



FCC LISTED, REGISTRATION
 NUMBER: 2764.01

ISED LISTED REGISTRATION
 NUMBER: 23595-1

Test report No:
3825ERM.001

Test report

**FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-20 Edition)
 &
 ICES-003 ISSUE 7 – October (2020)**

(*) Identification of item tested	Detects Audio Levels
(*) Trademark	Alarm.com
(*) Model and /or type reference tested	Smart Noise Monitor
Other identification of the product	FCC ID: YL6-143N10N IC ID: 9111A-143N10N
(*) Features	Z-Wave
Manufacturer	Alarm.com, Inc 8281 Greensboro Dr, Suite 100 Tyson, VA 22102 USA
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-20 Edition) ICES-003 ISSUE 7 – October (2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager
Date of issue	10-04-2022
Report template No	FDT08_23 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

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

DEKRA Certification Inc. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Certification at the time of performance of the test.

DEKRA Certification Inc. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

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 Certification Inc.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Certification Inc. and the Accreditation Bodies.

Uncertainty

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

	Frequency (MHz)	U (k=2)	Units
Radiated emission	30 - 1000	5.94	dB
	1000-18000	5.89	dB
Conducted emission	0,009 - 30	3.54	dB

Data provided by the client

Noise Monitor that detects audio levels and communicates data via Z-Wave to a controller.

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 used for test have been selected by **The Client**.

Sample S/01 is composed of the following elements:

Id	Control Number	Description	Manufacturer/Model	Serial N°	Date of Reception	Application
S/01	3825/03	Radiated Sample	Alarm.com / ADC-N10-N	46819	2022-08-11	Element Under Test
S/01	3825/04	USB debug cable	-	-	2022-09-15	Accessory

Sample S/01, was used for the following test(s): All test indicated in appendix A.

Test sample description

Test Sample description (compulsory information for EMC and RF testing services)

Ports..... :	Port name and description	Cable					
		Specified length [m]	Attached during test	Shielded	Coupled to patient		
	No Data Provided		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Supplementary information to the ports..... :	No Data Provided						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input checked="" type="checkbox"/>	AC: 86~305VAC, 47-63Hz	<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 type="checkbox"/>	DC:					
<input type="checkbox"/>	DC:						
Rated Power	2W						
Clock frequencies.....	32.768 kHz , 100 kHz , 3 MHz						
Other parameters	No Data Provided						
Software version	1						
Hardware version	1						
Dimensions in cm (W x H x D)	No Data Provided						
Mounting position	<input type="checkbox"/>	<i>Table top equipment</i>					
	<input type="checkbox"/>	<i>Wall/Ceiling mounted equipment</i>					
	<input type="checkbox"/>	<i>Floor standing equipment</i>					
	<input type="checkbox"/>	<i>Hand-held equipment</i>					
	<input type="checkbox"/>	<i>Other: Plugged into wall outlet</i>					

Modules/parts.....:	Module/parts of test item	Type	Manufacturer
	ZGM130S037HGN2R	Z-Wave	Silicon Labs
	WSM-BL241-ADA-008	Bluetooth	Murata
Accessories (not part of the test item)	Description	Type	Manufacturer
	No Data Provided		
Documents as provided by the applicant	Description	File name	Issue date
	Declaration Equipment Data	Alarm.com ADC-N10-N - FDT30_18 Declaration Equipment Data v2	09/16/2022
Copy of marking plate:			
NO MARKING PLATE FOUND			

Identification of the client

Alarm.com, Inc
 8281 Greensboro Dr, Suite 100
 Tyson, VA 22102
 USA

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	08-04-2022
Date (finish)	09-09-2022

Document history

Report number	Date	Description
3825ERM.001	10-04-2022	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 semi-anechoic 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

1. The tests have been performed by the technical personnel: Nasir Khan, Qi Zhang, and Koji Nishimoto .

Testing verdicts

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

Summary

Emission Test			
Report Section	Requirement – Test case	Verdict	Remark
A.1	Radiated emission test (30 MHz – 1000 MHz)	P	N/A
A.1	Radiated emission test (1 GHz – 18 GHz)	P	N/A
-	Radiated emission test (18 GHz – 26 GHz)	N/A	Refer 1
A.2	Conducted emission test (150 kHz to 30 MHz)	P	Refer 2

