

Annex 1: Measurement diagrams to Test Report 19-1-0097801T03a-A1



Number of pages:	20	Date of Report:	2020-Mai-12
Testing company:	CETECOM GmbH Im Teelbruch 116 45219 Essen Germany Tel. + 49 (0) 20 54 / 95 19-0 Fax: + 49 (0) 20 54 / 95 19-150	Applicant:	Robert Bosch GmbH
Test Object / Tested Device(s):	BUI350		
Listing FCC ID:	2AUXS-NYON350	ISED:	25847-NYON350
Testing has been carried out in accordance with:	Title 47 CFR, Chapter I FCC Regulations, Subchapter A Subpart C: §15.247 (DTS) , RSS-247, Issue 2 (DTS) RSS-Gen., Issue 5		



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1 Measurement diagrams

1.1 Conducted

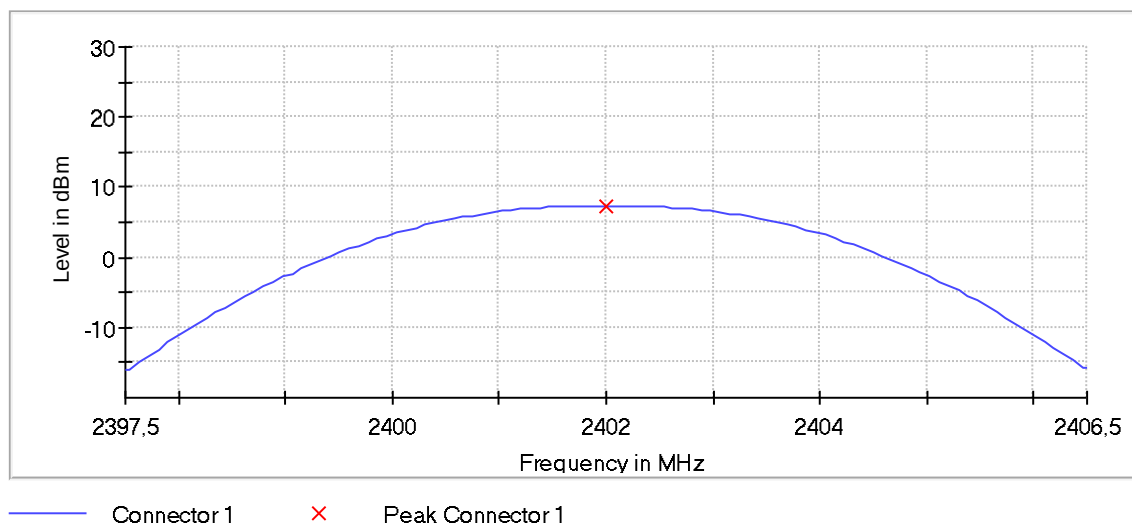
Peak output power (Sweep)

Mode	DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
10,000 2MHz	2402.000000	7.3	30.0	PASS
10,000 2MHz	2440.000000	8.3	30.0	PASS
10,000 2MHz	2480.000000	7.8	30.0	PASS

Peak output power (Sweep) (2402 MHz; 10,000 dBm; 2 MHz)

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	7.3	30.0	PASS



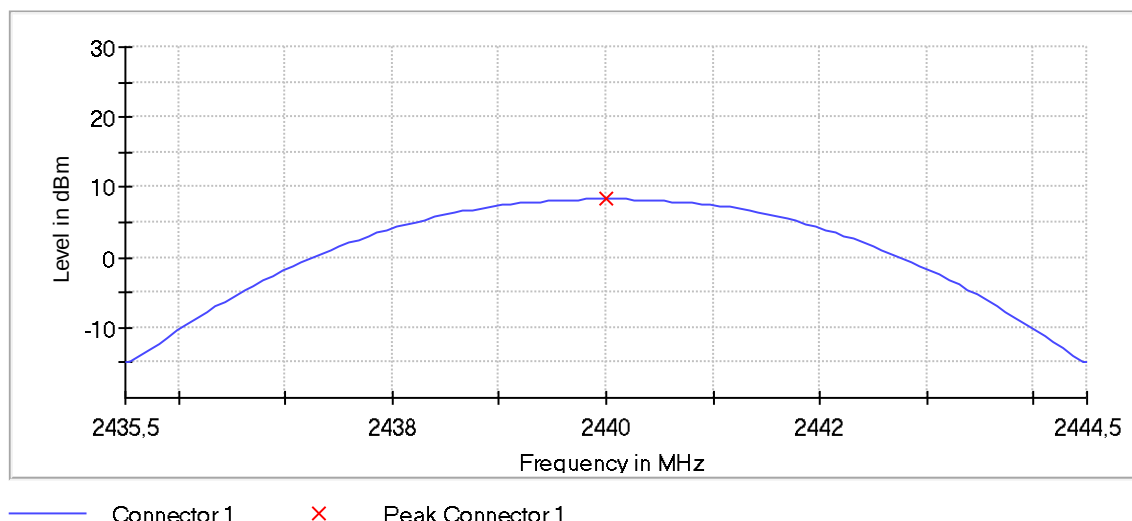
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39750 GHz	2.39750 GHz
Stop Frequency	2.40650 GHz	2.40650 GHz
Span	9.000 MHz	9.000 MHz
RBW	3.000 MHz	≥ 2.000 MHz
VBW	10.000 MHz	≥ 9.000 MHz
SweepPoints	101	~ 101
SweepTime	1.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	20.000 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	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.04 dB	0.50 dB

