# SEME LAB

## 2N6782

## MECHANICAL DATA
Dimensions in mm (inches)



8.64 (0.34)
9.40 (0.37)

8.01 (0.315)
9.01 (0.355)

4.06 (0.16)
4.57 (0.18)

0.89 (0.035) max.

12.70 (0.500) min.

0.41 (0.016)
0.53 (0.021) dia.

5.08 (0.200) typ.

2.54 (0.100)

0.74 (0.029)
1.14 (0.045)

0.71 (0.028)
0.53 (0.021)

45°
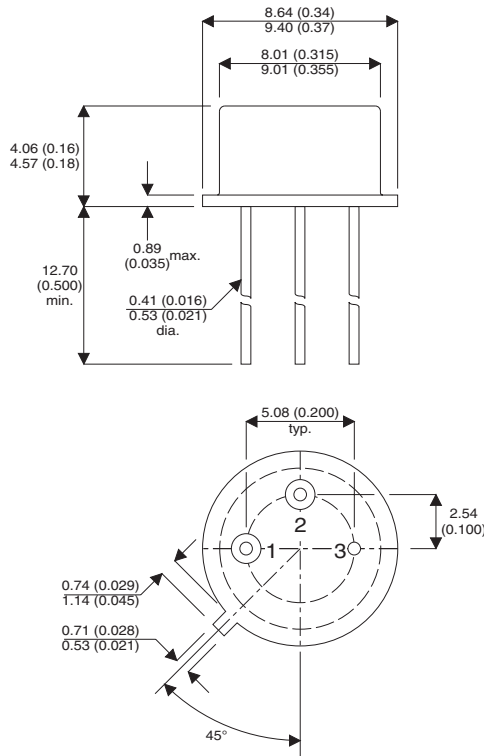
**TO39 Package (TO-205AF)**

**Underside View**

Pin 1 - Source          Pin 2 - Gate          Pin 3 - Drain and Case

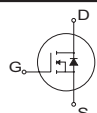## N–CHANNEL POWER MOSFET ENHANCEMENT MODE

### APPLICATIONS

• FAST SWITCHING

• MOTOR CONTROLS

• POWER SUPPLIES

## ABSOLUTE MAXIMUM RATINGS ($T_{case}$ = 25°C unless otherwise stated)

| | | |
|---|---|---|
| $V_{DS}$ | Drain Source Voltage | 100V |
| $V_{DGR}$ | Drain Gate Voltage ($R_{GS}$ = 1MΩ) | 100V |
| $I_D$ @ $T_{case}$ = 25°C | Continuous Drain Current | 3.5A |
| $I_D$ @ $T_{case}$ = 100°C | Continuous Drain Current | 2.25A |
| $I_{DM}$ | Pulsed Drain Current [1] | 14A |
| $V_{GS}$ | Gate Source Voltage | ±20V |
| $P_D$ @ $T_{case}$ = 25°C | Maximum Power Dissipation | 15W |
| $P_D$ @ $T_{case}$ = 100°C | Maximum Power Dissipation | 6W |
| Junction to Case | Linear Derating Factor | 0.12W/°C |
| Junction to ambient | Linear Derating Factor | 0.005W/°C |
| $T_J, T_{stg}$ | Operating and Storage Temperature Range | -55 to +150°C |
| Lead Temperature | ($\frac{1}{16}$" from case for 10 secs) | 300°C |

## ELECTRICAL CHARACTERISTICS ($T_{case}$ = 25°C unless otherwise stated)

| Parameter | | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| **STATIC ELECTRICAL RATINGS** | | | | | | | |
| $BV_{DSS}$ | Drain – Source Breakdown Voltage | $V_{GS}$ = 0 | $I_D$ = 0.25mA | 100* | | | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$ | $I_D$ = 0.5A | 2* | | 4.0* | V |
| | | $V_{DS}$ = 0 | $T_A$ = 125°C | 1* | | 4.0* | |
| $I_{GSSF}$ | Gate Body Leakage Forward | $V_{GS}$ = 20V | | | | 100* | nA |
| | | $V_{DS}$ = 0 | $T_A$ = 125°C | | | 200* | |
| $I_{GSSR}$ | Gate Body Leakage Reverse | $V_{GS}$ = -20V | | | | -100* | |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$ = 80V. | $V_{GS}$ =0 | | | 0.25* | mA |
| | | $V_{DS}$ = 100v | $V_{GS}$ = 0 | | | 1* | |
| | | | $T_C$ = 125°C | | | 1 | |
| $I_{D(on)}$ | On State Drain Current1 | $V_{GS}$ = 10V | | 3.5 | | | A |
| $V_{DS(on)}$ | Static Drain Source On-State Voltage1 | $V_{GS}$ = 10V | $I_D$ = 3.5A | 2.1* | | | V |
| $R_{DS(on)}$ | Static Drain Source On-State Resistance1 | $V_{GS}$ = 10V | $I_D$ = 2.25A | | | 0.6* | Ω |
| | | | $T_C$ = 125°C | | | 1.08* | |
| **DYNAMIC CHARACTERISTICS** | | | | | | | |
| gfs | Forward Transductance 1 | $V_{DS}$ = 5V | $I_{DS}$ = 2.25A | 1.0* | | 3.0* | S (℧) |
| $C_{iss}$ | Input Capacitance | $V_{GS}$ = 0 | $V_{DS}$ = 25V | 60* | | 200* | pF |
| $C_{oss}$ | Output Capacitance | f = 1MHz | | 40* | | 100* | |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 10* | | 25* | |
| $t_{d(on)}$ | Turn–On Delay Time | $V_{DD}$ = 34V | $I_D$ = 2.25A | | | 15* | ns |
| $t_r$ | Rise Time | $R_G$ = 50Ω | $R_L$ = 15Ω | | | 25* | |
| $t_{d(off)}$ | Turn–Off Delay Time | (MOSFET switching times are essentially | | | | 25* | |
| $t_f$ | Fall Time | independent of operating temperature.) | | | | 20* | |
| **BODY– DRAIN DIODE RATINGS & CHARACTERISTICS** | | | | | | | |
| $I_S$ | Continuous Source Current Body Diode | Modified MOS POWER symbol showing the intergal | | | | 3.5* | A |
| $I_{SM}$ | Source Current1 (Body Diode) | P-N junction rectifier. | | | | 14 | A |
| $V_{SD}$ | Diode Forward Voltage [1] | $I_S$ = 3.5A        $V_{GS}$ = 0 | | | | 1.5* | V |
| | | $T_J$ = 25°C | | | | | |
| $t_{rr}$ | Reverse Recovery Time | $I_F = I_S$        $T_J$ = 25°C | | | 200 | | nS |
| | | $d_i / d_t$ = 100A/µs | | | | | |
| **THERMAL CHARACTERISTICS** | | | | | | | |
| $R_{\theta JC}$ | Thermal Resistance Junction – Case | Free Air Operation | | | | 8.33* | °C\W |
| $R_{\theta JA}$ | Thermal Resistance Junction – Ambient | | | | | 175 | |

**Notes**

1)  Pulse Test: Pulse Width ≤ 300µs, δ ≤ 2%          *  JEDEC registered Values