

Annex 1: Measurement diagrams to PARTIAL Test Report 20-1-0183503T01a-A1

Number of pages:	16	Date of Report:	2021-Apr-01
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:	Husqvarna AB
Product: Model:	Base station board with Bluetooth functionality Base Station Board Type 1		
FCC ID:	ZASHQ-BLE-1D	IC:	23307-HQBLE1D
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 Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit"		

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1 Measurement diagrams

1.1 Radiated measurements

2.01a_BT_LE_low

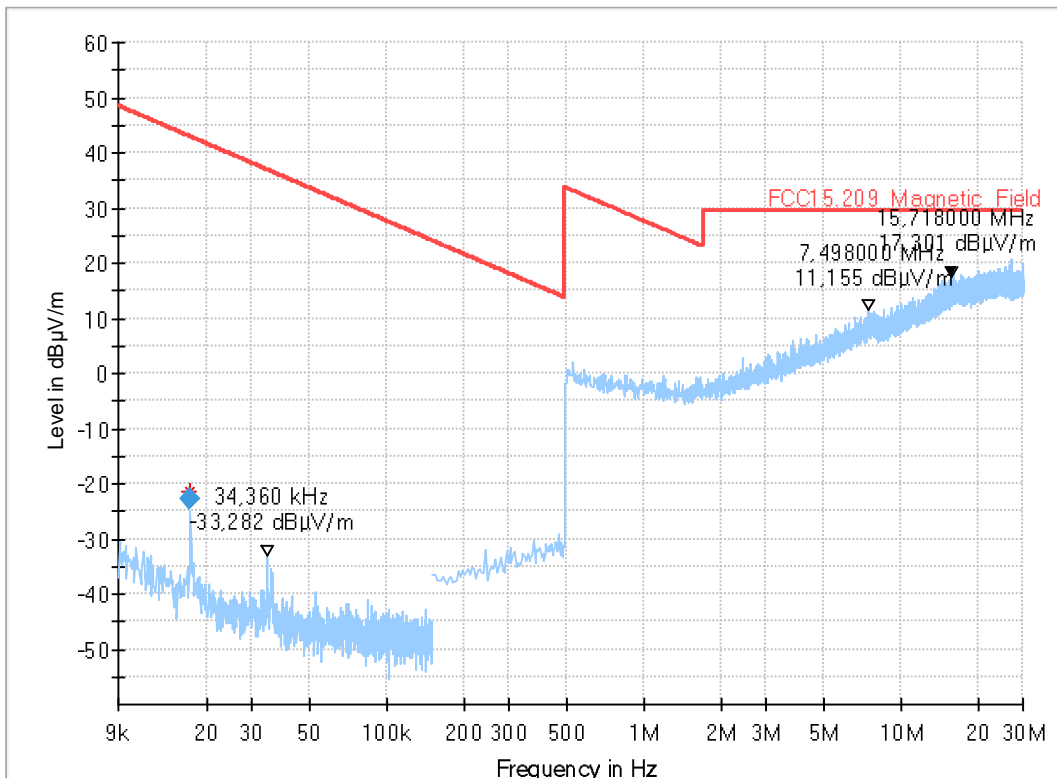
Common Information

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: HEL
 Operating Mode: BLE_CH:Low_Position :Standing
 Power during tests: 28V DC
 Environmental Conditions: Humidity : 48 %rH; Temperature: 21 °C
 EUT Setup: 1
 Verdict: Passed

EUT Information

PMT number: 20-1-01835S19_C01
 Manufacturer: Husqvarna AB

Full Spectrum



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margi n	Meas. Time (ms)	Bandwidt h	Pol	Azimet h	Corr. (dB/m)	Comment
0.017160	-22.90	42.91	65.80	1000.0	0.200	V	244.0	-59.4	16:32:41 - 27.02.2021

