

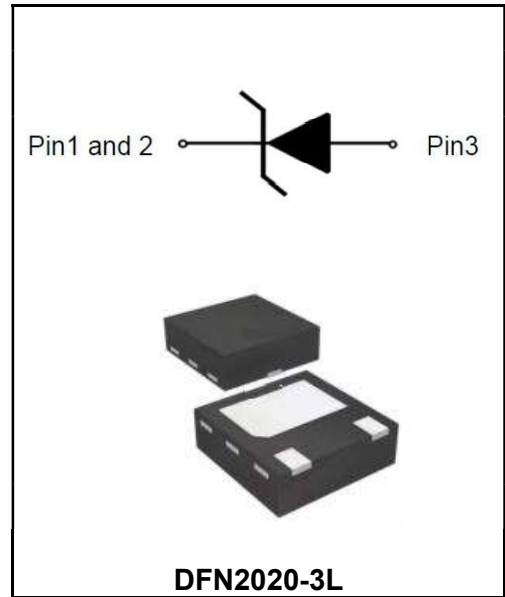
**High Power TVS Protection Diode**

**Features**

- ◆Protects one I/O lines
- ◆Working voltages :24V
- ◆Low leakage current
- ◆Low clamping voltage
- ◆Meets MSL 1 Requirements
- ◆Solid-state silicon avalanche technology
- ◆ROHS compliant

**Application**

- ◆Power lines
- ◆Personal digital assistants
- ◆Microprocessors based equipment
- ◆Notebooks, desktops, and servers
- ◆Portable electronics
- ◆Peripherals



**Order Information**

| Part Number | Package    | Marking | Size (mm)      | Delivery Form | Delivery Quantity |
|-------------|------------|---------|----------------|---------------|-------------------|
| ESD2020D12V | DFN2020-3L | 12      | 2.00X2.00X0.50 | 7" T&R        | 3000PCS/Tape      |

**Limiting Values(TA = 25 °C, unless otherwise specified)**

| Symbol           | Parameter                       | Conditions                       | Min | Typ. | Max | Unit |
|------------------|---------------------------------|----------------------------------|-----|------|-----|------|
| V <sub>ESD</sub> | Electrostatic Discharge Voltage | IEC 61000-4-2; Contact Discharge | -   | -    | ±30 | kV   |
|                  |                                 | IEC 61000-4-2; Air Discharge     | -   | -    | ±30 | kV   |
| P <sub>PP</sub>  | Peak Pulse Power                | tP = 8/20 μs                     | -   | 4500 | -   | W    |
| I <sub>PPM</sub> | Rated Peak Pulse Current        | tP = 8/20 μs                     | -   | -    | 180 | A    |
| T <sub>OP</sub>  | Operating Temperature Range     | -                                | -55 | -    | 125 | °C   |
| T <sub>stg</sub> | Storage Temperature Range       | -                                | -55 | -    | 150 | °C   |

**Electrical Characteristics(TA = 25 °C unless otherwise specified)**

| Symbol           | Parameter               | Conditions             | Min  | Typ. | Max  | Unit |
|------------------|-------------------------|------------------------|------|------|------|------|
| V <sub>RWM</sub> | Reverse Working Voltage | TA = 25 °C             | -    | -    | 24   | V    |
| I <sub>R</sub>   | Reverse Leakage Current | VRWM = 12V; TA = 25 °C | -    | -    | 1    | μA   |
| V <sub>BR</sub>  | Breakdown Voltage       | IR = 1mA; TA = 25 °C   | 13.5 | 14.5 | 15.5 | V    |
| V <sub>C</sub>   | Clamping Voltage        | IPP=100A, tP =8/20μs   | -    | -    | 25   | V    |
|                  |                         | IPP=180A, tP =8/20μs   | -    | -    | 31   | V    |
| C <sub>J</sub>   | Junction Capacitance    | VR = 0V, f = 1 MHz     | 900  | 950  | 1200 | pF   |

Typical Characteristics

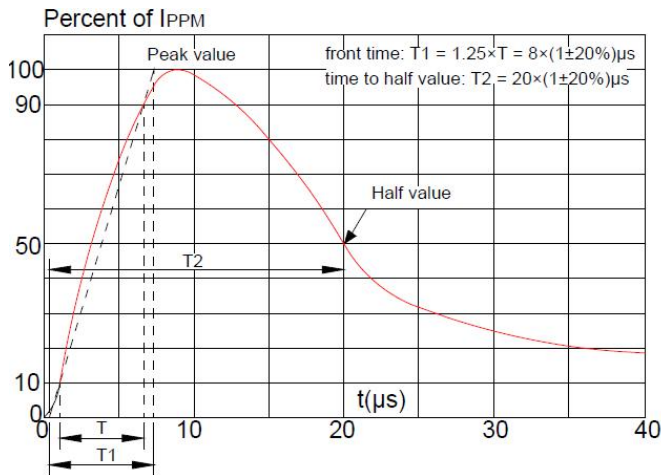


Fig.1 Pulse Waveform(8/20us)

