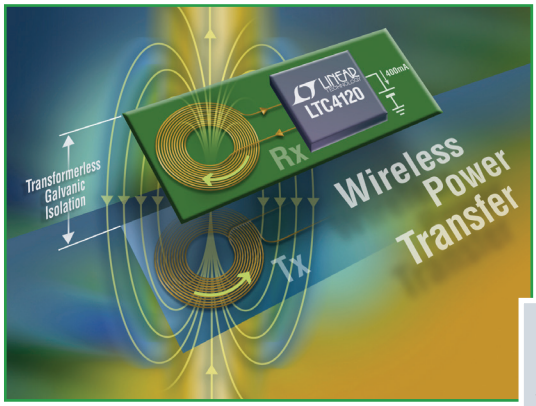
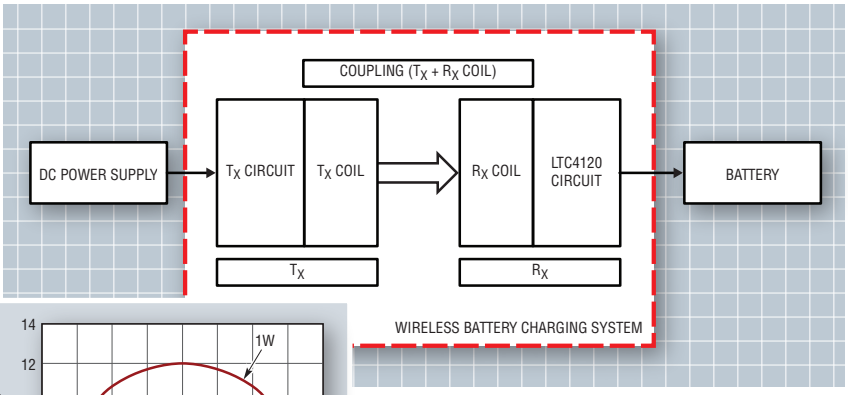
Wireless Power Transfer ICs

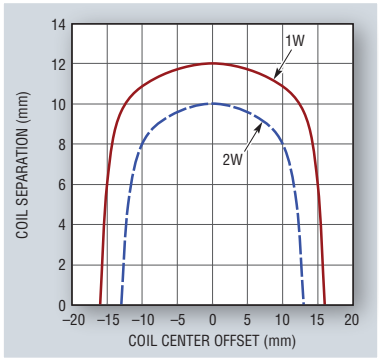
An inductive wireless power transfer (WPT) system consists of transmitter electronics, transmit coil, receive coil and receiver electronics. The LTC®4120-based resonant coupled system uses dynamic harmonization control (DHC) to optimize power transfer and provide overvoltage protection. This eliminates the need for precise mechanical alignment between the transmit and receive coils as well as the need for a coupling core. The LTC4120 wireless buck charger forms the basis for the receiver electronics. The receive coil can be integrated into the receiver electronics circuit board. The LTC4125 is a power controller for a simple but versatile wireless power transmitter. The LTC4125 enhances a basic wireless power transmitter by providing three additional key features: an AutoResonant™ function that maximizes available receiver power, an Optimum Power Search algorithm that maximizes overall wireless power system efficiency and foreign object detection to ensure safe and reliable operation when operating in the presence of conductive foreign objects.

LTC4120 Product Page: **www.linear.com/product/LTC4120**
LTC4120 Application Note: **www.linear.com/docs/43968**
LTC4125 Product Page: **www.linear.com/product/LTC4125**
LTC4123 Product Page: **www.linear.com/product/LTC4123**





Wireless Power Transfer System Charging Block Diagram



Battery Charge Power vs R_X-T_X Coil Location

Part Number	Device Architecture	V_{IN} Range (V)	Power Level (W)	AutoResonant Drive	Foreign Object Detection	Optimum Power Transfer	Practical Coupling Distance (mm)	Package (mmxmm)
Wireless Power Transmitter								
LTC4125	Wireless Transmitter	3 to 5.5	5	Yes	Yes	Yes	13 Full Power 16 Half Power	4x5 QFN-20

Part Number	Device Architecture	V_{IN} Range (V)	Power Level (W)	Charge Current (mA)	Practical Coupling Distance (mm)	Cell(s) Chemistry	Charge Termination Method	Package (mmxmm)
Battery Chargers								
LTC4120	Wireless Reciever & Battery Charger	4.25 to 40	2	50 to 400	12	1 to 3 Lithium	Adj. Timer	3x3 QFN-16
LTC4123	Wireless Reciever & Battery Charger	2.2 to 5	0.038	25	12	1 Nickle	Adj. Timer	2x2 DFN-6
LTC4071	Shunt Battery Charger	N/A Shunt	0.21	50	12	1 Lithium	Thermal NTC	2x3 DFN-8
LT3652HV	High Power Battery Charger	4.95 to 34 (40V Abs Max)	2	2A	12	1 to 5 Lithium Lead-Acid	Adj. Timer or C/10	3x3 DFN-12 MSOP-12E

