

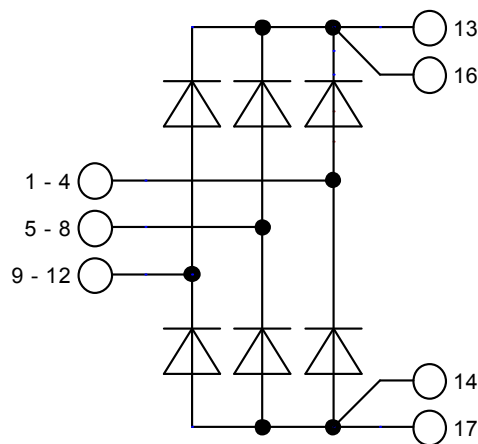
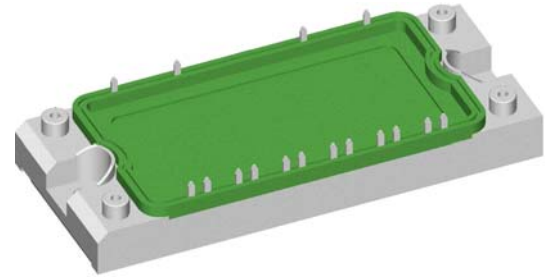
# Standard Rectifier Module

<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**



### Features / Advantages:

- Package with DCB ceramic
- Reduced weight
- Improved temperature and power cycling
- Planar passivated chips
- Very low forward voltage drop
- Very low leakage current

### Applications:

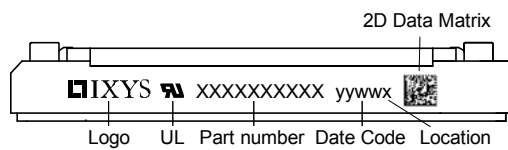
- Diode for main rectification
- For three phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

### Package: E2-Pack

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

Rectifier				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{RSM}$	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1700	V	
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1600	V	
$I_R$	reverse current, drain current	$V_R = 1600 V$	$T_{VJ} = 25^{\circ}C$		100	$\mu A$	
		$V_R = 1600 V$	$T_{VJ} = 150^{\circ}C$		1.5	mA	
$V_F$	forward voltage drop	$I_F = 40 A$	$T_{VJ} = 25^{\circ}C$		1.19	V	
		$I_F = 120 A$			1.64	V	
		$I_F = 40 A$	$T_{VJ} = 125^{\circ}C$		1.12	V	
		$I_F = 120 A$			1.70	V	
$I_{DAV}$	bridge output current	$T_C = 105^{\circ}C$ 120° rect.	$T_{VJ} = 150^{\circ}C$		120	A	
$V_{FO}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}C$		0.80	V	
$r_F$	slope resistance				7.6	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case				0.65	K/W	
$R_{thCH}$	thermal resistance case to heatsink			0.10		K/W	
$P_{tot}$	total power dissipation		$T_C = 25^{\circ}C$		190	W	
$I_{FSM}$	max. forward surge current	$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}C$		700	A	
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		755	A	
		$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}C$		595	A	
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		645	A	
$I^2t$	value for fusing	$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}C$		2.45	kA <sup>2</sup> s	
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		2.37	kA <sup>2</sup> s	
		$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}C$		1.77	kA <sup>2</sup> s	
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		1.73	kA <sup>2</sup> s	
$C_J$	junction capacitance	$V_R = 400 V; f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}C$		27	pF	

Package E2-Pack		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			200	A
$T_{stg}$	storage temperature		-40		125	°C
$T_{VJ}$	virtual junction temperature		-40		150	°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
$d_{Spb/Apb}$		terminal to backside	12.0			mm
$V_{ISOL}$	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V

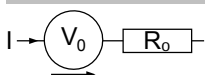


Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUO121-16NO1	VUO121-16NO1	Box	6	496278

