

Series UAC

250W Isolated Regulated Power Factor Corrected Modules

PICO
Electronics, Inc.

PRODUCT OVERVIEW

The UAC series are isolated AC to DC power supplies with integrated power factor corrections. The low profile 4.6" x 2.5" x 0.5" full brick can power up to 250W. Output voltage models ranges from 5V to 300V. The combination of front end PFC module and isolated low voltage output saves space - one module instead of two modules.



FEATURES

- 0.99 Power Factor
- Wide input voltage range
- Meets EN/IEC 610000-3-2
- Up to 250W output power in a full brick size
- Input/output isolation
- Regulated 5V to 300V output models
- Fixed operating frequency
- Low 0.5" height

Contact Pico for part number of available options:

- Expanded operating temp: -40°C to +85°C
- Select screening per MIL-STD-883:
 - Stabilization Bake
 - Temperature Cycle
 - Burn-In
- Special Input Voltage, Output Voltage, or Output Power
- 360-800Hz input frequency

UAC	28S
SERIES	NOM. OUTPUT VOLTAGE
UAC	5S = 5V 9S = 9V 12S = 12V 15S = 15V 24S = 24V 28S = 28V 48S = 48V HV100S = 100V HV125S = 125V HV150S = 150V HV175S = 175V HV200S = 200V HV225S = 225V HV250S = 250V HV275S = 275V HV300S = 300V

MODEL LIST

Pico Part Number	Output Voltage [VDC]	Output Current		Output Power [W]	Efficiency ⁽²⁾ [%] typ.	Load Regulation 10-100% ⁽¹⁾ [±%] max	Output Ripple @ 1MHz BW [mVp-p] max	Output Voltage Tolerance ⁽²⁾ [±%]
		Min. ^(1,3) [A]	Max. [A]					
UAC5S	5	2	20	100	76	1.5	100	1
UAC9S	9	1.11	11.1	100	78	1.5	75	1
UAC12S	12	1.25	12.5	150	80	1.5	75	0.5
UAC15S	15	1	10	150	80	1.5	75	0.5
UAC24S	24	0.833	8.33	200	81	1	100	0.5
UAC28S	28	0.714	7.14	200	82	1	100	0.5
UAC48S	48	0.417	4.17	200	84	1	200	0.5
UACHV100S	100	0.25	2.5	250	85	1	250	1
UACHV125S	125	0.2	2				250	
UACHV150S	150	0.167	1.67				350	
UACHV175S	175	0.143	1.43				350	
UACHV200S	200	0.125	1.25				400	
UACHV225S	225	0.111	1.11				400	
UACHV250S	250	0.1	1				500	
UACHV275S	275	0.091	0.91				500	
UACHV300S	300	0.083	0.83				500	

Note 1: Maintain minimum 10% of rated load to prevent a voltage surge.

Note 2: Tested at nominal input voltage and full output load.

Note 3: Units can operate <10% load but it may not meet all specifications.

Note 4: A minimum 220µF, 450V high quality aluminium electrolytic capacitor is required.

SPECIFICATIONS (115VAC/60Hz, Full Load, T_A = +25°C, 1 hour warm up unless otherwise specified)

INPUT

Parameter	Condition	Min.	Typ.	Max.	Units
Input Voltage Range	Refer to Output Power	85	115	265	VAC
Input Frequency		47	60	440	Hz
Input Fuse Recommendation	≤48V output models with 5Ω inrush thermistor	4A, Rated Voltage ≥ Input Voltage			
	≥100V output models	5A, Rated Voltage ≥ Input Voltage			
Input Thermistor Recommendation	≤48V output models	-	5	-	Ω
	≥100V output models	Integrated Thermistor			

OUTPUT

Parameter	Condition	Min.	Typ.	Max.	Units
Line Regulation		-	0.2	-	±%
Output Power	≤48V output models	85-265VAC input			W
	≥100V output models	85-95VAC input			
		95-265VAC input			

