

# Standard Rectifier

$$V_{RRM} = 1600 \text{ V}$$

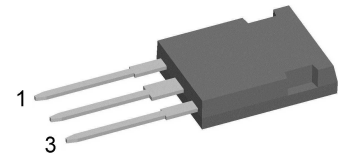
$$I_{FAV} = 2 \times 45 \text{ A}$$

$$V_F = 1.23 \text{ V}$$

## Common Cathode

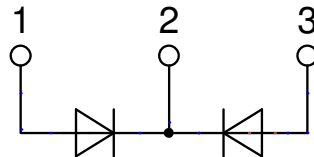
### Part number

**DSIK45-16AR**



Backside: isolated

 E72873



### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

### Applications:

- Diode for main rectification

### 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

### Terms .Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact the sales office, which is responsible for you.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the product in aviation, in health or live endangering or life support applications, please notify. For any such application we urgently recommend

- to perform joint risk and quality assessments;

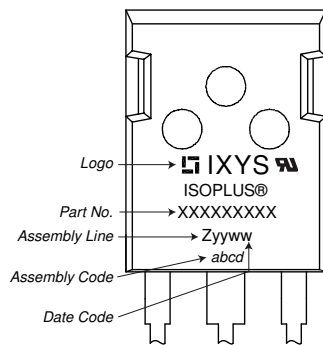
- the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

Rectifier				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{RSM}$	max. non-repetitive reverse blocking voltage				1700	V	
$V_{RRM}$	max. repetitive reverse blocking voltage				1600	V	
$I_R$	reverse current	$V_R = 1600$ V			40	$\mu$ A	
		$V_R = 1600$ V			1.5	mA	
$V_F$	forward voltage drop	$I_F = 45$ A			1.26	V	
		$I_F = 90$ A			1.57	V	
		$I_F = 45$ A			1.23	V	
		$I_F = 90$ A			1.66	V	
$I_{FAV}$	average forward current	$T_C = 100^\circ\text{C}$			45	A	
		sine $180^\circ$					
$V_{F0}$	threshold voltage	} for power loss calculation only			0.81	V	
$r_F$	slope resistance				9.1	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case				0.9	K/W	
$R_{thCH}$	thermal resistance case to heatsink			0.25		K/W	
$P_{tot}$	total power dissipation				165	W	
$I_{FSM}$	max. forward surge current	t = 10 ms; (50 Hz), sine			480	A	
		t = 8,3 ms; (60 Hz), sine			520	A	
		t = 10 ms; (50 Hz), sine			410	A	
		t = 8,3 ms; (60 Hz), sine			440	A	
$I^2t$	value for fusing	t = 10 ms; (50 Hz), sine			1.15	kA <sup>2</sup> s	
		t = 8,3 ms; (60 Hz), sine			1.13	kA <sup>2</sup> s	
		t = 10 ms; (50 Hz), sine			840	A <sup>2</sup> s	
		t = 8,3 ms; (60 Hz), sine			805	A <sup>2</sup> s	
$C_J$	junction capacitance	$V_R = 400$ V; f = 1 MHz			18	pF	

Package ISOPLUS247			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		175	°C
$T_{op}$	operation temperature		-40		150	°C
$T_{stg}$	storage temperature		-40		150	°C
<b>Weight</b>				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	3600			V
		t = 1 minute	3000			V

### Product Marking

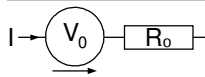


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSIK45-16AR	DSIK45-16AR	Tube	30	496022

