

## Features & Benefits

- Single-Phase Power Factor Correction Module
- Input Frequency Range: 47-63 Hz
- Wide Input Voltage Range: 90-265 V<sub>RMS</sub>
- Power Factor of 0.99 at Full Load
- Less Than 10% THD of AC Input Current
- Up To 3420 W Output Power
- 97% Efficiency at Full Load
- Internal Input EMI Filter\*
- Active Inrush Current Limiting
- RS-485 Communication
- Input Under/Over Voltage Protection
- Over Temperature Protection
- Input Over Current Protection
- Output Over Voltage Protection
- Baseplate Cooled
- Compatible With KOLT DC-DC Converters

## Compliance

Module is designed to meet:

- MIL-STD-461G\*
- MIL-STD-810G

\*MIL-STD-461G testing requires additional input EMI filtering

## Typical Applications

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

Product Ratings	
V <sub>IN</sub>	90–265 V <sub>RMS</sub> (Single-Phase)
V <sub>IN,NOM</sub>	220 V <sub>RMS</sub>
V <sub>OUT</sub>	380 V <sub>DC</sub>
I <sub>OUT</sub>	9 A
P <sub>OUT</sub>	3420 W

## Product Description

Single-Phase Power Factor Correction Module is an AC/DC power factor correction module that operates from a universal single-phase AC input and generates constant 380 V<sub>DC</sub> output. Module draws a nearly sinusoidal current with less than 10% THD and close to unity power factor. Converter is fully protected against all external faults and disturbances. The innovative baseplate cooling technology engineered by KOLT allows adaptation of different cooling strategies, including liquid baseplate cooling. The natural and forced air cooling strategies can also be implemented via mounting on an external heatsink with peace of mind.

The Power Factor Correction Module is engineered to perform reliably under extreme environmental conditions. It comes with advanced protection features against external faults and disturbances, meeting major military standards. Thanks to KOLT's innovative engineering, the converter has a compact design that provides high power density and performance. The module can be easily configured at the factory to fit specific electrical and mechanical requirements of the application.



Size: 200 × 130 × 35.8 mm

## Electrical Characteristics

Input Characteristics					
Parameters	Comments	Min	Typ	Max	Unit
Input Voltage	Continuous	90	220	265	V <sub>RMS</sub>
Input No Load Current	@Nominal input voltage	-	160	-	mA <sub>DC</sub>

Output Characteristics					
Parameters	Comments	Min	Typ	Max	Unit
Output Voltage	User settable		380		V <sub>DC</sub>
Output Current Limit	User settable	0	9	10	A <sub>DC</sub>
Output Power		-	-	3420	W
Output Ripple and Noise	@20 MHz Bandwidth	-	-	30	V <sub>pk-pk</sub>
Line Regulation	Over the full range of line input voltage	Insignificantly small			-
Load Regulation	From 10% load to full load, nominal input voltage	-	100	-	mV
External Load Capacitance		-	-	?	μF

General Characteristics					
Parameters	Comments	Min	Typ	Max	Unit
Efficiency	@Rated output power	98%	-	-	-
Turn-on Delay	Factory settable, health check	-	-	4500	ms
Soft-Start Time	Factory settable	-	-	50	ms
Power Density	@Rated output power	-	3554	4265	W/dm <sup>3</sup>
Weight		-	1.2	-	kg
Length	Connector's lengths are not included	-	166	-	mm
Depth		-	130	-	mm
Height		-	36.5	-	mm
Cooling	Baseplate Cooling				
Built-in Test Feature	DC OK, Remote Error Sensing				

