

# Annex 1: Measurement diagrams to TEST REPORT No.: 16-1-0141801T07b-C1

According to:  
**FCC Regulations**  
Part 22, Part 24

**IC-Regulations**  
RSS-132 Issue 3, RSS-133 Issue 6,  
RSS-Gen Issue 4

for

Daimler Trucks North America

ECU  
CTPBASDTNA

FCC-ID: 2AKC8CTP054631  
IC: 22221-CTP054631  
HVIN: CTPBASDTNA  
PMN: CTPBASDTNA  
FVIN: 16.095.2

| Laboratory Accreditation and Listings                                                                                                                                                                                                                                                                                      |                                                                                                                      |                                                                                                                                                          |                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><b>Deutsche<br/>Akkreditierungsstelle</b><br>D-PL-12047-01-01                                                                                                                                                                       | <br><b>MRA US-EU 0003</b>         | <br><b>Industry Canada</b><br>Reg. No.: 3462D-2<br>Reg. No.: 3462D-3 | <br><b>Voluntary Controls for<br/>Electromagnetic Emissions</b><br>Reg. No.:<br>R-2666 C-2914,<br>T-1967, G-301 |
| <br><b>AUTHORIZED<br/>RF LABORATORY</b>                                                                                                                                                                                                 | <br><b>Lab Code: 20011130-00</b> |                                                                                                                                                          |                                                                                                                                                                                                      |
| accredited according to DIN EN ISO/IEC 17025                                                                                                                                                                                                                                                                               |                                                                                                                      |                                                                                                                                                          |                                                                                                                                                                                                      |
| <b>CETECOM GmbH</b><br>Laboratory Radio Communications & Electromagnetic Compatibility<br>Im Teelbruch 116 • 45219 Essen • Germany<br>Registered in Essen, Germany, Reg. No.: HRB Essen 8984<br>Tel.: + 49 (0) 20 54 / 95 19-954 • Fax: + 49 (0) 20 54 / 95 19-964<br>E-mail: info@cetecom.com • Internet: www.cetecom.com |                                                                                                                      |                                                                                                                                                          |                                                                                                                                                                                                      |

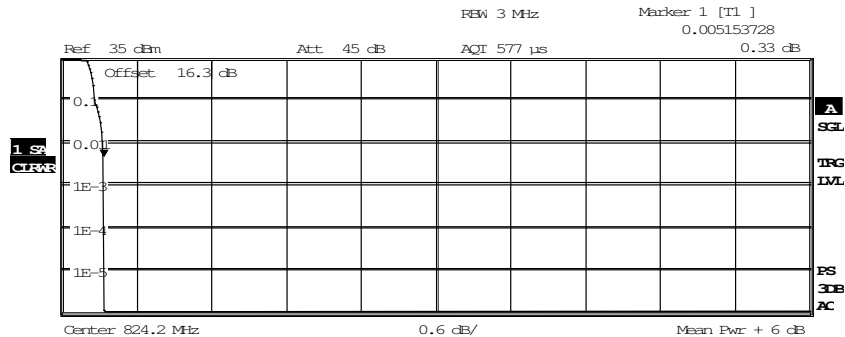
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## 1. Measurement diagrams

### 1.1. Power Measurements and PAPR-Value

#### 1.1.1. GSM 850 (GMSK Modulation)



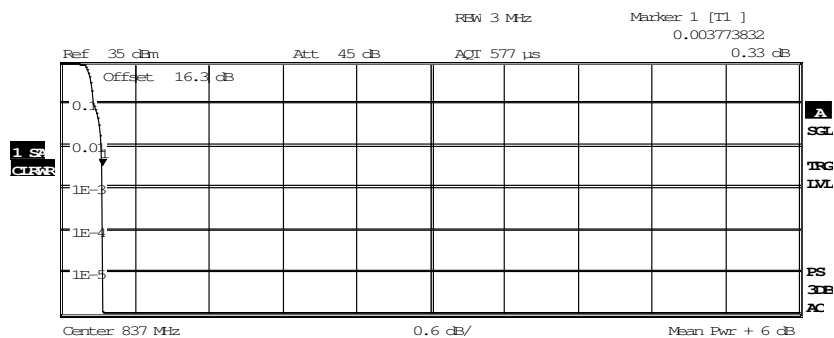
Trace 1

|       |           |
|-------|-----------|
| Mean  | 32.45 dBm |
| Peak  | 32.78 dBm |
| Crest | 0.33 dB   |

|       |         |
|-------|---------|
| 10 %  | 0.26 dB |
| 1 %   | 0.33 dB |
| .1 %  | 0.34 dB |
| .01 % | 0.34 dB |

Date: 21.DEC.2016 11:33:38

#### Diagram CCDF\_128\_GMSK



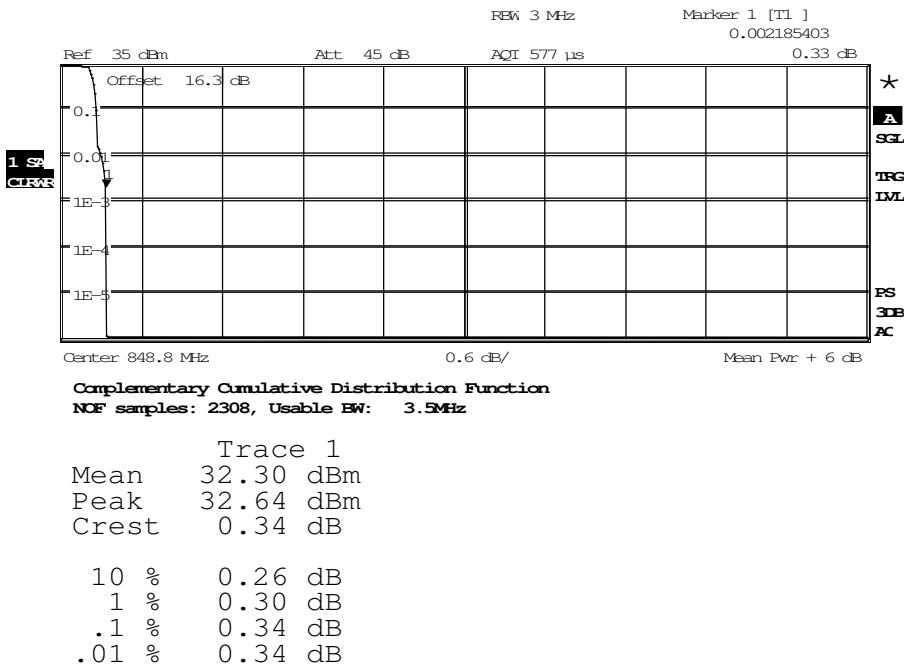
Trace 1

|       |           |
|-------|-----------|
| Mean  | 32.38 dBm |
| Peak  | 32.71 dBm |
| Crest | 0.33 dB   |

|       |         |
|-------|---------|
| 10 %  | 0.26 dB |
| 1 %   | 0.33 dB |
| .1 %  | 0.34 dB |
| .01 % | 0.34 dB |

