

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
CTPBASEDTNA

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







Laboratory Accreditation and Listings			
 DAkKS Deutsche Akkreditierungsstelle D-PL-12047-01-01	 FEDERAL COMMUNICATIONS COMMISSION USA MRA US-EU 0003	 Industry Canada Reg. No.: 3462D-2 Reg. No.: 3462D-3	 Voluntary Controls for Electromagnetic Emissions Reg. No.: R-2666 C-2914, T-1967, G-301
 WiFi ALLIANCE AUTHORIZED RF LABORATORY	 ctia Authorized TM Test Lab Lab Code: 20011130-00		
accredited according to DIN EN ISO/IEC 17025			
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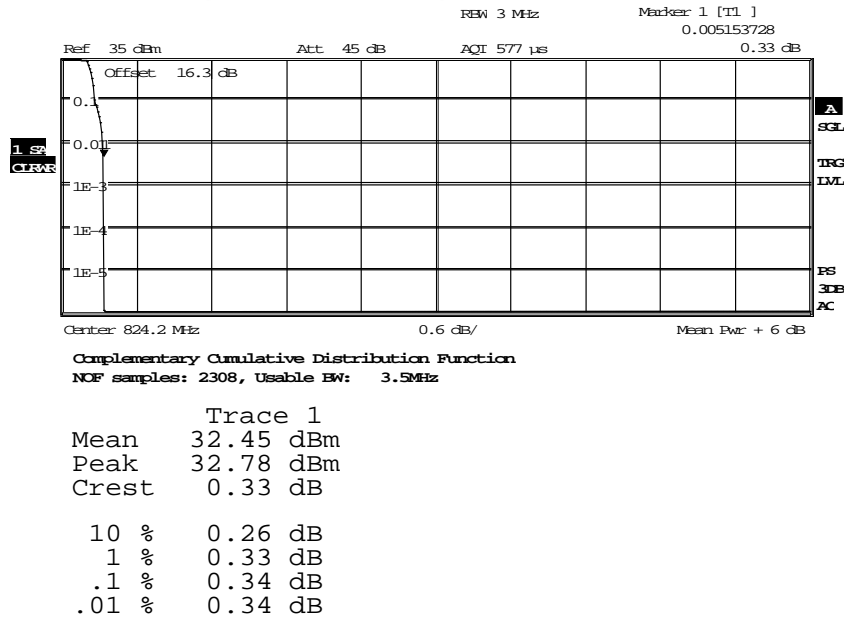
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1. Measurement diagrams

