CETECOM Inc.

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

Test report no.: 304FCC24/2002
FCC Part 24 / RSS 133
(S55)

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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

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1.3 Details of applicant

Name	**:**	**SIEMENS Mobile LLC**
Street	**:**	**16745 West Bernardo Dr.**
City / Zip Code	**:**	**San Diego, CA 92129**
Country	**:**	**U.S.A**
Contact	**:**	**Dr. Peter Nevermann**
Telephone	**:**	**(858) 521 3282**
Tele-fax	**:**	**(858) 521 3105**
e-mail	**:**	**peter.neuermann@icm.siemens.com**

1.4 Application details

Date of receipt of application	:	2002-07-01
Date of receipt test item	:	2002-07-02
Date of test	:	2002-07-02

1.5 Test item

Manufacturer	:	SIEMENS
Street Address	:	Suedstr. 9
City / Zip Code	:	47475 Kamp-Lintfort
Country	:	Germany
Marketing Name	:	S55
Model No.	:	L55 Marlin
Description	:	GSM 1900 PCS mobile phone + Bluetooth
FCC-ID	:	PWX-S55

Additional information

Frequency	:	1850.2MHz-1909.8MHz for PCS
Type of modulation	:	GMSK for PCS
Number of channels	:	299 for PCS
Antenna	:	embedded
Power supply	:	Battery or charger (AC adaptor)
Output power	:	32.43dBm (1.75W)
Extreme vol. Limits	:	3.6 VDC – 5.2 VDC
Extreme temp. Tolerance	:	-30 C to +50 C

1.6 Test standards

FCC Part 24 / RSS133 r1

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

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")	**Passed**

Technical responsibility for area of testing:

Date	Section	Name	Signature
2002-07-09	EMC & Radio	Lothar Schmidt (Manager)	

Responsible for test report and project leader:

Date	Section	Name	Signature
2002-07-09	EMC & Radio	Harpreet Sidhu (EMC Engineer)	

2.2 Test report

TEST REPORT

Test report no.: 304FCC24/2002
(S55)

TEST REPORT REFERENCE

POWER OUTPUT SUBCLAUSE § 24.232

Conducted

Limits:

Power Step	Nominal Peak Output Power (dBm)	Tolerance (dB)
0	+30	± 2

Power Measurements:

Conducted Average power measurements are provided by SIEMENS.
Please refer to attached document: EMC_S55_12 (page 4, Siemens S55, "FCC Sample 2" IMEI: 004999.51.116376.7)

Frequency (MHz)	Average Power (dBm)
1850.2	29.1
1880.0	29.2
1909.8	29.3

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 Pin + 2.1 - Pr.
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:

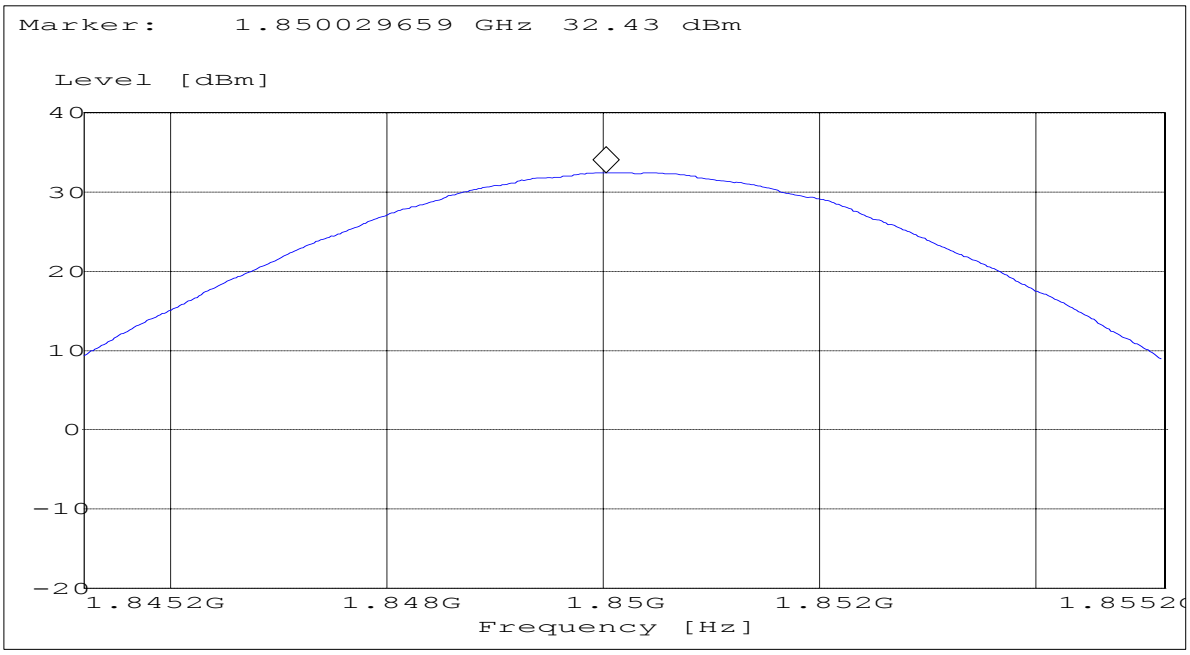
Frequency (MHz)	Power Step	BURST AVERAGE (dBm)	
		EIRP	ERP
1850.2	0	32.43	30.33
1880.0	0	32.15	30.05
1909.8	0	31.51	29.05
Measurement uncertainty	±0.5 dB		

ANALYZER SETTINGS: RBW = VBW = 3MHz

EIRP CHANNEL 512:

SWEEP TABLE: "EIRP 1900 CH512"

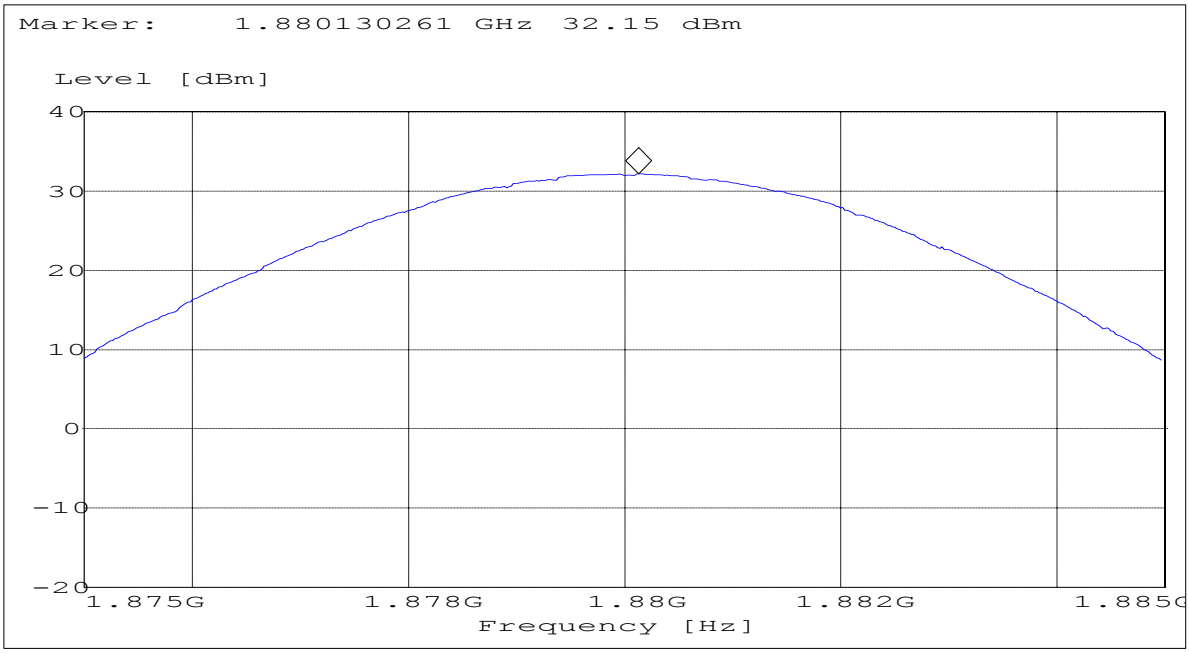
Start Frequency	*Stop Frequency*	*Detector*	*Meas. Time*	*RBW/VBW*
1.8452 GHz	1.8552 GHz	Max Peak	Coupled	3 MHz



EIRP CHANNEL 661:

SWEEP TABLE: "EIRP 1900 CH661"

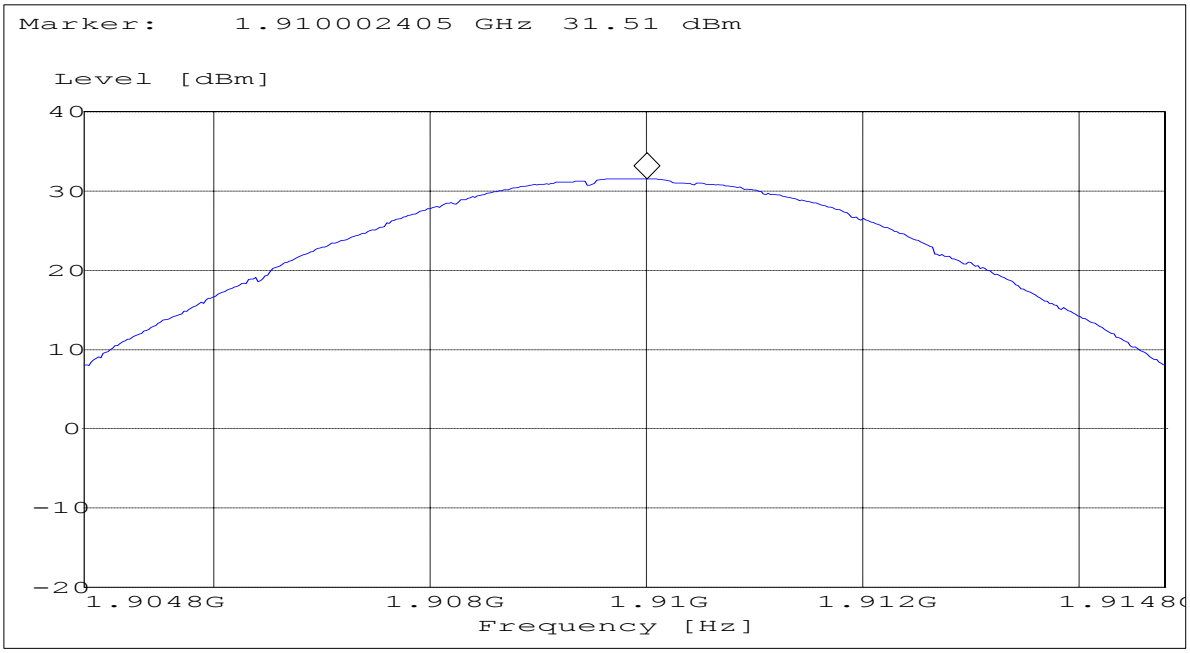
Start Frequency	*Stop Frequency*	*Detector*	*Meas. Time*	*RBW/VBW*
1.875 GHz	1.885 GHz	Max Peak	Coupled	3 MHz



EIRP CHANNEL 810:

SWEEP TABLE: "EIRP 1900 CH810"

Start Frequency	*Stop Frequency*	*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 0.1Volt 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 3.6 VDC and 5.2 VDC, with a nominal voltage of 3.8 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 –5.26 % and +36.84 %. 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

Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
3.6 v	-56 Hz	-.030 ppm
3.7 v	-57 Hz	-.0303 ppm
3.8 v	-49 Hz	-.026 ppm
3.9 v	-61 Hz	-.032 ppm
4.0 v	-53 Hz	-.028 ppm
4.1 v	-54 Hz	-.029 ppm
4.2 v	-60 Hz	-.032 ppm
4.3 v	-59 Hz	-.031 ppm
4.4 v	-63 Hz	-.034 ppm
4.5 v	-70 Hz	-.037 ppm
4.6 v	-56 Hz	-.030 ppm
4.7 v	-62 Hz	-.033 ppm
4.8 v	-64 Hz	-.034 ppm
4.9 v	-60 Hz	-.032 ppm
5.0 v	-60 Hz	-.032 ppm
5.1 v	-67 Hz	-.036 ppm
5.2 v	-69 Hz	-.037 ppm

AFC FREQ ERROR vs. TEMPERATURE

TEMPERATURE (°C)	Frequency Error (Hz)	Frequency Error (ppm)
-30	Device does not function.	---
-20	Device does not function.	---
-10	-47 Hz	-.025 ppm
0	-54 Hz	-.029 ppm
+10	-56 Hz	-.030 ppm
+20	-54 Hz	-.029 ppm
+30	-60 Hz	-.032 ppm
+40	-65 Hz	-.035 ppm
+50	-74 Hz	-.039 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.

Frequency	99% Occupied Bandwidth	-26 dBc Bandwidth
1850.2 MHz	276.55 kHz	320.64 kHz
1880.0 MHz	284.57 kHz	314.63 kHz
1909.2 MHz	278.56 kHz	314.63 kHz

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.

