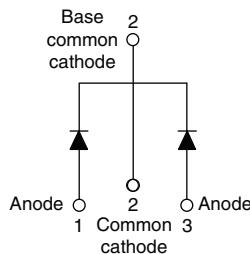


Schottky Rectifier, 2 x 15 A



TO-220AB



FEATURES

- 150 °C T_J operation
- Center tap configuration
- Very 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
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level


 RoHS*
COMPLIANT

DESCRIPTION

This center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

PRODUCT SUMMARY	
$I_{F(AV)}$	2 x 15 A
V_R	50/60 V

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	30	A
V_{RRM}		50/60	V
I_{FSM}	$t_p = 5 \mu s$ sine	1000	A
V_F	15 Apk, $T_J = 125$ °C (per leg)	0.56	V
T_J	Range	- 55 to 150	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	30CTQ050PbF	30CTQ060PbF	UNITS
Maximum DC reverse voltage	V_R	50	60	V
Maximum working peak reverse voltage	V_{RWM}			

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current per device See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 105$ °C, rectangular waveform		30	A	
per leg				15		
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	1000		
		10 ms sine or 6 ms rect. pulse		260		
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25$ °C, $I_{AS} = 1.50$ A, $L = 11.5$ mH		13	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		1.50	A	

* Pb containing terminations are not RoHS compliant, exemptions may apply

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop per leg See fig. 1	V _{FM} ⁽¹⁾	15 A	T _J = 25 °C	0.62	V	
		30 A		0.82		
		15 A	T _J = 125 °C	0.56		
		30 A		0.71		
Maximum reverse leakage current per leg See fig. 2	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	0.80	mA	
		T _J = 125 °C		45		
Threshold voltage	V _{F(TO)}	T _J = T _J maximum		0.39	V	
Forward slope resistance	r _f			8.47	mΩ	
Maximum junction capacitance per leg	C _T	V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz) 25 °C		720	pF	
Typical series inductance per leg	L _S	Measured lead to lead 5 mm from package body		8.0	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 _{Sig}			- 55 to 150	°C	
Maximum thermal resistance, junction to case per leg	R _{thJC}	DC operation		3.25	°C/W	
Maximum thermal resistance, junction to case per package				1.63		
Typical thermal resistance, case to heatsink	R _{thCS}	Mounting surface, smooth and greased		0.50		
Approximate weight				2	g	
				0.07	oz.	
Mounting torque	minimum			6 (5)	kgf · cm (lbf · in)	
	maximum			12 (10)		
Marking device		Case style TO-220AB		30CTQ050		
				30CTQ060		

