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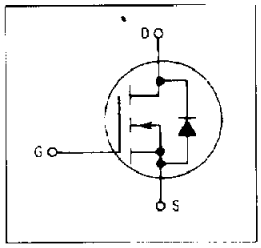
# MTP8N08
# MTP8N10

**TMOS POWER FETs**
**8 AMPERES**
**$r_{DS(on)}$ = 0.5 OHM**
**80 and 100 VOLTS**

TMOS™




**MAXIMUM RATINGS**

| Rating | Symbol | MTM or MTP 8N08 | MTM or MTP 8N10 | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | 80 | 100 | Vdc |
| Drain-Gate Voltage ($R_{GS}$ = 1 MΩ) | $V_{DGR}$ | 80 | 100 | Vdc |
| Gate-Source Voltage — Continuous | $V_{GS}$ | ±20 | | Vdc |
| — Non-repetitive ($t_p \leq 50\ \mu s$) | $V_{GSM}$ | ±40 | | Vpk |
| Drain Current — Continuous | $I_D$ | 8 | | Adc |
| Pulsed | $I_{DM}$ | 20 | | |
| Total Power Dissipation @ $T_C$ = 25°C | $P_D$ | 75 | | Watts |
| Derate above 25°C | | 0.6 | | W/°C |
| Operating and Storage Temperature Range | $T_J$, $T_{stg}$ | −65 to 150 | | °C |



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

**THERMAL CHARACTERISTICS**

| | | | |
|---|---|---|---|
| Thermal Resistance — Junction to Case | $R_{\theta JC}$ | 1.67 | °C/W |
| Junction to Ambient — TO-220 | $R_{\theta JA}$ | 62.5 | |
| Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds | $T_L$ | 275 | °C |

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 datasheet are current before placing orders.

**Quality Semi-Conductors**

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

| Characteristic | | Symbol | Min | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Drain-Source Breakdown Voltage ($V_{GS}$ = 0, $I_D$ = 0.25 mA) | MTP8N08<br>MTP8N10 | $V_{(BR)DSS}$ | <br>80<br>100 | <br>—<br>— | Vdc |
| Zero Gate Voltage Drain Current ($V_{DS}$ = Rated $V_{DSS}$, $V_{GS}$ = 0)<br>($V_{DS}$ = 0.8 Rated $V_{DSS}$, $V_{GS}$ = 0, $T_J$ = 125°C) | | $I_{DSS}$ | <br>—<br>— | <br>0.2<br>1 | mAdc |
| Gate-Body Leakage Current, Forward ($V_{GSF}$ = 20 Vdc, $V_{DS}$ = 0) | | $I_{GSSF}$ | — | 100 | nAdc |
| Gate-Body Leakage Current, Reverse ($V_{GSR}$ = 20 Vdc, $V_{DS}$ = 0) | | $I_{GSSR}$ | — | 100 | nAdc |
| **ON CHARACTERISTICS*** | | | | | |
| Gate Threshold Voltage ($V_{DS}$ = $V_{GS}$, $I_D$ = 1 mA)<br>$T_J$ = 100°C | | $V_{GS(th)}$ | <br>2<br>1.5 | <br>4.5<br>4 | Vdc |
| Static Drain-Source On-Resistance ($V_{GS}$ = 10 Vdc, $I_D$ = 4 Adc) | | $r_{DS(on)}$ | — | 0.5 | Ohm |
| Drain-Source On-Voltage ($V_{GS}$ = 10 V)<br>($I_D$ = 8 Adc)<br>($I_D$ = 4 Adc, $T_J$ = 100°C) | | $V_{DS(on)}$ | <br>—<br>— | <br>4.8<br>4 | Vdc |
| Forward Transconductance ($V_{DS}$ = 15 V, $I_D$ = 4 A) | | $g_{FS}$ | 1.5 | — | mhos |
| **DYNAMIC CHARACTERISTICS** | | | | | |
| Input Capacitance | ($V_{DS}$ = 25 V, $V_{GS}$ = 0, f = 1 MHz) See Figure 11 | $C_{iss}$ | — | 400 | pF |
| Output Capacitance | | $C_{oss}$ | — | 350 | |
| Reverse Transfer Capacitance | | $C_{rss}$ | — | 100 | |
| **SWITCHING CHARACTERISTICS*** ($T_J$ = 100°C) | | | | | |
| Turn-On Delay Time | ($V_{DD}$ = 25 V, $I_D$ = 0.5 Rated $I_D$, $R_{gen}$ = 50 ohms) See Figures 9, 13 and 14 | $t_{d(on)}$ | — | 50 | ns |
| Rise Time | | $t_r$ | — | 120 | |
| Turn-Off Delay Time | | $t_{d(off)}$ | — | 50 | |
| Fall Time | | $t_f$ | — | 60 | |
| Total Gate Charge | ($V_{DS}$ = 0.8 Rated $V_{DSS}$, $I_D$ = Rated $I_D$, $V_{GS}$ = 10 V) See Figure 12 | $Q_g$ | 13 (Typ) | 30 | nC |
| Gate-Source Charge | | $Q_{gs}$ | 6 (Typ) | — | |
| Gate-Drain Charge | | $Q_{gd}$ | 7 (Typ) | — | |
| **SOURCE DRAIN DIODE CHARACTERISTICS*** | | | | | |
| Forward On-Voltage | ($I_S$ = Rated $I_D$, $V_{GS}$ = 0) | $V_{SD}$ | 1.5 (Typ) | 3 | Vdc |
| Forward Turn-On Time | | $t_{on}$ | Limited by stray inductance | | |
| Reverse Recovery Time | | $t_{rr}$ | 300 (Typ) | — | ns |
| **INTERNAL PACKAGE INDUCTANCE (TO-220)** | | | | | |
| Internal Drain Inductance<br>(Measured from the contact screw on tab to center of die)<br>(Measured from the drain lead 0.25" from package to center of die) | | $L_d$ | <br>3.5 (Typ)<br>4.5 (Typ) | <br>—<br>— | nH |
| Internal Source Inductance<br>(Measured from the source lead 0.25" from package to source bond pad.) | | $L_s$ | 7.5 (Typ) | — | |

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

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