

International IOR Rectifier

SCHOTTKY RECTIFIER

20CJQ045

2 Amp



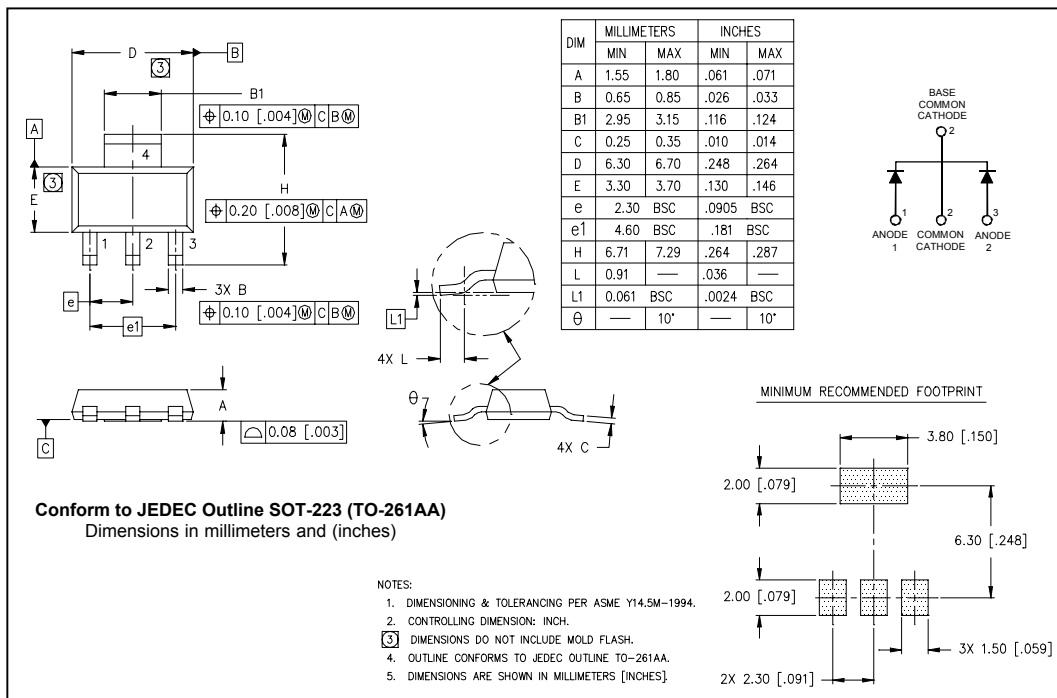
Major Ratings and Characteristics

Characteristics	20CJQ045	Units
$I_{F(AV)}$ Rectangular waveform	2.0	A
V_{RRM}	45	V
I_{FSM} @ $t_p = 5 \mu s$ sine	390	A
V_F @ 1 Apk, $T_J = 125^\circ C$ (per leg)	0.50	V
T_J range	-55 to 150	$^\circ C$

Description/Features

The 20CJQ045 surface mount Schottky rectifier series has been designed for applications requiring very low forward drop and very small foot prints. Typical applications are in portables, switching power supplies, converters, automotive system, free-wheeling diodes, battery charging, and reverse battery protection.

- Small footprint, surface mountable
- Low profile
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Common cathode



Voltage Ratings

Part number	20CJQ045
V_R Max. DC Reverse Voltage (V)	45
V_{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	Values	Units	Conditions
$I_{F(AV)}$ Max. Average Forward (Per Leg) Current * See Fig. 5 (Per Device)	2	A	50% duty cycle @ $T_C = 126^\circ\text{C}$, rectangular wave form
	4		50% duty cycle @ $T_C = 102^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	390	A	5 μs Sine or 3 μs Rect. pulse
	23		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	15	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 0.2\text{ Amps}$, $L = 750\text{ mH}$
I_{AR} Repetitive Avalanche Current (Per Leg)	0.2	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	Values	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.54	V	@ 1A
	0.67	V	@ 2A
	0.50	V	@ 1A
	0.65	V	@ 2A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.1	mA	$T_J = 25^\circ\text{C}$
	10	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.278	V	$T_J = T_J \text{ max.}$
r_t Forward Slope Resistance	168.4	m Ω	
C_T Typ. Junction Capacitance (Per Leg)	70	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance (Per Leg)	6	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change	7700	V/ μs	(Rated V_R)

