Annex 1: Measurement diagrams to Test Report 19-1-0142201T08a

Number of pages:	40	**Date of Report:**	2020-Feb-17
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:**	GROHE AG Industriepark Edelburg 58675, Hemer Germany
Test Object / Tested Device(s):	**Remote Control, Rainshower 310 SmartConnect (26646)**		
Contains FCC ID:	WFK-RCBT001	**Contains ISED:**	7787A-RCBT001
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**		

1 Measurement diagrams

1.1 Conducted

Minimum Emission Bandwidth 6 dB

Mode	DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
10 dBm) 2MHz	2402.0000	0.752476	0.500000	---	2401.7227	2402.4752
10 dBm) 2MHz	2442.0000	0.752476	0.500000	---	2441.7227	2442.4752
10 dBm) 2MHz	2480.0000	0.752476	0.500000	---	2479.7227	2480.4752

Peak output power (Sweep)

Mode	DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
10 dBm) 2MHz	2402.000000	-1.1	30.0	PASS
10 dBm) 2MHz	2442.000000	-0.9	30.0	PASS
10 dBm) 2MHz	2480.000000	-1.2	30.0	PASS

Power Spectral Density

Mode	DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
10 dBm) 2MHz	2402.000000	2402.092500	-11.437	8.0	PASS
10 dBm) 2MHz	2442.000000	2442.092500	-11.643	8.0	PASS
10 dBm) 2MHz	2480.000000	2480.097500	-11.482	8.0	PASS

Occupied Channel Bandwidth 99%

Mode	DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
10 dBm) 2MHz	2402.0000	1.040000	---	---	2401.5950	2402.6350
10 dBm) 2MHz	2442.0000	1.050000	---	---	2441.5850	2442.6350
10 dBm) 2MHz	2480.0000	1.050000	---	---	2479.5850	2480.6350

Minimum Emission Bandwidth 6 dB (2402 MHz; 10 (10 dBm); 2 MHz)

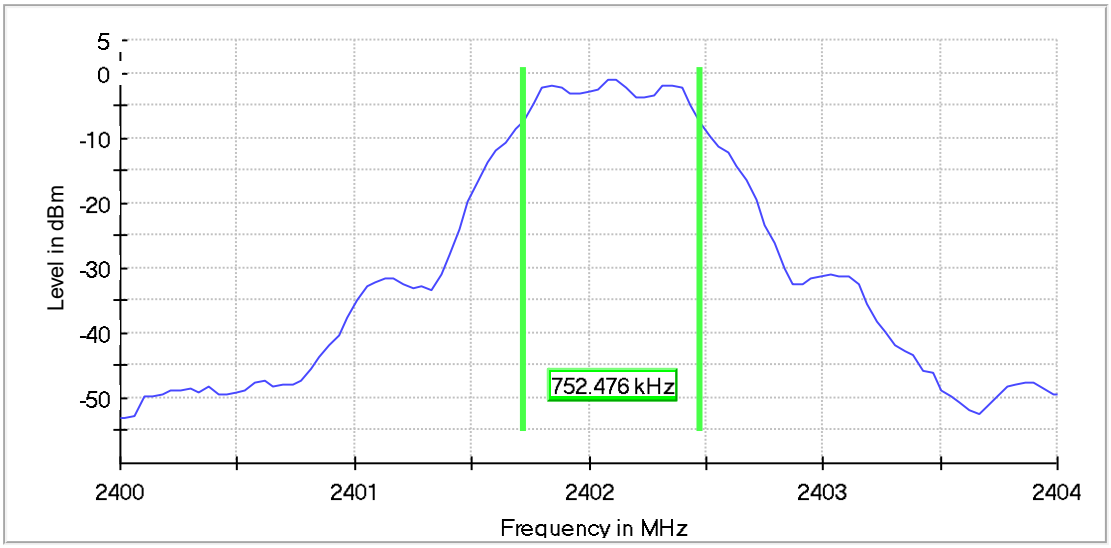
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	0.752476	0.500000	---	2401.722772	2402.475248

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2402.000000	-1.1	PASS



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	101	~ 80
Sweeptime	1.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	10.000 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	7 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.19 dB	0.50 dB

Minimum Emission Bandwidth 6 dB (2442 MHz; 10 (10 dBm); 2 MHz)

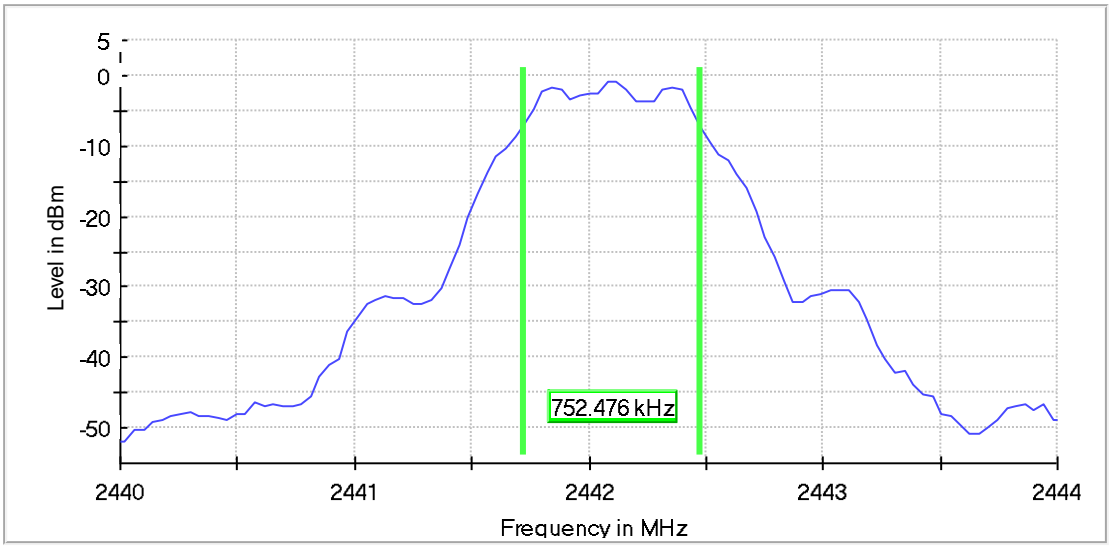
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2442.000000	0.752476	0.500000	---	2441.722772	2442.475248

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2442.000000	-1.0	PASS



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	101	~ 80
Sweeptime	1.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	10.000 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	7 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.15 dB	0.50 dB

Minimum Emission Bandwidth 6 dB (2480 MHz; 10 (10 dBm); 2 MHz)

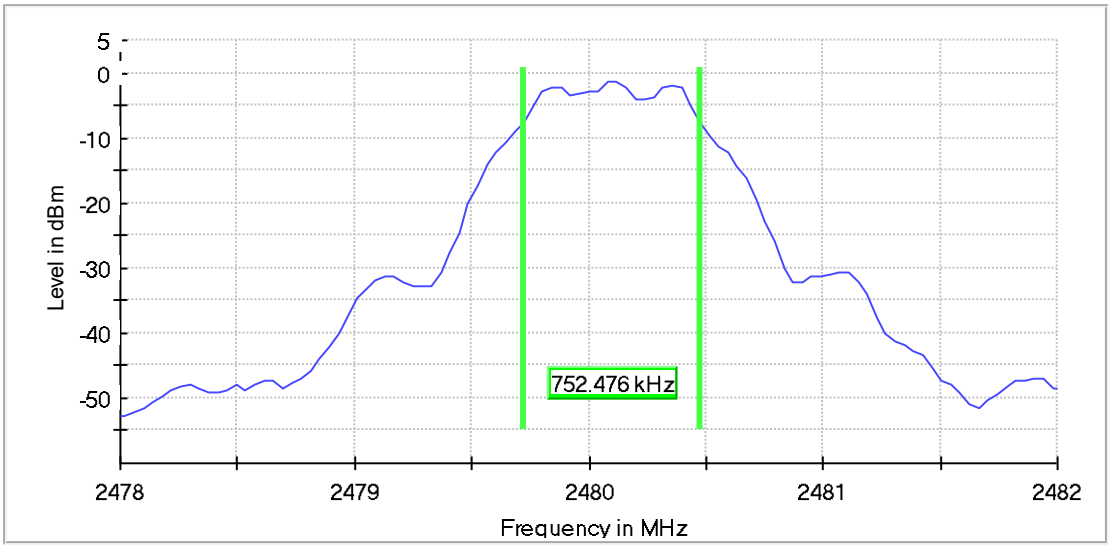
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	0.752476	0.500000	---	2479.722772	2480.475248

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2480.000000	-1.3	PASS



Measurement

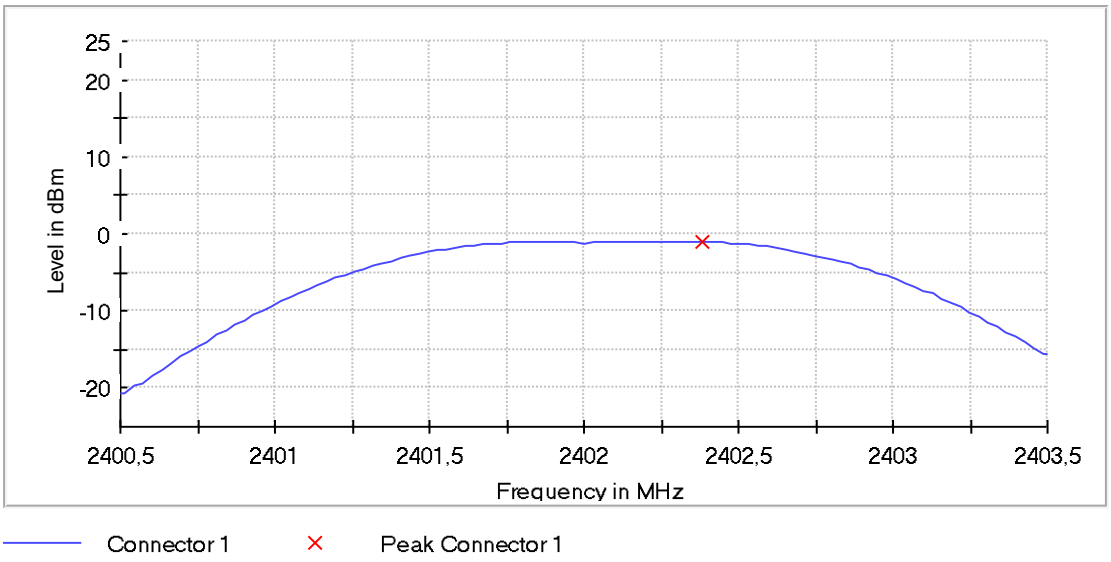
Setting	Instrument Value	Target Value
Start Frequency	2.47800 GHz	2.47800 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 80
Sweeptime	1.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	10.000 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	7 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.09 dB	0.50 dB

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

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	-1.1	30.0	PASS



Measurement

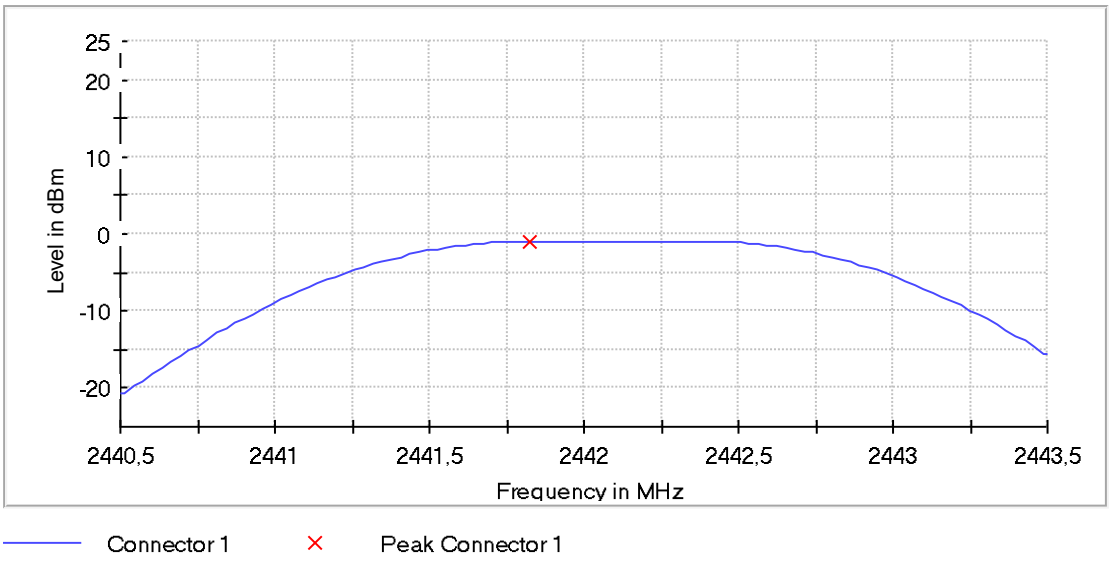
Setting	Instrument Value	Target Value
Start Frequency	2.40050 GHz	2.40050 GHz
Stop Frequency	2.40350 GHz	2.40350 GHz
Span	3.000 MHz	3.000 MHz
RBW	1.000 MHz	>= 752.477 kHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	101	~ 101
Sweeptime	1.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	20.000 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	0.08 dB	0.50 dB

Peak output power (Sweep) (2442 MHz; 10 (10 dBm); 2 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2442.000000	-0.9	30.0	PASS



