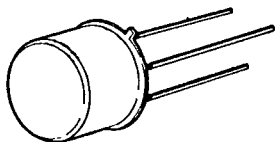
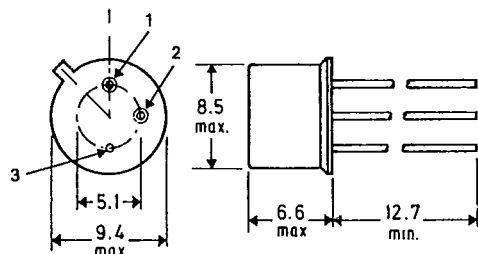


**SEMELAB****2N 6801****2N 6802****MECHANICAL DATA**

Dimensions in mm

**MOS POWER****N-Channel Enhancement Mode****APPLICATIONS**

- FAST SWITCHING
- MOTOR CONTROLS
- POWER SUPPLIES

PIN 1—Source PIN 2—Gate PIN 3 Drain and Case

T039

**ABSOLUTE MAXIMUM RATINGS** ( $T_{CASE} = 25^{\circ}\text{C}$  unless otherwise specified)

| Parameter                         |                                                    | 2N 6801                       | 2N 6802 |
|-----------------------------------|----------------------------------------------------|-------------------------------|---------|
| $V_{DS}$                          | Drain source voltage                               | 450V                          | 500V    |
| $V_{DGR}$                         | Drain gate voltage ( $R_{GS} = 1\text{ M}\Omega$ ) | 450V                          | 500V    |
| $I_D @ T_c = 25^{\circ}\text{C}$  | Continuous drain current                           | $\pm 2.5\text{A}$             |         |
| $I_D @ T_c = 100^{\circ}\text{C}$ | Continuous drain current                           | $\pm 1.5\text{A}$             |         |
| $I_{DM}$                          | Pulsed drain current (i)                           | $\pm 5\text{A}$               |         |
| $V_{GS}$                          | Gate-source voltage                                | $\pm 40\text{V}$              |         |
| $P_D @ T_c = 25^{\circ}\text{C}$  | Maximum power dissipation                          | 25W                           |         |
| $P_D @ T_c = 100^{\circ}\text{C}$ | Maximum power dissipation                          | 10W                           |         |
| Junction to case                  | Linear derating factor                             | 0.2 W/ $^{\circ}\text{C}$     |         |
| Junction to ambient               | Linear derating factor                             | 0.005 W/ $^{\circ}\text{C}$   |         |
| $T_j$                             | Operating and                                      | -55 to 150 $^{\circ}\text{C}$ |         |
| $T_{stg}$                         | storage temperature range                          |                               |         |
| Lead temperature                  | (1/16" from case for 10 secs.)                     | 300 $^{\circ}\text{C}$        |         |

(i) Pulse test: Pulse width  $\leq 300\mu\text{sec}$ , duty cycle  $\leq 2\%$ 

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2N 6801 2N 6802

**SEMELAB****ELECTRICAL CHARACTERISTICS (T<sub>CASE</sub> = 25°C unless otherwise specified)****STATIC**

| Parameter                                                                | Type   | Min. | Typ. | Max.  | Units | Test Conditions                                                              |
|--------------------------------------------------------------------------|--------|------|------|-------|-------|------------------------------------------------------------------------------|
| BV <sub>DSS</sub> Drain-Source Breakdown Voltage                         | 2N6801 | 450* |      |       | V     | V <sub>GS</sub> = 0<br>I <sub>D</sub> = 1.0 mA                               |
|                                                                          | 2N6802 | 500* |      |       | V     |                                                                              |
| V <sub>GS(th)</sub> Gate-Threshold Voltage                               | All    | 2.0* |      | 4.0*  | V     | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1.0 mA                  |
| I <sub>GSSF</sub> Gate-Body Leakage Forward                              | All    |      |      | 100*  | nA    | V <sub>GS</sub> = 20V                                                        |
| I <sub>GSSR</sub> Gate-Body Leakage Reverse                              | All    |      |      | -100  | nA    | V <sub>GS</sub> = -20V                                                       |
| I <sub>DSS</sub> Zero Gate Voltage Drain Current                         | All    |      |      | 1*    | mA    | V <sub>DS</sub> = Max. Rating, V <sub>GS</sub> = 0                           |
|                                                                          | All    |      |      | 4.0*  | mA    | V <sub>DS</sub> = Max. Rating, V <sub>GS</sub> = 0<br>T <sub>C</sub> = 125°C |
| I <sub>D(on)</sub> On-State Drain Current <sup>1</sup>                   | 2N6801 | 2.5  |      |       | A     | V <sub>DS</sub> ≥ 2 V <sub>DS(ON)</sub> , I <sub>D</sub> = 1.5A              |
|                                                                          | 2N6802 | 2.5  |      |       | A     | V <sub>DS</sub> ≥ 2 V <sub>DS(ON)</sub> , I <sub>D</sub> = 1.5A              |
| V <sub>DS(on)</sub> Static Drain-Source On-State Voltage <sup>1</sup>    | 2N6801 |      |      | 3.75* | V     | V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.5A                                 |
|                                                                          | 2N6802 |      |      | 3.75* | V     | V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.5A                                 |
| R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup> | 2N6801 |      |      | 1.5*  | Ω     | V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.5A                                 |
|                                                                          | 2N6802 |      |      | 1.5*  | Ω     | V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.5A                                 |
| R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup> | 2N6801 |      |      | 3.5*  | Ω     | V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.5A, T <sub>C</sub> = 125°C         |
|                                                                          | 2N6802 |      |      | 3.5*  | Ω     | V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.5A, T <sub>C</sub> = 125°C         |

