FCC Test Report

FCC Part 22, 24

For the

Braemer, Inc.

Ambulatory Arrhythmia Monitoring System

Model Number: Fusion

With Wavecom Q2687 QuadBand GSM/GPRS Module

FCC ID: HHMFUSION

TEST REPORT #: EMC_BRAEM_005_08001_FCC22_24
DATE: 2009-03-02

ilac-MRA ACCREDITED Certificate # 2135.01

Bluetooth

Bluetooth Qualification Test Facility (BQTF)

CTIA Authorized Test Lab
LAB CODE 20020328-00

FCC listed: A2LA accredited

IC recognized # 3462B

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

Table of Contents

1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and in compliance with the applicable criteria specified in Industry Canada rules RSS132 and RSS133.

Company	Description	Model #
Braemer, Inc.	**Ambulatory Arrhythmia Monitoring System**	**Fusion**

Technical responsibility for area of testing:

Date	Section	Name	Signature
2009-03-11	**EMC & Radio**	**Marc Douat (EMC Project Engineer)**	Marc Douat I am approving this document

This report is prepared by:

Date	Section	Name	Signature
2009-03-11	**EMC & Radio**	**Ahmad Safdari (EMC Project Engineer)**	Ahmad Safdari Digitally signed by Ahmad Safdari Reason: I am the author of this document

The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC ID. Refer to report ID # 2-4299-01-02/06 FCC/ ID # 09EQ2687

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	**CETECOM Inc.**
Department:	**EMC**
Address:	**411 Dixon Landing Road Milpitas, CA 95035 U.S.A.**
Telephone:	**+1 (408) 586 6200**
Fax:	**+1 (408) 586 6299**
Responsible Test Lab Manager:	**Lothar Schmidt**
Responsible Project Leader:	**Ahmad Safdari**

2.2 Identification of the Client

Applicant's Name:	**Braemer, Inc.**
Street Address:	**1285 Corporate Center Drive**
City/Zip Code	**Eagan 55121**
Country	**USA**
Contact Person:	**Adam ford**
Phone No.	**(651) 286-8620 x144**
e-mail:	**adam.ford@braemarinc.com**

2.3 Identification of the Manufacturer

Same as above applicant

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name of EUT (if not same as Model No.)	**Fusion**
Description	**Ambulatory Arrhythmia Monitoring System**
Model No.	**Fusion**
FCC-ID	**HHMFUSION**
Frequency Range:	**824.2MHz – 848.8MHz for GSM 850** **1850.2MHz – 1909.8MHz for PCS 1900**
Type(s) of Modulation:	**GMSK, 8PSK**
Number of Channels:	**124 for GSM-850, 299 for PCS-1900**
Antenna Type:	**Wire Antenna ¼ Wave Antenna**
Max. Output Power:	**Conducted : Tests not performed by Cetecom.** **Radiated : see section 5.1.5 and 5.1.6.** **27.83dBm @ GSM 848.8MHz ERP values** **27.47dBm @ PCS 1850.2MHz EIRP values**

3.2 Identification of the Equipment Under Test (EUT)

EUT #	TYPE	MANF.	MODEL	SERIAL #
1	**EUT**	**Braemer, Inc.**	**Fusion**	**N/A**

3.3 Identification of Accessory equipment

AE #	TYPE	MODEL
1	ECG Recording Leadwires	**N/A**
2	Battery	**N/A**

4 Subject of Investigation

All testing was performed on the EUT listed in Section 3. The EUT was maximized in the X,Y, Z positions , all data in this report shows the worst case between horizontal and vertical polarization for above 1GHz.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations.

EGPRS (EDGE) spurious emission was not conducted, GSM GPRS spurious emission was conducted since it was worst case.

This EUT contains an FCC approved module with the FCC ID **09EQ2687.** This report refers only to the radiated measurements in GSM technology.

5 Measurements

5.1 RF Power Output

5.1.1 FCC 2.1046 Measurements required: RF power output.

Power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on circuit elements as specified. The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

5.1.2 Limits:

5.1.2.1 FCC 22.913 (a) Effective radiated power limits.

The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.

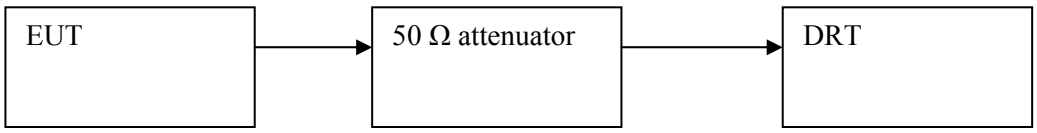
5.1.2.2 FCC 24.232 (b)(c) Power limits.

(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP).
(c) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement over the full bandwidth of the channel.

5.1.3 Conducted Output Power Measurement procedure:

Based on TIA-603C 2004

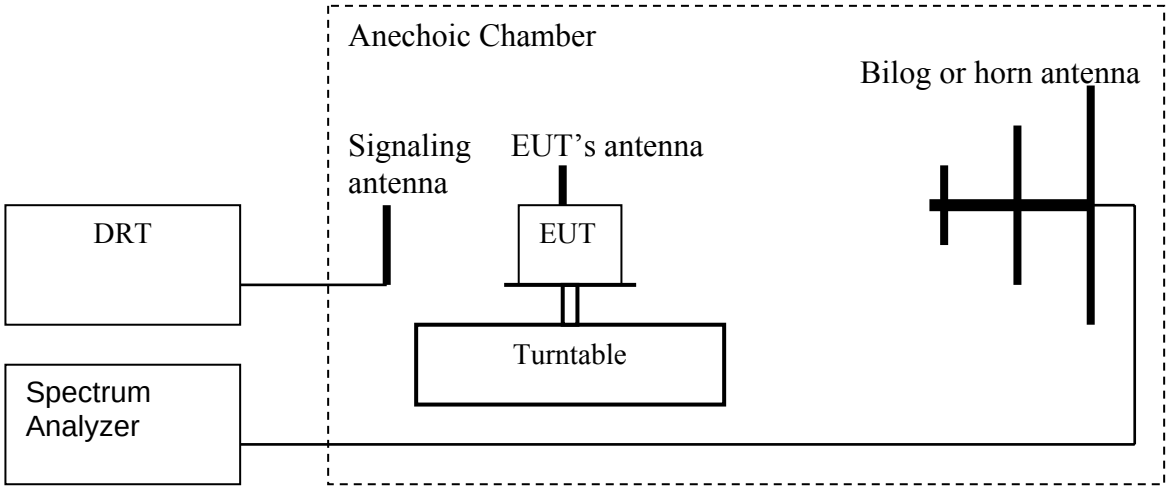
2.2.1 Conducted Carrier Output Power Rating



1. Connect the equipment as shown in the above diagram. A Digital Radiocommunication Tester (DRT) is used to enable the EUT to transmit and to measure the output power.
2. Adjust the settings of the DRT to set the EUT to its maximum power at the required channel.
3. Record the output power level measured by the DRT.
4. Correct the measured level for all losses in the RF path.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

5.1.4 Radiated Output Power Measurement procedure:

Based on TIA-603C 2004
2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic Radiated Power (EIRP)



1. Connect the equipment as shown in the above diagram with the EUT's antenna in a vertical orientation.
2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to the channel frequency. Set the analyzer to measure peak hold with the required settings.
4. Rotate the EUT 360°. Record the peak level in dBm (**LVL**).
5. Replace the EUT with a vertically polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS)**. **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the ERP using the following equation:
   ERP (dBm) = **LVL** (dBm) + **LOSS** (dB)
8. Determine the EIRP using the following equation:
   EIRP (dBm) = **ERP** (dBm) + 2.14 (dB)
9. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band. **Spectrum analyzer settings = rbw=vbw=3MHz**

(**note:** Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4, 7 and 8 above are performed with test software.)

5.1.5 ERP Results 850 MHz band:

Power Control Level	Burst Peak ERP
5	≤38.45dBm (7W)

Frequency (MHz)	Effective Isotropic Radiated Power (dBm)	
	GSM	EGPRS
824.2	28.8 (26.66)	26.24 (24.1)
836.6	29.11 (26.97)	26.62 (24.48)
848.8	29.97 (27.83)	26.69 (24.55)

*Values reported are EIRP and (ERP) in parentheses.

5.1.6 EIRP Results 1900 MHz band:

Power Control Level	Burst Peak EIRP
0	≤33dBm (2W)

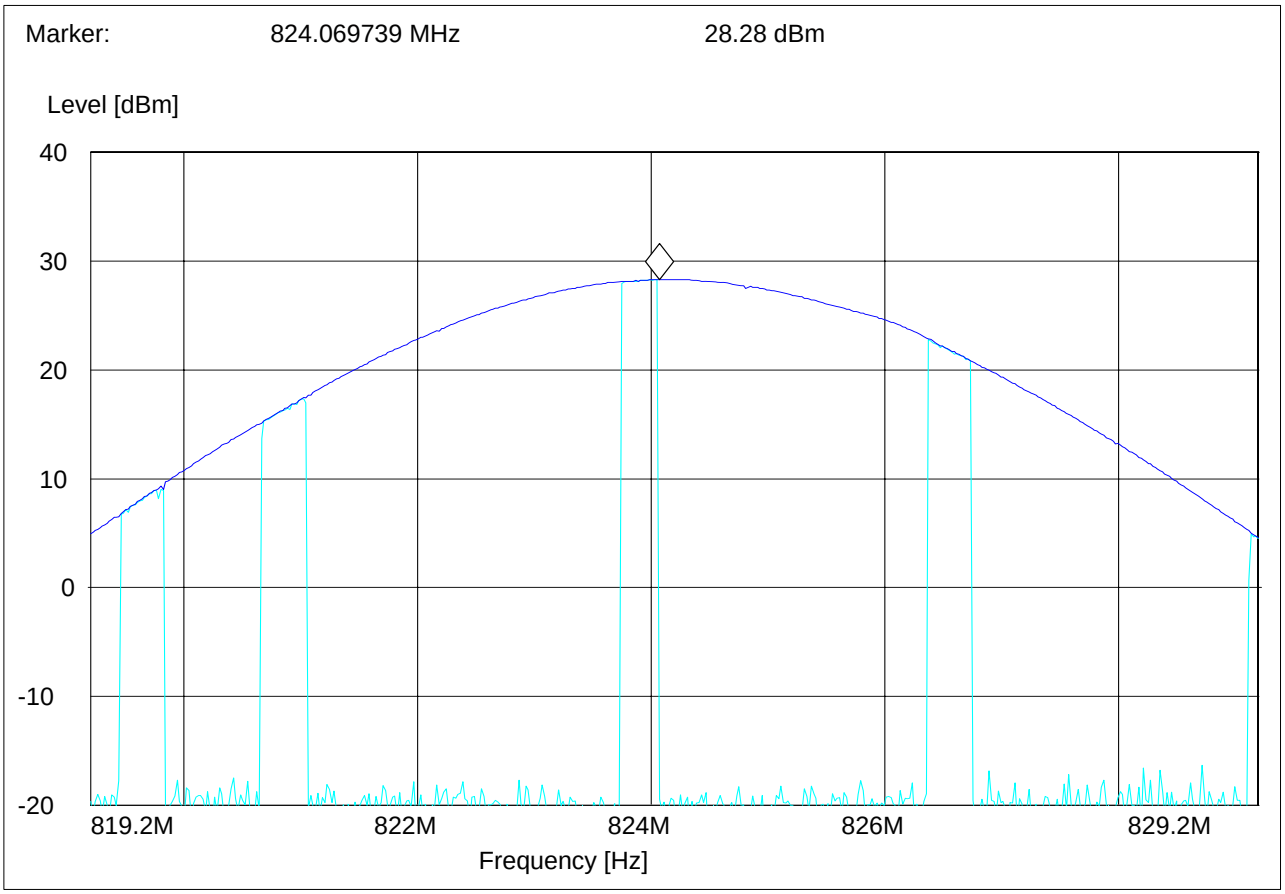
Frequency (MHz)	Effective Isotropic Radiated Power (dBm)	
	GSM	EGPRS
1850.2	27.47	26.02
1880.0	27.27	26.72
1909.8	27	25.66

EIRP (GSM 850) CHANNEL 128 §22.913(a)

```
 EUT:            04GU10b / C01
Customer::       Braemar
Test Mode:       GSM 850
ANT Orientation: V
EUT Orientation: V
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

SWEEP TABLE: "EIRP 850 CH 128 H"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
819.2 MHz	829.2 MHz	MaxPeak MaxPeak	Coupled	3 MHz	DUMMY-DBM

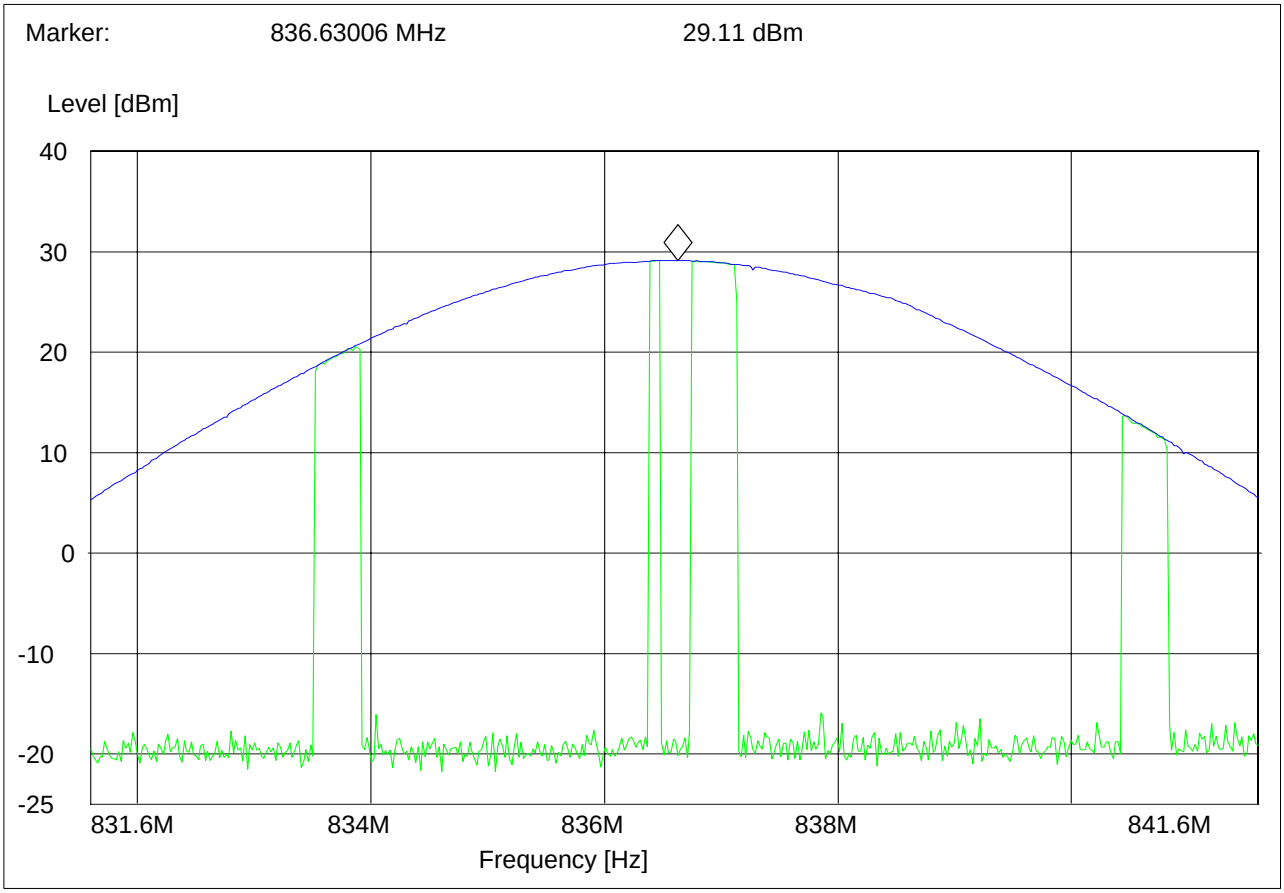


EIRP (GSM 850) CHANNEL 190 §22.913(a)

EUT: 04GU10b / C01
Customer:: Braemar
Test Mode: GSM 850
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: Internal Battery
Comments: TT@ 267° ANT @ 140cm

SWEEP TABLE: "EIRP 850 CH 190 H"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
831.6 MHz	841.6 MHz	MaxPeak MaxPeak	Coupled	3 MHz	DUMMY-DBM

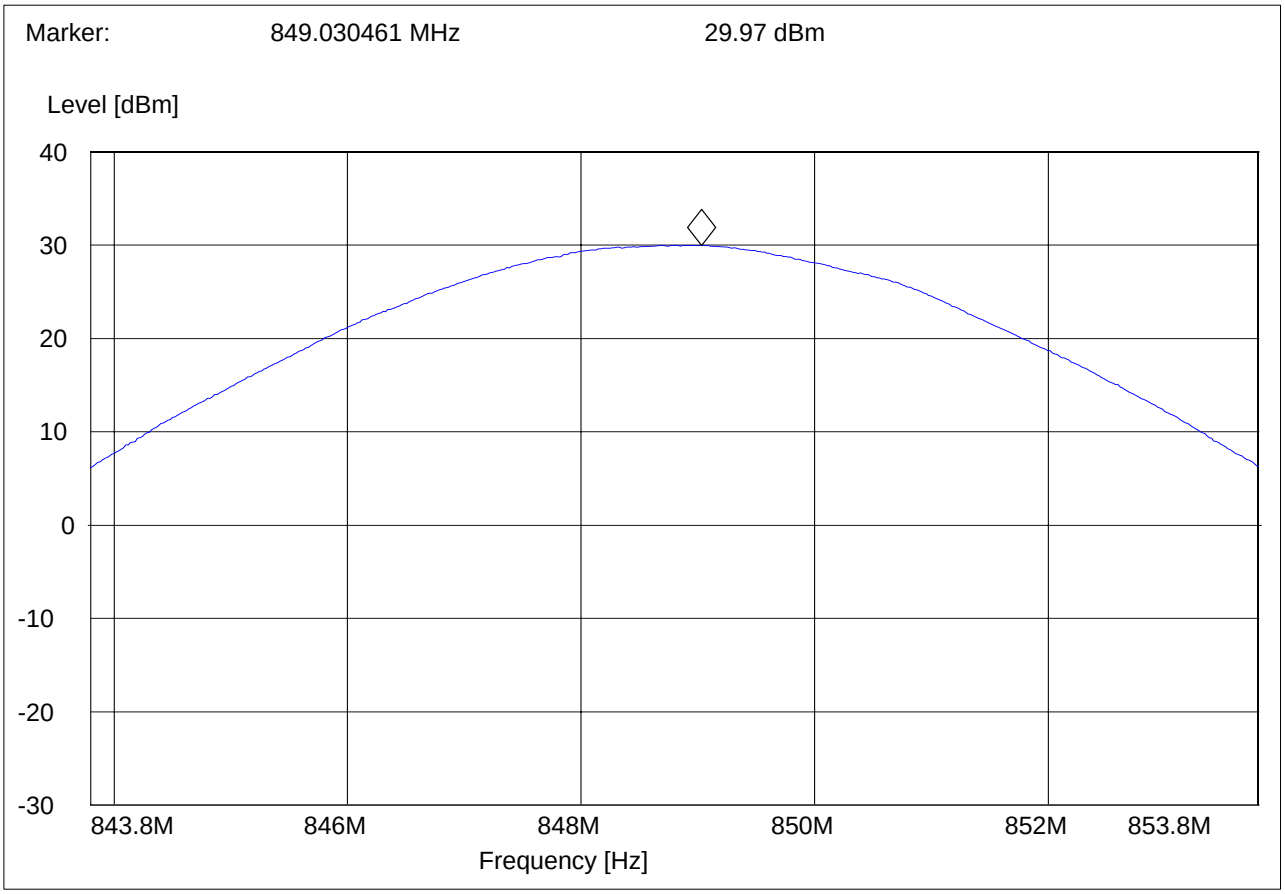


EIRP (GSM 850) CHANNEL 251 §22.913(a)

```
EUT:              04GU10b / C01
Customer::        Braemar
Test Mode:        GSM 850
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

SWEEP TABLE: "EIRP 850 CH 251 H"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
843.8 MHz	853.8 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM

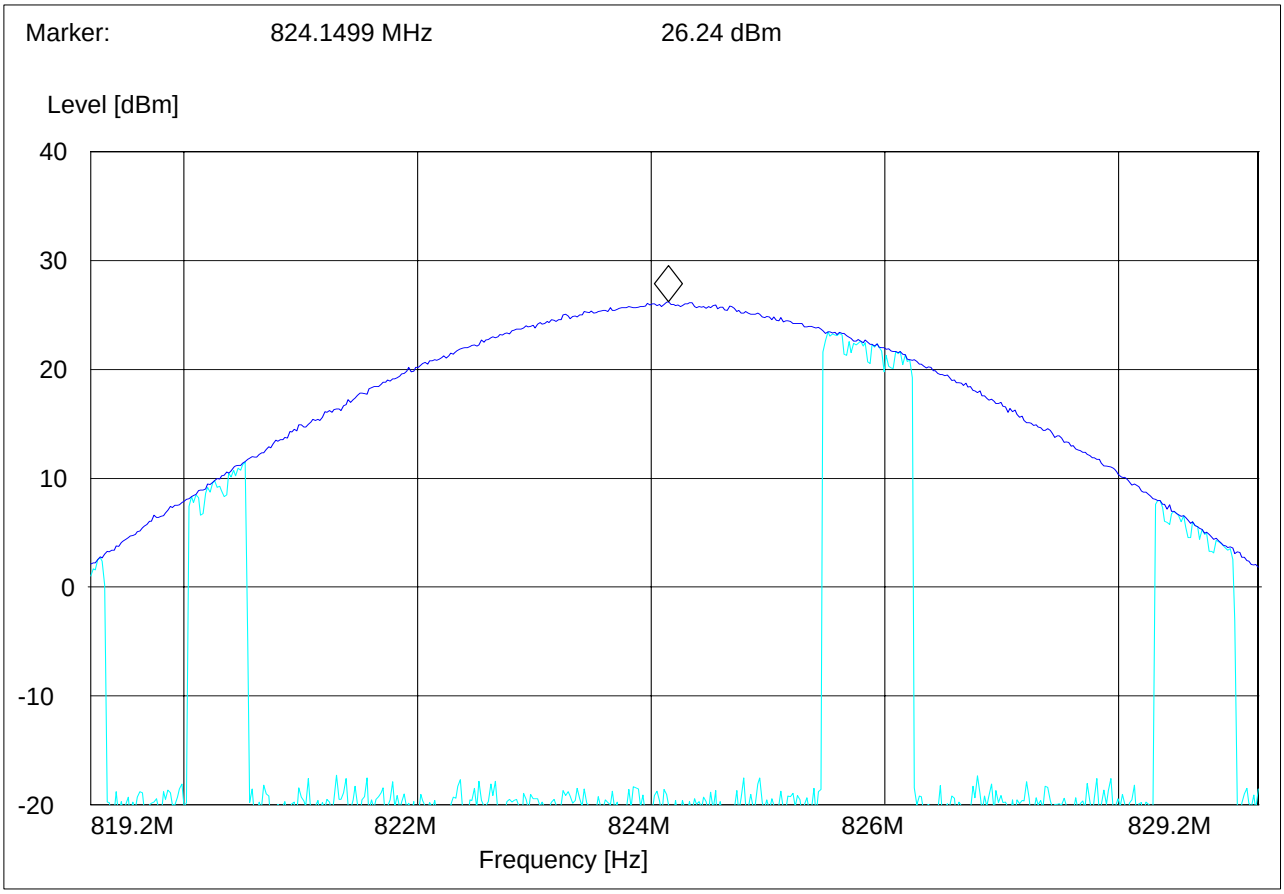


EIRP (EGPRS 850) CHANNEL 128 §22.913(a)

```
EUT:             04GU10c
Customer:        Breamar
Test Mode:       EGPRS 850
ANT Orientation: V
EUT Orientation: V
Test Engineer:   SAM
Voltage:         3.6v
Comments:
```

SWEEP TABLE: "EIRP 850 CH 128 V"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
819.2 MHz	829.2 MHz	MaxPeak MaxPeak	Coupled	3 MHz	DUMMY-DBM