Protections					
Parameters	Comments	Min	Typ	Max	Unit
<b>Input Under Voltage Protection</b>	When the voltage returns within the normal limits, unit resumes operation automatically	85	90	95	V <sub>AC</sub>
<b>Input Over Voltage Protection</b>		260	265	270	V <sub>AC</sub>
<b>Output Over Current Protection</b>	Fully electronic against over-load	-	-	130%	I <sub>OUT_TYP</sub>
<b>Output Over Voltage Protection</b>		-	-	115%	V <sub>OUT_TYP</sub>
<b>Output Short Circuit Protection</b>	Fully electronic against over-load and continuous short-circuit conditions				
<b>Over Temperature Protection</b>	Automatically resumes operation when the heat sink temperature decreases below 70°C	-	80	-	°C
<b>Battery</b>	Prevention of battery discharge when charger is off				
	Reverse polarity				

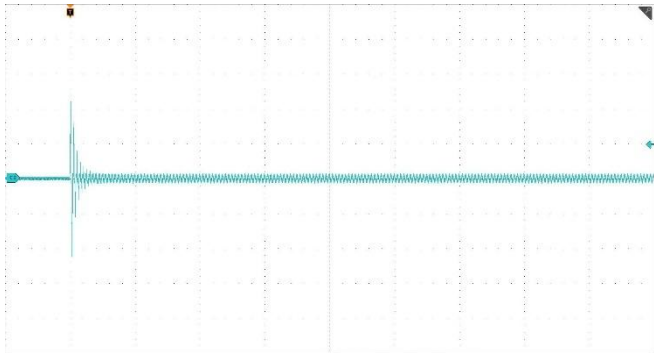
Isolation Characteristics					
Parameters	Comments	Min	Typ.	Max	Unit
<b>Insulation Resistance</b>	Input to Case	-	>4.8	-	GΩ
<b>Isolation Voltage</b>	Input to Case	-	-	500	V <sub>DC</sub>
<b>Isolation Voltage</b>	Output to Case	-	-	500	V <sub>DC</sub>

Environmental Characteristics					
Parameters	Standard / Method	Min	Typ	Max	Unit
Operational Temperature	MIL-STD-810G Method 501.5/502.5 Procedure II	-32	-	+50	°C
Storage / Transport Temperature	MIL-STD-810G Method 501.5/502.5 Procedure I	-40	-	+63	°C
Operational Low Pressure	MIL-STD-810G Method 500.5 Procedure II	-	-	10000	ft
Storage / Transport Low Pressure	MIL-STD-810G Method 500.5 Procedure I	-	-	15000	ft
Parameters	Standard / Method	Waveform	Peak Value	Pulse Duration	Axis
Shock	MIL-STD-810G Method 516.6 Procedure I	Sawtooth	20g	11 ms	±X, ±Y, ±Z
		Half-Sine	10g	11 ms	±X, ±Y, ±Z
Parameters	Standard / Method	Category		Platform	Vehicle
Vibration	MIL-STD-810G Method 514.6 Procedure I	Category 4		Secured Cargo	Truck Transportation and Composite Wheeled Vehicles
		Category 8		Aircraft	Propeller
		Category 10		Watercraft	Marine Vehicles
		Category 11		Railroad	Train
		Category 20		Ground Vehicles	Wheeled and Tracked Vehicles
Category 21		Watercraft	Marine Vehicles		
Parameters	Standard / Method	Condition			
Fungus	MIL-STD-810G Method 508.6	Analysis of the degree of inertness to fungus growth of the components.			
Solar Radiation	MIL-STD-810G Method 505.5 Procedure I	A2			
Humidity	MIL-STD-810G Method 507.5 Procedure II	≥ %95 Relative @30°C			
Parameters	Standard / Method	Test			
EMI/EMC*	MIL-STD-461E <sup>b</sup> MIL-STD-461G <sup>a</sup>	CE102 <sup>a,b</sup> CS101 <sup>a,b</sup> CS114 <sup>a,b</sup> CS115 <sup>a</sup> CS116 <sup>a,b</sup> CS118 <sup>a</sup> RE101 <sup>b</sup> RE102 <sup>a,b</sup> RS101 <sup>b</sup> RS103 <sup>a,b</sup>			