2.01b_BT_LE_low

Common Information

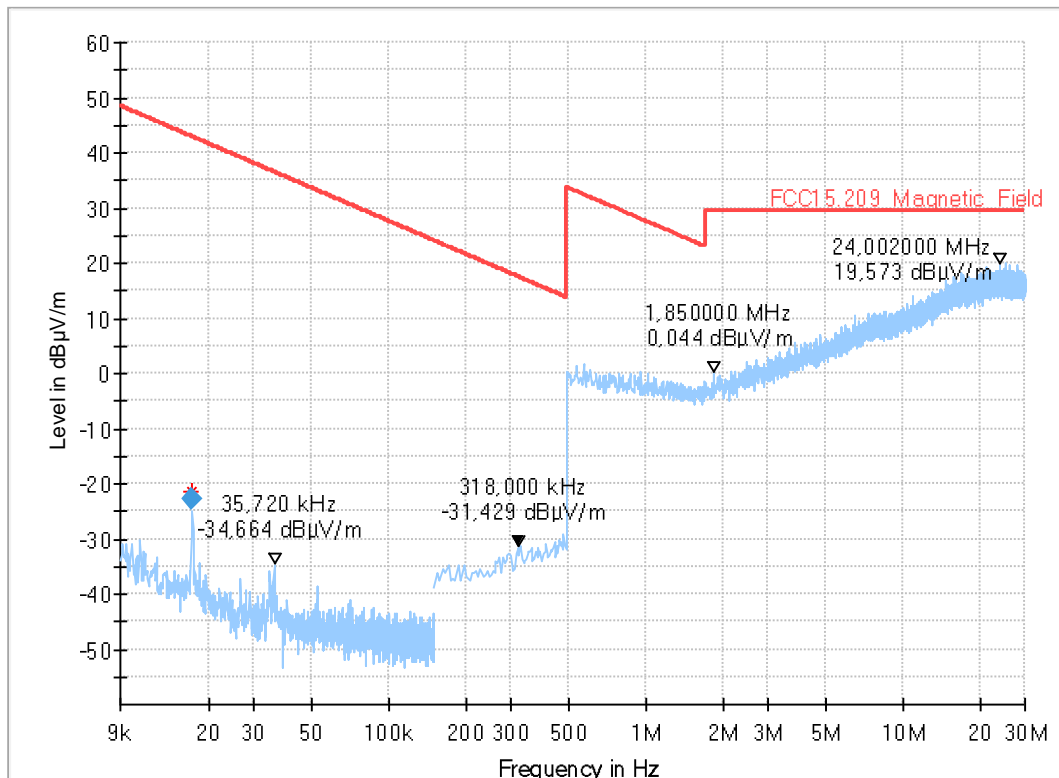
Test Description: Magnetic Field Strength Measurement related to 30/300 m distance
 Test Site Location: Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance
 Version of Testsoftware: EMC32 V10.50.0
 Distance correction: used accord. table, pls. see test report
 Technical Data: Please 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: HEL
 Operating Mode: BLE_CH:LOW_Position :Laying
 Power during tests: 28V DC
 Comment 1: Channel low
 Comment 2:
 Environmental Conditions: Humidity : 48 %rH; Temperature: 21 °C
 EUT Setup: 1
 Verdict: Passed
 Comment:

EUT Information

PMT number: 20-1-01835S19_C01
 Manufacturer: Husqvarna AB

Full Spectrum



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margi n	Meas. Time (ms)	Bandwidt h	Pol	Azimet h	Corr. (dB/m)	Comment
0.017160	-22.97	42.91	65.87	1000.0	0.200	V	311.0	-59.4	16:05:53 - 27.02.2021

