DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29 507 456

DEKRA

ilac-MRA ENAC ENSAYOS Nº 51/LE147

The standard marked with [#] is not covered by ENAC accreditation.

Test report No:
NIE: 62807REM.003

Test report

FCC Rules and Regulations CFR 47, Part 18.305, Subpart C (10-1-19 Edition) & [#] ISED RSS-216 Issue 2 and ICES001

(*) Identification of item tested	Wireless Charger Module (WCM)
(*) Trademark	Harman
(*) Model and /or type reference	VW WLC
Other identification of the product	HW Version: 02.00 SW Version: 00.10.05
(*) Features	No additional features except smartphone charging and Foreign Object detection
Manufacturer	Harman International Industries, Inc. 30001 Cabot Drive. 48377 Novi, Michigan. USA
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 18.305, Subpart C (10-1-19 Edition) & [#] ISED RSS-216 Issue 2 and ICES001
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López EMC Consumer & RF Lab. Manager RAFAEL LÓPEZ MARTÍN 2020.08.13 12:57:43 +02'00'
Date of issue	2020-08-13
Report template No	FDT08_22 (*) "Data provided by the client"

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Competences and guarantees

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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 radio disturbance characteristics of EUT from 150kHz to 30 MHz is I = ±5,08 dB for quasi-peak measurements, I = ± 5,00 dB for peak measurements (k = 2)

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested"

2. The sample of VW WLC model is a wireless charger which is a device that enables charging the battery of a smartphone or any other device that is Qi compliant using magnetic induction up to the power of 10W.

DEKRA Testing and Certification S.A.U. 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, is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
62807F/002	Wireless Charger Module (WCM)	VW WLC	VWZGZ1W3500680	2020-06-16

Auxiliary elements used with the sample S/01:

Control Nº	Description	Model	Serial Nº	Date of reception
62807F/006	Receiver for 99%	---	---	2020-06-16
62807F/010	DC power cable	---	---	2020-06-16

Test sample description

Ports:	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)		
	N/A		☐	☐	☐		
			☐	☐	☐		
Supplementary information to the ports…… :							
Rated power supply 9V to 16V	Voltage and Frequency			Reference poles			
				L1	L2	L3	N	PE
	☐	AC:		☐	☐	☐	☐	☐
	☒	DC: 9V to 16V						
Rated Power .....:	10W						
Clock frequencies.....:	127kHz						
Other parameters .....:	--						
Software version .....:	00.10.05						
Hardware version .....:	02.00						
Dimensions in cm (W x H x D) ....:	146 X 88 X 20						
Mounting position .....:	☒	Tabletop equipment					

	☐	Wall/Ceiling mounted equipment		
	☐	Floor standing equipment		
	☐	Hand-held equipment		
	☐	Other:		
Modules/parts.....:	Module/parts of test item		Type	Manufacturer
	Wireless charger		Up to 10W	Harman Brazil
Accessories (not part of the test item) .....:	Description		Type	Manufacturer
	Receiver for 1%.		Wireless Charger receivers	Harman
	Receiver for 50%.		Wireless Charger receivers	Harman
	Receiver for 99%.		Wireless Charger receivers	Harman
	Wiring Harness			Harman
	Load Boxes if required			Harman
Documents as provided by the applicant.....:	Description		File name	Issue date

Identification of the client

Harman International Industries, Inc.
30001 Cabot Drive. 48377 Novi,
Michigan. USA

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-06-23
Date (finish)	2020-06-23

Document history

Report number	Date	Description
62807REM.003	2020-08-13	First release

List of equipment used during the test

Control Number	Description	Model	Manufacturer	Next Calibration
0242	ACTIVE LOOP ANTENNA 9 KHZ-30 MHz	11966A	HEWLETT PACKARD	2020-06-05
2942	EMI TEST RECEIVER 20Hz-40GHz	ESU40	ROHDE AND SCHWARZ	2021-09-17
6064	SEMIANECHOIC ABSORBER LINED CHAMBER	SAC-3	Frankonia	---
6126	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2021-04-17
6132	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2021-04-20
6329	SHIELDED ROOM		FRANKONIA	---

Environmental conditions

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

Temperature	Min. = 15 ºC Max. = 35 ºC
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 ºC Max. = 35 ºC
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 ºC Max. = 35 ºC
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: Daniel Mejías & Antonio Ruiz.

