

3469674 FAIRCHILD SEMICONDUCTOR

84D 27478 D

**FAIRCHILD**

A Schlumberger Company

**1N658/FDLL658**

General Purpose Diodes

T-01-09

- BV... 120 V (MIN) @ 100  $\mu$ A
- V<sub>F</sub>... 1.0 V (MAX) @ 100 mA

**PACKAGES**

1N658 DO-35  
FDLL658 LL-34

**ABSOLUTE MAXIMUM RATINGS (Note 1)**

**Temperatures**

|  |                 |
|--|-----------------|
| Storage Temperature Range              | -65°C to +200°C |
| Maximum Operating Junction Temperature | +175°C          |
| Lead Temperature                       | +200°C          |

If you need this device in the SOT package, an electrical equivalent is available. See FDSO1400 family.

**Power Dissipation (Note 2)**

|   |            |
|---|------------|
| Maximum Total Dissipation at 25°C Ambient | 500 mW     |
| Linear Derating Factor (from 25°C)        | 3.33 mW/°C |

**Maximum Voltage and Currents**

|                        |                              |        |
|------------------------|------------------------------|--------|
| WIV                    | Working Inverse Voltage      | 100 V  |
| I <sub>O</sub>         | Average Rectified Current    | 200 mA |
| I <sub>F</sub>         | Forward Current Steady State | 500 mA |
| I <sub>F</sub> (surge) | Peak Forward Surge Current   |        |
|                        | Pulse Width = 1.0s           | 1.0 A  |
|                        | Pulse Width = 1.0 $\mu$ s    | 4.0 A  |

**ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)**

| SYMBOL          | CHARACTERISTIC        | MIN | MAX      | UNITS         | TEST CONDITIONS   |
|-----------------|-----------------------|-----|----------|---------------|---|
| V <sub>F</sub>  | Forward Voltage       |     | 1.0      | V             | I <sub>F</sub> = 100 mA   |
| I <sub>R</sub>  | Reverse Current       |     | 50<br>25 | nA<br>$\mu$ A | V <sub>R</sub> = 50 V<br>V <sub>R</sub> = 60 V, T <sub>A</sub> = 150°C  |
| BV              | Breakdown Voltage     | 120 |          | V             | I <sub>R</sub> = 100 $\mu$ A  |
| t <sub>rr</sub> | Reverse Recovery Time |     | 300      | ns            | V <sub>R</sub> = 40 V, I <sub>F</sub> = 5.0 mA,<br>R <sub>L</sub> = 2.0 k $\Omega$ , C <sub>L</sub> = 10 pF,<br>Recovery to 80 k $\Omega$ |

**NOTES:**

1. The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
3. For product family characteristic curves, refer to Chapter 4, D1.



**1N659/660/661**  
**FDLL659/660/661**  
 General Purpose Diodes

T-01-09

- $V_F \dots 1.0 \text{ V (MAX) @ } 6.0 \text{ mA}$
- $t_{rr} \dots 300 \text{ ns (MAX)}$

**ABSOLUTE MAXIMUM RATINGS (Note 1)**

**Temperatures**

|  |                 |
|--|-----------------|
| Storage Temperature Range              | -65°C to +200°C |
| Maximum Operating Junction Temperature | +175°C          |
| Lead Temperature                       | +260°C          |

**Power Dissipation (Notes 2)**

|   |            |
|---|------------|
| Maximum Total Dissipation at 25°C Ambient | 500 mW     |
| Linear Derating Factor (from 25°C)        | 3.33 mW/°C |

**Maximum Voltage and Currents**

|                       |                              | 1N659  | 1N660  | 1N661  |
|-----------------------|------------------------------|--------|--------|--------|
| WIV                   | Working Inverse Voltage      | 50 V   | 100 V  | 200 V  |
| $I_O$                 | Average Rectified Current    | 200 mA | 200 mA | 200 mA |
| $I_F$                 | Forward Current Steady State | 500 mA | 500 mA | 500 mA |
| $I_{f(\text{surge})}$ | Peak Forward Surge Current   |        |        |        |
|                       | Pulse Width = 1.0s           | 1.0 A  | 1.0 A  | 1.0 A  |
|                       | Pulse Width = 1.0 μs         | 4.0 A  | 4.0 A  | 4.0 A  |

**PACKAGES**

|         |       |
|---------|-------|
| 1N659   | DO-35 |
| 1N660   | DO-35 |
| 1N661   | DO-35 |
| FDLL659 | LL-34 |
| FDLL660 | LL-34 |
| FDLL661 | LL-34 |

If you need this device in the SOT package, an electrical equivalent is available. See FDSO1200 family.



**ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)**

| SYMBOL   | CHARACTERISTIC        | 1N659 |     | 1N660 |     | 1N661 |     | UNITS | TEST CONDITIONS  |
|----------|-----------------------|-------|-----|-------|-----|-------|-----|-------|--|
|          |                       | MIN   | MAX | MIN   | MAX | MIN   | MAX |       |  |
| $V_F$    | Forward Voltage       |       | 1.0 |       | 1.0 |       | 1.0 | V     | $I_F = 6.0 \text{ mA}$   |
| $I_R$    | Reverse Current       |       | 5.0 |       | 5.0 |       | 10  | μA    | $V_R = 50 \text{ V}$<br>$V_R = 100 \text{ V}$<br>$V_R = 200 \text{ V}$<br>$V_R = 50 \text{ V, } T_A = 100^\circ\text{C}$<br>$V_R = 100 \text{ V, } T_A = 100^\circ\text{C}$<br>$V_R = 200 \text{ V, } T_A = 100^\circ\text{C}$ |
| BV       | Breakdown Voltage     | 60    |     | 120   |     | 240   |     | V     | $I_R = 100 \text{ μA}$   |
| $t_{rr}$ | Reverse Recovery Time |       | 300 |       | 300 |       | 300 | ns    | $V_r = 35 \text{ V, } I_f = 30 \text{ mA, } R_L = 2.0 \text{ k}\Omega$<br>$C_L = 10 \text{ pF, Recovery to } 400 \text{ k}\Omega$  |

**NOTES:**

1. The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
3. For product family characteristic curves, refer to Chapter 4, D4 for 1N659, 4, D1 for 1N660 and 1N661.



A Schlumberger Company

**1N746 through 1N759** T-11-11  
500 mW Silicon Linear Diodes

**ABSOLUTE MAXIMUM RATINGS (Note 1)**

**Temperatures**

|  |                 |
|--|-----------------|
| Storage Temperature Range              | -65°C to +200°C |
| Maximum Junction Operating Temperature | +175°C          |
| Lead Temperature                       | +260°C          |

**PACKAGES**

All Devices DO-35

**Power Dissipation (Note 2)**

|   |            |
|---|------------|
| Maximum Total Power Dissipation at 25°C Ambient | 500 mW     |
| Linear Power Derating Factor (from 25°C)        | 3.33 mW/°C |

**ELECTRICAL CHARACTERISTICS (25°C Ambient unless otherwise noted)**

| SYMBOL | Z <sub>Z</sub> | V <sub>Z</sub> | I <sub>R</sub>  |   | TC     |   |        |
|--------|----------------|----------------|---|---|--------|---|--------|
|        |                |                | Maximum Zener Impedance (Note 4) (I <sub>Z</sub> = 20 mA) | Nominal Zener Voltage (Note 3) (I <sub>Z</sub> = 20 mA) |        | Maximum Reverse Current (V <sub>R</sub> = 1.0V) |        |
|        |                |                |   |   |        | @25°C   | @150°C |
| UNIT   | Ω              | V              | μA  | μA  | %/°C   |   |        |
| IN746  | 28.0           | 3.3            | 10.0  | 30.0  | -0.070 |   |        |
| IN747  | 24.0           | 3.6            | 10.0  | 30.0  | -0.065 |   |        |
| IN748  | 23.0           | 3.9            | 10.0  | 30.0  | -0.060 |   |        |
| IN749  | 22.0           | 4.3            | 2.0   | 30.0  | -0.055 |   |        |
| IN750  | 19.0           | 4.7            | 2.0   | 30.0  | -0.043 |   |        |
| IN751  | 17.0           | 5.1            | 1.0   | 20.0  | ±0.030 |   |        |
| IN752  | 11.0           | 5.6            | 1.0   | 20.0  | ±0.028 |   |        |
| IN753  | 7.0            | 6.2            | 0.1   | 20.0  | +0.045 |   |        |
| IN754  | 5.0            | 6.8            | 0.1   | 20.0  | +0.050 |   |        |
| IN755  | 6.0            | 7.5            | 0.1   | 20.0  | +0.058 |   |        |
| IN756  | 8.0            | 8.2            | 0.1   | 20.0  | +0.062 |   |        |
| IN757  | 10.0           | 9.1            | 0.1   | 20.0  | +0.068 |   |        |
| IN758  | 17.0           | 10.0           | 0.1   | 20.0  | +0.075 |   |        |
| IN759  | 30.0           | 12.0           | 0.1   | 20.0  | +0.077 |   |        |

**NOTES:**

1. These ratings are limiting values above which the serviceability of the diode may be impaired.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty-cycle operation.
3. Type numbers without suffix have ±10% tolerance on nominal V<sub>Z</sub>. Type numbers with suffix A have ±5% tolerance on nominal V<sub>Z</sub>.
4. The Zener impedance Z<sub>Z</sub> is derived by superimposing a 60 Hz 2 mA (RMS) signal on the 20 mA I<sub>Z</sub> test current.
5. For product family characteristic curves, refer to Chapter 4, D13