3.01a_BT_LE_low

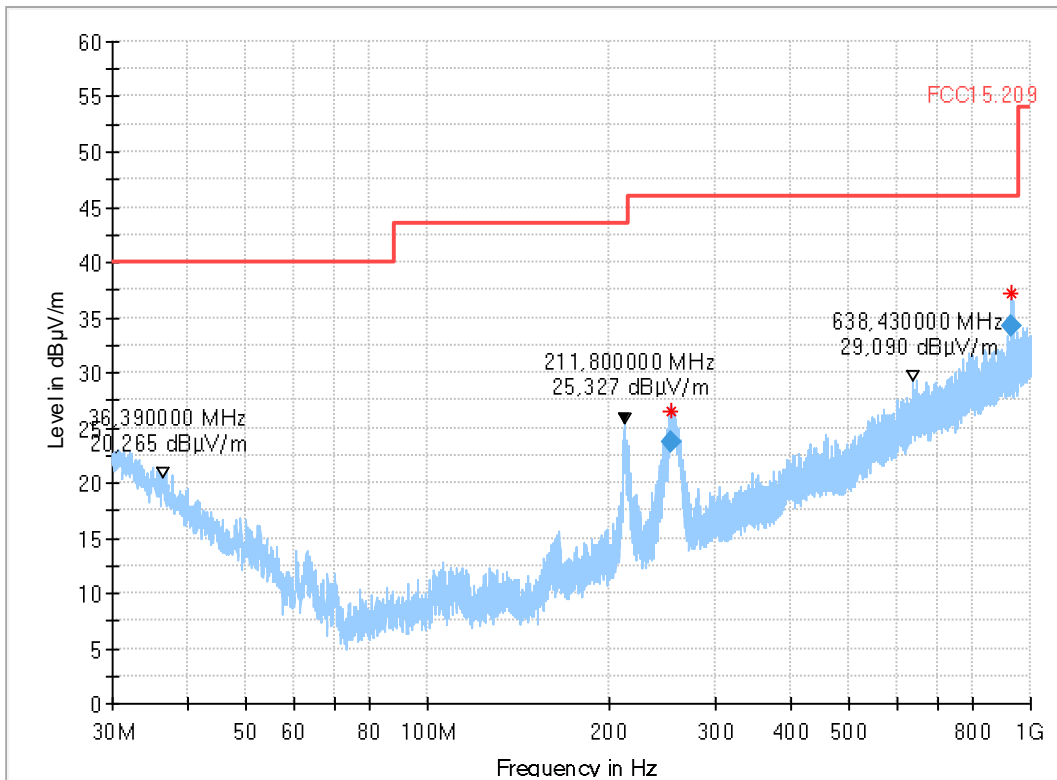
Common Information

Test Description: Radiated field strength emission in 3m distance
 Test Site: CETECOM GmbH Essen
 Test Standard: FCC 15.205&15.209 RSS Gen Issue 5 Intentional Radiator
 Antenna polarisation: horizontal/vertical
 Comment:
 Operating Mode: BLE_CH:Low_Positon : laying
 Environmental Conditions: Humidity : 45%rH; Temperature: 16°C
 Operator: HEL
 Verdict: Passed

EUT Information

PMT number: 20-1-01835S19_C01
 Manufacturer: Husqvarna AB

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)
253.110000	23.71	46.00	22.29	1000.0	120.000	173.0	V	349.0	13.2
928.332000	34.13	46.00	11.87	1000.0	120.000	360.0	V	284.0	27.0

Remark: Peak at 928.332 MHz is a known external interferer and does not come from the EUT

3.01b_BT_LE_low

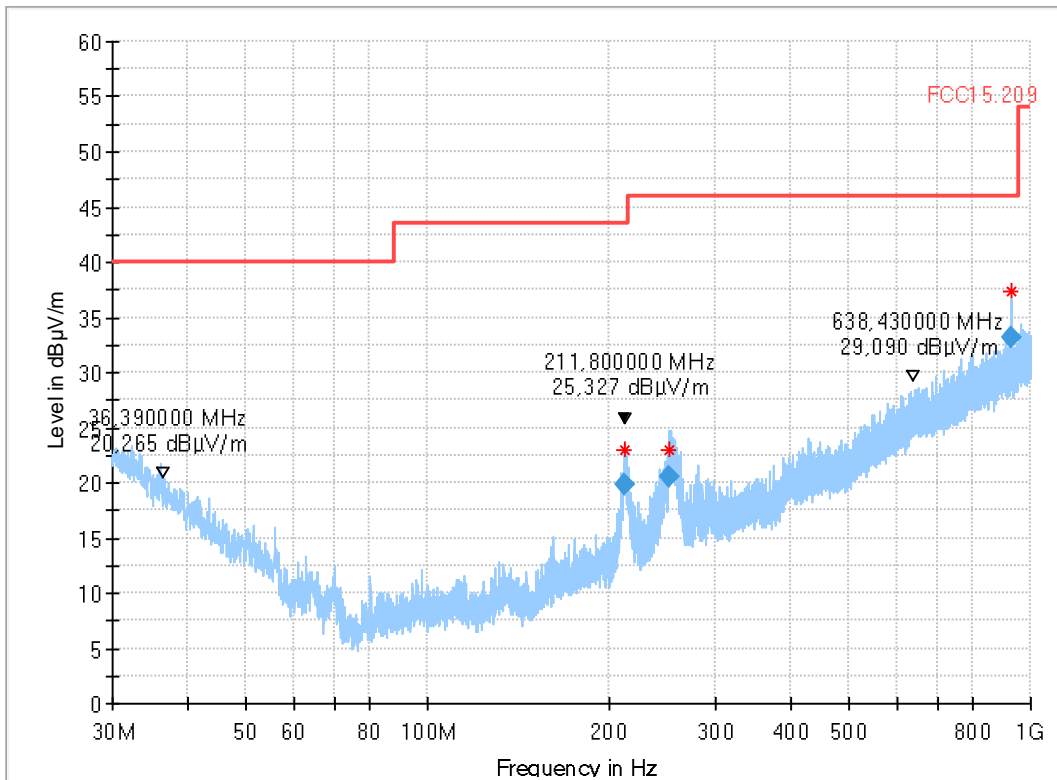
Common Information

Test Description: Radiated field strength emission in 3m distance
 Test Site: CETECOM GmbH Essen
 Test Standard: FCC 15.205&15.209 RSS Gen Issue 5 Intentional Radiator
 Antenna polarisation: horizontal/vertical
 Comment:
 Operating Mode: BLE_CH:LOW_Positon :Standing
 Environmental Conditions: Humidity : 45%rH; Temperature: 17°C
 Operator: HEL
 Verdict: Passed

