RoHS
Available on commercial versions

Silicon MELF 500 mW Zener Diodes

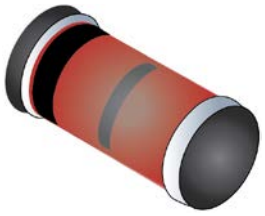
Qualified per MIL-PRF-19500/127

Qualified Levels:
JAN, JANTX, and JANTXV

DESCRIPTION

This popular series of 500 mW Zener voltage regulators provides a selection from 2.4 to 12 volts in a standard 5% tolerance as well as available tighter 2% and 1% tolerances. These glass, surface mount DO-213AA Zeners feature an internal metallurgical bond and are military qualified to the JAN, JANTX, and JANTXV level. A RoHS compliant commercial grade only version is also available.

Important: For the latest information, visit our website http://www.microsemi.com.



DO-213AA MELF Package

Also available in:

DO-35 (DO-204AH) package
(axial-leaded)
1N746A-1 – 1N759A-1 and 1N4370A-1 – 1N4372A-1

FEATURES

- JEDEC registered 1N746 through 1N759A and 1N4370 through 1N4372A series.
- Standard voltage tolerance is ± 5% with optional tighter tolerances of ± 2% or 1%.
- Internal metallurgical bond.
- JAN, JANTX, and JANTXV qualifications are available per MIL-PRF-19500/127.
  (See part nomenclature for all available options.)
- RoHS compliant versions available (commercial grade only).
- These commercial surface mount equivalents were also previously identified with a CDLL or MLL prefix instead of the "1N" prefix.

APPLICATIONS / BENEFITS

- Regulates voltage over a broad range of temperature and current.
- Regulated voltage range from 2.4 to 12 V.
- Small size for high density mounting using the surface mount method (see package illustration).
- Non-sensitive to ESD per MIL-STD-750 method 1020.
- Minimal capacitance.
- Inherently radiation hard as described in Microsemi MicroNote 050.

MAXIMUM RATINGS

Parameters/Test Conditions	Symbol	Value	Unit
Operating and Storage Temperature	T_J and T_{STG}	-65 to +175	ºC
Thermal Resistance Junction-to-End Cap	$R_{\Theta JEC}$	100	ºC/W
Thermal Resistance Junction-to-Ambient when mounted on PCB (1)	$R_{\Theta JA}$	300	ºC/W
Average Rated Power Dissipation @ T_{EC} = +125°C (2) @ T_A = 55°C mounted on PCB	$P_{M(AV)}$	0.5 0.4	W
Forward Voltage @ I_F = 200 mA	V_F	1.1	V
Solder Temperature @ 10 s		260	°C

NOTES:
1. See Figure 1 for derating curves. T_A = +75 °C on an FR4 PC board with 1 oz copper metalization.
2. The 0.5 W linearly derates starting at T_{EC} = 125 °C and goes to zero at 175 °C. For ambient T_A condition on a typical PC board, it linearly derates from 400 mW starting at 55 °C and goes to zero at 175 °C (see Figure2).