(1) Pulse Width < 300 μs , Duty Cycle <2%

Thermal-Mechanical Specifications

Parameters	Values	Units	Conditions
T_J Max. Junction Temperature Range (*)	-55 to 150	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
R_{thJA} Max. Thermal Resistance Junction to Ambient	65	$^\circ\text{C/W}$	DC operation
R_{thJL} Max. Thermal Resistance Junction to Lead	25	$^\circ\text{C/W}$	DC operation
wt Approximate Weight	0.13(.0045)	g (oz.)	
Case Style	SOT-223		
Device Marking	2CJQF		

(*) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{th}(j-a)}$ thermal runaway condition for a diode on its own heatsink

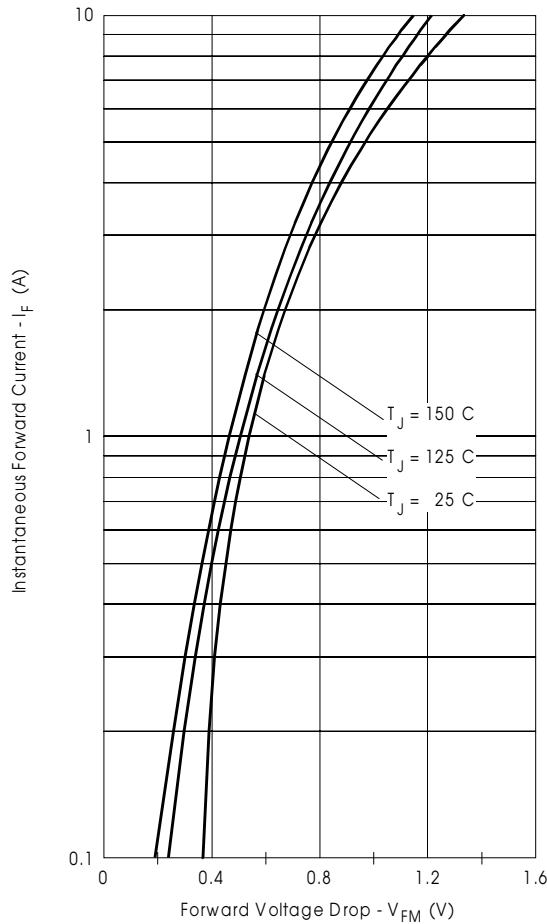


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

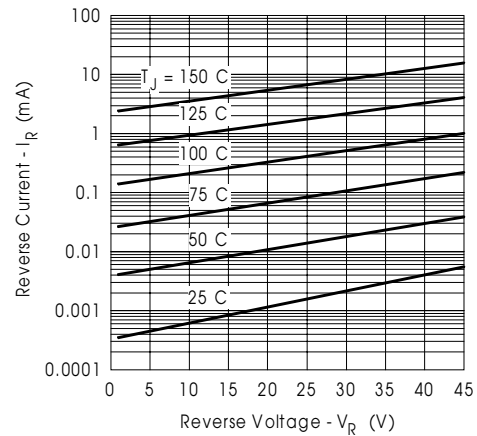


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

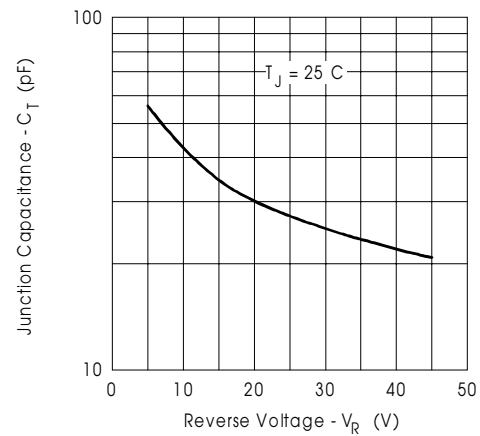


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

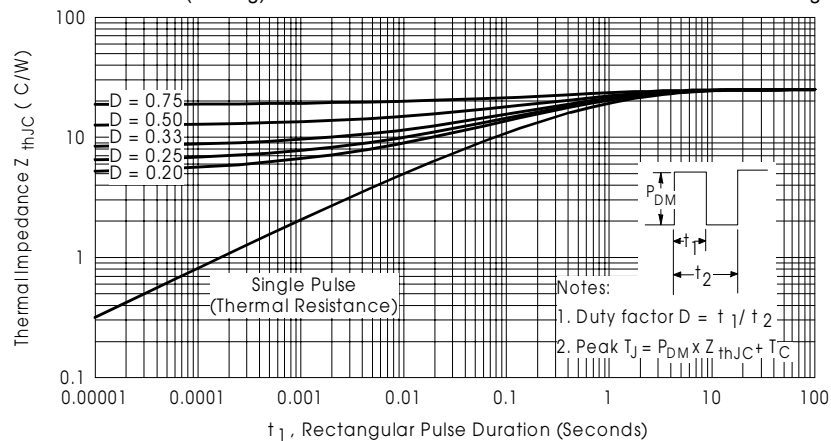


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

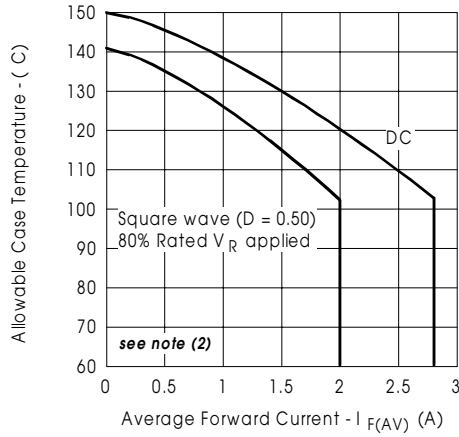


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

