

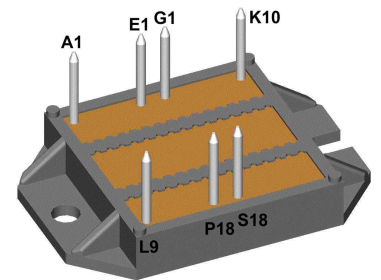
# HiPerFRED Module

$V_{RRM} = 1200\text{ V}$   
 $I_{DAV} = 130\text{ A}$   
 $t_{rr} = 80\text{ ns}$

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

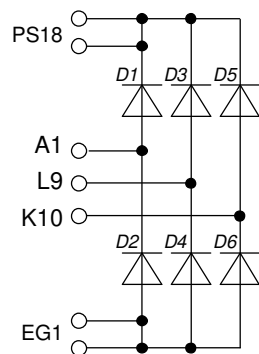
Part number

**VUE130-12NO7**



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-PAC2

- 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	$V_R = 1200\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		100	$\mu\text{A}$
		$V_R = 1200\text{ V}$		$T_{VJ} = 150^\circ\text{C}$		2.5	mA
$V_F$	forward voltage drop	$I_F = 60\text{ A}$		$T_{VJ} = 25^\circ\text{C}$		2.70	V
		$I_F = 180\text{ A}$				3.85	V
		$I_F = 60\text{ A}$		$T_{VJ} = 150^\circ\text{C}$		1.70	V
		$I_F = 180\text{ A}$				2.90	V
$I_{DAV}$	bridge output current	$T_C = 70^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		130	A
		rectangular	$d = \frac{1}{3}$				
$V_{FO}$	threshold voltage	} for power loss calculation only		$T_{VJ} = 150^\circ\text{C}$		1.28	V
$r_F$	slope resistance					8.2	m $\Omega$
$R_{thJC}$	thermal resistance junction to case					0.8	K/W
$R_{thCH}$	thermal resistance case to heatsink			0.20			K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		155	W
$I_{FSM}$	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$		$T_{VJ} = 45^\circ\text{C}$		500	A
$C_J$	junction capacitance	$V_R = 600\text{ V}$ $f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		30	pF
$I_{RM}$	max. reverse recovery current	} $I_F = 60\text{ A}; V_R = 600\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		13	A
				$T_{VJ} = 100^\circ\text{C}$		20	A
$t_{rr}$	reverse recovery time	} $-di_F/dt = 200\text{ A}/\mu\text{s}$		$T_{VJ} = 25^\circ\text{C}$		80	ns
				$T_{VJ} = 100^\circ\text{C}$		220	ns



Package ECO-PAC2		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
<b>Weight</b>				24		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	VUE130-12NO7	VUE130-12NO7	Box	25	494305

