

Annex 1: Measurement diagrams to
TEST REPORT
 No.: 16-1-0141801T03a-C2

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
CTPMIDDTNA
 FCC-ID: 2AKC8CTP054661
 IC: 22221-CTP054661
 PMN: CTPMIDDTNA
 HVIN: CTPMIDDTNA
 FVIN: 16.095.2







Laboratory Accreditation and Listings			
 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
 AUTHORIZED RF LABORATORY	 Authorized TM Test Lab Lab Code: 20011130-00		
accredited according to DIN EN ISO/IEC 17025			
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Table of contents

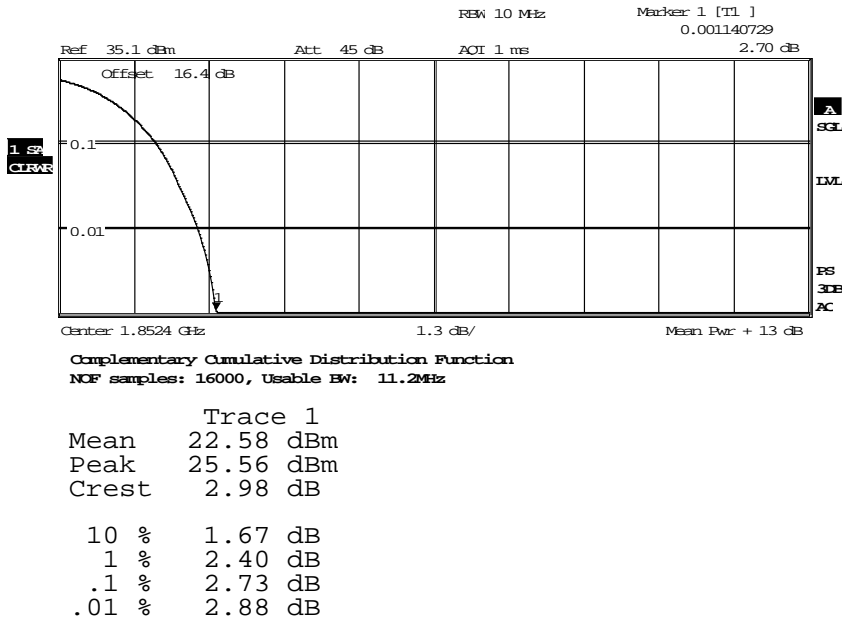
1. MEASUREMENT DIAGRAMS.....	3
1.1. Peak power output and PAPR-Value.....	3
1.2. Magnetic field emissions radiated (FDD Band II transmitting mode).....	6
1.3. Magnetic field emissions radiated (FDD Band V transmitting mode).....	9
1.4. Spurious emissions radiated (FDD Band II transmitting mode).....	12
1.5. Spurious emissions radiated (FDD Band V transmitting mode).....	15
1.6. Radiated emissions on FDD Band II band-edge.....	18
1.7. Radiated emissions on FDD Band V band-edge.....	20

1. Measurement diagrams

1.1. Peak power output and PAPR-Value

1.1.1. FDD Band 2

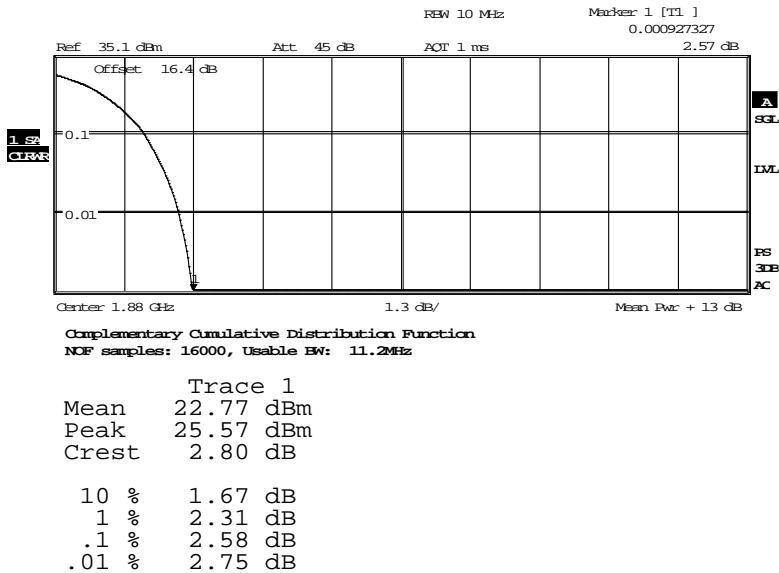
Channel 9262



Date: 14.DEC.2016 15:17:34

Diagram CCDF_Ch_9262

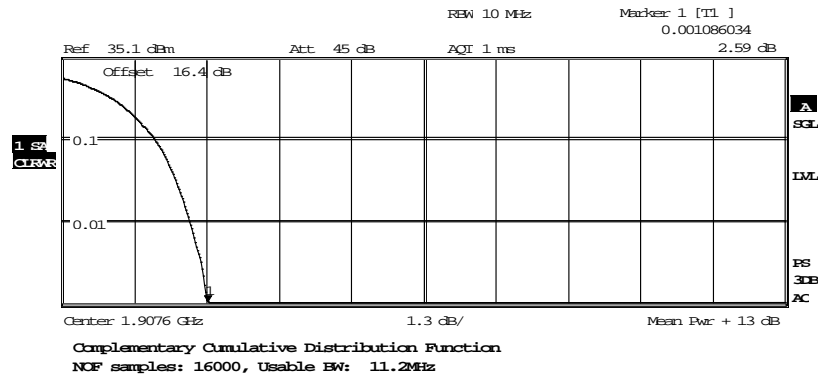
Channel 9400



Date: 14.DEC.2016 15:19:54

Diagram CCDF_Ch_9400

Channel 9538



Trace 1

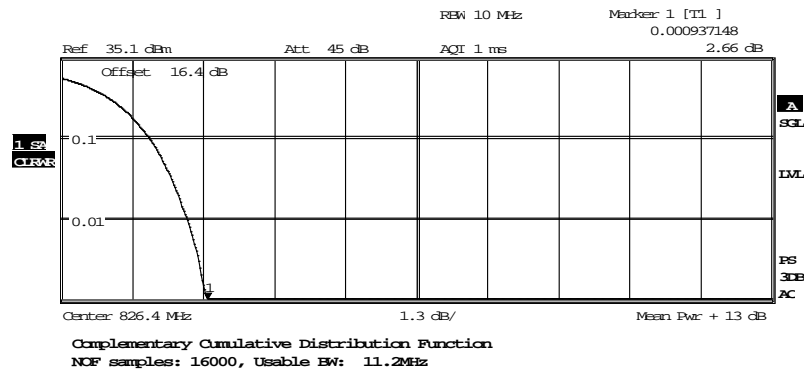
Mean	22.63 dBm
Peak	25.55 dBm
Crest	2.91 dB
10 %	1.65 dB
1 %	2.29 dB
.1 %	2.60 dB
.01 %	2.81 dB