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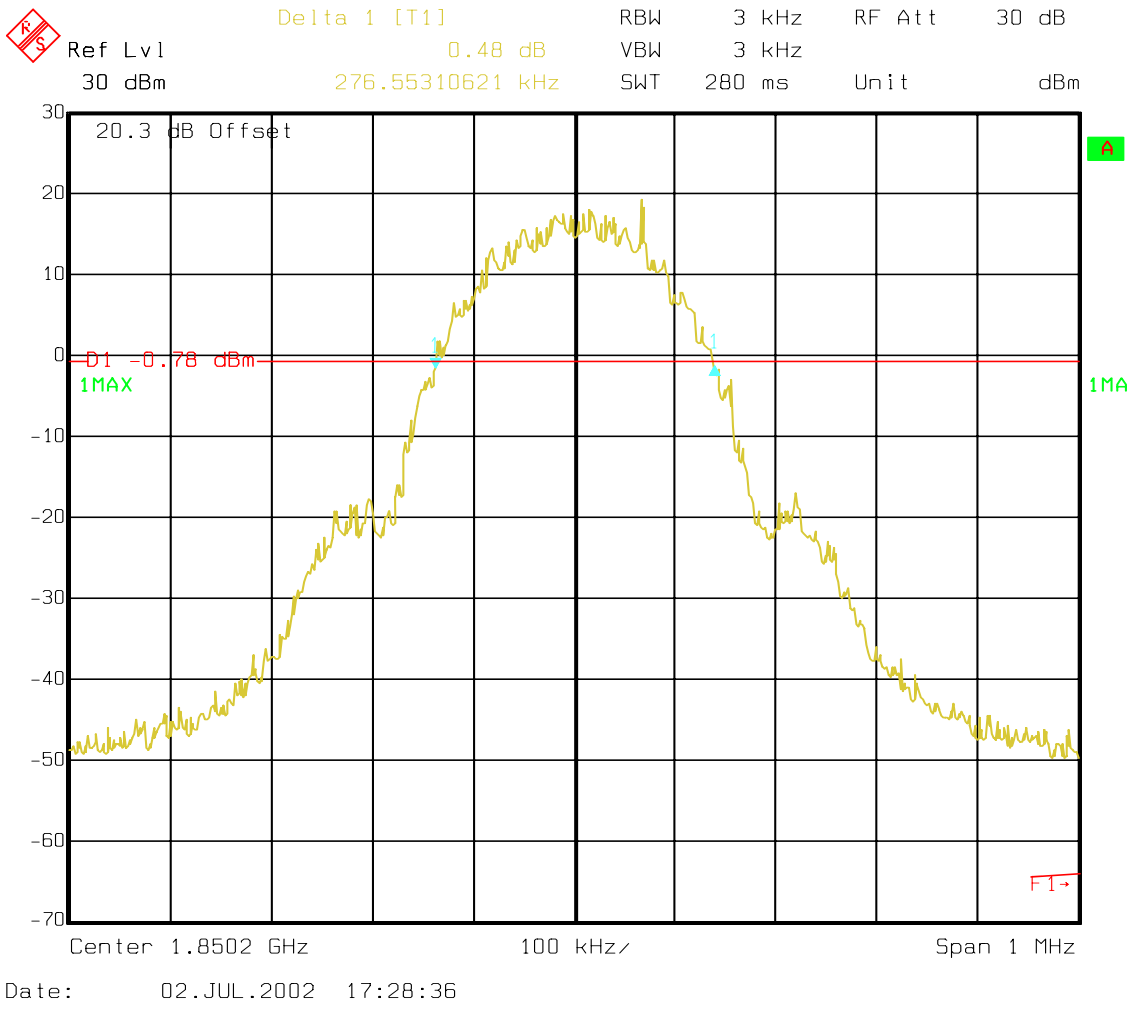
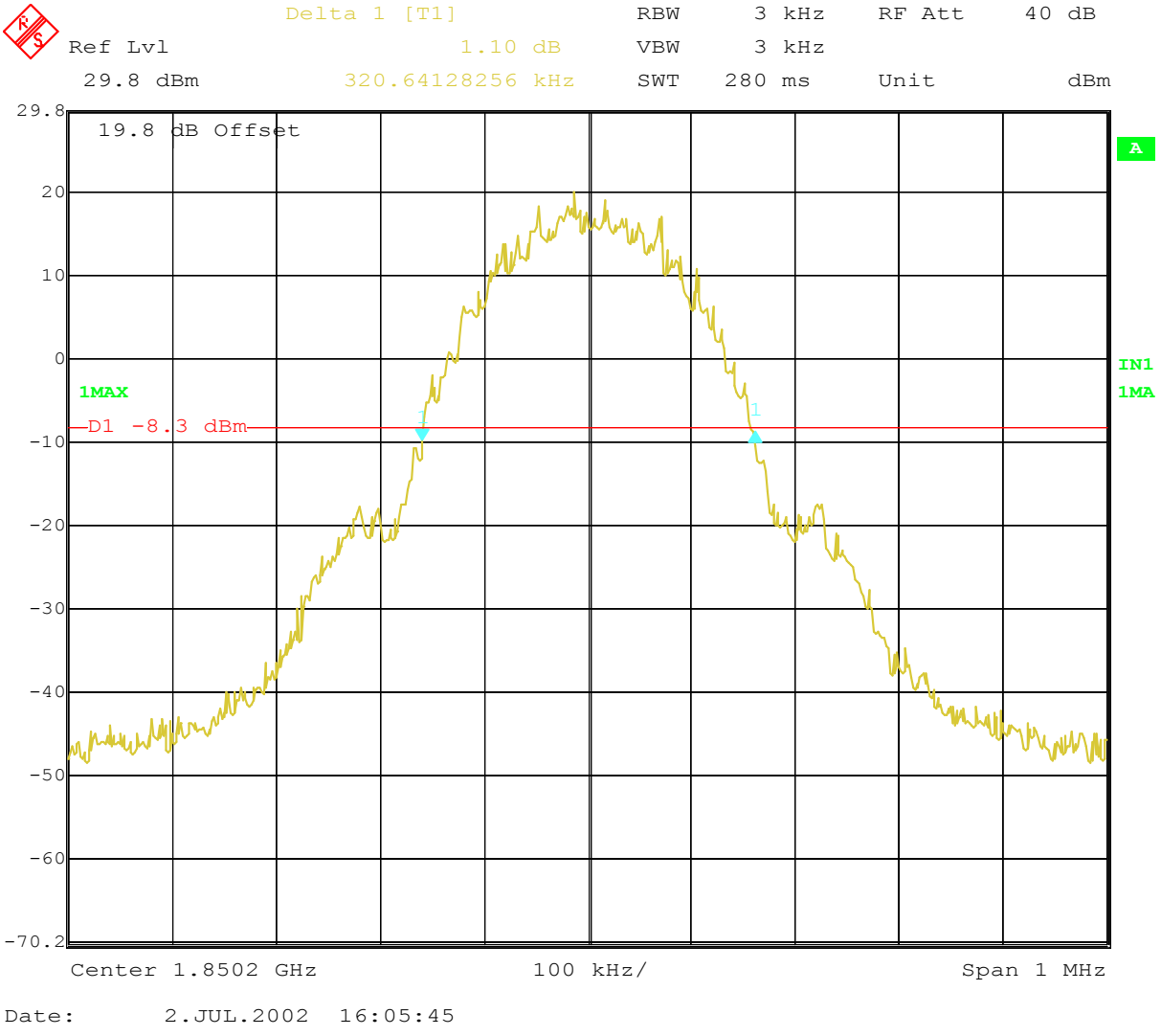
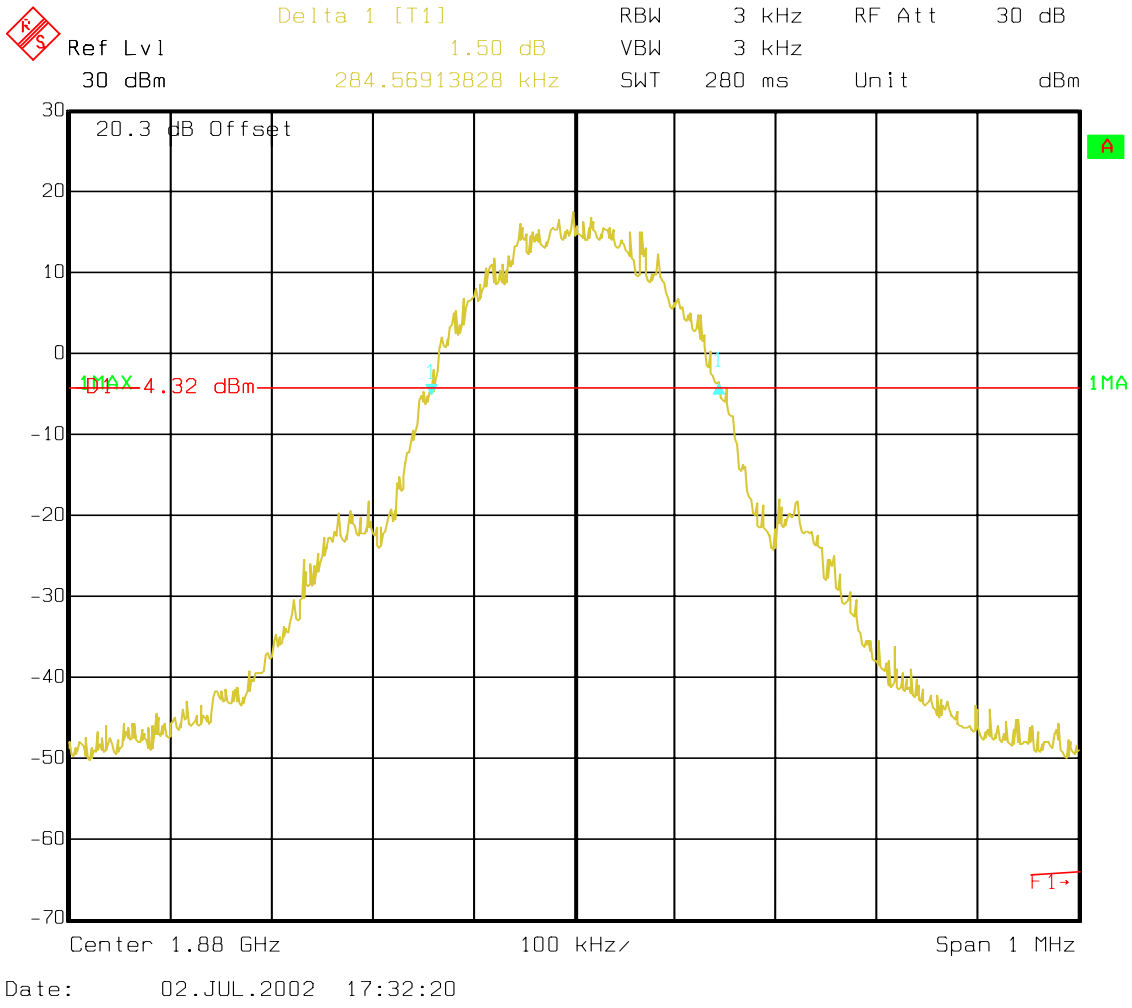
Channel 512
99% Occupied Bandwidth



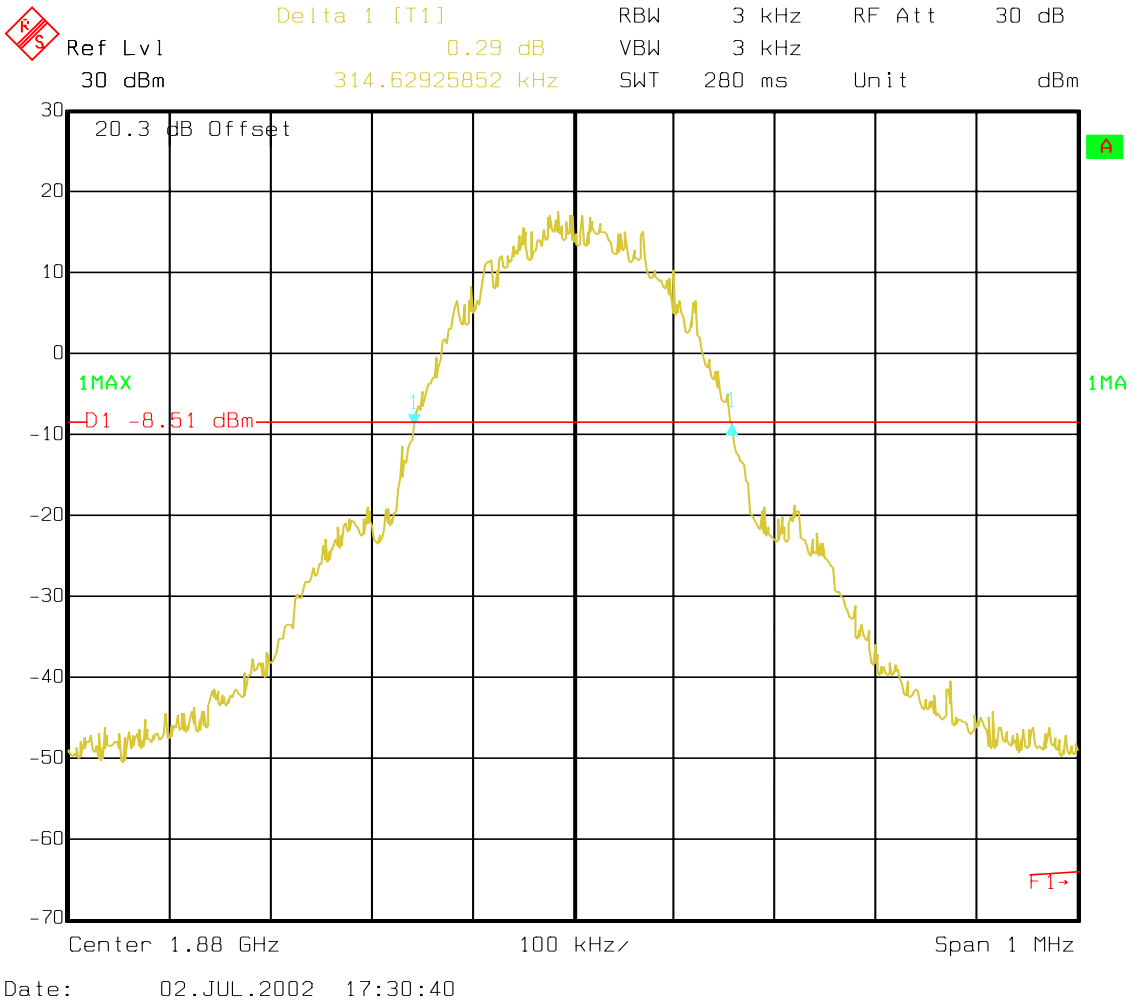
Channel 512
-26 dBc Bandwidth



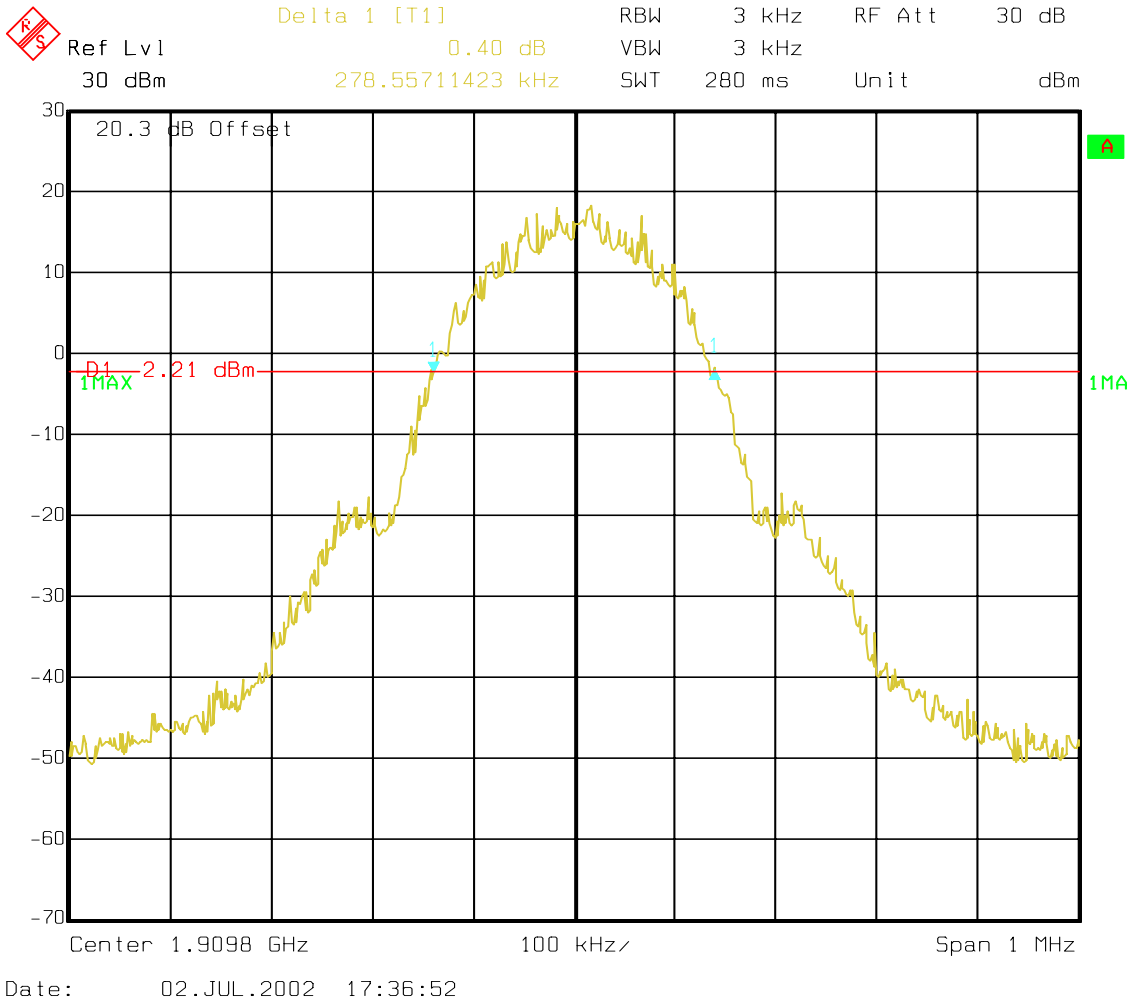
Channel 661
99% Occupied Bandwidth



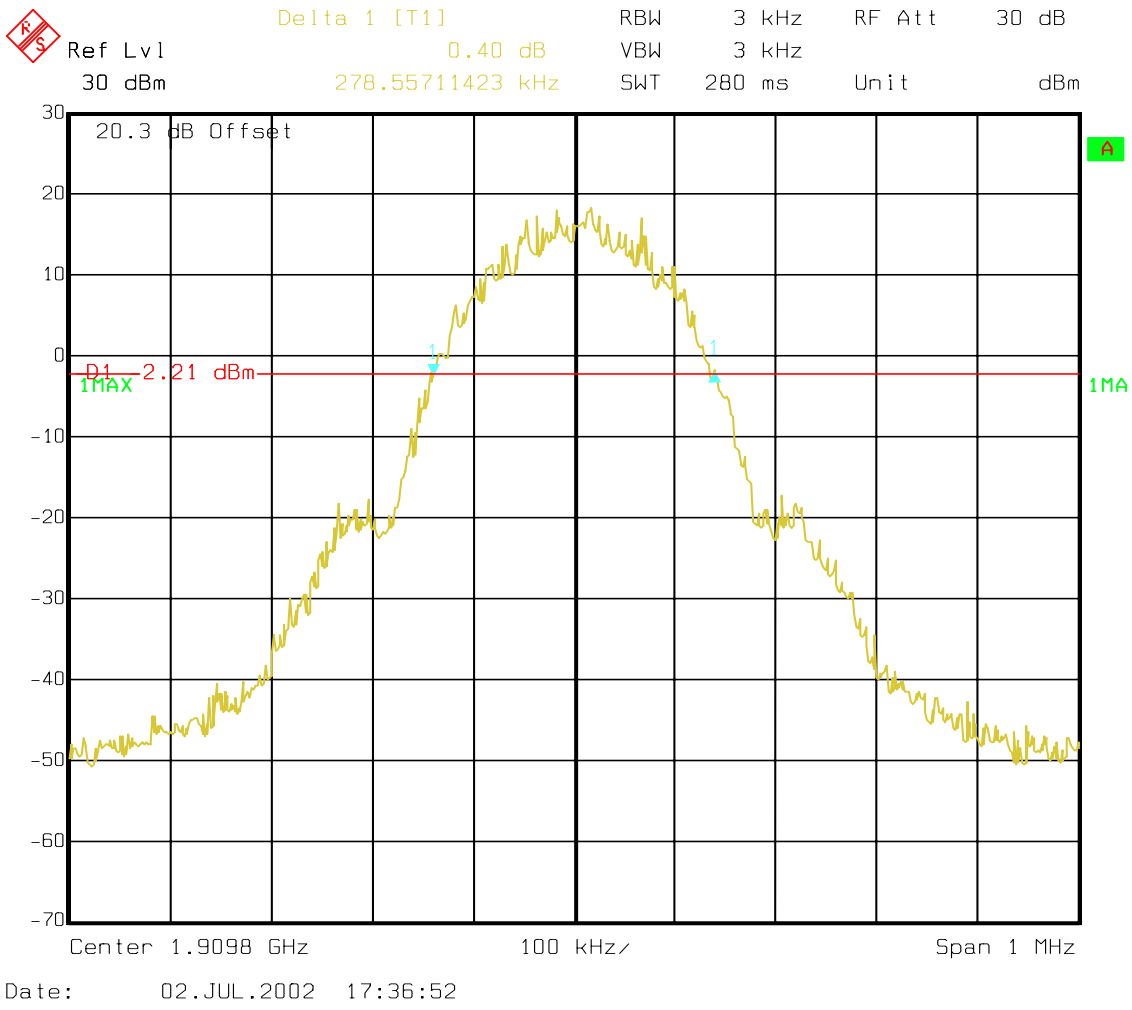
Channel 661
-26 dBc Bandwidth



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+10Log(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:

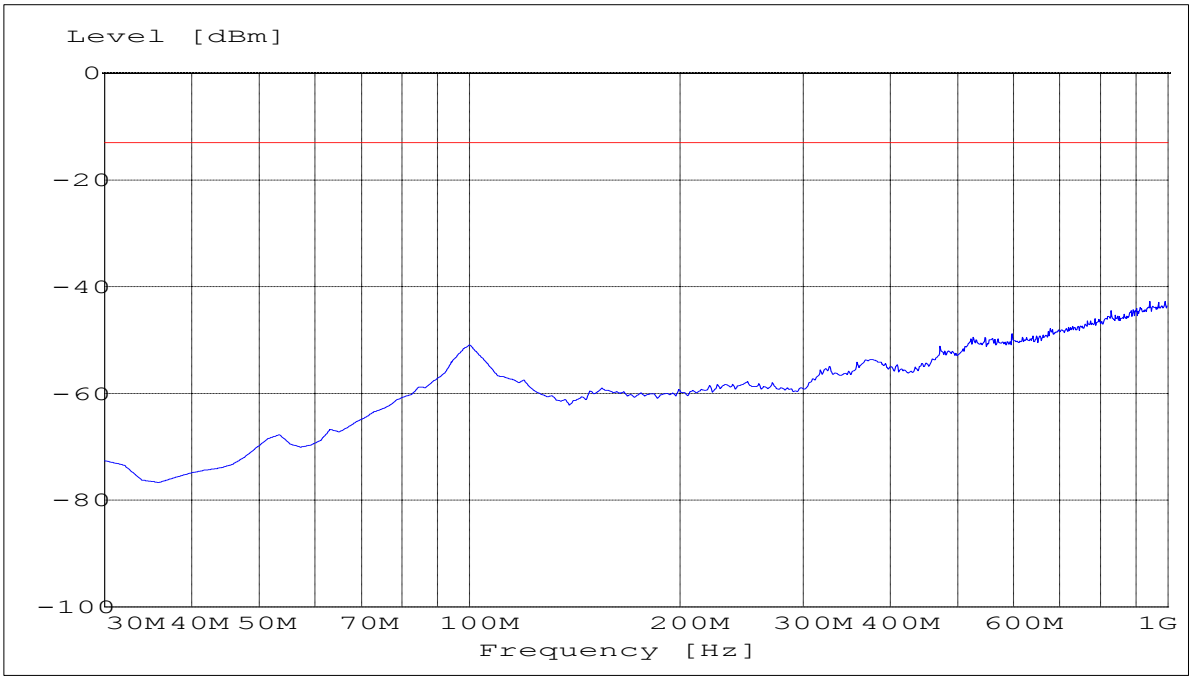
Harmonic	Tx ch-512 Freq.(MHz)	Level (dBm)	Tx ch-661 Freq. (MHz)	Level (dBm)	Tx ch-810 Freq. (MHz)	Level (dBm)
2	3700.4	-60.75	3760	-50.43	3819.6	-49.89
3	5550.6	-45.61	5640	-46.37	5729.4	-44.71
4	7400.8	-44.75	7520	-50.02	7639.2	-50.64
5	9251	-36.49	9400	-37.26	9549	-37.32
6	11101.2	-37.08	11280	-37.22	11458.8	-35.50
7	12951.4	-32.89	13160	-34.77	13368.6	-33.88
8	14801.6	-31.82	15040	-32.67	15278.4	-30.78
9	16651.8	-27.54	16920	-27.01	17188.2	-25.54
10	18502	-28.75	18800	-31.52	19098	-31.09

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



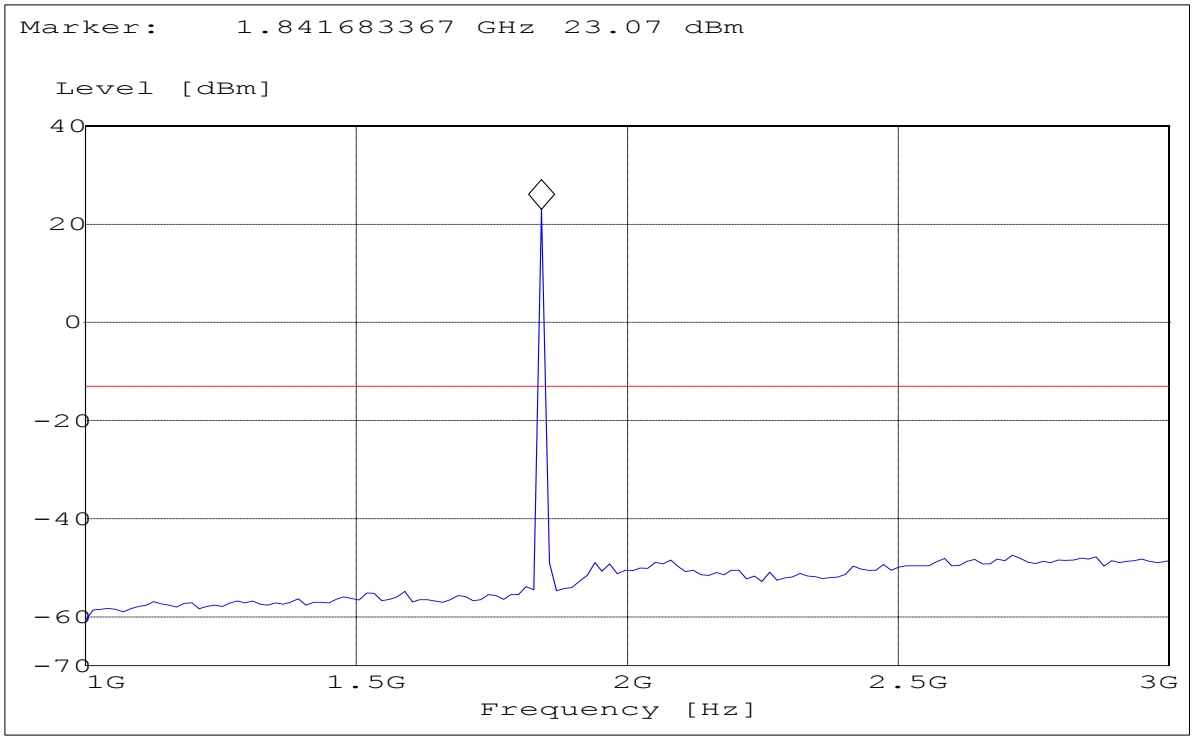
RADIATED SPURIOUS EMISSIONS
Channel 512 : 1GHz – 3GHz

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

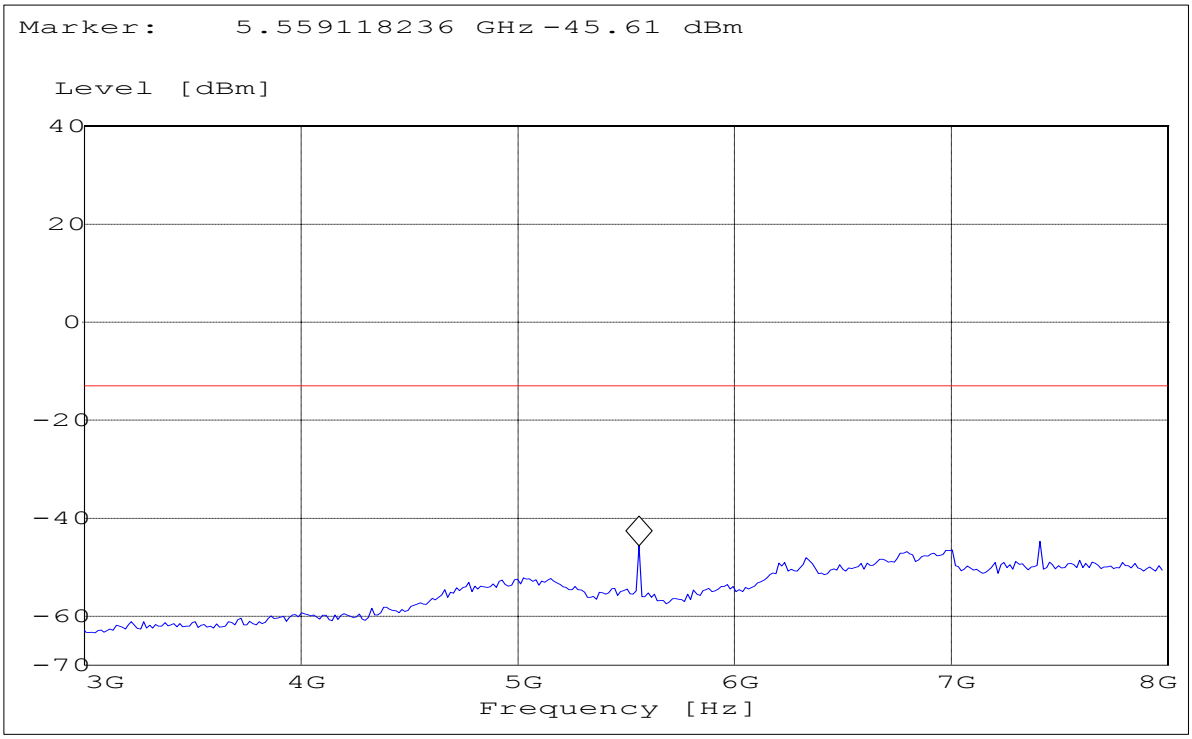


RADIATED SPURIOUS EMISSIONS
Channel 512 : 3GHz – 8GHz

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

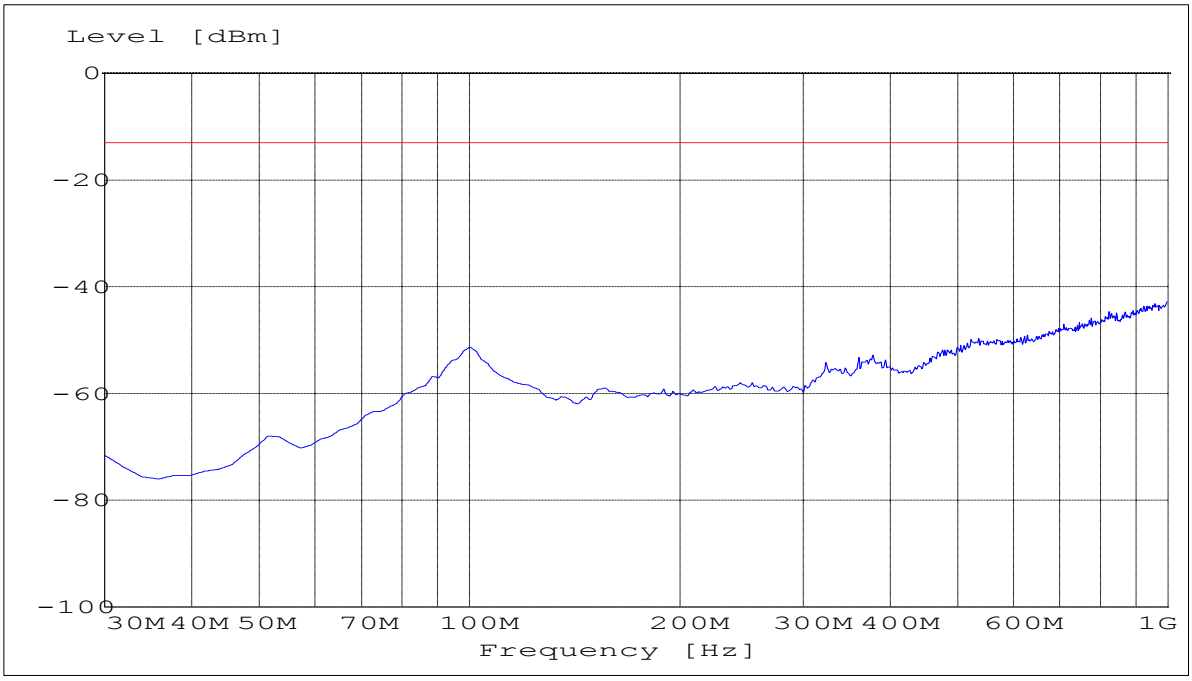


RADIATED SPURIOUS EMISSIONS
Channel 661: 30MHz –1GHz

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



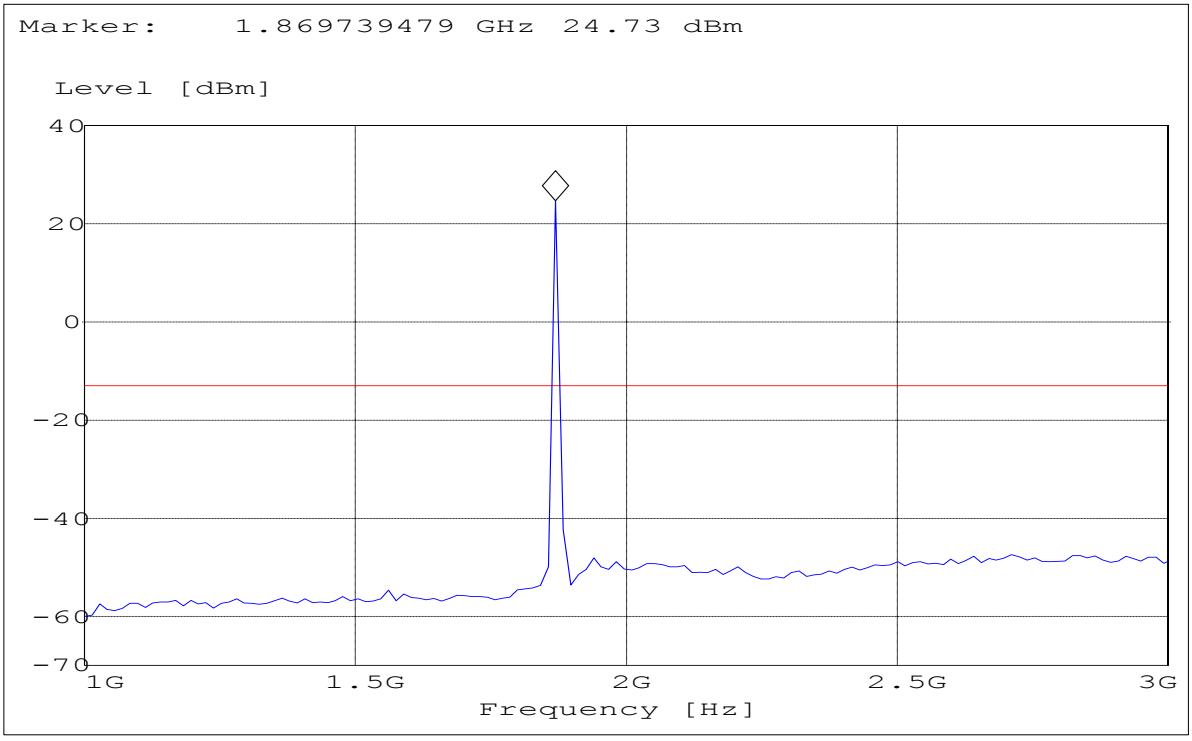
RADIATED SPURIOUS EMISSIONS
Channel 661: 1GHz – 3GHz