EUT Information

PMT number: 20-1-01835S19_C01
 Manufacturer: Husqvarna AB

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)
212.542000	19.82	43.50	23.68	1000.0	120.000	207.0	V	352.0	11.7
251.876000	20.47	46.00	25.53	1000.0	120.000	111.0	V	222.0	13.1
928.418000	33.12	46.00	12.88	1000.0	120.000	230.0	V	325.0	27.0

Remark: Peak at 928.418 MHz is a known external interferer and does not come from the EUT

4.01a_BT_LE_low

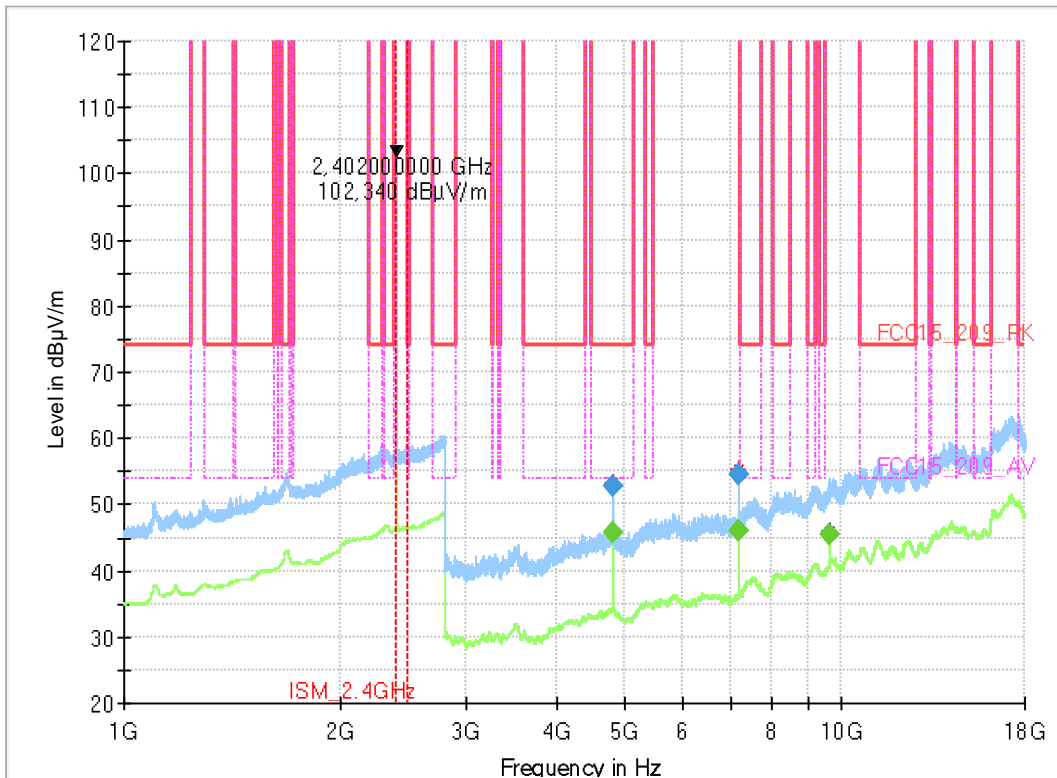
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	BT-LE Channel low
Set-up no.	
Operator:	TFa
Environmental Conditions:	Humidity : 40%rH; Temperature: 20°C
Verdict:	Passed

EUT Information

PMT number:	20-1-01835S19_C01
Manufacturer:	Husqvarna AB

Full Spectrum



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)
4804.400000	---	45.70	54.00	8.30	100.0	1000.000	155.0	V	268.0	90.0	6
4804.400000	52.74	---	74.00	21.26	100.0	1000.000	155.0	V	269.0	90.0	6
7206.800000	---	45.98	150.00	104.02	100.0	1000.000	155.0	V	-8.0	90.0	12
7206.800000	54.46	---	150.00	95.54	100.0	1000.000	155.0	V	15.0	90.0	12
9607.200000	---	45.41	150.00	104.59	100.0	1000.000	155.0	H	39.0	90.0	16