Date: 21.DEC.2016 11:35:24

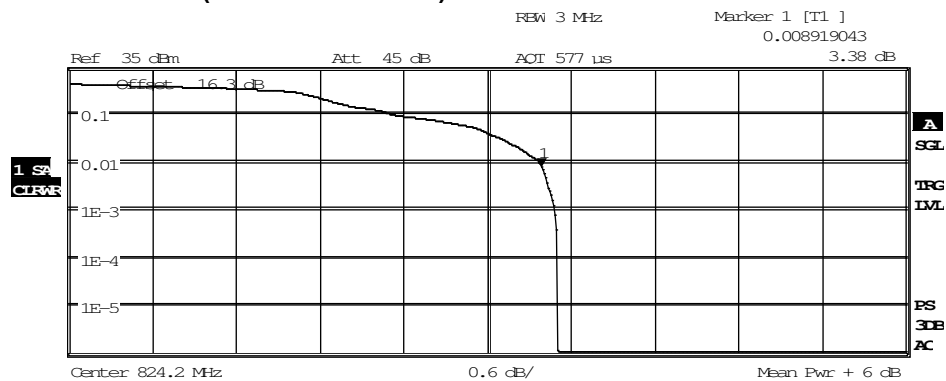
#### Diagram CCDF\_192\_GMSK



Date: 21.DEC.2016 11:37:43

Diagram CCDF\_251\_GMSK

## 1.1.2. GSM 850 (8-PSK Modulation)



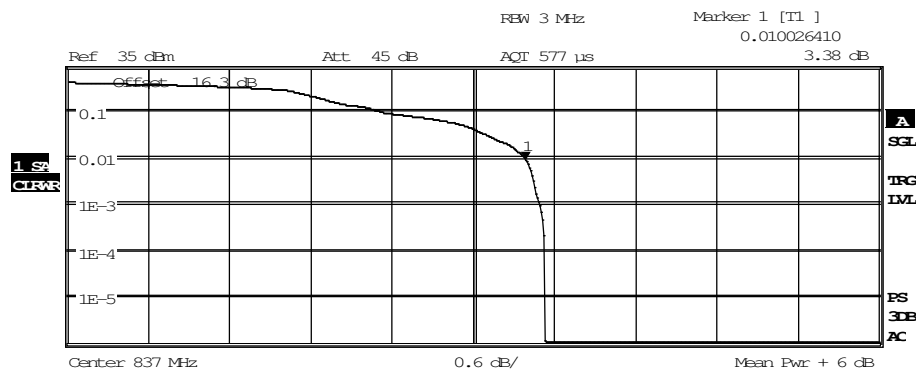
Complementary Cumulative Distribution Function  
NCF samples: 2308, Usable BW: 3.5MHz

Trace 1  
Mean 24.34 dBm  
Peak 27.84 dBm  
Crest 3.50 dB

|       |         |
|-------|---------|
| 10 %  | 2.36 dB |
| 1 %   | 3.38 dB |
| .1 %  | 3.48 dB |
| .01 % | 3.51 dB |

Date: 21.DEC.2016 11:25:16

### Diagram CCDF\_128\_8PSK



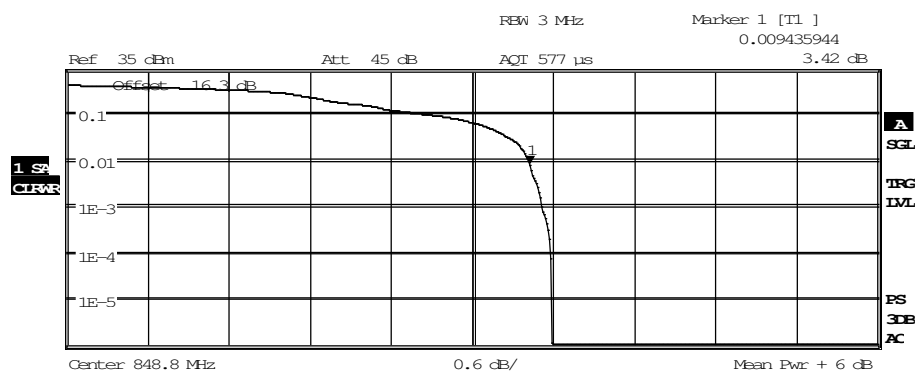
Complementary Cumulative Distribution Function  
NCF samples: 2308, Usable BW: 3.5MHz

Trace 1  
Mean 24.24 dBm  
Peak 27.77 dBm  
Crest 3.53 dB

|       |         |
|-------|---------|
| 10 %  | 2.37 dB |
| 1 %   | 3.38 dB |
| .1 %  | 3.50 dB |
| .01 % | 3.54 dB |

Date: 21.DEC.2016 11:28:01

### Diagram CCDF\_192\_8PSK



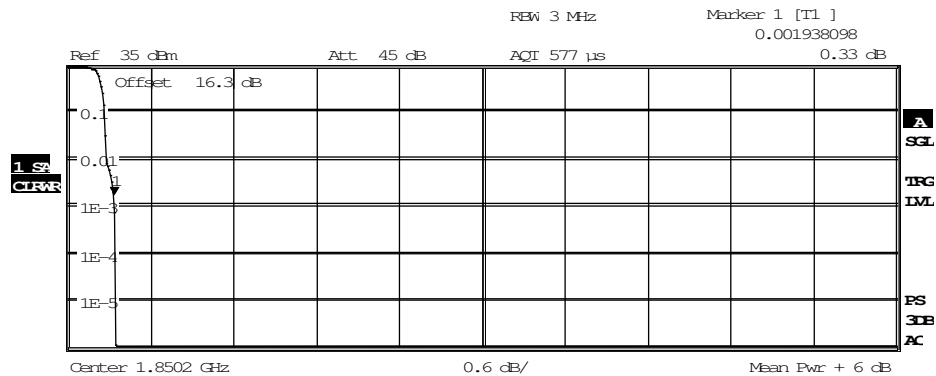
Complementary Cumulative Distribution Function  
NOF samples: 2308, Usable BW: 3.5MHz

Trace 1  
Mean 24.18 dBm  
Peak 27.77 dBm  
Crest 3.59 dB

10 % 2.75 dB  
1 % 3.42 dB  
.1 % 3.52 dB  
.01 % 3.59 dB

Date: 21.DEC.2016 11:29:52

### Diagram CCDF\_251\_8PSK 1.1.3. GSM 1900 (GMSK Modulation)



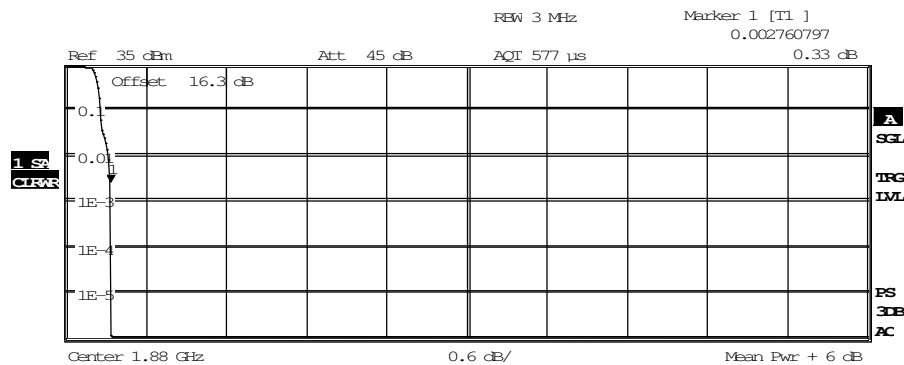
Complementary Cumulative Distribution Function  
 NOF samples: 2308, Usable BW: 3.5MHz