Supplementary information and remarks:

- 1) According with the requirements of FCC Rules and Regulations, title 47, Chapter I, Subchapter A, Part 15, Subpart A, §15.33 Frequency range of radiated measurements, (b) for unintentional radiators, (1) due to The Highest frequency generated or used in the device above 1000MHz, The Upper frequency of measurement range is up to 5th harmonic of the highest frequency or 40GHz, whichever is lower.
- 2) According with the requirements of FCC Rules and Regulations, title 47, Chapter I, Subchapter A, Part 15, Subpart B, §15.107 Conducted limits, (d) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation, and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provision for, the use of battery chargers which permit operating while charging, AC adaptors or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

List of equipment used during the test

Radiated Emission Equipment

Control Number	Description	Manufacturer	Model	Last Calibration	Next Calibration
981	RF pre-amplifier 1-18 GHz	Bonn Elektronik	BLMA 0118-2A	2020/11	2022/11
1012	ESR26 EMI Test Receiver	Rohde & Schwarz	ESR26	2022/04	2024/04
1014	FSV40 Signal Analyzer 40GHz	Rohde & Schwarz	FSV40	2021/05	2023/05
1056	3116C Double-Ridged Waveguide Horn Antennas	ETS Lindgren	3116C	2020/01	2023/01
1057	Double-ridge Waveguide Horn antenna	ETS Lindgren	3115	2020/06	2023/06
1065	Biconical log Antenna	ETS Lindgren	3142E	2020/08	2023/08
1108	Ethernet SNMP Thermometer- CR Room	HW Group	HWg-STE Plain	2020/09	2022/09
1111	Ethernet SNMP Thermometer- SAC	HW Group	HWg-STE Plain	2020/09	2022/09
1179	Semi-Anechoic Chamber	Frankonia	SAC 3plus 'L'	N/A	N/A
1217	Frankonia Transparent Test Table 1	Frankonia	FFT-Square	N/A	N/A
1314	Wireless measurement software EMC 32	Rohde & Schwarz	-	N/A	N/A

Conducted Emission Equipment

Control Number	Description	Manufacturer	Model	Last Calibration	Next Calibration
1010	EMI Test Receiver	Rohde & Schwarz	ESR7	2020/10	2022/10
1073	Pulse Limiter	Narda	PMM PL01	2020/10	2023/10
1082	Line Impedance Stabilization Network	Narda	PMM L3-32	2021/10	2023/10
1110	Ethernet SNMP Thermometer- MR	HW Group	HWg-STE Plain	2020/09	2022/09
1314	Wireless measurement software EMC 32	Rohde & Schwarz	-	N/A	N/A

Appendix A: Test results

Appendix A Content

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DESCRIPTION OF THE OPERATION MODES

The operation modes described in this paragraph represent functionalities of the sample under test.

The following operation modes of the samples were used during the test executions:

OPERATION MODE	DESCRIPTION
OM#01*	EUT ON. Powered by AC 120C. Z-Wave and BLE in idle mode.

* Worst case observed

A.1. RADIATED EMISSION ELECTROMAGNETIC FIELD

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-20 Edition), Secs. 15.109 & ICES-003 Issue 7 – October (2020)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-20 Edition), Secs. 15.109 & ICES-003 Issue 7 – October (2020); ANSI C63.4 (2014)

Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, in the frequency range 30 MHz to 40 GHz for class B equipment, according with the requirements of:

FCC Rules and Regulations 47 CFR Part 15, Subpart B, Secs. 15.109 (a) (10-01-20 Edition).

Frequency range (MHz)	QP Limit for 3 m	
	(μ V/m)	(dB μ V/m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46
Above 960	500	54

Frequency range (MHz)	AVG Limit for 3 m		PK Limit for 3 m (1)
	(μ V/m)	(dB μ V/m)	(dB μ V/m)
Above 1000	500	54	74

- (1) Frequencies above 1 GHz, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test, as per §15.35(b)

ICES-003 Issue 7, Secs 3.2.2, table 2 & 4 (October 2020).