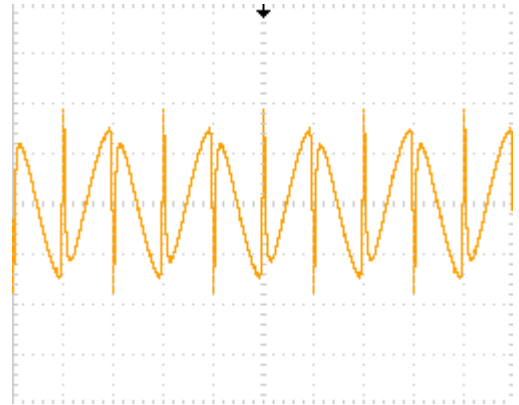
\* Tested at the system level with an EMI filter installed at the input.

<sup>a</sup> Ground Army

<sup>b</sup> Surface Ships

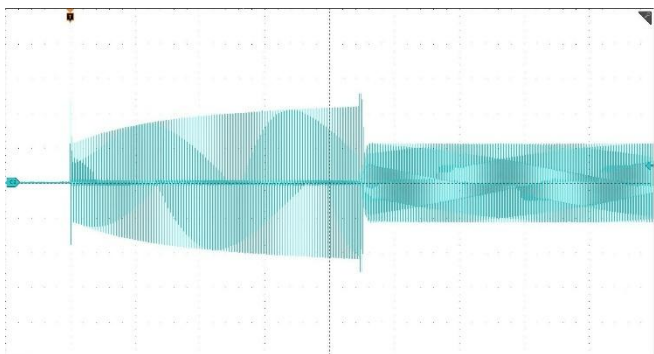


**Figure 1.** Inrush current at nominal input voltage

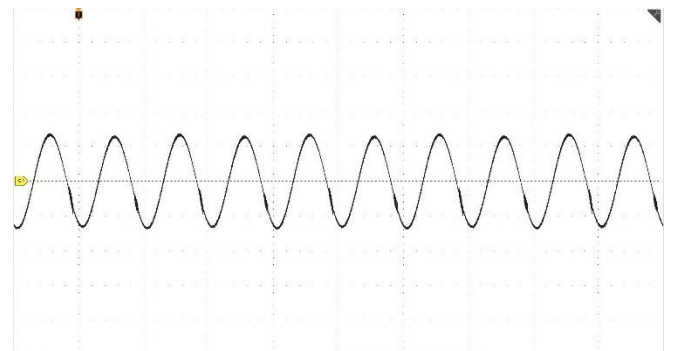


Leakage current (orange) (500uA/div) Time base : 10 ms/div

**Figure 4.** Leakage current to ground at nominal input voltage and 10% load current

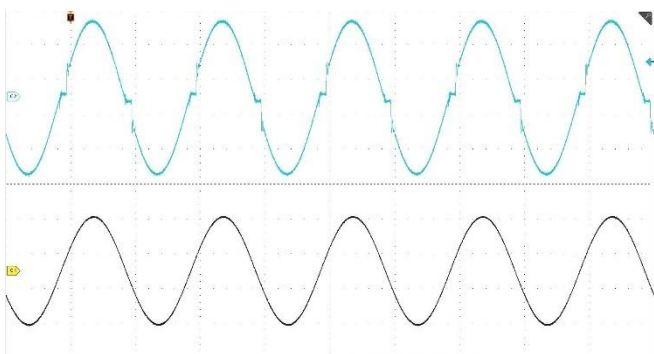


**Figure 2.** Input current for inrush and start-up stages at nominal input voltage

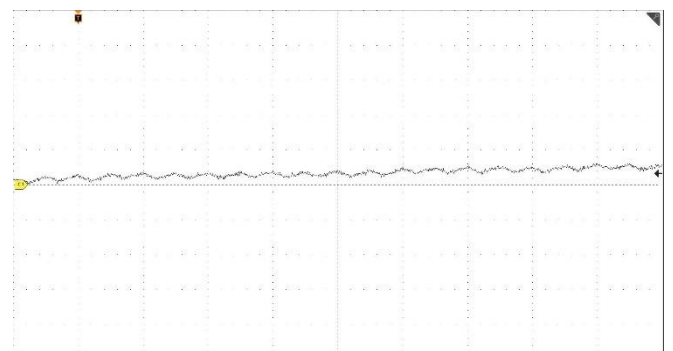


Output voltage (black) (10 V/div) Time base : 10 ms/div

