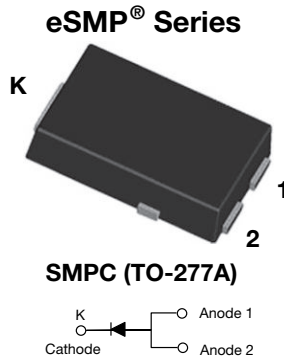




**THE DATASHEET OF  
SE70PD-M3/87A**



## Surface-Mount ESD Capability Rectifiers



### FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available  
- Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

### TYPICAL APPLICATIONS

General purpose, power line polarity protection in both consumer and automotive applications.

### MECHANICAL DATA

**Case:** SMPC (TO-277A)

Molding compound meets UL 94 V-0 flammability rating

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

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

("\_X" denotes revision code e.g. A, B,....)

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

M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

### LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	7.0 A
$V_{RRM}$	100 V to 600 V
$I_{FSM}$	120 A
$I_R$	10 $\mu$ A
$V_F$ at $I_F = 7.0$ A, (125 °C)	0.87 V
$T_J$ max.	175 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)						
PARAMETER	SYMBOL	SE70PB	SE70PD	SE70PG	SE70PJ	UNIT
Device marking code		70B	70D	70G	70J	
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	200	400	600	V
Maximum DC forward current	$I_F^{(1)}$	7.0				A
	$I_F^{(2)}$	2.9				
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	120				A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +175				°C

#### Notes

(1) Mounted on 30 mm x 30 mm pad areas, 2 oz. FR4 PCB

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



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 3.5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.90	-	V
	$I_F = 7.0\text{ A}$			0.97	1.05	
	$I_F = 3.5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.79	-	
	$I_F = 7.0\text{ A}$			0.87	0.96	
Reverse current	rated $V_R$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	0.1	10	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		20	150	
Typical reverse recovery time	$I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$		$t_{rr}$	2.6	-	$\mu\text{s}$
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	76	-	pF

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	SE70PB	SE70PD	SE70PG	SE70PJ	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	62				$^\circ\text{C/W}$
	$R_{\theta JM}^{(2)}$	5				

**Notes**(1) Free air, mounted on recommended PCB 1 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient(2) Units mounted on PCB with 30 mm x 30 mm pad areas, 2 oz. FR4 PCB;  $R_{\theta JM}$  - junction to mount

<b>IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS</b>					
$(T_A = 25\text{ }^\circ\text{C}, \text{ unless otherwise noted})$					
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	$> 8\text{ kV}$

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SE70PJ-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SE70PJ-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SE70PJHM3_A/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel
SE70PJHM3_A/I <sup>(1)</sup>	0.10	I	6500	13" diameter plastic tape and reel

