

FCC Part 15C

Measurement and Test Report

For
Shenzhen Future Automotive Technology Co,Ltd

FCC ID: 2ARYD-FC8091

FCC Rules: FCC Part 15C

Product Description: Vehicle phone wireless charger

Tested Model: FC8091

Report No.: BSL11463801RF

Tested Date: November 14~16, 2018

Issued Date: November 30,2018

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Shenzhen Future Automotive Technology Co,Ltd
Fuyong Street Fuyuan No.2 Road 10th Forzen
Address of applicant: Technology B third story B,Baoan District ShenZhen
City Guangdong Province,China

Manufacturer: Shenzhen Future Automotive Technology Co,Ltd
Fuyong Street Fuyuan No.2 Road 10th Forzen
Address of manufacturer: Technology B third story B,Baoan District ShenZhen
City Guangdong Province,China

General Description of EUT	
Product Name:	Vehicle phone wireless charger
Trade Name:	酷霸
Model No.:	FC8091
Adding Model(s):	FC8092,FC8093,FC8094,FC8095,FC8096,FC8097,FC8098,FC8099,FC8100,FC8101,FC8102,FC8103,FC8104,FC8105
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Frequency Range:	110~205KHz
Rated Voltage:	DC 5V (Wireless output)
Rated Current:	1A (Wireless output)
Rated Power:	5W (Wireless output)

1.2 Test Standards

The following report is prepared on behalf of the Dolphin Electronics Co., Ltd in accordance with Part 2, Subpart J, and FCC Part 15, Subpart B, Subpart C, and section 15.203, 15.205 and 15.209 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.205, 15.207, and 15.209 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

BSL Testing Co.,LTD.
NO. 24, ZH Park, Nantou, Shenzhen, 518000 China
Designation Number : CN1217
Test Firm Registration Number: 866035
Tel: 86- 755-26508703
Fax: 86- 755-26508703

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	Charging	With load
TM2	Charging	With mobile phone

Note: Test was performed with TM1 and TM2, TM1 is the worst case so it is only showed in this report.

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
AUX Cable	0.8	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Mobile Phone	SAMSUNG	SM-920V	/
Adapter	/	/	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
Communication Tester	Rohde & Schwarz	CMW500	100358	2018-11-08	2019-11-07
Spectrum Analyzer	R&S	FSP40	100550	2018-10-08	2019-10-07
Test Receiver	R&S	ESC17	US47140102	2018-10-08	2019-10-07
Signal Generator	HP	83630B	3844A01028	2018-10-08	2019-10-07
Test Receiver	R&S	ESPI-3	100180	2018-10-08	2019-10-07
Amplifier	Agilent	8449B	4035A00116	2018-10-08	2019-10-07
Amplifier	HP	8447E	2945A02770	2018-10-08	2019-10-07
Signal Generator	IFR	2023A	202307/242	2018-10-08	2019-10-07
Broadband Antenna	SCHAFFNER	2774	2774	2018-10-21	2019-10-20
Biconical and log periodic antennas	ELECTRO-METRICS	EM-6917B-1	171	2018-10-21	2019-10-20
Horn Antenna	R&S	HF906	100253	2018-10-21	2019-10-20
Horn Antenna	EM	EM-6961	6462	2018-10-21	2019-10-20
LISN	R&S	ESH3-Z5	100196	2018-10-08	2019-10-07
LISN	COM-POWER	LI-115	02027	2018-10-08	2019-10-07
3m Semi-Anechoic Chamber	Chengyu Electron	9 (L)*6 (W)* 6 (H)	BSL086	2018-10-08	2019-10-07
Horn Antenna	Schwarzbeck	BBHA9170	00814	2018-10-21	2019-10-20
Loop Antenna	Schwarz beck	FMZB 1516	9773	2018-06-16	2019-06-15

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.207 (a) Conducted Emission	N/A
§15.209(a) Radiated Emission	Compliant

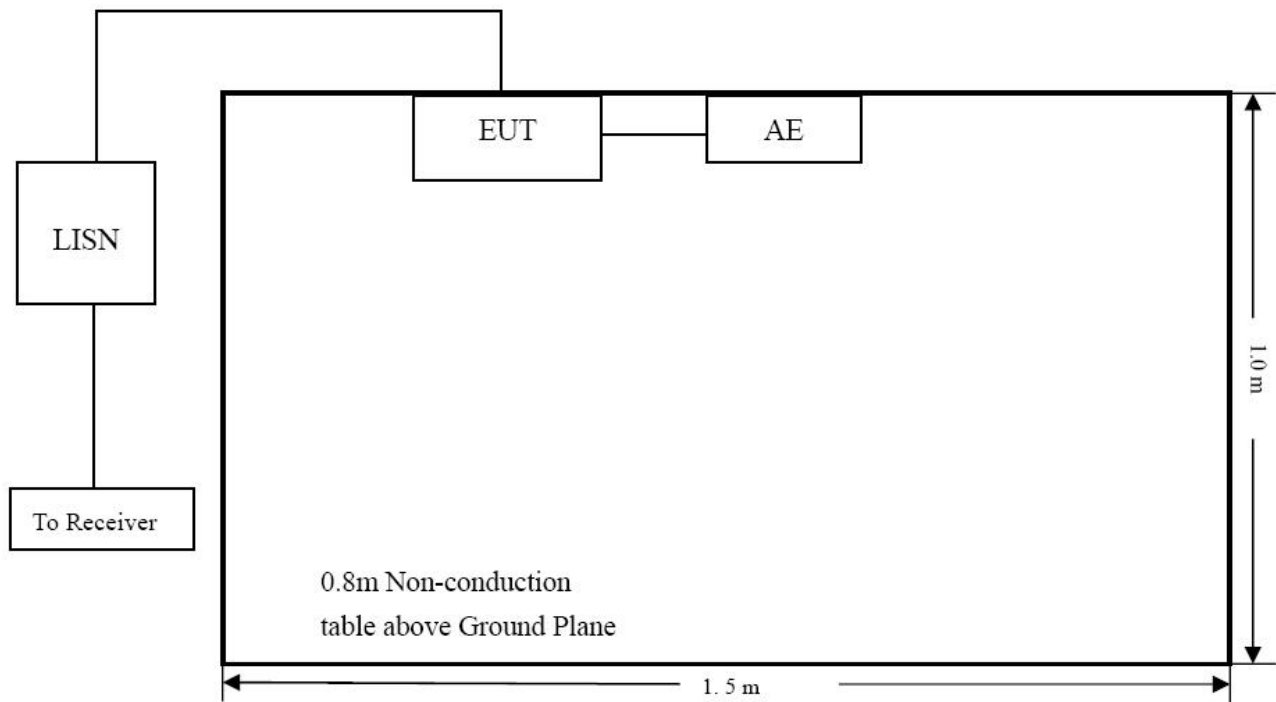
N/A: not applicable

3. CONDUCTED EMISSIONS

3.1 Test Procedure

Test is conducting under the description of ANSI C63.10-2013, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.4 Summary of Test Results/Plots

EUT uses battery to power

3.5 Conducted Emissions Test Data

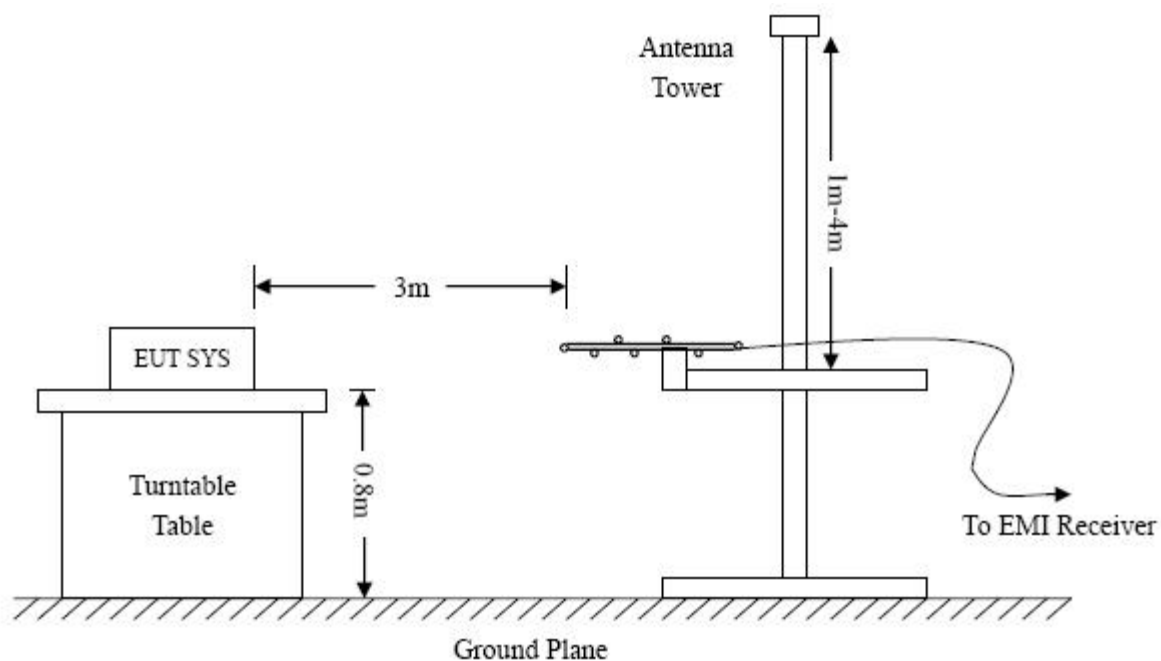
N/A

4. RADIATED EMISSION

4.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.



