



Test report No:
 NIE: 59573REM.001

Test report

FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-16 Edition) & ICES-003 Issue 6 (Updated 04-2017)

Identification of item tested	Wi-Fi bgn wireless radio module with embedded full stack
Trademark	Silicon Labs
Model and /or type reference	WGM160P22A (ordering code WGM160PX22KGA2) WGM160P22N (ordering code WGM160PX22KGN2)
Other identification of the product	FCC ID: QQQWGM160P IC: 5123A-WGM160P
Features	802.11bgn @ 2.4GHz, single spatial stream.
Manufacturer	SILICON LABORATORIES FINLAND OY Alberga Business Park, Bertel Junginaukio 3, 02600 Espoo. Finland.
Test method requested, standard	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition) & ICES-003 (Updated 04-2017)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Francisco Cañas Regulatory Laboratory Director
Date of issue	2019-02-05
Report template No	FDT08_21

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Competences and guarantees

DEKRA Testing and Certification is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

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In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

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The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification internal document PODT000.

The total uncertainty of the measurement system for the measured conducted disturbance characteristics of EUT from 150kHz to 30 MHz is $I = \pm 3,9$ dB for quasi-peak measurements, $I = \pm 3,2$ dB for average measurements ($k = 2$)

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1000 MHz is $I = \pm 4,9$ dB for quasi-peak measurements, $I = \pm 4,6$ dB for peak measurements ($k = 2$)

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 1000 MHz to 26 GHz is $I = \pm 2,6$ dB for peaks and average measurements ($k = 2$)

Data provided by the client

The sample consists of a Wi-Fi bgn wireless radio module with embedded full stack. As reference, the manufacturer declares the different WGM160P variants:



Description of WGM160P Variants and of Low Freq Crystal Oscillator Functionality

In the WGM160P family of Wi-Fi modules, four variants exist, and the manufacturing differences are described in the following table:

<ul style="list-style-type: none"> - Integral chip antenna assembled and connected to primary RF port - 32kHz crystal assembled - Orderable part number: WGM160PX22KGA2 - Known as "A" variant with generic model name: WGM160P22A 	<ul style="list-style-type: none"> - Integral chip antenna not assembled: external antenna(s) required for normal operations - 32kHz crystal assembled - Orderable part number: WGM160PX22KGN2 - Known as "N" variant with generic model name: WGM160P22N
<ul style="list-style-type: none"> - Integral chip antenna assembled and connected to primary RF port - 32kHz crystal not assembled - Orderable part number: WGM160P022KGA2 - Known as "A" variant with generic model name: WGM160P22A 	<ul style="list-style-type: none"> - Integral chip antenna not assembled: external antenna(s) required for normal operations - 32kHz crystal not assembled - Orderable part number: WGM160P022KGN2 - Known as "N" variant with generic model name: WGM160P22N

A 32.768kHz crystal is connected to the microcontroller inside the module, which contains a low-frequency crystal oscillator being used as the sleep clock for the power saving modes of the module. The microcontroller feeds the buffered 32kHz clock signal to the radio chip which uses it to schedule its sleep periods between RF operation periods.

A variant with the 32.768kHz crystal not assembled in production is provided to reduce the module cost, for customers for whom the power consumption is not as important as the cost. In the variants where the crystal has not been assembled, the software will detect its absence and will configure the microcontroller first, and consequently the radio chipset, to use internal RC clocks for sleep timing. The radio listen periods will be widened too, due to the lower timing precision, with the only side effect of increasing the average current consumption.

All RF operation is correlated to a separate, high precision, thermally compensated, crystal which is connected to the radio chipset, and which is used among others for all precision timings required by the radio communication. Nothing that affects radio operation depends on the low frequency crystal.

The printed circuit board with all the variants is identical, as is the software and all settings.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples under test have been selected by: The client.

Sample S/01, variant A with label A7 (antenna internal + antenna external), is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
59573/002	Wi-Fi bgn wireless radio module with embedded full stack	WGM160P22A (ordering code WGM160PX22KGA2)	---	2018-12-27
59573/010	Antenna	---	---	2018-12-27

Sample S/02, variant N with label N7 (two external antennas), is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
59573/003	Wi-Fi bgn wireless radio module with embedded full stack	WGM160P22N (ordering code WGM160PX22KGN2)	---	2018-12-27
59573/010	Antenna	---	---	2018-12-27
59573/011	Antenna	---	---	2018-12-27

Auxiliary element used with all the tested samples:

Control N°	Description	Model	Serial N°	Date of reception
59573/015	DC power supply cable	---	---	2018-12-27
---	Mouse	Microsoft mouse 200	---	---
3398	Keyboard	Genius KB-110X	---	---
CTC-7345-L	Laptop	Dell	---	---
---	USB cable	---	---	---

Test sample description

Ports..... :	Port name and description	Cable					
		Specified length [m]	Attached during test	Shielded			
	<i>Module has UART host interface (@ 115200 with no flow control), which is routed to USB-UART converter of certification board.</i>		Yes, to launch the test modes can be detached during testing when module is supplied by lab power supply.	<input type="checkbox"/>			
	N/A		<input type="checkbox"/>	<input type="checkbox"/>			
	N/A		<input type="checkbox"/>	<input type="checkbox"/>			
	N/A		<input type="checkbox"/>	<input type="checkbox"/>			
	N/A		<input type="checkbox"/>	<input type="checkbox"/>			
	N/A		<input type="checkbox"/>	<input type="checkbox"/>			
Supplementary information to the ports..... :	N/A						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	DC: V Nom: 3.3Vdc; Vmin: 3.0Vdc; Vmax: 3.6Vdc.						
<input type="checkbox"/>	DC:						
Rated Power	~0.7W						
Clock frequencies	38.4MHz (RF XTAL), 72MHz (internal processor), 32.768KHz (low freq XTAL) – None of the clocks is exposed to a module's pin.						
Other parameters..... :	Not provided data						
Software version	Not provided data						
Hardware version..... :	Not provided data						
Dimensions in cm (W x H x D).... :	23.8mm x 14.2mm x 2.3mm						
Mounting position..... :	<input type="checkbox"/>	Table top equipment					
	<input type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input type="checkbox"/>	Floor standing equipment					

	<input type="checkbox"/>	Hand-held equipment		
	<input checked="" type="checkbox"/>	Other: This is an embedded module, meant to be surface-mounted in the PCB of an end-product by OEMs etc.		
Modules/parts		Module/parts of test item	Type	Manufacturer
		N/A		
		N/A		
		N/A		
		N/A		
		N/A		

Identification of the client

SILICON LABORATORIES FINLAND OY
 Alberga Business Park, Bertel Jungin aukio 3,
 02600 Espoo. Finland.

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2018-12-28
Date (finish)	2019-01-17

Document history

Report number	Date	Description
59573REM.001	2019-02-05	First release

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The test have been performed by the technical personnel: Carlos Haro & David Rubio.

As reference, the manufacturer declares the different WGM160P variants in annex B.

