General Specifications

Standard Model for ON/OFF up to 10Hz

- General Purpose Solid State Switch, No Moving Parts
- Heavy-Duty, Raw Switching Power for High/Low Side
- Strict Control Protocols, Optimal Performance
- Optically Isolated DC Control, with Signal Indicator
- Standard Panel Mount Form Factor
- Patent Pending High Reliability Construction
- Made in Canada; UL Semiconductor Parts from USA

	Group A (up to 200A)		
Part#	**M1DS01A-200A**	**M1DS06-120A**	**M1DS10-150A**
	Output Specifications		
Rated Voltage	1-150 VDC	1 - 600 VDC	1 - 1000 VDC
Rated Load Current [1]	200 A	120 A	150 A
Rated Peak Current [2]	300A(200ms), 550A(10ms)	150A(200ms), 350A(10ms)	300A(10ms)
Typical ON Voltage Drop	0.2V@50A, 0.7V@200A	1V@50A, 1.25V@120A	1.25V@50A, 1.5V@150A
Max Leakage Current	<1 mA	<1 mA	<1 mA
Recommended Max PWM [3]	10 Hz (standard model) 10 kHz (advanced model)	10 Hz (standard model) 5 kHz (advanced model)	10 Hz (standard model) 5 kHz (advanced model)
	Input Specifications		
Control Input Voltage DC	Type: (1) 4-11V, (2) 12-32V (3) 12-24V, (4) 36-75V	Type: (1) 4-11V, (2) 12-32V (3) 12-24V, (4) 36-75V	Type: (1) 4-11V, (2) 12-32V (3) 12-24V, (4) 36-75V
Control Input Current	Type (1) 100-200 mA Type (2,3,4) 30-50 mA	Type (1) 100-200 mA Type (2,3,4) 30-50 mA	Type (1) 100-200 mA Type (2,3,4) 30-50 mA
Turn-On Response Delay [4]	<5 ms	<5 ms	<5 ms
Turn-Off Response Delay [4]	<10 ms	<10 ms	<10 ms
Turn-Off Voltage (Full Off)	Type (1) <3V, (2) <9.5V (3) <9.5V, (4) <30V	Type (1) <3V, (2) <9.5V (3) <9.5V, (4) <30V	Type (1) <3V, (2) <9.5V (3) <9.5V, (4) <30V
Isolation Voltage	2.5kV (AC 1min 50/60hz)	2.5kV (AC 1min 50/60hz)	2.5kV (AC 1min 50/60hz)
LED Indicators	Red (signal)	Red (signal)	Red (signal)
	Temperature & Physical Specifications		
Operating & Storage Temperature	Ambient Operating: -40 to 80°C Storage: -40 to 80°C	Ambient Operating: -40 to 80°C Storage: -40 to 80°C	Ambient Operating: -40 to 80°C Storage: -40 to 80°C
Max Junction Temperature	140°C	165°C	140°C
Thermal Impedance [5]	R_{JC} = 0.18°C/W, R_{CH}=0.1°C/W	R_{JC} = 0.23°C/W, R_{CH}=0.1°C/W	R_{JC} = 0.13°C/W, R_{CH}=0.1°C/W
Control Input Termination	16-28 AWG (max 0.2 Nm)	16-28 AWG (max 0.2 Nm)	16-28 AWG (max 0.2 Nm)
Busbar Output Termination	M6	M6	M6
Overall Dimensions LxWxH	105x73x50 mm	105x73x50 mm	105x73x50 mm
Typical Weight	350g	350g	350g
Mean Time Between Failures	3 million hours	3 million hours	3 million hours

[1] The rated continuous load current assumes the base plate is at 100°C

[2] Non-repetitive 250ms and 10ms surge current assumes the baseplate temperature is at 100°C and 25°C respectively

[3] Exceeding recommended PWM frequency may result in deviations to output duty cycle

