

High Performance Schottky Rectifier, 175 A



PowerTab®

Cathode — Anode



e4

RoHS
COMPLIANT

FEATURES

- 150 °C max. operating junction temperature
- High frequency operation
- Ultralow forward voltage drop
- Continuous high current operation
- Guard ring for enhanced ruggedness and long term reliability
- Screw mounting only
- AEC-Q101 qualified
- PowerTab® package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

DESCRIPTION

The VS-175BGQ045HF4 Schottky rectifier has been optimized for ultralow forward voltage drop specifically for low voltage output in high current AC/DC power supplies. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, reverse battery protection, and redundant power subsystems.

PRODUCT SUMMARY	
Package	PowerTab®
$I_{F(AV)}$	175 A
V_R	45 V
V_F at I_F	0.7 V
I_{RM}	640 mA at 125 °C
T_J max.	150 °C
Diode variation	Single die
E_{AS}	40 mJ

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	175	A
	T_C	84	°C
V_{RRM}		45	V
I_{FSM}	$t_p = 5 \mu s$ sine	8700	A
V_F	175 A _{pk} (typical)	0.63	V
	T_J	150	°C
T_J	Range	-55 to +150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-175BGQ045HF4	UNITS
Maximum DC reverse voltage	V_R	45	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 $T_C = 84^\circ C$, rectangular waveform		175	A	
Maximum peak one cycle non-repetitive surge current	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	8700	A	
		10 ms sine or 6 ms rect. pulse		1550		
Non-repetitive avalanche energy	E_{AS}	$T_J = 25^\circ C$, $I_{AS} = 6 A$, $L = 2 mH$		40	mJ	
Repetitive avalanche current	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			TYP.	MAX.	UNITS	
Forward voltage drop	$V_{FM}^{(1)}$	100 A	$T_J = 25^\circ\text{C}$		0.55	0.58	V	
		175 A			0.67	0.75		
		100 A	$T_J = 150^\circ\text{C}$		0.49	0.54		
		175 A			0.63	0.7		
Reverse leakage current	$I_{RM}^{(1)}$	$T_J = 150^\circ\text{C}, V_R = 45\text{ V}$			1200	2000	mA	
		$T_J = 25^\circ\text{C}$	$V_R = \text{Rated } V_R$		0.6	2		
		$T_J = 125^\circ\text{C}$			360	640		
Maximum junction capacitance	C_T	$V_R = 5\text{ V}_{\text{DC}}$, (test signal range 100 kHz to 1 MHz) 25°C			5600		pF	
Typical series inductance	L_S	Measured from tab to mounting plane			3.5		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	R_{thJC}	DC operation			0.35	°C/W
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased			0.20	
Approximate weight					5	g
					0.18	oz.
Mounting torque	minimum				1.2 (10)	N · m (lbf · in)
	maximum				2.4 (20)	
Marking device		Case style PowerTab®			175BGQ045H	

