Elektronische Bauelemente

# 2N7000

**200mA,60V,$R_{DS(ON)}$ 6Ω**

**N-Channel Enhancement Mode Power Mos.FET**

RoHS Compliant Product

## Description

The 2N7000 is designed for high voltage, high speed applications such as switching regulators, converters, solenoid and relay drives.

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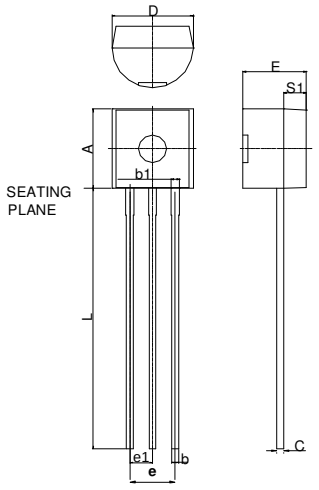


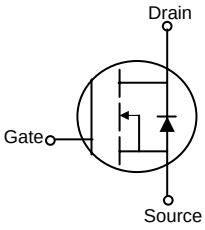


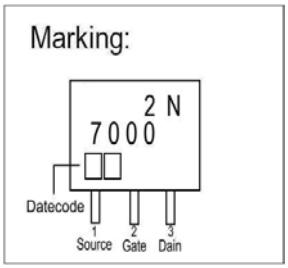


| REF. | Millimeter | | REF. | Millimeter | |
|---|---|---|---|---|---|
| | Min. | Max. | | Min. | Max. |
| A | 4.45 | 4.7 | D | 4.44 | 4.7 |
| $S_1$ | 1.02 | - | E | 3.30 | 3.81 |
| b | 0.36 | 0.51 | L | 12.70 | - |
| $b_1$ | 0.36 | 0.76 | e1 | 1.150 | 1.390 |
| C | 0.36 | 0.51 | e | 2.42 | 2.66 |

## Absolute Maximum Ratings

| Parameter | | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | -Continuous | $V_{GS}$ | ±20 | V |
| | -Non-Repetitive (tp ≦ 50us) | $V_{GSM}$ | ±40 | V |
| Drain Current | -Continuous | $I_D$ | 200 | mA |
| | -Pulsed | $I_{DM}$ | 500 | mA |
| Power Dissipation | - $T_A$=25°C | $P_D$ | 0.35 | W |
| | -Derate Above 25°C | | 2.8 | mW/°C |
| Thermal Resistance, Junction-To-Ambient | | $R\theta_{JA}$ | 357 | °C/W |
| Operating Junction and Storage Temperature Range | | Tj, Tstg | -55~+150 | °C |
| Max. Lead Temperature For Soldering Purposes, 1/16" From Case For 10 Seconds | | $T_L$ | 300 | °C |

## Electrical Characteristics( Tj=25°C Unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | 60 | – | – | V | $V_{GS}$=0V, $I_D$=250uA |
| Gate Threshold Voltage | $V_{GS(th)}$ | 0.8 | – | 3.0 | V | $V_{DS}$=$V_{GS}$, $I_D$=1.0mA |
| Gate Body Leakage Current | $I_{GSS}$ | – | – | ±10 | nA | $V_{GS}$=±15V,$V_{DS}$=0 |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | – | – | 1 | uA | $V_{DS}$=48V,$V_{GS}$=0 |
| On-State Drain Current | $I_{D(ON)}$ | 75 | – | – | mA | $V_{DS}$=10V ,$V_{GS}$=4.5V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | – | – | 5 | Ω | $V_{GS}$=10V, $I_D$=500mA |
| | | – | – | 6 | | $V_{GS}$=4.5V,$I_D$=75mA |
| Drain-Source On-Voltage | $V_{DS(ON)}$ | – | – | 2.5 | V | $V_{GS}$=10V, $I_D$=500mA |
| | | – | – | 0.45 | | $V_{GS}$=4.5V,$I_D$=75mA |
| Input Capacitance | Ciss | – | – | 60 | pF | $V_{GS}$=0V<br>$V_{DS}$=25V<br>f=1.0MHz |
| Output Capacitance | Coss | – | – | 25 | | |
| Reverse Transfer Capacitance | Crss | – | – | 5 | | |
| Forward Transconductance | Gfs | 100 | – | – | mS | $V_{DS}$=10V,$I_D$=200mA |

## Switching Characteristics[1]

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Turn-on Delay Time | $T_{ON}$ | – | – | 10 | nS | $V_{DD}$=15V,$I_D$=500mA<br>$R_G$=25 Ω<br>$R_L$=30 Ω<br>$V_{GEN}$=10V |
| Turn-off Delay Time | $T_{OFF}$ | – | – | 10 | | |

Notes: 1.Pulse width≦300us, dutycycle≦2%.

## Characteristics Curve

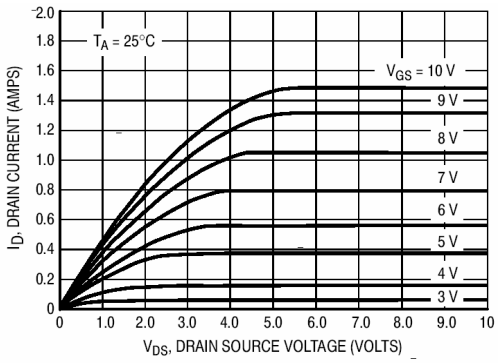


Figure 1. Ohmic Region

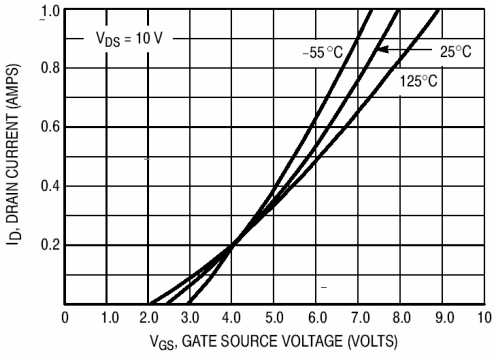


Figure 2. Transfer Characteristics

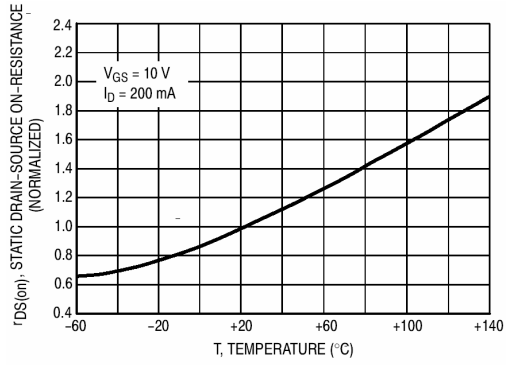


Figure 3. Temperature versus Static Drain−Source On−Resistance

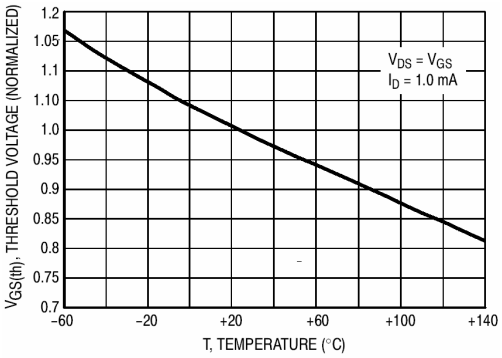


Figure 4. Temperature versus Gate Threshold Voltage