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Summary

Emission Test		
Requirement – Test case	Verdict	Remark
Radiated emission. Electromagnetic field measure (30 KHz – 1000 MHz)	P	---
Radiated emission. Electromagnetic field measure (1 GHz – 18 GHz)	P	---
Radiated emission. Electromagnetic field measure (18 GHz – 26 GHz)	P	---
Continuous conducted emission (150 KHz – 30 MHz)	P	---
<u>Supplymentary information and remarks:</u>		

List of equipment used during the test

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
4526	EMI TEST Receiver	ROHDE & SCHWARZ	ESU26	2018-02-21	2020-02-21
4578	Bilog Antenna	ETS LINDGREN	3142E	2017-04-03	2020-04-03
4612	Horn Antenna	SCHWARZBECK	BBHA 9120 D	2016-12-19	2019-12-19
3783	Preamplifier	BONN ELEKTRONIK	BLMA 0118-3A	2018-03-28	2019-03-28
4656	Horn Antenna	SCHWARZBECK	BBHA 9170	2017-03-24	2020-03-24
4570	Thermohigrometer	HW GROUP	HWg-STE	2018-04-03	2019-04-03
4567	Thermohigrometer	HW GROUP	HWg-STE	2018-04-04	2019-04-04
4522	EMC measurement software	ROHDE & SCHWARZ	EMC32 V9.01	---	---
6121	Preamplifier	BONN ELEKTRONIK	BLNA 0160-01N	2018-03-20	2019-03-20
4729	Preamplifier	BONN ELEKTRONIK	BLMA 1840-1M	2018-02-23	2020-02-23
1650	Artificial network	SCHWARZBECK	NNLK8121	2017-09-20	2019-09-20

Appendix A: Test results

APPENDIX A CONTENT

DESCRIPTION OF THE OPERATION MODES.....	12
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CONTINUOUS CONDUCTED EMISSION.....	25

DESCRIPTION OF THE OPERATION MODES

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. The operation modes used by the samples to which the present report refers, are shown in the following table:

OPERATION MODE	DESCRIPTION
OM#01	EUT ON. Wi-Fi in reception mode. Connected to a PC by USB cable. Tabletop configuration. External power supply: 3.3 Vdc. Auxiliary PC powered by 115Vac.

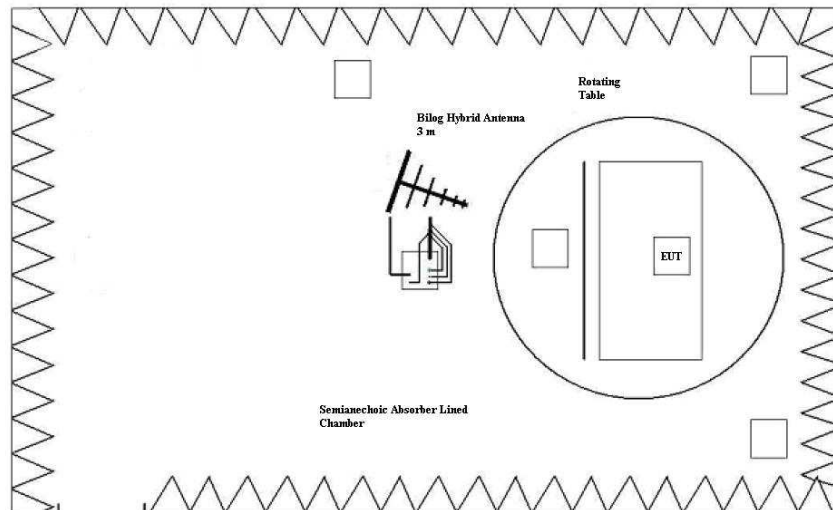
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.109 & ICES-003 Issue 6 (Updated 04-2017)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.109 & ICES-003 Issue 6 (Updated 04-2017)

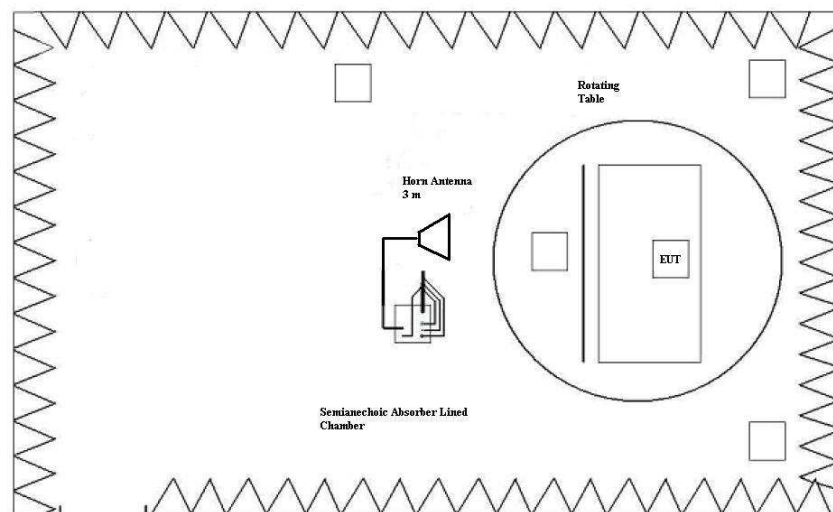
Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-16 Edition), Secs. 15.109 & ICES-003 Issue 6 (Updated 04-2017) in the frequency range 30 MHz to 26 GHz for class B equipments.

Frequency range (MHz)	QP Limit for 3 m		PK Limit for 3 m
	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)
30 to 88	100	40	---
88 to 216	150	43.5	---
216 to 960	200	46	---
Above 960	500	54	74



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

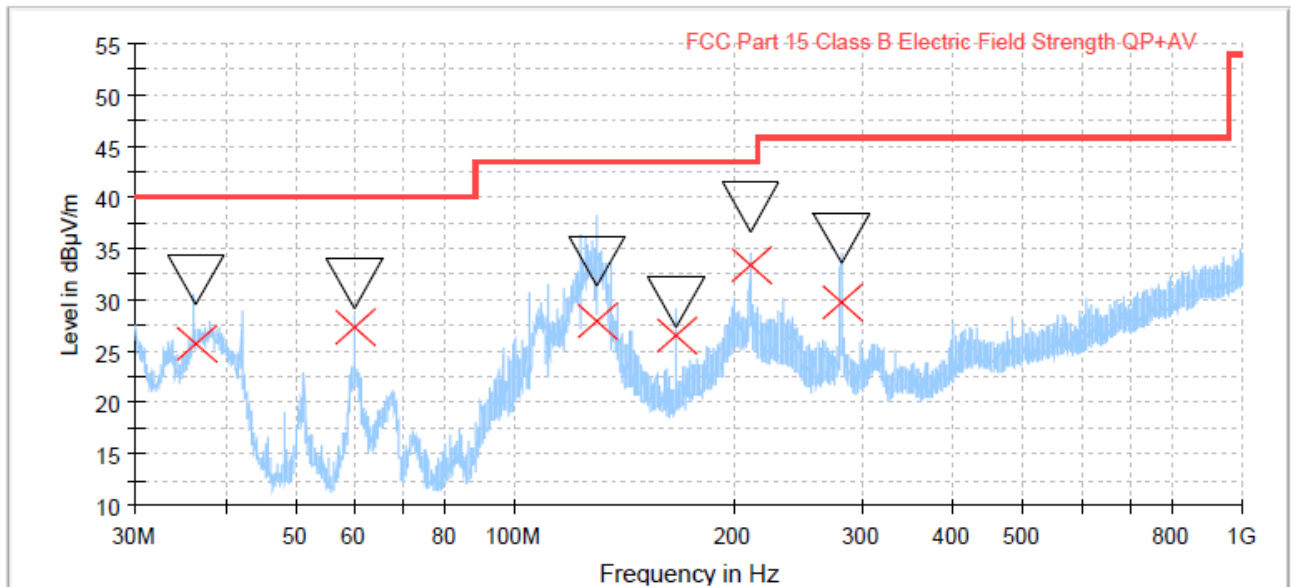
TESTED SAMPLE:	S/01 & S/02
TESTED OPERATION MODES:	OM#01
TEST RESULTS:	CRmmnnRRPP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; PP: Polarization.

