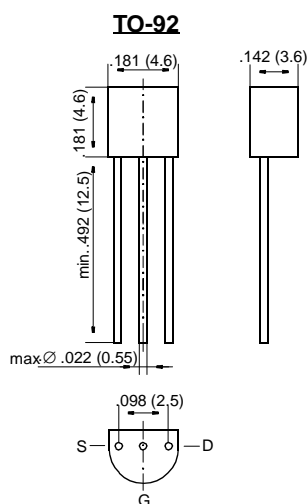


# 2N7000

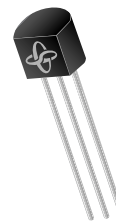
## DMOS Transistors (N-Channel)



Dimensions in inches and (millimeters)

### FEATURES

- ◆ High input impedance
- ◆ Low gate threshold voltage
- ◆ Low drain-source ON resistance
- ◆ High-speed switching
- ◆ No minority carrier storage time
- ◆ CMOS logic compatible input
- ◆ No thermal runaway
- ◆ No secondary breakdown



### MECHANICAL DATA

**Case:** TO-92 Plastic Package

**Weight:** approx. 0.18 g

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25 °C ambient temperature unless otherwise specified

	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	60	V
Drain-Gate Voltage	$V_{DGS}$	60	V
Gate-Source Voltage (pulsed)	$V_{GS}$	$\pm 20$	V
Drain Current (continuous)	$I_D$	300	mA
Power Dissipation at $T_{amb} = 25\text{ }^{\circ}\text{C}$	$P_{tot}$	830 <sup>1)</sup>	mW
Junction Temperature	$T_j$	150	$^{\circ}\text{C}$
Storage Temperature Range	$T_S$	-65 to +150	$^{\circ}\text{C}$

<sup>1)</sup> Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case.

### Inverse Diode

	Symbol	Value	Unit
Max. Forward Current (continuous) at $T_{amb} = 25\text{ }^{\circ}\text{C}$	$I_F$	500	mA
Forward Voltage Drop (typ.) at $V_{GS} = 0$ , $I_F = 0.5\text{ A}$ , $T_j = 25\text{ }^{\circ}\text{C}$	$V_F$	850	mV

# 2N7000

## ELECTRICAL CHARACTERISTICS

Ratings at 25 °C ambient temperature unless otherwise specified

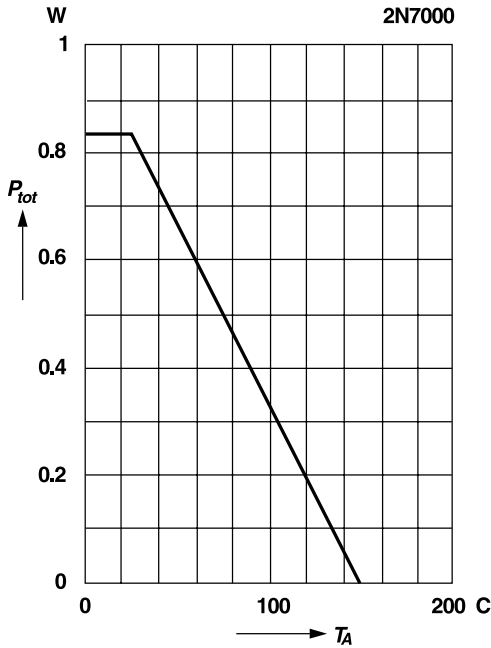
	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage at $I_D = 100 \mu\text{A}$ , $V_{GS} = 0 \text{ V}$	$V_{(BR)DSS}$	60	90	–	V
Gate-Body Leakage Current, Forward at $V_{GSF} = 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$	$I_{GSSF}$	–	–	10	nA
Gate-Body Leakage Current, Reverse at $V_{GSR} = -20 \text{ V}$ , $V_{DS} = 0 \text{ V}$	$I_{GSSR}$	–	–	-10	nA
Drain Cutoff Current at $V_{DS} = 48 \text{ V}$ , $V_{GS} = 0 \text{ V}$	$I_{DSS}$	–	–	1	$\mu\text{A}$
Gate-Source Threshold Voltage at $V_{GS} = V_{DS}$ , $I_D = 1.0 \text{ mA}$	$V_{GS(th)}$	0.8	1.5	3	V
Drain-Source ON Resistance at $V_{GS} = 10 \text{ V}$ , $I_D = 500 \text{ mA}$	$R_{DS(ON)}$	–	3.5	5.0	$\Omega$
Capacitance at $V_{DS} = 25 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 1 \text{ MHz}$ Input Capacitance Output Capacitance Feedback Capacitance	$C_{iSS}$ $C_{oSS}$ $C_{rSS}$	– – –	60 25 5	– – –	pF pF pF
Switching Times at $V_{GS} = 10 \text{ V}$ , $V_{DS} = 10 \text{ V}$ , $R_D = 100 \Omega$ Turn-On Time Turn-Off Time	$t_{on}$ $t_{off}$	– –	10 10	– –	ns ns
Thermal Resistance Junction to Ambient Air	$R_{thJA}$	–	–	150 <sup>1)</sup>	K/W