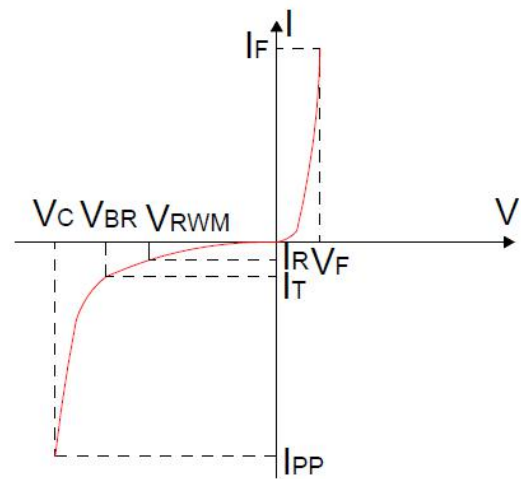


Fig.2 V-I curve characteristics(Uni-directional)

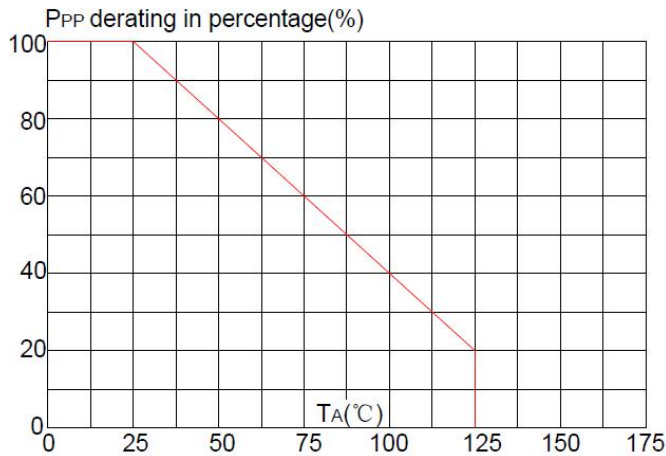


Fig.3 Power Derating Curve

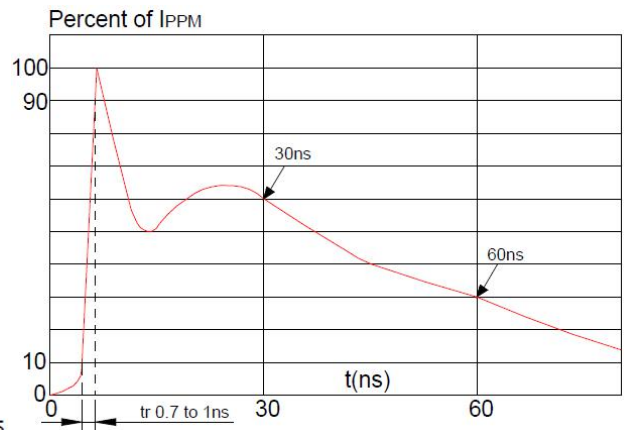
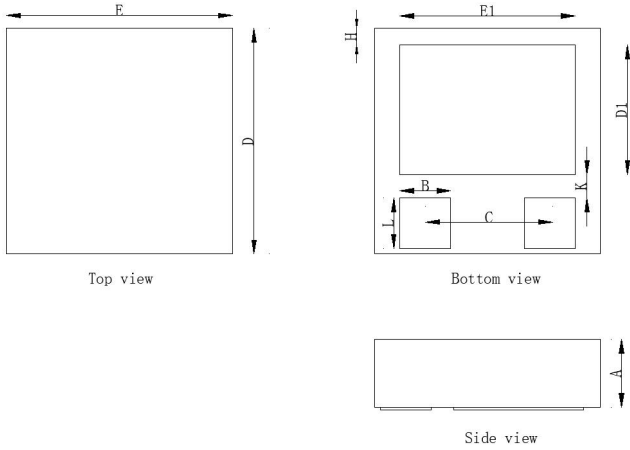


