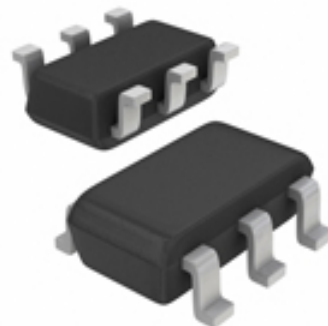


### Features

- Low Capacitance Diode Array for ESD Protection in Four Data Lines
- SOT23-6 package
- Low Capacitance (1.5 pf Between I/O-I/O Lines)
- Low leakage current
- Protection one data/power line to:
- IEC 61000-4-2  $\pm 8\text{kV}$  contact  $\pm 15\text{kV}$  air
- This is a Pb-Free Device



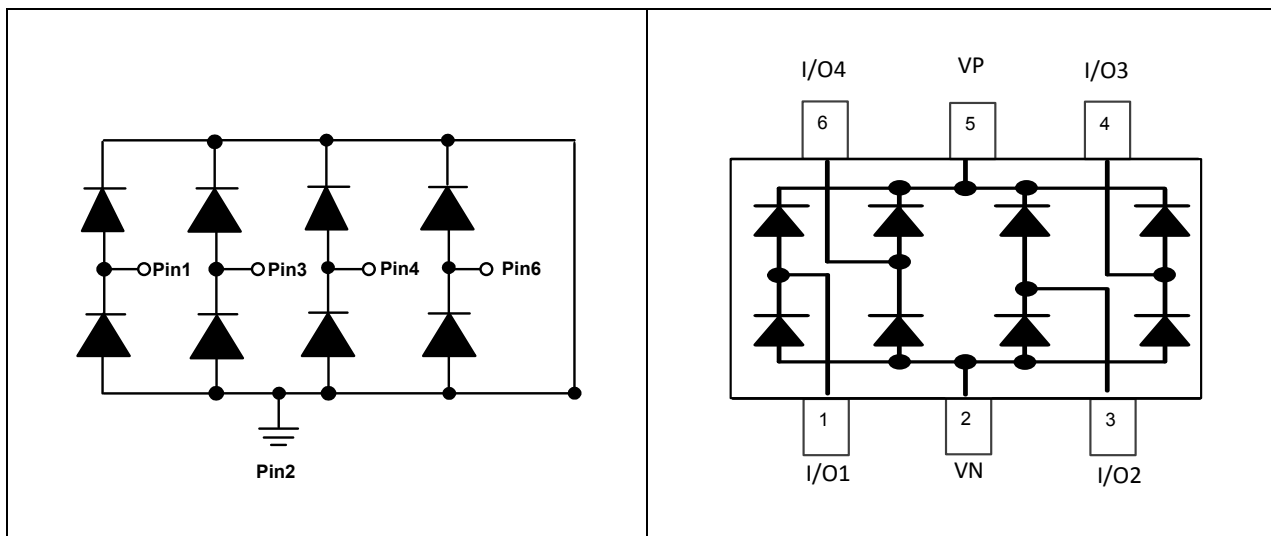
### Applications

- USB 1.1 and 2.0 Data Line Protection
- HDSL, IDSL Secondary IC Protection
- Video Line Protection
- Microcontroller Input Protection

### Mechanical Data

- SOT23-6 package
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

### Schematic & PIN Configuration



## MAXIMUM RATINGS (Each Diode) ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

| Rating                                                                                                      | Symbol      | Value             | Unit |
|-------------------------------------------------------------------------------------------------------------|-------------|-------------------|------|
| Reverse Voltage                                                                                             | $V_R$       | 70                | V    |
| Forward Current                                                                                             | $I_F$       | 200               | mA   |
| Peak Forward Surge Current                                                                                  | $I_{FM}$    | 500               | mA   |
| Repetitive Peak Reverse Voltage                                                                             | $V_{RRM}$   | 70                | V    |
| Average Rectified Forward Current (Note 1) (averaged over any 20 ms period)                                 | $I_{F(AV)}$ | 715               | mA   |
| Repetitive Peak Forward Current                                                                             | $I_{FRM}$   | 450               | mA   |
| Non-Repetitive Peak Forward Current<br>$t = 1.0 \mu\text{s}$<br>$t = 1.0 \text{ ms}$<br>$t = 1.0 \text{ S}$ | $I_{FSM}$   | 2.0<br>1.0<br>0.5 | A    |

