HiPerFRED

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

Part number

DSEP2x61-03A

$V_{RRM} =$ **300 V**
$I_{FAV} = 2x$ **60 A**
$t_{rr} =$ **30 ns**
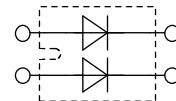
Backside: isolated

U 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		$T_{VJ} = 25°C$			300	V
I_R	reverse current	$V_R = 300 V$	$T_{VJ} = 25°C$			650	µA
		$V_R = 300 V$	$T_{VJ} = 150°C$			2.5	mA
V_F	forward voltage	$I_F = 60 A$	$T_{VJ} = 25°C$			1.51	V
		$I_F = 120 A$				1.82	V
		$I_F = 60 A$	$T_{VJ} = 150°C$			1.11	V
		$I_F = 120 A$				1.45	V
I_{FAV}	average forward current	rectangular $d = 0.5$	$T_C = 75°C$			60	A
V_{F0}	threshold voltage	} for power loss calculation only	$T_{VJ} = 150°C$			0.79	V
r_F	slope resistance					5.3	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		$T_{VJ} = 25°C$		12		A
		$I_F = 60 A; V_R = 190 V$	$T_{VJ} = 100°C$		15		A
t_{rr}	reverse recovery time	$-di_F/dt = 600 A/µs$	$T_{VJ} = 25°C$		40		ns
			$T_{VJ} = 100°C$		60		ns
C_J	junction capacitance	$V_R = 150 V; f = 1 MHz$	$T_{VJ} = 25°C$		170		pF

Data according to IEC 60747and per diode unless otherwise specified

20110531a

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

Logo → IXYS   abcde ← Part No.
          YYWWZ   XXXXXX

↑ ↑ ↑
DateCode | Assembly Code
Assembly Line
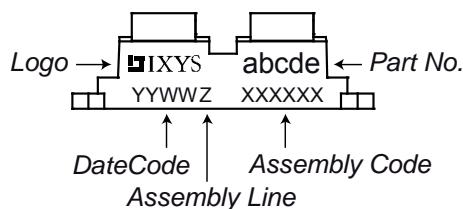
Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DSEP2x61-03A	DSEP2x61-03A	Tube	10	476250

Outlines SOT-227B (minibloc)

