

Standard Rectifier Module

$V_{RRM} = 1600 \text{ V}$

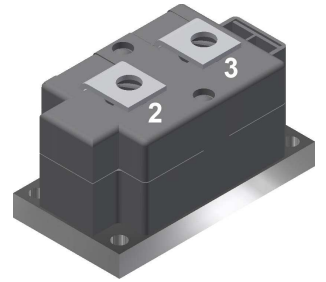
$I_{FAV} = 608 \text{ A}$

$V_F = 1.01 \text{ V}$


Single Diode

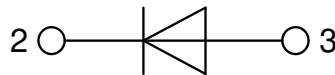
Part number

MDO600-16N1



Backside: isolated

 E72873



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

Applications:

- Diode for main rectification
- For single and three phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

Package: Y1

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Base plate: Copper internally DCB isolated
- Advanced power cycling

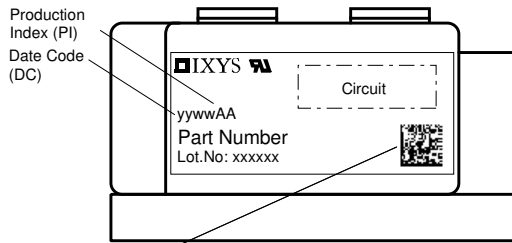
Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					1700	V
V_{RRM}	max. repetitive reverse blocking voltage					1600	V
I_R	reverse current	$V_R = 1600$ V		$T_{VJ} = 25^\circ\text{C}$		1	mA
		$V_R = 1600$ V		$T_{VJ} = 140^\circ\text{C}$		30	mA
V_F	forward voltage drop	$I_F = 600$ A		$T_{VJ} = 25^\circ\text{C}$		1.12	V
						1.30	V
		$I_F = 1200$ A		$T_{VJ} = 125^\circ\text{C}$		1.01	V
						1.23	V
I_{FAV}	average forward current	$T_C = 85^\circ\text{C}$ 180° sine	d = 0.5	$T_{VJ} = 140^\circ\text{C}$		608	A
V_{FO}	threshold voltage	} for power loss calculation only		$T_{VJ} = 140^\circ\text{C}$		0.76	V
r_F	slope resistance					0.32	mΩ
R_{thJC}	thermal resistance junction to case					0.072	K/W
R_{thCH}	thermal resistance case to heatsink				0.024		K/W
P_{tot}	total power dissipation			$T_C = 25^\circ\text{C}$		1600	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		15.0	kA
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		16.2	kA
		t = 10 ms; (50 Hz), sine		$T_{VJ} = 140^\circ\text{C}$		12.8	kA
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		13.8	kA
I^2t	value for fusing	t = 10 ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		1.13	MA ² s
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		1.09	MA ² s
		t = 10 ms; (50 Hz), sine		$T_{VJ} = 140^\circ\text{C}$		812.8	kA ² s
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		788.8	kA ² s
C_J	junction capacitance	$V_R = 400$ V; f = 1 MHz		$T_{VJ} = 25^\circ\text{C}$		762	pF



Package Y1			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			600	A
T_{VJ}	virtual junction temperature		-40		140	°C
T_{op}	operation temperature		-40		125	°C
T_{stg}	storage temperature		-40		125	°C
Weight				650		g
M_D	mounting torque		4.5		7	Nm
M_T	terminal torque		11		13	Nm
$d_{Spp/App}$	creepage distance on surface striking distance through air	terminal to terminal	16.0			mm
$d_{Spb/Apb}$		terminal to backside	25.0			mm
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V



Data Matrix: part no. (1-19), DC + PI (20-25), lot.no.# (26-31), blank (32), serial no.# (33-36)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDO600-16N1	MDO600-16N1	Box	2	509707

