

OM SENI

NUP2115LT1G ESD Protection Diode

Low Capacitance ESD Protection for High Speed Data

The SZ/NUP2115L has been designed to protect the FlexRay transceiver 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.

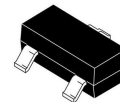
Features

- 200 W Peak Power Dissipation per Line (8/20 μ s Waveform)
- Diode Capacitance Matching
- Low Reverse Leakage Current (< 100 nA)
- Low Capacitance High-Speed FlexRay Data Rates
- IEC Compatibility:
 - IEC 61000-4-2 (ESD): Level 4
 - IEC 61000-4-4 (EFT): 50 A – 5/50 ns
 - IEC 61000-4-5 (Lighting) 3.0 A (8/20 μ s)
- ISO 7637-1, Nonrepetitive EMI Surge Pulse 2, 8.0 A (1/50 μ s)
- ISO 7637-3, Repetitive Electrical Fast Transient (EFT) EMI Surge Pulses, 50 A (5/50 ns)
- These are Pb-Free Devices

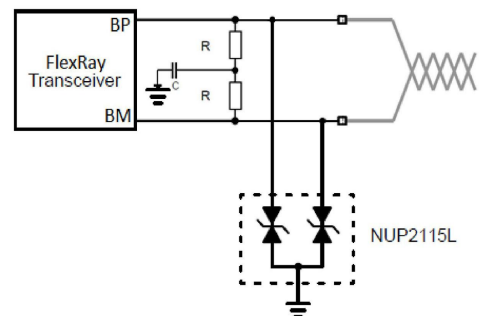
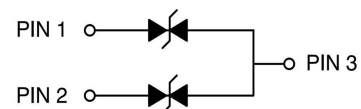
Applications

- Automotive Networks
 - ♦ FlexRay Bus

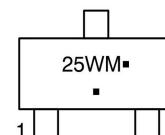
SOT-23 DUAL BIDIRECTIONAL VOLTAGE SUPPRESSOR 200 W PEAK POWER



SOT-23



MARKING DIAGRAM



25W = Device Code
M = Date Code
▪ = Pb-Free Package

(Note: Microdot may be in either location)

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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)	200	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)	8.0 400 30	kV V kV

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, 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	$I_{PP} = 1\text{ A}$ (8/20 μs Waveform) (Note 4)	–	33.4	36.6	V
V_C	Clamping Voltage	$I_{PP} = 3\text{ A}$ (8/20 μs Waveform) (Note 4)	–	44	50	V
I_{PP}	Maximum Peak Pulse Current	8/20 μs Waveform (Note 4)	–	–	3.0	A
C_J	Capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$ (Line to GND)	–	–	10	pF
ΔC	Diode Capacitance Matching	$V_R = 0\text{ V}$, 5 MHz (Note 5)	–	0.1	2	%

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

- Surge protection 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.
- V_{BR} is measured at pulse test current I_T .
- Pulse waveform per Figure 1.
- ΔC is the percentage difference between C_J of lines 1 and 2 measured according to the test conditions given in the electrical characteristics table.

ORDERING INFORMATION

Device	Package	Shipping [†]
NUP2115LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel
SZNUP2115LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel
NUP2115LT3G	SOT-23 (Pb-Free)	10,000 / Tape & Reel
SZNUP2115LT3G	SOT-23 (Pb-Free)	10,000 / Tape & Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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TYPICAL PERFORMANCE CURVES

