

Annex 1: Measurement diagrams to
TEST REPORT
 No.: 17-1-0051801T05a

According to:
FCC Regulations
 Part 15.209
 Part 15.247

for
 Daimler Trucks North America

CTPDIN
 7 620 000 283

FCC-ID: 2AMIOCTP4465460

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
 WiFi ALLIANCE	 ctia Authorized TM Test Lab Lab Code: 20011130-00		
accredited according to DIN EN ISO/IEC 17025			
CETECOM GmbH Laboratory Radio Communications & Electromagnetic Compatibility Im Teelbruch 116 • 45219 Essen • Germany Registered in Essen, Germany, Reg. No.: HRB Essen 8984 Tel.: + 49 (0) 20 54 / 95 19-954 • Fax: + 49 (0) 20 54 / 95 19-964 E-mail: info@cetecom.com • Internet: www.cetecom.com			

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1. Radiated field strength measurements accord. §15.209&15.205

1.1. Magnetic field measurements $f < 30 \text{ MHz}$

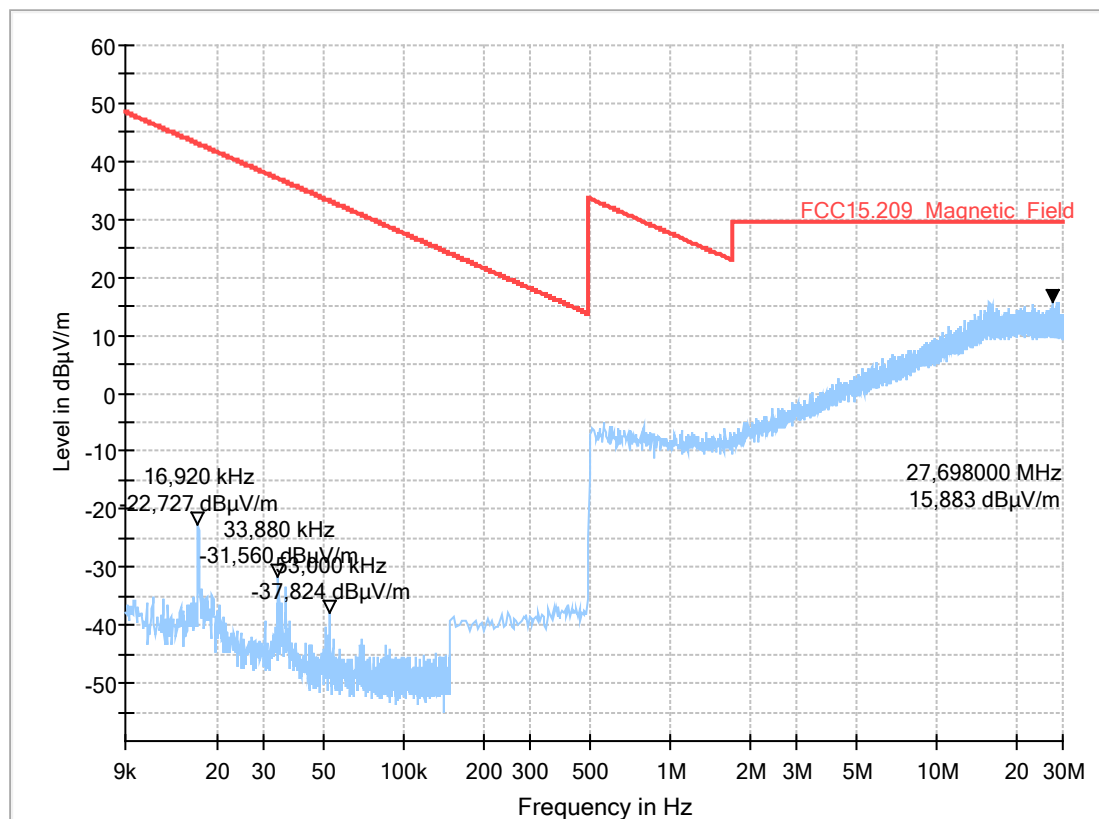
2.10a_BT_LE_low_standing

Test description:	18.05.2017 Page 1 of 1 Magnetic Field Strength Measurement related to 30 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
Technical Data:	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Test specification.:	height 1.00 m, parallel and 90° to EUT polarisation
Operator:	Klv
Operating conditions:	Bluetooth LE low
Power during tests:	24 V DC
Comment 1:	standing

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP_DIN
HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC

Full Spectrum



2.10b_BT_LE_low_laying

18.05.2017 Page 1 of 1

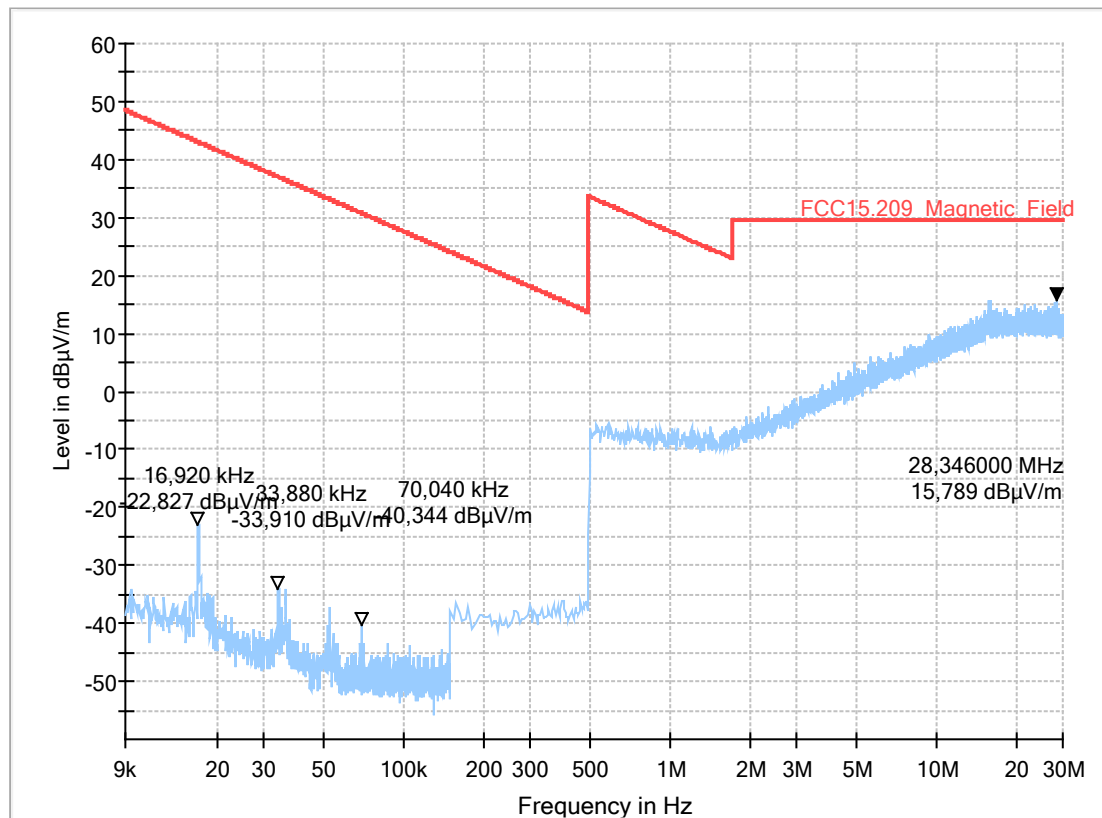
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Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Technical Data:	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Test specification.:	height 1.00 m, parallel and 90° to EUT polarisation
Operator:	Klv
Operating conditions:	Bluetooth LE low
Power during tests:	24 V DC
Comment 1:	laying

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Power Supply:	24 V DC

Full Spectrum



2.11a_BT_LE_mid_standing

18.05.2017 Page 1 of 1

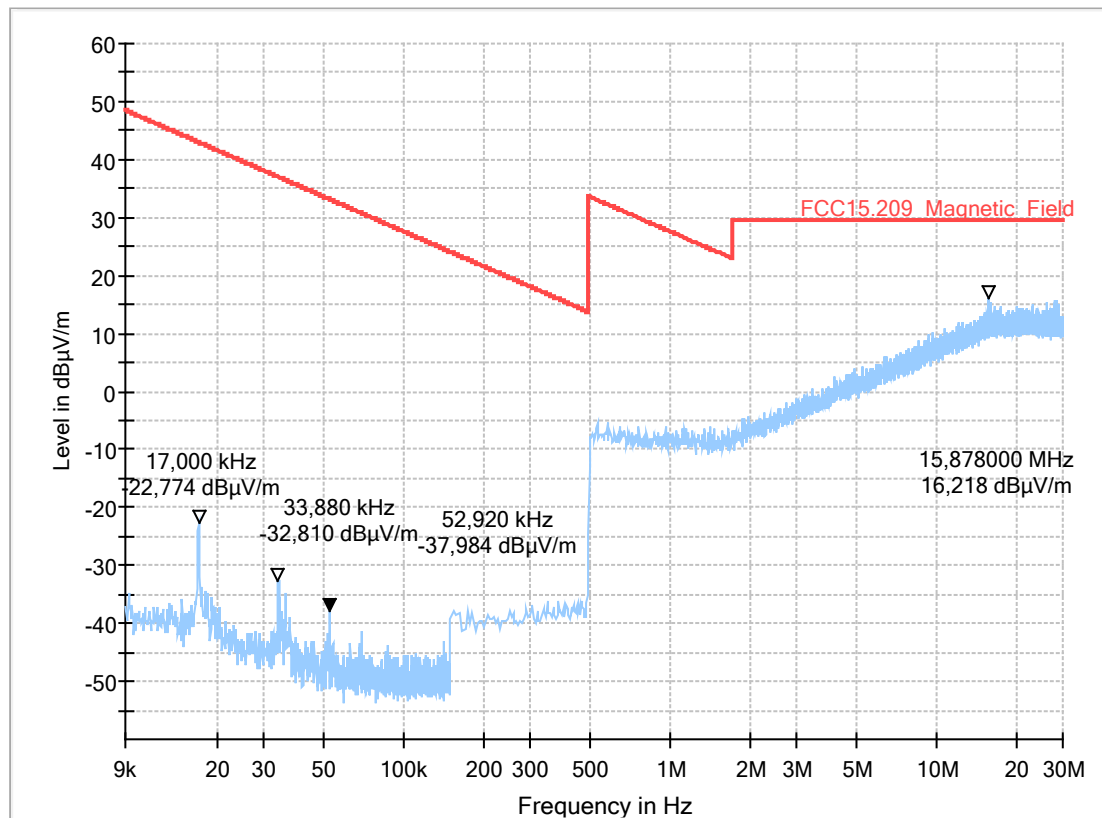
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Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Technical Data:	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Test specification.:	height 1.00 m, parallel and 90° to EUT polarisation
Operator:	Klv
Operating conditions:	Bluetooth LE middle
Power during tests:	24 V DC
Comment 1:	standing

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Power Supply:	24 V DC

Full Spectrum



2.11b_BT_LE_mid_laying

18.05.2017 Page 1 of 1

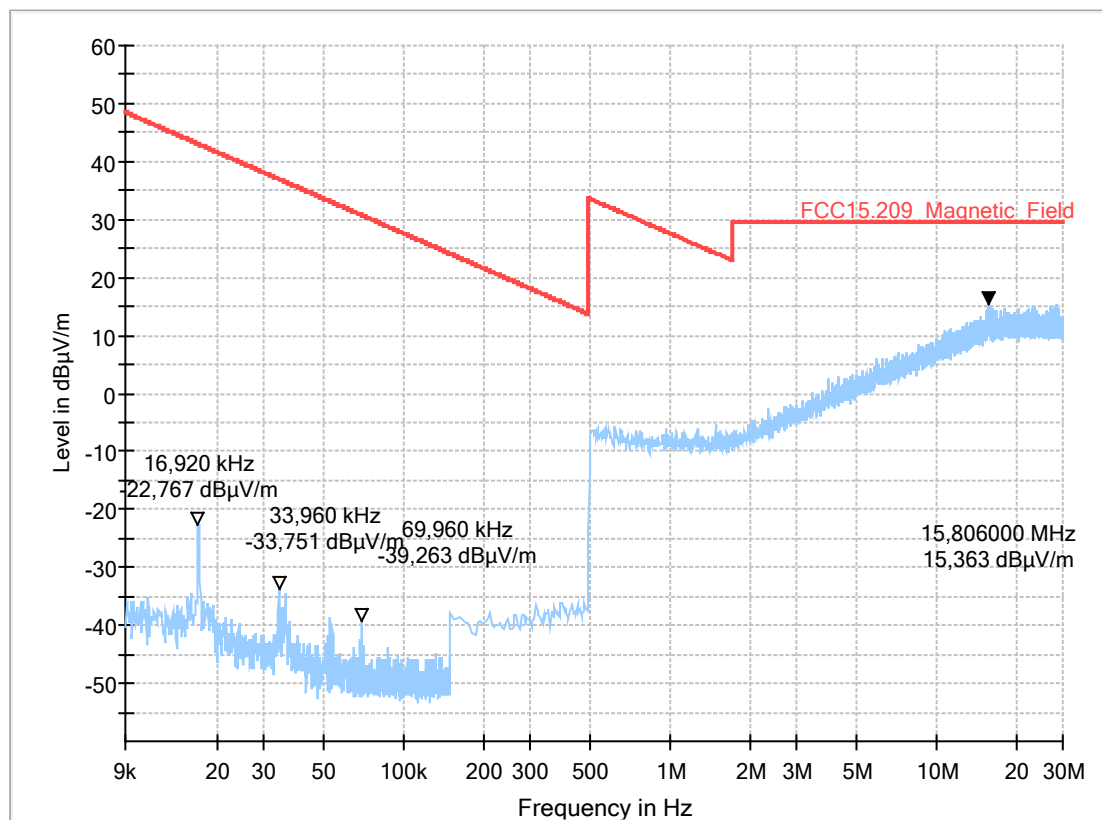
Test description:	Magnetic Field Strength Measurement related to 30 m distance
Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
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Full Spectrum



2.12a_BT_LE_high_standing

18.05.2017 Page 1 of 1

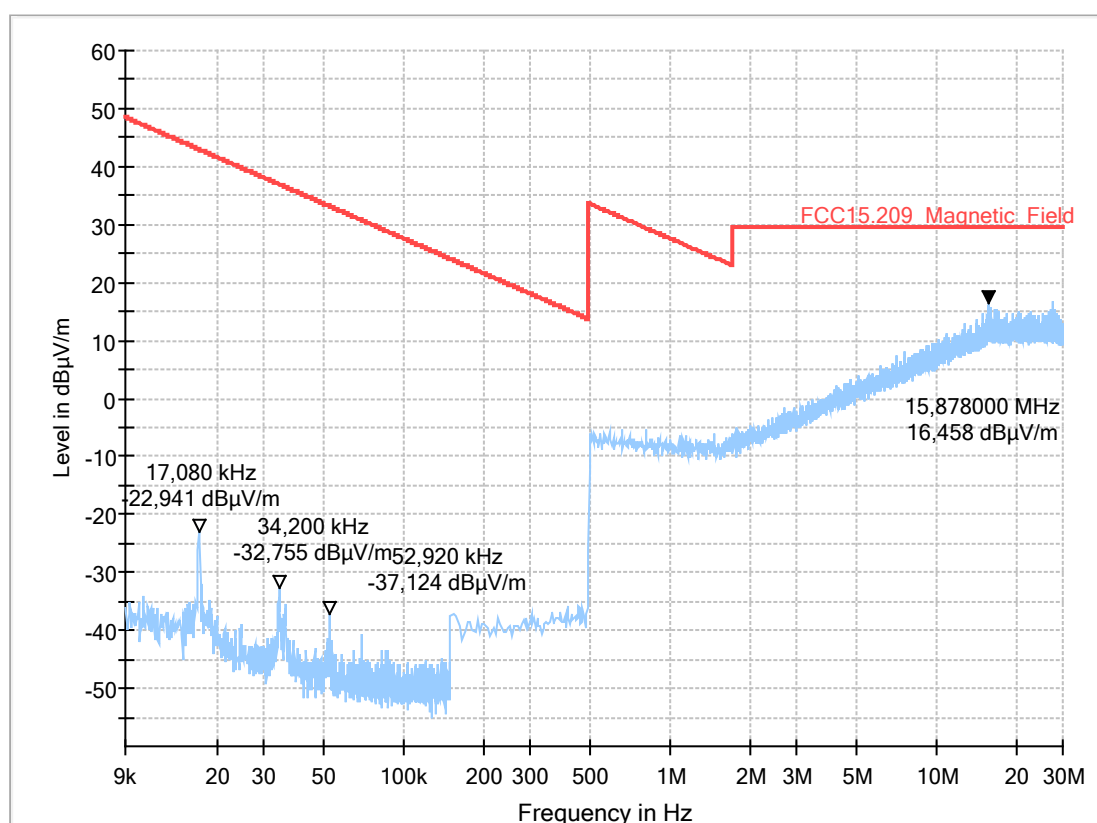
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Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Technical Data:	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Test specification.:	height 1.00 m, parallel and 90° to EUT polarisation
Operator:	Klv
Operating conditions:	Bluetooth LE high
Power during tests:	24 V DC
Comment 1:	standing

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Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP_DIN

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Power Supply:	24 V DC

Full Spectrum



2.12b_BT_LE_high_laying

18.05.2017 Page 1 of 1

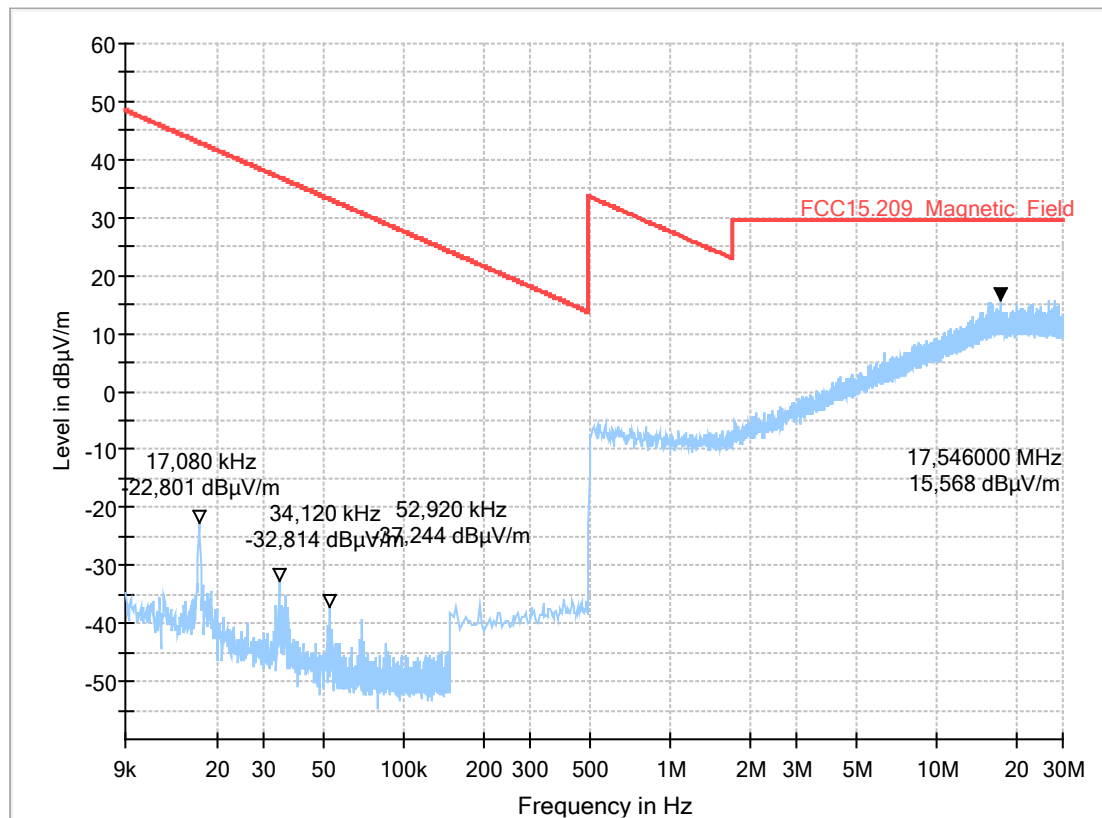
Test description:	Magnetic Field Strength Measurement related to 30 m distance
Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Technical Data:	FCC 15.205 § 15.209; RSS-Gen: Issue 4
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Operator:	Klv
Operating conditions:	Bluetooth LE high
Power during tests:	24 V DC
Comment 1:	laying

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SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC

Full Spectrum



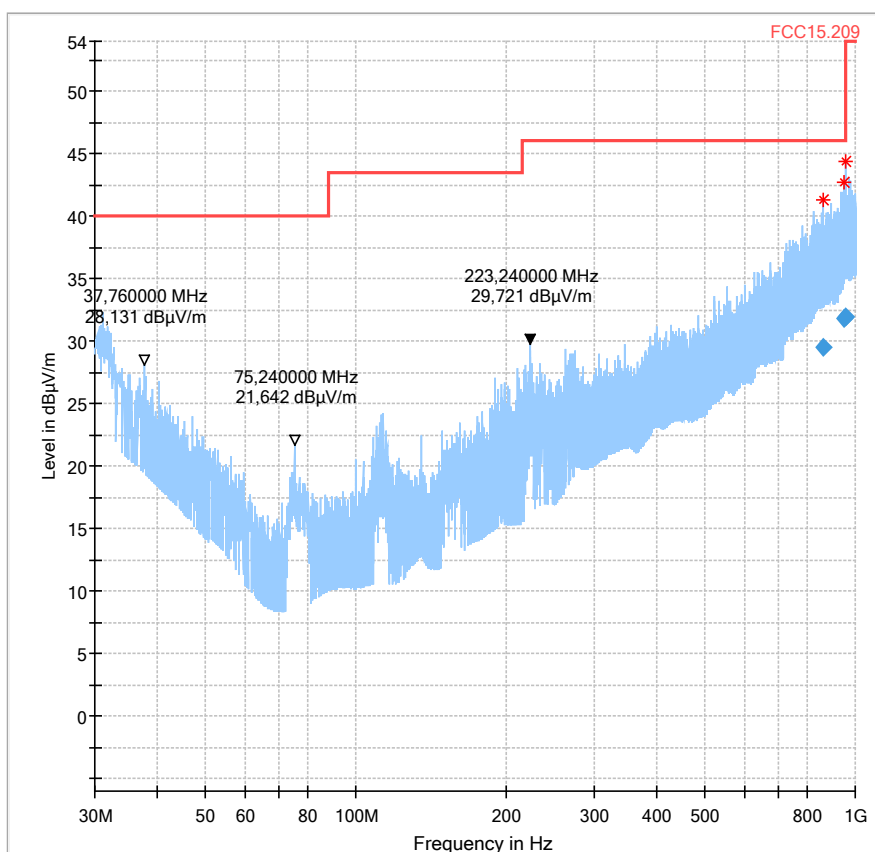
3.10a_BT_LE_low_standing

Test description: Electric Field Strength Measurement
 Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
 Version of Testsoftware: EMC32 V9.25.0
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.209; RSS-Gen: Issue 3
 Operator: Klv
 Operating conditions: Bluetooth LE low
 Power during tests: 24 V DC
 Comment 1: standing

EUT Information

Manufacturer: Robert Bosch Car Multimedia GmbH
 EuT: ECU cTP_DIN
 HW Version: 6797G04
 SW Version: 16.099.2
 Serial Number: 2830006236
 Connected Interfaces: Main wiring + SFTP 920 151 014
 Power Supply: 24 V DC

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
862.176000	29.52	46.00	16.48	1000.0	120.000	151.0	H	180.0	25.8
950.144000	31.82	46.00	14.18	1000.0	120.000	349.0	V	355.0	27.2
957.108000	31.98	46.00	14.02	1000.0	120.000	360.0	V	0.0	27.4