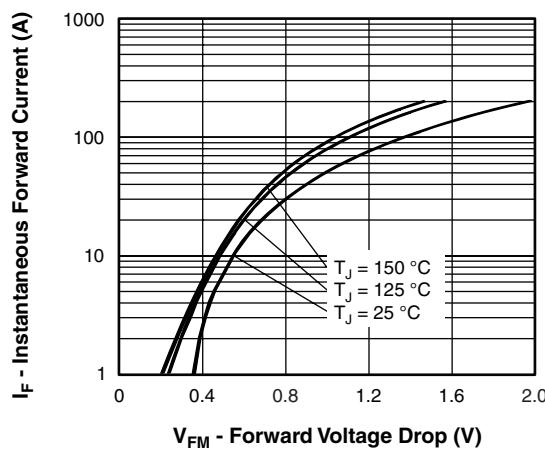


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

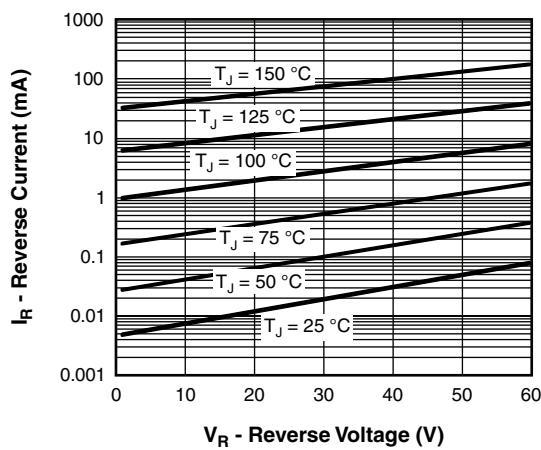


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

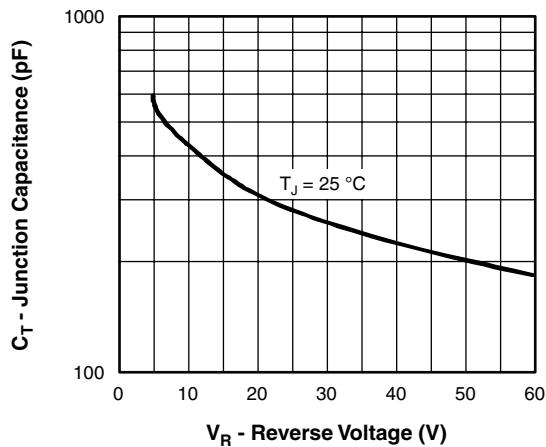


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

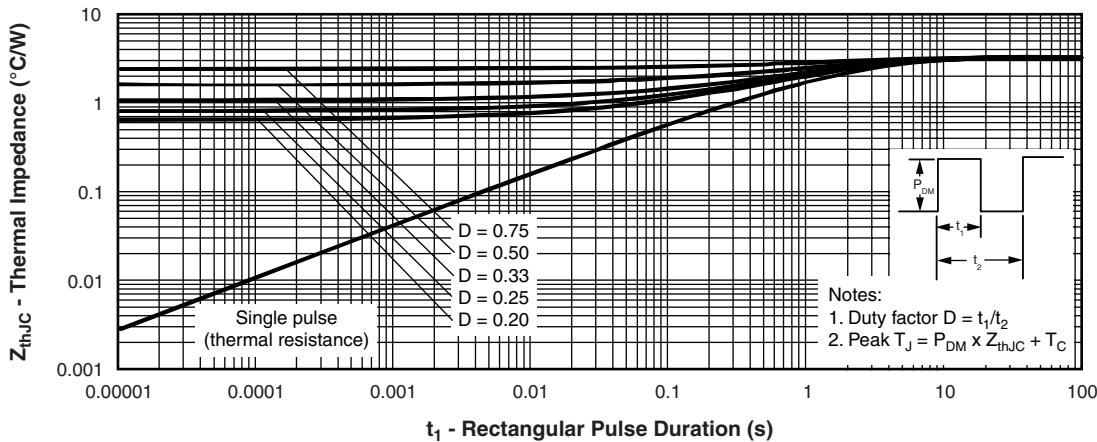


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

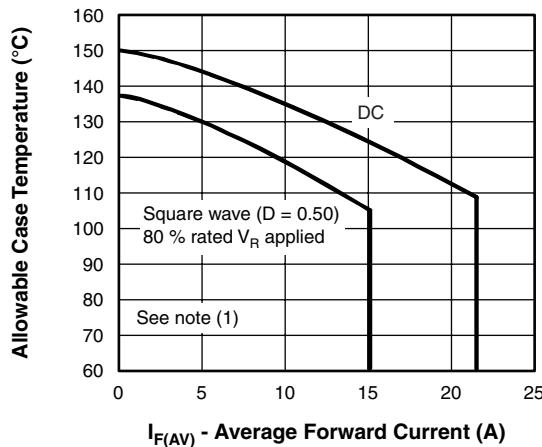


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

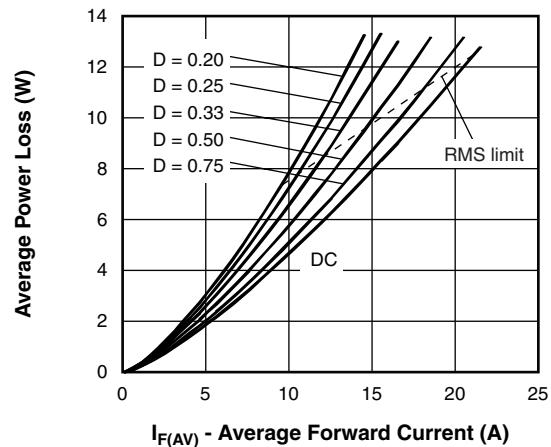


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

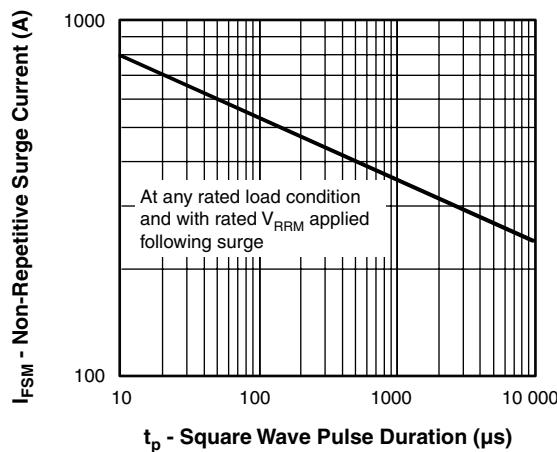


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

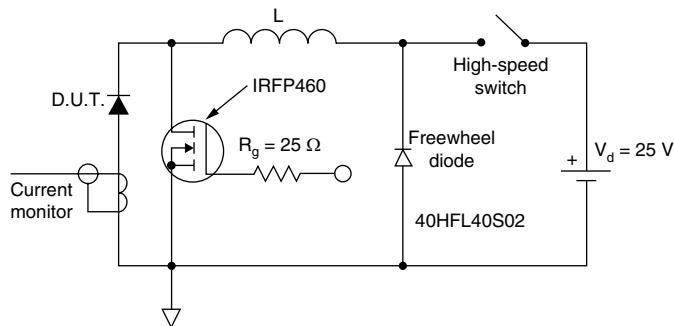


Fig. 8 - Unclamped Inductive Test Circuit

Note

(1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$
 $P_d = \text{Forward power loss} = I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{dREV} = \text{Inverse power loss} = V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 10\text{ V}$