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 9kHz-30MHz	P	(1)
Continuous conducted emission	N/A	(2)

Supplymentary information and remarks:

(1) 127 kHz carrier frequency is intentional designed charging frequency and results are declared PASS by considering this frequency as well

(2) Equipment powered in DC.

Appendix A: Test results

Appendix A Content

DESCRIPTION OF THE OPERATION MODES

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. Wireless charging mode (receiver to 99%). (worst case) Power supply: 12 Vdc.

RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE 9kHz-30MHz

LIMITS:	Product standard:	FCC CFR 47, Part 18, Subpart C (10-1-17 Edition), Sec. 18.305 & [#] ISED RSS-216 Issue 2 and ICES001
	Test standard:	FCC CFR 47, Part 18, Subpart C (10-1-17 Edition), Sec. 18.305 & [#] ISED RSS-216 Issue 2 and ICES001

Limit for FCC Part 18.305

FREQUENCY RANGE	**MEASURED FIELD LIMIT TO 3m (15uV-m 300m)** **Operating frequency=Any non-ISM frequency (below 500W).** **PEAK MEASUREMENT**
9 kHz to 30MHz	63.52 dBuV/m

§18.309 Frequency range of measurements.

(a) For field strength measurements:

Frequency band in which device operates (MHz)	**Range of frequency measurements**	
	Lowest frequency	**Highest frequency**
Below 1.705	Lowest frequency generated in the device, but not lower than 9 kHz	30 MHz.
1.705 to 30	Lowest frequency generated in the device, but not lower than 9 kHz	400 MHz.
30 to 500	Lowest frequency generated in the device or 25 MHz, whichever is lower	Tenth harmonic or 1,000 MHz, whichever is higher.
500 to 1,000	Lowest frequency generated in the device or 100 MHz, whichever is lower	Tenth harmonic.
Above 1,000	.....do	Tenth harmonic or highest detectable emission.

(b) For conducted powerline measurements, the frequency range over which the limits are specified will be scanned.

Limits for ISED RSS-216 Issue 2 and ICES001

EN 55011 (2016) / A1 (2017) Group 2 Class B

Frequency range (MHz)	**Measured field limit at 10 m (dBμV/m) Quasi-Peak measurement**	**Measured field limit at 3 m (dBμA/m) Quasi-Peak measurement**
0,15 to 30	-	39 to 3 *
30 to 80,872	30	-
80,872 to 81,848	50	-
81,848 to 134,786	30	-
134,786 to 136,414	50	-
136,414 to 230	30	-
230 to 1000	37	-

(*) Decreasing linearly with the logarithm of frequency

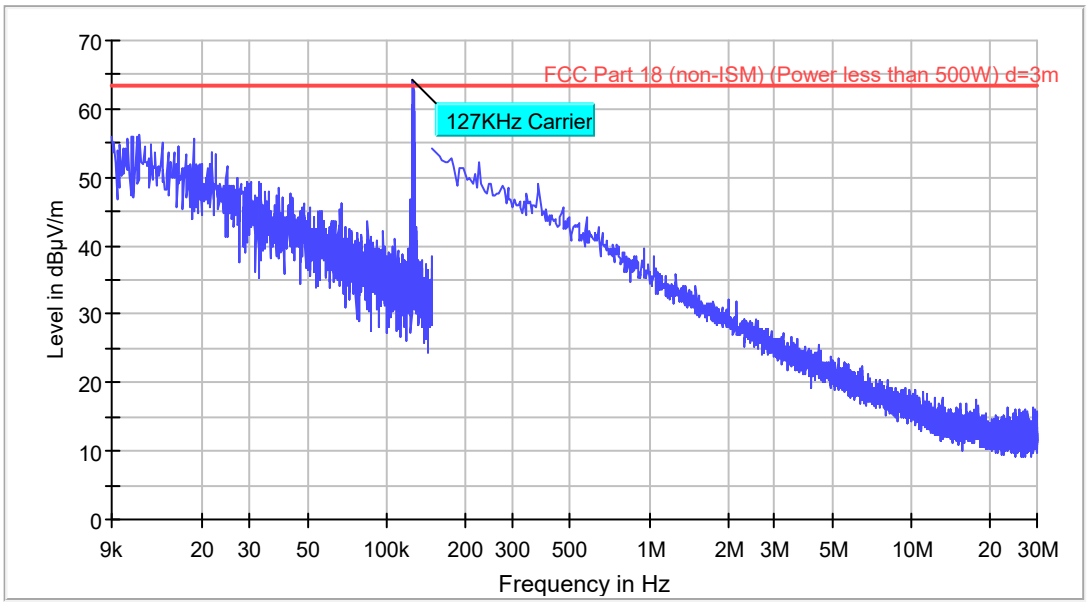
TESTED SAMPLE:	S/01
TESTED OPERATION MODES:	OM#01
TEST RESULTS:	CRmmnnRRPP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; OO: Orientation.

