# 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**

ACCREDITED
TESTING LABORATORY
CERTIFICATE # 2135.01

**Bluetooth Qualification Test Facility (BQTF)**

CTIA Authorized Test Lab
LAB CODE 20020328-00

**FCC listed: A2LA accredited**

**IC recognized # 3462B-1**


***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 Industry Canada Standards RSS 132 and RSS 133.**

| Company | Description | Model # |
|---|---|---|
| Komatsu Ltd. | Car Mounted Device | TC530 |

**Responsible for Testing Laboratory:**

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

**Responsible for the Report:**

| Date | Section | Name | Signature |
|---|---|---|---|
| 2010-02-18 | Compliance | Christopher Torio (Test Engineer) | Christopher Torio Digitally signed by Christopher Torio DN: cn=Christopher Torio, c=US, o=Catecom, Inc, ou=Compliance, email=christopher.torio@catecomusa.com Reason: I am the author of this document Date: 2010.02.18 13:35:33 -08'00' |

The test results of this test report relate exclusively to the test item specified in Section3.
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<br>Milpitas, CA 95035<br>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.

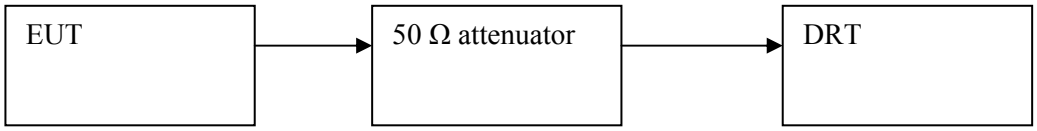
The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.

#### 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).
I 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

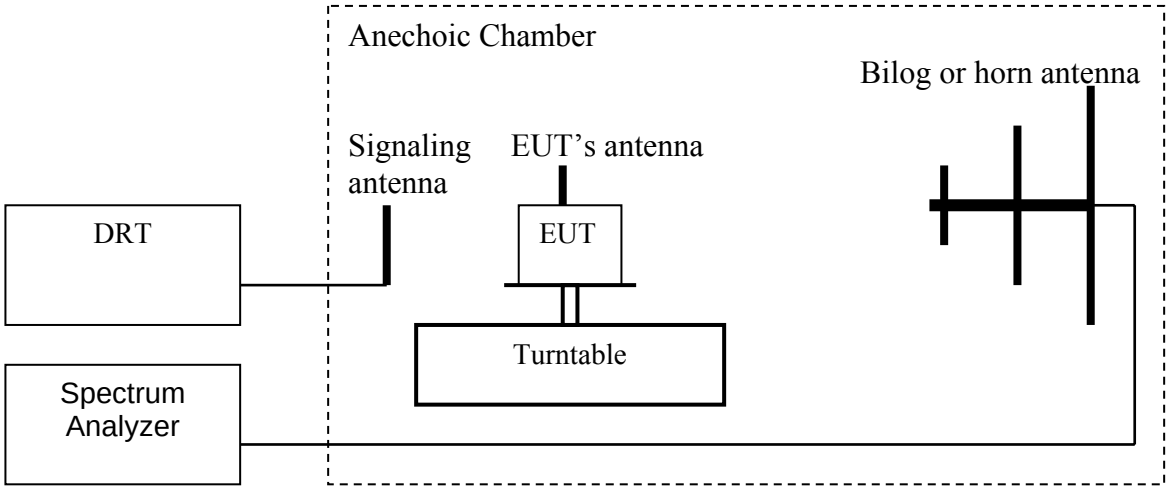
**Ref: TIA-603C 2004 2.2.1 Conducted Carrier Output Power Rating**




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:
   **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.)

### 5.1.6 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 many 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)**

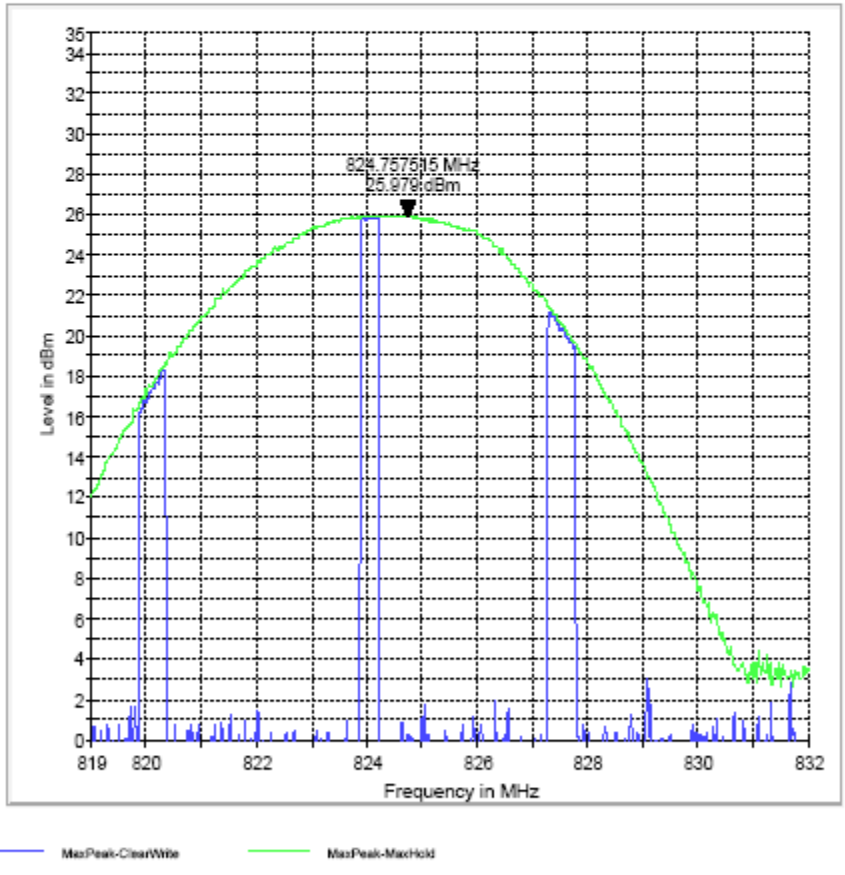
Low - 128 1 / 1

# Low - 128

## EUT Information

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

ERP 850 L

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## EIRP (GSM 850) CHANNEL 190 §22.913(a)

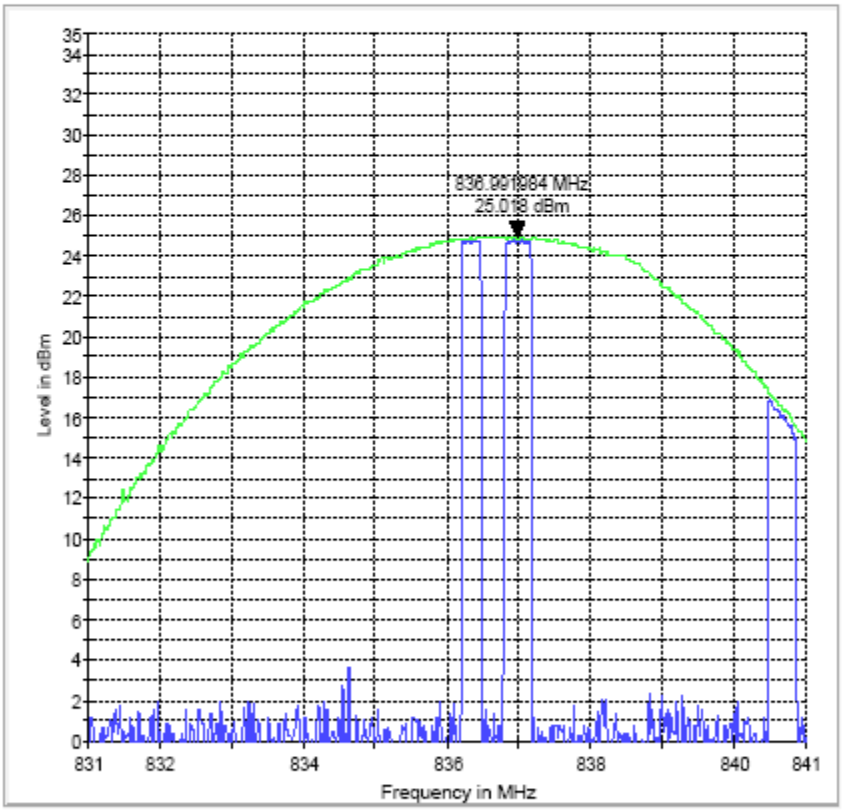
Mid- 190 1 / 1

# Mid- 190

### EUT Information

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

ERP 850 M

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## EIRP (GSM 850) CHANNEL 251 §22.913(a)

