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RADIO TEST REPORT

ETSI EN 303 417 V1.1.1 (2017-09)

Report Reference No.	:	**POCE19062465PRF**
Applicant's Name	:	
Address of Applicant	:	
Test Firm	:	Shenzhen POCE Technology Co., Ltd.
Address of Test Firm	:	H Building, Hongfa Science and Technology Park, Tangtou, Shiyan, Bao'An District, Shenzhen, China
Test Specification Standard	:	**ETSI EN 303 417 V1.1.1 (2017-09)**
Product Name	:	Wireless Charger
Model/Type Reference	:	WPC420-10W
Listed Models	:	N/A
Date of Receipt	:	Jun. 24, 2019
Date of Test	:	Jun. 24, 2019 -- Jun. 29, 2019
Data of Issue	:	Jun. 29, 2019
Result	:	PASS

Compiled by:	Supervised by:	Approved by:
Amy Zhu	Nick He	Machael Mo
Amy Zhu/ File administrators	Nick He/ Technique principal	Machael Mo/ Manager

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Revision History Of Report

REPORT No.	Version	Description	Issue Date
POCE19062465PRF	V1.0	Initial Test Report Release	Jun. 29, 2019

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1 TEST SUMMARY

1.1 Test Standards

ETSI EN 303 417 V1.1.1 (2017-09) -- Wireless power transmission systems, using technologies other than radio frequency beam in the 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6765 - 6795 kHz ranges; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

1.2 Test Description

ETSI EN 303 417 requirements		
Permitted range of operating frequencies	ETSI EN 303 417 V1.1.1 Sub-clause 4.3.2	PASS
Operating frequency ranges	ETSI EN 303 417 V1.1.1 Sub-clause 4.3.3	PASS
H-field requirements	ETSI EN 303 417 V1.1.1 Sub-clause 4.3.4	PASS
Transmitter spurious emissions	ETSI EN 303 417 V1.1.1 Sub-clause 4.3.5	PASS
Transmitter out of band (OOB) emissions	ETSI EN 303 417 V1.1.1 Sub-clause 4.3.6	PASS
WPT system unwanted conducted emissions	ETSI EN 303 417 V1.1.1 Sub-clause 4.3.7	N/A
Receiver blocking	ETSI EN 303 417 V1.1.1 Sub-clause 4.4.2	N/A

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2 General Information

2.1 Client Information

Applicant :

Address :

Manufacturer :

Address :

2.2 Test conditions

Temperature	Normal Temperature:	25°C
	High Temperature:	55°C
	Low Temperature:	-20°C
Voltage	Normal Voltage	DC 5.00V
	High Voltage	DC 5.75V
	Low Voltage	DC 4.25V
Other	Relative Humidity	55 %
	Air Pressure	101 kPa

2.3 Description of Device (EUT)

Equipment	Wireless Charger
Model Name	WPC420-10W
Charger Information	Input: 5V⎓2A; 9V⎓1.67A Wireless Output: 5V⎓1A(5W), 9V⎓1.1A(10W) USB Output: 5V⎓1A Max
Operation Frequency	114.28KHz
Modulation Type	MSK
Antenna Type	Loop coil antenna
Antenna Gain	0 dBi

Note: For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

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2.4 Operational modes

The can operate the operation mode description as bellow:

Operational Mode		Description
☐	1	Base station in stand-by, idle mode
☐	2	Communication before charging, adjustment charging mode / position
☐	3	Communication
☒	4	Energy transmission

2.5 Test Lab Information

CNAS Registration Number is L8229

Shenzhen POCE Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories,
Date of Registration: Jan. 06, 2016.

VCCI Membership No.: 3941

The 3m Semi-anechoic chamber of Shenzhen POCE Technology Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.:R-3941.
Date of Registration: Oct. 22, 2018.

