FCC and IC Test Report

FCC Part 22, 24 and 15 B / RSS 132,133

for

Breamar Inc.

ER920W

Model Number: ER920 Wireless.

FCC ID: HHMER920W

IC-ID: NA

TEST REPORT #:EMC_BRAEM_001_07002_ECG_FCC-22_24
DATE: 05/28/2008

ilac-MRA ACCREDITED Certificate # 2135.01

Bluetooth

Bluetooth Qualification Test Facility (BQTF)

CTIA Authorized Test Lab
LAB CODE 20020328-00

FCC listed
A2LA certified

IC recognized # 3462B

***CETECOM* Inc.**
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CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686
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 #
Breamar Inc.	Ambulatory heart monitor	**ER920 Wireless.**

Technical responsibility for area of testing:

Date	Section	Name	Signature
05/28/2008	EMC & Radio	Peter Mu (Project Engineer)	Peter Mu I am approving this document

Project Leader:

Date	Section	Name	Signature
05/28/2008	EMC & Radio	Val Tankov (Project Engineer)	Ivaylo Tankov 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.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the SAR Assessment Report

Company Name:	CETECOM Inc.
Department:	SAR
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

2.2 Identification of the Client

Applicant's Name:	Breamar Inc.
Address:	1285 Corporate Center Drive, Suite 150 Eagan MN 55121, USA
Contact Person:	Adam Ford
Phone No.	+1 651 286 8620 x.144
Fax:	+1 651 286 8630
e-mail:	Adam.fors@breamarinc.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	Breamar Inc
Manufacturer's Address:	1285 Corporate Center Drive, Suite , Eagan MN USA

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Product Type	Ambulatory heart monitor.
Marketing Name:	ER920W
Model No:	ER920 Wireless.
Hardware Revision :	A.02
Software Revision :	A.04
FCC-ID:	HHMER920W
IC-ID :	NA
Frequency Range: Number of Channels	824.7 MHz to 847.75 MHz and 1851.25MHz to 1908.75MHz No. of Channels-124
Type(s) of Modulation:	GMSK, 8PSK
Antenna Type:	Dual monopole ¼ wave Antenna
Conducted Output Power:	**Please refer to Test Report No.:** **Q2684_FCC_Part22 24_Report**
Radiated Output Power:	**ERP 26.25dBm (0.423W) @ 836.6 MHz** **EIRP 29.01dBm (0.797W) @ 1909.8MHz**

3.2 Identification of Accessory equipment

AE #	TYPE	MANUFACTURE	MODEL	SERIAL #
1	Heart monitoring sensors	Breamer Inc.	NA	NA

Subject of Investigation

Measurements were performed for the EUT Model No. ER920W. The device under test is a Ambulatory heart monitor used by the patients to provide wireless data communication. Data presented in this test report only includes Radiated emissions for transmit and receive and Radiated power, AC conducted emissions is NA, the device is battery operated.

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 and Industry Canada RSP-100, RSS-132, and RSS-133. The maximization of portable equipment is conducted in accordance with ANSI C63.4.

4 Measurements

4.1 RF Power Output

4.1.1 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.

4.1.2 Limits:

4.1.2.1 §22.913(a) & RSS-129 (9.1) Effective radiated power limits.

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

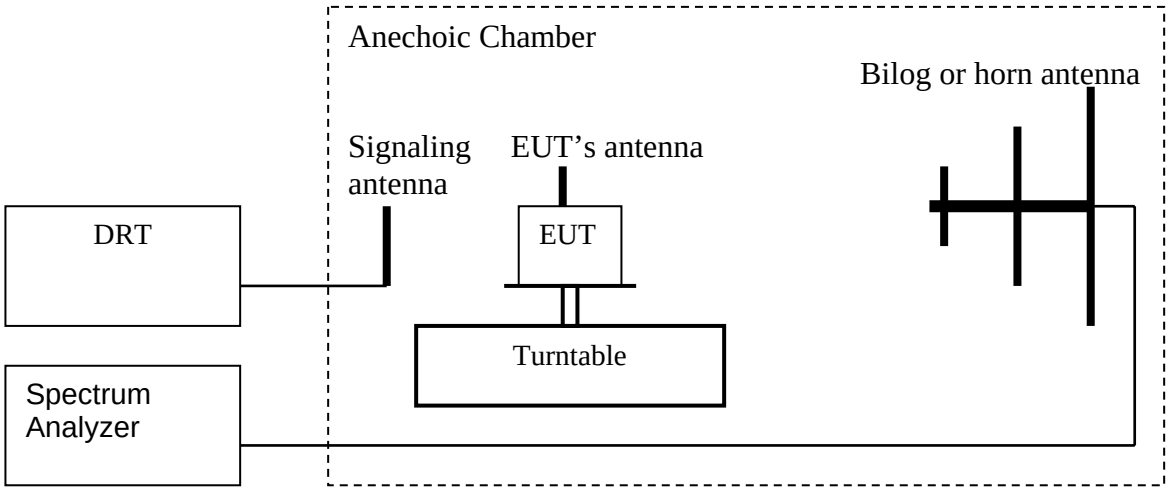
4.1.2.2 §24.232(b)(c) & RSS-133 (4.3) & (6.4) Power limits.

(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.

4.1.3 Radiated Output Power measurement procedure:

Based on TIA-603C 2004

2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic Radiated Power (EIRP)



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

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

4.1.4 ERP Results 850 MHz band:

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

Frequency (MHz)	Effective Radiated Power (dBm) Note 1	
	GPRS	EDGE
824.2	24.59	23.83
836.6	26.25	22.26
848.8	25.89	23.32

Note 1: Measurements were obtained in EIRP (Refer to plots) and converted EIRP to ERP by subtracting 2.14dB from EIRP.

4.1.5 EIRP Results 1900 MHz band:

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

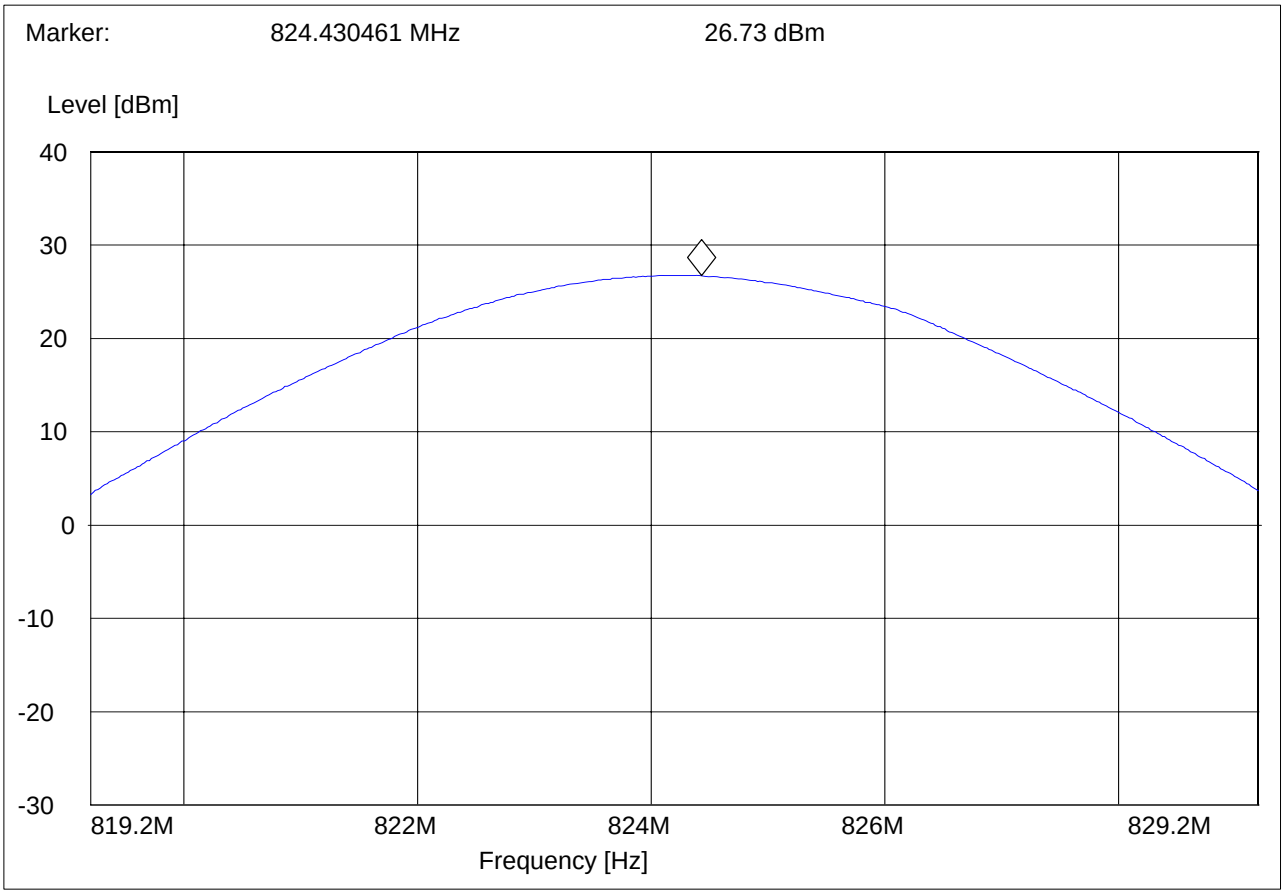
Frequency (MHz)	Effective Isotropic Radiated Power (dBm)	
	GPRS	EDGE
1850.2	27.75	23.47
1880.0	27.80	23.20
1909.8	29.01	23.05

EIRP (GSM 850) **§22.913(a) & RSS-129 (9.1)**
RF OUTPUT POWER (GSM-850)
CHANNEL 128 GPRS

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850, GPRS ch.128
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments: TT@270°; ANT @ 144cm

SWEEP TABLE: "EIRP 850 CH 128 H"

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

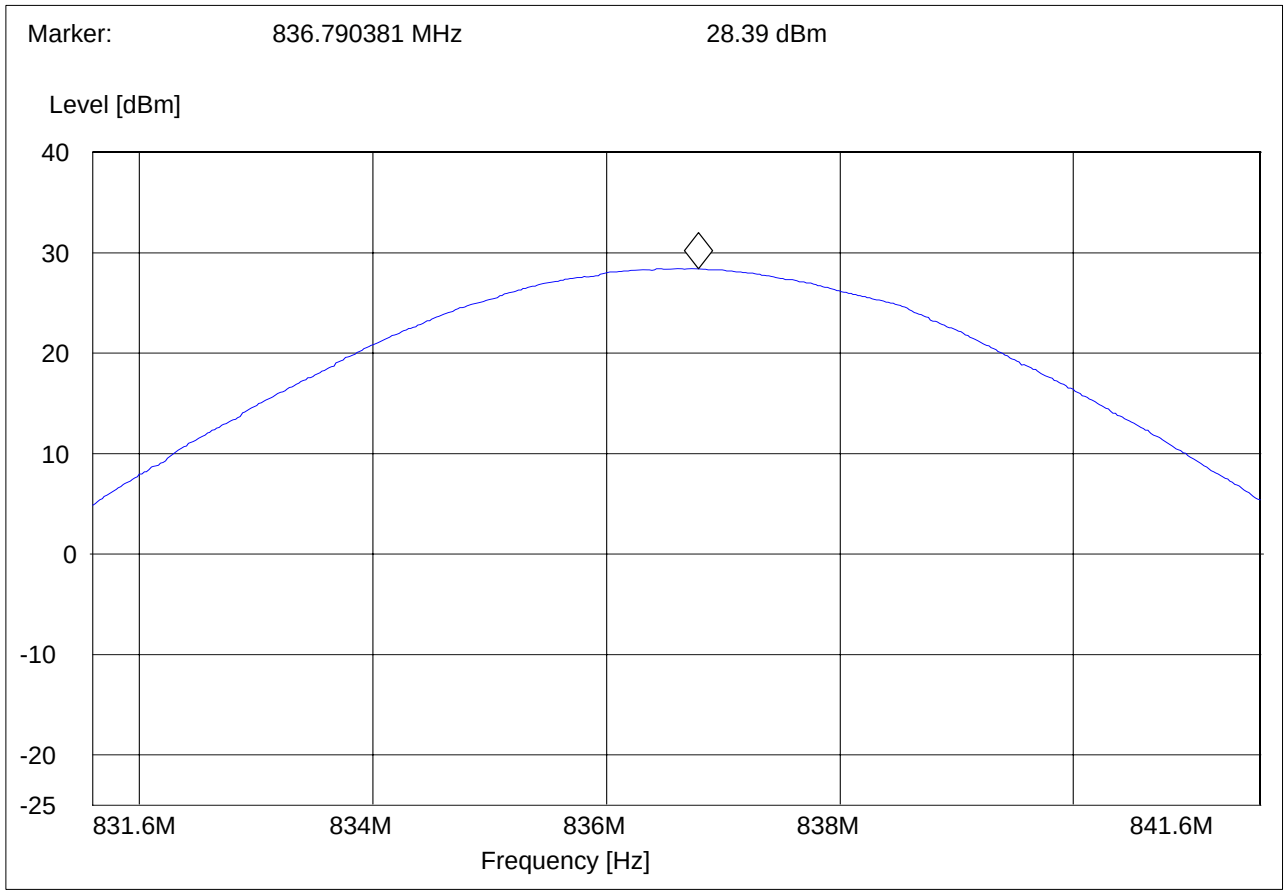


RF OUTPUT POWER (GSM-850) **§22.913(a) & RSS-129 (9.1)**
CHANNEL 190 GPRS

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850, GPRS ch.190
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments: TT@270°; ANT @ 144cm

SWEEP TABLE: "EIRP 850 CH 190 H"

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

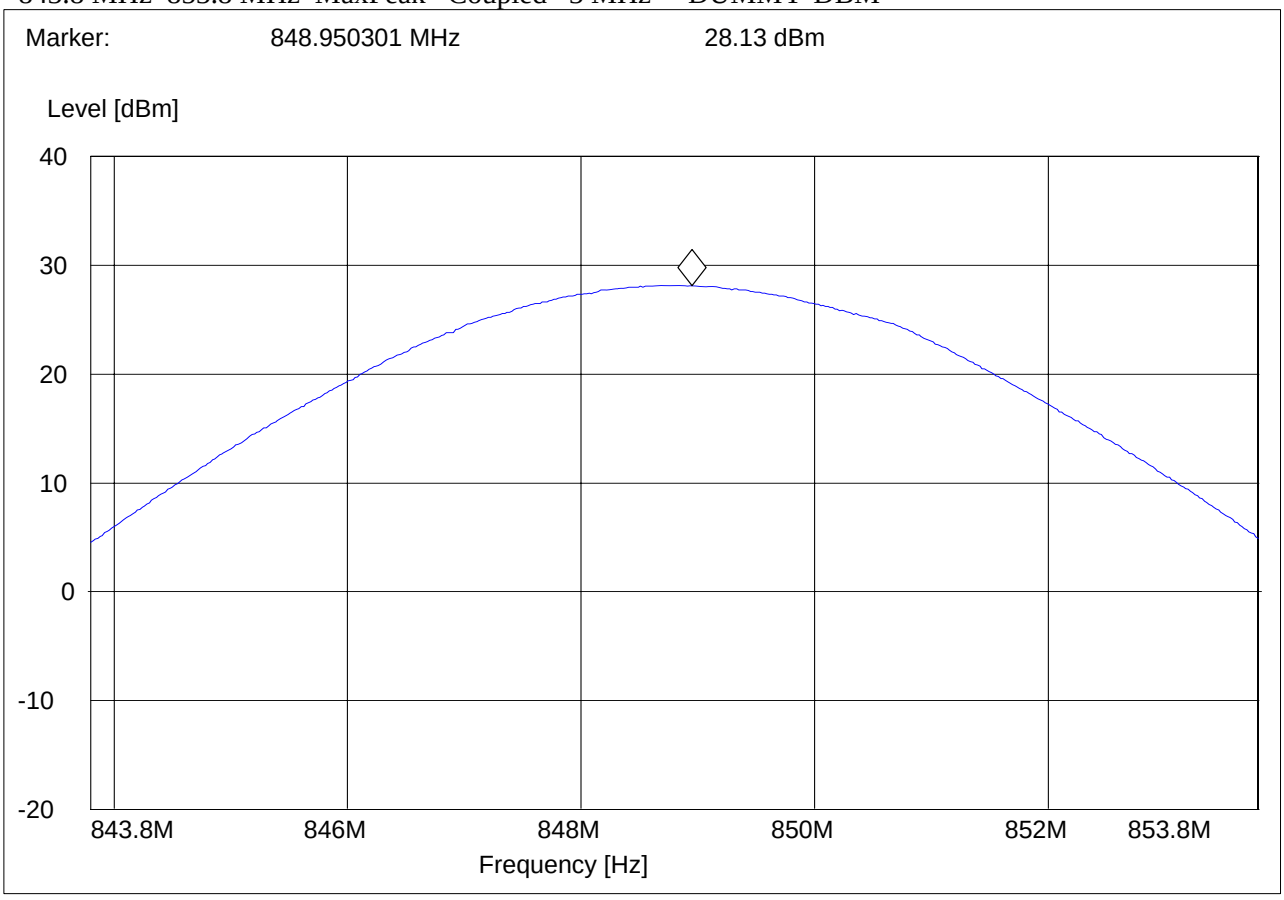


RF OUTPUT POWER (GSM-850) **§22.913(a) & RSS-129 (9.1)**
CHANNEL 251 GPRS

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850, GPRS ch.251
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments: TT@270°; ANT @ 144cm