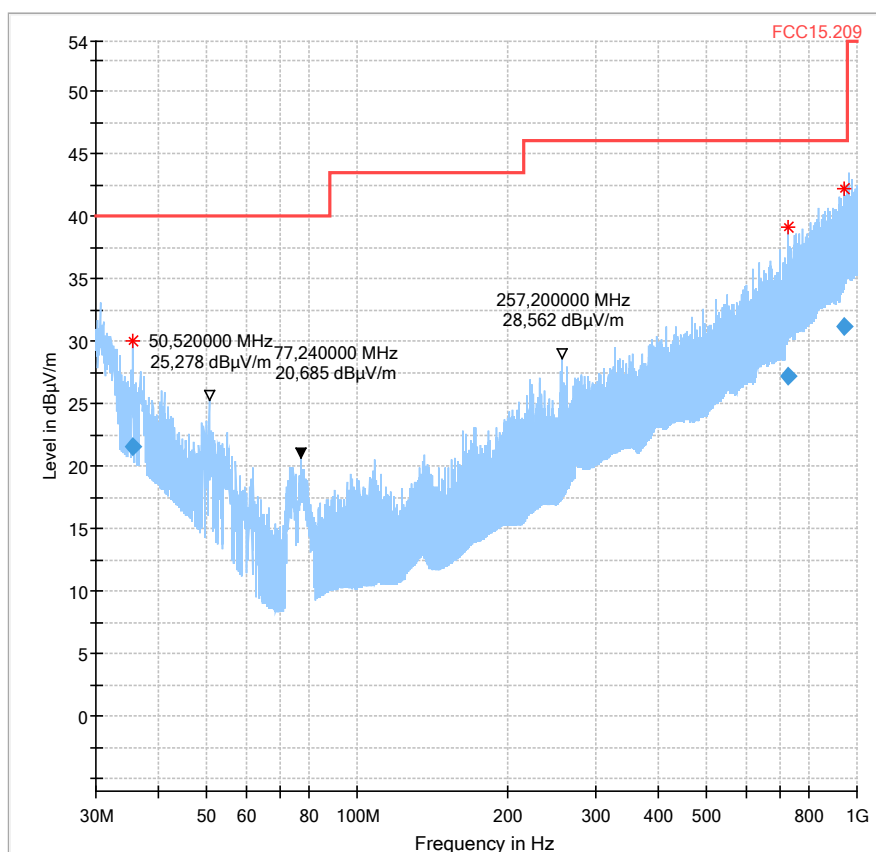
3.10b_BT_LE_low_laying

Test description: Electric Field Strength Measurement
 Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
 Version of Testsoftware: EMC32 V9.25.0
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.209; RSS-Gen: Issue 3
 Operator: Klv
 Operating conditions: Bluetooth LE low
 Power during tests: 24 V DC
 Comment 1: laying

EUT Information

Manufacturer: Robert Bosch Car Multimedia GmbH
 EuT: ECU cTP_DIN
 HW Version: 6797G04
 SW Version: 16.099.2
 Serial Number: 2830006236
 Connected Interfaces: Main wiring + SFTP 920 151 014
 Power Supply: 24 V DC

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
35.592000	21.62	40.00	18.38	1000.0	120.000	273.0	H	141.0	19.0
730.396000	27.18	46.00	18.82	1000.0	120.000	137.0	V	356.0	24.4
942.744000	31.18	46.00	14.82	1000.0	120.000	113.0	H	359.0	26.9

3.11a_BT_LE_mid_standing

14.05.2017 Page 1 of 2

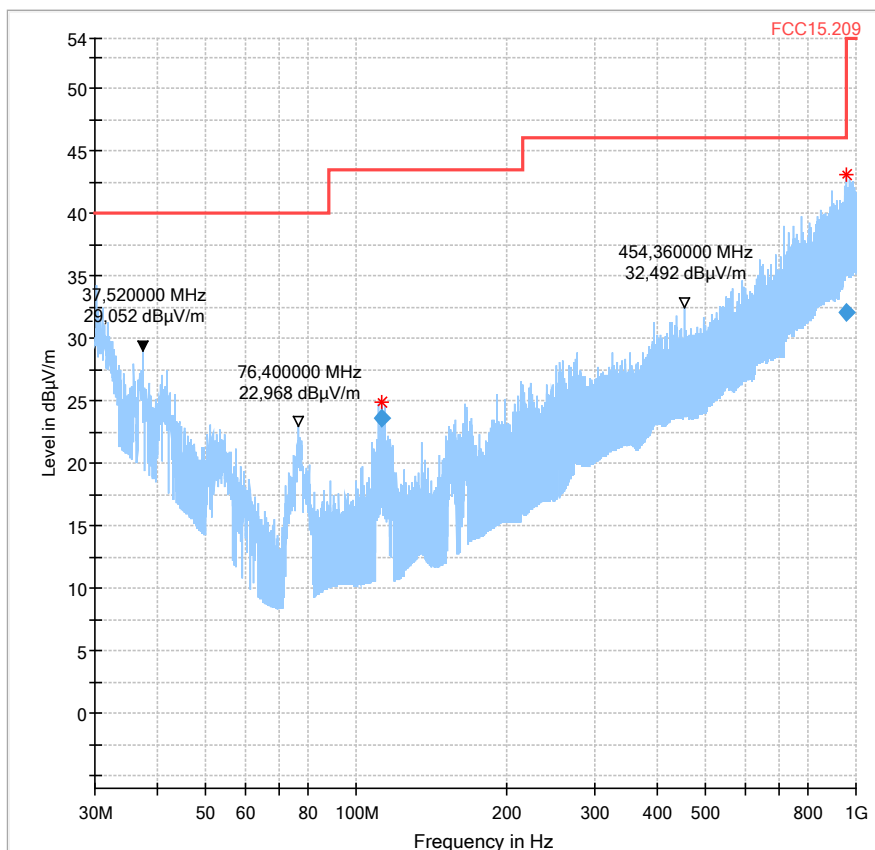
Test description: Electric Field Strength Measurement
Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware: EMC32 V9.25.0
Technical Data: please see page 2 for detailed data of measurement setup
Test specification.: FCC 15.209; RSS-Gen: Issue 3
Operator: Klv
Operating conditions: Bluetooth LE middle
Power during tests: 24 V DC
Comment 1: standing

EUT Information

Manufacturer: Robert Bosch Car Multimedia GmbH
EuT: ECU cTP_DIN

HW Version: 6797G04
SW Version: 16.099.2
Serial Number: 2830006236
Connected Interfaces: Main wiring + SFTP 920 151 014
Power Supply: 24 V DC

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
112.528000	23.58	43.50	19.92	1000.0	120.000	125.0	V	288.0	8.1
957.928000	32.09	46.00	13.91	1000.0	120.000	362.0	H	314.0	27.4

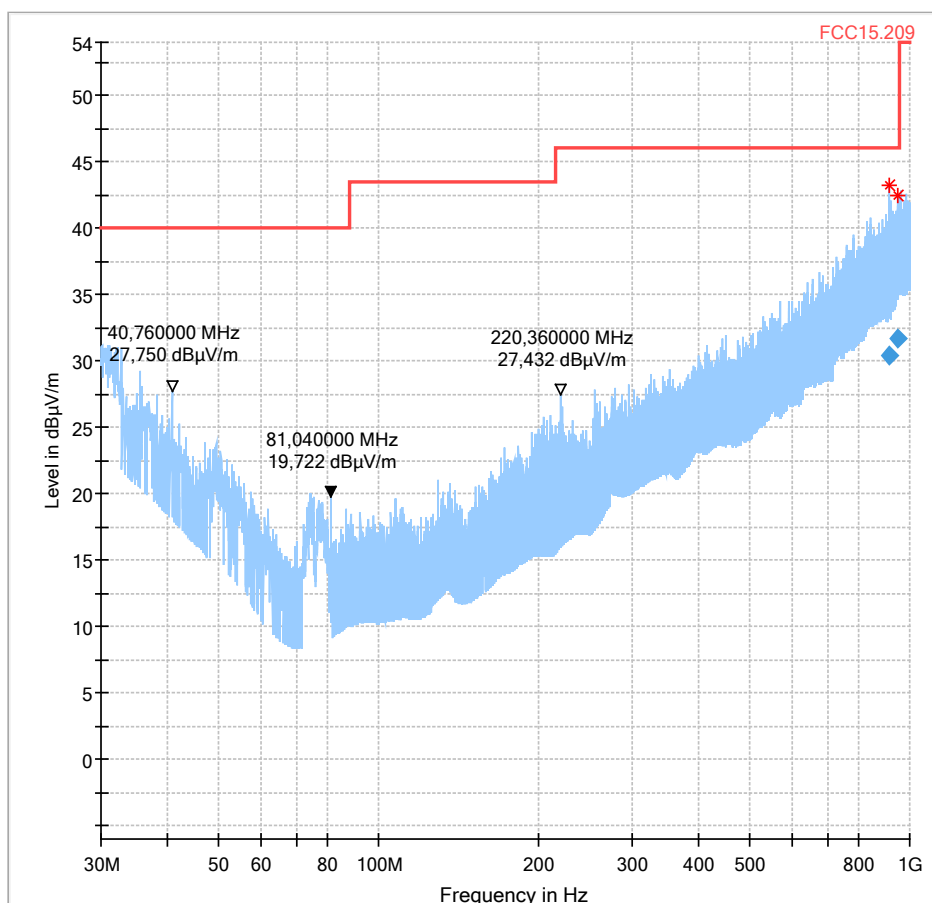
3.11b_BT_LE_mid_laying

Test description: Electric Field Strength Measurement
 Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
 Version of Testsoftware: EMC32 V9.25.0
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.209; RSS-Gen: Issue 3
 Operator: Klv
 Operating conditions: Bluetooth LE middle
 Power during tests: 24 V DC
 Comment 1: laying

EUT Information

Manufacturer: Robert Bosch Car Multimedia GmbH
 EuT: ECU cTP_DIN
 HW Version: 6797G04
 SW Version: 16.099.2
 Serial Number: 2830006236
 Connected Interfaces: Main wiring + SFTP 920 151 014
 Power Supply: 24 V DC

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
914.244000	30.39	46.00	15.61	1000.0	120.000	134.0	V	50.0	27.0
949.160000	31.69	46.00	14.31	1000.0	120.000	353.0	H	102.0	27.1

3.12a_BT_LE_high_standing

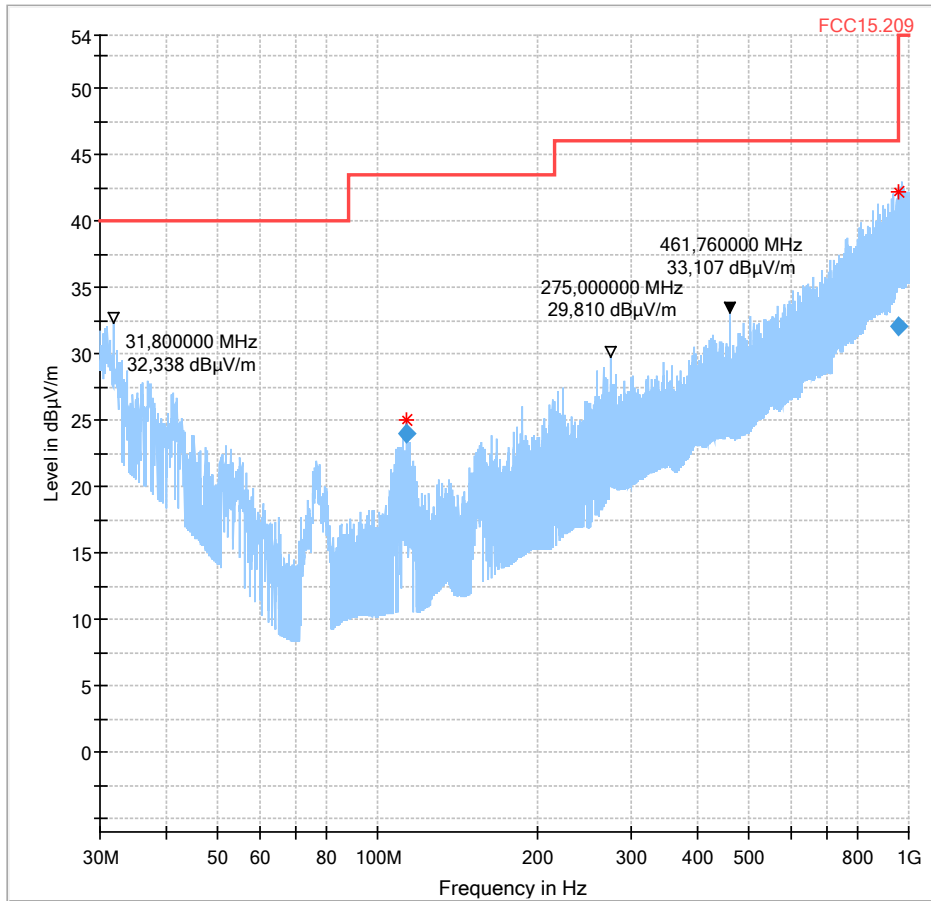
Test description: Electric Field Strength Measurement
 Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
 Version of Testsoftware: EMC32 V9.25.0
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.209; RSS-Gen: Issue 3
 Operator: Klv
 Operating conditions: Bluetooth LE high
 Power during tests: 24 V DC
 Comment 1: standing

EUT Information

Manufacturer: Robert Bosch Car Multimedia GmbH
 EuT: ECU cTP_DIN

 HW Version: 6797G04
 SW Version: 16.099.2
 Serial Number: 2830006236
 Connected Interfaces: Main wiring + SFTP 920 151 014
 Power Supply: 24 V DC

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
113.684000	24.02	43.50	19.48	1000.0	120.000	121.0	V	290.0	8.1
958.740000	32.11	46.00	13.89	1000.0	120.000	134.0	H	274.0	27.5

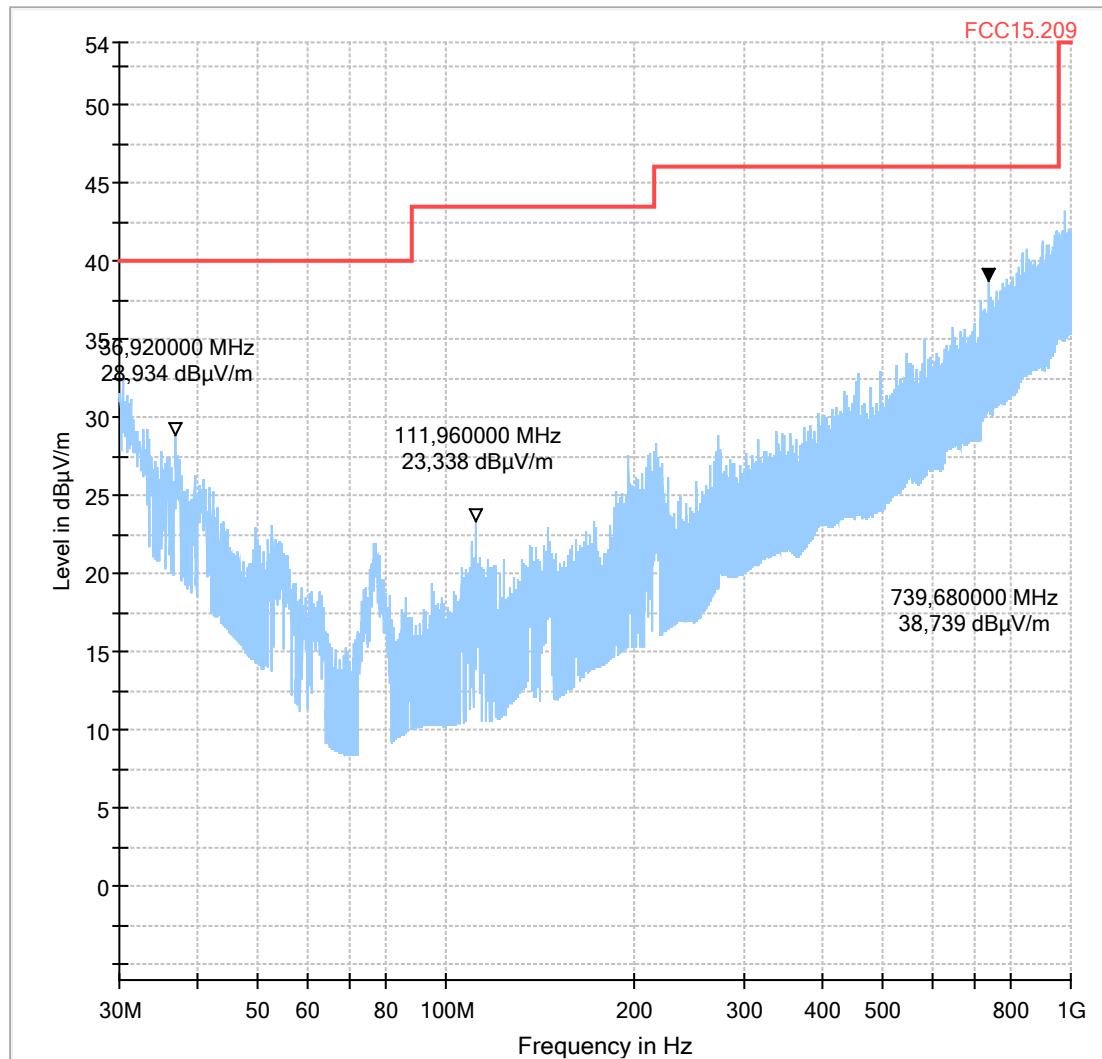
3.12b_BT_LE_high_laying

Test description:	14.05.2017 Page 1 of 1
Test site and distance:	Electric Field Strength Measurement
Version of Testsoftware:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Technical Data:	EMC32 V9.25.0
Test specification.:	please see page 2 for detailed data of measurement setup
Operator:	FCC 15.209; RSS-Gen: Issue 3
Operating conditions:	Klv
Power during tests:	Bluetooth LE high
Comment 1:	24 V DC
	laying

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP_DIN
HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC

Full Spectrum



1.2. Field strength measurements 30MHz <f <1GHz

3.10a_BT_LE_low_standing

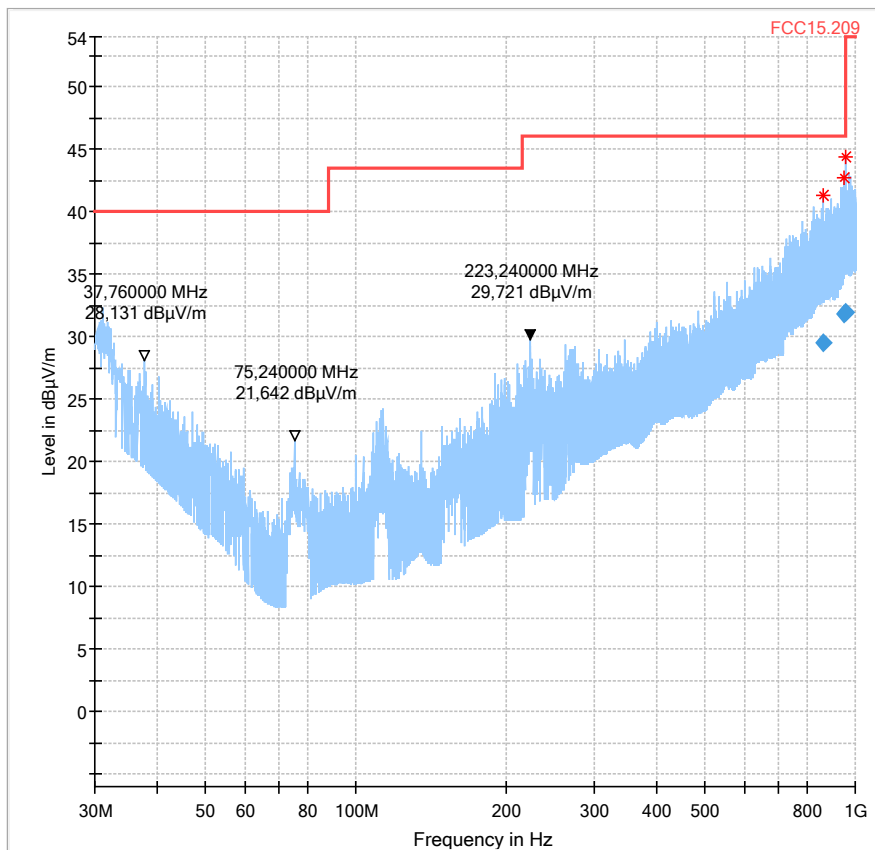
14.05.2017 Page 1 of 2
Test description: Electric Field Strength Measurement
Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware: EMC32 V9.25.0
Technical Data: please see page 2 for detailed data of measurement setup
Test specification.: FCC 15.209; RSS-Gen: Issue 3
Operator: Klv
Operating conditions: Bluetooth LE low
Power during tests: 24 V DC
Comment 1: standing

EUT Information

Manufacturer: Robert Bosch Car Multimedia GmbH
EuT: ECU cTP_DIN

HW Version: 6797G04
SW Version: 16.099.2
Serial Number: 2830006236
Connected Interfaces: Main wiring + SFTP 920 151 014
Power Supply: 24 V DC

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
862.176000	29.52	46.00	16.48	1000.0	120.000	151.0	H	180.0	25.8
950.144000	31.82	46.00	14.18	1000.0	120.000	349.0	V	355.0	27.2
957.108000	31.98	46.00	14.02	1000.0	120.000	360.0	V	0.0	27.4

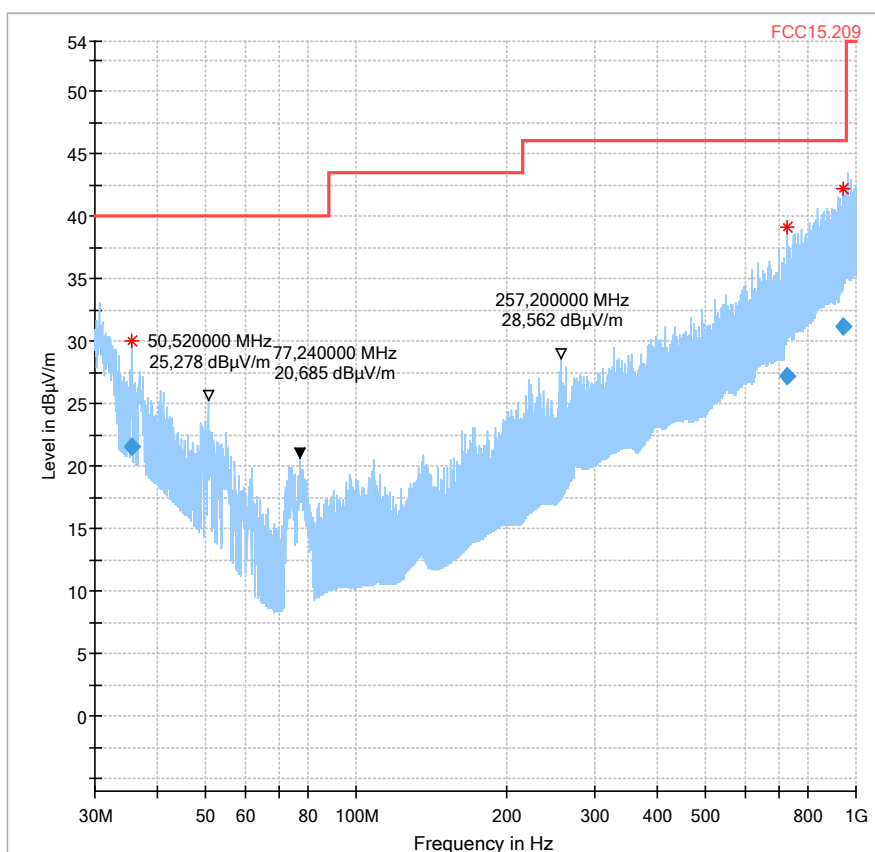
3.10b_BT_LE_low_laying

Test description: Electric Field Strength Measurement
 Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
 Version of Testsoftware: EMC32 V9.25.0
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.209; RSS-Gen: Issue 3
 Operator: Klv
 Operating conditions: Bluetooth LE low
 Power during tests: 24 V DC
 Comment 1: laying

EUT Information

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 EuT: ECU cTP_DIN
 HW Version: 6797G04
 SW Version: 16.099.2
 Serial Number: 2830006236
 Connected Interfaces: Main wiring + SFTP 920 151 014
 Power Supply: 24 V DC

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
35.592000	21.62	40.00	18.38	1000.0	120.000	273.0	H	141.0	19.0
730.396000	27.18	46.00	18.82	1000.0	120.000	137.0	V	356.0	24.4
942.744000	31.18	46.00	14.82	1000.0	120.000	113.0	H	359.0	26.9

