NUP2105

Dual Line CAN Bus Protector

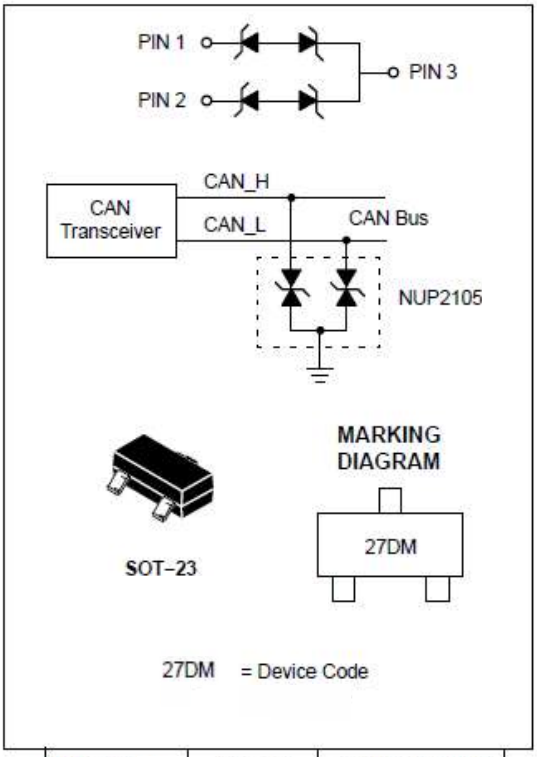
The NUP2105 has been designed to protect the CAN transceiver in high−speed and fault tolerant networks from ESD and other harmful transient voltage events. This device provides bidirectional protection for each data line with a single compact SOT−23 package, giving the system designer a low cost option for improving system reliability and meeting stringent EMI requirements.

FEATURES

'8 x 20 µsec Waveform)
)
ı Rates
D): Level 4
FT): 40 A – 5/50 ns
ighting) 8.0 A (8/20 µs)
ılse 2, 9.5 A

'ansient (EFT)

APPLICATIONS



NUP2105	SOT−23 (Pb−Free)	3000/Tape & Reel

Maximum Ratings (TJ=25℃ Unless Otherwise Specified)

Symbol		Value	Unit
PPK	Peak Power Dissipation 8 x 20 μs Double Exponential Wavefc	350	W
T_J	Operating Junction Temperature Ran	−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) Machine Model (MM) IEC 61000−4−2 Specification (Conta	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

