

FRED

$$V_{RRM} = 200 \text{ V}$$

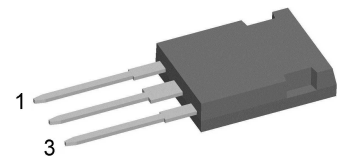
$$I_{FAV} = 2 \times 30 \text{ A}$$

$$t_{rr} = 20 \text{ ns}$$

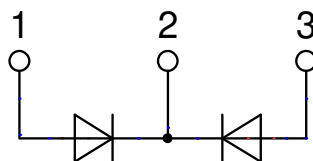
Fast Recovery Epitaxial Diode Common Cathode

Part number

DSEK60-02AR



Backside: isolated



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: ISOPLUS247

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

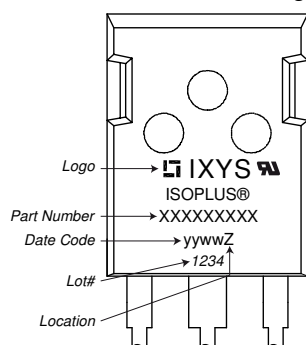
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Fast Diode				Ratings				
Symbol	Definition	Conditions		min.	typ.	max.	Unit	
V _{RSM}	max. non-repetitive reverse blocking voltage	T _{VJ} = 25°C				200	V	
V _{RRM}	max. repetitive reverse blocking voltage	T _{VJ} = 25°C				200	V	
I _R	reverse current, drain current	V _R = 200 V	T _{VJ} = 25°C			200	μA	
		V _R = 160 V	T _{VJ} = 125°C			5	mA	
V _F	forward voltage drop	I _F = 30 A	T _{VJ} = 25°C			1.16	V	
		I _F = 60 A				1.29	V	
		I _F = 30 A	T _{VJ} = 150°C			0.92	V	
		I _F = 60 A				1.09	V	
I _{FAV}	average forward current	T _C = 115°C rectangular d = 0.5	T _{VJ} = 150°C			30	A	
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 150°C		0.78	V	
r _F	slope resistance					4.9	mΩ	
R _{thJC}	thermal resistance junction to case					1.1	K/W	
R _{thCH}	thermal resistance case to heatsink				0.25		K/W	
P _{tot}	total power dissipation	T _C = 25°C				115	W	
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V		T _{VJ} = 45°C		325	A	
C _J	junction capacitance	V _R = 200 V f = 1 MHz		T _{VJ} = 25°C	77		pF	
I _{RM}	max. reverse recovery current	} I _F = 35 A; V _R = 100 V -di _F /dt = 200 A/μs		T _{VJ} = 25 °C	4		A	
				T _{VJ} = 125 °C	6		A	
t _{rr}	reverse recovery time			T _{VJ} = 25 °C	20		ns	
				T _{VJ} = 125 °C	45		ns	

Package ISOPLUS247				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal ⁿ				70	A
T_{VJ}	virtual junction temperature			-40		150	°C
T_{op}	operation temperature			-40		125	°C
T_{stg}	storage temperature			-40		150	°C
Weight					6		g
F_c	mounting force with clip			20		120	N
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal		2.7			mm
$d_{Spb/Apb}$		terminal to backside		4.1			mm
V_{ISOL}	isolation voltage	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3600			V
		t = 1 minute		3000			V

Product Marking



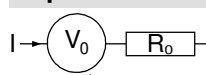
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEK60-02AR	DSEK60-02AR	Tube	30	480320