ENVIRONMENTAL

Parameter	Condition	Min.	Typ.	Max.	Units
Operating Temperature Range	Baseplate	0	-	+85	°C
Storage Temperature Range	Baseplate	-55	-	+105	°C
Cooling	Conduction through baseplate				

SPECIFICATIONS (115VAC/60Hz, Full Load, T_A = +25°C, 1 hour warm up unless otherwise specified)**GENERAL**

Parameter	Condition	Min.	Typ.	Max.	Units
Power Factor	50 to 100% load, 47 to 60Hz Input	0.99	-	-	
Operating Frequency		-	100	-	kHz
Isolation Voltage	Input to output	4242	-	-	VDC
	Input/output to baseplate	2121	-	-	
	Input to 380V BUS	None			
Size (L x W x H)	≤48V output models	4.6 x 2.5 x 0.5 (116.9 x 63.5 x 12.7)			inches (mm)
	≥100V output models	4.6 x 2.5 x 0.8 (116.9 x 63.5 x 20.32)			
Weight	≤48V output models	-	245	-	grams
	≥100V output models	-	340	-	
Case	Aluminum baseplate and Glass Reinforced Polymer				
Potting	Vacuum Impregnated Epoxy				
Box Packaging (W x L x H)	8 x 7.5 x 1.5 (203.2 x 190.5 x 38.1) or 12 x 9 x 1.5 (304.8 x 228.6 x 38.1)				inches (mm)

PROTECTIONS & FEATURES

Parameter	Condition	Min.	Typ.	Max.	Units
Output Current Limit	Set Point	-	130	-	%
Short circuit	Temporary, auto-recovery				
Overtemperature	Baseplate	90	-	100	°C

DESIGNED TO MEET

Test	Referenced Standard	Description
Vibration	MIL-STD-202	Method 204, Vibration, High Frequency, Condition D
Shock	MIL-STD-202	Method 213, Shock (Specified Pulse), Condition I
Humidity	MIL-STD-202	Method 106, Moisture Resistance
Altitude	MIL-STD-202	Method 105, Barometric Pressure (Reduced), Condition D

OPTIONS AVAILABLE - CONTACT PICO FOR PART NUMBER

Parameter	Referenced Standard	Description
Stabilization Bake	MIL-STD-883	Referenced Method 1008 Non-operating maximum storage temperature for 24 hours
Temperature Cycle	MIL-STD-883	Referenced Method 1010 Non-operating at temperature extremes, 15 mins/temp, 10 cycles
Burn-In	MIL-STD-883	Referenced Method 1015 Max operating temperature for 160 hours
Expanded Operating Temperature Range		-40°C to +85°C

THERMAL RESISTANCE

$$P_{OUT} = \frac{T_C - T_A}{T_{RCA} \times (1 / \eta - 1)}$$

P_{OUT} = Output Power in Watts

η = Efficiency

T_C = Case temperature in °C

T_A = Ambient temperature in °C

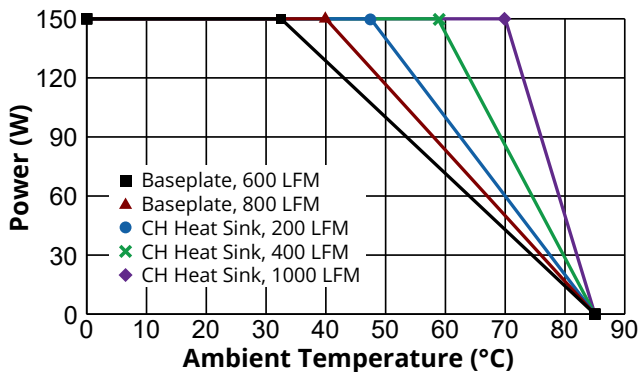
T_{RCA} = Thermal resistance of case to air in °C / W

Thermal resistance of case (T_{RCA})

