Standard Rectifier Module

3~ Rectifier		
V_{RRM} =	1600	V
I_{DAV} =	120	A
I_{FSM} =	700	A

3~ Rectifier Bridge

Part number

VUO121-16NO1

UL E72873
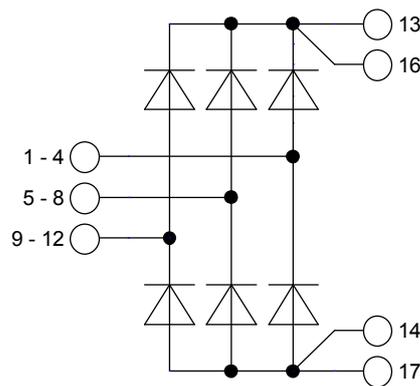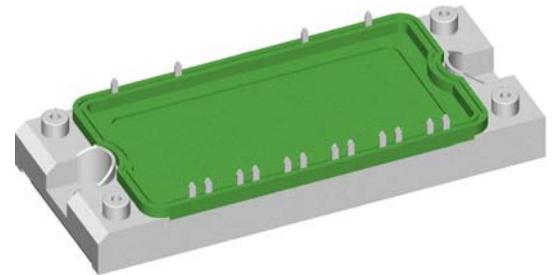
Features / Advantages:

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

Data according to IEC 60747and per semiconductor unless otherwise specified   20130507d

Rectifier — Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage		$T_{VJ} = 25°C$			1700	V
V_{RRM}	max. repetitive reverse blocking voltage		$T_{VJ} = 25°C$			1600	V
I_R	reverse current	$V_R = 1600 V$	$T_{VJ} = 25°C$			100	µA
		$V_R = 1600 V$	$T_{VJ} = 150°C$			1.5	mA
V_F	forward voltage drop	$I_F = 40 A$	$T_{VJ} = 25°C$			1.19	V
		$I_F = 120 A$				1.64	V
		$I_F = 40 A$	$T_{VJ} = 125°C$			1.12	V
		$I_F = 120 A$				1.70	V
I_{DAV}	bridge output current	$T_C = 105°C$ rectangular d = ⅓	$T_{VJ} = 150°C$			120	A
V_{F0}	threshold voltage	} for power loss calculation only	$T_{VJ} = 150°C$			0.80	V
r_F	slope resistance					7.6	mΩ
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		$T_C = 25°C$			190	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45°C$			700	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			755	A
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150°C$			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	$T_{VJ} = 45°C$			2.45	kA²s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			2.37	kA²s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150°C$			1.77	kA²s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			1.73	kA²s
C_J	junction capacitance	$V_R = 400 V; f = 1 MHz$	$T_{VJ} = 25°C$		27		pF

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Package   E2-Pack

Symbol	Definition	Conditions		min.	typ.	max.	Unit
			Ratings				
I_{RMS}	RMS current	per terminal				200	A
T_{stg}	storage temperature			-40		125	°C
T_{VJ}	virtual junction temperature			-40		150	°C
Weight					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	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3600			V
		t = 1 minute		3000			V

2D Data Matrix

IXYS ⓤ XXXXXXXXXX yywwx ▦

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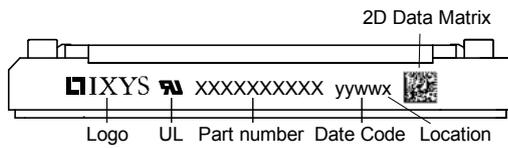
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUO121-16NO1	VUO121-16NO1	Box	6	496278

Equivalent Circuits for Simulation   *on die level* T_{VJ} = 150 °C

I → (V₀) → [R₀]   **Rectifier**
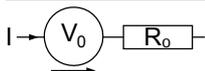
$V_{0\,max}$	threshold voltage	0.8	V
$R_{0\,max}$	slope resistance *	4.5	mΩ

