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## 15 A, 600 V, Ultrafast Diode

The RURP1560 is an ultrafast diode with low forward voltage drop. This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power switching applications. It is specially suited for use in switching power supplies and industrial application.

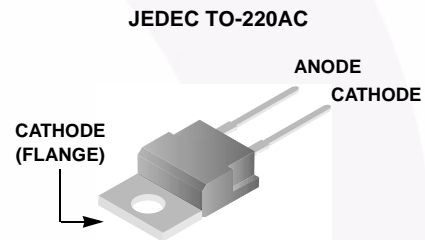
### Features

- Ultrafast Recovery  $t_{rr} = 60$  ns (@  $I_F = 15$  A)
- Max Forward Voltage,  $V_F = 1.5$  V (@  $T_C = 25^\circ\text{C}$ )
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

### Applications

- Switching Power Supply
- Power Switching Circuits
- General Purpose

### Packaging



### Ordering Information

| PART NUMBER | PACKAGE     | BRAND    |
|-------------|-------------|----------|
| RURP1560    | TO-220AC-2L | RURP1560 |

NOTE: When ordering, use the entire part number

### Symbol



### Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ , Unless Otherwise Specified

|  | RURP1560   | UNIT             |
|--|------------|------------------|
| Peak Repetitive Reverse Voltage . . . . . $V_{RRM}$                                      | 600        | V                |
| Working Peak Reverse Voltage . . . . . $V_{RWM}$   | 600        | V                |
| DC Blocking Voltage . . . . . $V_R$  | 600        | V                |
| Average Rectified Forward Current . . . . . $I_{F(AV)}$<br>( $T_C = 145^\circ\text{C}$ ) | 15         | A                |
| Repetitive Peak Surge Current . . . . . $I_{FRM}$<br>(Square Wave 20kHz)                 | 30         | A                |
| Nonrepetitive Peak Surge Current . . . . . $I_{FSM}$<br>(Halfwave 1 Phase 60Hz)          | 200        | A                |
| Maximum Power Dissipation . . . . . $P_D$  | 100        | W                |
| Avalanche Energy (See Figures 7 and 8) . . . . . $E_{AVL}$                               | 20         | mJ               |
| Operating and Storage Temperature . . . . . $T_{STG}, T_J$                               | -55 to 175 | $^\circ\text{C}$ |

# RURP1560

## Electrical Specifications $T_C = 25^\circ\text{C}$ , Unless Otherwise Specified

| SYMBOL          | TEST CONDITION  | RURP1560 |     |     | UNIT                      |
|-----------------|---|----------|-----|-----|---------------------------|
|                 |   | MIN      | TYP | MAX |                           |
| $V_F$           | $I_F = 15\text{ A}$                                     | -        | -   | 1.5 | V                         |
|                 | $I_F = 15\text{ A}, T_C = 150^\circ\text{C}$            | -        | -   | 1.2 | V                         |
| $I_R$           | $V_R = 600\text{ V}$                                    | -        | -   | 100 | $\mu\text{A}$             |
|                 | $V_R = 600\text{ V}, T_C = 150^\circ\text{C}$           | -        | -   | 500 | $\mu\text{A}$             |
| $t_{rr}$        | $I_F = 1\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$  | -        | -   | 55  | ns                        |
|                 | $I_F = 15\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$ | -        | -   | 60  | ns                        |
| $t_a$           | $I_F = 15\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$ | -        | 30  | -   | ns                        |
| $t_b$           | $I_F = 15\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$ | -        | 20  | -   | ns                        |
| $R_{\theta JC}$ |   | -        | -   | 1.5 | $^\circ\text{C}/\text{W}$ |

### DEFINITIONS

$V_F$  = Instantaneous forward voltage (pw = 300 $\mu\text{s}$ , D = 2%).

$I_R$  = Instantaneous reverse current.

$T_{rr}$  = Reverse recovery time at  $dI_F/dt = 100\text{ A}/\mu\text{s}$  (See Figure 6), summation of  $t_a + t_b$ .

$t_a$  = Time to reach peak reverse current at  $dI_F/dt = 100\text{ A}/\mu\text{s}$  (See Figure 6).

$t_b$  = Time from peak  $I_{RM}$  to projected zero crossing of  $I_{RM}$  based on a straight line from peak  $I_{RM}$  through 25% of  $I_{RM}$  (See Figure 6).

$R_{\theta JC}$  = Thermal resistance junction to case.

pw = pulse width.

D = duty cycle.

