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# Solid State Devices, Inc.

14701 Firestone Blvd \* La Mirada, CA 90638  
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## Designer's Data Sheet

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

SRM

D

L

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

— = Not Screened

TX = TX Level

TXV = TXV Level

S = S Level

### Package Type

— = Axial

SMS = Surface Mount Square Tab

BTR = Button

### Voltage

40 = 4000 V

## SRM40D

## 20 AMP DRIFT STEP RECOVERY DIODE (DSRD)

4000 VOLTS

tds = 5 nsec (typ)

### FEATURES:

- Extremely fast rise time (snappy recovery)
- Robust ceramic body
- Hermetically sealed void-free construction
- Low reverse leakage current
- Low thermal resistance
- TX, TXV, and Space Level Screening Available

### APPLICATIONS:

- High Power Microwave (HPM)
- Pulse Generator
- Radar

### MAXIMUM RATINGS

	Symbol	Value	Unit
<b>Peak Repetitive Reverse Voltage and DC Blocking Voltage</b>	<b>SRM40D</b> $V_{RRM}$ $V_{RWM}$ $V_R$	4000	V
<b>Average Rectified Forward Current</b> (Resistive Load, 60 Hz Sine Wave)	Axial Lead @ 3/8", $T_L \leq 55^\circ\text{C}$ SMS @ $T_E \leq 55^\circ\text{C}$ Button @ $T_C \leq 55^\circ\text{C}$ $I_O$	5 8 20	A
<b>Average Power Disipation</b>	Axial Lead @ 3/8", $T_L \leq 55^\circ\text{C}$ SMS @ $T_E \leq 55^\circ\text{C}$ Button @ $T_C \leq 55^\circ\text{C}$ $P_D$	12 24 60	W
<b>Peak Surge Current</b> (8.3 ms Pulse, Half Sine Wave, Allow Junction to Reach Equilibrium Between Pulses, $T_L$ or $T_C = 55^\circ\text{C}$ )	$I_{FSM}$	80	A
<b>Operating and Storage Temperature</b>	$T_{OP} \text{ \& } T_{stg}$	-65 to +175	$^\circ\text{C}$
<b>Maximum Thermal Resistance</b> Junction to Lead, $L = 3/8"$ Junction to End Tab Junction to Case	Axial (—) SMS Button (BTR) $R_{\theta JL}$ $R_{\theta JE}$ $R_{\theta JC}$	10 5 2	$^\circ\text{C/W}$

### Notes:

- 1/ For ordering information, price, operating curves, and availability- Contact factory.
- 2/ Screening based on MIL-PRF-19500. Screening flows available on request.
- 3/ Unless otherwise specified, all maximum ratings/electrical characteristics @25°C.

Axial (—)      Surface Mount Square Tab (SMS)      Button (BTR)



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

**DATA SHEET #: RC0204A**

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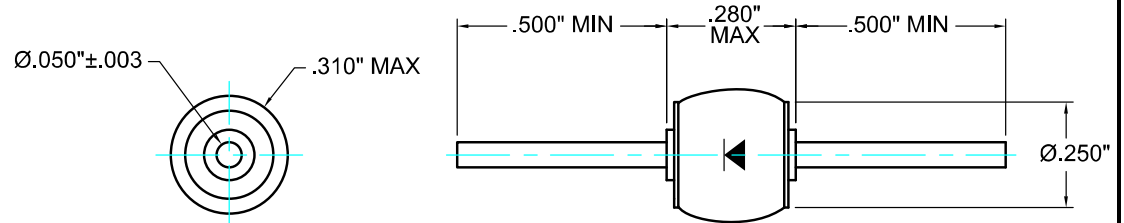
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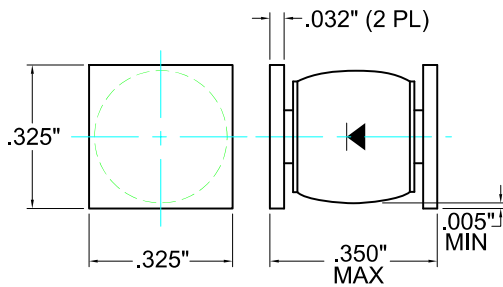
# SRM40D