[4] Signal response delay only, actual switching speed is in the range of 10's of µS

[5] R_{ch} assumes thermal interface material of 1W/mK, 0.07mm, is applied between the base plate and mounting surface

NOMINAL CONTROLS

General Specifications

	Group B (200A to 400A)		
Part#	**M1DS01-400A**	**M1DS06-200A**	**M1DS10-250A**
	Output Specifications		
Rated Voltage	1 - 100 VDC	1 - 600 VDC	1 - 1000 VDC
Rated Load Current[1]	400 A	200 A	250 A
Rated Surge Current[2]	520A(200ms), 950A(10ms)	275A(200ms), 500A(10ms)	400A(10ms)
Typical ON Voltage Drop	0.1V@100A, 0.36V@400A	1V@100A, 1.25V@200A	1.25V@100A, 1.8V@200A
Max Leakage Current	<1 mA	<1 mA	<1 mA
Recommended Max PWM[3]	5 Hz (standard model) 5 kHz (advanced model)	5 Hz (standard model) 2.5 kHz (advanced model)	5 Hz (standard model) 2.5 kHz (advanced model)
	Input Specifications		
Control Input Voltage	Type: (1) 4-11V, (2) 12-32V (3) 12-24V, (4) 36-75V	Type: (1) 4-11V, (2) 12-32V (3) 12-24V, (4) 36-75V	Type: (1) 4-11V, (2) 12-32V (3) 12-24V, (4) 36-75V
Control Input Current	Type (1) 100-200 mA Type (2,3,4) 30-50 mA	Type (1) 100-200 mA Type (2,3,4) 30-50 mA	Type (1) 100-200 mA Type (2,3,4) 30-50 mA
Turn-On Response Delay[4]	<5 ms	<5 ms	<5 ms
Turn-Off Response Delay[4]	<10 ms	<10 ms	<10 ms
Must Turn-Off Voltage)	Type (1) <3V, (2) <9.5V (3) <9.5V, (4) <30V	Type (1) <3V, (2) <9.5V (3) <9.5V, (4) <30V	Type (1) <3V, (2) <9.5V (3) <9.5V, (4) <30V
Isolation Voltage	2.5kV (AC 1min 50/60hz)	2.5kV (AC 1min 50/60hz)	2.5kV (AC 1min 50/60hz)
LED Indicators	Red (signal)	Red (signal)	Red (signal)
	Temperature & Physical Specifications		
Operating & Storage Temperature	Ambient Operating: -40 to 80°C Storage: -40 to 80°C	Ambient Operating: -40 to 80°C Storage: -40 to 80°C	Ambient Operating: -40 to 80°C Storage: -40 to 80°C
Max Junction Temperature	140°C	165°C	140°C
Thermal Impedance[5]	R_{JC} = 0.12°C/W, R_{CH}=0.0.07°C/W	R_{JC} = 0.13°C/W, R_{CH}=0.07°C/W	R_{JC} = 0.08°C/W, R_{CH}=0.07°C/W
Control Input Termination	16-28 AWG (max 0.2 Nm)	16-28 AWG (max 0.2 Nm)	16-28 AWG (max 0.2 Nm)
Busbar Output Termination	M6	M6	M6
Overall Dimensions LxWxH	105x73x50 mm	105x73x50 mm	105x73x50 mm
Typical Weight	390g	390g	390g
Mean Time Between Failures	3 million hours	3 million hours	3 million hours