Trace 1  
 Mean 25.52 dBm  
 Peak 25.87 dBm  
 Crest 0.34 dB

10 % 0.26 dB  
 1 % 0.28 dB  
 .1 % 0.34 dB  
 .01 % 0.35 dB

Date: 21.DEC.2016 11:44:12

### Diagram CCDF\_512\_GMSK



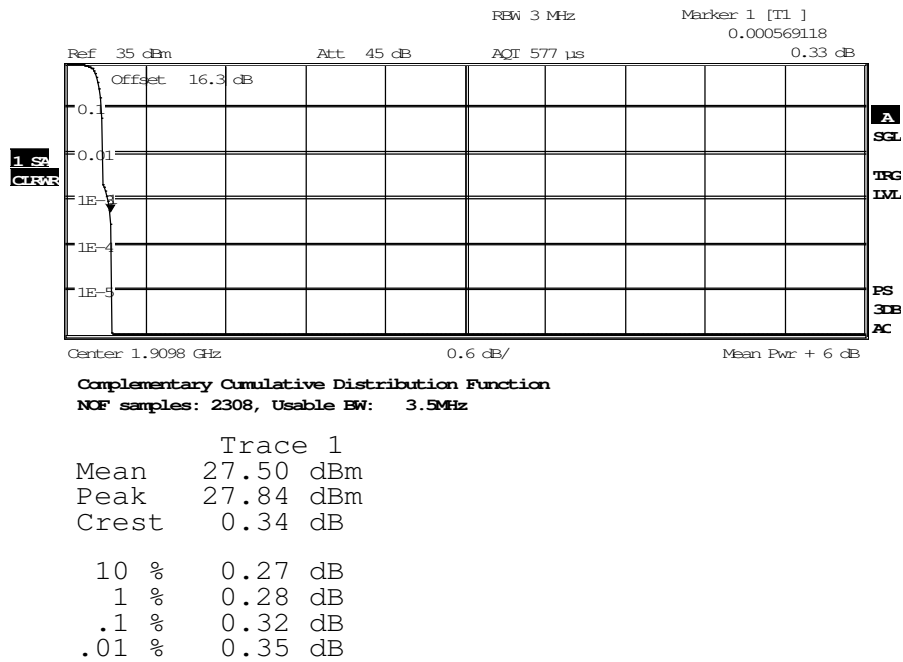
Complementary Cumulative Distribution Function  
 NOF samples: 2308, Usable BW: 3.5MHz

Trace 1  
 Mean 26.17 dBm  
 Peak 26.50 dBm  
 Crest 0.33 dB

10 % 0.26 dB  
 1 % 0.32 dB  
 .1 % 0.34 dB  
 .01 % 0.34 dB

Date: 21.DEC.2016 11:46:28

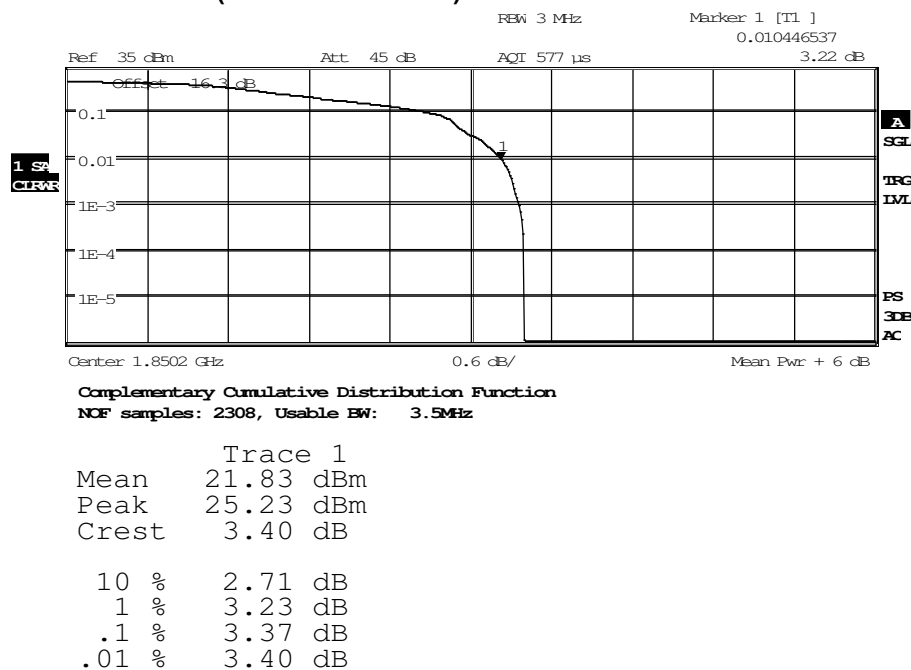
### Diagram CCDF\_661\_GMSK



Date: 21.DEC.2016 11:47:49

## Diagram CCDF\_810\_GMSK

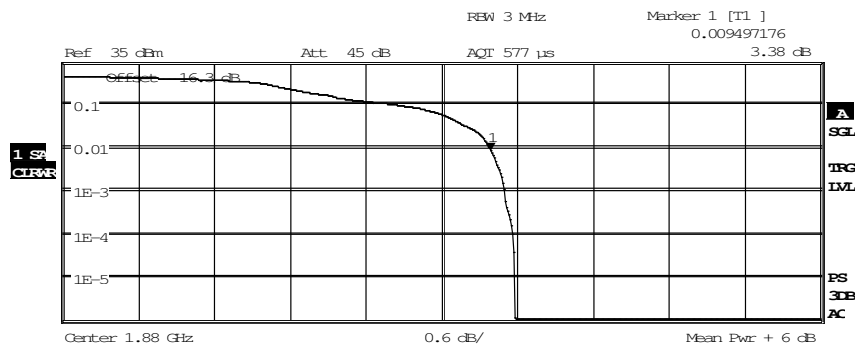
### 1.1.4. GSM 1900 (8-PSK Modulation)



Date: 21.DEC.2016 11:13:32

## Diagram CCDF\_512\_8PSK





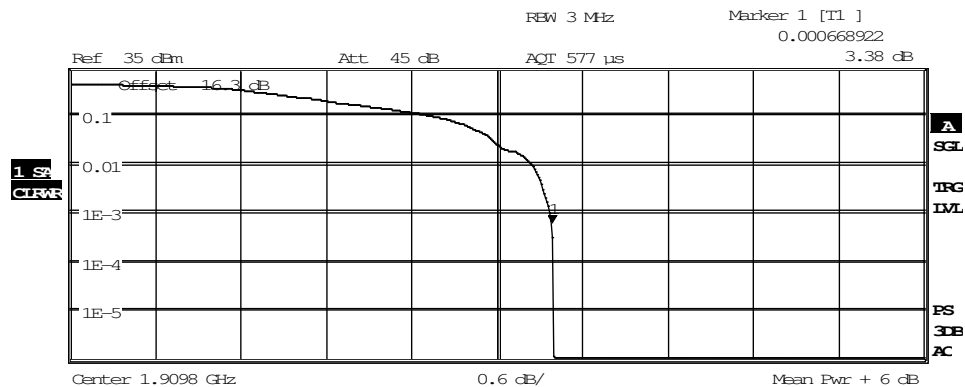
Complementary Cumulative Distribution Function  
NOF samples: 2308, Usable BW: 3.5MHz

