

### SCHOTTKY RECTIFIER

2 Amp

#### Major Ratings and Characteristics

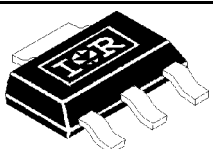
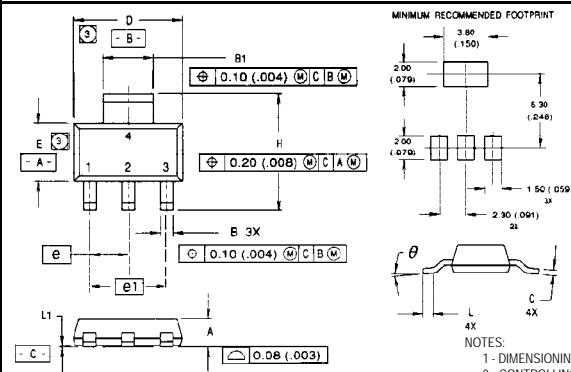
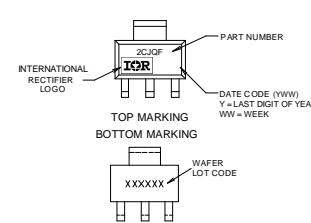
Characteristics	20CJQ045	Units
$I_{F(AV)}$ Rectangular waveform	2.0	A
$V_{RRM}$	45	V
$I_{FSM}$ @ $t_p = 5\mu s$ sine	390	A
$V_F$ @ 1.0Apk, $T_J = 125^\circ C$ (per leg)	0.46	V
$T_J$	-55 to 150	$^\circ C$

#### Description / Features

The 20CJQ045 surface-mount Schottky rectifier 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 systems, 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

### SOT-223

CASE STYLE	CASE OUTLINE																																																																						
																																																																							
<h4>PART MARKING</h4> 	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">DIM</th> <th colspan="2">MILLIMETERS</th> <th colspan="2">INCHES</th> </tr> <tr> <th>MIN</th> <th>MAX</th> <th>MIN</th> <th>MAX</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>1.56</td> <td>1.80</td> <td>.061</td> <td>.071</td> </tr> <tr> <td>B</td> <td>0.65</td> <td>0.85</td> <td>.026</td> <td>.033</td> </tr> <tr> <td>B1</td> <td>2.95</td> <td>3.15</td> <td>.116</td> <td>.124</td> </tr> <tr> <td>C</td> <td>0.25</td> <td>0.35</td> <td>.010</td> <td>.014</td> </tr> <tr> <td>D</td> <td>6.30</td> <td>6.70</td> <td>.248</td> <td>.264</td> </tr> <tr> <td>E</td> <td>3.30</td> <td>3.70</td> <td>.130</td> <td>.146</td> </tr> <tr> <td>e</td> <td>2.30</td> <td>BSC</td> <td>.0905</td> <td>BSC</td> </tr> <tr> <td>e1</td> <td>4.60</td> <td>BSC</td> <td>.181</td> <td>BSC</td> </tr> <tr> <td>H</td> <td>6.71</td> <td>7.29</td> <td>.267</td> <td>.284</td> </tr> <tr> <td>L</td> <td>—</td> <td>0.91</td> <td>—</td> <td>.036</td> </tr> <tr> <td>L1</td> <td>0.02</td> <td>0.10</td> <td>.0008</td> <td>.004</td> </tr> <tr> <td>theta</td> <td>—</td> <td>10° MAX</td> <td>—</td> <td>10° MAX</td> </tr> </tbody> </table> <p>NOTES:            1 - DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.            2 - CONTROLLING DIMENSION: INCH.            3 - DIMENSIONS DO NOT INCLUDE MOLD FLASH.            (C) CONFORMS TO JEDEC OUTLINE TO-261AA.</p>		DIM	MILLIMETERS		INCHES		MIN	MAX	MIN	MAX	A	1.56	1.80	.061	.071	B	0.65	0.85	.026	.033	B1	2.95	3.15	.116	.124	C	0.25	0.35	.010	.014	D	6.30	6.70	.248	.264	E	3.30	3.70	.130	.146	e	2.30	BSC	.0905	BSC	e1	4.60	BSC	.181	BSC	H	6.71	7.29	.267	.284	L	—	0.91	—	.036	L1	0.02	0.10	.0008	.004	theta	—	10° MAX	—	10° MAX
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# 20CJQ045



