

GL7101EVM User Guide**GL7101S Evaluation Module****NOTICE**

This user's guide describes the characteristics, operation, and use of the GL7101 evaluation module. This module is designed to evaluate the performance of the GL7101 as earth leakage current detector IC with self-test. This document also includes a schematic, printed-circuit board (PCB) layouts, and bill of materials (BOM) for the GL7101 evaluation module.

CONTENTS

| | |
|--|---|
| 1. Overview ----- | 2 |
| 2. Hardware ----- | 2 |
| 2.1. Features ----- | 2 |
| 3. Operation ----- | 3 |
| 3.1. Setup before testing ----- | 3 |
| 3.2. Testing trip current and operation for GL7101 ----- | 4 |
| 4. Schematic ----- | 5 |
| 5. Printed-circuit board (PCB) layouts ----- | 6 |
| 6. Bill of materials (BOM) ----- | 7 |
| 7. Ordering Information ----- | 7 |

1. Overview

The GL7101 is designed for use in earth leakage circuit interrupters for operation directly off the AC line in breakers. It contains pre-regulator, main regulator, subsequent(after) regulator, differential amplifier, level comparator, and latch circuit. The input in the differential amplifier is connected to the secondary node of zero current transformer. The level comparator generates high level when earth leakage current is greater than a certain level.

2. Hardware

The GL7101 Module is intended to provide basic functional evaluation for the GL7101 device. The fixture layout is not intended to be a model for the target circuit. GL7101 Module as the board is designed to connect to a high-power AC source. The entire board uses high-voltage, thus the parts of it are not safe to touch when it is connected to a live source. The GL7101 Module is not designed to actually break or interrupt the source voltage in case a fault current is detected.

2.1. Features

The GL7101 Module provides the following features:

- The device can operate with an input voltage ranging from 110VAC to 220VAC.
- Ease of access to device pins with test points and sockets pins.
- The setup process for testing is simple

* For additional detailed information on the leakage current detector IC, please refer to the GL7101 datasheet.



Figure 1. GL7101 Evaluation Module Image

3. Operation

3.1. Setup before testing

Before Testing, follow the procedures below to set up.

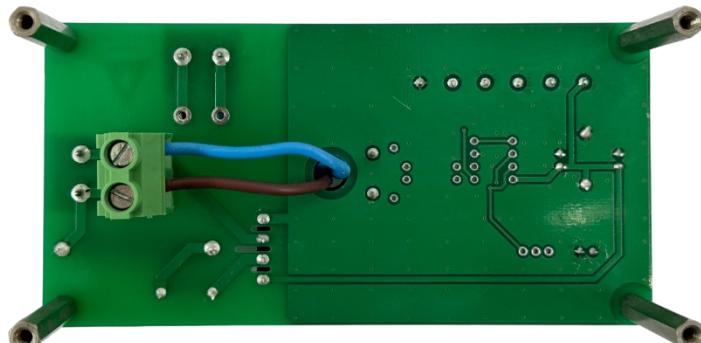
Step 1. Prepare equipment for safe high-voltage test setup.

Step 2. Ensure the GL7101 module is completely de-energized and not connected to any voltage source.

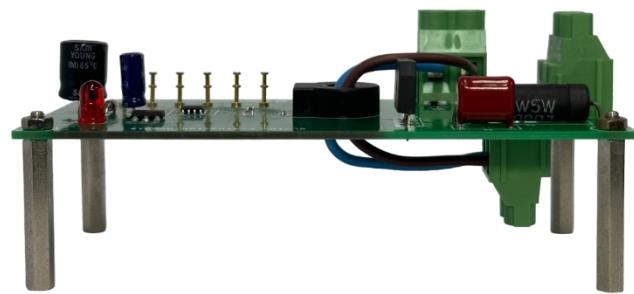
Step 3. Make sure the screw terminal and source wire are connected according to Figure 2.



Top View



Bottom View



Side View

Figure 2. Hardware and Wire Setup

3.2. Testing trip current and operation for GL7101

The operation of the GL7101 can be tested by the following procedures.

