

FRED Module

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

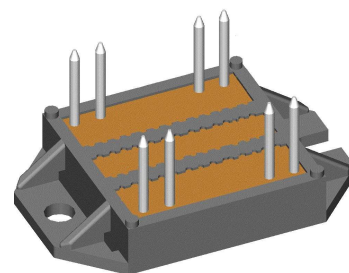
$$I_{FAV} = 2 \times 60 \text{ A}$$

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

Fast Recovery Epitaxial Diode
 Low Loss and Soft Recovery
 Parallel legs

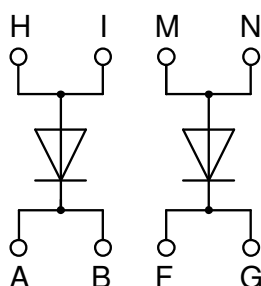
Part number

DSEI2x61-12P



Backside: isolated

 E72873



Features / Advantages:

- Planar passivated chips
- Low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low I_{rm} -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{rm} reduces:
 - Power dissipation within the diode
 - Turn-on loss in the commutating switch

Applications:

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

Package: ECO-PAC1

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 9 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			2.2	mA	
		V _R = 960 V	T _{VJ} = 125°C			14	mA	
V _F	forward voltage drop	I _F = 60 A	T _{VJ} = 25°C			2.41	V	
		I _F = 120 A				2.76	V	
		I _F = 60 A	T _{VJ} = 150°C			2.05	V	
		I _F = 120 A				2.56	V	
I _{FAV}	average forward current	T _C = 45°C rectangular d = 0.5	T _{VJ} = 150°C			60	A	
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 150°C		1.58	V	
r _F	slope resistance					7.9	mΩ	
R _{thJC}	thermal resistance junction to case					0.7	K/W	
R _{thCH}	thermal resistance case to heatsink				0.10		K/W	
P _{tot}	total power dissipation	T _C = 25°C				180	W	
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V		T _{VJ} = 45°C		450	A	
C _J	junction capacitance	V _R = 600 V f = 1 MHz		T _{VJ} = 25°C	31		pF	
I _{RM}	max. reverse recovery current	} I _F = 60 A; V _R = 540 V -di _F /dt = 300 A/μs		T _{VJ} = 25 °C	13		A	
				T _{VJ} = 100 °C	20		A	
t _{rr}	reverse recovery time			T _{VJ} = 25 °C	190		ns	
				T _{VJ} = 100 °C	380		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	3000			V
		t = 1 minute	2500			V



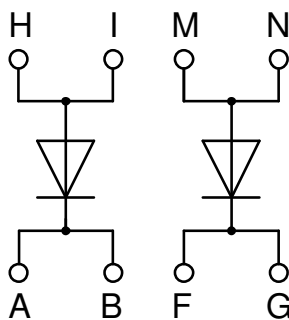
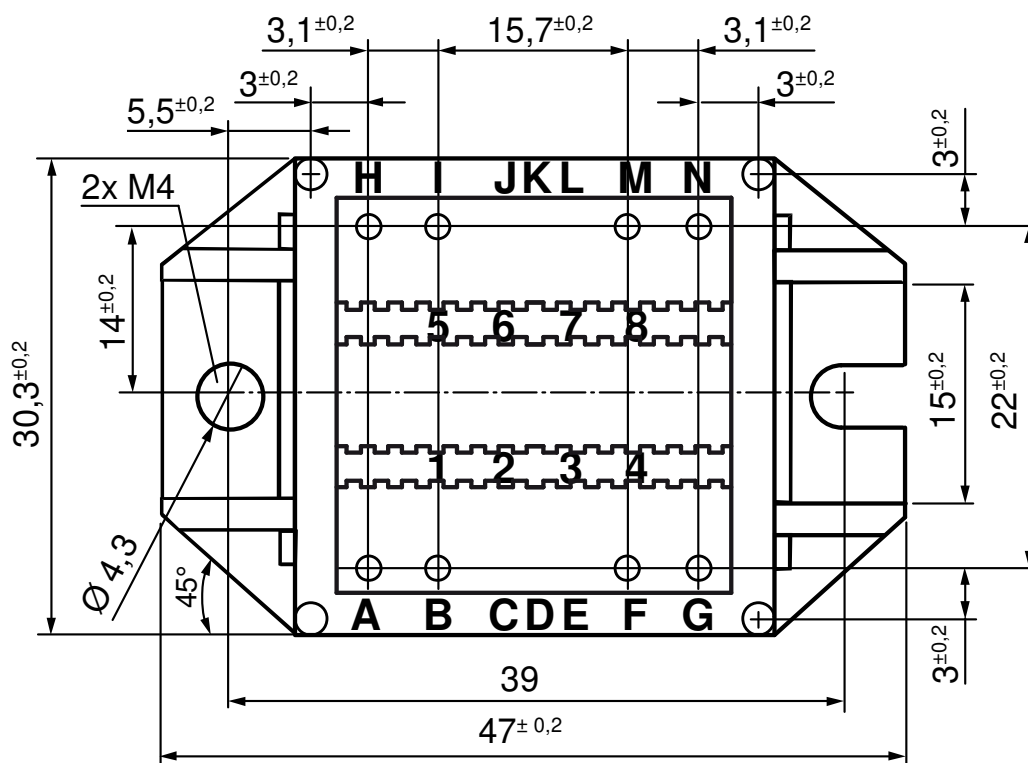
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEI2x61-12P	DSEI2x61-12P	Box	25	490806