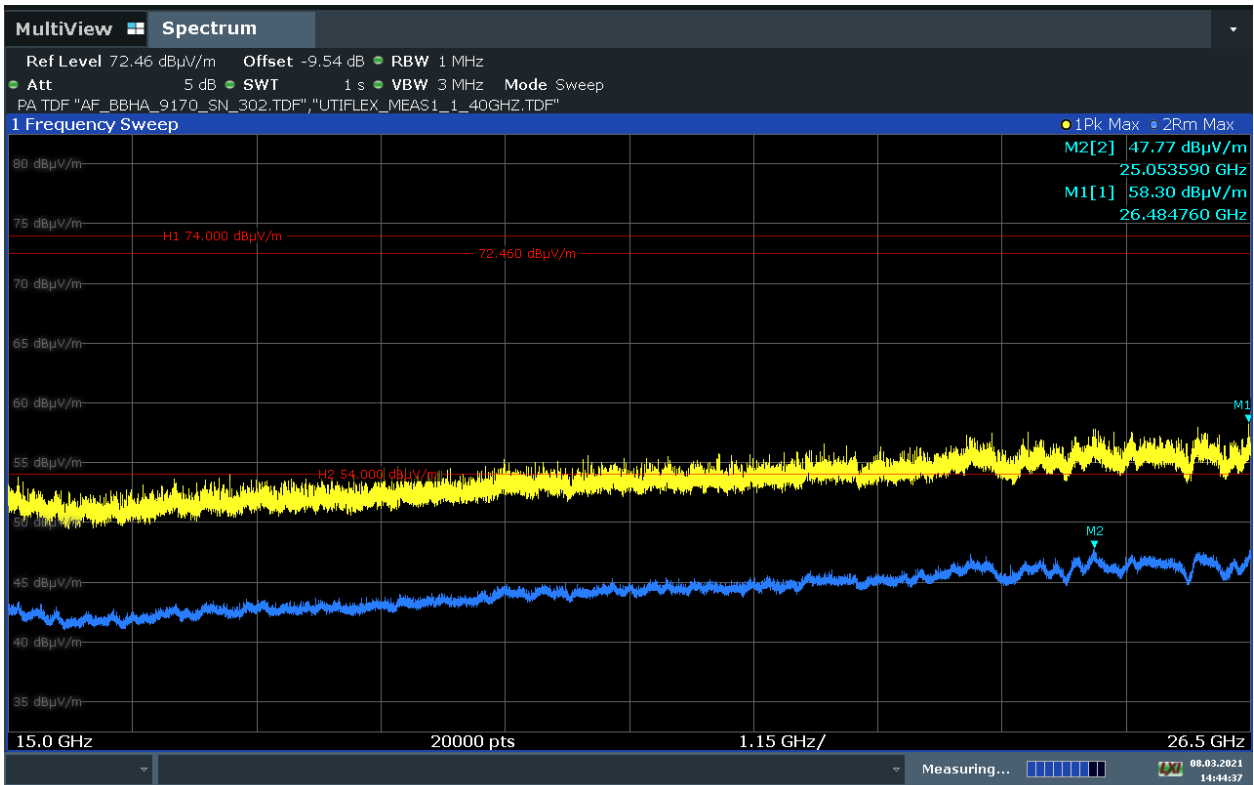
4.01b_BT_LE_low

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	Fully Anechoic Chamber (FAC1)
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	BT-LE Channel low
Set-up no.	
Operator:	TFa
Comment2:	Modulation Type: xxx Data Rate: yyy
Environmental Conditions:	Humidity : 40%rH; Temperature: 20°C
Verdict:	Passed