2.6 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.
The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.
The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huaxia Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025.
Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.
Hereafter the best measurement capability for CQA laboratory is reported:

No.	Item	Uncertainty
1	Conducted Emission Test	±0.69dB
2	RF power,conducted	±0.14dB
3	Spurious emissions,conducted	±0.35dB
4	All emissions,radiated(<1G)	±2.28dB
5	All emissions,radiated(>1G)	±3.31dB
6	Frequency Stability	$<\pm 1.3 \times 10^{-6}$

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7	Necessary bandwidth	<± 4.2%

2.7 Measurement Instruments List

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibration Date	Calibrated until
1	Spectrum Analyzer	Agilent	E4408B	CFG006	2018/12/14	2019/12/13
2	Test Receiver	R&S	ESPI	102109	2018/12/14	2019/12/13
3	Test Receiver	R&S	ESCI	101431	2018/12/14	2019/12/13
4	Bilog Antenna	Model JB6	CBL6111D	A090414	2018/12/14	2019/12/13
5	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2018/12/14	2019/12/13
6	Spectrum Analyzer	ADVANTEST	R3132	150900201	2018/12/14	2019/12/13
7	Horn Ant	Schwarzbeck	Model DRH-118	A091114	2018/12/14	2019/12/13
8	Low Fre.Amplifier	Schwarzbeck	BBV9743	9743-151	2018/12/14	2019/12/13
9	High Fre. AMP	Schwarzbeck	BBV9718	9718-282	2018/12/14	2019/12/13
10	Loop Antenna	ARA	PLA-2030/B	1029	2018/12/14	2019/12/13
11	Power Meter	R&S	NRVS	100696	2018/12/14	2019/12/13
12	Signal Generator	R&S	SMT 06	832080/007	2018/12/14	2019/12/13
13	Temperature & Humitidy Chamber	GIANT FORCE	GTH-056P	GF-94454-1	2018/12/14	2019/12/13
14	Power Sensor	Agilent	U2021XA	MY5365004	2018/12/14	2019/12/13
15	Power Meter	Agilent	U2531A	TW53323507	2018/12/14	2019/12/13
16	Spectrum Analyzer	Agilent	N9020A	US46220290	2018/12/14	2019/12/13
17	Noise Generaror	Ningbo Zhongce	DF1681	EMC0009	2018/12/14	2019/12/13
18	BT test set	Anritsu	MT8852B	6K00005966	2018/12/14	2019/12/13
19	Wireless communication	Agilent	E5515C	GB44300243	2018/12/14	2019/12/13

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3 TEST ITEM AND RESULTS

3.1 Operating frequency range

LIMIT

ETSI EN 303 417 V1.1.1 (2017-09) Sub-clause 4.3.2.3

Table 1: WPT systems within the permitted frequency bands below 30 MHz

	WPT frequency range	Frequency Bands	Applications
Transmit and Receive	1	19 kHz to 21 kHz	WPT systems
Transmit and Receive	2	59 kHz to 61 kHz	WPT systems
Transmit and Receive	3	79 kHz to 90 kHz	WPT systems
Transmit and Receive	4	100 kHz to 119 kHz	WPT systems
Transmit and Receive		119 kHz to 140 kHz	WPT systems
Transmit and Receive		140 kHz to 148,5 kHz	WPT systems
Transmit and Receive		148,5 kHz to 300 kHz	WPT systems
Transmit and Receive	5	6 765 kHz to 6 795 kHz	WPT systems

TEST RESULTS

---PASS---

The manufacturer declares the ranges of this device are 114.28 KHz, Belong to 100 - 300 kHz band.

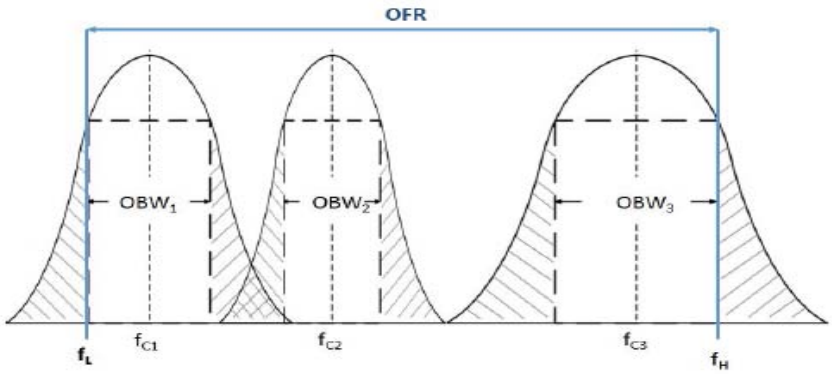
3.2 Operating frequency range

LIMIT

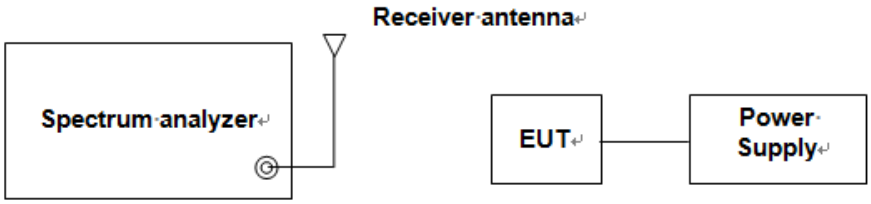
ETSI EN 303 417 V1.1.1 (2017-09) Sub-clause 4.3.3.3