General Specifications

	Group C (example of custom options)		
Part#	**M1DS01-500A (higher current)**	**M1DS15-150A (higher voltage)**	**M1DS10-100A (lower loss)[6]**
	Output Specifications		
Rated Voltage	1 - 100 VDC	1 - 1500 VDC	1 - 1000 VDC
Rated Load Current [1]	500A (busbar limit) 1000A (transistors)	150 A	100A
Rated Peak Current [2]	1200A(200ms), 1600A(10ms)	280A (10ms)	150A (10ms)
Typical ON Voltage Drop	0.35V @300A	1.9V @50A	0.8V @50A
Max Leakage Current	<2 mA	<5 mA	<1 mA
Recommended Max PWM [3]	5 Hz (standard model) 3 kHz (advanced model)	10 Hz (standard model) 5 kHz (advanced model)	10 Hz (standard model) 5 kHz (advanced model)
	Input Specifications		
Control Input Voltage	Type: (1) 4-11V, (2) 12-32V (3) 12-24V, (4) 36-75V	Type: (1) 4-11V, (2) 12-32V (3) 12-24V, (4) 36-75V	Type: (1) 4-11V, (2) 12-32V (3) 12-24V, (4) 36-75V
Control Input Current	Type (1) 100-200 mA Type (2,3,4) 30-50 mA	Type (1) 100-200 mA Type (2,3,4) 30-50 mA	Type (1) 100-200 mA Type (2,3,4) 30-50 mA
Turn-On Response Delay [4]	<5 ms	<5 ms	<5 ms
Turn-Off Response Delay [4]	<10 ms	<10 ms	<10 ms
Turn-Off Voltage (Full Off)	Type (1) <3V, (2) <9.5V (3) <9.5V, (4) <30V	Type (1) <3V, (2) <9.5V (3) <9.5V, (4) <30V	Type (1) <3V, (2) <9.5V (3) <9.5V, (4) <30V
Isolation Voltage	2.5kV (AC 1min 50/60hz)	2.5kV (AC 1min 50/60hz)	2.5kV (AC 1min 50/60hz)
LED Indicators	Red (signal)	Red (signal)	Red (signal)
	Temperature & Physical Specifications		
Operating & Storage Temperature	Ambient Operating: -40 to 80°C Storage: -40 to 80°C	Ambient Operating: -40 to 80°C Storage: -40 to 80°C	Ambient Operating: -40 to 80°C Storage: -40 to 80°C
Max Junction Temperature	140°C	165°C	165°C
Thermal Impedance [5]	R_{JC} = 0.04°C/W, R_{CH}=0.1°C/W	R_{JC} = 0.08°C/W, R_{CH}=0.1°C/W	R_{JC} = 0.25°C/W, R_{CH}=0.1°C/W
Control Input Termination	16-28 AWG (max 0.2 Nm)	16-28 AWG (max 0.2 Nm)	16-28 AWG (max 0.2 Nm)
Busbar Output Termination	M6	M6	M6
Overall Dimensions LxWxH	104x73x50 mm	104x73x50 mm	104x73x50 mm
Typical Weight	400g	380g	380g
Mean Time Between Failures	3 million hours	3 million hour	3 million hours

Contact us for any questions or custom requirements:

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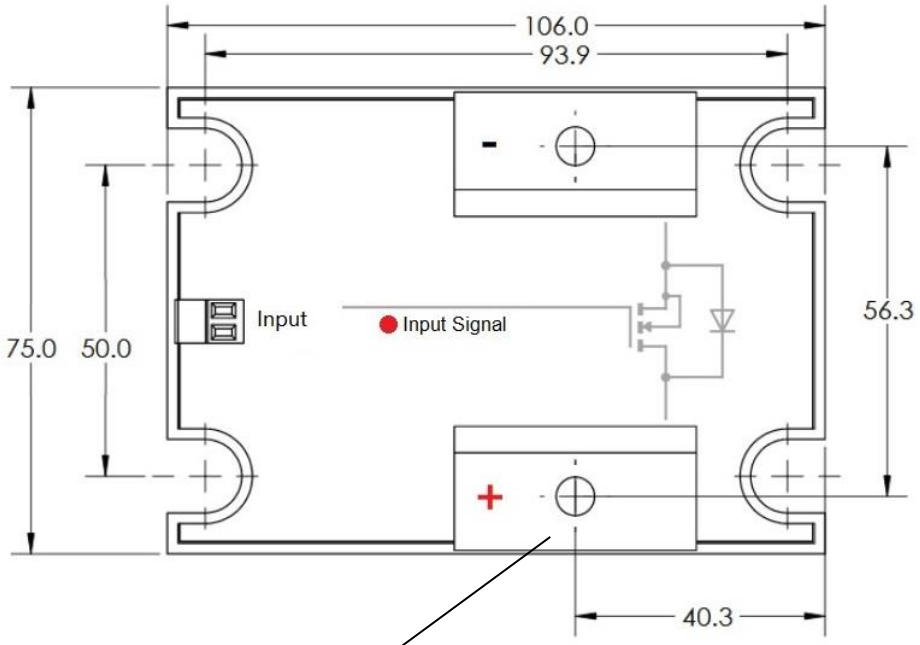
[6] *with 2x custom Mach-1 contactors in parallel*