### Equivalent Circuits for Simulation

\* on die level

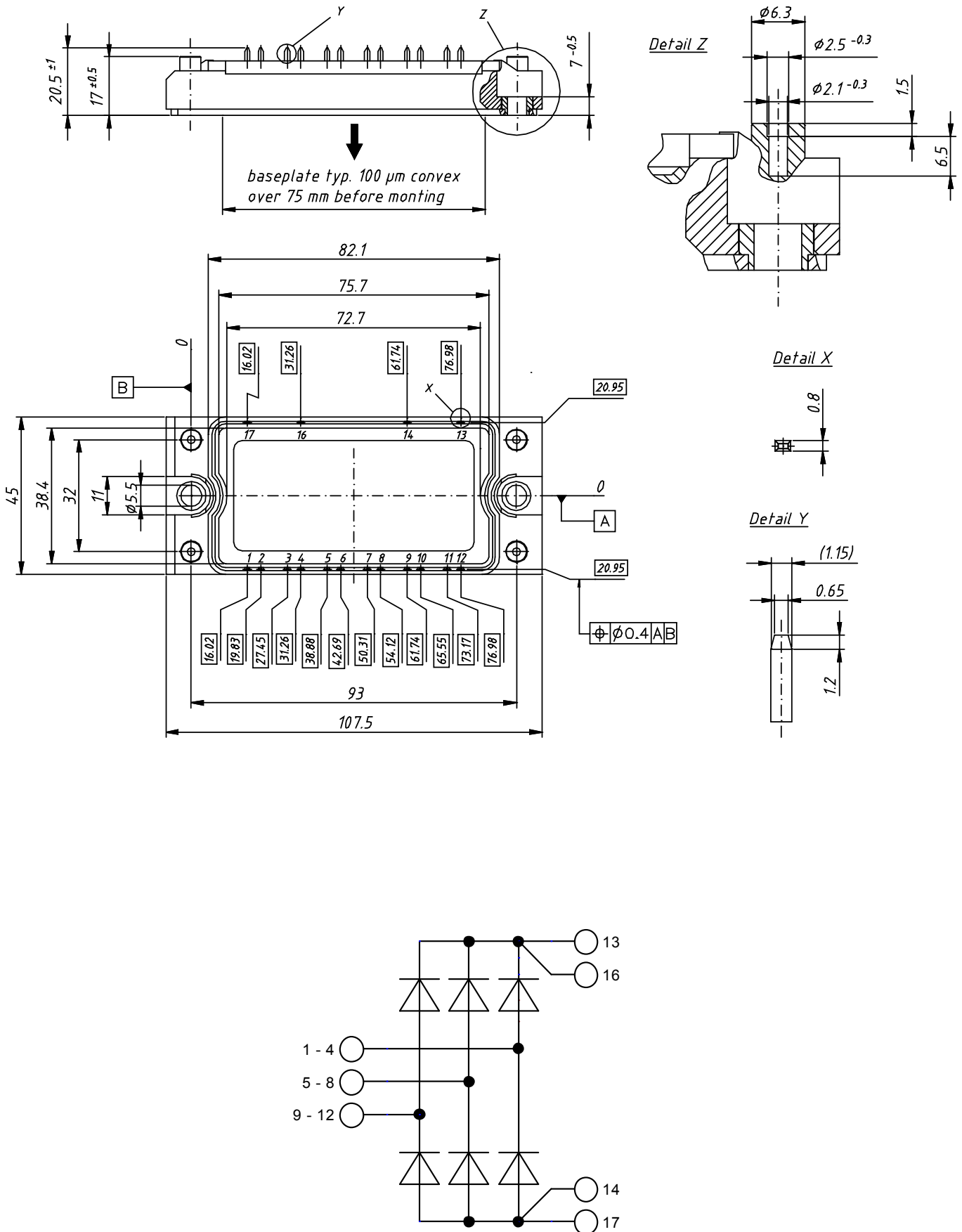
$T_{VJ} = 150^{\circ}C$



Rectifier

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

## Outlines E2-Pack



**Rectifier**

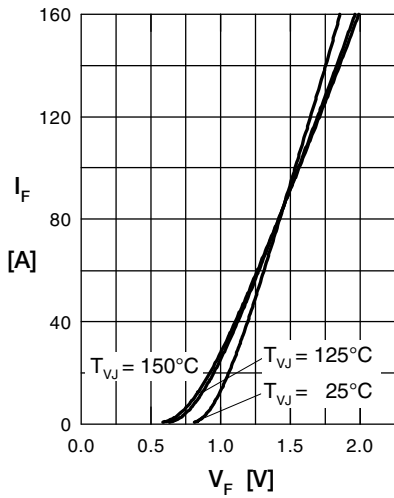


Fig. 1 Forward current versus voltage drop per diode

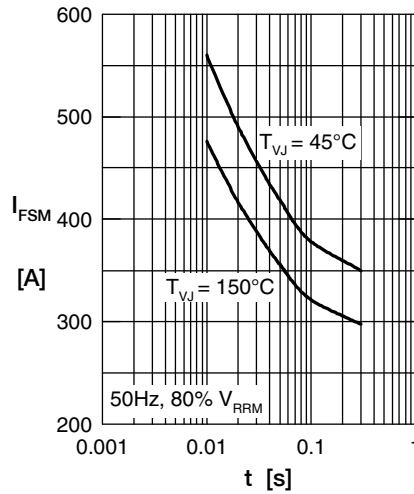


Fig. 2 Surge overload current

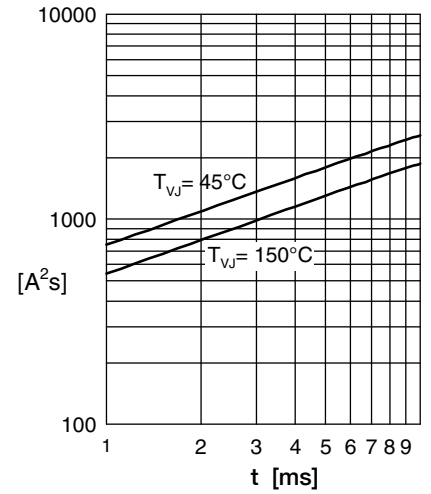


