashi
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:	Michio.Kobayashi@jp.sony.com

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Product Type	Personal Computer
Marketing Name:	PCG-31111L
Model No:	PCG-31111L
FCC-ID:	AK8PCG31111L
IC-ID :	409B-PCG31111L
Frequency Range:	824.7 MHz to 848.31 MHz & 1851.25 MHz to 1908.75 MHz
Type(s) of Modulation:	CDMA
Antenna Type:	PIFA, 824.7-848.31 MHz (+0.42 dBi Peak Gain) 1851.25-1908.75 MHz(+1.76 dBi Peak Gain)
	Radiated:
	CDMA Cellular: 22.874 dBm (0.194 W) ERP
Output Power	CDMA PCS: 31.392 dBm (1.378W) EIRP
	EVDO Cellular:23.886 dBm (244.68 mW) ERP
	EVDO PCS: 31.901 dBm (1549.17 mW) EIRP

3.2 Identification of the Equipment under Test (EUT)

EUT #	TYPE	MANF.	MODEL	SERIAL #
1	EUT	Sony Corporation	PCG-31111L	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.

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.

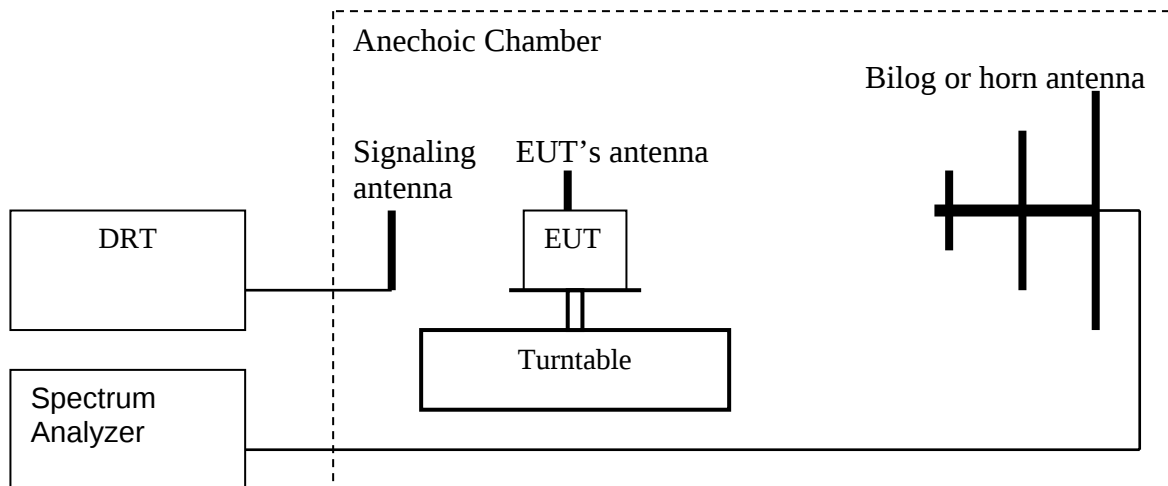
(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP).

(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 800 MHz band:

	Burst Peak ERP
	≤38.45dBm (7W)

Frequency (MHz)	Effective Radiated Power (dBm)	
	CDMA	EVDO
824.7	22.532	23.150
836.6	22.874	23.218
848.31	23.348	23.886

5.1.5 EIRP Results 1900 MHz band:

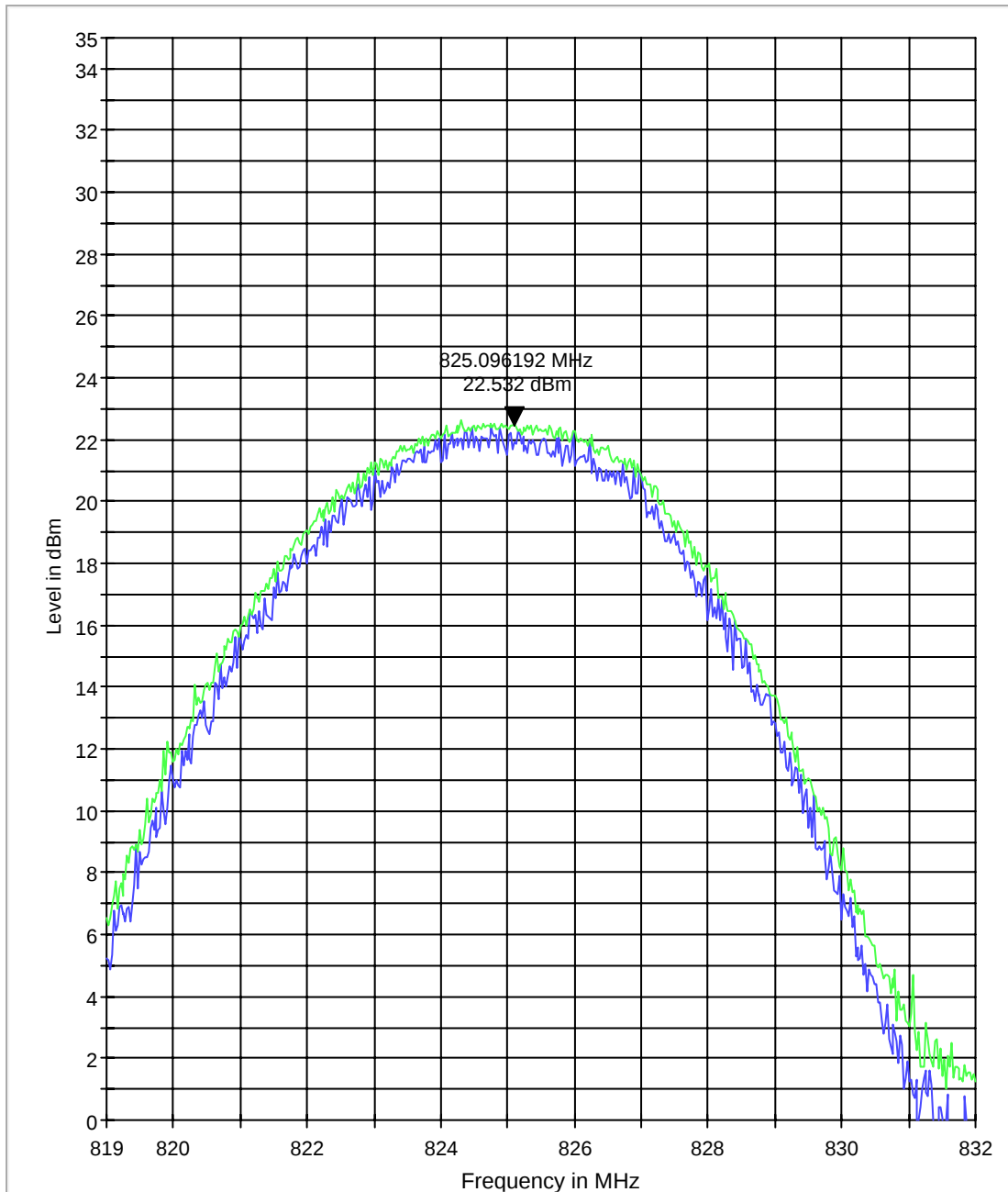
	Burst Peak EIRP
	≤33dBm (2W)

Frequency (MHz)	Equivalent Isotropic Radiated Power (dBm)	
	CDMA	EVDO
1851.25	30.096	30.275
1880.0	31.392	31.901
1908.25	30.101	29.81

**ERP (800 band) CDMA
CHANNEL 1013**

§22.913(a)

ERP 850 L

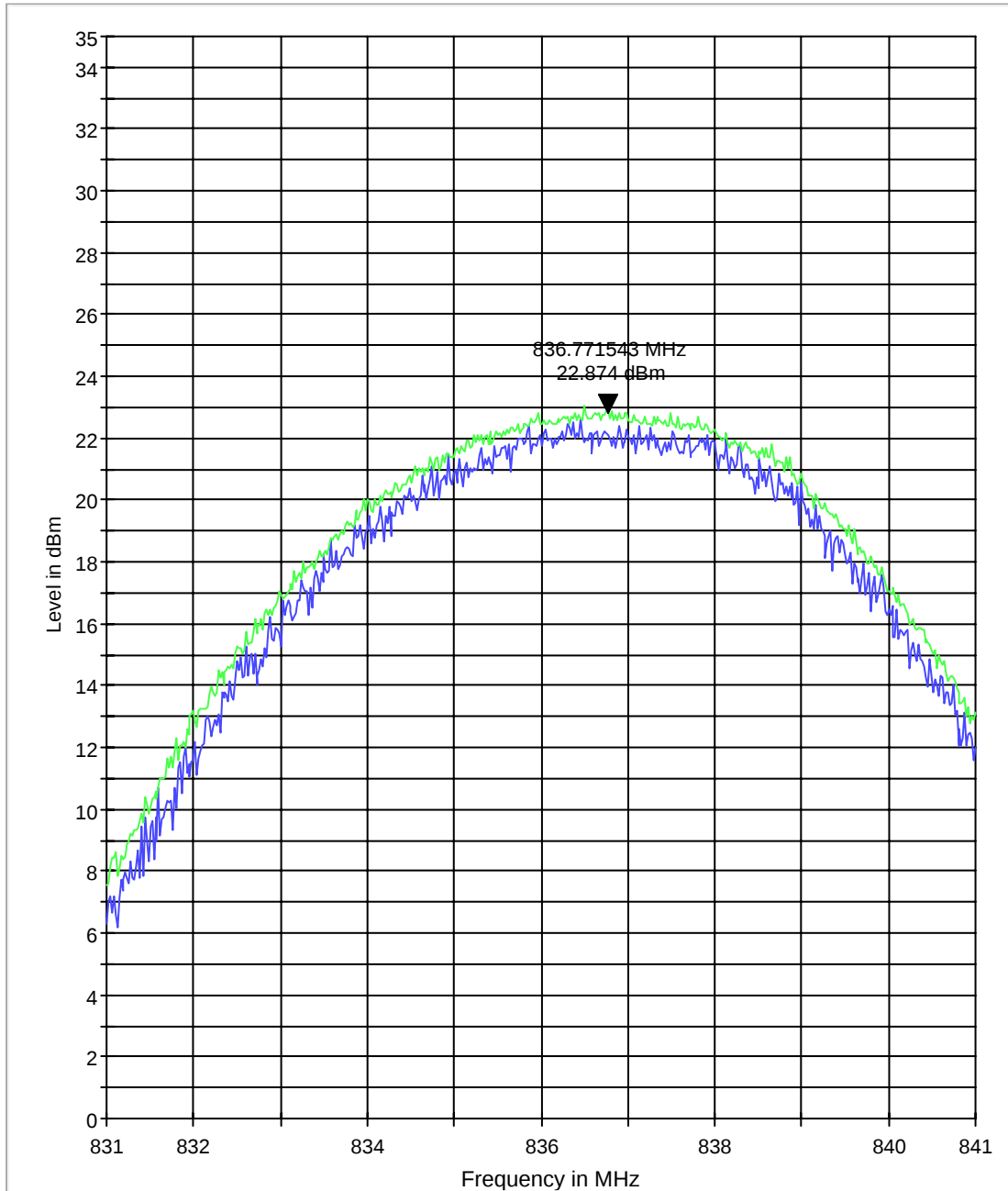


— MaxPeak-ClearWrite — MaxPeak-MaxHold

**(800 band) CDMA
CHANNEL 384**

§22.913(a)

