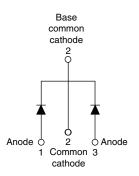


High Performance Schottky Rectifier, 2 x 30 A

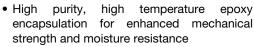


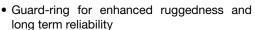


PRODUCT SUMMARY								
Package	TO-220AB							
I _{F(AV)}	2 x 30 A							
V _R	150 V							
V _F at I _F	0.72 V							
I _{RM} max.	20 mA at 125 °C							
T _J max.	175 °C							
Diode variation	Common cathode							
E _{AS}	0.4 mJ							

FEATURES

- 175 °C T_J operation
- Low forward voltage drop
- · High frequency operation







 Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>





ROHS COMPLIANT HALOGEN FREE

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 U								
I _{F(AV)}	Rectangular waveform	60	Α					
V _{RRM}		150	V					
I _{FSM}	t _p = 5 μs sine	710	Α					
V _F	30 A _{pk} , T _J = 125 °C (typical, per leg)	0.69	V					
TJ	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}	130	V				

ABSOLUTE MAXIMUM RATINGS								
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS			
Maximum average forward per le		I _{F(AV)} 50 % duty cycle at T _C = 137 °C, rectangular waveform —		30	Δ.			
current, see fig. 5 per device	F(AV)			60				
Maximum peak one cycle non-repetitive		5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated	710	A			
surge current per leg, see fig. 7	IFSM	10 ms sine or 6 ms rect. pulse	V _{RRM} applied	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 μ s Frequency limited by T _J maximum V _A = 1.5 x V _R typical		0.9	Α			

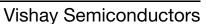


ELECTRICAL SPECIFICATIONS								
PARAMETER	SYMBOL	TEST CO	TYP	MAX.	UNITS			
		30 A	T _{.1} = 25 °C	0.83	0.88	V		
Maximum forward voltage drop per leg	V _{FM} ⁽¹⁾	60 A	1j=25 C	0.98	1.09			
See fig. 1	V _{FM} (1)	30 A	T _{.1} = 125 °C	0.67	0.72			
		60 A	1j=125 C	0.82	0.87			
Maximum reverse leakage current per leg	I _{RM}	T _J = 25 °C	V _R = Rated V _R	7	75	μΑ		
See fig. 2		T _J = 125 °C	VR = nateu VR	7.2	20	mA		
Typical junction capacitance per leg	C _T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °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		

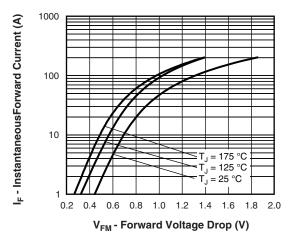
Note

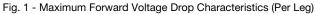
 $^{^{(1)}\,}$ Pulse width < 300 $\mu s,$ duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS								
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS			
Maximum junction and storage temperature range		T _J , T _{Stg}		-55 to +175	°C			
Maximum thermal resistance,	per leg	R _{thJC}	DC operation, see fig. 4	1.2				
junction to case	per package	□thJC	DC operation	0.6	°C/W			
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			6 (5)	kgf · cm			
Mounting torque	maximum			12 (10)	(lbf \cdot in)			
Marking device			Case style TO-220AB	60CT	Q150H			









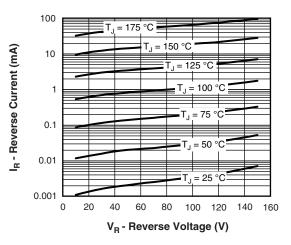


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

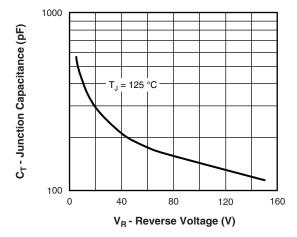


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

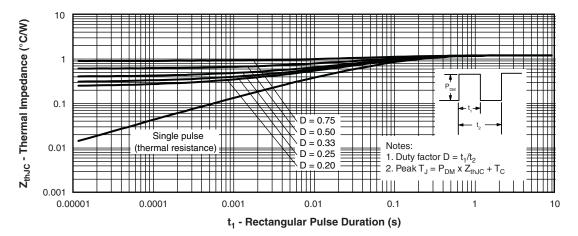
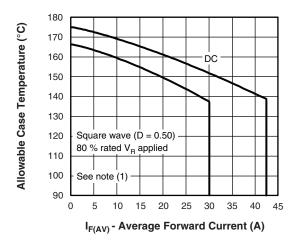


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)



30 RMS limit Average Power Loss (W) 25 20 D = 0.7515 D = 0.50D = 0.3310 D = 0.25D = 0.205 0 0 10 15 20 25 30 35 40 45 I_{F(AV)} - Average Forward Current (A)

