# VP1008 SERIES

Siliconix incorporated

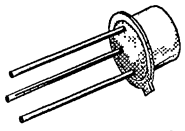
P-Channel Enhancement-Mode MOS Transistors

## PRODUCT SUMMARY

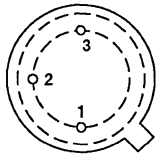
| PART NUMBER | $V_{(BR)DSS}$ (V) | $r_{DS(ON)}$ (Ω) | $I_D$ (A) | PACKAGE |
|---|---|---|---|---|
| VP1008B | –100 | 5 | –0.79 | TO-205AD |
| VP1008L | –100 | 5 | –0.28 | TO–92 |
| VP1008M | –100 | 5 | –0.31 | TO-237 |

Performance Curves: **VPDV10** (See Section 7)

TO-205AD

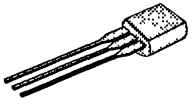


BOTTOM VIEW



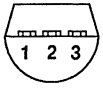

1 SOURCE
2 GATE
3 DRAIN & CASE

TO-92

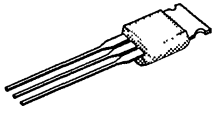


1 SOURCE
2 GATE
3 DRAIN

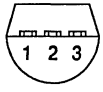
BOTTOM VIEW




TO-237



BOTTOM VIEW




1 SOURCE
2 GATE
3 DRAIN & TAB

## ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C unless otherwise noted)[3]

| PARAMETERS/TEST CONDITIONS | | SYMBOL | VP1008B[2] | VP1008L | VP1008M | UNITS |
|---|---|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | –100 | –100 | –100 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | ±30 | ±30 | V |
| Continuous Drain Current | $T_A$ = 25°C | $I_D$ | –0.79 | –0.28 | –0.31 | A |
| | $T_A$ = 100°C | | –0.53 | –0.17 | –0.20 | A |
| Pulsed Drain Current[1] | | $I_{DM}$ | –3 | –3 | –3 | A |
| Power Dissipation | $T_A$ = 25°C | $P_D$ | 6.25 | 0.8 | 1 | W |
| | $T_A$ = 100°C | | 2.5 | 0.32 | 0.4 | W |
| Operating Junction and Storage Temperature | | $T_j$, $T_{stg}$ | –55 to 150 | | | °C |
| Lead Temperature (1/16" from case for 10 seconds) | | $T_L$ | 300 | | | °C |

## THERMAL RESISTANCE

| THERMAL RESISTANCE | SYMBOL | VP1008B | VP1008L | VP1008M | UNITS |
|---|---|---|---|---|---|
| Junction-to-Ambient | $R_{thJA}$ | 170 | 156 | 125 | °C/W |

[1]Pulse width limited by maximum junction temperature
[2]Reference case temperature for all testing
[3]Absolute maximum ratings have been revised

| ELECTRICAL CHARACTERISTICS[1] | | | LIMITS | | | |
|---|---|---|---|---|---|---|
| | | | | VP1008[4] | | |
| PARAMETER | SYMBOL | TEST CONDITIONS[4] | TYP[2] | MIN | MAX | UNIT |
| **STATIC** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0 V, $I_D$ = -10 µA | -110 | -100 | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = -1 mA | -3.4 | -2 | -4.5 | V |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = ±20 V | ±1 | | ±100 | nA |
| | | $T_J$ = 125°C | ±5 | | ±500 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = -100 V, $V_{GS}$ = 0 V | -0.0005 | | -10 | µA |
| | | $T_J$ = 125°C | -0.1 | | -500 | µA |
| On-State Drain Current[3] | $I_{D(ON)}$ | $V_{DS}$ = -15 V, $V_{GS}$ = -10 V | -2 | -1.1 | | A |
| Drain-Source On-Resistance[3] | $r_{DS(ON)}$ | $V_{GS}$ = -10 V, $I_D$ = -1 A | 2.5 | | 5 | Ω |
| | | $T_J$ = 125°C | 4.3 | | 8 | Ω |
| Forward Transconductance[3] | $g_{FS}$ | $V_{DS}$ = -10 V, $I_D$ = -0.5 A | 325 | 200 | | mS |
| Common Source Output Conductance[3] | $g_{OS}$ | $V_{DS}$ = -7.5 V, $I_D$ = -0.1 A | 450 | | | µS |
| **DYNAMIC** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = -25 V, $V_{GS}$ = 0 V, f = 1 MHz | 75 | | 150 | pF |
| Output Capacitance | $C_{oss}$ | | 40 | | 60 | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | 18 | | 25 | pF |
| **SWITCHING** | | | | | | |
| Turn-On Time | $t_{d(ON)}$ | $V_{DD}$ = -25 V, $R_L$ = 47 Ω, $I_D$ = -0.5 A, $V_{GEN}$ = -10 V, $R_G$ = 25 Ω (Switching time is essentially independent of operating temperature) | 11 | | 15 | ns |
| | $t_r$ | | 30 | | 40 | ns |
| Turn-Off Time | $t_{d(OFF)}$ | | 20 | | 30 | ns |
| | $t_f$ | | 20 | | 30 | ns |

NOTES: 1. $T_A$ = 25 °C unless otherwise noted, $T_C$ = 25 °C for VP1008B.
2. For design aid only, not subject to production testing.
3. Pulse test; PW = 300 µs, duty cycle ≤ 3%.
4. Data sheet limits and/or test conditions have been revised.