**Figure 5.** Output voltage ripple at nominal input voltage and rated load current (AC Coupled), Bandwidth: 20 MHz

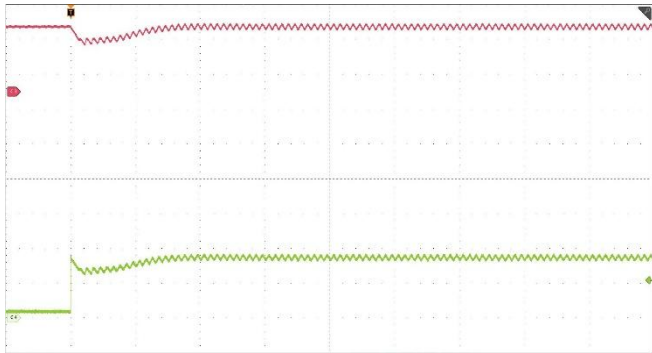


**Figure 3.** Typical input voltage and current waveforms at rated load current



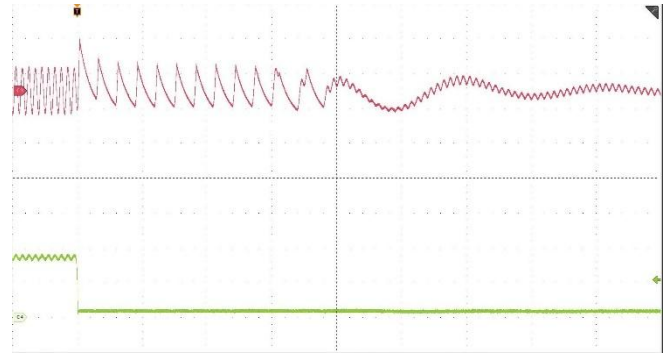
Output voltage (black) (2 V/div) Time base : 10 μs/div

**Figure 6.** Output voltage ripple at nominal input voltage and rated load current (AC Coupled), Bandwidth: 20 MHz



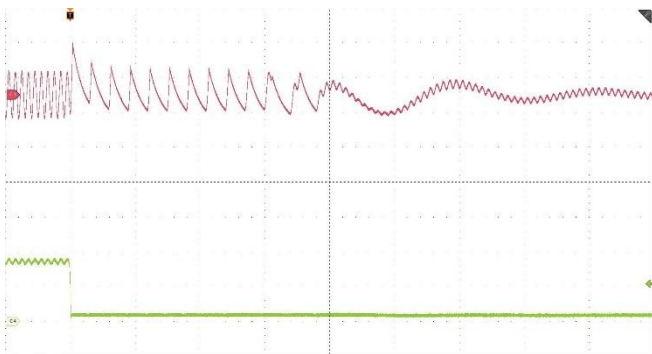
Output voltage (red) (200 V/div) Time base : 100 ms/div  
Output current (green) (5 A/div)

**Figure 7.** Load transient response: from 10% to 100% nominal output voltage (DC Coupled)



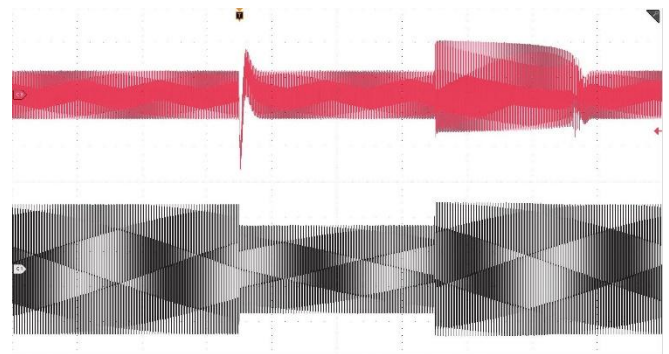
Output voltage (red) (20 V/div) Time base : 100 ms/div  
Output current (green) (5 A/div)