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 140^{\circ}C$

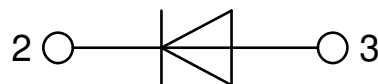
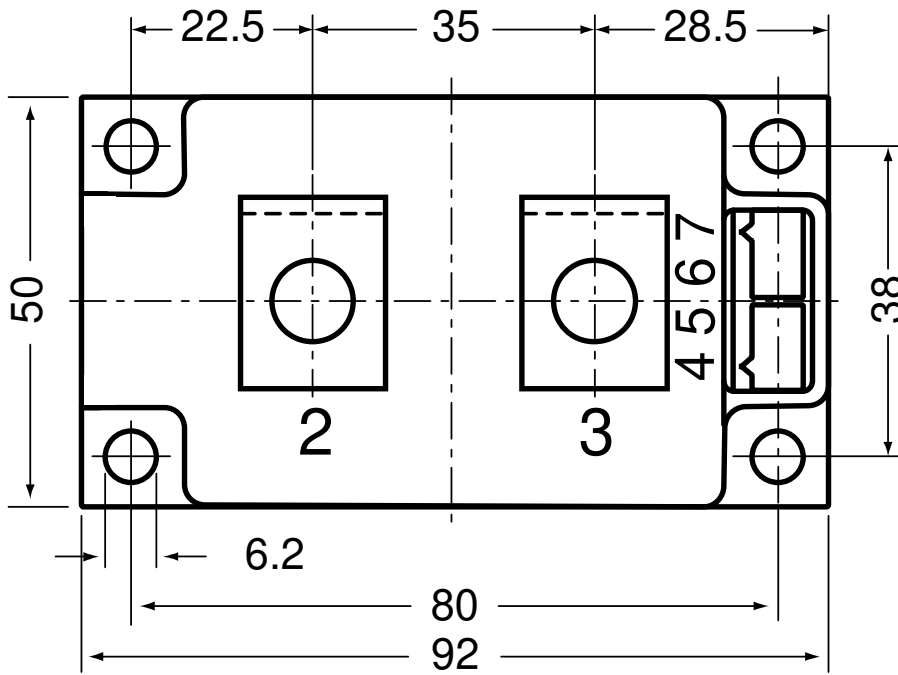
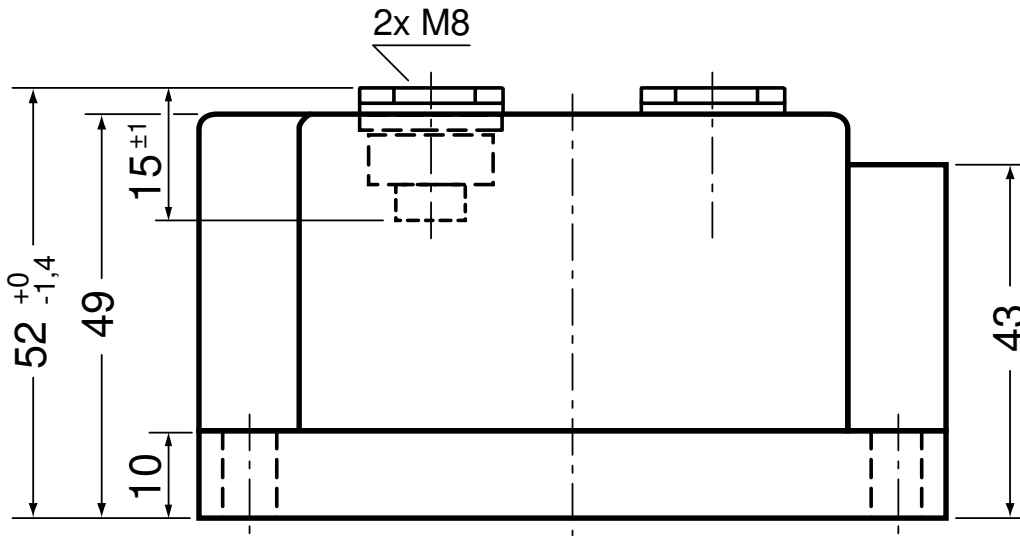


Rectifier

$V_{0\ max}$	threshold voltage	0.76	V
$R_{0\ max}$	slope resistance *	0.13	mΩ



Outlines Y1



Rectifier

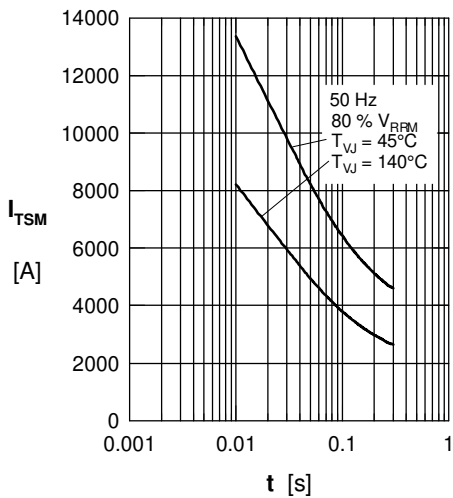


Fig. 1 Surge overload current
 I_{FSM} : Crest value, t: duration

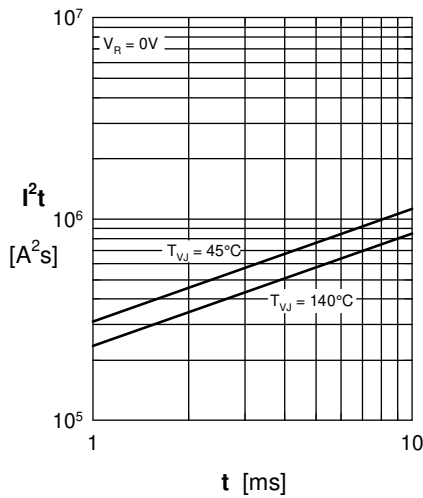


Fig. 2 I^2t versus time (1-10 ms)