Peak output power (Sweep) (2440 MHz; 10,000 dBm; 2 MHz)

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2440.000000	8.3	30.0	PASS



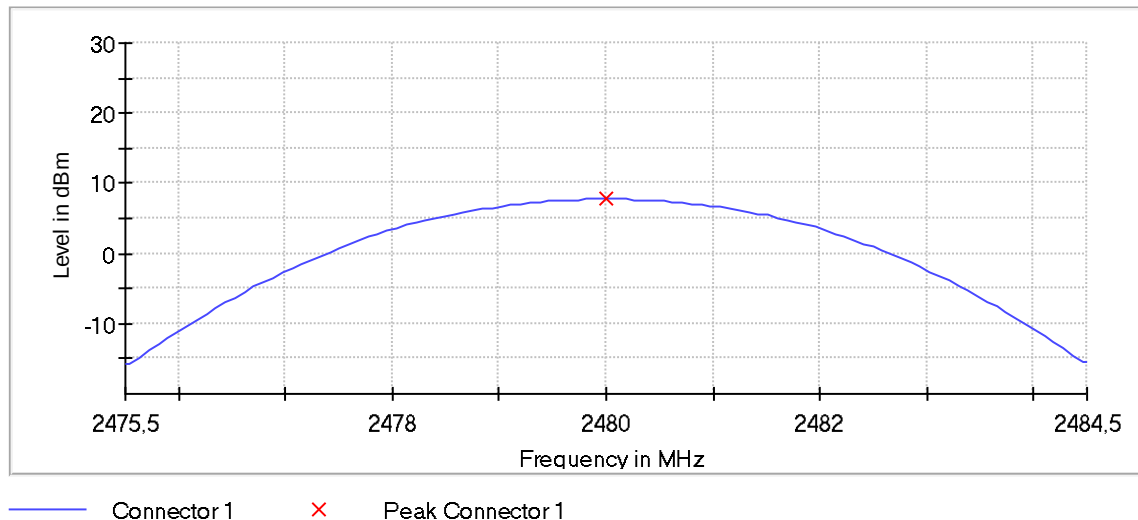
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43550 GHz	2.43550 GHz
Stop Frequency	2.44450 GHz	2.44450 GHz
Span	9.000 MHz	9.000 MHz
RBW	3.000 MHz	>= 2.000 MHz
VBW	10.000 MHz	>= 9.000 MHz
SweepPoints	101	~ 101
SweepTime	1.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.05 dB	0.50 dB

Peak output power (Sweep) (2480 MHz; 10,000 dBm; 2 MHz)

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2480.000000	7.8	30.0	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47550 GHz	2.47550 GHz
Stop Frequency	2.48450 GHz	2.48450 GHz
Span	9.000 MHz	9.000 MHz
RBW	3.000 MHz	>= 2.000 MHz
VBW	10.000 MHz	>= 9.000 MHz
SweepPoints	101	~ 101
SweepTime	1.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.04 dB	0.50 dB