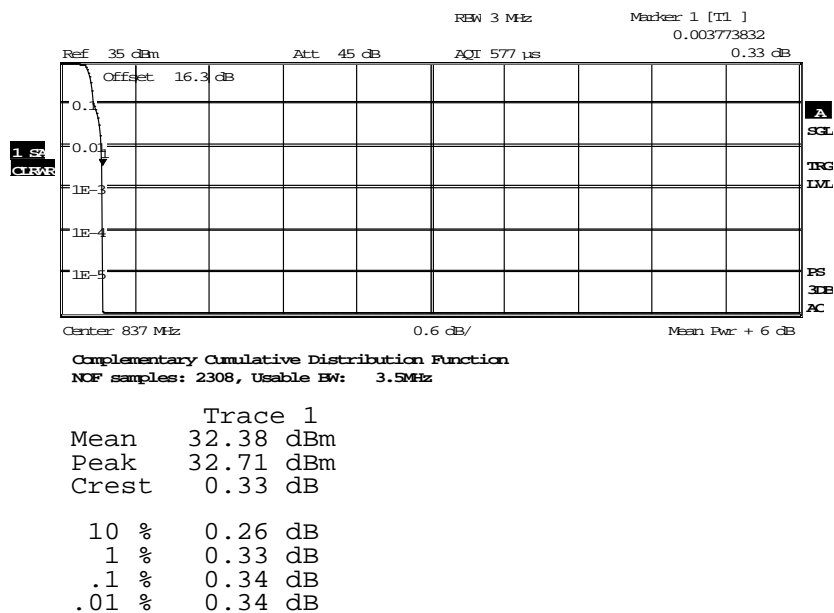
1.1. Power Measurements and PAPR-Value

1.1.1. GSM 850 (GMSK Modulation)



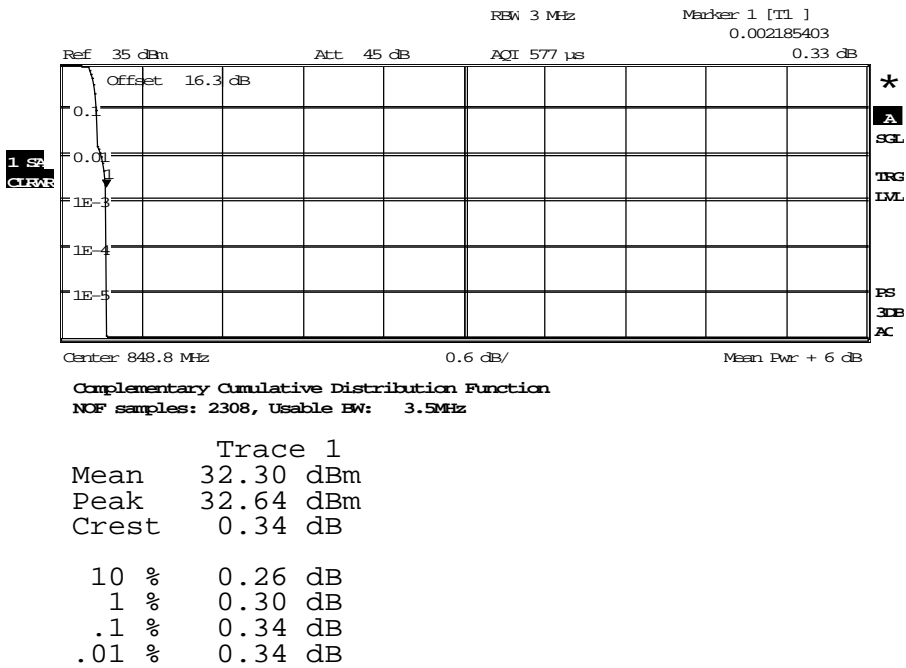
Date: 21.DEC.2016 11:33:38

Diagram CCDF_128_GMSK



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

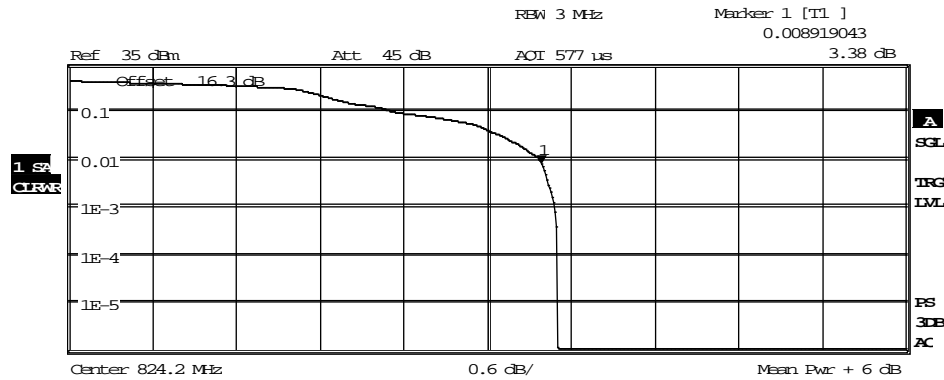
Diagram CCDF_192_GMSK



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

Diagram CCDF_251_GMSK

1.1.2. GSM 850 (8-PSK Modulation)

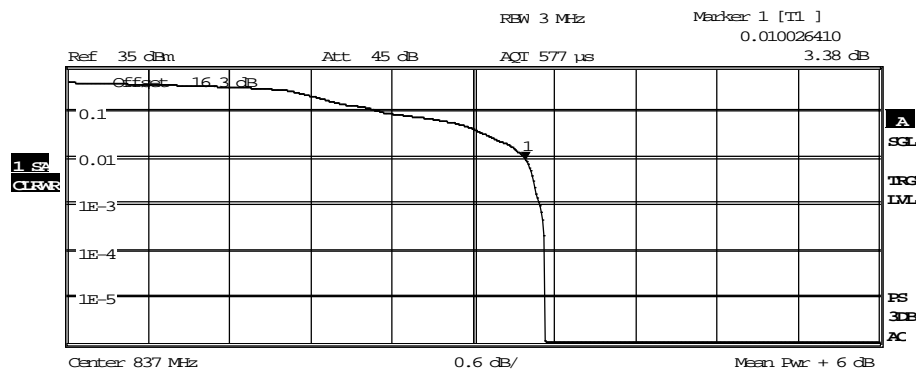


Complementary Cumulative Distribution Function
 NOF samples: 2308, Usable BW: 3.5MHz

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

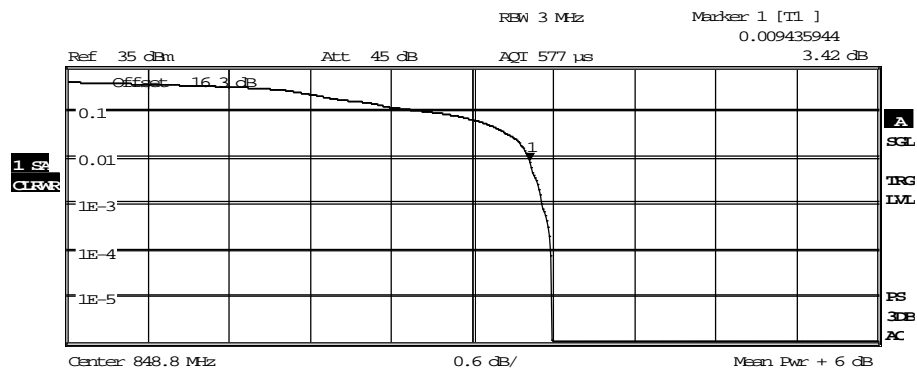


Complementary Cumulative Distribution Function
 NOF samples: 2308, Usable BW: 3.5MHz