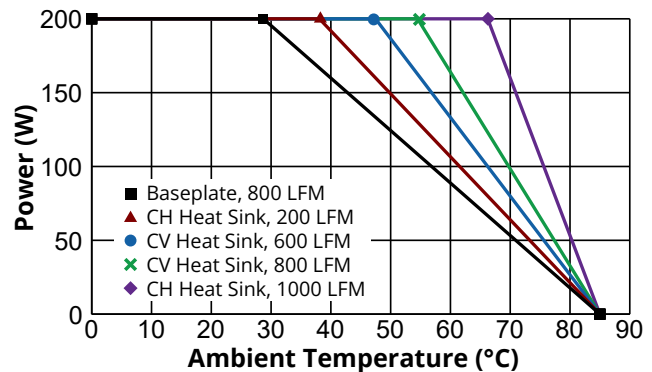
Airflow	≤48V output models			≥100V output models			Units
	Baseplate only	CV Heat Sink	CH Heat Sink	Baseplate only	CV Heat Sink	CH Heat Sink	
Free Air	5.10	3.50	3.00	4.80	3.30	2.80	°C / W
200 LFM	2.80	1.80	1.00	2.60	1.60	0.90	
400 LFM	1.80	1.10	0.70	1.60	1.00	0.60	
600 LFM	1.40	0.80	0.55	1.30	0.70	0.50	
800 LFM	1.20	0.65	0.45	1.10	0.60	0.40	
1000 LFM	1.00	0.55	0.40	0.90	0.50	0.35	

DERATING GRAPHS (Nominal V_{IN} , Full Load, Efficiency @ Full Load)

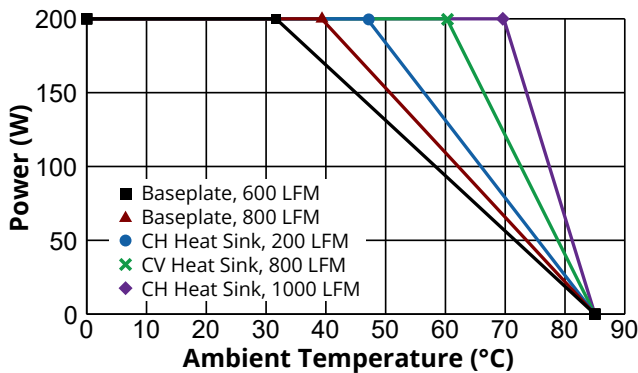
Models with Max. Output Power = 150W & Efficiency at full load = 80%



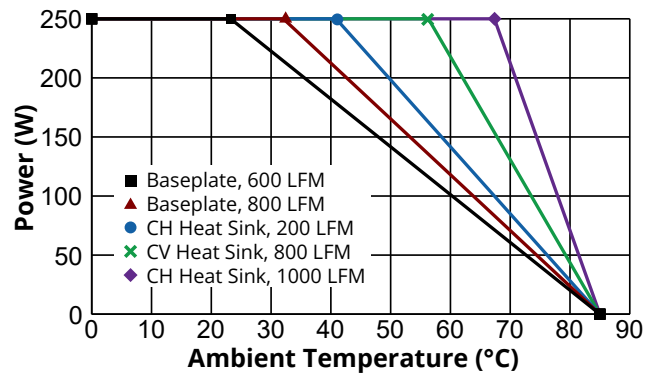
Models with Max. Output Power = 200W & Efficiency at full load = 81%

