

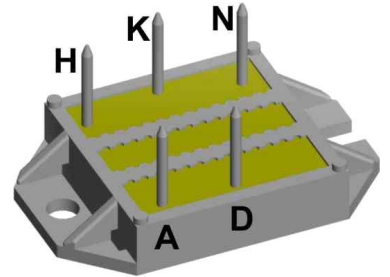
HiPerFRED Module

$V_{RRM} = 1200\text{ V}$
 $I_{DAV} = 74\text{ A}$
 $t_{rr} = 60\text{ ns}$


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

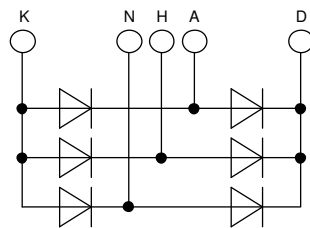
Part number

VUE75-12N07



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: ECO-PAC1

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 9 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

Disclaimer Notice

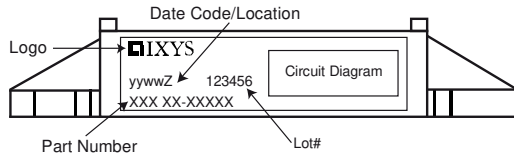
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Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					1200	V
V_{RRM}	max. repetitive reverse blocking voltage					1200	V
I_R	reverse current, drain current	$V_R = 1200\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		250	μA
		$V_R = 1200\text{ V}$		$T_{VJ} = 150^\circ\text{C}$		1	mA
V_F	forward voltage drop	$I_F = 30\text{ A}$		$T_{VJ} = 25^\circ\text{C}$		2.71	V
		$I_F = 90\text{ A}$				3.65	V
		$I_F = 30\text{ A}$		$T_{VJ} = 150^\circ\text{C}$		1.75	V
		$I_F = 90\text{ A}$				2.70	V
I_{DAV}	bridge output current	$T_C = 85^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		74	A
		rectangular	$d = \frac{1}{3}$				
V_{FO}	threshold voltage	} for power loss calculation only		$T_{VJ} = 150^\circ\text{C}$		1.31	V
r_F	slope resistance					15	m Ω
R_{thJC}	thermal resistance junction to case					0.9	K/W
R_{thCH}	thermal resistance case to heatsink				0.30		K/W
P_{tot}	total power dissipation			$T_C = 25^\circ\text{C}$		140	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$		$T_{VJ} = 45^\circ\text{C}$		200	A
C_J	junction capacitance	$V_R = 600\text{ V}$ $f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		12	pF
I_{RM}	max. reverse recovery current	} $I_F = 30\text{ A}; V_R = 600\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		8.5	A
				$T_{VJ} = 100^\circ\text{C}$		13	A
t_{rr}	reverse recovery time	} $-di_F/dt = 200\text{ A}/\mu\text{s}$		$T_{VJ} = 25^\circ\text{C}$		60	ns
				$T_{VJ} = 100^\circ\text{C}$		170	ns



Package ECO-PAC1		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				19		g
M_D	mounting torque		1.4		2	Nm
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	6.0			mm
$d_{Spb/Apb}$		terminal to backside	10.0			mm
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUE75-12NO7	VUE75-12NO7	Box	25	482315