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

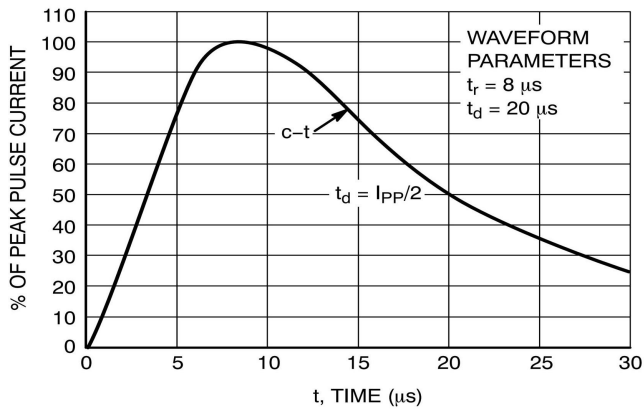


Figure 1. Pulse Waveform, $8 \times 20 \mu\text{s}$

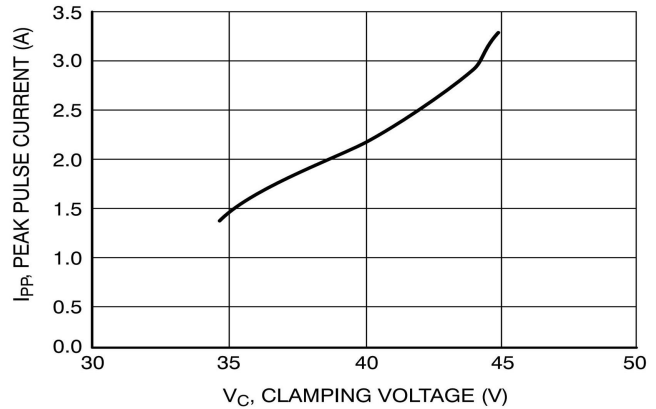


Figure 2. Clamping Voltage vs Peak Pulse Current

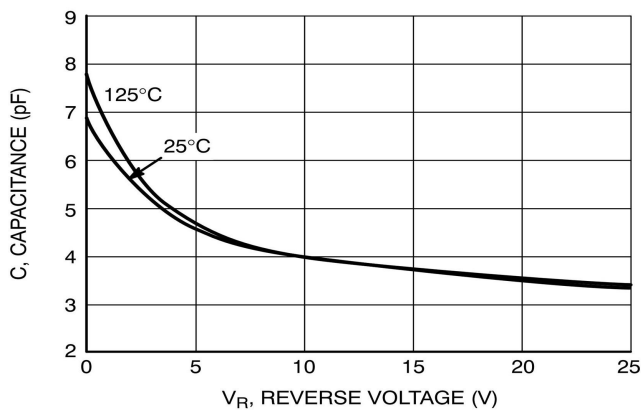


Figure 3. Typical Junction Capacitance vs Reverse Voltage

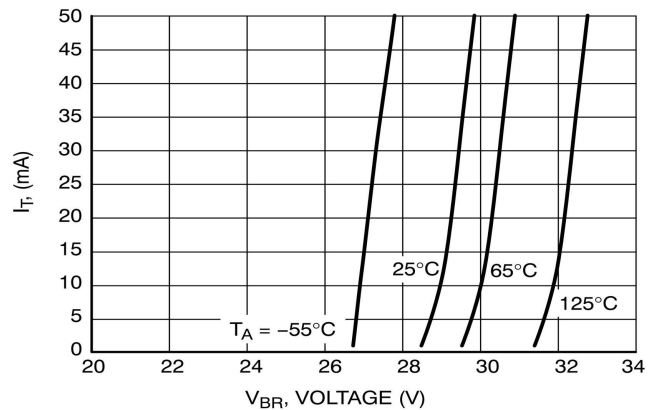


Figure 4. V_{BR} versus I_T Characteristics

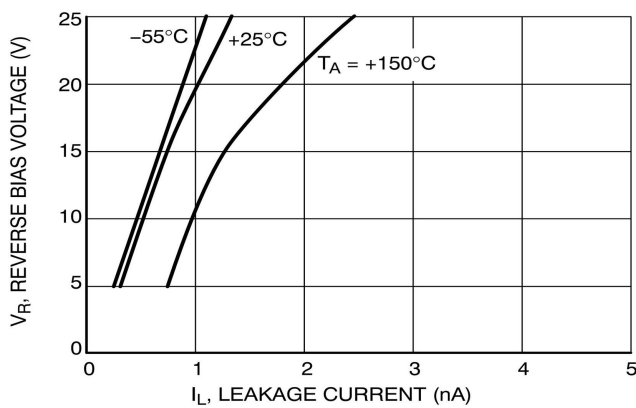


Figure 5. I_R versus Temperature Characteristics

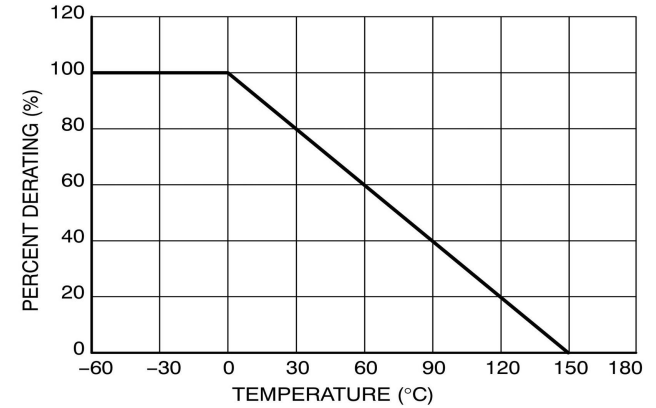


Figure 6. Temperature Power Dissipation Derating

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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