

**CETECOM Inc.**



**CETECOM Inc.**

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**Issued test report consists of 55 Pages**

**Page 1 (55)**

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**FCC LISTED, REG. NO.: 101450  
&  
RECOGNIZED BY INDUSTRY CANADA  
IC – 3925**

**Test report no.: 303FCC24/2002  
FCC Part 24 / RSS 133  
(SGH-S300)**

**Table of Contents**

<b>1</b>	<b>General information</b>
<b>1.1</b>	<b>Notes</b>
<b>1.2</b>	<b>Testing laboratory</b>
<b>1.3</b>	<b>Details of applicant</b>
<b>1.4</b>	<b>Application details</b>
<b>1.5</b>	<b>Test item</b>
<b>1.6</b>	<b>Test standards</b>
<b>2</b>	<b>Technical test</b>
<b>2.1</b>	<b>Summary of test results</b>
<b>2.2</b>	<b>Test report</b>
<b>1</b>	<b>General information</b>
<b>1.1</b>	<b>Notes</b>

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM Inc. does not assume responsibility for any conclusions and generalisations 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.

**TEST REPORT PREPARED BY:****EMC Engineer: Harpreet Sidhu****1.2 Testing laboratory****CETECOM Inc.**

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**1.3 Details of applicant**

**Name** : Samsung Electronics Co., Ltd.  
**Street** : #94-1, Imsoo-Dong, Gumi-City  
**City / Zip Code** : Kyung-Buk 730-350  
**Country** : Korea  
**Contact** : Byeong Kuk Lee  
**Telephone** : +82 54 479 5794  
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**e-mail** : [lbkuk@samsung.com](mailto:lbkuk@samsung.com)

**1.4 Application details**

Date of receipt of application : 2002-06-25  
Date of receipt test item : 2002-06-29  
Date of test : 2002-07-01

**1.5 Test item**

**Manufacturer** : Applicant  
**Model No.** : SGH-S300  
**Description** : GSM 900/1800/1900 Tri-Band folder type phone  
**HW & SW** : Rev 0.3A & Rev. 1.5  
**FCC-ID** : A3LSGHS300

**Additional information**

**Frequency** : 1850.2MHz – 1909.8MHz (in USA)  
**Type of modulation** : GMSK  
**Number of channels** : 299 (for PCS)  
**Antenna** : Fixed  
**Power supply** : Battery or charger (AC adaptor)  
**Output power** : 32.71dBm (1.87W)  
**Extreme vol. Limits** : 3.4 VDC – 4.2 VDC  
**Extreme temp. Tolerance** : -30 C to +50 C

**1.6 Test standards**

FCC Part 24 / RSS133 r1

**2 Technical test**

**2.1 Summary of test results**

No deviations from the technical specification(s) were ascertained in the course of the tests Performed	
Final Verdict: (only "passed" if all single measurements are "passed")	<b>Passed</b>

**Technical responsibility for area of testing:**

**2002-07-17    EMC & Radio    Lothar Schmidt (Manager)**

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<b>Date</b>	<b>Section</b>	<b>Name</b>	<b>Signature</b>
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**Responsible for test report and project leader:**

**2002-07-17    EMC & Radio    Harpreet Sidhu (EMC Engineer)**

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<b>Date</b>	<b>Section</b>	<b>Name</b>	<b>Signature</b>
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**2.2 Test report**

**TEST REPORT**

**Test report no.: 303FCC24/2002  
(SGH-S300)**

**TEST REPORT REFERENCE**

<b>PARAMETER TO BE MEASURED</b>	<b>PARAGRAPH</b>	<b>PAGE</b>
<b>POWER OUTPUT</b>	<b>SUBCLAUSE § 24.232</b>	<b>7</b>
<b>FREQUENCY STABILITY</b>	<b>SUBCLAUSE § 24.235</b>	<b>12</b>
<b>OCCUPIED BANDWIDTH</b>	<b>SUBCLAUSE §2.989</b>	<b>14</b>
<b>EMISSIONS LIMITS</b>	<b>SUBCLAUSE§24.238</b>	<b>21</b>
<b>RECEIVER RADIATED EMISSIONS</b>	<b>SUBCLAUSE § 15.209</b>	<b>41</b>
<b>CONDUCTED SPURIOUS EMISSIONS</b>	<b>SUBCLAUSE § 24.238</b>	<b>46</b>
<b>CONDUCTED EMISSIONS</b>	<b>SUBCLAUSE § 15.107/207</b>	<b>51</b>
<b>TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS</b>		<b>53</b>
<b>BLOCK DIAGRAMS</b>		<b>54</b>

**POWER OUTPUT****SUBCLAUSE § 24.232****Summary:**

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMD-55) to ensure max. power transmission and proper modulation.

This paragraph contains both average, peak output powers and EIRP measurements for the EUT. In all cases, the peak output power is within the specified limits.

**Method of Measurements:**

The EUT was set up for the max. output power with pseudo random data modulation.

The power was measured with R&S Spectrum Analyzer ESIB 40 ( peak) and NRVD power meter (average)

These measurements were done at 3 frequencies, 1850.2 MHz, 1880.0 MHz and 1909.8 MHz (bottom, middle and top of operational frequency range)

**Limits:**

<b>Power Step</b>	<b>Nominal Peak Output Power (dBm)</b>	<b>Tolerance (dB)</b>
<b>0</b>	<b>+30</b>	<b>± 2</b>

**Power Measurements:****Conducted:**

<b>Frequency (MHz)</b>	<b>Power Step</b>	<b>Peak Output Power (dBm)</b>	<b>Average Output Power (dBm)</b>
<b>1850.2</b>	<b>0</b>	<b>29.94</b>	<b>27.10</b>
<b>1880.0</b>	<b>0</b>	<b>29.15</b>	<b>26.20</b>
<b>1909.8</b>	<b>0</b>	<b>29.14</b>	<b>26.02</b>
<b>Measurement uncertainty</b>		<b>±0.5 dB</b>	

**ANALYZER SETTINGS: RBW = 3MHz VBW = 3MHz**

**EIRP Measurements**

Description: This is the test for the maximum radiated power from the EUT.

Rule Part 24.232(b) specifies that "Mobile/portable stations are limited to 2 watts e.i.r.p. peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

Method of Measurement:

1. In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.
2. A "reference path loss" is established as  $P_{in} + 2.1 - P_r$ .
3. The EUT is substituted for the dipole at the reference centre of the chamber. The EUT is put into CW test mode and a scan is performed to obtain the radiation pattern.
4. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs is identified.
5. The EUT is then put into pulse mode at its maximum power level (Power Step 0).
6. "Gated mode" power measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in FCC Rule 24.232 (b) and (c). The "reference path loss" from Step 1 is added to this result.
7. This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.1 dBi) and known input power (Pin).
8. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.1dBi$ .

**Limits:**

Power Step	Burst Average EIRP (dBm)
0	<33

**Power Measurements:**

Plots are shown on next pages

**Radiated:**

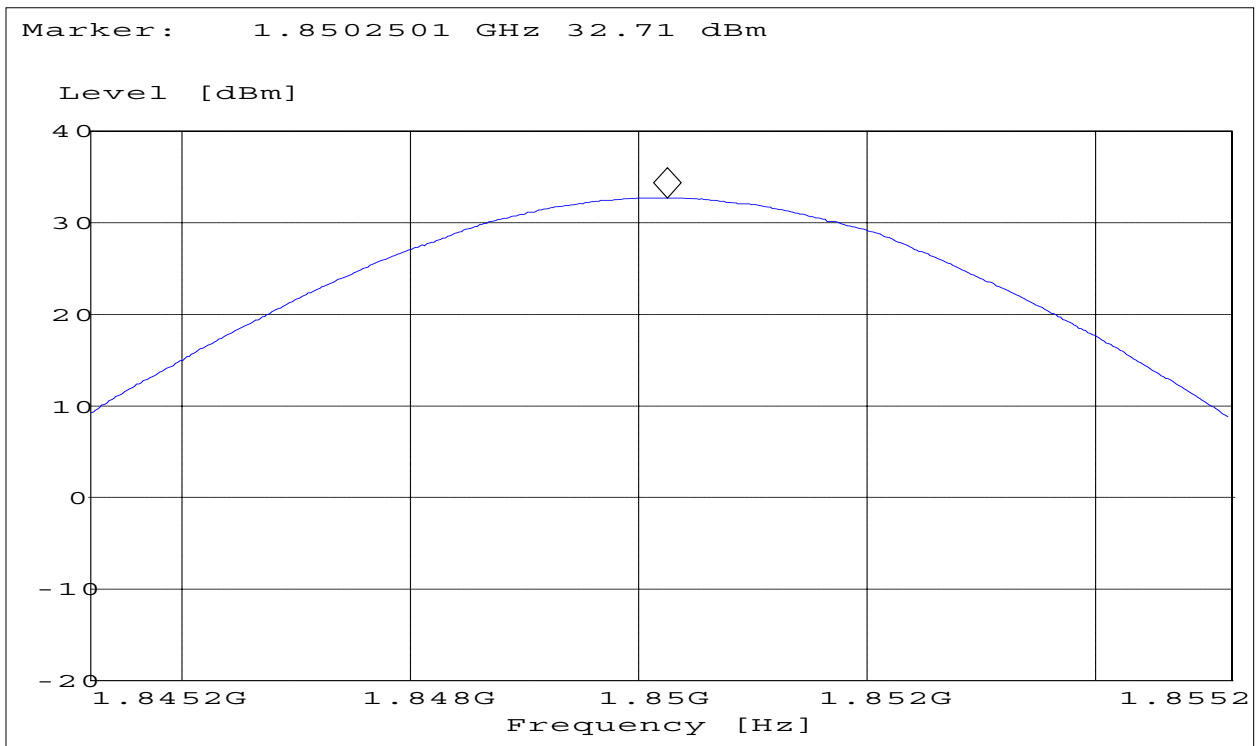
Frequency (MHz)	Power Step	BURST AVERAGE (dBm)	
		EIRP	ERP
1850.2	0	32.71	30.61
1880.0	0	32.40	30.30
1909.8	0	32.43	30.33
Measurement uncertainty		±0.5 dB	

ANALYZER SETTINGS: RBW = VBW = 3MHz

EIRP CHANNEL 512

SWEEP TABLE: "EIRP 1900 CH512"

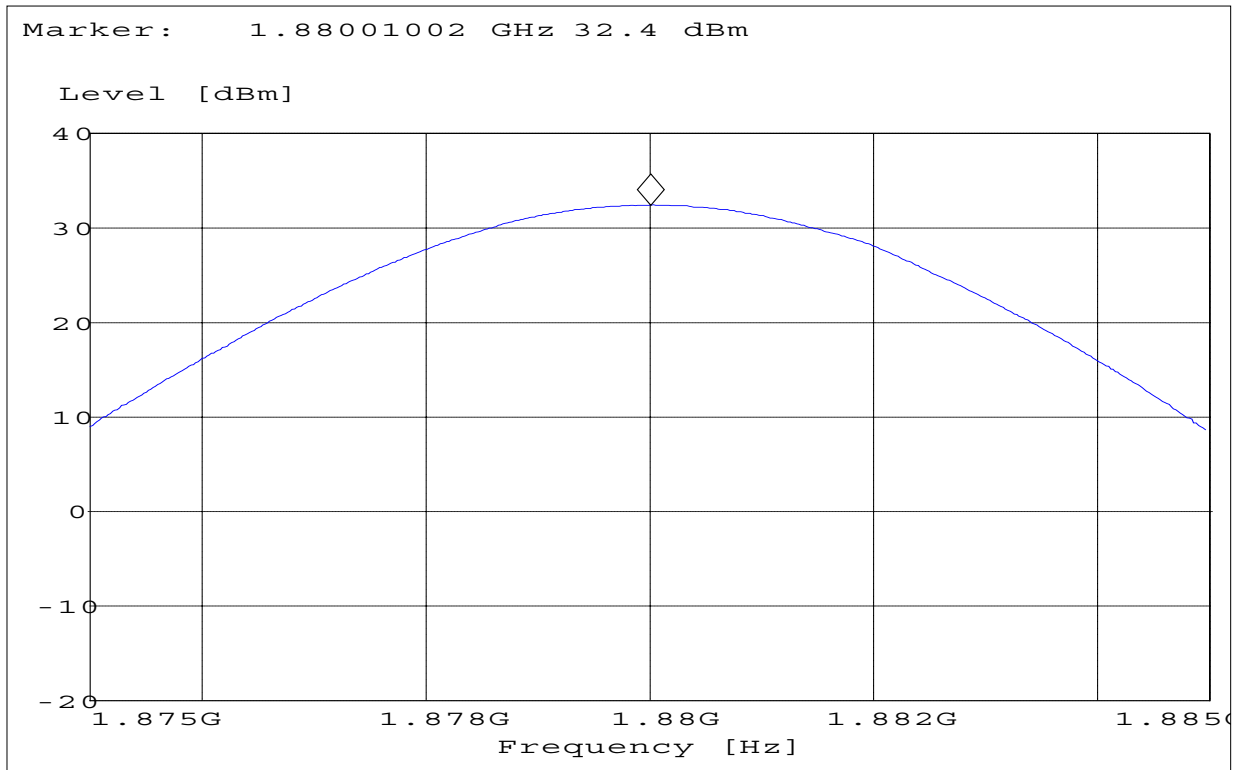
Start	Stop	Detector	Meas. Time	RBW/VBW
1.8452 GHz	1.8552 GHz	Max Peak	Coupled	3 MHz



EIRP CHANNEL 661:

SWEEP TABLE: "EIRP 1900 CH661"

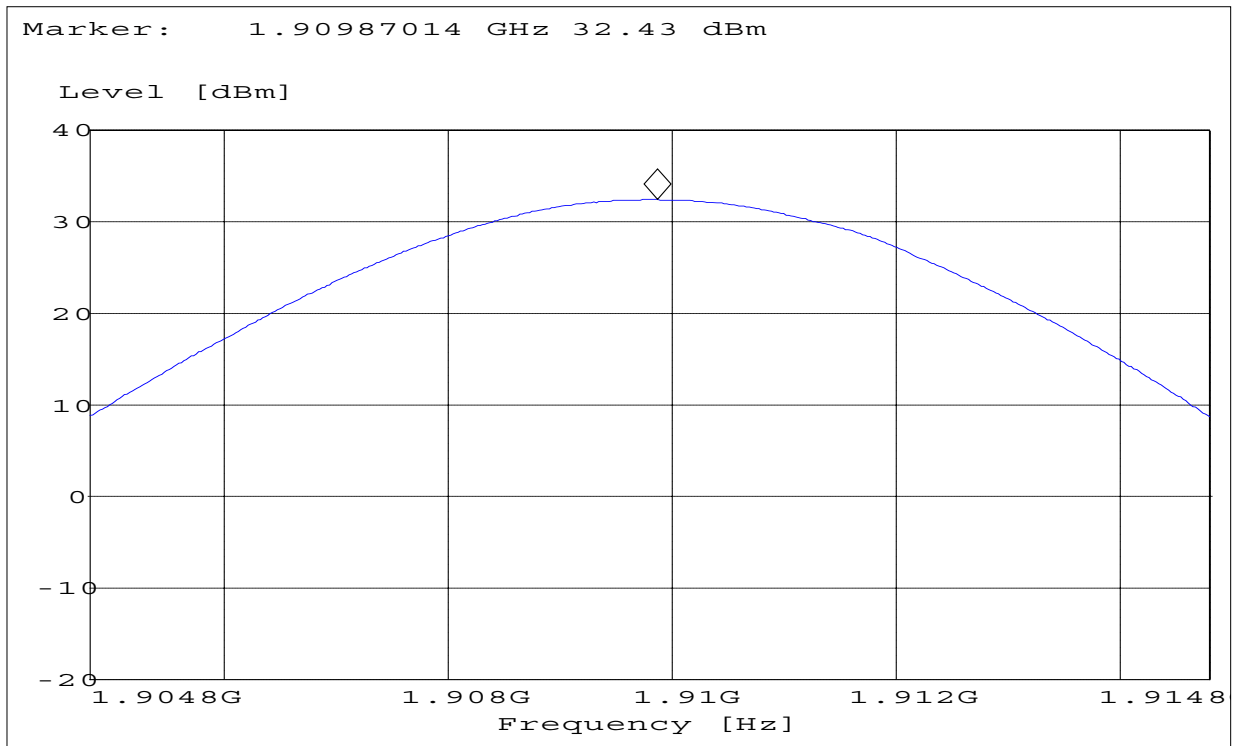
Start	Stop	Detector	Meas.	RBW/VBW
Frequency	Frequency		Time	
1.875 GHz	1.885 GHz	Max Peak	Coupled	3 MHz



EIRP CHANNEL 810:

SWEEP TABLE: "EIRP 1900 CH810"

Start	Stop	Detector	Meas. Time	RBW/VBW
1.9048 GHz	1.9148 GHz	Max Peak	Coupled	3 MHz



**FREQUENCY STABILITY****SUBCLAUSE § 24.235****Method of Measurement:**

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of a R&S CMD 55 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30 C.
3. With the EUT, powered via nominal voltage, connected to the CMD 55 and in a simulated call on channel 661 (centre channel), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the EUT, to prevent significant self warming.
4. Repeat the above measurements at 10 C increments from -30 C to +50 C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
5. Remeasure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1 Volt increments remeasuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50 C.
7. With the EUT, powered via nominal voltage, connected to the CMD 55 and in a simulated call on channel 661 (centre channel), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the EUT, to prevent significant self warming.
8. Repeat the above measurements at 10 C increments from +50 C to -30 C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5 C during the measurement procedure.

