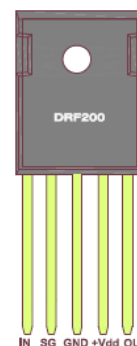



## MOSFET GATE DRIVER

The DRF200 drives up to 3nF gate capacitance of RF MOSFETs to frequencies over 15MHz or 30MHz into 50Ω. The output rise and fall times are 10ns, into 50Ω, 15ns into 3nF+50Ω. The DRF200 can deliver 100W of output power. In addition the Driver provides an Anti-Ring function which limits output ringing at turn-on and turn-off of the power MOSFET. These attributes allow the device to be used in a wide variety of RF applications.



### Features

- Switching Frequency DC to 30MHz 50Ω Load
- Switching Frequency DC 15MHz 3nF Load
- Switching Speeds 10ns 50Ω, 15ns 3nF Load
- Low Pulse Width Distortion, ≤ 2%
- Single Power Supply
- 1V CMOS Schmitt Trigger Input ~1V Hysteresis
- Current Output 12A Pk 8A RMS
- Power Dissipation Capability 100W
- RoHS compliant 

### Typical Applications

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

### Absolute Maximum Ratings

Symbol	Parameter	Ratings	Unit
$V_{DS}$	Supply Voltage	18	V
$V_{IN}$	Signal Input Voltage	-0.7 to +5.5	V
$I_D$	Continuous Drain Current @ $T_C = 25^\circ C$	8	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	12	

### Specifications

Symbol	Parameter	Ratings		Unit
V <sub>DS</sub>	Supply Voltage Typical Operating	8 to 15		V
V <sub>in</sub>	Signal Input Voltage	-.7 to +5.5		V
I <sub>D</sub>	Continuous Drain Current @ T <sub>C</sub> = 25°C	8		A
I <sub>DM</sub>	Pulsed Drain Current	12		
I <sub>DQ</sub>	Quiescent Current	<2		ma
P <sub>CONSUMPTION</sub>	Watts=C <sub>O</sub> +C <sub>L</sub> x V <sub>DS</sub> <sup>2</sup> x F x D <sub>UTY</sub> C <sub>YCLE</sub>	100		W
C <sub>o</sub>	Output Capacitance	2500		pF
C <sub>IN</sub>	Input Capacitance	3		pF
R <sub>IN</sub>	Input Parallel Resistance	≅1		MΩ
L <sub>OUT</sub>	Output Inductance	3		nH
R <sub>OUT</sub>	Output Series Resistance	~1		Ω
V <sub>IN (LOW)</sub>	Input Low	1.1		V
V <sub>IN (HIGH)</sub>	Input High	1.9		V
	Test Conditions V <sub>DS</sub> = 15V	RL=50Ω	CL=2.5nF	
Tr	Rise Time (10% to 90% ΔV <sub>OUT</sub> )	10	15	ns
Tf	Fall Time (90% to 10% ΔV <sub>OUT</sub> )	10	15	ns

T <sub>DLY (ON)</sub>	Throughput Delay	30±3	ns
T <sub>DLY (OFF)</sub>	Throughput Delay	23±2	ns
	Symmetry	1.5	%
F <sub>MAX CL</sub>	CL=3nF + 50Ω	15	MHz
F <sub>MAX RL</sub>	RL=50Ω	30	MHz

Thermal and Mechanical Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
P <sub>D</sub>	Total Power Dissipation @ T <sub>HS</sub> = 25°C		100		W
P <sub>DC</sub>	Total Power Dissipation @ T <sub>C</sub> = 25°C		170		W
R <sub>θJC</sub>	Junction to Case Thermal Resistance		.88		°C/W
R <sub>θJHS</sub>	Junction to Sink Thermal Resistance, Flat, Greased Surface		1.38		
T <sub>J</sub> , T <sub>STG</sub>	Maximum Operating Junction Temperature			+175	°C
T <sub>J</sub> , T <sub>STG</sub>	Storage Junction Temperature Range	-55		+150	°C

Microsemi Reserves the right to change, without notice, the specifications and information contained herein.