Similar Part	Package	Voltage class
DSEK60-02A	TO-247AD (3)	200

Equivalent Circuits for Simulation

* on die level

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



Fast Diode

$V_{0\max}$ threshold voltage

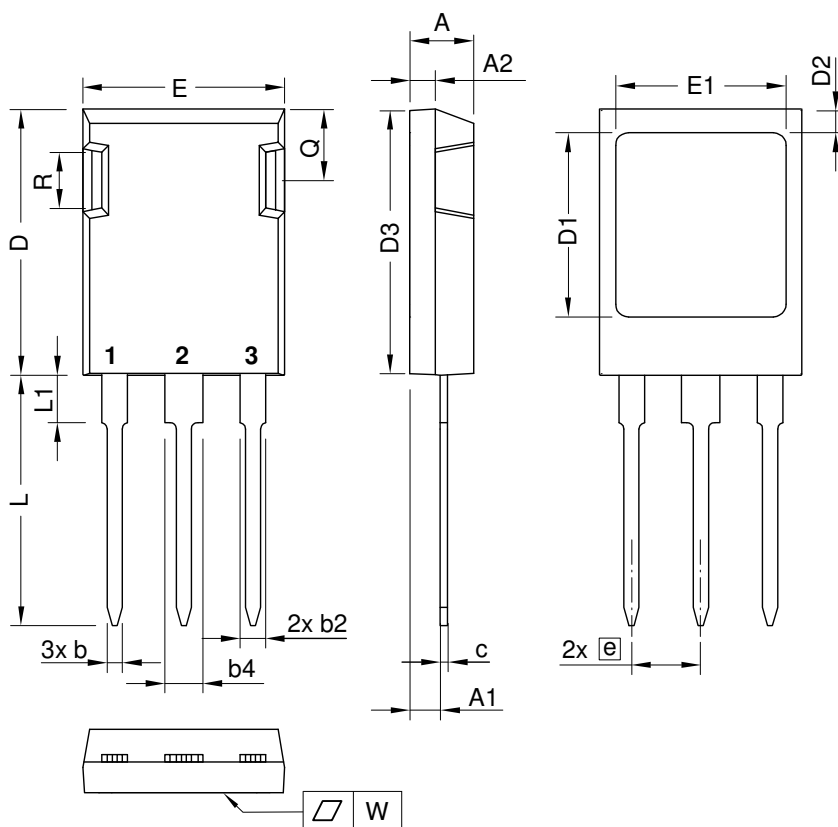
0.78

V

$R_{0\max}$ slope resistance *

2.4

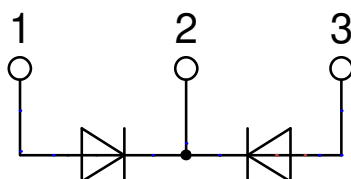
mΩ

Outlines ISOPLUS247


Dim.	Millimeter		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.14	1.40	0.045	0.055
b2	1.91	2.20	0.075	0.087
b4	2.92	3.24	0.115	0.128
c	0.61	0.83	0.024	0.033
D	20.80	21.34	0.819	0.840
D1	15.75	16.26	0.620	0.640
D2	1.65	2.15	0.065	0.085
D3	20.30	20.70	0.799	0.815
E	15.75	16.13	0.620	0.635
E1	13.21	13.72	0.520	0.540
e	5.45 BSC		0.215 BSC	
L	19.81	20.60	0.780	0.811
L1	3.81	4.38	0.150	0.172
Q	5.59	6.20	0.220	0.244
R	4.25	5.50	0.167	0.217
W	-	0.10	-	0.004

Die konvexe Form des Substrates ist typ. < 0.04 mm über der Kunststoffoberfläche der Bauteilunterseite
 The convex bow of substrate is typ. < 0.04 mm over plastic surface level of device bottom side

Die Gehäuseabmessungen entsprechen dem Typ TO-247 AD gemäß JEDEC außer Schraubloch und L_{max} .
 This drawing will meet all dimensions requirement of JEDEC outline TO-247 AD except screw hole and except L_{max} .



