Integrated Dual MOSFET Bridge Rectifier

Brief Description

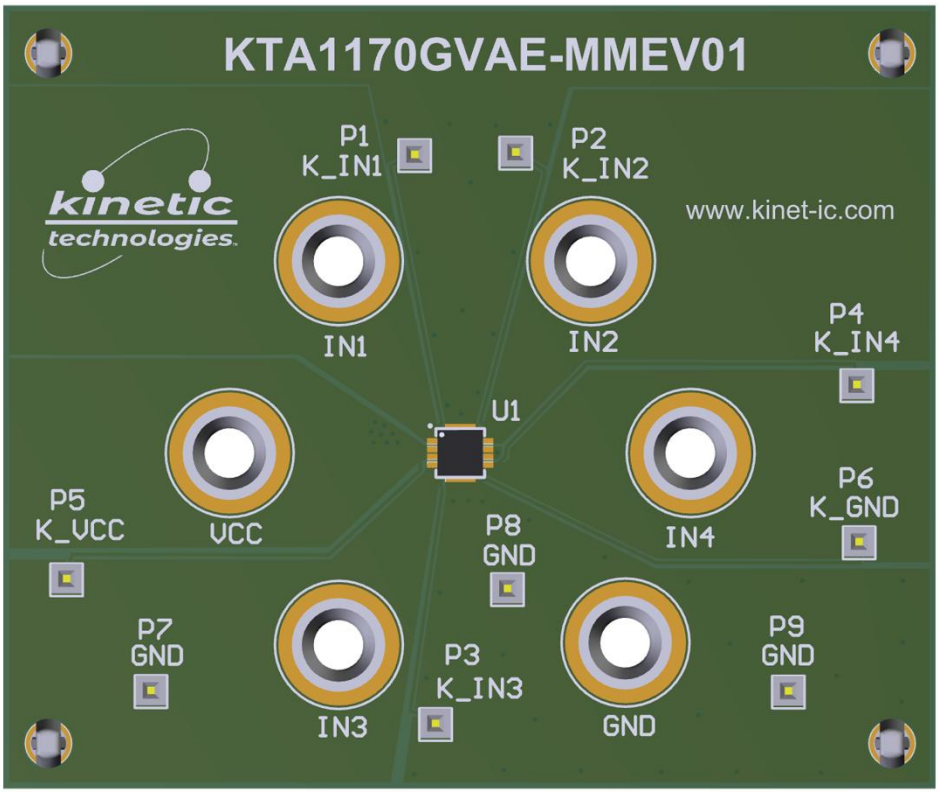
The KTA1170 Evaluation (EVAL) Kit is used to demonstrate and evaluate the KTA1170 single-chip, highly integrated solution for voltage rectification on Power over Ethernet (PoE) Powered Devices.

The kit includes a fully assembled and tested PCB with the KTA1170 IC installed and a printed copy of the Quick Start Guide.

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/
Application Note – AN167	
https://www.kinet-ic.com/wp-content/uploads/2025/09/AN167-04a.pdf	

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

User-Supplied Equipment

Required Equipment

1. IEEE standards compliant PSE (Power Sourcing Equipment) for IN1/IN2/IN3/IN4 inputs – 60V up to 1A capable, as needed for the intended application.
    a. If you are using a non-standards compliant supply such as a bench power supply, refer to Application Note AN167 providing guidelines to design with the KTA1170.
    b. Another approach to power using a bench power supply would be to set the maximum slew rate to 3V/µs (The IEEE 802.3 specification clearly defines the worst-case condition as the following: fastest rise time is 15µs from 10%-90% of 57V (maximum from POWER_ON to POWER_UP.))
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.

