

ANTREX Electronics

Electronic Components Sourcing Information

Product Reference Information

Part Number: VS-12CTQ045-N3

Manufacturer: Vishay General Semiconductor - Diodes Division

Package: Tube

Availability: Please confirm with sales

Product Page:

<https://antrexco.com/product/details/vishay-general-semiconductor-diodes-division-vs-12ctq045-n3.html>



Scan for product page

Request a Quote:

[Submit RFQ for this part](#)

Contact Information

Email: info@antrexco.com

WhatsApp: +86-186-8066-5326

Website: <https://antrexco.com>

Quality & Trust

New & Original Components

Supplier verification and packaging condition review

CoC / RoHS / REACH documents available on request

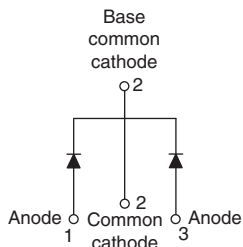
Secure sourcing support for OEM / EMS projects

Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

High Performance Schottky Rectifier, 2 x 6 A


TO-220AB


FEATURES

- 175 °C T_J operation
- Center tap TO-220 package
- 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
- Designed and qualified according to JEDEC®-JESD 47
- 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 6 A
V _R	35 V, 40 V, 45 V
V _F at I _F	0.53 V
I _{RM} max.	7 mA at 125 °C
T _J max.	175 °C
Diode variation	Common cathode
E _{AS}	8 mJ

DESCRIPTION

The VS-12CTQ... 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	12	A
V _{RRM}	Range	35 to 45	V
I _{FSM}	t _p = 5 μs sine	690	A
V _F	6 A _{pk} , T _J = 125 °C (per leg)	0.53	V
T _J	Range	-55 to +175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-12CTQ035PbF	VS-12CTQ035-N3	VS-12CTQ040PbF	VS-12CTQ040-N3	VS-12CTQ045PbF	VS-12CTQ045-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 = 160 °C, rectangular waveform	6	A
per leg			12	
Maximum peak one cycle non-repetitive surge current per leg. See fig. 7	I _{FSM}	5 μs sine or 3 μs rect. pulse	690	A
		10 ms sine or 6 ms rect. pulse	140	
Non-repetitive avalanche energy per leg	E _{AS}	T _J = 25 °C, I _{AS} = 1.20 A, L = 11.10 mH	8	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	1.20	A

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	6 A	$T_J = 25\text{ }^{\circ}\text{C}$	0.60	V	
		12 A		0.73		
		6 A	$T_J = 125\text{ }^{\circ}\text{C}$	0.53		
		12 A		0.64		
Maximum reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_R$	0.8	mA	
		$T_J = 125\text{ }^{\circ}\text{C}$		7.0		
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.35	V	
Forward slope resistance	r_t			18.23	mΩ	
Maximum junction capacitance per leg	C_T	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		400	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	3.50	°C/W
Maximum thermal resistance, junction to case per package		DC operation	1.75	
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	12CTQ035	
			12CTQ040	
			12CTQ045	