## THERMAL CHARACTERISTICS

| Characteristic                                       | Symbol          | Max         | Unit               |
|------------------------------------------------------|-----------------|-------------|--------------------|
| Thermal Resistance, Junction-to-Ambient              | $R_{\theta JA}$ | 556         | $^\circ\text{C/W}$ |
| Lead Solder Temperature, Maximum 10 Seconds Duration | $T_L$           | 260         | $^\circ\text{C}$   |
| Junction Temperature                                 | $T_J$           | -40 to +150 | $^\circ\text{C}$   |
| Storage Temperature                                  | $T_{stg}$       | -55 to +150 | $^\circ\text{C}$   |

## ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ unless otherwise noted) (Each Diode)

| Characteristic                                                                                                                                                                    | Symbol     | Min              | Typ              | Max                        | Unit             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------|------------------|----------------------------|------------------|
| <b>OFF CHARACTERISTICS</b>                                                                                                                                                        |            |                  |                  |                            |                  |
| Reverse Breakdown Voltage<br>( $I_{BR} = 100 \mu\text{A}$ )                                                                                                                       | $V_{(BR)}$ | 70               | –                | –                          | V                |
| Reverse Voltage Leakage Current<br>( $V_R = 70 \text{ Vdc}$ )<br>( $V_R = 25 \text{ Vdc}$ , $T_J = 150^\circ\text{C}$ )<br>( $V_R = 70 \text{ Vdc}$ , $T_J = 150^\circ\text{C}$ ) | $I_R$      | –<br>–<br>–      | –<br>–<br>–      | 2.5<br>30<br>50            | $\mu\text{A}$    |
| Capacitance (between I/O pins)<br>( $V_R = 0 \text{ V}$ , $f = 1.0 \text{ MHz}$ )                                                                                                 | $C_D$      | –                | –                | 1.5                        | pF               |
| Capacitance (between I/O pin and ground)<br>( $V_R = 0 \text{ V}$ , $f = 1.0 \text{ MHz}$ )                                                                                       | $C_D$      | –                | –                | 3                          | pF               |
| Forward Voltage<br>( $I_F = 1.0 \text{ mAdc}$ )<br>( $I_F = 10 \text{ mAdc}$ )<br>( $I_F = 50 \text{ mAdc}$ )<br>( $I_F = 150 \text{ mAdc}$ )                                     | $V_F$      | –<br>–<br>–<br>– | –<br>–<br>–<br>– | 715<br>855<br>1000<br>1250 | $\text{mV}_{dc}$ |

