

Features & Benefits

- -55°C Operating Temperature
- Digital Control
- Isolated DC-DC Quarter Brick
- 92% Efficiency at Full Load
- Input Under Voltage Lockout
- Input/Output Over Voltage Protection
- Output Current Limit
- Short Circuit Protection
- Thermal Shutdown
- Remote ON/OFF Control
- Output Voltage Remote Sense
- Output Voltage Trim Range +10%*, -40%

*: Trim-up capability input voltage range 18-40 V

Compliance

Converter (with a Passive EMI filter) is designed to meet:

- MIL-STD-461G
- MIL-STD-810G
- MIL-STD-1275E

Typical Applications

- Military/Defense Power Systems
- Armored Vehicles
- Land Platforms
- Aerospace Platforms
- Communications and Radar Systems
- Medical Systems

Product Ratings	
V _{IN}	16 – 40 V
V _{OUT}	12 V
I _{OUT}	25 A
P _{OUT}	300 W

Product Description

Quarter Brick is a 300 W DC/DC converter in quarter-brick size that operates from nominal 28 V input and generates 12V isolated output. It is designed to meet MIL-STD-461 EMI requirements when combined with the passive EMI filter module and has superior noise and ripple performance. Converter is fully protected to operate reliably under all kinds of disturbances. Baseplate is designed and manufactured in house to provide efficient cooling and safe operation at 100 °C base plate temperature.



Size: 58.4 x 36.8 x 12.7 mm
[2.3" x 1.45" x 0.5"]

Weight: 95 ± 5 g

Electrical Characteristics

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Basic Operation and Features

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Protection Features

Input Under Voltage Lockout

The converter module starts operating when the input voltage is raised above the "Under Voltage Turn-On Threshold." Once turned on, turn off is initiated when the input falls below the "Under Voltage Turn-Off Threshold." The "Module Input Specifications" Table gives the associated limits.

Input Over Voltage Protection

The converter module protects itself by ceasing operation when the input goes above the "Over Voltage Turn-Off Threshold." It resumes operation when the input falls below the "Over Voltage Turn-On Threshold." The associated limits are given in the "Module Input Specifications" Table.

Output Current Limit

The converter will derate the output voltage if the output current exceeds the "Output Current Limit" value. If the fault condition is resolved, the control output voltage will increase to the nominal value.

Output Over Voltage Protection

If the output voltage exceeds the "Output Over Voltage-Protection" value the converter outputs are disabled immediately and retries after cooldown period. The "Output Over Voltage Protection Limit" is 120% of Output Voltage. If trim up or down is used protection limit will change according to output voltage setting.

Output Over Current Protection

If the output current exceeds the "Output Current Shutdown Limit" value the converter outputs are disabled immediately and retries after cooldown period.

Short Circuit Protection

The short circuit condition is an extreme case of the Output Current Limit condition. When output Voltage drops below "Output DC Current-Limit Shutdown Voltage" limit, the converter outputs are disabled immediately and retries after cooldown period. The "Output DC Current-Limit Shutdown Voltage" is 50% of Output Voltage. If trim up or down is used protection limit will change according to output voltage setting.

Over Temperature Shutdown

The brick has a thermistor located at the hottest point inside the module. The thermal shutdown circuit is designed to turn the converter off when the temperature at the sensed location goes above the "Over Temperature Shutdown" limit. It locks itself and waits to cool off. The Converter then resumes operation automatically when the temperature of the sensed location falls below the trip point by the amount equal to the "Over Temperature Shutdown Hysteresis."

Soldering and Cleaning

Hand Soldering

1. Mounting of the brick module should not put mechanical stress on the pins and solder joints. If the brick module is to be fixed to an immovable surface, soldering should be done after the brick module is screwed to surface.
2. The tip temperature of soldering iron should not exceed 430 °C. Recommended soldering durations and soldering iron temperatures are detailed in table below.

Pin Type	Soldering Duration Range (second)	Soldering Temperature Range (°C)
PMBUS	3-5	330-390
+IN -IN +OUT -OUT	5-8	330-430
ON/OFF TRIM +SNS -SNS	4-6	330-410

3. Soldering the brick module for longer periods of time and at higher temperatures may result in damage to the brick module.