Trace 1  
Mean 22.43 dBm  
Peak 26.01 dBm  
Crest 3.58 dB

|       |         |
|-------|---------|
| 10 %  | 2.67 dB |
| 1 %   | 3.38 dB |
| .1 %  | 3.50 dB |
| .01 % | 3.57 dB |

Date: 21.DEC.2016 11:16:48

### Diagram CCDF\_661\_8PSK



Complementary Cumulative Distribution Function  
NOF samples: 2308, Usable BW: 3.5MHz

Trace 1  
Mean 23.74 dBm  
Peak 27.14 dBm  
Crest 3.40 dB

|       |         |
|-------|---------|
| 10 %  | 2.57 dB |
| 1 %   | 3.25 dB |
| .1 %  | 3.38 dB |
| .01 % | 3.40 dB |

Date: 21.DEC.2016 11:20:28

### Diagram CCDF\_810\_8PSK

## 1.2. Magnetic field emissions radiated (850 MHz transmitting mode)

### Diagram No. 2.01\_Magnetic\_GPRS850\_Ch192

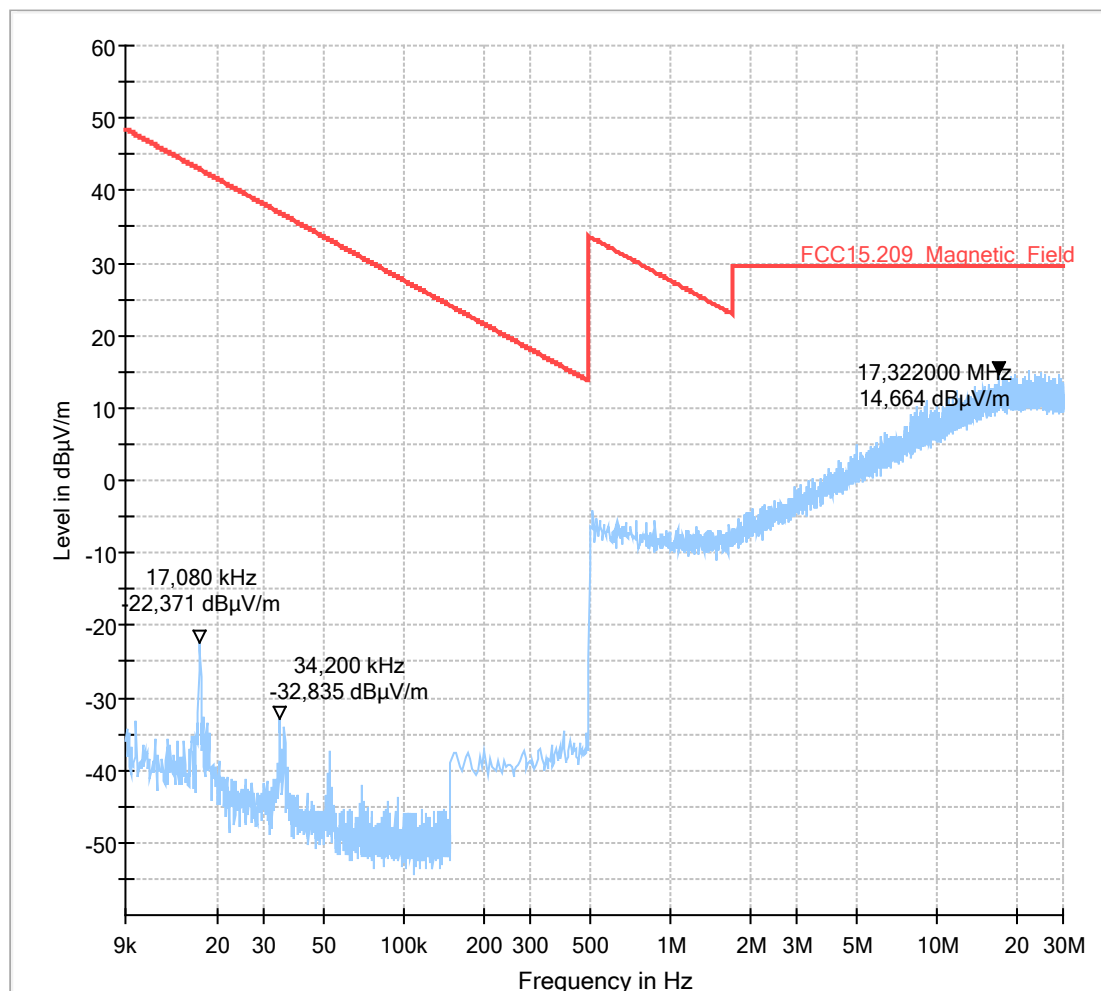
|                          |                                                                     |
|--------------------------|---------------------------------------------------------------------|
| Test description:        | Date: 21.12.2016 Page 1 of 1                                        |
| Test site and distance:  | Magnetic Field Strength Measurement related to 30/300 m distance    |
| Version of Testsoftware: | Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance |
| Distance correction:     | EMC32 V9.25.0                                                       |
| Technical Data:          | used accord. table, pls. see test report                            |
| Rec. antenna (pre-scan): | Please see page 2 for detailed data of measurement setup            |
| Used filter:             | height 1.00 m, parallel and 90° to EUT polarisation                 |
| Test specification:      | bypass                                                              |
|                          | FCC 15.205 § 15.209; RSS-Gen: Issue 4                               |

|                       |                       |
|-----------------------|-----------------------|
| Operator:             | Afr                   |
| Operating conditions: | GPRS Ch 192 (middle)  |
| Power during tests:   | 12 V DC (car battery) |

#### EUT Information

|                       |                                            |
|-----------------------|--------------------------------------------|
| Manufacturer:         | Bosch Car Multimedia Portugal, S.A.        |
| EuT:                  | ECU CTPBASEDTNA                            |
| HW Version:           | 6794G05                                    |
| SW Version:           | DAIMLER_CTP_16.095.2.                      |
| Serial Number:        | 2800003466                                 |
| Connected Interfaces: | USB-cable + main wiring + GSM/GNSS antenna |
| Power Supply:         | 12 V DC                                    |

