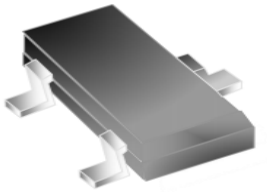
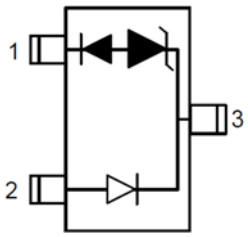
**JEU2.8LVU TVS Diode Array** Rev.1.0

## FEATURES

- ✧ 480 Watts peak pulse power ($t_P$=8/20μs)
- ✧ One device protects one unidirectional line
- ✧ Two devices protect two high-speed data line pairs
- ✧ Low capacitance
- ✧ Low leakage current
- ✧ Low operating and clamping voltage
- ✧ RoHS compliant



SOT-23




Pin Configuration

## MAIN APPLICATIONS

- ✧ Switching systems
- ✧ WAN/LAN equipment
- ✧ Desktops, serves, notebooks& handhelds
- ✧ T1/E1 secondary IC side protection
- ✧ Laser diode protection
- ✧ 10/100 ethernet
- ✧ Base stations

## PROTECTION SOLUTION TO MEET

- ✧ IEC61000-4-2 (ESD) ±20kV (air), ±15kV (contact)
- ✧ IEC61000-4-4 (EFT) 40A (5/50ns)
- ✧ IEC61000-4-5 (lightning) 20A (8/20μs)

## MECHANICAL CHARACTERISTICS

- ✧ SOT-23 package
- ✧ Molding compound flammability rating: UL 94V-0
- ✧ Weight 8 milligrams (approximate)
- ✧ Quantity per reel: 3,000pcs
- ✧ Reel size: 7 inch
- ✧ Lead finish: lead free
- ✧ Marking code: U2.8

## ABSOLUTE MAXIMUM RATINGS ($T_A$=25℃, RH=45%-75%, unless otherwise noted)

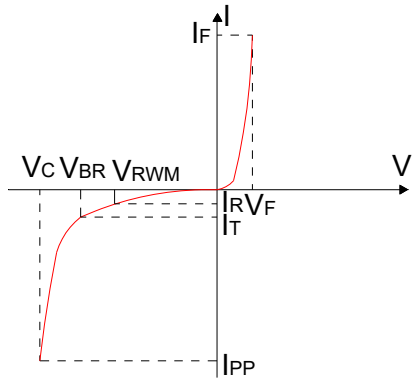
| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Peak pulse power dissipation on 8/20μs waveform | $P_{PP}$ | 480 | W |
| Peak pulse power dissipation on 8/20μs waveform | $I_{PP}$ | 20 | A |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | $V_{ESD}$ | +/- 20<br>+/- 15 | kV |
| Lead soldering temperature | $T_L$ | 260 (10 sec.) | ℃ |
| Operating junction temperature range | $T_J$ | -55 to +125 | ℃ |
| Storage temperature range | $T_{STG}$ | -55 to +150 | ℃ |

