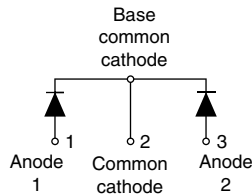
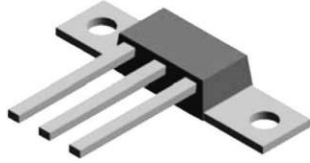


Schottky Rectifier

New Generation 3 D-61 Package, 2 x 40 A


D-61-8

FEATURES

- 150 °C T_J operation
- Center tap module
- 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
- New fully transfer-mold low profile, small footprint, high current package
- Through-hole versions are currently available for use in lead (Pb)-free applications ("PbF" suffix)
- Lead (Pb)-free
- Designed and qualified for industrial level


RoHS*
COMPLIANT

PRODUCT SUMMARY

$I_{F(AV)}$	2 x 40 A
V_R at 125 °C	20 V
V_R at 150 °C	10 V
I_{RM}	550 mA at 125 °C

DESCRIPTION

The center tap Schottky rectifier module 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	6000	A
V_F	40 Apk, $T_J = 125 \text{ °C}$ (per leg)	0.32	V
T_J	Range	- 55 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	87CNQ020APbF	UNITS
Maximum DC reverse voltage	V_R	125 °C	20	V
		150 °C	10	

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current per leg per device	$I_{F(AV)}$	50 % duty cycle at $T_C = 135 \text{ °C}$, 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	6000	
		10 ms sine or 6 ms rect. pulse	1100	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25 \text{ °C}$, $I_{AS} = 8 \text{ A}$, $L = 1.12 \text{ mH}$	36	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	8	A

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

ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop per leg	$V_{\text{FM}}^{(1)}$	40 A	$T_{\text{J}} = 25\text{ }^{\circ}\text{C}$	0.45	V	
		80 A		0.51		
		40 A	$T_{\text{J}} = 125\text{ }^{\circ}\text{C}$	0.32		
		80 A		0.39		
		40 A	$T_{\text{J}} = 150\text{ }^{\circ}\text{C}$	0.29		
		80 A		0.37		
Maximum reverse leakage current per leg	$I_{\text{RM}}^{(1)}$	$T_{\text{J}} = 125\text{ }^{\circ}\text{C}$	$V_{\text{R}} = 5\text{ V}$	90	mA	
			$V_{\text{R}} = 3.3\text{ V}$	70		
		$T_{\text{J}} = 150\text{ }^{\circ}\text{C}$	$V_{\text{R}} = 10\text{ V}$	480		
		$T_{\text{J}} = 25\text{ }^{\circ}\text{C}$	$V_{\text{R}} = \text{Rated } V_{\text{R}}$	5.5		
				550		
Threshold voltage	$V_{\text{F(TO)}}$	$T_{\text{J}} = T_{\text{J}} \text{ maximum}$		0.191	V	
Forward slope resistance	r_{t}			2.3	$\text{m}\Omega$	
Maximum junction capacitance per leg	C_{T}	$V_{\text{R}} = 5\text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$		6500	pF	
Typical series inductance per leg	L_{S}	Measured lead to lead 5 mm from package body		5.5	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, <div>per leg</div> <div>junction to case</div> <div>per package</div>	R _{thJC}	DC operation	0.85	°C/W
			0.42	
Typical thermal resistance, case to heatsink	R _{thCS}	Mounting surface, smooth and greased Device flatness < 5 mils	0.30	
Approximate weight			7.8	g
			0.28	oz.
Mounting torque	minimum		40 (35)	kgf · cm (lbf · in)
	maximum		58 (50)	
Marking device		Case style D-61	87CNQ020A	