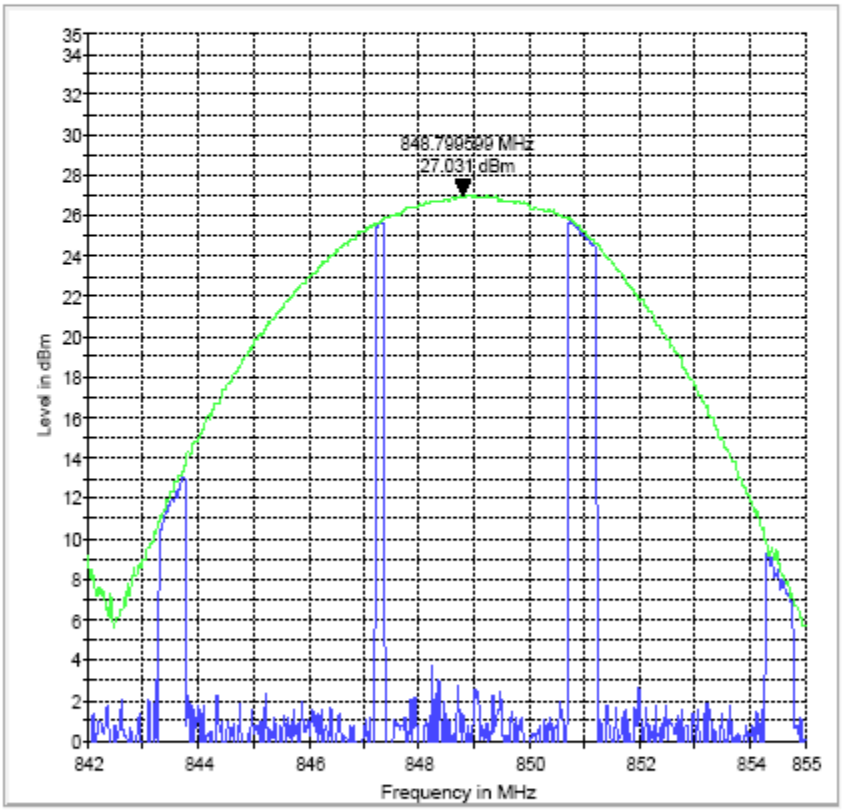


# High - 251

### EUT Information

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

ERP 850 H



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

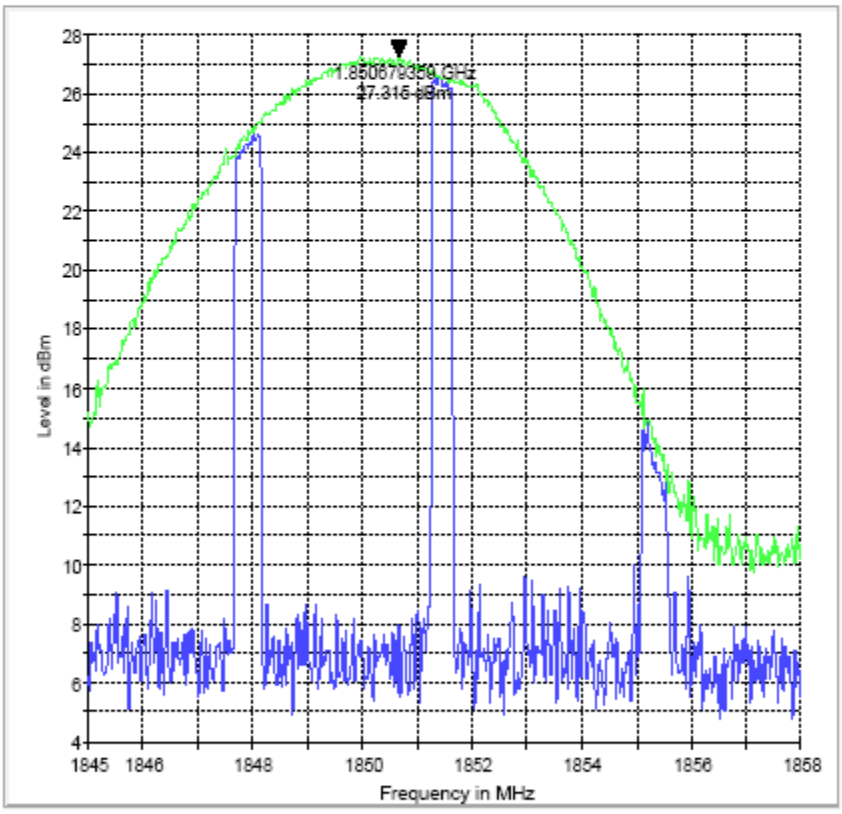
512 - L 1 / 1

# 512 - L

### EUT Information

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

EIRP 1900 L

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

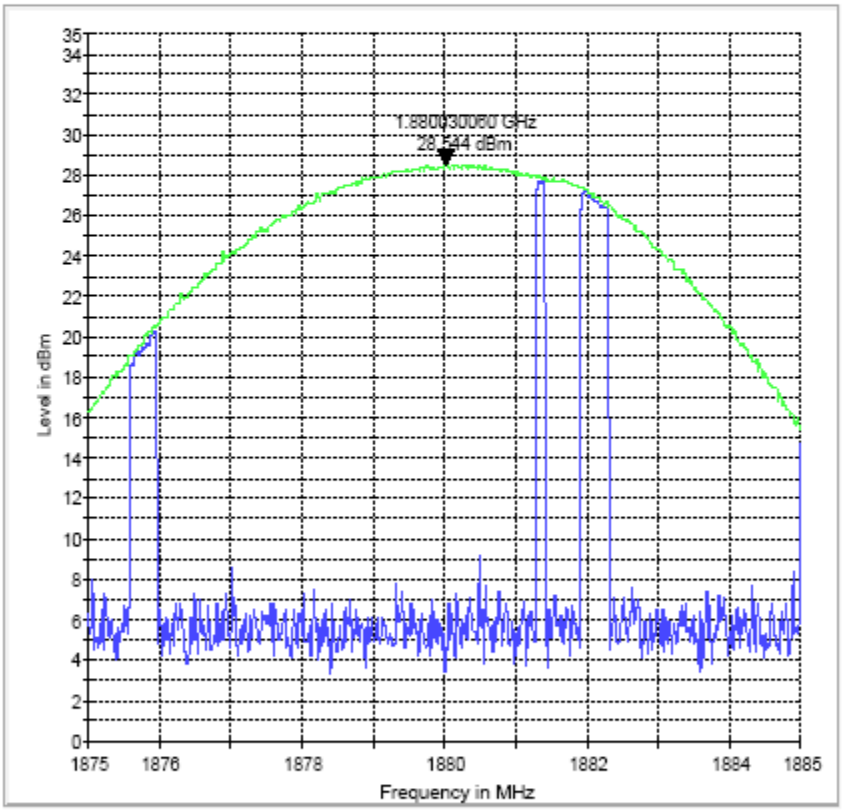
661 -M 1 / 1

# 661 -M

### EUT Information

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

EIRP 1900 M

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

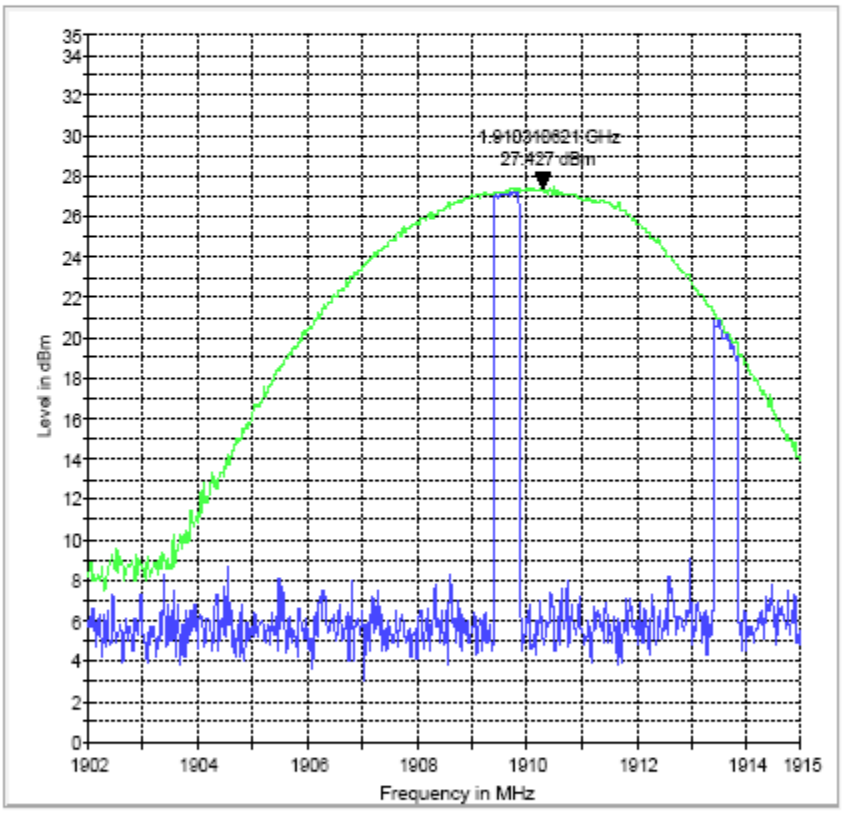


# 810 -H

### 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.

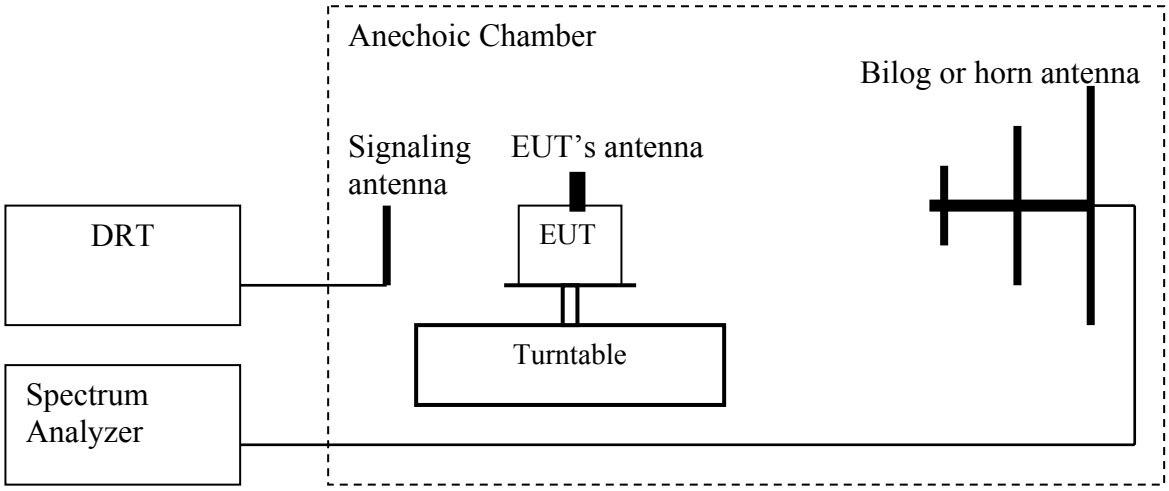
The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.
(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands 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.
    (N**ote:** 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 Surve**y:

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:

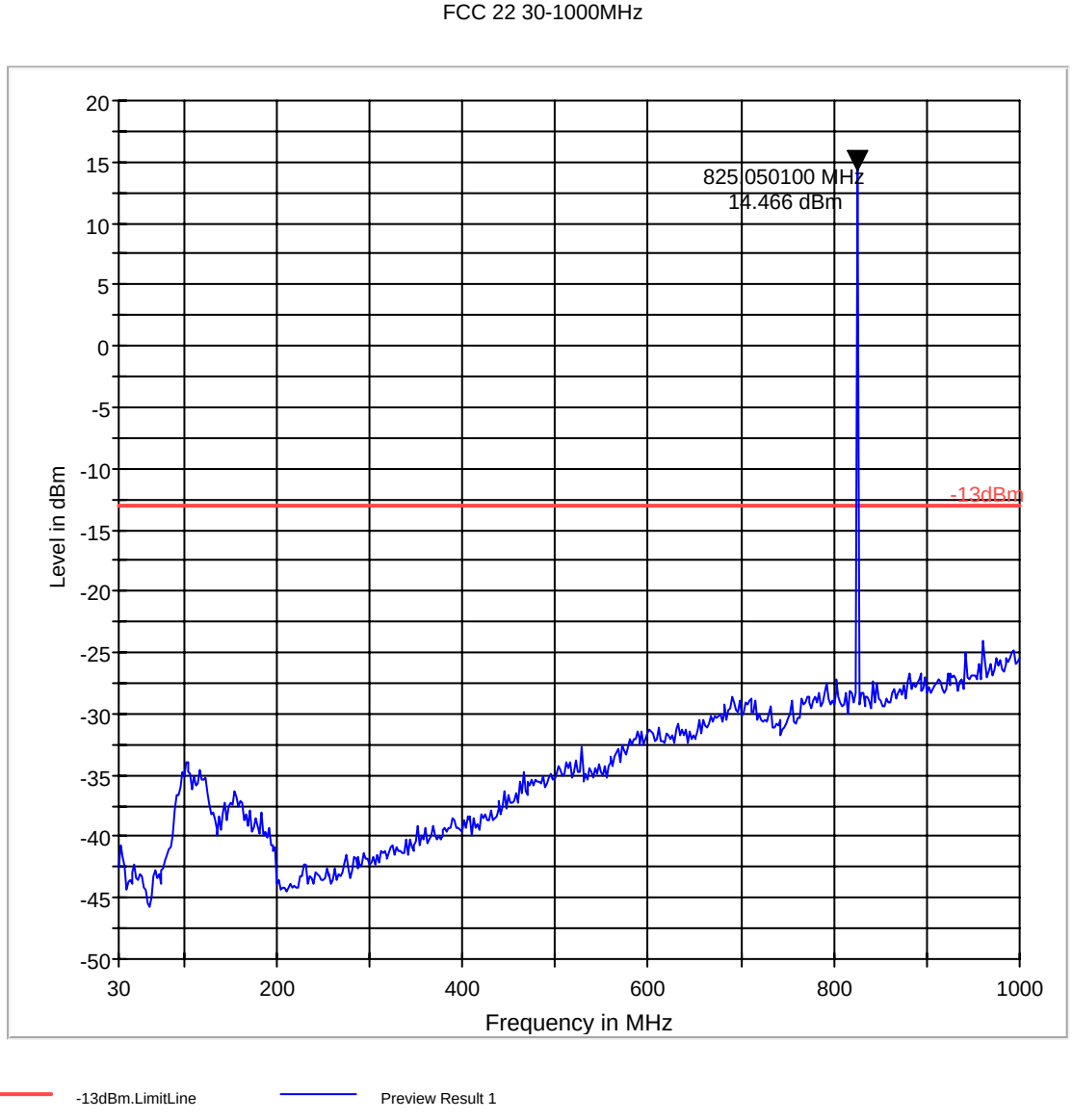
| Harmonic | Tx ch-128 Freq. (MHz) | Level (dBm) | Tx ch-190 Freq. (MHz) | Level (dBm) | Tx ch-251 Freq. (MHz) | Level (dBm) |
|---|---|---|---|---|---|---|
| **1** | **824.2** | - | **836.6** | - | **848.8** | - |
| **2** | **1648.4** | NF | **1673.2** | NF | **1697.6** | NF |
| **3** | **2472.6** | 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

