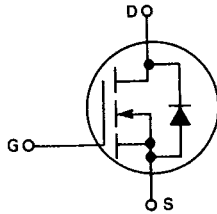
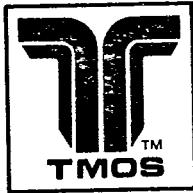


IRF530
IRF531
IRF532
IRF533

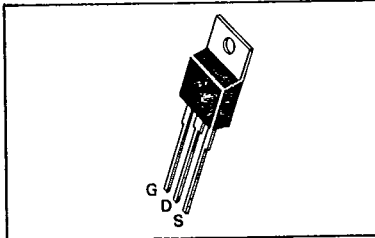
**N-CHANNEL ENHANCEMENT-MODE SILICON GATE
 TMOS POWER FIELD EFFECT TRANSISTOR**

These TMOS Power FETs are designed for low voltage, high speed power switching applications such as switching regulators, converters, solenoid and relay drivers.

- Silicon Gate for Fast Switching Speeds
- Rugged — SOA is Power Dissipation Limited
- Source-to-Drain Diode Characterized for Use With Inductive Loads



| Part Number | V _{DS} | r _{DS(on)} | I _D |
|-------------|-----------------|---------------------|----------------|
| IRF530 | 100 V | 0.18 Ω | 14 A |
| IRF531 | 60 V | 0.18 Ω | 14 A |
| IRF532 | 100 V | 0.25 Ω | 12 A |
| IRF533 | 60 V | 0.25 Ω | 12 A |



STYLE 5:
 PIN 1. GATE
 2. DRAIN
 3. SOURCE
 4. DRAIN

NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION INCH.
 3. DIM Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 14.48 | 15.75 | 0.570 | 0.620 |
| B | 3.66 | 13.78 | 0.280 | 0.465 |
| C | 4.67 | 4.82 | 0.180 | 0.190 |
| D | 0.64 | 0.98 | 0.025 | 0.039 |
| F | 3.61 | 3.71 | 0.142 | 0.147 |
| G | 2.42 | 2.68 | 0.096 | 0.106 |
| H | 2.80 | 3.83 | 0.110 | 0.151 |
| J | 0.26 | 0.55 | 0.014 | 0.022 |
| K | 13.75 | 14.27 | 0.500 | 0.562 |
| L | 1.15 | 1.29 | 0.045 | 0.051 |
| N | 4.83 | 5.33 | 0.190 | 0.210 |
| O | 2.54 | 3.04 | 0.100 | 0.120 |
| R | 2.04 | 2.29 | 0.080 | 0.110 |
| S | 1.15 | 1.29 | 0.045 | 0.051 |
| T | 5.97 | 6.47 | 0.235 | 0.255 |
| U | 0.00 | 1.27 | 0.000 | 0.050 |
| V | 1.15 | — | 0.045 | — |
| Z | — | 2.04 | — | 0.080 |

**CASE 221A-04
 TO-220AB**

MAXIMUM RATINGS

| Rating | Symbol | IRF | | | | Unit |
|---|-----------------------------------|------------|-----|-----|-----|-----------------|
| | | 530 | 531 | 532 | 533 | |
| Drain-Source Voltage | V _{DSS} | 100 | 60 | 100 | 60 | V _{dc} |
| Drain-Gate Voltage (R _{GS} = 1.0 MΩ) | V _{DGR} | 100 | 60 | 100 | 60 | V _{dc} |
| Gate-Source Voltage | V _{GS} | ± 20 | | | | V _{dc} |
| Continuous Drain Current T _C = 25°C | I _D | 14 | 14 | 12 | 12 | A _{dc} |
| Continuous Drain Current T _C = 100°C | I _D | 9.0 | 9.0 | 8.0 | 8.0 | A _{dc} |
| Drain Current — Pulsed | I _{DM} | 56 | 56 | 48 | 48 | A _{dc} |
| Total Power Dissipation @ T _C = 25°C Derate above 25°C | P _D | 75 0.6 | | | | Watts W/°C |
| Operating and Storage Temperature Range | T _J , T _{stg} | -55 to 150 | | | | °C |