Date: 14.DEC.2016 15:22:06

Diagram CCDF_Ch_9538

1.1.2. FDD Band 5

Channel 4132



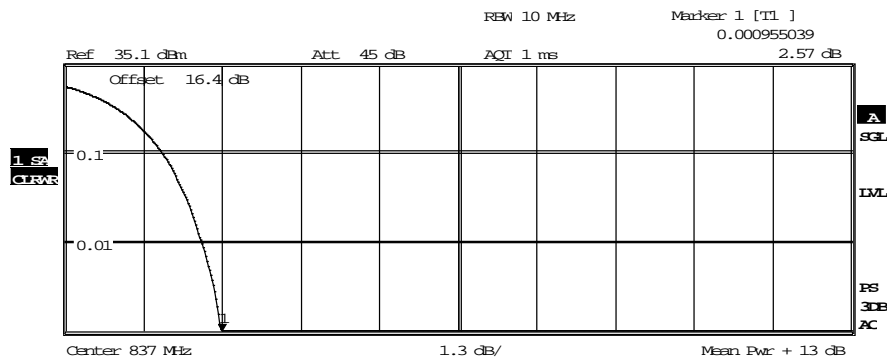
Trace 1

Mean	23.72 dBm
Peak	26.57 dBm
Crest	2.85 dB
10 %	1.60 dB
1 %	2.29 dB
.1 %	2.67 dB
.01 %	2.79 dB

Date: 14.DEC.2016 15:10:49

Diagram CCDF_Ch_4132

Channel 4185



Complementary Cumulative Distribution Function
NOF samples: 16000, Usable BW: 11.2MHz

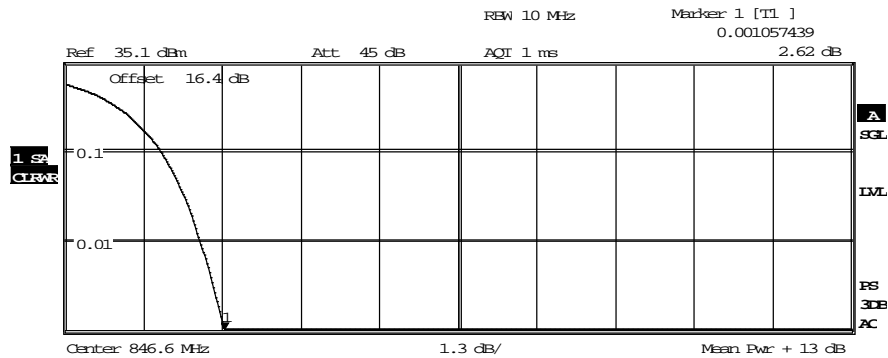
Trace 1
Mean 23.65 dBm
Peak 26.43 dBm
Crest 2.78 dB

10 % 1.60 dB
1 % 2.25 dB
.1 % 2.58 dB
.01 % 2.75 dB

Date: 14.DEC.2016 15:14:07

Diagram CCDF_Ch_4185

Channel 4233



Complementary Cumulative Distribution Function
NOF samples: 16000, Usable BW: 11.2MHz

Trace 1
Mean 23.44 dBm
Peak 26.27 dBm
Crest 2.83 dB

10 % 1.58 dB
1 % 2.23 dB
.1 % 2.63 dB
.01 % 2.81 dB

Date: 14.DEC.2016 15:15:30

Diagram CCDF_Ch_4233

1.2. Magnetic field emissions radiated (FDD Band II transmitting mode)

Diagram No. 2.07_FDD_Band2_Ch9262

Date:	13.12.2016	Page 1 of 5
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:	FDD Band2 Ch9262	
Power during tests:	12V DC	
Comment 1:	Channel low	
Comment 2:		

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003843
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum

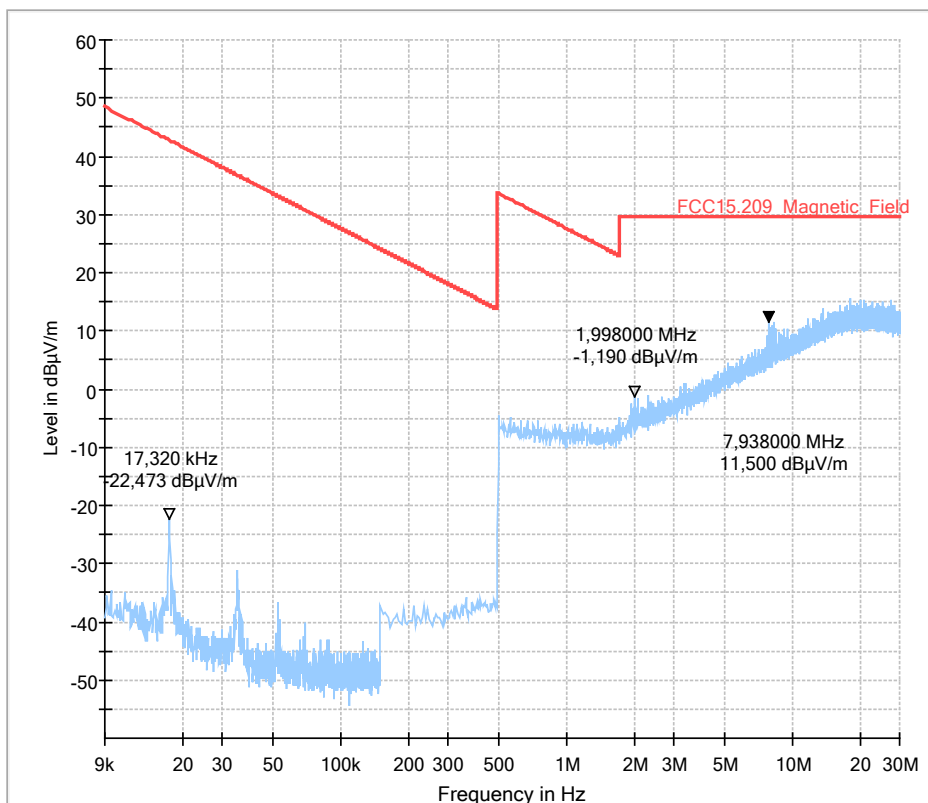


Diagram No. 2.08_FDD_Band2_Ch9400

Date:	13.12.2016	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:	FDD Band2 Ch9400	
Power during tests:	12V DC	
Comment 1:	Channel middle	
Comment 2:		

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003843
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum

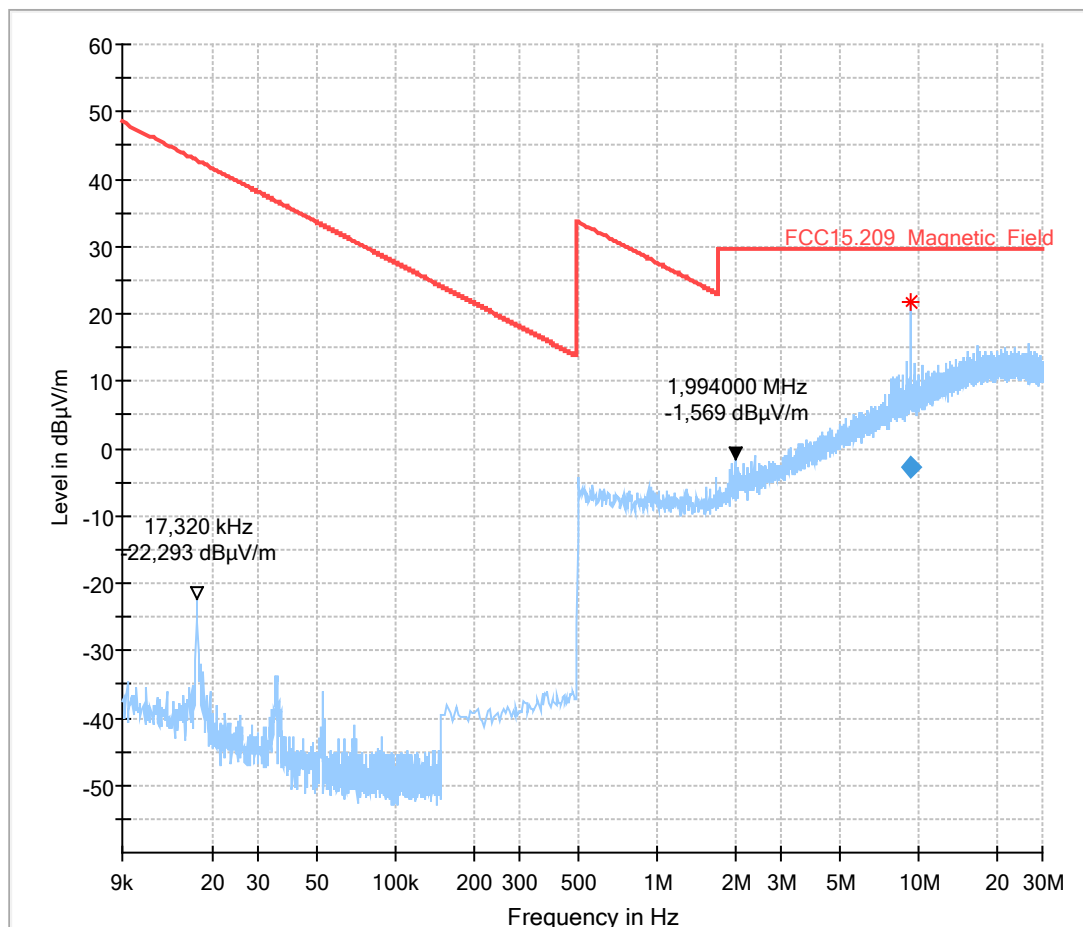


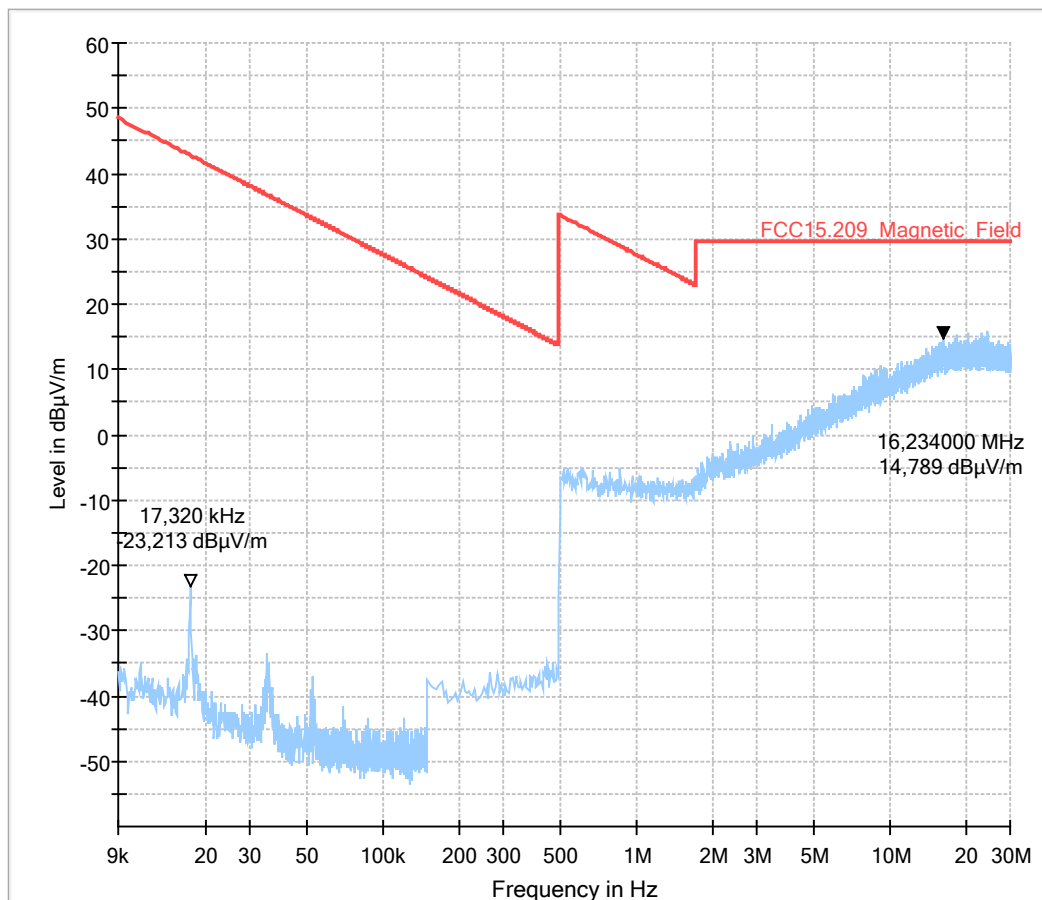
Diagram No. 2.09_FDD_Band2_Ch9538

Test description:	Date: 13.12.2016 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:	YSa
Operating conditions:	FDD Band2 Ch9538
Power during tests:	12V DC
Comment 1:	Channel high
Comment 2:	

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003843
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



1.3. Magnetic field emissions radiated (FDD Band V transmitting mode)

2.10a_FDDV_Ch4132

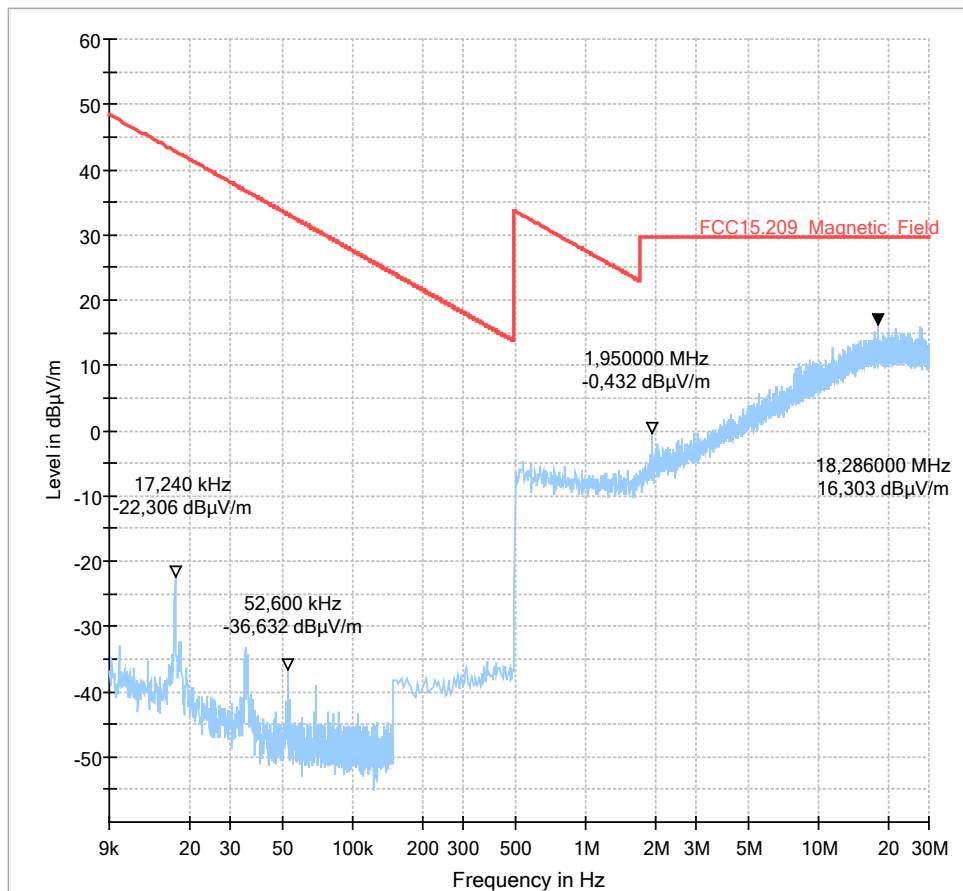
Common Information

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:	RIs
Operating conditions:	UMTS FDD BandV Ch4132
Power during tests:	12V DC
Comment 1:	Channel low