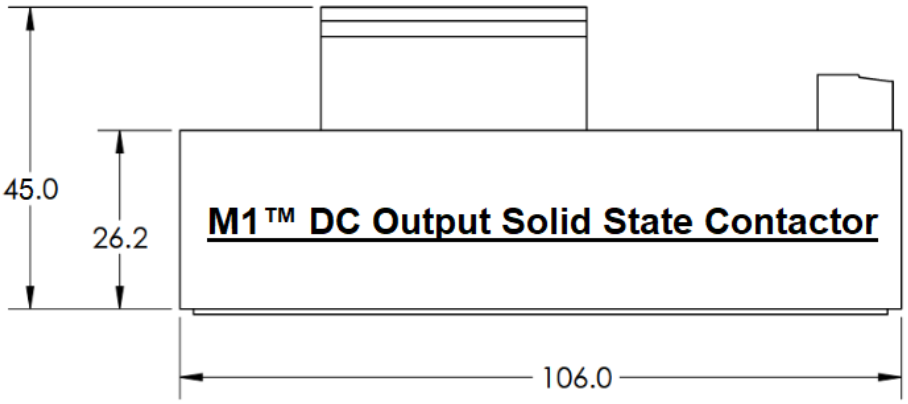
Technical Drawings

Model		Output Voltage			Output Current	Control Input			Other Features	
M1DS		*01A*		-	*200A*	*2*		-	*P1*	-
M1DS	M1™ Standard Model (20 Hz)	**01 =**	1-100 VDC		Rated Continuous Current (A)	**1 =**	3.3 - 11 VDC		P1 = Built-in snubber TVS T = Overheat protection Blank = N/A	Other Reference Blank = N/A
		01A =	1-150 VDC			**2 =**	12 - 32 VDC			
		02 =	1-200 VDC			**3 =**	12 - 24 VDC			
M1AS	M1™ Advanced Model (10 KHz)	**06 =**	1-600 VDC			**4 =**	36 - 75 VDC			
		10 =	1-1000 VDC							
		15 =	1-1500 VDC							