Equivalent Circuits for Simulation

* on die level

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

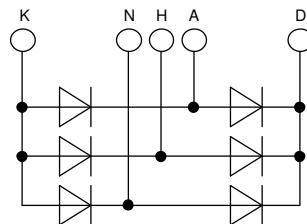
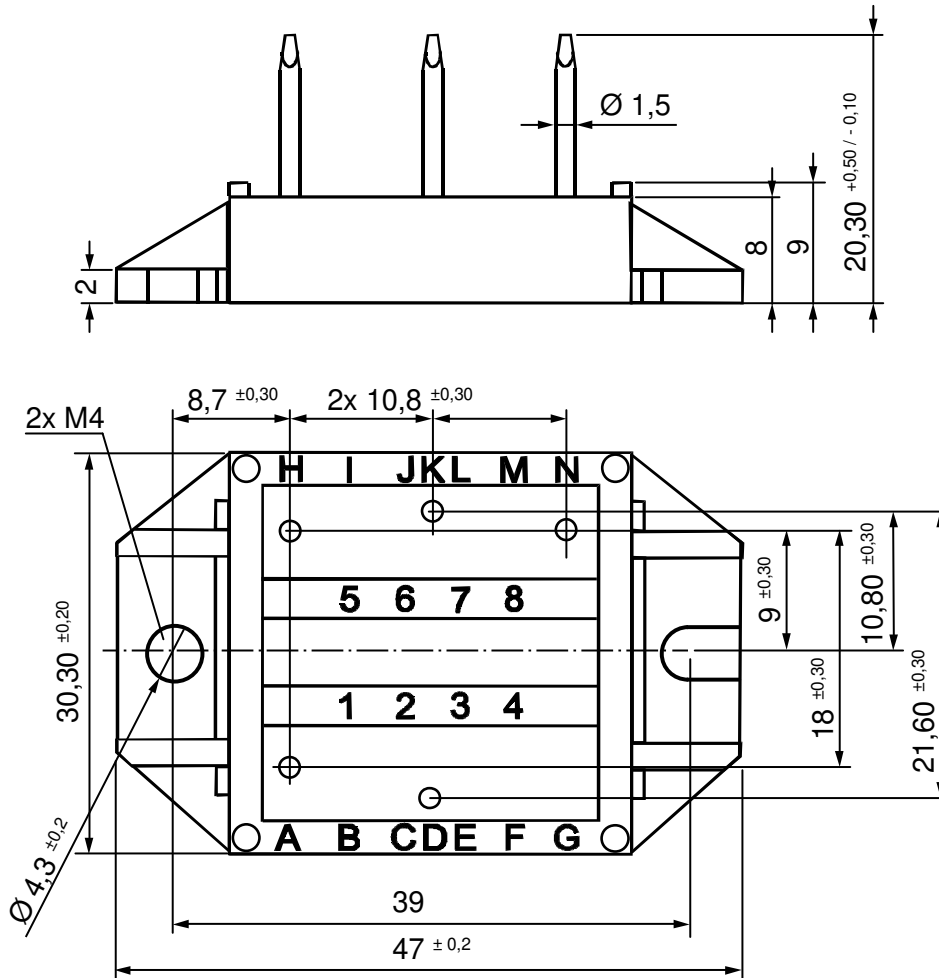


