# ESD PROTECTION

## ■ Description

SD05C is 1-Line Normal Capacitance Bi-Directional ElectroStatic Discharge Protection Device, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltagesensitive data lines. SD05C complies with the IEC 61000-4-2 (ESD) standard with±30KV air and ± 30KV contact discharge.It is assembled into a 1.3×2.5×1mm lead-free package.SD05C is an ideal choice to protect Mobile Set,Cellular Handsets and Accessories,Personal Digital Assistants,Notebooks and Handhelds,Portable Instrumentation,Desktop and Servers,etc.



## ■ Features

- 1-Line Normal Capacitance Bi-Directional
- Ultra low leakage
- Low operating voltage
- Low clamping voltage
- Silicon technology
- Epoxy resin package
- Complies with following standards:
  – IEC 61000-4-2 (ESD) immunity test
    Air discharge: ±30KV
    Contact discharge: ±30KV
  – IEC61000-4-4 (EFT) 40A (5/50ns)
  – IEC61000-4-5 (Lightning) 24A (8/20us)
- RoHS Compliant

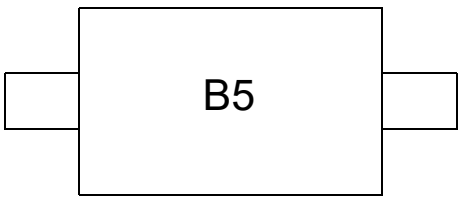
## ■ Mechanical Characteristics

- Package: SOD-323 (1.3×2.5×1mm)
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020

## ■ Applications

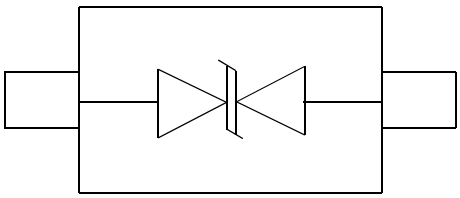
- Mobile Set
- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Desktop and Servers

## ■ Marking Information




05 = Marking Code

## ■ Pin Configuration



## ■ Summary of Packing Options

| Package | Packing Description | Packing Quantity | Industry Standard |
|---|---|---|---|
| SOD-323 | 8mm tape/7" reel | 3000PCS/Reel | EIA-481-1 |

## ■ Absolute Maximum Ratings

| Parameter | Symbol | Value | Units |
|---|---|---|---|
| Reverse Working Voltage | $V_{RWM}$ | 5 | V |
| Peak Pulse Power (8/20μs) | $P_{PK}$ | 350 | W |
| Peak Pulse Current (8/20μs) | $I_{PK}$ | 24 | A |
| ESD per IEC 61000−4−2 (Air) | $V_{ESD-Air}$ | 30 | KV |
| ESD per IEC 61000−4−2 (Contact) | $V_{ESD-Contact}$ | 30 | KV |
| Operating Temperature Range | $T_J$ | -55 to 125 | ℃ |
| Storage Temperature Range | $T_{STG}$ | -55 to 150 | ℃ |

## ■ Electrical Parameters

| Parameter | Symbol | Min | Typ | Max | Units | Conditions | Remarks |
|---|---|---|---|---|---|---|---|
| Breakdown Voltage | $V_{BR}$ | 6 | | 8 | V | IBR=1mA | |
| Reverse Leakage Current | $I_R$ | | | 0.1 | uA | VRWM=5V | |
| Clamping Voltage (8/20 μs) | $V_C$ | | | 10 | V | IPP=5A | 8/20us pulse |
| Maximum Clamping Voltage (8/20μs) | $V_{CM}$ | | | 15 | V | IPK=24A | 8/20us pulse |
| Junction Capacitance | $C_J$ | | 65 | 80 | pF | VDC=0V | f = 1MHz |