The operating frequency range for emissions shall be within one of the following limits: 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz.

For a single frequency systems the OFR is equal to the occupied bandwidth (OBW) of the WPT system.

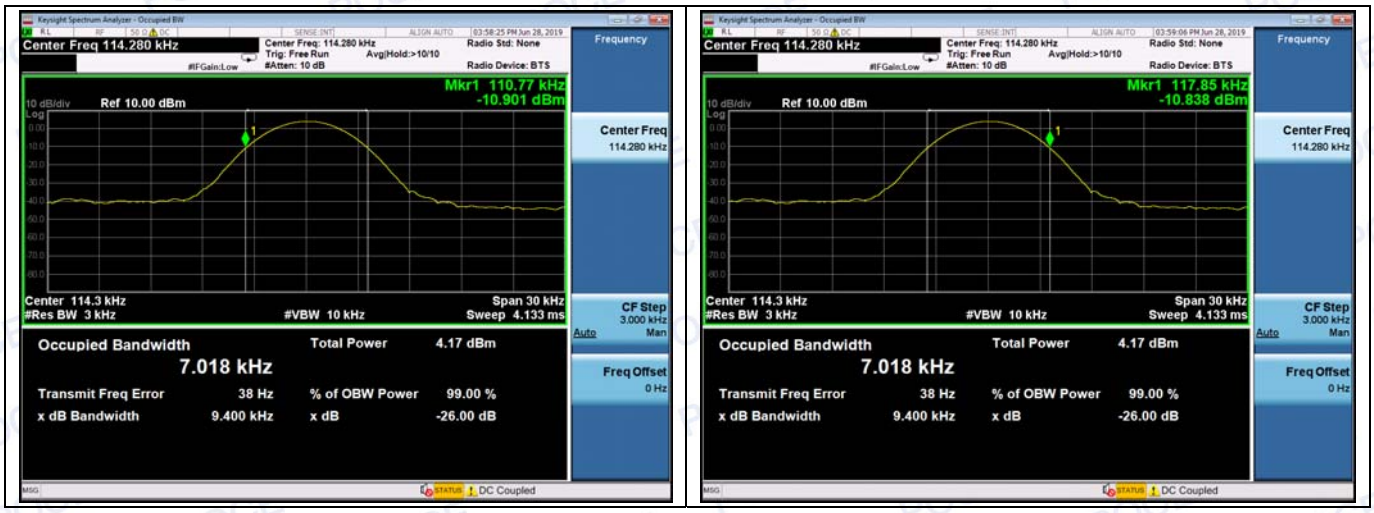


Test method



TEST RESULTS

f_L (KHz)	f_H (KHz)	f_C(KHz)	OBW(KHz)	Limit	Result
110.77	117.85	114.28	7.018	100- 300 kHz	Pass



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3.3 H-field requirements

LIMIT

The H-field limits are provided in Table 3.

They have been specified for control of any radiated emissions within the OFR originating from the WPT system (power transmission and accompanying data communication).

