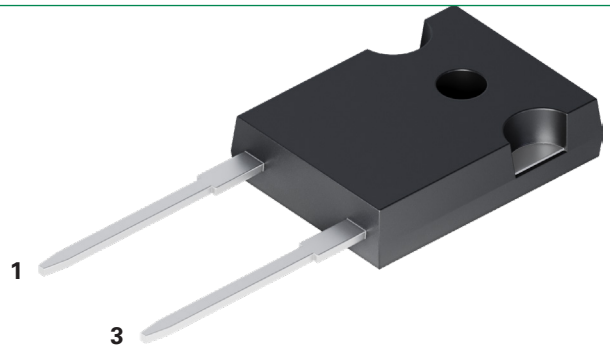
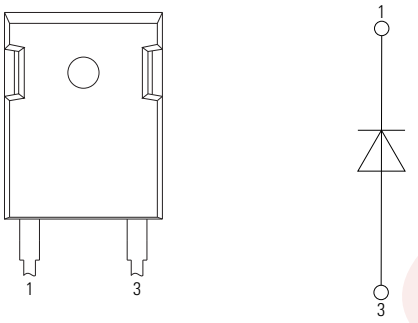
DSEI60-12A

1200 V, 60 A Fast Recovery Epitaxial Diode
Single Diode



Backside: cathode

Pinout Diagram TO-247



1: Cathode; **3:** Anode; **Backside:** Cathode

Description

The DSEI60-12A is a 1200 V, 60 A fast recovery epitaxial diode (FRED) designed for high-frequency power conversion systems. The device combines very short recovery time, soft recovery behaviour, and low reverse recovery current to reduce switching losses and EMI. Packaged in the industry-standard TO-247, the device delivers reliable operation and effective thermal management in demanding power electronic systems.

Features

- Short reverse recovery time
- Soft recovery behaviour
- Low reverse recovery current
- Avalanche voltage rated

Benefits

- Minimises switching losses and improves converter efficiency.
- Reduces EMI/RFI
- Enhanced robustness against transient operating conditions.
- Improved thermal behaviour

Applications

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

Package TO-247

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

Product Summary

Characteristic	Value	Unit
V_{RRM}	1200	V
$I_{F(AV)}$	60	A
t_{rr}	50	ns

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Maximum Ratings (T_{vj} = 25 °C, unless otherwise specified)

Symbol	Characteristics	Condition	Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage	T_{vj} = 25 °C	1200	V
V_{RSM}	Non-Repetitive Peak Reverse Voltage	T_{vj} = 25 °C	1200	V
$I_{F(AV)}$	Average Forward Current	T_c = 70 °C, T_{vj} = 150 °C, rectangular d = 0.5	60	A
I_{FSM}	Non-repetitive Surge Forward Current	t_p = 10 ms, f = 50 Hz, sine wave, V_R = 0 V, T_{vj} = 45 °C	500	A
P_{tot}	Total Power Dissipation	T_c = 25 °C	250	W
T_{stg}	Storage Temperature Range	–	–40 to +150	°C
T_{vj}	Virtual Junction Temperature Range	–	–40 to +150	°C
I_{tRMS}	Terminal RMS Current	–	70	A

Electrical Characteristics – Static (T_{vj} = 25 °C, unless otherwise specified)

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
I_R	Reverse 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	I_F = 60 A; T_{vj} = 25 °C	–	–	2.98	V
		I_F = 120 A; T_{vj} = 25 °C	–	–	3.35	
		I_F = 60 A; T_{vj} = 150 °C	–	–	2.12	
		I_F = 120 A; T_{vj} = 150 °C	–	–	2.71	
$V_{(TO)}$	Threshold Voltage	T_{vj} = 150 °C	–	–	1.68	V
r_T	Slope Resistance	T_{vj} = 150 °C	–	–	9.1	mΩ

Electrical Characteristics – Dynamic (T_{vj} = 25 °C, unless otherwise specified)

