

Small Signal MOSFET

115 mAmps, 60 Volts

N-Channel SOT-23

MAXIMUM RATINGS

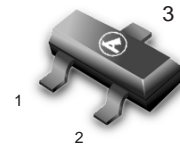
| Rating | Symbol | Value | Unit |
|---|----------------------------|------------------------------------|------------------------------------|
| Drain-Source Voltage | V_{DSS} | 60 | V _{dc} |
| Drain-Gate Voltage ($R_{GS} = 1.0\text{ M}\Omega$) | V_{DGR} | 60 | V _{dc} |
| Drain Current - Continuous $T_C = 25^\circ\text{C}$ (Note 1.) $T_C = 100^\circ\text{C}$ (Note 1.) - Pulsed (Note 2.) | I_D I_D I_{DM} | ± 115 ± 75 ± 800 | mAdc |
| Gate-Source Voltage - Continuous - Non-repetitive ($t_p \leq 50\ \mu\text{s}$) | V_{GS} V_{GSM} | ± 20 ± 40 | V _{dc} V _{pk} |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--|-----------------|----------------|----------------------------|
| Total Device Dissipation FR-5 Board (Note 3.) $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 225 1.8 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 556 | $^\circ\text{C}/\text{W}$ |
| Total Device Dissipation Alumina Substrate, (Note 4.) $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 300 2.4 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 417 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

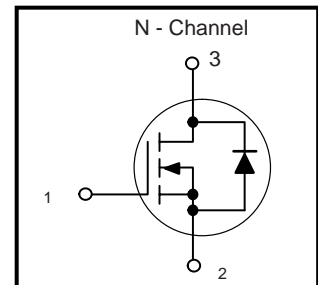
1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.
3. FR-5 = 1.0 x 0.75 x 0.062 in.
4. Alumina = 0.4 x 0.3 x 0.025 in 99.5% alumina.

L2N7002LT1

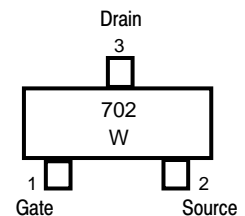


CASE 318, STYLE 21
SOT-23 (TO-236AB)

115 mAmps
60 Volts
 $R_{DS(on)} = 7.5\ \Omega$



MARKING DIAGRAM & PIN ASSIGNMENT



702 = Device Code
W = Work Week

ORDERING INFORMATION

| Device | Package | Shipping |
|-----------|---------|--------------------|
| 2N7002LT1 | SOT-23 | 3000 Tape & Reel |
| 2N7002LT3 | SOT-23 | 10,000 Tape & Reel |

L2N7002LT1
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|---------------|--------|--------|------------|---------------|
| OFF CHARACTERISTICS | | | | | |
| Drain–Source Breakdown Voltage ($V_{GS} = 0, I_D = 10 \mu\text{A}$) | $V_{(BR)DSS}$ | 60 | – | – | Vdc |
| Zero Gate Voltage Drain Current ($V_{GS} = 0, V_{DS} = 60 \text{ Vdc}$) | I_{DSS} | – – | – – | 1.0 500 | μA |
| Gate–Body Leakage Current, Forward ($V_{GS} = 20 \text{ Vdc}$) | I_{GSSF} | – | – | 100 | nA |
| Gate–Body Leakage Current, Reverse ($V_{GS} = -20 \text{ Vdc}$) | I_{GSSR} | – | – | -100 | nA |

ON CHARACTERISTICS (Note 2.)

| | | | | | |
|---|--------------|------------------|------------------|----------------------------|-------|
| Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$) | $V_{GS(th)}$ | 1.0 | – | 2.5 | Vdc |
| On–State Drain Current ($V_{DS} \geq 2.0 V_{DS(on)}, V_{GS} = 10 \text{ Vdc}$) | $I_{D(on)}$ | 500 | – | – | mA |
| Static Drain–Source On–State Voltage ($V_{GS} = 10 \text{ Vdc}, I_D = 500 \text{ mA}$) ($V_{GS} = 5.0 \text{ Vdc}, I_D = 50 \text{ mA}$) | $V_{DS(on)}$ | – – | – – | 3.75 0.375 | Vdc |
| Static Drain–Source On–State Resistance ($V_{GS} = 10 \text{ V}, I_D = 500 \text{ mA}$) $T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$ ($V_{GS} = 5.0 \text{ Vdc}, I_D = 50 \text{ mA}$) $T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$ | $r_{DS(on)}$ | – – – – | – – – – | 7.5 13.5 7.5 13.5 | Ohms |
| Forward Transconductance ($V_{DS} \geq 2.0 V_{DS(on)}, I_D = 200 \text{ mA}$) | g_{FS} | 80 | – | – | mmhos |

DYNAMIC CHARACTERISTICS

| | | | | | |
|--|-----------|---|---|-----|----|
| Input Capacitance ($V_{DS} = 25 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ MHz}$) | C_{iss} | – | – | 50 | pF |
| Output Capacitance ($V_{DS} = 25 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ MHz}$) | C_{oss} | – | – | 25 | pF |
| Reverse Transfer Capacitance ($V_{DS} = 25 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ MHz}$) | C_{rss} | – | – | 5.0 | pF |

SWITCHING CHARACTERISTICS (Note 2.)