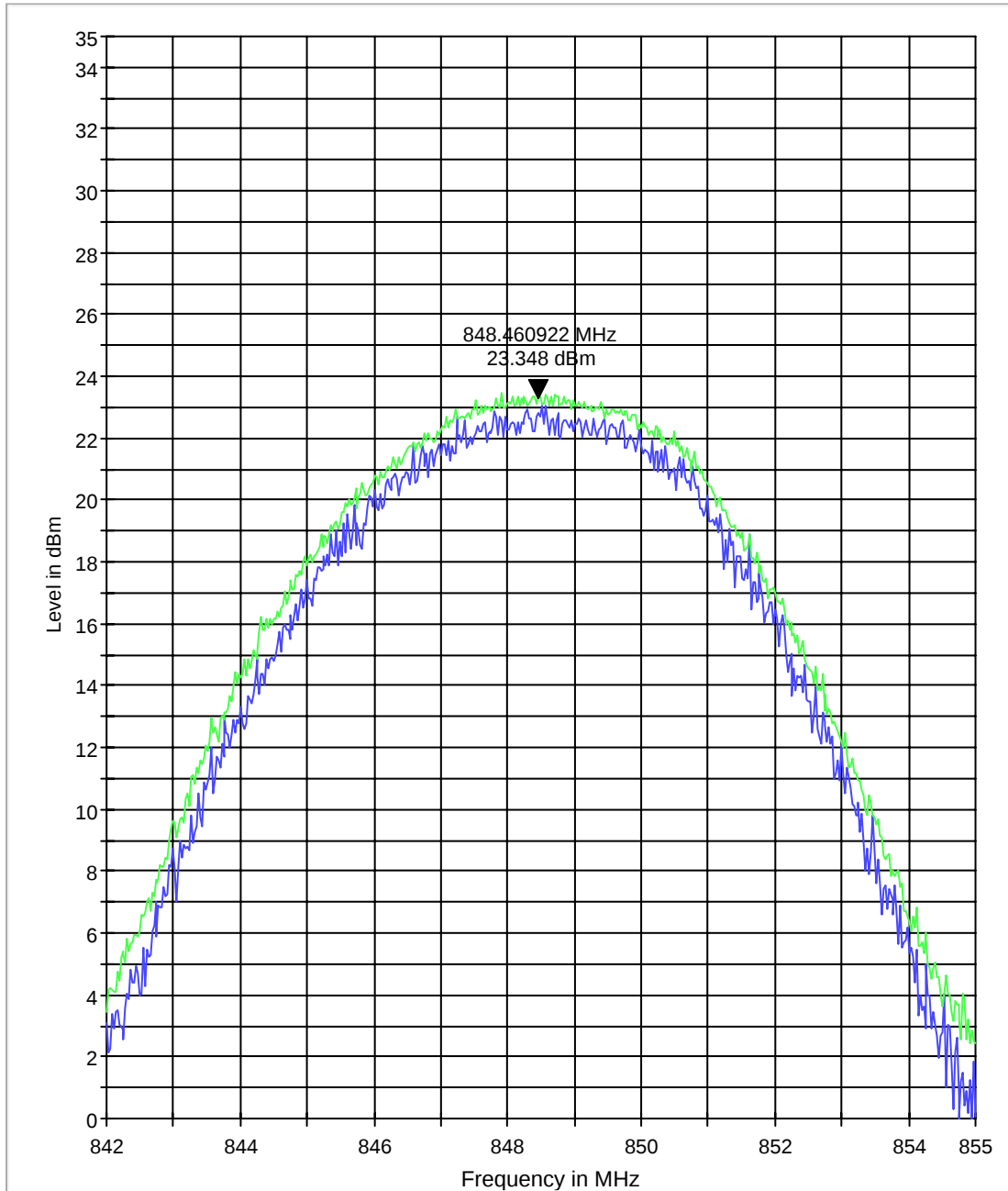
ERP 850 M



— MaxPeak-ClearWrite — MaxPeak-MaxHold

**EIRP (800 band) CDMA
CHANNEL 777****§22.913(a)**

ERP 850 H



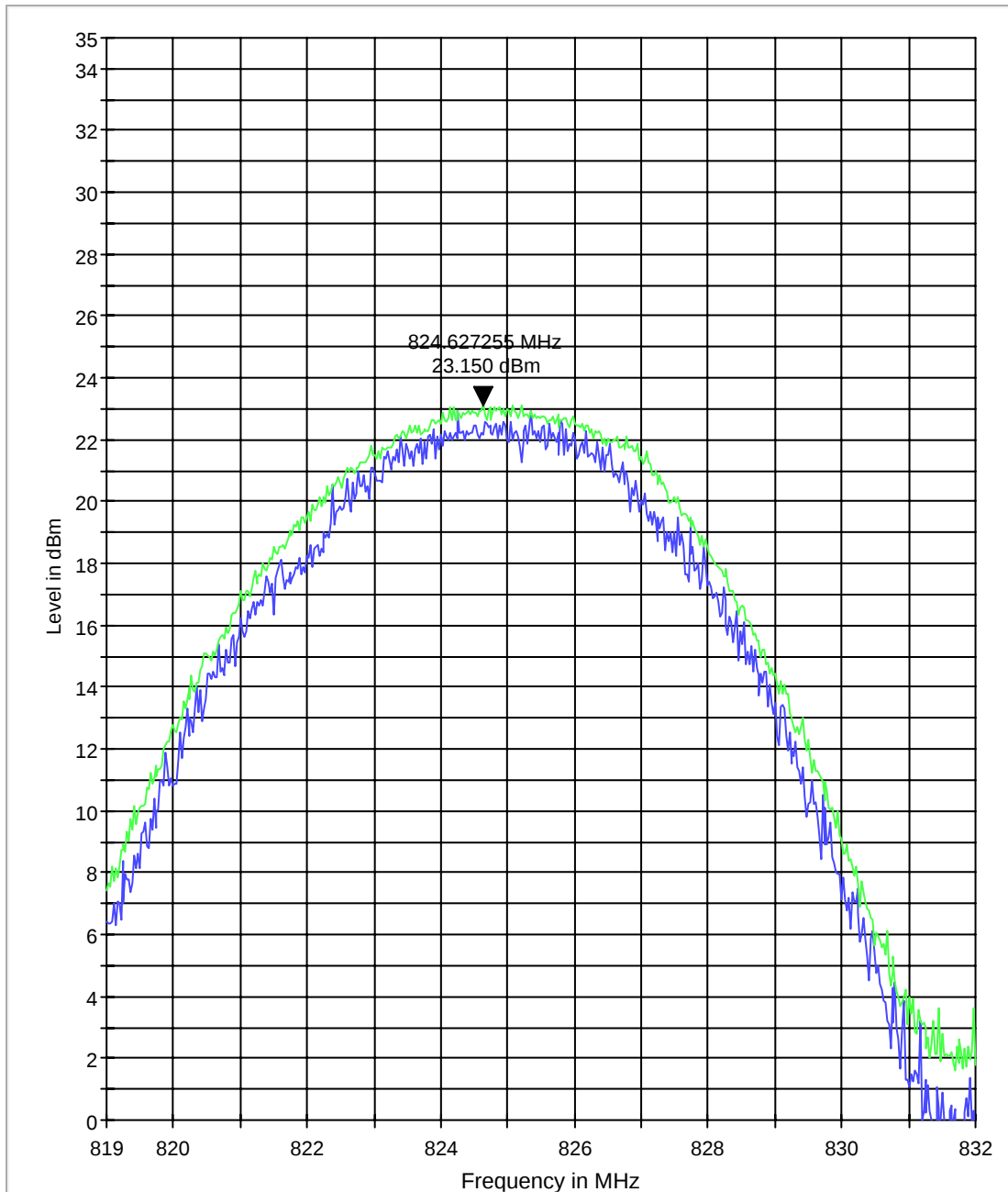
— MaxPeak-ClearWrite

— MaxPeak-MaxHold

**EIRP (800 band) EVDO
CHANNEL 1013**

§22.913(a)

ERP 850 L

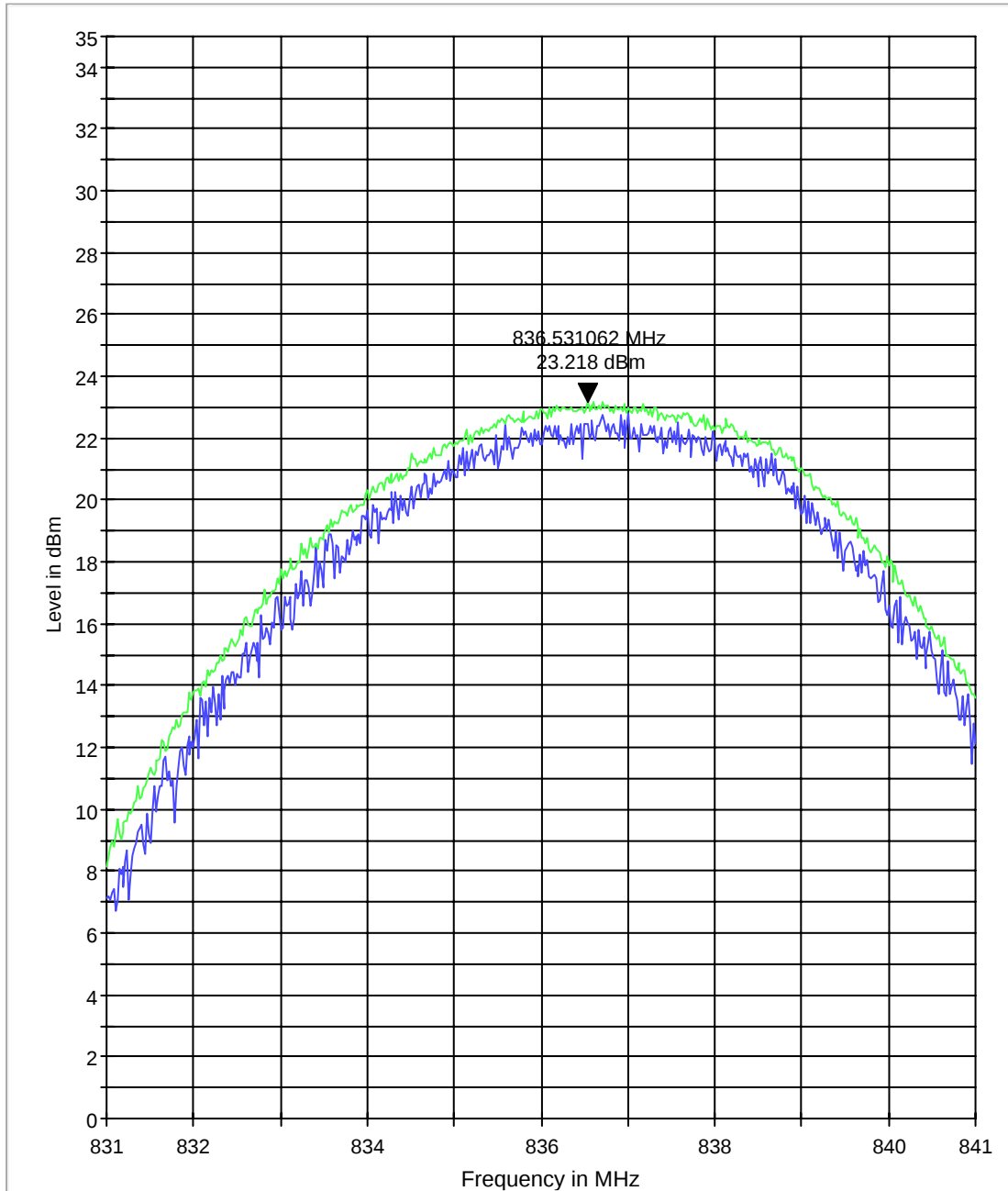


— MaxPeak-ClearWrite — MaxPeak-MaxHold

**EIRP (800 band) EVDO
CHANNEL 384**

§22.913(a)

ERP 850 M

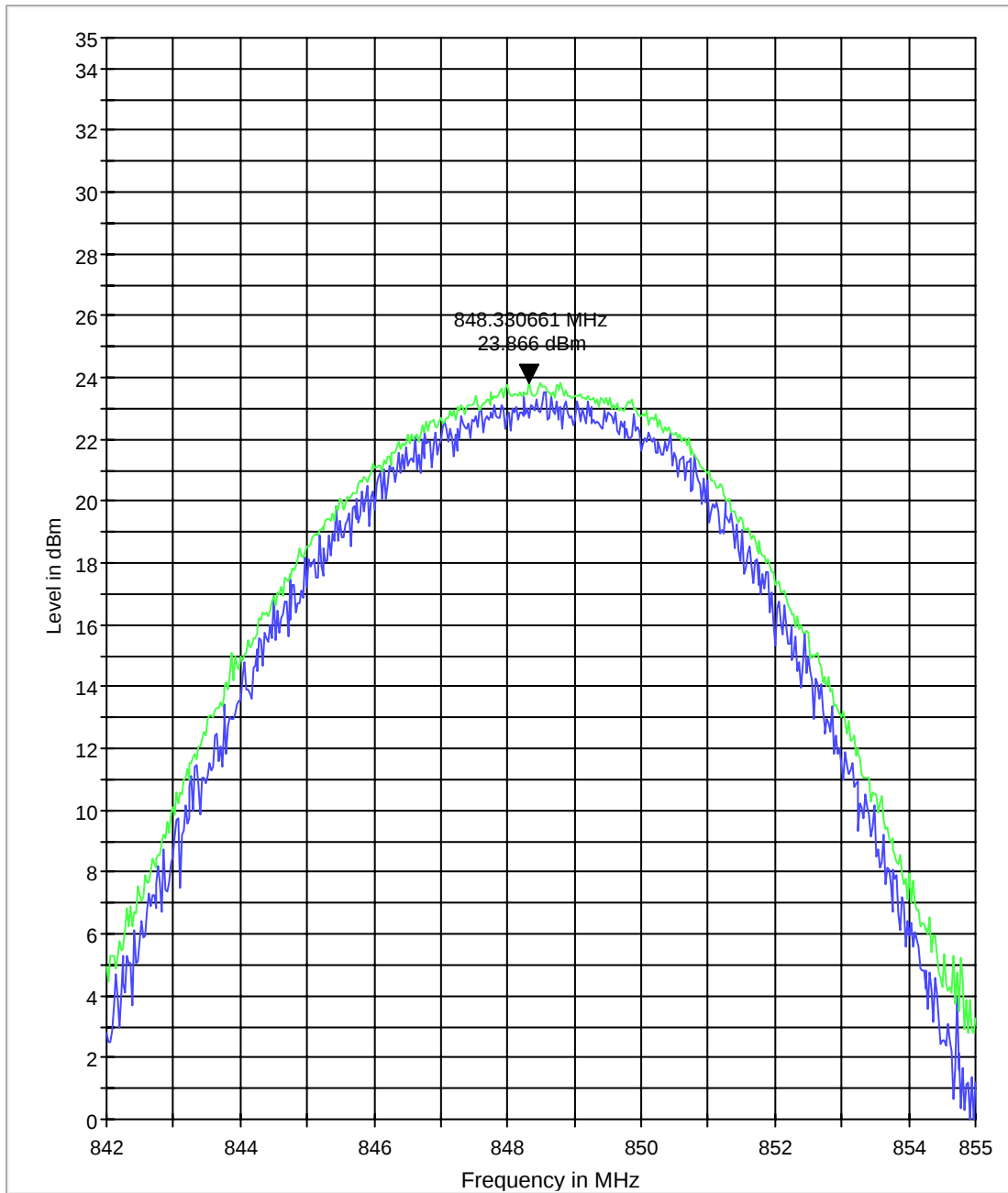


MaxPeak-ClearWrite

MaxPeak-MaxHold

**EIRP (800 band) EVDO
CHANNEL 777****§22.913(a)**

ERP 850 H



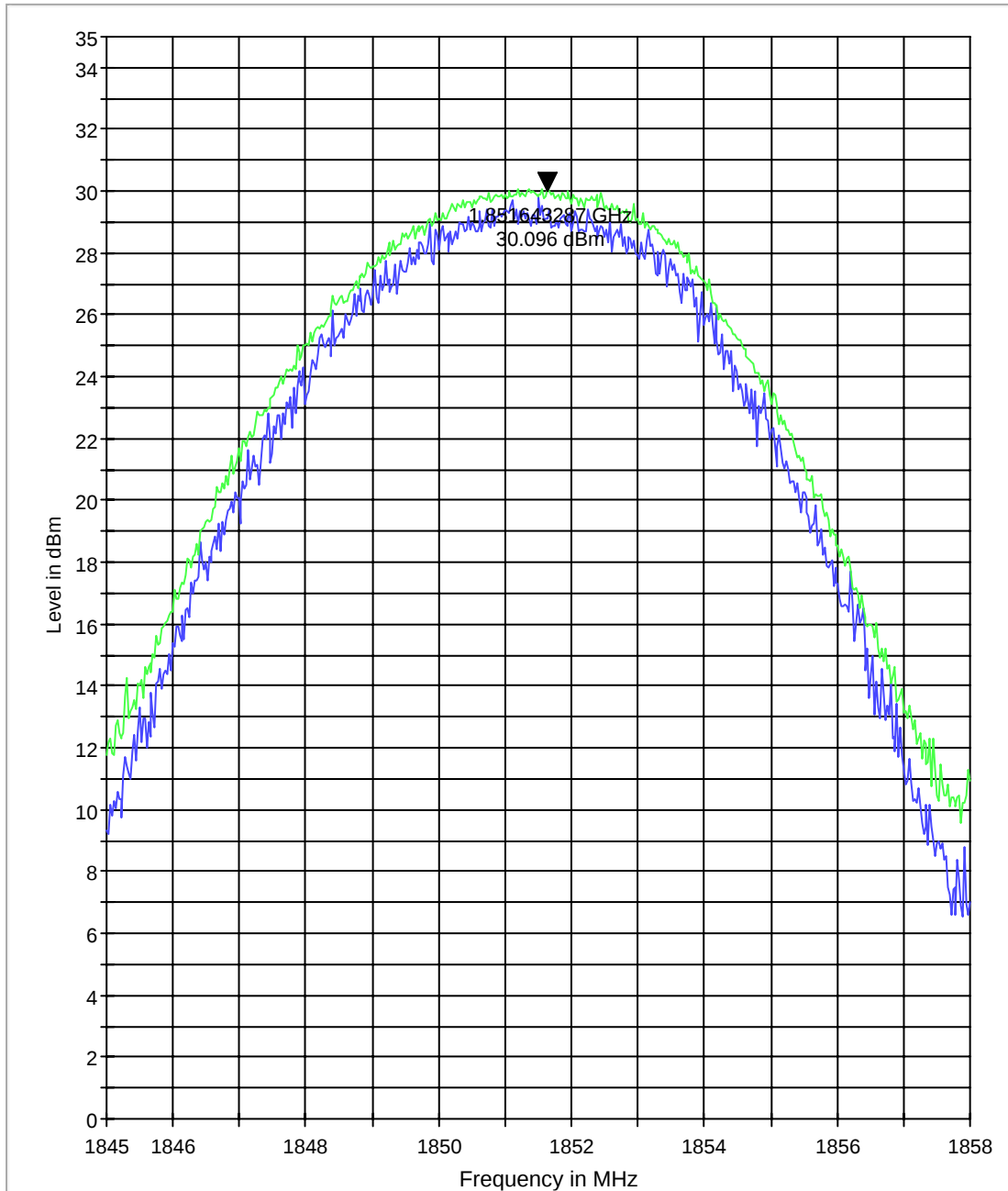
— MaxPeak-ClearWrite

— MaxPeak-MaxHold

**EIRP (PCS-1900) CDMA
CHANNEL 25**

§24.232(b)