## ELECTRICAL CHARACTERISTICS ($T_A$=25℃)

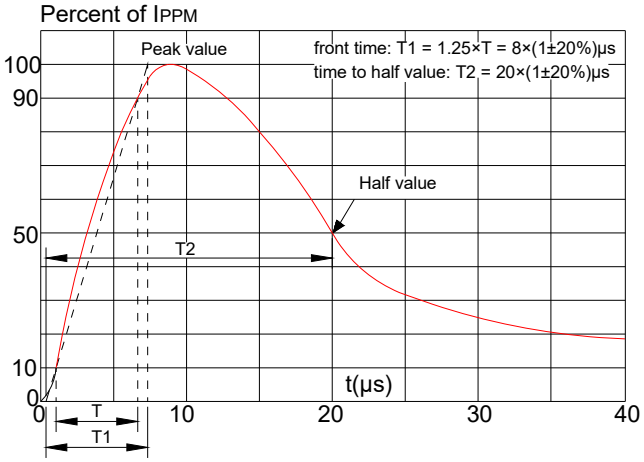
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Reverse working voltage | $V_{RWM}$ | | | | 2.8 | V |
| Punch-through Voltage | $V_{PT}$ | $I_{PT}$=2μA, pin 3 to 1 | 3 | | | V |
| Snap-Back Voltage | $V_{SB}$ | $I_{SB}$=50mA, pin 3 to 1 | 2.8 | | | V |
| Junction capacitance | $C_J$ | Pin 3 to pin1&2, $V_{RWM}$=0V,f=1MHz | | 20 | 50 | pF |
| | | Pin 2 to 1, $V_{RWM}$=0V, f=1MHz | | 3 | 6 | |
| **Steer Diode** | | | | | | |
| Clamping voltage | $V_C$ | $I_{PP}$=2A, $t_P$=8/20μs, pin 3 to 1 | | | 6 | V |
| | | $I_{PP}$=5A, $t_P$=8/20μs, pin 3 to 1 | | 10 | 12 | |
| | | $I_{PP}$=20A, $t_P$=8/20μs, pin 3 to 1 | | 22 | 24 | |
| Clamping voltage | $V_C$ | $I_{PP}$=5A, $t_P$=8/20μs, pin 2 to 1 | | | 10 | V |
| | | $I_{PP}$=20A, $t_P$=8/20μs, pin 2 to 1 | | | 24 | |
| Reverse breakdown voltage | $V_{BR}$ | $I_T$=10μA, pin 3 to 2 | 40 | | | V |
| Reverse leakage current | $I_R$ | $V_{RWM}$=2.8V, pin 3 to 2 | | | 1 | μA |
| Forward Voltage | $V_F$ | $I_F$=10mA, pin 2 to 3 | | | 2 | V |

## RATINGS AND V-I CHARACTERISTICS CURVES ($T_A$=25ºC, unless otherwise noted)

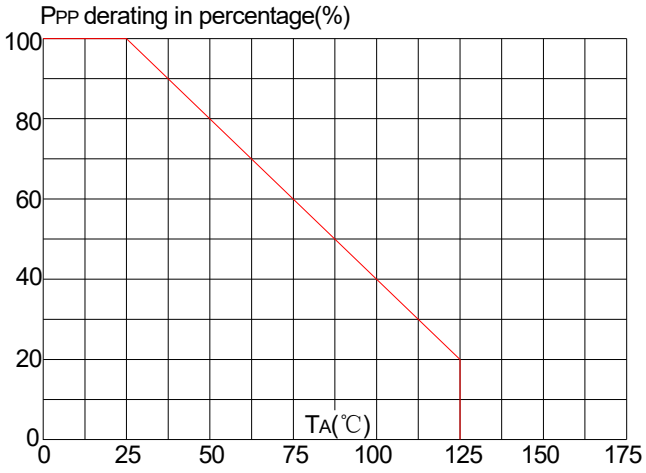
### FIG.1:V- I curve characteristics (Uni-directional)



