

# Integrated Dual MOSFET Bridge Rectifier

#### **Brief Description**

The KTA1170 Evaluation (EVAL) Kit is used to demonstrate and evaluate the KTA1170 single-chip, highly integrated solution for voltage rectification on Power over Ethernet (PoE) Powered Devices.

The kit includes a fully assembled and tested PCB with the KTA1170 IC installed, and a printed copy of the Quick Start Guide (also contained within this document).

#### **Ordering Information**

Part Number	Description	IC Package
KTA1170GVAE-MMEV01	KTA1170 EVAL Kit	WDFN44-8

#### **3D CAD Image**





# **EVAL Kit Physical Contents**

Item #	Description	Quantity
1	KTA1170 EVAL fully assembled PCB	1
2	Anti-static bag	1
3	Quick Start Guide, printed 1 page (A4 or US Letter)	1
4	EVAL Kit box	1

#### **QR Links for Documents**

IC Datasheet	EVAL Kit Landing Page
https://www.kinet-ic.com/kta1170	https://www.kinet-ic.com/kta1170gvae-mmev01/

Note: The full EVAL Kit Manual is available for download on the EVAL Kit Landing Page.

#### **User-Supplied Equipment**

#### **Required Equipment**

- 1. Bench Power Supply for IN1/IN2/IN3/IN4 inputs 60V up to 1A capable, as needed for the intended application.
- 2. Digital Multimeters one or more, used to measure input/output voltages and currents.

#### **Optional Equipment**

- 1. Oscilloscope for dynamic testing of input and output load voltages (and input or load currents with a current probe, if available).
- 2. Load Electronic Load, power resistors, or an actual system load.

#### **Recommended Operating Conditions**

Symbol	Description	Value	Units
IN1, IN2, IN3,	Input/Output pin Withstand Voltage	2.7 to 75	V
IN4, VCC	Input Power Supply Operating Voltage	37 to 57	V
Іоит	Output Load Current	0 to 2*	A

Note: \* For a single bridge rectifier, the recommended input current is up to 1A Max. For both bridge rectifiers combined, the total output current is up to 2A Max.



# **Typical Test Setup**

Use the following test setup for the Quick Start Procedure.



# **Quick Start Procedures**

KTA1170 includes two MOSFET bridges. First, the bridge with inputs IN1-IN2 is checked. Then the procedure is repeated for the other bridge IN3-IN4.

- 1. Connect one pair of Banana-to-Banana power cables to the banana connectors at IN1 and IN2 (either polarity is fine).
- 2. Before connecting the EVAL Kit to the VIN1-VIN2 input bench supply, turn on the supply and adjust the voltage as close to 0V as possible. Then turn off or disable the supply output. While off, connect the banana ends of the Banana-to-Banana power cables to the input bench supply.
- 3. Turn on the bench supply and very slowly ramp the output voltage to an appropriate level, such as 48V. While ramping VIN slowly, use the bench supply's output current indication (or a digital multimeter) to monitor the VIN current. If the current becomes high, reduce the supply voltage quickly to prevent damage. Then inspect the setup for any wiring errors.
- 4. With valid VIN voltage of 48V, use a digital multimeter to check the output voltage between the K\_VCC and K\_GND terminals on the evaluation board. It should be nearly the same as the input voltage.
- 5. Use a digital multimeter to check the no-load supply current to IN1. Consult the KTA1170 datasheet for the expected current range at the IN1 voltage condition in use. For conditions of VIN1-VIN2 = 48V, and no-load, the input supply current should be around 55μA.
- 6. Repeat steps 1 to 5 for the other diode bridge with inputs IN3-IN4.



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# **Electrical Schematic**



# Bill of Materials (BOM)

Designator	Description	Quantity	Case/ Package	Footprint	Manufacturer	Manufacturer Part Number
D1	TVS DIODE 58VWM 93.6VC DO-214	1		SMAJ58A	Littelfuse Inc.	SMAJ58A
H1, H2, H3, H4	BRD SPT SNAP LOCK REST MNT 4MM	4		Board Standoffs- Footprint-1	Essentra Components	PSD-4M-19
P1, P2, P3, P4, P5, P6, P7, P8, P9	CONN HDR .100" 1POS	9		PRECO01SAAN- RC-FOOTPRINT- 1	Samtec	PHT-101-01-L-S
TP1, TP2, TP3, TP4, TP5, TP6	Banana Jack Connector Standard Banana Solder	6		KSTN-575-4	Keystone Electronics	575-4
U1	Integrated Dual MOSFET Bridge Rectifier for Power over Ethernet	1	WDFN-8	KTA1170	Kinetic Technologies	KTA1170GVAE-TB



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# **Printed Circuit Board (PCB)**



# **Additional Test Procedures**

- 1. Testing with Load:
  - a. Use a second Banana-to-Banana power cable pair to apply loads between VCC to GND.
  - b. Use multimeters and an oscilloscope to make DC measurements as desired.



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