3.11a_BT_LE_mid_standing

14.05.2017 Page 1 of 2

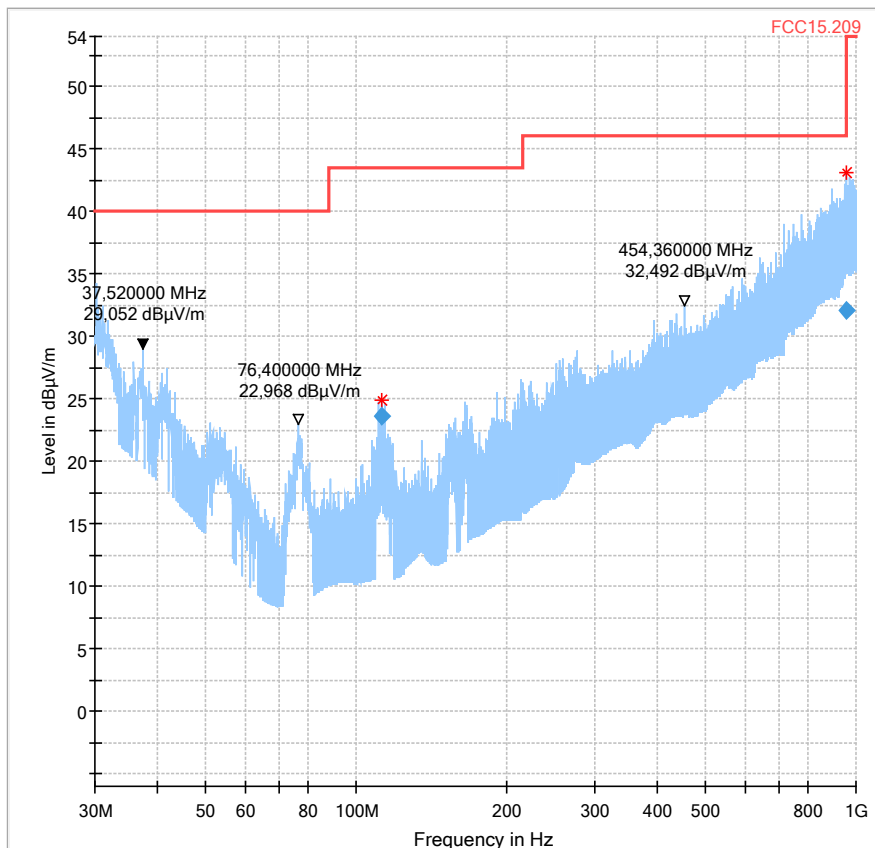
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 Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
 Version of Testsoftware: EMC32 V9.25.0
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.209; RSS-Gen: Issue 3
 Operator: Klv
 Operating conditions: Bluetooth LE middle
 Power during tests: 24 V DC
 Comment 1: standing

EUT Information

Manufacturer: Robert Bosch Car Multimedia GmbH
 EuT: ECU cTP_DIN

 HW Version: 6797G04
 SW Version: 16.099.2
 Serial Number: 2830006236
 Connected Interfaces: Main wiring + SFTP 920 151 014
 Power Supply: 24 V DC

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
112.528000	23.58	43.50	19.92	1000.0	120.000	125.0	V	288.0	8.1
957.928000	32.09	46.00	13.91	1000.0	120.000	362.0	H	314.0	27.4

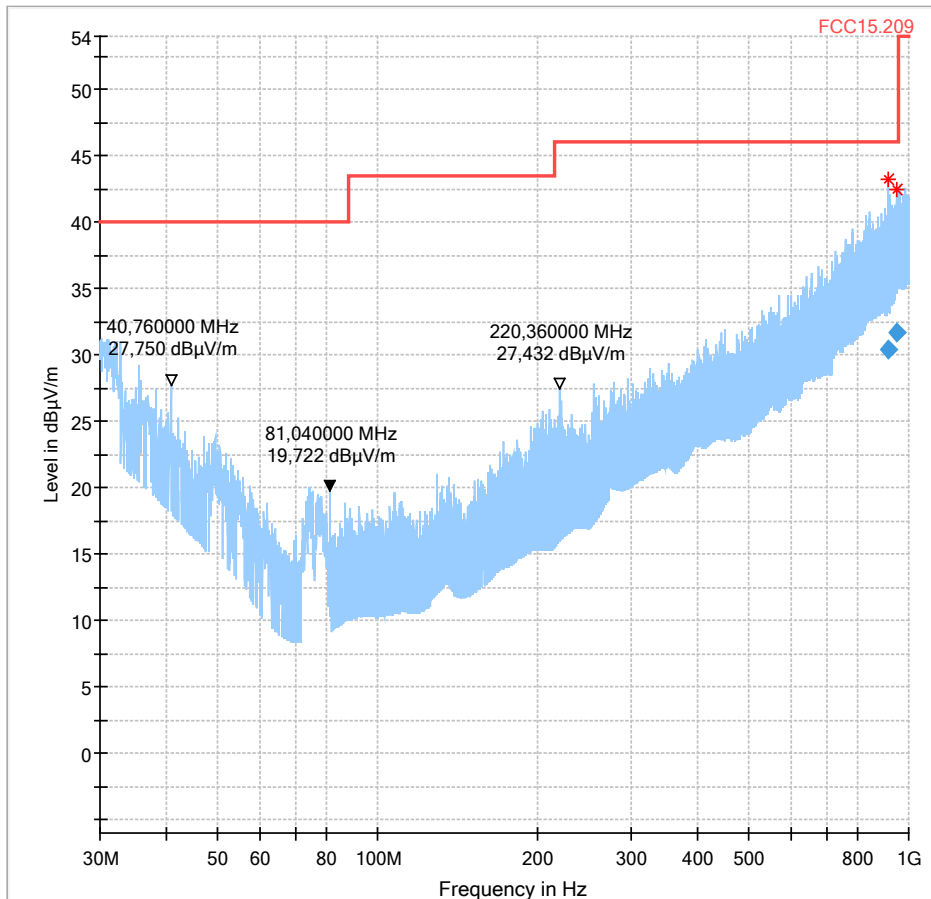
3.11b_BT_LE_mid_laying

Test description: Electric Field Strength Measurement
 Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
 Version of Testsoftware: EMC32 V9.25.0
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.209; RSS-Gen: Issue 3
 Operator: Klv
 Operating conditions: Bluetooth LE middle
 Power during tests: 24 V DC
 Comment 1: laying

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 HW Version: 6797G04
 SW Version: 16.099.2
 Serial Number: 2830006236
 Connected Interfaces: Main wiring + SFTP 920 151 014
 Power Supply: 24 V DC

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Correction (dB)
914.244000	30.39	46.00	15.61	1000.0	120.000	134.0	V	50.0	27.0
949.160000	31.69	46.00	14.31	1000.0	120.000	353.0	H	102.0	27.1

3.12a_BT_LE_high_standing

14.05.2017 Page 1 of 2

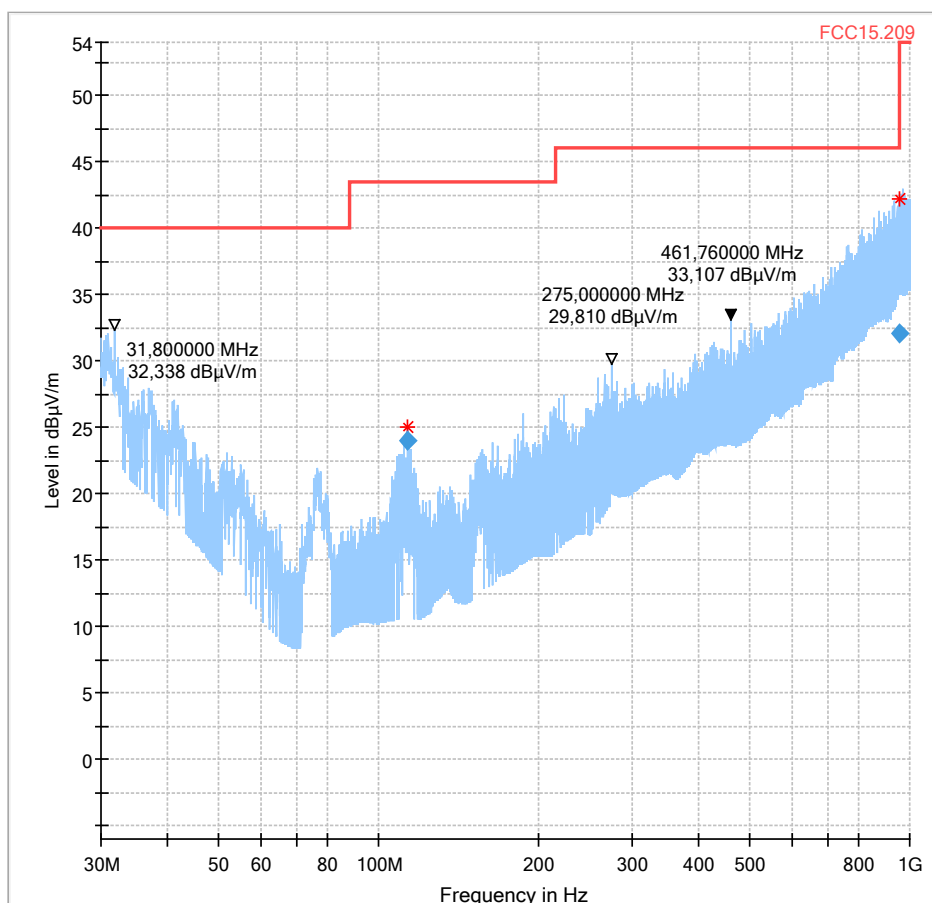
Test description: Electric Field Strength Measurement
 Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
 Version of Testsoftware: EMC32 V9.25.0
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.209; RSS-Gen: Issue 3
 Operator: Klv
 Operating conditions: Bluetooth LE high
 Power during tests: 24 V DC
 Comment 1: standing

EUT Information

Manufacturer: Robert Bosch Car Multimedia GmbH
 EuT: ECU cTP_DIN

HW Version: 6797G04
 SW Version: 16.099.2
 Serial Number: 2830006236
 Connected Interfaces: Main wiring + SFTP 920 151 014
 Power Supply: 24 V DC

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Correction (dB)
113.684000	24.02	43.50	19.48	1000.0	120.000	121.0	V	290.0	8.1
958.740000	32.11	46.00	13.89	1000.0	120.000	134.0	H	274.0	27.5

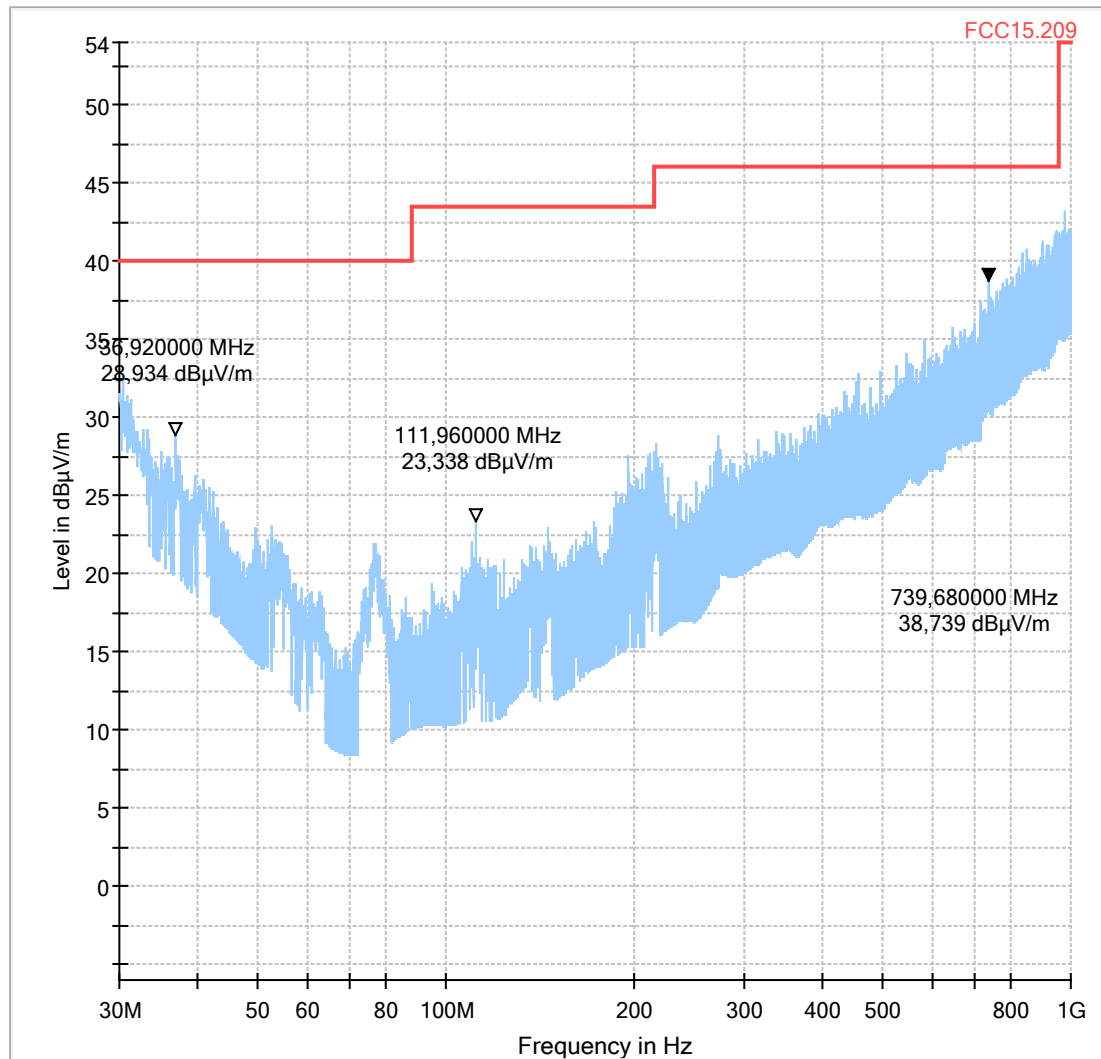
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Operating conditions:	Klv
Power during tests:	Bluetooth LE high
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EuT:	ECU cTP_DIN
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SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC

Full Spectrum



1.3. Field strength measurements $f < 18\text{GHz}$

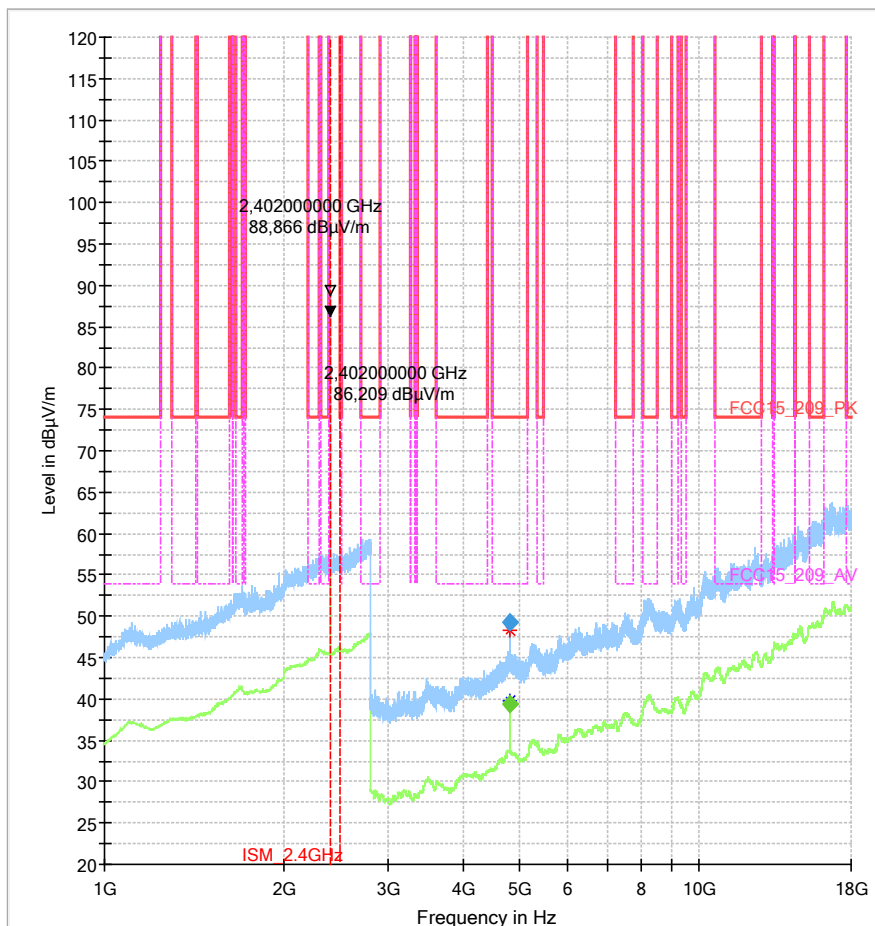
4.10a_BT_LE_low_standing

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, BT_LE_low
Operator Name:	RIs
Comment:	standing

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP_DIN
HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC



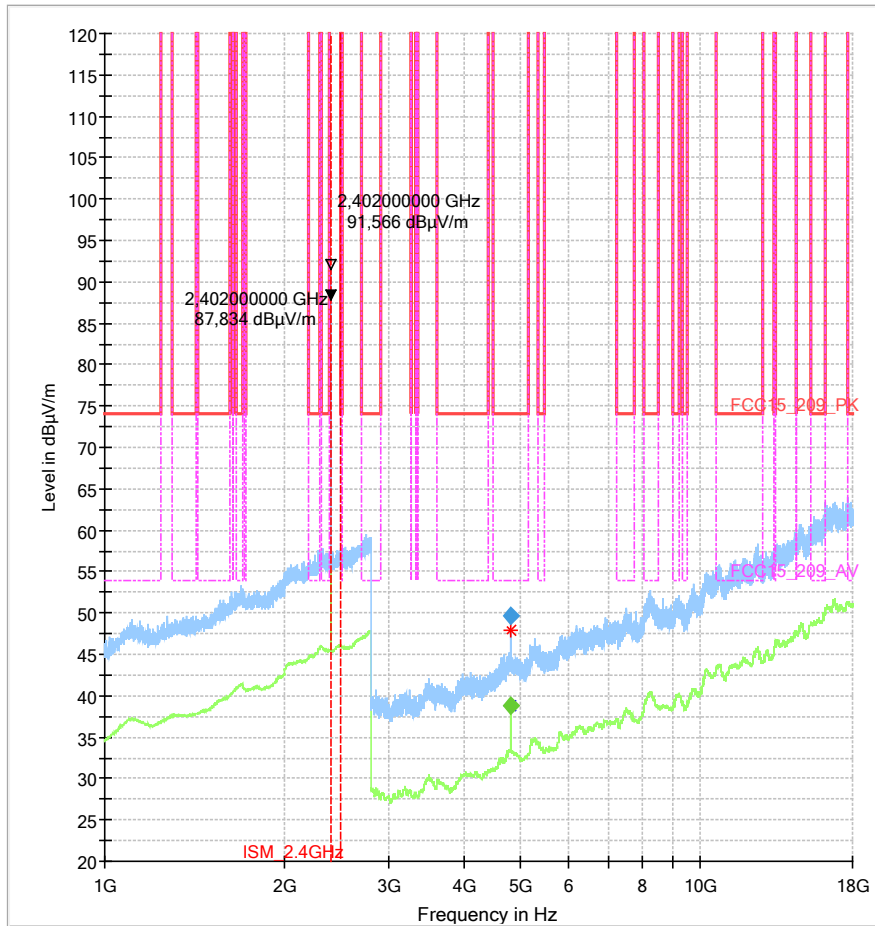
4.10b_BT_LE_low_laying

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, BT_LE_low
Operator Name:	RLS
Comment:	laying

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP_DIN
HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
4803.600000	---	38.80	54.00	15.20	100.0	1000.000	155.0	V	49.0	0.0
4804.400000	49.67	---	74.00	24.33	100.0	1000.000	155.0	V	50.0	0.0

4.11a_BT_LE_mid_standing

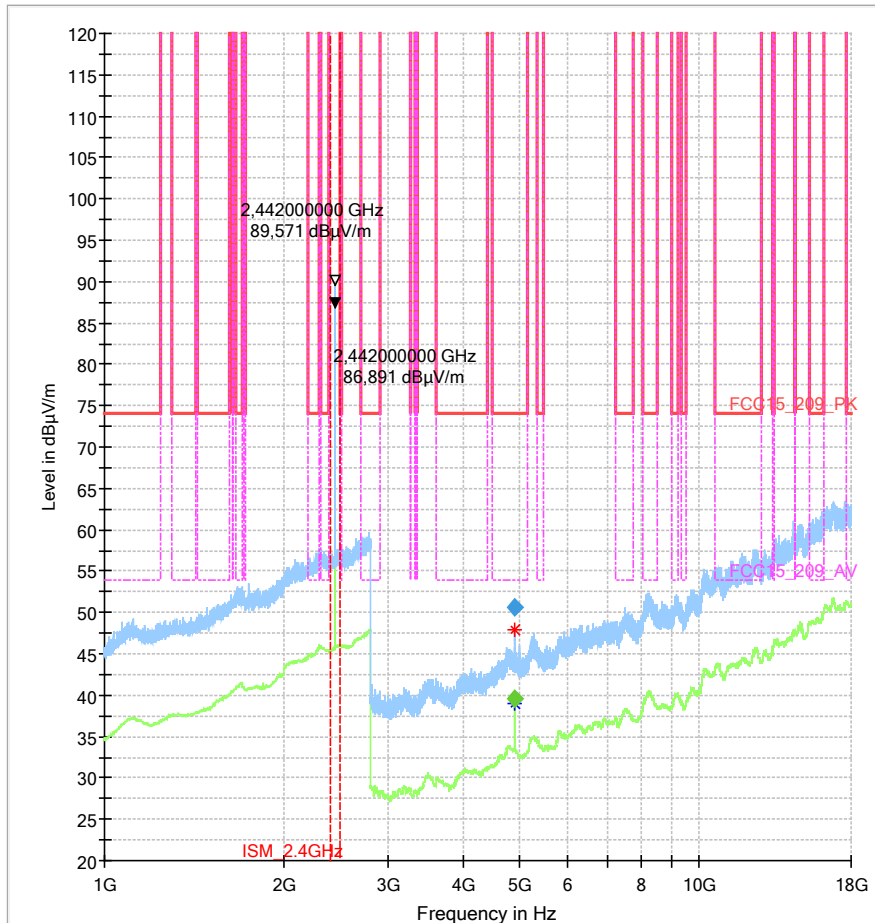
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, BT_LE_mid
Operator Name:	RLS
Comment:	standing

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP_DIN

HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC



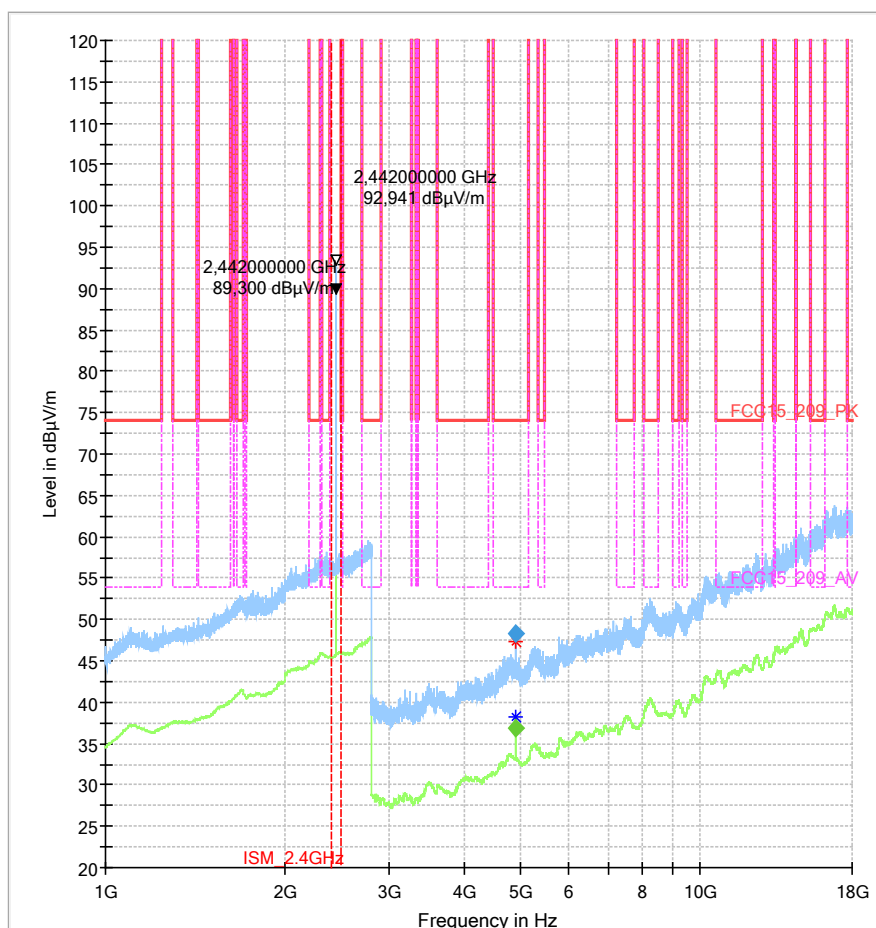
4.11b_BT_LE_mid_laying

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, BT_LE_mid
Operator Name:	RLS
Comment:	laying

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP_DIN
HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
4883.600000	---	36.95	54.00	17.05	100.0	1000.000	155.0	V	338.0	0.0
4884.400000	48.38	---	74.00	25.62	100.0	1000.000	155.0	V	337.0	0.0

