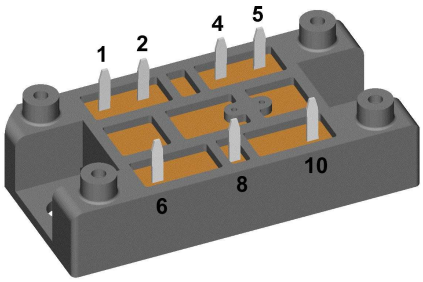
FRED Module

V_{RRM}	=	1200 V
I_{DAV}	=	50 A
t_{rr}	=	50 ns

Fast Recovery Epitaxial Diode
Low Loss and Soft Recovery
3~ Rectifier Bridge

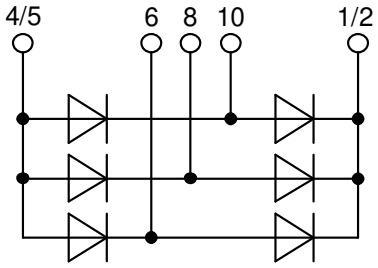
Part number

VUE50-12NO1



Backside: isolated

E72873



Features / Advantages:

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

Applications:

- Supplies for DC power equipment
- Input and output rectifiers for high frequency
- Battery DC power supplies
- Field supply for DC motors

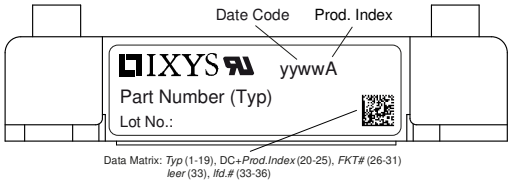
Package: V1-A-Pack

- 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

Fast Diode

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
I_R	*reverse current, drain current*	V_R = 1200 V	T_{VJ} = 25°C			750	µA
		V_R = 960 V	T_{VJ} = 150°C			7	mA
V_F	*forward voltage drop*	I_F = 20 A	T_{VJ} = 25°C			2.35	V
		I_F = 60 A				2.87	V
		I_F = 20 A	T_{VJ} = 150°C			1.95	V
		I_F = 60 A				2.68	V
I_{DAV}	*bridge output current*	T_C = 85°C	T_{VJ} = 150°C			50	A
		rectangular d = ⅓					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			1.58	V
r_F	*slope resistance* }					18.3	mΩ
R_{thJC}	*thermal resistance junction to case*					1.2	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.30		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			104	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			200	A
C_J	*junction capacitance*	V_R = 600 V f = 1 MHz	T_{VJ} = 25°C		14		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25 °C		9		A
		I_F = 30 A; V_R = 540 V	T_{VJ} = 100 °C		13		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25 °C		160		ns
			T_{VJ} = 100 °C		320		ns

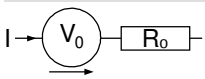
Package V1-A-Pack				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				100	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					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	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	3600			V
		t = 1 minute		3000			V



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUE50-12NO1	VUE50-12NO1	Blister	24	517915