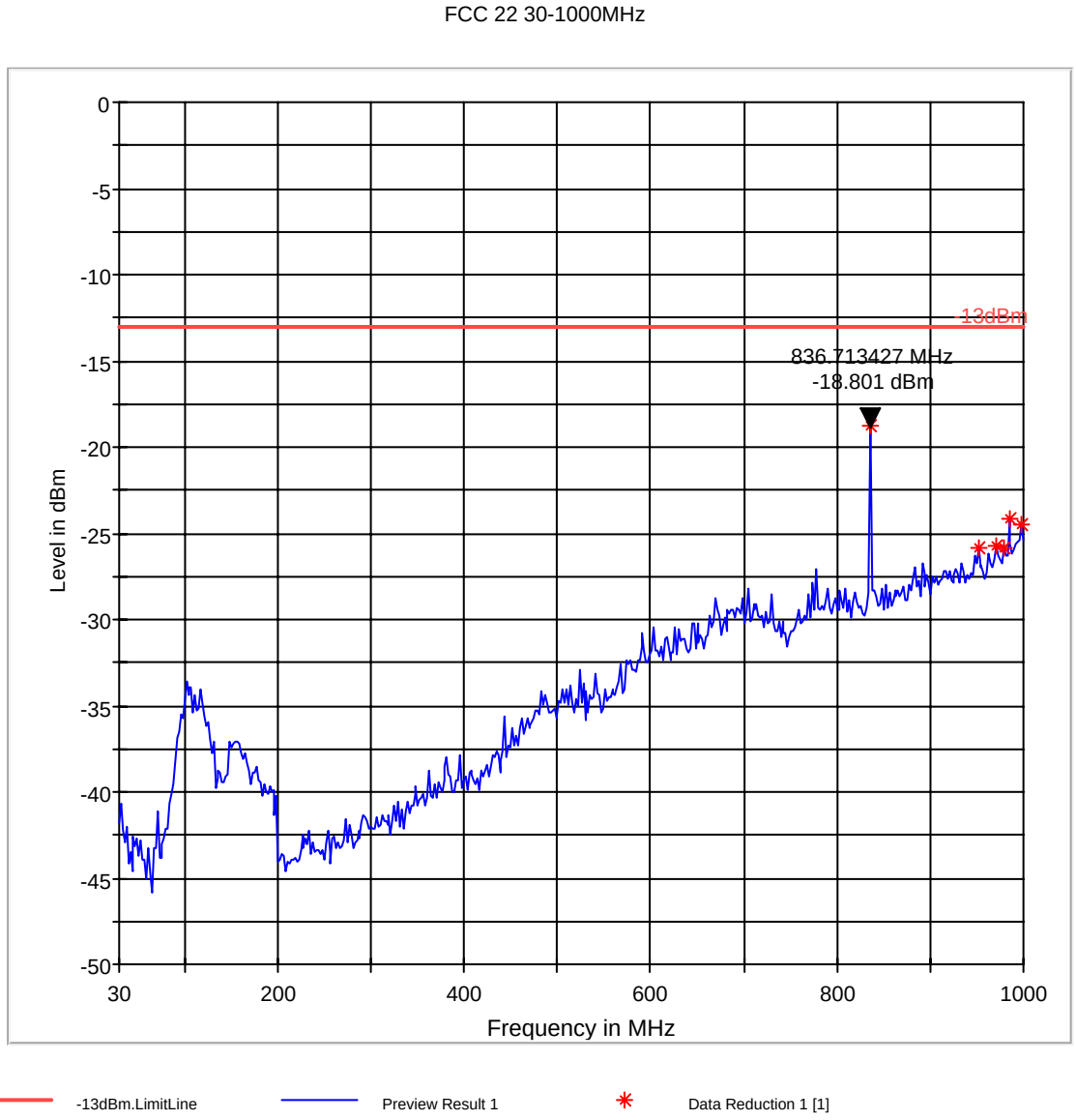
**Low Channel**

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



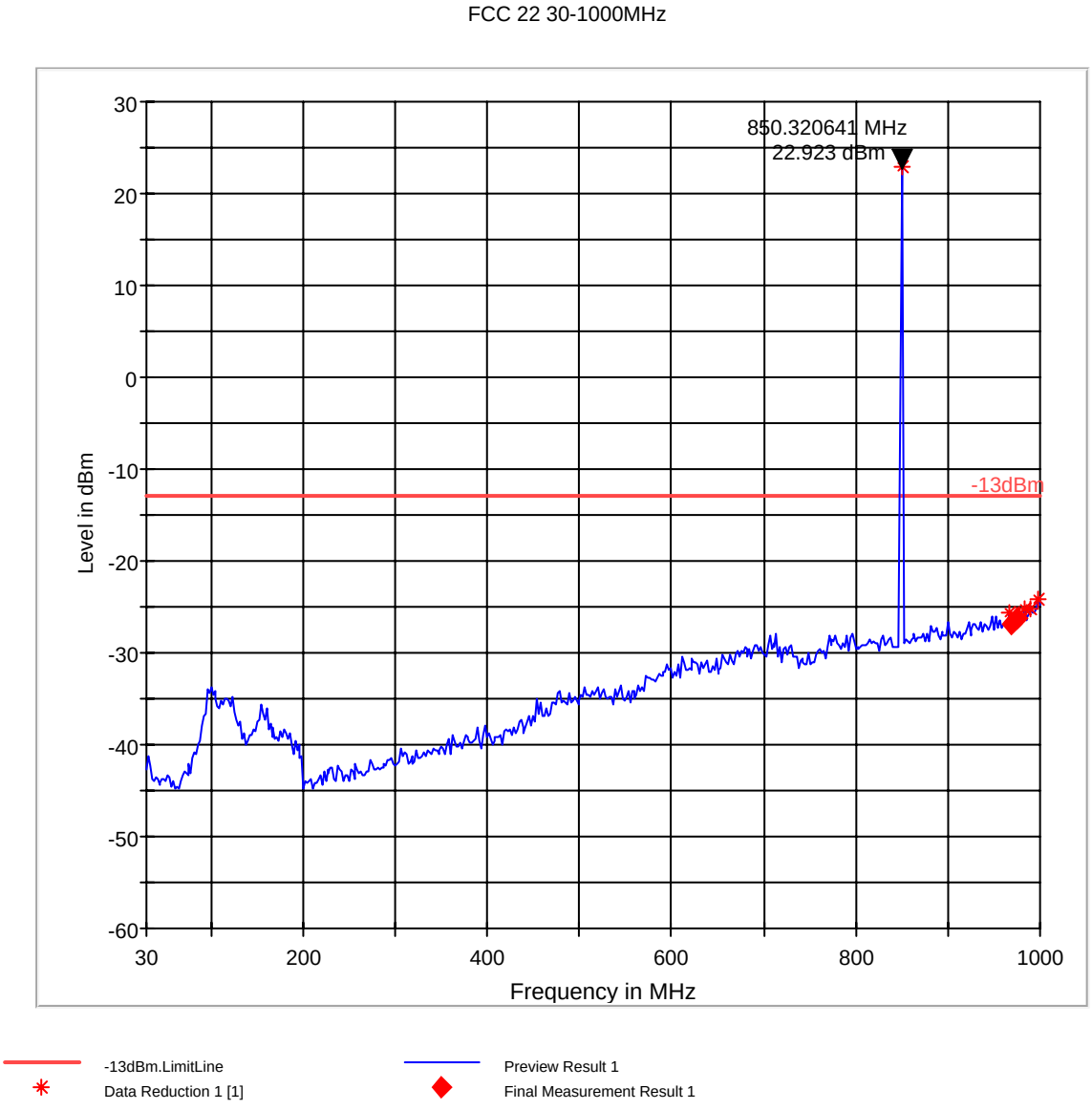
**Mid Channel**

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

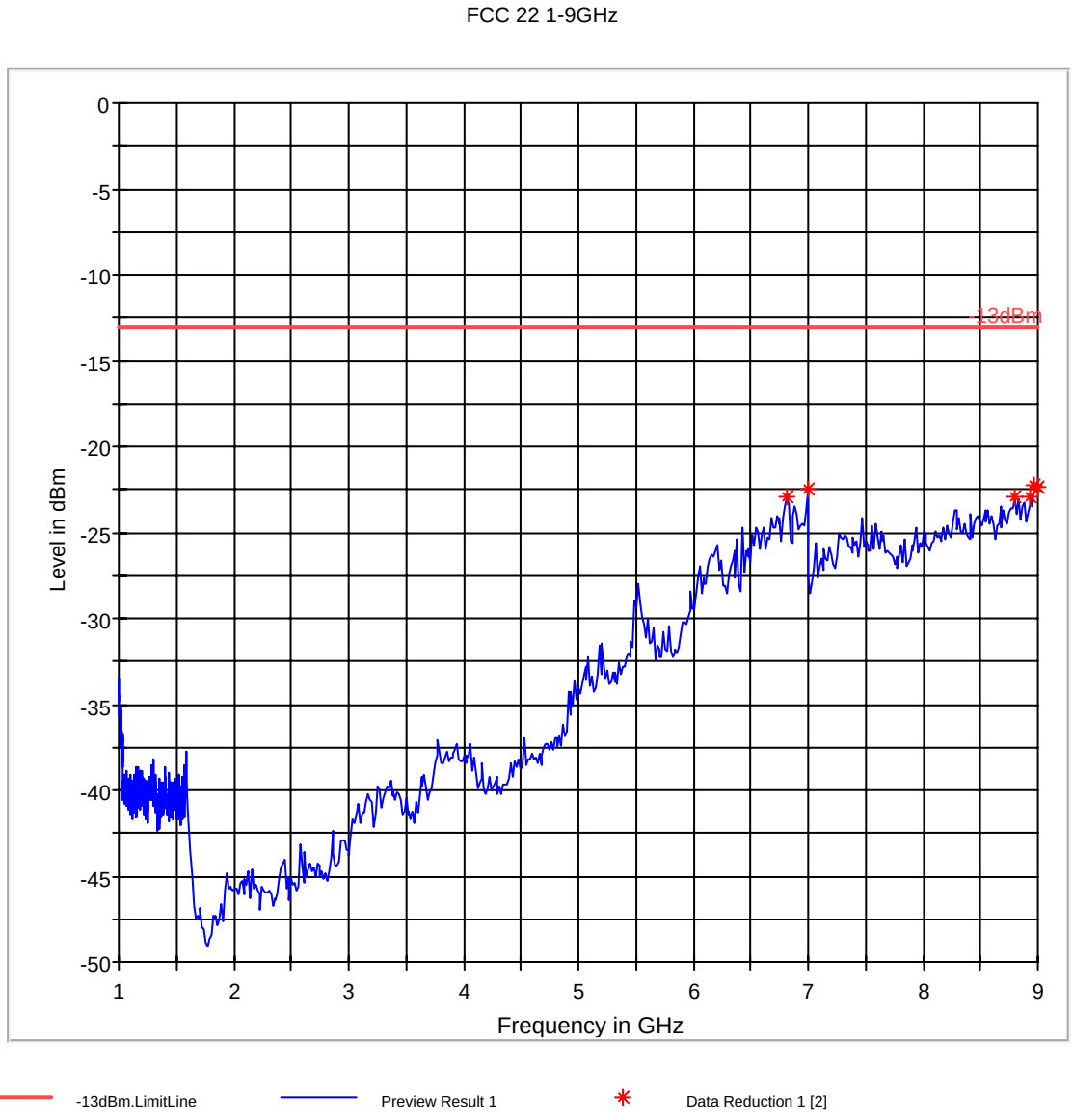


**High Channel**

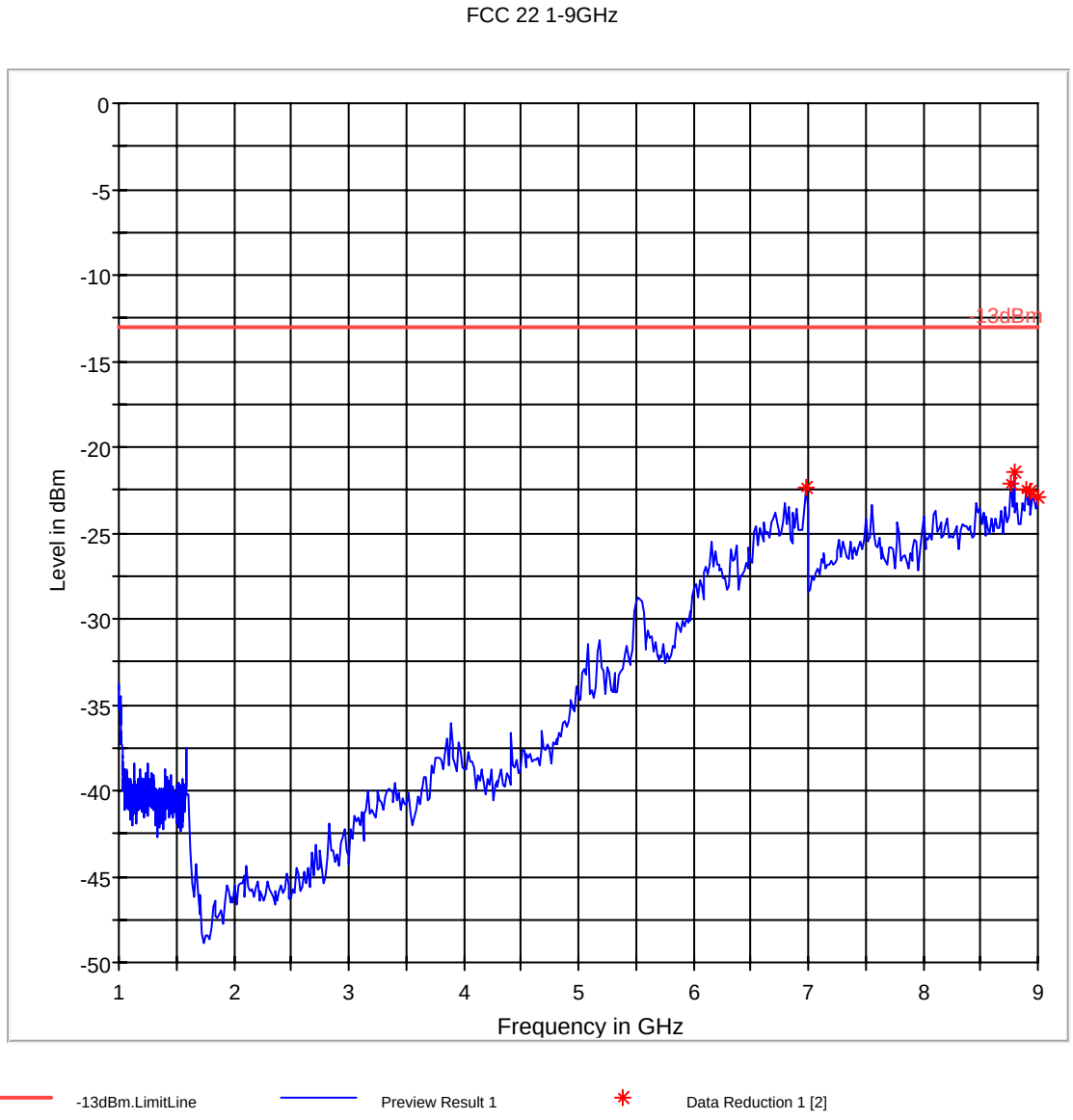