**FAIRCHILD**

A Schlumberger Company

**1N/FDLL914/A/B/916/A/B**  
**1N/FDLL4148/4149/4446**  
**1N/FDLL4447/4448/4449**  
 High Conductance Ultra Fast  
 Switching Diodes T-03-09

- $t_{rr}$ ... 4.0 ns (MAX)
- BV... 100 V (MIN)

**ABSOLUTE MAXIMUM RATINGS (Note 1)**

**Temperatures**

Storage Temperature Range  
 Max Junction Operating Temperature  
 Lead Temperature

-65° to +200°C  
 +175°C  
 +260°C

**Power Dissipation (Note 2)**

Maximum Total Dissipation at 25°C  
 Linear Derating Factor (from 25°C)

500 mW  
 3.33 mW/°C

**Maximum Voltage and Currents**

WIV Working Inverse Voltage  
 $I_O$  Average Rectified Current  
 $I_f$  DC Forward Current  
 $i_f$  Recurrent Peak Forward Current  
 $i_f(\text{surge})$  Peak Forward Surge Current  
 Pulse Width = 1.0 s  
 Pulse Width = 1.0  $\mu$ s

75 V  
 200 mA  
 300 mA  
 400 mA  
 1.0 A  
 4.0 A

**PACKAGES**

|          |       |
|----------|-------|
| 1N914    | DO-35 |
| 1N916    | DO-35 |
| 1N914A   | DO-35 |
| 1N914B   | DO-35 |
| 1N916A   | DO-35 |
| 1N916B   | DO-35 |
| 1N4148   | DO-35 |
| 1N4149   | DO-35 |
| 1N4446   | DO-35 |
| 1N4447   | DO-35 |
| 1N4448   | DO-35 |
| 1N4449   | DO-35 |
| FDLL914  | LL-34 |
| FDLL916  | LL-34 |
| FDLL914A | LL-34 |
| FDLL914B | LL-34 |
| FDLL916A | LL-34 |
| FDLL916B | LL-34 |
| FDLL4148 | LL-34 |
| FDLL4149 | LL-34 |
| FDLL4446 | LL-34 |
| FDLL4447 | LL-34 |
| FDLL4448 | LL-34 |
| FDLL4449 | LL-34 |

If you need this device in the SOT package, an electrical equivalent is available. See FDSO1200 family.

**ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)**

| SYMBOL   | CHARACTERISTIC        | MIN       | MAX                                      | UNITS                      | TEST CONDITIONS   |
|----------|-----------------------|-----------|--|----------------------------|---|
| BV       | Breakdown Voltage     | 100<br>75 |  | V<br>V                     | $I_R = 100 \mu A$<br>$I_R = 5.0 \mu A$  |
| $I_R$    | Reverse Current       |           | 25<br>50<br>5.0                          | nA<br>$\mu A$<br>$\mu A$   | $V_R = 20 V$<br>$V_R = 20 V, T_A = 150^\circ C$<br>$V_R = 75 V$                                       |
| $V_F$    | Forward Voltage       |           | 0.62<br>0.63<br>1.0<br>1.0<br>1.0<br>1.0 | V<br>V<br>V<br>V<br>V<br>V | $I_F = 5.0 mA$<br>$I_F = 5.0 mA$<br>$I_F = 10 mA$<br>$I_F = 20 mA$<br>$I_F = 30 mA$<br>$I_F = 100 mA$ |
| $t_{rr}$ | Reverse Recovery Time |           | 4.0                                      | ns                         | $I_f = 10 mA, V_r = 6.0 V,$<br>$R_L = 100 \Omega \text{ Rec. to } 1.0 mA$                             |

**NOTES:**

1. Maximum ratings are limiting values above which life or satisfactory performance may be impaired.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty-cycle operation.
3. For family characteristic curves, refer to Chapter 4, D4.

1N/FDLL914/A/B/916/A/B  
 1N/FDLL4148/4149/4446  
 1N/FDLL4447/44448/4449

T.03-09

## ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)

| SYMBOL   | CHARACTERISTIC                |   | MIN | MAX | UNITS | TEST CONDITIONS  |
|----------|-------------------------------|---|-----|-----|-------|--|
| C        | Capacitance                   | 1N914, 1N914A<br>1N914B, 1N4148<br>1N4446, 1N4447 |     | 4.0 | pF    | $V_R = 0, f = 1 \text{ MHz}$   |
|          |                               | 1N916, 1N916A<br>1N916B, 1N4149<br>1N4448, 1N4449 |     | 2.0 | pF    | $V_R = 0, f = 1 \text{ MHz}$   |
| $V_{fr}$ | Peak Forward Recovery Voltage | 1N914, 1N916<br>1N914B, 1N916B<br>1N4448, 1N4449  |     | 2.5 | V     | 50 mA Peak Square Wave,<br>0.1 $\mu\text{s}$ pulse width,<br>5 kHz - 100 kHz rep. rate |
| RE       | Rectification Efficiency      | 1N914A, 1N914B<br>1N916A, 1N916B                  | 45  |     | %     | 2.0 V rms, $f = 100 \text{ MHz}$   |