Nut M4 DIN 934
Lens Head
Screw M4x8
DIN 7985
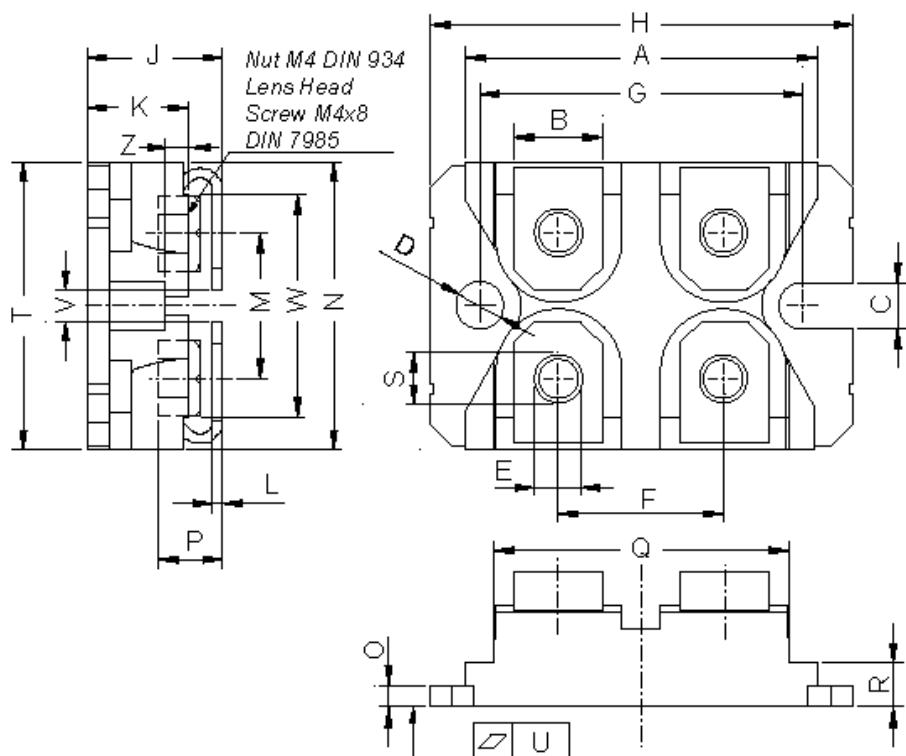
| Dim.	Millimeter		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	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
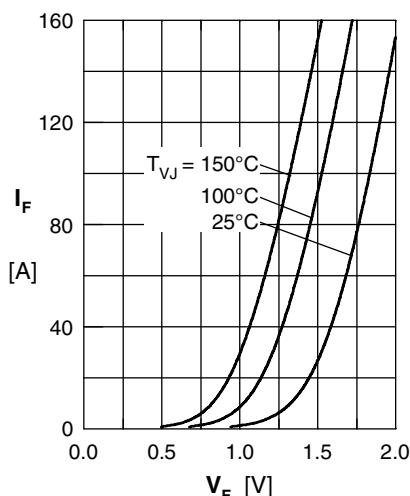
Fig. 1 Forward current I_F vs. V_F
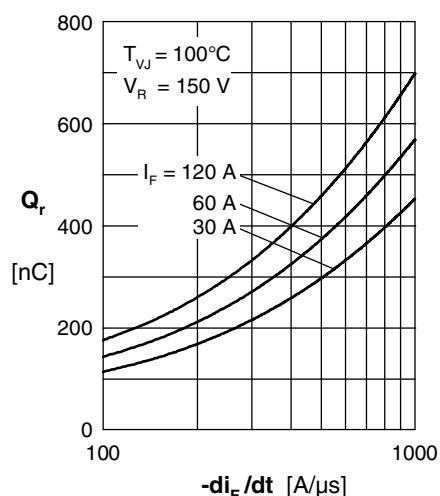
Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$
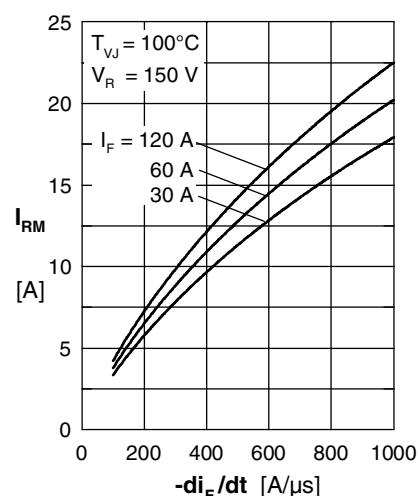
Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$
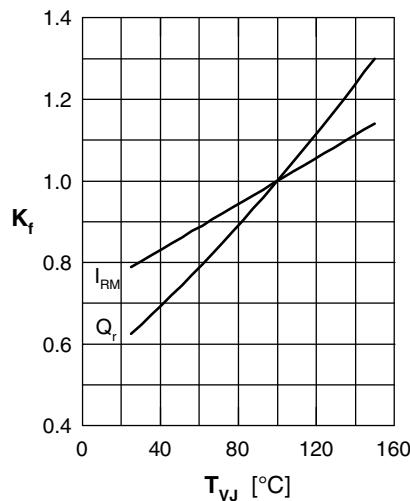
Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}
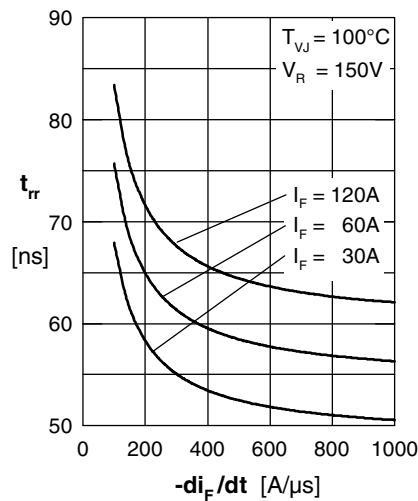
Fig. 5 Recovery time t_{rr} versus $-di_F/dt$
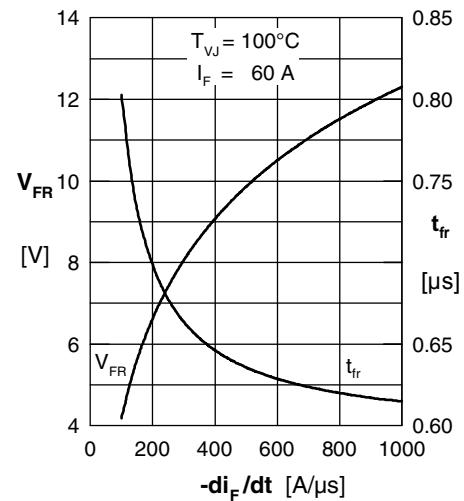
Fig. 6 Peak forward voltage V_{FR} and tfr versus di_F/dt
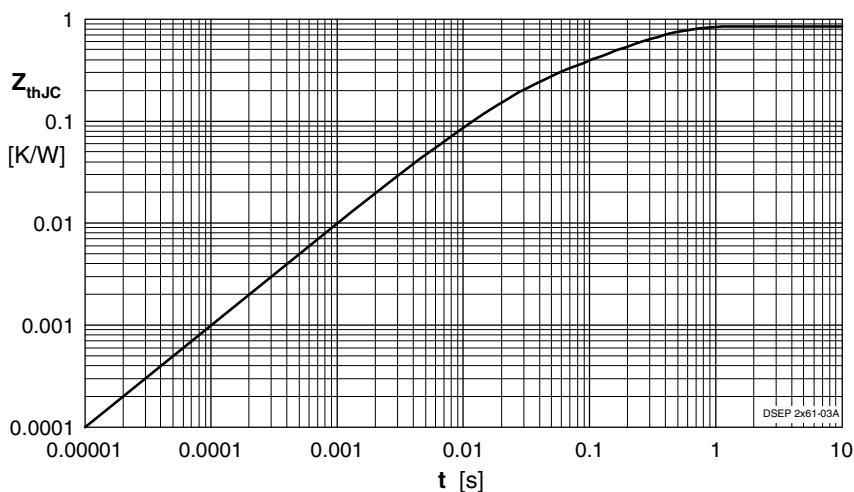
Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.307	0.0055
2	0.353	0.009
3	0.089	0.0007
4	0.101	0.04

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