Full Spectrum



### 1.3. Magnetic field emissions radiated 1900 MHz transmitting mode)

#### Diagram No. 2.05\_Magnetic\_GSM1900\_Ch661

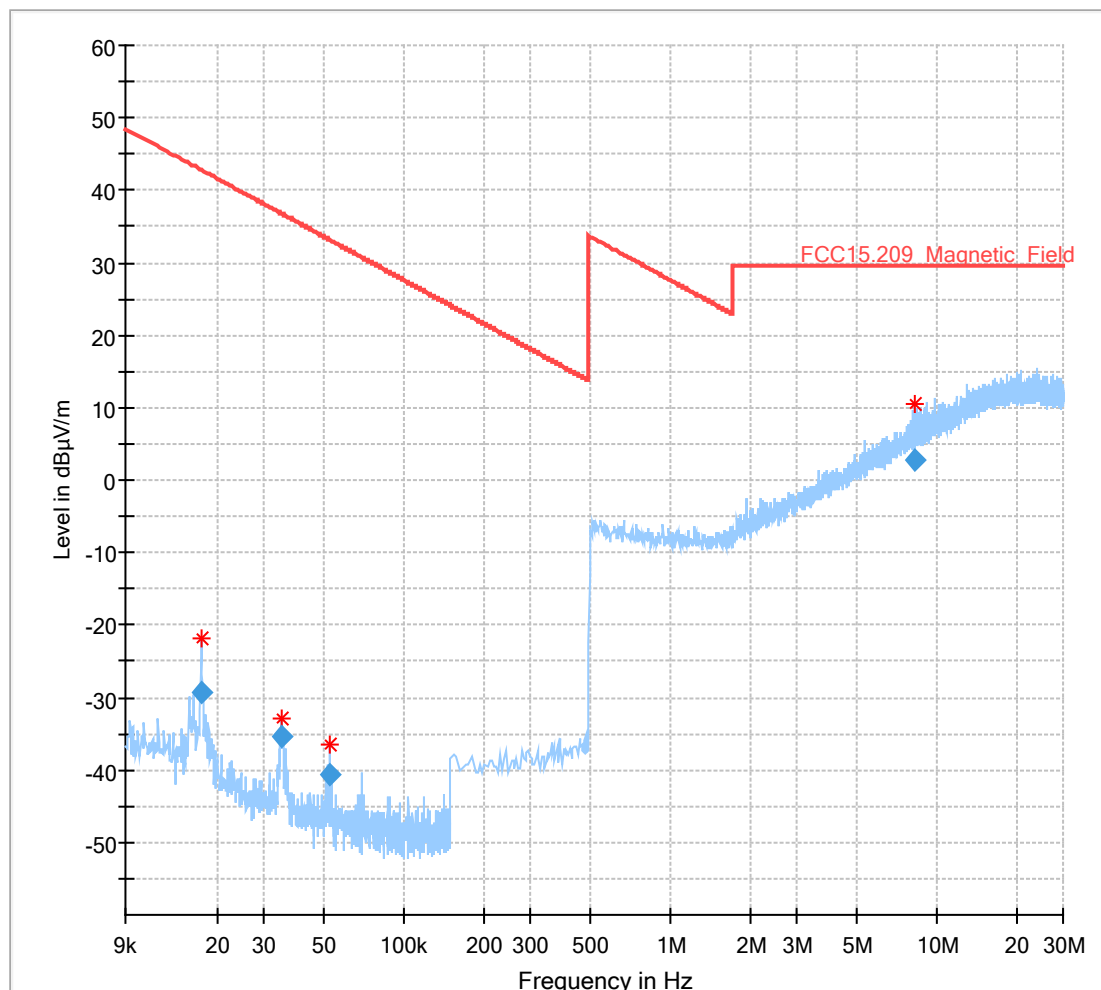
|                          |                                                                     |             |
|--------------------------|---------------------------------------------------------------------|-------------|
| Date:                    | 22.12.2016                                                          | Page 1 of 1 |
| Test description:        | Magnetic Field Strength Measurement related to 30/300 m distance    |             |
| Test site and distance:  | Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance |             |
| Version of Testsoftware: | EMC32 V9.25.0                                                       |             |
| Distance correction:     | used accord. table, pls. see test report                            |             |
| Technical Data:          | Please see page 2 for detailed data of measurement setup            |             |
| Rec. antenna (pre-scan): | height 1.00 m, parallel and 90° to EUT polarisation                 |             |
| Used filter:             | bypass                                                              |             |
| Test specification:      | FCC 15.205 § 15.209; RSS-Gen: Issue 4                               |             |

|                       |                       |
|-----------------------|-----------------------|
| Operator:             | YSa                   |
| Operating conditions: | TX-on                 |
| Power during tests:   | 12 V DC (car battery) |

#### EUT Information

|                       |                                            |
|-----------------------|--------------------------------------------|
| Manufacturer:         | Bosch Car Multimedia Portugal, S.A.        |
| EuT:                  | ECU CTPBASEDTNA                            |
| HW Version:           | 6794G05                                    |
| SW Version:           | DAIMLER_CTP_16.095.2.                      |
| Serial Number:        | 2800003466                                 |
| Connected Interfaces: | USB-cable + main wiring + GSM/GNSS antenna |
| Power Supply:         | 12 V DC                                    |

