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

ENAC ENSAYOS Nº 51/LE147

Test report No:
NIE: 63330REM.002

Test report

FCC Rules and Regulations CFR 47, Part 15, Subpart B (May 17, 2019 Edition) & ICES-003 Issue 6 (Updated 04-2019) & FCC Rules and Regulations CFR 47, Part 18, Subpart B (June 13, 2019 Edition) / RSS-216 Issue (January 20, 2016)

Identification of item tested	Wireless charger
Trademark	Delta
Model and /or type reference	WPU 1000W 1AC US WSU 1000W 24V, WSU 1000W 48V
Other identification of the product	Hw version: P2.5 Sw version: 4.0 / 5.0 / 4.0 FCC ID for WPU: 2AVWKWPU1000W1ACUS FCC ID for WSU: 2AVWKWSU1000W
Features	Support 802.15.4 @ 2.4GHz RF transceiver
Manufacturer	DELTA ENERGY SYSTEMS (GERMANY) GMBH Tscheulinstrasse 21 79331 Teningen Germany
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (May 17, 2019 Edition) & ICES-003 Issue 6 (Updated 04-2019) & FCC Rules and Regulations CFR 47, Part 18, Subpart B (June 13, 2019 Edition) / RSS-216 Issue (January 20, 2016)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Industrial & Automotive EMC Lab Manager JOSE MANUEL GÓMEZ GALVÁN Firmado digitalmente por JOSE MANUEL GÓMEZ GALVÁN Fecha: 2020.05.12 18:56:57 +02'00'
Date of issue	2020-03-26
Report template No	FDT08_22 (*) "Data provided by the client"

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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 conducted disturbance characteristics of EUT from 150 kHz to 30 MHz is I = ± 3,9 dB for quasi-peak measurements, I = ± 3,2 dB for peak 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 = ± 4,9 dB for quasi-peak measurements, I = ± 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 = ± 2,6 dB for peaks and average measurements (k = 2)

Data provided by the client

The following data has been provided by the client:

Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested" and "Derived model not tested"):

WPU 1000W 1AC US + WSU 1000W 24V

WPU 1000W 1AC US + WSU 1000W 48V

Wireless charger including a primary side (transmitter) and a secondary side (receiver). Primary side includes Wall-Box and Base-Pad, and a cable between them. Normally primary side is installed on the infrastructure, such as wall or ground. Secondary side includes On-Board-Pad and On-Board-Electronics, and a cable between them. Normally secondary side is installed on moving devices like AGVs

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 (48V sample) is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
63330/02	Power supply 48V	EOE14010803	EOE140108031943000126P2.5	2020-01-20
63330/03	Power supply	EOE14010738	EOE140107381943000379P2.5	2020-01-20
63330/04	Wireless charger	WPU 1000W 1AC US	-	2020-01-20
63330/05	Wireless charger	WSU 1000W 48V	-	2020-01-20

Sample S/02 (24V sample) is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
63330/16	Power supply 24V	EOE14010740	EOE140107401943000289P2.5	2020-01-20
63330/17	Wireless charger	-	-	2020-01-20
63330/18	Power supply	EOE14010738	EOE140107381943000405P2.5	2020-01-20
63330/19	Wireless charger	-	-	2020-01-20

Auxiliary elements used with sample S/01 and sample S/02:

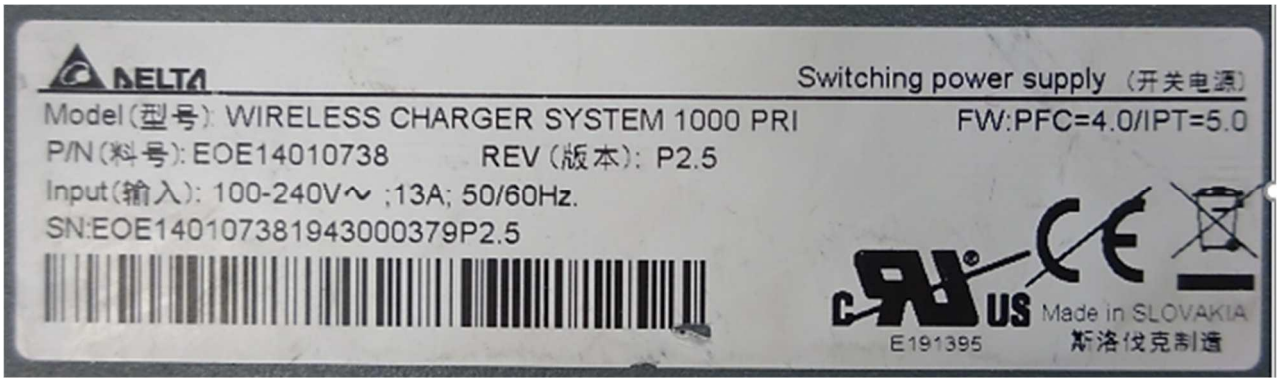
Control Nº	Description	Model	Serial Nº	Date of reception
63330/01	Wooden test rack	-	-	2020-01-20
63330/20	Load 1KW 24V – 48V	JOVYLOAD CM13.20	-	2020-01-20

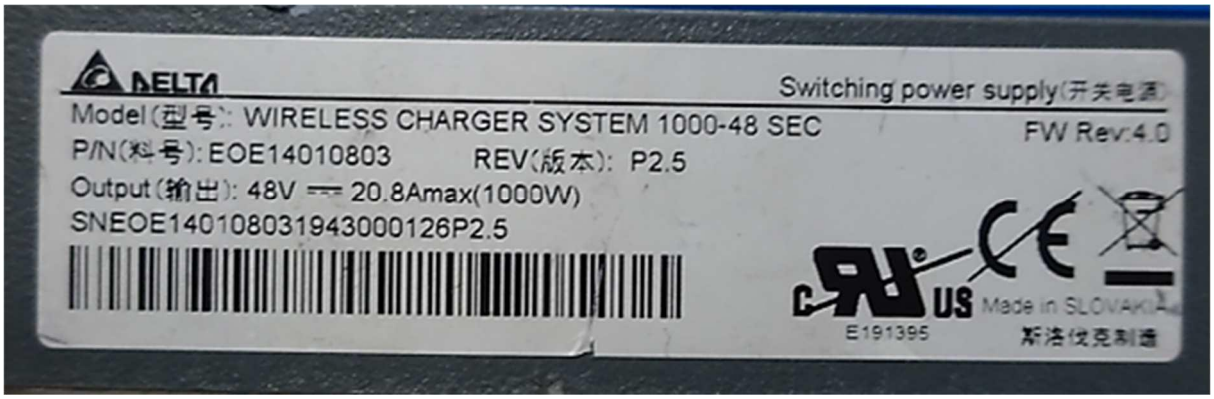
Test sample description

Ports..... :	Port name and description	Cable				
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)	
	AC input	1m	☒	☐	☐	
	Power output	0.5m	☒	☐	☐	
	Signal interface for CAN-Bus	0.5m	☒	☐	☐	
	Signal inputs for Ext_Enable function and Sleep mode functio.	0.5m	☒	☐	☐	
	Temperature sensor	0.5m	☒	☐	☐	
Supplementary information to the ports..... :	Not provided data					
Rated power supply .....:	Voltage and Frequency		Reference poles			
			L1	L2	L3	N	PE
	☒ AC: 100...240V		☒	☐	☐	☒	☒
Rated Power .....:	1000W					
Clock frequencies .....:	160…300kHz, 2.4GHz bands.					
Other parameters.....:	Not provided data					
Software version .....:	4.0 / 5.0 / 4.0					
Hardware version.....:	P2.5					
Dimensions in cm (W x H x D)....:	Primary: 28 * 19.2 * 6 + 16 (diameter) * 1.9 Secondary: 16 * 8.2 * 2.8 + 16 (diameter) * 1.9					
Mounting position.....:	☐	Table top equipment				
	☒	Wall/Ceiling mounted equipment				
	☐	Floor standing equipment				
	☐	Hand-held equipment				
	☒	Other: Primary side can be mounted vertically on the wall, or horizontally on the ground/ceiling, correspondingly, the secondary side can be mounted vertically on the side of a vehicle, or horizontally on the bottom/top of a vehicle.				
Modules/parts .....:	Module/parts of test item		Type		Manufacturer	
	Primary side		WPU 1000W 1AC US		DELTA ENERGY SYSTEMS (GERMANY) GMBH	
	Secondary side		WSU 1000W 24V, or WSU 1000W 48V		DELTA ENERGY SYSTEMS (GERMANY) GMBH	
Accessories (not part of the test item) .....:	Description		Type		Manufacturer	
	Not provided data					
Documents as provided by the applicant.....:	Description		File name		Issue date	
	User manual		1kW Wireless Charger User Manual P2.3 RevD.2 22_Jan_2020		Jan 22nd, 2020	