Measurement

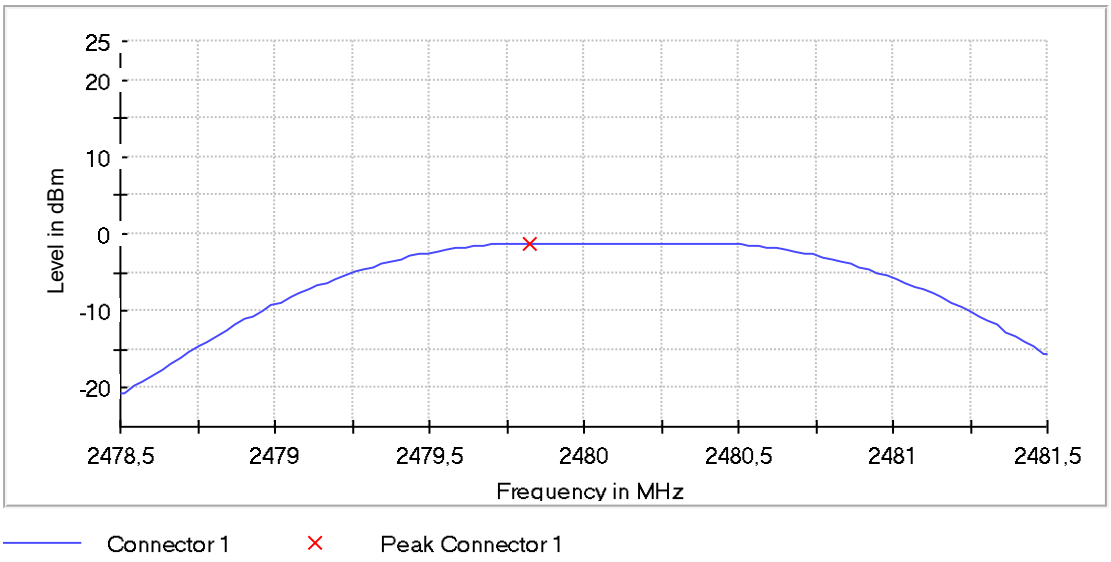
Setting	Instrument Value	Target Value
Start Frequency	2.44050 GHz	2.44050 GHz
Stop Frequency	2.44350 GHz	2.44350 GHz
Span	3.000 MHz	3.000 MHz
RBW	1.000 MHz	>= 752.477 kHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	101	~ 101
Sweeptime	1.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	20.000 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	0.02 dB	0.50 dB

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

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2480.000000	-1.2	30.0	PASS



Measurement

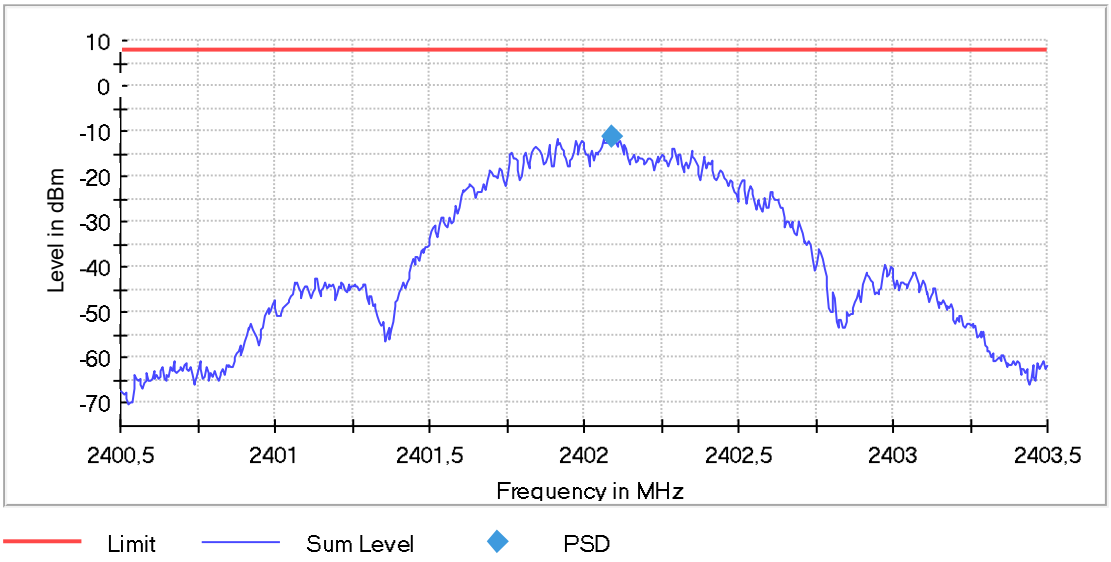
Setting	Instrument Value	Target Value
Start Frequency	2.47850 GHz	2.47850 GHz
Stop Frequency	2.48150 GHz	2.48150 GHz
Span	3.000 MHz	3.000 MHz
RBW	1.000 MHz	>= 752.477 kHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	101	~ 101
Sweeptime	1.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	20.000 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

Power Spectral Density (2402 MHz; 10 (10 dBm); 2 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2402.000000	2402.092500	-11.437	8.0	PASS



Measurement

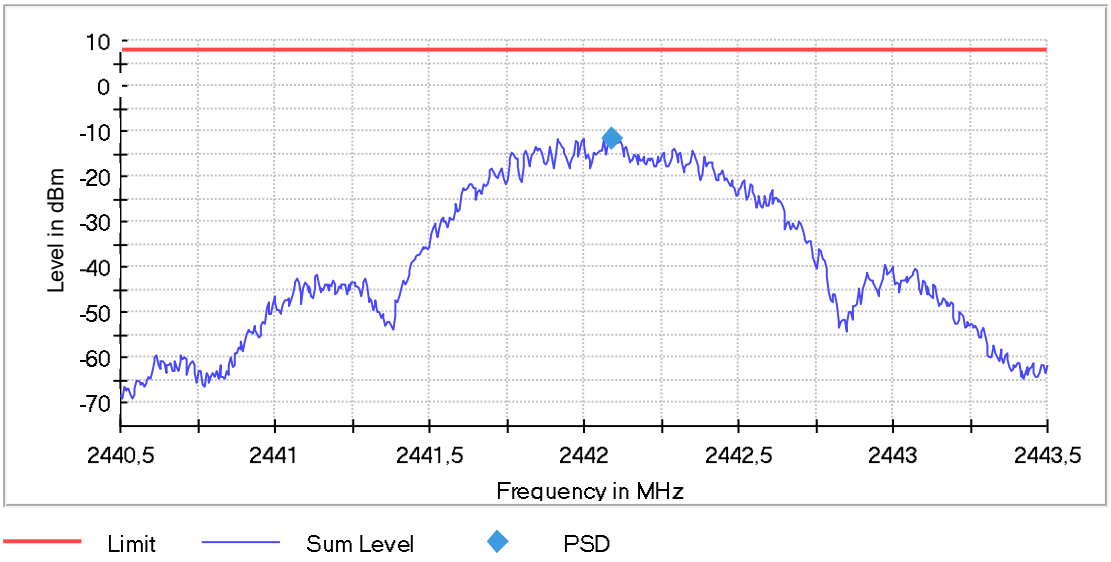
Setting	Instrument Value	Target Value
Start Frequency	2.40050 GHz	2.40050 GHz
Stop Frequency	2.40350 GHz	2.40350 GHz
Span	3.000 MHz	3.000 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	600	~ 600
Sweeptime	12.000 ms	12.000 ms
Reference Level	0.000 dBm	0.000 dBm
Attenuation	10.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	49 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.20 dB	0.50 dB

Power Spectral Density (2442 MHz; 10 (10 dBm); 2 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2442.000000	2442.092500	-11.643	8.0	PASS



Measurement

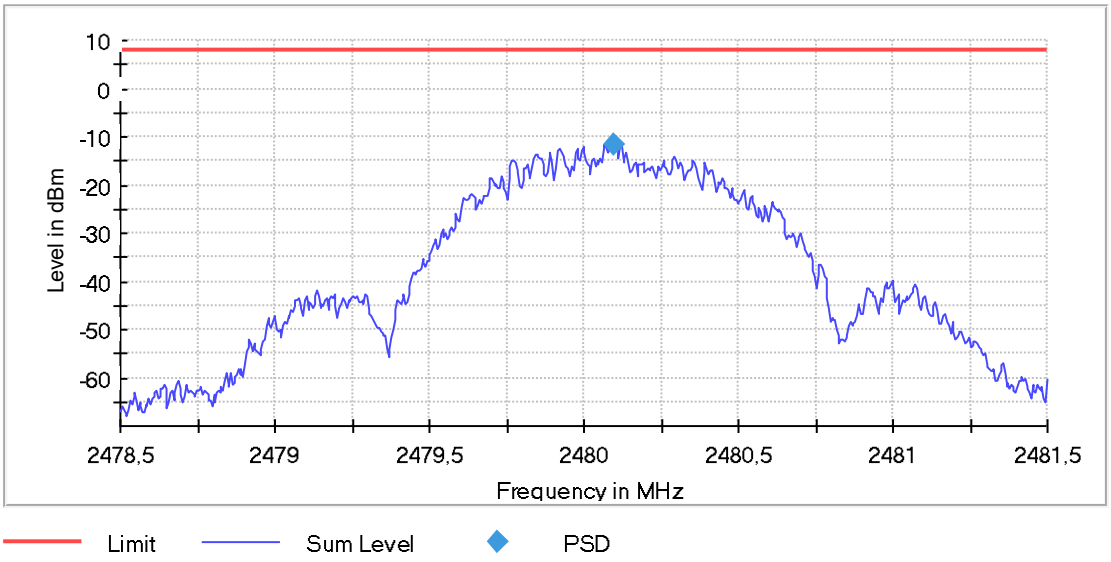
Setting	Instrument Value	Target Value
Start Frequency	2.44050 GHz	2.44050 GHz
Stop Frequency	2.44350 GHz	2.44350 GHz
Span	3.000 MHz	3.000 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	600	~ 600
Sweeptime	12.000 ms	12.000 ms
Reference Level	0.000 dBm	0.000 dBm
Attenuation	10.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	40 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.17 dB	0.50 dB

Power Spectral Density (2480 MHz; 10 (10 dBm); 2 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2480.000000	2480.097500	-11.482	8.0	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47850 GHz	2.47850 GHz
Stop Frequency	2.48150 GHz	2.48150 GHz
Span	3.000 MHz	3.000 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	600	~ 600
Sweeptime	12.000 ms	12.000 ms
Reference Level	0.000 dBm	0.000 dBm
Attenuation	10.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	43 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.05 dB	0.50 dB

Occupied Channel Bandwidth 99% (2402 MHz; 10 (10 dBm); 2 MHz)

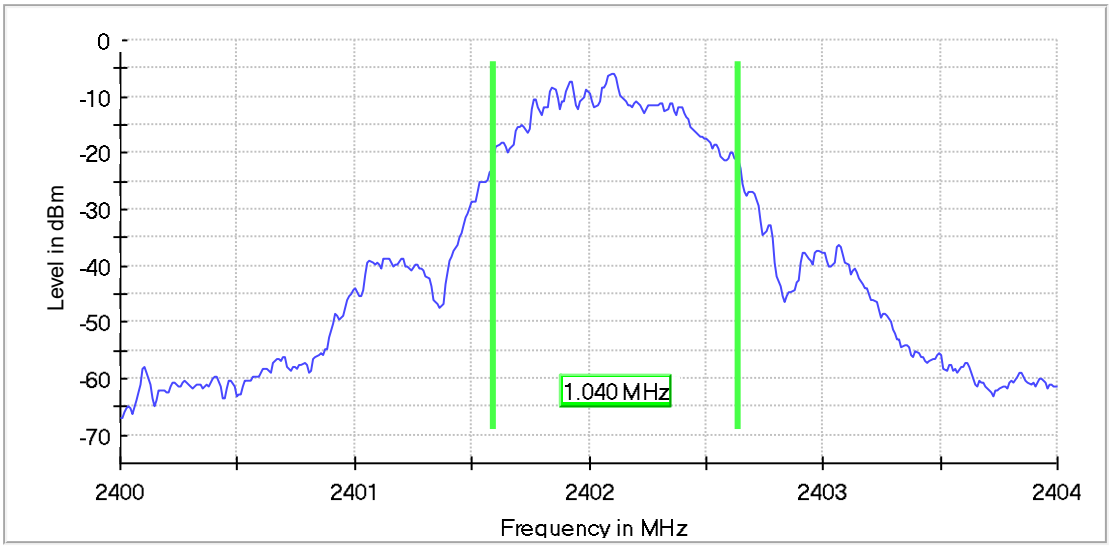
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	1.040000	---	---	2401.595000	2402.635000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2402.000000	PASS



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	20.000 kHz	>= 20.000 kHz
VBW	100.000 kHz	>= 60.000 kHz
SweepPoints	400	~ 400
Sweeptime	210.000 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	10 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.04 dB	0.30 dB

Occupied Channel Bandwidth 99% (2442 MHz; 10 (10 dBm); 2 MHz)

