



Data Sheet

MIL-COTS VIPAC Array

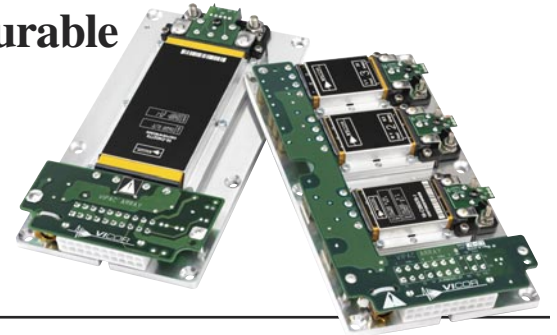
Low Profile, Configurable Power Solution

Features

- Inputs: 24, 28 (VA-D only), or 300 Vdc
- -55°C operation
- Configurable single, dual, triple and quad outputs
- Any output: 0.5 – 48 Vdc; up to 650 W
- Current share option for high power/ redundant operation
- Fully connectorized input & output for simplified hook up
- Rugged, low profile, cold plate chassis
- High temperature capability
- Environmental stress screening (modules only)
- Compliant to MIL-STD-810F for vibration (Method 514.5, Procedure I) and shock (Method 516.5, Procedure I)

Product Highlights

VIPAC Arrays are a highly flexible system of DC input, power building-blocks that can be configured with as many as four user definable outputs on a low profile, cold plate chassis. Using Vicor's VCAD design tool, designers are able to specify VIPAC Arrays with Maxi, Mini and Micro product series H or M grade converters with nominal inputs of 24, 28 (VA-D only), or 300 Vdc and outputs from 2 to 48 Vdc at power levels up to 500 W per output. VIPAC Arrays are ideal for use in distributed and modular power systems where power density and reliable operation are critical. A current share option is available on single output models enabling them to be used in applications requiring high power / redundancy. Fully connectorized input and output terminations speed system installation and a versatile cold plate chassis simplifies thermal management. For additional technical or design information; or to create a VIPAC Array tailored to your specific requirements using Vicor's online configurator, please visit www.vicorpower.com.



Configurations

	<p>2 Minis (A)</p> <ul style="list-style-type: none"> • 3.62" x 6.69" (92,0 x 170,0 mm) • 1.25 lbs. (567 g) 	<ul style="list-style-type: none"> • Single or dual outputs • Up to 500 W total
	<p>1 Mini, 2 Micros (B)</p> <ul style="list-style-type: none"> • 3.62" x 6.69" (92,0 x 170,0 mm) • 1.3 lbs. (590 g) 	<ul style="list-style-type: none"> • Single, dual or triple outputs • Up to 550 W total
	<p>3 Micros (C)</p> <ul style="list-style-type: none"> • 3.62" x 6.69" (92,0 x 170,0 mm) • 1.3 lbs. (590 g) 	<ul style="list-style-type: none"> • Dual or triple outputs • Up to 450 W total
	<p>1 Maxi (D/J)</p> <ul style="list-style-type: none"> • 3.62" x 6.69" (92,0 x 170,0 mm) • 1.05 lbs. (476 g) 	<ul style="list-style-type: none"> • Single output • Up to 500 W • Current share option
	<p>1 Micro, 2 Minis (E)</p> <ul style="list-style-type: none"> • 3.62" x 7.52" (92,0 x 191,0 mm) • 1.35 lbs. (612 g) 	<ul style="list-style-type: none"> • Dual or triple outputs • Up to 650 W total
	<p>4 Micros (F)</p> <ul style="list-style-type: none"> • 3.62" x 7.52" (92,0 x 191,0 mm) • 1.3 lbs. (590 g) 	<ul style="list-style-type: none"> • Dual, triple, or quad outputs • Up to 600 W total
	<p>1 Mini (G/K)</p> <ul style="list-style-type: none"> • 3.62" x 4.39" (92,0 x 112,0 mm) • 0.7 lbs. (318 g) 	<ul style="list-style-type: none"> • Single output • Up to 250 W total • Current share option
	<p>2 Micros (H)</p> <ul style="list-style-type: none"> • 3.62" x 4.39" (92,0 x 112,0 mm) • 0.7 lbs. (318 g) 	<ul style="list-style-type: none"> • Single or dual outputs • Up to 300 W total

MIL VIPAC ARRAY GENERAL SPECIFICATIONS

Typical at 25°C, nominal line and load, unless otherwise specified.

