



# FRED

$V_{RRM} = 200\text{ V}$   
 $I_{FAV} = 2 \times 30\text{ A}$   
 $t_{rr} = 20\text{ ns}$

## Fast Recovery Epitaxial Diode Common Cathode

**Part number**

**DSEK60-02A**



Backside: cathode



**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: TO-247**

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

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Fast Diode				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{RSM}$	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			200	V	
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			200	V	
$I_R$	reverse current, drain current	$V_R = 200 V$	$T_{VJ} = 25^{\circ}C$		200	$\mu A$	
		$V_R = 160 V$	$T_{VJ} = 125^{\circ}C$		5	mA	
$V_F$	forward voltage drop	$I_F = 30 A$	$T_{VJ} = 25^{\circ}C$		1.16	V	
		$I_F = 60 A$			1.29	V	
		$I_F = 30 A$	$T_{VJ} = 150^{\circ}C$		0.92	V	
		$I_F = 60 A$			1.09	V	
$I_{FAV}$	average forward current	$T_C = 125^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 150^{\circ}C$		30	A	
$V_{FO}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}C$		0.78	V	
$r_F$	slope resistance				4.9	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case				0.8	K/W	
$R_{thCH}$	thermal resistance case to heatsink			0.25		K/W	
$P_{tot}$	total power dissipation		$T_C = 25^{\circ}C$		155	W	
$I_{FSM}$	max. forward surge current	$t = 10 ms; (50 Hz), sine; V_R = 0 V$	$T_{VJ} = 45^{\circ}C$		325	A	
$C_J$	junction capacitance	$V_R = 200 V$ $f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		77	pF	
$I_{RM}$	max. reverse recovery current	} $I_F = 35 A; V_R = 100 V$ $-di_F/dt = 200 A/\mu s$	$T_{VJ} = 25^{\circ}C$		4	A	
			$T_{VJ} = 125^{\circ}C$		6	A	
$t_{rr}$	reverse recovery time		$T_{VJ} = 25^{\circ}C$		20	ns	
			$T_{VJ} = 125^{\circ}C$		45	ns	



Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal <sup>1)</sup>			70	A
$T_{VJ}$	virtual junction temperature		-40		150	°C
$T_{op}$	operation temperature		-40		125	°C
$T_{stg}$	storage temperature		-40		150	°C
<b>Weight</b>				6		g
$M_D$	mounting torque		0.8		1.2	Nm
$F_C$	mounting force with clip		20		120	N

**Product Marking**



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEK60-02A	DSEK60-02A	Tube	30	471526

