

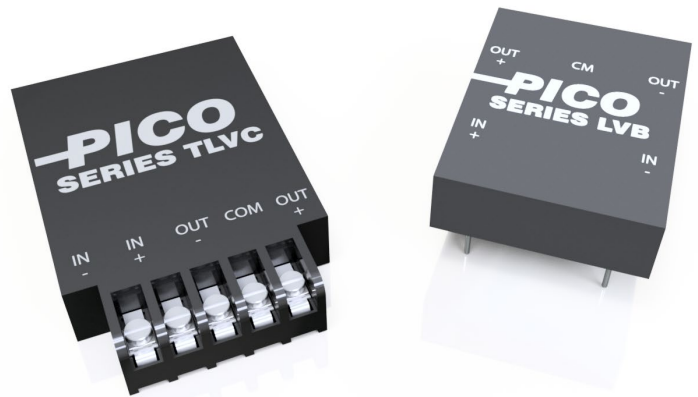
# Series LV & TLV

3-10W Isolated Regulated Low Profile DC-DC Converter

**PICO**  
Electronics, Inc.

## PRODUCT OVERVIEW

The LV & TLV series are regulated DC-DC converters with a wide 36 to 80V input range and low profile – 0.500". Over 80 models are available in both single and dual outputs, through hole and terminal strip. They can operate over the temperature range of -25°C to +70°C without derating, a heat sink or active cooling.



## FEATURES

- Up to 10W output models
- Encapsulated semiconductors, conservatively rated for maximum reliability
- Low profile – down to 0.500" height
- Wide input voltage range - 36 to 80V
- 3.3 to 48V output models
- Up to 1000VDC isolation at 100MΩ
- Input/output isolation
- Single and dual output
- No heat sink or derating required
- No external components required

Contact Pico for part number of available options:

- Expanded operating temp: -55°C to +85°C
- Select screening per MIL-STD-883:
  - Stabilization Bake
  - Temperature Cycle
  - Burn-In
- Special Input Voltage, Output Voltage, Isolation Voltage or Output Power

LV	A	28	S
MOUNTING	OUTPUT POWER	NOM. OUTPUT VOLTAGE	NUMBER OF OUTPUTS

**LV** = THROUGH HOLE

**TLV** = TERMINAL STRIP

**A** = 3W

**B** = 5W

**C** = 8W

**D** = 10W

**3.3** = 3.3V

**5** = 5V

**5.2** = 5.2V

**12** = 12V

**15** = 15V

**24** = 24V

**28** = 28V

**48** = 48V

**S** = SINGLE

**D** = DUAL



## MODEL LIST

## SINGLE OUTPUT

Through Hole	Terminal Strip	Output Voltage [VDC]	Output Current		Output Power [W]	Efficiency @ Full Load [%] typ.	Output Ripple @ 1MHz BW [mVp-p max]
			Min. [mA]	Max. [mA]			
LVA3.3S	-	3.3	60.6	606	2	61	40
LVA5S	-	5	60	600	3	64	20
LVA5.2S	-	5.2	57.7	577	3	64	20
LVA12S	-	12	25	250	3	65	20
LVA15S	-	15	20	200	3	65	15
LVA24S	-	24	12.5	125	3	66	15
LVA28S	-	28	10.7	107	3	66	15
LVA48S	-	48	6.2	62	3	66	15
LVB3.3S	TLVB3.3S	3.3	121.2	1212	4	62	80
LVB5S	TLVB5S	5	100	1000	5	68	50
LVB5.2S	TLVB5.2S	5.2	96.1	961	5	68	50
LVB12S	TLVB12S	12	41.5	415	5	70	25
LVB15S	TLVB15S	15	33	333	5	70	25
LVB24S	TLVB24S	24	21	208	5	72	25
LVB28S	TLVB28S	28	17.5	178	5	72	25
LVB48S	TLVB48S	48	10.5	104	5	74	25
LVC3.3S	TLVC3.3S	3.3	151.5	1515	5	63	80
LVC5S	TLVC5S	5	140	1400	7	68	50
LVC5.2S	TLVC5.2S	5.2	134.6	1346	7	68	50
LVC12S	TLVC12S	12	66.6	666	8	74	25
LVC15S	TLVC15S	15	53.3	533	8	74	25
LVC24S	TLVC24S	24	33.3	333	8	74	25
LVC28S	TLVC28S	28	28.5	285	8	74	25
LVC48S	TLVC48S	48	16.6	166	8	74	25
LVD3.3S	TLVD3.3S	3.3	212.1	2121	7	65	80
LVD5S	TLVD5S	5	180	1800	9	70	50
LVD5.2S	TLVD5.2S	5.2	173	1730	9	70	50
LVD12S	TLVD12S	12	83.3	833	10	74	25
LVD15S	TLVD15S	15	66.6	666	10	74	25
LVD24S	TLVD24S	24	41.6	416	10	74	25
LVD28S	TLVD28S	28	35.7	357	10	74	25
LVD48S	TLVD48S	48	20.8	208	10	74	25

