

FCC Test Report

Product Name : Wireless Charger (WLC 5W)
Model No. : CONTINENTAL-WLC-CEM00
FCC ID : KR5WLC-CEM00

Applicant : Continental Automotive GmbH
Address : Siemensstrasse 12, 93055 Regensburg, Germany

Date of Receipt : 2020/03/05
Issued Date : 2020/06/18
Report No. : 2030110R-ITUSP04V00
Report Version : V2.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Laboratory Information

We, **DEKRA Testing and Certification Co., Ltd.**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scopes:

Taiwan	:	BSMI, NCC, TAF
Norway	:	DNVGL
USA	:	FCC
Japan	:	VCCI

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site : <http://www.dekra.com.tw>

TABLE OF CONTENTS

Description	Page
1. General Information	5
1.1. EUT Description.....	5
1.2. Mode of Operation	6
1.3. Tested System Details	7
1.4. Configuration of Tested System	8
1.5. EUT Exercise Software.....	9
2. Technical Test	10
2.1. Summary of Test Result.....	10
2.2. List of Test Equipment	11
2.3. Measurement Uncertainty.....	12
2.4. Test Environment.....	13
3. Radiated Emission.....	14
3.1. Test Specification.....	14
3.2. Test Setup.....	14
3.3. Limit.....	15
3.4. Test Procedure	17
3.5. Test Result.....	18

1. General Information

1.1. EUT Description

Product Name	Wireless Charger (WLC 5W)
Trade Name	Continental
Model No.	CONTINENTAL-WLC-CEM00
FCC ID	KR5WLC-CEM00
EUT Max Frequency	108.7kHz
Antenna spec	A13 Litz coil Antenna
Temperature range	-20°C ~ 40°C
Power supply	8V~16V
dummy load	MFR: ARCOL, M/N: HS50

1.2. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

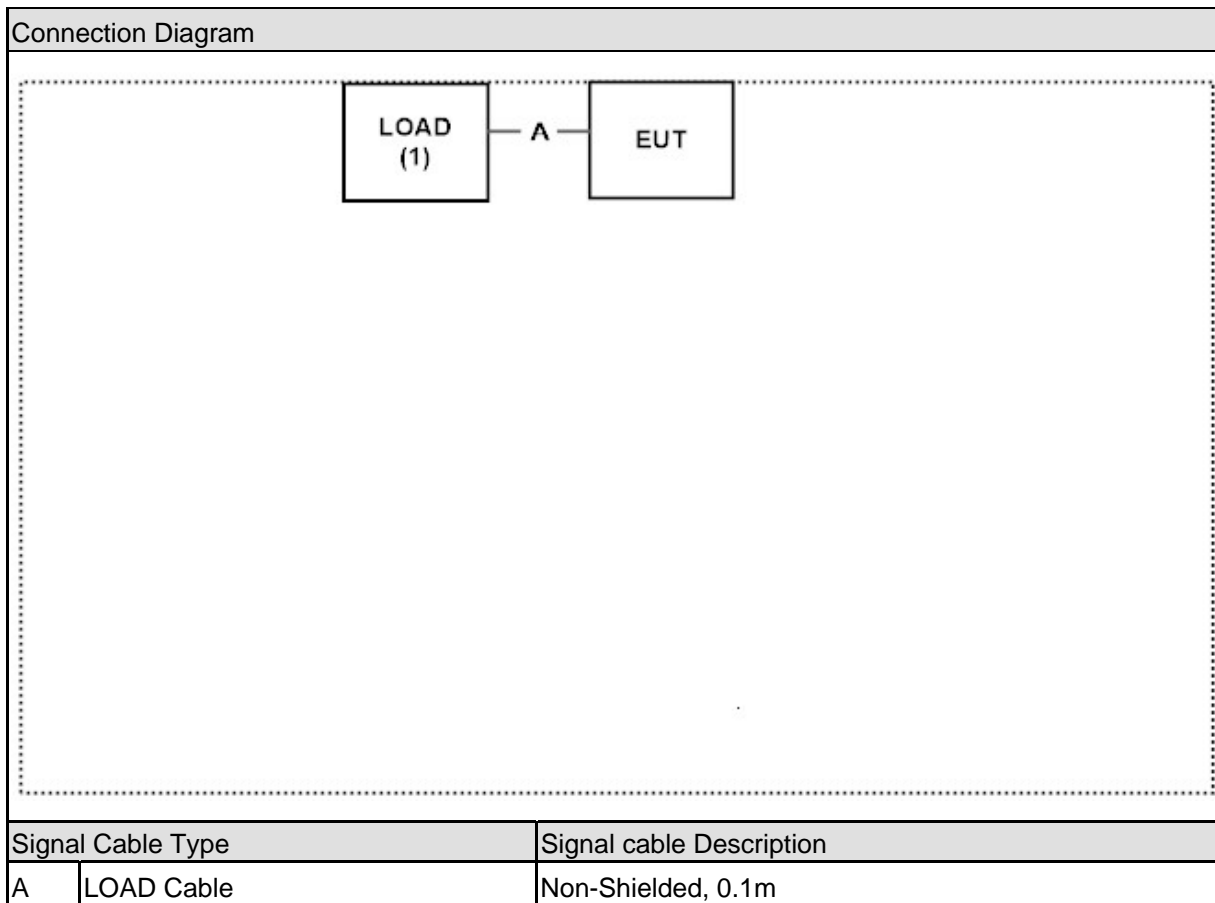
Pre-Test Mode
Mode 1: Charger Mode
Final Test Mode
Emission
Mode 1: Charger Mode