CRmmnnRRPP	Description	Result
CR0101LR	Range: 30 MHz - 1000 MHz.	P
CR0101HR1_H	Range: 1 GHz - 18 GHz. Horizontal polarization.	P
CR0101HR1_V	Range: 1 GHz - 18 GHz. Vertical polarization.	P
CR0101HR2_H	Range: 18 GHz - 26 GHz. Horizontal polarization.	P
CR0101HR2_V	Range: 18 GHz - 26 GHz. Vertical polarization.	P
CR0201LR	Range: 30 MHz - 1000 MHz.	P
CR0201HR1_H	Range: 1 GHz - 18 GHz. Horizontal polarization.	P
CR0201HR1_V	Range: 1 GHz - 18 GHz. Vertical polarization.	P
CR0201HR2_H	Range: 18 GHz - 26 GHz. Horizontal polarization.	P
CR0201HR2_V	Range: 18 GHz - 26 GHz. Vertical polarization.	P

Radiated Emission. CR0101LR

Project: 59573Rem001
 Operating Conditions: SILICON LABS FINLAND OY
 Operator Name: S/01
 Comment: EUT ON. WiFi in reception mode. Conected to a PC by USB cable. Tabletop configuration .External power supply: 3.3 Vdc. Auxiliary PC powered by 115Vac.

Full Spectrum



- Peak Preview
- ▽ Max Peak
- FCC Part 15 Class B Electric Field Strength QP+AV
- × QuasiPeak

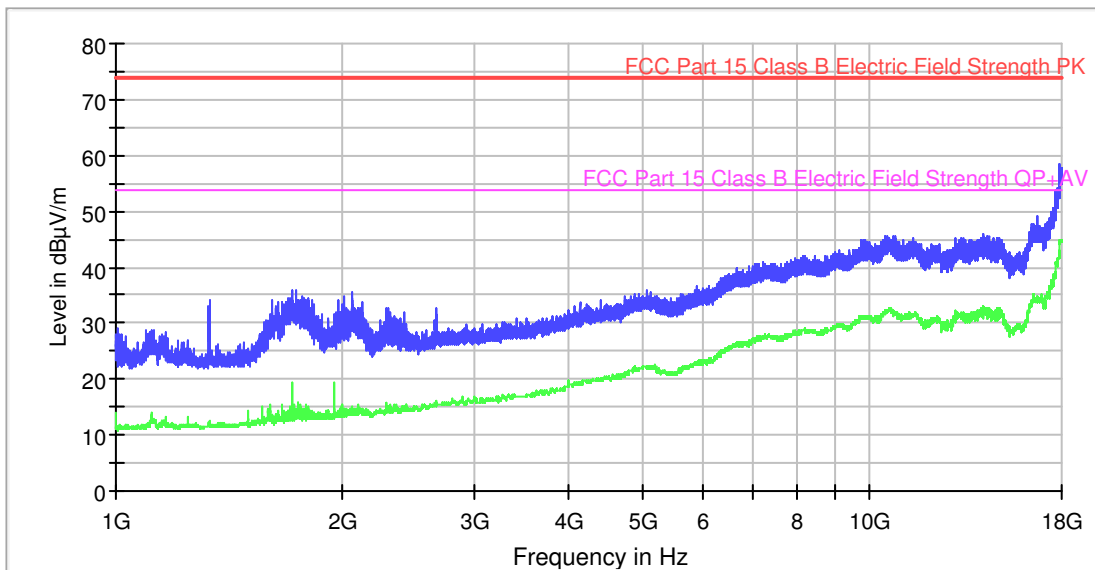
Maximizations

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Height (cm)	Pol	Azimuth (deg)
36.380000	32.09	25.84	115.0	V	238.0
60.170000	31.64	27.34	115.0	V	21.0
129.460000	33.80	27.96	182.0	H	19.0
166.305000	29.74	26.46	131.0	H	100.0
210.175000	39.01	33.45	167.0	H	288.0
280.710000	36.01	29.86	236.0	V	307.0

Radiated Emission. CR0101HR1_H

Project: 59573Rem001
 Company: SILICON LABS FINLAND OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. WiFi in reception mode. Conected to a PC by USB cable. Tabletop configuration. External power supply:3.3 Vdc. Auxiliary PC power by 115 Vac. Horizontal polarization.

FCC 15 Class B (1-18GHz)



- AVG_CLRWR
- PK+_CLRWR
- FCC Part 15 Class B Electric Field Strength PK
- FCC Part 15 Class B Electric Field Strength QP+AV

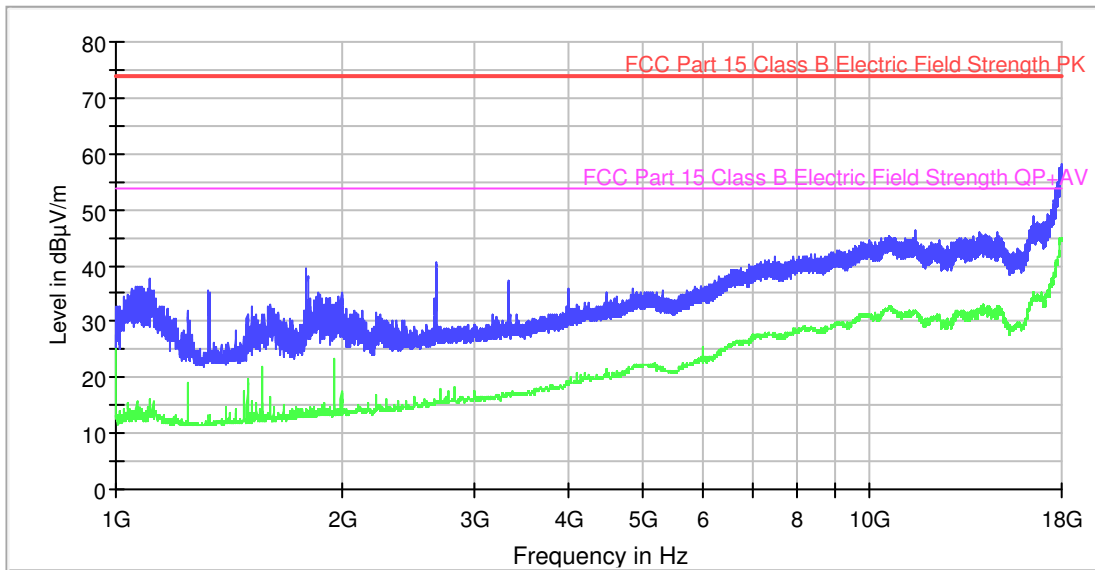
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)	Poi
1732.800000	36.0	13.0	H
4388.400000	34.1	19.8	H
5898.800000	36.4	23.0	H
7784.400000	40.9	27.7	H
9101.200000	43.1	29.4	H
10494.000000	45.7	32.0	H
11432.400000	45.3	31.6	H
14174.800000	46.0	32.6	H
16294.000000	45.4	32.6	H
17912.800000	58.6	44.6	H

Radiated Emission. CR0101HR1_V

Project: 59573Rem001
 Company: SILICON LABS FINLAND OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. WiFi in reception mode. Conected to a PC by USB cable. Tabletop configuration. External power supply:3.3 Vdc. Auxiliary PC power by 115 Vac. Vertical polarization.