**Figure 10.** Load transient response: from 100% to 10% nominal output voltage (DC Coupled)



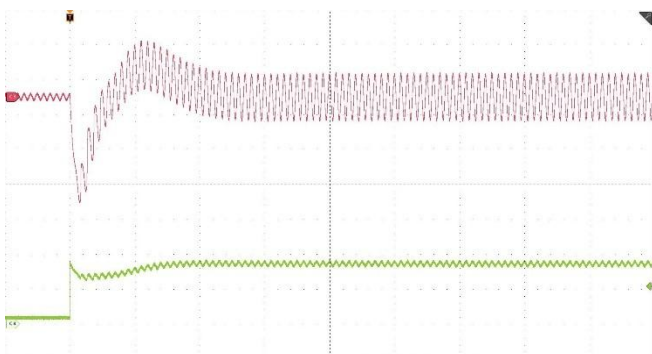
Output voltage (red) (200 V/div) Time base : 100 ms/div  
Output current (green) (5 A/div)

**Figure 8.** Load transient response: from 100% to 10% nominal output voltage (DC Coupled)



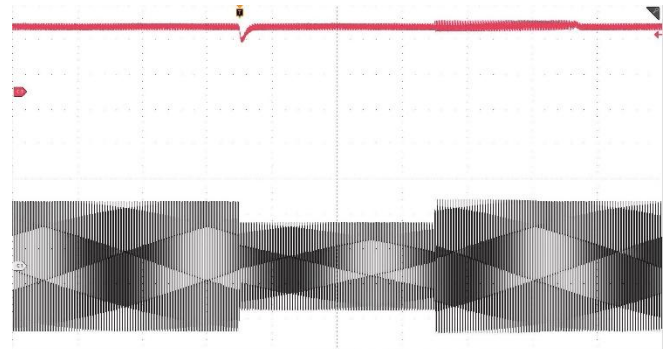
Output voltage (red) (20 V/div) Time base : 1 s/div  
Input voltage (black) (200 V/div)

**Figure 11.** Line transient response: from 265 V<sub>RMS</sub> to 175 V<sub>RMS</sub> and from 175 V<sub>RMS</sub> to 265 V<sub>RMS</sub> at nominal output voltage (DC Coupled)



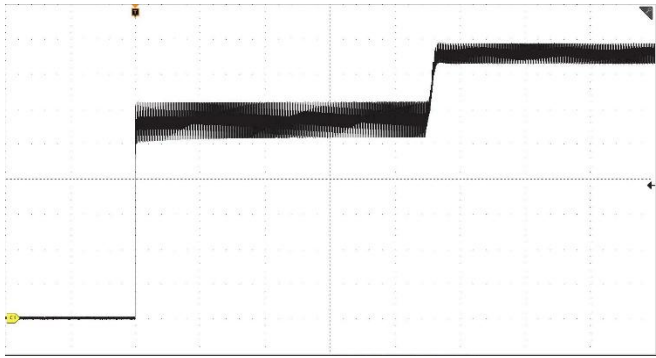
Output voltage (red) (20 V/div) Time base : 100 ms/div  
Output current (green) (5 A/div)

**Figure 9.** Load transient response from 10% to 100% nominal output voltage (AC Coupled)



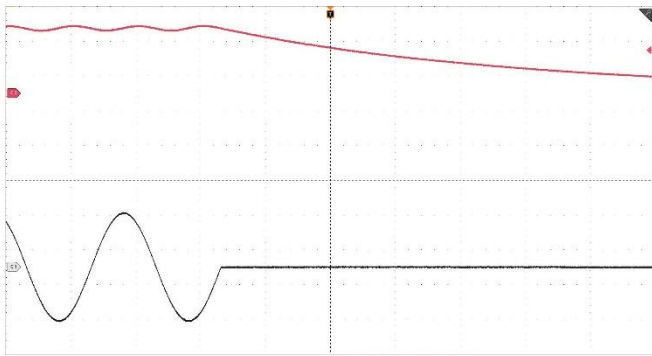
Output voltage (red) (200 V/div) Time base : 1 s/div  
Input voltage (black) (200 V/div)