**Equivalent Circuits for Simulation**

\* on die level

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

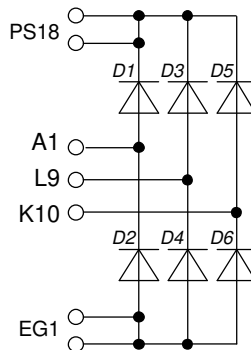
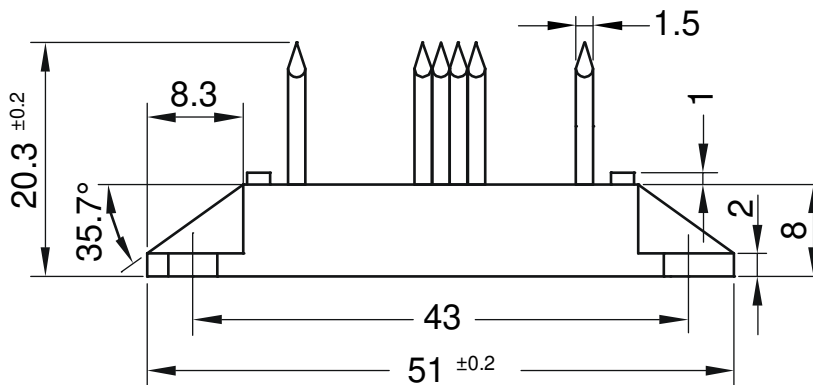
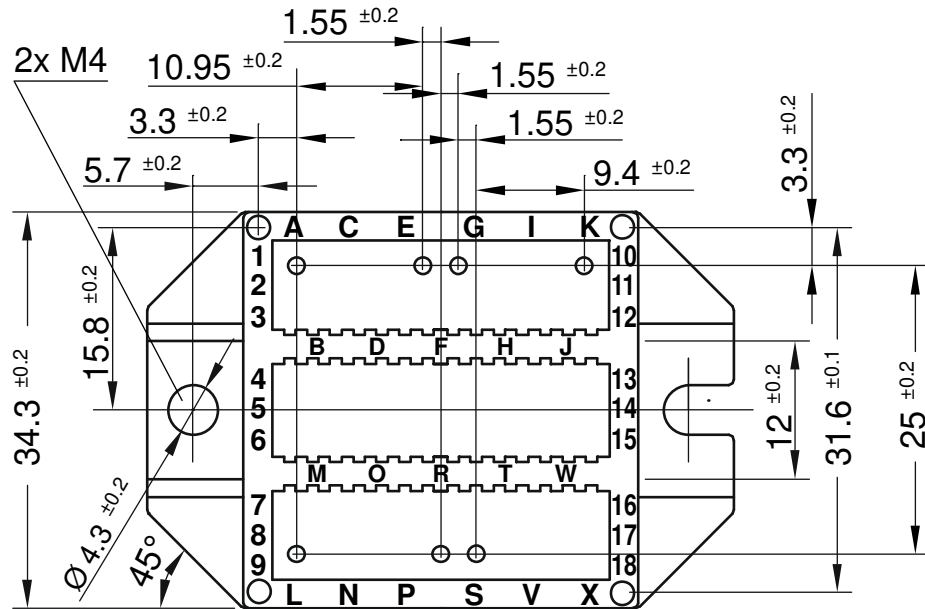


