# SOT-23 Plastic-Encapsulate ESD Protection Diodes

## Features

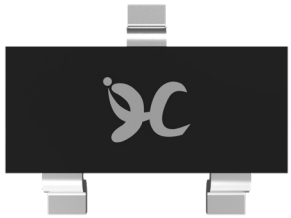
- Low leakage current
- SOT-23 surface mount package
- IEC 61000-4-2 (ESD Air): ±30kV
- IEC 61000-4-2 (ESD Contact): ±30kV
- IEC 61000-4-5 (Lightning 8/20μs): 35A

**Reverse Working Voltage**
12V Max.
**Normal capacitance**
60pF(Typ.)

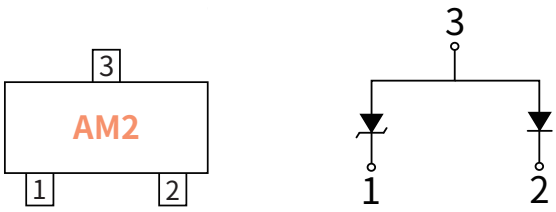
## Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Set Top Box
- Server and Desktop PC

**SOT-23**



## Reference News

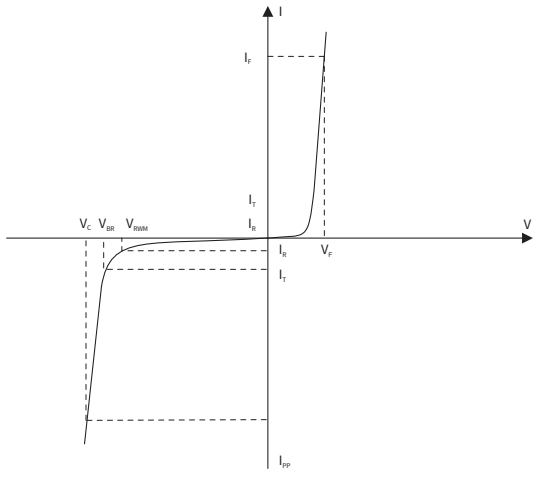



## Maximum Ratings (Ta=25°C Unless otherwise specified)

| 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 | 1260 | W |
| $I_{PP}$ | Rated Peak Pulse Current | tp = 8/20 μs | 35 | 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 | — | — | 12 | V |
| Breakdown Voltage | $V_{BR}$ | $I_T$=1.0mA,$T_a$=25°C | 13.3 | — | 16 | V |
| Reverse Leakage Current | $I_R$ | $V_{RWM}$=12V,$T_a$=25°C | — | — | 1 | μA |
| Clamping Voltage | $V_C$ | $I_{PP}$=1.0A, $t_p$=8/20μs | — | — | 20 | V |
| | | $I_{PP}$=12A,$t_p$=8/20μs | — | — | 25 | |
| | | $I_{PP}$=35A,$t_p$=8/20μs | — | — | 36 | |
| Junction Capacitance | $C_J$ | $V_R$=0V,f=1MHz,Pin1 to Pin2 | — | 60 | 90 | pF |

