



FCC/IC Test Report

FOR:

Model Name: TC530

FCC ID: X4QKDTC530

IC ID: 4472A-KDTC530

47 CFR Part 2, 22, 24

RSS-132 Issue 2

RSS-133 Issue 5

TEST REPORT #: EMC_CET10_050_09501_FCC_22_24_Rev3

DATE: 2010-02-18



FCC listed:
A2LA accredited

IC recognized #
3462B-1

CETECOM Inc.

411 Dixon Landing Road • Milpitas, CA 95035 • U.S.A.

Phone: +1 (408) 586 6200 • Fax: +1 (408) 586 6299 • E-mail: info@cetecomusa.com • <http://www.cetecom.com>

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	3
2	Administrative Data.....	4
2.1	IDENTIFICATION OF THE TESTING LABORATORY ISSUING THE EMC TEST REPORT.....	4
2.2	IDENTIFICATION OF THE CLIENT	4
2.3	IDENTIFICATION OF THE MANUFACTURER	4
3	Equipment under Test (EUT)	5
3.1	SPECIFICATION OF THE EQUIPMENT UNDER TEST	5
3.2	IDENTIFICATION OF THE EQUIPMENT UNDER TEST (EUT).....	5
3.3	IDENTIFICATION OF ACCESSORY EQUIPMENT	5
4	Subject of Investigation	6
5	Measurements.....	7
5.1	RF POWER OUTPUT	7
5.1.1	References	7
5.1.2	FCC 2.1046 Measurements required: RF power output.....	7
5.1.3	Limits:	7
5.1.3.1	FCC 22.913 (a) Effective radiated power limits.	7
5.1.3.2	FCC 24.232 (b)(c) Power limits.....	7
5.1.4	Conducted Output Power Measurement procedure.....	7
5.1.5	Radiated Output Power Measurement procedure.....	8
5.1.6	RF Power Output 850MHz band.....	9
5.1.7	RF Power Output 1900MHz band.....	9
5.1.8	Results	10
5.2	SPURIOUS EMISSIONS RADIATED	16
5.2.1	References	16
5.2.2	FCC 2.1053 Measurements required: Field strength of spurious radiation.....	16
5.2.3	Limits:	16
	For all power levels +30dBm to 0dBm, this becomes a constant specification of -13dBm.....	16
5.2.3.1	FCC 22.917 Emission limitations for cellular equipment.	16
5.2.3.2	FCC 24.238 Emission limitations for Broadband PCS equipment.	16
5.2.4	Radiated out of band measurement procedure:	17
5.2.5	Radiated out of band emissions results on EUT- Transmit Mode:	19
5.2.5.1	Test Results Transmitter Spurious Emission GSM850:.....	19
5.2.5.2	Test Results Transmitter Spurious Emission PCS-1900:	26
5.2.6	Radiated out of band emissions results on EUT- Receive Mode:	36
5.2.6.1	References	36
5.2.6.2	§15.109 Radiated emission limits- Unintentional Radiators:	36
5.2.6.3	Results	36
5.2.6.4	Test Results Receiver Spurious Emission	37
6	Test Equipment And Ancillaries Used For Tests	39
7	Block Diagrams	40
8	Revision History	42

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 Industry Canada Standards RSS 132 and RSS 133.

Company	Description	Model #
Komatsu Ltd.	Car Mounted Device	TC530

Responsible for Testing Laboratory:

2010-02-18	Compliance	Marc Douat (Test Lab Manager)	
Date	Section	Name	Signature

Responsible for the Report:

2010-02-18	Compliance	Christopher Torio (Test Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3.

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 EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
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:	Heiko Strehlow
Responsible Project Leader:	Peter Mu

2.2 Identification of the Client

Applicant's Name:	Komatsu Ltd.
Street Address:	3-25-1 Shinomiya Hiratsuka-shi
City/Zip Code	Kanagawa-ken 254-8555
Country	Japan
Contact Person:	Hisataka Fukasu
Phone No.	+81-463-22-8790
Fax:	-81-463-22-8586
e-mail:	N/A

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as above
Manufacturers Address:	Same as above
City/Zip Code	Same as above
Country	Same as above

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name:	TC530
Model No:	TC530
Product Type:	Car mounted device
Hardware Revision :	490C; Rev.B2.0.1
Software Revision :	001.003.014; Revision 01.000
FCC-ID:	X4QKDTC530
IC-ID :	4472A-KDTC530
Frequency:	GSM 850: 824.2-848.8MHz; PCS 1900: 1850.2-1909.8MHz
Type(s) of Modulation:	GMSK
Number of channels:	GSM850: 125 and PCS 1900: 300
Antenna Type:	External Quad band/+2dBi
Power Supply:	12VDC

3.2 Identification of the Equipment under Test (EUT)

EUT #	Serial Number	Cetecom ID	HW Version	SW Version
1	000005	C004404	490C; Rev.B2.0.1	001.003.014; Revision 01.000

3.3 Identification of Accessory equipment

AE #	Type	Serial Number	Cetecom ID
1	GSM Antenna	6	C004401
2	GPS Antenna	5	C00402
3	Power/Communication Cable	N/A	C00403

4 Subject of Investigation

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in the following test standards:

- 47 CFR Part 2: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission Frequency allocations and radio treaty matters; general rules and regulations.
- 47 CFR Part 22: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission subchapter B- common carrier services; Part 22- Public mobile services
- 47 CFR Part 24: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission subchapter B- common carrier services; Part 24- Personal communication services
- RSS 132- Issue 2: Spectrum management and telecommunication policy- Radio Standards Specifications Cellular telephones employing new technologies operating in the bands 824-849MHz and 869-894MHz
- RSS 133- Issue 5: Spectrum management and telecommunication policy- Radio Standards Specifications- 2GHz personal communication services

This EUT contains an FCC approved module with the FCC ID: QIPAC65i. This report refers only to the radiated measurements in GSM technology.

The EUT is battery operated by the vehicle and no AC Adapter is supplied. No AC Line Conducted Emissions were performed.

5 Measurements

5.1 RF Power Output

5.1.1 References

FCC: CFR Part 2.1046, CFR Part 22.913, CFR Part 24.232

IC: RSS 132 Section 4.4 and 6.4; RSS 133 Section 4.3

5.1.2 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.

5.1.3 Limits:

5.1.3.1 FCC 22.913 (a) Effective radiated power limits.

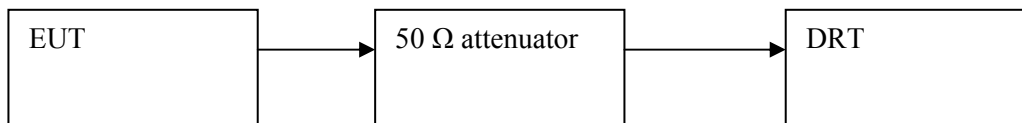
The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.

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

(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP). 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.

5.1.4 Conducted Output Power Measurement procedure

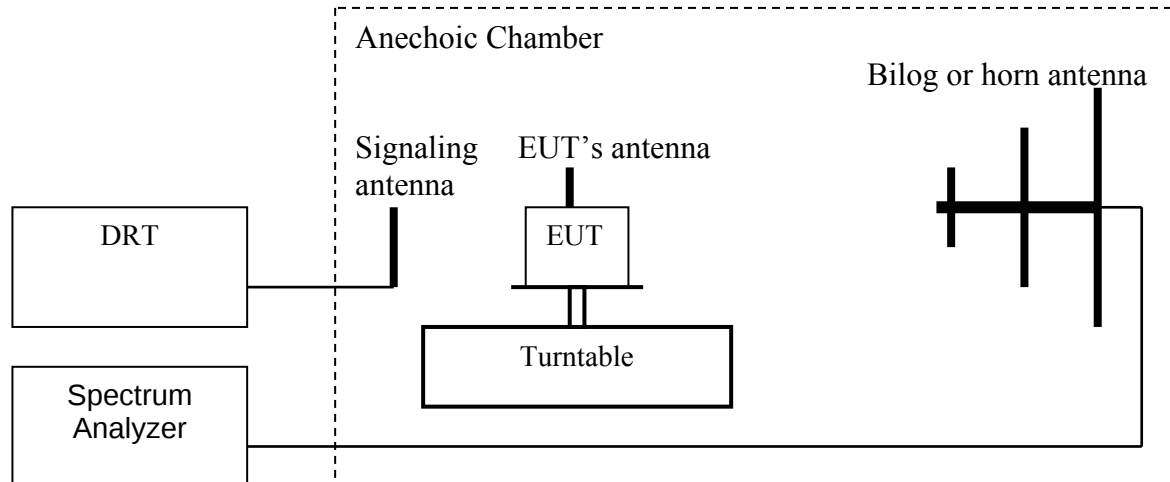
Ref: TIA-603C 2004 2.2.1 Conducted Carrier Output Power Rating



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.

5.1.5 Radiated Output Power Measurement procedure

Ref: 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 Radio Communication 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:

$$\mathbf{ERP\ (dBm) = LVL\ (dBm) + LOSS\ (dB)}$$
8. Determine the EIRP using the following equation:

$$\mathbf{EIRP\ (dBm) = ERP\ (dBm) + 2.14\ (dB)}$$
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.)

5.1.6 RF Power Output 850MHz band**Limit: Nominal Peak Output Power < 38.45 dBm (7W)****Measurement Uncertainty: ± 0.5 dB**

GSM 850: GMSK Mode	
Frequency (MHz)	Radiated Power
	ERP (dBm)
824.2	25.98
836.4	25.02
848.8	27.03

5.1.7 RF Power Output 1900MHz band**Limit: Nominal Peak Output Power < 33 dBm (2W)****PAR may not exceed 13dB****Measurement Uncertainty: ± 0.5 dB**

GSM 1900: GMSK Mode	
Frequency (MHz)	Radiated Power
	EIRP (dBm)
1850.2	27.32
1880.0	27.43
1909.8	28.55

5.1.8 Results

EIRP (GSM 850) CHANNEL 128 §22.913(a)

Low - 128

1 / 1

Low - 128

EUT Information

Description:

EUT Name:

Manufacturer:

Serial Number:

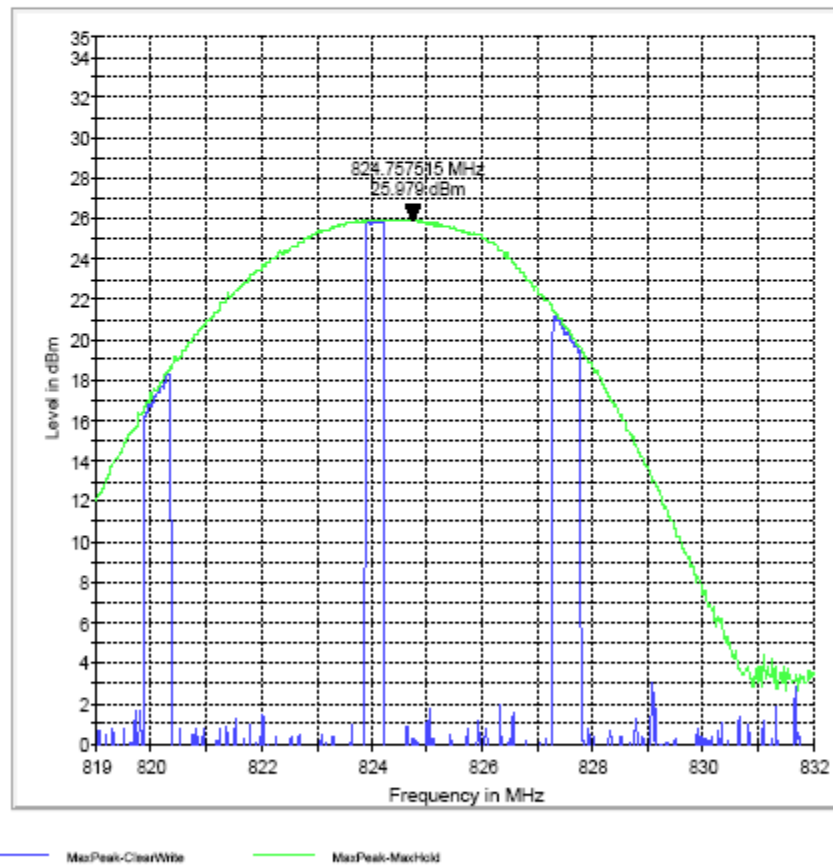
Hardware Rev:

Voltage:

Comment:

Komatsu

ERP 850 L



EIRP (GSM 850) CHANNEL 190 §22.913(a)

Mid- 190

1 / 1

Mid- 190**EUT Information**

Description:

EUT Name:

Manufacturer:

Komatsu

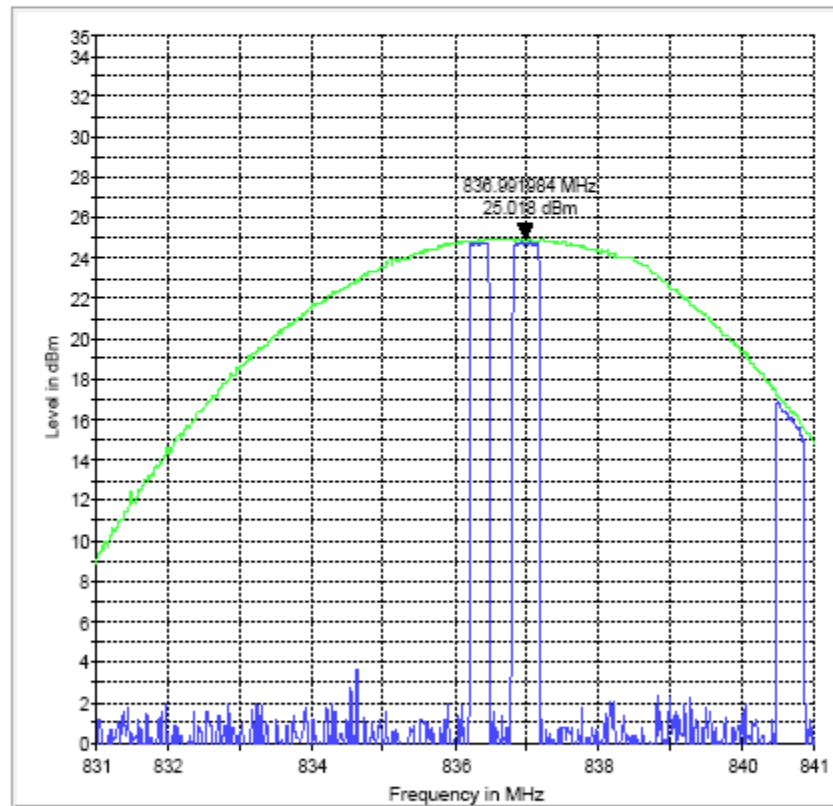
Serial Number:

Hardware Rev:

Voltage:

Comment:

ERP 850 M



MaxPeak-ClearWide

MaxPeak-MaxHold

EIRP (GSM 850) CHANNEL 251 §22.913(a)

High - 251

1 / 1

High - 251**EUT Information**

Description:

EUT Name:

Manufacturer:

Komatsu

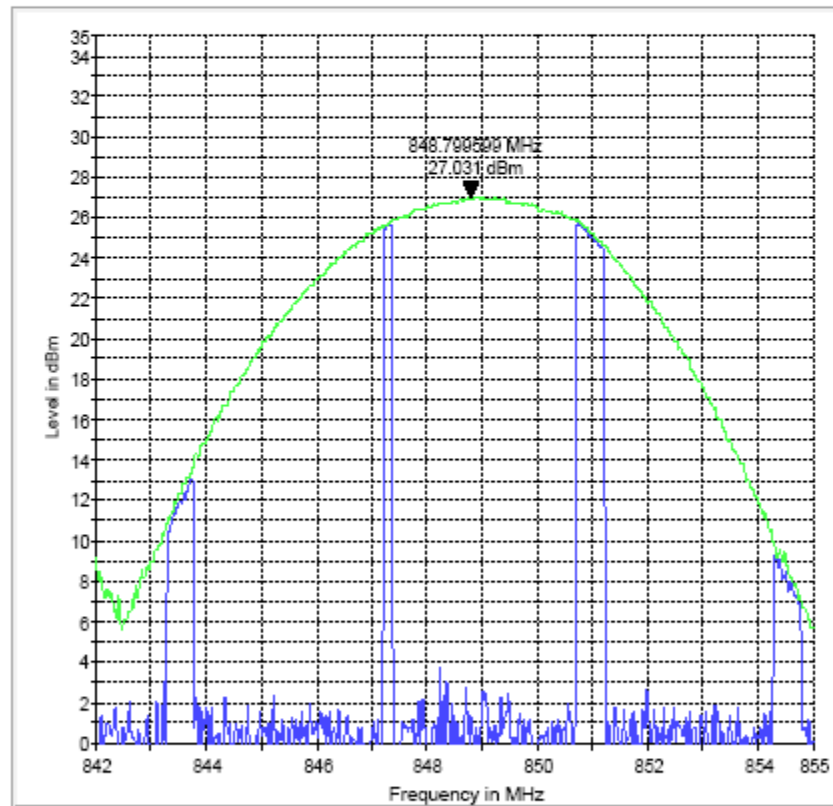
Serial Number:

Hardware Rev:

Voltage:

Comment:

ERP 850 H



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

512 - L

1 / 1

512 - L**EUT Information**

Description:

EUT Name:

Manufacturer:

Komatsu

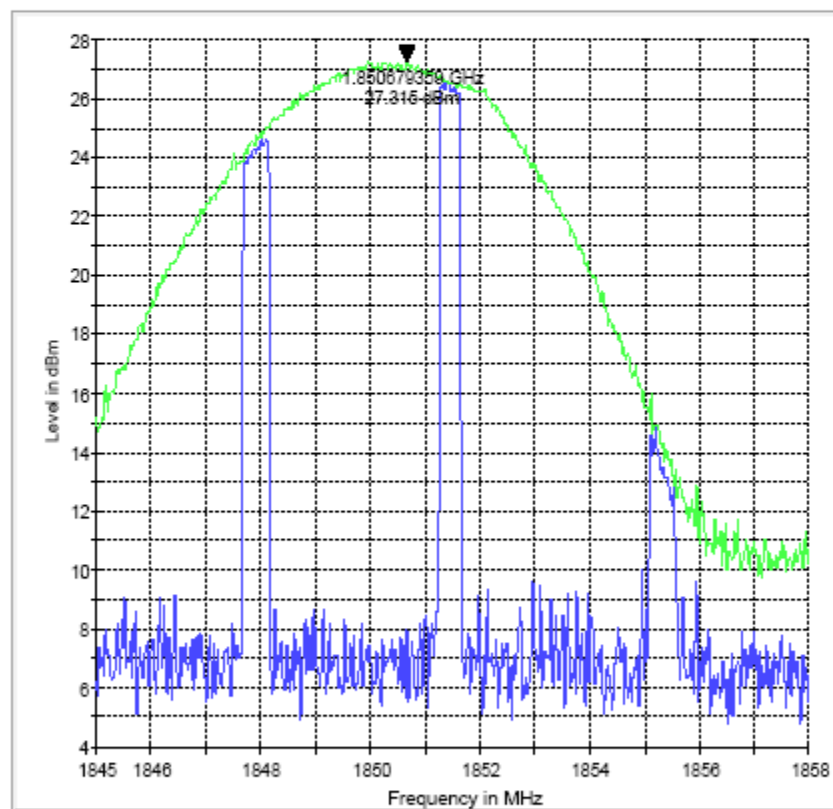
Serial Number:

Hardware Rev:

Voltage:

Comment:

EIRP 1900 L



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

661 -M

1 / 1

661 -M**EUT Information**

Description:

EUT Name:

Manufacturer:

Komatsu

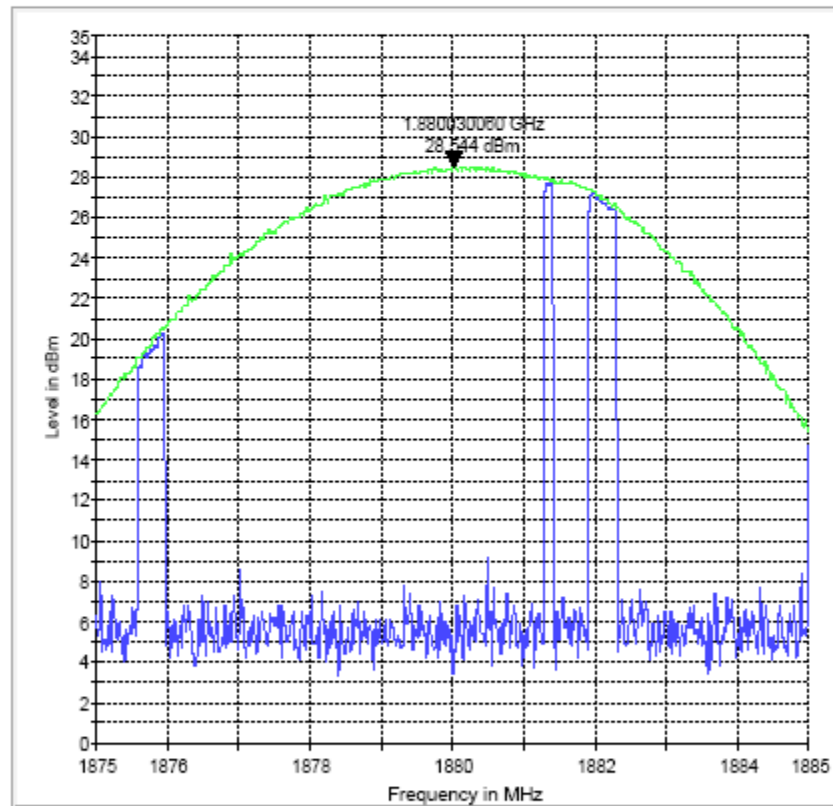
Serial Number:

Hardware Rev:

Voltage:

Comment:

EIRP 1900 M



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

810 -H

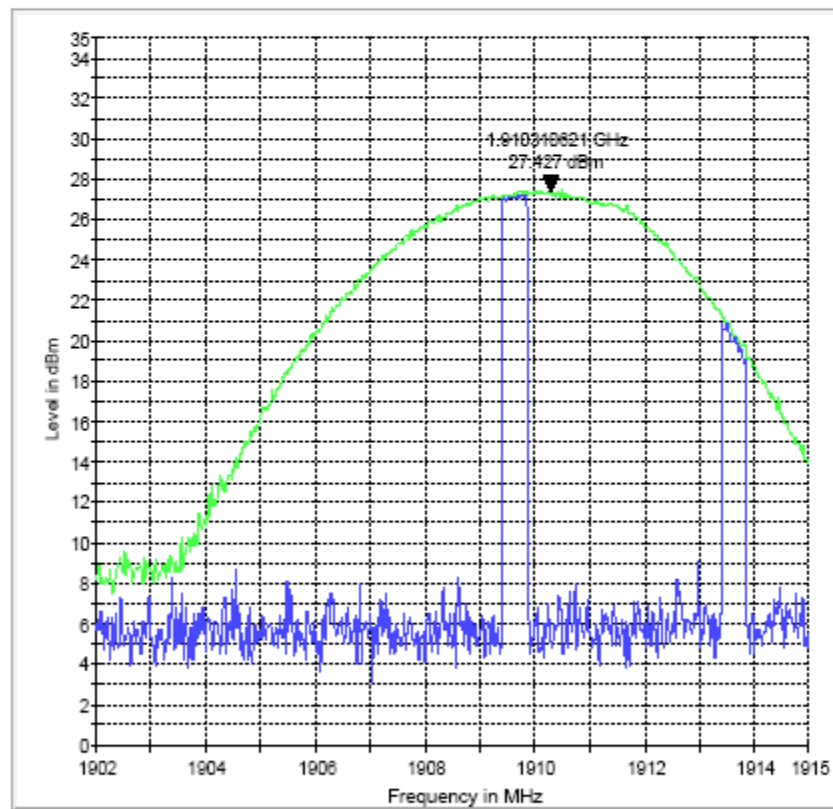
1 / 1

810 -H**EUT Information**

Description:

EUT Name:
Manufacturer: Komatsu
Serial Number:
Hardware Rev:
Voltage:
Comment:

EIRP 1900 H



5.2 Spurious Emissions Radiated

5.2.1 References

FCC: CFR Part 2.1053, CFR Part 22.917, CFR Part 24.238

IC: RSS 132 Section 4.5 and 6.5; RSS 133 Section 4.4

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

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.