■ ENVIRONMENTAL - SYSTEM

Parameter	Min	Typ	Max	Unit	Notes
Dielectric withstand, input to chassis	1500/2121			Vrms/Vdc	
Operating chassis temperature					
H-grade	-40		95	°C	
M-grade	-55		95	°C	
Storage temperature					
H-Grade	-55		125	°C	
M-Grade	-65		125	°C	
Shock	MIL-STD-810F, Method 514.5, Procedure I				40 g for 15-23 ms, 75 g for 8-13 ms
Vibration	MIL-STD-810F, Method 516.5, Procedure I				20-2000 Hz at 5 g

■ ENVIRONMENTAL MODULES ONLY

Altitude MIL-STD-810C, Method 500.2, Procedure I & II, 40,000 ft. and 70,000 ft. Operational.
Explosive Atmosphere MIL-STD-810F, Method 511.4, Procedure I, Operational.
Vibration MIL-STD-810F, Method 514.5, Procedure I, Category 14, Sine and Random vibration per Table 514.5C for Helicopter AH-6J Main Rotor with overall level of 5.6 grams for 4 hours per axis. MIL-STD-810F, Method 514.5C, General Minimum Integrity Curve per Figure 514.5C-17 with overall level of 7.7 grams for 1 hour per axis.
Shock MIL-STD-810-F, Method 516.5, Procedure I, Functional Shock, 40 G's. MIL-S-901D, Lightweight Hammer Shock, 3 impacts/axis, 1,3,5 ft. MIL-STD-202F, Method 213B, 60 G's, 9ms half sine. MIL-STD-202F, Method 213B, 75 G's, 11ms Saw Tooth Shock.
Acceleration MIL-STD-810F, Method 513.5, Procedure II, Table 513.5-II, Operational, 2-7 G's, 6 directions.
Humidity MIL-STD-810F, Method 507.4, Procedure I, Cycle I, 240 hrs, 95% RH.
Solder Test MIL-STD-202F, Method 208, 8 hour aging.

MIL VIPAC ARRAY GENERAL SPECIFICATIONS (CONT.)

Typical at 25°C, nominal line and load, unless otherwise specified.

■ OPERATING SPECIFICATIONS – 24 V INPUT

Parameter	Min	Typ	Max	Unit	Notes
Operating input voltage	18	24	36	Vdc	
Input surge withstand			50	Vdc	<100 ms
Output voltage setpoint			±1	% Vout nom.	Nominal input; full load; 25°C

■ OPERATING SPECIFICATIONS – 28 V INPUT

Parameter	Min	Typ	Max	Unit	Notes
Operating input voltage	10	24	36	Vdc	
Input surge withstand			50	Vdc	<100 ms
Output voltage setpoint			±1	% Vout nom.	Nominal input; full load; 25°C

■ OPERATING SPECIFICATIONS – 300 V INPUT

Parameter	Min	Typ	Max	Unit	Notes
Operating input voltage	180	300	375	Vdc	
Input surge withstand			400	Vdc	<100 ms
Output voltage setpoint			±1	% Vout nom.	Nominal input; full load; 25°C

■ INPUT SPECIFICATIONS – 24 V INPUT

Parameter	Min	Typ	Max	Unit	Notes
Undervoltage turn-on		17.5	17.9	Vdc	
Undervoltage turn-off	14.8	15.3		Vdc	See note
Overvoltage turn-off/on	36.3	37.8	39.6	Vdc	

■ INPUT SPECIFICATIONS – 28 V INPUT

Parameter	Min	Typ	Max	Unit	Notes
Undervoltage turn-on		9.75	9.9	Vdc	
Undervoltage turn-off		9.5		Vdc	
Overvoltage turn-off/on	36.3	37.8	39.6	Vdc	