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



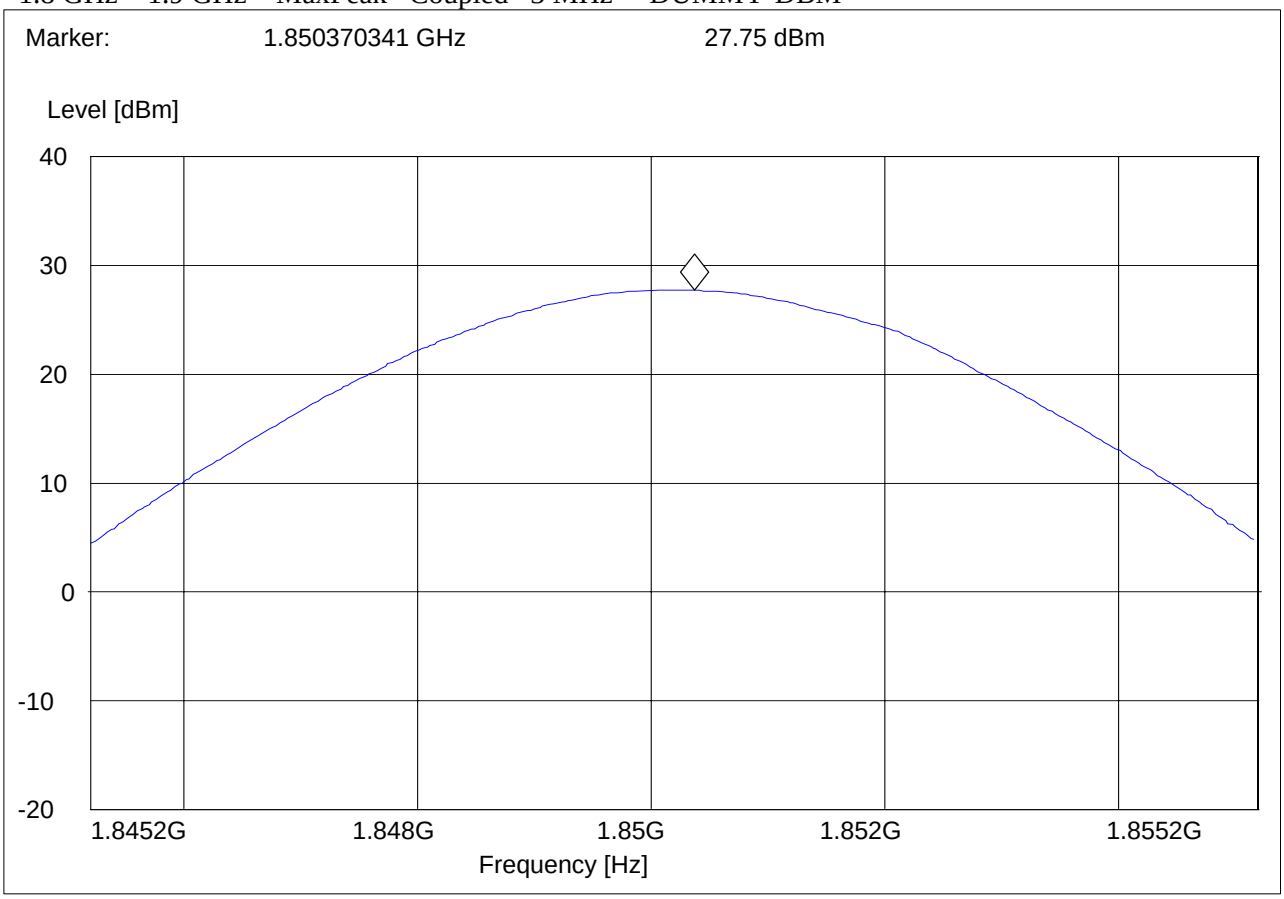
RF OUTPUT POWER (PCS-1900) **§24.232(b)(c) & RSS-133 (4.3) & (6.4)**
CHANNEL 512 GPRS

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900, GPRS ch.512
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments: TT@342°

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



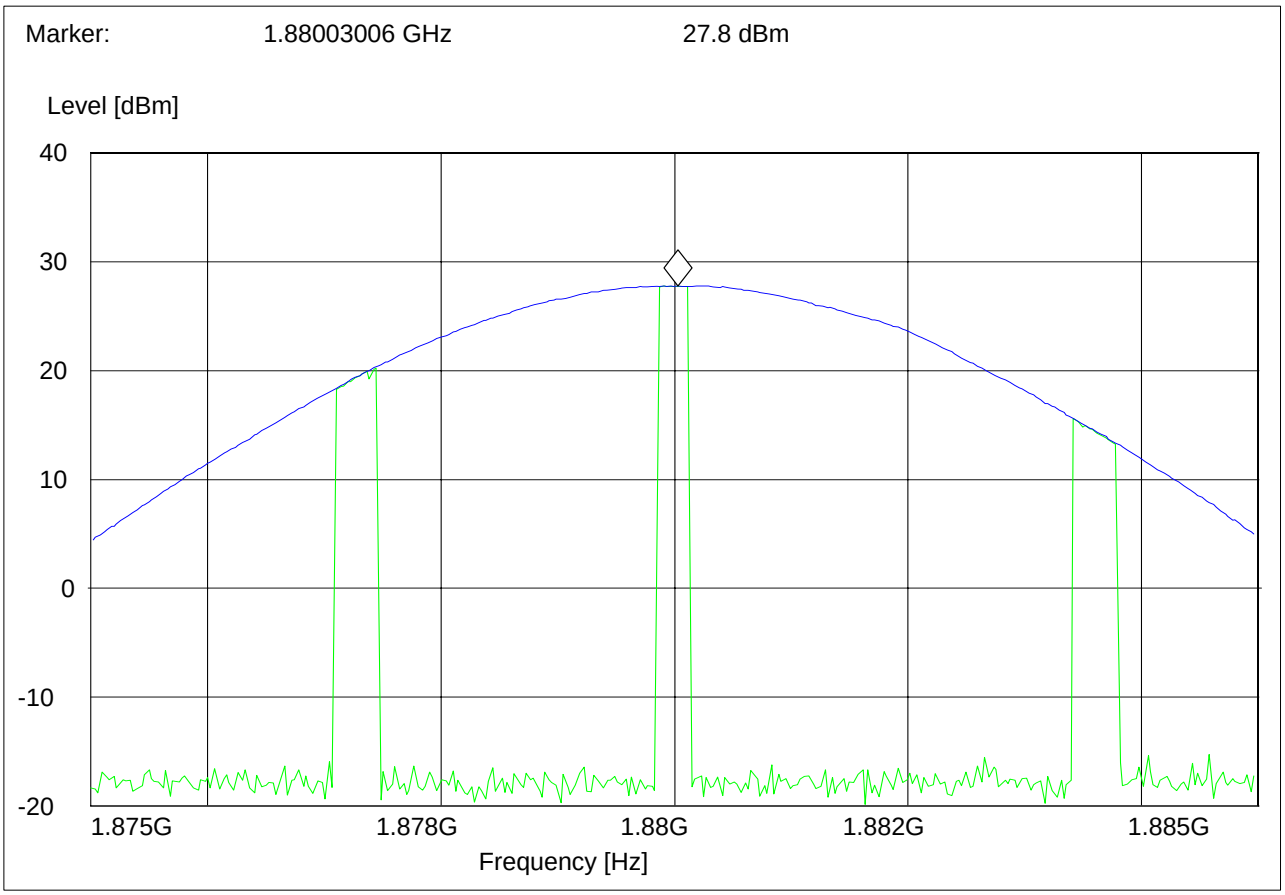
RF OUTPUT POWER (PCS-1900) **§24.232(b)(c) & RSS-133 (4.3) & (6.4)**
CHANNEL 661 GPRS

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900, GPRS ch.661
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments: TT@342°

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	Coupled	3 MHz	DUMMY-DBM MaxPeak



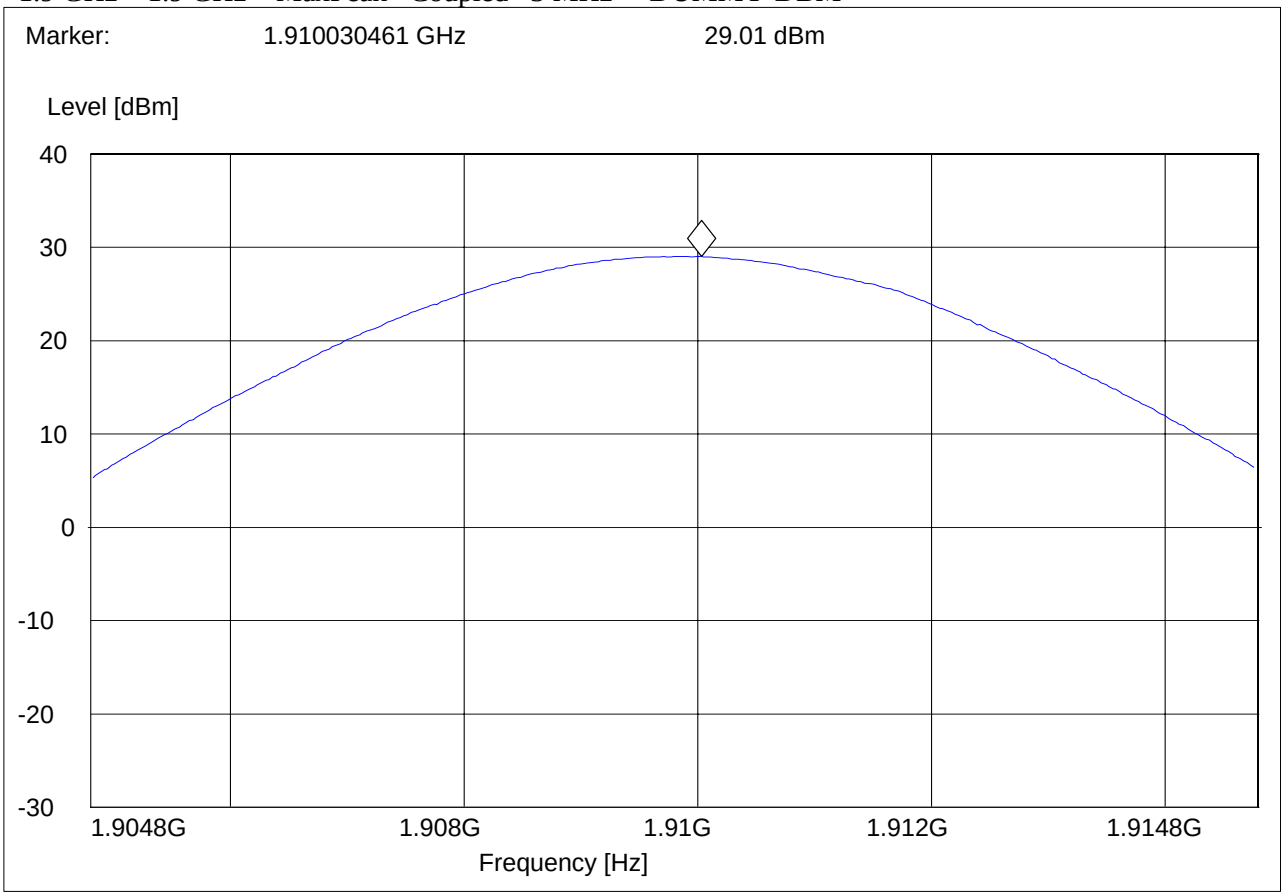
RF OUTPUT POWER (PCS-1900) **§24.232(b)(c) & RSS-133 (4.3) & (6.4)**
CHANNEL 810 GPRS

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900, GPRS ch.810
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments: TT@342°

SWEEP TABLE: "EIRP 1900 CH810"

Short Description: EIRP PCS 1900 for channel-810

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



4.2 Occupied Bandwidth/Emission Bandwidth

Refer to test report no. Q2684_FCC_Part22 24_Report

4.3 Frequency Stability

Refer to test report no. Q2684_FCC_Part22 24_Report

4.4 Transmitter Spurious Emissions Conducted

Refer to test report no. Q2684_FCC_Part22 24_Report

4.5 Transmitter Spurious Emissions Radiated

4.5.1 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.

4.5.2 Limits:

4.5.2.1 §22.917 & RSS-129 (8.1.2) 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.

4.5.2.2 §24.238 & RSS-133 (4.4) & (6.5) 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.

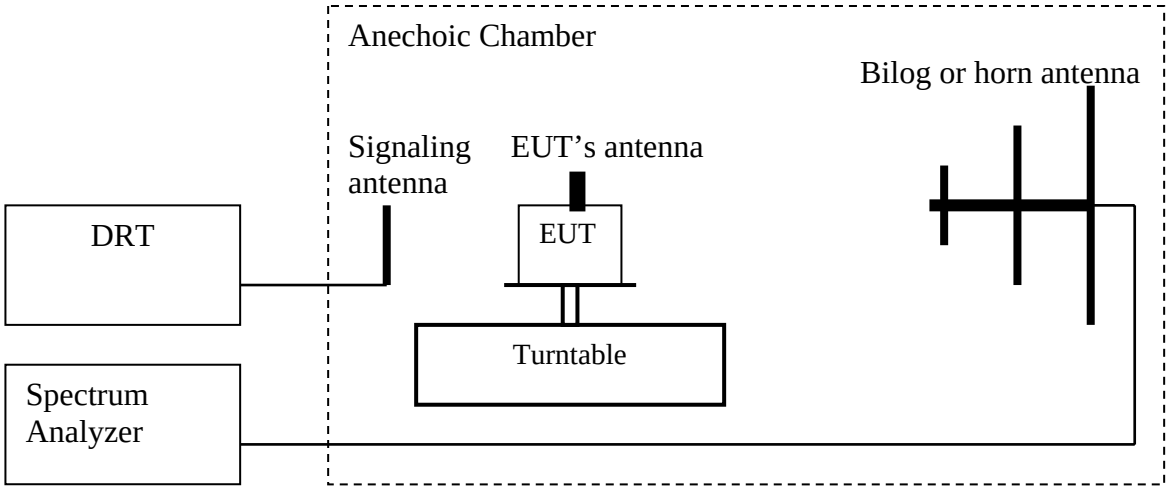
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the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

4.5.3 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.

All radiated Spurious Emissions measurements were performed in GPRS mode which has higher Radiated Output Power - ref. 4.1.4 and 4.1.5 of this Report.

Results for the radiated measurements below 30MHz according § 15.33

Frequency	Measured values	Remarks
9KHz – 30MHz	No emissions found, caused by the EUT	This is valid for all the tested channels

4.5.4 Radiated out of band emissions results on EUT:

4.5.4.1 RESULTS OF RADIATED TESTS GSM-850:

Harmonics	Tx ch-8 Freq. (MHz)	Level (dBm)	Tx ch-383 Freq. (MHz)	Level (dBm)	Tx ch-758 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						

4.5.4.2 RADIATED SPURIOUS EMISSIONS (GSM-850)

TX: 30MHz - 1GHz

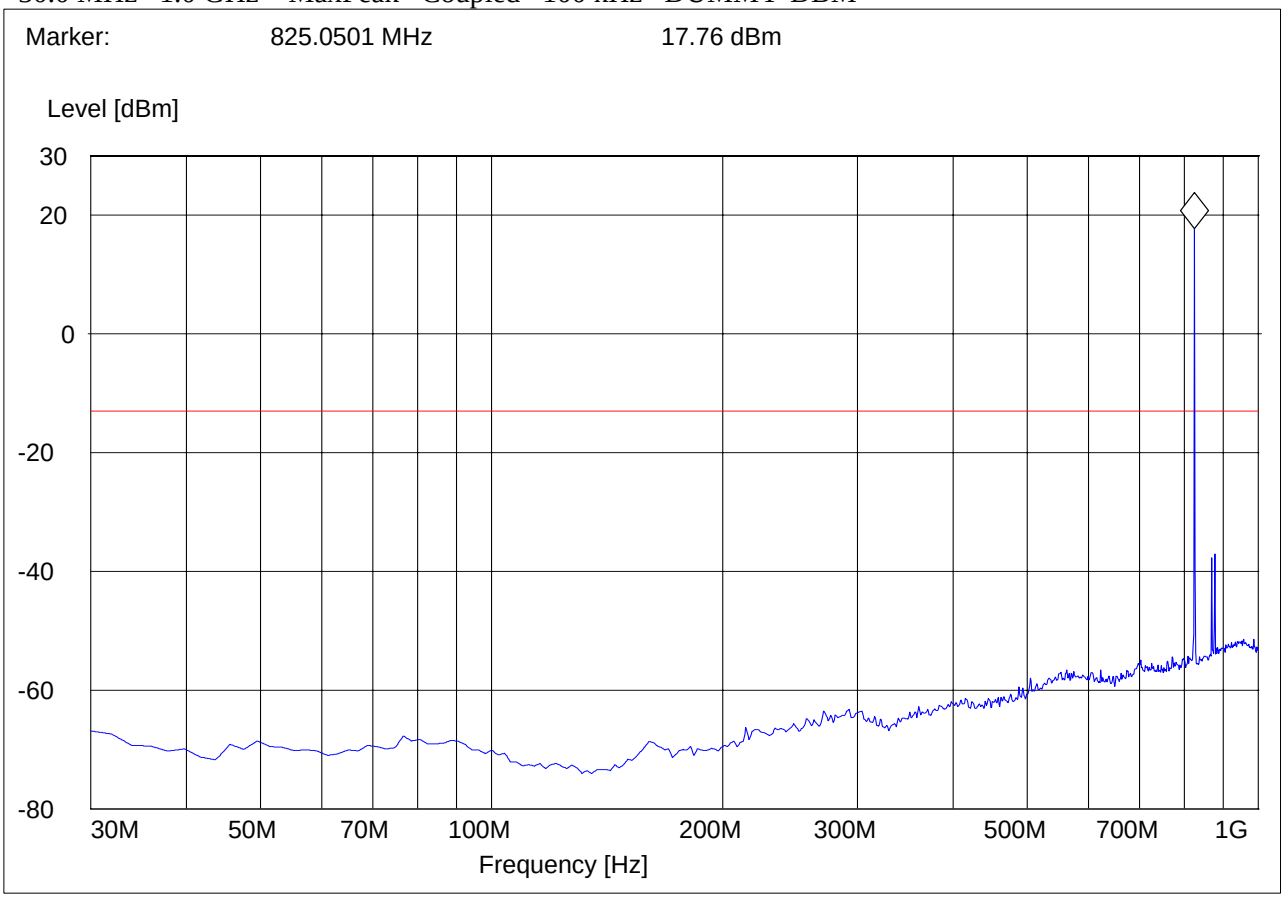
Spurious emission limit –13dBm

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

EUT: 04GU00/C05
Customer:: Braemar
Test Mode: GSM 850 ch.128
ANT Orientation: H
EUT Orientation: H
Test Engineer: Chris
Voltage: battery
Comments: marker placed on uplink

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

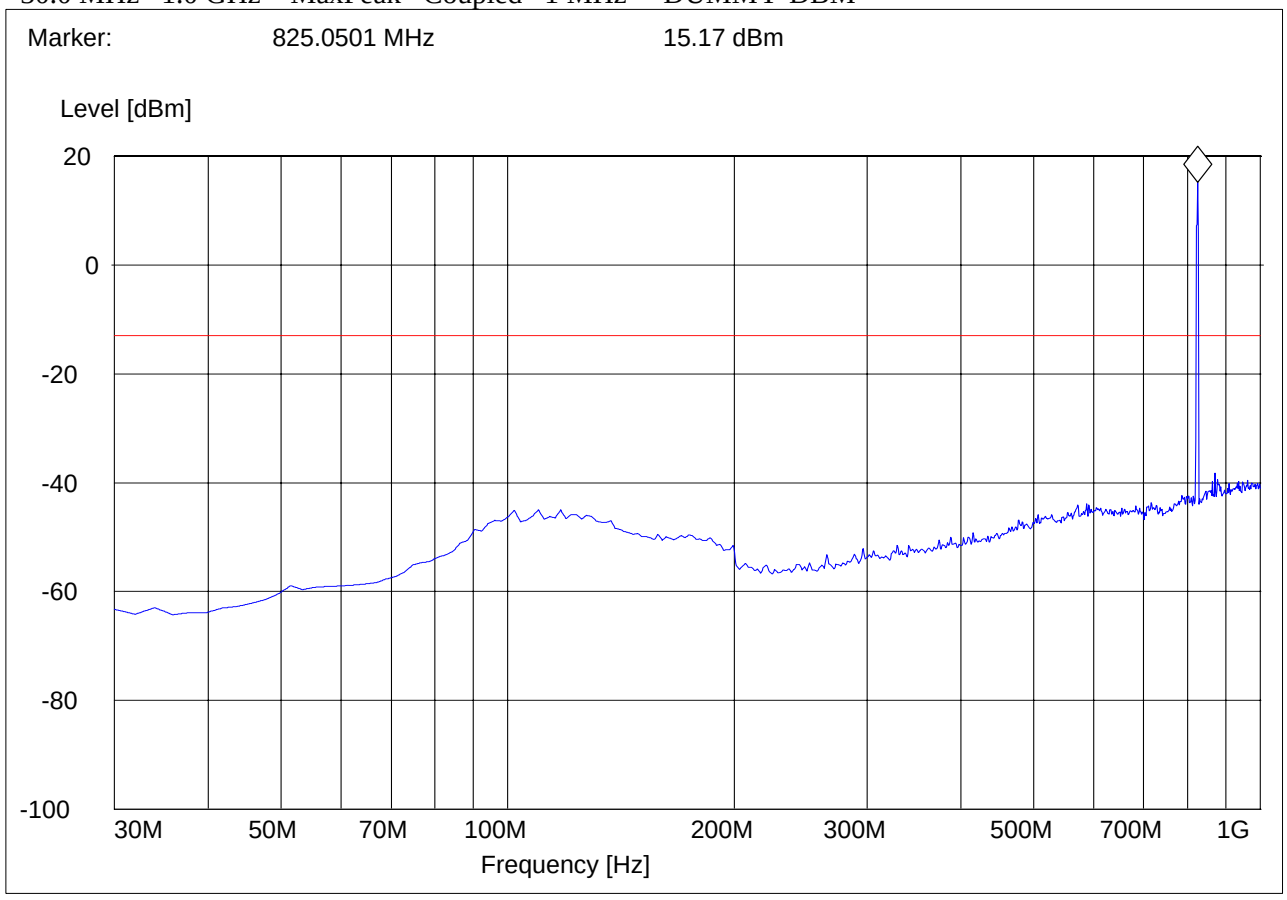


TX: 30MHz - 1GHz
Spurious emission limit –13dBm
Note: 1.The peak above the limit line is the carrier freq.