ORDERING INFORMATION TABLE

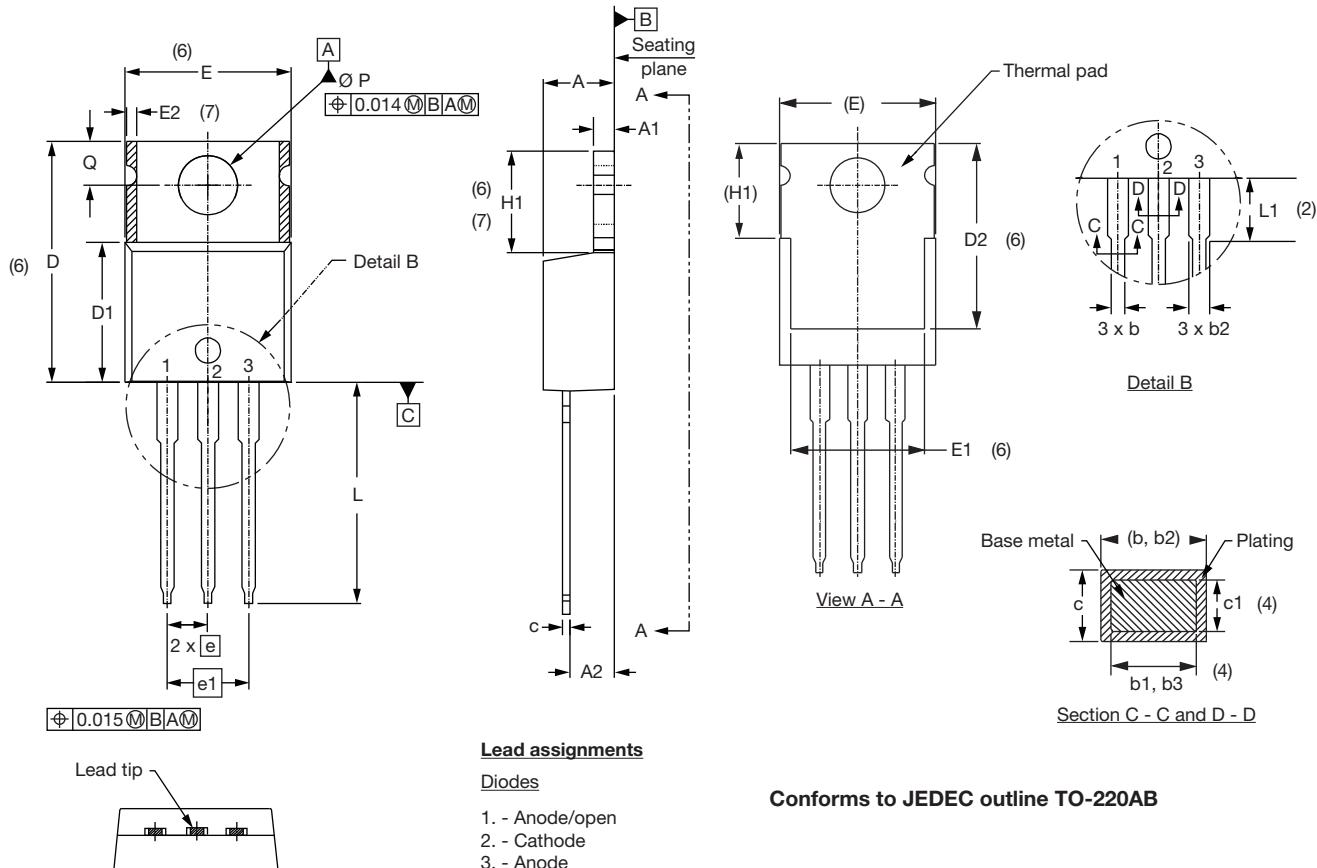
Device code	30	C	T	Q	060	PbF
	1	2	3	4	5	6
1	- Current rating (30 = 30 A)					
2	- Circuit configuration: C = Common cathode					
3	- Package T = TO-220					
4	- Schottky "Q" series					
5	- Voltage ratings					
6	<ul style="list-style-type: none"> • None = Standard production • PbF = Lead (Pb)-free 					

Tube standard pack quantity: 50 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95222
Part marking information	http://www.vishay.com/doc?95225

TO-220AB

DIMENSIONS in millimeters and inches



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.25	4.65	0.167	0.183	
A1	1.14	1.40	0.045	0.055	
A2	2.56	2.92	0.101	0.115	
b	0.69	1.01	0.027	0.040	
b1	0.38	0.97	0.015	0.038	4
b2	1.20	1.73	0.047	0.068	
b3	1.14	1.73	0.045	0.068	4
c	0.36	0.61	0.014	0.024	
c1	0.36	0.56	0.014	0.022	4
D	14.85	15.25	0.585	0.600	3
D1	8.38	9.02	0.330	0.355	
D2	11.68	12.88	0.460	0.507	6

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

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