

Zener diode

Features

1. High reliability
2. Very sharp reverse characteristic
3. Zener voltage 1.8V to 43V
4. V_Z -tolerance $\pm 5\%$

Applications

Voltage stabilization



Absolute Maximum Ratings

$T_j=25^\circ\text{C}$

Parameter	Test Conditions	Type	Symbol	Value	Unit
Power dissipation	$T_{amb} \leq 75^\circ\text{C}$		P_V	500	mW
Z-current			I_Z	P_V/V_Z	mA
Junction temperature			T_j	200	$^\circ\text{C}$
Storage temperature range			T_{stg}	-65~+200	$^\circ\text{C}$

Maximum Thermal Resistance

$T_j=25^\circ\text{C}$

Parameter	Test Conditions	Symbol	Value	Unit
Junction ambient	$l=9.5\text{mm}(3/8")$ $T_L=\text{constant}$	R_{thJA}	300	K/W

Stresses exceeding maximum ratings may damage the device. Maximum ratings are stress ratings only. Functional operation above the recommended operating conditions is not implied. Extended exposure to stresses above the recommended operating conditions may affect device reliability.

Electrical Characteristics

$T_j=25^\circ\text{C}$

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Forward voltage	$I_F=100\text{mA}$		V_F			1.5	V

1N4678~1N4717

Type ¹⁾	Zener voltage V_Z @ $I_{ZT}=50 \mu A$			I_R at V_{R3}		I_{ZM2}	ΔV_{Z4}
	V_{Znom1}	V_{ZMin}	V_{ZMax}	μA	V		
	V	V	V				
1N4678	1.8	1.71	1.89	7.5	1	120	0.7
1N4679	2	1.9	2.1	5	1	110	0.7
1N4680	2.2	2.09	2.31	4	1	100	0.75
1N4681	2.4	2.28	2.52	2	1	95	0.8
1N4682	2.7	2.565	2.835	1	1	90	0.85
1N4683	3	2.85	3.15	0.8	1	85	0.9
1N4684	3.3	3.135	3.465	7.5	1.5	80	0.95
1N4685	3.6	3.42	3.78	7.5	2	75	0.95
1N4686	3.9	3.705	4.095	5	2	70	0.97
1N4687	4.3	4.085	4.515	4	2	65	0.99
1N4688	4.7	4.465	4.935	10	3	60	0.99
1N4689	5.1	4.845	5.355	10	3	55	0.97
1N4690	5.6	5.32	5.88	10	4	50	0.96
1N4691	6.2	5.89	6.51	10	5	45	0.95
1N4692	6.8	6.46	7.14	10	5.1	35	0.9
1N4693	7.5	7.125	7.875	10	5.7	31.8	0.75
1N4694	8.2	7.79	8.61	1	6.2	29	0.5
1N4695	8.7	8.265	9.135	1	6.6	27.4	0.1
1N4696	9.1	8.645	9.555	1	6.9	26.2	0.08
1N4697	10	9.5	10.5	1	7.6	24.8	0.1
1N4698	11	10.45	11.55	0.05	8.4	21.6	0.11
1N4699	12	11.4	12.6	0.05	9.1	20.4	0.12
1N4700	13	12.35	13.65	0.05	9.8	19	0.13
1N4701	14	13.3	14.7	0.05	10.6	17.5	0.14
1N4702	15	14.25	15.75	0.05	11.4	16.3	0.15
1N4703	16	15.20	16.8	0.05	12.1	15.4	0.16
1N4704	17	16.15	17.85	0.05	12.9	14.5	0.17
1N4705	18	17.10	18.9	0.05	13.6	13.2	0.18
1N4707	20	19	21	0.01	15.2	11.9	0.2
1N4711	27	25.65	28.35	0.01	20.4	8.8	0.27
1N4713	30	28.5	31.5	0.01	22.8	7.9	0.3
1N4714	33	31.35	34.65	0.01	25	7.2	0.33
1N4715	36	34.2	37.8	0.01	27.3	6.6	0.36
1N4716	39	37.05	40.95	0.01	29.6	6.1	0.39
1N4717	43	40.85	45.15	0.01	32.6	5.5	0.43

¹⁾ Tolerance and voltage designation (V_Z):

The type numbers shown have a standard tolerance of ?% on the nominal zener voltage, C for ?%, D for ?%.