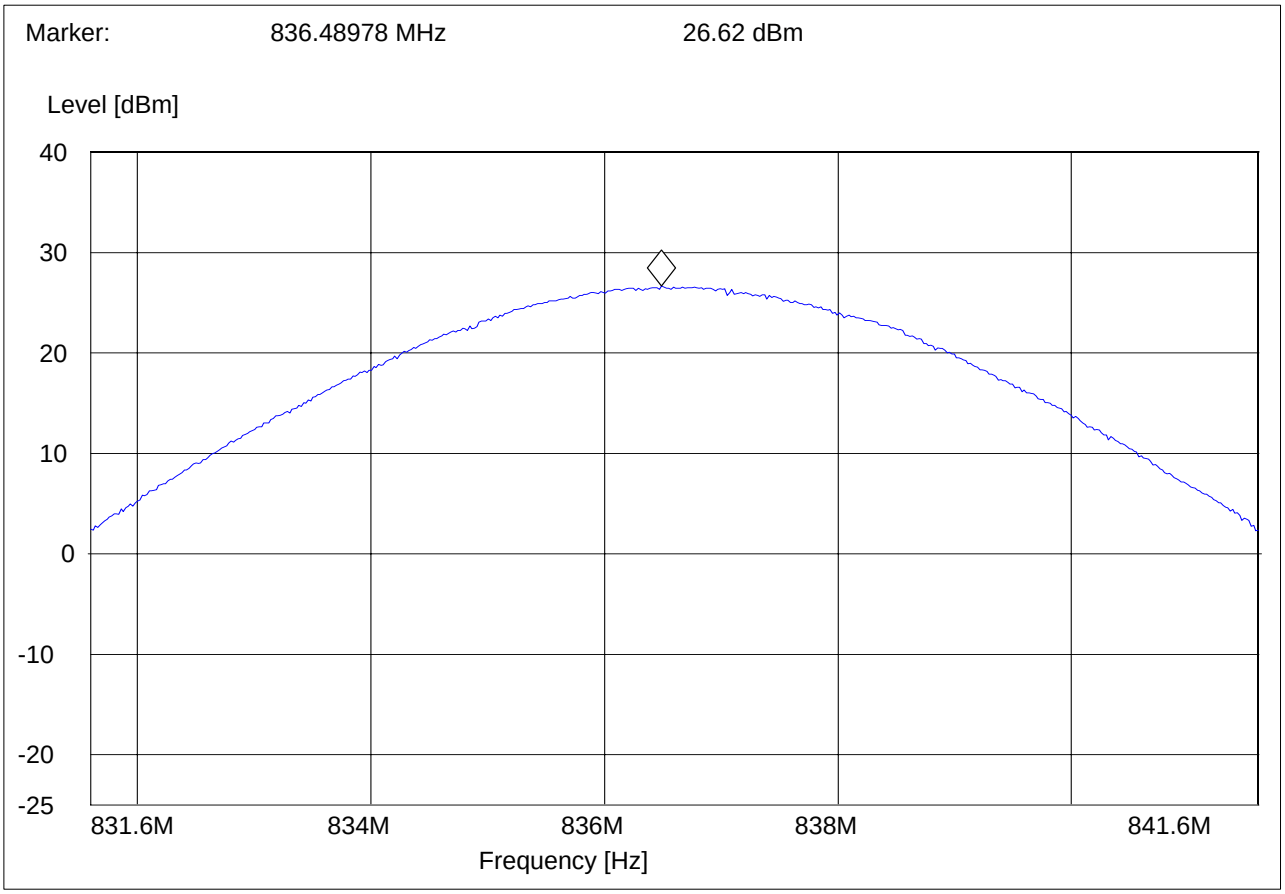


EIRP (EGPRS 850) CHANNEL 190 §22.913(a)

```
EUT:             04GU10c
Customer:        Breamar
Test Mode:       EGPRS 850
ANT Orientation: V
EUT Orientation: V (at an angle)
Test Engineer:   SAM
Voltage:         3.6v
Comments:
```

SWEEP TABLE: "EIRP 850 CH 190 V"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
831.6 MHz	841.6 MHz	MaxPeak MaxPeak	Coupled	3 MHz	DUMMY-DBM

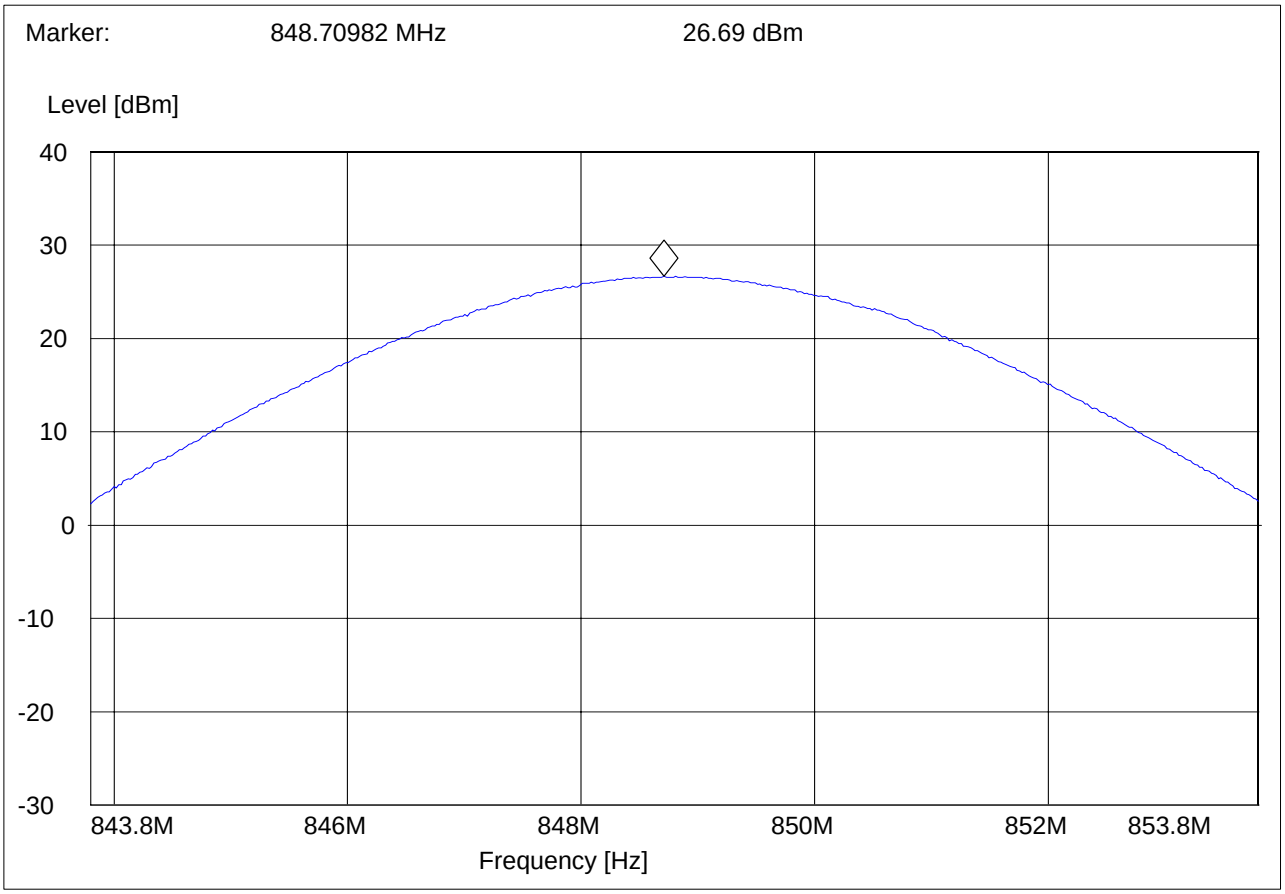


EIRP (EGPRS 850) CHANNEL 251 §22.913(a)

```
EUT:             04GU10c
Customer::       Breamar
Test Mode:       EGPRS 850
ANT Orientation: V
EUT Orientation: V
Test Engineer:   SAM
Voltage:         3.6v
Comments:
```

SWEEP TABLE: "EIRP 850 CH 251 V"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
843.8 MHz	853.8 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM

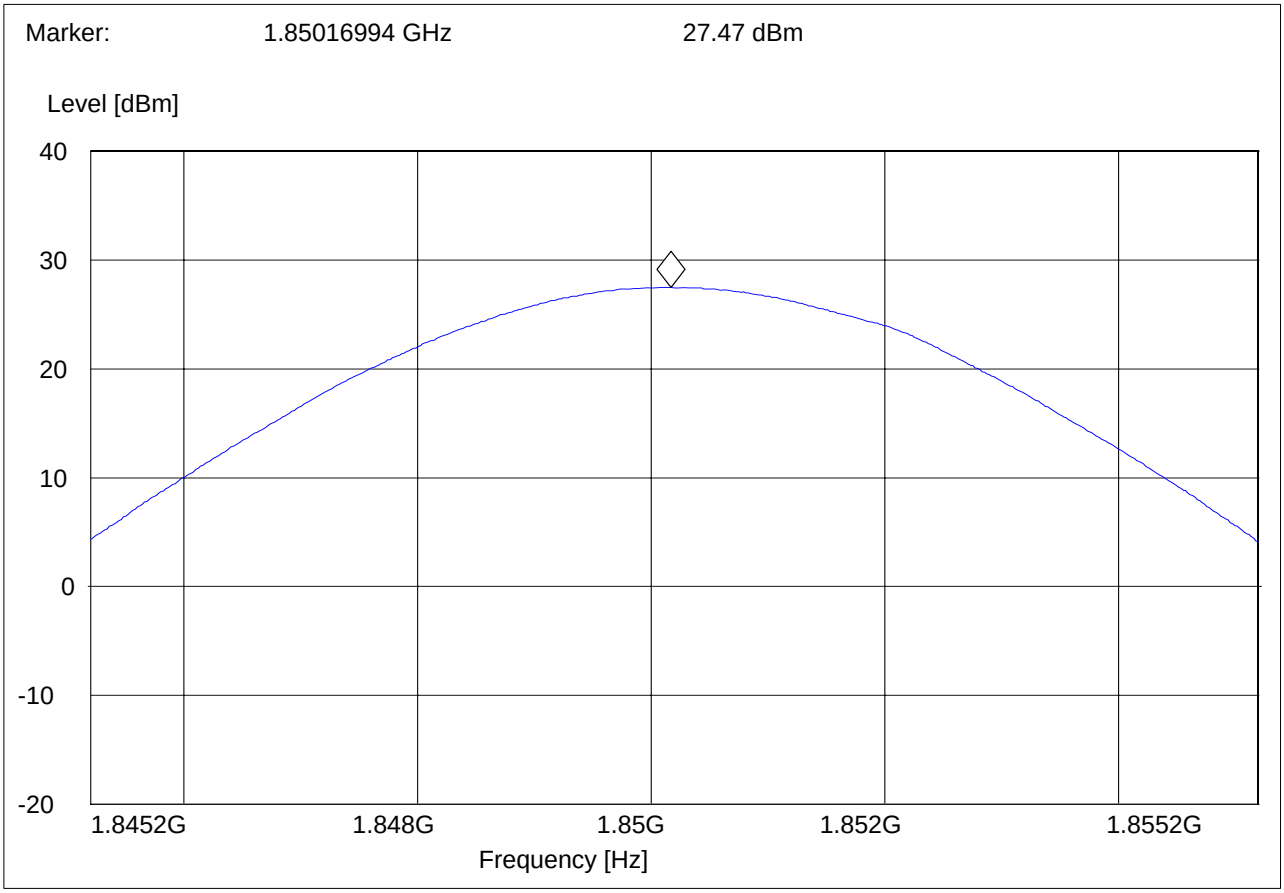


EIRP (PCS-1900) CHANNEL 512 §24.232(b)

```
EUT:             04GU10a
Customer:        BRAEMAR
Test Mode:       GSM 1900
ANT Orientation: H
EUT Orientation: H
Test Engineer:   Chris
Voltage:         int battery
Comments:        TT@ 232°
```

SWEEP TABLE: "EIRP 1900 CH512"

```
Short Description:            EIRP PCS 1900 for channel-512
Start      Stop       Detector  Meas.     IF        Transducer
Frequency  Frequency            Time      Bandw.
1.8 GHz    1.9 GHz    MaxPeak   Coupled   3 MHz     DUMMY-DBM
```



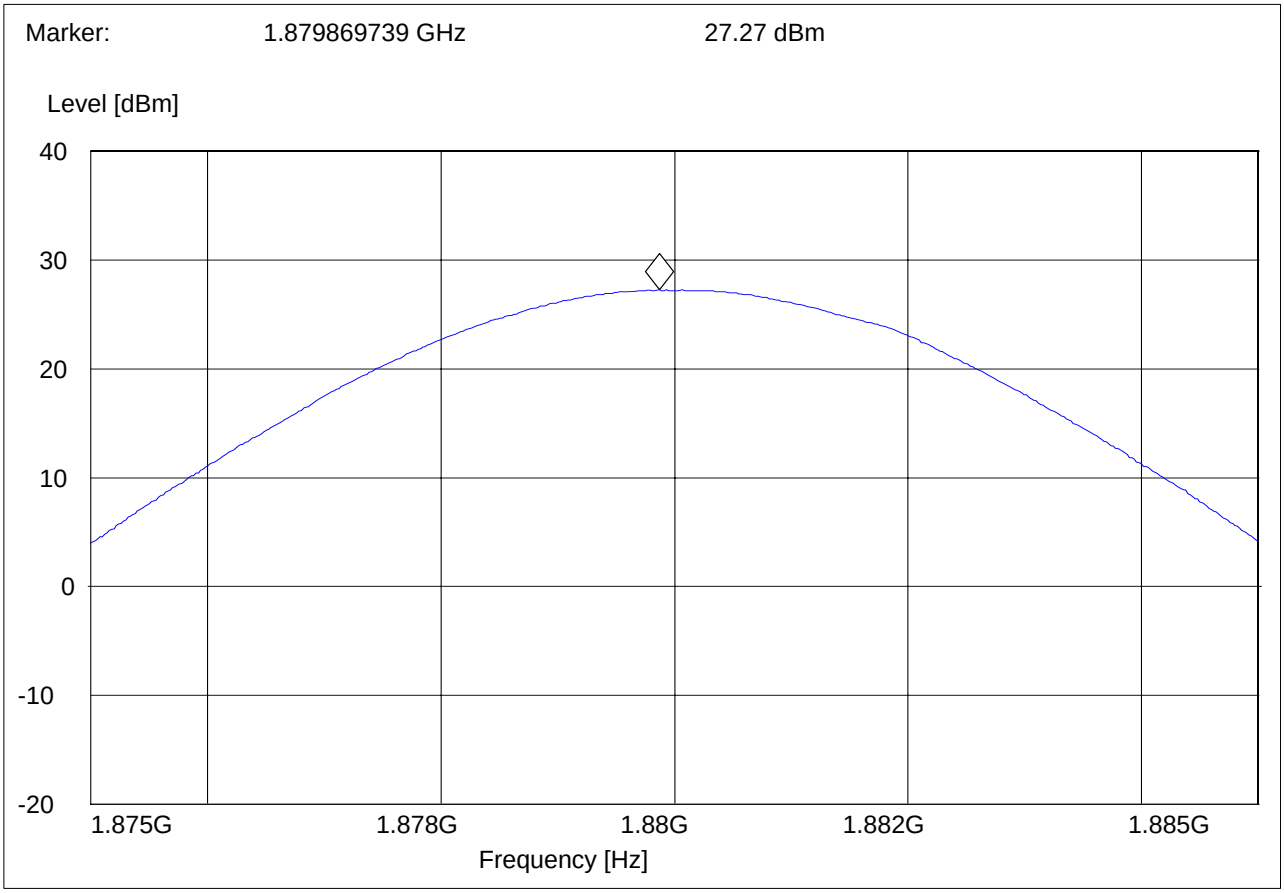
EIRP (PCS-1900) CHANNEL 661 §24.232(b)

EUT: 04GU10a
Customer: BRAEMAR
Test Mode: GSM 1900
ANT Orientation: H
EUT Orientation: H
Test Engineer: Chris
Voltage: int battery
Comments: TT@ 232°

SWEEP TABLE: "EIRP 1900 CH661"

Short Description: EIRP PCS 1900 for channel-661

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

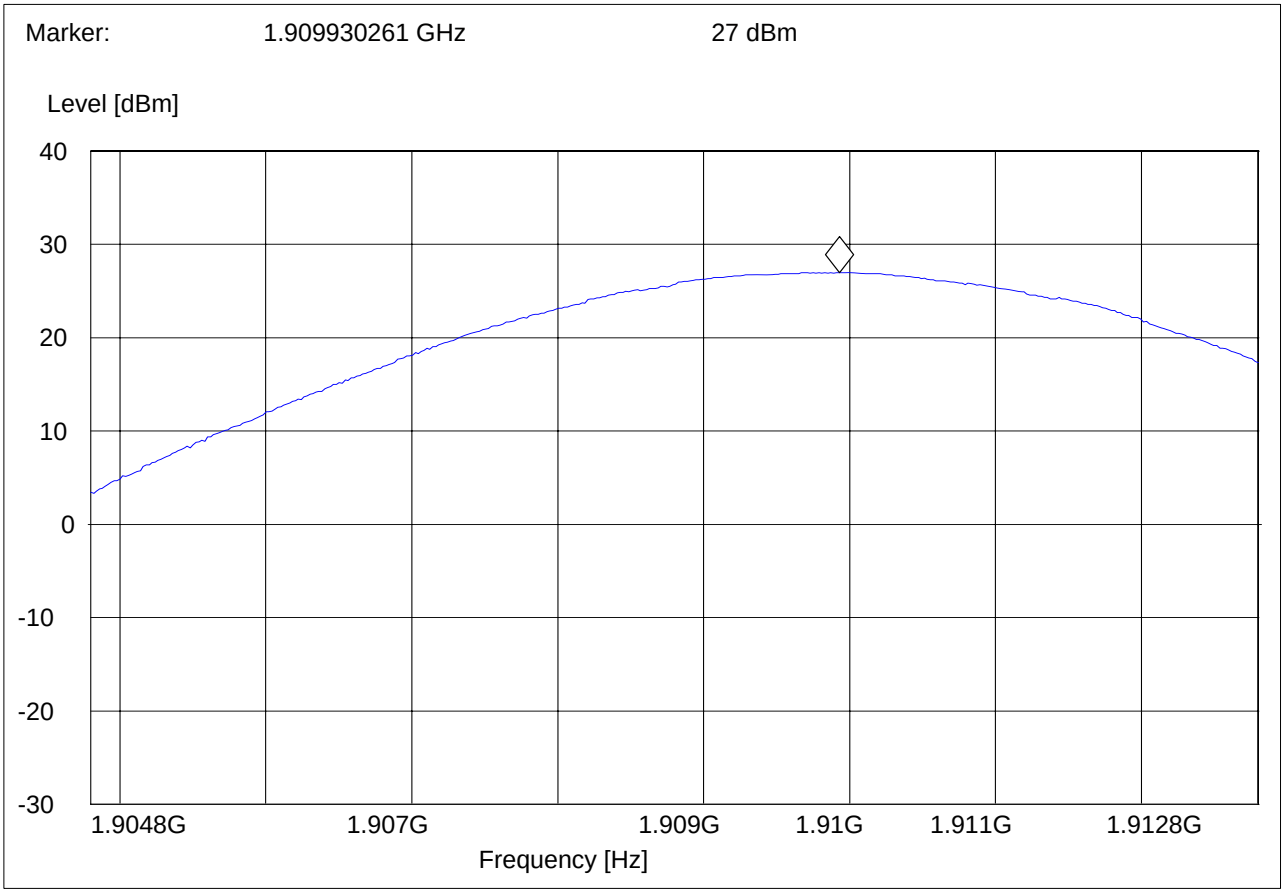


EIRP (PCS-1900) CHANNEL 810 §24.232(b)

```
EUT:             04GU10a
Customer::       BRAEMAR
Test Mode:       GSM 1900
ANT Orientation: H
EUT Orientation: H
Test Engineer:   Chris
Voltage:         int battery
Comments:        TT@ 232°
```

SWEEP TABLE: "EIRP 1900 CH810"

```
Short Description:            EIRP PCS 1900 for channel-810
Start      Stop       Detector  Meas.     IF        Transducer
Frequency  Frequency            Time      Bandw.
1.9 GHz    1.9 GHz    MaxPeak   Coupled   3 MHz     DUMMY-DBM
```



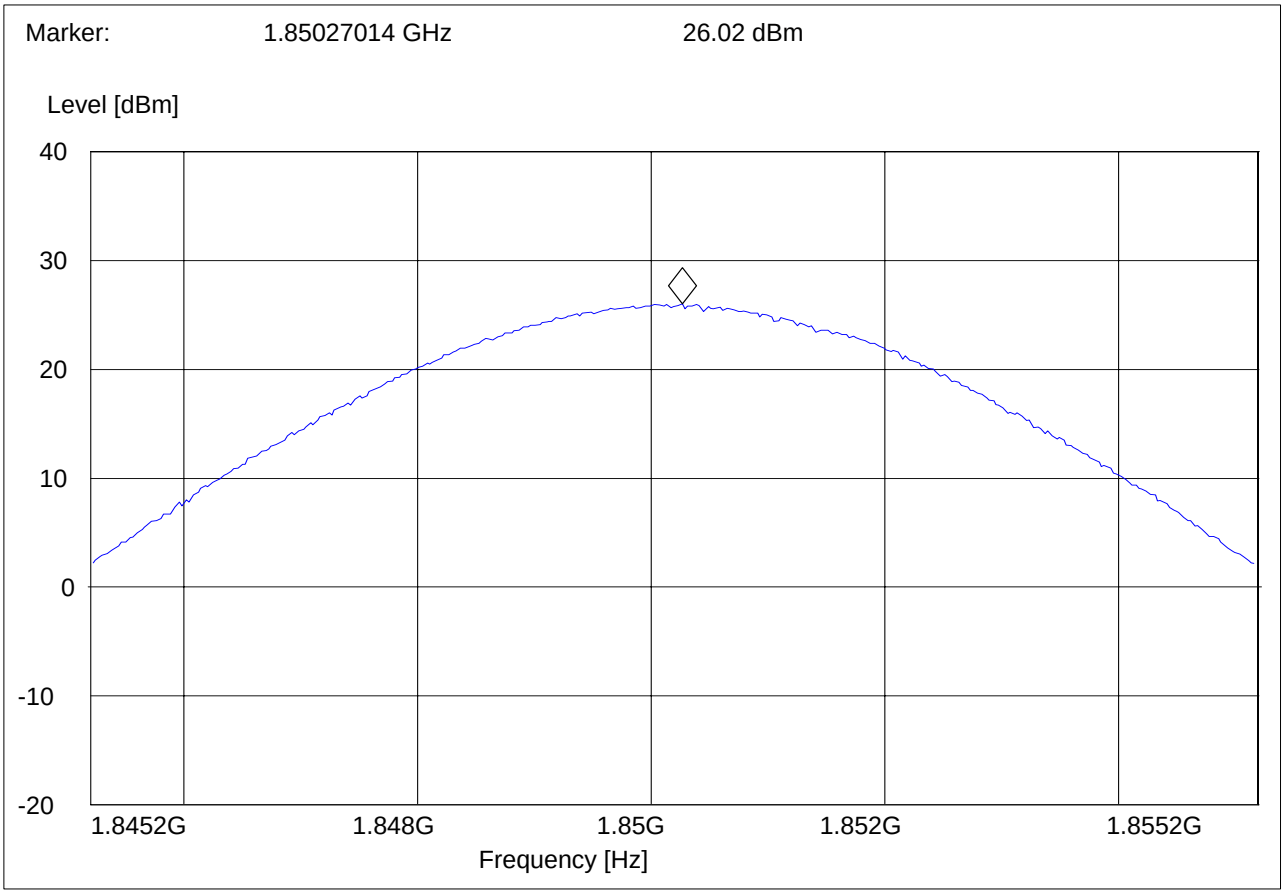
EIRP (EGPRS-1900) CHANNEL 512 §24.232(b)

EUT: 04GU10c
Customer: Breamar
Test Mode: EGPRS 1900
ANT Orientation: V
EUT Orientation: V
Test Engineer: SAM
Voltage: 3.6v
Comments:

SWEEP TABLE: "EIRP 1900 CH512"