## 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		20CJQ	Units	Conditions
$I_{F(AV)}$	Max. Average Forward Current See Fig. 5	2.0	A	50% duty cycle @ $T_C = 126^\circ\text{C}$ , rectangular waveform
		4.0		50% duty cycle @ $T_C = 110^\circ\text{C}$ , rectangular waveform
$I_{FSM}$	Max. Peak One Cycle Non - Repetitive Surge Current (Per Leg) See Fig. 7	390	A	Following any rated load condition and with rated $V_{RWM}$ applied.
		23		
$E_{AS}$	Non - Repetitive Avalanche Energy (Per Leg)	15	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 0.2\text{A}$ , $L = 750\text{mH}$
$I_{AR}$	Repetitive Avalanche Current (Per Leg)	0.2	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical

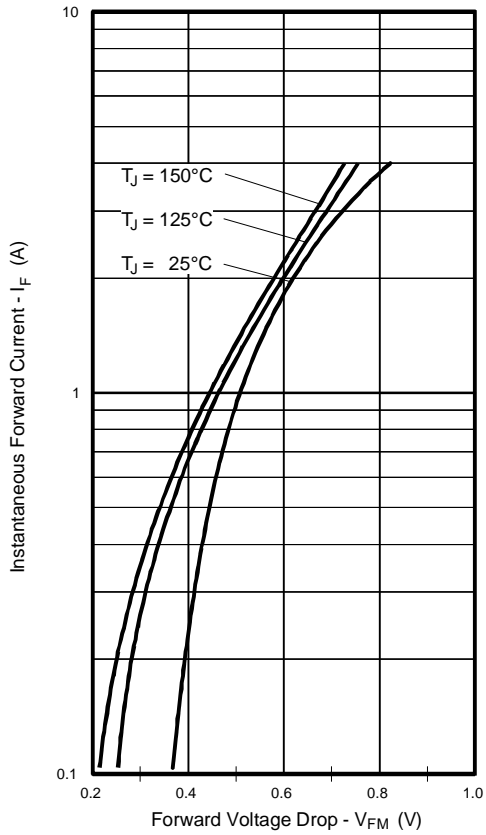
## Electrical Specifications

Parameters		20CJQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (Per Leg) See Fig. 1	①	0.50	V	@ 1.0A
		0.62	V	@ 2.0A
		0.46	V	@ 1.0A
		0.60	V	@ 2.0A
$I_{RM}$ Max. Reverse Leakage Current (Per Leg) See Fig. 2	①	0.1	mA	$T_J = 25^\circ\text{C}$
		7.5	mA	$T_J = 125^\circ\text{C}$
$C_T$ Max. Junction Capacitance (Per Leg)		70	pF	$V_R = 5V_{DC}$ , (test signal range 100kHz to 1MHz) $25^\circ\text{C}$
$L_S$ Typical Series Inductance (Per Leg)		6.0	nH	Measured lead to lead 5mm from package body
$dv/dt$ Max. Voltage Rate of Change (Rated $V_R$ )		7700	V/ $\mu\text{s}$	

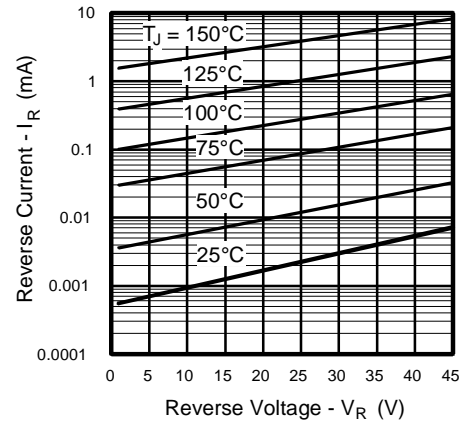
## Thermal-Mechanical Specifications

Parameters		20CJQ	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	$^\circ\text{C}/\text{W}$	DC operation
$R_{thJL}$	Max. Thermal Resistance, Junction to Lead	25	$^\circ\text{C}/\text{W}$	DC operation — see Fig. 4.
wt	Approximate Weight	0.13(.0045)	g (oz.)	
	Case Style	SOT-223		

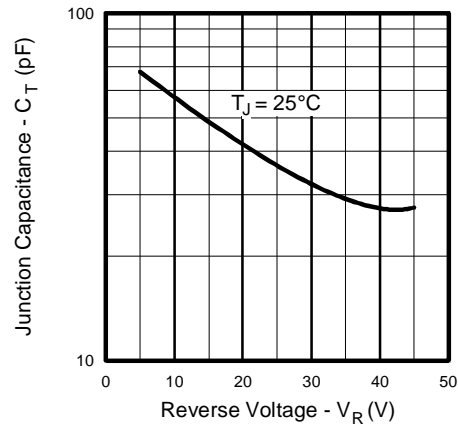
① Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%



