Document Title: Wireless Charging Coil -10W, Low Frequency Receive Product Specification		
Revision	Responsibility	Date
Rev B	Zhou Tao	2016/12/27

1461790001 Wireless Charging Coil -10W, Low Frequency Receive

1.0 SCOPE

This Product Specification covers the environmental and mechanical performance requirements for Wireless Charging Coil -10W, Low Frequency Receive.

2.0 PRODUCT DESCRIPTION

2.1 Product Name

Wireless Charging Antenna Coil -10W Low Frequency Receive

2.2 Product Description

This high efficiency coil is made of a copper printed circuit board and ferrite shield, designed for high performance mobile phones, handheld mobile terminals or any other device / accessory requiring up to 10W power receive using Low Frequency wireless charging standard like Qi or PMA. Standard PCB construction enables integration with other electronics, high durability, and high yield manufacturing and consistent performance.

2.3 Series No.

146179

2.4 BOM

| Molex PN	Part Description
1461790001	Wireless Charging Coil – 10W Low Frequency Receive

3.0 DESIGN AND CONSTRUCTION

For details, please refer to the 2D sales drawing at www.molex.com

REVISION: **B**	ECR/ECN INFORMATION: EC No: **111410** DATE: **2016/ 12/ 27**	TITLE: **Wireless Charging Coil -10W, Low Frequency Receive**	SHEET No. **1** of **4**
DOCUMENT NUMBER: **PS-146179-001**	CREATED / REVISED BY: **Tao Zhou**	CHECKED BY: **Yuxi Gao**	APPROVED BY: **Chris Yu**

TEMPLATE FILENAME: PRODUCT_SPEC[SIZE_A4](V.1).DOC
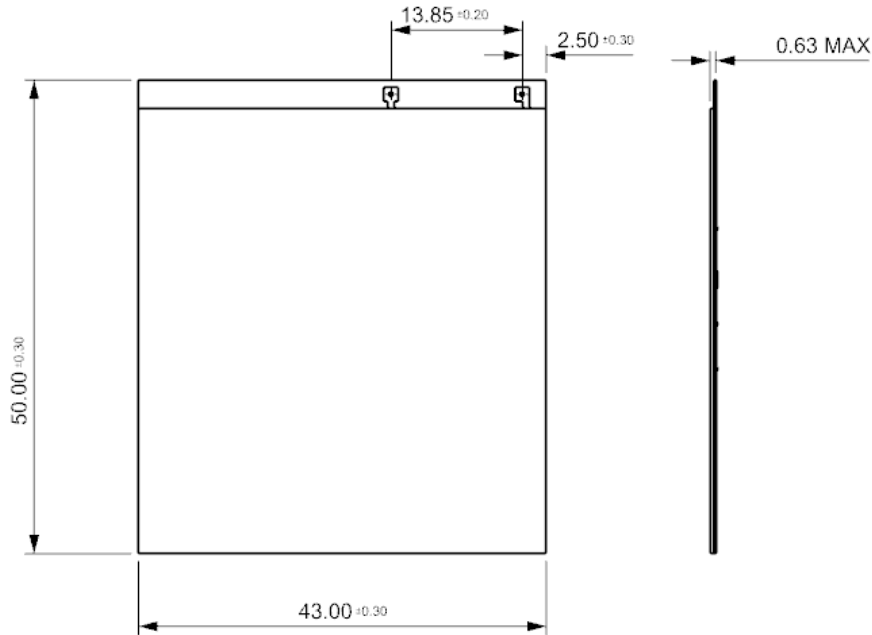
4.0 ELECTRICAL REQUIREMENTS

Electrical Parameters at 25°C			
Inductance +/-2%, @ 200kHz (uH)	DCR +/- 2% (mOhm)	ESR +/- 2%(mOhm)	Typical End-End Efficiency[1] (%)
17.3	450	975	>70

[1] End to End Efficiency is typical and will depend on Power Amplifier, matching circuit, device configuration, charging distance and other factors. Please contact Molex directly if further guidance is required; www. Molex.com or via phone at 1 800-78MOLEX (1 800 786-6539).