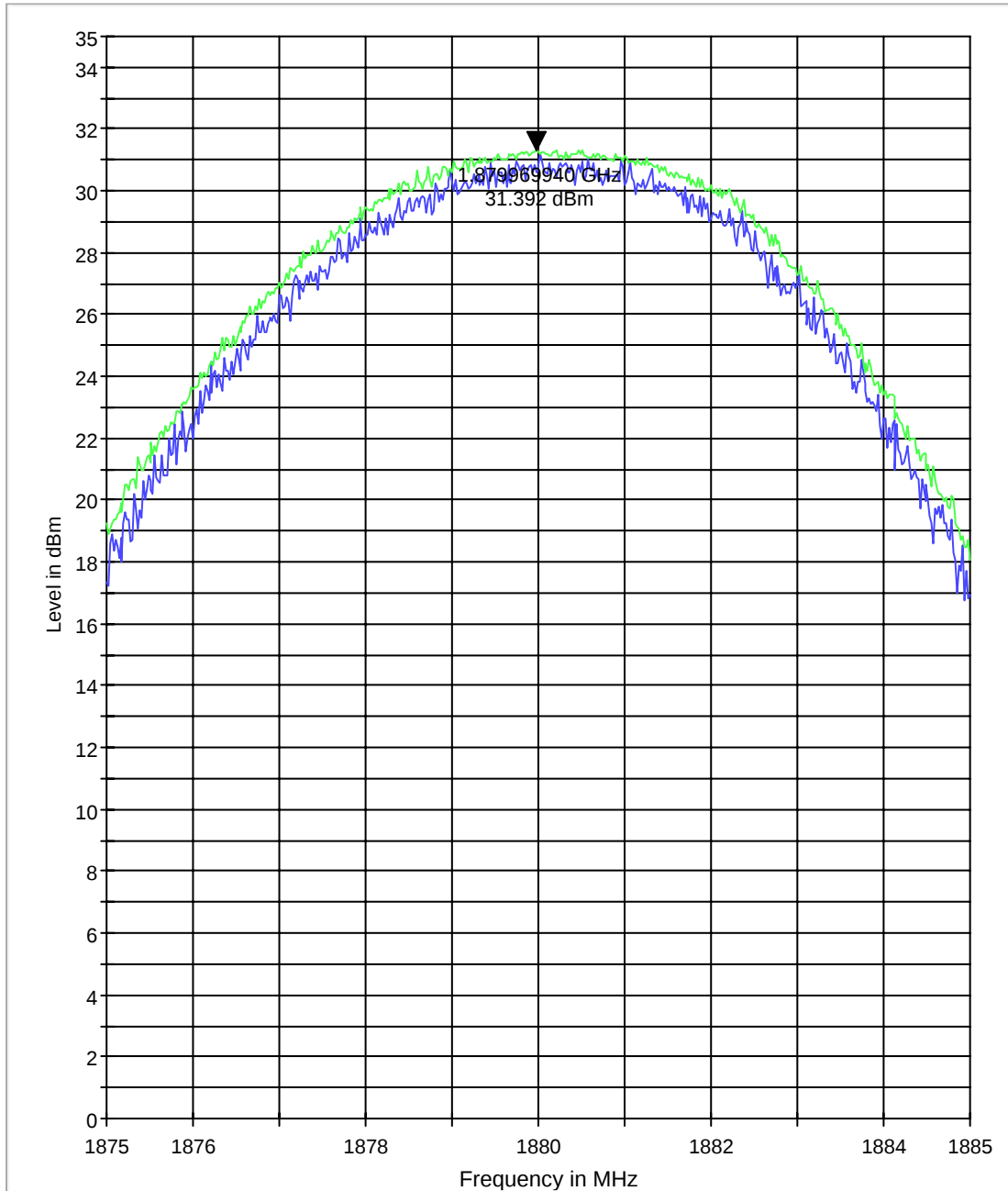
EIRP 1900 L



MaxPeak-ClearWrite MaxPeak-MaxHold

**EIRP (PCS-1900) CDMA
CHANNEL 600****§24.232(b)**

EIRP 1900 M



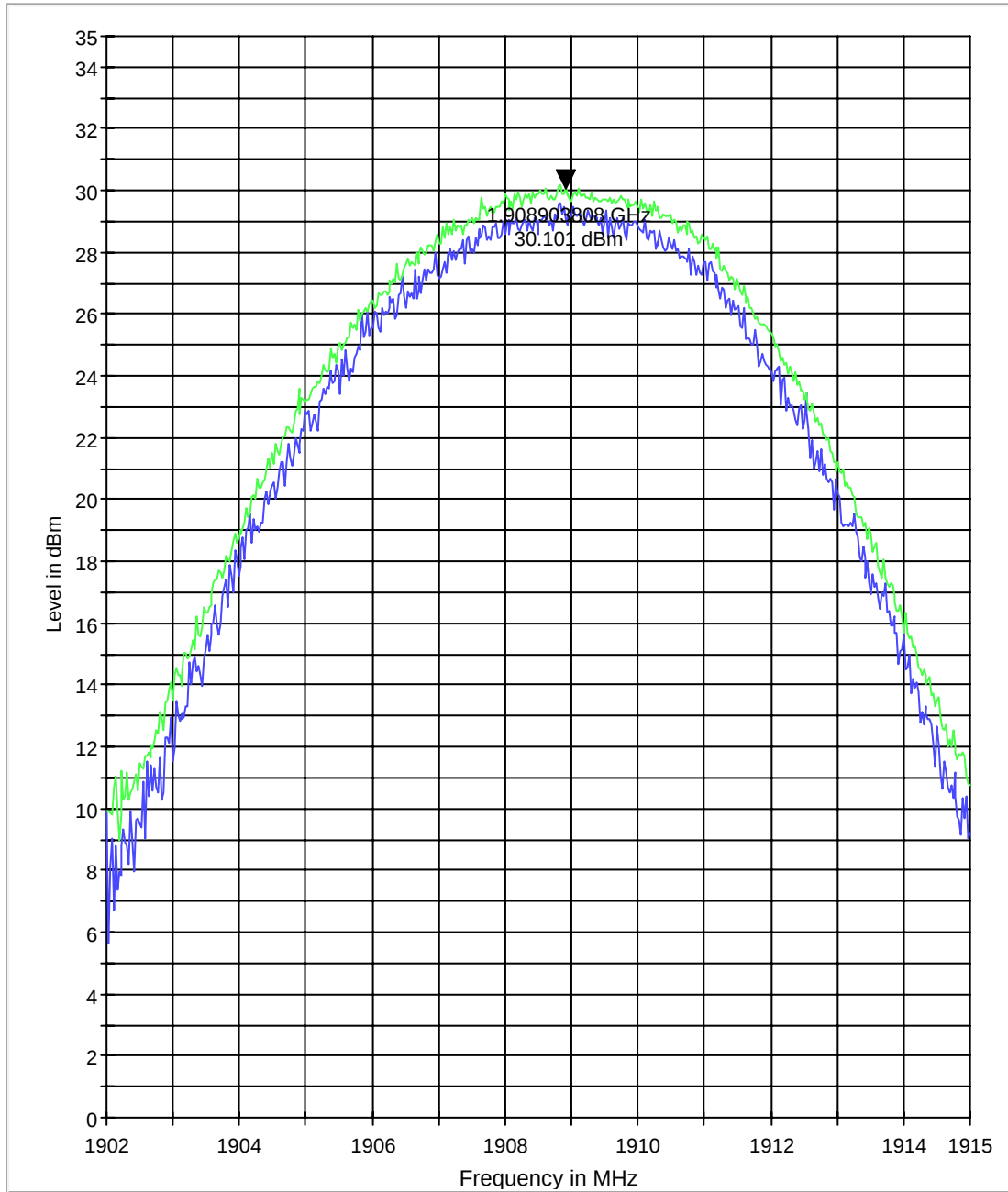
MaxPeak-ClearWrite

MaxPeak-MaxHold

**EIRP (PCS-1900) CDMA
CHANNEL 1175**

§24.232(b)

EIRP 1900 H



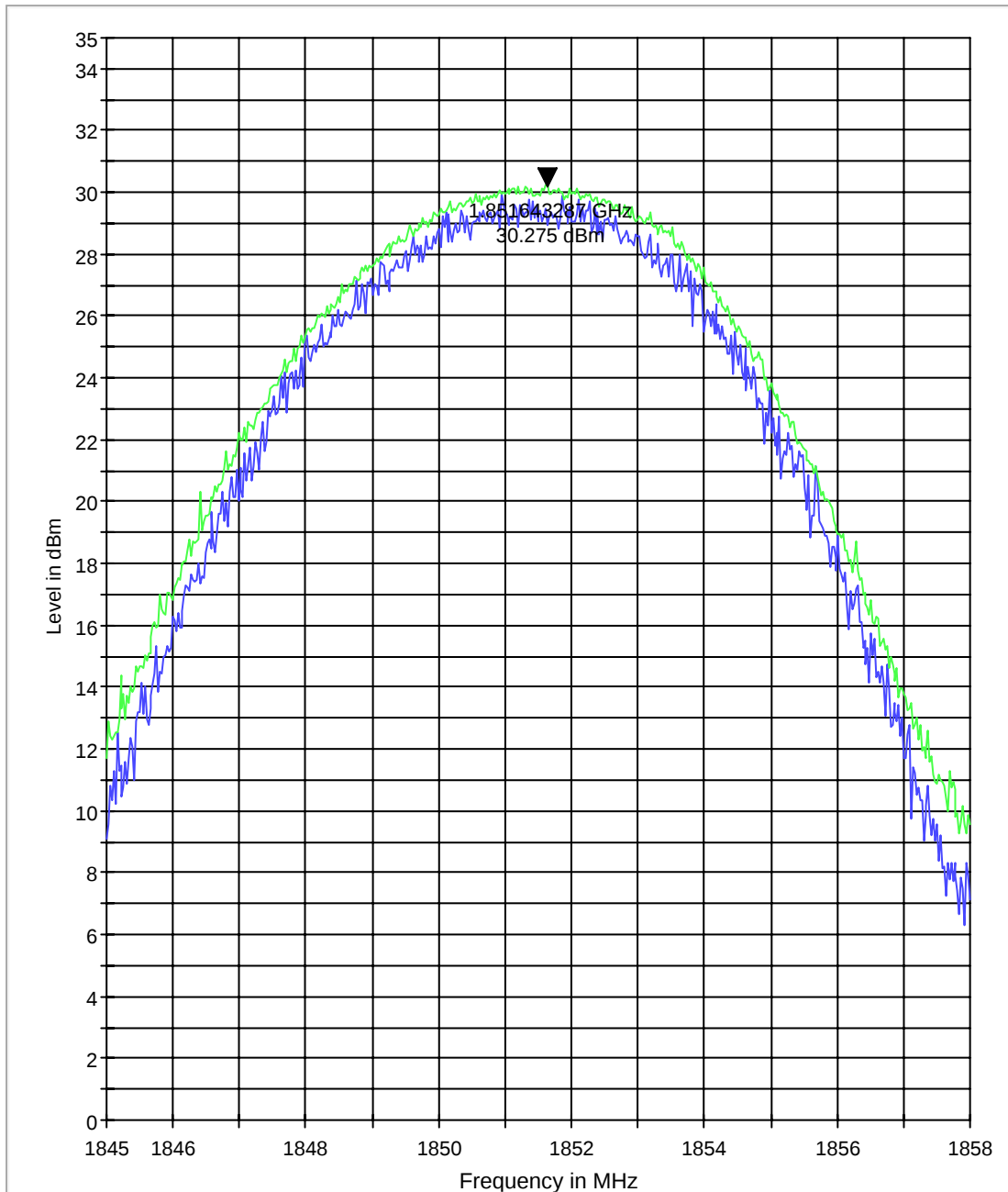
MaxPeak-ClearWrite

MaxPeak-MaxHold

**EIRP (PCS-1900) EVDO
CHANNEL 25**

§24.232(b)

EIRP 1900 L

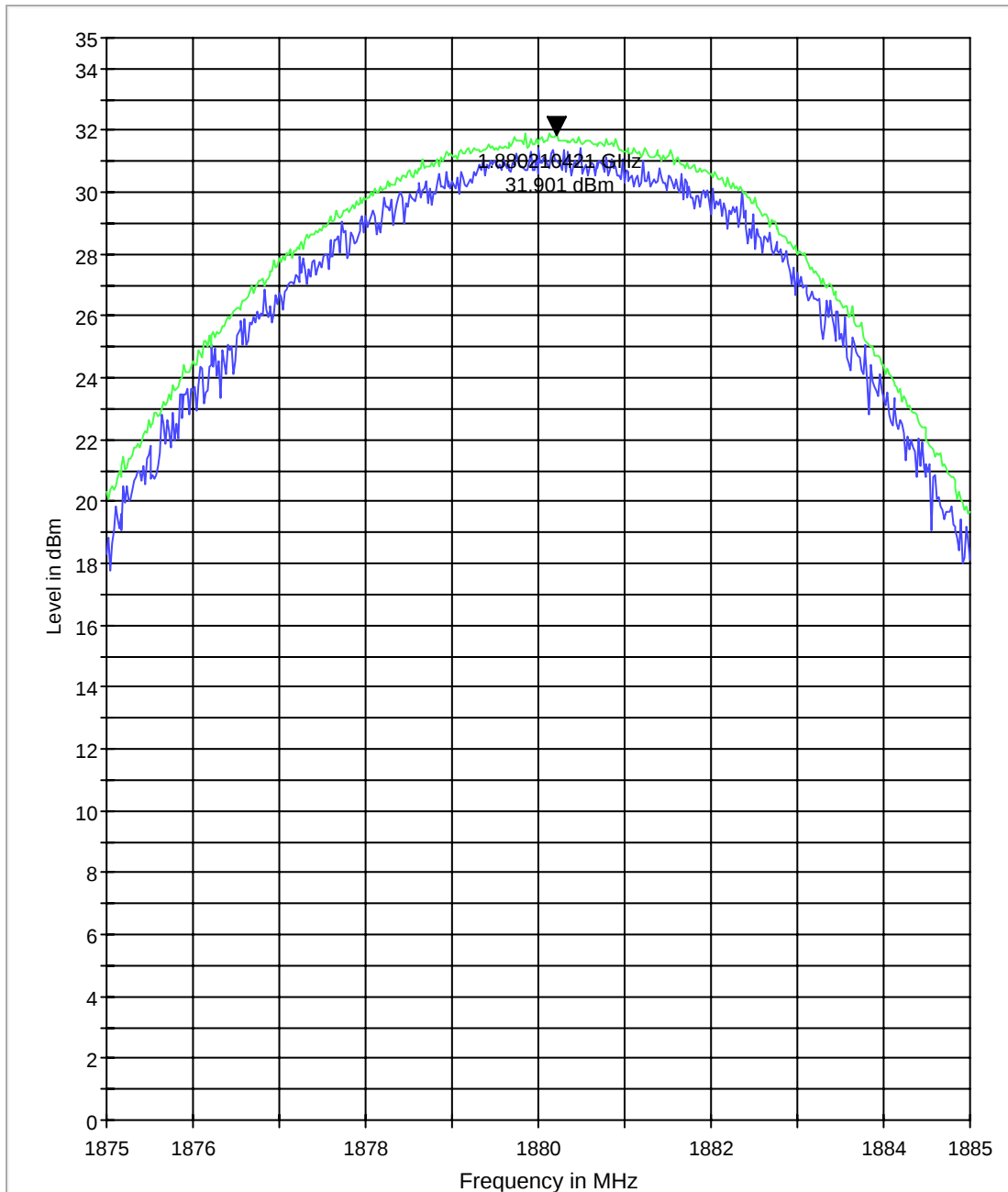


— MaxPeak-ClearWrite — MaxPeak-MaxHold

EIRP (PCS-1900) EVDO
CHANNEL 600

§24.232(b)

