



**Solid State Devices, Inc.**

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**SDR643CTS1  
 thru  
 SDR647CTS1**

**50 AMP  
 Hyperfast Centertap Rectifier  
 300 - 700 Volts  
 35 nsec**

**DESIGNER'S DATA SHEET**

**SDR64 CT**

**Screening <sup>2/</sup>**  
 — = Not Screened  
 TX = TX Level  
 TXV = TXV Level  
 S = S Level

**Package**  
 S1= SMD1

**Voltage/Family**  
 3 = 300 V  
 4 = 400 V  
 5 = 500 V  
 6 = 600 V  
 7 = 700 V

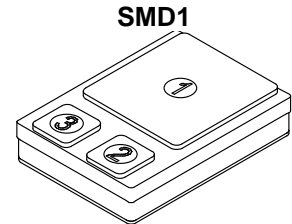
- Features:**
- Hyperfast Recovery: 25 nsec typical
  - High Surge Rating
  - Low Reverse Leakage Current
  - Low Junction Capacitance
  - Hermetically Sealed Power Surface Mount Package
  - Ceramic Seals Available
  - Higher Currents & Voltages Available – Contact Factory
  - TX, TXV, and S Level Screening Available<sup>2/</sup>

| Maximum Ratings   | Symbol  | Value                           | Unit  |
|---|---|---------------------------------|---|
| <b>Peak Repetitive Reverse and DC Blocking Voltage</b>  | <b>SDR643CTS1</b><br><b>SDR644CTS1</b><br><b>SDR645CTS1</b><br><b>SDR646CTS1</b><br><b>SDR647CTS1</b> | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 300<br>400<br>500<br>600<br>700<br><b>V</b> |
| <b>Average Rectified Forward Current<sup>3/</sup></b><br>Resistive Load, 60 Hz Sine Wave, $T_A = 25^\circ C$  | $I_o$   | 50                              | <b>A</b>                                    |
| <b>Peak Surge Current<sup>3/</sup></b><br>8.3 ms Pulse, Half Sine Wave Superimposed on $I_o$ , Allow Junction to Reach Equilibrium Between Pulses, $T_A = 25^\circ C$ | $I_{FSM}$   | 500                             | <b>A</b>                                    |
| <b>Operating &amp; Storage Temperature</b>  | $T_{OP} \& T_{STG}$   | -65 to +200                     | <b>°C</b>                                   |
| <b>Maximum Thermal Resistance</b><br>Junction to Case, each individual diode<br>Junction to Case <sup>3/</sup>  | $R_{\theta JC}$   | 2.00<br>1.20                    | <b>°C/W</b>                                 |

**NOTES:**

- <sup>1/</sup> For ordering information, price, operating curves, and availability - contact factory.
- <sup>2/</sup> Screening based on MIL-PRF-19500. Screening flows available on request.
- <sup>3/</sup> Both legs tied together.

\*Also available in other packages: TO-254, TO-254Z, TO-257, and 28 Pin CLCC – consult factory.





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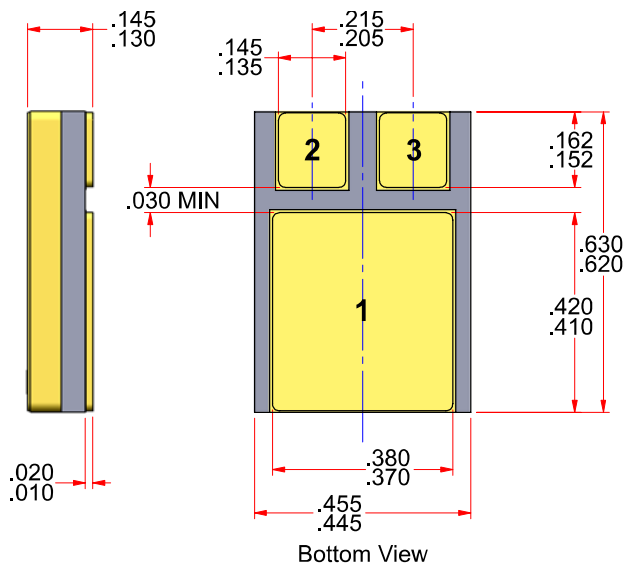
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# SDR643CTS1 thru SDR647CTS1