Note: The spike in the plot is the TCH signal from the EUT.



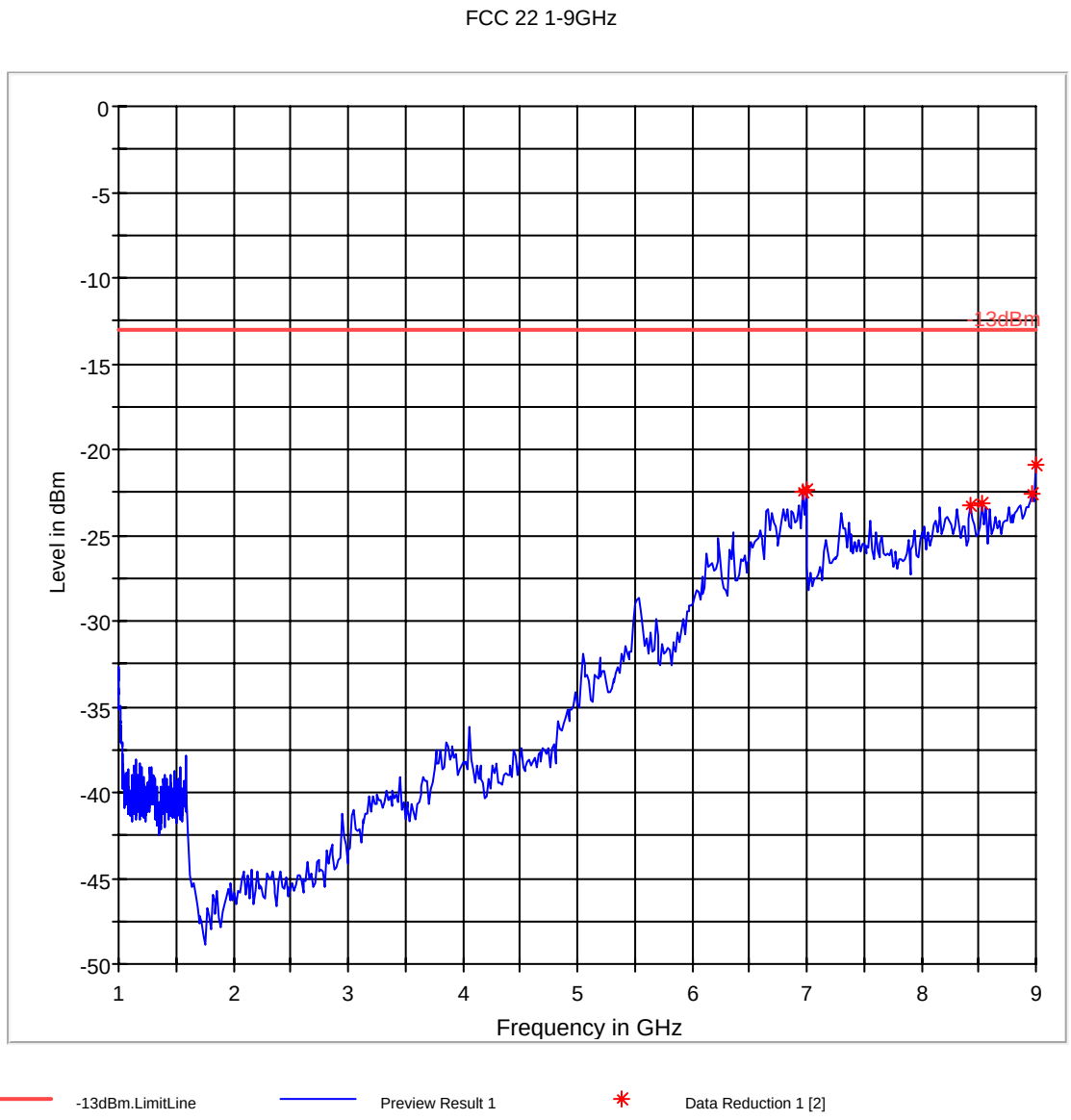
## Radiated Spurious Emissions (GSM-850): 1GHz – 9GHz
## Low Channel



## Mid Channel


FCC 22 1-9GHz
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
Level in dBm
-13dBm
1
2
3
4
5
6
7
8
9
Frequency in GHz
-13dBm.LimitLine
Preview Result 1
Data Reduction 1 [2]