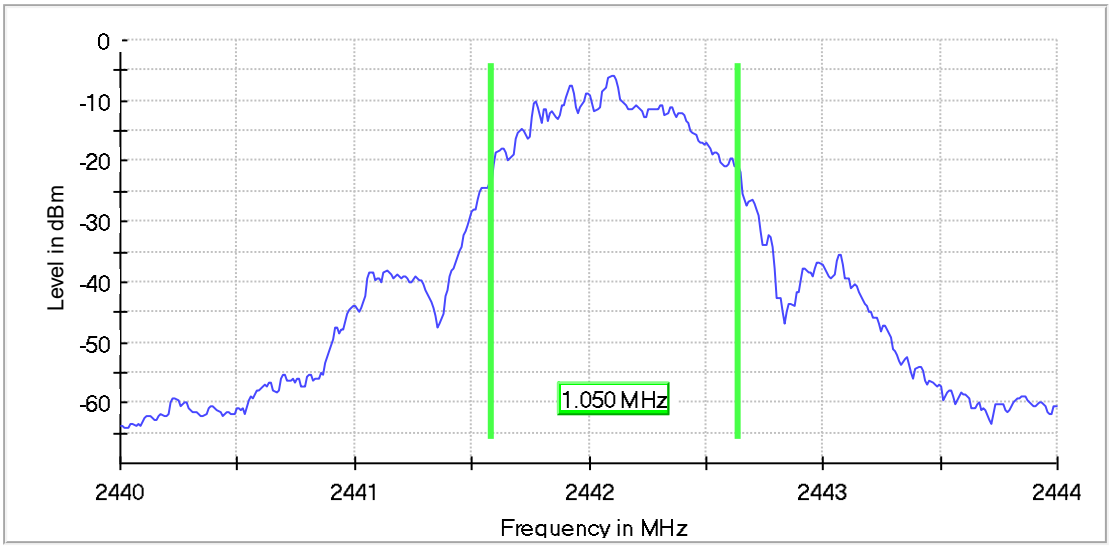
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2442.000000	1.050000	---	---	2441.585000	2442.635000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2442.000000	PASS



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	20.000 kHz	>= 20.000 kHz
VBW	100.000 kHz	>= 60.000 kHz
SweepPoints	400	~ 400
Sweeptime	210.000 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	6 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.13 dB	0.30 dB

Occupied Channel Bandwidth 99% (2480 MHz; 10 (10 dBm); 2 MHz)

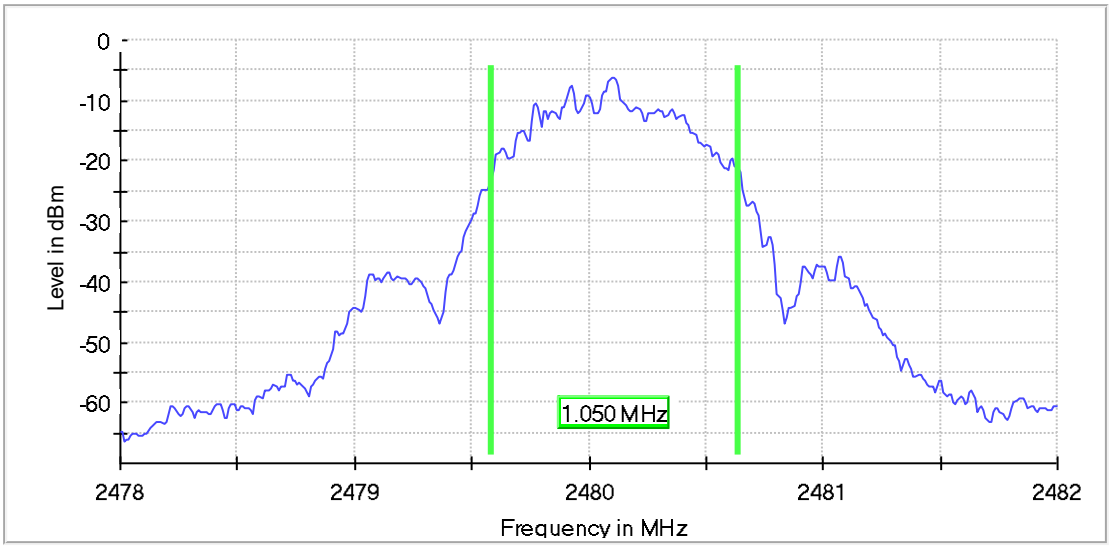
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	1.050000	---	---	2479.585000	2480.635000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2480.000000	PASS



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	20.000 kHz	>= 20.000 kHz
VBW	100.000 kHz	>= 60.000 kHz
SweepPoints	400	~ 400
Sweeptime	210.000 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.28 dB	0.30 dB

Tx Spurious Emission (2402 MHz; 10 (10 dBm); 2 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Result
2402.000000	PASS

Final measurements

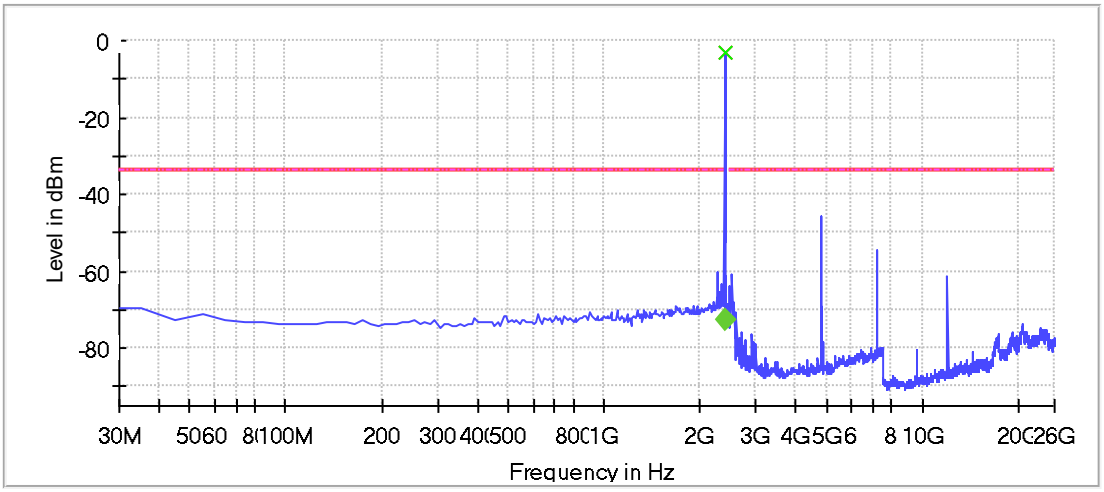
Frequency (MHz)	Level Pre Measurement (dBm)	level (dBm)	Limit (dBm)	Margin (dB)	Result
2399.908789	-4.8	-72.8	-33.8	39.0	PASS

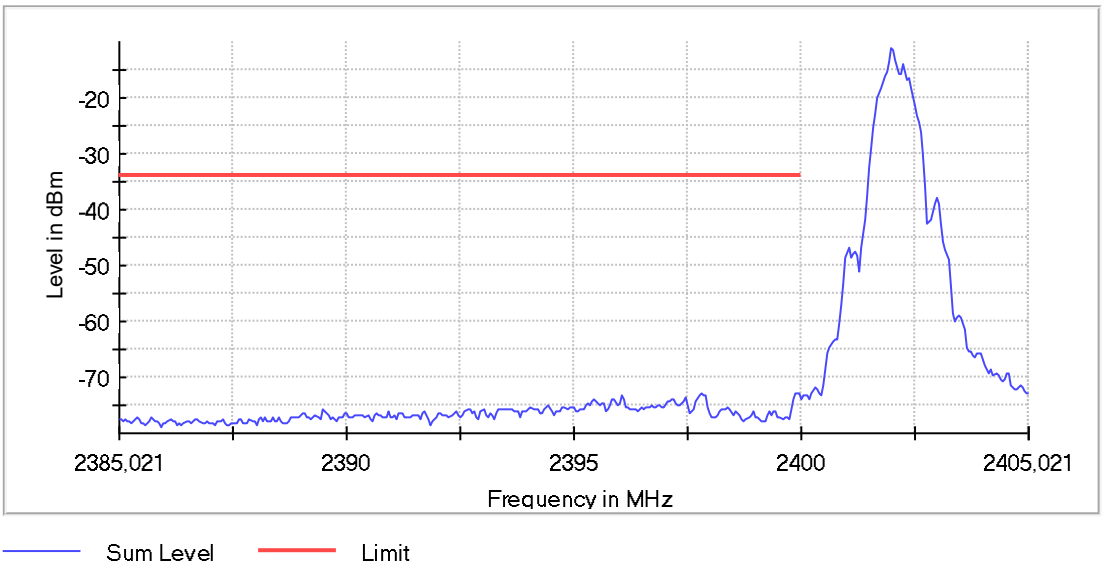
Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-2.9	-30.9	-33.8
4807.166065	-45.6	11.8	-33.8
7205.789099	-54.8	21.0	-33.8
2265.567227	-60.3	26.5	-33.8
2528.474182	-60.9	27.1	-33.8
12013.029431	-61.1	27.3	-33.8
2518.479919	-63.1	29.3	-33.8
2335.273109	-63.5	29.7	-33.8
2305.399160	-65.4	31.6	-33.8
2508.485657	-65.5	31.7	-33.8
2255.609244	-66.2	32.4	-33.8
2385.063025	-66.9	33.1	-33.8
2365.147059	-67.5	33.7	-33.8
2375.105042	-67.6	33.8	-33.8
2205.819328	-67.9	34.1	-33.8

Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	2400.000000	1	1
2400.000000	2483.500000	1	1
2483.500000	26000.000000	1	1





Final Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	401	~ 401
Sweeptime	1.010 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	20.000 dB	AUTO
Detector	Sample	Sample
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Average Linear	Average Linear
Sweeptype	Sweep	AUTO
Preamp	off	off

Tx Spurious Emission (2442 MHz; 10 (10 dBm); 2 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Result
2442.000000	PASS

Final measurements

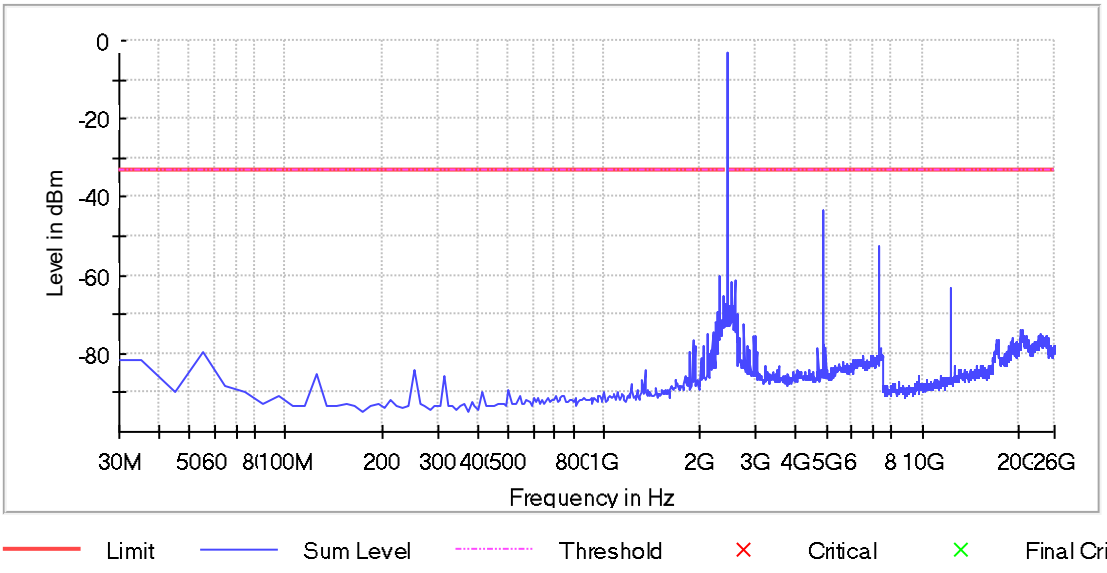
Frequency (MHz)	Level Pre Measurement (dBm)	level (dBm)	Limit (dBm)	Margin (dB)	Result
---	---	---	---	---	---

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
4887.120166	-43.5	10.3	-33.3
7325.720251	-52.6	19.3	-33.3
2305.399160	-60.2	26.9	-33.3
2568.451232	-61.2	27.9	-33.3
2508.485657	-61.9	28.6	-33.3
12212.914683	-63.3	30.0	-33.3
2375.105042	-65.5	32.2	-33.3
2538.468445	-68.0	34.7	-33.3
2275.525210	-69.6	36.3	-33.3
2618.422546	-69.8	36.5	-33.3
2528.474182	-70.9	37.6	-33.3
2598.434020	-70.9	37.6	-33.3
2518.479919	-71.0	37.7	-33.3
2548.462707	-71.1	37.9	-33.3
2345.231092	-71.4	38.2	-33.3

Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	2400.000000	1	1
2400.000000	2483.500000	1	1
2483.500000	26000.000000	1	1


0
-20
-40
-60
-80
Level in dBm
30M
5060
8(100M
200
300
40(500
80(1G
2G
3G
4G
5G
6
8
10G
20(26G
Frequency in Hz
Limit
Sum Level
Threshold
Critical
Final Critical

Tx Spurious Emission (2480 MHz; 10 (10 dBm); 2 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Result
2480.000000	PASS

Final measurements

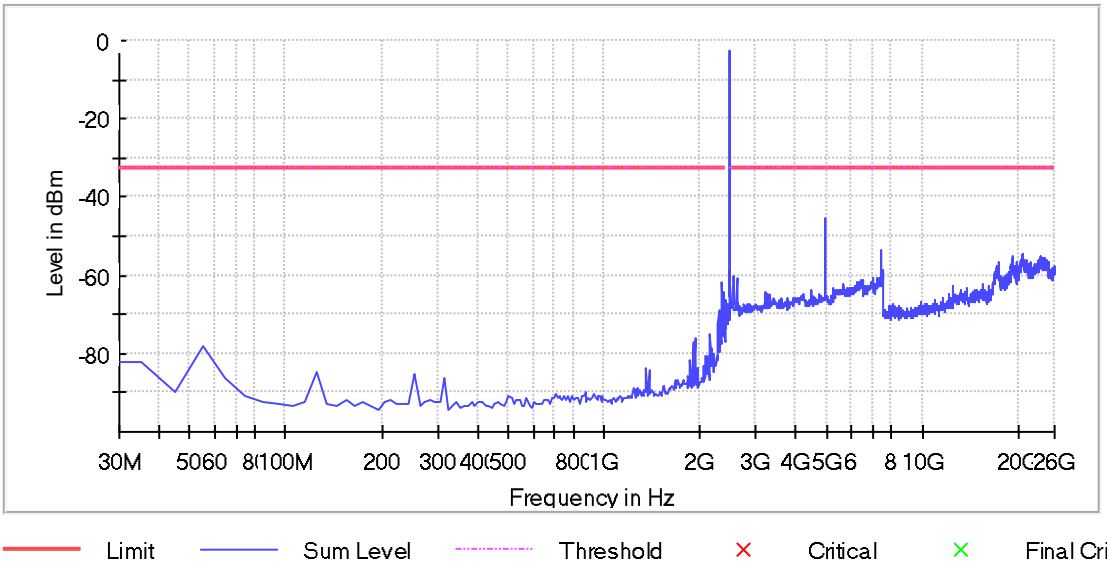
Frequency (MHz)	Level Pre Measurement (dBm)	level (dBm)	Limit (dBm)	Margin (dB)	Result
---	---	---	---	---	---