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 *	6.6	mΩ



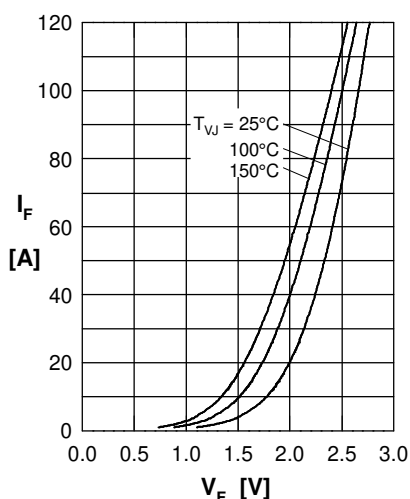
Fast Diode


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

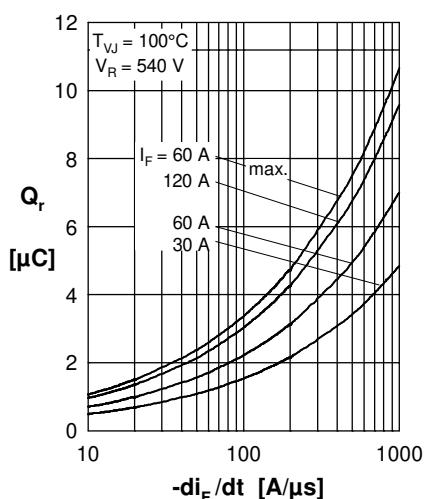


Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$

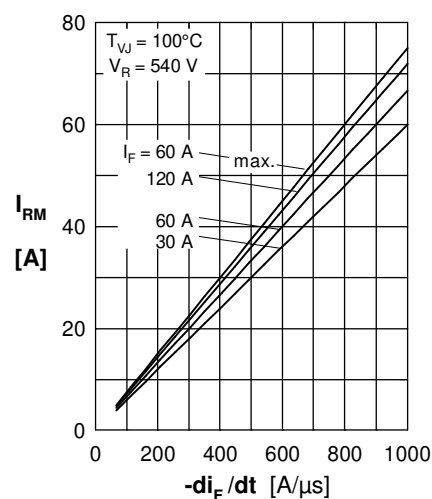


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

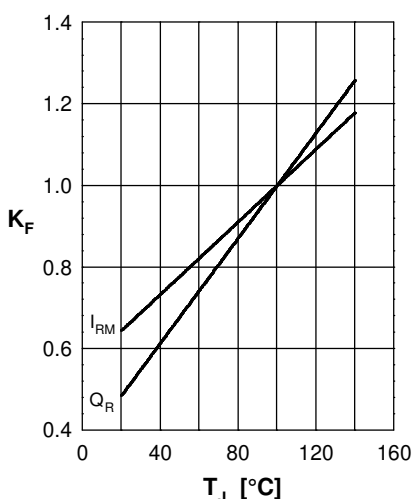


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

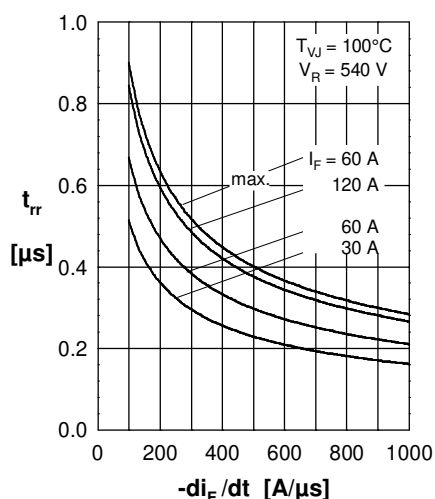


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

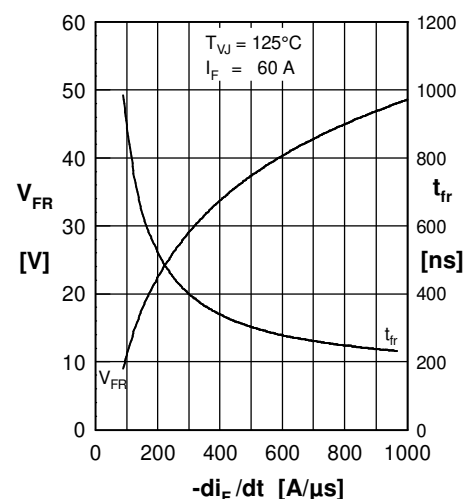


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

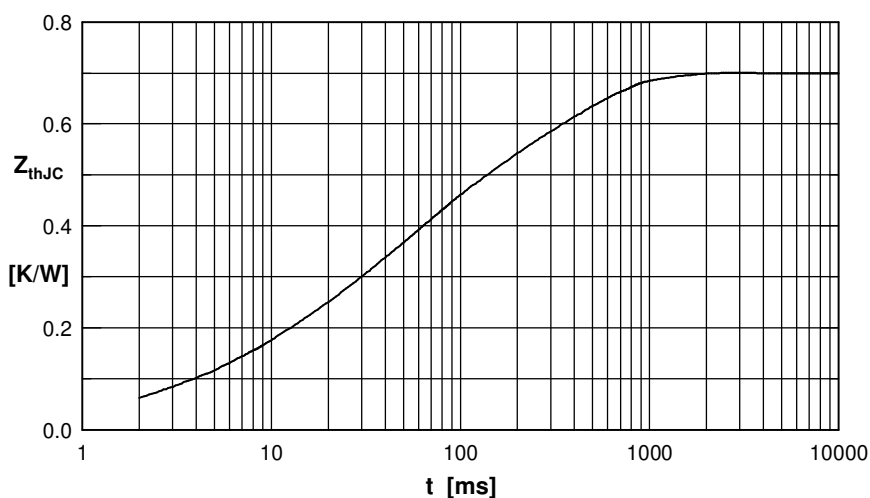


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.120	0.0100
2	0.045	0.0020
3	0.105	0.0500
4	0.160	0.0500
5	0.270	0.3500