



# FCC Test Report

## FCC Part 22, 24 / RSS 129, 133

**Sony Corporation**

**Personal Computer**

**Model Number: PCG-2111L**

**FCC ID: AK8PCG2111L**

**IC-ID: 409B-PCG2111L**

**TEST REPORT #: EMC\_SONYE\_033\_FCC22\_24\_Rev3**  
**DATE: 2009-08-28**



**FCC listed:  
A2LA accredited**

**IC recognized #  
3462B**

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## 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-21111L

This report is reviewed by:

**Josie Sabado**  
 2009-08-28 Compliance (EMC Engineer)

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Date	Section	Name	Signature
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This report is prepared by:

**Marc Douat**  
 2009-08-28 Compliance (Test Lab Manager)

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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:	<b>CETECOM Inc.</b>
Department:	<b>EMC</b>
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Responsible Test Lab Manager:	<b>Heiko Strehlow</b>

### 2.2 Identification of the Client

Applicant's Name:	<b>Sony Corporation</b>
Address:	<b>1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan</b>
Contact Person:	<b>Michio Kobayashi</b>
Phone No.	<b>+81-263-72-5696</b>
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e-mail:	<b>Michio.Kobayashi@jp.sony.com</b>

### 2.3 Identification of the Manufacturer

<b>MANUFACTURER (If different from Applicant)</b>	
Applicant (Firm Name):	<b>Sony EMCS Corporation</b>
Contact Person:	<b>Michio Kobayashi</b>
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Fax:	<b>+81-263-72-9755</b>
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City:	<b>Azumino-shi, Nagano</b>
Postal Code:	<b>399-8282,</b>
Country:	<b>Japan</b>
e-mail:	<b>Michio.Kobayashi@jp.sony.com</b>

### **3 Equipment under Test (EUT)**

#### **3.1 Specification of the Equipment under Test**

Product Type	<b>Personal Computer</b>
Marketing Name:	<b>PCG-21111L</b>
Model No:	<b>PCG-21111L</b>
FCC-ID:	<b>AK8PCG21111L</b>
IC-ID :	<b>409B-PCG21111L</b>
Frequency Range:	<b>824.7 MHz to 848.31 MHz &amp; 1851.25 MHz to 1908.75 MHz</b>
Type(s) of Modulation:	<b>CDMA</b>
Antenna Type:	<b>PIFA, +2.4 dBi</b>
	<b>Radiated:</b>
Output Power	<b>CDMA Cellular: 24.2 dBm (263 mW) ERP</b>
	<b>CDMA PCS: 31.6 dBm (1445 mW) EIRP</b>

#### **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.

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.

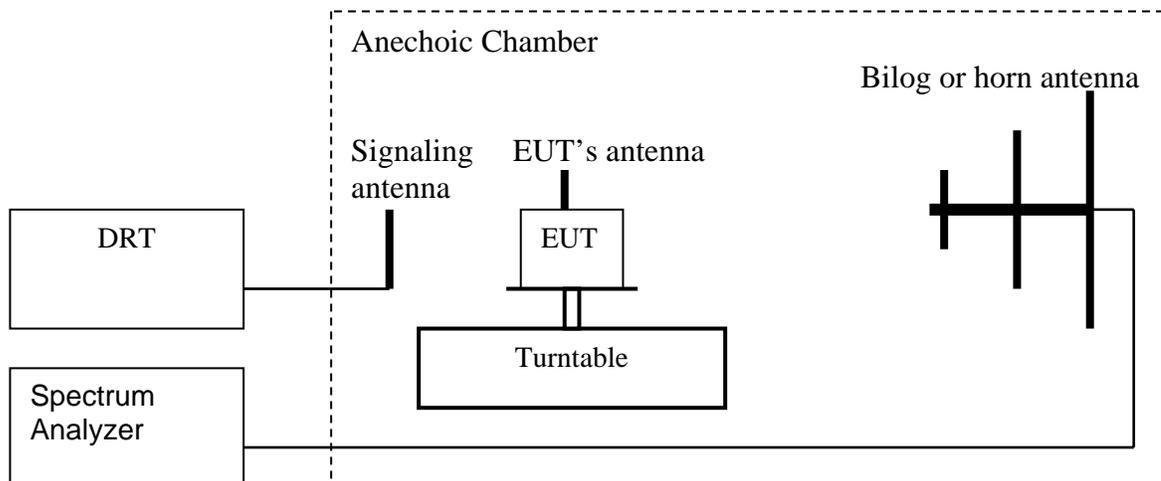
(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP).

(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:**

	<b>Burst Peak ERP</b>
	<b>≤38.45dBm (7W)</b>

Frequency (MHz)	Effective Radiated Power (dBm)	
	CDMA	EVDO
824.7	22.63	22.39
836.6	24.2	23.72
848.31	23.37	23.2

**5.1.5 EIRP Results 1900 MHz band:**

	<b>Burst Peak EIRP</b>
	<b>≤33dBm (2W)</b>

Frequency (MHz)	Equivalent Isotropic Radiated Power (dBm)	
	CDMA	EVDO
1851.25	31.26	31.6
1880.0	28.7	28.97
1908.25	27.45	27.93

**EIRP (800 band) CDMA**

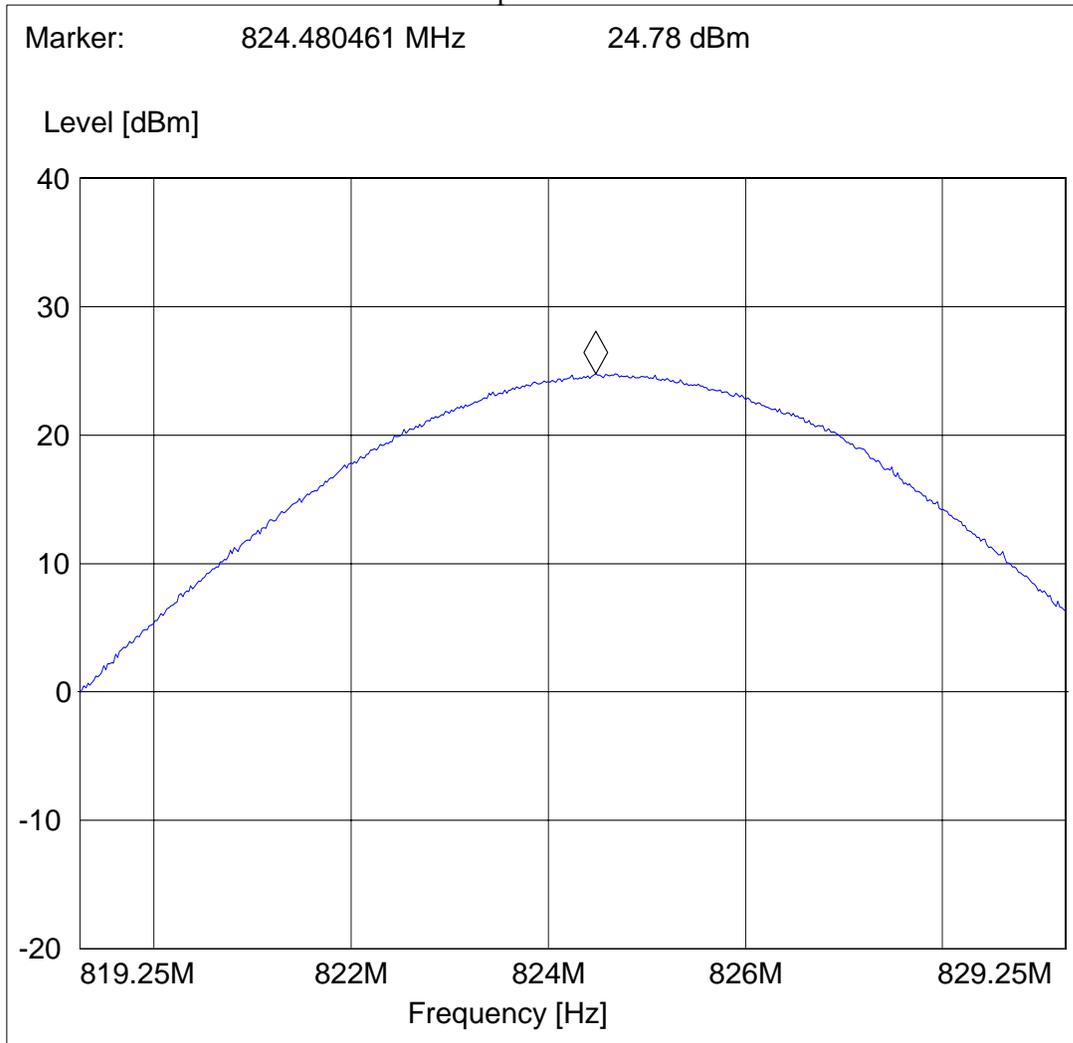
§22.913(a)

**CHANNEL 1013**

EUT: pcg-211111  
Customer:: Sony  
Test Mode: CDMA 850 CH1013  
ANT Orientation: H  
EUT Orientation: H  
Test Engineer: Marc  
Voltage: AC Adapter  
Comments:

**SWEEP TABLE: "EIRP CDMA 850 CH8"**

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
819.3 MHz	829.3 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



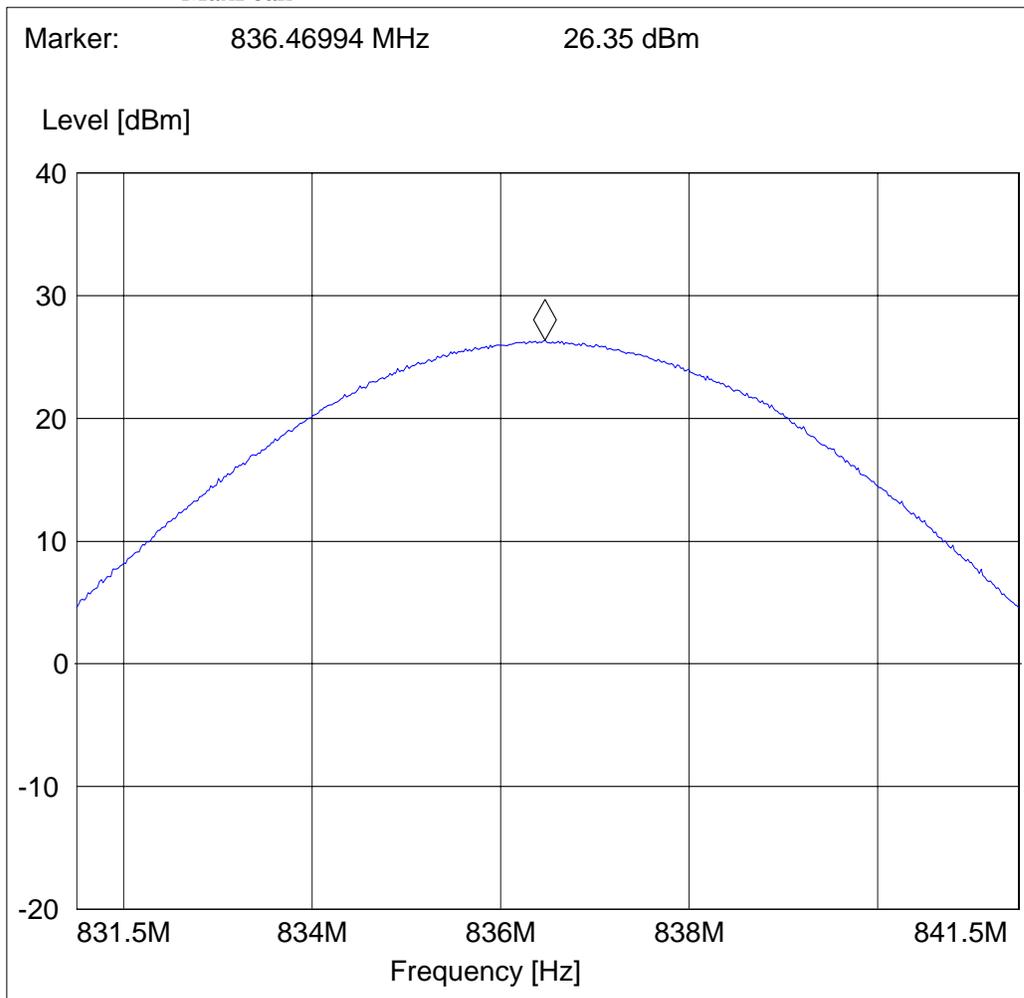
**EIRP (800 band) CDMA  
CHANNEL 384**

§22.913(a)

EUT: pcg-211111  
Customer:: Sony  
Test Mode: CDMA 850 CH384  
ANT Orientation: H  
EUT Orientation: H  
Test Engineer: Marc  
Voltage: AC Adapter  
Comments:

***SWEEP TABLE: "EIRP CDMA 850 CH383"***

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
831.5 MHz	841.5 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



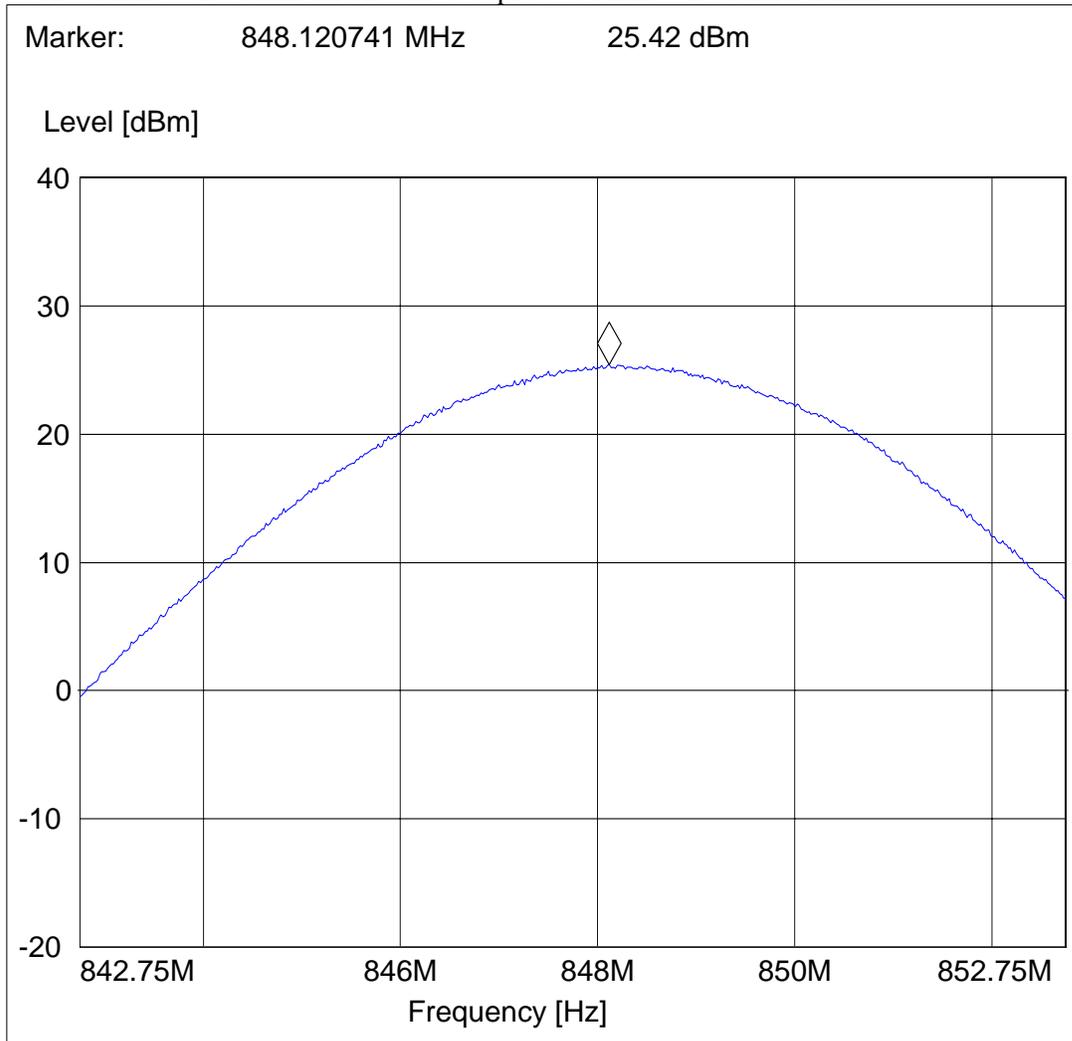
**EIRP (800 band) CDMA  
 CHANNEL 777**

§22.913(a)