### Equivalent Circuits for Simulation

\* on die level

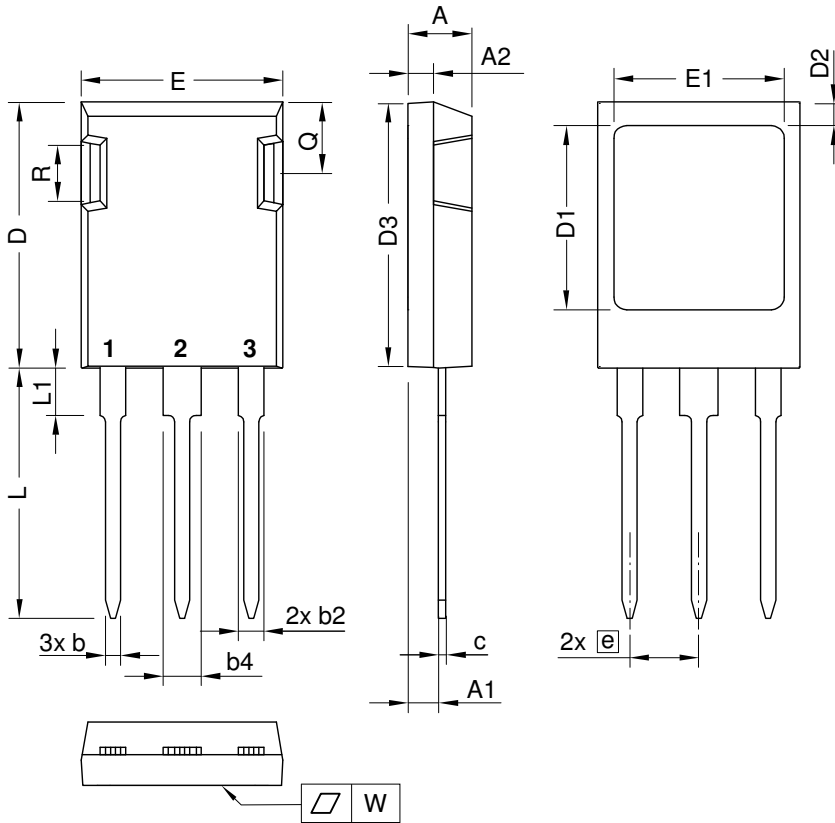
$T_{VJ} = 175\text{ °C}$



Rectifier

$V_{0\ max}$	threshold voltage	0.81	V
$R_{0\ max}$	slope resistance *	6.5	mΩ

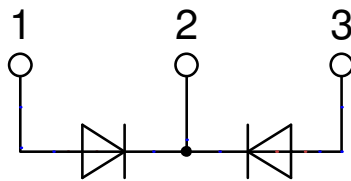
# Outlines ISOPLUS247



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  $L_{max}$ .