ER EMI FCC 15 Class B (1-18GHz)



- AVG_CLRWR
- PK+_CLRWR
- FCC Part 15 Class B Electric Field Strength PK
- FCC Part 15 Class B Electric Field Strength QP+AV

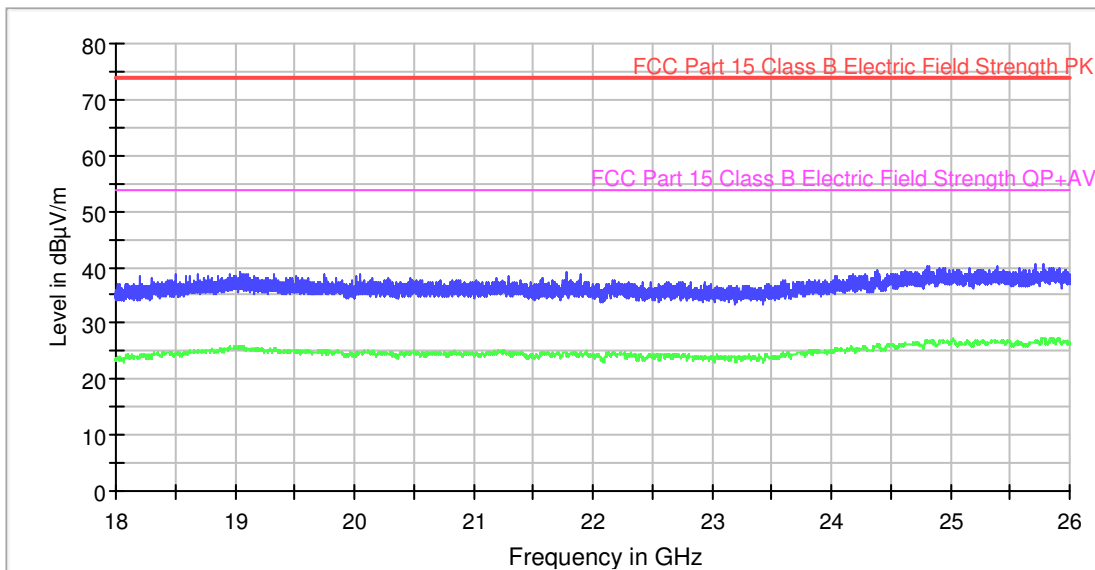
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)	Poi
2661.200000	40.5	15.6	V
3325.600000	37.2	17.3	V
5974.400000	36.4	23.8	V
7512.400000	41.5	27.6	V
9495.600000	42.9	30.0	V
10636.000000	45.2	32.4	V
11525.200000	46.3	31.6	V
14042.400000	46.0	32.2	V
14835.200000	45.8	32.5	V
17953.600000	58.2	45.0	V

Radiated Emission. CR0101HR2_H

Project: 59573Rem001
 Company: SILICON LABS FINLAND OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. WiFi in reception mode. Conected to a PC by USB cable. Tabletop configuration. External power supply:3.3 Vdc. Auxiliary PC power by 115 Vac. Horizontal polarization.

ER EMI FCC 15 Class B(18-26GHz)



- AVG_CLRWR
- PK+_CLRWR
- FCC Part 15 Class B Electric Field Strength PK
- FCC Part 15 Class B Electric Field Strength QP+AV

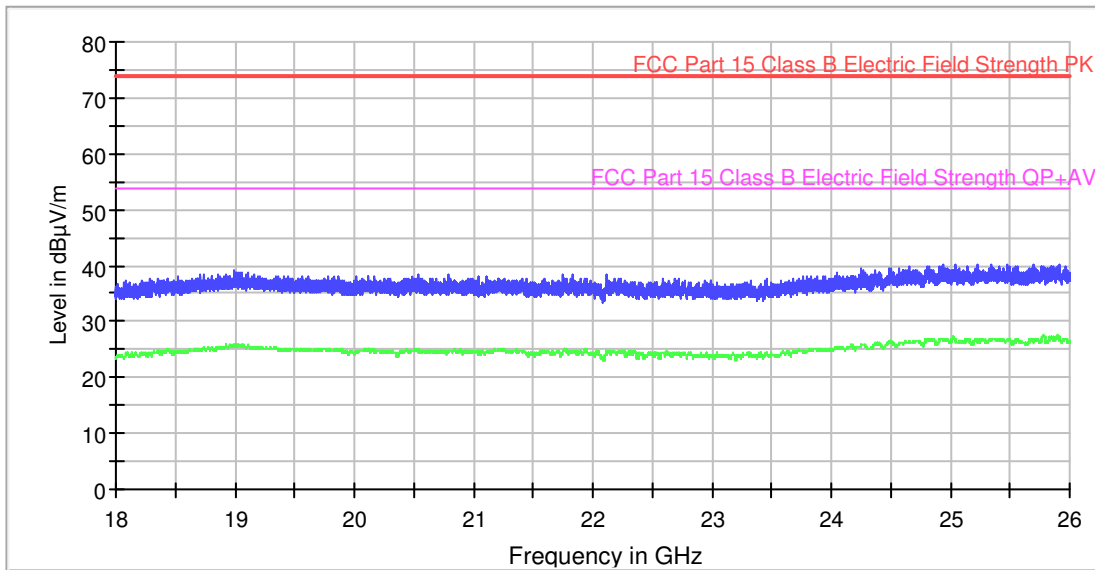
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)	Poi
18500.000000	38.9	24.5	H
19035.600000	39.1	25.9	H
20052.000000	38.9	24.7	H
20468.000000	38.0	24.7	H
21774.400000	39.0	24.8	H
22192.800000	37.8	24.5	H
23590.400000	37.7	24.6	H
24378.800000	39.3	25.9	H
24802.800000	40.2	26.9	H
25784.800000	40.4	27.3	H

Radiated Emission. CR0101HR2_V

Project: 59573Rem001
 Company: SILICON LABS FINLAND OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. WiFi in reception mode. Conected to a PC by USB cable. Tabletop configuration. External power supply:3.3 Vdc. Auxiliary PC power by 115 Vac. Vertical polarization.

