

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

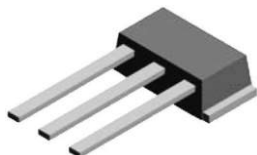
VS-80CNQ...APbF



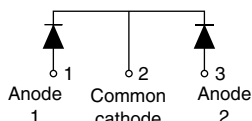
D-61-8



VS-80CNQ...ASMPbF



D-61-8-SM



VS-80CNQ...ASLPbF



D-61-8-SL



FEATURES

- 150 °C T_J operation
- Center tap module
- 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
- New fully transfer-mould low profile, small footprint, high current package
- Through-hole versions are currently available for use in lead (Pb)-free applications ("PbF" suffix)
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level



Available
RoHS*
COMPLIANT

DESCRIPTION

The center tap Schottky rectifier module series 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 40 A
V_R	35 V to 45 V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	80	A
V_{RRM}	Range	35 to 45	V
I_{FSM}	$t_p = 5 \mu s$ sine	5800	A
V_F	40 Apk, $T_J = 125^\circ C$ (per leg)	0.47	V
T_J	Range	- 55 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-80CNQ035APbF	VS-80CNQ040APbF	VS-80CNQ045APbF	UNITS
Maximum DC reverse voltage	V_R	35	40	45	V
Maximum working peak reverse voltage	V_{RWM}				

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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 114^\circ\text{C}$, rectangular waveform	40 80	A
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	I_{FSM}	5 μs sine or 3 μs rect. pulse 10 ms sine or 6 ms rect. pulse	5800 750	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25^\circ\text{C}$, $I_{AS} = 8\text{ A}$, $L = 1.7\text{ mH}$	54	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

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	40 A 80 A	0.52 0.66	V
		$T_J = 25^\circ\text{C}$		
		40 A 80 A	0.47 0.61	
		$T_J = 125^\circ\text{C}$		
Maximum reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	5 250	mA
		$V_R = \text{Rated } V_R$		
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$	0.26	V
Forward slope resistance	r_f		3.93	m Ω
Maximum junction capacitance per leg	C_T	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) 25°C	2600	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	$^\circ\text{C}$
Maximum thermal resistance, junction to case	R_{thJC}	DC operation (see fig. 4)	0.85	$^\circ\text{C/W}$
		DC operation	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
	maximum		58 (50)	(lbf · in)
Marking device	Case style D-61		80CNQ035A	
			80CNQ040A	
			80CNQ045A	
	Case style D-61-8-SM		80CNQ035ASM	
			80CNQ040ASM	
			80CNQ045ASM	
	Case style D-61-8-SL		80CNQ035ASL	
			80CNQ040ASL	
			80CNQ045ASL	



