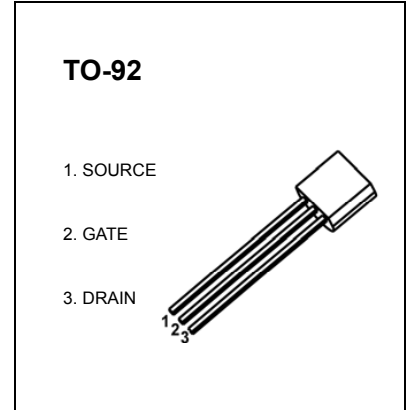


TO-92 Plastic-Encapsulate MOSFETS

2N7000 MOSFET (N-Channel)

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| 60V | 5Ω@10V | 200mA |
| | 6Ω@4.5V | |



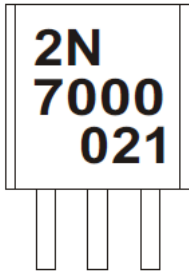
FEATURE

- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

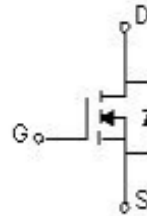
APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

MARKING



Equivalent Circuit



MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|-----------------|-----------|--------------------|
| Drain-Source Voltage | V_{DS} | 60 | V |
| Continuous Drain Current | I_D | 0.2 | A |
| Power Dissipation | P_D | 0.625 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 200 | $^\circ\text{C/W}$ |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 ~+150 | |

MOSFET ELECTRICAL CHARACTERISTICS

$T_a=25\text{ }^\circ\text{C}$ unless otherwise specified

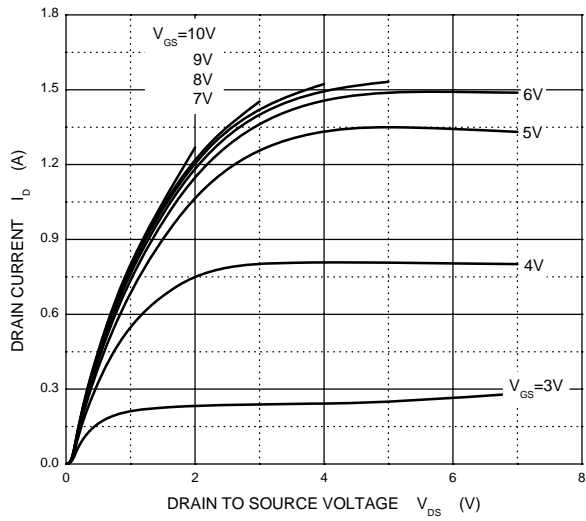
| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---------------------------------|---------------|---|-----|-----|----------|---------------|
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0\text{ V}, I_D=10\mu\text{A}$ | 60 | | | V |
| Gate-Threshold Voltage* | $V_{(GS)th}$ | $V_{DS}=V_{GS}, I_D=1\text{mA}$ | 0.8 | | 3 | |
| Gate-body Leakage | I_{GSS} | $V_{DS}=0\text{ V}, V_{GS}=\pm 15\text{ V}$ | | | ± 10 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=60\text{ V}, V_{GS}=0\text{ V}$ | | | 1 | μA |
| On-state Drain Current | $I_{D(ON)}$ | $V_{GS}=4.5\text{ V}, V_{DS}=10\text{ V}$ | 75 | | | mA |
| Drain-Source On-Resistance* | $R_{DS(on)}$ | $V_{GS}=4.5\text{V}, I_D=75\text{mA}$ | | | 6 | Ω |
| | | $V_{GS}=10\text{V}, I_D=500\text{mA}$ | | | 5 | |
| Forward Trans conductance* | g_{fs} | $V_{DS}=10\text{ V}, I_D=200\text{mA}$ | 100 | | | ms |
| Drain-source on-voltage* | $V_{DS(on)}$ | $V_{GS}=10\text{V}, I_D=500\text{mA}$ | | | 2.5 | V |
| | | $V_{GS}=4.5\text{V}, I_D=75\text{mA}$ | | | 0.45 | V |
| Input Capacitance ** | C_{iss} | $V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$ | | | 60 | pF |
| Output Capacitance ** | C_{oss} | | | | 25 | |
| Reverse Transfer Capacitance ** | C_{rss} | | | | 5 | |
| Turn-on Time ** | $t_{d(on)}$ | $V_{DD}=15\text{ V}, R_L=30\Omega$ $I_D=500\text{mA}, V_{GEN}=10\text{ V}$ $R_G=25\Omega$ | | | 10 | ns |
| Turn-off Time ** | $t_{d(off)}$ | | | | 10 | |