Short Description: EIRP PCS 1900 for channel-512

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



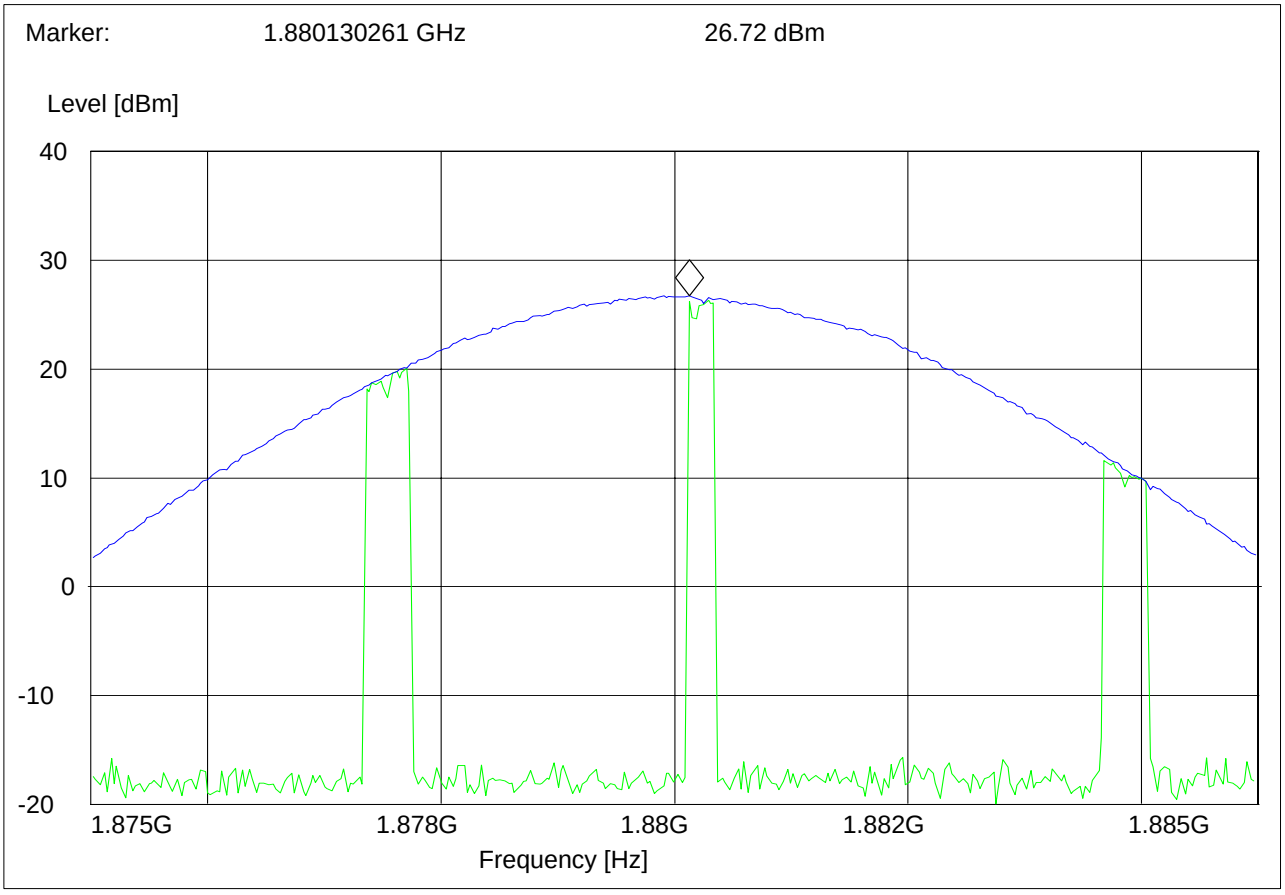
EIRP (EGPRS-1900) CHANNEL 661 §24.232(b)

EUT: 04GU10c
Customer: Breamar
Test Mode: EGPRS 1900
ANT Orientation: V
EUT Orientation: V
Test Engineer: SAM
Voltage: 3.6v
Comments:

SWEEP TABLE: "EIRP 1900 CH661"

Short Description: EIRP PCS 1900 for channel-661

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

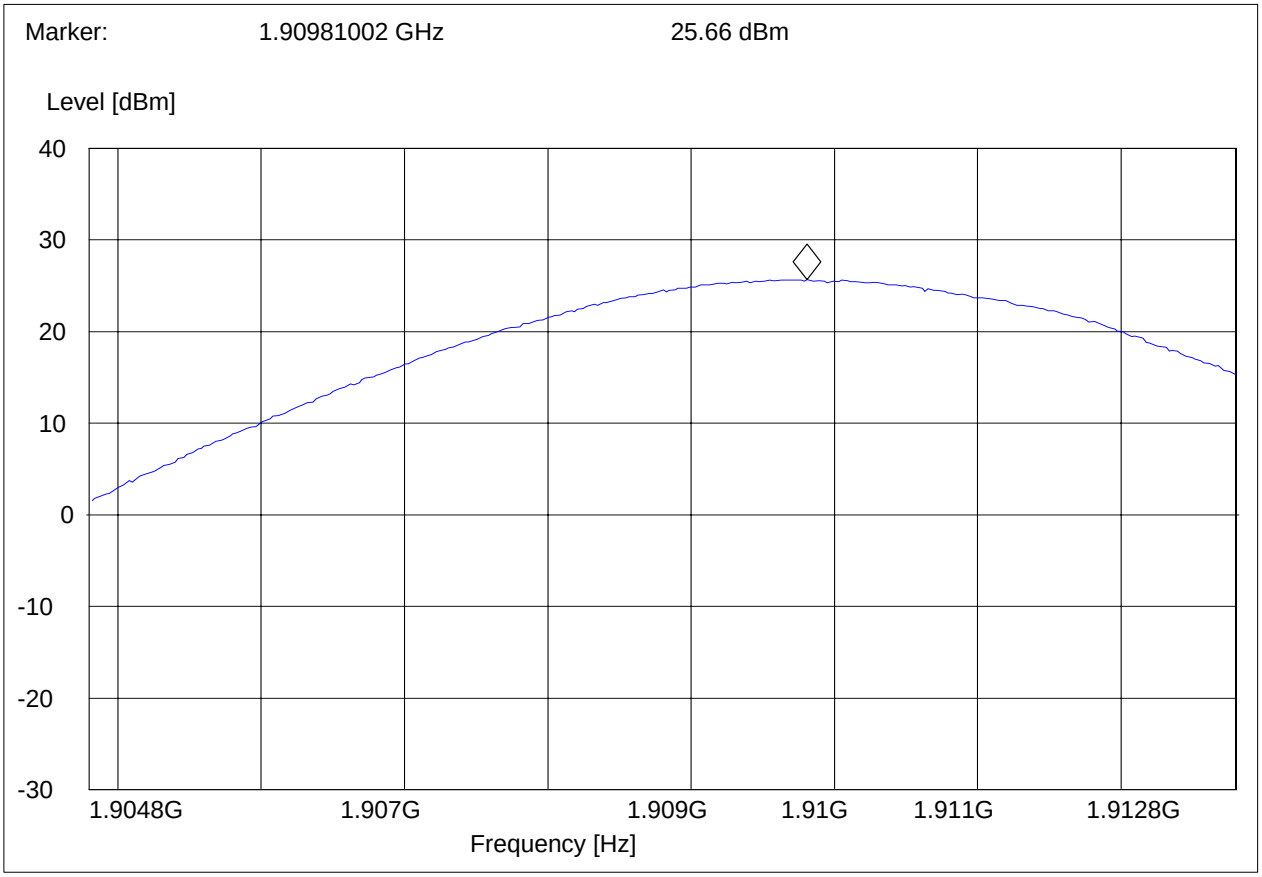


EIRP (EGPRS-1900) CHANNEL 810 §24.232(b)

```
EUT:             04GU10c
Customer::       Breamar
Test Mode:       EGPRS 1900
ANT Orientation: V
EUT Orientation: V
Test Engineer:   SAM
Voltage:         3.6v
Comments:
```

SWEEP TABLE: "EIRP 1900 CH810"

```
Short Description:            EIRP PCS 1900 for channel-810
Start      Stop       Detector  Meas.     IF        Transducer
Frequency  Frequency            Time      Bandw.
1.9 GHz    1.9 GHz    MaxPeak   Coupled   3 MHz     DUMMY-DBM
```



5.2 Spurious Emissions Radiated

5.2.1 FCC 2.1053 Measurements required: Field strength of spurious radiation.

(a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission.

5.2.2 Limits:

5.2.2.1 FCC 22.917 Emission limitations for cellular equipment.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

(a) *Out of band emissions*. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.2.2.2 FCC 24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

(a) *Out of band emissions*. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

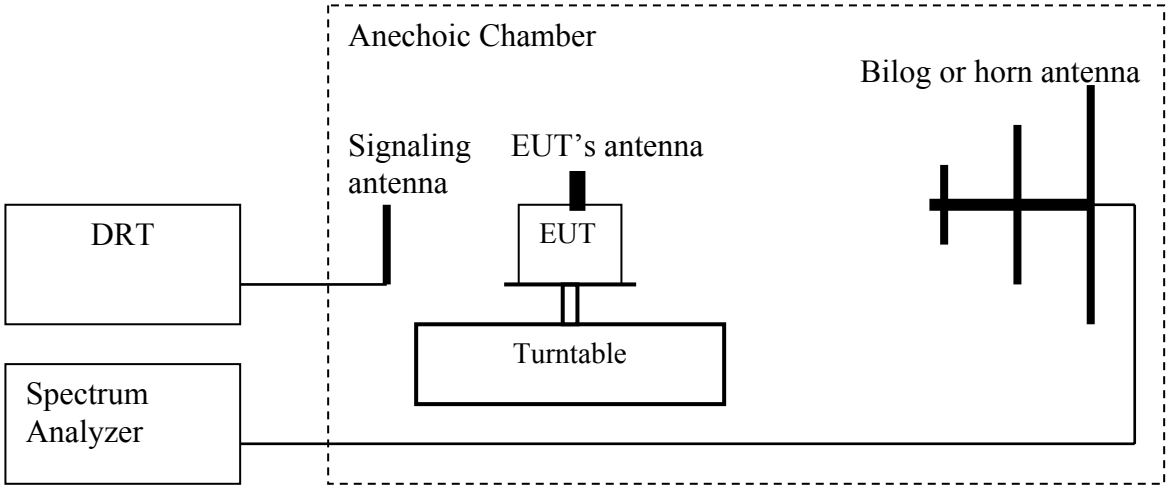
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the

carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.2.3 Radiated out of band measurement procedure:

Based on TIA-603C 2004

2.2.12 Unwanted emissions: Radiated Spurious



1. Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure peak hold with the required settings.
4. Place the measurement antenna in a horizontal orientation. Rotate the EUT 360°. Raise the measurement antenna up to 4 meters in 0.5 meters increments and rotate the EUT 360° at each height to maximize all emissions. Measure and record all spurious emissions (**LVL**) up to the tenth harmonic of the carrier frequency.
5. Replace the EUT with a horizontally polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS)**. **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the level of spurious emissions using the following equation: **Spurious** (dBm) = **LVL** (dBm) + **LOSS** (dB):
8. Repeat steps 4, 5 and 6 with all antennas vertically polarized.
9. Determine the level of spurious emissions using the following equation: **Spurious** (dBm) = **LVL** (dBm) + **LOSS** (dB):
10. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

(**note:** Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4 and 7 above are performed with test software.)

Spectrum analyzer settings:
Res B/W: 1 MHz
Vid B/W: 1 MHz

Measurement Survey:

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the GSM-850 & PCS-1900 bands. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the GSM-850 & PCS-1900 band into any of the other blocks respectively. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

Radiated emission measurements were made only with Circuit Switched mode GMSK modulation because this mode represents the worse case emission for all the modulations for GSM. See section 5.5.4.1 and 5.5.4.3

Radiated emissions measurements were made also with UMTS FDD mode. See section 5.5.4.2 and 5.5.4.4

5.2.4 Radiated out of band emissions results on EUT:

5.2.4.1 Test Results Transmitter Spurious Emission GSM850:

Harmonics	Tx ch-128 Freq. (MHz)	Level (dBm)	Tx ch-190 Freq. (MHz)	Level (dBm)	Tx ch-251 Freq. (MHz)	Level (dBm)
2	**1648.4**	NF	**1673.2**	NF	**1697.6**	NF
3	**2472.6**	NF	**2509.8**	NF	**2546.4**	NF
4	**3296.8**	NF	**3346.4**	NF	**3395.2**	NF
5	**4121**	NF	**4183**	NF	**4244**	NF
6	**4945.2**	NF	**5019.6**	NF	**5092.8**	NF
7	**5769.4**	NF	**5856.2**	NF	**5941.6**	NF
8	**6593.6**	NF	**6692.8**	NF	**6790.4**	NF
9	**7417.8**	NF	**7529.4**	NF	**7639.2**	NF
10	**8242**	NF	**8366**	NF	**8488**	NF
NF = NOISE FLOOR						

RADIATED SPURIOUS EMISSIONS (GSM-850) TX: 30MHz - 1GHz
Spurious emission limit –13dBm
Antenna: vertical

Note:

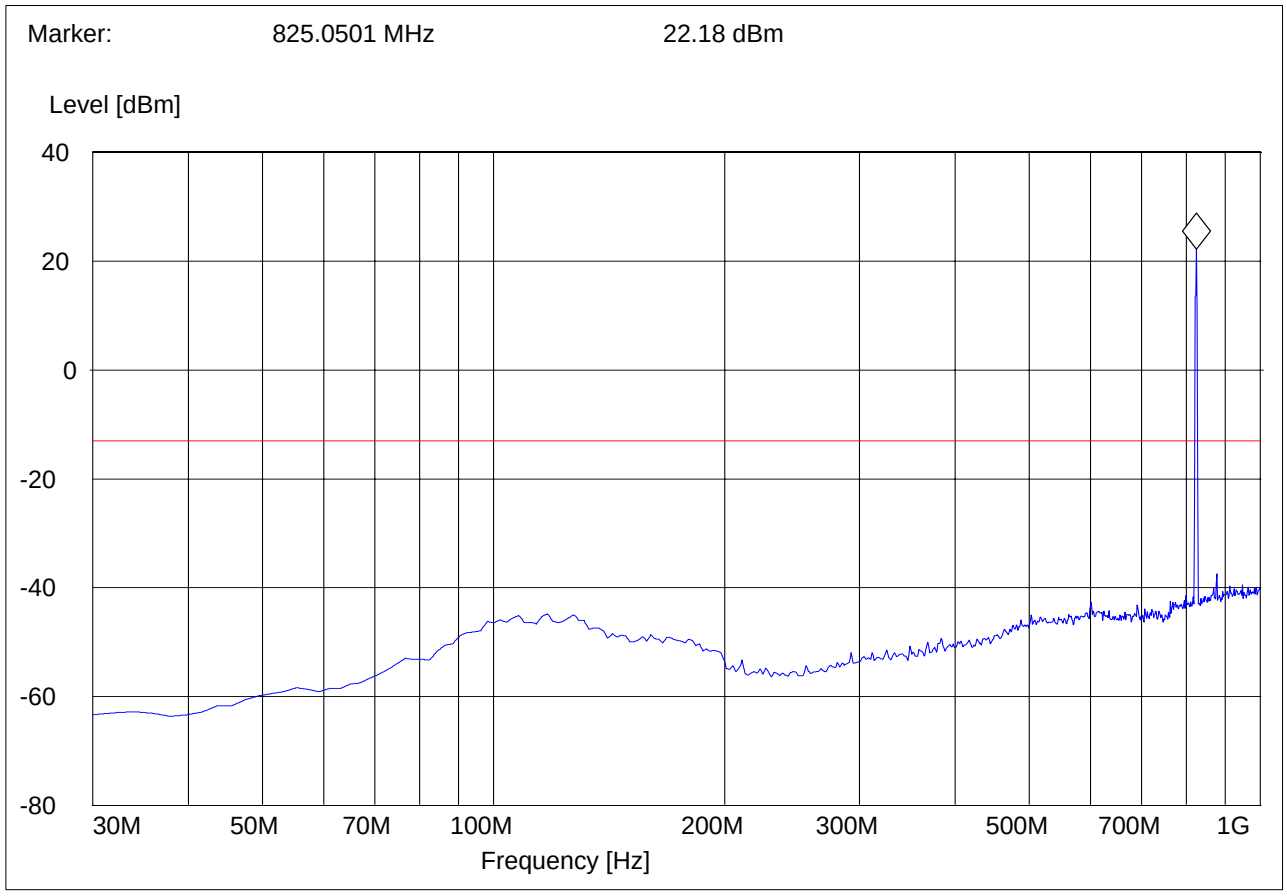
1.The peak above the limit line is the carrier freq.

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

```
EUT:             04GU10b / C01
Customer:        Braemar
Test Mode:       GSM 850 CH 128
ANT Orientation: V
EUT Orientation: V
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

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

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

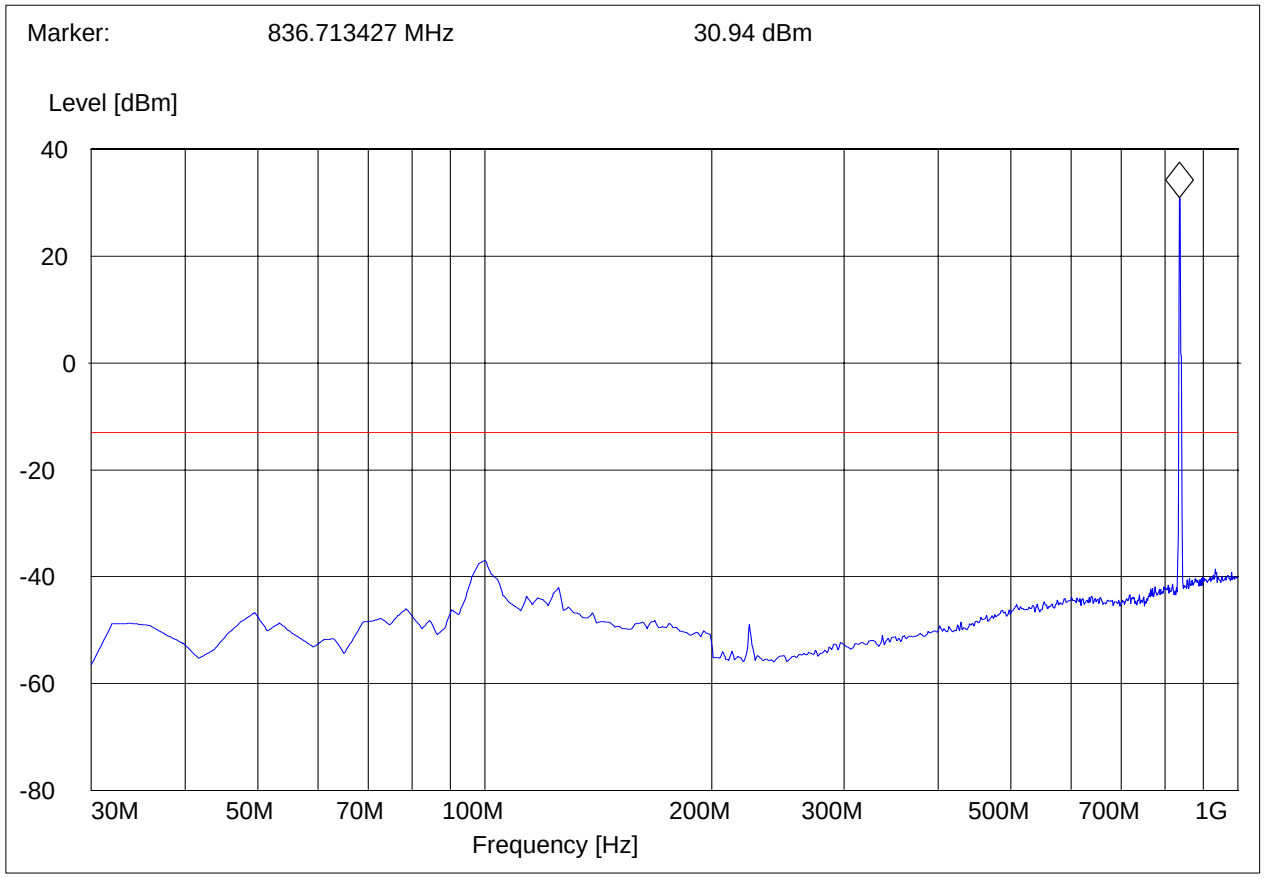


RADIATED SPURIOUS EMISSIONS (GSM-850)TX: 30MHz - 1GHz

```
EUT:              04GU10b / C01
Customer::        Braemar
Test Mode:        GSM 850 CH 190
ANT Orientation:  V
EUT Orientation:  V
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