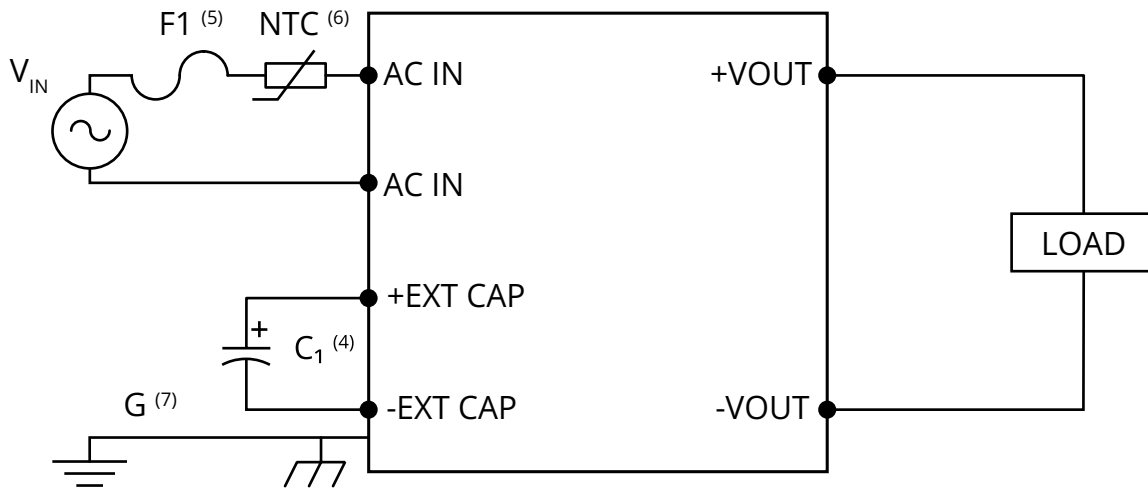


Models with Max. Output Power = 200W & Efficiency at full load = 84%



Models with Max. Output Power = 250W & Efficiency at full load = 85%



TYPICAL CONNECTION CIRCUIT

Note 4: A minimum 220 μ F, 450V high quality aluminium electrolytic capacitor is required.

Note 5: For ≤ 48 V output models, a 4A fuse is required on the input. For ≥ 100 V output models, a 5A fuse is required on the input.

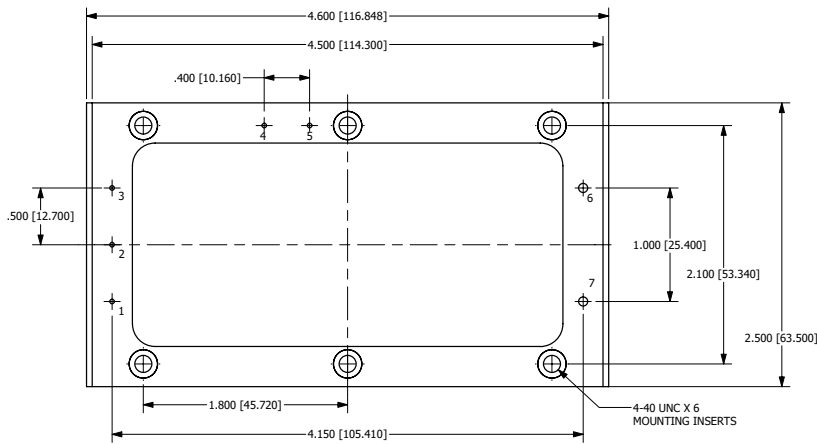
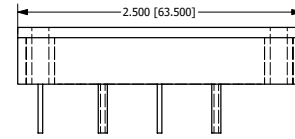
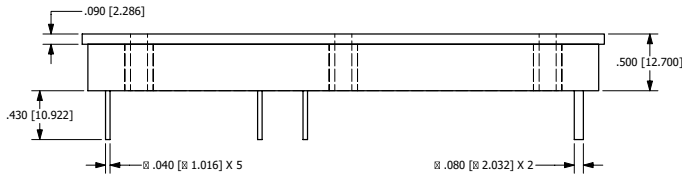
Note 6: For ≤ 48 V output models, a 5 Ω inrush thermistor is required on the input. For ≥ 100 V output models, an external thermistor is not required on the input.

Note 7: Physical Earth/Ground may be connected to baseplate/chassis or not connected.

Please note: The external hold up capacitor must be installed prior to operation. It cannot be connected to physical earth or ground.

