

4855452 INTERNATIONAL RECTIFIER

55C 04906 D

Data Sheet No. PD-2.004C

T-01-15

INTERNATIONAL RECTIFIER 

**1N4816, 1N5052, 10D, 20D SERIES**  
**1.5 and 2.0 Amp Molded Silicon Rectifier Diodes**

**Major Ratings and Characteristics**

|               | 10D         | 20D   | 1N4816 | 1N5052 | Units         |
|---------------|-------------|-------|--------|--------|---------------|
| $I_F(AV)$     | 1.5         | 2.0   | 1.5*   | 1.5    | A             |
| @ Max. $T_A$  | 40          | 100†  | 40*    | 40*    | °C            |
| $I_{FSM}$     |             |       |        |        |               |
| @ 50 Hz       | 48          | 48    | 48     | 48     | A             |
| @ 60 Hz       | 50          | 50    | 50*    | 50*    |               |
| $I^2\sqrt{t}$ | 161.4       | 161.4 | 161.4  | 161.4  | $A^2\sqrt{s}$ |
| $T_J$         | -65 to 170* |       |        |        | °C            |
| VRRM Range    | 50 - 1000*  |       |        |        | V             |

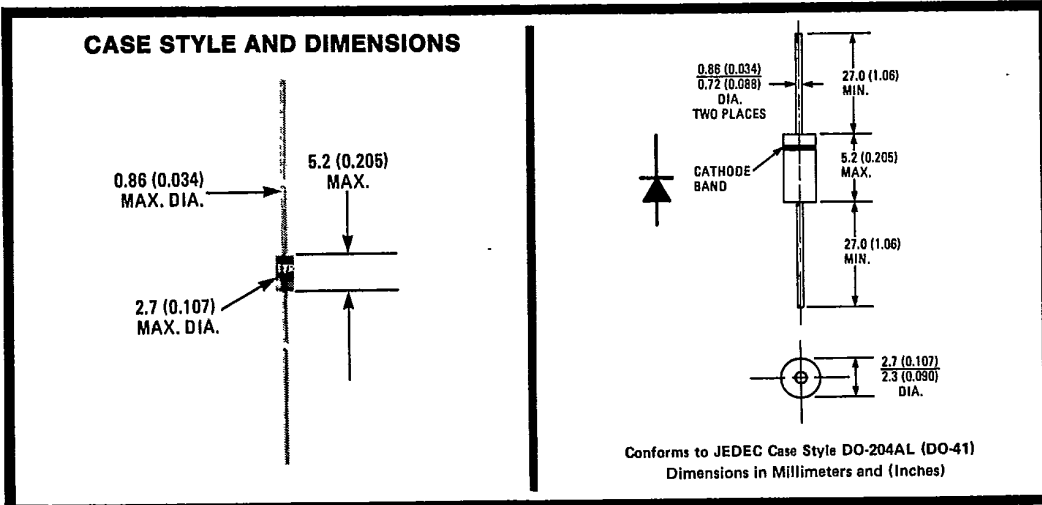
†Maximum lead temperature,  $T_L$ .

\*JEDEC registered value.

**Description/Features**

- Economical miniature case
- High surge ratings
- Molded epoxy DO-204AL case style.

