The NUP1105LT1G-JSM has been designed to protect the CAN transceiver in high–speed and fault to lerant networks from ESD and other harmful transient voltage events. This device provides bidirectional protection for each data line with a single compact SOT–23 package,giving the system designer a low cost option for improving system reliability and meeting stringent EMI requirements.

## Features

350W Peak Power Dissipation per Line (8x20μ see Waveform)

- ◆Low Reverse Leakage Curren t(<100nA)
- ◆Low Capacitance High-Speed CAN Data Rates
- ◆IEC Compatibilty -EC 61000-4-2(ESD)Level 4
  -IEC61000-4-4(EFT):40A-5/50 ns
  -IEC61000-4-5(Lighting)8.0A(8/20us)
- ◆IS07637-1.Nonrepetitive EMI Surge Pulse 2,9.5A (1x50μs)
  ISO 7637-3.Repetitive Electrical Fast Transient(EFT) EMI Surge Pulses,50A(5x50 ns)
- ◆Flammability Rating UL94V-0
- ◆Pb-Free Packages ae Available

SOT-23

## Applications

- ◆ Industrial Control Networks
- ◆ Smart Distribution Systems(SDS™)
- ◆ DeviceNet™
- ◆ Automotive Networks
- ◆ Low and High-Speed CAN
- ◆ Fault Tolerant CAN


## Maximum Ratings (TJ=25℃,unless otherwise specified)

| Symbol | Rating | Value | Unit |
|---|---|---|---|
| PPK | Peak Power Dissipation<br>8 x 20 μs Double Exponential Waveform (Note 1) | 350 | W |
| $T_J$ | Operating Junction Temperature Range | −40 to 125 | °C |
| $T_J$ | Storage Temperature Range | −55 to 150 | °C |
| $T_L$ | Lead Solder Temperature (10 s) | 260 | °C |
| ESD | Human Body model (HBM)<br>Machine Model (MM)<br>IEC 61000−4−2 Specification (Contact) | 16<br>400<br>30 | kV<br>V<br>kV |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1.Non−repetitive current pulse per Figure1.

## Electrical characteristics

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{RWM}$ | Reverse Working Voltage | (Note 2) | 24 | | | V |
| $V_{BR}$ | Breakdown Voltage | $I_T$ = 1 mA (Note 3) | 26.2 | | 32 | V |
| $I_R$ | Reverse Leakage Current | $V_{RWM}$ = 24 V | | 15 | 100 | nA |
| $V_C$ | Clamping Voltage | $I_{PP}$ = 5 A (8 x 20 μs Waveform) (Note 4) | | | 40 | V |
| $V_C$ | Clamping Voltage | $I_{PP}$ = 8 A (8 x 20 μs Waveform) (Note 4) | | | 44 | V |
| $I_{PP}$ | Maximum Peak Pulse Current | 8 x 20 μs Waveform (Note 4) | | | 8.0 | A |
| CJ | Capacitance | $V_R$ = 0 V, f = 1 MHz (Line to GND) | | | 30 | pF |

2.TVS devices are normally selected according to the working peak reverse voltage ($V_{RWM}$), which should be equa or greater than the DC or continuous peak operating voltage level.
3.VBR is measured at pulse tes tcurrent IT.
4.Pulse waveform per Figure1.