LINEAR TECHNOLOGY

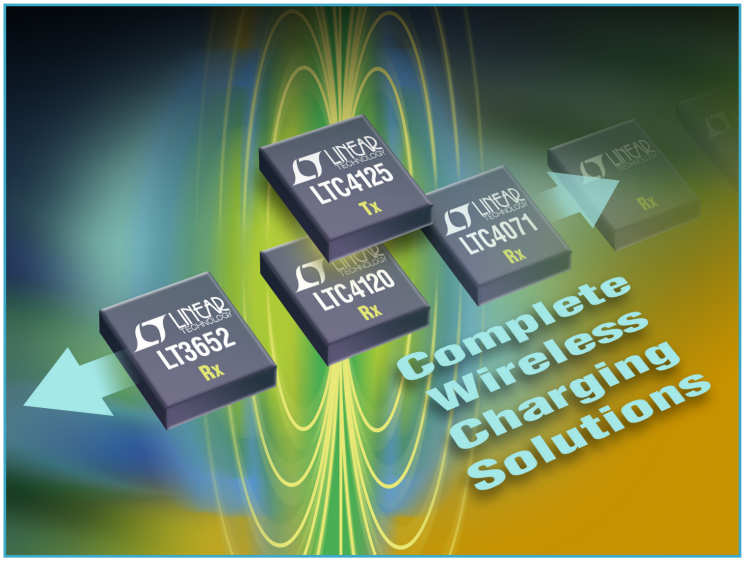
Wireless Power Receiver and Buck Battery Charger

Wireless Power Receiver/Charger

The LTC4120, a high performance wireless receiver and battery charger, serves as the central component of the receiver electronics in a wireless battery charging system. The Linear Technology wireless power system is designed to transmit up to 2W to a battery with a maximum charge current of 400mA. The programmable float voltage of the device accommodates several battery chemistries and configurations. The IC utilizes a patented dynamic harmonization control (DHC) technique that enables high efficiency contactless charging with maximum T_X to R_X coil distance and misalignment without any of the thermal or overvoltage issues typically associated with wireless power systems. Wireless charging with the LTC4120 enables or improves many different applications. For instance, expensive connectors which become failure-prone in harsh environments can be eliminated. Similarly, wireless charging allows for a completely sealed enclosure for applications that require sterilization. Elimination of wires enables rechargeable batteries to be placed in moving or rotating equipment. Some applications are simply too small to use a conventional connector. Wireless charging can also provide transformerless galvanic isolation for high reliability isolated applications.

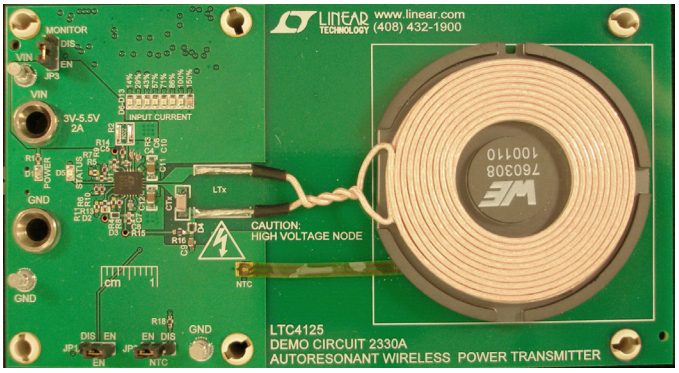
LTC4120 Features

- Dynamic Harmonization Control Reduces Alignment Sensitivity and Extends Power Transmission Range
- Enables Up to 2W Wireless Charging at Up to a 1.2cm Gap
- Adjustable Battery Charge Voltage: 3.5V to 11V
- 50mA to 400mA Charge Current, Programmed with a Single Resistor
- No Microprocessor or Firmware Required
- No Transformer Core
- Wide Rectified Input Voltage Range: 4.3V to 40V
- Thermally Enhanced 16-Lead 3mm × 3mm QFN Package

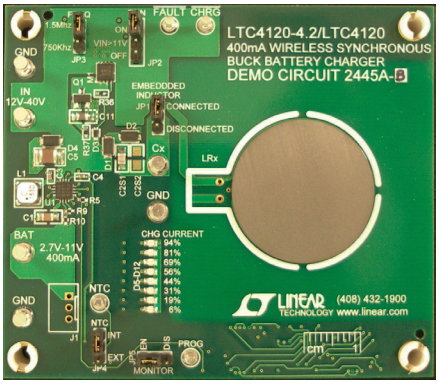


LTC4125: Monolithic 5W Wireless Power Transmitter

- AutoResonant Switching Frequency Adjusts to Resonant Capacitance and Transmit Coil Inductance
- Transmit Power Automatically Adjusts to Receiver Load
- Input Voltage Range: 3V to 5.5V
- Integrated 100mΩ Full Bridge Switches
- Multiple Foreign Object Detection Methods
- NTC Input for System/Component Temperature Qualified Power Transfer
- Thermally Enhanced 20-Lead 4mm × 5mm QFN Package



LTC4125 DC2386A/B Demo Kit
Transmitter Demo Circuit



LTC4120 DC2386A/B Demo Kit
Receiver/Charger Demo Circuit