EUT: pcg-211111  
 Customer:: Sony  
 Test Mode: CDMA 850 CH777  
 ANT Orientation: H  
 EUT Orientation: H  
 Test Engineer: Marc  
 Voltage: AC Adapter  
 Comments:

**SWEEP TABLE: "EIRP CDMA 850 CH758"**

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
842.8 MHz	852.8 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



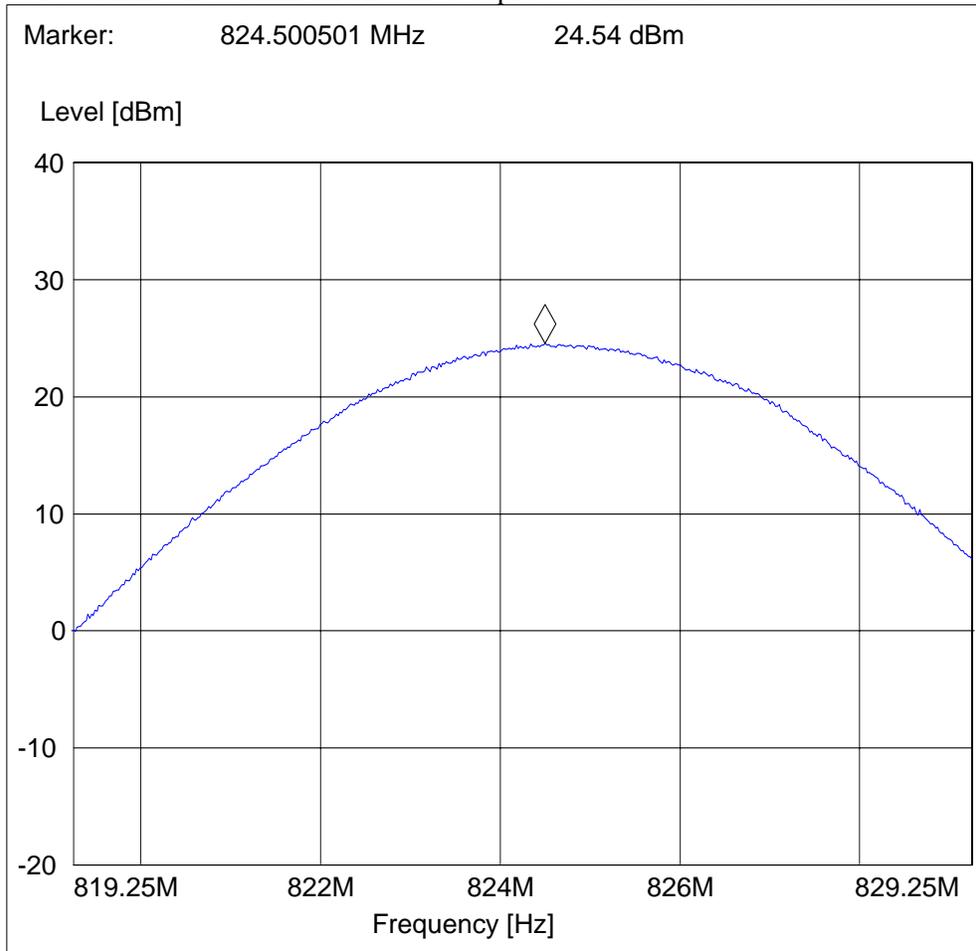
**EIRP (800 band) EVDO  
CHANNEL 1013**

§22.913(a)

EUT: pcg-211111  
Customer:: Sony  
Test Mode: EVDO CH1013  
ANT Orientation: H  
EUT Orientation: H  
Test Engineer: Marc  
Voltage: AC Adapter  
Comments:

***SWEEP TABLE: "EIRP CDMA 850 CH8"***

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
819.3 MHz	829.3 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



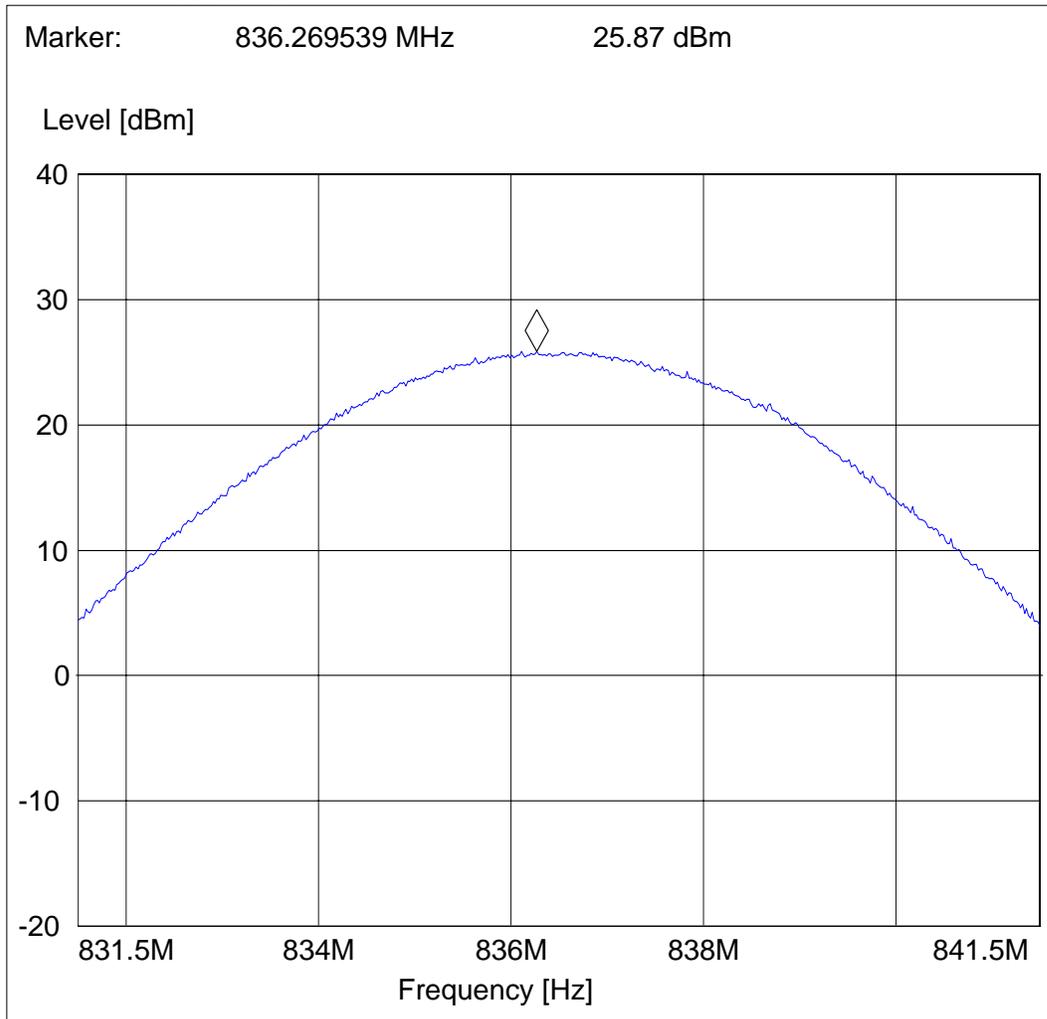
**EIRP (800 band) EVDO  
 CHANNEL 384**

§22.913(a)

EUT: pcg-211111  
 Customer:: Sony  
 Test Mode: EVDO CH384  
 ANT Orientation: H  
 EUT Orientation: H  
 Test Engineer: Marc  
 Voltage: AC Adapter  
 Comments:

***SWEEP TABLE: "EIRP CDMA 850 CH383"***

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
831.5 MHz	841.5 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



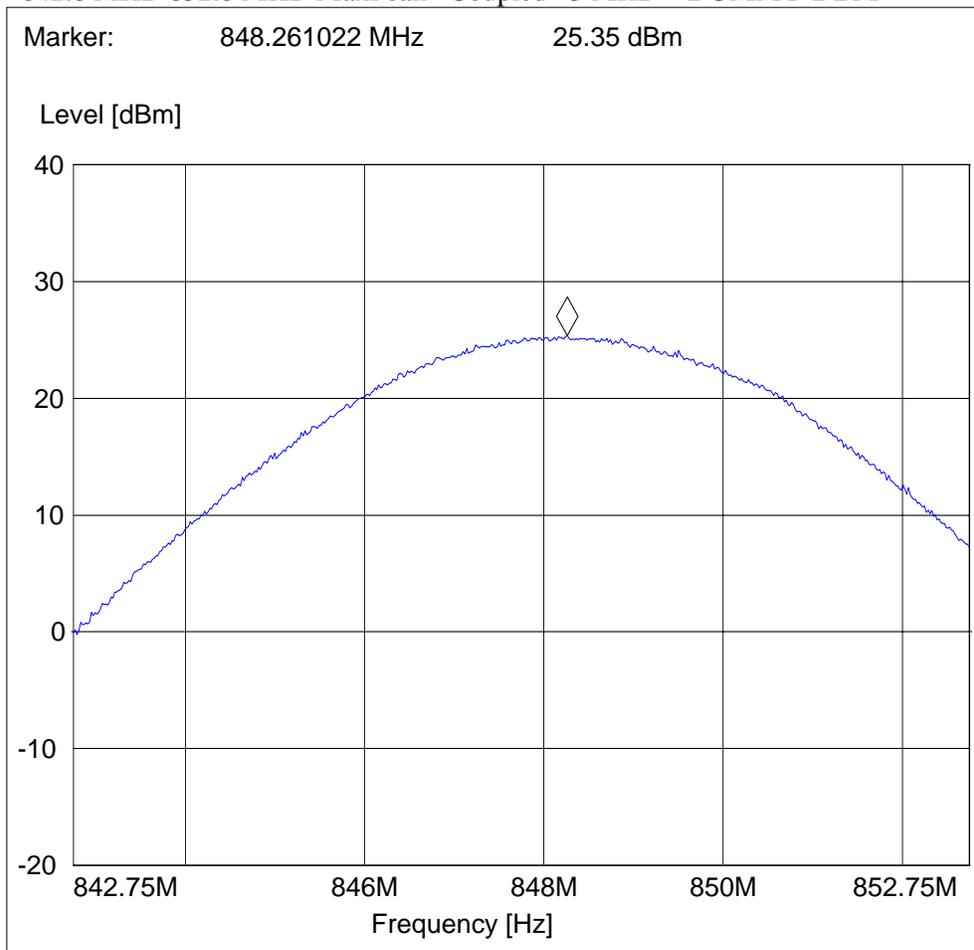
**EIRP (800 band) EVDO  
CHANNEL 777**

§22.913(a)

EUT: pcg-211111  
Customer:: Sony  
Test Mode: EVDO CH777  
ANT Orientation: H  
EUT Orientation: H  
Test Engineer: Marc  
Voltage: AC Adapter  
Comments:

***SWEEP TABLE: "EIRP CDMA 850 CH758"***

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
842.8 MHz	852.8 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



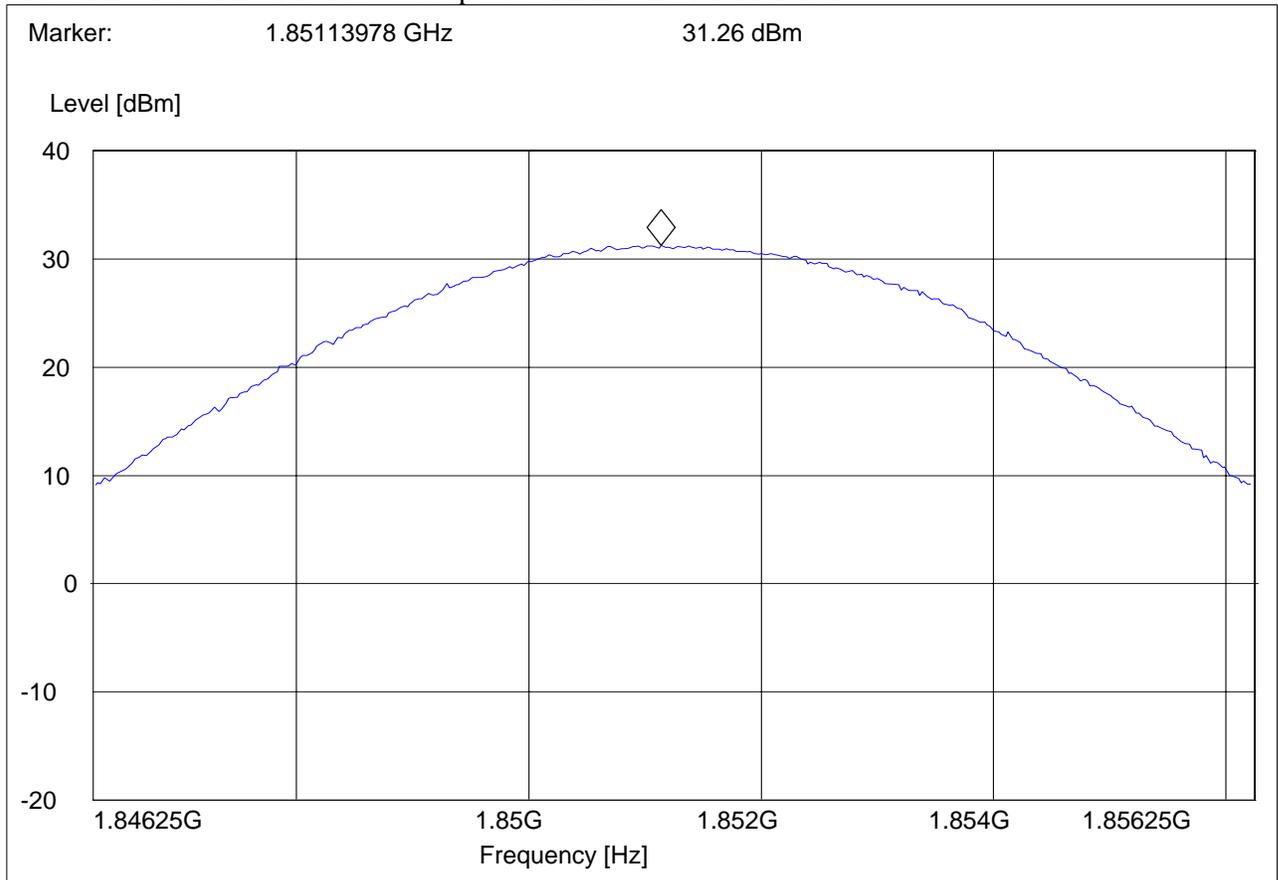
**EIRP (PCS-1900) CDMA  
 CHANNEL 25**

§24.232(b)

EUT: pcg-21111L  
 Customer:: Sony  
 Test Mode: EVDO ch25  
 ANT Orientation: V 126 cm  
 EUT Orientation: H 259 deg  
 Test Engineer: Marc  
 Voltage: AC Adapter  
 Comments:

***SWEEP TABLE: "EIRP CDMA1900 CH25"***

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.8 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



