# SOP-8 Plastic-Encapsulate ESD Protection Diodes

## Features

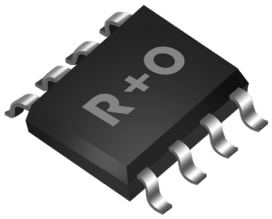
- Low leakage current
- Low clamping voltage
- IEC 61000-4-2 (ESD Air): ±30kV
- IEC 61000-4-2 (ESD Contact): ±30kV
- IEC 61000-4-5 (Lightning 8/20μs): 10A

**Reverse Working Voltage**
2.8V Max.
**Normal capacitance**
4.7pF(Typ.)

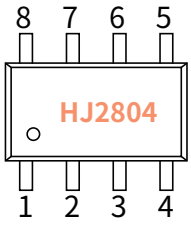
## Applications

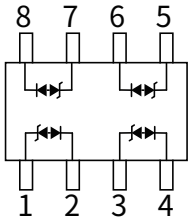
- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation,Digital Cameras
- Peripherals, Audio Players, Industrial Equipment

**SOP-8**




## Function Diagram



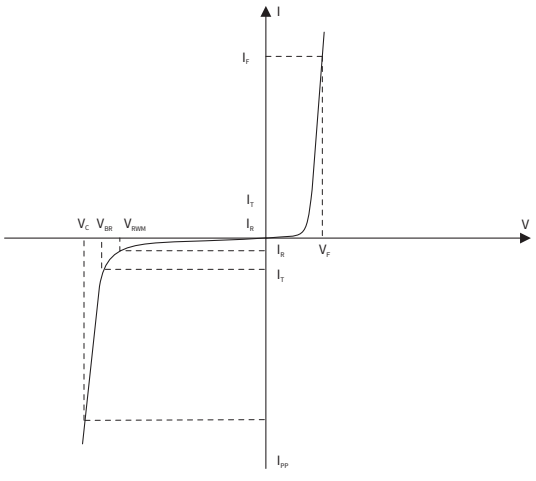




## Maximum Ratings (Ta=25°C Unless otherwise specified)

| 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 | 160 | W |
| $I_{PP}$ | Rated Peak Pulse Current | tp = 8/20 μs | 10 | A |
| $T_J$ | Operating JunctionTemperature Range | — | -40 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 | — | — | 2.8 | V |
| Breakdown Voltage | $V_{BR}$ | $I_T$=2μA,$T_a$=25°C | 3.5 | — | — | V |
| Reverse Leakage Current | $I_R$ | $V_{RWM}$=2.8V,$T_a$=25°C | — | — | 1.0 | μA |
| Clamping Voltage | $V_C$ | $I_{PP}$=1A,$t_p$=8/20μs | — | — | 8.5 | V |
| | $V_C$ | $I_{PP}$=10A,$t_p$=8/20μs | — | — | 16.5 | V |
| Junction Capacitance | $C_J$ | $V_{RMW}$=2.8V,f=1MHz | — | 1.0 | 2.0 | pF |

