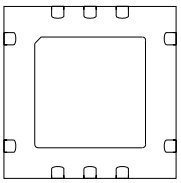
# DRF101

**15V, 15A, 60MHz**

## High Speed MOSFET Driver

The DRF101 is a High-Speed Power MOSFET driver with a unique anti-ring function. It is intended to drive the gate of a power MOSFET with ≥3nF gate capacitance to 15V at frequencies up to 60MHz.



## FEATURES

- **Switching Frequency: DC TO 60MHz**
- **Low Pulse Width Distortion**
- **Single Power Supply**
- **1V CMOS Schmitt Trigger Input 1V Hysteresis**
- **RoHS Compliant**
- **Output Capable of ≥ 15A RMS**
- **Power Dissipation 80W**

## TYPICAL APPLICATIONS

- **MOSFET Drivers**
- **Switch Mode Power Amplifiers**
- **Digital Output Amplifiers**
- **Pulse Generators**
- **Laser Diode Drivers**
- **Ultrasound Transducer Drivers**
- **Acoustic Optical Modulators**

### Driver Absolute Maximum Ratings

| Symbol | Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| $V_{dd}$ | Supply Voltage | | | 15 | V |
| IN | Input Single Voltages | | | -5~Vdd to +0.3 | |
| $I_{O\,PK}$ | Output Current Peak | | | 15 | A |
| $T_{JMAX}$ | Operating Temperature | | | 150 | °C |

### Driver Specifications

| Symbol | Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| $V_{dd}$ | Supply Voltage | 8 | | 15 | V |
| IN | Input Voltage | -5 | | Vdd +0.3 | |
| $IN_{(R)}$ | Input Voltage Rising Edge | | 2.5 | | ns |
| $IN_{(F)}$ | Input Voltage Falling Edge | | 2.5 | | |
| $I_{DDQ}$ | Quiescent Current @ $V_{dd}$ = 12V | | 15 | 25 | mA |
| $I_O$ | Output Current | | 15 | | A |
| $C_{oss}$ | Output Capacitance | | 2500 | | pF |
| $C_{iss}$ | Input Capacitance | | 35 | | |
| $R_{IN}$ | Input Parallel Resistance, $V_{in}$ = 5V, $V_{dd}$ = 12V | | 1 | | MΩ |
| $V_{thon}$ | V threshhold On, $V_{dd}$ = 12V, Vin = 0 to 5V Ramp | 2.2 | | 3.2 | V |
| $V_{thoff}$ | V threshhold Off, $V_{dd}$ = 12V, Vin = 0 to 5V Ramp | 1.0 | | 1.9 | |
| $t_r$ | Rise Time 10% to 90%, $V_{dd}$ = 12V, Vin = 0 to 5V, $R_L$ = 1.0Ω, $C_L$ = 3nF | 1.5 | 2.5 | 3.0 | ns |
| $t_f$ | Fall Time 90% to 10%, $V_{dd}$ = 12V, Vin = 0 to 5V, $R_L$ = 1.0Ω, $C_L$ = 3nF | 1.5 | 2.5 | 3.0 | |
| $T_{D(ON)}$ | On Delay Time, 50% to 50%, $V_{dd}$ = 12V, Vin = 0 to 5V, $R_L$ = 1.0Ω, $C_L$ = 3nF | | 18 | | |
| $T_{D(OFF)}$ | Off Delay Time, 50% to 50%, $V_{dd}$ = 12V, Vin = 0 to 5V, $R_L$ = 1.0Ω, $C_L$ = 3nF | | 18 | | |



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## Output Characteristics

**DRF101**

| Symbol | Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| $C_{out}$ | Output Capacitance | | 2500 | | pF |
| $R_{out}$ | Output Resistance | | 0.5 | 1 | Ω |
| $L_{out}$ | Output Inductance | 2 | 3 | 4 | nH |
| $F_{MAX}$ | Operating Frequency @ CL=3nF, RL = 50Ω | | | 60 | MHz |

## MOSFET Dynamic Characteristics

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $C_{iss}$ | Input Capacitance | $V_{gs}$ = 0<br>$V_{DS}$ = 50V<br>f = 1 MHz | | 35 | | pF |
| $C_{oss}$ | Output Capacitance | | | 2500 | | |

## Thermal Characteristics

| Symbol | Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance Junction to Case | | 1.5 | | °C/W |
| $T_J$, $T_{STG}$ | Operating and Storage Temperature | | -55 to150 | | °C |
| $P_{DC}$ | Maximum Power Dissipation @ $T_C$ = 25°C | | 80 | | W |



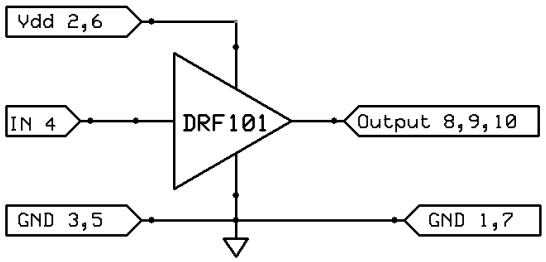



**Figure 1, DRF101 Simplified Circuit Diagram**

The Simplified DRF101 Circuit diagram is illustrated in Figure 1. DRF101 Anti-ring function is always on and Vin is the control input signal and it is paired with SG, the signal GND DRF101 has internal ESD protection and Schmitt Trigger circuit,