EIRP 1900 M

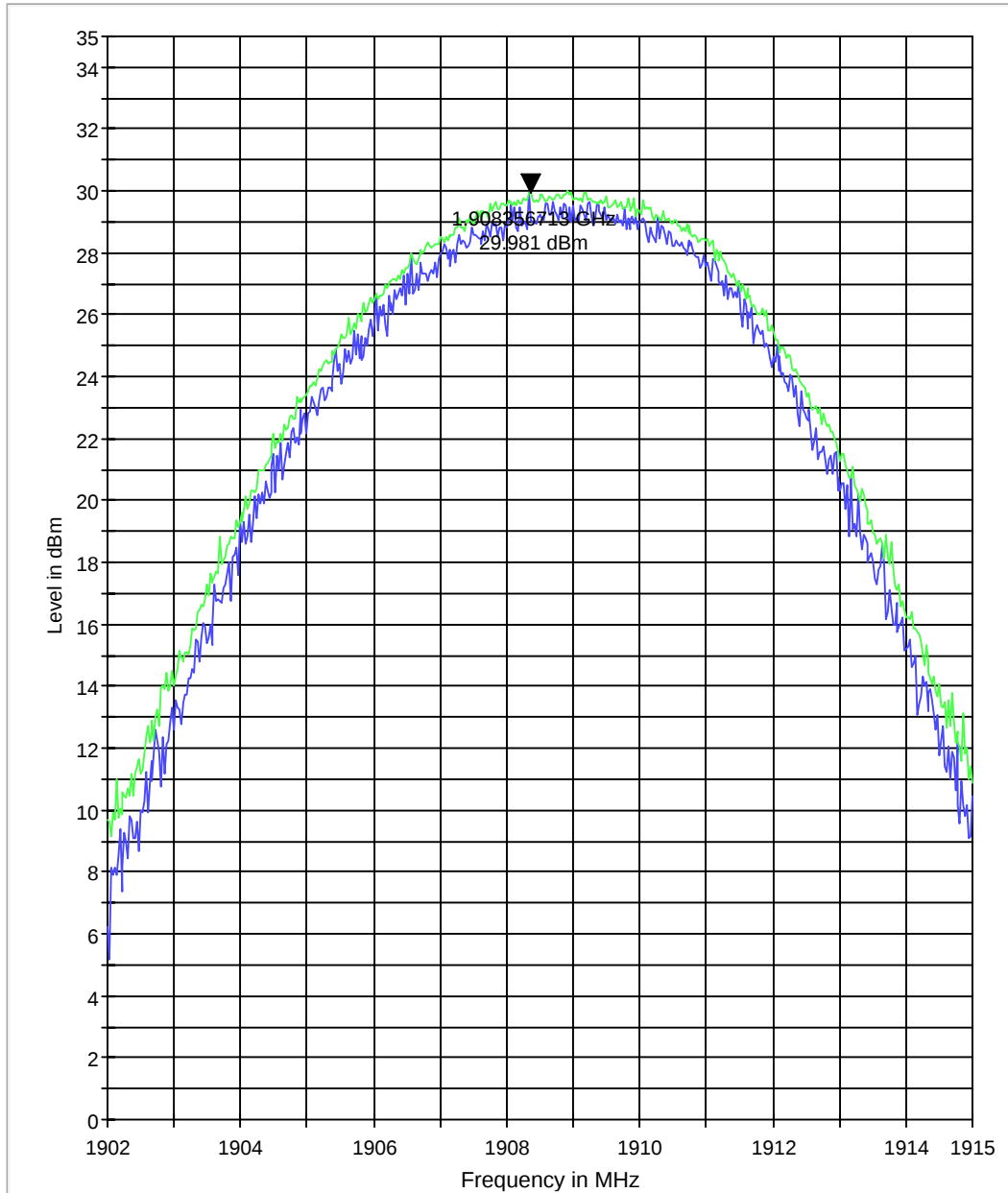


— MaxPeak-ClearWrite — MaxPeak-MaxHold

**EIRP (PCS-1900) EVDO
CHANNEL 1175**

§24.232(b)

EIRP 1900 H



— MaxPeak-ClearWrite — MaxPeak-MaxHold

5.2 Spurious Emissions Radiated

5.2.1 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.

5.2.2 Limits:

5.2.2.1 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.

5.2.2.2 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.

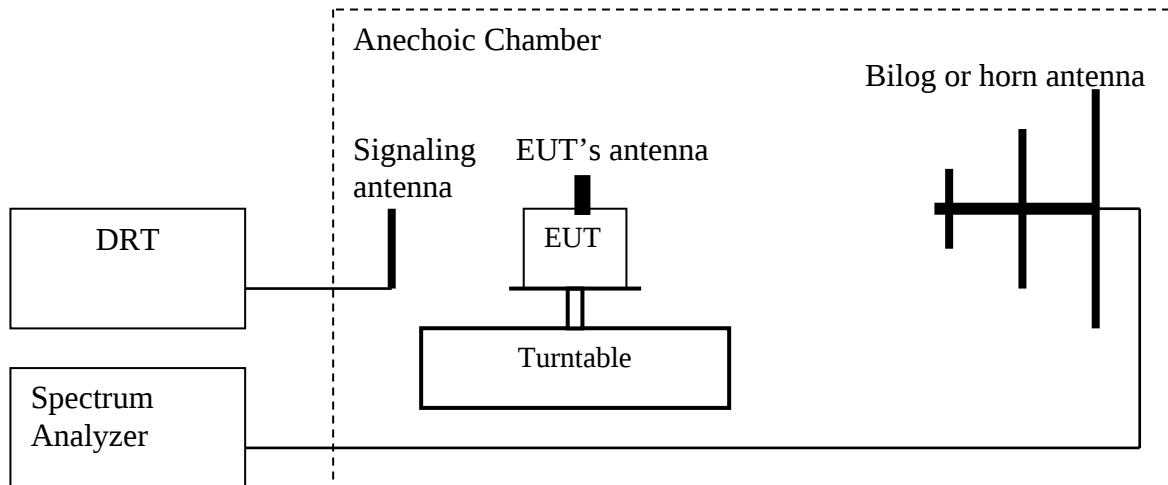
- (b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of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

5.2.3 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). $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$.
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.

5.2.4 Radiated out of band emissions results on EUT:**5.2.4.1 RESULTS OF RADIATED TESTS 800:**

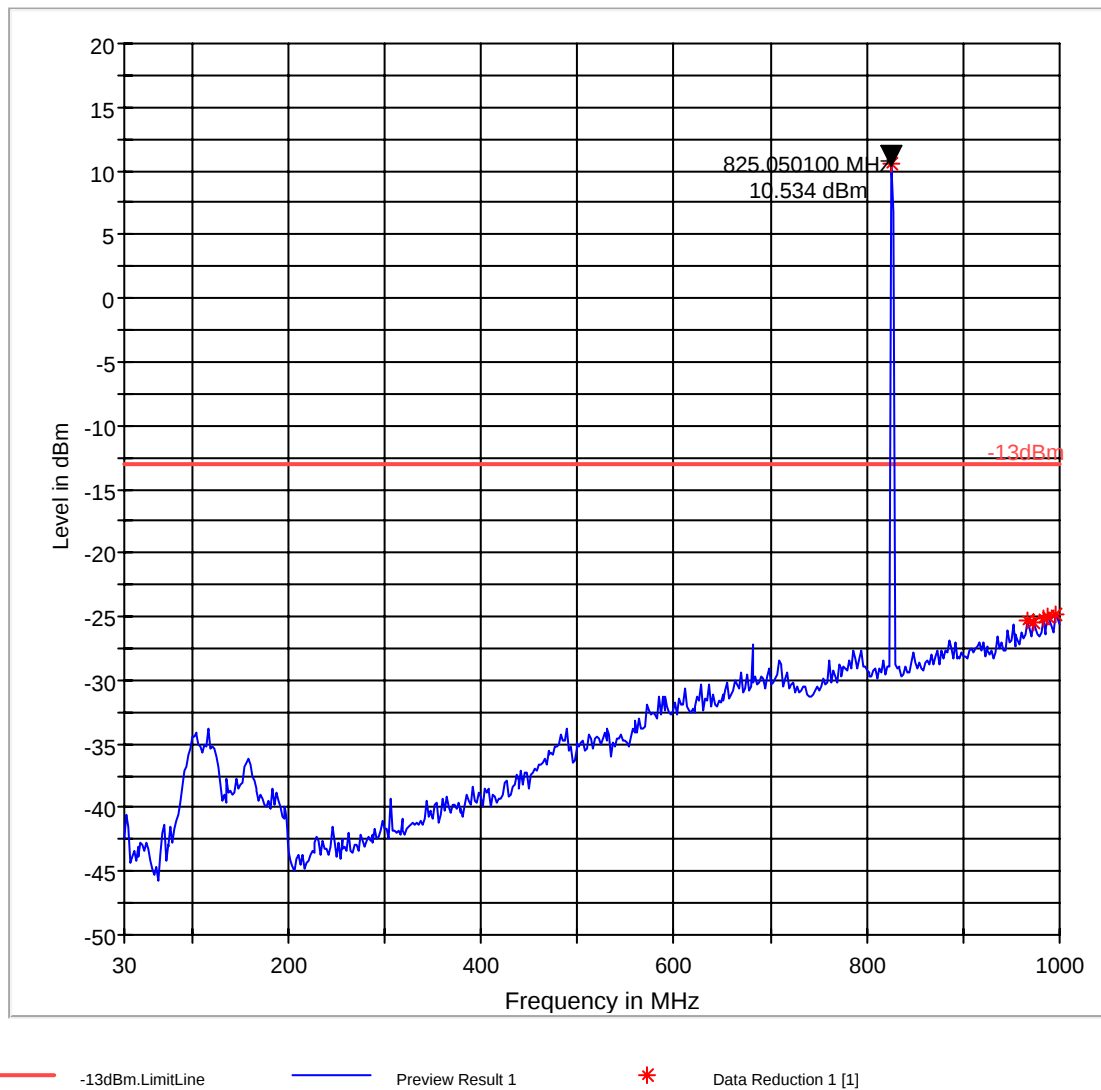
Harmonics	Tx ch-1013 Freq. (MHz)	Level (dBm)	Tx ch-600 Freq. (MHz)	Level (dBm)	Tx ch-777 Freq. (MHz)	Level (dBm)
2	1648.4	NF	1673.2	NF	1697.6	NF
3	2472.6	NF	2509.8	NF	2546.4	NF
4	3296.8	NF	3346.4	NF	3395.2	NF
5	4121	NF	4183	NF	4244	NF
6	4945.2	NF	5019.6	NF	5092.8	NF
7	5769.4	NF	5856.2	NF	5941.6	NF
8	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						

5.2.4.2 RADIATED SPURIOUS EMISSIONS (800 band CDMA)**TX: 30MHz - 1GHz**

Spurious emission limit -13dBm

Note: The peak above the limit line is the carrier freq.**FCC 22 30-1000MHz Low Channel**