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
4957.080004	-45.5	12.8	-32.7
7445.651402	-53.4	20.7	-32.7
7435.657140	-54.2	21.5	-32.7
20588.106779	-54.4	21.7	-32.7
20608.095304	-54.4	21.7	-32.7
20558.123991	-54.9	22.1	-32.7
23636.356885	-54.9	22.2	-32.7
20668.060880	-55.0	22.3	-32.7
20538.135465	-55.0	22.3	-32.7
20718.032193	-55.1	22.4	-32.7
19098.961645	-55.3	22.6	-32.7
23976.161815	-55.4	22.7	-32.7
23996.150340	-55.5	22.8	-32.7
20578.112516	-55.6	22.8	-32.7
23566.397046	-55.6	22.9	-32.7

Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	2400.000000	1	1
2400.000000	2483.500000	1	1
2483.500000	26000.000000	1	1


0
-20
-40
-60
-80
Level in dBm
30M
5060
8(100M
200
300
40(500
80(1G
2G
3G
4G
5G
6
8
10G
20(26G
Frequency in Hz
Limit
Sum Level
Threshold
Critical
Final Critical

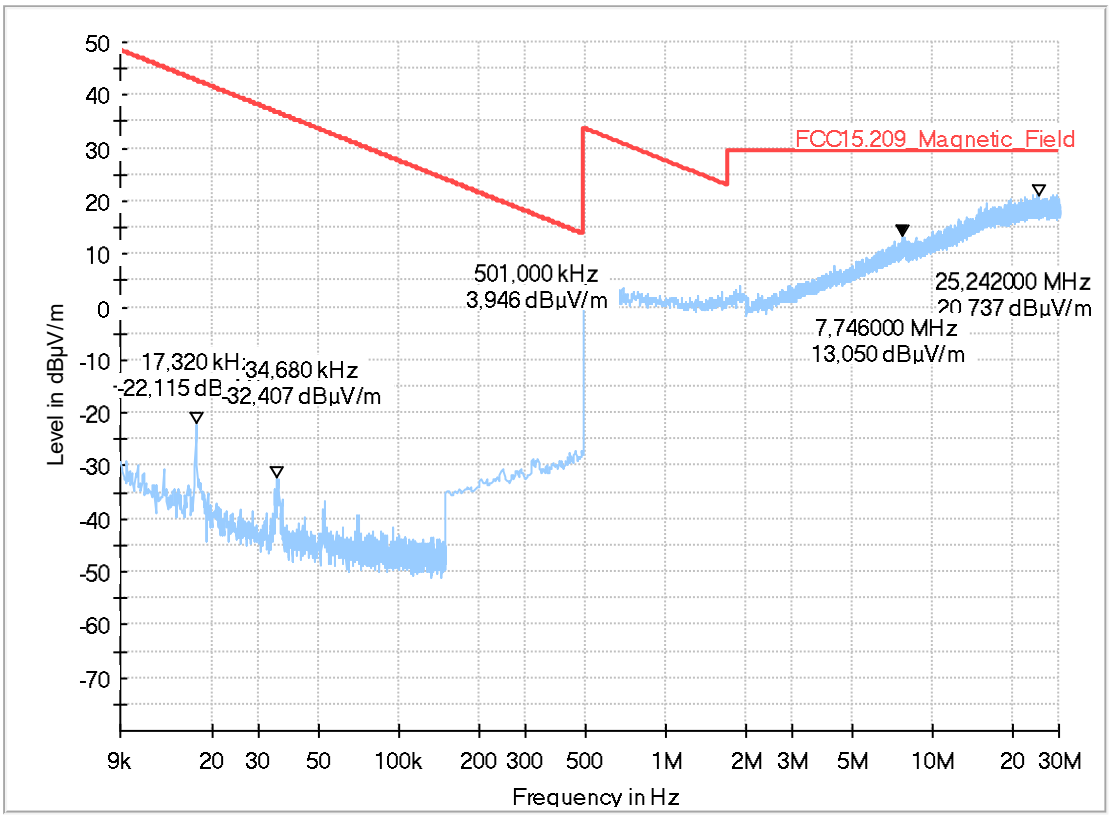
1.2 Radiated

2.01a_BT_LE_low_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 V10.60.0
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:	LKu
Operating Mode:	BT_LE Channel 0
Power during tests:	via Laptop
Environmental Conditions::	Humidity : 40% rH; Temperature: 20° C
EUT Setup:	standing
Verdict:	Pass

Full Spectrum



2.01b_BT_LE_low_laying

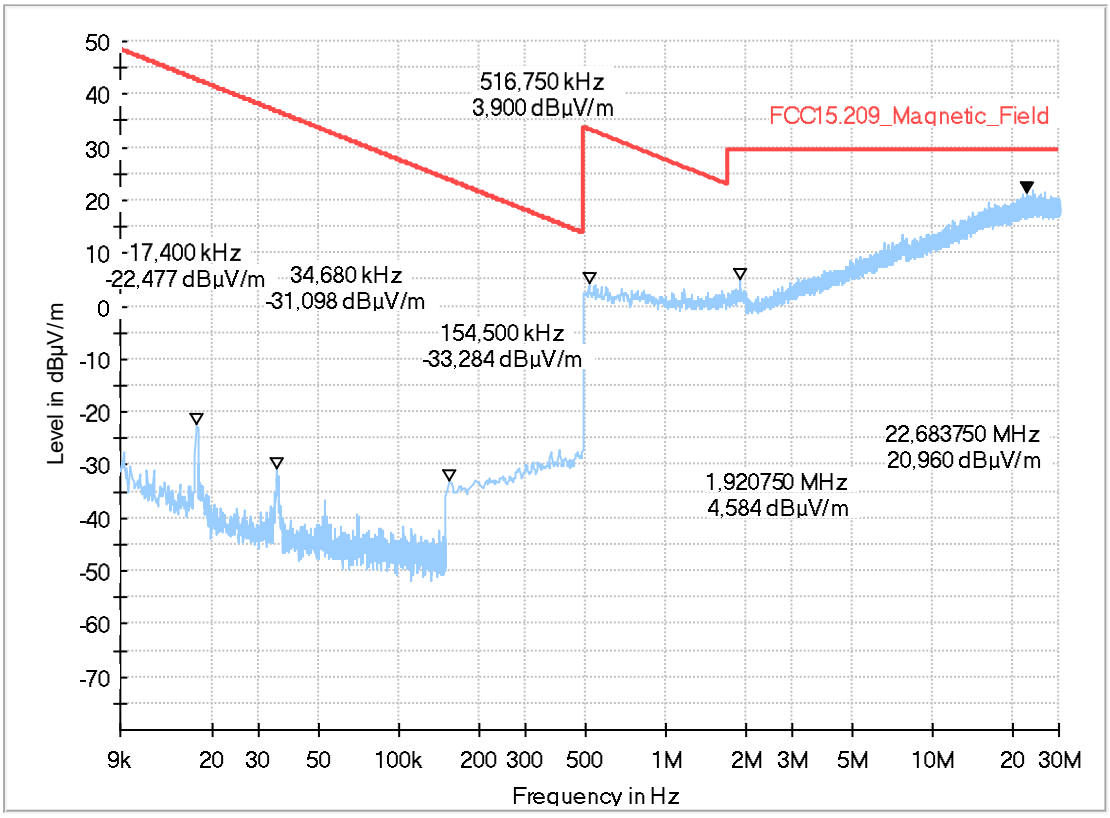
Common Information

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 V10.60.0
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:	LKu
Operating Mode:	BT_LE Channel 0
Power during tests:	via Laptop
Environmental Conditions::	Humidity : 40% rH; Temperature: 20° C
EUT Setup:	Laying
Verdict:	Pass

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
HW version:	GH_RC-1V3
SW version:	--
Serial number:	--
Power Supply:	via Laptop

Full Spectrum



2.02a_BT_LE_mid_standing

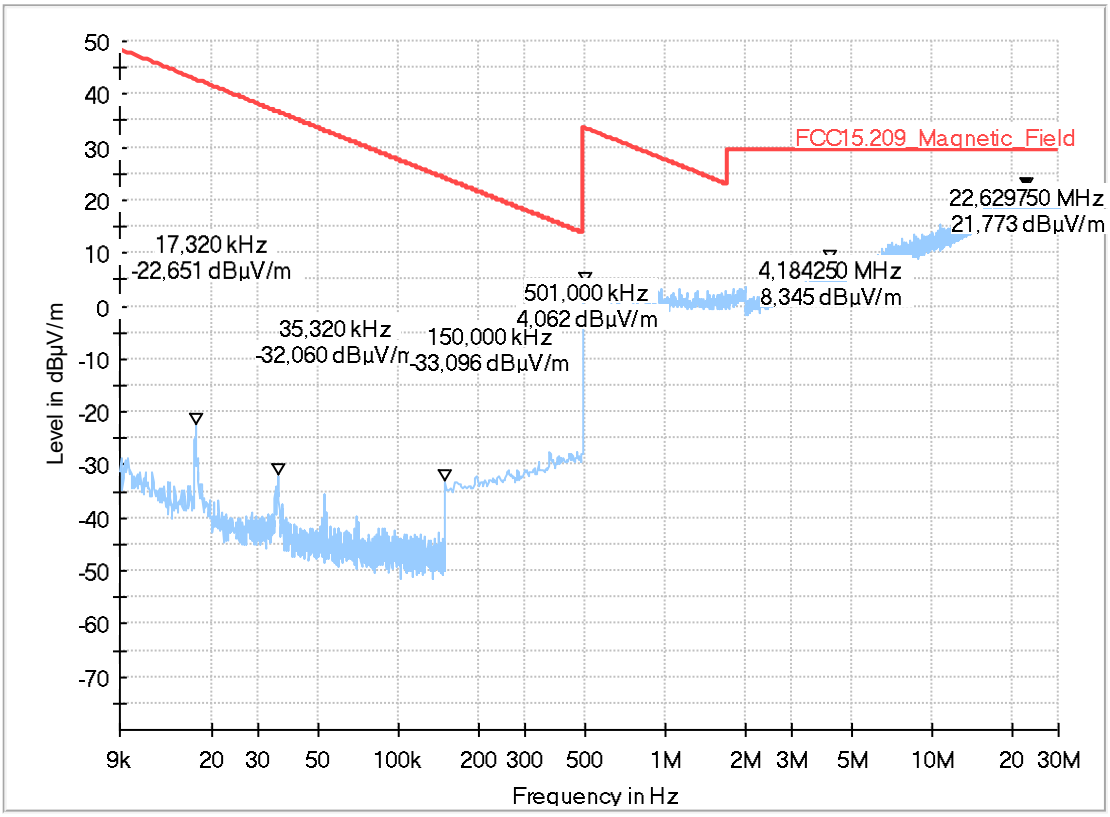
Common Information

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 V10.60.0
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:	LKu
Operating Mode:	BT_LE Channel 20
Power during tests:	via Laptop
Environmental Conditions::	Humidity : 40% rH; Temperature: 20° C
EUT Setup:	standing
Verdict:	Pass

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
HW version:	GH_RC-1V3
SW version:	--
Serial number:	--
Power Supply:	via Laptop