## High Channel

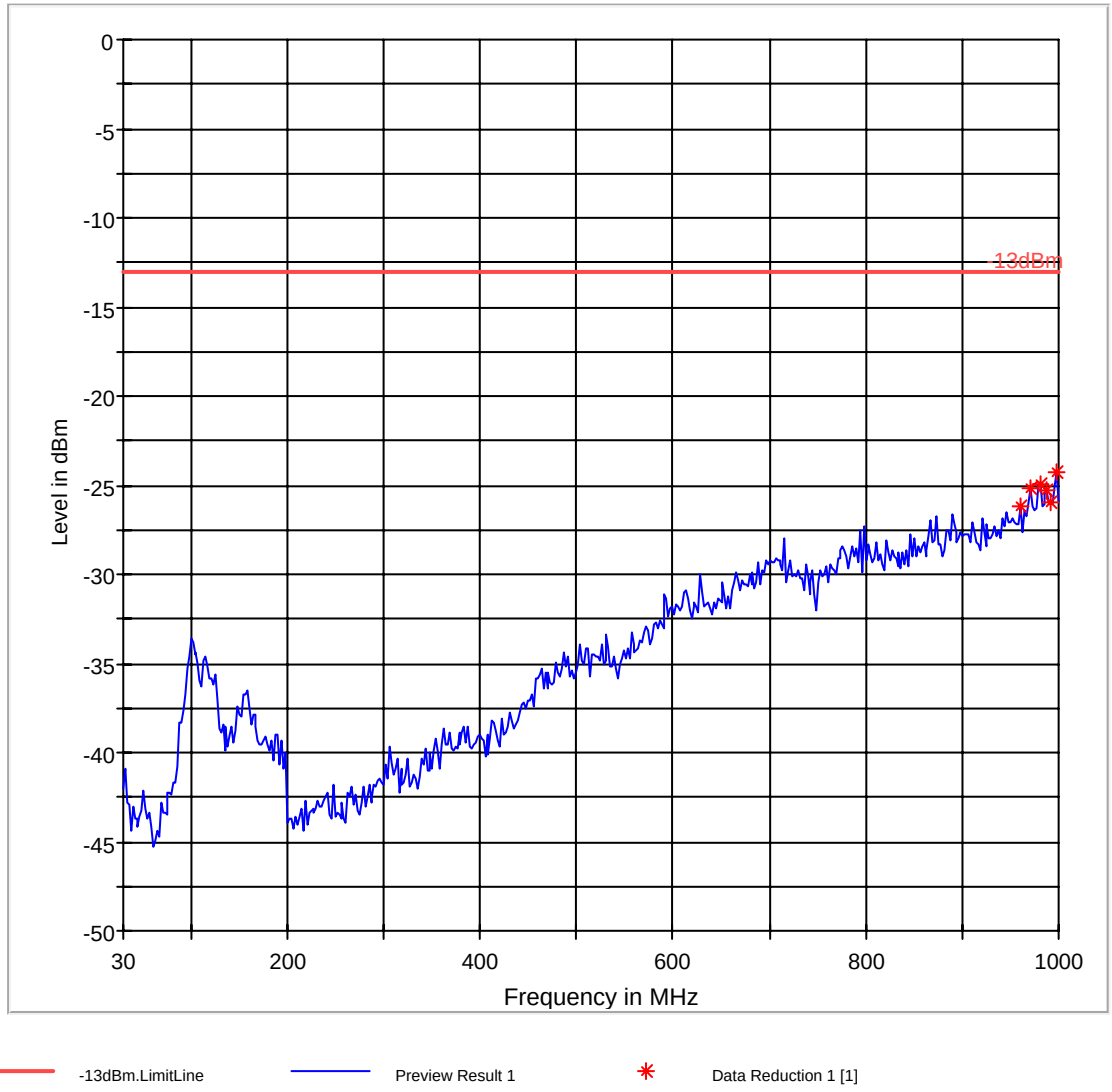


### 5.2.5.2 Test Results Transmitter Spurious Emission PCS-1900:

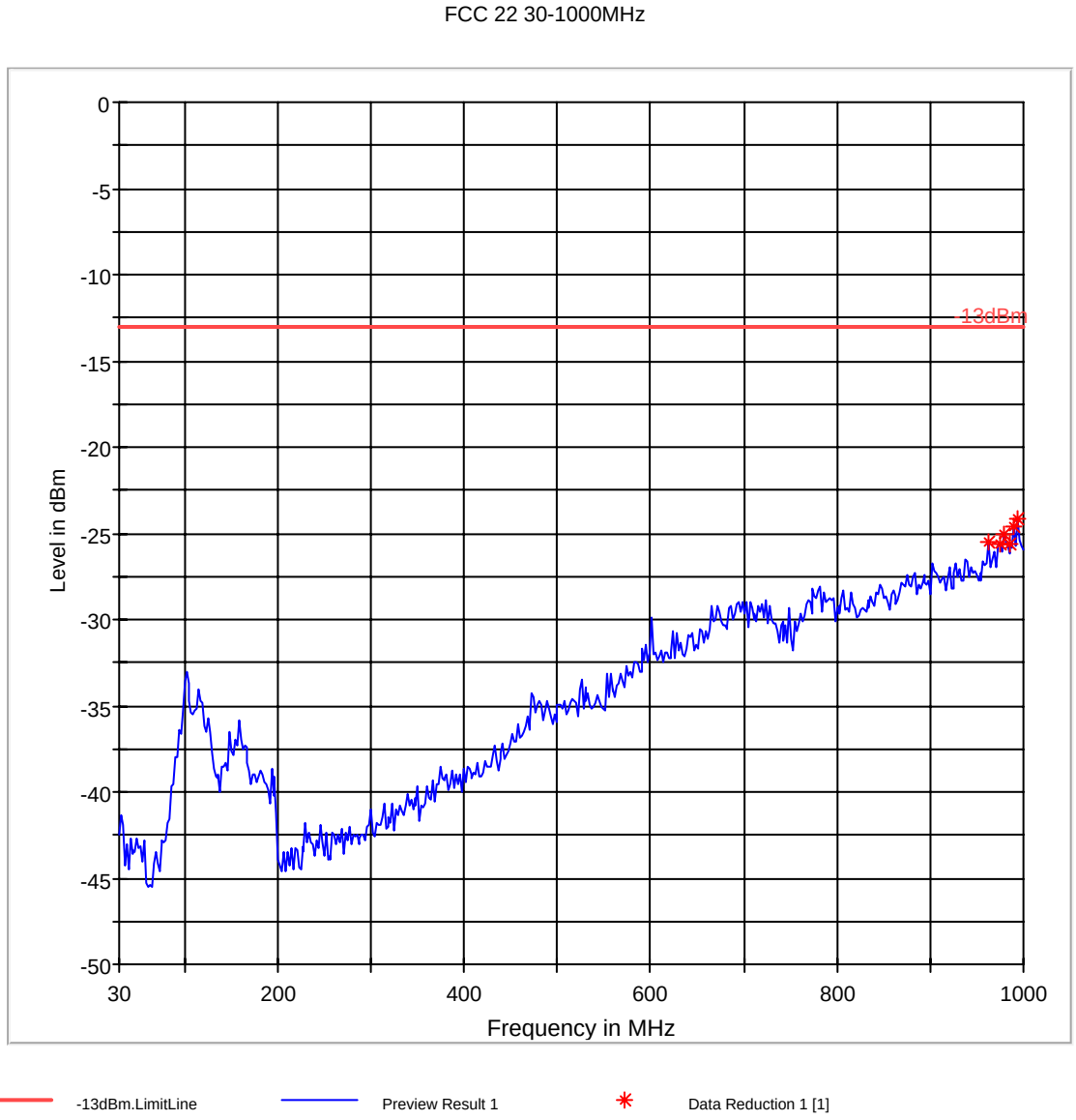
| Harmonic | Tx ch-512 Freq.(MHz) | Level (dBm) | Tx ch-661 Freq. (MHz) | Level (dBm) | Tx ch-810 Freq. (MHz) | Level (dBm) |
|---|---|---|---|---|---|---|
| **1** | **1850.2** | - | **1880.0** | - | **1909.8** | - |
| **2** | **3700.4** | NF | **3760** | NF | **3819.6** | NF |
| **3** | **5550.6** | 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.**

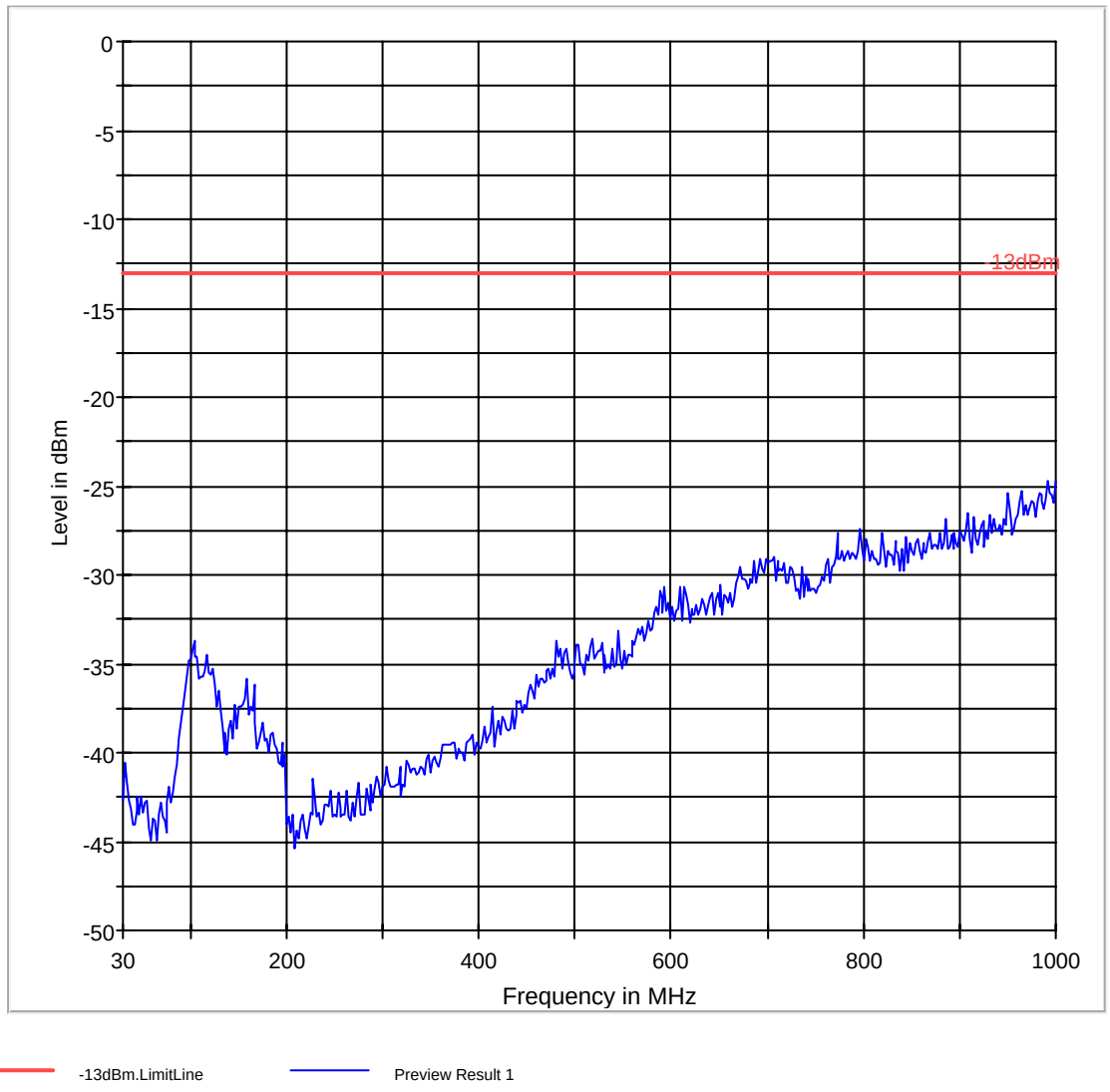
## Radiated Spurious Emissions (PCS 1900) Tx: 30MHz – 1GHz
## Low Channel



## Mid Channel


FCC 22 30-1000MHz
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
Level in dBm
13dBm
30
200
400
600
800
1000
Frequency in MHz
-13dBm.LimitLine
Preview Result 1
Data Reduction 1 [1]