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



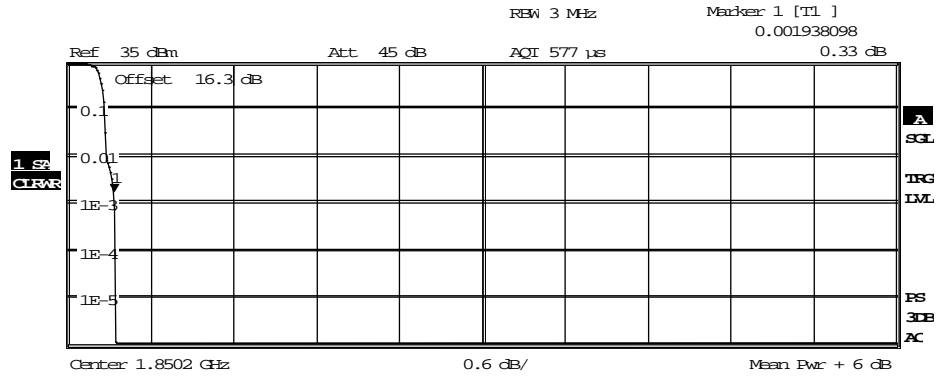
Complementary Cumulative Distribution Function
NOF samples: 2308, Usable BW: 3.5MHz

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)

