

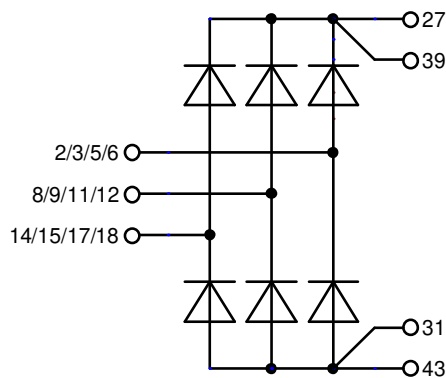
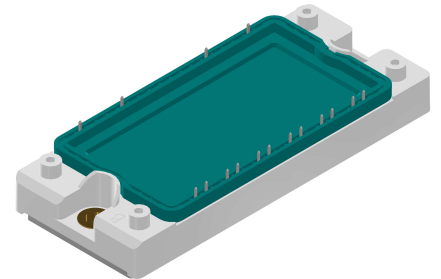
# Standard Rectifier Module

<b>3~ Rectifier</b>
$V_{RRM} = 1600\text{ V}$
$I_{DAV} = 120\text{ A}$
$I_{FSM} = 700\text{ A}$

## 3~ Rectifier Bridge

Part number

**VUO121-16NO1**



 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: E2-Pack

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 17 mm
- Base plate: Copper internally DCB isolated
- Advanced power cycling
- Phase Change Material available

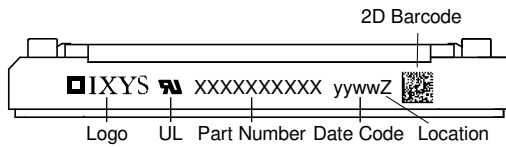
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					1700	V
$V_{RRM}$	max. repetitive reverse blocking voltage					1600	V
$I_R$	reverse current	$V_R = 1600$ V		$T_{VJ} = 25^\circ\text{C}$		100	$\mu\text{A}$
		$V_R = 1600$ V		$T_{VJ} = 150^\circ\text{C}$		1.5	mA
$V_F$	forward voltage drop	$I_F = 40$ A		$T_{VJ} = 25^\circ\text{C}$		1.19	V
		$I_F = 120$ A				1.64	V
		$I_F = 40$ A		$T_{VJ} = 125^\circ\text{C}$		1.12	V
		$I_F = 120$ A				1.70	V
$I_{DAV}$	bridge output current	$T_C = 105^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		120	A
		rectangular	$d = \frac{1}{3}$				
$V_{FO}$	threshold voltage			$T_{VJ} = 150^\circ\text{C}$		0.80	V
$r_F$	slope resistance					7.6	m $\Omega$
						} for power loss calculation only	
$R_{thJC}$	thermal resistance junction to case					0.65	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.1		K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		190	W
$I_{FSM}$	max. forward surge current	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		700	A
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		755	A
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		595	A
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		645	A
$I^2t$	value for fusing	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		2.45	kA <sup>2</sup> s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		2.37	kA <sup>2</sup> s
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		1.77	kA <sup>2</sup> s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		1.73	kA <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400$ V; $f = 1$ MHz		$T_{VJ} = 25^\circ\text{C}$		27	pF



Package E2-Pack		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			50	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>				176		g
$M_D$	mounting torque		3		6	Nm
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	6.0			mm
$d_{Spb/Appb}$		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				



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUO121-16NO1	VUO121-16NO1	Box	6	496278