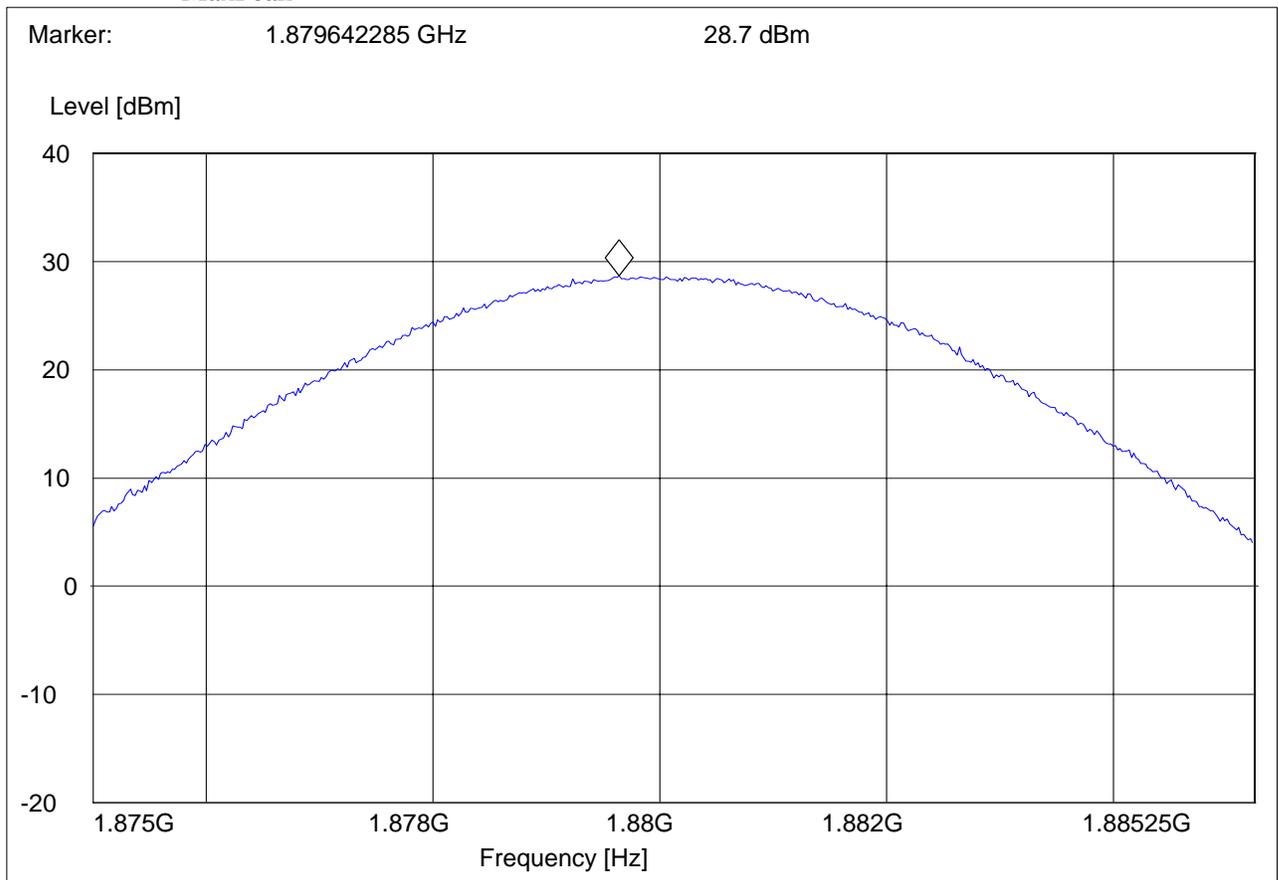
**EIRP (PCS-1900) CDMA  
 CHANNEL 600**

§24.232(b)

EUT: pcg-21111L  
 Customer:: Sony  
 Test Mode: EVDO ch600  
 ANT Orientation: V 126 cm  
 EUT Orientation: H 259 deg  
 Test Engineer: Marc  
 Voltage: AC Adapter  
 Comments:

***SWEEP TABLE: "EIRP CDMA1900 CH600"***

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.9 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



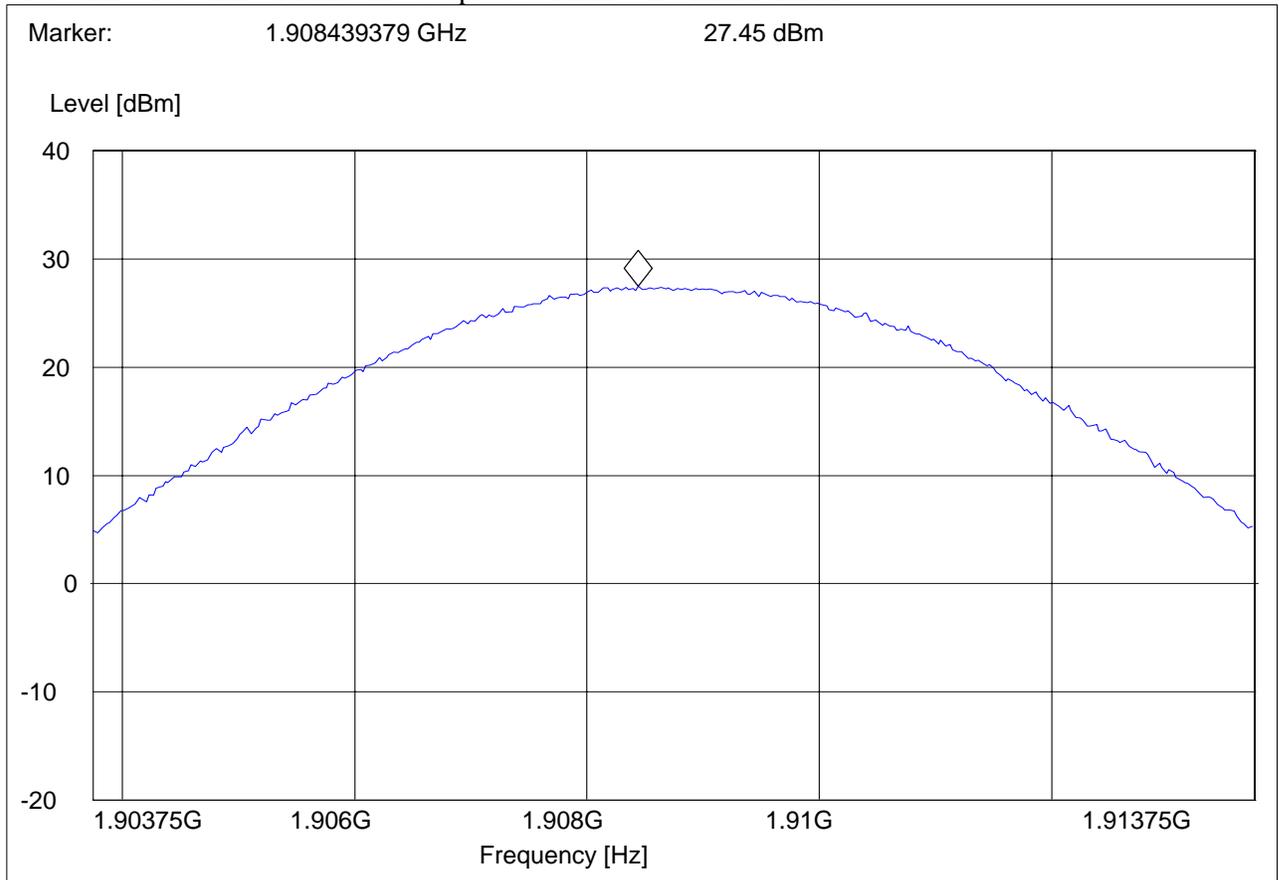
**EIRP (PCS-1900) CDMA  
 CHANNEL 1175**

§24.232(b)

EUT: pcg-21111L  
 Customer:: Sony  
 Test Mode: EVDO ch1175  
 ANT Orientation: V 126 cm  
 EUT Orientation: H 259 deg  
 Test Engineer: Marc  
 Voltage: AC Adapter  
 Comments:

***SWEEP TABLE: "EIRP CDMA1900 CH1175"***

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.9 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM





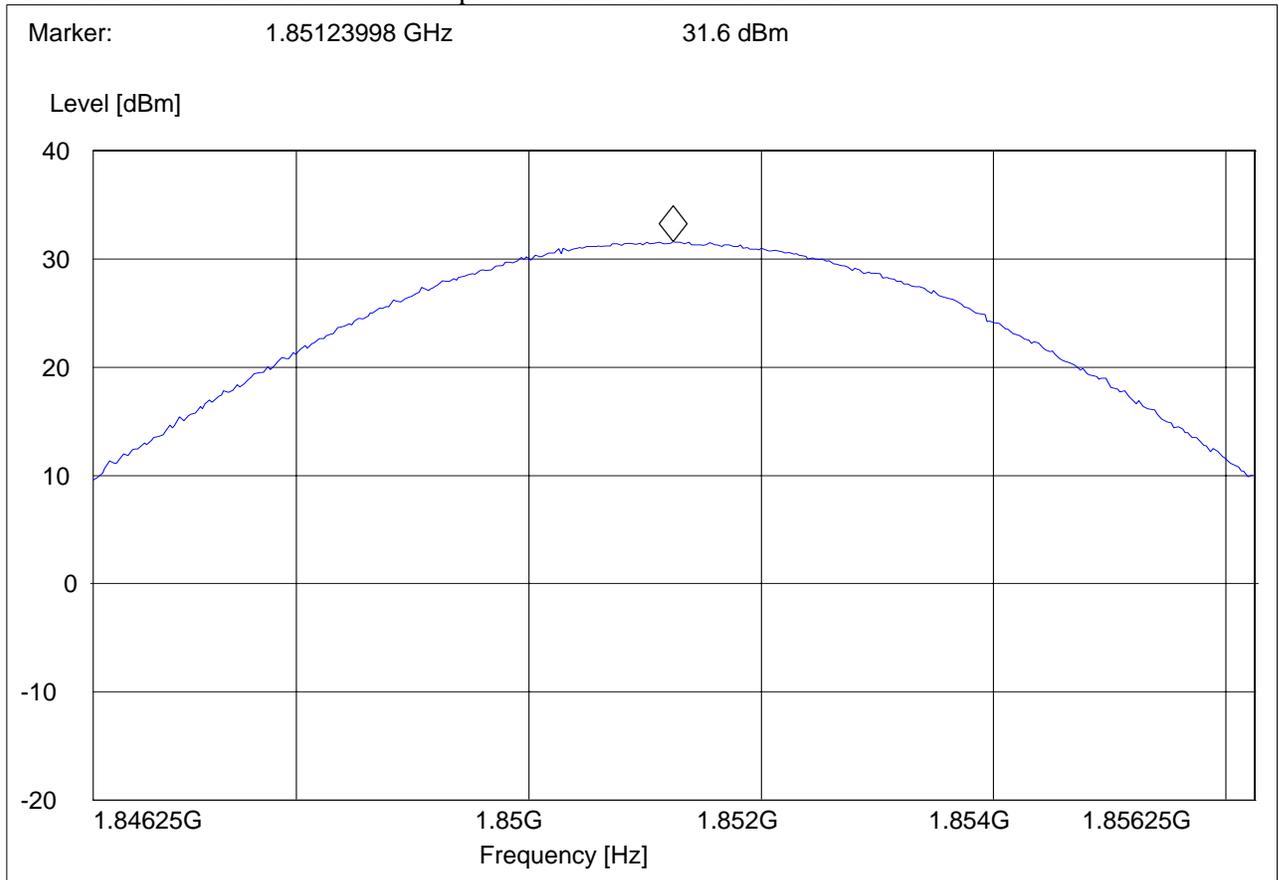
**EIRP (PCS-1900) EVDO  
CHANNEL 25**

§24.232(b)

EUT: pcg-21111L  
Customer:: Sony  
Test Mode: EVDO ch25  
ANT Orientation: V 126 cm  
EUT Orientation: H 259 deg  
Test Engineer: Marc  
Voltage: AC Adapter  
Comments:

***SWEEP TABLE: "EIRP CDMA1900 CH25"***

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.8 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



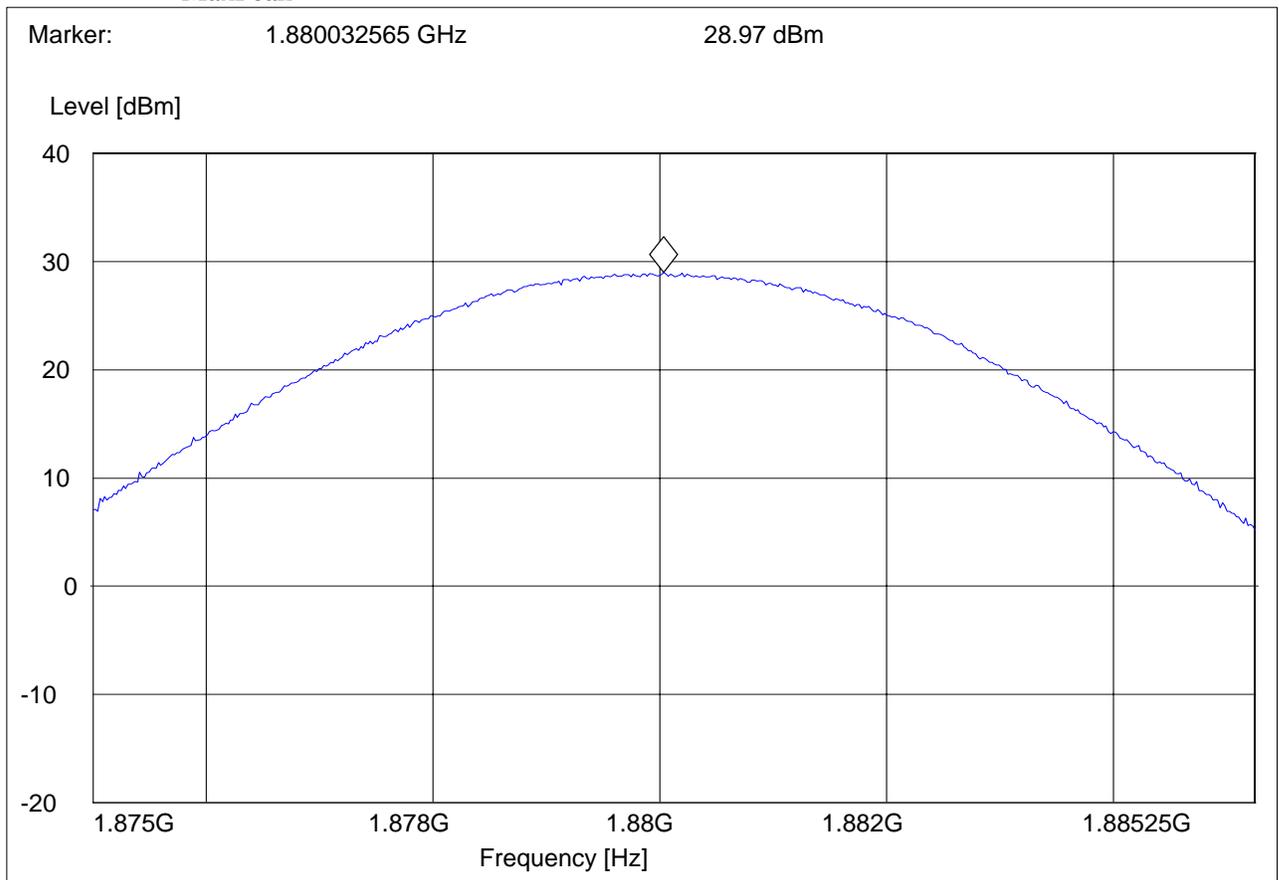
**EIRP (PCS-1900) EVDO  
 CHANNEL 600**

§24.232(b)

