

### POWER DISCRETES

#### Description

Quick reference data

$$V_R = 6.2 - 200V$$

$$I_Z(\text{MAX}) = 7.2\text{mA} - 230\text{mA}$$

$$Z_Z = 4\Omega - 1500\Omega$$

$$I_R = 0.05\mu\text{A} - 10\mu\text{A}$$

#### Features

- ◆ Low dynamic impedance
- ◆ Hermetically sealed.
- ◆ 1.5 Watt applications
- ◆ Low reverse leakage currents
- ◆ Small package

These products are qualified to MIL-PRF-19500/406.  
They can be supplied fully released as JAN,  
JANTX, JANTXV and JANS versions.

#### Electrical Specifications

Electrical specifications @  $T_A = 25^\circ\text{C}$  unless otherwise specified.

| Device Types | $V_Z$ Nom | $V_Z$ Min | $V_Z$ Max | $I_Z$ Test Current<br>$T_A = +25^\circ\text{C}$ | $Z_Z$ Imped. | $Z_K$ Knee Imped. | $I_Z$ Max DC Current | $V_Z$ (reg) Voltage Reg. | $I_{ZSM}$ @<br>$T_A = +25^\circ\text{C}$ | $V_R$ Reverse Voltage | $I_R$ Reverse Current DC | $\alpha$ VZ Temp. Coeff. | $I_{ZK}$ Test Current | $I_R$ Reverse Current DC<br>$T_A = 150^\circ\text{C}$ |
|--------------|-----------|-----------|-----------|-------------------------------------------------|--------------|-------------------|----------------------|--------------------------|------------------------------------------|-----------------------|--------------------------|--------------------------|-----------------------|-------------------------------------------------------|
|              | V         | V         | V         | mA                                              | $\Omega$     | $\Omega$          | mA                   | V                        | A                                        | V                     | $\mu\text{A}$            | %/ $^\circ\text{C}$      | mA                    | $\mu\text{A}$                                         |
| 1N4460       | 6.2       | 5.89      | 6.51      | 40                                              | 4            | 200               | 230                  | 0.35                     | 2.3                                      | 3.72                  | 10                       | 0.050                    | 1.0                   | 50                                                    |
| 1N4461       | 6.8       | 6.46      | 7.14      | 37                                              | 2.5          | 200               | 210                  | 0.30                     | 2.1                                      | 4.08                  | 5                        | 0.057                    | 1.0                   | 20                                                    |
| 1N4462       | 7.5       | 7.13      | 7.87      | 34                                              | 2.5          | 400               | 191                  | 0.35                     | 1.9                                      | 4.50                  | 1                        | 0.061                    | 0.5                   | 10                                                    |
| 1N4463       | 8.2       | 7.79      | 8.61      | 31                                              | 3.0          | 400               | 174                  | 0.40                     | 1.7                                      | 4.92                  | 0.5                      | 0.065                    | 0.5                   | 5                                                     |
| 1N4464       | 9.1       | 8.65      | 9.55      | 28                                              | 4.0          | 500               | 157                  | 0.45                     | 1.6                                      | 5.46                  | 0.3                      | 0.068                    | 0.5                   | 3                                                     |
| 1N4465       | 10.0      | 9.50      | 10.5      | 25                                              | 5.0          | 500               | 143                  | 0.50                     | 1.4                                      | 8.0                   | 0.3                      | 0.071                    | 0.25                  | 3                                                     |
| 1N4466       | 11.0      | 10.45     | 11.55     | 23                                              | 6.0          | 550               | 130                  | 0.55                     | 1.3                                      | 8.8                   | 0.3                      | 0.073                    | 0.25                  | 2                                                     |
| 1N4467       | 12.0      | 11.40     | 12.6      | 21                                              | 7.0          | 550               | 119                  | 0.60                     | 1.2                                      | 9.6                   | 0.2                      | 0.076                    | 0.25                  | 2                                                     |
| 1N4468       | 13.0      | 12.35     | 13.65     | 19                                              | 8.0          | 550               | 110                  | 0.65                     | 1.1                                      | 10.4                  | 0.05                     | 0.079                    | 0.25                  | 2                                                     |
| 1N4469       | 15.0      | 14.25     | 15.75     | 17                                              | 9.0          | 600               | 95                   | 0.75                     | 0.95                                     | 12.0                  | 0.05                     | 0.082                    | 0.25                  | 2                                                     |
| 1N4470       | 16.0      | 15.20     | 16.8      | 15.5                                            | 10.0         | 600               | 90                   | 0.80                     | 0.90                                     | 12.8                  | 0.05                     | 0.083                    | 0.25                  | 2                                                     |
| 1N4471       | 18.0      | 17.10     | 18.9      | 14                                              | 11.0         | 650               | 79                   | 0.83                     | 0.79                                     | 14.4                  | 0.05                     | 0.085                    | 0.25                  | 2                                                     |
| 1N4472       | 20.0      | 19.0      | 21.0      | 12.5                                            | 12.0         | 650               | 71                   | 0.95                     | 0.71                                     | 16.0                  | 0.05                     | 0.086                    | 0.25                  | 2                                                     |
| 1N4473       | 22.0      | 20.9      | 23.10     | 11.5                                            | 14.0         | 650               | 65                   | 1.0                      | 0.65                                     | 17.6                  | 0.05                     | 0.087                    | 0.25                  | 2                                                     |
| 1N4474       | 24.0      | 22.8      | 25.2      | 10.5                                            | 16.0         | 700               | 60                   | 1.1                      | 0.60                                     | 19.2                  | 0.05                     | 0.088                    | 0.25                  | 2                                                     |
| 1N4475       | 27.0      | 25.7      | 28.3      | 9.5                                             | 18.0         | 700               | 53                   | 1.3                      | 0.53                                     | 21.6                  | 0.05                     | 0.090                    | 0.25                  | 2                                                     |
| 1N4476       | 30.0      | 28.5      | 31.5      | 8.5                                             | 20.0         | 750               | 48                   | 1.4                      | 0.48                                     | 24.0                  | 0.05                     | 0.091                    | 0.25                  | 2                                                     |