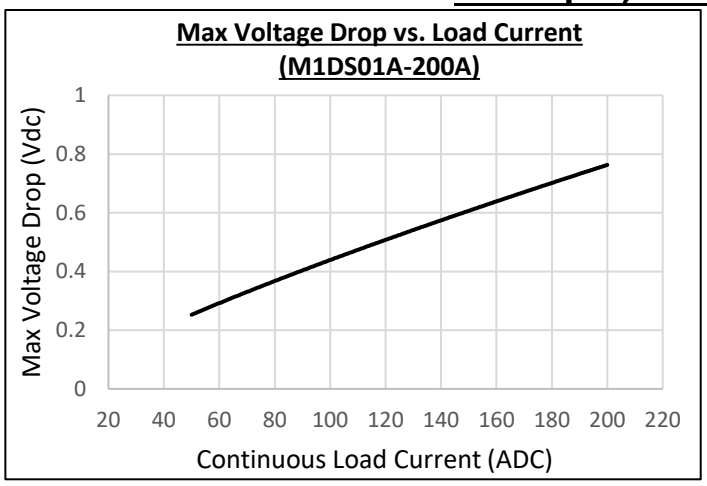
Included Accessories

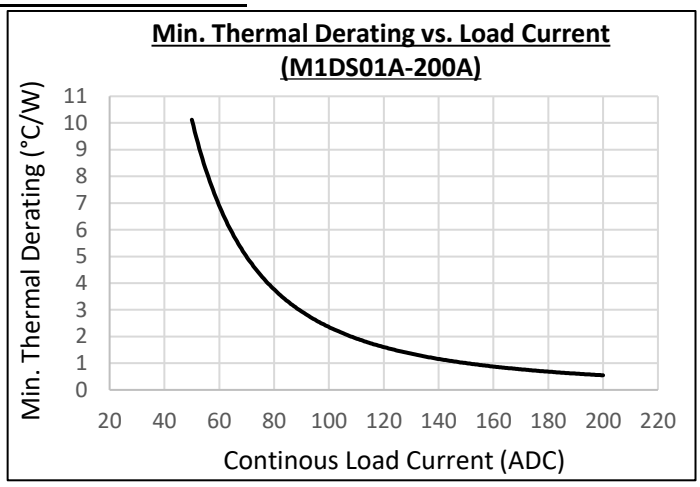
1x Thermal Pad
4x M4x12 Panel Mount Screws
2x M6 Terminal Bolts