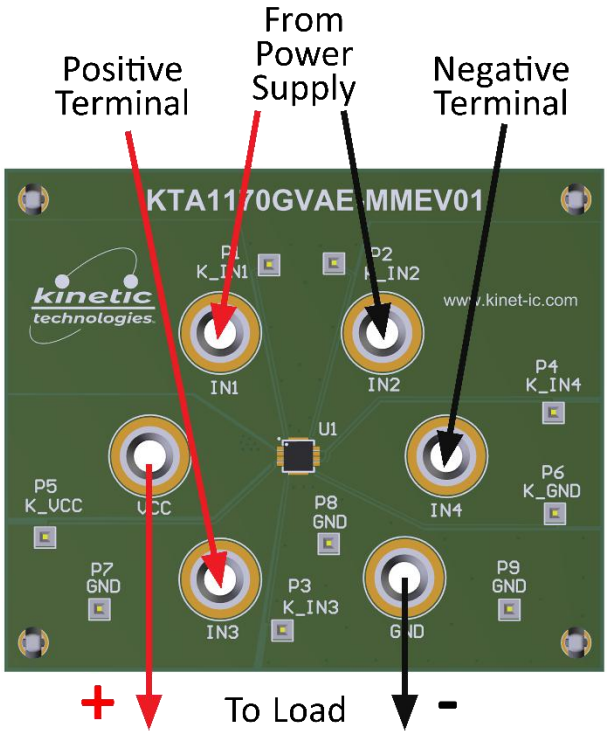
Recommended Operating Conditions

Symbol	Description	Value	Units
IN1, IN2, IN3, IN4, VCC	Input/Output pin Withstand Voltage	2.7 to 75	V
	Input Power Supply Operating Voltage	37 to 57	V
I_{OUT}	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.

