

5A eFuse with Current Limit Control and Reverse Blocking FET Control

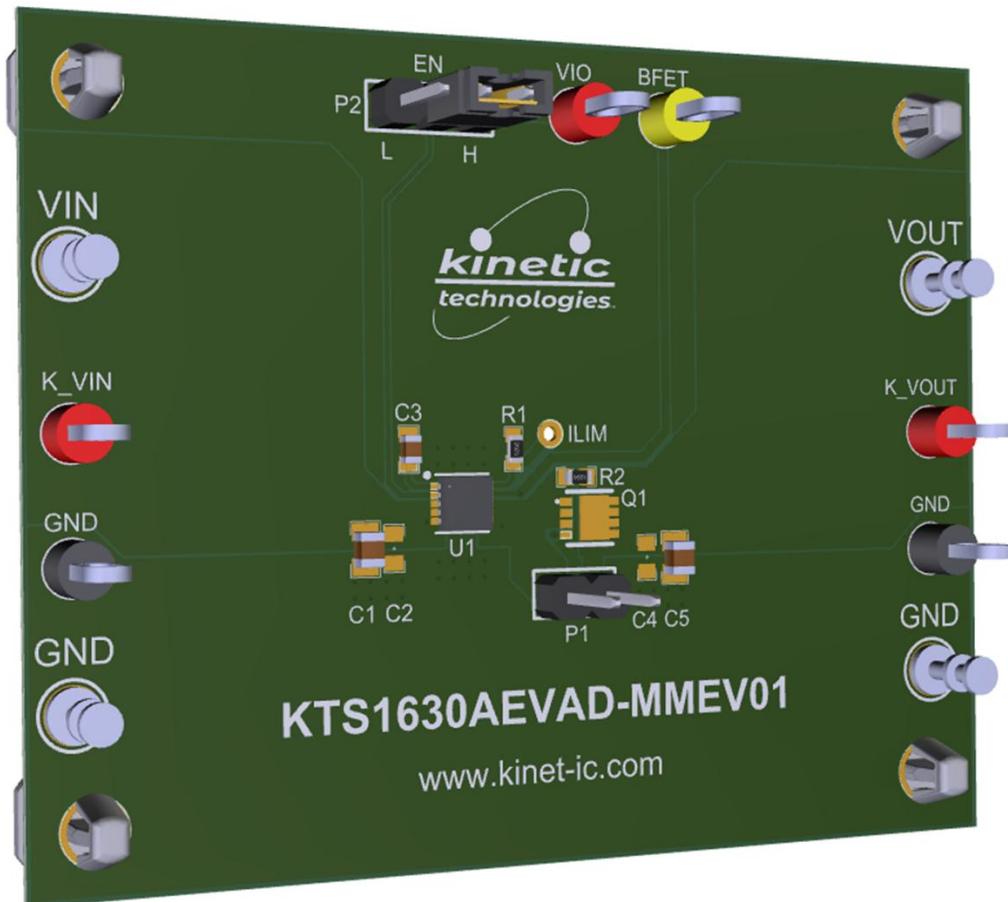
Brief Description

The KTS1630A Evaluation (EVAL) Kit is used to demonstrate and evaluate the KTS1630A functionality, performance, and PCB layout. The kit includes a fully assembled and tested PCB with the KTS1630A IC installed, and a printed copy of the Quick Start Guide (also contained within this document). The KTS1630A has enable EN active-high input logic.

Ordering Information

Part Number	Description	IC Package
KTS1630AEVAD-MMEV01	KTS1630A EVAL Kit	TDFN-10

3D CAD Image



EVAL Kit Physical Contents

Item #	Description	Quantity
1	KTS1630A 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 Landing Page	EVAL Kit Landing Page
	

<https://www.kinet-ic.com/kts1630/> <https://www.kinet-ic.com/kts1630aevad-mmev01/>

User-Supplied Equipment

Required Equipment

1. Bench Power Supply for VIN – 5V to 18V and 3A/5A, as needed for the intended application.
2. Digital Multimeter – one or more, used to measure input/output voltages and currents.