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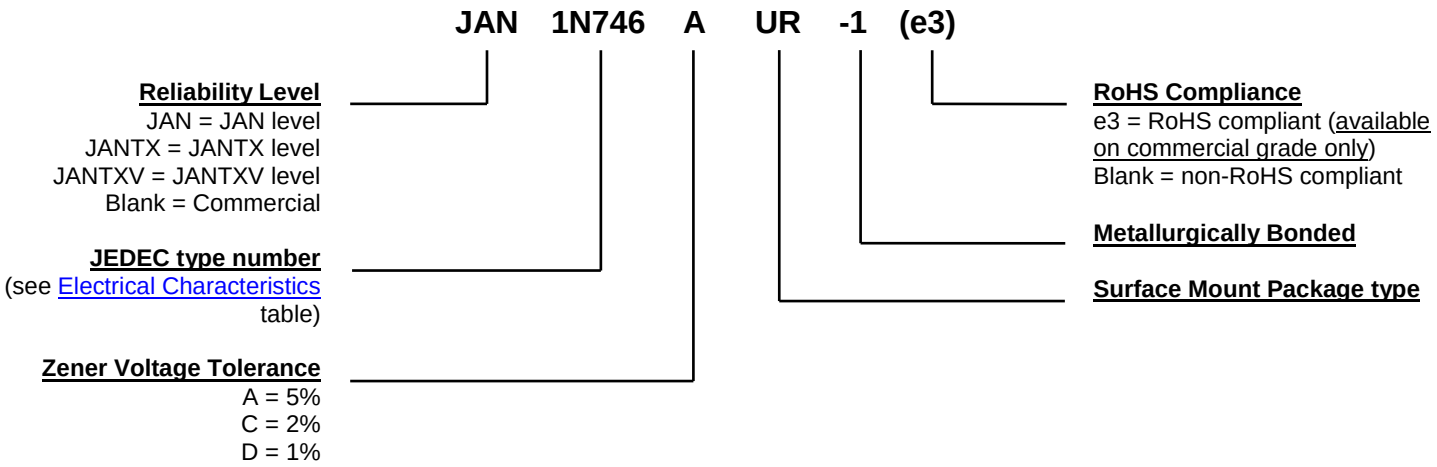
MECHANICAL and PACKAGING

- CASE: Hermetically sealed glass case package.
- TERMINALS: Tin/lead plated or RoHS compliant matte-tin (on commercial grade only) over copper clad steel. Solderable per MIL-STD-750, method 2026.
- POLARITY: Cathode end is banded.
- MOUNTING: The axial coefficient of expansion (COE) of this device is approximately +6PPM/°C. The COE of the mounting surface system should be selected to provide a suitable match with this device.
- MARKING: Part number.
- TAPE & REEL option: Standard per EIA-296. Consult factory for quantities.
- WEIGHT: Approximately 0.04 grams.
- See Package Dimensions on last page.

PART NOMENCLATURE



SYMBOLS & DEFINITIONS

Symbol	Definition
I_R	Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.
I_Z, I_{ZT}, I_{ZK}	Regulator Current: The dc regulator current (I_Z), at a specified test point (I_{ZT}), near breakdown knee (I_{ZK}).
I_{ZM}	Maximum Regulator (Zener) Current: The maximum rated dc current for the specified power rating.
I_{ZSM}	Maximum Zener Surge Current: The non-repetitive peak value of Zener surge current at a specified wave form.
V_F	Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.
V_R	Reverse Voltage: The reverse voltage dc value, no alternating component.
V_Z	Zener Voltage: The Zener voltage the device will exhibit at a specified current (I_Z) in its breakdown region.
Z_{ZT} or Z_{ZK}	Dynamic Impedance: The small signal impedance of the diode when biased to operate in its breakdown region at a specified rms current modulation (typically 10% of I_{ZT} or I_{ZK}) and superimposed on I_{ZT} or I_{ZK} respectively.

ELECTRICAL CHARACTERISTICS @ 25 ºC

JEDEC TYPE NO. (NOTE 1)	NOMINAL ZENER VOLTAGE V_Z @ I_{ZT} (NOTE 2)	MAXIMUM ZENER IMPEDANCE Z_{ZT} @ I_{ZT} (NOTE 3)	REVERSE VOLTAGE V_R	MAXIMUM REVERSE CURRENT I_R @ V_R		MAXIMUM ZENER CURRENT I_{ZM} (NOTE 4)	TEMPERATURE COEFFICIENT OF ZENER VOLTAGE α_{VZ}
				@ 25 °C	@ +150 °C		
	Volts	Ohms	Volts	µA	µA	mA	% / °C
1N4370A-1	2.4	30	1.0	100	200	155	-0.085
1N4371A-1	2.7	30	1.0	60	150	140	-0.080
1N4372A-1	3.0	29	1.0	30	100	125	-0.075
1N746A-1	3.3	24	1.0	5	30	120	-0.070
1N747A-1	3.6	22	1.0	3	30	110	-0.065
1N748A-1	3.9	20	1.0	2	30	100	-0.060
1N749A-1	4.3	18	1.0	2	50	90	-0.055 / +.020
1N750A-1	4.7	15	1.5	5	50	85	-0.043 / +.025
1N751A-1	5.1	14	2.0	5	50	75	-0.030 / +.030
1N752A-1	5.6	8	2.5	5	50	70	-0.028 / +.036
1N753A-1	6.2	3	3.5	5	50	65	+0.045
1N754A-1	6.8	3	4.0	2	50	60	+0.050
1N755A-1	7.5	4	5.0	2	50	55	+0.058
1N756A-1	8.2	5	6.0	1	50	50	+0.062
1N757A-1	9.1	6	7.0	1	50	45	+0.068
1N758A-1	10.0	7	8.0	1	50	40	+0.076
1N759A-1	12.0	10	9.0	1	50	35	+0.080