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

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

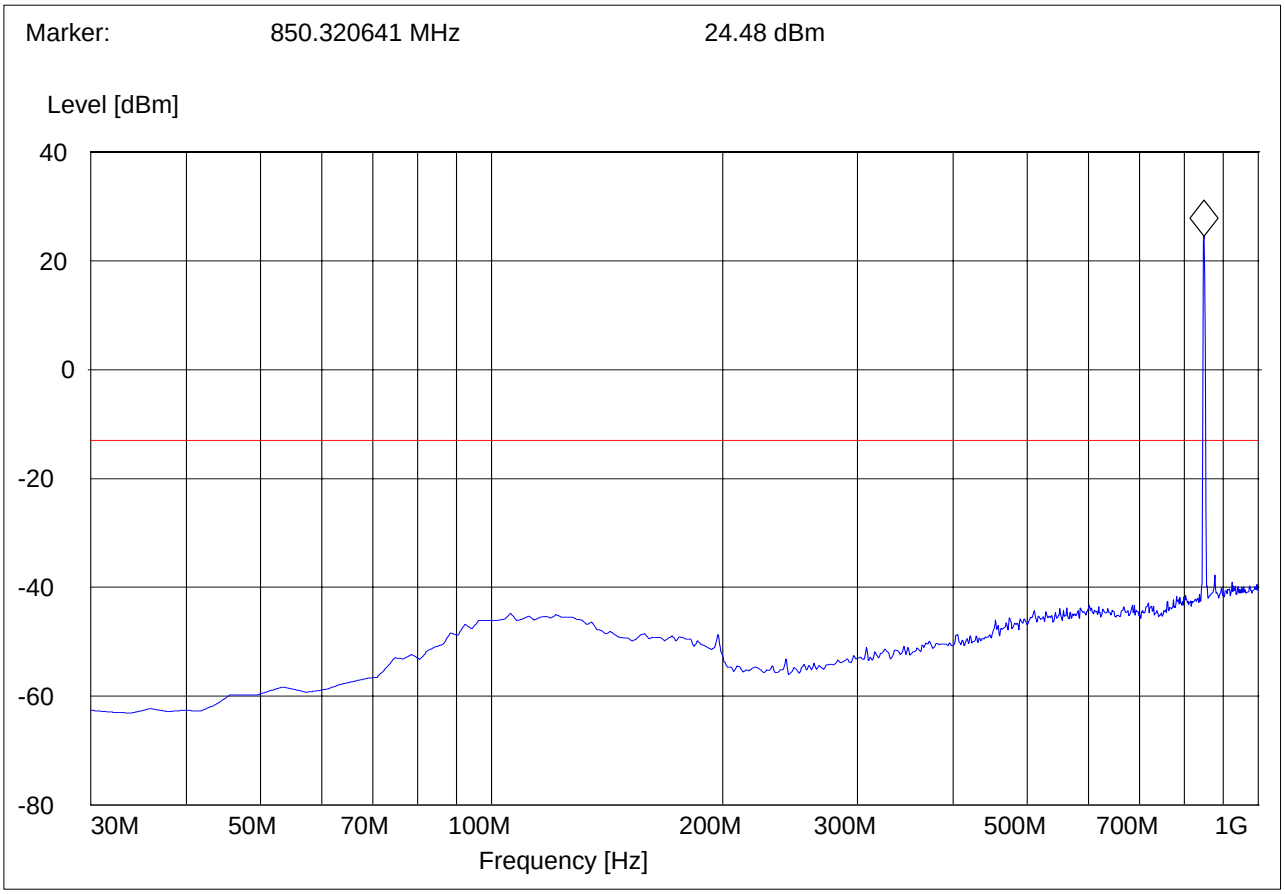


RADIATED SPURIOUS EMISSIONS (GSM-850)TX: 30MHz - 1GHz

```
EUT:              04GU10b / C01
Customer:         Braemar
Test Mode:        GSM 850 CH 251
ANT Orientation:  V
EUT Orientation:  V
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

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

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM



RADIATED SPURIOUS EMISSIONS (GSM-850) TX: 30MHz - 1GHz
Spurious emission limit –13dBm
Antenna: Horizontal

Note:

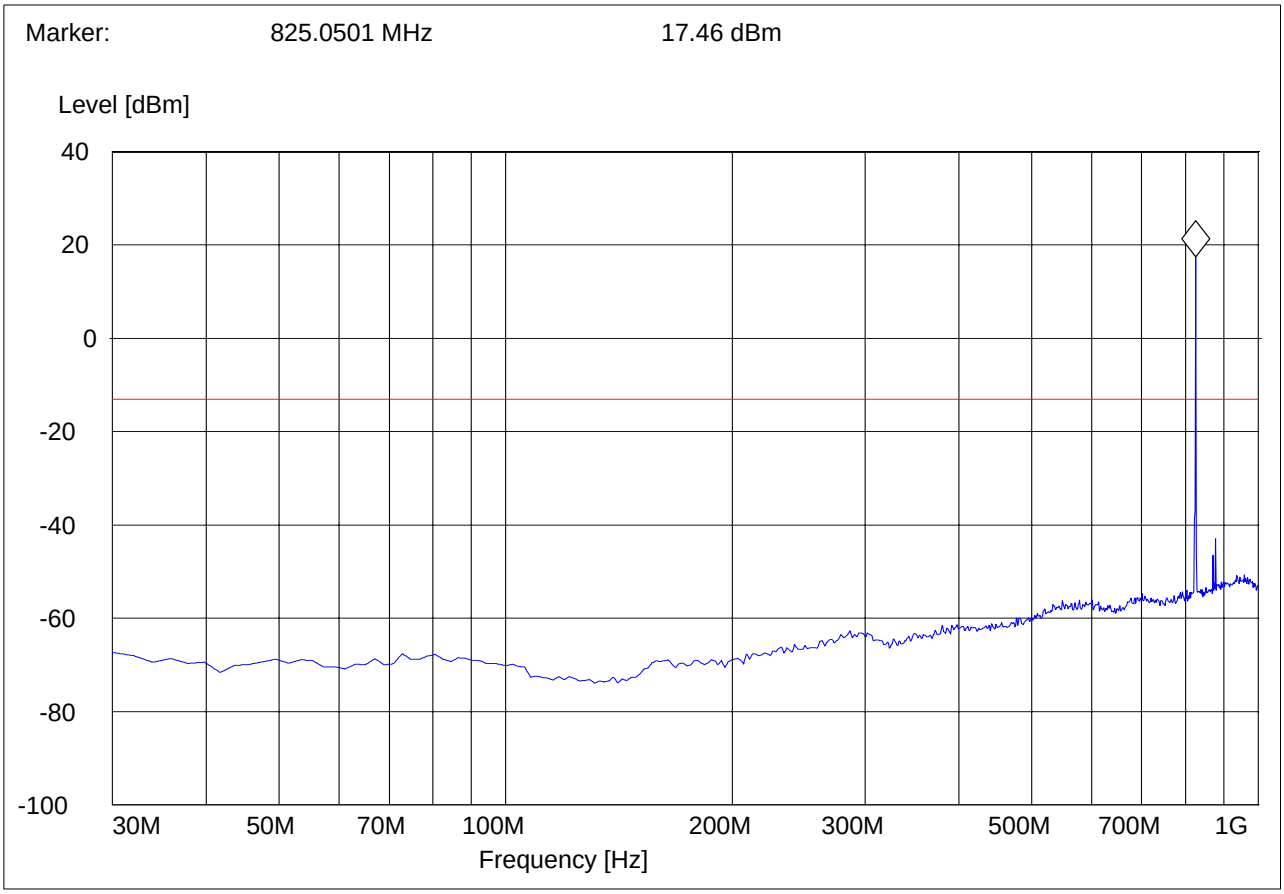
1.The peak above the limit line is the carrier freq.

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

```
EUT:             04GU10b / C01
Customer:        Braemar
Test Mode:       GSM 850 CH 128
ANT Orientation: H
EUT Orientation: V
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

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

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	DUMMY-DBM

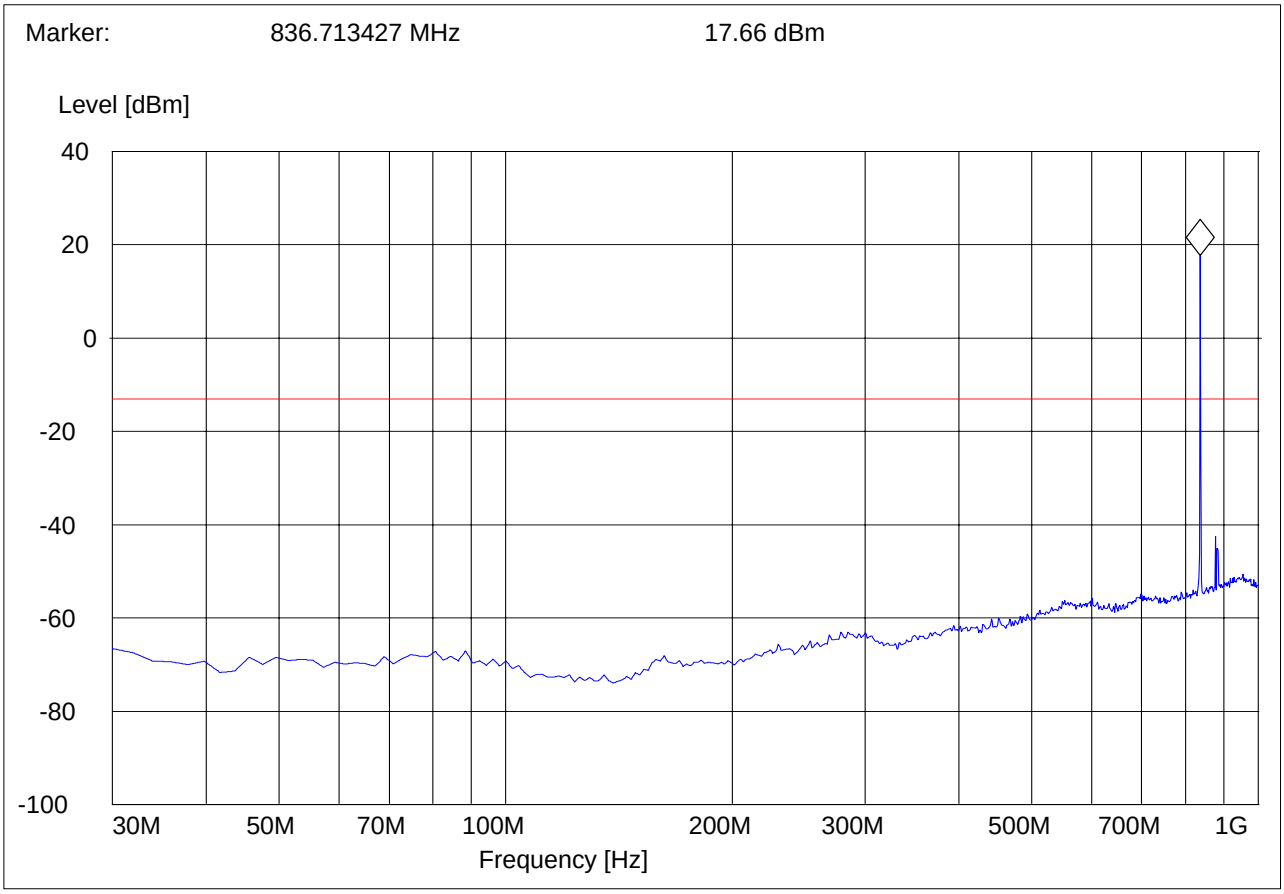


RADIATED SPURIOUS EMISSIONS (GSM-850) TX: 30MHz - 1GHz

```
EUT:              04GU10b / C01
Customer:         Braemar
Test Mode:        GSM 850 CH 190
ANT Orientation:  H
EUT Orientation:  V
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

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

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	DUMMY-DBM

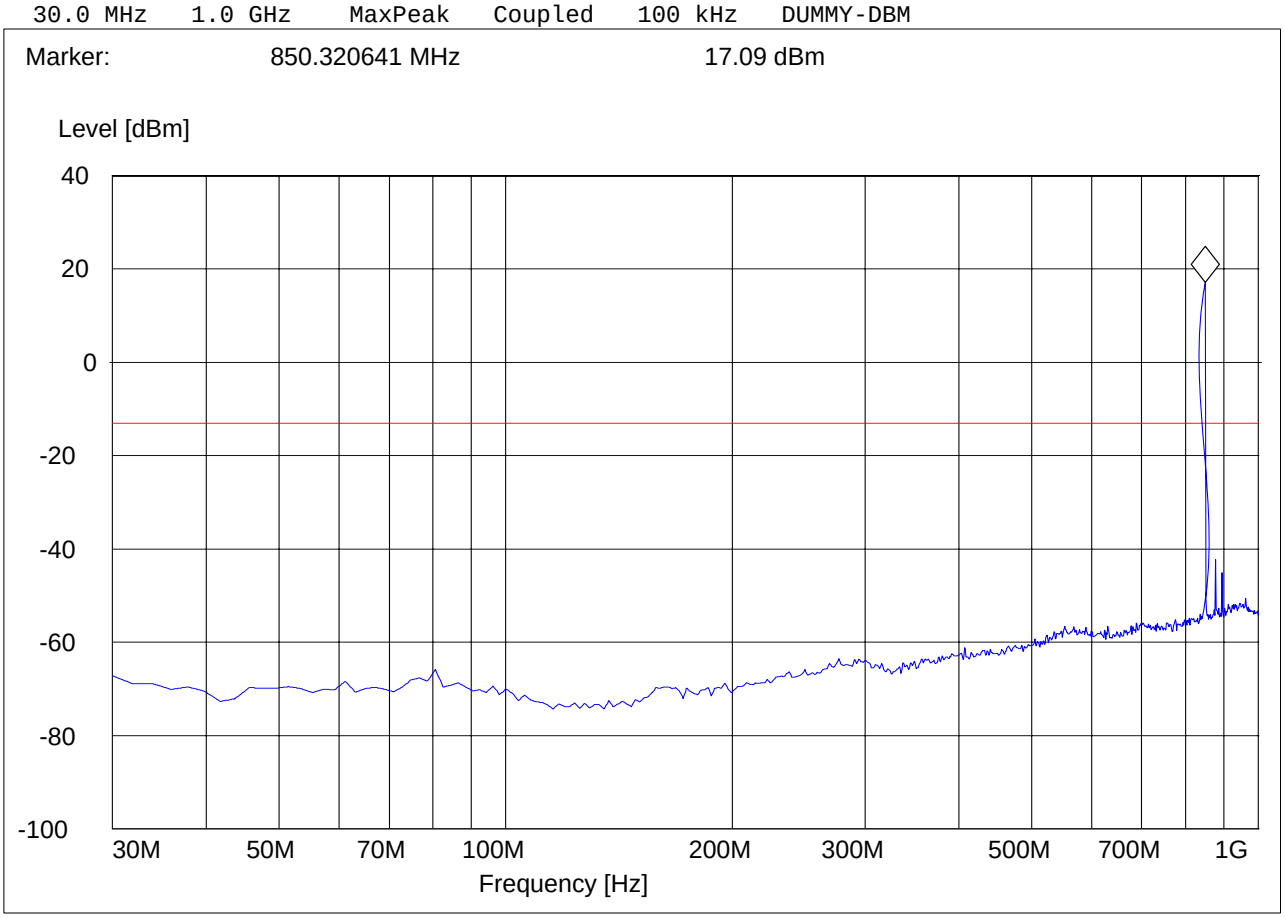


RADIATED SPURIOUS EMISSIONS (GSM-850) TX: 30MHz - 1GHz

```
EUT:              04GU10b / C01
Customer::        Braemar
Test Mode:        GSM 850 CH 251
ANT Orientation:  H
EUT Orientation:  V
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

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

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	DUMMY-DBM

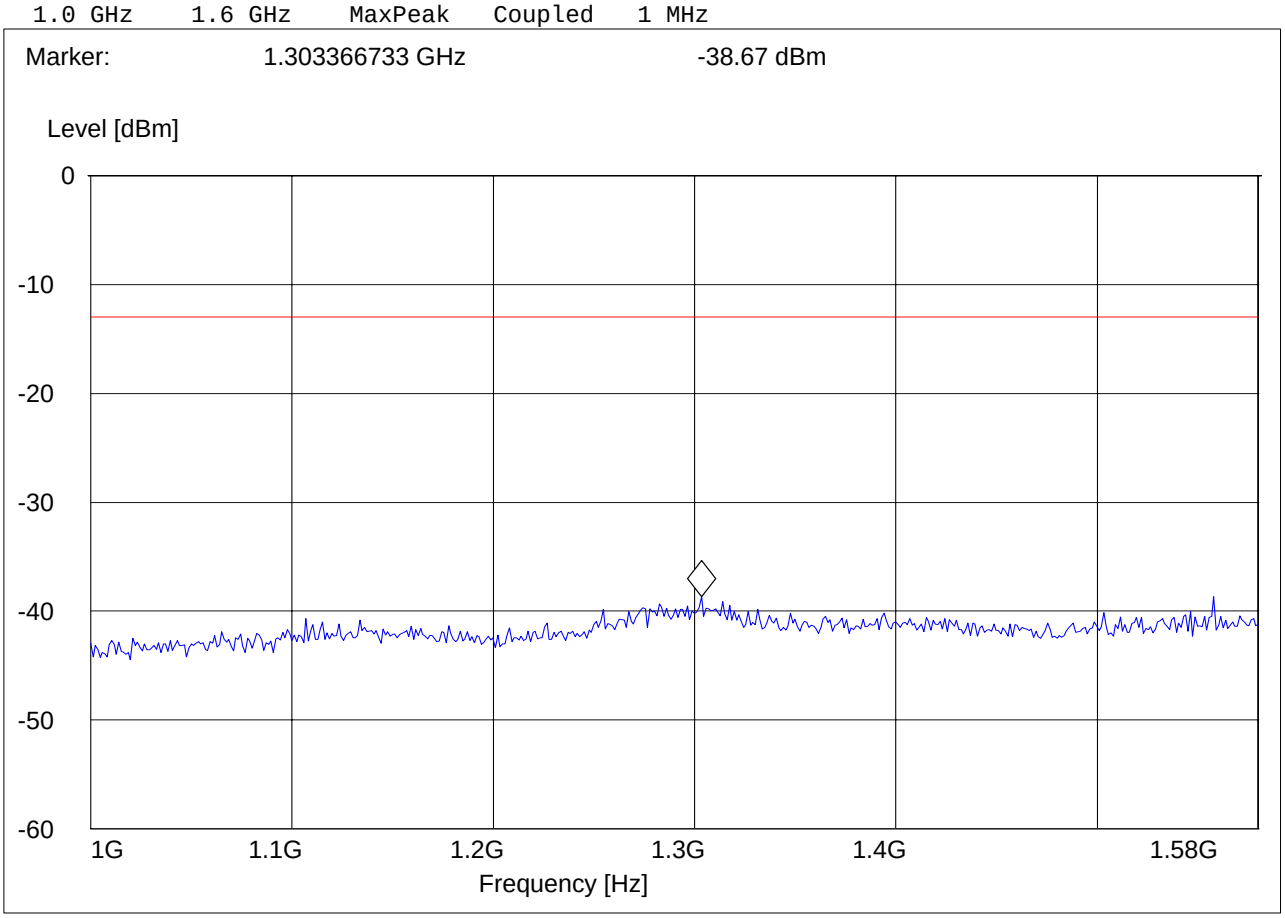


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 128: 1GHz – 1.58GHz

```
EUT:              04GU10a
Customer:         BRAEMAR
Test Mode:        GSM 850 CH 128
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz	

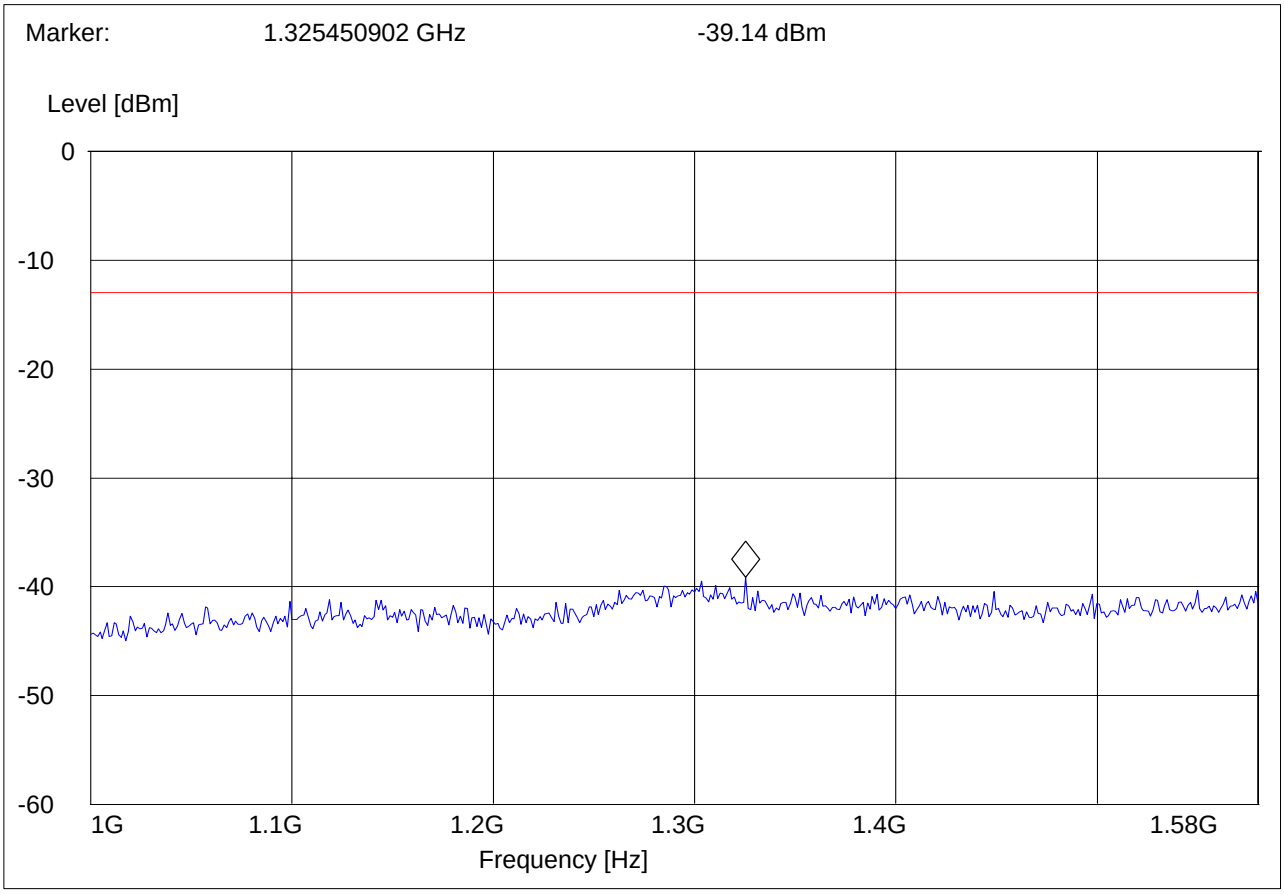


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 190: 1GHz – 1.58GHz

```
EUT:             04GU10a
Customer:        BRAEMAR
Test Mode:       GSM 850 CH 190
ANT Orientation: H
EUT Orientation: H
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

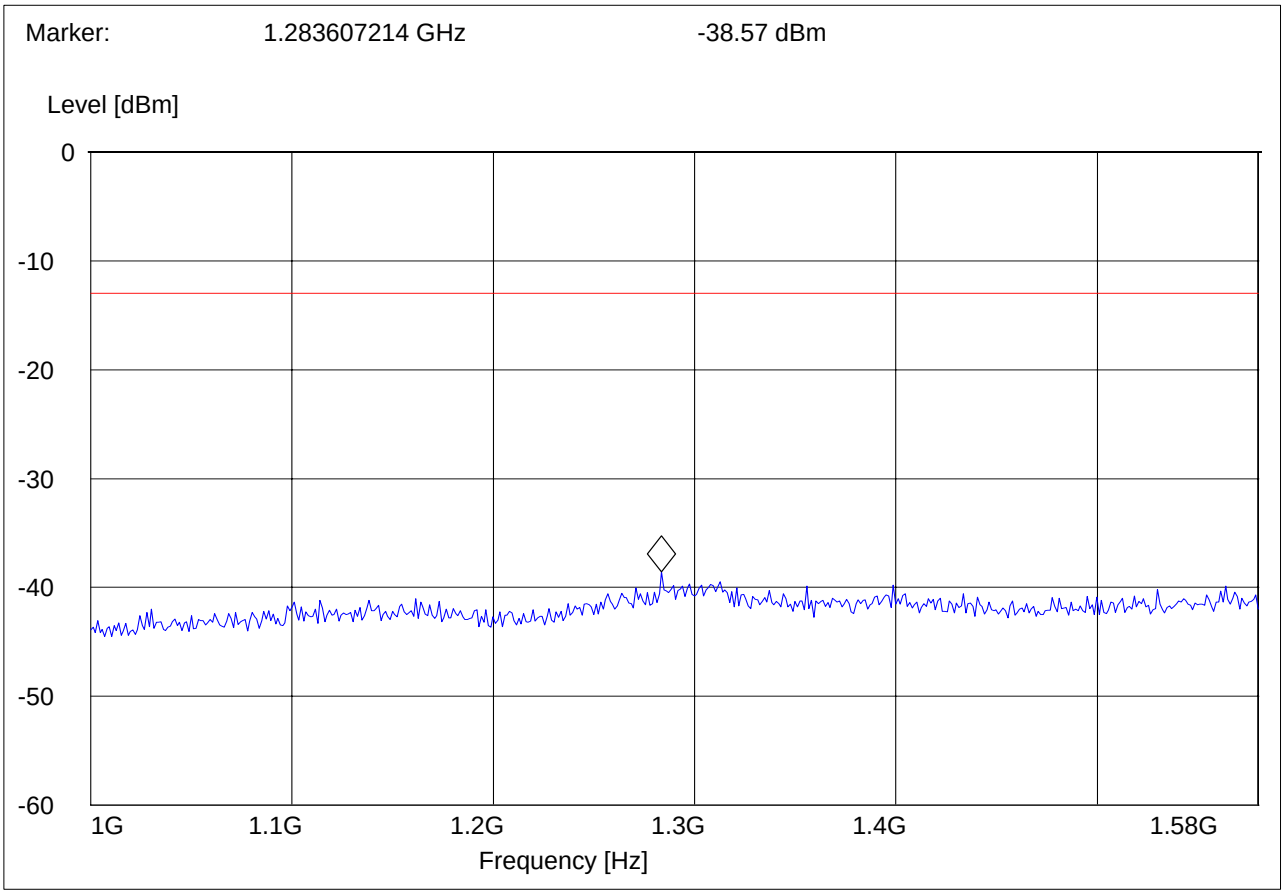


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 251: 1GHz – 1.58GHz

```
EUT:              04GU10a
Customer:         BRAEMAR
Test Mode:        GSM 850 CH 251
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

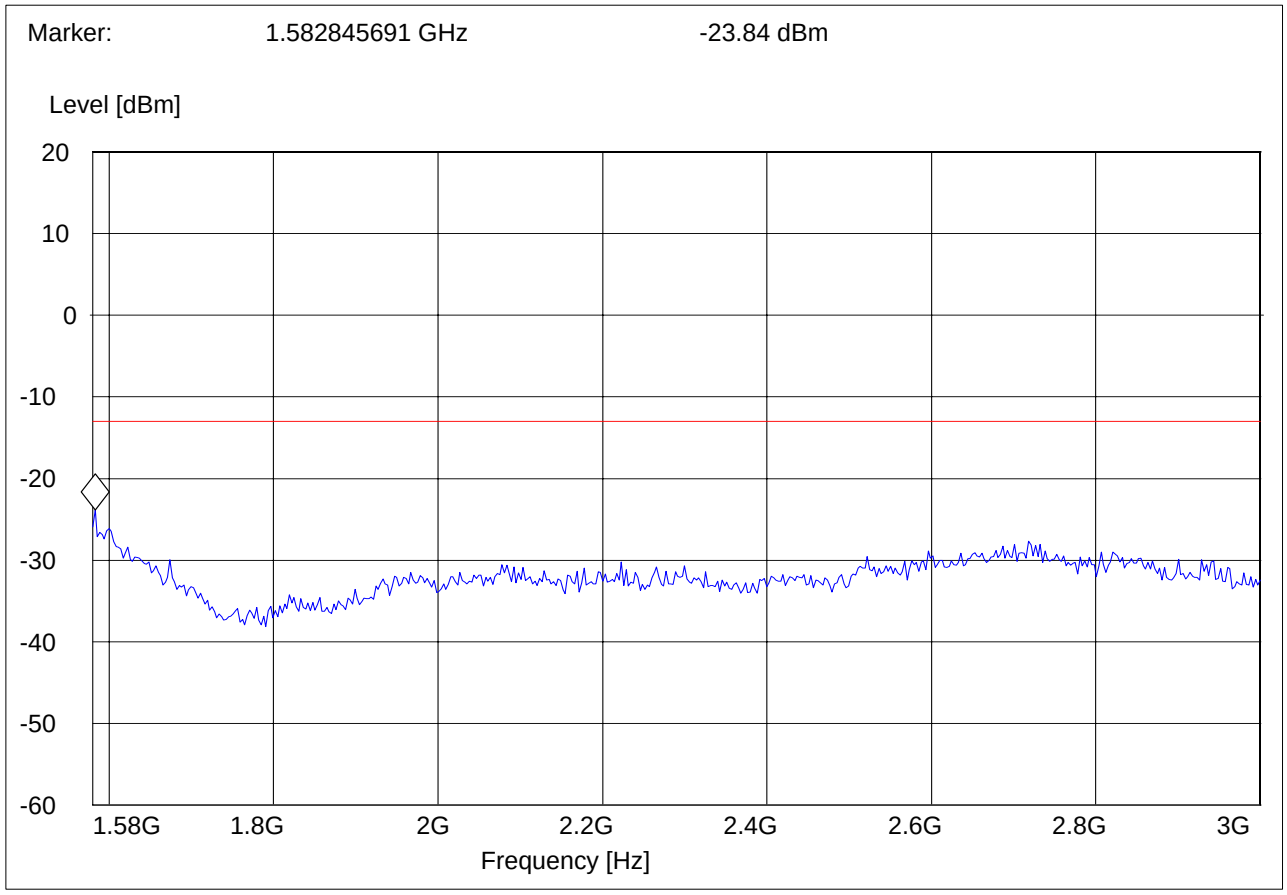


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 128: 1.58GHz – 3GHz