Copy of marking plate:

S/01:





S/02:

Identification of the client

DELTA ENERGY SYSTEMS (GERMANY) GMBH
Tscheulinstrasse 21
79331 Teningen
Germany

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-01-22
Date (finish)	2020-02-10

Document history

Report number	Date	Description
63330REM.002	2020-03-25	First release

List of equipment used during the test

Control Number	Description	Model	Manufacturer	Next Calibration
2942	EMI TEST RECEIVER 20Hz-40GHz	ESU40	ROHDE AND SCHWARZ	17/09/2021
6129	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	03/04/2020
6196	PRE-AMPLIFIER G>55dB 1-18GHz	AMF-7D-01001800-22-10P	NARDA	17/12/2020
6205	THREE-PHASE ARTIFICIAL NETWORK 32A	PMM L3-32	NARDA	26/09/2020
6498	ACTIVE LOOP ANTENNA 9kHz-30MHz	FMZB 1519B	SCHWARZBECK	03/01/2021
6607	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	03/04/2020
6666	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	05/02/2022
6815	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	01/02/2022
7006	HORN ANTENNA 1-18GHz	BBHA 9120D	SCHWARZBECK MESS-ELEKTRONIK	15/05/2021
7615	SHIELDED ROOM	S101	ETS LINDGREN	---

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: Victoria Olmedo & David Rubio.

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 30MHz-26GHz	P	---
Radiated emission. Electromagnetic field measure 9kHz-30MHz	P	---
Continuous conducted emission (150 KHz – 30 MHz)	P	---
Supplymentary information and remarks: N/A		

Appendix A: Test results

Appendix A content

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. Wireless charging OFF, 2.4 GHz Propietary radio idle mode. Power supply: 115Vac.
OM#02	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 24Vdc. (Worst case)
OM#03	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 48Vdc. (Worst case)

CONTINUOUS CONDUCTED EMISSION

LIMITS:	Product standard:	FCC Rules and Regulations CFR 47, Part 15, Subpart B (May 17, 2019 Edition) & ICES-003 Issue 6 (Updated 04-2019) & FCC Rules and Regulations CFR 47, Part 18, Subpart B (June 13, 2019 Edition) / RSS-216 Issue (January 20, 2016)
	Test standard:	FCC Rules and Regulations CFR 47, Part 15, Subpart B (May 17, 2019 Edition) & ICES-003 Issue 6 (Updated 04-2019) & FCC Rules and Regulations CFR 47, Part 18, Subpart B (June 13, 2019 Edition) / RSS-216 Issue (January 20, 2016)

CLASS A

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 A equipment was:

Frequency range	**Limit (dBµV)**	
(MHz)	**Quasi-peak**	**Average**
0,15 to 0,5	79	66
0,5 to 5	73	60

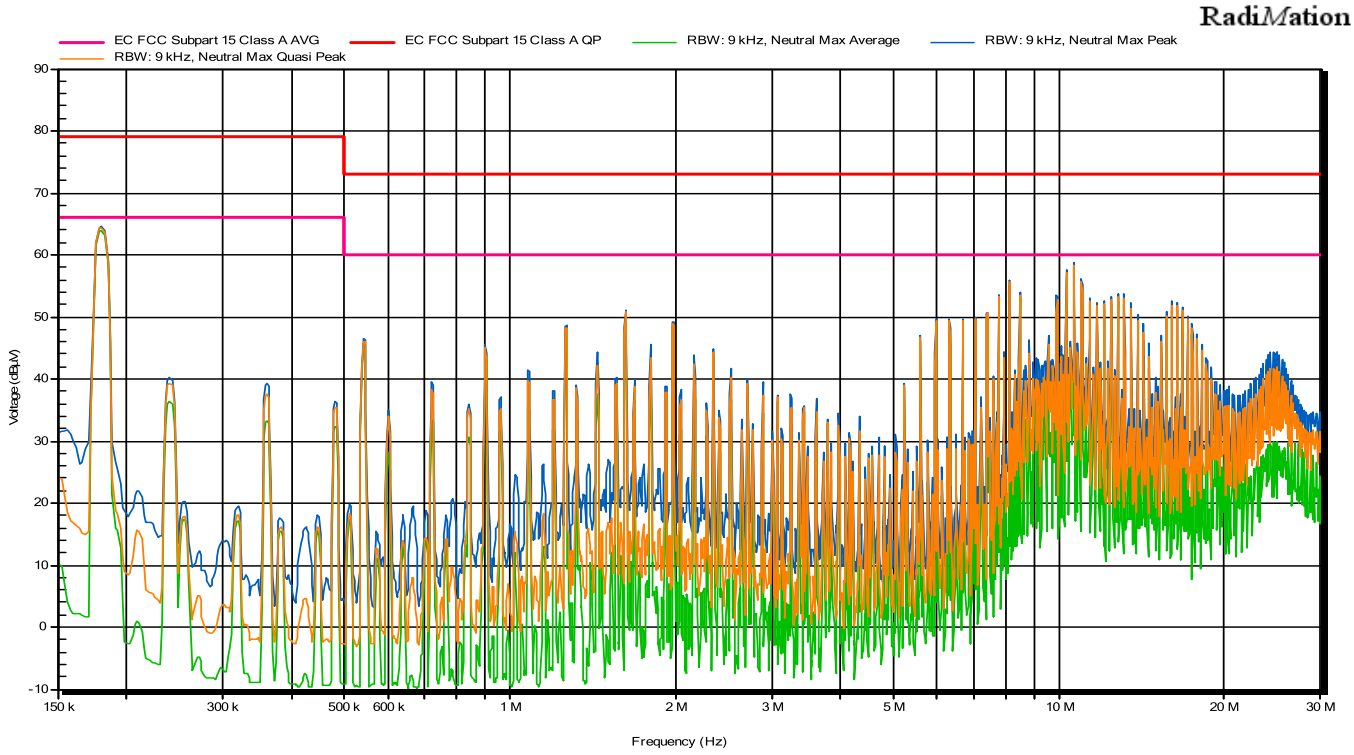
TESTED SAMPLES:	S/01 & S/02
TESTED OPERATION MODES:	OM#02 & OM#03
TEST RESULTS:	CCmmnnhh_SS: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

CCmmnnhh	**DESCRIPTION**	**RESULT**
CC01030N	Range 150kHz – 30MHz. AC port. Neutral wire noise.	P
CC0103L1	Range 150kHz – 30MHz. AC port. Phase wire noise.	P
CC02020N	Range 150kHz – 30MHz. AC port. Neutral wire noise.	P
CC0202L1	Range 150kHz – 30MHz. AC port. Phase wire noise.	P

Continuous Conducted Emission: CC01030N

Project:	63330REM.002
Company:	DELTA
Sample:	S/01
Operation mode:	OM#03
Description:	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 48Vdc. Neutral wire noise.