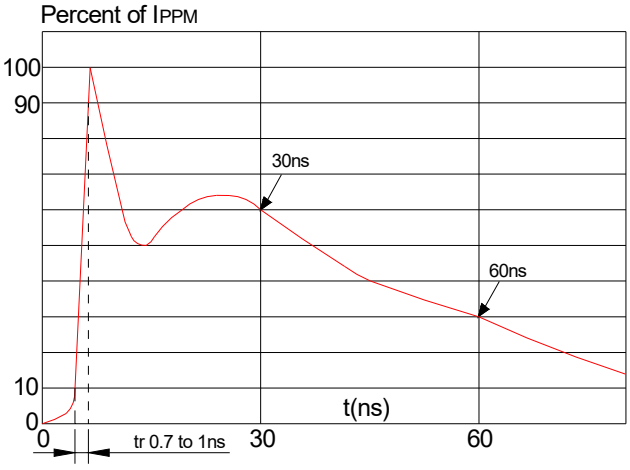

### FIG.2: Pulse waveform (8/20μs)



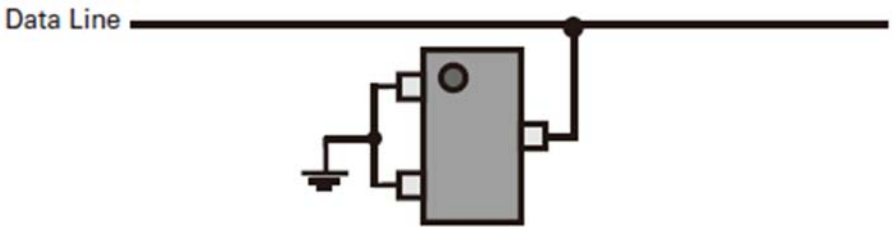

### FIG.3: Pulse derating curve




### FIG.4: ESD clamping (15kV contact)

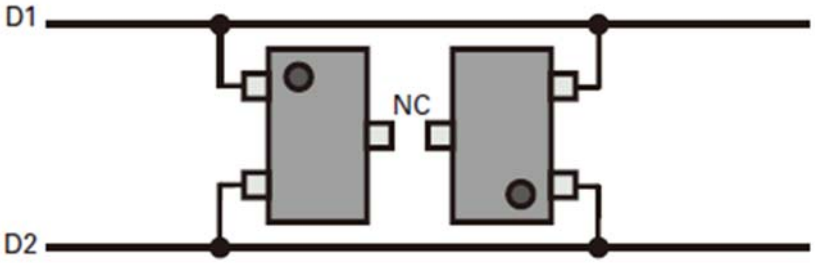


## APPLICATION EXAMPLE



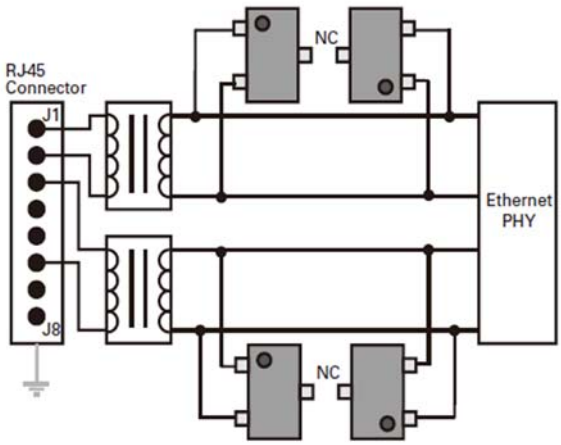

Protection of one unidirectional line

Protection of one unidirectional data line is realied by connecting pin 3 to the protected line, and pins 1 and 2 to GND.In this configuration,the device presents a maximum loading capacitance of tens of picofarads.During positive transients, the internal TVS diode will conduct and steer current from pin 3 to 1(GND),clamping the data line at or below the specified voltages for the device(see Electrical Characteristics section).For negative transients, the internal compensating diode is forward biased, steering the current from pin 2(GND) to 3.



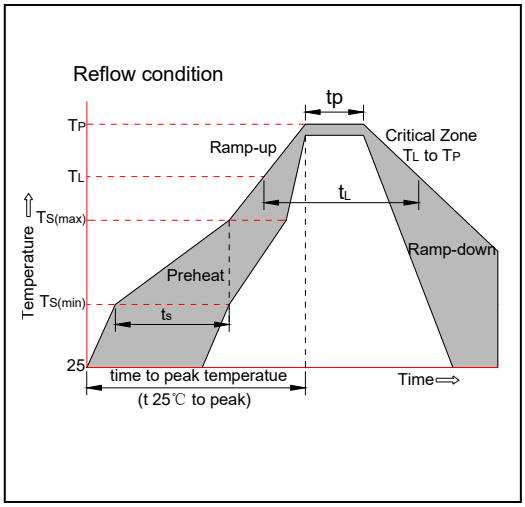

Low capacitance protection of one high speed data pair

Low capacitance protection of a high-speed data pair is realized by connecting two devices in antiparallel.As shown,pin 1 of the first device is connected to D1 and pin 2 is connected to D2. Additionally,pin 2 of the second device is connected to D1 and pin 1 is connected to D2. Pin 3 must be NC(or not connected)for both devices.When the potential on D1 exceeds the potential on D2(by the rated standoff voltage),pin 2 on the second device will steer current into pin 1.The compensating diode will conduct in the forward direction steering current into the avalanching TVS diode which is operating in the reverse direction. For the opposite transient,the first device will behave in the same manner. In this two device arrangement, the total loading capacitance is two times the rated capacitance from pin 2 to pin1 which will typically be much less than 10pF making it suitable for high-speed data pair such as 10/100/1000 Ethernet.

