

NUP4301MR6T1

Low Capacitance Diode Array for ESD Protection in Four Data Lines

NUP4301MR6T1 is a MicroIntegration™ device designed to provide protection for sensitive components from possible harmful electrical transients; for example, ESD (electrostatic discharge).

Features

- Low Capacitance (1.5 pf Maximum Between I/O Lines)
- Single Package Integration Design
- Provides ESD Protection for JEDEC Standards JESD22
Machine Model = Class C
Human Body Model = Class 3B
- Protection for IEC61000-4-2 (Level 4)
8.0 kV (Contact)
15 kV (Air)
- Ensures Data Line Speed and Integrity
- Fewer Components and Less Board Space
- Direct the Transient to Either Positive Side or to the Ground

Applications

- USB 1.1 and 2.0 Data Line Protection
- T1/E1 Secondary IC Protection
- T3/E3 Secondary IC Protection
- HDSL, IDSL Secondary IC Protection
- Video Line Protection
- Microcontroller Input Protection
- Base Stations
- I²C Bus Protection

MAXIMUM RATINGS (Each Diode) (T_J = 25°C unless otherwise noted)

| Rating | Symbol | Value | Unit |
|--|------------------------|-------------------|------|
| Reverse Voltage | V _R | 70 | Vdc |
| Forward Current | I _F | 200 | mAdc |
| Peak Forward Surge Current | I _{FM(surge)} | 500 | mAdc |
| 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 t = 1.0 μs t = 1.0 ms t = 1.0 S | I _{FSM} | 2.0 1.0 0.5 | A |

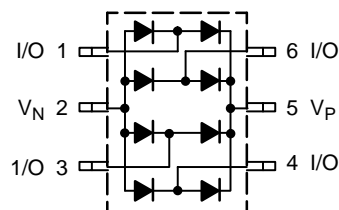
1. FR-5 = 1.0 × 0.75 × 0.062 in.



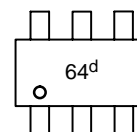
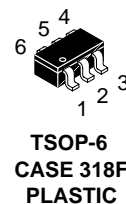
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<http://onsemi.com>

PIN CONFIGURATION AND SCHEMATIC



MARKING DIAGRAM



64 = Specific Device Code
d = Date Code

ORDERING INFORMATION

| Device | Package | Shipping |
|--------------|---------|------------------|
| NUP4301MR6T1 | TSOP-6 | 3000/Tape & Reel |

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THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--|-----------------|-------------|------|
| Thermal Resistance Junction-to-Ambient | $R_{\theta JA}$ | 556 | °C/W |
| Lead Solder Temperature Maximum 10 Seconds Duration | T_L | 260 | °C |
| Junction Temperature | T_J | -40 to +85 | °C |
| Storage Temperature | T_{stg} | -55 to +150 | °C |

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | |
|---|------------|------------------|------------------|----------------------------|------------------|
| Reverse Breakdown Voltage ($I_{(BR)} = 100 \mu\text{A}$) | $V_{(BR)}$ | 70 | - | - | Vdc |
| Reverse Voltage Leakage Current ($V_R = 70 \text{ Vdc}$) ($V_R = 25 \text{ Vdc}$, $T_J = 150^\circ\text{C}$) ($V_R = 70 \text{ Vdc}$, $T_J = 150^\circ\text{C}$) | I_R | - - - | - - - | 2.5 30 50 | μAdc |
| Capacitance (between I/O pins) ($V_R = 0 \text{ V}$, $f = 1.0 \text{ MHz}$) | C_D | - | 0.8 | 1.5 | pF |
| Capacitance (between I/O pin and ground) ($V_R = 0 \text{ V}$, $f = 1.0 \text{ MHz}$) | C_D | - | 1.6 | 3 | pF |
| Forward Voltage ($I_F = 1.0 \text{ mAdc}$) ($I_F = 10 \text{ mAdc}$) ($I_F = 50 \text{ mAdc}$) ($I_F = 150 \text{ mAdc}$) | V_F | - - - - | - - - - | 715 855 1000 1250 | mV_{dc} |

- FR-5 = $1.0 \times 0.75 \times 0.062 \text{ in.}$
- Alumina = $0.4 \times 0.3 \times 0.024 \text{ in.}$ 99.5% alumina.

