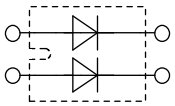
HiPerFRED

High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Parallel legs

V_{RRM} = 600 V
I_{FAV} = 2x 60 A
t_{rr} = 35 ns

Part number

DSEP2x61-06A



Backside: isolated

E72873

Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low Irm 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:

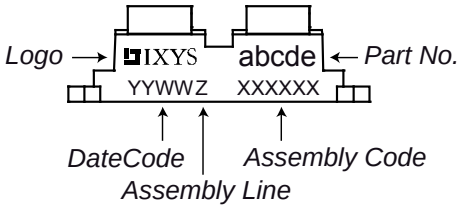
- Housing: SOT-227B (minibloc)
- Industry standard outline
- Cu base plate internal DCB isolated
- Isolation Voltage 3000 V
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			600	V
I_R	*reverse current*	V_R = 600 V	T_{VJ} = 25°C			650	µA
		V_R = 600 V	T_{VJ} = 150°C			2.5	mA
V_F	*forward voltage*	I_F = 60 A	T_{VJ} = 25°C			2.01	V
		I_F = 120 A				2.27	V
		I_F = 60 A	T_{VJ} = 150°C			1.35	V
		I_F = 120 A				1.63	V
I_{FAV}	*average forward current*	rectangular d = 0.5	T_C = 65°C			60	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			1.09	V
r_F	*slope resistance* }					4.3	mΩ
R_{thJC}	*thermal resistance junction to case*					0.85	K/W
T_{VJ}	*virtual junction temperature*			-40		150	°C
P_{tot}	*total power dissipation*		T_C = 25°C			140	W
I_{FSM}	*max. forward surge current*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			600	A
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		18		A
		I_F = 60 A; V_R = 300 V	T_{VJ} = 100°C		30		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 600 A/µs	T_{VJ} = 25°C		30		ns
			T_{VJ} = 100°C		55		ns
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		67		pF

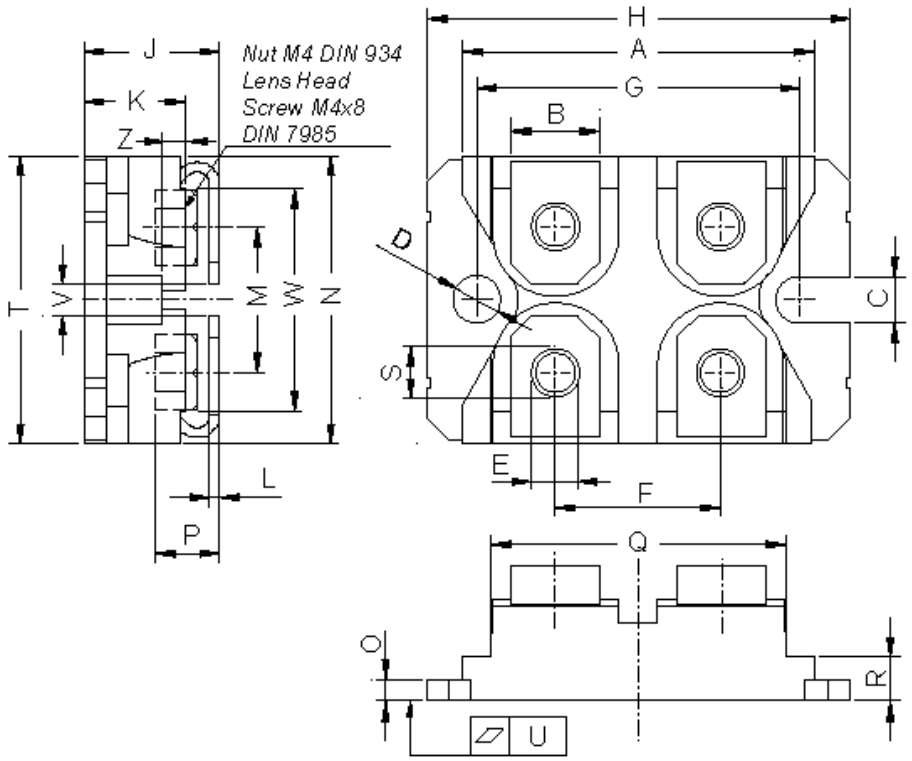
Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal				100	A
R_{thCH}	*thermal resistance case to heatsink*				0.10		K/W
T_{stg}	*storage temperature*			-40		150	°C
Weight					30		g
M_D	*mounting torque*			1.1		1.5	Nm
M_T	*terminal torque*			1.1		1.5	Nm
V_{ISOL}	*isolation voltage*	t = 1 second		3000			V
		t = 1 minute		2500			V
$d_{Spp/App}$	*creepage | striking distance on surface | through air*	*terminal to terminal*	10.5	3.2			mm
$d_{Spb/Apb}$	*creepage | striking distance on surface | through air*	*terminal to backside*	8.6	6.8			mm

Product Marking



Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DSEP2x61-06A	DSEP2x61-06A	Tube	10	474754

Outlines SOT-227B (minibloc)