Fast Diode

$V_{0\ max}$	threshold voltage	1.31	V
$R_{0\ max}$	slope resistance *	13	mΩ



Outlines ECO-PAC1





Fast Diode

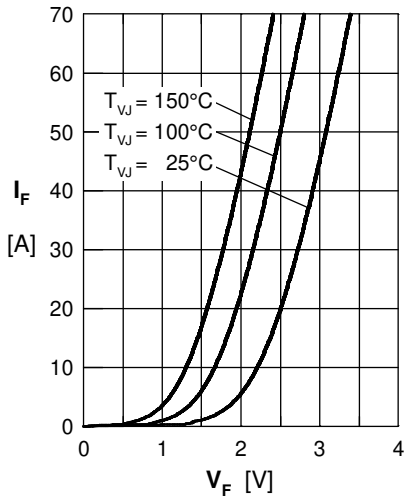


Fig. 1 Forward current I_F vs. V_F

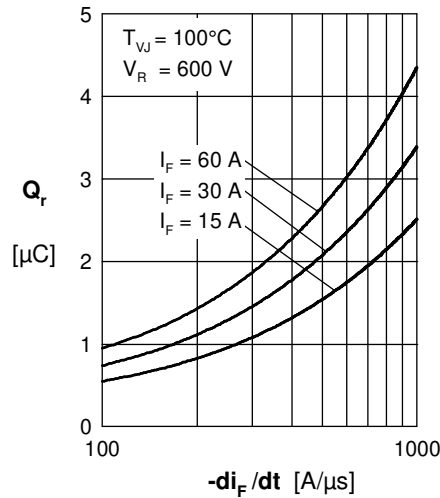


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

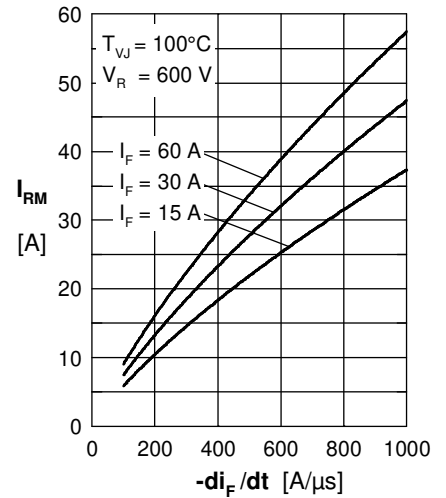


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

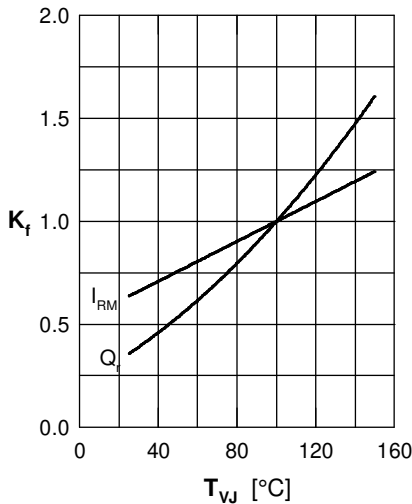


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

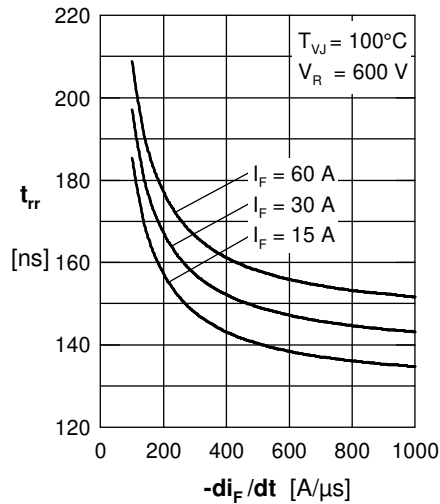


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

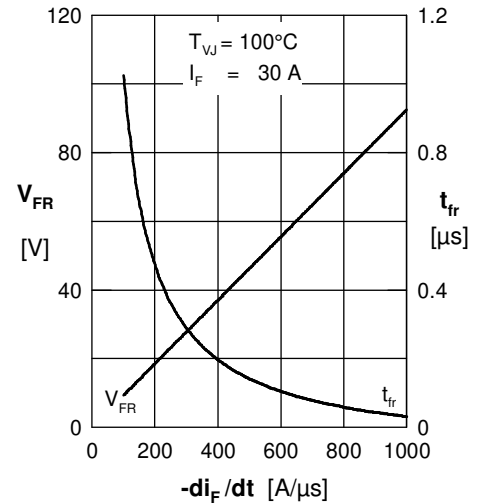


Fig. 6 Peak forward voltage V_{FR} and t_{fr} vs. $-di_F/dt$

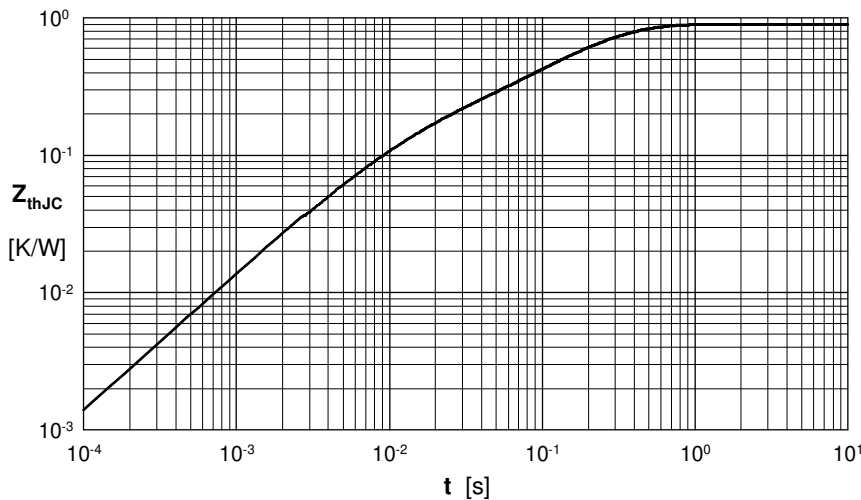


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.3012	0.0052
2	0.1160	0.0003
3	0.0241	0.0004
4	0.4586	0.0092