## Typical Characteristic Curves

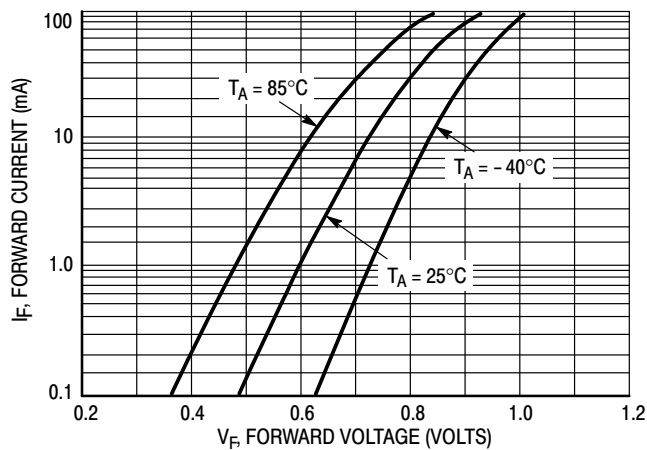


Figure 1. Forward Voltage

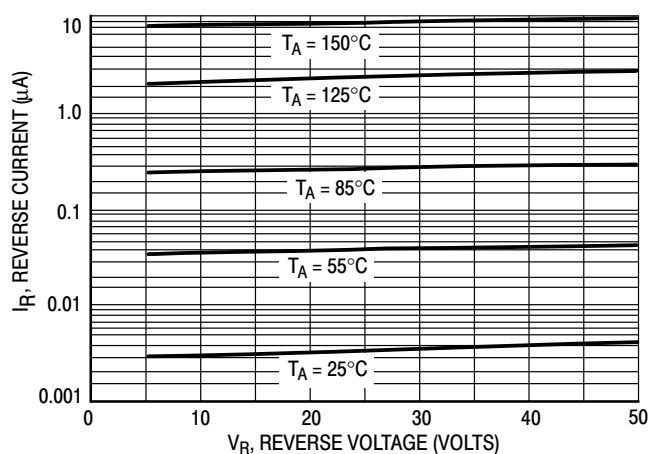


Figure 2. Leakage Current

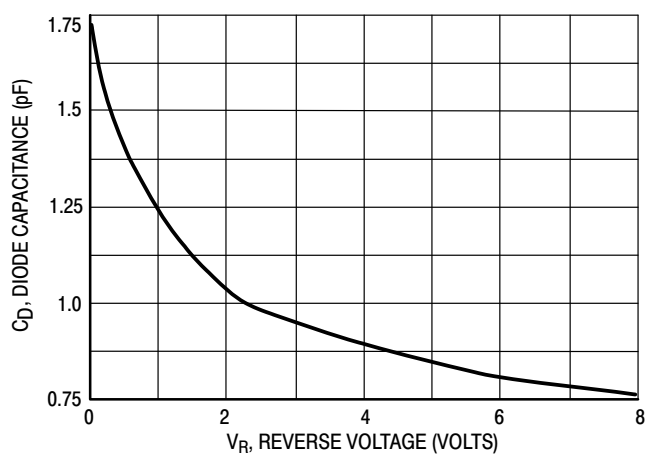
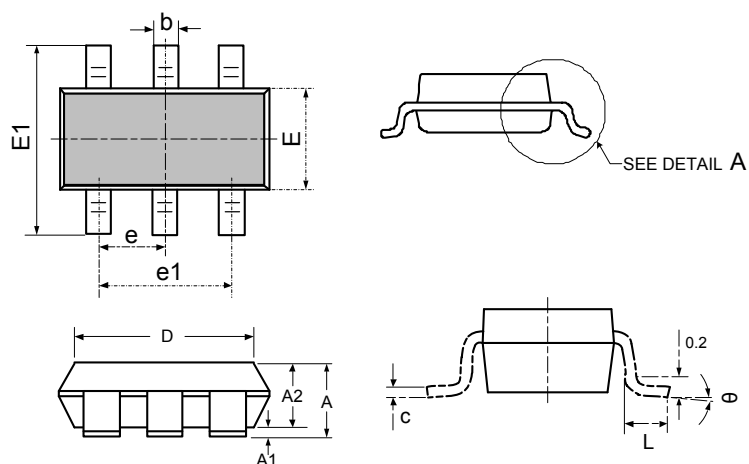


Figure 3. Capacitance

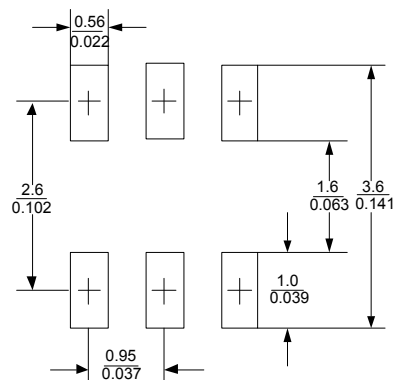
## Outline Drawing – SOT23-6



| SYMBOL   | DIMENSIONS |       |            |       |
|----------|------------|-------|------------|-------|
|          | INCHES     |       | MILLIMETER |       |
|          | MIN        | MAX   | MIN        | MAX   |
| A        | 0.041      | 0.049 | 1.050      | 1.250 |
| A1       | 0.000      | 0.004 | 0.000      | 0.100 |
| A2       | 0.041      | 0.045 | 1.050      | 1.150 |
| D        | 0.111      | 0.119 | 2.820      | 3.020 |
| E        | 0.059      | 0.067 | 1.500      | 1.700 |
| E1       | 0.104      | 0.116 | 2.650      | 2.950 |
| b        | 0.012      | 0.020 | 0.300      | 0.500 |
| e        | 0.037(BSC) |       | 0.950(BSC) |       |
| e1       | 0.071      | 0.079 | 1.800      | 2.000 |
| L        | 0.012      | 0.024 | 0.300      | 0.600 |
| $\theta$ | 0°         | 8°    | 0°         | 8°    |

### Notes

1. This land pattern is for reference purposes only consult your manufacturing group to ensure your company's manufacturing guidelines are met.



## Marking



## Ordering information

| Order code | Package | Base qty | Delivery mode |
|------------|---------|----------|---------------|
| NUP4301MR6 | SOT23-6 | 3k       | Tape and reel |

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