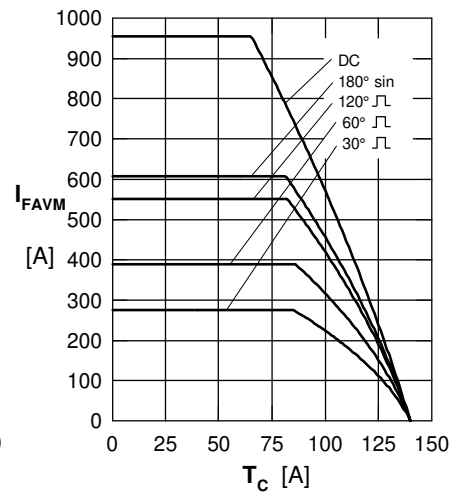


Fig. 3 Max. forward current at case temperature

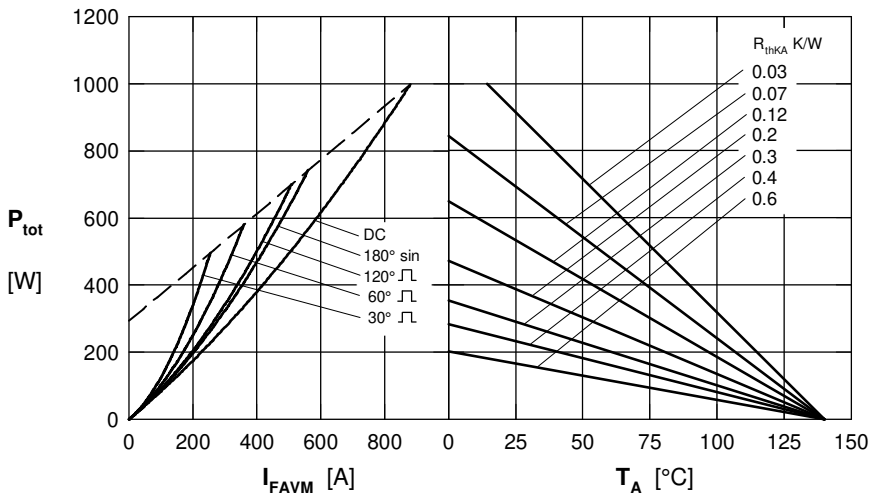


Fig. 4 Power dissipation vs. forward current and ambient temperature

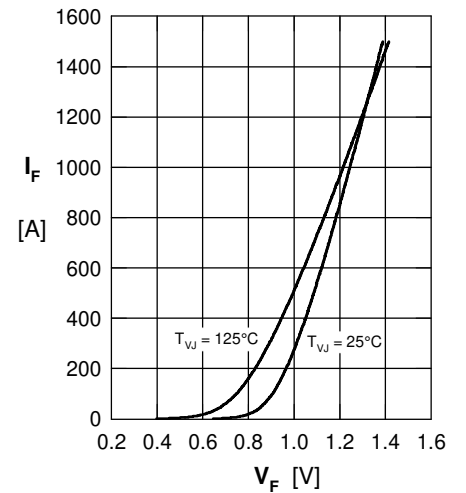


Fig. 5 Forward current I_F vs. V_F

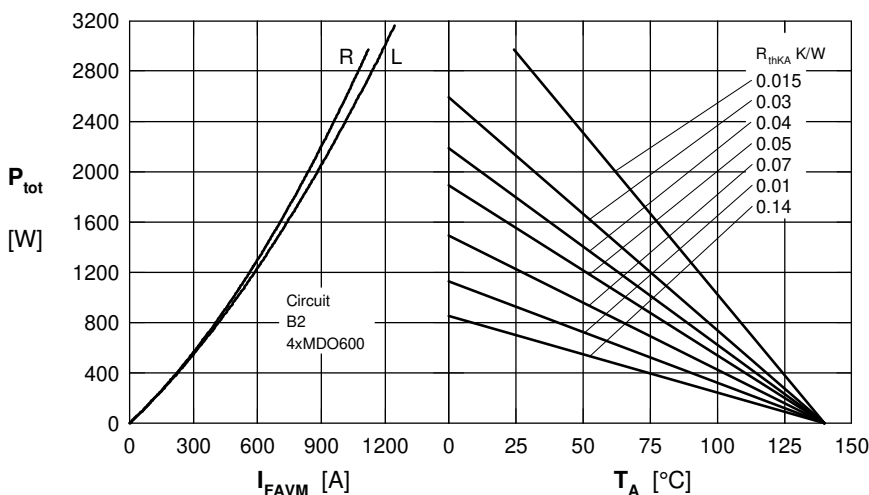


Fig. 6 Single phase rectifier bridge: Power dissipation vs. direct output current and ambient temperature R = resistive load, L = inductive load