Full Spectrum



## 1.4. Spurious emissions radiated (850 MHz transmitting mode)

### 8.05\_RSE\_R\_Ch192\_GPRS

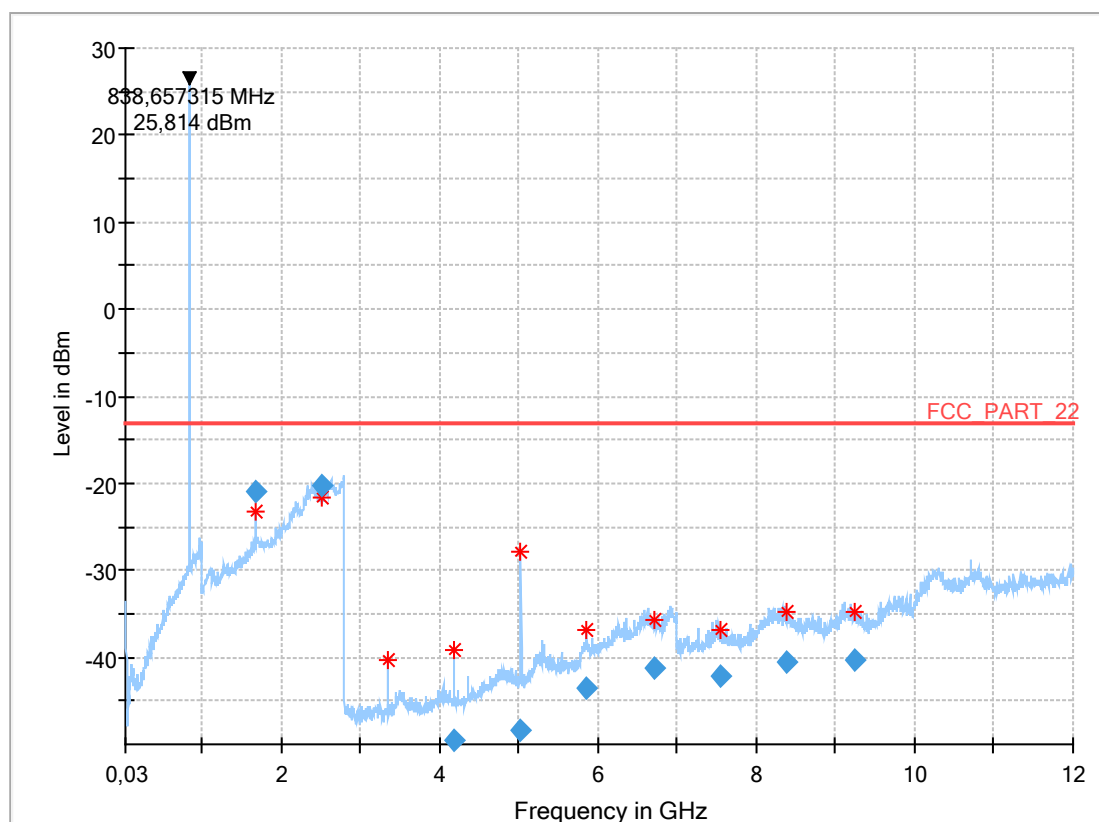
#### Common Information

|                           |                                    |
|---------------------------|------------------------------------|
| Test Description:         | Radiated Emissions GSM850          |
| Test Site Location:       | CETECOM GmbH Essen                 |
| Test Site:                | Fully Anechoic Room (FAR)          |
| Test Standard:            | FCC Part22.917                     |
| Test Case:                | GPRS_850                           |
| Operating Mode:           | RSE_R_Ch192_GPRS                   |
| Exclusionband:            | 824 - 849MHz                       |
| Environmental Conditions: | Humidity: 40%rH; Temperature: 20°C |
| Operator:                 | TFR                                |

#### EUT Information

|                       |                                            |
|-----------------------|--------------------------------------------|
| Manufacturer:         | Bosch Car Multimedia Portugal, S.A.        |
| EuT:                  | ECU CTPBASEDTNA                            |
| HW Version:           | 6794G05                                    |
| SW Version:           | DAIMLER_CTP_16.095.2.                      |
| Serial Number:        | 2800003466                                 |
| Connected Interfaces: | USB-cable + main wiring + GSM/GNSS antenna |
| Power Supply:         | 12 V DC                                    |

Full Spectrum



## 1.5. Spurious emissions radiated (1900 MHz transmitting mode)

### 8.14\_RSE\_R\_Ch661\_GPRS

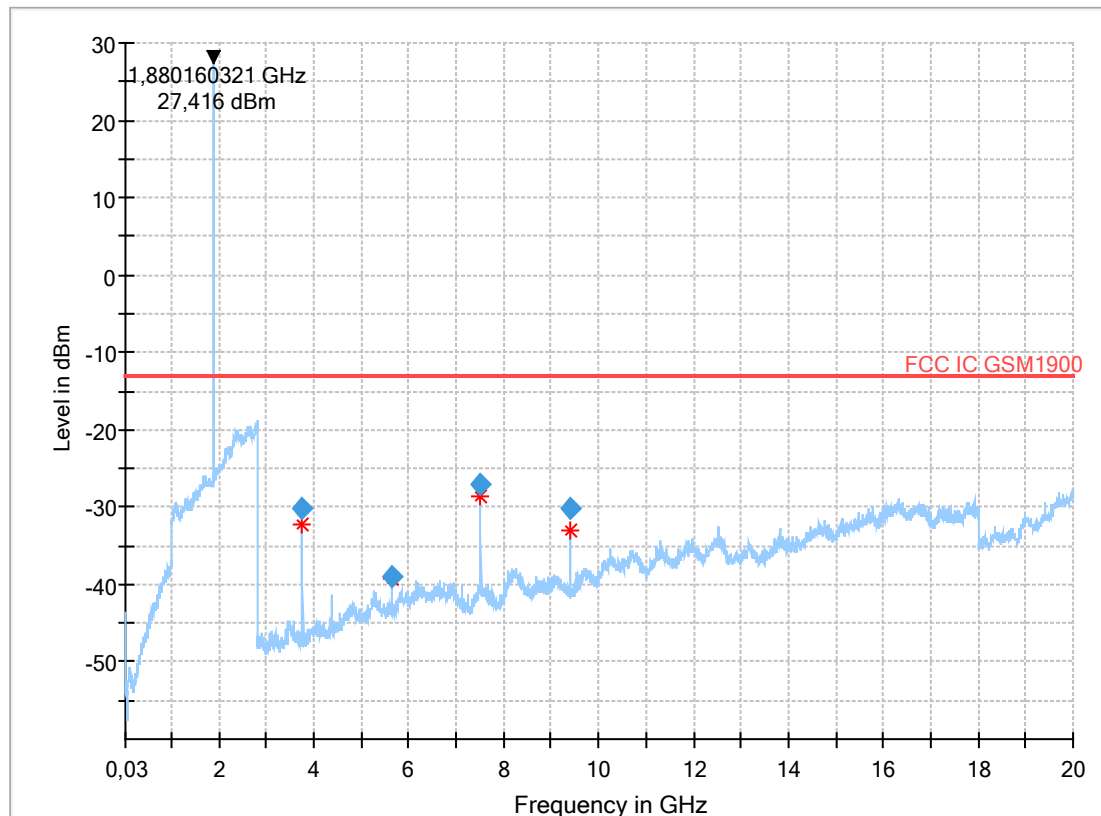
#### Common Information

|                           |                                     |
|---------------------------|-------------------------------------|
| Test Description:         | Radiated Emissions GSM850           |
| Test Site Location:       | CETECOM GmbH Essen                  |
| Test Site:                | Fully Anechoic Room (FAR)           |
| Test Standard:            | FCC Part24.238                      |
| Test Case:                | -                                   |
| Operating Mode:           | MS allocated UL channel 512,661,810 |
| Exclusionband:            | 1850 - 1910MHz                      |
| Environmental Conditions: | Humidity: 40%rH; Temperature: 20°C  |
| Operator:                 | TFR                                 |

#### EUT Information

|                       |                                            |
|-----------------------|--------------------------------------------|
| Manufacturer:         | Bosch Car Multimedia Portugal, S.A.        |
| EuT:                  | ECU cTP mid                                |
| HW Version:           | 67946794G05                                |
| SW Version:           | 16/41/01                                   |
| Serial Number:        | 2820003843                                 |
| Connected Interfaces: | USB-cable + main wiring + GSM/GNSS antenna |
| Power Supply:         | 12 V DC                                    |

Full Spectrum



#### Final Result

| Frequency (MHz) | Limit (dBm) | Margin (dB) | Meas. Time (ms) | Pol | Azimuth (deg) | Elevation (deg) | Corr. (dB) |
|-----------------|-------------|-------------|-----------------|-----|---------------|-----------------|------------|
| 3759.864729     | -           | 17.22       | 1000.0          | V   | 11.0          | 0.0             | -95.1      |
| 5639.794589     | -           | 26.08       | 1000.0          | H   | 22.0          | 90.0            | -89.7      |
| 7520.055110     | -           | 14.07       | 1000.0          | V   | 47.0          | 90.0            | -83.4      |
| 9399.644288     | -           | 17.24       | 1000.0          | H   | -26.0         | 90.0            | -82.8      |

