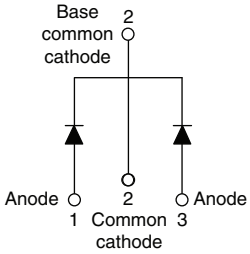
Schottky Rectifier, 2 x 15 A

TO-220AB



FEATURES

- 175 °C T_J operation
- 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
- Compliant to RoHS Directive 2002/95/EC
- Designed and qualified according to JEDEC-JESD47
- Halogen-free according to IEC 61249-2-21 definition (-N3 only)

Pb-free
e3
RoHS COMPLIANT
HALOGEN FREE Available

DESCRIPTION

The VS-30CTQ... 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 175 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

PRODUCT SUMMARY	
Package	TO-220AB
$I_{F(AV)}$	2 x 15 A
V_R	35 V, 40 V, 45 V
V_F at I_F	0.56 V
I_{RM} max.	15 mA at 125 °C
T_J max.	175 °C
Diode variation	Common cathode
E_{AS}	20 mJ

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	30	A
V_{RRM}		35 to 45	V
I_{FSM}	t_p = 5 µs sine	1060	A
V_F	15 A_{pk}, T_J = 125 °C (per leg)	0.56	V
T_J		- 55 to 175	°C

VOLTAGE RATINGS								
PARAMETER	SYMBOL	VS-30CTQ035PbF	VS-30CTQ035-N3	VS-30CTQ040PbF	VS-30CTQ040-N3	VS-30CTQ045PbF	VS-30CTQ045-N3	UNITS
Maximum DC reverse voltage	V_R	35	35	40	40	45	45	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 = 127 °C, rectangular waveform		30	A
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	1060	
		10 ms sine or 6 ms rect. pulse		265	
Non-repetitive avalanche energy per leg	E_{AS}	T_J = 25 °C, I_{AS} = 3.0 A, L = 4.40 mH		20	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 x V_R typical		3.0	A

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		0.76	
		15 A	T_J = 125 °C	0.56	
		30 A		0.70	
Maximum reverse leakage current per leg See fig. 2	I_{RM} (1)	T_J = 25 °C	V_R = Rated V_R	2	mA
		T_J = 125 °C		15	
Maximum junction capacitance per leg	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) 25 °C		900	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_{Stg}		- 55 to 175	°C
Maximum thermal resistance, junction to case per leg		R_{thJC}	DC operation See fig. 4	3.25	°C/W
Maximum thermal resistance, junction to case per package			DC operation	1.63	
Typical thermal resistance, case to heatsink		R_{thCS}	Mounting surface, smooth and greased	0.50	
Approximate weight				2.0	g
				0.07	oz.
Mounting torque	minimum			6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device			Case style TO-220AB	30CTQ035	
				30CTQ040	
				30CTQ045	