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



2.11a_FDDV_Ch4185

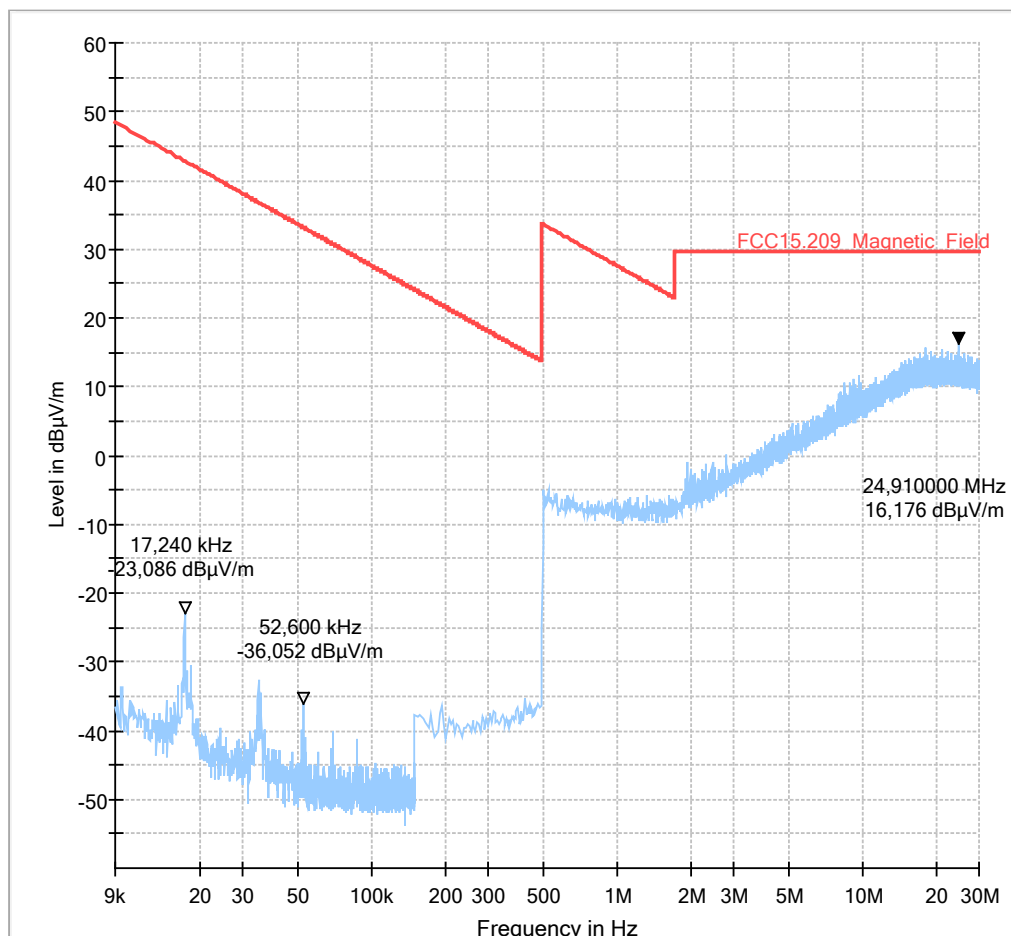
Common Information

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:	RIIs
Operating conditions:	UMTS FDD BandV Ch4185
Power during tests:	12V DC
Comment 1:	Channel mid

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



2.12a_FDDV_Ch4233

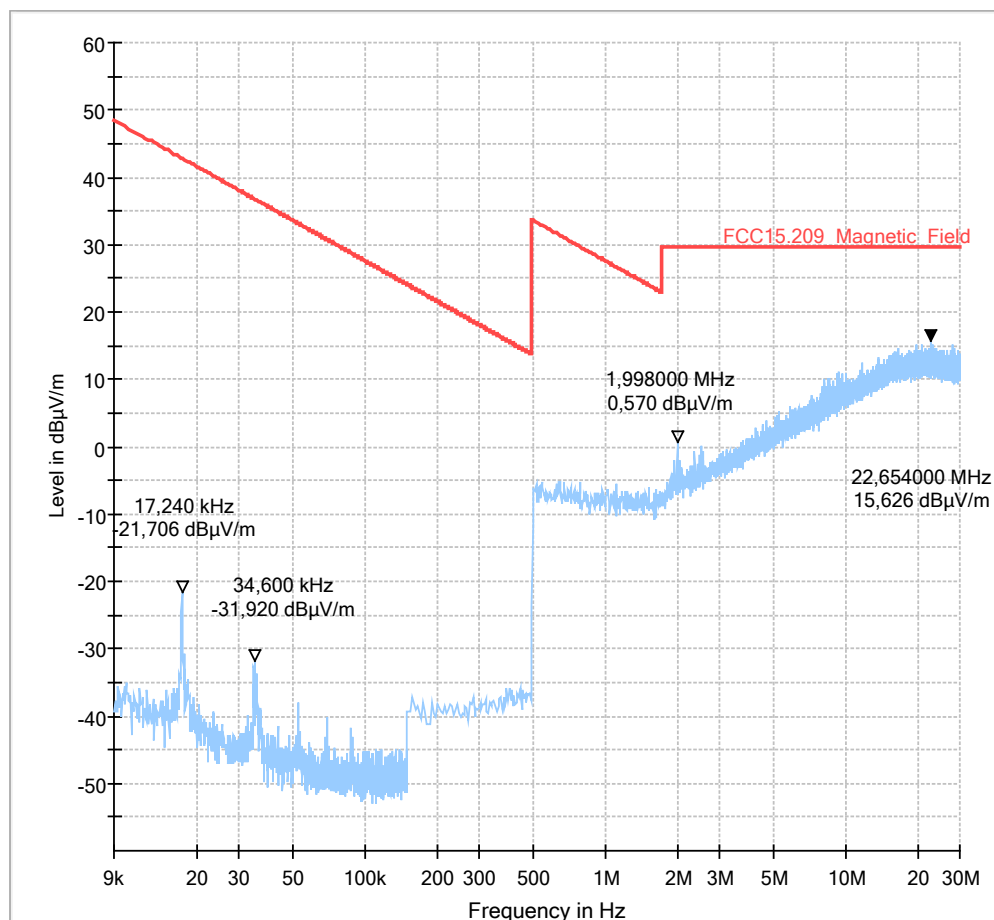
Common Information

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:	RI
Operating conditions:	UMTS FDD BandV Ch4233
Power during tests:	12V DC
Comment 1:	Channel high

