Description

The SRV05 integrates low capacitance rail-to-rail diodes with an additional zener diode to protect each I/O pin against ESD and high surge events. This robust device can safely absorb surge current per IEC61000-4-5 (tₚ=8/20µs) without performance degradation and a minimum ±20kV ESD per IEC61000-4-2. Their very low loading capacitance also makes them ideal for protecting high speed signal pins.

Features

- ESD, IEC61000-4-2, ±20kV contact, ±30kV air
- EFT, IEC61000-4-4, 40A (5/50ns)
- Lightning, IEC61000-4-5, 10A (8/20µs)
- Low capacitance of 2pF (TYP) per I/O
- Low leakage current of 0.5μA (MAX) at 5V
- Small SOT23-6 (JEDEC MO-178) packaging

Applications

- LCD/PDP TVs
- Monitors
- Notebooks
- 10/100/1000 Ethernet
- Firewire
- Set Top Boxes
- Flat Panel Displays
- Portable Medical

Application Examples

- USB Dual Port Protection
- 10/100/1000 Ethernet Protection

Additional Information

Datasheet
Resources
Samples

Life Support Note:
Not Intended for Use in Life Support or Life Saving Applications
The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.
CAUTION: Stresses above those listed in “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Non-repetitive pulse per waveform on page 3.

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_{PP}</td>
<td>Peak Current (t_p=8/20μs)</td>
<td>10</td>
<td>A</td>
</tr>
<tr>
<td>P_{PP}</td>
<td>Peak Pulse Power (t_p=8/20μs)</td>
<td>150</td>
<td>W</td>
</tr>
<tr>
<td>T_{OP}</td>
<td>Operating Temperature</td>
<td>–40 to 125</td>
<td>°C</td>
</tr>
<tr>
<td>T_{STOR}</td>
<td>Storage Temperature</td>
<td>–55 to 150</td>
<td>°C</td>
</tr>
</tbody>
</table>

Thermal Information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Rating</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Temperature Range</td>
<td>–55 to 150</td>
<td>°C</td>
</tr>
<tr>
<td>Maximum Junction Temperature</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>Maximum Lead Temperature (Soldering 20-40s)</td>
<td>260</td>
<td>°C</td>
</tr>
</tbody>
</table>

Electrical Characteristics (T_{OP}=25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Standoff Voltage</td>
<td>V_{RWM}</td>
<td>I_R ≤ 1µA</td>
<td>6.0</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse Voltage Drop</td>
<td>V_R</td>
<td>I_R = 1mA</td>
<td>8.0</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse Leakage Current</td>
<td>I_{LEAK}</td>
<td>V_R = 5V</td>
<td>0.1</td>
<td>0.5</td>
<td>µA</td>
<td></td>
</tr>
<tr>
<td>Clamp Voltage^1</td>
<td>V_C</td>
<td>I_{PP}=1A, t_p=8/20µs, I/O to GND^2</td>
<td>8.8</td>
<td>10.0</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_{PP}=5A, t_p=8/20µs, I/O to GND^2</td>
<td>11.5</td>
<td>13.0</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_{PP}=8A, t_p=8/20µs, I/O to GND^2</td>
<td>13.2</td>
<td>15.0</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Dynamic Resistance</td>
<td>R_{DIN}</td>
<td>(V_{C2} - V_{C1}) / (I_{PP2} - I_{PP1})</td>
<td>0.7</td>
<td>Ω</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD Withstand Voltage^1</td>
<td>V_{ESD}</td>
<td>IEC61000-4-2 (Contact) ±20</td>
<td>kV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>IEC61000-4-2 (Air) ±30</td>
<td>kV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diode Capacitance^1</td>
<td>C_{I/O-GND}</td>
<td>Reverse Bias=0V</td>
<td>2.4</td>
<td>3.0</td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reverse Bias=1.65V</td>
<td>2.0</td>
<td>pF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diode Capacitance^1</td>
<td>C_{I/O-I/O}</td>
<td>Reverse Bias=0V</td>
<td>1.2</td>
<td>pF</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: ^1 Parameter is guaranteed by design and/or device characterization.

^2 Repetitive pulse per waveform on page 3.

Clamping Voltage vs. I_{PP}

Lead Plating | Matte Tin
---|---
Lead Material | Copper Alloy
Lead Coplanarity | 0.0004 inches (0.102mm)
Substitute Material | Silicon
Body Material | Molded Epoxy
Flammability | UL 94 V-0

Notes:
1. All dimensions are in millimeters
2. Dimensions include solder plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. Blo is facing up for mold and facing down for trim/form, i.e. reverse trim/form.
Soldering Parameters

Reflow Condition: Pb – Free assembly

Pre Heat:
- Temperature Min ($T_{(s\text{min})}$): 150°C
- Temperature Max ($T_{(s\text{max})}$): 200°C
- Time (min to max) ($t_s$): 60 – 180 secs

Average ramp up rate (Liquidus) Temp ($T_L$) to peak: 3°C/second max

$T_{(s\text{max})}$ to $T_L$ - Ramp-up Rate: 3°C/second max

Reflow:
- Temperature ($T_L$) (Liquidus): 217°C
- Temperature ($t_L$): 60 – 150 seconds

Peak Temperature ($T_P$): 260°C 

Time within 5°C of actual peak Temperature ($t_P$): 20 – 40 seconds

Ramp-down Rate: 6°C/second max

Time 25°C to peak Temperature ($T_P$): 8 minutes Max.

Do not exceed: 260°C

Part Numbering System

<table>
<thead>
<tr>
<th>Series</th>
<th>Number of Channels</th>
<th>H</th>
<th>T</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRV05</td>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part Marking System

Product Series: $L = SRV05$

Assembly Site (Varies): $H = SOT23-6$

Number of Channels: $L^*4$

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
<th>Marking</th>
<th>Min. Order Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRV05-4HTG</td>
<td>SOT23-6</td>
<td>L*4</td>
<td>3000</td>
</tr>
</tbody>
</table>
TVS Diode Arrays (SPA® Diodes)
Low Capacitance ESD Protection - SRV05 Series

Package Dimensions — SOT23-6

Embossed Carrier Tape & Reel Specification — SOT23-6

8mm TAPE AND REEL

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