TYPES 1N5226 THRU 1N5257, 1N5226A THRU 1N5257A, 1N5226B THRU 1N5257B SILICON VOLTAGE-REGULATOR DIODES

BULLETIN NO. DL-S 7311944, MARCH 1973

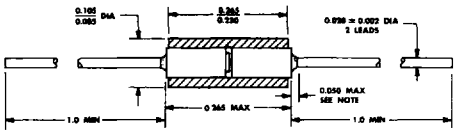
V_Z . . . 3.3 V to 33 V
P_D . . . 500 mW

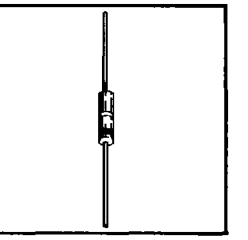
- Available with 5%, 10% and 20% Tolerances
- Rugged Double-Plug Construction

description and mechanical data

These voltage regulator diodes have been designed using the best of both silicon material processing and packaging technologies. The silicon die is a planar oxide-passivated structure which has additional true-glass passivation over the junction. The double-plug package, proven by years of volume production, ensures the best in mechanical integrity and the lowest possible junction temperature when compared to the thermal characteristics of whisker packages. Because of this rugged double-plug (heat-sink) package, these devices offer very conservatively rated power dissipation capabilities.

FALLS WITHIN JEDEC DO-7* DIMENSIONS
CATHODE END IS DENOTED BY A CONTRASTING COLOR BAND





*absolute maximum ratings at specified lead temperature

Steady-State Regulator Current, I_{ZM}, at (or below) 75°C	See Table 2
Continuous Power Dissipation at (or below) 75°C (See Note 1)	500 mW
Peak Nonrepetitive Reverse Surge Power at 55°C (See Note 2)	10 W
Operating Lead Temperature Range	−65°C to 200°C
Lead Temperature 1/16 Inch from Case for 10 Seconds	230°C

TABLE 1—STEADY-STATE REGULATOR CURRENT

TYPE	I_{ZM}† (mA)	TYPE	I_{ZM}† (mA)	TYPE	I_{ZM}† (mA)	TYPE	I_{ZM}† (mA)
1N5226, A, B	138	1N5234, A, B	73	1N5242, A, B	38	1N5250, A, B	23
1N5227, A, B	126	1N5235, A, B	67	1N5243, A, B	35	1N5251, A, B	21
1N5228, A, B	115	1N5236, A, B	61	1N5244, A, B	32	1N5252, A, B	19.1
1N5229, A, B	106	1N5237, A, B	55	1N5245, A, B	30	1N5253, A, B	18.2
1N5230, A, B	97	1N5238, A, B	52	1N5246, A, B	28	1N5254, A, B,	16.8
1N5231, A, B	89	1N5239, A, B	50	1N5247, A, B	27	1N5255, A, B	16.2
1N5232, A, B	81	1N5240, A, B	45	1N5248, A, B	25	1N5256, A, B	15.1
1N5233, A, B	76	1N5241, A, B	41	1N5249, A, B	24	1N5257, A, B	13.8

10

†The nominal I_{ZM} currents shown are applicable for devices having regulator voltages approximately 10% above the nominal V_Z values shown under electrical characteristics. These values do not represent absolute limits. The actual steady-state current-voltage product must not exceed the power rating.

NOTES: 1. Derate linearly to 200°C lead temperature at the rate of 4 mW/°C.
2. This value applies for an 8.3-ms square-wave pulse with the device at nonoperating thermal equilibrium immediately prior to the surge.

