



# FCC Test Report

Test report no.: EMC\_631FCC24\_2004\_PV-100

**FCC Part 24 / RSS 133**

**Model: PV-100**

**FCC ID: P5J-ONISH**

**IC ID: 4274A-WAGP**



Accredited according to **ISO/IEC 17025**



**FCC listed # 101450**

**IC recognized # 3925**

## **CETECOM Inc.**

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| <b>1</b>   | <b>General information</b>     |
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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** : Danger Inc.  
**Street** : 3101 Park Blvd  
**City / Zip Code** : Palo Alto, CA 94306  
**Country** : USA  
**Contact** : Gavin O'Duffy  
**Telephone** : +1 650 289 6633  
**Tele-fax** : +1 650 289 5001  
**e-mail** : gavin@danger.com

**1.4 Application details**

Date of receipt test item : 2004-03-09  
Date of test : 2004-03-09

**1.5 Test item**

**Manufacturer** : Sharp Corporation  
**Street** : 492 Minosho-Cho, Yamatokoriyama-Shi  
**City / Zip Code** : Nara, 639-1189  
**Country** : Japan  
**Marketing Name** : Hiptop / Sidekick  
**Model No.** : PV-100  
**Description** : **GSM / GPRS Wireless Voice & Data Communication Device**  
**FCC-ID** : **P5J-ONISH**  
**IC-ID** : **4274A-WAGP**  
**Additional information**  
**Frequency** : 1850.2MHz – 1909.8MHz for PCS 1900  
**Type of modulation** : GMSK  
**Number of channels** : 299 for PCS-1900  
**Antenna** : Integral  
**Power supply** : 4.2 VDC Nominal voltage  
**Output power** : 30.19dBm (1.045W) max. EIRP measured in PCS-1900  
**Extreme voltage limits** : 3.3VDC to 4.5VDC  
**Extreme temp. Tolerance** : Lower: 0°C Upper: +50°C

**1.6 Test standards**

FCC Part 22,24 / RSS133 r1

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

**The EUT (PV-100) carries pre-certified Enfora GSM module model# GSM0107 with FCC ID: MIVGSM0107 & IC ID: 4160A-GSM0107**

**This test report covers full radiated testing as per FCC 24 on EUT with GSM module. All conducted measurements are covered under test report# 3L0345RUS1**

**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:**

2004-03-31 EMC & Radio Siegfried Lehmann  
(Technical Manager)



Date

Section

Name

Signature

**Responsible for test report and project leader:**

2004-03-31 EMC & Radio Harpreet Sidhu (EMC Engineer)



Date

Section

Name

Signature

## **2.2 Test report**

### **TEST REPORT**

**Test report no.: EMC\_631FCC24\_2004\_PV-100**  
**Model: PV-100**

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**TEST REPORT REFERENCE**

| <b>PARAMETER TO BE MEASURED</b>                      | <b>PARAGRAPH</b>                 | <b>PAGE</b> |
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| <b>POWER OUTPUT</b>                                  | <b>§22.913(a) / § 24.232 (b)</b> | <b>7</b>    |
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**POWER OUTPUT****§ 22.913(a) / § 24.232 (b)****Summary:**

During the process of testing, the EUT was controlled via Rhode & Schwarz Universal Radio Communication tester (CMU 200) to ensure max. Power transmission and proper modulation.

This paragraph contains EIRP measurements for the EUT.

**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)

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) for PCS-1900

**EIRP (PCS-1900)****§24.232(b)****Limits:**

| <b>Power Control Level</b> | <b>Burst Peak EIRP</b> |
|----------------------------|------------------------|
| <b>0</b>                   | <b>≤33dBm (1W)</b>     |

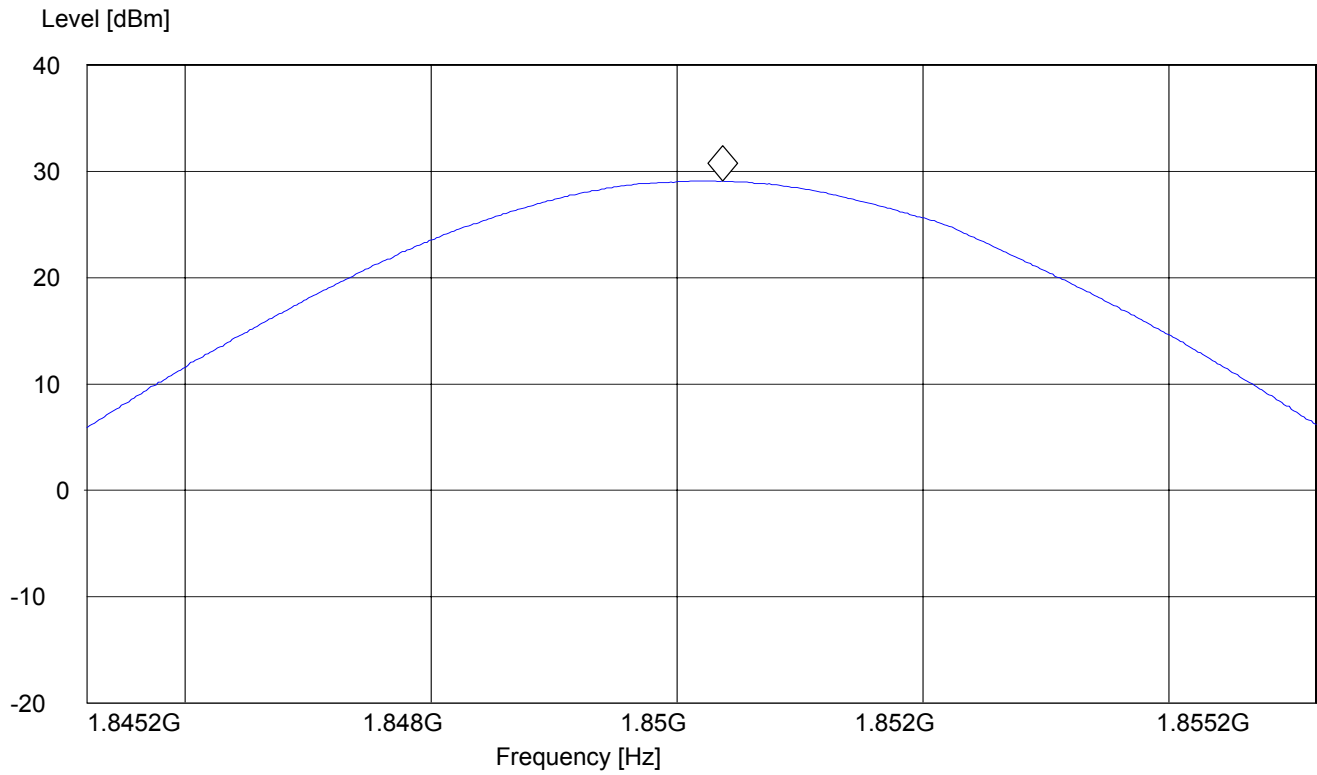
**EIRP**

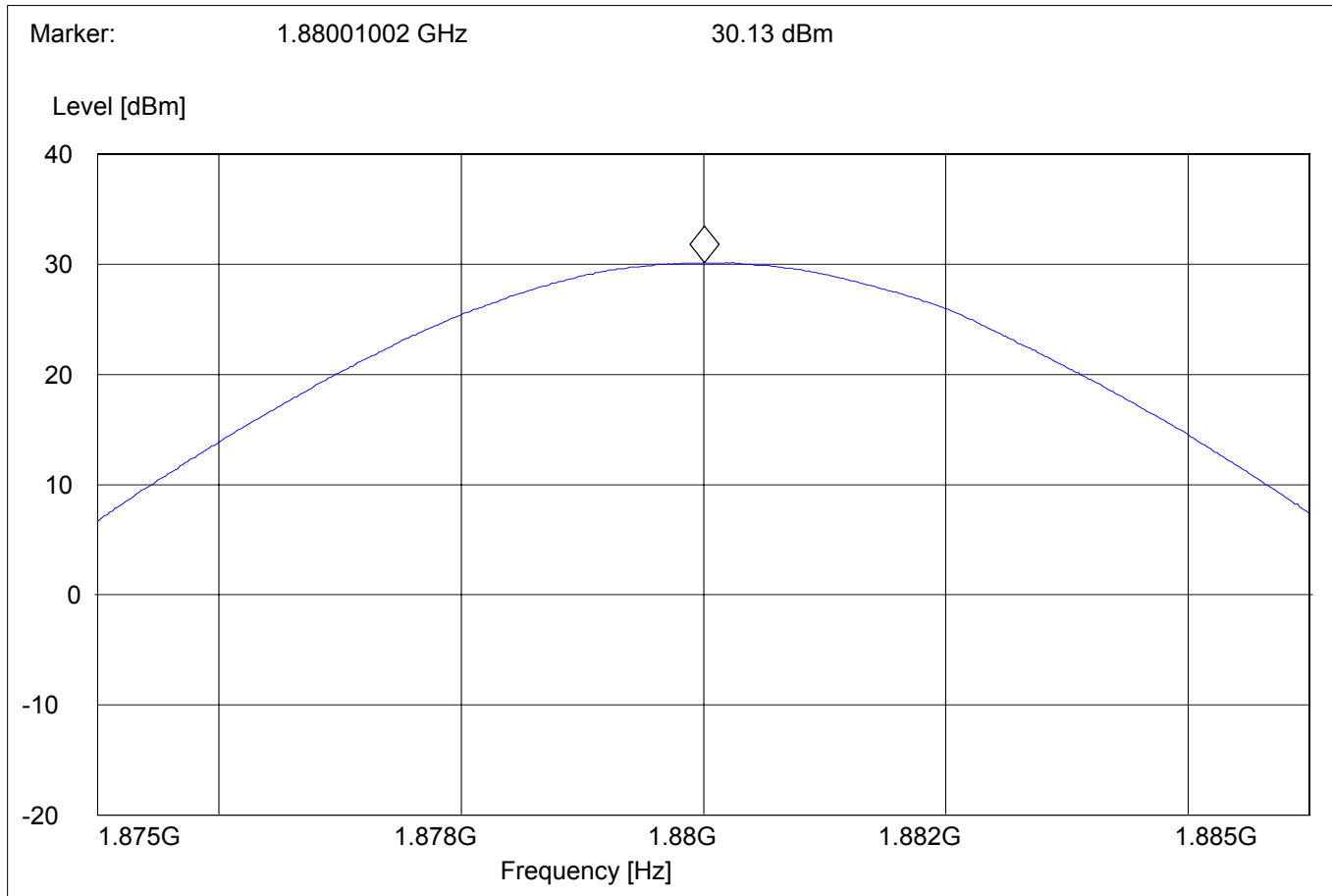
| <b>Frequency<br/>(MHz)</b>     | <b>Power Control Level</b> | <b>Burst Peak<br/>(dBm)</b> |
|--------------------------------|----------------------------|-----------------------------|
|                                |                            | <b>EIRP</b>                 |
| <b>1850.2</b>                  | <b>0</b>                   | <b>29.08</b>                |
| <b>1880.0</b>                  | <b>0</b>                   | <b>30.13</b>                |
| <b>1909.8</b>                  | <b>0</b>                   | <b>30.19</b>                |
| <b>Measurement uncertainty</b> | <b>±0.5 dB</b>             |                             |