**Note**<sup>(1)</sup> AEC-Q101 qualified

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

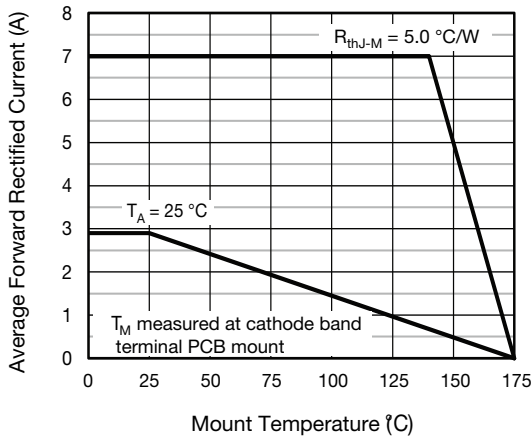


Fig. 1 - Maximum Forward Current Derating Curve

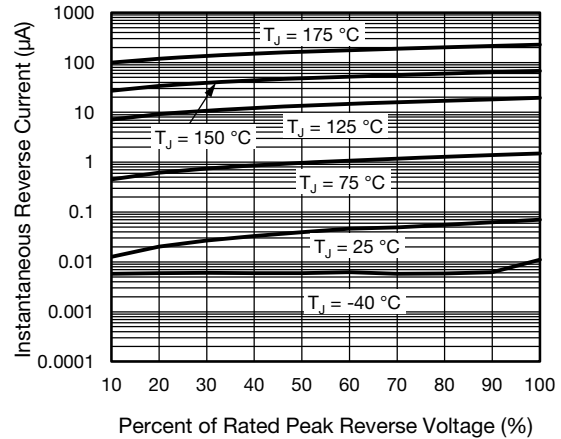


Fig. 4 - Typical Reverse Leakage Characteristics

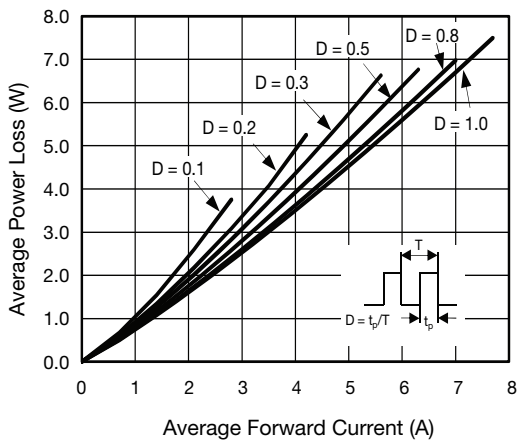


Fig. 2 - Forward Power Loss Characteristics

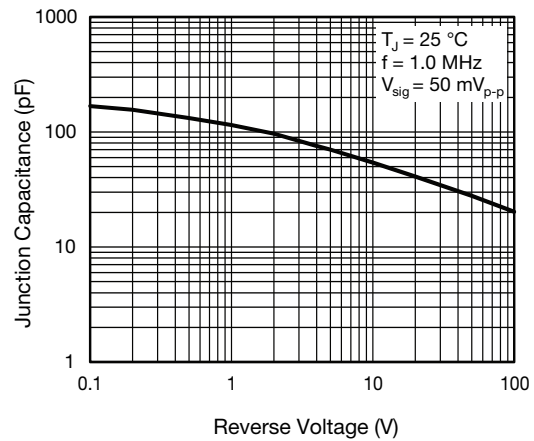


Fig. 5 - Typical Junction Capacitance

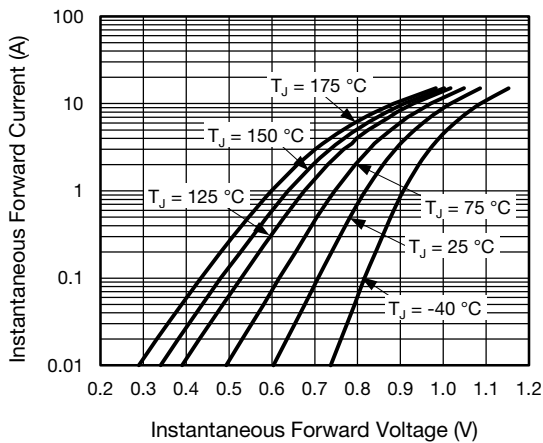


Fig. 3 - Typical Instantaneous Forward Characteristics

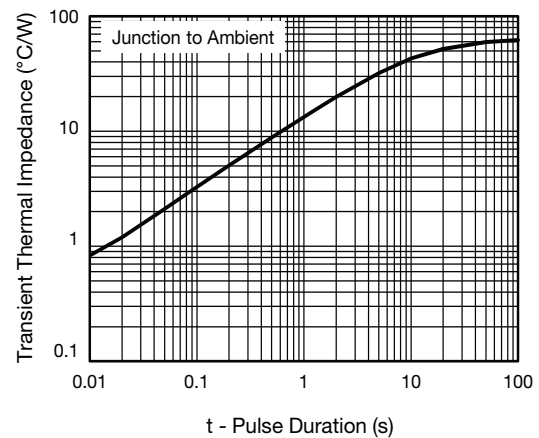
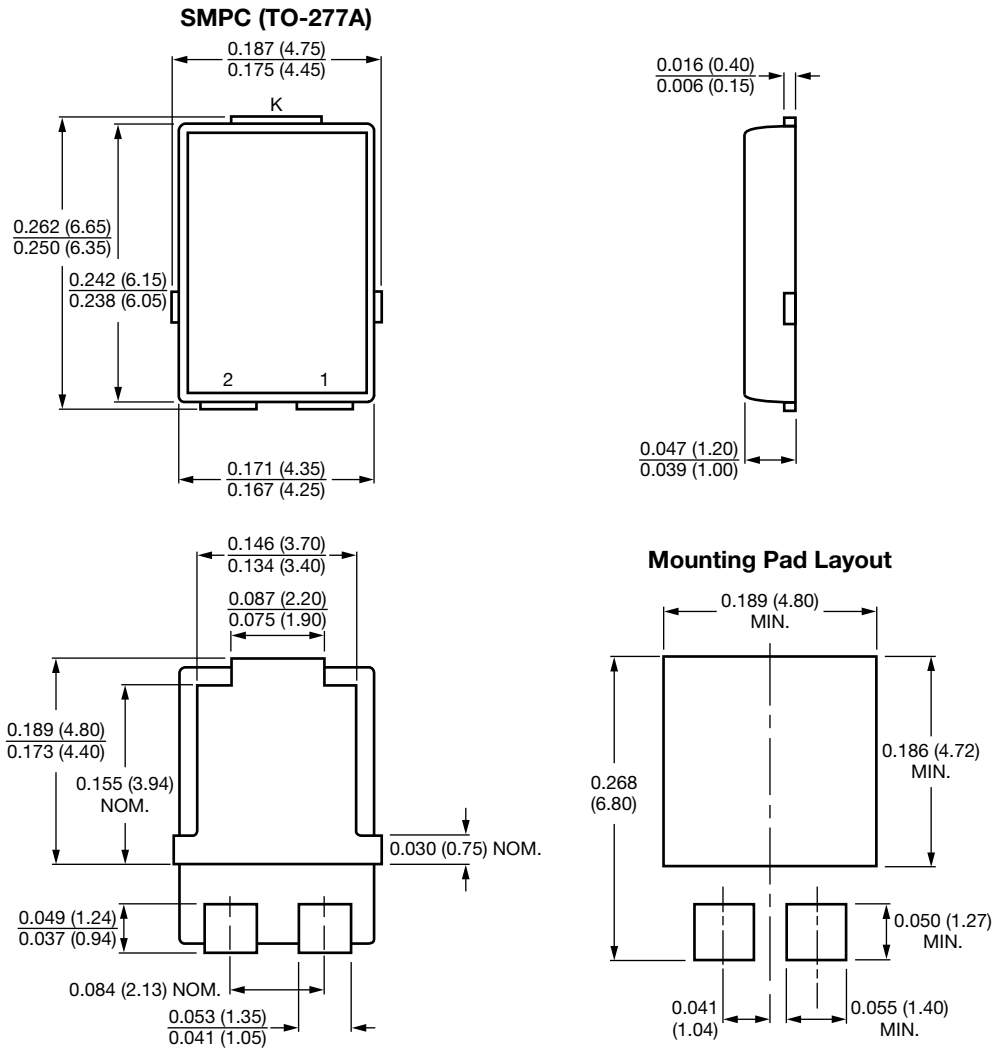


Fig. 6 - Typical Transient Thermal Impedance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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