



# Solid State Devices, Inc.

14701 Firestone Blvd \* La Mirada, Ca 90638  
Phone: (562) 404-4474 \* Fax: (562) 404-1773  
ssdi@ssdi-power.com \* www.ssdi-power.com

## SPD6638, SPD6642, SPD6643 SERIES

**300 mA**  
**50 - 125 VOLTS**  
**4.5 - 6.0 nsec HYPER FAST RECOVERY  
RECTIFIER**

### Designer's Data Sheet

#### Part Number/Ordering Information <sup>1/</sup>

SPD \_\_\_\_\_

#### Screening <sup>2/</sup>

\_\_\_\_\_ = Not Screened

TX = TX Level

TXV = TXV

S = S Level

#### Package Type

\_\_\_\_\_ = Axial Leaded

SMS = Surface Mount Square Tab

#### Device Type (VRWM)

**6638** = 125 V

**6642** = 75 V

**6643** = 50 V

#### FEATURES:

- Hyper Fast Reverse Recovery Time 4.5 - 6 ns Max
- Hermetically Sealed
- Planar Passivated Chip
- For High Efficiency Applications
- Available in Axial & Subminiature Square Tab Versions
- TX, TXV, and S-Level Screening Available<sup>2/</sup>
- Replacement for 1N6638, 1N6642, 1N6643
- Low Thermal Resistance
- Metallurgical Class 3 Bond

#### MAXIMUM RATINGS <sup>3/</sup>

RATING		SYMBOL	VALUE	UNIT
Peak Repetitive Reverse Voltage DC Blocking Voltage	SPD6638 SPD6642 SPD6643	$V_{RWM}$ $V_R$	125 75 50	Volts
Average Rectified Forward Current (Resistive Load, 60 Hz, Sine Wave, $T_c = 25^\circ\text{C}$ )		$I_o$	300	mAmps
Peak Surge Current (8.3 msec Pulse, Half Sine Wave Superimposed on $I_o$ , allow junction to reach equilibrium between pulses, $T_c = 25^\circ\text{C}$ )		$I_{FSM}$	2.5	Amps
Operating & Storage Temperature		$T_{OP}$ and $T_{STG}$	-65 to +175	$^\circ\text{C}$
Thermal Resistance	SMS- Junction to End Tab Axial- Junction to Lead @ .375"	$R_{\theta JE}$ $R_{\theta JL}$	65 220	$^\circ\text{C/W}$

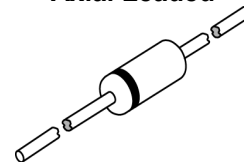
#### NOTES:

<sup>1/</sup> For Ordering Information, Price, and Availability- Contact Factory.

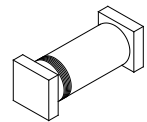
<sup>2/</sup> Screening Based on MIL-PRF-19500. Screening Flows Available on Request.

<sup>3/</sup> Unless Otherwise Specified, All Electrical Characteristics @25 $^\circ\text{C}$ .

Axial Leaded



SMS



**NOTE:** All specifications are subject to change without notification.  
SCD's for these devices should be reviewed by SSDI prior to release.

**DATA SHEET #: RH0004F**

**DOC**



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 SERIES**

**ELECTRICAL CHARACTERISTICS <sup>3/</sup>**

CHARACTERISTICS	SYMBOL	VALUE	UNIT	
Maximum Instantaneous Forward Voltage Drop (Pulsed, T <sub>A</sub> = 25°C)	SPD6638 @ I <sub>F</sub> = 10mA SPD6642 @ I <sub>F</sub> = 10mA SPD6643 @ I <sub>F</sub> = 10mA	V <sub>F1</sub>	0.8 0.8 1.0	Vdc
	SPD6638 @ I <sub>F</sub> = 200mA SPD6642 @ I <sub>F</sub> = 100mA SPD6643 @ I <sub>F</sub> = 100mA	V <sub>F2</sub>	1.1 1.2 1.2	Vdc
Maximum Instantaneous Forward Voltage Drop (Pulsed)	I <sub>F</sub> = 100mA, T <sub>A</sub> = -55°C	V <sub>F3</sub>	1.3	Vdc
Minimum Breakdown Voltage I <sub>r</sub> = 100 μA	SPD6638 SPD6642 SPD6643	B <sub>VR</sub>	125 100 75	Vdc
Maximum Reverse Leakage Current (300 μs Pulse Minimum , T <sub>A</sub> = 25°C)	SPD6638 @ V <sub>R</sub> = 20V SPD6642 @ V <sub>R</sub> = 20V SPD6643 @ V <sub>R</sub> = 20V	I <sub>R1</sub>	35 25 50	nA
Maximum Reverse Leakage Current (300 μs Pulse Minimum , T <sub>A</sub> = 25°C)	SPD6638 @ V <sub>R</sub> = 100V SPD6642 @ V <sub>R</sub> = 75V SPD6643 @ V <sub>R</sub> = 50V	I <sub>R2</sub>	500 500 500	nA
Maximum Reverse Leakage Current (300 μs Pulse Minimum , T <sub>A</sub> = 150°C)	SPD6638 @ V <sub>R</sub> = 20V SPD6642 @ V <sub>R</sub> = 20V SPD6643 @ V <sub>R</sub> = 20V	I <sub>R3</sub>	50 50 75	μA
Maximum Reverse Leakage Current (300 μs Pulse Minimum , T <sub>A</sub> = 150°C)	SPD6638 @ V <sub>R</sub> = 100V SPD6642 @ V <sub>R</sub> = 75V SPD6643 @ V <sub>R</sub> = 50V	I <sub>R4</sub>	100 100 160	μA
Maximum Junction Capacitance (T <sub>A</sub> = 25°C , f = 1MHz) V <sub>R</sub> = 0V	SPD6638 SPD6642 SPD6643	C <sub>J1</sub>	2.5 5.0 5.0	pf
Maximum Junction Capacitance (T <sub>A</sub> = 25°C , f = 1MHz) V <sub>R</sub> = 1.5V	SPD6638 SPD6642 SPD6643	C <sub>J2</sub>	2.0 2.8 2.8	pf
Maximum Reverse Recovery Time (I <sub>F</sub> = I <sub>R</sub> = 10 mA, I <sub>RR</sub> = 1 mA)	SPD6638 SPD6642 SPD6643	t <sub>rr</sub>	4.5 5.0 6.0	nsec