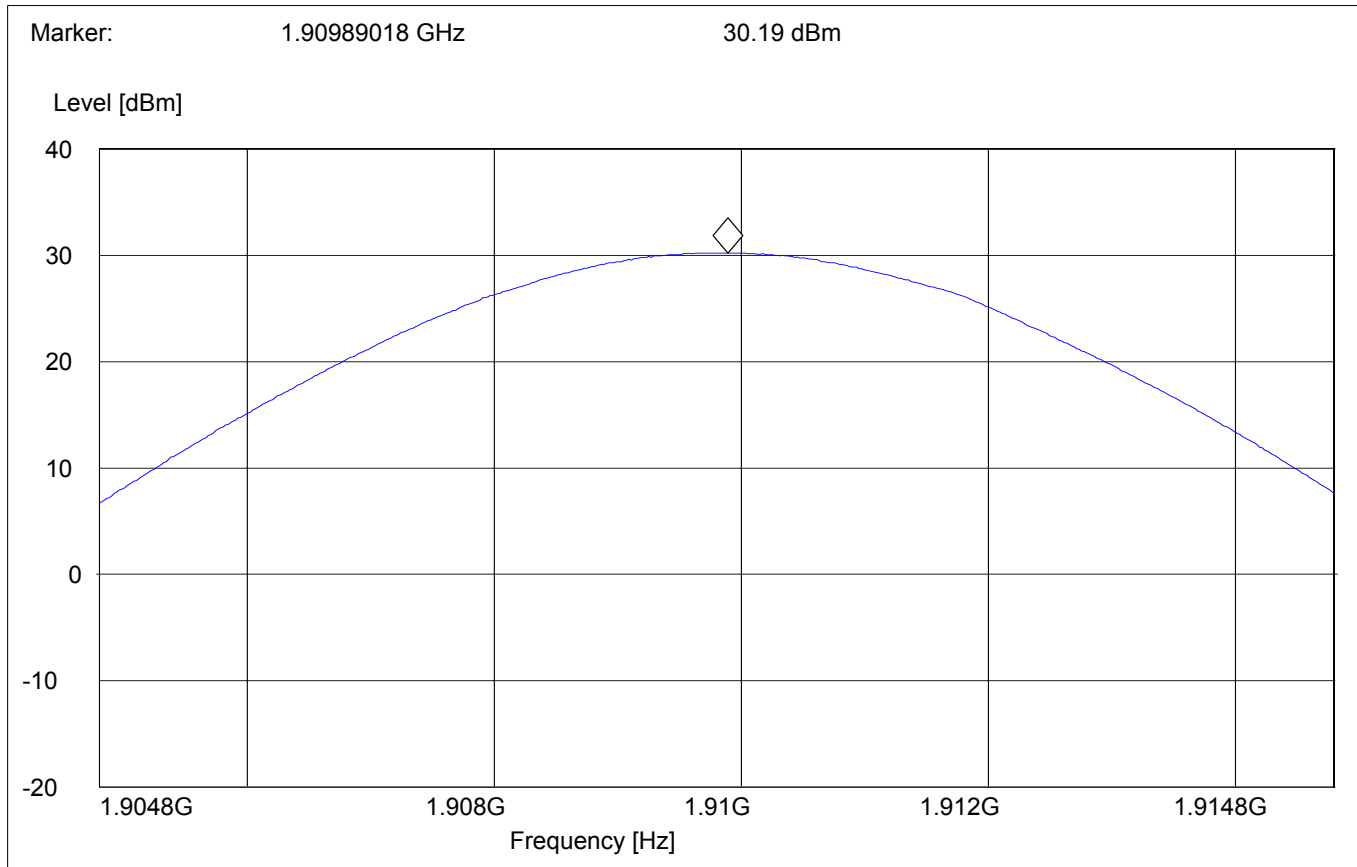
ANALYZER SETTINGS: RBW = VBW = 3MHz

**EIRP (PCS-1900)**  
**CHANNEL 512****§24.232(b)**

Marker: 1.850370341 GHz 29.08 dBm



**EIRP (PCS-1900)**  
**CHANNEL 661****§24.232(b)**

**EIRP (PCS-1900)**  
**CHANNEL 810****§24.232(b)**

**EMISSION LIMITS TRANSMITTER****§2.1051 / §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 for PCS-1900. 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 PCS-1900 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 wave guide 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 EIRP 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 PCS-1900 band. 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 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.

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

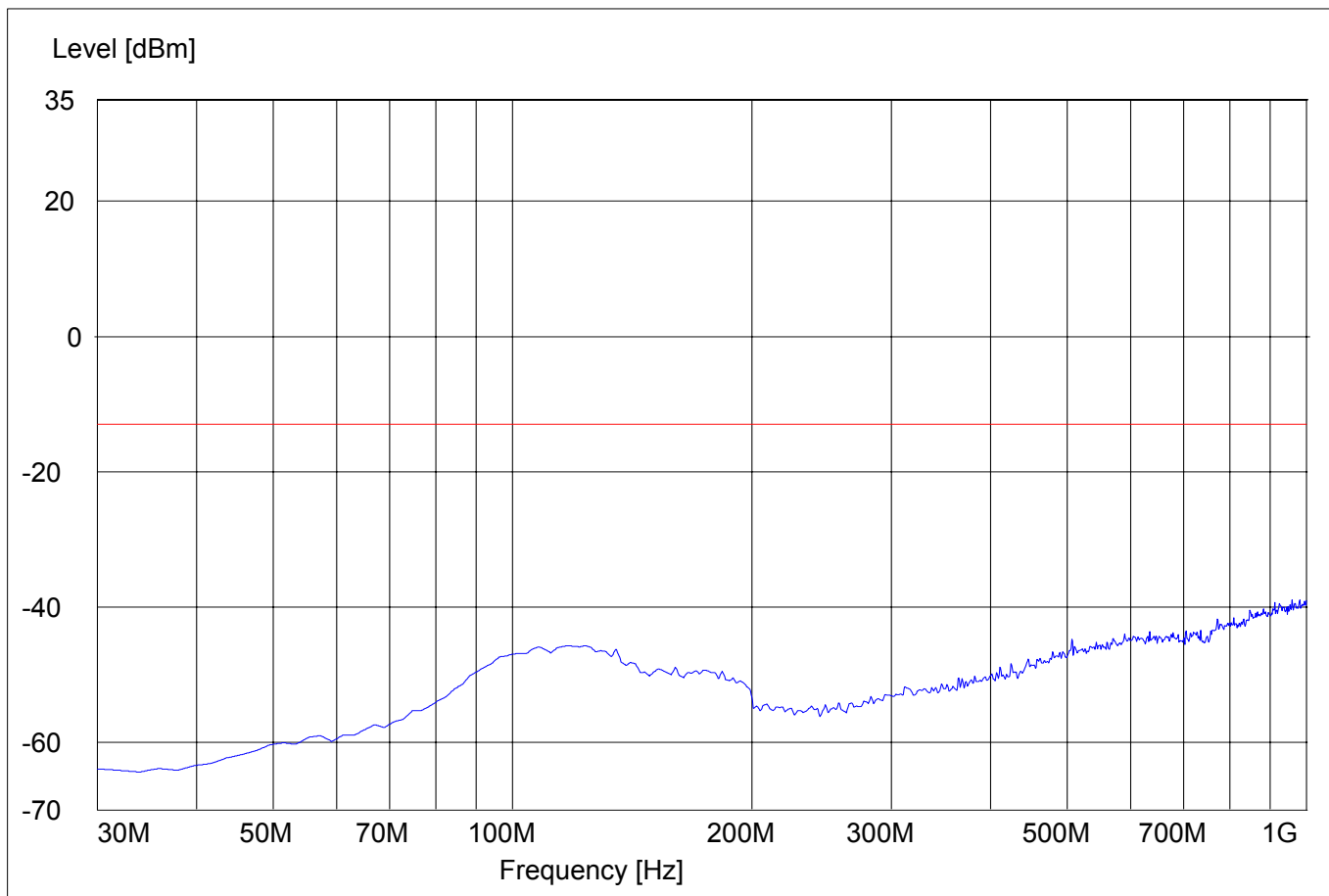
| Harmonic | Tx ch-512<br>Freq.(MHz) | Level<br>(dBm) | Tx ch-661<br>Freq. (MHz) | Level<br>(dBm) | Tx ch-810<br>Freq. (MHz) | Level<br>(dBm) |
|----------|-------------------------|----------------|--------------------------|----------------|--------------------------|----------------|
| 2        | 3700.4                  | -29.02         | 3760                     | -25.91         | 3819.6                   | -22.53         |
| 3        | 5550.6                  | -36.86         | 5640                     | -41.73         | 5729.4                   | -45.30         |
| 4        | 7400.8                  | -17.37         | 7520                     | -17.43         | 7639.2                   | -26.53         |
| 5        | 9251                    | -20.91         | 9400                     | -21.25         | 9549                     | -32.53         |
| 6        | 11101.2                 | -19.09         | 11280                    | -14.61         | 11458.8                  | -20.66         |
| 7        | 12951.4                 | -26.14         | 13160                    | -25.11         | 13368.6                  | -26.67         |
| 8        | 14801.6                 | -38.93         | 15040                    | -36.27         | 15278.4                  | -38.64         |
| 9        | 16651.8                 | -32.16         | 16920                    | -24.14         | 17188.2                  | -32.81         |
| 10       | 18502                   | nf             | 18800                    | nf             | 19098                    | nf             |

**RADIATED SPURIOUS EMISSIONS****Tx @ 1850.2MHz: 30MHz - 1GHz**

Spurious emission limit -13dBm

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

| <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>  |                |
| 30MHz            | 1GHz             | Max Peak        | Coupled      | 1 MHz          |