4.2 Test Receiver Setup

Frequency :9kHz-30MHz
 RBW=10KHz,
 VBW =30KHz
 Sweep time= Auto
 Trace = max hold
 Detector function = peak

Frequency :30MHz-1GHz
 RBW=120KHz,
 VBW=300KHz
 Sweep time= Auto
 Trace = max hold
 Detector function = peak, QP

Frequency :Above 1GHz
 RBW=1MHz,
 VBW=3MHz(Peak), 10Hz(AV)
 Sweep time= Auto
 Trace = max hold
 Detector function = peak, AV

4.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for this device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.209(a) Limit}$$

4.4 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 15.209(a) rule, and had the worst margin of:

-12.78 dB at 42.4508 MHz in the Vertical polarization, 9 KHz to 1 GHz, 3Meters

Plot of Radiated Emissions Test Data(Below 30MHz)

EUT: Vehicle phone wireless charger

Tested Model: FC8091

Operating Condition: TM1

Comment: DC 12V

Test Specification: Loop Antenna

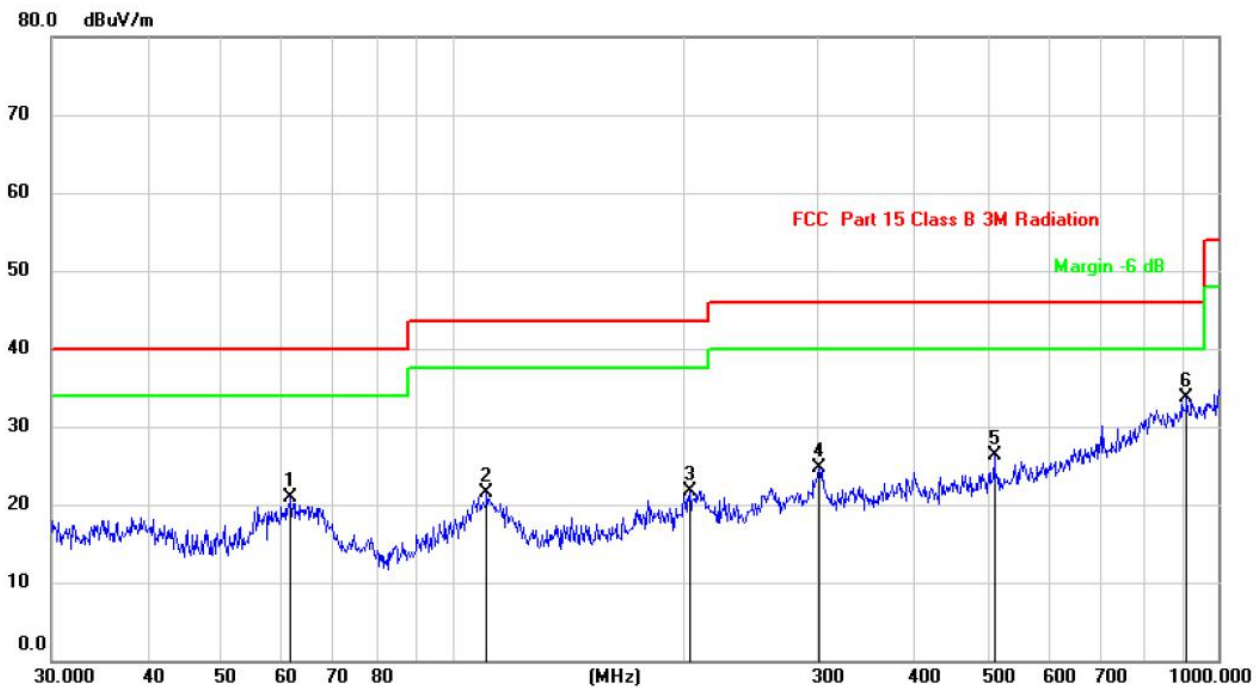
No.	Frequency	Reading	Detector	Emission	Limit	Margin
	(KHz)	(dBuV)	(PK/QP/A)	(dBuV/m)	(dBuV/m)	(dB)
1	39	82.62	AV	89.62	115.78	-26.16
2	58	81.51	AV	88.35	112.34	-23.99
3	107	64.24	QP	79.51	107.02	-27.51
4	258	63.58	AV	78.24	99.37	-21.13
5	388	61.94	AV	76.58	95.83	-19.25
6	443	71.35	AV	78.94	94.68	-15.74
7	480	62.57	AV	75.51	93.98	-18.47
8	1154	55.95	QP	48.24	66.36	-18.12
9	1562	39.74	QP	42.84	63.73	-20.89