EUT: 04GU00/C05
Customer:: Braemar
Test Mode: GSM 850 ch.128
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: battery
Comments: marker placed on uplink

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

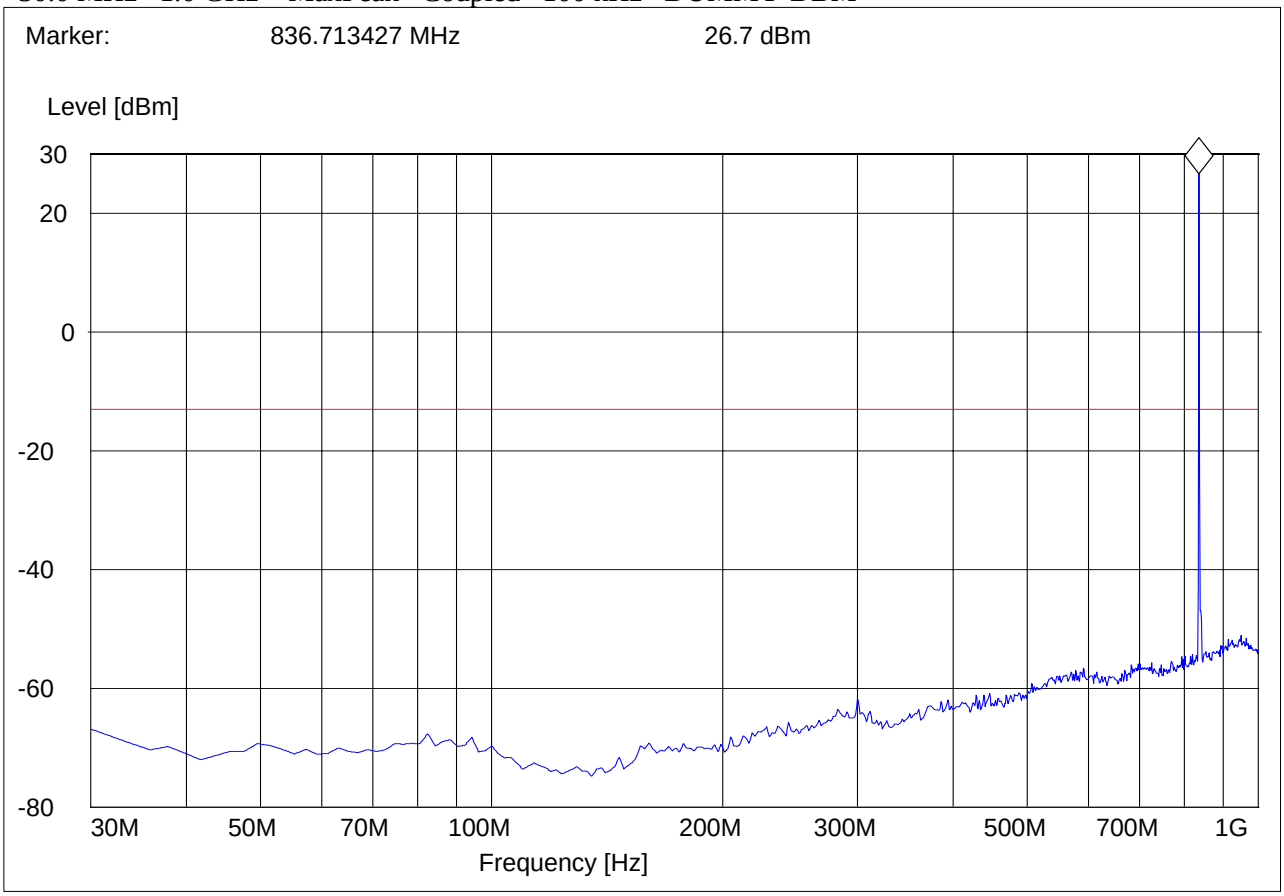


TX: 30MHz - 1GHz
Spurious emission limit –13dBm
Note: 1.The peak above the limit line is the carrier freq.

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850, ch.190
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments: marker placed on uplink

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

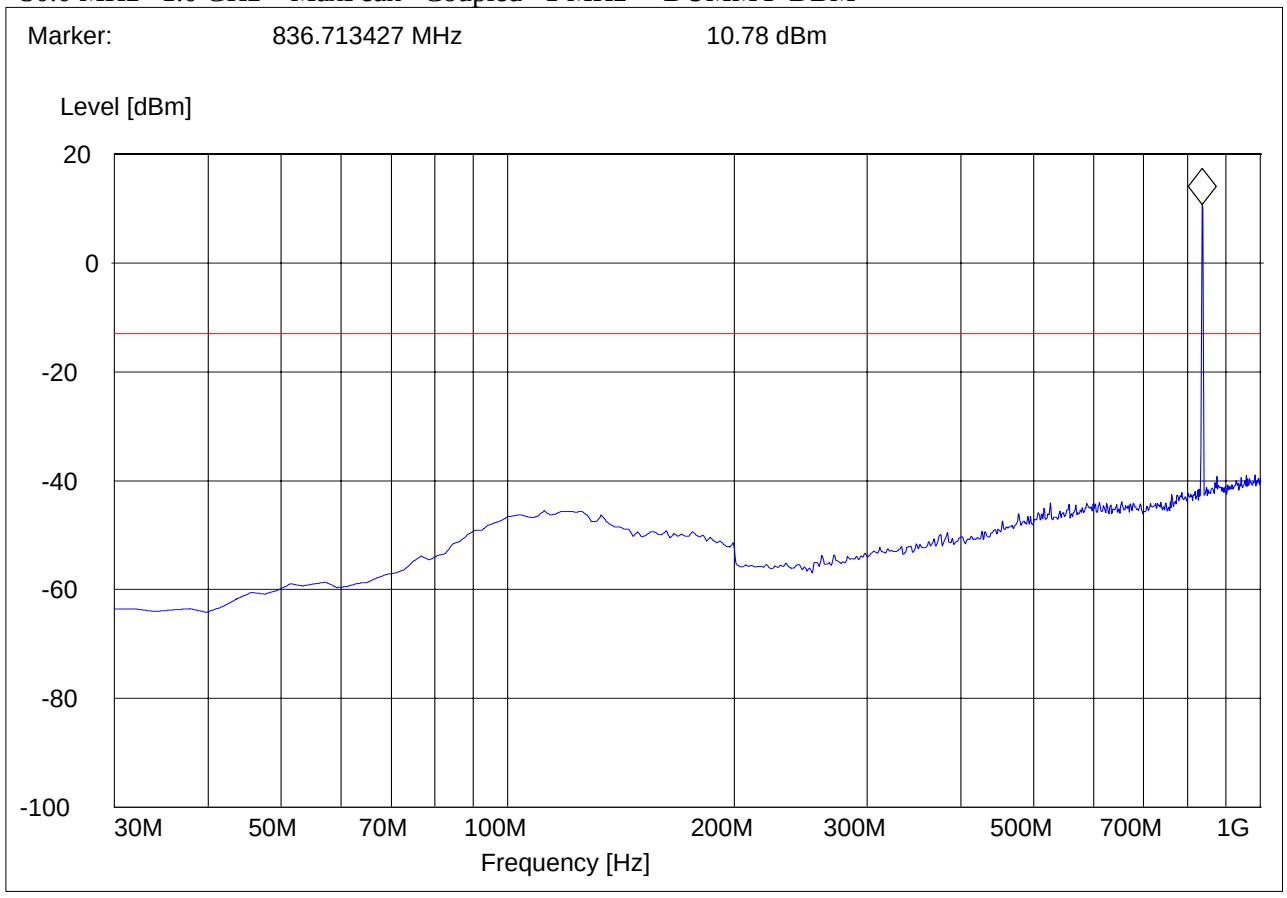


TX: 30MHz - 1GHz
Spurious emission limit –13dBm
Note: 1.The peak above the limit line is the carrier freq.

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850, ch.190
ANT Orientation: V
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments: marker placed on uplink

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

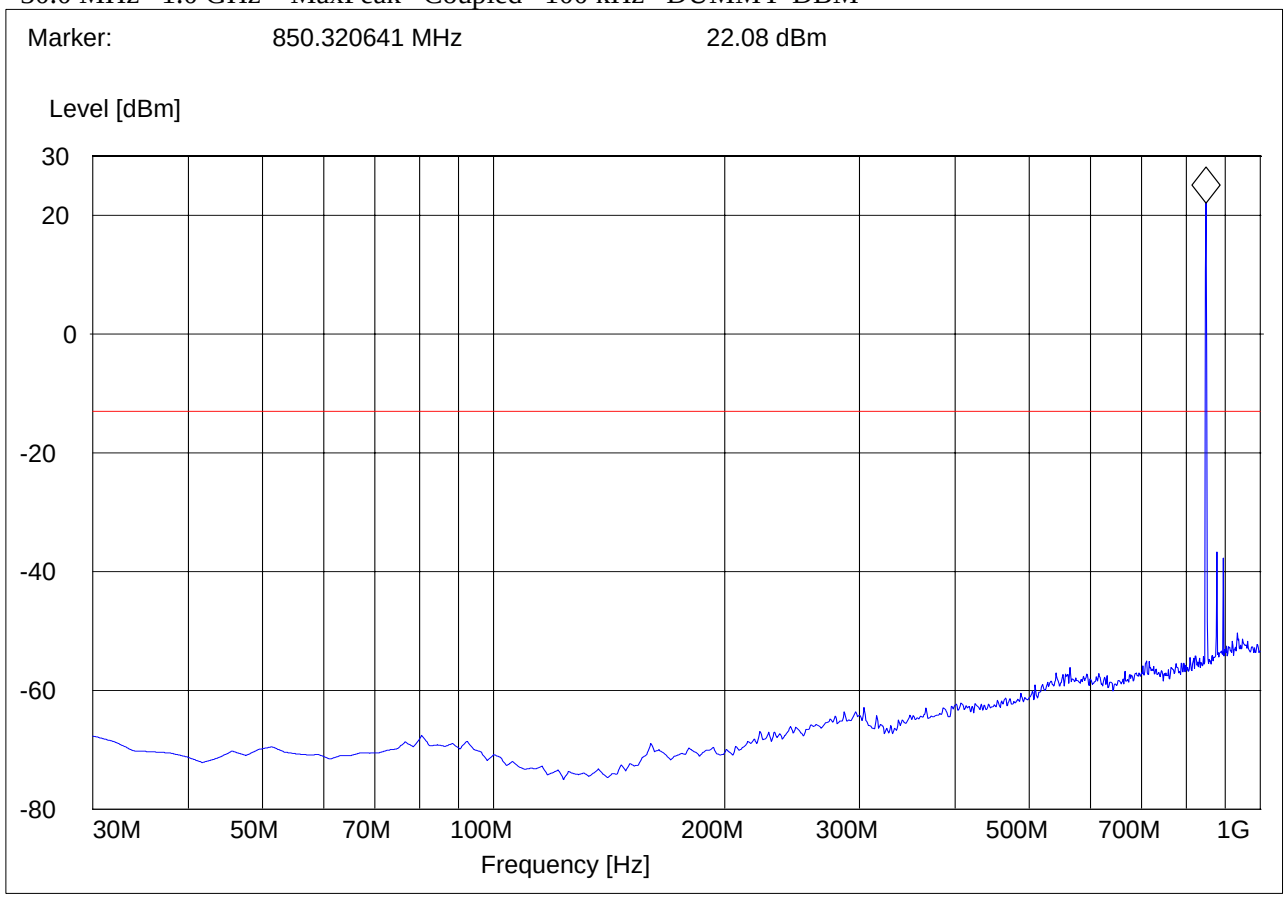


TX: 30MHz - 1GHz
Spurious emission limit –13dBm
Note: 1.The peak above the limit line is the carrier freq.

EUT: 04GU00/C05
Customer:: Braemar
Test Mode: GSM 850 ch.251
ANT Orientation: H
EUT Orientation: H
Test Engineer: Chris
Voltage: battery
Comments: marker placed on uplink

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

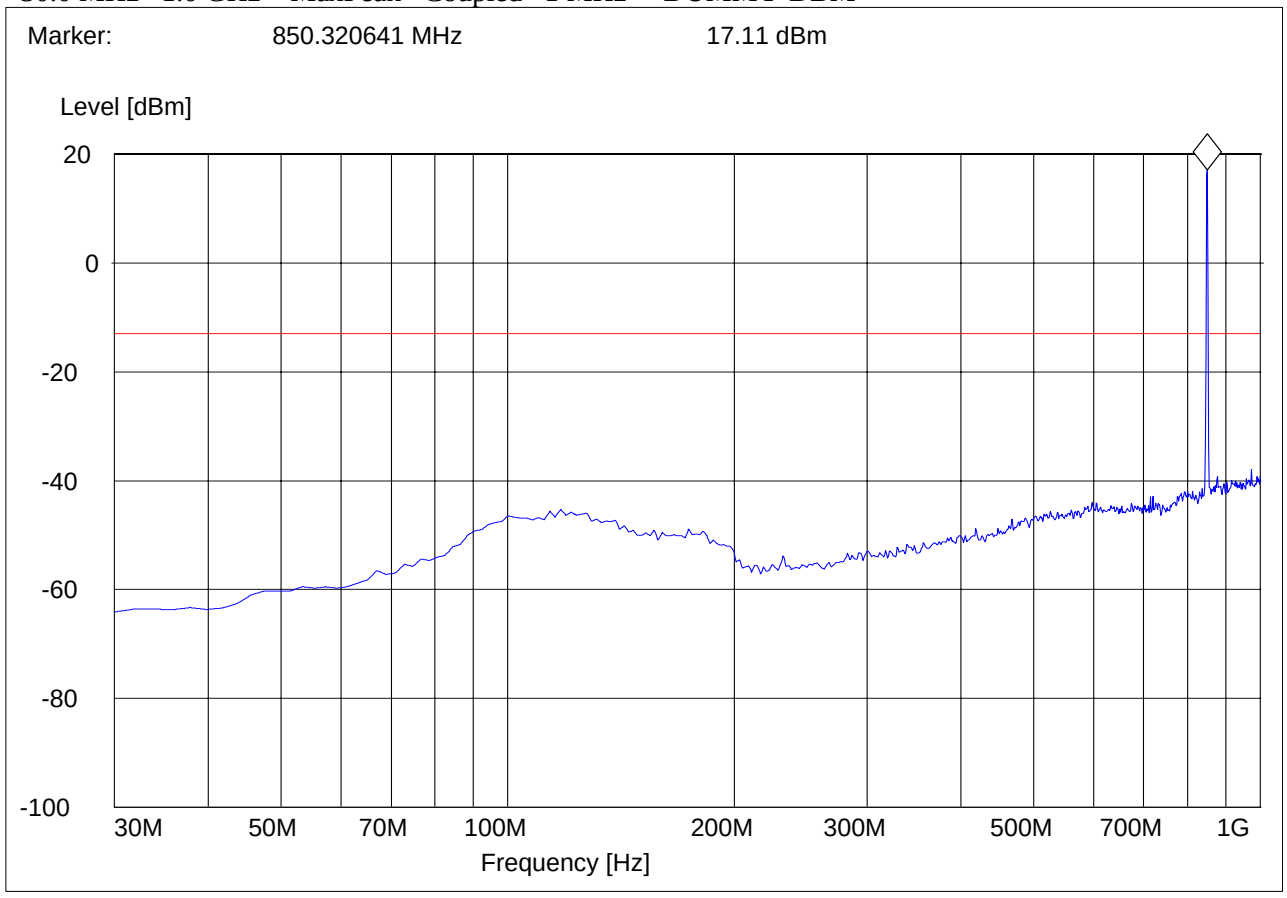


TX: 30MHz - 1GHz
Spurious emission limit –13dBm
Note: 1.The peak above the limit line is the carrier freq.