EUT: pcg-21111L  
 Customer:: Sony  
 Test Mode: EVDO ch600  
 ANT Orientation: V 126 cm  
 EUT Orientation: H 259 deg  
 Test Engineer: Marc  
 Voltage: AC Adapter  
 Comments:

***SWEEP TABLE: "EIRP CDMA1900 CH600"***

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.9 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



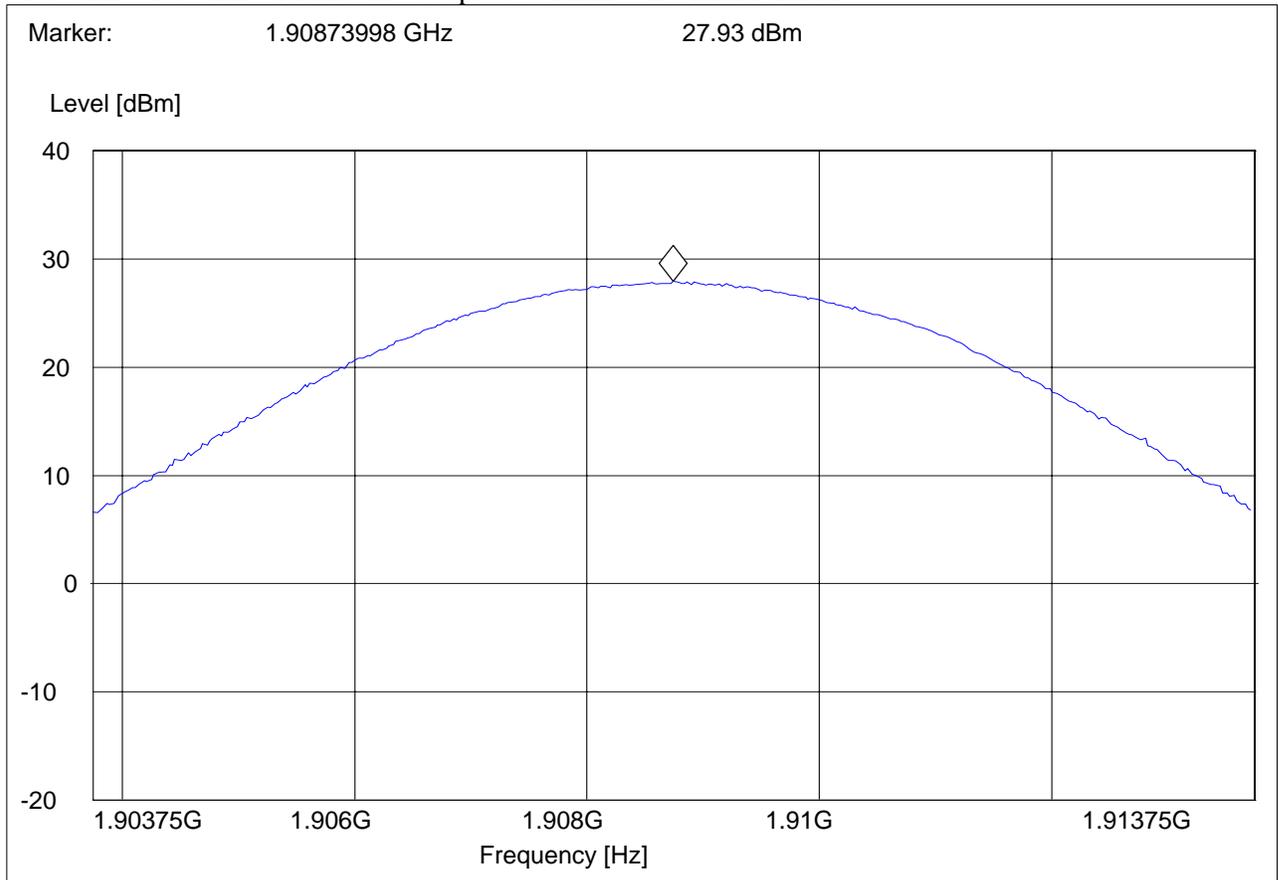
**EIRP (PCS-1900) EVDO  
CHANNEL 1175**

§24.232(b)

EUT: pcg-21111L  
Customer:: Sony  
Test Mode: EVDO ch1175  
ANT Orientation: V 126 cm  
EUT Orientation: H 259 deg  
Test Engineer: Marc  
Voltage: AC Adapter  
Comments:

***SWEEP TABLE: "EIRP CDMA1900 CH1175"***

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.9 GHz	1.9 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



## 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.

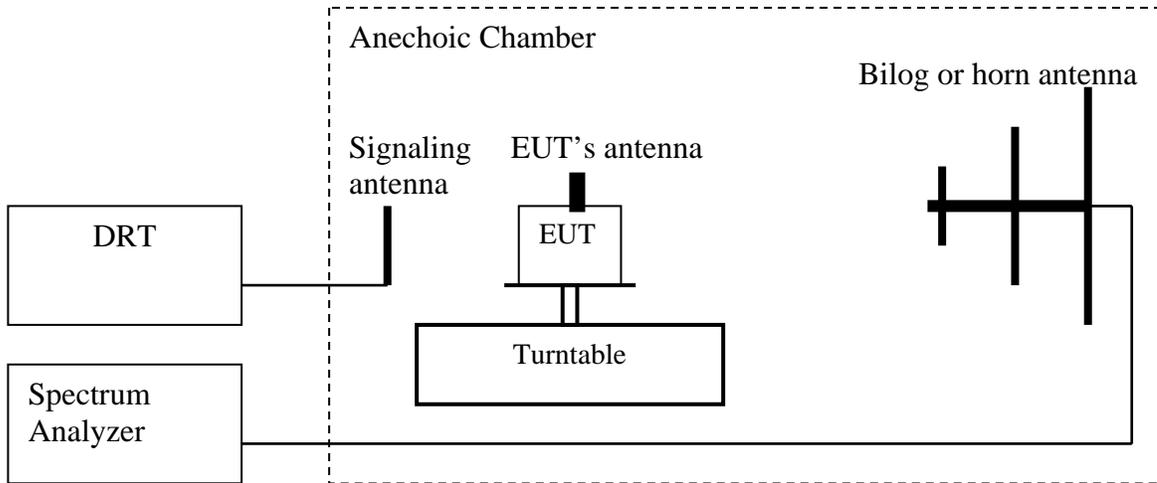
(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of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

**TX: 30MHz - 1GHz**

Spurious emission limit -13dBm

Note:

1. The peak above the limit line is the carrier freq.
2. This plot is valid for low, mid & high channels (worst-case plot)

**FCC 22 30-1000MHz Mid Channel**

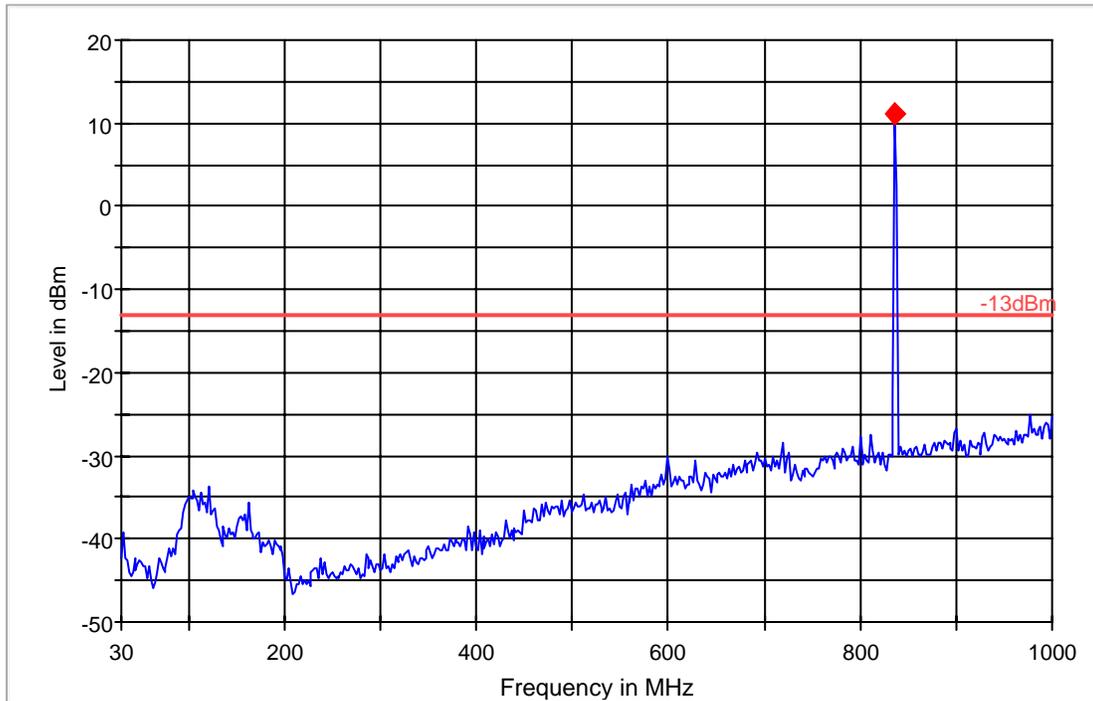
**Final Result 1**

Frequency (MHz)	MaxPeak (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
836.233467	11.2	20.000	100.000	120.0	V	292.0	-70.6	-24.2	-13.0

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

Frequency (MHz)	Comment
836.233467	

FCC 22 30-1000MHz



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

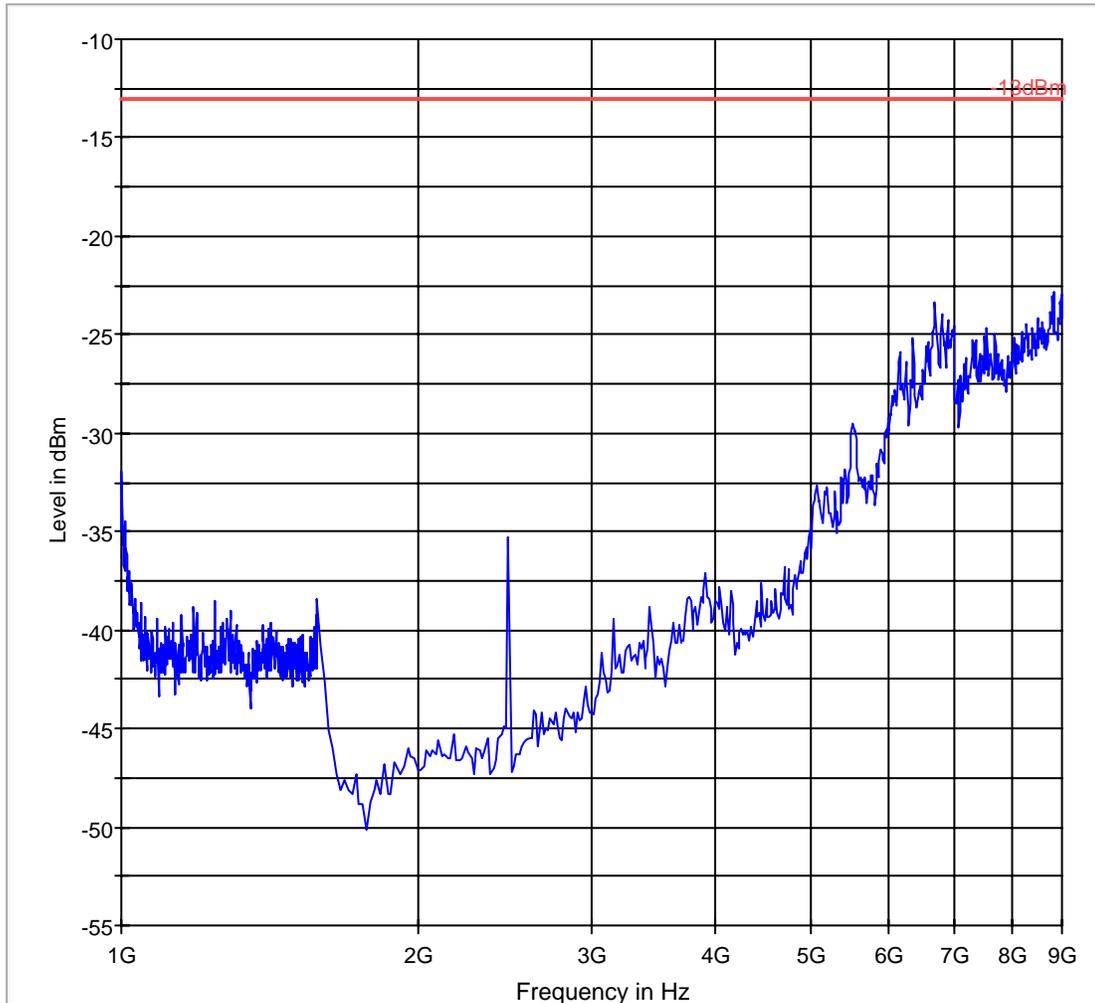
**RADIATED SPURIOUS EMISSIONS (800 band)**

**Ch 1013**

**1GHz – 9GHz**

Spurious emission limit -13dBm

FCC 22 1-9GHz



— -13dBm.LimitLine      — Preview Result 1      — I

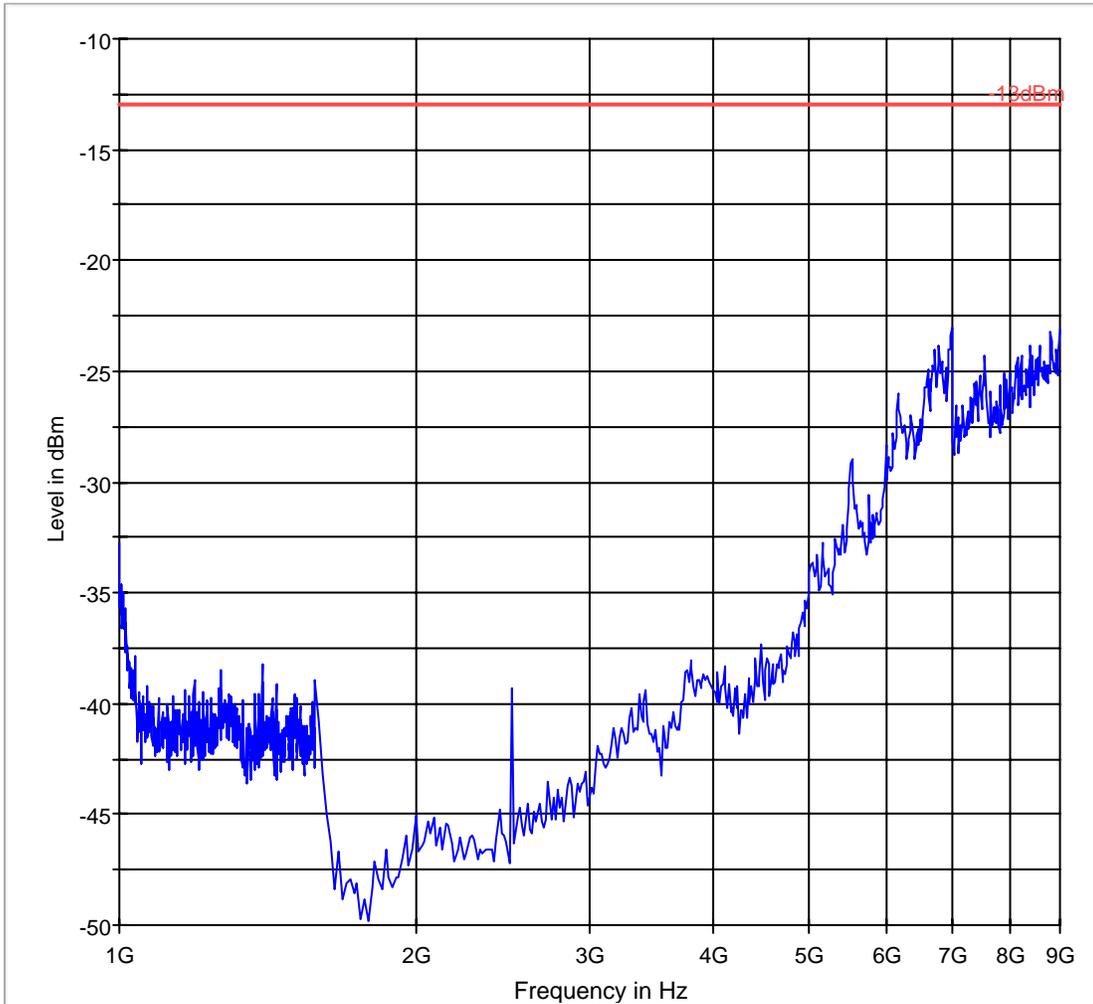
**RADIATED SPURIOUS EMISSIONS (800 band)**

