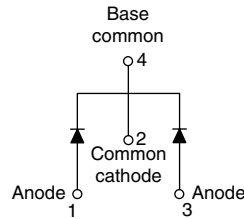


Schottky Rectifier, 2 x 1 A


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
- Designed and qualified for industrial level

DESCRIPTION

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, freewheeling diodes, battery charging, and reverse battery protection.

PRODUCT SUMMARY

$I_{F(AV)}$	2 x 1 A
V_R	45 V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	2	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		- 55 to 150	$^\circ C$

VOLTAGE RATINGS

PARAMETER	SYMBOL	20CJQ045	UNITS
DC reverse voltage	V_R	45	V
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 $T_C = 126^\circ C$, rectangular waveform	1	A
		50 % duty cycle at $T_C = 102^\circ C$, rectangular waveform	2	
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	I_{FSM}	5 μs sine or 3 μs rect. pulse	390	
		10 ms sine or 6 ms rect. pulse	23	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25^\circ C$, $I_{AS} = 1 A$, $L = 4 mH$	2	mJ
Repetitive avalanche current per leg	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical	1	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	1 A	$T_J = 25\text{ }^\circ\text{C}$	0.54	V
		2 A		0.67	
		1 A	$T_J = 125\text{ }^\circ\text{C}$	0.50	
		2 A		0.65	
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) $25\text{ }^\circ\text{C}$		70	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		7700	V/ μs

Note(1) Pulse width < 300 μs , 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 150	$^\circ\text{C}$
Maximum thermal resistance, junction to ambient	R_{thJA}	DC operation		65	$^\circ\text{C/W}$
Maximum thermal resistance, junction to lead	R_{thJL}		25		
Approximate weight				0.13	g
				0.0045	oz.
Marking device		Case style SOT-223		2CJQF	

