TAVAKOL ELECTRONIC
توکل الکترونیک
مرجع تخصصی تأمین قطعات الکترونیکی اورجینال

**این دیتاشیت توسط توکل الکترونیک تهیه و ارائه شده است.**

جهت مشاهده قیمت، موجودی و ثبت سفارش این قطعه به وب‌سایت توکل الکترونیک مراجعه فرمایید.

**مشاهده قیمت و خرید**
برای خرید و مشاهده سایر محصولات کلیک کنید

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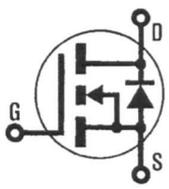
# HEXFET® TRANSISTORS

**IRFZ30**
**IRFZ32**

## N-Channel 50 VOLT POWER MOSFETs



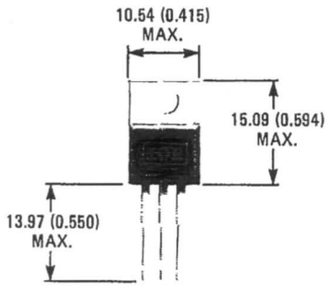

### Product Summary

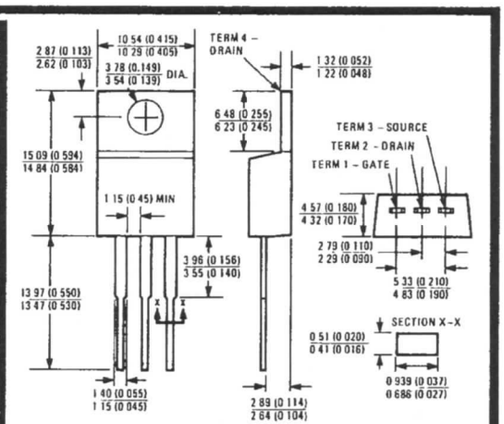
| Part Number | $V_{DS}$ | $R_{DS(on)}$ | $I_D$ |
|---|---|---|---|
| IRFZ30 | 50V | 0.05Ω | 30A |
| IRFZ32 | 50V | 0.07Ω | 25A |

### 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

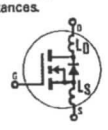
### Absolute Maximum Ratings

| 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<br>80 | 60 | A |
| $T_J$<br>$T_{stg}$ | Operating Junction and<br>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 |
| $C_{oss}$ | Output Capacitance | ALL | — | 550 | 800 | pF | See Fig. 10 |
| $C_{rss}$ | 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 |
| $t_r$ | 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 |
| $t_f$ | Fall Time | ALL | — | 16 | 35 | ns | operating temperature.) |
| $Q_g$ | Total Gate Charge<br>(Gate-Source Plus Gate-Drain) | ALL | — | 26 | 30 | nC | $V_{GS}$ = 10V, $I_D$ = 38A, $V_{DS}$ = 0.8 Max. Rating. |
| $Q_{gs}$ | Gate-Source Charge | ALL | — | 14 | — | nC | See Fig. 18 for test circuit. (Gate charge is essentially |
| $Q_{gd}$ | Gate-Drain ("Miller") Charge | ALL | — | 12 | — | nC | independent of operating temperature.) |
| $L_D$ | Internal Drain Inductance | ALL | — | 3.5 | — | nH | Measured from the contact screw on tab to center of die. |
| | | | — | 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. |

Modified MOSFET symbol showing the internal device inductances.




### 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 |

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## 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/μs |
| $Q_{RR}$ | Reverse Recovered Charge | ALL | — | 1.5 | — | μC | $T_J$ = 150°C, $I_F$ = 30A, $dI_F/dt$ = 100A/μs |
| $t_{on}$ | 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

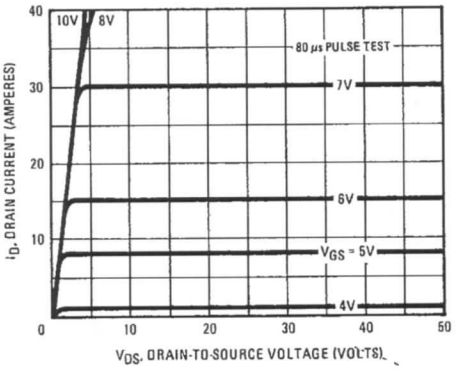


Fig. 1 — Typical Output Characteristics

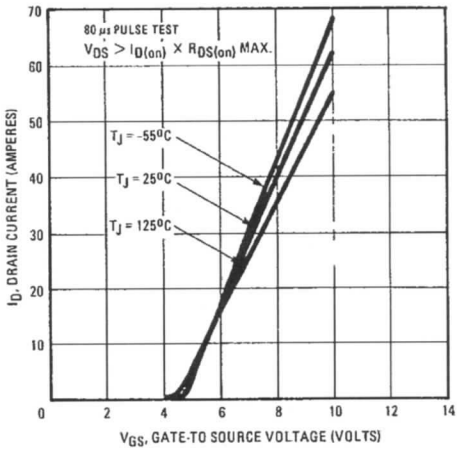


Fig. 2 — Typical Transfer Characteristics

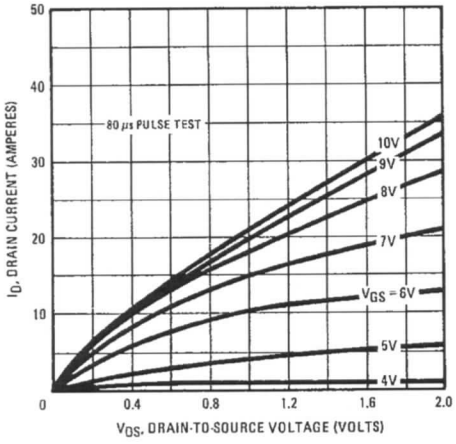


Fig. 3 — Typical Saturation Characteristics

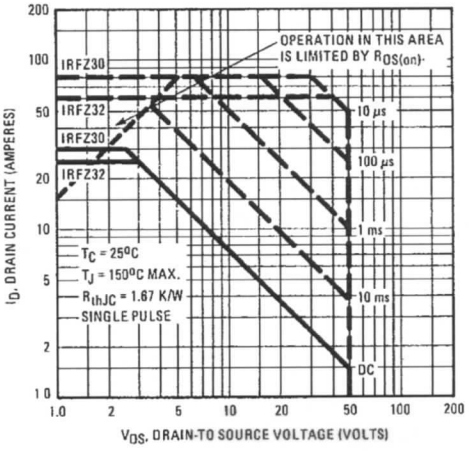


Fig. 4 — Maximum Safe Operating Area