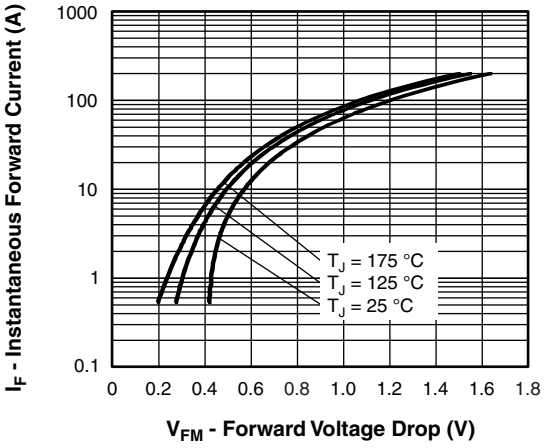


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

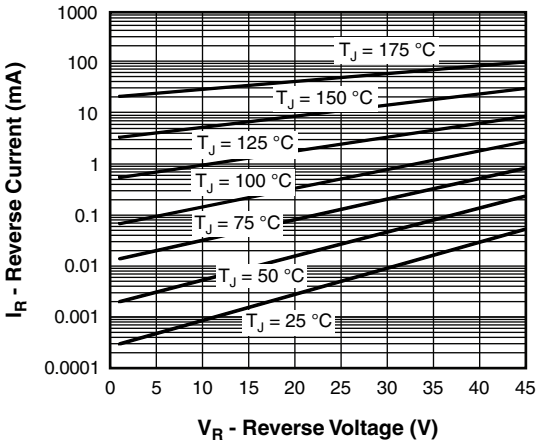


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

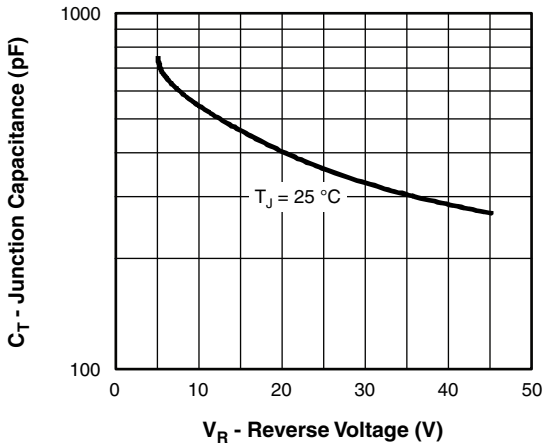


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

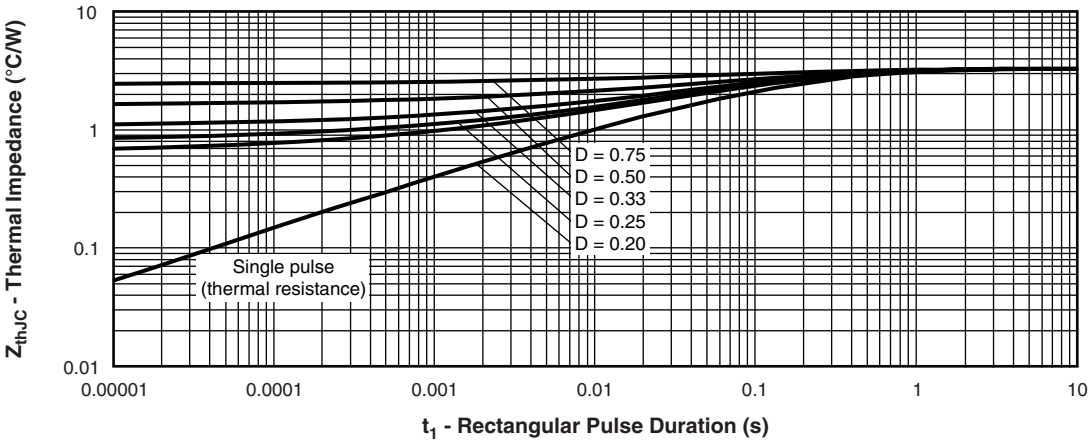


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

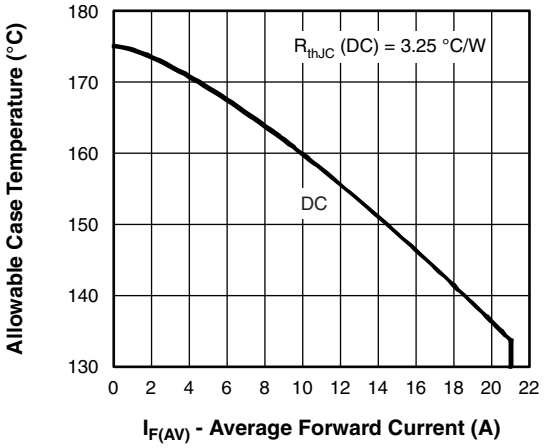


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

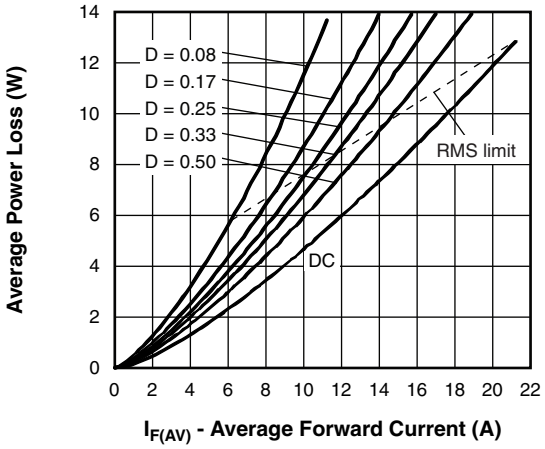


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

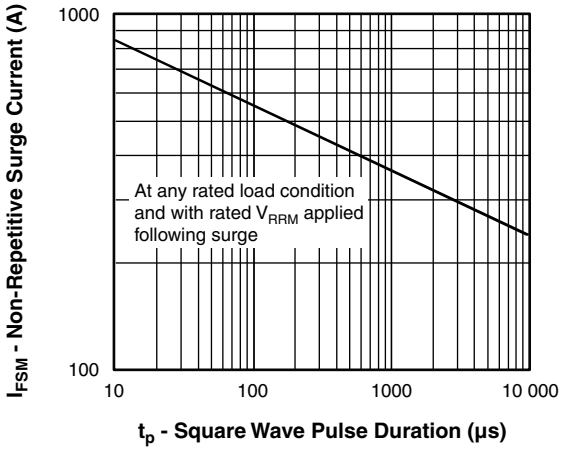


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

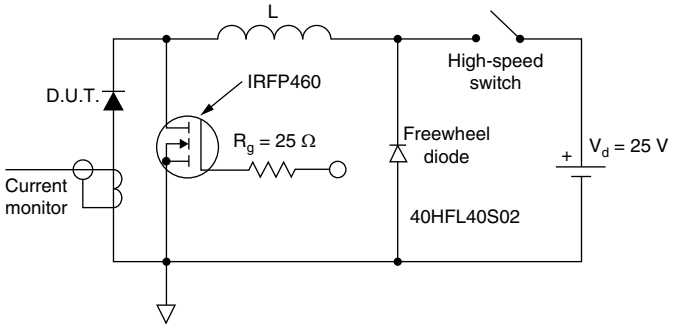


Fig. 8 - Unclamped Inductive Test Circuit

ORDERING INFORMATION TABLE

Device code

VS-	30	C	T	Q	045	PbF
1	2	3	4	5	6	7

1 - Vishay Semiconductors product

2 - Current rating (30 = 30 A)

3 - Circuit configuration:
C = Common cathode

4 - Package:
T = TO-220

5 - Schottky "Q" series

6 - Voltage ratings
035 = 35 V
040 = 40 V
045 = 45 V

7 - Environmental digit
- PbF = Lead (Pb)-free and RoHS compliant
- -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-30CTQ035PbF	50	1000	Antistatic plastic tube
VS-30CTQ035-N3	50	1000	Antistatic plastic tube
VS-30CTQ040PbF	50	1000	Antistatic plastic tube
VS-30CTQ040-N3	50	1000	Antistatic plastic tube
VS-30CTQ045PbF	50	1000	Antistatic plastic tube
VS-30CTQ045-N3	50	1000	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS		
Dimensions		www.vishay.com/doc?95222
Part marking information	TO-220AB PbF	www.vishay.com/doc?95225
	TO-220AB -N3	www.vishay.com/doc?95028

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