```
EUT:              04GU10a
Customer:         BRAEMAR
Test Mode:        GSM 850 CH 128
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

SWEEP TABLE: "FCC 22Spuri 1.58-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

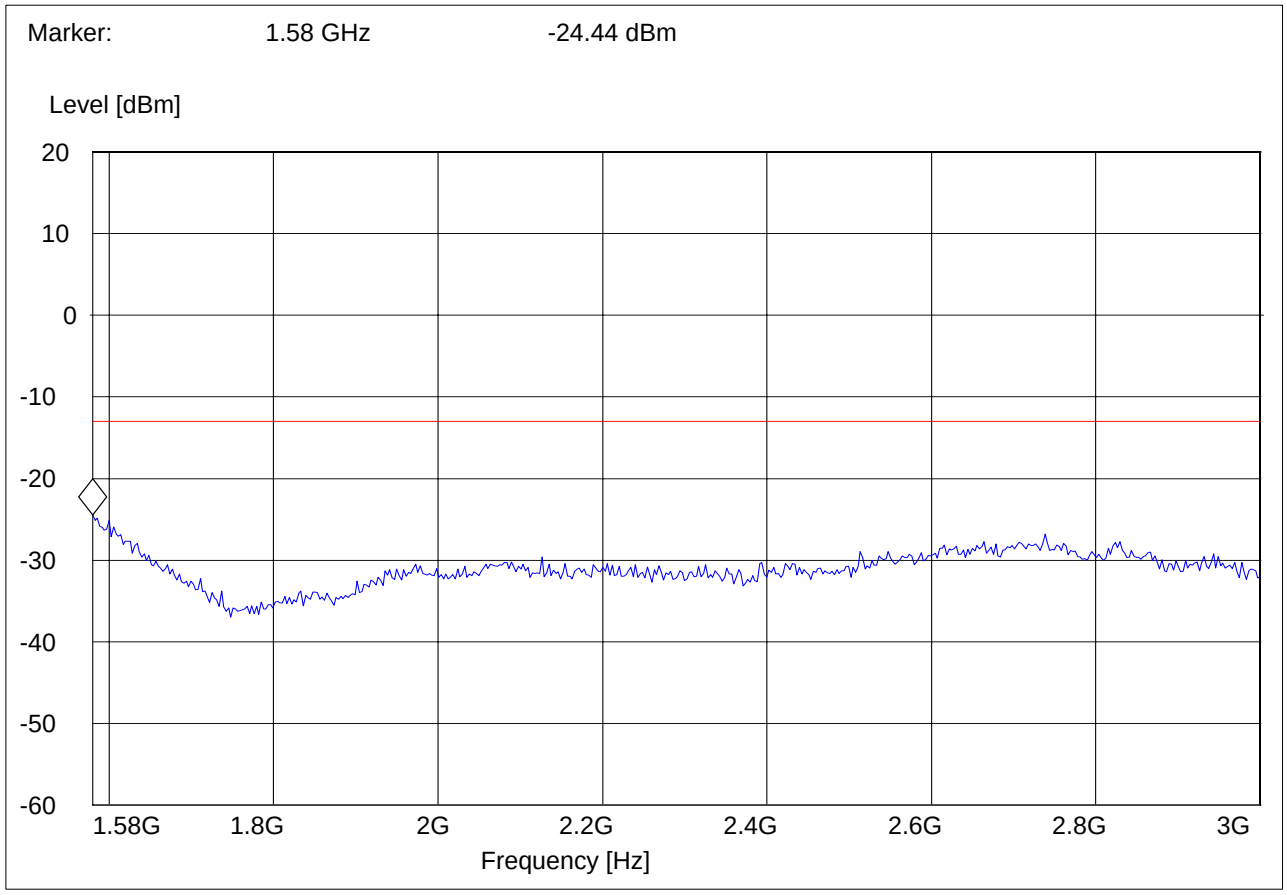


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 190: 1.58GHz – 3GHz

```
EUT:              04GU10a
Customer:         BRAEMAR
Test Mode:        GSM 850 CH 190
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

SWEEP TABLE: "FCC 22Spuri 1.58-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

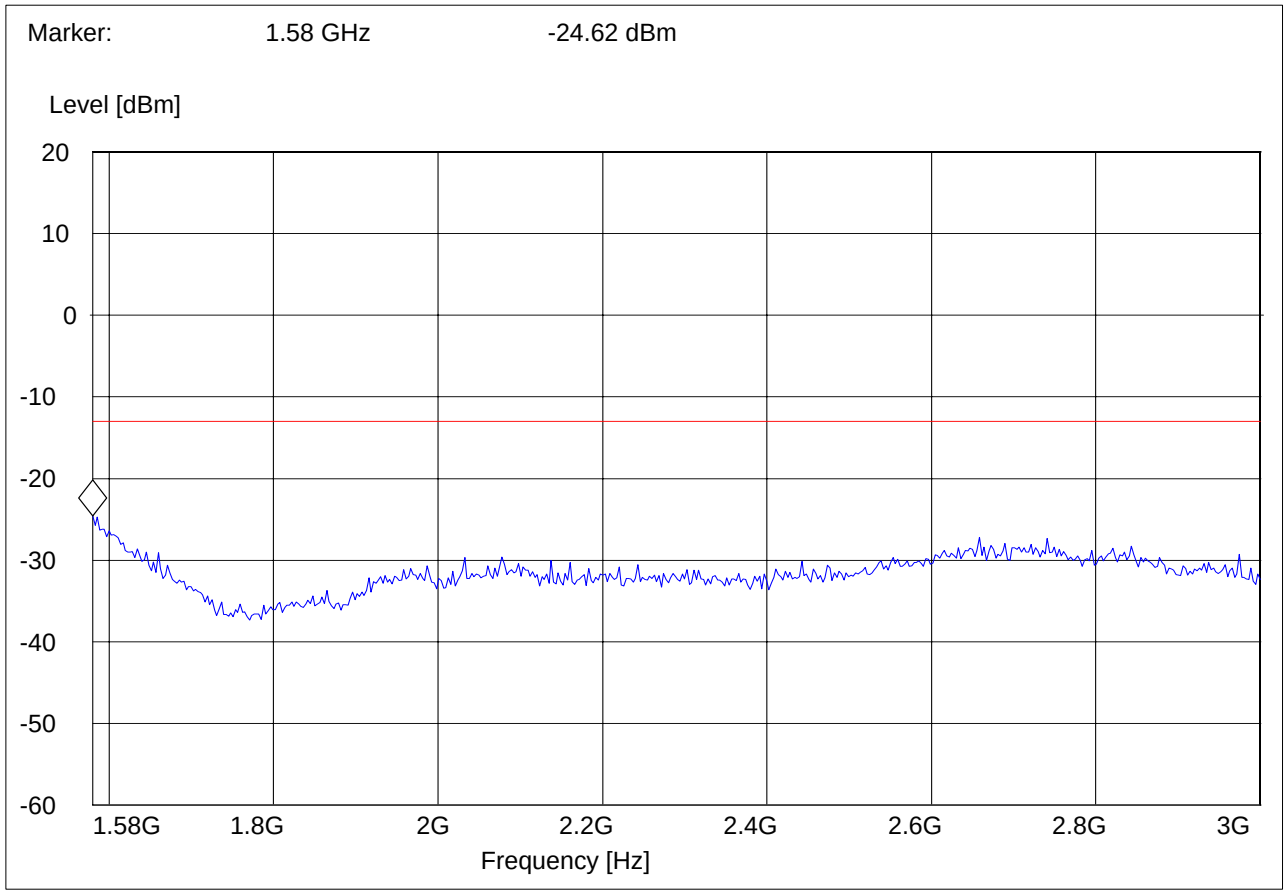


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 251: 1.58GHz – 3GHz

```
EUT:             04GU10a
Customer:        BRAEMAR
Test Mode:       GSM 850 CH 251
ANT Orientation: H
EUT Orientation: H
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

SWEEP TABLE: "FCC 22Spuri 1.58-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

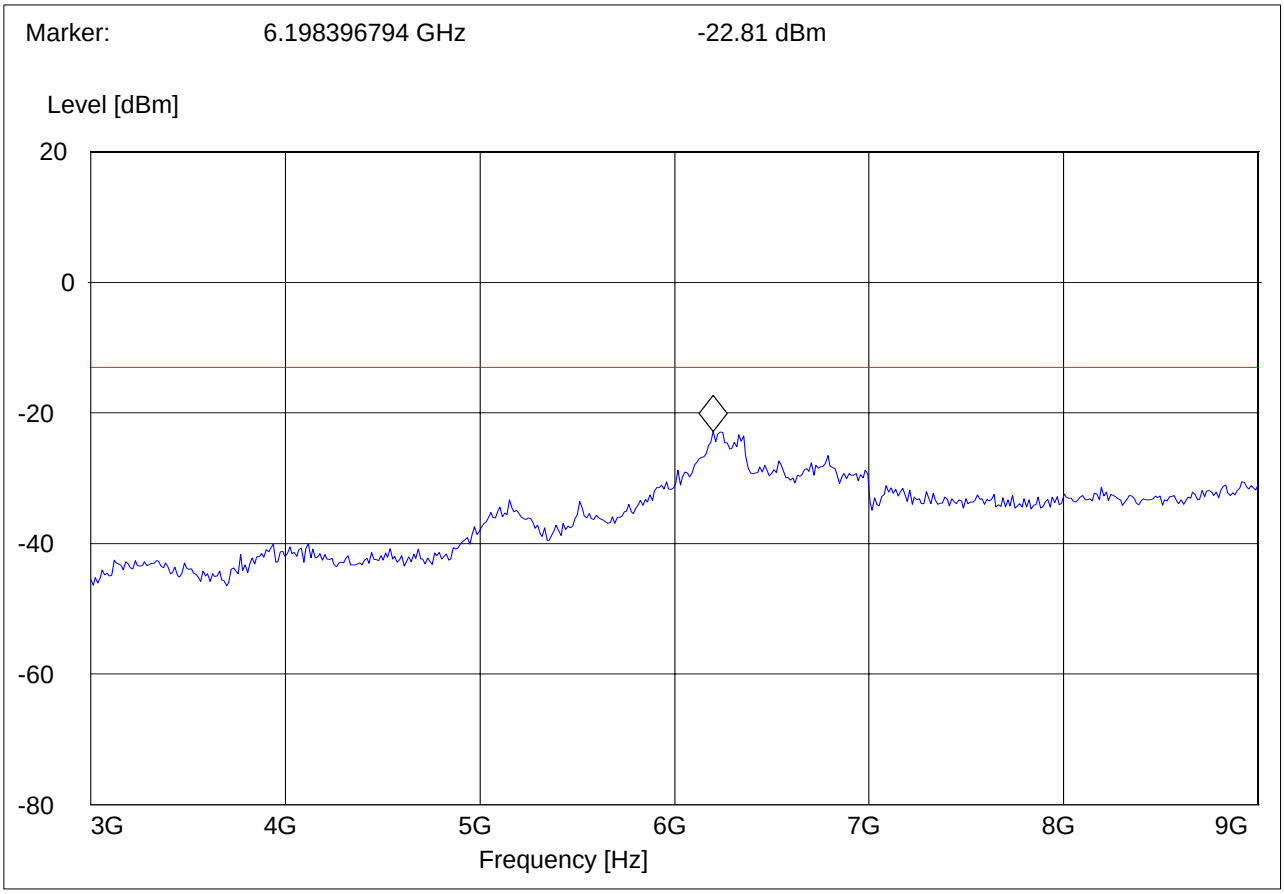


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 128: 3GHz – 9GHz

```
EUT:              04GU10a
Customer:         BRAEMAR
Test Mode:        GSM 850 CH 128
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

SWEEP TABLE: "FCC 22Spuri 3-9G"

```
  Short Description:            FCC  24 1GHz-8GHz
  Start      Stop       Detector  Meas.     IF        Transducer
  Frequency  Frequency            Time      Bandw.
  3.0 GHz    9.0 GHz    MaxPeak   Coupled   1 MHz     DUMMY-DBM
```

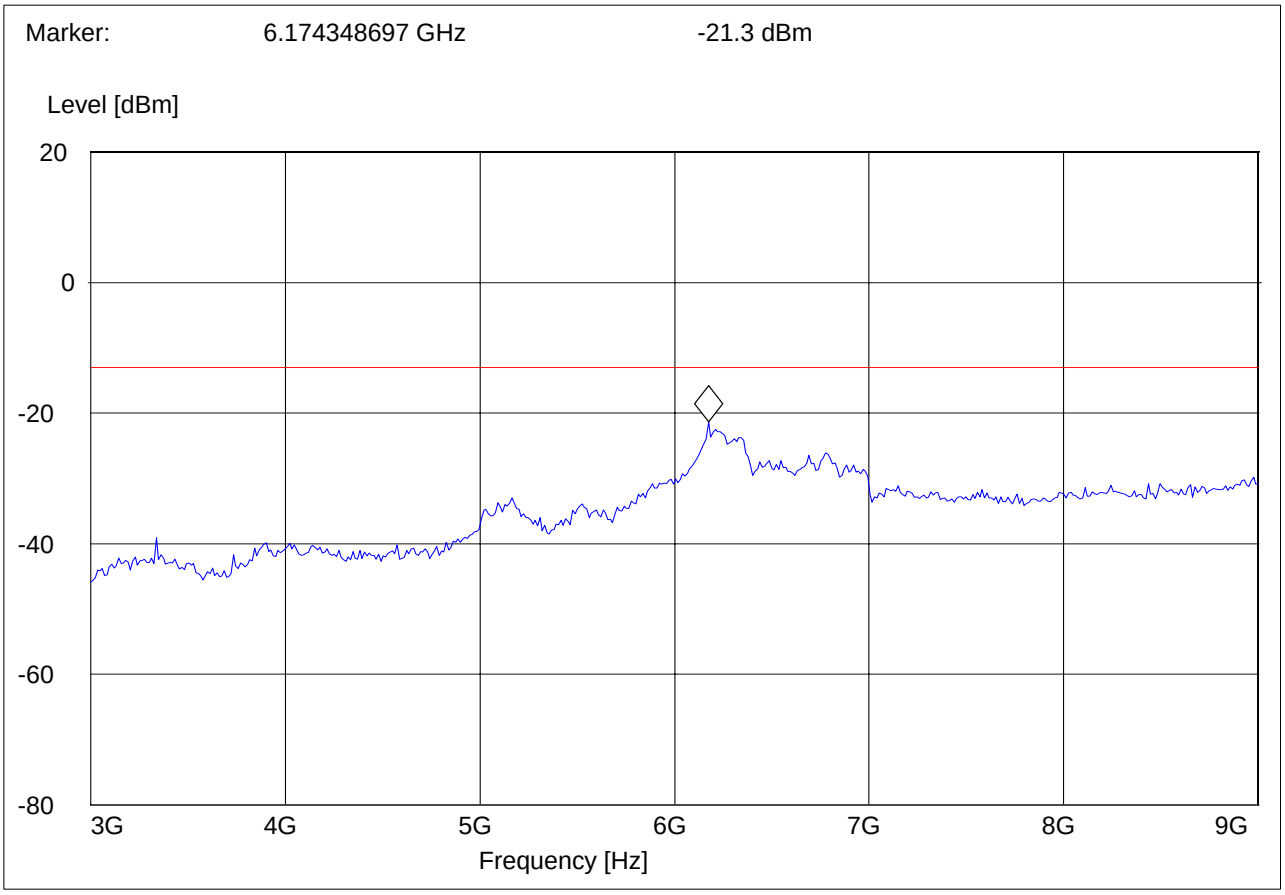


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 190: 3GHz – 9GHz

```
EUT:              04GU10a
Customer:         BRAEMAR
Test Mode:        GSM 850 CH 190
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

SWEEP TABLE: "FCC 22Spuri 3-9G"

```
Short Description:              FCC  24 1GHz-8GHz
Start       Stop        Detector  Meas.      IF         Transducer
Frequency   Frequency             Time       Bandw.
3.0 GHz     9.0 GHz     MaxPeak   Coupled    1 MHz      DUMMY-DBM
```

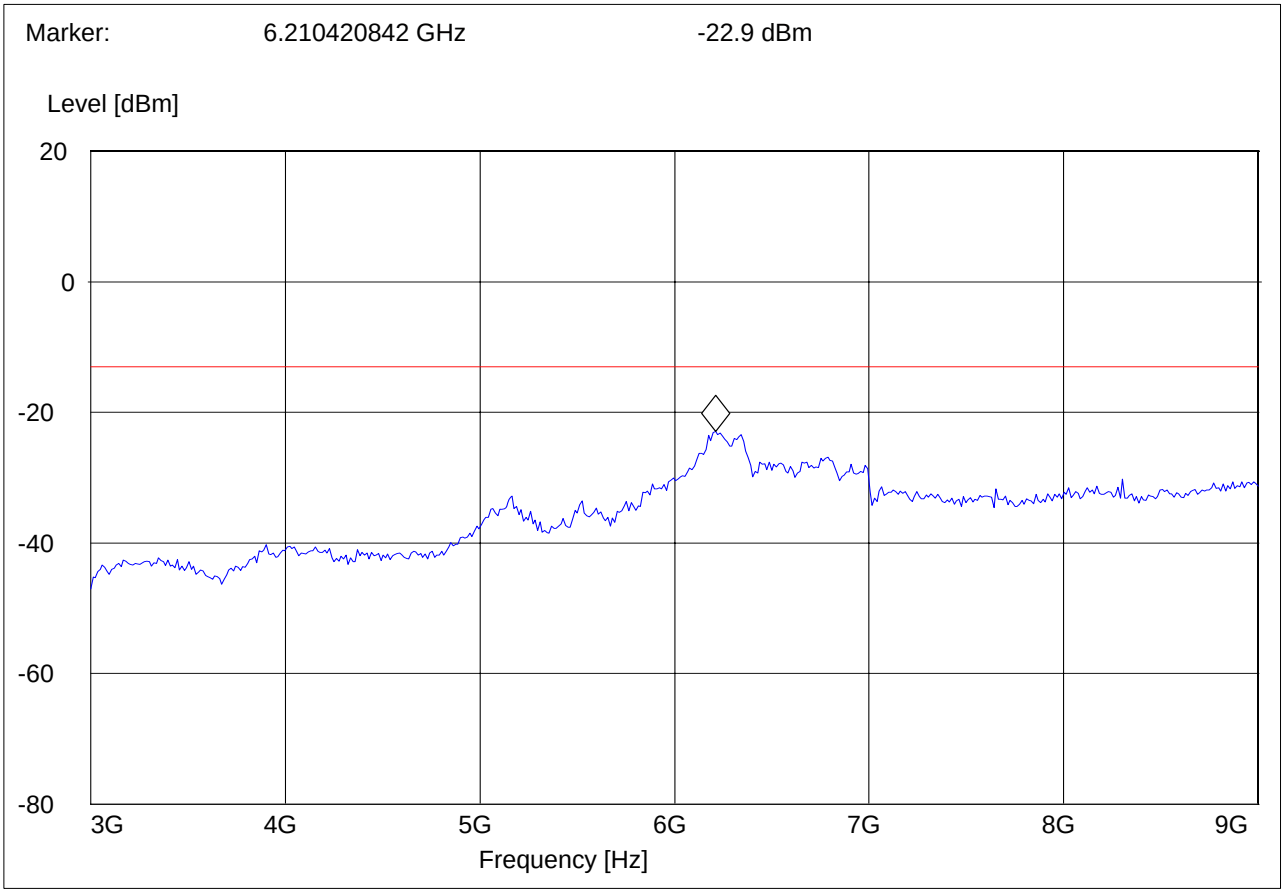


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 251: 3GHz – 9GHz

```
EUT:              04GU10a
Customer:         BRAEMAR
Test Mode:        GSM 850 CH 251
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

SWEEP TABLE: "FCC 22Spuri 3-9G"