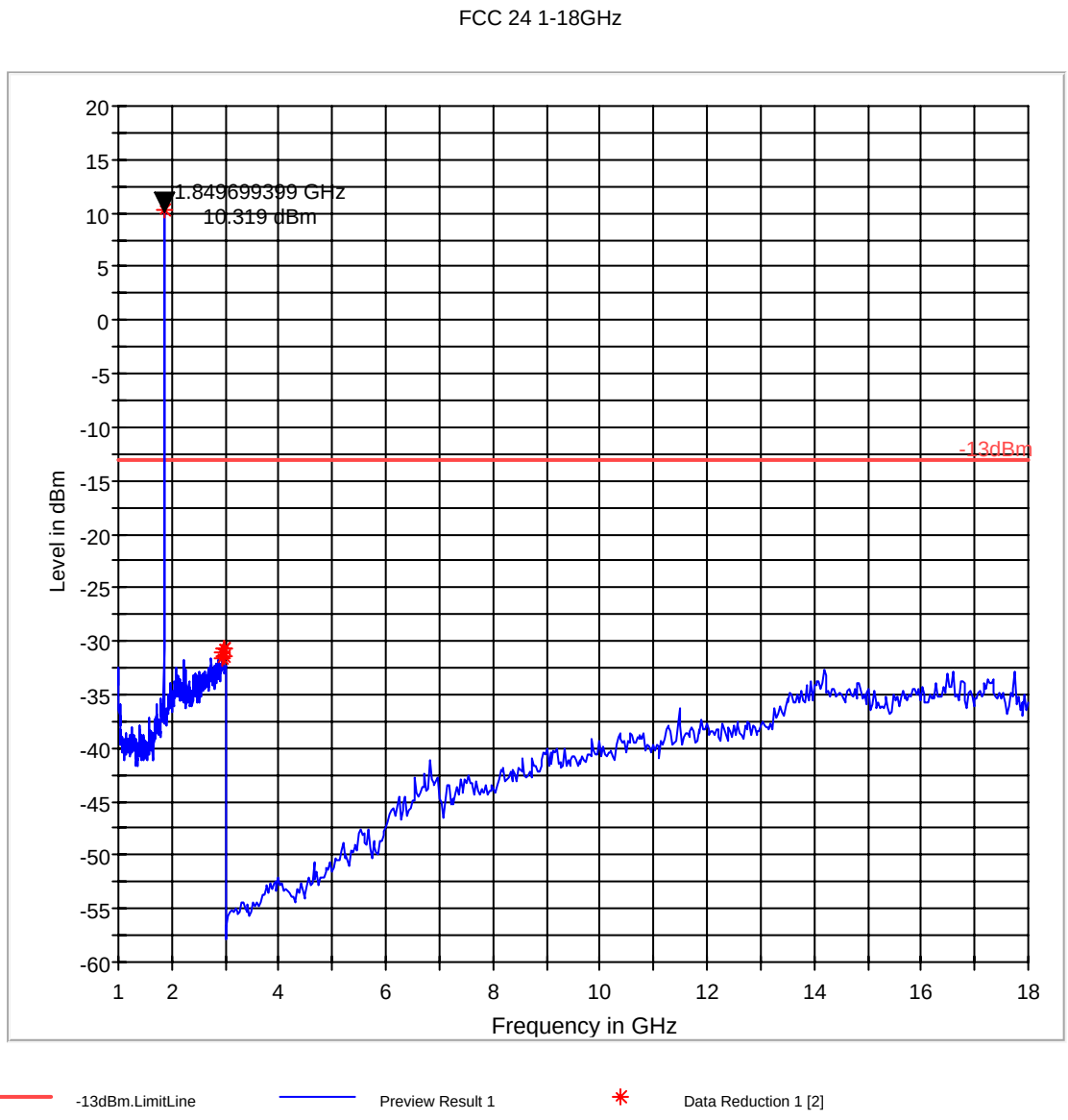
## High Channel



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

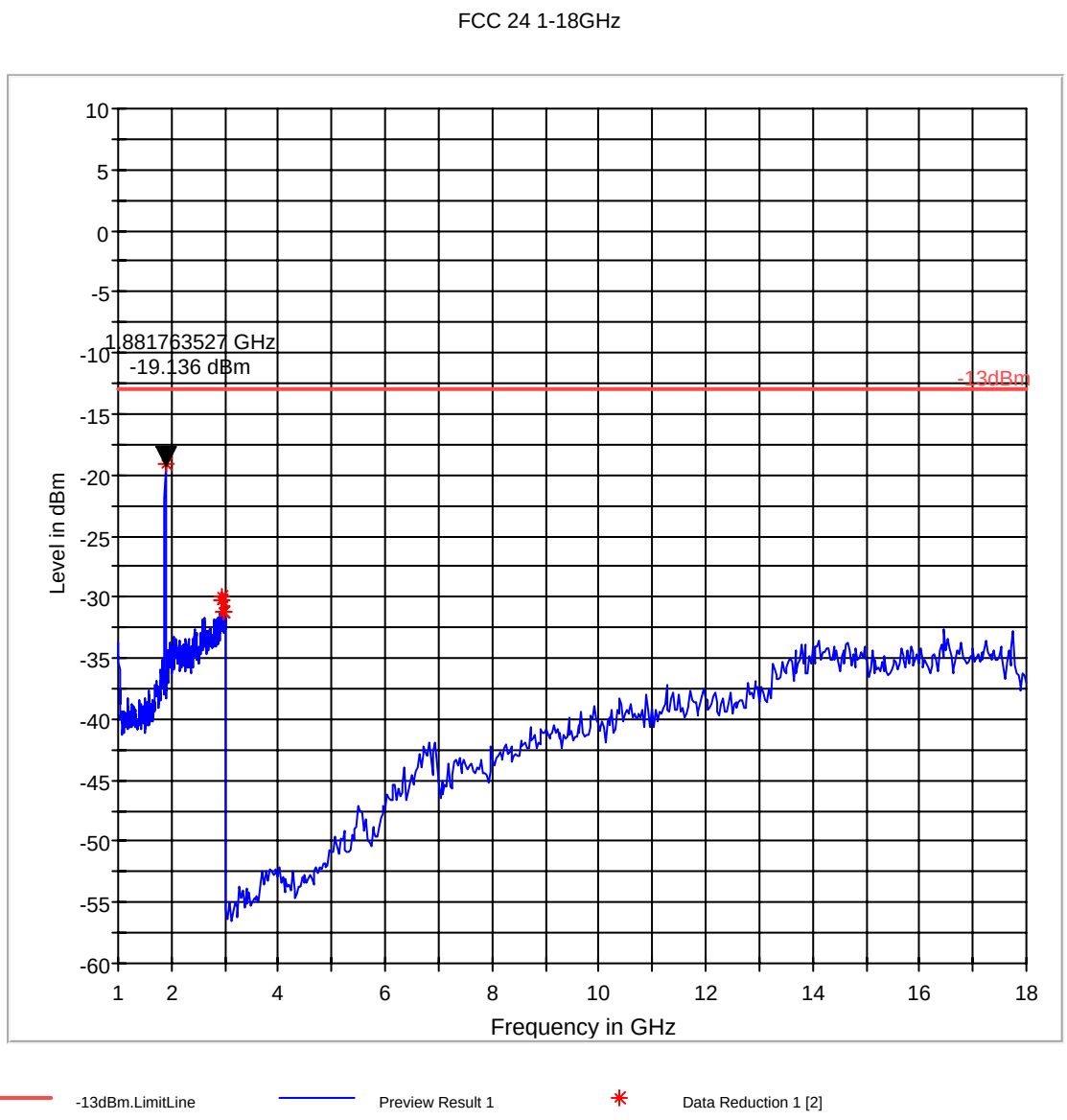
**Low Channel**

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



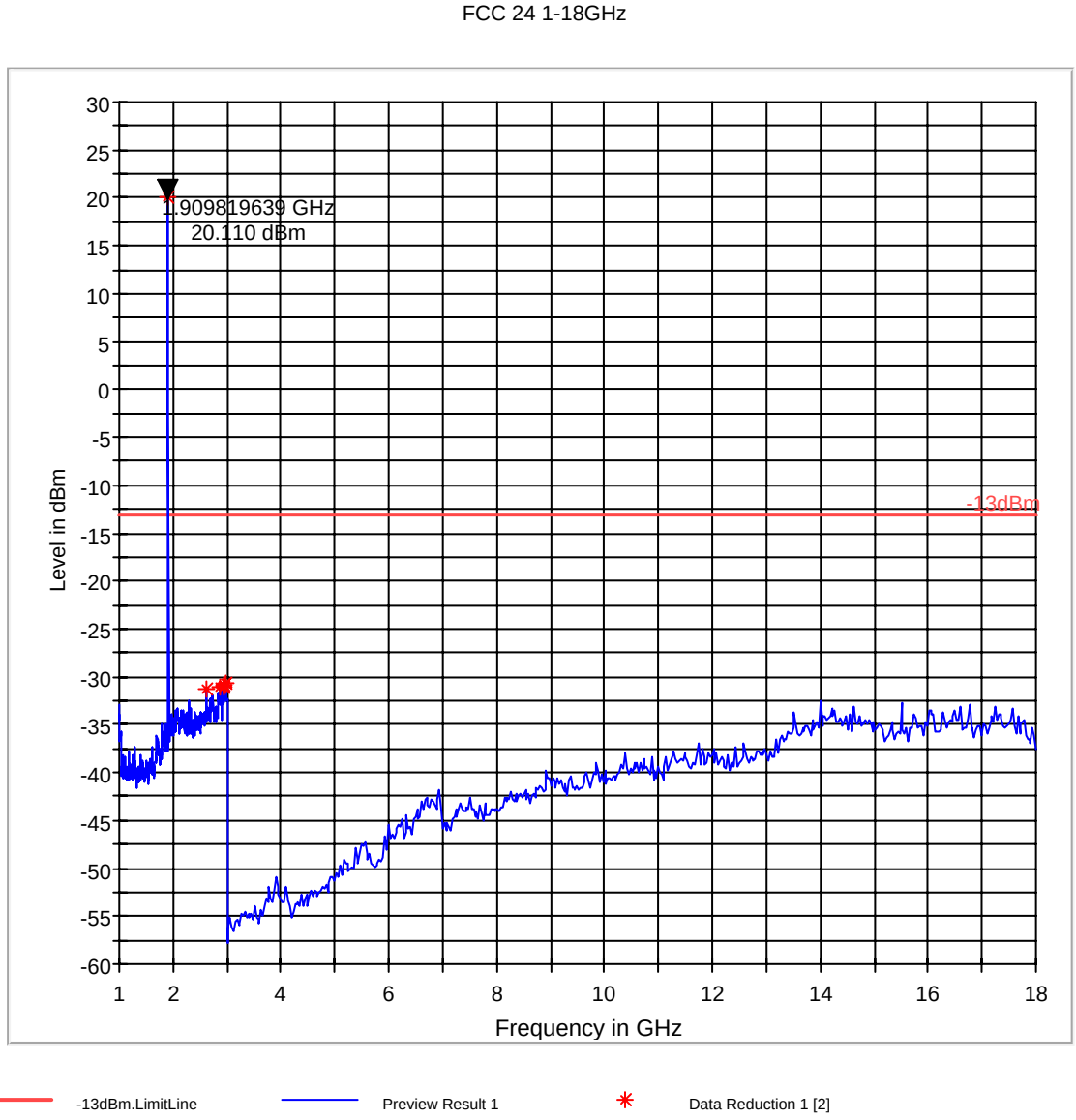
**Mid Channel**

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



**High Channel**

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



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

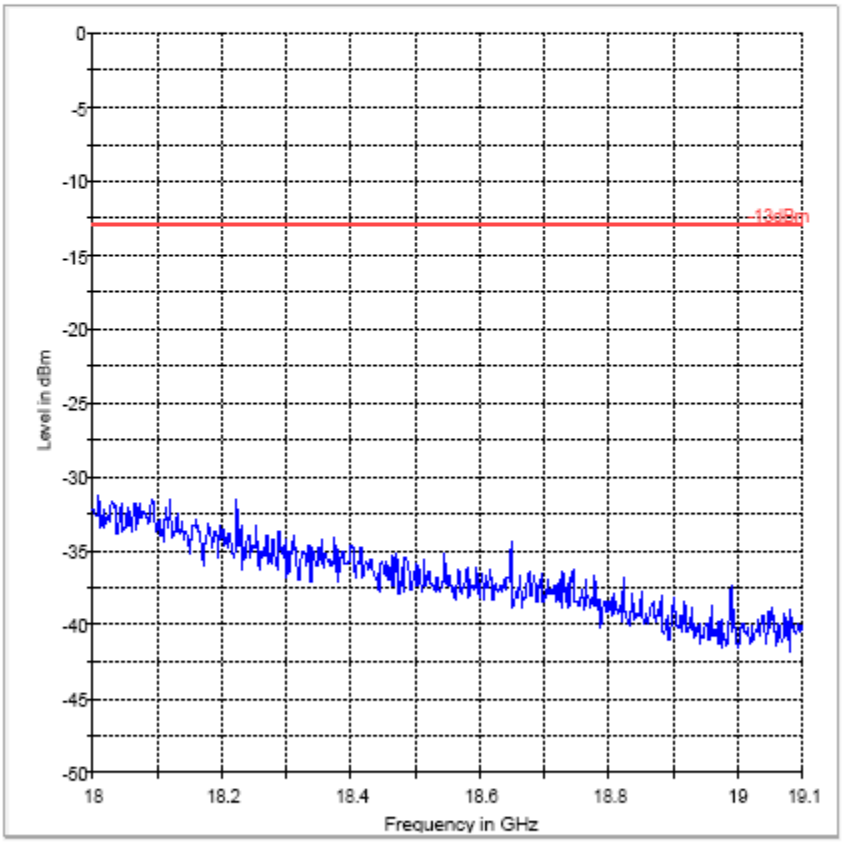
EMI Auto Test(1) 1 / 1

# EMI Auto Test(1)

## EUT Information

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

FCC 24 18-19.1GHz




2/18/2010 ctorio EMC32 V8.30.10 1:14:51

