## Features

- ◇ 45W (8/20μs) Peak Pulse Power
- ◇ Low Capacitance ESD Protection
- ◇ SOT-143 Package
- ◇ RoHS Compliant
- ◇ Matte Tin Lead finish (Pb-Free)
- ◇ Protect Two High Speed Data Lines and Vcc
- ◇ Meet IEC61000-4-2 Level 4:
  - Contact Discharge > 15kV
  - Air Discharge > 20kV


## Applications

- ◇ I²C Bus Protection
- ◇ ISDN S/T Interface
- ◇ Ethernet 10/100 BaseT
- ◇ Portable Electronics
- ◇ Video Line Protection
- ◇ WAN/LAN Equipment
- ◇ Microcontroller Input Protection
- ◇ USB Power and Data Line Protection
- ◇ T1/E1 Secondary IC Side Protection

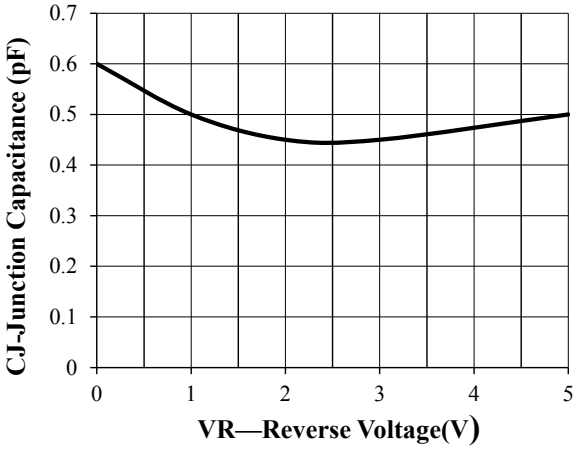
## Absolute Maximum Rating

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Peak Pulse Power (8/20μs,I/O-GND) | Ppk | 45 | W |
| Peak Pulse Power (8/20μs,Vcc-GND) | Ppk | 60 | W |
| Peak Pulse Current (8/20μs,I/O-GND) | IPP | 3 | A |
| Peak Pulse Current (8/20μs,Vcc-GND) | IPP | 4 | A |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | $V_{ESD,VDD}$<br>$V_{ESD,I/O}$ | ±20<br>±15 | kV |
| Operating Temperature Range | TJ | −55 to +125 | °C |
| Storage Temperature Range | Tstg | −55 to +150 | °C |

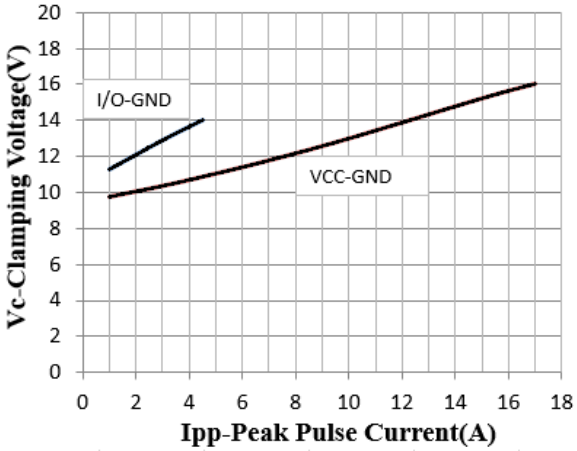
# Electrical Characteristics

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Reverse Working Voltage | $V_{RWM}$ | Pin 5 to GND,I/O-GND | | | 5. 0 | V |
| Breakdown Voltage | $V_{BR}$ | $I_T$ = 1mA($_{Pin\ 5\ to\ GND,I/O-GND}$) | 6.0 | 7.5 | 8.5 | V |
| Reverse Leakage Current | $I_R$ | $V_{RWM}$ = 5. 0V | | | 0.5 | μA |
| Forward Breakdown Voltage | $V_F$ | $I_F$ = 15mA,GND to Pin 5/IO | | 0.8 | 1.0 | V |
| Clamping Voltage | $V_C$ | IPP = 3A (8 x 20μs pulse, I/O to GND) | | 14.0 | 15.0 | V |
| Clamping Voltage | $V_C$ | IPP = 4A (8 x 20μs pulse,Pin 5 to GND) | | 16.0 | 18. 0 | V |
| Junction Capacitance | $C_J$ | $V_{pin5}$ = 5V, I/O=0V, f = 1MHz,I/O-GND | | 0.6 | 0.7 | pF |
| Junction Capacitance | $C_J$ | $V_{pin5}$ = 5V, I/O=0V, f = 1MHz,I/O-I/O pins | | 0.3 | 0.4 | pF |