Full Spectrum



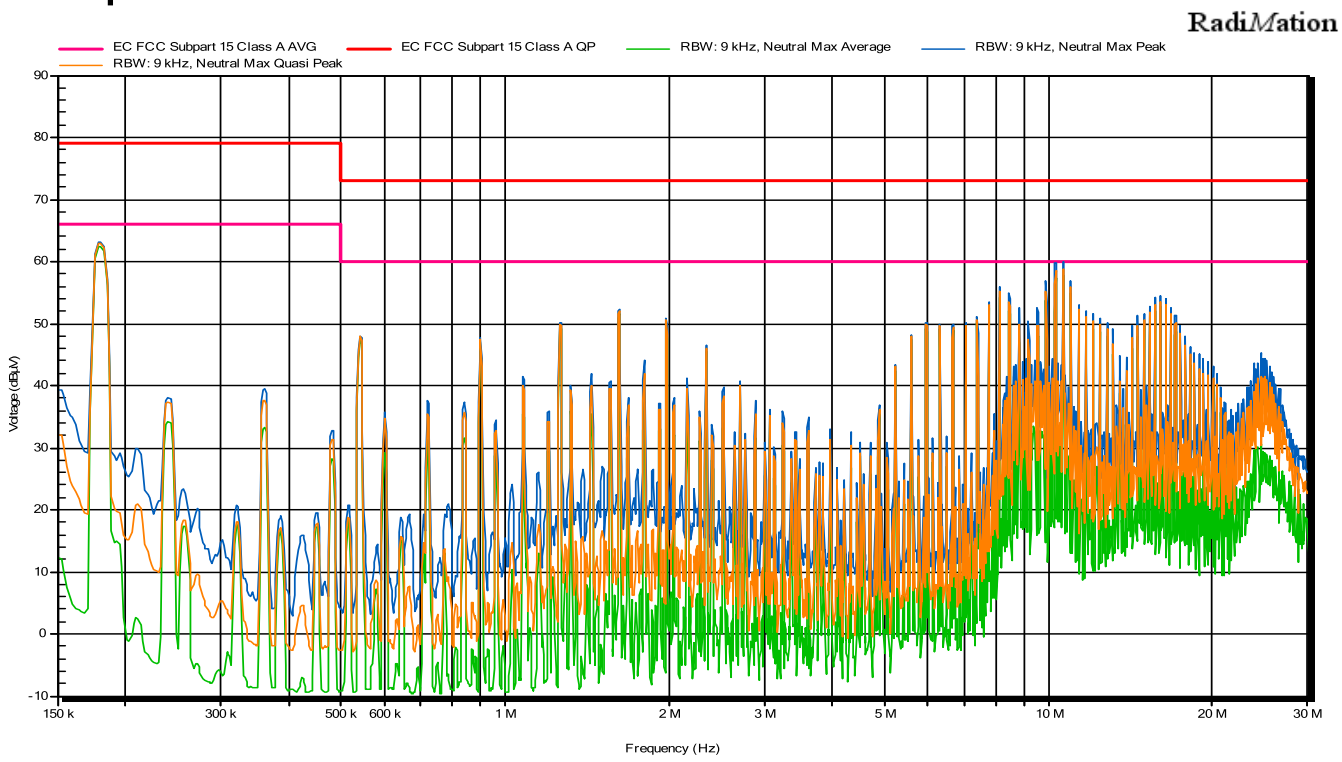
Subrange Maxima

Peak Number	Frequency	Peak	Average	Quasi-Peak
1	180,67 kHz	64,5 dBµV	63,9 dBµV	64,4 dBµV
2	1,622 MHz	51 dBµV	50,2 dBµV	50,8 dBµV
3	8,11 MHz	55,9 dBµV	55 dBµV	55,6 dBµV
4	8,47 MHz	54 dBµV	52,7 dBµV	53,4 dBµV
5	10,273 MHz	57,5 dBµV	56,5 dBµV	57,1 dBµV
6	10,633 MHz	58,7 dBµV	57,4 dBµV	58,2 dBµV
7	12,798 MHz	53,8 dBµV	52,5 dBµV	53,4 dBµV
8	13,158 MHz	53,5 dBµV	52,1 dBµV	52,9 dBµV
9	15,681 MHz	50,8 dBµV	49,6 dBµV	50,2 dBµV
10	16,041 MHz	52,5 dBµV	51,1 dBµV	51,9 dBµV

Continuous Conducted Emission. CC0103L1

Project:	63330REM.002
Company:	DELTA
Sample:	S/01
Operation mode:	OM#03
Description:	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 48Vdc. Phase wire noise.

Full Spectrum



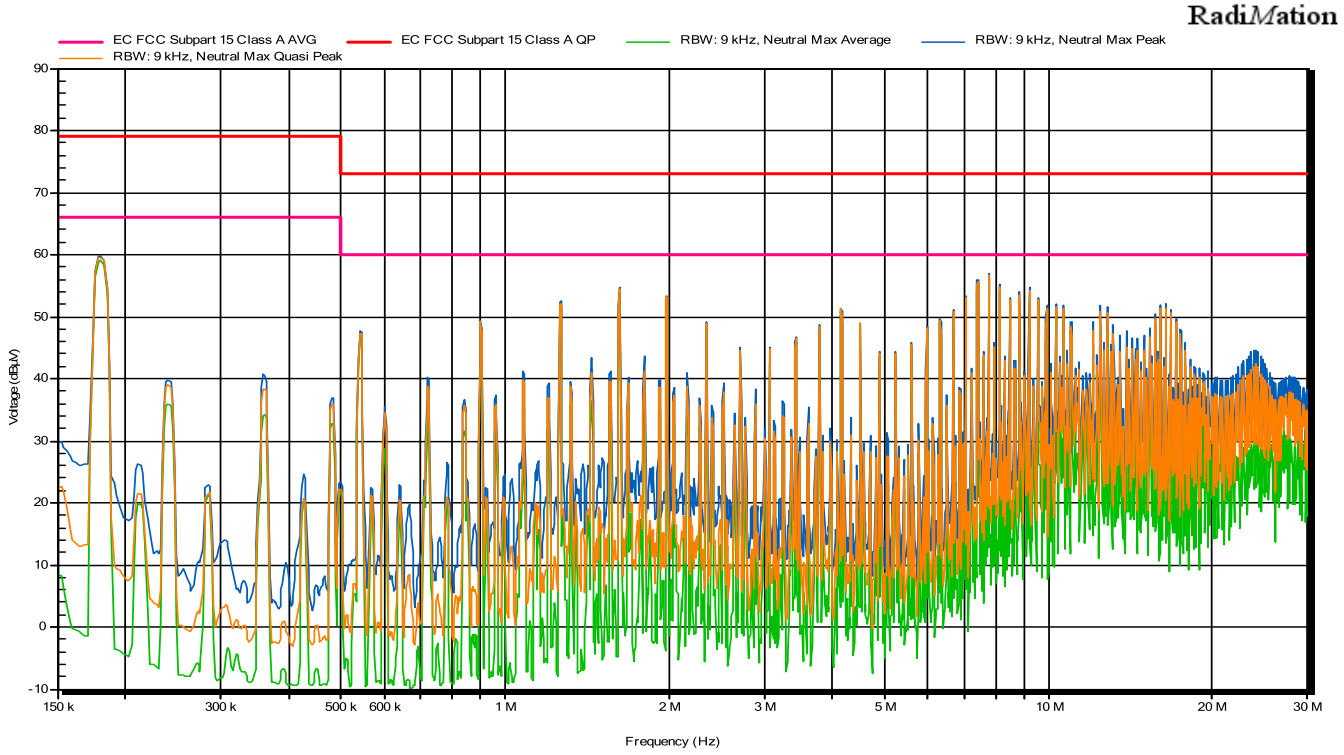
Subrange Maxima

Peak Number	Frequency	Peak	Average	Quasi-Peak
1	180,67 kHz	63,2 dBµV	62,5 dBµV	63 dBµV
2	1,62 MHz	52,2 dBµV	51,5 dBµV	52,1 dBµV
3	7,382 MHz	51 dBµV	50 dBµV	50,6 dBµV
4	8,104 MHz	55,8 dBµV	54,3 dBµV	55,1 dBµV
5	8,464 MHz	54,6 dBµV	52,1 dBµV	53,4 dBµV
6	10,263 MHz	59,6 dBµV	57,4 dBµV	58,6 dBµV
7	10,623 MHz	60 dBµV	57,9 dBµV	58,9 dBµV
8	11,704 MHz	52,1 dBµV	49,9 dBµV	51,1 dBµV
9	15,667 MHz	53,8 dBµV	52,2 dBµV	53,1 dBµV
10	16,027 MHz	54,5 dBµV	52,7 dBµV	53,5 dBµV

Continuous Conducted Emission. CC02020N

Project:	63330REM.002
Company:	DELTA
Sample:	S/02
Operation mode:	OM#02
Description:	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 24Vdc. Neutral wire noise.

