

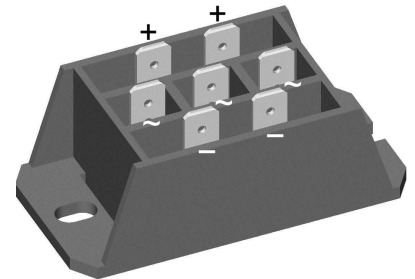
# Standard Rectifier Module


<b>3~ Rectifier</b>	
$V_{RRM}$	= 1600 V
$I_{DAV}$	= 60 A
$I_{FSM}$	= 500 A

## 3~ Rectifier Bridge

Part number

**VUO50-16NO3**



 E72873



### Features / Advantages:

- Package with DCB ceramic
- Improved temperature and power cycling
- Planar passivated chips
- Very low forward voltage drop
- Very low leakage current

### Applications:

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

### Package: FO-F

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- ¼" fast-on terminals
- Easy to mount with two screws
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

### Disclaimer Notice

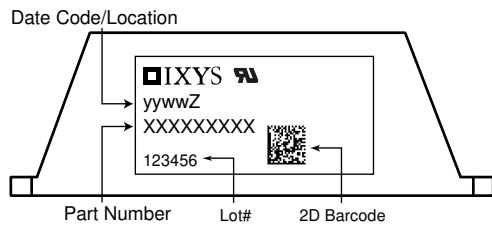
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					1700	V
$V_{RRM}$	max. repetitive reverse blocking voltage					1600	V
$I_R$	reverse current	$V_R = 1600$ V		$T_{VJ} = 25^\circ\text{C}$		40	$\mu\text{A}$
		$V_R = 1600$ V		$T_{VJ} = 150^\circ\text{C}$		1.5	mA
$V_F$	forward voltage drop	$I_F = 20$ A		$T_{VJ} = 25^\circ\text{C}$		1.07	V
		$I_F = 60$ A				1.32	V
		$I_F = 20$ A		$T_{VJ} = 125^\circ\text{C}$		0.98	V
		$I_F = 60$ A				1.30	V
$I_{DAV}$	bridge output current	$T_C = 110^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		60	A
		rectangular	$d = \frac{1}{3}$				
$V_{FO}$	threshold voltage			$T_{VJ} = 150^\circ\text{C}$		0.78	V
$r_F$	slope resistance					8.5	m $\Omega$
						} for power loss calculation only	
$R_{thJC}$	thermal resistance junction to case					1.5	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.4		K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		80	W
$I_{FSM}$	max. forward surge current	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		500	A
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		540	A
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		425	A
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		460	A
$I^2t$	value for fusing	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		1.25	kA <sup>2</sup> s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		1.22	kA <sup>2</sup> s
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		905	A <sup>2</sup> s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		880	A <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400$ V; $f = 1$ MHz		$T_{VJ} = 25^\circ\text{C}$		25	pF



Package FO-F		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			100	A
$T_{VJ}$	virtual junction temperature		-40		150	°C
$T_{op}$	operation temperature		-40		125	°C
$T_{stg}$	storage temperature		-40		125	°C
<b>Weight</b>				45		g
$M_D$	mounting torque		2		2.5	Nm
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	18.0	6.0		mm
$d_{Spb/Apb}$		terminal to backside	26.0	20.0		mm
$V_{ISOL}$	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V

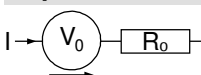


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUO50-16NO3	VUO50-16NO3	Box	10	426113