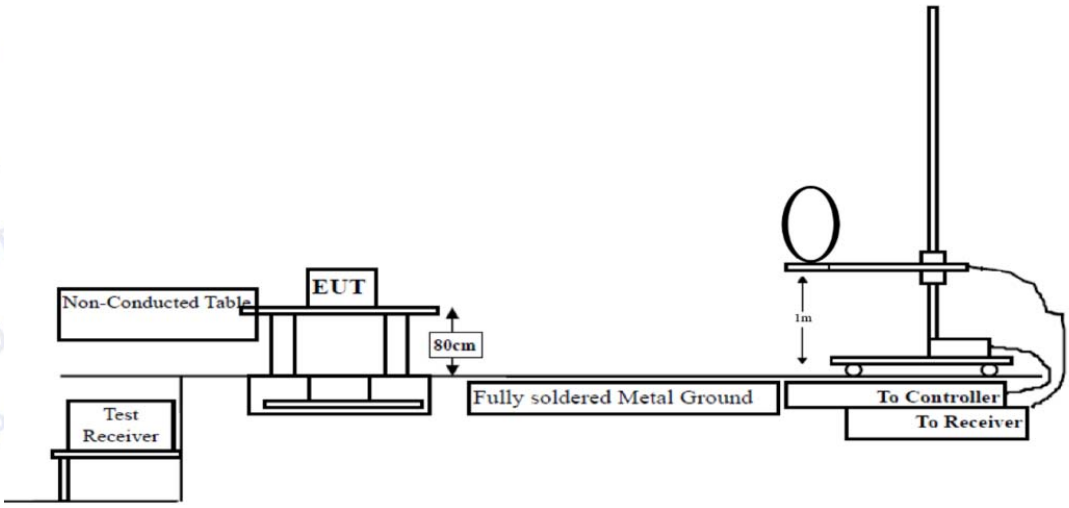
The H-field limits in Table 3 are EU wide harmonised according to EC Decision 2013/752/EU [i.2]. Further information is available in CEPT/ERC/REC 70-03 [i.1].

Table 3: H-field limits

Frequency range [MHz]	H-field strength limit [dBµA/m at 10 m]	Comments
0,019 ≤ f < 0,021	72	
0,059 ≤ f < 0,061	69,1 descending 10 dB/dec above 0,059 MHz	See note 1
0,079 ≤ f < 0,090	67,8 descending 10 dB/dec above 0,079 MHz	See note 2
0,100 ≤ f < 0,119	42	
0,119 ≤ f < 0,135	66 descending 10 dB/dec above 0,119 MHz	See note 1
0,135 ≤ f < 0,140	42	
0,140 ≤ f < 0,1485	37,7	
0,1485 ≤ f < 0,30	-5	
6,765 ≤ f < 6,795	42	

NOTE 1: Limit is 42 dBµA/m for the following spot frequencies: 60 kHz ± 250 Hz and 129,1 kHz ± 500 Hz.
NOTE 2: At the time of preparation of the present document the feasibility of increased limits for high power wireless power transmission systems to charge vehicles [i.4] was prepared. New specific requirements for such systems (e.g. higher H-field emission limits in the 79 - 90 kHz band) will be reflected within a future revision of the present document.

Test method



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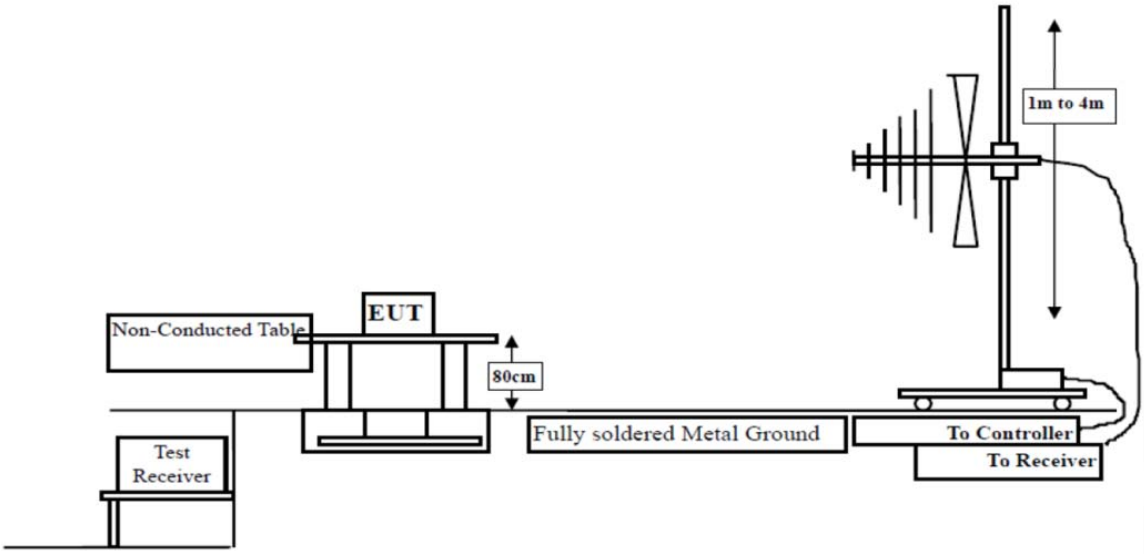

Test Procedure

Refer to chapter 4.3.5 of EN 303 417 V1.1.1.