Full Spectrum



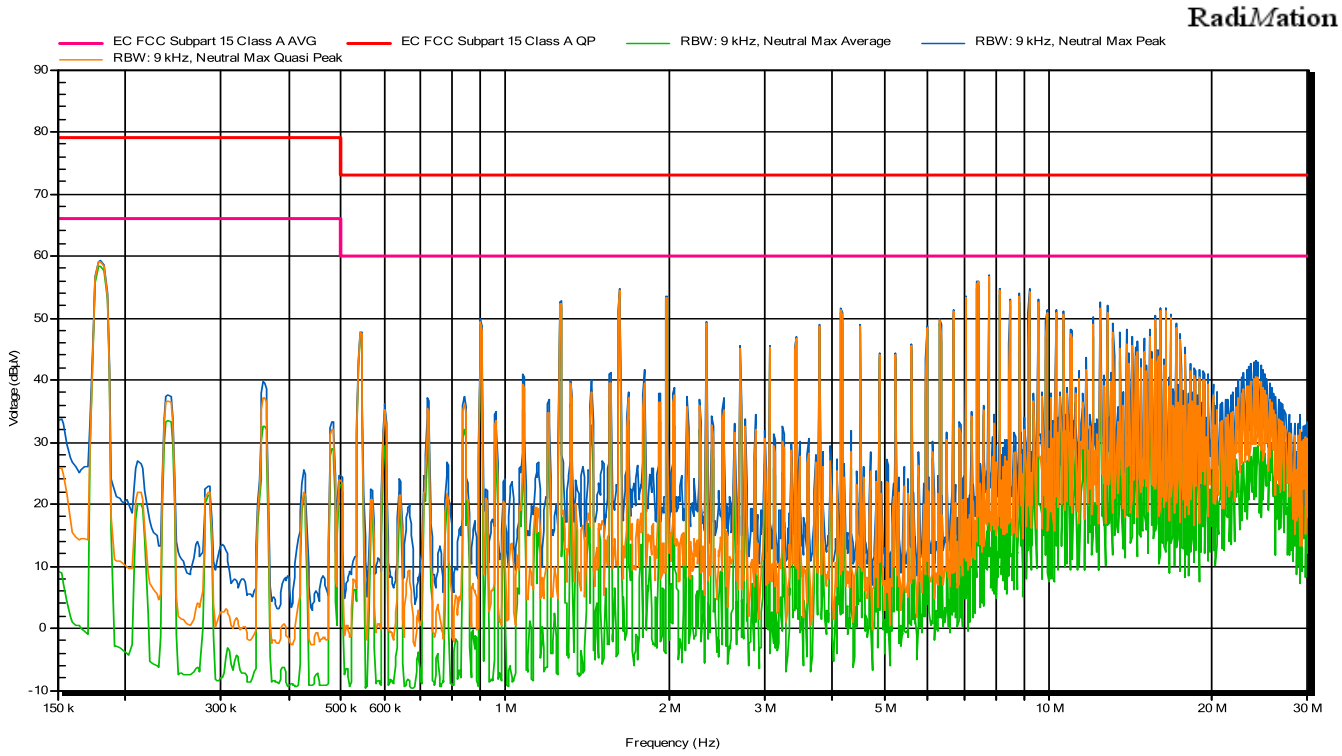
Subrange Maxima

Peak Number	Frequency	Peak	Average	Quasi-Peak
1	180,67 kHz	59,8 dBµV	58,9 dBµV	59,6 dBµV
2	1,262 MHz	52,4 dBµV	51,7 dBµV	52,1 dBµV
3	1,622 MHz	54,7 dBµV	54 dBµV	54,6 dBµV
4	1,984 MHz	53,3 dBµV	52,5 dBµV	53,1 dBµV
5	7,39 MHz	55,8 dBµV	55,1 dBµV	55,6 dBµV
6	7,752 MHz	56,9 dBµV	56,1 dBµV	56,7 dBµV
7	9,194 MHz	54,6 dBµV	53,5 dBµV	54,2 dBµV
8	9,553 MHz	53,1 dBµV	52 dBµV	52,7 dBµV
9	12,436 MHz	51,9 dBµV	49 dBµV	50,7 dBµV
10	16,405 MHz	52 dBµV	50,4 dBµV	51,4 dBµV

Continuous Conducted Emission. CC0202L1

Project:	63330REM.002
Company:	DELTA
Sample:	S/02
Operation mode:	OM#02
Description:	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 24Vdc. Phase wire noise.

Full Spectrum



Subrange Maxima

Peak Number	Frequency	Peak	Average	Quasi-Peak
1	180,67 kHz	59,2 dBµV	58,3 dBµV	59 dBµV
2	1,262 MHz	52,7 dBµV	51,9 dBµV	52,4 dBµV
3	1,622 MHz	54,7 dBµV	53,9 dBµV	54,5 dBµV
4	1,984 MHz	53,5 dBµV	52,7 dBµV	53,2 dBµV
5	7,39 MHz	56 dBµV	55,3 dBµV	55,8 dBµV
6	7,75 MHz	56,9 dBµV	55,9 dBµV	56,6 dBµV
7	9,192 MHz	54,7 dBµV	53 dBµV	53,8 dBµV
8	9,553 MHz	52,9 dBµV	51,8 dBµV	52,5 dBµV
9	12,439 MHz	52,4 dBµV	49,8 dBµV	51,5 dBµV
10	16,403 MHz	51,6 dBµV	50,3 dBµV	51 dBµV

RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE 30MHz-12.75GHz

LIMITS:	Product standard:	FCC Rules and Regulations CFR 47, Part 15, Subpart B (May 17, 2019 Edition) & ICES-003 Issue 6 (Updated 04-2019) & FCC Rules and Regulations CFR 47, Part 18, Subpart B (June 13, 2019 Edition) / RSS-216 Issue (January 20, 2016)
	Test standard:	FCC Rules and Regulations CFR 47, Part 15, Subpart B (May 17, 2019 Edition) & ICES-003 Issue 6 (Updated 04-2019) & FCC Rules and Regulations CFR 47, Part 18, Subpart B (June 13, 2019 Edition) / RSS-216 Issue (January 20, 2016)

Limits for radiated emissions, Class A

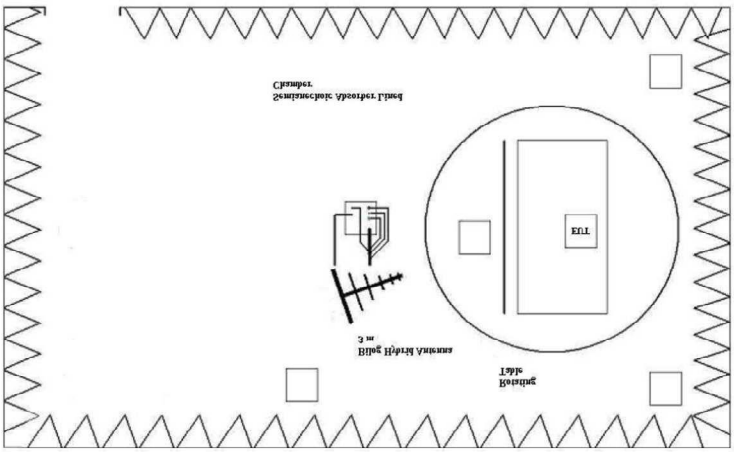
The applied limit for radiated emissions, 10 m distance, according to the requirements of FCC Rules and Regulations CFR 47, Part 15, Subpart B (May 17, 2019 Edition) is

Frequency range (MHz)	QP Limit at 10 m	
	(µV/m)	(dBµV/m)
30 to 88	90	39.08
88 to 216	150	43.52
216 to 960	210	46.44
Above 960	300	49.54

Frequency range (MHz)	AVG Limit at 10 m		PK Limit at 10 m
	(µV/m)	(dBµV/m)	(dBµV/m)
Above 1000	300	49.54	69.54

Note: When a different measure distance “d” in meters is used, the following correction can be applied in far field condition:

Field dBuV/m @ 10m = Field dBuV/m @ d - 20*log(10/d)



Setup for measurements for f < 1GHz

d=3m

Setup for measurements for 1GHz > f > 12.75GHz*

d=1m

*Note: Test required only to the 5th harmonics of the maximum internal work frequency in the EUT.