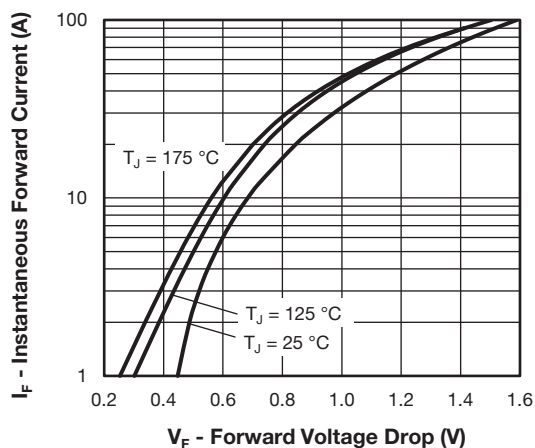


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

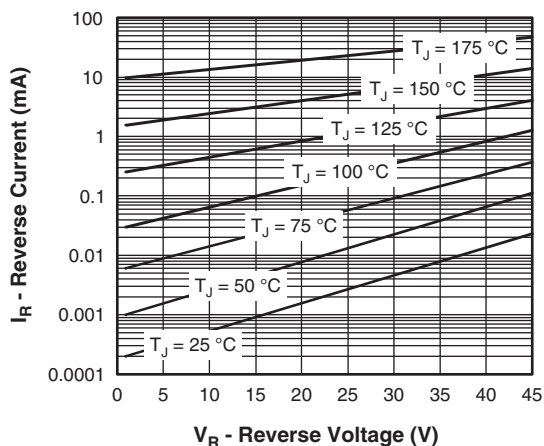


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

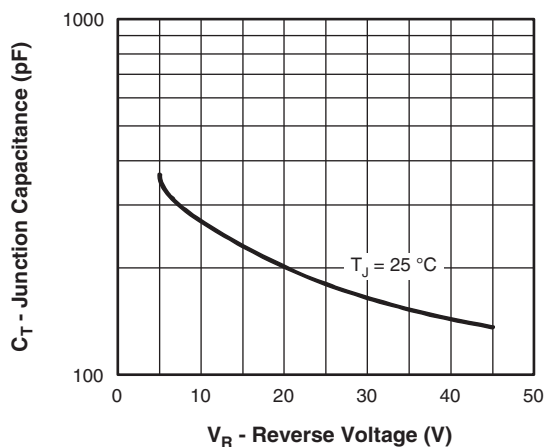


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

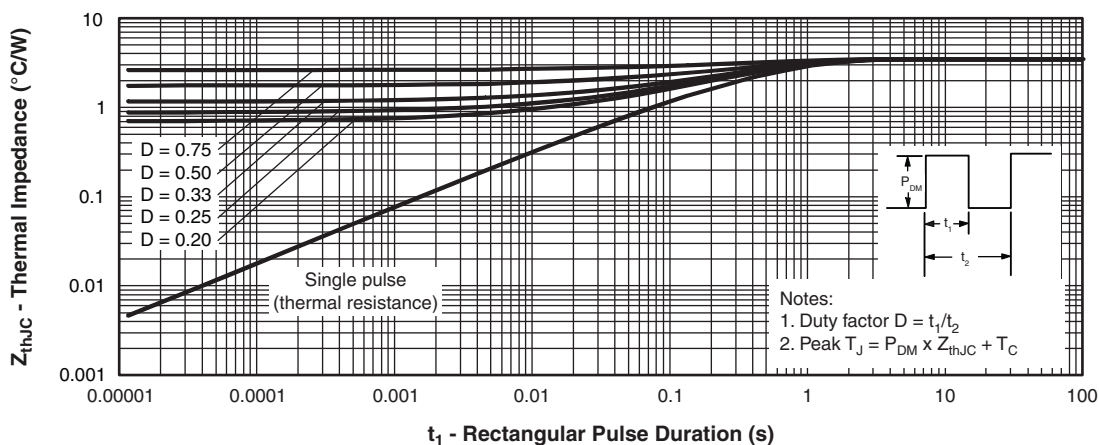


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

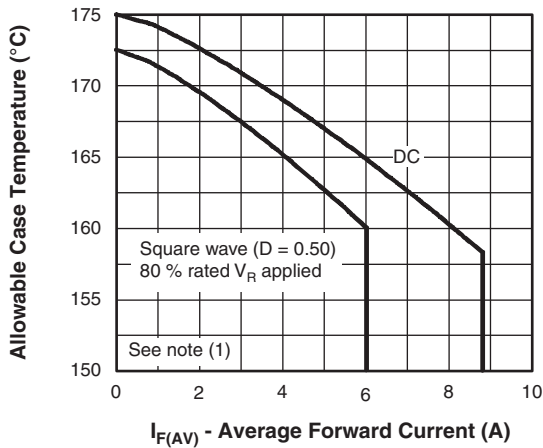


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

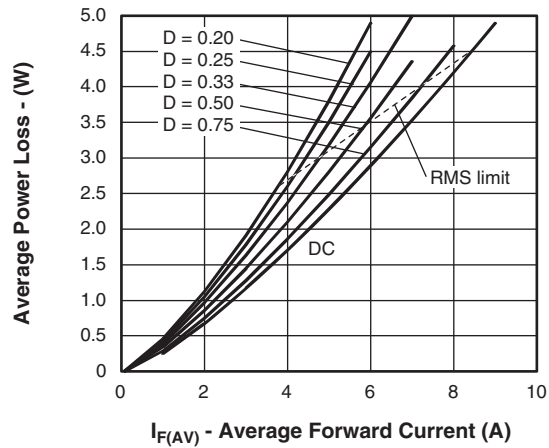


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

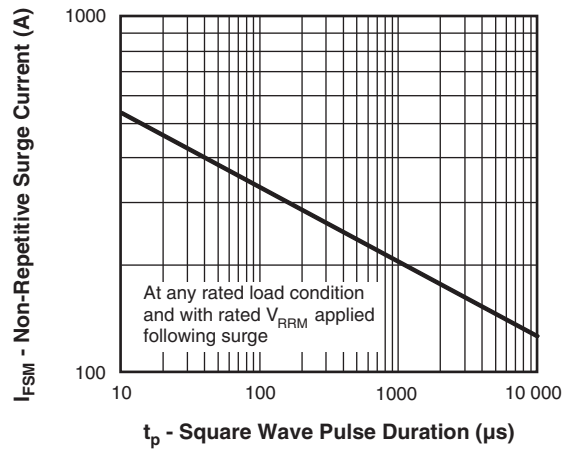


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

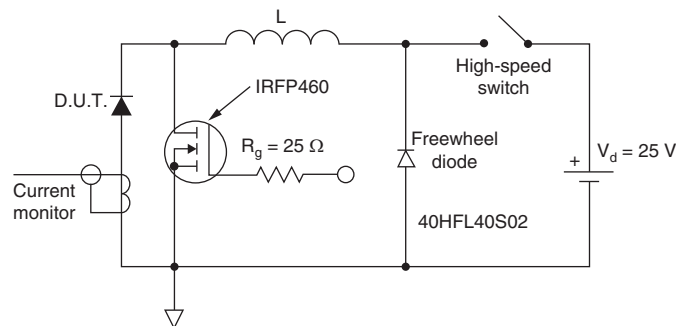


Fig. 8 - Unclamped Inductive Test Circuit

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

- | | | | |
|----------|---|--|------------|
| 1 | - | Vishay Semiconductors product | |
| 2 | - | Current rating (12 = 12 A) | |
| 3 | - | Circuit configuration:
C = Common cathode | |
| 4 | - | Package:
T = TO-220 | |
| 5 | - | Schottky "Q" series | 035 = 35 V |
| 6 | - | Voltage ratings | 040 = 40 V |
| 7 | - | Environmental digit | 045 = 45 V |
- 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-12CTQ035PbF	50	1000	Antistatic plastic tube
VS-12CTQ035-N3	50	1000	Antistatic plastic tube
VS-12CTQ040PbF	50	1000	Antistatic plastic tube
VS-12CTQ040-N3	50	1000	Antistatic plastic tube
VS-12CTQ045PbF	50	1000	Antistatic plastic tube
VS-12CTQ045-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
SPIICE model	www.vishay.com/doc?95629



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.