Dim.	Millimeter		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106

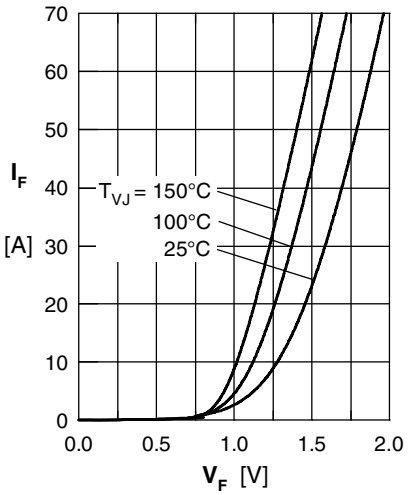


Fig. 1 Forward current I_F vs. V_F

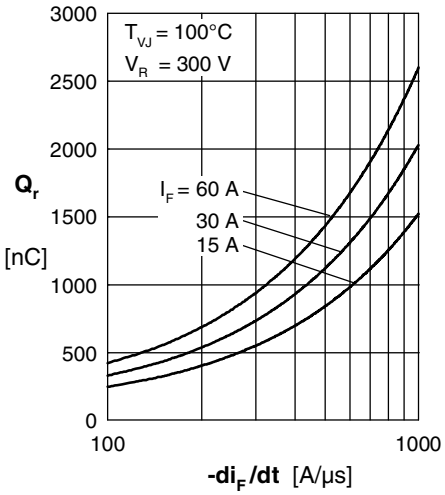


Fig. 2 Reverse recovery charge Q_r versus -di$_F$/dt

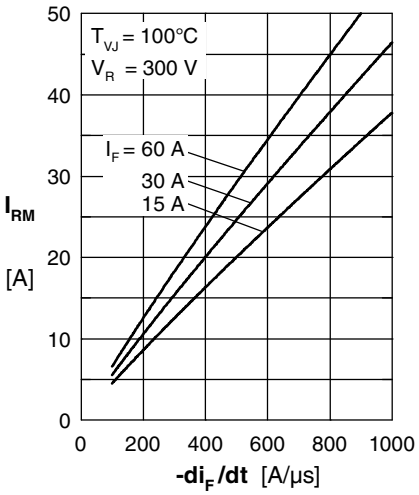


Fig. 3 Peak reverse current I_{RM} versus -di$_F$/dt

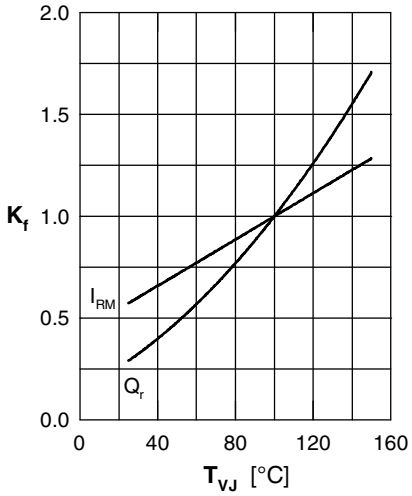


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

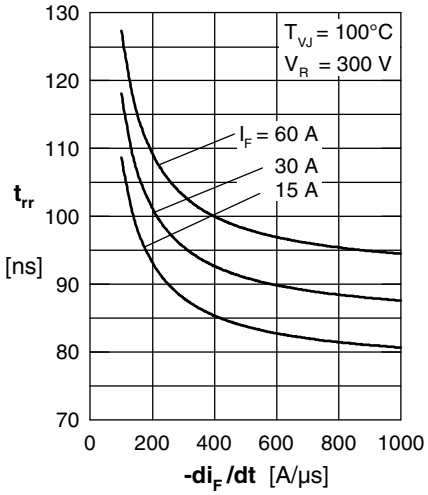


Fig. 5 Recovery time t_{rr} versus -di$_F$/dt

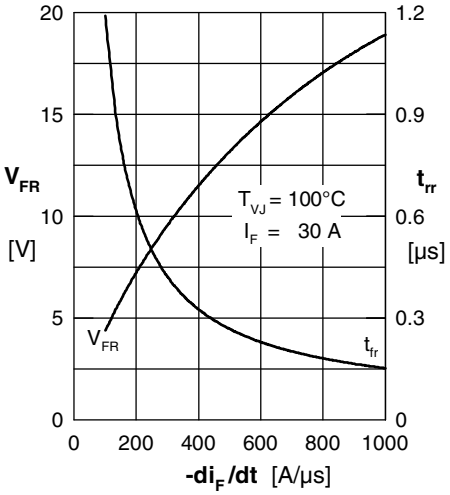


Fig. 6 Peak forward voltage V_{FR} and tfr versus di$_F$/dt

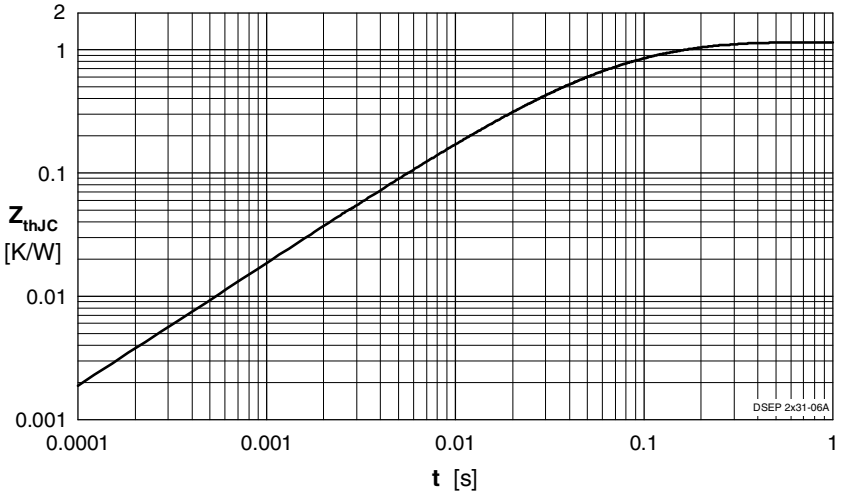


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.436	0.0055
2	0.482	0.0092
3	0.117	0.0007
4	0.115	0.0418