

FRED Module

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

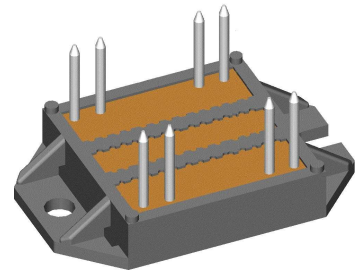
$$I_{FAV} = 2 \times 60 \text{ A}$$

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

Fast Recovery Epitaxial Diode
 Low Loss and Soft Recovery
 Parallel legs

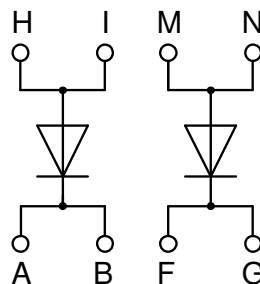
Part number

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

Disclaimer Notice

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Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1200	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1200	V
I_R	reverse current, drain current	$V_R = 1200\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			2.2	mA
		$V_R = 960\text{ V}$	$T_{VJ} = 125^{\circ}\text{C}$			14	mA
V_F	forward voltage drop	$I_F = 60\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			2.41	V
		$I_F = 120\text{ A}$				2.76	V
		$I_F = 60\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			2.05	V
		$I_F = 120\text{ A}$				2.56	V
I_{FAV}	average forward current	$T_C = 45^{\circ}\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 150^{\circ}\text{C}$			60	A
V_{F0}	threshold voltage	} for power loss calculation only		$T_{VJ} = 150^{\circ}\text{C}$		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	$T_C = 25^{\circ}\text{C}$				180	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$	$T_{VJ} = 45^{\circ}\text{C}$			450	A
C_J	junction capacitance	$V_R = 600\text{ V}$ $f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		31		pF
I_{RM}	max. reverse recovery current	$I_F = 60\text{ A}; V_R = 540\text{ V}$ $-di_F/dt = 300\text{ A}/\mu\text{s}$		$T_{VJ} = 25^{\circ}\text{C}$		13	A
				$T_{VJ} = 100^{\circ}\text{C}$		20	A
t_{rr}	reverse recovery time			$T_{VJ} = 25^{\circ}\text{C}$		190	ns
				$T_{VJ} = 100^{\circ}\text{C}$		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



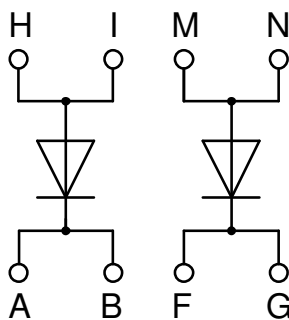
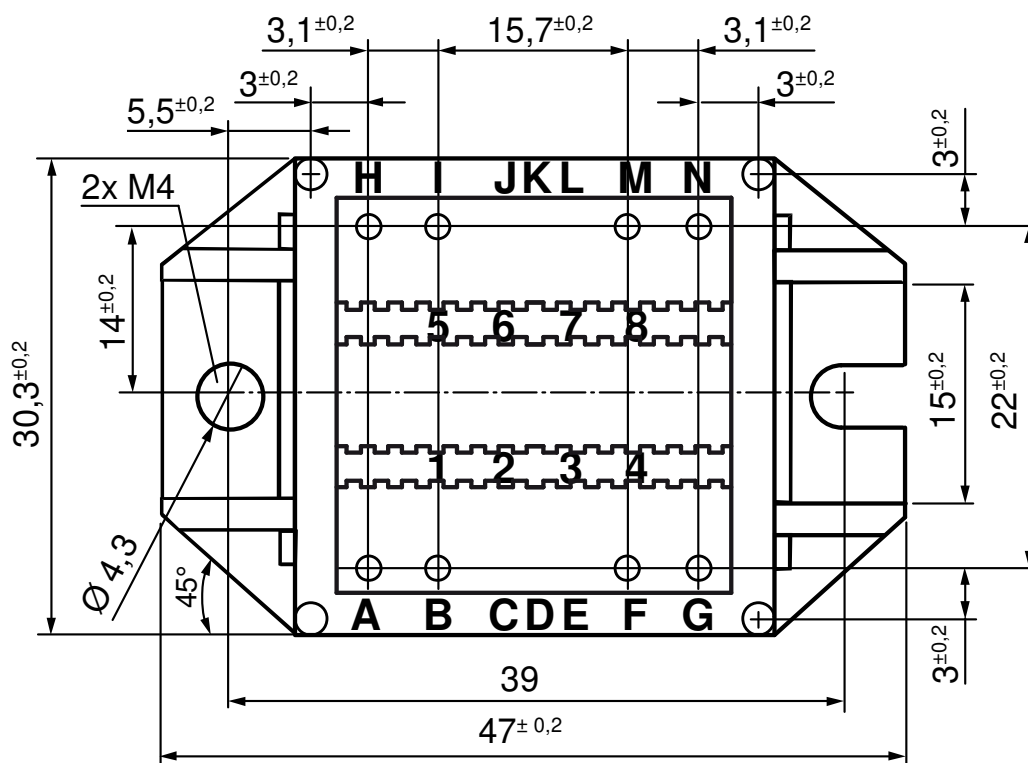
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEI2x61-12P	DSEI2x61-12P	Box	25	490806

