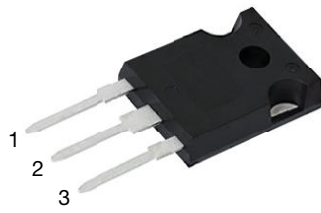
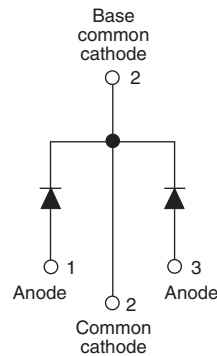


High Performance Schottky Rectifier, 2 x 40 A


TO-247AC 3L


FEATURES

- 150 °C T_J operation
- Optimized for 3.3 V application
- Ultralow forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 40 A
V_R	20 V
V_F at I_F	0.36 V
I_{RM} max.	1100 mA at 125 °C
T_J max.	150 °C
E_{AS}	27 mJ
Package	TO-247AC 3L
Circuit configuration	Common cathode

DESCRIPTION

This center tap Schottky rectifier has been optimized for ultralow forward voltage drop specifically for 3.3 V output power supplies. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	80	A
V_{RRM}		20	V
I_{FSM}	$t_p = 5 \mu s$ sine	2200	A
V_F	40 A_{pk} , $T_J = 150$ °C (per leg)	0.32	V
T_J	Range	-55 to +150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-80CPQ020-N3	UNITS
Maximum DC reverse voltage	V_R	20	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at $T_C = 138$ °C, rectangular waveform	40	A
			80	
Maximum peak one cycle non-repetitive surge current per leg	I_{FSM}	5 μs sine or 3 μs rect. pulse	2200	A
		10 ms sine or 6 ms rect. pulse		
		Following any rated load condition and with rated V_{RRM} applied	500	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25$ °C, $I_{AS} = 6$ A, $L = 1.5$ mH	27	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	6	A



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg	$V_{FM}^{(1)}$	40 A	$T_J = 25\text{ }^\circ\text{C}$	0.46	V
		80 A		0.55	
		40 A	$T_J = 125\text{ }^\circ\text{C}$	0.36	
		80 A		0.46	
		40 A	$T_J = 150\text{ }^\circ\text{C}$	0.32	
		80 A		0.43	
Maximum reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 125\text{ }^\circ\text{C}$	$V_R = 5\text{ V}$	110	mA
		$T_J = 150\text{ }^\circ\text{C}$	$V_R = 10\text{ V}$	600	
		$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	5.5	
		$T_J = 125\text{ }^\circ\text{C}$		1100	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.185	V
Maximum junction capacitance per leg	C_T	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		6500	pF
Typical series inductance per leg	L_S	Measured lead to lead 5 mm from package body		7.5	nH
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/ μ s

Note

⁽¹⁾ Pulse width < 300 μ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}			-55 to 150	°C
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation		0.6	°C/W
Maximum thermal resistance, junction to case per package				0.3	
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased		0.25	
Approximate weight			6		g
			0.21		oz.
Mounting torque	minimum			6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device			Case style TO-247AC 3L	80CPQ020	