**FAIRCHILD**

A Schlumberger Company

**1N957 through 1N973** T-11-11

500 mW Silicon Planar  
Zener Diodes

**ABSOLUTE MAXIMUM RATINGS (Note 1)**

**Temperatures**

|  |                 |
|--|-----------------|
| Storage Temperature Range              | -65°C to +200°C |
| Maximum Junction Operating Temperature | +175°C          |
| Lead Temperature                       | +260°C          |

**Power Dissipation (Note 2)**

|   |            |
|---|------------|
| Maximum Total Power Dissipation at 25°C Ambient | 500 mW     |
| Linear Power Derating Factor (from 25°C)        | 3.33 mW/°C |

**PACKAGES**

All Devices DO-35

**ELECTRICAL CHARACTERISTICS (25°C Ambient)**

| SYMBOL | V <sub>Z</sub>                                     | Z <sub>Z</sub>                                       | I <sub>ZT</sub> | Z <sub>ZK</sub>   | I <sub>ZK</sub> | I <sub>R</sub>                           | V <sub>RT</sub>                |                                |                               | TC  | I <sub>ZM</sub>                |
|--------|--|--|-----------------|---|-----------------|--|--------------------------------|--------------------------------|-------------------------------|---|--------------------------------|
|        | Nominal Zener Voltage (Note 3)<br>@I <sub>ZT</sub> | Maximum Zener Impedance (Note 4)<br>@I <sub>ZT</sub> | Test Current    | Maximum Zener Knee Impedance (Note 4)<br>@I <sub>ZK</sub> | Test Current    | Maximum Reverse Current @V <sub>RT</sub> | Test Voltage                   |                                |                               | Typical Temperature Coefficient of V <sub>Z</sub> | Maximum Zener Current (Note 5) |
|        |  |  |                 |   |                 |  | ± 20% V <sub>Z</sub> Tolerance | ± 10% V <sub>Z</sub> Tolerance | ± 5% V <sub>Z</sub> Tolerance |   |                                |
| UNIT   | V  | Ω  | mA              | Ω   | mA              | μA                                       | V                              | V                              | V                             | %/°C  | mA                             |
| 1N957  | 6.8  | 4.5  | 18.5            | 700   | 1.0             | 150                                      | 4.4                            | 4.9                            | 5.2                           | +0.050  | 47                             |
| 1N958  | 7.5  | 5.5  | 16.5            | 700   | 0.5             | 75                                       | 4.8                            | 5.4                            | 5.7                           | +0.058  | 42                             |
| 1N959  | 8.2  | 6.5  | 15.0            | 700   | 0.5             | 50                                       | 5.2                            | 5.9                            | 6.2                           | +0.062  | 38                             |
| 1N960  | 9.1  | 7.5  | 14.0            | 700   | 0.5             | 25                                       | 5.8                            | 6.6                            | 6.9                           | +0.068  | 35                             |
| 1N961  | 10.0   | 8.5  | 12.5            | 700   | 0.25            | 10                                       | 6.4                            | 7.2                            | 7.6                           | +0.072  | 32                             |
| 1N962  | 11.0   | 9.5  | 11.5            | 700   | 0.25            | 5.0                                      | 7.0                            | 8.0                            | 8.4                           | +0.073  | 28                             |
| 1N963  | 12.0   | 11.5   | 10.5            | 700   | 0.25            | 5.0                                      | 7.6                            | 8.6                            | 9.1                           | +0.076  | 26                             |
| 1N964  | 13.0   | 13.0   | 9.5             | 700   | 0.25            | 5.0                                      | 8.3                            | 9.4                            | 9.9                           | +0.079  | 24                             |
| 1N965  | 15.0   | 16.0   | 8.5             | 700   | 0.25            | 5.0                                      | 9.6                            | 10.8                           | 11.4                          | +0.082  | 21                             |
| 1N966  | 16.0   | 17.0   | 7.8             | 700   | 0.25            | 5.0                                      | 10.2                           | 11.5                           | 12.2                          | +0.083  | 19                             |
| 1N967  | 18.0   | 21.0   | 7.0             | 750   | 0.25            | 5.0                                      | 11.5                           | 13.0                           | 13.7                          | +0.085  | 17                             |
| 1N968  | 20.0   | 25.0   | 6.2             | 750   | 0.25            | 5.0                                      | 12.8                           | 14.4                           | 15.2                          | +0.086  | 15                             |
| 1N969  | 22.0   | 29.0   | 5.6             | 750   | 0.25            | 5.0                                      | 14.0                           | 15.8                           | 16.7                          | +0.087  | 14                             |
| 1N970  | 24.0   | 33.0   | 5.2             | 750   | 0.25            | 5.0                                      | 15.4                           | 17.3                           | 18.2                          | +0.088  | 13                             |
| 1N971  | 27.0   | 41.0   | 4.6             | 750   | 0.25            | 5.0                                      | 17.2                           | 19.4                           | 20.6                          | +0.090  | 11                             |
| 1N972  | 30.0   | 49.0   | 4.2             | 1000  | 0.25            | 5.0                                      | 19.2                           | 21.6                           | 22.8                          | +0.091  | 10                             |
| 1N973  | 33.0   | 58.0   | 3.8             | 1000  | 0.25            | 5.0                                      | 21.1                           | 23.8                           | 25.1                          | ±0.092  | 9.2                            |

