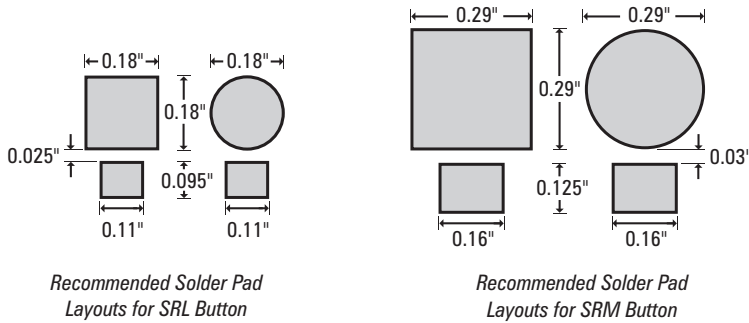
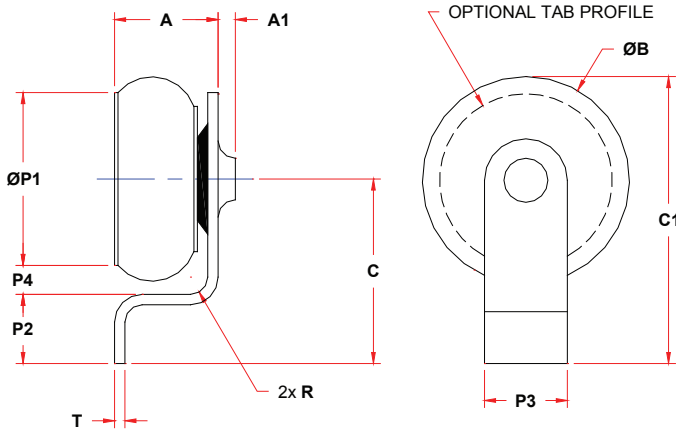


SSDI's Button package is a surface mount option for high current rectifiers providing ultra-low thermal resistance, typically 0.8°C/W for θ_{j-c} (Theta junction-case). The classic DO-4/5 type stud packages or TO type metal cans offer similar performance but require the added cost of complying with electrical isolation and wiring harness for the DO package; and the metal can requires a through-hole board plus mechanical attachment of the package flange to the heat sink. The Button's dimensional footprint is small, the recommended layout pad size is shown below.



SRL and SRM Button Rectifiers



The Button's ultra-low thermal resistance feature is best utilized when the PCB also has low thermal resistance. The combined performance of the Button and PCB is represented by J-A, which is equal to J-C (Button package) added to B-A (board to ambient). A low J-A allows the heat generated in the die to be easily transported away for a minimal temperature gradient. A ceramic substrate "board" offers a high performance thermal option compared to the standard FR-4 PCB. SSDI manufactures module solutions constructed using ceramic substrates and a mix of power surface mount packages combined with discrete passive components. The result is a low thermal resistance assembly that is electrically isolated and features a matched thermal expansion coefficient for the components and substrate.

The Button package can be used reliably on the FR-4 type PCB with the advantages of low loss and high surge current capabilities in applications where the power dissipation is below 2 watts dc. This thermal limitation occurs because the board epoxy-glass material is a poor conductor of heat.

Another useful application for the Button package involves high power pulses at a low duty cycle, the button package's thermal transient rating enable much longer pulse widths compared to an axial rectifier while still using the FR-4 board material.

SRL Button			SRM Button		
Dim	Min	Max	Dim	Min	Max
A	.125"	.150"	A	.140"	.170"
A1	--	.020"	A1	--	.060"
ØB	--	.190"	ØB	--	.300"
C	.190"	.210"	C		
C1	.280" REF		C1	.415" REF	
ØP1	.145"	.155"	ØP1	--	.260"
P2	.055"	.075"	P2	.090"	.110"
P3	.090"	.110"	P3	.115"	.125"
P4	.060" REF		P4	--	
T	.008"	.012"	T	.010"	.020"
R	.015" REF		R	.025" REF	

Notes: * Diode body profile may differ from the one shown for illustration

**Dimensions prior to solder dipping

Lead Finish and Solderability

- Package lead finish is PbSn (5% Pb minimum)
- Solderability meets the requirements of MIL-STD-750, Method 2026

Soldering Process Guidelines (63Sn / 37Pb)

- **Infrared or forced hot air convection reflow is recommended for best performance.**
 - Preheat peak temperature 135°C ±15°C at 2°C to 5°C per second ramp rate
 - Time above reflow temperature of 183°C: 120 seconds max
 - Peak package body temperature: 220°C to 255°C for 20 to 30 seconds
 - Cooling rate 2°C to 5°C per second
- **For Vapor Phase Reflow**
 - Heating rate: 5°C per second max
 - Preheat temperature: 45°C to 80°C
 - Time above 200°C: 50 to 90 seconds
 - Peak package temperature: 225°C
- **Hand soldering of package is not recommended**

Thermal Information

- **Maximum power dissipation may be calculated by the following formula:**

$$P_{DMAX}(T_A) = \frac{T_{JMAX} - T_A}{\theta_{J-A}}$$

- T_{JMAX} = Maximum operating junction temperature
- T_A = Expected ambient operating temperature
- θ_{J-A} = Junction-to-ambient thermal resistance is the sum of the primary thermal resistance along the path through the package, board and heat sink (if used)
 $\theta_{J-A} = \theta_{J-C} + \theta_{SOLDER} + [\theta_{HS-AMB} \text{ or } \theta_{SOLDER-AMB}]$

- **Examples of Calculated Power Dissipation for Button Rectifier**

PCB Board Type	Ceramic Substrate	Ceramic Substrate	FR-4	FR-4
Button Package Type	M	L	M	L
Calculated Continuous Power Dissipation Allowed	28.6W	18.2W	2.3W	1.9W
T_A	55°C	55°C	55°C	55°C
T_{JMAX}	125°C	125°C	125°C	125°C
θ_{J-C} (Button data sheet)	1°C/W	2°C/W	1°C/W	2°C/W
θ_{SOLDER}	0.2°C/W	0.6°C/W	0.2°C/W	0.6°C/W
θ_{HS-AMB} $\theta_{SOLDER-AMB}$	1.25°C/W	1.25°C/W	30°C/W	35°C/W