ER EMI FCC 15 Class B(18-26GHz)



- AVG_CLRWR
- PK+_CLRWR
- FCC Part 15 Class B Electric Field Strength PK
- FCC Part 15 Class B Electric Field Strength QP+AV

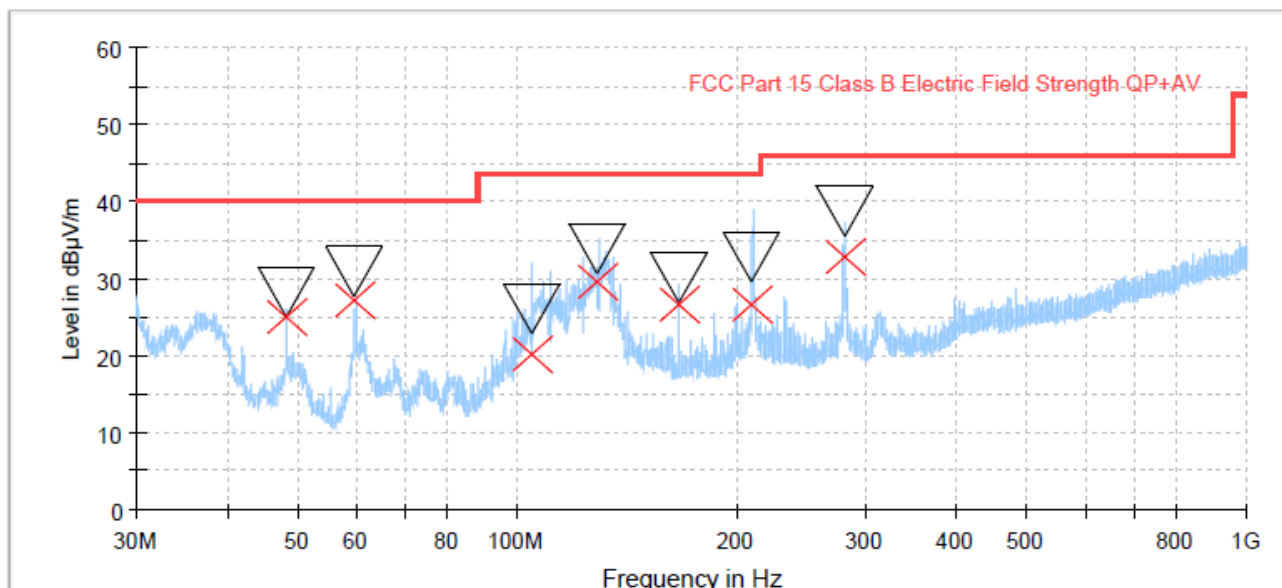
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
18734.800000	39.0	24.9
18940.200000	38.8	25.3
19761.400000	38.8	25.5
20648.000000	38.0	24.6
21832.000000	38.4	25.1
22231.400000	38.2	24.6
23402.800000	37.7	24.3
24332.000000	39.1	25.2
24723.400000	40.4	26.6
25918.400000	40.3	27.3

Radiated Emission. CR0201LR

Project: 59573Rem001
 Operating Conditions: SILICON LABS FINLAND OY
 Operator Name: S/02
 Comment: EUT ON. WiFi in recepcion mode. Conected to a PC by USB cable. Tabletop configuration .External power supply: 3.3 Vdc. Auxiliary PC powered by 115Vac.

Full Spectrum



— Peak Preview
 — FCC Part 15 Class B Electric Field Strength QP+AV
 ▽ Max Peak
 × QuasiPeak

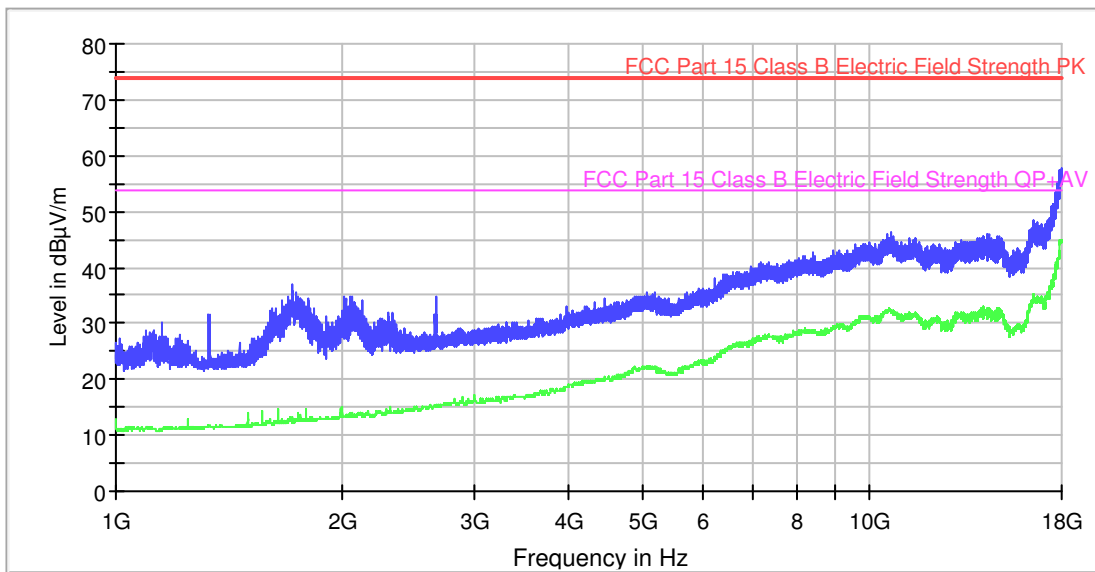
Maximizations

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Height (cm)	Pol	Azimuth (deg)
48.040000	28.37	24.93	149.0	V	244.0
59.580000	30.92	27.19	129.0	V	69.0
104.540000	26.04	20.26	313.0	H	350.0
128.805000	33.91	29.53	191.0	H	7.0
166.170000	30.04	26.66	172.0	H	97.0
209.470000	32.80	26.51	158.0	H	315.0
281.185000	38.70	32.74	162.0	V	4.0

Radiated Emission. CR0201HR1_H

Project: 59573Rem001
 Company: SILICON LABS FINLAND OY
 Sample: S/02
 Operation mode: OM#01
 Description: EUT ON. WiFi in reception mode. Conected to a PC by USB cable. Tabletop configuration. External power supply:3.3 Vdc. Auxiliary PC power by 115 Vac. Horizontal polarization.