■ INPUT SPECIFICATIONS – 300 V INPUT

Parameter	Min	Typ	Max	Unit	Notes
Undervoltage turn-on		174.6	178.2	Vdc	
Undervoltage turn-off	147.4	152.8		Vdc	
Overvoltage turn-off/on				Vdc	Not included

Note: The following models will operate down to 16 V at 75% rated power after startup at >17.9 V :

- Maxi – 48 V
- Mini – all modules
- Micro – all 50 W modules, 3.3 V/75 W, 5 V/100 W, 12 V/100 W

MIL VIPAC ARRAY OUTPUT SPECIFICATIONS

24 Vin Modules

■ MICRO MODULES¹

Parameter	3.3 V	5 V	12 V	15 V	24 V	28 V	48 V	Unit	Notes
Efficiency (typ)	79	84	85.8	89	88	89	87.7	%	Nominal input; full load; 25°C
Ripple & noise, p-p (typ)	140	100	209	100	70	85	100	mV	20 MHz bandwidth
Output power	75	100	100	100	100	100	100	Watts	95°C Chassis
Output OVP setpoint	4.3	6.25	14.3	17.8	28.1	32.7	55.7	Volts	Recycle input volt. to restart (1 m off)
Dissipation, standby (typ)	4	3.2	4.4	4.6	3.6	3.3	3	Watts	No load
Load reg. (typ)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	±%Vout	No load to full load

■ MINI MODULES¹

Parameter	3.3 V	5 V	12 V	15 V	24 V	28 V	48 V	Unit	Notes
Efficiency (typ)	79	82.5	86	86.6	87	87	87.5	%	Nominal input; full load; 25°C
Ripple & noise, p-p (typ)	100	95	360	250	260	180	225	mV	20 MHz bandwidth
Output power	150	200	200	200	200	200	200	Watts	95 °C Chassis
Output OVP setpoint	4.3	6.3	14.4	17.8	28.5	32.8	55.8	Volts	Recycle input volt. to restart (1 m off)
Dissipation, standby (typ)	5	5.1	4.6	3.4	5.1	4.5	5.4	Watts	No load
Load reg. (typ)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	±%Vout	No load to full load

■ MAXI MODULES¹

Parameter	3.3 V	5 V	12 V	15 V	24 V	28 V	48 V	Unit	Notes
Efficiency (typ)	78.5	82	86.8	87.5	88.5	87.8	86.7	%	Nominal input; full load; 25°C
Ripple & noise, p-p (typ)	75	152	70	60	80	172	58	mV	20 MHz bandwidth
Output power	264	400	400	400	400	400	400	Watts	95 °C Chassis
Output OVP setpoint	4.3	6.25	14.3	17.8	28.1	32.7	55.8	Volts	Recycle input volt. to restart (1 m off)
Dissipation, standby (typ)	8	6.8	6.8	6.3	11	6.3	11.8	Watts	No load
Load reg. (typ)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	±%Vout	No load to full load

28 Vin Modules

■ MAXI MODULES

Parameter	3.3 V	5 V	12 V	15 V	24 V	28 V	48 V	Unit	Notes
Efficiency (typ)	78.6	76.8	83.0	83.5	84.8	85.0	82.5	%	Nominal input; full load; 25°C
Ripple & noise, p-p (typ)	80	280	280	220	200	200	360	mV	20 MHz bandwidth
Output power	150	175	200	200	200	200	200	Watts	95 °C Chassis
Output OVP setpoint	4.3	6.25	14.3	17.8	28.1	32.7	55.8	Volts	Recycle input volt. to restart (1 m off)
Dissipation, standby (typ)	11.4	14.4	11.0	12.7	12.3	15.5	15.6	Watts	No load
Load reg. (typ)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	±%Vout	No load to full load