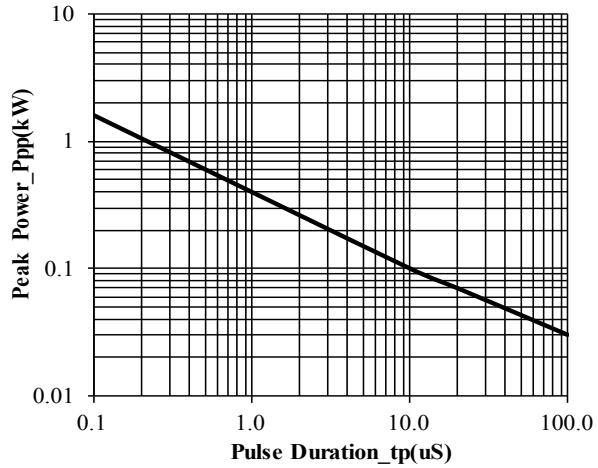
## RATING AND CHARACTERISTIC CURVES



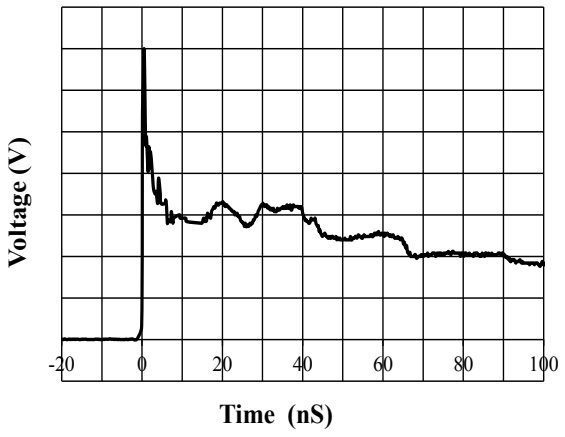

Junction Capacitance vs. Reverse Voltage



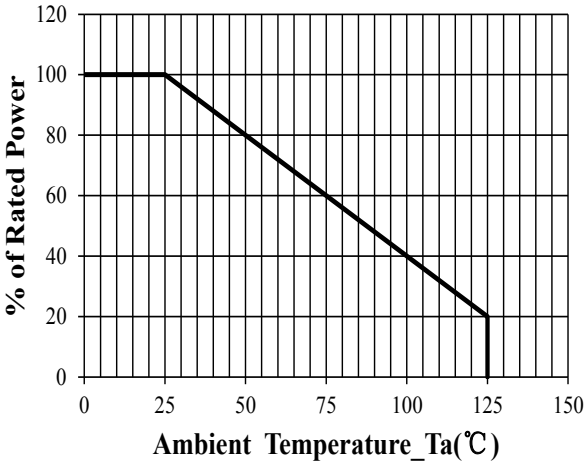

Clamping Voltage vs. Peak Pulse Current



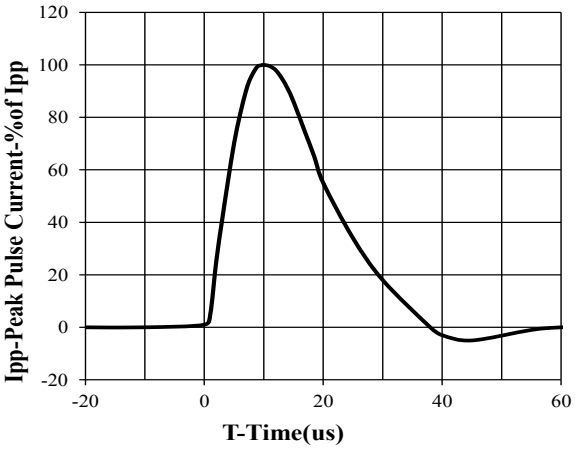

Peak Pulse Power vs. Pulse Time




IEC61000−4−2 Pulse Waveform




Power Derating Curve

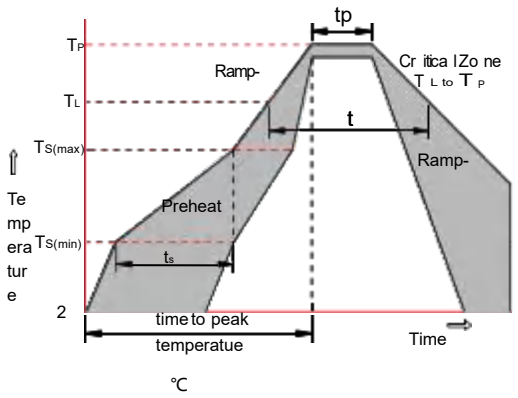



8 X 20us Pulse Waveform

## Soldering parameters

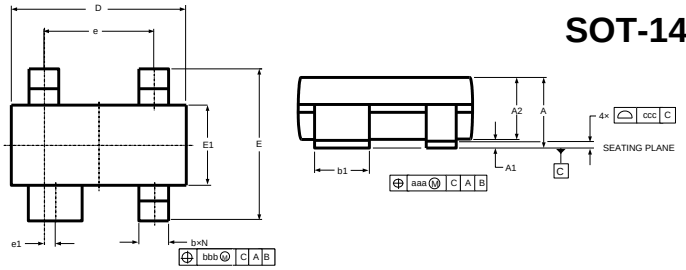
| Reflow Condition | | Pb-Free assembly (see as bellow) |
|---|---|---|
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150℃ |
| | -Temperature Max($T_{s(max)}$) | +200℃ |
| | -Time (Min to Max) (ts) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp ($T_L$) to peak) | | 3℃/sec. Max |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate | | 3℃/sec. Max |
| Reflow | -Temperature($T_L$)(Liquid us) | +217℃ |
| | -Temperature($t_L$) | 60-150 secs. |
| Peak Temp ($T_p$) | | +260(+0/-5)℃ |
| Time within 5℃ of actual Peak Temp ($t_p$) | | 30 secs. Max |
| Ramp-down Rate | | 6℃/sec. Max |
| Time 25℃ to Peak Temp ($T_P$) | | 8 min. Max |
| Do not exceed | | +260℃ |

**FIG5:** Reflow condition



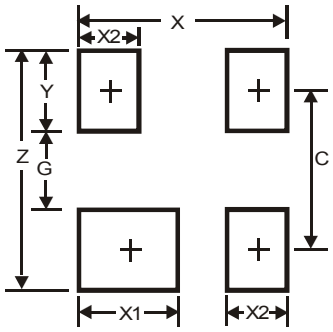