**Figure 12.** Line transient response: from 265 V<sub>RMS</sub> to 175 V<sub>RMS</sub> and from 175 V<sub>RMS</sub> to 265 V<sub>RMS</sub> at nominal output voltage (AC Coupled)



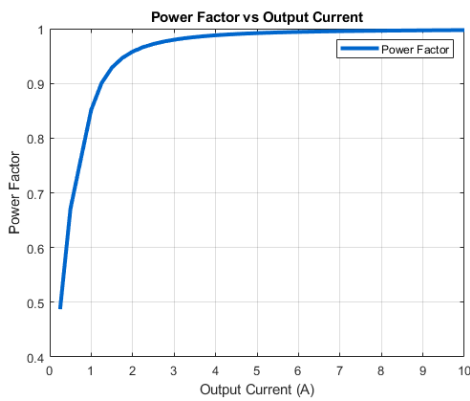
Output voltage (black) (50 V/div) Time base : 1 s/div

**Figure 13.** Start-up waveform at rated load current and nominal output voltage

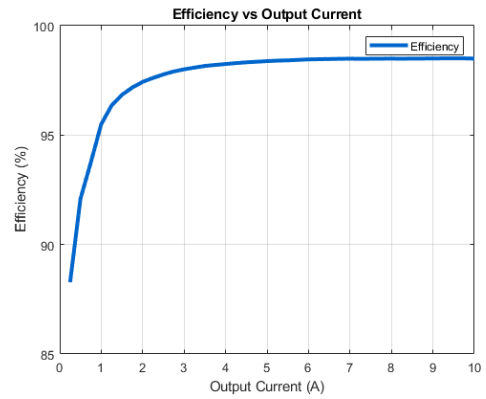


Output voltage (red) (200 V/div) Time base : 10 ms/div  
Input voltage (black) (200 V/div)

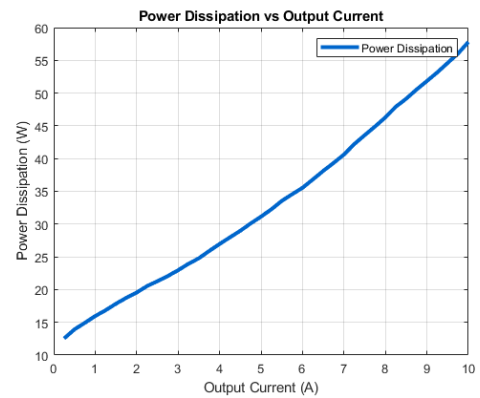
**Figure 14.** Hold-up waveform at rated load current and nominal output voltage



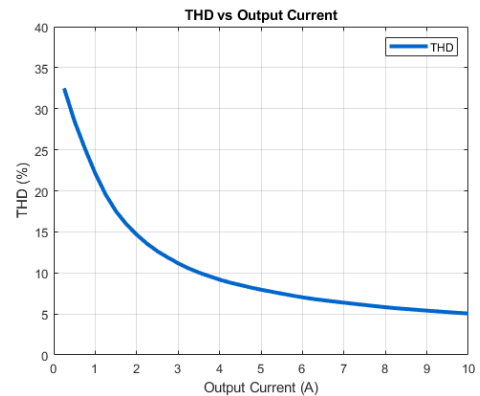
**Figure 15.** Power factor versus output current at nominal input voltage