ER EMI FCC 15 Class B (1-18GHz)



- AVG_CLRWR
- PK+ CLRWR
- FCC Part 15 Class B Electric Field Strength PK
- FCC Part 15 Class B Electric Field Strength QP+AV

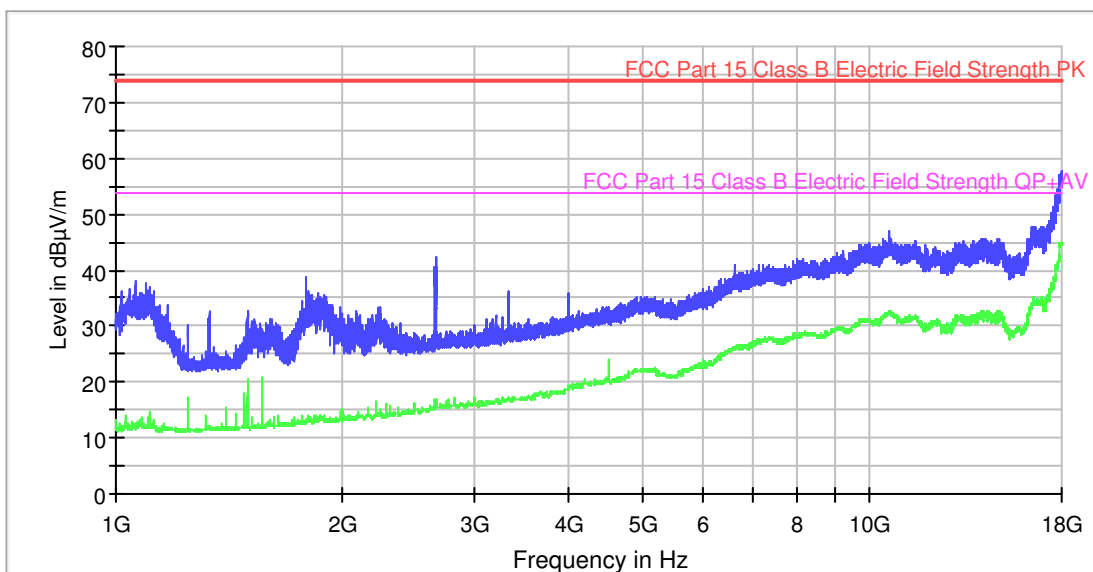
Subrange Maxima

Frequency (MHz)	PK+ CLRWR (dBµV/m)	AVG CLRWR (dBµV/m)	PoI
1714.400000	36.8	12.7	H
4310.000000	33.6	19.7	H
6032.000000	36.4	23.1	H
7201.200000	41.0	27.3	H
9114.800000	43.2	29.4	H
10670.400000	46.1	32.4	H
11525.600000	45.3	31.6	H
14324.400000	45.9	32.1	H
14858.800000	45.7	32.4	H
17950.000000	57.9	44.8	H

Radiated Emission. CR0201HR1_V

Project: 59573Rem001
 Company: SILICON LABS FINLAND OY
 Sample: S/02
 Operation mode: OM#01
 Description: EUT ON. WiFi in reception mode. Conected to a PC by USB cable. Tabletop configuration. External power supply:3.3 Vdc. Auxiliary PC power by 115 Vac. Vertical polarization.

ER EMI FCC 15 Class B (1-18GHz)



- AVG_CLRWR
- PK+_CLRWR
- FCC Part 15 Class B Electric Field Strength PK
- FCC Part 15 Class B Electric Field Strength QP+AV

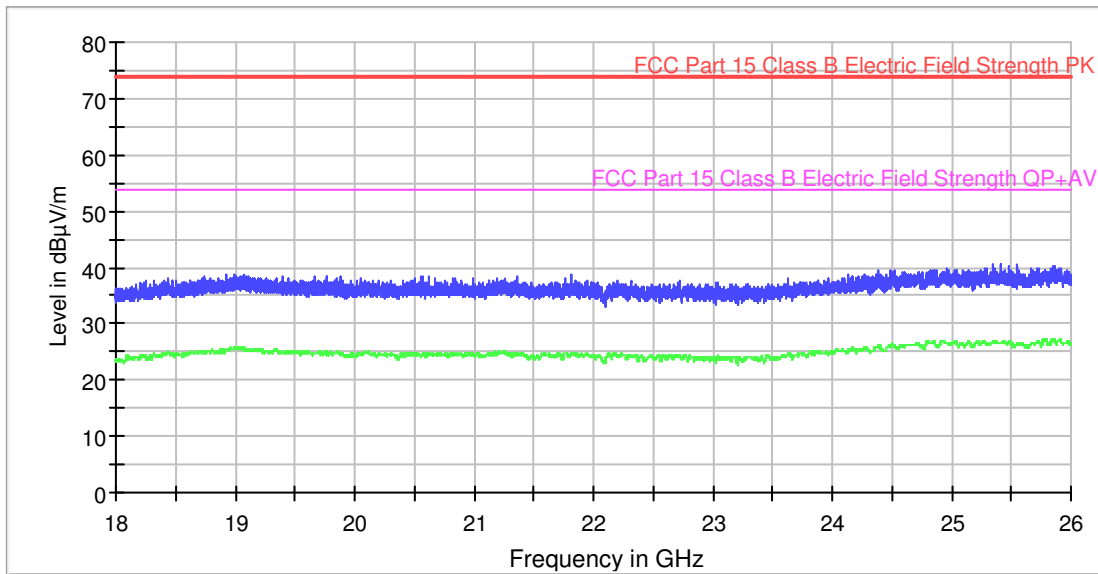
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)	PoI
2660.400000	42.3	15.9	V
3325.600000	36.1	17.2	V
6032.800000	36.7	23.2	V
7355.200000	41.0	27.8	V
9252.800000	43.5	29.1	V
10634.800000	46.9	32.2	V
11492.800000	45.1	31.6	V
14243.200000	45.7	32.1	V
14843.200000	45.5	32.4	V
17950.800000	57.7	44.9	V

Radiated Emission. CR0201HR2_H

Project: 59573Rem001
 Company: SILICON LABS FINLAND OY
 Sample: S/02
 Operation mode: OM#01
 Description: EUT ON. WiFi in reception mode. Conected to a PC by USB cable. Tabletop configuration. External power supply:3.3 Vdc. Auxiliary PC power by 115 Vac. Horizontal polarization.

ER EMI FCC 15 Class B(18-26GHz)



- AVG_CLRWR
- PK+_CLRWR
- FCC Part 15 Class B Electric Field Strength PK
- FCC Part 15 Class B Electric Field Strength QP+AV