*JEDEC registered data. This data sheet contains all applicable registered data in effect at the time of publication.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 5012 • DALLAS, TEXAS 75222

1N5226 THRU 1N5257

***electrical characteristics at 25°C lead temperature**

CHARACTERISTICS				TEST CURRENT AND VOLTAGE	
PARAMETER	V_Z Regulator Voltage	I_R Static Reverse Current	V_F Static Forward Voltage		
TEST CONDITIONS	$I_R = I_{Z(T)}$, See Note 3	$V_R = V_{R(T)}$	I_F = 200 mA	$I_{Z(T)}$	$V_{R(T)}$
LIMIT	NOM‡	MAX	MAX		
UNIT	V	μA	V	mA	V
1N5226	3.3	100	1.1	20	0.95
1N5227	3.6	100	1.1	20	0.95
1N5228	3.9	75	1.1	20	0.95
1N5229	4.3	50	1.1	20	0.95
1N5230	4.7	50	1.1	20	1.9
1N5231	5.1	50	1.1	20	1.9
1N5232	5.6	50	1.1	20	2.9
1N5233	6.0	50	1.1	20	3.3
1N5234	6.2	50	1.1	20	3.8
1N5235	6.8	30	1.1	20	4.8
1N5236	7.5	30	1.1	20	5.7
1N5237	8.2	30	1.1	20	6.2
1N5238	8.7	30	1.1	20	6.2
1N5239	9.1	30	1.1	20	6.7
1N5240	10	30	1.1	20	7.6
1N5241	11	30	1.1	20	8.0
1N5242	12	10	1.1	20	8.7
1N5243	13	10	1.1	9.5	9.4
1N5244	14	10	1.1	9.0	9.5
1N5245	15	10	1.1	8.5	10.5
1N5246	16	10	1.1	7.8	11.4
1N5247	17	10	1.1	7.4	12.4
1N5248	18	10	1.1	7.0	13.3
1N5249	19	10	1.1	6.6	13.3
1N5250	20	10	1.1	6.2	14.3
1N5251	22	10	1.1	5.6	16.2
1N5252	24	10	1.1	5.2	17.1
1N5253	25	10	1.1	5.0	18.1
1N5254	27	10	1.1	4.6	20
1N5255	28	10	1.1	4.5	20
1N5256	30	10	1.1	4.2	22
1N5257	33	10	1.1	3.8	24

‡V_Z tolerance is ±20% for 1N5226 thru 1N5257. See next page for 5%-tolerance and 10%-tolerance devices.
NOTE 3: V_Z is measured with the device at thermal equilibrium while held in clips at least 3/8 inch from the case in still air at 25°C.
*JEDEC registered data