Full Spectrum



2.02b_BT_LE_mid_laying

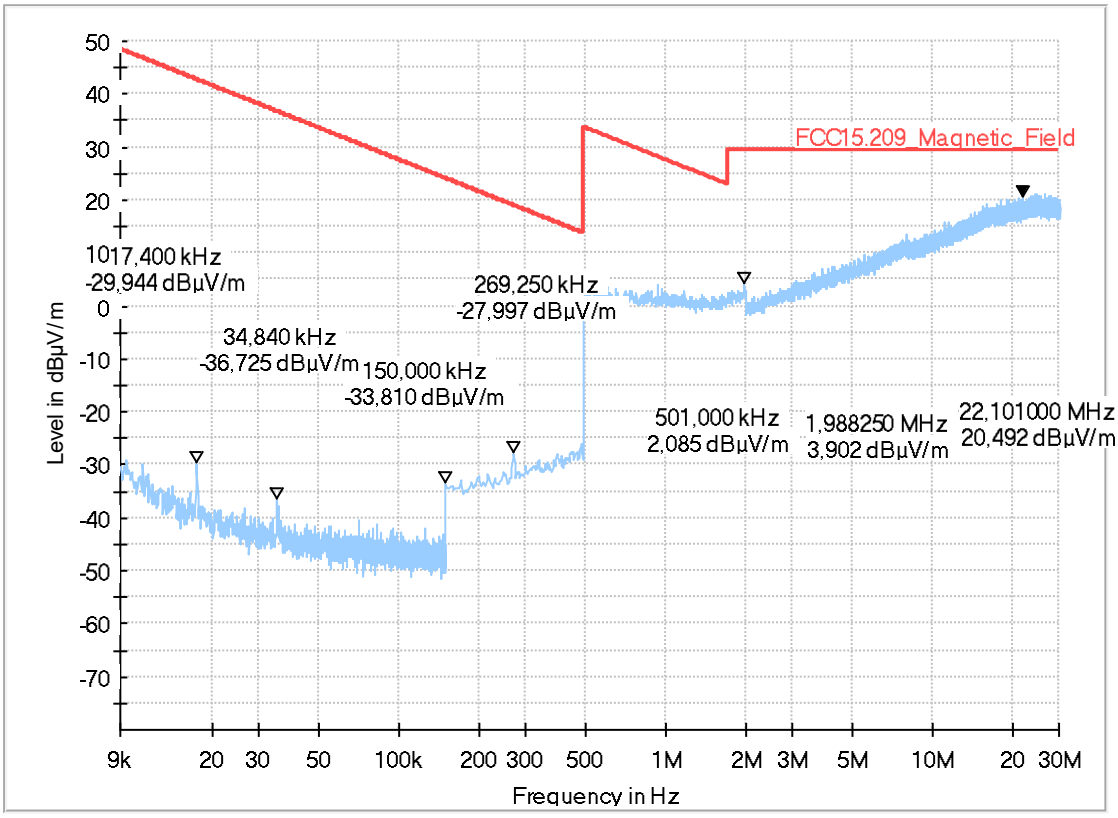
Common Information

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 V10.60.0
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:	Mkh
Operating Mode:	BT_LE Channel 20
Power during tests:	via Laptop
Environmental Conditions::	Humidity : 51% rH; Temperature: 21° C
EUT Setup:	laying
Verdict:	Pass

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
HW version:	GH_RC-1V3
SW version:	--
Serial number:	--
Power Supply:	via Laptop

Full Spectrum



2.03a_BT_LE_high_standing

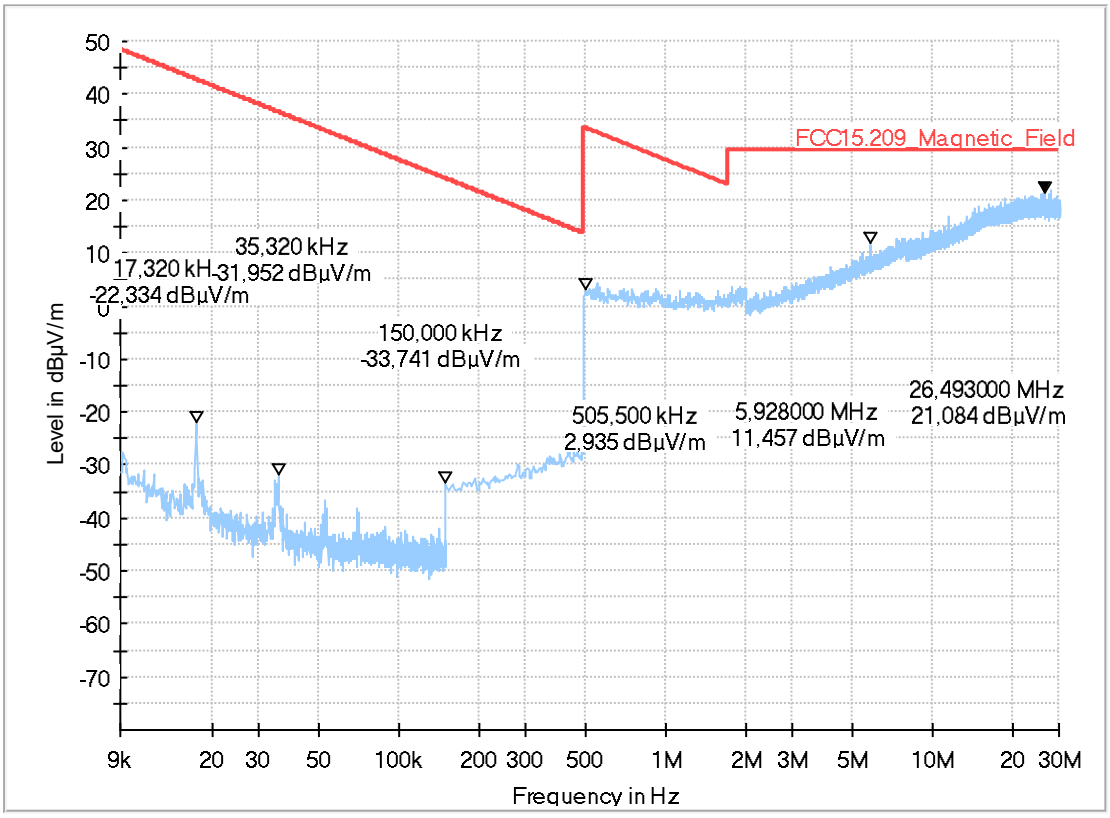
Common Information

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 V10.60.0
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:	Mkh
Operating Mode:	BT_LE Channel 39
Power during tests:	via Laptop
Environmental Conditions::	Humidity : 51% rH; Temperature: 21° C
EUT Setup:	standing
Verdict:	Pass

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
HW version:	GH_RC-1V3
SW version:	--
Serial number:	--
Power Supply:	via Laptop

Full Spectrum



2.03b_BT_LE_high_laying

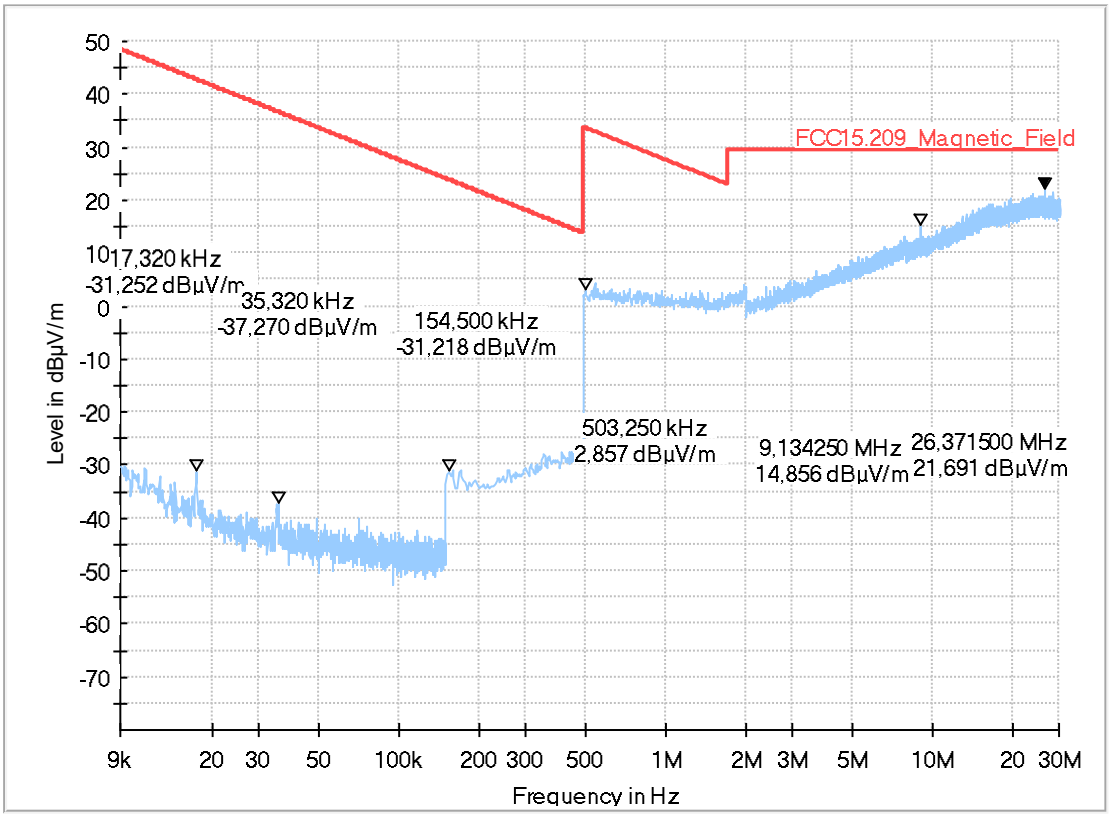
Common Information

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 V10.60.0
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:	Mkh
Operating Mode:	BT_LE Channel 39
Power during tests:	via Laptop
Environmental Conditions::	Humidity : 51% rH; Temperature: 21° C
EUT Setup:	laying
Verdict:	Pass

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
HW version:	GH_RC-1V3
SW version:	--
Serial number:	--
Power Supply:	via Laptop

Full Spectrum



3.01a_BT_LE_low_Standing

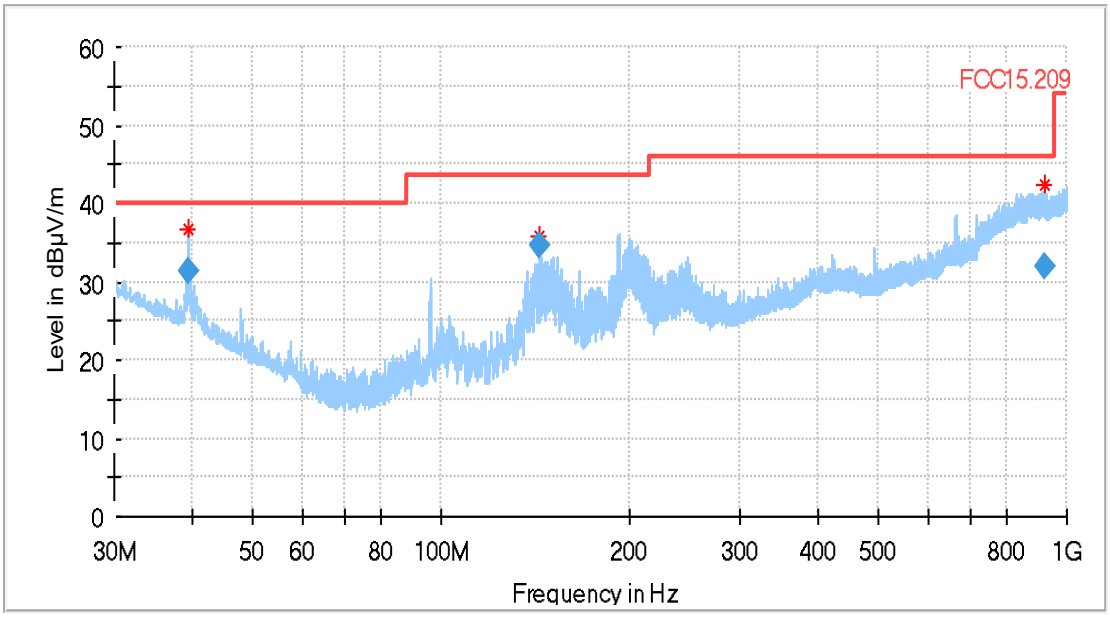
Common Information

Test description:	Electric Field Strength Measurement
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test Standard.:	FCC 15.209; RSS-Gen: Issue 5
Operator:	mkh
Operating Mode:	Bletooth Low Energy _ Low Channel (00)-2402 MHz
Verdict:	Pass

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
---	---
HW version:	GH_RC-1V3
SW version:	--
SVN:	
Config:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board
Comments:	--

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
39.380000	31.45	40.00	8.55	120.000	105.0	V	238.0	17.4
144.004000	34.64	43.50	8.86	120.000	112.0	V	243.0	8.6
925.096000	32.06	46.00	13.94	120.000	360.0	V	288.0	27.0

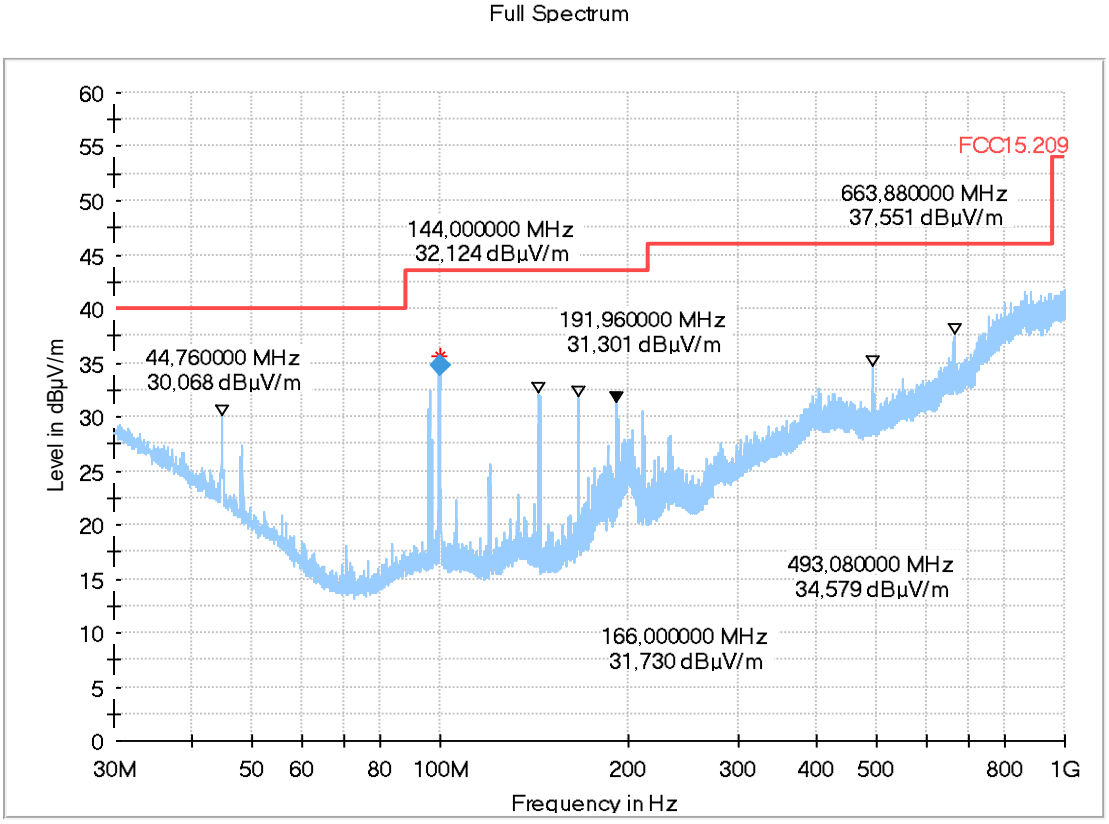
3.01b_BT_LE_low_Laying

Common Information

Test description:	Electric Field Strength Measurement
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test Standard.:	FCC 15.209; RSS-Gen: Issue 5
Operator:	mkh
Operating Mode:	Bletooth Low Energy _ Low Channel (00)-2402 MHz
Verdict:	Pass

