

1N4678 THRU 1N4717

SILICON ZENER DIODE  
LOW LEVEL  
500mW, 1.8 THRU 43 VOLT  
5% TOLERANCE



DO-35 CASE



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#### DESCRIPTION:

The CENTRAL SEMICONDUCTOR 1N4678 series devices are silicon Zener diodes designed for applications requiring an extremely low operating current (50 $\mu$ A), and low leakage.

#### MARKING: FULL PART NUMBER

#### MAXIMUM RATINGS: (T<sub>L</sub>=75°C)

Power Dissipation

Operating and Storage Junction Temperature

#### SYMBOL

P<sub>D</sub>

T<sub>J</sub>, T<sub>stg</sub>

500

-65 to +200

#### UNITS

mW

°C

#### ELECTRICAL CHARACTERISTICS: (T<sub>A</sub>=25°C) V<sub>F</sub>=1.5V MAX @ I<sub>F</sub>=100mA (for all types)

| Type   | Zener Voltage<br>V <sub>Z</sub> @ I <sub>ZT</sub> |     |       | Test Current<br>I <sub>ZT</sub> | Maximum Reverse Leakage Current |                  | Maximum Voltage Change* | Maximum Regulator Current |
|--------|---------------------------------------------------|-----|-------|---------------------------------|---------------------------------|------------------|-------------------------|---------------------------|
|        | MIN                                               | NOM | MAX   |                                 | I <sub>R</sub>                  | @ V <sub>R</sub> |                         |                           |
|        | V                                                 | V   | V     |                                 | $\mu$ A                         | V                | V                       | mA                        |
| 1N4678 | 1.710                                             | 1.8 | 1.890 | 50                              | 7.5                             | 1.0              | 0.70                    | 120.0                     |
| 1N4679 | 1.900                                             | 2.0 | 2.100 | 50                              | 5.0                             | 1.0              | 0.70                    | 110.0                     |
| 1N4680 | 2.090                                             | 2.2 | 2.310 | 50                              | 4.0                             | 1.0              | 0.75                    | 100.0                     |
| 1N4681 | 2.280                                             | 2.4 | 2.520 | 50                              | 2.0                             | 1.0              | 0.80                    | 95.0                      |
| 1N4682 | 2.565                                             | 2.7 | 2.835 | 50                              | 1.0                             | 1.0              | 0.85                    | 90.0                      |
| 1N4683 | 2.850                                             | 3.0 | 3.150 | 50                              | 0.8                             | 1.0              | 0.90                    | 85.0                      |
| 1N4684 | 3.135                                             | 3.3 | 3.465 | 50                              | 7.5                             | 1.5              | 0.95                    | 80.0                      |
| 1N4685 | 3.420                                             | 3.6 | 3.780 | 50                              | 7.5                             | 2.0              | 0.95                    | 75.0                      |
| 1N4686 | 3.705                                             | 3.9 | 4.095 | 50                              | 5.0                             | 2.0              | 0.97                    | 70.0                      |
| 1N4687 | 4.085                                             | 4.3 | 4.515 | 50                              | 4.0                             | 2.0              | 0.99                    | 65.0                      |
| 1N4688 | 4.465                                             | 4.7 | 4.935 | 50                              | 10                              | 3.0              | 0.99                    | 60.0                      |
| 1N4689 | 4.845                                             | 5.1 | 5.355 | 50                              | 10                              | 3.0              | 0.97                    | 55.0                      |
| 1N4690 | 5.320                                             | 5.6 | 5.880 | 50                              | 10                              | 4.0              | 0.96                    | 50.0                      |
| 1N4691 | 5.890                                             | 6.2 | 6.510 | 50                              | 10                              | 5.0              | 0.95                    | 45.0                      |
| 1N4692 | 6.460                                             | 6.8 | 7.140 | 50                              | 10                              | 5.1              | 0.90                    | 35.0                      |
| 1N4693 | 7.125                                             | 7.5 | 7.875 | 50                              | 10                              | 5.7              | 0.75                    | 31.8                      |
| 1N4694 | 7.790                                             | 8.2 | 8.610 | 50                              | 1.0                             | 6.2              | 0.50                    | 29.0                      |
| 1N4695 | 8.265                                             | 8.7 | 9.135 | 50                              | 1.0                             | 6.6              | 0.10                    | 27.6                      |
| 1N4696 | 8.645                                             | 9.1 | 9.555 | 50                              | 1.0                             | 6.9              | 0.08                    | 26.2                      |
| 1N4697 | 9.500                                             | 10  | 10.50 | 50                              | 1.0                             | 7.6              | 0.10                    | 24.8                      |