The conformance test suite for unwanted emissions shall be as defined in clause 6.2.1.

The manufacturer shall declare all necessary information (distance, orientation) which are necessary to set-up the different alignments as defined in clause 6.1.1 for each operational mode as defined in clause 4.2.3, Table 2.

Conformance shall be established under test conditions to be declared by the manufacturer according to clause 4.1. Theinterpretation of the results for the measurements uncertainty shall be as given in clause 5.11.

Test Data

Test Condition		Power Measurement Result (dBµA/m)		Limit (dBµA/m)	Result
Temperature (℃)	Voltage (V)	3M	10M		
T Nor (25℃)	5.00	48.24	24.34	60.00	PASS
T min (-20℃)	4.25	45.41	23.92	60.00	PASS
	5.75	46.15	23.28	60.00	PASS
T Max (+55℃)	4.25	43.66	21.36	60.00	PASS
	5.75	45.78	23.88	60.00	PASS

Note: The limit in dBµA/m at 3 m

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3.4 Transmitter out of band (OOB) emissions

Test Limit

The OOB limits are visualized in figures 4 and 5; they are descending from the intentional limits from Table 3 at f_H/f_L with 10 dB/decade.

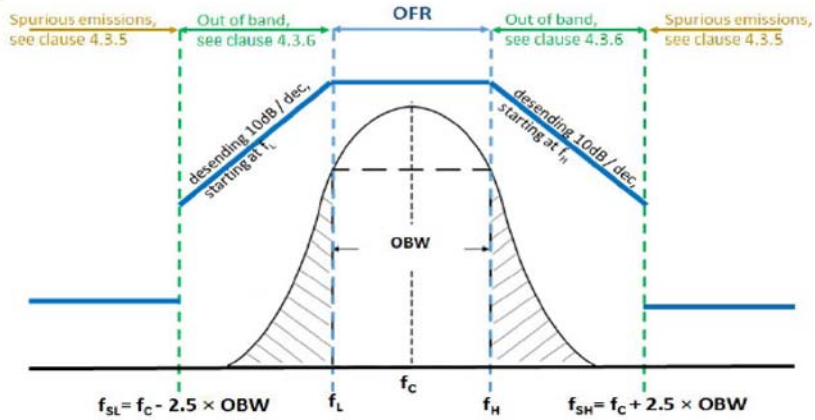
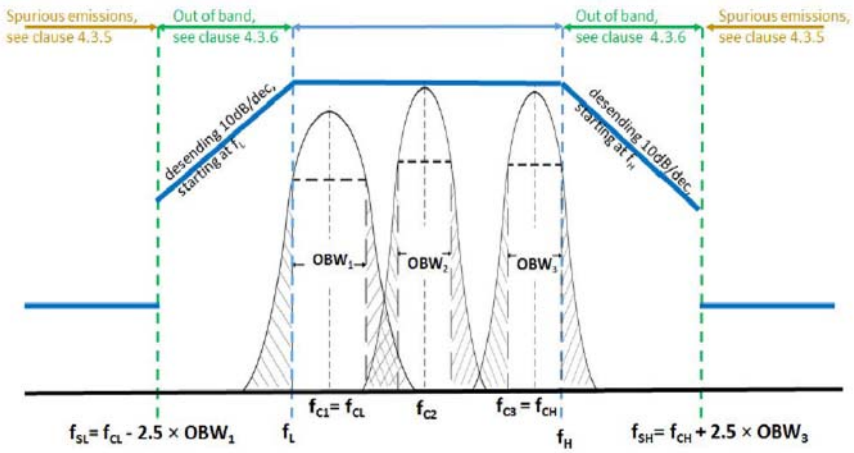


Figure 4: Out of band and spurious domain of a single frequency WPT system

The transmitter spurious emissions for a single frequency system are to be considered in frequency ranges defined in

Figure 4 ($f < f_{SL}$ and $f > f_{SH}$).