Wave Soldering Profile

1. Bottom side preheaters: Zone 1: 180 °C, Zone 2: 150 °C, Zone 3: 360 °C
2. Top side preheaters: Zone 1: 105-115 °C
3. Wave Temperature: 265 °C
4. Wave type: 108 mm standard laminar wave

Cleaning

1. Brick modules are not sealed, and exposure to liquids may result in damage to the brick module.
2. If PCB needs to be exposed to an aqueous wash after soldering, surface-mount or through-hole sockets are recommended for mounting the brick modules after cleaning process.

De-soldering

1. Brick modules should not be reused after de-soldering. De-soldering may cause mechanical and thermal stresses that could damage the brick module. KOLT does not guarantee the reusability of brick modules after de-soldering.

Application Considerations

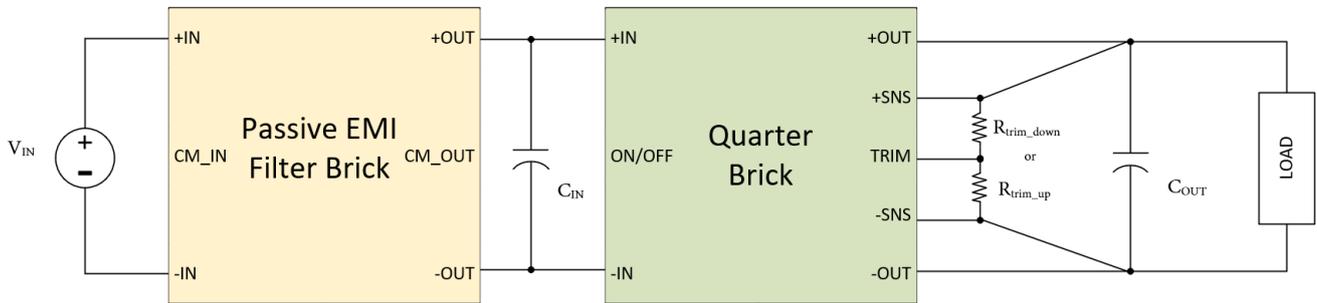


Figure A. Typical Application

NOTE: If the output voltage is to be used in its default state, there is no need to use trim resistors.

CM_IN and CM_OUT of KRFL02 should be connected to the chassis.

C_{IN}: A759KS476M1KAAE045 (47uF 80V Aluminum-Polymer Capacitor)

C_{OUT}: EEH-ZS1H181UP (180uF 50V Aluminum-Polymer Capacitor)