<sup>1)</sup> Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case.

# RATINGS AND CHARACTERISTIC CURVES 2N7000

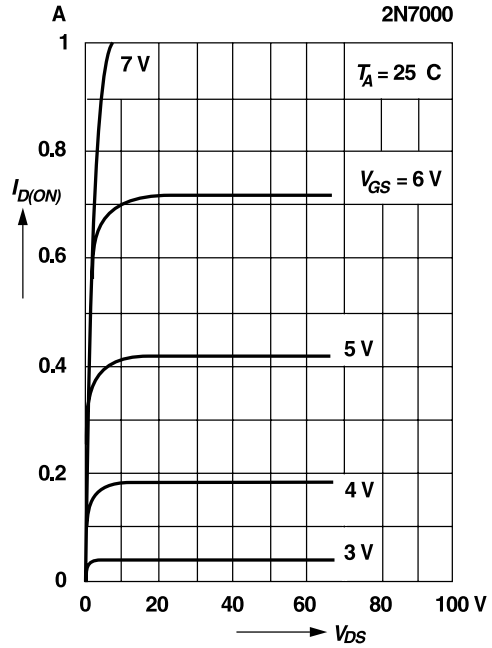
## Admissible power dissipation versus temperature

Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case



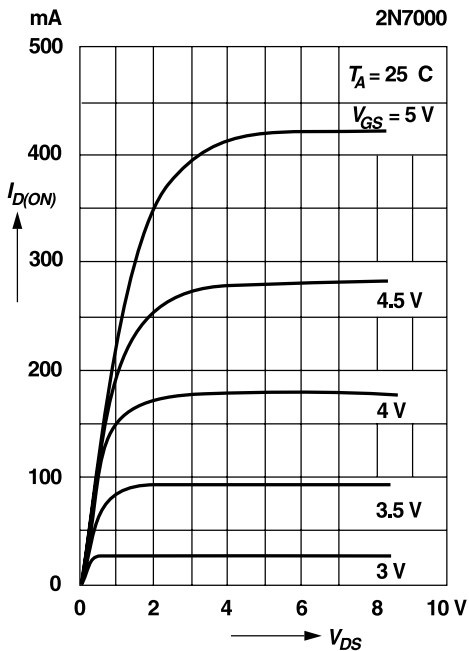
## Output characteristics

Pulse test width 80 ms; pulse duty factor 1%.

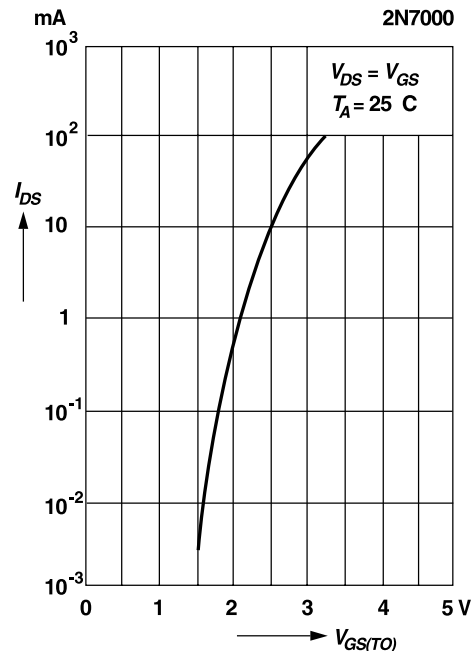


## Saturation characteristics

Pulse test width 80 ms; pulse duty factor 1%.



