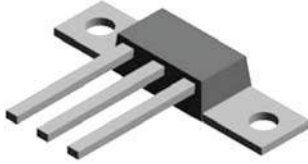
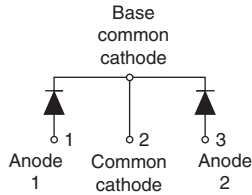


## High Performance Schottky Rectifier Gen 3, D-61 Package, 2 x 40 A

VS-81CNQ...APbF



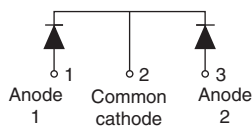
D-61-8



VS-81CNQ...ASMPbF



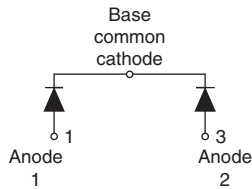
D-61-8-SM



VS-81CNQ...ASLPbF



D-61-8-SL



### FEATURES

- 175 °C  $T_J$  operation
- Center tap module
- Low forward voltage drop
- High frequency operation
- High power discrete
- 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-mold low profile, small footprint, high current package
- Through-hole versions are currently available for use in lead (Pb)-free applications ("PbF" suffix)
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


 Available  
**RoHS\***  
 Available

### Note

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details.

### DESCRIPTION

The center tap Schottky rectifier module has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

PRODUCT SUMMARY	
Package	D-61
$I_{F(AV)}$	2 x 40 A
$V_R$	35 V to 45 V
$V_F$ at $I_F$	0.60
$I_{RM}$ max.	45 mA at 125 °C
$T_J$ max.	175 °C
Diode variation	Common cathode
$E_{AS}$	54 mJ

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	4600	A
$V_F$	40 A <sub>pk</sub> , $T_J = 125$ °C (per leg)	0.54	V
$T_J$	Range	-55 to +175	°C

VOLTAGE RATINGS					
PARAMETER	SYMBOL	VS-81CNQ035APbF	VS-81CNQ040APbF	VS-81CNQ045APbF	UNITS
Maximum DC reverse voltage	$V_R$	35	40	45	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 $T_C = 141\text{ }^\circ\text{C}$ , rectangular waveform		80	A
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	$I_{FSM}$	5 $\mu\text{s}$ sine or 3 $\mu\text{s}$ rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied	4600	
		10 ms sine or 6 ms rect. pulse		790	
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25\text{ }^\circ\text{C}$ , $I_{AS} = 8\text{ A}$ , $L = 1.7\text{ mH}$		54	mJ
Repetitive avalanche current per leg	$I_{AR}$	Current decaying linearly to zero in 1 $\mu\text{s}$ 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	$T_J = 25\text{ }^\circ\text{C}$	0.60	V
		80 A		0.74	
		40 A	$T_J = 125\text{ }^\circ\text{C}$	0.54	
		80 A		0.66	
Maximum reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	5	mA
		$T_J = 125\text{ }^\circ\text{C}$		45	
Maximum junction capacitance per leg	$C_T$	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$		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/ $\mu\text{s}$

**Note**

<sup>(1)</sup> Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$			-55 to +175	$^\circ\text{C}$
Maximum thermal resistance, junction to case per leg	$R_{thJC}$	DC operation See fig. 4		0.85	$^\circ\text{C/W}$
Maximum thermal resistance, junction to case per package		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 (lbf · in)
	maximum			58 (50)	
Marking device		Case style D-61			81CNQ035A
					81CNQ040A
					81CNQ045A
		Case style D-61-8-SM			81CNQ035ASM
					81CNQ040ASM
					81CNQ045ASM
		Case style D-61-8-SL			81CNQ035ASL
					81CNQ040ASL
					81CNQ045ASL

