

Standard Rectifier Module

3~ Rectifier	
$V_{RRM} =$	1200 V
$I_{DAV} =$	30 A
$I_{FSM} =$	120 A

3~ Rectifier Bridge

Part number

VUO28-12N07



 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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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					1300	V
V_{RRM}	max. repetitive reverse blocking voltage					1200	V
I_R	reverse current	$V_R = 1200\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		10	μA
		$V_R = 1200\text{ V}$		$T_{VJ} = 150^\circ\text{C}$		0.7	mA
V_F	forward voltage drop	$I_F = 10\text{ A}$		$T_{VJ} = 25^\circ\text{C}$		1.20	V
		$I_F = 30\text{ A}$				1.61	V
		$I_F = 10\text{ A}$		$T_{VJ} = 125^\circ\text{C}$		1.14	V
		$I_F = 30\text{ A}$				1.68	V
I_{DAV}	bridge output current	$T_C = 105^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		30	A
		rectangular	$d = \frac{1}{3}$				
V_{FO}	threshold voltage			$T_{VJ} = 150^\circ\text{C}$		0.84	V
r_F	slope resistance					28.8	m Ω
						} for power loss calculation only	
R_{thJC}	thermal resistance junction to case					2.5	K/W
R_{thCH}	thermal resistance case to heatsink				0.4		K/W
P_{tot}	total power dissipation			$T_C = 25^\circ\text{C}$		50	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 45^\circ\text{C}$		120	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		130	A
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 150^\circ\text{C}$		100	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		110	A
I^2t	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 45^\circ\text{C}$		72	A ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		70	A ² s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 150^\circ\text{C}$		50	A ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		50	A ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		4	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	VUO28-12NO7	VUO28-12NO7	Box	25	479632