**B**



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VOLTAGE RATINGS

| Part Numbers         | VRRM - Max. Repetitive Peak Reverse Voltage (V) | V <sub>RSM</sub> - Max. Non-Repetitive Peak Reverse Voltage (V) | V <sub>R</sub> (RMS) - Max. RMS Reverse Voltage (V) | V <sub>R</sub> - Max. DC Blocking Voltage (V) | Surge Resistor <sup>①</sup> (Ohms) |      |
|----------------------|---|---|---|---|------------------------------------|------|
|                      | T = -65 to 175°C <sup>①</sup>                   | T = -65 to 175°C <sup>①</sup>                                   | T = -65 to 175°C <sup>①</sup>                       | T = -65 to 165°C <sup>①</sup>                 | Min.                               | Typ. |
| 10D05, 20D05, 1N4816 | 50*   | 100*  | 35  | 50*   | 4.7                                | 7.5  |
| 10D1, 20D1, 1N4817   | 100*  | 200*  | 70  | 100*  | 4.7                                | 7.5  |
| 10D2, 20D2, 1N4818   | 200*  | 300*  | 140   | 200*  | 4.7                                | 7.5  |
| — — 1N4819           | 300   | 400   | 210   | 300   | 4.7                                | 7.5  |
| 10D4, 20D4, 1N4820   | 400*  | 525*  | 280   | 400*  | 4.7                                | 7.5  |
| — — 1N4821           | 500   | 650   | 350   | 500   | 6.2                                | 10   |
| 10D6, 20D6, 1N4822   | 600*  | 800*  | 420   | 600*  | 7.5                                | 12   |
| — — 1N5052           | 700*  | 900*  | 490   | 700*  | —                                  | —    |
| 10D8, 20D8, 1N5053   | 800*  | 1000*   | 560   | 800*  | 10                                 | 15   |
| 10D10, 20D10, 1N5054 | 1000*   | 1200*   | 700   | 1000*   | 12                                 | 20   |

ELECTRICAL SPECIFICATIONS

|   | 10D            | 20D            | 1N4816 | 1N5052 | Units             | Conditions  |
|---|----------------|----------------|--------|--------|-------------------|---|
| I <sub>F(AV)</sub> Max. average forward current @ Max. T <sup>①</sup> | 1.5            | 2.0            | 1.5*   | 1.5*   | A                 | 180° sinusoidal conduction  |
|   | 40             | 100            | 40*    | 40*    | °C                | 20D: Double side cooled.  |
| I <sub>FSM</sub> Max. peak one cycle, non-repetitive surge current    | 48             | 48             | 48     | 48     | A                 | Half cycle 50 Hz sine wave or 6 ms rectangular pulse. Following any rated load condition and with rated VRRM reapplied.                 |
|   | 50             | 50             | 50*    | 50*    | A                 | Half cycle 60 Hz sine wave or 5 ms rectangular pulse.   |
| I <sup>2</sup> √t Max. I <sup>2</sup> √t for fusing <sup>④</sup>      | 161.4          | 161.4          | 161.4  | 161.4  | A <sup>2</sup> √s | t = 0.1 to 10 ms with VRRM following surge = rated VRRM.  |
| V <sub>FM</sub> Max. peak forward voltage                             | 0.95           | —              | —      | —      | V                 | T <sub>A</sub> = 25°C, I <sub>FM</sub> = 1A   |
|   | 1.30           | —              | 1.30*  | 1.30*  | V                 | T <sub>A</sub> = 40°C, I <sub>F(AV)</sub> = 1.5A (4.71A pk)   |
|   | —              | 1.30           | —      | —      | V                 | T <sub>A</sub> = 25°C, I <sub>F(AV)</sub> = 2.0A (6.28A pk)   |
| I <sub>R</sub> Max. dc reverse current                                | 5 <sup>③</sup> | 5 <sup>③</sup> | 5      | 5      | μA                | T = 25°C  |
|   | —              | —              | 500*   | 500*   | μA                | T <sub>A</sub> = 170°C V <sub>R</sub> = Rated V <sub>R</sub>  |
| I <sub>R(AV)</sub> Max. average reverse current                       | 250            | 250            | 250*   | 250*   | μA                | VRRM = Rated VRRM<br>20D: T <sub>L</sub> = 100°C, I <sub>F(AV)</sub> = 2.0A<br>Others: T <sub>A</sub> = 40°C, I <sub>F(AV)</sub> = 1.5A |

THERMAL-MECHANICAL SPECIFICATIONS

|  |                  |        |   |
|--|------------------|--------|---|
| T <sub>J</sub> Max. operating junction temperature range | -65 to 170*      | °C     |   |
| T <sub>stg</sub> Max. storage temperature range          | -65 to 175*      | °C     |   |
| T <sub>slid</sub> Max. lead temperature during soldering | 240*             | °C     | Duration, 10s max., measured 9.5 mm (0.375 in.) from device case. |
| wt Approximate weight                                    | 0.33 (0.012)     | g (oz) |   |
| Case Style   | DO-204AL (DO-41) |        | JEDEC   |

① T = T<sub>A</sub> for 10D series, 1N4816 through 1N4822 and 1N5052 through 1N5054. T = T<sub>L</sub> for 20D series. (T<sub>L</sub> is measured 9.5 mm (0.375 in.) from device case.)

