# SOD-523 Plastic-Encapsulate ESD Protection Diodes

## Features

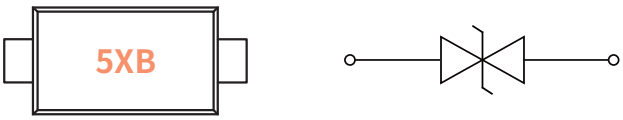
- Low leakage current
- SOD-523 surface mount package
- IEC 61000-4-2 (ESD Air): ±25kV
- IEC 61000-4-2 (ESD Contact): ±20kV
- IEC 61000-4-5 (Lightning 8/20μs): 8A

**Reverse Working Voltage**
5.0V Max.
**Normal capacitance**
20pF(Max.)

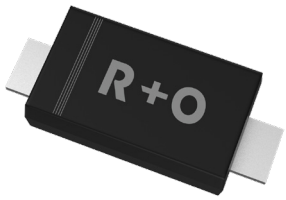
## Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation,Digital Cameras
- Peripherals, Audio Players, Industrial Equipment

## Function Diagram




**SOD-523**

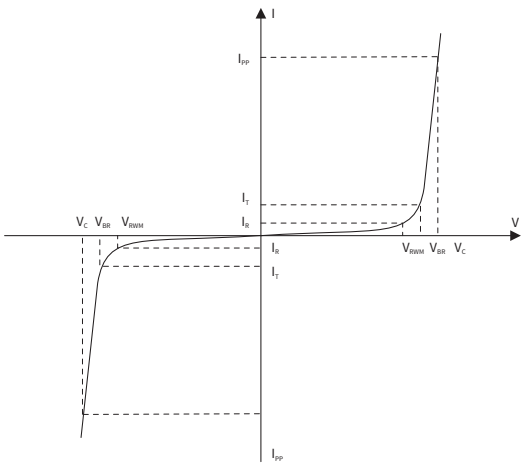



## Maximum Ratings (Ta=25°C Unless otherwise specified)

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $V_{ESD}$ | Electrostatic Discharge Voltage | ESD per IEC 61000-4-2( Air ) | ±25 | KV |
| | | ESD per IEC 61000-4-2( Contact) | ±20 | KV |
| $P_{PP}$ | Peak Pulse Power | tp = 8/20 μs | 120 | W |
| $I_{PP}$ | Rated Peak Pulse Current | tp = 8/20 μs | 8 | A |
| $T_J$ | Operating JunctionTemperature Range | — | -55 to +125 | °C |
| $T_{STG}$ | Storage Temperature Range | — | -55 to +150 | °C |

## Electrical Parameter

| SYMBOL | PARAMETER |
|---|---|
| $V_C$ | Clamping Voltage @ $I_{PP}$ |
| $V_{BR}$ | Breakdown Voltage @ $I_T$ |
| $I_{PP}$ | Peak Pulse Current |
| $I_T$ | Test Current |
| $I_R$ | Reverse Leakage Current @ VRWM |
| $V_{RWM}$ | Peak Reverse Working Voltage |
| $P_{PP}$ | Peak Pulse Power Dissipation |
| $C_J$ | Junction Capacitance @ $V_R$=0V,f=1MHz |
| $I_F$ | Forward Current |
| $V_F$ | Forward Voltage @$I_F$ |



## Electrical Characteristics (Ta=25°C Unless otherwise specified)

| PARAMETER | SYMBOL | CONDITION | Min | Typ | Max | UNIT |
|---|---|---|---|---|---|---|
| Peak Reverse Working Voltage | $V_{RWM}$ | $T_a$=25°C | — | — | 5.0 | V |
| Breakdown Voltage | $V_{BR}$ | $I_R$=1mA,$T_a$=25°C | 6.0 | — | 8.0 | V |
| Reverse Leakage Current | $I_R$ | $V_R$=5.0V,$T_a$=25°C | — | — | 0.2 | μA |
| Clamping Voltage | $V_C$ | $I_{PP}$=1A,$t_p$=8/20μs | — | — | 8 | V |
| | | $I_{PP}$=8A,$t_p$=8/20μs | — | — | 15 | |
| Junction Capacitance | $C_J$ | $V_R$=0V,f=1MHz | — | — | 20 | pF |

## Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

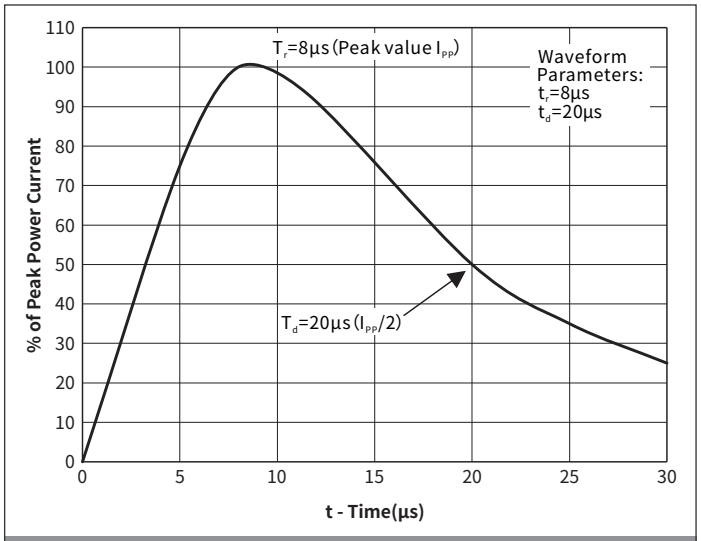



Fig.1 Pulse Waveform

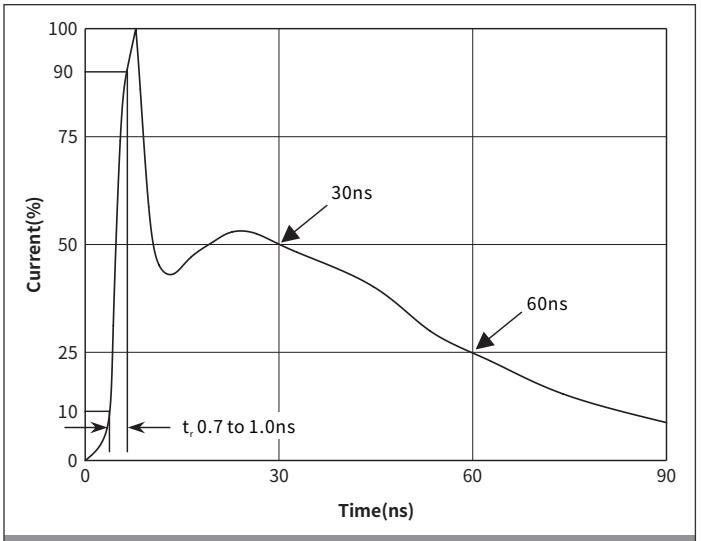



Fig.2 Pulse Waveform-ESD(IEC61000-4-2)