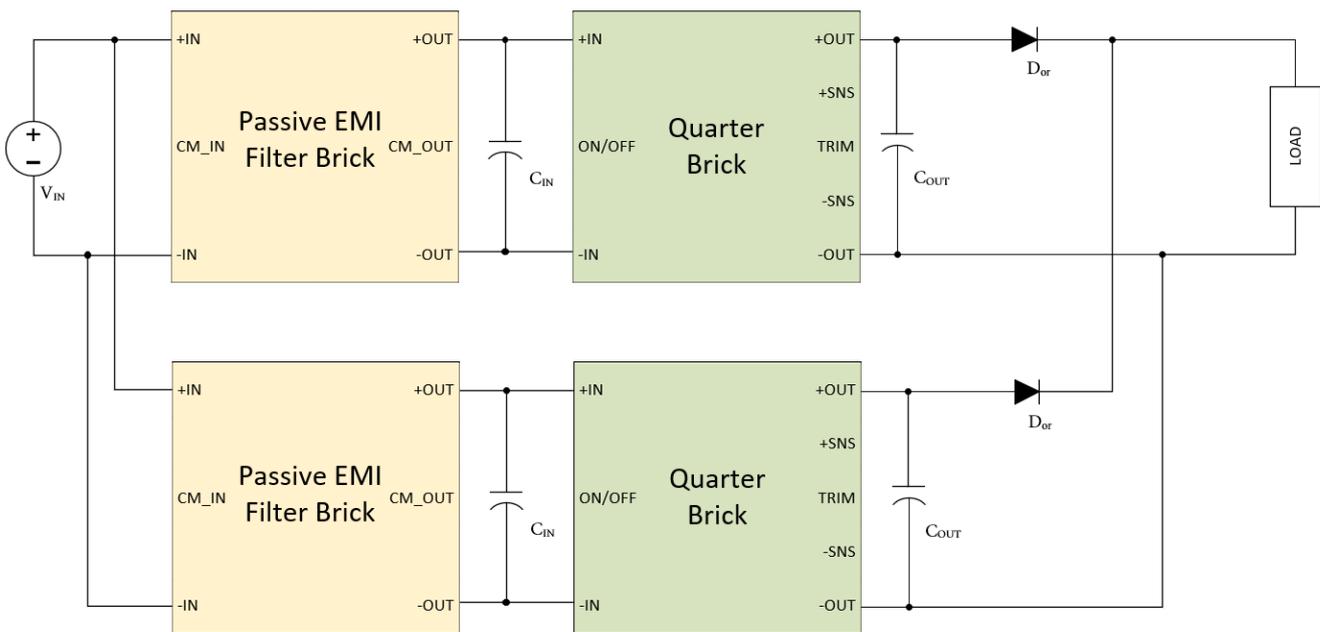


Figure B. Recommended Application N+1 Redundant Parallel Connection

CM_IN and CM_OUT of Passive EMI Filter should be connected to the chassis.

C_{IN}: A759KS476M1KAAE045 (47uF 80V Aluminum-Polymer Capacitor)

C_{OUT}: EEH-ZS1H181UP (180uF 50V Aluminum-Polymer Capacitor)

D_{OR}: Can be either an ORing diode or ideal diode driver circuit

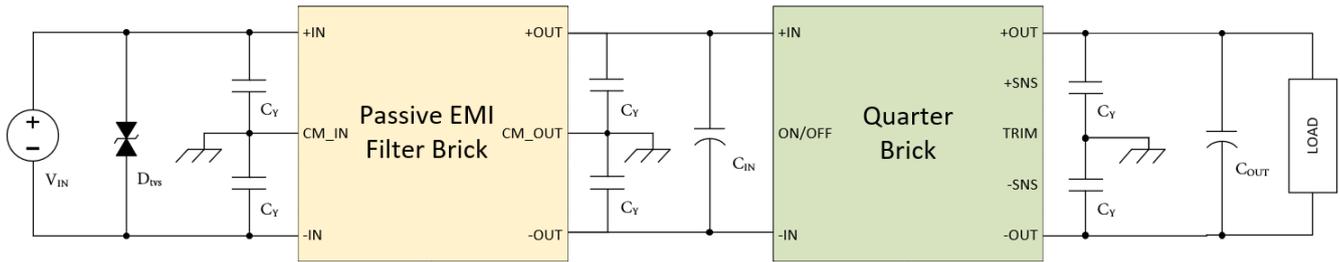


Figure C. Recommended Application for better EMI/EMC compliance

CM_IN and CM_OUT of Passive EMI Filter should be connected to the chassis.

C_Y: CHV1206N2K0472KXT (4700 pF 2kV X7R Ceramic Capacitor)

C_{IN}: A759KS476M1KAAE045 (47uF 80V Aluminum-Polymer Capacitor)

C_{OUT}: EEH-ZS1H181UP (180uF 50V Aluminum-Polymer Capacitor)

D_{TVS}: 5.0SMDJ40CA (Bi-directional 40Vwm TVS Diode)