**Figure 16.** Efficiency versus output current at nominal input voltage



**Figure 17.** Power dissipation versus output current at nominal input voltage



**Figure 18.** Total harmonic distortion (THD) versus output current at nominal input voltage

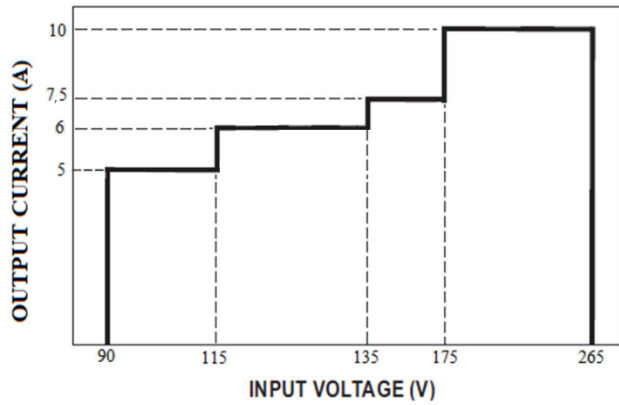
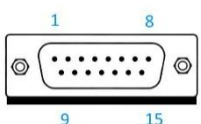


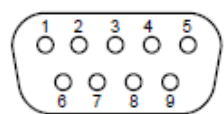
Figure 19. Derating curve of output load versus input voltage

## Connector Configuration

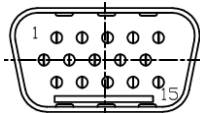
Input Connector DAMG-15P-J-K87	
Pin	Signal
1	VIN_N
2	VIN_N
3	VIN_N
4	NC
5	NC
6	VIN_P
7	VIN_P
8	VIN_P
9	VIN_N
10	VIN_N
11	NC
12	CHASSIS
13	NC
14	VIN_P
15	VIN_P
MTG1	CHASSIS
MTG2	CHASSIS



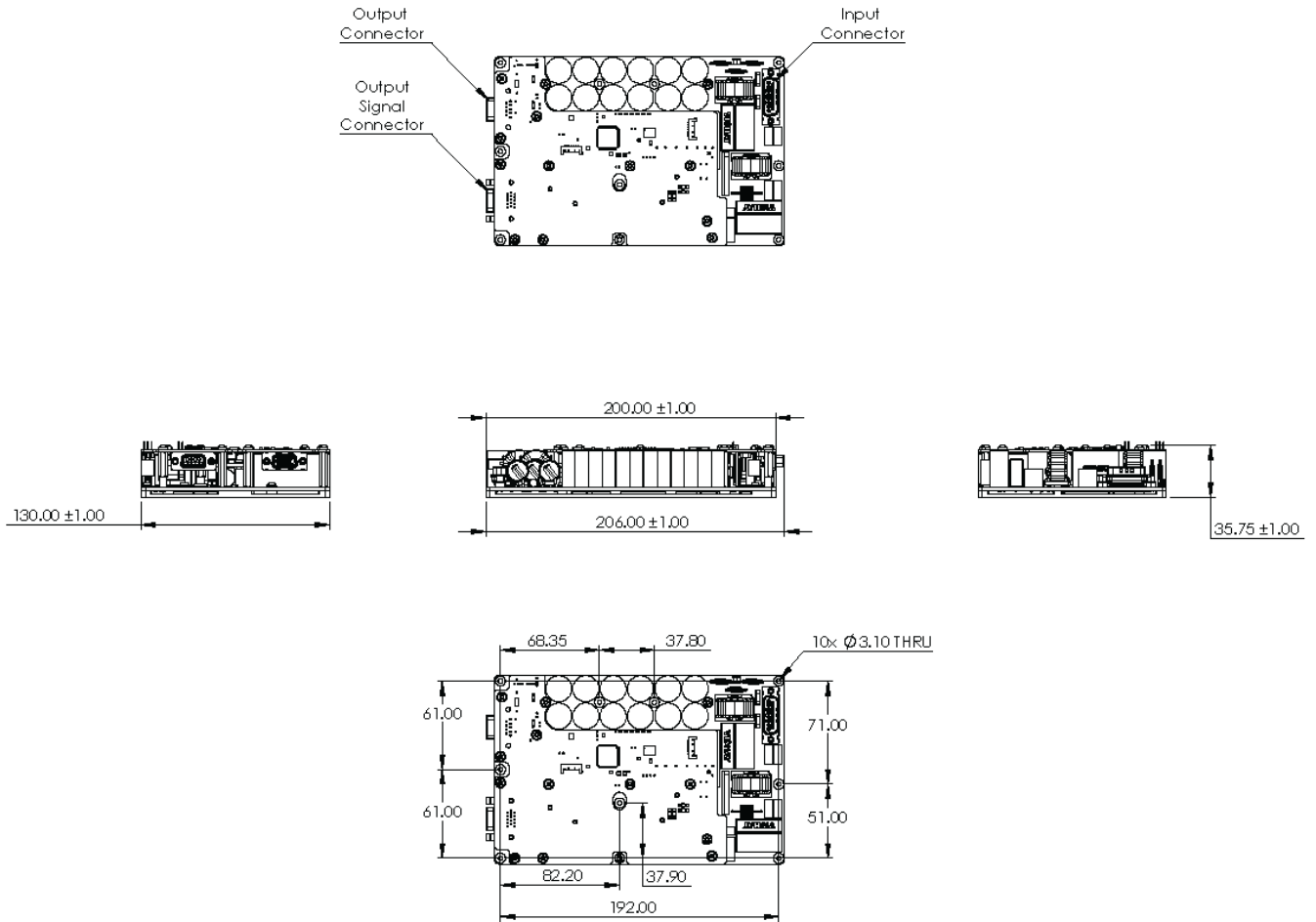
Output Terminals DEMM9SL	
Pin	Signal
1	DCOUT
2	DCOUT
3	NC
4	DCOUT_RTN
5	DCOUT_RTN
6	DCOUT
7	NC
8	NC
9	DCIN_RTN
MTG1	CHASSIS
MTG2	CHASSIS



