# SOT23-6L Plastic-Encapsulate ESD Protection Diodes

## Features

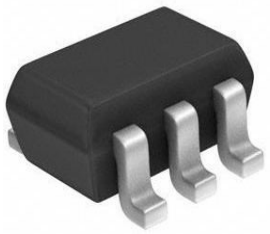
- Low leakage current
- SOT-23-6L surface mount package
- IEC 61000-4-2 (ESD Air): ±30kV
- IEC 61000-4-2 (ESD Contact): ±30kV
- IEC 61000-4-5 (Lightning 8/20μs): 5A

**Reverse Working Voltage**
5.0V Max.
**Ultra small capacitance**
$C_{I/O-GND}$=1.0pF(Typ.)
$C_{I/O-I/O}$=0.5pF(Typ.)

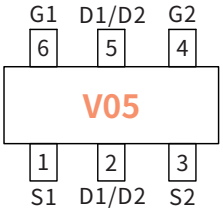
## Applications

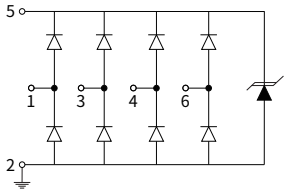
- Automotive Applications
- CAN Bus
- Electronic Control Units
- Body Control Units
- ADAS Control Units
- Power Train Control Units

**SOT-23-6L**



## Function Diagram



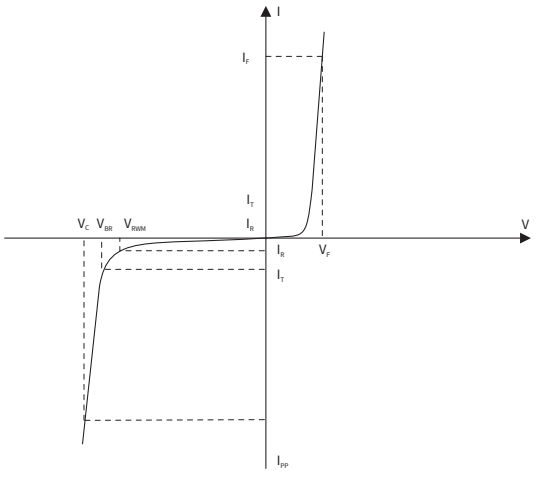




## Maximum Ratings (Ta=25°C Unless otherwise specified)

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $V_{ESD}$ | Electrostatic Discharge Voltage | ESD per IEC 61000-4-2( Air ) | ±30 | KV |
| | | ESD per IEC 61000-4-2( Contact) | ±30 | KV |
| $P_{PP}$ | Peak Pulse Power | tp = 8/20 μs | 80 | W |
| $I_{PP}$ | Rated Peak Pulse Current | tp = 8/20 μs | 5.0 | A |
| $T_J$ | Operating JunctionTemperature Range | — | -55 to +125 | °C |
| $T_{STG}$ | Operating JunctionTemperature 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 | — | — | V |
| Reverse Leakage Current | $I_R$ | $V_{RWM}$=5.0V,$T_a$=25°C | — | — | 5.0 | μA |
| Forward voltage | $V_F$ | $I_F$=10mA,$T_a$=25°C | — | 0.8 | 1.0 | V |
| Clamping Voltage | $V_C$ | $I_{PP}$=4.0A, $t_p$=8/20μs | — | 13.5 | 15 | V |
| Junction Capacitance | $C_J$ | $V_{RMW}$=0V,f=1MHz,Between I/O pins | — | 0.5 | — | pF |
| | | $V_{RMW}$=0V,f=1MHz,pin to GND | — | 1.0 | — | |