**Equivalent Circuits for Simulation**

\* on die level

$T_{VJ} = 150^{\circ}C$

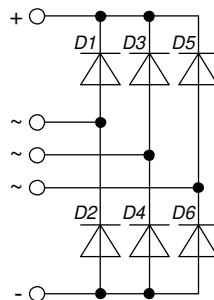
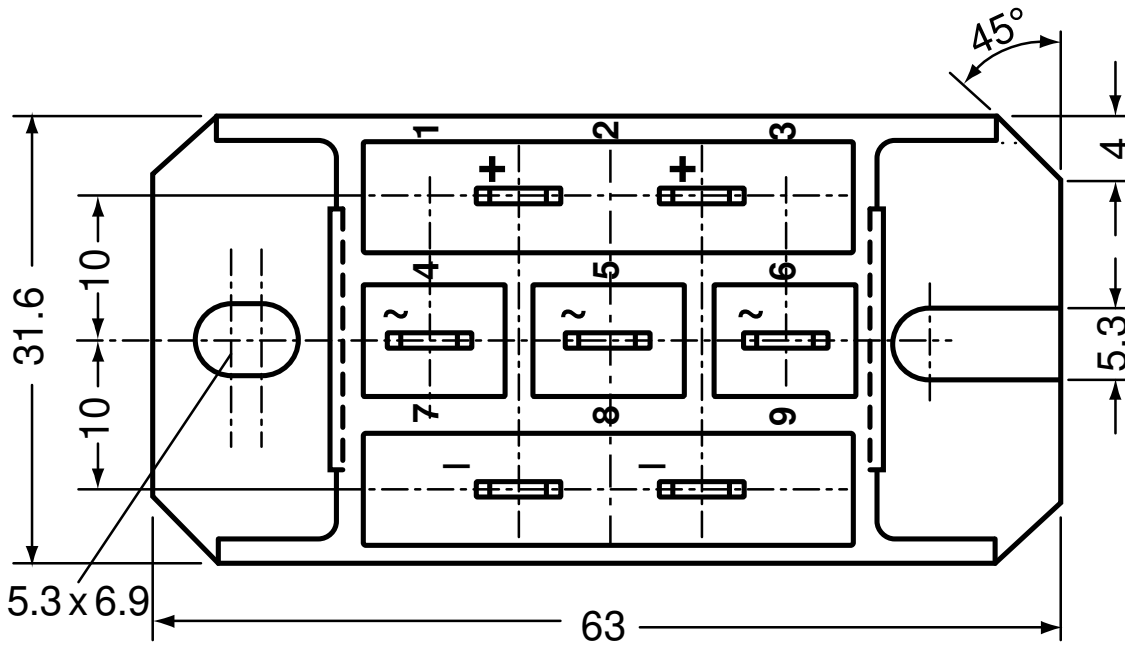
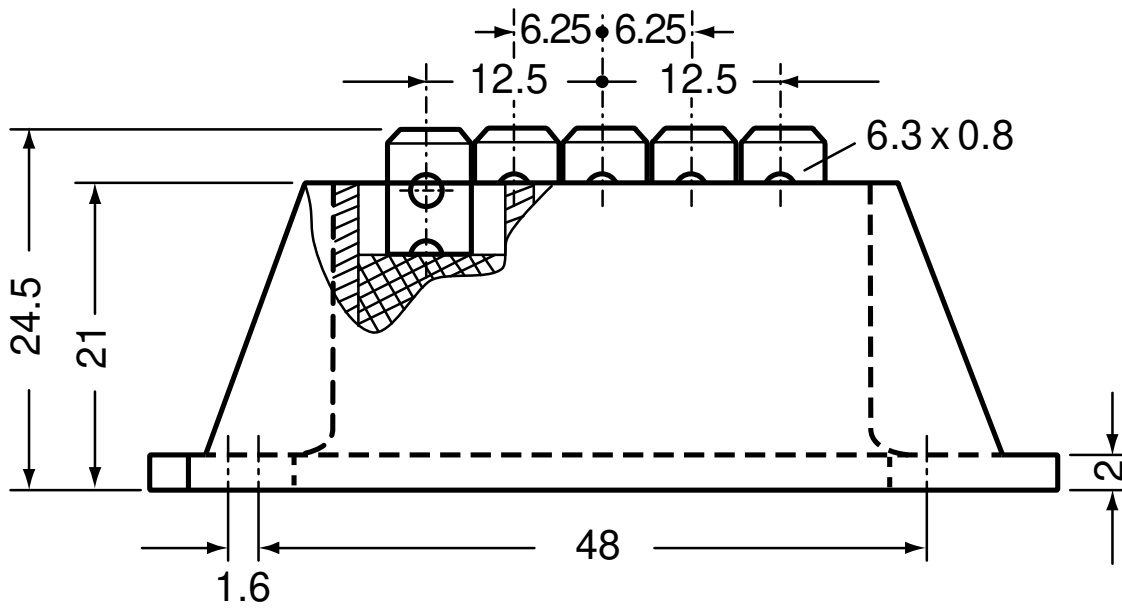