1. “*” Means Fundamental frequency

2. Emission Level [dBμV/m] = Reading [dBμV] + Ant. Factor [dB/m] + Cable Loss [dB]

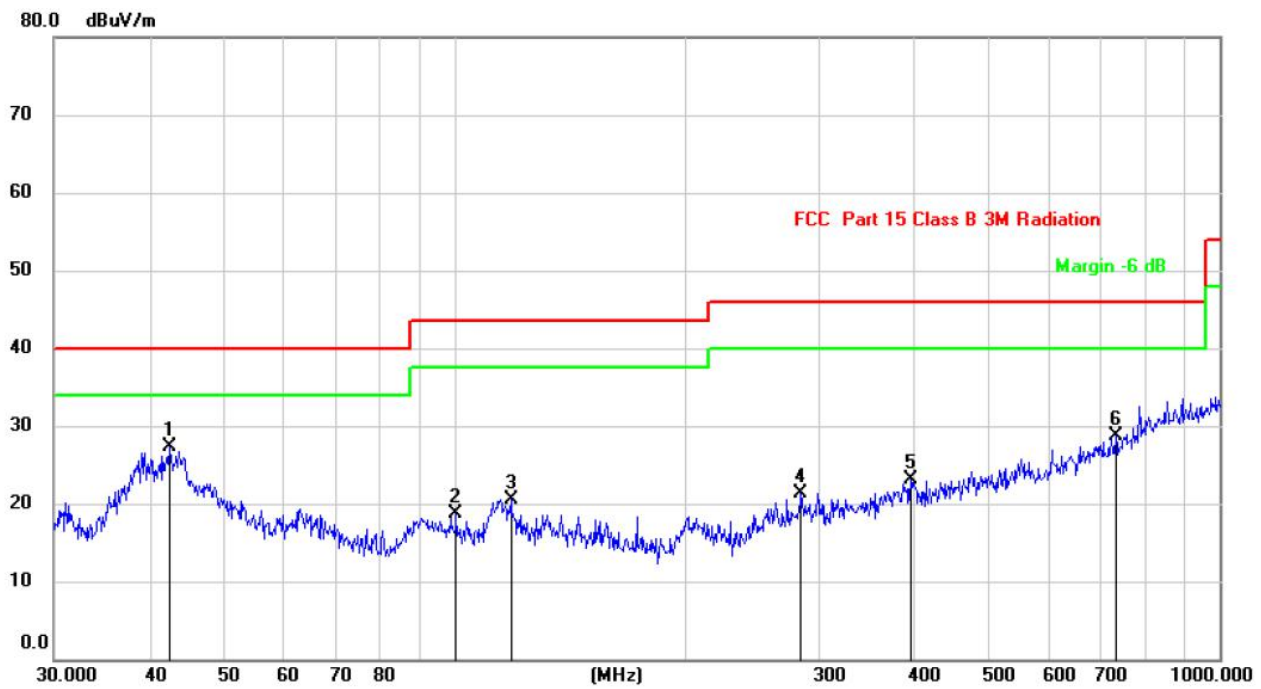
3. Margin [dB] = Emission Level [dBμV/m] – Limit [dBμV/m]

4. Limit calculation: Limit at specified distance + 40log (300/3) = Limit + 80 dB for up to 0.49 MHz Limit at specified distance + 40log (30/3) = Limit + 40 dB for above 0.49 MHz, Below 30 MHz

Plot of Radiated Emissions Test Data (From 30MHz to 1GHz)*EUT: Vehicle phone wireless charger**Tested Model: FC8091**Operating Condition: TM1**Comment: DC 12V**Test Specification: Horizontal*

No.	Mk.	Freq.	Measure- ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		61.5618	20.84	40.00	-19.16	QP		
2		110.9571	21.55	43.50	-21.95	QP		
3		204.2377	21.70	43.50	-21.80	QP		
4		301.4224	24.79	46.00	-21.21	QP		
5		510.0436	26.27	46.00	-19.73	QP		
6	*	909.6667	33.76	46.00	-12.24	QP		

Test Specification: Vertical



No.	Mk.	Freq.	Measure- ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	42.4508	27.22	40.00	-12.78	QP		
2		100.5806	18.64	43.50	-24.86	QP		
3		118.6014	20.59	43.50	-22.91	QP		
4		283.9791	21.32	46.00	-24.68	QP		
5		394.8545	23.13	46.00	-22.87	QP		
6		731.9203	28.65	46.00	-17.35	QP		

***** END OF REPORT *****