CRmmnnRRPP	Description	Result
CR0101LR1_OX	Range: 9 KHz - 30 MHz. Orientation X (FCC 18.305 limits)	P
CR0101LR1_OY	Range: 9 KHz - 30 MHz. Orientation Y (FCC 18.305 limits)	P
CR0101LR1_OZ	Range: 9 KHz - 30 MHz. Orientation Z (FCC 18.305 limits)	P
CR0101LR2_OX	Range: 9 KHz - 30 MHz. Orientation X (ISED RSS-216 Issue 2 & ICES001 limits)	P
CR0101LR2_OY	Range: 9 KHz - 30 MHz. Orientation Y (ISED RSS-216 Issue 2 & ICES001 limits)	P
CR0101LR2_OZ	Range: 9 KHz - 30 MHz. Orientation Z (ISED RSS-216 Issue 2 & ICES001 limits)	P
CR0101LR	Range: 30 MHz.-1000MHz (ISED RSS-216 Issue 2 & ICES001 limits)	P

Radiated Emission. CR0101LR1_OX

Project:	62807REM.003
Company:	Harman International Industries, Inc.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Wireless charging mode (receiver to 99%). Power supply: 12 Vdc. X axis

FCC Part 18 9 kHz - 30 MHz



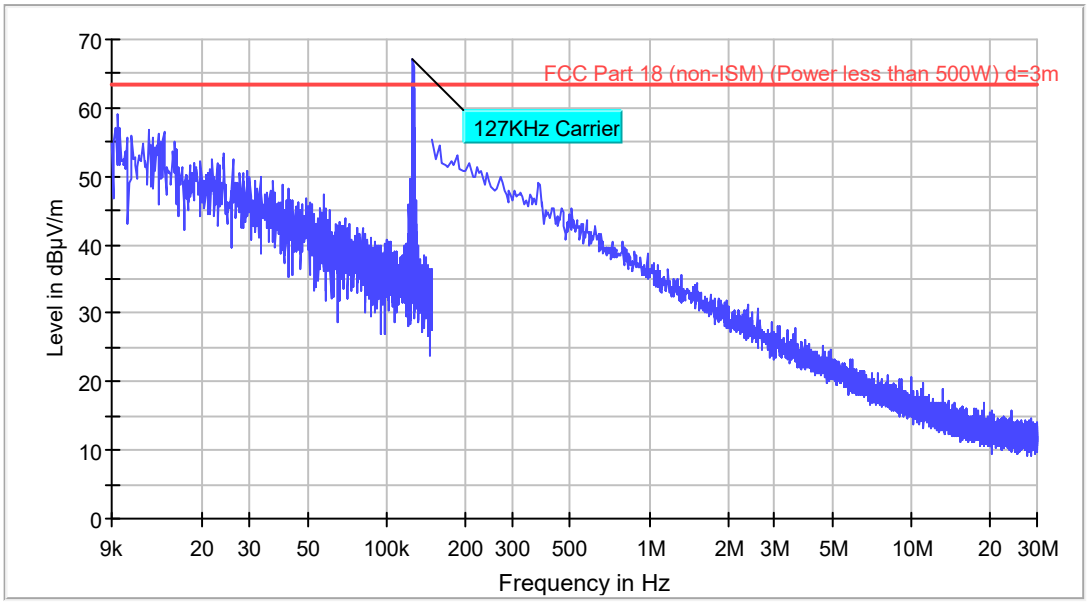
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)
0.126500	64.4
3.228000	27.3
6.477000	22.3
9.451500	19.1
13.218000	17.7
17.646000	17.4
19.135500	15.4
23.181000	16.3
26.974500	16.1
28.842000	16.3