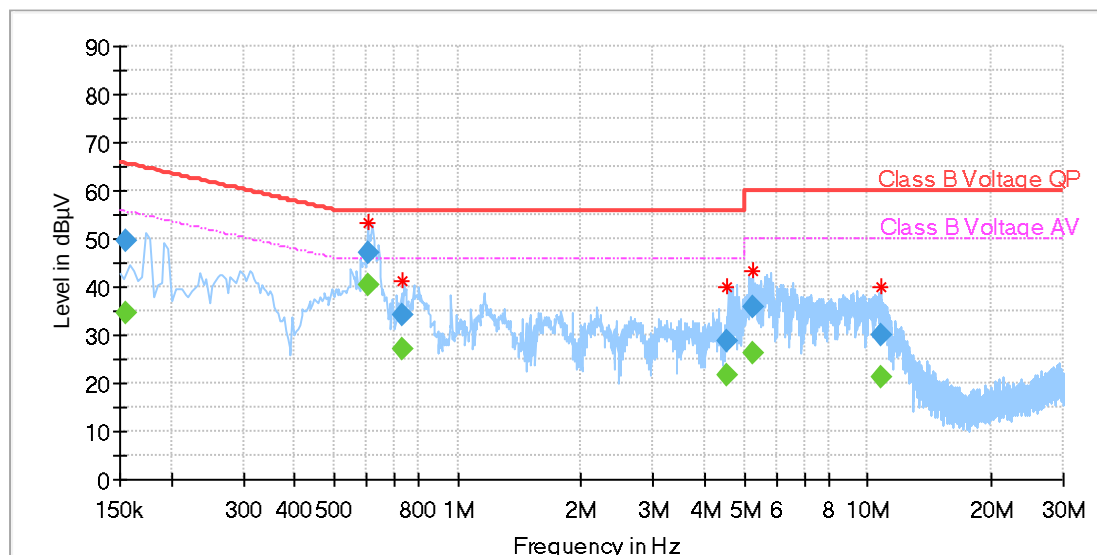
1.3 EMI AC

1.02_BLE

Common Information

Test Description:	Conducted Voltage Measurement Class B
Test Site Location:	Conducted Emission, CETECOM GmbH Essen
Test Software:	R&S EMC32 v9.15
Test Standard:	FCC 15.207 / RSS-Gen, Issue 5
Operating Mode:	BT-LE mid channel
Measured on line:	N/L1
Diagram details:	Shows the peak values as a sum of measured ports in maxhold mode
Environmental Conditions:	Humidity : 52%rH; Temperature: 20°C
Operator:	Mah
Comments:	
EUT Setup:	120V AC via USB Charger AE5
Verdict:	Passed

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.154844	---	34.54	55.74	21.20	1000.0	9.000	L1	GND	0.1
0.154844	49.69	---	65.74	16.05	1000.0	9.000	L1	GND	0.1
0.605625	---	40.46	46.00	5.54	1000.0	9.000	L1	GND	0.2
0.605625	47.29	---	56.00	8.71	1000.0	9.000	L1	GND	0.2
0.732344	---	26.90	46.00	19.10	1000.0	9.000	L1	GND	0.2
0.732344	34.27	---	56.00	21.73	1000.0	9.000	L1	GND	0.2
4.552656	---	21.85	46.00	24.15	1000.0	9.000	L1	GND	0.4
4.552656	28.95	---	56.00	27.05	1000.0	9.000	L1	GND	0.4
5.256875	---	26.37	50.00	23.63	1000.0	9.000	N	GND	0.4
5.256875	35.73	---	60.00	24.27	1000.0	9.000	N	GND	0.4
10.754063	---	21.43	50.00	28.57	1000.0	9.000	N	GND	0.4
10.754063	30.09	---	60.00	29.91	1000.0	9.000	N	GND	0.4

1.4 Radiated

2.01a_BT_LE_mid_standing

Common Information

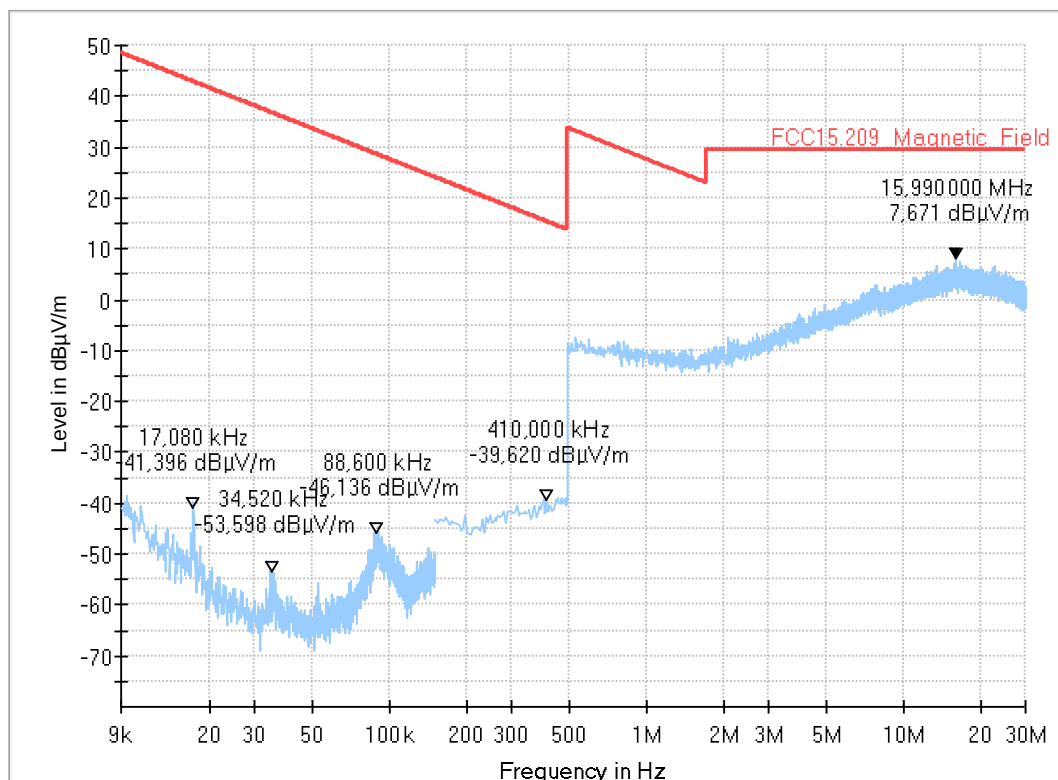
Test Description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance
Version of Testsoftware:	EMC32 V10.50.0
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see 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 Standard:	FCC 15.205 § 15.209; RSS-Gen: Issue 5