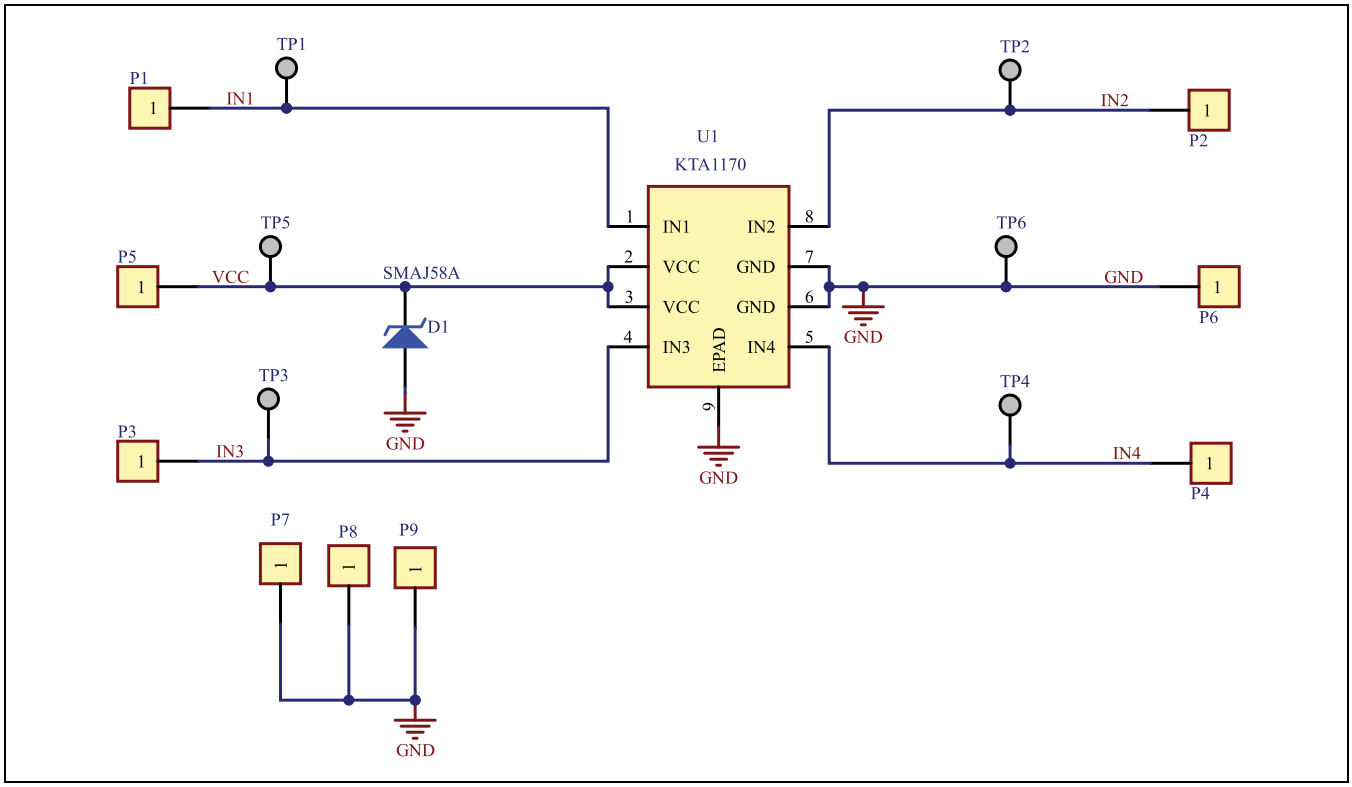


Quick Start Procedures

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 IN1 and IN2 of EVAL board to the PSE input 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 supply.
3. Turn on the supply and ramp the output voltage to an appropriate level, such as 48V. While ramping VIN, use the supply's output current indication (or a digital multimeter) to monitor the VIN current. Please note that if a non-standards compliant PSE or bench supply is used for input power, set the slew rate as described above in section "User-Supplied Equipment - Required Equipment – 1b".
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.

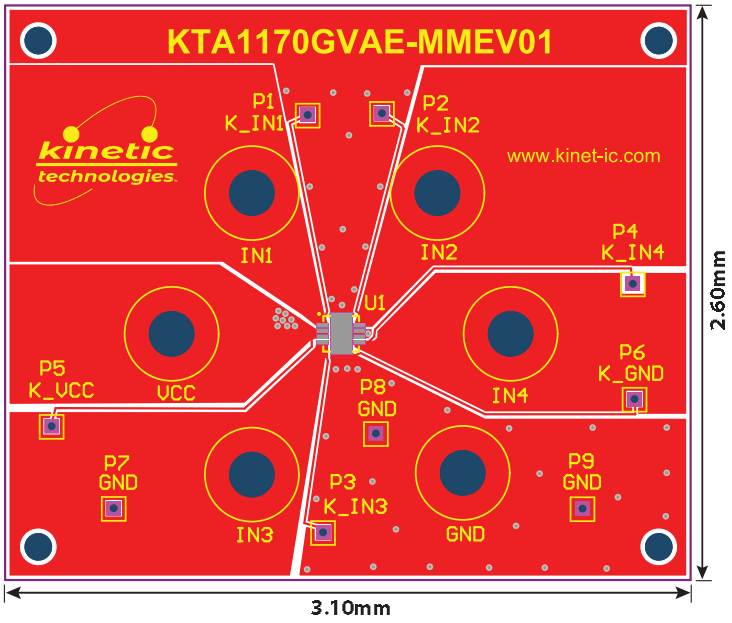
Electrical Schematic

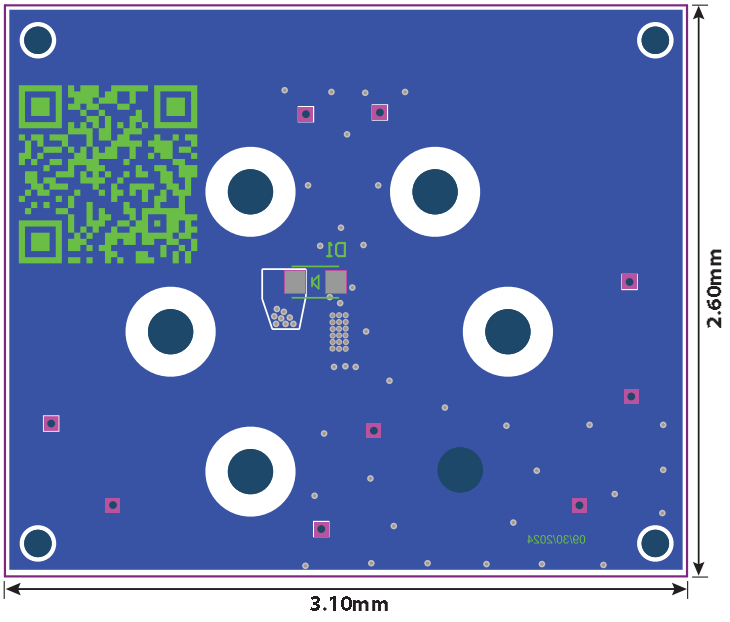


Bill of Materials (BOM)

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		PREC001SAAN-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

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.

Important Notices

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