Radiated Emission. CR0101LR1_OY

Project:	62807REM.003
Company:	Harman International Industries, Inc.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Wireless charging mode (receiver to 99%). Power supply: 12 Vdc. Y axis

FCC Part 18 9 kHz - 30 MHz



PK+_CLRWR — FCC Part 18 (non-ISM) (Power less than 500W) d=3m

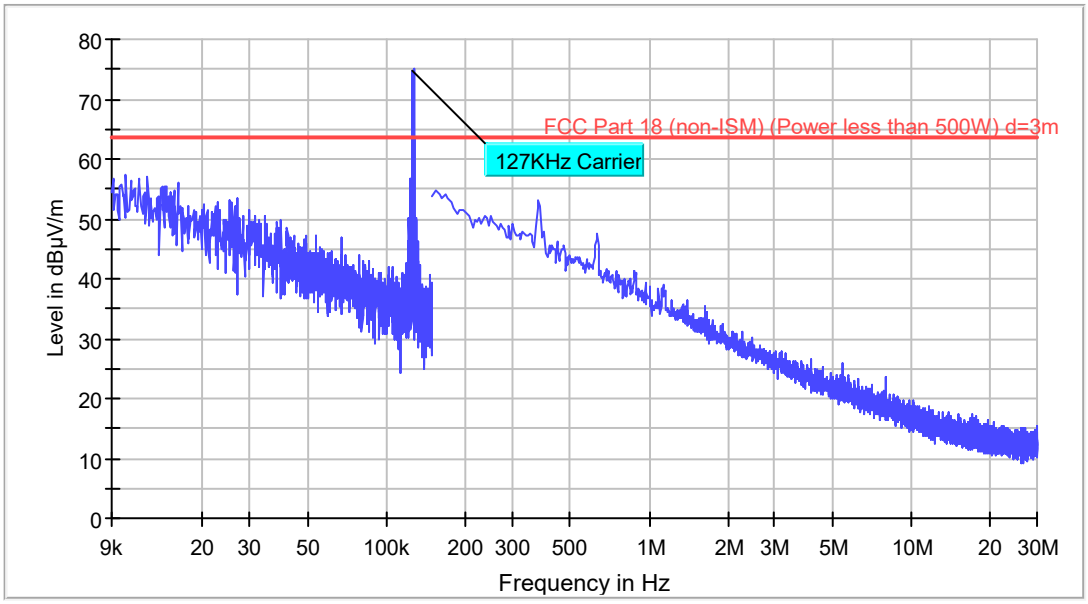
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)
0.126500	67.2
3.079500	28.2
6.063000	21.8
10.014000	20.8
13.065000	18.8
15.616500	16.4
18.735000	16.9
22.227000	14.8
24.081000	15.7
28.698000	14.6

Radiated Emission. CR0101LR1_OZ

Project:	62807REM.003
Company:	Harman International Industries, Inc.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Wireless charging mode (receiver to 99%). Power supply: 12 Vdc. Z axis