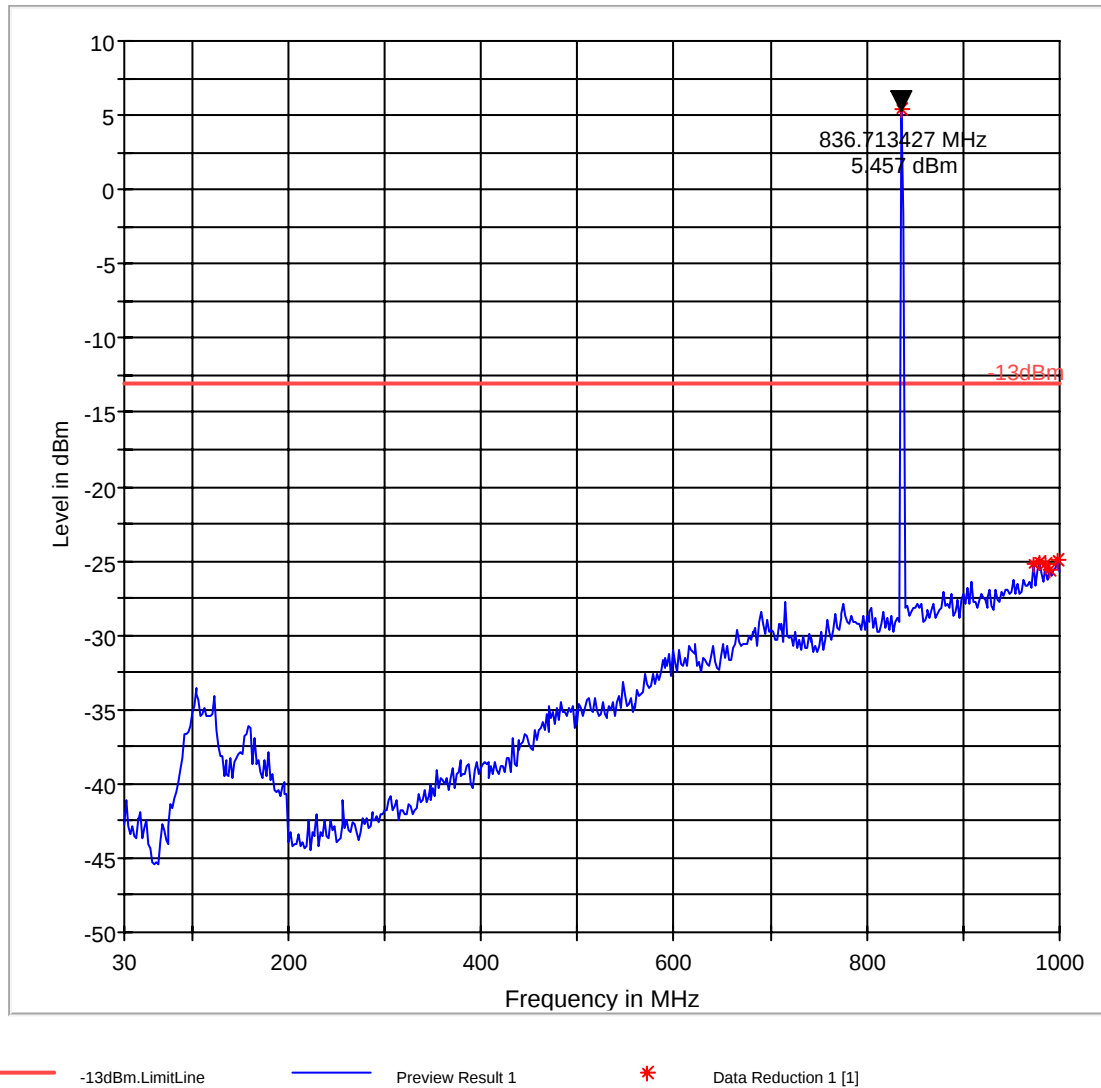
FCC 22 30-1000MHz



FCC 22 30-1000MHz Mid Channel

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

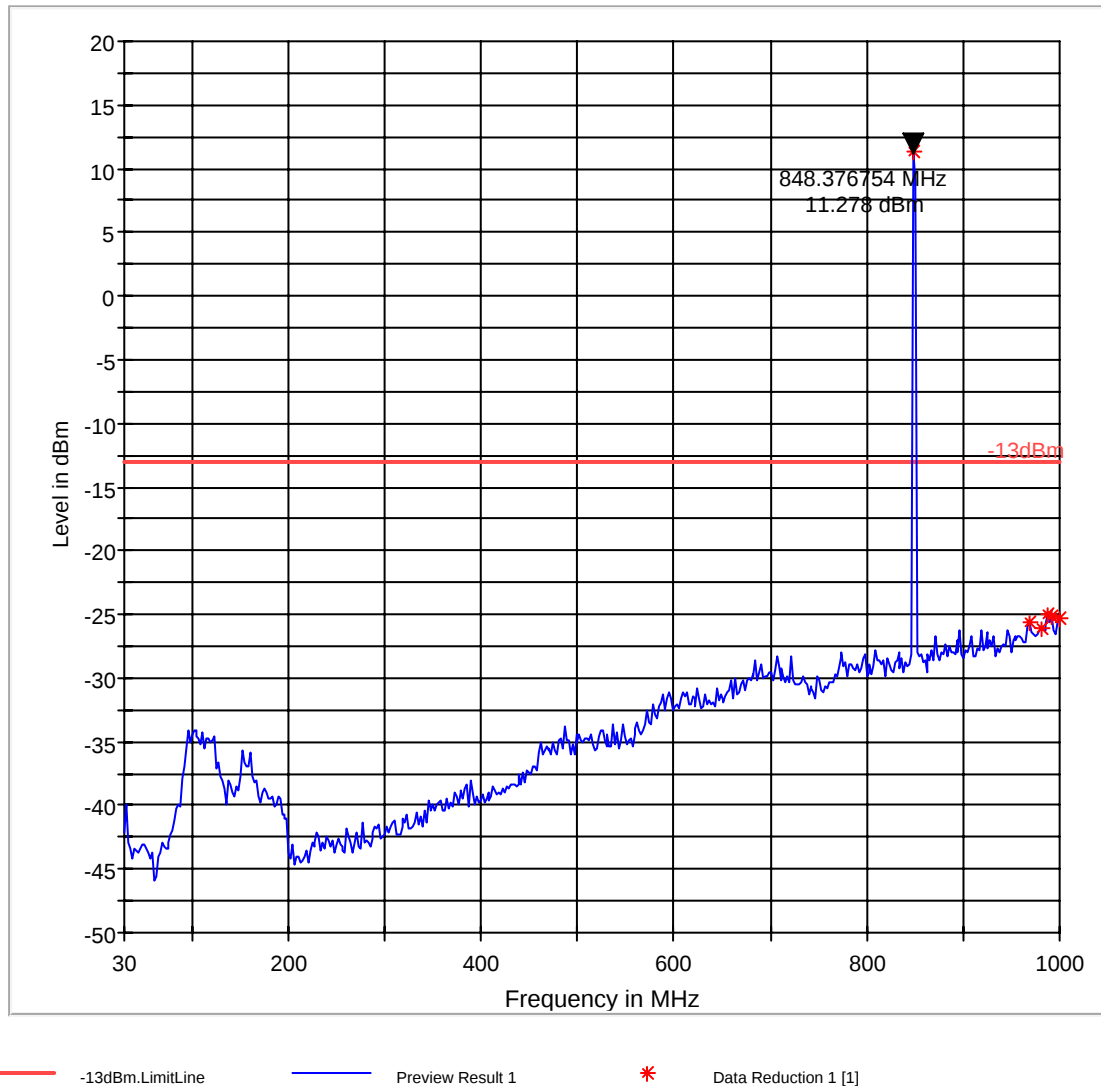
FCC 22 30-1000MHz



FCC 22 30-1000MHz High Channel

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

FCC 22 30-1000MHz

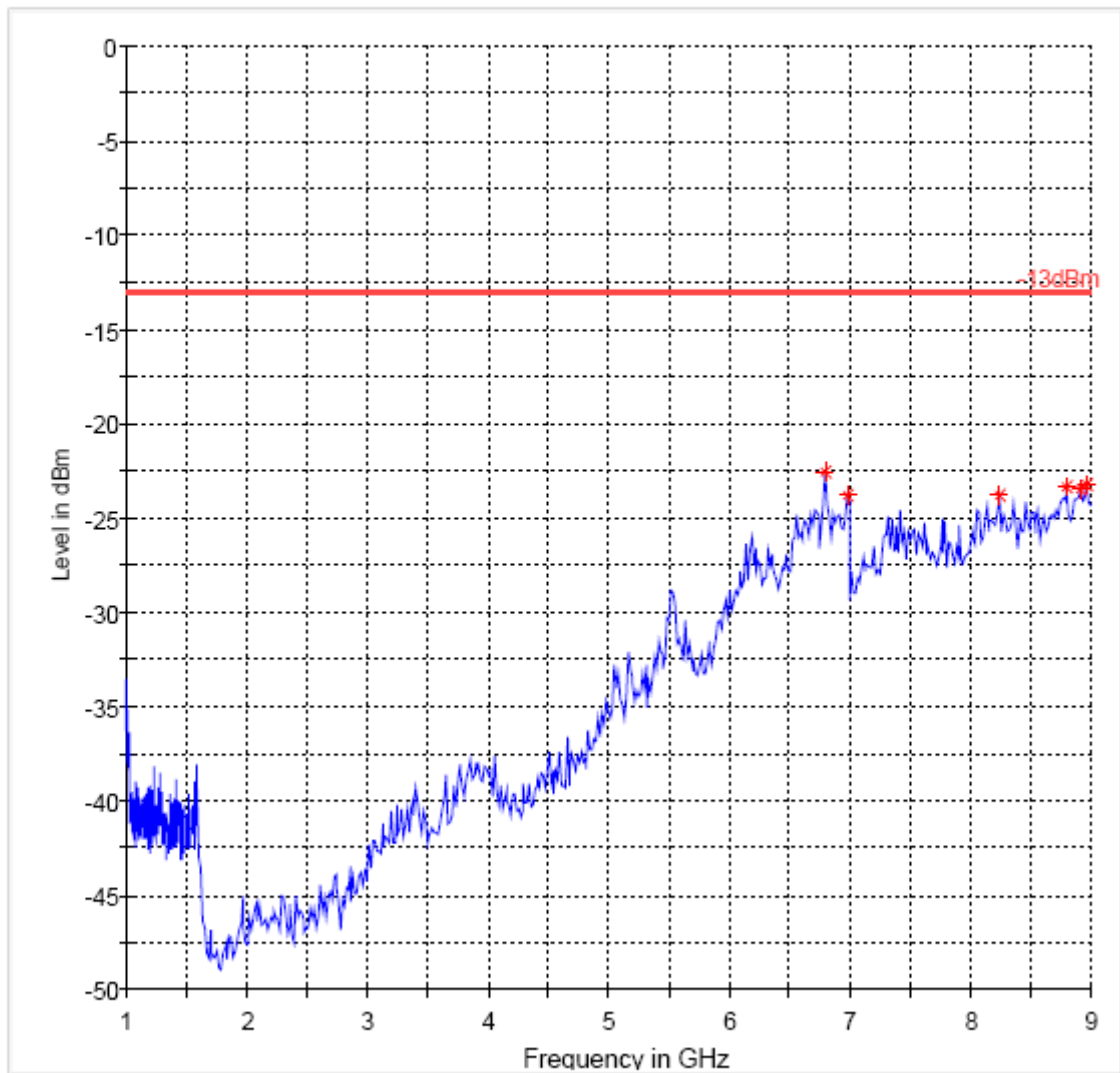


RADIATED SPURIOUS EMISSIONS (800 band CDMA)**Ch 1013****1GHz – 9GHz**

Spurious emission limit –13dBm

FCC 22 1-9GHz Low Channel

FCC 22 1-9GHz



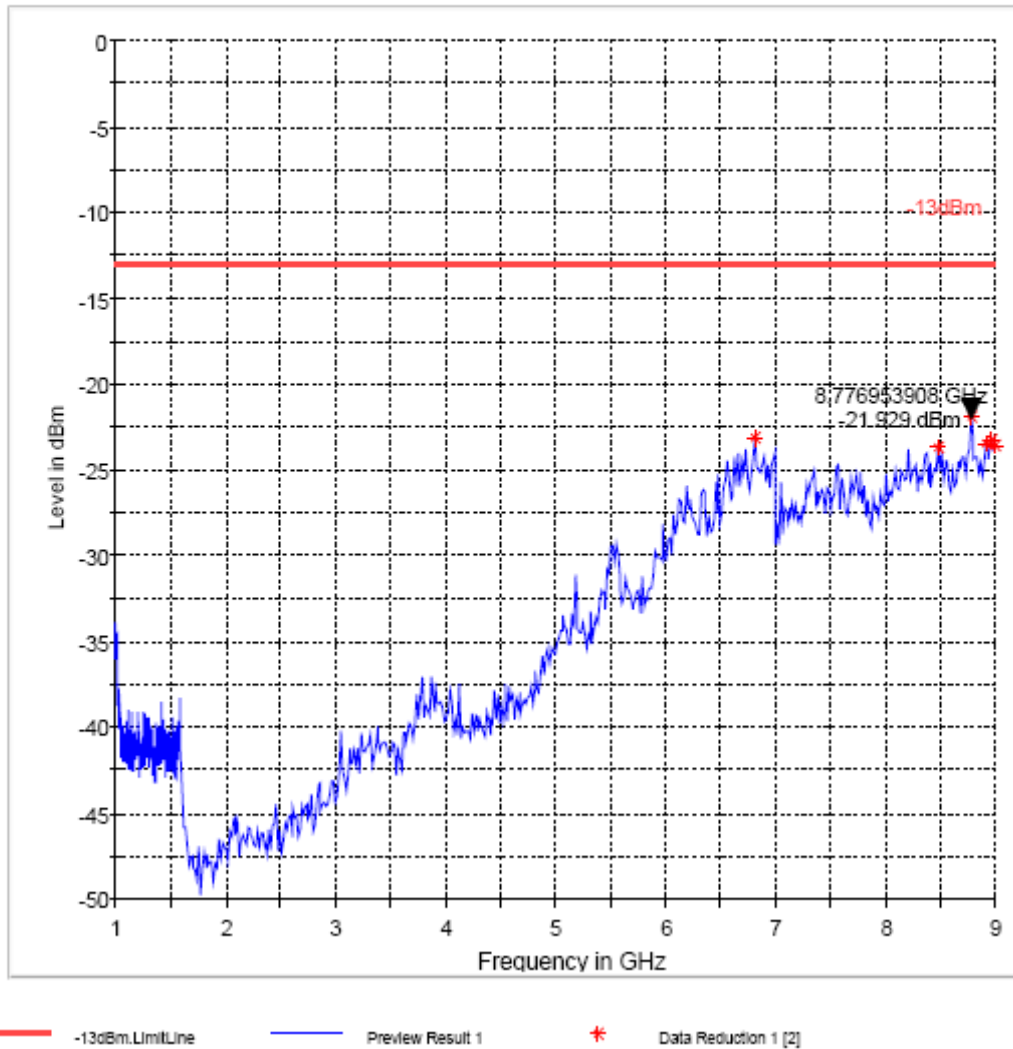
— -13dBm.LimitLine — Preview Result 1 * Data Reduction 1 [2]

RADIATED SPURIOUS EMISSIONS (800 band CDMA)**Ch 384****1GHz – 9GHz**

Spurious emission limit -13dBm

FCC 22 1-9GHz Mid Channel

FCC 22 1-9GHz



RADIATED SPURIOUS EMISSIONS (800 band CDMA)

Ch 777

1GHz – 9GHz

Spurious emission limit -13dBm

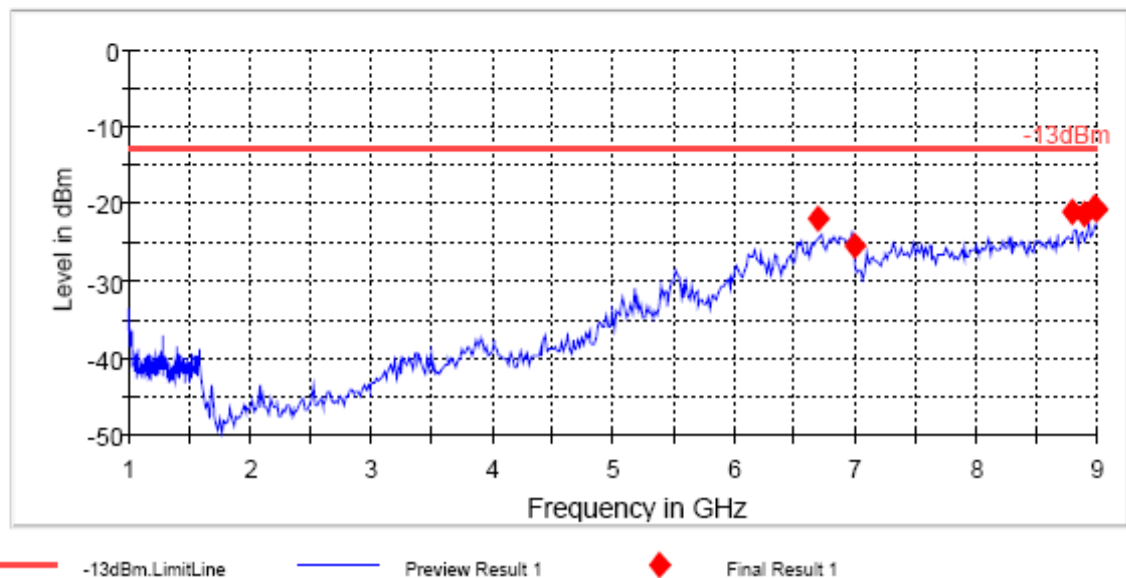
FCC 22 1-9GHz High Channel**Final Result 1**

Frequency (MHz)	MaxPeak (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
6704.377811	-21.9	1000.000	1000.000	100.0	H	6.0	-56.3	8.9	-13.0
7003.514743	-25.3	1000.000	1000.000	145.0	H	287.0	-56.4	12.3	-13.0
8795.840825	-21.0	1000.000	1000.000	132.0	H	267.0	-52.0	8.0	-13.0
8895.369148	-21.3	1000.000	1000.000	100.0	H	0.0	-51.8	8.3	-13.0
8983.611027	-20.6	1000.000	1000.000	133.0	H	254.0	-51.3	7.6	-13.0
8994.679359	-20.8	1000.000	1000.000	145.0	H	6.0	-51.2	7.8	-13.0

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Comment
6704.377811	
7003.514743	
8795.840825	
8895.369148	
8983.611027	
8994.679359	