**Equivalent Circuits for Simulation**

\* on die level

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

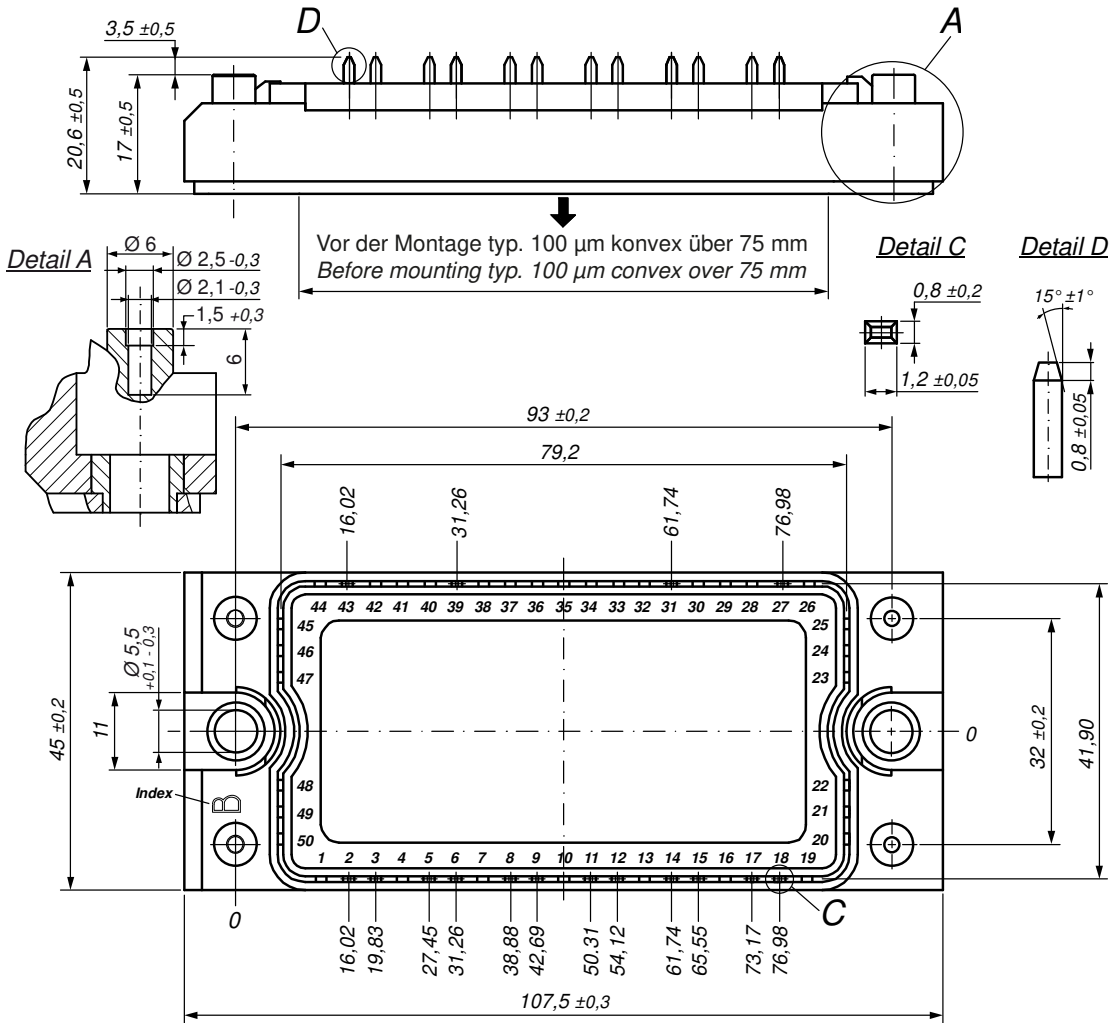


Rectifier

$V_{0\ max}$	threshold voltage	0.8	V
$R_{0\ max}$	slope resistance *	4.5	mΩ



**Outlines E2-Pack**

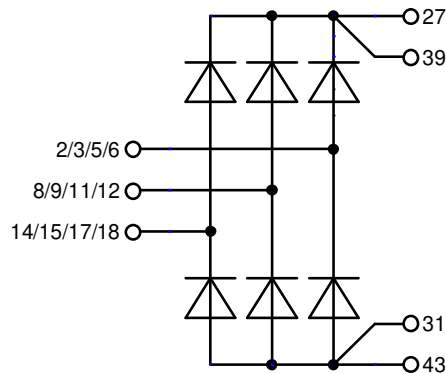


**Bemerkung / Note:**

- Nichttolerierete Maße nach / *Measure without tolerances according DIN ISO 2768-T1-m*
- PCB-Lochmuster / *PCB hole pattern: see pin position*
- Toleranz Pin-Position und PCB-Lochmuster / *Tolerance of pin position and PCB hole pattern:  $\oplus 0.1$*
- Montageanleitung / *Mounting instruction: www.ixys.com Application note IXAN0024*

**Detail A:** PCB-Montage / *Mounting on PCB*

- Empfohlene, selbstschneidende Schraube / *Recommended, self-tapping screw: EJOT PT® (Größe / size: K25)*
- Max. Schraubenlänge / *Max. screw length: PCB-Dicke / thickness + 6 mm (max. Lochtiefe / hole depth)*
- Empfohlenes Drehmoment / *Recommended mounting torque: 1.5 Nm*