²⁾ Maximum zener current ratings (I_{ZM}):

Maximum zener current ratings are based on maximum zener voltage of the individual units and JEDEC 250 mW rating.

³⁾ Reverse leakage current (I_R):

Reverse leakage currents are guaranteed and measured at V_R as shown on the table.

⁴⁾ Maximum voltage change (ΔV_Z):

Voltage change is equal to the difference between V_Z at 100 μA and V_Z at 10 μA .

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

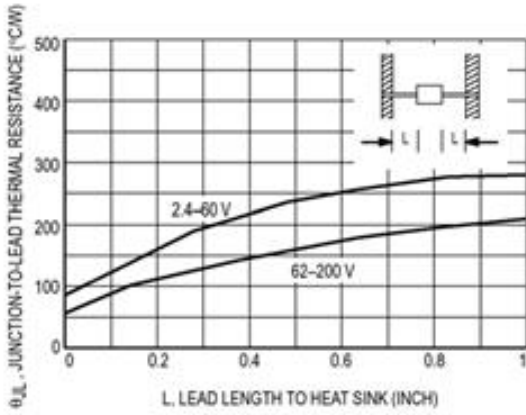


Figure 1. Typical Thermal Resistance

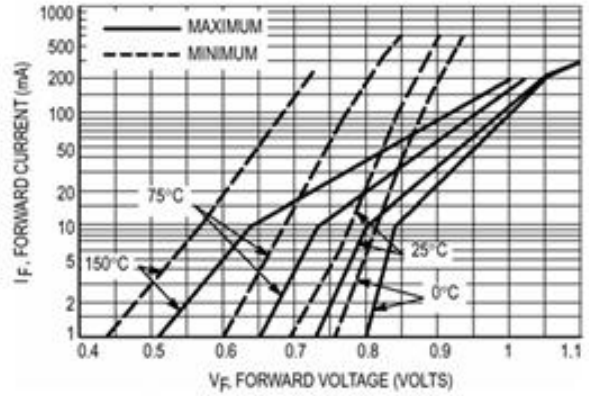


Figure 2. Typical Forward Characteristics

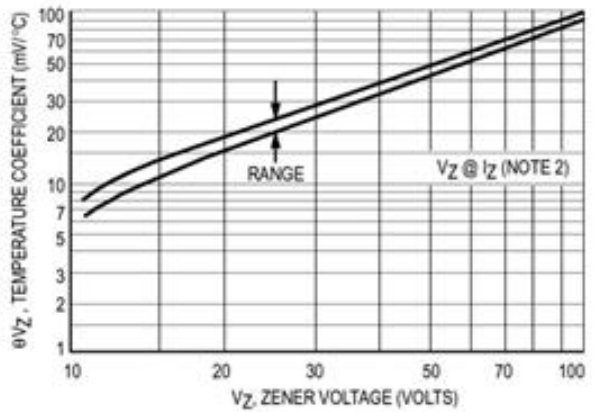
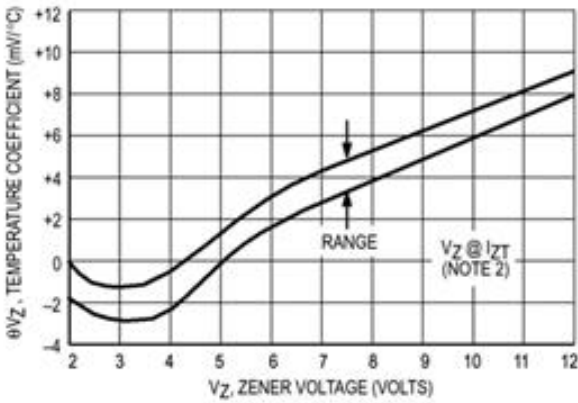


Figure 3. Temperature coefficients

(-55°C to $+150^\circ\text{C}$ temperature range; 90% of the units are in the ranges indicated.)