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



1.4. Spurious emissions radiated (FDD Band II transmitting mode)

8.20a_RSE_R_Ch9262_RMC

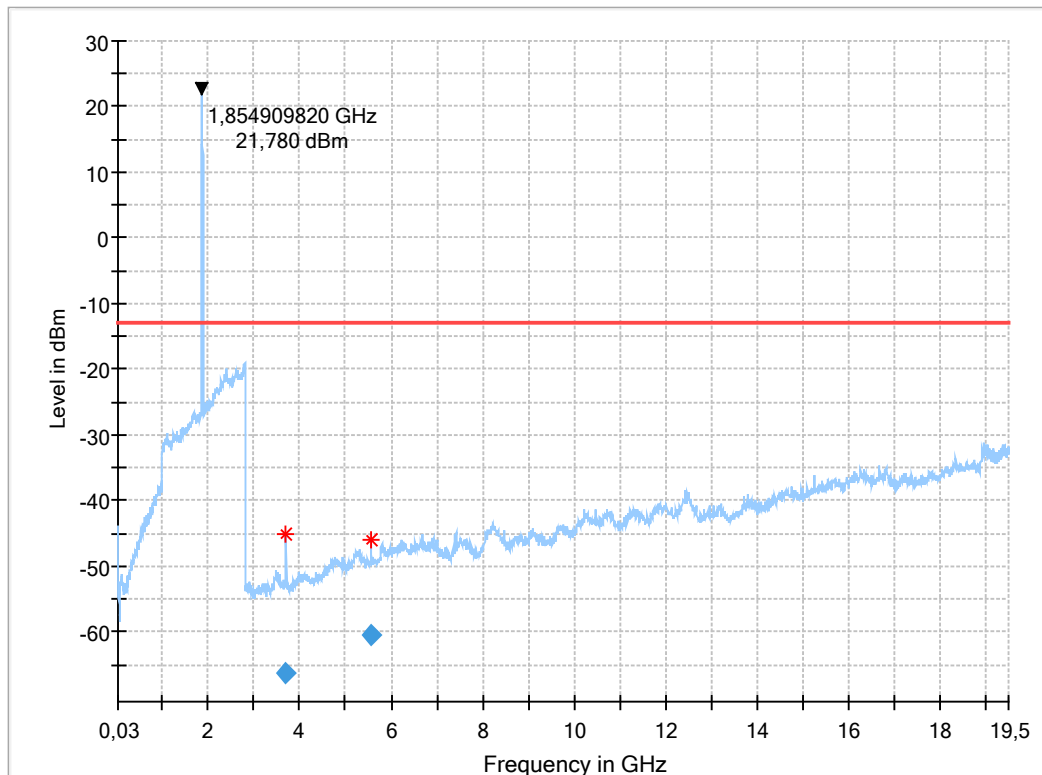
Common Information

Test Description:	Radiated Spurious Emissions UMTS FDDII
Test Site Location:	CETECOM Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24
Operating Mode:	UE allocated channel 9262 (fc = 1852.4 MHz)
Environmental Conditions:	Humidity: 43%rH; Temperature: 20°C
Operator:	RI

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



Final Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3706.177354	-66.23	-13.00	53.23	10000.0	1000.000	V	315.0	0.0	-94.9
5547.269539	-60.43	-13.00	47.43	10000.0	1000.000	V	-11.0	0.0	-89.9

8.21a_RSE_R_Ch9400_RMC

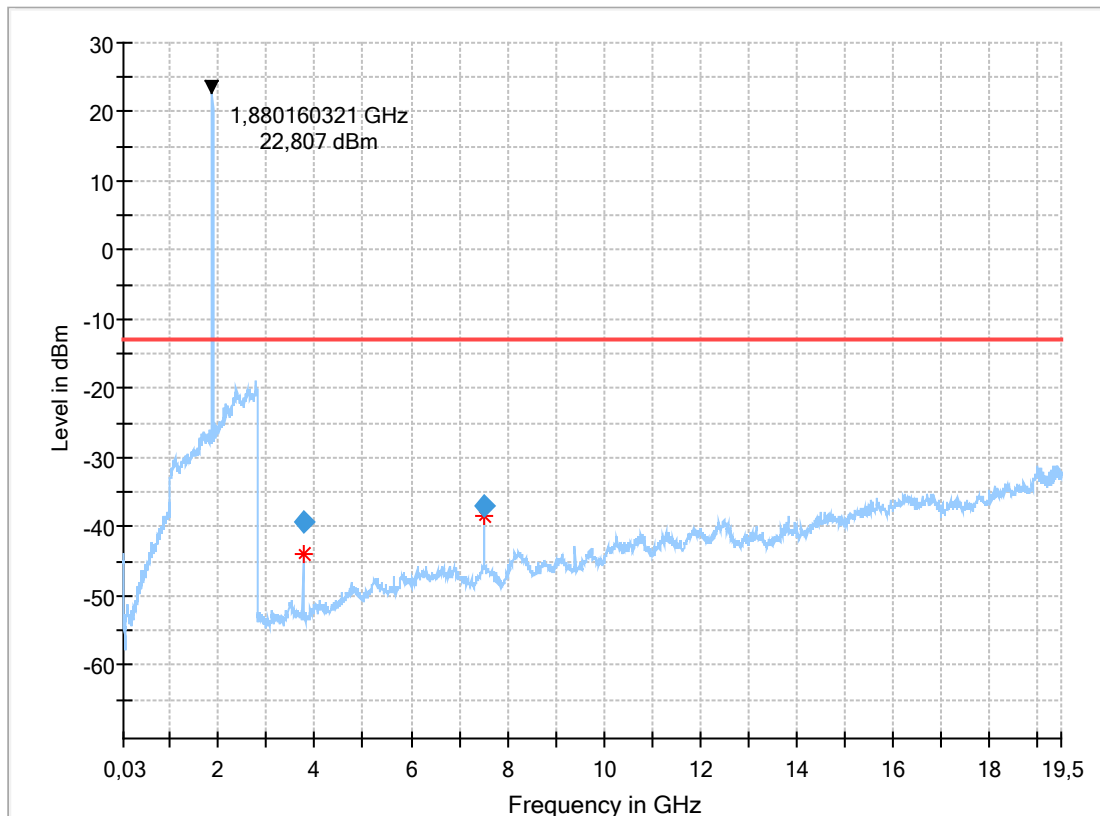
Common Information

Test Description:	Radiated Spurious Emissions UMTS FDDII
Test Site Location:	CETECOM Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24
Operating Mode:	UE allocated channel 9400 (fc = 1880.0 MHz)
Environmental Conditions:	Humidity: 43%rH; Temperature: 20°C
Operator:	RI

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



Final Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3761.457916	-39.31	-13.00	26.31	10000.0	1000.000	V	334.0	0.0	-95.1
7517.139278	-36.83	-13.00	23.83	10000.0	1000.000	V	317.0	90.0	-83.3

