

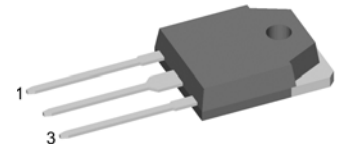
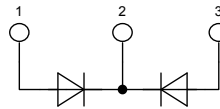
HiPerFRED

High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Common Cathode

$V_{RRM} = 300\text{ V}$
 $I_{FAV} = 2 \times 30\text{ A}$
 $t_{rr} = 35\text{ ns}$

Part number

DSEC59-03AQ



Backside: cathode

Features / Advantages:

- Planar passivated chips
- Very 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:

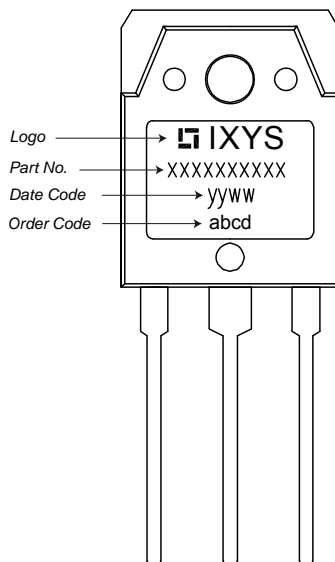
- Housing: TO-3P
- Industry standard outline compatible with TO-247
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
V_{RRM}	max. repetitive reverse voltage				300	V
I_R	reverse current	$V_R = 300\text{ V}$			1	μA
		$V_R = 300\text{ V}$			0.1	mA
V_F	forward voltage	$I_F = 30\text{ A}$			1.34	V
		$I_F = 60\text{ A}$			1.63	V
		$I_F = 30\text{ A}$			1.06	V
		$I_F = 60\text{ A}$			1.39	V
I_{FAV}	average forward current	rectangular d = 0.5			30	A
V_{F0}	threshold voltage	} for power loss calculation only			0.69	V
r_F	slope resistance				10.5	$\text{m}\Omega$
R_{thJC}	thermal resistance junction to case				0.95	K/W
T_{VJ}	virtual junction temperature		-55		175	$^{\circ}\text{C}$
P_{tot}	total power dissipation				160	W
I_{FSM}	max. forward surge current	t = 10 ms (50 Hz), sine			340	A
I_{RM}	max. reverse recovery current				3	A
		$I_F = 30\text{ A}; V_R = 200\text{ V}$			7	A
t_{rr}	reverse recovery time	$-di_F/dt = 200\text{ A}/\mu\text{s}$			35	ns
					55	ns
C_J	junction capacitance	$V_R = 150\text{ V}; f = 1\text{ MHz}$			50	pF

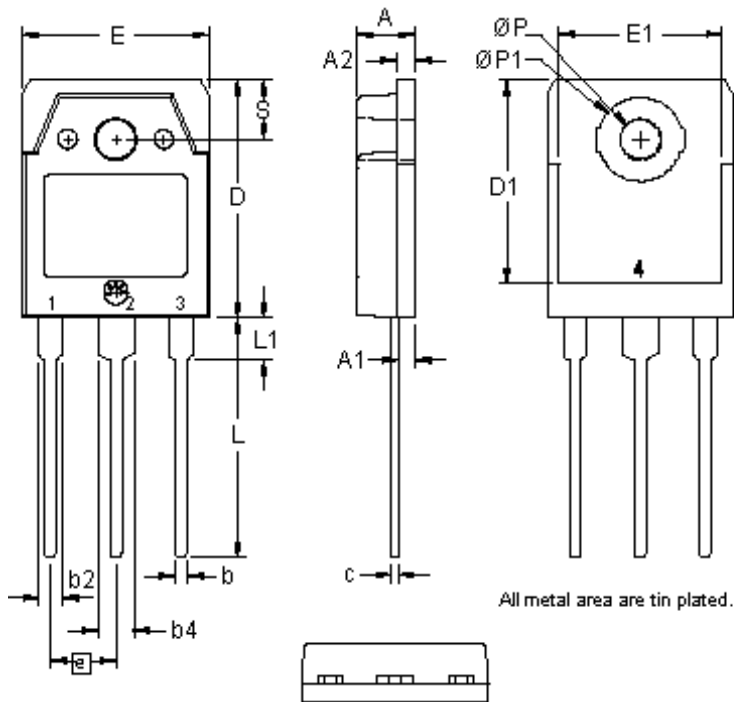
Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
I_{RMS}	RMS current	per pin ¹⁾			50	A
R_{thCH}	thermal resistance case to heatsink			0.25		K/W
T_{stg}	storage temperature		-55		150	°C
Weight				5		g
M_D	mounting torque		0.8		1.2	Nm
F_C	mounting force with clip		20		120	N