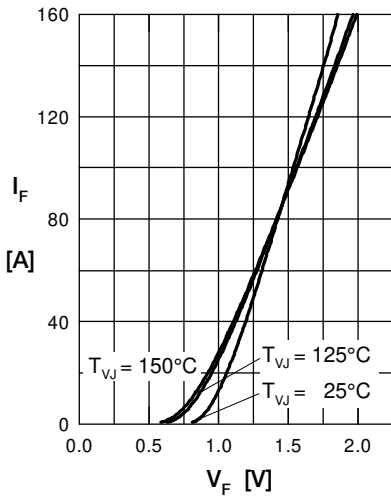
**Rectifier**


Fig. 1 Forward current vs. voltage drop per diode

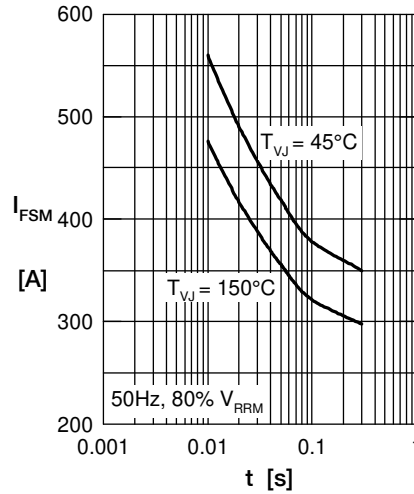


Fig. 2 Surge overload current vs. time per diode

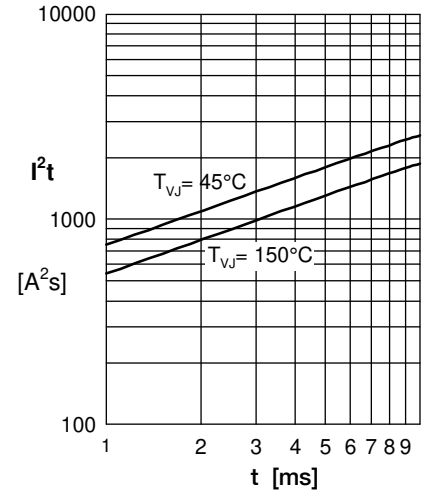
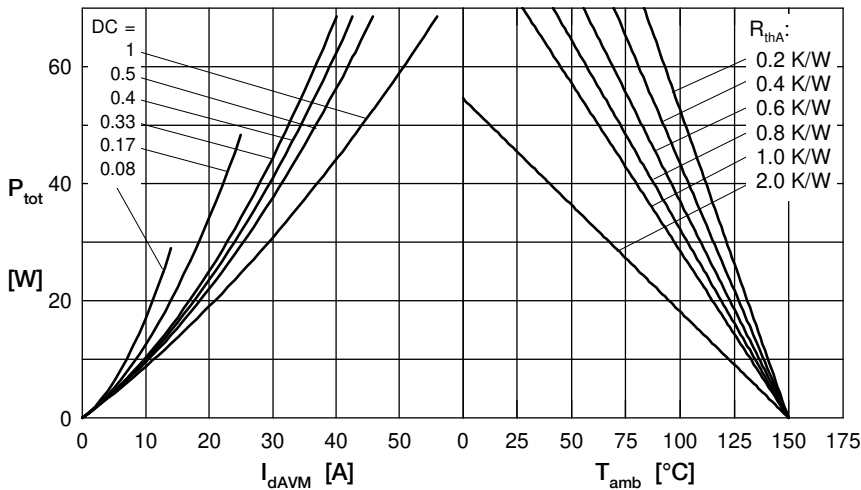

 Fig. 3  $I^2t$  vs. time per diode


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

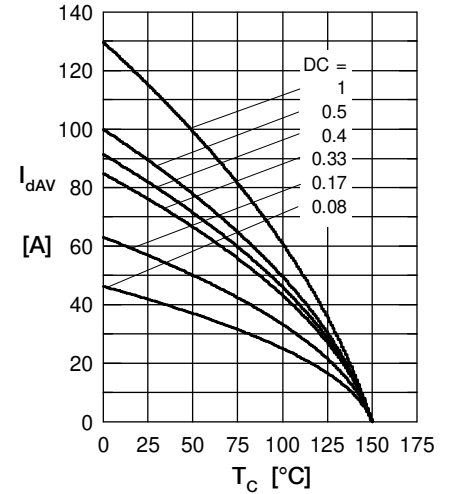


Fig. 5 Max. forward current vs. case temperature per diode

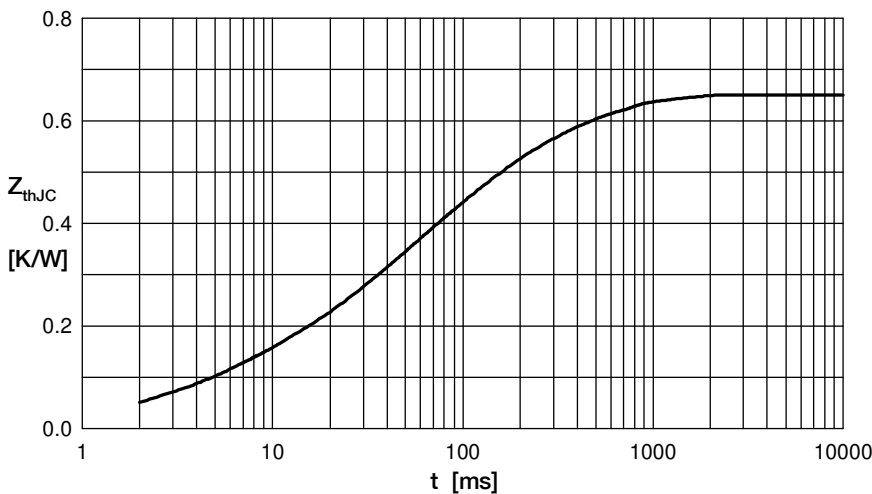


Fig. 6 Transient thermal impedance junction to case vs. time per diode