POWER-MOS FET
FIELD EFFECT POWER TRANSISTOR

IRFF222,223

3 AMPERES
200, 150 VOLTS
$R_{DS(ON)} = 1.2\ \Omega$

Preliminary

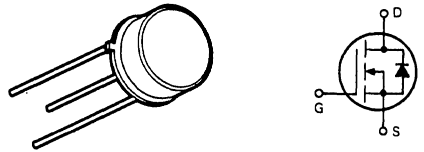
This series of N-Channel Enhancement-mode Power MOSFETs utilizes GE's advanced Power DMOS technology to achieve low on-resistance with excellent device ruggedness and reliability.

This design has been optimized to give superior performance in most switching applications including: switching power supplies, inverters, converters and solenoid/relay drivers. Also, the extended safe operating area with good linear transfer characteristics makes it well suited for many linear applications such as audio amplifiers and servo motors.

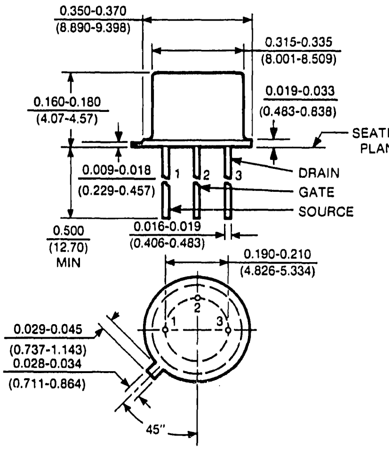
Features

- Polysilicon gate — Improved stability and reliability
- No secondary breakdown — Excellent ruggedness
- Ultra-fast switching — Independent of temperature
- Voltage controlled — High transconductance
- Low input capacitance — Reduced drive requirement
- Excellent thermal stability — Ease of paralleling

N-CHANNEL



CASE STYLE TO-205AF (TO-39)
DIMENSIONS ARE IN INCHES AND (MILLIMETERS)



TYPE	TERM. 1	TERM. 2	TERM. 3
TO-205AF	SOURCE	GATE	DRAIN

maximum ratings ($T_C = 25°C$) (unless otherwise specified)

RATING	SYMBOL	IRFF222	IRFF223	UNITS
Drain-Source Voltage	V_{DSS}	200	150	Volts
Drain-Gate Voltage, $R_{GS} = 1M\Omega$	V_{DGR}	200	150	Volts
Continuous Drain Current @ $T_C = 25°C$	I_D	3.0	3.0	A
Pulsed Drain Current⁽¹⁾	I_{DM}	12	12	A
Gate-Source Voltage	V_{GS}	±20	±20	Volts
Total Power Dissipation @ $T_C = 25°C$ Derate Above 25°C	P_D	20 0.16	20 0.16	Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	-55 to 150	°C

thermal characteristics

Thermal Resistance, Junction to Case	$R_{\theta JC}$	6.25	6.25	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	175	175	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/16" from Case for 10 Seconds	T_L	260	260	°C

(1) Repetitive Rating: Pulse width limited by max. junction temperature.

electrical characteristics ($T_C = 25°C$) (unless otherwise specified)

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT

off characteristics

Drain-Source Breakdown Voltage ($V_{GS} = 0V$, $I_D = 250\ \mu A$)	IRFF222 IRFF223	BV_{DSS}	200 150	— —	— —	Volts
Zero Gate Voltage Drain Current (V_{DS} = Max Rating, $V_{GS} = 0V$, $T_C = 25°C$) (V_{DS} = Max Rating, × 0.8, $V_{GS} = 0V$, $T_C = 125°C$)		I_{DSS}	— —	— —	250 1000	μA
Gate-Source Leakage Current ($V_{GS} = \pm 20V$)		I_{GSS}	—	—	±100	nA