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



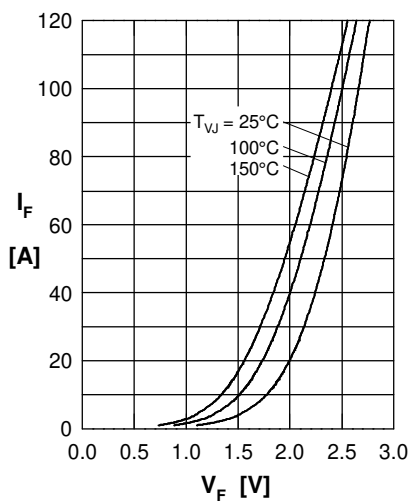
Fast Diode


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

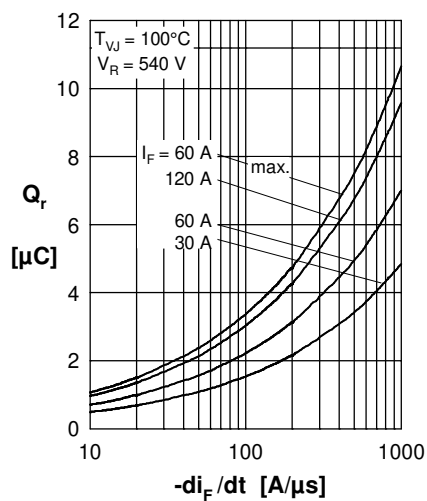


Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$

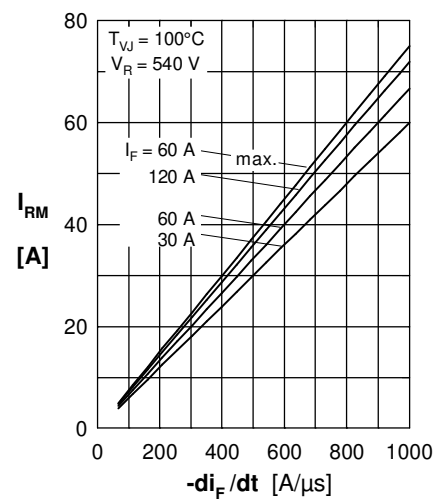


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

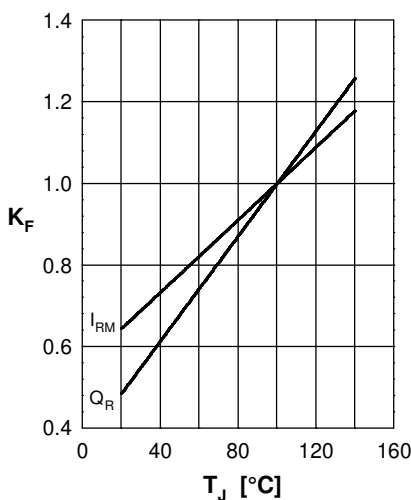


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

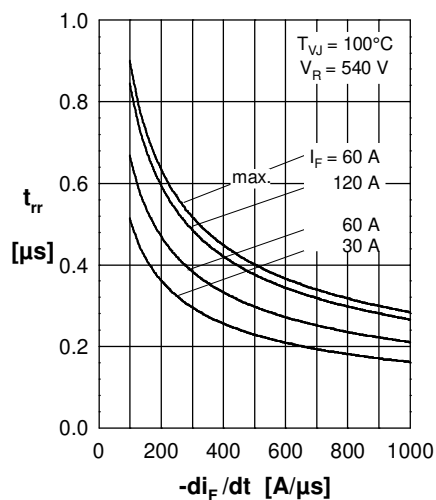


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

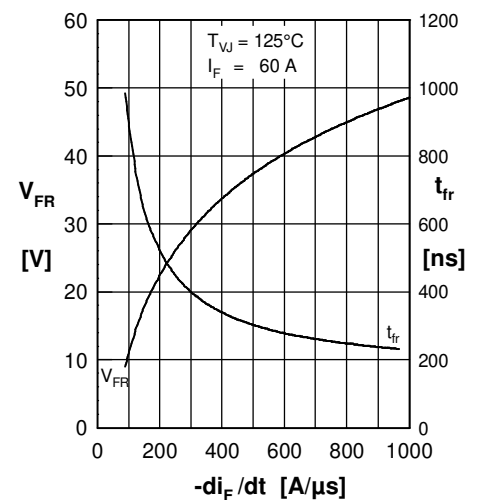


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

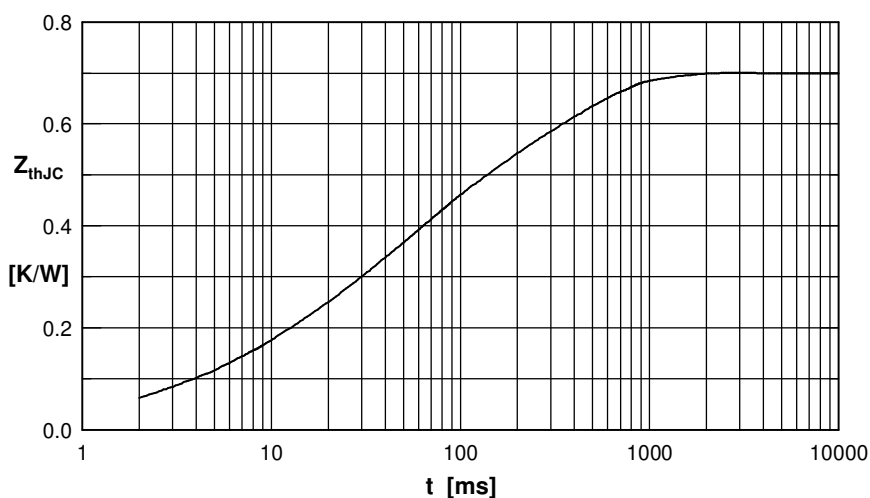


Fig. 7 Transient thermal impedance junction to case

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