## ■ Rating And Characteristic Curves ($T_A$=25°C unless otherwise noted)

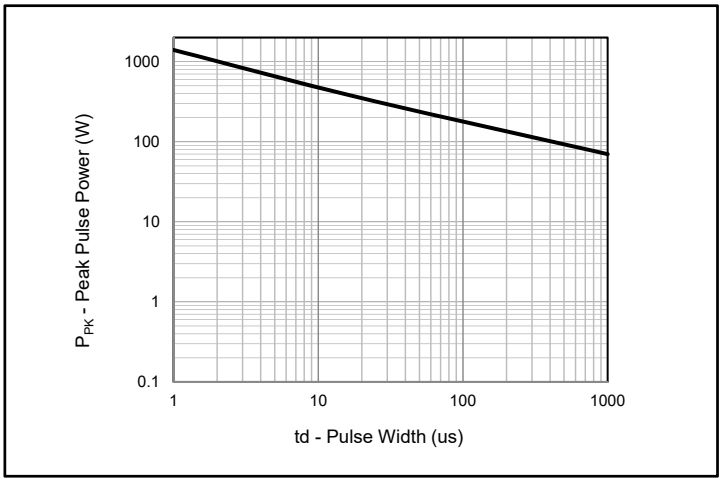



Fig.1 - Peak Pulse Power Rating

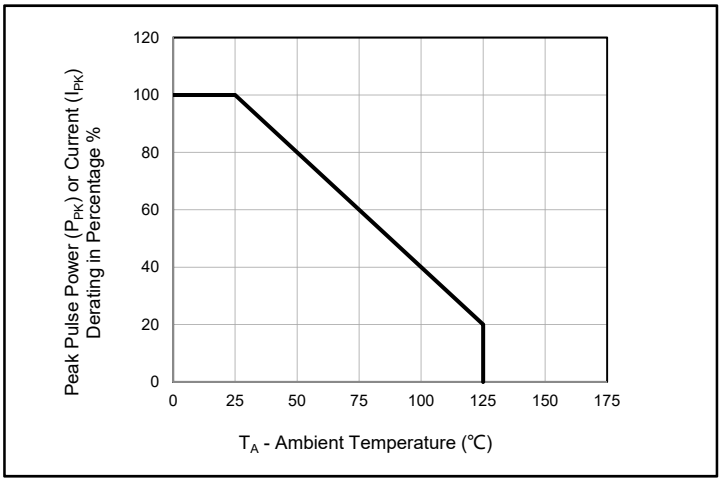



Fig.2 - Pulse Derating Curve

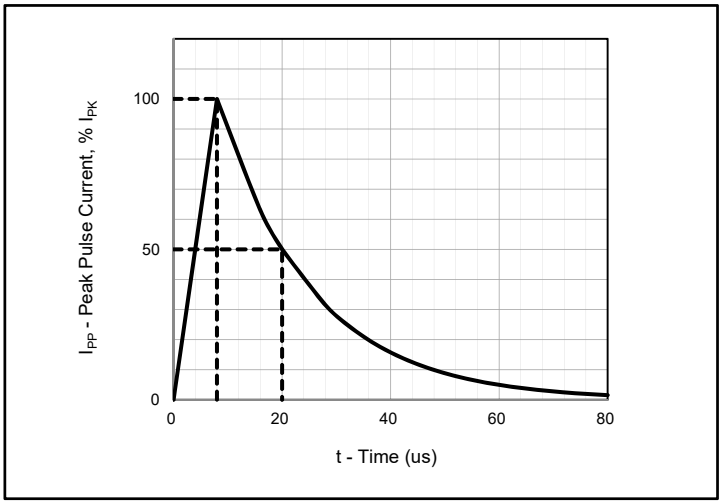



Fig.3 - 8/20us Pulse Waveform

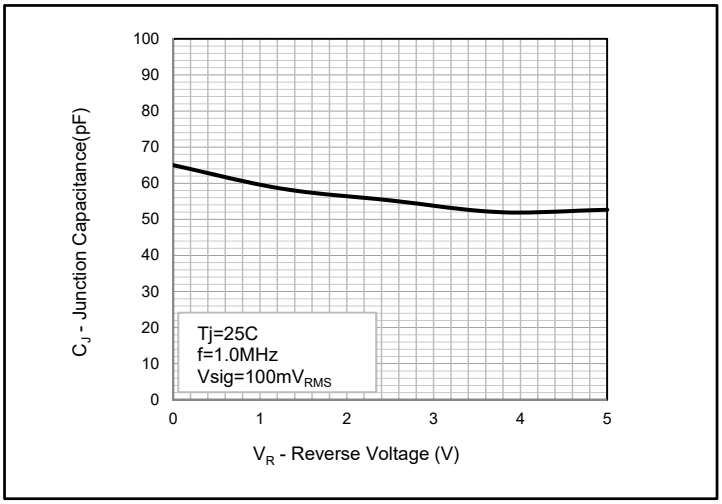



Fig.4 - Typical Junction Capacitance

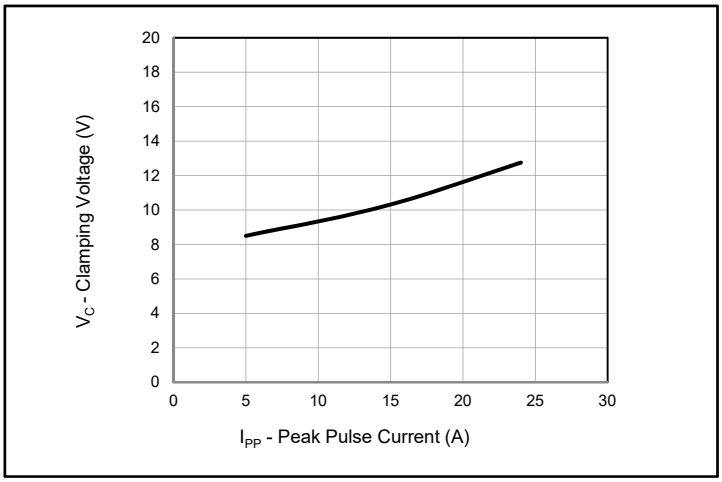
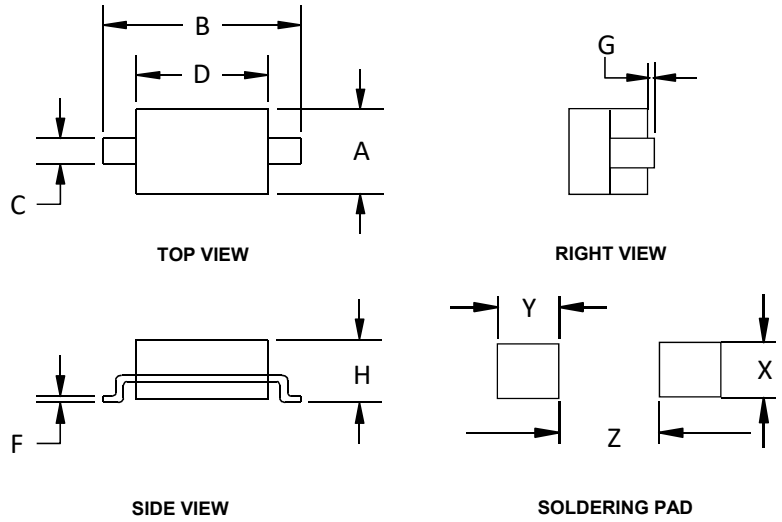


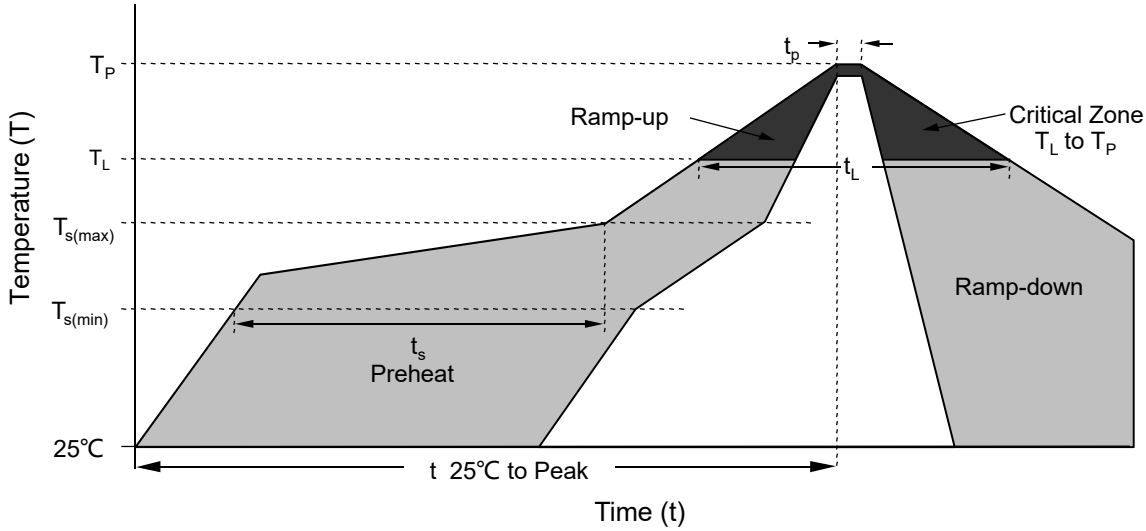

Fig.5 - Clamping Voltage

## ■ Package Dimensions




| SOD-323 | | | | | | |
|---|---|---|---|---|---|---|
| Dimension | Inches | | | Millimeters | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.047 | 0.051 | 0.055 | 1.2 | 1.3 | 1.4 |
| B | 0.091 | 0.098 | 0.106 | 2.3 | 2.5 | 2.7 |
| C | 0.012 | | 0.016 | 0.3 | | 0.4 |
| D | 0.059 | | 0.071 | 1.5 | | 1.8 |
| F | 0.004 | | 0.01 | 0.1 | | 0.25 |
| G | - | | 0.004 | - | | 0.1 |
| H | 0.035 | 0.039 | 0.043 | 0.9 | 1 | 1.1 |
| X | | 0.031 | | | 0.8 | |
| Y | | 0.031 | | | 0.8 | |
| Z | | 0.061 | | | 1.55 | |

## ■ Soldering Parameters




| Reflow Condition | | Lead-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 (Liquidus Temp ($T_L$) to peak) | | 3°C/second max |
| $T_{S(max)}$ to TL - Ramp-up Rate | | 3°C/second max |
| Reflow | - Temperature ($T_L$) (Liquidus) | 217°C |
| | - Time ($t_L$) | 60 – 150 secs |
| Peak Temperature ($T_P$) | | $260^{+0/-5\ °C}$ |
| Time within 5°C of actual peak Temperature ($t_p$) | | 20 – 40 secs |
| Ramp-down Rate | | 6°C/second max |
| Time 25°C to peak Temperature (t) | | 8 minutes Max. |
| Do not exceed | | 260°C |