

HEXFET® TRANSISTORS

**N-Channel
 50 VOLT
 POWER MOSFETs**



IRFZ30

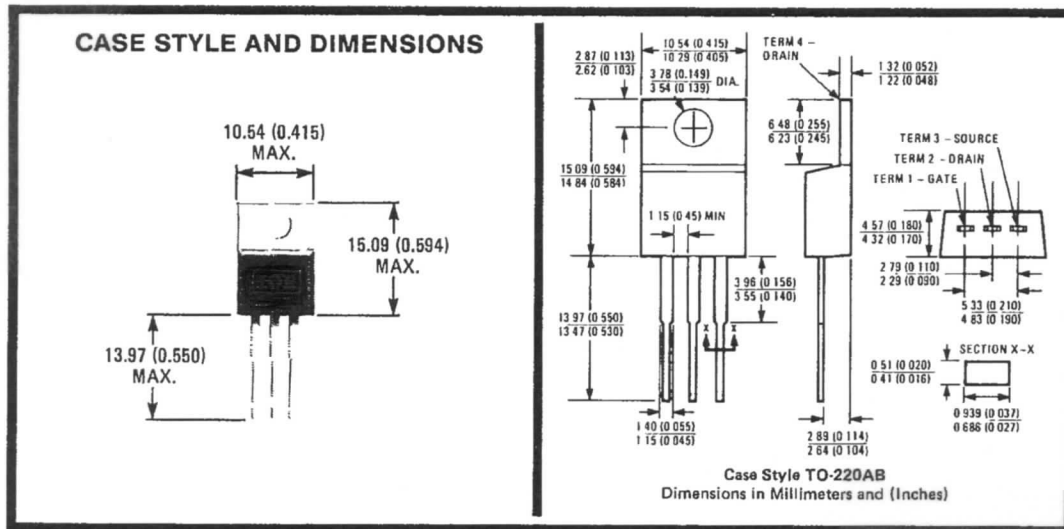
IRFZ32

Product Summary

Part Number	V _{DS}	R _{DS(on)}	I _D
IRFZ30	50V	0.05Ω	30A
IRFZ32	50V	0.07Ω	25A

Features:

- Extremely Low R_{DS(on)}
- Compact Plastic Package
- Fast Switching
- Low Drive Current
- Ease of Paralleling
- Excellent Temperature Stability
- Parts Per Million Quality



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Quality Semi-Conductors

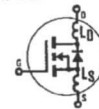
IRFZ30, IRFZ32 Devices

Absolute Maximum Ratings

Parameter	IRFZ30	IRFZ32	Units
V_{DS} Drain - Source Voltage ①	50	50	V
V_{DGR} Drain - Gate Voltage ($R_{GS} = 20\text{ k}\Omega$) ①	50	50	V
$I_D @ T_C = 25^\circ\text{C}$ Continuous Drain Current	30	25	A
$I_D @ T_C = 100^\circ\text{C}$ Continuous Drain Current	19	16	A
I_{DM} Pulsed Drain Current ②	80	60	A
V_{GS} Gate - Source Voltage	±20		V
$P_D @ T_C = 25^\circ\text{C}$ Max. Power Dissipation	75 (See Fig. 14)		W
Linear Derating Factor	0.6 (See Fig. 14)		W/K ④
I_{LM} Inductive Current, Clamped	80 (See Fig. 15 and 16) $L = 100\mu\text{H}$		A
T_J Operating Junction and Storage Temperature Range	-55 to 150		$^\circ\text{C}$
T_{stg} Lead Temperature	300 (0.063 in. (1.6mm) from case for 10s)		$^\circ\text{C}$

Electrical Characteristics @ $T_C = 25^\circ\text{C}$ (Unless Otherwise Specified)