Frequency range (MHz)	QP Limit for 3 m	
	(μ V/m)	(dB μ V/m)
30 to 88	100	40
88 to 216	150	43.5
216 to 230	200	46
230 to 960	224	47
Above 960	500	54

Frequency range (MHz)	AVG Limit for 3 m		PK Limit for 3 m (1)
	(μ V/m)	(dB μ V/m)	(dB μ V/m)
Above 1000	500	54	74

TEST SETUP

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 3 m for the frequency range 30-1000 MHz (Bilog antenna) and 1-18 GHz (Double ridge horn antenna).

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

TEST SETUP (CONT.)

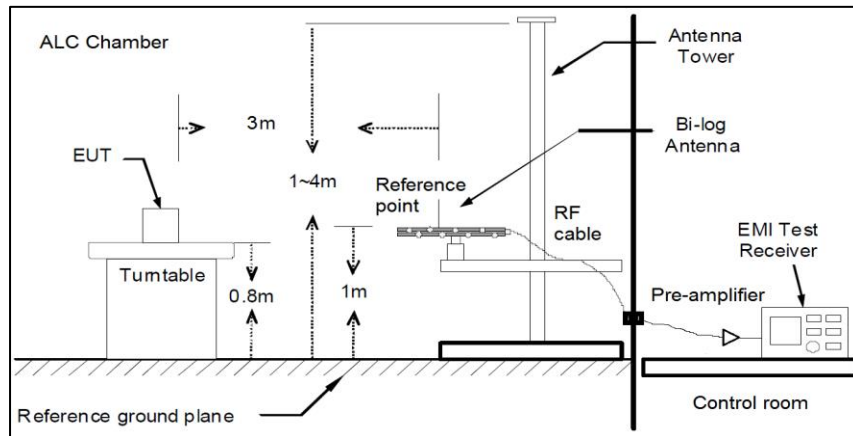