FCC 22 1-9GHz



5.2.4.3 RESULTS OF RADIATED TESTS PCS-1900:

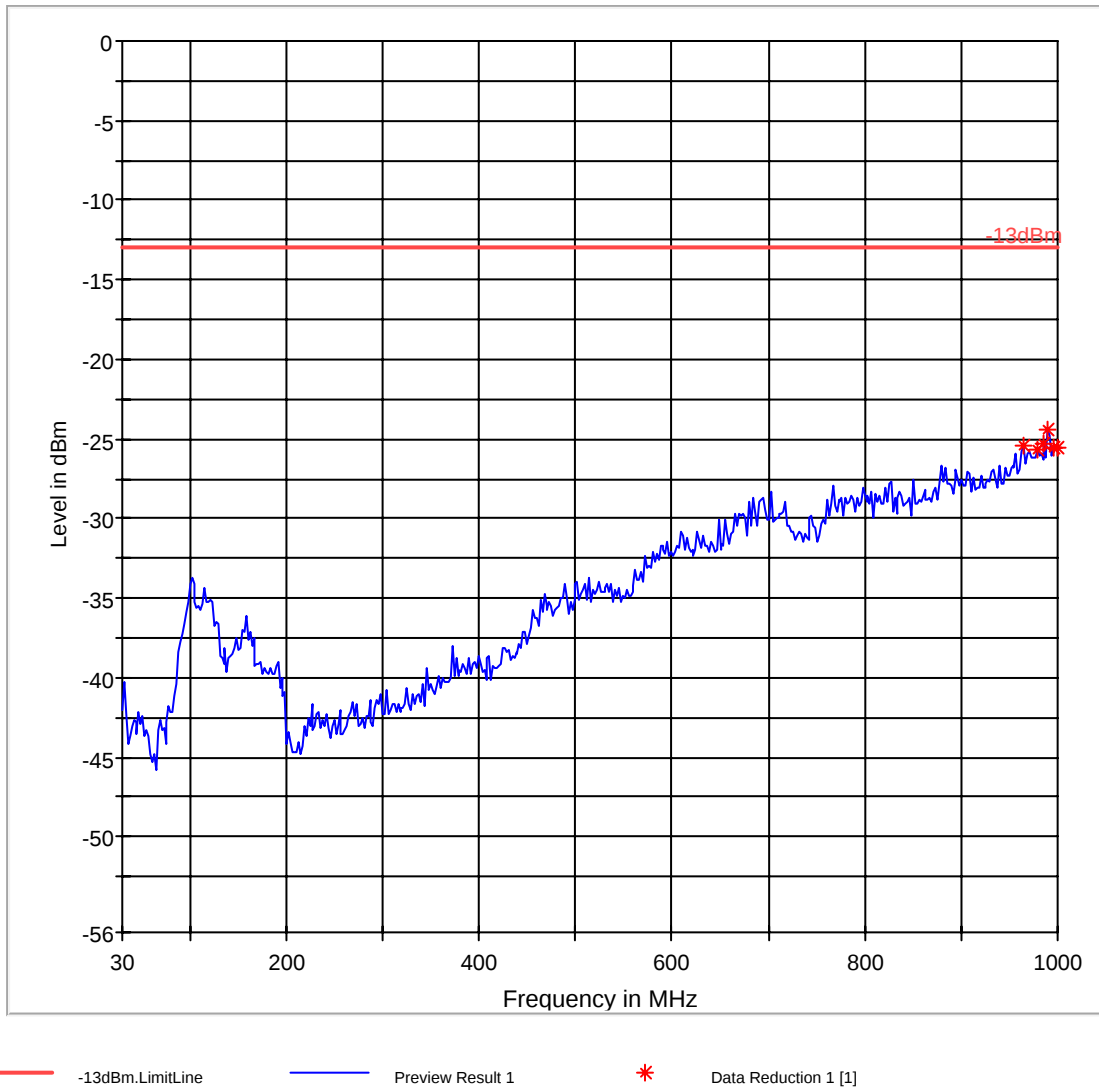
Harmonic	Tx ch-25 Freq.(MHz)	Level (dBm)	Tx ch-600 Freq. (MHz)	Level (dBm)	Tx ch-1175 Freq. (MHz)	Level (dBm)
2	3700.4	NF	3760	NF	3819.6	NF
3	5550.6	NF	5640	NF	5729.4	NF
4	7400.8	NF	7520	NF	7639.2	NF
5	9251	NF	9400	NF	9549	NF
6	11101.2	NF	11280	NF	11458.8	NF
7	12951.4	NF	13160	NF	13368.6	NF
8	14801.6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

5.2.4.4 RADIATED SPURIOUS EMISSIONS(PCS 1900) CDMA**TX: 30MHz - 1GHz**

Spurious emission limit -13dBm

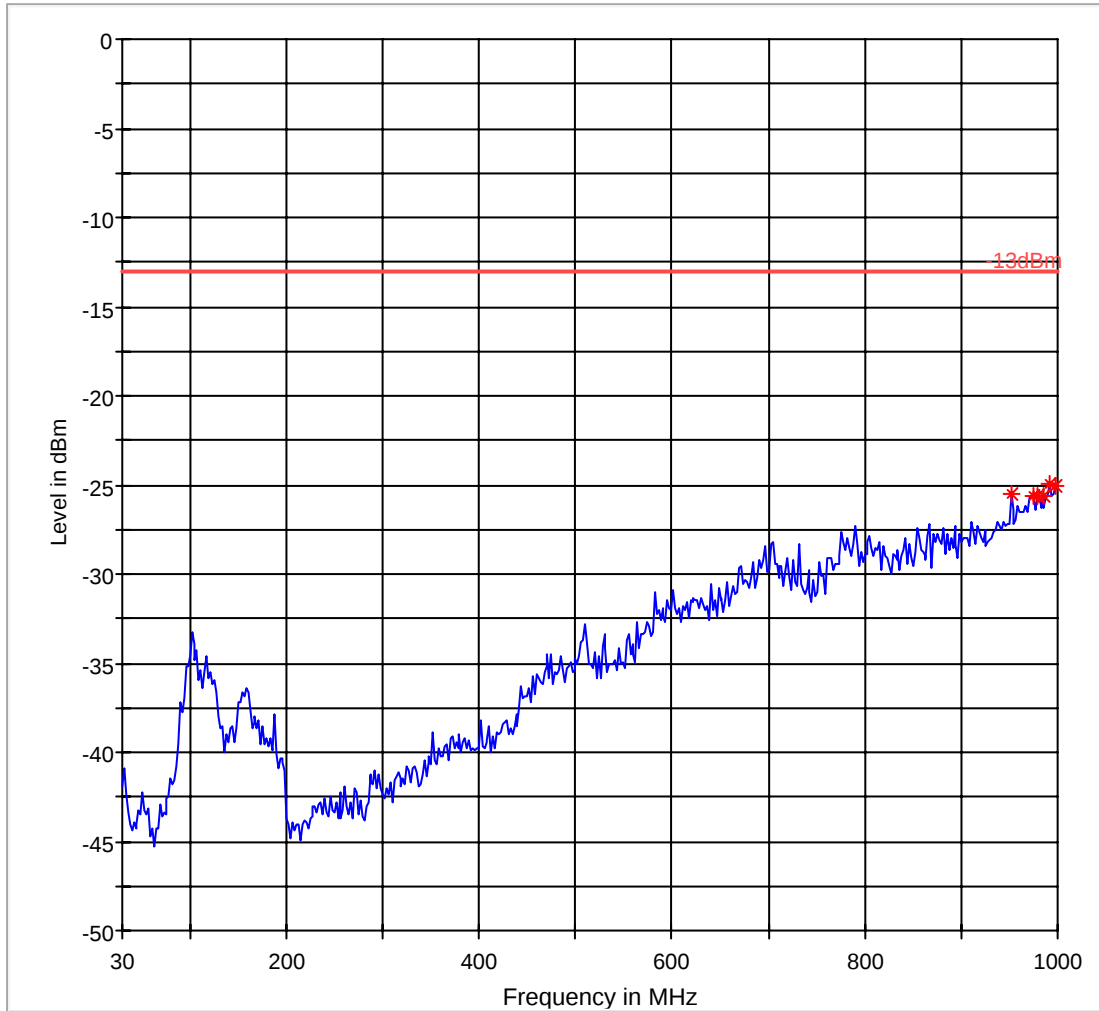
FCC 24 30-1000MHz Low Channel

FCC 22 30-1000MHz



FCC 24 30-1000MHz Mid Channel

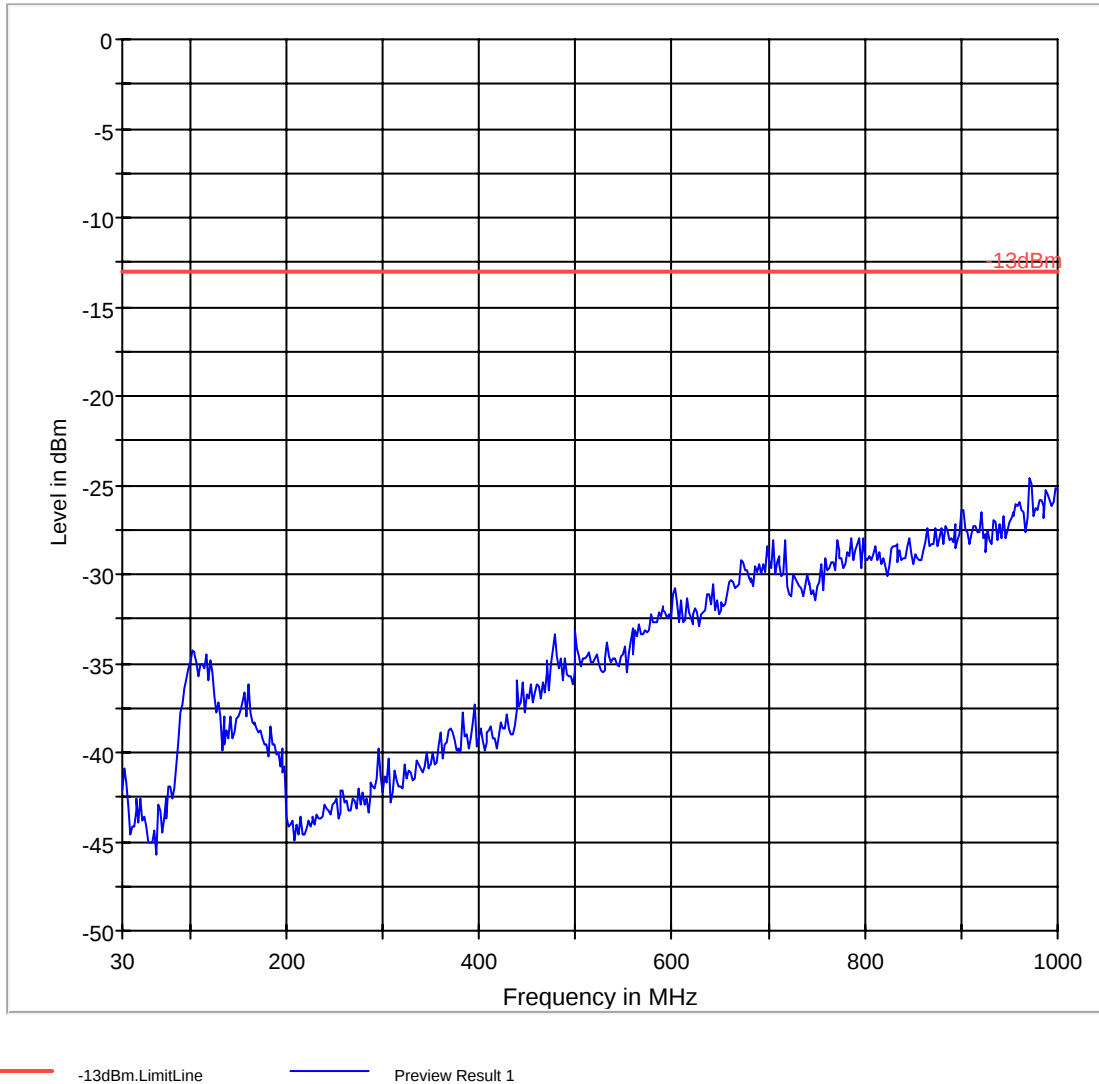
FCC 22 30-1000MHz



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

FCC 24 30-1000MHz High Channel

FCC 22 30-1000MHz



RADIATED SPURIOUS EMISSIONS(PCS 1900) CDMA**Ch 25****1GHz – 18GHz**

Spurious emission limit -13dBm

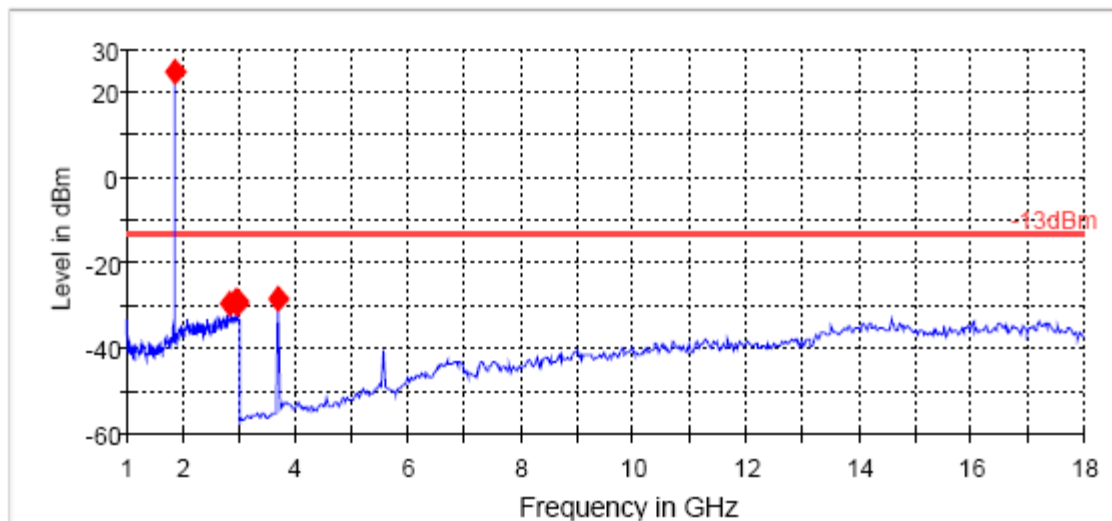
Note: The peak above the limit line is the carrier freq. at ch-25.**FCC 24 1-18GHz Low Channel****Final Result 1**

Frequency (MHz)	MaxPeak (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
1851.497204	24.8	1000.000	1000.000	145.0	V	267.0	-70.4	-37.8	-13.0
2834.245338	-29.3	1000.000	1000.000	120.0	H	165.0	-66.6	16.3	-13.0
2950.491687	-28.9	1000.000	1000.000	100.0	H	278.0	-65.5	15.9	-13.0
2960.360029	-29.0	1000.000	1000.000	145.0	V	108.0	-65.3	16.0	-13.0
2985.065932	-29.7	1000.000	1000.000	145.0	H	292.0	-65.3	16.7	-13.0
3701.998315	-28.5	1000.000	1000.000	133.0	H	0.0	-92.9	15.5	-13.0

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Comment
1851.497204	
2834.245338	
2950.491687	
2960.360029	
2985.065932	
3701.998315	