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
---	---
HW version:	GH_RC-1V3
SW version:	--
SVN:	
Config:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
99.648000	34.79	43.50	8.71	120.000	105.0	V	136.0	8.1

3.02a_BT_LE_mid_Standing

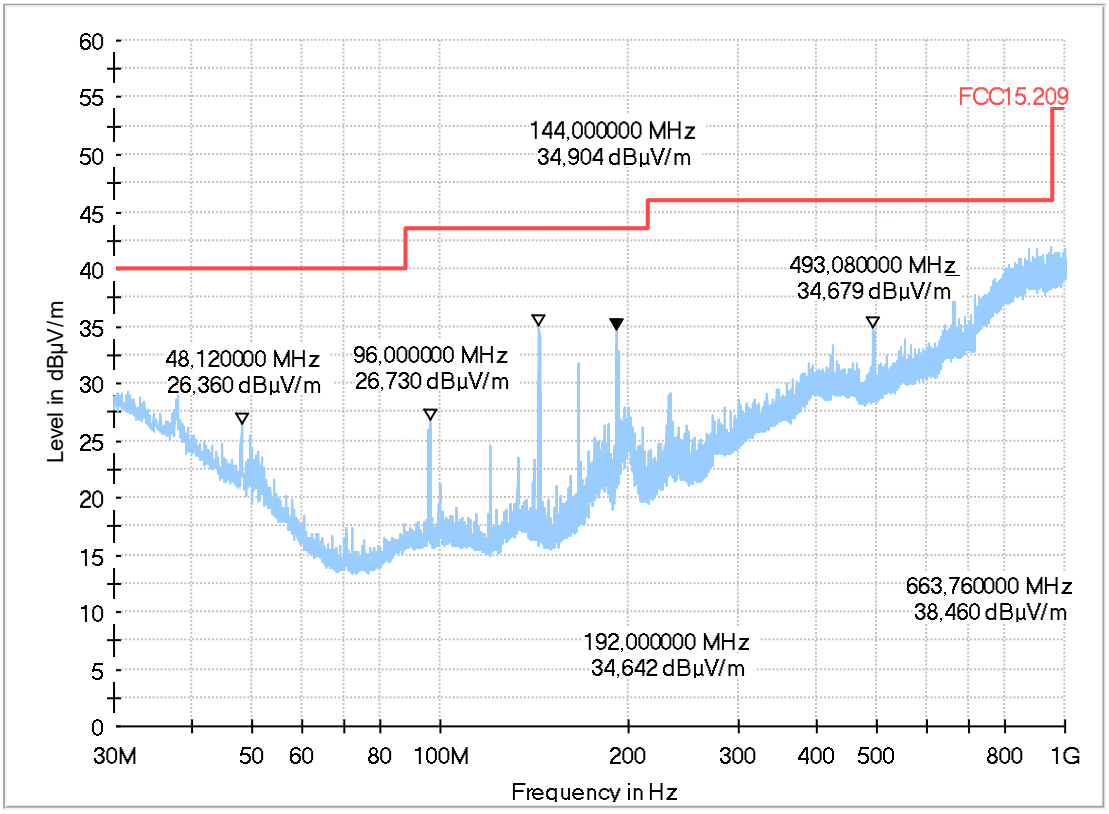
Common Information

Test description:	Electric Field Strength Measurement
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test Standard.:	FCC 15.209; RSS-Gen: Issue 5
Operator:	mkh
Operating Mode:	Bletooth Low Energy _ Mid Channel (20)-2442 MHz
Verdict:	Pass

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
---	---
HW version:	GH_RC-1V3
SW version:	--
SVN:	
Config:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board
Comments:	--

Full Spectrum



3.02b_BT_LE_low_Laying

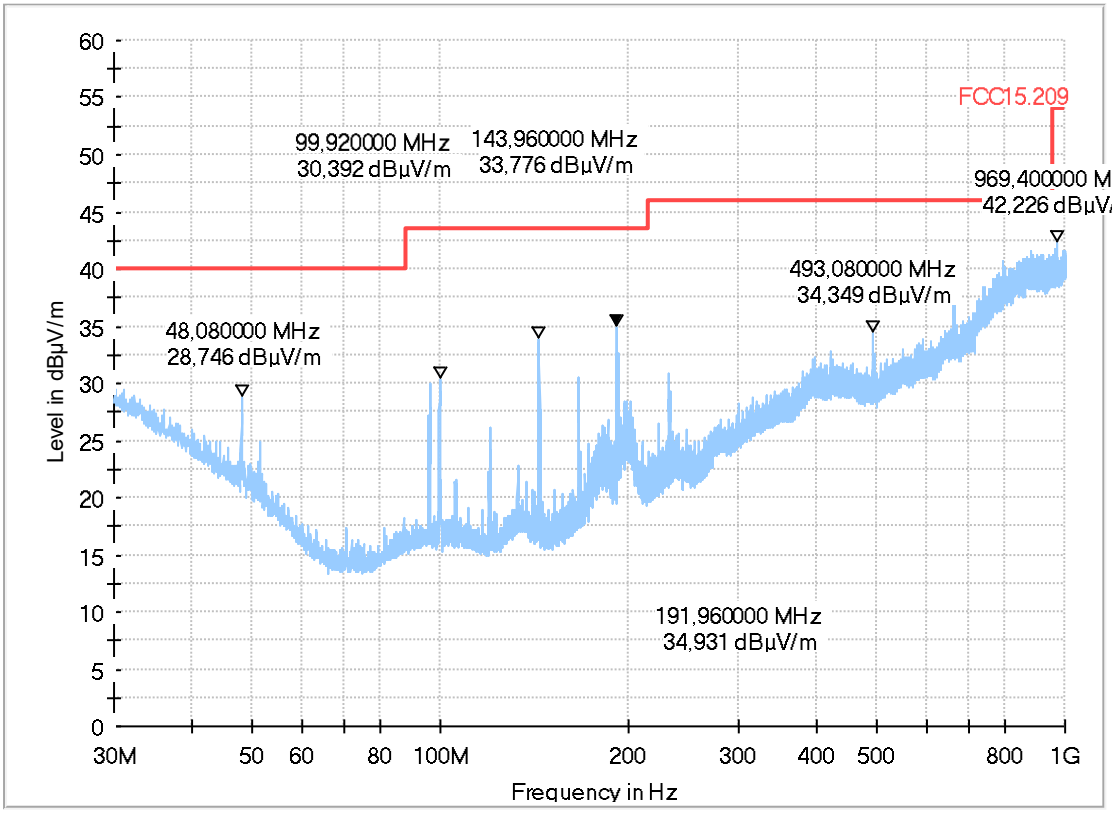
Common Information

Test description:	Electric Field Strength Measurement
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test Standard.:	FCC 15.209; RSS-Gen: Issue 5
Operator:	mkh
Operating Mode:	Bletooth Low Energy _ Mid Channel (20)-2442 MHz
Verdict:	Pass

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
---	---
HW version:	GH_RC-1V3
SW version:	--
SVN:	
Config:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board
Comments:	--

Full Spectrum



3.03a_BT_LE_high_Standing

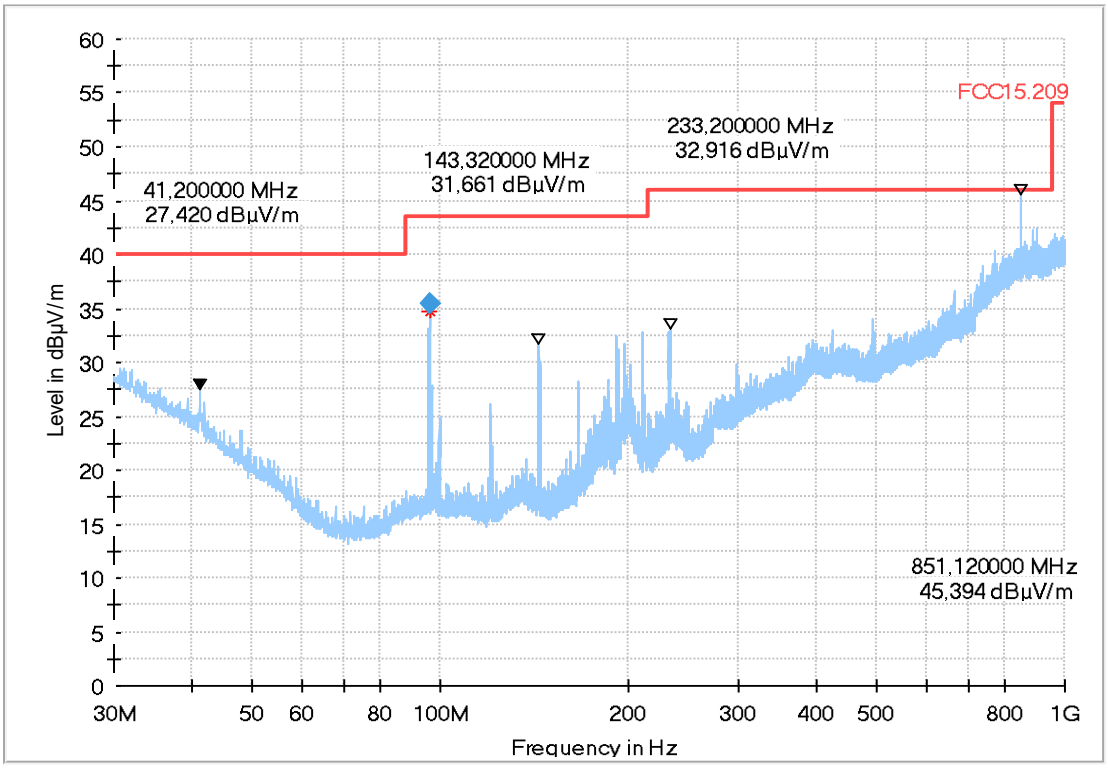
Common Information

Test description:	Electric Field Strength Measurement
Test Site Location:	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 Standard.:	FCC 15.209; RSS-Gen: Issue 5
Operator:	mkh
Operating Mode:	Bletooth Low Energy _ High Channel (39)-2480 MHz
Verdict:	Pass

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
---	---
HW version:	GH_RC-1V3
SW version:	--
SVN:	
Config:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board

Full Spectrum



Remarks: The peak at 851.12MHz is a known external disturbance and does not come from the EUT.

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
96.000000	35.44	43.50	8.06	120.000	105.0	V	88.0	8.2

3.03b_BT_LE_high_Laying

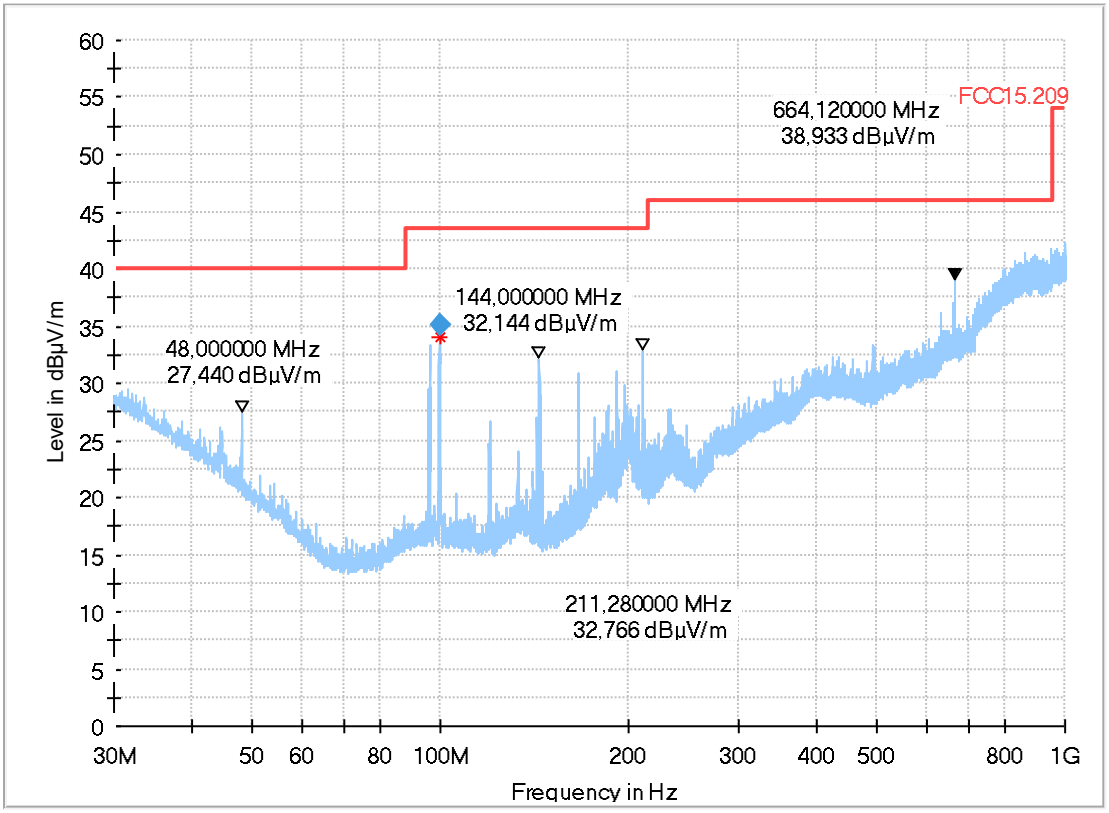
Common Information

Test description:	Electric Field Strength Measurement
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test Standard.:	FCC 15.209; RSS-Gen: Issue 5
Operator:	mkh
Operating Mode:	Bluetooth Low Energy _ High Channel (39)-2480 MHz
Verdict:	Passed