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

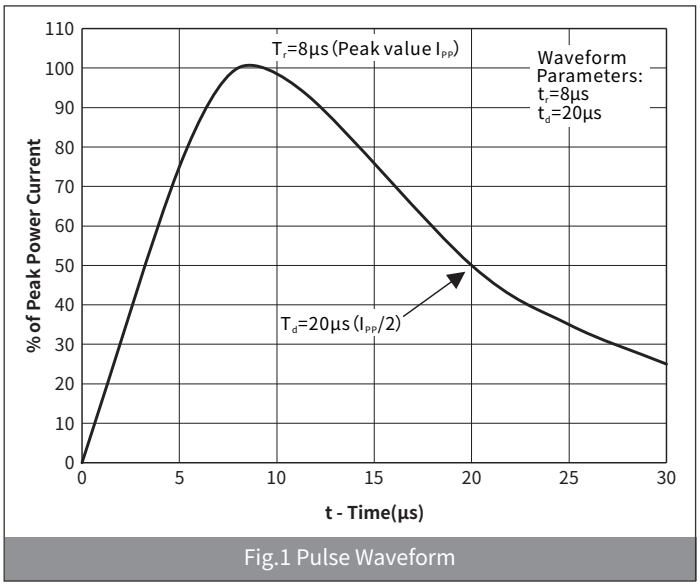



Fig.1 Pulse Waveform

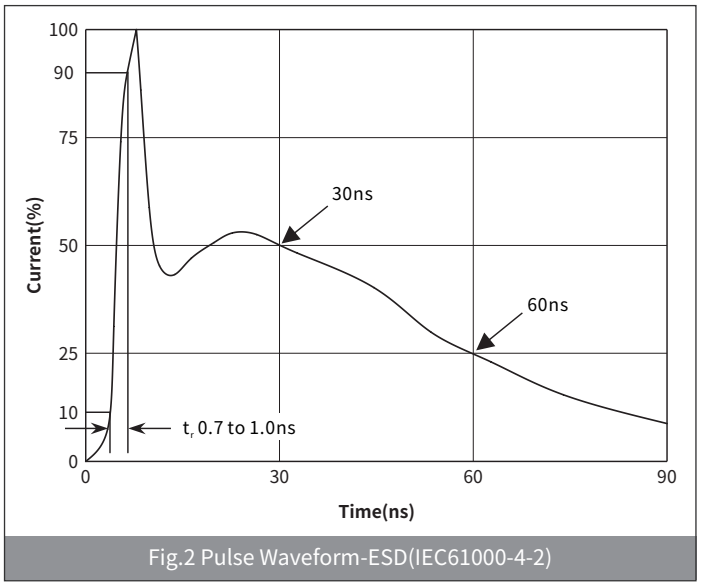



Fig.2 Pulse Waveform-ESD(IEC61000-4-2)