## Typical performance curves

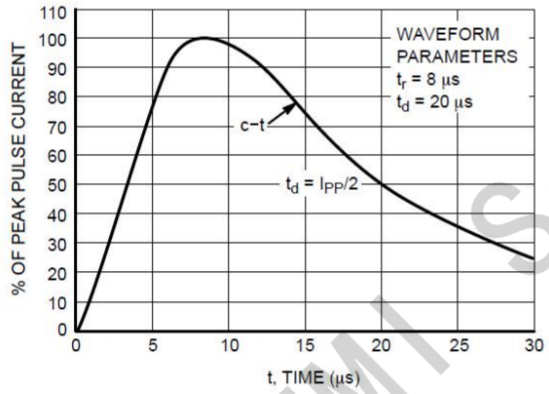



Figure 1. Pulse Waveform, 8 × 20 μs

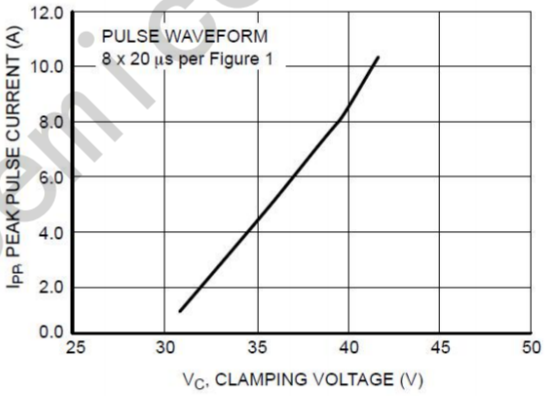



Figure 2. Clamping Voltage vs Peak Pulse Current

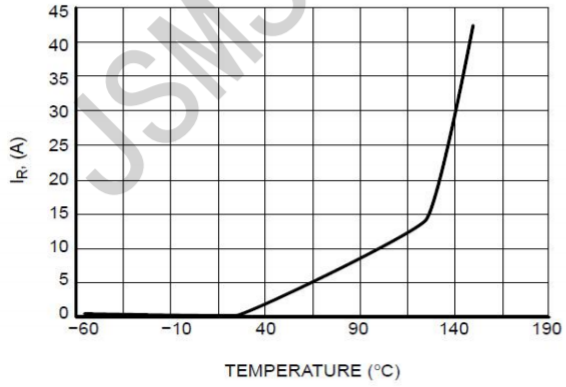



Figure 3. Typical Leakage vs. Temperature

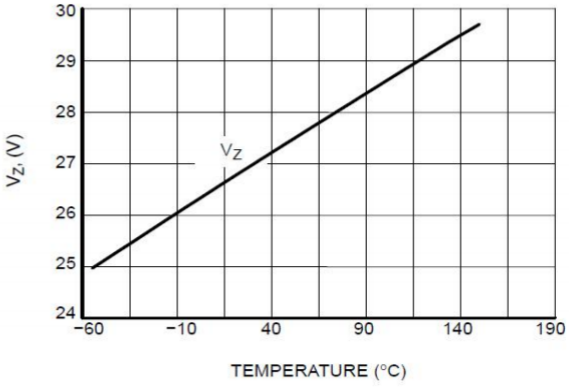



Figure 4. Typical $V_Z$ @ 1.0 mA vs. Temperature

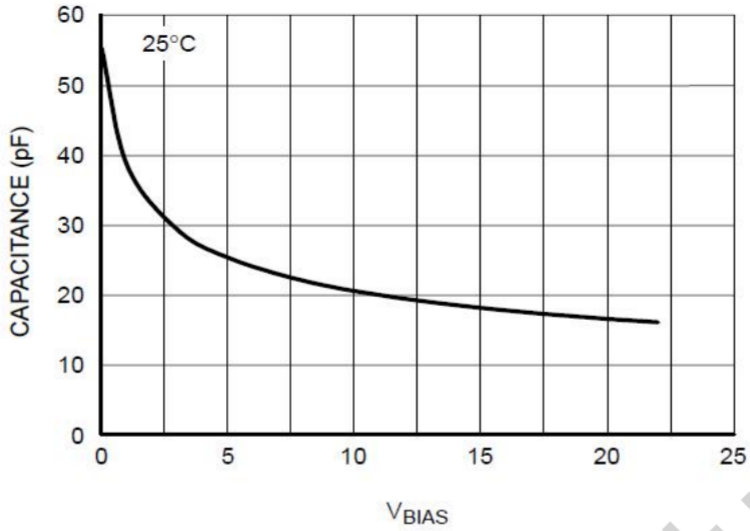



**Figure 5. Capacitance vs. $V_{BIAS}$**

## TVS Diode Protection Circuit

The NUP1105LT1G-JSM provides a transient voltage suppression solution for the LIN data communication bus. The NUP1105LT1G-JSM is a dual bidirectional TVS device in a compact SOT-23 package.This device is based on Zener technology that optimizes the active area of a PN junction to provide robust protection against transient EMI surge voltage and ESD.The NUP1105LT1G-JSM has been tested to EMI and ESD Levels that exceed the specifications of popular high speed LIN netvorks.