Fig A1: Generic setup for measurements from 30 to 1000 MHz

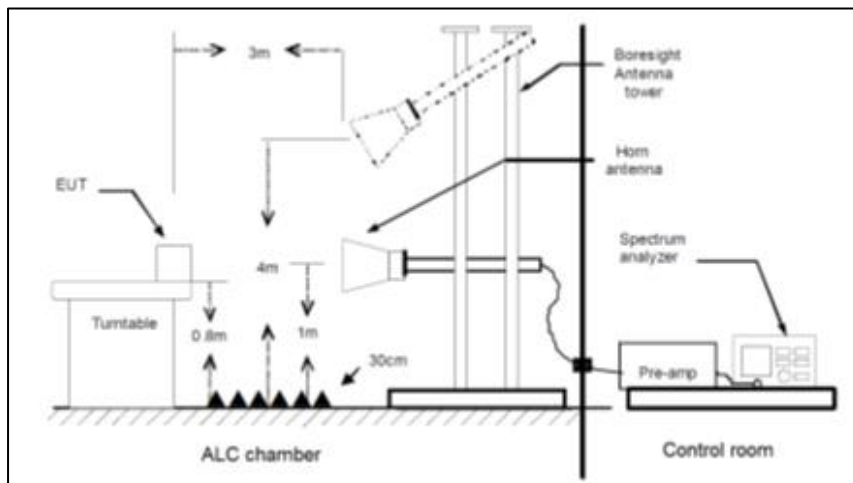


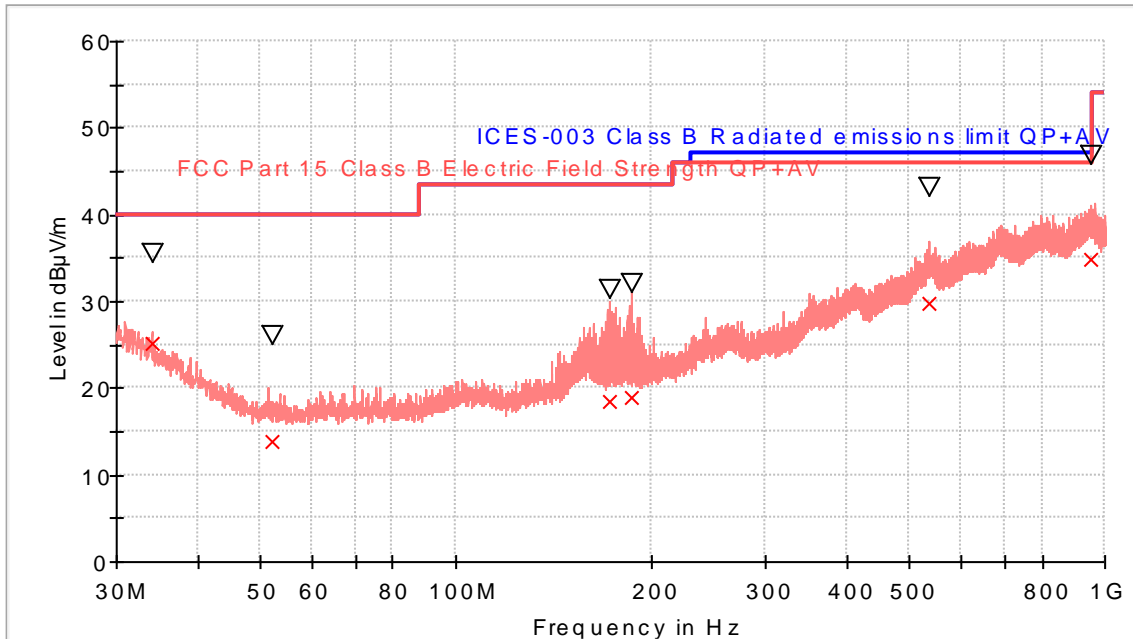
Fig A2: Generic setup for measurements from 1 to 18 GHz

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	OM#01
TEST RESULTS:	CRmmnxx: CR: Radiation Condition, mm: Sample number, nn: Operation mode, xx: Frequency Range

CRmmnxx	Description	Result
CR0101LR	Range: 30 - 1000 MHz Horizontal and Vertical Polarization	P
CR0101HR	Range: 1 - 18 GHz Horizontal and Vertical Polarization	P

TEST RESULTS (Cont.):