FCC Part 18 9 kHz - 30 MHz



PK+_CLRWR — FCC Part 18 (non-ISM) (Power less than 500W) d=3m

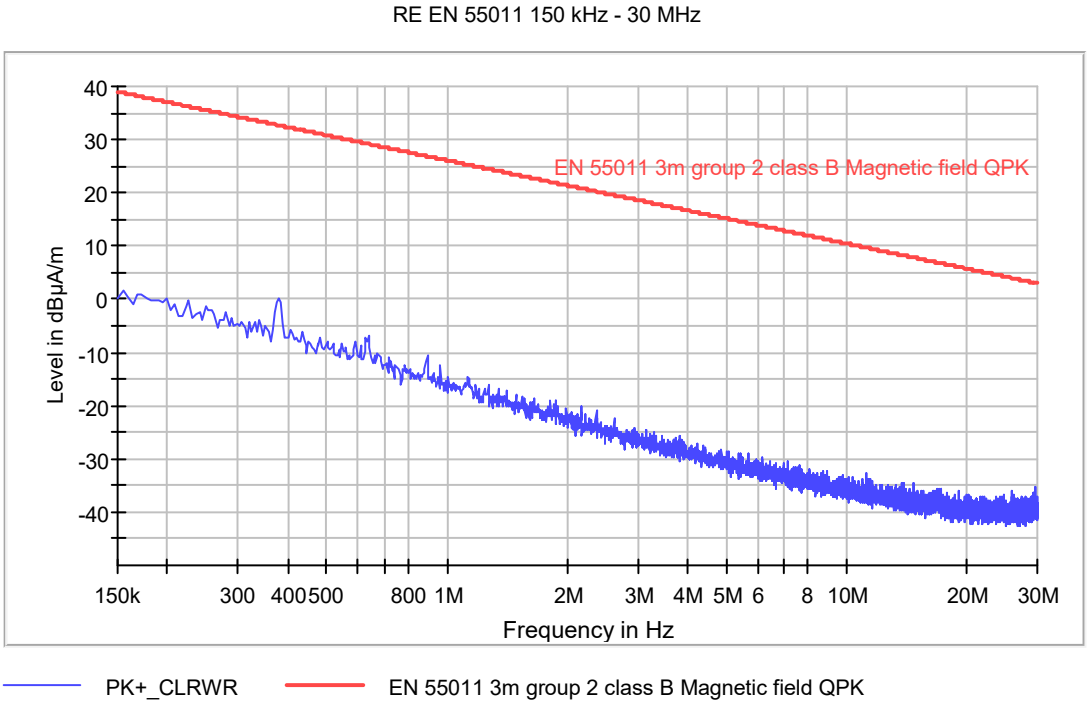
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)
0.127400	75.0
3.183000	27.8
7.926000	23.6
9.739500	19.7
12.750000	17.8
16.863000	17.5
19.405500	16.4
22.375500	15.4
26.052000	15.0
29.814000	15.3

Radiated Emission. CR0101LR2_OX

Project:	62807REM.003
Company:	Harman International Industries, Inc.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Wireless charging mode (receiver to 99%). Power supply: 12 Vdc. X axis

