



## Introduction

Mach-1® DC Solid State Contactor can switch high-power DC loads up to 2,500VDC and 500A per module. It can be configured with the latest semiconductors, such as SiC and GaN, to significantly reduce power loss for systems with higher bus voltage.

While the Advanced PWM model (M1DA-) is for switching on/off in 10's of  $\mu$ S, The **Standard Model (M1DS-)** operates just like electromechanical contactors, the difference being maintenance-free, arc-free, and noise-free.

## Features and Benefits

- Extremely high power density, up to 500A per module
- Patented Design and Construction
- Standard Panel Mount Form Factor
- Directly retrofits electromechanical contactor with 12V/24V coil voltage
- Made in Canada; Semiconductor Parts from Taiwan

	Custom Model
<b>Part#</b>	M1DS01-500A-P1
<b>Output Specifications</b>	
<b>Rated Voltage</b>	1-100 VDC
<b>Rated Load Current<sup>(1)</sup></b>	500A
<b>Rated Inrush Current<sup>(1)</sup></b>	1,200A (200ms)
<b>Typical ON Resistance</b>	$\leq 0.5 \text{ m}\Omega$
<b>Max Leakage Current</b>	$< 0.1 \text{ mA}$
<b>Max PWM (Resistive Load)<sup>(2)</sup></b>	20 Hz
<b>Input Specifications</b>	
<b>Control Input Voltage</b>	12-32 VDC, $\sim 50 \text{ mA}$
<b>Must Turn-Off Voltage</b>	$< 10.5 \text{ V}$
<b>Turn-On Response Delay<sup>(3)</sup></b>	$< 10 \text{ ms}$
<b>Turn-Off Response Delay<sup>(3)</sup></b>	$< 5 \text{ ms}$
<b>Isolation Voltage</b>	2.5kV (AC 1min 50/60hz)
<b>LED Indicators</b>	Red (signal)
<b>Temp. &amp; Physical Specifications</b>	
<b>Operating &amp; Storage Temp.</b>	-40 to 80°C or -40 to 176°F
<b>Maximum Junction and Baseplate Temp.</b>	140°C (junction) 90°C (baseplate)
<b>Thermal Impedance<sup>(4)</sup></b>	$R_{\text{Junction-Case}} = 0.035^\circ\text{C/W}$ $R_{\text{Case-Heatsink}} = 0.04^\circ\text{C/W}$
<b>Control Input Termination</b>	16-28 AWG (max 0.2 Nm)
<b>Output Termination</b>	Busbar (M6)
<b>Overall Dimensions LxWxH</b>	104x80x50 mm
<b>Typical Weight</b>	450g
<b>Mean Time Between Failures</b>	3 million hours

Contact us for any questions or custom requirements:

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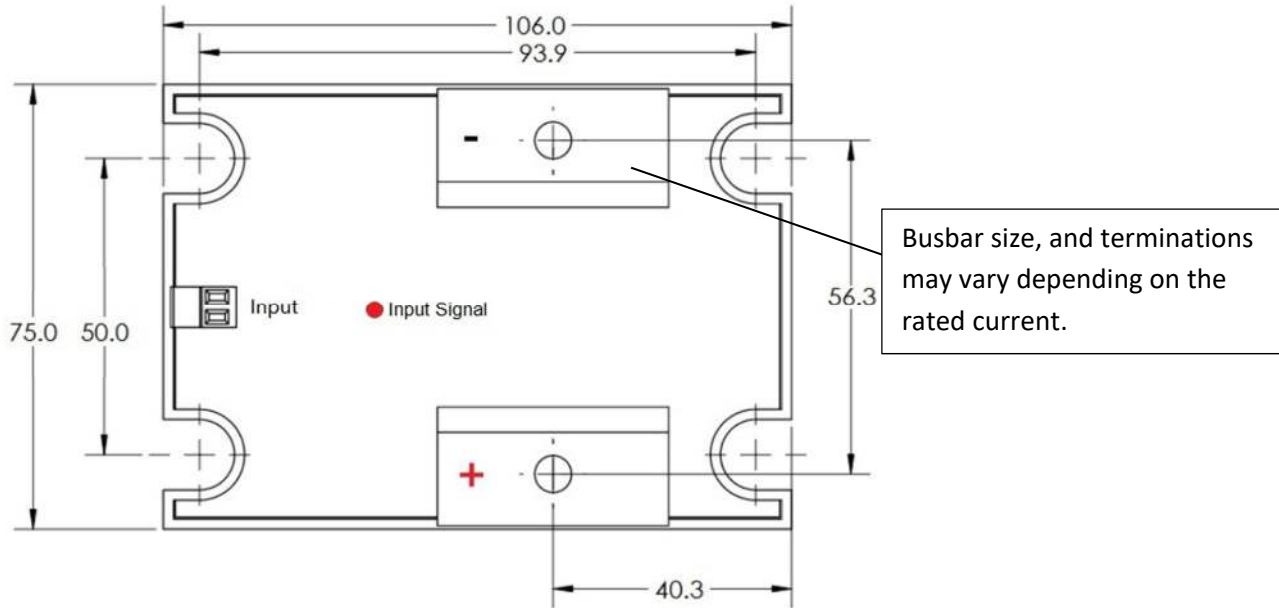
<sup>1</sup> This rating assumes module's baseplate temperature is at 90°C.