4.12a_BT_LE_high_standing

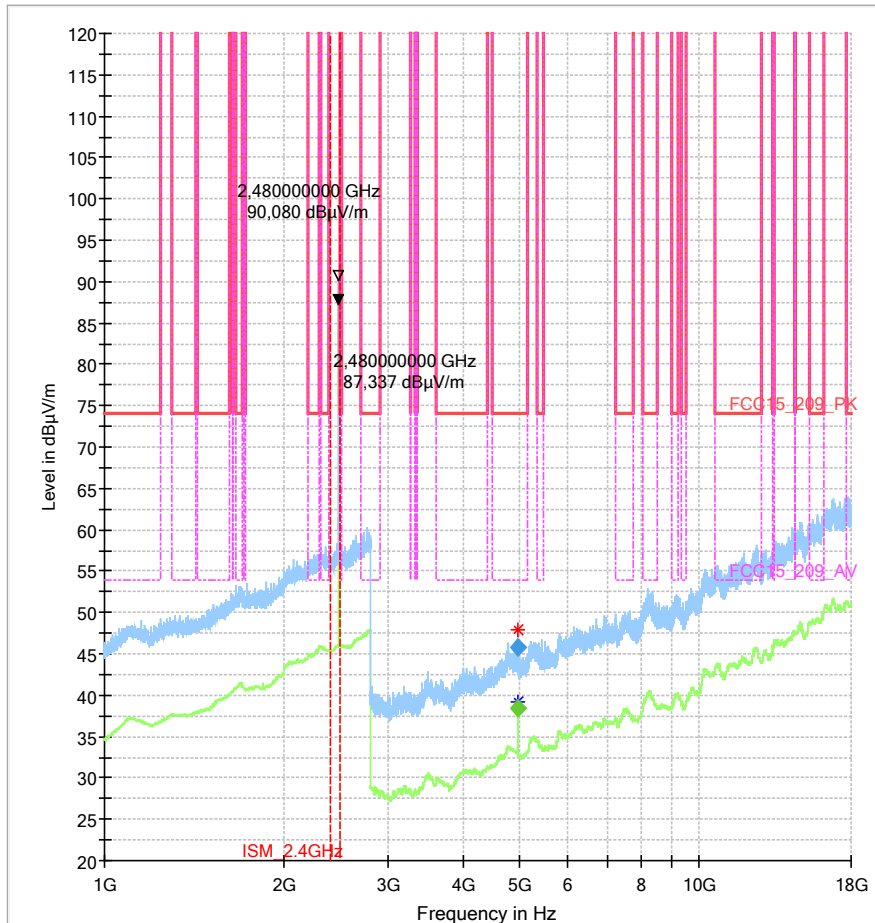
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, BT_LE_high
Operator Name:	RLS
Comment:	standing

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP_DIN

HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC



4.12b_BT_LE_high_laying

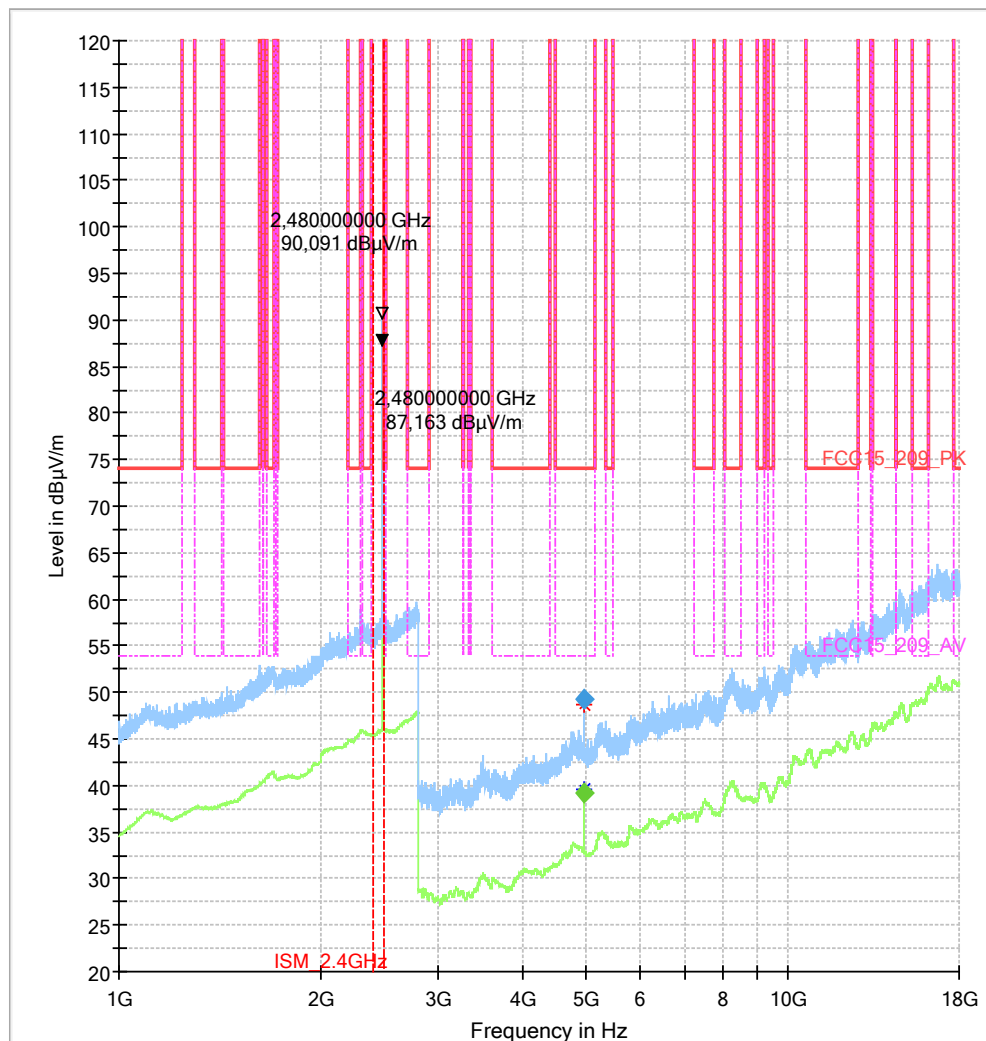
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, BT_LE_high
Operator Name:	RIs
Comment:	laying

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP _DIN

HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC



1.4. Field strength measurements $f > 18\text{GHz}$

Diagram No.: 4.10c_BT_LE_low

Common Information

Test Description:	Radiated field strength emission in 1m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247, 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Distance correction factor	3 to 1m: -10.5 dB applying to measurement results
SW-Version:	EMC32 V8.53.0
Operation mode:	TX mode continuous
Operator Name:	TFr

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP _DIN

HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014

FCC_Sweep_15.247_18_25GHz_Pre

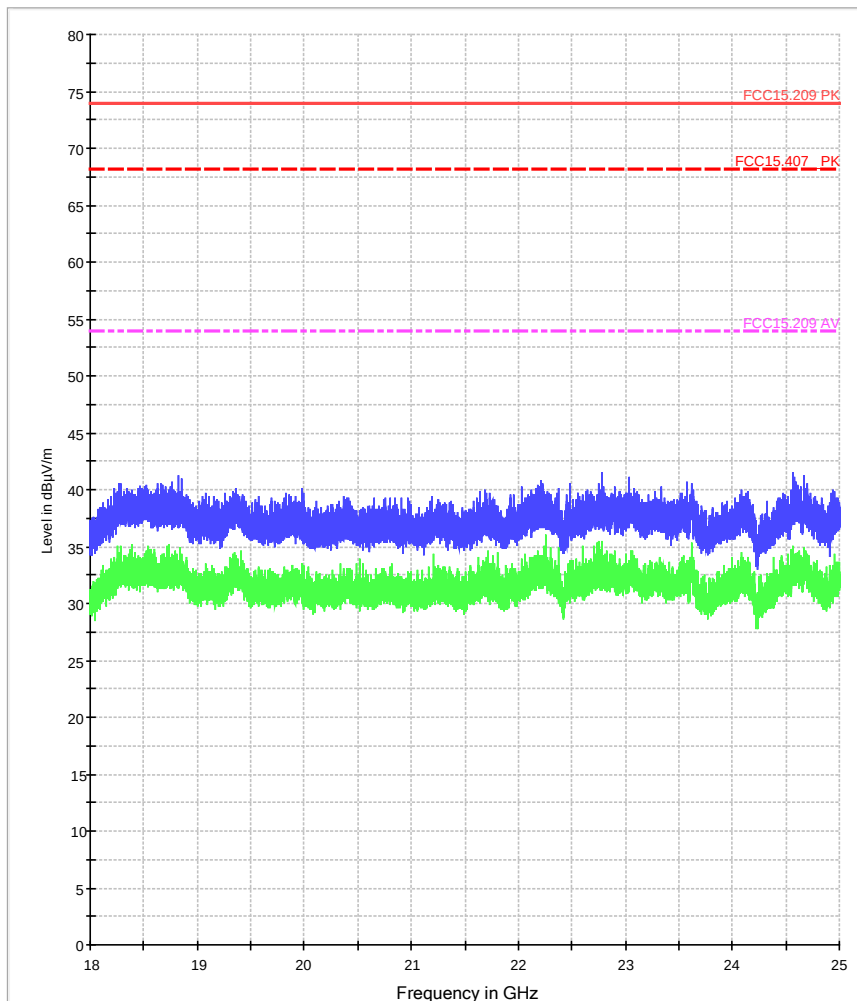


Diagram No.: 4.11c_BT_LE_mid

Common Information

Test Description:	Radiated field strength emission in 1m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247, 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Distance correction factor	3 to 1m: -10.5 dB applying to measurement results
SW-Version:	EMC32 V8.53.0
Operation mode:	TX mode continuous
Operator Name:	TFr

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP _DIN

HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014

FCC_Sweep_15.247_18_25GHz_Pre

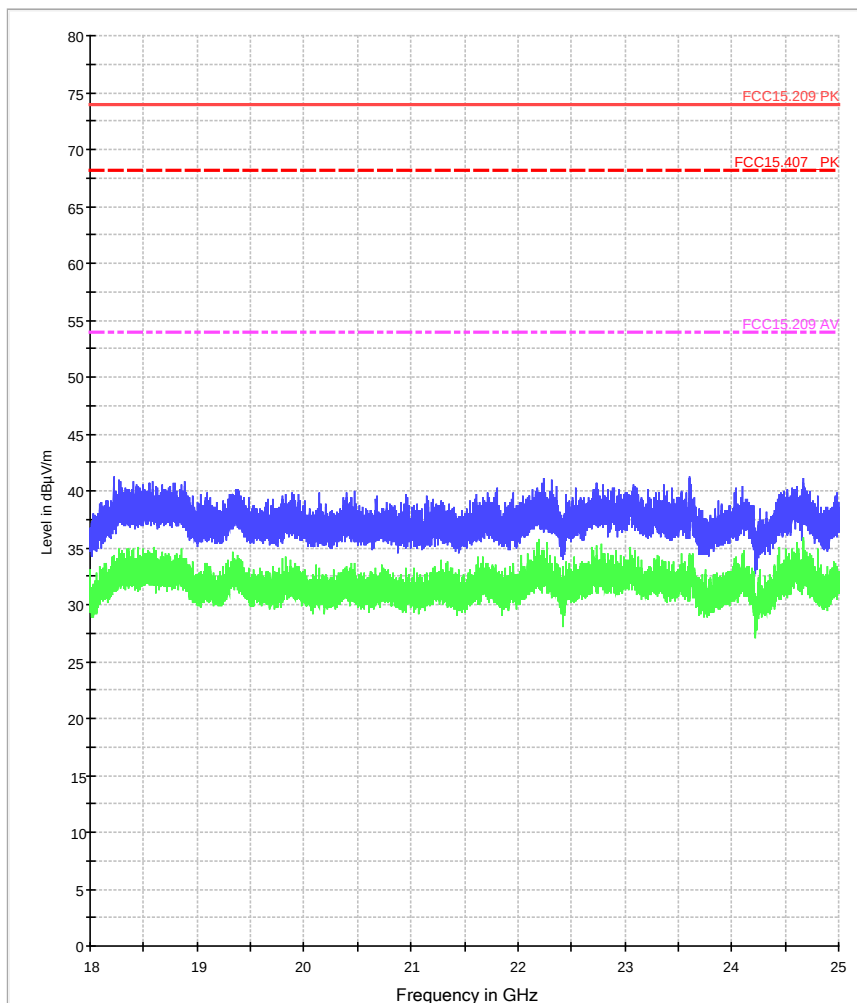


Diagram No.: 4.12c_BT_LE_high

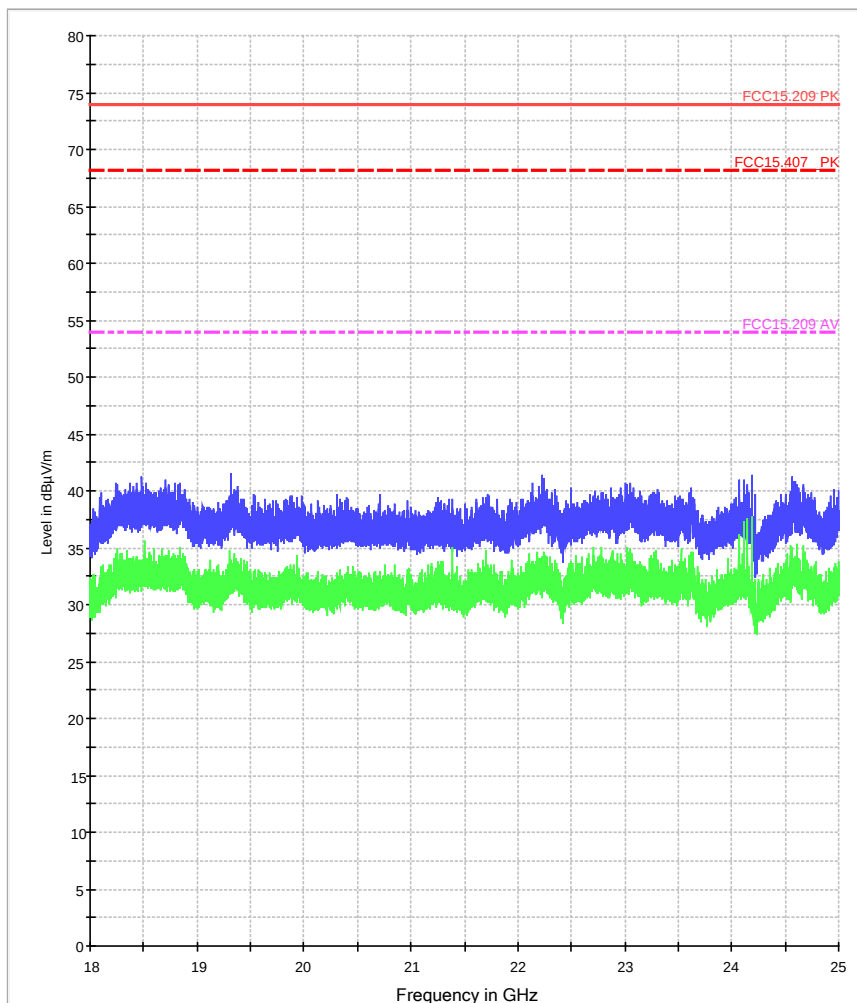
Common Information

Test Description:	Radiated field strength emission in 1m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247, 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Distance correction factor	3 to 1m: -10.5 dB applying to measurement results
SW-Version:	EMC32 V8.53.0
Operation mode:	TX mode continuous
Operator Name:	TFr

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP _DIN
HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014

FCC_Sweep_15.247_18_25GHz_Pre



2. Radiated band-edge measurements accord. §15.209 & §15.205 (§15.247)

2.1. Channel 37 (left band edge)

Diagram No.: 9.07a_BE_BT_LE_low_standing

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous BlueTooth LE
Operator Name:	AFr
Comment:	Channel low

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP _DIN
HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC

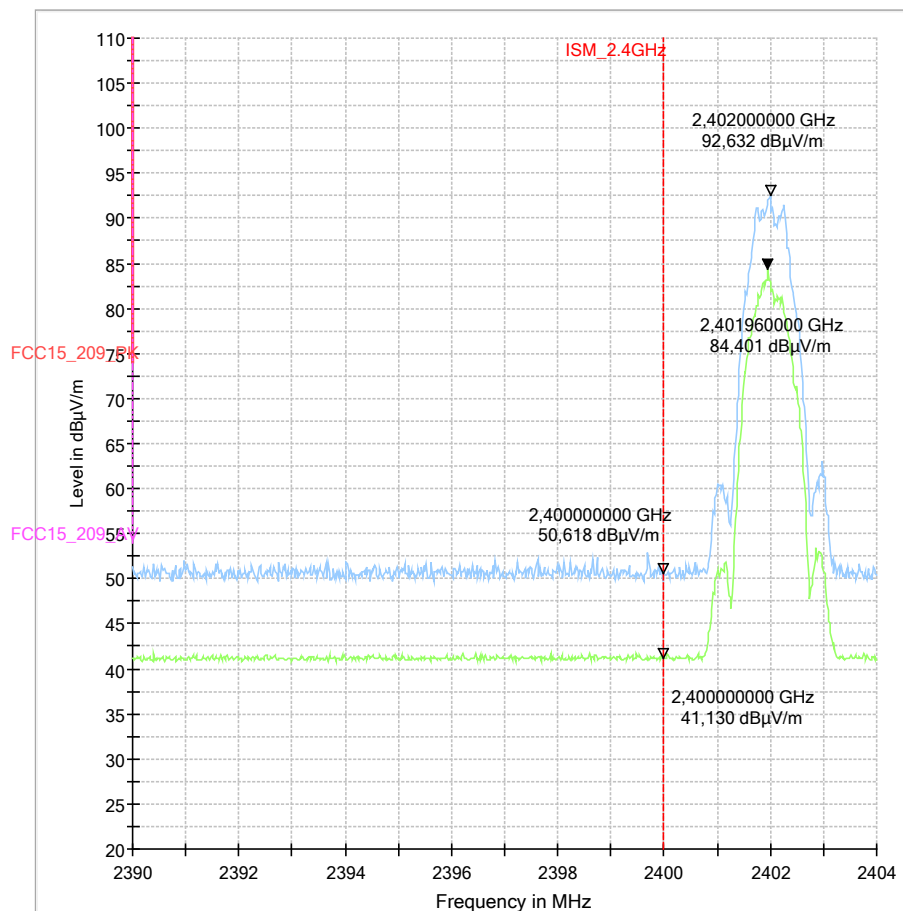


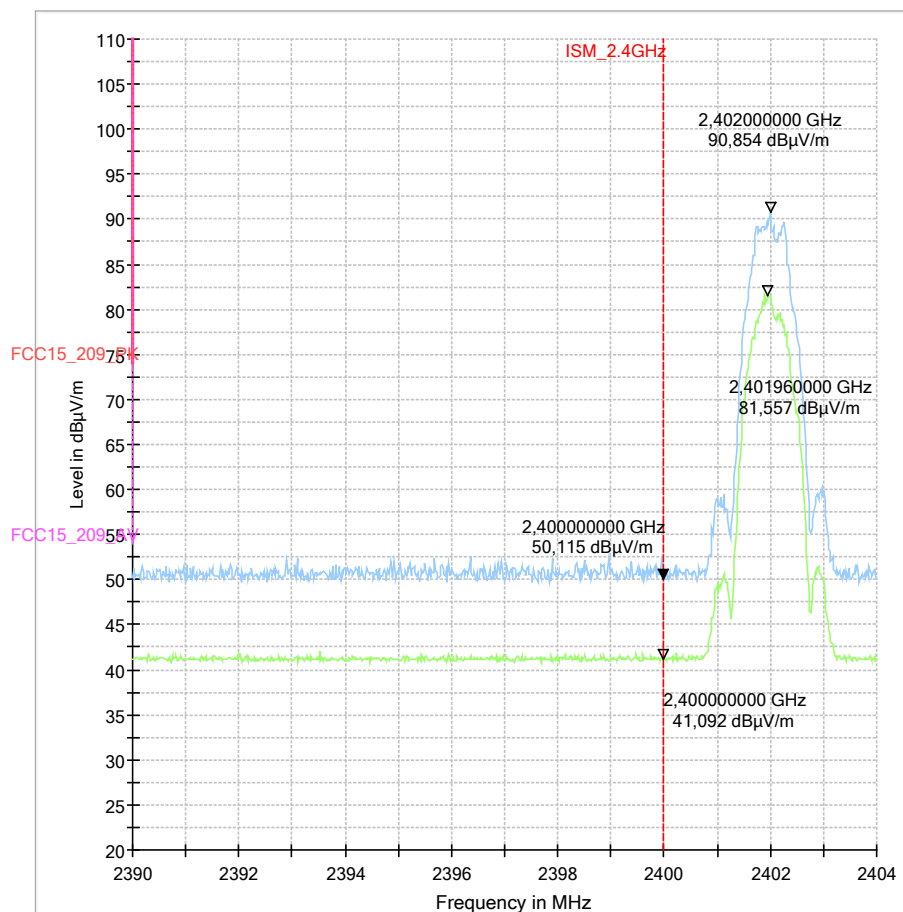
Diagram No.: 9.07b_BE_BT_LE_low_laying

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous BlueTooth LE
Operator Name:	AFr
Comment:	Channel low

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP_DIN
HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC



2.2. Channel 39 (right band edge)

9.08a_BE_BT_LE_high_standing

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, BT_LE_high
Operator Name:	Rls
Comment:	standing

EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP_DIN
HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC

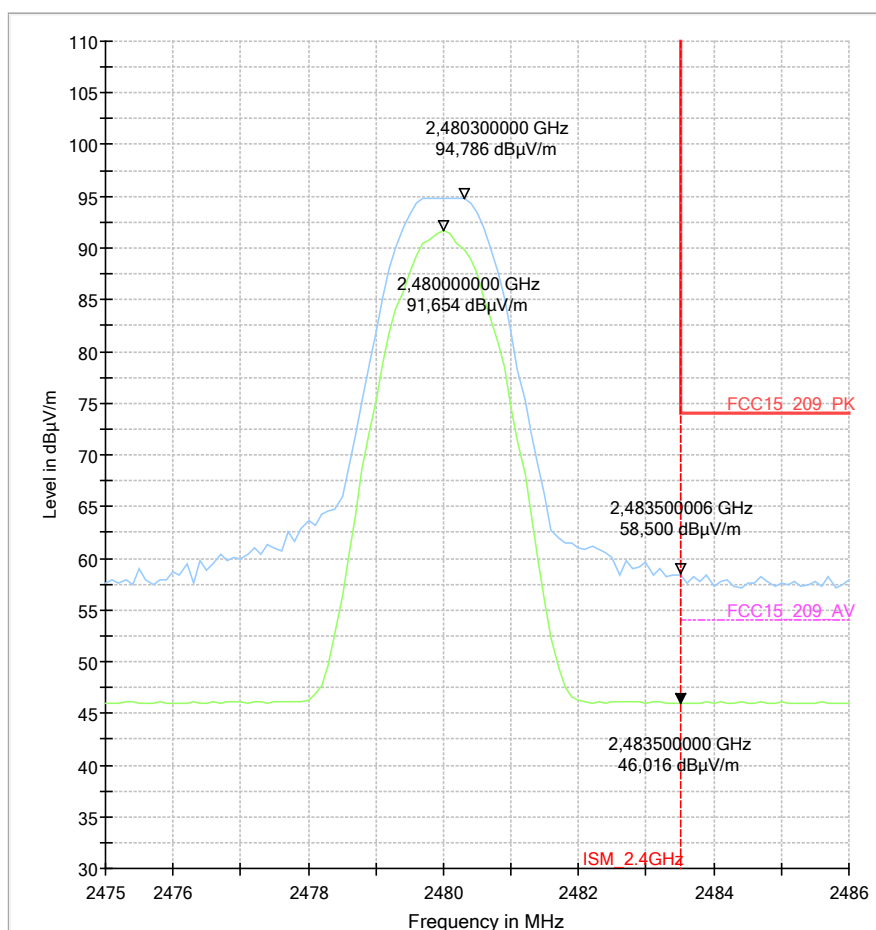


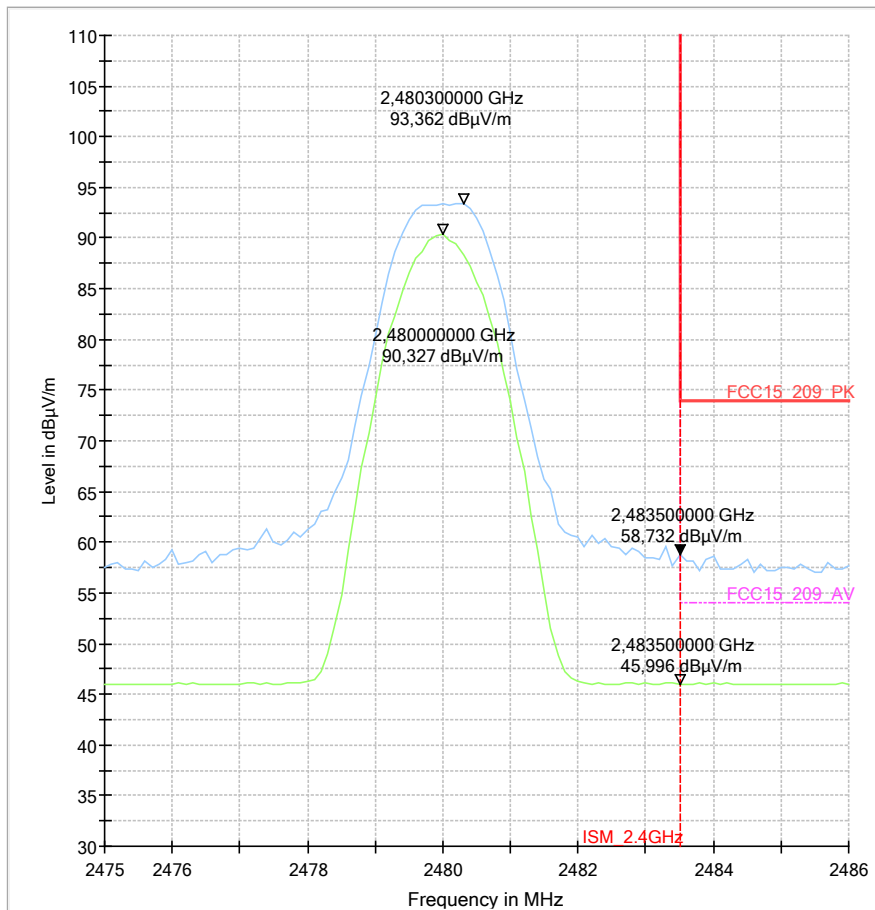
Diagram No.: 9.08b_BE_BT_LE_high_laying

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous BlueTooth LE
Operator Name:	AFr
Comment:	Channel high

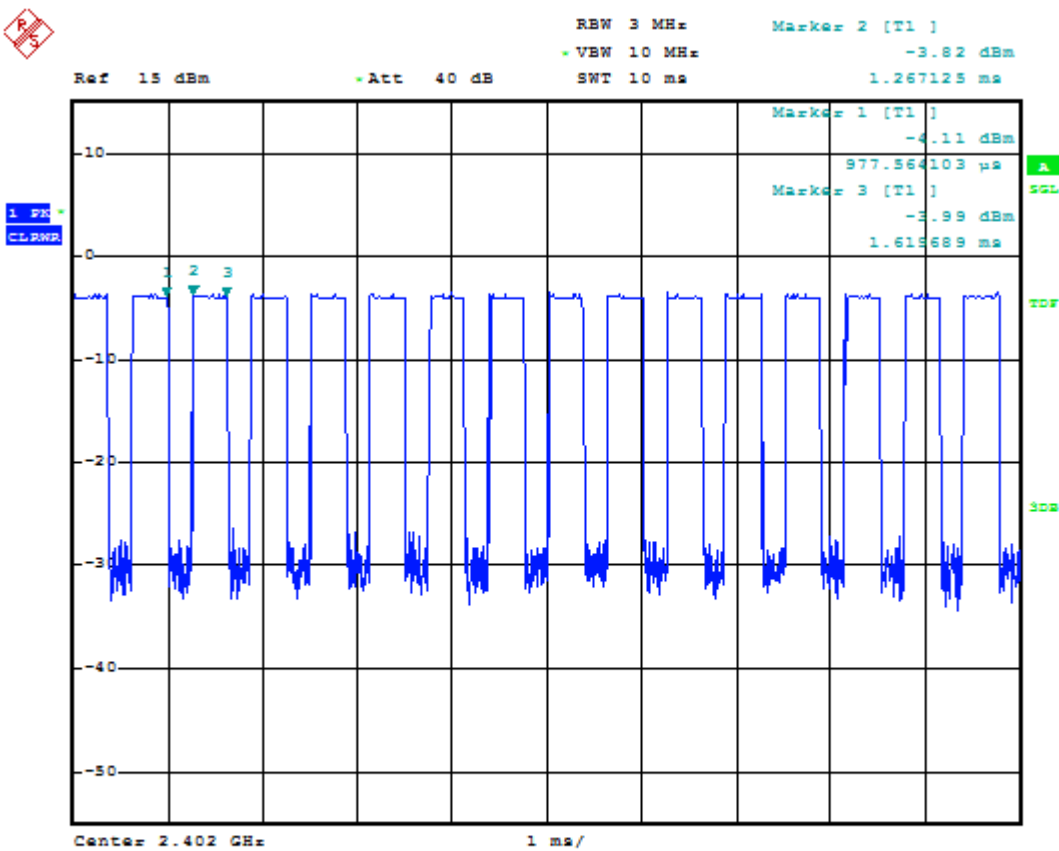
EUT Information

Manufacturer:	Robert Bosch Car Multimedia GmbH
EuT:	ECU cTP _DIN
-----	-----
HW Version:	6797G04
SW Version:	16.099.2
Serial Number:	2830006236
Connected Interfaces:	Main wiring + SFTP 920 151 014
Power Supply:	24 V DC



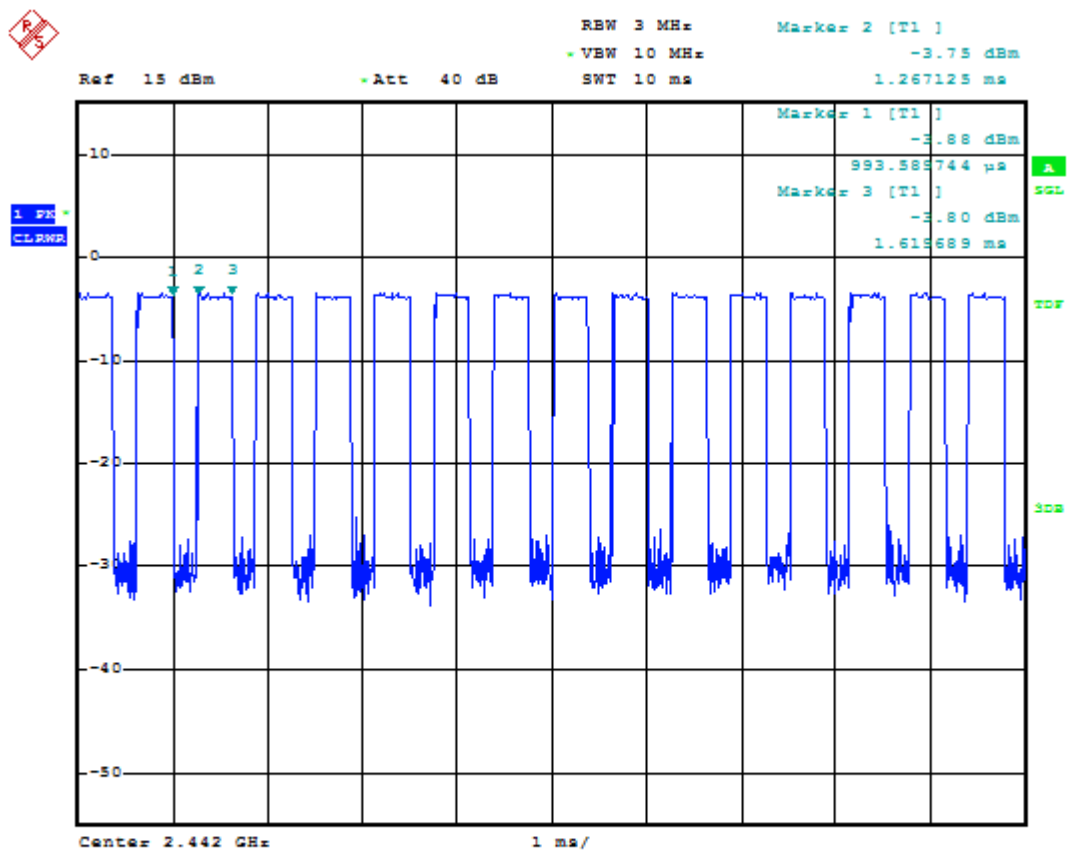
3. Conducted RF-measurements on antenna port

3.1. Duty cycle



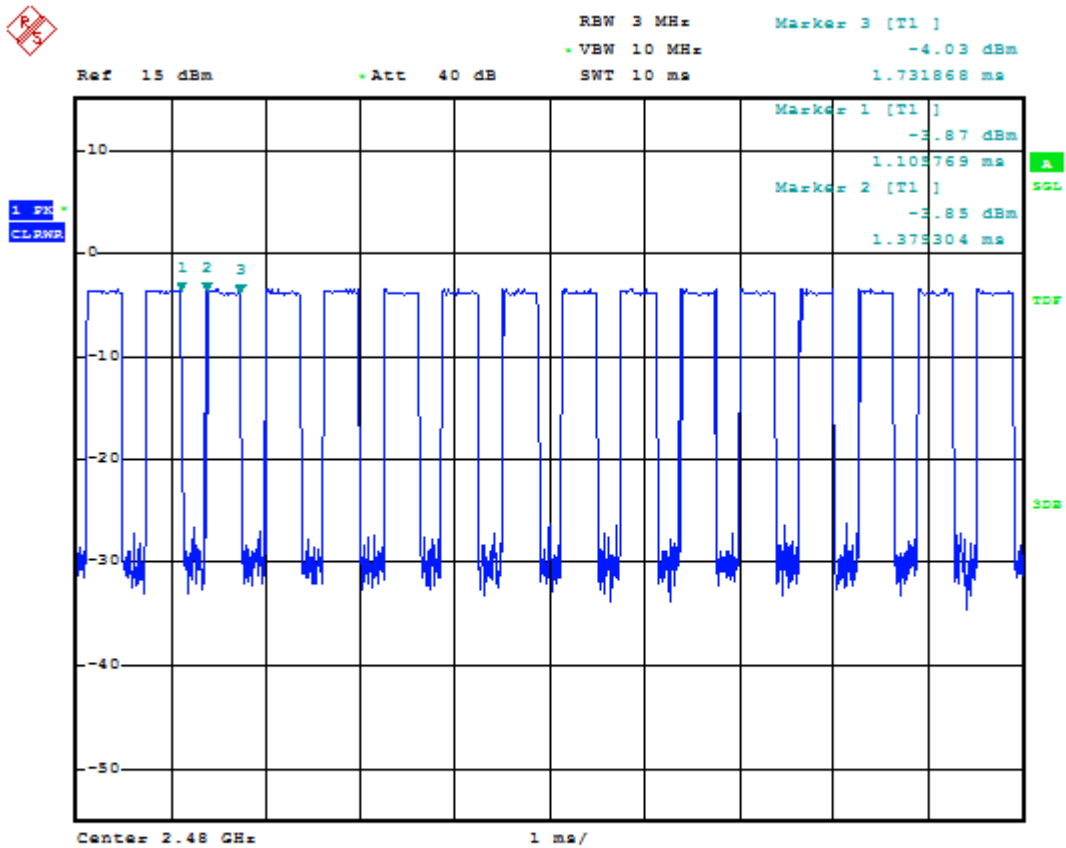
Date: 15.DEC.2016 16:04:27

DC-Ch37-2402MHz



Date: 15.DEC.2016 15:59:40

DC-Ch18-2442MHz



Date: 15.DEC.2016 16:02:26

DC-Ch39-2480MHz

3.2. 6dB bandwidth, 99% occupied channel bandwidth, Power spectral density

FCC Part 47 §15.247 2400-2483.5 MHz 2016

DUT Information

DUT Name:	CTP DIN FCC
Hersteller:	Bosch
Seriennummer:	7 620 000 283 01
Hardware-Version:	6797G04
Software-Version:	16/41/01
Kommentar:	

Frequencies		
2402 MHz (2402 MHz)	2442 MHz (2442 MHz)	2480 MHz (2480 MHz)

Bandwidths
2 MHz (2 MHz)

Power
-3,400 dBm (-3,4 dBm)

Beamforming Gain	
-3,400 dBm (-3,4 dBm)	0 dB

Gain Tables	
-3,400 dBm (-3,4 dBm)	Port 1: Nominal;

DUT Settings	
No. of transmission chains	1
Equipment Type	Other
Digital Modulation	Yes
Frequency Hopping	No

Hardware Setup: WMS Measurements\WMS

Spectrum Analyzer:	SA FSU 26 (SA FSU 26) @ VISA (ADR TCPIP::192.168.48.145::INST0::INSTR), SN 200571/026, FW 4.51
--------------------	--

Vector Generator:	VG SMU200A (VG SMU200A) @ VISA (ADR TCPIP::192.168.48.148::INST0::INSTR), SN 100754, FW 2.1.96.0-02.10.111.189
-------------------	--

Generator:	SMF100A (SMF100A) @ VISA (ADR TCPIP::192.168.48.146::INST0::INSTR), SN 102073, FW Rev 2.21.1, 02/2017, CVI 2015
------------	---

OSP:	OSP (OSP) @ VISA (ADR TCPIP::192.168.48.147::INST0::INSTR), SN OSP120 V02, 101183, FW 2.53.140911
------	---

Power Meter:	OSP-B157 Power Meter (OSP-B157 Power Meter) @ USB (ADR 20), SN 25955149, FW 3.1
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Turn Table:	Generic Turntable (Generic Turntable)
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Antenna Tower:	Generic Mast (Generic Mast) @ GPIB0 (ADR 16)
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Summary

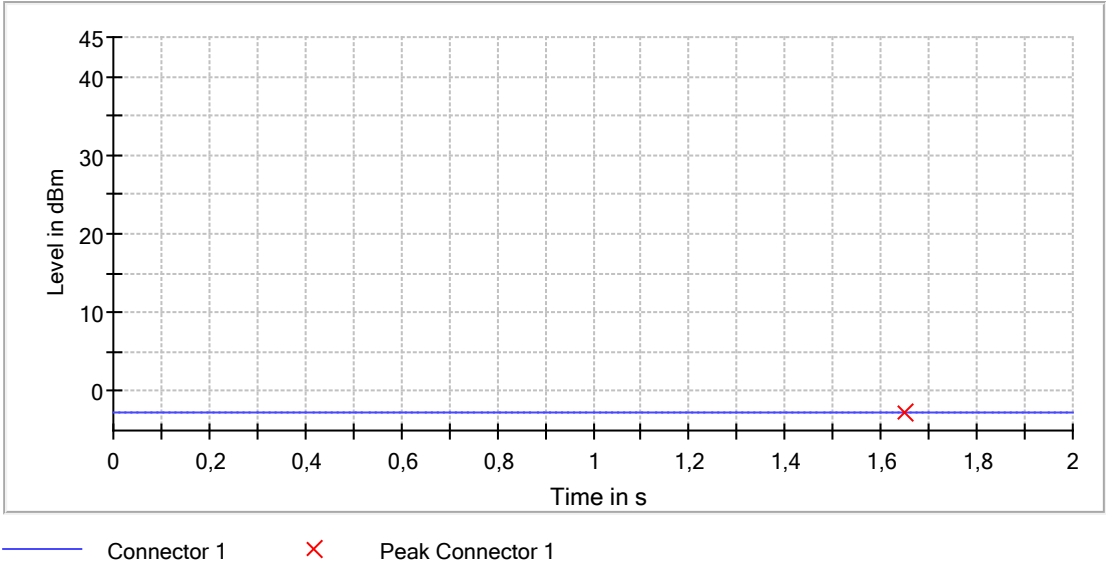
Test	Frequency (MHz)	Nominal Power (dBm)	Nominal Bandwidth (MHz)	Result
Peak output power	2402.000	-3.4	2.000000	PASS
Power Spectral Density	2402.000	-3.4	2.000000	PASS
Minimum Emission Bandwidth 6 dB	2402.000	-3.4	2.000000	PASS
Peak output power	2442.000	-3.4	2.000000	PASS
Power Spectral Density	2442.000	-3.4	2.000000	PASS
Minimum Emission Bandwidth 6 dB	2442.000	-3.4	2.000000	PASS
Peak output power	2480.000	-3.4	2.000000	PASS
Power Spectral Density	2480.000	-3.4	2.000000	PASS
Minimum Emission Bandwidth 6 dB	2480.000	-3.4	2.000000	PASS

Peak output power (2402 MHz; -3,400 dBm; 2 MHz)

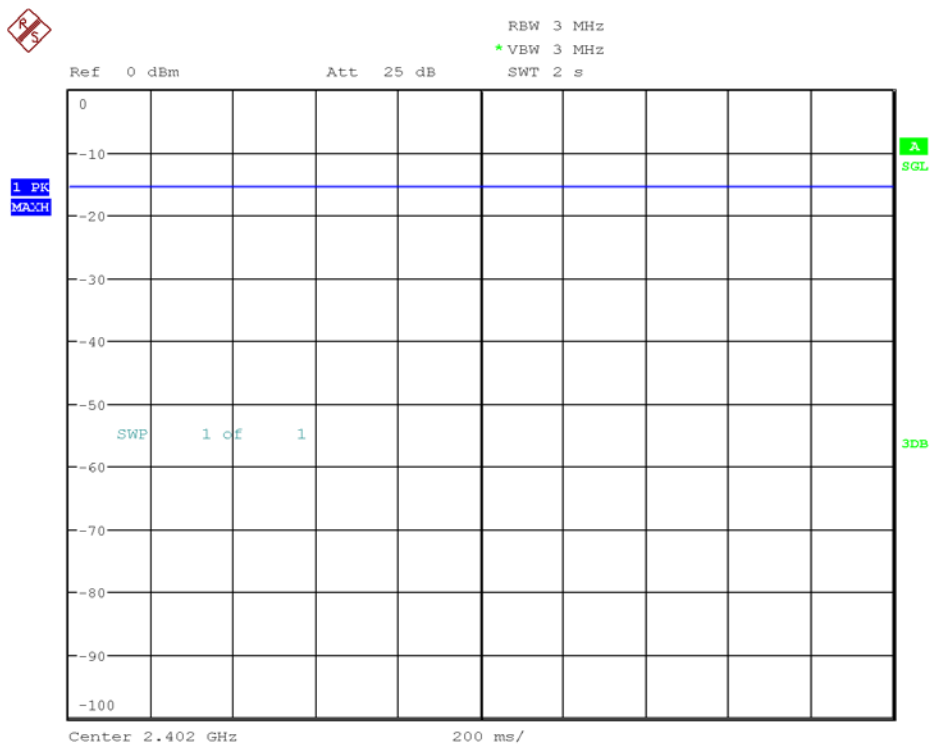
Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	-2.6	30.0	PASS



Peak Power 1



Date: 26.JUN.2017 20:54:53

Measurement

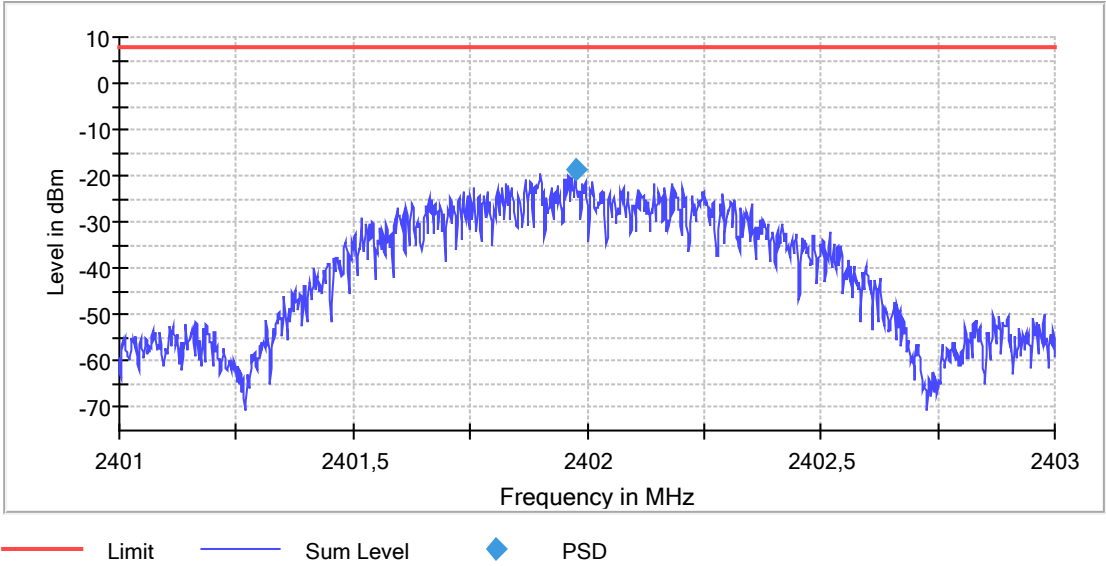
Setting	Instrument Value	Target Value
Center Frequency	2.40200 GHz	2.40200 GHz
Span	ZeroSpan	ZeroSpan
RBW	3.000 MHz	>= 2.000 MHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	155	~ 101
SweepTime	2.000 s	2.000 s
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	1	1
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off

Power Spectral Density (2402 MHz; -3,400 dBm; 2 MHz)

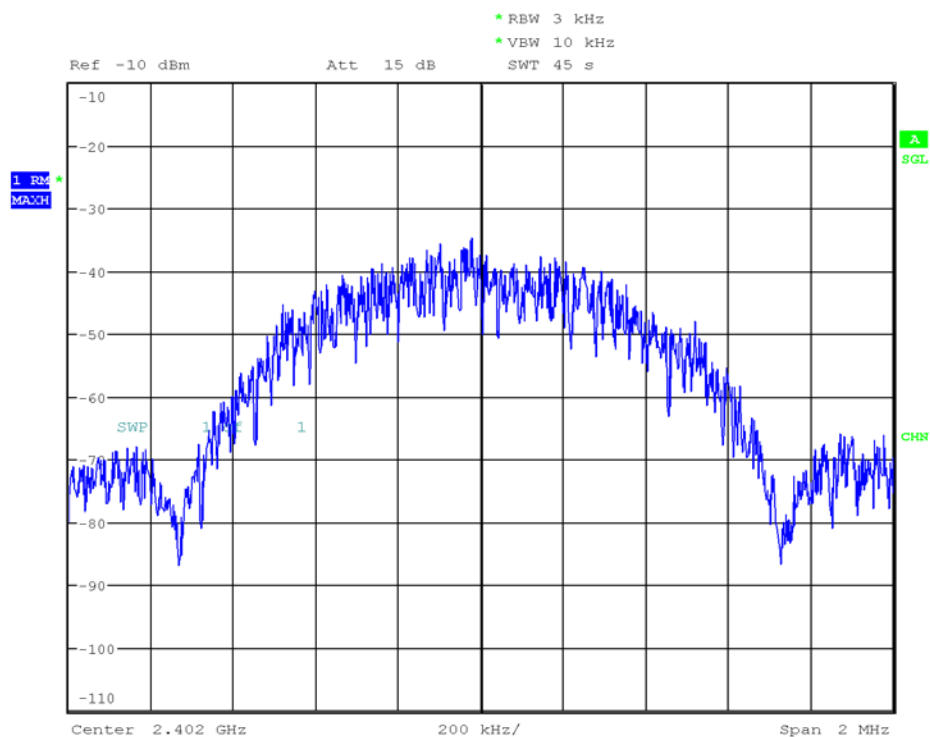
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2402.000000	2401.976923	-18.601	8.0	PASS



PSD Connector 1



Date: 26.JUN.2017 18:38:11

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40100 GHz	2.40100 GHz
Stop Frequency	2.40300 GHz	2.40300 GHz
Span	2.000 MHz	2.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	1301	~ 1333
SweepTime	45.000 s	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	Sweep
Preamp	off	off

Minimum Emission Bandwidth 6 dB (2402 MHz; -3,400 dBm; 2 MHz)

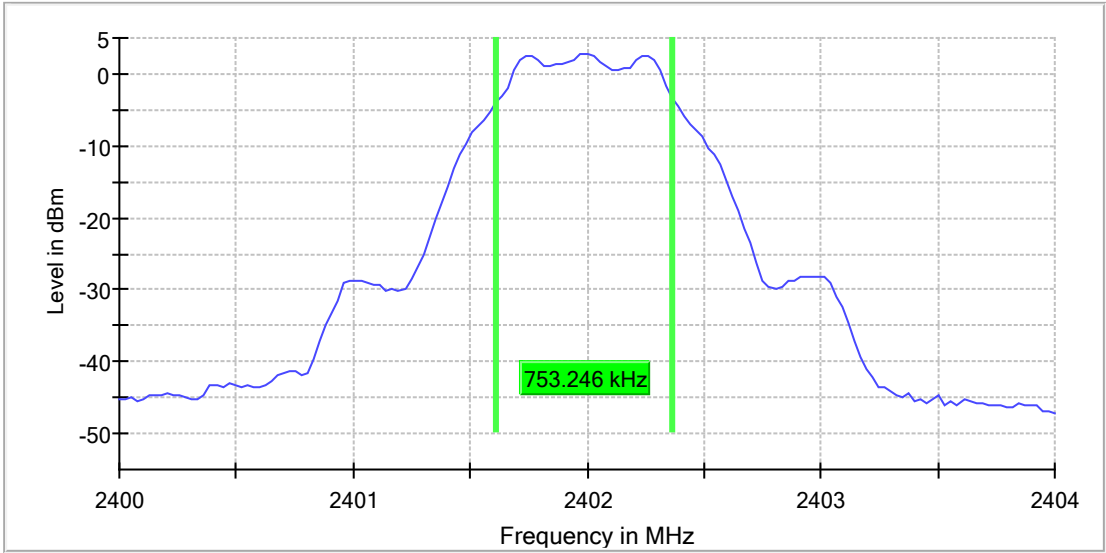
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10

6 dB Bandwidth

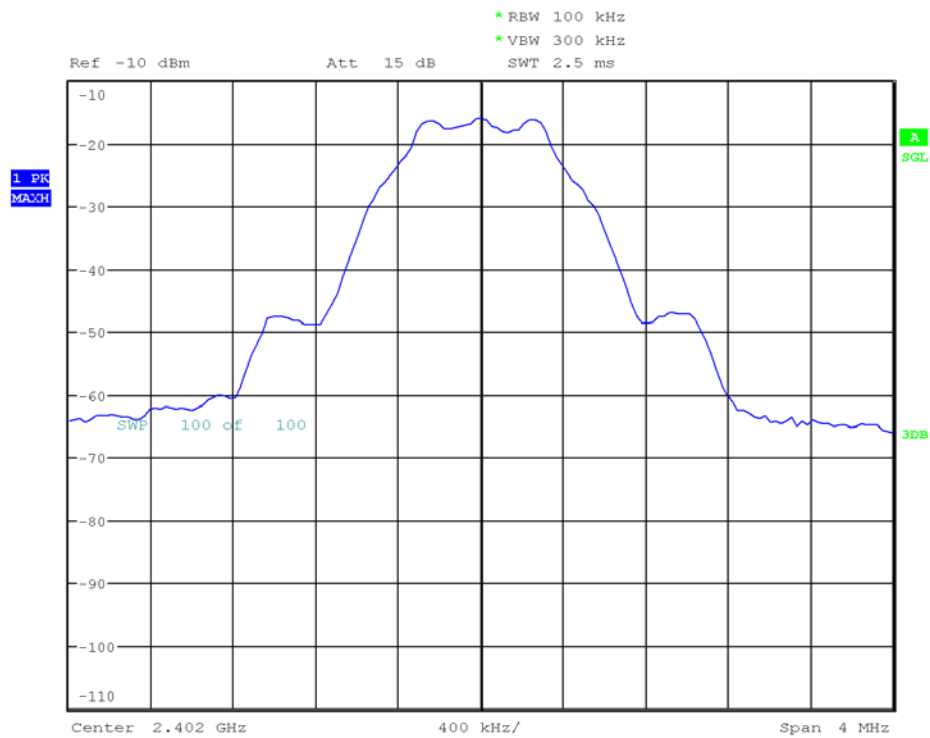
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)
2402.000000	0.753246	0.500000	---	2401.610390	2402.363636	2.8

(continuation of the "6 dB Bandwidth" table from column 7 ...)