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

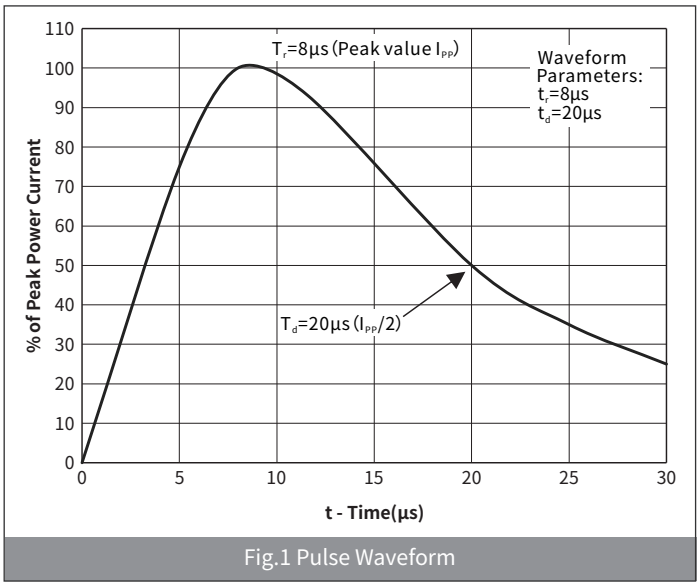



Fig.1 Pulse Waveform

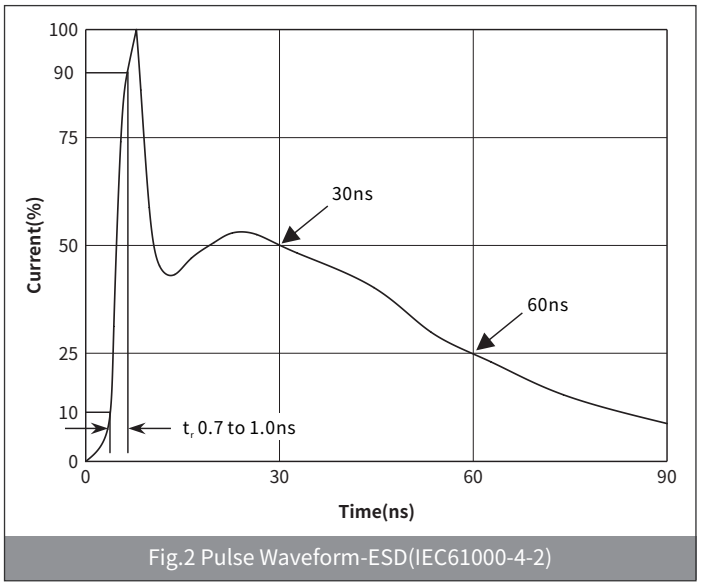



Fig.2 Pulse Waveform-ESD(IEC61000-4-2)

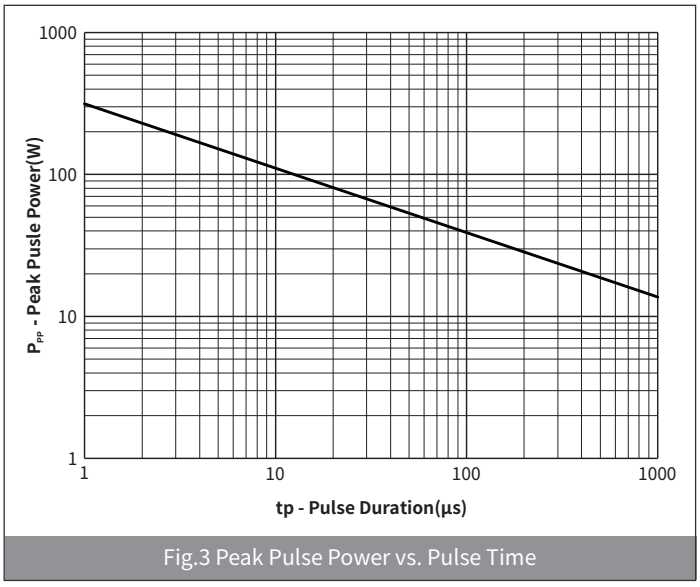



Fig.3 Peak Pulse Power vs. Pulse Time

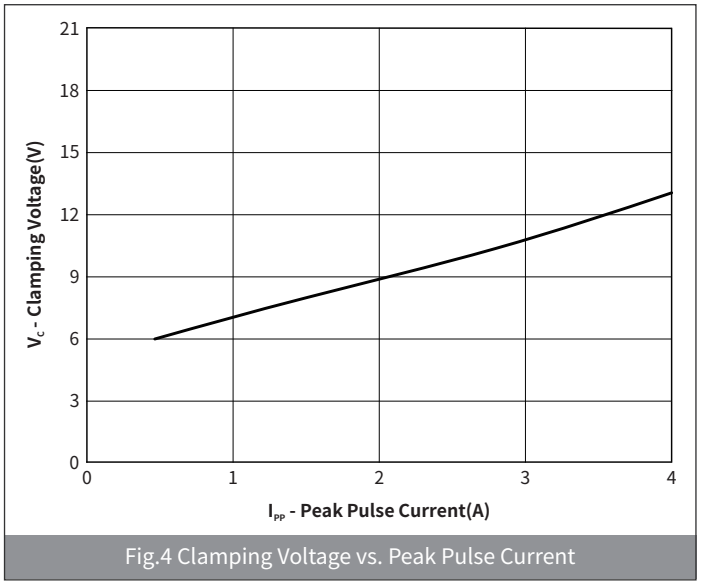
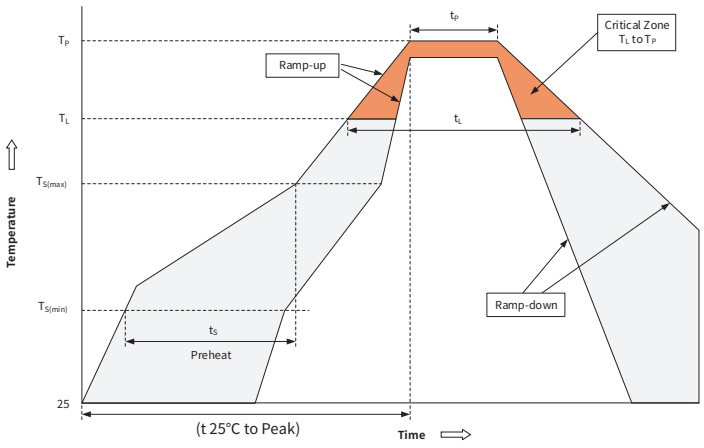