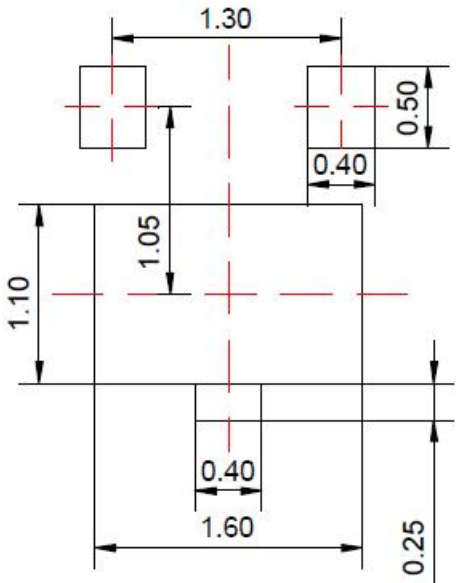
Fig.4 ESD clamping(30kV contact)

**DFN2020 Package Outline**

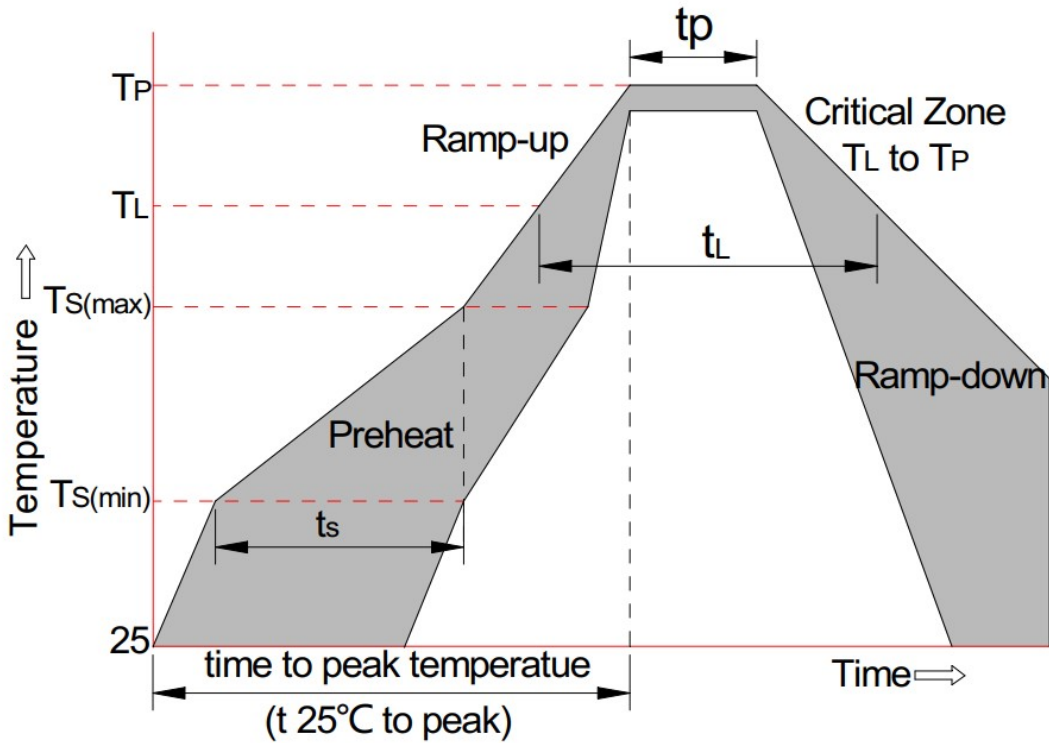


| Item | Dimensions In Millimeters |       |       |
|------|---------------------------|-------|-------|
|      | Min                       | Typ   | Min   |
| A    | 0.400                     | 0.500 | 0.600 |
| B    | 0.400                     | 0.450 | 0.500 |
| C    | 1.000                     | 1.100 | 1.200 |
| D    | 1.900                     | 2.000 | 2.100 |
| D1   | 1.100                     | 1.150 | 1.200 |
| E    | 1.900                     | 2.000 | 2.100 |
| E1   | 1.500                     | 1.550 | 1.600 |
| H    | 0.100                     | 0.150 | 0.200 |
| K    | 0.150                     | 0.200 | 0.250 |
| L    | 0.450                     | 0.500 | 0.550 |

**Suggested Land Pattern**



Recommended soldering footprint(mm)



| Reflow Condition                                   |                             | 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)           |                             | 30 secs. Max     |
| Ramp-down Rate                                     |                             | 6°C/sec. Max     |
| xTime 25°C to Peak Temp (TP)                       |                             | 8 min. Max       |
| Do not exceed                                      |                             | +260°C           |