**POWER DISCRETES**
**Electrical Specifications (Cont.)**

 Electrical specifications @  $T_A = 25^\circ\text{C}$  unless otherwise specified.

| Device Types | $V_Z$ Nom | $V_Z$ Min | $V_Z$ Max | $I_Z$ Test Current<br>$T_A = +25^\circ\text{C}$ | $Z_Z$ Imped. | $Z_K$ Knee Imped. | $I_Z$ Max DC Current | $V_Z$ (reg) Voltage Reg. | $I_{ZSM}$ @<br>$T_A = +25^\circ\text{C}$ | $V_R$ Reverse Voltage | $I_R$ Reverse Current DC | $\alpha$ VZ Temp. Coeff. | $I_{ZK}$ Test Current | $I_R$ Reverse Current DC<br>$T_A = +150^\circ\text{C}$ |
|--------------|-----------|-----------|-----------|-------------------------------------------------|--------------|-------------------|----------------------|--------------------------|------------------------------------------|-----------------------|--------------------------|--------------------------|-----------------------|--------------------------------------------------------|
|              | V         | V         | V         | mA                                              | $\Omega$     | $\Omega$          | mA                   | V                        | A                                        | V                     | $\mu\text{A}$            | % $^\circ\text{C}$       | mA                    | $\mu\text{A}$                                          |
| 1N4477       | 33        | 31.4      | 34.6      | 7.5                                             | 25           | 800               | 43                   | 1.5                      | 0.43                                     | 26.4                  | 0.05                     | 0.092                    | 0.25                  | 2                                                      |
| 1N4478       | 36        | 34.2      | 37.8      | 7.0                                             | 27           | 850               | 40                   | 1.7                      | 0.4                                      | 28.8                  | 0.05                     | 0.093                    | 0.25                  | 2                                                      |
| 1N4479       | 39        | 37.1      | 40.9      | 6.5                                             | 30           | 900               | 37                   | 1.8                      | 0.37                                     | 31.2                  | 0.05                     | 0.094                    | 0.25                  | 2                                                      |
| 1N4480       | 43        | 40.9      | 45.1      | 6.0                                             | 40           | 950               | 33                   | 1.9                      | 0.33                                     | 34.4                  | 0.05                     | 0.095                    | 0.25                  | 2                                                      |
| 1N4481       | 47        | 44.7      | 49.3      | 5.5                                             | 50           | 1000              | 30                   | 2.1                      | 0.30                                     | 37.6                  | 0.05                     | 0.095                    | 0.25                  | 2                                                      |
| 1N4482       | 51        | 48.5      | 53.5      | 5.0                                             | 60           | 1100              | 28                   | 2.3                      | 0.28                                     | 40.8                  | 0.05                     | 0.096                    | 0.25                  | 2                                                      |
| 1N4483       | 56        | 53.2      | 58.8      | 4.5                                             | 70           | 1300              | 26                   | 2.5                      | 0.26                                     | 44.8                  | 0.25                     | 0.096                    | 0.25                  | 10                                                     |
| 1N4484       | 62        | 58.9      | 65.1      | 4.0                                             | 80           | 1500              | 23                   | 2.7                      | 0.23                                     | 49.6                  | 0.25                     | 0.097                    | 0.25                  | 10                                                     |
| 1N4485       | 68        | 64.6      | 71.4      | 3.7                                             | 100          | 1700              | 21                   | 3.0                      | 0.21                                     | 54.4                  | 0.25                     | 0.097                    | 0.25                  | 10                                                     |
| 1N4486       | 75        | 71.3      | 78.7      | 3.3                                             | 130          | 2000              | 19                   | 3.3                      | 0.19                                     | 60.0                  | 0.25                     | 0.098                    | 0.25                  | 10                                                     |
| 1N4487       | 82        | 77.9      | 86.1      | 3.0                                             | 160          | 2500              | 17                   | 3.6                      | 0.17                                     | 65.6                  | 0.25                     | 0.098                    | 0.25                  | 10                                                     |
| 1N4488       | 91        | 86.5      | 95.5      | 2.8                                             | 200          | 3000              | 16                   | 4.0                      | 0.16                                     | 72.8                  | 0.25                     | 0.099                    | 0.25                  | 10                                                     |
| 1N4489       | 100       | 95.0      | 105.0     | 2.5                                             | 250          | 3100              | 14                   | 4.4                      | 0.14                                     | 80.0                  | 0.25                     | 0.1                      | 0.25                  | 10                                                     |
| 1N4490       | 110       | 104.5     | 115.5     | 2.3                                             | 300          | 4000              | 13                   | 5.0                      | 0.13                                     | 88.0                  | 0.25                     | 0.1                      | 0.25                  | 10                                                     |
| 1N4491       | 120       | 114.0     | 126.0     | 2.0                                             | 400          | 4500              | 12                   | 5.5                      | 0.12                                     | 96.0                  | 0.25                     | 0.1                      | 0.25                  | 10                                                     |
| 1N4492       | 130       | 123.5     | 136.5     | 1.9                                             | 500          | 5000              | 11                   | 6.0                      | 0.11                                     | 104.0                 | 0.25                     | 0.1                      | 0.25                  | 10                                                     |
| 1N4493       | 150       | 142.5     | 157.5     | 1.7                                             | 700          | 6000              | 9.5                  | 7.0                      | 0.095                                    | 120                   | 0.25                     | 0.1                      | 0.25                  | 10                                                     |
| 1N4494       | 160       | 152       | 168       | 1.6                                             | 1000         | 6500              | 8.9                  | 8.0                      | 0.089                                    | 128                   | 0.25                     | 0.1                      | 0.25                  | 10                                                     |
| 1N4495       | 180       | 171       | 189       | 1.4                                             | 1300         | 7000              | 7.9                  | 10.0                     | 0.079                                    | 144                   | 0.25                     | 0.1                      | 0.25                  | 10                                                     |
| 1N4496       | 200       | 190       | 210       | 1.2                                             | 1500         | 8000              | 7.2                  | 12.0                     | 0.072                                    | 160                   | 0.25                     | 0.1                      | 0.25                  | 10                                                     |