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

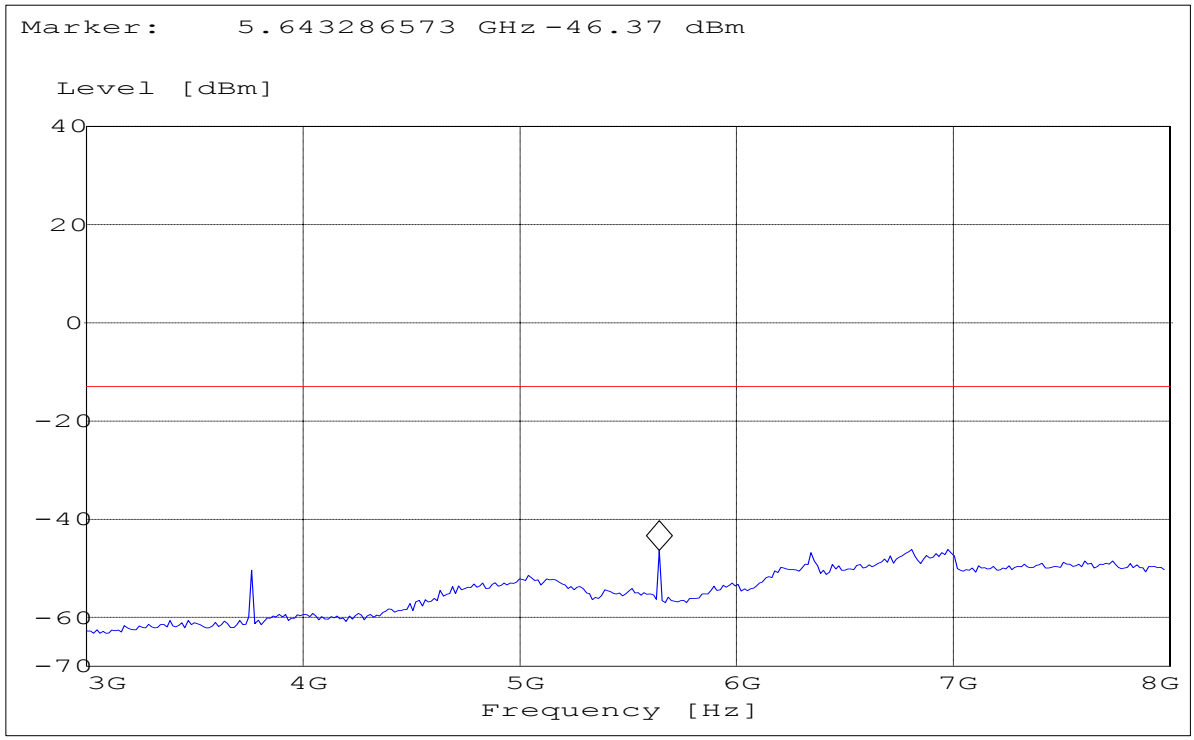


RADIATED SPURIOUS EMISSIONS
Channel 661: 3GHz – 8GHz

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

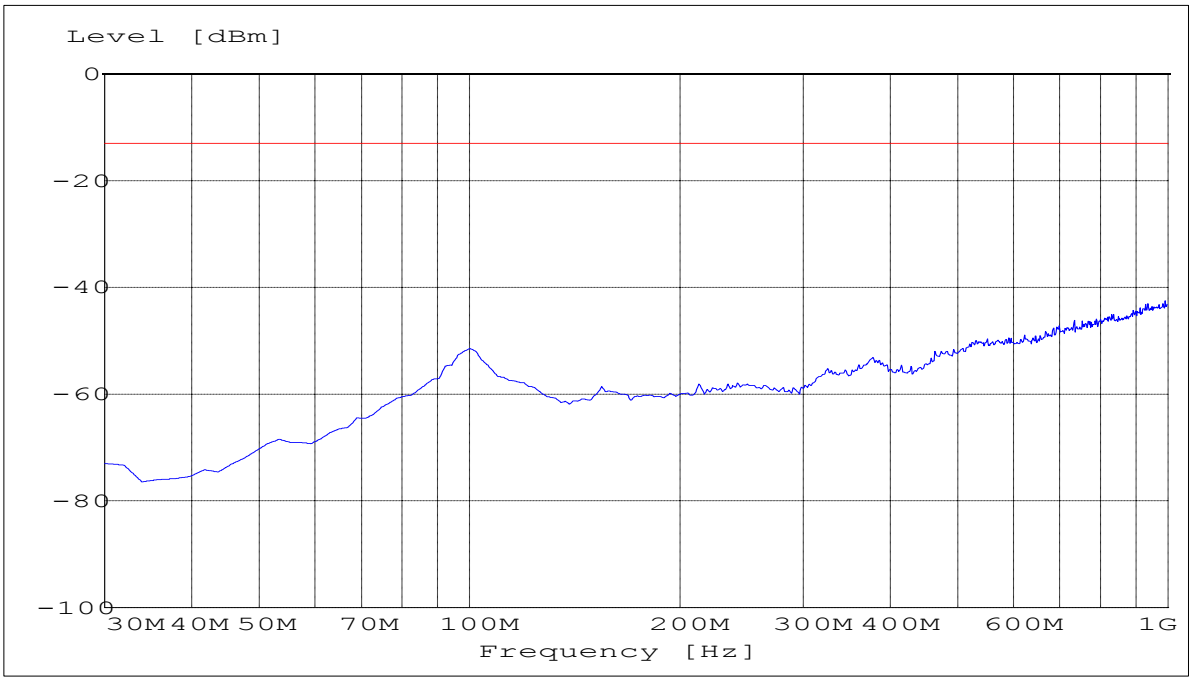


RADIATED SPURIOUS EMISSIONS
Channel 810: 30MHz – 1GHz

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



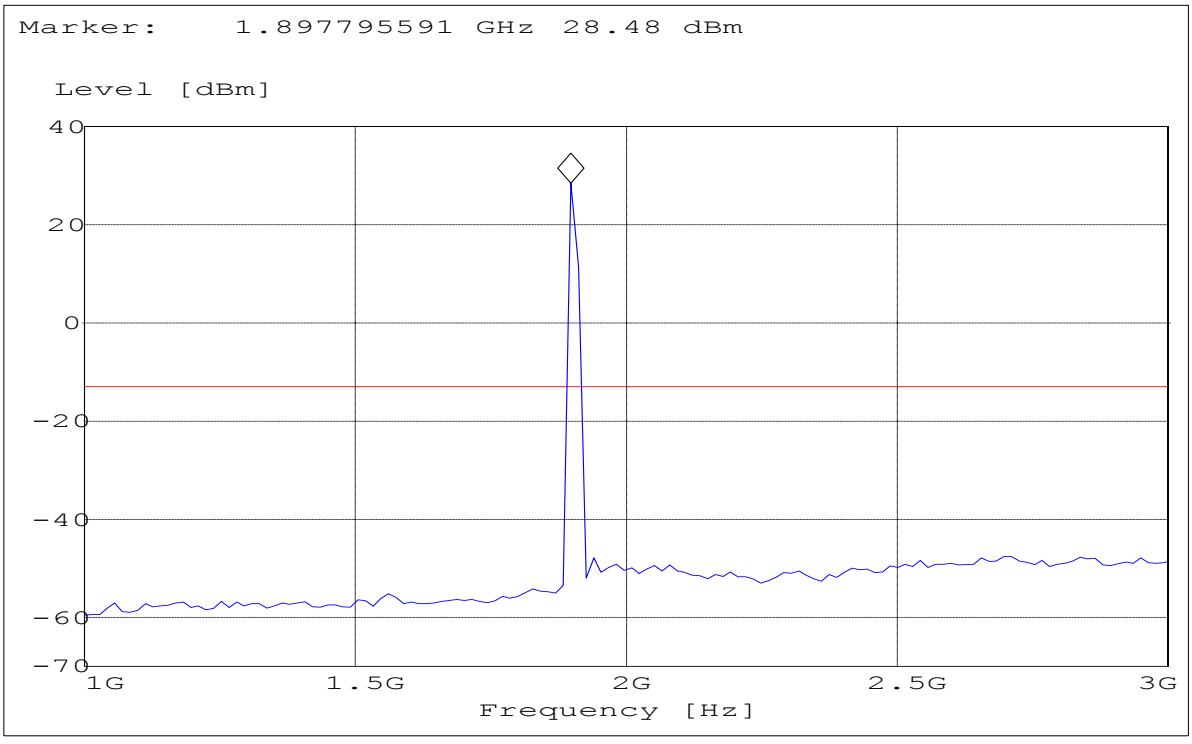
RADIATED SPURIOUS EMISSIONS
Channel 810: 1GHz – 3GHz

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

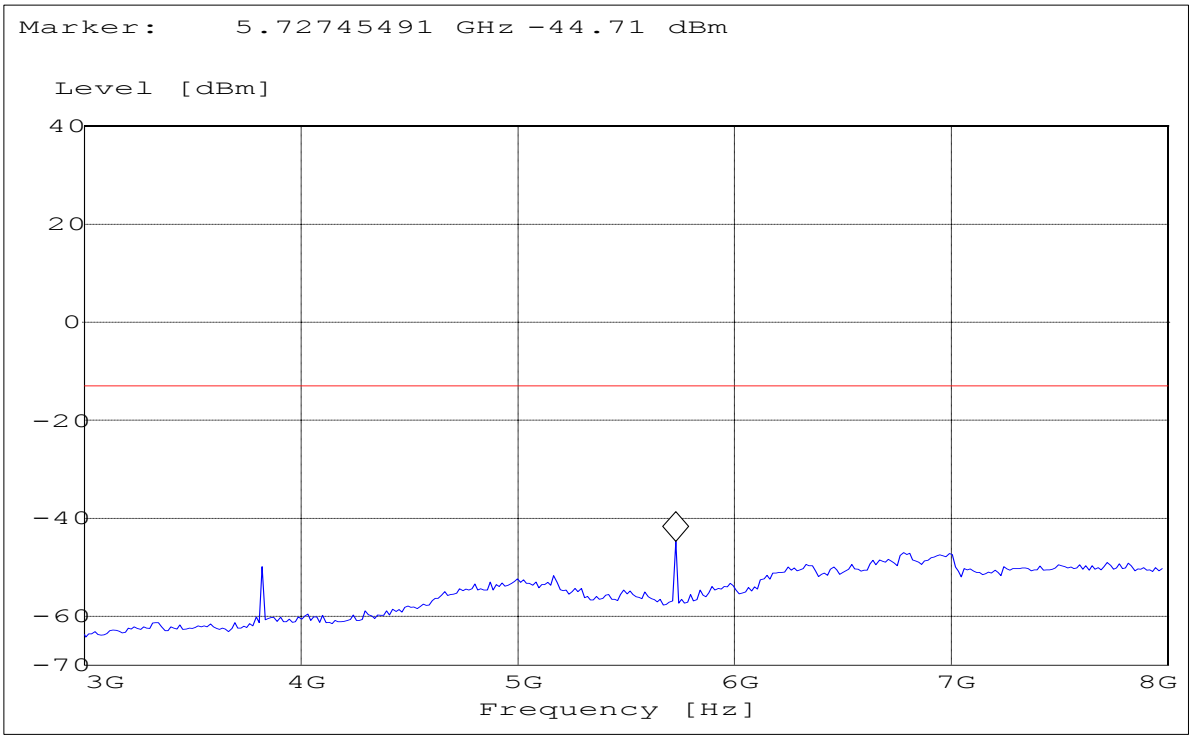


RADIATED SPURIOUS EMISSIONS
Channel 810: 3GHz – 8GHz

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



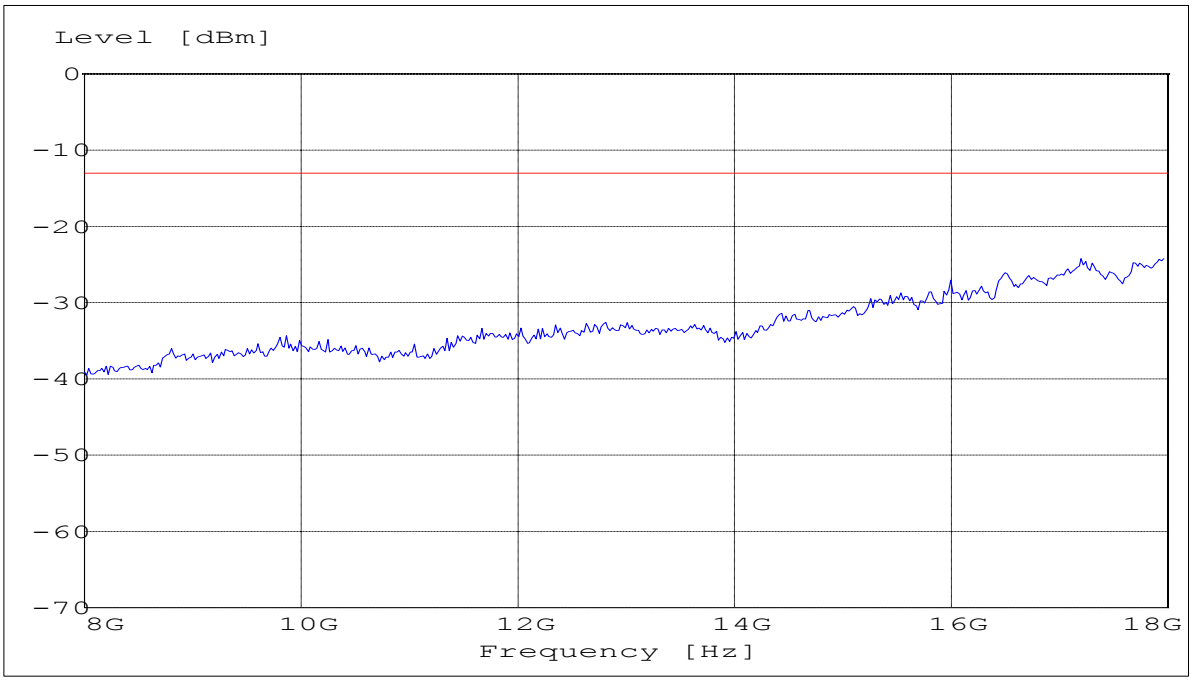
RADIATED SPURIOUS EMISSIONS
8GHz – 18GHz

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



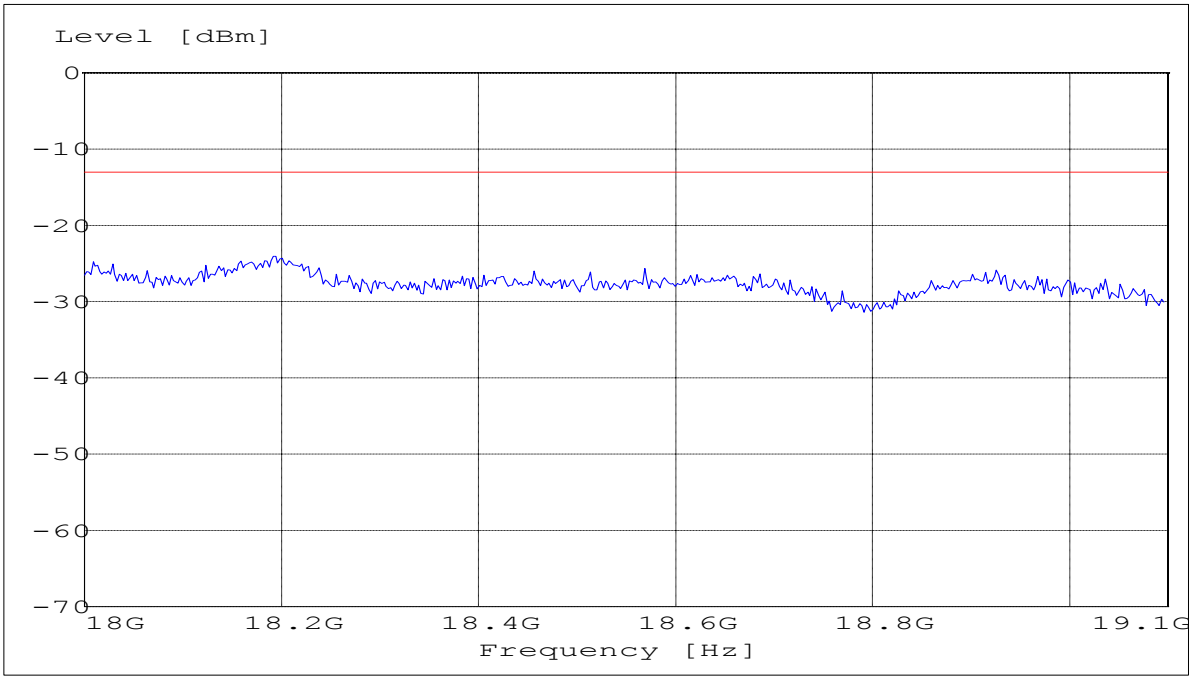
RADIATED SPURIOUS EMISSIONS
18GHz – 19.1GHz