The NUP1105LT1G-JSM device can be used to provide transcient voltage suppression for a single data line CAN system.Figure 7 provides an example of a single data line CAN protection circuit.

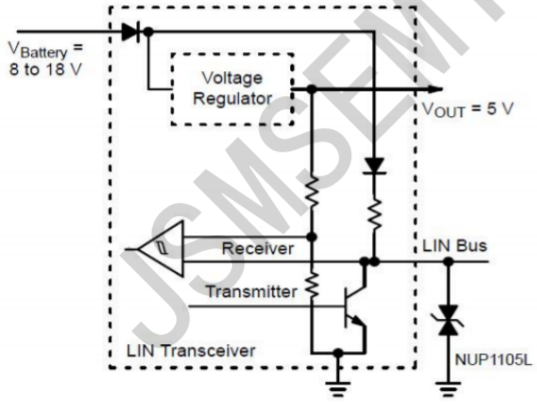



**Figure 6. LIN Transceiver**

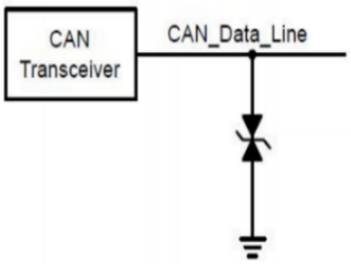
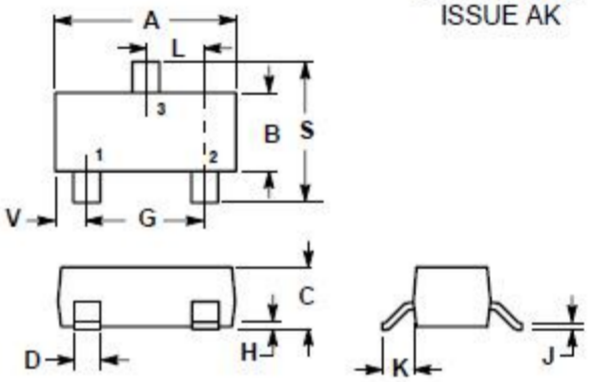



**Figure 7. High−Speed and Fault Tolerant CAN TVS Protection Circuit**

## Package Dimensions

**SOT−23 (TO−236)**
CASE 318−08
ISSUE AK




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. 318−01 THRU −07 AND −09 OBSOLETE, NEW STANDARD 318−08.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.1102 | 0.1197 | 2.80 | 3.04 |
| B | 0.0472 | 0.0551 | 1.20 | 1.40 |
| C | 0.0350 | 0.0440 | 0.89 | 1.11 |
| D | 0.0150 | 0.0200 | 0.37 | 0.50 |
| G | 0.0701 | 0.0807 | 1.78 | 2.04 |
| H | 0.0005 | 0.0040 | 0.013 | 0.100 |
| J | 0.0034 | 0.0070 | 0.085 | 0.177 |
| K | 0.0140 | 0.0285 | 0.35 | 0.69 |
| L | 0.0350 | 0.0401 | 0.89 | 1.02 |
| S | 0.0830 | 0.1039 | 2.10 | 2.64 |
| V | 0.0177 | 0.0236 | 0.45 | 0.60 |

STYLE 27:
PIN 1. CATHODE
2. CATHODE
3. CATHODE