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Vishay High Power Products

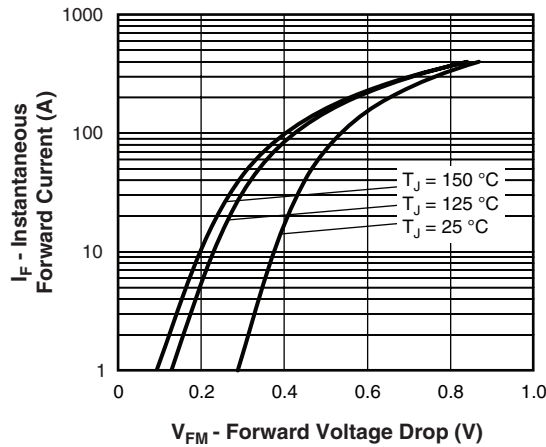


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

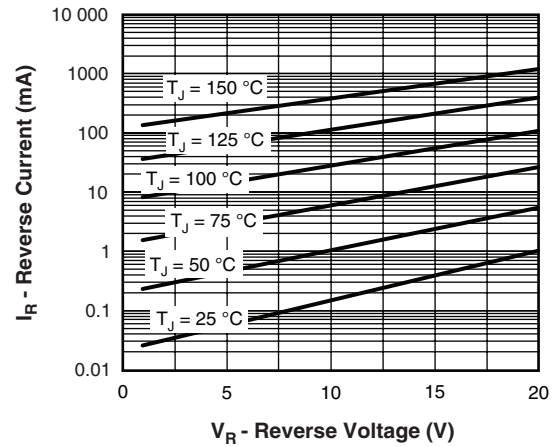


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

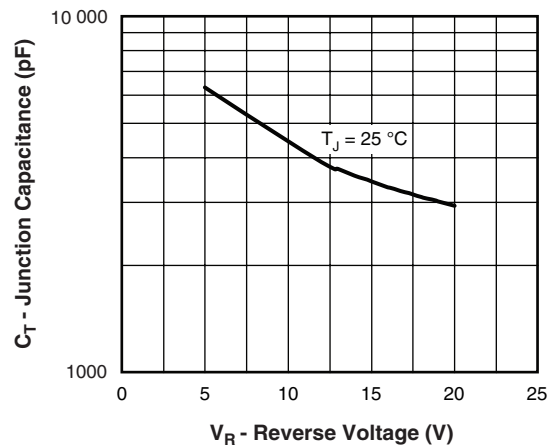


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

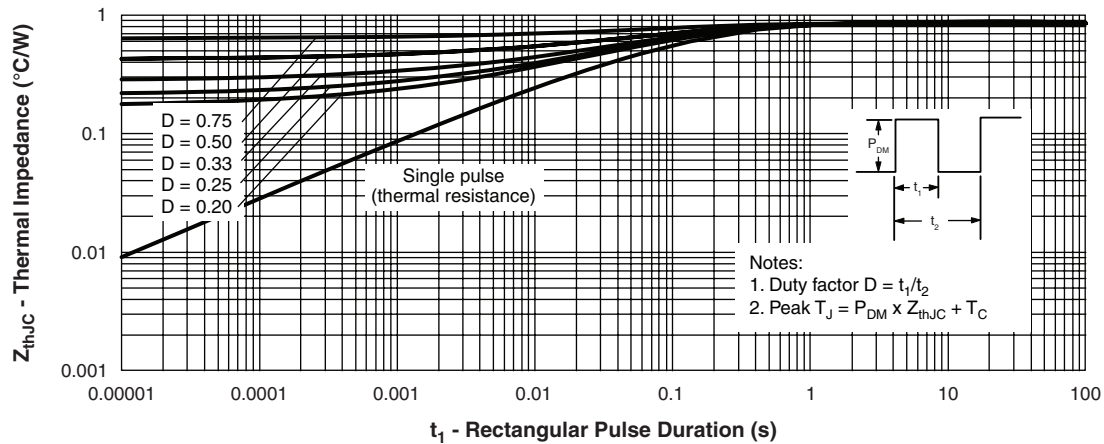


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

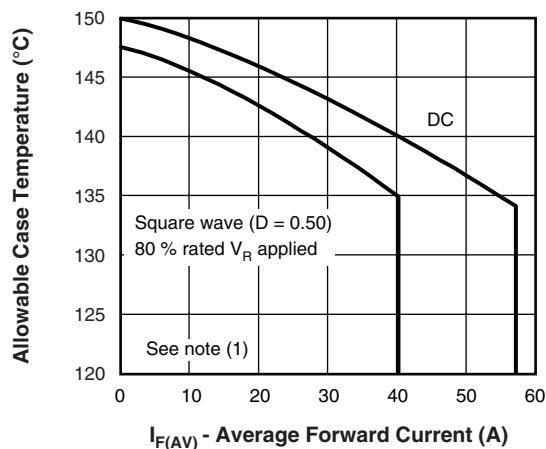


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

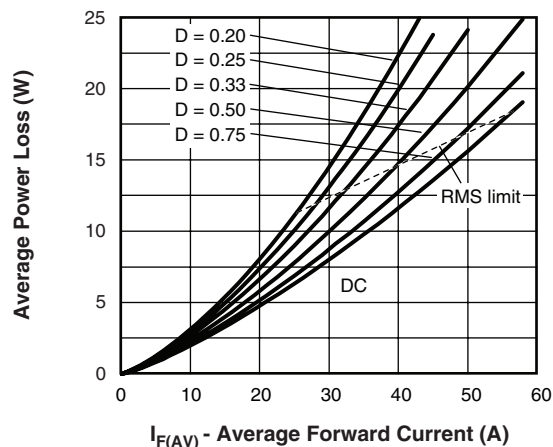


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

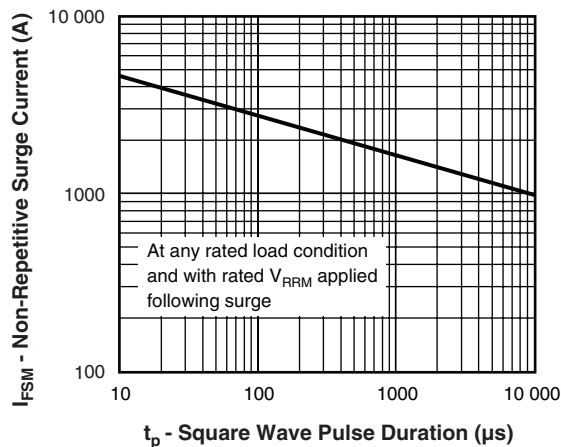


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

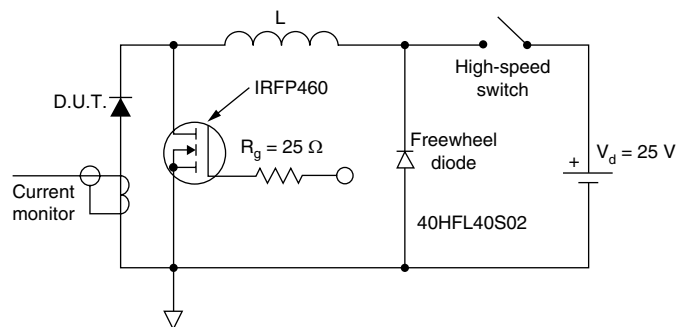


Fig. 8 - Unclamped Inductive Test Circuit

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



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Vishay High Power Products

ORDERING INFORMATION TABLE

Device code	87	C	N	Q	020	A	PbF
	1	2	3	4	5	6	7

- | | | |
|----------|---|--------------------------------------------------------|
| 1 | - | Current rating (80 A) |
| 2 | - | Circuit configuration:
C = Common cathode |
| 3 | - | Package:
N = D-61 |
| 4 | - | Schottky "Q" series |
| 5 | - | Voltage rating (020 = 20 V) |
| 6 | - | A = D-61-8 package style |
| 7 | - | • None = Standard production
• PbF = Lead (Pb)-free |

Standard pack quantity: A = 10 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95019
Part marking information	http://www.vishay.com/doc?95030



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