

# Schottky Diode

$$V_{RRM} = 45\text{ V}$$

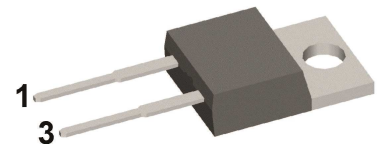
$$I_{FAV} = 25\text{ A}$$

$$V_F = 0.56\text{ V}$$

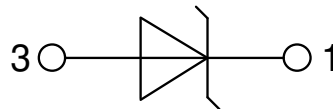
High Performance Schottky Diode  
 Low Loss and Soft Recovery  
 Single Diode

Part number

**DSS25-0045A**



Backside: cathode



### Features / Advantages:

- Very low  $V_f$
- Extremely low switching losses
- Low  $I_{rm}$  values
- Improved thermal behaviour
- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching

### Applications:

- Rectifiers in switch mode power supplies (SMPS)
- Free wheeling diode in low voltage converters

### Package: TO-220

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

### Disclaimer Notice

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Schottky				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					45	V
$V_{RRM}$	max. repetitive reverse blocking voltage					45	V
$I_R$	reverse current, drain current	$V_R = 45\text{ V}$	$T_{VJ} = 25^\circ\text{C}$			1	mA
		$V_R = 45\text{ V}$	$T_{VJ} = 125^\circ\text{C}$			10	mA
$V_F$	forward voltage drop	$I_F = 25\text{ A}$	$T_{VJ} = 25^\circ\text{C}$			0.68	V
		$I_F = 50\text{ A}$				0.81	V
		$I_F = 25\text{ A}$	$T_{VJ} = 125^\circ\text{C}$			0.56	V
		$I_F = 50\text{ A}$				0.71	V
$I_{FAV}$	average forward current	$T_C = 155^\circ\text{C}$ rectangular	$T_{VJ} = 175^\circ\text{C}$			25	A
$V_{FO}$	threshold voltage	} for power loss calculation only				0.36	V
$r_F$	slope resistance					5.9	mΩ
$R_{thJC}$	thermal resistance junction to case					1.1	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.5		K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		135	W
$I_{FSM}$	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$	$T_{VJ} = 45^\circ\text{C}$			400	A
$C_J$	junction capacitance	$V_R = 5\text{ V}$ $f = 1\text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		1.94		nF
$E_{AS}$	non-repetitive avalanche energy	$I_{AS} = 18\text{ A}$ $L = 180\text{ }\mu\text{H}$	$T_{VJ} = 25^\circ\text{C}$			46	mJ
$I_{AR}$	repetitive avalanche current	$V_A = 1.5 \cdot V_R$ typ. $f = 10\text{ kHz}$				1.8	A



Package TO-220			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			35	A
$T_{VJ}$	virtual junction temperature		-55		175	°C
$T_{op}$	operation temperature		-55		150	°C
$T_{stg}$	storage temperature		-55		150	°C
<b>Weight</b>				2		g
$M_D$	mounting torque		0.4		0.6	Nm
$F_C$	mounting force with clip		20		60	N

**Product Marking**



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSS25-0045A	DSS25-0045A	Tube	50	472433

**Equivalent Circuits for Simulation**

*\* on die level*

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

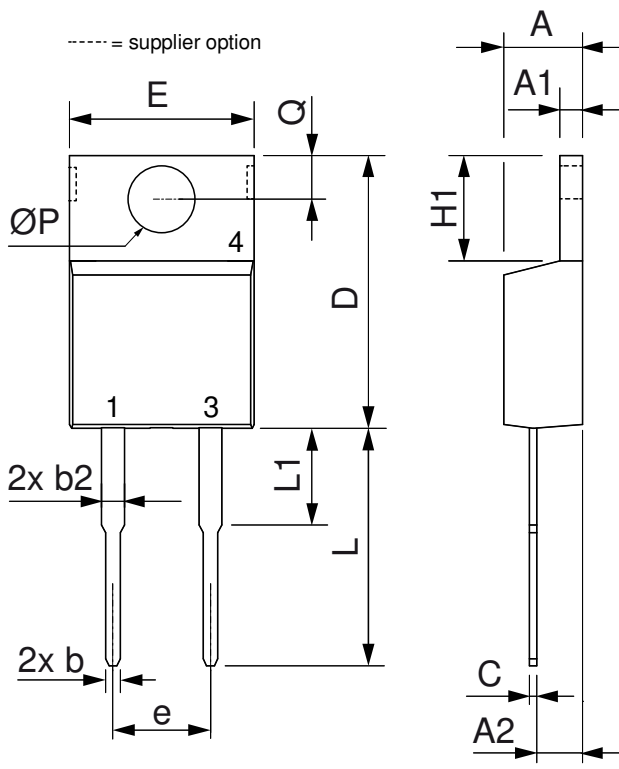


**Schottky**

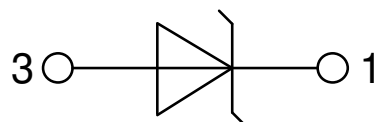
$V_{0\ max}$	threshold voltage	0.36	V
$R_{0\ max}$	slope resistance *	2.7	mΩ



**Outlines TO-220**



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	5.08	BSC	0.200	BSC
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
ØP	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125