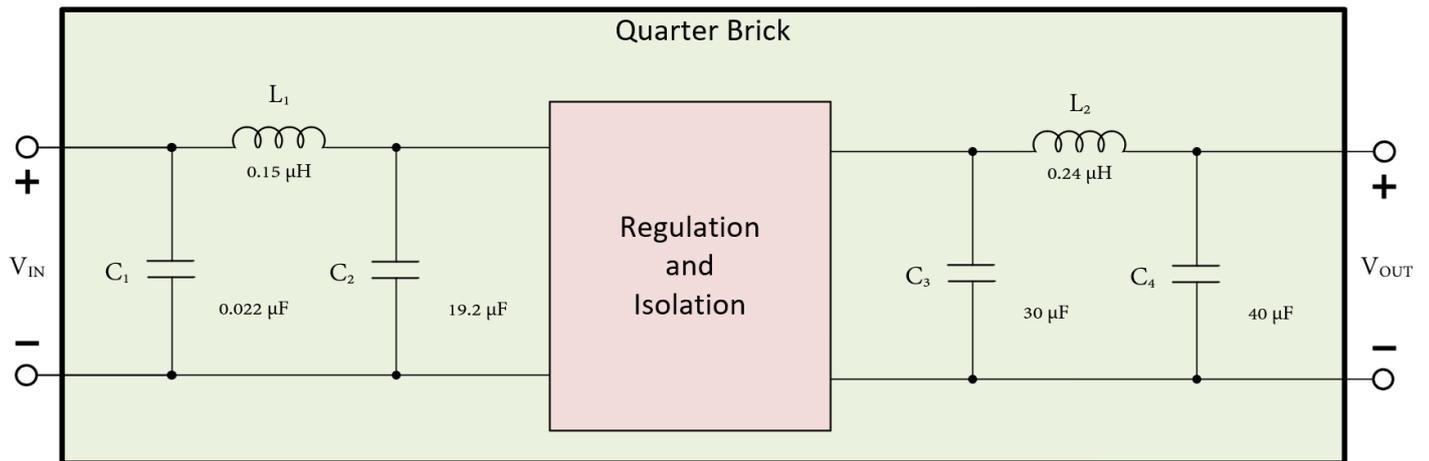
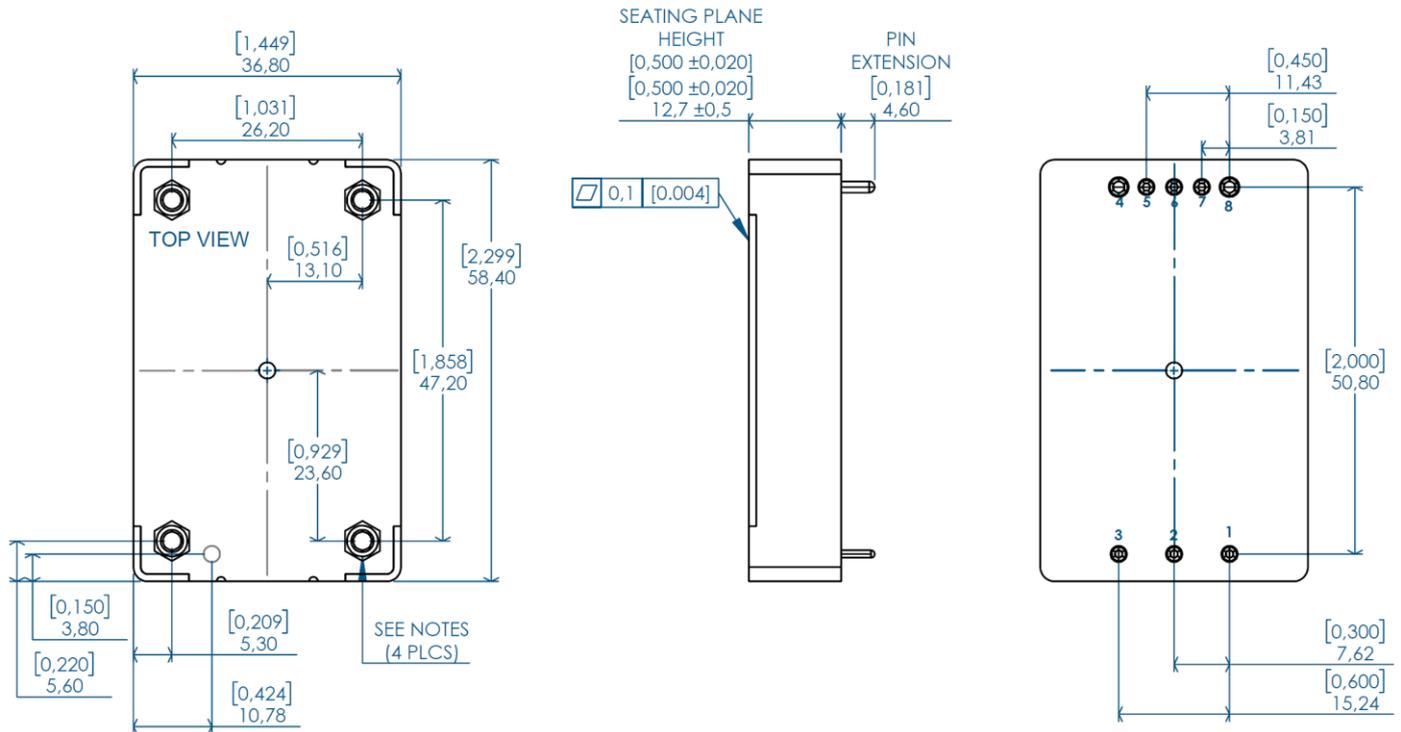