## Package Dimensions & Suggested Pad Layout

**SOT-143**




| DIMENSIONS | | | | |
|---|---|---|---|---|
| SYMBOL | MILLIMETER | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| b1 | 0.750 | 0.900 | 0.030 | 0.035 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| e | 1.800 | 2.000 | 0.071 | 0.079 |
| e1 | 0.200TYP | | 0.008TYP | |
| E | 2.250 | 2.550 | 0.089 | 0.100 |
| E1 | 1.200 | 1.400 | 0.047 | 0.055 |
| θ | 0° | 8° | 0° | 8° |
| aaa | .006 | | 0.15 | |
| bbb | .008 | | 0.20 | |
| ccc | .004 | | 0.10 | |

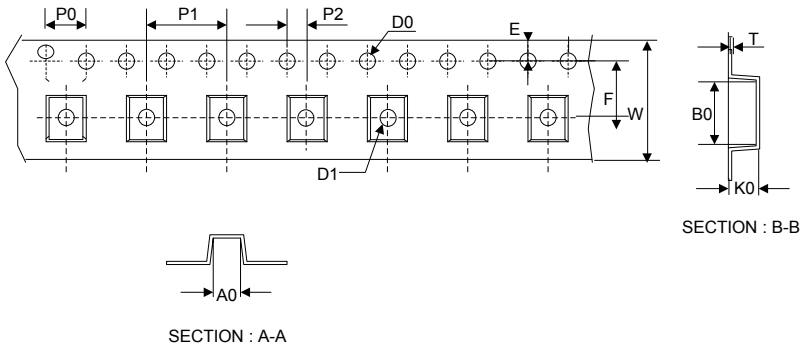
Dimensions in inches and (millimeters)




| Dimensions | Value (in mm) |
|---|---|
| Z | 2.90 |
| G | 1.20 |
| X | 2.50 |
| X1 | 1.00 |
| X2 | 0.60 |
| Y | 0.85 |
| C | 2.05 |

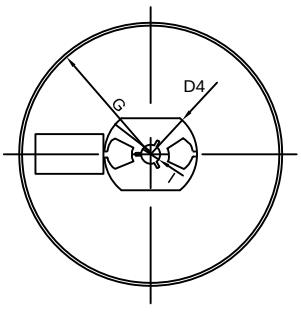
## Tape & rell specification

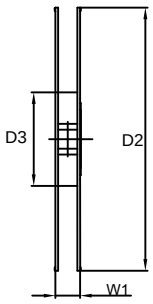
Tape




| Symbol | Dimension (mm) |
|---|---|
| P0 | 4.00±0.20 |
| P1 | 4.00±0.20 |
| P2 | 2.00±0.20 |
| D0 | 1.55±0.20 |
| D1 | 1.20±0.20 |
| E | 1.55±0.25 |
| F | 3.60±0.20 |
| W | 8.00±0.20 |
| A0 | 3.80±0.20 |
| B0 | 3.10±0.20 |
| K0 | 1.40±0.20 |
| T | 0.20±0.20 |

7” Reel




| | |
|---|---|
| D2 | 177.0±5.0 |
| D3 | 55Min. |
| D4 | R24.6±2.0 |
| G | R82.0±2.0 |
| I | 13.0±2.0 |
| W1 | 10.20±3.0 |

Quantity: 3000PCS