CR0101LR

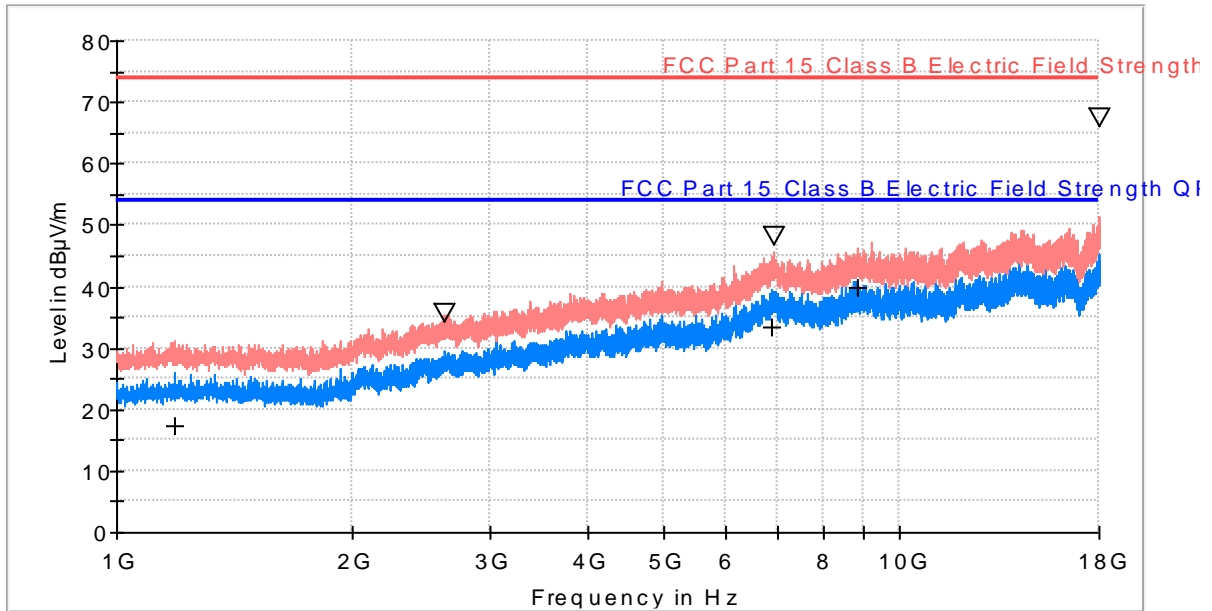


- Preview Result 1-PK+
- ICES-003 Class B Radiated emissions limit QP+AV
- FCC Part 15 Class B Electric Field Strength QP+AV
- x Final_Result QPK
- ▽ Final_Result PK+

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
34.057000	25.23	35.57	40.00	14.77	284.0	H	-11.0
51.975500	13.80	26.10	40.00	26.20	180.0	V	88.0
172.935500	18.57	31.46	43.50	24.93	114.0	V	-171.0
187.130500	19.01	32.16	43.50	24.49	100.0	V	-165.0
536.418000	29.88	43.05	46.00	16.12	128.0	H	9.0
952.319500	34.81	46.94	46.00	11.19	201.0	V	75.0

TEST RESULTS (Cont.):

CR0101HR



- Preview Result 2-AVG
- Preview Result 1-PK+
- FCC Part 15 Class B Electric Field Strength PK
- FCC Part 15 Class B Electric Field Strength QP+AV
- ▽ Final_Result PK+
- + Final_Result AVG

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
1184.900000	---	17.24	53.90	36.66	129.0	V	-123.0
2623.100000	35.71	---	73.90	38.19	176.0	H	108.0
6881.000000	---	33.30	53.90	20.60	136.0	V	-20.0
6895.700000	48.07	---	73.90	25.83	135.0	V	141.0
8836.900000	---	39.92	53.90	13.98	182.0	H	161.0
17988.500000	67.31	---	73.90	6.60	153.0	V	-56.0

A.2. CONTINUOUS CONDUCTED EMISSION ON POWER LEADS

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-20 Edition), Secs. 15.109 & ICES-003 Issue 7 – Update October (2020)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-20 Edition), Secs. 15.109 & ICES-003 Issue 7 – Update October (2020); ANSI C63.4 (2014)

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 (10-01-20 Edition), Secs. 15.109 & ICES Issue 7 (2020), in the frequency range 0,15 to 30 MHz, for Class B equipment was:

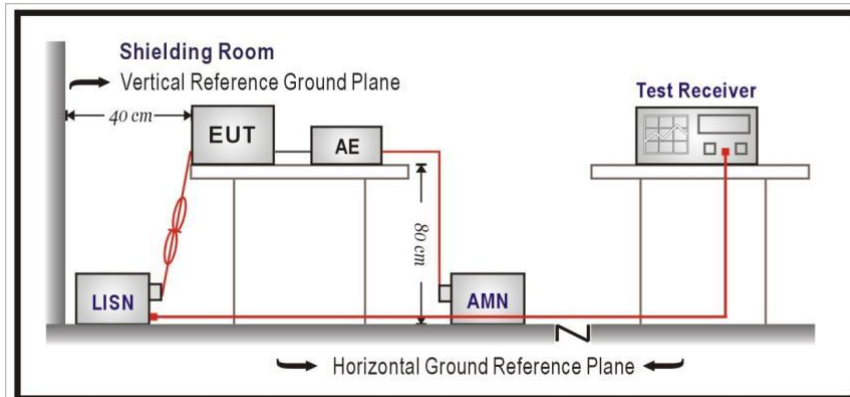
Frequency range (MHz)	Limit	
	Quasi-peak [dB(μV) ¹⁾	Average [dB(μV) ¹⁾
0,15 to 0,5	66-56 ²⁾	56-46 ²⁾
0,5 to 5	56	46
5 to 30	60	50

¹⁾ At the transition frequency, the lower limit applies.
²⁾ The limit decreases linearly with the logarithm of the frequency.