Figure D. Internal input and output filter diagram of Quarter Brick

Mechanical Drawing – Threaded



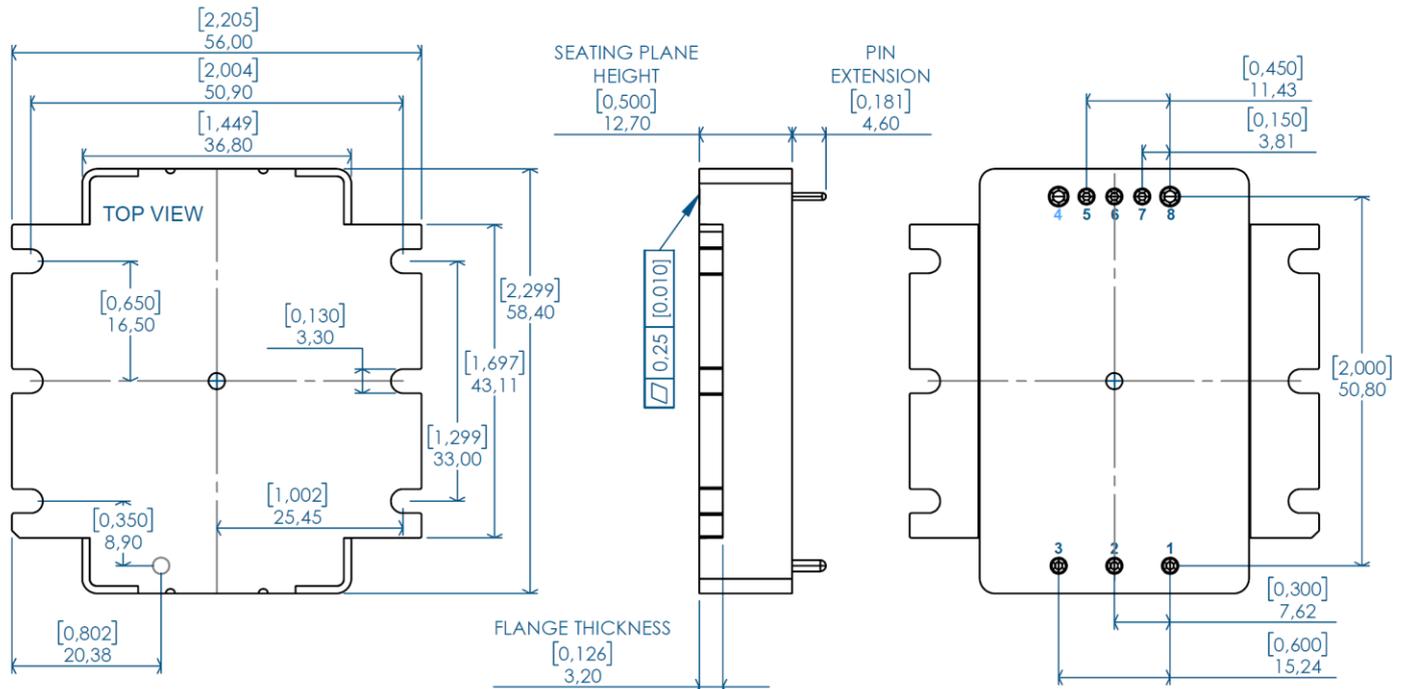
NOTES:

- APPLIED TORQUE PER M3 SCREW 0.36Nm (3in-lb) RECOMMENDED [0.4Nm (3.5in-lb) LIMIT]. M3 SCREW SHOULD NOT EXCEED 3mm (0.118") DEPTH BELOW THE SURFACE OF THE BASEPLATE.
- BASEPLATE FLATNESS TOLERANCE IS 0.1mm (0.004") TIR FOR SURFACE.
- PINS 1-3 AND 5-7 ARE 1.02mm DIA. (0.040") WITH 2.03mm DIA. (0.080") STANDOFFS.
- PINS 4 AND 8 ARE 1.57mm DIA. (0.062") WITH 2.54mm DIA. (0.100") STANDOFFS.
- PINS 1-8
MATERIAL: BRASS ALLOY
FINISH: 10µ" GOLD OVER NICKEL
WEIGHT: 95.0 g (3.35 oz)
- ALL DIMENSIONS IN MILLIMETERS [inches]
- TOLERANCES: X.Xmm ±0.5mm (X.XXIN ±0.020)
X.XXmm ±0.25mm (X.XXXIN ±0.010)