Equivalent Circuits for Simulation

* on die level

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



Rectifier

$V_{0\ max}$	threshold voltage	0.84	V
$R_{0\ max}$	slope resistance *	27.6	mΩ



Outlines ECO-PAC1



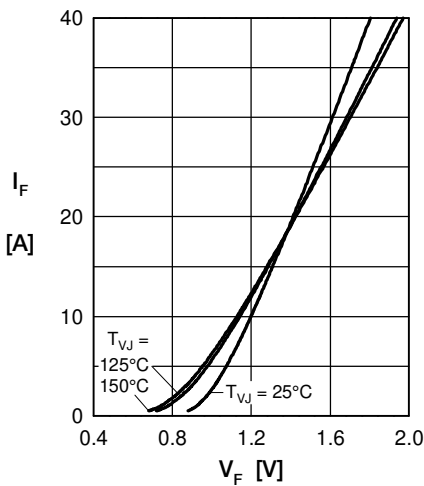
Rectifier


Fig. 1 Forward current vs. voltage drop per diode

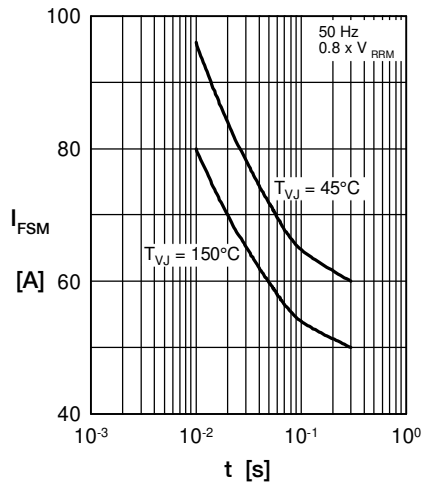


Fig. 2 Surge overload current vs. time per diode

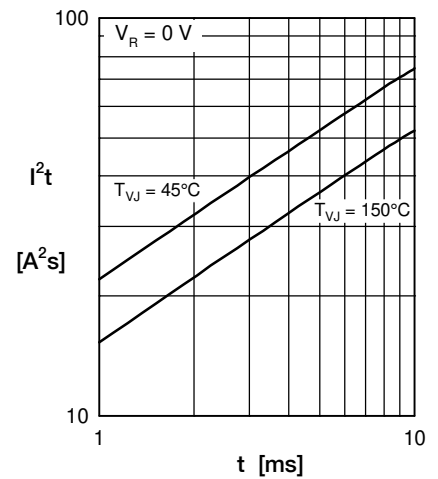
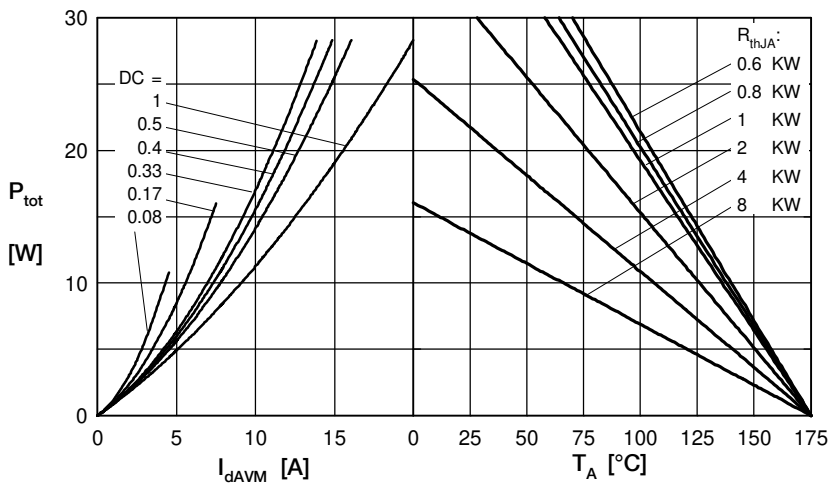

 Fig. 3 I^2t vs. time per diode


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

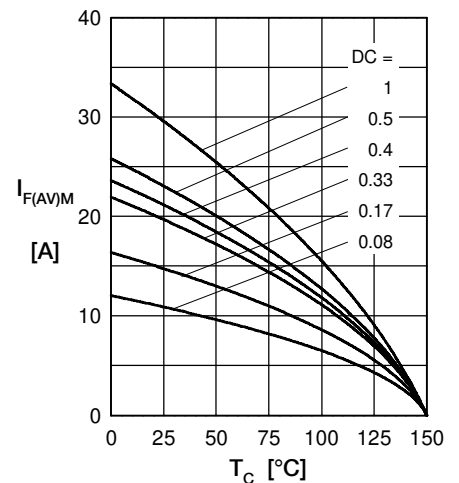


Fig. 5 Max. forward current vs. case temperature per diode

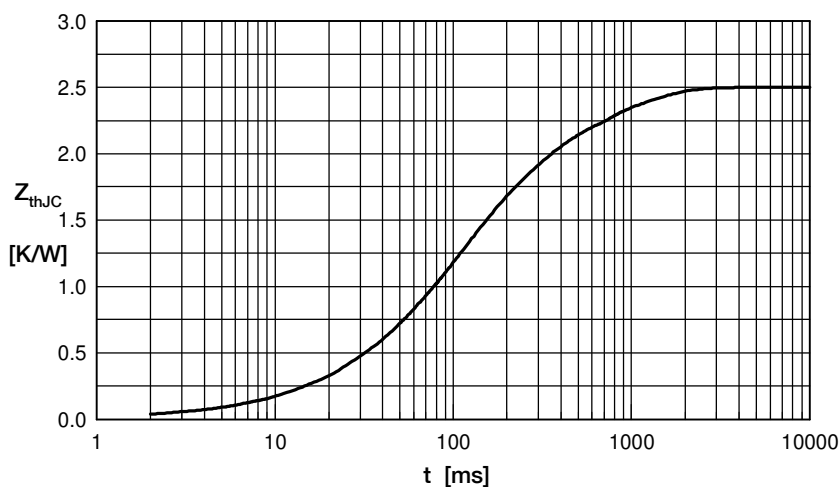


Fig. 6 Transient thermal impedance junction to case vs. time per diode

 Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	1.359	0.1015
2	0.3286	0.1026
3	0.1651	0.4919
4	0.6473	0.62