

Surface-Mount High Voltage Rectifiers


DO-218AB

Cathode  Anode

RoHS
COMPLIANT
HALOGEN
FREE

FEATURES

- Excellent heat dissipation
- Oxide planar chip junction
- High surge current capability
- Ultra-low forward conduction
- High junction temperature capability
- High ESD capability
- High avalanche capability
- Meets MSL level 1, per J-STD-02, LF maximum peak of 245 °C
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

- Fly-wheeling diode for big power motor in EV/HEV
- Single or three phase bridge rectification circuit
- High voltage block diode

MECHANICAL DATA

Case: DO-218AB

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	40 A
V_{RRM}	1200 V
I_{FSM}	700 A
V_F at $I_F = 40$ A ($T_J = 125$ °C)	1.02 V
I_R	10 μ A
E_{AS}	20 mJ
T_J max.	175 °C
Package	DO-218AB
Circuit configurations	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	SE40124	UNIT
Device marking code		SE40124	
Maximum repetitive peak reverse voltage	V_{RRM}	1200	V
Maximum DC forward current	$I_F^{(1)}$	40	A
	$I_F^{(2)}$	4.2	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	700	A
8 x 20 μ s wave form by 10 surge pulses in 10 minutes	I_{FSM}	3500	A
Typical Non-repetitive Avalanche energy at $I_{AS} = 1$ A, $T_J = 25$ °C	E_{AS}	20	mJ
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175	°C

Notes

⁽¹⁾ Mounted on aluminum PCB 30 mm x 30 mm with aluminum heatsink

⁽²⁾ Free air, mounted on recommended copper pad area



ELECTRICAL CHARACTERISTICS (T _J = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 20 A	T _J = 25 °C	V _F ⁽¹⁾	0.99	-	V
	I _F = 40 A			1.10	1.25	
	I _F = 20 A	T _J = 125 °C		0.88	-	
	I _F = 40 A			1.02	-	
Reverse current	Rated V _R	T _J = 25 °C	I _R ⁽²⁾	-	10	μA
		T _J = 125 °C		30	-	
Typical junction capacitance	400 V, 1 MHz		C _J	35	-	pF

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
 (2) Pulse test: Pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	SE40124	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	57	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(3)}$	0.2	

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$
 (2) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient
 (3) Thermal resistance junction-to-mount to follow JEDEC® 51-14 transient dual interface test method (TDIM)

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)					
STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	CLASS	VALUE
AEC-Q101-001	Human body model (contact mode)	$C = 100\text{ pF}$, $R = 1.5\text{ k}\Omega$	V_C	H3B	$> 8\text{ kV}$
IEC 61000-4-2 ⁽²⁾	Human body model (air discharge mode) ⁽¹⁾	$C = 150\text{ pF}$, $R = 330\text{ }\Omega$		4	$> 30\text{ kV}$

Notes

- (1) Immerse to IEC 61000-4-2 air discharge mode has a typical performance $> 30\text{ kV}$
 (2) System ESD standard

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SE40124-M3/I	2.56	I	750/reel	13" diameter plastic tape and reel
SE40124HM3/I ⁽¹⁾	2.56	I	750/reel	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified

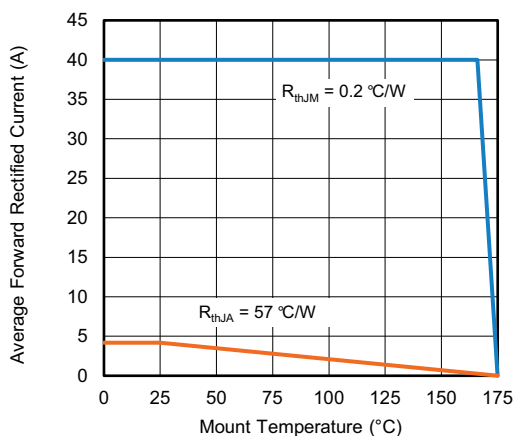
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

