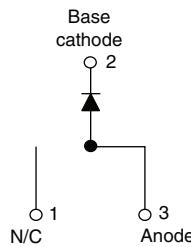


Schottky Rectifier, 15 A


 D²PAK


FEATURES

- 150 °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
- Designed and qualified for Q101 level

DESCRIPTION

The 12TQ...S Schottky rectifier series 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)}	15 A
V _R	35 to 45 V

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
I _{F(AV)}	Rectangular waveform	15	A
V _{RRM}	Range	35 to 45	V
I _{FSM}	t _p = 5 µs sine	990	A
V _F	15 Apk, T _J = 125 °C	0.50	V
T _J	Range	- 55 to 150	°C

VOLTAGE RATINGS					
PARAMETER	SYMBOL	12TQ035S	12TQ040S	12TQ045S	UNITS
Maximum DC reverse voltage	V _R	35	40	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 = 120 °C, rectangular waveform		15	A
Maximum peak one cycle non-repetitive surge current See fig. 7	I _{FSM}	5 µs sine or 3 µs rect. pulse		990	A
		10 ms sine or 6 ms rect. pulse		250	
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 2.4 A, L = 5.5 mH		16	mJ
Repetitive avalanche current	I _{AR}	Current decaying linearly to zero in 1 µs Frequency limited by T _J maximum V _A = 1.5 x V _R typical		2.4	A

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop See fig. 1	V _{FM} ⁽¹⁾	15 A	T _J = 25 °C	0.56	V	
		30 A		0.71		
		15 A	T _J = 125 °C	0.50		
		30 A		0.64		
Maximum reverse leakage current See fig. 2	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	1.75	mA	
		T _J = 125 °C		70		
Maximum junction capacitance	C _T	V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz) 25 °C		900	pF	
Typical series inductance	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 150	°C	
Maximum thermal resistance, junction to case	R _{thJC}	DC operation See fig. 4	2.0	°C/W	
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 D ² PAK	12TQ035S		
			12TQ040S		
			12TQ045S		

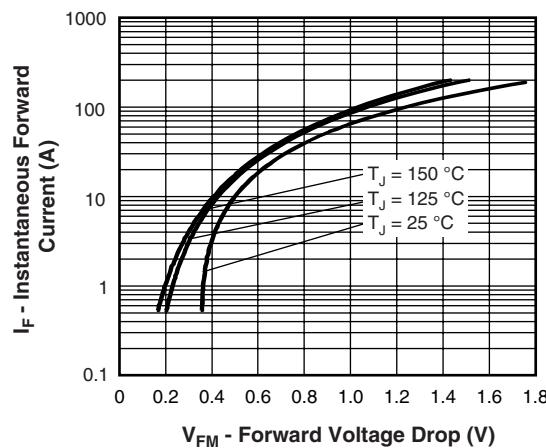


Fig. 1 - Maximum Forward Voltage Drop Characteristics

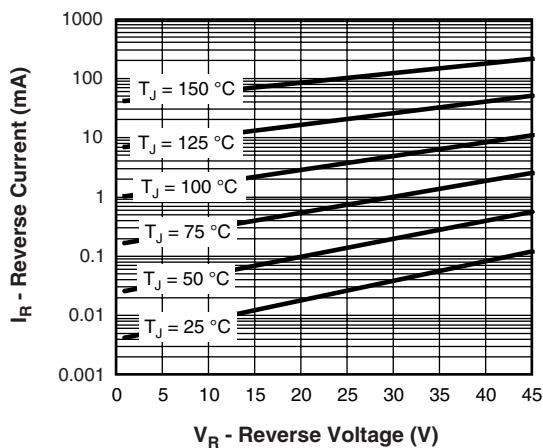


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

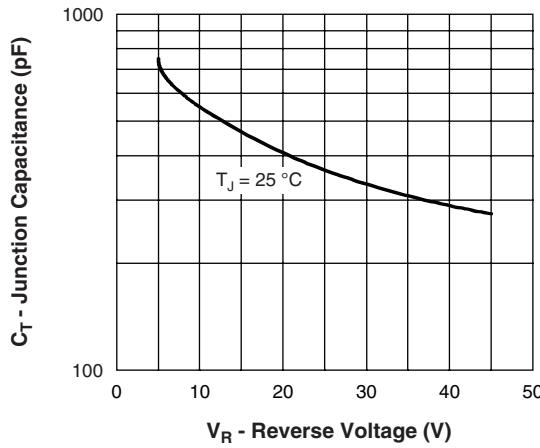
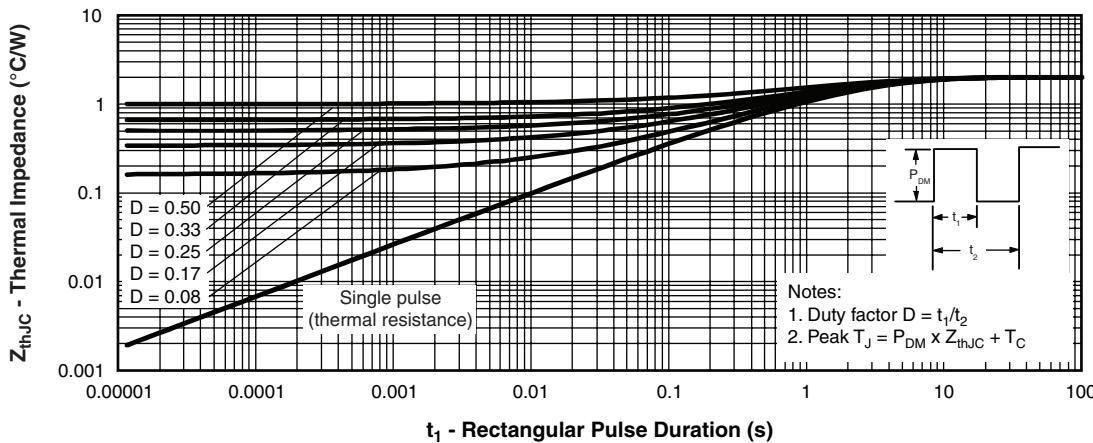


