

OM SENI

NUP2105LT1G Dual Line CAN Bus Protector

The SZ/NUP2105L has been designed to protect the CAN transceiver in high-speed and fault tolerant 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

- 350 W Peak Power Dissipation per Line (8 x 20 μ sec Waveform)
- Low Reverse Leakage Current (< 100 nA)
- Low Capacitance High-Speed CAN Data Rates
- IEC Compatibility:
 - IEC 61000-4-2 (ESD): Level 4
 - IEC 61000-4-4 (EFT): 40 A – 5/50 ns
 - IEC 61000-4-5 (Lighting) 8.0 A (8/20 μ s)
- ISO 7637-1, Nonrepetitive EMI Surge Pulse 2, 9.5 A (1 x 50 μ s)
- ISO 7637-3, Repetitive Electrical Fast Transient (EFT) EMI Surge Pulses, 50 A (5 x 50 ns)
- SZ Prefix for Automotive and Other Applications Requiring Unique

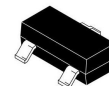
Site and Control Change Requirements

- Pb-Free Packages are Available*

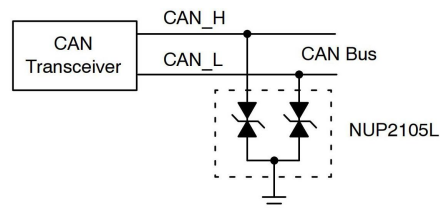
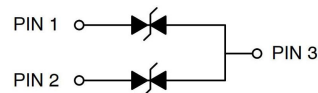
Applications

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

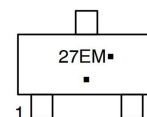
SOT-23 DUAL BIDIRECTIONAL VOLTAGE SUPPRESSOR 350 W PEAK POWER



SOT-23



MARKING DIAGRAM



27E = Device Code
M = Date Code
▪ = Pb-Free Package

(Note: Microdot may be in either location)

OM SENI

NUP2105LT1G

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Rating	Value	Unit
PPK	Peak Power Dissipation 8 x 20 μs Double Exponential Waveform (Note 1)	350	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_L	Lead Solder Temperature (10 s)	260	$^\circ\text{C}$
ESD	Human Body model (HBM) Machine Model (MM) IEC 61000-4-2 Specification (Contact)	16 400 30	kV V 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 Figure 1.

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

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

2. TVS devices are normally selected according to the working peak reverse voltage (V_{RWM}), which should be equal or greater than the DC or continuous peak operating voltage level.

