

**5W Rx Coil for Low frequency wireless power transfer**

**Product Name**

Wireless Charging Coil - Dual Band, NFC, Low Frequency Receive

Molex PN	Part Description
1461794001	Wireless Charging Coil - Dual Band, NFC, Low Frequency Receive

<b>REVISION:</b>  <b>B</b>	<b>ECR/ECN INFORMATION:</b> EC No: 111410 DATE: 2016/12/28	<b>TITLE:</b>  <b><u>5W Rx Coil for Low frequency wireless</u></b>		<b>SHEET No.</b>  <b>1 of 5</b>
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## Low Frequency Dual Mode + NFC Rx

### 5W Rx COIL FOR LOW FREQUENCY WIRELESS POWER TRANSFER

#### FEATURES

- Industry's highest FPCB Q Factor
- Smartphone and accessory form factor
- Industry leading thinness of 0.57 mm MAX (w/shield)
- Enables high efficiency solutions  
>70% Efficient
- FPCB construction:
  - Increased durability
  - Repeatable performance
  - Integration with other electronics

Molex Part Number

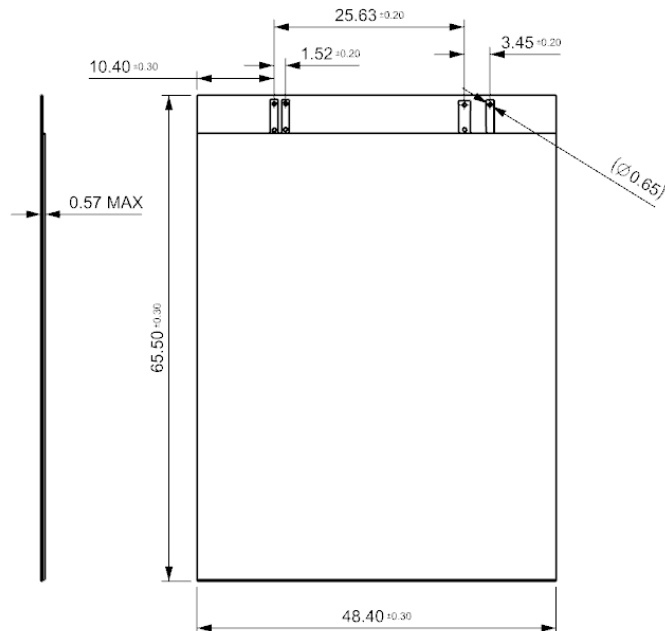
1461794001

#### Electrical Parameters at 25°C

Inductance +/-2%, @ 200kHz (uH)	DCR +/- 2% (mOhm)	ESR +/- 2% (mOhm)	Quality Factor
8.9	350	435	25

#### Mechanical Parameters (mm)

Coil Thickness	Assembly Thickness (w/shield)	Material
0.24	0.57 MAX	Flex

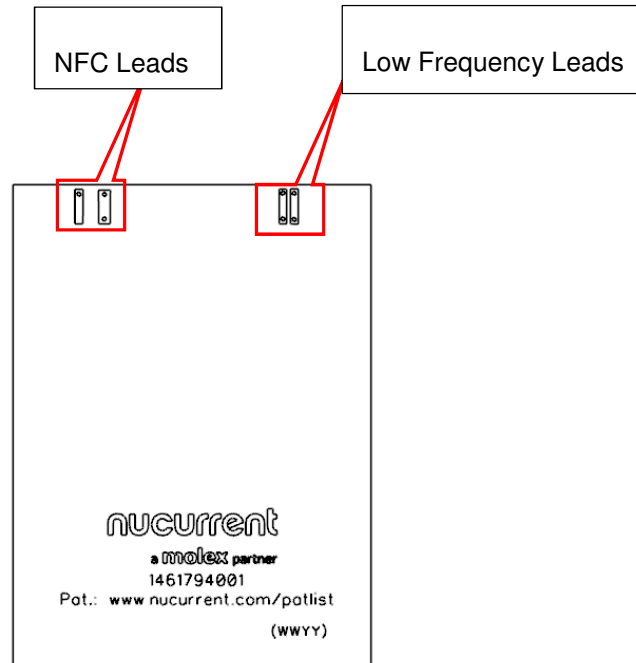


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## Low Frequency Dual Mode + NFC Rx

NFC and Low Frequency Leads:



### GENERAL DESCRIPTION:

This specification describes a FPCB receiver coil for wireless power transfer at frequencies 100 kHz to 300 kHz. The information in this document is for reference and benchmark purposes only. The user is responsible for validating coil performance based on users own testing environment.

### PRODUCT DESCRIPTION:

This high efficiency coil is designed for high performance mobile phones, handheld mobile terminals or any other device / accessory requiring up to 5W power out. Standard FPCB construction enables integration with other electronics, high durability, high yield manufacturing and consistent performance.