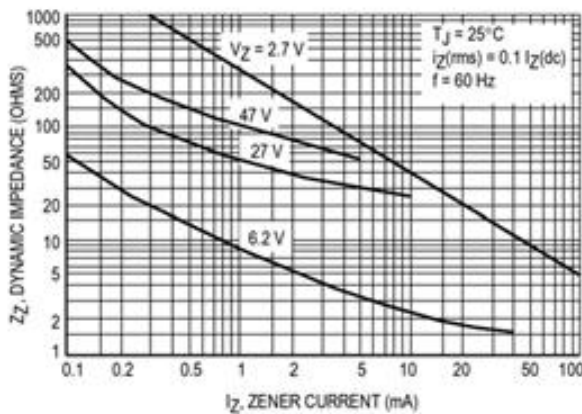


Figure 4. Effect of zener current on zener impedance

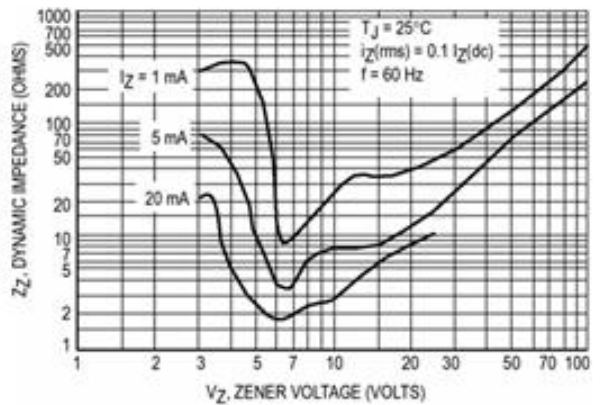


Figure 5. Effect of zener voltage on zener impedance

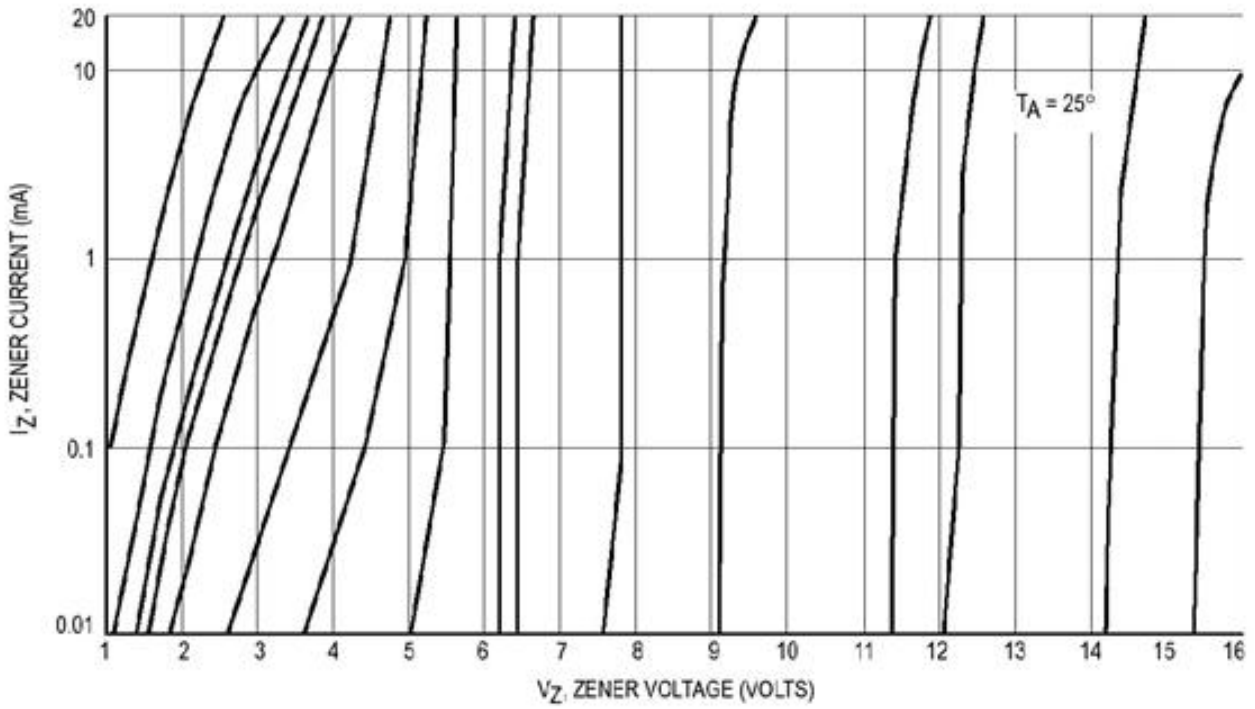