| | | | | | | |
|---------------------|---|--------------|---|---|----|----|
| Turn–On Delay Time | ($V_{DD} = 25 \text{ Vdc}, I_D \cong 500 \text{ mA}$, $R_G = 25 \Omega, R_L = 50 \Omega, V_{gen} = 10 \text{ V}$) | $t_{d(on)}$ | – | – | 20 | ns |
| Turn–Off Delay Time | | $t_{d(off)}$ | – | – | 40 | ns |

BODY–DRAIN DIODE RATINGS

| | | | | | |
|---|----------|---|---|------|-----|
| Diode Forward On–Voltage ($I_S = 11.5 \text{ mA}, V_{GS} = 0 \text{ V}$) | V_{SD} | – | – | -1.5 | Vdc |
| Source Current Continuous (Body Diode) | I_S | – | – | -115 | mA |
| Source Current Pulsed | I_{SM} | – | – | -800 | mA |

 2. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

TYPICAL ELECTRICAL CHARACTERISTICS

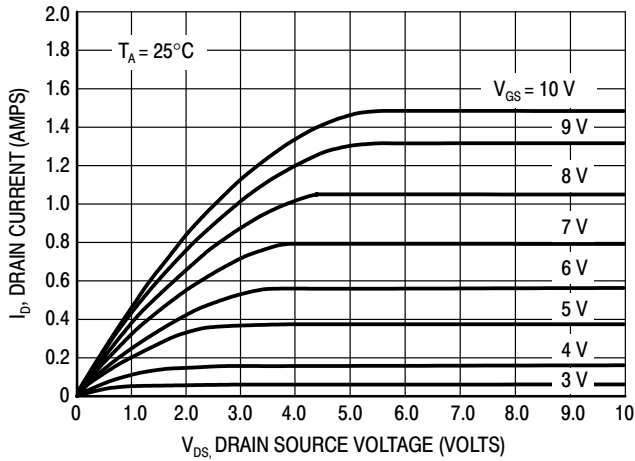


Figure 1. Ohmic Region

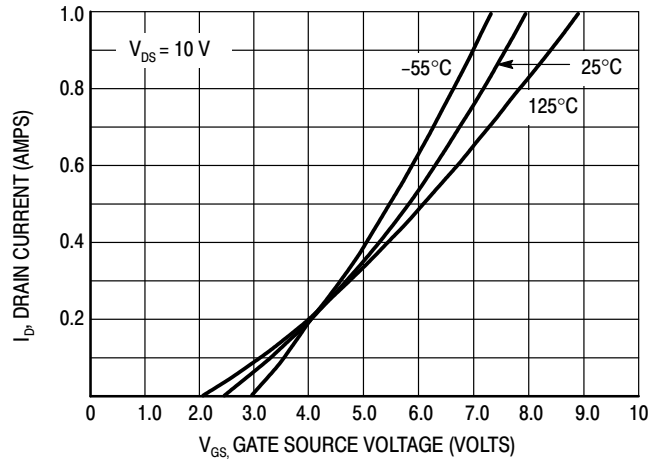


Figure 2. Transfer Characteristics

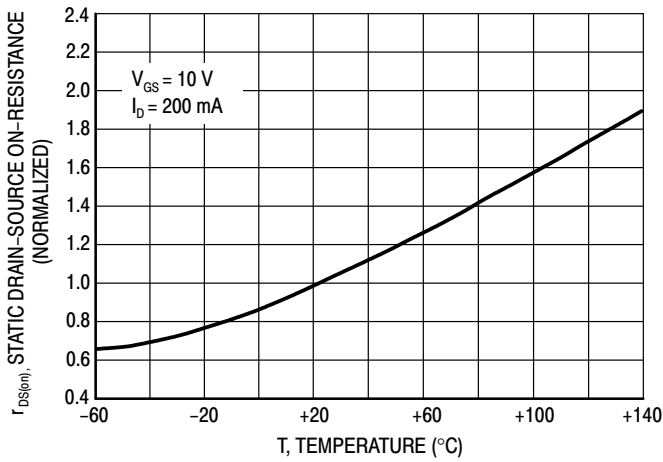


Figure 3. Temperature versus Static Drain-Source On-Resistance

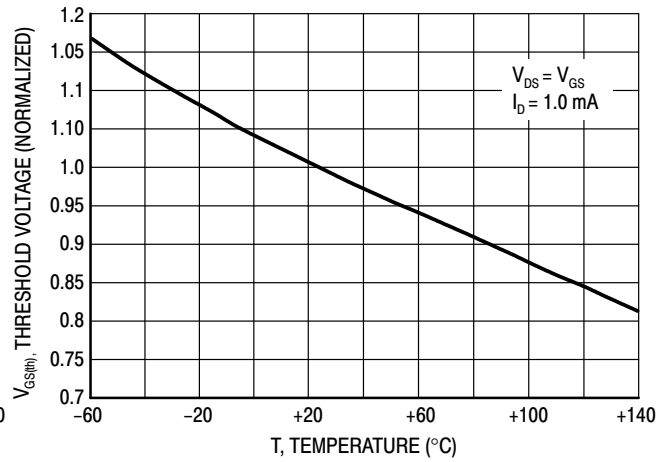


Figure 4. Temperature versus Gate Threshold Voltage