

FRED Module

$$V_{RRM} = 1200\text{ V}$$

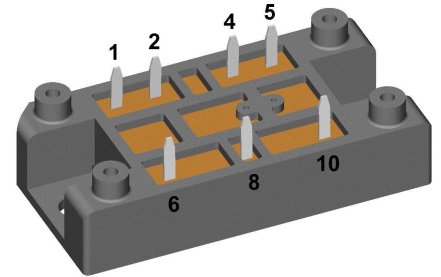
$$I_{DAV} = 50\text{ A}$$

$$t_{rr} = 50\text{ ns}$$

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

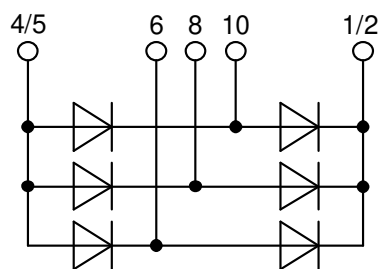
Part number

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

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Fast Diode				Ratings				
Symbol	Definition	Conditions		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 rectangular d = ⅓	T _{VJ} = 150°C			50	A	
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	} I _F = 30 A; V _R = 540 V -di _F /dt = 200 A/μs		T _{VJ} = 25 °C		9	A	
				T _{VJ} = 100 °C		13	A	
t _{rr}	reverse recovery time			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 _{Spt/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

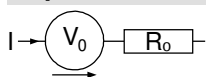


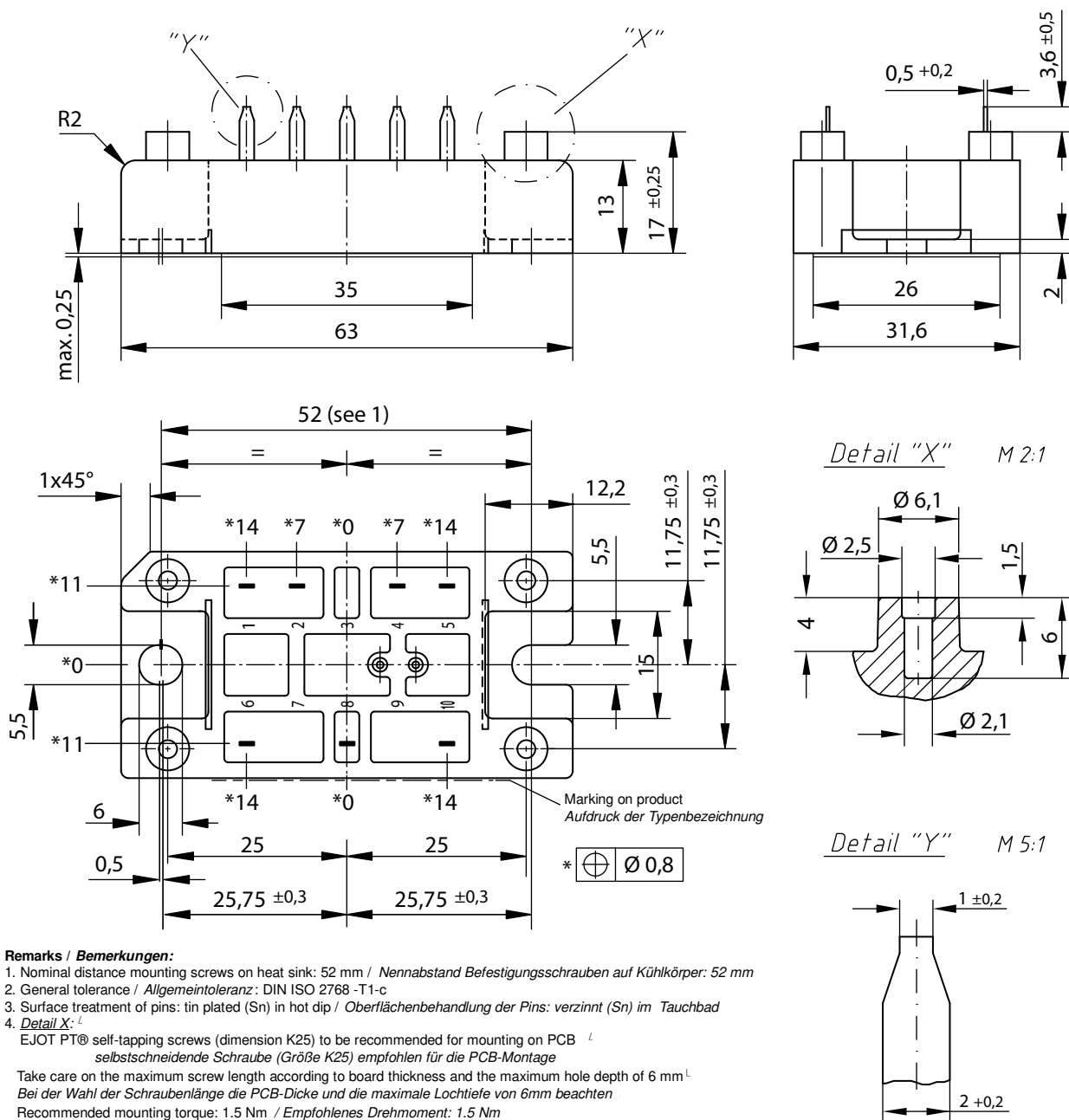
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUE50-12NO1	VUE50-12NO1	Blister	24	517915