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

# RADIATED SPURIOUS EMISSIONS

**Tx @ 1850.2MHz: 30MHz - 1GHz**

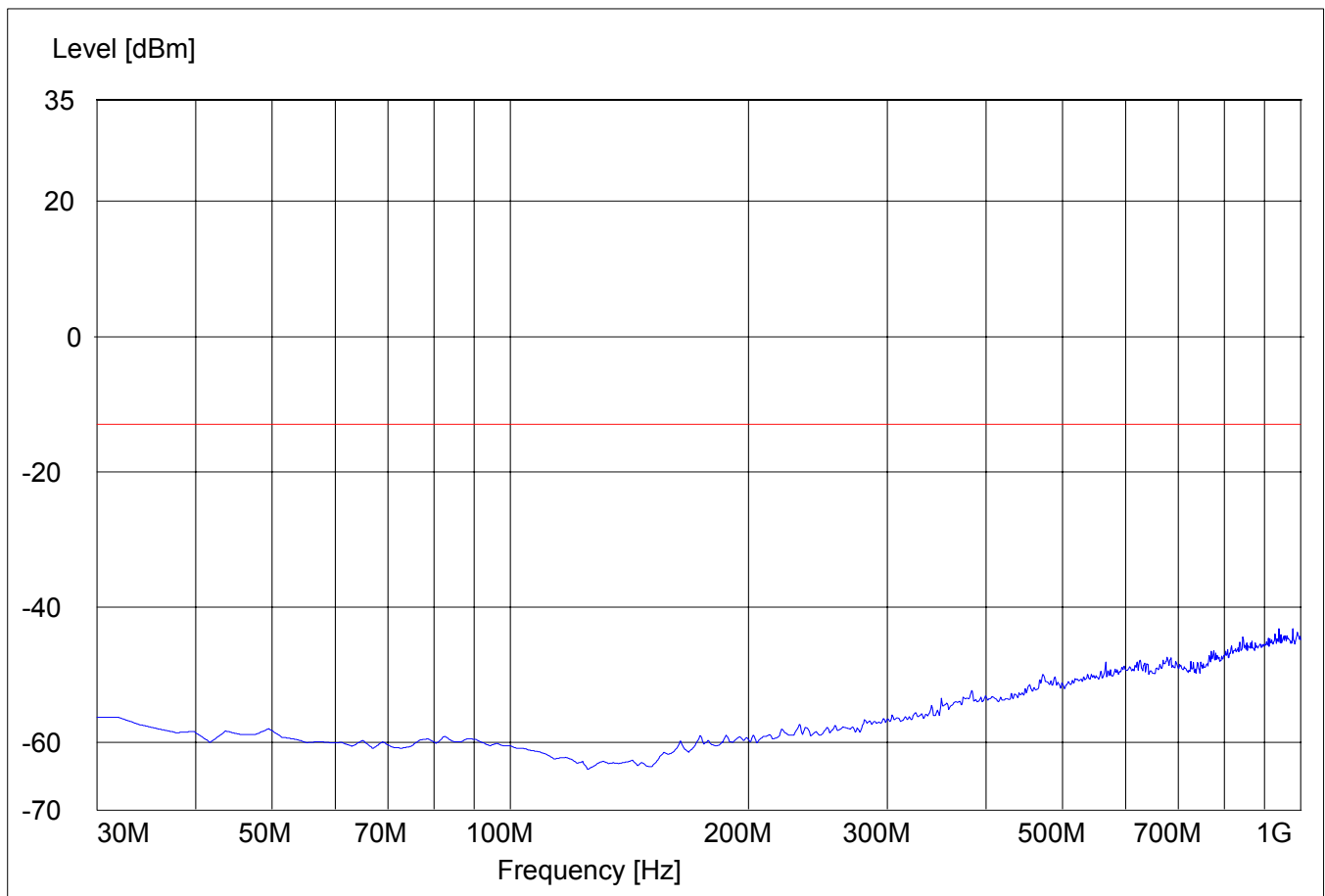
Spurious emission limit -13dBm

**Antenna: horizontal**

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

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

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



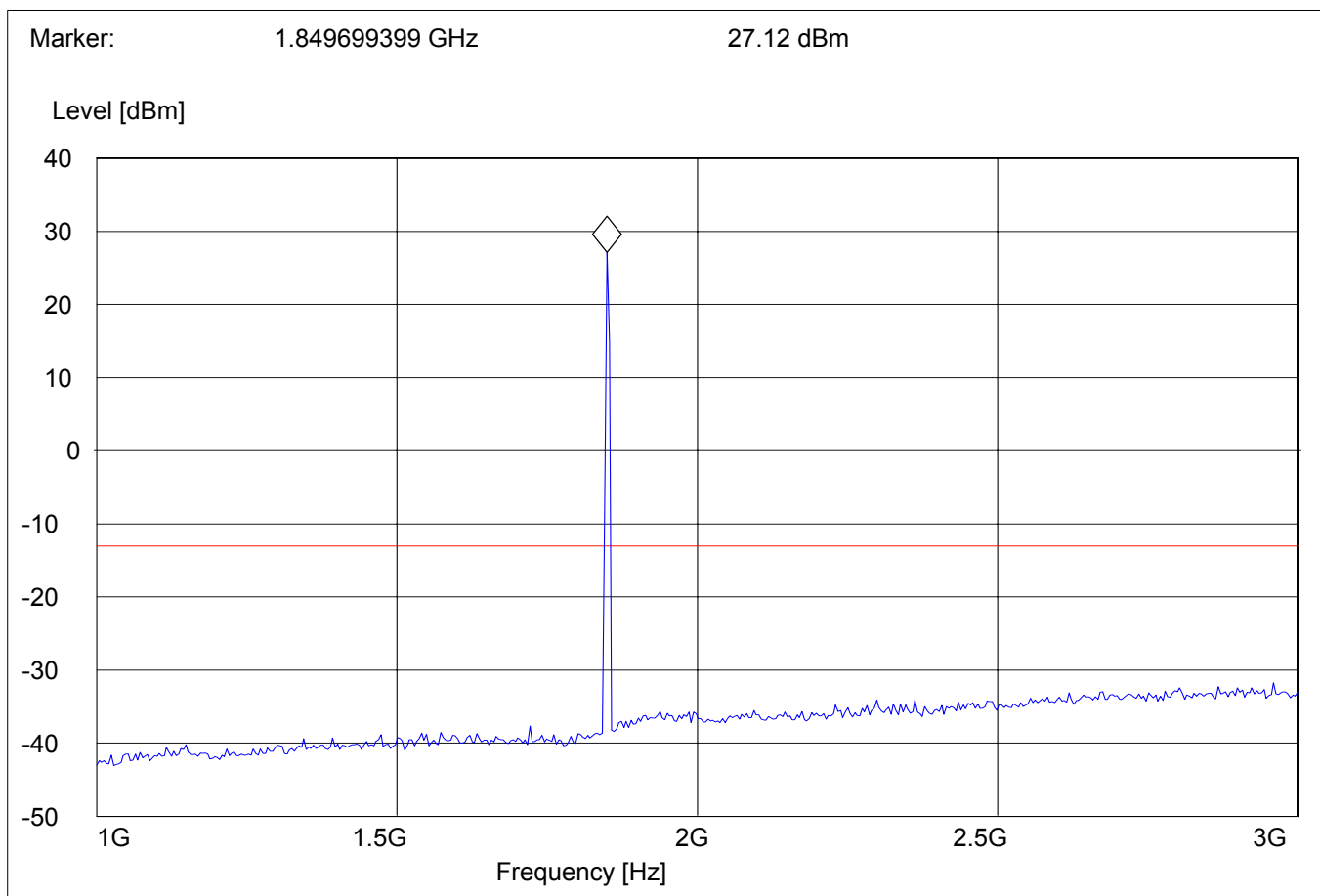
**RADIATED SPURIOUS EMISSIONS****Tx @ 1850.2MHz: 1GHz – 3GHz**

Spurious emission limit -13dBm

***SWEEP TABLE: "FCC24 Spuri 1-3G"***

| <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>  |                |
| 1GHz             | 3GHz             | Max Peak        | Coupled      | 1 MHz          |

Note: The peak above the limit line is the carrier freq. at ch-512.

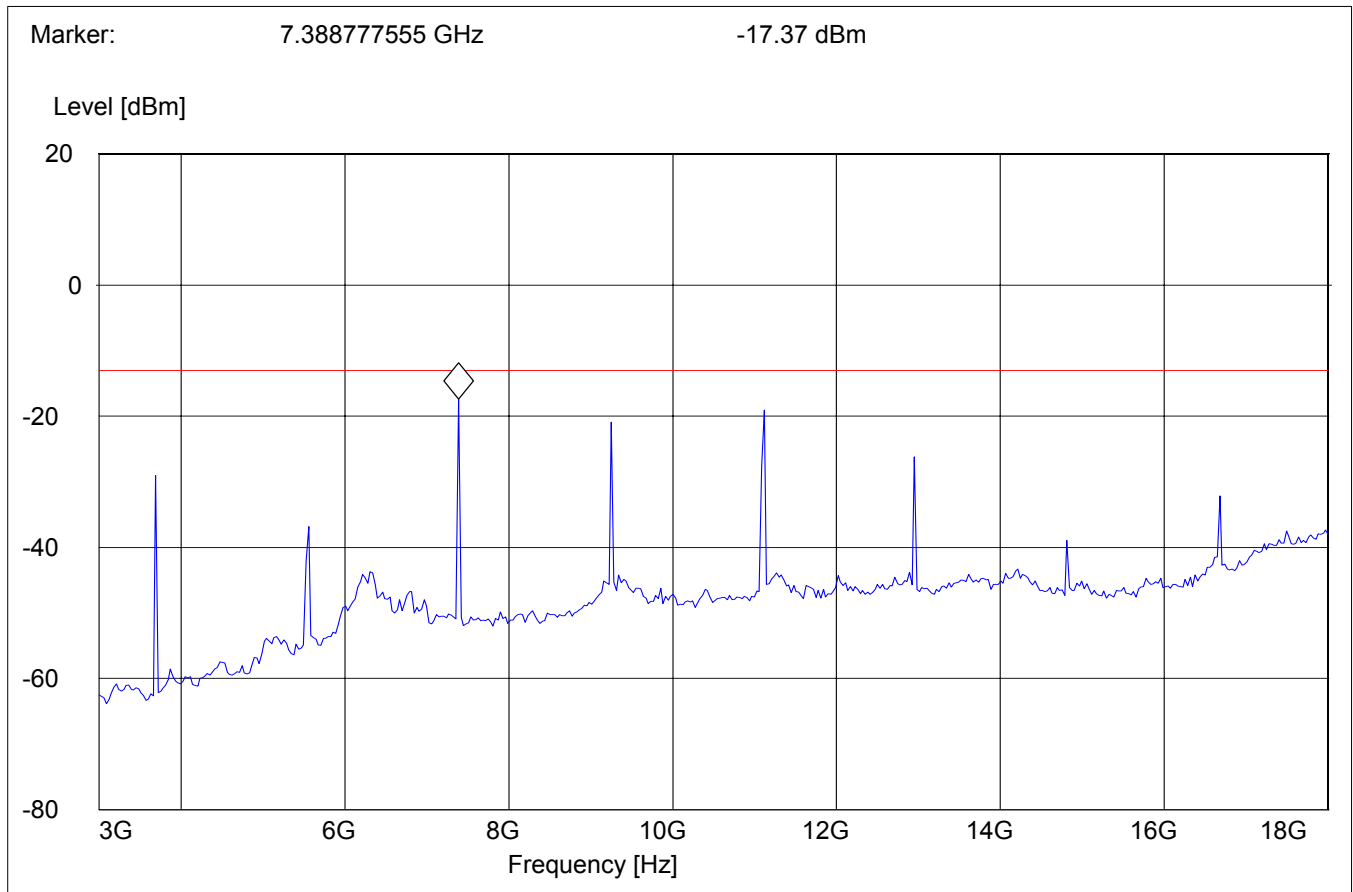


**RADIATED SPURIOUS EMISSIONS****Tx @ 1850.2MHz: 3GHz – 18GHz**

Spurious emission limit -13dBm

***SWEEP TABLE: "FCC24 Spuri 3-18G"***

| <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>  |                |
| 3GHz             | 18GHz            | Max Peak        | Coupled      | 1 MHz          |



# RADIATED SPURIOUS EMISSIONS

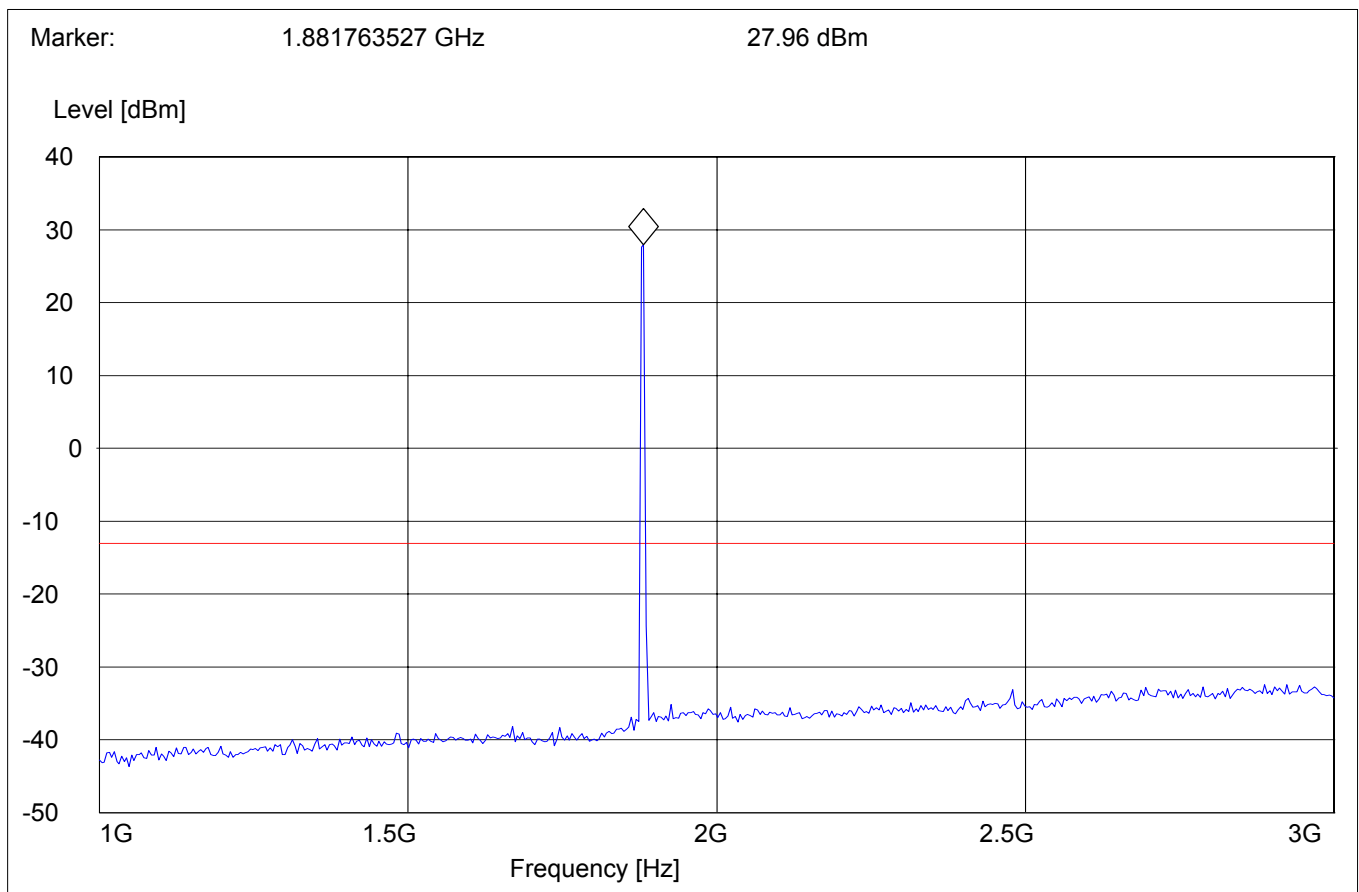
**Tx @ 1880MHz: 1GHz – 3GHz**

Spurious emission limit –13dBm

## SWEEP TABLE: "FCC24 Spuri 1-3G"

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

Note: The peak above the limit line is the carrier freq. at ch-661.