EUT: 04GU00/C05
Customer:: Braemar
Test Mode: GSM 850 ch.251
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: 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

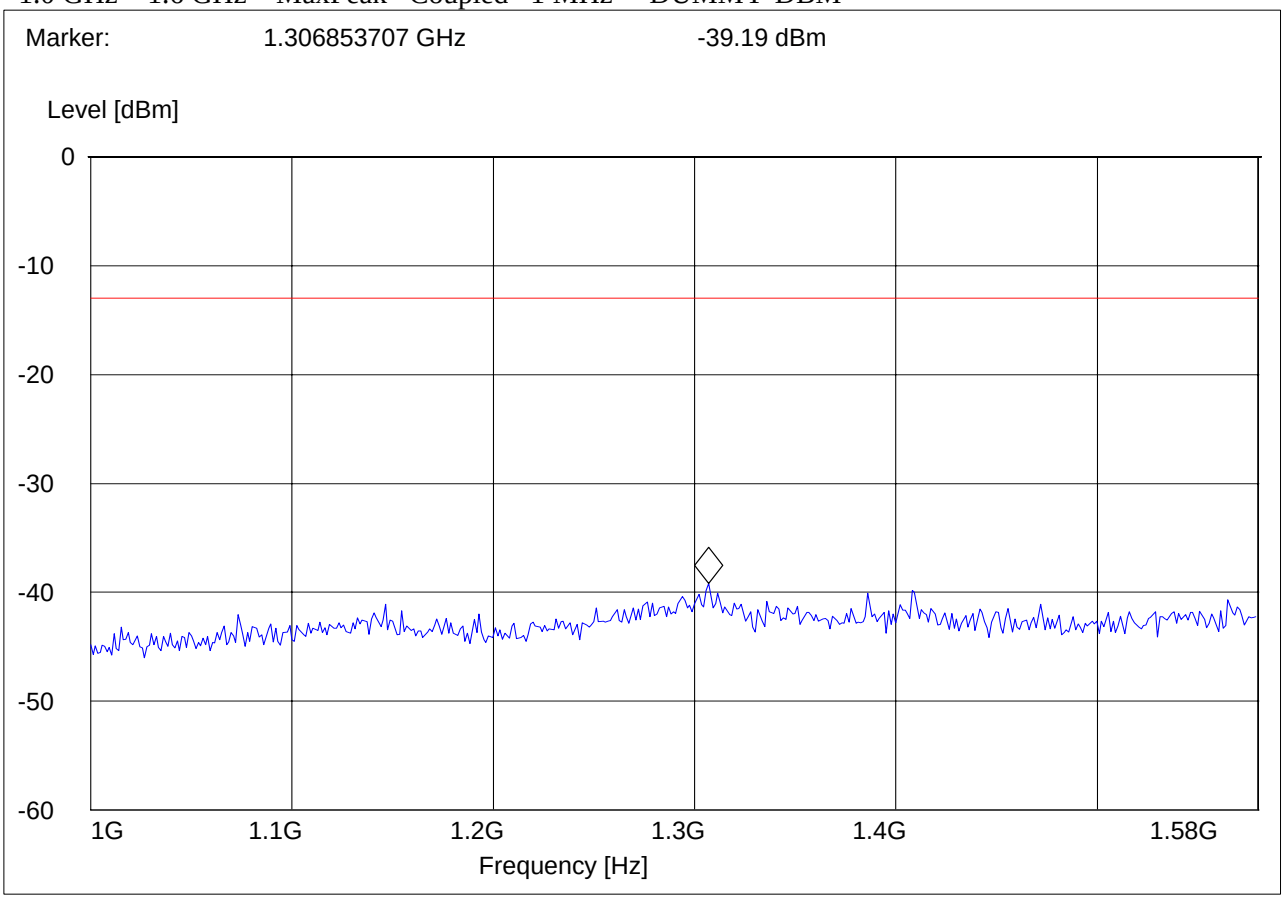


RADIATED SPURIOUS EMISSIONS (GSM-850)
Tx @ 825.5MHz: 1GHz – 1.58GHz
Spurious emission limit –13dBm
Note: **This plot is valid for horizontal and vertical polarization (worst-case plot)**

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850, Ch.128
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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

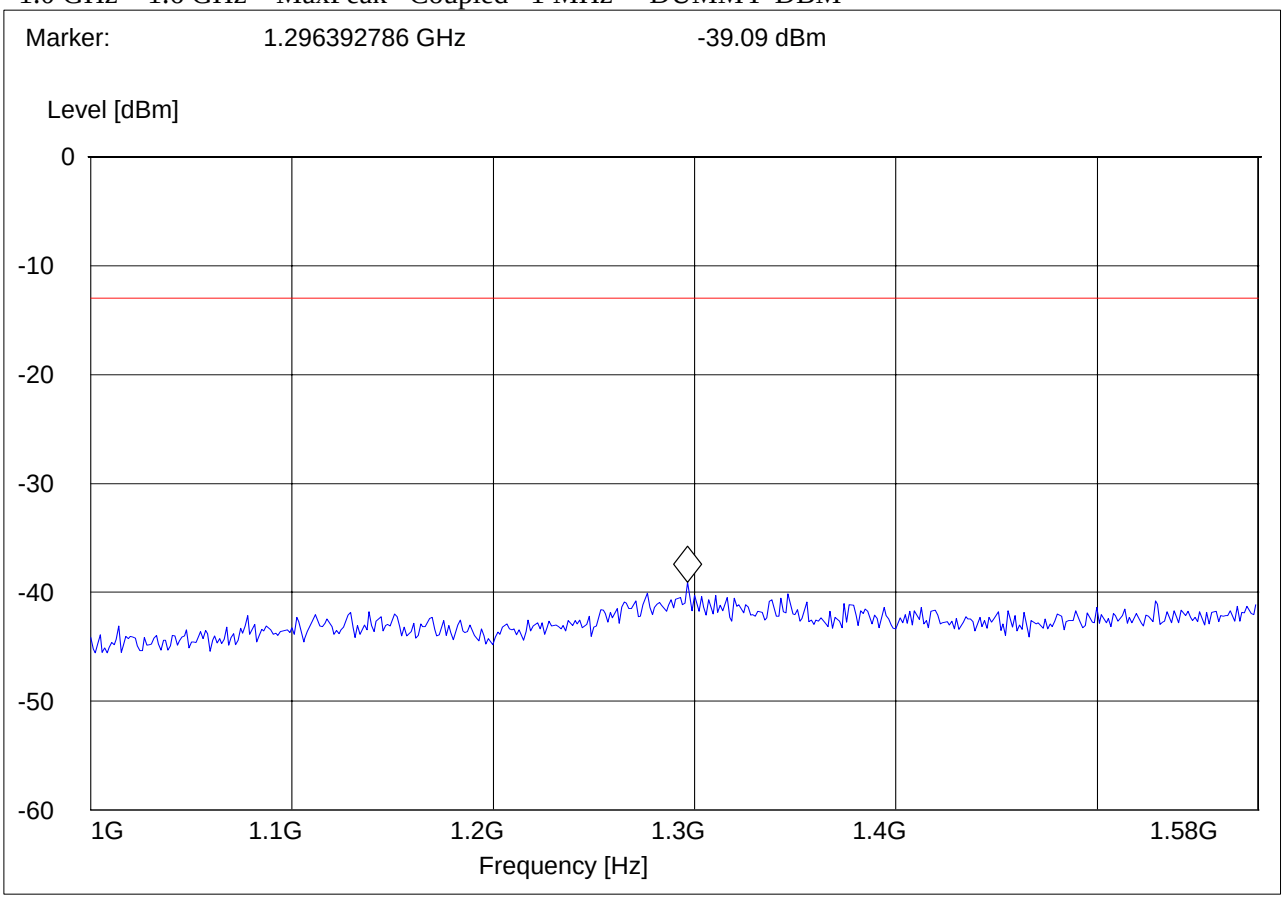


RADIATED SPURIOUS EMISSIONS (GSM-850)
Tx @ 825.5MHz: 1GHz – 1.58GHz
Spurious emission limit –13dBm
Note: **This plot is valid for horizontal and vertical polarization (worst-case plot)**

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850, ch.190
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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

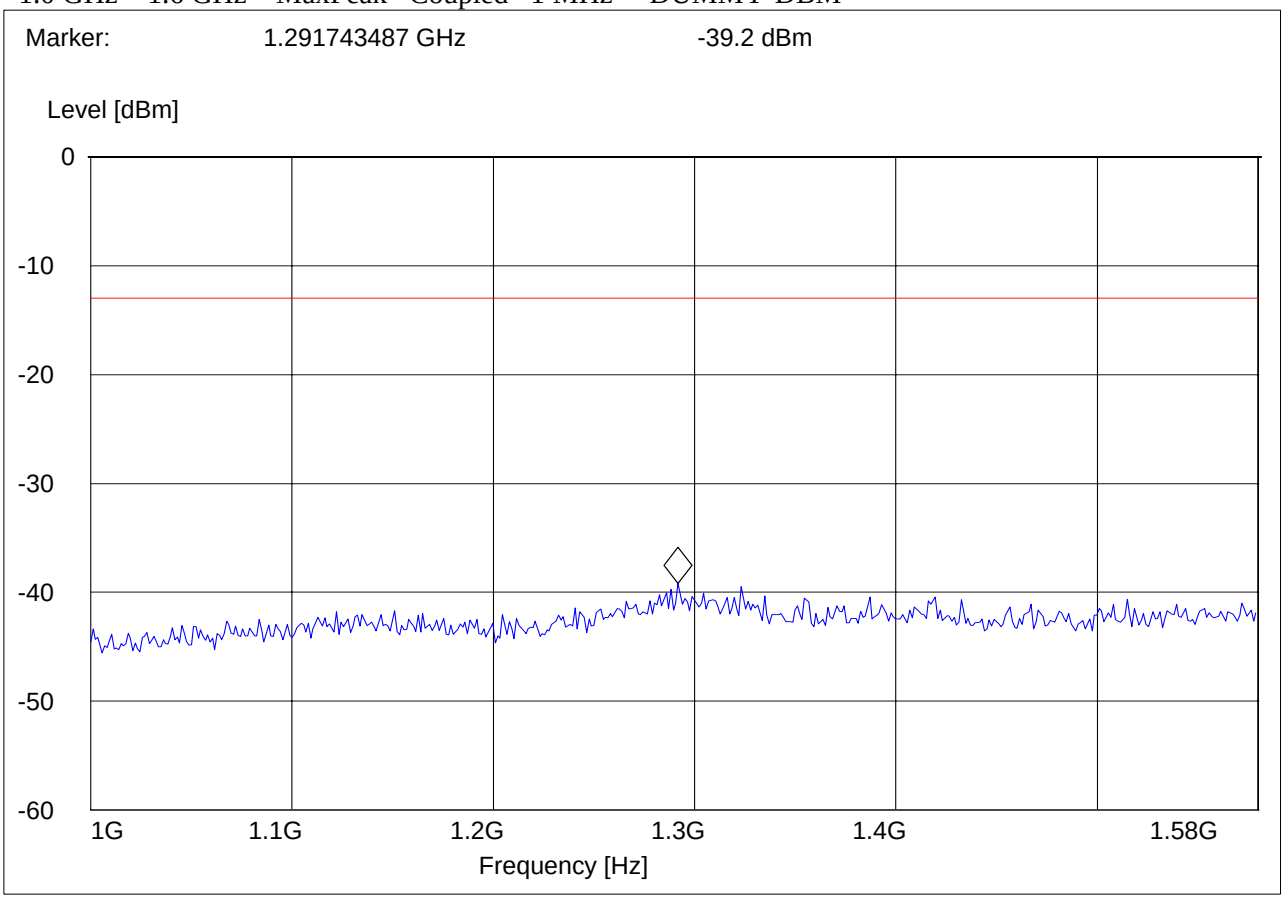


RADIATED SPURIOUS EMISSIONS (GSM-850)
Tx @ 825.5MHz: 1GHz – 1.58GHz
Spurious emission limit –13dBm
Note: **This plot is valid for horizontal and vertical polarization (worst-case plot)**

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850, ch.251
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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

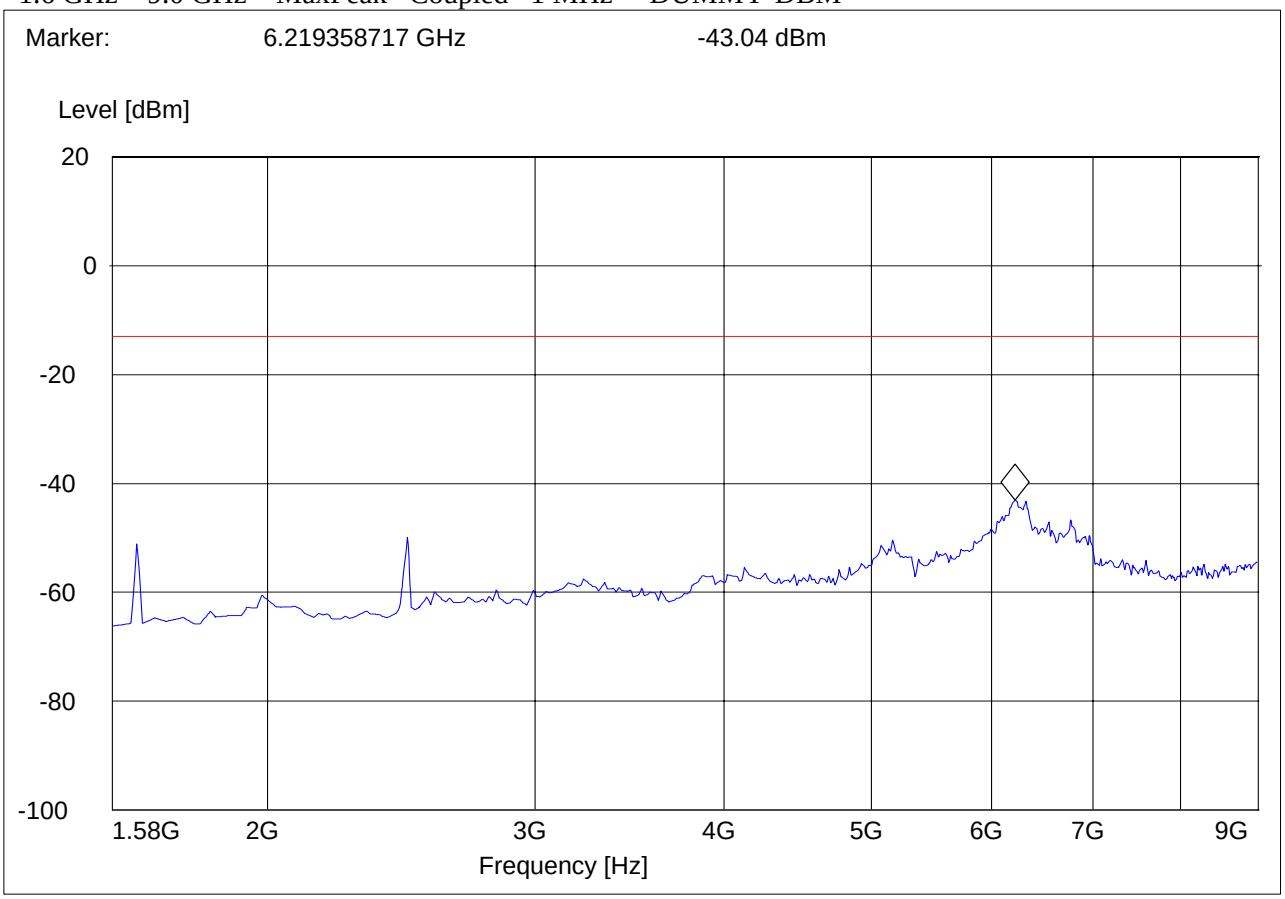


RADIATED SPURIOUS EMISSIONS (GSM-850)
Tx @ 836.5MHz: 1.58GHz – 9GHz
Spurious emission limit –13dBm
Note: **This plot is valid for horizontal and vertical polarization (worst-case plot)**

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850, ch.128
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments:

SWEEP TABLE: "FCC 22Spuri 1.58-9G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

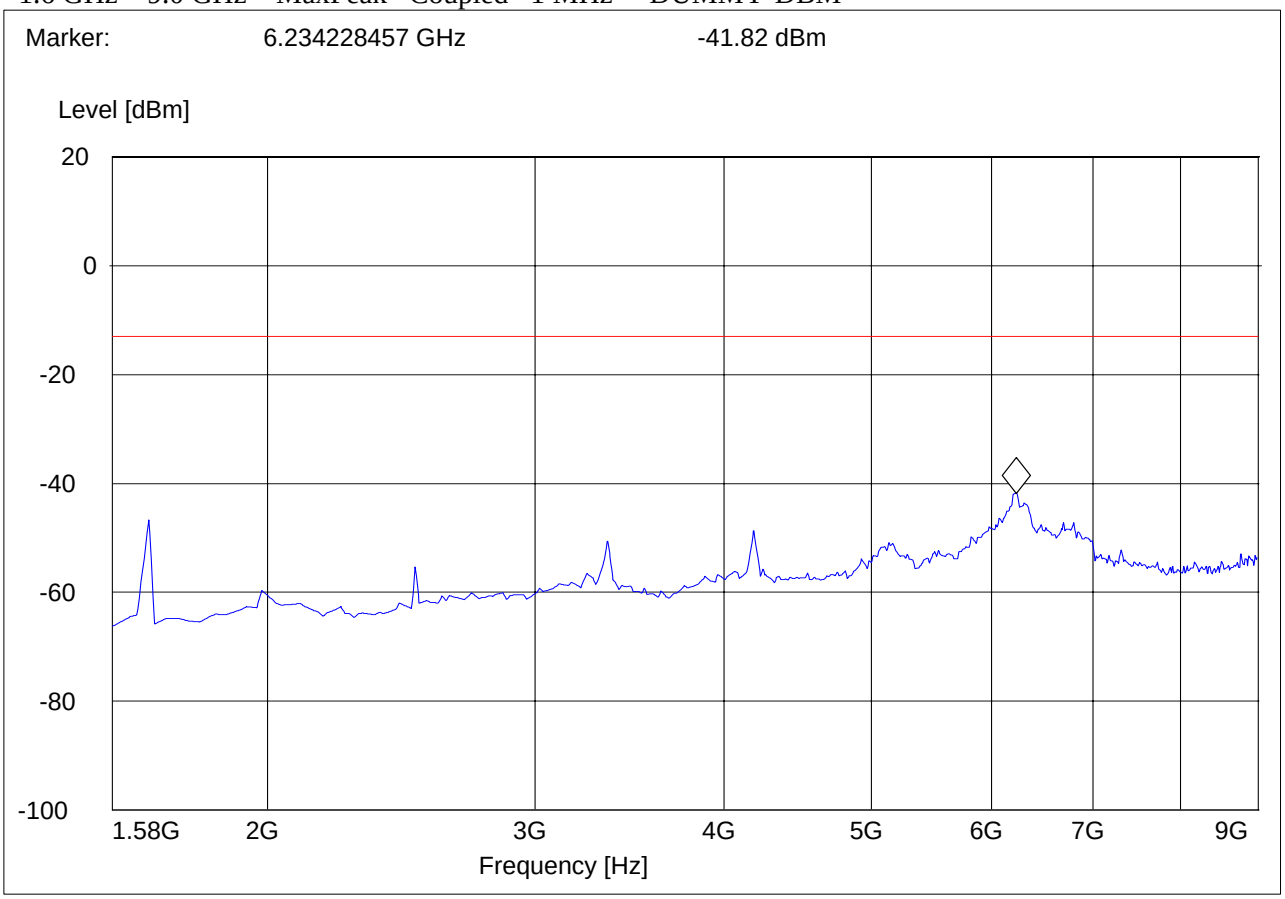


RADIATED SPURIOUS EMISSIONS (GSM-850)
Tx @ 836.5MHz: 1.58GHz – 9GHz
Spurious emission limit –13dBm
Note: **This plot is valid for horizontal and vertical polarization (worst-case plot)**

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850, ch, 190
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments:

SWEEP TABLE: "FCC 22Spuri 1.58-9G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