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


 Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

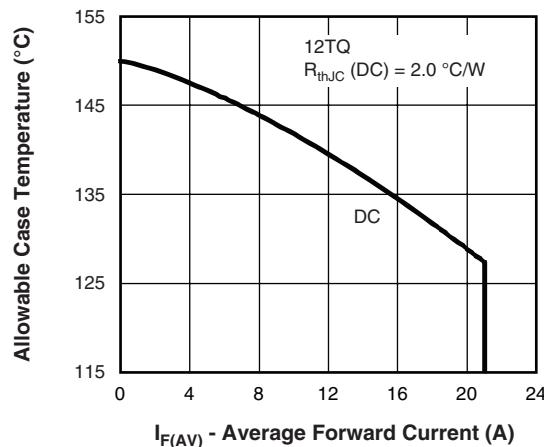


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current

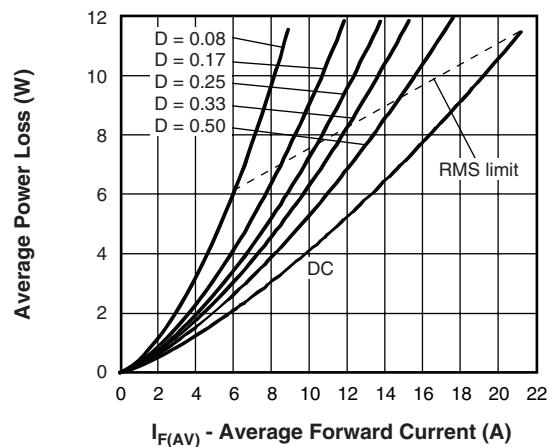


Fig. 6 - Forward Power Loss Characteristics

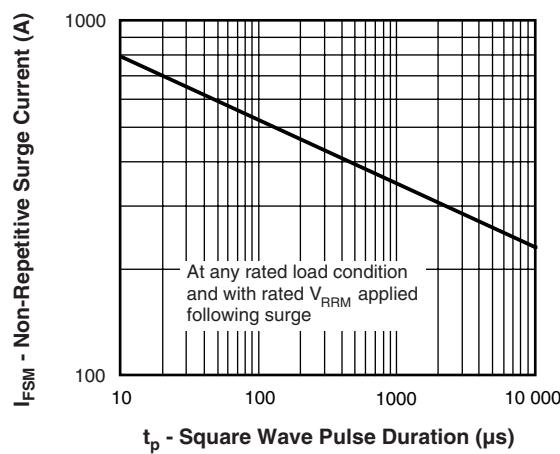


Fig. 7 - Maximum Non-Repetitive Surge Current

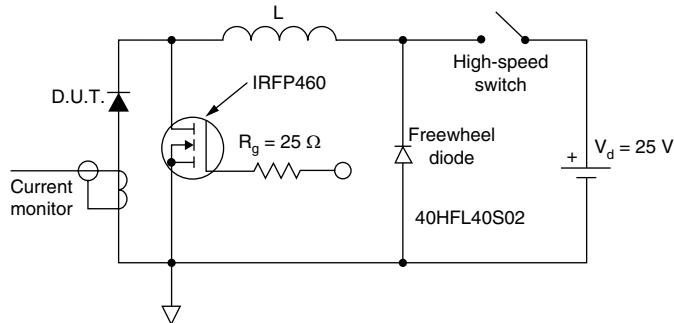


Fig. 8 - Unclamped Inductive Test Circuit

ORDERING INFORMATION TABLE

Device code	12	T	Q	045	S	TRL	-
	1	2	3	4	5	6	7

1	- Current rating
2	- Package: T = TO-220
3	- Schottky "Q" series
4	- Voltage ratings
5	• S = D ² PAK
6	• None = Tube (50 pieces) • TRL = Tape and reel (left oriented) • TRR = Tape and reel (right oriented)
7	• None = Standard production • PbF = Lead (Pb)-free

035 = 35 V
040 = 40 V
045 = 45 V

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95014
Part marking information	http://www.vishay.com/doc?95008
Packaging information	http://www.vishay.com/doc?95032

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