**Measurement Limit:****For Hand carried battery powered equipment:**

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.4 VDC and 4.2 VDC, with a nominal voltage of 3.75 VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -9.3 % and +12.0 %. For the purposes of measuring frequency stability these voltage limits are to be used.

**For equipment powered by primary supply voltage:**

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires to vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

**AFC FREQ ERROR vs. VOLTAGE**

<b>Voltage (V)</b>	<b>Frequency Error (Hz)</b>	<b>Frequency Error (ppm)</b>
3.4 volt	151 Hz	.0803 ppm
3.5 volt	155 Hz	.0824 ppm
3.6 volt	135 Hz	.0718 ppm
3.7 volt	143 Hz	.0761 ppm
3.8 volt	156 Hz	.0830 ppm
3.9 volt	156 Hz	.0830 ppm
4.0 volt	160 Hz	.0851 ppm
4.1 volt	161 Hz	.0856 ppm
4.2 volt	163 Hz	.0867 ppm

**AFC FREQ ERROR vs. TEMPERATURE**

<b>TEMPERATURE (°C)</b>	<b>Frequency Error (Hz)</b>	<b>Frequency Error (ppm)</b>
-30	177 Hz	.0941 ppm
-20	158 Hz	.0840 ppm
-10	173 Hz	.0920 ppm
0	159 Hz	.0846 ppm
+10	166 Hz	.0883 ppm
+20	147 Hz	.0782 ppm
+30	132 Hz	.0702 ppm
+40	150 Hz	.0800 ppm
+50	153 Hz	.0814 ppm

**OCCUPIED BANDWIDTH**

**§2.989**

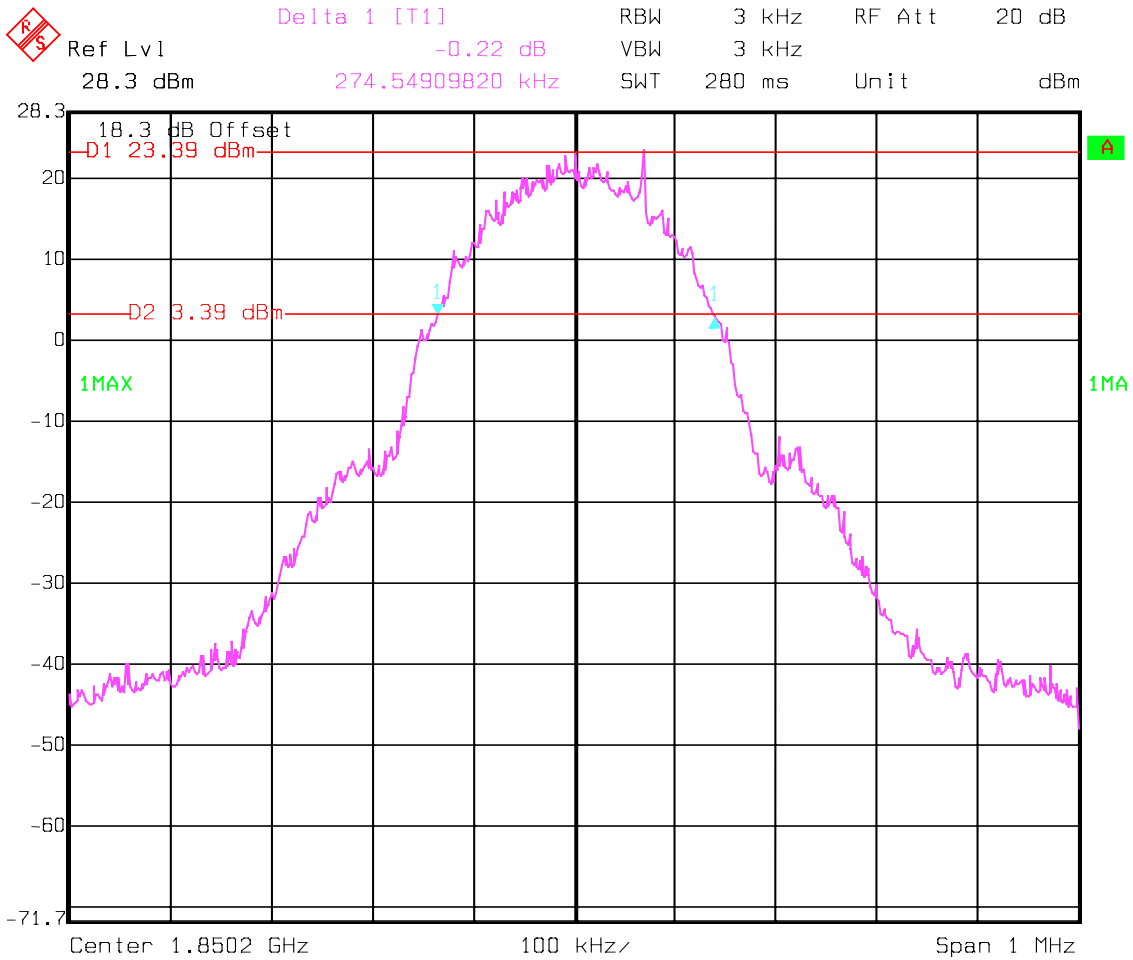
**Occupied Bandwidth Results**

Similar to conducted emissions, occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the USPCS frequency band. Table below lists the measured 99% power and -26dBC occupied bandwidths. Spectrum analyzer plots are included on the following pages.

<b>Frequency</b>	<b>99% Occupied Bandwidth</b>	<b>-26 dBc Bandwidth</b>
<b>1850.2 MHz</b>	<b>274.55 kHz</b>	<b>320.64 kHz</b>
<b>1880.0 MHz</b>	<b>272.54 kHz</b>	<b>320.64 kHz</b>
<b>1909.2 MHz</b>	<b>278.55 kHz</b>	<b>318.63 kHz</b>

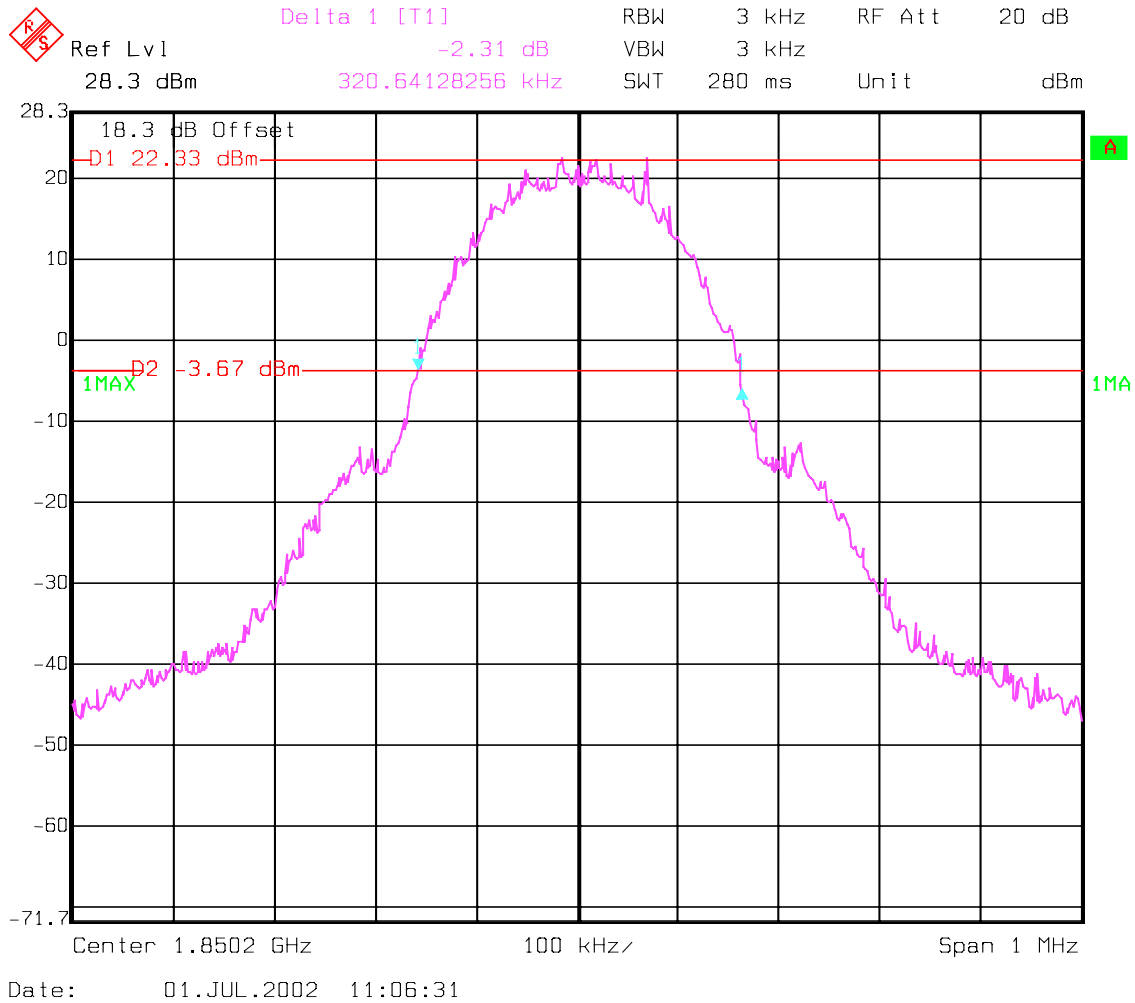
Part 24.238 (a) requires a measurement bandwidth of at least 1% of the occupied bandwidth. For 320.64 kHz, this equates to a resolution bandwidth of at least 3.5 kHz. For this testing, a resolution bandwidth 5.0 kHz was used.

Channel 512  
99% Occupied Bandwidth

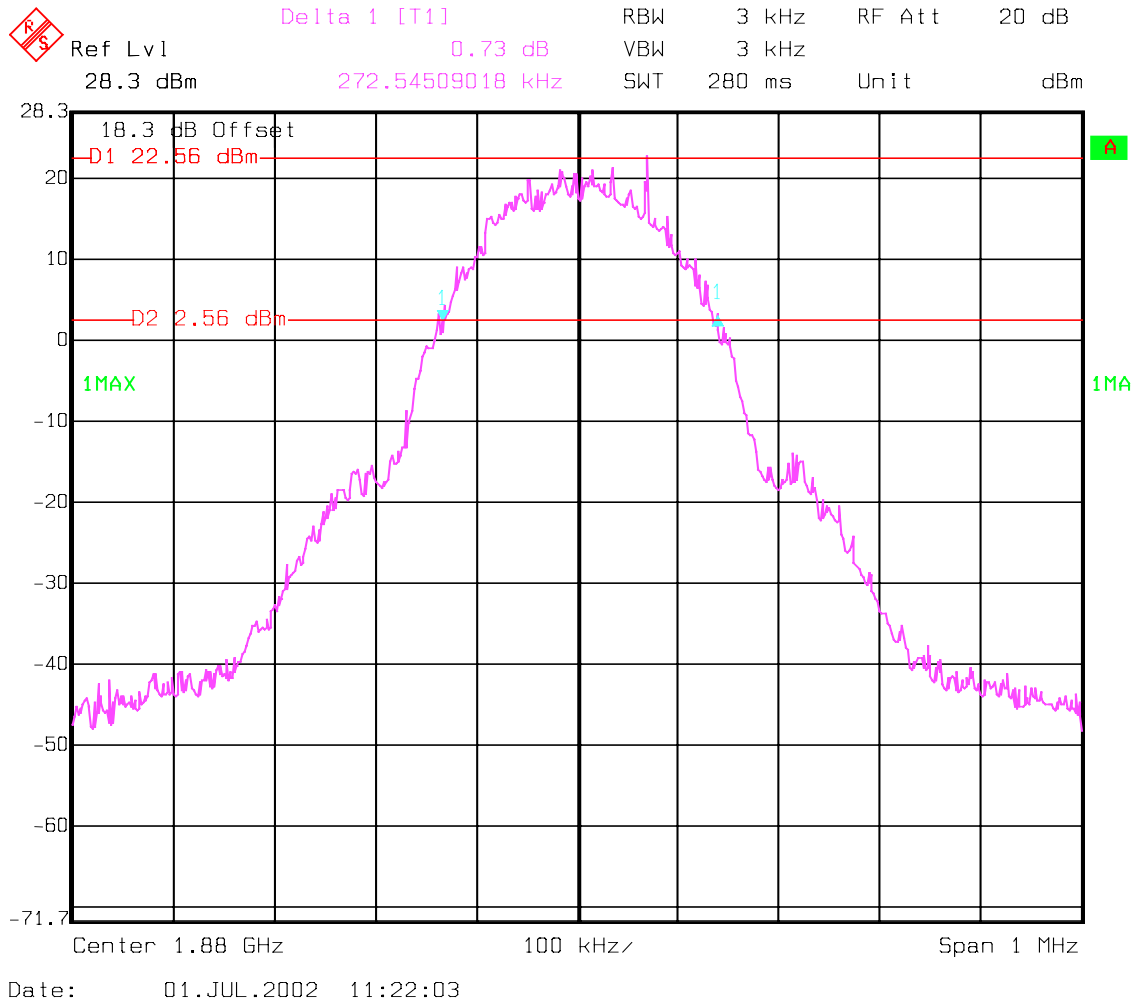


Date: 01.JUL.2002 11:19:32

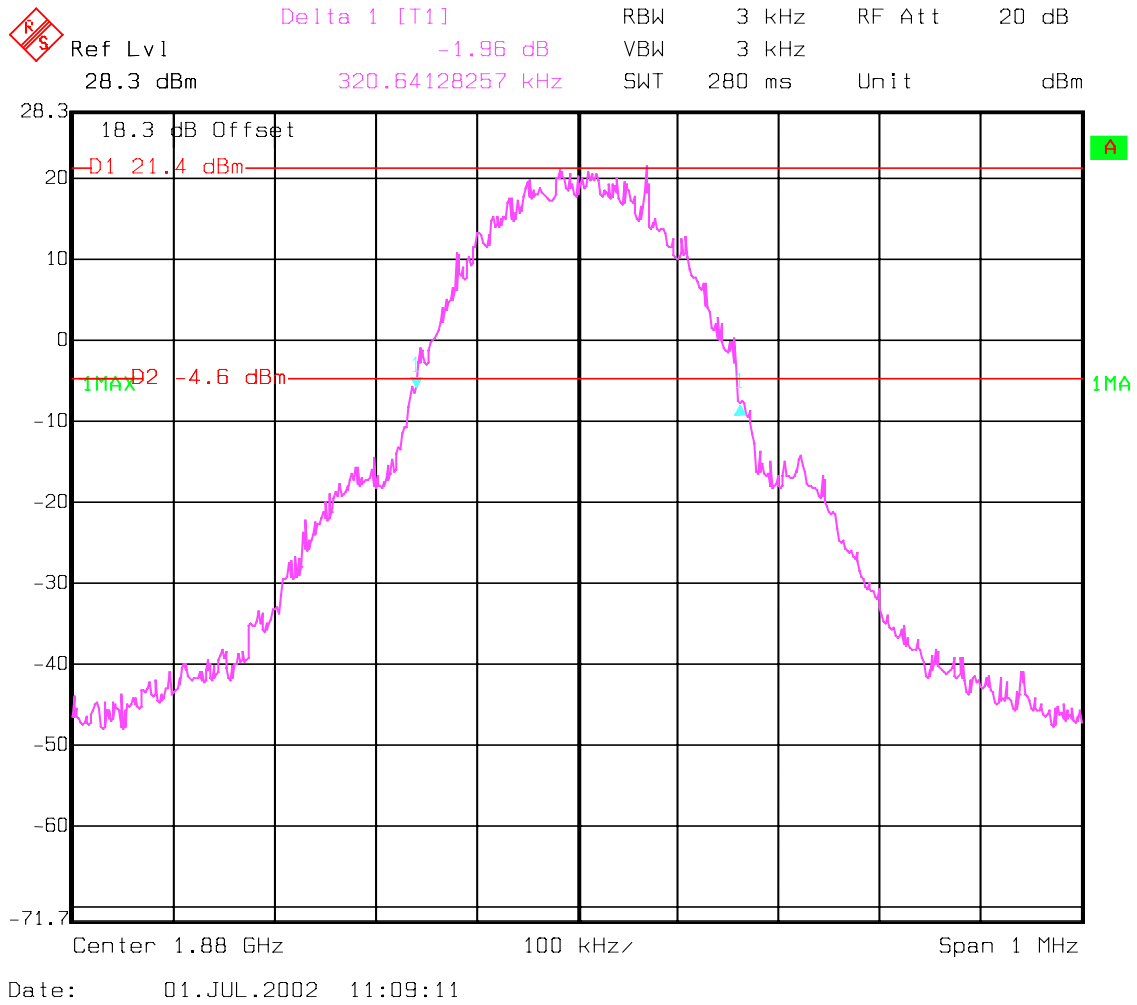
Channel 512  
-26 dBc Bandwidth



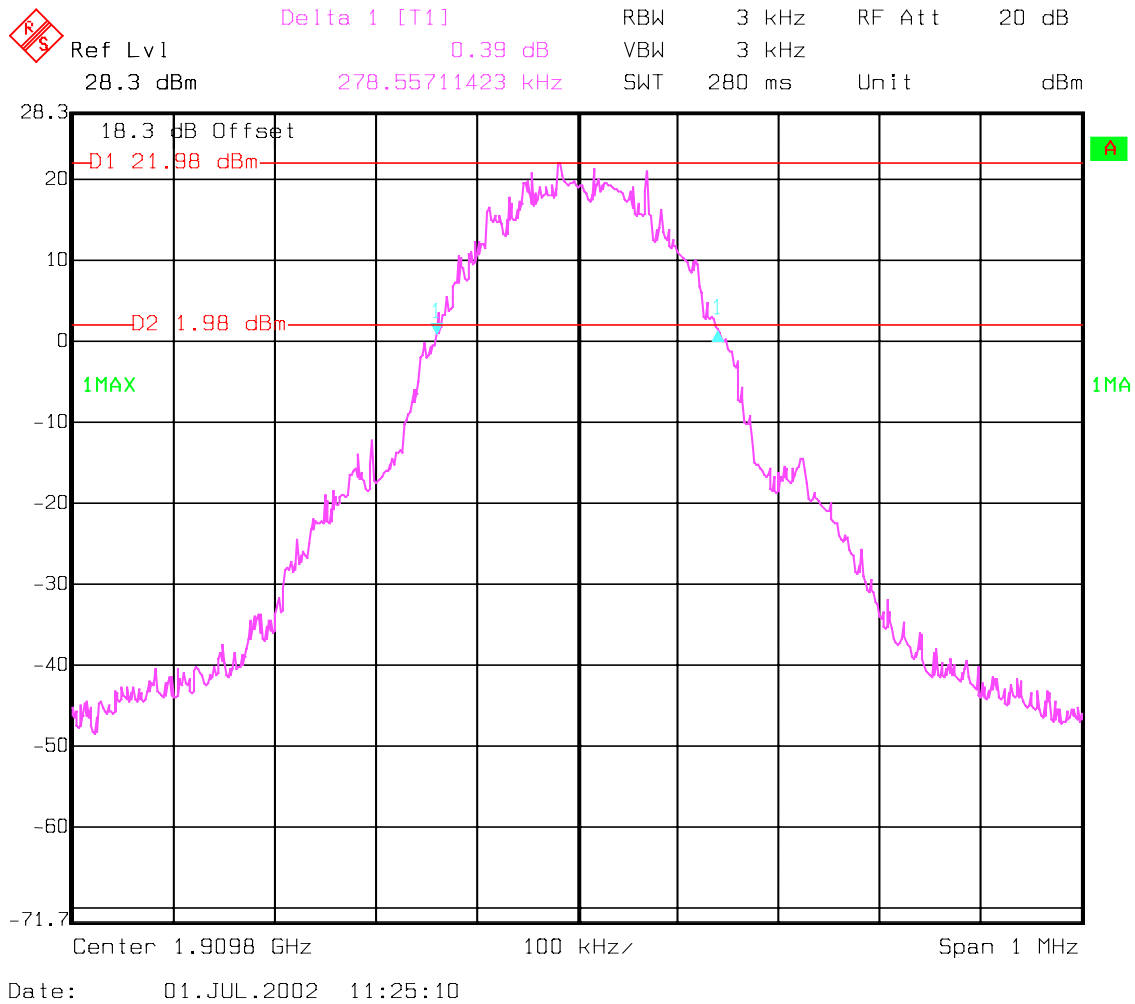
Channel 661  
99% Occupied Bandwidth



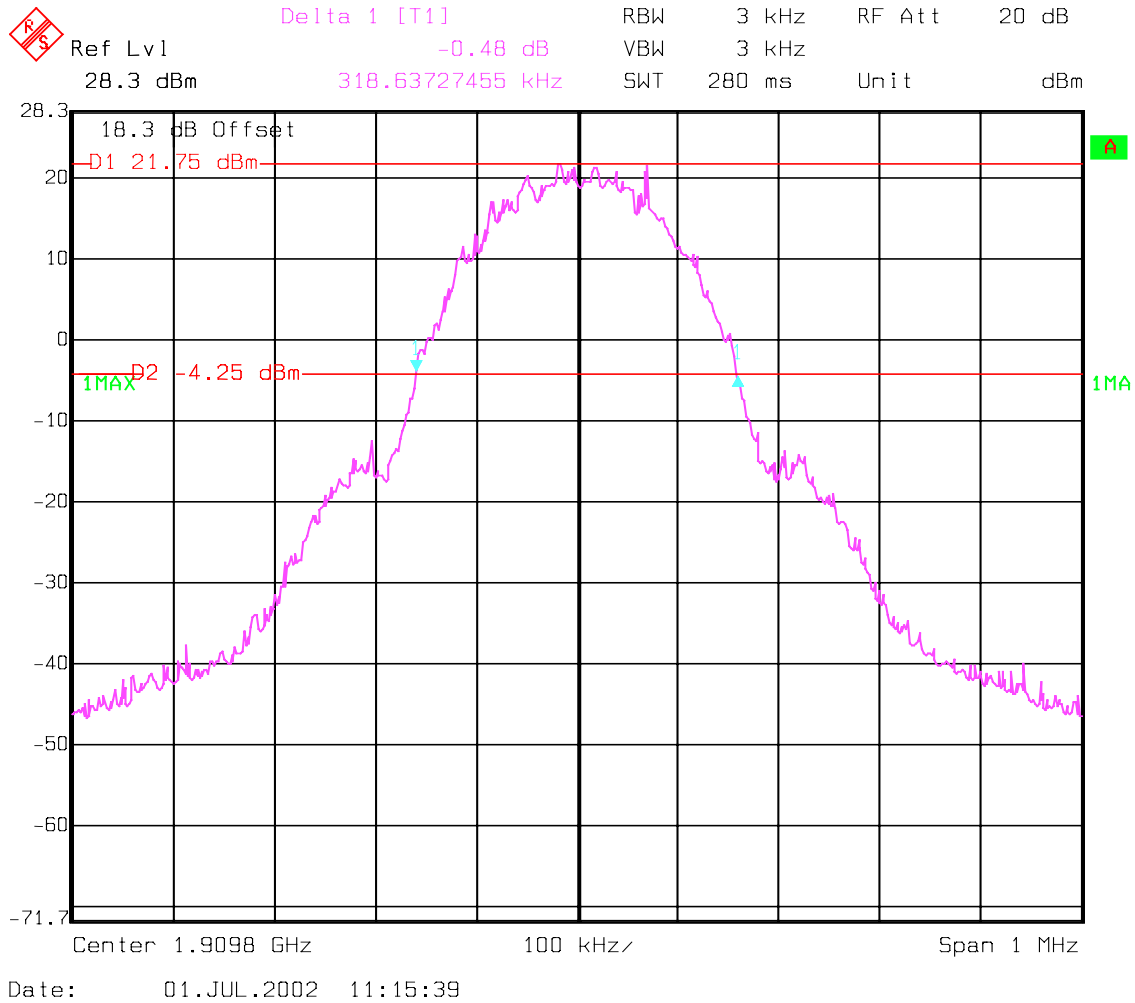
Channel 661  
-26 dBc Bandwidth



Channel 810  
99% Occupied Bandwidth



Channel 810  
-26 dBc Bandwidth



**EMISSIONS LIMITS****§24.238****Measurement Procedure:**

The following steps outline the procedure used to measure the radiated emissions from the EUT. The site is constructed in accordance with ANSI C63.4 – 1992 requirements and is recognised by the FCC. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. The resolution bandwidth is set as outlined in Part 24.238. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the USPCS band.

**The final Radiated emission test procedure is as follows:**

- a) The test item was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna.
- b) The antenna output was terminated in a 50 ohm load.
- c) A double ridged waveguide antenna was placed on an adjustable height antenna mast 3 meters from the test item for emission measurements.
- d) Detected emissions were maximized at each frequency by rotating the test item and adjusting the receive antenna height and polarization. The maximum meter reading was recorded. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth. If the harmonic could not be detected above the noise floor, the ambient level was recorded. The equivalent power into a dipole antenna was determined by the substitution method described for ERP measurements.

**Measurement Limit:**

Sec. 24.238 Emission Limits.

- (a) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least  $43 + 10 \log(P)$  dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

**Measurement Results:**

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the USPCS band (1850.2 MHz, 1880 MHz and 1909.8 MHz). 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 USPCS band into any of the other blocks. 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.

**NOTE: The spurious 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 18 GHz and 19.1 GHz very short cable connections to the antenna was used to minimize the noise level.**

**RESULTS OF RADIATED TESTS FOR FCC-24:**

<b>Harmonic</b>	<b>Tx ch-512 Freq.(MHz)</b>	<b>Level (dBm)</b>	<b>Tx ch-661 Freq. (MHz)</b>	<b>Level (dBm)</b>	<b>Tx ch-810 Freq. (MHz)</b>	<b>Level (dBm)</b>
<b>2</b>	3700.4	-30.73	3760	-36.57	3819.6	-35.33
<b>3</b>	5550.6	-32.85	5640	-35.04	5729.4	-36.18
<b>4</b>	7400.8	-31.30	7520	-31.10	7639.2	-31.21
<b>5</b>	9251	-34.31	9400	-35.21	9549	-32.70
<b>6</b>	11101.2	-36.17	11280	-36.39	11458.8	-34.27
<b>7</b>	12951.4	-33.65	13160	-33.35	13368.6	-34.66
<b>8</b>	14801.6	-33.42	15040	-31.20	15278.4	-31.32
<b>9</b>	16651.8	-27.17	16920	-27.55	17188.2	-25.70
<b>10</b>	18502	-27.38	18800	-29.86	19098	-29.06

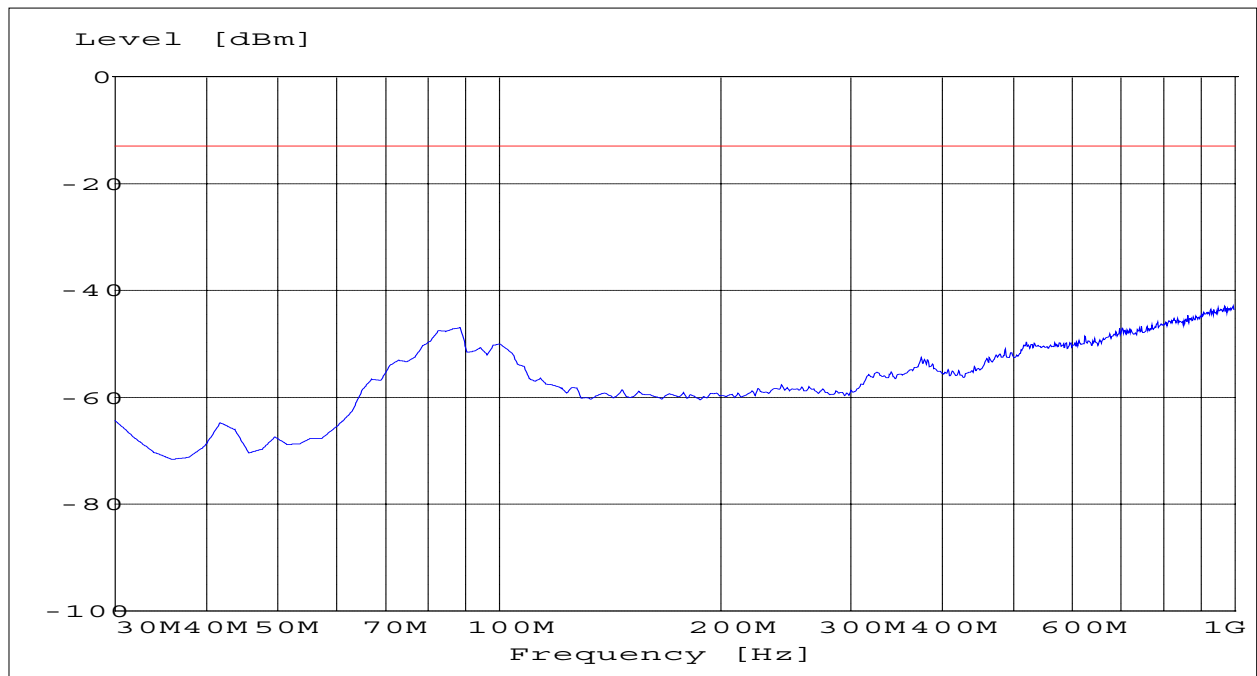
**RADIATED SPURIOUS EMISSIONS**

**Channel 512 : 30MHz - 1GHz**

Spurious emission limit -13dBm

**SWEEP TABLE: "FCC 24 Spur 30M-1G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
30MHz	1GHz	Max Peak	Coupled	1 MHz



**RADIATED SPURIOUS EMISSIONS**

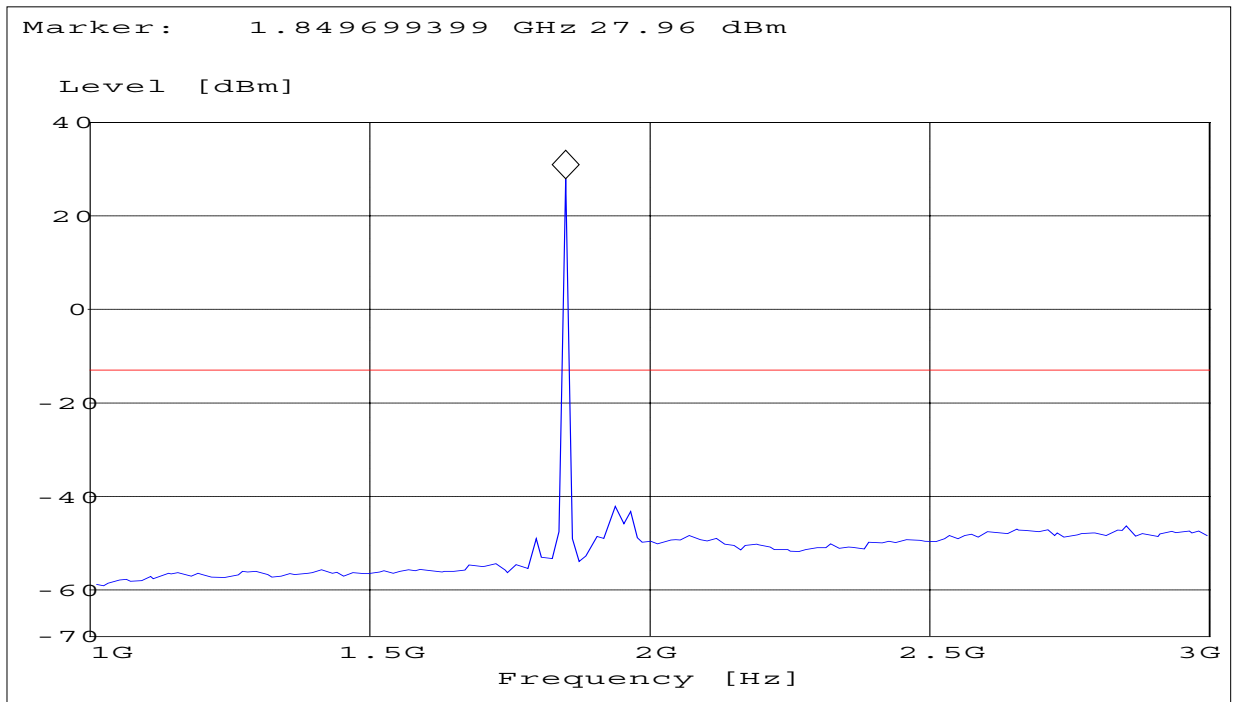
**Channel 512 : 1GHz – 3GHz**

Spurious emission limit -13dBm

**NOTE: peak above the limit line is the Carrier frequency. Frequency resolution is not fine enough to show the exact frequency of the carrier, refer to plots under EIRP.**