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

**MODEL LIST**

**DUAL OUTPUT**

Through Hole	Terminal Strip	Output Voltage [±VDC]	Output Current		Output Power [±W]	Efficiency @ Full Load [%] typ.	Output Ripple Per Output @ 1MHz BW [mVp-p max]
			Min. [±mA]	Max. [±mA]			
LVA5D	-	5	30	300	1.5	60	25
LVA12D	-	12	12.5	125	1.5	65	25
LVA15D	-	15	10	100	1.5	67	25
LVB5D	TLVB5D	5	50	500	2.5	68	50
LVB12D	TLVB12D	12	20	208	2.5	70	25
LVB15D	TLVB15D	15	16.5	166	2.5	70	25
LVC5D	TLVC5D	5	70	700	3.5	68	50
LVC12D	TLVC12D	12	33.3	333	4	74	25
LVC15D	TLVC15D	15	26.6	266	4	74	25
LVD5D	TLVD5D	5	90	900	4.5	70	50
LVD12D	TLVD12D	12	41.5	416	5	74	25
LVD15D	TLVD15D	15	33.3	333	5	74	25

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

Note 2: Dual output loads must be balanced.

**SPECIFICATIONS (Nominal  $V_{IN}$ , Full Load,  $T_A = +25^\circ\text{C}$ , 1 hour warm up unless otherwise specified)**

**INPUT**

Parameter	Condition	Min.	Typ.	Max.	Units
Input Voltage Range		36	48	80	VDC

**OUTPUT**

Parameter	Condition	Min.	Typ.	Max.	Units
Line Regulation	3.3V Output models	-	-	1.5	±%
	All other models			1	
Load Regulation	25-100% load	3.3V Output models	-	3.5	±%
		All other models	-	2	
Output Power	LVC & LVD TLVC & TLVD	48-80V input		See Model List	
		36-48V input		Derate 1.25% power per input voltage	
	All other models		See Model List		
Output Voltage Tolerance	Nominal $V_{IN}$ Full Load	3.3V Output models	-	3	±%
		All other models	-	2	

**ENVIRONMENTAL**

Parameter	Condition	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient without derating	-25	-	+70	°C
Storage Temperature Range	Ambient	-55	-	+105	°C
Temperature Coefficient		-	0.02	-	%/°C
Cooling	Free Air Convection				

**SPECIFICATIONS (Nominal  $V_{IN}$ , Full Load,  $T_A = +25^{\circ}\text{C}$ , 1 hour warm up unless otherwise specified)**

**GENERAL**

Parameter	Condition	Min.	Typ.	Max.	Units
Isolation Voltage		1000	-	-	VDC
Insulation Resistance		100	-	-	MΩ
Switching Frequency		200	-	1000	kHz
Size (L x W x H)	LVA models	1.5 x 1.5 x 0.5 (38.1 x 38.1 x 12.7)			inches (mm)
	LVB models	2 x 1.5 x 0.5 (50.8 x 38.1 x 12.7)			
	LVC models	2.22 x 1.825 x 0.5 (56.388 x 46.355 x 12.7)			
	LVD models	2.3 x 2.3 x 0.5 (58.42 x 58.42 x 12.7)			
	TLVB models	2.55 x 1.5 x 0.5 (64.77 x 38.1 x 12.7)			
	TLVC models	2.77 x 1.825 x 0.5 (70.358 x 46.355 x 12.7)			
	TLVD models	2.85 x 2.3 x 0.5 (72.39 x 58.42 x 12.7)			
Weight	LVA models	-	34	-	grams
	LVB models	-	43	-	
	LVC models	-	57	-	
	LVD models	-	79	-	
	TLVB models	-	54	-	
	TLVC models	-	71	-	
	TLVD models	-	91	-	
Case	Diallyl Phthalate (DAP)				
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
Short circuit	Continuous				