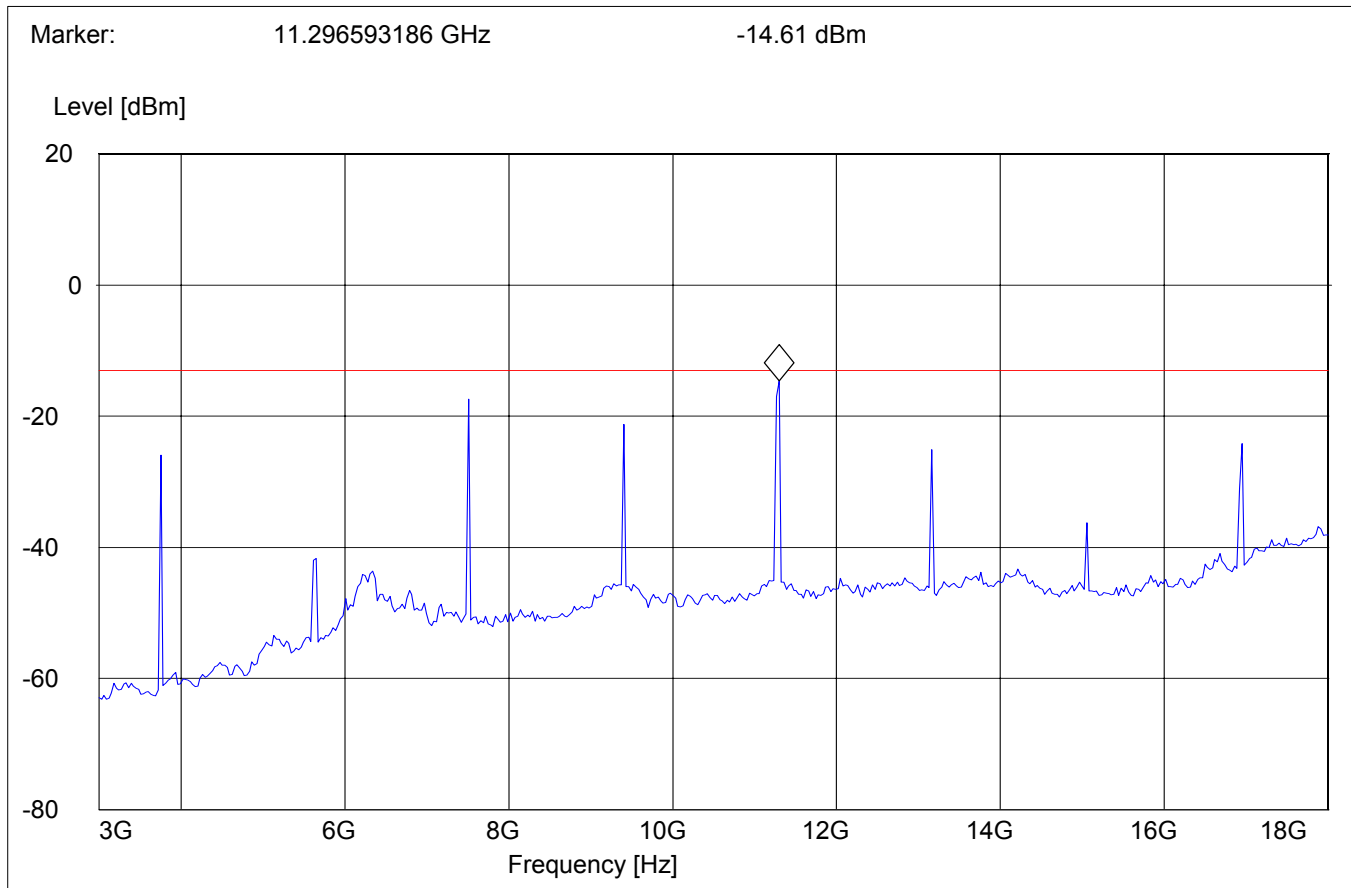
## RADIATED SPURIOUS EMISSIONS

**Tx @ 1880MHz: 3GHz – 18GHz**

Spurious emission limit –13dBm

### SWEEP TABLE: "FCC24 Spuri 3-18G"

| Start     | Stop      | Detector | Meas.   | RBW/VBW |
|-----------|-----------|----------|---------|---------|
| Frequency | Frequency |          | Time    |         |
| 3GHz      | 18GHz     | Max Peak | Coupled | 1 MHz   |



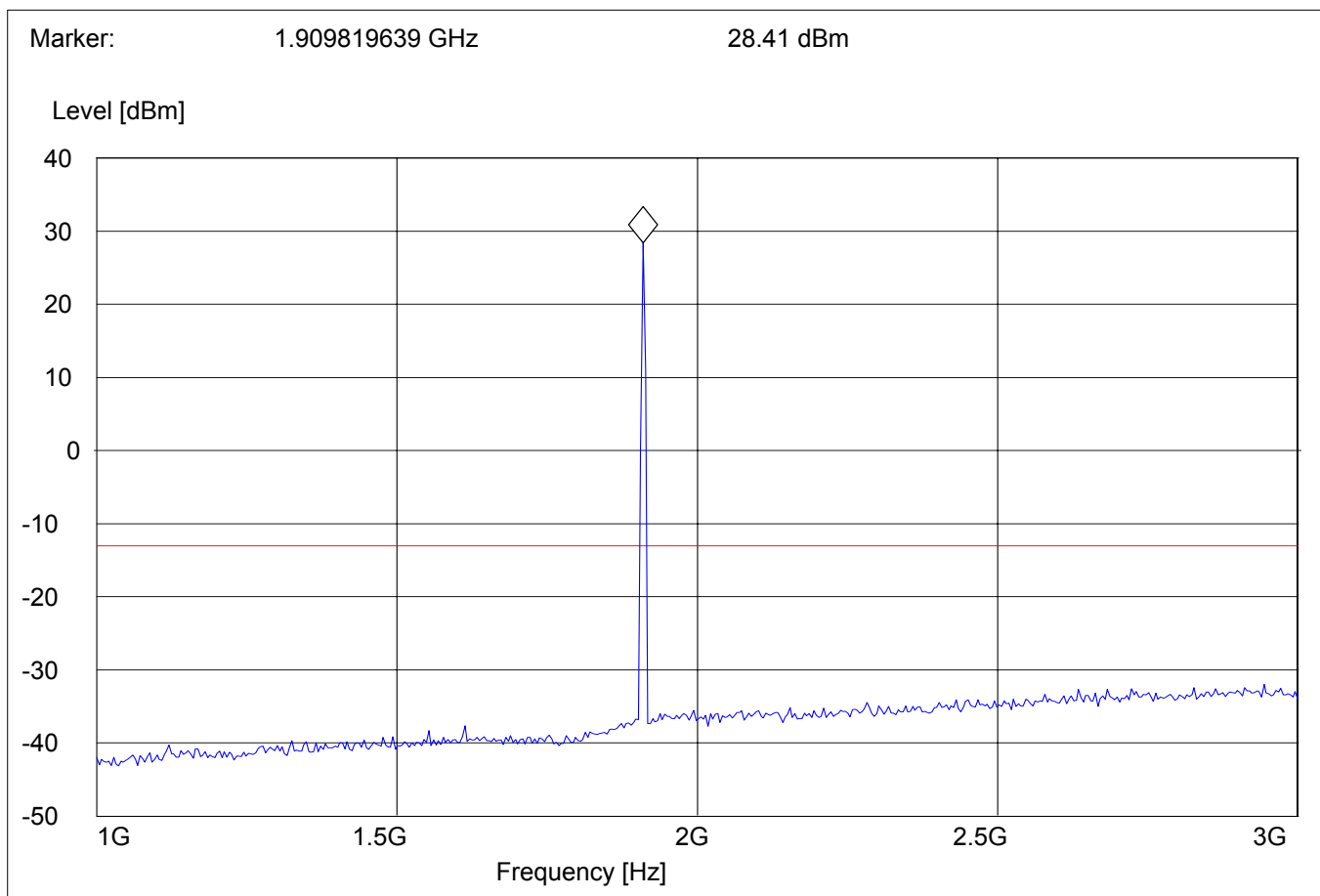
**RADIATED SPURIOUS EMISSIONS****Tx @ 1909.8MHz: 1GHz – 3GHz**

Spurious emission limit –13dBm

***SWEEP TABLE: "FCC24 Spuri 1-3G"***

| <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>  |                |
| 1GHz             | 3GHz             | Max Peak        | Coupled      | 1 MHz          |

Note: The peak above the limit line is the carrier freq. at ch-810.



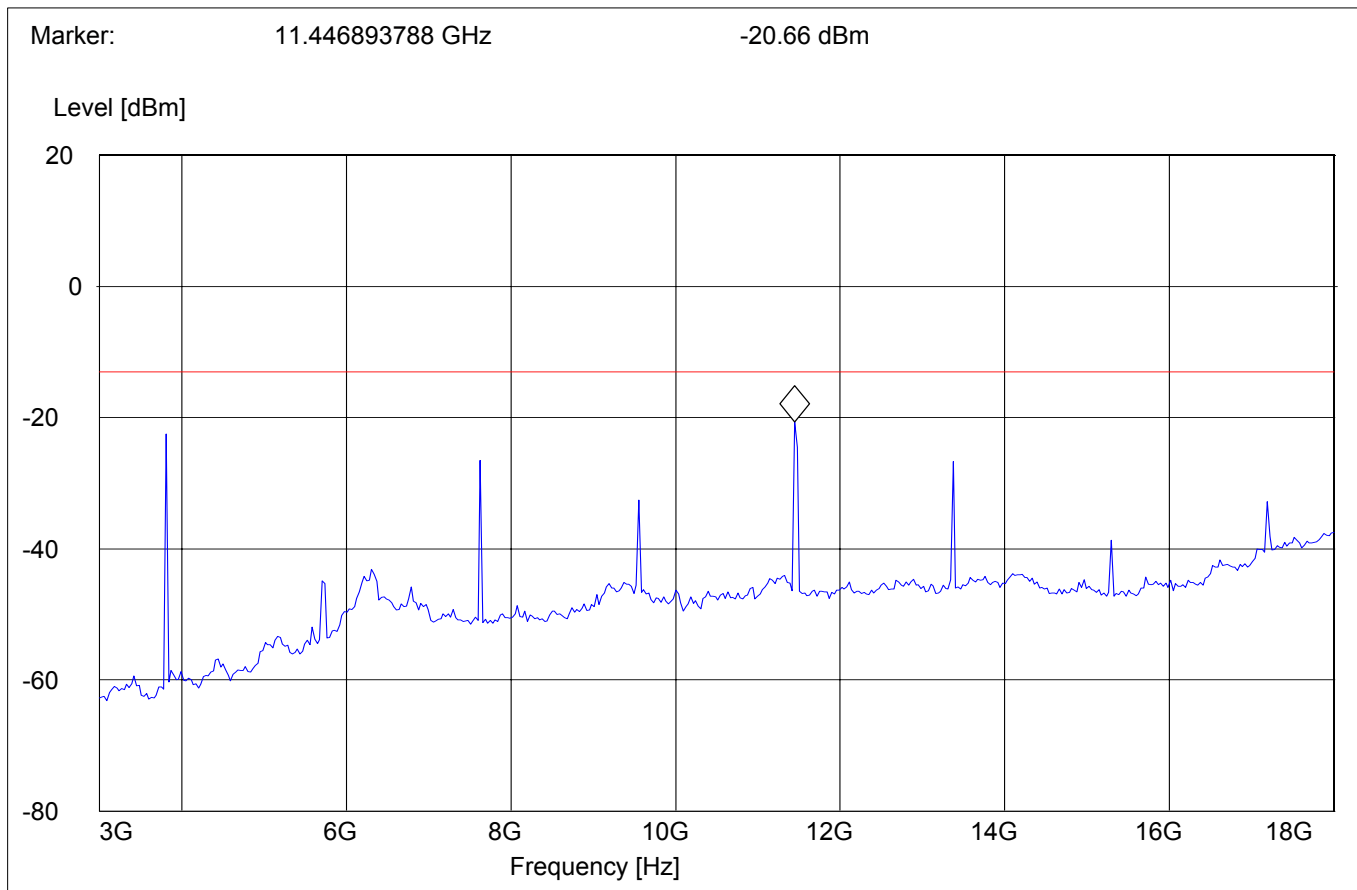
## RADIATED SPURIOUS EMISSIONS

**Tx @ 1909.8MHz: 3GHz – 18GHz**

Spurious emission limit –13dBm

### SWEEP TABLE: "FCC24 Spuri 3-18G"

| Start<br>Frequency | Stop<br>Frequency | Detector | Meas.<br>Time | RBW/VBW |
|--------------------|-------------------|----------|---------------|---------|
| 3GHz               | 18GHz             | Max Peak | Coupled       | 1 MHz   |