¹ Lower output Maxi, Mini and Micro modules are available

MIL VIPAC ARRAY OUTPUT SPECIFICATIONS

300 Vin Modules

■ MICRO MODULES¹

Parameter	2V	3.3 V	5 V	12 V	15 V	24 V	28 V	48 V	Unit	Notes
Efficiency (typ)	75.9	79.8	81.5	85.3	86.5	86.5	86.5	88.2	%	Nominal input; full load; 25°C
Ripple & noise, p-p (typ)	120	120	105	170	150	150	180	55	mV	20 MHz bandwidth
Output power	75	75	100	150	150	150	150	150	Watts	95 °C Chassis
Output OVP setpoint	2.8	4.3	6.25	14.3	17.8	28.1	32.7	55.7	Volts	Recycle input volt. to restart (1 m off)
Dissipation, standby (typ)	3.5	3.4	4.4	5	7	4.9	4.6	3.5	Watts	No load
Load reg. (typ)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	±%Vout	No load to full load

■ MINI MODULES¹

Parameter	2V	3.3 V	5 V	12 V	15 V	24 V	28 V	48 V	Unit	Notes
Efficiency (typ)	74	80	83	86.3	87.5	87.5	88.5	89	%	Nominal input; full load; 25°C
Ripple & noise, p-p (typ)	120	160	80	150	300	320	200	100	mV	20 MHz bandwidth
Output power	100	150	200	250	250	250	250	250	Watts	95 °C Chassis
Output OVP setpoint	2.8	4.3	6.25	14.3	17.8	28.1	32.7	55.7	Volts	Recycle input volt. to restart (1 m off)
Dissipation, standby (typ)	3.8	4.6	4.2	4	5.5	6.4	5.9	4.2	Watts	No load
Load reg. (typ)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	±%Vout	No load to full load

■ MAXI MODULES¹

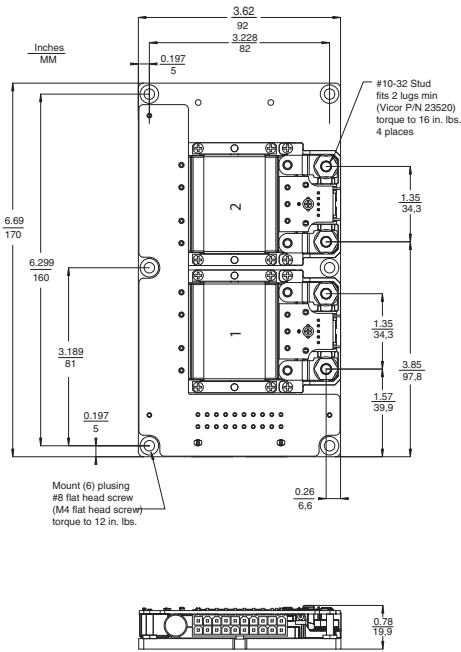
Parameter	2V	3.3 V	5 V	12 V	15 V	24 V	28 V	48 V	Unit	Notes
Efficiency (typ)	74	81	83	86	86	89	88	89	%	Nominal input; full load; 25°C
Ripple & noise, p-p (typ)	80	80	100	280	200	100	80	100	mV	20 MHz bandwidth
Output power	160	264	400	500	500	500	500	500	Watts	95 °C Chassis
Output OVP setpoint	2.8	4.3	6.25	14.3	17.8	28.1	32.7	55.7	Volts	Recycle input volt. to restart (1 m off)
Dissipation, standby (typ)	7.9	8.1	6.2	8	8	9.8	10.1	12.6	Watts	No load
Load reg. (typ)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	±%Vout	No load to full load