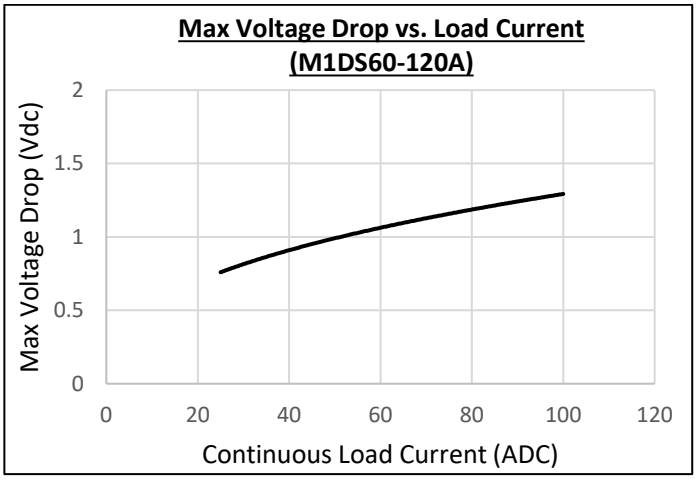


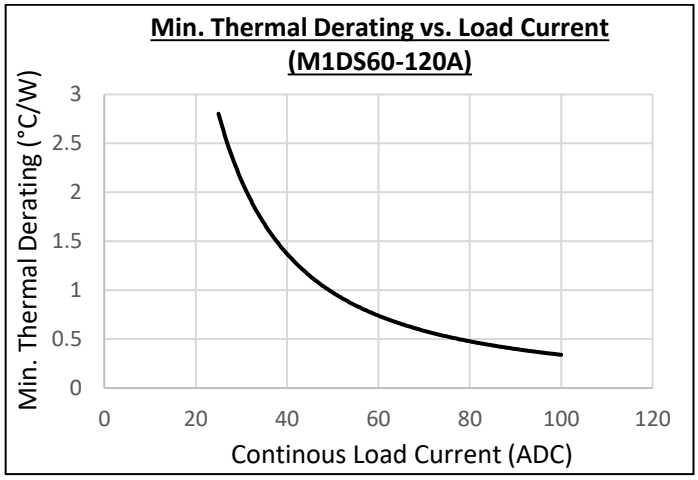
<Dimensions in mm>

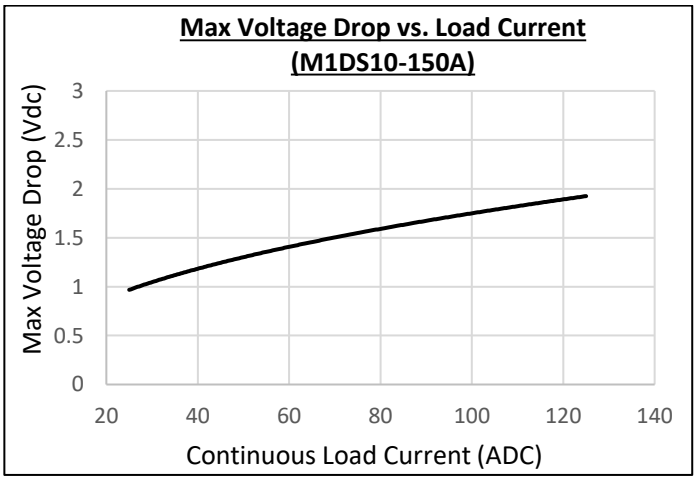
<Group A, Technical Charts>

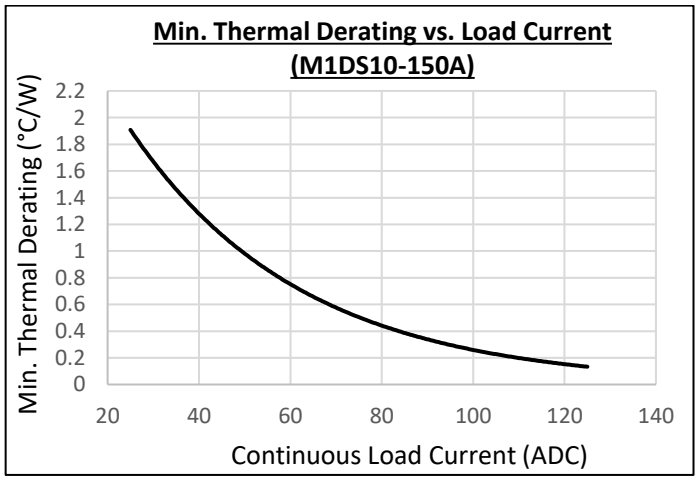








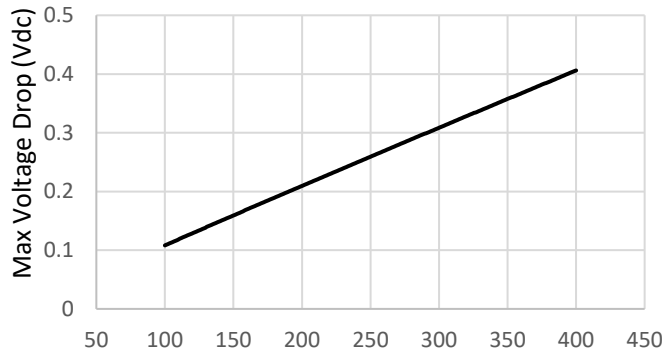




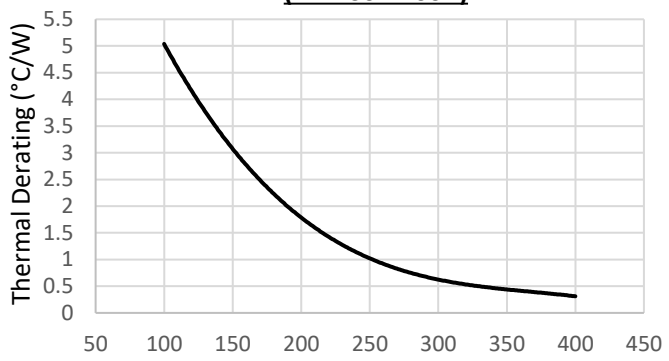
Thermal derating curve is for reference only, plotted based on an ambient temperature of 40°C or 104°F