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

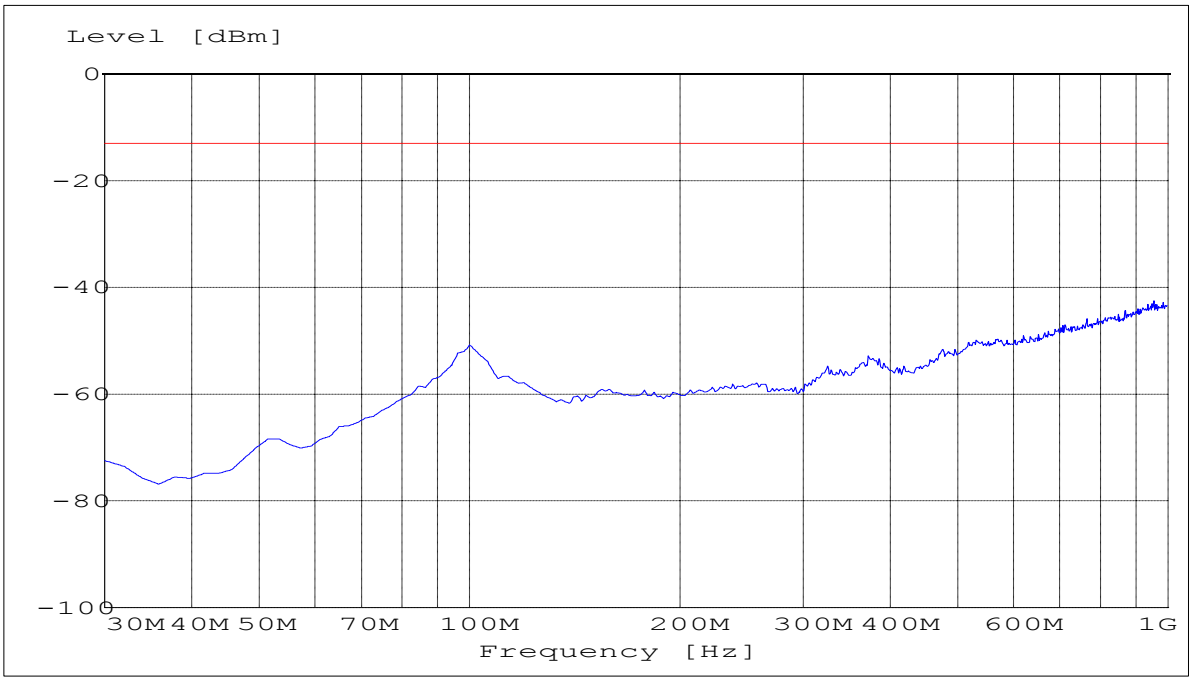


RADIATED SPURIOUS EMISSIONS
EUT in Idle Mode: 30MHz – 1GHz

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

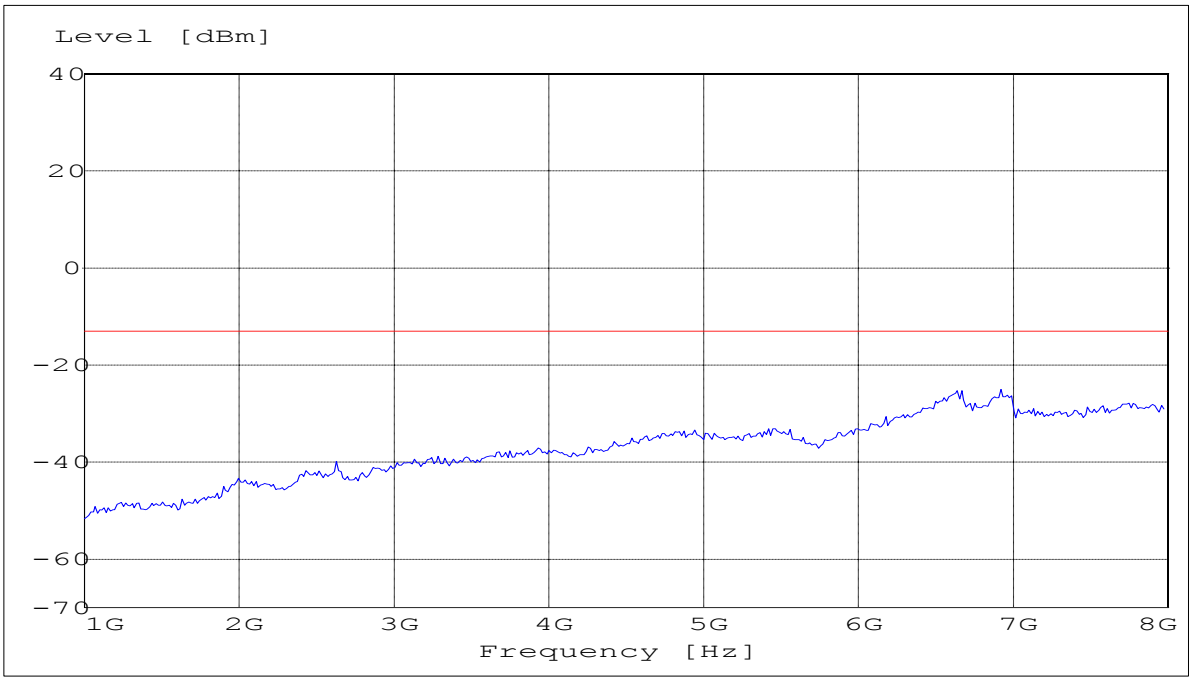


RADIATED SPURIOUS EMISSIONS
EUT in Idle Mode: 1GHz – 8GHz

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

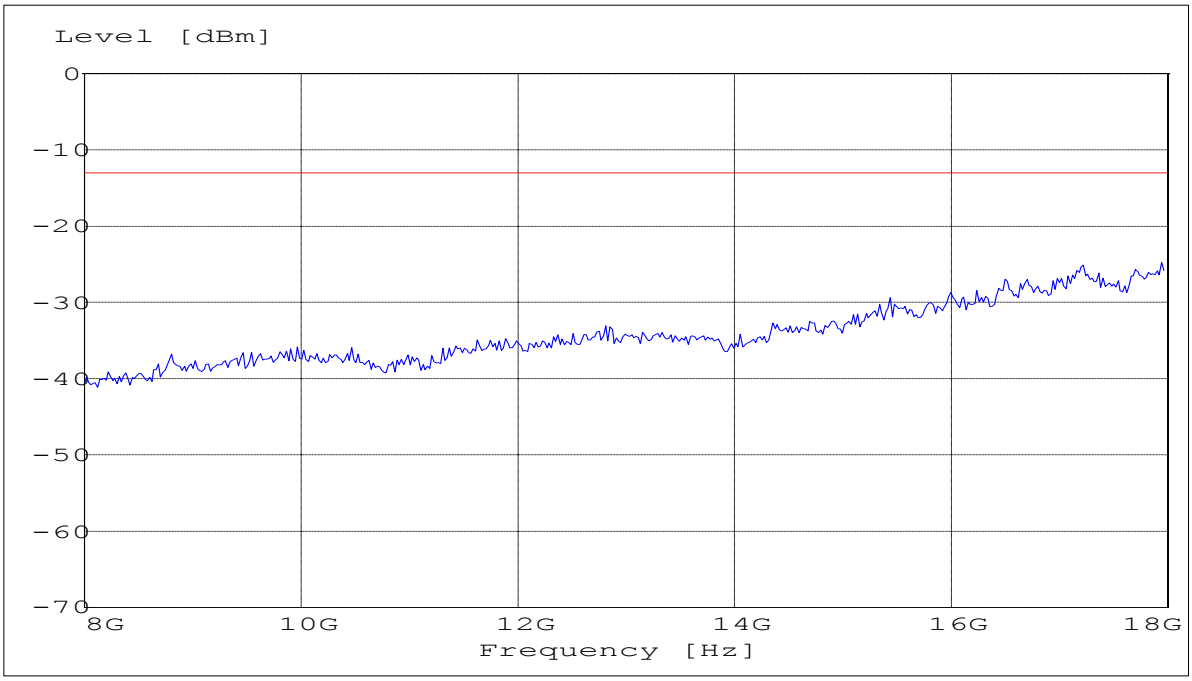


RADIATED SPURIOUS EMISSIONS
EUT in Idle Mode: 8GHz – 18GHz

Spurious emission limit –13dBm

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

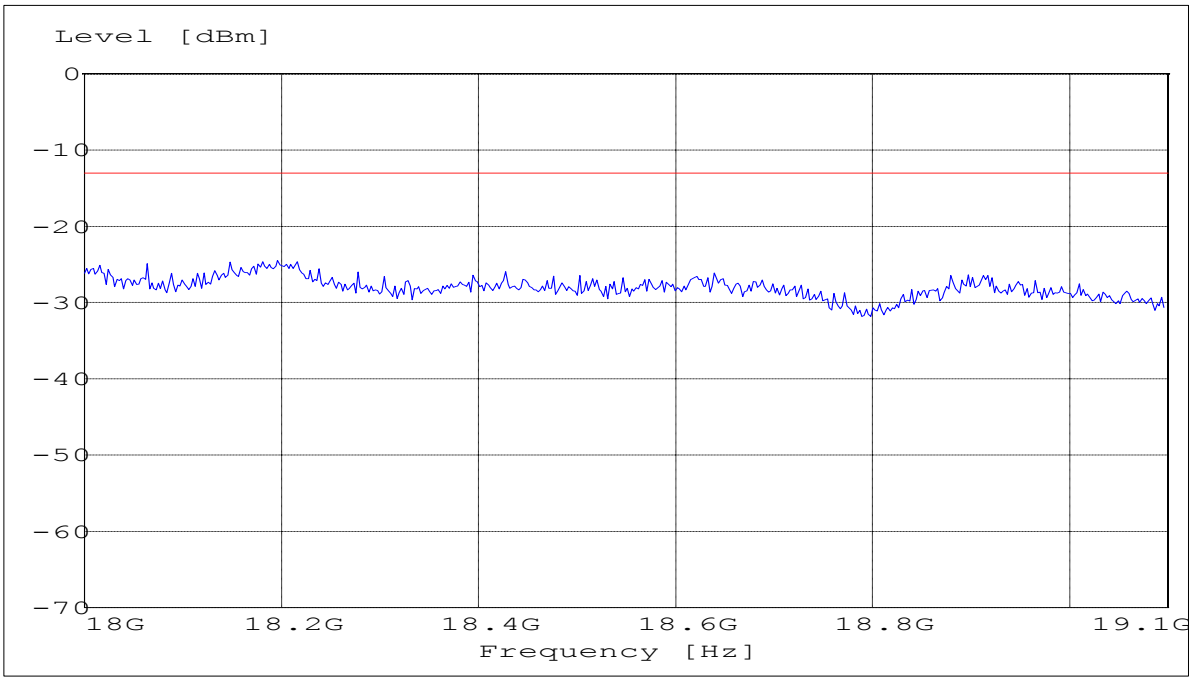
Start Frequency	*Stop Frequency*	*Detector*	*Meas. Time*	*RBW/VBW*
8GHz	18GHz	Max Peak	Coupled	1 MHz



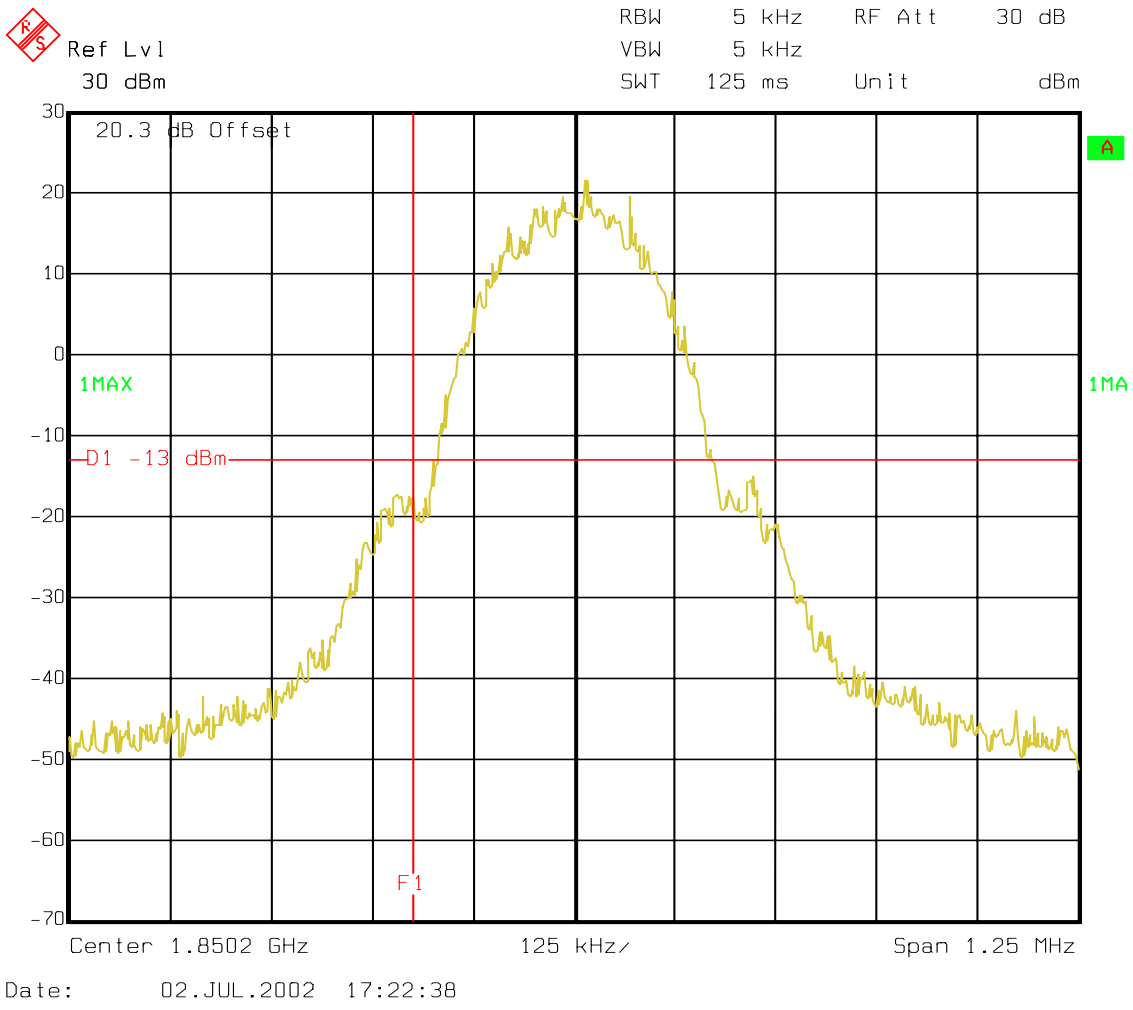
RADIATED SPURIOUS EMISSIONS
EUT in Idle Mode: 18GHz – 19.1GHz
Spurious emission limit –13dBm

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

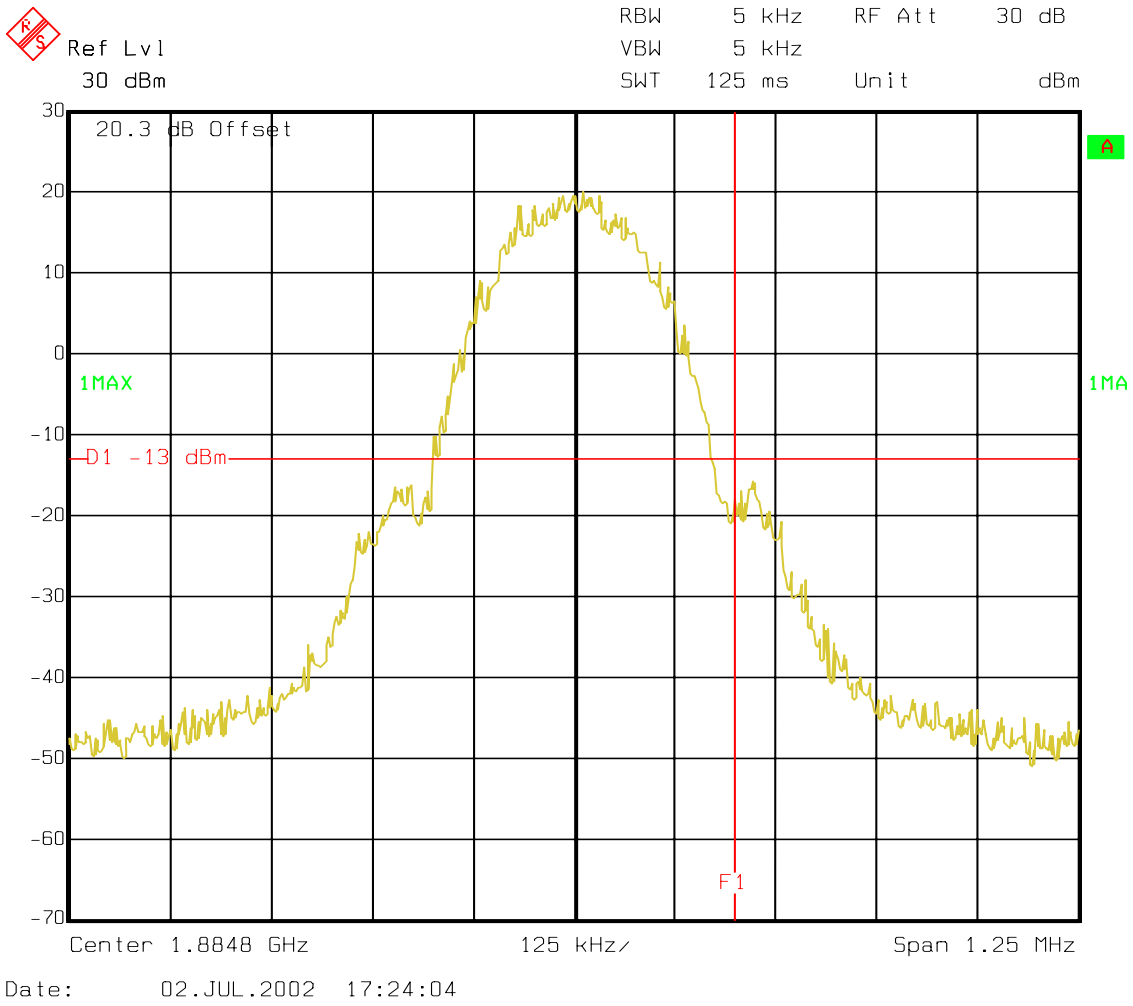
Start Frequency	*Stop Frequency*	*Detector*	*Meas. Time*	*RBW/VBW*
18GHz	19.1GHz	Max Peak	Coupled	1 MHz