**DESIGNED TO MEET**

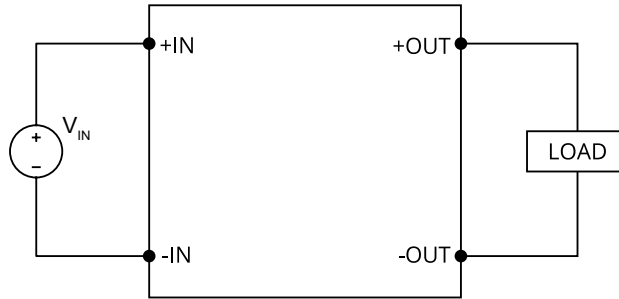
Test	Referenced Standard	Description
Vibration	MIL-STD-202	Method 204, Vibration, High Frequency, Condition D
Shock	MIL-STD-202	Method 213, Shock (Specified Pulse), Condition I
Humidity	MIL-STD-202	Method 106, Moisture Resistance
Altitude	MIL-STD-202	Method 105, Barometric Pressure (Reduced), Condition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

**OPTIONS AVAILABLE - CONTACT PICO FOR PART NUMBER**

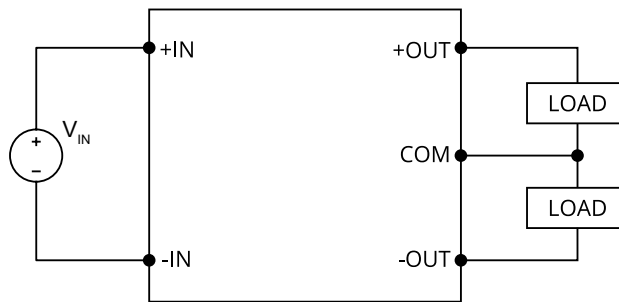
Parameter	Referenced Standard	Description
Stabilization Bake	MIL-STD-883	Referenced Method 1008 Non-operating maximum storage temperature for 24 hours
Temperature Cycle	MIL-STD-883	Referenced Method 1010 Non-operating at temperature extremes, 15 mins/temp, 10 cycles
Burn-In	MIL-STD-883	Referenced Method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