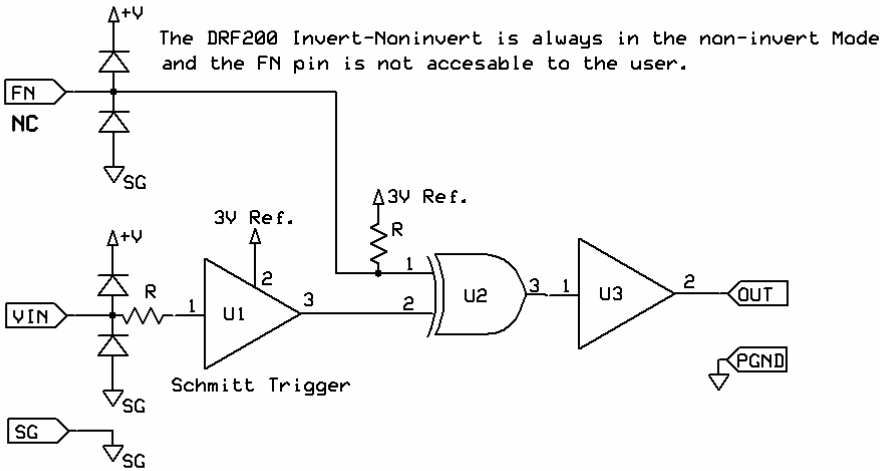
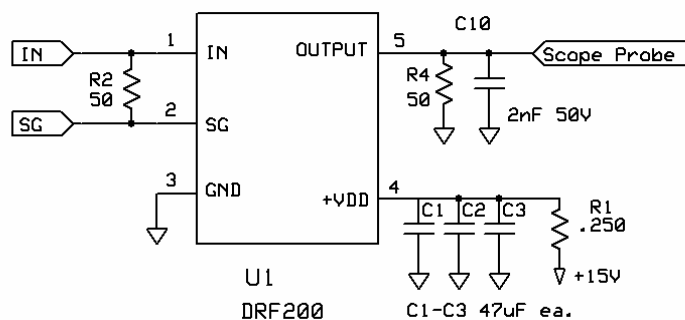


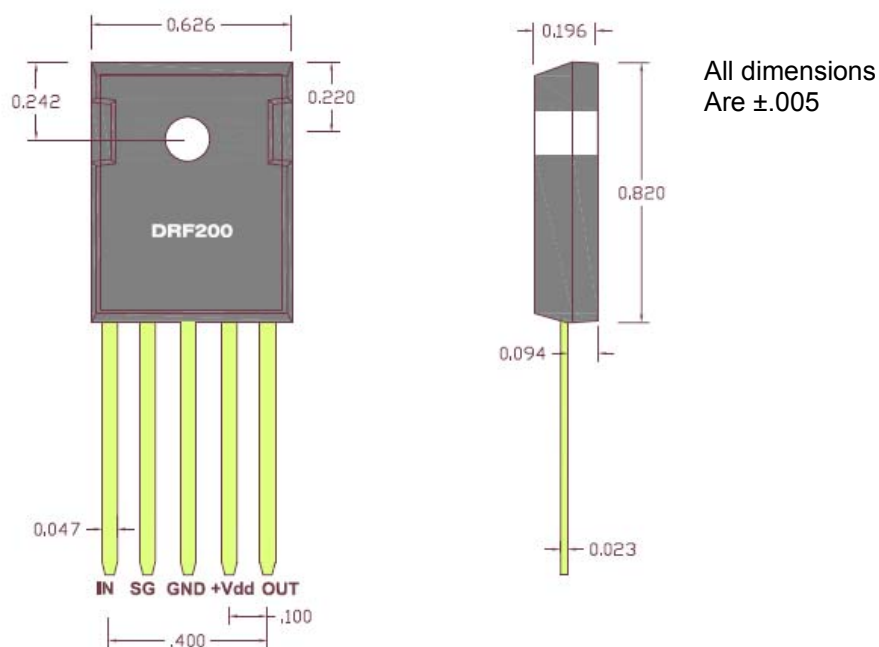
Figure 1 Driver Circuit

A Simplified Driver IC circuit diagram is illustrated in Figure 1. The DRF200 Anti-Ring function is always on and the Invert, Non-Invert function is in the Non-invert mode. This function is not accessible in the DRF200. VIN is the control input Signal and it is paired with SG, the signal ground. This configuration provides a Kelvin signal connection to preserve control signal purity. The Driver has internal ESD protection, however good ESD practices should still be used when handling the device. U1 is a Schmitt Trigger Circuit; U2 provides the drive for U3. U3 is a power driver.



**Figure 2 Driver Test Circuit**

Figure 2 illustrates the Test Circuit for the DRF200. A 5V signal is applied to the VIN and SG. +15V is applied to Pin 4 (+Vds) Pin 3 (GND) is attached the common ground. VOUT is measured at the Output Pin 5, across the RL and the CL, shown. All electrical data for this device is generated with the circuit of Figure 2.



**Figure 3 DRF200 Mechanical Outline**

Referring to Figure 3, the GND pin is the circuit ground for the +VDS supply and the output. No isolating Pad is required for mounting.

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