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 LOAD	N/A	N/A	N/A	N/A

1.4. Configuration of Tested System



Note:

- Use Full system setup configuration determines Worst-Case Mode.
- Use 2dB law program determines Max. Cable Configuration and Worst-Case Mode.
- Radiated emission item test: Performed using the Horn Antenna 3dB Beamwidth to 3m from the EUT size sufficient to cover the procedure.
- Radiated emission item test: Performed using the Horn Antenna 3dB Beamwidth non 3m distance sufficient to cover the size of the EUT program.

1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the power of all equipment.
3	Confirm sample is working
4	Start Test.

2. Technical Test

2.1. Summary of Test Result

- No deviations from the test standards
- Deviations from the test standards as below description:

Emission			
Performed Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 18: 2018 (Subpart C) ANSI C63.4: 2014	No	No
Radiated Emission	FCC CFR Title 47 Part 18: 2018 (Subpart C) ANSI C63.4: 2014	Yes	No

Note: Test Procedure ANSI C63.4:2014 MP-5:1986

2.2. List of Test Equipment

Radiated Emission / CB8

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMI Test Receiver	R&S	ESR26	101385	2019/08/08
Horn Antenna	ETS-Lindgren	3117	00135205	2019/04/30
Pre-Amplifier	EMCI	EMC012630SE	980210	2019/04/16
CB8 VSWR	DEKRA	N/A	N/A	2019/06/25
Magnetic Loop Antenna	Teseq	HLA6121	37133	2019/10/15

Radiated Emission / Site6

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Broadband Antenna	Schwarzbeck	VULB 9168	0674	2019/04/23
EMI Test Receiver	R&S	ESCS 30	100369	2019/11/27
Coaxial Cable	DEKRA	RG 214	LC006-RG	2019/06/16
Pre-Amplifier	DEKRA	AP-025C	CHM-0506002	2019/06/16
Coaxial signal switch	Anritsu	MP59B	6201454660	2019/06/16
Site6 NSA	DEKRA	N/A	N/A	2019/06/16

Note: Test Receiver Detector: Quasipeak Bandwidth: 120KHz

2.3. Measurement Uncertainty

Radiated Emission(Under 1GHz)

The measurement uncertainty is evaluated as ± 4.22 dB.