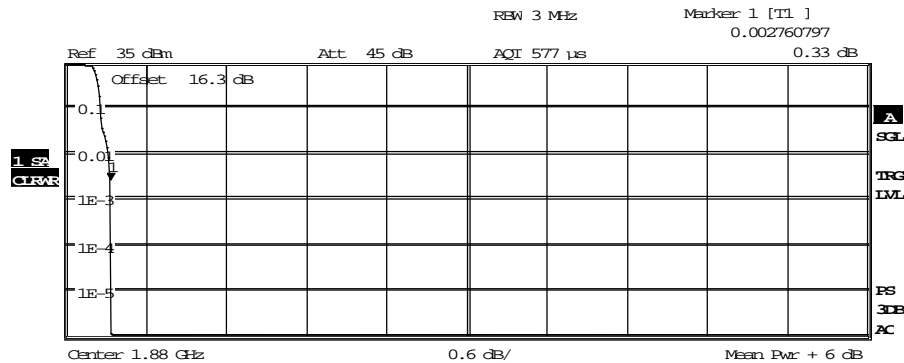


Trace 1
Mean 25.52 dBm
Peak 25.87 dBm
Crest 0.34 dB

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

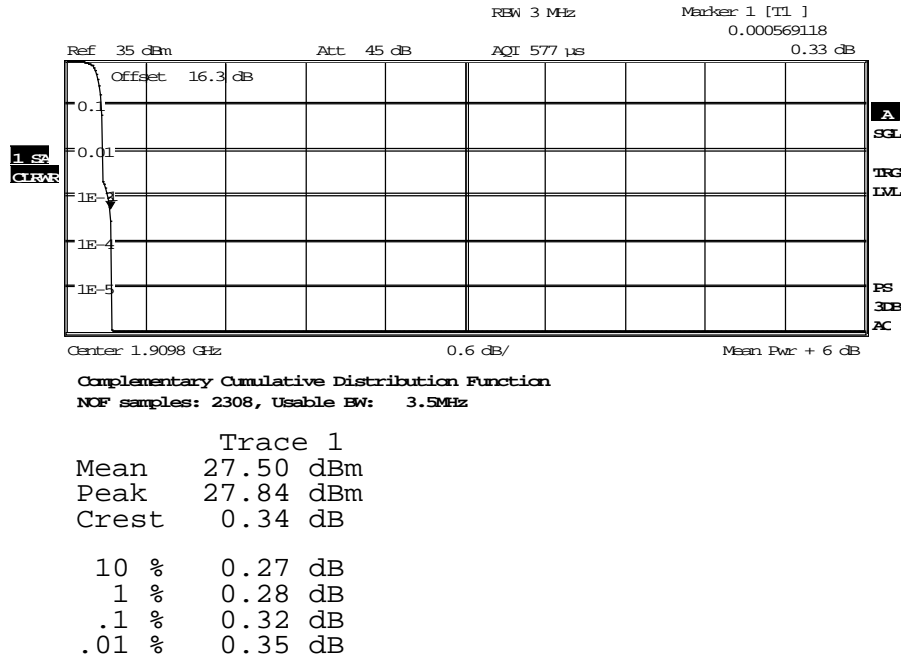


Trace 1
Mean 26.17 dBm
Peak 26.50 dBm
Crest 0.33 dB

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

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

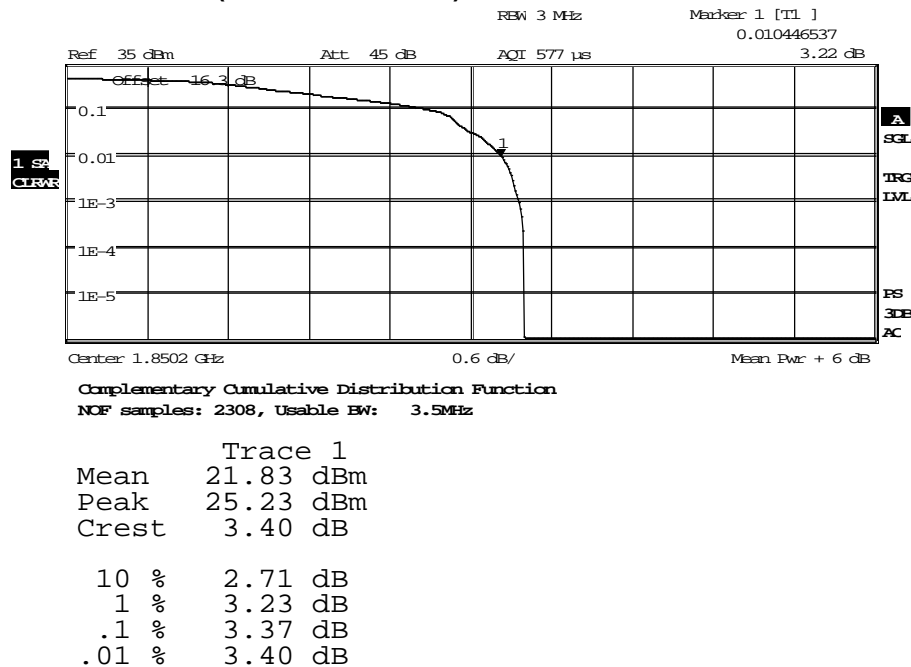
Diagram CCDF_661_GMSK



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

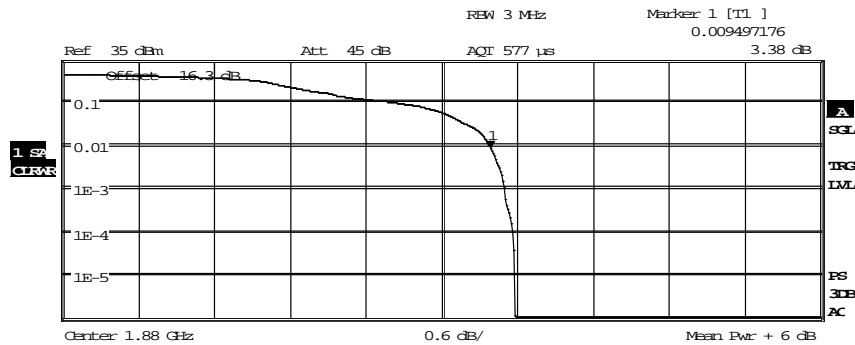
Diagram CCDF_810_GMSK

1.1.4. GSM 1900 (8-PSK Modulation)



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