Similar Part	Package	Voltage class
DSEK60-02AR	ISOPLUS247 (3)	200

**Equivalent Circuits for Simulation**

\* on die level

$T_{VJ} = 150^{\circ}C$

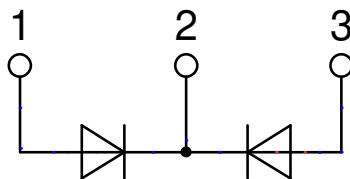


**Fast Diode**

$V_{0 \max}$	threshold voltage	0.78	V
$R_{0 \max}$	slope resistance *	2.4	mΩ



**Outlines TO-247**





**Fast Diode**

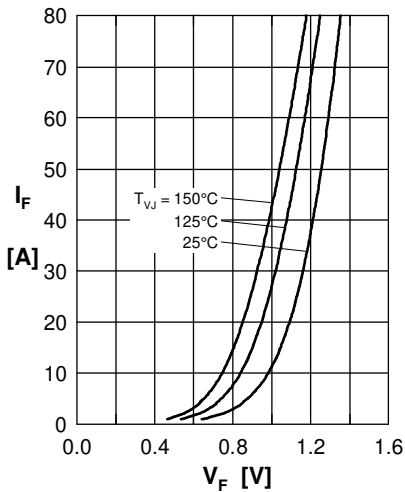


Fig. 1 Forward current  $I_F$  versus max. forward Voltage drop  $V_F$

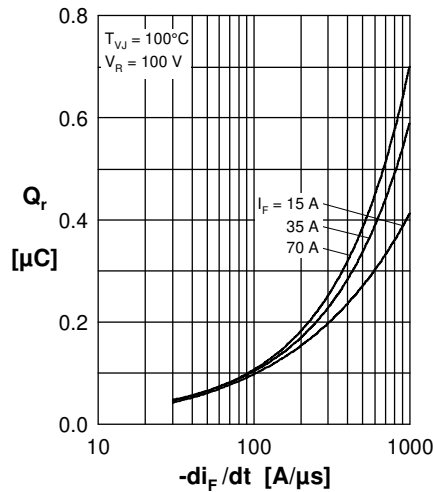


Fig. 2 Typ. reverse recov. charge  $Q_r$  versus  $-di_F/dt$

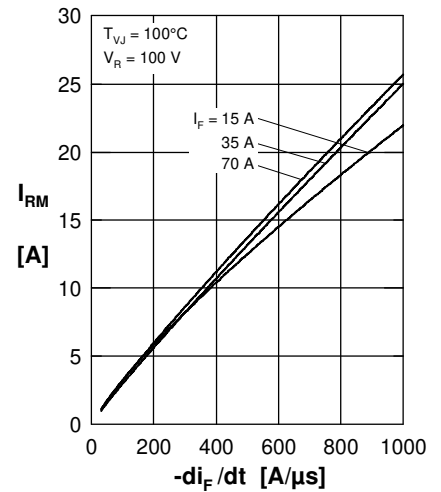


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

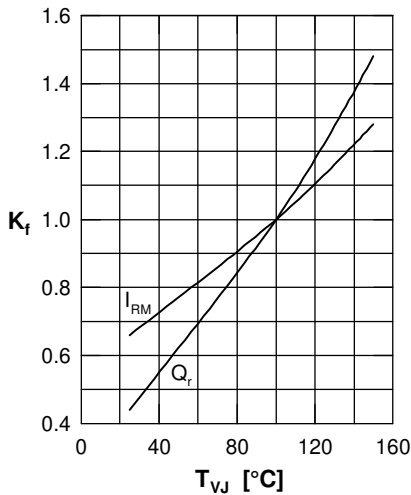


Fig. 4 Typ. dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

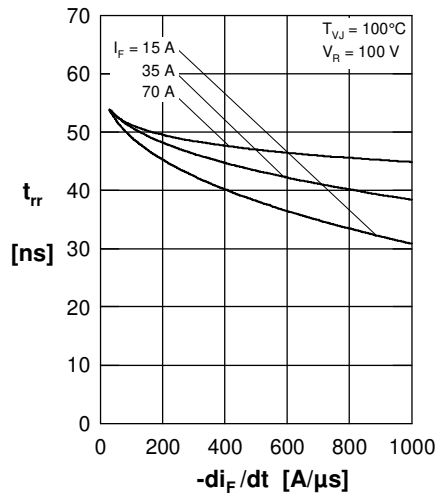


Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$

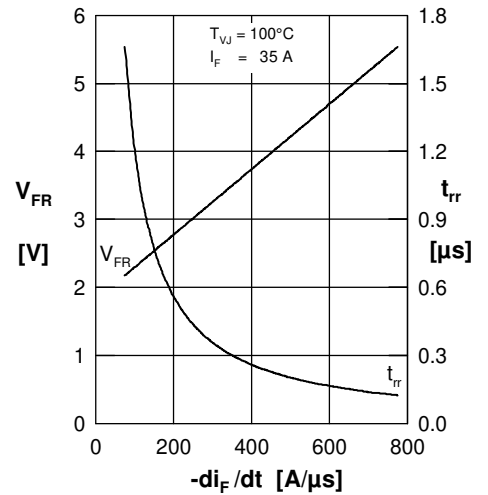


Fig. 6 Typ. peak forward voltage  $V_{FR}$  and  $t_{rr}$  versus  $-di_F/dt$

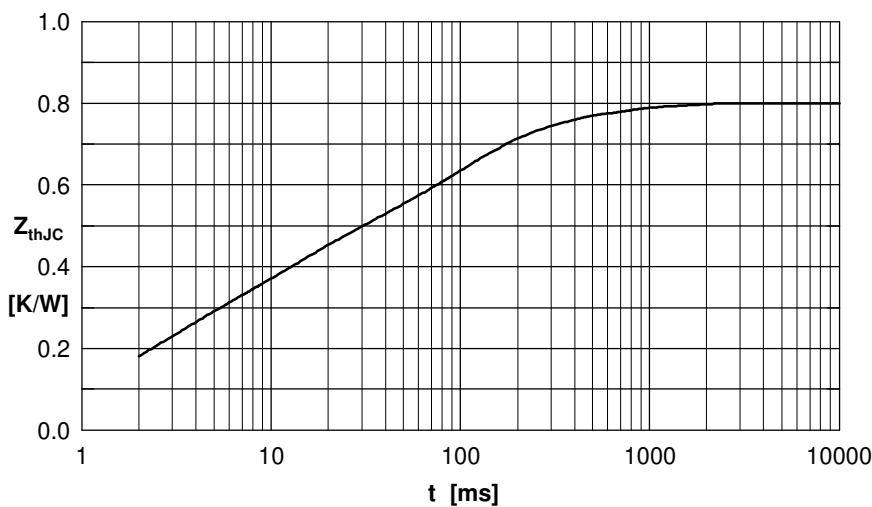


Fig. 7 Transient thermal resistance junction to case

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.200	0.0018
2	0.220	0.0100
3	0.080	0.5000
4	0.300	0.0900