**Ch 384**

**1GHz – 9GHz**

Spurious emission limit -13dBm

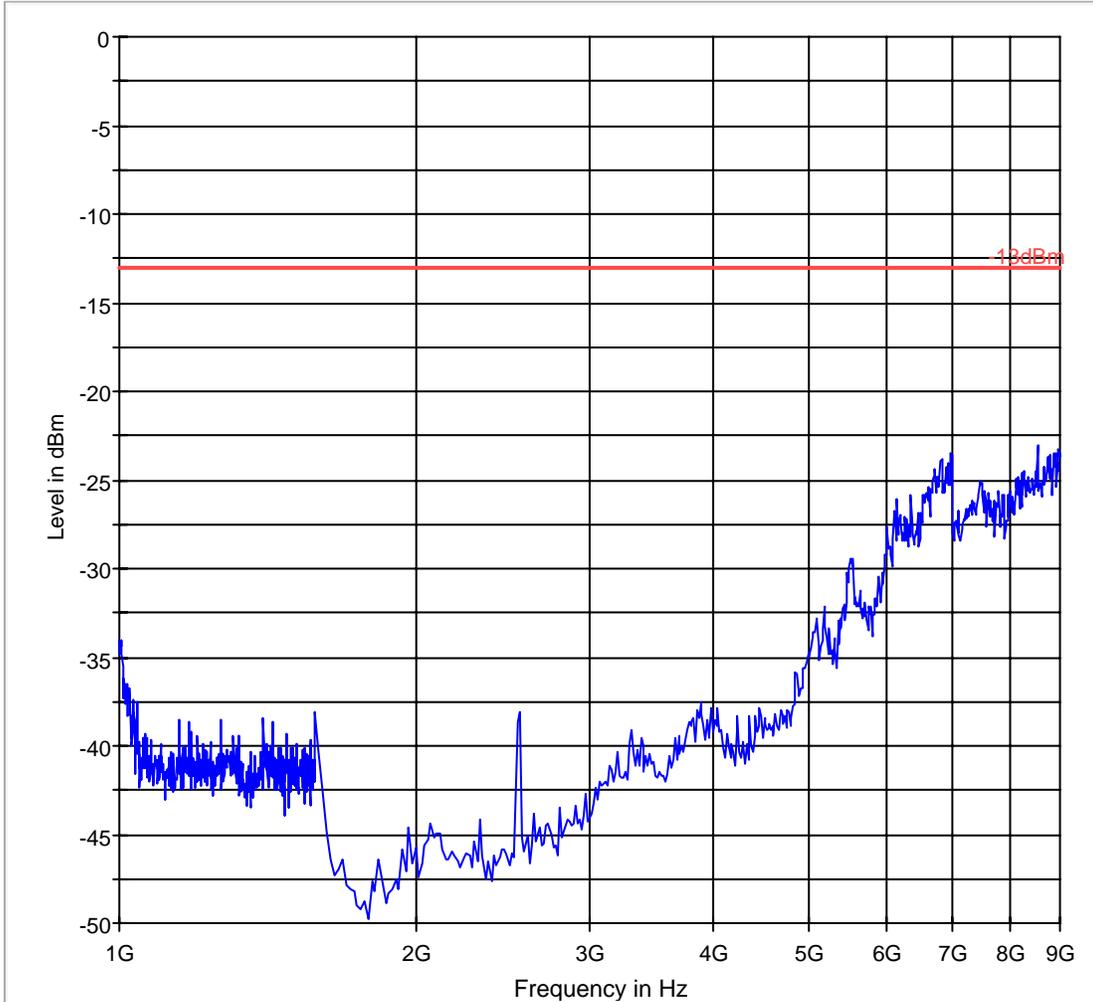
FCC 22 1-9GHz



— -13dBm.LimitLine      — Preview Result 1      — k

**RADIATED SPURIOUS EMISSIONS (800 band)**  
**Ch 777**  
**1GHz – 9GHz**  
Spurious emission limit -13dBm

FCC 22 1-9GHz



— -13dBm.LimitLine      — j      — Preview Result 1

**5.2.4.3 RESULTS OF RADIATED TESTS PCS-1900:**

<b>Harmonic</b>	<b>Tx ch-25 Freq.(MHz)</b>	<b>Level (dBm)</b>	<b>Tx ch-600 Freq. (MHz)</b>	<b>Level (dBm)</b>	<b>Tx ch-1175 Freq. (MHz)</b>	<b>Level (dBm)</b>
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						

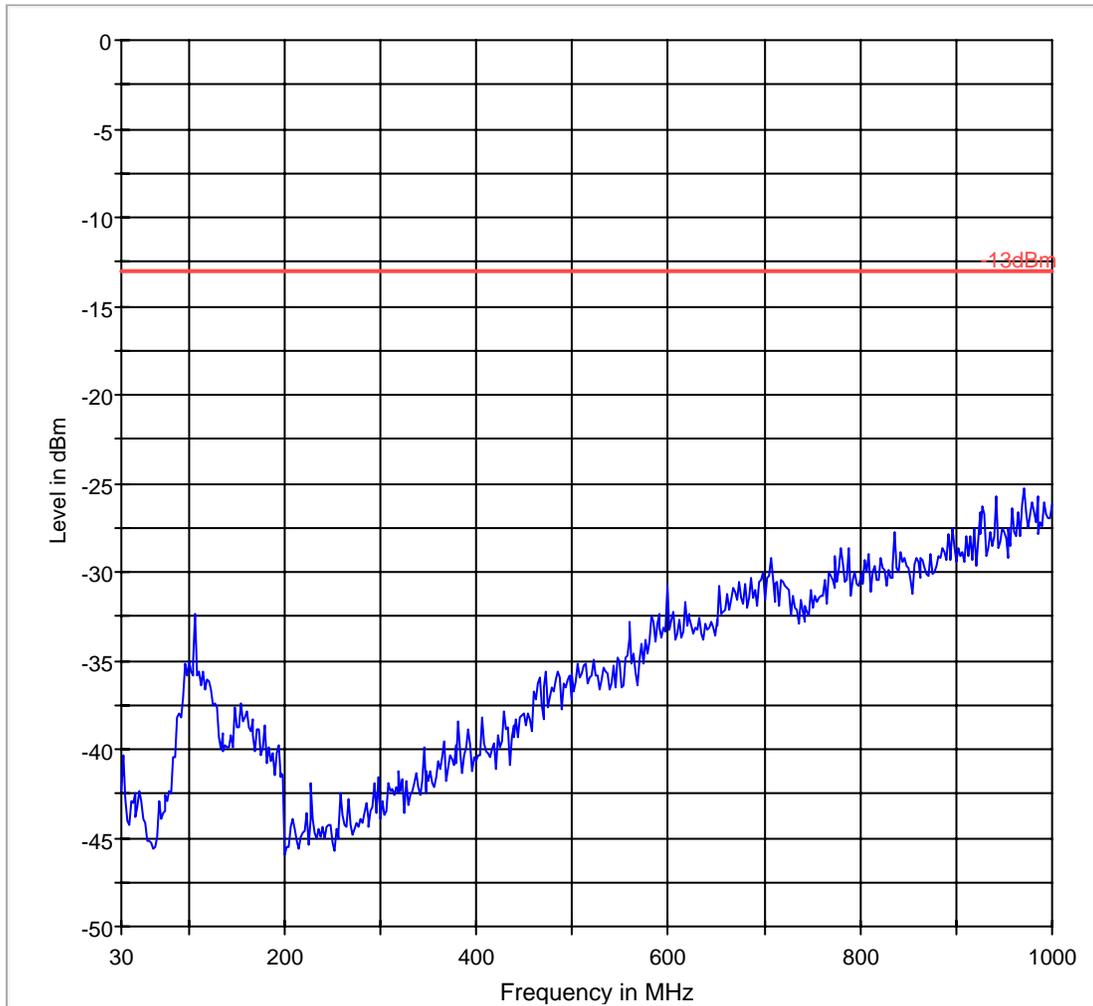
### 5.2.4.4 RADIATED SPURIOUS EMISSIONS(PCS 1900)

**TX: 30MHz - 1GHz**

Spurious emission limit -13dBm

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

FCC 22 30-1000MHz



— -13dBm.LimitLine      — Preview Result 1

**RADIATED SPURIOUS EMISSIONS(PCS 1900)**

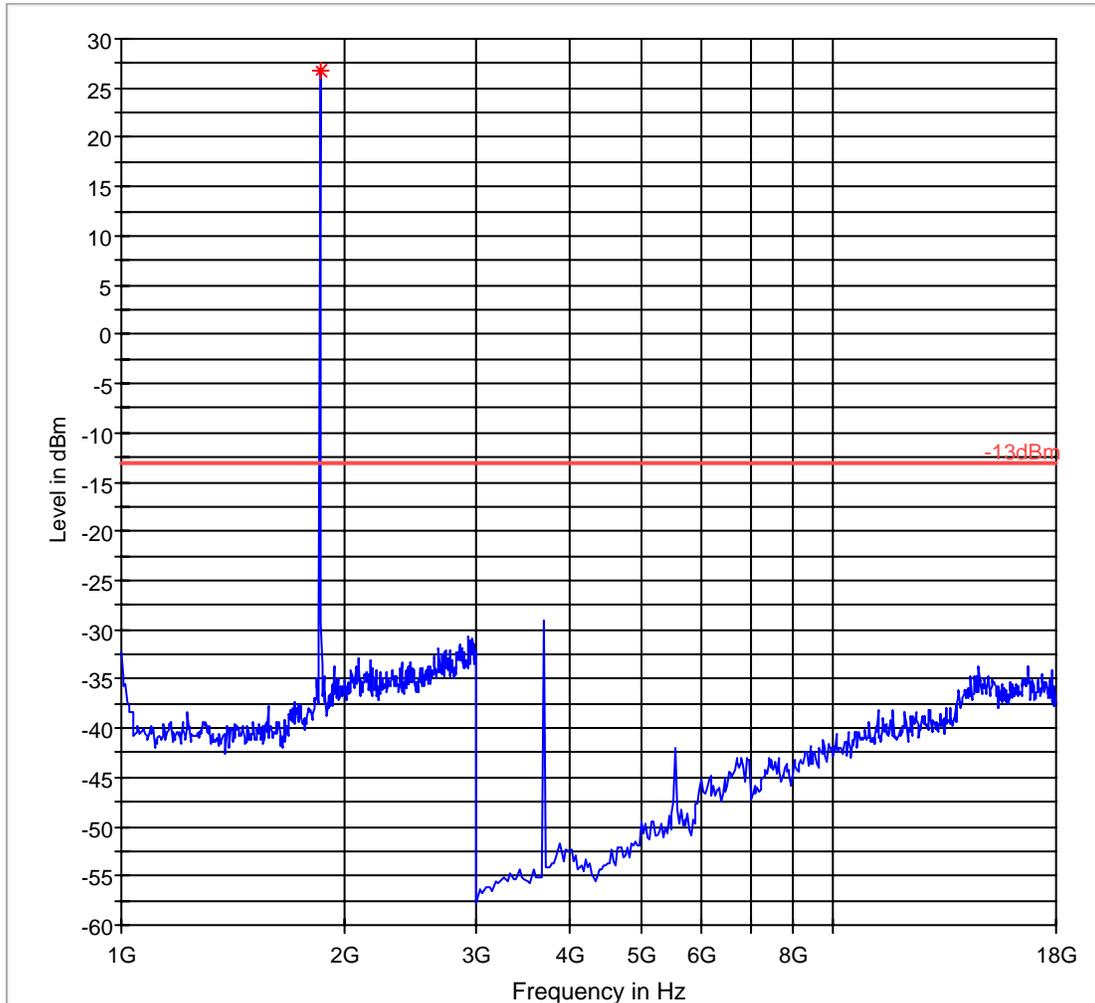
**Ch 25**

**1GHz – 18GHz**

Spurious emission limit -13dBm

**Note: The peak above the limit line is the carrier freq. at ch-25.**

FCC 24 1-18GHz



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



**RADIATED SPURIOUS EMISSIONS(PCS 1900)**

**Ch 25**

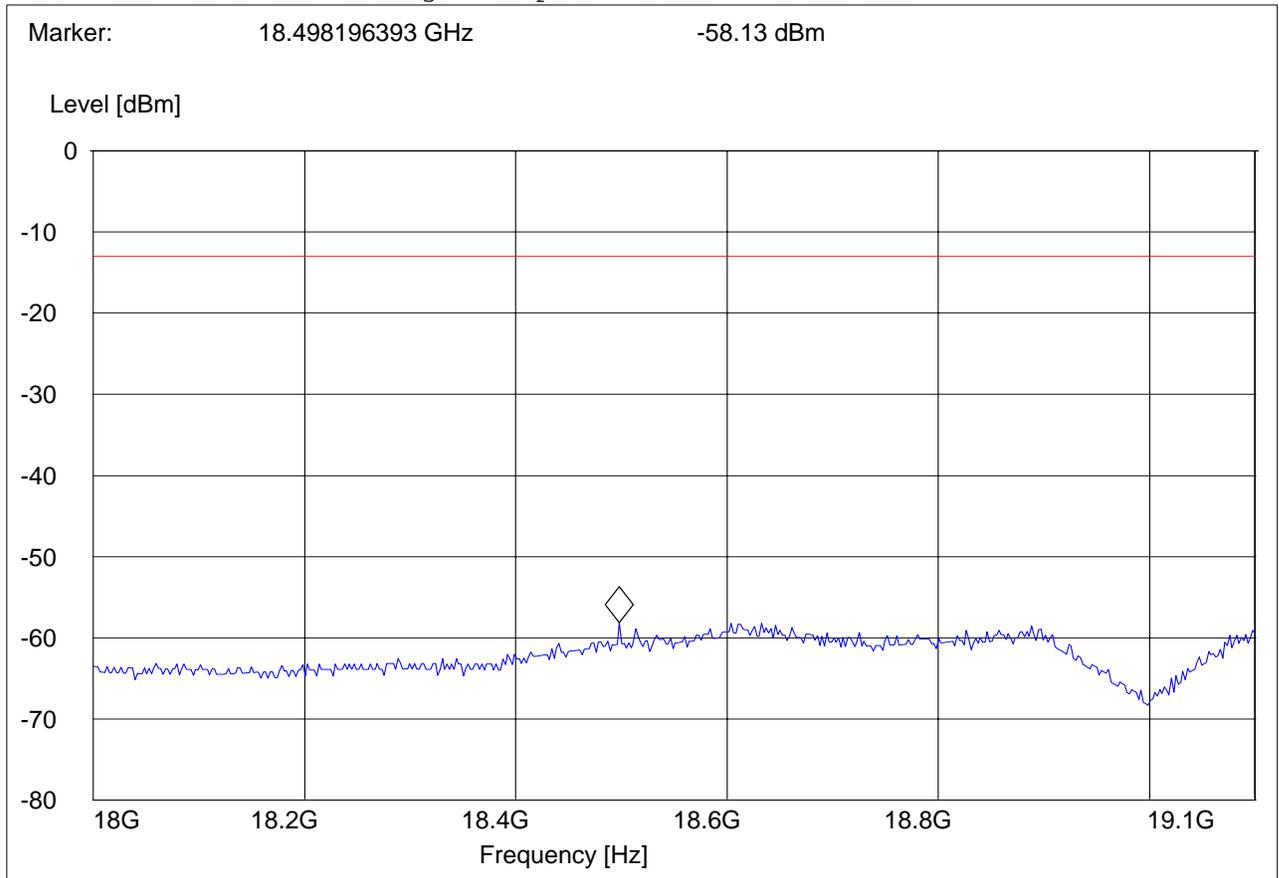
**18GHz – 19GHz**

Spurious emission limit -13dBm

EUT: 21111L  
 Customer:: Sony Electronics  
 Test Mode: CDMA 1900; CH 25  
 ANT Orientation: H  
 EUT Orientation: H  
 Test Engineer: Chris  
 Voltage: AC  
 Comments:

**SWEEP TABLE: "FCC 24spuri 18-19.1G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
18.0 GHz	19.1 GHz	Average	Coupled	1 MHz	DUMMY-DBM



**RADIATED SPURIOUS EMISSIONS(PCS 1900)**

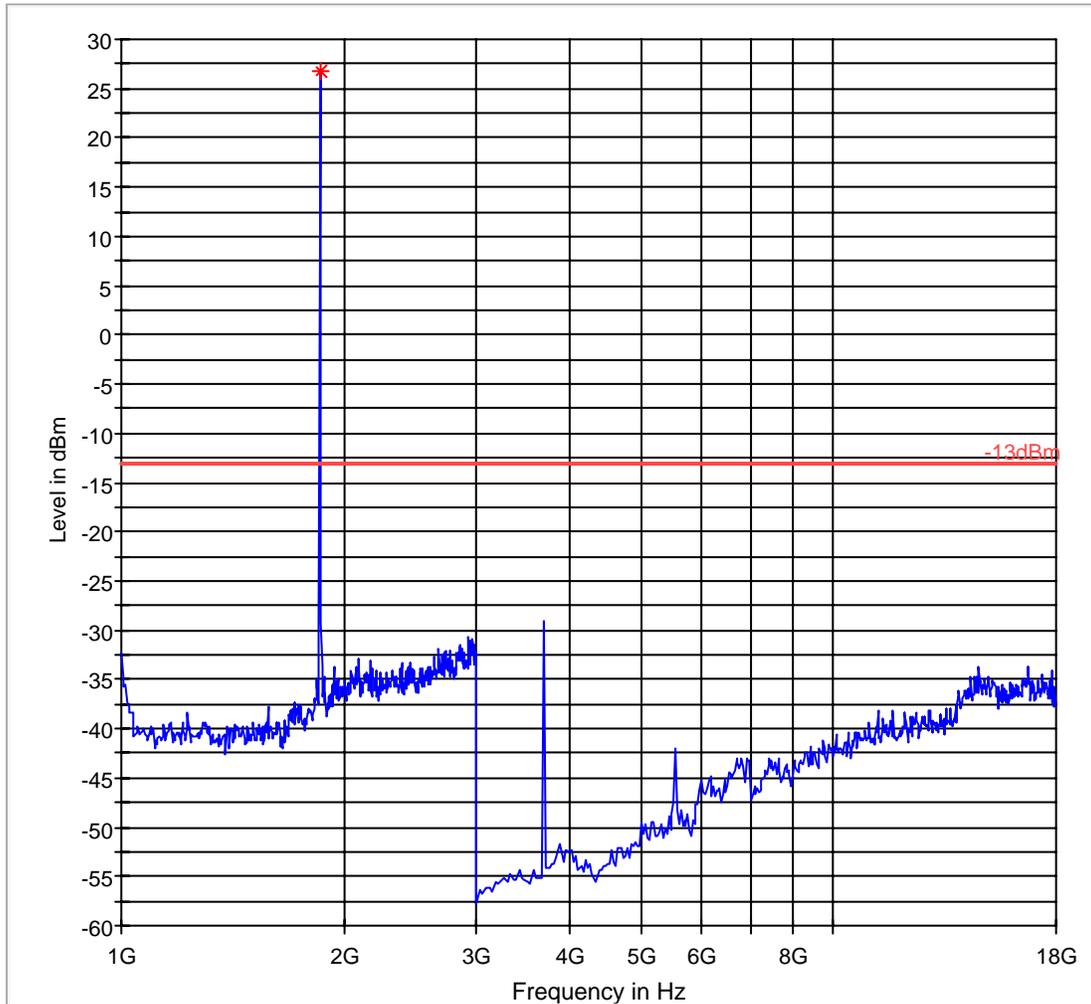
**Ch 600**

**1GHz – 18GHz**

Spurious emission limit -13dBm

**Note: The peak above/close to the limit line is the carrier freq. at ch-600.**

FCC 24 1-18GHz



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

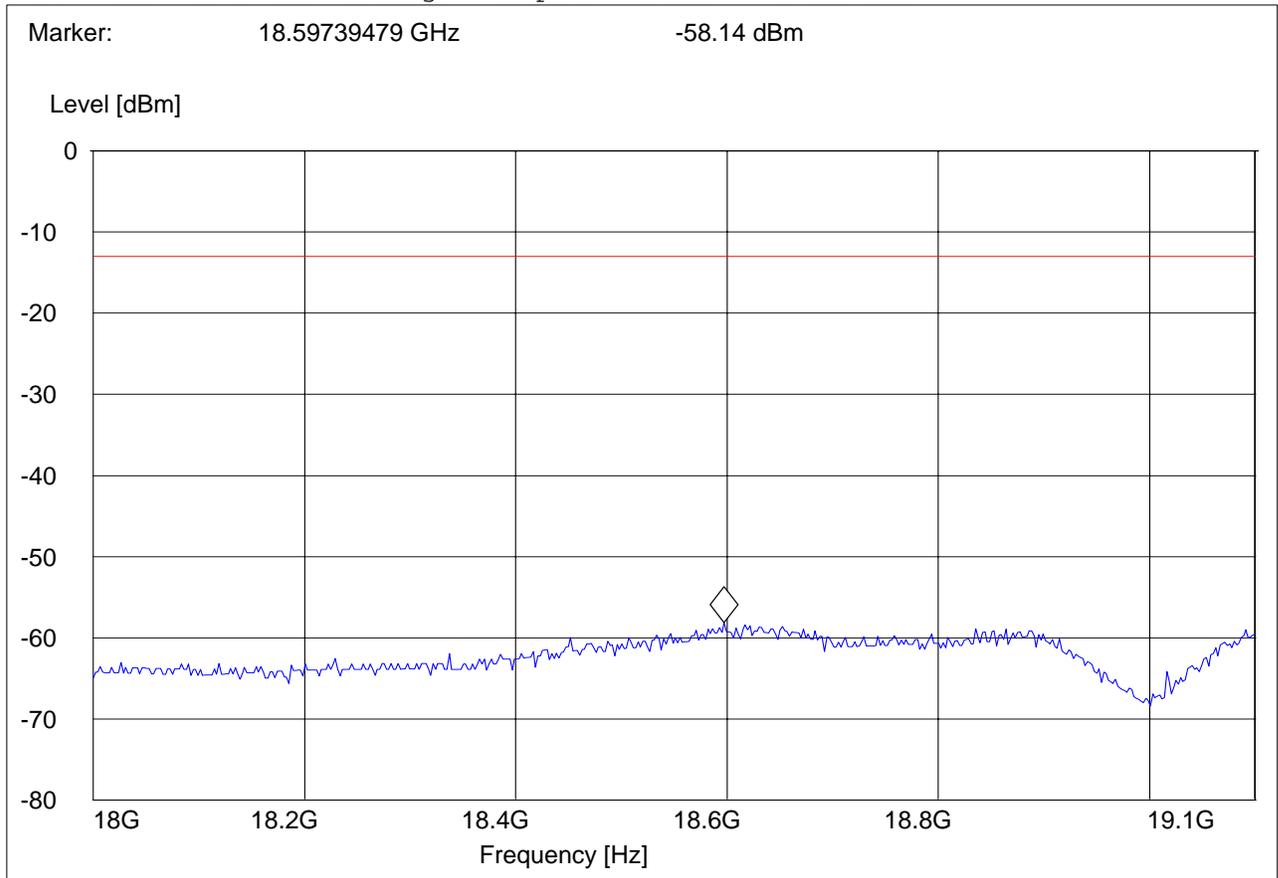


**RADIATED SPURIOUS EMISSIONS(PCS 1900)**  
**Ch 600**  
**18GHz – 19GHz**  
 Spurious emission limit -13dBm

EUT: 21111L  
 Customer:: Sony Electronics  
 Test Mode: CDMA 1900; CH 600  
 ANT Orientation: H  
 EUT Orientation: H  
 Test Engineer: Chris  
 Voltage: AC  
 Comments:

**SWEEP TABLE: "FCC 24spuri 18-19.1G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
18.0 GHz	19.1 GHz	Average	Coupled	1 MHz	DUMMY-DBM





**RADIATED SPURIOUS EMISSIONS(PCS 1900)**

**Ch 1175**

**1GHz – 18GHz**

Spurious emission limit -13dBm

**Note: The peak above the limit line is the carrier freq. at ch-1175.**

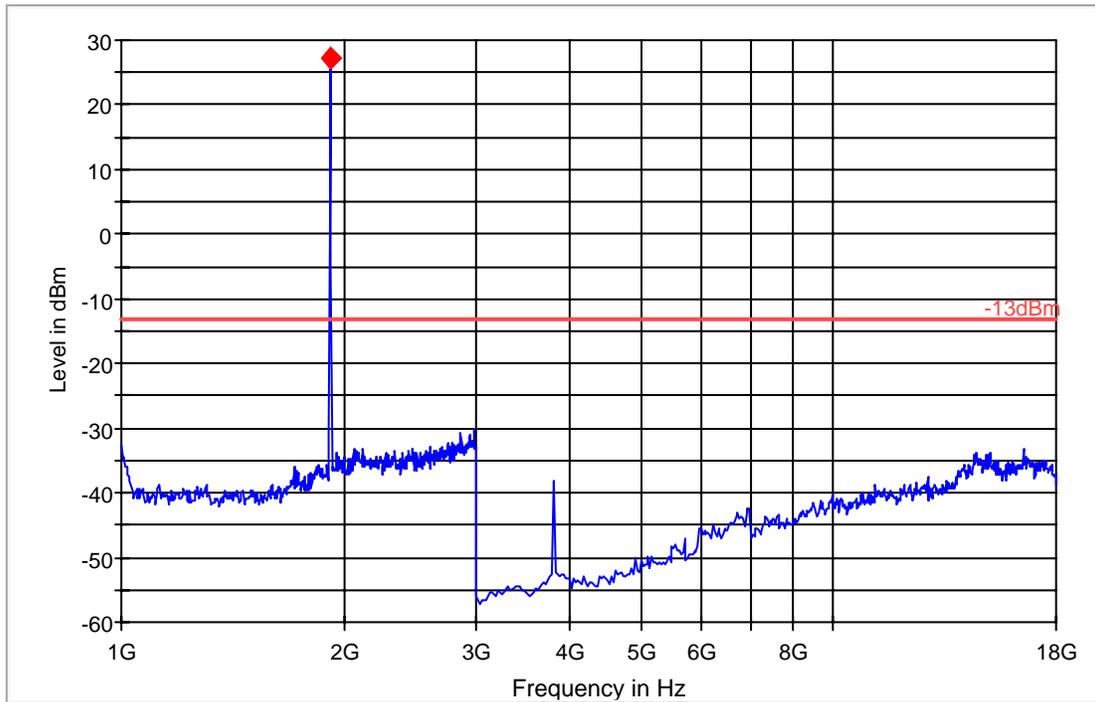
**Final Result 1**

Frequency (MHz)	MaxPeak (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
1908.567134	27.2	1000.000	1000.000	146.0	H	187.0	-69.4	-40.2	-13.0

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

Frequency (MHz)	Comment
1908.567134	

FCC 24 1-18GHz



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



**RADIATED SPURIOUS EMISSIONS(PCS 1900)**

**Ch 1175**

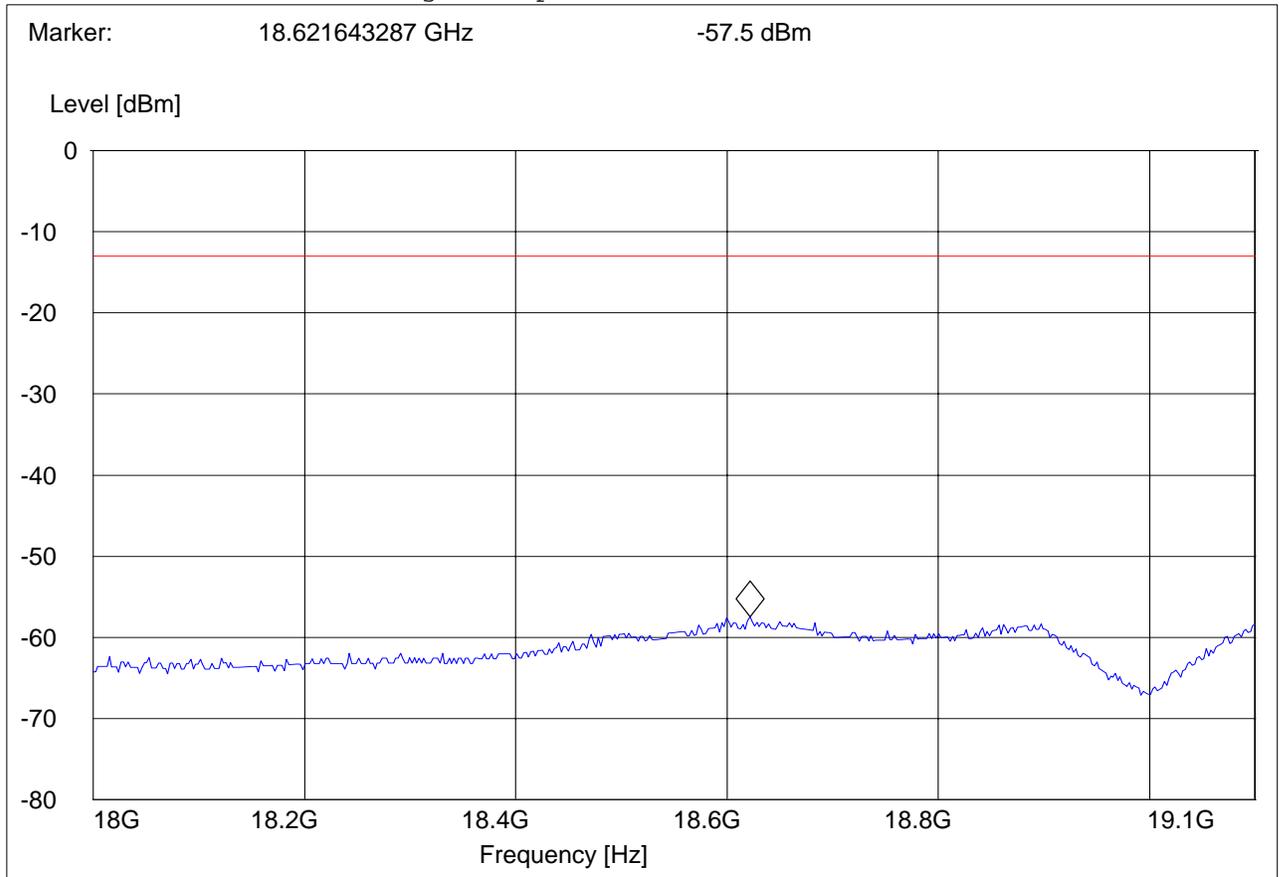
**18GHz – 19.1GHz**

Spurious emission limit –13dBm

EUT: 21111L  
 Customer:: Sony Electronics  
 Test Mode: CDMA 1900; CH 1175  
 ANT Orientation: H  
 EUT Orientation: H  
 Test Engineer: Chris  
 Voltage: AC  
 Comments:

**SWEEP TABLE: "FCC 24spuri 18-19.1G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
18.0 GHz	19.1 GHz	Average	Coupled	1 MHz	DUMMY-DBM



**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**

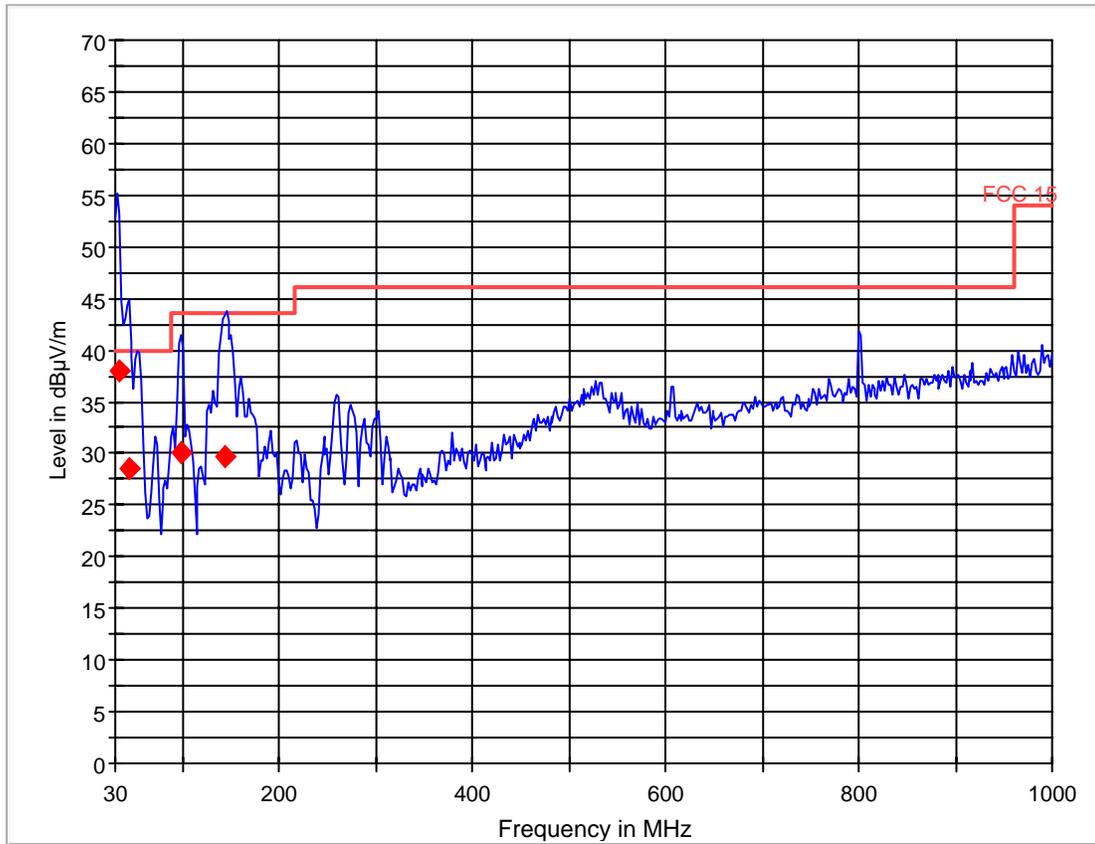
Spurious emission limit -13dBm

Note: This plot is valid for low, mid & high channels (worst-case plot)

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
33.228421	37.9	20.000	120.000	121.0	V	1.0	6.8	2.1	40.0
43.997996	28.5	20.000	120.000	121.0	V	69.0	6.0	11.5	40.0
98.206413	30.0	20.000	120.000	121.0	V	278.0	9.9	13.5	43.5
144.358718	29.6	20.000	120.000	121.0	V	292.0	9.6	13.9	43.5

FCC 15 30-1000MHz



— FCC 15.LimitLine      — Preview Result 1      ◆ Final Result 1

**RECEIVER RADIATED SPURIOUS EMISSIONS**

**RX: 1GHz - 18GHz**

Spurious emission limit -13dBm

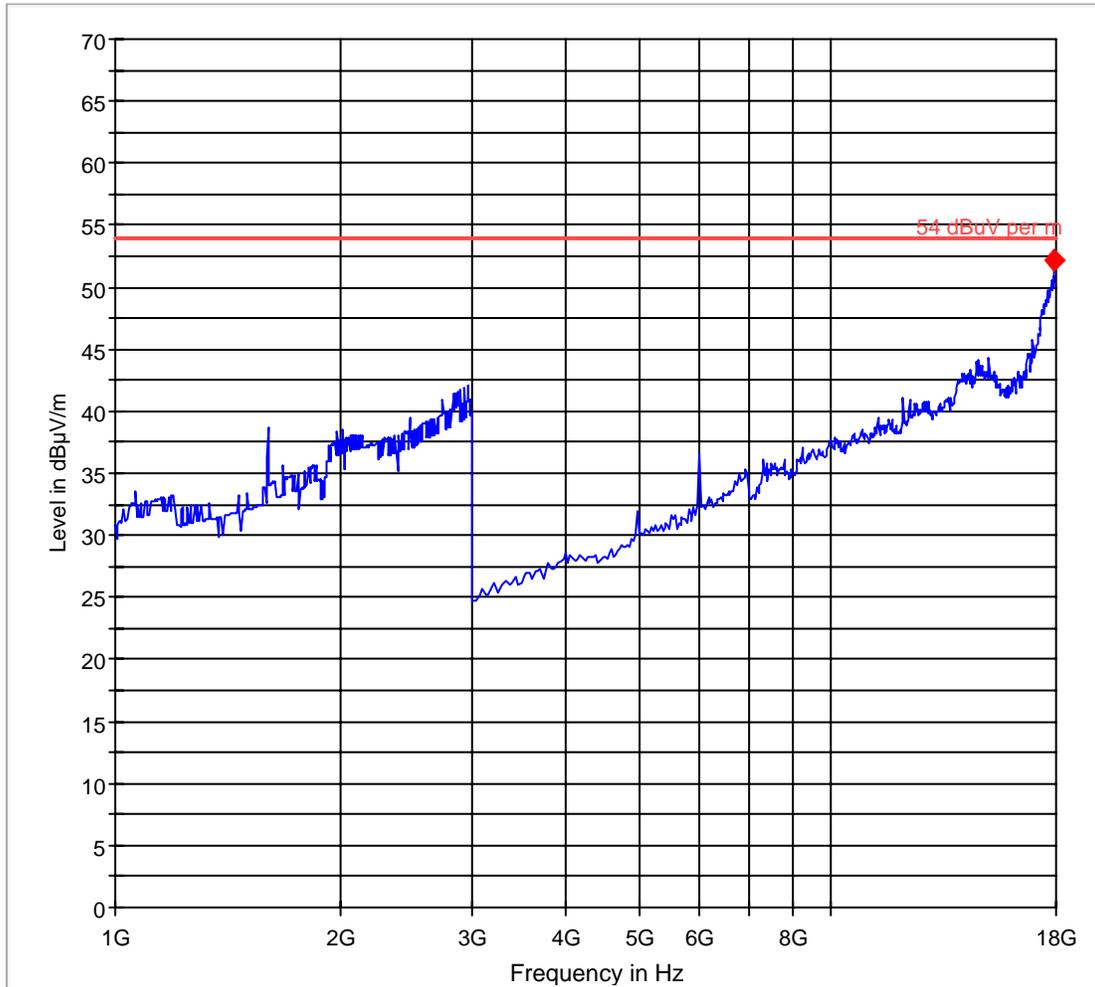
**Final Result 1**

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
17944.058117	52.1	20.000	1000.000	120.0	V	108.0	29.5	1.9	54.0

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

Frequency (MHz)	Comment
17944.058117	

FCC 15 1-18GHz



— 54 dBµV per m.LimitLine      — Preview Result 1      ◆ Final Result 1



**RECEIVER RADIATED SPURIOUS EMISSIONS**

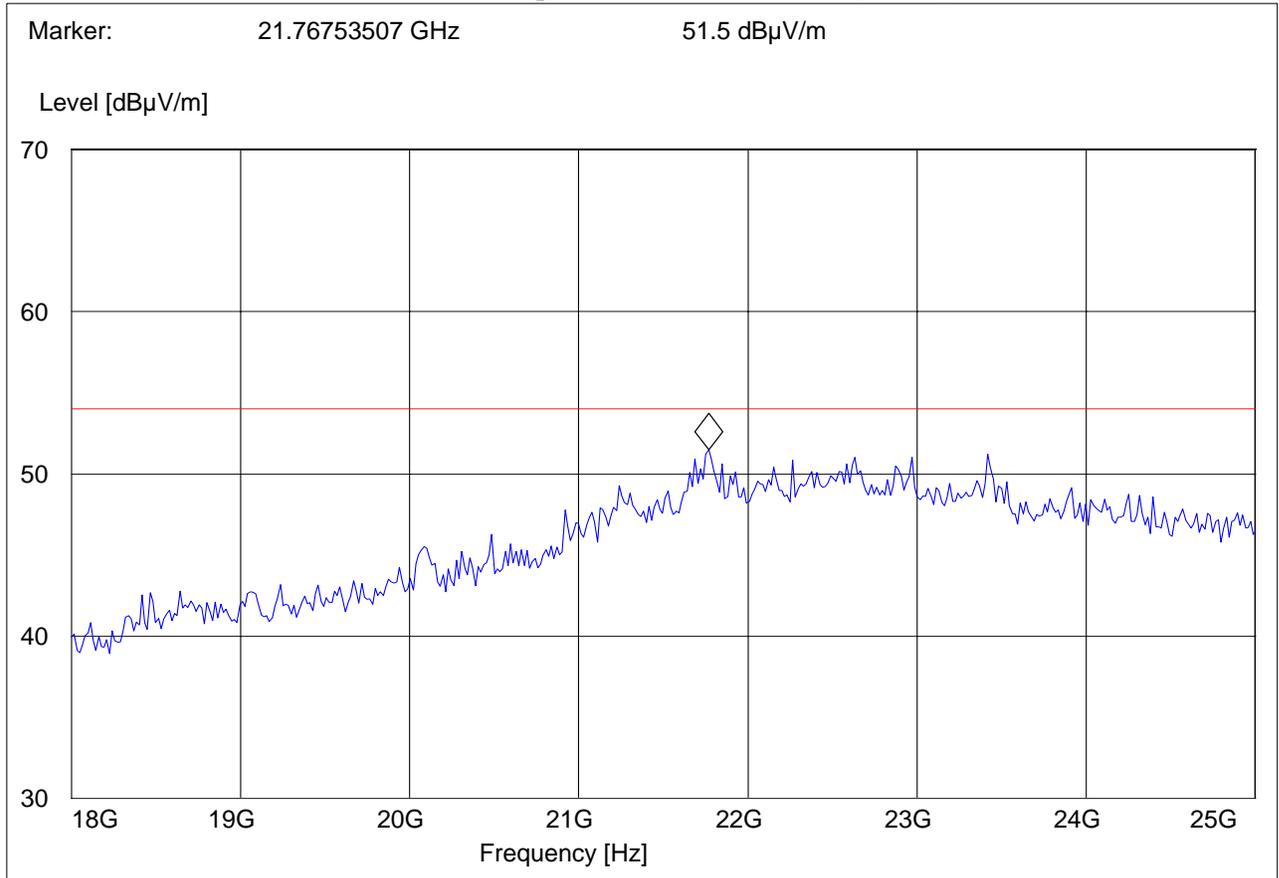
**RX: 18-26GHz**

Spurious emission limit -13dBm

EUT: 21111L  
 Customer:: Sony Electronics  
 Test Mode: CDMA 1900; RX  
 ANT Orientation: H  
 EUT Orientation: H  
 Test Engineer: Chris  
 Voltage: AC  
 Comments:

**SWEEP TABLE: "CANADA RE\_18-26.5G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
18.0 GHz	26.0 GHz	MaxPeak	Coupled	1 MHz	Horn # 3116_18-40G



**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 μH/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 (dBμV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

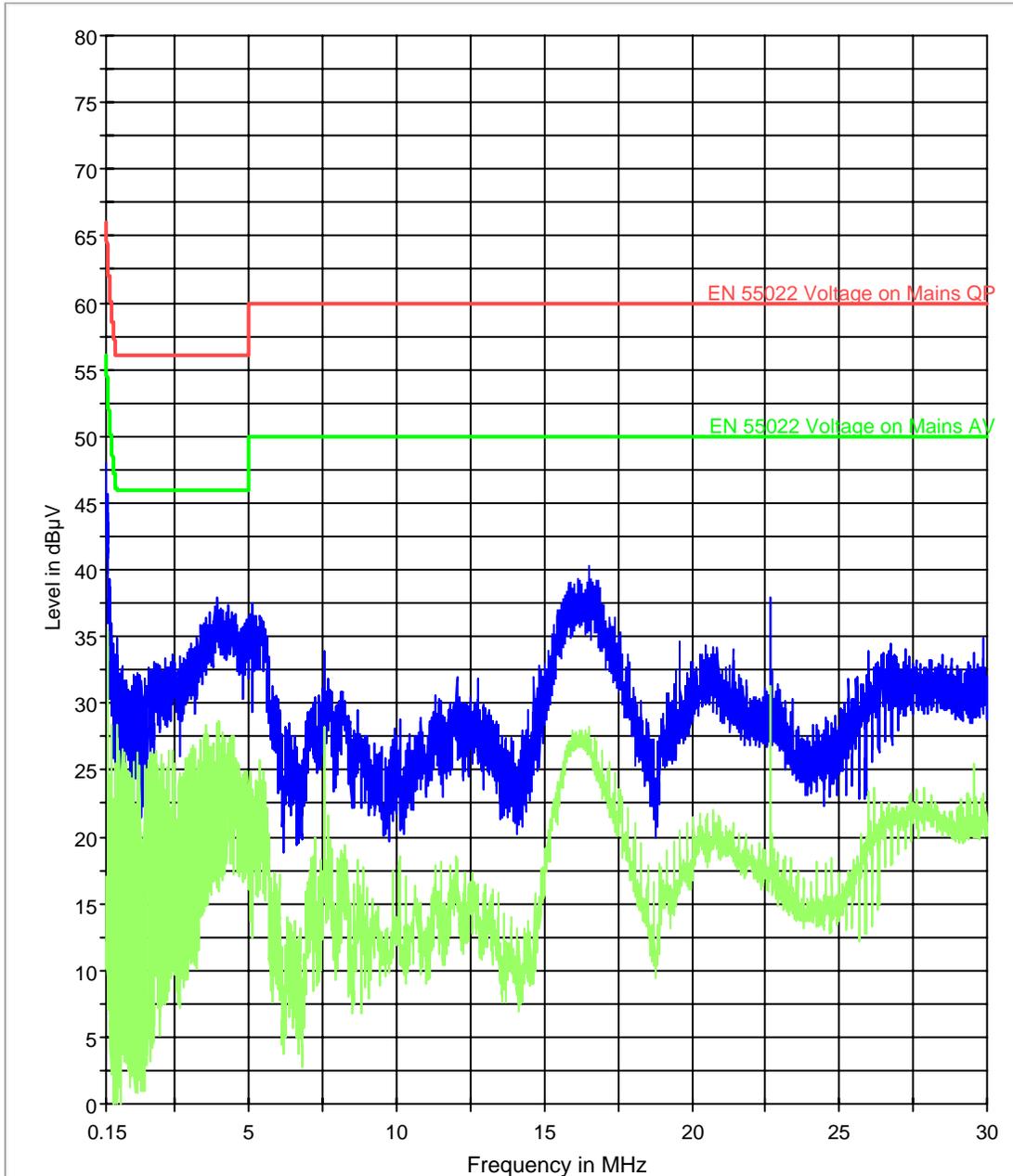
\* Decreases with logarithm of the frequency