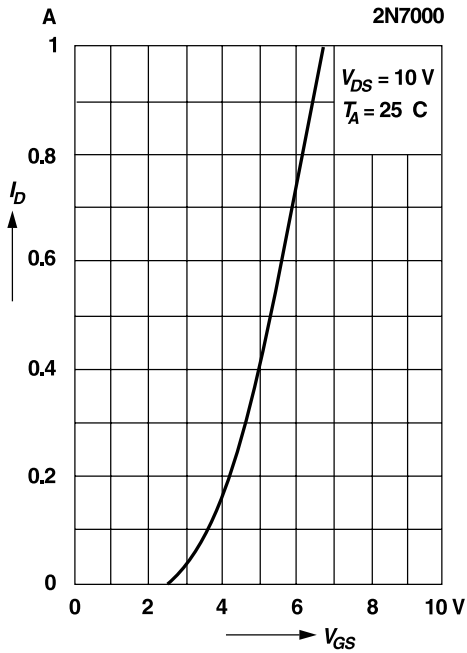
## Drain-source current versus gate threshold voltage



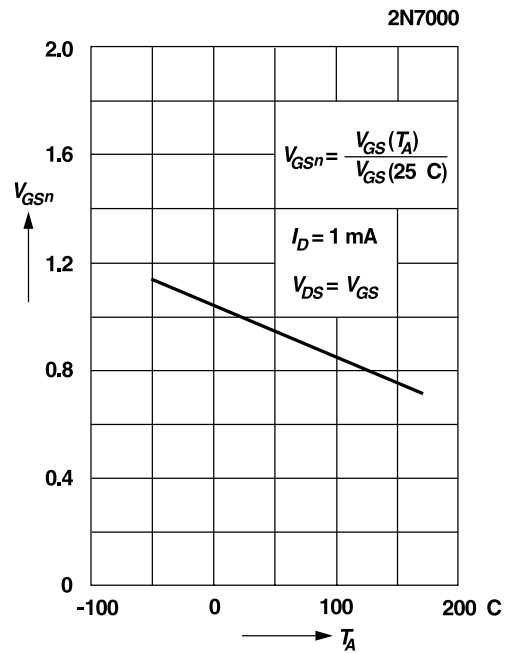
# RATINGS AND CHARACTERISTIC CURVES 2N7000

**Drain current versus gate-source voltage**

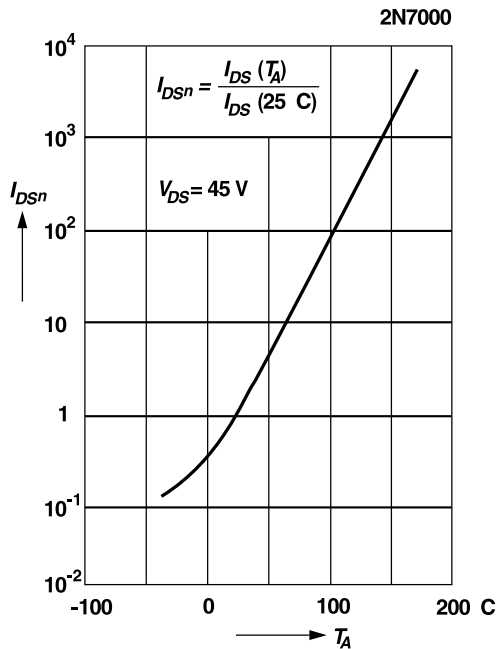
Pulse test width 80 ms; pulse duty factor 1%.



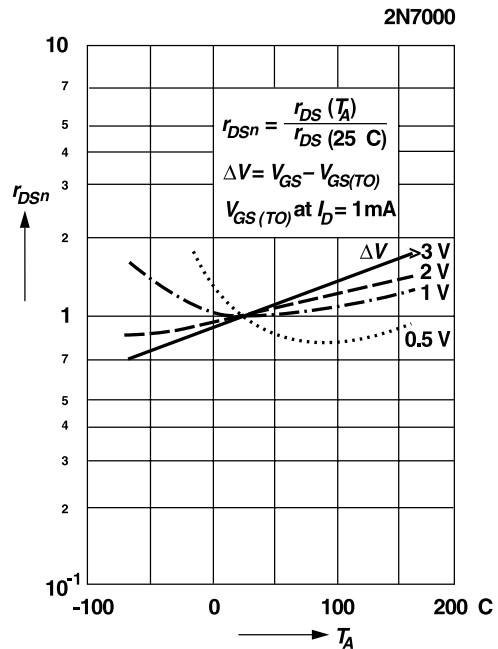
**Normalized gate-source voltage versus temperature**