5.2.3 Limits:

- (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.

For all power levels +30dBm to 0dBm, this becomes a constant specification of -13dBm.

5.2.3.1 **FCC 22.917 Emission limitations for cellular equipment.**

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

(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.

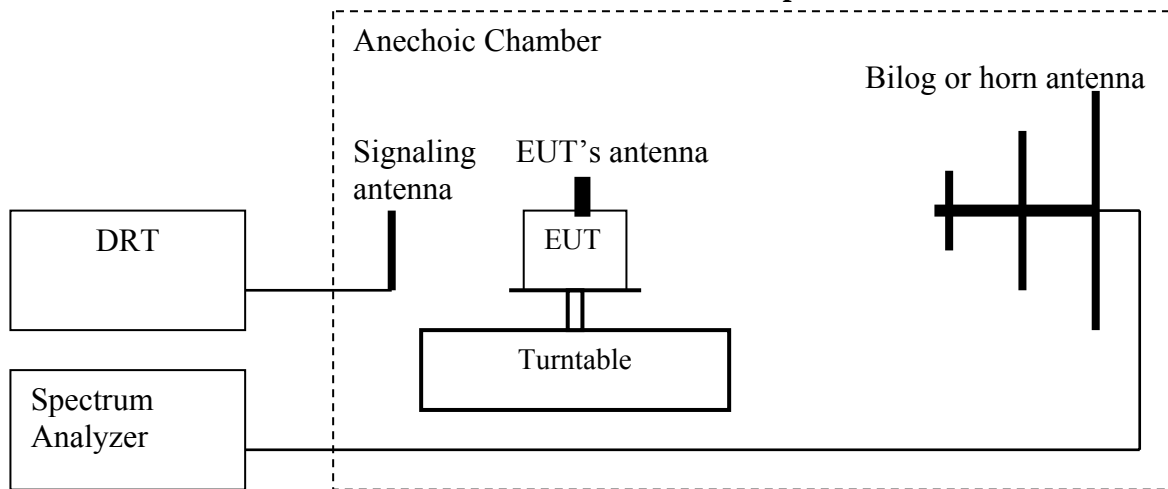
5.2.3.2 **FCC 24.238 Emission limitations for Broadband PCS equipment.**

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

(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.

5.2.4 Radiated out of band measurement procedure:

Ref: 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: RBW=VBW=1MHz

Measurement Survey:

The site is constructed in accordance with ANSI C63.4 requirements and is recognized by the FCC to be in compliance for a 3m site. The spectrum is scanned from 30MHz to the 10th harmonic of the highest frequency generated by the EUT.

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. All measurements are done in horizontal and vertical polarization; the plots show the worst case where it is not indicated otherwise.

Unless mentioned otherwise, the peaks in the plots are from the carrier frequency.

Radiated emissions measurements were made also with UMTS FDD mode where the EUT supports such technology.

5.2.5 Radiated out of band emissions results on EUT- Transmit Mode:

5.2.5.1 Test Results Transmitter Spurious Emission GSM850:

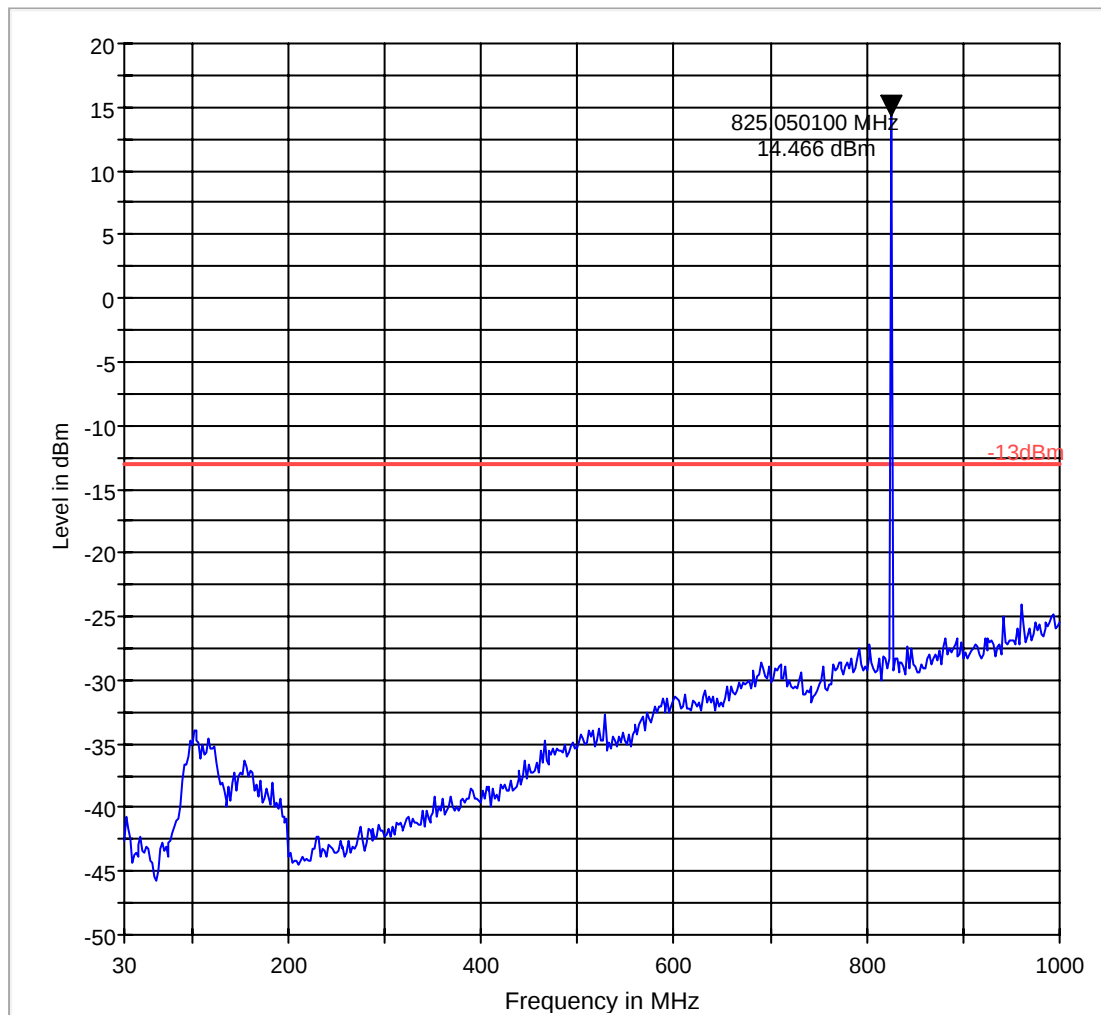
Harmonic	Tx ch-128 Freq. (MHz)	Level (dBm)	Tx ch-190 Freq. (MHz)	Level (dBm)	Tx ch-251 Freq. (MHz)	Level (dBm)
1	824.2	-	836.6	-	848.8	-
2	1648.4	NF	1673.2	NF	1697.6	NF
3	2472.6	NF	2509.8	NF	2546.4	NF
4	3296.8	NF	3346.4	NF	3395.2	NF
5	4121	NF	4183	NF	4244	NF
6	4945.2	NF	5019.6	NF	5092.8	NF
7	5769.4	NF	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						

Note: The plots shown below are the worst case results for both horizontal and vertical polarizations of the measurement antenna.

Radiated Spurious Emissions (GSM-850) Tx: 30MHz – 1GHz**Low Channel**

Note: The spike in the plot is the TCH signal from the EUT.

FCC 22 30-1000MHz



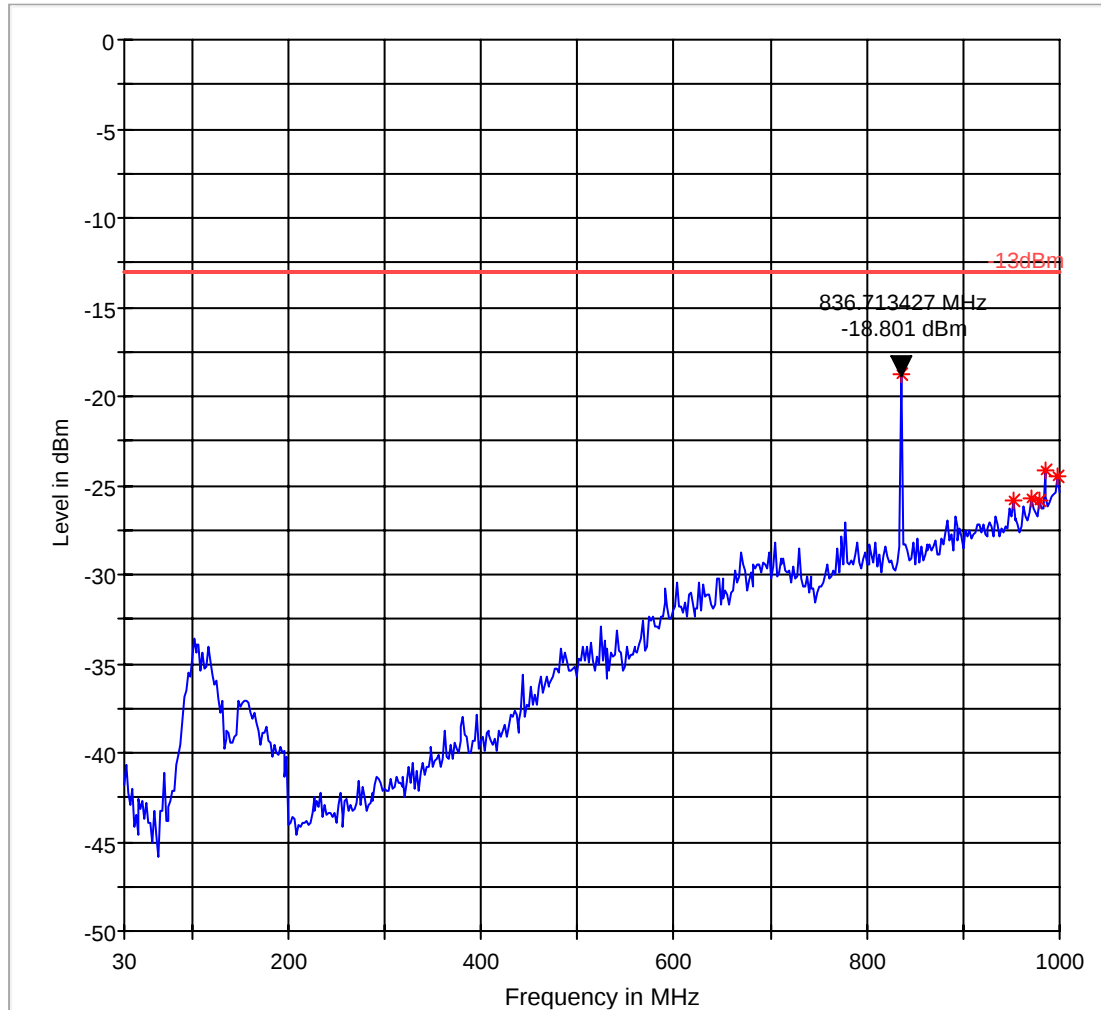
— -13dBm.LimitLine

— Preview Result 1

Mid Channel

Note: The spike in the plot is the TCH signal from the EUT.

FCC 22 30-1000MHz



— -13dBm.LimitLine

— Preview Result 1

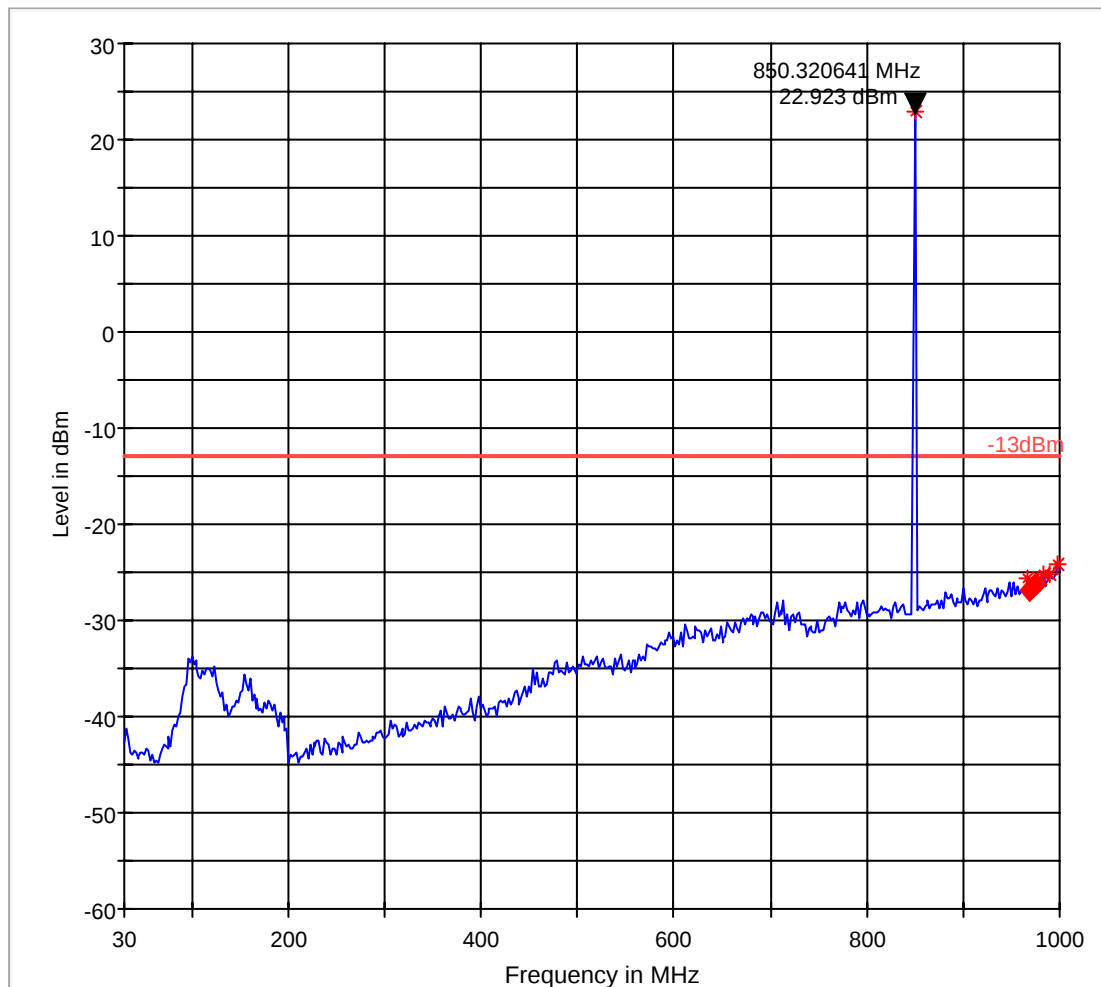
*

Data Reduction 1 [1]

High Channel

Note: The spike in the plot is the TCH signal from the EUT.

FCC 22 30-1000MHz



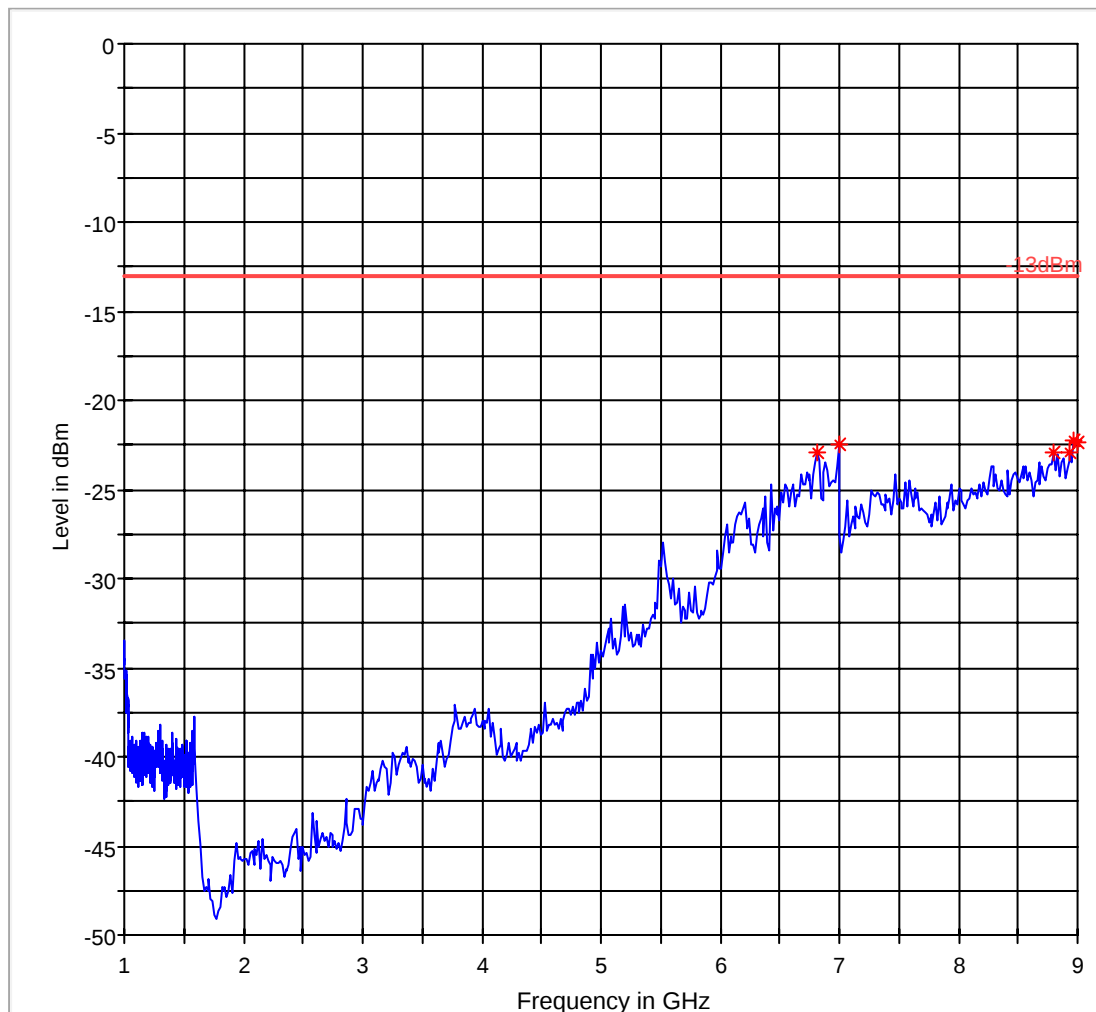
— -13dBm.LimitLine
* Data Reduction 1 [1]

— Preview Result 1
◆ Final Measurement Result 1

Radiated Spurious Emissions (GSM-850): 1GHz – 9GHz

Low Channel

FCC 22 1-9GHz



— -13dBm.LimitLine

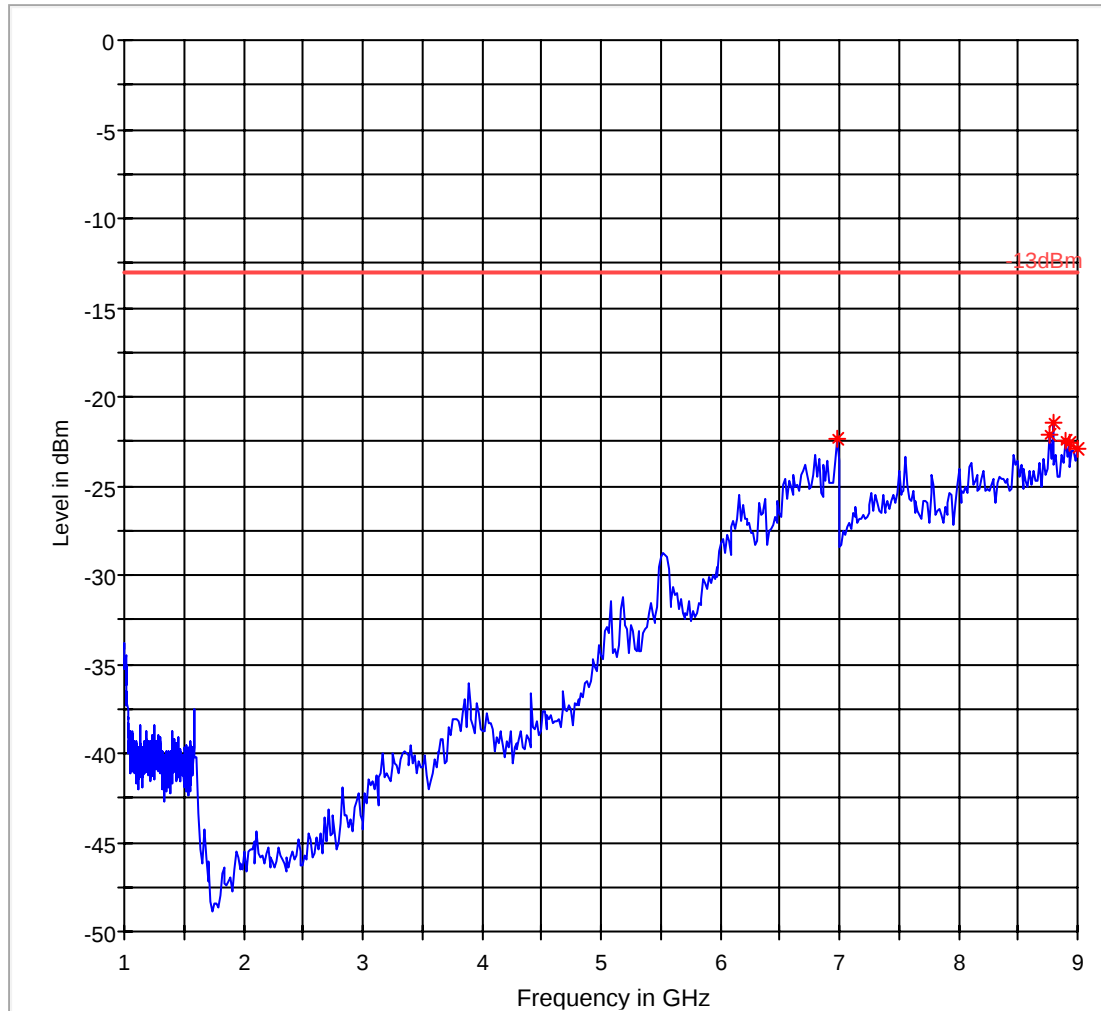
— Preview Result 1

*

Data Reduction 1 [2]

Mid Channel

FCC 22 1-9GHz



— -13dBm.LimitLine

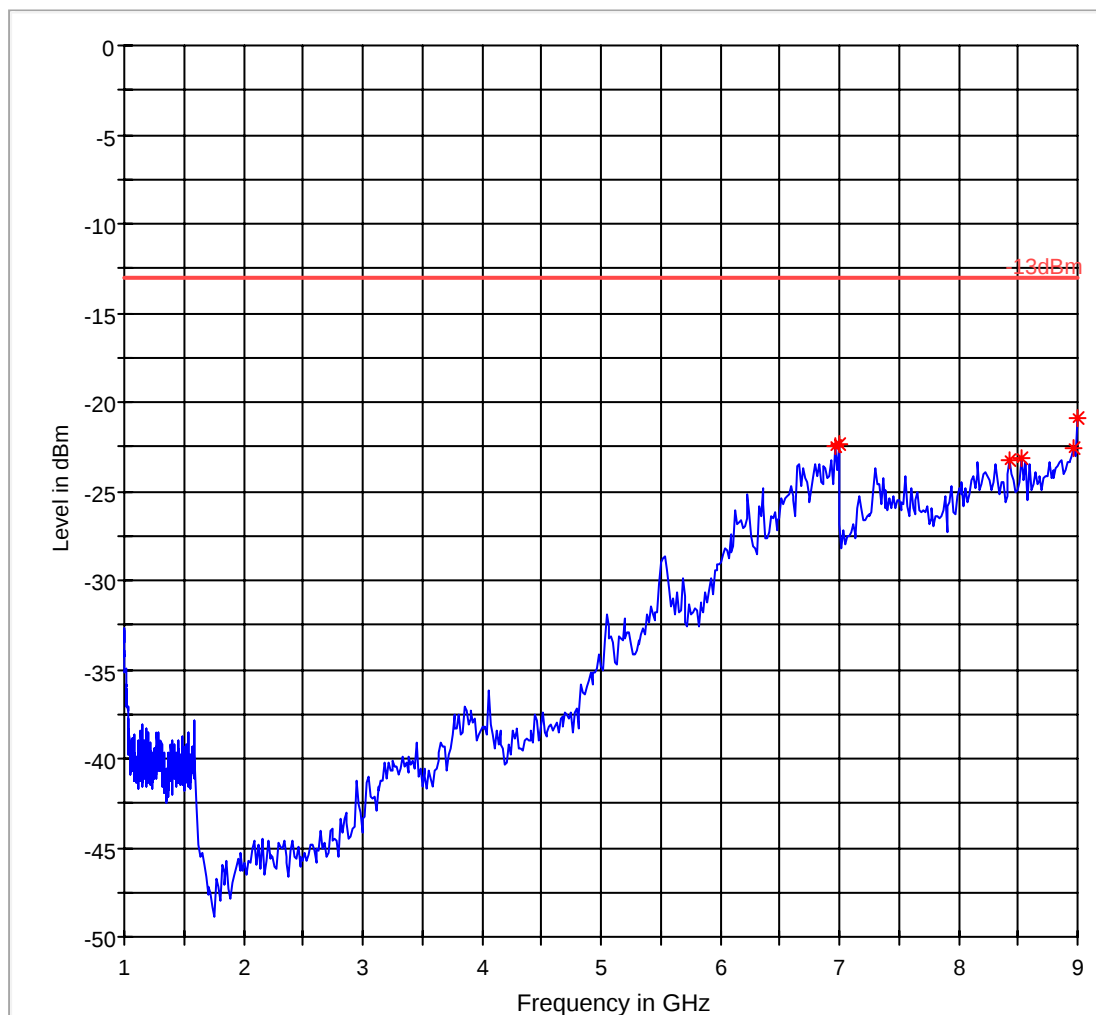
— Preview Result 1

*

Data Reduction 1 [2]