TYPICAL CONNECTION CIRCUIT

SINGLE OUTPUTS



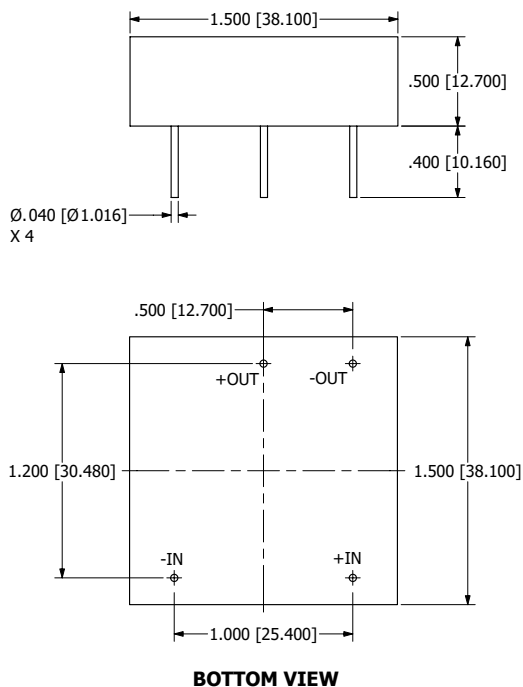
DUAL OUTPUTS



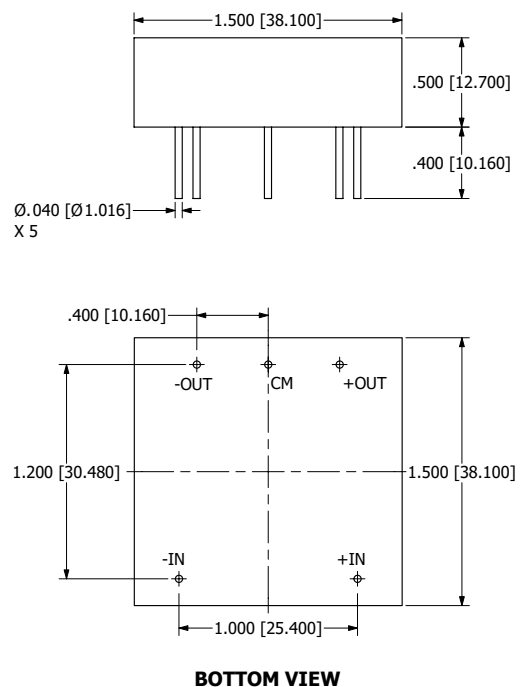
MECHANICAL DRAWINGS

LVA MODELS

SINGLE OUTPUTS



DUAL OUTPUTS

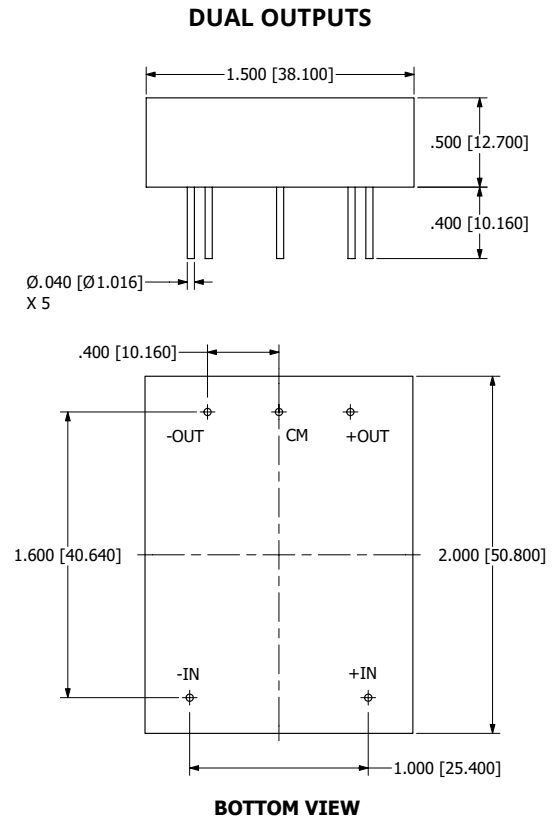
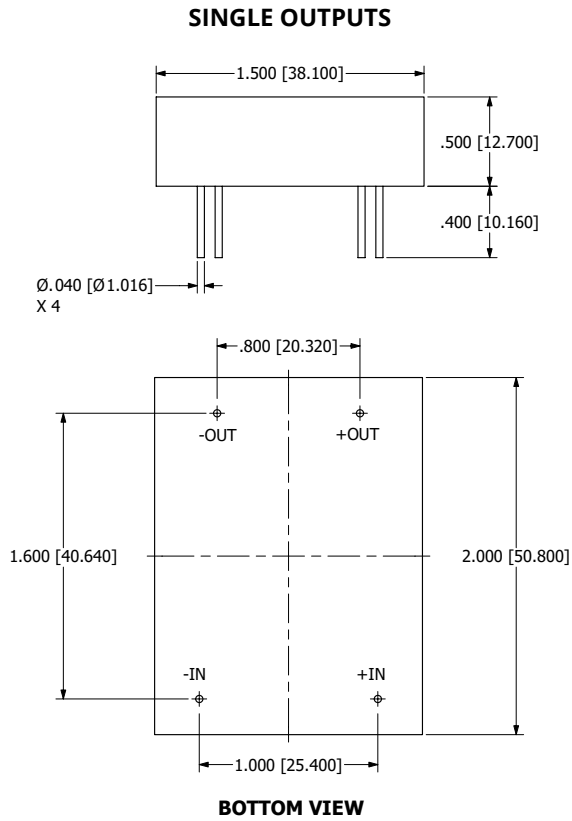