**NOTES**

- These ratings are limiting values above which the serviceability of the diode may be impaired.
- These are steady state limits. The factory should be consulted on applications involving pulsed or low duty-cycle operation.
- Type numbers without suffix have ± 20% tolerance on nominal V<sub>Z</sub>.  
Type numbers with suffix A have ± 10% tolerance on nominal V<sub>Z</sub>.  
Type numbers with suffix B have ± 5% tolerance on nominal V<sub>Z</sub>.
- The Zener impedances Z<sub>Z</sub> and Z<sub>ZK</sub> are derived by superimposing a 60 Hz signal on test currents I<sub>ZT</sub> and I<sub>ZK</sub>, having an RMS value of 10% of the d.c. value of I<sub>ZT</sub> and I<sub>ZK</sub> respectively.
- Maximum Zener Current (I<sub>ZM</sub>) is based on the maximum Zener voltage of a 20% tolerance unit.
- For product family characteristic curves, refer to Chapter 4, D13.

3469674 FAIRCHILD SEMICONDUCTOR

84D 27484 D1

**FAIRCHILD**

A Schlumberger Company

**1N3064/4305/4454 T-03-09**  
**FDLL3064/4305/4454**Ultra Fast Low  
Capacitance Diodes

- C...2.0 pF @  $V_R = 0$ ,  $f = 1.0$  MHz
- $t_{rr}$ ...4.0 ns @  $I_f = 10$  mA,  $I_r = 10$  mA,  $V_r = 1.0$  V
- BV...75 V (MIN)

**ABSOLUTE MAXIMUM RATINGS (Note 1)****Temperatures**

|                                    |                 |
|------------------------------------|-----------------|
| Storage Temperature Range          | -65°C to +200°C |
| Max Junction Operating Temperature | +175°C          |
| Lead Temperature                   | +260°C          |

**Power Dissipation (Note 2)**

|                                    |            |
|------------------------------------|------------|
| Maximum Total Dissipation at 25°C  | 500 mW     |
| Linear Derating Factor (from 25°C) | 3.33 mW/°C |

**Maximum Voltages and Currents**

|               |                                |        |
|---------------|--------------------------------|--------|
| WIV           | Working Inverse Voltage        | 50 V   |
| $I_O$         | Average Rectified Current      | 100 mA |
| $I_F$         | Forward Current Steady State   | 300 mA |
| $i_f$         | Recurrent Peak Forward Current | 400 mA |
| $i_f$ (surge) | Peak Forward Surge Current     |        |
|               | Pulse Width = 1.0 s            | 1.0 A  |
|               | Pulse Width = 1.0 $\mu$ s      | 4.0 A  |

**PACKAGES**

|          |       |
|----------|-------|
| 1N3064   | DO-35 |
| 1N4305   | DO-35 |
| 1N4454   | DO-35 |
| FDLL3064 | LL-34 |
| FDLL4305 | LL-34 |
| FDLL4454 | LL-34 |

If you need this device in the SOT package, an electrical equivalent is available. See FDSO1200 family.

**ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)**

| SYMBOL                  | CHARACTERISTIC                                   | MIN    | MAX   | UNITS   | TEST CONDITIONS  |
|-------------------------|--|--------|-------|---------|--|
| $V_F$                   | Forward Voltage                                  | 0.610  | 0.710 | V       | $I_F = 2.0$ mA<br>$I_F = 1.0$ mA<br>$I_F = 250$ $\mu$ A<br>$I_F = 10$ mA<br>$I_F = 10$ mA                          |
|                         |  | 0.550  | 0.650 | V       |  |
|                         |  | 0.505  | 0.575 | V       |  |
|                         |  |        | 1.0   | V       |  |
|                         |  |        | 0.70  | 0.85    |  |
|                         |  |        |       |         |  |
| $I_R$                   | Reverse Current                                  |        | 0.1   | $\mu$ A | $V_R = 50$ V<br>$V_R = 50$ V, $T_A = 150^\circ$ C  |
|                         |  |        | 100   | $\mu$ A |  |
| BV                      | Breakdown Voltage                                | 75     |       | V       | $I_R = 5.0$ $\mu$ A  |
| $t_{rr}$                | Reverse Recovery Time (Note 3)                   | 1N4305 | 2.0   | ns      | $I_f = 10$ mA, $V_r = 6.0$ V, $R_L = 100$ $\Omega$<br>$I_f = I_r = 10$ mA, $R_L = 100$ $\Omega$ ,<br>$V_r = 1.0$ V |
|                         |  | 1N3064 |       |         |  |
|                         |  | 1N4305 | 4.0   | ns      |  |
|                         |  | 1N4454 |       |         |  |
| C                       | Capacitance                                      |        | 2.0   | pF      | $V_R = 0$ , $f = 1.0$ MHz  |
| RE                      | Rectification Efficiency (Note 4)                | 45     |       | %       | $f = 1.0$ MHz  |
| $\Delta V_F / ^\circ$ C | Forward Voltage Temperature Coefficient (Note 5) |        | 3.0   | mV/°C   |  |

**NOTES:**

- The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
- These are steady state limits. The factory should be consulted on applications involving pulsed or low duty-cycle operation.
- Recovery to 1.0 mA.
- Rectification efficiency is defined as the ratio of dc load voltage to peak rf input voltage to the detector circuit, measured with 2.0 V rms input to the circuit. Load resistance 5.0  $\Omega$ , load capacitance 20 pF.
- This value for  $\Delta V_F / ^\circ$ C is a typical value not a minimum or maximum.
- For product family characteristic curves, refer to Chapter 4, D4.

**FAIRCHILD**

A Schlumberger Company

**1N3070/4938**

**FDLL3070/4938**

T-03-09

High Speed High  
Conductance Diodes

- BV... 200 V (MIN)
- I<sub>R</sub>... 100 nA (MAX)

**ABSOLUTE MAXIMUM RATINGS (Note 1)**

**Temperatures**

|                                    |                 |
|------------------------------------|-----------------|
| Storage Temperature Range          | -65°C to +200°C |
| Max Junction Operating Temperature | +175°C          |
| Lead Temperature                   | +260°C          |

**Power Dissipation (Note 2)**

|   |            |
|---|------------|
| Maximum Total Dissipation at 25°C Ambient | 500 mW     |
| Linear Derating Factor (from 25°C)        | 3.33 mW/°C |

**Maximum Voltage and Currents**

|                        |                                 |        |
|------------------------|---------------------------------|--------|
| WIV                    | Working Inverse Voltage         | 175 V  |
| I <sub>O</sub>         | Average Rectified Current       | 200 mA |
| I <sub>F</sub>         | Forward Current Steady State DC | 500 mA |
| i <sub>f</sub>         | Recurrent Peak Forward Current  | 600 mA |
| i <sub>f</sub> (surge) | Peak Forward Surge Current      |        |
|                        | Pulse Width = 1.0 s             | 1.0 A  |
|                        | Pulse Width = 1.0 μs            | 4.0 A  |

**PACKAGES**

|          |       |
|----------|-------|
| 1N3070   | DO-35 |
| 1N4938   | DO-35 |
| FDLL3070 | LL-34 |
| FDLL4938 | LL-34 |

If you need this device in the SOT package, an electrical equivalent is available. See FDSO1400 family.



**ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)**

| SYMBOL          | CHARACTERISTIC                    | MIN | MAX        | UNITS    | TEST CONDITIONS  |
|-----------------|-----------------------------------|-----|------------|----------|--|
| I <sub>R</sub>  | Reverse Current                   |     | 100<br>100 | nA<br>μA | V <sub>R</sub> = 175 V<br>V <sub>R</sub> = 175 V, T <sub>A</sub> = 150°C |
| BV              | Breakdown Voltage                 | 200 |            | V        | I <sub>R</sub> = 100 μA  |
| V <sub>F</sub>  | Forward Voltage                   |     | 1.0        | V        | I <sub>F</sub> = 100 mA  |
| C               | Capacitance                       |     | 5.0        | pF       | V <sub>R</sub> = 0, f = 1.0 MHz  |
| t <sub>rr</sub> | Reverse Recovery Time (Note 3)    |     | 50         | ns       | I <sub>F</sub> = I <sub>r</sub> = 30 mA, R <sub>L</sub> = 100Ω           |
| RE              | Rectification Efficiency (Note 4) | 35  |            | %        | f = 100 MHz  |

**NOTES:**

1. The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty-cycle operation.
3. Recovery to 1.0 mA.
4. Rectification efficiency is defined as the ratio of dc load voltage to peak rf input voltage to the detector circuit, measured with 2.0 V rms input to the circuit. Load resistance: 5.0 kΩ, load capacitance 20 pF.
5. 1N3070 and 1N4938 are electrically and mechanically identical.
6. For product family characteristic curves, refer to Chapter 4, D1.