FCC 24 1-18GHz

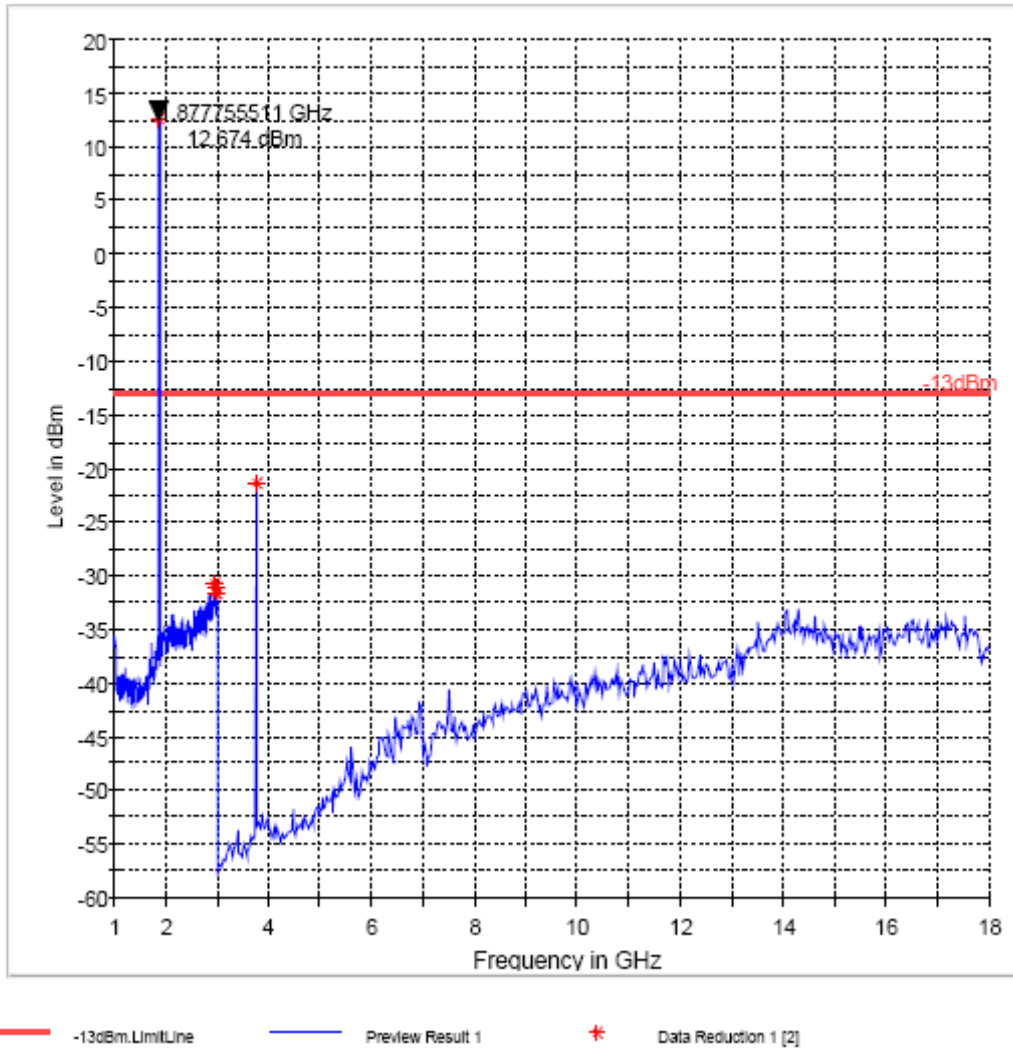


— -13dBm.LimitLine
 — Preview Result 1
 ◆ Final Result 1

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

FCC 24 1-18GHz Mid Channel

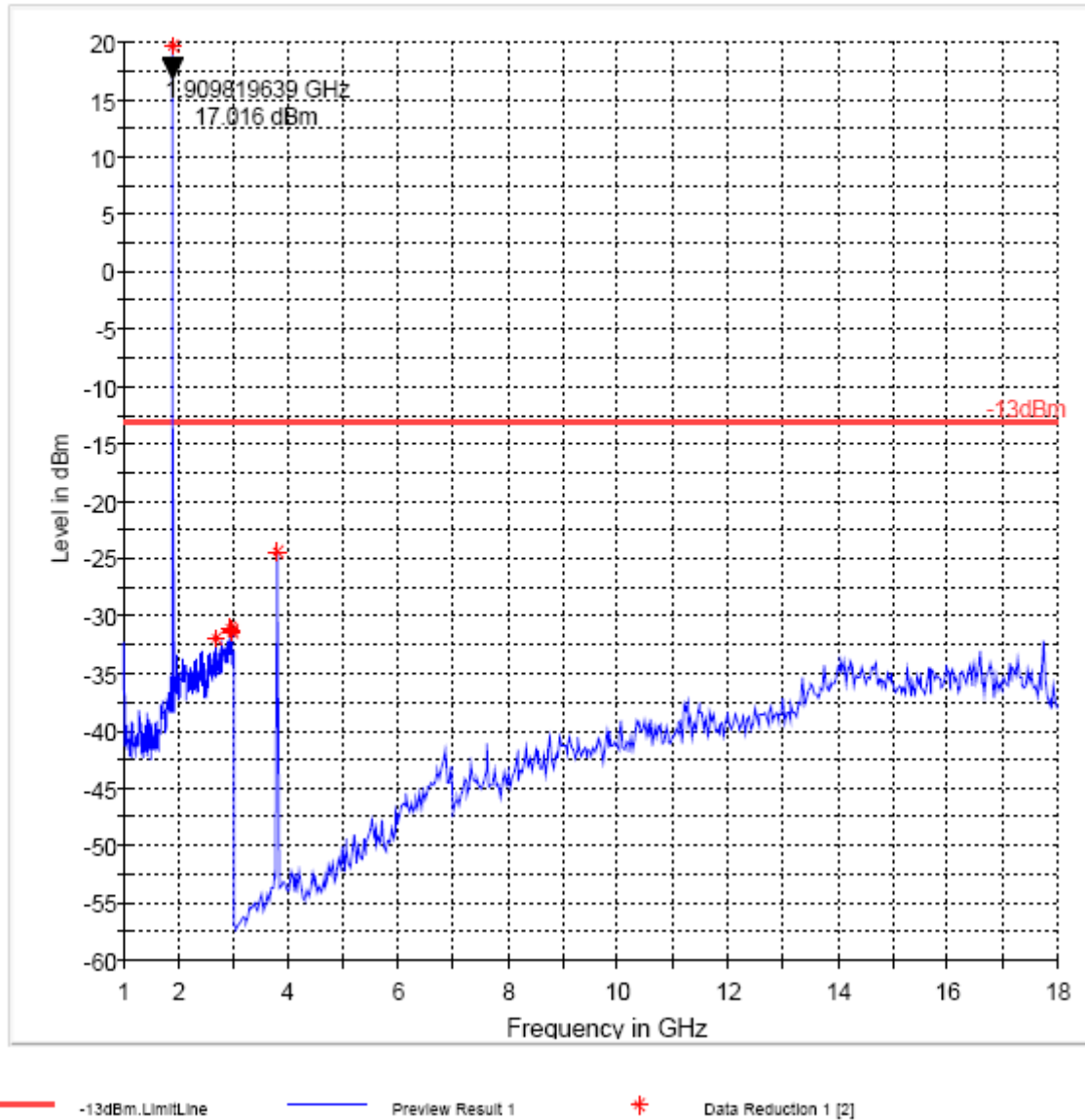
FCC 24 1-18GHz

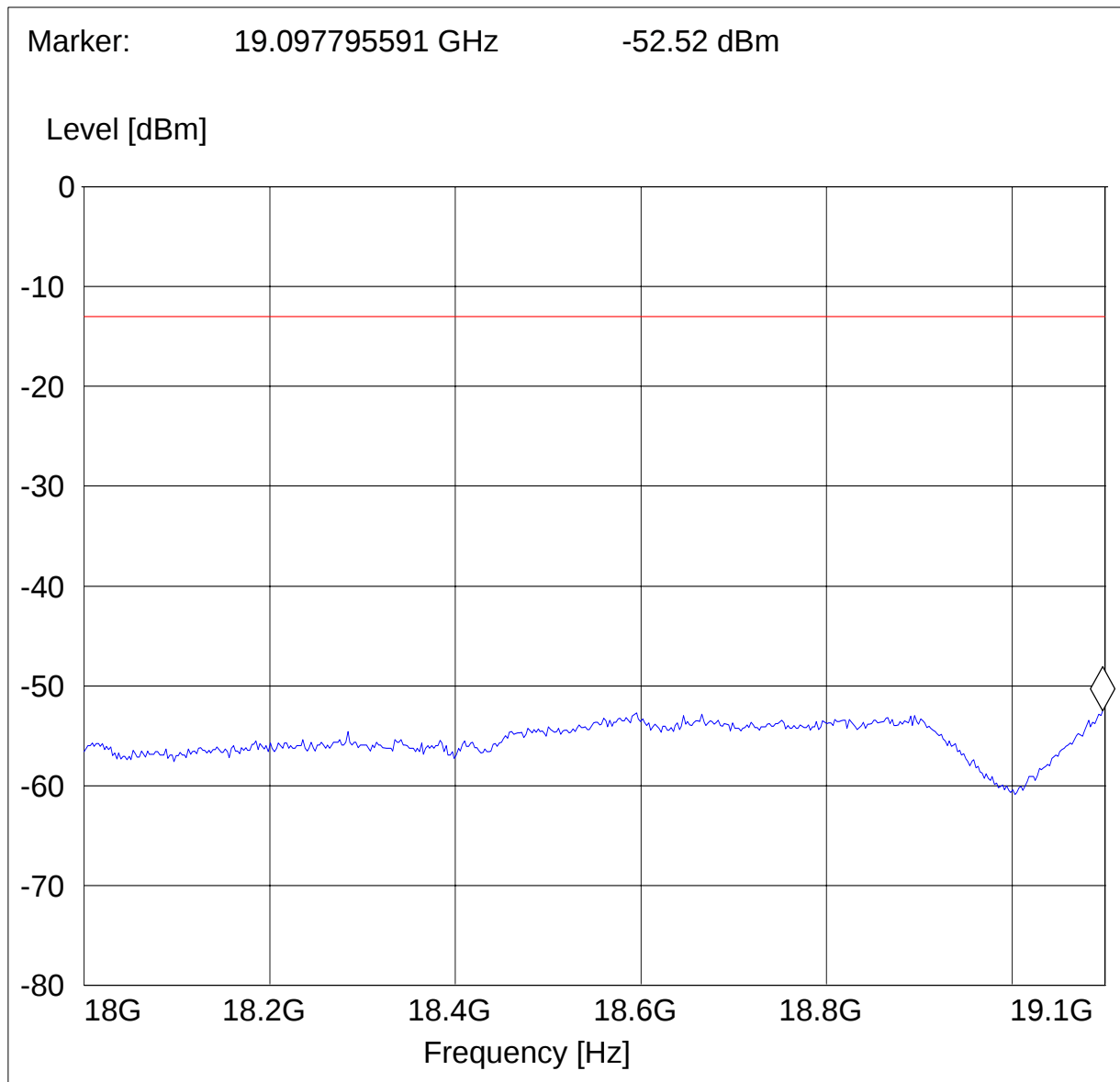


Note: The peak above the limit line is the carrier freq.

FCC 24 1-18GHz High Channel

FCC 24 1-18GHz



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

5.3 RECEIVER RADIATED EMISSIONS**§ 2.1053 / RSS-129 & 133****NOTE:**

1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3GHz and 26.5GHz very short cable connections to the antenna was used to minimize the noise level.

Limits**SUBCLAUSE § RSS-133**

Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

5.3.1 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.

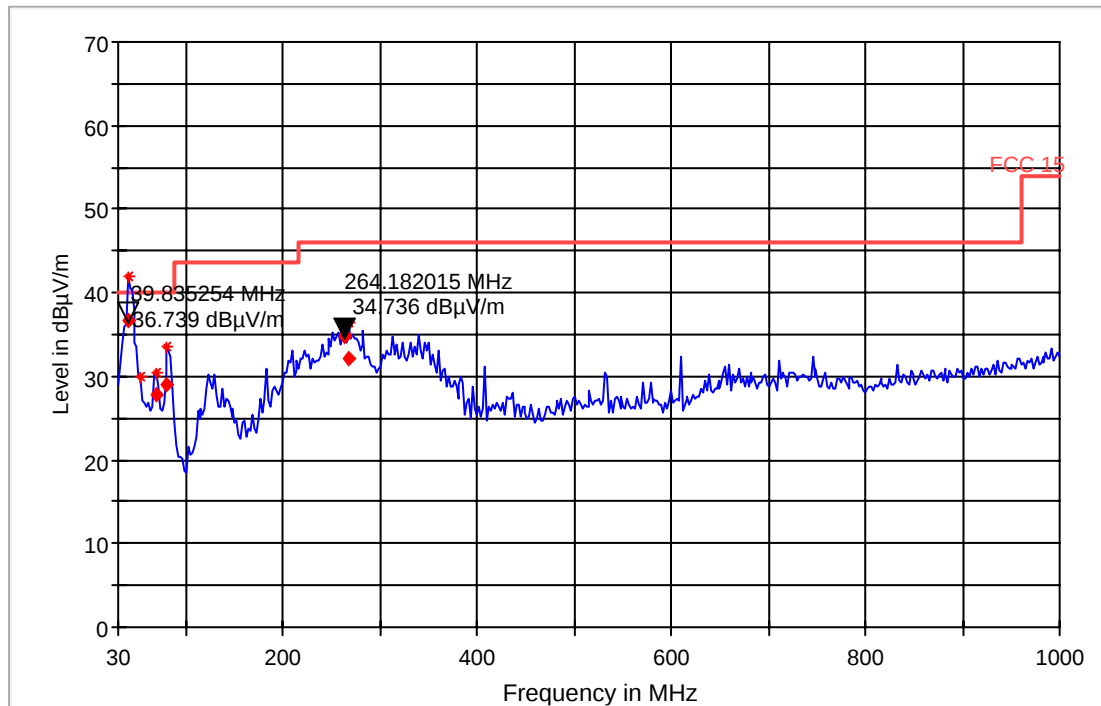
RECEIVER RADIATED SPURIOUS EMISSIONS**RX: 30MHz - 1GHz**

Spurious emission limit -13dBm

Note: This plot is valid for low, mid & high channels (worst-case plot)**Final Measurement Result 1**

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
39.835254	36.7	20.000	120.000	100.0	V	112.0	5.5	
68.635510	27.7	20.000	120.000	157.0	V	68.0	8.9	
80.551573	28.9	20.000	120.000	100.0	V	22.0	9.6	
264.182015	34.9	20.000	120.000	100.0	H	17.0	14.0	
264.182015	34.7	20.000	120.000	100.0	H	17.0	14.0	
268.077996	32.2	20.000	120.000	100.0	H	10.0	14.2	

