

SOT-23 Plastic-Encapsulate ESD Protection Diodes

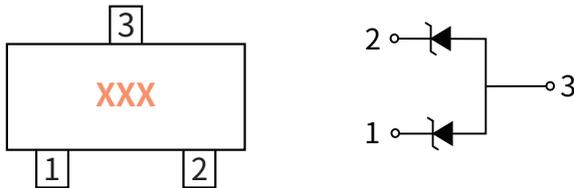
Features

- Low leakage current
- SOT-23 surface mount package
- IEC 61000-4-2 (ESD Air): $\pm 15\text{kV}$
- IEC 61000-4-2 (ESD Contact): $\pm 8\text{kV}$
- 350 Watts Peak Pulse Power per (tp=8/20us)

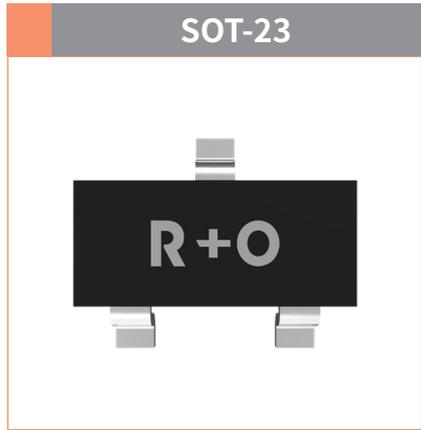
Applications

- Cellular Handsets and Accessories
- Microprocessor based equipment
- Personal Digital Assistants
- Notebooks, Desktops, and Servers
- Portable Instrumentation, Networking and Telecom
- Peripherals, Serial and Parallel Ports

Function Diagram



Reverse Working Voltage
3.3 to 36V Max.
Normal capacitance
450 to 60 pF(Max.)

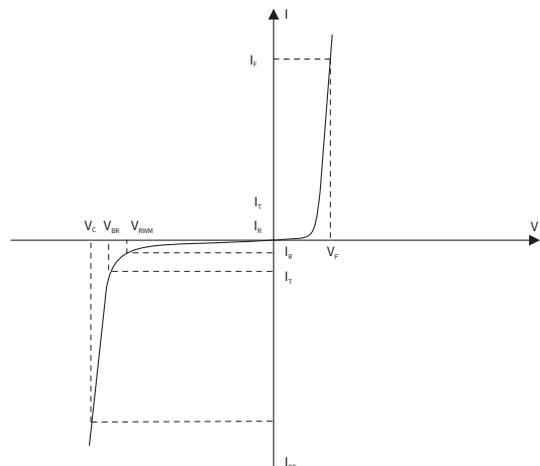


Maximum Ratings (Ta=25°C Unless otherwise specified)

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|------------------|--|---------------------------------|-------------|------|
| V _{ESD} | Electrostatic Discharge Voltage | ESD per IEC 61000-4-2(Air) | ± 15 | KV |
| | | ESD per IEC 61000-4-2(Contact) | ± 8 | KV |
| P _{PP} | Peak Pulse Power | tp = 8/20 μs | 350 | W |
| V _F | Forward Voltage@100mA, s00us-square wave (Applies to unidirectional pins only) | — | 1.5 | V |
| T _J | Operating JunctionTemperature Range | — | -55 to +125 | °C |
| T _{STG} | Operating JunctionTemperature Range | — | -55 to +125 | °C |