¹ Lower output Maxi, Mini and Micro modules are available

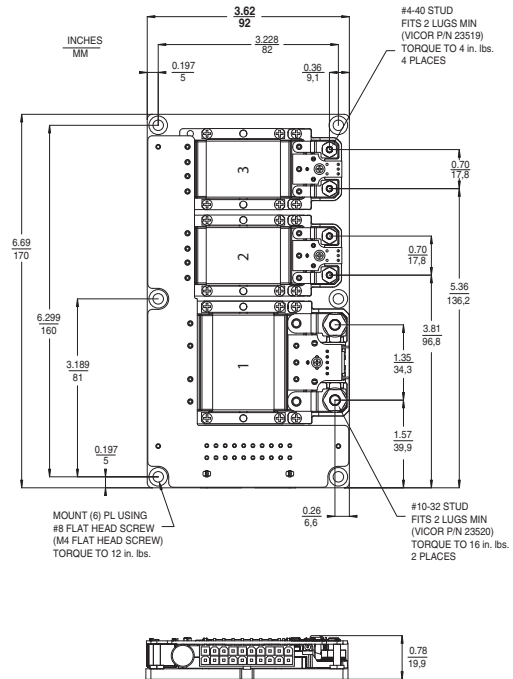
Configuration Type				Nominal Output Voltage/Maximum Output Power (W)									
				Vin	2 V	3.3 V	5 V	12 V	15 V	24 V	28 V	48 V	
Single Output Configurations		VA-H 4.39 x 3.62 in. (111.5 x 92.0 mm)	Dual Micro	24	100	150	200	200	200	200	200	200	200
				300	100	150	200	300	300	300	300	300	
		VA-G/K 4.39 x 3.62 in. (111.5 x 92.0 mm)	Single Mini	24	100	132	200	200	200	200	200	200	
				300	100	150	200	250	250	250	250	250	
	VA-A 6.69 x 3.62 in. (170.0 x 92.0 mm)	Dual Mini	24	200	264	400	400	400	400	400	400		
			300	200	300	400	500	500	500	500	500		
	VA-D/J 6.69 x 3.62 in. (170.0 x 92.0 mm)	Single Maxi	24	160	264	400	400	400	400	400	400		
			28	—	150	175	200	200	200	200	200		
			300	160	264	400	500	500	500	500	500		
Dual Output Configurations		VA-H 4.39 x 3.62 in. (111.5 x 92.0 mm)	Single Micro Output 1 & 2	24	50	75	100	100	100	100	100	100	
				300	50	75	100	150	150	150	150	150	
		VA-A 6.69 x 3.62 in. (170.0 x 92.0 mm)	Single Mini Output 1 & 2	24	100	132	200	200	200	200	200	200	
				300	100	150	200	250	250	250	250	250	
		VA-C 6.69 x 3.62 in. (170.0 x 92.0 mm)	Single Micro Output 1	24	50	75	100	100	100	100	100	100	
				300	50	75	100	150	150	150	150	150	
			Dual Micro Output 2	24	50	75	100	100	100	100	100	100	
				300	50	75	100	150	150	150	150	150	
		VA-B 6.69 x 3.62 in. (170.0 x 92.0 mm)	Single Mini Output 1	24	100	132	200	200	200	200	200	200	
				300	100	150	200	250	250	250	250	250	
			Dual Micro Output 2	24	100	150	200	200	200	200	200	200	
				300	100	150	200	300	300	300	300	300	
	VA-E 7.52 x 3.62 in. (191.0 x 92.0 mm)	Single Micro Output 1	24	50	75	100	100	100	100	100	100		
			300	50	75	100	150	150	150	150	150		
		Dual Mini Output 2	24	200	264	400	400	400	400	400	400		
			300	200	300	400	500	500	500	500	500		
	VA-F 7.52 x 3.62 in. (191.0 x 92.0 mm)	Dual Micro Output 1	24	100	150	200	200	200	200	200	200		
			300	100	150	200	300	300	300	300	300		
		Dual Micro Output 2	24	100	150	200	200	200	200	200	200		
			300	100	150	200	300	300	300	300	300		
Triple Output Configurations		VA-B 6.69 x 3.62 in. (170.0 x 92.0 mm)	Single Mini Output 1	24	100	132	200	200	200	200	200	200	
				300	100	150	200	250	250	250	250	250	
	Single Micro Output 2 & 3	24	50	75	100	100	100	100	100	100			
		300	50	75	100	150	150	150	150	150			
		VA-C 6.69 x 3.62 in. (170.0 x 92.0 mm)	Single Micro Output 1-3	24	50	75	100	100	100	100	100		
				300	50	75	100	150	150	150	150	150	
		VA-E 7.52 x 3.62 in. (191.0 x 92.0 mm)	Single Micro Output 1	24	50	75	100	100	100	100	100	100	
				300	50	75	100	150	150	150	150	150	
Single Mini Output 2 & 3			24	100	132	200	200	200	200	200	200		
			300	100	150	200	250	250	250	250	250		
	VA-F 7.52 x 3.62 in. (191.0 x 92.0 mm)	Single Micro Output 1 & 2	24	50	75	100	100	100	100	100	100		
			300	50	75	100	150	150	150	150	150		
		Dual Micro Output 3	24	100	150	200	200	200	200	200	200		
			300	100	150	200	300	300	300	300	300		
Quad Output Config.		VA-F 7.52 x 3.62 in. (191.0 x 92.0 mm)	Single Micro Output 1-4	24	50	75	100	100	100	100	100	100	
				300	50	75	100	150	150	150	150	150	