Optional Equipment

1. Bench Power Supply for VIO – 1.5V to 5V, low current. Needed to enable the part (EN = H).
2. Oscilloscope – for dynamic testing of voltages (and currents with a current probe, if available).
3. Load – either an eLoad, power resistors, or an actual system load.
4. Additional Digital Multimeters

Recommended Operating Conditions

Symbol	Description	Value	Units
VBUS	Supply Operating Voltage	4.5 to 18	V
VIO	VIO Operating Voltage	up to 5.5	V
I _{OUT}	Output Load Current	0 to 6	A

Jumper Descriptions

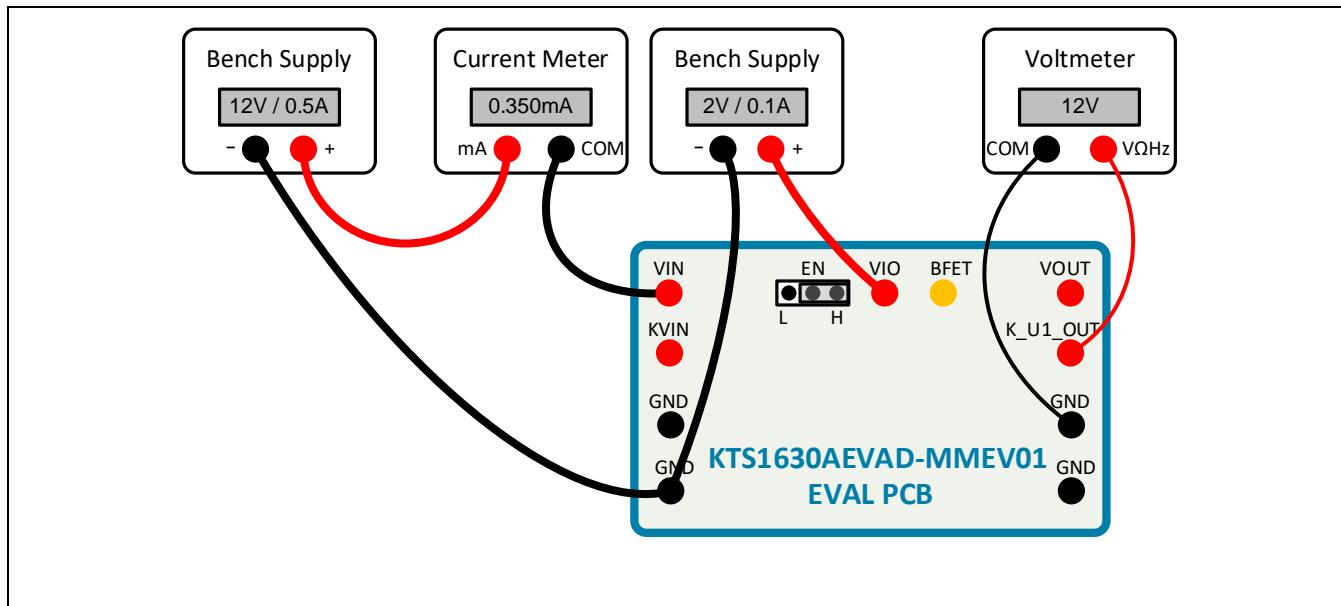
Designator	Name	Description	Default
P1	VOUT	KTS1630A VOUT testpoint / jumper	Open (EVK is configured with R2 0Ω shorting P1 header)
P2	EN	Enable Input L: e-fuse Disabled H: e-fuse Enabled	H