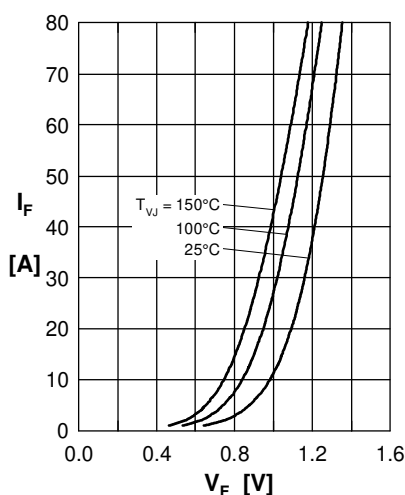
Fast Diode


Fig. 1 Forward current I_F versus max. forward voltage drop V_F

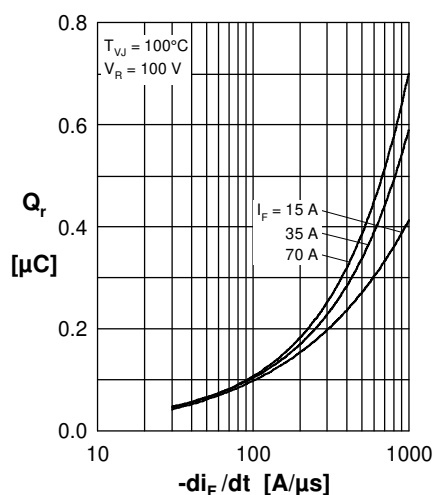


Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$

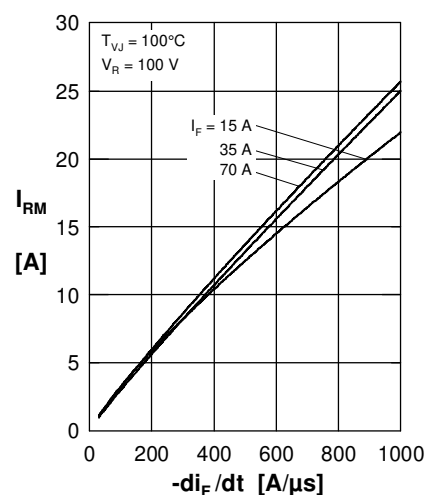


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

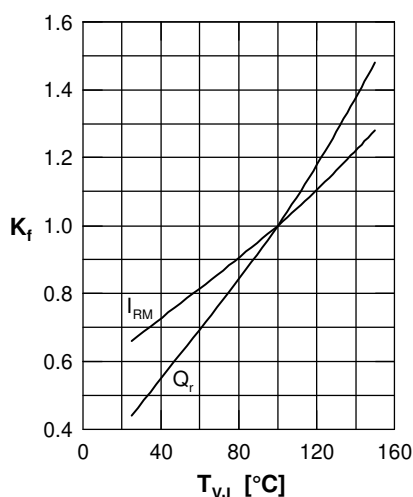


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

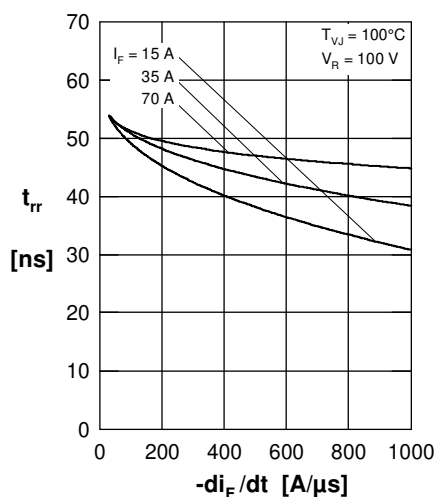


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

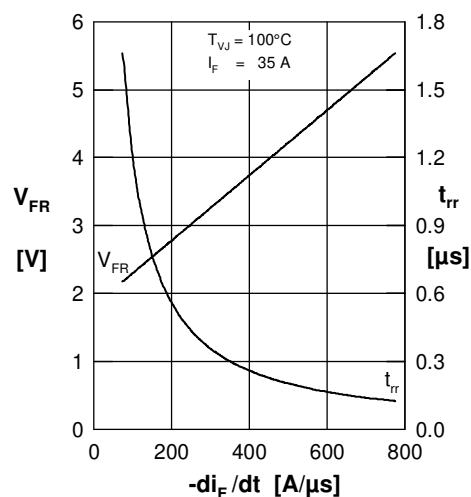


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

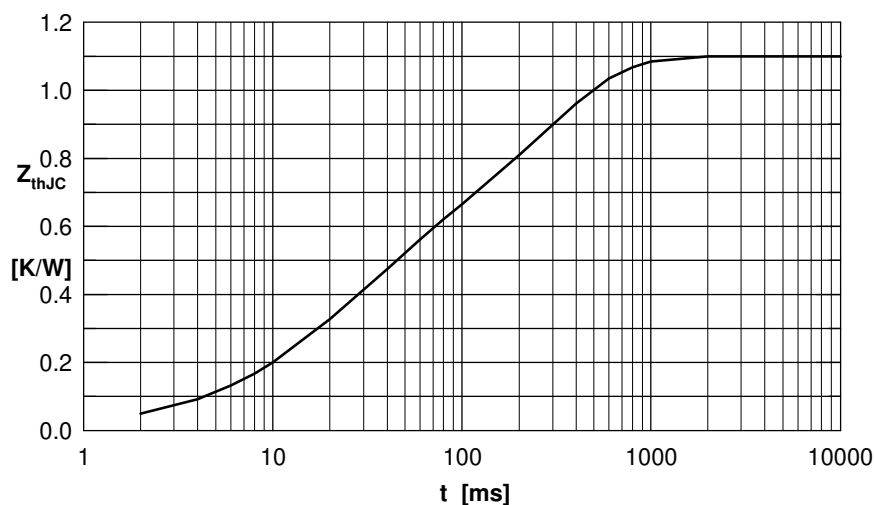


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.030	0.0100
2	0.100	0.0120
3	0.360	0.0300
4	0.610	0.2700