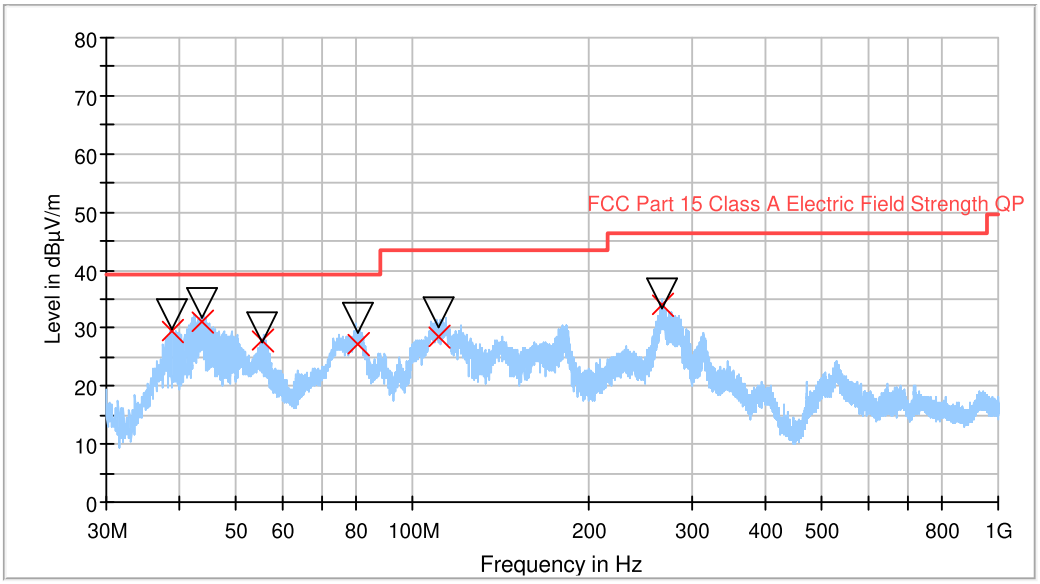
TESTED SAMPLE:	S/01 & S/02
TESTED OPERATION MODES:	OM#01
TEST RESULTS:	CRmmnnRR_PP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; PP: Polarization.

CRmmnnRR_PP	Description	Result
CR0101LR	Range: 30 MHz - 1000 MHz. (FCC CFR part 15 / part 18)	P
CR0101HR_HP	Range: 1 GHz – 12.75 GHz. Horizontal polarization.	P
CR0101HR_VP	Range: 1 GHz – 12.75 GHz. Vertical polarization.	P
CR0201LR	Range: 30 MHz - 1000 MHz. (FCC CFR part 15 / part 18)	P
CR0201HR_HP	Range: 1 GHz – 12.75 GHz. Horizontal polarization.	P
CR0201HR_VP	Range: 1 GHz – 12.75 GHz. Vertical polarization.	P

Radiated Emission. CR0101LR

Project:	63330Rem002
Company:	DELTA ENERGY SYSTEMS
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Wireless charging OFF, Bluetooth idle mode. Power supply: 115Vac.

Full Spectrum



Peak Preview
QuasiPeak
FCC Part 15 Class A Electric Field Strength QI
MaxPeak

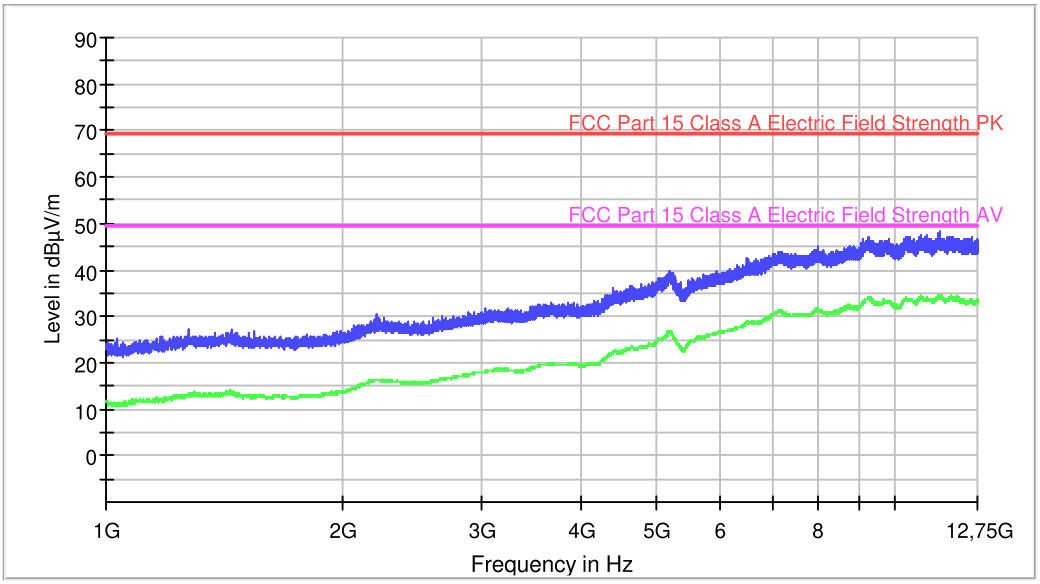
Maximizations

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
38.987000	29.56	32.36	39.08	9.52	100.0	V	329.0
43.653000	31.03	34.19	39.08	8.05	107.0	V	351.0
55.500000	27.85	30.16	39.08	11.23	100.0	V	318.0
80.623000	27.24	31.89	39.08	11.84	106.0	V	355.0
110.406000	28.43	32.66	43.52	15.09	120.0	V	103.0
267.223000	33.95	36.04	46.44	12.49	108.0	H	310.0

Radiated Emission: CR0101HR_HP

Project:	63330Rem002
Company:	DELTA ENERGY SYSTEMS
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Wireless charging OFF, Bluetooth idle mode. Power supply: 115Vac. Horizontal polarization.

FCC Part 15 Class A 1-12,75 GHz



Average Scan
FCC Part 15 Class A Electric Field Strength PK
Peak Scan
FCC Part 15 Class A Electric Field Strength AV

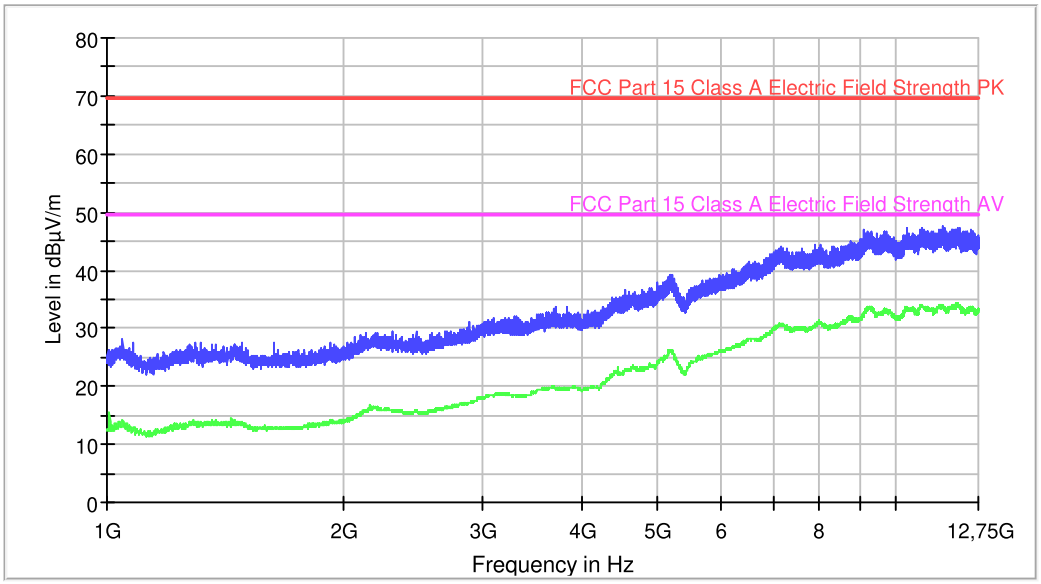
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
2924.400000	30.9	17.7
4893.200000	37.0	24.3
6508.400000	42.5	28.6
8803.200000	45.2	32.1
10328.400000	47.1	33.8
11400.000000	48.1	34.3

Radiated Emission: CR0101HR_VP

Project:	63330Rem002
Company:	DELTA ENERGY SYSTEMS
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Wireless charging OFF, Bluetooth idle mode. Power supply: 115Vac. Vertical polarization.