EUT Information

PMT number:	20-1-01835S19_C01
Manufacturer:	Husqvarna AB



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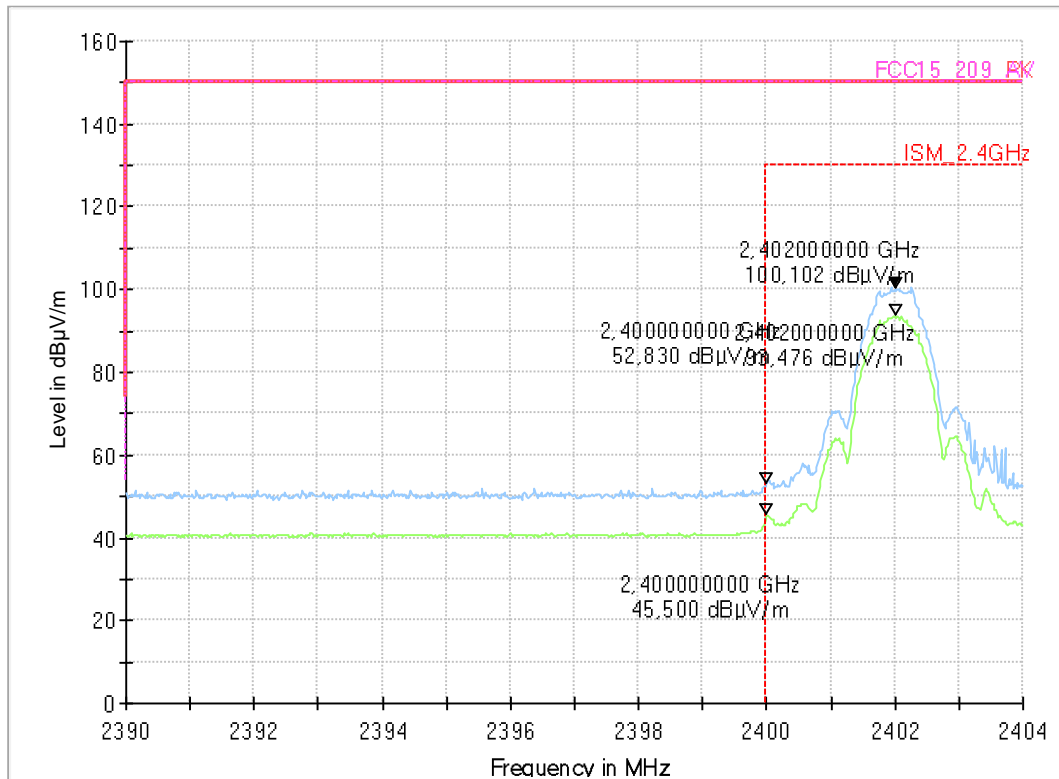
9.01_BE_BT_LE_low

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 low
Operator:	TFa
Comment:	Channel no. low
Comment2:	
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	20-1-01835S19_C01
Manufacturer:	Husqvarna AB
	Full Spectrum



9.02_BE_BT_LE_high

Common Information

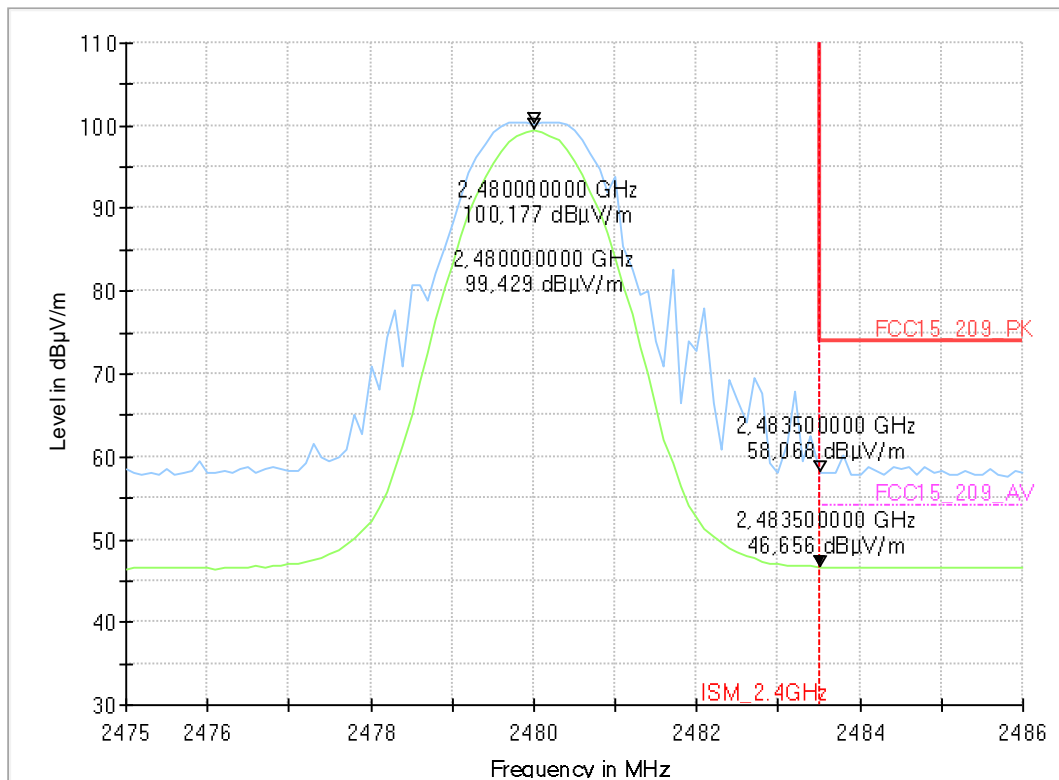
Test Description: Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
 Test Site: Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
 Test Standard: FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 5
 Antenna polarisation: horizontal/vertical