## RADIATED SPURIOUS EMISSIONS

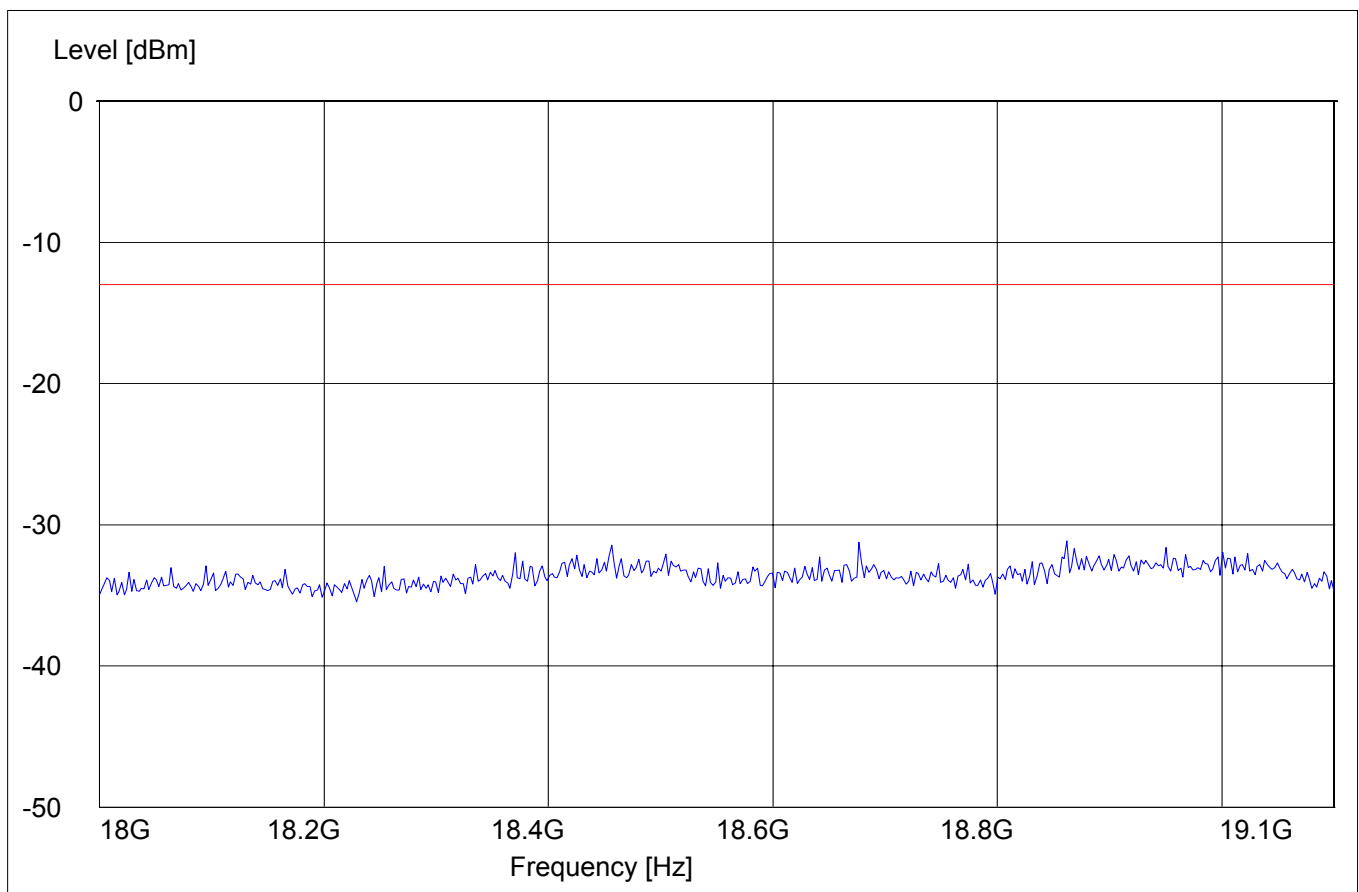
### 18GHz – 19.1GHz

Spurious emission limit –13dBm

#### ***SWEEP TABLE: "FCC24 spuri 18-19.1G"***

| <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>  |                |
| 18GHz            | 19.1GHz          | Max Peak        | Coupled      | 1 MHz          |

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

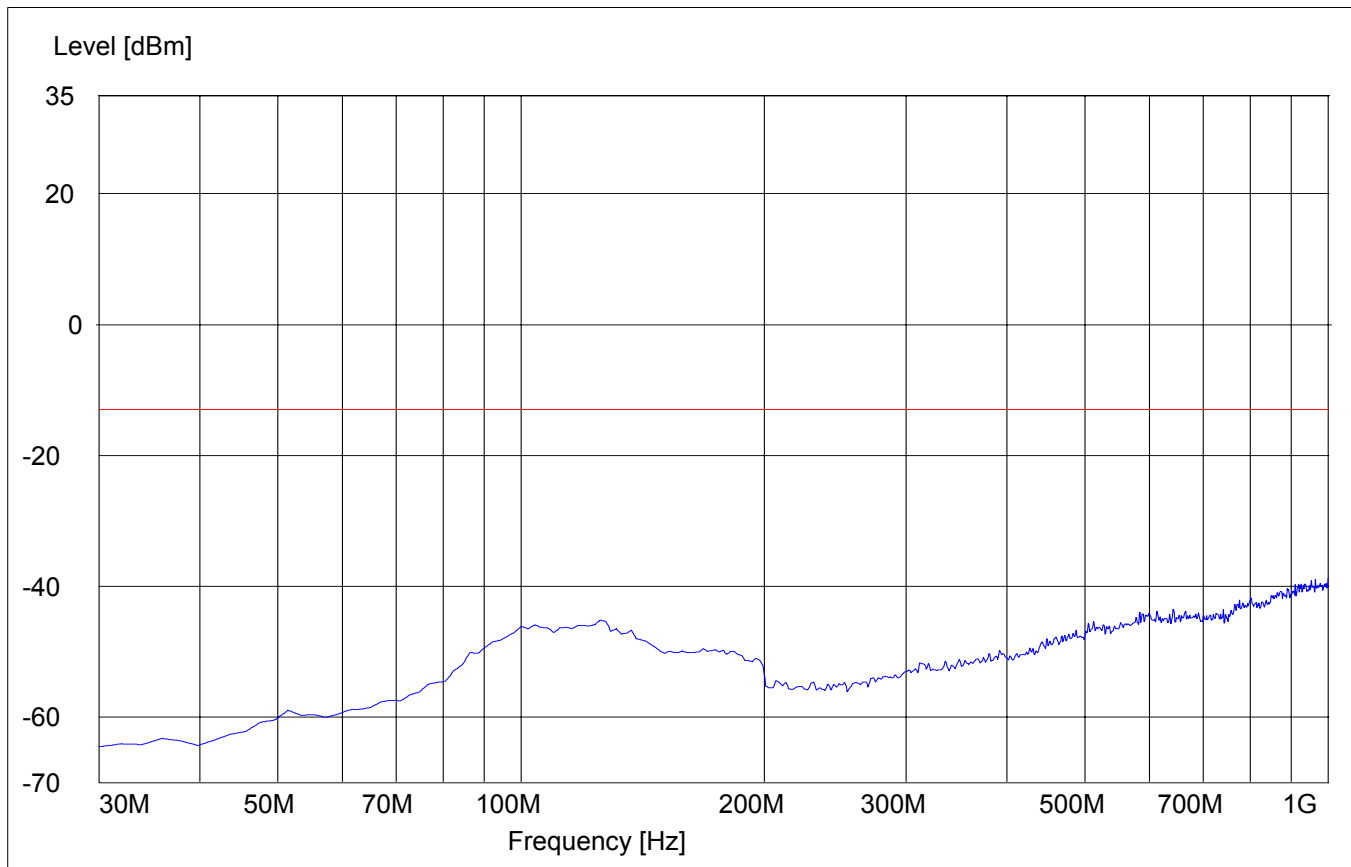


**RADIATED SPURIOUS EMISSIONS (IDLE MODE – GSM 1900)****Antenna: vertical****EUT in Idle Mode: 30MHz – 1GHz**

Spurious emission limit –13dBm

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

| <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>  |                |
| 30MHz            | 1GHz             | Max Peak        | Coupled      | 1 MHz          |

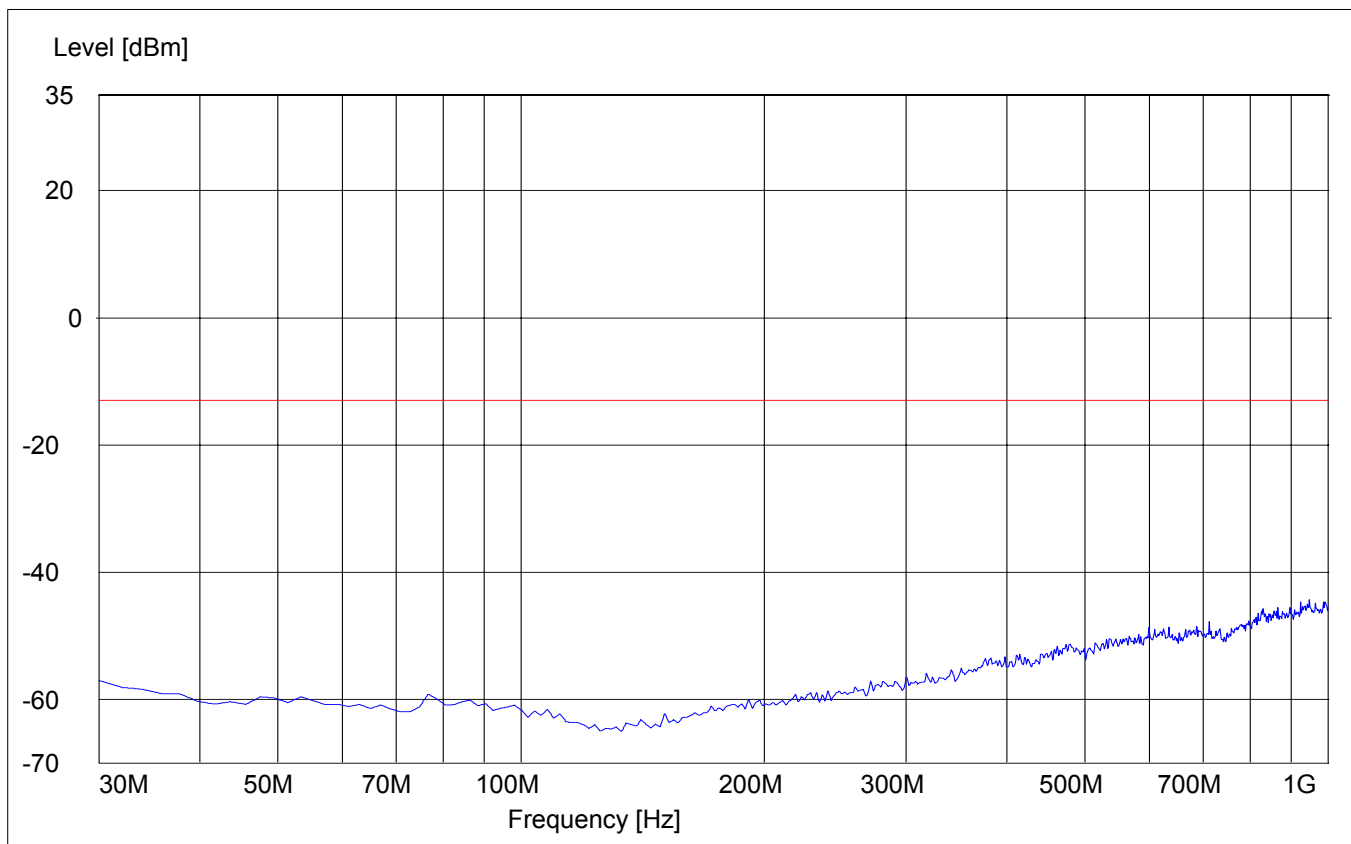


**RADIATED SPURIOUS EMISSIONS (IDLE MODE – GSM 1900)****Antenna: horizontal****EUT in Idle Mode: 30MHz – 1GHz**

Spurious emission limit –13dBm

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

| <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>  |                |
| 30MHz            | 1GHz             | Max Peak        | Coupled      | 1 MHz          |



