

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,  $T_L$ .

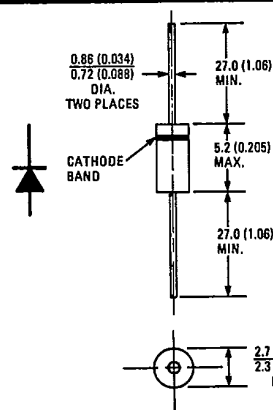
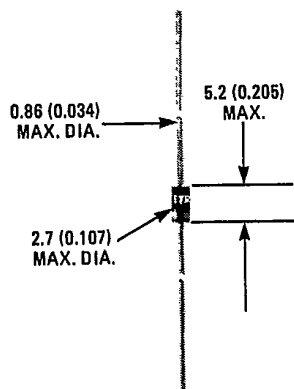
\*JEDEC registered value.

#### Description/Features

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

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#### CASE STYLE AND DIMENSIONS



Conforms to JEDEC Case Style DO-204AL (DO-41)  
Dimensions in Millimeters and (Inches)

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## VOLTAGE RATINGS

| Part Numbers         | VRRM — Max.<br>Repetitive Peak<br>Reverse Voltage<br>(V) | VRS — Max.<br>Non-Repetitive Peak<br>Reverse Voltage<br>(V) | VR(RMS) — Max.<br>RMS Reverse Voltage<br>(V) | VR — Max.<br>DC Blocking Voltage<br>(V) | Surge Resistor <sup>①</sup><br>(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                                                                                                              |
|------------------------------------------------------------------|----------------|----------------|--------|--------|-------------------|-------------------------------------------------------------------------------------------------------------------------|
| IF(AV) Max. average forward current<br>@ 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.                                                                                                |
| IFSM 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>①</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.                                                                |
| VFM Max. peak forward voltage                                    | 0.95           | —              | —      | —      | V                 | TA = 25°C, IFM = 1A                                                                                                     |
|                                                                  | 1.30           | —              | 1.30*  | 1.30*  | V                 | TA = 40°C, IF(AV) = 1.5A (4.71A pk)                                                                                     |
|                                                                  | —              | 1.30           | —      | —      | V                 | TA = 25°C, IF(AV) = 2.0A (6.28A pk)                                                                                     |
| IR Max. dc reverse current                                       | 5 <sup>①</sup> | 5 <sup>①</sup> | 5      | 5      | μA                | T = 25°C                                                                                                                |
|                                                                  | —              | —              | 500*   | 500*   | μA                | TA = 170°C VR = Rated VR                                                                                                |
| IR(AV) Max. average reverse current                              | 250            | 250            | 250*   | 250*   | μA                | VRRM = Rated VRRM<br>20D: TL = 100°C, IF(AV) = 2.0A<br>Others: TA = 40°C, IF(AV) = 1.5A                                 |

## THERMAL-MECHANICAL SPECIFICATIONS

|      |                                           |                  |        |                                                                   |
|------|-------------------------------------------|------------------|--------|-------------------------------------------------------------------|
| TJ   | Max. operating junction temperature range | -65 to 170*      | °C     |                                                                   |
| Tstg | Max. storage temperature range            | -65 to 175*      | °C     |                                                                   |
| Tsld | 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 = TA for 10D series, 1N4816 through 1N4822 and 1N5052 through 1N5054. T = TL for 20D series.  
(TL 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 IR = 10 μA for devices rated 200V or less.

④ I<sup>2</sup>t for time tx = I<sup>2</sup>√t \* √tx.

\* JEDEC registered value.

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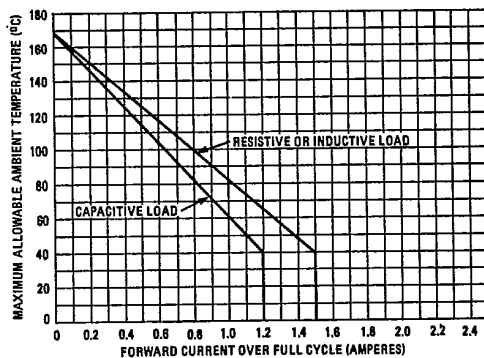


Fig. 1 - Average Forward Current Vs. Maximum Allowable Ambient Temperature, 1N4816-22, 1N5052-54 & 10D Series

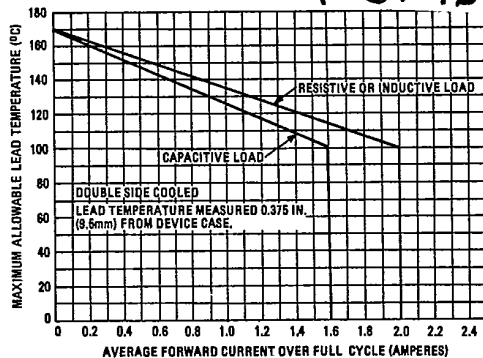


Fig. 2 - Average Forward Current Vs. Maximum Allowable Lead Temperature, 20D Series

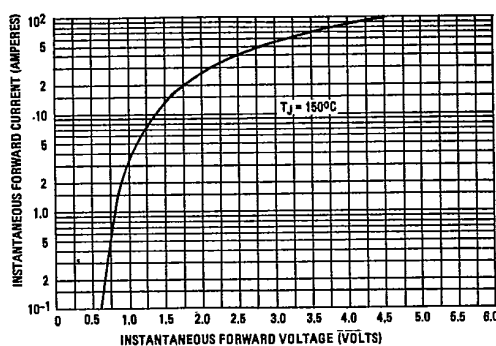


Fig. 3 - Maximum Forward Voltage Vs. Forward Current, 1N4816-22, 1N5052-54, 10D Series

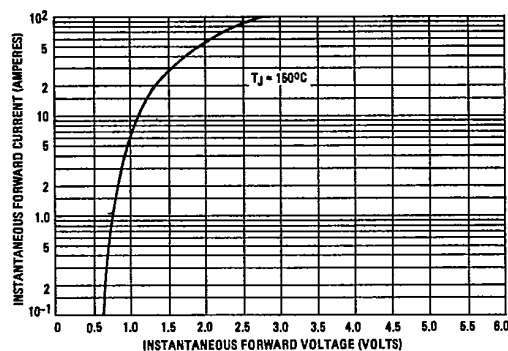


Fig. 4 - Maximum Forward Voltage Vs. Forward Current, 20D Series

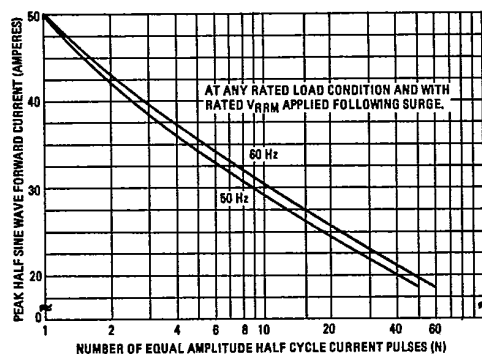


Fig. 5 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, All Series

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