

## The assembly two silicon epitaxial planar Schottky diodes with common cathode

### TYPICAL APPLICATIONS

The IDSJP1545 Schottky rectifier has been optimized for low forward voltage drop, with low leakage. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

### FEATURES

- Low Forward Voltage.
- High operating frequency.
- 150°C Operating Junction Temperature.
- Guard ring for enhanced ruggedness and long term reliability.
- Original design based on the structure of the set of sub-micron integrated Schottky diodes and pn junctions.
- Designed and qualified for industrial level.
- High resistance to avalanche breakdown.
- 100% control on the plates of resistance to avalanche breakdown.

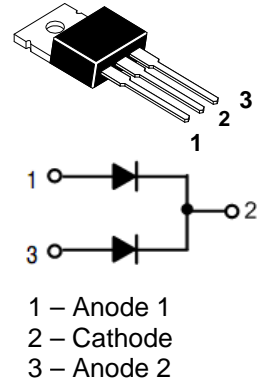


Figure 1 – The pin diode assembly  
IDSJP1545  
TO-220AB Package

**Table 1 – Absolute Maximum Ratings**

Parameter (test conditions)	Symbol	Values	Units
Peak Repetitive Reverse Voltage (Single phase, half wave, $t_p \leq 10$ ms, $f \geq 50$ Hz)	$V_{RRM}$	45	V
Breakdown voltage	$V_{(BR)}$	45	V
Maximum average forward current per leg	$I_{F(AV)}$	15	A
Maximum peak one cycle non-repetitive surge current per leg (Single phase, half wave, $t_p \leq 10$ ms)	$I_{FSM}$	150	A
Maximum junction temperature	$T_{J\ max}$	150	°C
Repetitive avalanche current per leg, ( $t_p \leq 2,0$ $\mu$ s, Frequency limited by $T_{J\ max}$ )	$I_{AR}$	5	A

**Table 2 – Electrical Characteristics** (@ $T_A = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop per leg (Note 1)	$V_F$	–	–	0.55	V	$I_F = 15\text{A}, T_J = 25^\circ\text{C}$
		–	–	0.52		$I_F = 15\text{A}, T_J = 125^\circ\text{C}$
		–	–	0.76		$I_F = 15\text{A}, T_J = -60^\circ\text{C}$
Forward Voltage Drop per leg (Note 1)	$V_F$	–	–	0.76	V	$I_F = 30\text{A}, T_J = 25^\circ\text{C}$
Reverse Leakage Current per leg	$I_R$	–	–	0.12	mA	$V_R = 45\text{V}, T_J = 25^\circ\text{C}$
		–	–	80.0		$V_R = 45\text{V}, T_J = 125^\circ\text{C}$
		–	–	0.12		$V_R = 45\text{V}, T_J = -60^\circ\text{C}$
Junction capacitance per leg	$C_T$	–	800	1000	pF	$V_R = 5\text{V}, f = 1\text{MHz}$ $T_J = 25^\circ\text{C}$