Equivalent Circuits for Simulation

* on die level

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

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

Outlines V1-A-Pack


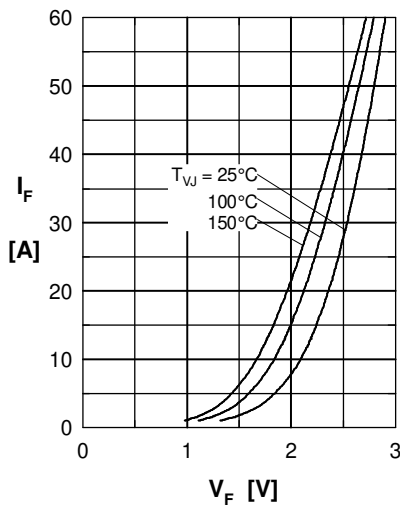
Fast Diode


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

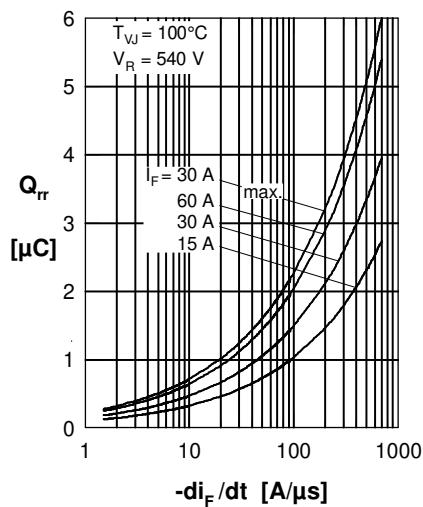


Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$

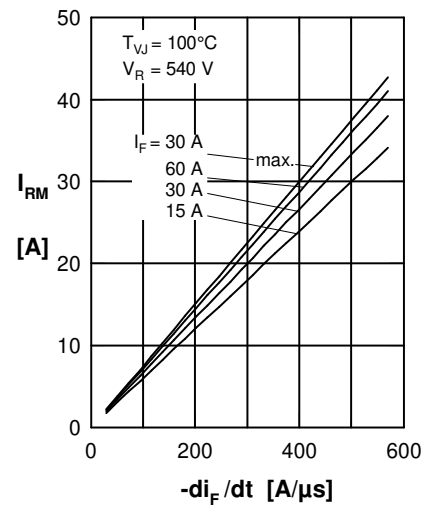


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

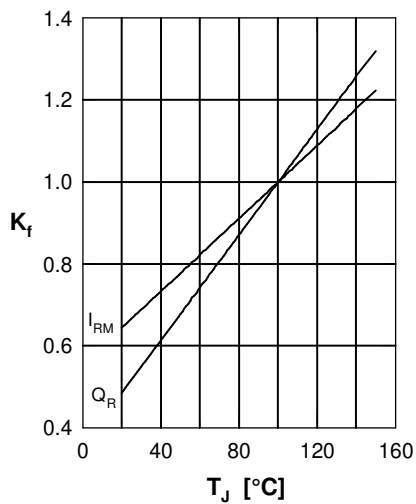


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

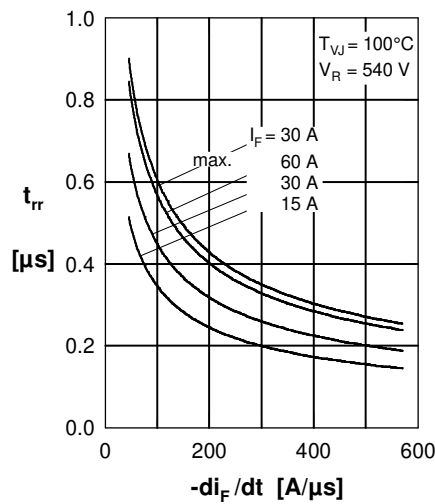


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

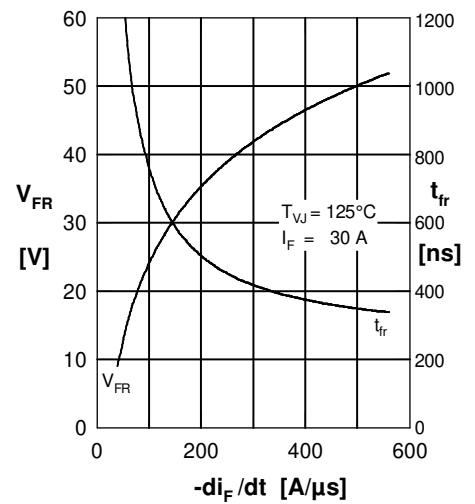


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

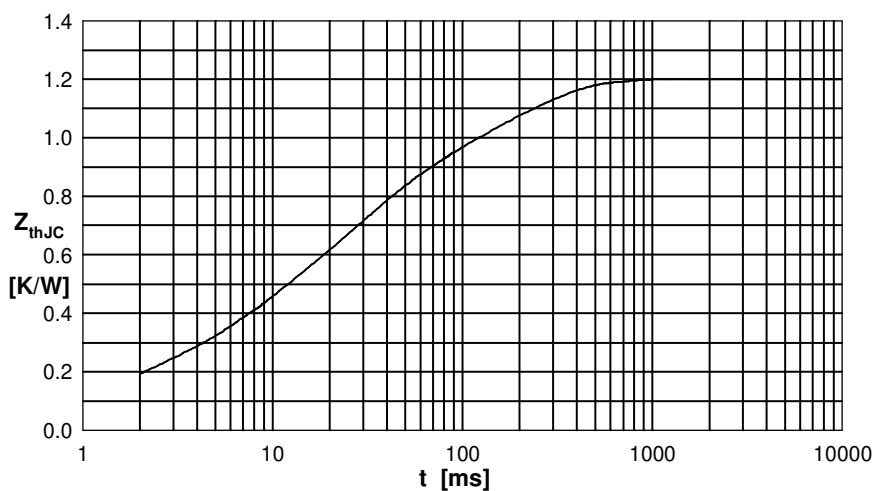


Fig. 7 Transient thermal impedance junction to case

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