Diagram CCDF_512_8PSK



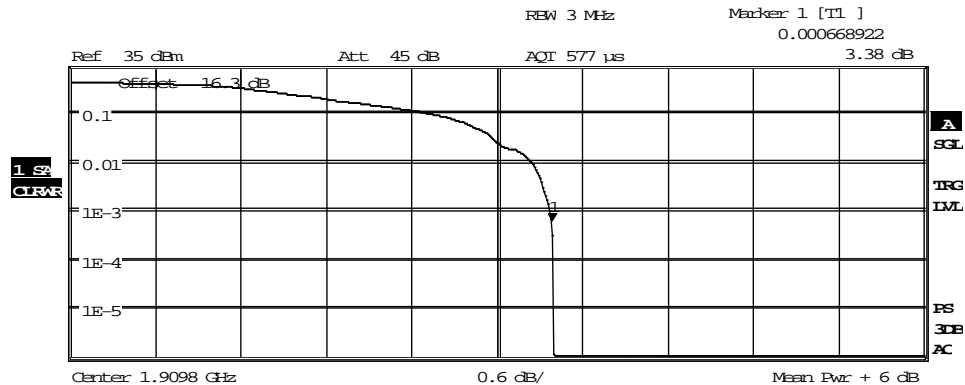
Complementary Cumulative Distribution Function
NOF samples: 2308, Usable BW: 3.5MHz

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

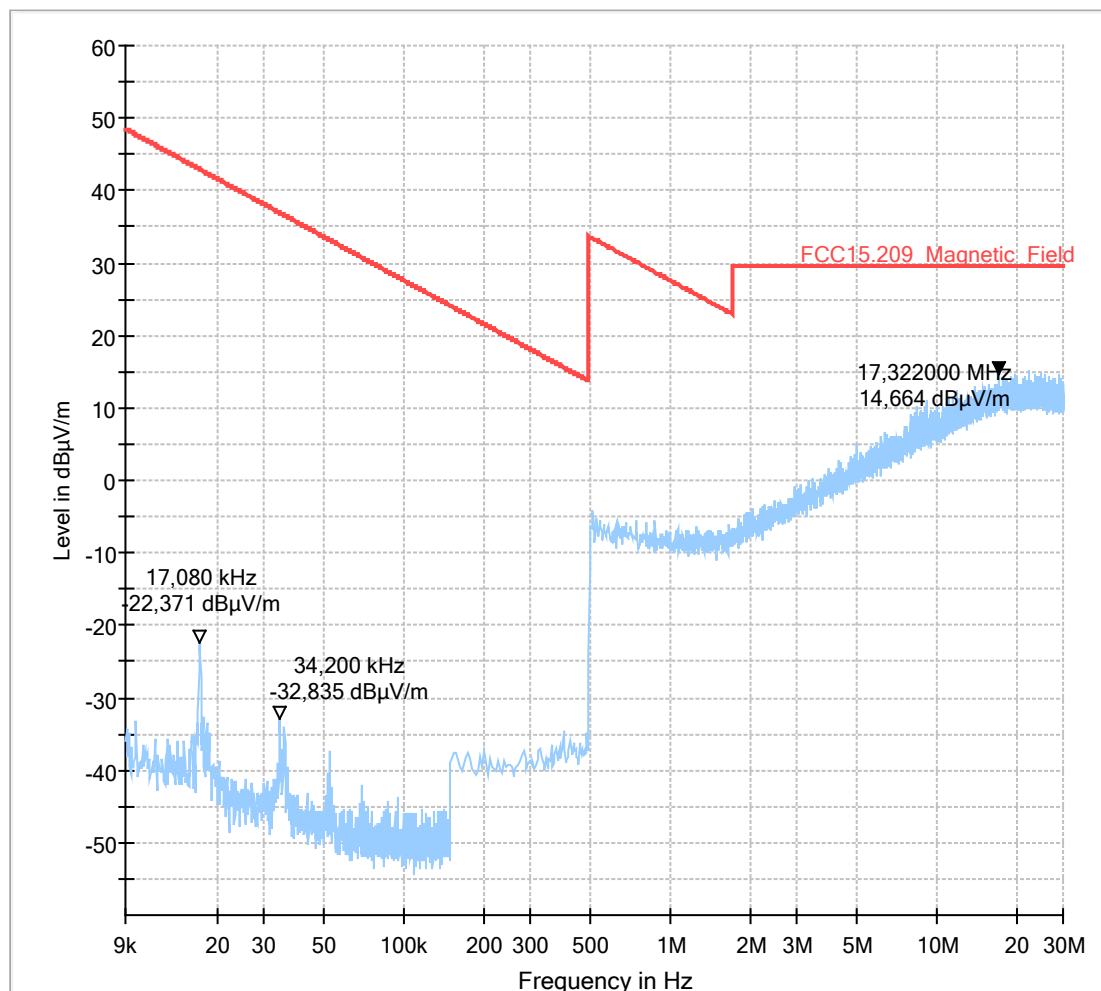
Test description:	Date: 21.12.2016 Page 1 of 1
Test site and distance:	Magnetic Field Strength Measurement related to 30/300 m distance
Version of Testsoftware:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Distance correction:	EMC32 V9.25.0
Technical Data:	used accord. table, pls. 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