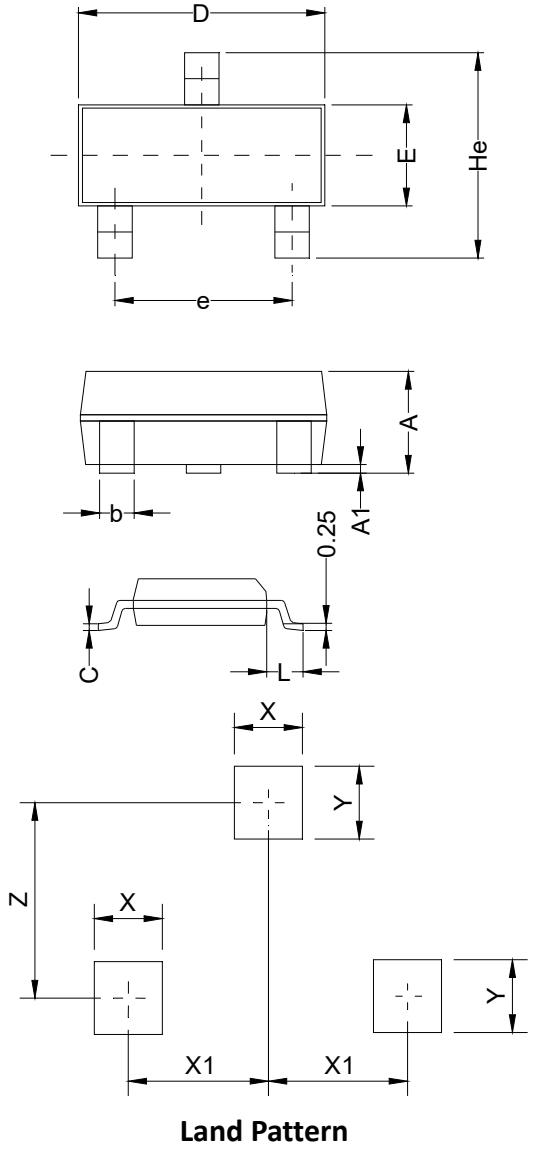


## SOLDERING PARAMETERS

| Reflow Condition | | Pb-Free assembly (see figure at right) |
|---|---|---|
| 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 (Liquidus Temp ($T_L$)to peak) | | 3℃/sec. Max |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate | | 3℃/sec. Max |
| Reflow | -Temperature($T_L$)(Liquidus) | +217℃ |
| | -Temperature($t_L$) | 60-150 secs. |
| Peak Temp ($T_p$) | | +260(+0/-5)℃ |
| Time within 5℃of actual Peak Temp ($t_p$) | | 20-40secs. |
| Ramp-down Rate | | 6℃/sec. Max |
| Time 25℃ to Peak Temp ($T_P$) | | 8 min. Max |
| Do not exceed | | +260℃ |