RE CISPR11 9 kHz - 30 MHz



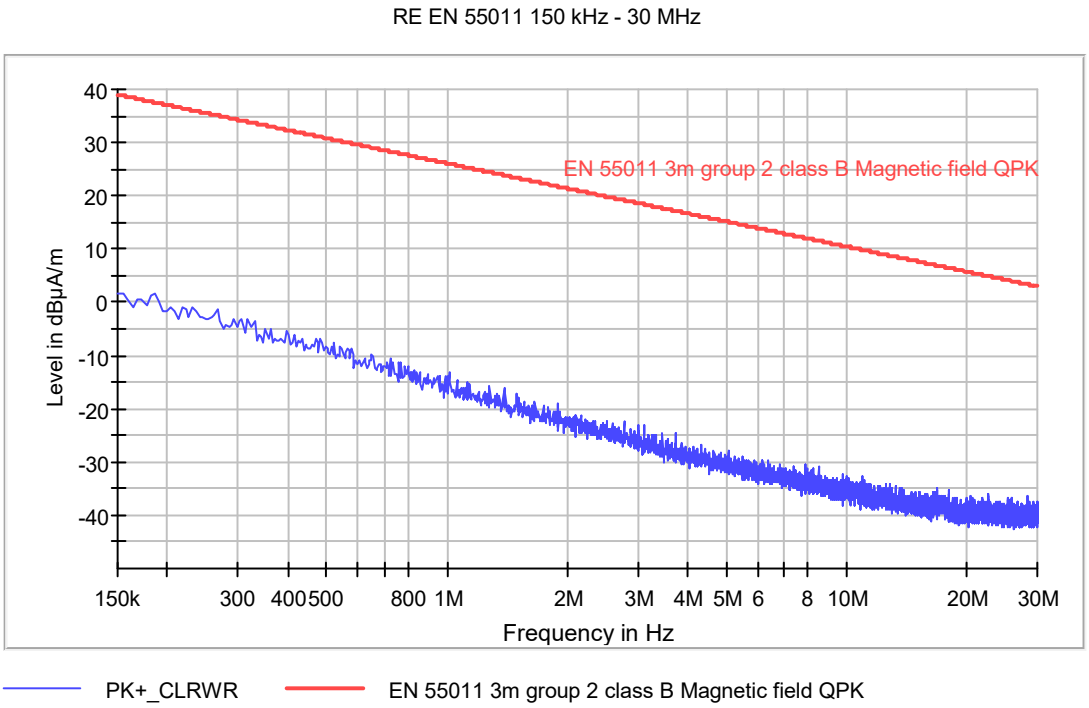
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµA/m)
0.154500	1.8
3.156000	-24.7
6.121500	-29.7
11.170500	-32.7
13.785000	-34.6
17.137500	-35.4
19.068000	-36.0
23.752500	-36.9
25.885500	-35.9
29.773500	-35.3

Radiated Emission. CR0101LR2_OY

Project:	62807REM.003
Company:	Harman International Industries, Inc.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Wireless charging mode (receiver to 99%). Power supply: 12 Vdc. Y axis

RE CISPR11 9 kHz - 30 MHz



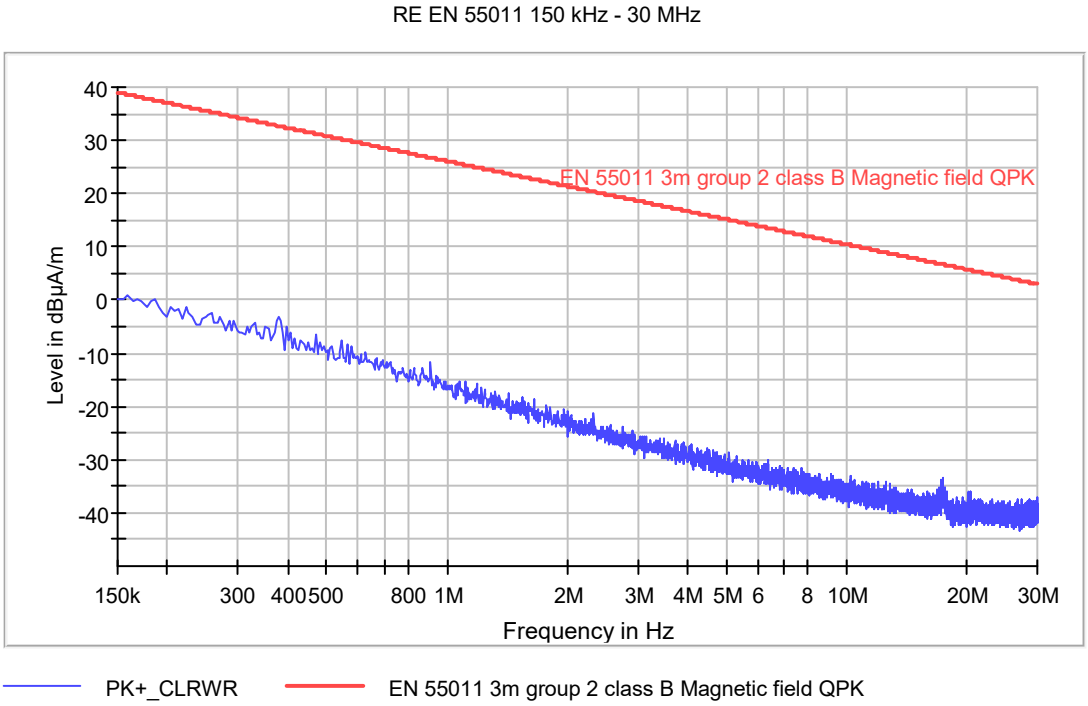
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµA/m)
0.150000	1.7
3.471000	-24.6
6.175500	-29.6
9.757500	-32.3
12.565500	-34.3
16.912500	-35.0
18.073500	-36.1
22.609500	-36.1
25.836000	-36.8
28.464000	-36.3