Output Signal Connector ICD15S13E4GV00LF	
Pin	Signal
1	AC LED RED
2	AC LED GREEN
3	GND
4	POWER OUT GOOD
5	GND
6	CAN IN P
7	CAN IN N
8	RS422_D+_PFC
9	RS422_D-_PFC
10	12V
11	NC
12	NC
13	NC
14	RS422_D-_PSFB
15	RS422_D+_PSFB
MTG1	CHASSIS
MTG2	CHASSIS



## Mechanical Drawings



**Figure 20.** Mechanical Dimensions

## Part Ordering Information

Family	Product Variant	Option Variant	Compliance
KEU-PF822	-001	-XXX	R: RoHS & REACH

Ordering Number	Conformal Coating	RoHS (Note*)
KEU- PF822-001-001	Yes	RoHS 5/6 (Pb above limit)*
KEU- PF822-001-002	No	RoHS 5/6 (Pb above limit)*
KEU- PF822-001-001R	Yes	RoHS-3 & REACH compliant
KEU- PF822-001-002R	No	RoHS-3 & REACH compliant

### RoHS & REACH Compliance\*

By default, KOLT products are manufactured using SnPb solder for high-reliability applications and therefore are **not** compliant with EU RoHS Directive 2011/65/EU (as amended by (EU) 2015/863). These products meet RoHS requirements for all substances except lead (Pb). **These products are NOT CE marked due to SnPb solder.**

A **lead-free** build that meets RoHS-3 requirements and is designed to be REACH compliant is available by adding the “-R” suffix to the part number. **Only these products are CE marked.**

## Revision History

Document Number	Revision	Date	Description	Page Number(s)
107907	01	23.10.2024	Initial Release	-
107907	02	23.03.2025	Second Release <ul style="list-style-type: none"><li>• Compliances updated</li><li>• EMI filter information added</li><li>• Revision History and Contact information added</li></ul>	1, 2
107907	03	5.08.2025	Part Number Updated	-
107907	04	12.12.2025	CE marking updated.	-

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