

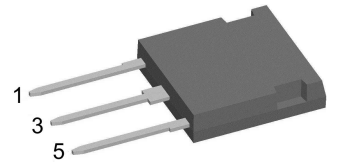
HiPerFRED

$V_{RRM} = 2 \times 1200 \text{ V}$
 $I_{FAV} = 60 \text{ A}$
 $t_{rr} = 40 \text{ ns}$


High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 Phase leg

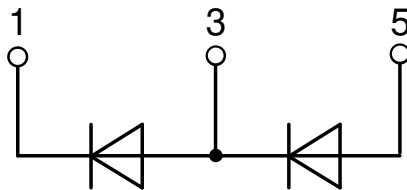
Part number

DSEE55-24N1F



Backside: isolated

 E72873



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: i4-Pac

- Isolation Voltage: 3000 V~
- Industry convenient outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

Disclaimer Notice

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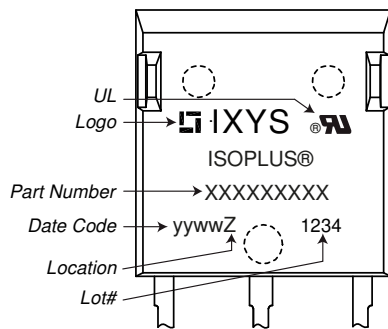


Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					1200	V
V_{RRM}	max. repetitive reverse blocking voltage					1200	V
I_R	reverse current, drain current	$V_R = 1200\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		1	mA
		$V_R = 1200\text{ V}$		$T_{VJ} = 150^\circ\text{C}$		4	mA
V_F	forward voltage drop	$I_F = 60\text{ A}$		$T_{VJ} = 25^\circ\text{C}$		2.45	V
		$I_F = 120\text{ A}$				2.90	V
		$I_F = 60\text{ A}$		$T_{VJ} = 150^\circ\text{C}$		1.56	V
		$I_F = 120\text{ A}$				2.00	V
I_{FAV}	average forward current	$T_C = 110^\circ\text{C}$	rectangular	$T_{VJ} = 175^\circ\text{C}$		60	A
V_{FO}	threshold voltage	} for power loss calculation only		$T_{VJ} = 175^\circ\text{C}$		0.97	V
r_F	slope resistance					6.8	mΩ
R_{thJC}	thermal resistance junction to case					0.6	K/W
R_{thCH}	thermal resistance case to heatsink				0.2		K/W
P_{tot}	total power dissipation			$T_C = 25^\circ\text{C}$		250	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$		$T_{VJ} = 45^\circ\text{C}$		800	A
C_J	junction capacitance	$V_R = 600\text{ V}$ $f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		48	pF
I_{RM}	max. reverse recovery current	} $I_F = 60\text{ A}; V_R = 600\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		13	A
				$T_{VJ} = 100^\circ\text{C}$		20	A
t_{rr}	reverse recovery time	} $-di_F/dt = 200\text{ A}/\mu\text{s}$		$T_{VJ} = 25^\circ\text{C}$		85	ns
				$T_{VJ} = 100^\circ\text{C}$		250	ns



Package i4-Pac		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			70	A
T_{VJ}	virtual junction temperature		-55		175	°C
T_{op}	operation temperature		-55		150	°C
T_{stg}	storage temperature		-55		150	°C
Weight				5.5		g
F_C	mounting force with clip		20		120	N
$d_{Spp/ App}$	creepage distance on surface striking distance through air	terminal to terminal	5.5			mm
$d_{Spb/ Apb}$		terminal to backside	5.1			mm
V_{ISOL}	isolation voltage	t = 1 second	3000			V
		t = 1 minute	2500			V

Product Marking



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEE55-24N1F	DSEE55-24N1F	Tube	25	488739