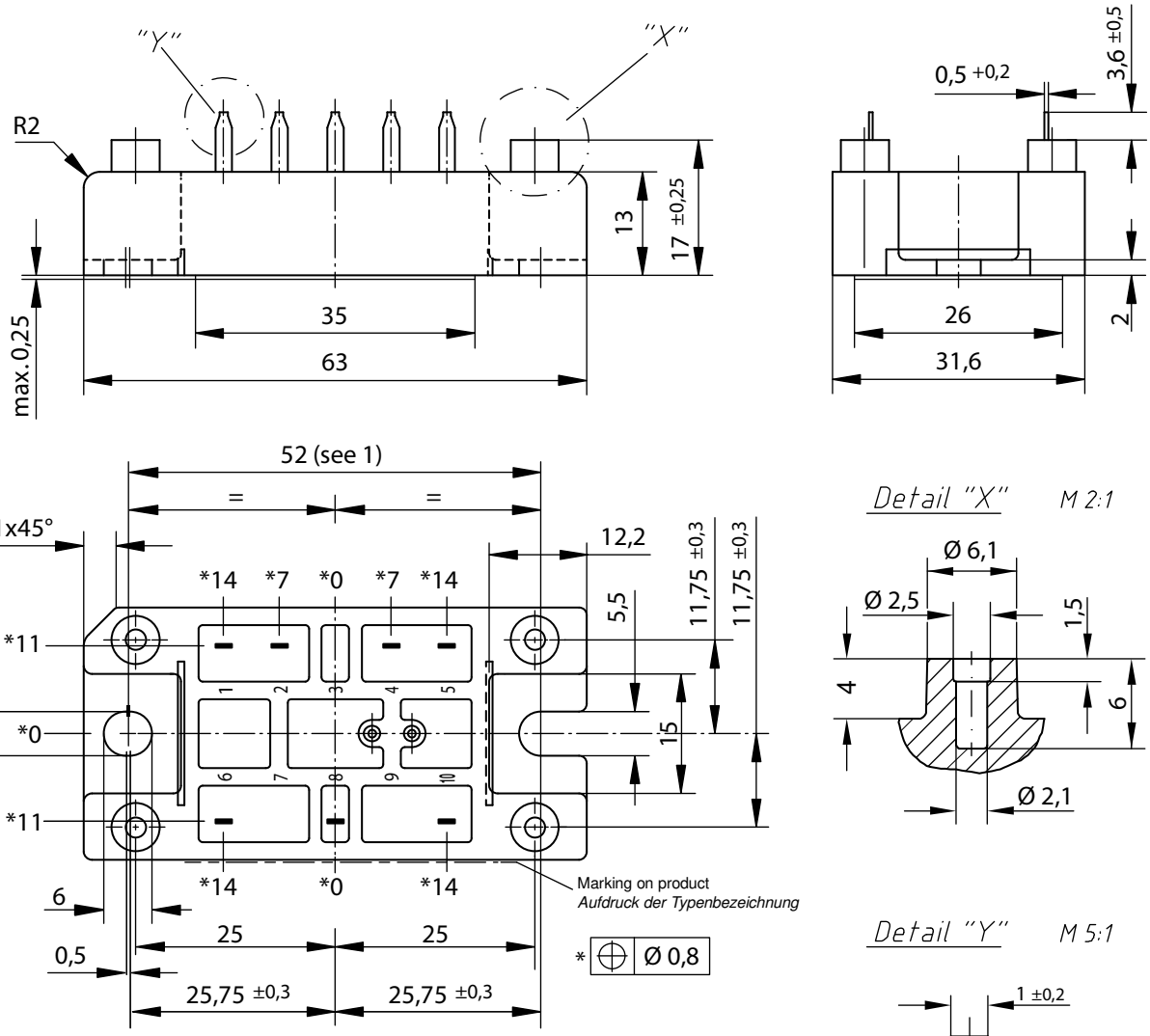
Equivalent Circuits for Simulation

** on die level* T_{VJ} = 150°C



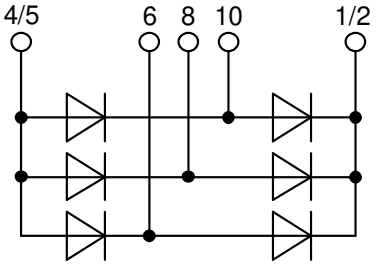
		Fast Diode	
$V_{0\ max}$	*threshold voltage*	1.58	V
$R_{0\ max}$	*slope resistance **	17	mΩ

Outlines V1-A-Pack



Remarks / ***Bemerkungen:***

1. Nominal distance mounting screws on heat sink: 52 mm / *Nennabstand Befestigungsschrauben auf Kühlkörper: 52 mm*
2. General tolerance / *Allgemeintoleranz*: DIN ISO 2768 -T1-c
3. Surface treatment of pins: tin plated (Sn) in hot dip / *Oberflächenbehandlung der Pins: verzinnt (Sn) im Tauchbad*
4. *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
   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*