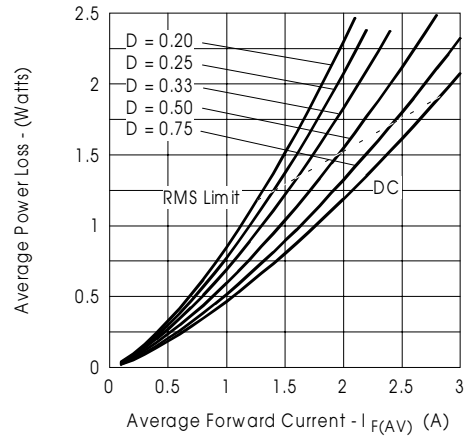


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

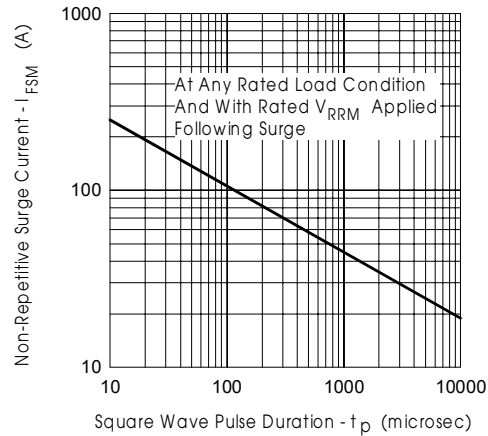


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

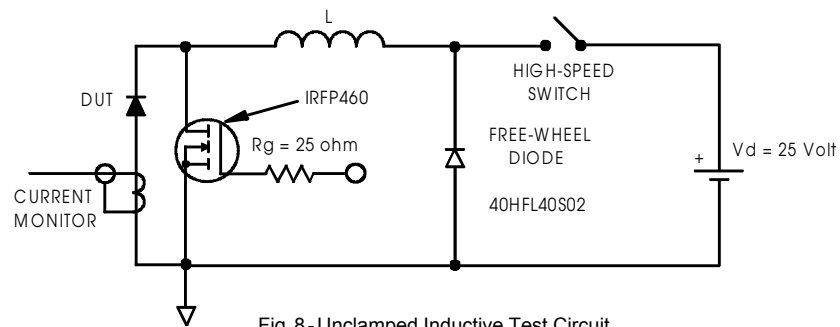


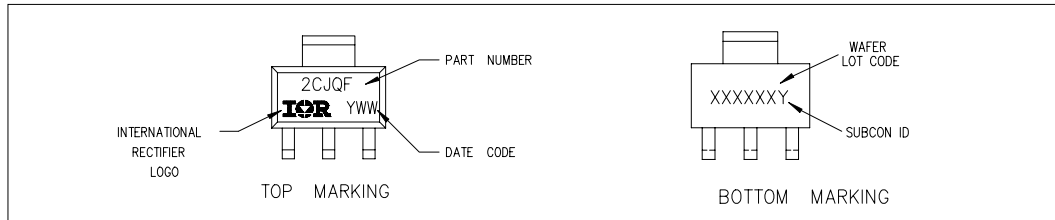
Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$

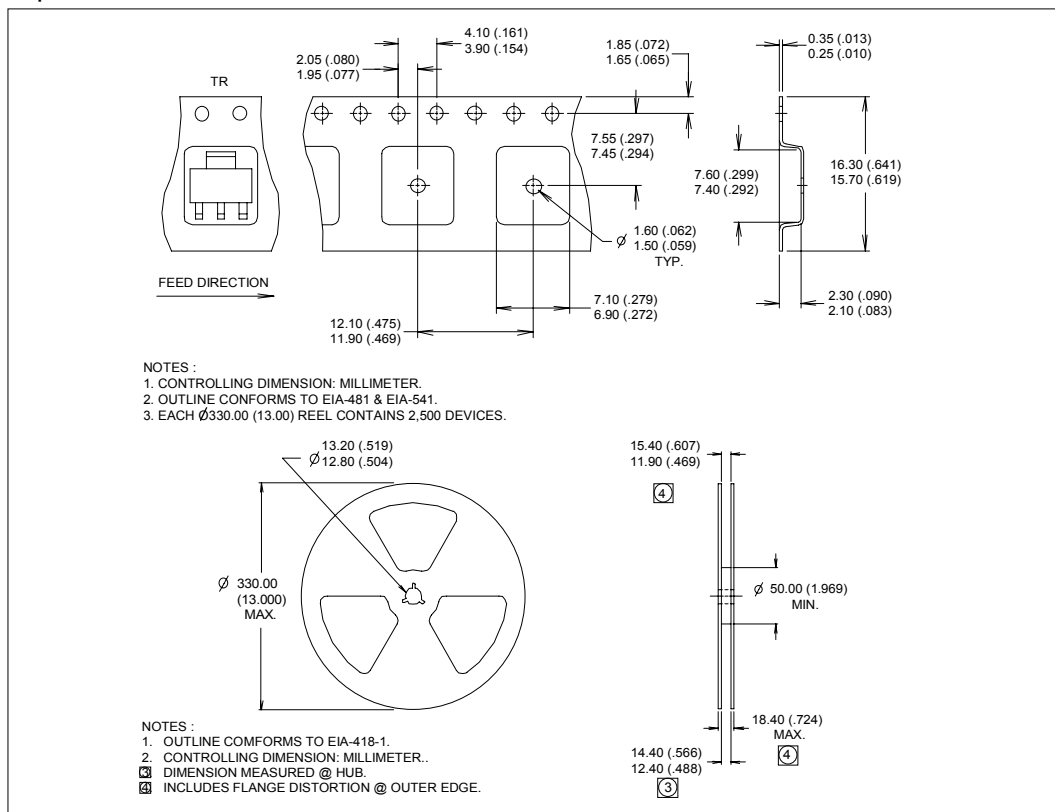
P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\% \text{ rated } V_R$

Marking Information



Tape and Reel Information



Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.