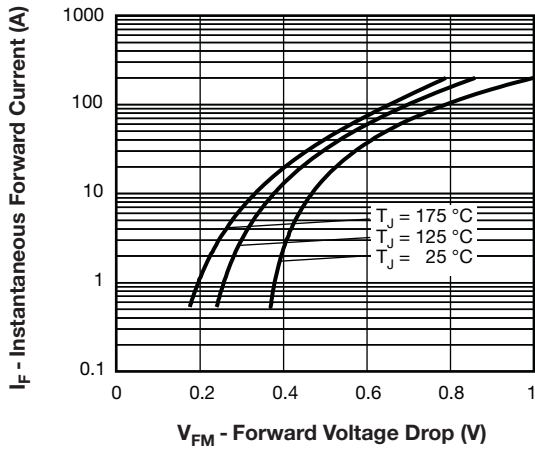


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

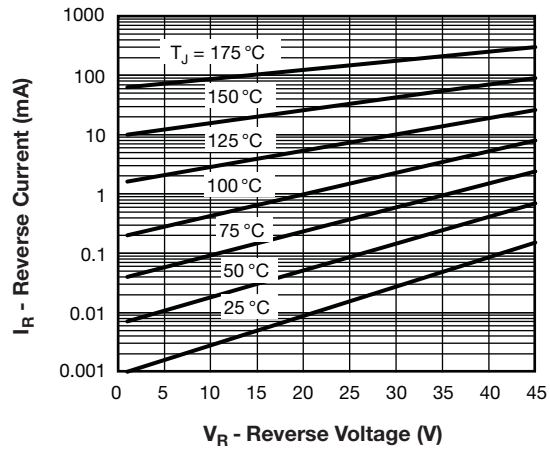


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

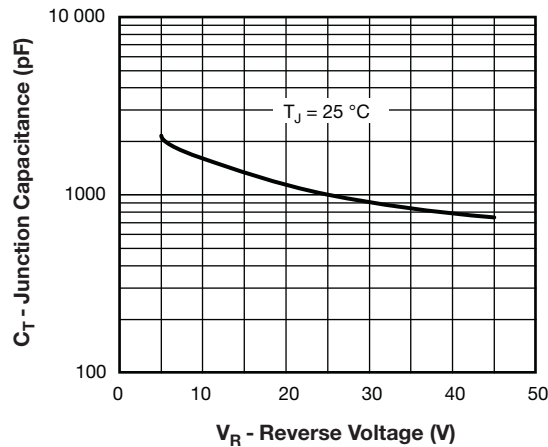


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

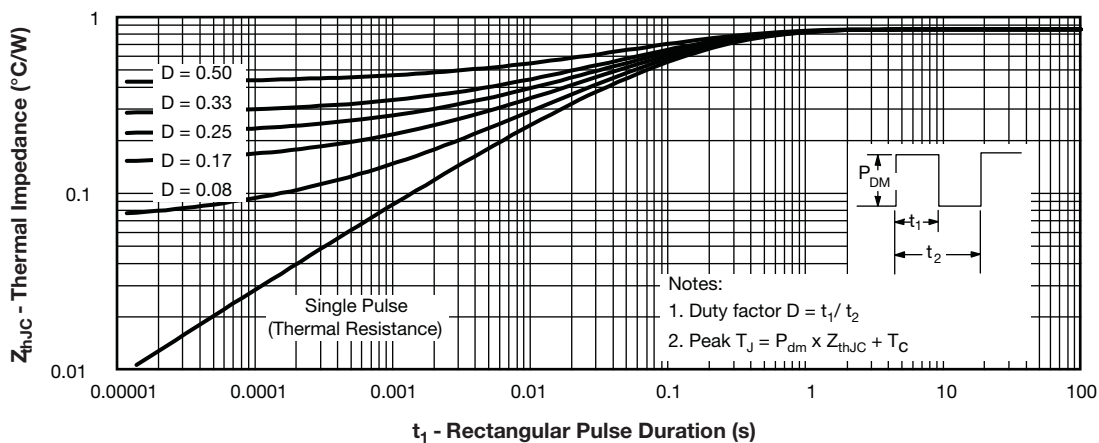


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

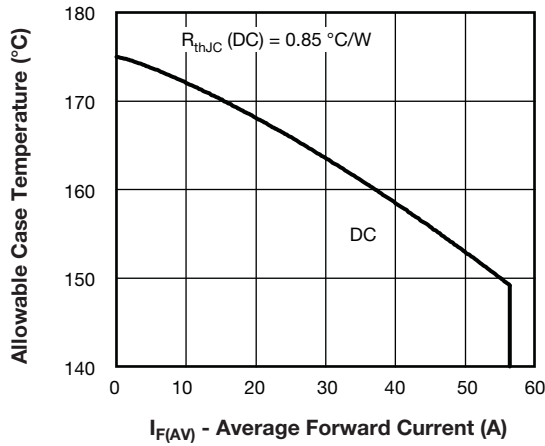


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

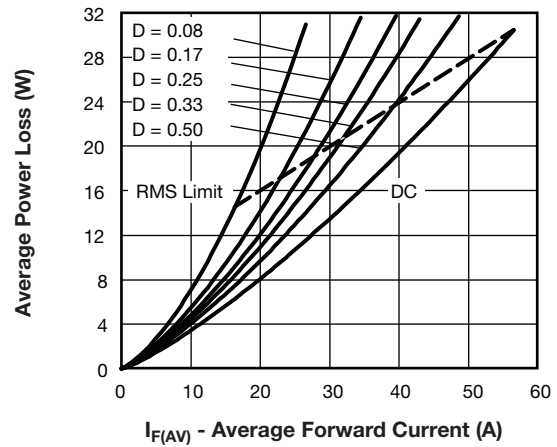


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

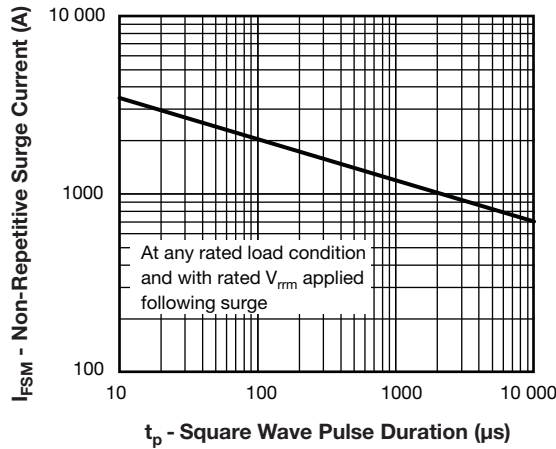