**SWEEP TABLE: "FCC Spuri 1-3G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
1GHz	3GHz	Max Peak	Coupled	1 MHz



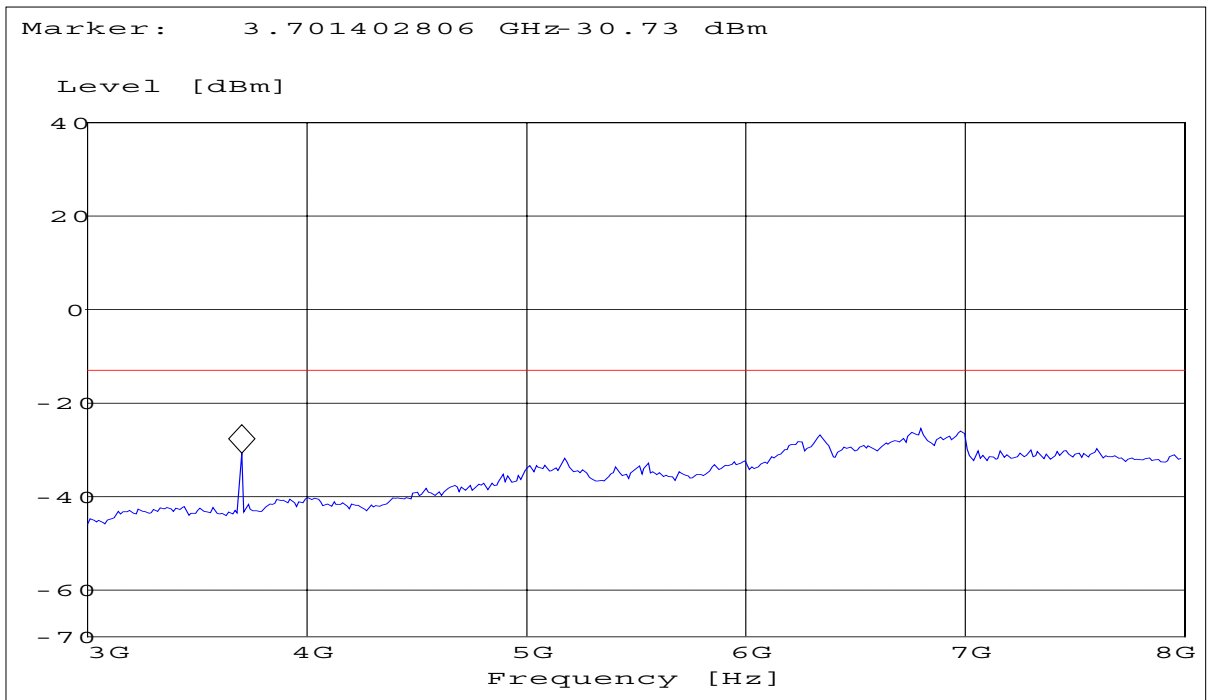
**RADIATED SPURIOUS EMISSIONS**

**Channel 512 : 3GHz – 8GHz**

Spurious emission limit -13dBm

**SWEEP TABLE: "FCC Spuri 3-8G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
3GHz	8GHz	Max Peak	Coupled	1 MHz



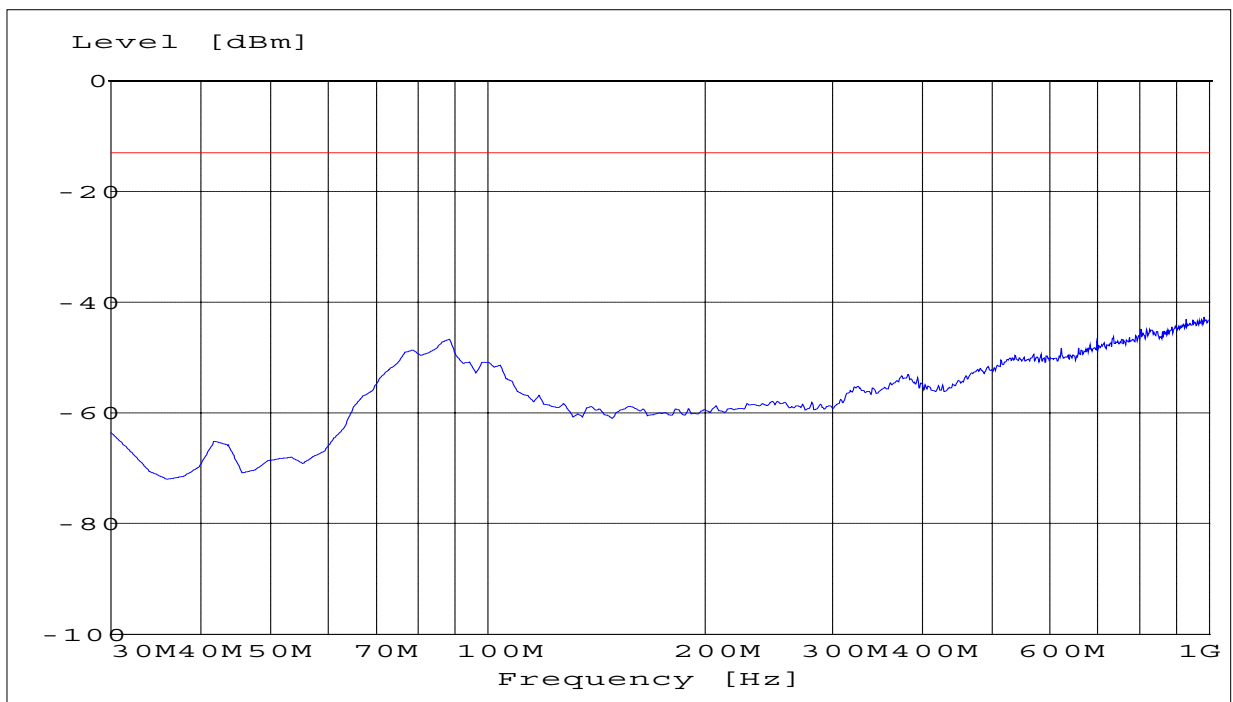
**RADIATED SPURIOUS EMISSIONS**

**Channel 661: 30MHz –1GHz**

Spurious emission limit –13dBm

**SWEEP TABLE: "FCC 24 Spur 30M-1G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
30MHz	1GHz	Max Peak	Coupled	1 MHz



**RADIATED SPURIOUS EMISSIONS**

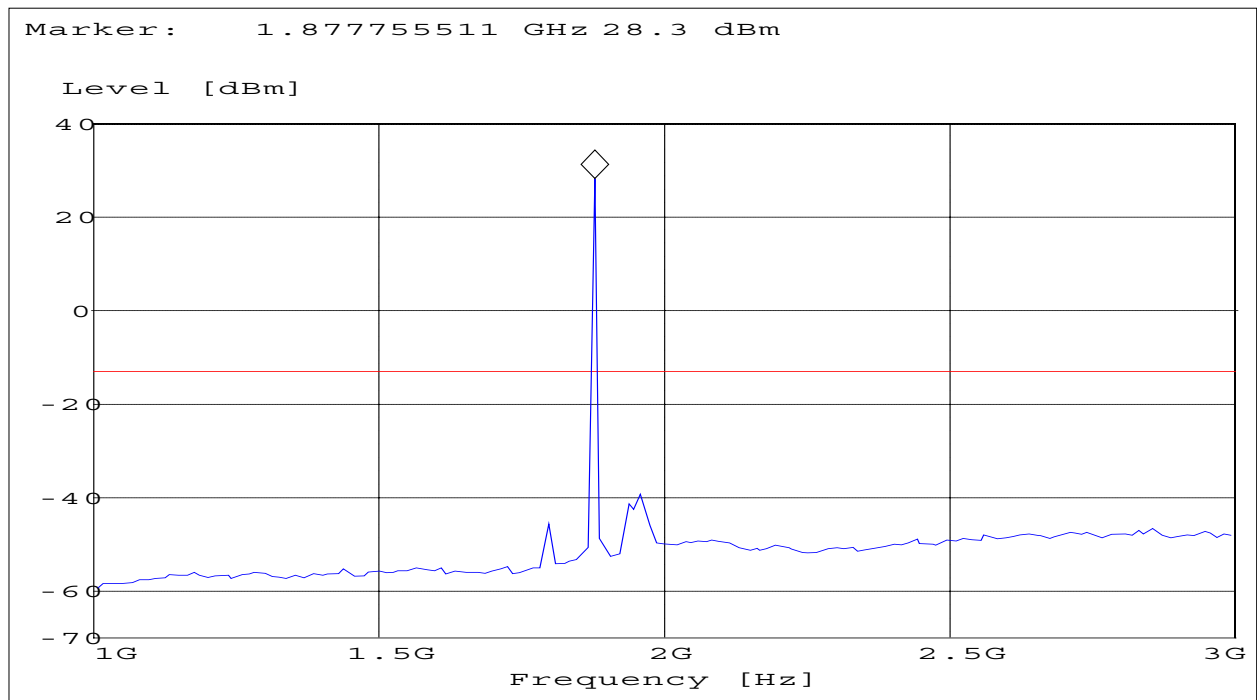
**Channel 661: 1GHz – 3GHz**

Spurious emission limit –13dBm

**NOTE: peak above the limit line is the Carrier frequency. Frequency resolution is not fine enough to show the exact frequency of the carrier, refer to plots under EIRP.**

**SWEEP TABLE: "FCC Spuri 1-3G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
1GHz	3GHz	Max Peak	Coupled	1 MHz



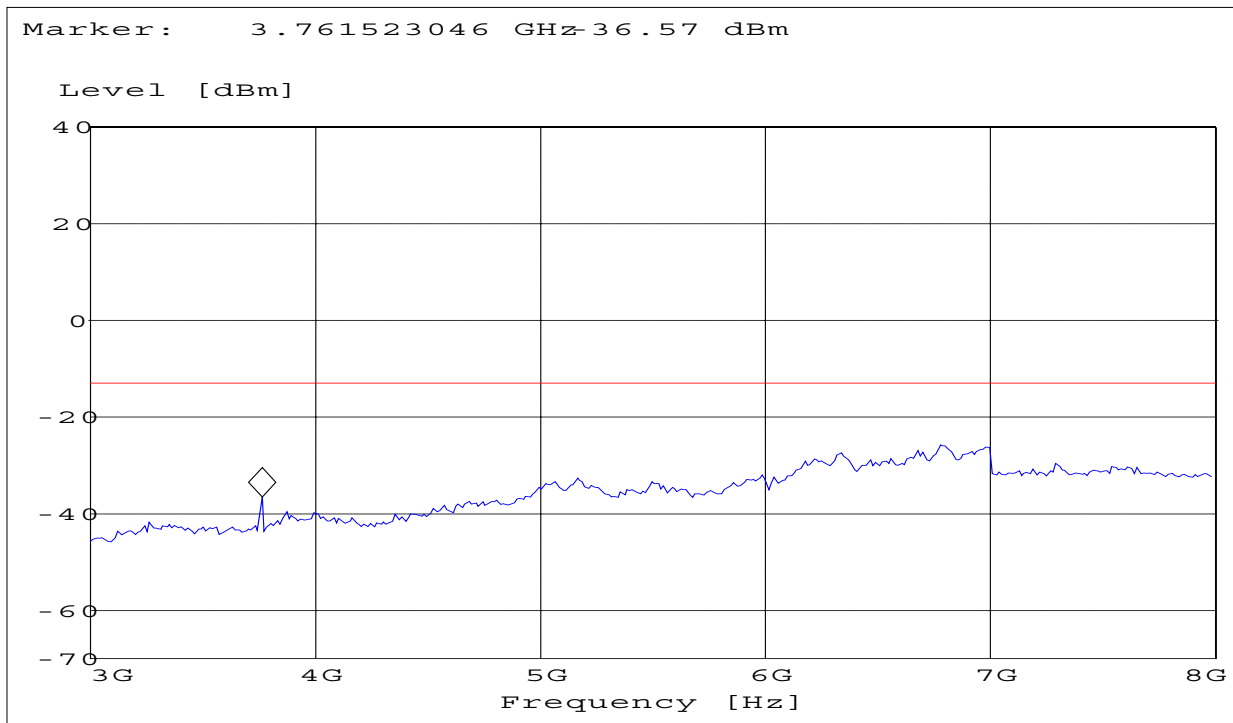
**RADIATED SPURIOUS EMISSIONS**

**Channel 661: 3GHz – 8GHz**

Spurious emission limit –13dBm

**SWEEP TABLE: "FCC Spuri 3-8G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
3GHz	8GHz	Max Peak	Coupled	1 MHz



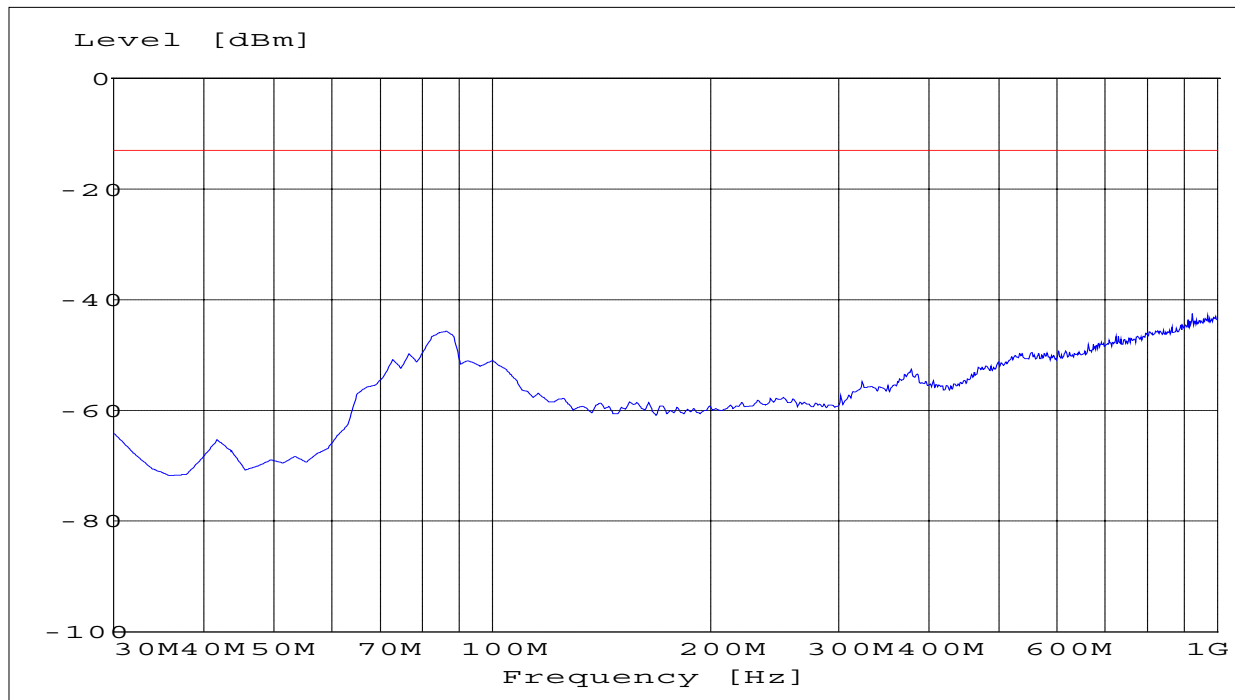
**RADIATED SPURIOUS EMISSIONS**

**Channel 810: 30MHz – 1GHz**

Spurious emission limit –13dBm

**SWEEP TABLE: "FCC 24 Spur 30M-1G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
30MHz	1GHz	Max Peak	Coupled	1 MHz



**RADIATED SPURIOUS EMISSIONS**

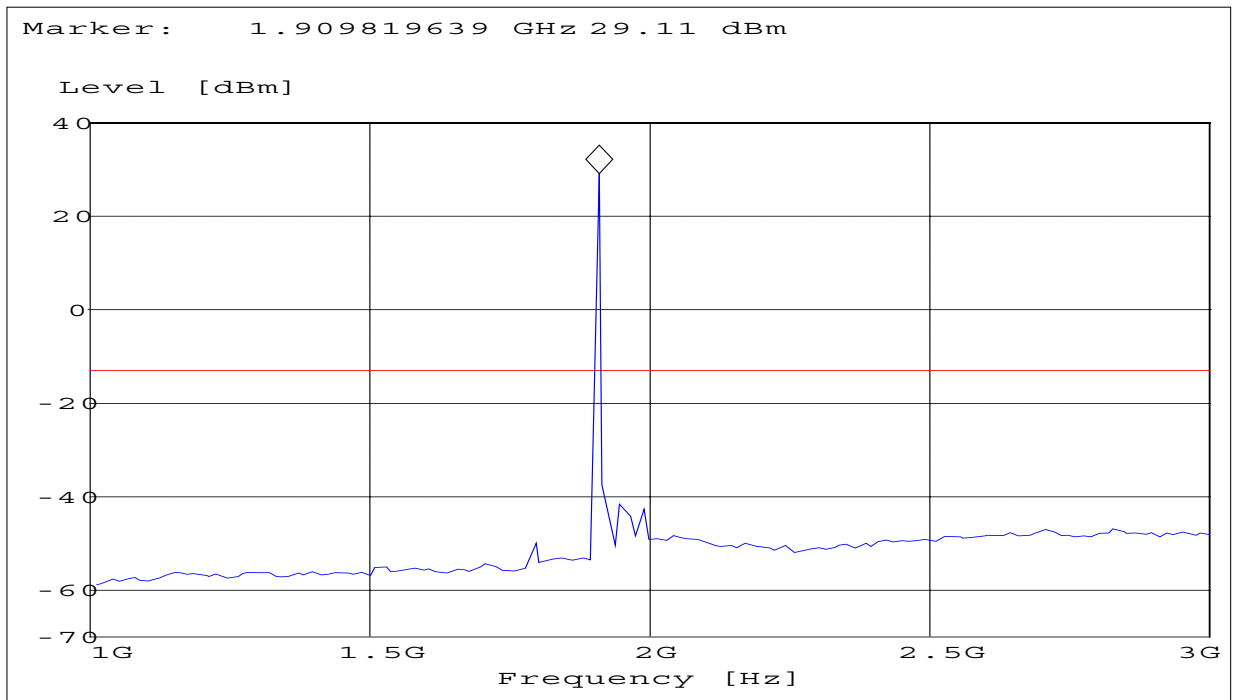
**Channel 810: 1GHz – 3GHz**

Spurious emission limit –13dBm

**NOTE: peak above the limit line is the Carrier frequency. Frequency resolution is not fine enough to show the exact frequency of the carrier, refer to plots under EIRP.**