Test description:

Test site and distance:

Version of Testsoftware:

Distance correction:

Technical Data:

Rec. antenna (pre-scan):

Used filter:

Test specification:

Date: 22.12.2016 Page 1 of 1

Magnetic Field Strength Measurement related to 30/300 m distance

Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance

EMC32 V9.25.0

used accord. table, pls. see test report

Please see page 2 for detailed data of measurement setup

height 1.00 m, parallel and 90° to EUT polarisation

bypass

FCC 15.205 § 15.209; RSS-Gen: Issue 4

Operator:

Operating conditions:

Power during tests:

YSa

TX-on

12 V DC (car battery)

EUT Information

Manufacturer:

EuT:

Bosch Car Multimedia Portugal, S.A.

ECU CTPBASEDNA

HW Version:

SW Version:

Serial Number:

Connected Interfaces:

Power Supply:

6794G05

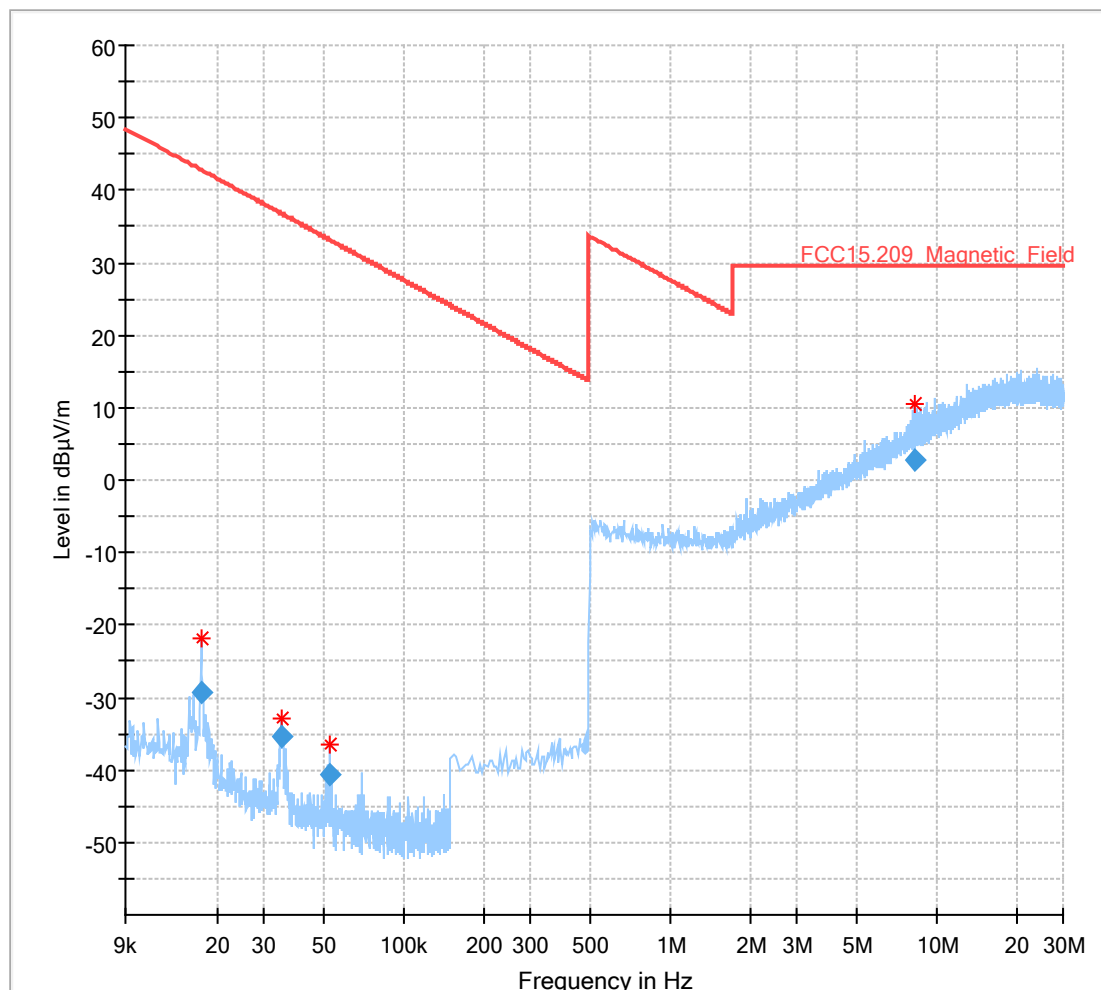
DAIMLER_CTP_16.095.2.