*Pulse test

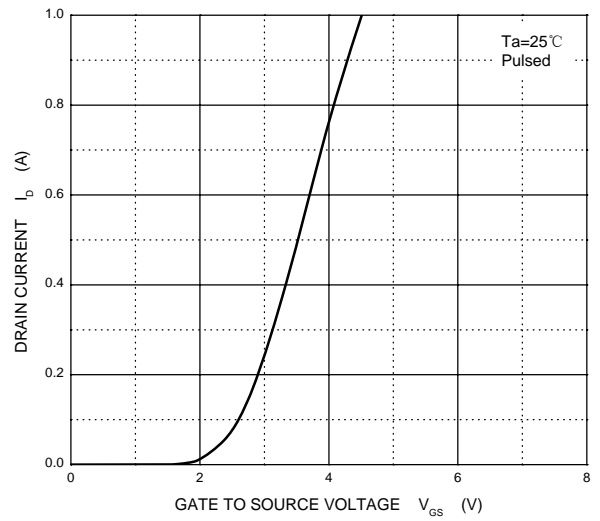
**These parameters have no way to verify.

Typical Characteristics

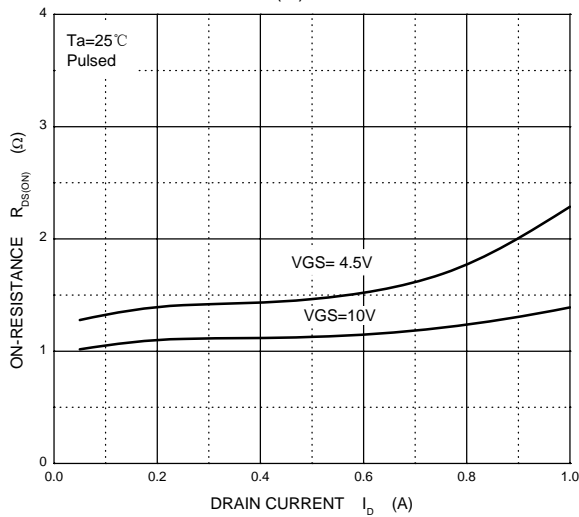
Output Characteristics



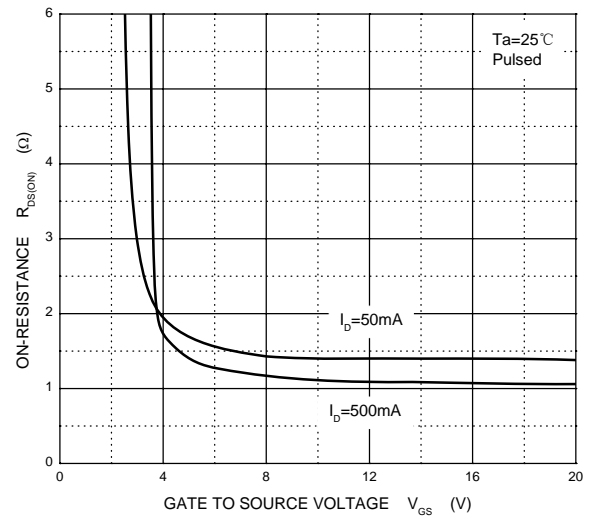
Transfer Characteristics



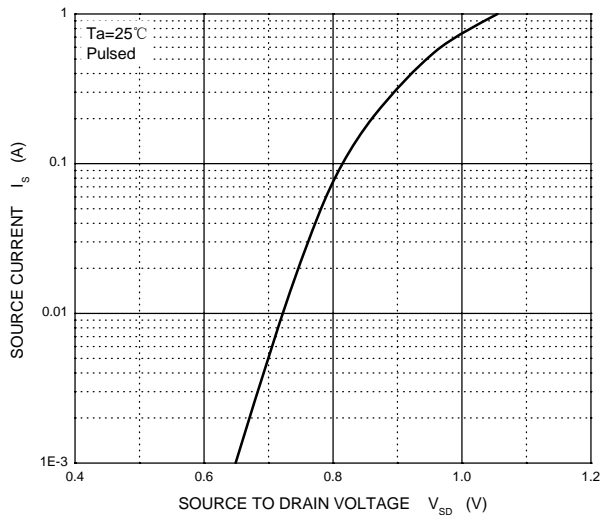
$R_{DS(ON)}$ — I_D



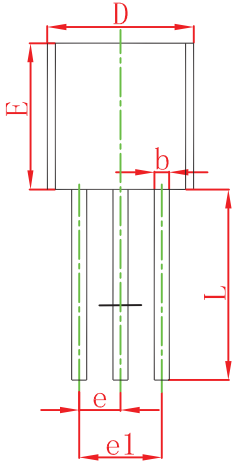
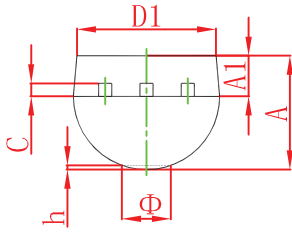
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}

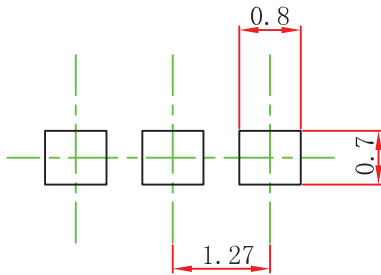


TO-92 Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 3.400 | 3.600 | 0.134 | 0.142 |
| A1 | 1.150 | 1.350 | 0.045 | 0.053 |
| b | 0.380 | 0.550 | 0.015 | 0.022 |
| c | 0.410 | 0.510 | 0.016 | 0.020 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 3.430 | | 0.135 | |
| E | 4.400 | 4.600 | 0.173 | 0.181 |
| e | 1.270 TYP. | | 0.050 TYP. | |
| e1 | 2.440 | 2.640 | 0.096 | 0.104 |
| L | 14.100 | 14.500 | 0.555 | 0.571 |
| Φ | | 1.600 | | 0.063 |
| h | 0.000 | 0.380 | 0.000 | 0.015 |

