HARRIS SEMICONDUCTOR

# A315 Series

December 1993

## 3A, 50V - 200V Ultrafast Diodes

### Features

- **Glass Passivated Junction**
- **Ultra-Fast Recovery Times**
- **Low Forward Voltage Drop, High-Current Capability**
- **Low Leakage Current**
- **High Surge Current Capability**

### Description

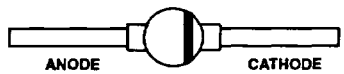
The A315A, A315B, A315F, and A315G are ultra-fast recovery silicon rectifiers ($t_{RR}$ = 35ns max.) featuring low forward voltage drop, high-current capability. They use glass passivated epitaxial construction.

These rectifiers are intended for TV deflection, inverter, high-frequency power supplies, energy recovery, and output rectification.

These types are supplied in unitized-glass hermetically-sealed AL-4 package.

### Package

AL-4
TOP VIEW




### Symbol

**Absolute Maximum Ratings** Supply Frequency of 60Hz, Resistive or Inductive Loads (Note 1)

| | | A315F | A315A | A315G | A315B | UNITS |
|---|---|---|---|---|---|---|
| Maximum Peak Repetitive Reverse Voltage | $V_{RRM}$ | 50 | 100 | 150 | 200 | V |
| Maximum RMS Input (Supply) Voltage | $V_{RMS}$ | 35 | 70 | 105 | 105 | V |
| Maximum DC Reverse (Blocking) Voltage | $V_{R(DC)}$ | 50 | 100 | 150 | 200 | V |
| Maximum Average Forward Current Lead Length = 0.375 in. (9.5mm); $T_A$ = 55°C | $I_O$ | 3 | 3 | 3 | 3 | A |
| Maximum Peak Surge (Non-Repetitive) Forward Current For 8.3ms Half Sine Wave, Superimposed on Rated Load, $T_L$ = 55°C | $I_{FSM}$ | 135 | 135 | 135 | 135 | A |
| Operating Junction and Storage Temperature | $T_J$, $T_{STG}$ | -65 to +175 | -65 to +175 | -65 to +175 | -65 to +175 | °C |

NOTE:

1. For capacitive load derate current by 20%.

Copyright © Harris Corporation 1993

File Number **2163.1**

**Electrical Specifications** $T_A$ = +25°C, Unless Otherwise Specified

| PARAMETERS | SYMBOL | LIMITS FOR ALL TYPES | | | UNITS |
|---|---|---|---|---|---|
| | | MIN | TYP | MAX | |
| Maximum Instantaneous Forward-Voltage Drop<br>At 3A | $V_F$ | - | - | 0.95 | V |
| Maximum Reverse Current<br>At Maximum DC Reverse (Blocking) Voltage, $T_A$ = +25°C | $I_R$ | - | - | 3 | µA |
| At Maximum DC Reverse (Blocking) Voltage, $T_A$ = +150°C | $I_R$ | - | - | 50 | µA |
| Maximum Reverse Recovery Time<br>At $I_F$ = 0.5A, $I_R$ = 1A, $I_{RR}$ = 0.25A | $t_{RR}$ | - | - | 35 | ns |
| Typical Junction Capacitance<br>At Frequency = 1MHz and Applied Reverse Voltage = 4V | $C_J$ | - | 100 | - | pF |