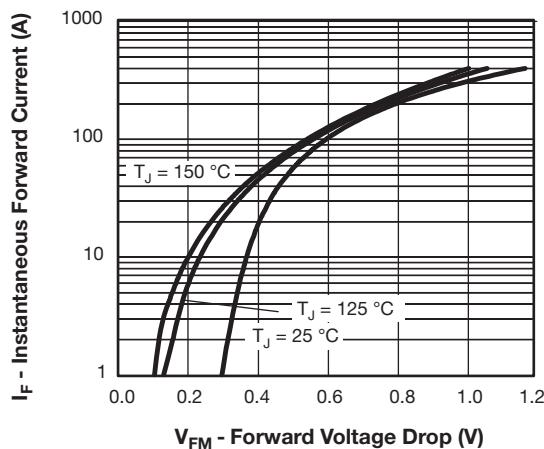


Fig. 1 - Maximum Forward Voltage Drop Characteristics

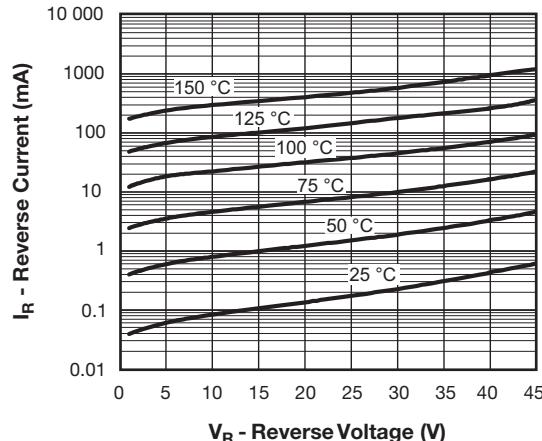


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

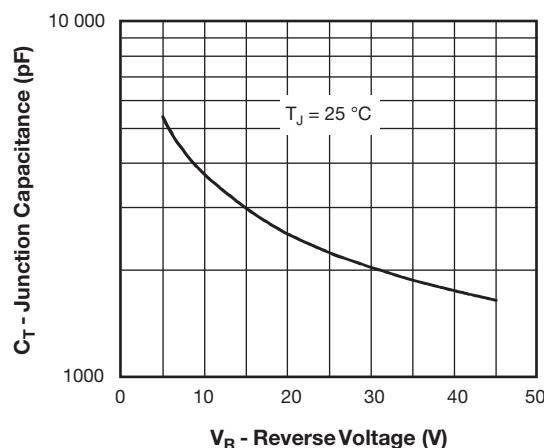


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

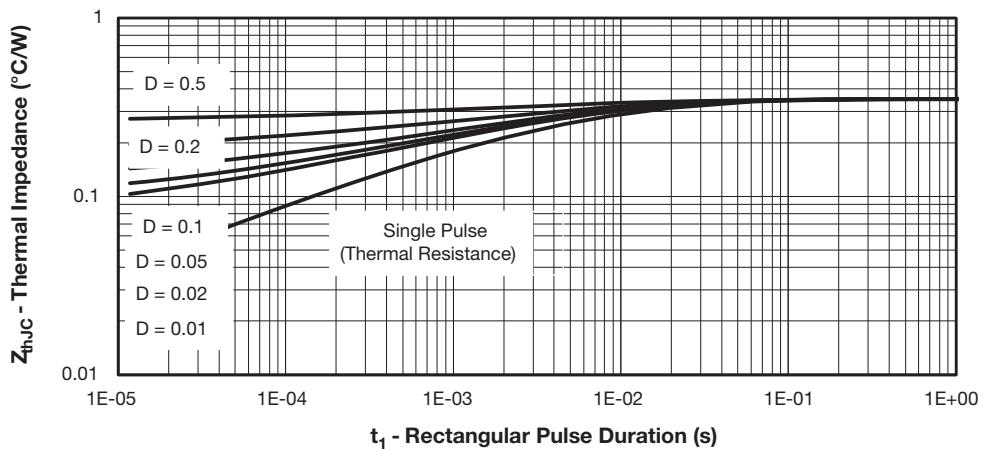


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

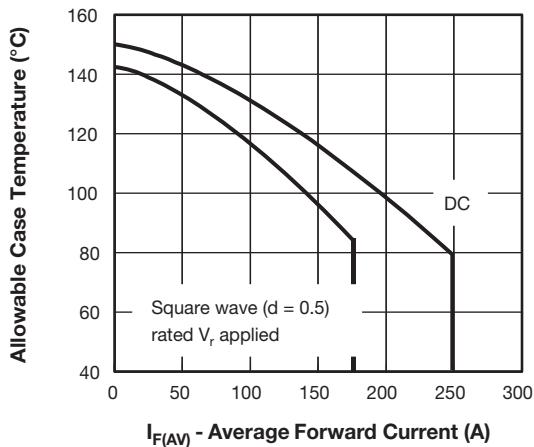


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

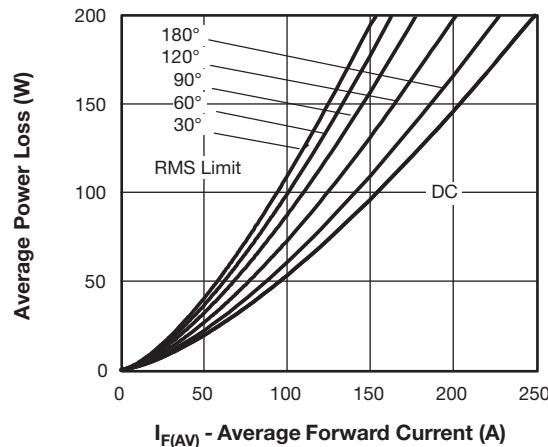


Fig. 6 - Forward Power Loss Characteristics

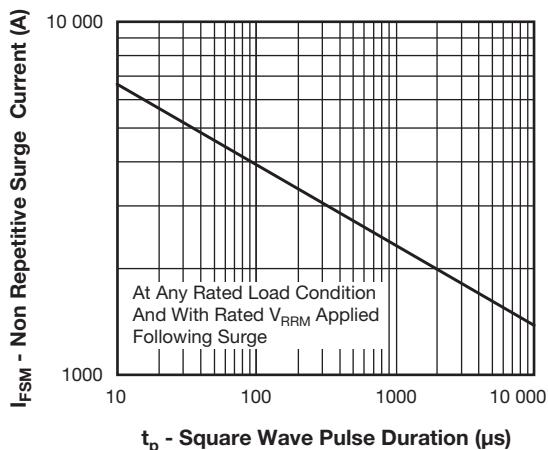


Fig. 7 - Maximum Non-Repetitive Surge Current

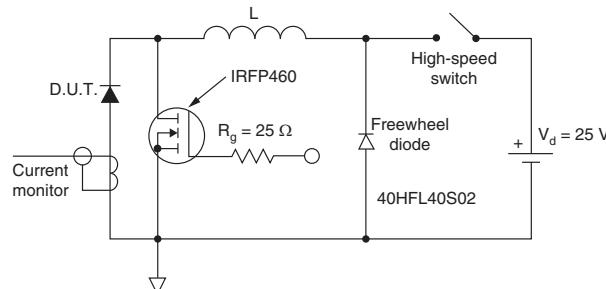


Fig. 8 - Unclamped Inductive Test Circuit

ORDERING INFORMATION TABLE