\*  $\Delta V_Z = V_Z @ 100\mu A$  Minus  $V_Z @ 10\mu A$

R5 (8-October 2015)

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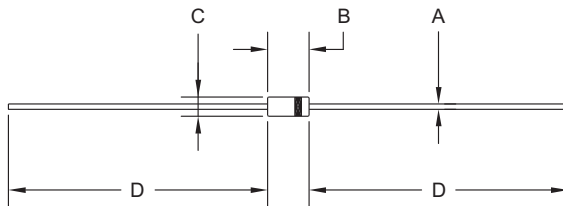


ELECTRICAL CHARACTERISTICS - Continued: ( $T_A=25^\circ\text{C}$ )  $V_F=1.5\text{V MAX @ } I_F=100\text{mA}$  (for all types)

| Type   | Zener Voltage<br>$V_Z @ I_{ZT}$ |     |       | Test Current  | Maximum Reverse Leakage Current |         | Maximum Voltage Change* | Maximum Regulator Current |
|--------|---------------------------------|-----|-------|---------------|---------------------------------|---------|-------------------------|---------------------------|
|        | MIN                             | NOM | MAX   | $I_{ZT}$      | $I_R$                           | @ $V_R$ | $\Delta V_Z$            | $I_{ZM}$                  |
|        | V                               | V   | V     | $\mu\text{A}$ | $\mu\text{A}$                   | V       | V                       | mA                        |
| 1N4698 | 10.45                           | 11  | 11.55 | 50            | 0.05                            | 8.4     | 0.11                    | 21.6                      |
| 1N4699 | 11.40                           | 12  | 12.60 | 50            | 0.05                            | 9.1     | 0.12                    | 20.4                      |
| 1N4700 | 12.35                           | 13  | 13.65 | 50            | 0.05                            | 9.8     | 0.13                    | 19.0                      |
| 1N4701 | 13.30                           | 14  | 14.70 | 50            | 0.05                            | 10.6    | 0.14                    | 17.5                      |
| 1N4702 | 14.25                           | 15  | 15.75 | 50            | 0.05                            | 11.4    | 0.15                    | 16.3                      |
| 1N4703 | 15.20                           | 16  | 16.80 | 50            | 0.05                            | 12.1    | 0.16                    | 15.4                      |
| 1N4704 | 16.15                           | 17  | 17.85 | 50            | 0.05                            | 12.9    | 0.17                    | 14.5                      |
| 1N4705 | 17.10                           | 18  | 18.90 | 50            | 0.05                            | 13.6    | 0.18                    | 13.2                      |
| 1N4706 | 18.05                           | 19  | 19.95 | 50            | 0.05                            | 14.4    | 0.19                    | 12.5                      |
| 1N4707 | 19.00                           | 20  | 21.00 | 50            | 0.01                            | 15.2    | 0.20                    | 11.9                      |
| 1N4708 | 20.90                           | 22  | 23.10 | 50            | 0.01                            | 16.7    | 0.22                    | 10.8                      |
| 1N4709 | 22.80                           | 24  | 25.20 | 50            | 0.01                            | 18.2    | 0.24                    | 9.9                       |
| 1N4710 | 23.75                           | 25  | 26.25 | 50            | 0.01                            | 19.0    | 0.25                    | 9.5                       |
| 1N4711 | 25.65                           | 27  | 28.35 | 50            | 0.01                            | 20.4    | 0.27                    | 8.8                       |
| 1N4712 | 26.60                           | 28  | 29.40 | 50            | 0.01                            | 21.2    | 0.28                    | 8.5                       |
| 1N4713 | 28.50                           | 30  | 31.50 | 50            | 0.01                            | 22.8    | 0.30                    | 7.9                       |
| 1N4714 | 31.35                           | 33  | 34.65 | 50            | 0.01                            | 25.0    | 0.33                    | 7.2                       |
| 1N4715 | 34.20                           | 36  | 37.80 | 50            | 0.01                            | 27.3    | 0.36                    | 6.6                       |
| 1N4716 | 37.05                           | 39  | 40.95 | 50            | 0.01                            | 29.6    | 0.39                    | 6.1                       |
| 1N4717 | 40.85                           | 43  | 45.15 | 50            | 0.01                            | 32.6    | 0.43                    | 5.5                       |