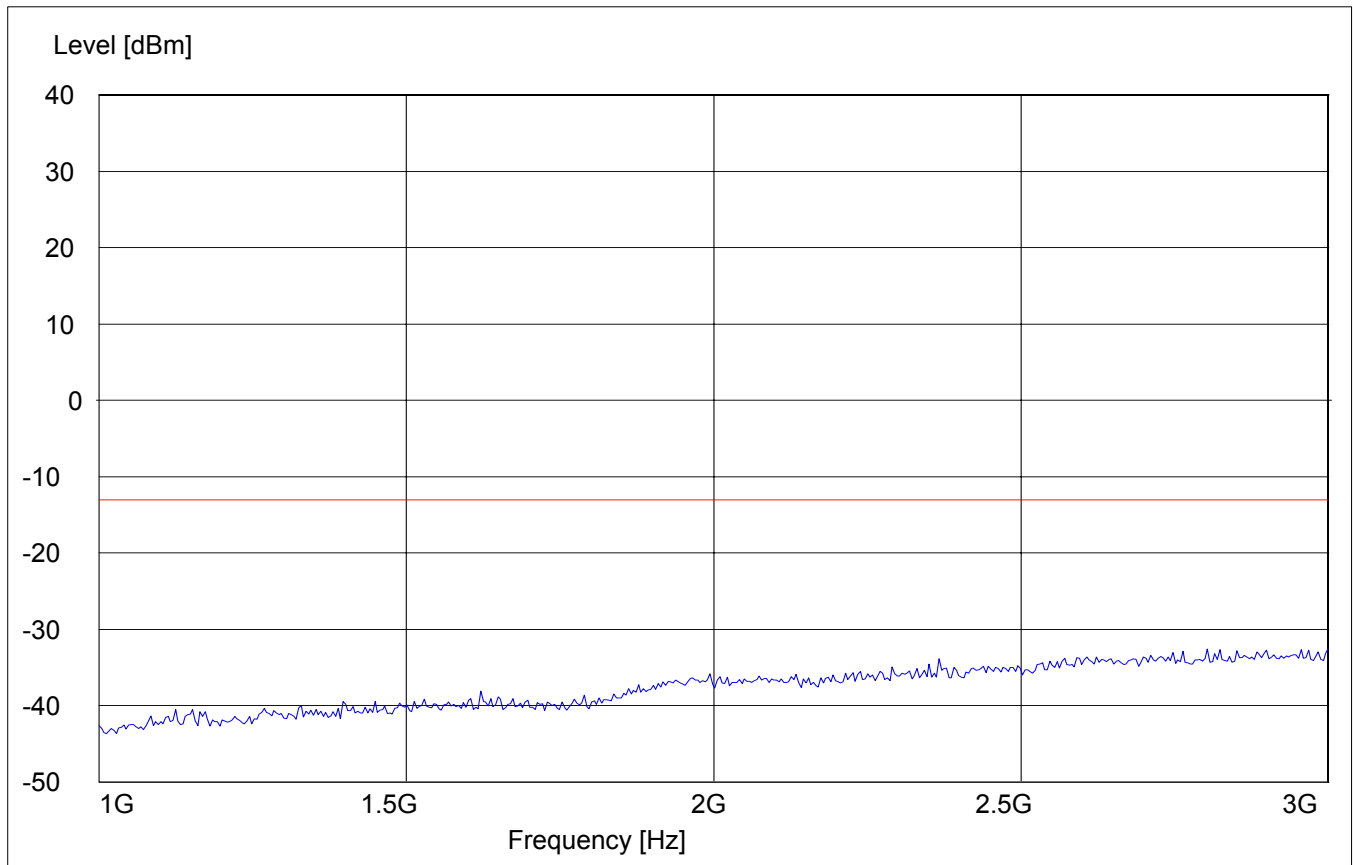
# **RADIATED SPURIOUS EMISSIONS (IDLE MODE – GSM 1900)**

## **EUT in Idle Mode: 1GHz – 3GHz**

Spurious emission limit –13dBm

### **SWEEP TABLE: "FCC24 Spuri 1-3G"**

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

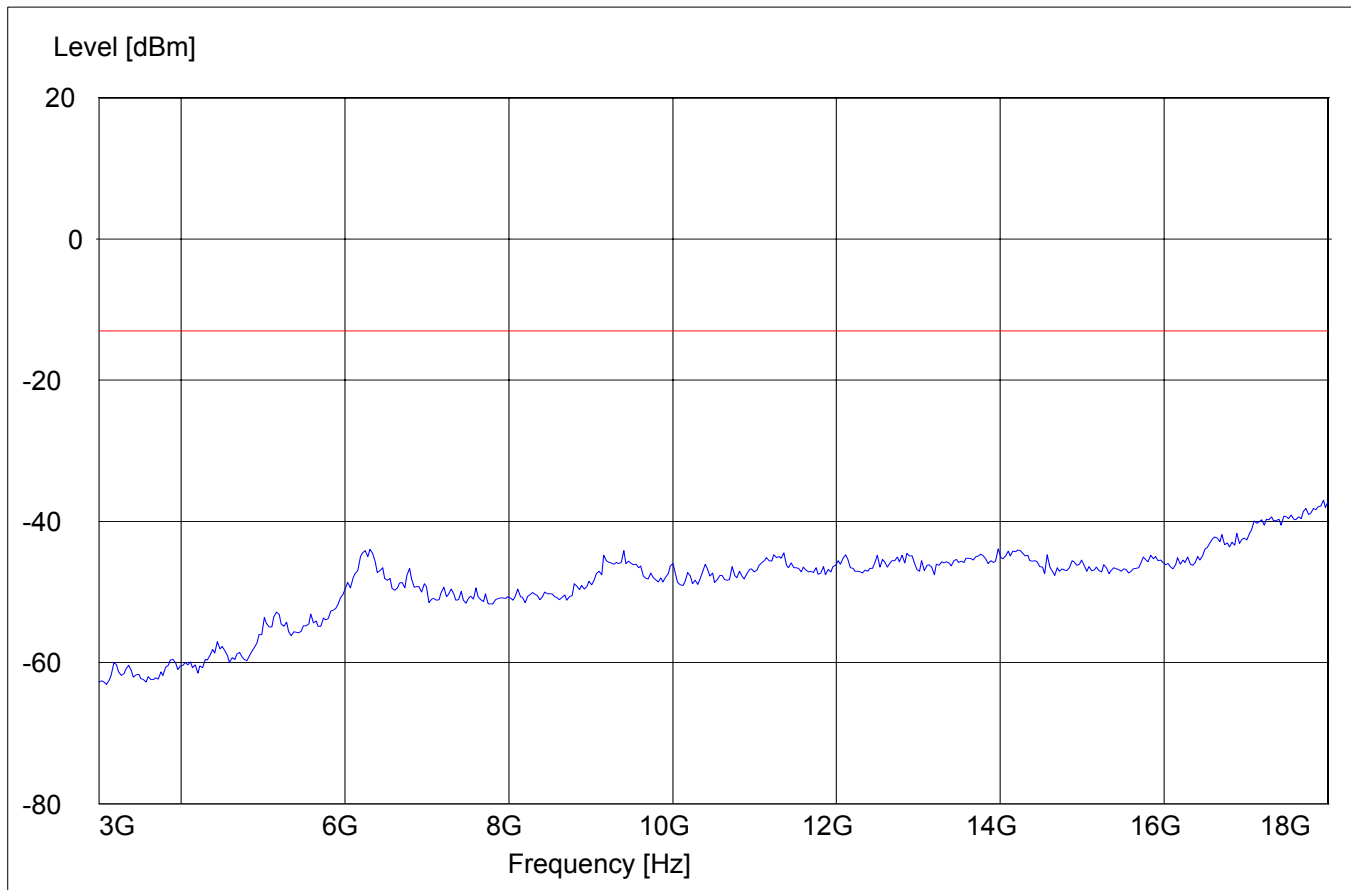


**RADIATED SPURIOUS EMISSIONS (IDLE MODE – GSM 1900)****EUT in Idle Mode: 3GHz – 18GHz**

Spurious emission limit –13dBm

***SWEEP TABLE: "FCC 24 spuri 3-18G"***

| <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>  |                |
| 3GHz             | 18GHz            | Max Peak        | Coupled      | 1 MHz          |



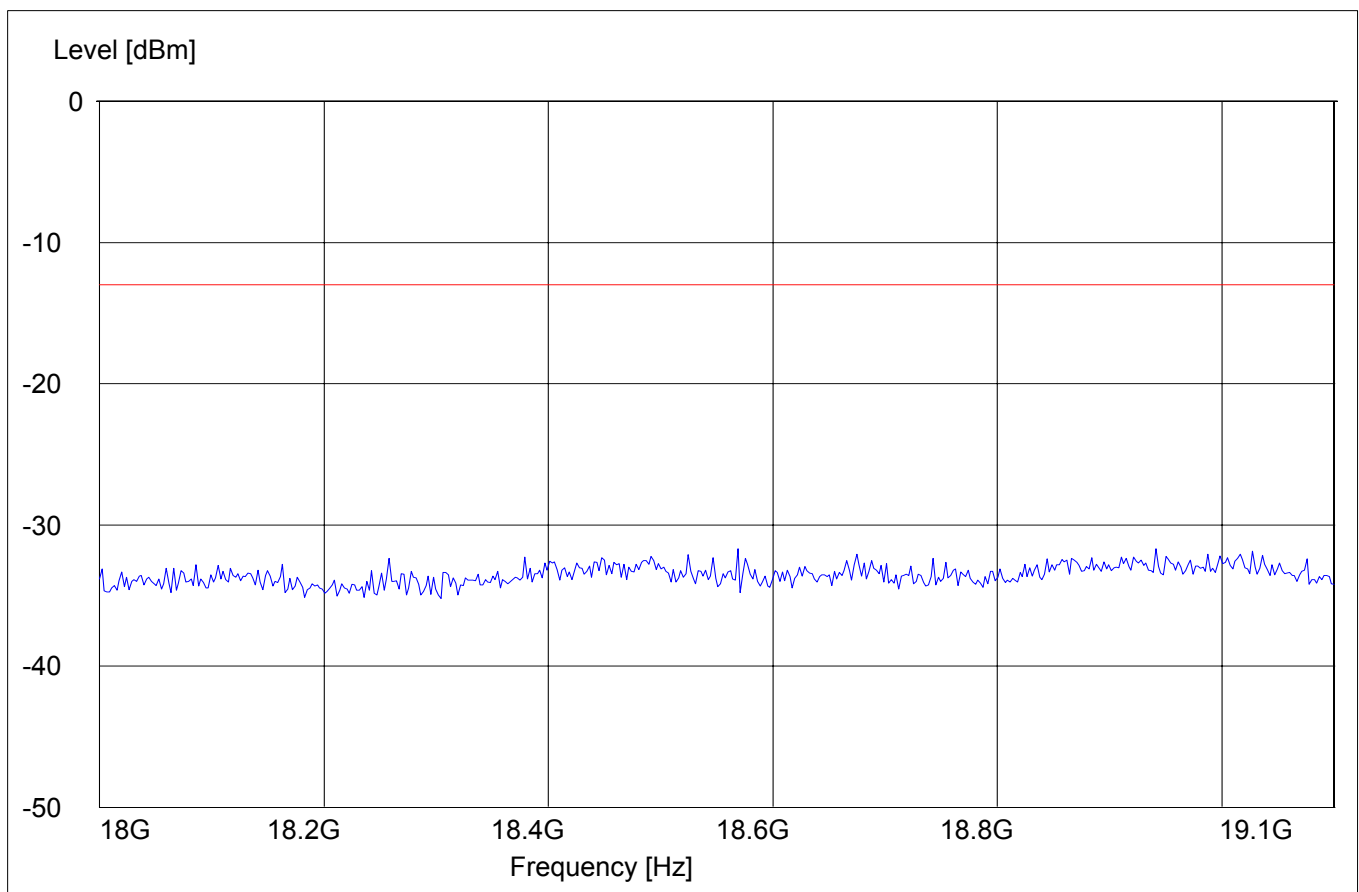
# **RADIATED SPURIOUS EMISSIONS (IDLE MODE – GSM 1900)**