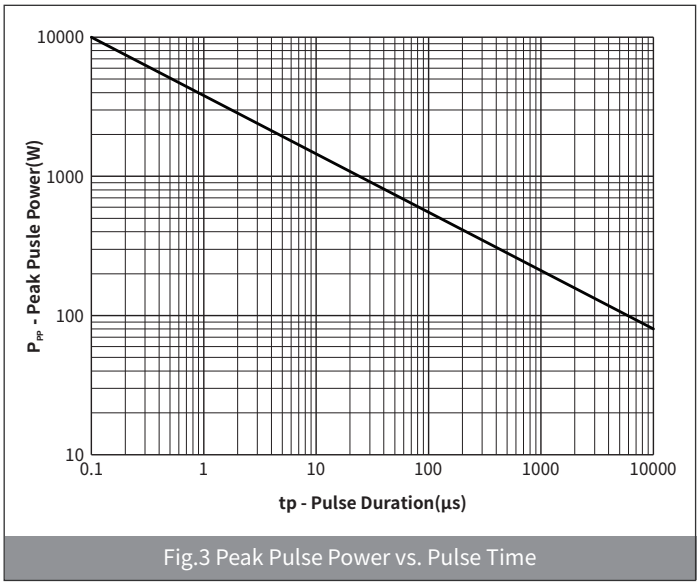



Fig.3 Peak Pulse Power vs. Pulse Time

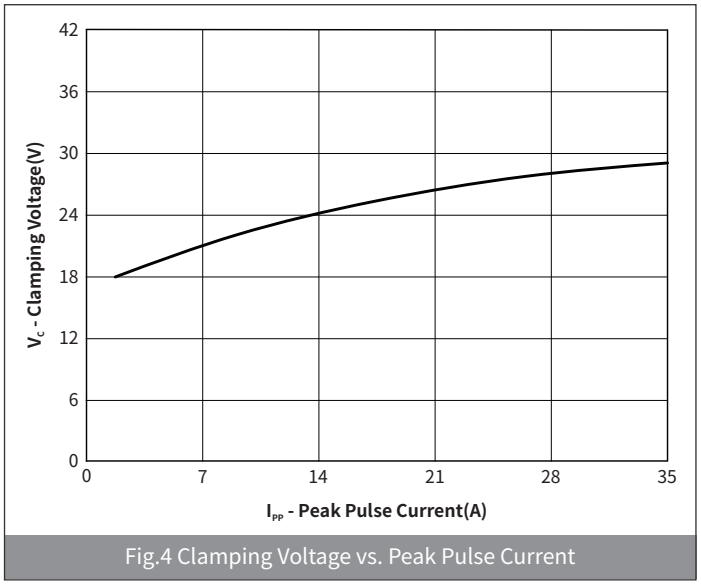
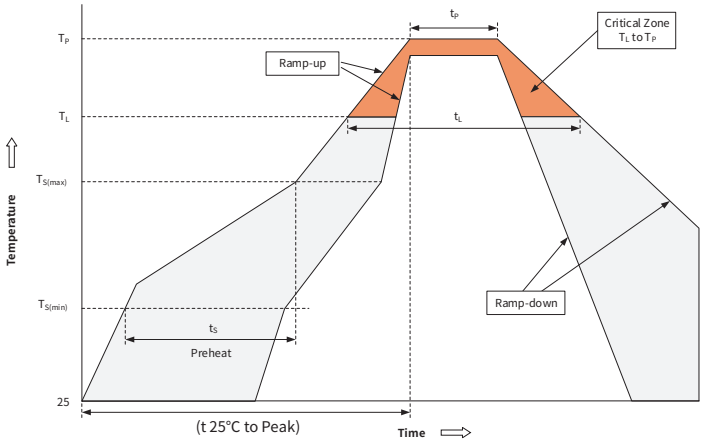



Fig.4 Clamping Voltage vs. Peak Pulse Current

## Ordering Information

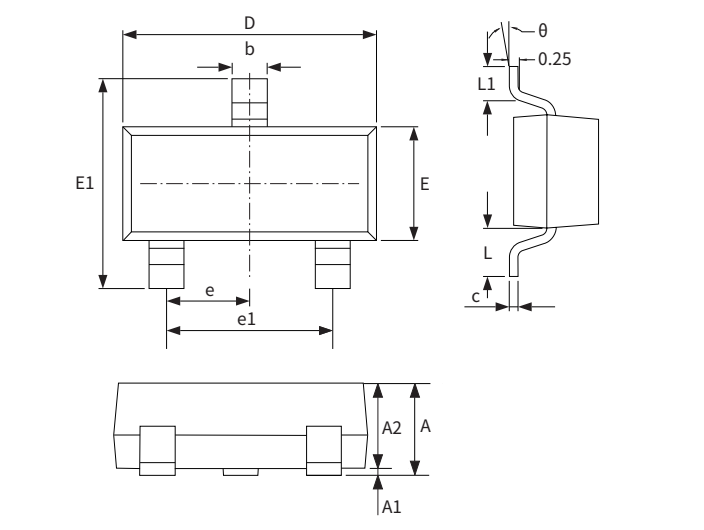
| PREFERED P/N | PACKAGE | SIZE(mm) | DELIVERY MODE | MPQ(PCS) |
|---|---|---|---|---|
| H12VNT2U | SOT-23 | 2.90×2.40×1.025 | 7''REEL | 3000 |

## Recommended Soldering Conditions



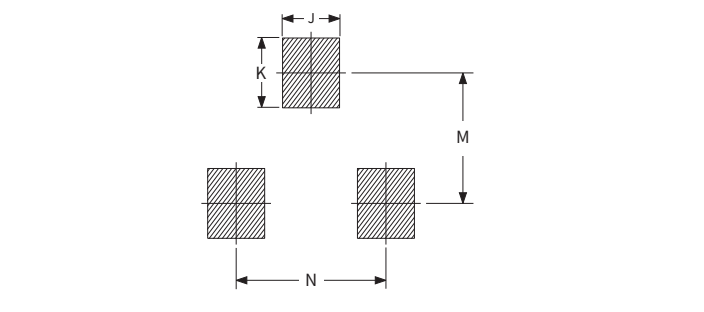

| Profile Feature | | Pb-Free Assembly |
|---|---|---|
| Pre-heat | Temperature Min ($T_{S(min)}$) | +150°C |
| | Temperature Max($T_{S(max)}$) | +200°C |
| | Time (Min to Max) ($t_S$) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp ($T_L$) to peak) | | 3°C /sec. Max |
| $T_{S(max)}$ to $T_L$ - 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 (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 | 0.80 | - | 0.031 | - |
| K | - | 0.90 | - | 0.035 |
| M | 2.00 | - | 0.078 | - |
| N | - | 1.90 | - | 0.074 |

Note :

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