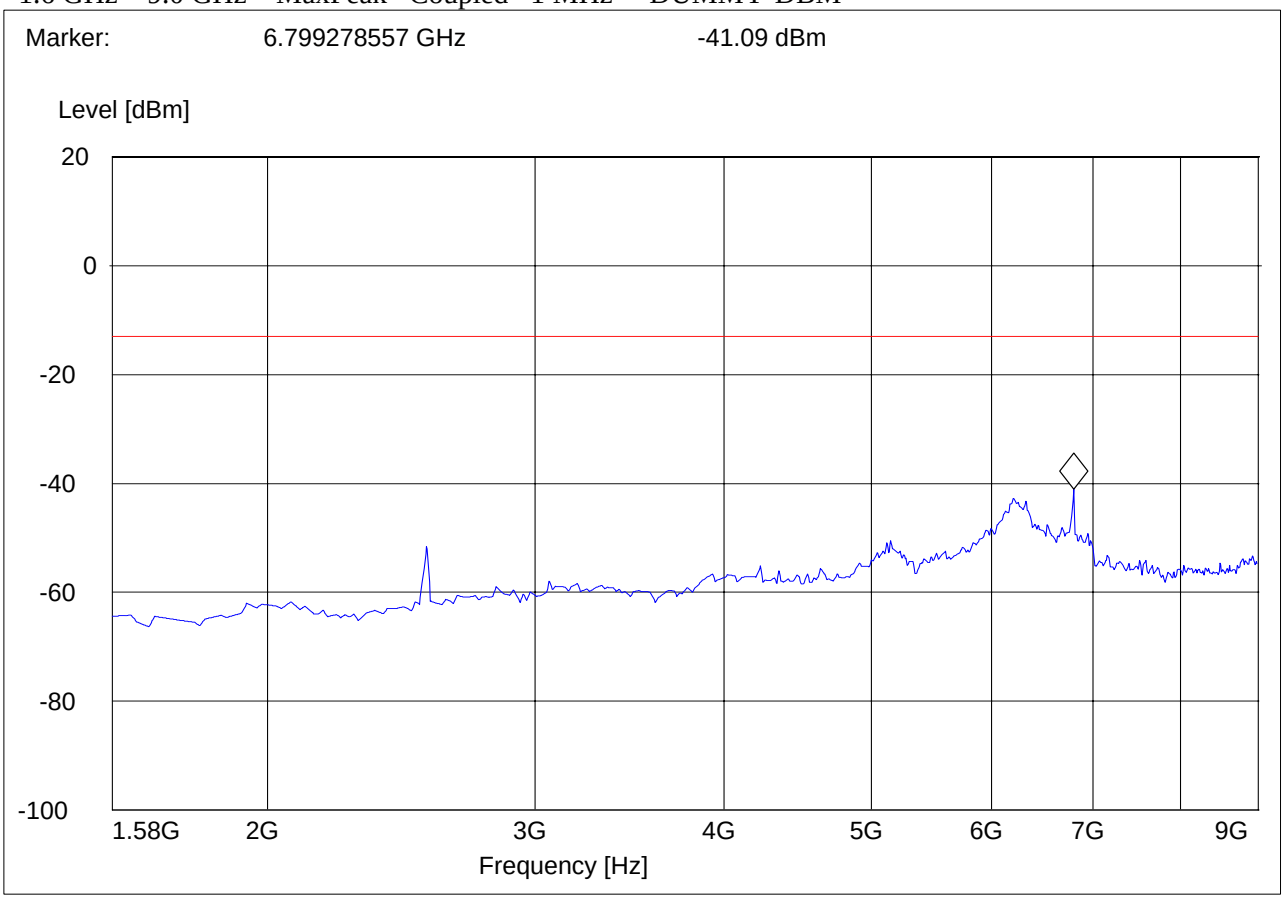


RADIATED SPURIOUS EMISSIONS (GSM-850)
Tx @ 836.5MHz: 1.58GHz – 9**GHz**
Spurious emission limit –13dBm
Note: **This plot is valid for horizontal and vertical polarization (worst-case plot)**

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 850
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: battery
Comments:

SWEEP TABLE: "FCC 22Spuri 1.58-9G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.6 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM



4.5.4.3 RESULTS OF RADIATED TESTS 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						

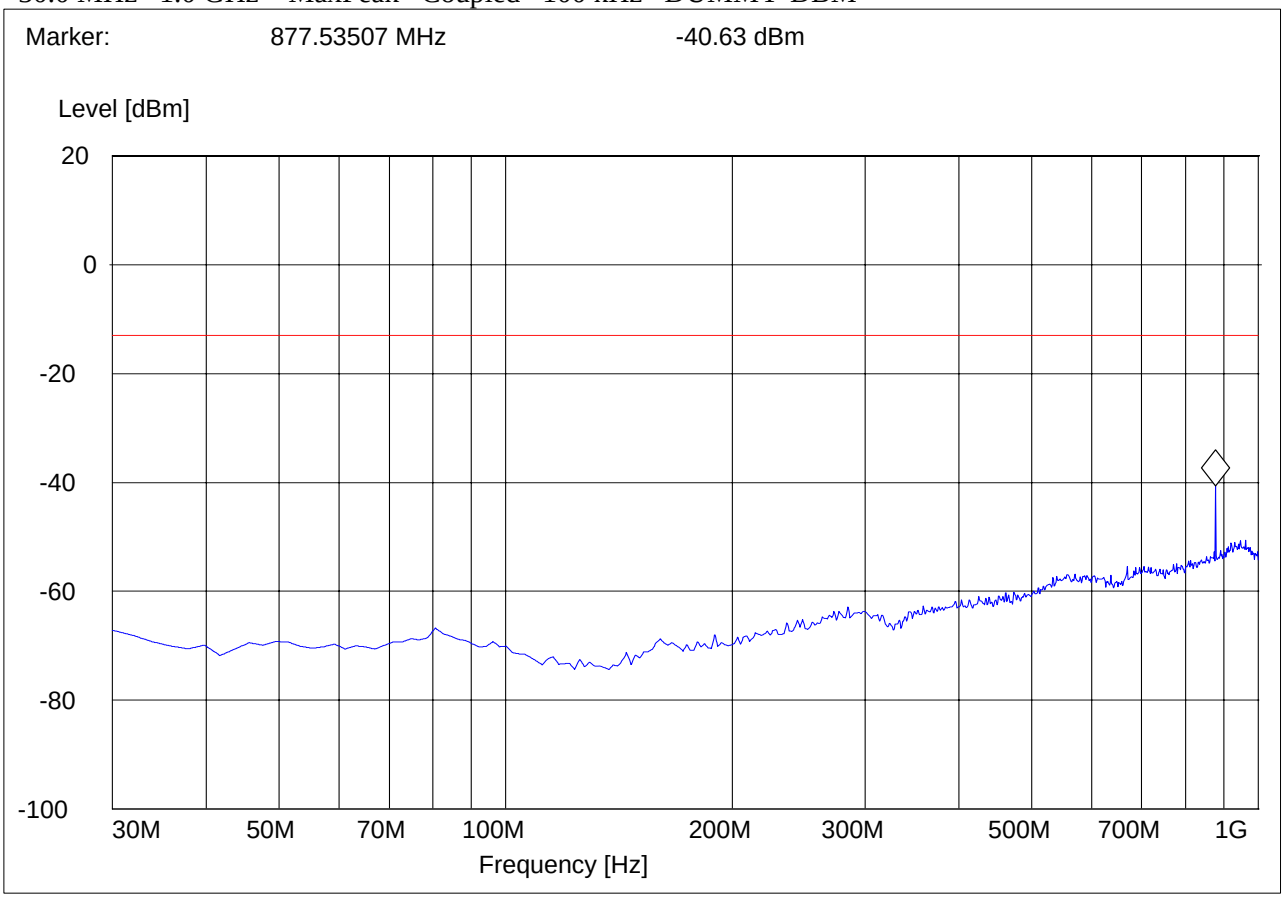
4.5.4.4 RADIATED SPURIOUS EMISSIONS (PCS 1900)

TX: 30MHz - 1GHz
Spurious emission limit –13dBm
Note: This plot is valid for low, mid & high channels (worst-case plot)

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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

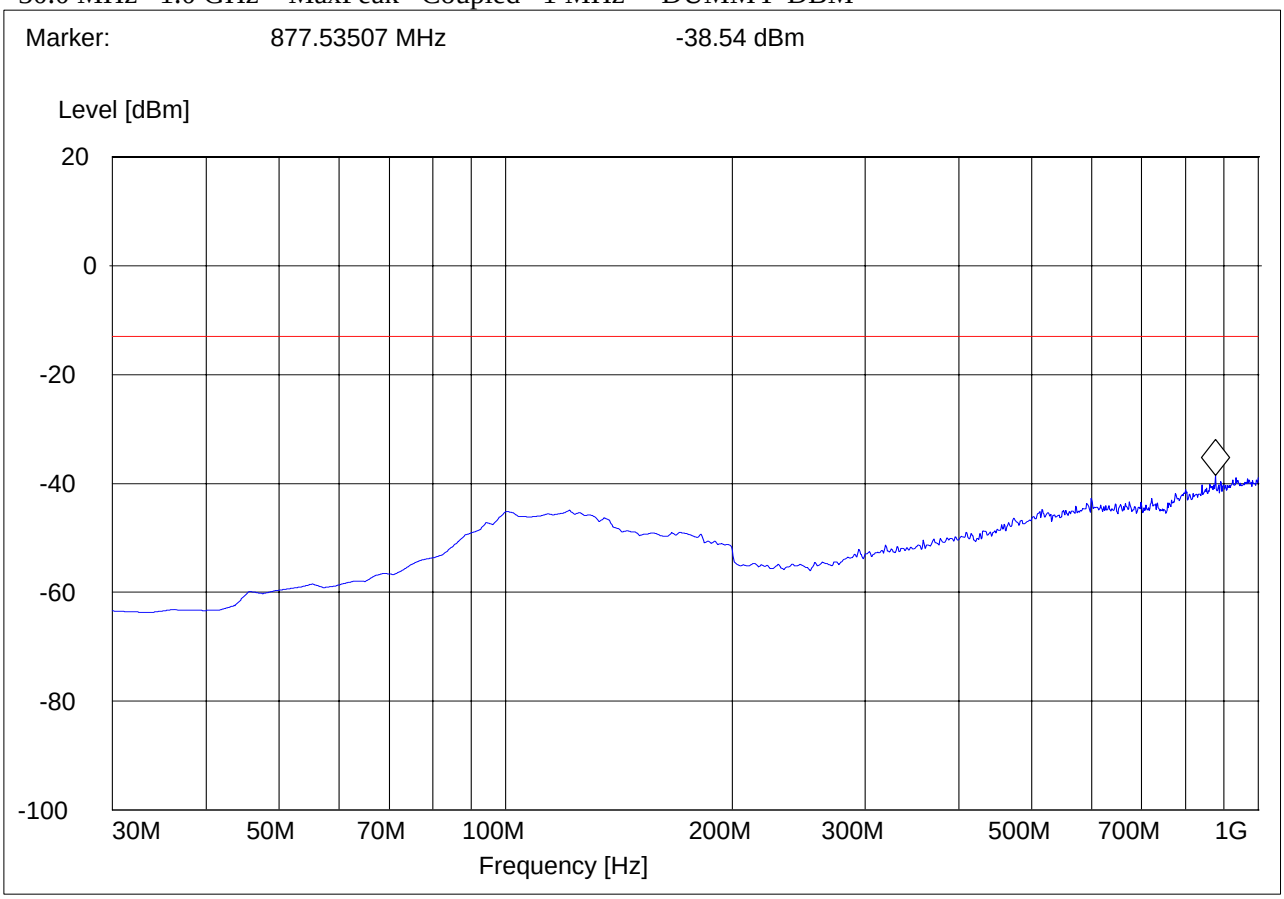


RADIATED SPURIOUS EMISSIONS (PCS 1900)
TX: 30MHz - 1GHz
Spurious emission limit –13dBm
Note: This plot is valid for low, mid & high channels (worst-case plot).

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900
ANT Orientation: V
EUT Orientation: H
Test Engineer: SAM
Voltage: 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

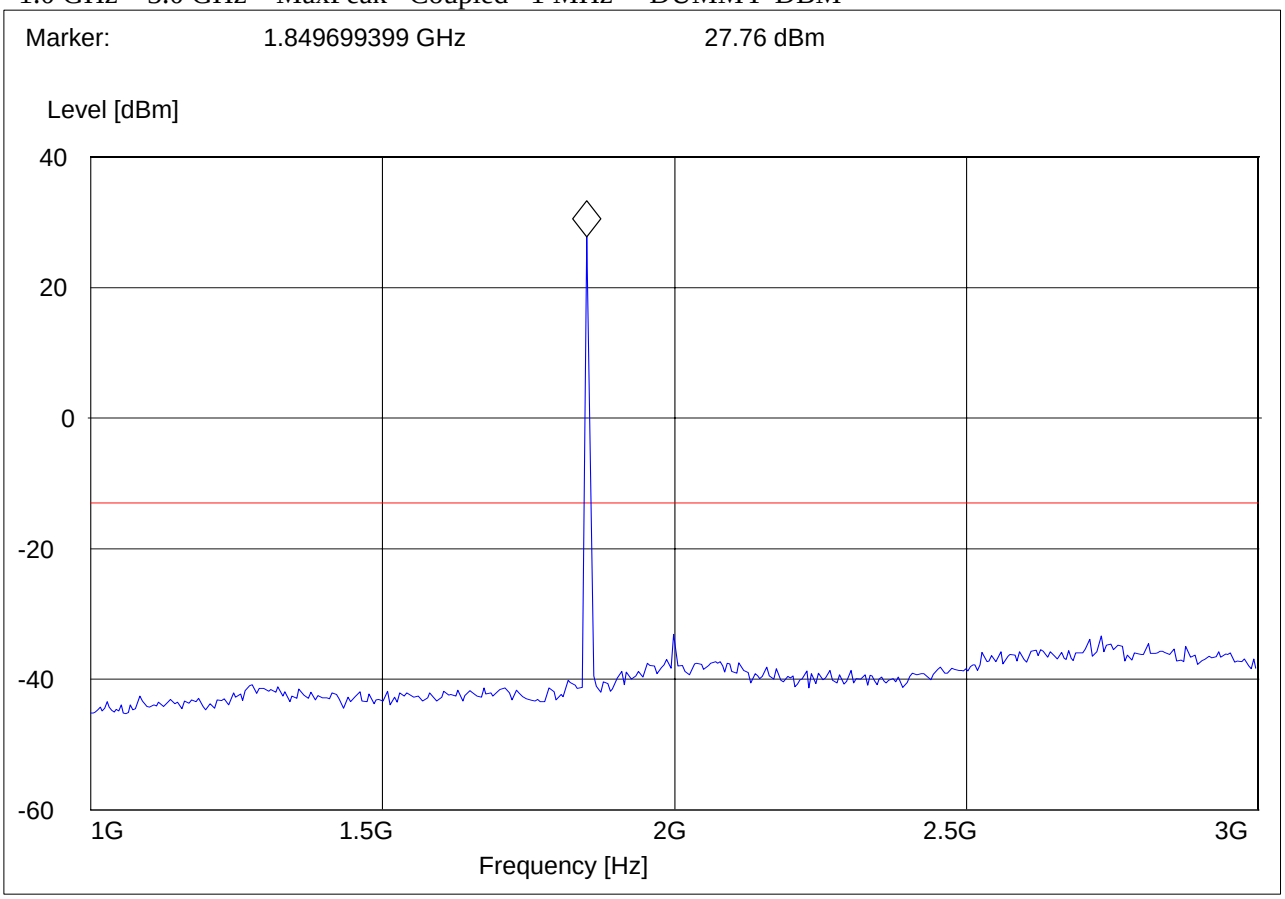


RADIATED SPURIOUS EMISSIONS (PCS 1900)
Tx @ 1850.2 MHz: 1GHz – 3GHz
Spurious emission limit –13dBm
Note: The peak above the limit line is the carrier freq. at ch-512.

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900, ch.512
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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

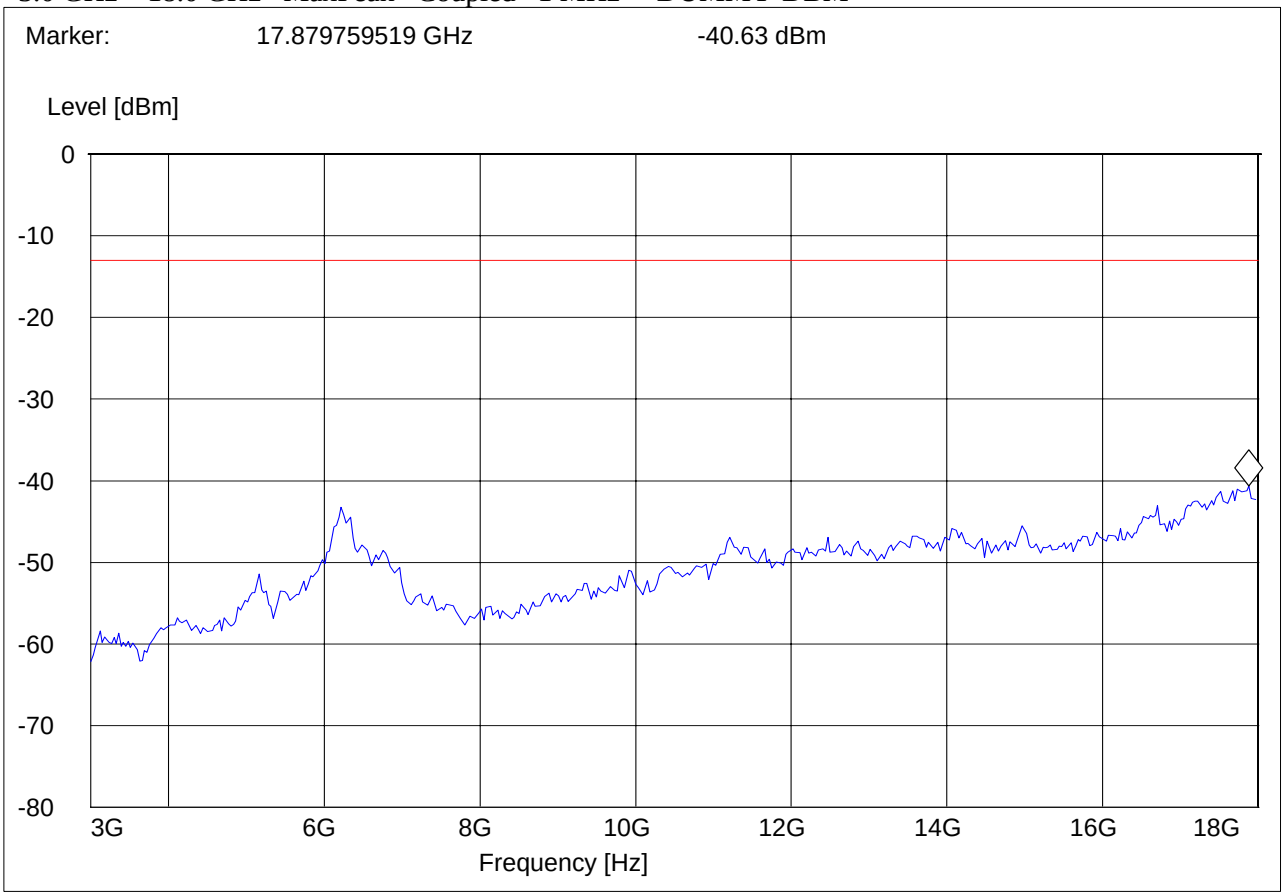


RADIATED SPURIOUS EMISSIONS (PCS 1900)
Tx @ 1850.2 MHz: 3GHz – 18GHz
Spurious emission limit –13dBm

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900, ch.512
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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