**Rectifier**

$V_{0\ max}$	threshold voltage	0.78	V
$R_{0\ max}$	slope resistance *	7.3	mΩ



Outlines FO-F





**Rectifier**

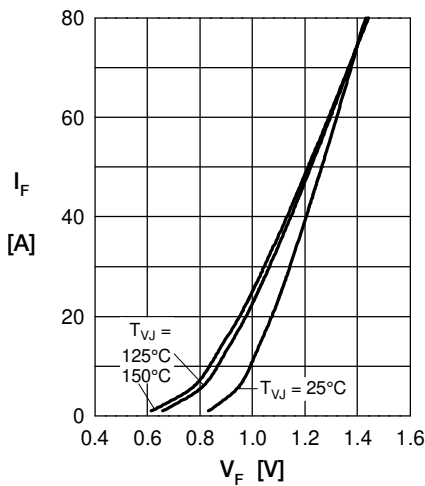


Fig. 1 Forward current vs. voltage drop per diode

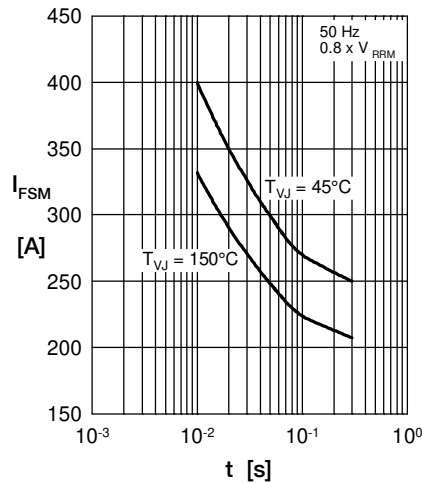


Fig. 2 Surge overload current vs. time per diode

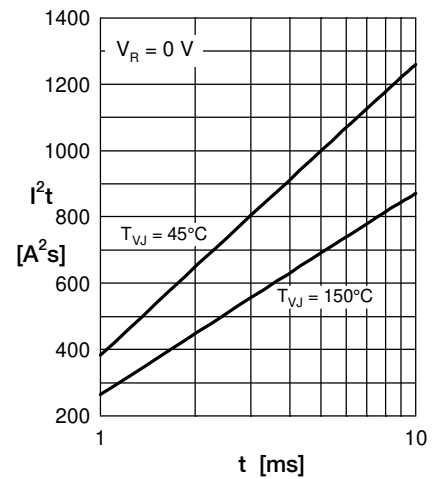


Fig. 3  $I^2t$  vs. time per diode

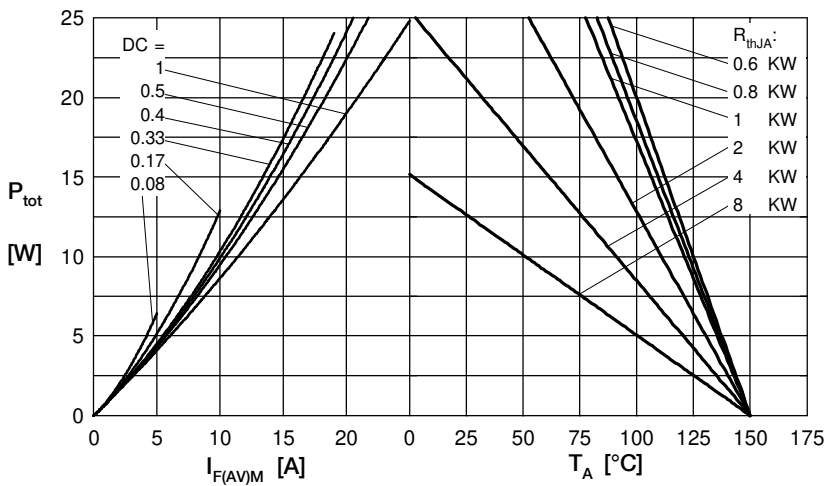


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

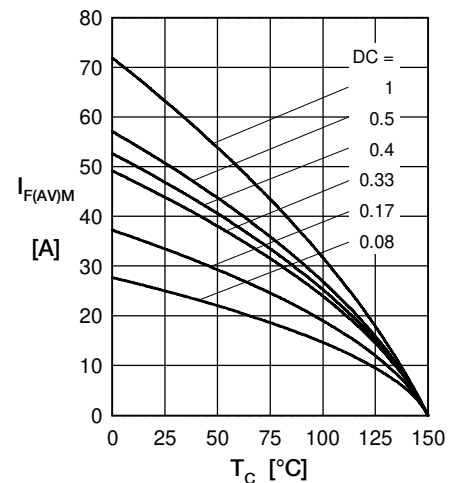


Fig. 5 Max. forward current vs. case temperature per diode

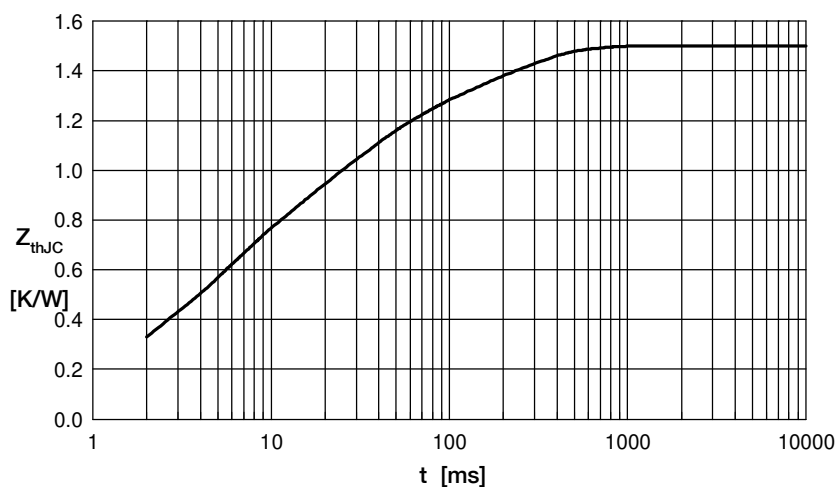


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for  $Z_{thJC}$  calculation:

i	$R_{th}$ (K/W)	$t_i$ (s)
1	0.0607	0.00040
2	0.1330	0.00256
3	0.4305	0.00450
4	0.5130	0.02420
5	0.3628	0.18000

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