FCC 15 30-1000MHz



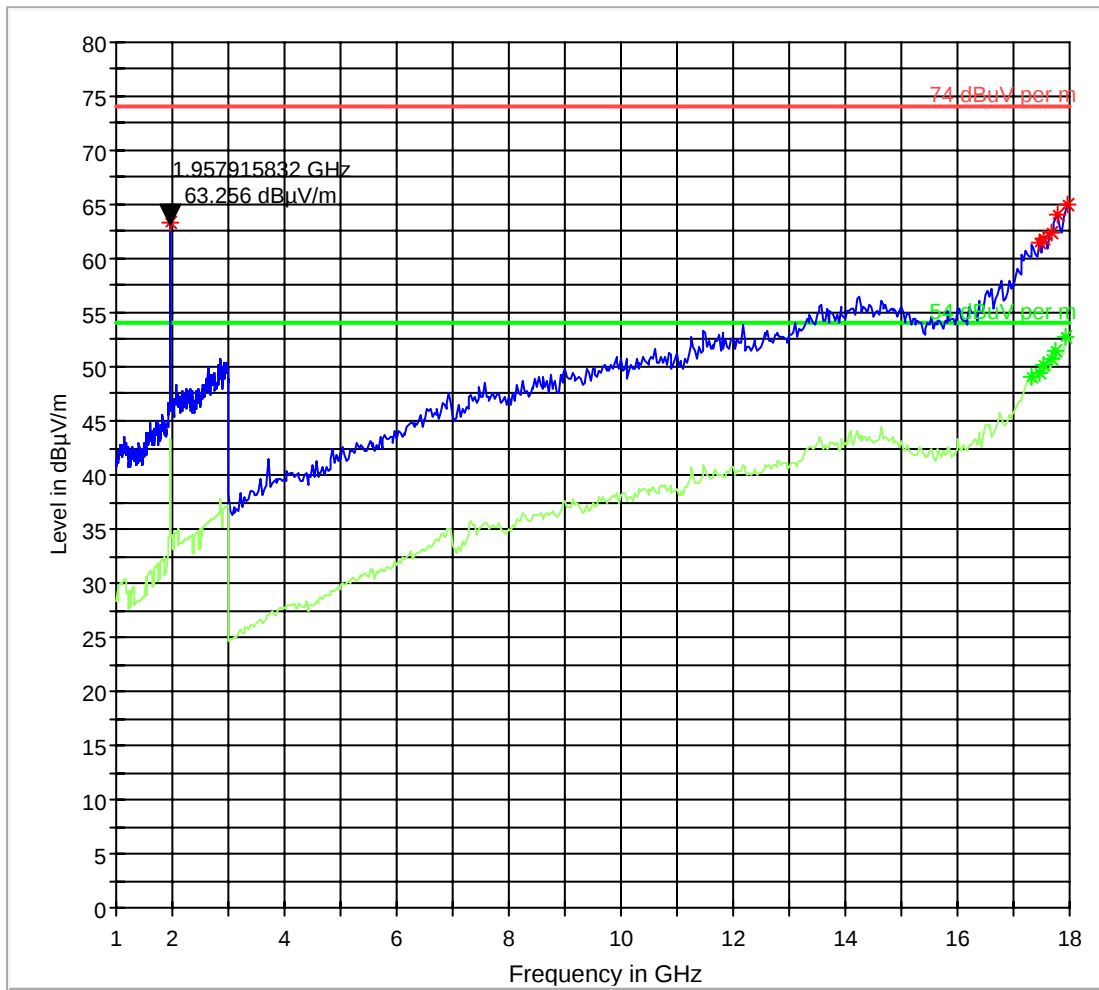
— FCC 15.LimitLine
* Data Reduction 1 [1]

— Preview Result 1
◆ Final Measurement Result 1

RECEIVER RADIATED SPURIOUS EMISSIONS
RX: 1GHz - 18GHz

Note: Marker placed on downlink

FCC 15 1-18GHz



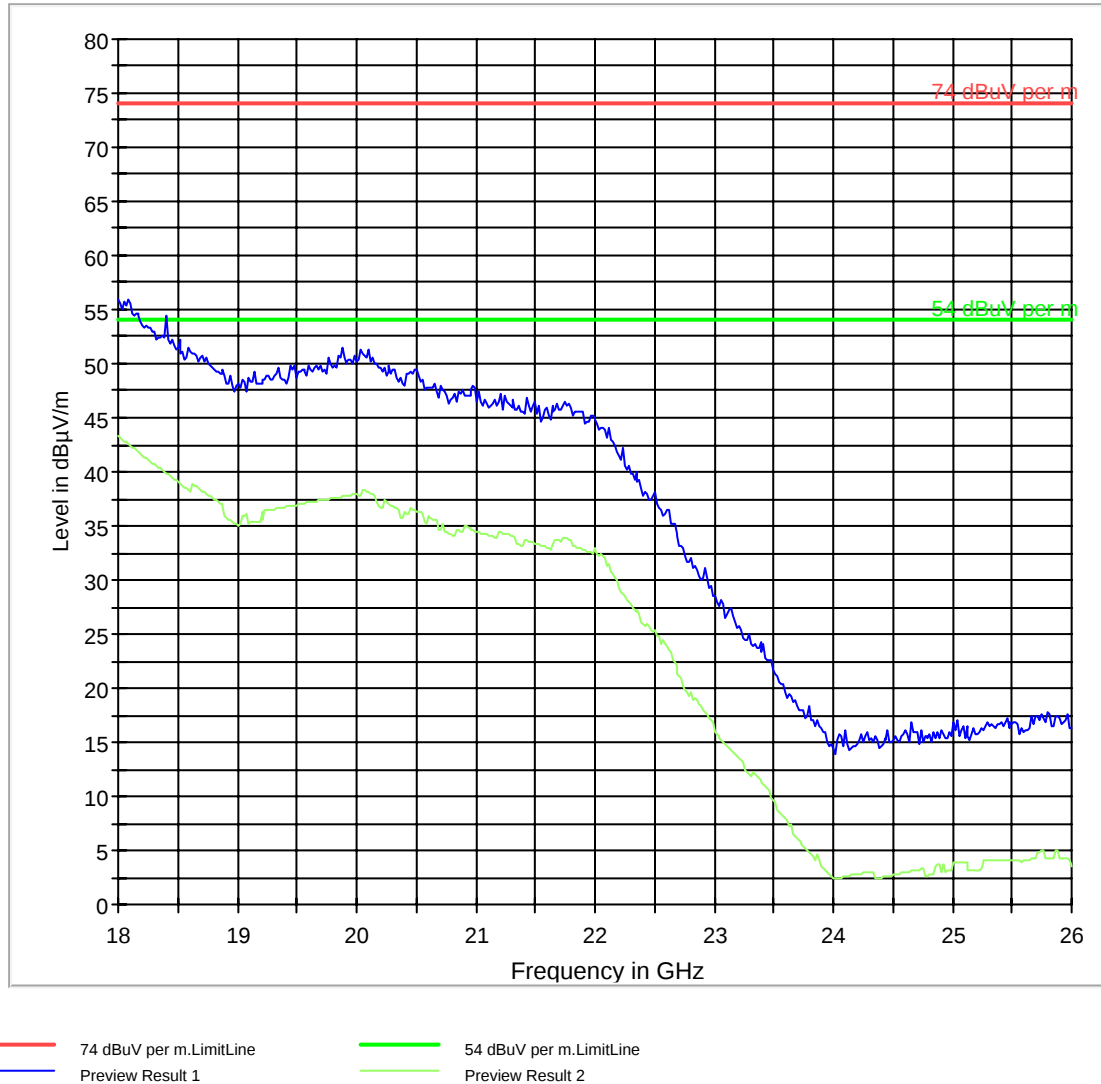
74 dBuV per m.LimitLine
Preview Result 2

54 dBuV per m.LimitLine
Data Reduction 1 [2]

Preview Result 1
Data Reduction 2 [2]

RECEIVER RADIATED SPURIOUS EMISSIONS
RX: 18-26GHz

FCC 15 18-26GHz



5.4 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

5.4.1 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.

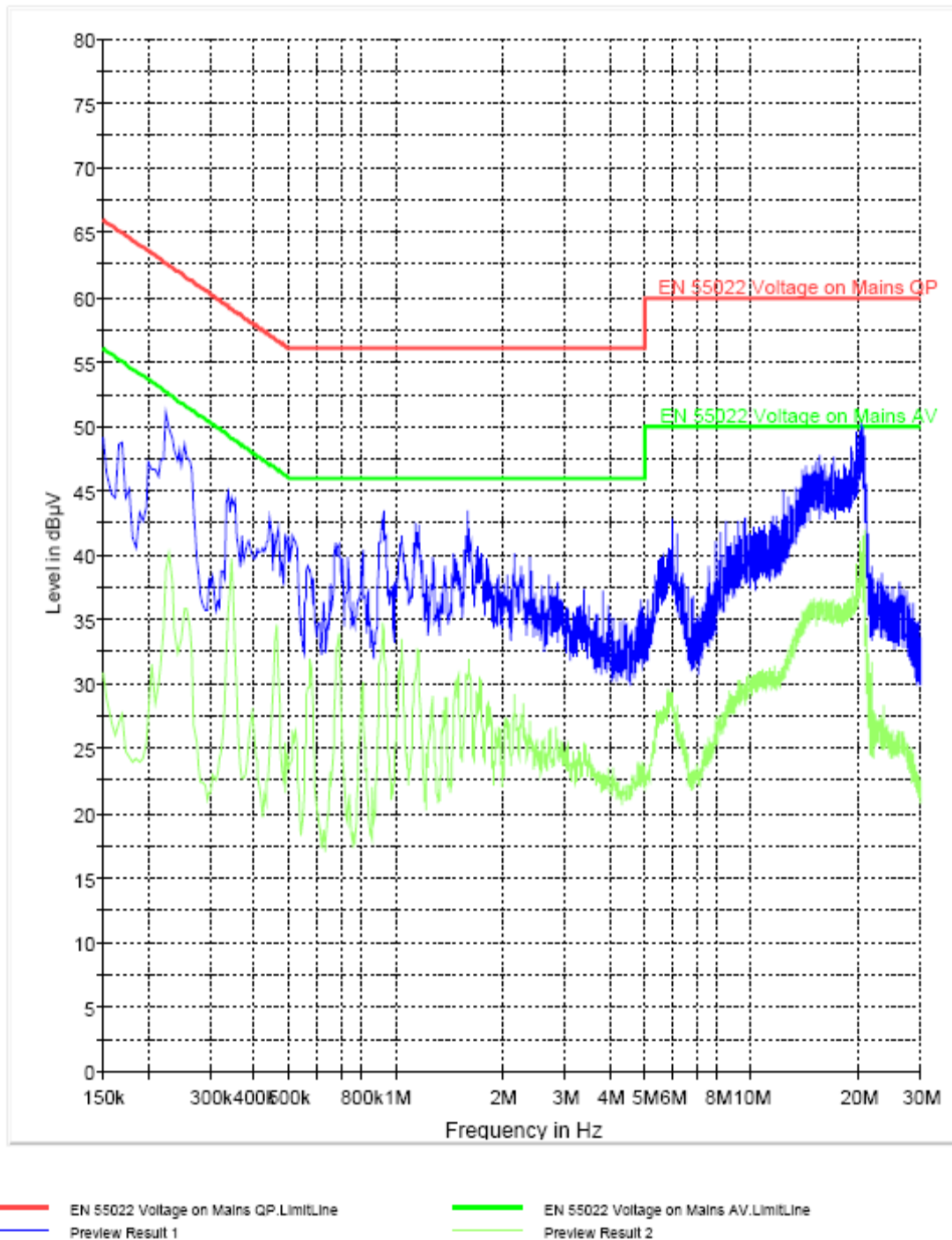
Limit

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

5.4.2 RESULTS TX CDMA 800:

CISPR 22 Mains Conducted



6 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

7 References

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

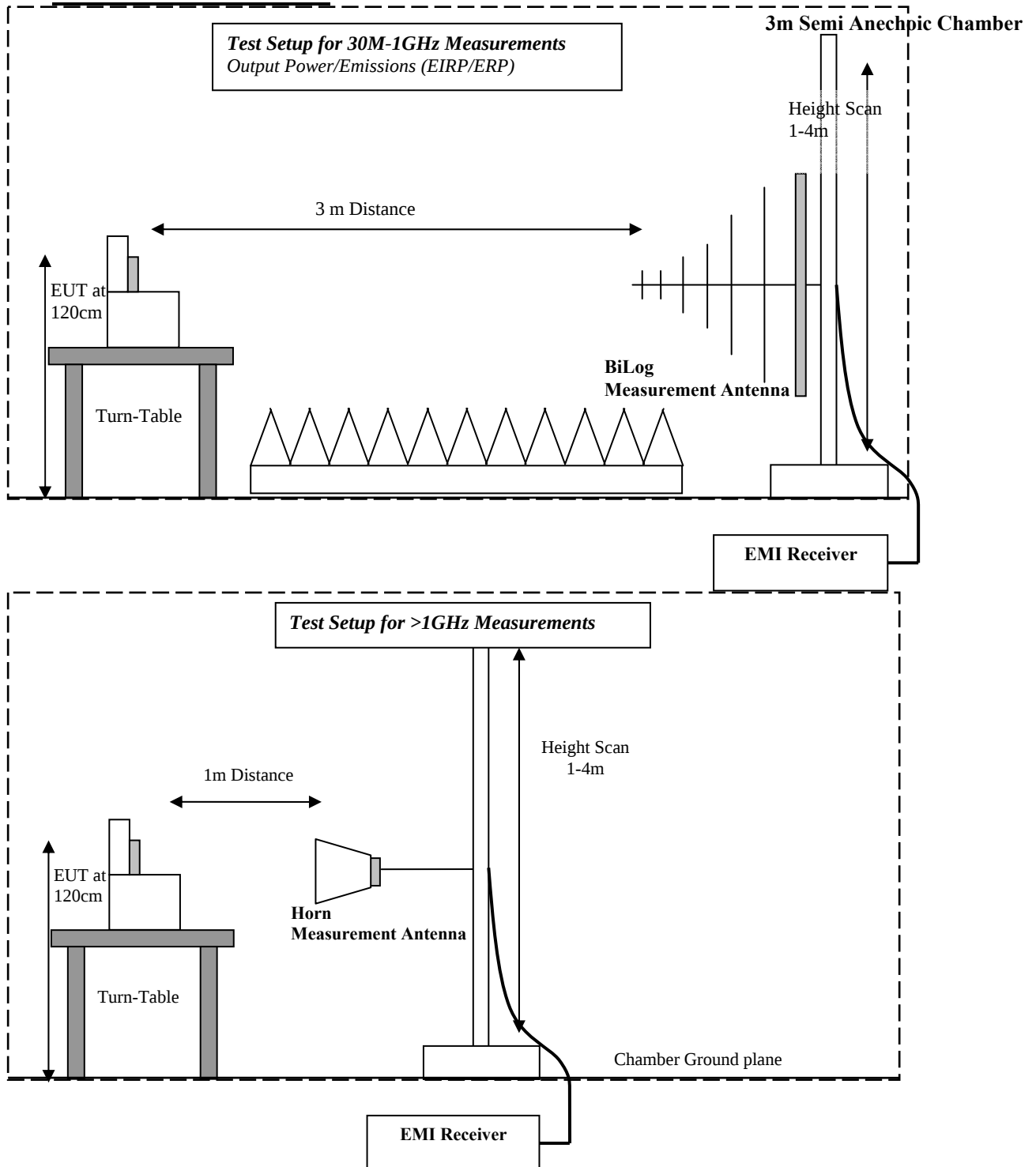
Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION,
PART 22 PUBLIC MOBILE SERVICES October 1, 1998.

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.

8 BLOCK DIAGRAMS



9 Revision History

2009-12-01:

EMC_SONYE_034_09002_FCC22_24_CDMA_PCG-31111L: Original report