NOTES:

1 The JEDEC type numbers shown (A suffix) have a ± 5% tolerance on nominal Zener voltage.

2. Voltage measurements to be performed 20 seconds after application of dc test current.

3. Zener impedance derived by superimposing on I_{ZT}, a 60 cps, rms current equal to 10% I_{ZT} (20 mA). See MicroNote 202 for typical Zener Impedance variation with different operating currents.

4. Allowance has been made for the increase in V_Z due to Z_Z and for the increase in junction temperature as the unit approaches thermal equilibrium at the power dissipation of 400mW.

GRAPHS

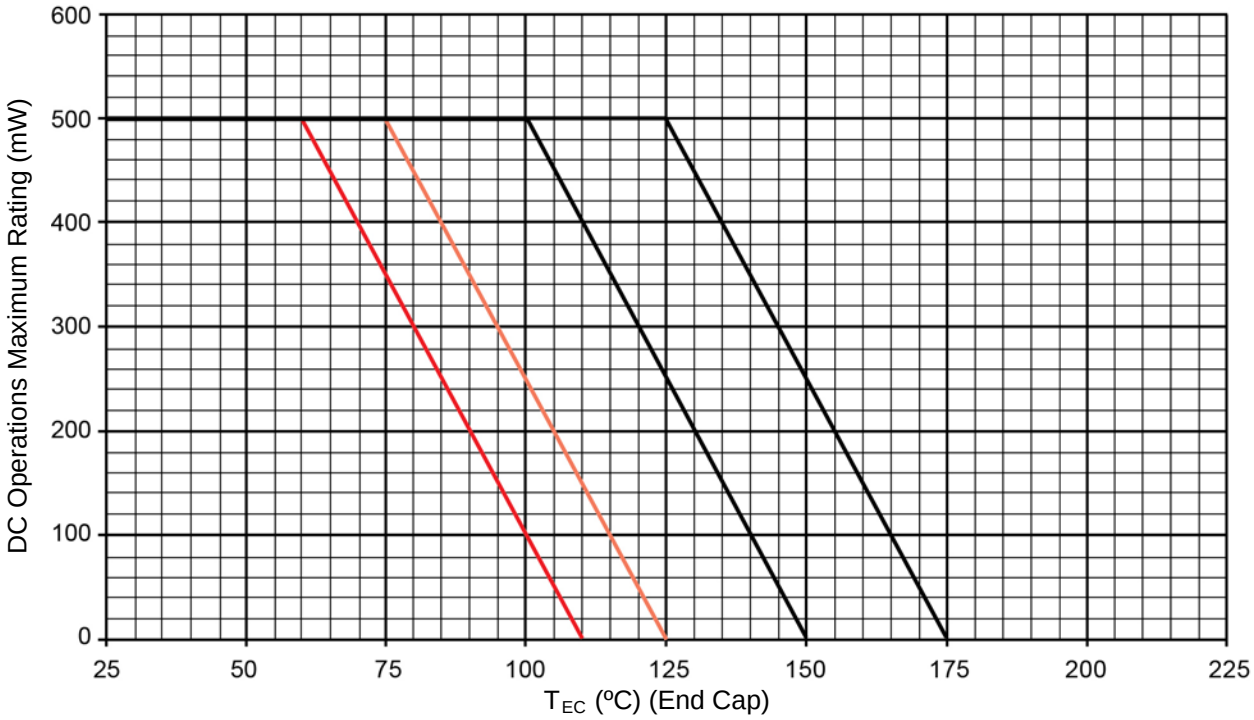


FIGURE 1
Temperature-Power Derating Curve

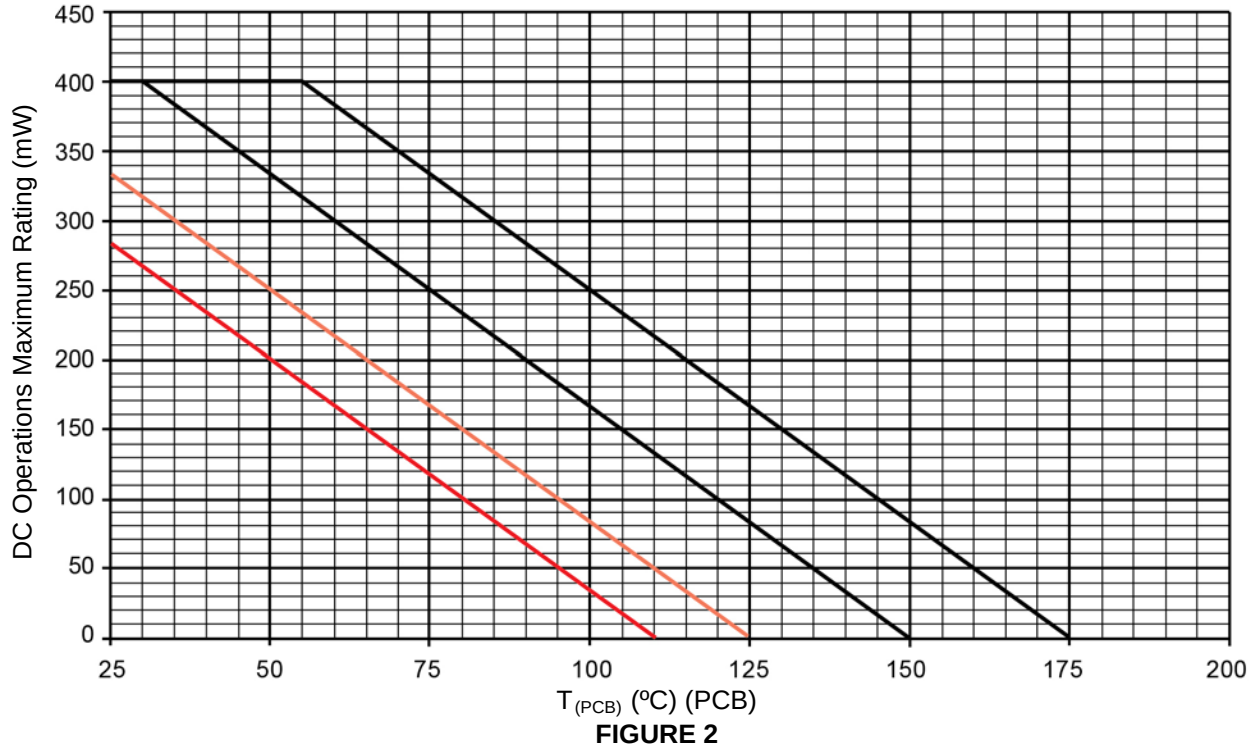


FIGURE 2
Temperature-Power Derating Curve

GRAPHS (continued)