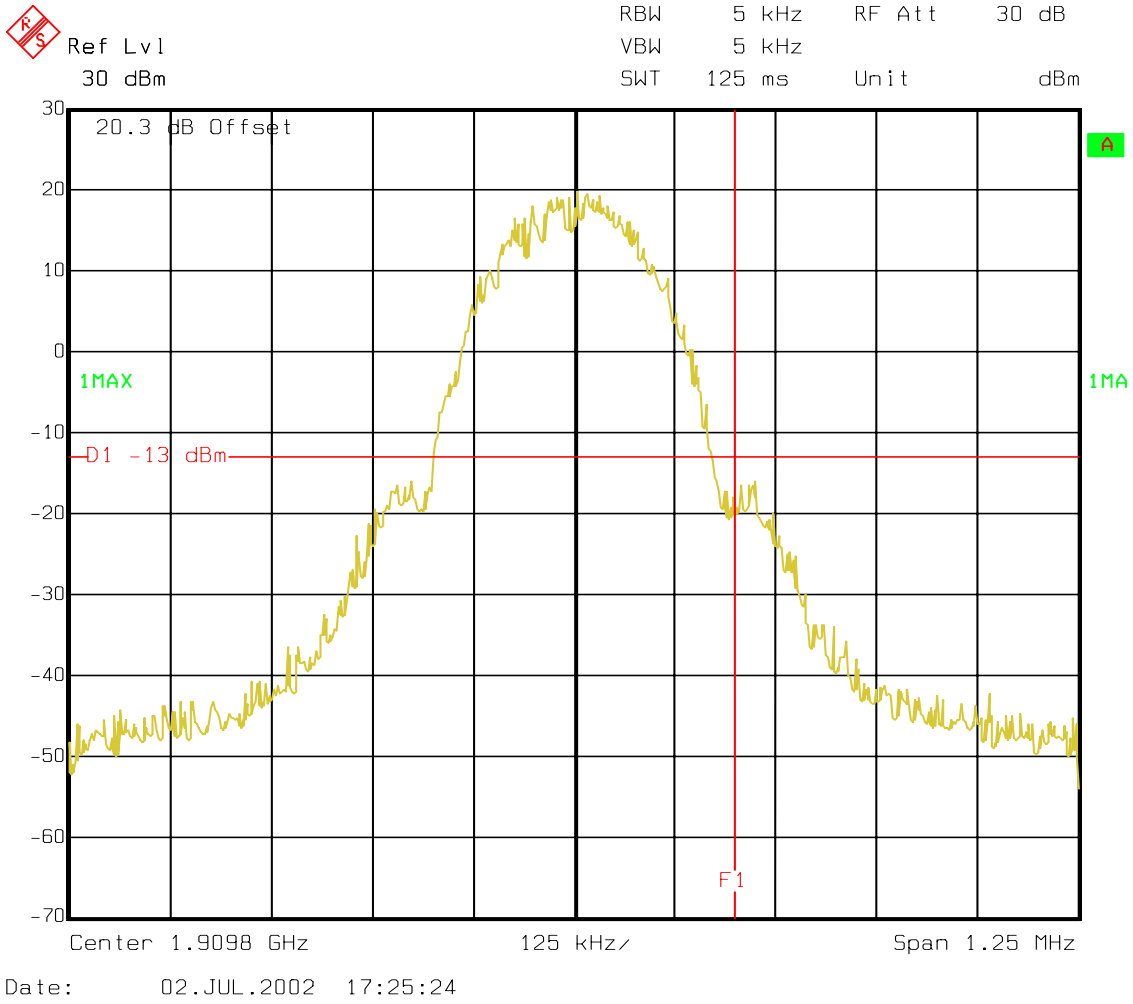
Lower Band Edge:
(Conducted)



Mid-Band Edge:
(Conducted)



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.

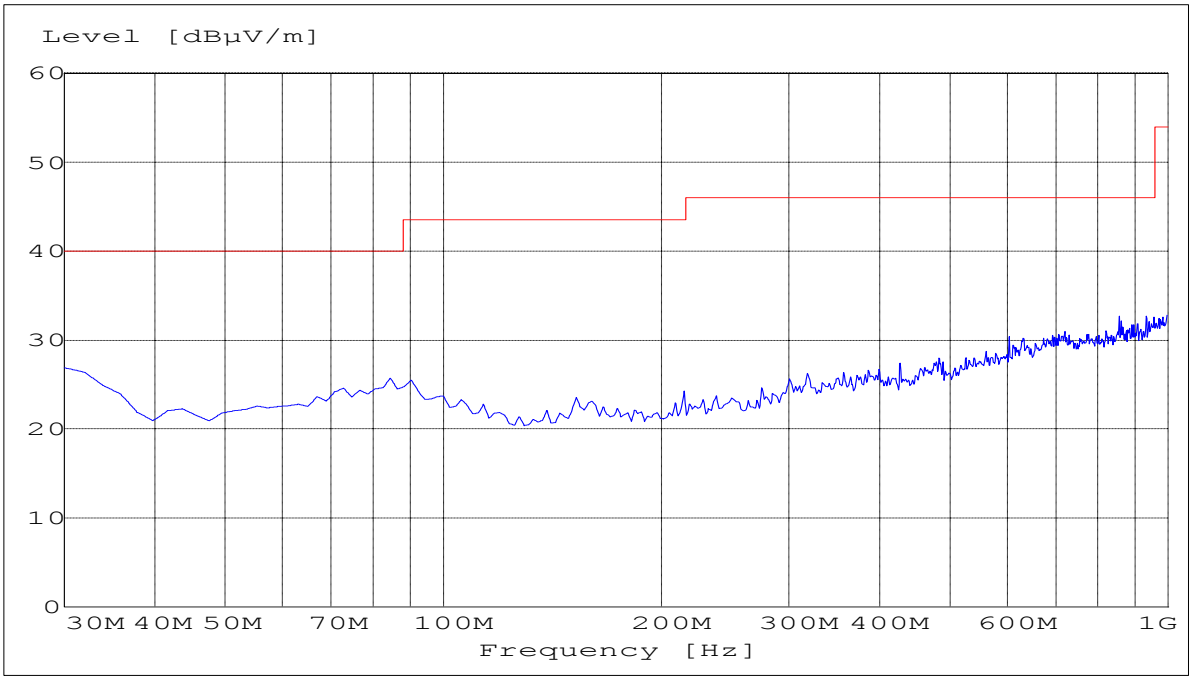
Limits **SUBCLAUSE § 15.209**

Frequency (MHz)	Field strength (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

RECEIVER RADIATED EMISSIONS
EUT in Idle Mode: 30MHz – 1GHz

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

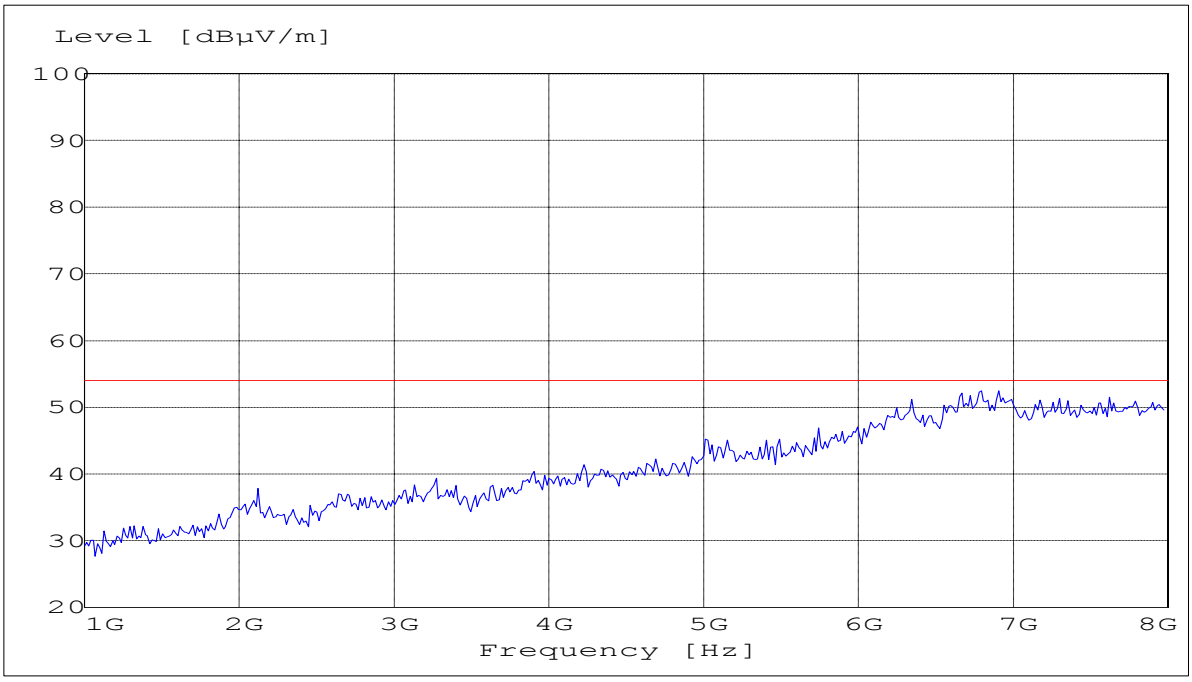
Start Frequency	*Stop Frequency*	*Detector*	*Meas. Time*	*RBW/VBW*
30MHz	1GHz	Max Peak	Coupled	100KHz



RECEIVER RADIATED EMISSIONS
EUT in Idle Mode: 1GHz – 8GHz

SWEEP TABLE: "FCC Spuri 1-8G"

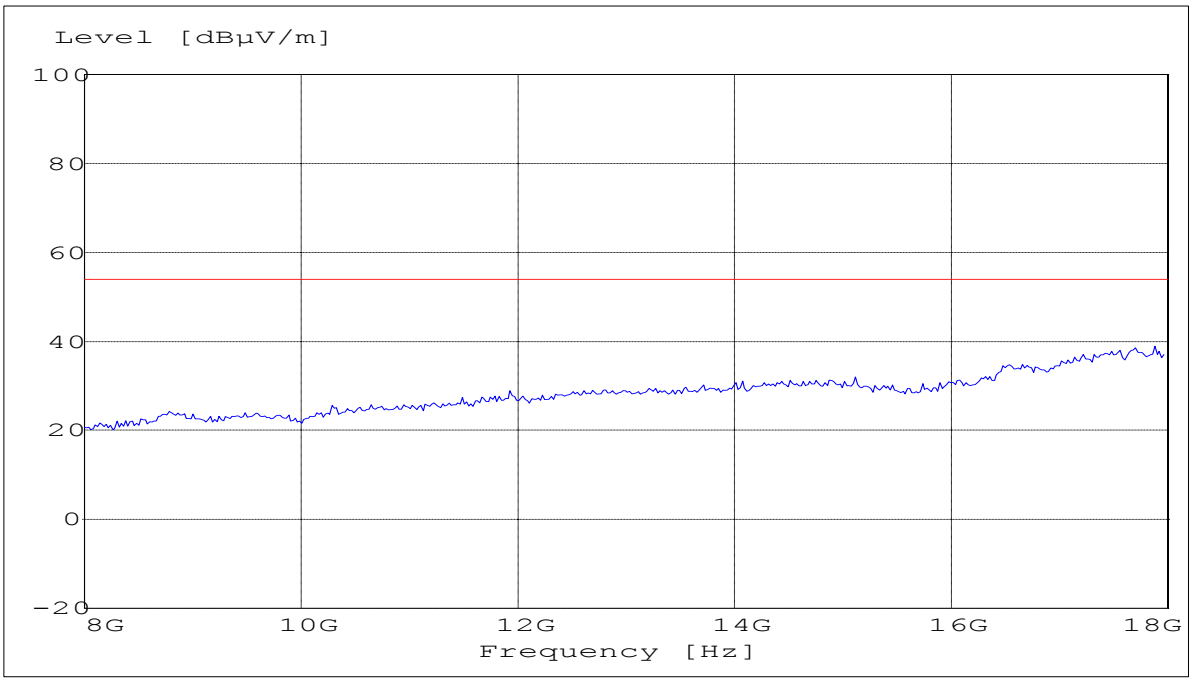
Start Frequency	*Stop Frequency*	*Detector*	*Meas. Time*	*RBW/VBW*
1GHz	8GHz	Max Peak	Coupled	1 MHz



RECEIVER RADIATED EMISSIONS
EUT in Idle Mode: 8GHz – 18GHz

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

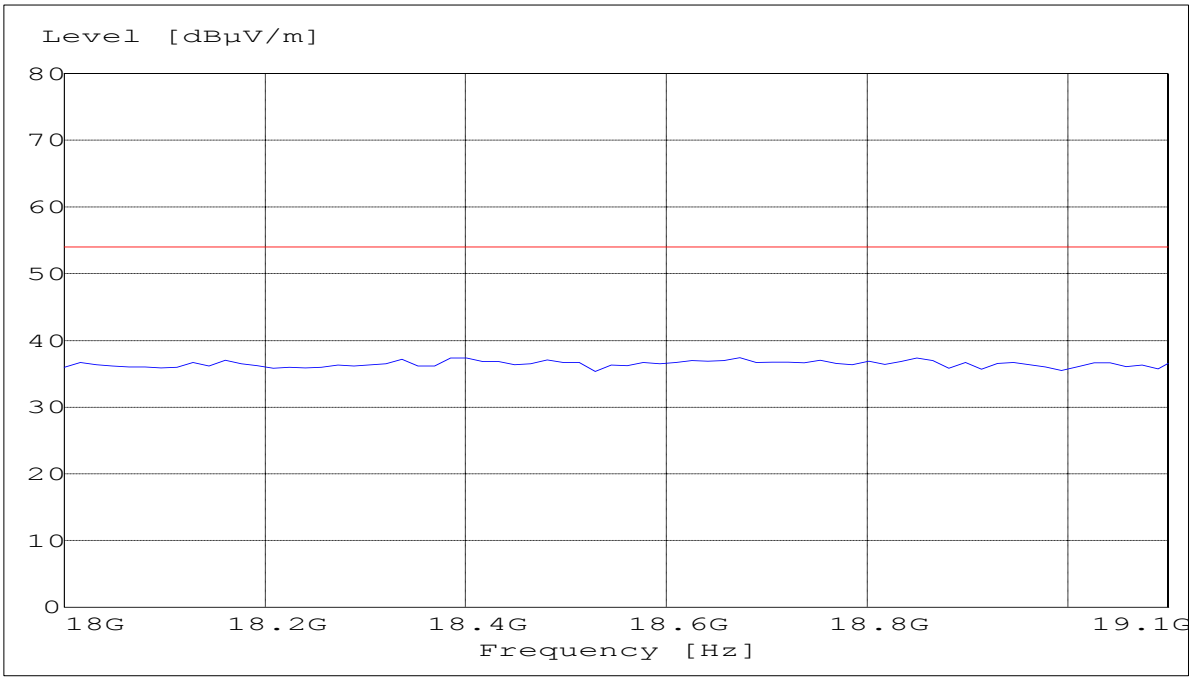
Start Frequency	*Stop Frequency*	*Detector*	*Meas. Time*	*RBW/VBW*
8GHz	18GHz	Max Peak	Coupled	1 MHz



RECEIVER RADIATED EMISSIONS
EUT in Idle Mode: 18GHz – 19.1GHz

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

Start Frequency	*Stop Frequency*	*Detector*	*Meas. Time*	*RBW/VBW*
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