Electrical Parameter

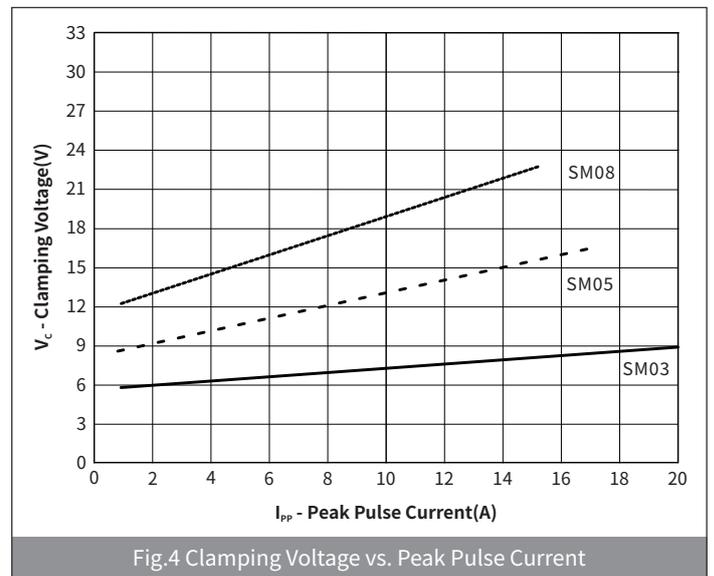
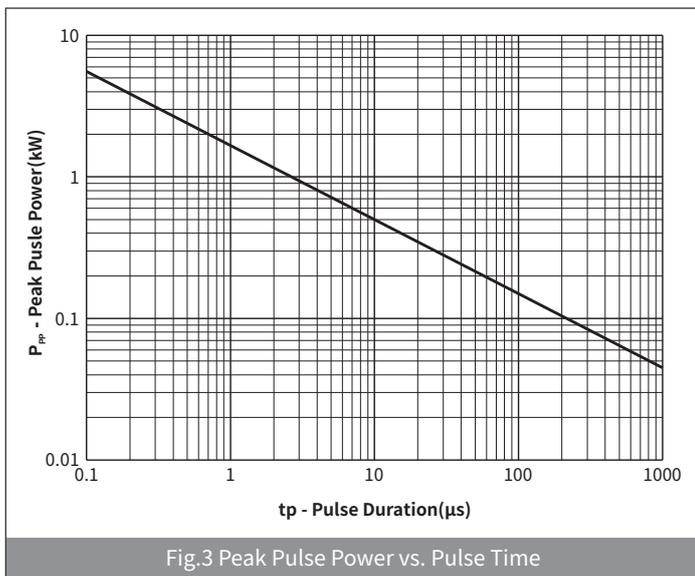
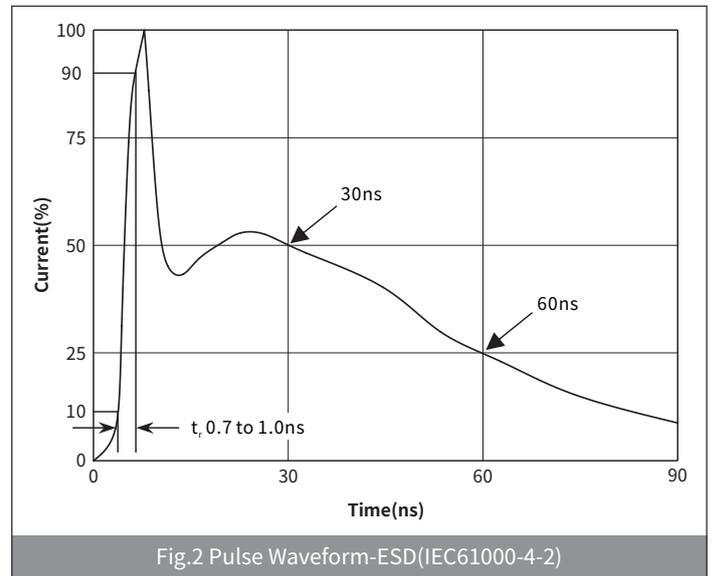
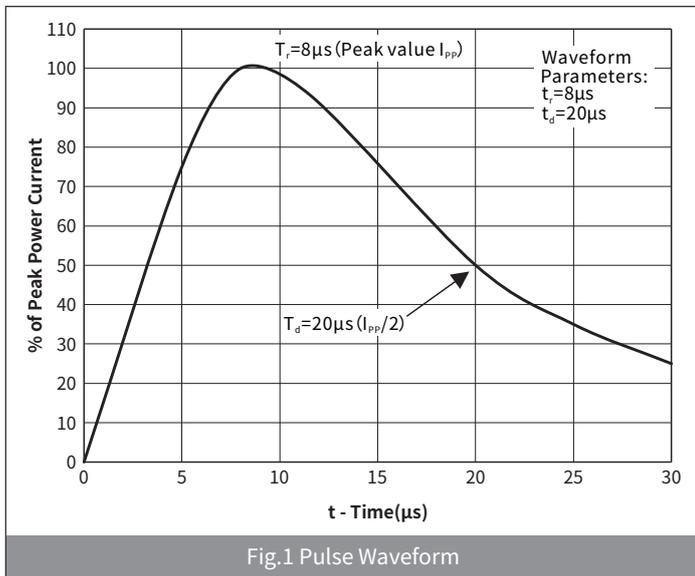
| SYMBOL | PARAMETER |
|------------------|---|
| V _C | Clamping Voltage @ I _{pp} |
| V _{BR} | Breakdown Voltage @ I _T |
| I _{PP} | Peak Pulse Current |
| I _T | Test Current |
| I _R | Reverse Leakage Current @ VRWM |
| V _{RWM} | Peak Reverse Working Voltage |
| P _{PP} | Peak Pulse Power Dissipation |
| C _J | Junction Capacitance @ V _R =0V, f=1MHz |
| I _F | Forward Current |
| V _F | Forward Voltage @ I _F |