Figure 6. Zener Voltage versus Zener Current - $V_Z=1$ thru 16 Volts

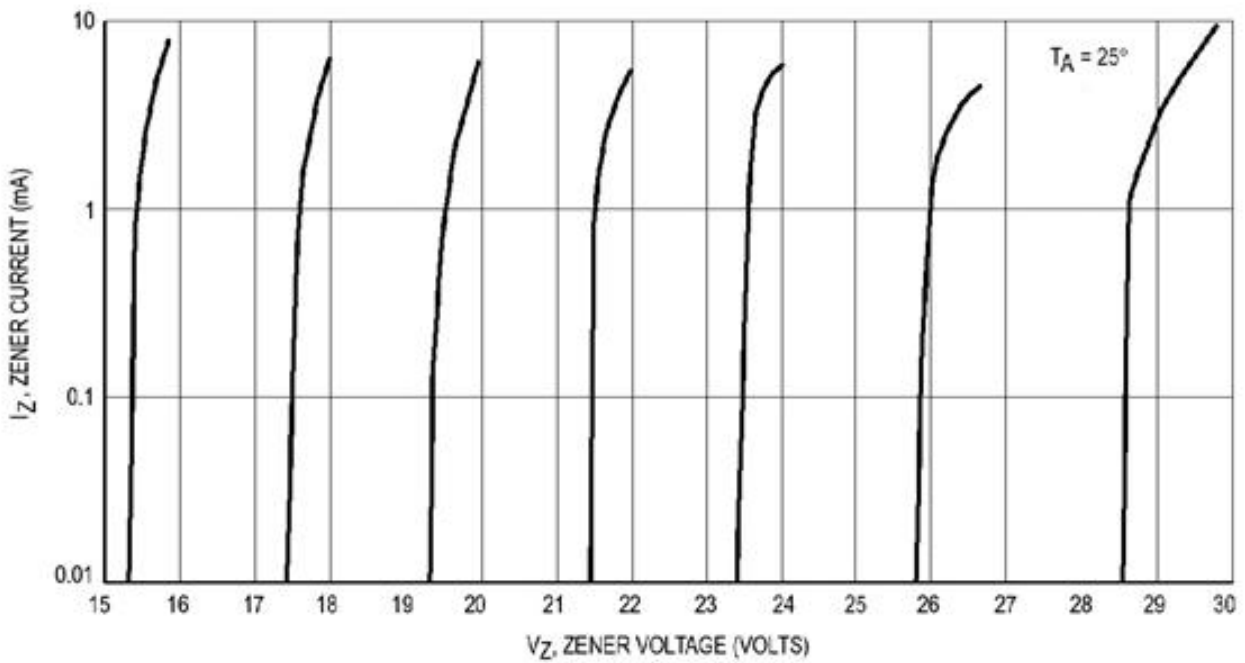


Figure 7. Zener Voltage versus Zener Current - $V_Z=15$ thru 30 Volts