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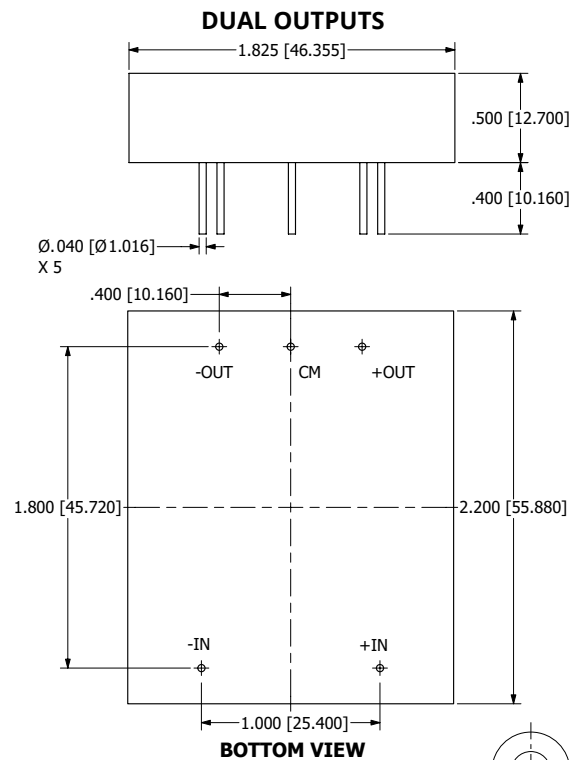
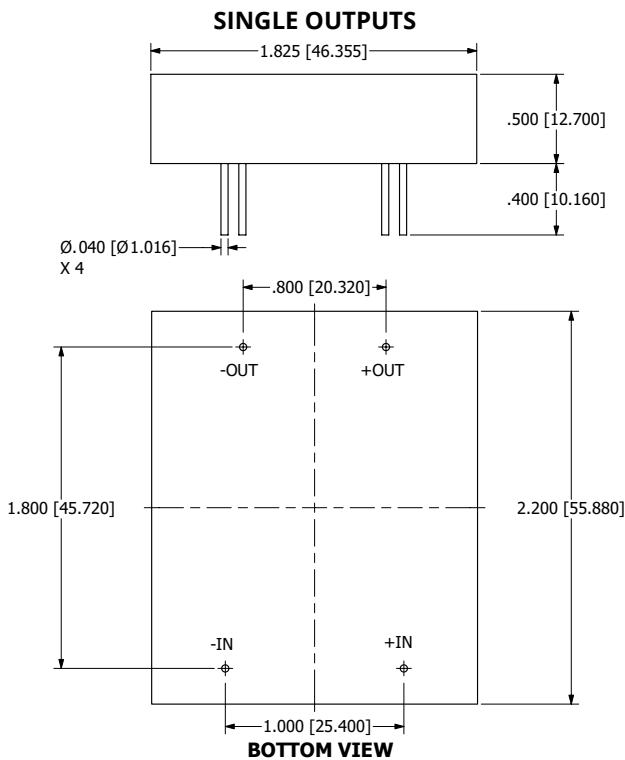
a. ALL DIMENSIONS ARE IN INCHES, [ ] = MM