8.22a_RSE_R_Ch9538_RMC

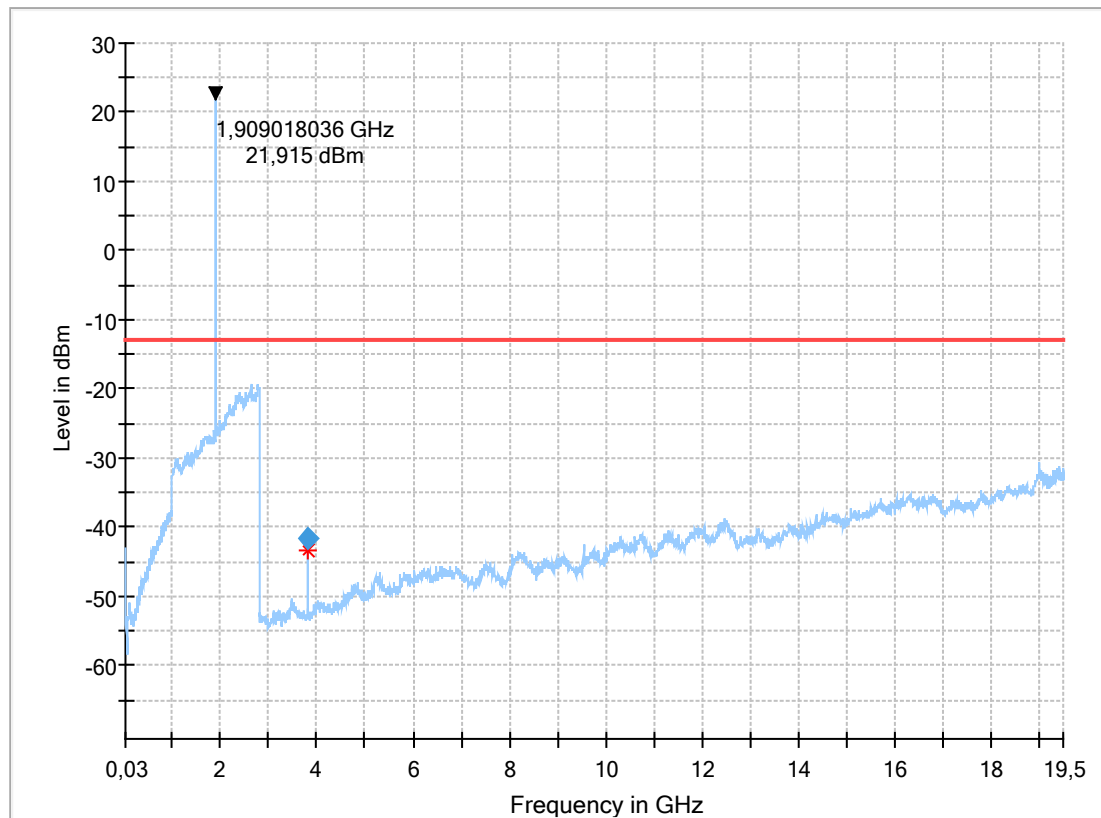
Common Information

Test Description:	Radiated Spurious Emissions UMTS FDDII
Test Site Location:	CETECOM Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24
Operating Mode:	UE allocated channel 9538 (fc = 1907.6 MHz)
Environmental Conditions:	Humidity: 43%rH; Temperature: 20°C
Operator:	RI

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



Final Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3816.648297	-41.59	13.00	28.59	10000.0	1000.000	H	32.0	90.0	-95.1

1.5. Spurious emissions radiated (FDD Band V transmitting mode)

8.50a_RSE_R_Ch4132_RMC

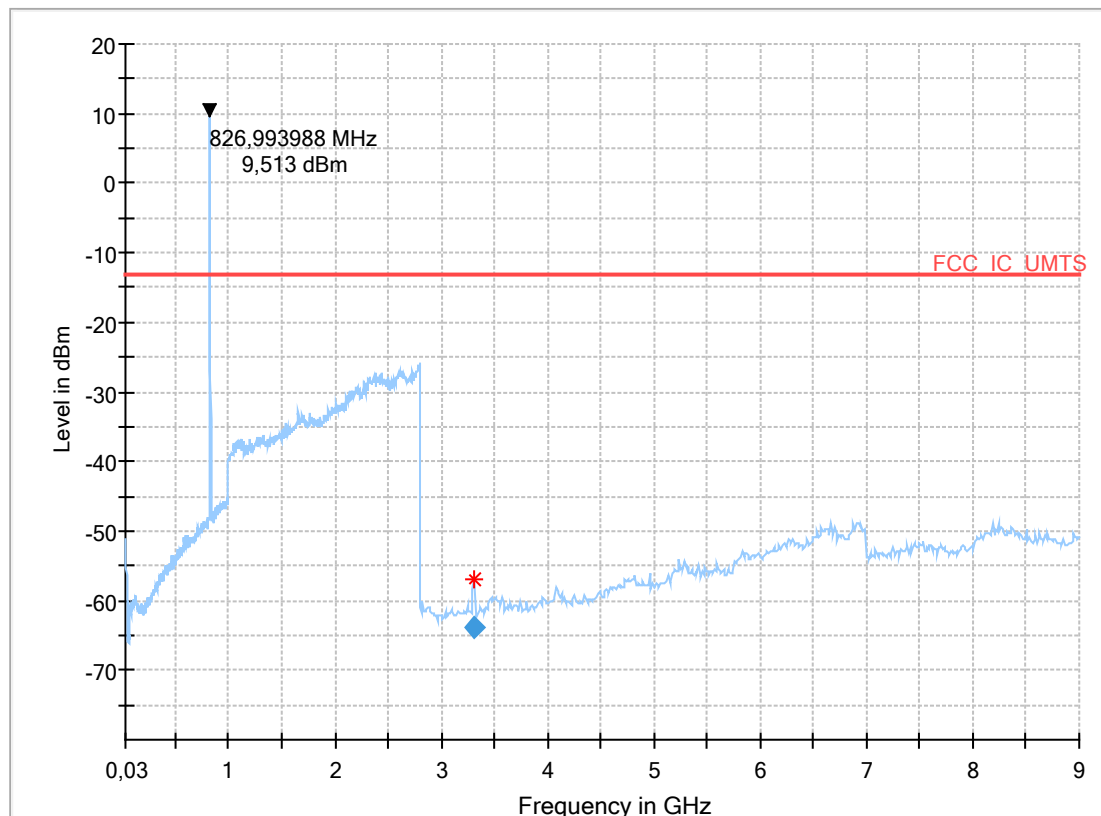
Common Information

Test Description:	Radiated Spurious Emissions UMTS FDDV
Test Site Location:	CETECOM Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917(a)
Operating Mode:	UE allocated channel 4133 (fc = 826.6 MHz), Voice/HSDPA/HSUPA/HSPA+, H-Set x
Environmental Conditions:	Humidity: 35%rH; Temperature: 20°C
Operator:	RI

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3310.370742	-	50.84	1000.0	100.000	V	270.0	0.0	-95.7

8.51a_RSE_R_Ch4183_RMC

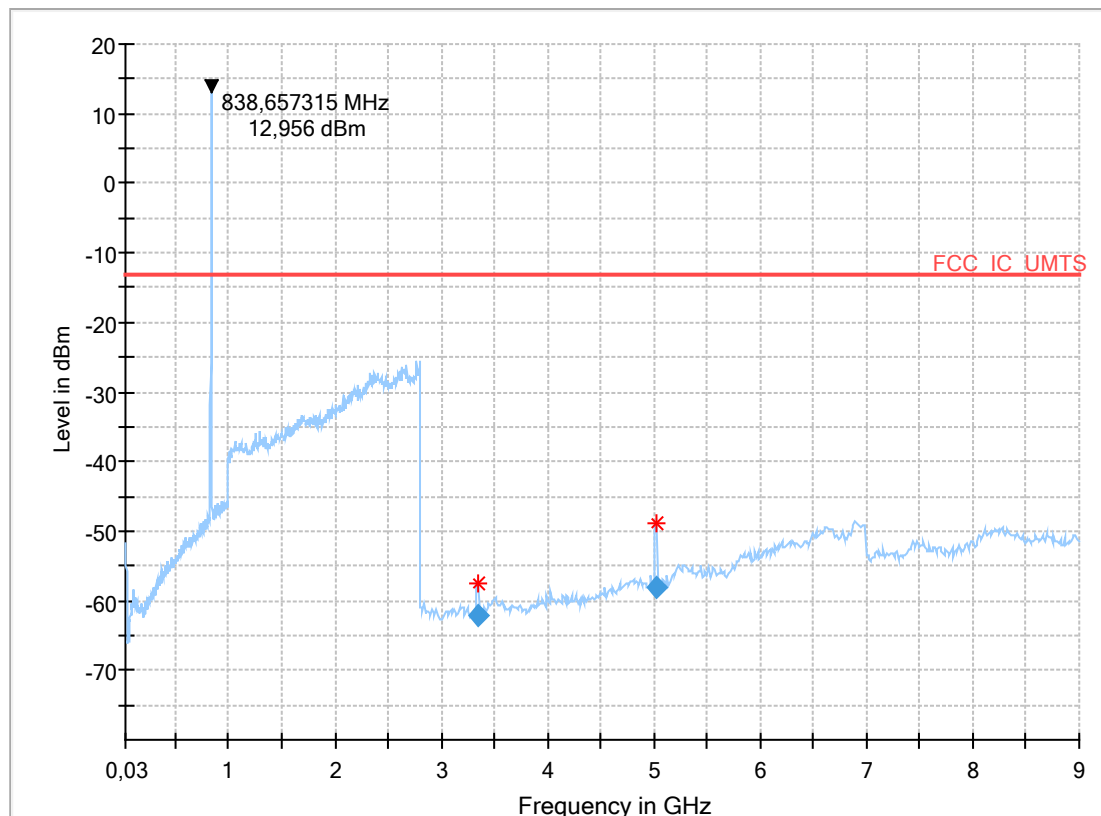
Common Information

Test Description:	Radiated Spurious Emissions UMTS FDDV
Test Site Location:	CETECOM Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917(a)
Operating Mode:	UE allocated channel 4183 (fc = 836.4 MHz)
Environmental Conditions:	Humidity: 35%rH; Temperature: 20°C
Operator:	RI