Pin	Name	Function
1	+IN	Positive input voltage
2	ON/OFF	Remote on/off, referenced to -IN
3	-IN	Input return
4	-OUT	Output return
5	-SNS	Negative remote sense
6	TRIM	Output voltage trim
7	+SNS	Positive remote sense
8	+OUT	Positive output voltage



Mechanical Drawing – Flanged



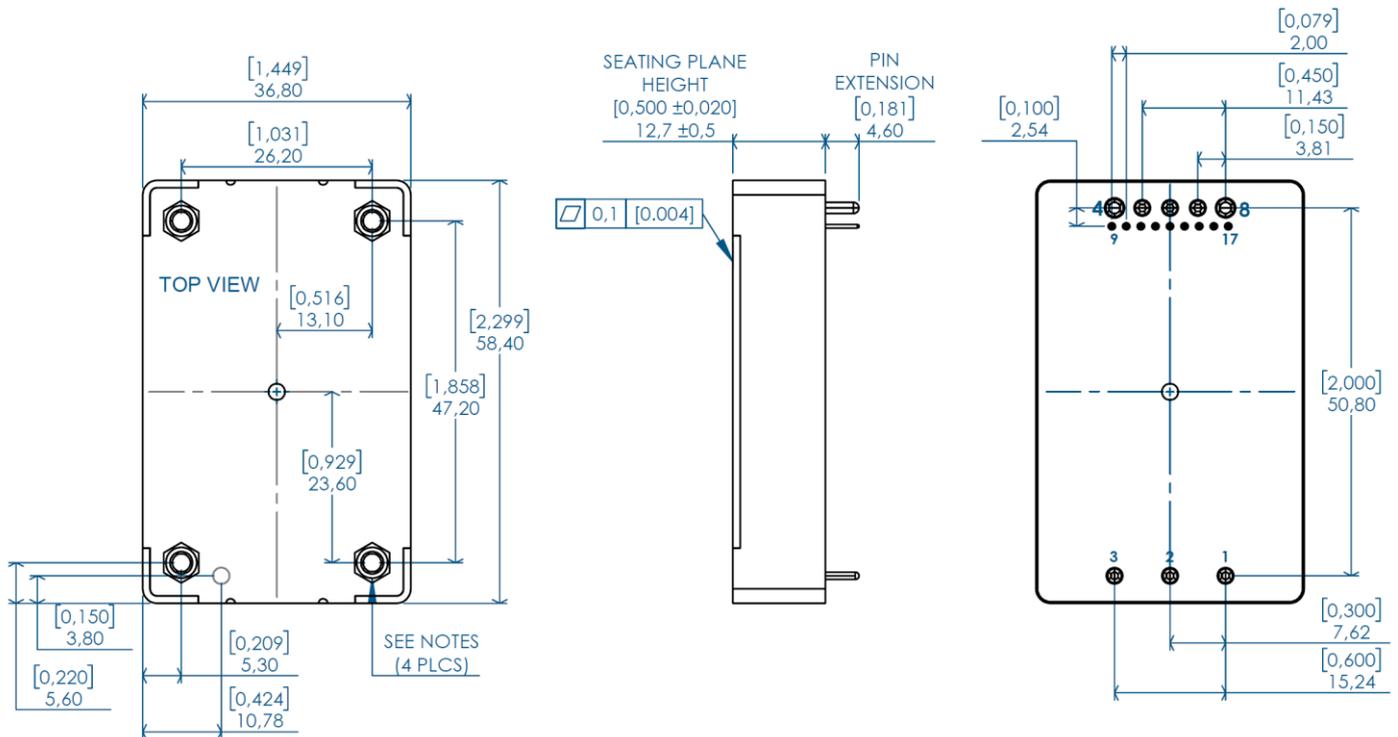
NOTES:

- APPLIED TORQUE NOT TO EXCEED 0.7Nm (6in-lb).
- BASEPLATE FLATNESS TOLERANCE IS 0.25mm (0.010") TIR FOR SURFACE.
- PINS 1-3 AND 5-7 ARE 1.02mm DIA. (0.040") WITH 2.03mm DIA. (0.080") STANDOFFS.
- PINS 4 AND 8 ARE 1.57mm DIA. (0.062") WITH 2.54mm DIA. (0.100") STANDOFFS.
- PINS 1-8
- MATERIAL: BRASS ALLOY
- FINISH: 10µ" GOLD OVER NICKEL
- WEIGHT: 105.0 g (3.70 oz)
- ALL DIMENSIONS IN MILLIMETERS [inches]
- TOLERANCES: X.Xmm ±0.5mm (X.XXIN ±0.020)
X.XXmm ±0.25mm (X.XXXIN ±0.010)

Pin	Name	Function
1	+IN	Positive input voltage
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3	-IN	Input return
4	-OUT	Output return
5	-SNS	Negative remote sense
6	TRIM	Output voltage trim
7	+SNS	Positive remote sense
8	+OUT	Positive output voltage



Mechanical Drawing – Threaded & PMBUS Capable



NOTES:

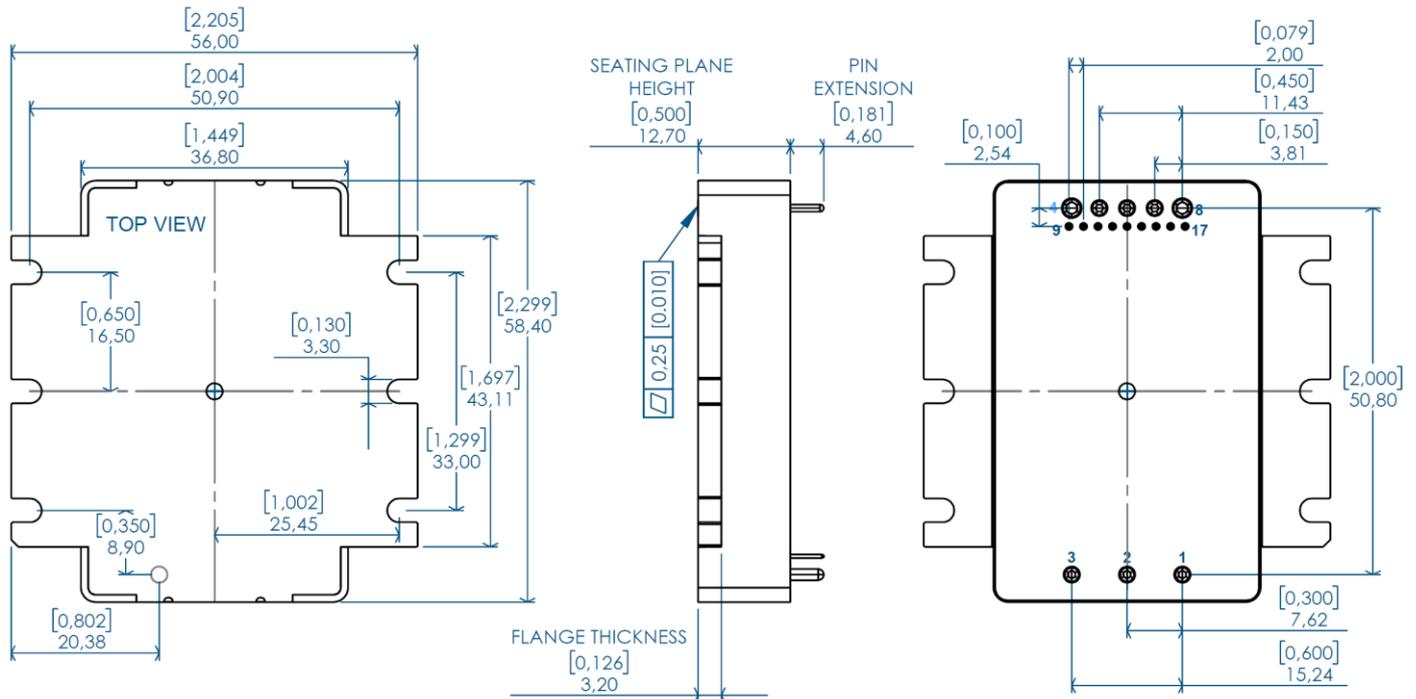
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- PM OPTION PINS 9-17 ARE 0.50mm x 0.50mm SQUARE
- PINS 1-8
MATERIAL: BRASS ALLOY
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- PM OPTION PINS 9-17
MATERIAL: PHOSPHOR BRONZE
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- WEIGHT: 95.0 g (3.35 oz)
- ALL DIMENSIONS IN MILLIMETERS [inches]
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3	-IN	Input return
4	-OUT	Output return
5	-SNS	Negative remote sense
6	TRIM	Output voltage trim
7	+SNS	Positive remote sense
8	+OUT	Positive output voltage
9*	SYNCH	Active Current Synchronization
10*	DATA-	RS485 Data-
11*	DATA+	RS485 Data+
12*	PMBUS_C2	I2C Control
13*	GND	Digital Ground
14*	PMBUS_SDA	I2C Data
15*	PMBUS_SMBALERT	I2C slave to master alert
16*	PMBUS_SCL	I2C Clock
17*	PMBUS_ADDRESS	I2C address selection