2800003466

USB-cable + main wiring + GSM/GNSS antenna

12 V DC

Full Spectrum



1.4. Spurious emissions radiated (850 MHz transmitting mode)

8.05_RSE_R_Ch192_GPRS

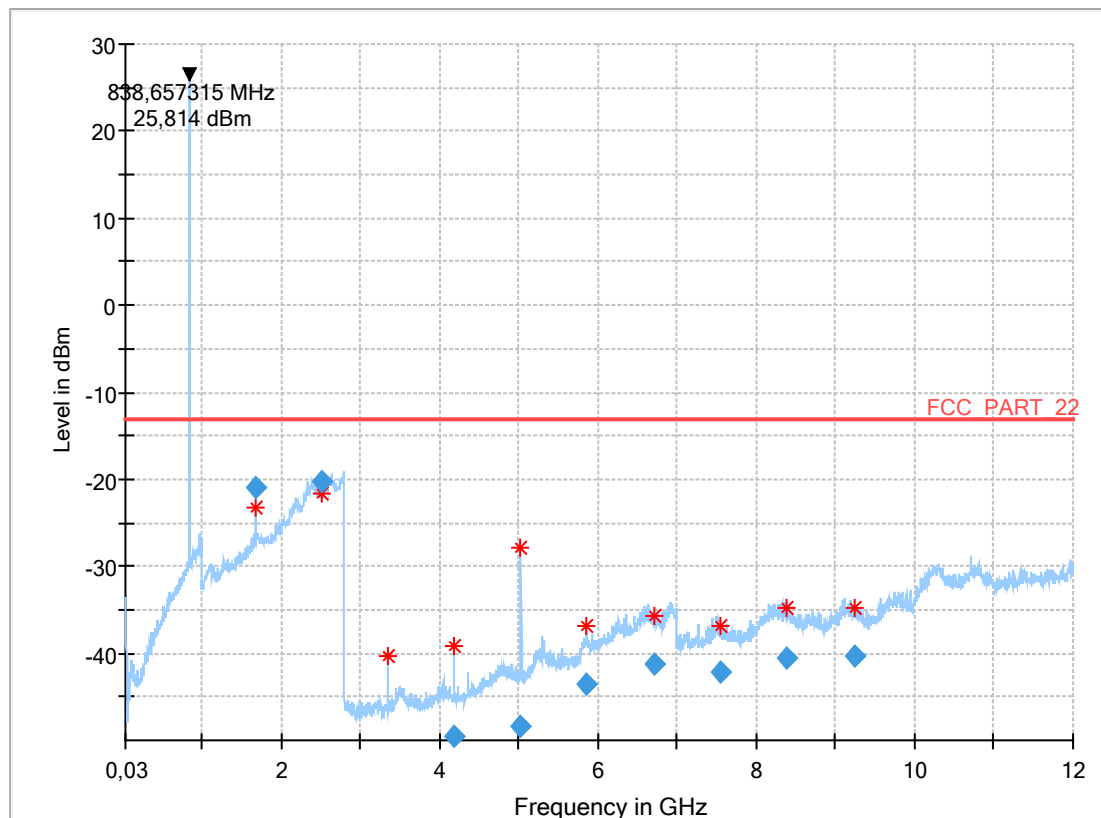
Common Information

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

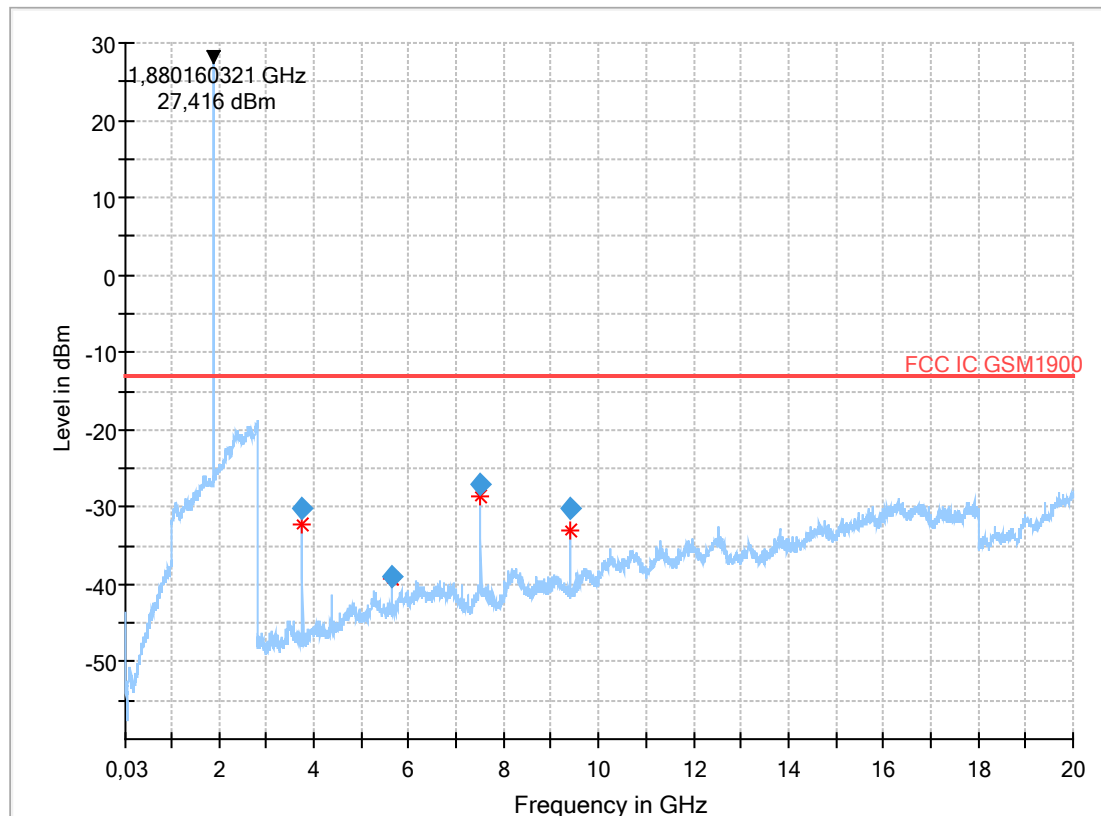
Common Information

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