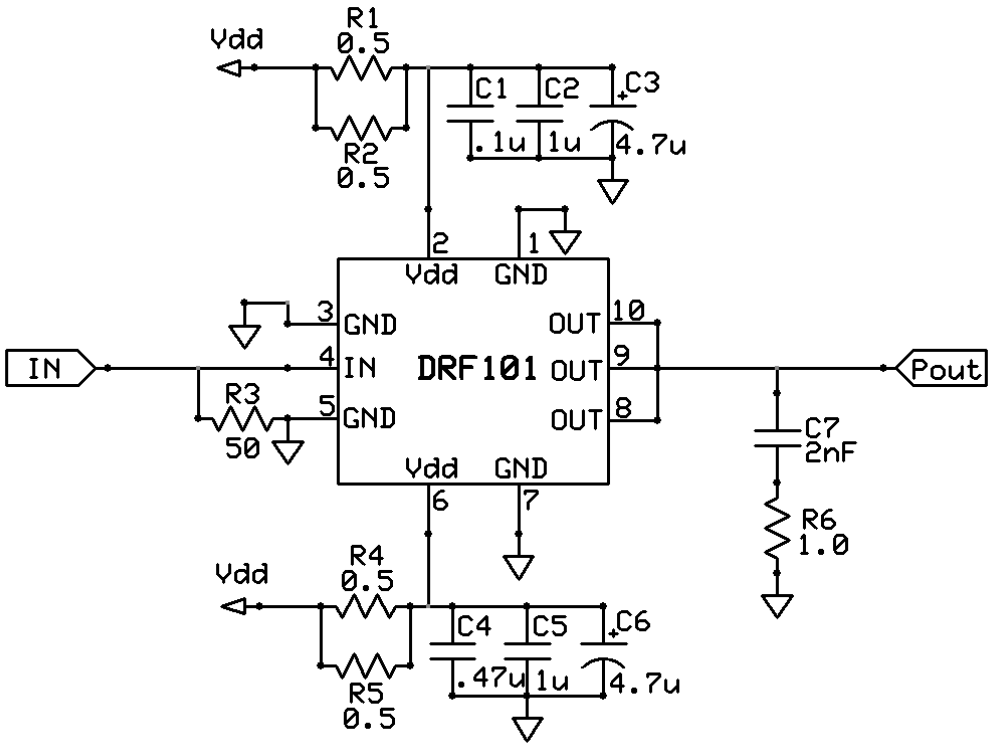
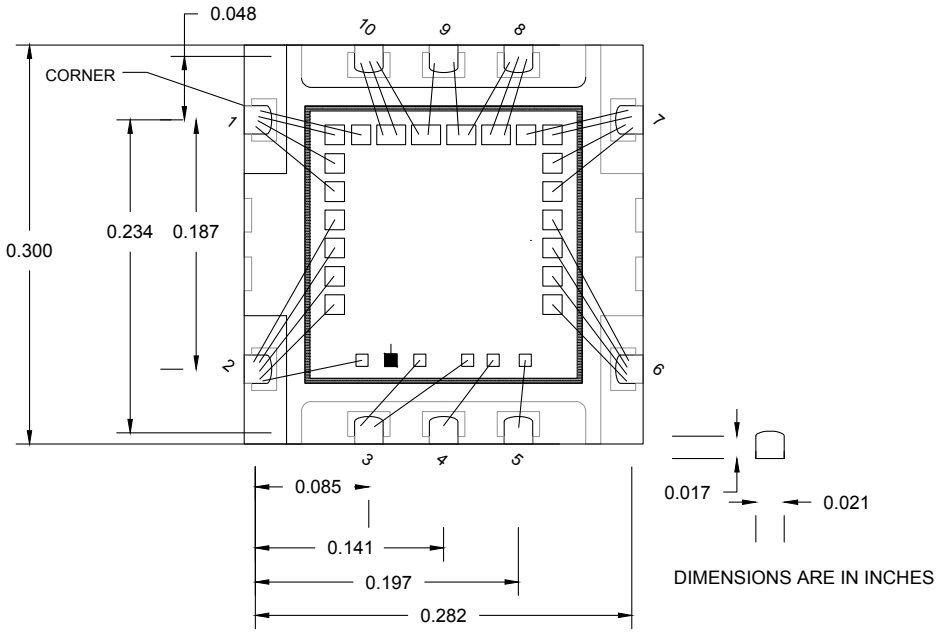



**Figure 2, DRF101 Test Circuit**

The Test Circuit illustrated in Figure 2 is used to evaluate the DRF101. The input control signal is applied to the DRF101 via IN(4) and SG. Vdd is applied to pin 2/6(+Vdd) and GND. Output is measured at pin 8/9/10 (output) across the RL and the CL

| Pin Assignments | |
|---|---|
| Pin 1 | Ground |
| Pin 2 | +Vdd |
| Pin 3 | Ground |
| Pin 4 | IN |
| Pin 5 | Ground |
| Pin 6 | +Vdd |
| Pin 7 | Ground |
| Pin 8 | Output |
| Pin 9 | Output |
| Pin 10 | Output |

**All dimensions are ± .005**




TOP VIEW

**Figure 3, DRF101 Mechanical Outline**

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## Disclaimer:



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