

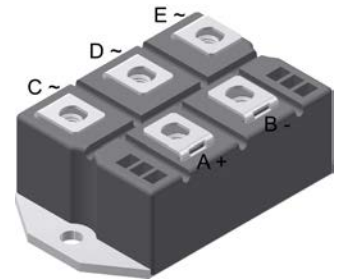
# Standard Rectifier Module

<b>3~ Rectifier</b>
$V_{RRM} = 1600\text{ V}$
$I_{DAV} = 175\text{ A}$
$I_{FSM} = 1800\text{ A}$

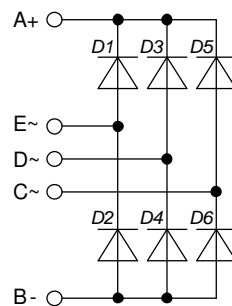
## 3~ Rectifier Bridge

Part number

**VUO160-16NO7**



 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: PWS-E

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Easy to mount with two screws
- Base plate: Copper internally DCB isolated
- Advanced power cycling

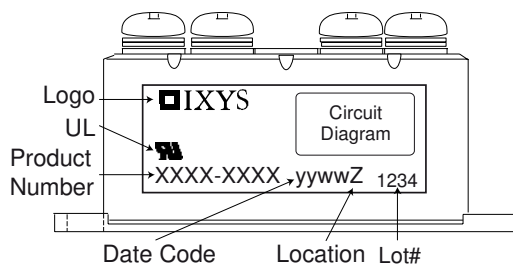
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					1700	V
$V_{RRM}$	max. repetitive reverse blocking voltage					1600	V
$I_R$	reverse current	$V_R = 1600$ V		$T_{VJ} = 25^\circ\text{C}$		200	$\mu\text{A}$
		$V_R = 1600$ V		$T_{VJ} = 150^\circ\text{C}$		2	mA
$V_F$	forward voltage drop	$I_F = 60$ A		$T_{VJ} = 25^\circ\text{C}$		1,10	V
		$I_F = 180$ A				1,40	V
		$I_F = 60$ A		$T_{VJ} = 125^\circ\text{C}$		1,00	V
		$I_F = 180$ A				1,39	V
$I_{DAV}$	bridge output current	$T_C = 110^\circ\text{C}$ rectangular	$d = \frac{1}{3}$	$T_{VJ} = 150^\circ\text{C}$		175	A
$V_{FO}$	threshold voltage	} for power loss calculation only				0,77	V
$r_F$	slope resistance					3,4	m $\Omega$
$R_{thJC}$	thermal resistance junction to case					0,5	K/W
$R_{thCH}$	thermal resistance case to heatsink					0,2	K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		250	W
$I_{FSM}$	max. forward surge current	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		1,80	kA
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		1,95	kA
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		1,53	kA
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		1,65	kA
$I^2t$	value for fusing	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		16,2	kA <sup>2</sup> s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		15,7	kA <sup>2</sup> s
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		11,7	kA <sup>2</sup> s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		11,3	kA <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400$ V; $f = 1$ MHz		$T_{VJ} = 25^\circ\text{C}$		35	pF

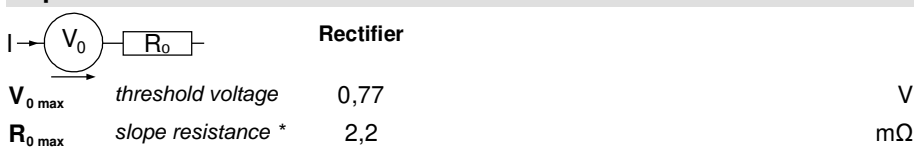
Package PWS-E				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$I_{RMS}$	RMS current	per terminal			200	A	
$T_{VJ}$	virtual junction temperature		-40		150	°C	
$T_{op}$	operation temperature		-40		125	°C	
$T_{stg}$	storage temperature		-40		125	°C	
<b>Weight</b>					284	g	
$M_D$	mounting torque		4,25		5,75	Nm	
$M_T$	terminal torque		4,25		5,75	Nm	
$d_{Spp/App}$	creepage distance on surface   striking distance through air	terminal to terminal	12,0			mm	
$d_{Spb/Apb}$		terminal to backside	26,0			mm	
$V_{ISOL}$	isolation voltage	t = 1 second	3000			V	
		t = 1 minute	2500			V	



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUO160-16NO7	VUO160-16NO7	Box	5	462462