## Rectifier

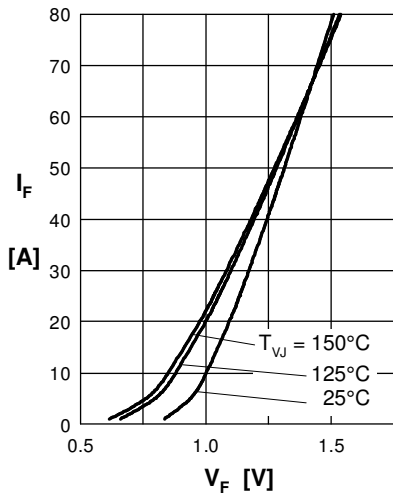


Fig. 1 Forward current versus voltage drop per diode

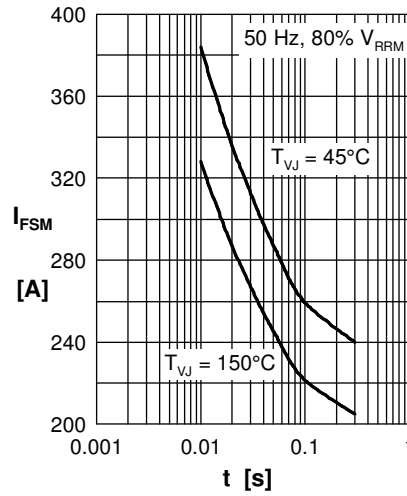


Fig. 2 Surge overload current

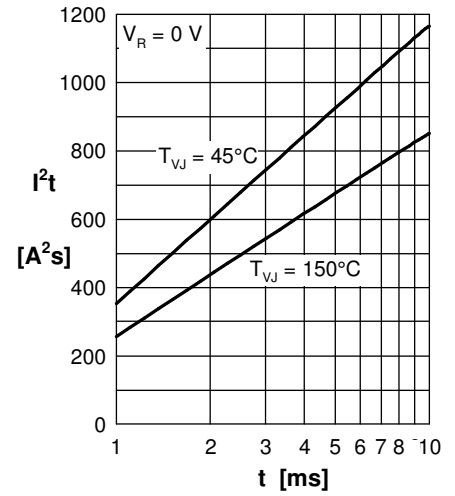


Fig. 3  $I^2t$  versus time per diode

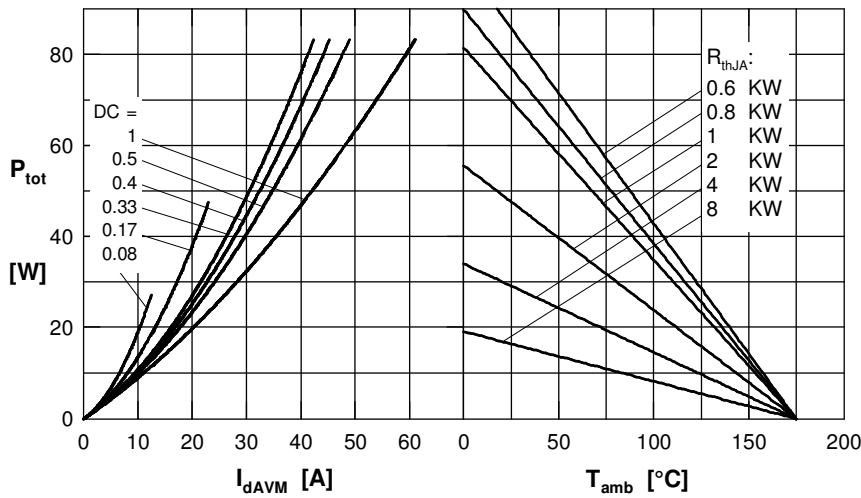


Fig. 4 Power dissipation vs. direct output current & ambient temperature

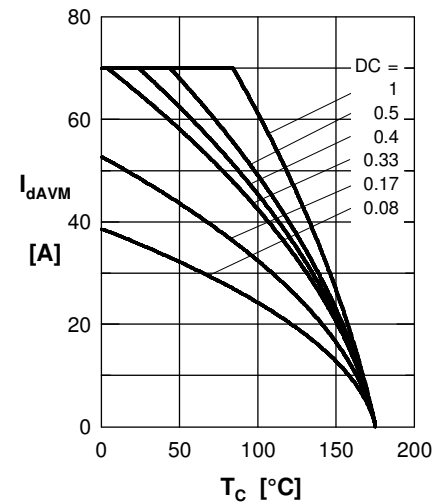


Fig. 5 Max. forward current vs. case temperature

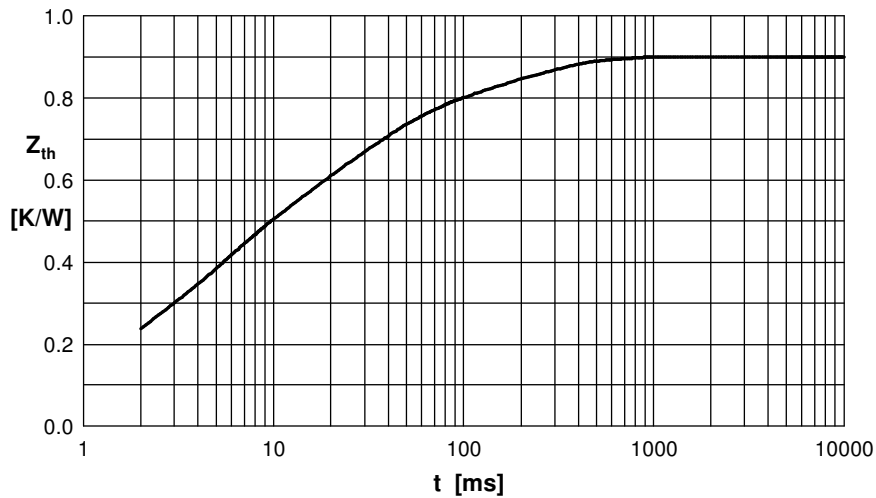


Fig. 6 Transient thermal impedance junction to case

i	R <sub>i</sub>	t <sub>i</sub>
1	0.0607	0.0004
2	0.123	0.00256
3	0.2305	0.045
4	0.323	0.0242
5	0.1628	0.18