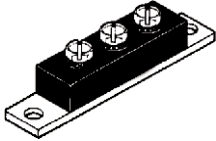
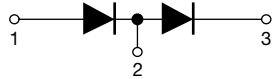


Schottky Rectifier, 400 A


TO-244AB Isolated Doubler

FEATURES

- 175 °C T_J operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level


RoHS
COMPLIANT

PRODUCT SUMMARY

$I_{F(AV)}$	400 A
V_R	135 V

DESCRIPTION

The 409DMQ135 Schottky rectifier doubler module 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 high current switching power supplies, plating power supplies, UPS systems, converters, freewheeling diodes, welding, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	400	A
V_{RRM}		135	V
I_{FSM}	$t_p = 5 \mu s$ sine	25 500	A
V_F	200 Apk, $T_J = 125 \text{ }^\circ\text{C}$ per leg	0.72	V
T_J	Range	- 55 to 175	$^\circ\text{C}$

VOLTAGE RATINGS

PARAMETER	SYMBOL	409DMQ135	UNITS
Maximum DC reverse voltage	V_R	135	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current per device	$I_{F(AV)}$	50 % duty cycle at $T_C = 80 \text{ }^\circ\text{C}$, rectangular waveform	400	A
Maximum peak one cycle non-repetitive surge current per leg	I_{FSM}	5 μs sine or 3 μs rect. pulse	20 000	
		10 ms sine or 6 ms rect. pulse	2300	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25 \text{ }^\circ\text{C}$, $I_{AS} = 1 \text{ A}$, $L = 30 \text{ mH}$	15	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	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg	$V_{FM}^{(1)}$	200 A	$T_J = 25\text{ }^\circ\text{C}$	1.03	V
		400 A		1.21	
		200 A	$T_J = 125\text{ }^\circ\text{C}$	0.71	
		400 A		0.82	
Maximum reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	6	mA
		$T_J = 125\text{ }^\circ\text{C}$		85	
Maximum junction capacitance per leg	C_T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^\circ\text{C}$		6000	pF
Typical series inductance per leg	L_S	From top of terminal hole to mounting plane		5.0	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	$^\circ\text{C}$
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.4	$^\circ\text{C/W}$
			0.2	
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased	0.1	$^\circ\text{C/W}$
Approximate weight			79	g
			2.80	oz.
Mounting torque base	minimum	Non-lubricated threads	24 (20)	kgf · cm (lbf · in)
	maximum		35 (30)	
Mounting torque center hole	typical		13.5 (12)	
Terminal torque	minimum		35 (30)	
	maximum		46 (40)	
Case style			Modified JEDEC	