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3343.557114	-	49.12	1000.0	100.000	V	281.0	0.0	-95.6
5022.034068	-	45.22	1000.0	100.000	H	311.0	90.0	-91.1

8.52a_RSE_R_Ch4233_RMC

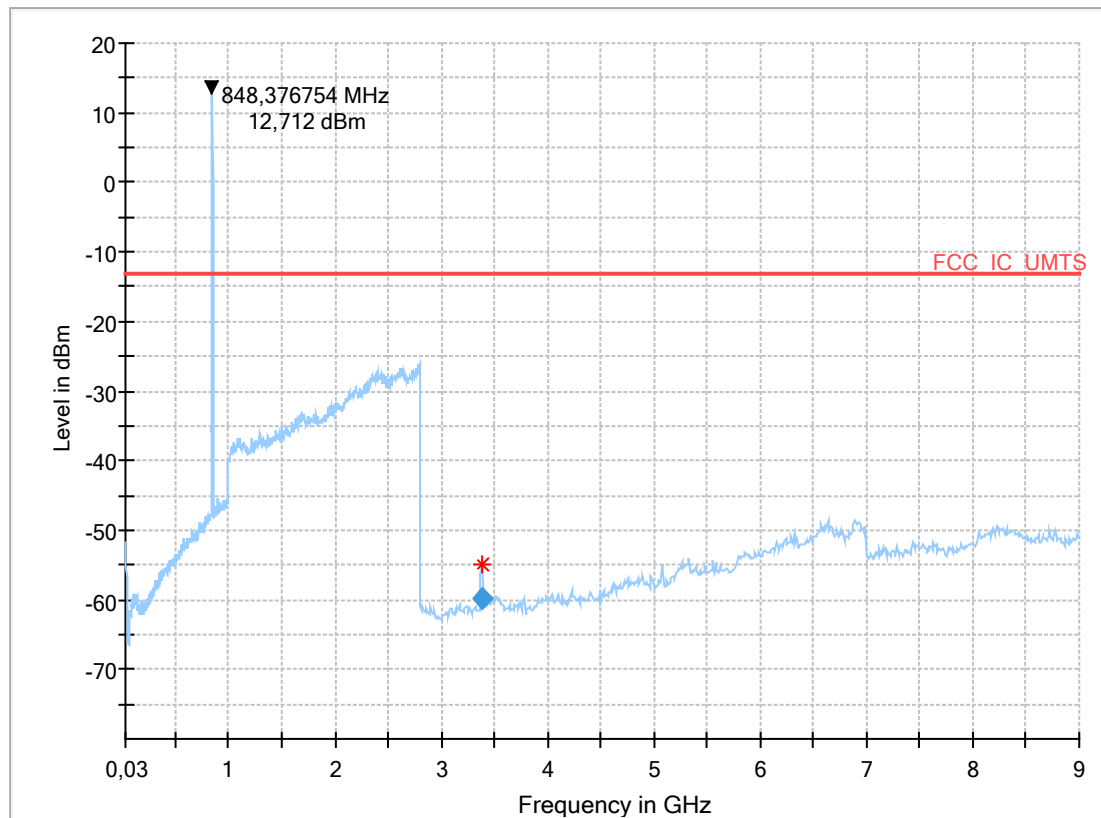
Common Information

Test Description:	Radiated Spurious Emissions UMTS FDDV
Test Site Location:	CETECOM Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917(a)
Operating Mode:	UE allocated channel 4233 (fc = 846.6 MHz)
Environmental Conditions:	Humidity: 35%rH; Temperature: 20°C
Operator:	RIs

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3383.537074	-	46.79	1000.0	100.000	V	267.0	0.0	-95.5

1.6. Radiated emissions on FDD Band II band-edge

9.20a_BE_R_Ch9262_RMC

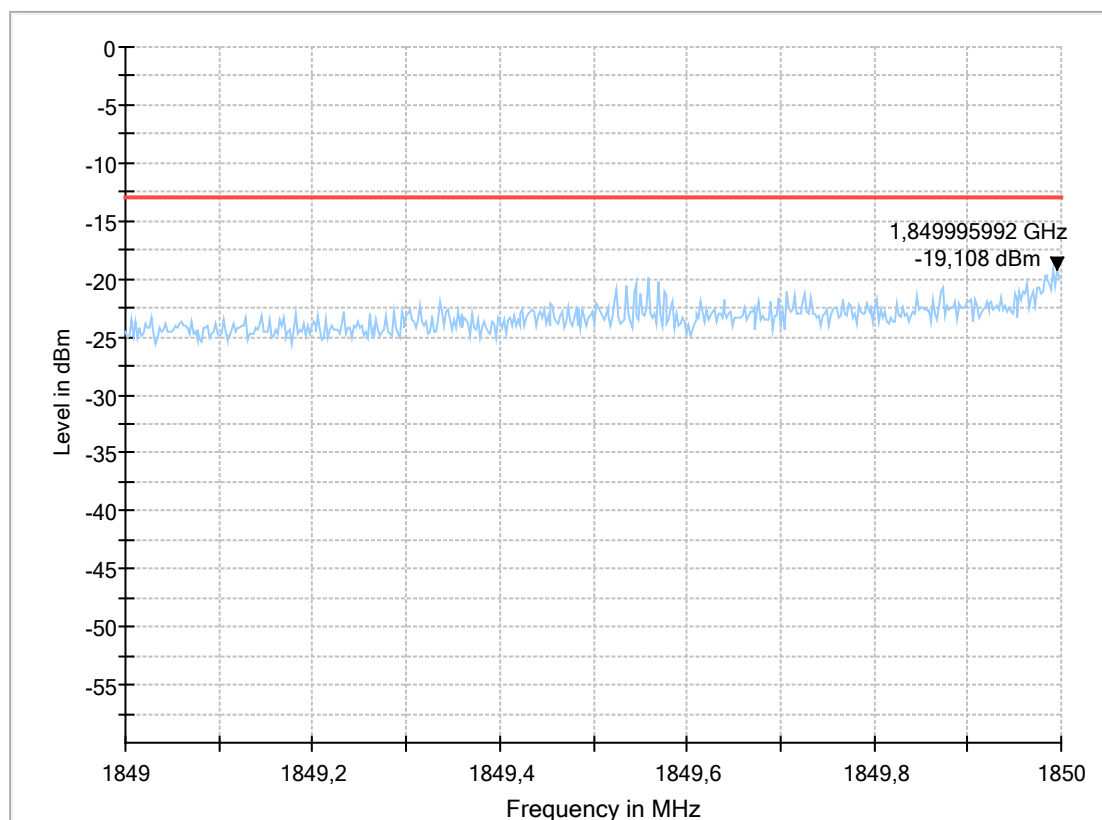
Common Information

Test Description:	Radiated Band Edge Compliance UMTS FDDII
Test Site Location:	CETECOM Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 27
Operating Mode:	MS allocated channel 9262 (fc = 1852.4MHz)
Environmental Conditions:	Humidity: 35%rH; Temperature: 22°C
Operator:	Rls