2.4. Test Environment

Performed Item	Items	Required
Radiated Emission	Temperature (°C)	10-40
	Humidity (%RH)	10-90

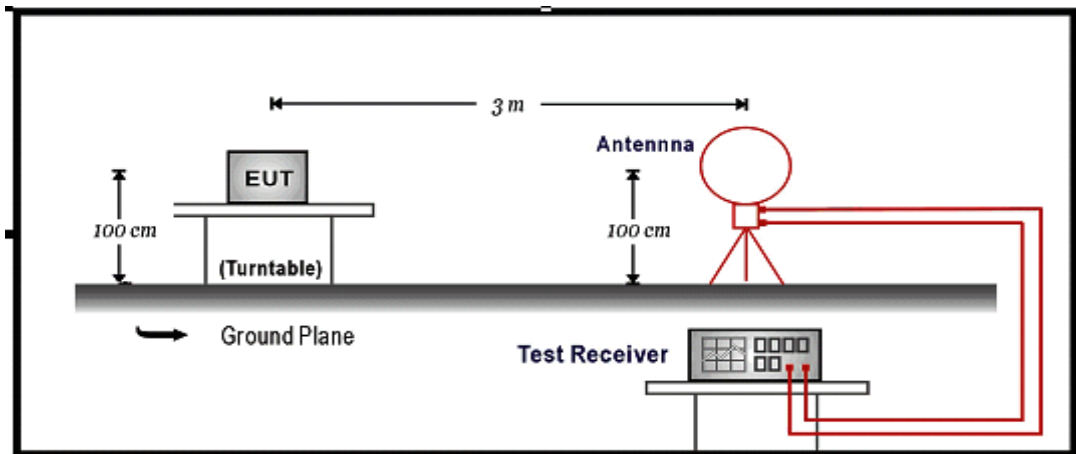
3. Radiated Emission

3.1. Test Specification

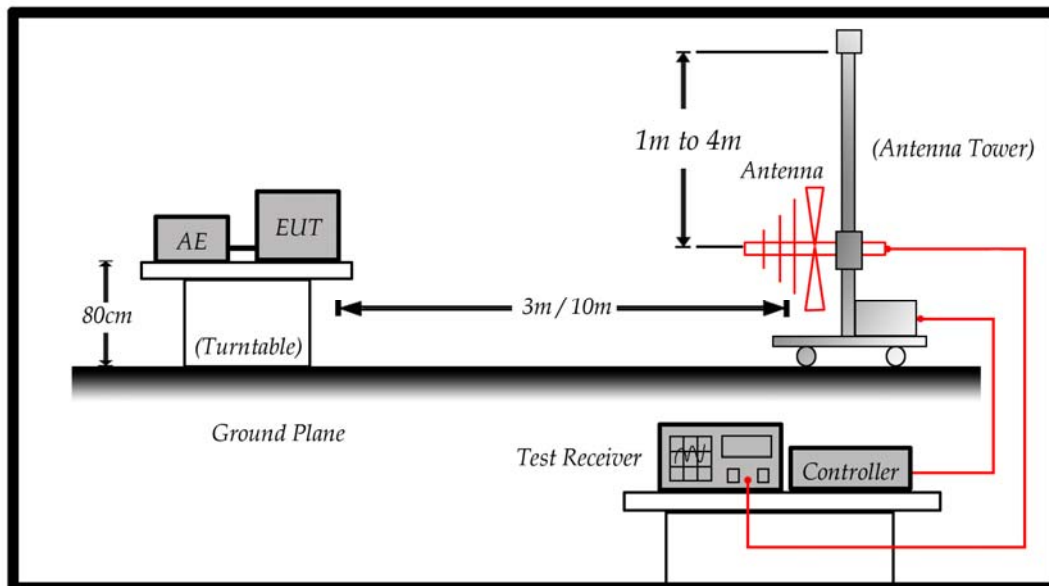
According to EMC Standard : FCC Part 18 and ANSI C63.4

3.2. Test Setup

For 9kHz-30MHz Test Setup



For 30MHz-1GHz Test Setup



3.3. Limit

(a) ISM equipment operating on a frequency specified in §18.301 is permitted unlimited radiated energy in the band specified for that frequency:

ISM frequency	Tolerance	ISM frequency	Tolerance	ISM frequency	Tolerance
6.78 MHz	± 15.0 kHz	13.56 MHz	± 7.0 kHz	27.12 MHz	± 163.0 kHz
40.68 MHz	± 20.0 kHz	915 MHz	± 13.0 MHz	2,450 MHz	± 50.0 MHz
5,800 MHz	± 75.0 MHz	24,125 MHz	± 125.0 MHz	61.25 GHz	± 250.0 MHz
122.50 GHz	± 500.0 MHz	245.00 GHz	± 1.0 GHz		

Remark:

The use of the 6.78 MHz ± 15.0 kHz frequency band is subject to the condition of footnote 524 of the Table of Allocations.

(b) The field strength level of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following:

Equipment	Operating frequency	RF Power generated by equipment (Watts)	Field strength limit (uV/m)	Distance (meters)
Any type unless otherwise specified (miscellaneous).	Any ISM frequency	Below 500 500 or more	25 25*SQRT(power/500)	300 ¹ 300
	Any Non-ISM frequency	Below 500 500 or more	15 15*SQRT(power/500)	300 ¹ 300
Industrial heaters and RF stabilized arc welders.	ON or below 5.725MHz Above 5.725MHz	Any Any	10 (²)	1600 (²)
Medical diathermy	Any ISM frequency Any Non-ISM frequency	Any Any	25 15	300 300
Ultrasonic	Below 490 kHz	Below 500 500 or more	2400/F(kHz) 2400/F(kHz)* SQRT(power/500)	300 ³ 300
	490 to 1600 kHz	Any	24000/F(kHz)	30
	Above 1600 kHz	Any	15	30
Induction cooking ranges	Below 90 kHz	Any	1500	⁴ 30
	On or above 90 kHz	Any	300	⁴ 30

Remark:

1. Field strength may not exceed 10 uV/m at 1600 meters. Consumer equipment operating below 1000 MHz is not permitted the increase in field strength otherwise permitted here for power over 500watts.
2. Reduced to the greatest extend possible.
3. Field strength may not exceed 10 uV/m at 1600 meters. Consumer equipment is not permitted the increase in field strength otherwise permitted here for over 500watts.
4. Induction cooking ranges manufactured prior to February 1, 1980, shall be subject to the field strength limits for miscellaneous ISM equipment.

(c) The field strength limits for RF lighting devices shall be the following:

Frequency (MHz)	Field strength limit at 30 meters (uV/m)	
	(uV/m)	(dBuV/m)
Non-consumer equipment:		
30 – 88	30	29.5
88 – 216	50	34
216 – 1000	70	36.9
Consumer equipment:		
30 – 88	10	20
88 – 216	15	23.5
216 – 1000	20	26

Remark:

1. The tighter limits shall apply at the boundary between two frequency ranges.
2. Testing for compliance with these limits may be made at closer distances, provided a sufficient number of measurements are taken to plot the radiation pattern, to determine the major lobes of radiation, and to determine the expected field strength level at 30, 300, or 1600 meters. Alternatively, if measurements are made at only one closer fixed distance, then the permissible field strength limits shall be adjusted using 1/d as attenuation factor.

3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground.