FCC Part 15 Class A 1-12,75 GHz



Average Scan
FCC Part 15 Class A Electric Field Strength PK
Peak Scan
FCC Part 15 Class A Electric Field Strength AV

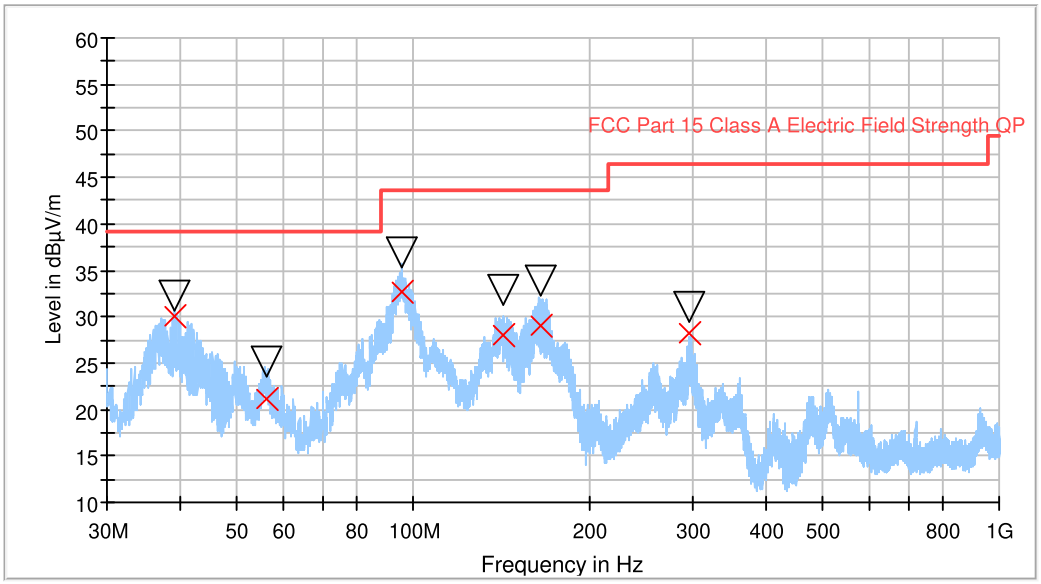
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
2886.400000	31.0	17.1
4898.800000	36.9	23.5
6822.800000	41.7	28.6
8758.400000	45.1	31.8
10333.600000	47.3	33.6
11473.200000	47.6	33.8

Radiated Emission: CR0201LR

Project:	63330REM.002
Company:	DELTA ENERGY SYSTEMS
Sample:	S/02
Operation mode:	OM#01
Description:	EUT ON. Wireless charging OFF, Bluetooth idle mode. Power supply: 115Vac. Vertical polarization.

Full Spectrum



Peak Preview
QuasiPeak
FCC Part 15 Class A Electric Field Strength QP
MaxPeak

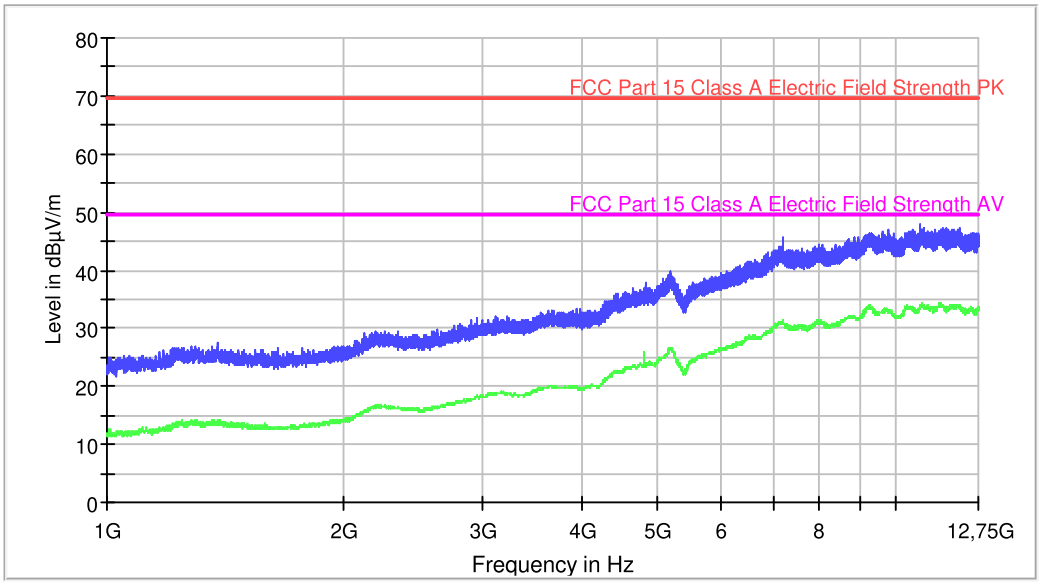
Maximizations

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Height (cm)	Pol	Azimuth (deg)
39.231000	30.10	32.36	112.0	V	348.0
56.305000	21.13	25.26	100.0	V	2.0
95.748000	32.59	36.90	104.0	V	120.0
142.686000	28.09	32.87	109.0	V	320.0
165.426000	28.95	33.85	155.0	H	110.0
295.803000	28.23	31.01	173.0	V	-50.0

Radiated Emission: CR0201HR_HP

Project:	63330REM.002
Company:	DELTA ENERGY SYSTEMS
Sample:	S/02
Operation mode:	OM#01
Description:	EUT ON. Wireless charging OFF. Propietary radio idle mode. Power supply: 115Vac. Horizontal polarization.

FCC Part 15 Class A 1-12,75 GHz



Average Scan
FCC Part 15 Class A Electric Field Strength PK
Peak Scan
FCC Part 15 Class A Electric Field Strength AV

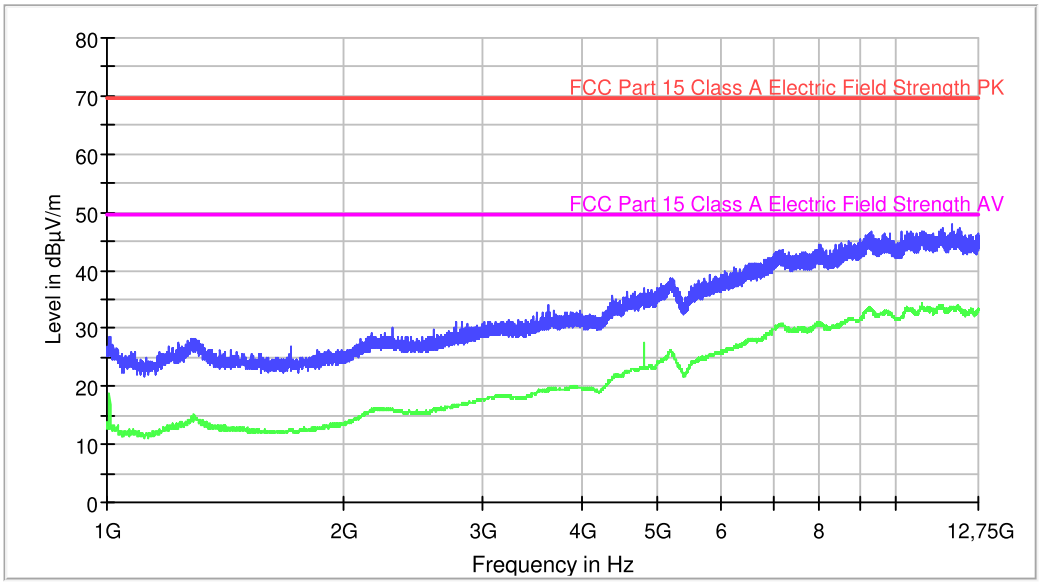
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
2939.600000	31.6	18.1
4815.200000	38.0	23.9
6874.800000	42.7	29.4
7211.600000	45.6	31.4
10779.200000	47.8	33.8
10854.000000	47.4	33.9

Radiated Emission: CR0201HR_VP

Project:	63330REM.002
Company:	DELTA ENERGY SYSTEMS
Sample:	S/02
Operation mode:	OM#01
Description:	EUT ON. Wireless charging OFF. Propietary radio idle mode. Power supply: 115Vac. Vertical polarization.

