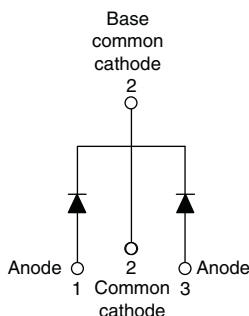


High Performance Schottky Rectifier, 2 x 30 A


TO-220AB


FEATURES

- 175 °C T_J operation
- 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
- AEC-Q101 qualified, meets JESD 201 class 2 whisker test
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
Available

PRODUCT SUMMARY

Package	TO-220AB
$I_{F(AV)}$	2 x 30 A
V_R	150 V
V_F at I_F	0.72 V
I_{RM} max.	20 mA at 125 °C
T_J max.	175 °C
Diode variation	Common cathode
E_{AS}	0.4 mJ

DESCRIPTION

The center tap Schottky rectifier series 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.

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	60	A
V_{RRM}		150	V
I_{FSM}	$t_p = 5 \mu s$ sine	710	A
V_F	30 A _{pk} , $T_J = 125$ °C (typical, per leg)	0.69	V
T_J	Range	-55 to +175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-60CTQ150HN3	UNITS
Maximum DC reverse voltage	V_R	150	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 $T_C = 137$ °C, rectangular waveform	30	A
			60	
Maximum peak one cycle non-repetitive surge current per leg, see fig. 7	I_{FSM}	5 μs sine or 3 μs rect. pulse	710	
		10 ms sine or 6 ms rect. pulse	270	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25$ °C, $I_{AS} = 0.9$ A, $L = 1$ mH	0.4	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	0.9	A

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	TYP	MAX.	UNITS
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	30 A	$T_J = 25\text{ }^{\circ}\text{C}$	0.83	V
		60 A		0.98	
		30 A	$T_J = 125\text{ }^{\circ}\text{C}$	0.67	
		60 A		0.82	
Maximum reverse leakage current per leg See fig. 2	I_{RM}	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_R$	7	μA
		$T_J = 125\text{ }^{\circ}\text{C}$		7.2	mA
Typical junction capacitance per leg	C_T	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$	-	650	pF
Typical series inductance per leg	L_S	Measured lead to lead 5 mm from package body	-	7.5	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 +175	$^{\circ}\text{C}$
Maximum thermal resistance, _____ per leg junction to case _____ per package	R_{thJC}	DC operation, see fig. 4	1.2	$^{\circ}\text{C/W}$
		DC operation	0.6	
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased	0.25	
Approximate weight			6	g
			0.21	oz.
Mounting torque _____ minimum _____ maximum			6 (5)	kgf · cm
			12 (10)	(lbf · in)
Marking device		Case style TO-220AB	60CTQ150H	

