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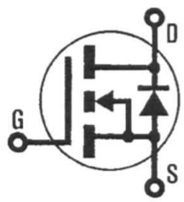
HEXFET® TRANSISTORS

IRFZ30
IRFZ32

N-Channel
50 VOLT
POWER MOSFETs



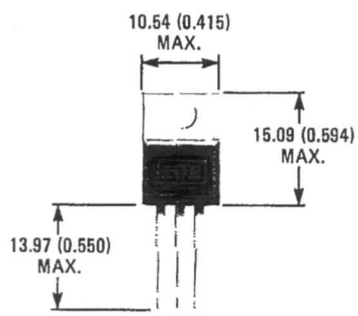
Product Summary

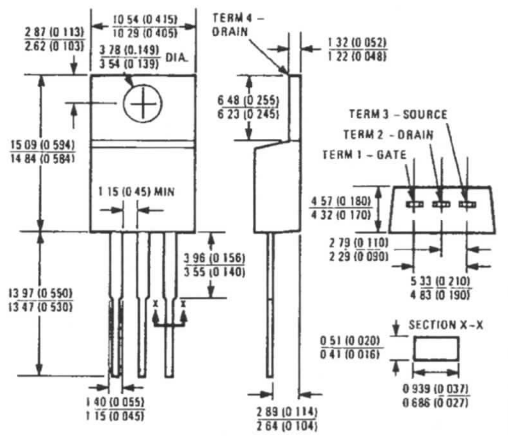
Part Number	V_{DS}	$R_{DS(on)}$	I_D
IRFZ30	50V	0.05Ω	30A
IRFZ32	50V	0.07Ω	25A

Features:

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

CASE STYLE AND DIMENSIONS





Case Style TO-220AB
Dimensions in Millimeters and (Inches)

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

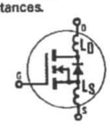
Quality Semi-Conductors

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 KΩ) ①	50	50	V
I_D @ T_C = 25°C	Continuous Drain Current	30	25	A
I_D @ T_C = 100°C	Continuous Drain Current	19	16	A
I_{DM}	Pulsed Drain Current ③	80	60	A
V_{GS}	Gate - Source Voltage	±20		V
P_D @ T_C = 25°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	(See Fig. 15 and 16) L = 100μH 80	60	A
T_J T_{stg}	Operating Junction and Storage Temperature Range	−55 to 150		°C
	Lead Temperature	300 (0.063 in. (1.6mm) from case for 10s)		°C

Electrical Characteristics @ T_C = 25°C (Unless Otherwise Specified)

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions	
BV_{DSS}	Drain - Source Breakdown Voltage	IRFZ30	50	—	—	V	V_{GS} = 0V	
		IRFZ32	50	—	—	V	I_D = 250 μA	
$V_{GS(th)}$	Gate Threshold Voltage	ALL	2.0	—	4.0	V	V_{DS} = V_{GS}, I_D = 250 μA	
I_{GSS}	Gate-Source Leakage Forward	ALL	—	—	500	nA	V_{GS} = 20V	
I_{GSS}	Gate-Source Leakage Reverse	ALL	—	—	−500	nA	V_{GS} = −20V	
I_{DSS}	Zero Gate Voltage Drain Current	ALL	—	—	250	μA	V_{DS} = Max. Rating, V_{GS} = 0V	
			—	—	1000	μA	V_{DS} = Max. Rating × 0.8, V_{GS} = 0V, T_C = 125°C	
$I_{D(on)}$	On-State Drain Current ②	IRFZ30	30	—	—	A	V_{DS} > $I_{D(on)}$ × $R_{DS(on)max.}$, V_{GS} = 10V	
		IRFZ32	25	—	—	A		
$R_{DS(on)}$	Static Drain-Source On-State Resistance ②	IRFZ30	—	0.045	0.050	Ω	V_{GS} = 10V, I_D = 16A	
		IRFZ32	—	0.065	0.070	Ω		
g_{fs}	Forward Transconductance ②	ALL	9.0	12	—	S(℧)	V_{DS} > $I_{D(on)}$ × $R_{DS(on)}$ max., I_D = 16A	
C_{iss}	Input Capacitance	ALL	—	1250	1600	pF	V_{GS} = 0V, V_{DS} = 25V, f = 1.0 MHz See Fig. 10	
C_{oss}	Output Capacitance	ALL	—	550	800	pF		
C_{rss}	Reverse Transfer Capacitance	ALL	—	130	200	pF		
$t_{d(on)}$	Turn-On Delay Time	ALL	—	12	25	ns	V_{DD} ≅ 25V, I_D = 16A, Z_o = 50Ω See Fig. 17 (MOSFET switching times are essentially independent of operating temperature.)	
t_r	Rise Time	ALL	—	16	35	ns		
$t_{d(off)}$	Turn-Off Delay Time	ALL	—	23	45	ns		
t_f	Fall Time	ALL	—	16	35	ns		
Q_g	Total Gate Charge (Gate-Source Plus Gate-Drain)	ALL	—	26	30	nC	V_{GS} = 10V, I_D = 38A, V_{DS} = 0.8 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 die.	Modified MOSFET symbol showing the internal device inductances. 
			—	4.5	—	nH	Measured from the drain lead, 6mm (0.25 in.) from package to center of die.	
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