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 (I ine to GND)			30	pF

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

3. VBR is measured at pulse test current IT.

4. Pulse waveform per Figure 1.

TYPICAL PERFORMANCE CURVES

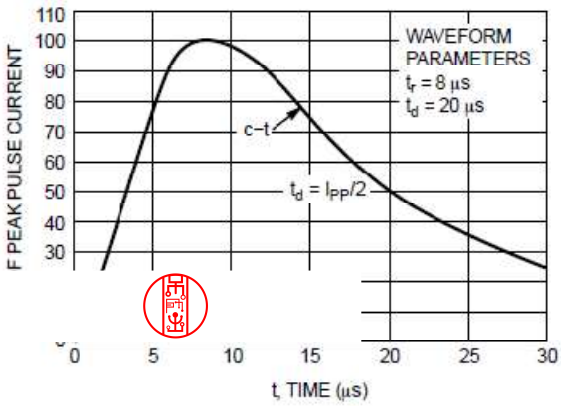


Figure 1. Pulse Waveform, 8 × 20 μs

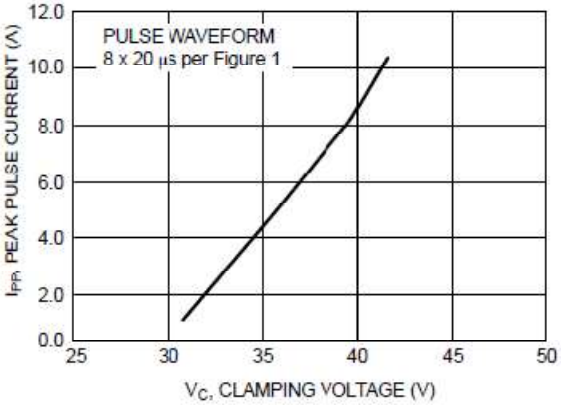


Figure 2. Clamping Voltage vs Peak Pulse Current

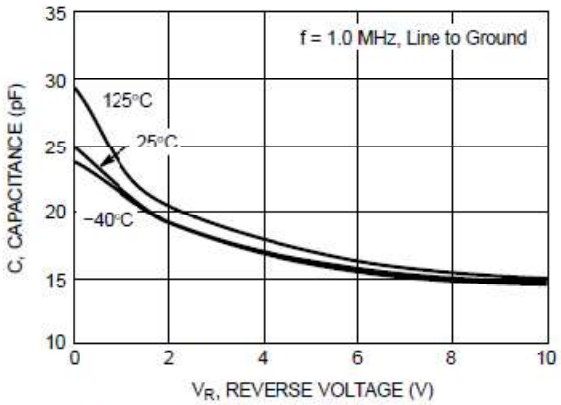


Figure 3. Typical Junction Capacitance vs Reverse Voltage

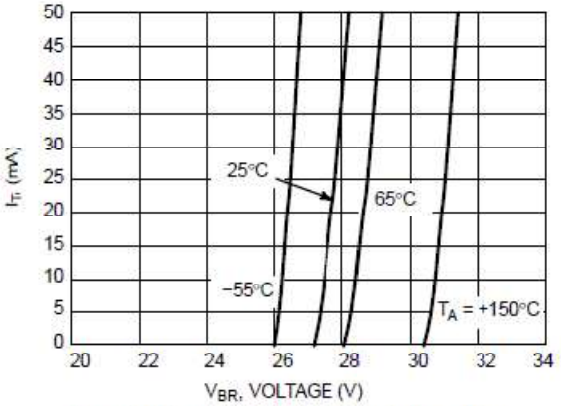


Figure 4. V_{BR} versus I_T Characteristics of the NUP2105

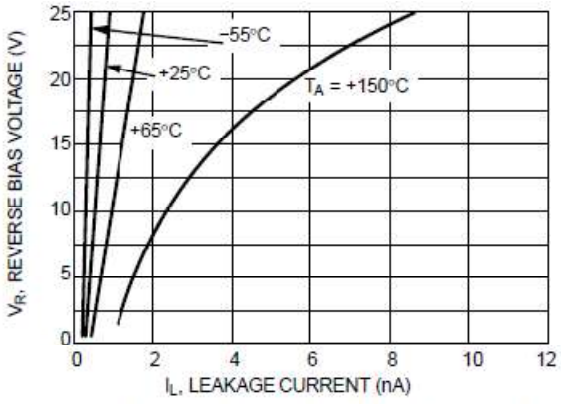


Figure 5. I_R versus Temperature Characteristics of the NUP2105

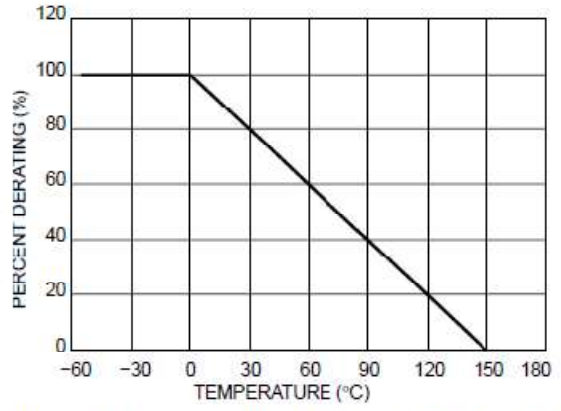


Figure 6. Temperature Power Dissipation Derating of

TVS Diode Protection Circuit

nsceiver by
diodes have
above their
its junction
f a transient
esigned and

bidirectional
ion with the
ay is created
ne clamping
e breakdown

voltage of the diode that is reversed biased, plus the diode drop of the second diode that is forwarded biased.

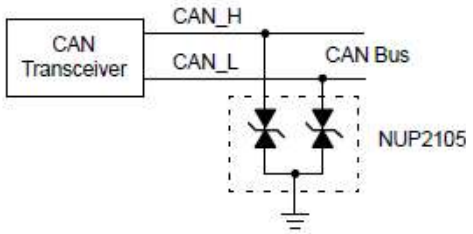
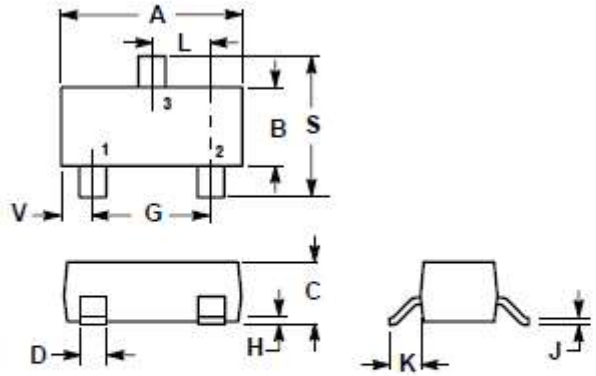


Figure 7. High−Speed and Fault Tolerant CAN TVS Protection Circuit

PACKAGE DIMENSIONS

SOT−23



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