**SWEEP TABLE: "FCC Spuri 1-3G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
1GHz	3GHz	Max Peak	Coupled	1 MHz



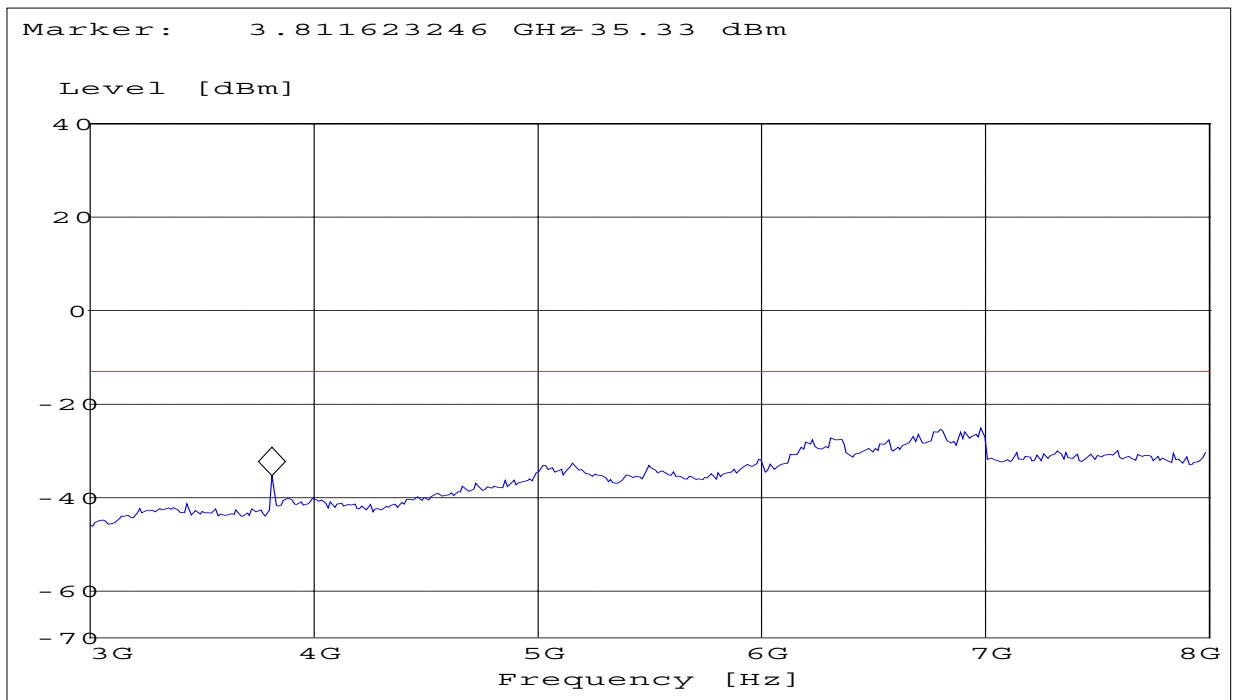
**RADIATED SPURIOUS EMISSIONS**

**Channel 810: 3GHz – 8GHz**

Spurious emission limit -13dBm

**SWEEP TABLE: "FCC Spuri 3-8G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
3GHz	8GHz	Max Peak	Coupled	1 MHz



**RADIATED SPURIOUS EMISSIONS**

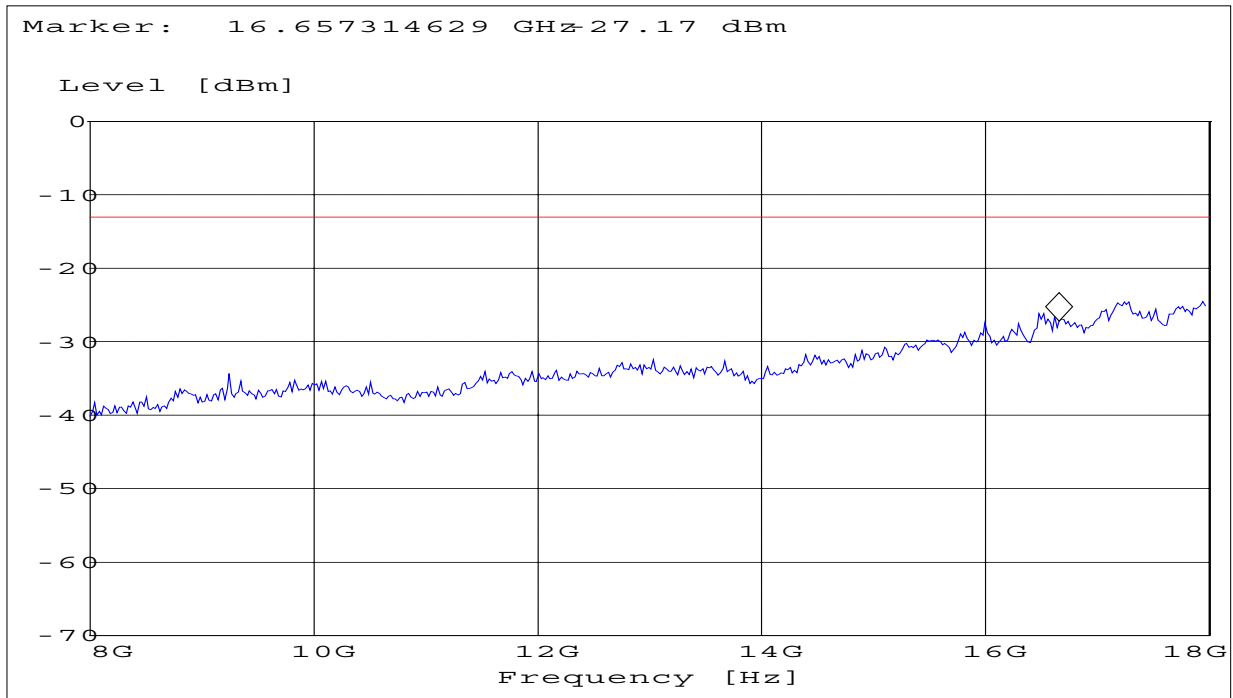
**8GHz – 18GHz**

Spurious emission limit –13dBm

(NOTE: This plot is valid for all three channels)

***SWEEP TABLE: "FCC 24 spuri 8-18G"***

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
8GHz	18GHz	Max Peak	Coupled	1 MHz



**RADIATED SPURIOUS EMISSIONS**

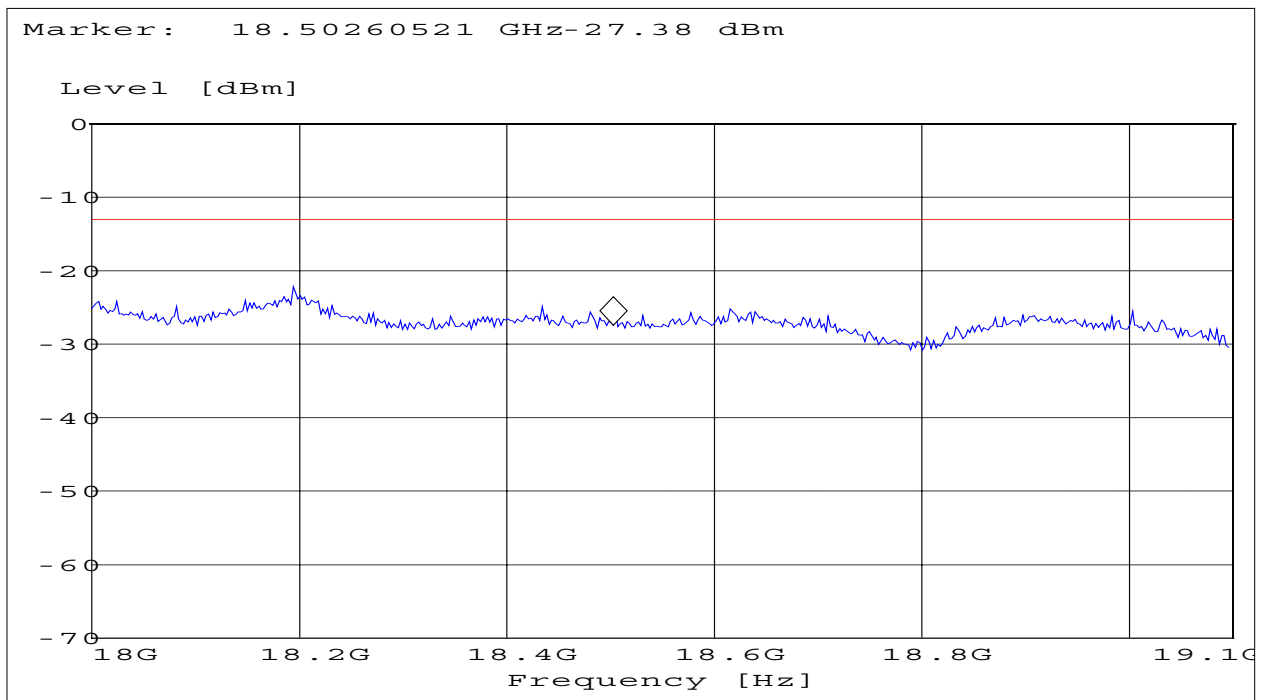
**18GHz – 19.1GHz**

Spurious emission limit –13dBm

(NOTE: This plot is valid for all three channels)

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

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
18GHz	19.1GHz	Max Peak	Coupled	1 MHz



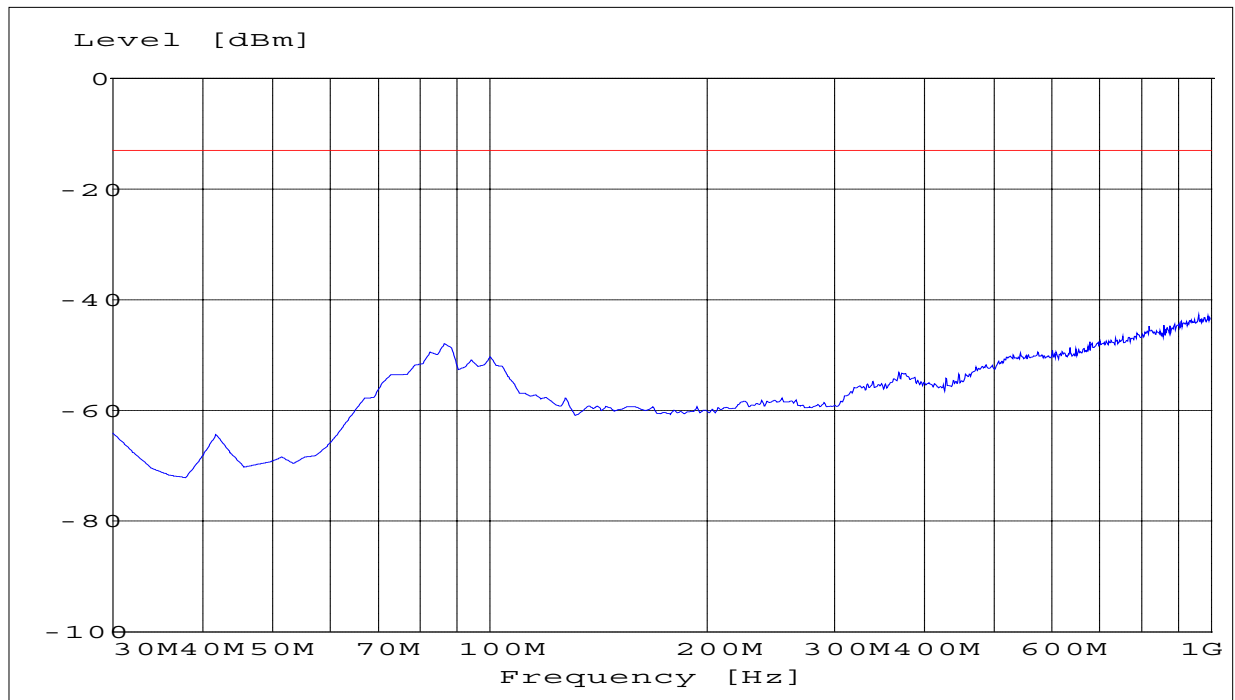
**RADIATED SPURIOUS EMISSIONS**

**EUT in Idle Mode: 30MHz – 1GHz**

Spurious emission limit –13dBm

**SWEEP TABLE: "FCC 24 Spur 30M-1G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
30MHz	1GHz	Max Peak	Coupled	1 MHz



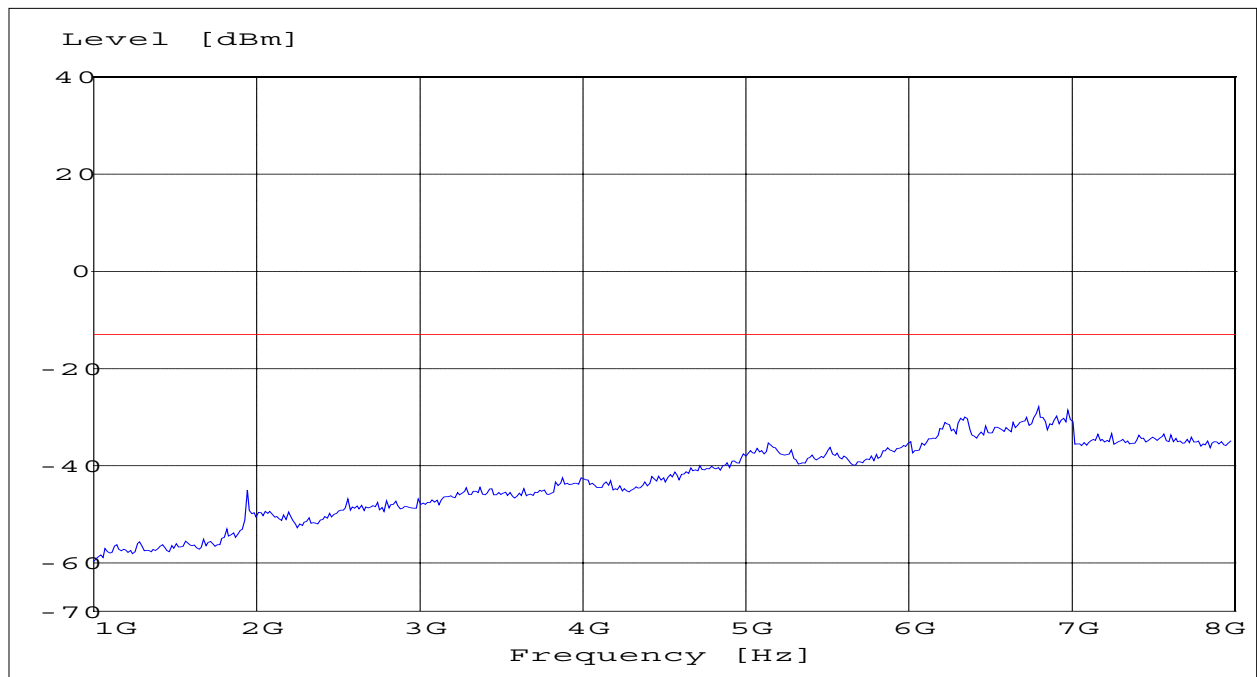
**RADIATED SPURIOUS EMISSIONS**

**EUT in Idle Mode: 1GHz – 8GHz**

Spurious emission limit –13dBm

**SWEEP TABLE: "FCC Spuri 1-8G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
1GHz	8GHz	Max Peak	Coupled	1 MHz



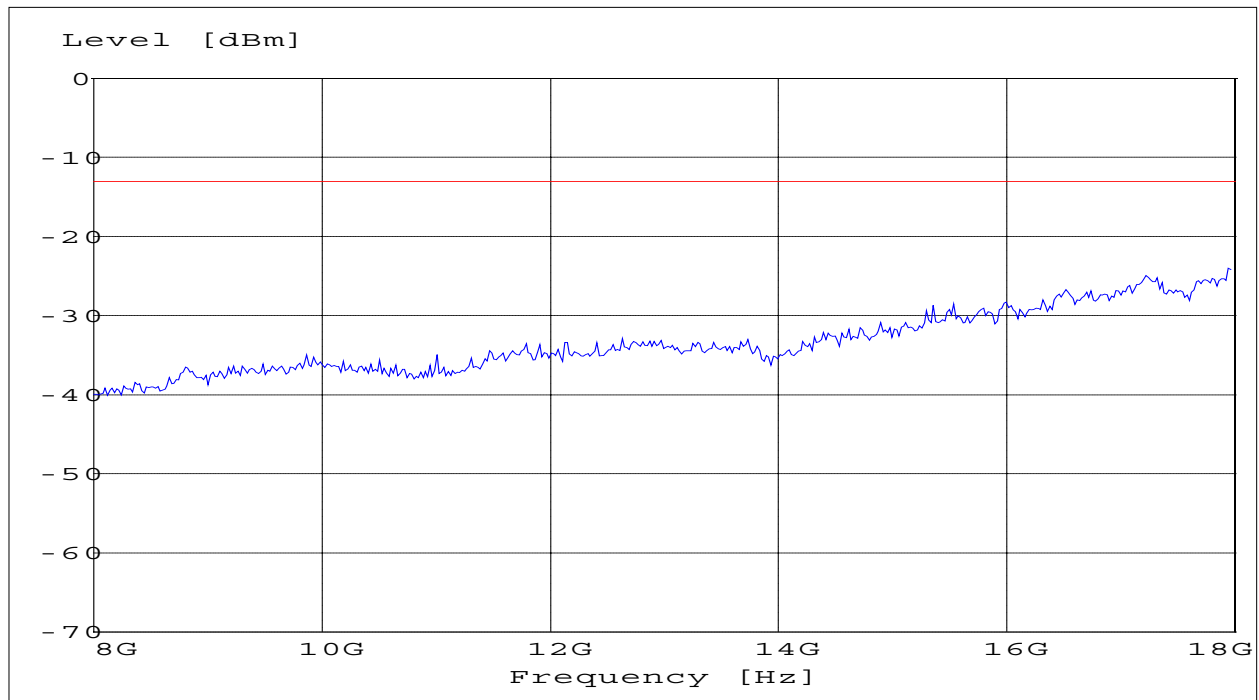
**RADIATED SPURIOUS EMISSIONS**

**EUT in Idle Mode: 8GHz – 18GHz**

Spurious emission limit –13dBm

***SWEEP TABLE: "FCC 24 spuri 8-18G"***

<i>Start</i>	<i>Stop</i>	<i>Detector</i>	<i>Meas.</i>	<i>RBW/VBW</i>
<i>Frequency</i>	<i>Frequency</i>		<i>Time</i>	
8GHz	18GHz	Max Peak	Coupled	1 MHz