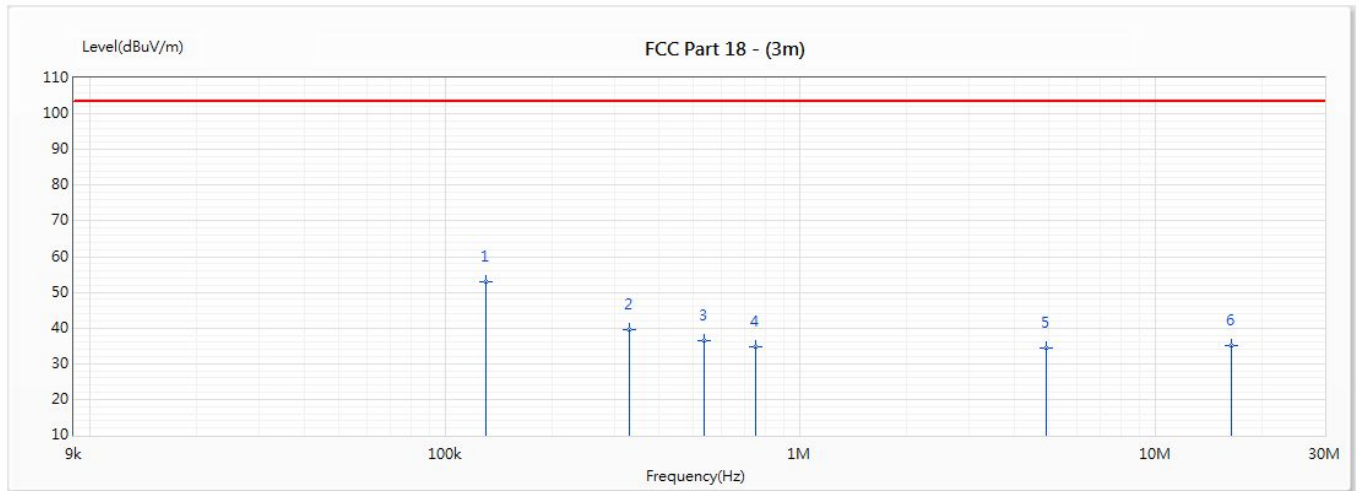
The turn table can rotate 360 degrees to determine the position of the maximum emission level and the antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

Radiated emissions were investigated over the frequency range from 30MHz to 1GHz using a receiver bandwidth of 120kHz. Radiated was performed at an antenna to EUT distance of 10 meters.

3.5. Test Result

Model No	CONTINENTAL-WLC-CEM00	Site	CB8
Test Voltage	DC 13.5V	Test Date	2020/3/24
Test Mode	Mode 1	Engineer	Way
Polarity	Horizontal	Temperature (°C)	26
Test Condition	--	Humidity (%RH)	63