## **EUT in Idle Mode: 18GHz – 19.1GHz**

Spurious emission limit –13dBm

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

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



**RECEIVER RADIATED EMISSIONS****§ 2.1053 / RSS-133**

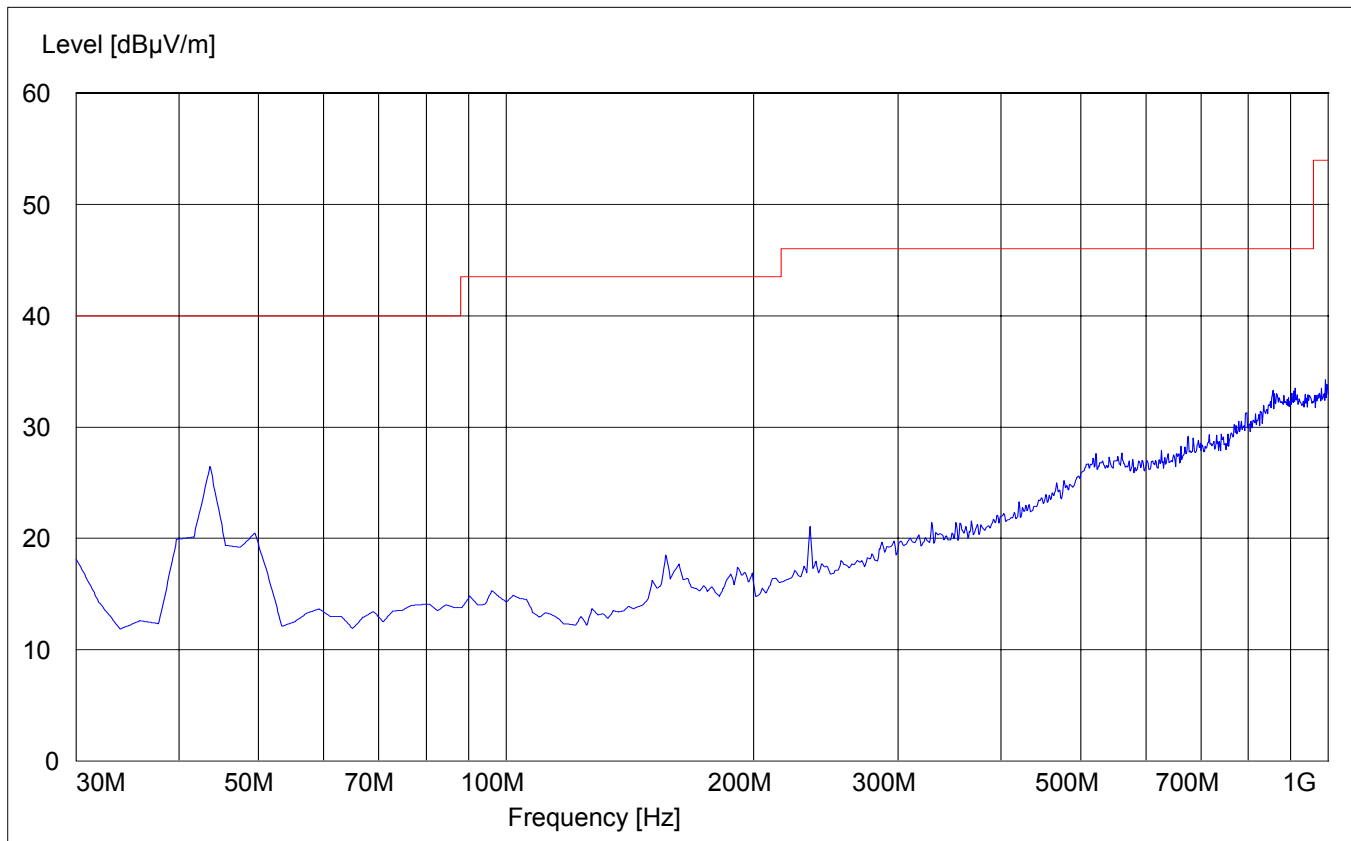
**NOTE:** The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3GHz and 19.1GHz very short cable connections to the antenna was used to minimize 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****Antenna: vertical****SWEEP TABLE: "FCC 15 Spur 30M-1G"**

| <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>  |                |
| 30MHz            | 1GHz             | Max Peak        | Coupled      | 100KHz         |



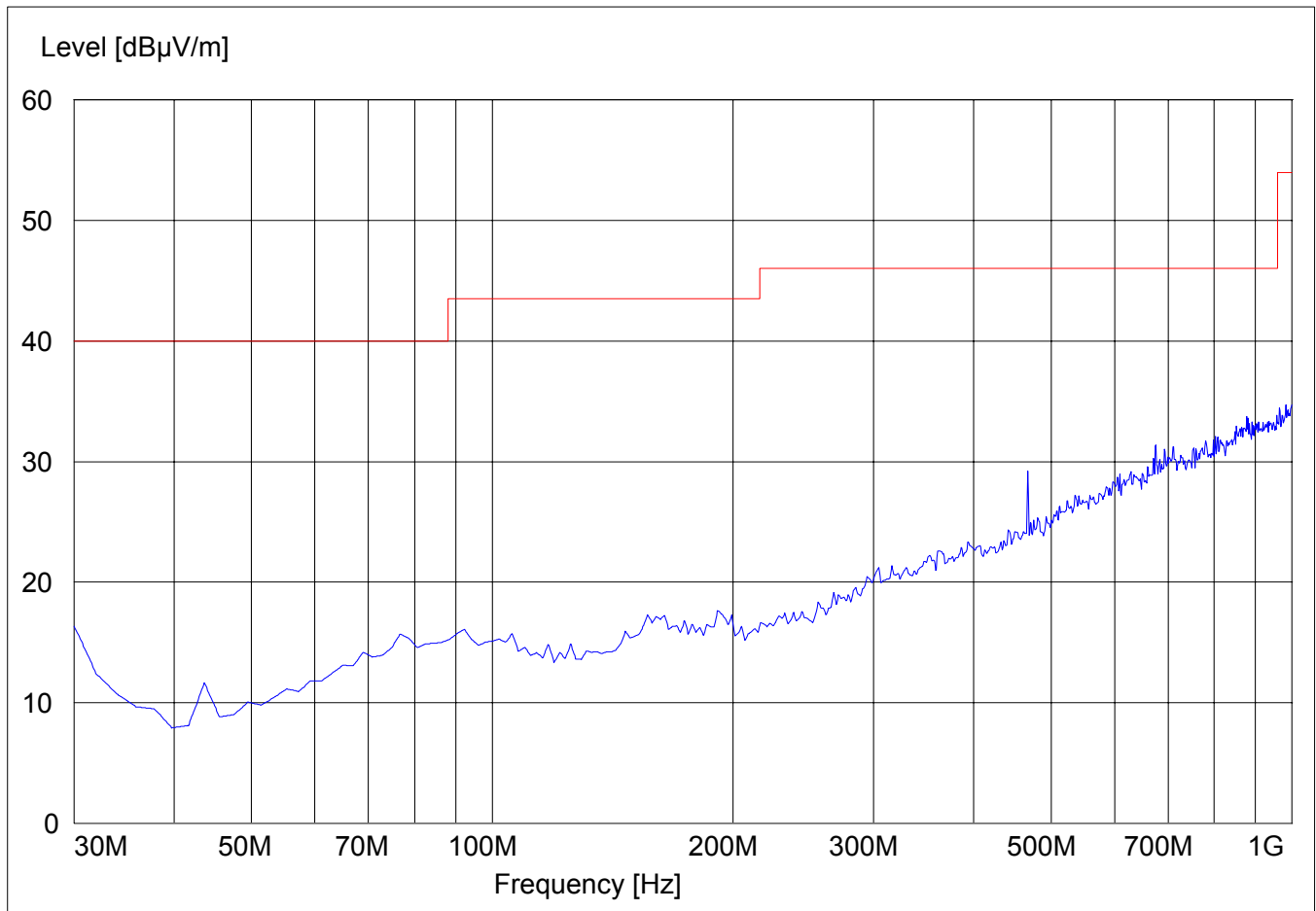
# RECEIVER RADIATED EMISSIONS

EUT in Idle Mode: 30MHz – 1GHz

Antenna: horizontal

SWEEP TABLE: "FCC 15 Spur 30M-1G"

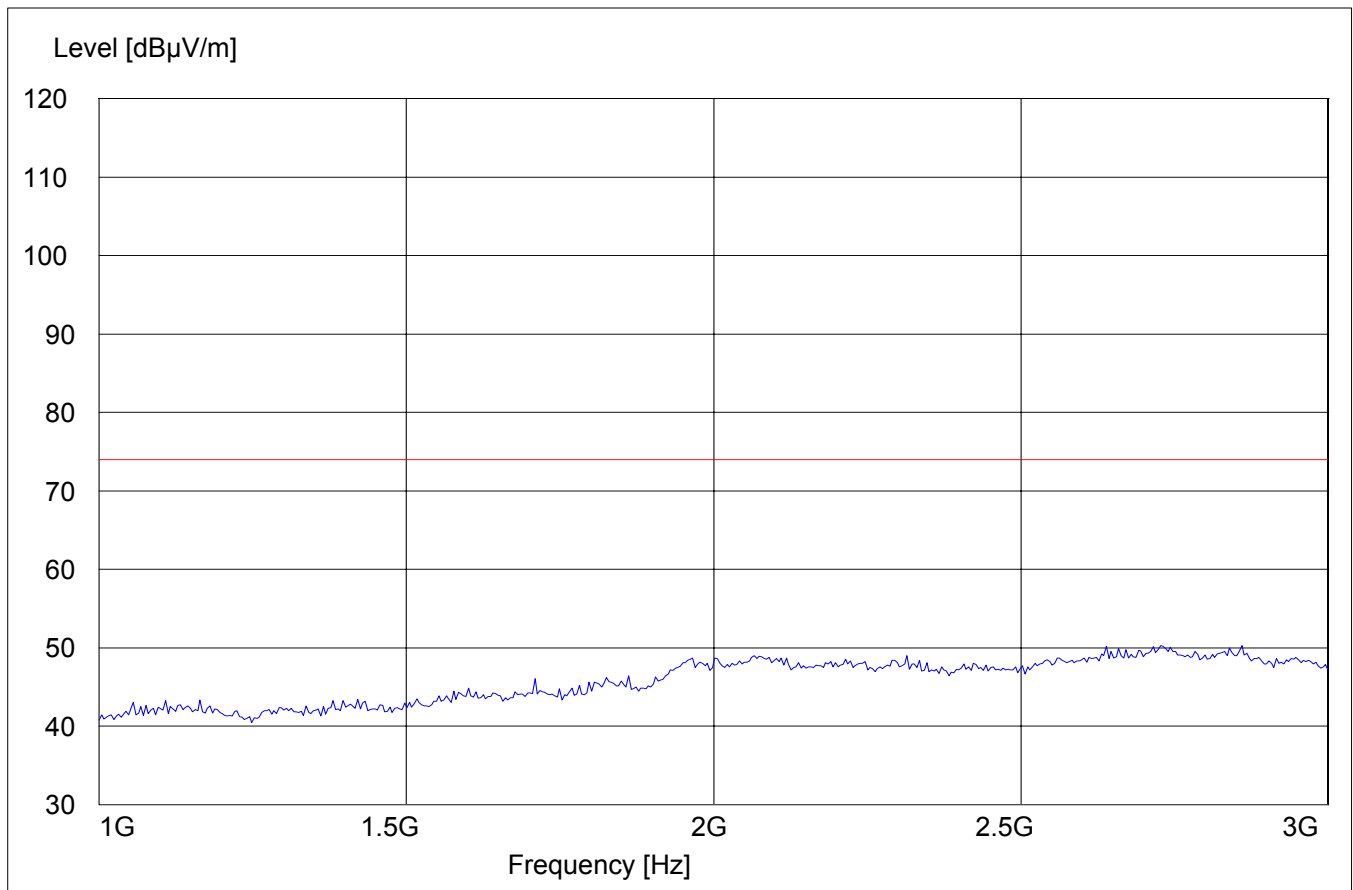
| Start     | Stop      | Detector | Meas.   | RBW/VBW |
|-----------|-----------|----------|---------|---------|
| Frequency | Frequency |          | Time    |         |
| 30MHz     | 1GHz      | Max Peak | Coupled | 100KHz  |