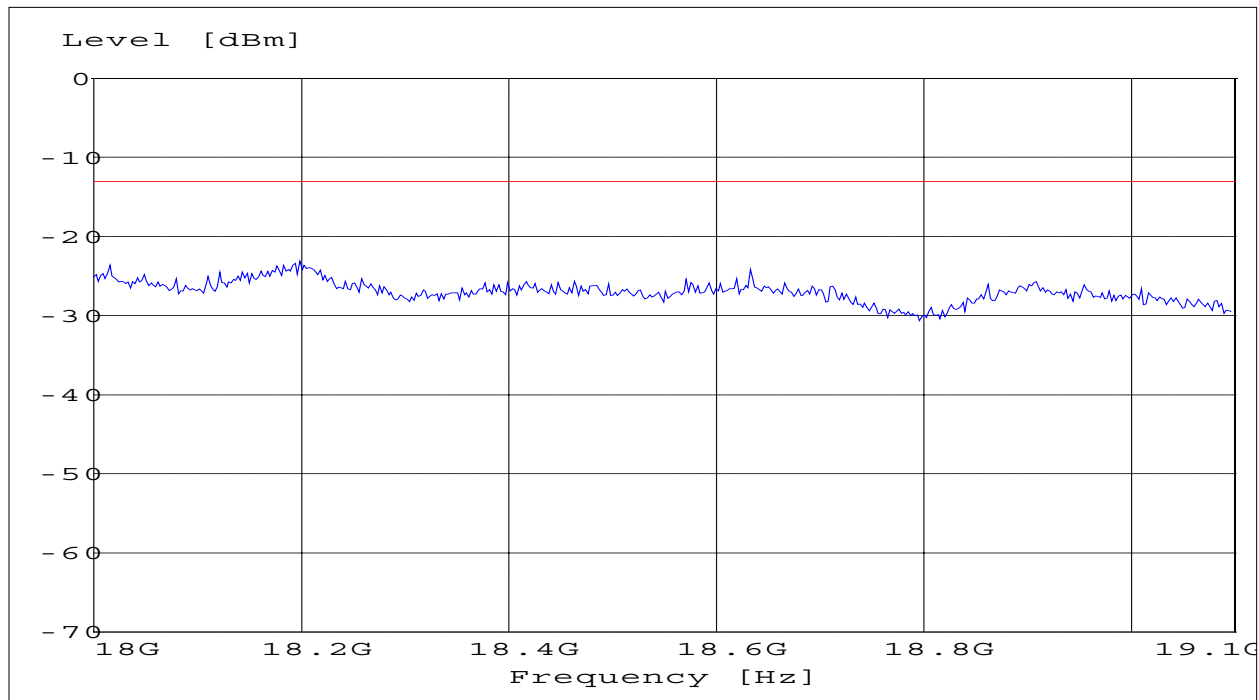
**RADIATED SPURIOUS EMISSIONS**

**EUT in Idle Mode: 18GHz – 19.1GHz**

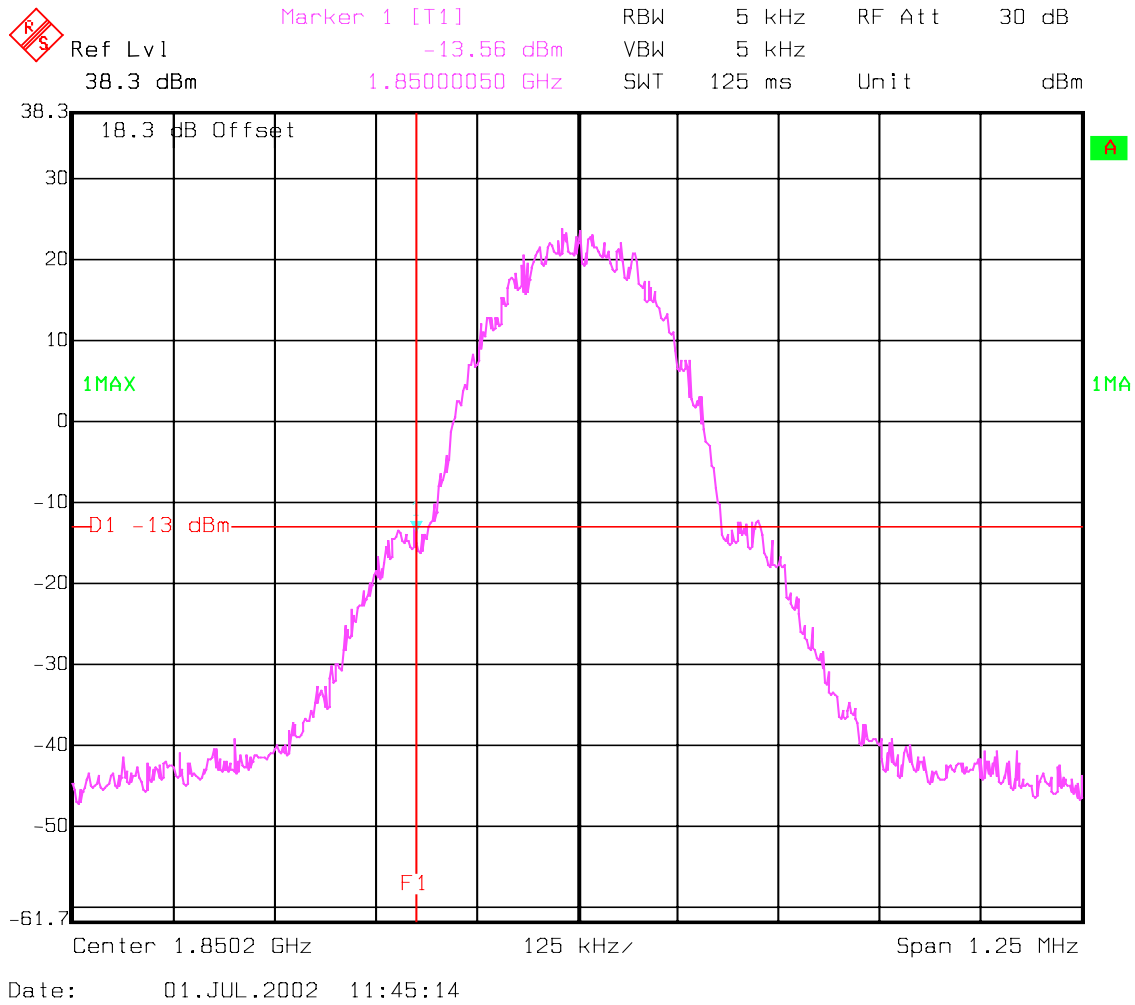
Spurious emission limit –13dBm

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

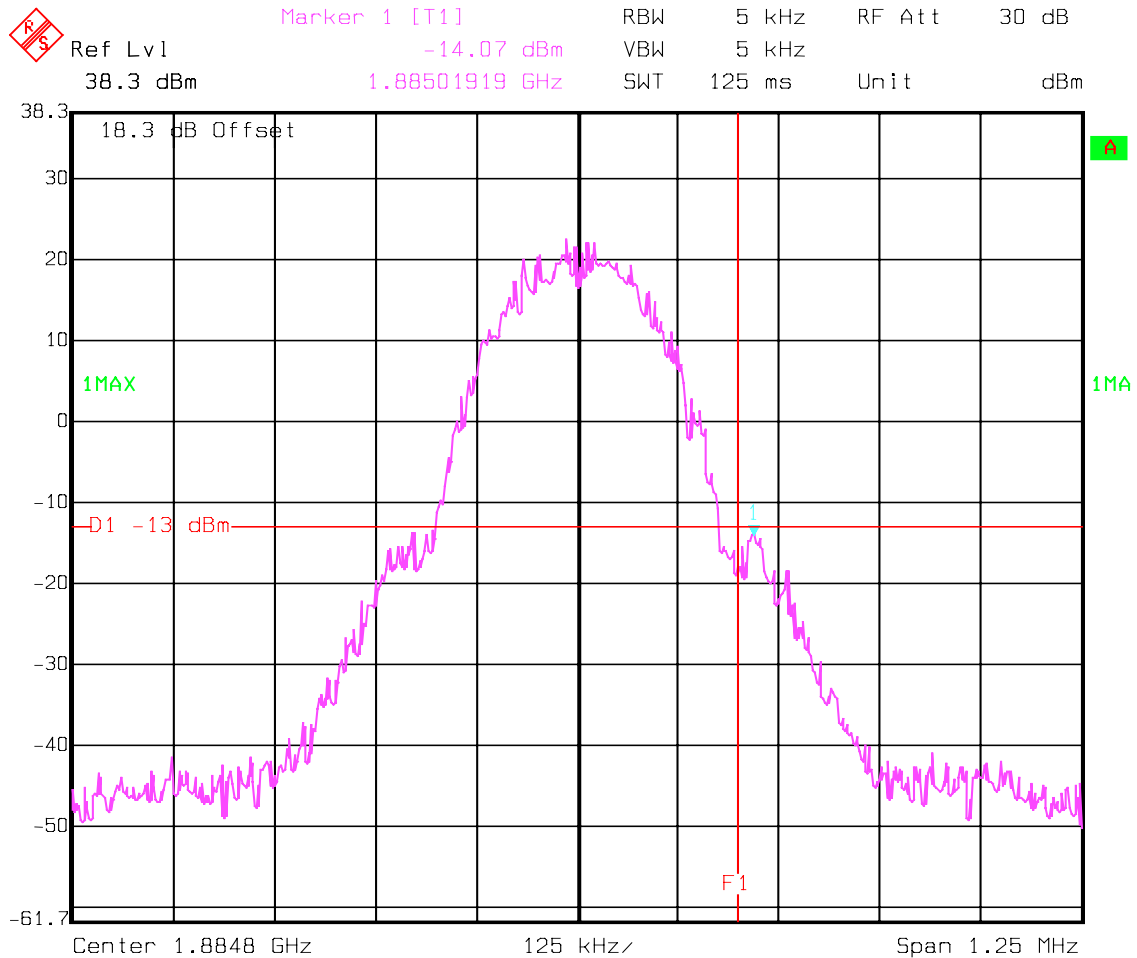
Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
18GHz	19.1GHz	Max Peak	Coupled	1 MHz



**Lower Band Edge:**  
**(Conducted)**

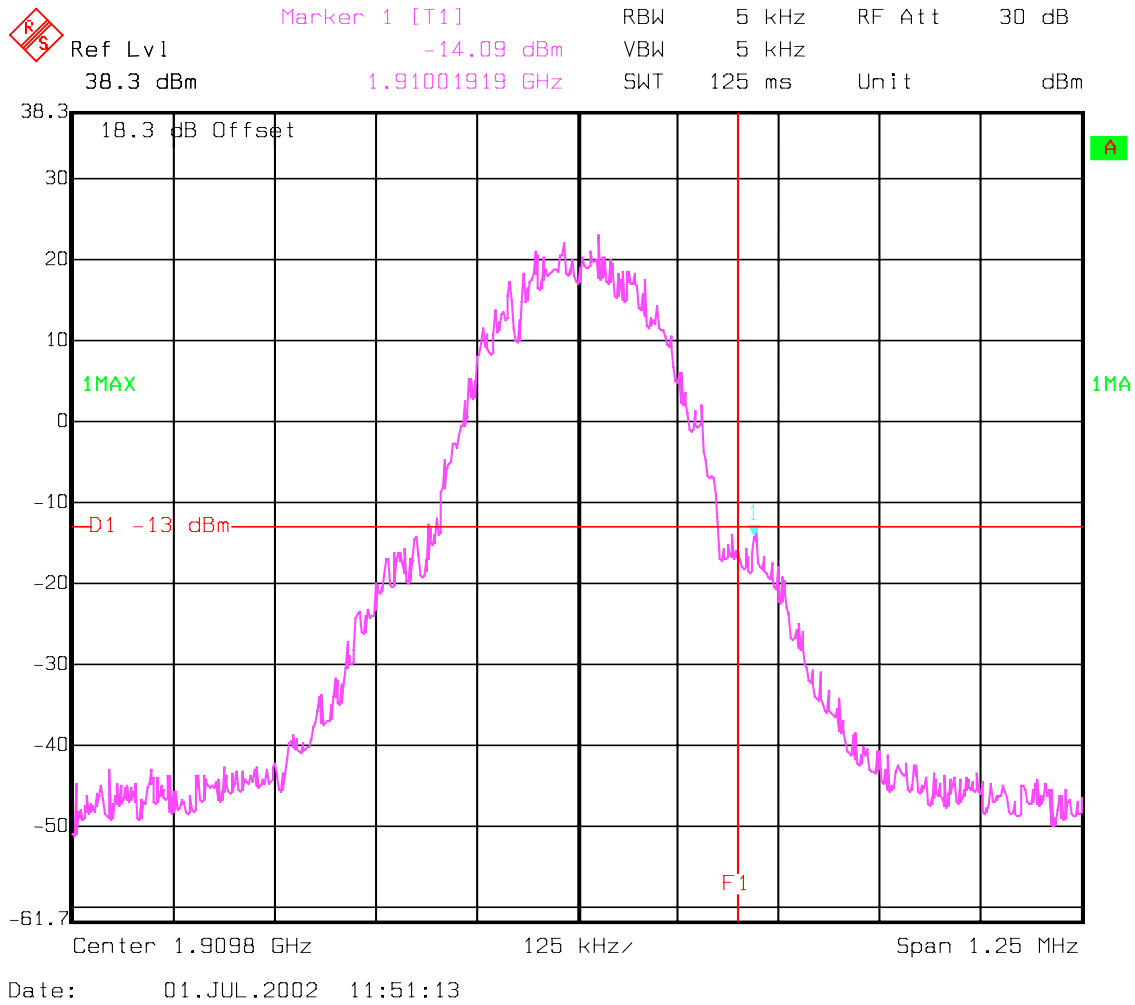


**Mid-Band Edge:**  
**(Conducted)**



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**Higher Band Edge:**  
**(Conducted)**



**RECEIVER RADIATED EMISSIONS**

**SUBCLAUSE § 15.209**

**NOTE:** 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 18GHz and 19.1GHz very short cable connections to the antenna was used to minimize the noise level.

**Limits**

**SUBCLAUSE § 15.209**

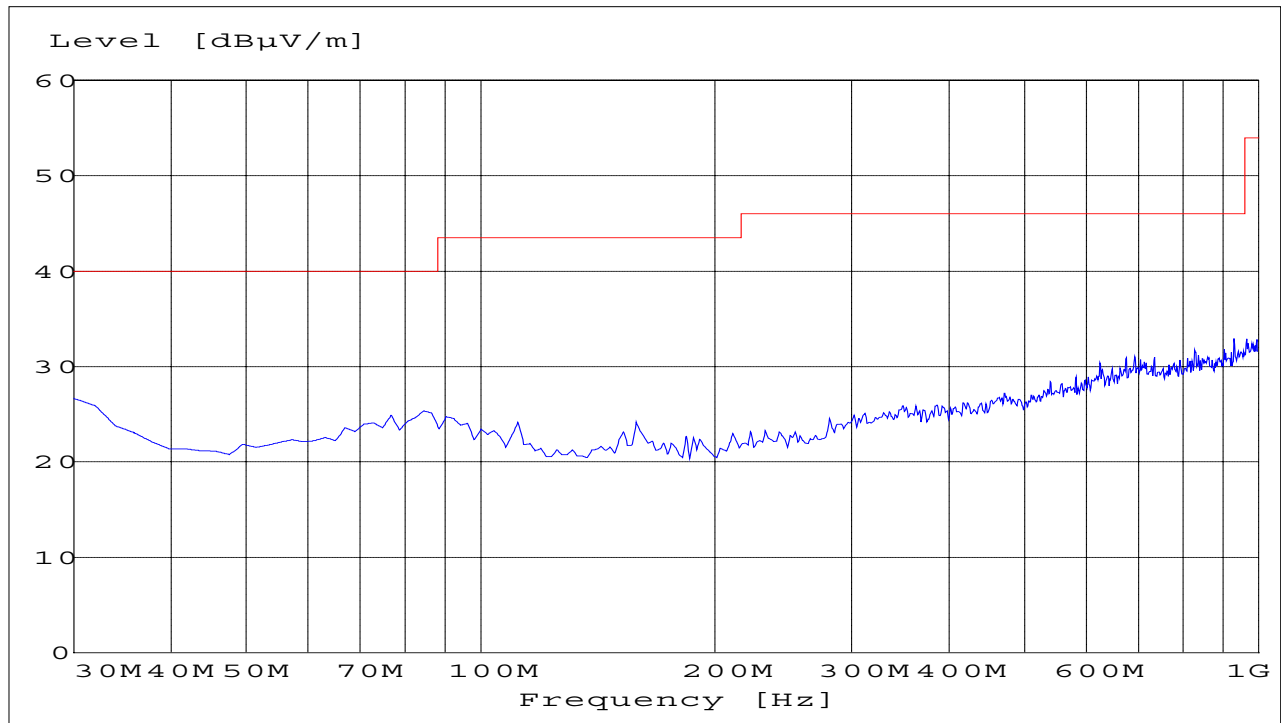
Frequency (MHz)	Field strength ( $\mu\text{V/m}$ )	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

**RECEIVER RADIATED EMISSIONS**

**EUT in Idle Mode: 30MHz – 1GHz**

**SWEEP TABLE: "FCC 24 Spur 30M-1G"**

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW/VBW
30MHz	1GHz	Max Peak	Coupled	100KHz