## Typical Performance Curves

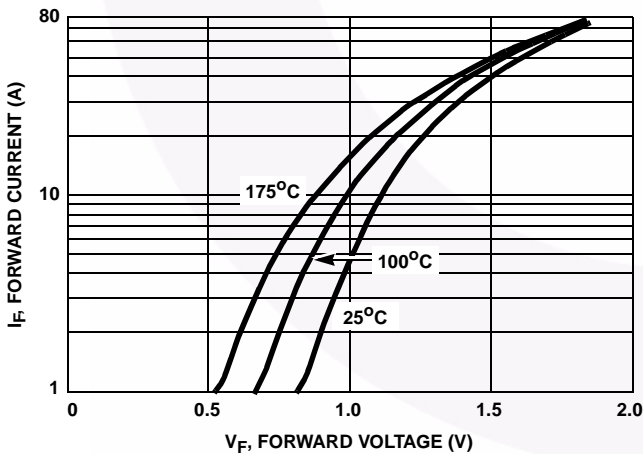


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

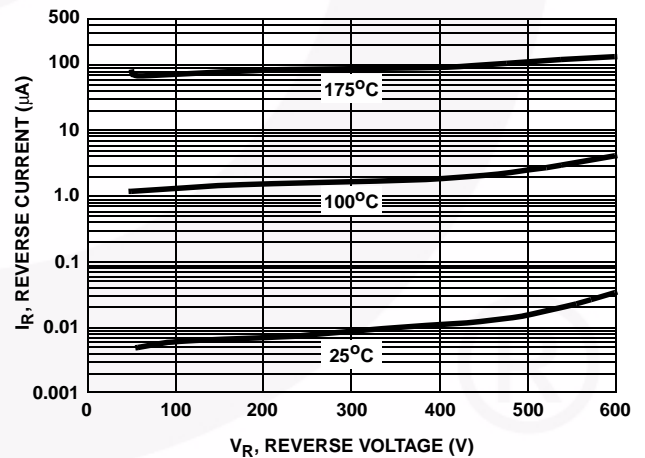


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

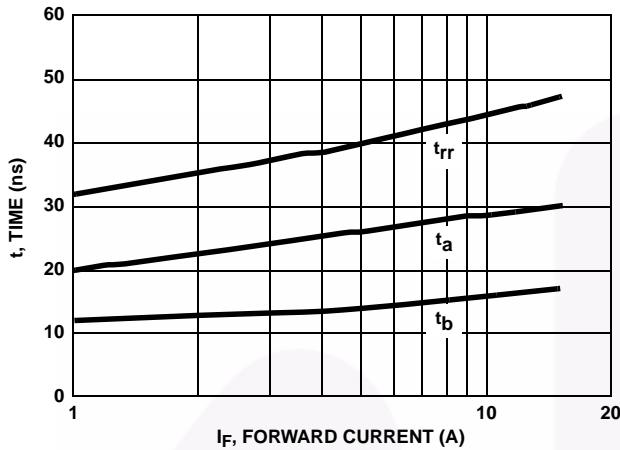


FIGURE 3.  $t_{rr}$ ,  $t_a$  AND  $t_b$  CURVES vs FORWARD CURRENT

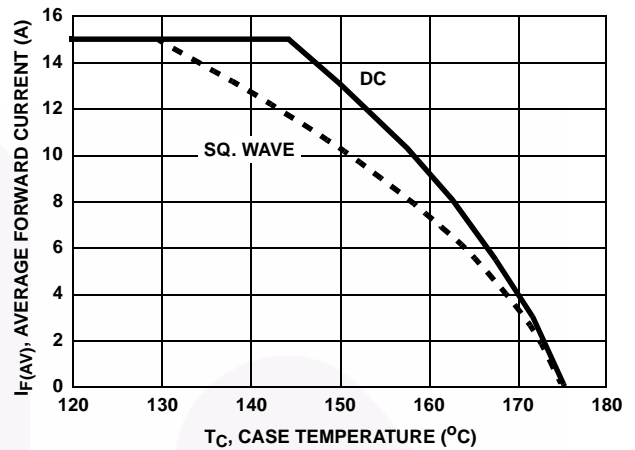


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

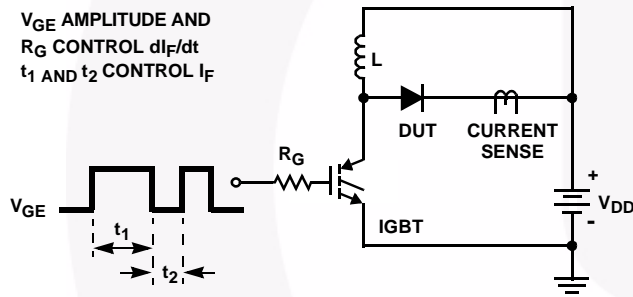


FIGURE 5.  $t_{rr}$  TEST CIRCUIT

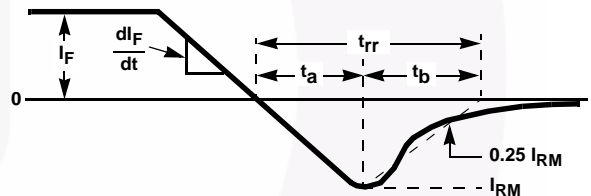


FIGURE 6.  $t_{rr}$  WAVEFORMS AND DEFINITIONS

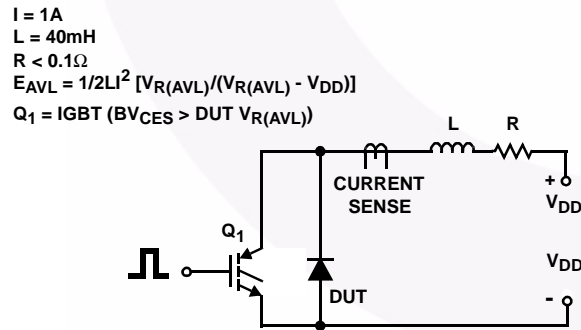


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

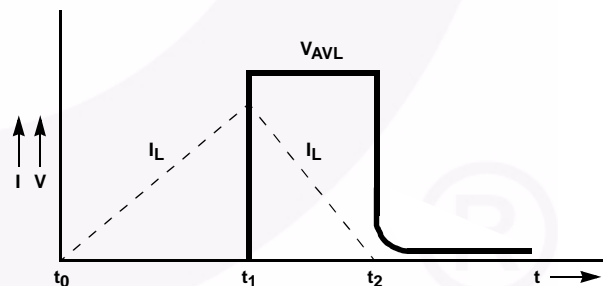





FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS





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