Outlines   E2-Pack

baseplate typ. 100 µm convex
over 75 mm before monting

Detail Z

Detail X

Detail Y
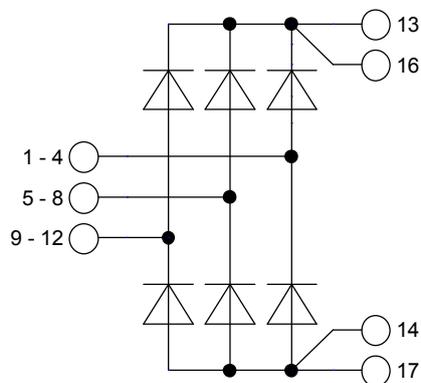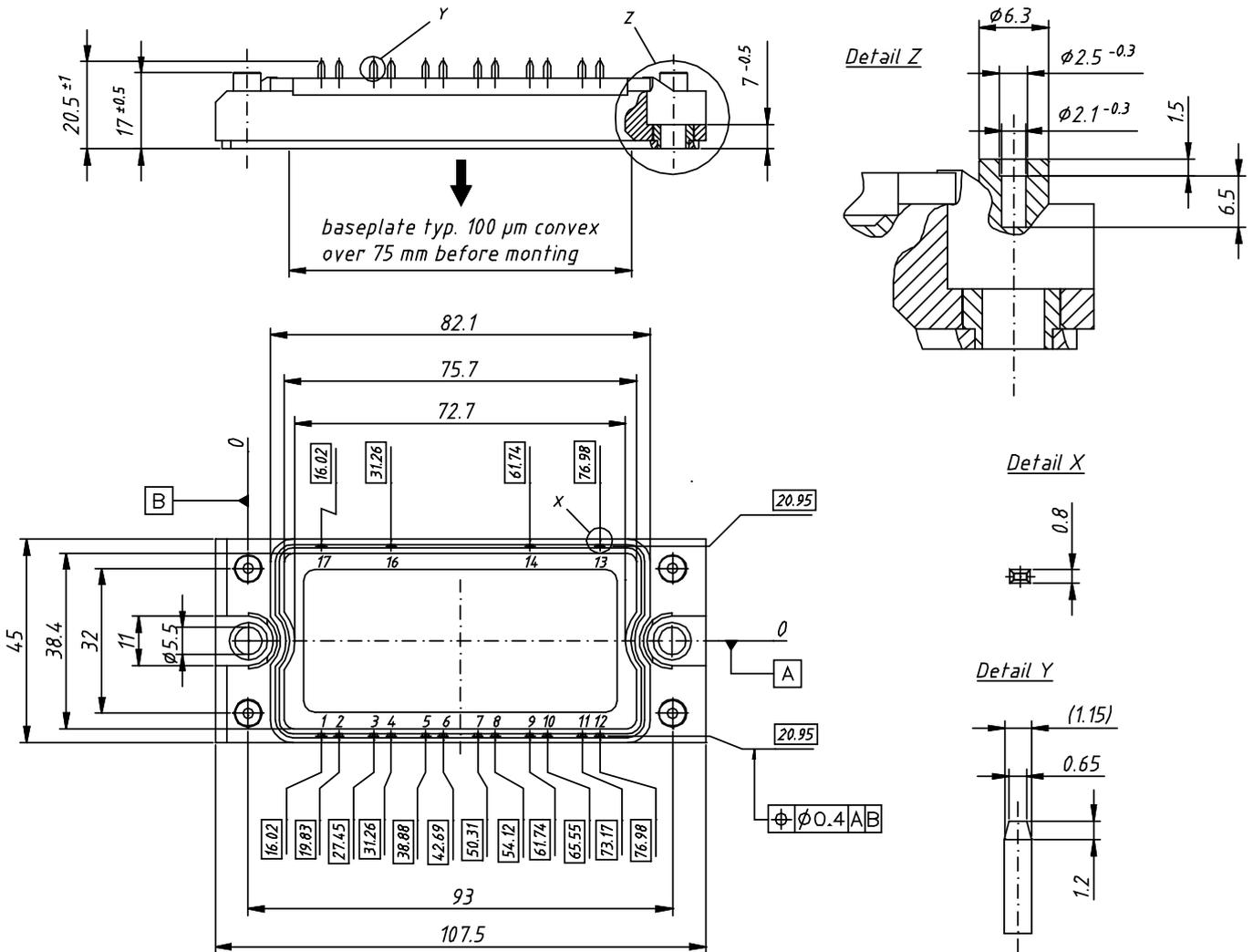
Rectifier
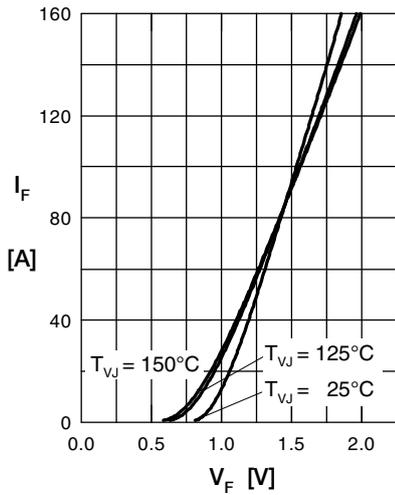
Fig. 1 Forward current vs.
voltage drop per diode
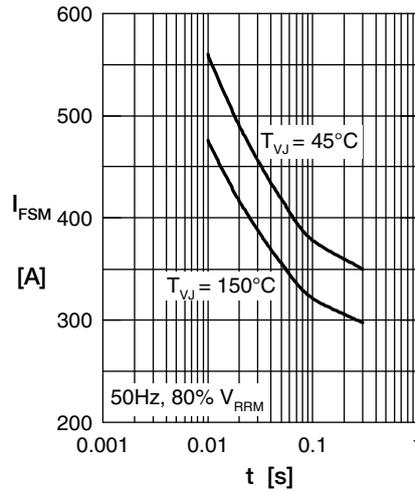
Fig. 2 Surge overload current
vs. time per diode
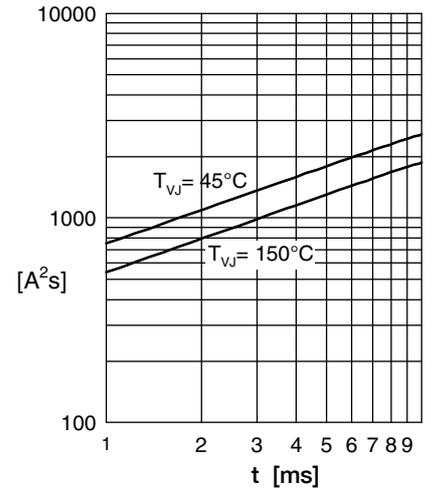