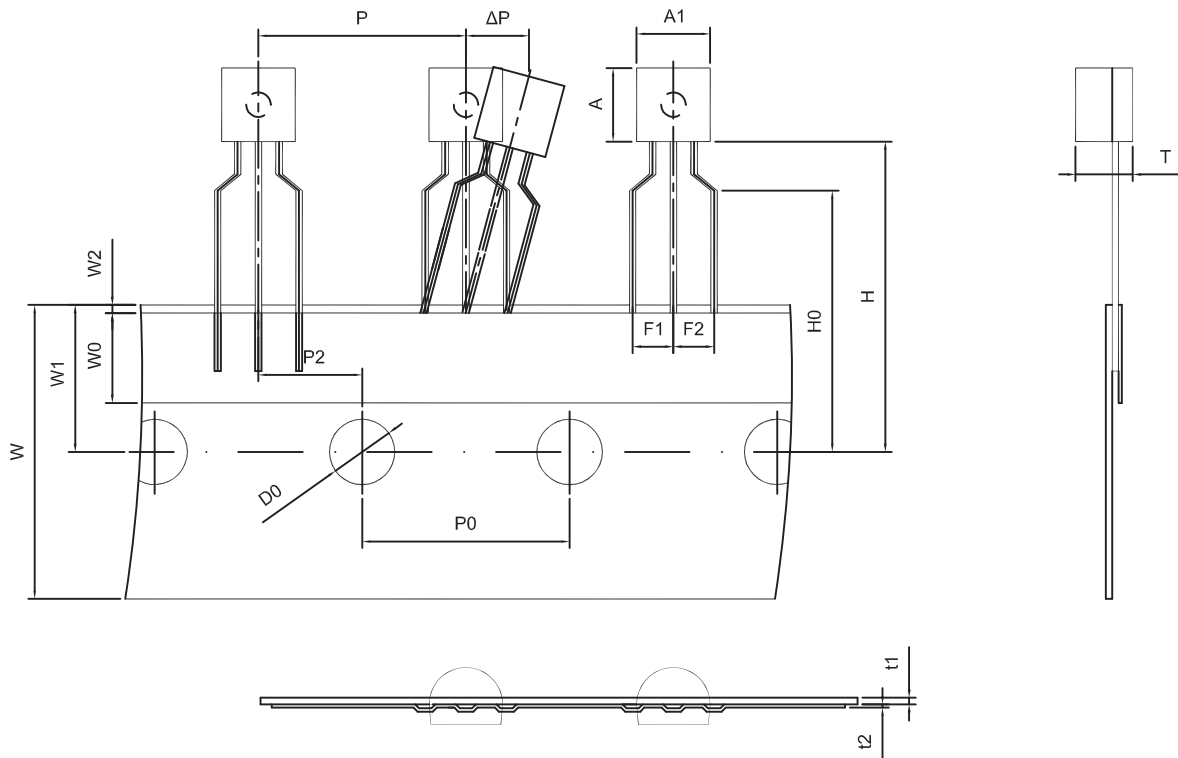
TO-92 Suggested Pad Layout



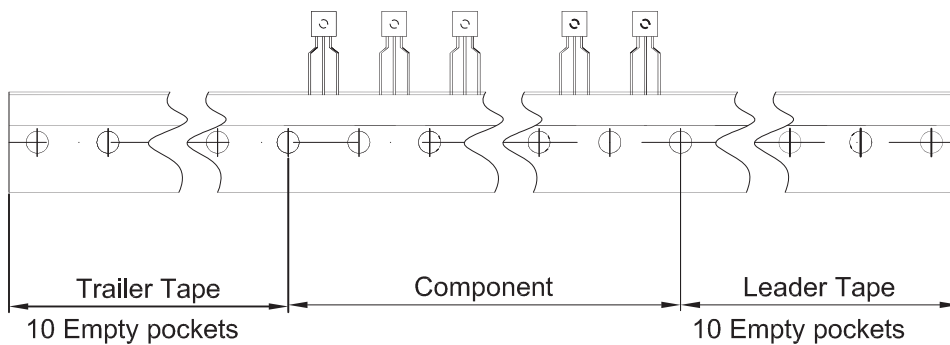
Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

TO-92 PACKAGE TAPEING DIMENSION



| Dimensions are in millimeter | | | | | | | | |
|------------------------------|---------|----------|----------|----------|----------|----------|----------|---------------|
| A1 | A | T | P | P0 | P2 | F1 | F2 | W |
| 4.5±0.1 | 4.5±0.1 | 3.5±0.1 | 12.7±0.3 | 12.7±0.2 | 6.35±0.3 | 2.5±0.3 | 2.5±0.3 | 18.0+1.0/-0.5 |
| W0 | W1 | W2 | H | H0 | D0 | t1 | t2 | ΔP |
| 6.0±0.5 | 9.0±0.5 | 1.0 MAX. | 19.0±1.0 | 16.0±0.5 | 4.0±0.5 | 0.4±0.05 | 0.2±0.05 | 0 ± 1.0 |



| Package | Box | Box Size(mm) | Carton | Carton Size(mm) |
|---------|----------|--------------|------------|-----------------|
| TO-92 | 2000 pcs | 333×162×43 | 20,000 pcs | 350×340×250 |