Operator:	FKA
Operating Mode:	Channel 2440 MHz standing
Power during tests:	12V DC, full loaded batteries
Comment 1:	Channel low/middle/high
Comment 2:	
Environmental Conditions::	Humidity : 40%rH; Temperature: 20°C
EUT Setup:	Standing
Verdict:	passed
Comment:	

EUT Information

PMT number:	19-1-00978S08
Manufacturer:	Robert Bosch GmbH

Full Spectrum



2.01b_BT_LE_mid_laying

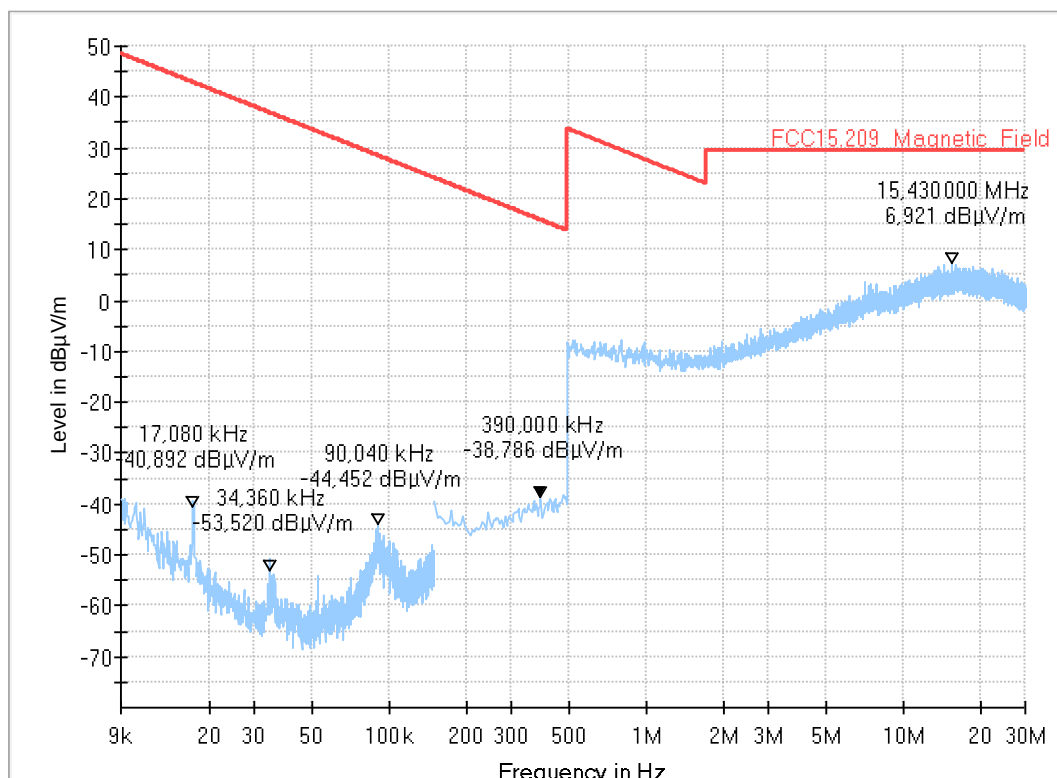
Common Information

Test Description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance
Version of Testsoftware:	EMC32 V10.50.0
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 Standard:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Operator:	FKA
Operating Mode:	Channel I 2440 MHz laying
Power during tests:	12V DC, full loaded batteries
Comment 1:	Channel low/middle/high
Comment 2:	
Environmental Conditions:	Humidity : 40%rH; Temperature: 20°C
EUT Setup:	laying
Verdict:	Passed
Comment:	