```
Short Description:              FCC  24 1GHz-8GHz
Start       Stop        Detector  Meas.     IF         Transducer
Frequency   Frequency             Time      Bandw.
3.0 GHz     9.0 GHz     MaxPeak   Coupled   1 MHz      DUMMY-DBM
```



5.2.4.2 Test Results Transmitter Spurious Emission PCS-1900:

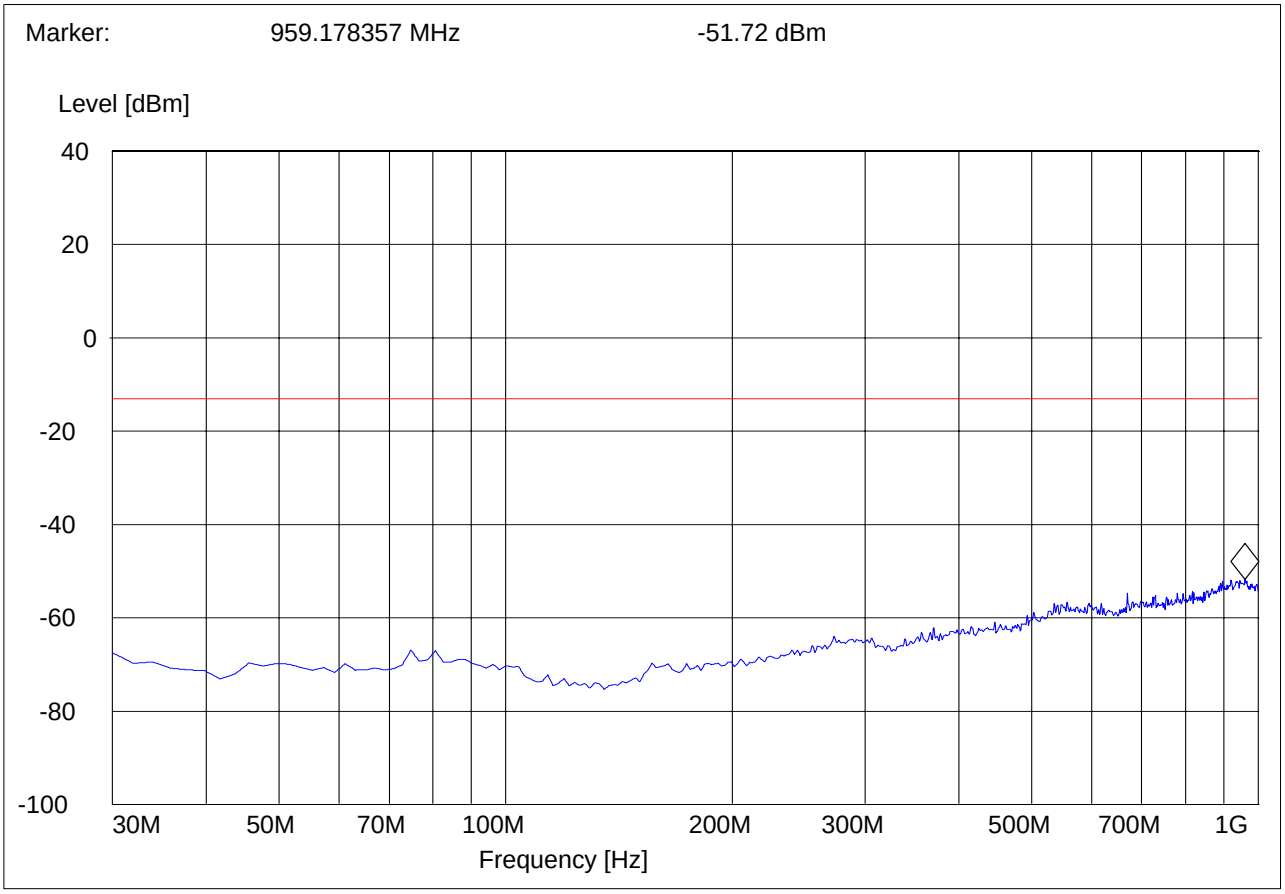
Harmonic	Tx ch-512 Freq.(MHz)	Level (dBm)	Tx ch-661 Freq. (MHz)	Level (dBm)	Tx ch-810 Freq. (MHz)	Level (dBm)
2	**3700.4**	NF	**3760**	NF	**3819.6**	NF
3	**5550.6**	NF	**5640**	NF	**5729.4**	NF
4	**7400.8**	NF	**7520**	NF	**7639.2**	NF
5	**9251**	NF	**9400**	NF	**9549**	NF
6	**11101.2**	NF	**11280**	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
NF = NOISE FLOOR						

RADIATED SPURIOUS EMISSIONS(PCS 1900) TX: 30MHz - 1GHz
Antenna: Horizontal

```
EUT:              04GU10b / C01
Customer:         Braemar
Test Mode:        GSM 1900
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

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

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	DUMMY-DBM



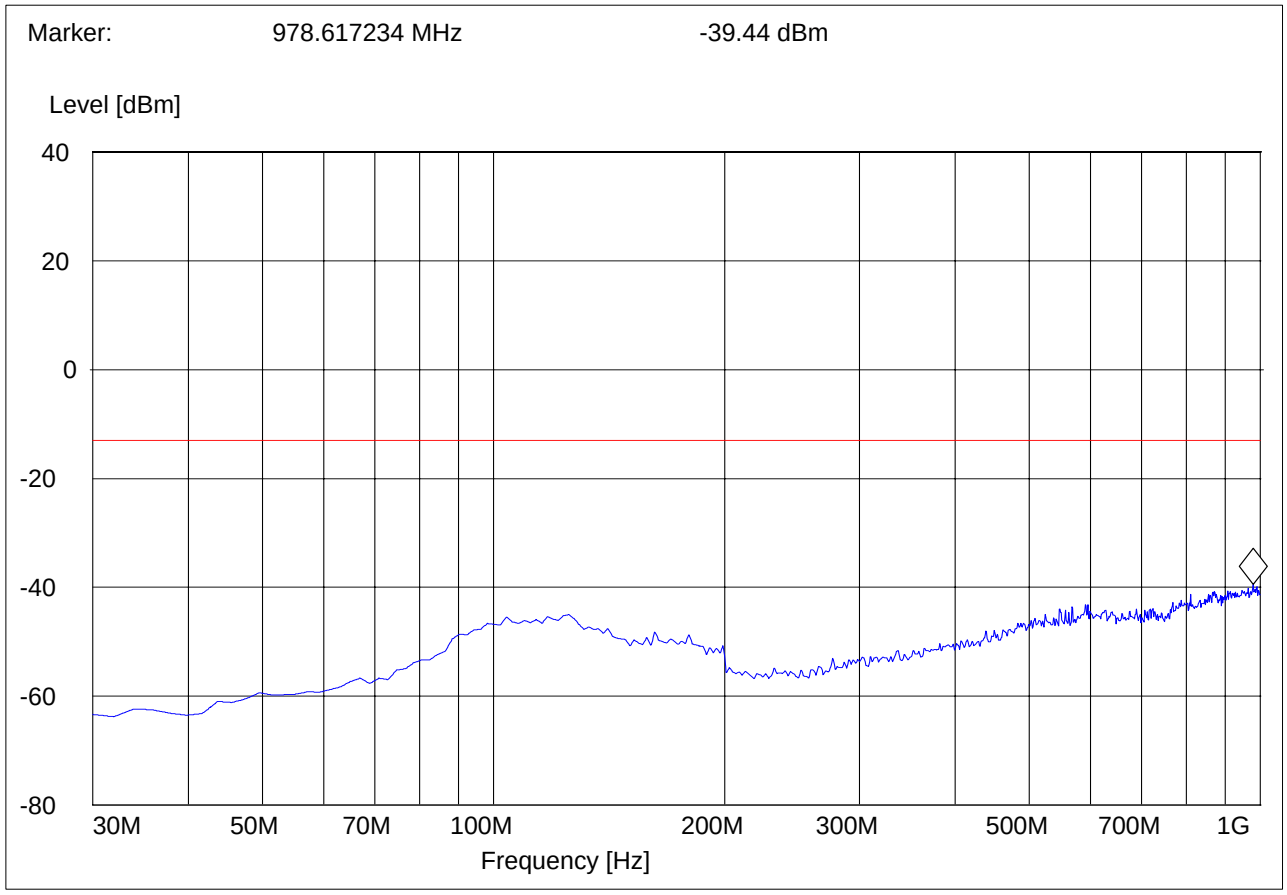
RADIATED SPURIOUS EMISSIONS(PCS 1900) TX: 30MHz - 1GHz

Antenna: Vertical

EUT: 04GU10b / C01
Customer: Braemar
Test Mode: GSM 1900
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: Internal Battery
Comments:

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

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

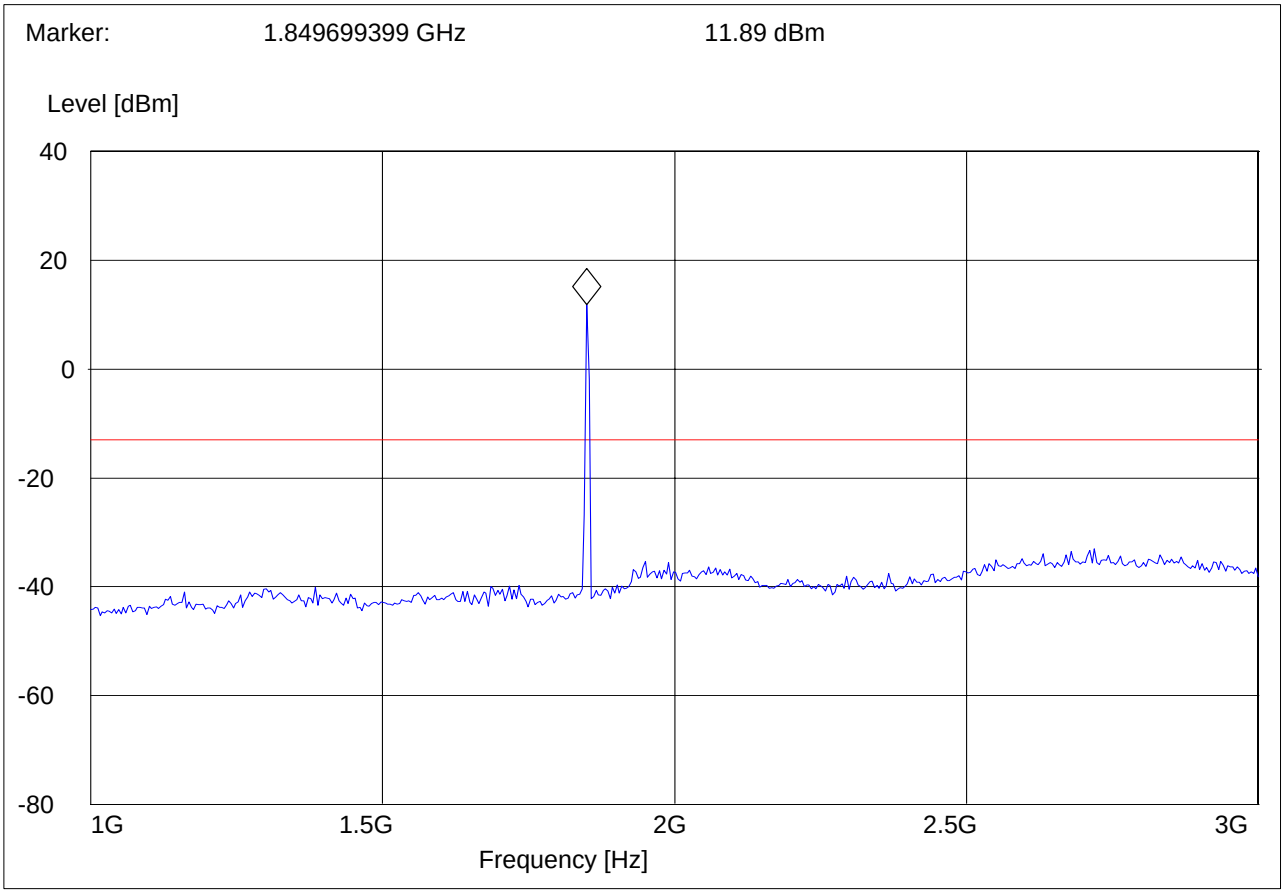


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 512: 1GHz – 3GHz

```
EUT:             04GU10a
Customer:        BRAEMAR
Test Mode:       GSM 1900 CH 512
ANT Orientation: H
EUT Orientation: H
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

SWEEP TABLE: "FCC 24Spuri 1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

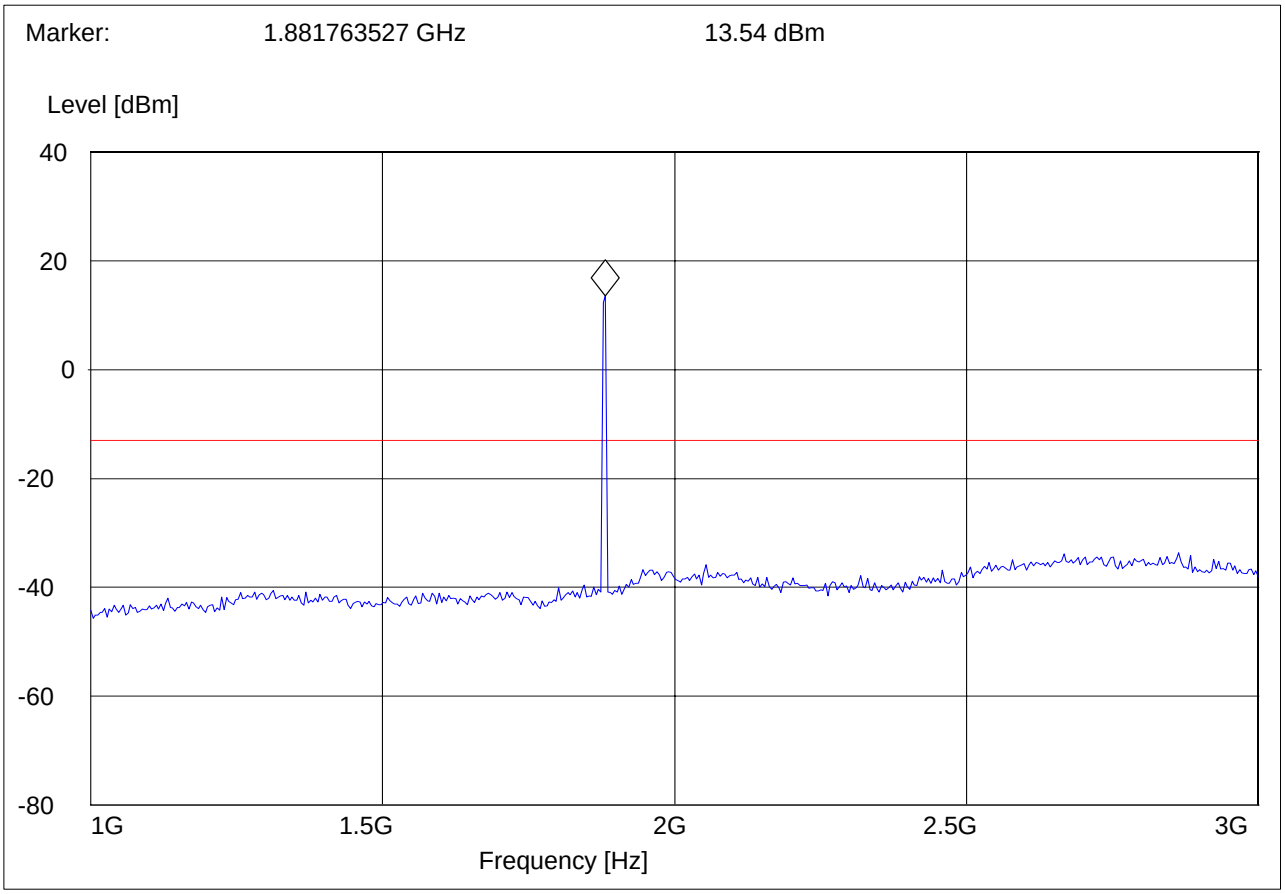


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 661: 1GHz – 3GHz

```
EUT:             04GU10a
Customer:        BRAEMAR
Test Mode:       GSM 1900 CH 661
ANT Orientation: H
EUT Orientation: H
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

SWEEP TABLE: "FCC 24Spuri 1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

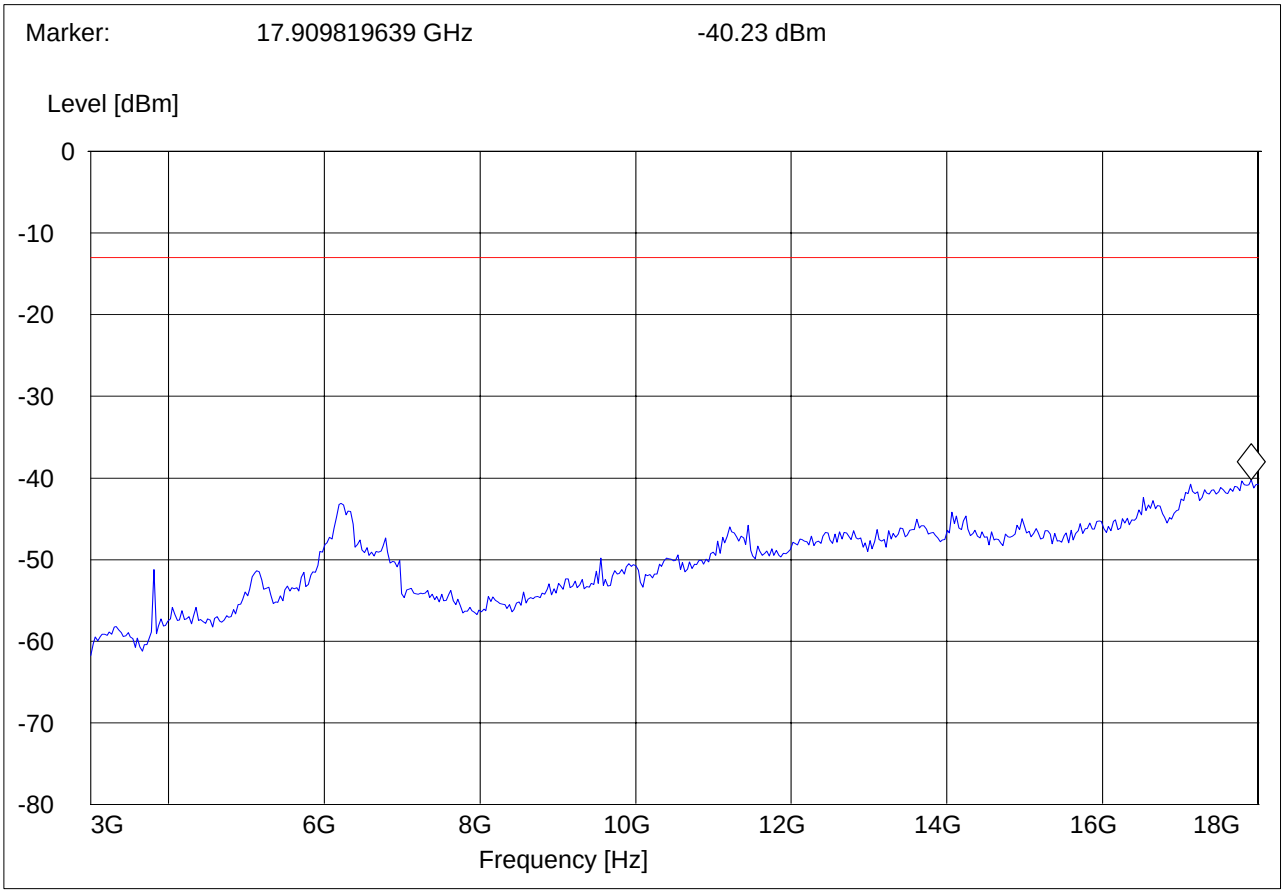


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 661: 3GHz – 18GHz

```
EUT:              04GU10a
Customer:         BRAEMAR
Test Mode:        GSM 1900 CH 661
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

SWEEP TABLE: "FCC 24Spuri 3-18G"

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

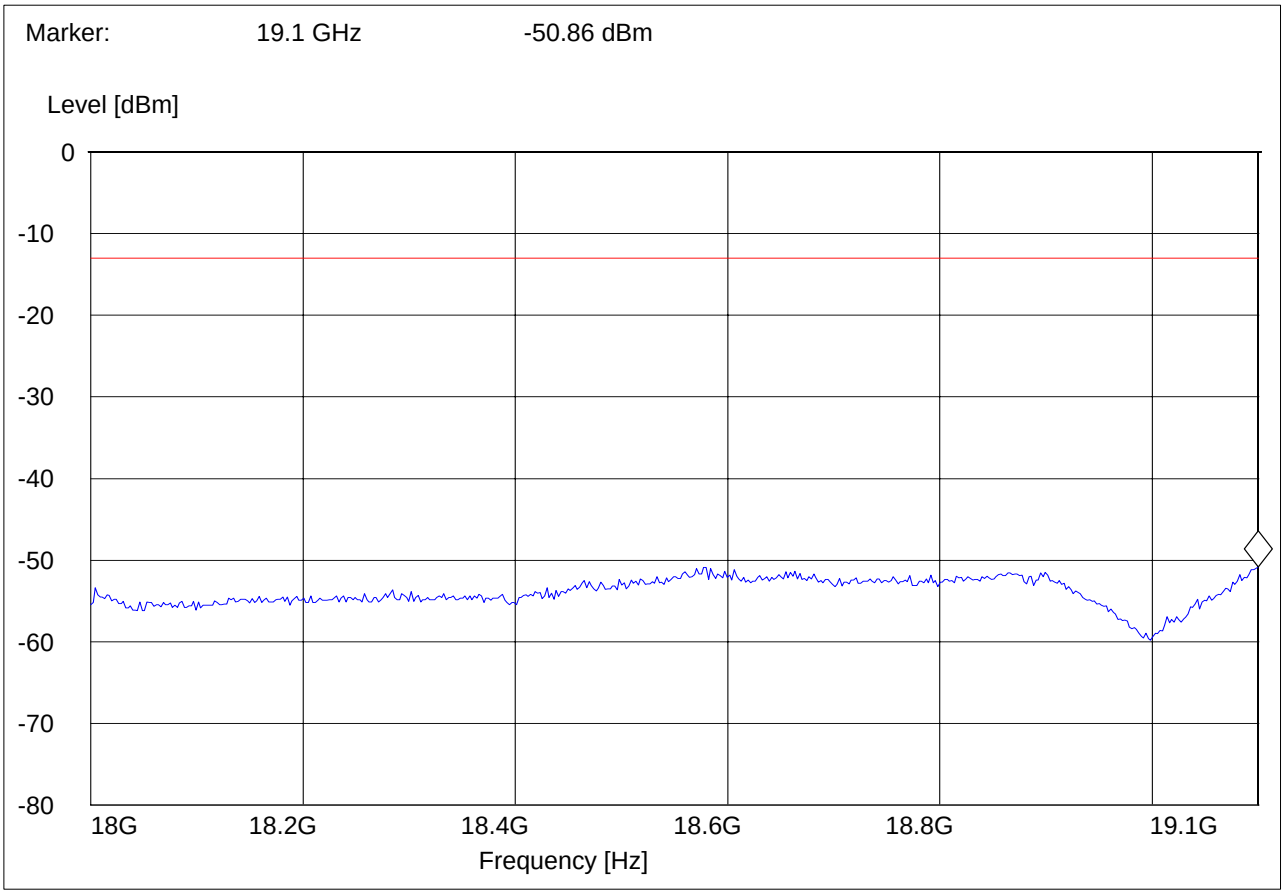


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 661: 18-19.1GHz

```
EUT:             04GU10a
Customer:        BRAEMAR
Test Mode:       GSM 1900 CH 661
ANT Orientation: H
EUT Orientation: H
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

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

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

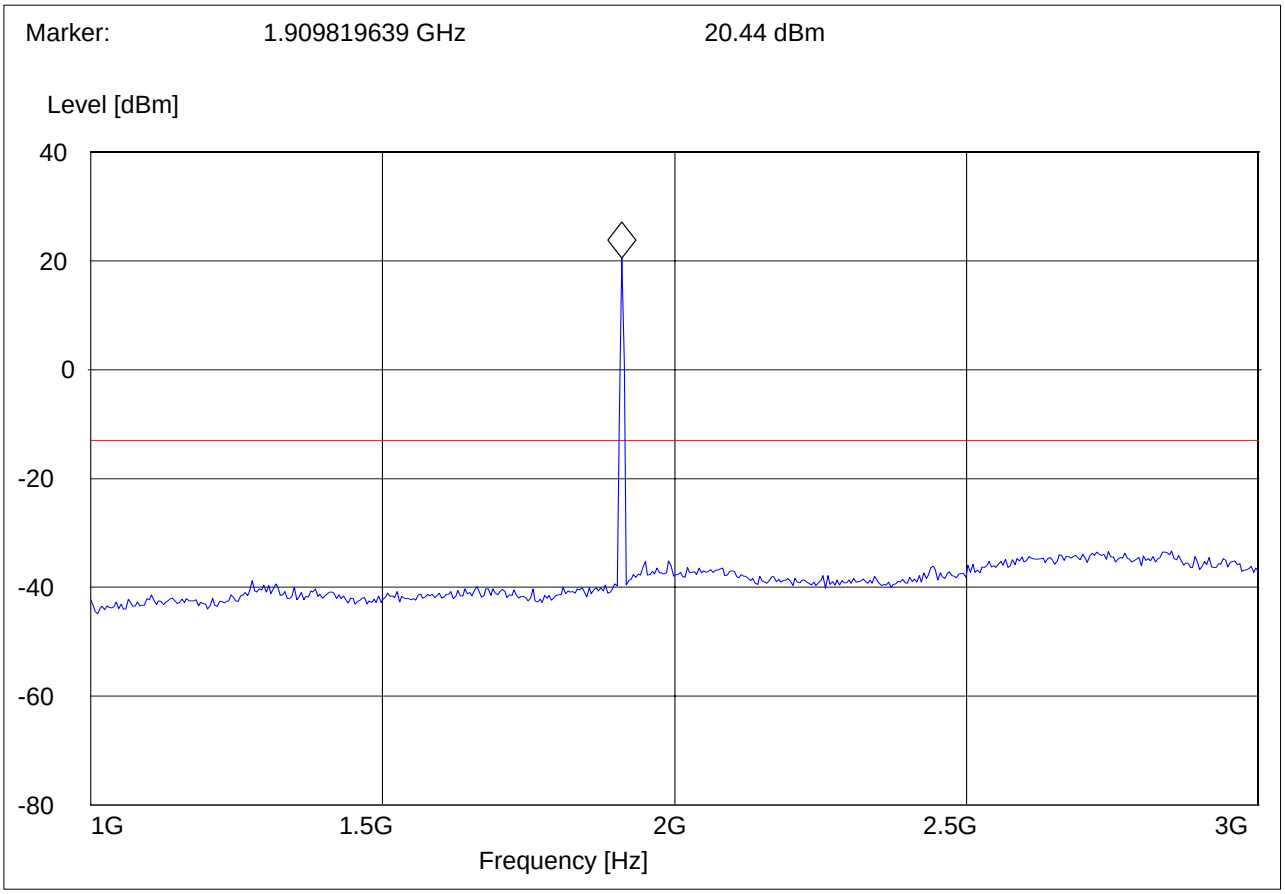


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 810: 1GHz – 3GHz

```
EUT:              04GU10a
Customer::        BREAMAR
Test Mode:        GSM 1900
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          int battery
Comments:
```