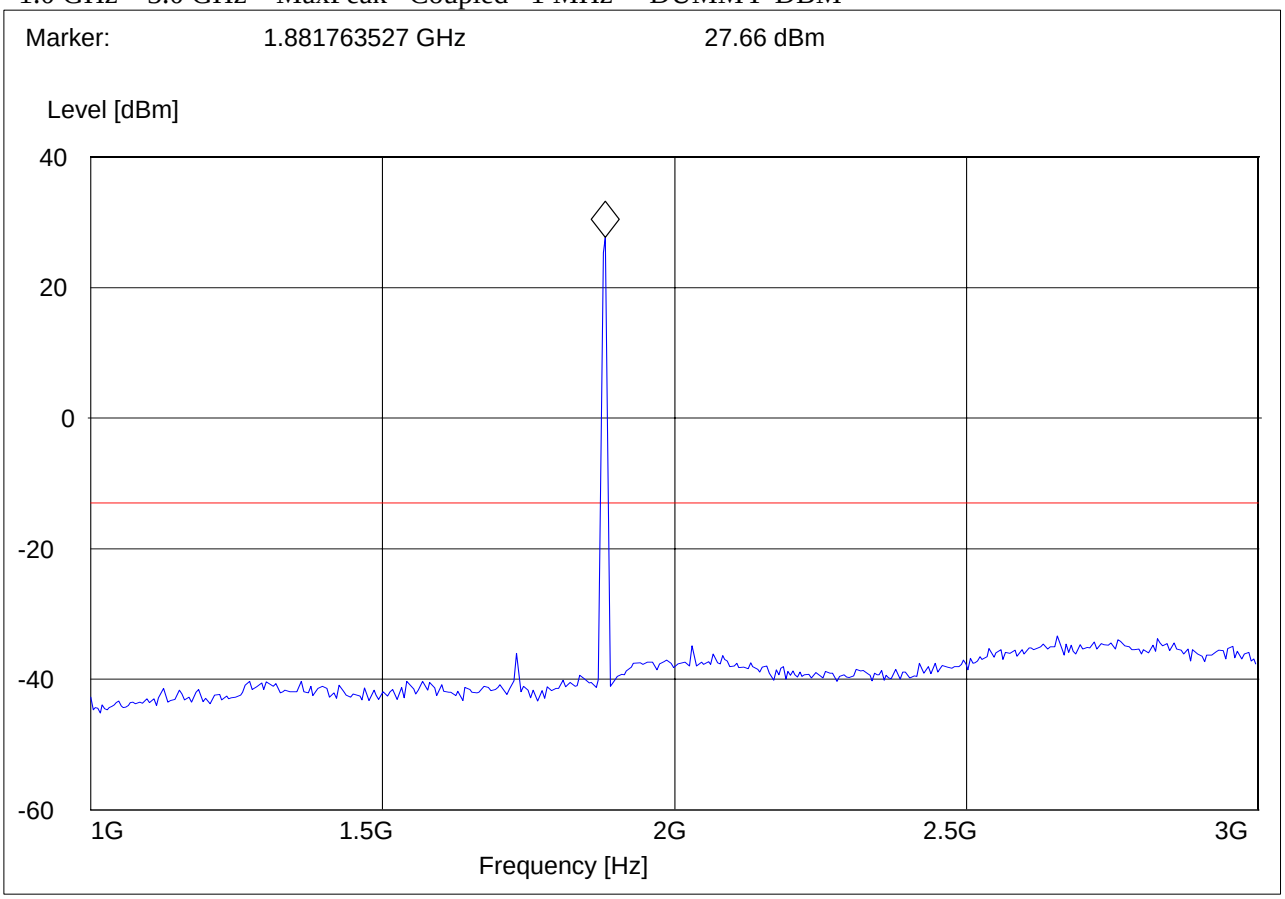


RADIATED SPURIOUS EMISSIONS (PCS 1900)
Tx @ 1880.0MHz: 1GHz – 3GHz
Spurious emission limit –13dBm
Note: The peak above/close to the limit line is the carrier freq. at ch-661.

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900, ch.661
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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

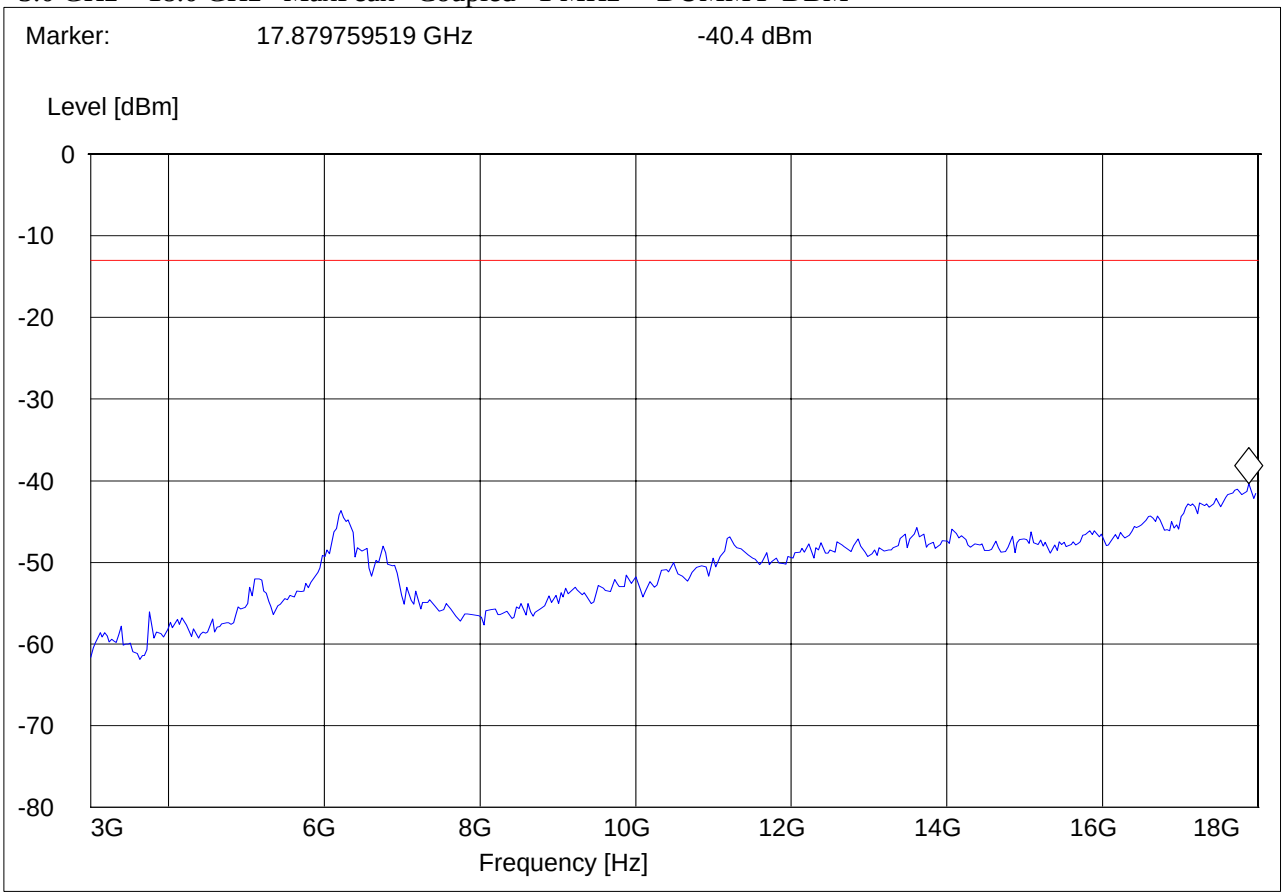


RADIATED SPURIOUS EMISSIONS (PCS 1900)
Tx @ 1880.0MHz: 3GHz – 18GHz
Spurious emission limit –13dBm

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900, ch.661
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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



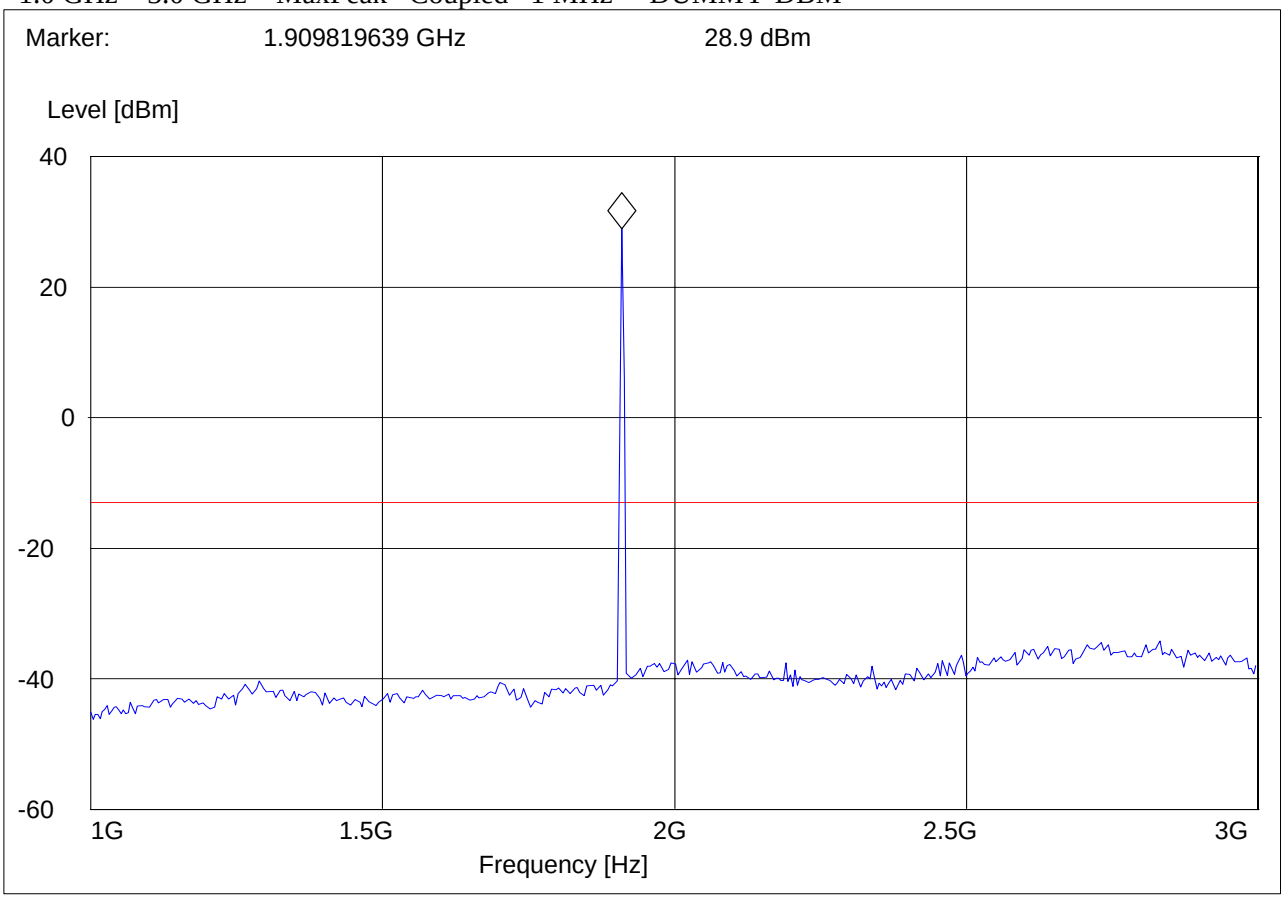
RADIATED SPURIOUS EMISSIONS (PCS 1900)
Tx @ 1909.8 MHz: 1GHz – 3GHz
Spurious emission limit –13dBm

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

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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

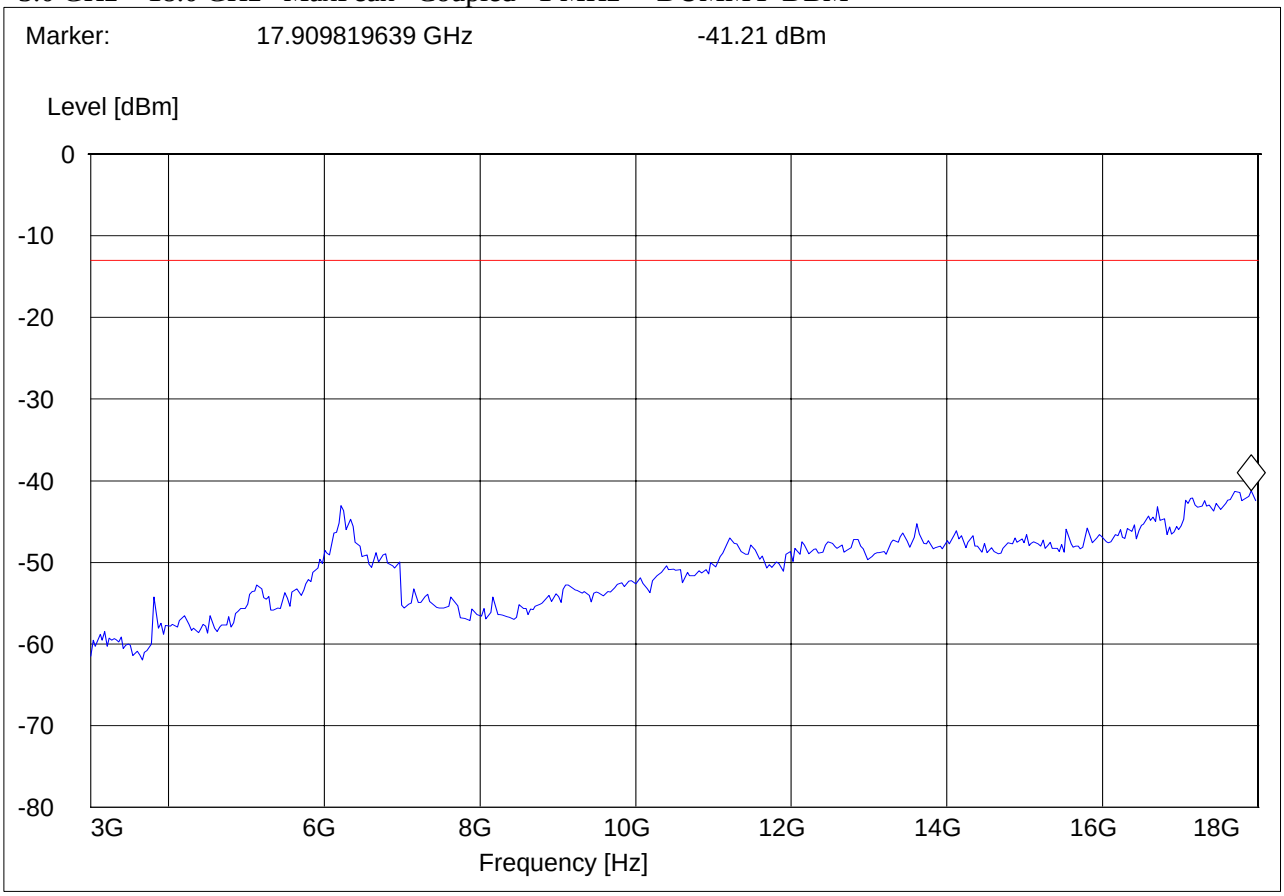


RADIATED SPURIOUS EMISSIONS (PCS 1900)
Tx @ 1909.8 MHz: 3GHz – 18GHz
Spurious emission limit –13dBm

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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

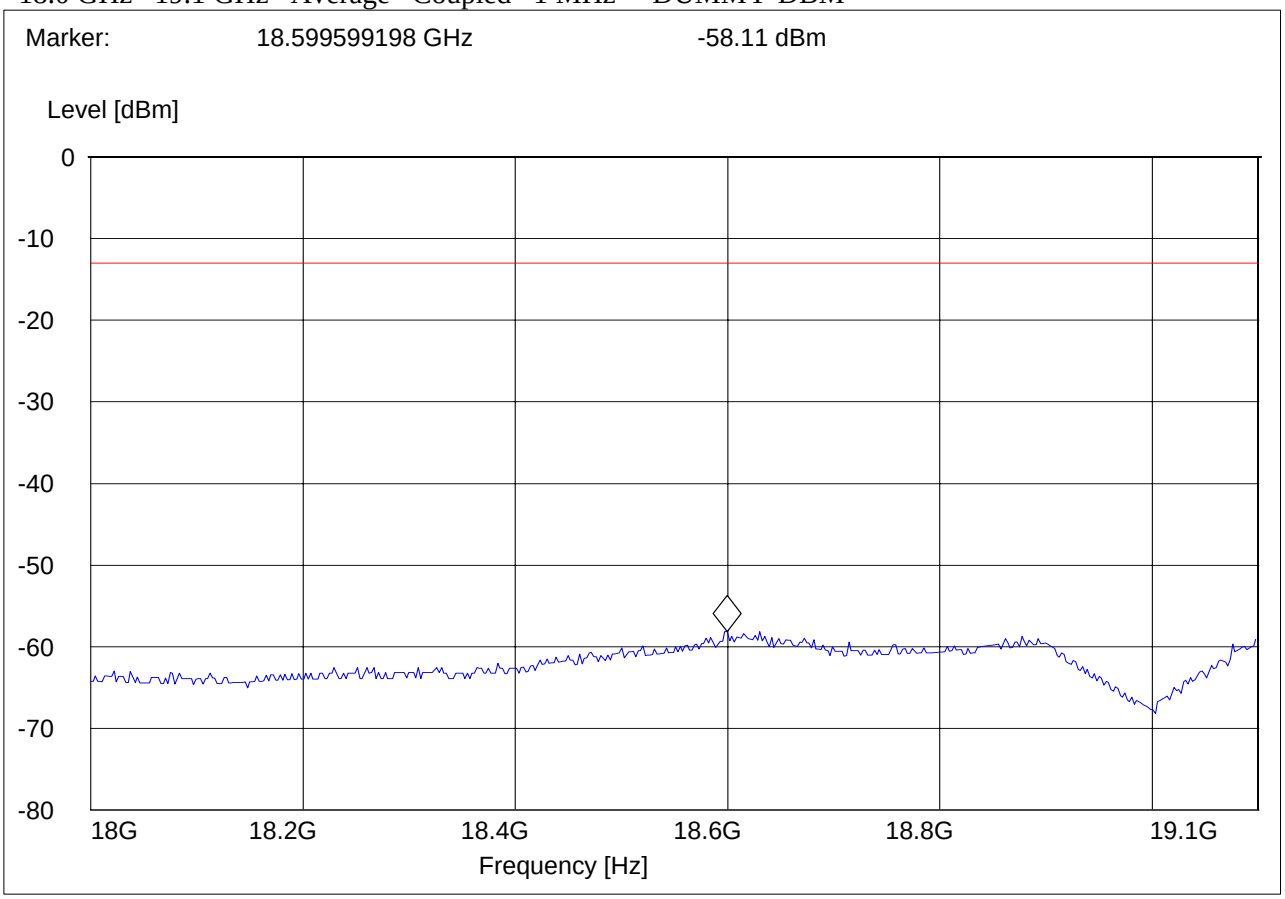


RADIATED SPURIOUS EMISSIONS (PCS 1900)
Tx mode: 18GHz – 19.1GHz
Spurious emission limit –13dBm
Note: This plot is valid for low, mid & high channels (worst-case plot).