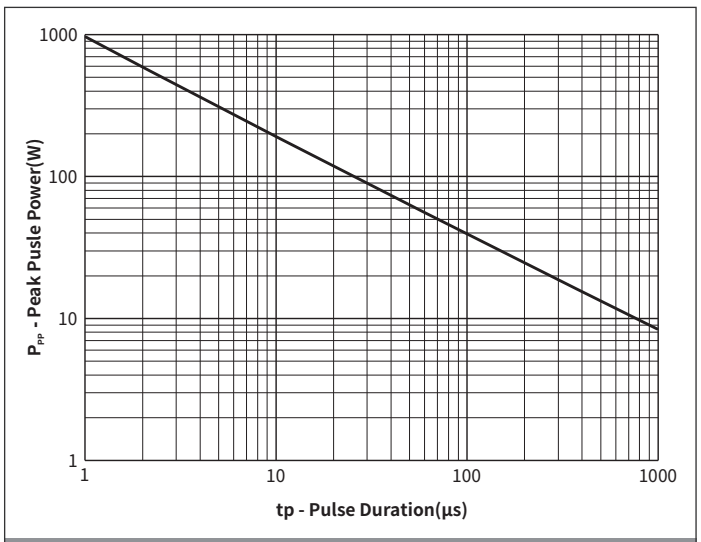



Fig.3 Peak Pulse Power vs. Pulse Time

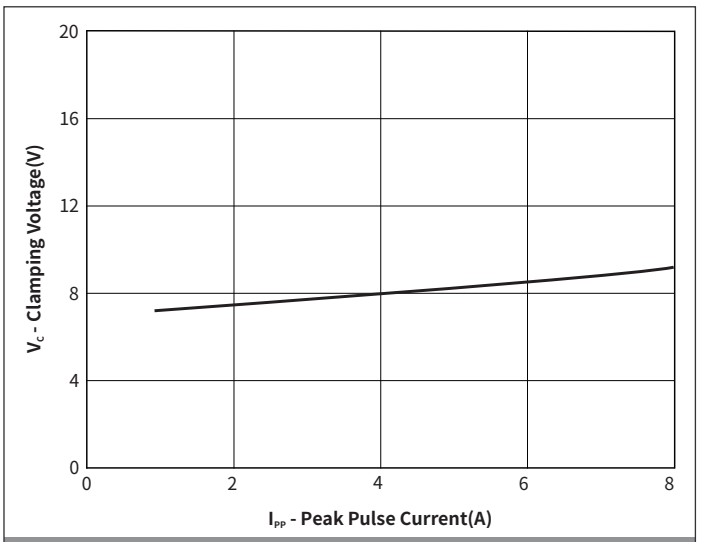
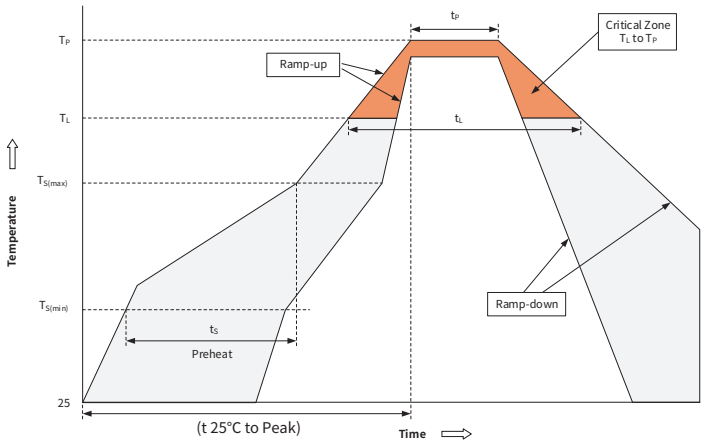



Fig.4 Clamping Voltage vs. Peak Pulse Current

## Ordering Information

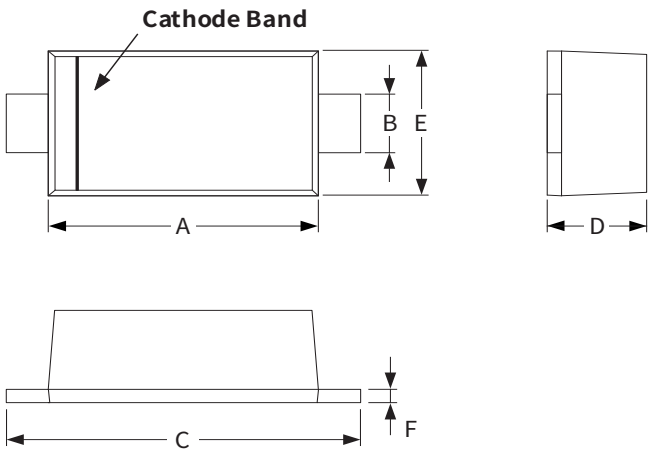
| PACKAGE | PACKAGE CODE | UNIT WEIGHT(g) | REEL(pcs) | BOX(pcs) | CARTON(pcs) | DELIVERY MODE |
|---|---|---|---|---|---|---|
| SOD-523 | R1 | 0.002 | 8000 | 80000 | 320000 | 7" |

## Recommended Soldering Conditions



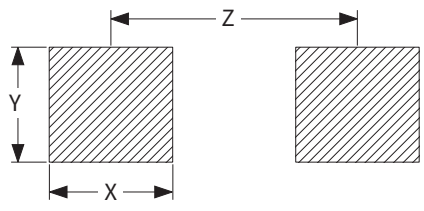

| Profile Feature | | Pb-Free Assembly |
|---|---|---|
| Pre-heat | Temperature Min ($T_{S(min)}$) | +150°C |
| | Temperature Max($T_{S(max)}$) | +200°C |
| | Time (Min to Max) ($t_S$) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp ($T_L$) to peak) | | 3°C /sec. Max |
| $T_{S(max)}$ to $T_L$ - Ramp-up Rate | | 3°C /sec. Max |
| Reflow | Temperature($T_L$)(Liquid us) | +217°C |
| | Temperature($t_L$) | 60-150 secs. |
| Peak Temp ($T_P$) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp ($t_P$) | | 20-40secs |
| Ramp-down Rate | | 6°C /sec. Max |
| Time 25°C to Peak Temp ($T_P$) | | 8 min. Max |
| Do not exceed | | +260°C |

## Package Outline Dimensions (SOD-523)




| Symbol | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min | Max | Min | Max |
| A | 1.10 | 1.30 | 0.043 | 0.051 |
| B | 0.25 | 0.35 | 0.010 | 0.014 |
| C | 1.50 | 1.70 | 0.059 | 0.067 |
| D | 0.50 | 0.70 | 0.020 | 0.027 |
| E | 0.70 | 0.90 | 0.027 | 0.035 |
| F | 0.05 | 0.20 | 0.002 | 0.008 |

## Suggested Pad Layout




| Symbol | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| X | 0.55 | 0.65 | 0.022 | 0.026 |
| Y | 0.65 | 0.75 | 0.026 | 0.029 |
| Z | 1.37 | 1.47 | 0.054 | 0.058 |