② Value of series resistance required for capacitive loads, 10D, 1N4816, and 1N5052 series.

③ I<sub>R</sub> = 10 μA for devices rated 200V or less.

④ I<sup>2</sup>t for time t<sub>x</sub> = I<sup>2</sup>√t · √t<sub>x</sub>.

\* JEDEC registered value.

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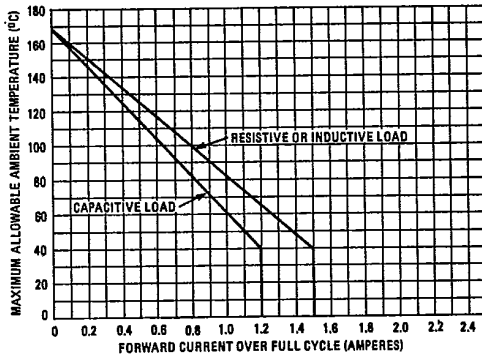


Fig. 1 - Average Forward Current Vs. Maximum Allowable Ambient Temperature, 1N4816-22, 1N5052-54 & 10D Series

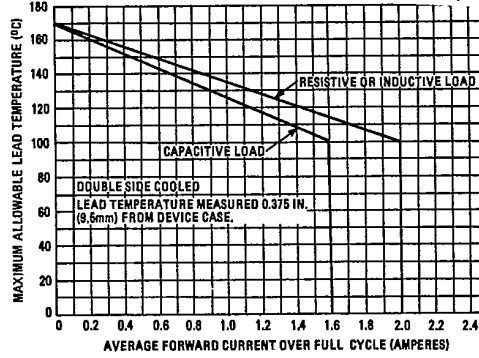


Fig. 2 - Average Forward Current Vs. Maximum Allowable Lead Temperature, 20D Series

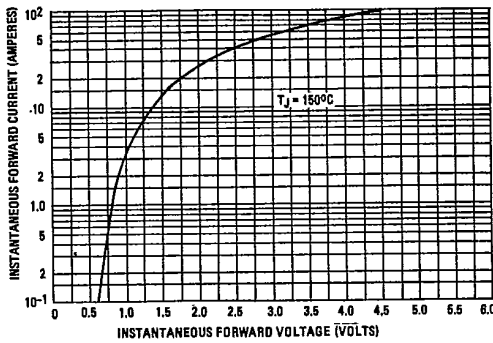


Fig. 3 - Maximum Forward Voltage Vs. Forward Current, 1N4816-22, 1N5052-54, 10D Series

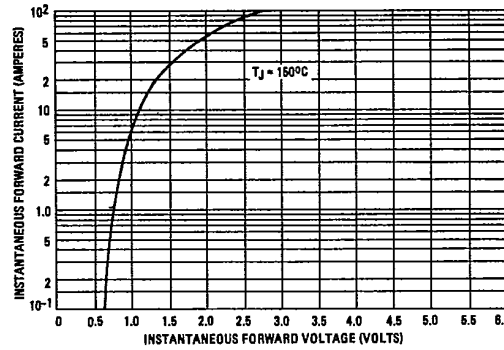


Fig. 4 - Maximum Forward Voltage Vs. Forward Current, 20D Series

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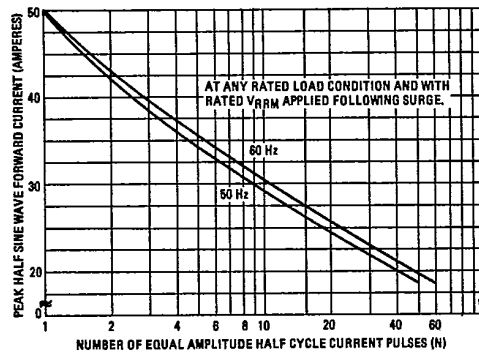


Fig. 5 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, All Series