**DYNAMIC**

|                                                       |     |      |  |      |       |                                                                                                                                                                                  |
|-------------------------------------------------------|-----|------|--|------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| g <sub>fs</sub> Forward Transconductance <sup>1</sup> | All | 1.5* |  | 4.5* | S (U) | V <sub>DS</sub> ≥ 2 V <sub>DS(ON)</sub> , I <sub>D</sub> = 1.5A                                                                                                                  |
| C <sub>iss</sub> Input Capacitance                    | All | 350* |  | 900* | pF    | V <sub>GS</sub> = 0, V <sub>DS</sub> = 25V<br>f = 1 MHz                                                                                                                          |
| C <sub>oss</sub> Output Capacitance                   | All | 25*  |  | 200* | pF    |                                                                                                                                                                                  |
| C <sub>rss</sub> Reverse Transfer Capacitance         | All | 15*  |  | 60*  | pF    |                                                                                                                                                                                  |
| t <sub>d(on)</sub> Turn-On Delay Time                 | All |      |  | 30*  | ns    | V <sub>DD</sub> = 225V, I <sub>D</sub> = 1.5A<br>R <sub>g</sub> = 7.5Ω, R <sub>L</sub> = 150Ω<br>(MOS FET switching times are essentially independent of operating temperature.) |
| t <sub>r</sub> Rise Time                              | All |      |  | 30*  | ns    |                                                                                                                                                                                  |
| t <sub>d(off)</sub> Turn-Off Delay Time               | All |      |  | 55*  | ns    |                                                                                                                                                                                  |
| t <sub>f</sub> Fall Time                              | All |      |  | 30*  | ns    |                                                                                                                                                                                  |

**THERMAL RESISTANCE**

|                                       |     |  |  |      |      |                    |
|---------------------------------------|-----|--|--|------|------|--------------------|
| R <sub>thJC</sub> Junction-to-Case    | All |  |  | 5.0* | °C/W |                    |
| R <sub>thJA</sub> Junction-to-Ambient | All |  |  | 170  | °C/W | Free Air Operation |

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

|                                                          |        |      |     |       |    |                                                                                                                                                               |
|----------------------------------------------------------|--------|------|-----|-------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I <sub>S</sub> Continuous Source Current (Body Diode)    | 2N6801 |      |     | -5    | A  | Modified MOS POWER symbol showing the integral P-N junction rectifier.<br> |
|                                                          | 2N6802 |      |     | -5    | A  |                                                                                                                                                               |
| I <sub>SM</sub> Source Current <sup>1</sup> (Body Diode) | 2N6801 |      |     | -2.5  | A  |                                                                                                                                                               |
|                                                          | 2N6802 |      |     | -2.5  | A  |                                                                                                                                                               |
| V <sub>SD</sub> Diode Forward Voltage <sup>1</sup>       | 2N6801 | -0.7 |     | -1.4* | V  | T <sub>C</sub> = 25°C, I <sub>S</sub> = -2.5A, V <sub>GS</sub> = 0                                                                                            |
|                                                          | 2N6802 | -0.7 |     | -1.4* | V  | T <sub>C</sub> = 25°C, I <sub>S</sub> = -2.5A, V <sub>GS</sub> = 0                                                                                            |
| t <sub>rr</sub> Reverse Recovery Time                    | All    |      | 400 |       | ns | T <sub>J</sub> = 150°C, I <sub>F</sub> = I <sub>S</sub> ,<br>dI <sub>F</sub> /ds = 100 A/μs                                                                   |

<sup>1</sup> Pulse Test: Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%**SEMELAB LTD., COVENTRY ROAD, LUTTERWORTH, LEICS. LE17 4JB**