Fig.4 Clamping Voltage vs. Peak Pulse Current

## Ordering Information

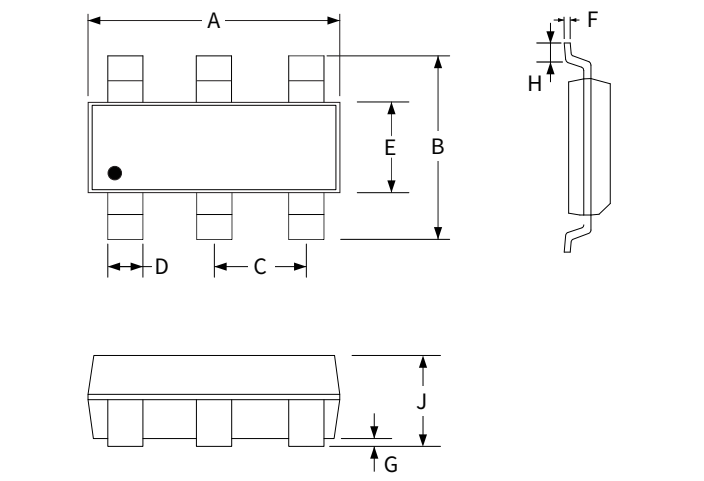
| PACKAGE | PACKAGE CODE | UNIT WEIGHT(g) | REEL(pcs) | BOX(pcs) | CARTON(pcs) | DELIVERY MODE |
|---|---|---|---|---|---|---|
| SOT-23-6L | R1 | 0.008 | 3000 | 30000 | 120000 | 7'' |

## Recommended Soldering Conditions



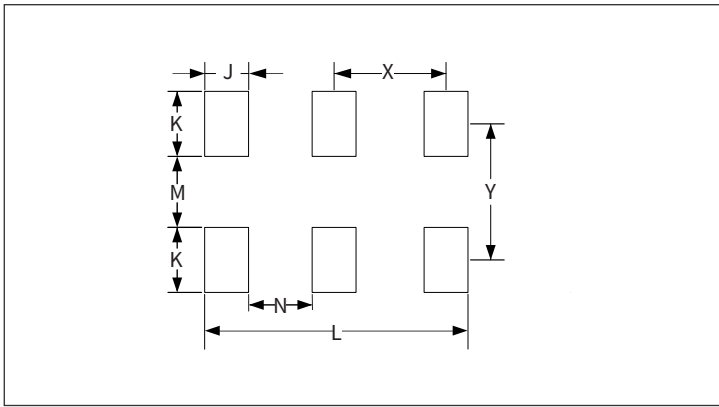

| Profile Feature | | Pb-Free Assembly |
|---|---|---|
| Pre-heat | Temperature Min ($T_{S(min)}$) | +150°C |
| | Temperature Max($T_{S(max)}$) | +200°C |
| | Time (Min to Max) ($t_S$) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp ($T_L$) to peak) | | 3°C /sec. Max |
| $T_{S(max)}$ to $T_L$ - 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 (SOT23-6L)




| Symbol | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 2.80 | 3.00 | 0.110 | 0.118 |
| B | 2.60 | 3.00 | 0.102 | 0.118 |
| C | 0.93 | 0.97 | 0.037 | 0.038 |
| D | 0.41 | | 0.016 | |
| E | 1.50 | 1.70 | 0.059 | 0.067 |
| F | 0.11 | 0.19 | 0.004 | 0.007 |
| G | - | 0.10 | - | 0.004 |
| H | 0.40 | - | 0.016 | - |
| J | 1.00 | 1.20 | 0.035 | 0.057 |

## Suggested Pad Layout




| Symbol | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| J | 0.60 | - | 0.024 | - |
| K | 0.90 | - | 0.035 | - |
| M | - | 1.40 | - | 0.055 |
| N | - | 0.35 | - | 0.014 |
| X | - | 0.95 | - | 0.037 |
| Y | - | 2.30 | - | 0.090 |
| L | - | 2.50 | - | 0.098 |

Note :

This soldering footprint is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.