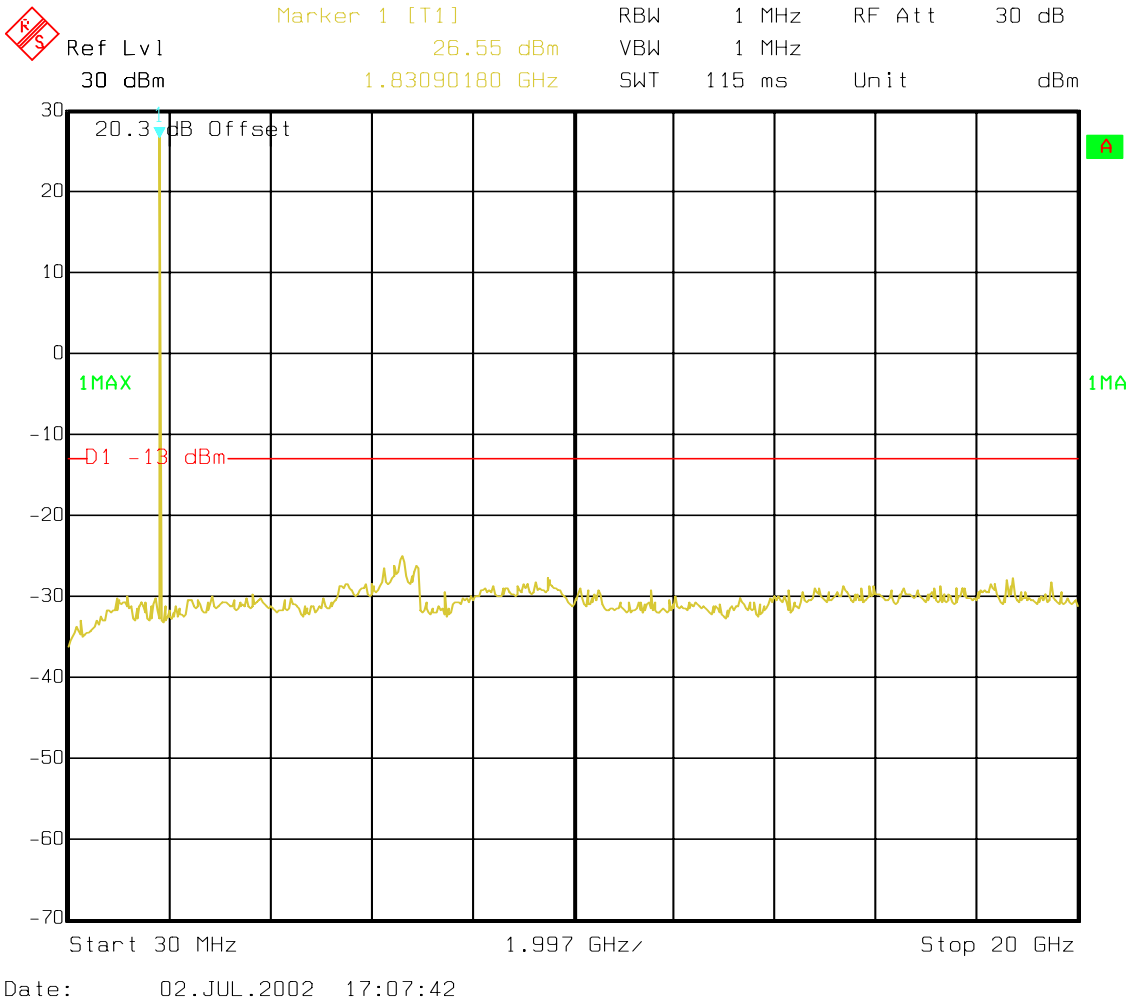
Measurement Limit:
Sec. 24.238 Emission Limits.
(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification 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	-30.28	3760	-29.87	3819.6	-28.78
3	5550.6	-28.52	5640	-28.91	5729.4	-28.84
4	7400.8	-26.54	7520	-31.47	7639.2	-30.95
5	9251	-28.25	9400	-28.32	9549	-28.31
6	11101.2	-29.58	11280	-30.87	11458.8	-30.51
7	12951.4	-30.78	13160	-30.70	13368.6	-31.08
8	14801.6	-28.61	15040	-29.55	15278.4	-29.48
9	16651.8	-28.91	16920	-29.37	17188.2	-29.35
10	18502	-28.22	18800	-29.14	19098	-29.01

CONDUCTED SPURIOUS EMISSIONS
Channel 512: 30MHz – 20GHz

Spurious emission limit –13dBm

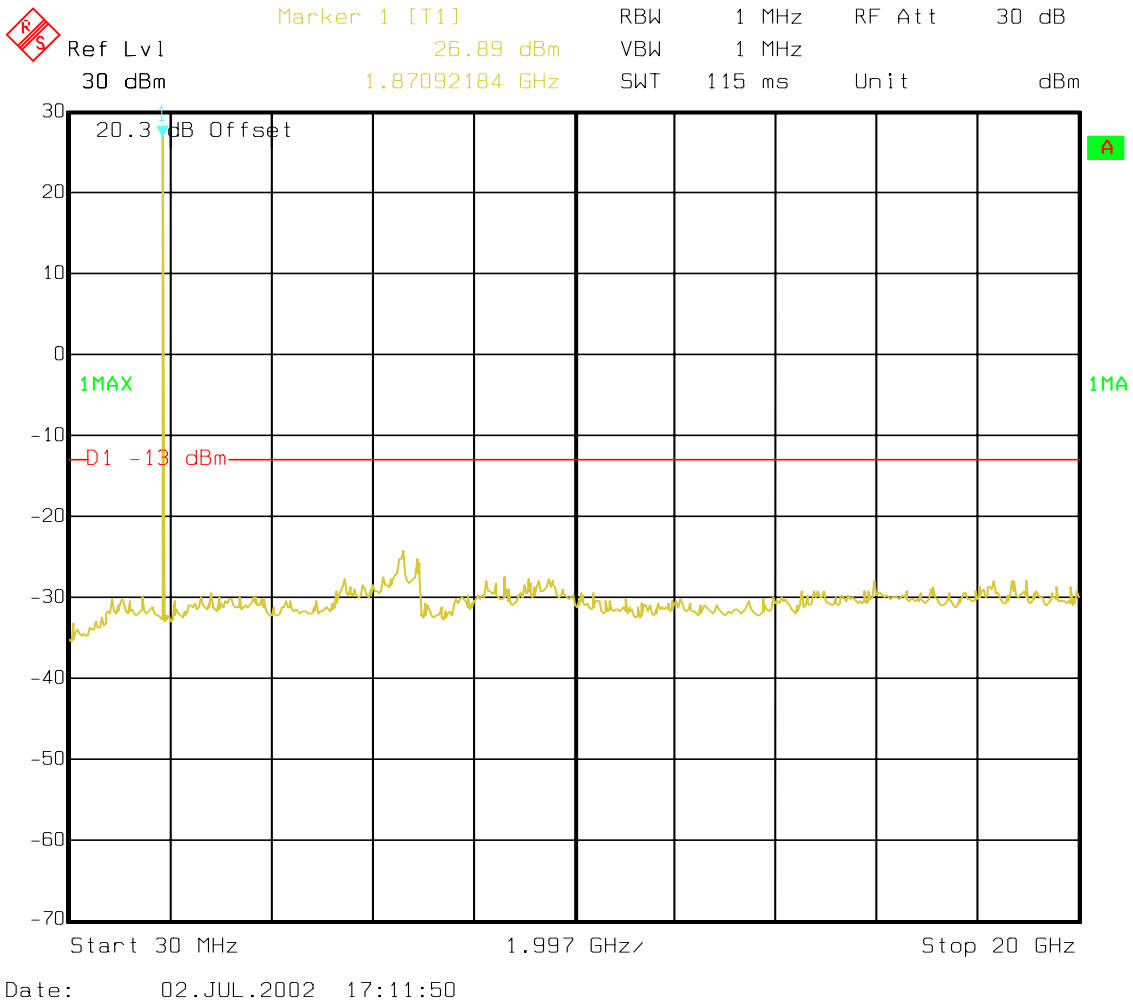
NOTE: peak above the limit line is the carrier frequency.



CONDUCTED SPURIOUS EMISSIONS
Channel 661: 30MHz – 20GHz

Spurious emission limit –13dBm

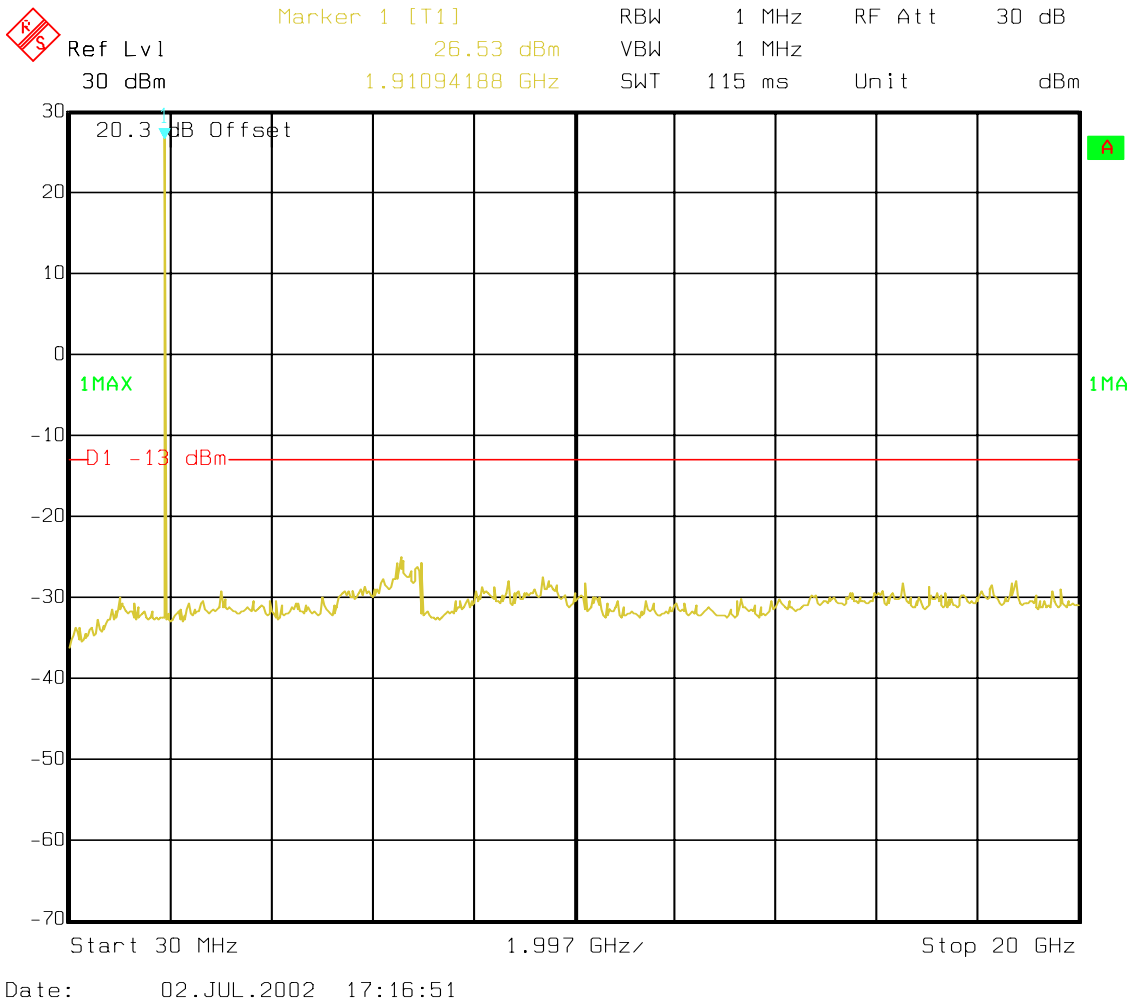
NOTE: peak above the limit line is the carrier frequency.



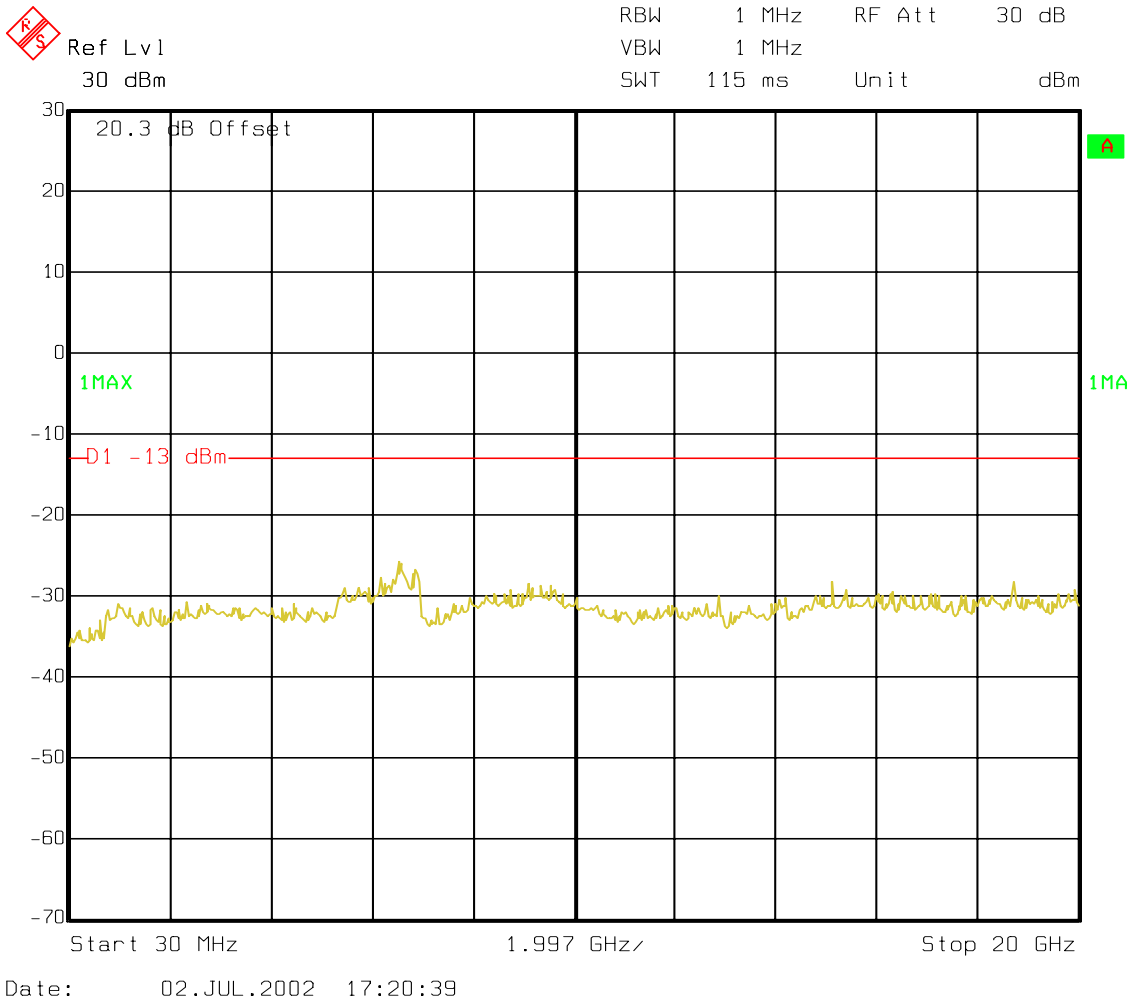
CONDUCTED SPURIOUS EMISSIONS
Channel 810: 30MHz – 20GHz

Spurious emission limit –13dBm

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



CONDUCTED SPURIOUS EMISSIONS
Idle mode: 30MHz – 20GHz
Spurious emission limit –13dBm

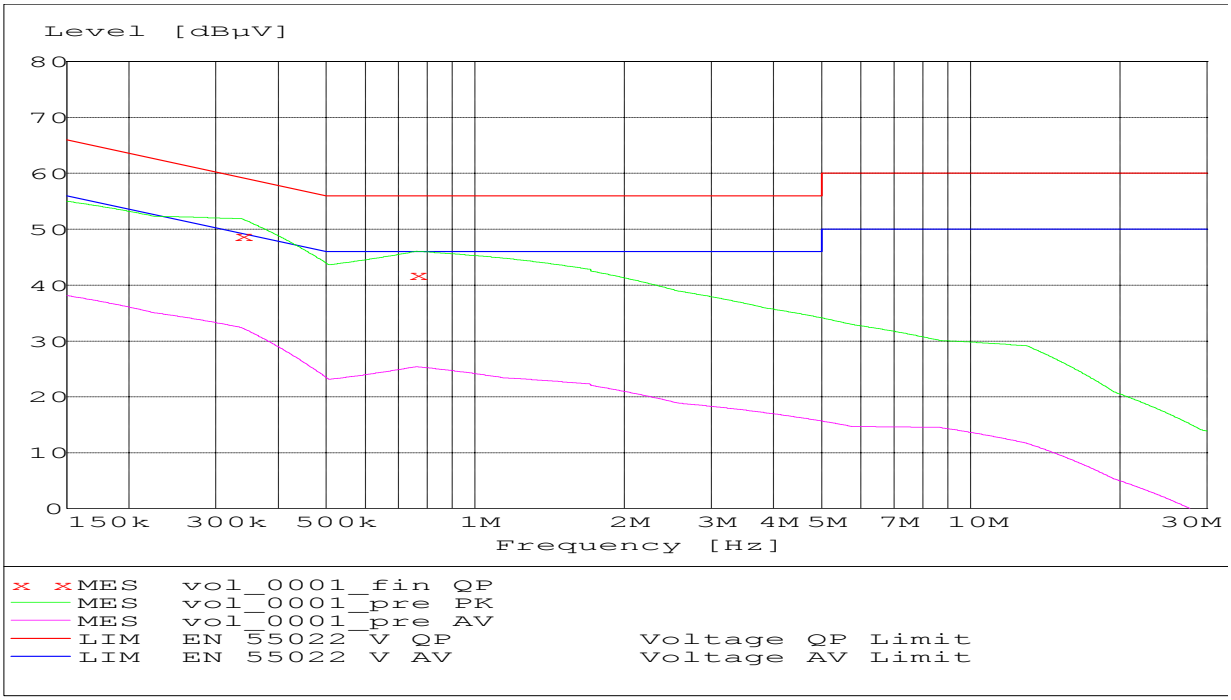


CONDUCTED EMISSIONS **§ 15.107/207**

Measured with AC/DC power adapter plugged in LISN

(Limit: CISPR 22 class-B)