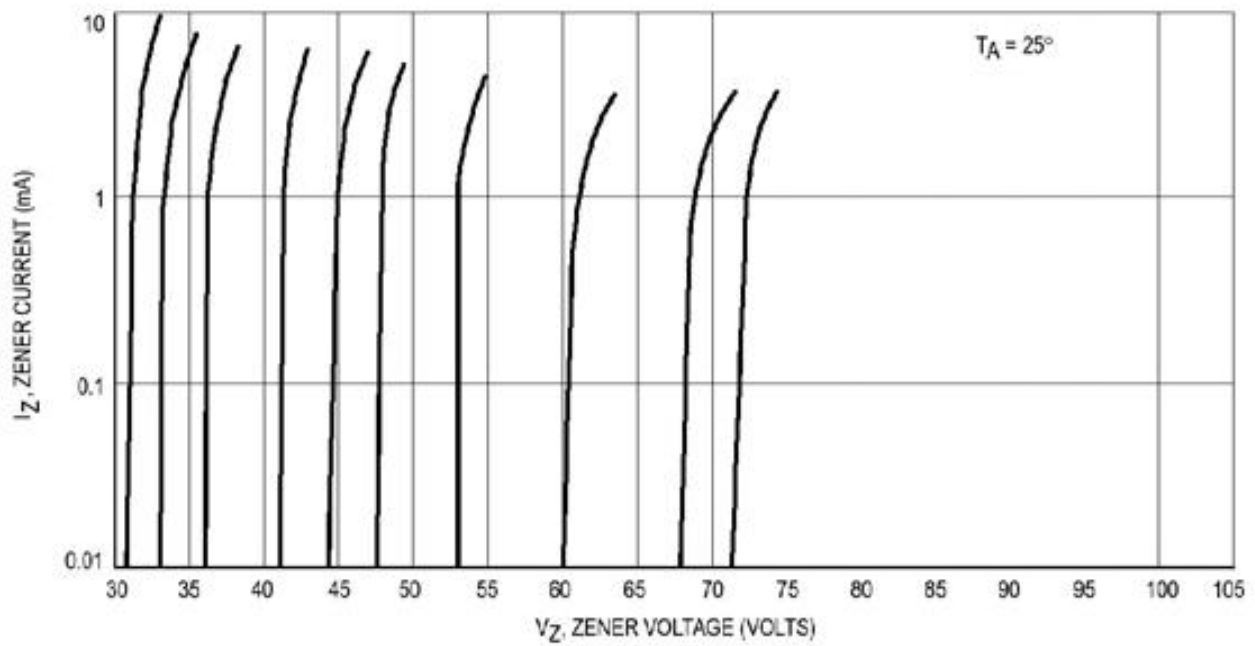
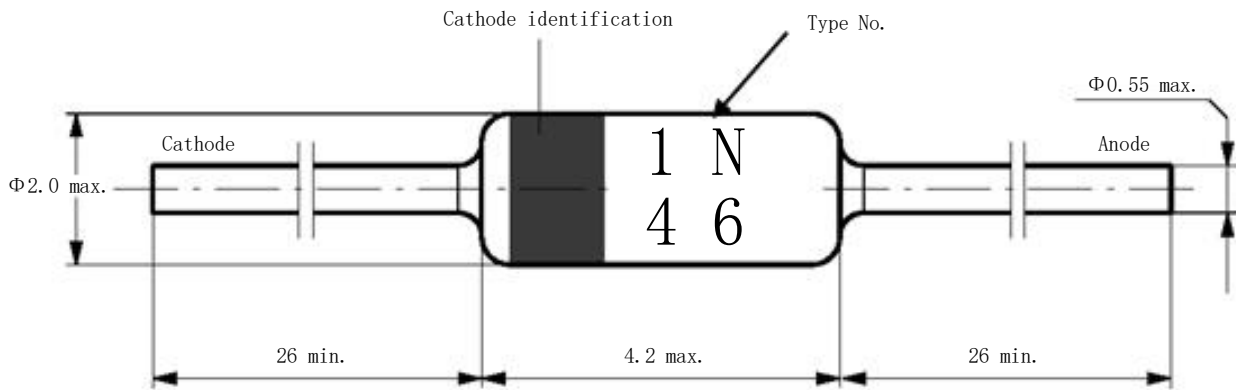


Figure 8. Zener Voltage versus Zener Current - $V_Z=30$ thru 75 Volts

1N4678~1N4717

Dimensions in mm



Standard Glass Case
JEDEC DO-35

Marking