MECHANICAL DRAWINGS

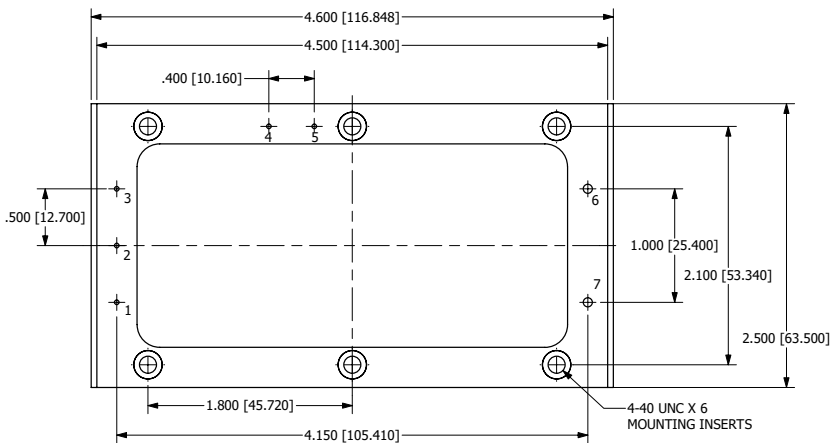
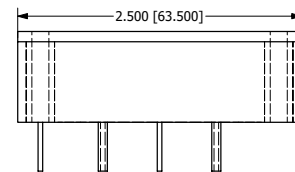
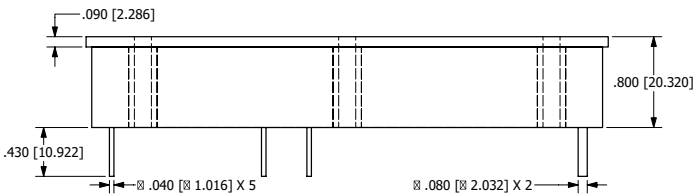
≤48V OUTPUT MODELS



BOTTOM VIEW

PIN	FUNCTION	PIN DIAMETER
1	AC IN	.040 [1.016]
2	AC IN	.040 [1.016]
3	N.C.	.040 [1.016]
4	+380V BUS	.040 [1.016]
5	-380V BUS	.040 [1.016]
6	-VOUT	.080 [2.032]
7	+VOUT	.080 [2.032]

≥100V OUTPUT MODELS

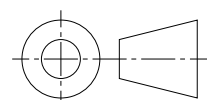


BOTTOM VIEW

PIN	FUNCTION	PIN DIAMETER
1	AC IN	.040 [1.016]
2	AC IN	.040 [1.016]
3	N.C.	.040 [1.016]
4	+380V BUS	.040 [1.016]
5	-380V BUS	.040 [1.016]
6	-VOUT	.080 [2.032]
7	+VOUT	.080 [2.032]

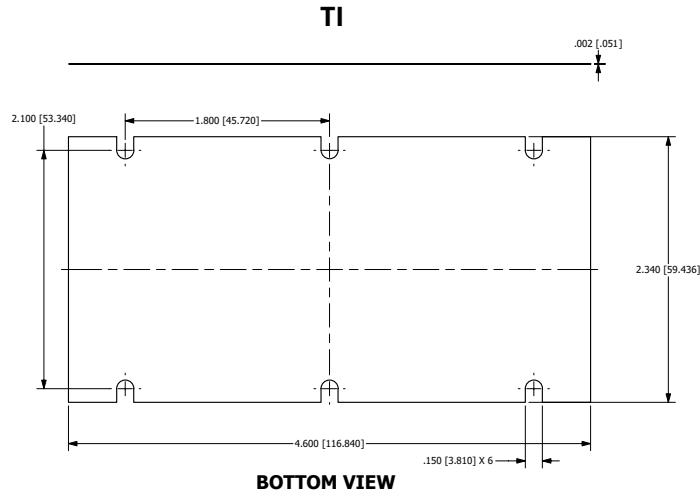
NOTES

- a. ALL DIMENSIONS ARE IN INCHES, [] = MM
- b. RECOMMENDED TORQUE FOR MOUNTING SCREWS: 6-9 INCH-LBS
- c. EXTERNAL CAPACITOR REQUIRED ACROSS TERMINALS 4 AND 5