## *Typical Performance Curves*

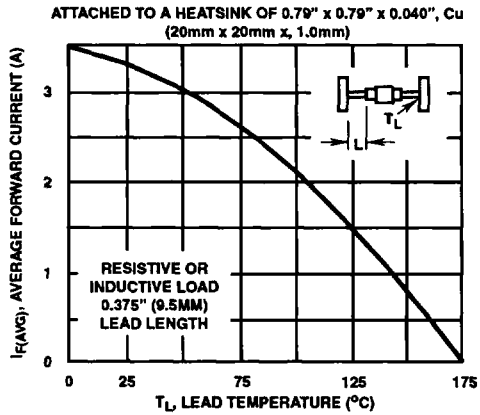



FIGURE 1. MAXIMUM AVERAGE FORWARD OUTPUT CURRENT CHARACTERISTIC

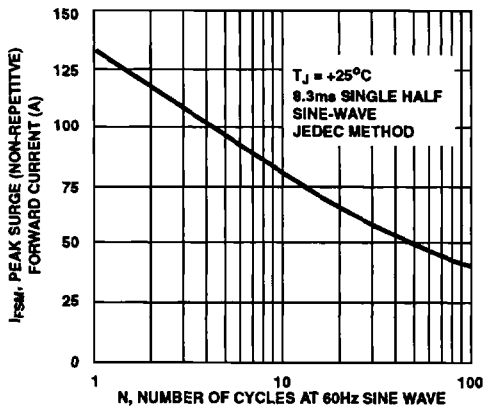



FIGURE 2. MAXIMUM PEAK SURGE (NON-REPETITIVE) FORWARD CURRENT CHARACTERISTIC

## Typical Performance Curves (Continued)

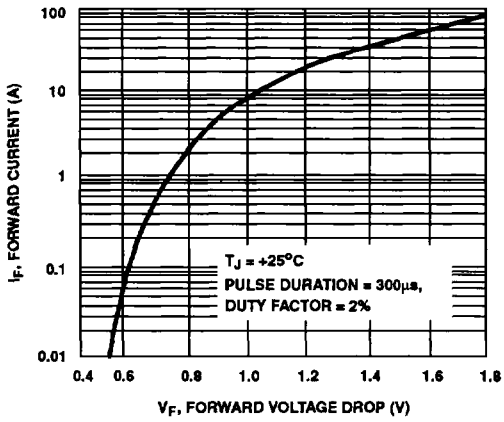



FIGURE 3. TYPICAL INSTANTANEOUS FORWARD CURRENT CHARACTERISTIC

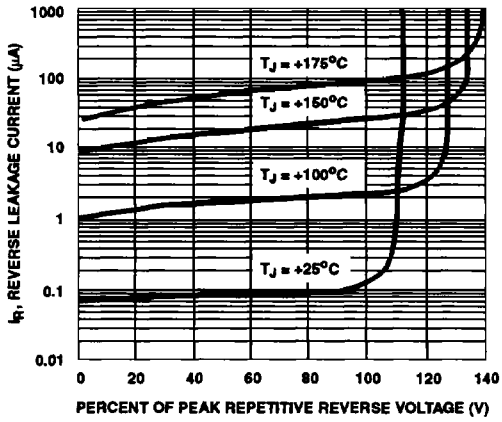



FIGURE 4. TYPICAL REVERSE LEAKAGE CURRENT CHARACTERISTICS

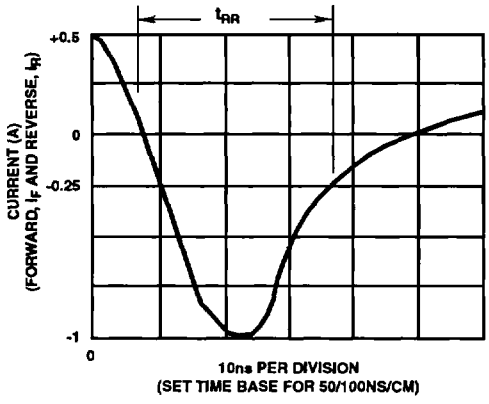



FIGURE 5. REVERSE-RECOVERY TIME WAVEFORM

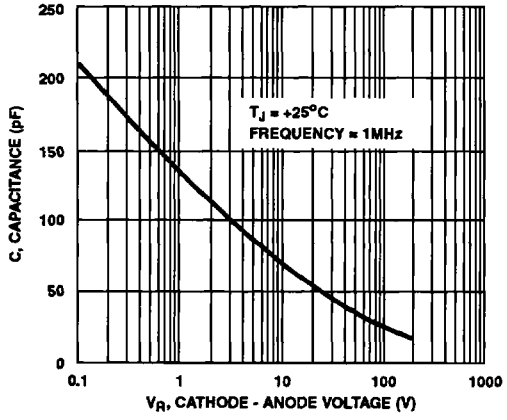
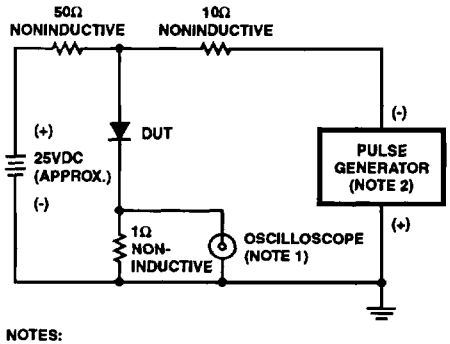



FIGURE 6. TYPICAL JUNCTION CAPACITANCE CHARACTERISTIC




NOTES:
1. RISE TIME = 7ns MAX., INPUT IMPEDANCE = 1MΩ, 22pF
2. RISE TIME = 10ns MAX., SOURCE IMPEDANCE = 50Ω

FIGURE 7. REVERSE-RECOVERY TIME TEST CIRCUIT