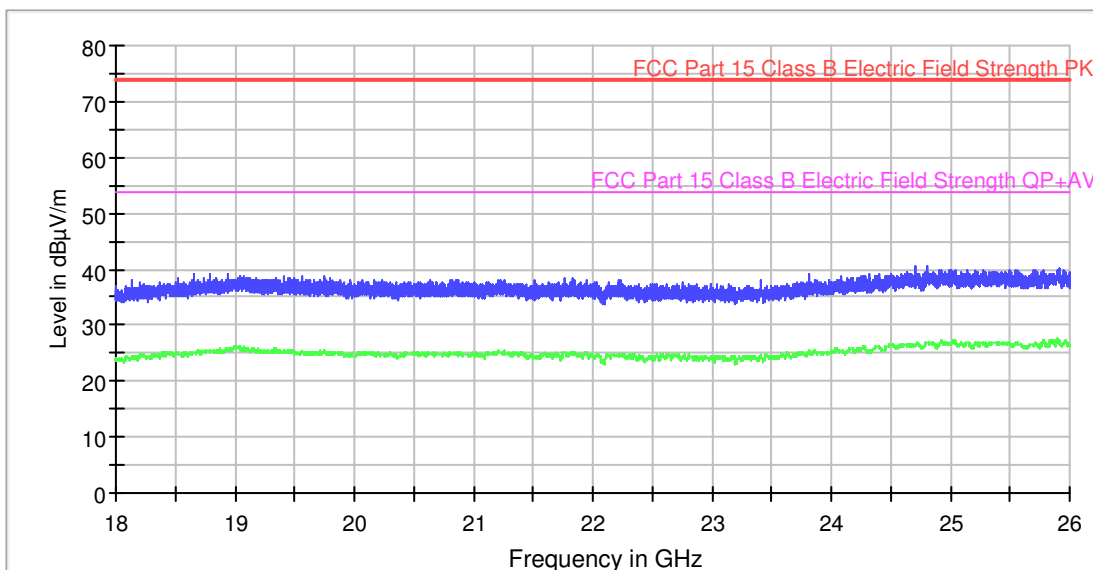
Subrange Maxima

Frequency (MHz)	PK+_ CLRWR (dBµV/m)	AVG CLRWR (dBµV/m)	Poi
18732.400000	38.3	25.2	H
18919.200000	38.8	25.5	H
19876.400000	38.3	24.6	H
20556.800000	38.4	24.3	H
21812.000000	38.7	24.5	H
22721.600000	37.7	24.3	H
23038.800000	37.4	24.2	H
24386.400000	39.3	25.9	H
24956.800000	39.9	26.5	H
25554.400000	40.5	26.6	H

Radiated Emission. CR0201HR2_V

Project: 59573Rem001
 Company: SILICON LABS FINLAND OY
 Sample: S/02
 Operation mode: OM#01
 Description: EUT ON. WiFi in recepcion mode. Conected to a PC by USB cable. Tabletop configuration. External power supply:3.3 Vdc. Auxiliary PC power by 115 Vac. Vertical polarization.

ER EMI FCC 15 Class B(18-26GHz)



- AVG_CLRWR
- PK+_CLRWR
- FCC Part 15 Class B Electric Field Strength PK
- FCC Part 15 Class B Electric Field Strength QP+AV

Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
18650.000000	39.1	25.0
18939.200000	39.0	25.5
19752.400000	38.8	25.3
20644.000000	38.1	24.8
21828.000000	38.3	24.9
22223.200000	38.0	24.4
23404.400000	37.9	24.4
24326.000000	39.1	25.3
24710.800000	40.5	26.5
25916.400000	40.2	27.2

CONTINUOUS CONDUCTED EMISSION

LIMITS:	Product standard :	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.107; ICES-003 Issue 6 (January 2016)
	Test standard :	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.107; ICES-003 Issue 6 (January 2016)

CLASS B

The applied limit for continuous conducted emissions in power leads, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-16 Edition), Secs. 15.107 & ICES-003 Issue 6 (January 2016), in the frequency range 0,15 to 30 MHz, for Class B equipment was:

Frequency range (MHz)	Limit (dB μ V)	
	Quasi-peak	Average
0,15 to 0,5	66-56*	56-46*
0,5 to 5	56	46
5 to 30	60	50

*Decreases with the logarithm of the frequency.

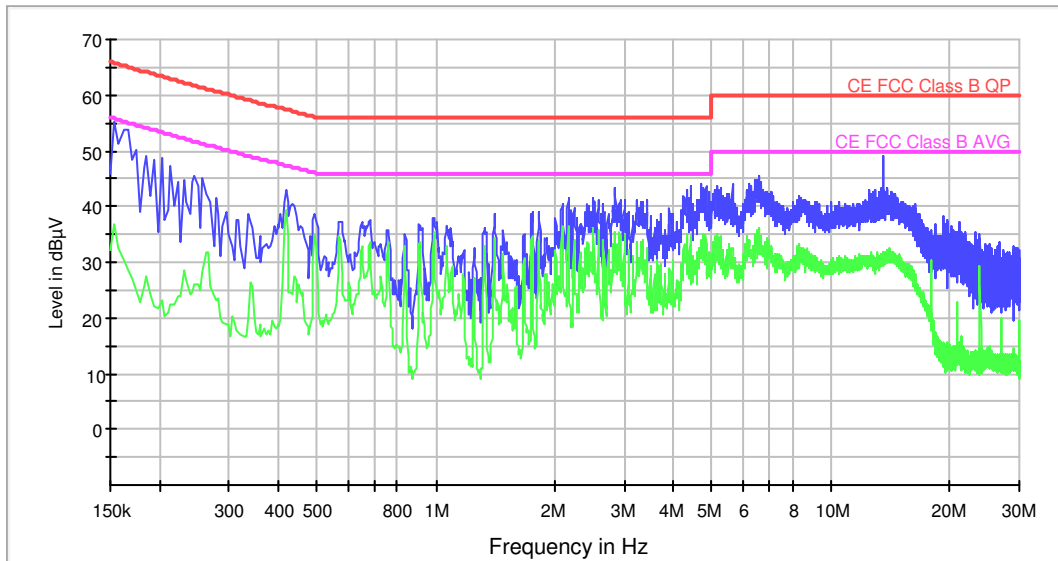
TESTED SAMPLES:	S/01 & S/02
TESTED OPERATION MODES:	OM#01
TEST RESULTS:	CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

CCmmnnhh	DESCRIPTION	RESULT
CC01010N	Range: 150kHz – 30MHz. Neutral wire noise.	P
CC0101L1	Range: 150kHz – 30MHz. Phase wire noise.	P
CC02010N	Range: 150kHz – 30MHz. Neutral wire noise.	P
CC0201L1	Range: 150kHz – 30MHz. Phase wire noise.	P

Conducted Emission. CC01010N

Project: 59573REM.001
 Company: Silicon Labs
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Wi-Fi in reception mode. Connected to a PC by USB cable. Tabletop configuration. External power supply: 3.3 Vdc. Auxiliary PC powered by 115Vac. Neutral wire noise.

FCC Class B



— Result Table Eval Peak — Result Table Eval Average
 — CE FCC Class B QP — CE FCC Class B AVG

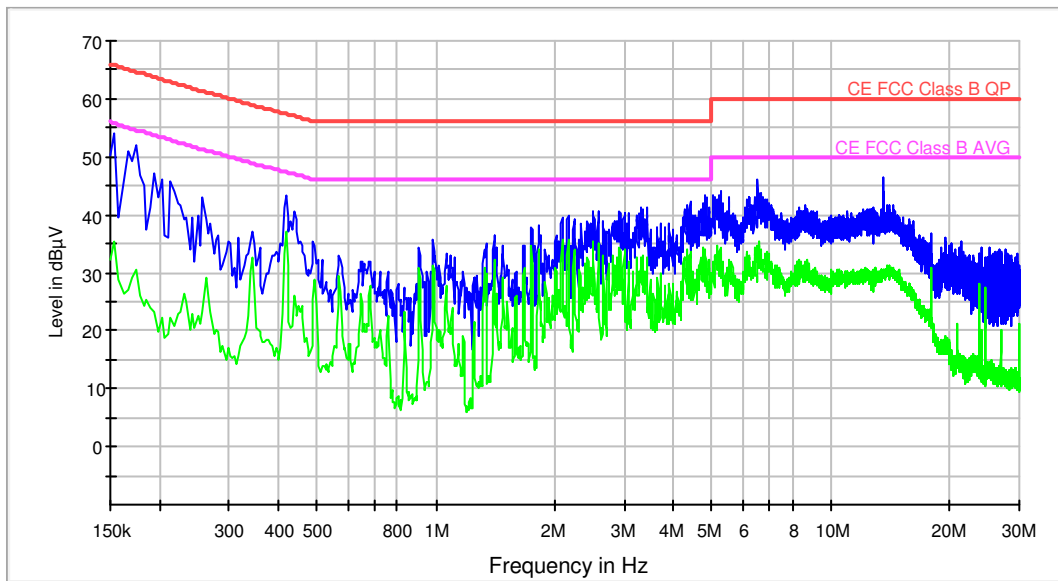
Subrange Maxima Peak

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)
0.154000	55.3
0.258000	45.3
0.434000	40.4
0.986000	38.1
2.094000	40.6
2.850000	43.2
5.622000	44.2
6.582000	45.6
13.530000	49.1
19.358000	38.3

