

## HIGH RELIABILITY ULTRA FAST RECOVERY RECTIFIER

Qualified per MIL-PRF-19500/550

- 800 Amps Surge Rating
- VRRM 50 to 150 Volts
- 70 Amps Current Rating

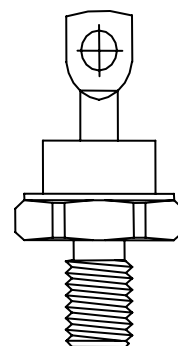
### DEVICES

|               |                |
|---------------|----------------|
| <b>1N6304</b> | <b>1N6304R</b> |
| <b>1N6305</b> | <b>1N6305R</b> |
| <b>1N6306</b> | <b>1N6306R</b> |

**LEVELS**  
**JAN**  
**JANTX**  
**JANTXV**

### ABSOLUTE MAXIMUM RATINGS ( $T_C = +25^\circ\text{C}$ unless otherwise noted)

| Parameters / Test Conditions                                                                | Symbol          | Value                                      | Unit               |
|---------------------------------------------------------------------------------------------|-----------------|--------------------------------------------|--------------------|
| Peak Repetitive Reverse Voltage<br>1N6304 / R<br>1N6305 / R<br>1N6306 / R                   | $V_{RWM}$       | 50<br>100<br>150                           | V                  |
| Peak Working Reverse Voltage<br>1N6304 / R<br>1N6305 / R<br>1N6306 / R                      | $V_{RRM}$       | 50<br>100<br>150                           | V                  |
| Average Forward Current, $T_C = 100^\circ$                                                  | $I_F$           | 70                                         | A                  |
| Peak Surge Forward Current @ $t_p = 8.3\text{ms}$ , half sinewave, $T_C = 55^\circ\text{C}$ | $I_{FSM}$       | 800                                        | A                  |
| Thermal Resistance, Junction to Case                                                        | $R_{\theta JC}$ | 0.8                                        | $^\circ\text{C/W}$ |
| Operating Junction Temperature Range                                                        | $T_J$           | $-65^\circ\text{C}$ to $175^\circ\text{C}$ | $^\circ\text{C}$   |
| Storage Temperature Range                                                                   | $T_{stg}$       | $-65^\circ\text{C}$ to $175^\circ\text{C}$ | $^\circ\text{C}$   |