**Schottky**

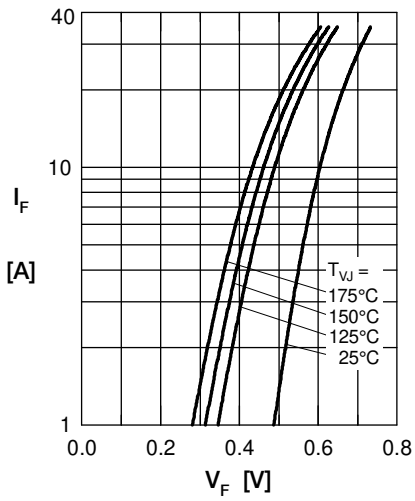


Fig. 1 Maximum forward voltage drop characteristics

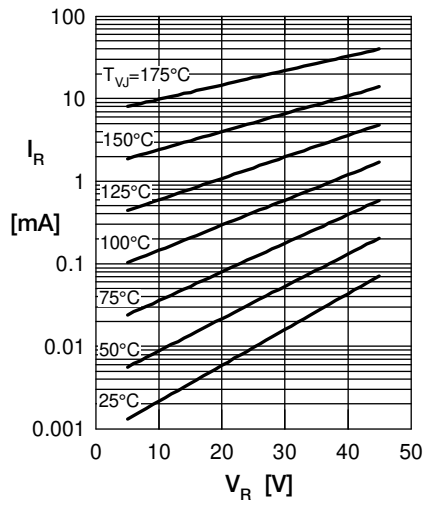


Fig. 2 Typ. reverse current  $I_R$  vs. reverse voltage  $V_R$

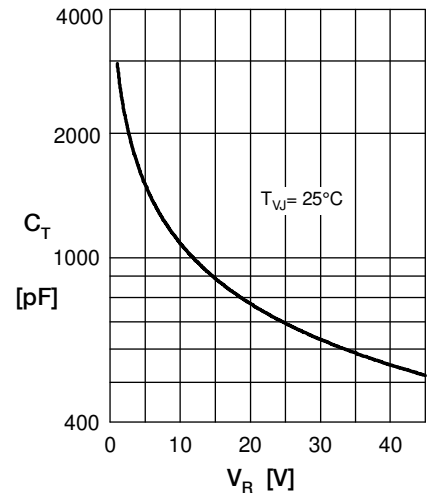


Fig. 3 Typ. junction capacitance  $C_T$  vs. reverse voltage  $V_R$

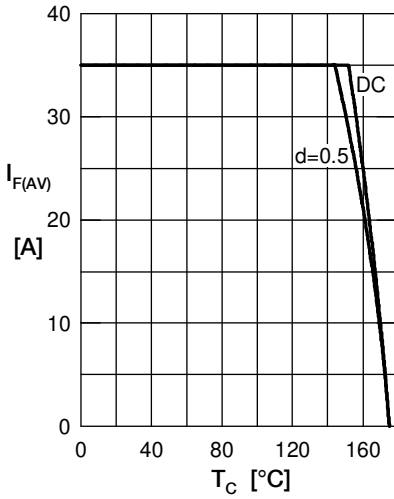


Fig. 4 Average forward current  $I_{F(AV)}$  vs. case temp.  $T_C$

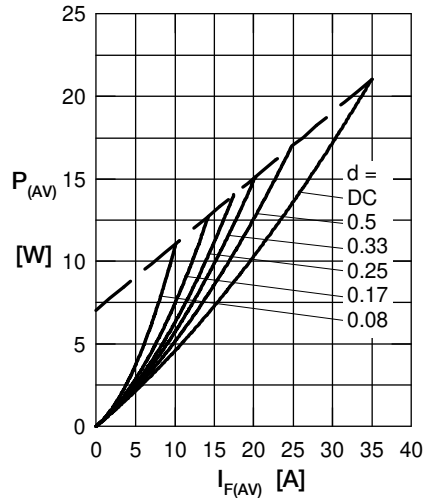


Fig. 5 Forward power loss characteristics

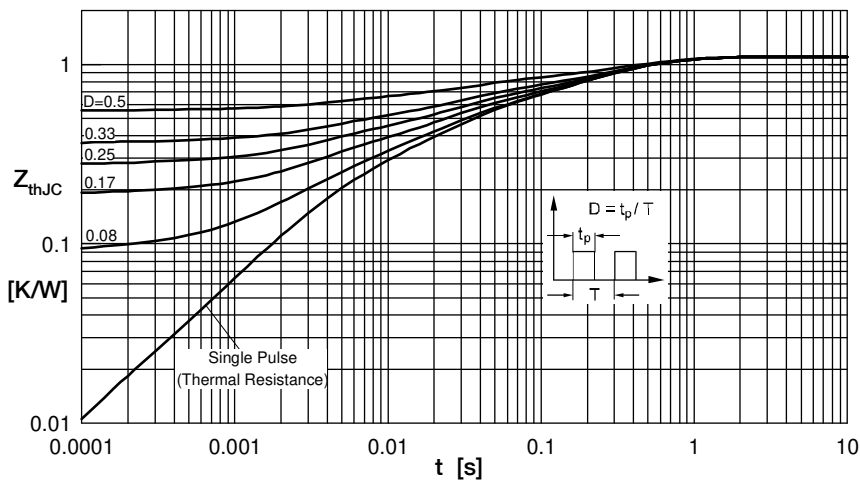


Fig. 6 Transient thermal impedance junction to case at various duty cycles

Note: All curves are per diode