MECHANICAL DRAWINGS

LVB MODELS

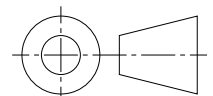


LVC MODELS



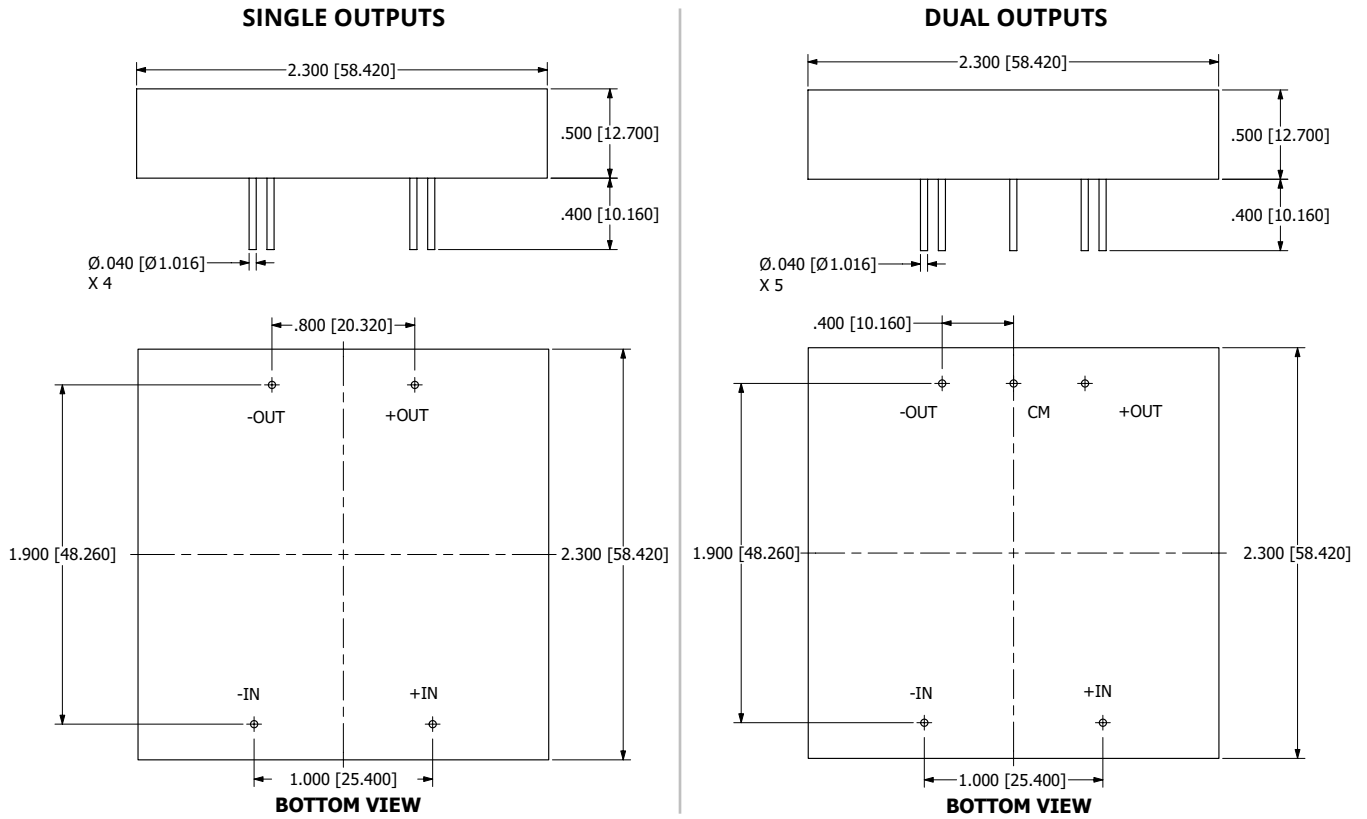
NOTES

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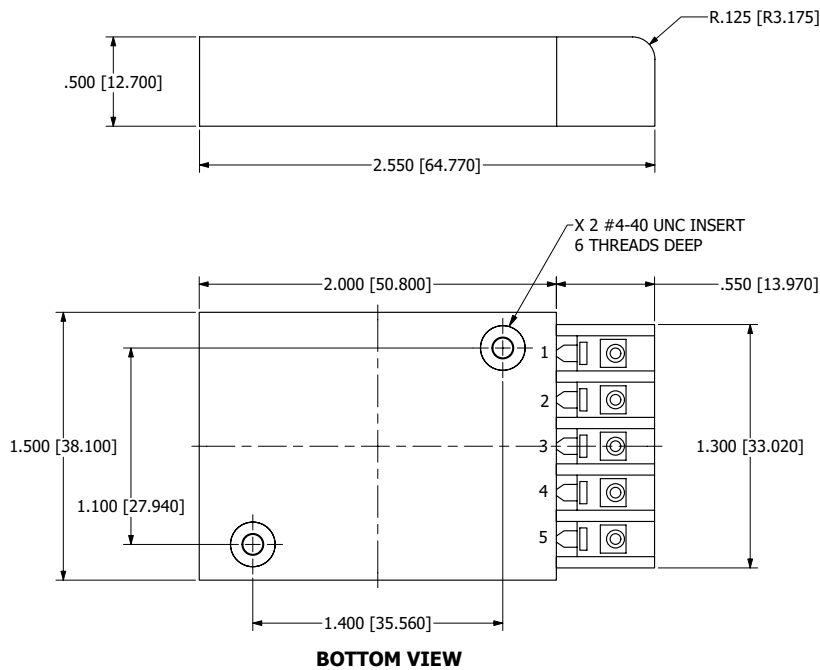