# RECEIVER RADIATED EMISSIONS EUT in Idle Mode: 1GHz – 3GHz

## SWEEP TABLE: "FCC15 Spuri 1-3G"

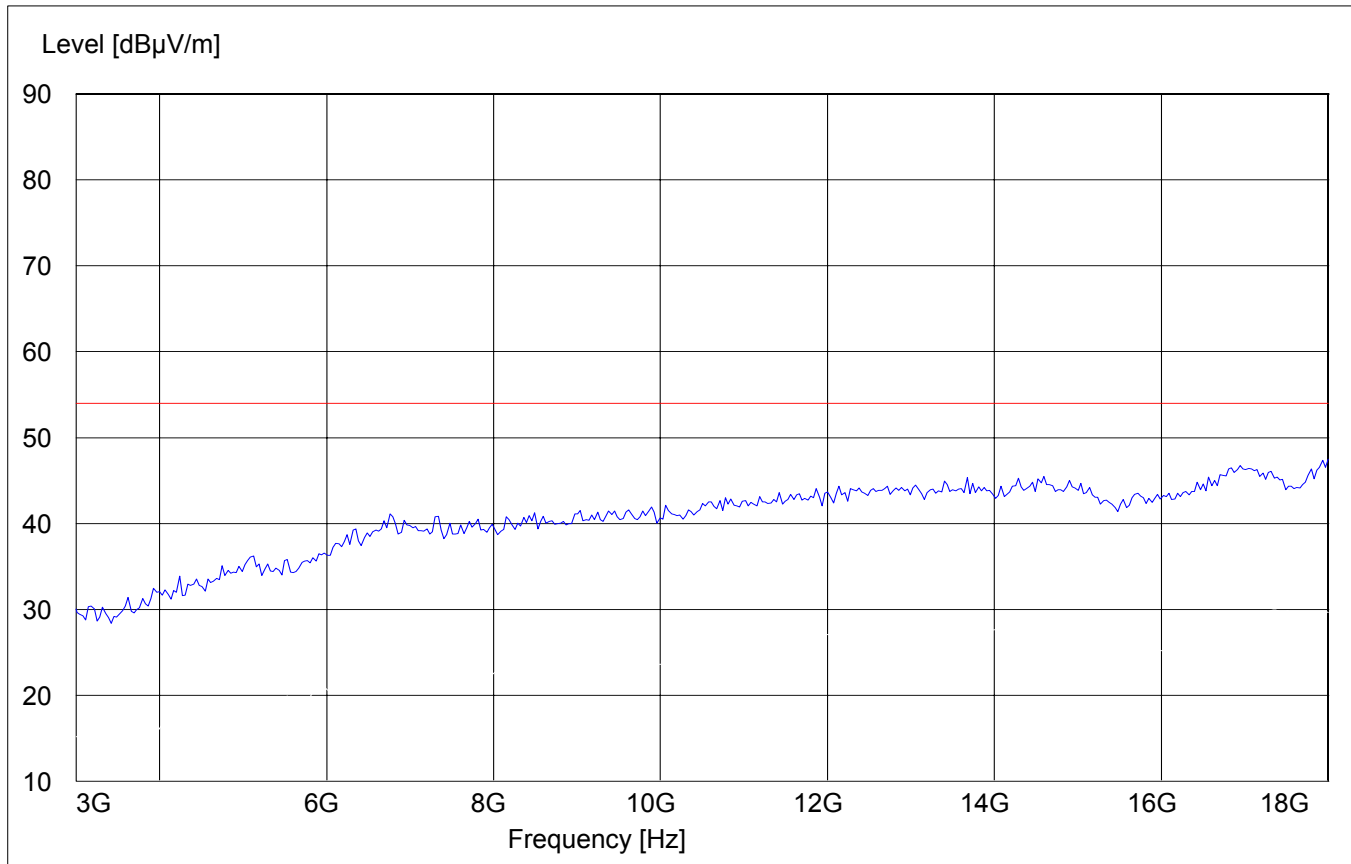
| Start     | Stop      | Detector | Meas.   | RBW/VBW |
|-----------|-----------|----------|---------|---------|
| Frequency | Frequency |          | Time    |         |
| 1GHz      | 3GHz      | Max Peak | Coupled | 1 MHz   |



**RECEIVER RADIATED EMISSIONS**  
**EUT in Idle Mode: 3GHz – 18GHz**

***SWEEP TABLE: "FCC 15spuri 3-18G"***

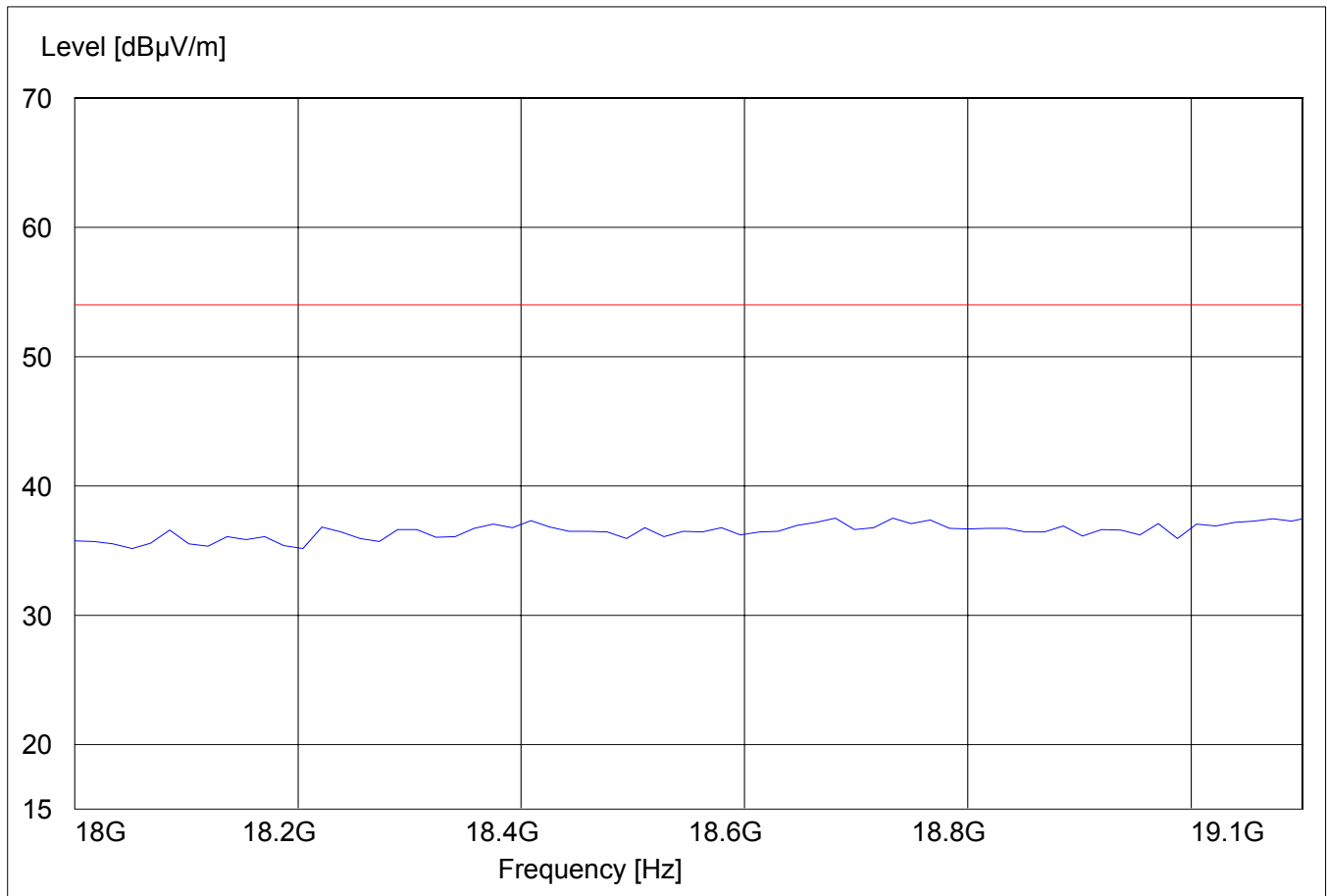
| <i>Start</i>     | <i>Stop</i>      | <i>Detector</i> | <i>Meas.</i> | <i>RBW/VBW</i> |
|------------------|------------------|-----------------|--------------|----------------|
| <i>Frequency</i> | <i>Frequency</i> |                 | <i>Time</i>  |                |
| 3GHz             | 18GHz            | Max Peak        | Coupled      | 1 MHz          |



**RECEIVER RADIATED EMISSIONS**  
**EUT in Idle Mode: 18GHz – 26.5GHz**

***SWEEP TABLE: "FCC 15 spuri 18-26.5G"***

| <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>  |                |
| 18GHz            | 26.5GHz          | Max Peak        | Coupled      | 1 MHz          |



# CONDUCTED EMISSIONS

§ 15.107/207

Measured with AC/DC power adapter plugged in LISN

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

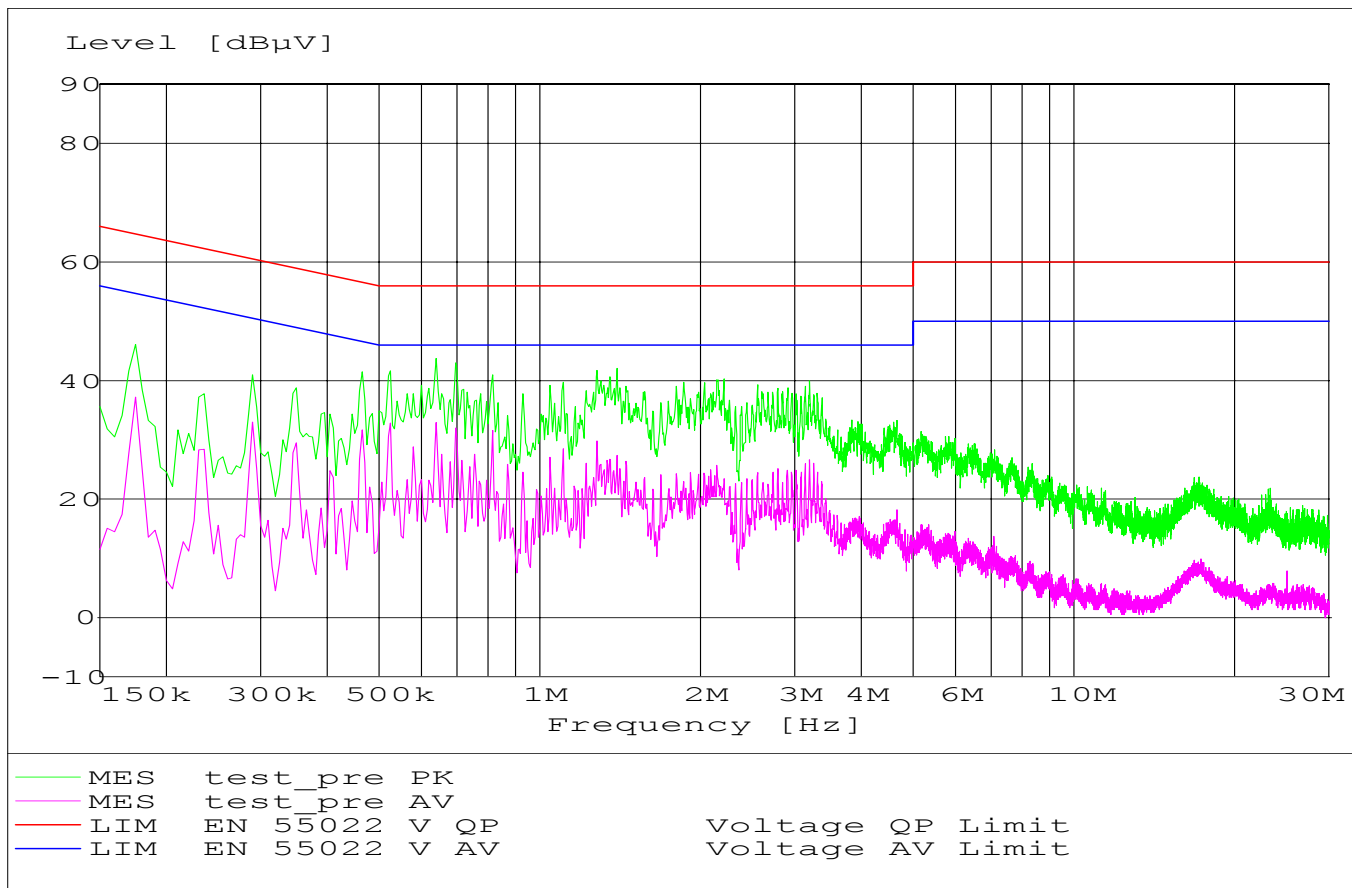
## Limit

| 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



**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 | Biconilog Antenna            | 3141         | EMCO            | 0005-1186    |
| 06 | Horn Antenna (1-18GHz)       | SAS-200/571  | AH Systems      | 325          |
| 07 | Horn Antenna (18-26.5GHz)    | 3160-09      | EMCO            | 1240         |
| 08 | Power Splitter               | 11667B       | Hewlett Packard | 645348       |
| 09 | Climatic Chamber             | VT4004       | Voltsch         | G1115        |
| 10 | High Pass Filter             | 5HC2700      | Trilithic Inc.  | 9926013      |
| 11 | High Pass Filter             | 4HC1600      | Trilithic Inc.  | 9922307      |
| 12 | Pre-Amplifier                | JS4-00102600 | Miteq           | 00616        |
| 13 | Power Sensor                 | URV5-Z2      | Rohde & Schwarz | DE30807      |
| 14 | Digital Radio Comm. Tester   | CMD-55       | Rohde & Schwarz | 847958/008   |
| 15 | Universal Radio Comm. Tester | CMU 200      | Rohde & Schwarz | 832221/06    |

**BLOCK DIAGRAMS**  
**Radiated Testing****ANECHOIC CHAMBER**