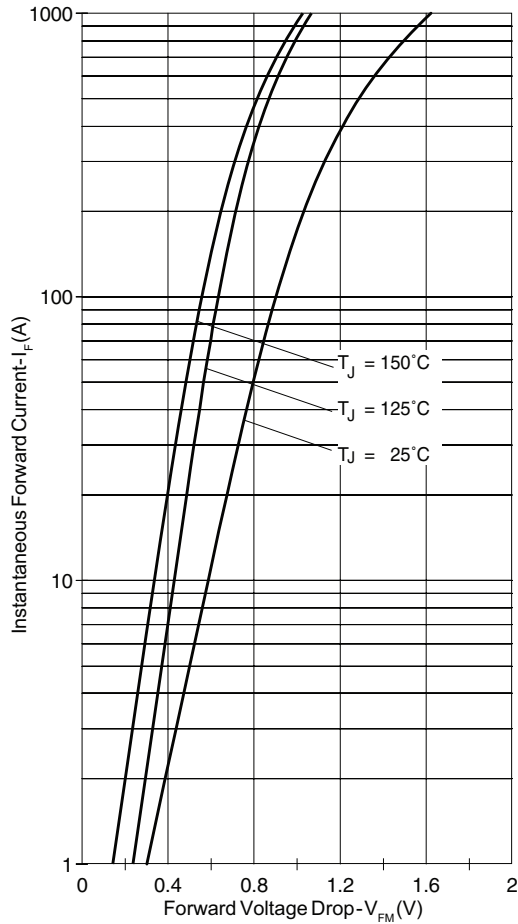


Fig. 1 - Maximum Forward Voltage Drop Characteristics

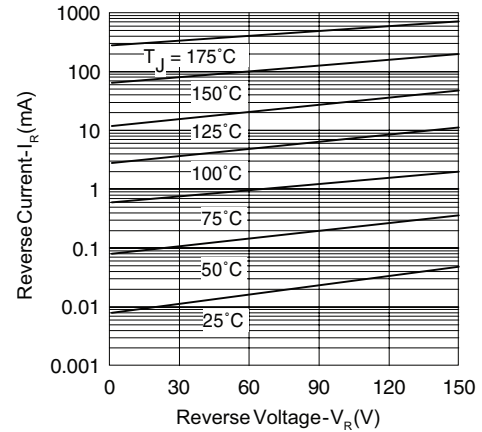


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

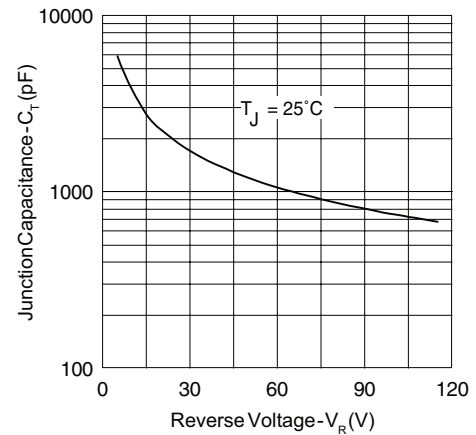


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

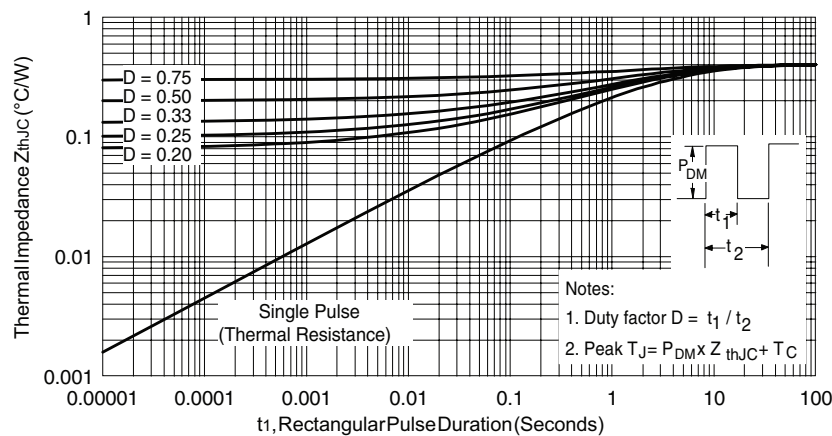


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

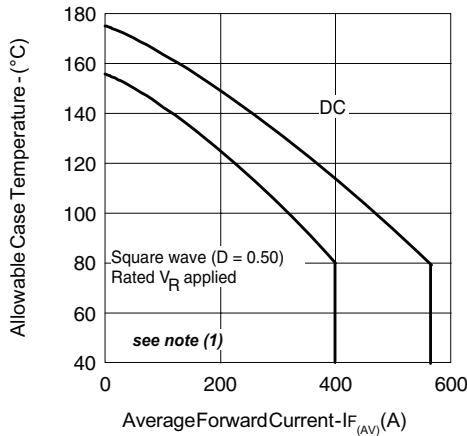


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

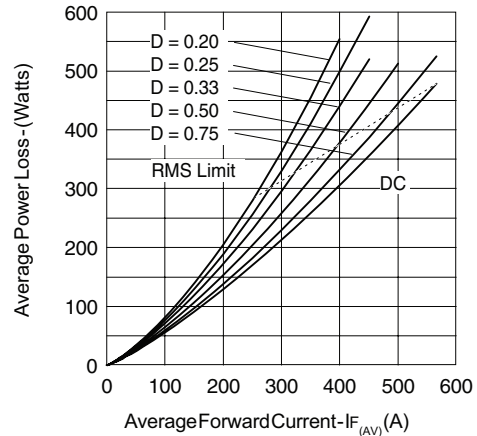