<Group B, Technical Charts>

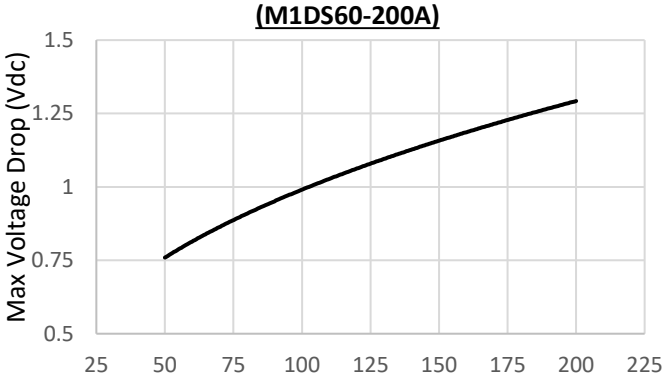
Max Voltage Drop vs. Load Current (M1DS01-400A)



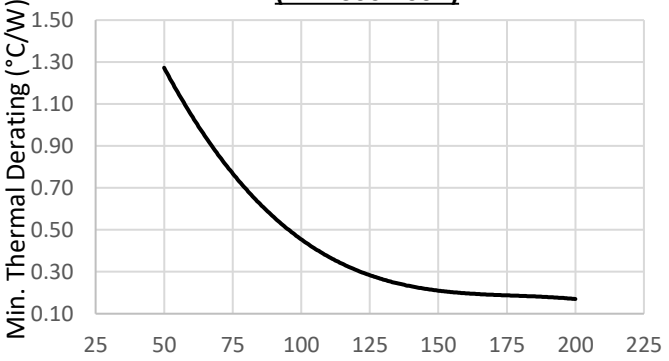
Min. Thermal Derating vs. Load Current (M1DS01-400A)



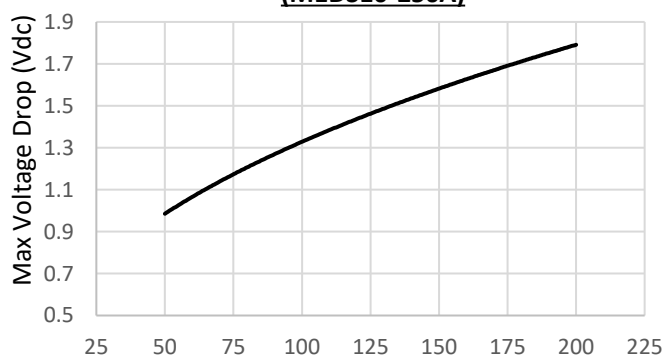
Max Voltage Drop vs. Load Current (M1DS60-200A)



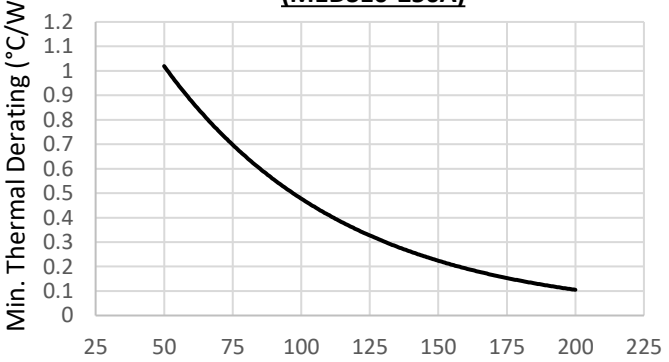
Min. Thermal Derating vs. Load Current (M1DS06-200A)



Max Voltage Drop vs. Load Current (M1DS10-250A)



Min. Thermal Derating vs. Load Current (M1DS10-250A)



Thermal derating curve is for reference only, plotted based on an ambient temperature of 40°C or 104°F