High Channel

FCC 22 1-9GHz



— -13dBm.LimitLine — Preview Result 1 * Data Reduction 1 [2]

5.2.5.2 Test Results Transmitter Spurious Emission PCS-1900:

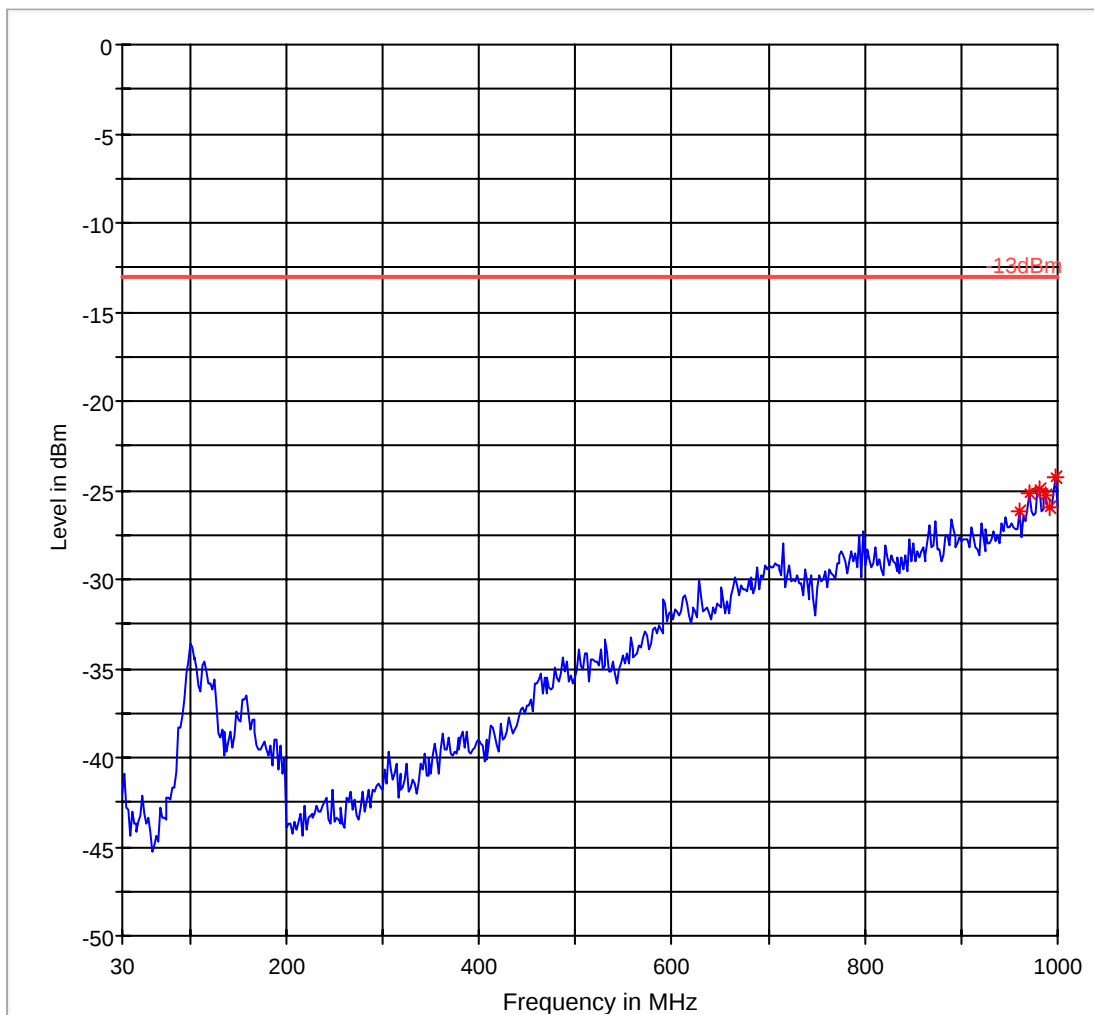
Harmonic	Tx ch-512 Freq.(MHz)	Level (dBm)	Tx ch-661 Freq. (MHz)	Level (dBm)	Tx ch-810 Freq. (MHz)	Level (dBm)
1	1850.2	-	1880.0	-	1909.8	-
2	3700.4	NF	3760	NF	3819.6	NF
3	5550.6	NF	5640	NF	5729.4	NF
4	7400.8	NF	7520	NF	7639.2	NF
5	9251	NF	9400	NF	9549	NF
6	11101.2	NF	11280	NF	11458.8	NF
7	12951.4	NF	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						

Note: The plots shown below are the worst case results for both horizontal and vertical polarizations of the measurement antenna.

Radiated Spurious Emissions (PCS 1900) Tx: 30MHz – 1GHz

Low Channel

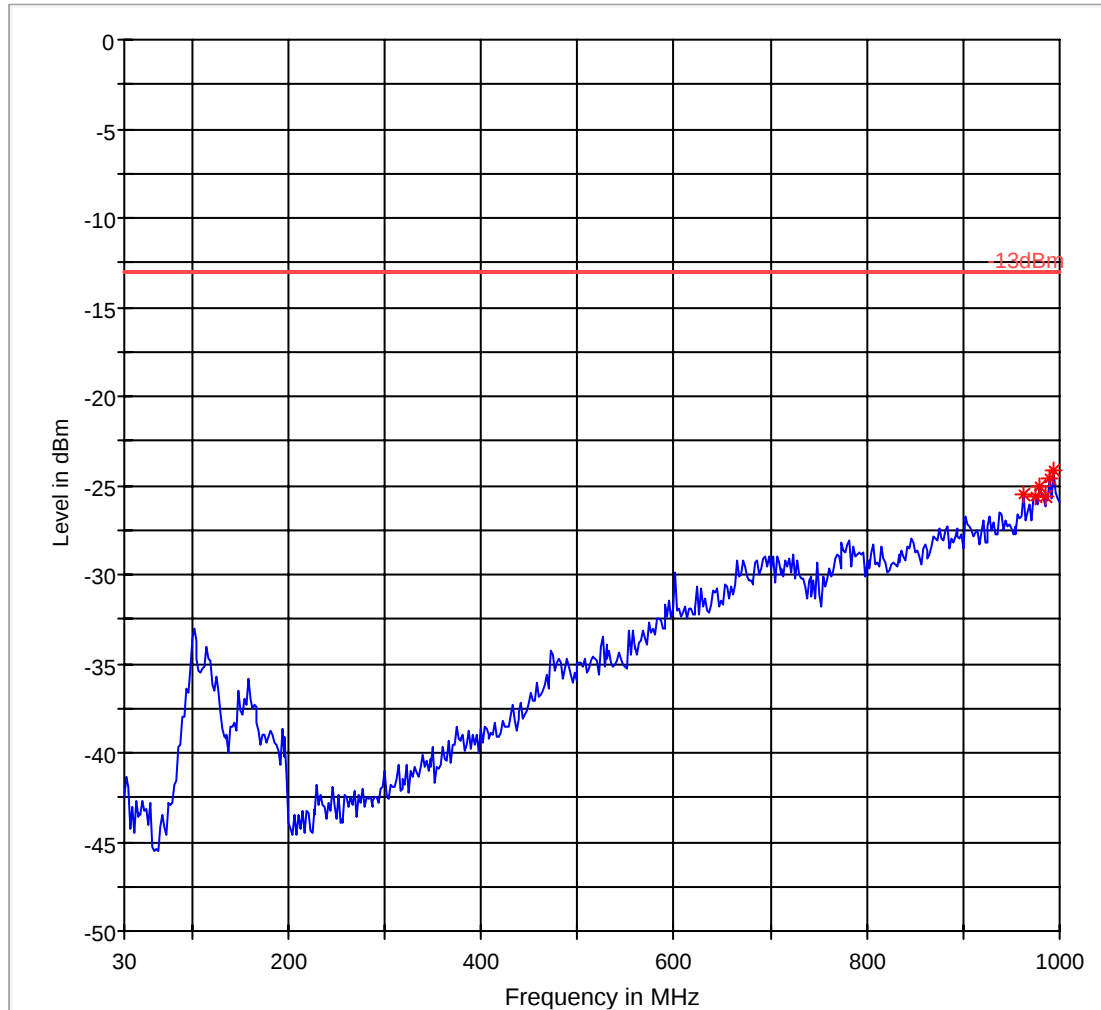
FCC 22 30-1000MHz



— -13dBm.LimitLine — Preview Result 1 * Data Reduction 1 [1]

Mid Channel

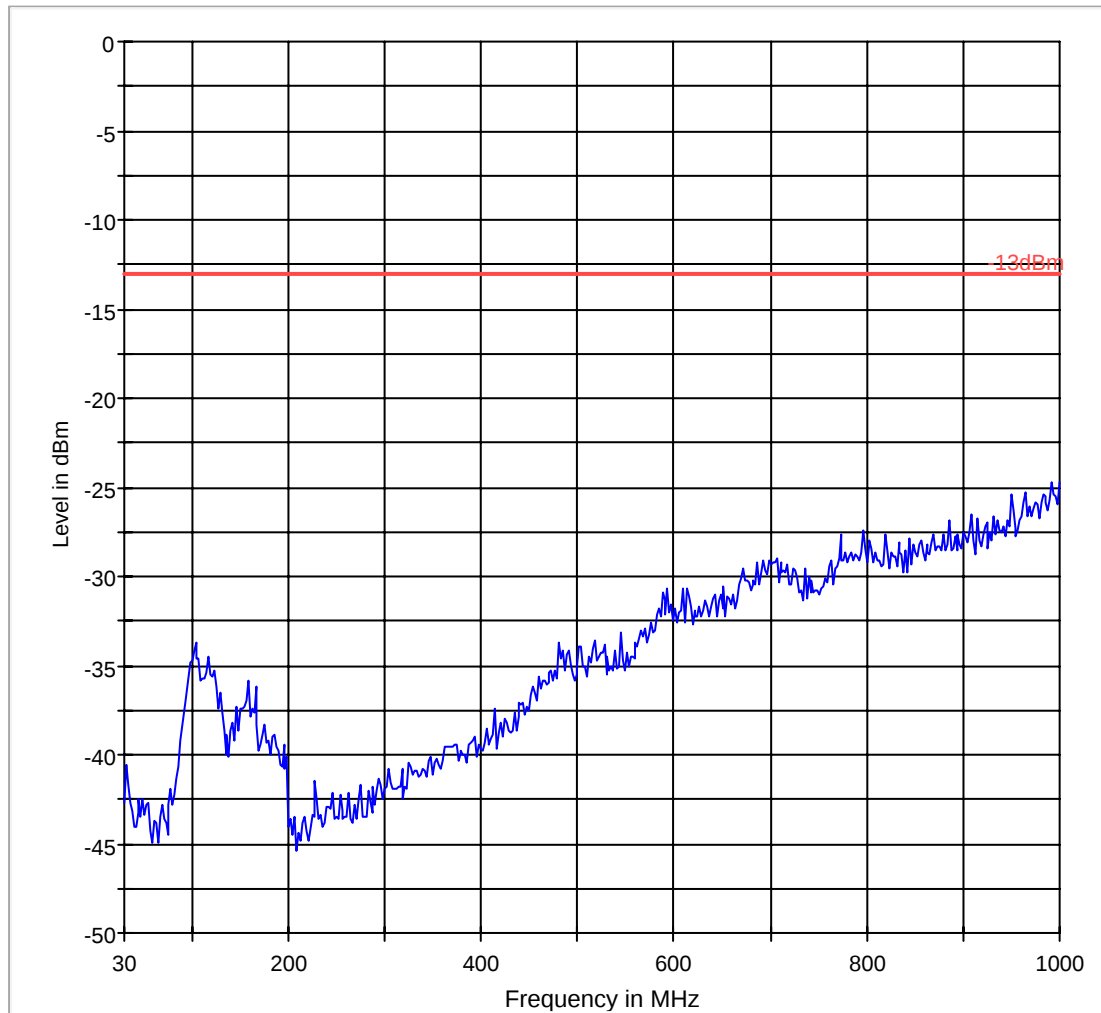
FCC 22 30-1000MHz



— -13dBm.LimitLine — Preview Result 1 * Data Reduction 1 [1]