*: AVAILABLE ON PMBUS OPTION



Mechanical Drawing – Flanged & PMBUS Capable



NOTES:

- APPLIED TORQUE NOT TO EXCEED 0.7Nm (6in-lb).
- BASEPLATE FLATNESS TOLERANCE IS 0.25mm (0.010") TIR FOR SURFACE.
- PINS 1-3 AND 5-7 ARE 1.02mm DIA. (0.040") WITH 2.03mm DIA. (0.080") STANDOFFS.
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15*	PMBUS_SMBALERT	I2C slave to master alert
16*	PMBUS_SCL	I2C Clock
17*	PMBUS_ADDRESS	I2C address selection

*: AVAILABLE ON PMBUS OPTION



Part Ordering Information

Family	Product Variant	Option Variant	Compliance
KEU-BM734	-001	-XXX	R: RoHS & REACH

Ordering Number	Baseplate	Communication	Current Sharing	RoHS (Note*)
KEU-BM734-001-001	Threaded	No communication capability, PMBUS pins are absent.	Not Available	RoHS compliant with exemptions
KEU-BM734-001-002	Threaded	No communication capability, PMBUS pins are absent.	Droop Sharing	RoHS compliant with exemptions
KEU-BM734-001-003	Threaded	With PMBUS communication capability	Not Available	RoHS compliant with exemptions
KEU-BM734-001-004	Threaded	With PMBUS communication capability	Droop Sharing	RoHS compliant with exemptions
KEU-BM734-001-005	Flanged	No communication capability, PMBUS pins are absent.	Not Available	RoHS compliant with exemptions
KEU-BM734-001-006	Flanged	No communication capability, PMBUS pins are absent.	Droop Sharing	RoHS compliant with exemptions
KEU-BM734-001-007	Flanged	With PMBUS communication capability	Not Available	RoHS compliant with exemptions
KEU-BM734-001-008	Flanged	With PMBUS communication capability	Droop Sharing	RoHS compliant with exemptions
KEU-BM734-001-001R	Threaded	No communication capability, PMBUS pins are absent.	Not Available	RoHS-3 & REACH compliant
KEU-BM734-001-002R	Threaded	No communication capability, PMBUS pins are absent.	Droop Sharing	RoHS-3 & REACH compliant
KEU-BM734-001-003R	Threaded	With PMBUS communication capability	Not Available	RoHS-3 & REACH compliant
KEU-BM734-001-004R	Threaded	With PMBUS communication capability	Droop Sharing	RoHS-3 & REACH compliant
KEU-BM734-001-005R	Flanged	No communication capability, PMBUS pins are absent.	Not Available	RoHS-3 & REACH compliant
KEU-BM734-001-006R	Flanged	No communication capability, PMBUS pins are absent.	Droop Sharing	RoHS-3 & REACH compliant
KEU-BM734-001-007R	Flanged	With PMBUS communication capability	Not Available	RoHS-3 & REACH compliant
KEU-BM734-001-008R	Flanged	With PMBUS communication capability	Droop Sharing	RoHS-3 & REACH compliant

RoHS & REACH Compliance*

All KOLT products ship by default with SnPb solder under EU RoHS Directive 2011/65/EU, utilizing lead Exemption 7(a).

To obtain a lead-free build that meets **RoHS-3** requirements and REACH compliancy, add the “-R” suffix to the part number. These units are CE marked.

Revision History

Document Number	Revision	Date	Description	Page Number(s)
110263	01	20.03.2025	Initial Release	-
110263	02	29.07.2025	Part Number Updated	-

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