Note: Model numbers and total output power capability are application specific.
See VIPAC configuration tool at: vicorpower.com/vcad

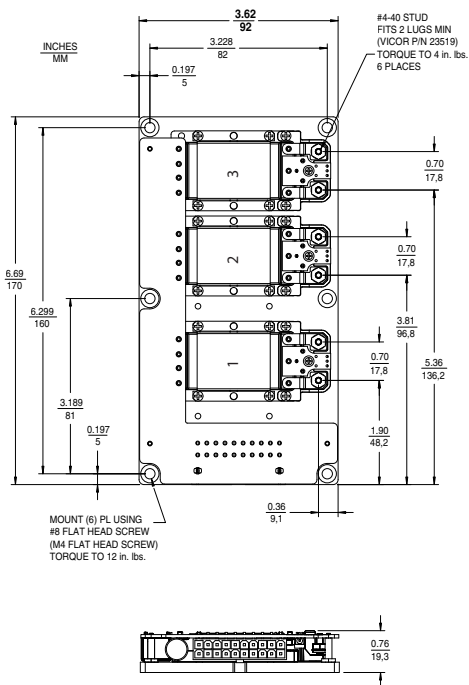
Configuration VA-A
LugMates



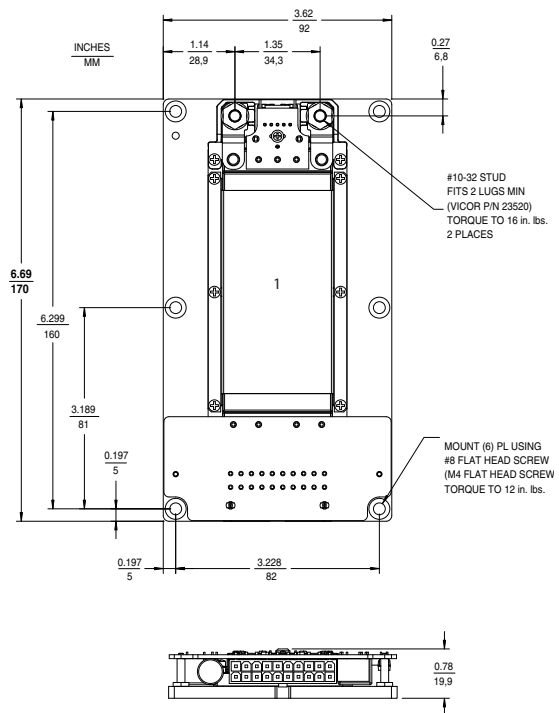
Configuration VA-B
LugMates



Configuration VA-C
LugMates

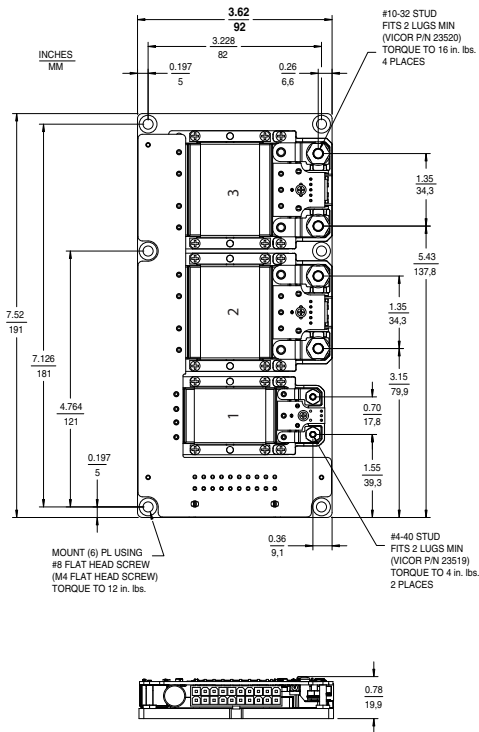


Configuration VA-D/J