**Mid Channel**

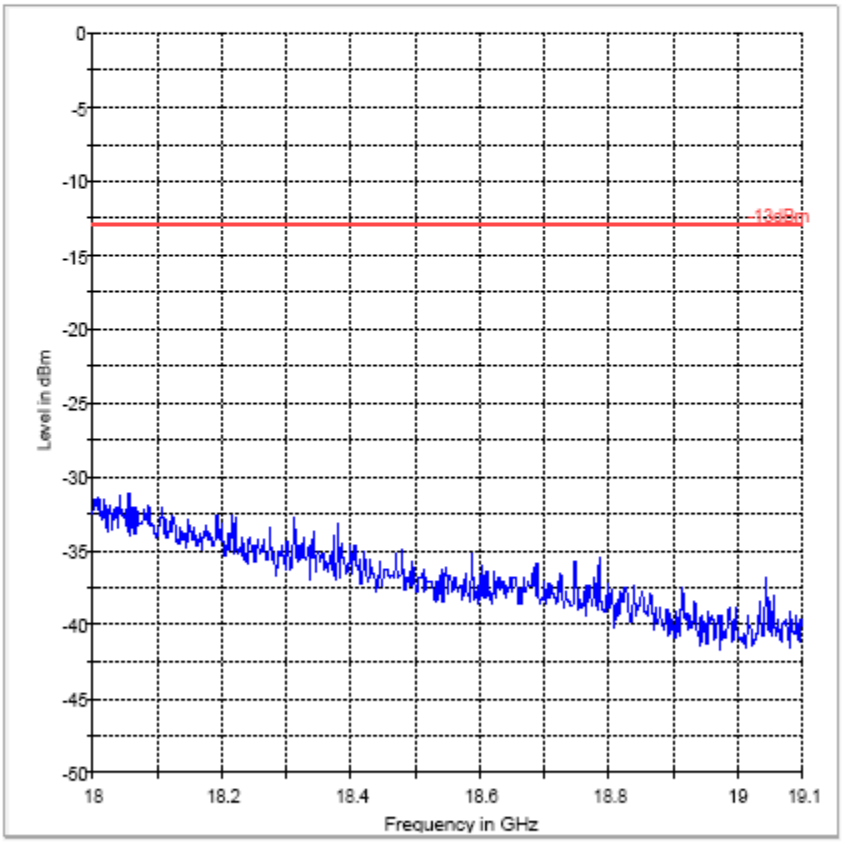
EMI Auto Test(1) 1 / 1

# EMI Auto Test(1)

## EUT Information

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

FCC 24 18-19.1GHz




2/18/2010 ctorio EMC32 V8.30.10 1:13:45

**High Channel**

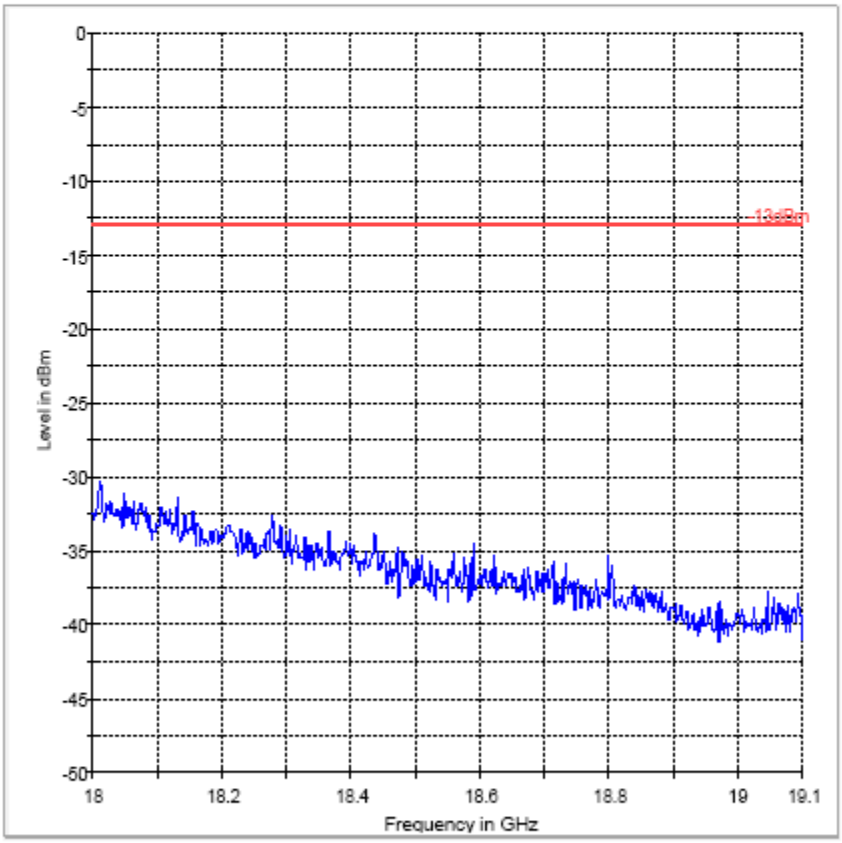
EMI Auto Test(1) 1 / 1

# EMI Auto Test(1)

## EUT Information

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

FCC 24 18-19.1GHz

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### 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**

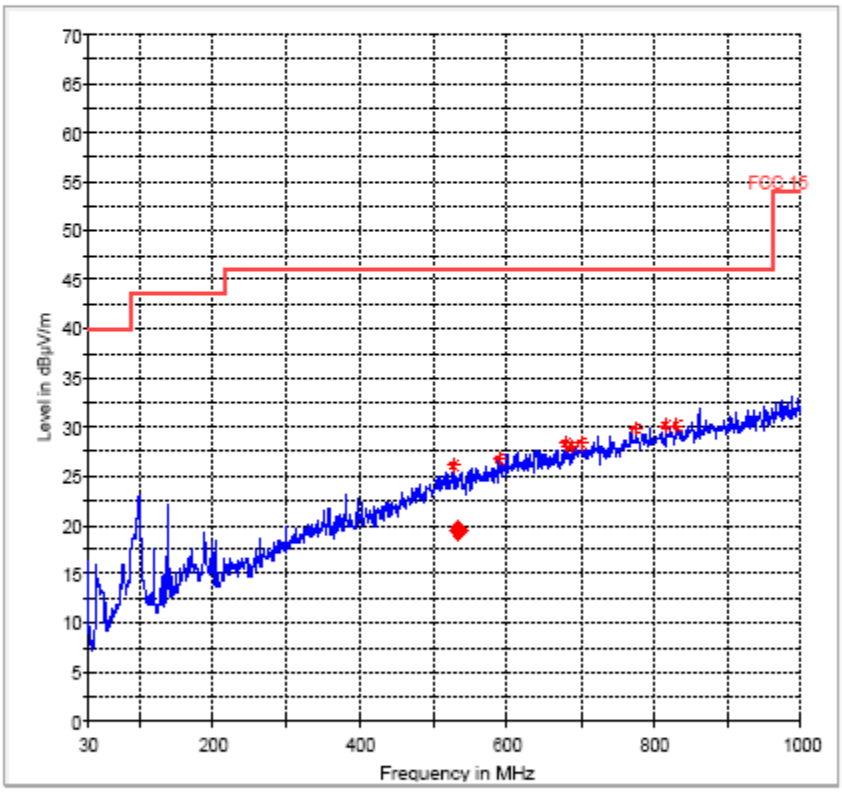
30-1 Rx 1 / 1

# 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

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**Receive Mode: 1GHz-18GHz**

