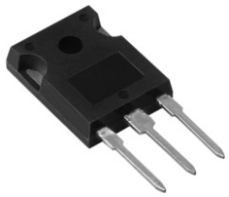
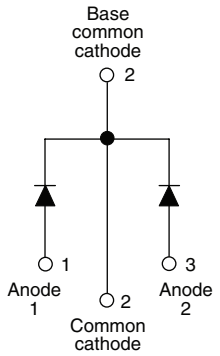
Schottky Rectifier, 2 x 20 A



TO-247AC



FEATURES

- 150 °C T_J operation
- Center tap TO-247 package
- Very low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified for industrial level

DESCRIPTION

The 40CPQ... center tap Schottky rectifier has been optimized for very low forward voltage drop with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

PRODUCT SUMMARY	
$I_{F(AV)}$	2 x 20 A
V_R	50/60 V

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	40	A
V_{RRM}		50/60	V
I_{FSM}	t_p = 5 µs sine	3200	A
V_F	20 Apk, T_J = 125 °C (per leg)	0.49	V
T_J		- 55 to 150	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	40CPQ050	40CPQ060	UNITS
Maximum DC reverse voltage	V_R	50	60	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 = 120 °C, rectangular waveform		40	A
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	I_{FSM}	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	3200	
		10 ms sine or 6 ms rect. pulse		320	
Non-repetitive avalanche energy per leg	E_{AS}	T_J = 25 °C, I_{AS} = 2 A, L = 9.0 mH		18	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 x V_R typical		2	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg See fig. 1	V_{FM} (1)	20 A	T_J = 25 °C	0.53	V
		40 A		0.68	
		20 A	T_J = 125 °C	0.49	
		40 A		0.64	
Maximum reverse leakage current per leg See fig. 2	I_{RM} (1)	T_J = 25 °C	V_R = Rated V_R	1.7	mA
		T_J = 125 °C		96	
Maximum junction capacitance per leg	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) 25 °C		1600	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/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, T_{Stg}		- 55 to 150	°C
Maximum thermal resistance, junction to case per leg		R_{thJC}	DC operation See fig. 4	1.25	°C/W
Maximum thermal resistance, junction to case per package			DC operation	0.63	
Typical thermal resistance, case to heatsink		R_{thCS}	Mounting surface, smooth and greased	0.24	
Approximate weight				6	g
				0.21	oz.
Mounting torque	minimum		Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device			Case style TO-247AC (JEDEC)	40CPQ050	
				40CPQ060	