DUT Frequency (MHz)	Result
2402.000000	PASS



Bandwidth



Date: 26.JUN.2017 18:38:37

Measurement

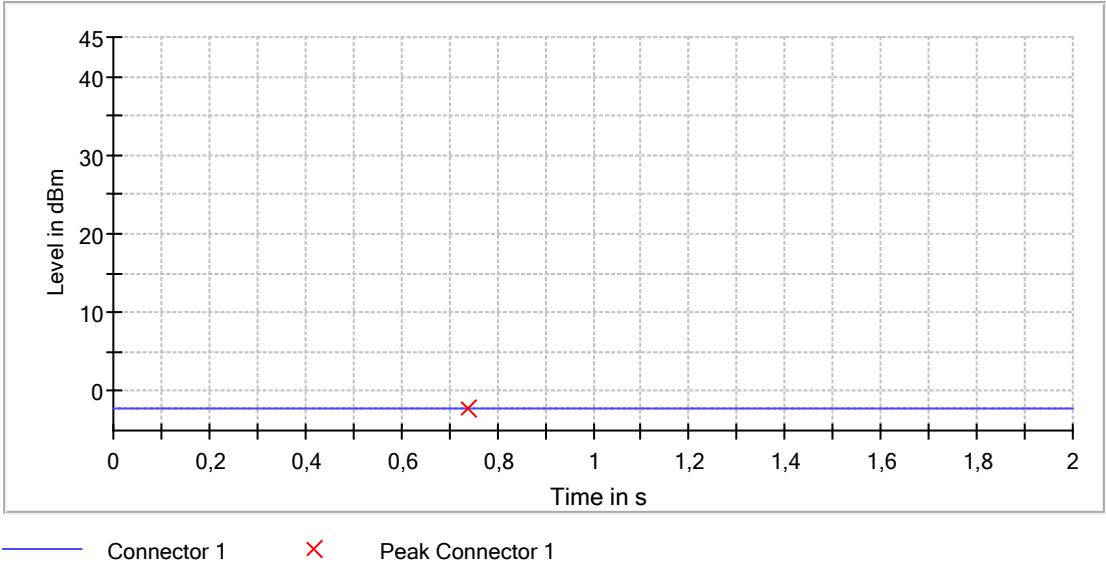
Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.40400 GHz	2.40400 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	155	~ 40
SweepTime	2.500 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	16 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.04 dB	0.50 dB

Peak output power (2442 MHz; -3,400 dBm; 2 MHz)

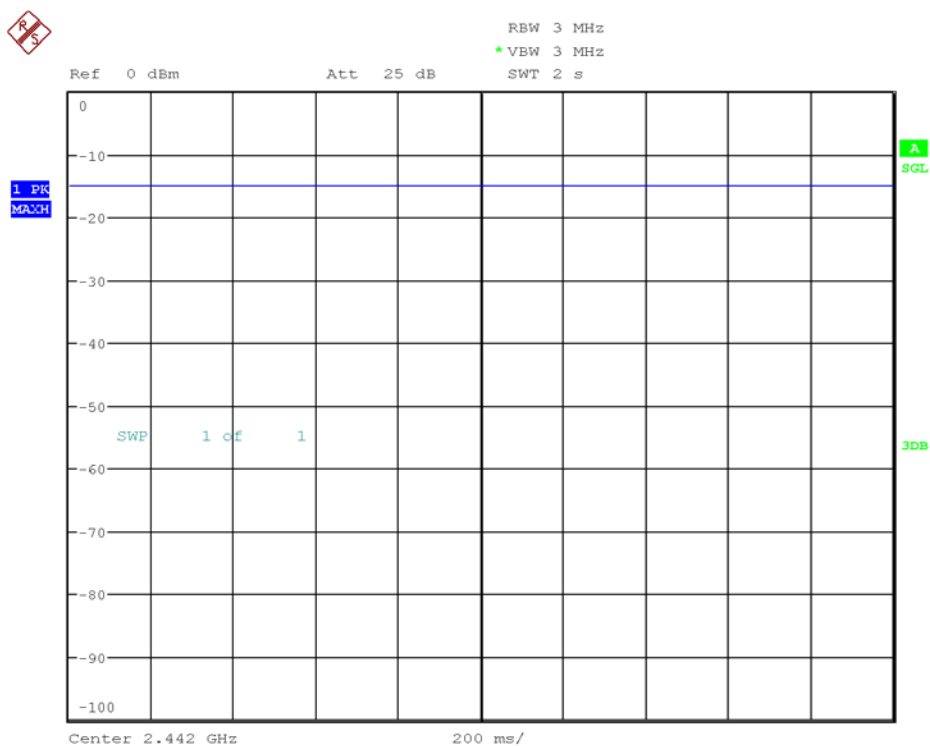
Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2442.000000	-2.1	30.0	PASS



Peak Power 1



Date: 26.JUN.2017 20:55:18

Measurement

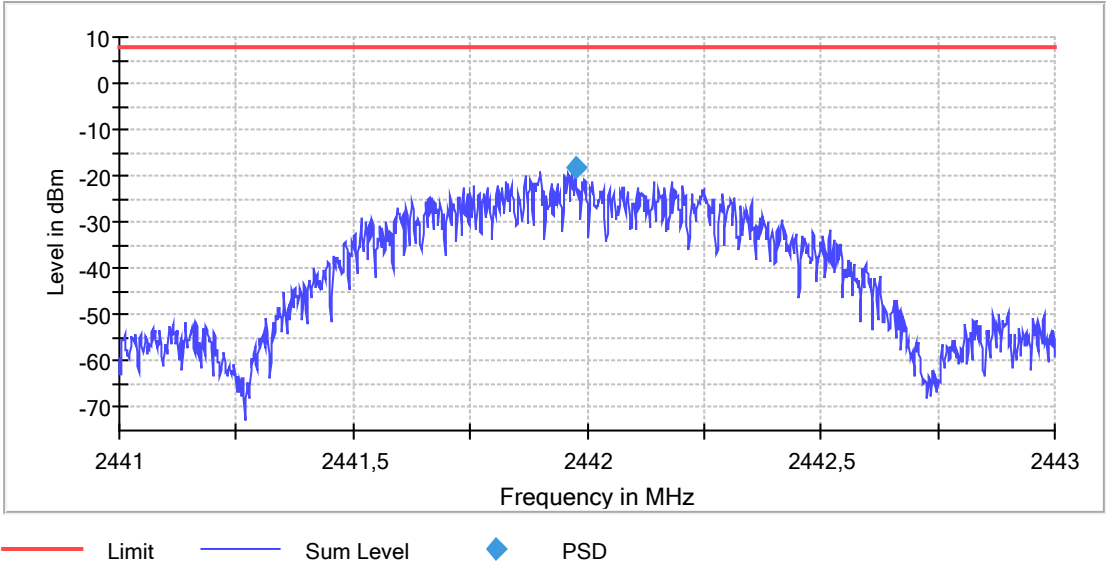
Setting	Instrument Value	Target Value
Center Frequency	2.44200 GHz	2.44200 GHz
Span	ZeroSpan	ZeroSpan
RBW	3.000 MHz	>= 2.000 MHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	155	~ 101
SweepTime	2.000 s	2.000 s
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	1	1
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off

Power Spectral Density (2442 MHz; -3,400 dBm; 2 MHz)

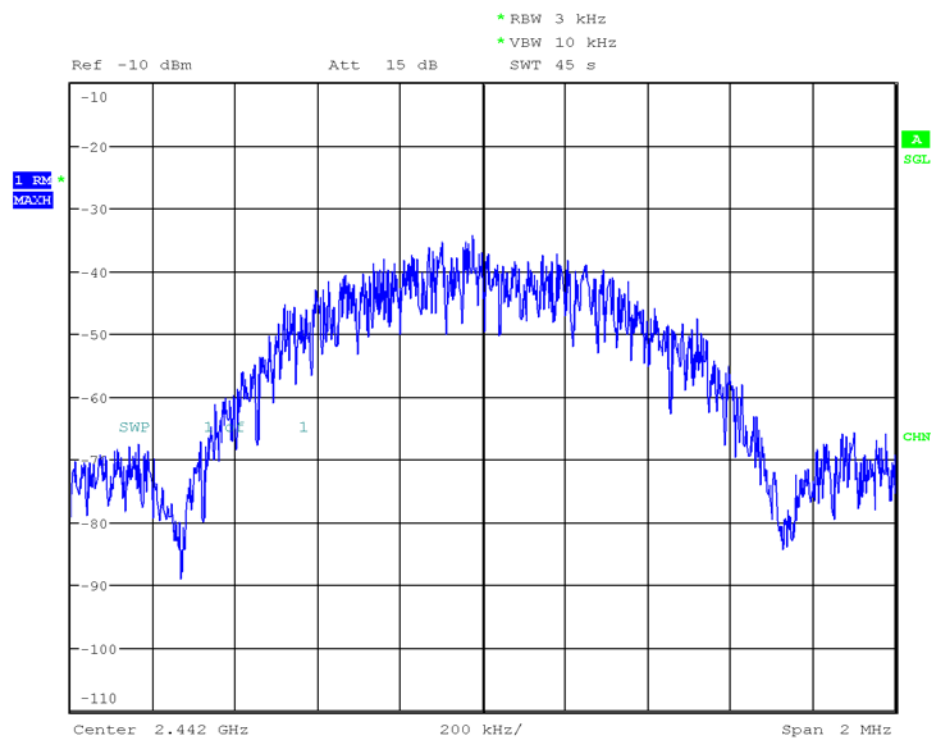
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2442.000000	2441.975385	-18.248	8.0	PASS



PSD Connector 1



Date: 26.JUN.2017 18:39:59

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44100 GHz	2.44100 GHz
Stop Frequency	2.44300 GHz	2.44300 GHz
Span	2.000 MHz	2.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	1301	~ 1333
SweepTime	45.000 s	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	Sweep
Preamp	off	off

Minimum Emission Bandwidth 6 dB (2442 MHz; -3,400 dBm; 2 MHz)

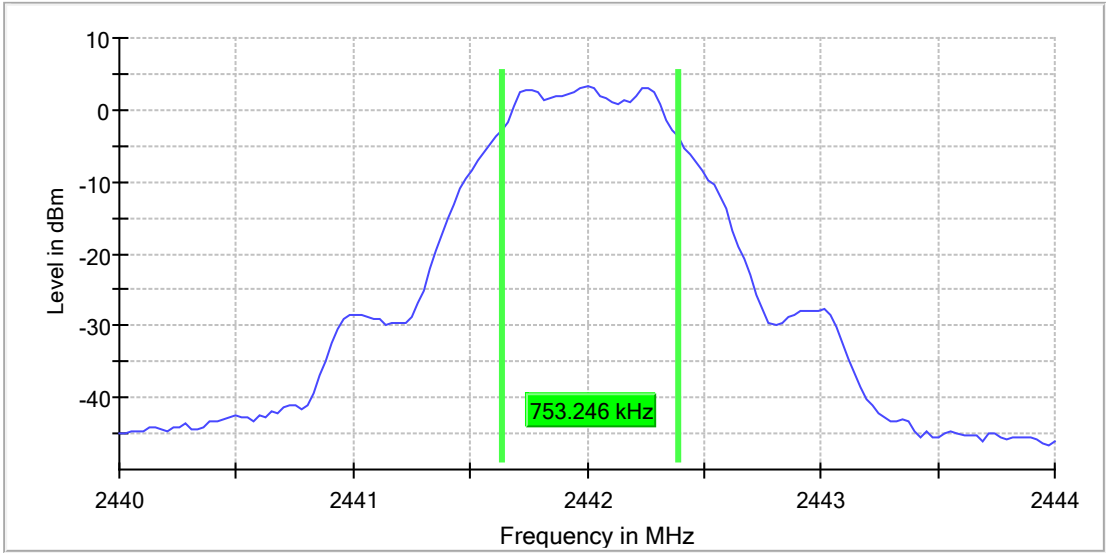
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10

6 dB Bandwidth

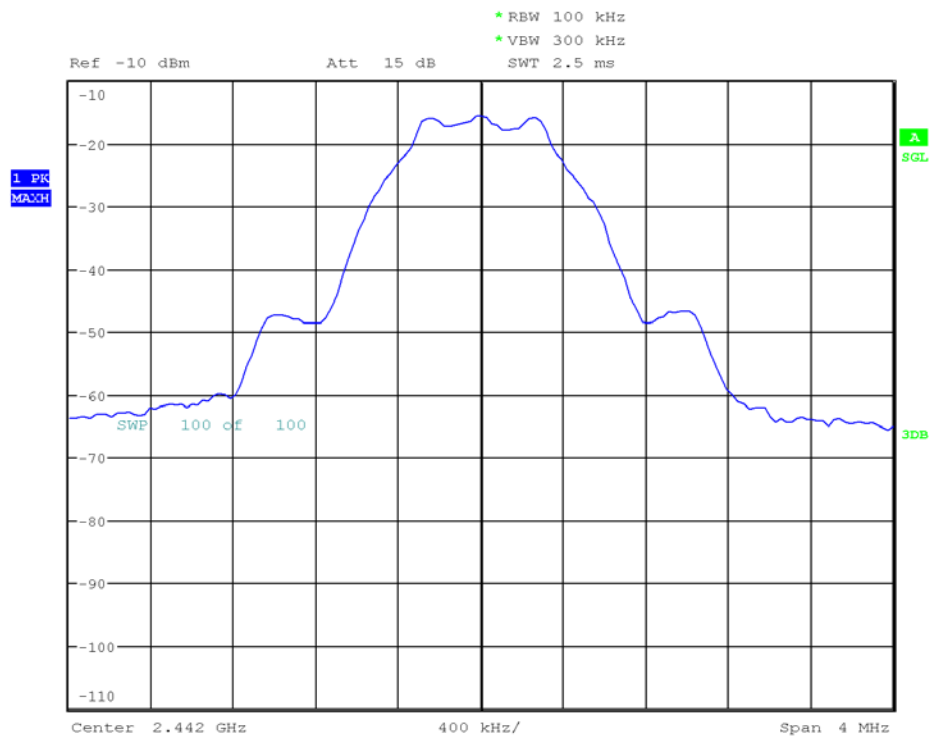
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)
2442.000000	0.753246	0.500000	---	2441.636364	2442.389610	3.2

(continuation of the "6 dB Bandwidth" table from column 7 ...)

DUT Frequency (MHz)	Result
2442.000000	PASS



Bandwidth



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Measurement

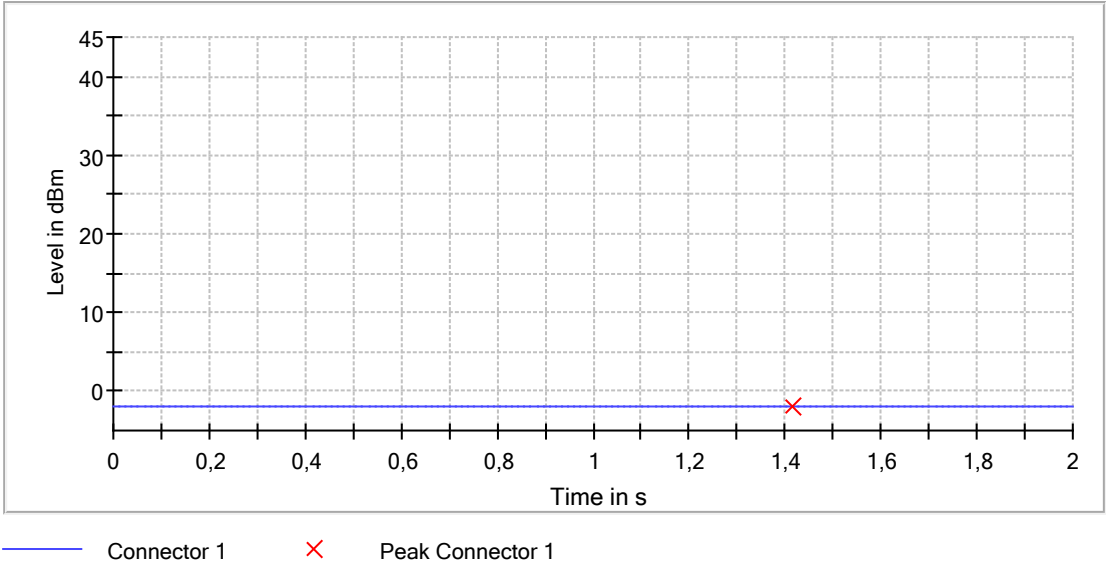
Setting	Instrument Value	Target Value
Start Frequency	2.44000 GHz	2.44000 GHz
Stop Frequency	2.44400 GHz	2.44400 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	155	~ 40
SweepTime	2.500 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	17 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.03 dB	0.50 dB

Peak output power (2480 MHz; -3,400 dBm; 2 MHz)

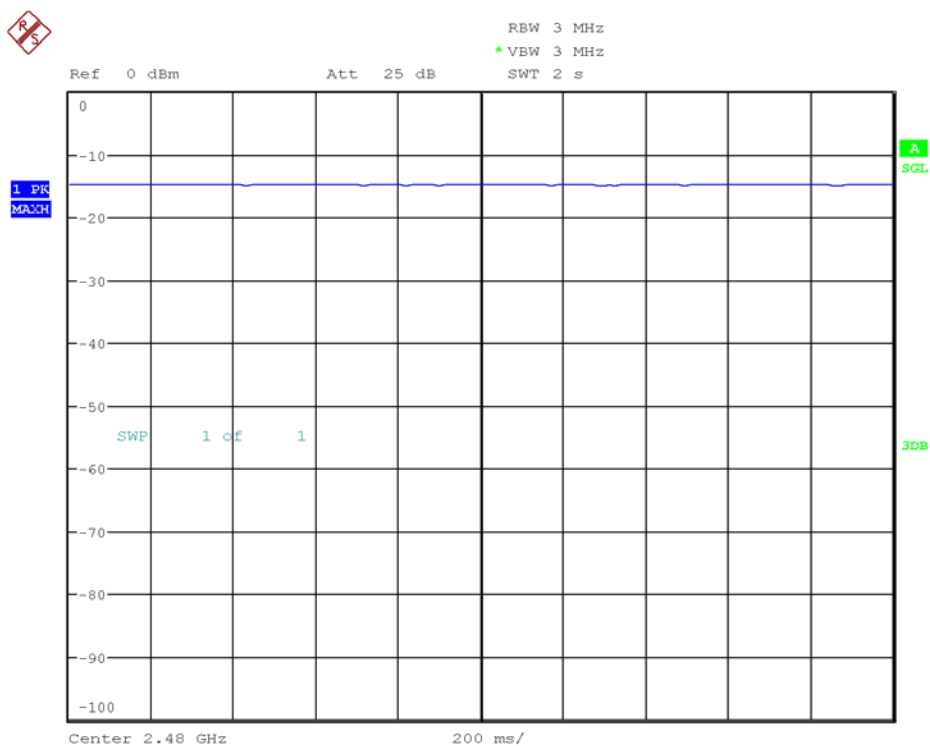
Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2480.000000	-1.8	30.0	PASS



Peak Power 1



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Measurement

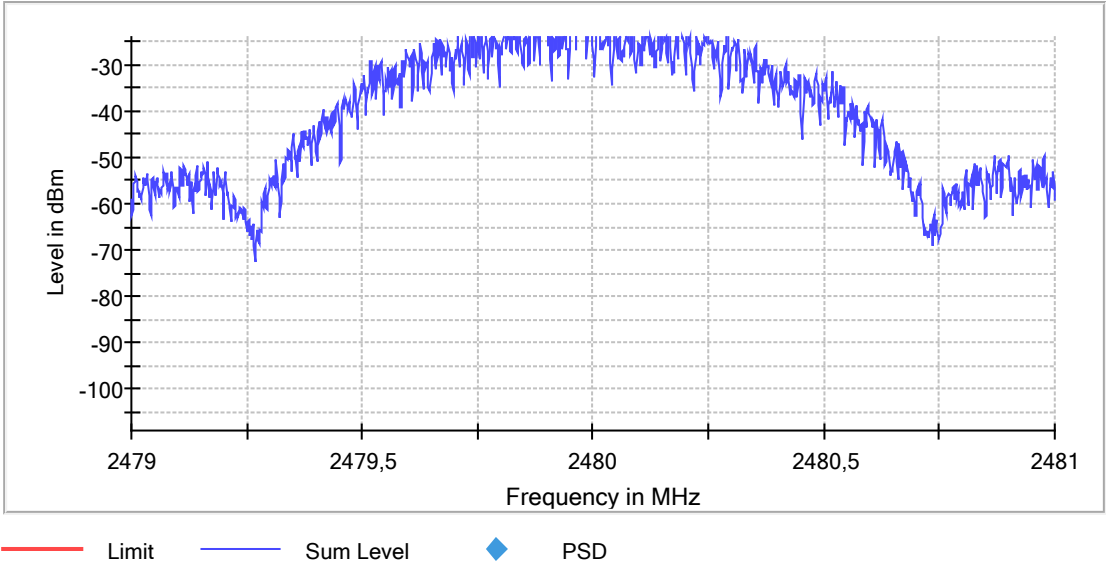
Setting	Instrument Value	Target Value
Center Frequency	2.48000 GHz	2.48000 GHz
Span	ZeroSpan	ZeroSpan
RBW	3.000 MHz	≥ 2.000 MHz
VBW	3.000 MHz	≥ 3.000 MHz
SweepPoints	155	~ 101
SweepTime	2.000 s	2.000 s
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	1	1
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off

Power Spectral Density (2480 MHz; -3,400 dBm; 2 MHz)

