



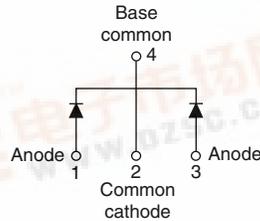
# 20CJQ100PbF

Vishay High Power Products

## Schottky Rectifier, 2 x 1 A



SOT-223



### FEATURES

- Small foot print, surface mountable
- Low profile
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Common cathode
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level



RoHS\*  
COMPLIANT

### PRODUCT SUMMARY

$I_{F(AV)}$	2 x 1 A
$V_R$	100 V

### DESCRIPTION

The 20CJQ100PbF 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, freewheeling diodes, battery charging, and reverse battery protection.

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	2	A
$V_{RRM}$		100	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	380	A
$V_F$	1 Apk, $T_J = 125^\circ C$ (per leg)	0.67	V
$T_J$	Range	- 55 to 175	$^\circ C$

### VOLTAGE RATINGS

PARAMETER	SYMBOL	20CJQ100PbF	UNITS
Maximum DC reverse voltage	$V_R$	100	V
Maximum working peak reverse voltage	$V_{RWM}$		

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 129^\circ C$ , rectangular waveform	1	A
			2	
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	380	A
		10 ms sine or 6 ms rect. pulse	22	
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25^\circ C$ , $I_{AS} = 1 A$ , $L = 2 mH$	1	mJ
Repetitive avalanche current per leg	$I_{AR}$	Current decaying linearly to zero in 1 $\mu s$ Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical	1	A



\*Pb-containing terminations are not RoHS compliant, exemptions may apply

# 20CJQ100PbF



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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	1 A	$T_J = 25\text{ }^\circ\text{C}$	0.79	V
		2 A		0.89	
		1 A	$T_J = 125\text{ }^\circ\text{C}$	0.67	
		2 A		0.76	
Maximum reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.1	mA
		$T_J = 125\text{ }^\circ\text{C}$		10	
Typical junction capacitance per leg	$C_T$	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$		45	pF
Typical series inductance per leg	$L_S$	Measured lead to lead 5 mm from package body		6	nH
Maximum voltage rate of change	dV/dt	Rated $V_R$		10 000	V/ $\mu$ s

### Note

(1) Pulse width < 300  $\mu$ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	$T_J^{(1)}, T_{Stg}$			- 55 to 175	$^\circ\text{C}$
Maximum thermal resistance, junction to lead	$R_{thJL}$	DC operation		25	$^\circ\text{C/W}$
Maximum thermal resistance, junction to ambient	$R_{thJA}$		65		
Approximate weight				0.13	g
				0.0045	oz.
Marking device		Case style SOT-223		20CJQ100	