ELECTRICAL CHARACTERISTICS <sup>3/</sup>		Symbol	Min	Typ	Max	Unit
<b>Instantaneous Forward Voltage Drop</b> ( $I_F = 20 A_{DC}$ , 300 $\mu$ sec min pulse)	$T_A = 25^\circ C$	$V_{F1}$	-	3.9	4.2	$V_{DC}$
	$T_A = 150^\circ C$	$V_{F2}$	-	3.4	3.9	$V_{DC}$
<b>Instantaneous Forward Voltage Drop</b> ( $I_F = 60 A_{DC}$ , 300 $\mu$ sec min pulse)	$T_A = 25^\circ C$	$V_{F3}$	-	4.6	5.1	$V_{DC}$
	$T_A = 150^\circ C$	$V_{F4}$	-	4.3	4.8	$V_{DC}$
<b>Reverse Leakage Current</b> ( $V_R = 4000 V$ )	$T_A = 25^\circ C$	$I_{R1}$	-	100	250	$\mu A$
	$T_A = 150^\circ C$	$I_{R2}$	-	3	-	$mA$
<b>Avalanche Breakdown Voltage</b> ( $I_R = 100 \mu A$ )		$B_{VR}$	4000	4500	-	$V$
<b>Junction Capacitance</b> ( $V_R = 10 V_{DC}$ , $f = 1 MHz$ )		$C_J$	-	35	100	$pF$
<b>Reverse Recovery Time</b> <b>Drift Step time</b> ( $I_{FM} = 9.9 A$ , $V_R = 30 V$ , $di/dt = 100 A/\mu s$ )		$t_{rr1}$ $t_{ds}$	-	950 5	1200 -	$ns$
<b>Reverse Recovery Time</b> ( $I_F = 0.5 A$ , $I_R = 1 A$ , $I_{RR} = 0.25 A$ )		$t_{rr2}$	-	3	5	$\mu s$

## Case Outline: AXIAL



## Case Outline: SMS



TOLERANCES: (unless otherwise specified)  
.XX±.03, .XXX±.010

## Case Outline: SRM Button

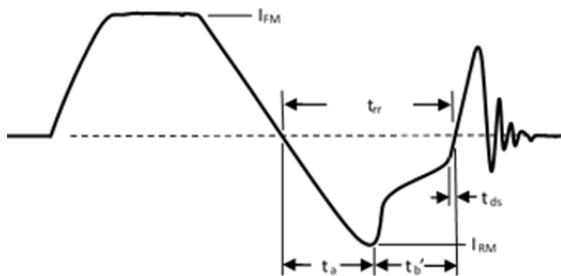
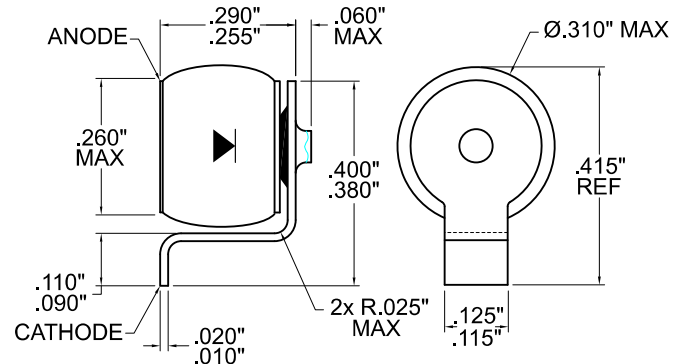


Fig 1.  $t_{RR1}$  current waveform



Fig 2. SMS diodes can be soldered tab to tab to boost voltage.

\*For improved thermal management, assembly can be encased in high thermal conductivity epoxy or mounted to ceramic substrate.

\* For more information, refer to SSDI's Hermetic High Voltage Products brochure: <https://www.ssdi-power.com/literature>.

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