

Precautions for Use

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The S-8473 Series and the S-8474 Series are wireless power ICs.

The S-8473 Series is a receiver control IC (Receiver), and the S-8474 Series is a transmitter control IC (Transmitter).

This application note serves as technical documentation that describes the combined operation and characteristics of the S-8473 Series and S-8474 Series.

Refer to the S-8473 Series and S-8474 Series datasheets for additional details.

- Caution 1. Wireless power transfer devices which use the S-8473 Series and S-8474 Series are optimized to operate at LC resonant frequencies of approximately 88kHz to 106kHz. Within the 88kHz to 106kHz LC resonant frequency range, the circuit for detecting the receiver control IC operates, and the transmitter control IC also operates correctly. If the constants of the used coil (L) and capacitor (C) are changed, the LC resonant frequency also will change, so make sure to maintain the LC resonant frequency within the 88kHz to 106kHz range.**
- 2. There is polarity to the receiver coil and transmitter coil in wireless power transfer devices which use the S-8473 Series and S-8474 Series. Combine receiver coils and transmitter coils according to the details in this application note.**

5. Precautions for Use

The S-8473 Series monitors the VBAT pin and the VSS pin voltage and performs charge control.

5.1 When connected to a battery

If the wiring loop area is large when connected to a battery, magnetic flux from the transmitter coil will be mixed into the circuit, and may affect charge control, so caution must be exercised. As a preventative measure, make the wiring as short as possible in order to minimize the wiring loop area. The following methods are recommended to minimize the wiring loop area.

- Twisted wiring
- Flexible wiring which narrows wiring interval

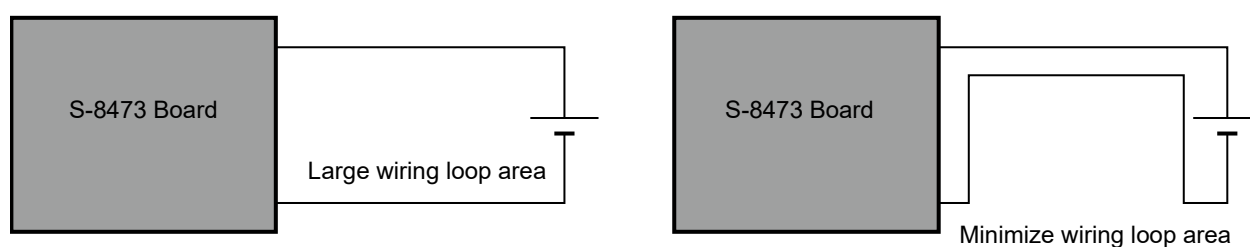


Figure 35 Battery Wiring Loop

5.2 When wiring the board

When wiring the board, make a single GND as described in the S-8473 Series datasheet.

In **Figure 36**, a large current repeatedly flows through the receiver coil and resonant capacitor as indicated by the arrow loop. For this reason, the dotted line GND wiring route voltage also continuously changes. In the wiring method like that shown in **Figure 36**, this voltage fluctuation is added to the battery voltage, the IC is unable to correctly monitor the battery voltage of the VBAT pin and VSS pin voltage. Therefore, charging may not be carried out properly, so caution must be exercised. Also caution is necessary so that the C_{CT} and NTC2 shown in **Figure 36** are not subjected to the voltage fluctuation of the dotted line GND wiring route.