Radiated Emission. CR0101LR2_OZ

Project:	62807REM.003
Company:	Harman International Industries, Inc.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Wireless charging mode (receiver to 99%). Power supply: 12 Vdc. Z axis

RE CISPR11 9 kHz - 30 MHz



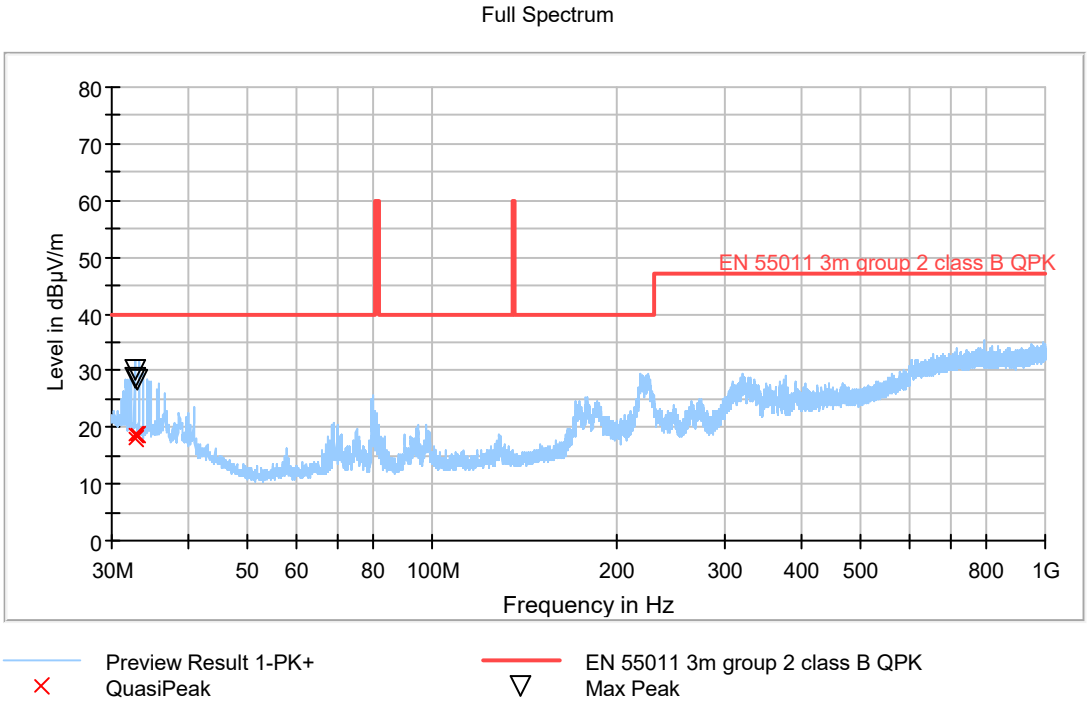
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµA/m)
0.159000	0.9
3.160500	-25.7
6.382500	-30.2
9.177000	-32.6
12.507000	-34.1
17.380500	-33.3
20.071500	-36.1
21.624000	-37.4
26.898000	-37.4
29.881500	-37.2

Radiated Emission. CR0101LR

Project:	62807REM.003
Company:	Harman International Industries, Inc.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Wireless charging mode (receiver to 99%). Power supply: 12 Vdc.

RE CISPR11 30-1000MHz



Maximizations

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Height (cm)	Pol	Azimuth (deg)
32.693000	17.98	28.59	121.0	V	118.0
32.874000	18.81	30.00	107.0	V	-30.0
33.097000	18.59	28.46	121.0	V	-88.0