TEST SETUP

The EUT is placed on the test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rest of the EUT.

The EUT is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 ohms LISN port.

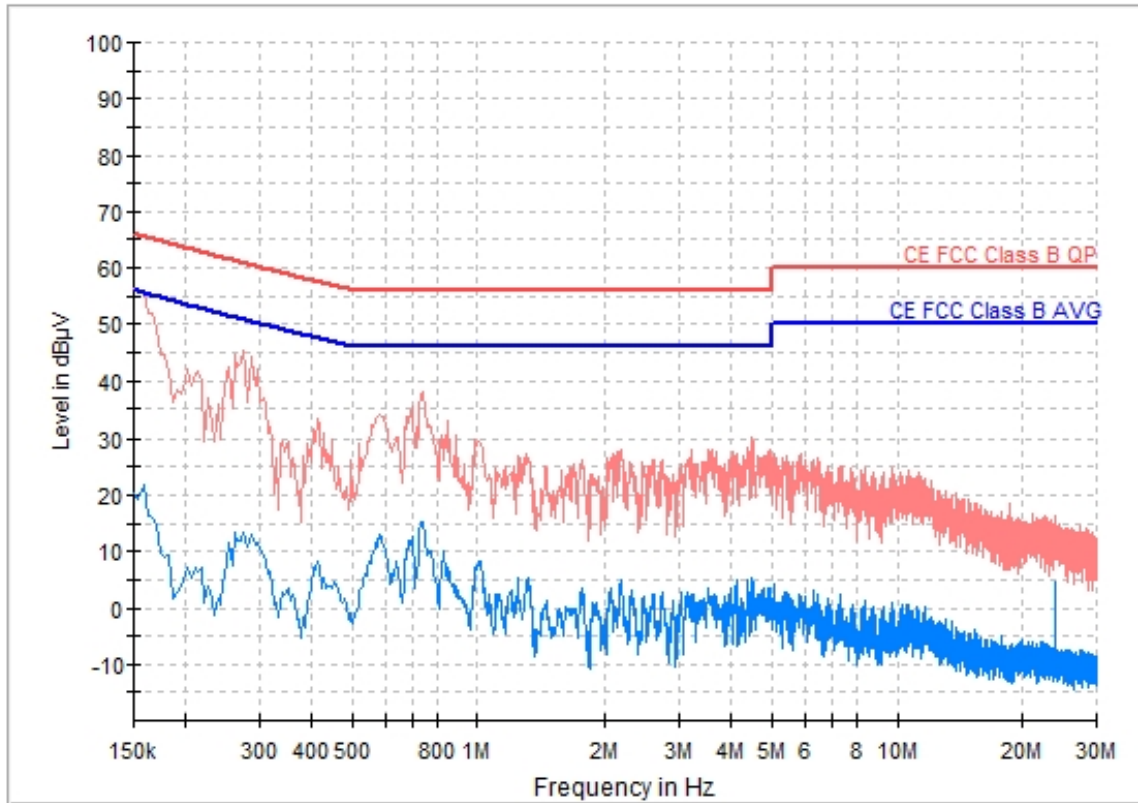


TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	OM#01
TEST RESULTS:	CCmmnnhh: CC: Conducted Condition, mm: Sample number, nn: Test condition mode, hh: wire

CRmmnnhh	DESCRIPTION	RESULT
CC0101L1	Phase wire noise.	P
CC0101N	Neutral wire noise.	P

TEST RESULTS (Cont.):