Note  
1 – Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %

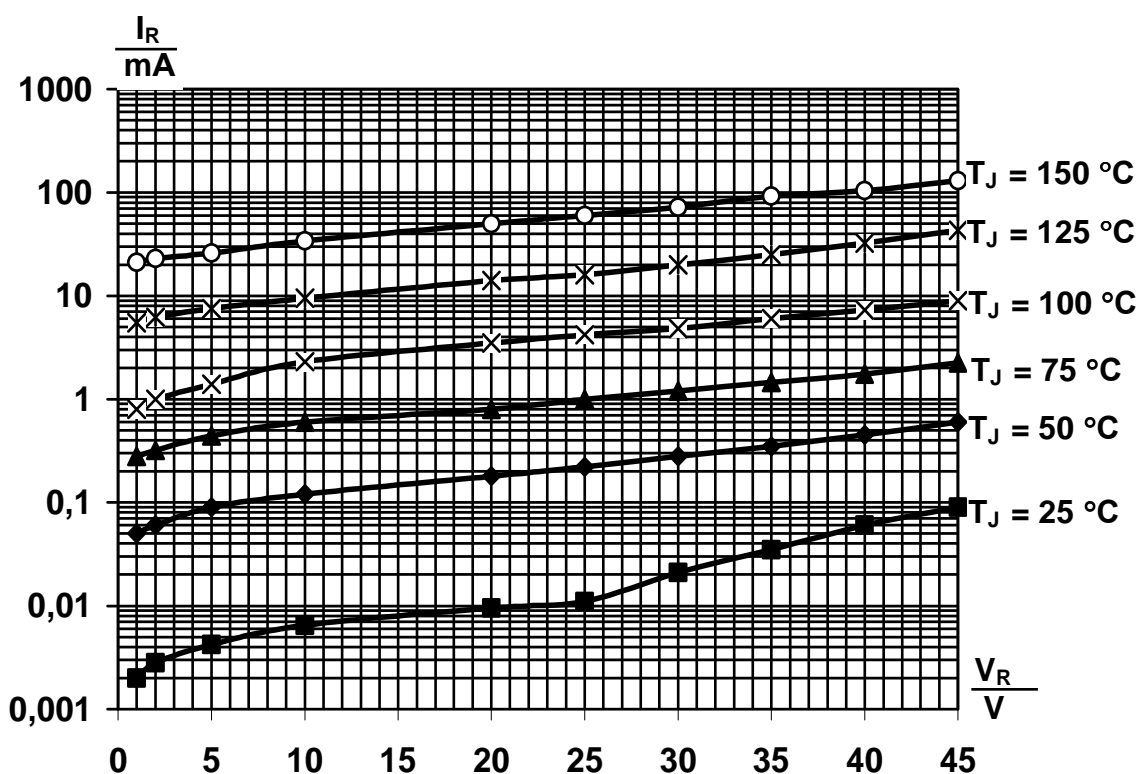


Figure 2 – Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

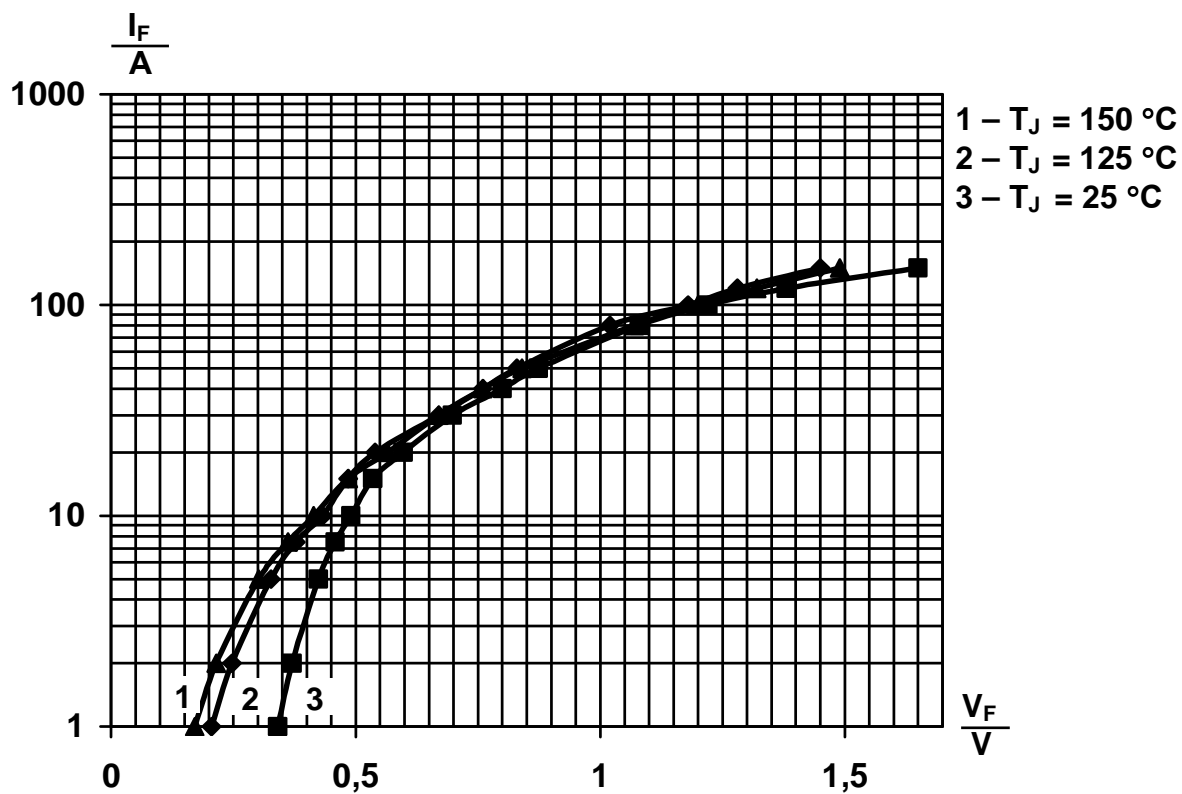


Figure 3 – Typical Forward Voltage Drop Characteristics (Per Leg)