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VS-80CNQ...A PbF Series

Vishay High Power Products

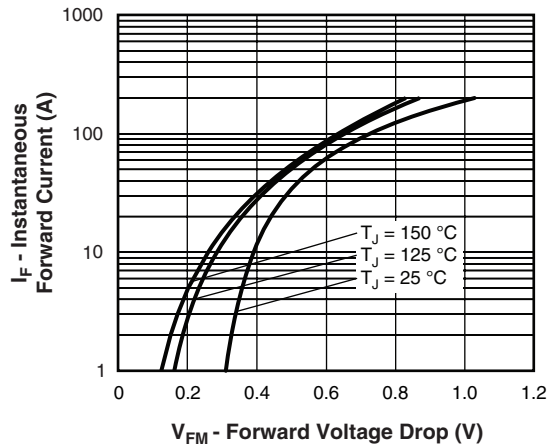


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

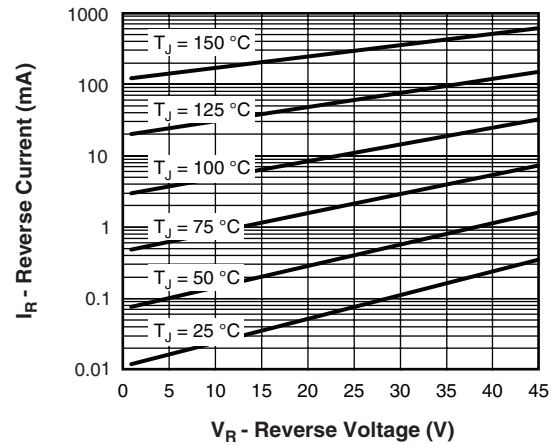


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

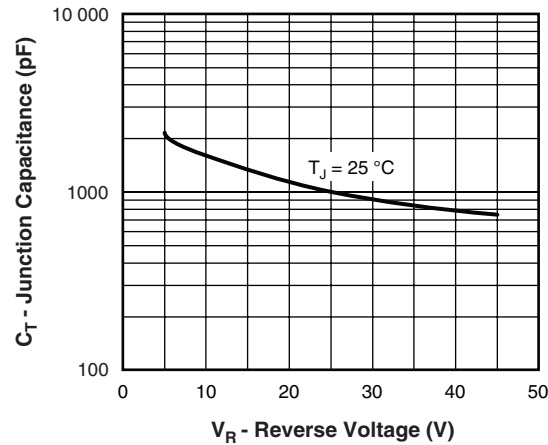


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

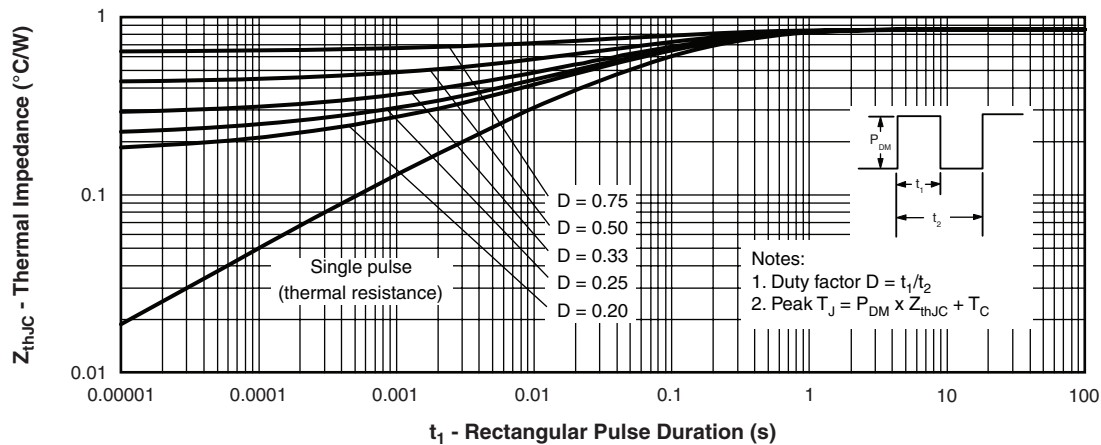


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

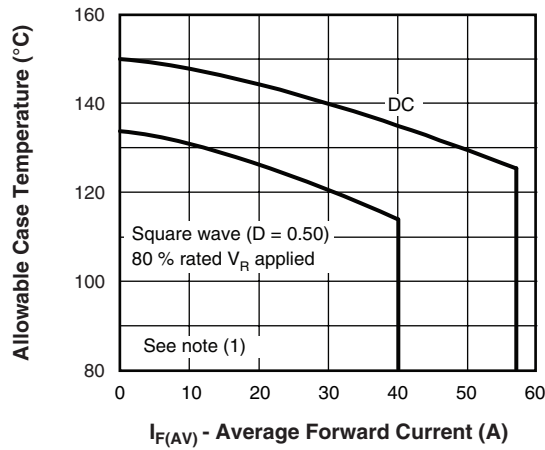


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

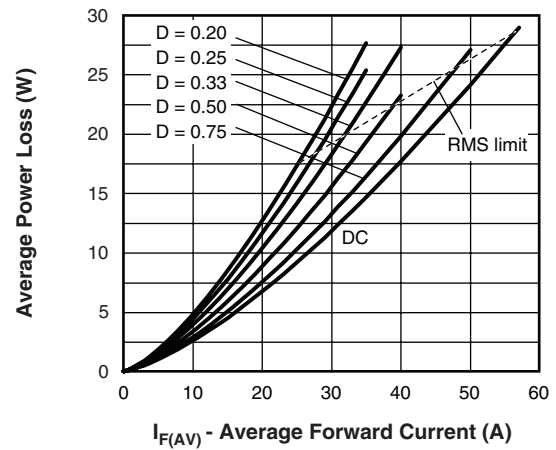


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

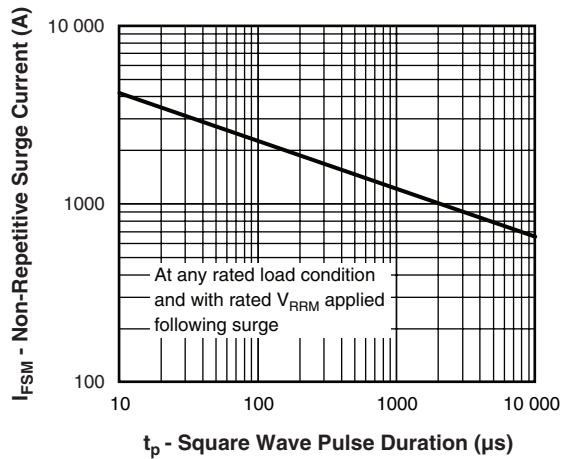


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

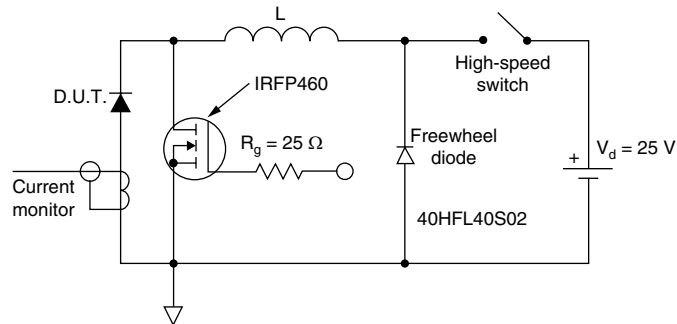


Fig. 8 - Unclamped Inductive Test Circuit

Note

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



VS-80CNQ...A PbF Series

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Vishay High Power Products

ORDERING INFORMATION TABLE

Device code	VS-	80	C	N	Q	045	A	PbF
	1	2	3	4	5	6	7	8

- | | | | |
|----------|---|------------------------------|--|
| 1 | - | HPP product suffix | |
| 2 | - | Current rating (80 A) | |
| 3 | - | Circuit configuration: | |
| | | C = Common cathode | |
| 4 | - | Package: | |
| | | N = D-61 | |
| 5 | - | Schottky "Q" series | |
| 6 | - | Voltage ratings | 035 = 35 V
040 = 40 V
045 = 45 V |
| 7 | - | Package style: | |
| | | • A = D-61-8 | |
| | | • ASM = D-61-8-SM | |
| | | • ASL = D-61-8-SL | |
| 8 | - | • None = Standard production | |
| | | • PbF = Lead (Pb)-free | |

Standard pack quantity: A = 10 pieces; ASM/ASL = 20 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95354
Part marking information	www.vishay.com/doc?95356



D-61-8, D-61-8-SM, D-61-8-SL

DIMENSIONS - D-61-8 in millimeters (inches)





DIMENSIONS - D-61-8-SM in millimeters (inches)





DIMENSIONS - D-61-8-SL in millimeters (inches)





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