EUT: 04GU00j/C99
Customer:: Braemar
Test Mode: GSM 1900
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: 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



4.6 Receiver Spurious Emissions Radiated

4.6.1 Limits:

4.6.1.1 FCC §15.109 & RSS-129 (10) Emission limitations for cellular equipment.

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

EUT in Idle mode & hooked up with any available ancillary equipment (Limit: FCC-15.109 Class B) Per FCC section 15.31(m) receiver has to be tested on the low, middle, and high channel.
Per RSS-129 (10) states that receiver emissions are to be performed at the middle channel up to the 3rd harmonic of the LO.

4.6.1.2 IC § RSS-133 (4.5) & (6.7) Emission limitations for Broadband PCS equipment.

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

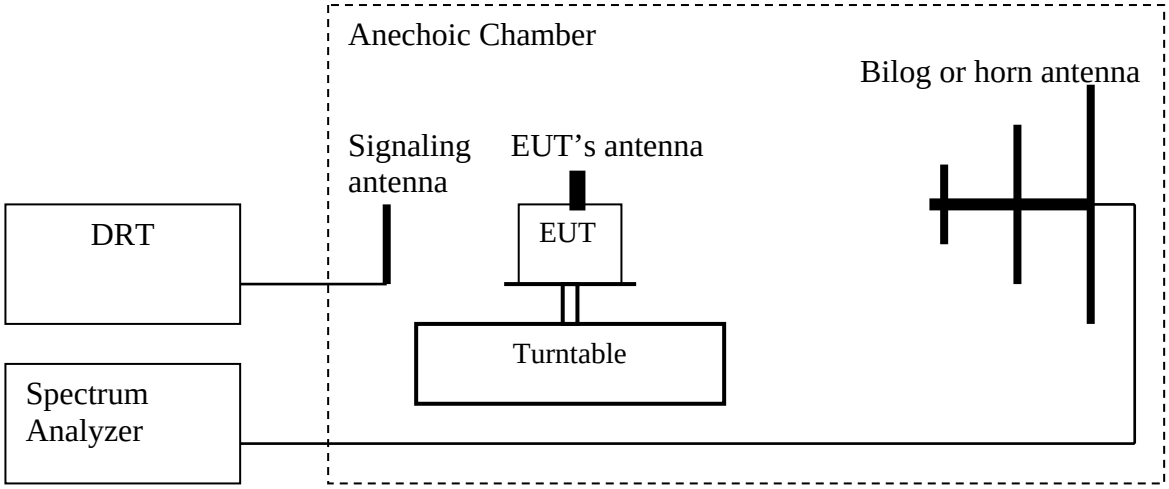
EUT in Idle mode & hooked up with any available ancillary equipment (Limit: FCC-15.109 Class B) Per FCC section 15.31(m) receiver has to be tested on the low, middle, and high channel.
Per RSS-129 (10) states that receiver emissions are to be performed at the middle channel up to the 3rd harmonic of the LO.

Note: Per 15.111 Receivers that operate or tune between 30 to 960 MHz must show compliance to section 15.109 limits. All other receivers operating below 30 MHz or above 960 MHz are exempt from testing. No such exclusion exists in the RSS standards, so all receivers are to be tested.

4.6.2 Radiated receiver measurement procedure:

Based on ANSI63.4: 2004

2.2.12 Unwanted emissions: Radiated Spurious



11. Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
12. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
13. Set the spectrum analyzer to measure peak hold with the required settings.
14. 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.
15. 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.
16. Repeat steps 4, 5 and 6 with all antennas vertically polarized.
17. Determine the level of spurious emissions using the following equation: **Spurious** (dBuV/m) = **LVL** (dBuV) + **LOSS** (dB/m):
18. 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:
Below 1GHz: RBW=VBW=100 kHz, Detector: QP
Above 1GHz: RBW=VBW= 1MHz, Detector: Peak

Measurement Survey:

For FCC receiver radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the GSM-850. For Industry Canada receiver radiated emissions measurements were made only at the middle carrier frequencies of the PCS-1900 bands. 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.

All measurements were performed with Heart monitoring sensors connected to the device.

4.6.2.1 RESULTS OF RADIATED TESTS GSM-850:

Harmonics	Tx ch-8 Freq. (MHz)	Level (dBuV/m)	Tx ch-383 Freq. (MHz)	Level (dBuV/m)	Tx ch-758 Freq. (MHz)	Level (dBuV/m)
1	**825.25**	NF	**836.5**	NF	**847.75**	NF
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
NF = NOISE FLOOR						

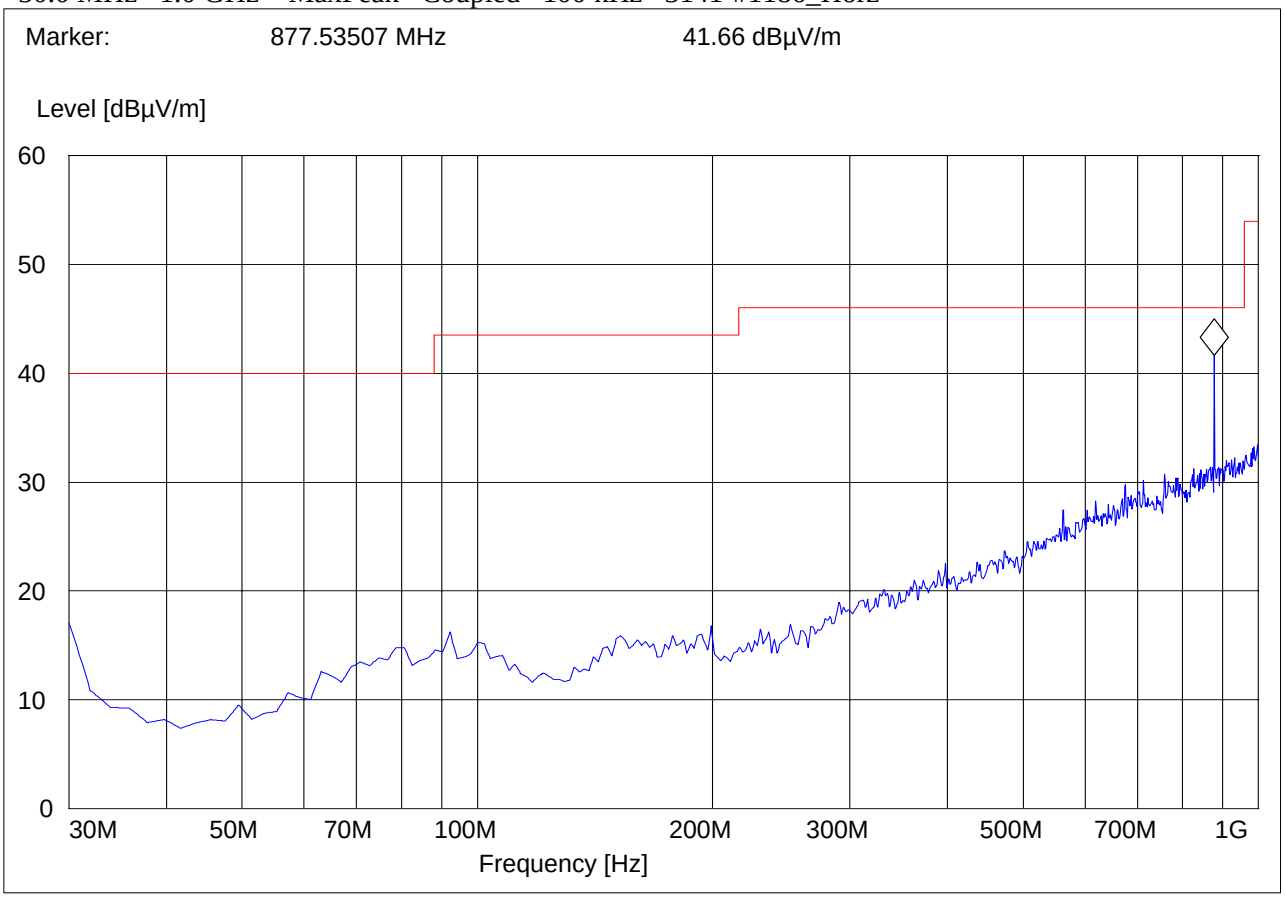
4.6.2.2 RADIATED SPURIOUS EMISSIONS (GSM-850)

RX: 30MHz - 1GHz
Note: This plot is valid for low, mid & high channels (worst-case plot)

EUT: 04GU00/C05
Customer:: Braemar
Test Mode: GSM 850, ch.190
ANT Orientation: H
EUT Orientation: H
Test Engineer: Chris
Voltage: 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

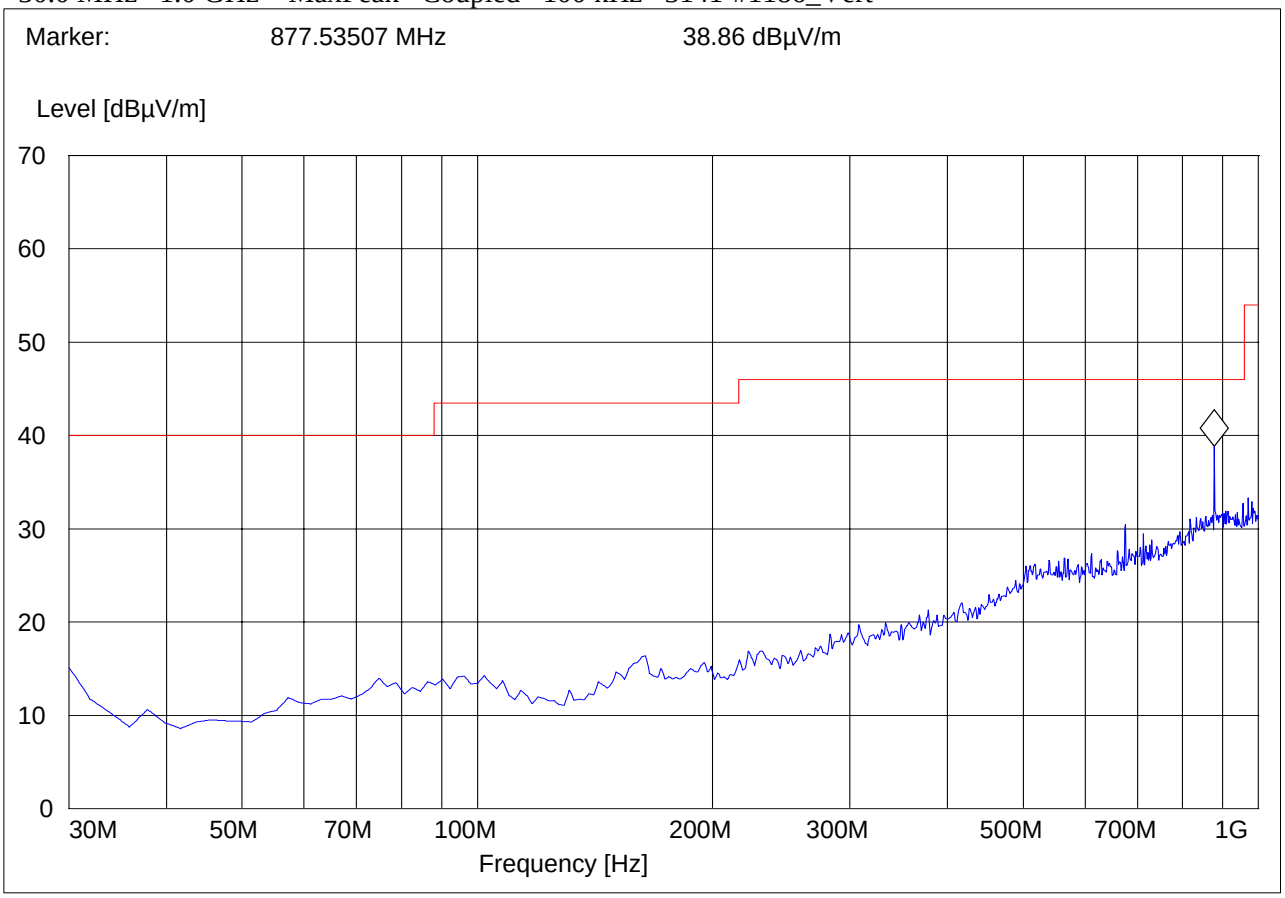


RADIATED SPURIOUS EMISSIONS (GSM-850)
RX: 30MHz - 1GHz
Note: This plot is valid for low, mid & high channels (worst-case plot)

EUT: 04GU00/C05
Customer:: Braemar
Test Mode: GSM 850, ch.190
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: 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



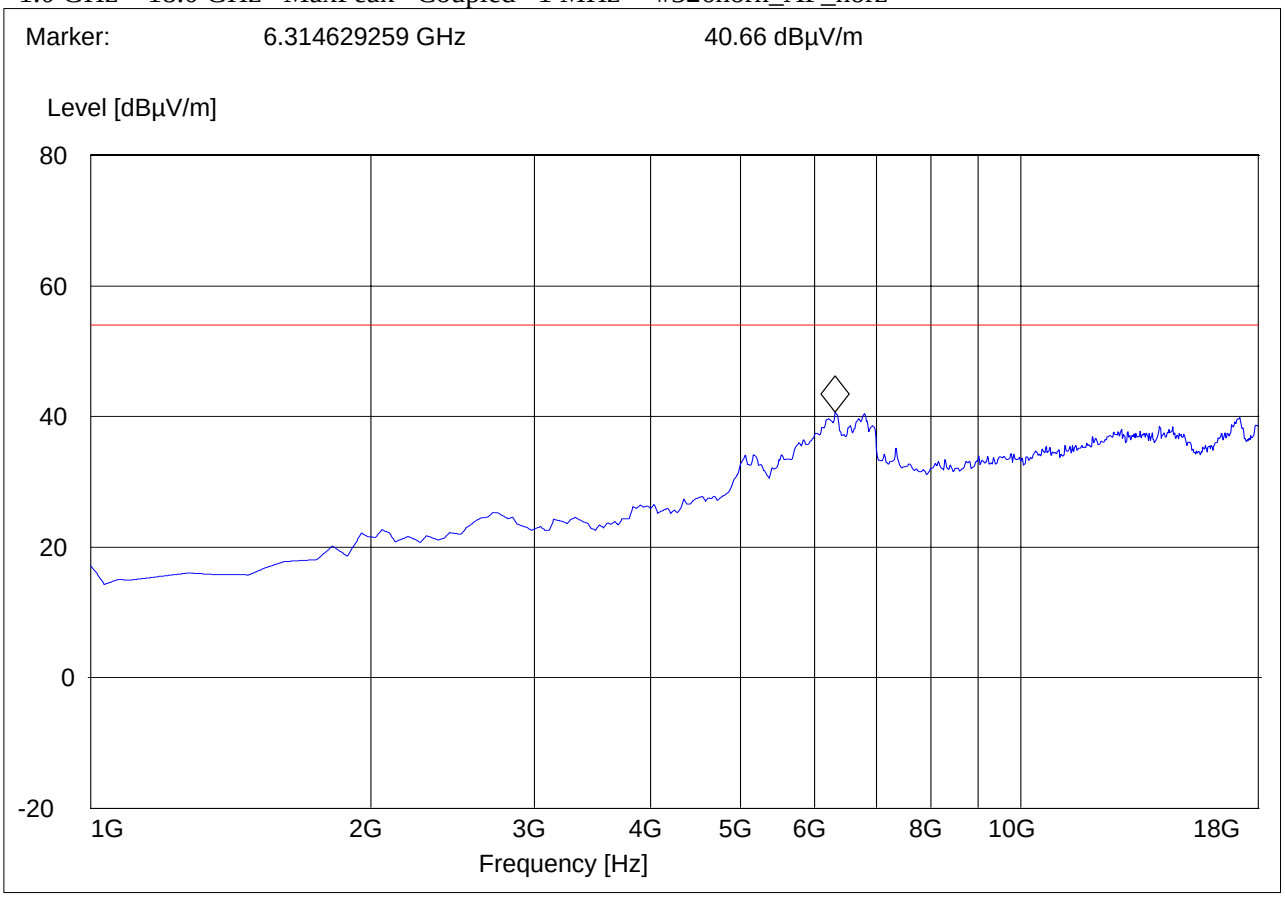
RADIATED SPURIOUS EMISSIONS (GSM-850)
Rx Mode: 1 – 9 GHz
Note: This plot is valid for low, mid & high channels (worst-case plot)

CETECOM Inc. 411 Dixon Landing Road; Milpitas, CA 95035

EUT / Description: 04GU00/C05
Manufacturer: Braemar
Operation Mode: GSM 850, ch.190
ANT Orientation: : V
EUT Orientation:: H
Test Engineer: Chris
Voltage: 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



4.6.2.3 RESULTS OF RADIATED TESTS PCS-1900:

Harmonic	Tx ch-661 Freq. (MHz)	Level (dBuV/m)
1	**1880**	NF
2	**3760**	NF
3	**5640**	NF
4	**7520**	NF
5	**9400**	NF
NF = NOISE FLOOR		

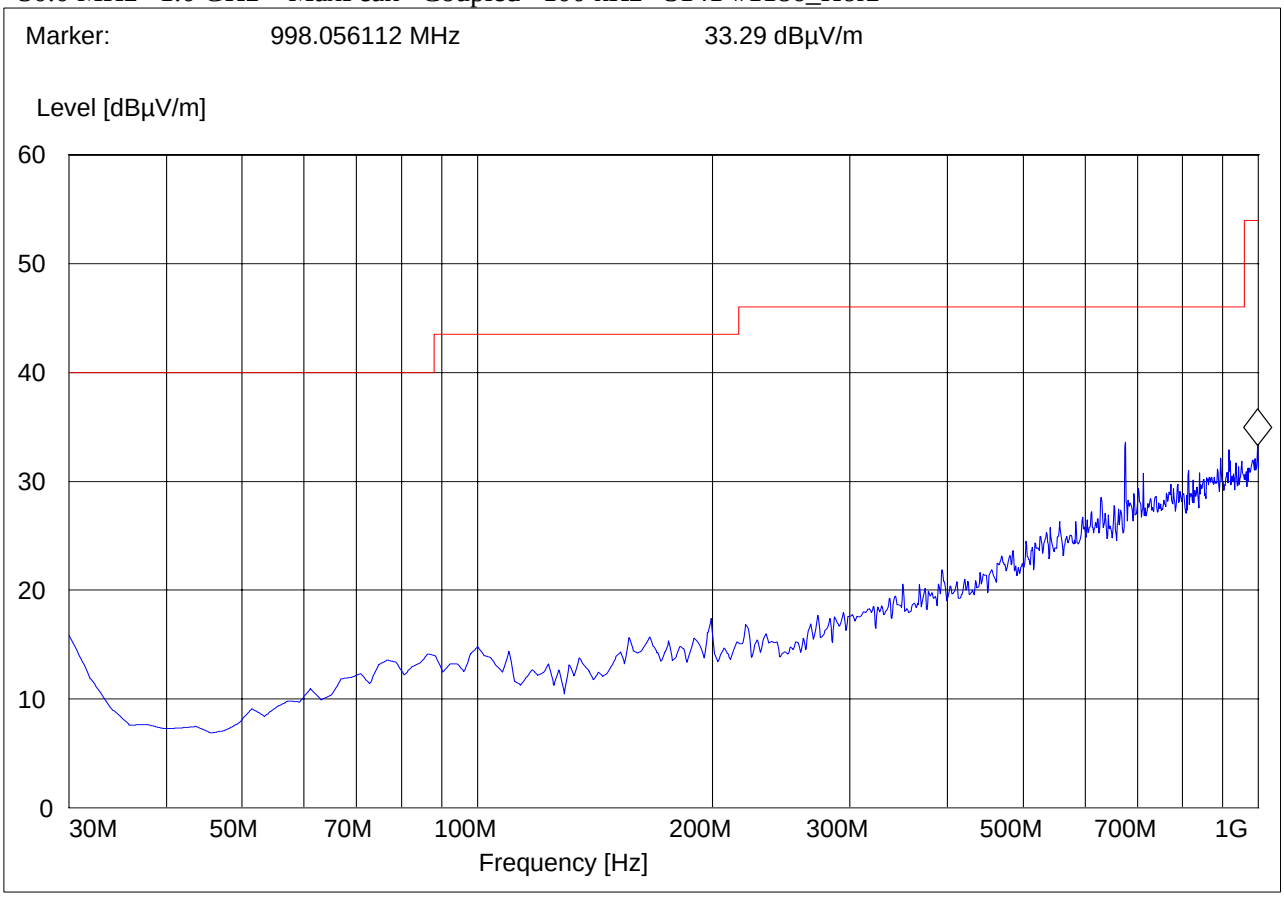
4.6.2.4 RADIATED SPURIOUS EMISSIONS (PCS 1900)