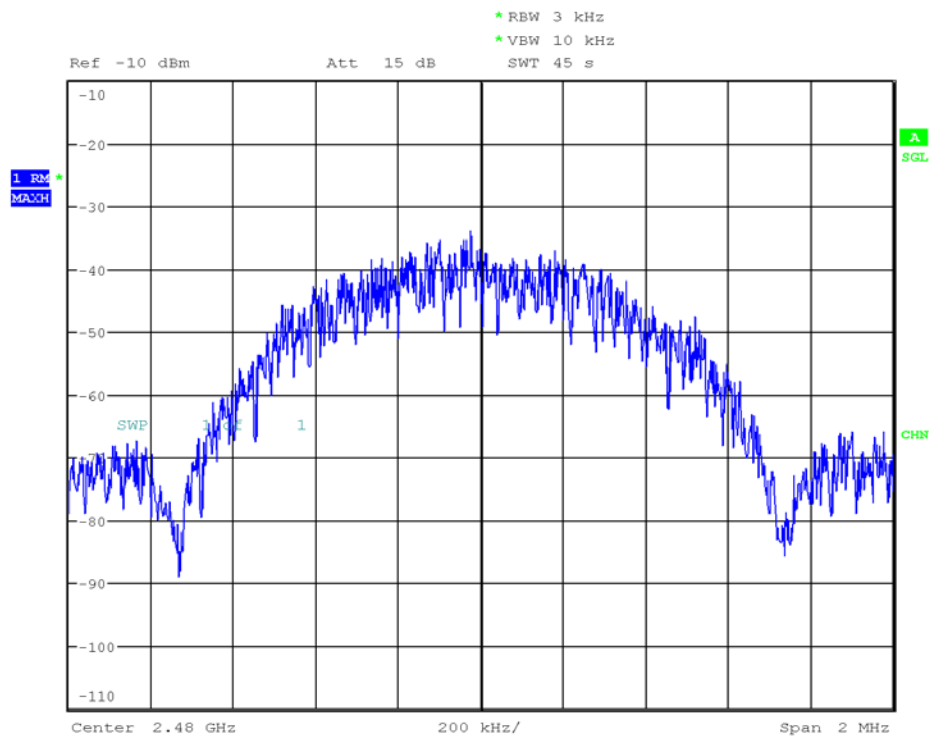
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2480.000000	2479.975385	-17.660	8.0	PASS



PSD Connector 1



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Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47900 GHz	2.47900 GHz
Stop Frequency	2.48100 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	1301	~ 1333
SweepTime	45.000 s	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	Sweep
Preamp	off	off

Minimum Emission Bandwidth 6 dB (2480 MHz; -3,400 dBm; 2 MHz)

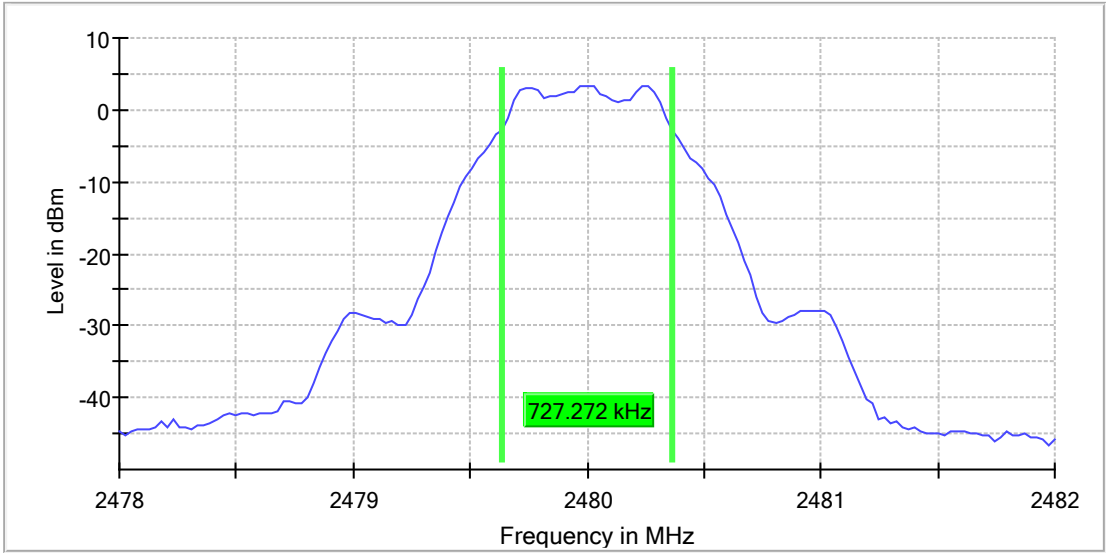
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10

6 dB Bandwidth

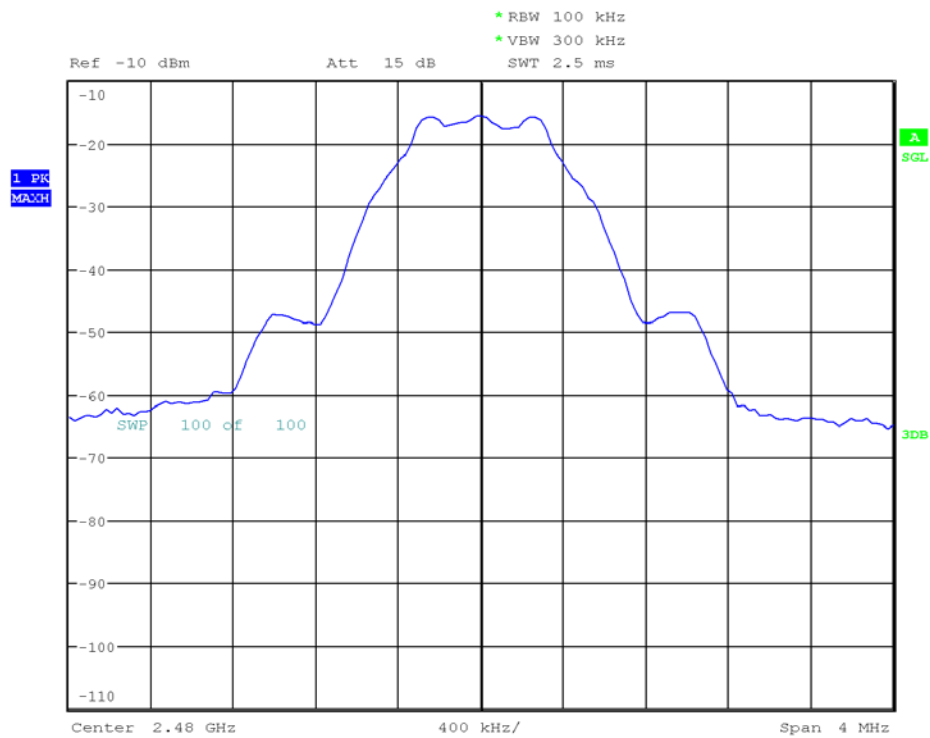
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)
2480.000000	0.727272	0.500000	---	2479.636364	2480.363636	3.4

(continuation of the "6 dB Bandwidth" table from column 7 ...)

DUT Frequency (MHz)	Result
2480.000000	PASS



Bandwidth

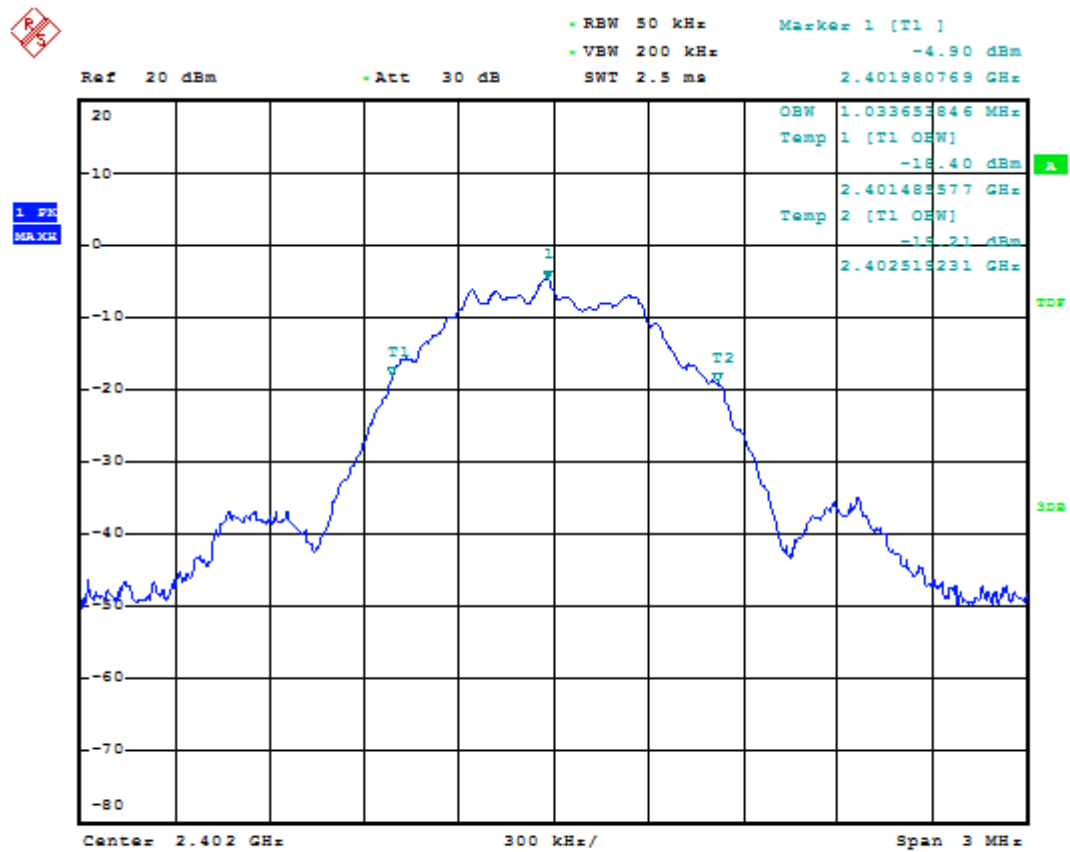


Date: 26.JUN.2017 18:42:27

Measurement

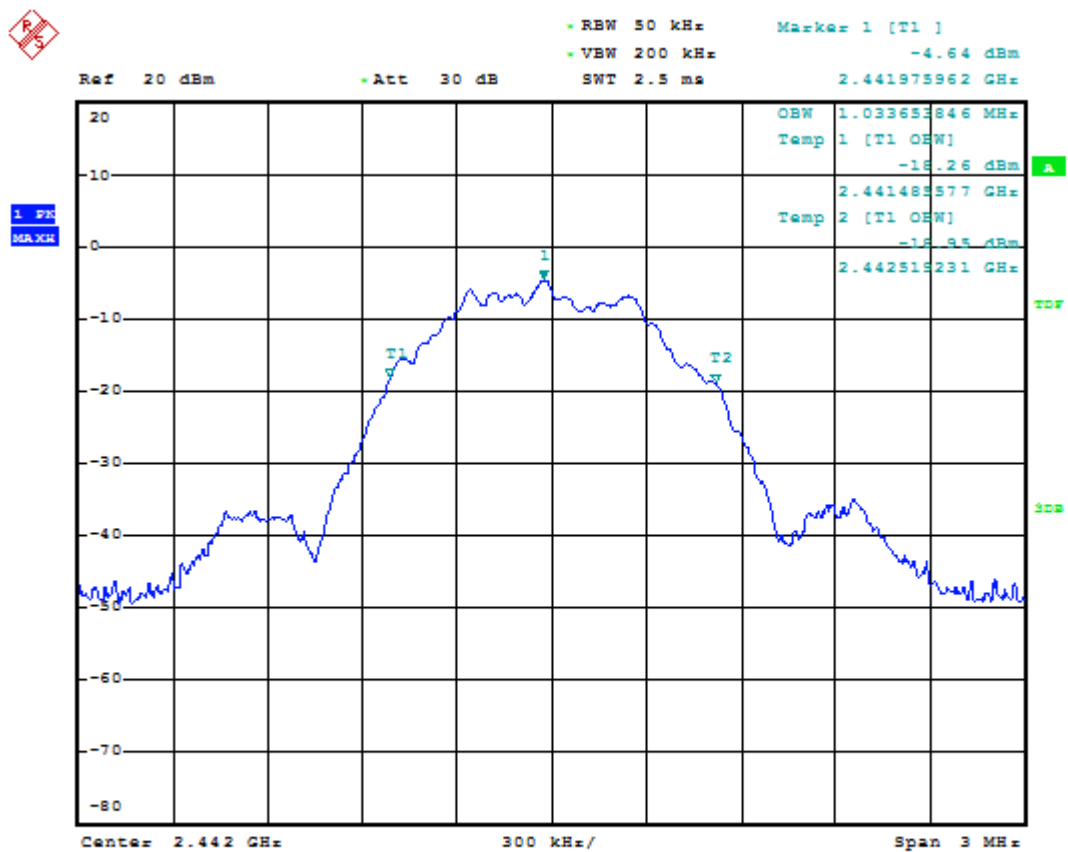
Setting	Instrument Value	Target Value
Start Frequency	2.47800 GHz	2.47800 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	155	~ 40
SweepTime	2.500 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	18 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.00 dB	0.50 dB