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
HW version:	GH_RC-1V3
SW version:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board
Comments:	--

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
99.648000	35.01	43.50	8.49	120.000	105.0	V	284.0	8.1

4.01a_BT_LE_low

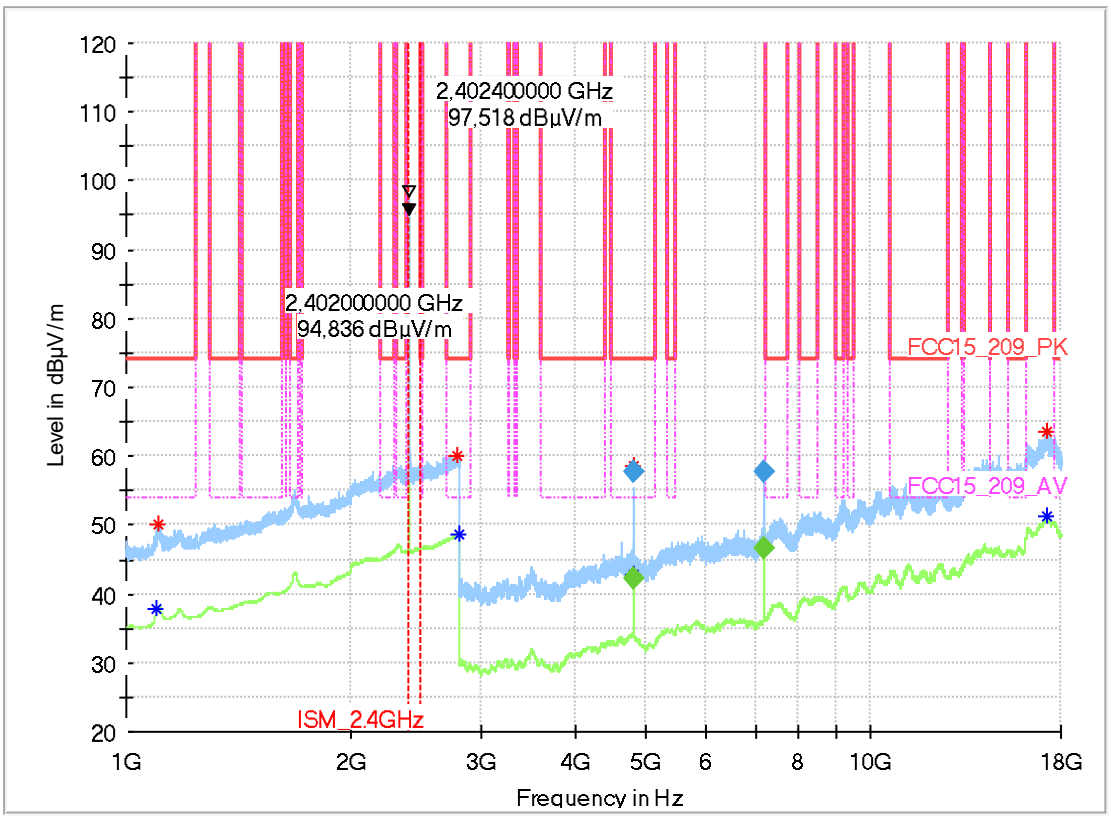
Common Information

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 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	Bletooth Low Energy _ Low Channel (00)-2402 MHz
Operator:	mkh
Verdict:	Passed

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
---	---
HW version:	GH_RC-1V3
SW version:	--
SVN:	
Config:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board
Comments:	--

Full Spectrum



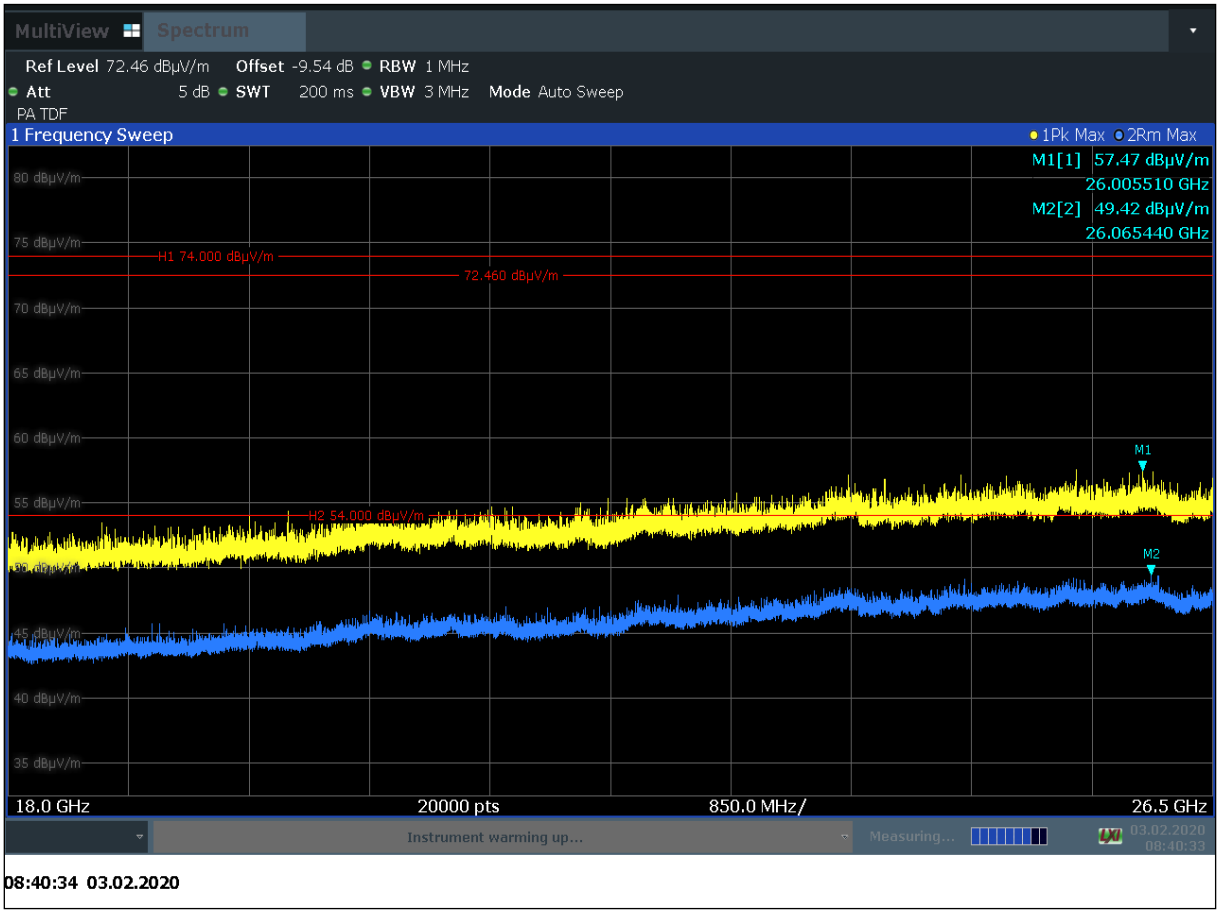
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin	Bandwidth	Height	Pol	Azimuth	Elevation	Corr. (dB/m)
4804.000000	---	42.11	54.00	11.89	1000.000	155.0	H	49.0	0.0	6
4804.000000	57.83	---	74.00	16.17	1000.000	155.0	V	84.0	0.0	6
7205.600000	57.83	---	150.00	92.17	1000.000	155.0	V	48.0	0.0	12
7206.800000	---	46.58	150.00	103.42	1000.000	155.0	V	48.0	0.0	12

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin	Bandwidth	Height	Pol	Azimuth	Elevation	Corr. (dB/m)
1100.000000	---	37.96	54.00	16.04	---	155.0	H	315.0	0.0	29
1102.000000	50.17	---	74.00	23.83	---	155.0	H	270.0	0.0	29
2784.000000	60.16	---	74.00	13.84	---	155.0	H	315.0	90.0	39
2798.400000	---	48.75	54.00	5.25	---	155.0	V	270.0	90.0	39
4804.000000	58.54	---	74.00	18.63	---	155.0	V	84.0	0.0	6
4804.000000	---	42.87	54.00	10.24	---	155.0	H	49.0	0.0	6
7205.600000	57.88	---	150.00	92.44	---	155.0	V	48.0	0.0	12
7206.800000	---	46.68	150.00	100.40	---	155.0	V	48.0	0.0	12
17250.000000	63.63	---	150.00	86.37	---	155.0	V	90.0	90.0	31
17269.200000	---	51.27	150.00	98.73	---	155.0	H	225.0	90.0	31

4.01b_BT_LE_low



4.02a_BT_LE_mid

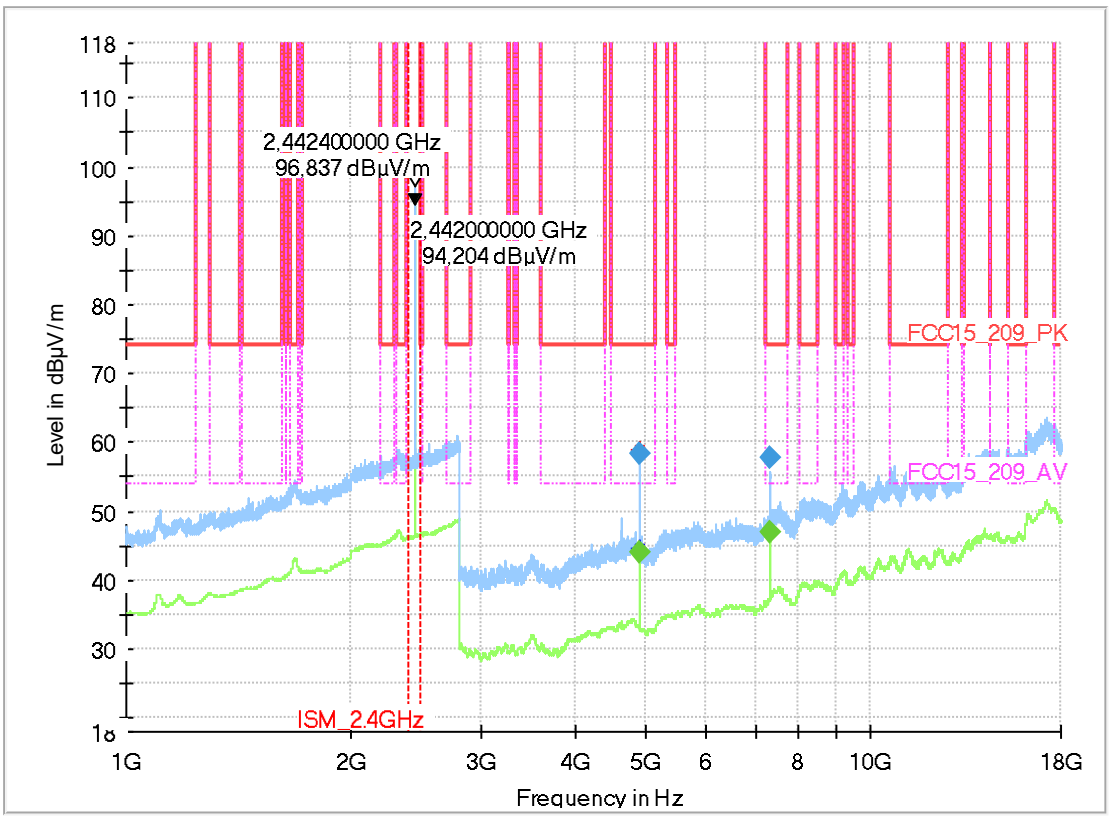
Common Information

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 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	Bluetooth Low Energy _ Mid Channel (20)-2442 MHz
Operator:	RIs
EUT Setup:	1

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
---	---
HW version:	GH_RC-1V3
SW version:	--
SVN:	
Config:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board
Comments:	--