**Fast Diode**

$V_{0\ max}$	threshold voltage	1.28	V
$R_{0\ max}$	slope resistance *	6.2	mΩ



**Outlines ECO-PAC2**



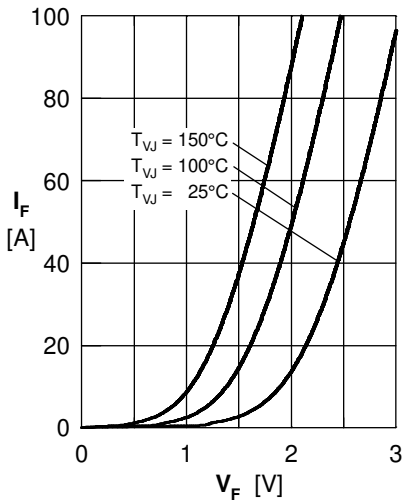
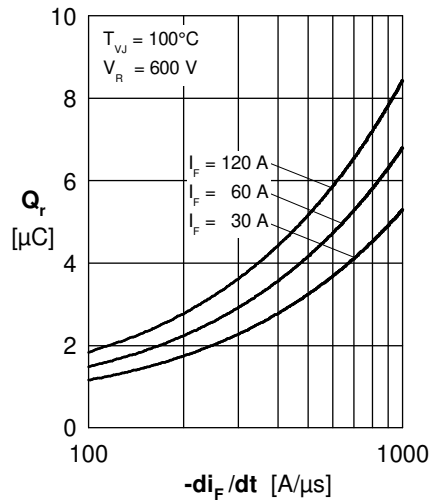
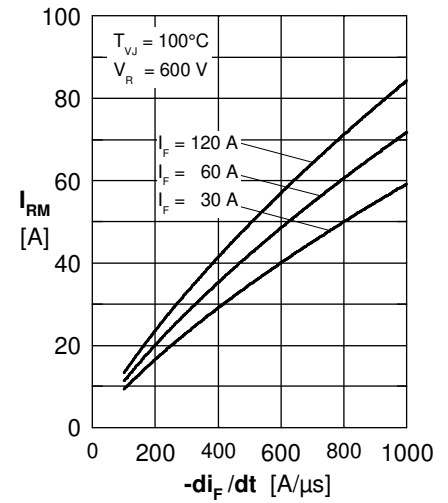
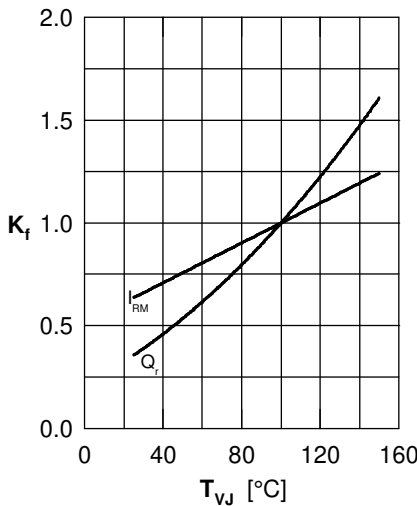
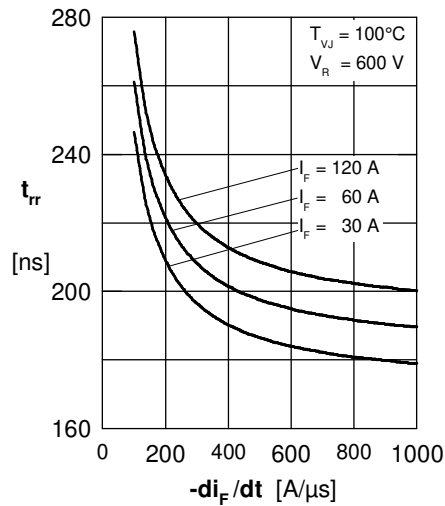
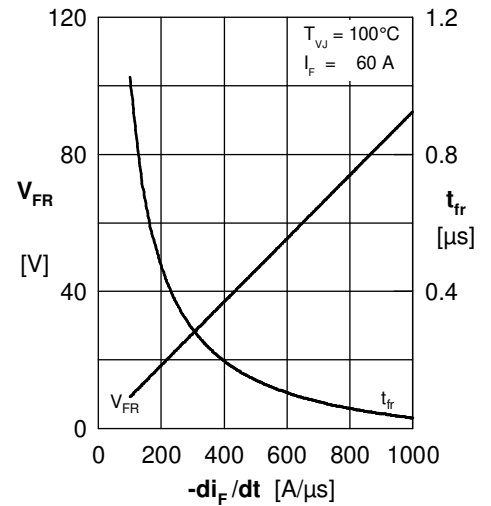
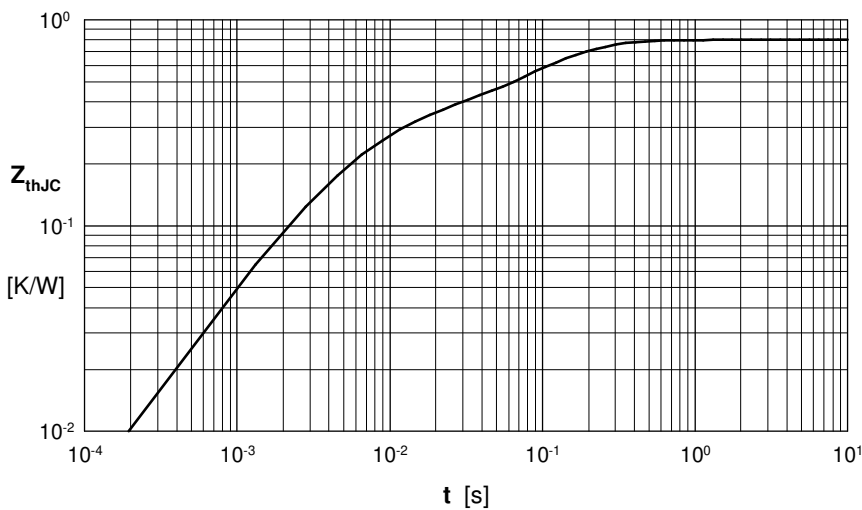
**Fast Diode**

 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  $t_{tr}$  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	0.0010	0.0010
2	0.0790	0.0300
3	0.2500	0.0050
4	0.4700	0.1200