## 1.6. Radiated emissions on 850 MHz transmitting band-edge 9.03\_BE\_R\_Ch128\_GPRS

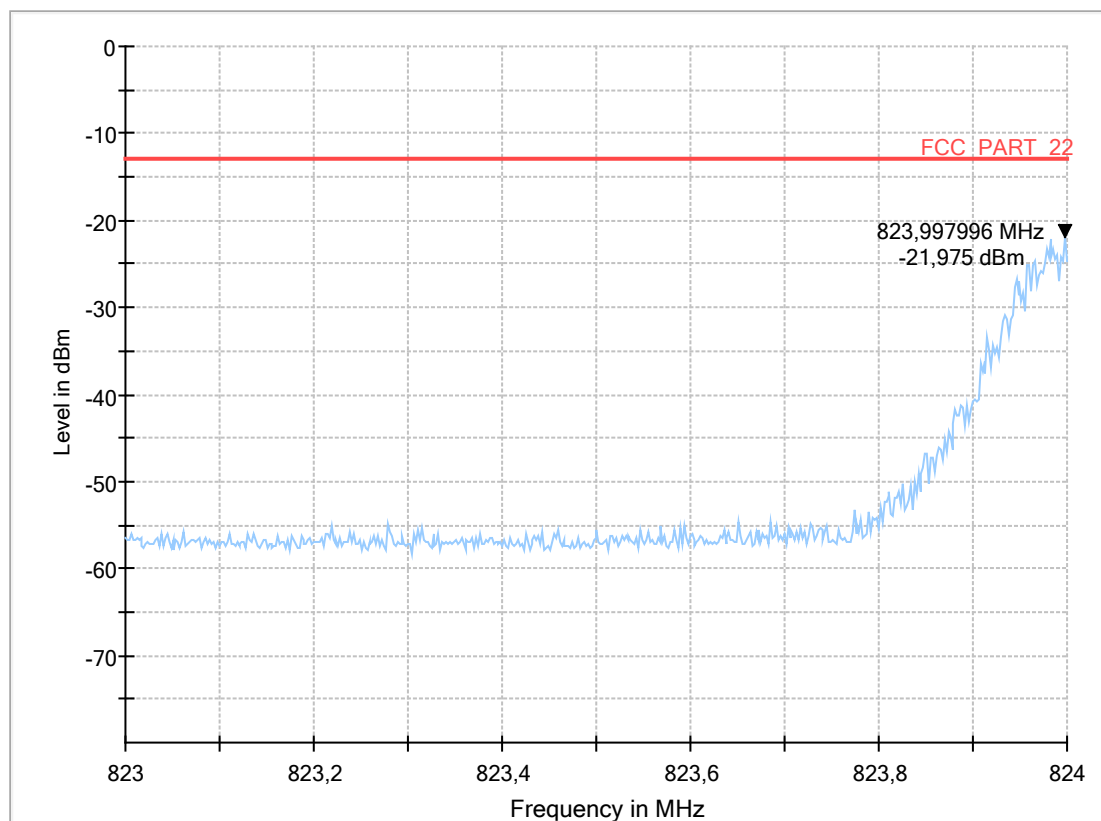
### Common Information

|                           |                                                                |
|---------------------------|----------------------------------------------------------------|
| Test Description:         | Radiated Band Edge Compliance GSM850                           |
| Test Site Location:       | CETECOM GmbH Essen                                             |
| Test Site:                | Fully Anechoic Room (FAR)                                      |
| Test Standard:            | FCC Part 22.917                                                |
| Operating Mode:           | MS allocated channel 128 (fc = 824.2MHz), Voice, PCL5 (+33dBm) |
| Exclusionband:            | 824 - 849MHz                                                   |
| Environmental Conditions: | Humidity: 35%rH; Temperature: 20°C                             |
| Operator:                 | AFr                                                            |

### EUT Information

|                       |                                            |
|-----------------------|--------------------------------------------|
| Manufacturer:         | Bosch Car Multimedia Portugal, S.A.        |
| EuT:                  | ECU CTPBASEDTNA                            |
| HW Version:           | 6794G05                                    |
| SW Version:           | DAIMLER_CTP_16.095.2.                      |
| Serial Number:        | 2800003466                                 |
| Connected Interfaces: | USB-cable + main wiring + GSM/GNSS antenna |
| Power Supply:         | 12 V DC                                    |

Full Spectrum



## 9.04\_BE\_R\_Ch251\_GPRS

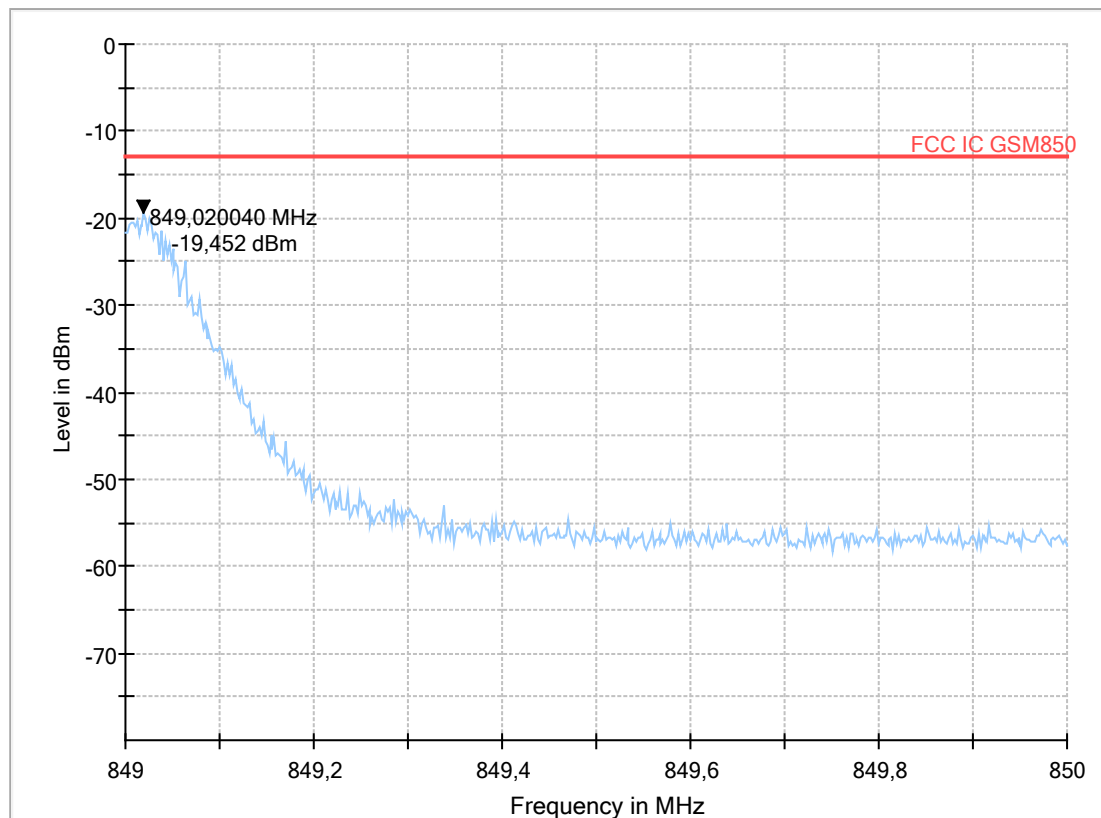
### Common Information

|                           |                                                                |
|---------------------------|----------------------------------------------------------------|
| Test Description:         | Radiated Band Edge Compliance GSM850                           |
| Test Site Location:       | CETECOM GmbH Essen                                             |
| Test Site:                | Fully Anechoic Room (FAR)                                      |
| Test Standard:            | FCC Part 22.917                                                |
| Operating Mode:           | MS allocated channel 251 (fc = 848.8MHz), Voice, PCL0 (+33dBm) |
| Exclusionband:            | 824 - 849MHz                                                   |
| Environmental Conditions: | Humidity: 35%rH; Temperature: 20°C                             |
| Operator:                 | AFr                                                            |