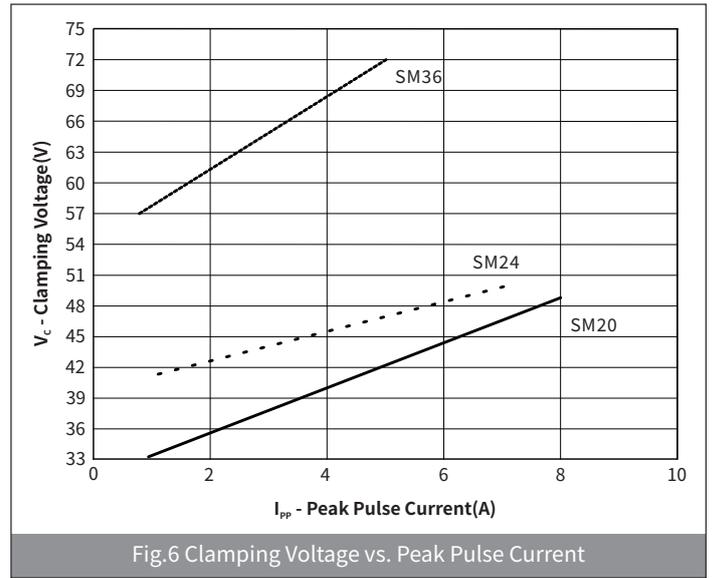
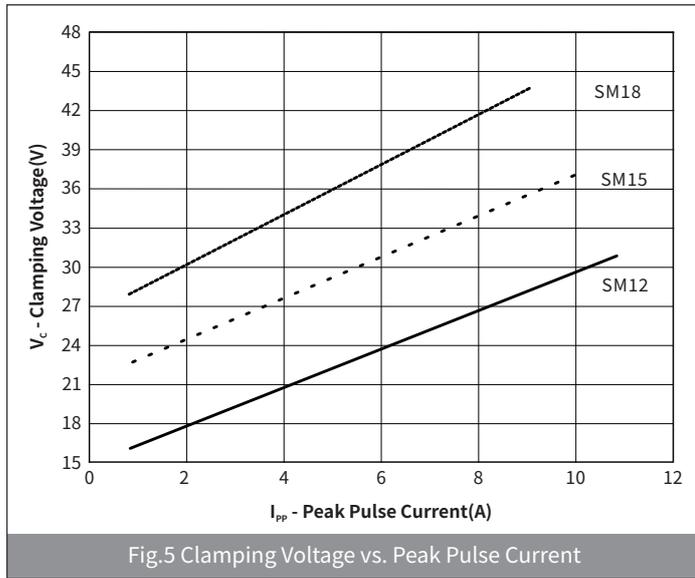
● Electrical Characteristics (Ta=25°C Unless otherwise specified)

| Part Number | Marking | $V_{RWM}(V)(Max.)$ | $V_B(V)(Min.)$ | IT(mA) | $V_C@1A(V)(Max.)$ | $V_C(V)(Max.)@I_{PP}(A)$ | $I_R(\mu A)(Max.)$ | $C_T(pF)(ax.)$ |
|-------------|---------|--------------------|----------------|--------|-------------------|--------------------------|--------------------|----------------|
| SM03 | M03 | 3.3 | 4.0 | 1.0 | 7.0 | 10.5 | 20 | 450 |
| SM05 | M05 | 5.0 | 6.0 | 1.0 | 9.8 | 18 | 17 | 300 |
| SM08 | M08 | 8.0 | 8.5 | 1.0 | 13.4 | 24 | 15 | 240 |
| SM12 | M12 | 12 | 13.3 | 1.0 | 19 | 32 | 11 | 130 |
| SM15 | M15 | 15 | 16.7 | 1.0 | 24 | 38 | 10 | 120 |
| SM18 | M18 | 18 | 20 | 1.0 | 29 | 45 | 9.0 | 100 |
| SM20 | M20 | 20 | 22.3 | 1.0 | 35 | 50 | 8.0 | 90 |
| SM24 | M24 | 24 | 26.7 | 1.0 | 43 | 52 | 7.0 | 80 |
| SM36 | M36 | 36 | 40 | 1.0 | 60 | 75 | 4.0 | 60 |