**Equivalent Circuits for Simulation**

\* on die level

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




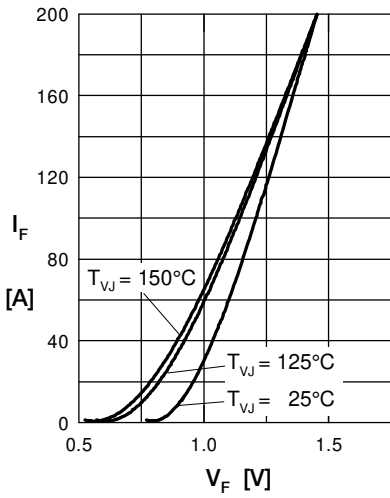
**Rectifier**


Fig. 1 Forward current vs. voltage drop per diode

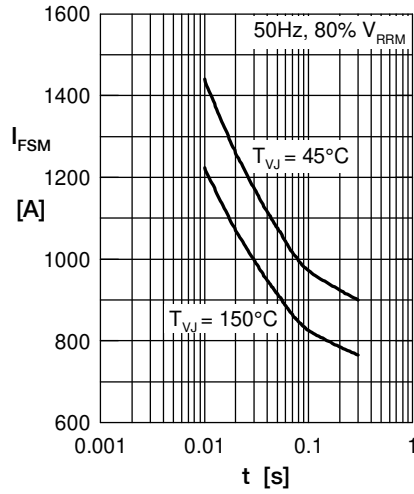


Fig. 2 Surge overload current vs. time per diode

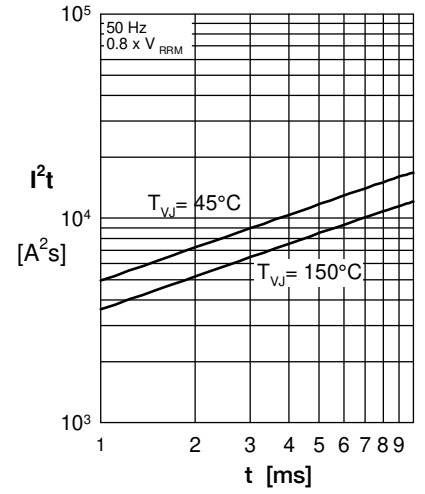
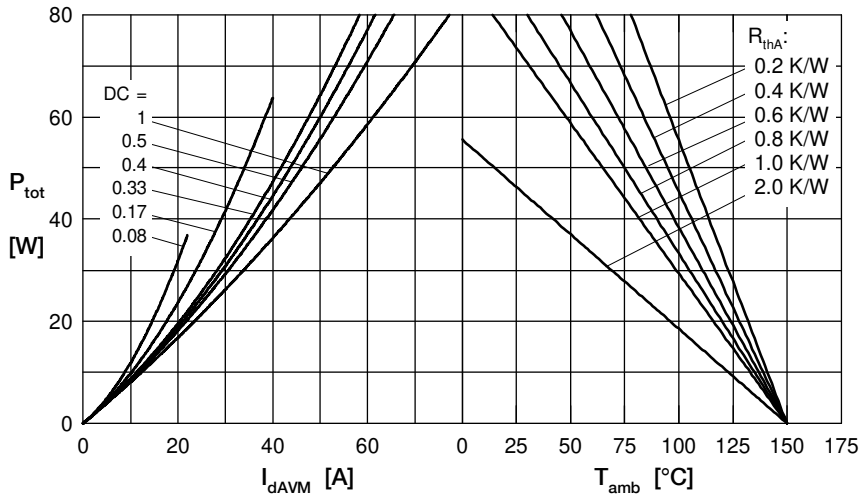

 Fig. 3  $I^2t$  vs. time per diode


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

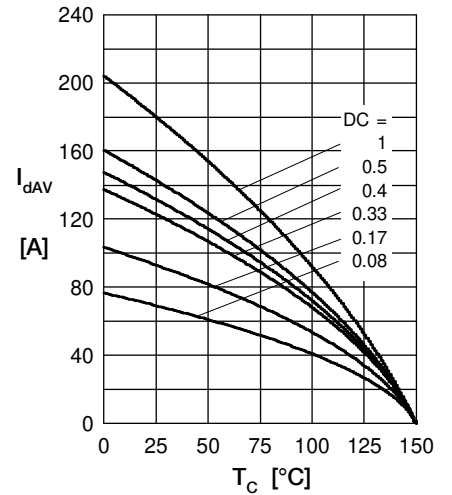


Fig. 5 Max. forward current vs. case temperature per diode

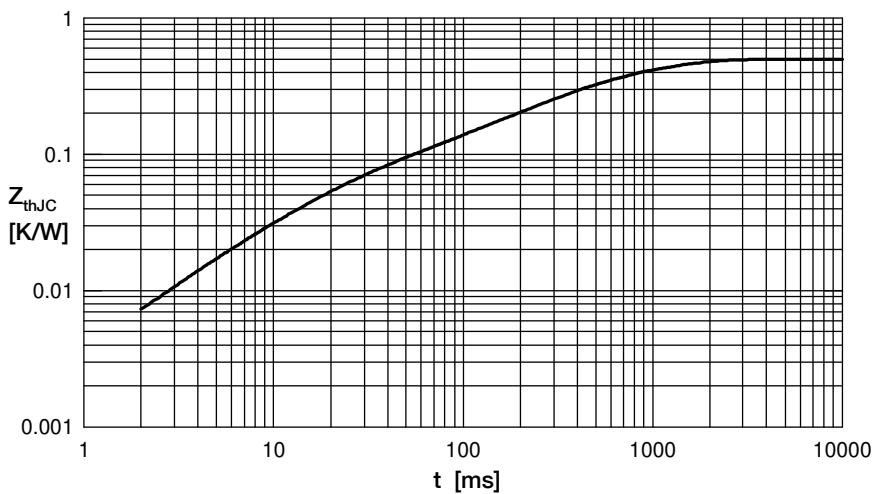


Fig. 6 Transient thermal impedance junction to case vs. time per diode

$R_i$	$t_i$
0.050	0.02
0.003	0.01
0.120	0.225
0.217	0.8
0.110	0.58