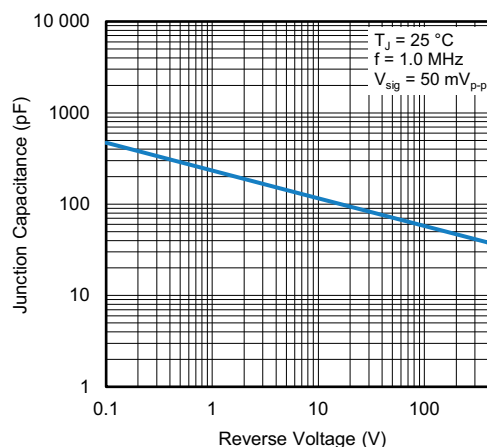


Fig. 4 - Typical Junction Capacitance

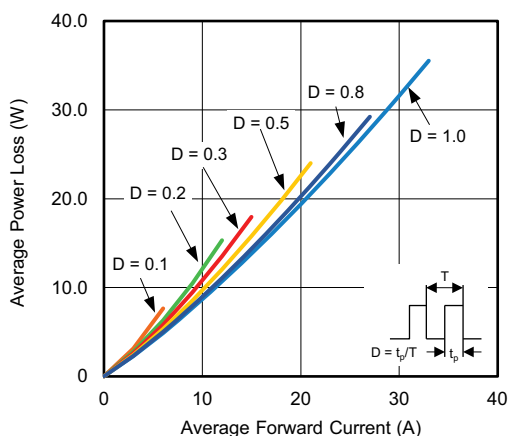


Fig. 2 - Forward Power Loss Characteristics

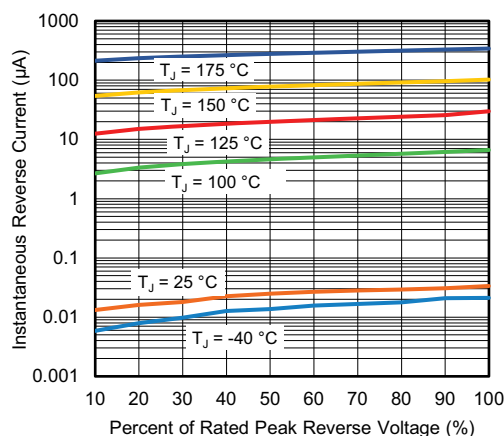


Fig. 5 - Typical Reverse Leakage Characteristics

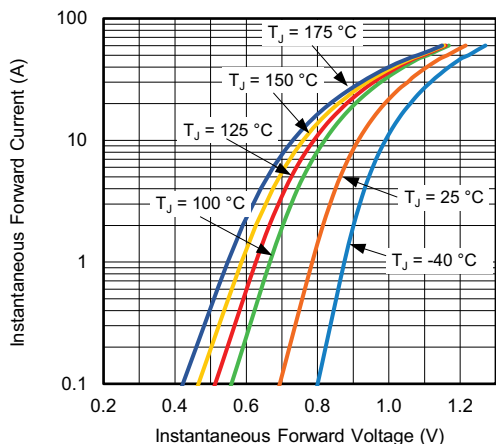


Fig. 3 - Typical Instantaneous Forward Characteristics

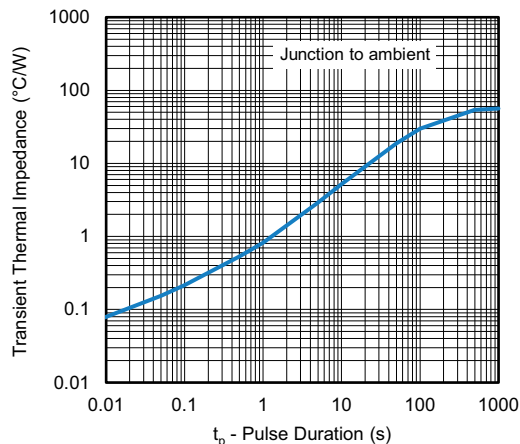
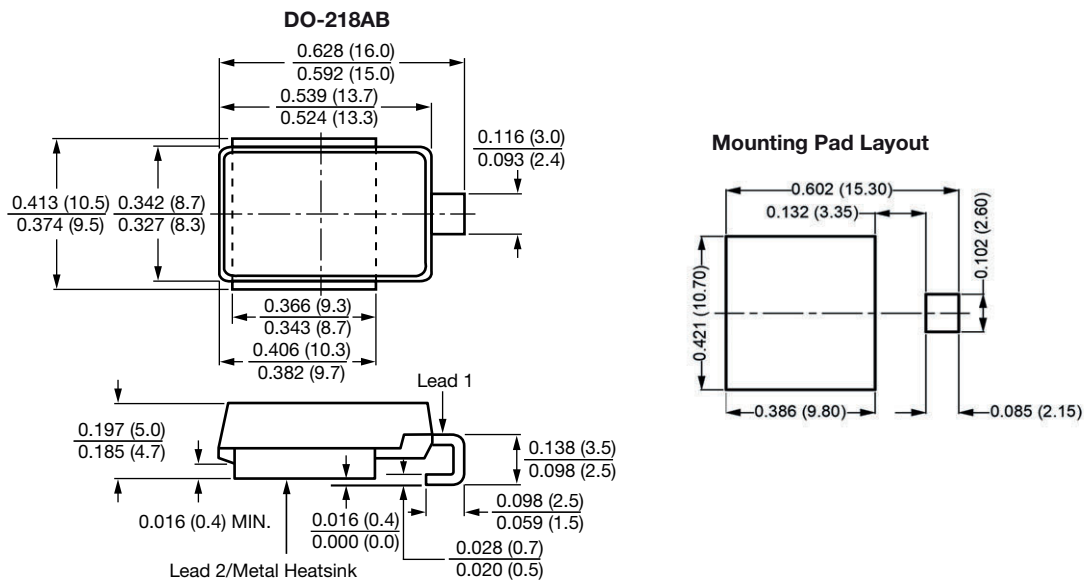


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Note

- Footprint in accordance with IPC 7351 standard



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