EUT Information

PMT number:	19-1-00978S08
Manufacturer:	Robert Bosch GmbH

Full Spectrum



3.01a_BT_LE_mid_standing

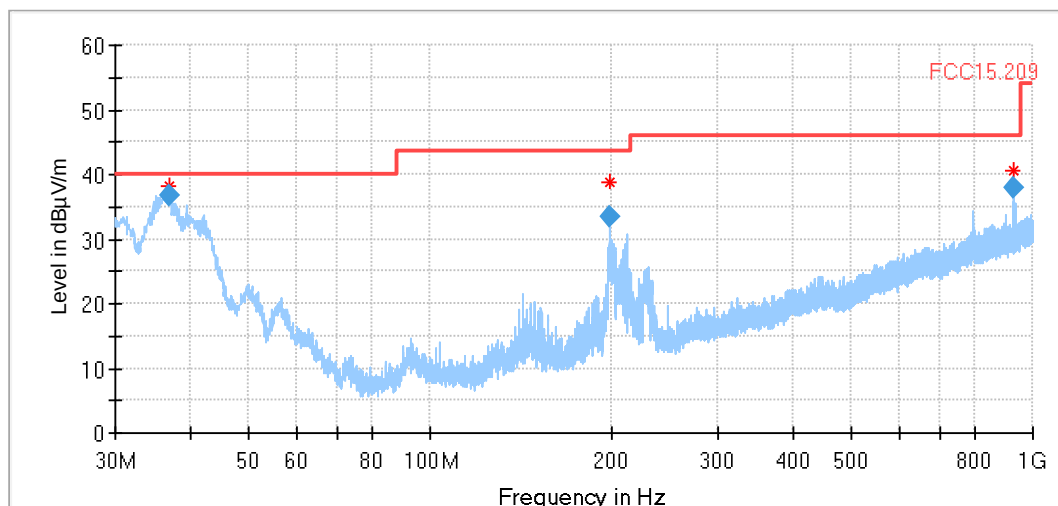
Common Information

Test Description:	Electric Fieldstrength Measurement
Test Spec.:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Antenna:	receiving antenna is directed to all sides
Operating Mode:	BLE GFSK 2440 MHz
Environmental Conditions:	Humidity : 40%rH; Temperature: 21°C
Operator:	npe
Verdict:	PassedComment:

EUT Information

PMT number:	19-1-00978S08
Manufacturer:	Robert Bosch GmbH

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/m)
36.828000	36.59	40.00	3.41	1000.0	120.000	105.0	V	211.0	18.5
197.982000	33.52	43.50	9.98	1000.0	120.000	219.0	H	275.0	11.4
928.382000	37.96	46.00	8.04	1000.0	120.000	310.0	H	159.0	27.0

The peak @ 928.382 MHz is known external disturbances and do not come from the EUT.

3.01b_BT_LE_mid_laying

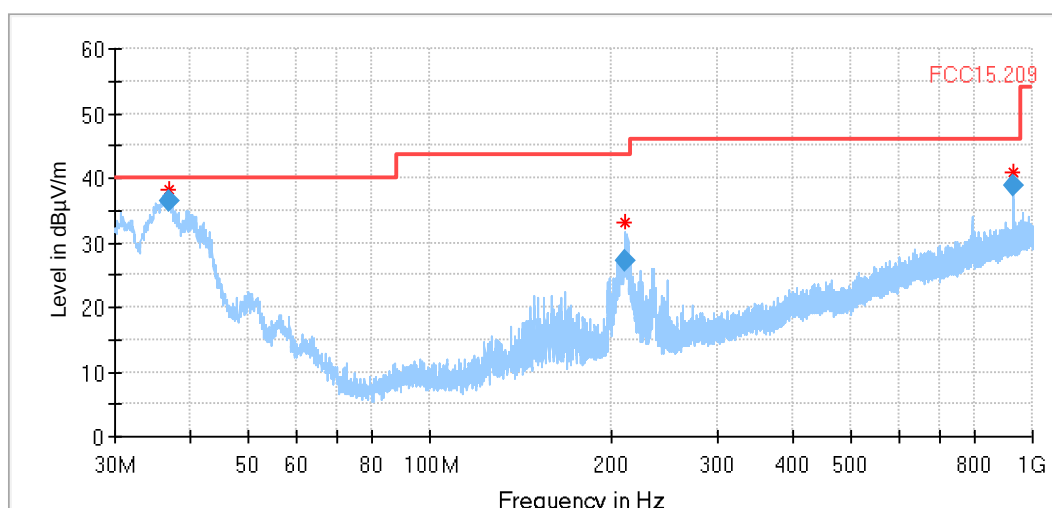
Common Information

Test Description:	Electric Fieldstrength Measurement
Test Spec.:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Antenna:	receiving antenna is directed to all sides
Operating Mode:	BLE GFSK 2440 MHz
Environmental Conditions:	Humidity : 40%rH; Temperature: 21°C
Operator:	npe
Verdict:	PassedComment:

EUT Information

PMT number:	19-1-00978S08
Manufacturer:	Robert Bosch GmbH

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin	Meas. Time (ms)	Bandwidth (Hz)	Height	Pol	Azimuth	Corr. (dB/m)
36.824000	36.42	40.00	3.58	1000.0	120.000	105.0	V	222.0	18.5
210.010000	27.14	43.50	16.36	1000.0	120.000	211.0	H	235.0	11.6
928.458000	38.68	46.00	7.32	1000.0	120.000	195.0	H	47.0	27.0

The peak @ 928.458 MHz is known external disturbances and do not come from the EUT.

4.01a_BT_LE_mid

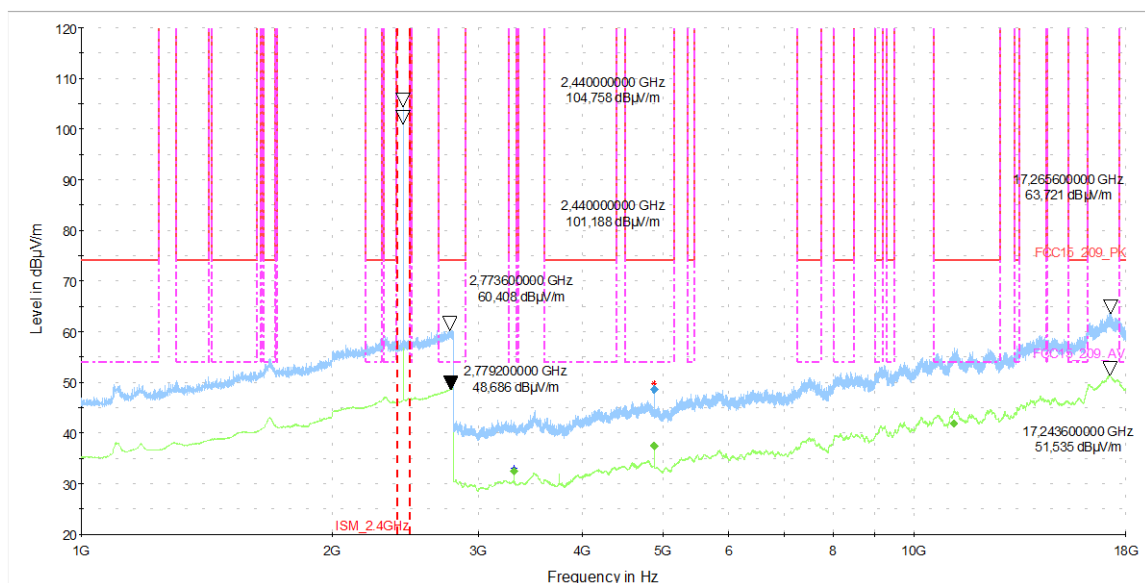
Common Information

Test Description: Radiated field strength emission in 3m distance
 Test Site: Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
 Test Standard: FCC 15.209 Intentional Radiator / RSS-Gen, Issue 5
 Antenna polarisation: horizontal/vertical

 Operating Mode: Channel 2440 MHz
 Operator: TFra
 Environmental Conditions: Humidity : 40%rH; Temperature: 20°C
 Verdict: Passed

EUT Information

PMT number: 19-1-00978S08
 Manufacturer: Robert Bosch GmbH



Remark:

Marker were set at system noise level

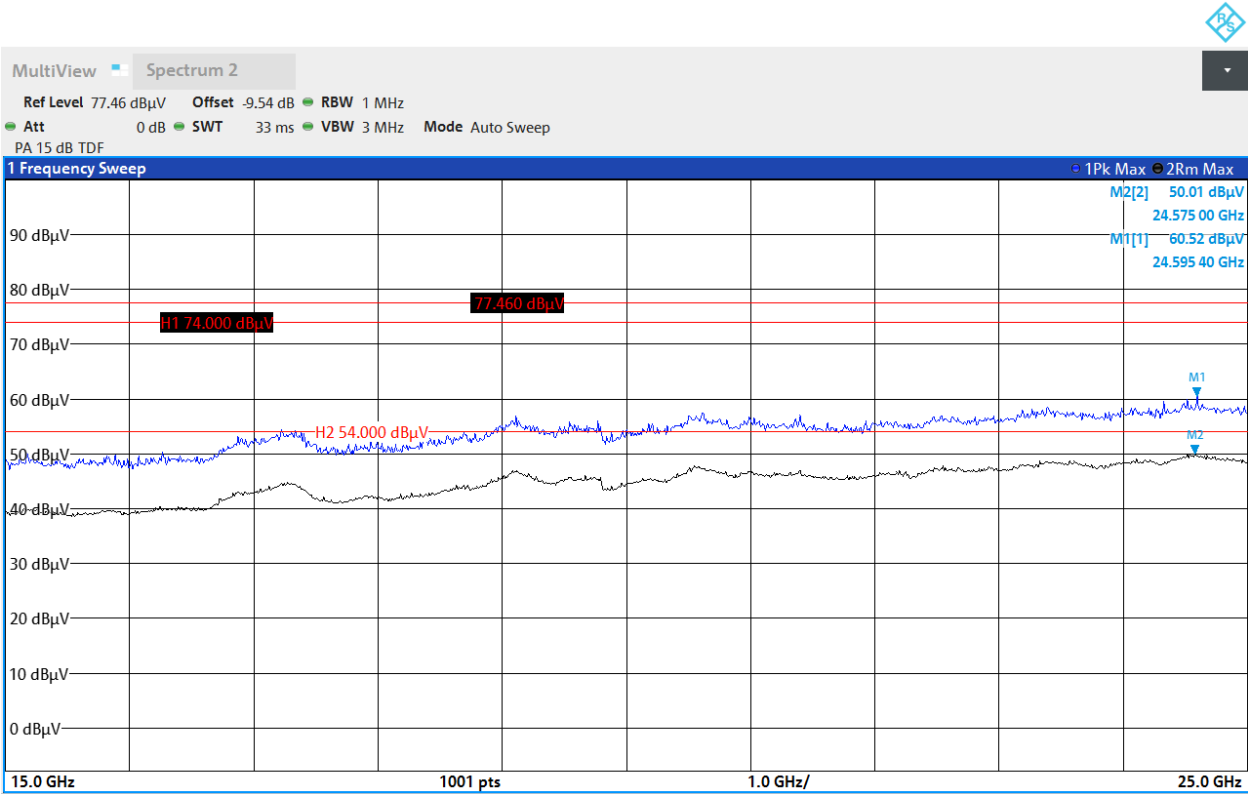
Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
3312.400000	---	36.527	150.00	113.48	100.0	1000.000	155.0	V	0.0	90.0	2
4879.600000	---	41.57	54.00	12.43	100.0	1000.000	155.0	V	180.0	0.0	6
4880.400000	48.66	---	74.00	25.34	100.0	1000.000	155.0	V	194.0	0.0	6
11203.600000	---	45.99	54.00	8.01	100.0	1000.000	155.0	V	-6.0	90.0	20

*average values are corrected with Duty Cycle Factor.



