

Standard Rectifier Module

3~ Rectifier	
V_{RRM}	= 1600 V
I_{DAV}	= 90 A
I_{FSM}	= 550 A

3~ Rectifier Bridge

Part number

VUO86-16NO7



 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: ECO-PAC1

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 9 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

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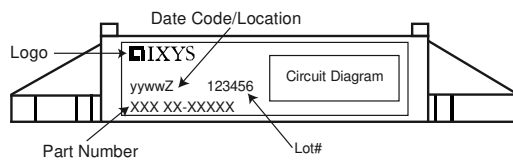
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					1700	V
V_{RRM}	max. repetitive reverse blocking voltage					1600	V
I_R	reverse current	$V_R = 1600$ V		$T_{VJ} = 25^\circ\text{C}$		40	μA
		$V_R = 1600$ V		$T_{VJ} = 150^\circ\text{C}$		1.5	mA
V_F	forward voltage drop	$I_F = 30$ A		$T_{VJ} = 25^\circ\text{C}$		1.14	V
		$I_F = 90$ A				1.48	V
		$I_F = 30$ A		$T_{VJ} = 125^\circ\text{C}$		1.06	V
		$I_F = 90$ A				1.51	V
I_{DAV}	bridge output current	$T_C = 105^\circ\text{C}$	rectangular	$T_{VJ} = 150^\circ\text{C}$		90	A
			$d = \frac{1}{3}$				
V_{FO}	threshold voltage	} for power loss calculation only				0.81	V
r_F	slope resistance					7.8	m Ω
R_{thJC}	thermal resistance junction to case					0.9	K/W
R_{thCH}	thermal resistance case to heatsink					0.4	K/W
P_{tot}	total power dissipation			$T_C = 25^\circ\text{C}$		135	W
I_{FSM}	max. forward surge current	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		550	A
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		595	A
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		470	A
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		505	A
I^2t	value for fusing	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		1.52	kA ² s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		1.48	kA ² s
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		1.11	kA ² s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		1.06	kA ² s
C_J	junction capacitance	$V_R = 400$ V; $f = 1$ MHz		$T_{VJ} = 25^\circ\text{C}$		18	pF



Package ECO-PAC1		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
Weight				19		g
M_D	mounting torque		1.4		2	Nm
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	6.0			mm
$d_{Spb/Apb}$		terminal to backside	10.0			mm
V_{ISOL}	isolation voltage	t = 1 second	3000			V
		t = 1 minute	2500			V

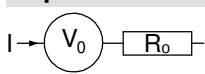


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUO86-16NO7	VUO86-16NO7	Box	25	479608