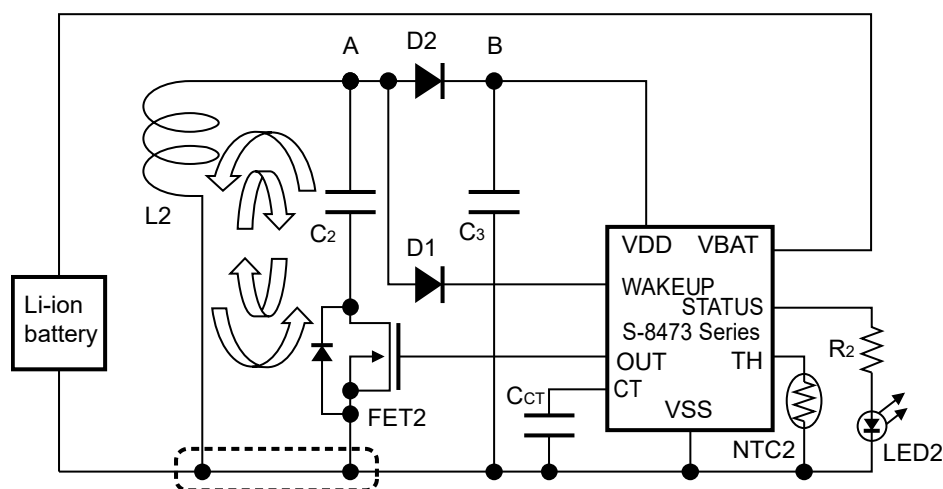


Figure 36 Bad Wiring Pattern Example

9. Board Design Considerations

- When wiring a board, make a single GND as described in the S-8473 Series and the S-8474 Series datasheets.
- To protect from overheat, be sure to connect an NTC thermistor to the TH pin for its use.
- For VCC in **Figure 47**, do not use a power supply which might cause frequency component amplitude of 1kHz to 110kHz (LC resonant frequency). It may result in a malfunction.
- For VDD in **Figure 47**, do not use a power supply which might cause frequency component amplitude to prevent from malfunction.
- When designing the board in **Figure 47**, for the following reasons, do not place a wiring near the RTON pin, the VS pin, and the TH pin. Layout so that resistor R_{TON} is as close to the RTON pin as possible.

(1) Due to coil L1 and resonant capacitor (C_1), large voltage fluctuation is generated at point C.

(2) Since impedance in the RTON pin, the VS pin, and the TH pin is high, they are easily affected by an extraneous signal. By connecting C_{RTON} (approximately 100pF to 1000pF) between the RTON pin and GND, C_{VS} (approximately 100pF to 1000pF) between the VS pin and GND and C_{NTC} (approximately 100pF to 1000pF) between the TH pin and GND, the influence of extraneous signal can be reduced.

When detecting the coil temperature using an NTC thermistor in particular, the detection temperature may shift to the high temperature side as a result of the effect of the coil signal. It is recommended that C_{NTC} be connected between the TH pin and GND.

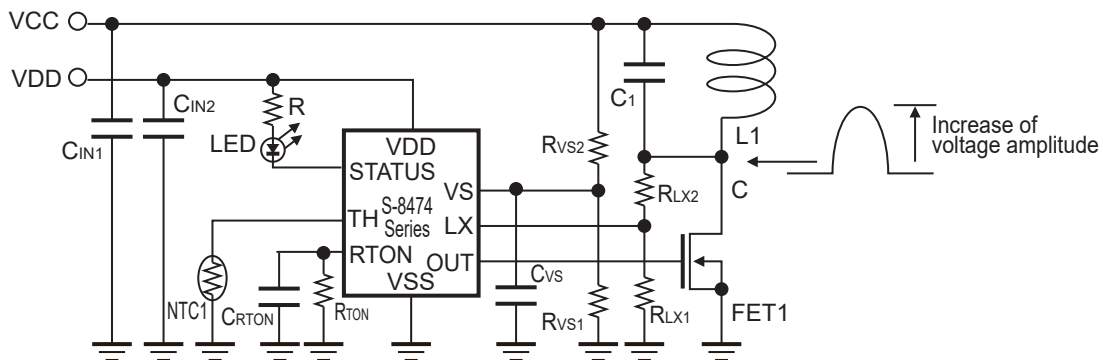


Figure 47

10. Precautions

- The usages described in this application note are typical examples using ABLIC Inc. ICs. Perform thorough evaluation before use.
- When designing for mass production using an application circuit described herein, the product deviation and temperature characteristics of the external components should be taken into consideration. ABLIC Inc. bears no responsibility for any patent infringements related to products using the circuits described herein.
- ABLIC Inc. claims no responsibility for any and all disputes arising out of or in connection with any infringement by products including this IC of patents owned by a third party.

11. Related Sources

Refer to the following datasheets for details of the S-8473 Series and the S-8474 Series.

S-8473 Series Datasheet
S-8474 Series Datasheet

The information described herein is subject to change without notice.
 Please contact our sales representatives for information regarding the latest product version / revision.