¹⁾ I_{RMS} is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.
 In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

Product Marking


Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DSEC59-03AQ	DSEC59-03AQ	Tube	30	500959

Similar Part	Package	Voltage Class
DSEC60-03AQ	TO-3P (3)	300
DSEC60-03A	TO-247AD (3)	300
DSEC60-03AR	ISOPLUS247 (3)	300

Outlines TO-3P


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	.090	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	.055	.080
D	.780	.791	19.80	20.10
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
e	.215 BSC		.545 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
ØP	.126	.134	3.20	3.40
ØP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

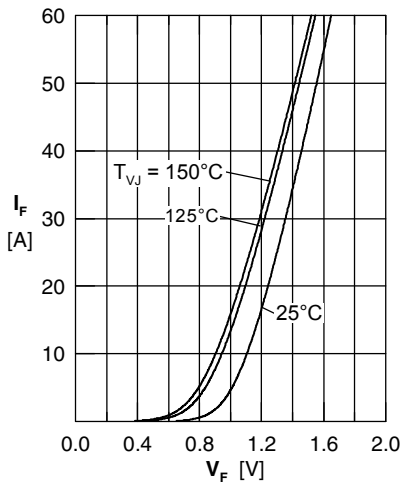


Fig. 1 Forward current I_F versus forward voltage V_F

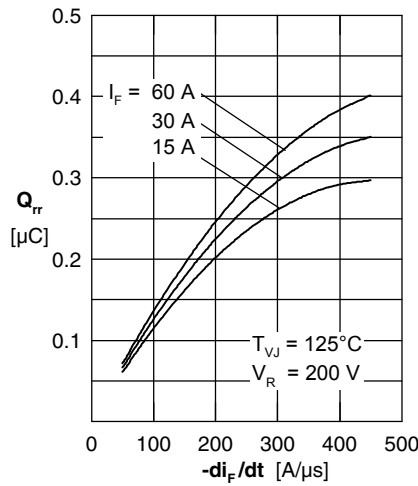


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

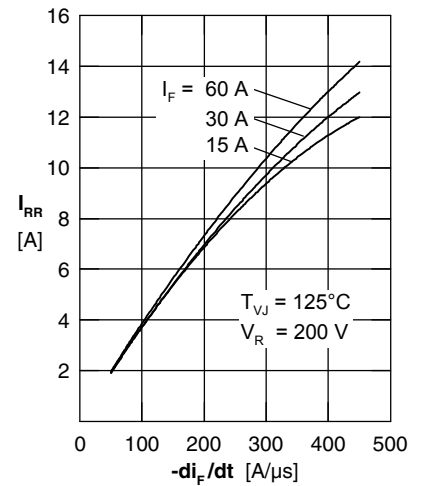


Fig. 3 Typ. reverse recovery current I_{RR} versus $-di_F/dt$

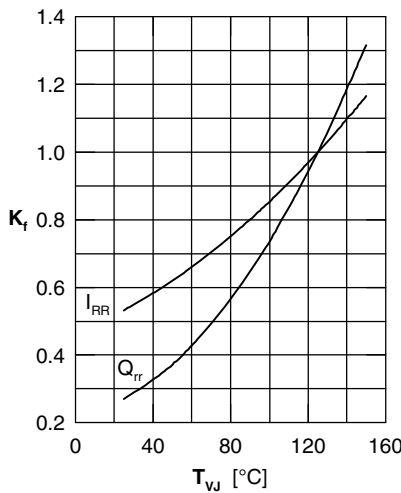


Fig. 4 Dynamic parameters Q_{rr} , I_{RR} versus T_{VJ}

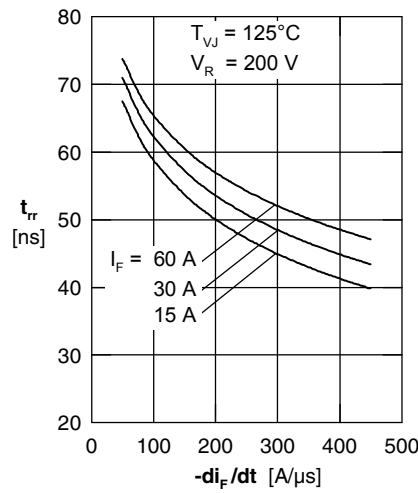


Fig. 5 Typ. reverse recovery time t_{rr} versus $-di_F/dt$

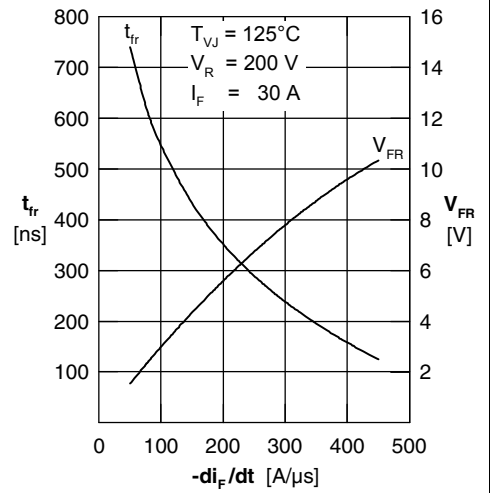


Fig. 6 Typ. forward recovery voltage V_{FR} & forward recovery time t_{fr} vs. di_F/dt

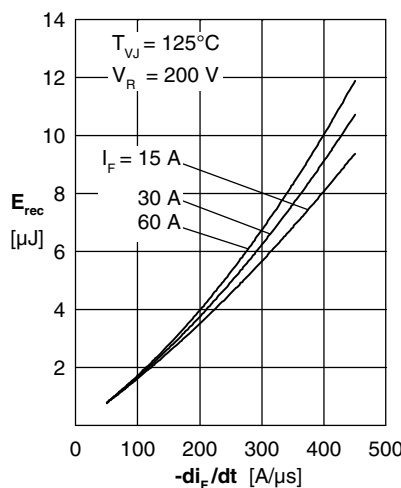


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

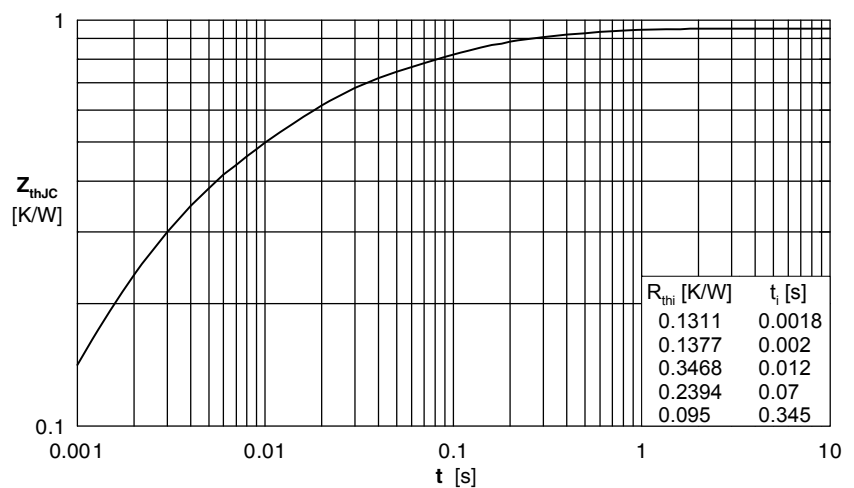


Fig. 8 Transient thermal impedance junction to case