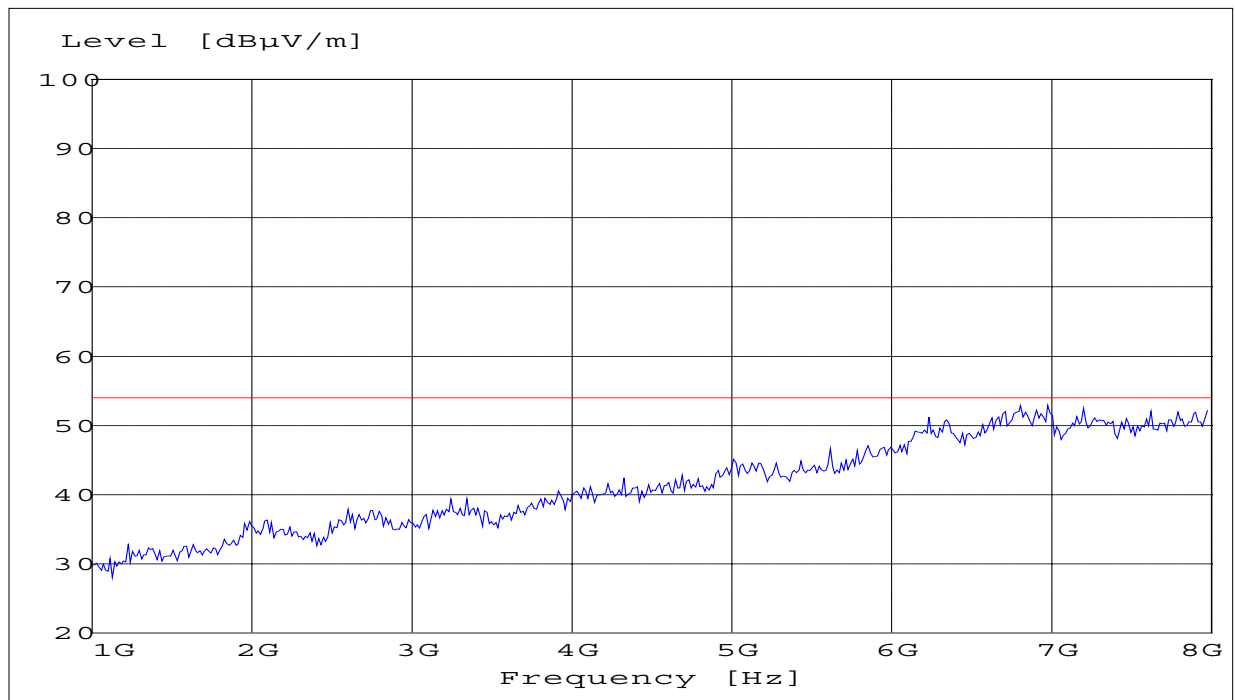


**RECEIVER RADIATED EMISSIONS**

**EUT in Idle Mode: 1GHz – 8GHz**

***SWEEP TABLE: "FCC Spuri 1-8G"***

<i>Start Frequency</i>	<i>Stop Frequency</i>	<i>Detector</i>	<i>Meas. Time</i>	<i>RBW/VBW</i>
1GHz	8GHz	Max Peak	Coupled	1 MHz

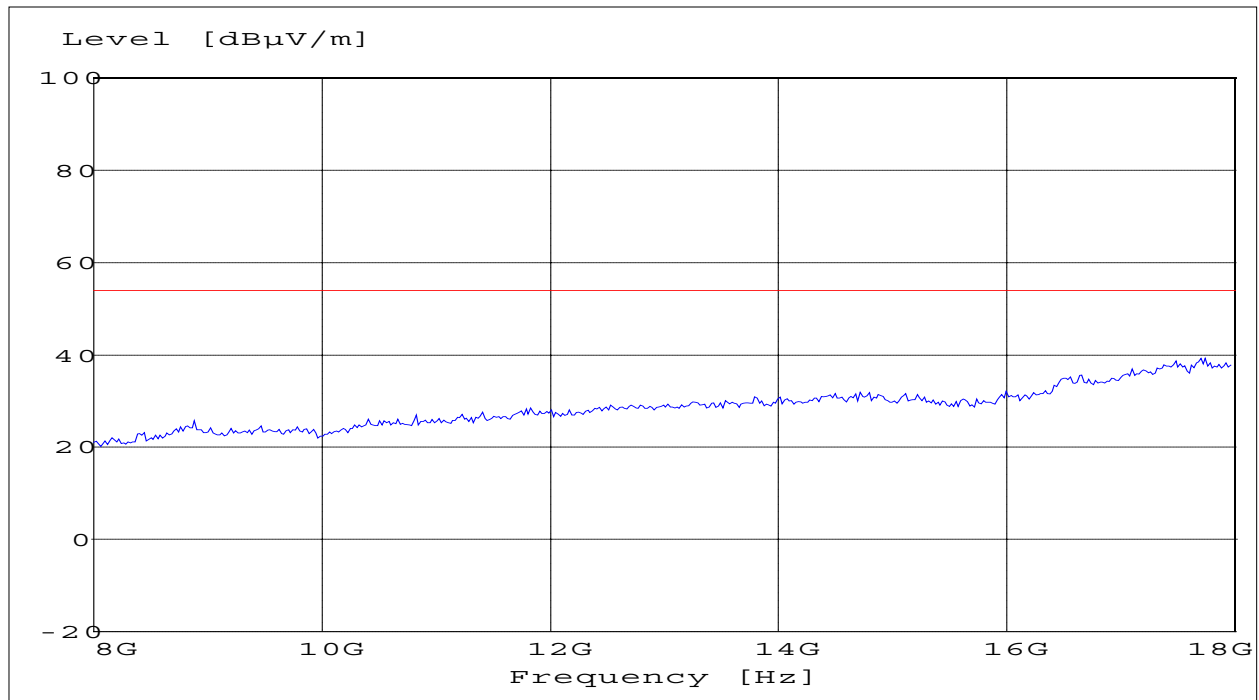


**RECEIVER RADIATED EMISSIONS**

**EUT in Idle Mode: 8GHz – 18GHz**

***SWEEP TABLE: "FCC 24 spuri 8-18G"***

<i>Start</i>	<i>Stop</i>	<i>Detector</i>	<i>Meas.</i>	<i>RBW/VBW</i>
<i>Frequency</i>	<i>Frequency</i>		<i>Time</i>	
8GHz	18GHz	Max Peak	Coupled	1 MHz

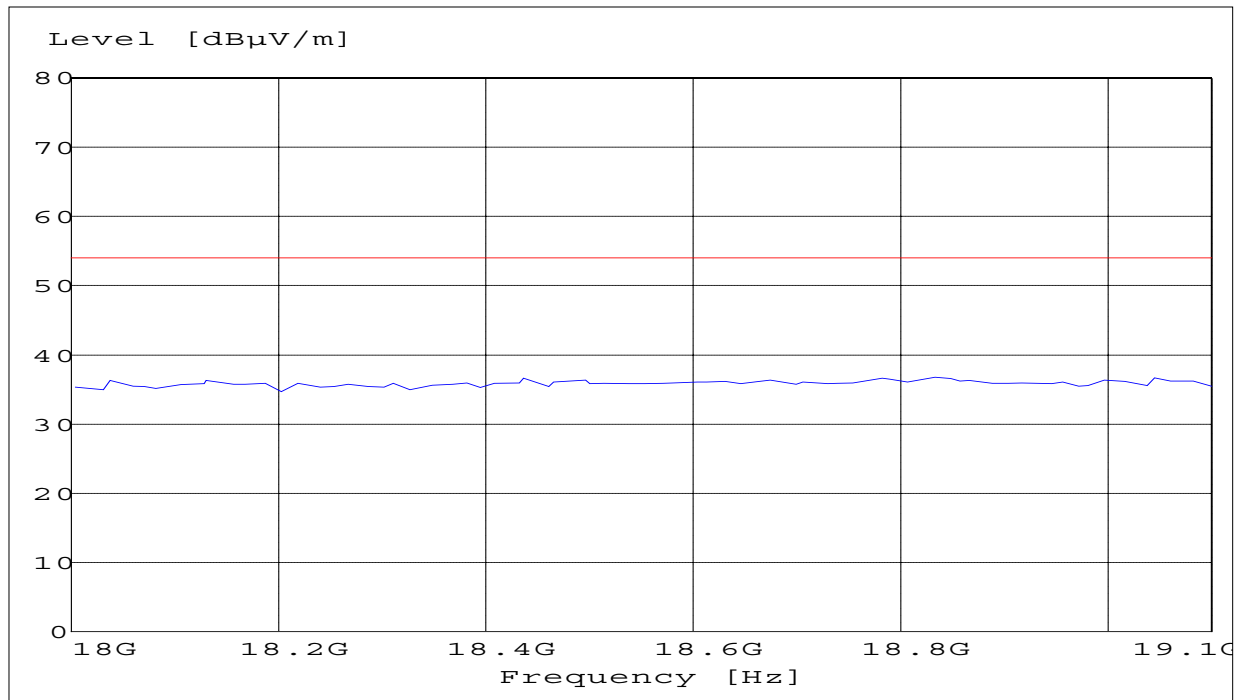


**RECEIVER RADIATED EMISSIONS**

**EUT in Idle Mode: 18GHz – 19.1GHz**

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

<i>Start Frequency</i>	<i>Stop Frequency</i>	<i>Detector</i>	<i>Meas. Time</i>	<i>RBW/VBW</i>
18GHz	19.1GHz	Max Peak	Coupled	1 MHz



**CONDUCTED SPURIOUS EMISSIONS**

**Measurement Procedure:**

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment under test, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

**USPCS Transmitter**

Channel	Frequency
512	1850.2 MHz
661	1880.0 MHz
810	1909.8 MHz

**Measurement Limit:**

Sec. 24.238 Emission Limits.

(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least  $43+10\text{Log}(P)$  dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

Harmonic	Tx ch-512 Freq.(MHz)	Level (dBm)	Tx ch-661 Freq. (MHz)	Level (dBm)	Tx ch-810 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

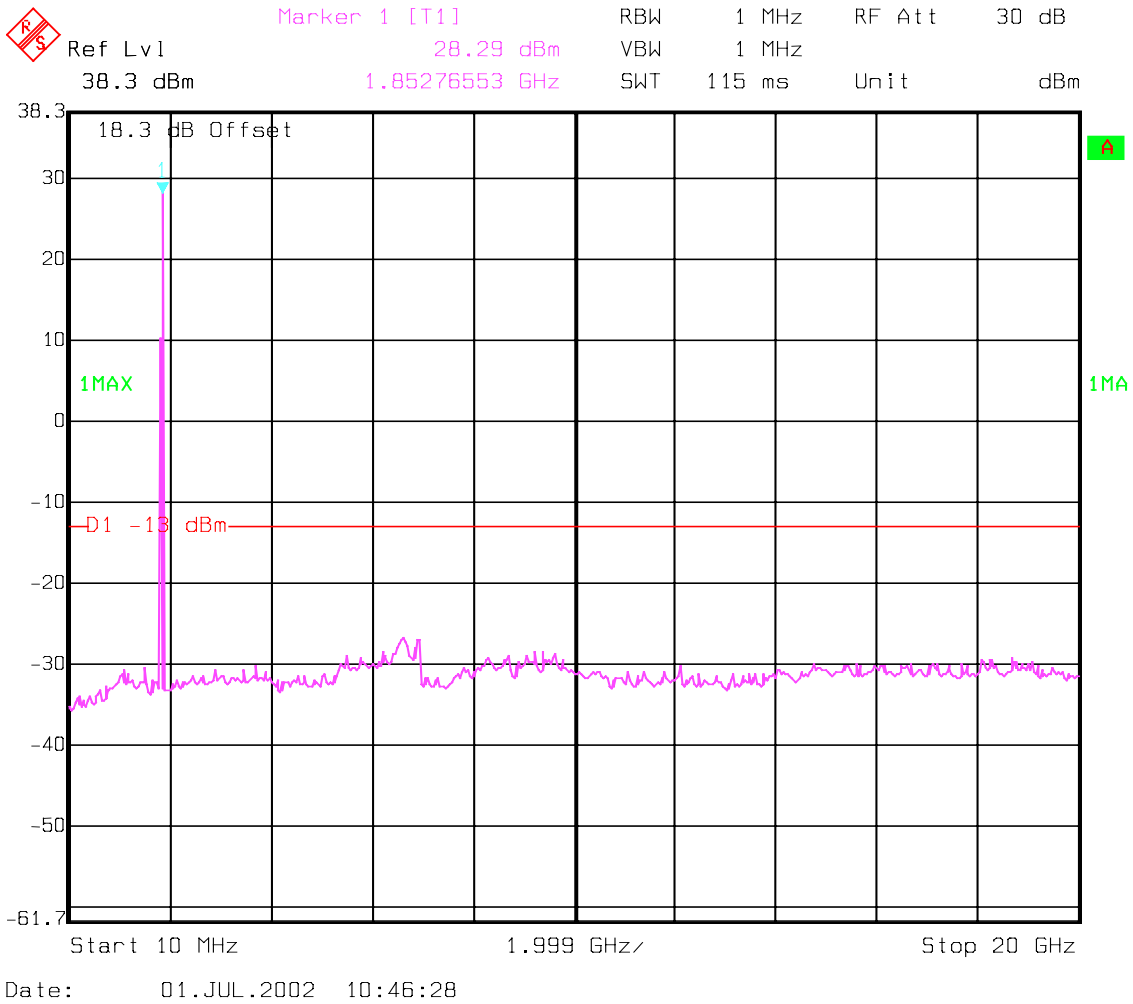
NOTE: nf=noise floor

CONDUCTED SPURIOUS EMISSIONS

Channel 512: 30MHz – 20GHz

Spurious emission limit –13dBm

NOTE: peak above the limit line is the carrier frequency.

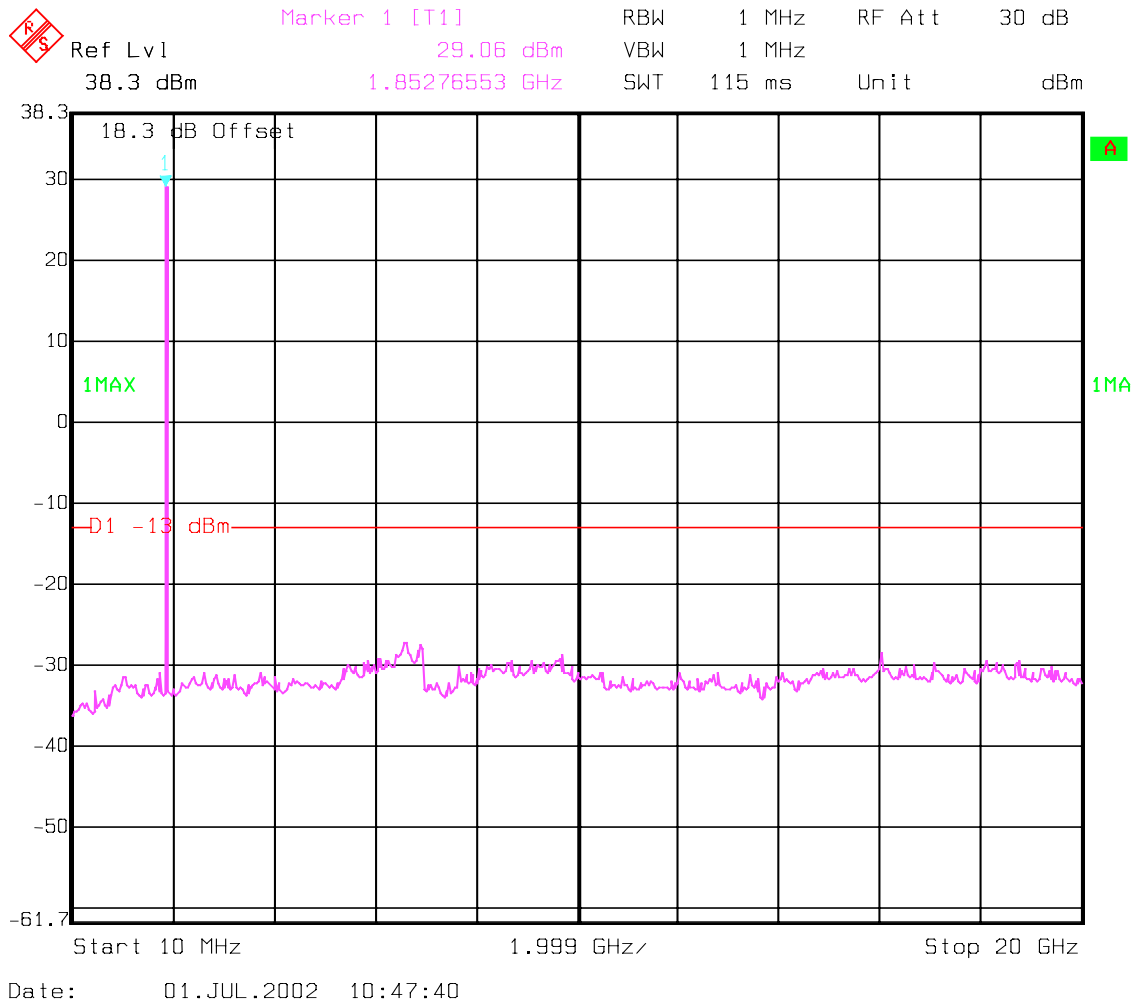


CONDUCTED SPURIOUS EMISSIONS

Channel 661: 30MHz – 20GHz

Spurious emission limit –13dBm

NOTE: peak above the limit line is the carrier frequency.