**Normalized drain-source current versus temperature**

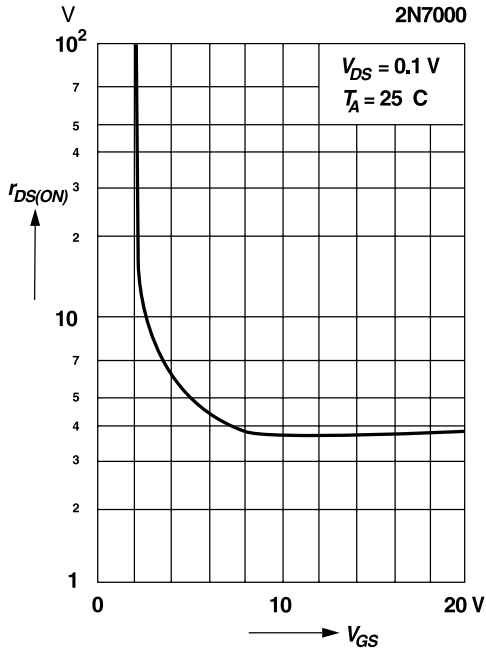


**Normalized drain-source resistance versus temperature**



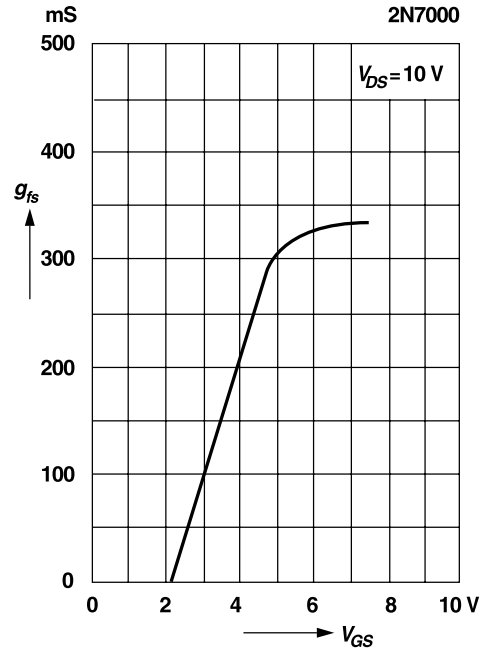
# RATINGS AND CHARACTERISTIC CURVES 2N7000

**Drain-source resistance versus gate-source voltage**



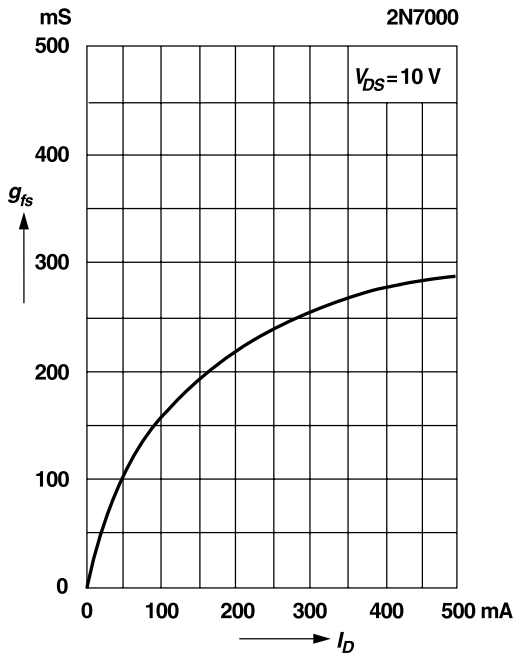
**Transconductance versus gate-source voltage**

Pulse test width 80 ms; pulse duty factor 1%



**Transconductance versus drain current**

Pulse test width 80 ms; pulse duty factor 1%



**Capacitance versus drain-source voltage**