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
-----	-----
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



9.21a_BE_R_Ch9538_RMC

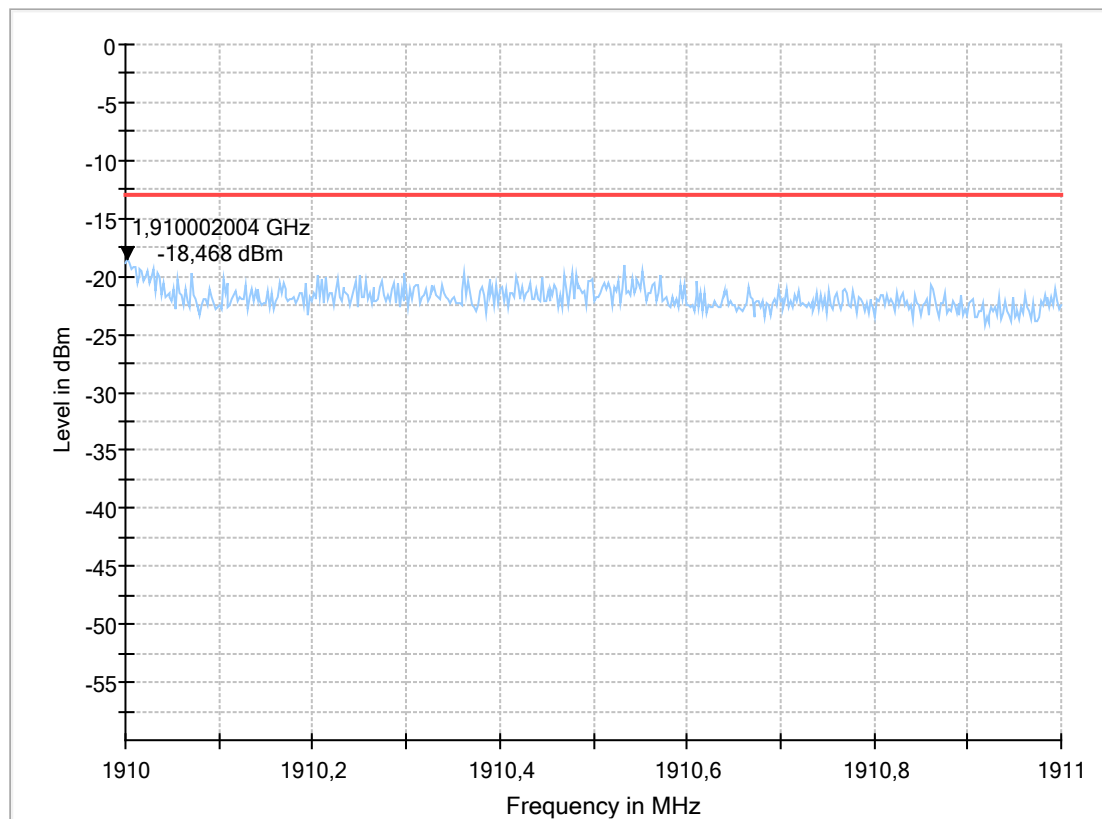
Common Information

Test Description:	Radiated Band Edge Compliance UMTS-FDDII
Test Site Location:	CETECOM Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917
Operating Mode:	UE allocated channel 9538 ($f_c = 1907.6$ MHz)
Environmental Conditions:	Humidity: 35%rH; Temperature: 20°C
Operator:	RI

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
-----	-----
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



1.7. Radiated emissions on FDD Band V band-edge

9.50a_BE_R_Ch4132_RMC

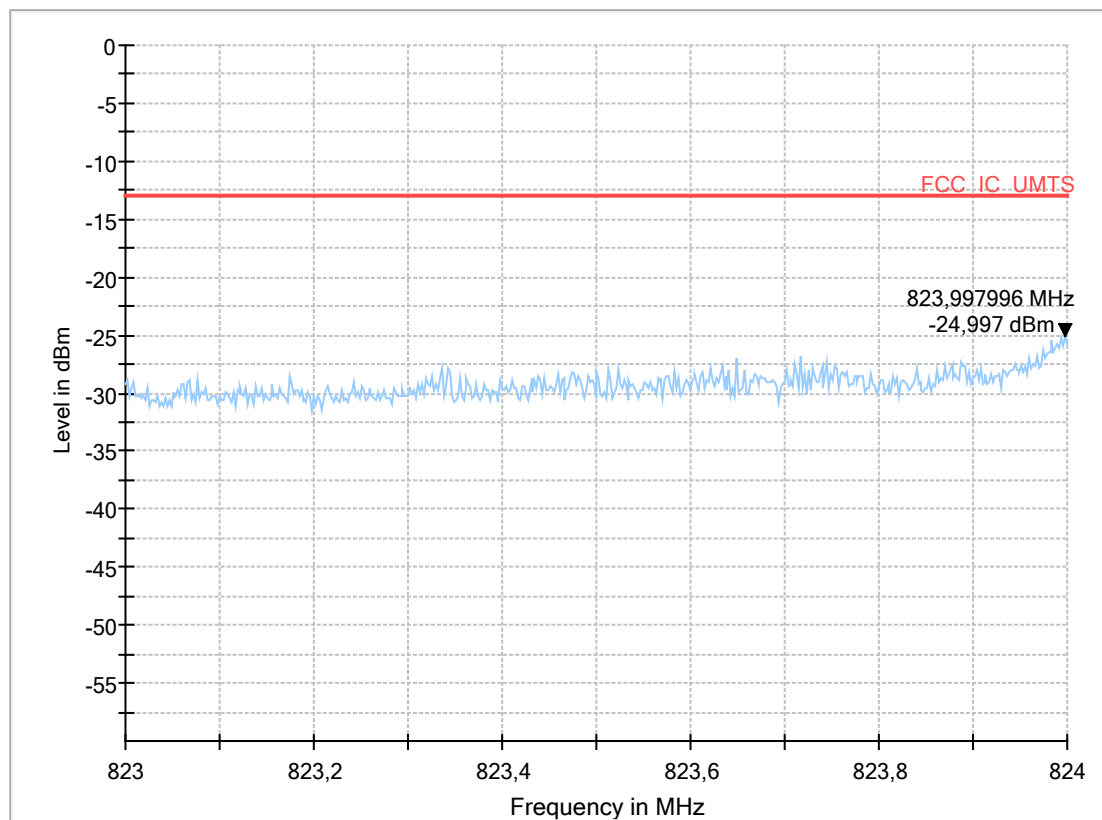
Common Information

Test Description:	Band-Edge low - Radiated Spurious Emissions UMTS FDDV
Test Site Location:	CETECOM Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917(a)
Operating Mode:	UE allocated channel 4132
Environmental Conditions:	Humidity: 35%rH; Temperature: 20°C
Operator:	RLS

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
<hr/>	
HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum



9.51a_BE_R_Ch4233_RMC

Common Information

Test Description:	Band-Edge low - Radiated Spurious Emissions UMTS FDDV
Test Site Location:	CETECOM Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917(a)
Operating Mode:	UE allocated channel 4233
Environmental Conditions:	Humidity: 35%rH; Temperature: 20°C
Operator:	RIs

EUT Information

Manufacturer:	Bosch Car Multimedia Portugal, S.A.
EuT:	ECU CTPMIDDTNA
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HW Version:	6794G05
SW Version:	DAIMLER_CTP_16.095.2.
Serial Number:	2820003846
Connected Interfaces:	USB-cable + main wiring + GSM/GNSS antenna + WLAN antenna
Power Supply:	12 V DC

Full Spectrum