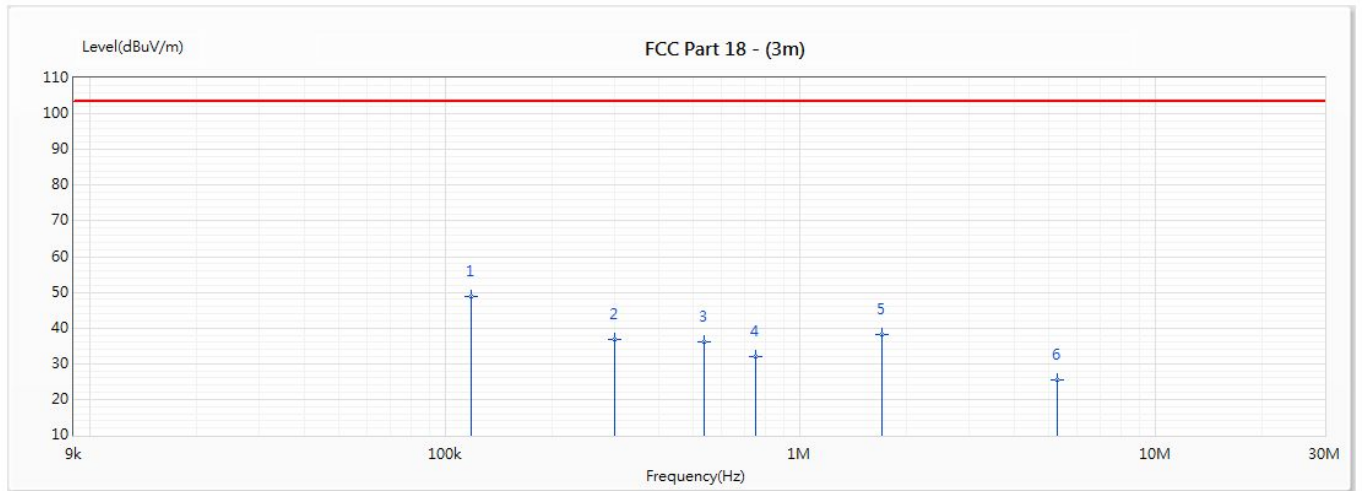


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Ant Pos (cm)	TT Pos (deg)	Detector Type
* 1	0.13	52.83	103.52	-50.69	33.62	19.21	100	66	QP
2	0.329	39.50	103.52	-64.02	19.70	19.80	100	82	QP
3	0.538	36.43	103.52	-67.09	16.62	19.81	100	-32	QP
4	0.747	34.90	103.52	-68.62	15.05	19.85	100	99	QP
5	4.926	34.50	103.52	-69.02	14.41	20.09	100	-117	QP
6	16.418	35.11	103.52	-68.41	13.32	21.79	100	97	QP

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
3. Margin=Emission Level-Limit.

Model No	CONTINENTAL-WLC-CEM00	Site	CB8
Test Voltage	DC 13.5V	Test Date	2020/3/24
Test Mode	Mode 1	Engineer	Way
Polarity	Vertical	Temperature (°C)	26
Test Condition	--	Humidity (%RH)	63

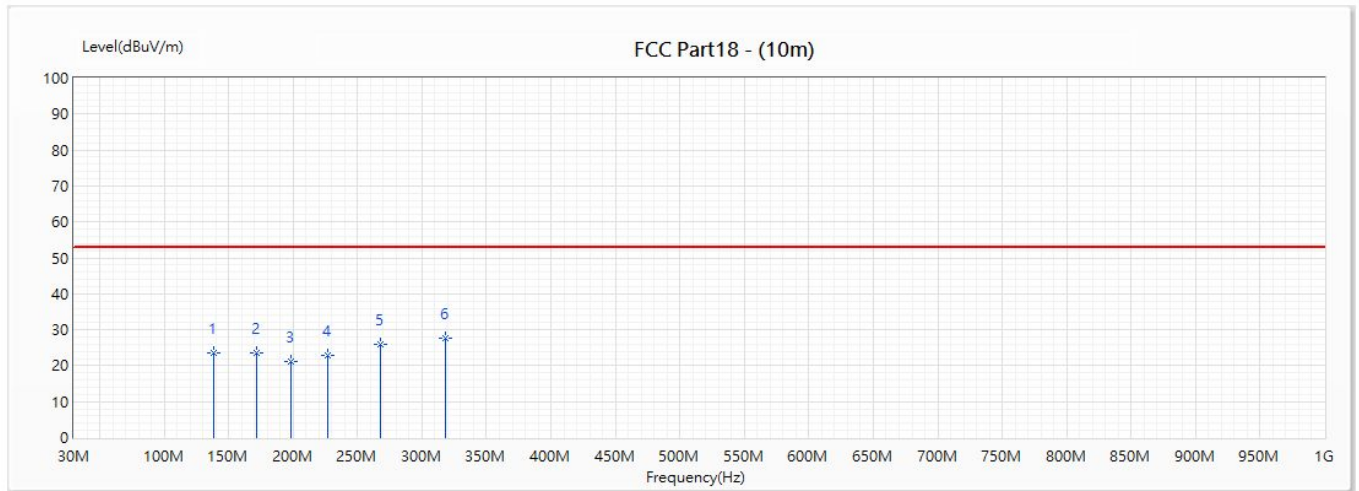


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Ant Pos (cm)	TT Pos (deg)	Detector Type
* 1	0.118	48.77	103.52	-54.75	29.61	19.16	100	100	QP
2	0.299	36.88	103.52	-66.64	17.08	19.80	100	108	QP
3	0.538	36.11	103.52	-67.41	16.30	19.81	100	92	QP
4	0.747	32.06	103.52	-71.46	12.21	19.85	100	-165	QP
5	1.702	38.08	103.52	-65.44	18.18	19.90	100	82	QP
6	5.284	25.56	103.52	-77.96	5.37	20.19	100	-81	QP

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
3. Margin=Emission Level-Limit.