Fig. 6 - Forward Power Loss Characteristics

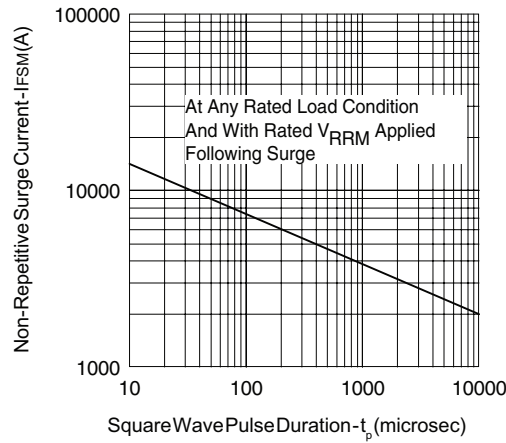


Fig. 7 - Maximum Non-Repetitive Surge Current

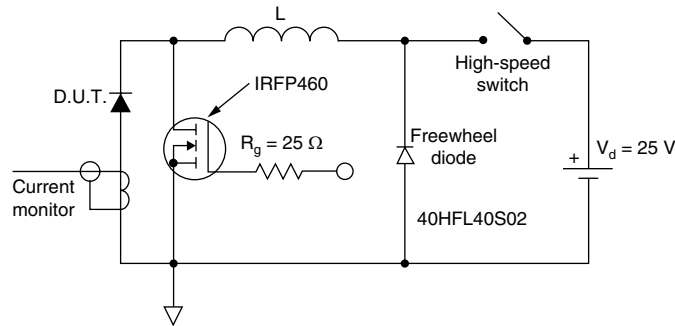


Fig. 8 - Unclamped Inductive Test Circuit

Note

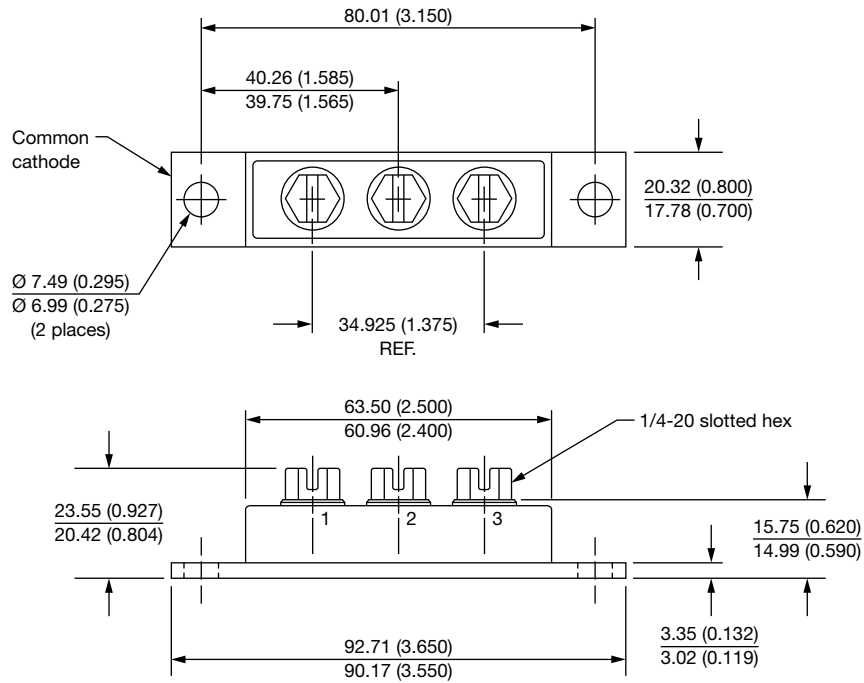
(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;

Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6); Pd_{REV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95269

TO-244AB Isolated

DIMENSIONS in millimeters (inches)





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