Device code	VS-	175	BGQ	045	H	F4
	(1)	(2)	(3)	(4)	(5)	(6)

- 1** - Vishay Semiconductors product
- 2** - Current rating (175 = 175 A)
- 3** - Essential part number
- 4** - Voltage rating (045 = 45 V)
- 5** - H = AEC-Q101 qualified
- 6** - Environmental digit:
- F4 = RoHS compliant and totally lead (Pb)-free

ORDERING INFORMATION (Example)

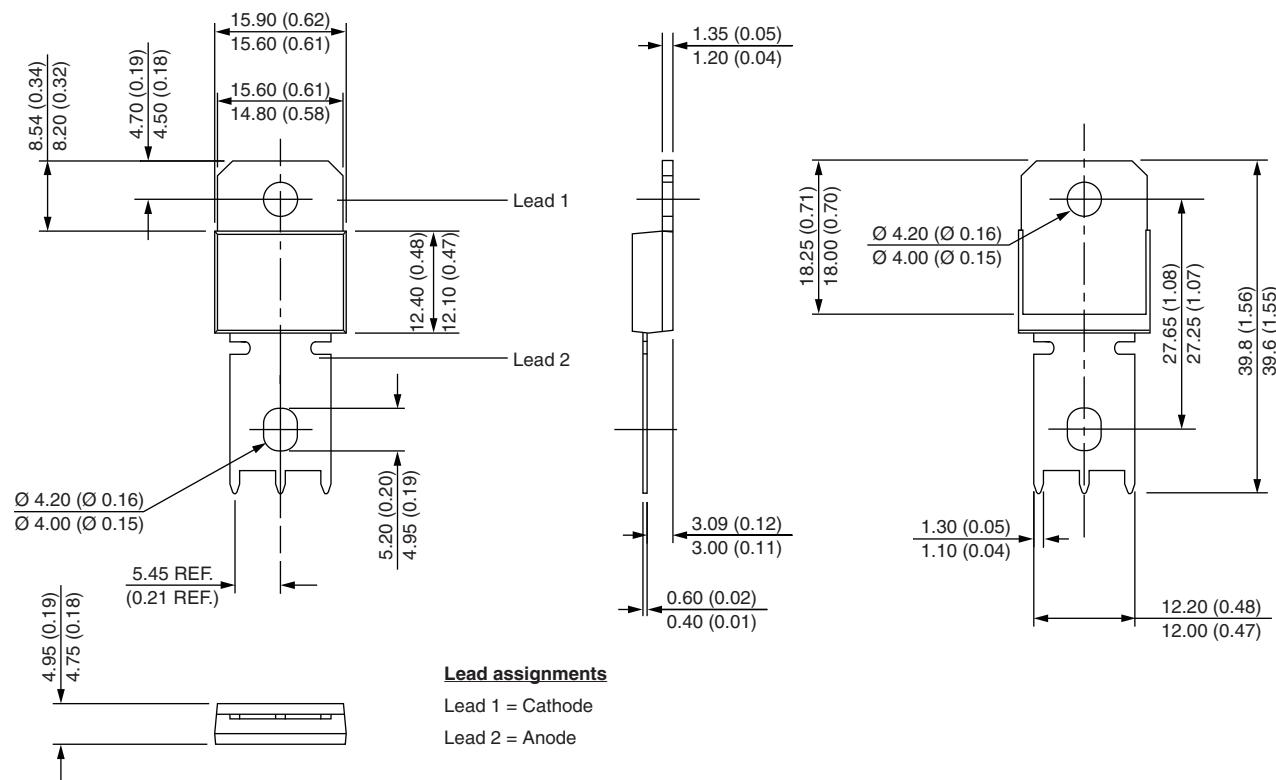
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-175BGQ045HF4	25	375	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?95240
Part marking information	www.vishay.com/doc?95467
Application note	www.vishay.com/doc?95179

PowerTab®

DIMENSIONS in millimeters (inches)



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Material Category Policy

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