Quick Start Procedures

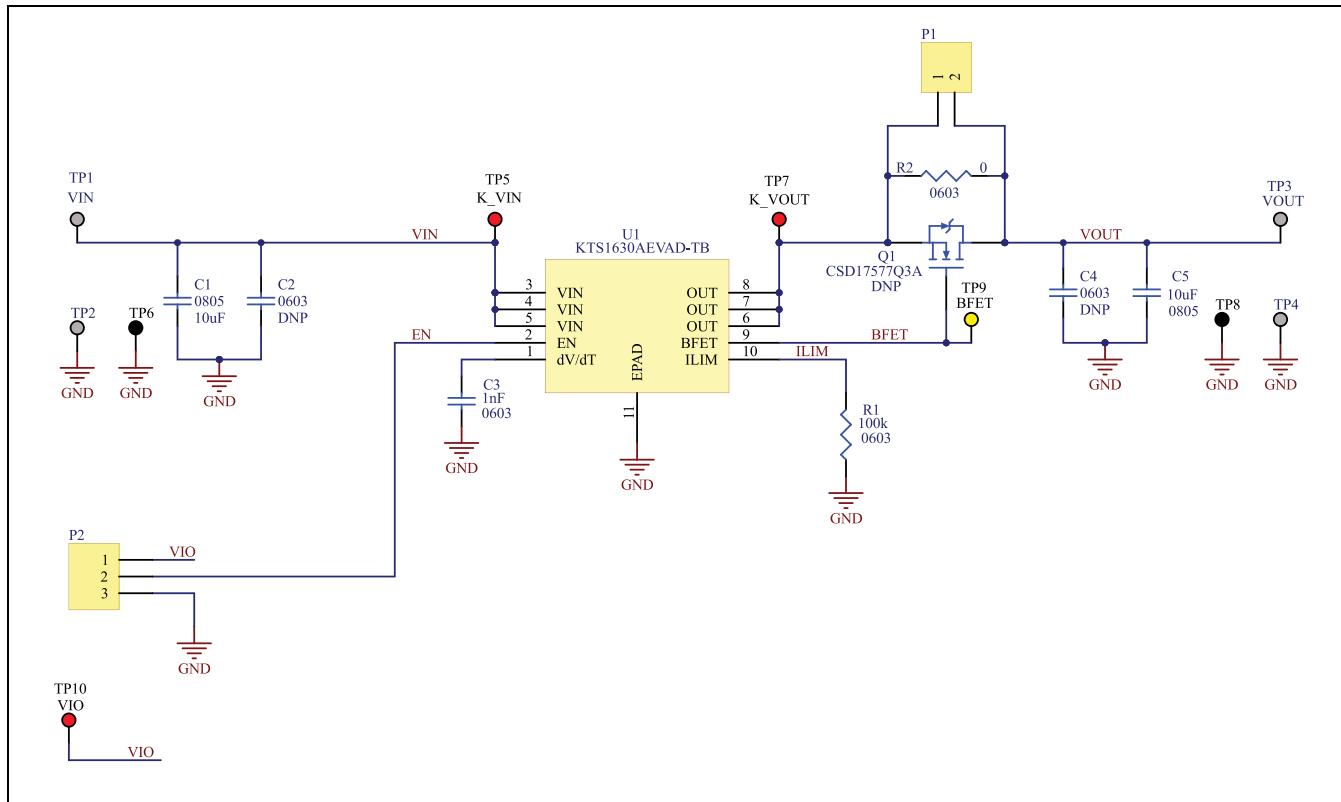
1. Connect the VIO bench power supply between VIO testpoint and GND. Turn on VIO power supply to 3V.
2. Set Jumper to default: EN = H (e-Fuse switch enabled)
3. Connect one pair of Banana-to-clip power cables to the test points at VIN and GND (left side of EVAL Kit).
4. Before connecting the EVAL Kit to the VIN bench supply, turn on the supply and adjust the voltage as close to 0V as possible. Then turn off the supply. While off, connect the banana ends of the Banana-to-clip power cables to the VIN bench supply.
5. Turn on the VIN bench supply and very slowly ramp its voltage to an appropriate voltage, such as 5, 12V, 15V. 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 VIN voltage quickly to prevent damage. Then inspect the setup for any wiring errors.
6. With a valid VIN voltage for example 12V, use a digital multimeter to check the output voltage between the K_U1_OUT and GND terminals on the EVAL Kit. It should be nearly the same as the input voltage.
7. Use a digital multimeter to check the no-load supply current at VIN. Consult the KTS1630 datasheet for the expected current range at the VIN voltage condition in use. For conditions of VIN = 12.0V, EN = H, and no-load, the VIN supply current should be close to 350 μ A.

Typical Test Setup Diagram

As an example, use the following test setup to measure items 5 and 6 in the Quick Start Procedures.