on characteristics*

Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250\ \mu A$)	$T_C = 25°C$	$V_{GS(TH)}$	2.0	—	4.0	Volts
On-State Drain Current ($V_{GS} = 10V$, $V_{DS} = 10V$)		$I_{D(ON)}$	3.0	—	—	A
Static Drain-Source On-State Resistance ($V_{GS} = 10V$, $I_D = 2.0A$)		$R_{DS(ON)}$	—	—	1.2	Ohms
Forward Transconductance ($V_{DS} = 10V$, $I_D = 2.0A$)		g_{fs}	1.2	—	—	mhos

dynamic characteristics

Input Capacitance	$V_{GS} = 10V$	C_{iss}	—	—	600	pF
Output Capacitance	$V_{DS} = 25V$	C_{oss}	—	—	300	pF
Reverse Transfer Capacitance	f = 1 MHz	C_{rss}	—	—	80	pF

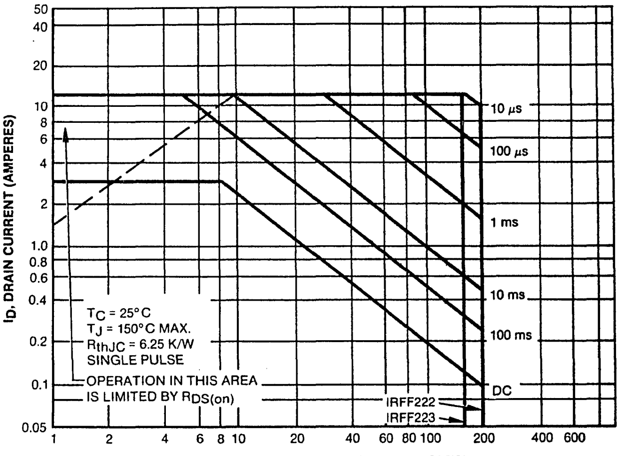
switching characteristics*

Turn-on Delay Time	$V_{DS} = 90V$	$t_{d(on)}$	—	20	—	ns
Rise Time	$I_D = 2.0A$, $V_{GS} = 15V$	t_r	—	30	—	ns
Turn-off Delay Time	$R_{GEN} = 50\Omega$, $R_{GS} = 12.5\Omega$	$t_{d(off)}$	—	50	—	ns
Fall Time	($R_{GS\ (EQUIV.)} = 10\Omega$)	t_f	—	30	—	ns

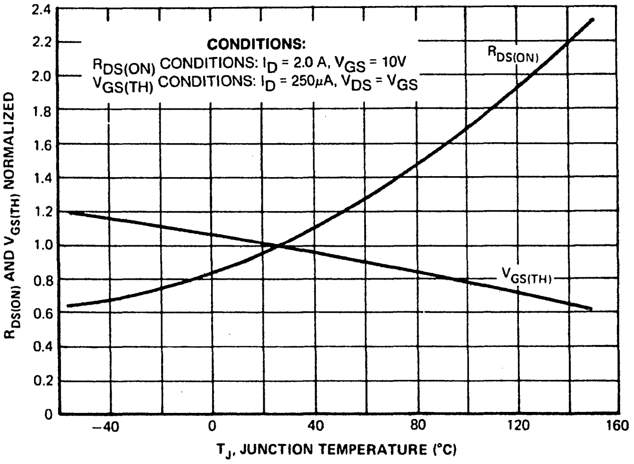
source-drain diode ratings and characteristics*

Continuous Source Current	I_S	—	—	3	A
Pulsed Source Current	I_{SM}	—	—	12	A
Diode Forward Voltage ($T_C = 25°C$, $V_{GS} = 0V$, $I_S = 3.0A$)	V_{SD}	—	—	1.8	Volts
Reverse Recovery Time ($I_S = 3.5A$, $dI_s/dt = 100A/\mu sec$, $T_C = 125°C$)	t_{rr} Q_{RR}	— —	350 2.3	— —	ns μC

*Pulse Test: Pulse width ≤ 300 μs, duty cycle ≤ 2%



MAXIMUM SAFE OPERATING AREA



TYPICAL NORMALIZED $R_{DS(ON)}$ AND $V_{GS(TH)}$ VS. TEMP.