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS} Drain - Source Breakdown Voltage	IRFZ30	60	—	—	V	$V_{GS} = 0\text{V}$
	IRFZ32	50	—	—	V	$I_D = 250\mu\text{A}$
$V_{GS(th)}$ Gate Threshold Voltage	ALL	2.0	—	4.0	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
I_{GSS} Gate-Source Leakage Forward	ALL	—	—	500	nA	$V_{GS} = 20\text{V}$
I_{GSS} Gate-Source Leakage Reverse	ALL	—	—	-500	nA	$V_{GS} = -20\text{V}$
I_{DSS} Zero Gate Voltage Drain Current	ALL	—	—	250	μA	$V_{DS} = \text{Max. Rating}, V_{GS} = 0\text{V}$
		—	—	1000	μA	$V_{DS} = \text{Max. Rating} \times 0.8, V_{GS} = 0\text{V}, T_C = 125^\circ\text{C}$
$I_{D(on)}$ On-State Drain Current ②	IRFZ30	30	—	—	A	$V_{DS} > I_{D(on)} \times R_{DS(on)max}, V_{GS} = 10\text{V}$
	IRFZ32	25	—	—	A	
$R_{DS(on)}$ Static Drain-Source On-State Resistance ②	IRFZ30	—	0.045	0.050	Ω	$V_{GS} = 10\text{V}, I_D = 16\text{A}$
	IRFZ32	—	0.065	0.070	Ω	
g_{fs} Forward Transconductance ②	ALL	9.0	12	—	S(U)	$V_{DS} > I_{D(on)} \times R_{DS(on)max}, I_D = 16\text{A}$
C_{iss} Input Capacitance	ALL	—	1250	1600	pF	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1.0\text{MHz}$
C_{oss} Output Capacitance	ALL	—	650	800	pF	See Fig. 10
C_{riss} Reverse Transfer Capacitance	ALL	—	130	200	pF	
$t_{d(on)}$ Turn-On Delay Time	ALL	—	12	25	ns	$V_{DD} \approx 25\text{V}, I_D = 16\text{A}, Z_\theta = 50\Omega$
t_r Rise Time	ALL	—	16	35	ns	See Fig. 17
$t_{d(off)}$ Turn-Off Delay Time	ALL	—	23	45	ns	(MOSFET switching times are essentially independent of operating temperature.)
t_f Fall Time	ALL	—	16	35	ns	
Q_g Total Gate Charge (Gate-Source Plus Gate-Drain)	ALL	—	26	30	nC	$V_{GS} = 10\text{V}, I_D = 38\text{A}, V_{DS} = 0.8\text{Max. Rating}$. See Fig. 18 for test circuit. (Gate charge is essentially independent of operating temperature.)
Q_{gs} Gate-Source Charge	ALL	—	14	—	nC	
Q_{gd} Gate-Drain ("Miller") Charge	ALL	—	12	—	nC	
L_D Internal Drain Inductance	ALL	—	3.5	—	nH	Measured from the contact screw on tab to center of dia.
		—	4.5	—	nH	Measured from the drain lead, 6mm (0.25 in.) from package to center of dia.
L_S Internal Source Inductance	ALL	—	7.5	—	nH	Measured from the source lead, 6mm (0.25 in.) from package to source bonding pad.



Thermal Resistance

Parameter	Value	Units	Notes
R_{thJC} Junction-to-Case	1.67	K/W ④	
R_{thCS} Case-to-Sink	1.0	K/W ④	Mounting surface flat, smooth, and greased.
R_{thJA} Junction-to-Ambient	80	K/W ④	Typical socket mount

