# NUP2301MW6T1

*Advance Information*

# Low Capacitance Diode Array for ESD Protection in Two Data Lines

NUP2301MW6T1 is a MicroIntegration™ device designed to provide protection for sensitive components from possible harmful electrical transients; for example, ESD (electrostatic discharge).

### Features

- Low Capacitance (5 pf Maximum)
- 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

- T1/E1 Secondary IC Protection
- T3/E3 Secondary IC Protection
- HDSL, IDSL Secondary IC Protection
- Video Line Protection
- Microcontroller Input Protection
- Base Stations
- $I^2C$ Bus Protection

**MAXIMUM RATINGS** (Each Diode)

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Reverse Voltage | $V_R$ | 70 | Vdc |
| Forward Current | $I_F$ | 215 | 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<br>t = 1.0 μs<br>t = 1.0 ms<br>t = 1.0 S | $I_{FSM}$ | <br>2.0<br>1.0<br>0.5 | A |

1. FR-5 = 1.0 × 0.75 × 0.062 in.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

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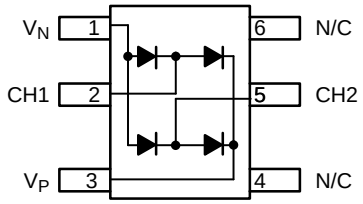
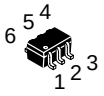
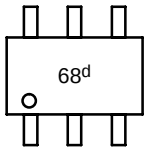
**PIN CONFIGURATION AND SCHEMATIC**




**SC-88**
**CASE 419B**
**STYLE 23**

**MARKING DIAGRAM**




68 = Specific Device Code
d = Date Code
O = Pin 1 Indicator

**ORDERING INFORMATION**

| Device | Package | Shipping |
|---|---|---|
| NUP2301MW6T1 | SC-88 | 3000 Tape & Reel |

## THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Total Device Dissipation<br>FR-5 Board, (Note 2) $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | <br>200<br>1.6 | mW<br><br>mW/°C |
| Thermal Resistance Junction-to-Ambient | $R_{\theta JA}$ | 625 | °C/W |
| Total Device Dissipation<br>Alumina Substrate, (Note 3) $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | <br>300<br>24 | mW<br><br>mW/°C |
| Thermal Resistance Junction-to-Ambient | $R_{\theta JA}$ | 417 | °C/W |
| Junction and Storage Temperature | $T_J$, $T_{stg}$ | -65 to +150 | °C |

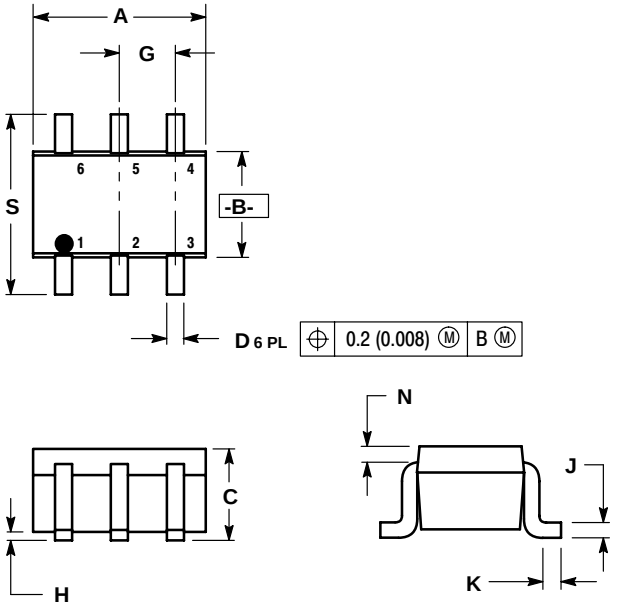
## ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C unless otherwise noted) (Each Diode)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Reverse Breakdown Voltage ($I_{(BR)}$ = 100 μA) | $V_{(BR)}$ | 70 | - | - | Vdc |
| Reverse Voltage Leakage Current ($V_R$ = 70 Vdc)<br>($V_R$ = 25 Vdc, $T_J$ = 150°C)<br>($V_R$ = 70 Vdc, $T_J$ = 150°C) | $I_R$ | -<br>-<br>- | -<br>-<br>- | 2.5<br>30<br>50 | μAdc |
| Diode Capacitance<br>($V_R$ = 0, f = 1.0 MHz) | $C_D$ | - | TBD | 5 | pF |
| Forward Voltage ($I_F$ = 1.0 mAdc)<br>($I_F$ = 10 mAdc)<br>($I_F$ = 50 mAdc)<br>($I_F$ = 150 mAdc) | $V_F$ | -<br>-<br>-<br>- | -<br>-<br>-<br>- | 715<br>855<br>1000<br>1250 | $mV_{dc}$ |

2. FR-5 = 1.0 × 0.75 × 0.062 in.
3. Alumina = 0.4 × 0.3 × 0.024 in. 99.5% alumina.

## PACKAGE DIMENSIONS

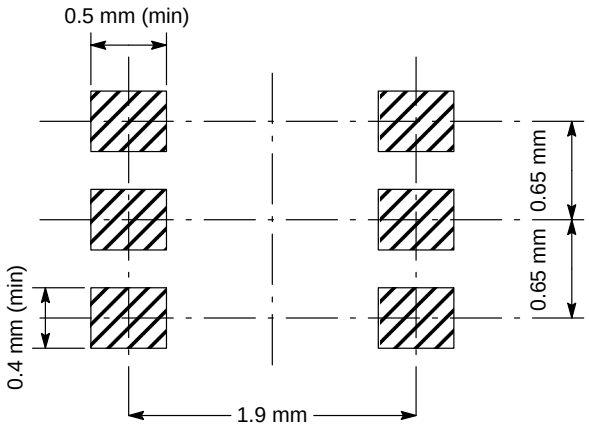
**TSOP-6**
CASE 419B-02
ISSUE N




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B-01 OBSOLETE, NEW STANDARD 419B-02.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.071 | 0.087 | 1.80 | 2.20 |
| B | 0.045 | 0.053 | 1.15 | 1.35 |
| C | 0.031 | 0.043 | 0.80 | 1.10 |
| D | 0.004 | 0.012 | 0.10 | 0.30 |
| G | 0.026 BSC | | 0.65 BSC | |
| H | --- | 0.004 | --- | 0.10 |
| J | 0.004 | 0.010 | 0.10 | 0.25 |
| K | 0.004 | 0.012 | 0.10 | 0.30 |
| N | 0.008 REF | | 0.20 REF | |
| S | 0.079 | 0.087 | 2.00 | 2.20 |

STYLE 23:
PIN 1. Vn
2. CH1
3. Vp
4. N/C
5. CH2
6. N/C



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