Symbol	Characteristics	Conditions		Value			Units
				Min.	Typ.	Max.	
t_{rr}	Reverse Recovery Time	I_F = 60 A, V_R = 540 V, $-di_F/dt$ = 300 A/µs	T_{vj} = 25 °C	–	190	–	ns
			T_{vj} = 100 °C	–	380	–	ns
I_{rrm}	Peak 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
C_j	Junction Capacitance	V_R = 600 V, f = 1 MHz, T_{vj} = 25 °C		–	31	–	pF

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Thermal Characteristics

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
$R_{th(j-c)}$	Thermal Resistance Junction To Case	–	–	–	0.5	K/W
$R_{th(c-h)}$	Thermal Resistance Case To Heat Sink	–	–	0.25	–	K/W

Package TO-247

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
M_s	Mounting Torque For Screws To Heat Sink	–	0.8	–	1.2	Nm
F_C	Mounting force	with clip	20	–	120	Nm
G	Weight	–	–	6	–	g
T_{op}	Operating Temperature	–	-40	–	125	°C

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Characteristic Curves

Fig. 1. Typical Forward Characteristics

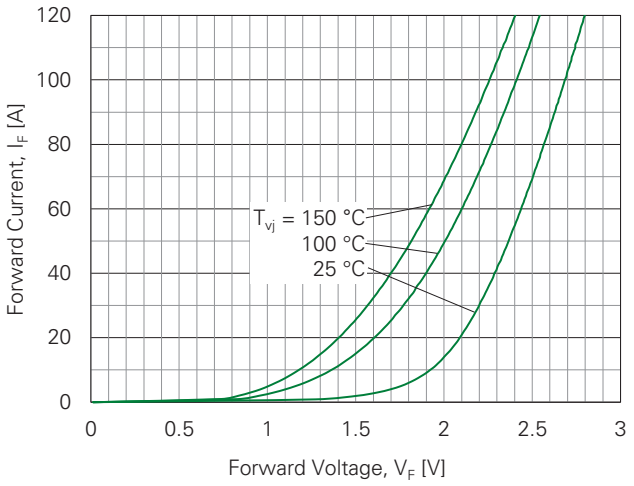


Fig. 2. Typical Reverse Recovery Charge vs. Diode Current Slope

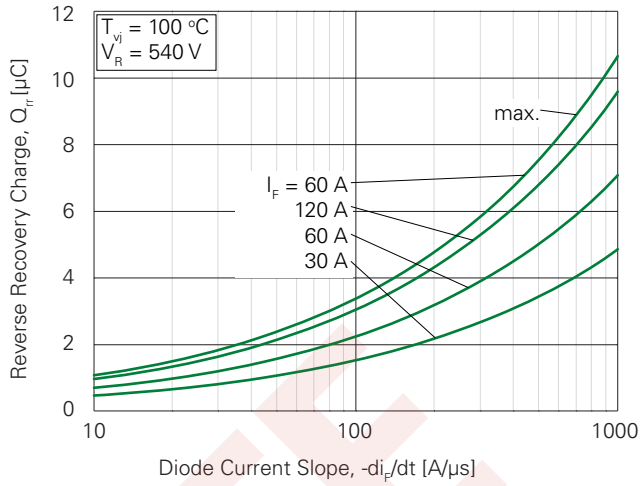


Fig. 3. Typical Peak Reverse Recovery Current vs. Diode Current Slope

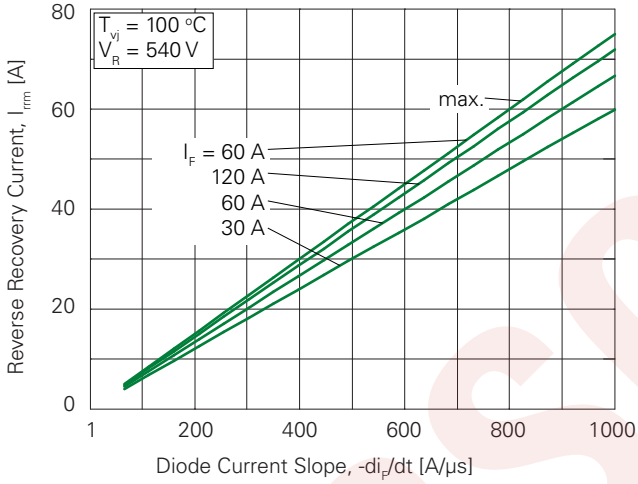


Fig. 4. Typical Dynamic Parameters vs. Virtual Junction Temperature

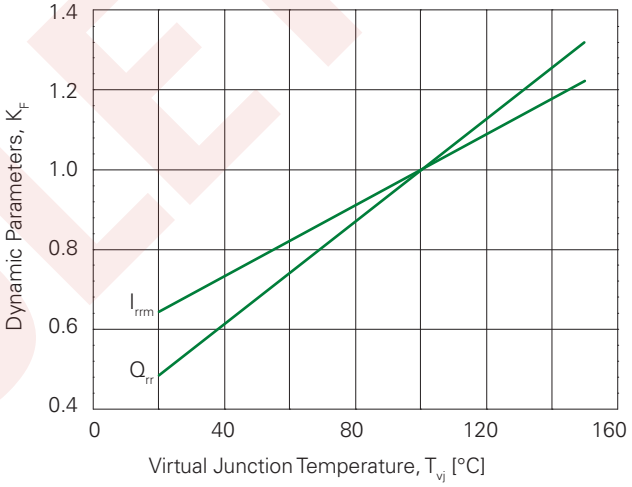


Fig. 5. Typical Reverse Recovery Time vs. Diode Current Slope

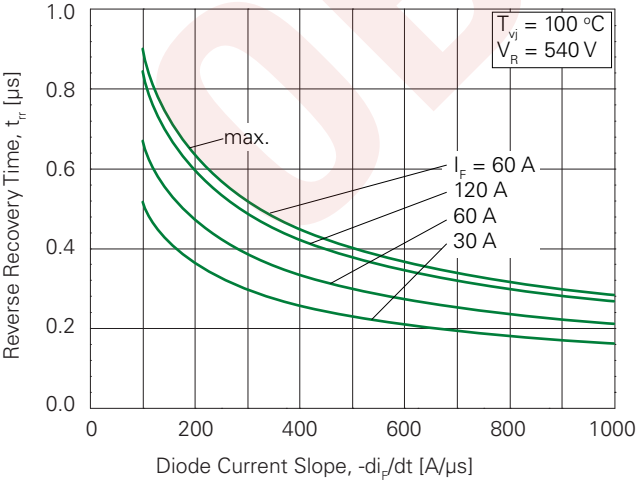
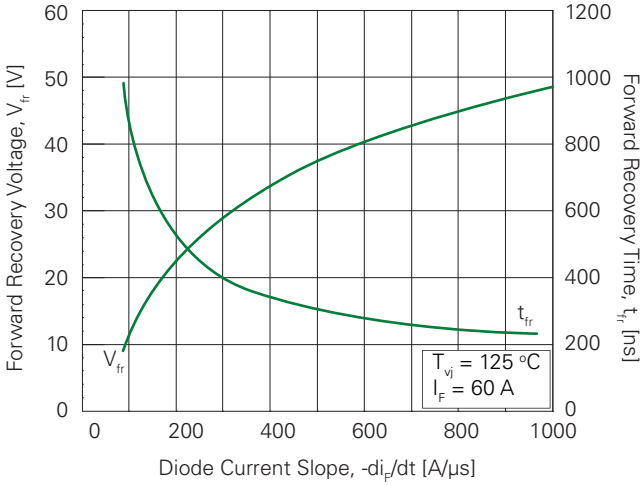


Fig. 6. Typical Peak Forward Recovery Voltage, V_{fr} and Forward Recovery Time, t_{fr} vs. Diode Current Slope