\*  $\Delta V_Z = V_Z @ 100\mu\text{A}$  Minus  $V_Z @ 10\mu\text{A}$

#### DO-35 CASE - MECHANICAL OUTLINE



| SYMBOL | INCHES |       | MILLIMETERS |      |
|--------|--------|-------|-------------|------|
|        | MIN    | MAX   | MIN         | MAX  |
| A      | 0.018  | 0.022 | 0.46        | 0.56 |
| B      | 0.120  | 0.200 | 3.05        | 5.08 |
| C      | 0.060  | 0.090 | 1.52        | 2.29 |
| D      | 1.000  | -     | 25.40       | -    |

DO-35 (REV: R1)

MARKING: FULL PART NUMBER

R5 (8-October 2015)

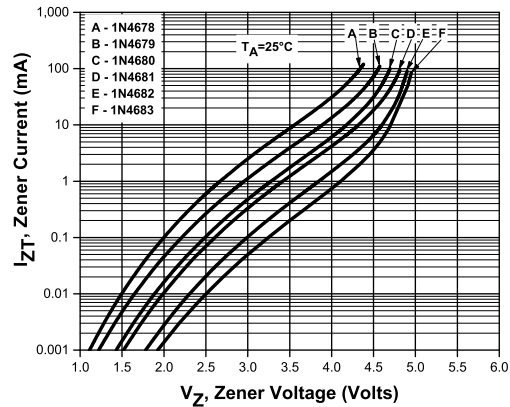
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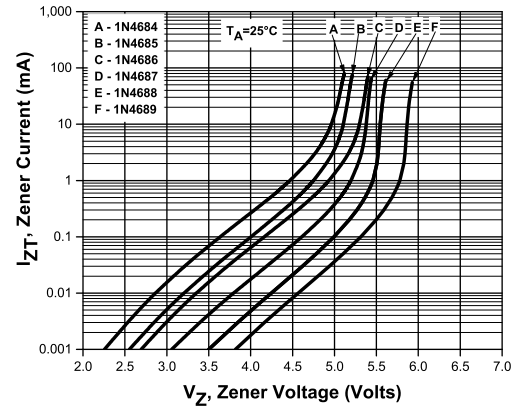