This module is not designed to actually break or interrupt the source voltage in case a fault current is detected.

Step 1. Power off a voltage source.

Step 2. Verify that the setup in section 3.1 has been correctly completed.

Step 3. Turn on the voltage source between 110VAC and 220VAC. It is recommended to apply isolated voltage.

Step 4. Generate a leakage current from load AC Line to Earth Ground or from load between AC Lines.

Leakage current would be appropriate between 39 mA RMS and 48 mA RMS.

Step 5. Check the LED1. If the LED1 turns on, it means the GL7101 is operating normally. (Figure 3.)

If LED1 does not turn on, increase the leakage current and retest.

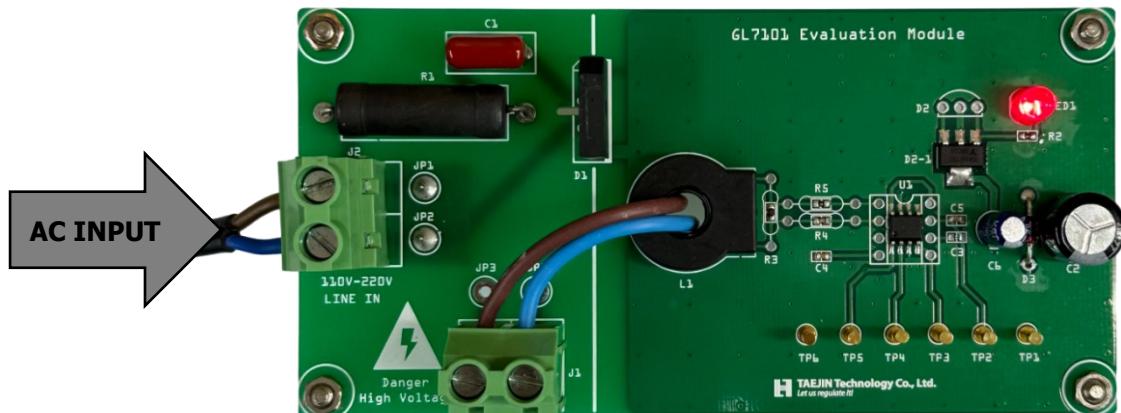


Figure 3. Check normal operation of GL7101