Fast Diode

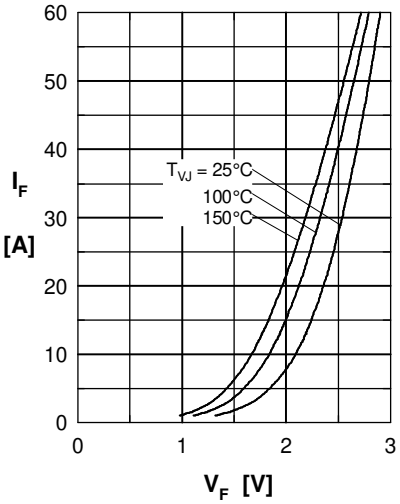


Fig. 1 Forward current I_F versus max. forward voltage drop V_F

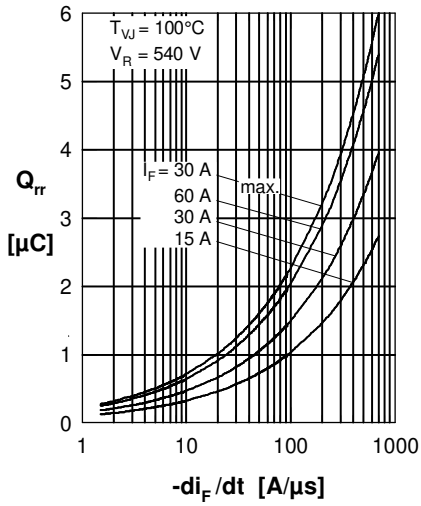


Fig. 2 Typ. reverse recov. charge Q_r versus -di$_F$/dt

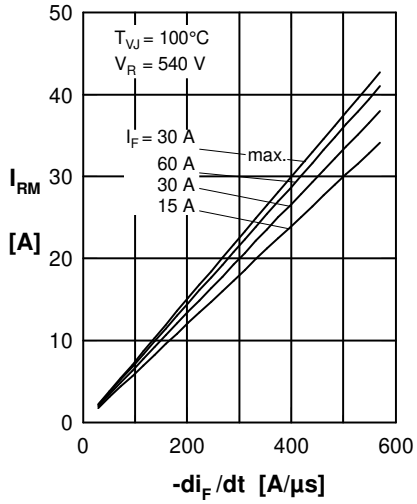


Fig. 3 Typ. peak reverse current I_{RM} versus -di$_F$/dt

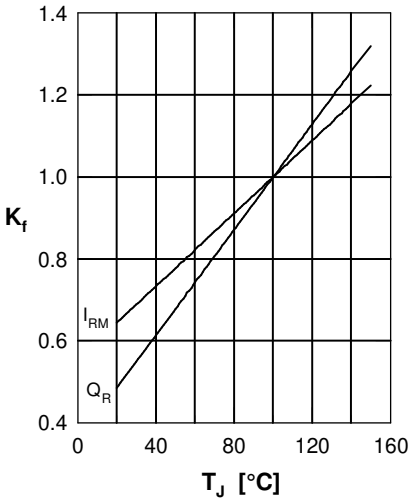


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

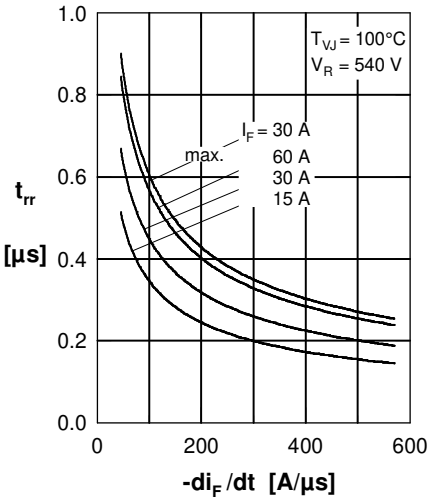


Fig. 5 Typ. recovery time t_{rr} versus -di$_F$/dt

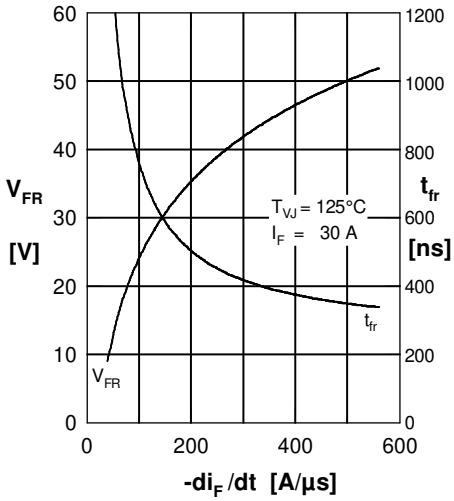


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di$_F$/dt

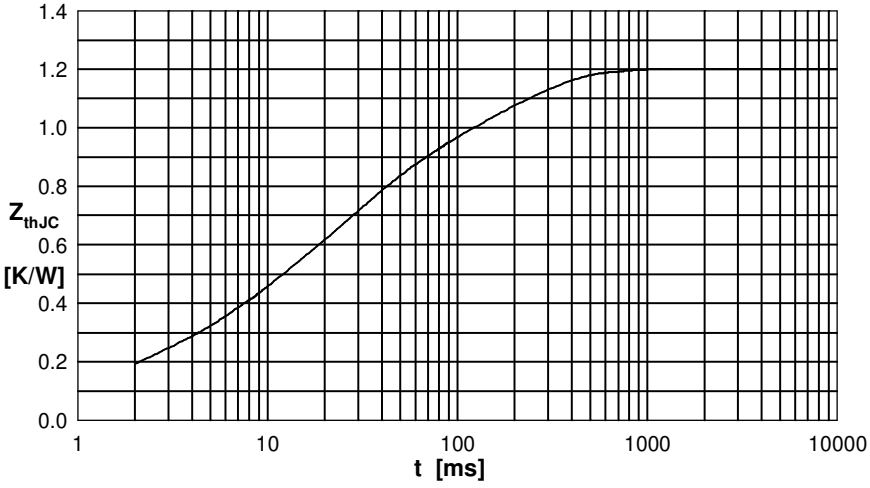


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.180	0.0050
2	0.020	0.0600
3	0.100	0.0010
4	0.400	0.1700
5	0.500	0.0230