3.3. 99% bandwidth



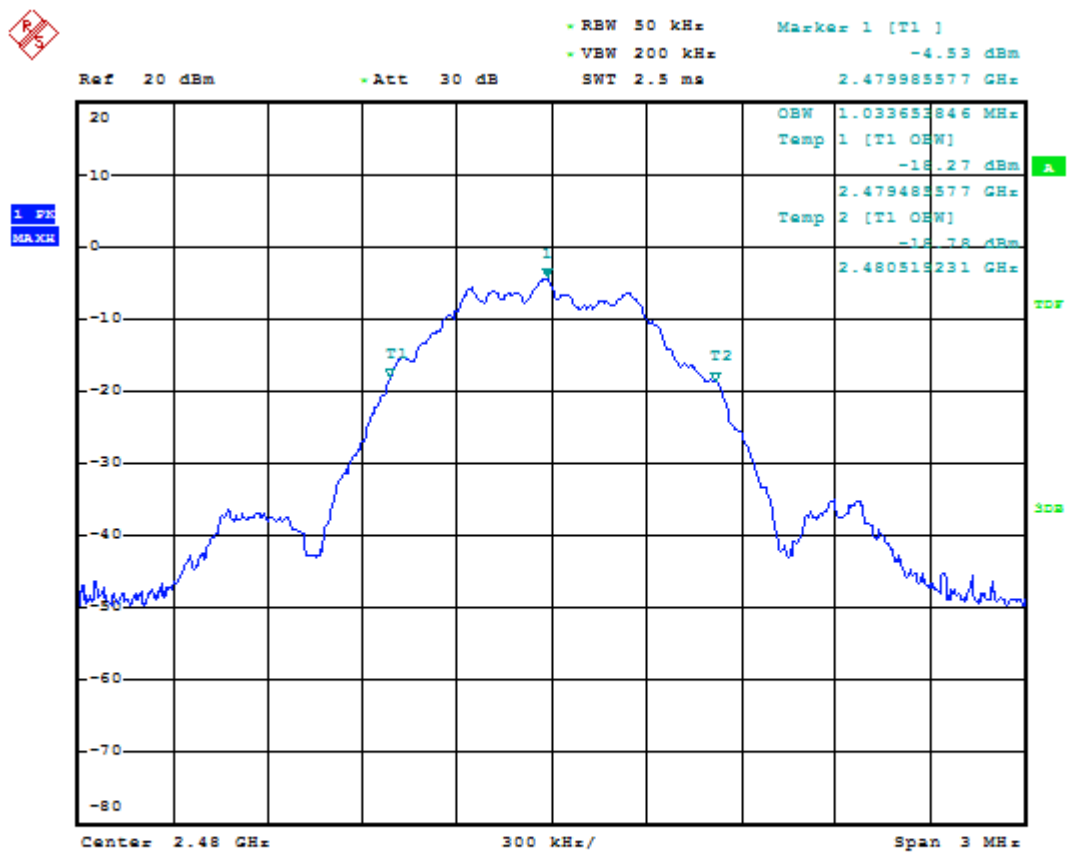
Date: 26. JUN. 2017 19:38:55

BT LE channel 37



Date: 26 JUN 2017 19:38:02

BT LE channel 18

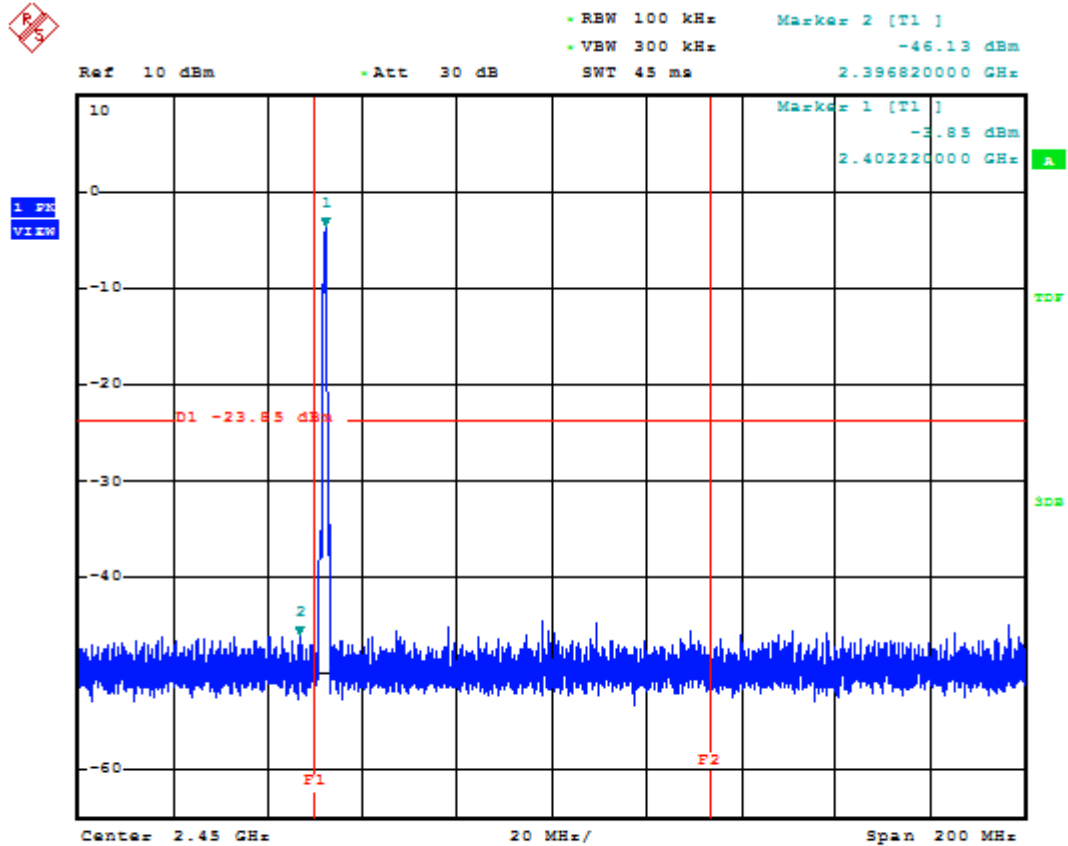


Date: 26. JUN. 2017 19:39:29

BT LE channel 39

3.4. 20dBc Emissions

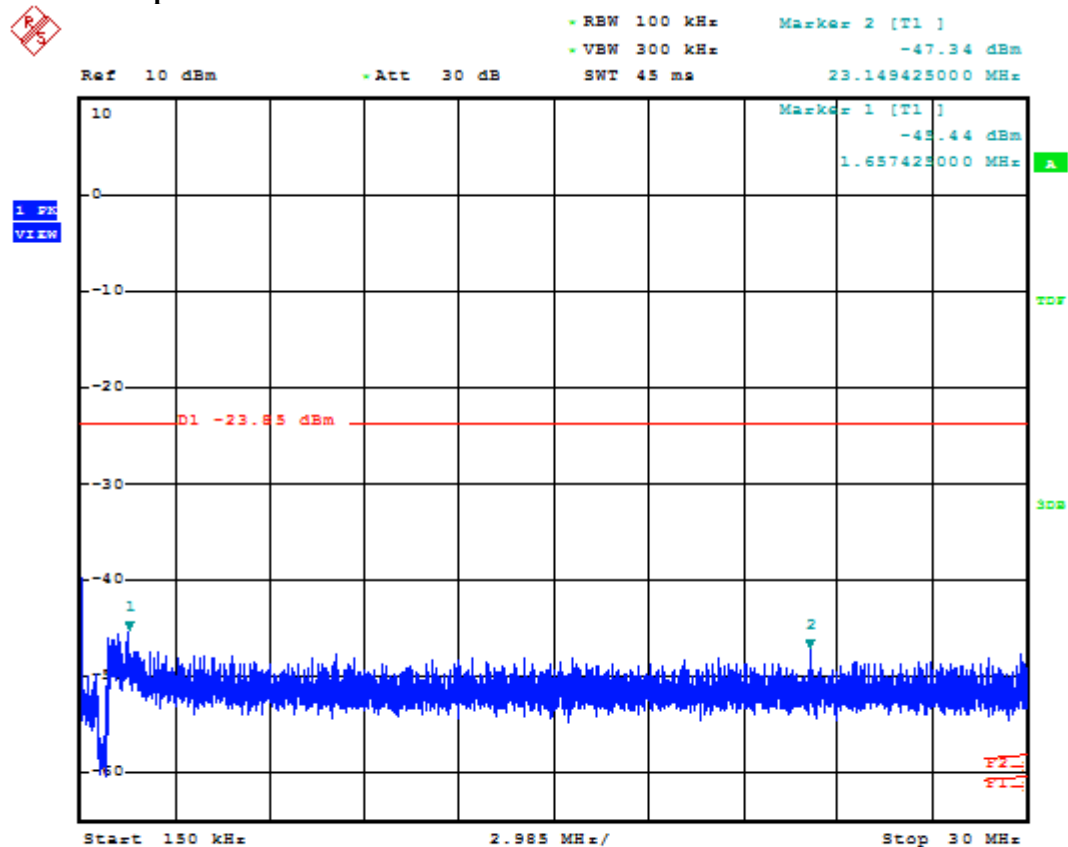
3.4.0.1. Channel 37 Reference



Date: 13.JUN.2017 08:46:23

20dBc-Ref-Ch37-2402MHz

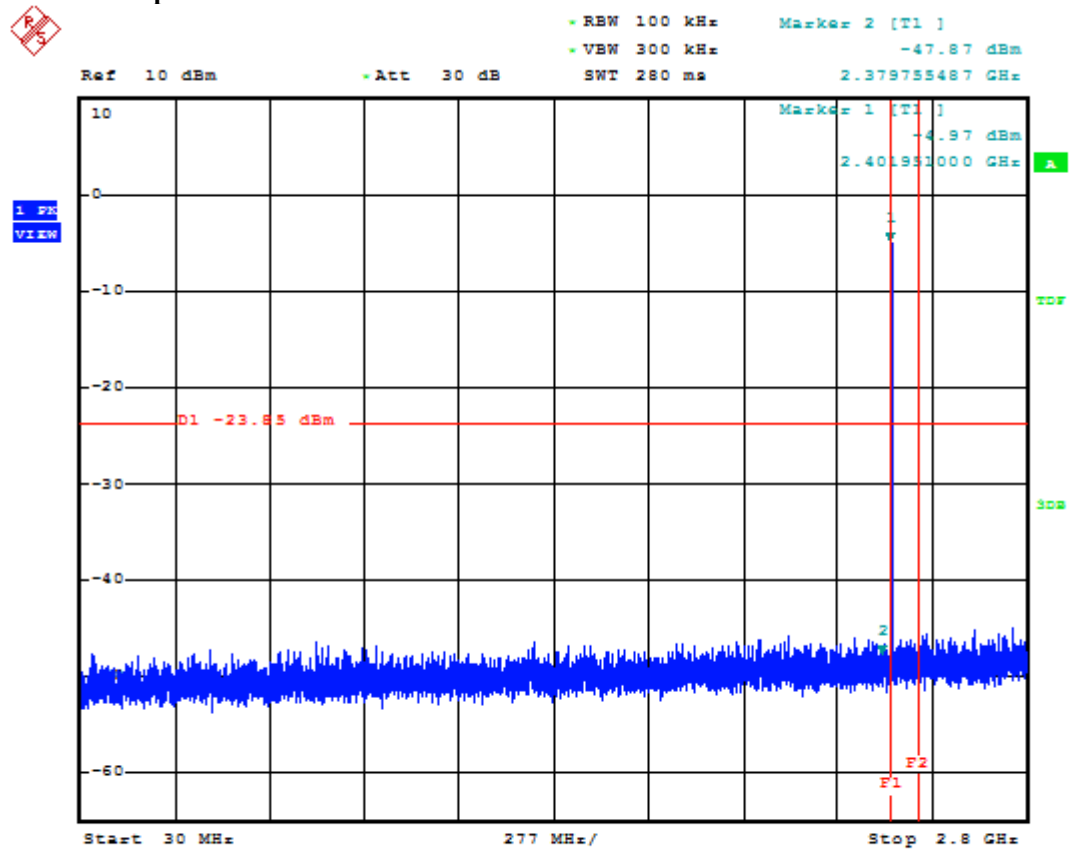
3.4.0.2. Sweep 1: 150kHz to 30MHz



Date: 13.JUN.2017 08:47:52

20dBc-0.15-30MHz-Ch37-2402MHz

3.4.0.3. Sweep 2: 30MHz to 2.8GHz



Date: 13.JUN.2017 08:48:55

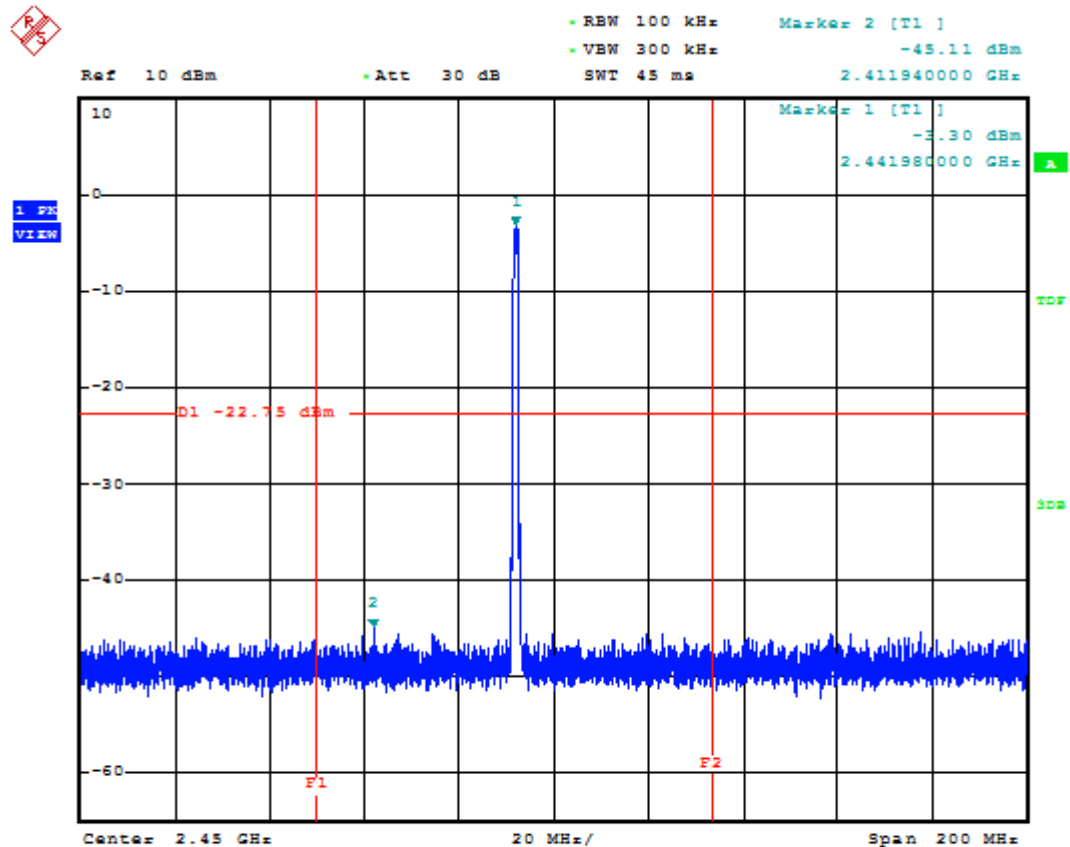
20dBc-30MHz-2.8GHz-Ch37-2402MHz



20dBc-2.8GHz-25GHz-Ch37-2402MHz

20dBc-2.8GHz-25GHz-Ch37-2402MHz

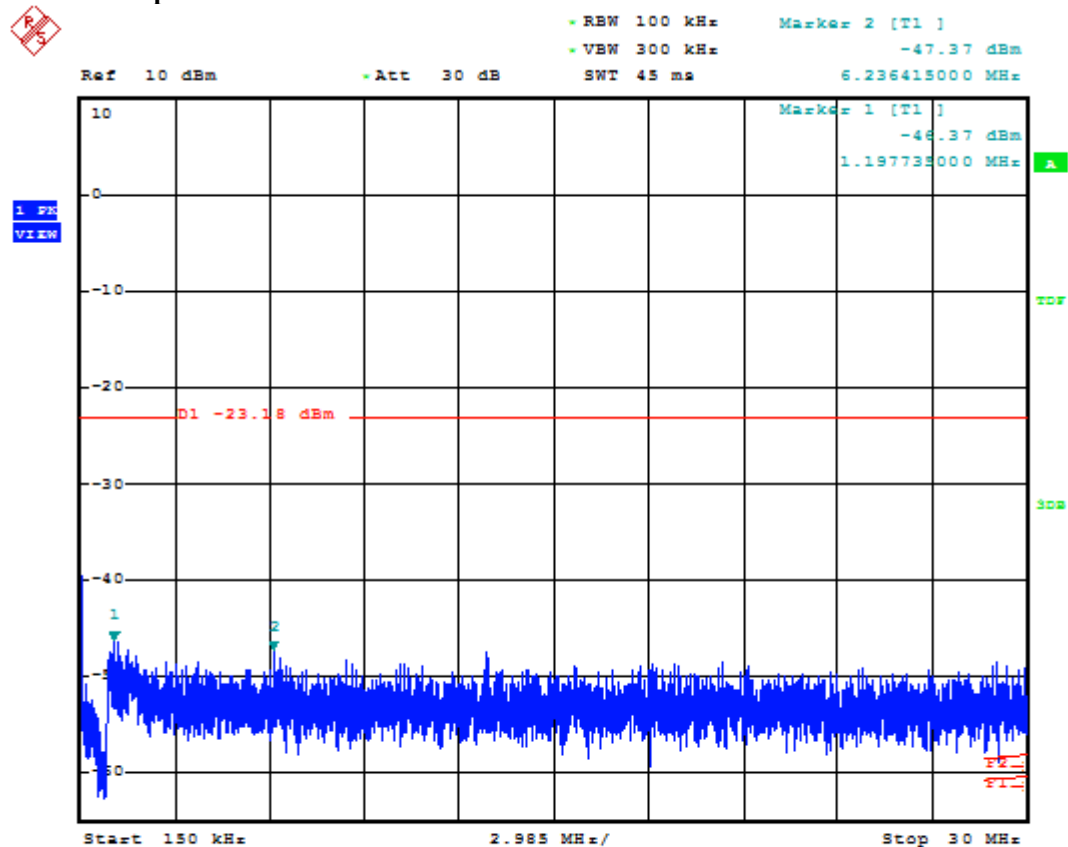
3.4.0.5. Channel 18 Reference



Date: 13 JUN 2017 08:52:59

20dBc-Ref-Ch18-2442MHz

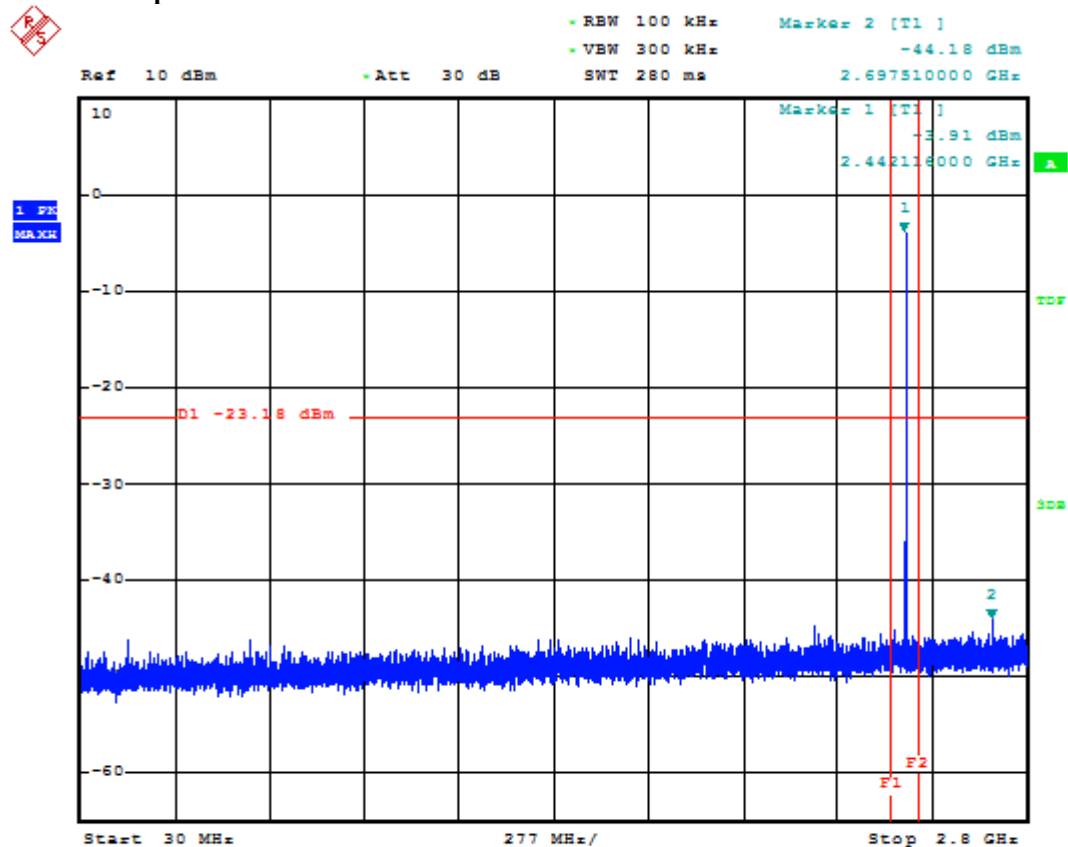
3.4.0.6. Sweep 1: 150kHz to 30MHz



Date: 13.JUN.2017 09:08:53

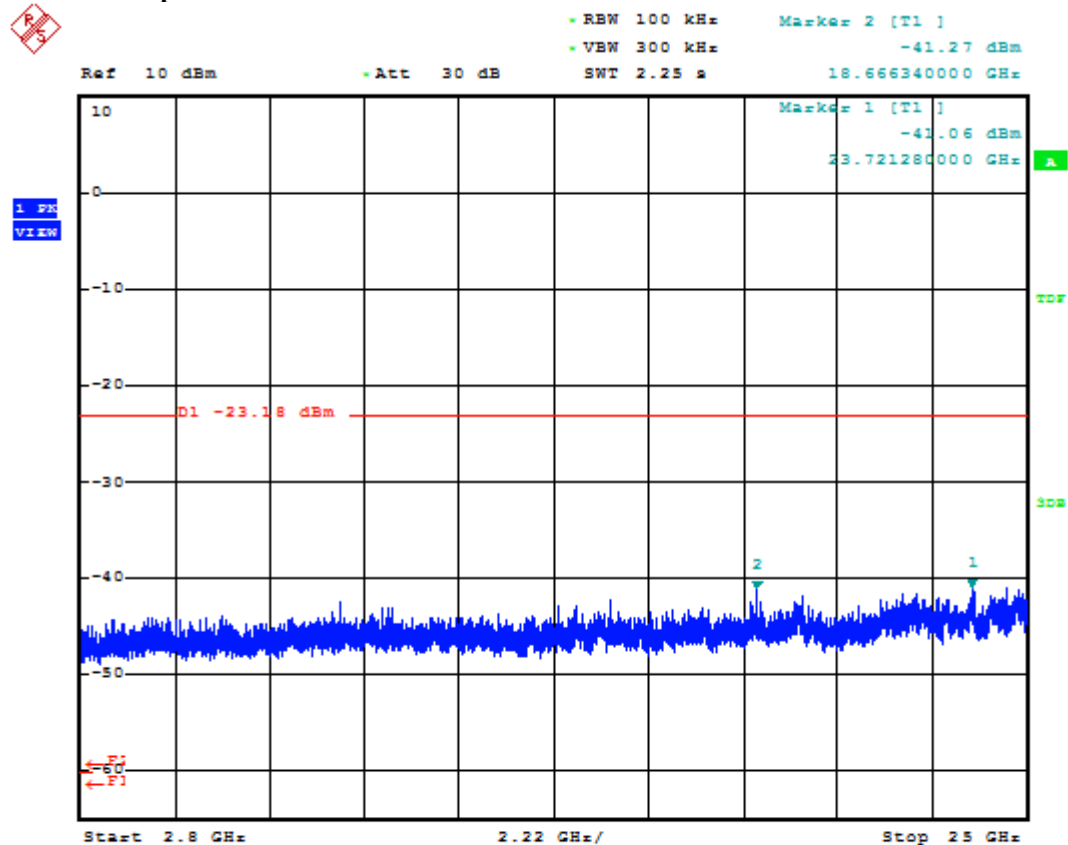
20dBc-0.15-30MHz-Ch18-2442MHz

3.4.0.7. Sweep 2: 30MHz to 2.8GHz



Date: 13.JUN.2017 09:13:23

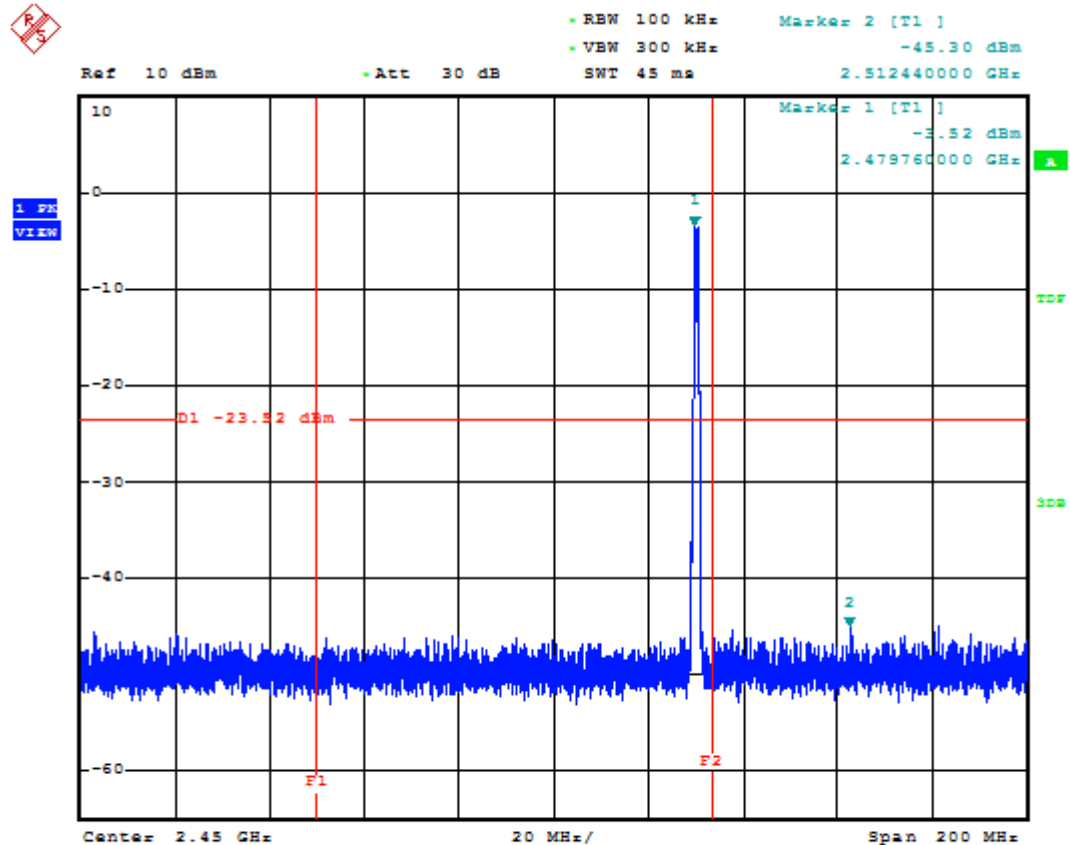
20dBc-30MHz-2.8GHz-Ch18-2442MHz



Date: 13.JUN.2017 09:11:52

20dBc-2.8GHz-25GHz-Ch18-2442MHz

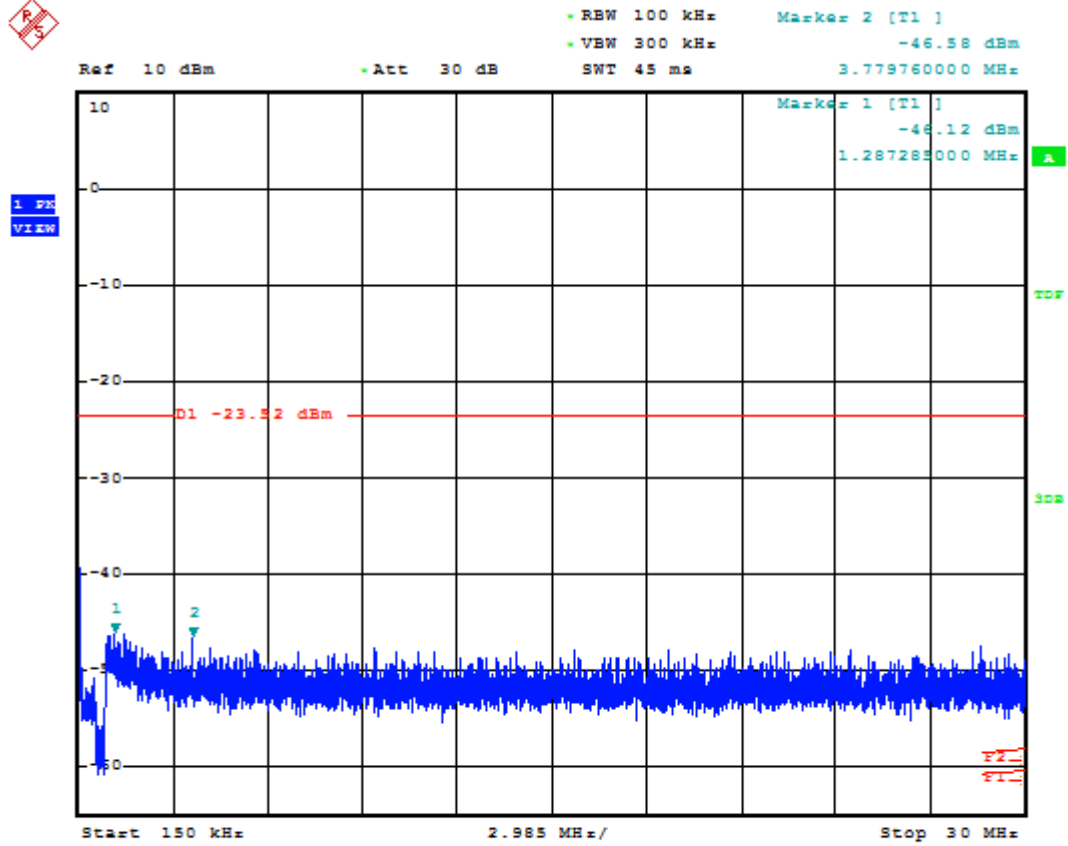
3.4.0.9. Channel 39 Reference



Date: 13.JUN.2017 09:00:57

20dBc-Ref-Ch39-2480MHz

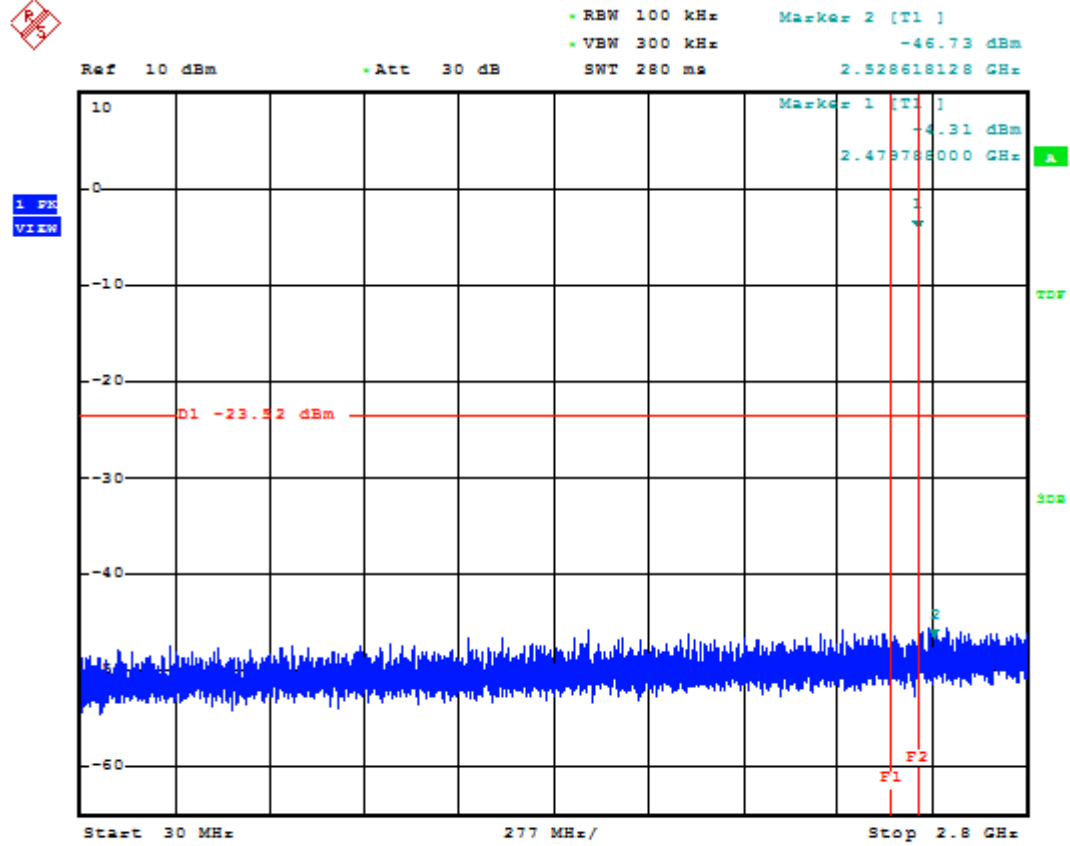
3.4.0.10. Sweep 1: 150kHz to 30MHz



Date: 13.JUN.2017 09:02:27

20dBc-0.15-30MHz-Ch39-2480MHz

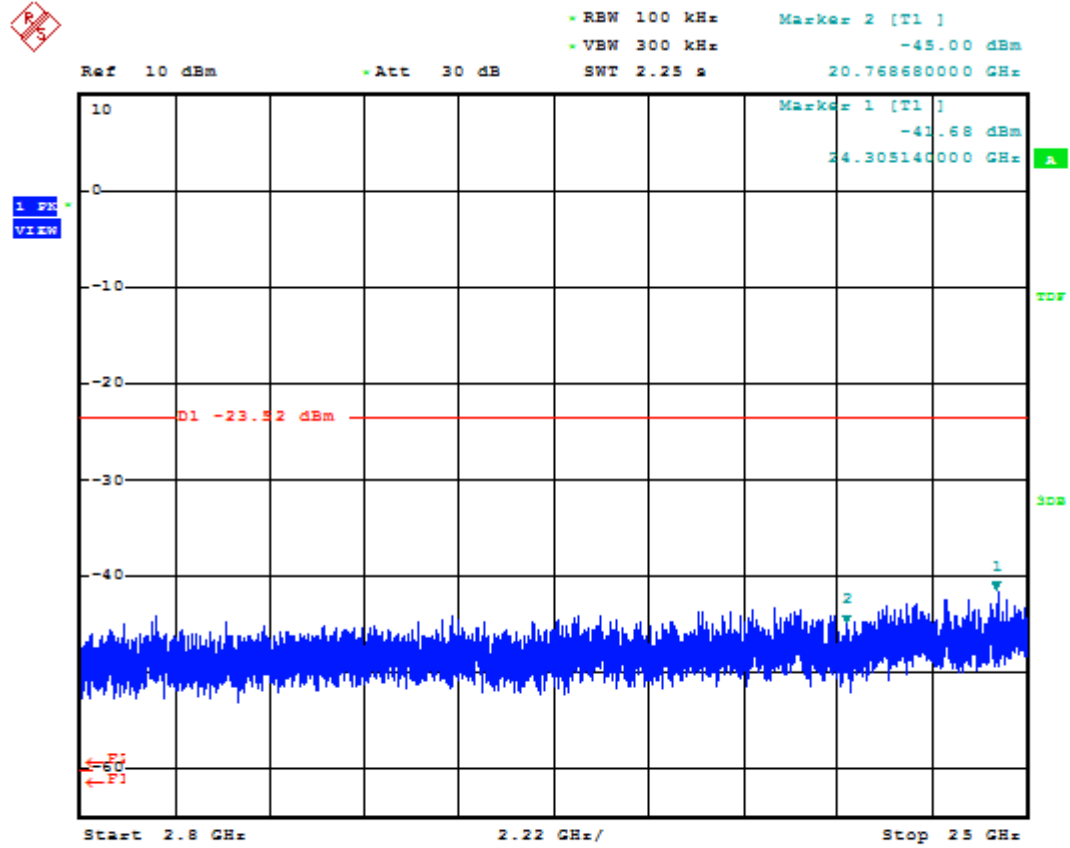
3.4.0.11. Sweep 2: 30MHz to 2.8GHz



Date: 13.JUN.2017 09:03:51

20dBc-30MHz-2.8GHz-Ch39-2480MHz

3.4.0.12. Sweep3: 2.8GHz to 25GHz



Date: 13.JUN.2017 09:05:35

20dBc-2.8GHz-25GHz-Ch39-2480MHz