### EUT Information

|                       |                                            |
|-----------------------|--------------------------------------------|
| Manufacturer:         | Bosch Car Multimedia Portugal, S.A.        |
| EuT:                  | ECU CTPBASEDTNA                            |
| HW Version:           | 6794G05                                    |
| SW Version:           | DAIMLER_CTP_16.095.2.                      |
| Serial Number:        | 2800003466                                 |
| Connected Interfaces: | USB-cable + main wiring + GSM/GNSS antenna |
| Power Supply:         | 12 V DC                                    |

Full Spectrum



## 1.7. Radiated emissions on 1900 MHz transmitting band-edge 9.09\_BE\_R\_Ch512\_GPRS

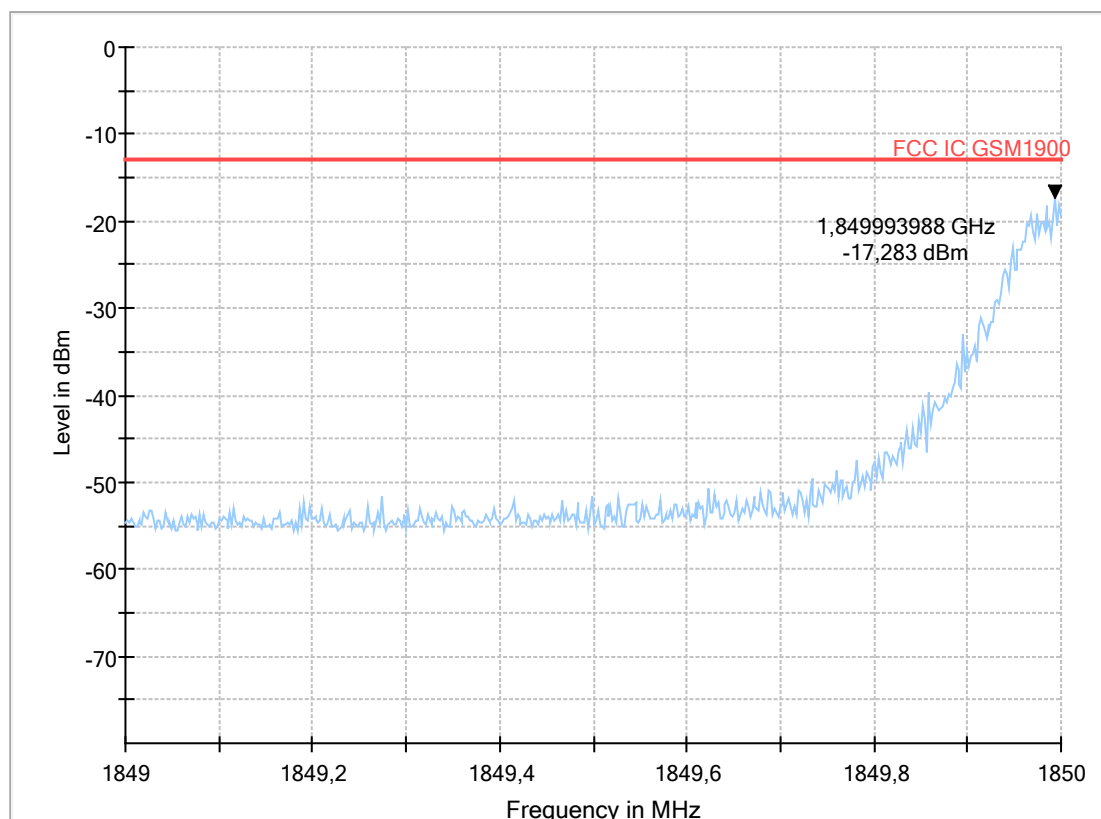
### Common Information

|                           |                                                                                    |
|---------------------------|------------------------------------------------------------------------------------|
| Test Description:         | Radiated Spurious Emissions GSM1900                                                |
| Test Site Location:       | CETECOM GmbH Essen                                                                 |
| Test Site:                | Fully Anechoic Room (FAR)                                                          |
| Test Standard:            | FCC Part 24.238                                                                    |
| Comm. Link:               | GSM1900, Voice/EDGE                                                                |
| Operating Mode:           | MS allocated channel 512 (UL = 1850.2MHz),661(UL = 1880.0MHz),810 (UL = 1909.8MHz) |
| Exclusionband:            | 1850- 1910MHz                                                                      |
| Environmental Conditions: | Humidity: 40%rH; Temperature: 20°C                                                 |
| Operator:                 | AFr                                                                                |

### EUT Information

|                       |                                            |
|-----------------------|--------------------------------------------|
| Manufacturer:         | Bosch Car Multimedia Portugal, S.A.        |
| EuT:                  | ECU CTPBASEDTNA                            |
| -----                 | -----                                      |
| HW Version:           | 6794G05                                    |
| SW Version:           | DAIMLER_CTP_16.095.2.                      |
| Serial Number:        | 2800003466                                 |
| Connected Interfaces: | USB-cable + main wiring + GSM/GNSS antenna |
| Power Supply:         | 12 V DC                                    |

Full Spectrum





## 9.10\_BE\_R\_Ch810\_GPRS

### Common Information

|                           |                                                                                    |
|---------------------------|------------------------------------------------------------------------------------|
| Test Description:         | Radiated Spurious Emissions GSM1900                                                |
| Test Site Location:       | CETECOM GmbH Essen                                                                 |
| Test Site:                | Fully Anechoic Room (FAR)                                                          |
| Test Standard:            | FCC Part 24.238                                                                    |
| Comm. Link:               | GSM1900, Voice/EDGE                                                                |
| Operating Mode:           | MS allocated channel 512 (UL = 1850.2MHz),661(UL = 1880.0MHz),810 (UL = 1909.8MHz) |
| Exclusionband:            | 1850- 1910MHz                                                                      |
| Environmental Conditions: | Humidity: 40%rH; Temperature: 20°C                                                 |
| Operator:                 | AFr                                                                                |

### EUT Information

|                       |                                            |
|-----------------------|--------------------------------------------|
| Manufacturer:         | Bosch Car Multimedia Portugal, S.A.        |
| EuT:                  | ECU CTPBASEDTNA                            |
| -----                 | -----                                      |
| HW Version:           | 6794G05                                    |
| SW Version:           | DAIMLER_CTP_16.095.2.                      |
| Serial Number:        | 2800003466                                 |
| Connected Interfaces: | USB-cable + main wiring + GSM/GNSS antenna |
| Power Supply:         | 12 V DC                                    |

Full Spectrum