High Channel

FCC 22 30-1000MHz



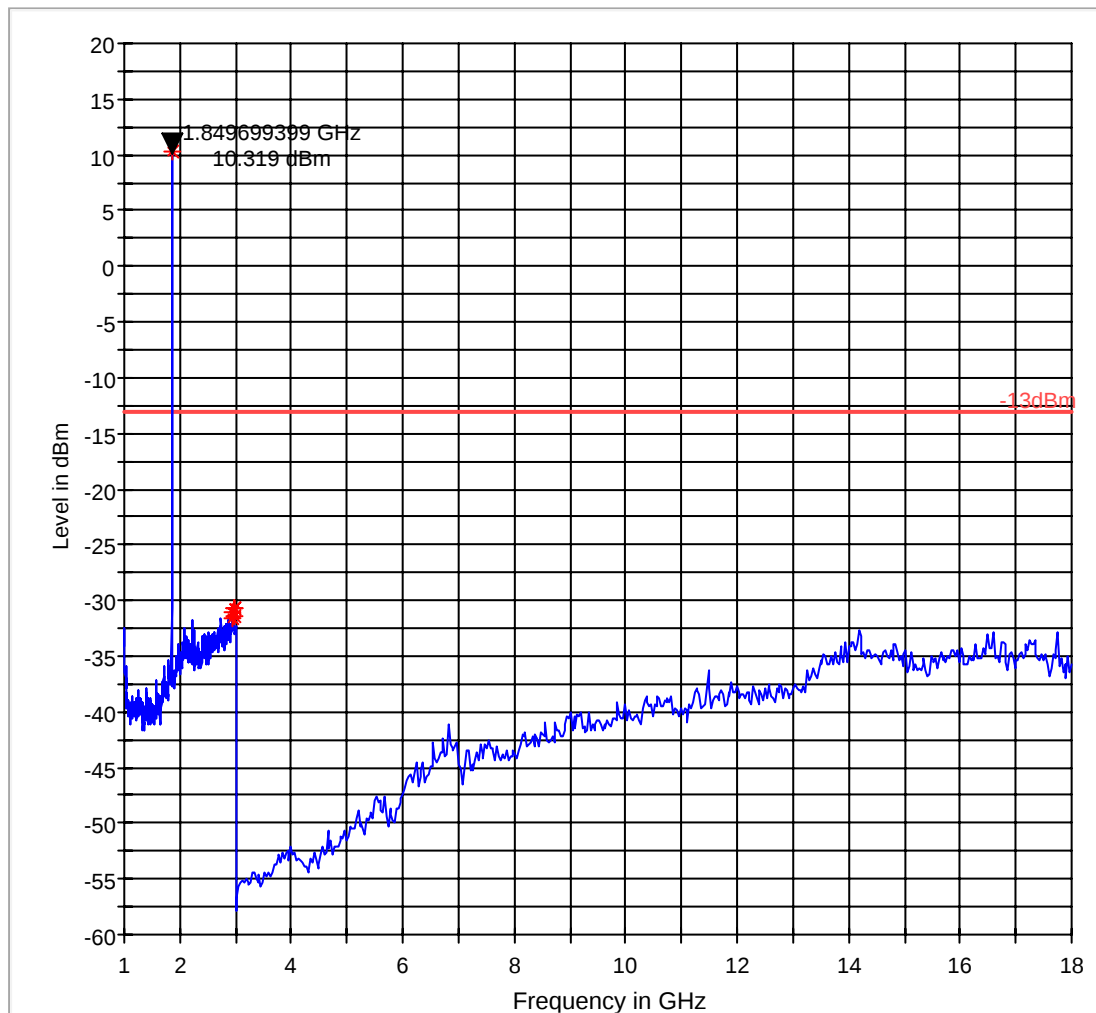
— -13dBm.LimitLine

— Preview Result 1

Radiated Spurious Emissions (PCS 1900) Tx: 1GHz – 18GHz**Low Channel**

Note: The spike in the plot is the TCH signal from the EUT.

FCC 24 1-18GHz



-13dBm.LimitLine

Preview Result 1

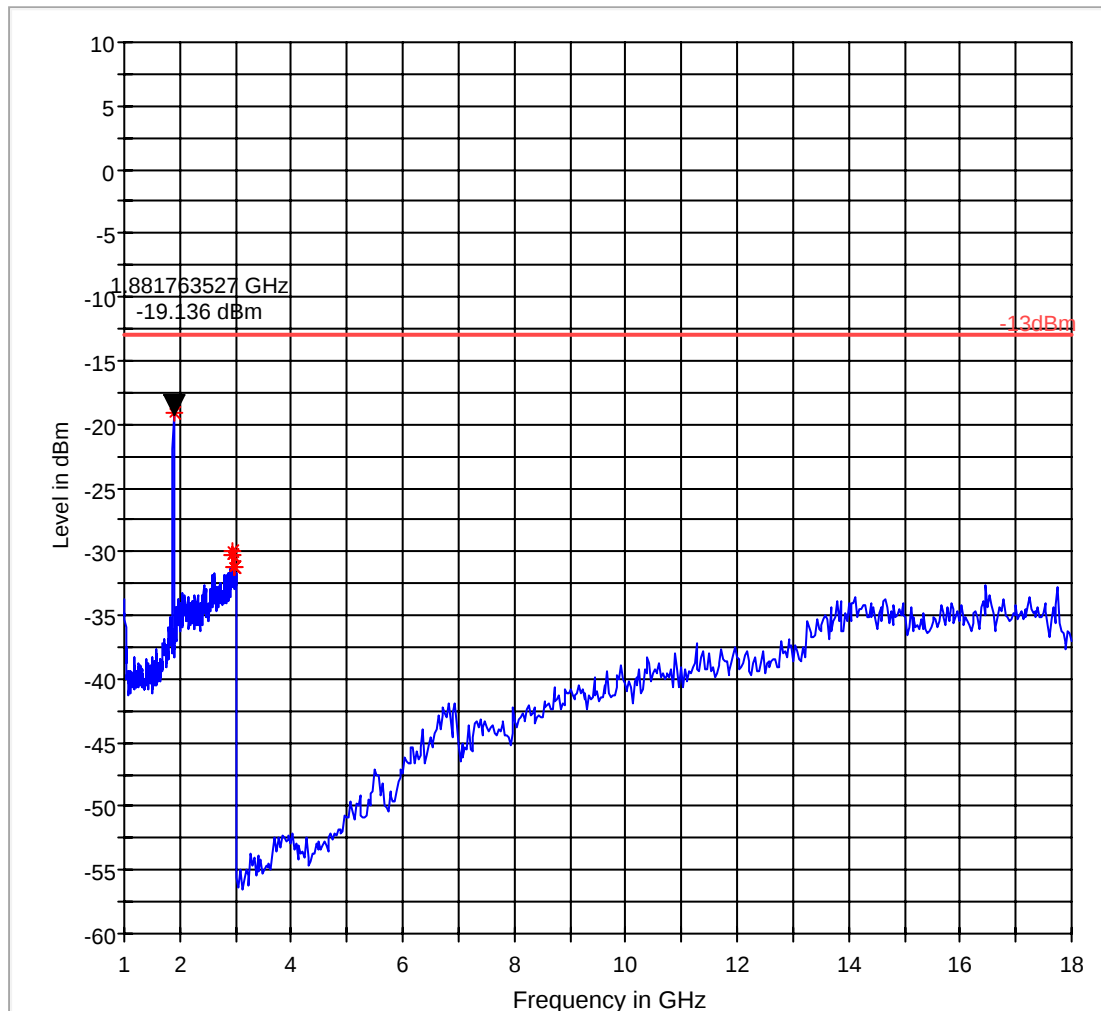
*

Data Reduction 1 [2]

Mid Channel

Note: The spike in the plot is the TCH signal from the EUT.

FCC 24 1-18GHz



— -13dBm.LimitLine

— Preview Result 1

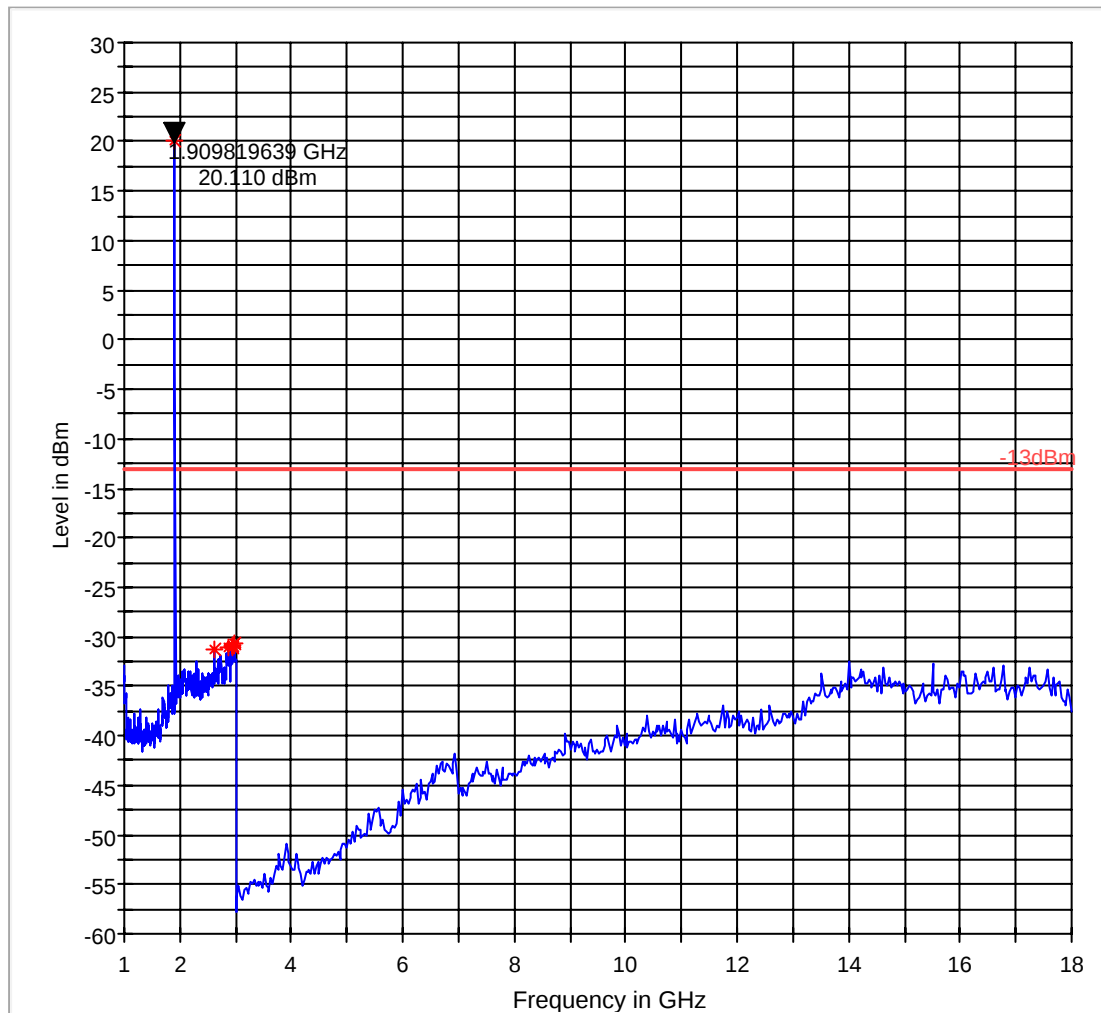
*

Data Reduction 1 [2]

High Channel

Note: The spike in the plot is the TCH signal from the EUT.