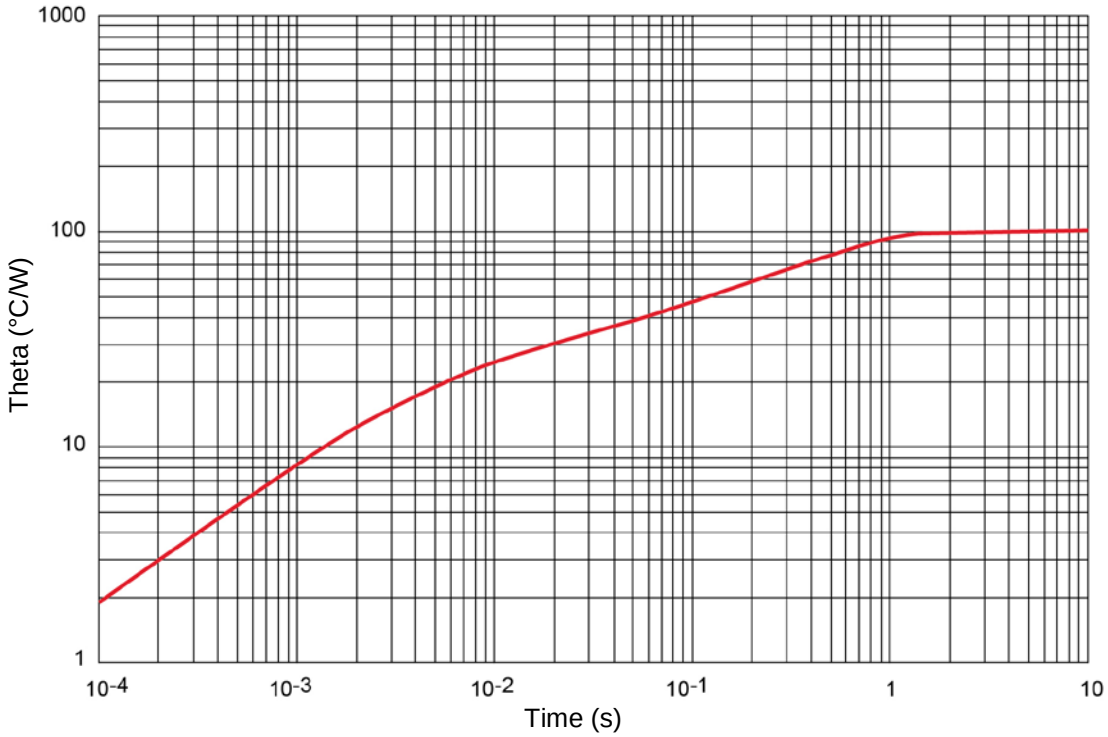
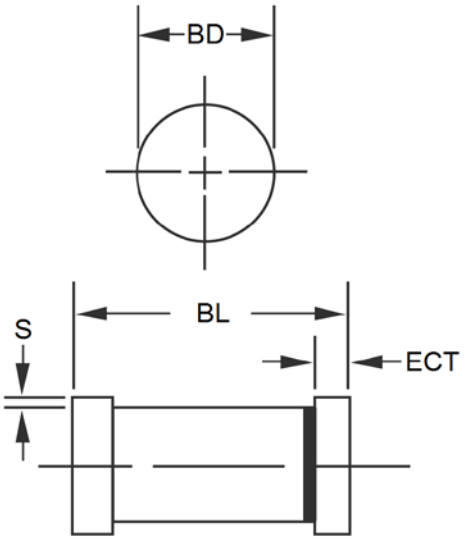


FIGURE 3
Thermal Impedance To End Cap

PACKAGE DIMENSIONS

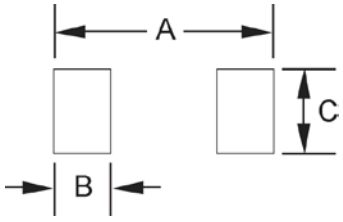


DIM	INCH		MILLIMETERS	
	MIN	MAX	MIN	MAX
BD	0.063	0.067	1.60	1.70
BL	0.130	0.146	3.30	3.71
ECT	0.016	0.022	0.41	0.56
S	0.001 min		0.03 min	

NOTES:

1. Dimensions are in inches. Millimeters are given for information only.
2. Dimensions are pre-solder dip.
3. Referencing to dimension S, minimum clearance of glass body to mounting surface on all orientations.
4. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.

PAD LAYOUT



	INCH	mm
A	0.200	5.08
B	0.055	1.40
C	0.080	2.03