**FAIRCHILD**

A Schlumberger Company

**1N3595/6099** T201-09

**FDLL3595/6099**  
High Conductance Low  
Leakage Diodes

- BV... 150 V (MIN) @ 100  $\mu$ A
- V<sub>F</sub>... 1.0 V @ 200 mA

**PACKAGES**

|          |       |
|----------|-------|
| 1N3595   | DO-35 |
| 1N6099   | DO-35 |
| FDLL3595 | LL-34 |
| FDLL6099 | LL-34 |

**ABSOLUTE MAXIMUM RATINGS (Note 1)**

**Temperatures**

|                                    |                 |
|------------------------------------|-----------------|
| Storage Temperature Range          | -65°C to +200°C |
| Max Junction Operating Temperature | +175°C          |
| Lead Temperature                   | +260°C          |

**Power Dissipation (Note 2)**

|   |            |
|---|------------|
| Maximum Total Dissipation at 25°C Ambient | 500 mW     |
| Linear Derating Factor (From 25°C)        | 3.33 mW/°C |

**Maximum Voltage and Currents**

|                        |                                 |        |
|------------------------|---------------------------------|--------|
| WIV                    | Working Inverse Voltage         | 125 V  |
| I <sub>O</sub>         | Average Rectified Current       | 200 mA |
| I <sub>F</sub>         | Forward Current Steady State    | 500 mA |
| I <sub>F</sub>         | Peak Repetitive Forward Current | 600 mA |
| i <sub>F</sub> (surge) | Peak Forward Surge Current      |        |
|                        | Pulse Width = 1.0 s             | 1.0 A  |
|                        | Pulse Width = 1.0 $\mu$ s       | 4.0 A  |

If you need this device in the SOT package, an electrical equivalent is available. See FDSO1500 family.

**ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)**

| SYMBOL          | CHARACTERISTIC        | MIN  | MAX  | UNITS   | TEST CONDITIONS   |
|-----------------|-----------------------|------|------|---------|---|
| V <sub>F</sub>  | Forward Voltage       | 0.83 | 1.0  | V       | I <sub>F</sub> = 200 mA   |
|                 |                       | 0.79 | 0.92 | V       | I <sub>F</sub> = 100 mA   |
|                 |                       | 0.75 | 0.88 | V       | I <sub>F</sub> = 50 mA  |
|                 |                       | 0.65 | 0.80 | V       | I <sub>F</sub> = 10 mA  |
|                 |                       | 0.60 | 0.75 | V       | I <sub>F</sub> = 5.0 mA   |
|                 |                       | 0.52 | 0.68 | V       | I <sub>F</sub> = 1.0 mA   |
| I <sub>R</sub>  | Reverse Current       |      | 1.0  | nA      | V <sub>R</sub> = 125 V  |
|                 |                       |      | 300  | nA      | V <sub>R</sub> = 30 V, T <sub>A</sub> = 125°C                                   |
|                 |                       |      | 500  | nA      | V <sub>R</sub> = 125 V, T <sub>A</sub> = 125°C                                  |
|                 |                       |      | 3.0  | $\mu$ A | V <sub>R</sub> = 125 V, T <sub>A</sub> = 150°C                                  |
| t <sub>rr</sub> | Reverse Recovery Time |      | 3.0  | $\mu$ s | I <sub>F</sub> = 10 mA, V <sub>r</sub> = 3.5 V, R <sub>L</sub> = 1.0 k $\Omega$ |
| C               | Capacitance           |      | 8.0  | pF      | V <sub>R</sub> = 0, f = 1.0 MHz   |
| BV              | Breakdown Voltage     | 150  |      | V       | I <sub>R</sub> = 100 $\mu$ A  |

**NOTES:**

1. The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty-cycle operation.
3. 1N3595 and 1N6099 are electrically and mechanically identical.
4. For product family characteristic curves, refer to Chapter 4, D2.