Equivalent Circuits for Simulation

* on die level

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



Rectifier

$V_{0\ max}$	threshold voltage	0.81	V
$R_{0\ max}$	slope resistance *	6.6	mΩ



Outlines ECO-PAC1



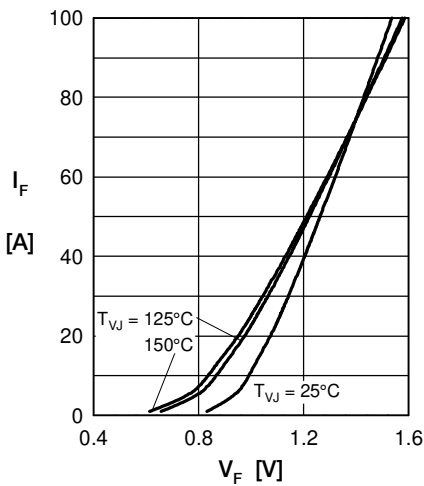
Rectifier


Fig. 1 Forward current versus voltage drop per diode

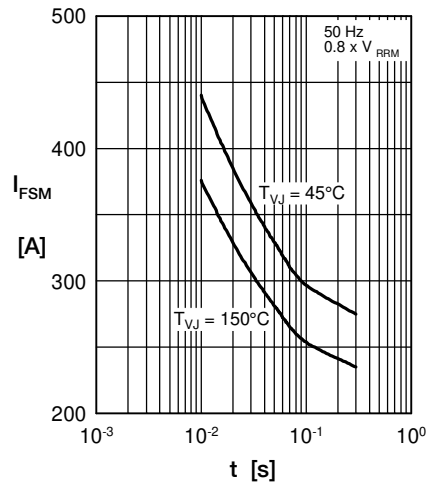


Fig. 2 Surge overload current

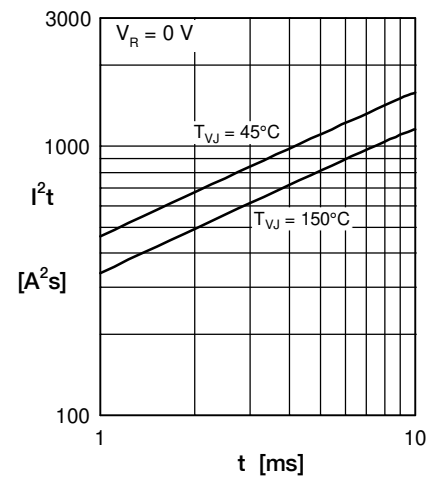
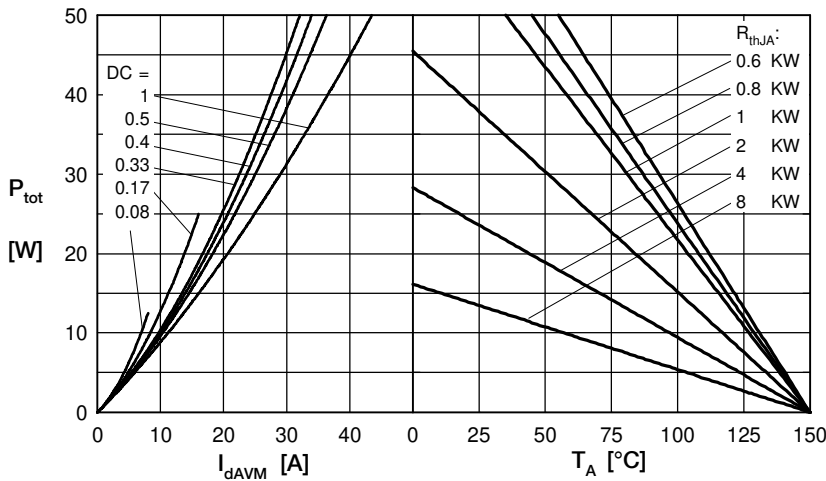

 Fig. 3 I^2t versus time per diode


Fig. 4 Power dissipation vs. direct output current & ambient temperature

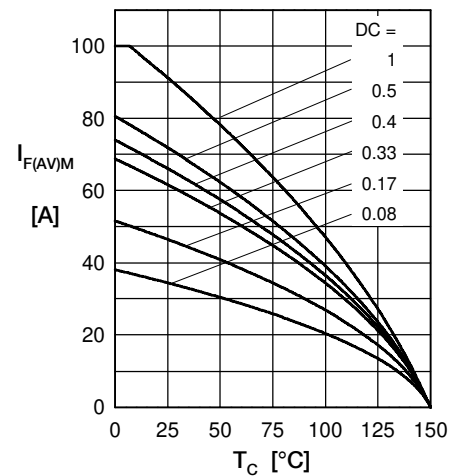


Fig. 5 Max. forward current vs. case temperature

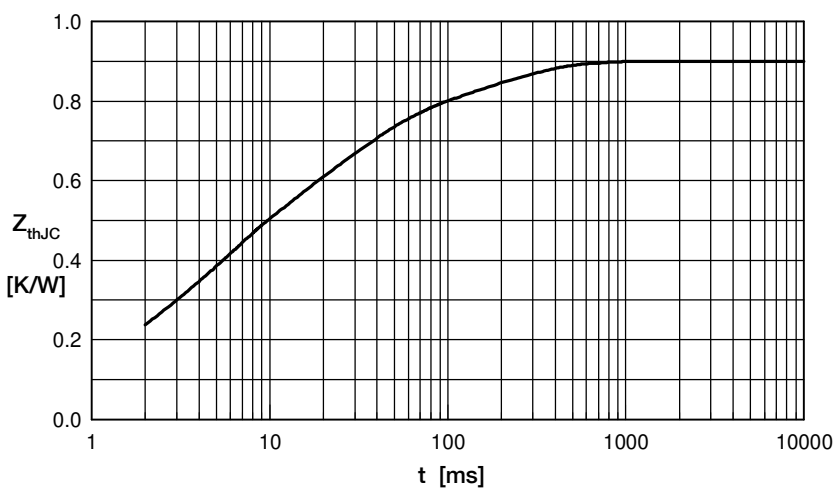


Fig. 6 Transient thermal impedance junction to case

 Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.0607	0.000
2	0.1230	0.00256
3	0.2330	0.0045
4	0.3230	0.0242
5	0.1628	0.18