# MPF1010

**CASE 29-03, STYLE 22**
**TO-92 (TO-226AE)**

**TMOS**
**SWITCHING**

**N-CHANNEL — ENHANCEMENT**

## MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | 100 | Vdc |
| Gate-Source Voltage | $V_{GS}$ | ±30 | Vdc |
| Drain Current — Continuous(1)<br>Pulsed(2) | $I_D$<br>$I_{DM}$ | 500<br>1000 | mAdc |
| Total Device Dissipation @ $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 1<br>8 | Watts<br>mW/°C |
| Operating and Storage Temperature Range | $T_J$, $T_{stg}$ | −55 to +150 | °C |
| Thermal Resistance Junction to Ambient | $\theta_{JA}$ | 125 | °C/W |

(1) The Power Dissipation of the package may result in a lower continuous drain current.
(2) Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

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## ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C unless otherwise noted.)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Drain-Source Breakdown Voltage ($V_{GS}$ = 0, $I_D$ = 100 μA) | $V_{(BR)DSS}$ | 100 | — | — | Vdc |
| Zero Gate Voltage Drain Current ($V_{DS}$ = 60 V, $V_{GS}$ = 0) | $I_{DSS}$ | — | — | 10 | μAdc |
| Gate-Body Leakage Current ($V_{GS}$ = 10 Vdc, $V_{DS}$ = 0) | $I_{GSS}$ | — | 0.01 | 10 | nAdc |
| **ON CHARACTERISTICS*** | | | | | |
| Gate Threshold Voltage ($I_D$ = 15 mA, $V_{DS}$ = $V_{GS}$) | $V_{GS(th)}$ | 0.3 | — | 2.5 | Vdc |
| Drain-Source On-Voltage ($I_D$ = 120 mA, $V_{GS}$ = 5 V)<br>($I_D$ = 20 mA, $V_{GS}$ = 3.5 V) | $V_{DS(on)}$ | —<br>— | —<br>— | 1.2<br>0.16 | Vdc |
| On State Drain Current ($V_{DS}$ = 25 V, $V_{GS}$ = 10 V)<br>($V_{DS}$ = 25 V, $V_{GS}$ = 5 V) | $I_{D(on)}$ | 500<br>250 | 700 | — | mA |
| Forward Transconductance ($V_{DS}$ = 15 V, $I_D$ = 0.5 A) | $g_{fs}$ | 100 | 300 | — | mmhos |
| **DYNAMIC CHARACTERISTICS** | | | | | |
| Input Capacitance ($V_{DS}$ = 25 V, $V_{GS}$ = 0, f = 1.0 MHz) | $C_{iss}$ | — | 60 | 70 | pF |
| Output Capacitance ($V_{DS}$ = 25 V, $V_{GS}$ = 0, f = 1.0 MHz) | $C_{oss}$ | — | 49 | 60 | pF |
| Reverse Transfer Capacitance ($V_{DS}$ = 25 V, $V_{GS}$ = 0, f = 1.0 MHz) | $C_{rss}$ | — | 13 | 18 | pF |
| **SWITCHING CHARACTERISTICS*** | | | | | |
| Turn-On Time<br>See Figure 1 | $t_{on}$ | — | 7 | 15 | ns |
| Turn-Off Time<br>See Figure 1 | $t_{off}$ | — | 7 | 15 | ns |

* Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

## RESISTIVE SWITCHING

**FIGURE 1 — SWITCHING TEST CIRCUIT**

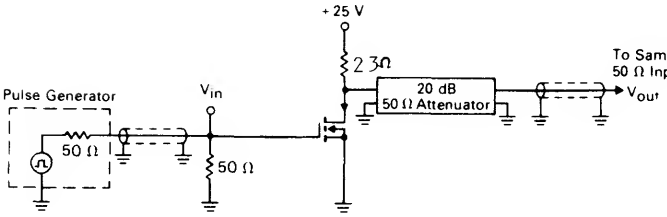
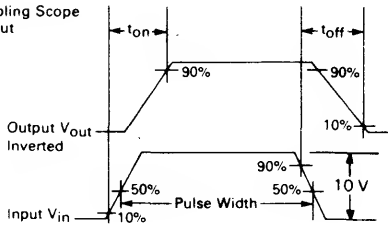



**FIGURE 2 — SWITCHING WAVEFORMS**

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