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



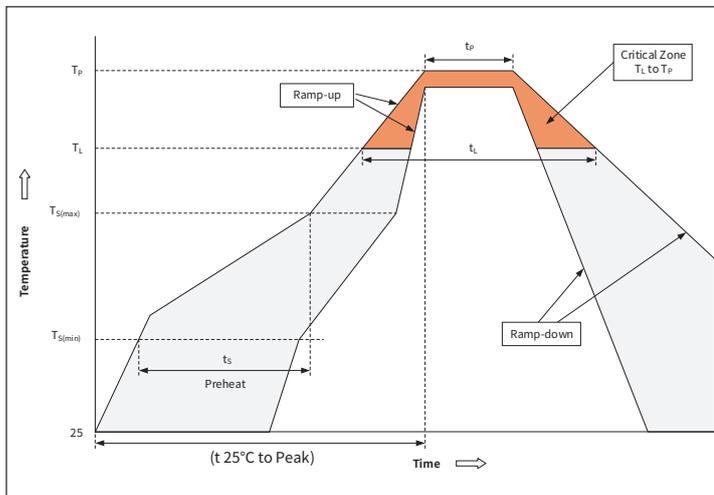
● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



● Ordering Information

| PACKAGE | PACKAGE CODE | UNIT WEIGHT(g) | REEL(pcs) | BOX(pcs) | CARTON(pcs) | DELIVERY MODE |
|---------|--------------|----------------|-----------|----------|-------------|---------------|
| SOT-23 | R1 | 0.008 | 3000 | 45000 | 180000 | 7" |

● Recommended Soldering Conditions



| Profile Feature | | Pb-Free Assembly |
|--|----------------------------|------------------|
| Pre-heat | Temperature Min (Ts(min)) | +150°C |
| | Temperature Max(Ts(max)) | +200°C |
| | Time (Min to Max) (ts) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp (TL) to peak) | | 3°C /sec. Max |
| Ts(max) to TL - Ramp-up Rate | | 3°C /sec. Max |
| Reflow | Temperature(TL)(Liquid us) | +217°C |
| | Temperature(tL) | 60-150 secs. |
| Peak Temp (TP) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (tp) | | 20-40secs |
| Ramp-down Rate | | 6°C /sec. Max |
| Time 25°C to Peak Temp (TP) | | 8 min. Max |
| Do not exceed | | +260°C |

● Package Outline Dimensions (SOT-23)

| Symbol | Dimensions | | | |
|----------|-------------|------|----------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 0.90 | 1.15 | 0.035 | 0.045 |
| A1 | - | 0.10 | - | 0.004 |
| A2 | 0.90 | 1.05 | 0.035 | 0.041 |
| b | 0.30 | 0.50 | 0.012 | 0.020 |
| c | 0.10 | 0.20 | 0.004 | 0.008 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 1.20 | 1.40 | 0.047 | 0.055 |
| E1 | 2.25 | 2.55 | 0.089 | 0.100 |
| e | 0.950TYP | | 0.037TYP | |
| e1 | 1.80 | 2.00 | 0.071 | 0.079 |
| L | 0.550REF | | 0.022REF | |
| L1 | 0.30 | 0.50 | 0.012 | 0.020 |
| θ | - | 8° | - | 8° |

● Suggested Pad Layout

| Symbol | Dimensions | | | |
|--------|-------------|------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| J | 0.75 | 0.85 | 0.030 | 0.033 |
| K | 0.85 | 0.95 | 0.033 | 0.037 |
| M | 1.95 | 2.05 | 0.077 | 0.081 |
| N | 1.85 | 1.95 | 0.073 | 0.077 |