4.01b_BT_LE_mid



9.01_BE_BT_LE_low

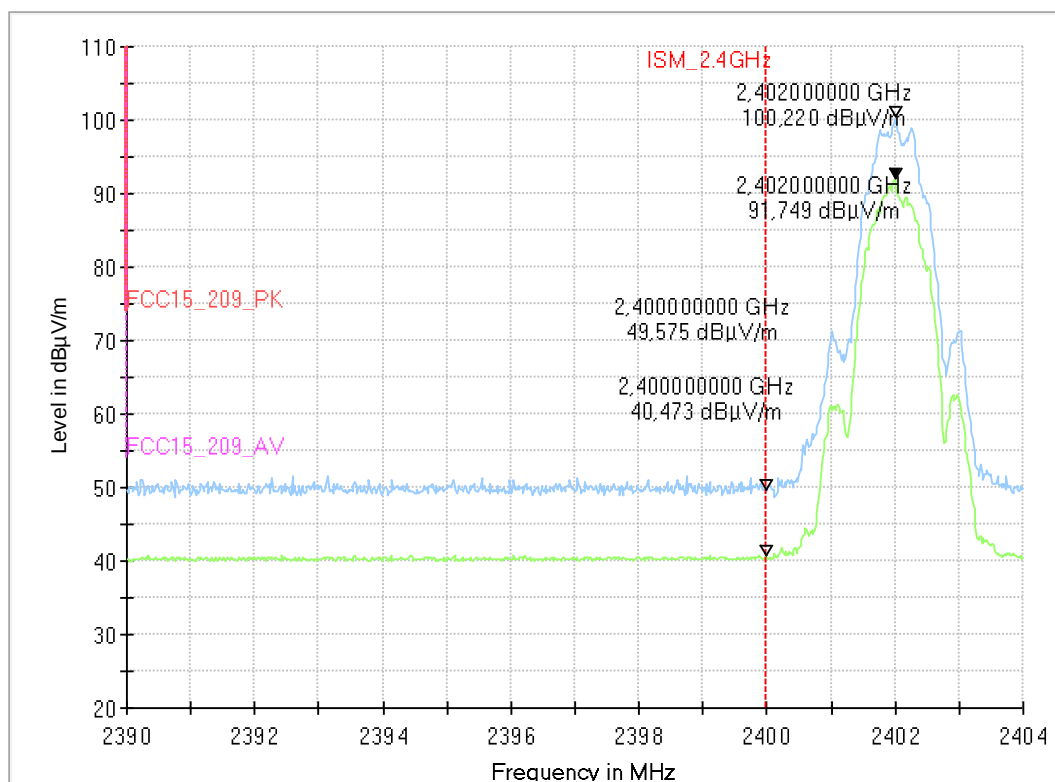
Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	BT LE - Channel 0 - 2402 MHz
Operator:	FKa
EUT Setup:	new seup
Verdict:	Passed

EUT Information

PMT number:	19-1-00978S08
Manufacturer:	Robert Bosch GmbH

Full Spectrum



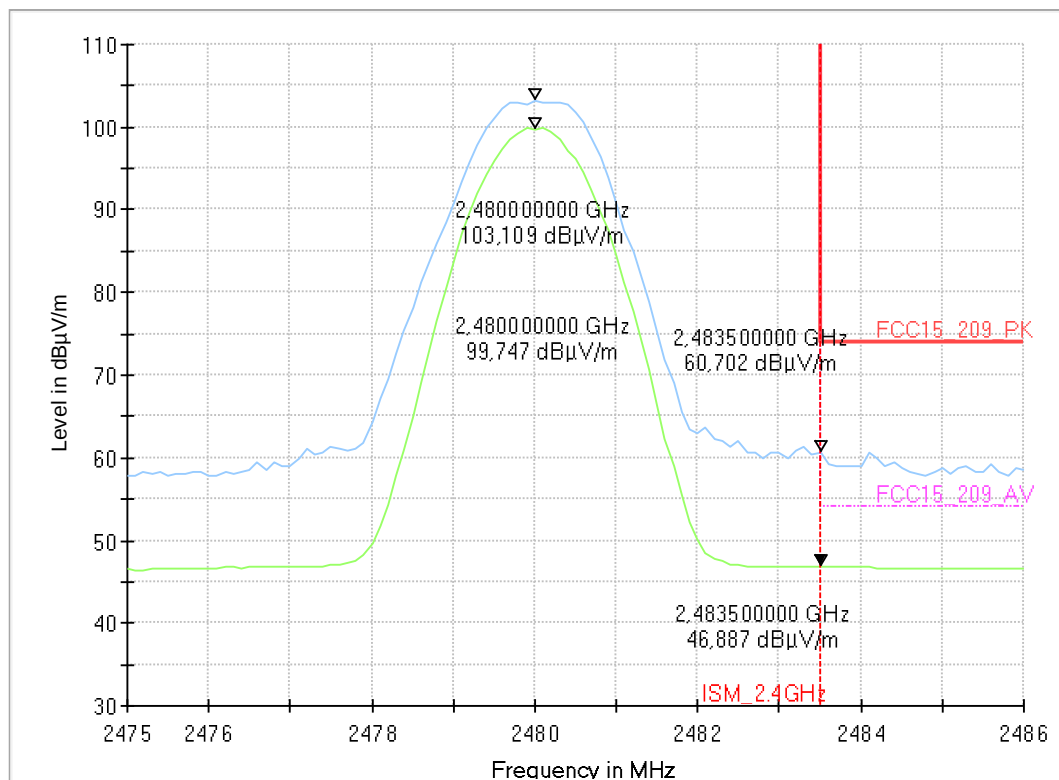
9.02_BE_BT_LE_high

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	BT LE - Channel 39 - 2480 MHz
Operator:	FKa
EUT Setup:	new setup
Verdict:	Passed

EUT Information

PMT number:	19-1-00978S08
Manufacturer:	Robert Bosch GmbH
Full Spectrum	



End Of Annex 1