Operating Mode: BT-LE | Channel High
 Operator: TFa
 Comment: Channel no. high
 EUT Setup: 1
 Verdict: Passed

EUT Information

PMT number: 20-1-01835S19_C01
 Manufacturer: Husqvarna AB

Full Spectrum



1.2 Conducted measurements

Peak output power (Sweep)

Mode	DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
BT-LE [GFSK]; 2402MHz	2402.000000	4.3	30.0	PASS
BT-LE [GFSK]; 2442MHz	2442.000000	4.3	30.0	PASS
BT-LE [GFSK]; 2480MHz	2480.000000	3.8	30.0	PASS

Duty Cycle (2402 MHz; BT-LE [GFSK] (5 dBm); 1 MHz)

Result

DUT Frequency (MHz)	DutyCycle (%)	Result
2402.000000	100.000	PASS

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Duty Cycle (2442 MHz; BT-LE [GFSK] (5 dBm); 1 MHz)

Result

DUT Frequency (MHz)	DutyCycle (%)	Result
2442.000000	100.000	PASS

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Duty Cycle (2480 MHz; BT-LE [GFSK] (5 dBm); 1 MHz)**Result**

DUT Frequency (MHz)	DutyCycle (%)	Result
2480.000000	100.000	PASS

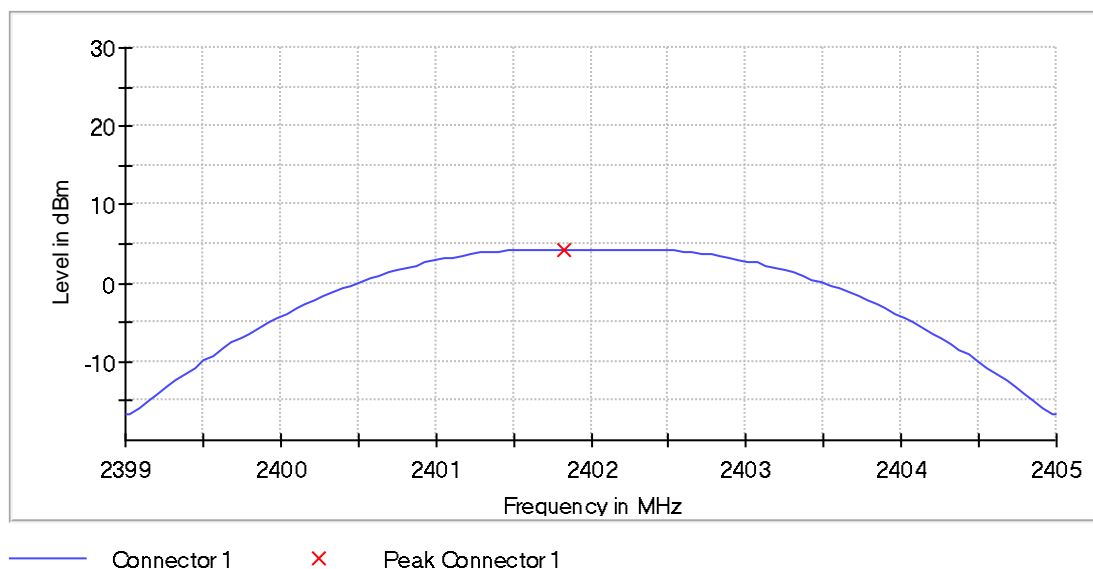
OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Peak output power (Sweep) (2402 MHz; BT-LE [GFSK] (5 dBm); 1 MHz)