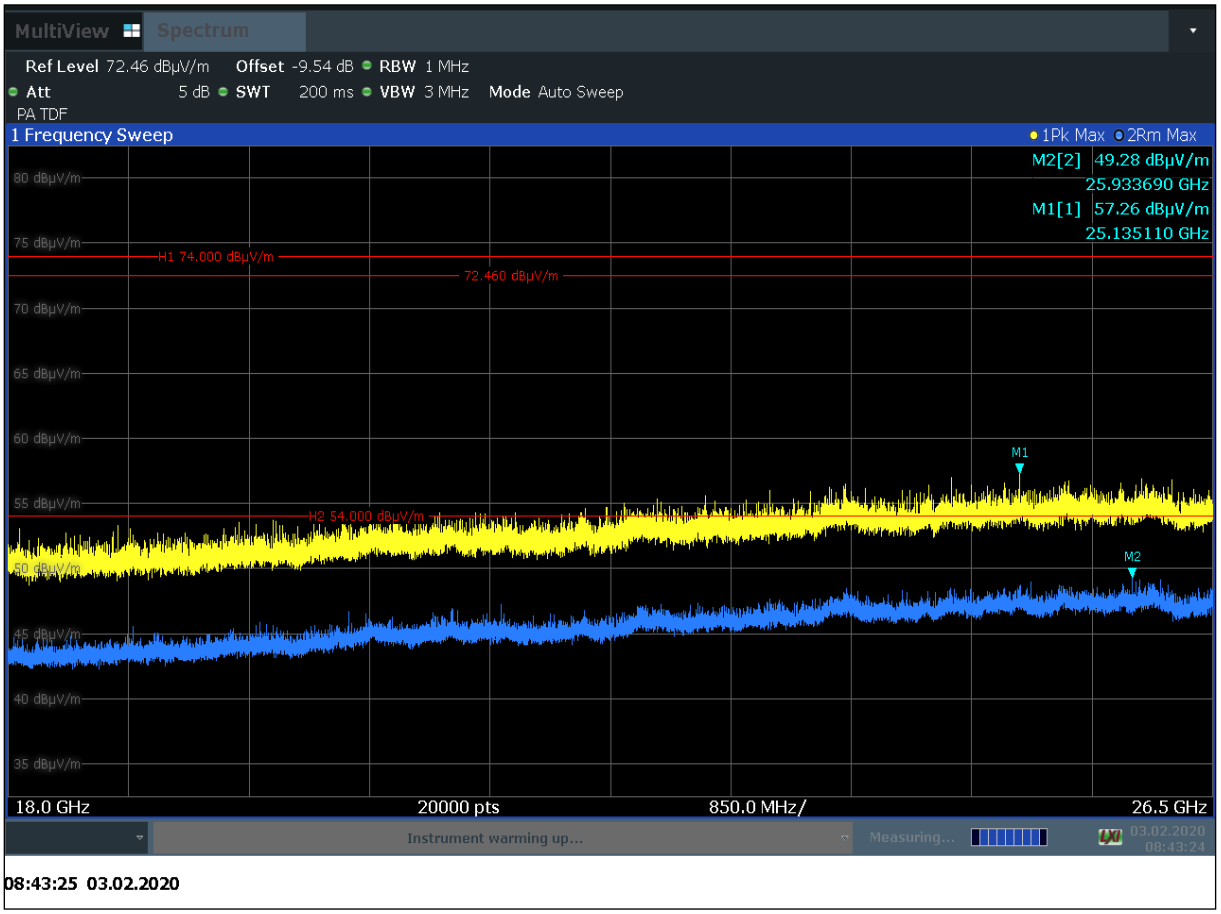
Full Spectrum



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin	Bandwidth (kHz)	Height (cm)	Pol	Meas. Time	Azimuth (deg)	Elevation
4884.000000	---	43.98	54.00	10.02	1000.000	155.0	V	100.0	128.0	0.0
4884.400000	58.42	---	74.00	15.58	1000.000	155.0	V	100.0	94.0	0.0
7325.600000	---	46.91	54.00	7.09	1000.000	155.0	V	100.0	-14.0	90.0
7325.600000	57.62	---	74.00	16.38	1000.000	155.0	V	100.0	-14.0	90.0

4.02b_BT_LE_low



4.03a_BT_LE_high

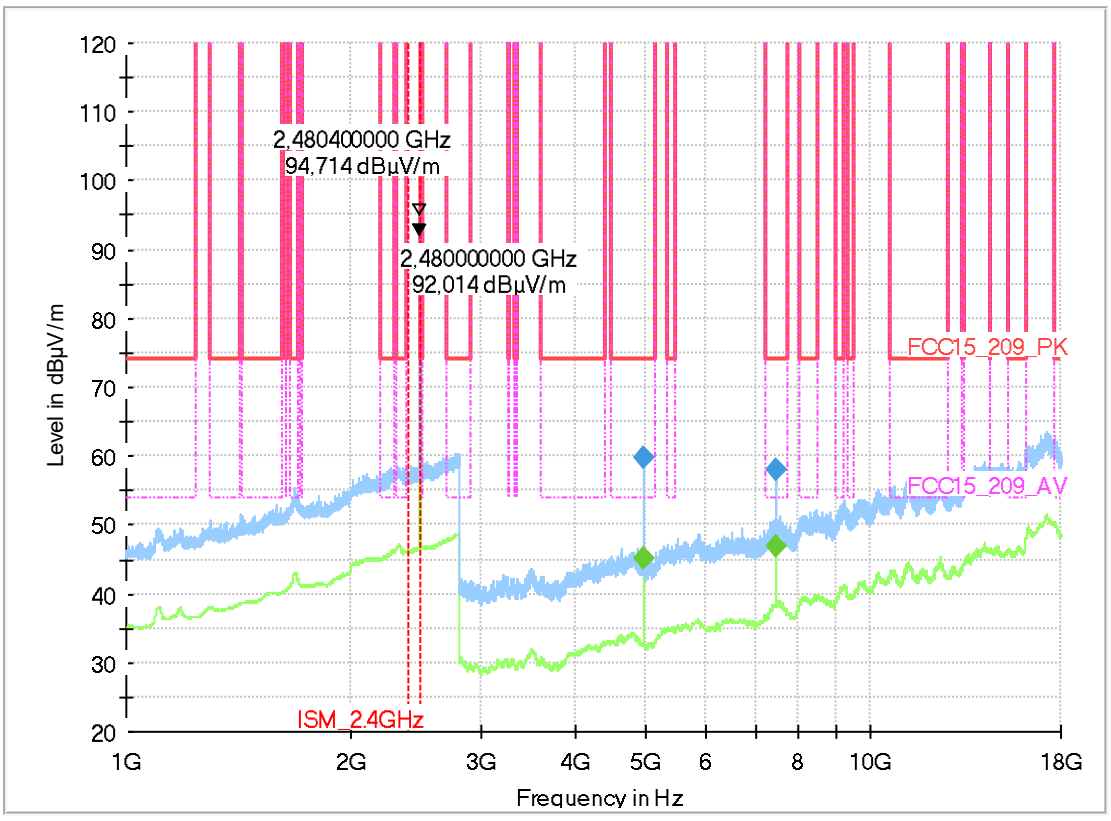
Common Information

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 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	Bluetooth Low Energy _ High Channel (39)-2480 MHz
Operator:	RIs
EUT Setup:	1

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
---	---
HW version:	GH_RC-1V3
SW version:	--
SVN:	
Config:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board
Comments:	--

Full Spectrum



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Elevation
4960.000000	---	45.29	54.00	8.71	100.0	1000.000	155.0	V	126.0	0.0
4960.400000	59.88	---	74.00	14.12	100.0	1000.000	155.0	V	86.0	0.0
7440.800000	---	46.94	54.00	7.06	100.0	1000.000	155.0	V	35.0	90.0
7441.200000	58.05	---	74.00	15.95	100.0	1000.000	155.0	V	-6.0	90.0

4.03b_BT_LE_low

9.01_BE_BT_LE_low

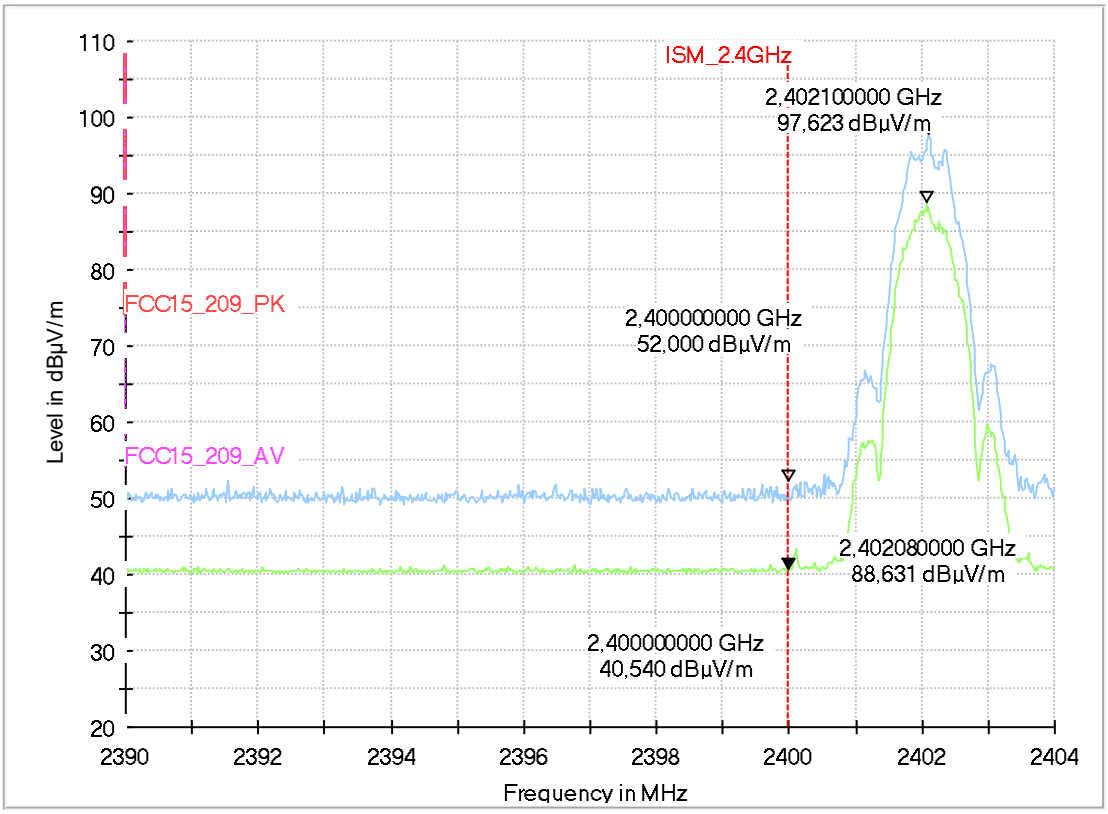
Common Information

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 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	Bluetooth Low Energy _ Low Channel (00)-2402 MHz
Operator:	mkh
Verdict:	Passed
Conditioons:	Humidity : 46% rH; Temperature: 20° C

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
---	---
HW version:	GH_RC-1V3
SW version:	--
SVN:	
Config:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board
Comments:	--

Full Spectrum



9.02_BE_BT_LE_high

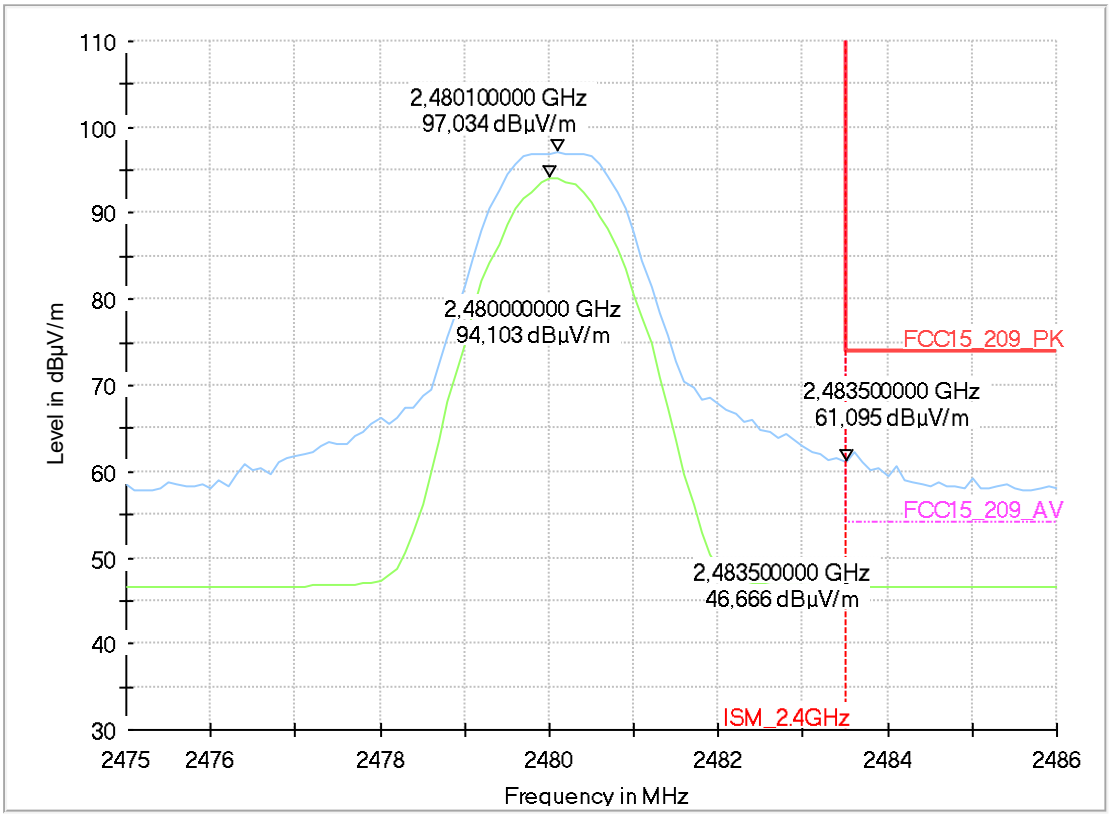
Common Information

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 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	Bluetooth Low Energy _ Low Channel (01)-2404 MHz
Operator:	RIs
EUT Setup:	1

EUT Information

PMT number:	19-1-01422S30
Manufacturer:	Grohe AG
Product:	Remote Control
Model:	Rainshower 310 SmartConnect (26646)
HW version:	GH_RC-1V3
SW version:	--
Serial number:	--
Connected Interfaces:	--
Power Supply:	via PC through development board

Full Spectrum



End Of Annex 1