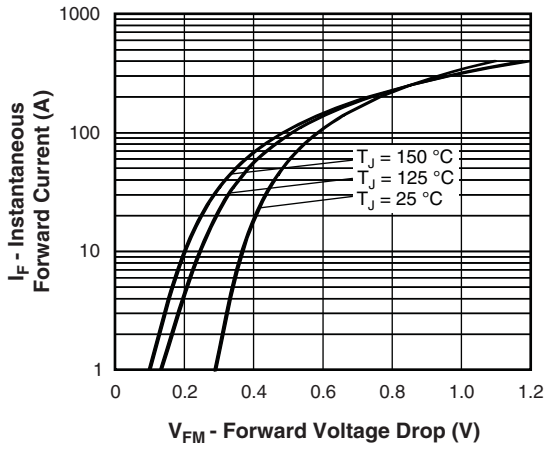


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

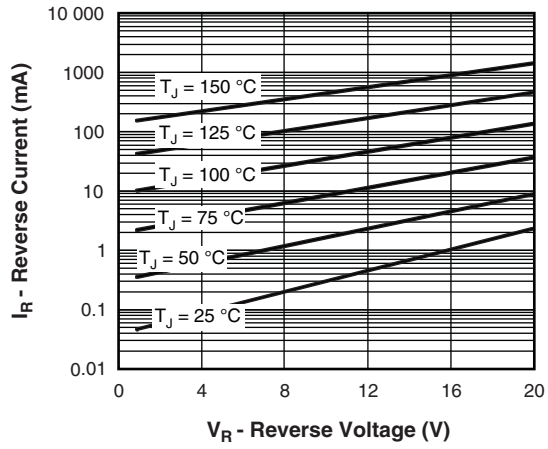


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

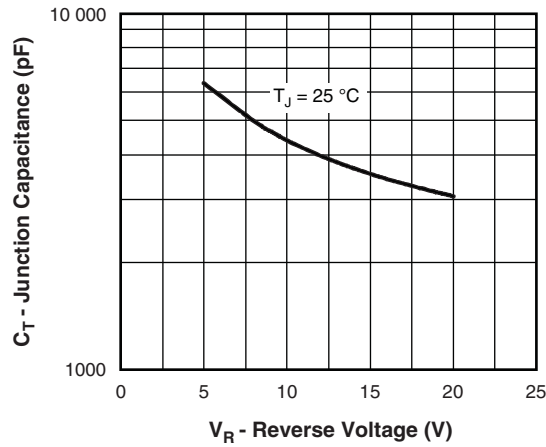


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

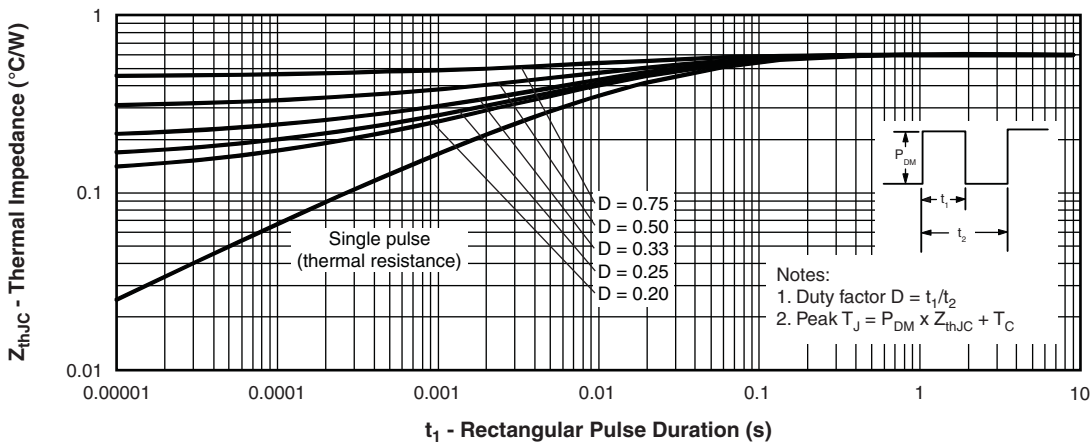


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

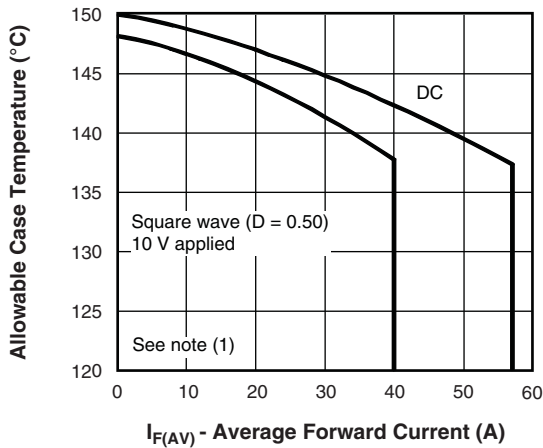


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

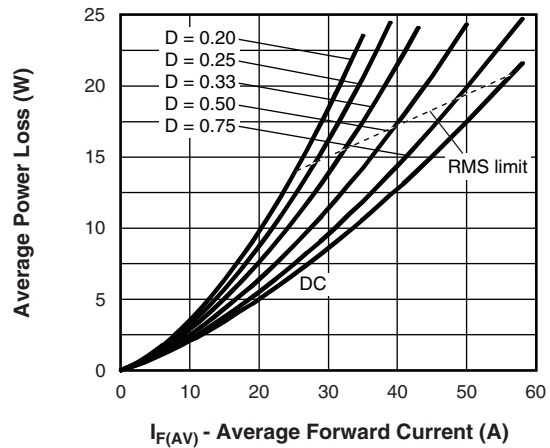


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

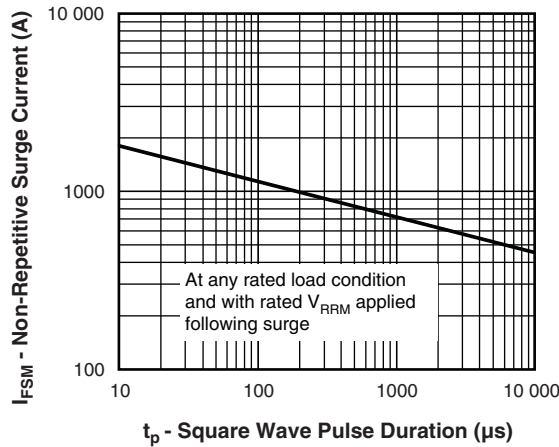


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

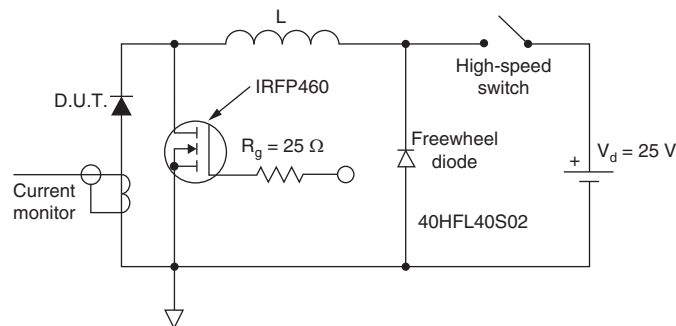


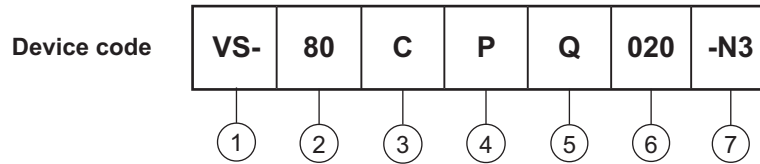
Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
- 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 $V_{R1} = 10$ V



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (80 = 80 A)
- 3** - Circuit configuration:
C = common cathode
- 4** - Package:
P = TO-247
- 5** - Schottky "Q" series
- 6** - Voltage code (020 = 20 V)
- 7** - Environmental digit
-N3 = halogen-free, RoHS-compliant, and totally lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-80CPQ020-N3	25	500	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?96138
Part marking information	www.vishay.com/doc?95007
SPIICE model	www.vishay.com/doc?95289



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