## TYPICAL ELECTRICAL CHARACTERISTICS

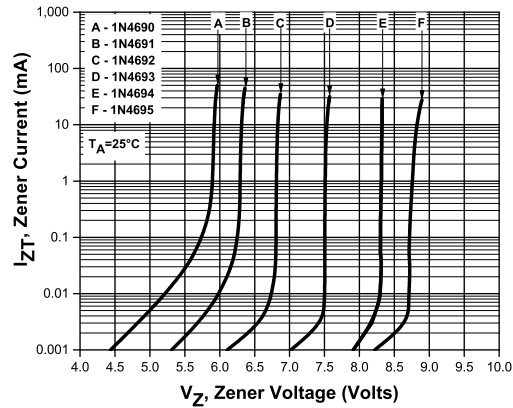
Zener Voltage, 1N4678-1N4683



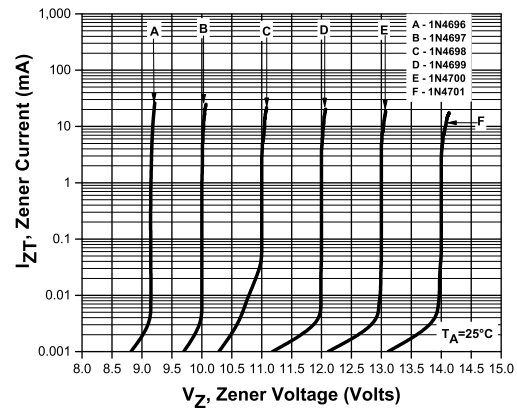
Zener Voltage, 1N4684-1N4689



Zener Voltage, 1N4690-1N4695



Zener Voltage, 1N4696-1N4701



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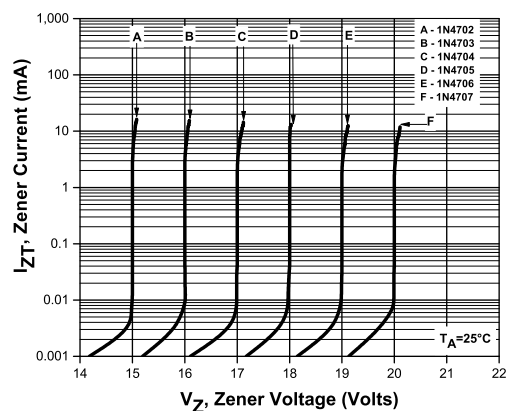
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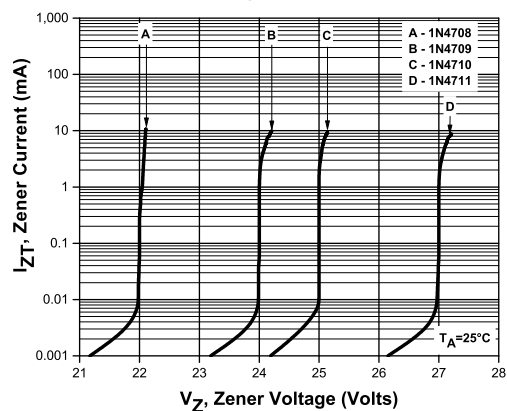