RX: 30MHz - 1GHz

EUT: 04GU00/C05
Customer:: Braemar
Test Mode: GSM 1900, IDLE ch.661
ANT Orientation: H
EUT Orientation: H
Test Engineer: Chris
Voltage: 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

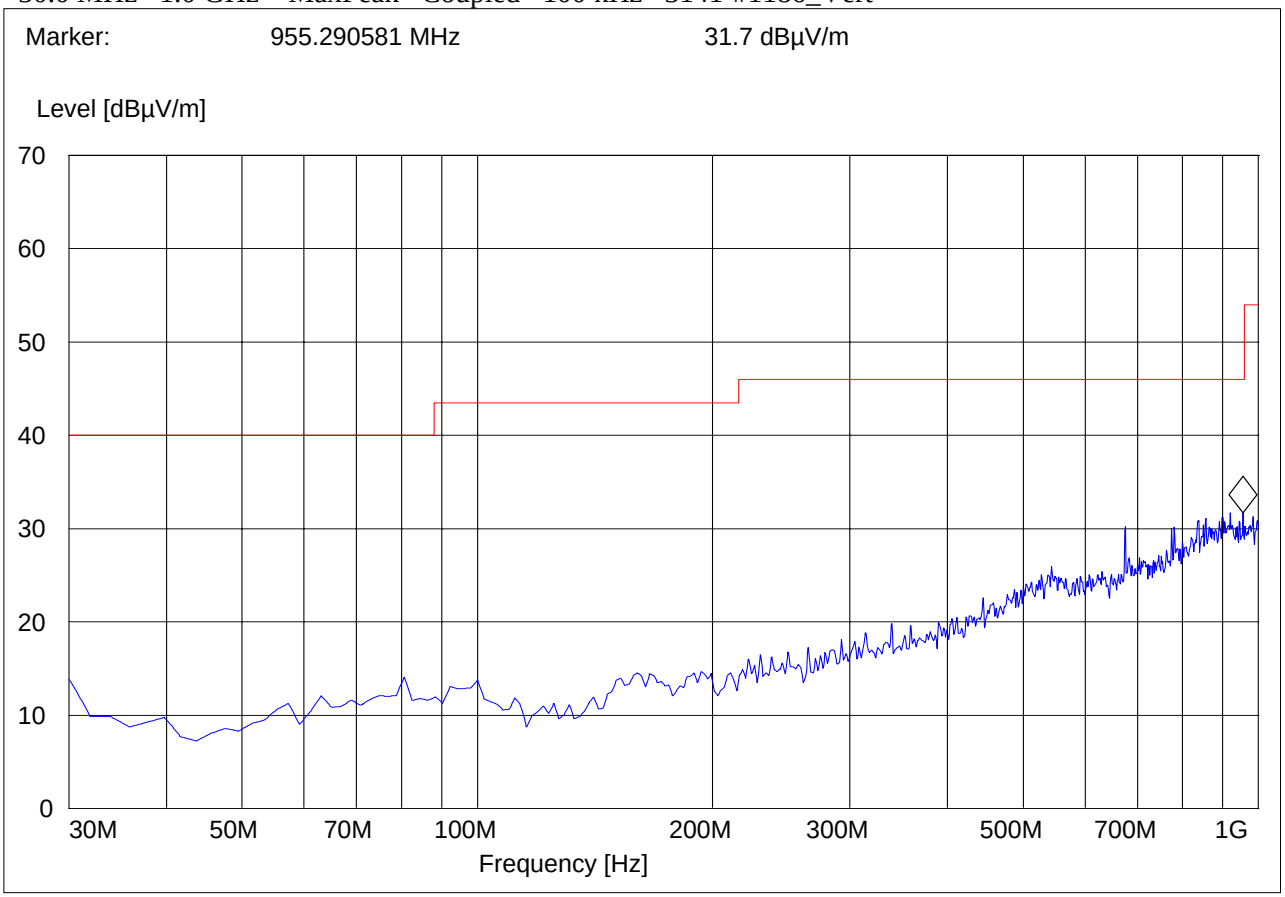


RADIATED SPURIOUS EMISSIONS (PCS 1900)
RX: 30MHz - 1GHz

EUT: 04GU00/C05
Customer:: Braemar
Test Mode: GSM 1900, IDLE ch.661
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: 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



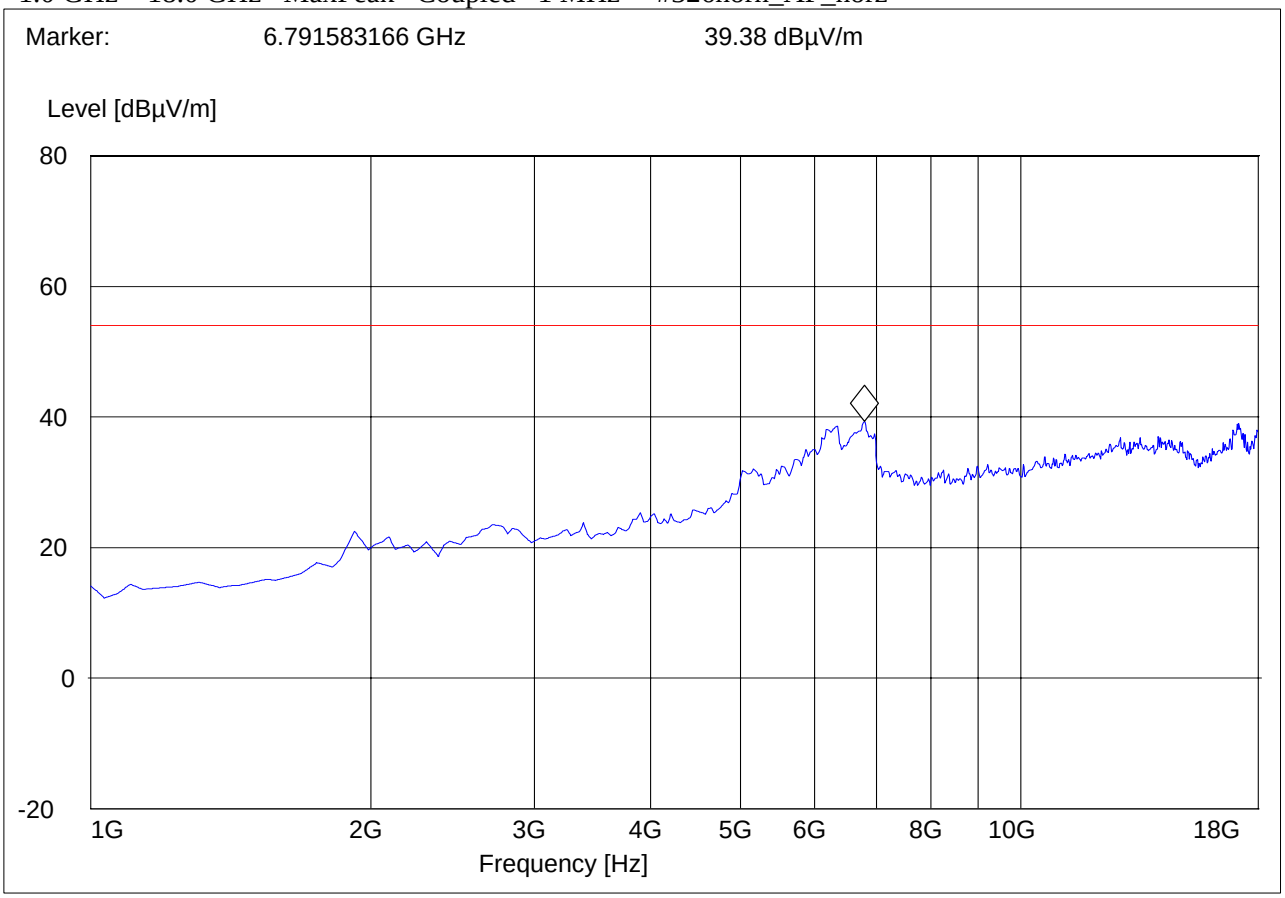
RADIATED SPURIOUS EMISSIONS (PCS 1900)
Rx @ 1880.0MHz: 1GHz – 18GHz

CETECOM Inc. 411 Dixon Landing Road; Milpitas, CA 95035

EUT / Description: 04GU00/C05
Manufacturer: Braemar
Operation Mode: GSM 1900
ANT Orientation: : V
EUT Orientation:: H
Test Engineer: Chris
Voltage: Battery
Comments:: Plot represent the worst case of Horizontal and Vertical polarizations.

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



4.7 AC LINE CONDUCTED EMISSIONS

§15.107 revised as of Aug. 20, 2002 & RSS-GEN (7.2.2)

NOTE: Test setup should be according ANSI C63.4 (Page 30/36). Both transmit and receive must be tested. For transmit test the channel with the highest power. For receive test the channel that produce worst radiated emission level only.

(Please do not repeat if already covered under part 24 or 15.247)

	Frequency (MHz)	
Frequency Range	**150KHz – 30MHz**	
LISN Setting	**Result Saved**	**Result (Fail/Pass)**
TRANSMIT MODE		
Line	**TXLISN-L**	NA Battery operated
Neutral	**TXLISN-N**	NA Battery operated
RECEIVE MODE		
Line	**RXLISN-L**	NA Battery operated
Neutral	**RXLISN-N**	NA Battery operated

Technical specification : 15.107 & RSS-GEN (7.2.2) Limit

Frequency Range (MHz)	**Conducted Limit (dBuV)**	
	Quasi-peak	**Average**
0.15 to .5	66 to 56	56 to 46
.5 to 5	56	46
5 to 30	60	50

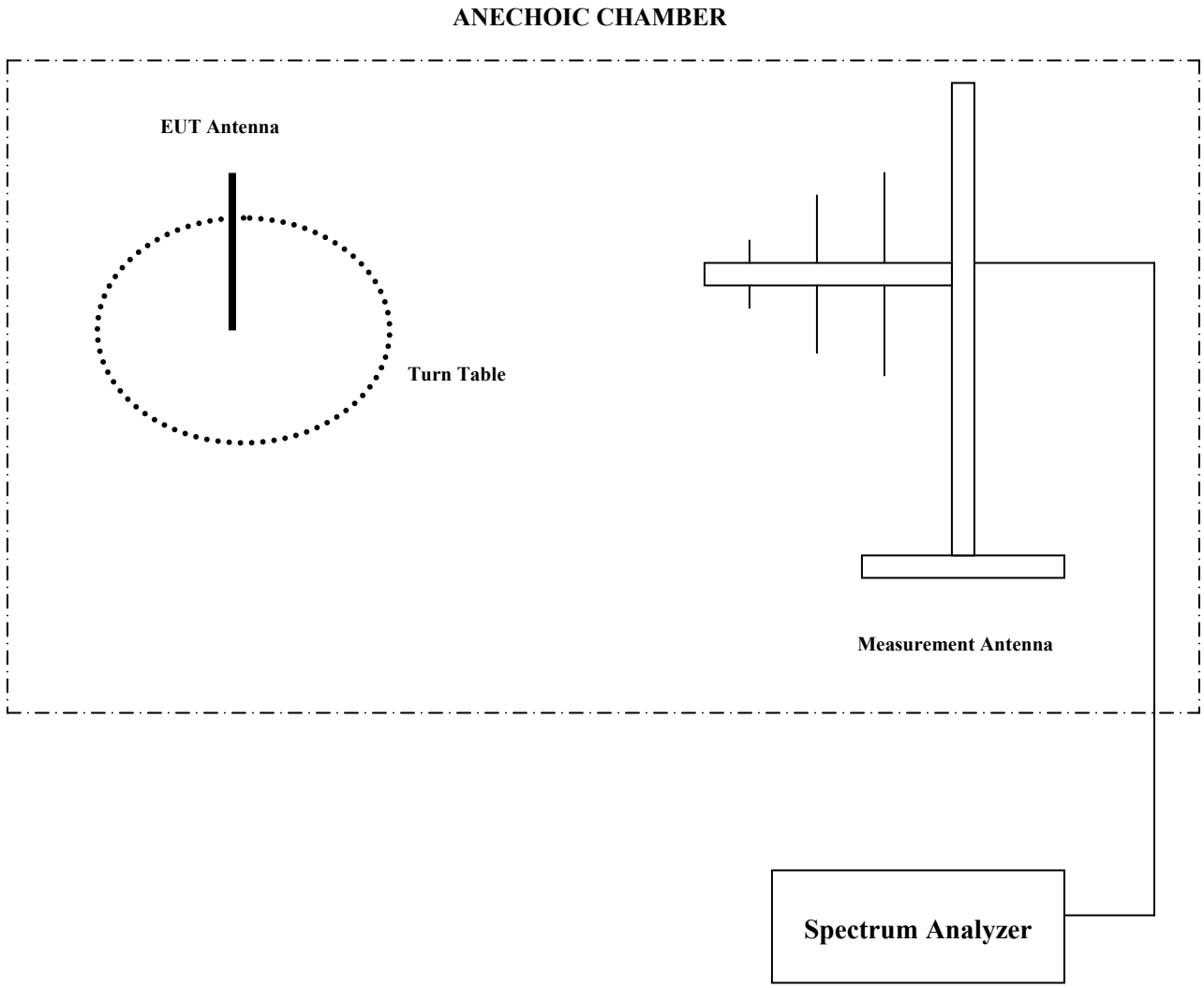
Note: Per Section 15.107(d) only performed if device is normally connected to the AC mains either by an external AC adaptor or DC supply. In this case AC conducted emissions is to be performed on the external AC adaptor or DC supply. If the device uses a rechargeable adaptor and the device could be used while charging, conducted measurements must be perform. If the device receives its power from a host device, conducted measurements are to be performed on the host device. Battery operated devices are exempt from testing even if an external DC supply is being used.

5 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

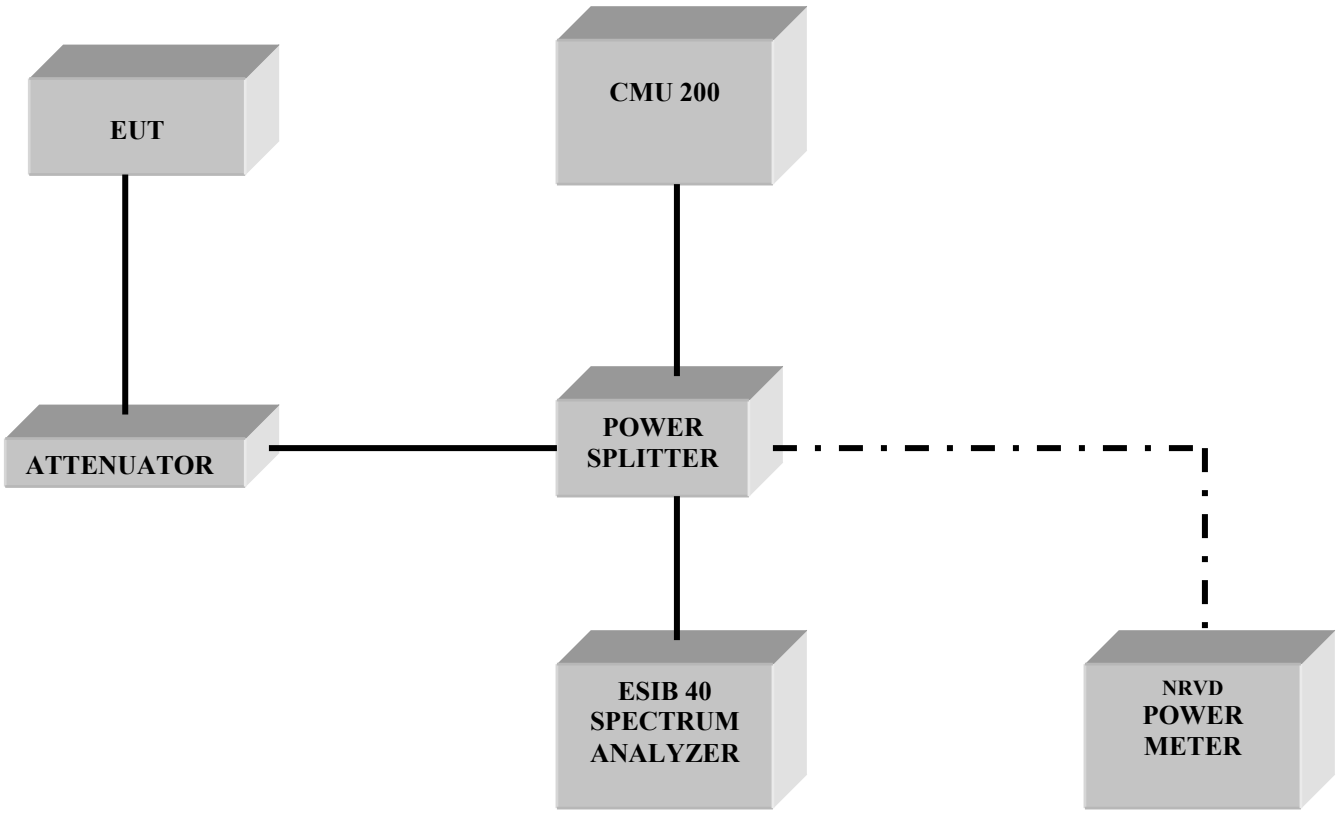
No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Anechoic Chamber	3 meter	Euroshield	NA	NA	In house
02	Receiver / Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100017	31-May-2008	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2008	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2009	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	July 2008	1 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2008	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2008	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Turn table	2088	EMCO/ETS	NA	NA	In house
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	340125	31- May 2008	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2009	1 year
14	MAPS Position Controller	2092	ETS-Lindgren	0004-1510	NA	In house
15	Universal Radio Comm. Tester	CMU 200 #2	Rohde & Schwarz	109879	May 2008	1 year
16	EMC Software	ESK1	Rohde & Schwarz	NA	NA	NA

6 BLOCK DIAGRAMS

Radiated Testing



Conducted Testing



7 DOCUMENT REVISIONS

Document Revision	Description of Changes	Name	Date
1.0	Original Document	Val Tankov	05/23/2008