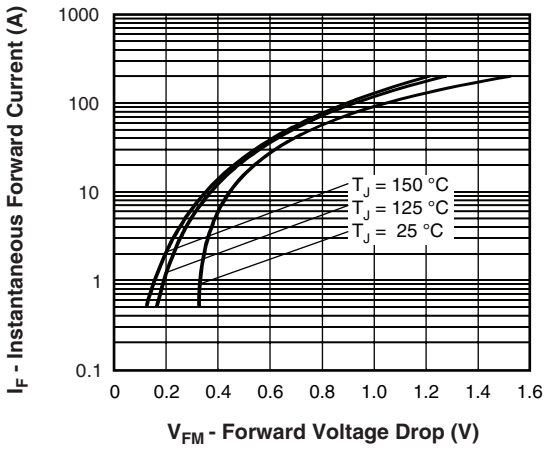


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

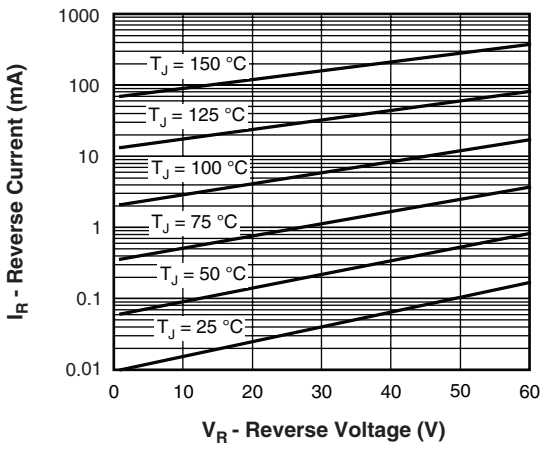


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

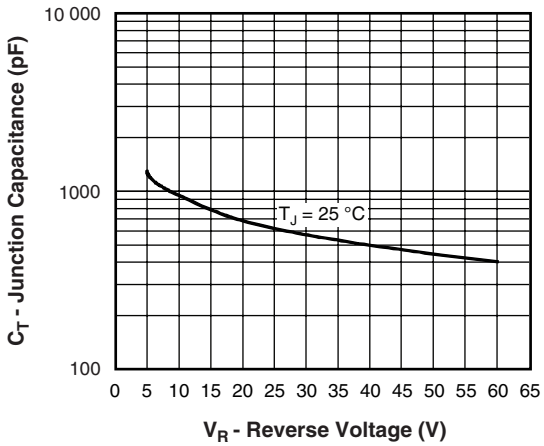


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

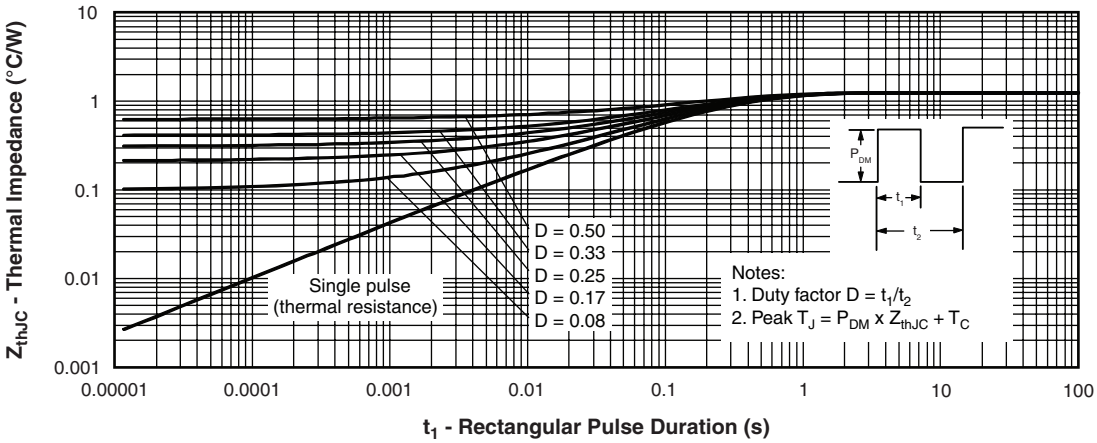


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

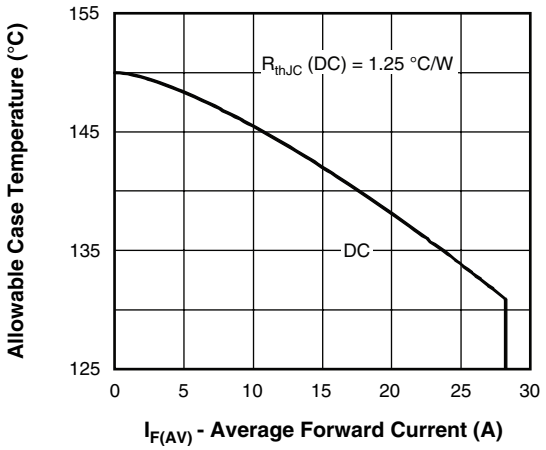


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

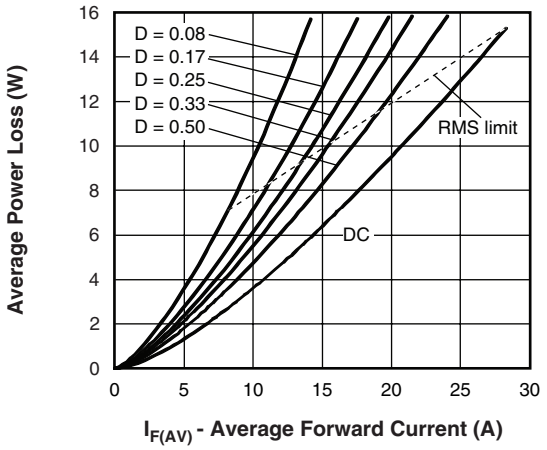


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

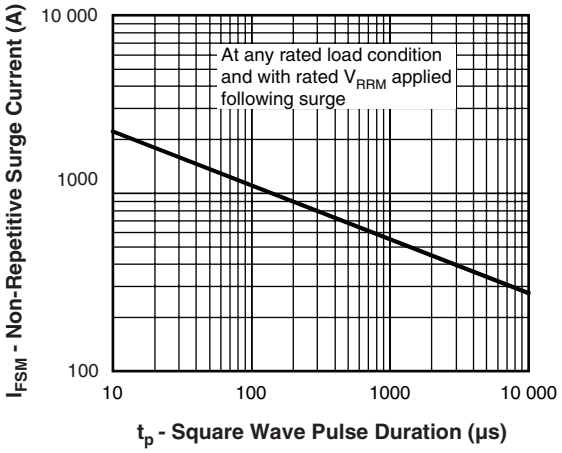


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

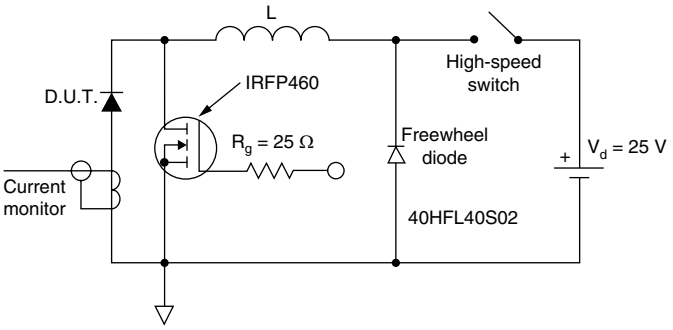


Fig. 8 - Unclamped Inductive Test Circuit

ORDERING INFORMATION TABLE

Device code	40	C	P	Q	060	-
	1	2	3	4	5	6

1 - Current rating (40 = 40 A)

2 - Circuit configuration:
C = Common cathode

3 - Package:
P = TO-247

4 - Schottky “Q” series

5 - Voltage code — 050 = 50 V, 060 = 60 V

6 - • None = Standard production
• PbF = Lead (Pb)-free

Tube standard pack quantity: 25 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95223
Part marking information	http://www.vishay.com/doc?95226

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