## TYPICAL ELECTRICAL CHARACTERISTICS

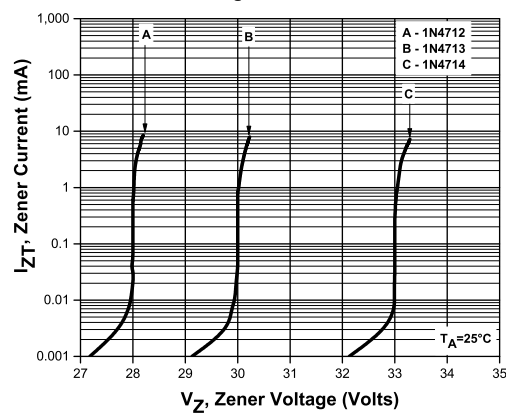
Zener Voltage, 1N4702-1N4707



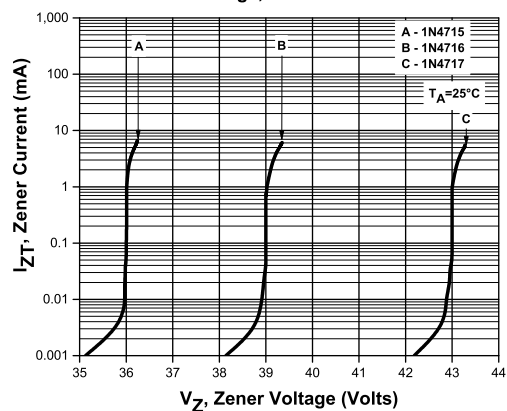
Zener Voltage, 1N4708-1N4711



Zener Voltage, 1N4712-1N4714



Zener Voltage, 1N4715-1N4717

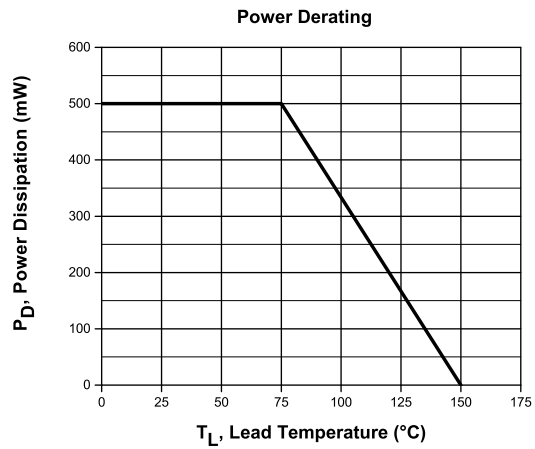


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## TYPICAL ELECTRICAL CHARACTERISTICS



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Central's operations team provides the highest level of support to insure product is delivered on-time.

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- Inventory bonding
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- Custom bar coding for shipments
- Custom product packing

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- Package details
- Application notes
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| <a href="#"><u>1N4679</u></a>    | <a href="#"><u>1N4686</u></a>    | <a href="#"><u>1N4693</u></a>    | <a href="#"><u>1N4682</u></a>    | <a href="#"><u>1N4706 TR</u></a> | <a href="#"><u>1N4696 TR</u></a> | <a href="#"><u>1N4716 TR</u></a> | <a href="#"><u>1N4683 TR</u></a> | <a href="#"><u>1N4680 TR</u></a> | <a href="#"><u>1N4713 TR</u></a> |
| <a href="#"><u>1N4695 TR</u></a> | <a href="#"><u>1N4702 TR</u></a> | <a href="#"><u>1N4703 TR</u></a> | <a href="#"><u>1N4705 TR</u></a> | <a href="#"><u>1N4687 TR</u></a> | <a href="#"><u>1N4700 TR</u></a> | <a href="#"><u>1N4708 TR</u></a> | <a href="#"><u>1N4678 TR</u></a> | <a href="#"><u>1N4710 TR</u></a> |                                  |
| <a href="#"><u>1N4689 TR</u></a> | <a href="#"><u>1N4704 TR</u></a> | <a href="#"><u>1N4684 TR</u></a> | <a href="#"><u>1N4707 TR</u></a> | <a href="#"><u>1N4711 TR</u></a> | <a href="#"><u>1N4701 TR</u></a> | <a href="#"><u>1N4688 TR</u></a> | <a href="#"><u>1N4690 TR</u></a> | <a href="#"><u>1N4697 TR</u></a> |                                  |
| <a href="#"><u>1N4715 TR</u></a> | <a href="#"><u>1N4692 TR</u></a> | <a href="#"><u>1N4699 TR</u></a> | <a href="#"><u>1N4712 TR</u></a> | <a href="#"><u>1N4698 TR</u></a> | <a href="#"><u>1N4714 TR</u></a> | <a href="#"><u>1N4694 TR</u></a> | <a href="#"><u>1N4685 TR</u></a> | <a href="#"><u>1N4709 TR</u></a> |                                  |
| <a href="#"><u>1N4691 TR</u></a> | <a href="#"><u>1N4681 TR</u></a> | <a href="#"><u>1N4717 TR</u></a> | <a href="#"><u>1N4693 TR</u></a> | <a href="#"><u>1N4679 TR</u></a> |                                  |                                  |                                  |                                  |                                  |