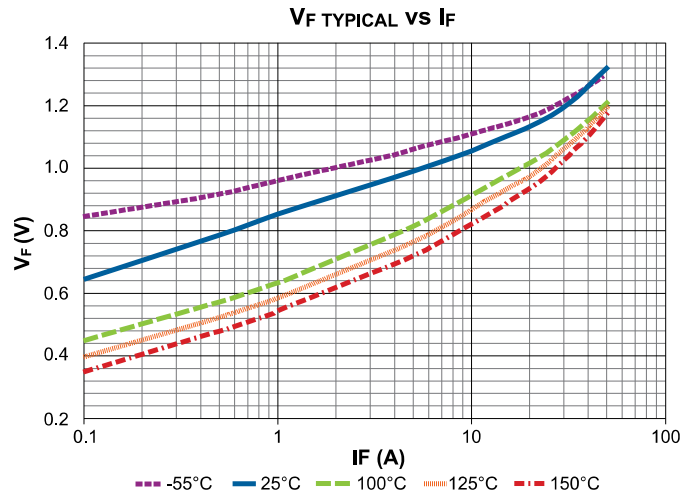
## Electrical Characteristics (Per Leg)

| Characteristics  | Symbol   | Typical   | Maximum | Unit |                                 |
|--|--|-----------|---------|------|---------------------------------|
| <b>Instantaneous Forward Voltage Drop</b>  | $I_F = 5 \text{ Adc}, T_A = 25^\circ\text{C}, \text{ pulse}$                               | $V_{F1}$  | 0.94    | -    | <b>V</b>                        |
|  | $I_F = 10 \text{ Adc}, T_A = 25^\circ\text{C}, \text{ pulse}$                              | $V_{F2}$  | 1.00    | -    |                                 |
|  | $I_F = 15 \text{ Adc}, T_A = 25^\circ\text{C}, \text{ pulse}$                              | $V_{F3}$  | 1.05    | 1.35 |                                 |
|  | $I_F = 20 \text{ Adc}, T_A = 25^\circ\text{C}, \text{ pulse}$                              | $V_{F4}$  | 1.07    | -    |                                 |
|  | $I_F = 30 \text{ Adc}, T_A = 25^\circ\text{C}, \text{ pulse}$                              | $V_{F5}$  | 1.10    | 1.50 |                                 |
| <b>Instantaneous Forward Voltage Drop</b>  | $I_F = 15 \text{ Adc}, T_A = 100^\circ\text{C}, \text{ pulse}$                             | $V_{F6}$  | 0.93    | 1.25 | <b>V</b>                        |
|  | $I_F = 30 \text{ Adc}, T_A = 100^\circ\text{C}, \text{ pulse}$                             | $V_{F7}$  | 1.00    | -    |                                 |
|  | $I_F = 15 \text{ Adc}, T_A = -55^\circ\text{C}, \text{ pulse}$                             | $V_{F8}$  | 1.15    | 1.50 |                                 |
|  | $I_F = 30 \text{ Adc}, T_A = -55^\circ\text{C}, \text{ pulse}$                             | $V_{F9}$  | 1.20    | -    |                                 |
| <b>Reverse Leakage Current</b><br>Rated $V_R, T_A = 25^\circ\text{C}, \text{ pulse}$ | SDR647CTS1   | $I_{R1}$  | 30      | 150  | <b><math>\mu\text{A}</math></b> |
|  | ALL OTHER  | $I_{R2}$  | 10      | 50   |                                 |
| <b>Reverse Leakage Current</b>   | Rated $V_R, T_A = 100^\circ\text{C}, \text{ pulse}$  | $I_{R3}$  | 2       | 10   | <b>mA</b>                       |
|  | Rated $V_R, T_A = 125^\circ\text{C}, \text{ pulse}$  | $I_{R4}$  | 8       | -    |                                 |
|  | Rated $V_R, T_A = 150^\circ\text{C}, \text{ pulse}$  | $I_{R5}$  | 25      | -    |                                 |
| <b>Junction Capacitance</b>  | $V_R = 10 \text{ Vdc}, T_A = 25^\circ\text{C}, f = 1 \text{ MHz}$                          | $C_J$     | 60      | 120  | <b>pF</b>                       |
| <b>Reverse Recovery Time</b>   | $I_F = 0.5 \text{ A}, I_R = 1 \text{ A}, I_{RR} = 0.25 \text{ A}, T_A = 25^\circ\text{C}$  | $t_{rr1}$ | 25      | 35   | <b>nsec</b>                     |
|  |  | $t_{rr2}$ | 70      | -    | <b>nsec</b>                     |
|  | $I_F = 0.5 \text{ A}, I_R = 1 \text{ A}, I_{RR} = 0.25 \text{ A}, T_A = 100^\circ\text{C}$ | $t_{rr3}$ | 35      | -    | <b>nsec</b>                     |
|  |  | $I_{RM3}$ | 2.7     | -    | <b>A</b>                        |
|  | $I_F = 10 \text{ A}, dI_F/dt = 100 \text{ A/us}, T_A = 25^\circ\text{C}$                   | $t_a/t_b$ | 1.83    | -    | <b>-</b>                        |
|  |  | $t_{rr4}$ | 80      | -    | <b>nsec</b>                     |
|  |  | $I_{RM4}$ | 3.6     | -    | <b>A</b>                        |
|  |  | $t_a/t_b$ | 1.0     | -    | <b>-</b>                        |

### Case Outline: SMD1



**PIN OUT:**  
 PIN 1: CATHODE  
 PIN 2: ANODE 1  
 PIN 3: ANODE 2



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

**DATA SHEET #: RU0087F**

**DOCX**