4. Schematic

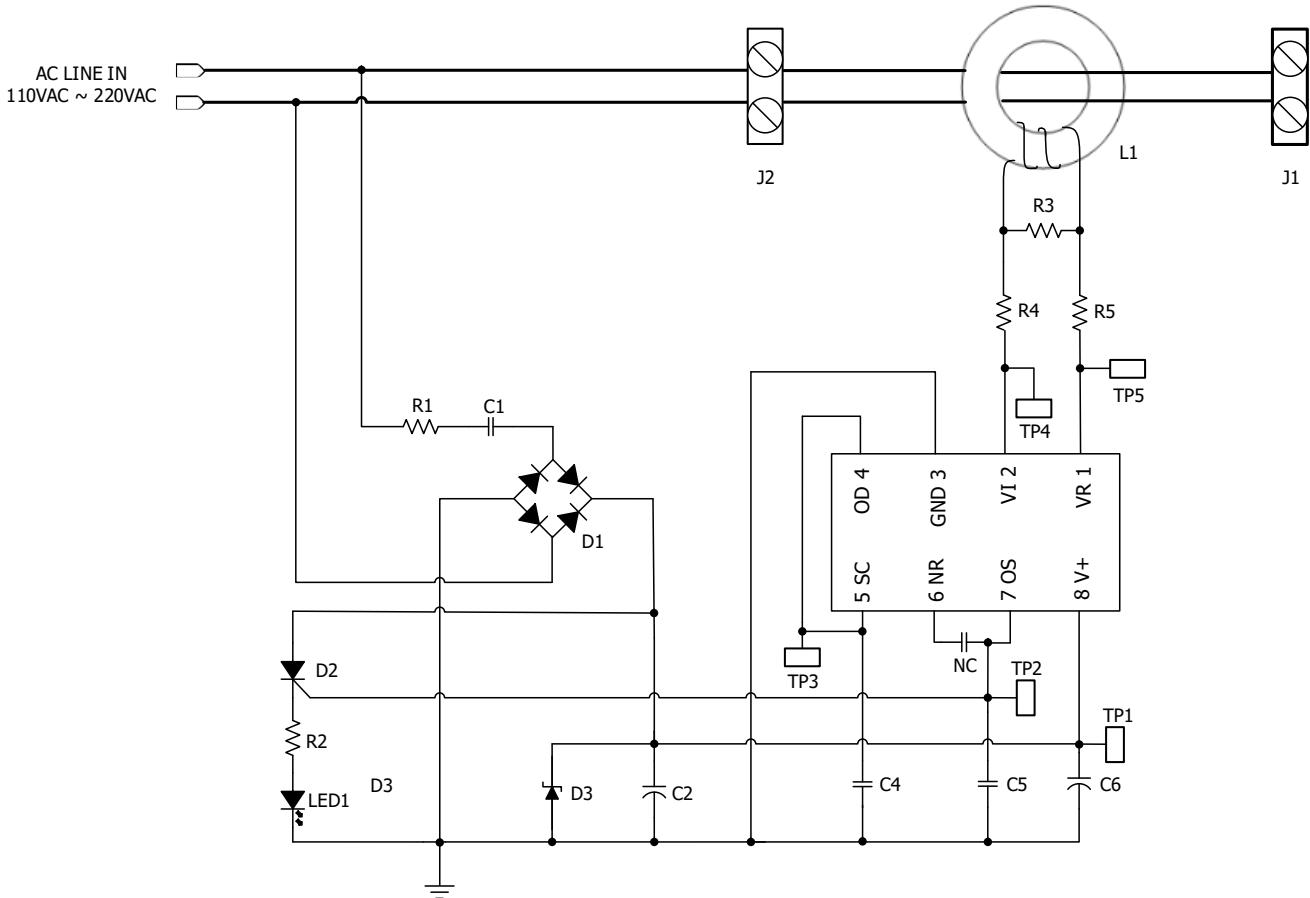


Figure 4. GL7101 Evaluation Module Schematic

5. Printed-circuit board (PCB) layouts

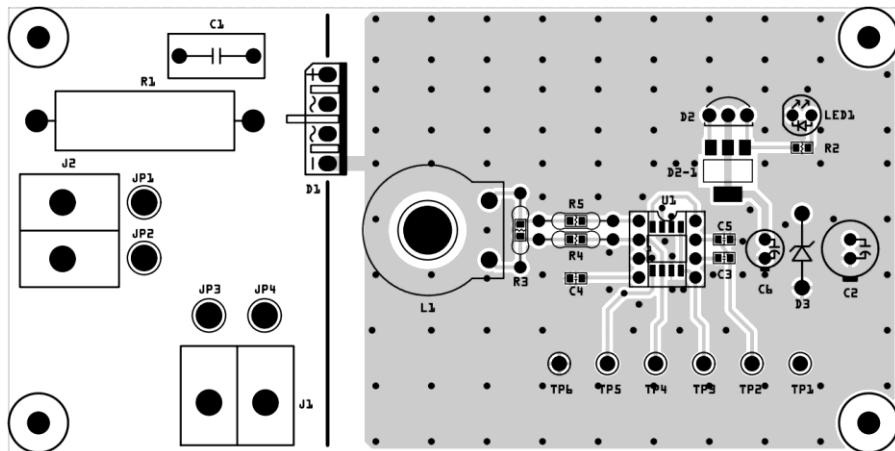


Figure 5. GL7101 Evaluation Module Top Layer

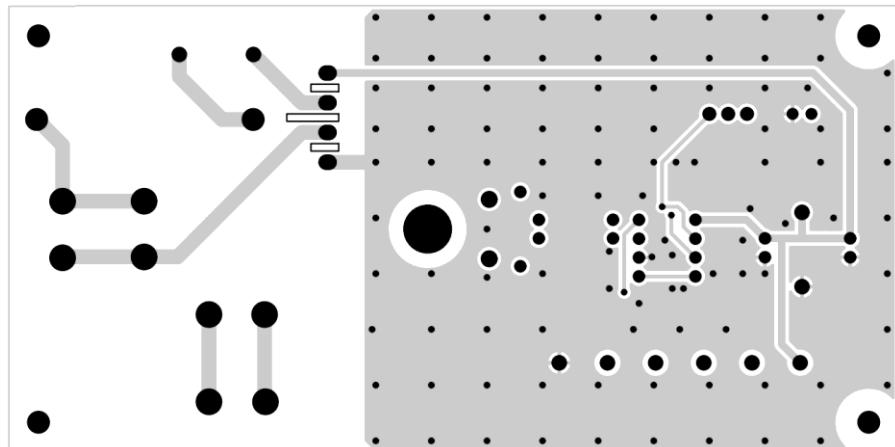


Figure 6. GL7101 Evaluation Module Bottom Layer

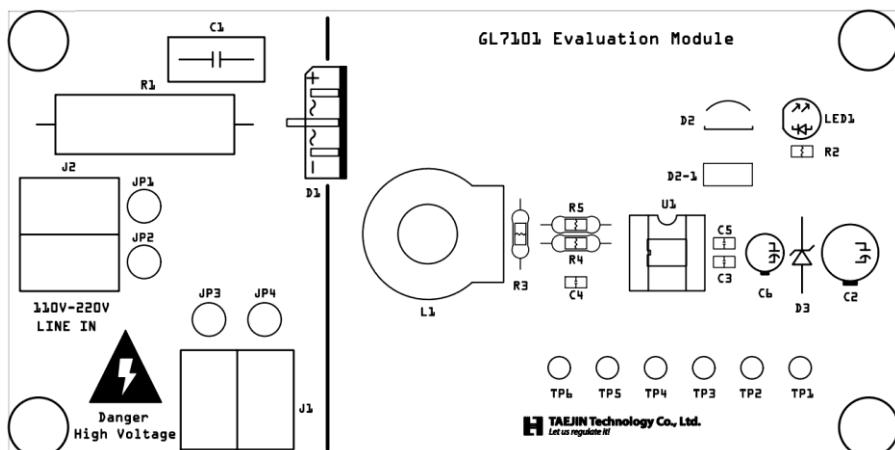


Figure 7. GL7101 Evaluation Module Top Silk

6. Bill of materials (BOM)

| R. No | Description | Part Number | Package | Manufacturer |
|-------|---------------------------------|-------------|---------------|--------------|
| U1 | Earth Leakage Current Detector | GL7101 | SOP-8 / DIP-8 | TAEJIN |
| L1 | Zero-Phase Current Transformers | MR/C-01 | | Kemet |
| D1 | 2.0A Bridge Rectifier | KBP206G | | Diodes |
| D2-1 | 0.8A Thyristors | S4X8TS1RP | SOT-223 | Littlefuse |
| D3 | 15V Zener Diodes | 1N4744A | DO-41 | Vishay |
| R1 | 300Ω / 5W | | | |
| R2 | 1KΩ | | 0603 | |
| R3 | 300Ω | | 0603 | |
| R4 | 100Ω | | 0603 | |
| R5 | 0Ω | | 0603 | |
| C1 | 0.1uF / 400V | | | |
| C2 | 220uF / 25V | SHL | | Samyoung |
| C3 | NC | | | |
| C4 | 0.047uF / 50V | MLCC | 0603 | |
| C5 | 0.047uF / 50V | MLCC | 0603 | |
| C6 | 10uF / 50V | SHL | | Samyoung |
| LED1 | Red Led | | | |
| J1,J2 | Screw Terminal Block | | | |

7. Ordering Information

| | |
|-------------|---------------------------|
| Part Number | GL7101EVM |
| Device | GL7101S Evaluation Module |
| Package | Assembled Module |

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