The transmitter spurious emissions for a multi frequency system (within one WPT frequency range from Table 2) are to be considered in frequency ranges defined in Figure 5 ($f < f_{SL}$ and $f > f_{SH}$).

Table 3: H-field limits

Frequency range [MHz]	H-field strength limit [dBµA/m at 10 m]	Comments
0,019 ≤ f < 0,021	72	
0,059 ≤ f < 0,061	69,1 descending 10 dB/dec above 0,059 MHz	See note 1
0,079 ≤ f < 0,090	67,8 descending 10 dB/dec above 0,079 MHz	See note 2
0,100 ≤ f < 0,119	42	
0,119 ≤ f < 0,135	66 descending 10 dB/dec above 0,119 MHz	See note 1
0,135 ≤ f < 0,140	42	
0,140 ≤ f < 0,1485	37,7	
0,1485 ≤ f < 0,30	-5	
6,765 ≤ f < 6,795	42	

NOTE 1: Limit is 42 dBµA/m for the following spot frequencies: 60 kHz ± 250 Hz and 129,1 kHz ± 500 Hz.
NOTE 2: At the time of preparation of the present document the feasibility of increased limits for high power wireless power transmission systems to charge vehicles [i.4] was prepared. New specific requirements for such systems (e.g. higher H-field emission limits in the 79 - 90 kHz band) will be reflected within a future revision of the present document.

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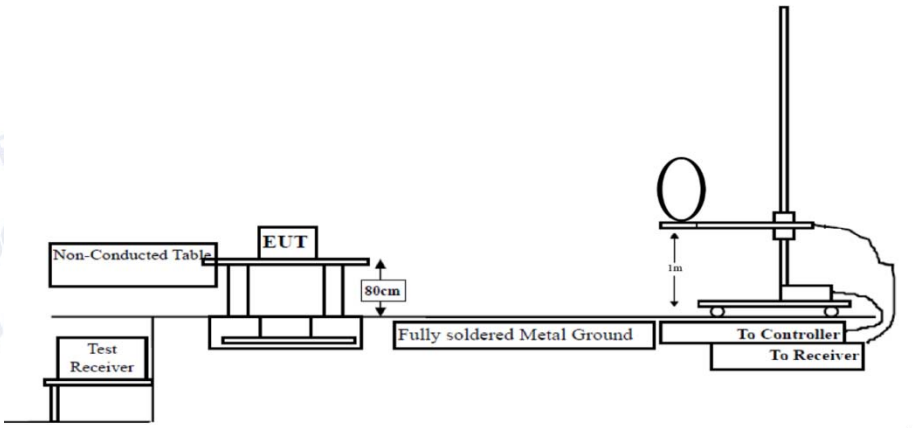
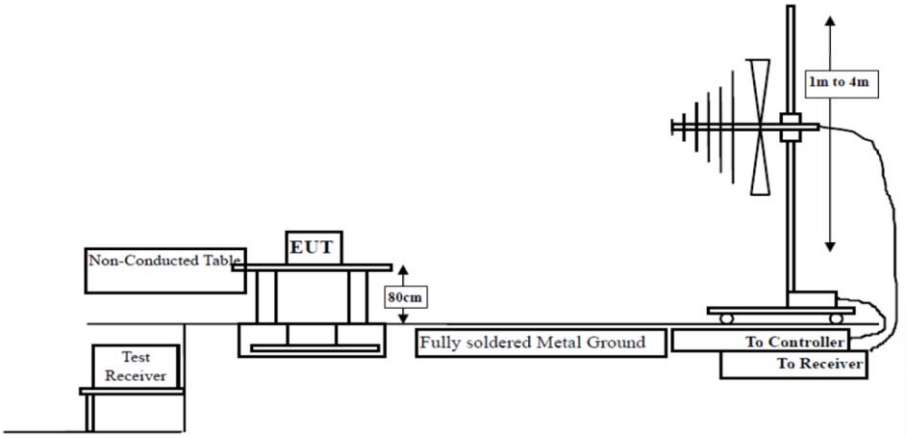
Test Setup





Test Procedure

Refer to chapter 4.3.6 of EN 303 417 V1.1.1.

The conformance test suite for Transmitter out of band emissions is provided in clause 6.2.1.

Conformance shall be established under test conditions to be declared by the manufacturer according to clause 4.1.