5.0 PRODUCT MECHANICAL AND ENVIRONMENT REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	ACCEPTANCE CRITERIA
5.1	Thermal Cycling Test	• -40°C to 85°C,23 min dwell,20°C/min ramp rate,100 cycles. • Verify functionality pre and post-test.	• Parts shall not have any peeling off, damage. • Parts shall meet the electrical requirement before and after test.

REVISION: **B**	ECR/ECN INFORMATION: EC No: **111410** DATE: **2016/ 12/ 27**	TITLE: **Wireless Charging Coil -10W, Low Frequency Receive**	SHEET No. **2** of **4**
DOCUMENT NUMBER: **PS-146179-001**	CREATED / REVISED BY: **Tao Zhou**	CHECKED BY: **Yuxi Gao**	APPROVED BY: **Chris Yu**

5.2	Heat Soak Test	• 65°C/90 % RH Humidity, 168 hrs. • Verify functionality pre and post-test.	• Parts shall not have any peeling off, damage. • Parts shall meet the electrical requirement before and after test.
5.3	Salt Mist	• The device under test is exposed to a spray of a 5%(by volume) resolution of NaCl in water for 48 hours. • Visual Inspect the part and verify functionality pre and post-test	• Parts shall meet the electrical requirement before and after test.

6.0   PACKAGING REQUIREMENT

6.1 Packaging Method

Please refer to Molex packaging drawing for the details at www.molex.com

6.2 Packaging Test

Packaging test method refers to Molex documents of IEP-02 & ES-4000-7001:

ITEM	DESCRIPTION	TEST CONDITION	ACCEPTANCE CRITERIA
6.2.1	Drop Test	➤ Drop height: 120 cm ➤ Packed carton box with full product for sufficient gross weight. ➤ Cycle: 1 Cycle ➤ Angle: Test in each ten (10) angles of the carton box onto the floor	➤ No Permanent Damage Visual / Mechanical ➤ No Appreciable Electrical Degradation Pre / Post Performance
6.2.2	Vibration Test	➤ Test Method: ASTM 5112 or ISO 2247 or ISTA 2A or JIS Z 0200 or equivalent ➤ Start the test machine to vibrate at 25.4 mm / 1 inch total displacement. ➤ The frequency should be 240 cycles per minute and 4.0 Hz with a maximum acceleration ± 10.78 m/s2 (± 1.1 G)	➤ No Permanent Damage Visual / Mechanical ➤ No Appreciable Electrical Degradation Pre / Post Performance

REVISION: **B**	ECR/ECN INFORMATION: EC No: **111410** DATE: **2016/ 12/ 27**	TITLE: **Wireless Charging Coil -10W, Low Frequency Receive**	SHEET No. **3** of **4**
DOCUMENT NUMBER: **PS-146179-001**	CREATED / REVISED BY: **Tao Zhou**	CHECKED BY: **Yuxi Gao**	APPROVED BY: **Chris Yu**

7.0 OTHERS

Store in package or tightly re-closed box with the following conditions:

Temperature: -10°C to +40 °C

Humidity: 15 % to 85 % RH

Check the terminal function before use, if the product has been stored for more than 6 months.

8.0 DEFINITIONS FOR REFERENCE

Equivalent Series Resistance (ESR): resistance measured at or around the operating frequency. ESR accurately characterizes any losses such as skin effect or proximity effect and any additional effects that may occur in the presence of material such as shielding, metal backing, or the housing. Comparison of coil assembly and in situation ESR measurements can accurately determine sources of loss. This metric should be given serious consideration during product selection to ensure full characterization of system electrical parameters.

Direct Current Resistance (DCR): resistance measured at DC or measured at very low frequencies (60 Hz - 100 Hz) and is often considered an incomplete measurement in wireless charging environments because it does not take into account actual causes of resistance during operation. NuCurrent recommends ESR as the most relevant measurement of resistance in a wireless power coil, but provides DCR values as well.

Product Tuning: Tuning is a critical aspect that greatly impacts system performance. The receiver coil should be placed in the final housing, placed on desired charging surface, and have situational inductance, Ls', measured. The necessary tuning capacitor values can be calculated using Equation 1:

$$C_{tune} = \frac{1}{(2 * \pi * f)^2 * Ls'} \; (1)$$

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
B	EC No: **111410** DATE: **2016/ 12/ 27**	**Wireless Charging Coil -10W, Low Frequency Receive**	**4** of **4**

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