

# Standard Rectifier Module

<b>3~ Rectifier</b>	
$V_{RRM} =$	800 V
$I_{DAV} =$	80 A
$I_{FSM} =$	600 A

## 3~ Rectifier Bridge

Part number

**VUO80-08NO1**



Backside: isolated

 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: V1-A-Pack

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 17 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					900	V
$V_{RRM}$	max. repetitive reverse blocking voltage					800	V
$I_R$	reverse current	$V_R = 800\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		40	$\mu\text{A}$
		$V_R = 800\text{ V}$		$T_{VJ} = 150^\circ\text{C}$		1.5	mA
$V_F$	forward voltage drop	$I_F = 30\text{ A}$		$T_{VJ} = 25^\circ\text{C}$		1.14	V
		$I_F = 90\text{ A}$				1.48	V
		$I_F = 30\text{ A}$		$T_{VJ} = 125^\circ\text{C}$		1.06	V
		$I_F = 90\text{ A}$				1.51	V
$I_{DAV}$	bridge output current	$T_C = 110^\circ\text{C}$	rectangular	$T_{VJ} = 150^\circ\text{C}$		80	A
$V_{FO}$	threshold voltage	} for power loss calculation only		$T_{VJ} = 150^\circ\text{C}$		0.81	V
$r_F$	slope resistance					7.8	m $\Omega$
$R_{thJC}$	thermal resistance junction to case					1.1	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.3		K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		110	W
$I_{FSM}$	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 45^\circ\text{C}$		600	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		650	A
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 150^\circ\text{C}$		510	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		550	A
$I^2t$	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 45^\circ\text{C}$		1.80	kA <sup>2</sup> s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		1.76	kA <sup>2</sup> s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 150^\circ\text{C}$		1.30	kA <sup>2</sup> s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		1.26	kA <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		18	pF



Package V1-A-Pack				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>				37		g	
$M_D$	mounting torque		2		2.5	Nm	
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	6.0			mm	
$d_{Spb/Apb}$		terminal to backside	12.0			mm	
$V_{ISOL}$	isolation voltage	t = 1 second t = 1 minute	3600 3000			V V	
		50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA					



Data Matrix: Typ (1-19), DC+Prod.Index (20-25), FKT# (26-31)  
leer (33), lld.# (33-36)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUO80-08NO1	VUO80-08NO1	Blister	24	516847

**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 V1-A-Pack**



**Remarks / Bemerkungen:**

- Nominal distance mounting screws on heat sink: 52 mm / Nennabstand Befestigungsschrauben auf Kühlkörper: 52 mm
  - General tolerance / Allgemeintoleranz: DIN ISO 2768 -T1-c
  - Surface treatment of pins: tin plated (Sn) in hot dip / Oberflächenbehandlung der Pins: verzinkt (Sn) im Tauchbad
  - Detail X:** EJOT PT® self-tapping screws (dimension K25) to be recommended for mounting on PCB  
selbstschneidende Schraube (Größe K25) empfohlen für die PCB-Montage
- Take care on the maximum screw length according to board thickness and the maximum hole depth of 6 mm<sup>L</sup>  
Bei der Wahl der Schraubenlänge die PCB-Dicke und die maximale Lochtiefe von 6mm beachten
- Recommended mounting torque: 1.5 Nm / Empfohlenes Drehmoment: 1.5 Nm





**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	0.0004
2	0.1230	0.00256
3	0.2305	0.0045
4	0.4230	0.0242
5	0.2628	0.1800