SWEEP TABLE: "FCC 24Spuri 1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

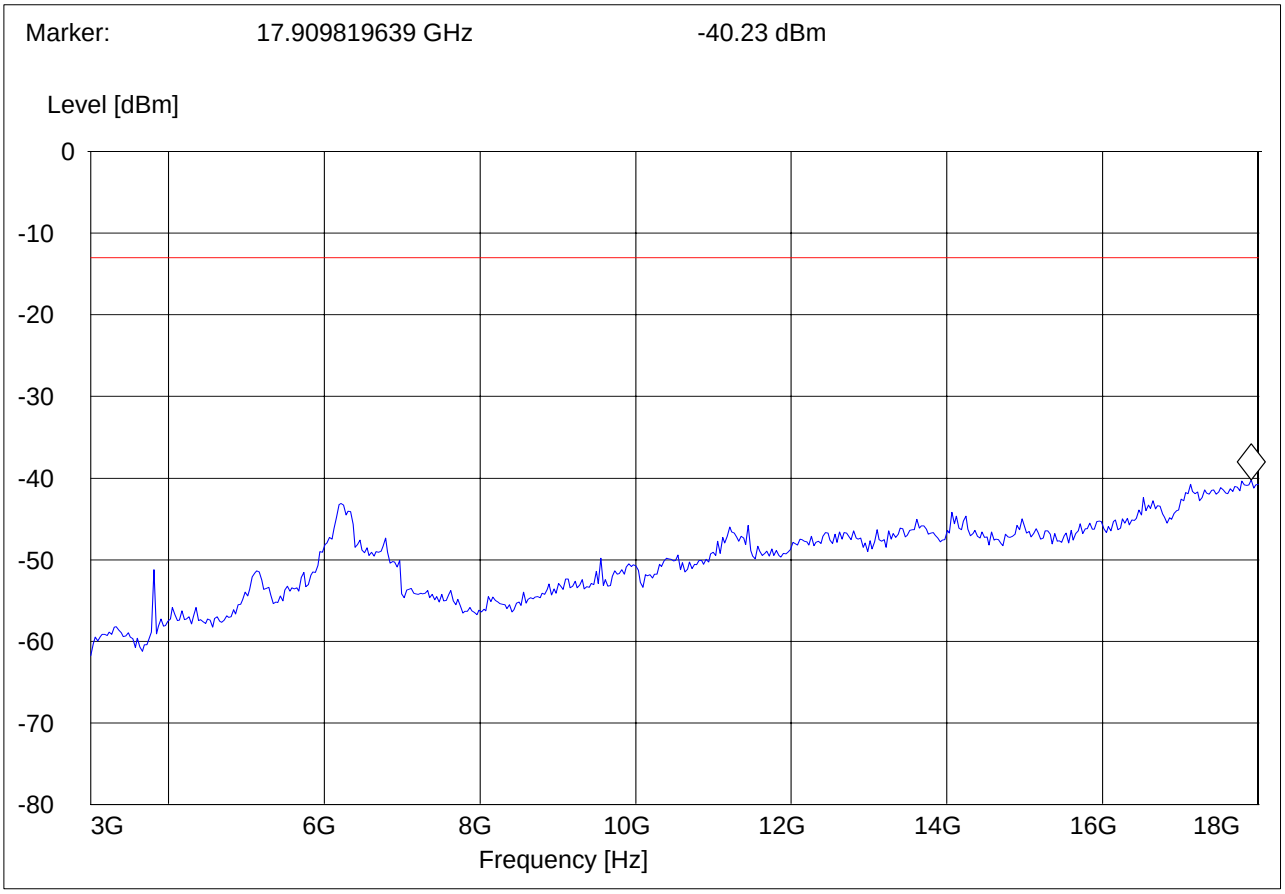


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 810: 3GHz – 18GHz

```
EUT:              04GU10a
Customer::        BREAMAR
Test Mode:        GSM 1900
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          int battery
Comments:
```

SWEEP TABLE: "FCC 24Spuri 3-18G"

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

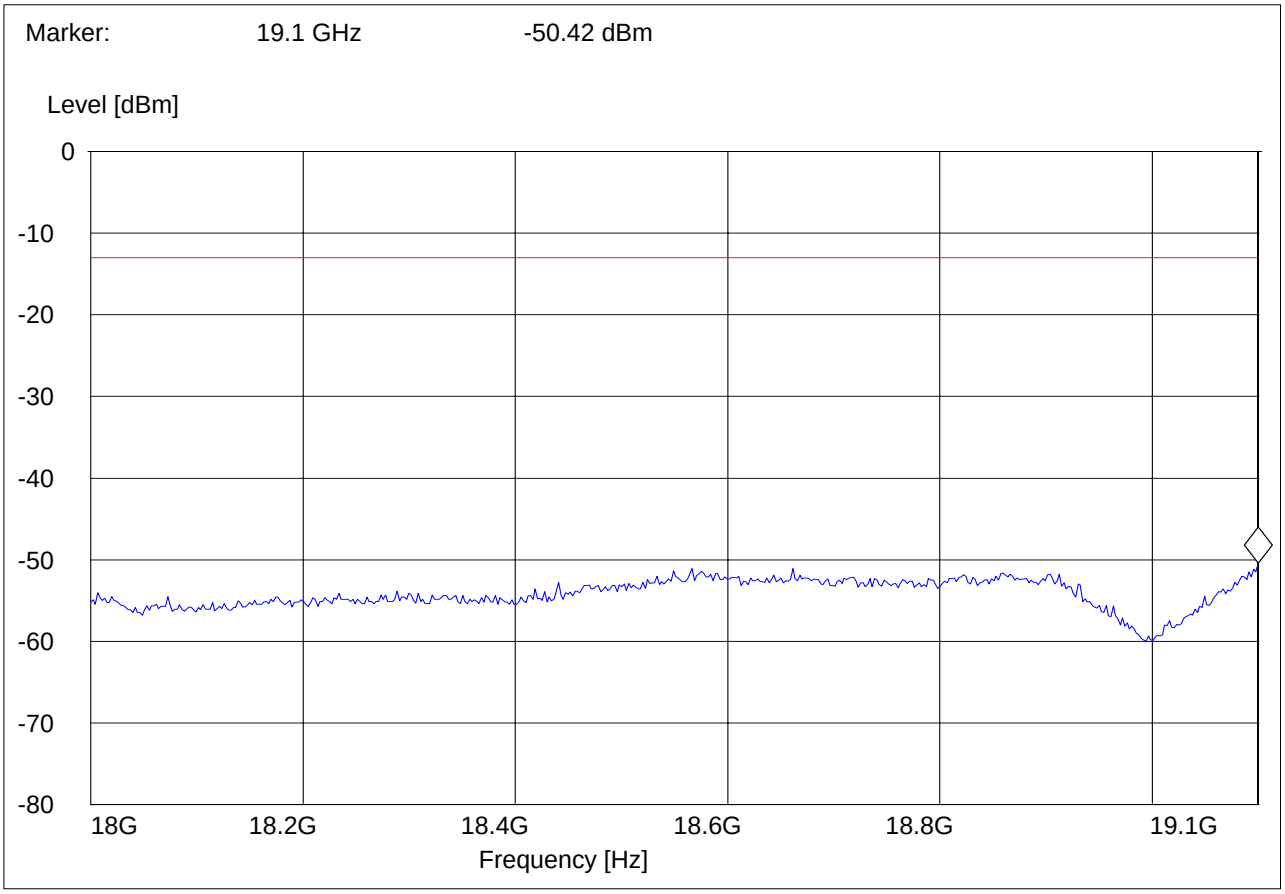


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 810: 18GHz – 19.1GHz

```
EUT:              04GU10a
Customer::        BREAMAR
Test Mode:        GSM 1900
ANT Orientation:  H
EUT Orientation:  H
Test Engineer:    Chris
Voltage:          int battery
Comments:
```

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

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



5.2.5 RECEIVER RADIATED EMISSIONS § 2.1053 / RSS-132 & 133

NOTE:

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

Limits **SUBCLAUSE § RSS-133**

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

No significant emissions measurable. Plots reported here represent the worse case emissions.

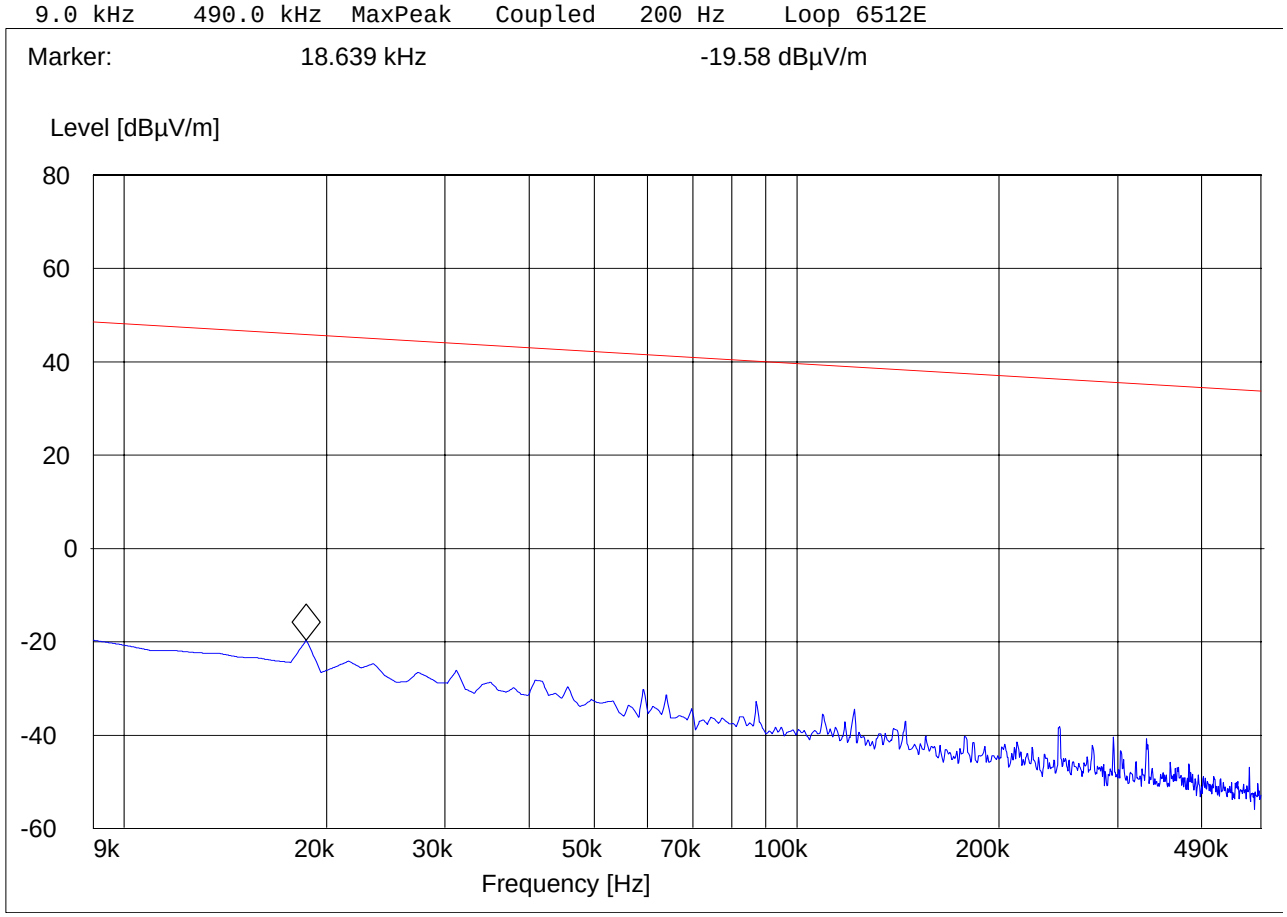
Test Results Receiver Spurious Emission GSM850

9KHz-490KHz, Antenna Loop
This plot is valid for low, mid & high channels (worst-case plot)

```
EUT:             04GU10b / C01
Customer:        Braemar
Test Mode:       Rx
ANT Orientation: Loop
EUT Orientation: H
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

SWEEP TABLE: "FCC15.209<490k_Loop"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	490.0 kHz	MaxPeak	Coupled	200 Hz	Loop 6512E



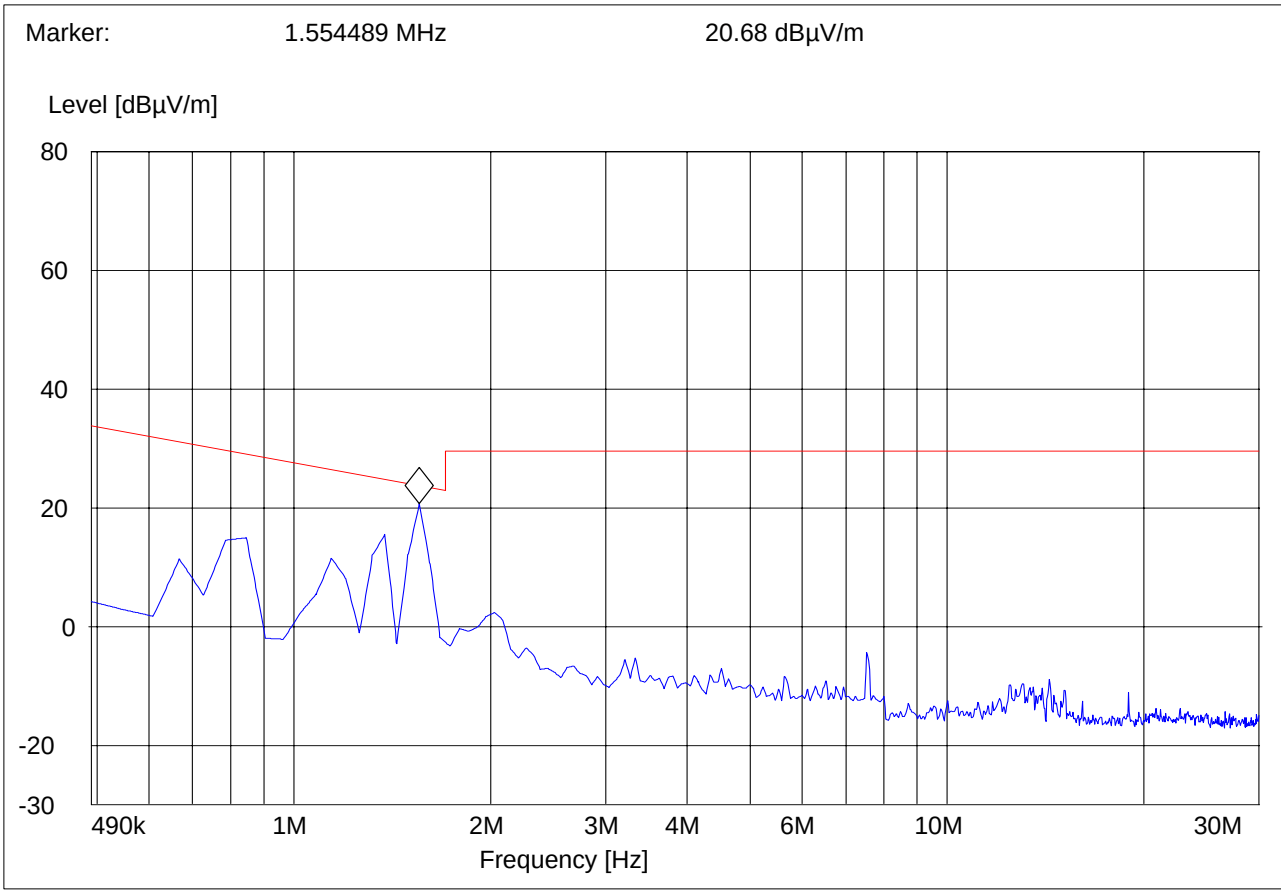
Test Results Receiver Spurious Emission GSM850

490KHz-30MHz, Antenna Loop
This plot is valid for low, mid & high channels (worst-case plot)

```
EUT:             04GU10b / C01
Customer:        Braemar
Test Mode:       RX
ANT Orientation: Loop
EUT Orientation: H
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

SWEEP TABLE: "FCC15.209>490k_Loop"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
490.0 kHz	30.0 MHz	MaxPeak	Coupled	10 kHz	Loop 6512E



Test Results Receiver Spurious Emission GSM850

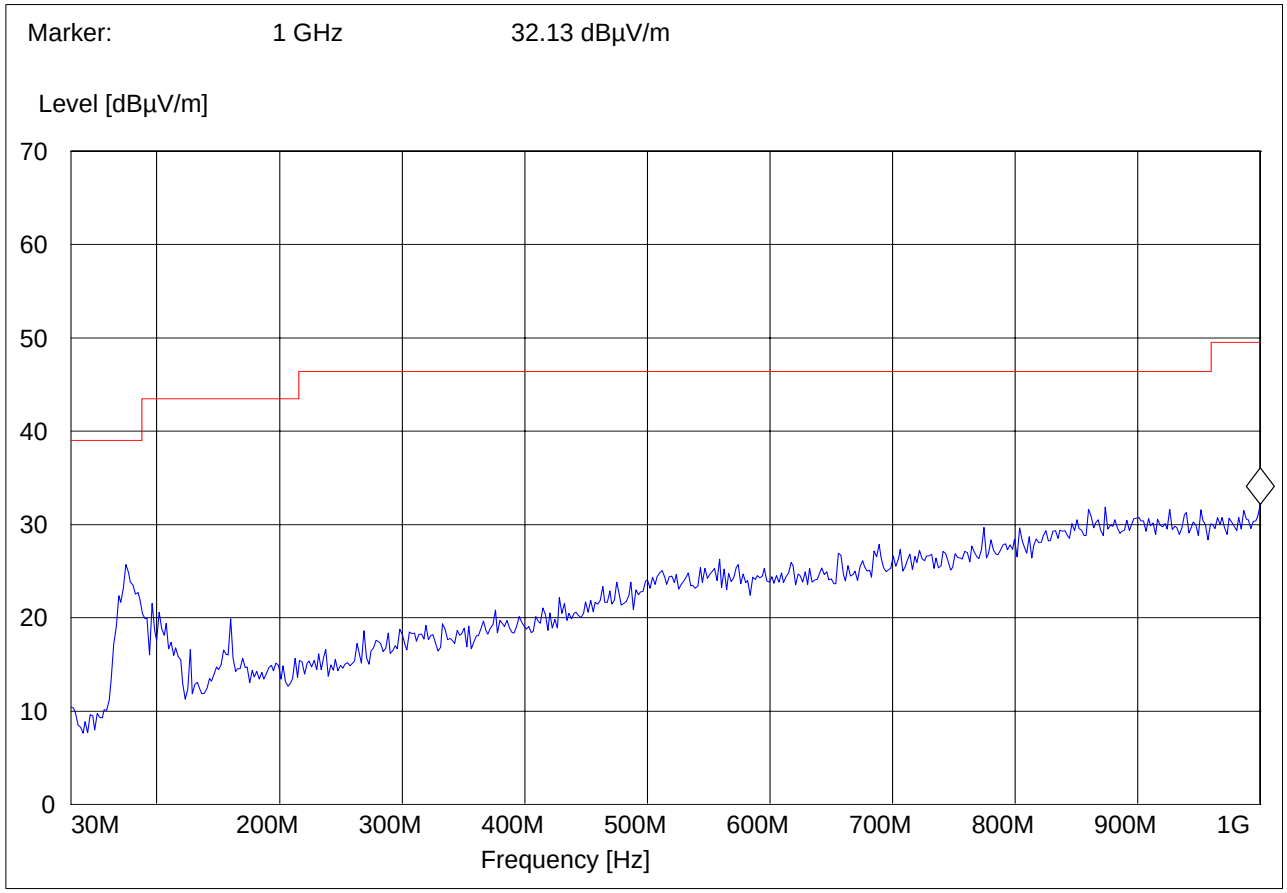
30M-1GHz, Antenna Vertical

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

```
EUT:             04GU10b / C01
Customer:        Braemar
Test Mode:       Rx
ANT Orientation: V
EUT Orientation: V
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

SWEEP TABLE: "CANADA RE_30M-1G_Ver"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Vert

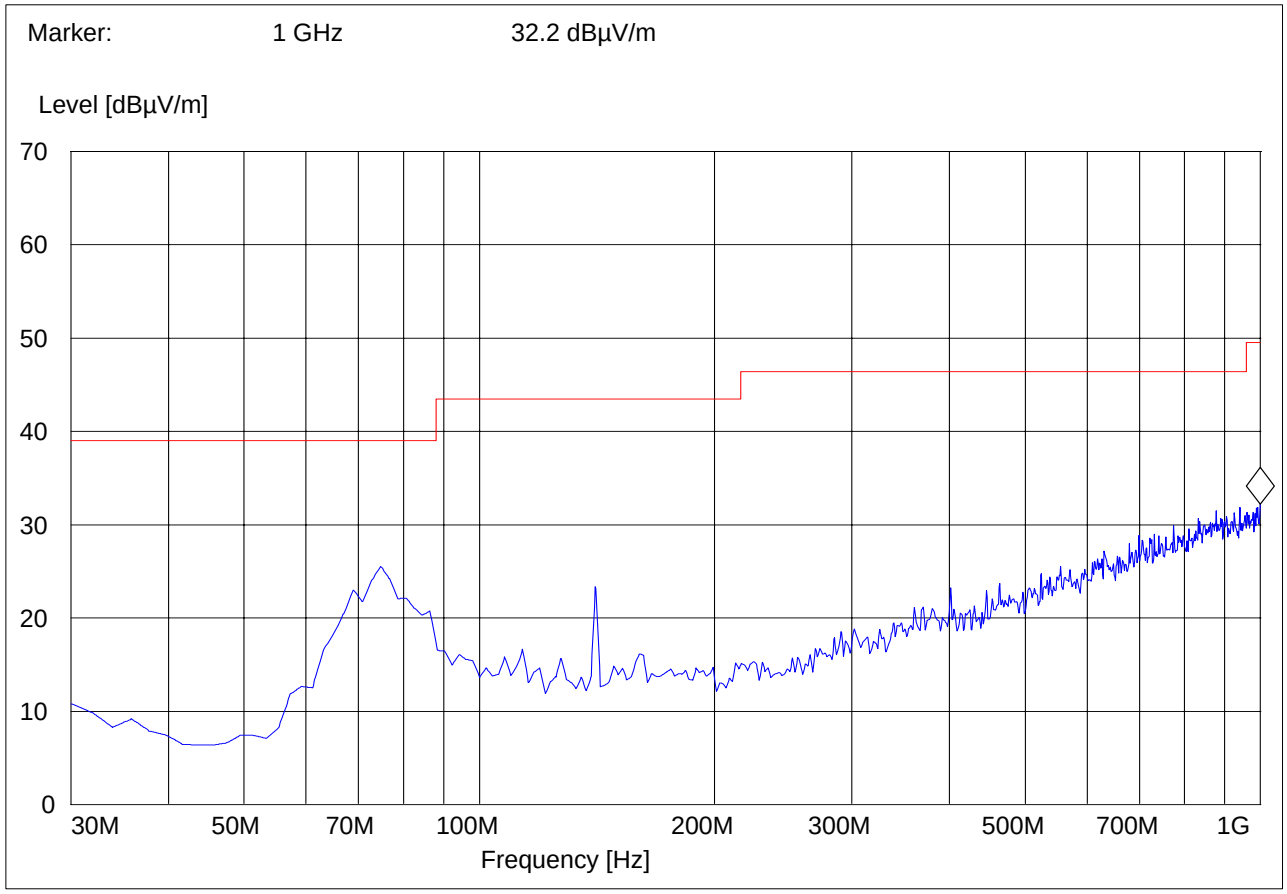


Receiver Spurious Emission GSM850 30M-1GHz, Antenna Horizontal
This plot is valid for low, mid & high channels (worst-case plot)