**DO-203AB (DO-5)**

### ELECTRICAL CHARACTERISTICS ( $T_A = +25^\circ\text{C}$ , unless otherwise noted)

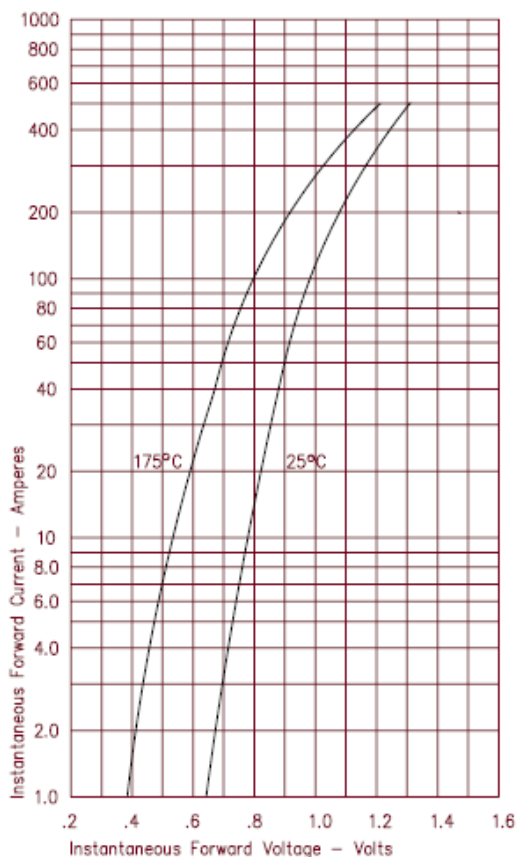
| Parameters / Test Conditions                                                                                                                                                                                               | Symbol   | Min. | Max.  | Unit          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|-------|---------------|
| Forward Voltage<br>$I_{FM} = 70\text{A}$ , $T_C = 25^\circ\text{C}^*$                                                                                                                                                      | $V_{FM}$ |      | 0.975 | V             |
| Forward Voltage<br>$I_{FM} = 150\text{A}$ , $T_C = 25^\circ\text{C}^*$                                                                                                                                                     | $V_{FM}$ |      | 1.18  | V             |
| Forward Voltage<br>$I_{FM} = 70\text{A}$ , $T_C = 150^\circ\text{C}^*$                                                                                                                                                     | $V_{FM}$ |      | 0.84  | V             |
| Reverse Current<br>$V_{RM} = 50\text{V}$ , $T_C = 25^\circ\text{C}$<br>$V_{RM} = 100\text{V}$ , $T_C = 25^\circ\text{C}$<br>$V_{RM} = 150\text{V}$ , $T_C = 25^\circ\text{C}$<br>1N6304 / R<br>1N6305 / R<br>1N6306 / R    | $I_{RM}$ |      | 25    | $\mu\text{A}$ |
| Reverse Current<br>$V_{RM} = 50\text{V}$ , $T_C = 150^\circ\text{C}$<br>$V_{RM} = 100\text{V}$ , $T_C = 150^\circ\text{C}$<br>$V_{RM} = 150\text{V}$ , $T_C = 150^\circ\text{C}$<br>1N6304 / R<br>1N6305 / R<br>1N6306 / R | $I_{RM}$ |      | 30    | mA            |
| Reverse Recovery Time<br>$I_F = 0.5\text{A}$ , $I_R = 1\text{A}$                                                                                                                                                           | $T_{rr}$ |      | 50    | ns            |
| Reverse Recovery Time<br>$I_F = 70\text{A}$                                                                                                                                                                                | $T_{rr}$ |      | 60    | ns            |
| Capacitance Junction<br>$V_R = 10\text{V}$ , $f = 1\text{MHz}$ , $T_J = 25^\circ\text{C}$                                                                                                                                  | $C_J$    |      | 600   | pF            |

\* Pulse test: Pulse width 300  $\mu\text{sec}$ , Duty cycle 2%

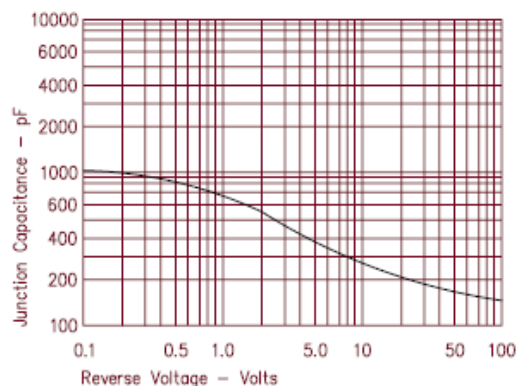
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### GRAPHS

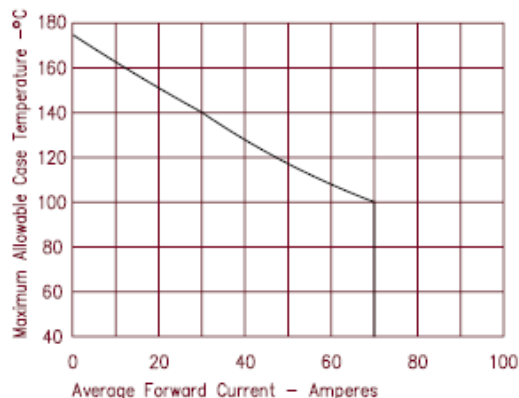
**FIGURE 1**  
**TYPICAL FORWARD CHARACTERISTICS**



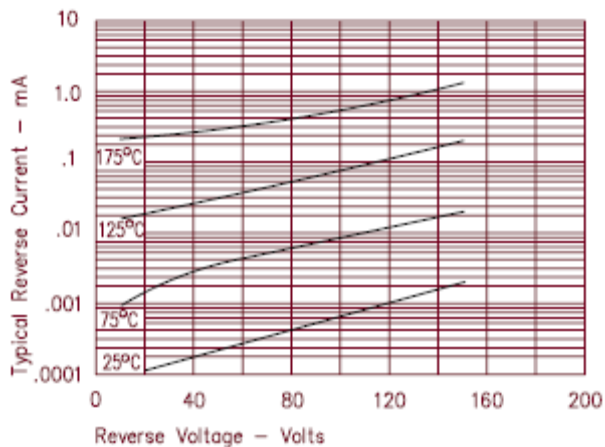
**FIGURE 3**  
**TYPICAL JUNCTION CAPACITANCE**