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

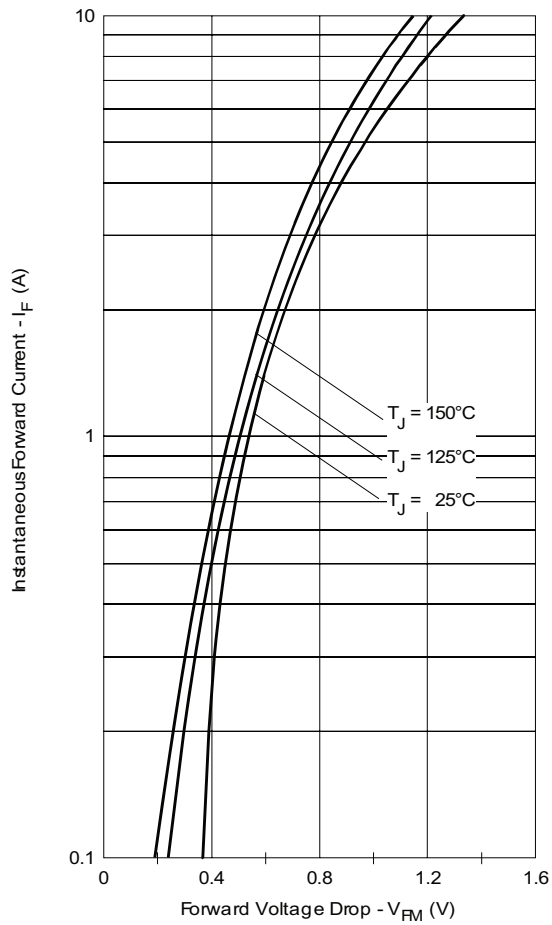


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

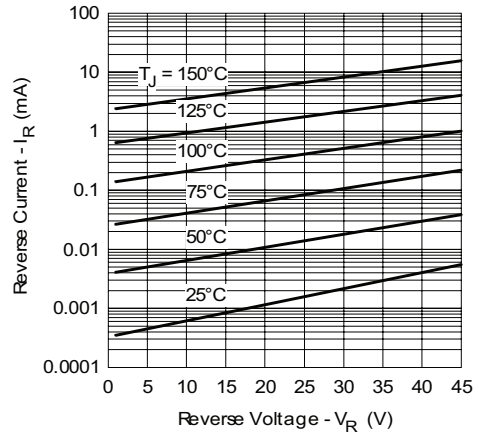


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

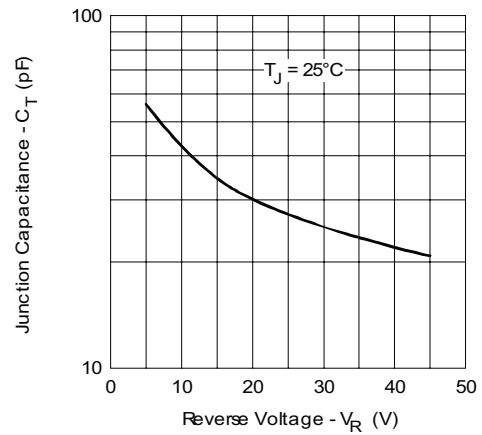


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

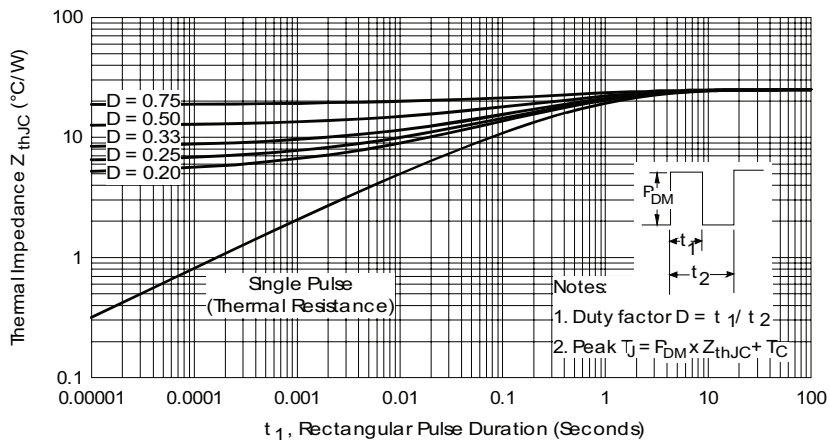


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

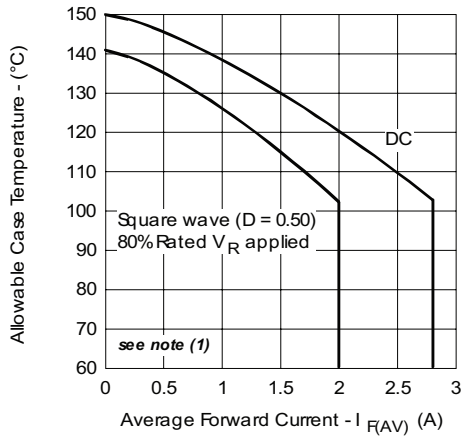


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

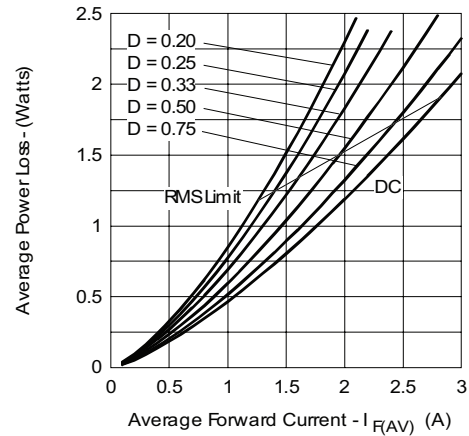


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

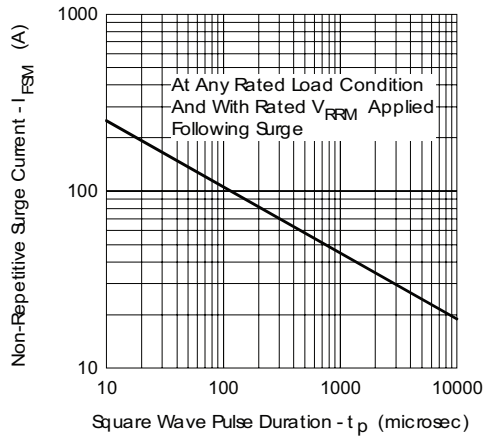


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

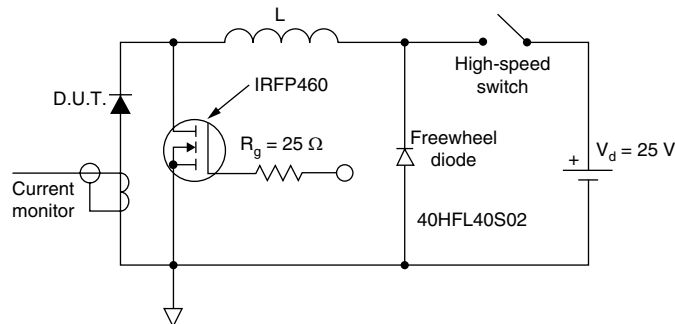


Fig. 8 - Unclamped Inductive Test Circuit

Note

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



ORDERING INFORMATION TABLE

Device code	2	0	C	J	Q	045	-
	①	②	③	④	⑤	⑥	⑦
	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 (045 = 45 V)				
	7	-	• None = Standard production • PbF = Lead (Pb)-free				

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95022
Part marking information	http://www.vishay.com/doc?95031
Packaging information	http://www.vishay.com/doc?95035



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