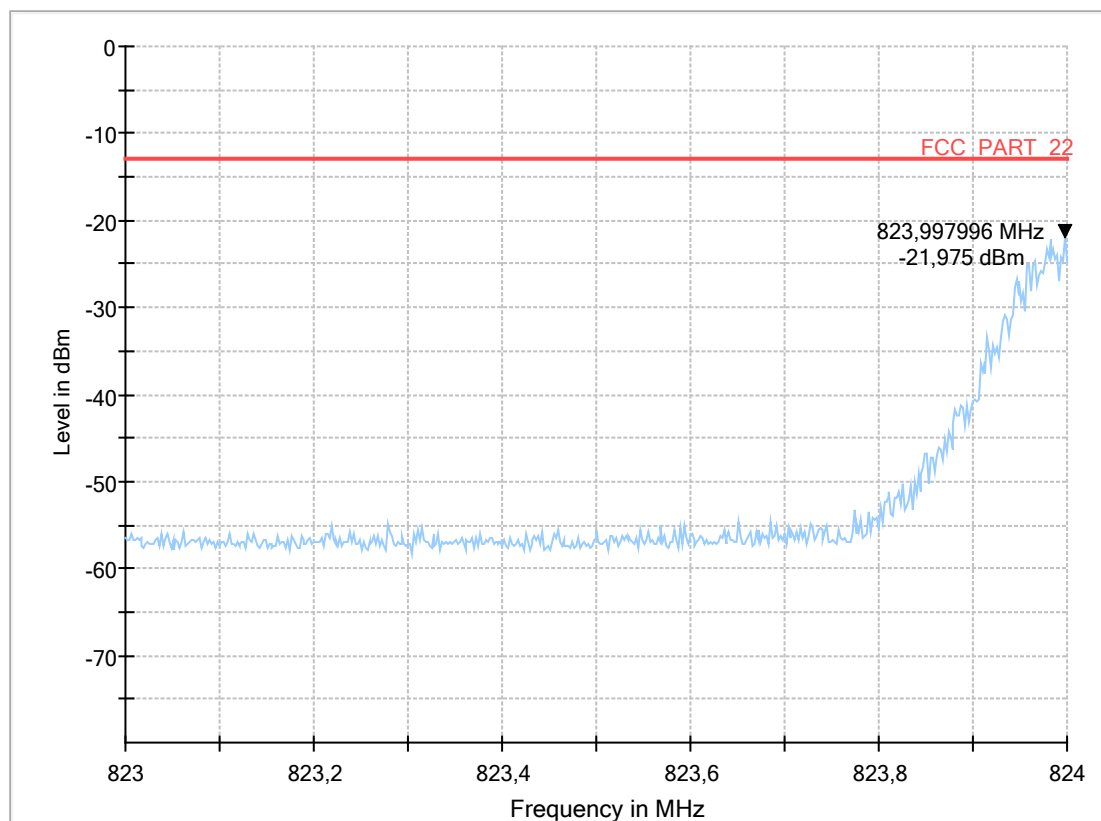
Common Information

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

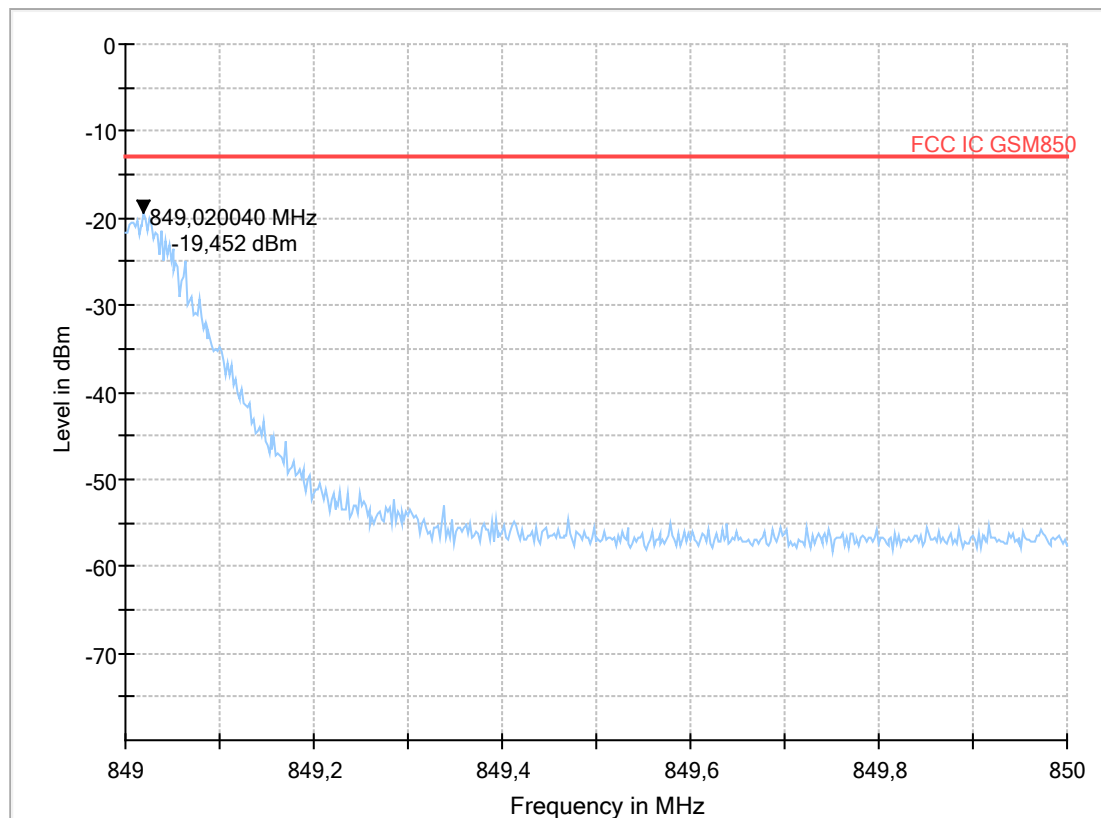
Common Information

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

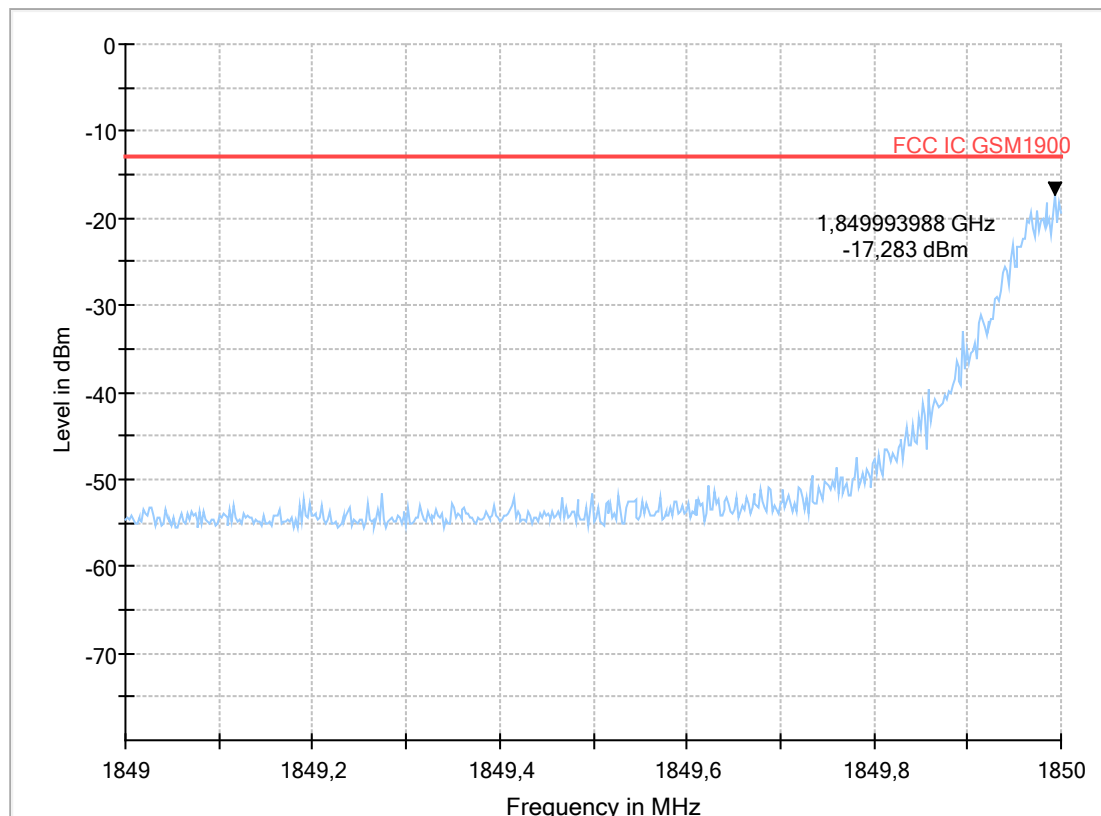
Common Information

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