Note: This measurement is carried out according to guidelines of FCC 02-157



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

Limit

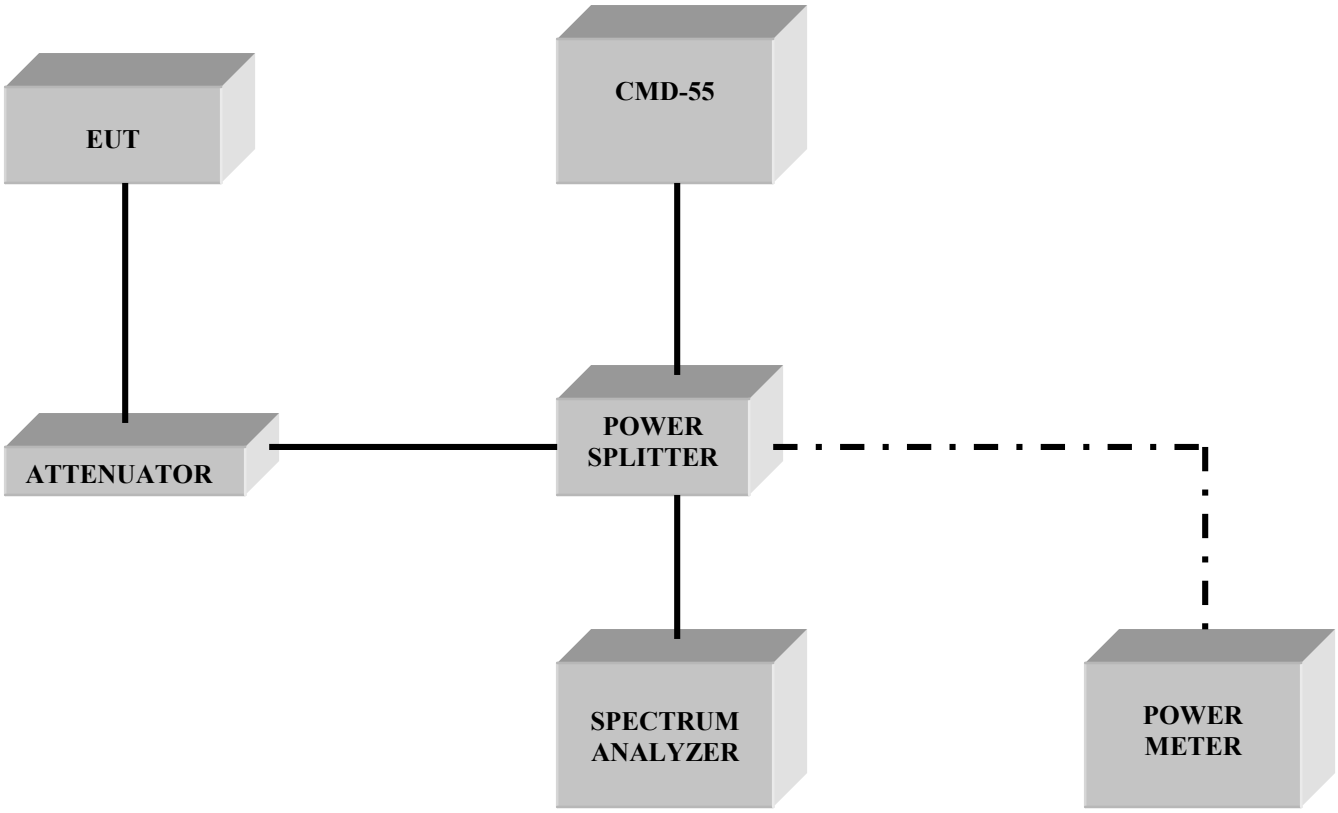
0.45 to 30 MHz	250 µV / 47.96 dBµV

ANALYZER SETTINGS: RBW = 10KHz VBW = 10KHz

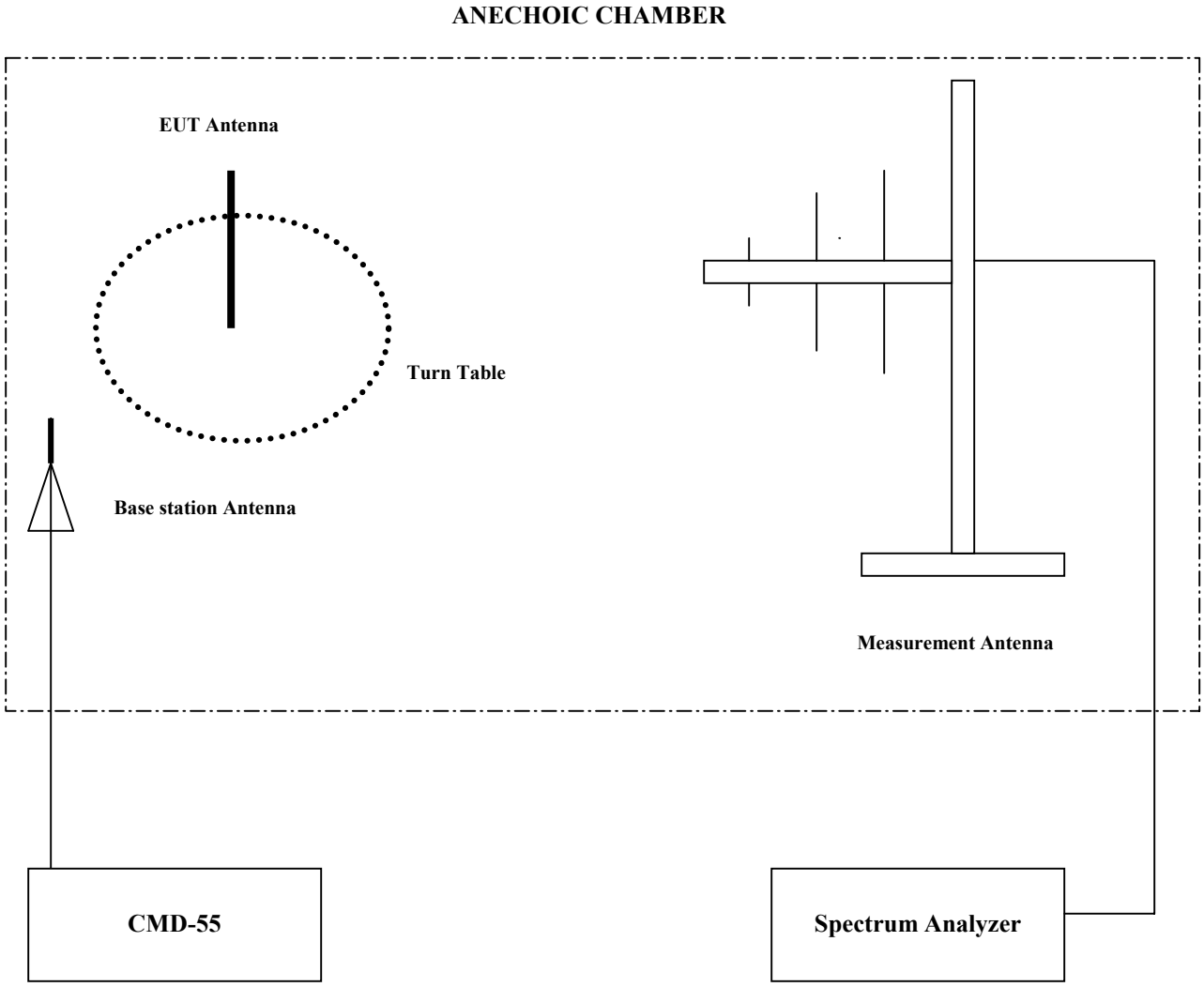
TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

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 Amlifier	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



Test Report

Conducted Output Power GSM 900, GSM 1800 and GSM 1900

SIEMENS S55

Report no: EMC_S55_1
Issue date: June 24, 2002

Test Site

SIEMENS ICM MP PO2 KLF 6
Information and Communication Mobile
Südstraße 9
D-47475 Kamp-Lintfort
Federal Republic of Germany

Tel.: +49-2842-95-4483
Fax.: +49-2842-95-4717

Test Engineer:

Thomas Jakobi

Supervisor:

Wolfgang Kösters
RF Manager EMC and Antenna

Contents:

1 Objective and Method

FCC approval for mobile phones requires reporting output power at RF output terminal pursuant to title 47 CFR part 2.1046. SIEMENS devices feature a special 50 Ohm RF connector suitable for such measurement. Using a special adapter and connecting to an appropriate load in terms of the input port of measurement equipment used, we report hereby the values for highest power setting.

2 Results

2.1 GSM 900 Band

Device	Average Power during burst at connector		
	ARFCN 975 880.2 MHz	ARFCN 38 897.6 MHz	ARFCN 124 914.8 MHz
Siemens S55, “FCC Sample 1” IMEI: 004999.51.116375.9	+31.9 dBm	+31.8 dBm	+31.6 dBm
Siemens S55, “FCC Sample 2” IMEI: 004999.51.116376.7	+32.0 dBm	+31.8 dBm	+31.6 dBm
Siemens S55, “SAR Sample 3” IMEI: 004999.51.116378.3	+31.9 dBm	+31.7 dBm	+31.5 dBm
Siemens S55, “SAR Sample 4” IMEI: 004999.51.116384.1	+31.8 dBm	+31.6 dBm	+31.5 dBm

Tab. 1: Results of power measurements at connector for Siemens S55.

2.2 GSM 1800 Band

Device	Average Power during burst at connector		
	ARFCN 512 1710.2 MHz	ARFCN 698 1747.4 MHz	ARFCN 885 1784.8 MHz
Siemens S55, “FCC Sample 1” IMEI: 004999.51.116375.9	+30.0 dBm	+29.8 dBm	+29.3 dBm
Siemens S55, “FCC Sample 2” IMEI: 004999.51.116376.7	+29.8 dBm	+29.6 dBm	+29.1 dBm
Siemens S55, “SAR Sample 3” IMEI: 004999.51.116378.3	+29.8 dBm	+29.6 dBm	+29.1 dBm
Siemens S55, “SAR Sample 4” IMEI: 004999.51.116384.1	+29.8 dBm	+29.6 dBm	+29.1 dBm

Tab. 2: Results of power measurements at connector for Siemens S55

2.3 GSM 1900 Band

Device	Average Power during burst at connector		
	ARFCN 512 1850.2 MHz	**ARFCN 661 1880.0 MHz**	**ARFCN 810 1909.8 MHz**
Siemens S55, “FCC Sample 1” IMEI: 004999.51.116375.9	+29.2 dBm	+29.4 dBm	+29.5 dBm
Siemens S55, “FCC Sample 2” IMEI: 004999.51.116376.7	+29.1 dBm	+29.2 dBm	+29.3 dBm
Siemens S55, “SAR Sample 3” IMEI: 004999.51.116378.3	+29.1 dBm	+29.2 dBm	+29.3 dBm
Siemens S55, “SAR Sample 4” IMEI: 004999.51.116384.1	+29.0 dBm	+29.2 dBm	+29.3 dBm

Tab. 3: Results of power measurements at connector for Siemens S55

3 Minutes of Test

3.1 Description of Device under Test

Mobile Phone: Siemens S55
Frequency range GSM 900: 880 - 960 MHz
Frequency range GSM 1800: 1710 - 1880 MHz
Frequency range GSM 1900: 1850 - 1990 MHz
Siemens part number: S30880-S5720-*
FCC ID: PWX-S55

3.2 Measurement Set Up

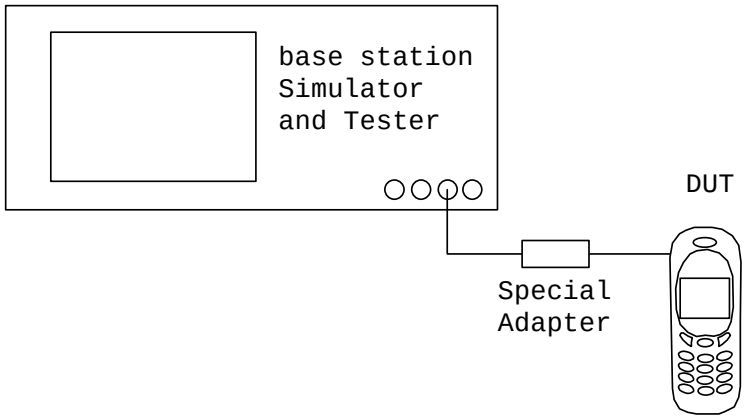


Fig. 1: Block diagram of set up for conducted power measurement.

Fig. 2: Set up for conducted power measurement.

4 Calibration Certificate

GT055023

ROHDE&SCHWARZ
Messgerätebau GmbH

Kalibrierschein / *Calibration Certificate*

Nummer / *Number* 20-57494

Gegenstand *Item*	UNIVERSAL RADIO COMMUNICATION TESTER
Hersteller *Manufacturer*	ROHDE & SCHWARZ
Typ *Type*	CMU200
Sach-Nr. *Stock-No.*	1100.0008.02
Serien-Nr. *Serial-No.*	837586/039
Auftraggeber *Customer*	SIEMENS AG ICM CD DP B ERP SUEDSTRASSE 9 47475 KAMP-LINTFORT
Bestellung Nr. *Order No.*	03.04.00 NR. 4300068991/K28
Ort u. Datum d. Kalibrierung *Place and date of calibration*	Memmingen, 2000-11-20
Umfang der Kalibrierung *Scope of calibration*	Standard Calibration
Eingangsprüfung *Performance on receipt*	
Kalibrierergebnis *Result of calibration*	Measurement results within specifications
Umfang des Kalibrierscheins *Extent of the certificate*	3 pages 53 pages test report

Dieser Kalibrierschein dokumentiert, daß der genannte Gegenstand nach festgelegten Vorgaben geprüft und gemessen wurde. Die Meßwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 95 % im zugeordneten Werteintervall (Erweiterte Meßunsicherheit mit *k = 2*).
Die Kalibrierung erfolgte mit Meßmitteln und Normalen, die direkt oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken rückgeführt sind auf Normale der PTB/DKD oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der R&S-Laboratorien.
Grundsätze und Verfahren der Kalibrierung entsprechen ISO Guide 25. Das Bestätigungssystem für die verwendeten Meßmittel entspricht DIN ISO 10012-1.
Das angewandte Qualitätsmanagement-System ist zertifiziert nach DIN EN ISO 9001.
Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Signifizierungen sind ungültig.
Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

This calibration certificate documents, that the named item is tested and measured against defined specifications.
Measurement results are located usually in the corresponding interval with a probability of approx. 95 % (coverage factor k = 2).
Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national/international standards, which realize the physical units of measurement according to the International System of Units (SI). In all cases where no national standards are available, measurements are referenced to standards of the R&S laboratories.
Principles and methods of calibration correspond with ISO Guide 25. The metrological confirmation system for the measuring equipment used is in compliance with DIN ISO 10012-1. The applied quality system is certified to DIN EN ISO 9001.
This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid.
The user is obliged to have the item recalibrated at appropriate intervals.

ROHDE&SCHWARZ
RefNo. 20-57494
Cal. 2000-11-20 Customized Due Date

Certified Quality System
ISO 9001
DQS REG. NO 1954-04

Ausstellungsdatum *Date of issue*	**Laborleitung** *Head of laboratory*	**Bearbeiter** *Person responsible*
2000-11-21	Steigmüller	Rampp

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Telefon national: 08331/108-0; international: 0049 8331/108-0; Fax: 08331/108-124
Geschäftsführer: Dipl.-Ing. Dipl.-Wirtsch.-Ing. Friedrich Schwarz · Aufsichtsratsvorsitzender: Ing. (grad) Heinz Ewald
Sitz der Gesellschaft: München Registereintrag: Amtsgericht München HRB 1059

vers9811/MB0010

Pr. NS 4007.0406