**Notes:**

- (1) Operating Temperature:  $-55^\circ\text{C}$  to  $175^\circ\text{C}$ .
- (2) Storage Temperature:  $-65^\circ\text{C}$  to  $175^\circ\text{C}$ .

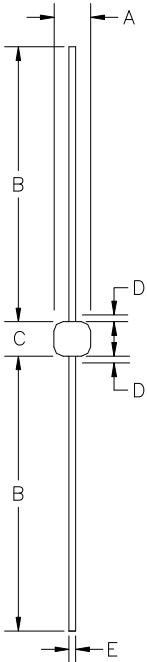
**POWER DISCRETES**

**Ordering Information**

| Part Number | Description                                     |
|-------------|-------------------------------------------------|
| 1N4460      | Axial leaded hermetically sealed <sup>(1)</sup> |
| THRU        |                                                 |
| 1N4496      |                                                 |

Note:  
 (1) Available in bulk or tape and reel packaging. Please consult factory for quantities.

**Outline Drawing**



G99

| Dimensions       |        |       |             |       |      |
|------------------|--------|-------|-------------|-------|------|
| DIM <sup>N</sup> | Inches |       | Millimeters |       | Note |
|                  | MIN    | MAX   | MIN         | MAX   |      |
| A                | 0.06   | 0.085 | 1.52        | 2.16  | -    |
| B                | 0.8    | 1.30  | 20.32       | 33.02 | -    |
| C                | 0.106  | 0.16  | 2.69        | 4.06  | -    |
| D                | -      | 0.05  | -           | 1.27  | 1    |
| E                | 0.028  | 0.032 | 0.71        | 0.81  | -    |

Note:  
 (1) Lead diameter uncontrolled over this region.

**Contact Information**

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