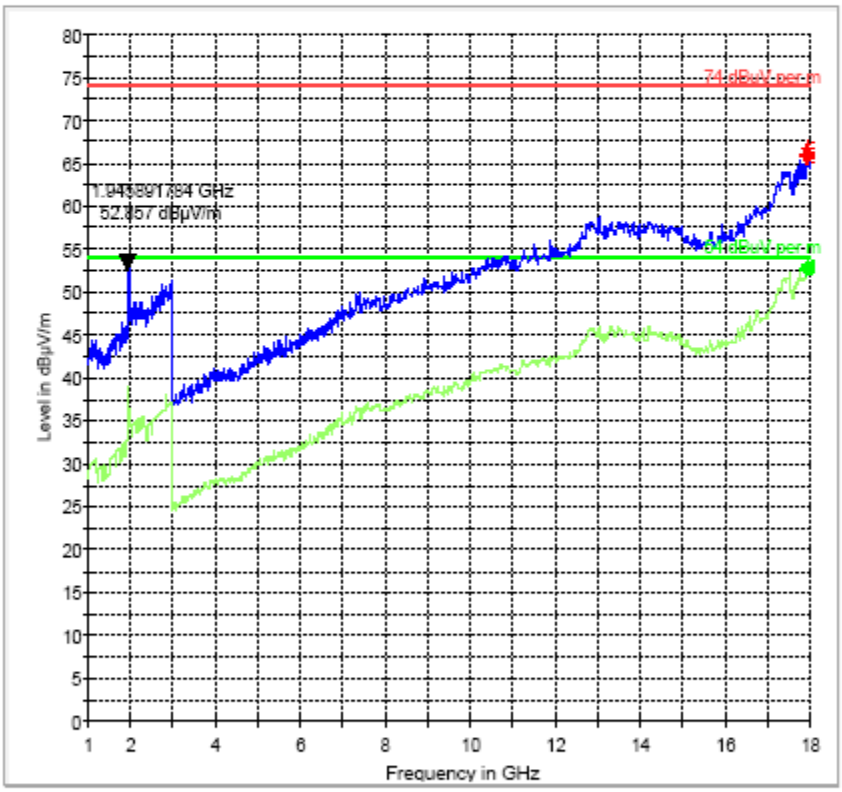
1-18 Rx 1 / 1

# 1-18 Rx

## EUT Information

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

FCC 15 1-18GHz




74 dBuV per m LimitLine
Preview Result 2
54 dBuV per m LimitLine
Data Reduction 1 [2]
Preview Result 1
Data Reduction 2 [2]

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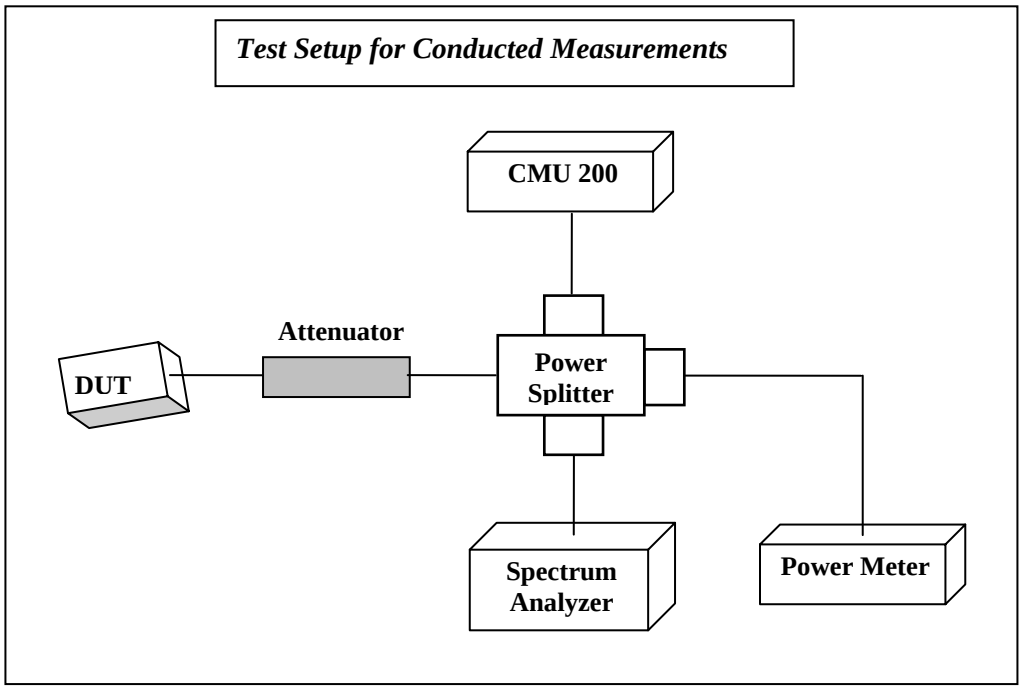
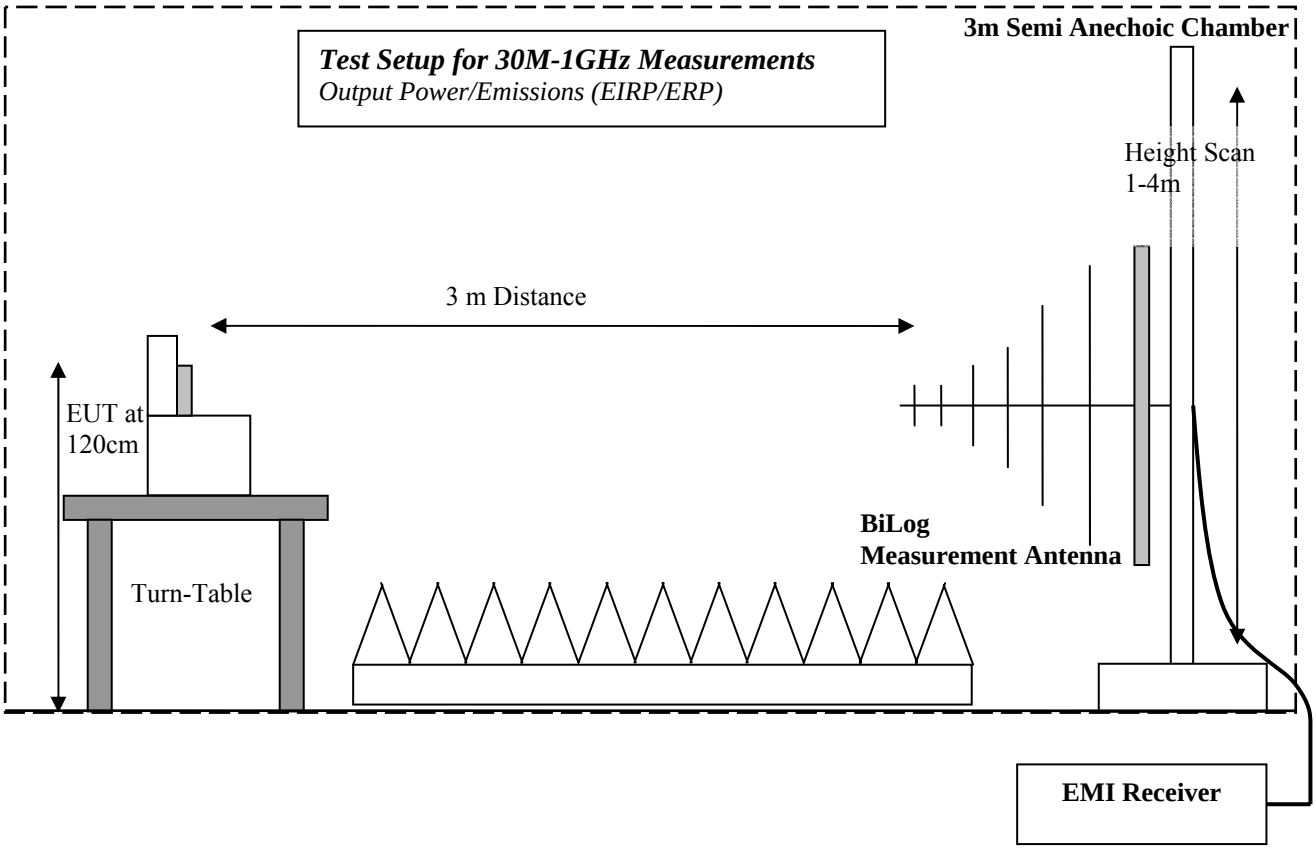
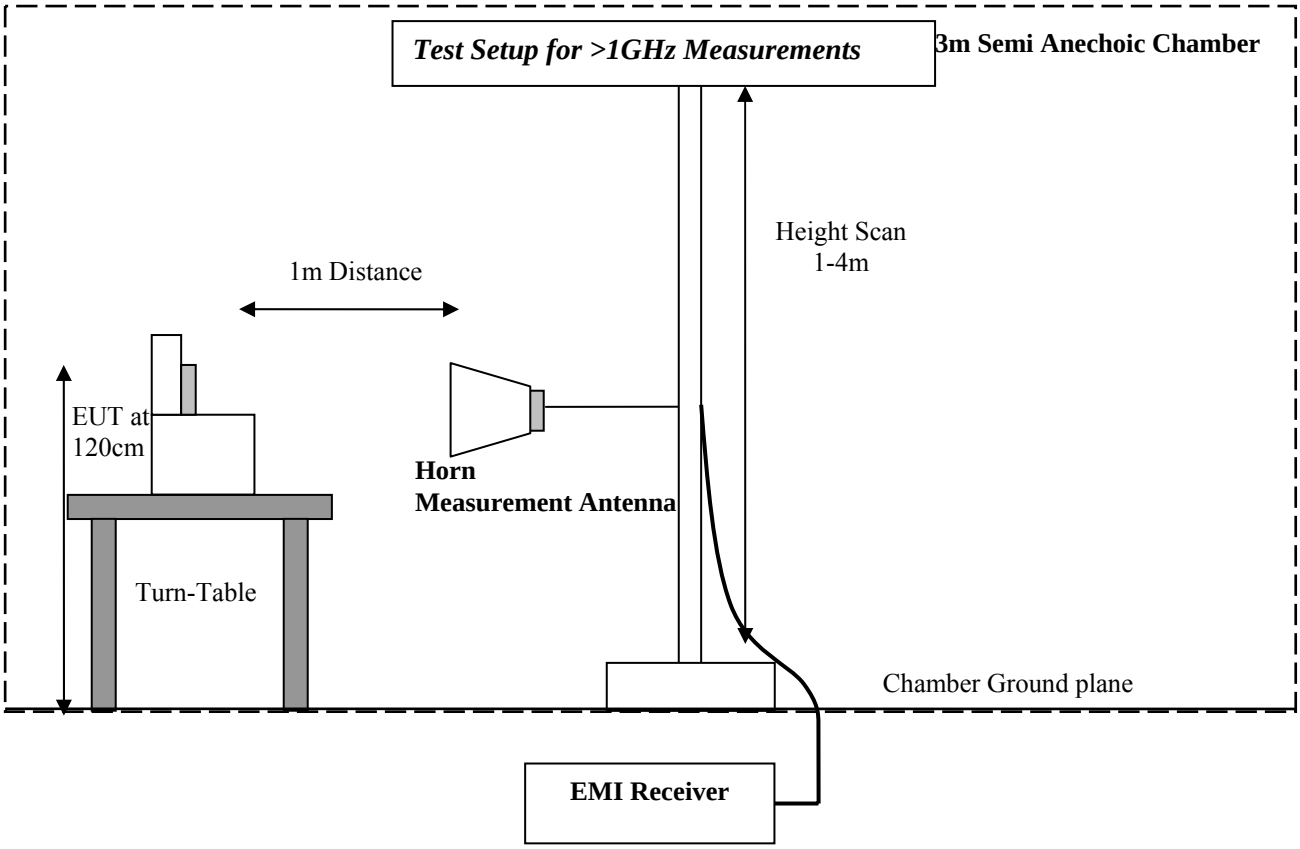
## 6 Test Equipment And Ancillaries Used For Tests

| 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




Test Setup for >1GHz Measurements
3m Semi Anechoic Chamber
Height Scan
1-4m
1m Distance
EUT at
120cm
Horn
Measurement Antenna
Turn-Table
Chamber Ground plane
EMI Receiver

## 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 |