CC0101L1

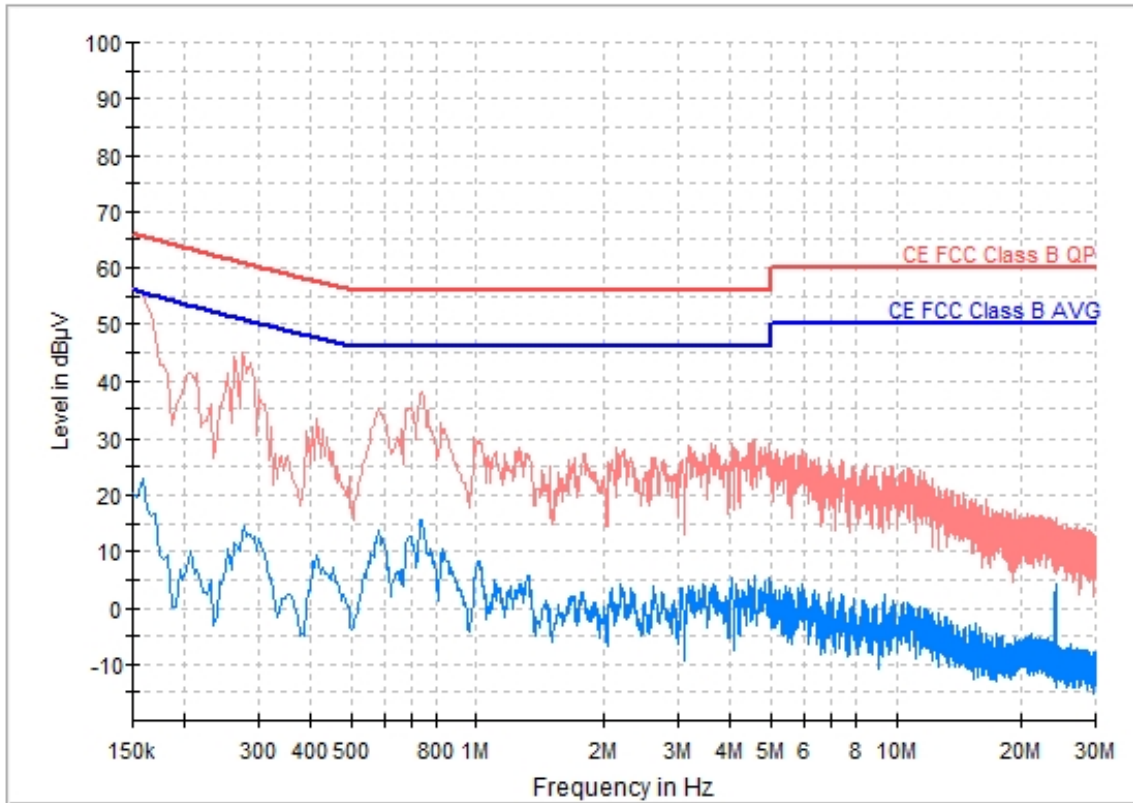


— AVG_CLRWR — PK+_CLRWR
— CE FCC Class B QP — CE FCC Class B AVG

Limit and Margin

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)	Line	Margin - AVG (dB)	Limit - AVG (dBµV)
0.254000	42.5	11.5	L1	39.9	51.4
0.430000	31.0	5.4	L1	41.8	47.1
0.734000	37.5	15.4	L1	30.6	46.0
1.246000	24.3	1.3	L1	44.7	46.0
2.118000	21.8	-1.4	L1	47.4	46.0
3.602000	24.9	-0.5	L1	46.5	46.0
6.118000	22.6	0.0	L1	50.0	50.0
10.394000	20.7	-5.8	L1	55.8	50.0
17.658000	14.5	-7.8	L1	57.8	50.0
24.006000	15.5	4.7	L1	45.3	50.0

TEST RESULTS (Cont.): **CC0101N**



— QPK_CLRWR — AVG_CLRWR — PK+_CLRWR
— CE FCC Class B QP — CE FCC Class B AVG

Limit and Margin

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)	Line	Margin - AVG (dB)	Limit - AVG (dBµV)
0.254000	41.3	10.6	N	40.7	51.4
0.430000	30.6	7.1	N	40.1	47.1
0.734000	37.5	15.6	N	30.4	46.0
1.246000	27.2	1.7	N	44.3	46.0
2.118000	21.8	-3.2	N	49.2	46.0
3.602000	26.6	3.0	N	43.0	46.0
6.118000	23.3	-1.3	N	51.3	50.0
10.394000	23.2	-1.1	N	51.1	50.0
17.658000	11.3	-9.8	N	59.8	50.0
24.026000	14.2	4.1	N	45.9	50.0