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

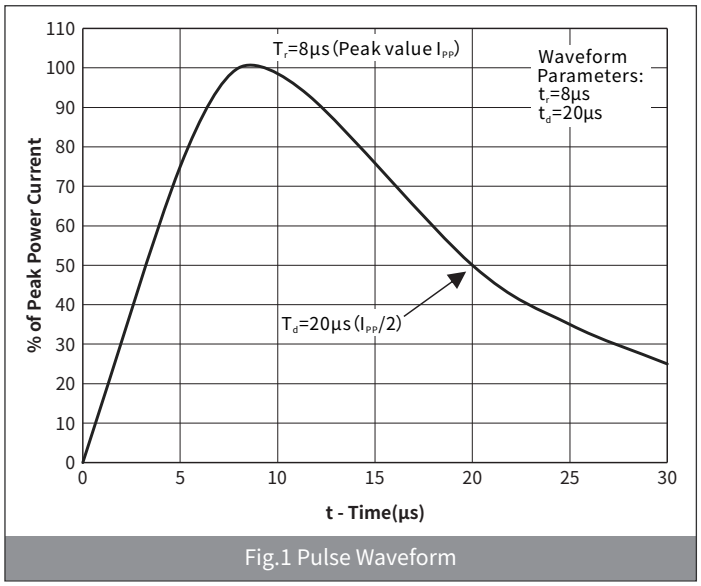



Fig.1 Pulse Waveform

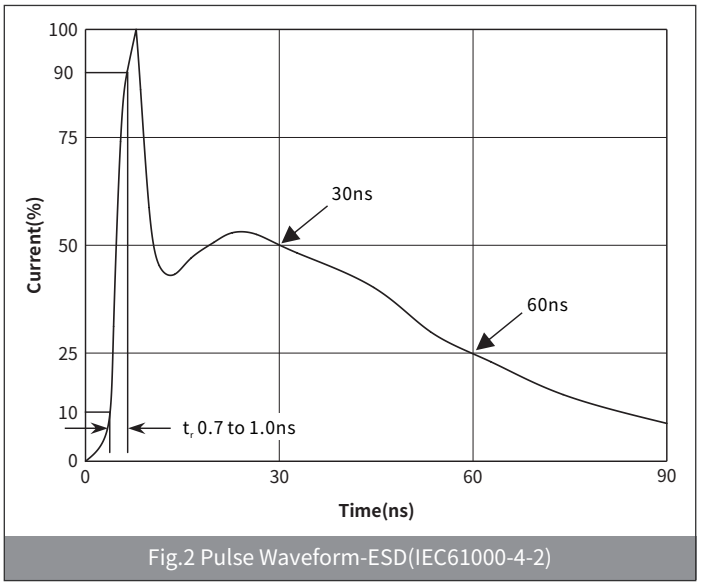



Fig.2 Pulse Waveform-ESD(IEC61000-4-2)

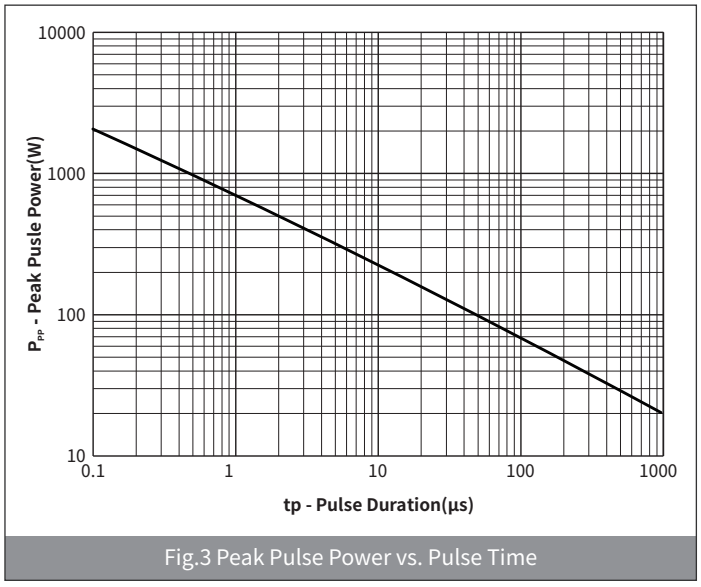



Fig.3 Peak Pulse Power vs. Pulse Time

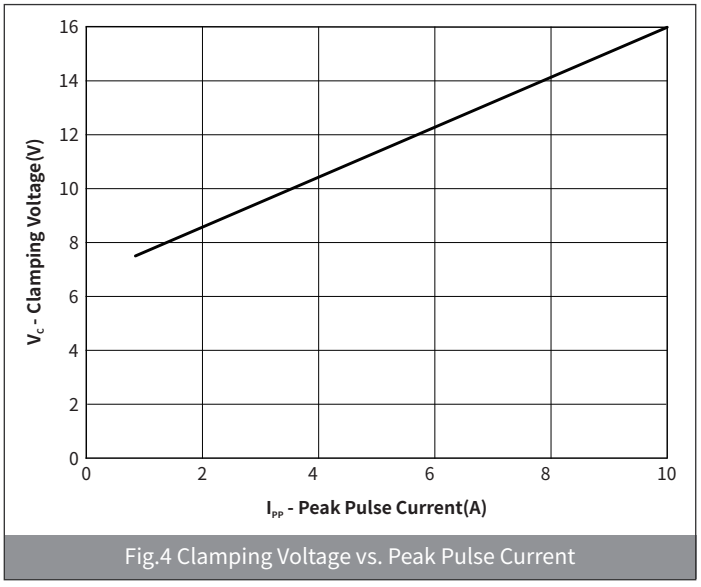
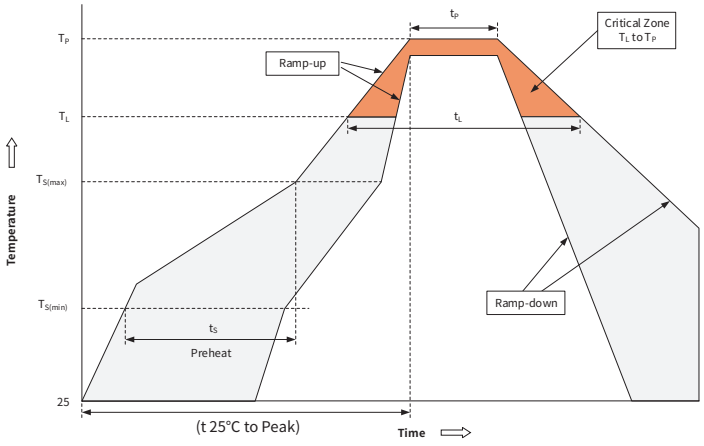