**FIGURE 4**  
**FORWARD CURRENT DERATING**

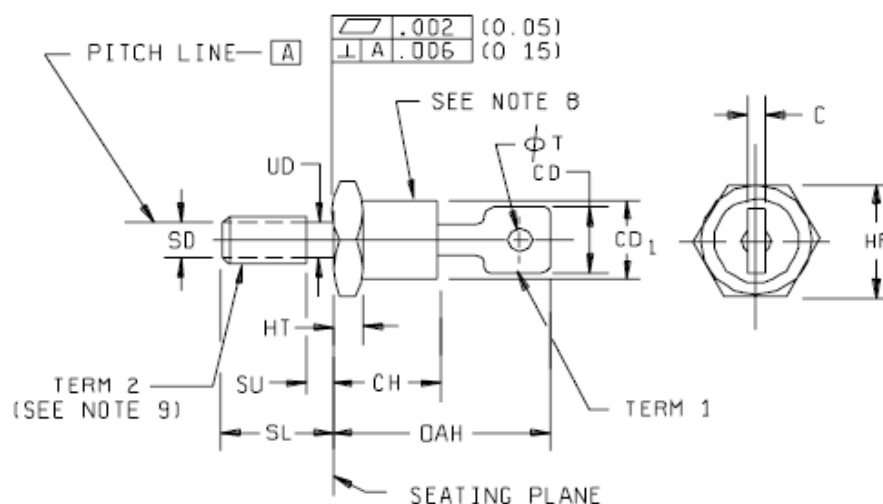


**FIGURE 2**  
**TYPICAL REVERSE CHARACTERISTICS**



## HIGH RELIABILITY ULTRA FAST RECOVERY RECTIFIER

### PACKAGE DIMENSIONS



#### NOTES:

- 1 Dimensions are in inches.
- 2 Millimeter equivalents are given for information only.
- 3 Units must not be damaged by torque of 30 inch-pound applied to .25-28 UNF-2B nut assembled on thread.
- 4 Length of incomplete or undercut threads of UD.
- 5 Maximum pitch diameter of plated threads shall be basic pitch diameter .2268 inch (5.761 mm).
- 6 A chamfer or undercut on one or both ends of the hex portion is optional; minimum base diameter at seating plane .60 inch (15.2 mm).
- 7 The angular orientation and peripheral configuration of terminal 1 is undefined.
- 8 Standard types shall have cathode connected to stud. Reverse types shall have anode connected to stud.
- 9 Term 2 threads in accordance with FED-STD-H28.
- 10 In accordance with ASME Y14.5M, diameters are equivalent to  $\phi$ x symbology.

| Ltr             | Dimensions |           |             |       | Notes |
|-----------------|------------|-----------|-------------|-------|-------|
|                 | Inches     |           | Millimeters |       |       |
|                 | Min        | Max       | Min         | Max   |       |
| CD              |            | .375      |             | 9.53  | 7     |
| C               |            | .080      |             | 2.03  |       |
| HF              | .669       | .688      | 16.99       | 17.48 |       |
| HT              | .115       | .200      | 2.92        | 5.08  |       |
| CH              |            | .450      |             | 11.43 |       |
| OAH             | .750       | 1.00<br>0 | 19.05       | 25.40 |       |
| SL              | .422       | .453      | 10.72       | 11.51 |       |
| SU              |            | .090      |             | 2.29  | 4     |
| CD <sub>1</sub> |            | .667      |             | 16.94 |       |
| SD              |            |           |             |       | 5     |
| UD              | .220       | .249      | 5.59        | 6.32  |       |
| ØT              | .140       | .175      | 3.56        | 4.45  |       |

#### Physical dimensions (DO-203AB)