**ANALYZER SETTINGS: RBW = 10KHz VBW = 10KHz**

5.4.2 RESULTS TX CDMA 800:

# Line

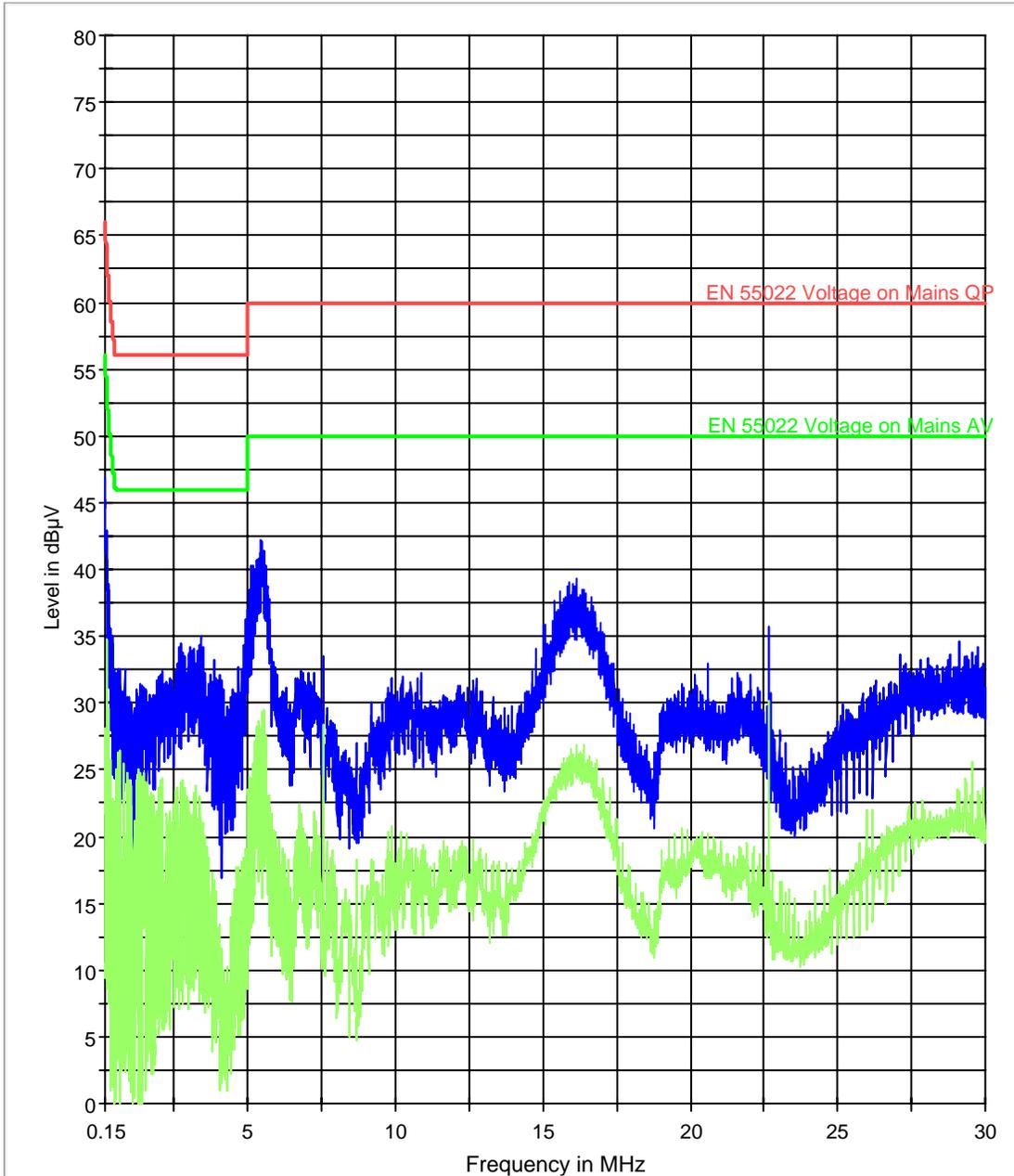
CISPR 22 Mains Conducted - L



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

# Neutral

CISPR 22 Mains Conducted - N

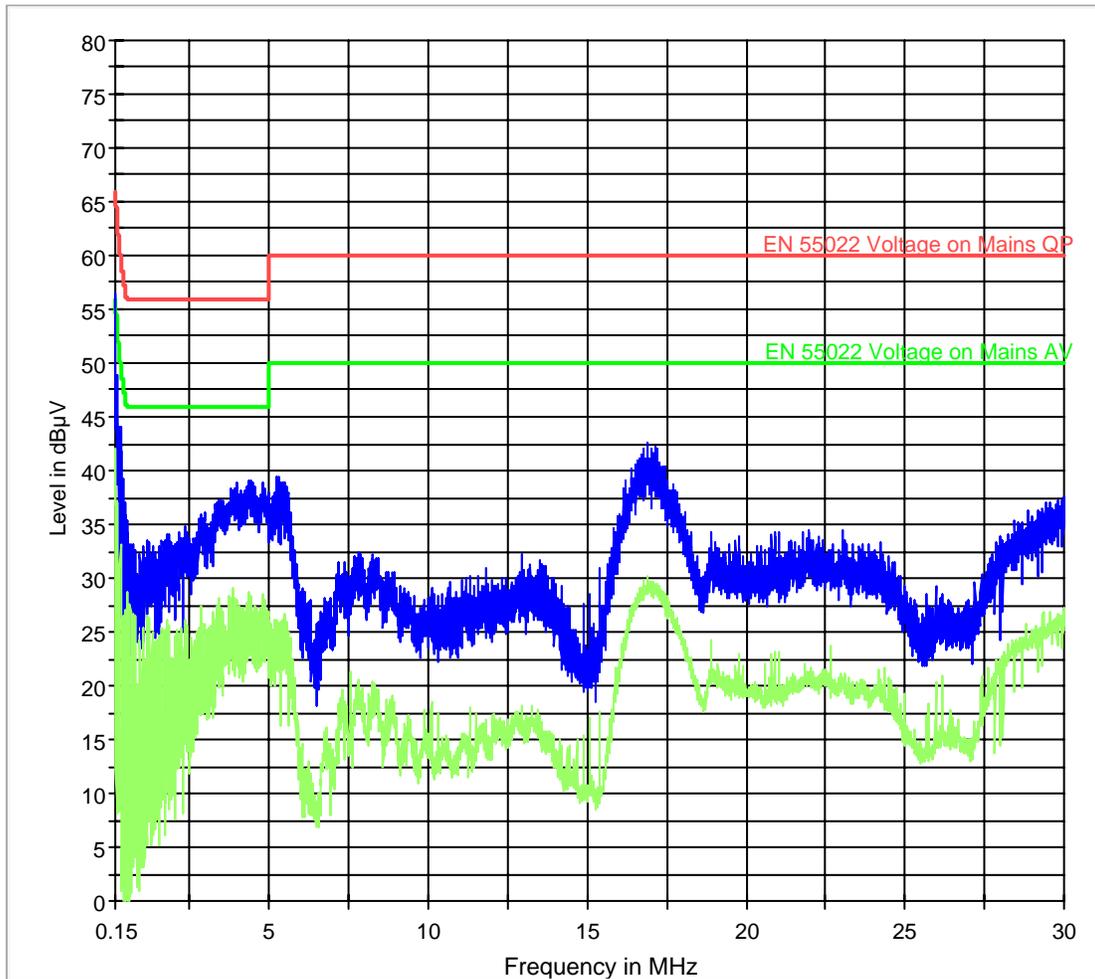


- EN 55022 Voltage on Mains QP.LimitLine
- EN 55022 Voltage on Mains AV.LimitLine
- Preview Result 1
- Preview Result 2

### 5.4.3 RESULTS TX CDMA 1900:

## Line

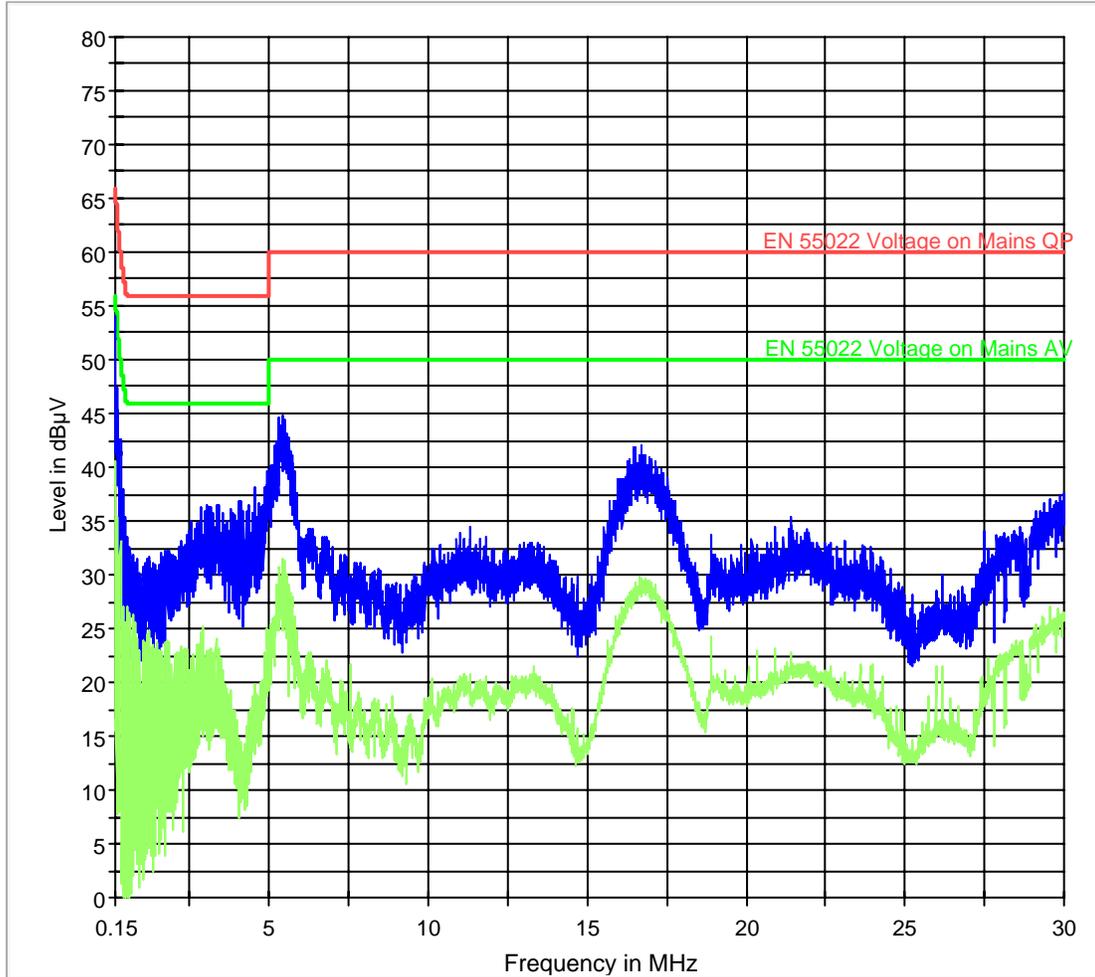
CISPR 22 Mains Conducted - L



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

# Neutral

CISPR 22 Mains Conducted - N



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

## 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.

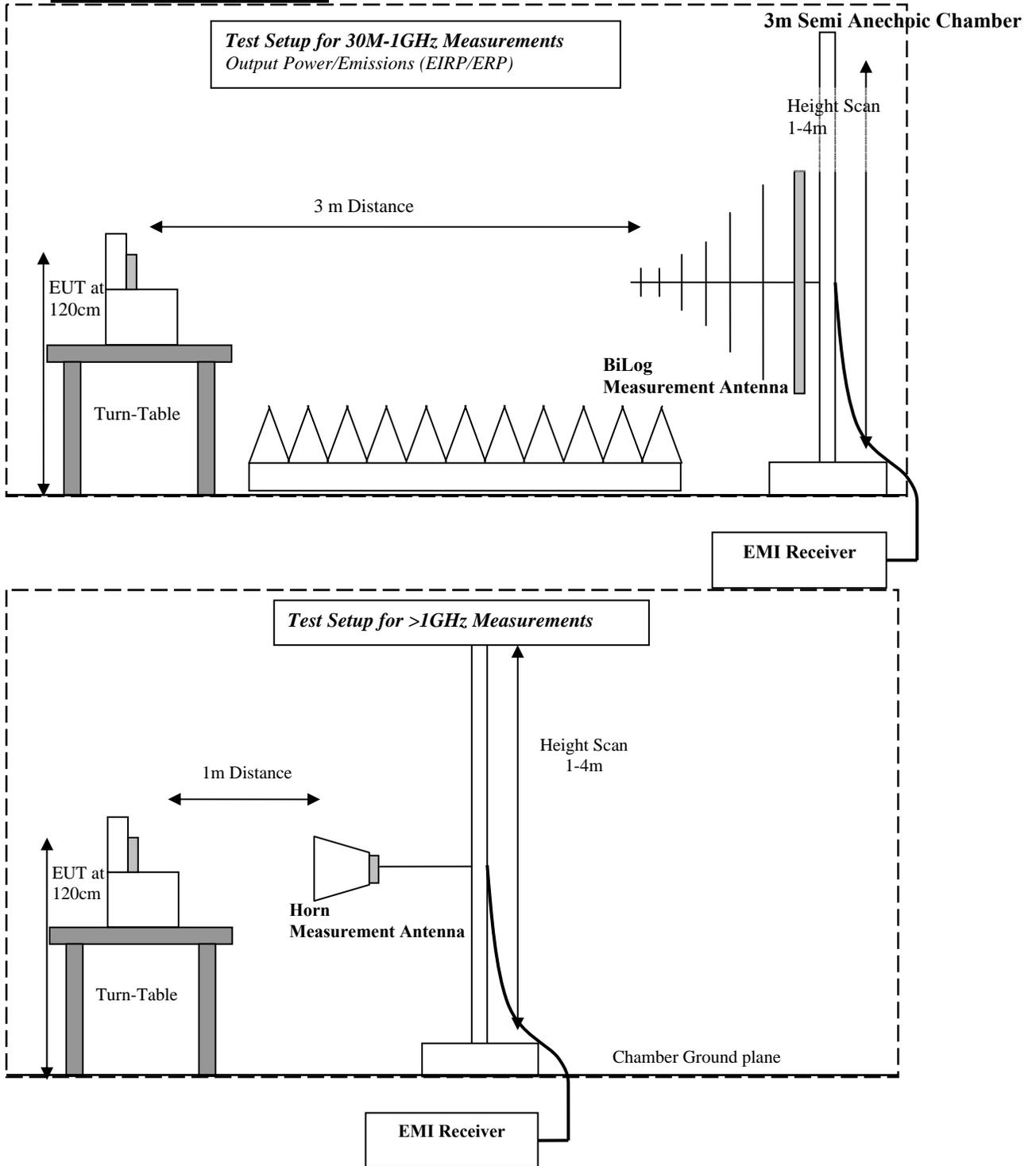
Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION,  
PART 22 PUBLIC MOBILE SERVICES October 1, 1998.

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

2009-07-30 First Issue  
2009-08-07 Rev1, Updated EUT description  
2009-08-27 Rev2, Updated ERP/EIRP  
2009-08-28 Rev3, Corrected 3.1