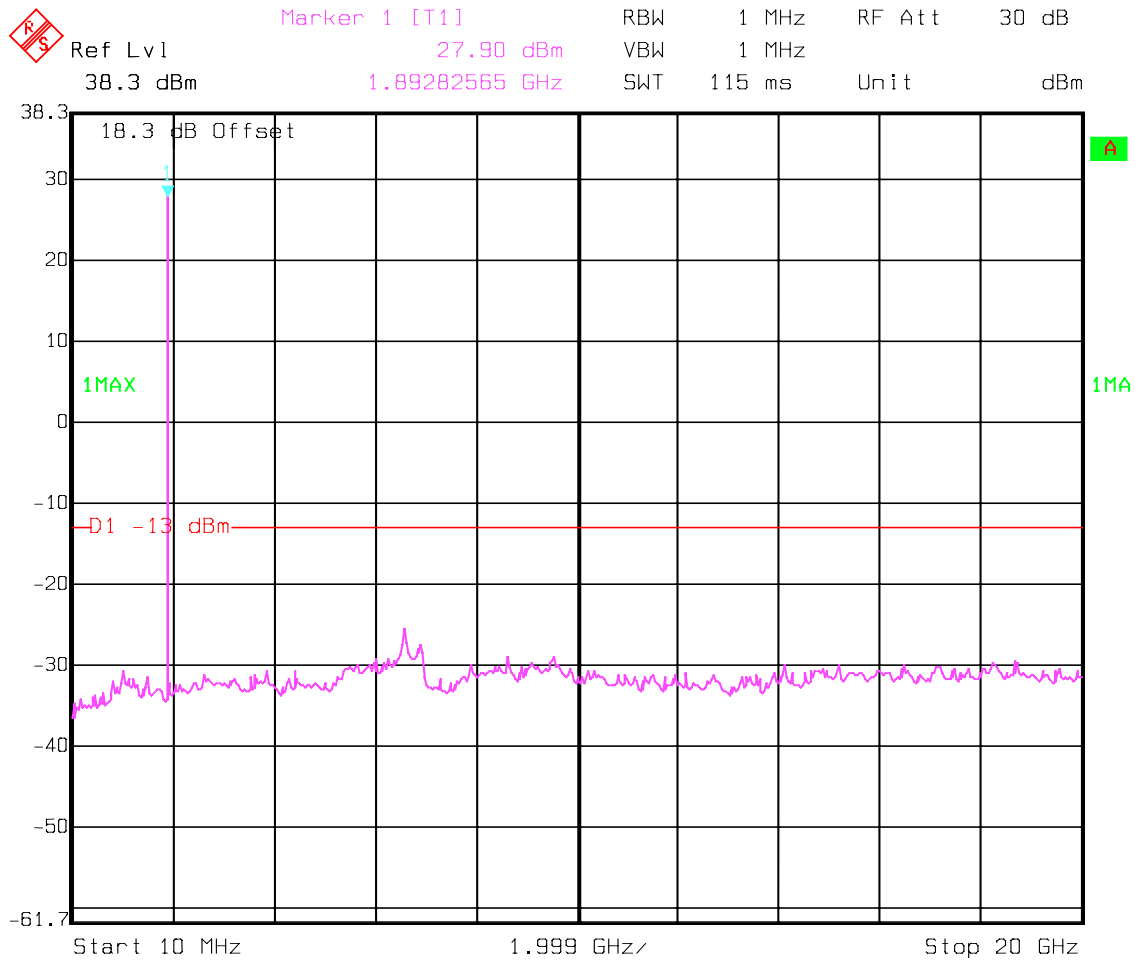


CONDUCTED SPURIOUS EMISSIONS

Channel 810: 30MHz – 20GHz

Spurious emission limit –13dBm

NOTE: peak above the limit line is the carrier frequency.

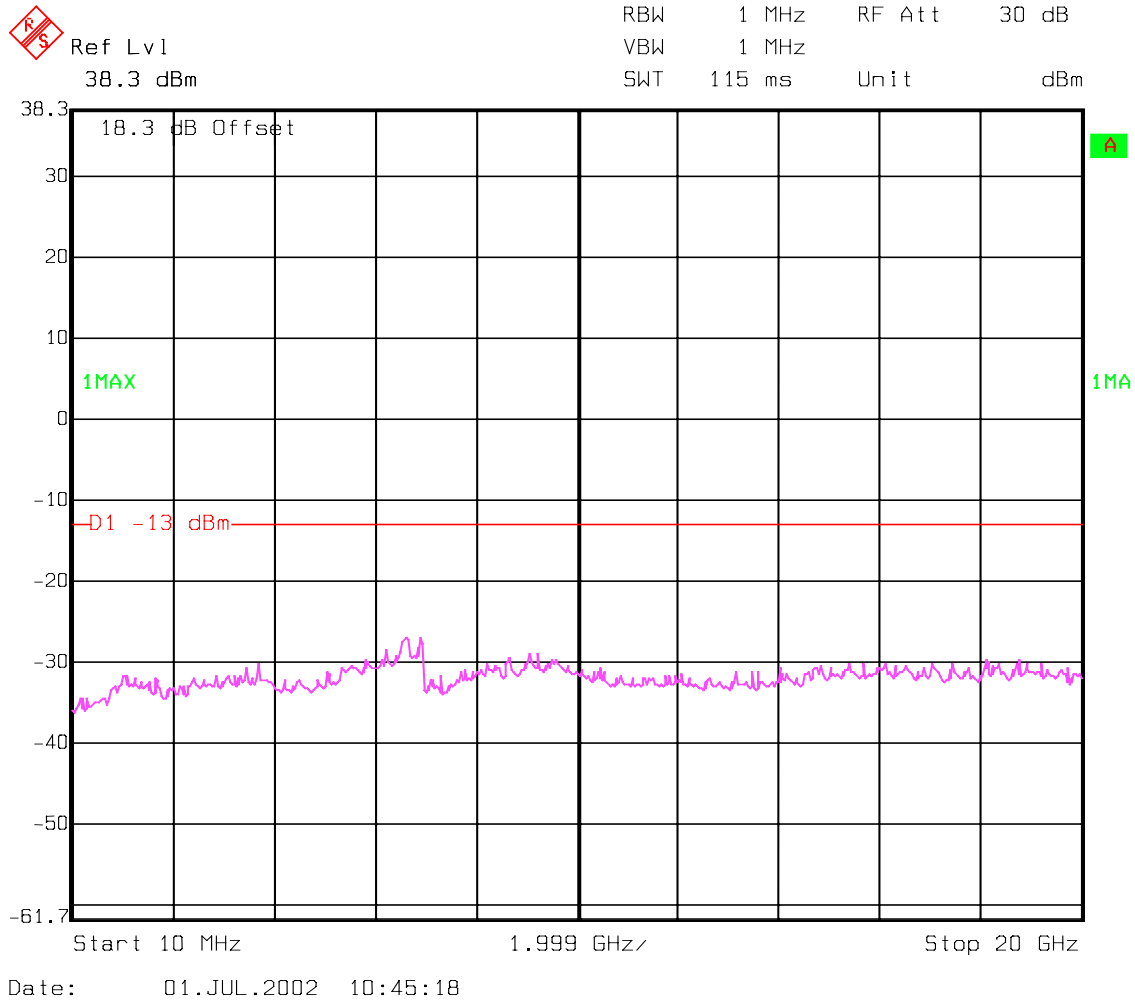


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CONDUCTED SPURIOUS EMISSIONS

Idle mode: 30MHz – 20GHz

Spurious emission limit –13dBm

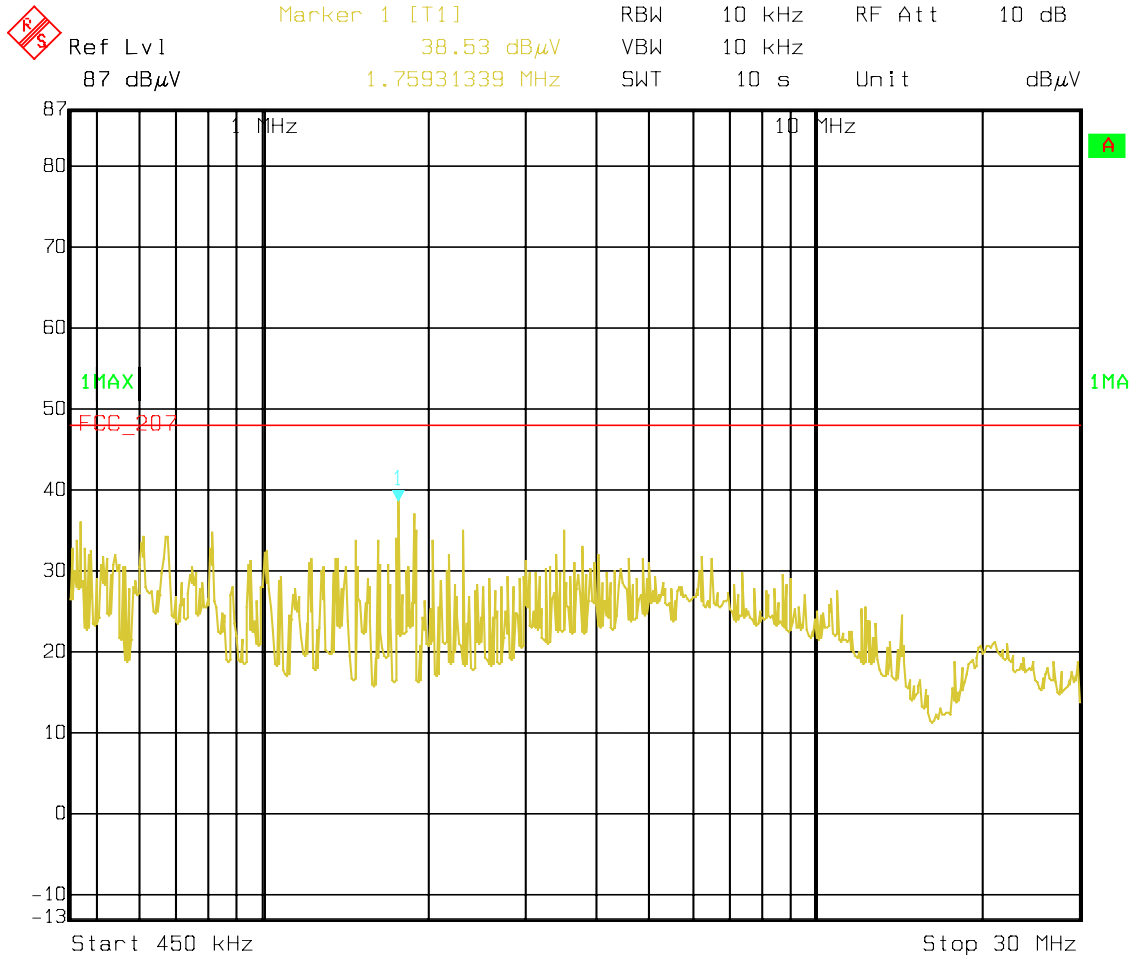


**CONDUCTED EMISSIONS**

§ 15.107/207

Measured with AC/DC power adapter plugged in LISN

Phase: Line



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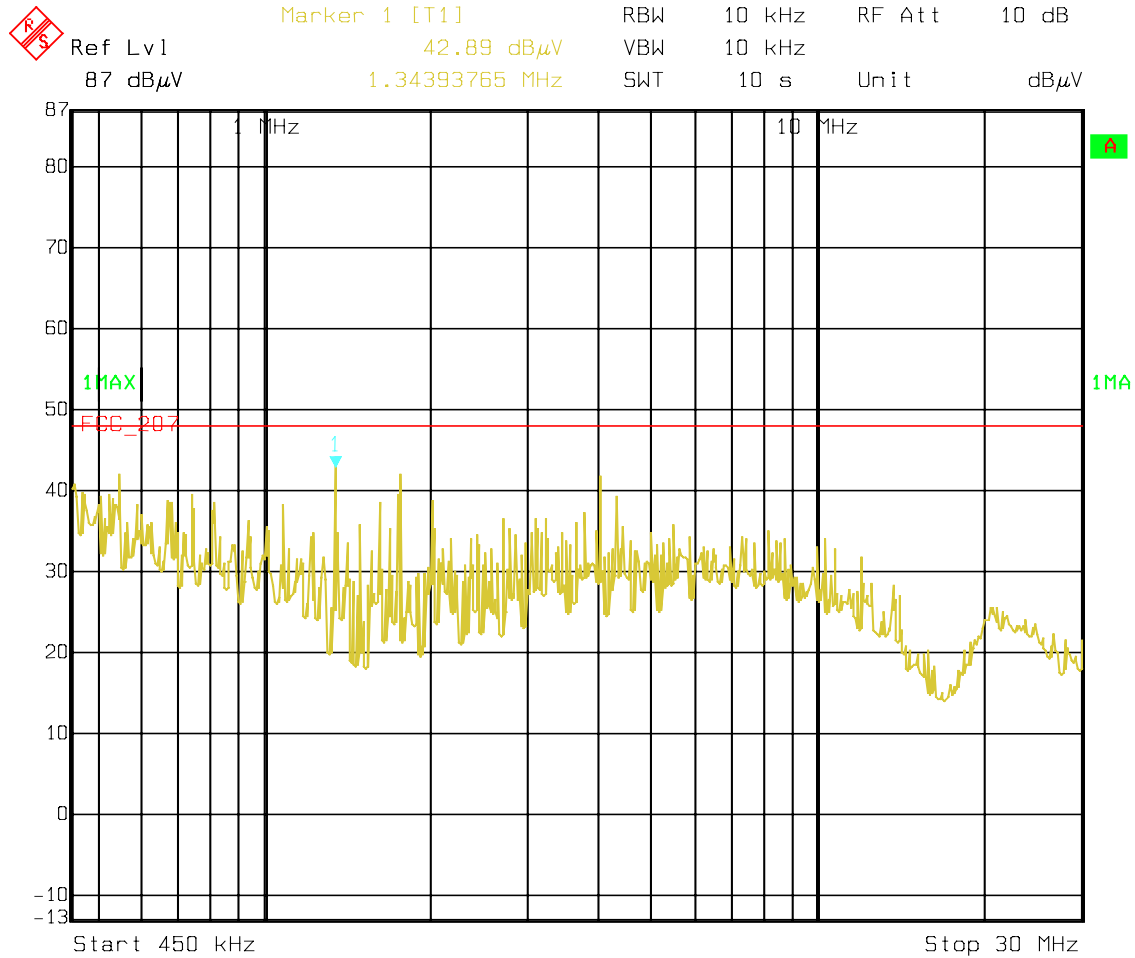
**Technical specification : 15.107 / 15.207 (Revised as of October 1, 1991 )**  
**Limit**

0.45 to 30 MHz	250 $\mu$ V / 47.96 dB $\mu$ V
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**ANALYZER SETTINGS: RBW = 10KHz**

**VBW = 10KHz**

Phase: Neutral

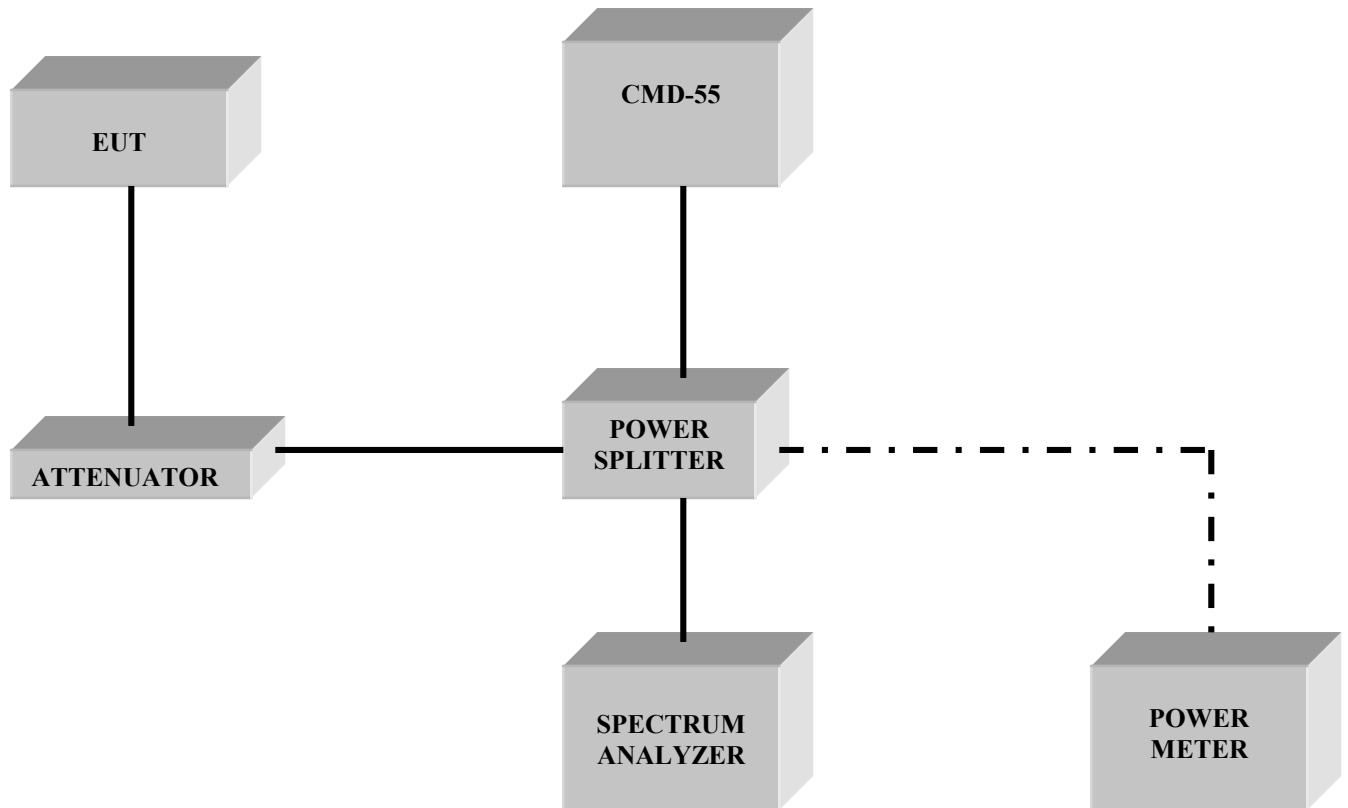


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**TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	826880/010
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02
05	Power Amplifier	250W1000	Amplifier Research	300031
06	Biconilog Antenna	3141	EMCO	0005-1186
07	Horn Antenna	SAS-200/571	AH Systems	325
08	Power Splitter	11667B	Hewlett Packard	645348
09	Climatic Chamber	VT4004	Votch	G1115
10	Pre-Amplifier	JS4-00102600	Miteq	00616
11	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807
12	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008

**BLOCK DIAGRAMS**  
Conducted Testing



**Radiated Testing**

**ANECHOIC CHAMBER**

