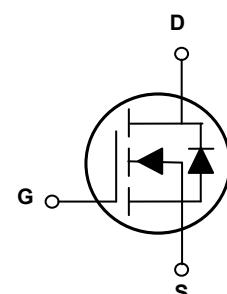
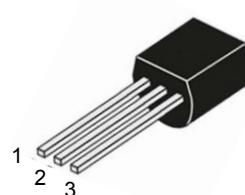


## Main Product Characteristics

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



## Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



## Description

The 2N7000 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

## Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	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, Junction-to-Ambient	$R_{\theta JA}$	200	°C/W
Operation Junction Temperature	$T_J$	-55 To +150	°C
Storage Temperature Range	$T_{STG}$	-55 To +150	°C

**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{GS}=0\text{V}, I_D=10\mu\text{A}$	60	-	-	V
Zero Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{DS}=60\text{V}, V_{GS}=0\text{V}$	-	-	1	$\mu\text{A}$
Gate-Body Leakage	$I_{\text{GSS}}$	$V_{GS}=\pm 15\text{V}, V_{DS}=0\text{V}$	-	-	$\pm 10$	nA
On-State Drain Current	$I_{\text{D(ON)}}$	$V_{GS}=4.5\text{V}, V_{DS}=10\text{V}$	75	-	-	mA
Drain-Source On-Resistance <sup>1</sup>	$R_{\text{DS(ON)}}$	$V_{GS}=4.5\text{V}, I_D=75\text{mA}$	-	-	6	$\Omega$
		$V_{GS}=10\text{V}, I_D=500\text{mA}$	-	-	5	$\Omega$
Forward Transconductance <sup>1</sup>	$g_{\text{fs}}$	$V_{DS}=10\text{V}, I_D=200\text{mA}$	100	-	-	ms
Gate Threshold Voltage <sup>1</sup>	$V_{GS(\text{th})}$	$V_{GS}=V_{DS}, I_D=1\text{mA}$	0.8	-	3	V
Drain-Source On-Voltage <sup>1</sup>	$V_{\text{DS(ON)}}$	$V_{GS}=10\text{V}, I_D=500\text{mA}$	-	-	2.5	V
		$V_{GS}=4.5\text{V}, I_D=75\text{mA}$	-	-	0.45	V
<b>Dynamic and Switching Characteristics</b>						
Turn-On Delay Time	$t_{\text{d(on)}}$	$V_{DD}=15\text{V}, R_L=30\Omega$ $V_{\text{GEN}}=10\text{V}, I_D=500\text{mA}$ $R_G=25\Omega$	-	-	10	nS
Turn-Off Delay Time	$t_{\text{d(off)}}$		-	-	10	
Input Capacitance	$C_{\text{iss}}$	$V_{DS}=25\text{V}, V_{GS}=0\text{V},$ $F=1\text{MHz}$	-	-	60	pF
Output Capacitance	$C_{\text{oss}}$		-	-	25	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	-	5	

Note:

1. Pulse test.

### Typical Electrical and Thermal Characteristic Curves

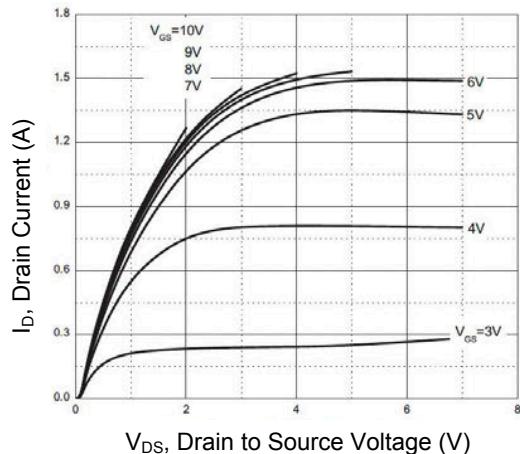


Figure 1. Output Characteristics

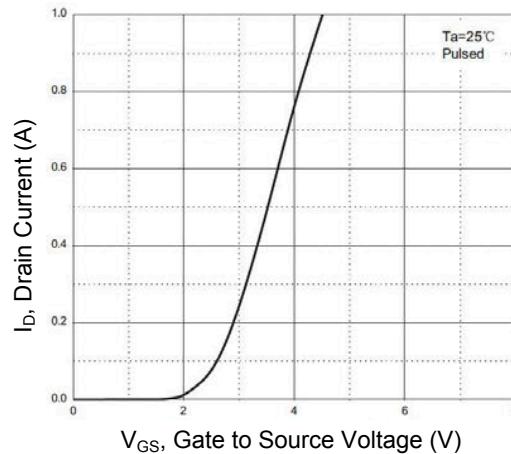


Figure 2. Transfer Characteristics

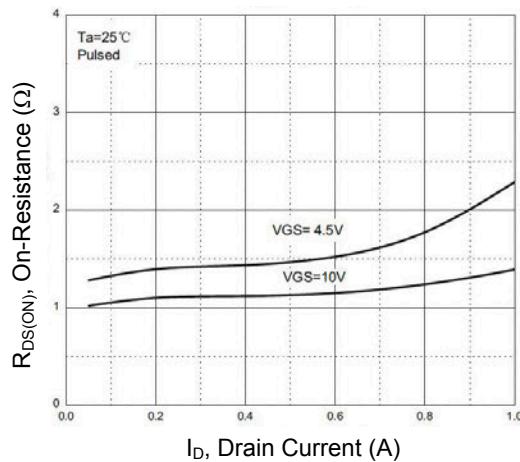


Figure 3.  $R_{DS(ON)}$  vs. Drain Current

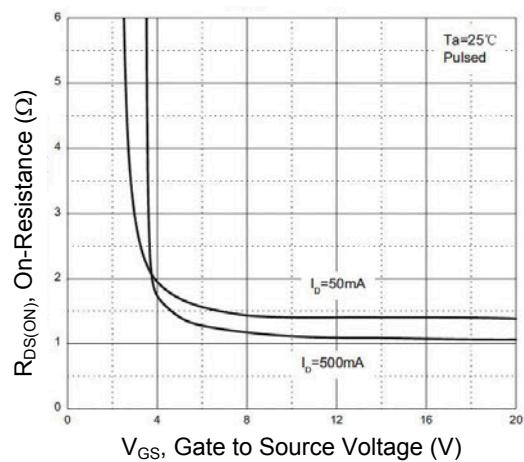


Figure 4.  $R_{DS(ON)}$  vs. Gate to Source Voltage

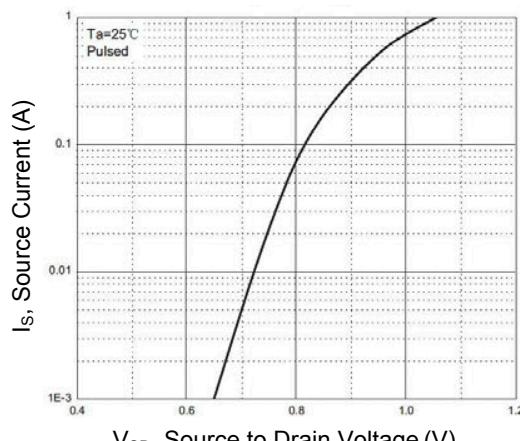
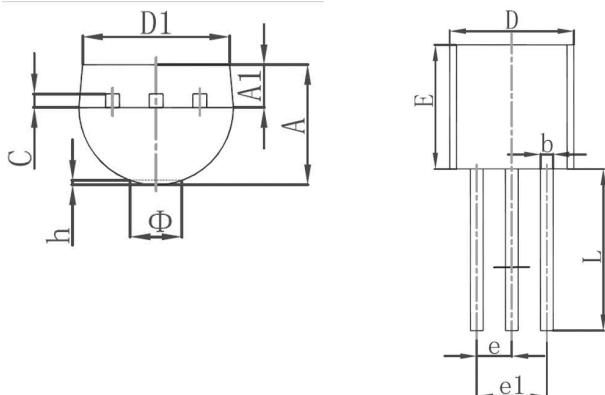


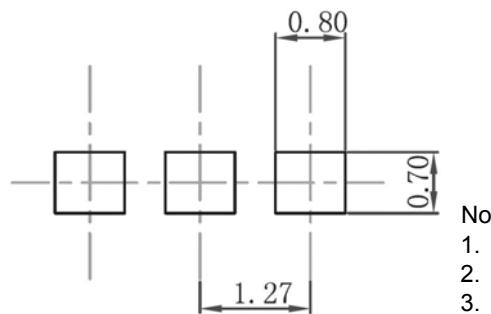
Figure 5. Source Current vs. Source to Drain Voltage

### Package Outline Dimensions (TO-92)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430	-	0.135	-
E	4.300	4.700	0.169	0.185
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

### Recommended Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.050\text{mm}$ .
3. The pad layout is for reference purposes only.

### Order Information

Device	Package	Marking	Quantity	HSF Status
2N7000	TO-92	2N7000	2,000pcs / Box	RoHS Compliant