R_{thJC}	Junction-to-Case	ALL	—	—	1.67	K/W④	
R_{thCS}	Case-to-Sink	ALL	—	1.0	—	K/W④	Mounting surface flat, smooth, and greased.
R_{thJA}	Junction-to-Ambient	ALL	—	—	80	K/W④	Typical socket mount

T-39-11

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) ③	IRFZ30	—	—	80	A	
		IRFZ32	—	—	60	A	
V_{SD}	Diode Forward Voltage ②	IRFZ30	—	—	1.6	V	$T_C = 25°C, I_S = 30A, V_{GS} = 0V$
		IRFZ32	—	—	1.5	V	$T_C = 25°C, I_S = 25A, V_{GS} = 0V$
t_{rr}	Reverse Recovery Time	ALL	—	160	—	ns	$T_J = 150°C, I_F = 30A, dI_F/dt = 100A/\mu s$
Q_{RR}	Reverse Recovered Charge	ALL	—	1.5	—	μC	$T_J = 150°C, I_F = 30A, dI_F/dt = 100A/\mu s$
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 $T_J = 25°C$ to 150°C.
② Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%.
③ Repetitive Rating: Pulse width limited by max. junction temperature. See Transient Thermal Impedance Curve (Fig. 5).
④ K/W = °C/W
W/K = W/°C

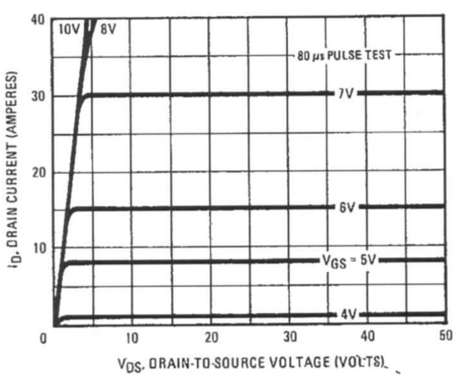


Fig. 1 — Typical Output Characteristics

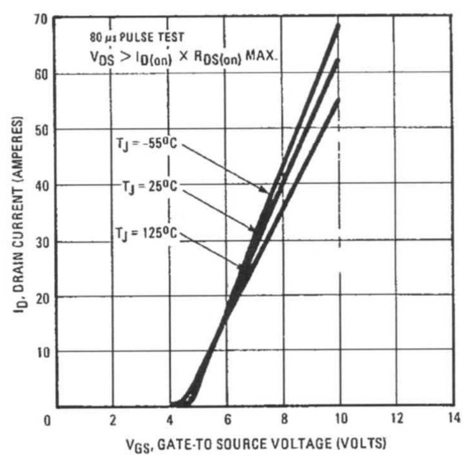


Fig. 2 — Typical Transfer Characteristics

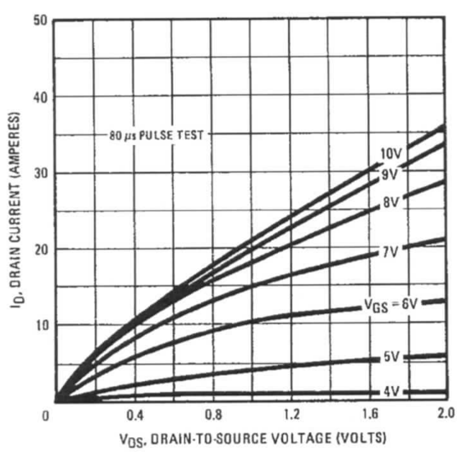


Fig. 3 — Typical Saturation Characteristics

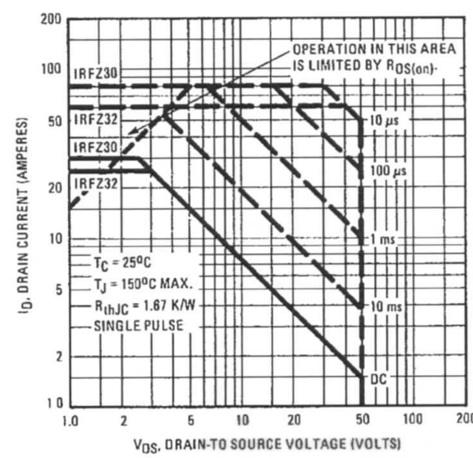


Fig. 4 — Maximum Safe Operating Area