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Curves Applicable to Each Cathode

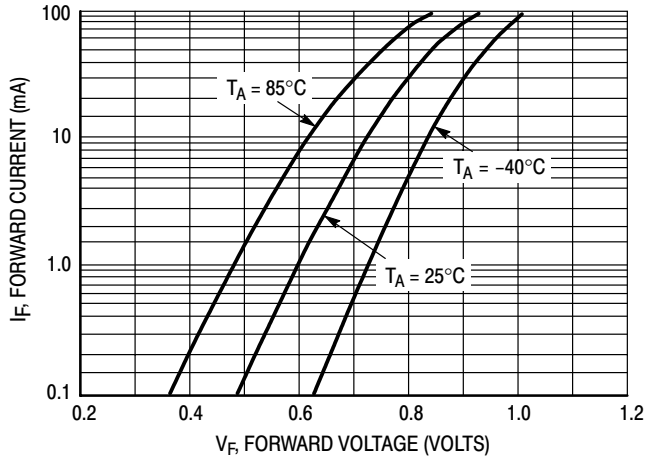


Figure 1. Forward Voltage

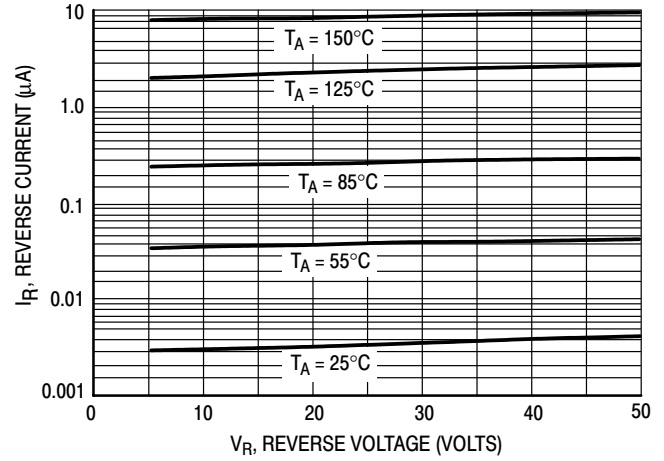


Figure 2. Leakage Current

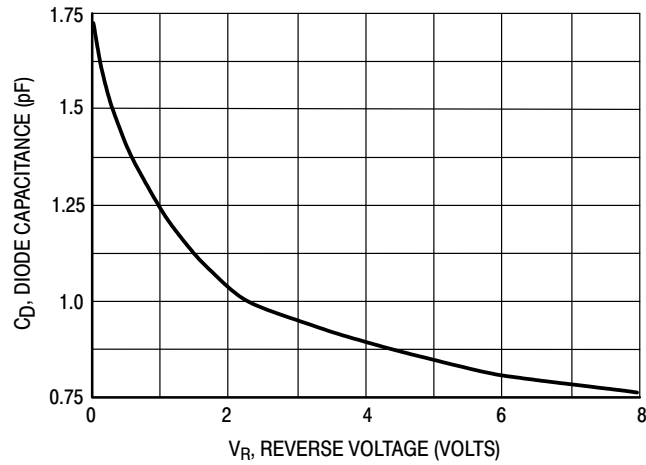
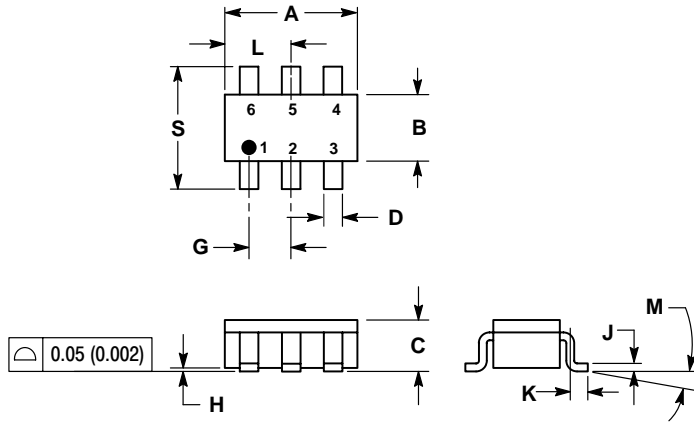


Figure 3. Capacitance

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PACKAGE DIMENSIONS

TSOP-6
CASE 318F-04
ISSUE J




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318F-01, -02, -03 OBSOLETE. NEW STANDARD 318F-04.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|--------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.1142 | 0.1220 | 2.90 | 3.10 |
| B | 0.0512 | 0.0669 | 1.30 | 1.70 |
| C | 0.0354 | 0.0433 | 0.90 | 1.10 |
| D | 0.0098 | 0.0197 | 0.25 | 0.50 |
| E | 0.0335 | 0.0413 | 0.85 | 1.05 |
| F | 0.0005 | 0.0040 | 0.013 | 0.100 |
| G | 0.0040 | 0.0102 | 0.10 | 0.26 |
| H | 0.0079 | 0.0236 | 0.20 | 0.60 |
| I | 0.0493 | 0.0649 | 1.25 | 1.65 |
| J | 0° | 10° | 0° | 10° |
| K | 0.0985 | 0.1181 | 2.50 | 3.00 |

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