MECHANICAL DRAWINGS

LVD MODELS



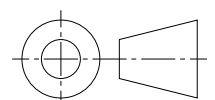
TLVB MODELS



PIN	FUNCTION	
	SINGLE	DUAL
1	-IN	
2	+IN	
3	N/C	-OUT
4	-OUT	COM
5		+OUT

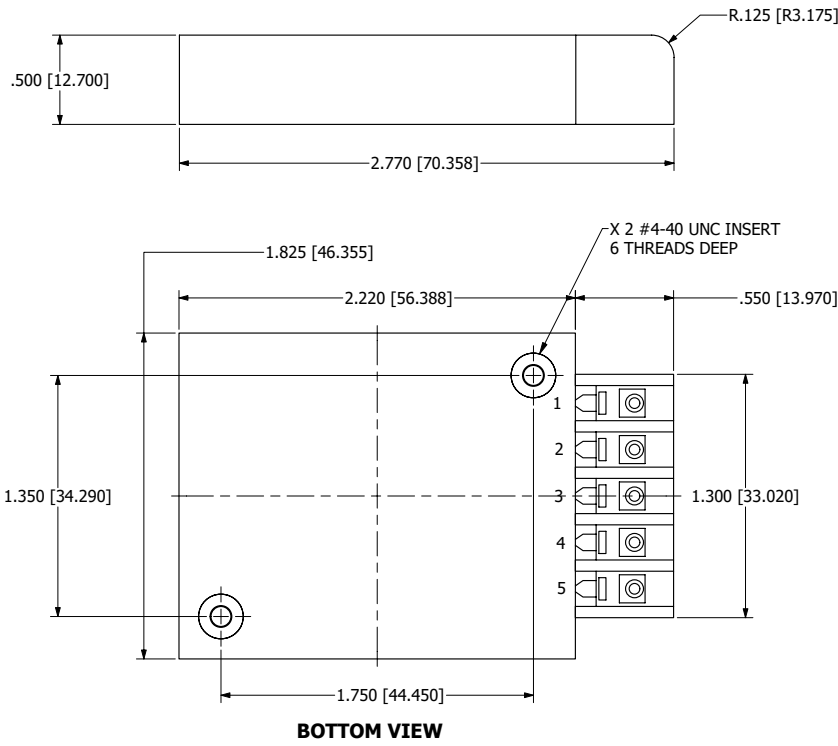
NOTES

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- b. RECOMMENDED MOUNTING TORQUE: 3-5 IN-LBS