### Note

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

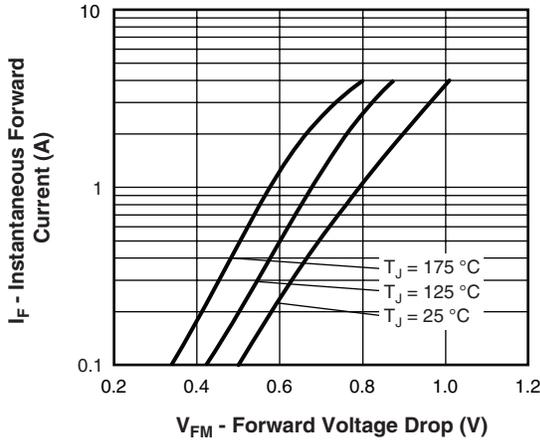


Fig. 1 - Maximum Forward Voltage Drop Characteristics

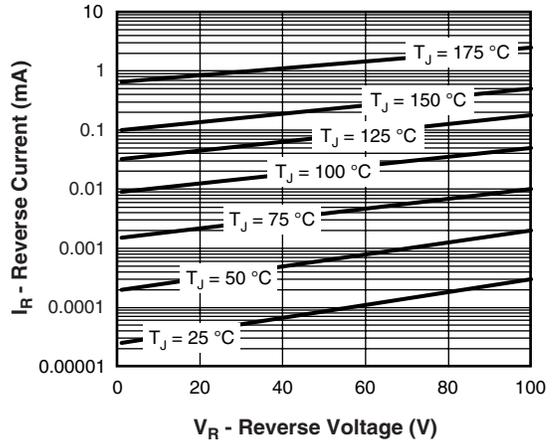


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

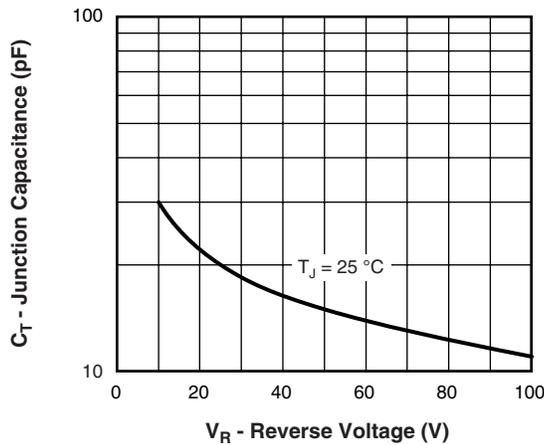


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

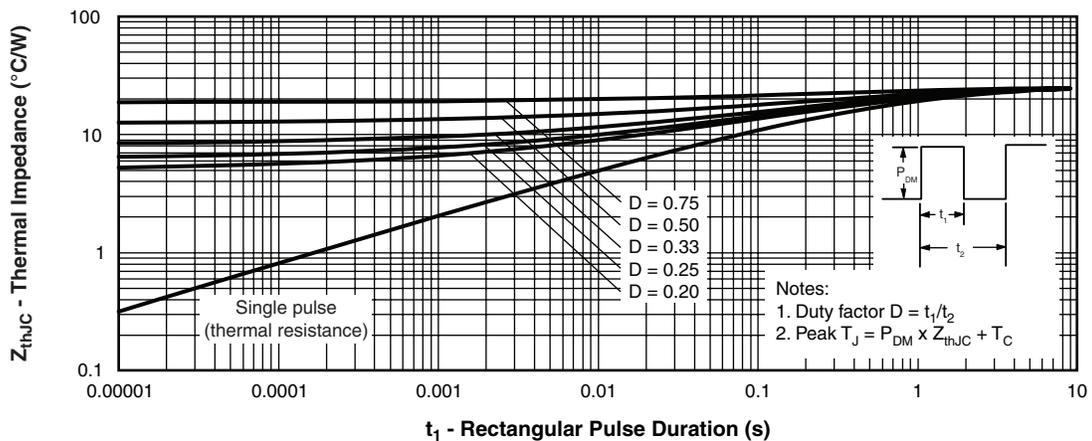


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

# 20CJQ100PbF

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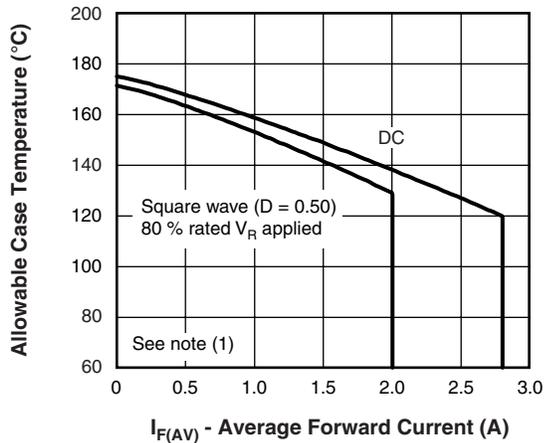


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

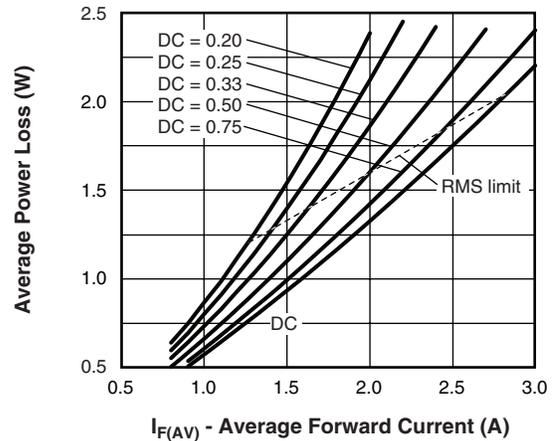


Fig. 6 - Forward Power Loss Characteristics

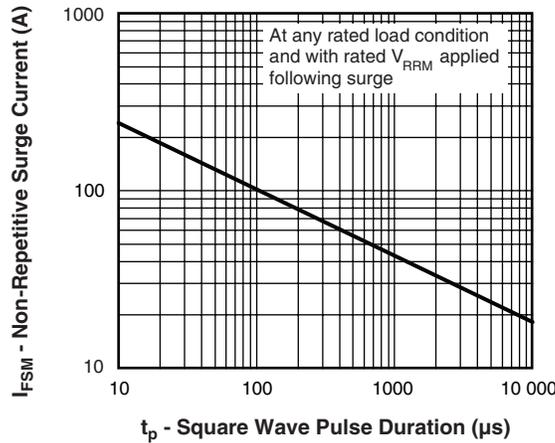


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

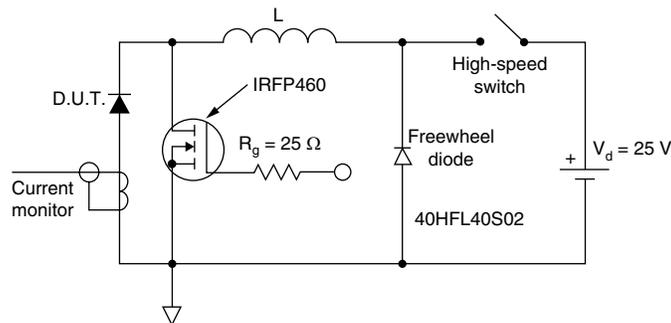


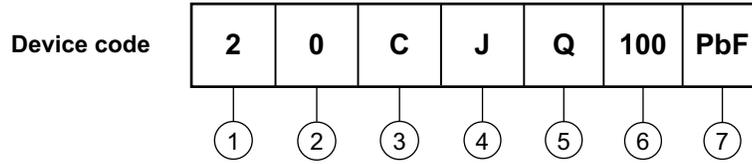
Fig. 8 - Unclamped Inductive Test Circuit

**Note**

- (1) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;
- $P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);
- $P_{d_{REV}}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1} = 80\%$  rated  $V_R$



**ORDERING INFORMATION TABLE**



- 1** - Current rating (2 = 2 A)
- 2** - Schottky rectifier series
- 3** - Circuit configuration:  
C = Common cathode
- 4** - Package:  
J = SOT-223
- 5** - Schottky "Q" series
- 6** - Voltage rating (100 = 100 V)
- 7** -
  - None = Standard production
  - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95022">http://www.vishay.com/doc?95022</a>
Part marking information	<a href="http://www.vishay.com/doc?95031">http://www.vishay.com/doc?95031</a>
Packaging information	<a href="http://www.vishay.com/doc?95035">http://www.vishay.com/doc?95035</a>



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