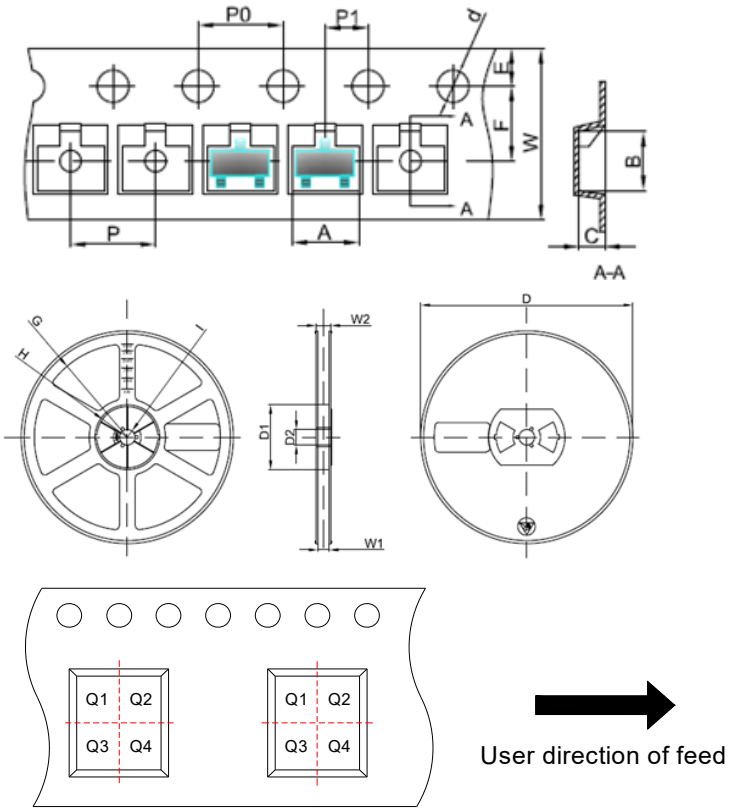
## PACKAGE MECHANICAL DATA




Land Pattern

| Symbol | Millimeters | | | Inches | | |
|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 0.90 | 1.063 | 1.15 | 0.035 | 0.042 | 0.045 |
| A1 | 0.00 | 0.075 | 0.14 | 0.000 | 0.003 | 0.006 |
| b | 0.30 | 0.40 | 0.50 | 0.012 | 0.016 | 0.020 |
| C | 0.07 | 0.10 | 0.15 | 0.003 | 0.004 | 0.006 |
| D | 2.80 | 2.90 | 3.00 | 0.110 | 0.114 | 0.118 |
| e | 1.80 | 1.90 | 2.00 | 0.071 | 0.075 | 0.079 |
| E | 1.20 | 1.30 | 1.40 | 0.047 | 0.051 | 0.055 |
| L | 0.55REF | | | 0.022REF | | |
| He | 2.25 | 2.40 | 2.55 | 0.089 | 0.094 | 0.100 |
| X | 0.80 | | | 0.031 | | |
| X1 | 0.95 | | | 0.037 | | |
| Y | 0.80 | | | 0.031 | | |
| Z | 2.02 | | | 0.080 | | |

## TAPE AND REEL SPECIFICATION-SOT-23




Pin 1 quadrant: Q3

Packaging Description:

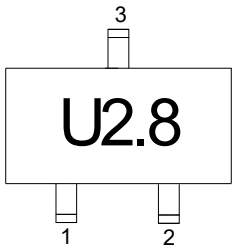
SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative(carbon filled) polycarbonate resin. The cover tape is a multilayer film(heat activated adhesive in nature)primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000units per 7" or 17.8cm diameter reel. The reels are clear in color and made of polystyrene plastic(anti-static coated).

| Symbol | Millimeters | Inches |
|---|---|---|
| | Typ. | Typ. |
| A | 3.15 | 0.124 |
| B | 2.77 | 0.109 |
| C | 1.22 | 0.048 |
| d | Φ1.50 | Φ0.059 |
| E | 1.75 | 0.069 |
| F | 3.50 | 0.138 |
| P0 | 4.00 | 0.157 |
| P | 4.00 | 0.157 |
| P1 | 2.00 | 0.079 |
| W | 8.00 | 0.315 |
| D | Φ178 | Φ7.008 |
| D1 | 54.40 | 2.142 |
| D2 | 13.00 | 0.512 |
| G | R78.00 | R3.071 |
| H | R25.60 | R1.008 |
| I | R6.50 | R0.256 |
| W1 | 9.50 | 0.374 |
| W2 | 12.30 | 0.484 |

## ORDERING INFORMATION

| PART No. | PACKAGE TYPE | QUANTITY(PCS) REEL | DESCIPTION |
|---|---|---|---|
| JEU2.8LVU | SOT-23 | 3,000 | 7 inch reel pack |

## MARKING CODE

| Part Number | Marking Code |
|---|---|
| JEU2.8LVU |  |



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