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 175^{\circ}C$

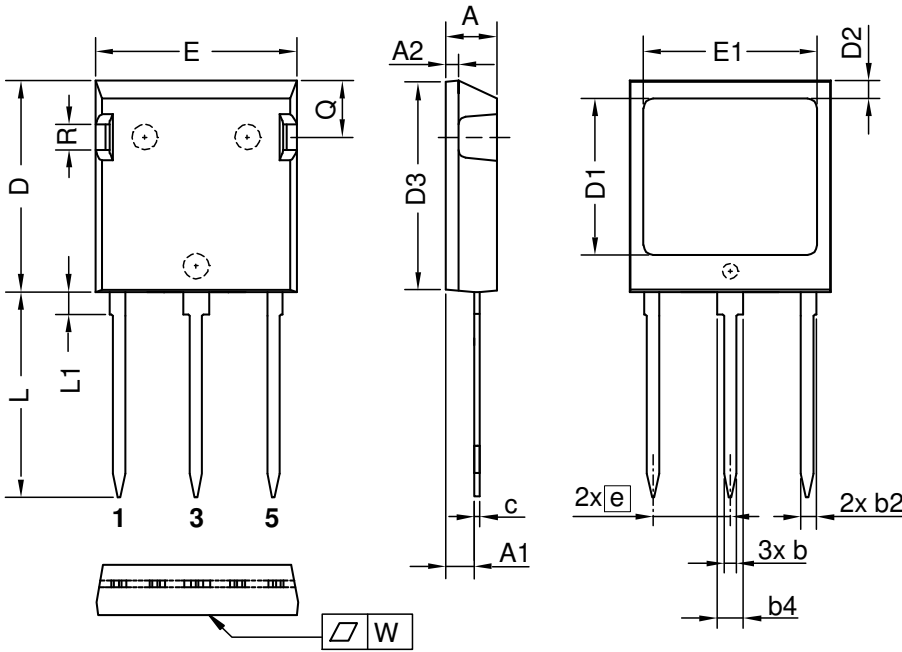


Fast Diode

$V_{0\ max}$	threshold voltage	0.97	V
$R_{0\ max}$	slope resistance *	4.4	mΩ

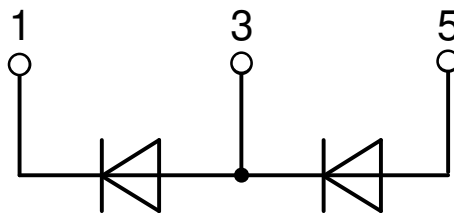


Outlines i4-Pac



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
b4	2.54	2.79	0.100	0.110
c	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
D3	20.30	20.70	0.799	0.815
E	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
e	7.62 BSC		0.300 BSC	
L	19.81	21.34	0.780	0.840
L1	2.11	2.59	0.083	0.102
Q	5.33	6.20	0.210	0.244
R	2.54	4.57	0.100	0.180
W	-	0.10	-	0.004

Die konvexe Form des Substrates ist typ. < 0.05 mm über der Kunststoffoberfläche der Bauteilunterseite
The convex bow of substrate is typ. < 0.05 mm over plastic surface level of device bottom side