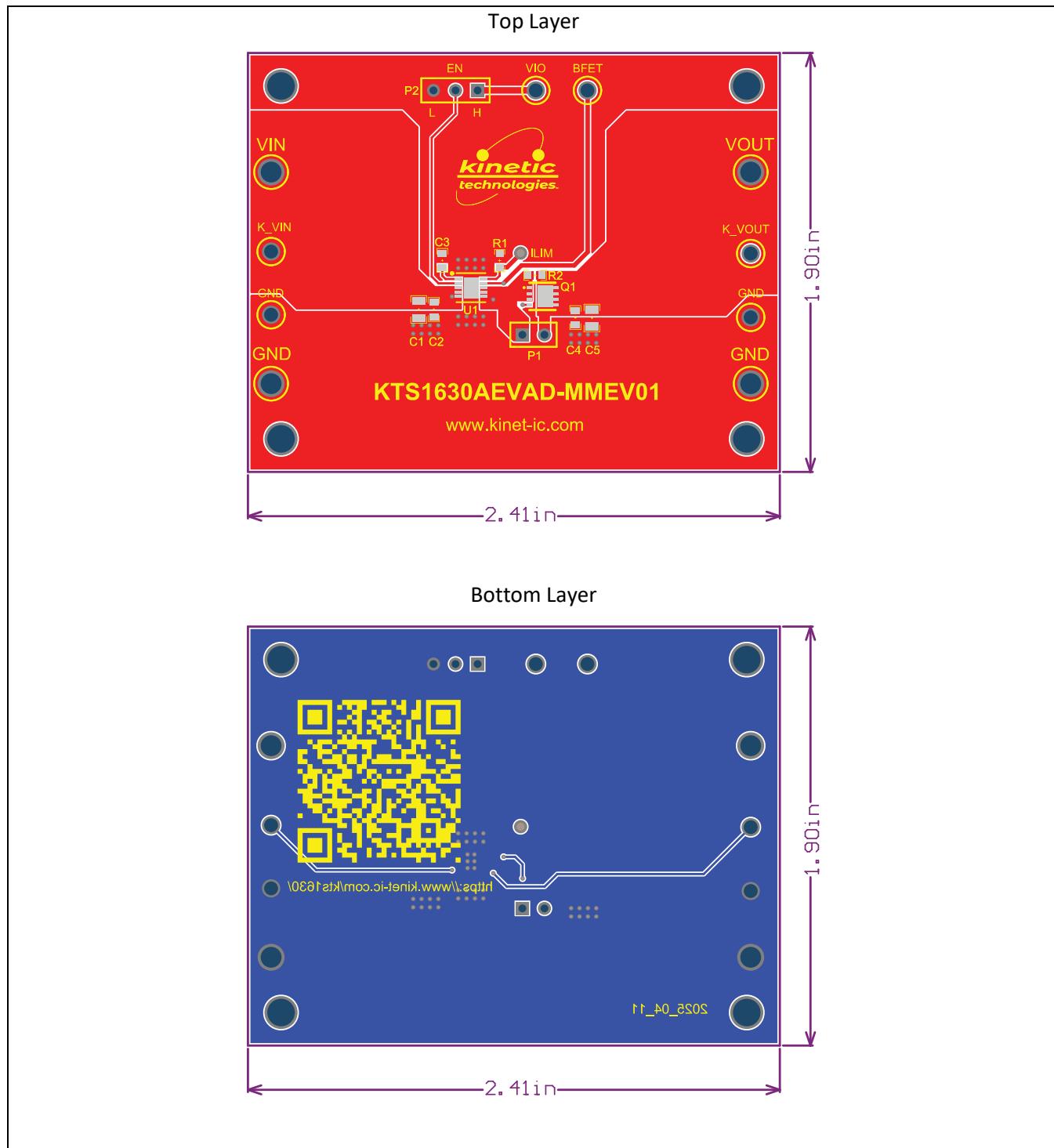
Electrical Schematic



Bill of Materials (BOM)

Designator	Description	Quantity	Value	Manufacturer	Manufacturer Part Number
C1, C5	CAP CER 10uF 35V X5R 0805	2	10uF	Murata	GRM21BR6YA106KE43L
C2, C4	CAP 0603 DNP	2	DNP		
C3	CAP CER 1000PF 50V X7R 0603	1	1nF	Samsung	CL10B102KB8NNNC
H1, H2, H3, H4	BRD SPT SNAP LOCK REST MNT 4MM	4		Essentra Components	PSD-4M-19
P1	CONN HEADER VERT 2POS 2.54MM	1		Sullins Connector Solutions	PREC002SAAN-RC
P2	CONN HEADER VERT 3POS 2.54MM	1		Sullins Connector Solutions	PREC003SAAN-RC
Q1	MOSFET N-CH 30V 35A 8VSON CSD17577Q3A DNP	1	DNP		
R1	RES 100K OHM 1% 1/10W 0603	1	100k	Yageo	RC0603FR-07100KL
R2	RES 0 OHM JUMPER 1/10W 0603	1	0	Yageo	RC0603FR-070RL
TP1, TP2, TP3, TP4	TERM TURRET SINGLE L=5.56MM TIN	4		Keystone	1502-2
TP5, TP7, TP10	PC TEST POINT MULTIPURPOSE RED	3		Keystone	5010
TP6, TP8	PC TEST POINT MULTIPURPOSE BLACK	2		Keystone	5011
TP9	PC TEST POINT MULTIPURPOSE YELLOW	1		Keystone	5014
U1	5A Load Switch with Current Limit Control and Reverse Blocking FET Control	1		Kinetic Technologies	KTS1630AEVAD-TB

Printed Circuit Board (PCB)



Additional Test Procedures

1. Testing with Load:
 - a. Use the second Banana-to-clip power cable pair to apply loads from VOUT to GND.
 - b. The voltage drop across the e-Fuse switch measured between the KVIN and K_U1_OUT terminals, for 1A load condition, should be close to 32mV due to the on-resistance of the switch.
 - c. Use multimeters and an oscilloscope to make DC and transient measurements as desired.

Adding Additional Input Capacitance

The C1 input capacitance of the EVAL Kit is 10uF by design. The C2 footprint (not populated) is available to add additional input capacitance.

Troubleshooting

Symptom	Root Cause	Solution
EN = H does not enable the switch.	VIO supply is off or not connected.	Connect VIO pull-up supply. Optionally, remove the jumper on P2 and connect EN (at pin 2 of P2) to VIN with a clip-to-clip lead. EN pin has a maximum recommended operating voltage of 18V.

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