Fig. 3 I^2t vs. time per diode
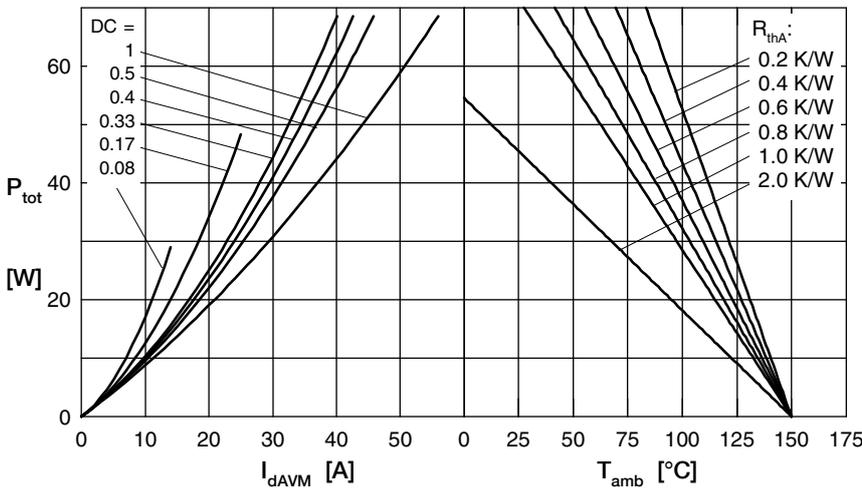
Fig. 4 Power dissipation vs. forward current
and ambient temperature per diode
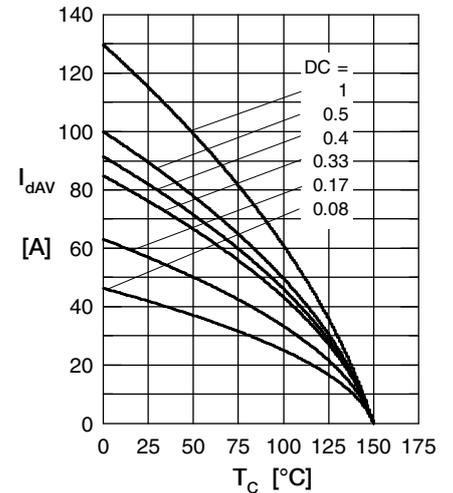
Fig. 5 Max. forward current vs.
case temperature per diode
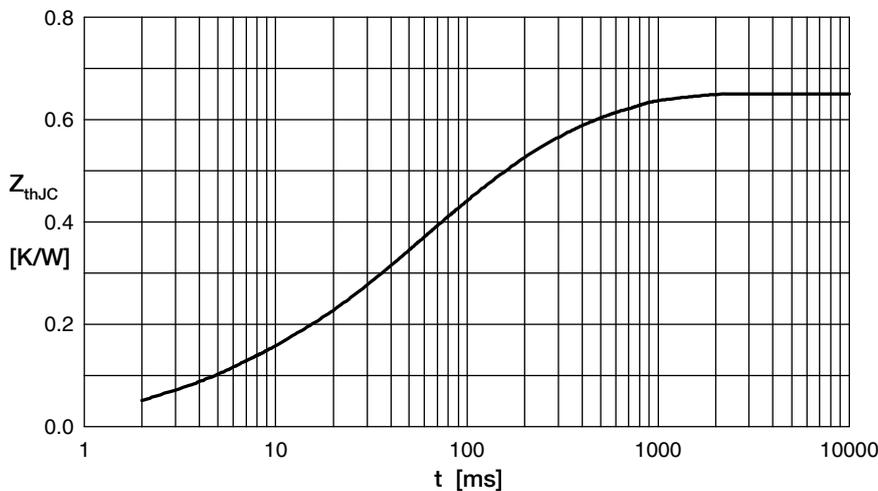
Fig. 6 Transient thermal impedance junction to case vs. time per diode

R_i	t_i
0.080	0.004
0.003	0.010
0.160	0.025
0.160	0.400
0.247	0.090

IXYS reserves the right to change limits, conditions and dimensions.   Data according to IEC 60747and per semiconductor unless otherwise specified   20130507d