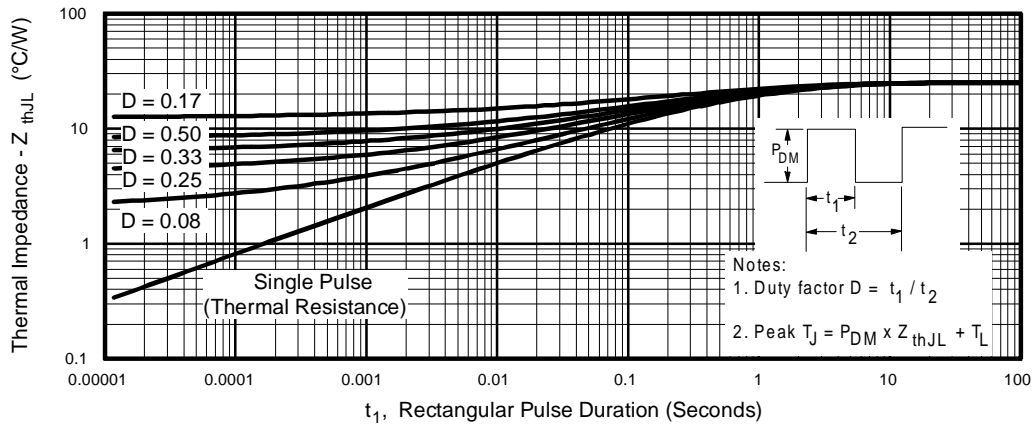
**Fig. 1** Max. Forward Voltage Drop Characteristics (Per Leg)



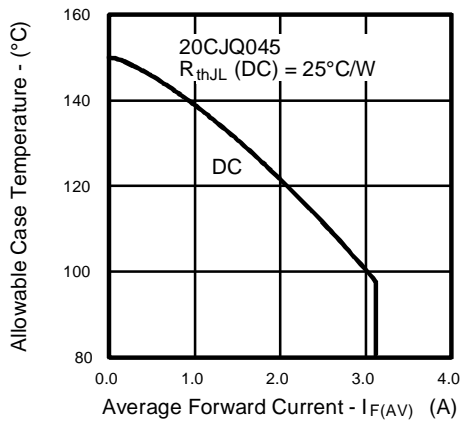
**Fig. 2** Typical Values of Reverse Current Vs. Reverse Voltage (Per Leg)



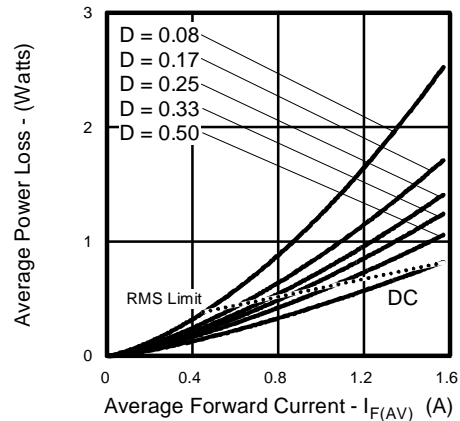
**Fig. 3** Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)



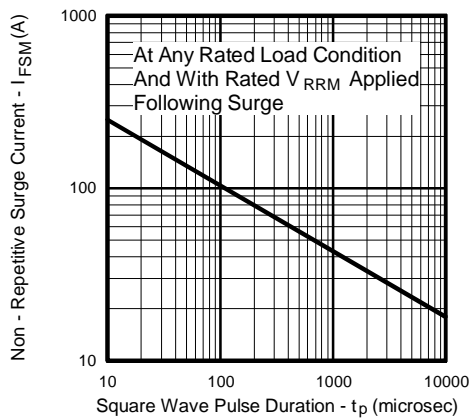
**Fig. 4** Max. Thermal Impedance  $Z_{thJL}$  Characteristics (Per Leg)



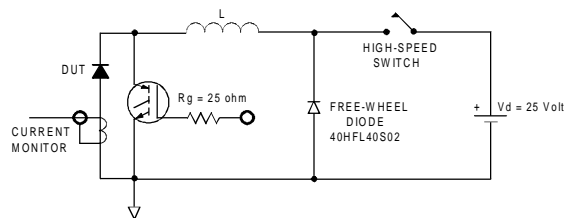
**Fig. 5** Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)



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



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



**Fig. 8** Unclamped Inductive Test Circuit

Refer to the Appendix Section for the following:

**Appendix D:** Tape and Reel Information — See page 340.