FCC Part 15 Class A 1-12,75 GHz



Average Scan
FCC Part 15 Class A Electric Field Strength PK
Peak Scan
FCC Part 15 Class A Electric Field Strength AV

Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
2771.600000	31.1	16.9
4805.200000	37.1	26.9
6844.800000	41.8	28.4
8727.600000	45.1	31.6
10463.200000	46.6	33.1
11802.800000	47.8	33.7

RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE 9kHz-30MHz

LIMITS:	Product standard:	FCC Rules and Regulations CFR 47, Part 15, Subpart B (May 17, 2019 Edition) & ICES-003 Issue 6 (Updated 04-2019) & FCC Rules and Regulations CFR 47, Part 18, Subpart B (June 13, 2019 Edition) / RSS-216 Issue (January 20, 2016)
	Test standard:	FCC Rules and Regulations CFR 47, Part 15, Subpart B (May 17, 2019 Edition) & ICES-003 Issue 6 (Updated 04-2019) & FCC Rules and Regulations CFR 47, Part 18, Subpart B (June 13, 2019 Edition) / RSS-216 Issue (January 20, 2016)

Limits for FCC Part 18:

FREQUENCY RANGE Operating frequency=Any non-ISM frequency.	**MEASURED FIELD PEAK LIMIT AT 3m** **(15*SQRT(power/500) uV-m 300m)** **power=1000W**
9kHz to 30MHz	106.5 dBuV/m

The measurement was made at 3 meter while the FCC limit is defined at 300m. According to FCC 18.305, the distance correction factor was applied to the FCC limitation by applying the following equation:

Limit in dBuV/m @ 3m = Limit in dBuV/m @ 300 m + 40*log(300/3)

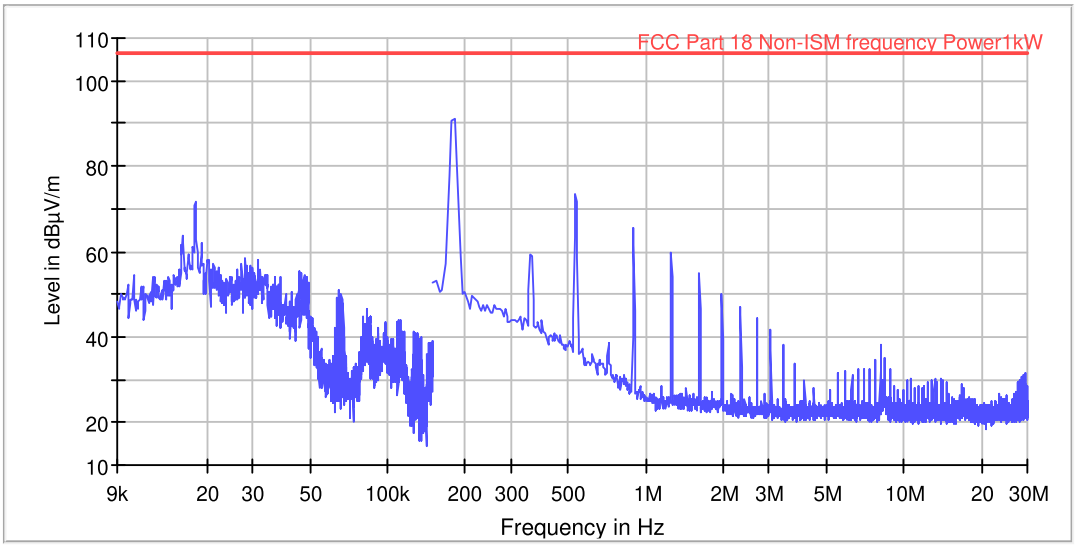
TESTED SAMPLES:	S/01 & S/02
TESTED OPERATION MODES:	OM#02 & OM#03
TEST RESULTS:	CRmmnn: CR, Condición de Radiación; mm: Sample number; nn: Operation mode; RR: Measured range/axis.

CRmmnnRR	**DESCRIPTION**	**RESULT**
CR0103_X	Range: 9 KHz - 30 MHz Orientation X	P
CR0103_Y	Range: 9 KHz - 30 MHz Orientation Y	P
CR0103_Z	Range: 9 KHz - 30 MHz Orientation Z	P
CR0202_X	Range: 9 KHz - 30 MHz Orientation X	P
CR0202_Y	Range: 9 KHz - 30 MHz Orientation Y	P
CR0202_Z	Range: 9 KHz - 30 MHz Orientation Z	P

Radiated Emission: CR0103_X. X axis.

Project:	63330REM.002
Company:	DELTA
Sample:	S/01
Operation mode:	OM#03
Description:	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 48Vdc. X axis.

Graphics



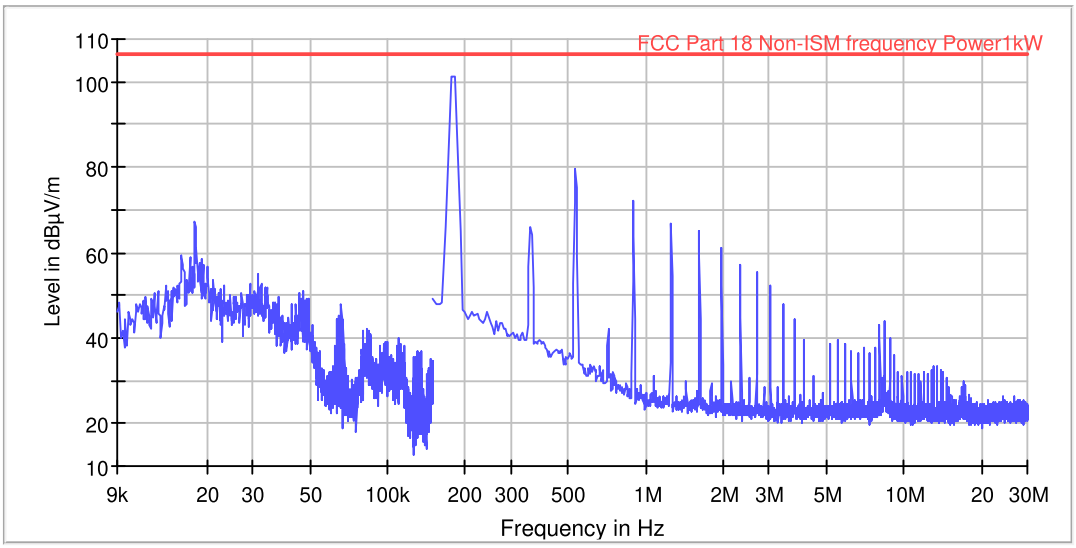
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.181500	91.2	106.5	15.3
3.052500	41.7	106.5	64.8
8.079000	38.0	106.5	68.5
10.594500	30.5	106.5	76.0
13.110000	30.3	106.5	76.2
16.701000	28.9	106.5	77.6
18.838500	25.5	106.5	81.0
23.415000	26.6	106.5	79.9
26.754000	26.9	106.5	79.6
29.274000	31.4	106.5	75.1

Radiated Emission: CR0103_Y. Y axis.

Project:	63330REM.002
Company:	DELTA
Sample:	S/01
Operation mode:	OM#03
Description:	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 48Vdc. Y axis.

Graphics



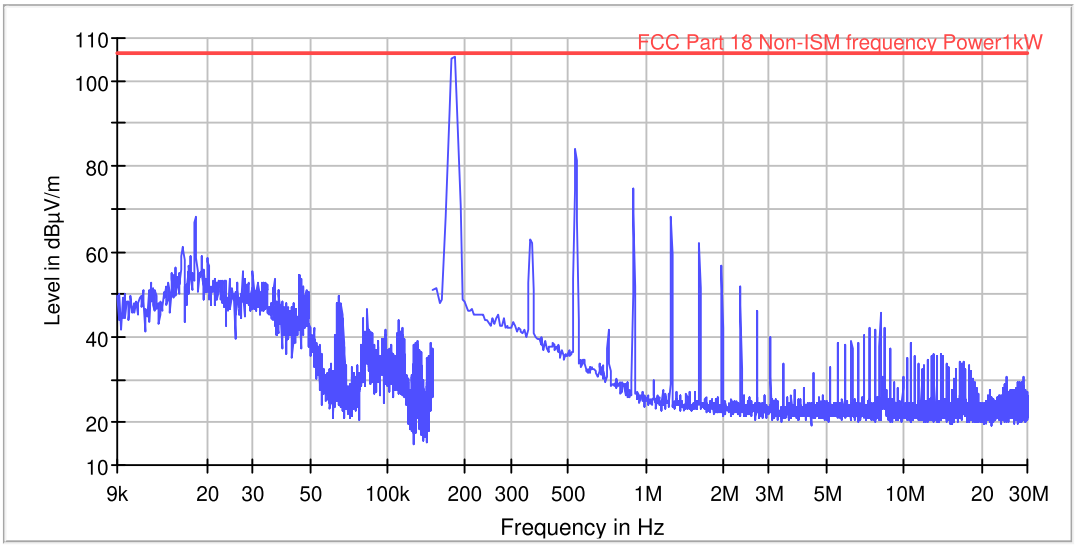
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.177000	101.2	106.5	5.3
3.048000	52.2	106.5	54.3
8.425500	43.8	106.5	62.7
9.141000	35.8	106.5	70.7
13.087500	33.2	106.5	73.3
17.034000	29.9	106.5	76.6
18.109500	25.8	106.5	80.7
24.000000	26.3	106.5	80.2
26.655000	26.1	106.5	80.4
27.793500	25.5	106.5	81.0

Radiated Emission: CR0103_Z. Z axis.