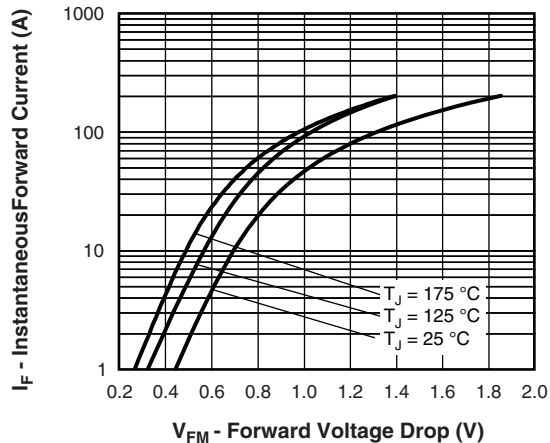


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

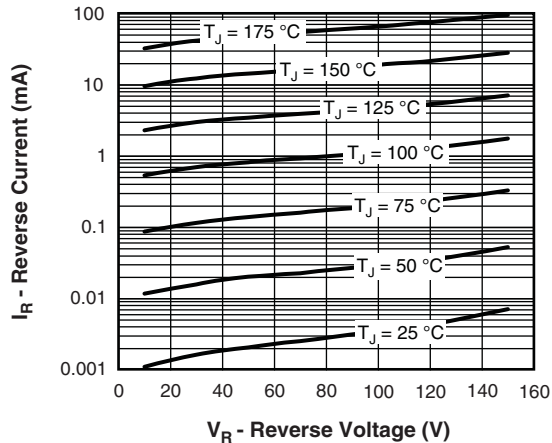


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

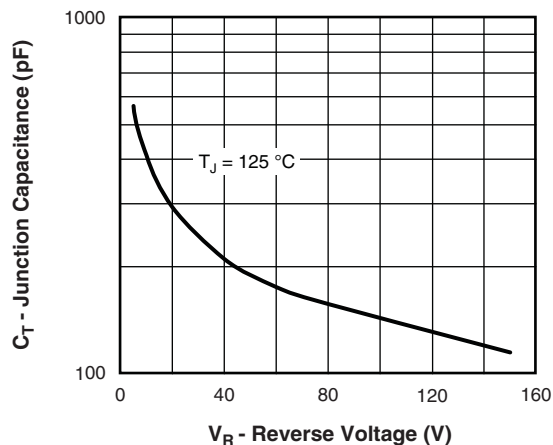
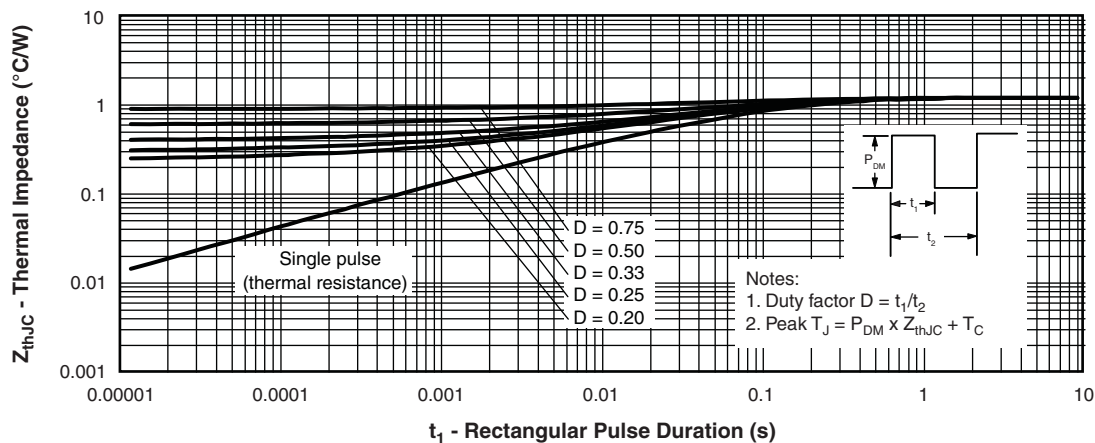


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)


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

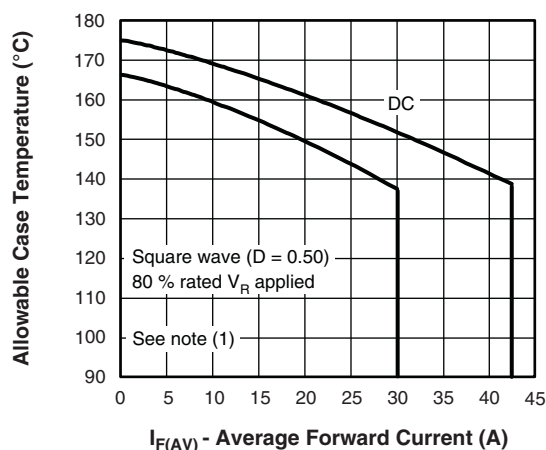


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

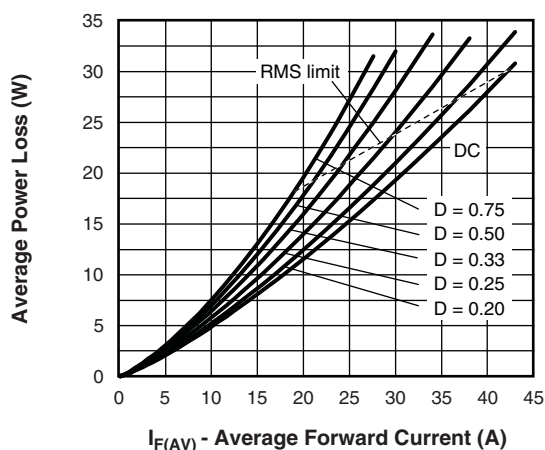


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

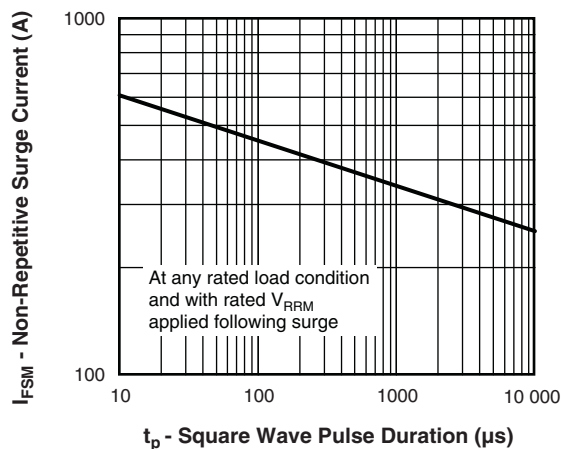


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

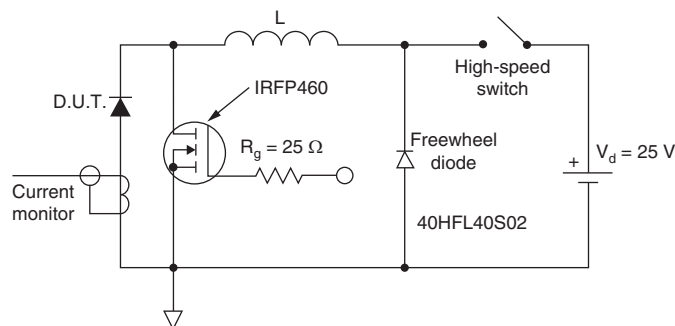


Fig. 8 - Unclamped Inductive Test Circuit

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

**ORDERING INFORMATION TABLE**

Device code	VS-	60	C	T	Q	150	H	N3
	①	②	③	④	⑤	⑥	⑦	⑧

- | | |
|----------|--|
| 1 | - Vishay Semiconductors product |
| 2 | - Current rating (60 = 60 A) |
| 3 | - Circuit configuration
C = common cathode |
| 4 | - Package
T = TO-220 |
| 5 | - Schottky "Q" series |
| 6 | - Voltage rating (150 = 150 V) |
| 7 | - H = AEC-Q101 qualified |
| 8 | - Environmental digit
N3 = halogen-free, RoHS-compliant, and totally lead (Pb)-free |

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-60CTQ150HN3	50	1000	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95222
Part marking information	www.vishay.com/doc?95028



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