### DEFINITIONS:

**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.

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### 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,  $L_s'$ , measured. The necessary tuning capacitor values can be calculated using Equation 1:

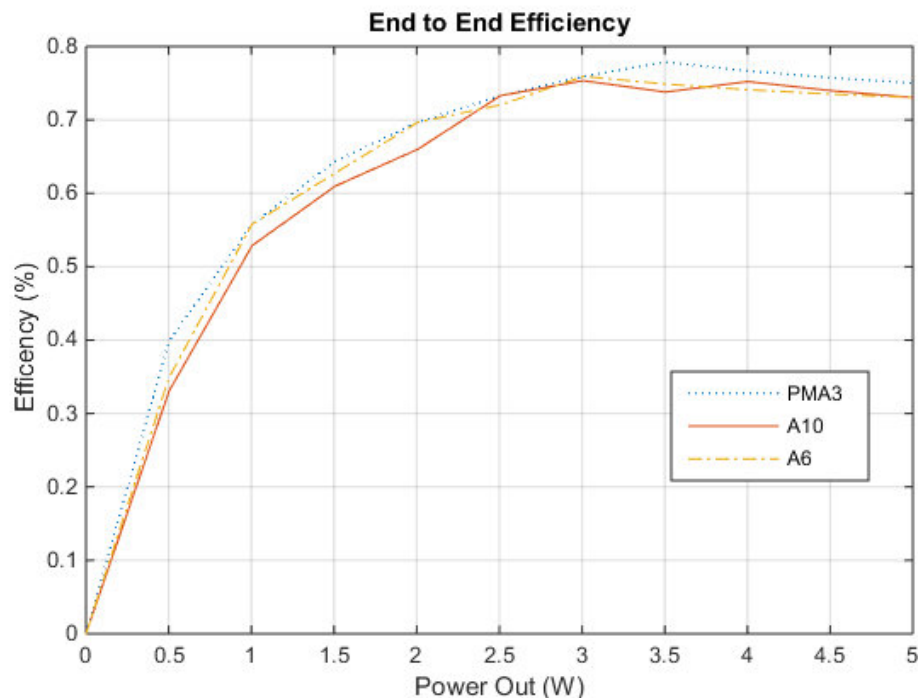
$$C_{tune} = \frac{1}{(2 * \pi * f)^2 * L_s'} \quad (1)$$

\*It is important to note that the equation above should be used as reference, and for additional tuning information, please check appropriate system datasheets for further information.

For detailed product specific tuning information, please contact Molex at [www.molex.com](http://www.molex.com) or via phone 1 800-78MOLEX (1 800 786-6539).

### PERFORMANCE:

For custom applications, Molex and NuCurrent can optimize antenna assemblies for thickness, price or efficiency. The data below demonstrates the performance of the coil up to 5W on multiple transmitters.



Test Equipment used for all tests

- Standard Qi/PMA transmitter
- Standard Qi/PMA receiver
- Coil assembly (coil and shield)

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## Low Frequency Dual Mode + NFC Rx

### NFC CHARACTERISTICS

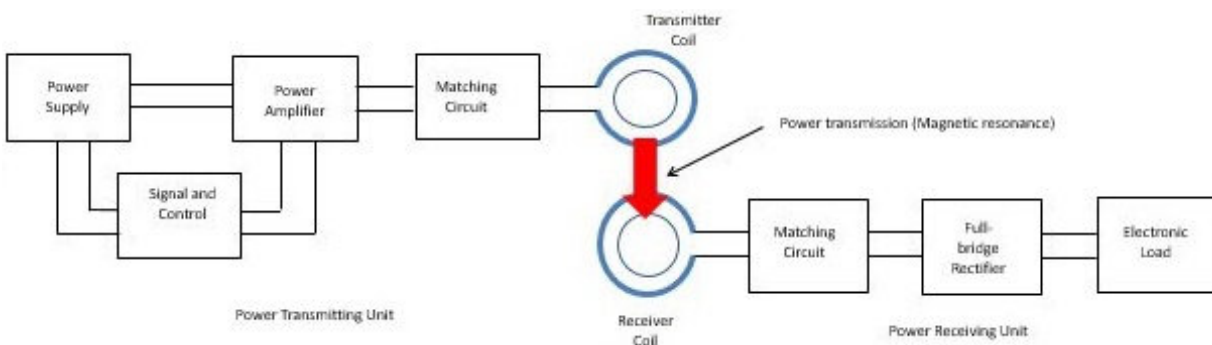
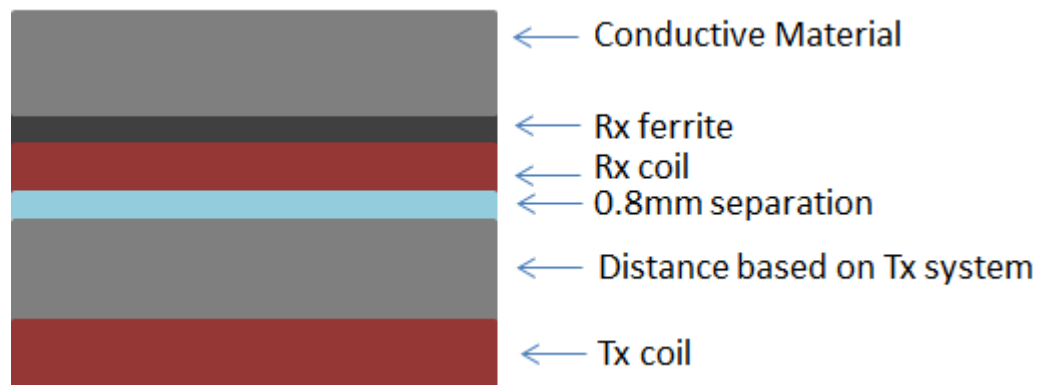
NFC Electrical Parameters		
Inductance (uH)	DCR (mOhm)	Q (typ)
1.6	100	15

### GENERAL REQUIREMENTS:

#### A. CONNECTIONS FOR TESTING

- I. 28AWG copper wire recommended for pad soldering

#### B. RECOMMENDED TEST SETUP



### REFERENCE DOCUMENTS:

Please see Company website for more information.