Source-Drain Diode Ratings and Characteristics

I_S	Continuous Source Current (Body Diode)	IRFZ30	—	—	30	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier.
		IRFZ32	—	—	25	A	
I_{SM}	Pulse Source Current (Body Diode) ②	IRFZ30	—	—	80	A	
		IRFZ32	—	—	60	A	
V_{SD}	Diode Forward Voltage ②	IRFZ30	—	—	1.6	V	$T_C = 25^\circ\text{C}, I_S = 30\text{A}, V_{GS} = 0\text{V}$
		IRFZ32	—	—	1.5	V	$T_C = 25^\circ\text{C}, I_S = 25\text{A}, V_{GS} = 0\text{V}$
t_{rr}	Reverse Recovery Time	ALL	—	160	—	ns	$T_J = 150^\circ\text{C}, I_F = 30\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$
Q_{RR}	Reverse Recovered Charge	ALL	—	1.5	—	μC	$T_J = 150^\circ\text{C}, I_F = 30\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$
t_{on}	Forward Turn-on Time	ALL	Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by $L_S + L_D$.				

① $T_J = 25^\circ\text{C}$ to 150°C .

② Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

③ Repetitive Rating: Pulse width limited by max. junction temperature. See Transient Thermal Impedance Curve (Fig. 5).

④ $K/W = ^\circ\text{C}/\text{W}$
 $W/K = \text{W}/^\circ\text{C}$

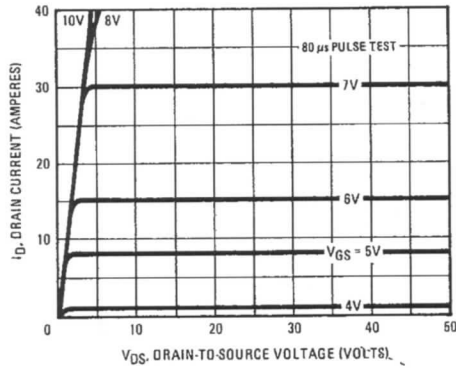


Fig. 1 - Typical Output Characteristics

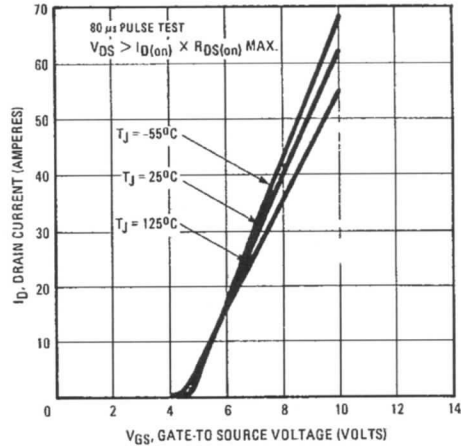


Fig. 2 - Typical Transfer Characteristics

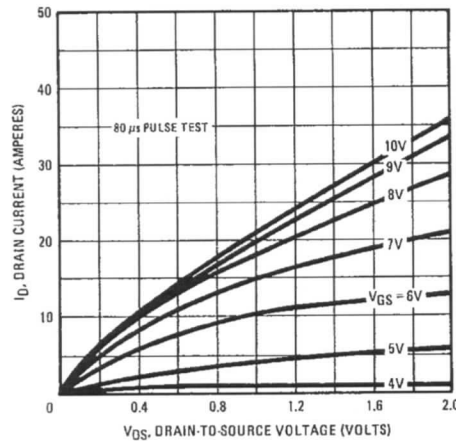


Fig. 3 - Typical Saturation Characteristics

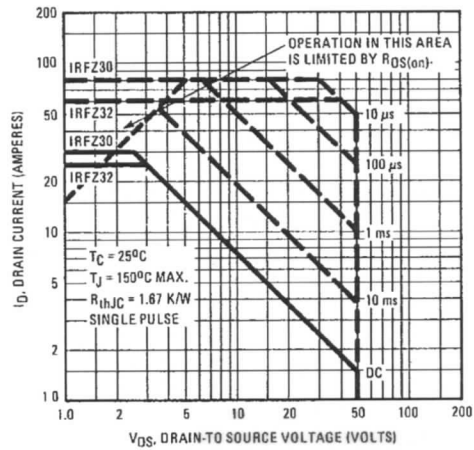


Fig. 4 - Maximum Safe Operating Area