Conducted Emission. CC0101L1

Project: 59573REM.002
 Company: Silicon Labs
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Wi-Fi in reception mode. Connected to a PC by USB cable. Tabletop configuration. External power supply: 3.3 Vdc. Auxiliary PC powered by 115Vac. Phase wire noise

FCC Class B



— CE FCC Class B QP — CE FCC Class B AVG — Peak Scan — Average Scan

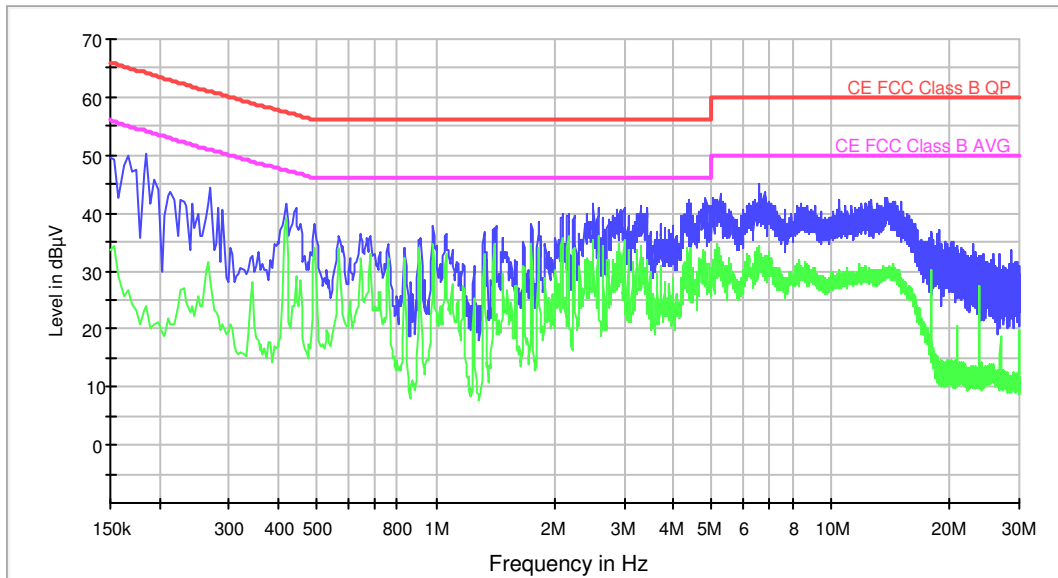
Subrange Maxima Peak

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)
0.154000	54.1
0.418000	43.4
0.438000	40.7
0.986000	35.7
2.086000	39.6
3.414000	41.3
5.254000	44.1
6.538000	46.3
13.610000	46.6
17.906000	36.6

Conducted Emission. CC02010N

Project: 59573REM.002
 Company: Silicon Labs
 Sample: S/02
 Operation mode: OM#01
 Description: EUT ON. Wi-Fi in reception mode. Connected to a PC by USB cable. Tabletop configuration. External power supply: 3.3 Vdc. Auxiliary PC powered by 115Vac. Neutral wire noise.

FCC Class B



— Peak Scan — Average Scan — CE FCC Class B QP — CE FCC Class B AVG

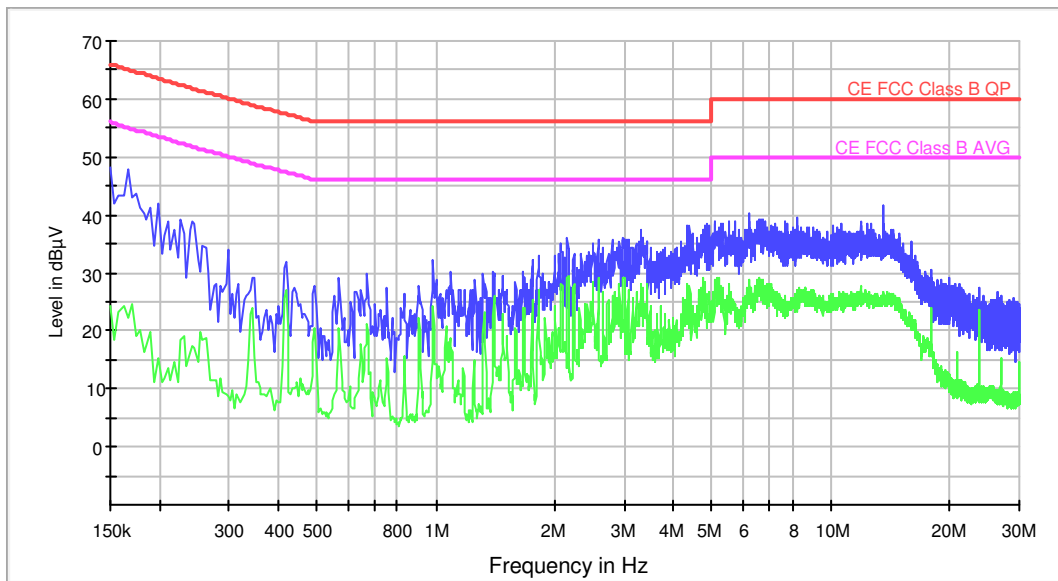
Subrange Maxima Peak

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)
0.186000	50.3
0.270000	44.5
0.442000	40.9
0.986000	37.6
2.090000	39.8
2.502000	41.6
5.242000	43.5
6.570000	45.0
13.834000	42.7
18.726000	37.2

Conducted Emission. CC0201L1

Project: 59573REM.002
 Company: Silicon Labs
 Sample: S/02
 Operation mode: OM#01
 Description: EUT ON. Wi-Fi in reception mode. Connected to a PC by USB cable. Tabletop configuration. External power supply: 3.3 Vdc. Auxiliary PC powered by 115Vac. Phase wire noise.

FCC Class B



— Peak Scan — Average Scan — CE FCC Class B QP — CE FCC Class B AVG

Subrange Maxima Peak

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)
0.150000	48.3
0.258000	34.5
0.670000	29.7
0.986000	32.2
2.078000	35.1
3.294000	37.3
5.730000	39.0
6.222000	40.2
13.626000	41.6
17.902000	30.6