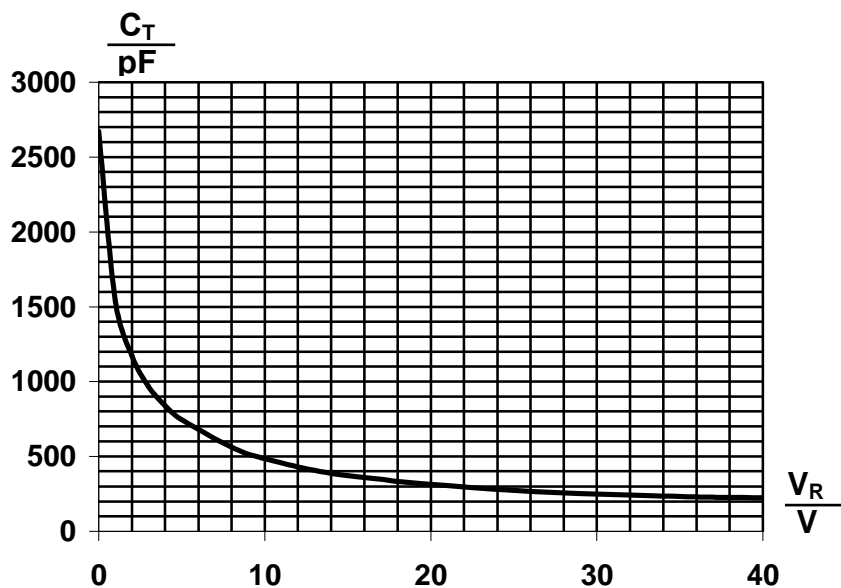
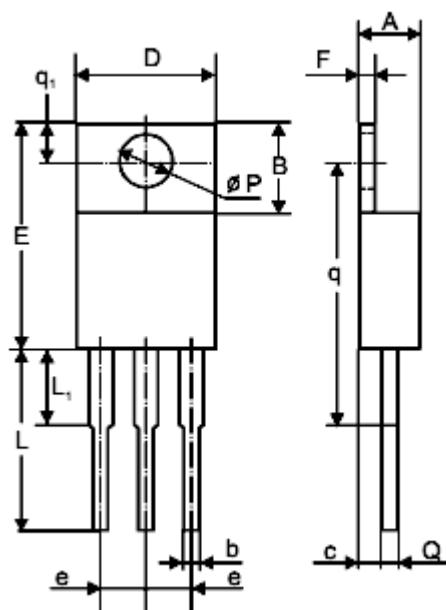


Figure 4 – Typical Junction Capacitance vs. Reverse Voltage (Per Leg)



SYMBOL	MILLIMETERS	
	min	max
A	4,32	4,8
B	5,9	6,8
b	0,6	0,85
c	2,3	2,5
D	10,37	10,7
E	15,2	15,9
e	2,49	2,59
F	1,1	1,3
L	13,4	13,6
L <sub>1</sub>	3,06	3,79
P	3,6	3,73
Q	0,56	0,7
q	15,785	16,465
q <sub>1</sub>	2,6	3,0

Figure 5 – Package dimensions. Conforms to JEDEC outline TO-220AB.

Schottky diode chips IDSJZ1545 with bond pads, without the chip carrier, without leads, supplied on the common wafer or separated and packed in special packages

**Physical characteristics:**

Wafer diameter, mm .....  $100 \pm 0,5$

Wafer thickness,  $\mu\text{m}$  .....  $280 \pm 20$

Die size, mm .....  $2,67 \times 2,67$

Scribe width,  $\mu\text{m}$  ..... 80

Metallization:

Front side (anode) ..... Al or Al-Ti-Ni-Ag

Back side (cathode) ..... Ti-Ni-Ag

Anode pads size, mm .....  $2,51 \times 2,51$

Anode pads thickness,  $\mu\text{m}$

– Al:  $(4,0 \pm 0,4)$ ;

– Al-Ti-Ni-Ag:  $(1,4 \pm 0,2)$ – $(0,1 \pm 0,02)$ – $(0,5 \pm 0,1)$ – $(0,6 \pm 0,1)$

Cathode metallization thickness,  $\mu\text{m}$

– Ti-Ni-Ag:  $(0,1 \pm 0,02)$ – $(0,5 \pm 0,1)$ – $(0,6 \pm 0,1)$