Fig. 3  $I^2t$  versus time per diode

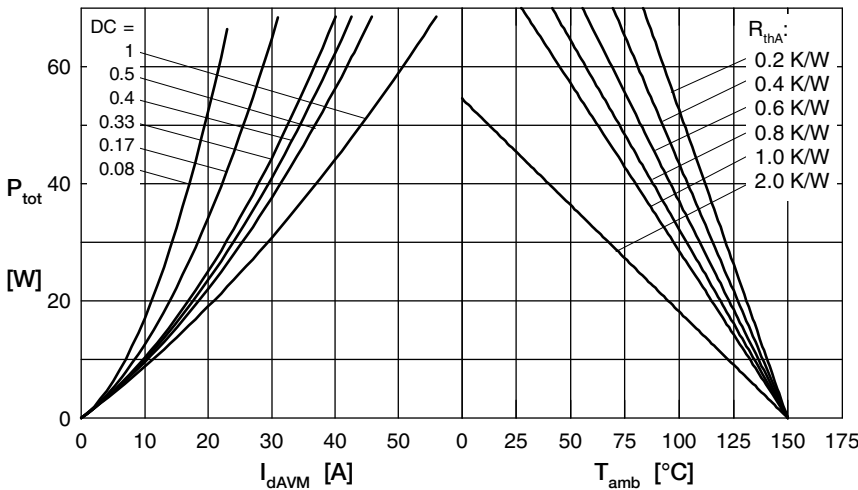


Fig. 4 Power dissipation vs. direct output current and ambient temperature

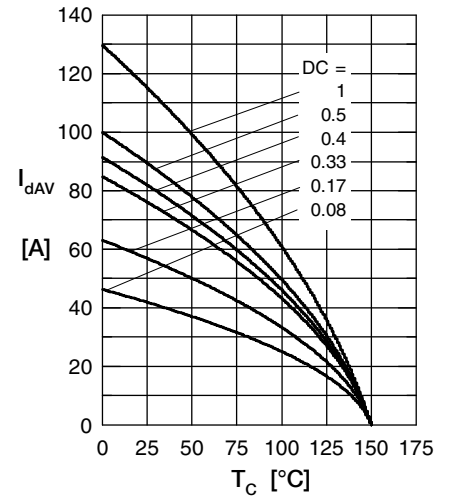


Fig. 5 Max. forward current vs. case temperature

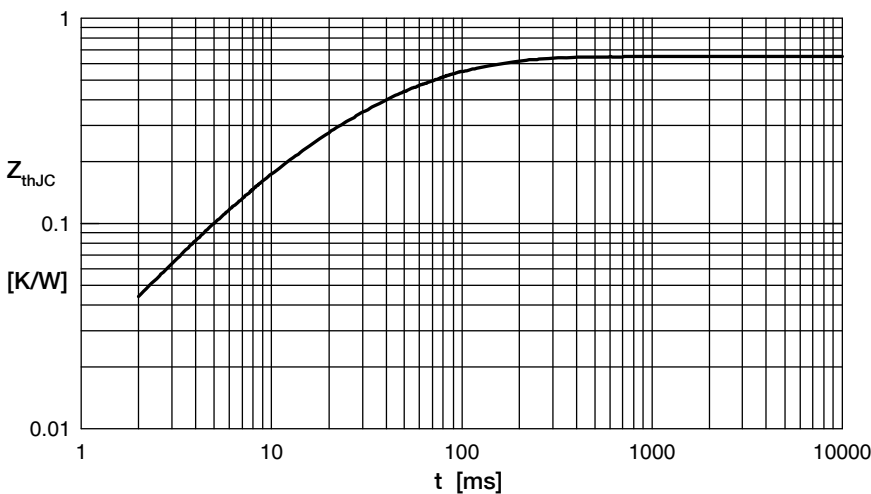


Fig. 6 Transient thermal impedance junction to case

$R_i$	$i$
0.085	0.012
0.041	0.007
0.309	0.036
0.215	0.102