Fig.4 Clamping Voltage vs. Peak Pulse Current

## Ordering Information

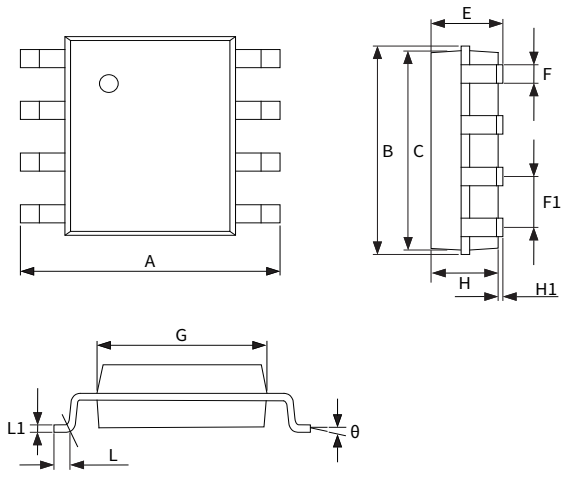
| PART NUMBER | PACKAGE | REEL(pcs) | DELIVERY MODE |
|---|---|---|---|
| H2V8NP8U | SOP-8 | 2500 | 7" |

## Recommended Soldering Conditions



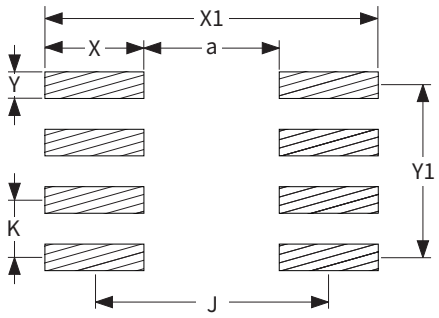

| Profile Feature | | Pb-Free Assembly |
|---|---|---|
| Pre-heat | Temperature Min ($T_{S(min)}$) | +150°C |
| | Temperature Max($T_{S(max)}$) | +200°C |
| | Time (Min to Max) ($t_S$) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp ($T_L$) to peak) | | 3°C /sec. Max |
| $T_{S(max)}$ to $T_L$ - 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 (SOP-8)




| Symbol | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 5.70 | 6.30 | 0.228 | 0.252 |
| B | 5.13MAX. | | 0.205MAX. | |
| C | 4.72 | 5.12 | 0.189 | 0.205 |
| E | 1.80MAX. | | 0.072MAX. | |
| F | 0.31 | 0.51 | 0.0124 | 0.0204 |
| F1 | 1.27TYP. | | 0.0508TYP. | |
| G | 3.75 | 4.15 | 0.15 | 0.166 |
| H | 1.35 | 1.65 | 0.054 | 0.066 |
| H1 | 0.1 | 0.25 | 0.004 | 0.01 |
| L | 0.3 | 0.7 | 0.012 | 0.028 |
| L1 | 0.21TYP. | | 0.0084TYP. | |
| θ | - | 8° | - | 8° |

## Suggested Pad Layout




| Symbol | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| a | 2.90 | 3.10 | 0.116 | 0.124 |
| J | 5.10 | 5.30 | 0.204 | 0.212 |
| K | 1.17 | 1.37 | 0.047 | 0.055 |
| X | 2.10 | 2.30 | 0.084 | 0.092 |
| X1 | 7.30 | 7.50 | 0.292 | 0.300 |
| Y | 0.50 | 0.70 | 0.020 | 0.028 |
| Y1 | 3.71 | 3.91 | 0.148 | 0.156 |