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	4.3	30.0	PASS



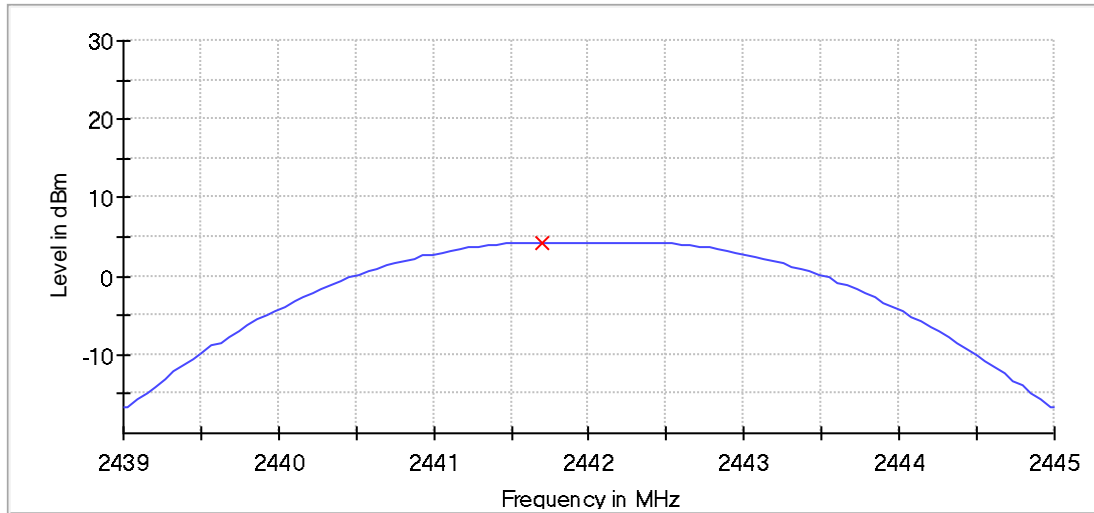
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39900 GHz	2.39900 GHz
Stop Frequency	2.40500 GHz	2.40500 GHz
Span	6.000 MHz	6.000 MHz
RBW	2.000 MHz	>= 1.000 MHz
VBW	10.000 MHz	>= 6.000 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	0.05 dB	0.50 dB

Peak output power (Sweep) (2442 MHz; BT-LE [GFSK] (5 dBm); 1 MHz)

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2442.000000	4.3	30.0	PASS



— Connector 1 × Peak Connector 1

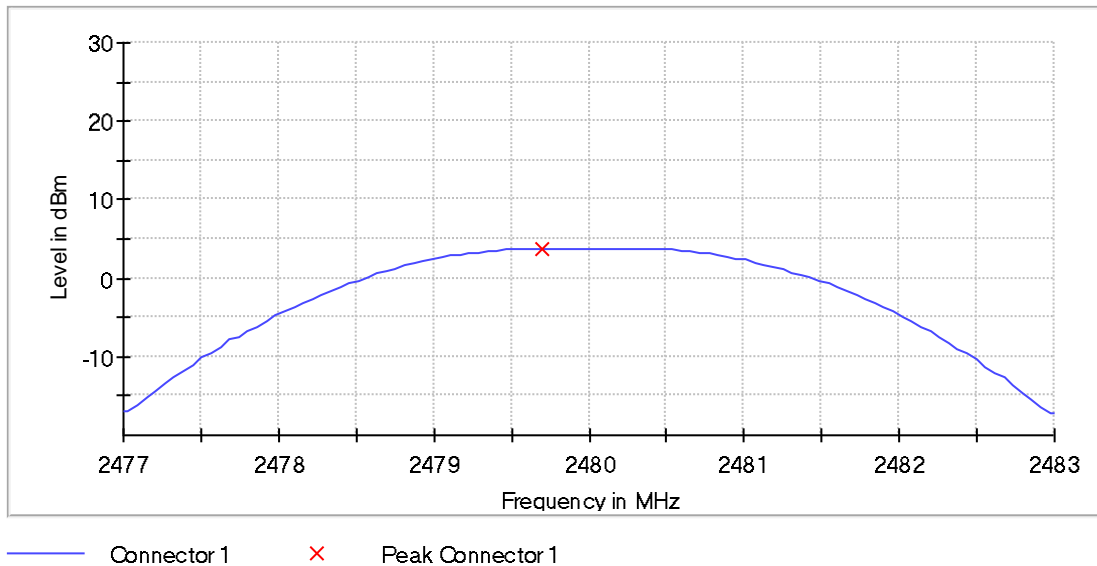
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43900 GHz	2.43900 GHz
Stop Frequency	2.44500 GHz	2.44500 GHz
Span	6.000 MHz	6.000 MHz
RBW	2.000 MHz	>= 1.000 MHz
VBW	10.000 MHz	>= 6.000 MHz
SweepPoints	101	~ 101
Sweptime	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	0.11 dB	0.50 dB

Peak output power (Sweep) (2480 MHz; BT-LE [GFSK] (5 dBm); 1 MHz)

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2480.000000	3.8	30.0	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47700 GHz	2.47700 GHz
Stop Frequency	2.48300 GHz	2.48300 GHz
Span	6.000 MHz	6.000 MHz
RBW	2.000 MHz	>= 1.000 MHz
VBW	10.000 MHz	>= 6.000 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	0.07 dB	0.50 dB

End Of Annex 1