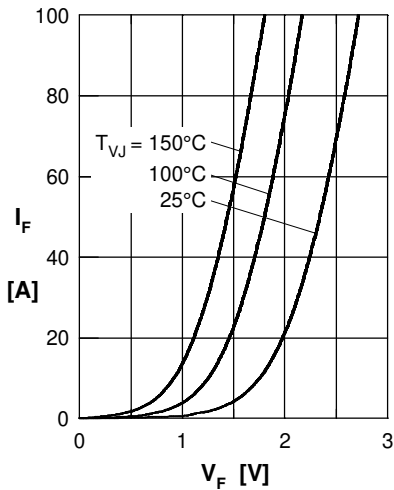
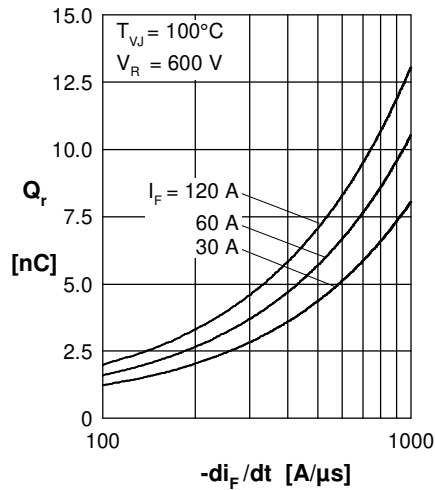
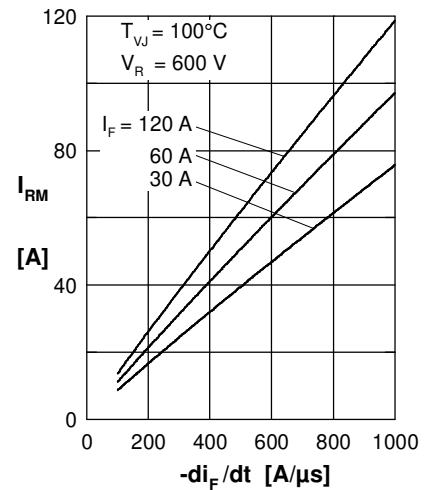
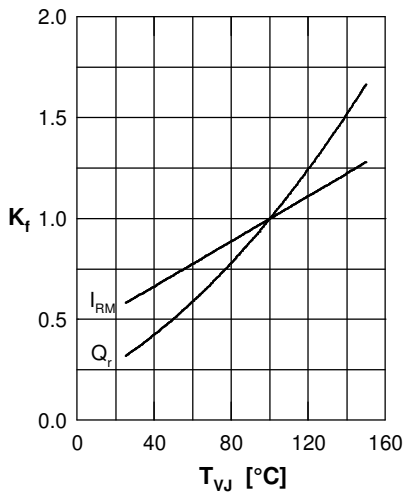
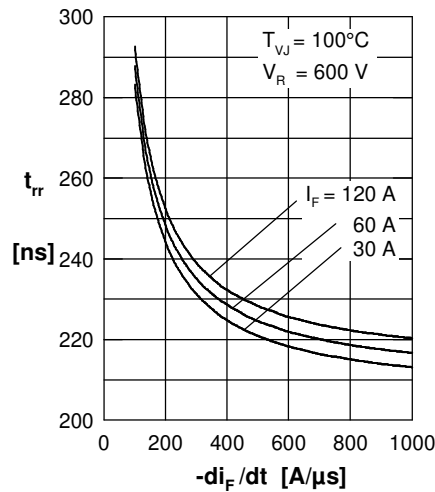
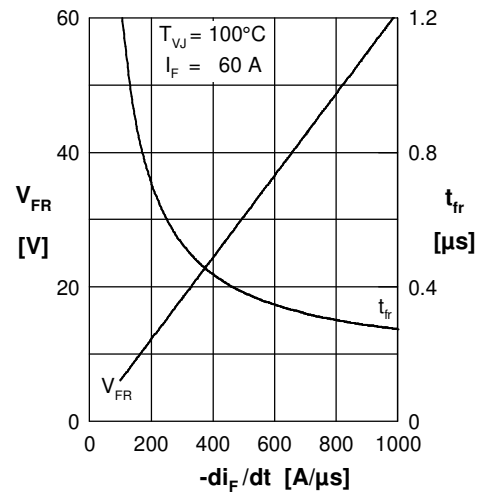
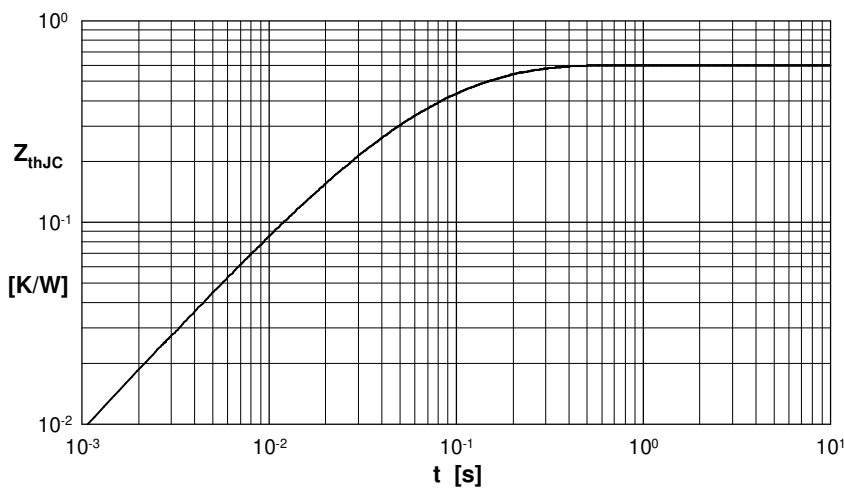
Fast Diode

 Fig. 1 Forward current I_F vs. V_F

 Fig. 2 Typ. reverse recovery 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 typ. forward recovery time t_{fr} 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	0.212	0.0055
2	0.248	0.0092
3	0.063	0.0007
4	0.077	0.0391