```
EUT:             04GU10b / C01
Customer:        Braemar
Test Mode:       Rx
ANT Orientation: H
EUT Orientation: V
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

SWEEP TABLE: "CANDA RE_30M-1G_Hor"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Horz

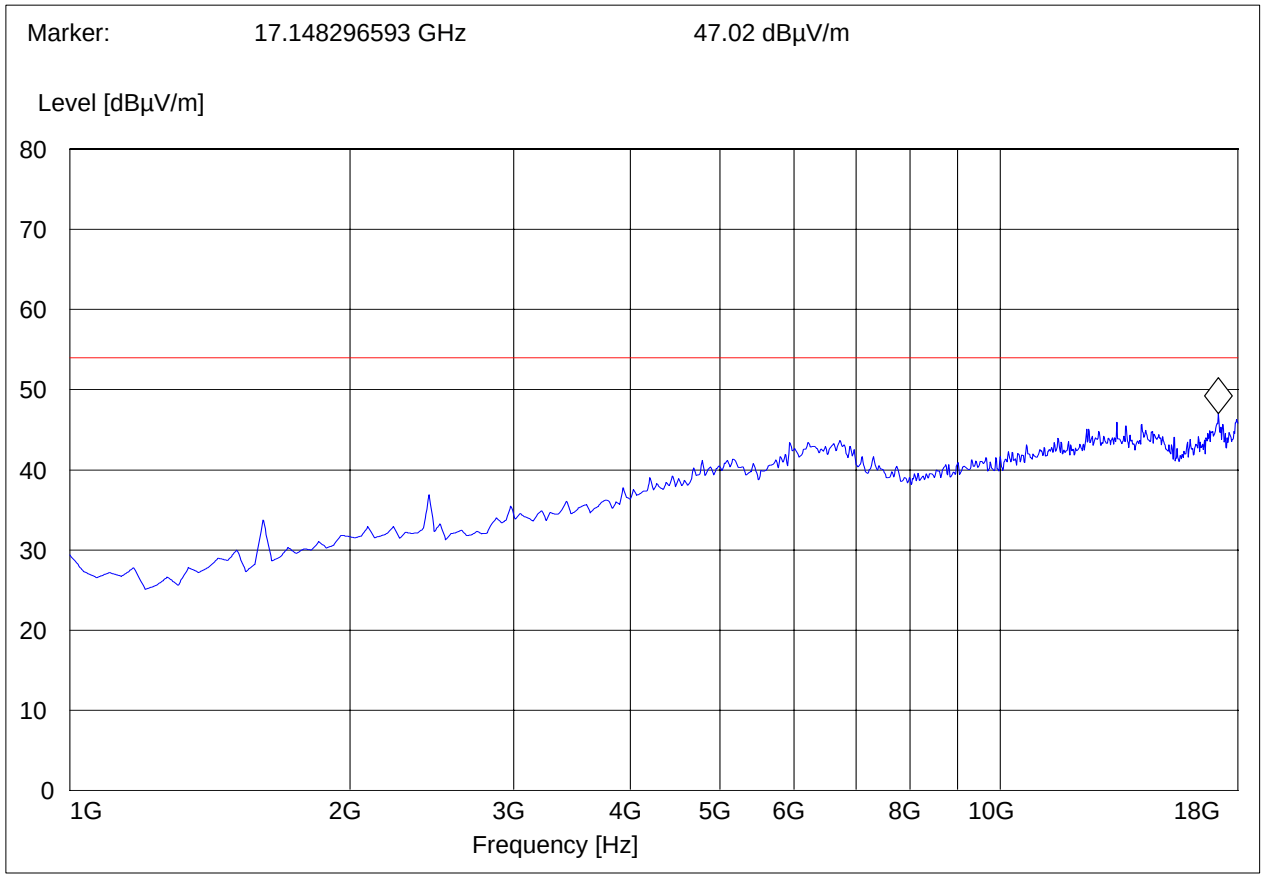


Receiver Spurious Emission GSM850: 1-18GHz

```
EUT / Description: 04GU10b / C01
Customer:          Braemar
Operation Mode:    RX
ANT Orientation:   V
EUT Orientation::  V
Test Engineer:     Chris
Voltage:           Internal Battery
Comments::
```

SWEEP TABLE: "CANADA RE_1-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_horz



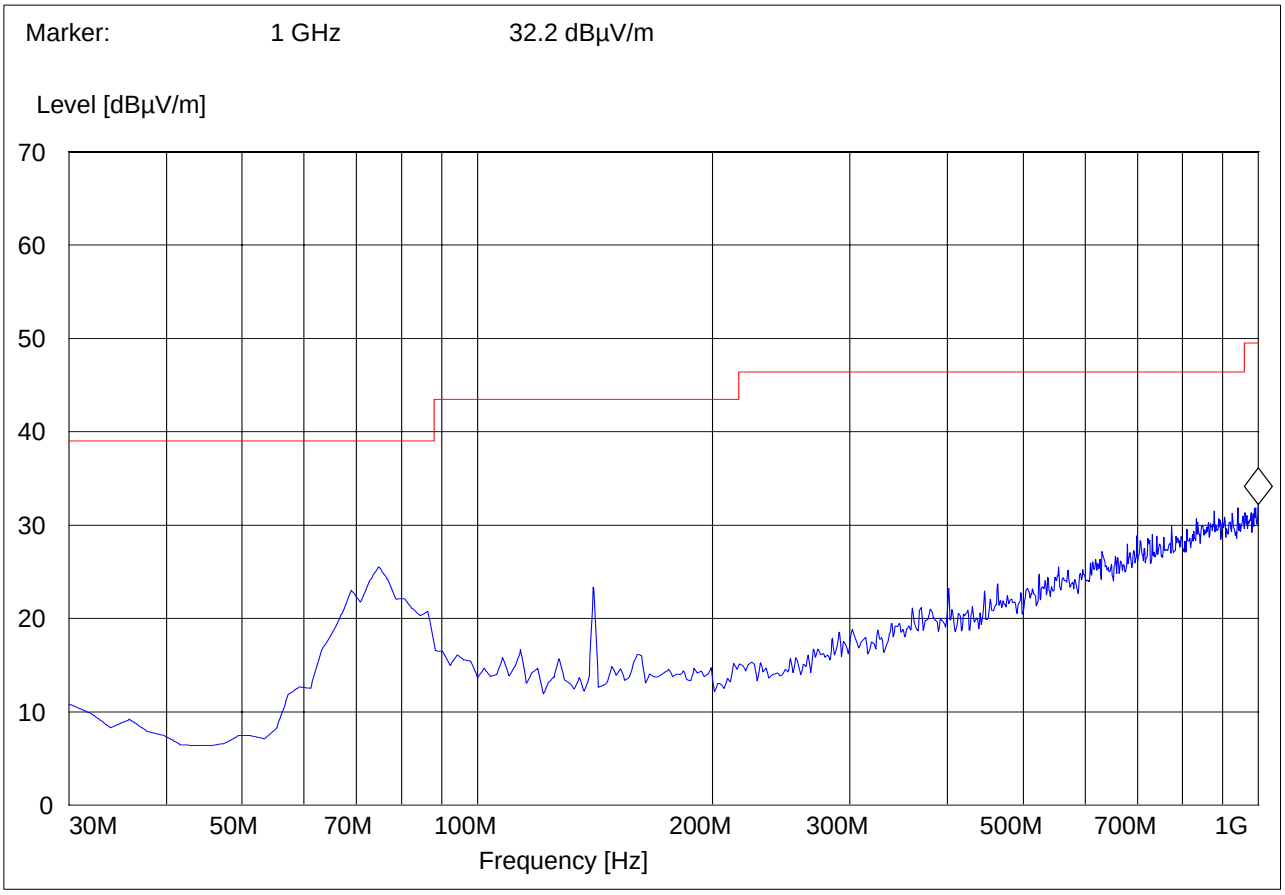
5.2.5.1 Test Results Receiver Spurious Emission GSM1900

30M-1GHz, Antenna Vertical
This plot is valid for low, mid & high channels (worst-case plot)

```
EUT:              04GU10b / C01
Customer::        Braemar
Test Mode:        Rx
ANT Orientation:  H
EUT Orientation:  V
Test Engineer:    Chris
Voltage:          Internal Battery
Comments:
```

SWEEP TABLE: "CANDA RE_30M-1G_Hor"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Horz

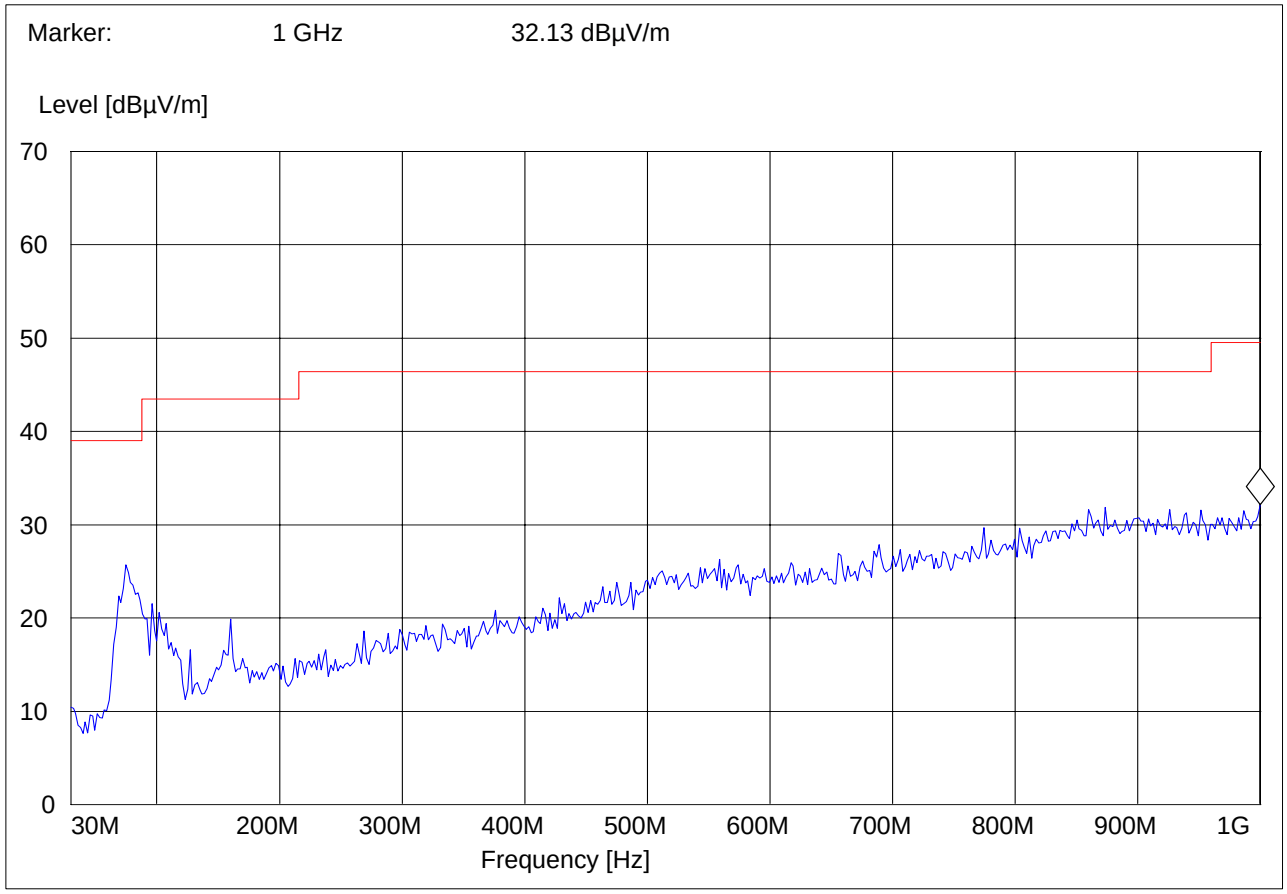


Receiver Spurious Emission GSM1900 30M-1GHz, Antenna Horizontal
This plot is valid for low, mid & high channels (worst-case plot)

```
EUT:             04GU10b / C01
Customer:        Braemar
Test Mode:       Rx
ANT Orientation: V
EUT Orientation: V
Test Engineer:   Chris
Voltage:         Internal Battery
Comments:
```

SWEEP TABLE: "CANADA RE_30M-1G_Ver"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Vert

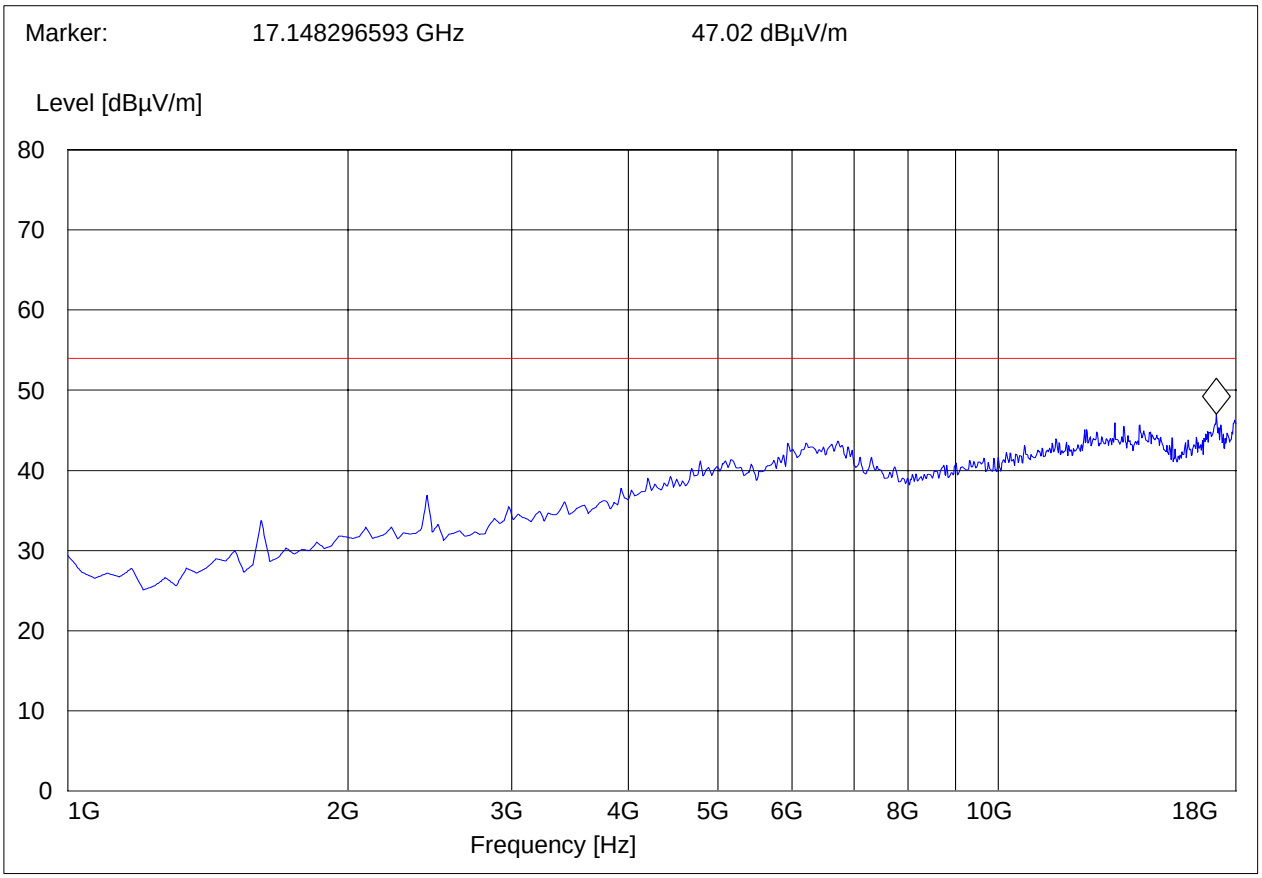


Receiver Spurious Emission GSM1900: 1-18GHz

```
EUT / Description: 04GU10b / C01
Customer:          Braemar
Operation Mode:    RX
ANT Orientation:   V
EUT Orientation::  V
Test Engineer:     Chris
Voltage:           Internal Battery
Comments::
```

SWEEP TABLE: "CANADA RE_1-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_horz



6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2009	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	May 2009	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2009	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2009	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2009	1 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2009	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2009	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2009	1 year
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
12	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2009	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2009	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2009	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2009	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2009	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2010	2 years

7 References

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

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

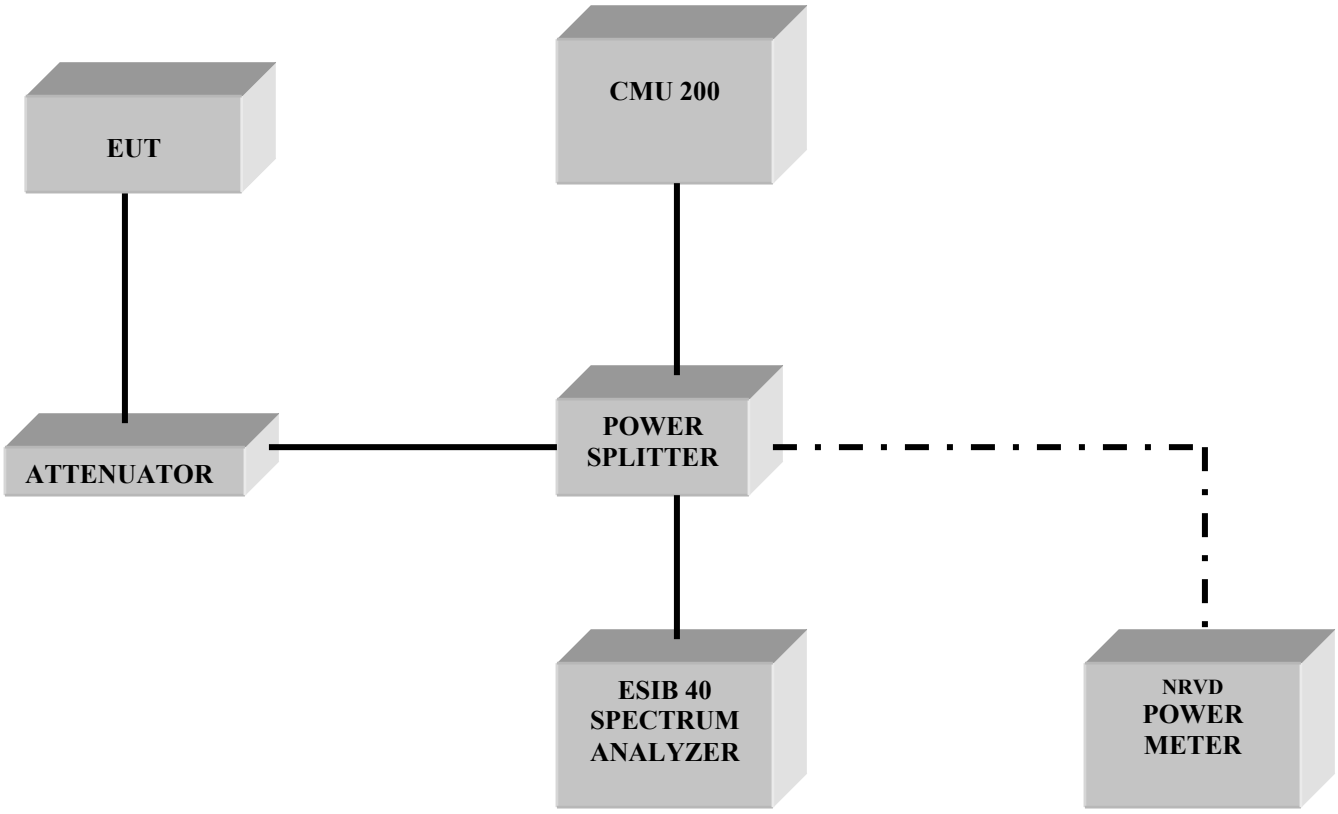
FCC Report and order 02-229 September 24, 2002.

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION, PART 24 PERSONAL COMMUNICATIONS SERVICES October 1, 1998.

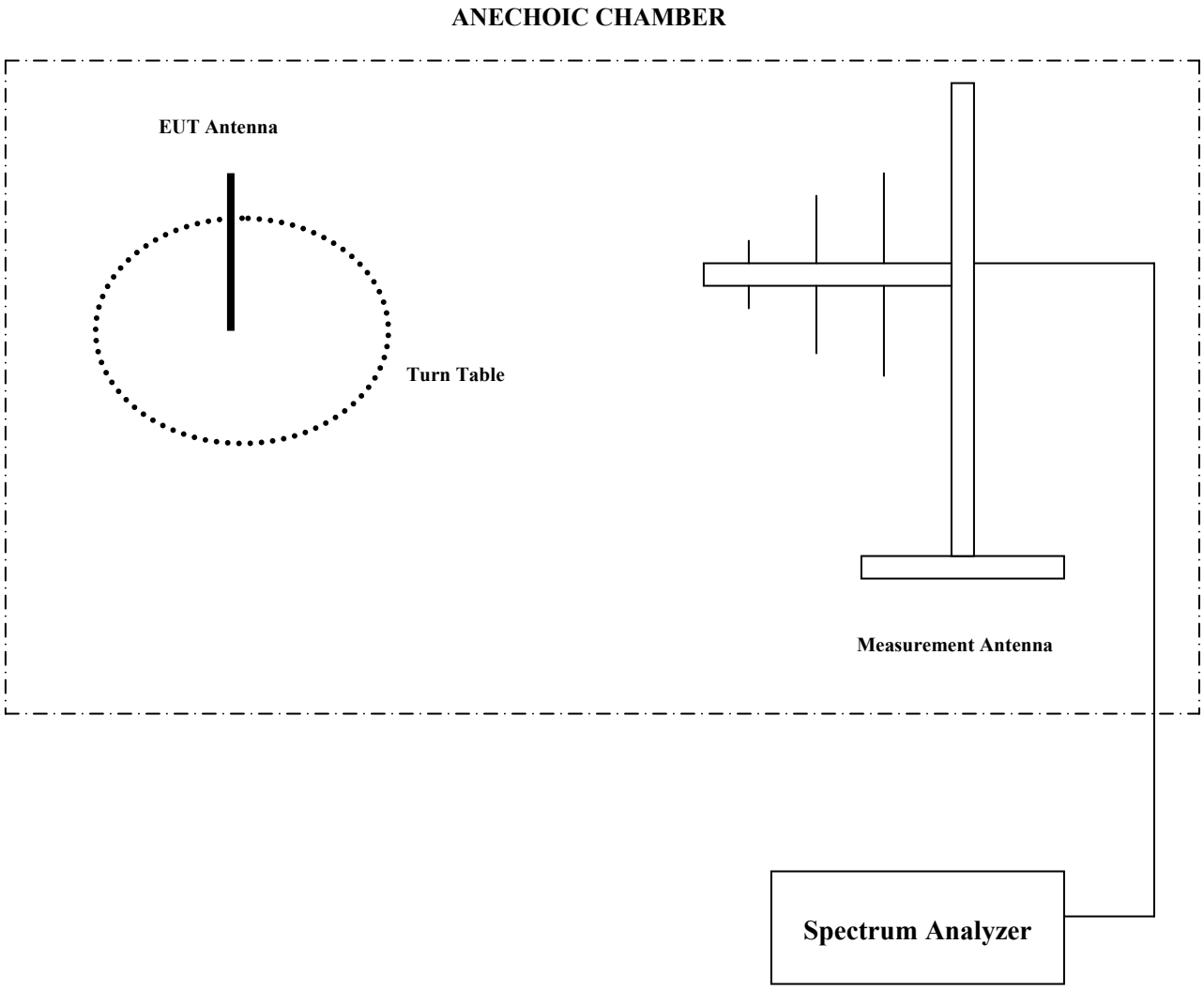
ANSI / TIA-603-C-2004 Land Mobile FM or PM Communications Equipment Measurement and Performance Standard November 7, 2002.

8 BLOCK DIAGRAMS

Conducted Testing



Radiated Testing



9 Revision History