35

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

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

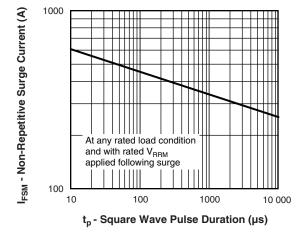


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

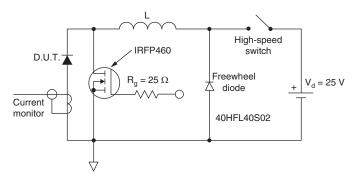


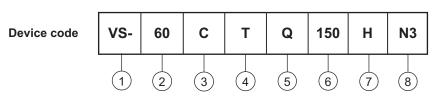
Fig. 8 - Unclamped Inductive Test Circuit

Note

 $\begin{array}{ll} \text{(1)} & \text{Formula used: } T_C = T_J - (Pd + Pd_{REV}) \times R_{th,JC}; \\ Pd = \text{Forward power loss} = I_{F(AV)} \times V_{FM} \text{ at } (I_{F(AV)}/D) \text{ (see fig. 6);} \\ Pd_{REV} = \text{Inverse power loss} = V_{R1} \times I_R \text{ (1 - D); } I_R \text{ at } V_{R1} = 80 \text{ \% rated } V_R \\ \end{array}$



ORDERING INFORMATION TABLE



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

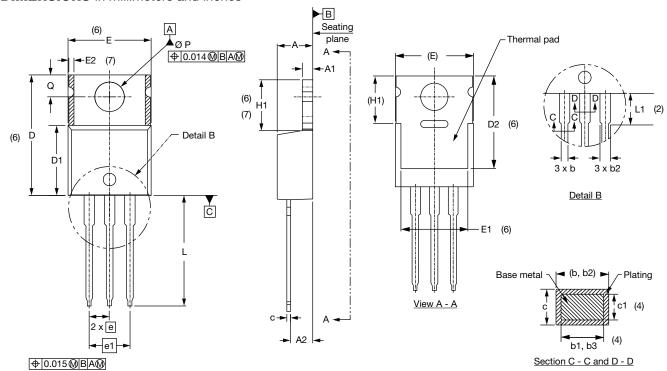
ORDERING INFORMATION (Example)									
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION						
VS-60CTQ150HN3	50	1000	Antistatic plastic tube						

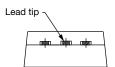
LINKS TO RELATED DOCUMENTS							
Dimensions <u>www.vishay.com/doc?95222</u>							
Part marking information	www.vishay.com/doc?95028						



TO-220AB

DIMENSIONS in millimeters and inches





Conforms to JEDEC® outline TO-220AB

SYMBOL	MILLIMETERS		INCHES		HES NOTES		SYMBOL	MILLIM	IETERS	INC	HES	NOTES
STINIBUL	MIN.	MAX.	MIN.	MAX.	NOTES		STIVIDOL	MIN.	MAX.	MIN.	MAX.	NOTES
Α	4.25	4.65	0.167	0.183			D2	11.68	12.88	0.460	0.507	6
A1	1.14	1.40	0.045	0.055			Е	10.11	10.51	0.398	0.414	3, 6
A2	2.56	2.92	0.101	0.115			E1	6.86	8.89	0.270	0.350	6
b	0.69	1.01	0.027	0.040			E2	ı	0.76	-	0.030	7
b1	0.38	0.97	0.015	0.038	4		е	2.41	2.67	0.095	0.105	
b2	1.20	1.73	0.047	0.068			e1	4.88	5.28	0.192	0.208	
b3	1.14	1.73	0.045	0.068	4		H1	5.84	6.86	0.230	0.270	6, 7
С	0.36	0.61	0.014	0.024			L	13.52	14.02	0.532	0.552	
c1	0.36	0.56	0.014	0.022	4		L1	3.32	3.82	0.131	0.150	2
D	14.85	15.25	0.585	0.600	3		ØР	3.54	3.73	0.139	0.147	
D1	8.38	9.02	0.330	0.355			Q	2.60	3.00	0.102	0.118	

Notes

- ⁽¹⁾ Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Lead dimension and finish uncontrolled in L1
- (3) Dimension D, D1 and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (4) Dimension b1, b3 and c1 apply to base metal only
- (5) Controlling dimensions: inches
- (6) Thermal pad contour optional within dimensions E, H1, D2 and E1
- (7) Dimensions E2 x H1 define a zone where stamping and singulation irregularities are allowed
- (8) Outline conforms to JEDEC® TO-220, except A2 (maximum) and D2 (minimum) where dimensions are derived from the actual package outline

Revision: 23-Feb-2024 1 Document Number: 95222



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Vishay

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