The interpretation of the results for the measurements uncertainty shall be as given in clause 5.11.

Test Result

---PASS---

Remark: Only record worst case as below:

Frequency (KHz)	Pol./Ant	Measurement Result (dBμA/m)	Limit (dBμ	Margin (dB)	Test Result
110.77	/	12.41	16.8	4.39	Pass
117.85	/	12.27	16.8	4.53	Pass

Remark:

1) Margin=limit-Measurement Result.
2) For the H-field limit in dBμA/m at 3 m, please refer to EN 300 330 Annex H

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3.5 Transmitter spurious emissions

Limit

ETSI EN 303 417 V1.1.1 (2017-09) Sub-clause 4.3.5.3

The radiated field strength of spurious emissions below 30 MHz shall not exceed the generated H-field given in table below:

Table 4

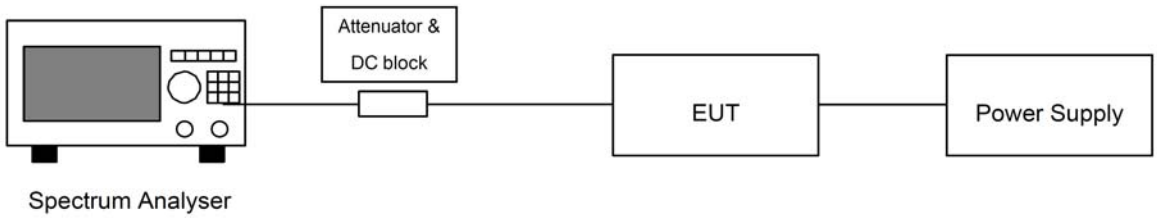
State (see note)	Frequency 9 kHz ≤ f < 10 MHz	Frequency 10 MHz ≤ f < 30 MHz
Operating	27 dBµA/m at 9 kHz descending 10 dB/dec	-3,5 dBµA/m
Standby	5,5 dBµA/m at 9 kHz descending 10 dB/dec	-25 dBµA/m
NOTE: "Operating" means mode 2, 3 and 4 according to Table 2; "standby" means mode 1 according to Table 2.		

The power of any radiated emission above 30MHz shall not exceed the values given in table below.

Table 5

State (see note)	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 790 MHz	Other frequencies between 30 MHz to 1 000 MHz
Operating	4 nW	250 nW
Standby	2 nW	2 nW
NOTE: "Operating" means mode 2, 3 and 4 according to Table 2; "standby" means mode 1 according to Table 2.		

Test Setup



Test Procedure

Refer to chapter 4.3.7 of EN 303 417 V1.1.1.

The conformance test suite for common mode current shall be as defined in clause 6.2.4.

The manufacturer shall declare all necessary information (distance, orientation) which are necessary to set-up thedifferent alignments as defined in clause 6.1.1 for each operational mode as defined in clause 4.2.3, Table 2.

Conformance shall be established under test conditions to be declared by the manufacturer according to clause 4.1. Theinterpretation of the results for the measurements uncertainty shall be as given in clause 5.11.

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Test result

---PASS---

Blow 30MHz

Frequency (MHz)	Pol./Ant	Measurement Result (dBμA/m)	Limit (dBμ	Margin (dB)	Result
0.414	/	-17.56	10.32	27.88	Pass
2.427	/	-16.11	2.53	18.64	Pass
26.84	/	-26.17	-3.50	22.67	Pass

Remark:
1) Margin=limit-Measurement Result.
2) For the H-field limit in dBμA/m at 3 m, please refer to EN 300 330 Annex H

For 30MHz-1GHz

Frequency (MHz)	Pol./Ant	Measurement Result (dBm)	Limit (dBm)	Margin (dB)	Result
35.78	V	-54.12	-36	18.12	Pass
52.75	V	-62.14	-54	8.14	Pass
64.25	V	-63.75	-54	9.75	Pass
--	--	--	--	--	--
35.78	H	-53.49	-36	17.49	Pass
52.75	H	-63.77	-54	9.77	Pass
64.25	H	-65.15	-54	11.15	Pass
--	--	----	--	--	--

Remark:
1) Margin=limit-Measurement Result.
2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 PHOTOGRAPHS OF EUT

Please refer to the report No: POCE19062413YRE

********** **THE END** **********

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