THERMAL CHARACTERISTICS

| | | | |
|--|------------------|------|------|
| Thermal Resistance Junction to Case | R _{θJC} | 1.67 | °C/W |
| Junction to Ambient | R _{θJA} | 62.5 | °C/W |
| Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds | T _L | 300 | °C |

See the MTM12N10 Designer's Data Sheet for a complete set of design curves for this product.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

14E D

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|-----------|------------|-----------------------------|-----------------|
| OFF CHARACTERISTICS | | | | | |
| Drain-Source Breakdown Voltage (V _{GS} = 0, I _D = 250 μA) | V _{(BR)DSS} | 100 60 | — | — | V _{dc} |
| Zero Gate Voltage Drain Current (V _{GS} = 0 V, V _{DS} = Rated V _{DSS}) (V _{GS} = 0 V, V _{DS} = 0.8 Rated V _{DSS} , T _C = 125°C) | I _{DSS} | — | — | 0.25 1.0 | mAdc |
| Forward Gate-Body Leakage Current (V _{GS} = 20 V, V _{DS} = 0) | I _{GSSF} | — | — | 100 | nAdc |
| Reverse Gate-Body Leakage Current (V _{GS} = -20 V, V _{DS} = 0) | I _{GSSR} | — | — | -100 | nAdc |
| ON CHARACTERISTICS* | | | | | |
| Gate Threshold Voltage (V _{DS} = V _{GS} , I _D = 250 μA) | V _{GS(th)} | 2.0 | — | 4.0 | V _{dc} |
| On-State Drain Current (V _{DS} = 25 V, V _{GS} = 10 V) | I _{D(on)} | 14 12 | — | — | Adc |
| Static Drain-Source On-Resistance (V _{GS} = 10 V, I _D = 8.0 A) | r _{DS(on)} | — | — | 0.18 0.25 | Ohm |
| Forward Transconductance (V _{DS} = 15 V, I _D = 8.0 A) | g _{FS} | 4.0 | — | — | mhos |
| DYNAMIC CHARACTERISTICS | | | | | |
| Input Capacitance | C _{iss} C _{oss} C _{rss} | — | — | 800 | pF |
| Output Capacitance | | | | 500 | |
| Reverse Transfer Capacitance | | | | 150 | |
| SWITCHING CHARACTERISTICS* (T_J = 100°C) | | | | | |
| Turn-On Delay Time | V _{DD} = 36 V, I _D = 8.0 A Z _O = 15 Ω | — | — | 30 | ns |
| Rise Time | | | | 75 | |
| Turn-Off Delay Time | | | | 40 | |
| Fall Time | | | | 45 | |
| SOURCE DRAIN DIODE CHARACTERISTICS* | | | | | |
| Forward On-Voltage | Symbol | Typ | Unit | V _{SD} | |
| Forward Turn-On Time | | | | 2.3 V _{dc} | |
| Reverse Recovery Time | | | | Limited by stray inductance | |
| | | | | 360 | ns |
| INTERNAL PACKAGE INDUCTANCE (TO-220) | | | | | |
| Internal Drain Inductance (Measured from the contact screw on tab to center of die) (Measured from the drain lead 0.25" from package to center of die) | L _d | — | 3.5 4.5 | — | nH |
| Internal Source Inductance (Measured from the source lead 0.25" from package to source bond pad.) | L _s | — | 7.5 | — | nH |

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0 %.

FIGURE 1 — SWITCHING TEST CIRCUIT

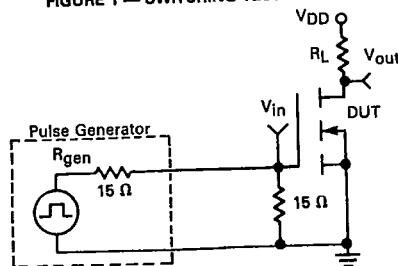


FIGURE 2 — SWITCHING WAVEFORMS