Model No	CONTINENTAL-WLC-CEM00	Site	SITE6
Test Voltage	DC 13.5V	Test Date	2020/3/18
Test Mode	Mode 1	Engineer	John
Polarity	Horizontal	Temperature (°C)	20.7
Test Condition	--	Humidity (%RH)	78

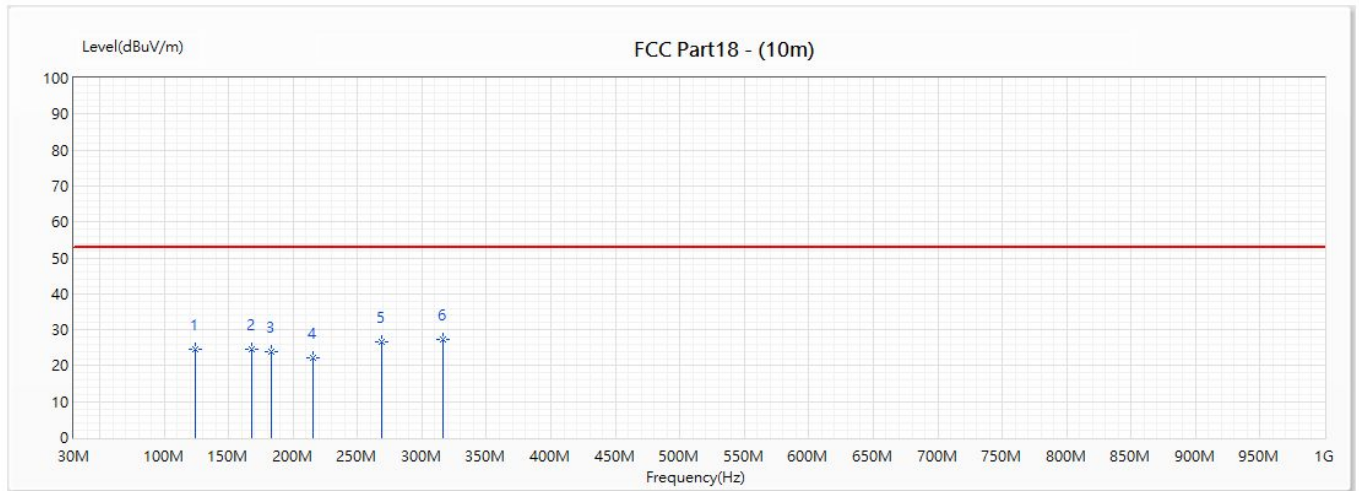


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Ant Pos (cm)	TT Pos (deg)	Detector Type
1	138.42	23.57	53.00	-29.43	34.51	-10.94	400	-29	QP
2	172.16	23.41	53.00	-29.59	33.80	-10.39	400	52	QP
3	198.66	21.24	53.00	-31.76	33.70	-12.46	400	65	QP
4	227.26	22.88	53.00	-30.12	35.20	-12.32	400	118	QP
5	268.2	25.79	53.00	-27.21	35.40	-9.61	400	166	QP
* 6	318.06	27.66	53.00	-25.34	35.10	-7.44	221	166	QP

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level - Limit.

Model No	CONTINENTAL-WLC-CEM00	Site	SITE6
Test Voltage	DC 13.5V	Test Date	2020/3/18
Test Mode	Mode 1	Engineer	John
Polarity	Vertical	Temperature (°C)	20.7
Test Condition	--	Humidity (%RH)	78



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Ant Pos (cm)	TT Pos (deg)	Detector Type
1	124.22	24.61	53.00	-28.39	37.20	-12.59	100	69	QP
2	168.22	24.44	53.00	-28.56	34.50	-10.06	100	86	QP
3	183.44	24.02	53.00	-28.98	35.60	-11.58	100	-78	QP
4	215.42	22.08	53.00	-30.92	34.60	-12.52	100	108	QP
5	268.32	26.59	53.00	-26.41	36.20	-9.61	100	78	QP
* 6	316.12	27.41	53.00	-25.59	34.90	-7.49	100	87	QP

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level - Limit.