Project:	63330REM.002
Company:	DELTA
Sample:	S/01
Operation mode:	OM#03
Description:	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 48Vdc. Z axis.

Graphics



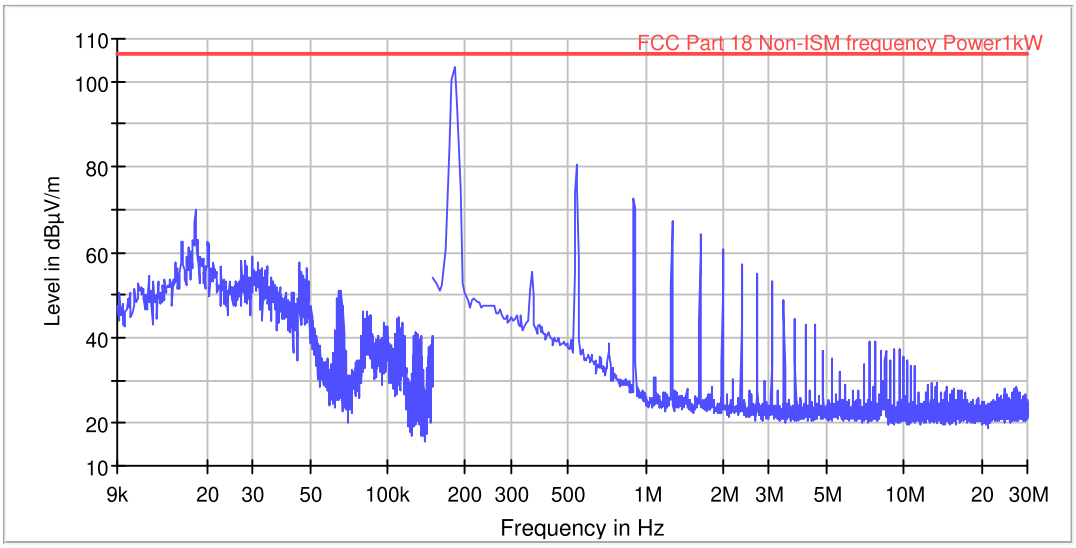
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.181500	105.6	106.5	0.9
3.052500	40.0	106.5	66.5
8.074500	45.9	106.5	60.6
10.590000	38.5	106.5	68.0
13.101000	36.2	106.5	70.3
16.332000	34.1	106.5	72.4
18.127500	32.0	106.5	74.5
21.354000	27.5	106.5	79.0
24.949500	30.8	106.5	75.7
28.900500	30.9	106.5	75.6

Radiated Emission: CR0202_X. X axis.

Project:	63330REM.002
Company:	DELTA
Sample:	S/02
Operation mode:	OM#02
Description:	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 24Vdc. X axis.

Graphics



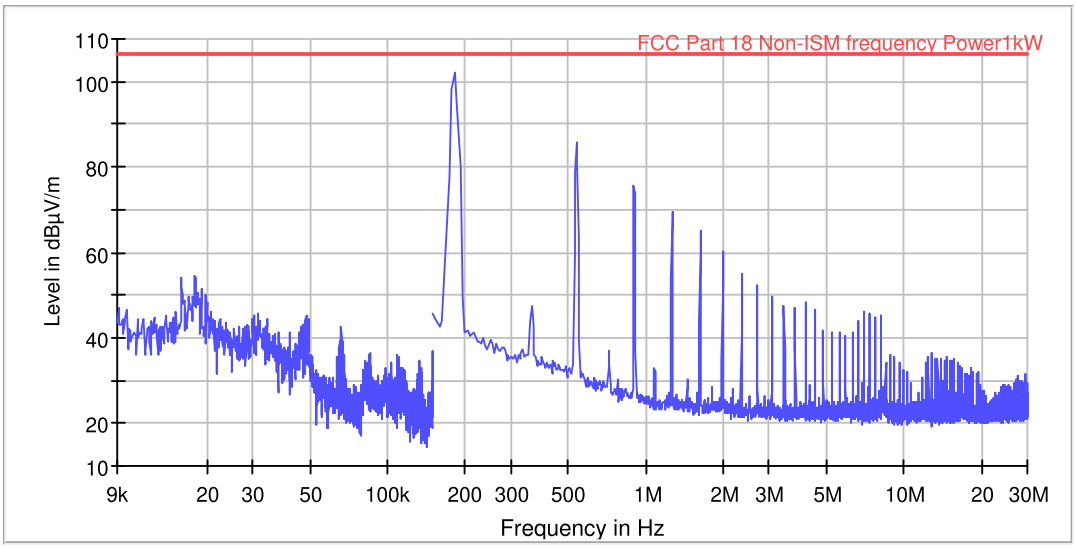
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.181500	103.6	106.5	2.9
3.070500	53.0	106.5	53.5
7.404000	39.2	106.5	67.3
9.213000	37.3	106.5	69.2
12.822000	29.6	106.5	76.9
15.715500	28.0	106.5	78.5
19.333500	26.0	106.5	80.5
23.041500	26.5	106.5	80.0
24.738000	27.9	106.5	78.6
27.361500	28.6	106.5	77.9

Radiated Emission: CR0202_Y. Y axis.

Project:	63330REM.002
Company:	DELTA
Sample:	S/02
Operation mode:	OM#02
Description:	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 24Vdc. Y axis.

Graphics



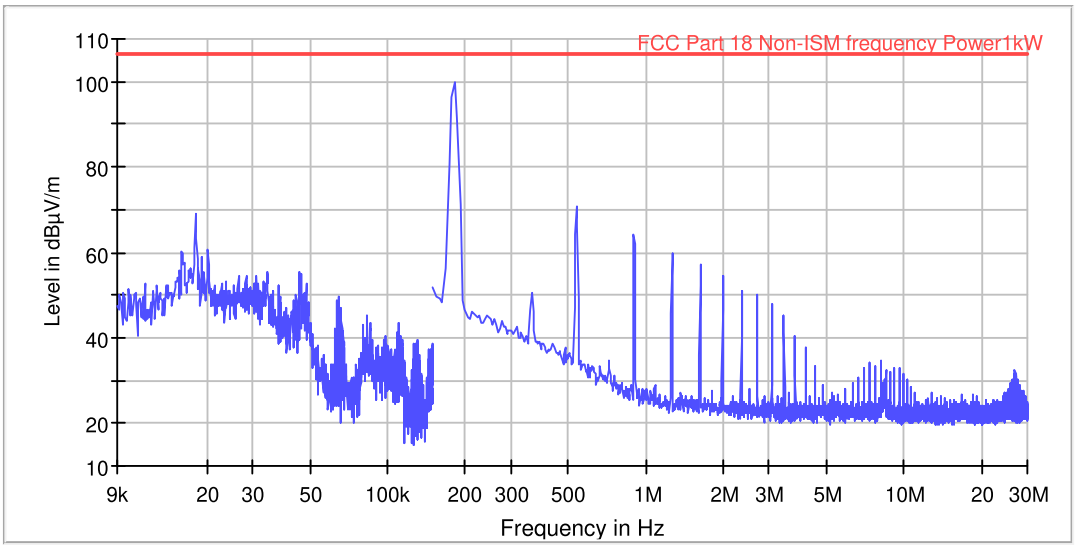
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.181500	102.0	106.5	4.5
3.070500	49.6	106.5	56.9
7.044000	46.3	106.5	60.2
9.213000	35.4	106.5	71.1
12.826500	36.3	106.5	70.2
15.715500	35.3	106.5	71.2
18.244500	32.7	106.5	73.8
24.000000	29.2	106.5	77.3
26.916000	30.1	106.5	76.4
29.265000	31.7	106.5	74.8

Radiated Emission: CR0202_Z. Z axis.

Project:	63330REM.002
Company:	DELTA
Sample:	S/02
Operation mode:	OM#02
Description:	EUT ON. Wireless charging ON, 2.4 GHz Propietary radio ON. Power supply: 115Vac. Output: 24Vdc. Z axis.

Graphics



Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.181500	99.8	106.5	6.7
3.070500	48.0	106.5	58.5
8.128500	34.7	106.5	71.8
9.573000	33.0	106.5	73.5
12.826500	27.2	106.5	79.3
16.795500	26.5	106.5	80.0
18.604500	26.7	106.5	798
24.000000	26.4	106.5	80.1
26.907000	32.6	106.5	73.9
27.280500	31.3	106.5	75.2