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

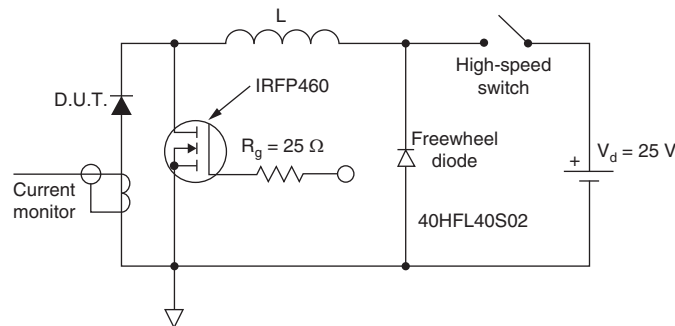
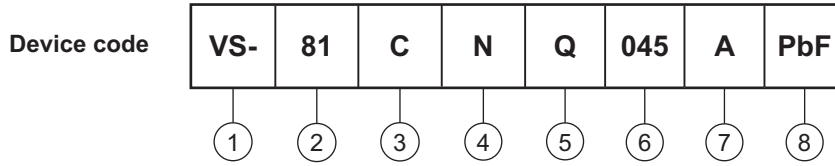


Fig. 8 - Unclamped Inductive Test Circuit



## ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 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	<a href="http://www.vishay.com/doc?95354">www.vishay.com/doc?95354</a>
Part marking information	<a href="http://www.vishay.com/doc?95356">www.vishay.com/doc?95356</a>



## 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)







## **Disclaimer**

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.