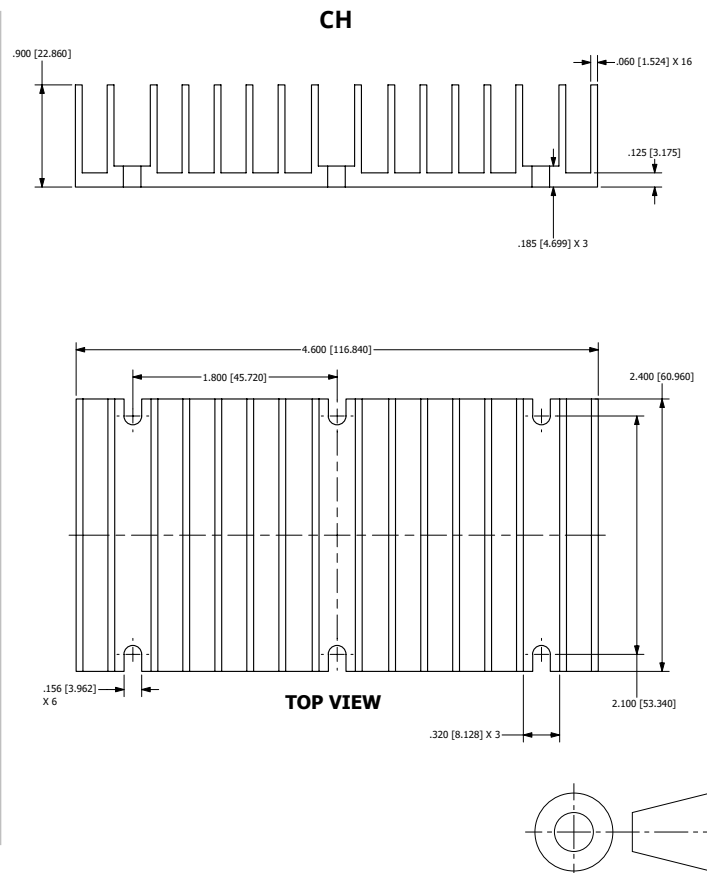
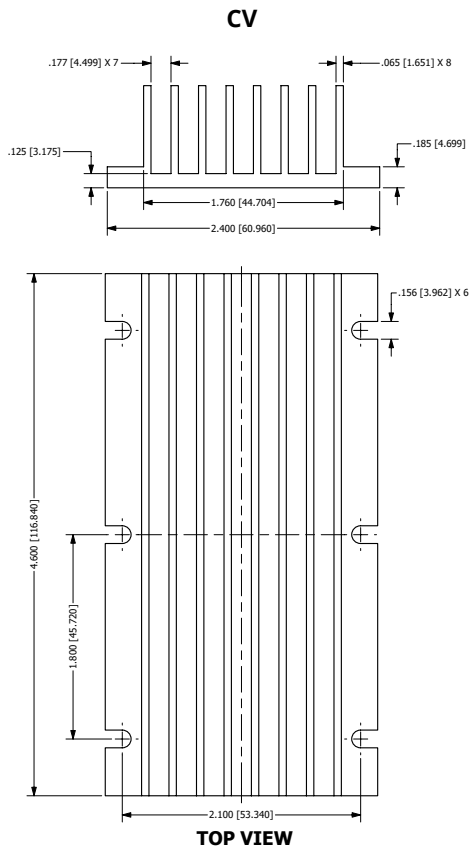
MECHANICAL DRAWINGS

THERMAL INTERFACE



Material	Alloy Aluminum Substrate
Thermal Conductivity	1530 BTU-in/hr sq.ft °F
Coefficient of Thermal Expansion, (25-100°C)	13.1 10 ⁻⁶ in-in/°F
Brinell Hardness	23 HB
Endurance Limit	5000 PSI
Standard Thickness	0.002 inches