10

TYPES 1N5226 THRU 1N5257, 1N5226A THRU 1N5257A, 1N5226B THRU 1N5257B SILICON VOLTAGE-REGULATOR DIODES

1N5226A THRU 1N5257A AND 1N5226B THRU 1N5257B

***electrical characteristics at 25°C lead temperature (unless otherwise noted)**

CHARACTERISTICS							TEST CURRENT AND VOLTAGE		
PARAMETER	V_Z Regulator Voltage	α_{VZ} Temperature Coefficient of Regulator Voltage	z_z Small-Signal Regulator Impedance	z_{zk} Small-Signal Regulator Knee Impedance	I_R Static Reverse Current	V_F Static Forward Voltage		$V_{R(T)}$	
TEST CONDITIONS	$I_R = I_{Z(T)}$, See Note 3	See Note 4	$I_R = I_{Z(T)}$, $I_r = 10\% I_{Z(T)}$, f = 60 Hz	$I_{ZK} = 250\ \mu A$, $I_{zk} = 25\ \mu A$, f = 60 Hz	$V_R = V_{R(T)}$	$I_F = 200$ mA	$I_{Z(T)}$	1N5226A thru 1N5257A	1N5226B thru 1N5257B
LIMIT	NOM§	MAX	MAX	MAX	MAX	MAX			
UNIT	V	%/°C	Ω	Ω	μA	V	mA	V	V
1N5226A, B	3.3	−0.070	28	1600	25	1.1	20	0.95	1.0
1N5227A, B	3.6	−0.065	24	1700	15	1.1	20	0.95	1.0
1N5228A, B	3.9	−0.060	23	1900	10	1.1	20	0.95	1.0
1N5229A, B	4.3	±0.055	22	2000	5	1.1	20	0.95	1.0
1N5230A, B	4.7	±0.030	19	1900	5	1.1	20	1.9	2.0
1N5231A, B	5.1	±0.030	17	1600	5	1.1	20	1.9	2.0
1N5232A, B	5.6	+0.038	11	1600	5	1.1	20	2.9	3.0
1N5233A, B	6.0	+0.038	7	1600	5	1.1	20	3.3	3.5
1N5234A, B	6.2	+0.045	7	1000	5	1.1	20	3.8	4.0
1N5235A, B	6.8	+0.050	5	750	3	1.1	20	4.8	5.0
1N5236A, B	7.5	+0.058	6	500	3	1.1	20	5.7	6.0
1N5237A, B	8.2	+0.062	8	500	3	1.1	20	6.2	6.5
1N5238A, B	8.7	+0.065	8	600	3	1.1	20	6.2	6.5
1N5239A, B	9.1	+0.068	10	600	3	1.1	20	6.7	7.0
1N5240A, B	10	+0.075	17	600	3	1.1	20	7.6	8.0
1N5241A, B	11	+0.076	22	600	2	1.1	20	8.0	8.4
1N5242A, B	12	+0.077	30	600	1	1.1	20	8.7	9.1
1N5243A, B	13	+0.079	13	600	0.5	1.1	9.5	9.4	9.9
1N5244A, B	14	+0.082	15	600	0.1	1.1	9.0	9.5	10
1N5245A, B	15	+0.082	16	600	0.1	1.1	8.5	10.5	11
1N5246A, B	16	+0.083	17	600	0.1	1.1	7.8	11.4	12
1N5247A, B	17	+0.084	19	600	0.1	1.1	7.4	12.4	13
1N5248A, B	18	+0.085	21	600	0.1	1.1	7.0	13.3	14
1N5249A, B	19	+0.086	23	600	0.1	1.1	6.6	13.3	14
1N5250A, B	20	+0.086	25	600	0.1	1.1	6.2	14.3	15
1N5251A, B	22	+0.087	29	600	0.1	1.1	5.6	16.2	17
1N5252A, B	24	+0.088	33	600	0.1	1.1	5.2	17.1	18
1N5253A, B	25	+0.089	35	600	0.1	1.1	5.0	18.1	19
1N5254A, B	27	+0.090	41	600	0.1	1.1	4.6	20	21
1N5225A, B	28	+0.091	44	600	0.1	1.1	4.5	20	21
1N5226A, B	30	+0.091	49	600	0.1	1.1	4.2	22	23
1N5257A, B	33	+0.092	58	700	0.1	1.1	3.8	24	25

§V_Z tolerance is ±10% for 1N5226A thru 1N5257A series; ±5% for 1N5226B thru 1N5257B series. See preceding page for 20%-tolerance devices.

NOTES: 3. V_Z is measured with the device at thermal equilbrium while held in clips at least 3/8 inch from the case in still air at 25°C.

4. Temperature Coefficient $\alpha_{VZ} = \left[\frac{(V_Z @ 125°C) - (V_Z @ 25°C)}{V_Z @ 25°C}\right] \times \frac{100\%}{125°C - 25°C}$

For determining α_{VZ}, V_Z is measured at 7.5 mA for 1N5226A/1N5226B thru 1N5242A/1N5242B and at I_{ZT} for 1N5243A/1N5243B thru 1N5257A/1N5257B.

*JEDEC registered data

TEXAS INSTRUMENTS INCORPORATED
POST OFFICE BOX 5012 • DALLAS, TEXAS 75222

TEXAS INSTRUMENTS RESERVES THE RIGHT TO MAKE CHANGES AT ANY TIME IN ORDER TO IMPROVE DESIGN AND TO SUPPLY THE BEST PRODUCT POSSIBLE.