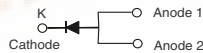


SMD Photovoltaic Solar Cell Protection Schottky Rectifier

eSMP™ Series



TO-277A (SMPC)



PRIMARY CHARACTERISTICS

$I_{F(AV)}$	15 A
V_{RRM}	30 V
I_{FSM}	280 A
E_{AS}	20 mJ
V_F at $I_F = 15$ A	0.42 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in solar cell junction box as a bypass diode for protection, using DC forward current without reverse bias.

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**



MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94 V-0 flammability rating

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

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

M3 suffix meets JESD 201 class 1A whisker test

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	SS15P3S	UNIT
Device marking code		153S	
Maximum repetitive peak reverse voltage	V_{RRM}	30	V
Maximum DC forward current (fig. 1)	I_F	15 ⁽¹⁾ 4.5 ⁽²⁾	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	280	A
Non-repetitive avalanche energy at $I_{AS} = 2$ A, $T_J = 25$ °C	E_{AS}	20	mJ
Operating junction and storage temperature range	T_{OP}, T_{STG}	- 55 to + 150	°C
Junction temperature in DC forward current without reverse bias, $t \leq 1$ h ⁽³⁾	T_J	≤ 200	°C

Notes

⁽¹⁾ Mounted on 30 mm x 30 mm Al P.C.B. with 50 mm x 25 mm x 100 mm fin heat sink

⁽²⁾ Units mounted on recommended P.C.B. 1 oz. pad layout

⁽³⁾ Meets the requirements of IEC 61215 Ed. 2 bypass diode thermal test



SS15P3S

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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage ⁽¹⁾	I _F = 7.5 A I _F = 15 A	T _A = 25 °C	V _F	0.43 0.50	- 0.57	V
	I _F = 5 A I _F = 15 A	T _A = 125 °C		0.32 0.42	- 0.49	
Reverse current ⁽²⁾	V _R = 30 V	T _A = 25 °C T _A = 125 °C	I _R	150 59	1000 120	μA mA
Typical junction capacitance	4.0 V, 1 MHz		C _J	930	-	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	SS15P3S	UNIT
Typical thermal resistance	$R_{\theta JA}$ ⁽¹⁾	100	$^{\circ}\text{C/W}$
	$R_{\theta JM}$ ⁽²⁾	3	

Notes

⁽¹⁾ Free air, mounted on recommended copper pad area. Thermal resistance $R_{\theta JA}$ - junction to ambient.⁽²⁾ Mounted on 30 mm x 30 mm Al P.C.B. with 50 mm x 25 mm x 100 mm fin heat sink. Thermal resistance $R_{\theta JM}$ - junction to mount.

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SS15P3S-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS15P3S-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

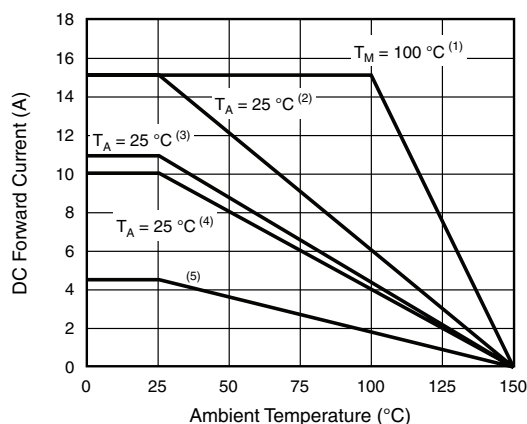
 $(T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Figure 1. Forward Current Derating Curve

Notes

⁽¹⁾ Mounted on 30 mm x 30 mm Al P.C.B. with 50 mm x 25 mm x 100 mm fin heat sink, T_M measured at the terminal of cathode band⁽²⁾ Mounted on 30 mm x 30 mm Al P.C.B. ($R_{\theta JA} = 20\text{ }^{\circ}\text{C/W}$)⁽³⁾ Mounted on 30 mm x 30 mm x 2 copper pad areas FR4 P.C.B. ($R_{\theta JA} = 28\text{ }^{\circ}\text{C/W}$)⁽⁴⁾ Mounted on 25 mm x 25 mm x 2 copper pad areas FR4 P.C.B. ($R_{\theta JA} = 28\text{ }^{\circ}\text{C/W}$)⁽⁵⁾ Free air, mounted on recommended copper pad area ($R_{\theta JA} = 100\text{ }^{\circ}\text{C/W}$)

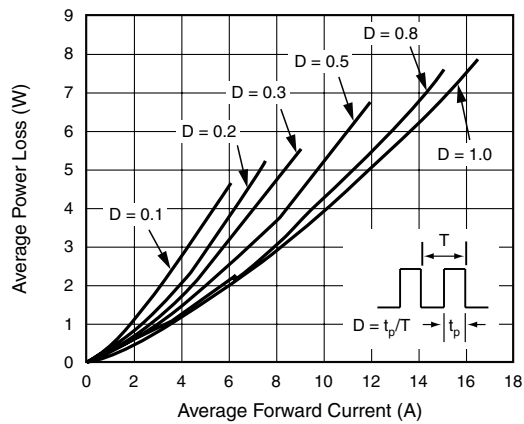


Figure 2. Forward Power Loss Characteristics

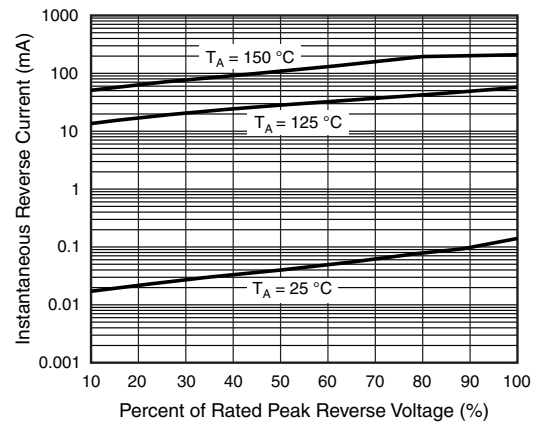


Figure 4. Typical Reverse Leakage Characteristics

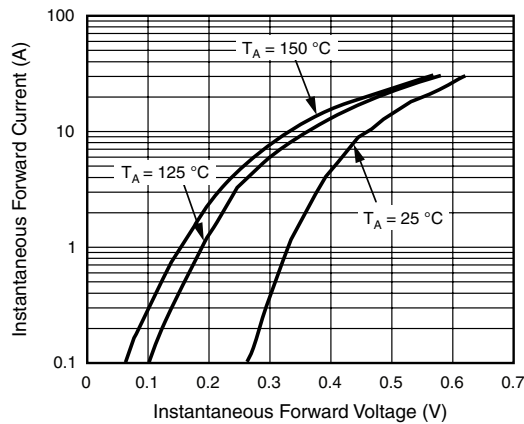


Figure 3. Typical Instantaneous Forward Characteristics

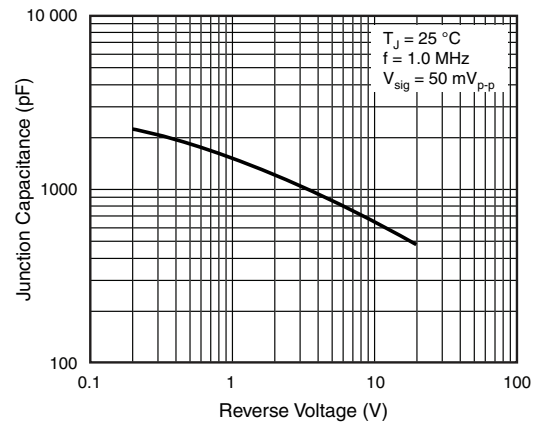
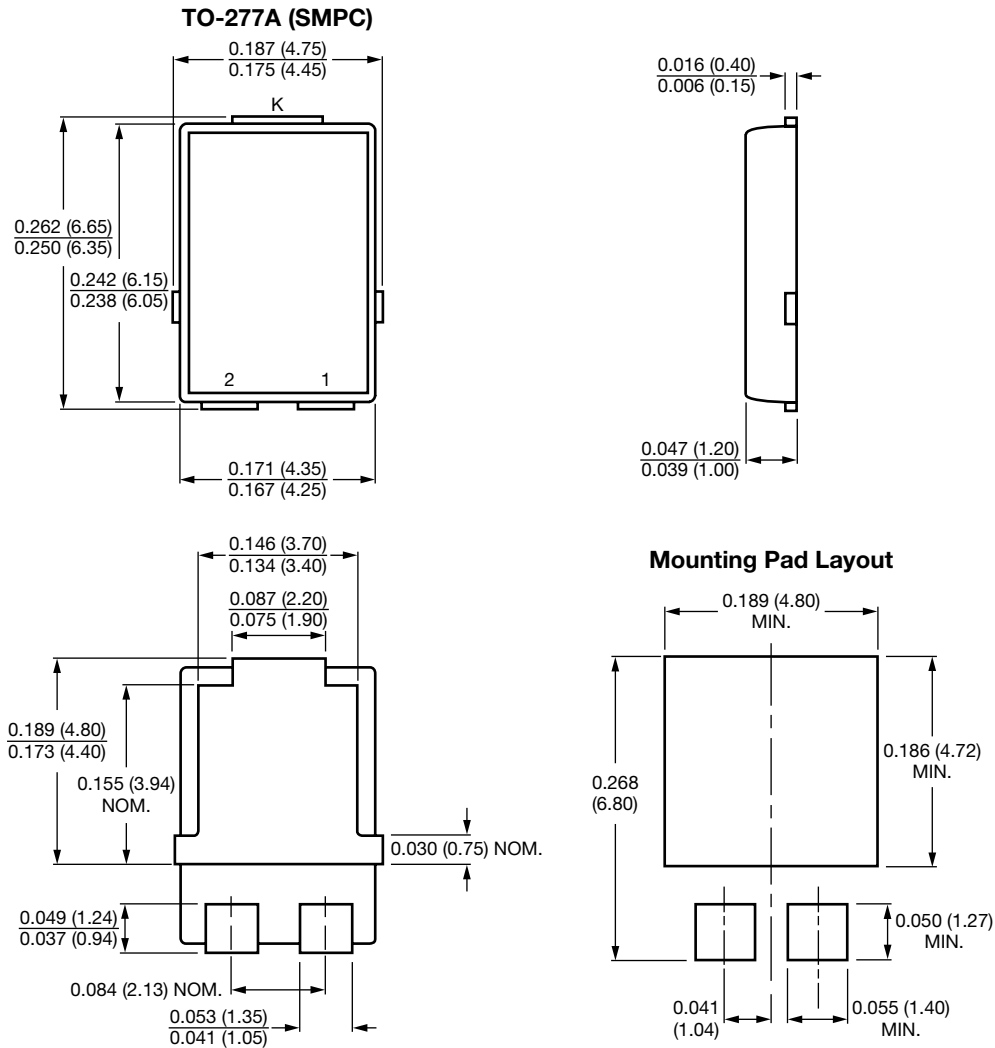


Figure 5. Typical Junction Capacitance

SS15P3S

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**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

Conform to JEDEC TO-277A

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