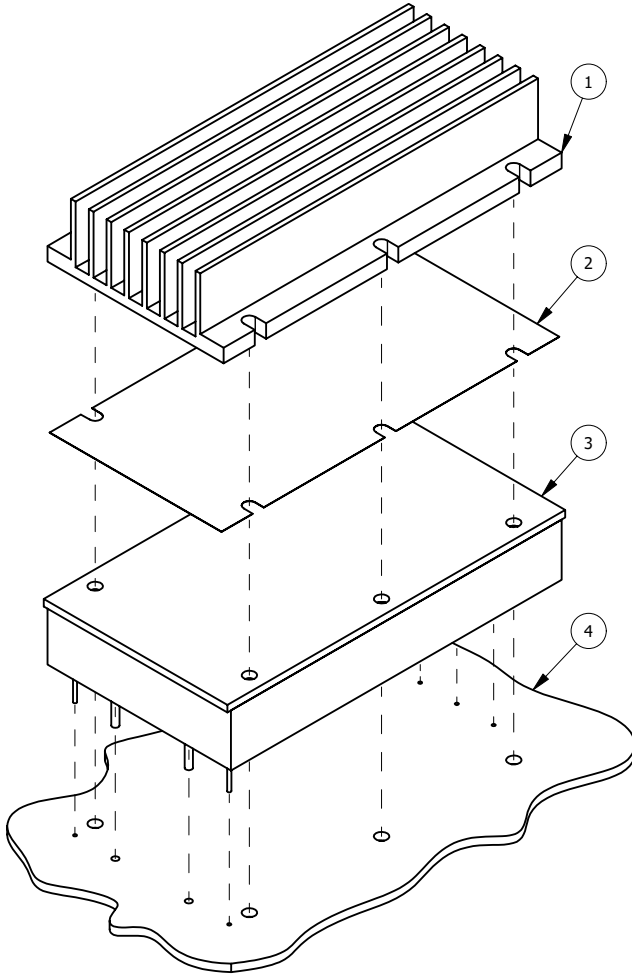
HEAT SINKS



Weight: 145 grams typical

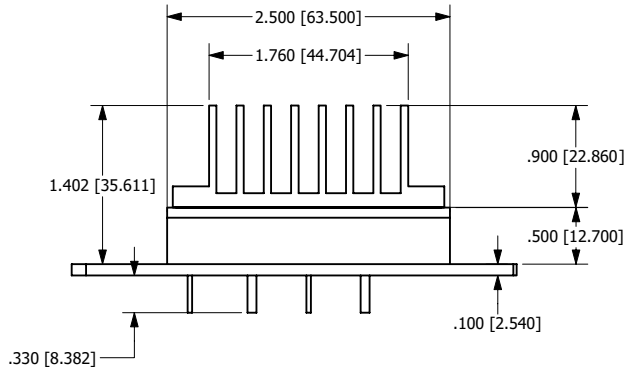
MECHANICAL DRAWINGS

HEAT SINK ASSEMBLY

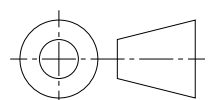
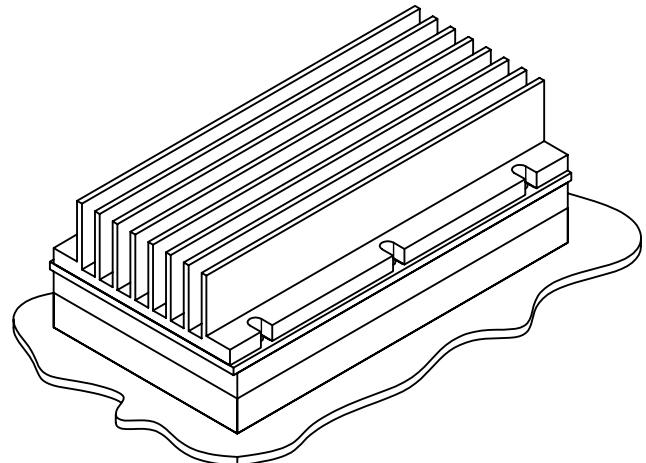
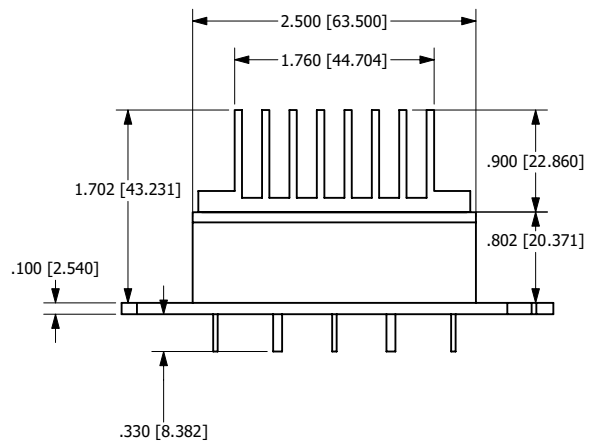