FCC 24 1-18GHz



— -13dBm.LimitLine

— Preview Result 1

*

Data Reduction 1 [2]

Radiated Spurious Emissions (PCS 1900) Tx: 18GHz – 19.1GHz
Low Channel

EMI Auto Test(1)

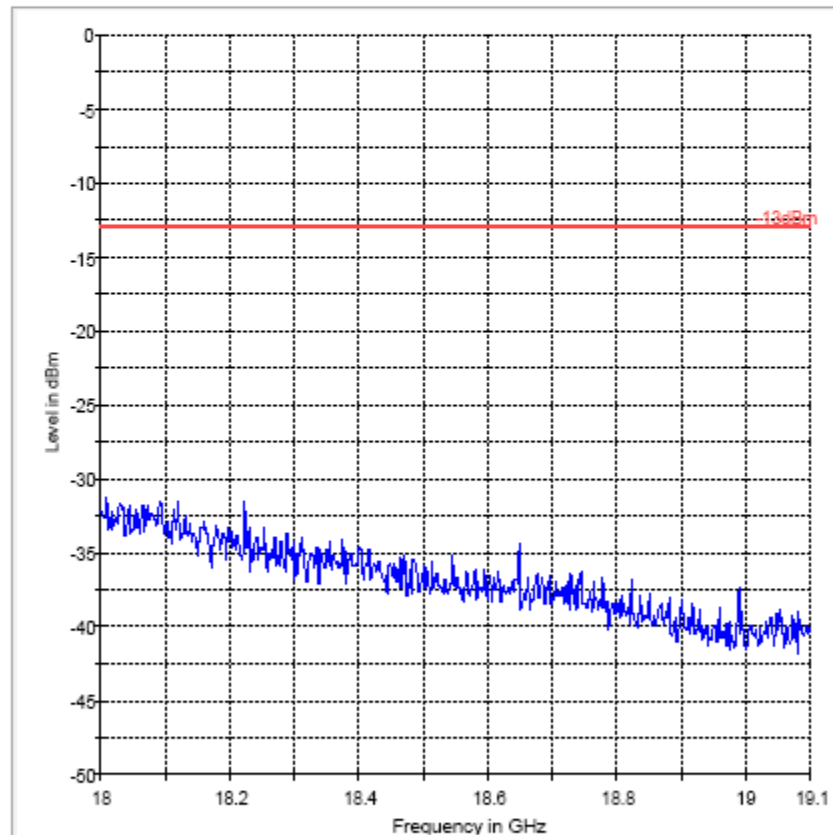
1 / 1

EMI Auto Test(1)**EUT Information**

Description:

EUT Name:
Manufacturer: Komatsu
Serial Number:
Hardware Rev:
Voltage: DC
Comment:

FCC 24 18-19.1GHz



Mid Channel

EMI Auto Test(1)

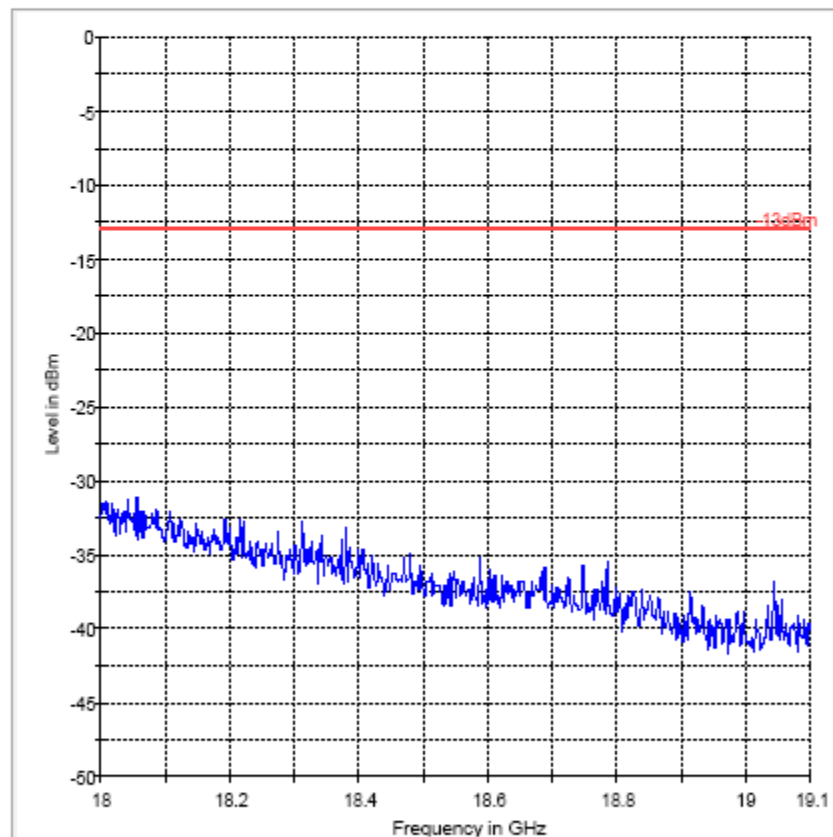
1 / 1

EMI Auto Test(1)**EUT Information**

Description:

EUT Name:
Manufacturer: Komatsu
Serial Number:
Hardware Rev:
Voltage: DC
Comment:

FCC 24 18-19.1GHz



High Channel

EMI Auto Test(1)

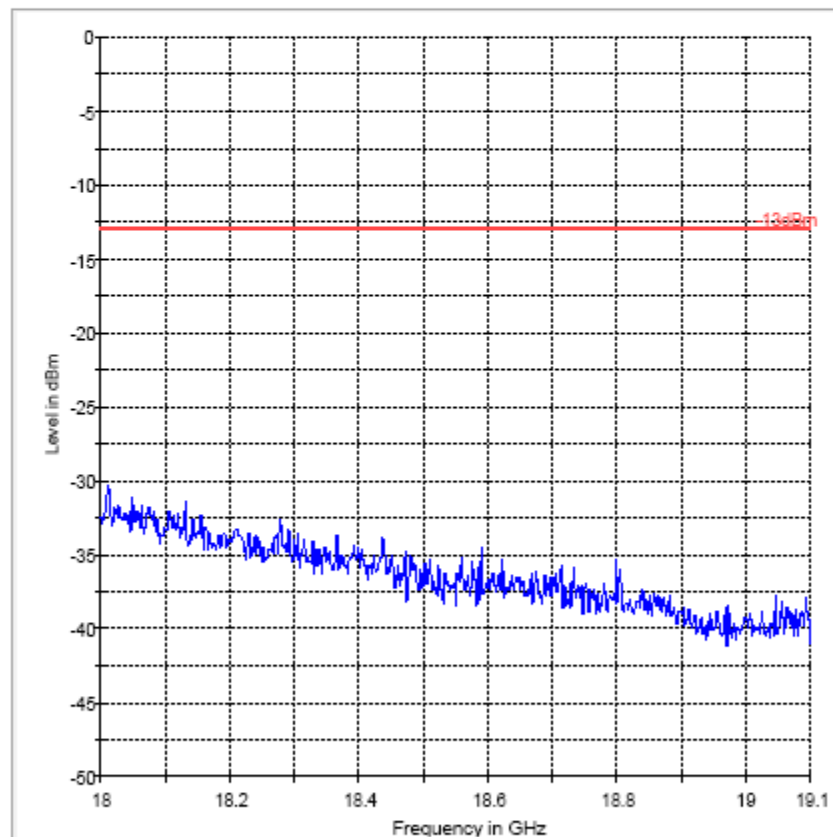
1 / 1

EMI Auto Test(1)**EUT Information**

Description:

EUT Name:
Manufacturer: Komatsu
Serial Number:
Hardware Rev:
Voltage: DC
Comment:

FCC 24 18-19.1GHz



5.2.6 Radiated out of band emissions results on EUT- Receive Mode:**5.2.6.1 References**

FCC: CFR Part 15.109, 2.1053

IC: RSS 132 Section 4.6 and 6.6

5.2.6.2 §15.109 Radiated emission limits- Unintentional Radiators:

- (b) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of emission (MHz)	Field strength (μV/m)
30–88	100 (40dBμV/m)
88–216	150 (43.5 dBμV/m)
216–960	200 (46 dBμV/m)
Above 960	500 (54 dBμV/m)

- (c) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following:

Frequency of emission (MHz)	Field strength (μV/m)
30–88	90
88–216	150
216–960	210
Above 960	300

5.2.6.3 Results

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

5.2.6.4 Test Results Receiver Spurious Emission**Receive Mode: 30MHz-1GHz**

30-1 Rx

1 / 1

30-1 Rx**EUT Information**

Description:

EUT Name:

Manufacturer:

Komatsu

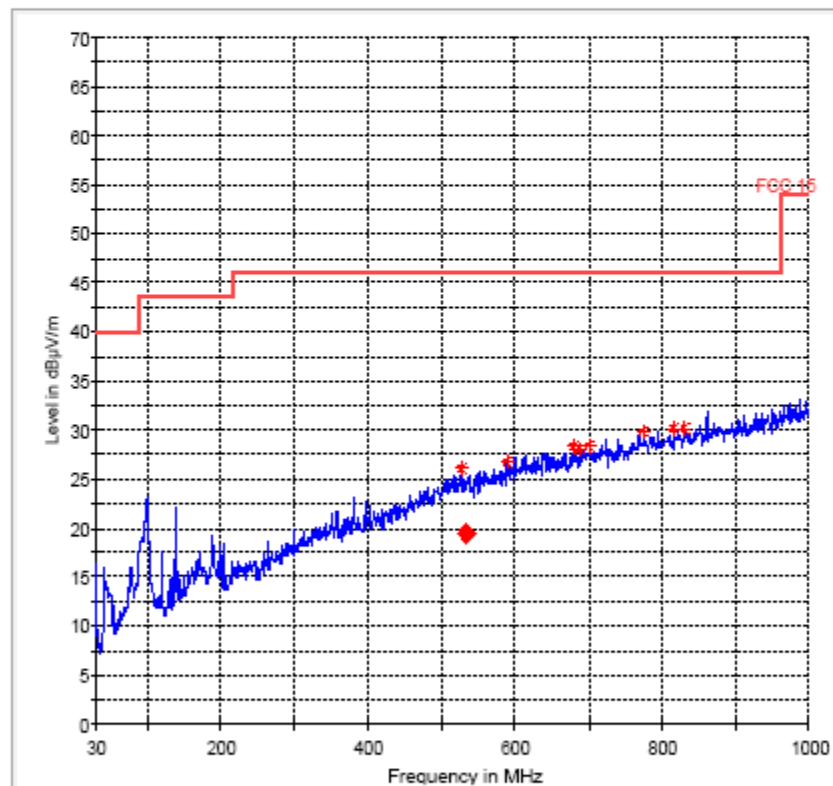
Serial Number:

Hardware Rev:

Voltage:

Comment:

FCC 15 30-1000MHz

FCC 15 LimitLine
Data Reduction 1 (1)Preview Result 1
Final Measurement Result 1

Receive Mode: 1GHz-18GHz

1-18 Rx

1 / 1

1-18 Rx**EUT Information**

Description:

EUT Name:

Manufacturer:

Komatsu

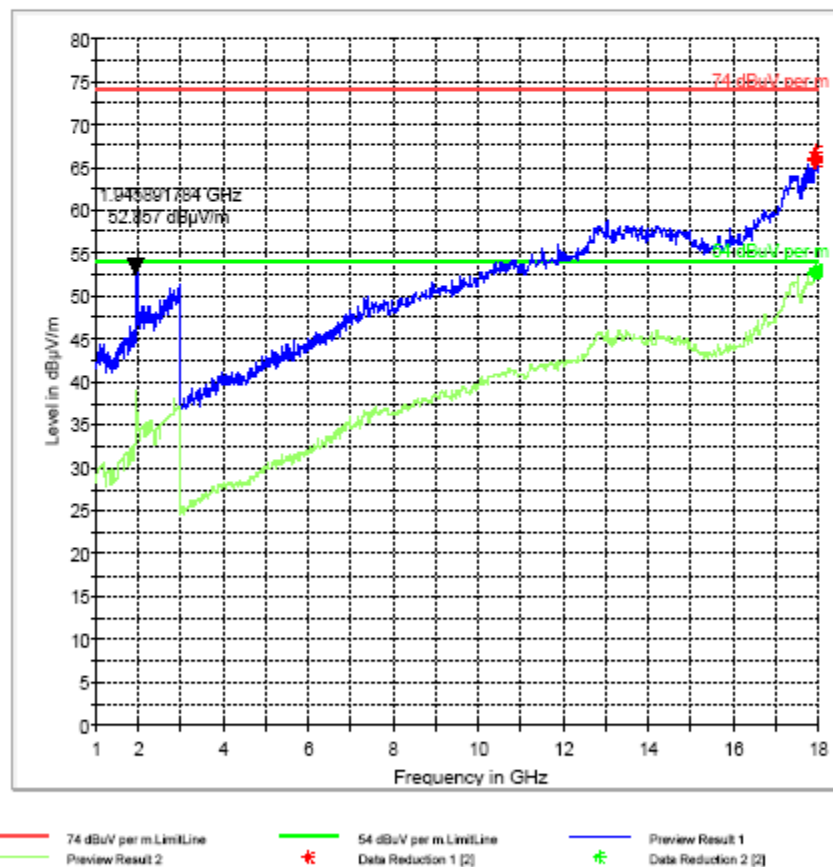
Serial Number:

Hardware Rev:

Voltage:

Comment:

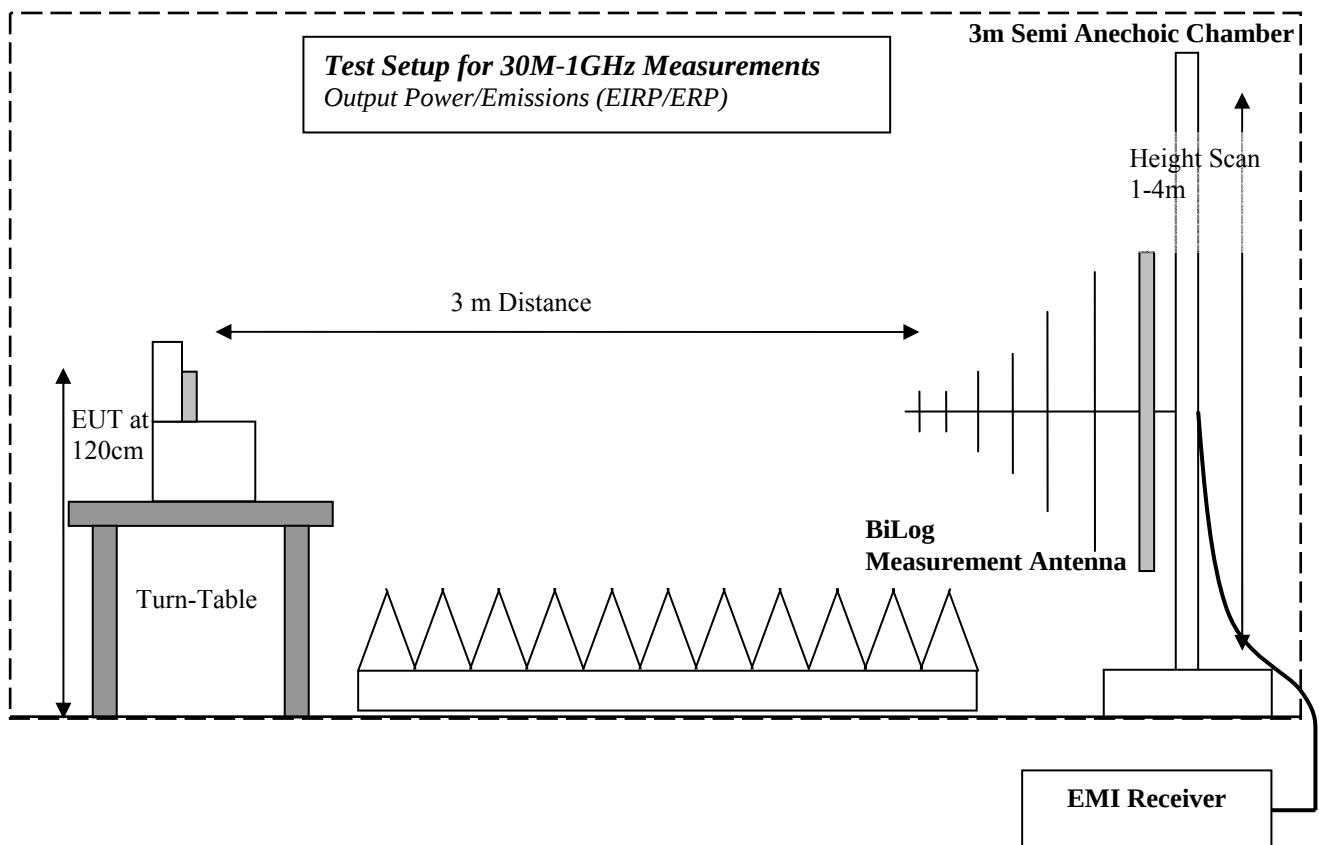
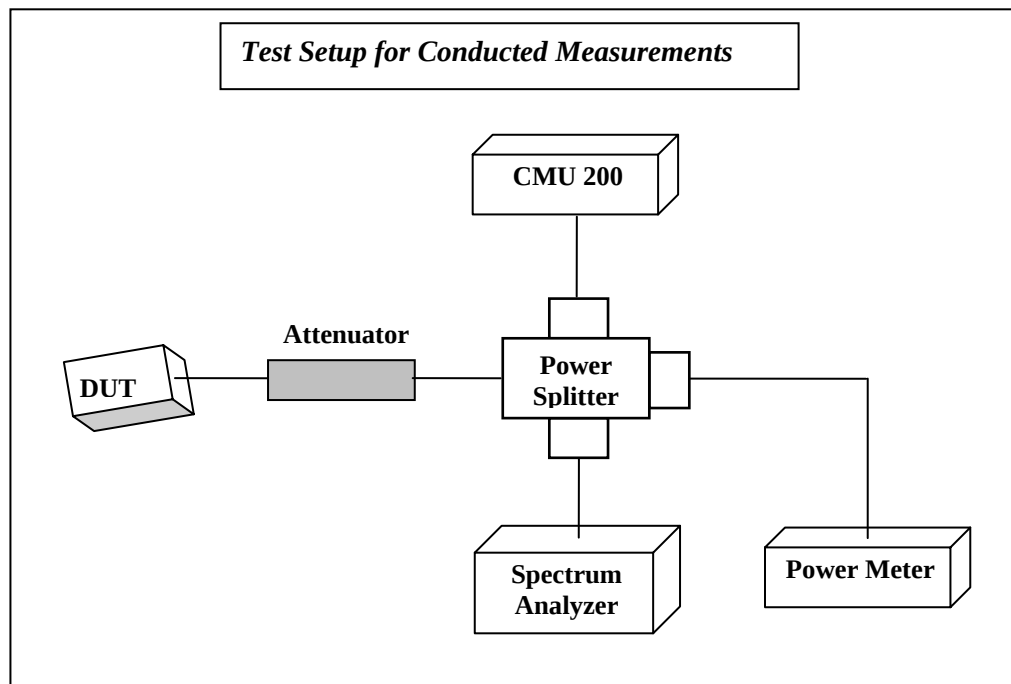
FCC 15 1-18GHz

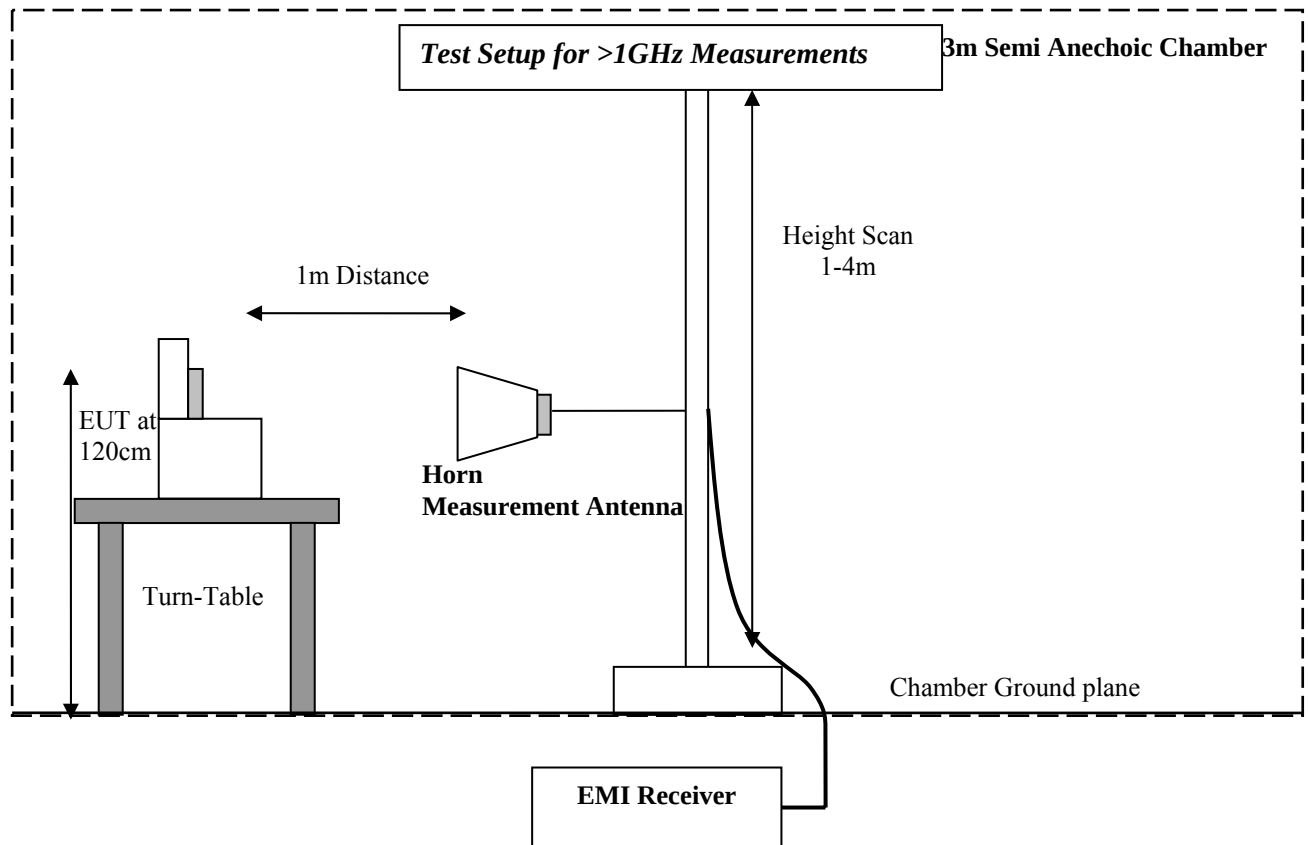


6 Test Equipment And Ancillaries Used For Tests

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

7 Block Diagrams





8 Revision History

Date	Report Name	Changes to report	Report prepared by
01-29-10	CET10_050_09501_FCC22_24	Original Version	Christopher Torio
02-12-10	CET10_050_09501_FCC22_24_Rev1	Added 18-19.1Mhz Spurious Emission Sweep for PCS-1900	Christopher Torio
02-16-10	CET10_050_09501_FCC22_24_Rev2	Updated 18-19.1 GHz plot	Christopher Torio
02-18-10	CET10_050_09501_FCC22_24_Rev3	Updated plot to have -13dBm	Christopher Torio