

RoHS

HALOGEN

FREE

High Performance Schottky Rectifier, 175 A



PowerTab®

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
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			
E _{AS}	36 mJ			
Package	PowerTab [®]			
Circuit configuration	Single			

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 <u>www.vishav.com/doc?99912</u>

DESCRIPTION

The VS-175BGQ045HN4 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.

MECHANICAL DATA

Case: PowerTab®

Molding compound meets UL 94 V-0 flammability rating

Terminal: nickel plated, screwable

MAJOR RATINGS AND CHARACTERISTICS					
SYMBOL	CHARACTERISTICS	VALUES	UNITS		
1	Rectangular waveform	175	A		
I _{F(AV)}	T _C	103	°C		
V _{RRM}		45	V		
I _{FSM}	t _p = 5 μs sine	8700	Α		
V	175 A _{pk} (typical)	0.63	V		
V_{F}	TJ	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}	45	V	

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	I _{F(AV)}	50 % duty cycle at T _C = 103 °C, rectangular waveform		175	Α
Maximum peak one cycle		5 μs sine or 3 μs rect. pulse	Following any rated load	8700	
non-repetitive surge current	I _{FSM}	10 ms sine or 6 ms rect. pulse	condition and with rated V _{RRM} applied	1500	Α
Non-repetitive avalanche energy	E _{AS}	$T_J = 25 ^{\circ}\text{C}, I_{AS} = 6 \text{A}, L = 2 \text{mH}$		36	mJ
Repetitive avalanche current	I _{AR}	Current decaying linearly to zero in 1 μ s Frequency limited by T _J maximum V _A = 1.5 x V _R typical		Α	



ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS
Faculty of the sandy of		100 A	T _{.1} = 25 °C	0.55	0.58	
	V _{FM} ⁽¹⁾	175 A	11 = 23 0	0.67	0.75	V
Forward voltage drop	V FM (*)	100 A	T _J = 150 °C	0.49	0.54	
		175 A		0.63	0.7	
		$T_J = 150 ^{\circ}\text{C}, V_R = 45 \text{V}$		1300	2000	
Reverse leakage current I _{RM} ⁽¹⁾	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	0.6	2	mA
		T _J = 125 °C		360	640	
Maximum junction capacitance	C _T	$V_R = 5 V_{DC}$, (test signal range 100 kHz to 1 MHz) 25 °C		56	00	pF
Typical series inductance	L _S	Measured from tab to mounting plane		3	.5	nΗ
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 an temperature range	d storage	T _J , T _{Stg}		-55 to +150	°C
Maximum thermal resignation to case	istance,	R _{thJC}	DC operation	0.25	°C/W
Typical thermal resista case to heatsink	ance,	R _{thCS}	Mounting surface, smooth and greased	0.20	C/VV
Approximate weight				5	g
Mounting torque	minimum			1.2 (10)	N⋅m
maximum	maximum			2.4 (20)	(lbf \cdot in)
Marking device			Case style PowerTab®	175BG	Q045H

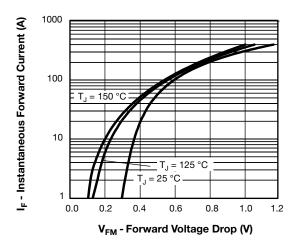


Fig. 1 - Maximum Forward Voltage Drop Characteristics

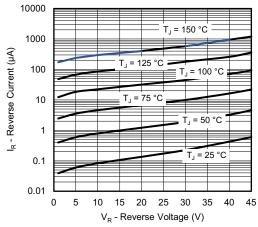


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



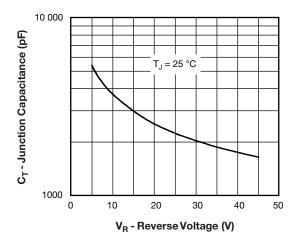


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

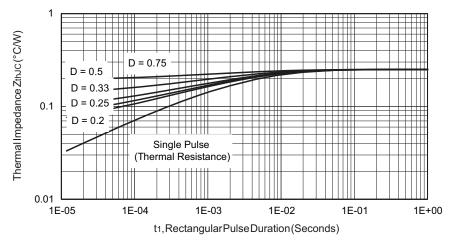


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

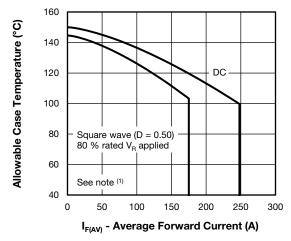


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

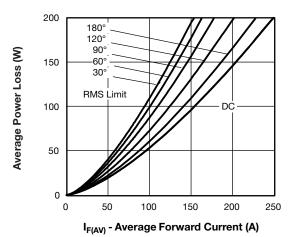
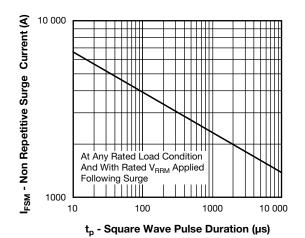


Fig. 6 - Forward Power Loss Characteristics





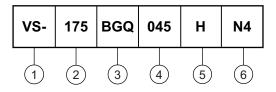
D.U.T. $R_g = 25 \Omega$ Current Migh-speed Switch $R_g = 25 \Omega$ Migh-speed Mig

Fig. 8 - Unclamped Inductive Test Circuit

Fig. 7 - Maximum Non-Repetitive Surge Current

ORDERING INFORMATION TABLE

Device code



- Vishay Semiconductors product
- 2 Current rating (175 = 175 A)
- Essential part number
- Voltage rating (045 = 45 V)
- 5 H = AEC-Q101 qualified
- 6 Environmental digit:
 - N4 = Halogen-free, RoHS compliant, and totally lead (Pb)-free

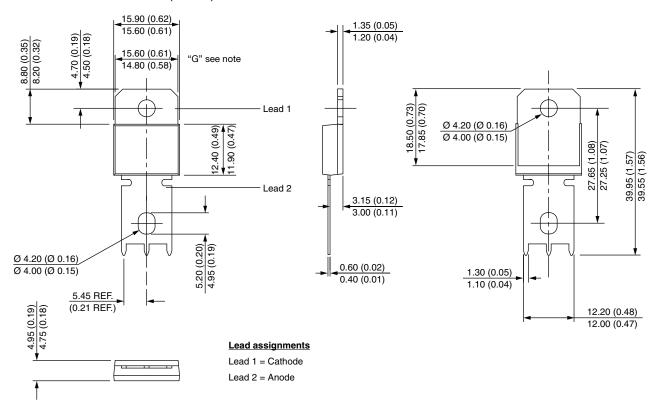
ORDERING INFORMATION (Example)			
PREFERRED P/N	BASE QUANTITY	PACKAGING DESCRIPTION	
VS-175BGQ045HN4	25/tube	Antistatic plastic tube	

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)



Note:

Outline conform to JEDEC® TO-275, except for dimension "G" only



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Vishay

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