ITEM	QTY	DESCRIPTION
1	1	CH OR CV HEAT SINK
2	1	TI THERMAL INTERFACE
3	1	UAC MODULE
4	1	PCB

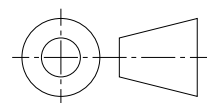
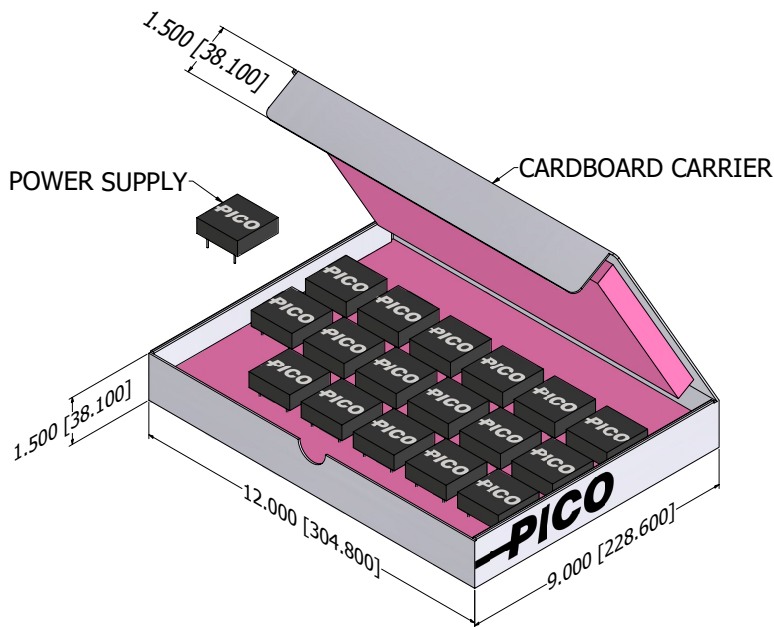
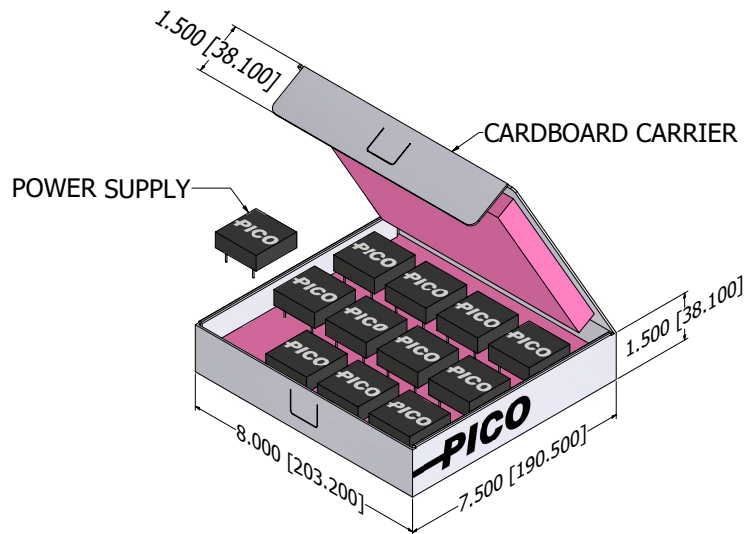
≤48V OUTPUT MODELS



≥100V OUTPUT MODELS



BOX PACKAGING - BULK



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