3. V_{BR} is measured at pulse test current I_T .

4. Pulse waveform per Figure 1.

OM SENI

NUP2105LT1G

TYPICAL PERFORMANCE CURVES

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

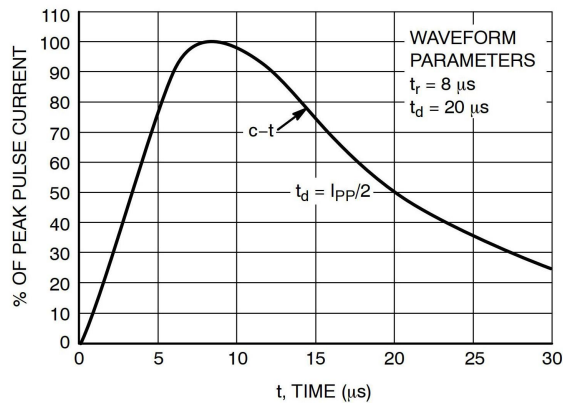


Figure 1. Pulse Waveform, $8 \times 20 \mu\text{s}$

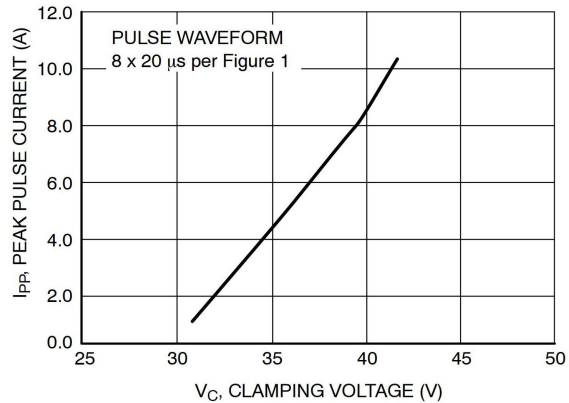


Figure 2. Clamping Voltage vs Peak Pulse Current

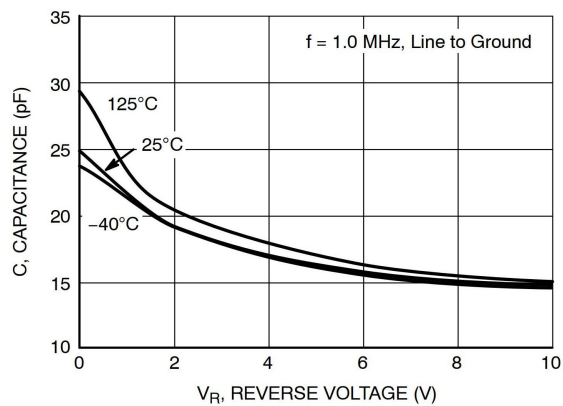


Figure 3. Typical Junction Capacitance vs Reverse Voltage

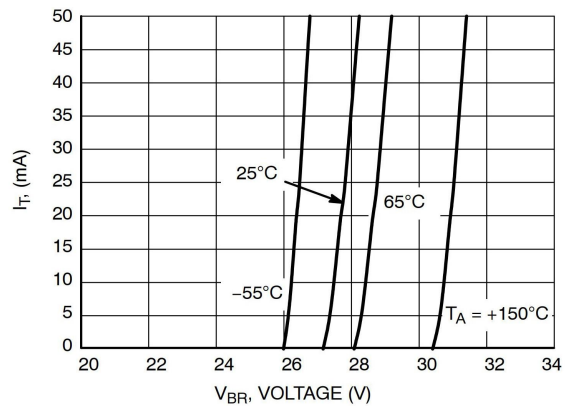


Figure 4. V_{BR} versus I_T Characteristics

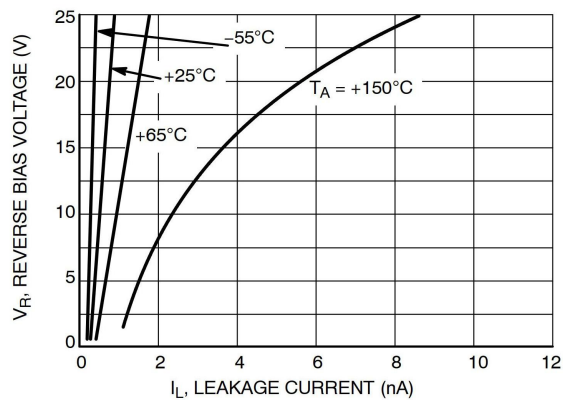


Figure 5. I_R versus Temperature Characteristics

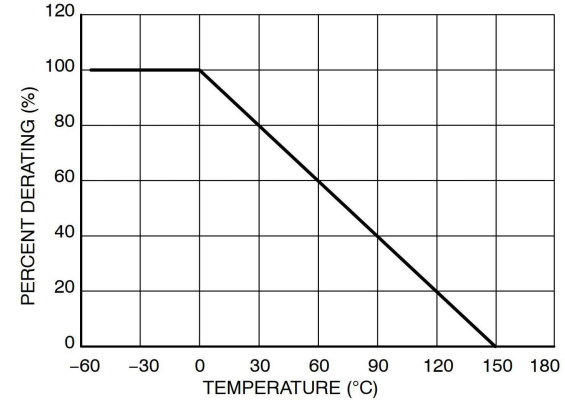


Figure 6. Temperature Power Dissipation Derating

OM SENI

Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-23	R1	0.008	3000	30000	240000	7"

Package Outline Dimensions (SOT-23)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.15	0.035	0.045
A1	-	0.10	-	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.80	2.00	0.071	0.079
L	0.550REF		0.022REF	
L1	0.30	0.50	0.012	0.020
θ	-	8°	-	8°

Suggested Pad Layout

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
J	0.75	0.85	0.030	0.033
K	0.85	0.95	0.033	0.037
M	1.95	2.05	0.077	0.081
N	1.85	1.95	0.073	0.077