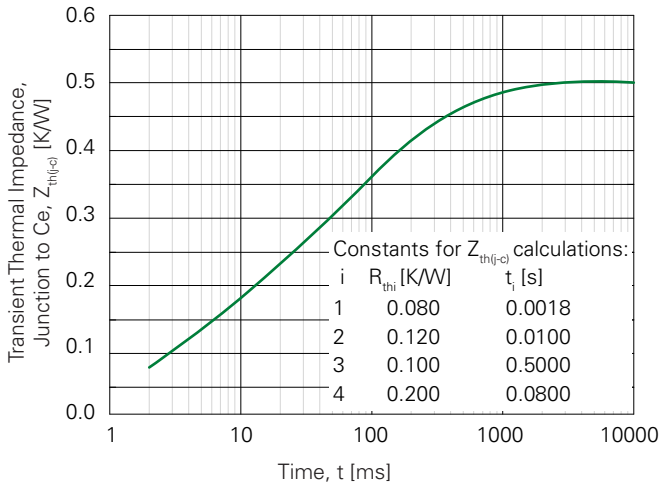


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Characteristic Curves

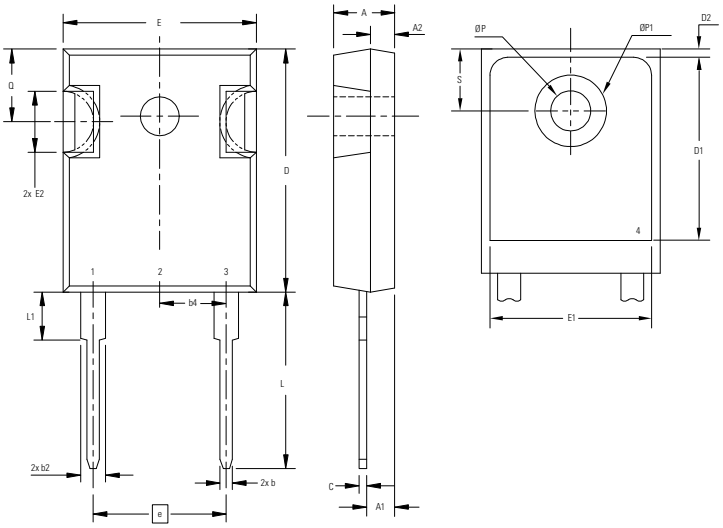
Fig. 7. Typical Transient Thermal Impedance



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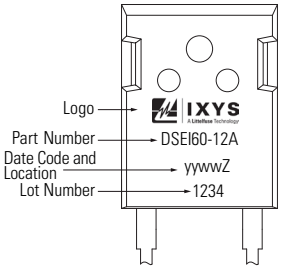
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Part Outline Drawing TO-247 2L



Symbol	Inches		Millimeters	
	Min.	Max	Min.	Max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
C	0.015	0.035	0.38	0.89
D	0.819	0.845	20.79	21.45
D1	0.515	–	13.07	–
D2	0.020	0.053	0.51	1.35
E	0.610	0.640	15.48	16.24
E1	0.530	–	13.45	–
E2	0.170	0.216	4.31	5.48
e	0.430 BSC		10.92 BSC	
L	0.780	0.800	19.80	20.30
L1	–	0.177	–	4.49
Q	0.212	0.244	5.38	6.19
S	0.242 BSC		6.14BSC	
ØP	0.140	0.144	3.55	3.65
ØP1	–	0.29	–	7.39

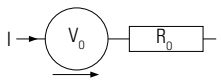
Part Numbering and Marking



Ordering Information

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity
Standard	DSEI60-12A	DSEI60-12A	Tube	30

Equivalent Circuits for Simulation (*on die level, T_{vj} = 150 °C)

Symbol	Definition	Fast Diode	Units
			
V_{0max}	Threshold voltage	1.68	V
R_{0max}	Slope resistance*	6.6	mΩ

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