A Schlumberger Company

**1N3600/FDLL3600** T-03-09  
**1N4150/FDLL4150**  
**1N4450/FDLL4450**  
 High Conductance Ultra Fast Diodes

- $t_{rr} \dots 4.0$  ns (MAX)
- $V_F \dots 1.0$  V (MAX) @ 200 mA

**ABSOLUTE MAXIMUM RATINGS (Note 1)**

|                                    |                 |
|------------------------------------|-----------------|
| <b>Temperatures</b>                |                 |
| Storage Temperature Range          | -85°C to +200°C |
| Max Junction Operating Temperature | +175°C          |
| Lead Temperature                   | +260°C          |

|   |            |
|---|------------|
| <b>Power Dissipation (Note 2)</b>           |            |
| Max Total Power Dissipation at 25°C Ambient | 500 mW     |
| Linear Derating Factor (from 25°C)          | 3.33 mW/°C |

|                                      |                                |               |               |               |
|--------------------------------------|--------------------------------|---------------|---------------|---------------|
| <b>Maximum Voltages and Currents</b> |                                | <b>1N3600</b> | <b>1N4150</b> | <b>1N4450</b> |
| WIV                                  | Working Inverse Voltage        | 50 V          | 50 V          | 30 V          |
| $I_O$                                | Average Rectified Current      | 200 mA        | 200 mA        | 200 mA        |
| $I_F$                                | DC Forward Current             | 400 mA        | 400 mA        | 400 mA        |
| $i_f$                                | Recurrent Peak Forward Current | 600 mA        | 600 mA        | 600 mA        |
| $i_f(\text{surge})$                  | Peak Forward Surge Current     |               |               |               |
|                                      | Pulse Width = 1.0 s            | 1.0 A         | 1.0 A         | 1.0 A         |
|                                      | Pulse Width = 1.0 $\mu$ s      | 4.0 A         | 4.0 A         | 4.0 A         |

**PACKAGES**

|          |       |
|----------|-------|
| 1N3600   | DO-35 |
| 1N4150   | DO-35 |
| 1N4450   | DO-35 |
| FDLL3600 | LL-34 |
| FDLL4150 | LL-34 |
| FDLL4450 | LL-34 |

If you need this device in the SOT package, an electrical equivalent is available. See FDSO1200 family.



**ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)**

| SYMBOL   | CHARACTERISTIC                    | 1N3600<br>1N4150                     |                                     | 1N4450                       |                                     | UNITS                          | TEST CONDITIONS  |
|----------|-----------------------------------|--------------------------------------|-------------------------------------|------------------------------|-------------------------------------|--------------------------------|--|
|          |                                   | MIN                                  | MAX                                 | MIN                          | MAX                                 |                                |  |
| BV       | Breakdown Voltage                 | 75                                   |                                     | 40                           |                                     | V<br>V                         | $I_R = 5.0 \mu A$<br>$I_R = 5.0 \mu A$   |
| $I_R$    | Reverse Current                   |                                      | 100                                 |                              | 50                                  | nA<br>nA<br>$\mu A$<br>$\mu A$ | $V_R = 50$ V<br>$V_R = 30$ V<br>$V_R = 50$ V, $T_A = 150^\circ C$<br>$V_R = 30$ V, $T_A = 150^\circ C$   |
| $V_F$    | Forward Voltage                   | 0.54<br>0.66<br>0.76<br>0.82<br>0.87 | 0.62<br>0.74<br>0.86<br>0.92<br>1.0 | 0.42<br>0.52<br>0.64<br>0.80 | 0.54<br>0.64<br>0.76<br>0.92<br>1.0 | V<br>V<br>V<br>V<br>V          | $I_F = 0.1$ mA<br>$I_F = 1.0$ mA<br>$I_F = 10$ mA<br>$I_F = 50$ mA<br>$I_F = 100$ mA<br>$I_F = 200$ mA   |
| C        | Capacitance                       |                                      | 2.5                                 |                              | 4.0                                 | pF                             | $V_R = 0, f = 1.0$ MHz   |
| $t_{rr}$ | Reverse Recovery Time<br>(Note 3) |                                      | 4.0<br>6.0                          |                              | 4.0                                 | ns<br>ns<br>ns                 | $I_f = I_r = 10$ mA to 200 mA,<br>$R_L = 100 \Omega$<br>$I_f = I_r = 10$ mA, $R_L = 100 \Omega$<br>$I_f = I_r = 200$ mA to 400 mA,<br>$R_L = 100 \Omega$ |
| $t_{fr}$ | Forward Recovery Time             |                                      | 10                                  |                              |                                     | ns                             | $I_f = 200$ mA, $t_r = 0.4$ ns,<br>$V_{fr} = 1.0$ V  |

- NOTES:**
1. Maximum ratings are limiting values above which life or satisfactory performance may be impaired.
  2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty-cycle operation.
  3. Recovery to 0.1  $I_f$ .
  4. For family characteristic curves, refer to Chapter 4, D4.