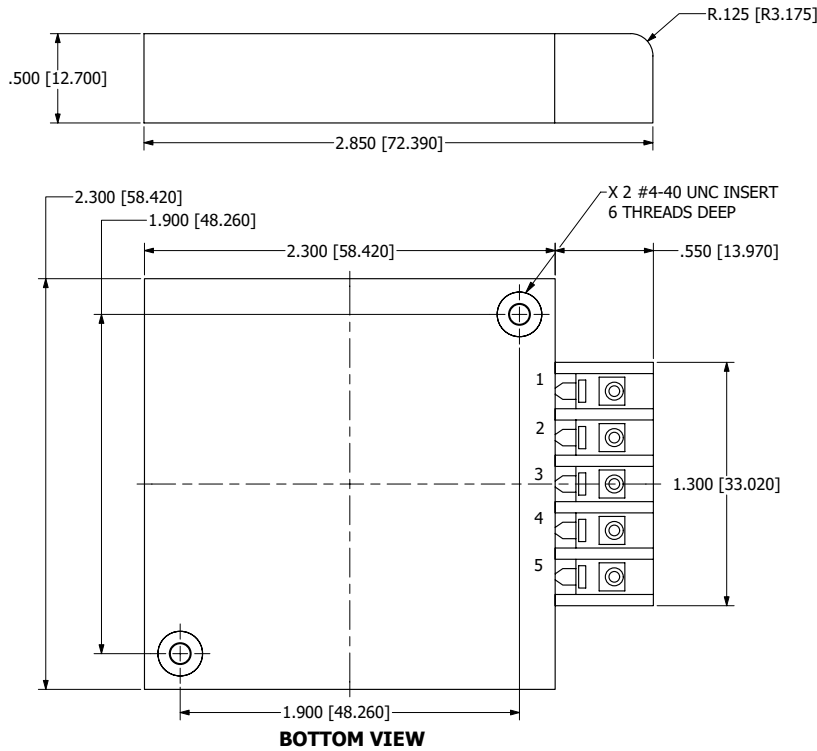
**MECHANICAL DRAWINGS**

**TLVC MODELS**



PIN	FUNCTION	
	SINGLE	DUAL
1	-IN	
2	+IN	
3	N/C	-OUT
4	-OUT	COM
5	+OUT	

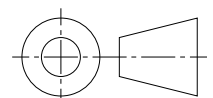
**TLVD MODELS**



PIN	FUNCTION	
	SINGLE	DUAL
1	-IN	
2	+IN	
3	N/C	-OUT
4	-OUT	COM
5	+OUT	

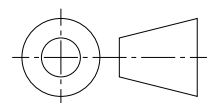
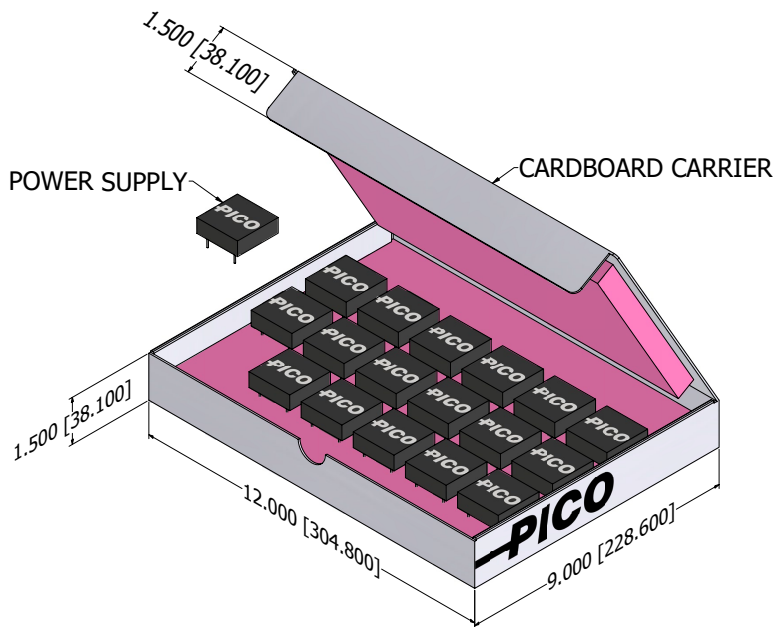
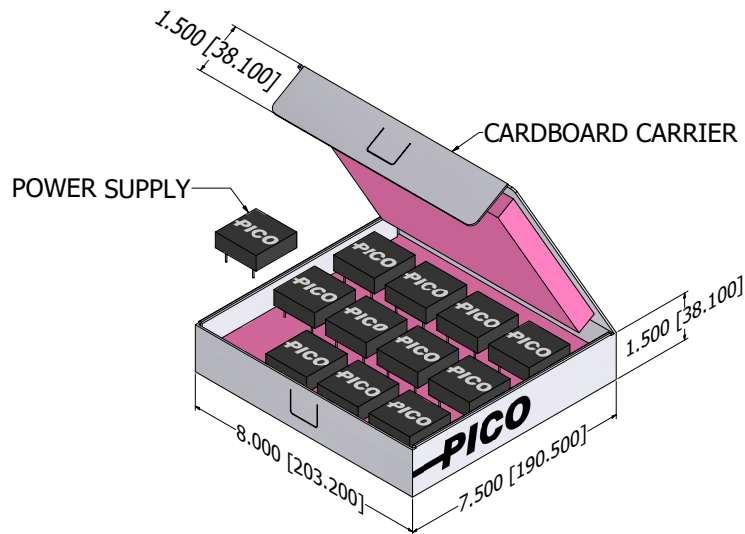
**NOTES**

- a. ALL DIMENSIONS ARE IN INCHES, [ ] = MM
- b. RECOMMENDED MOUNTING TORQUE: 3-5 IN-LBS





BOX PACKAGING - BULK



Pico warrants each product manufactured by us and sold by us or an authorized representative, to be free from defects in material and workmanship. If properly used, it will perform within its applicable specifications for a period of one year after original shipment. Pico's obligation under this guarantee is limited to repairing or replacing our product to the original purchaser. This warranty is in lieu of all other warranties, express or implied and constitutes fulfillment of our obligations to the purchaser. We do not guarantee that the products can be used for a particular purpose other than those solely covered by the product's specifications. Pico must be notified if the product must meet particular certifications and/or standards. We assume no liability, in any event, for consequential damages, for anticipated or lost profits, incidental damages or loss of time or other losses incurred by the purchaser or any third party in connection with products covered by this warranty or otherwise. The purchaser will indemnify and hold Pico harmless for any damages, losses, costs, etc. from usage not within the product's specifications. Pico must be consulted before usage of its products in a nuclear, radioactive or space environment.

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