LugMates

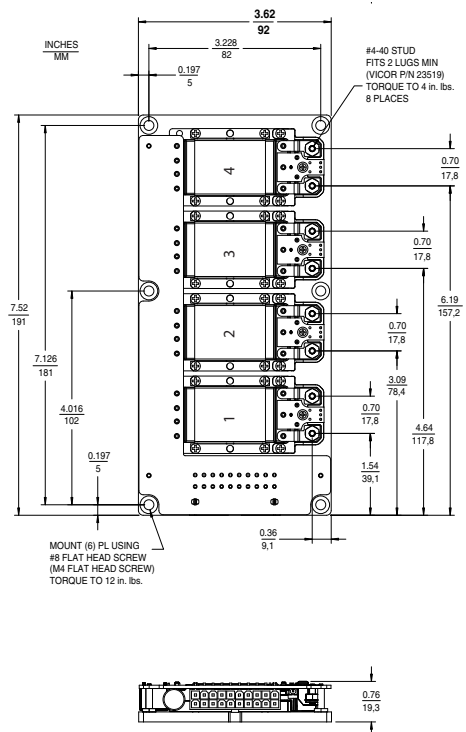


MECHANICAL DRAWINGS (CONT.)

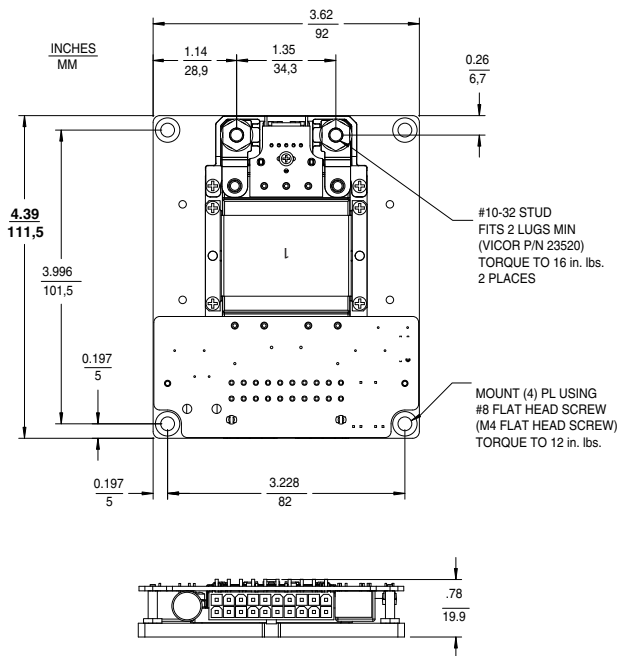
**Configuration VA-E
LugMates**



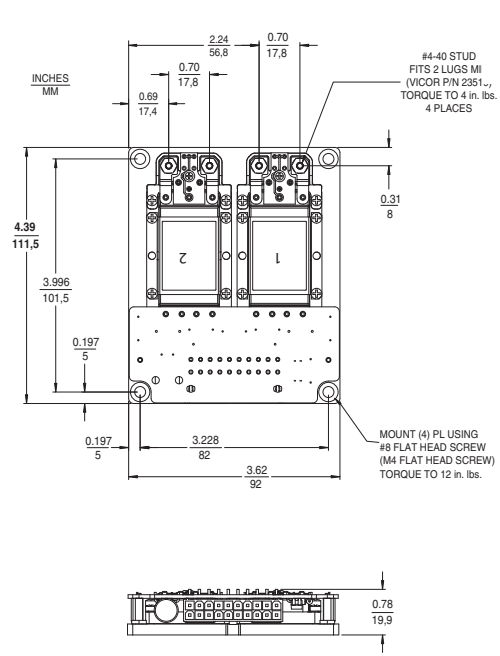
**Configuration VA-F
LugMates**



**Configuration VA-G/K
LugMates**



**Configuration VA-H
LugMates**



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