<sup>2</sup> Exceeding this recommended max PWM rating may result in deviations to output duty cycle and SSR not turning-off.

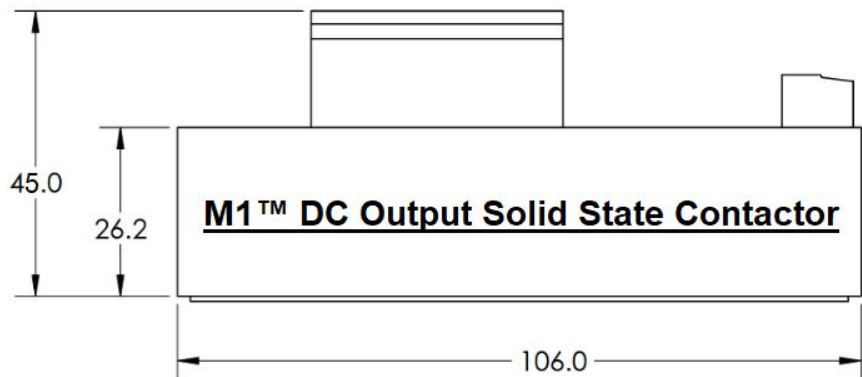
<sup>3</sup> Signal response delay only, actual opening/closing speed is typically in the range of 10's of  $\mu$ S.

<sup>4</sup>  $R_{ch}$  assumes thermal interface material of 1W/mK, 0.1mm, is applied between the base plate and the heatsink surface.

Model		Output Voltage		Output Current	Control Input		Other Features	
<i>M1DS</i>		<i>01</i>		-	<i>500A</i>		<i>P1</i>	
M1DS	Mach1® Standard Model (non-PWM)	<b>01</b> =	1-100 VDC	Rated Continuous Current (A)	-	3 - 32 VDC	P1 = Built-in snubber  P2 = External Snubber  T1 = Internal thermal protection  Blank = N/A	Other Reference  Blank = N/A
		<b>01A</b> =	1-150 VDC		<b>1</b> =	4 - 11 VDC		
		<b>02</b> =	1-200 VDC		<b>2</b> =	12 - 32 VDC		
M1DA	Mach1® Advanced PWM Model (up to 10 KHz)	<b>06</b> =	1-600 VDC		<b>3</b> =	12 - 24 VDC		
		<b>1K</b> =	1-1000 VDC		<b>4</b> =	4 - 36 VDC		
		<b>1K5</b> =	1-1500 VDC					

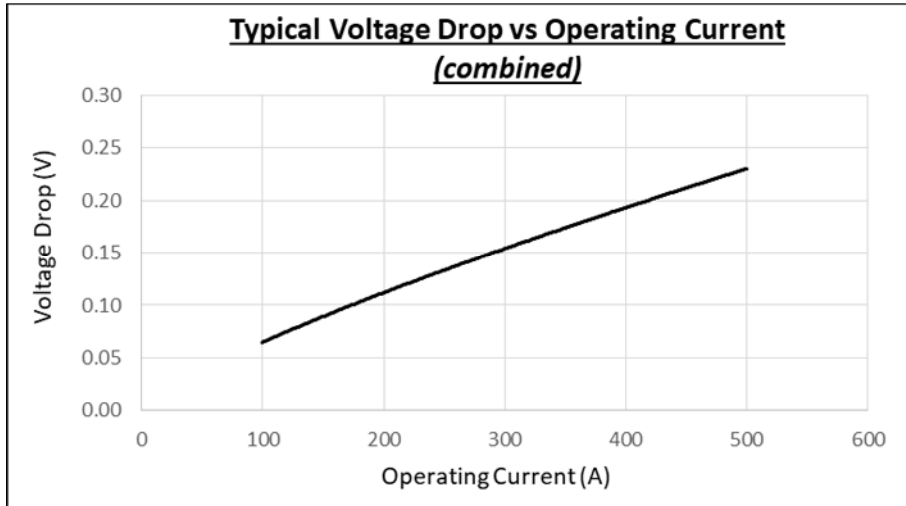


- Included Accessories**
- 1x Thermal Pad
  - 4x M4x12 Panel Mount Screws
  - 2x Busbar Terminal Screws



<Dimensions in mm>

Typical On-state Voltage Drop:



Minimum Heatsink Thermal Derating:

