DMOS Transistor (N-Channel)

TO-226AA (TO-92)

0.181 (4.6) 0.142 (3.6)

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min. 0.492 (12.5)

max. ⌀
0.022 (0.55)

0.098 (2.5)

Dimensions in inches and (millimeters)

S ─── D

Bottom View

G
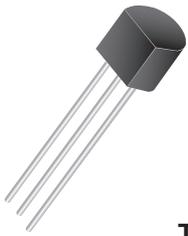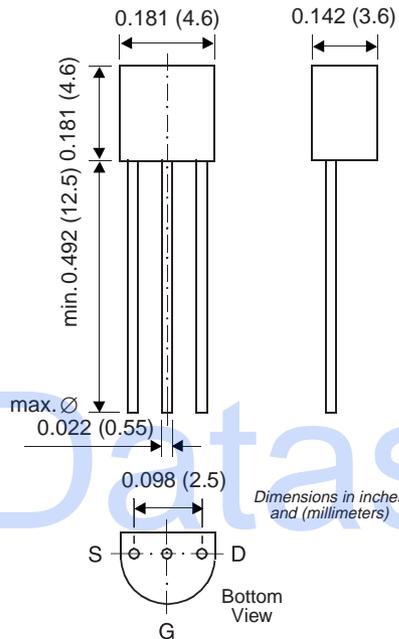
Features

- 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. 0.18g
Packaging Codes/Options:
E7/4K per Ammo tape, 20K/box

Maximum Ratings and Thermal Characteristics (T_A = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DSS}	60	V
Drain-Gate Voltage	V_{DGS}	60	V
Gate-Source-Voltage	V_{GS}	±20	V
Drain Current (continuous)	I_D	300	mA
Peak Drain Current (pulsed)	I_{DM}	1.3	A
Power Dissipation at T_{amb} = 25°C	P_{tot}	830[1]	mW
Thermal Resistance Junction to Ambient Air	$R_{\theta JA}$	150[1]	°C/W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_S	−65 to +150	°C

Note:
(1) Valid provided that leads are kept at ambient temperature at a distance of 2mm from case.

Electrical Characteristics $(T_J = 25°C$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 100\mu A$, $V_{GS} = 0$	60	90	—	V
Gate-Body Leakage Current	I_{GSS}	$V_{GS} \pm 20V$, $V_{DS} = 0V$	—	—	±10	nA
Drain Cutoff Current	I_{DSS}	$V_{DS} = 48V$, $V_{GS} = 0V$	—	—	1	μA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}$, $I_D = 1.0mA$	0.8	1.5	3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 500mA$	—	3.5	5.0	Ω
Input Capacitance	C_{iss}	$V_{DS} = 25V$, $V_{GS} = 0$, $f = 1MHz$	—	60	—	pF
Output Capacitance	C_{oss}	$V_{DS} = 25V$, $V_{GS} = 0$, $f = 1MHz$	—	25	—	pF
Feedback Capacitance	C_{rss}	$V_{DS} = 25V$, $V_{GS} = 0$, $f = 1MHz$	—	5	—	pF
Turn-On Time	t_{on}	$V_{GS} = 10V$, $V_{DS} = 10V$ $R_D = 100\Omega$	—	10	—	ns
Turn-Off Time	t_{off}		—	10	—	ns

Source-Drain Diode

| Parameter	Symbol	Test Condition	Value	Unit
Max. Forward Current (continuous)	I_F	$T_{amb} = 25°C$	500	mA
Diode Forward Voltage (typ.)	V_{SD}	$V_{GS} = 0$, $I_F = 0.5A$ $T_j = 25°C$	850	mV

VISHAY

Ratings and
Characteristic Curves (T_A = 25°C unless otherwise noted)

### Admissible power dissipation versus temperature

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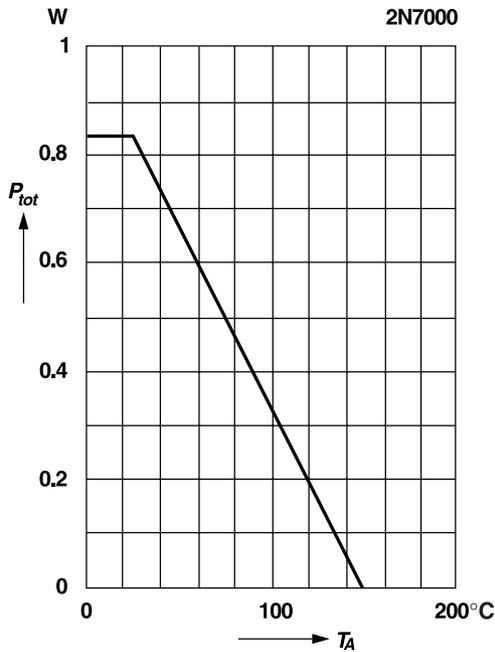
Output characteristics

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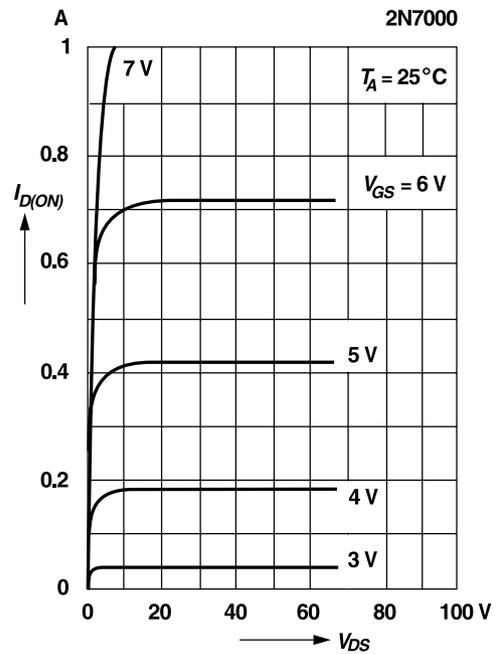

Saturation characteristics

Pulse test width 80 ms; pulse duty factor 1%.
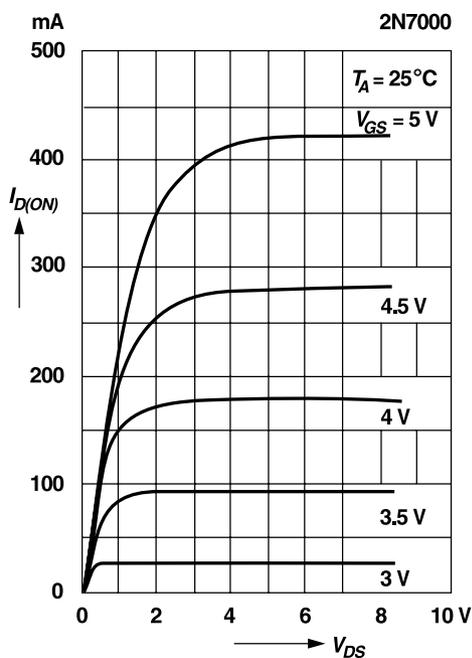
### Drain-source current versus gate threshold voltage

Vishay Semiconductors
formerly General Semiconductor
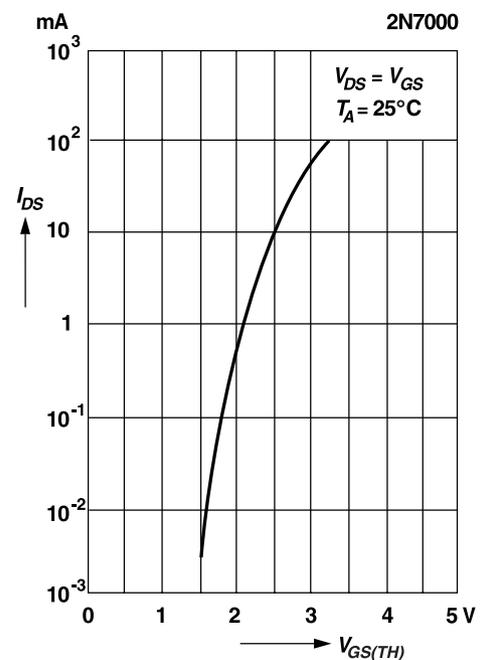
Ratings and
Characteristic Curves (T$_A$ = 25°C unless otherwise noted)

Drain current
versus gate-source voltage

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

2N7000

$V_{DS} = 10$ V
$T_A = 25°C$
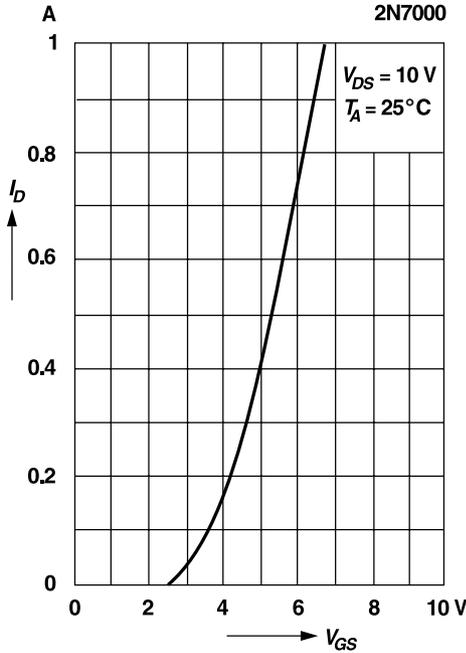
Normalized gate-source voltage
versus temperature

2N7000

$$V_{GSn} = \frac{V_{GS}(T_A)}{V_{GS}(25°C)}$$

$I_D = 1$ mA

$V_{DS} = V_{GS}$
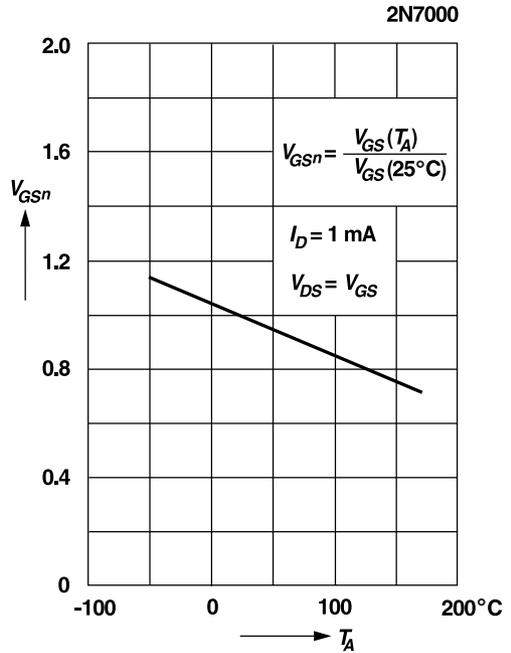
Normalized drain-source current
versus temperature

2N7000

$$I_{DSn} = \frac{I_{DS}(T_A)}{I_{DS}(25°C)}$$

$V_{DS} = 45$ V
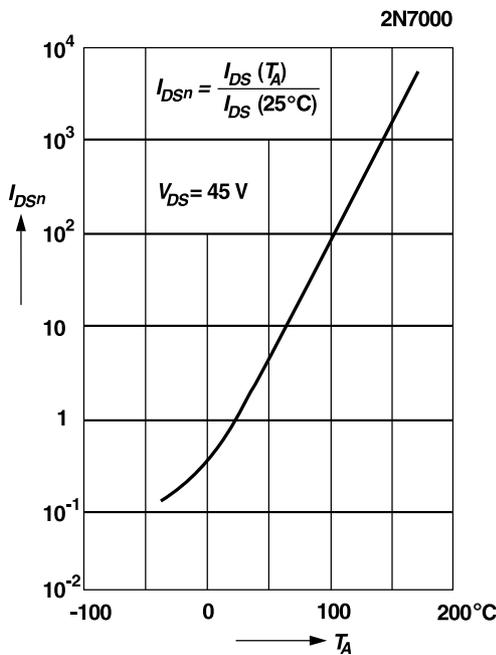
Normalized drain-source resistance
versus temperature

2N7000

$$r_{DSn} = \frac{r_{DS}(T_A)}{r_{DS}(25°C)}$$

$\Delta V = V_{GS} - V_{GS(TO)}$

$V_{GS(TO)}$ at $I_D = 1$ mA

ΔV 3 V
2 V
1 V
0.5 V
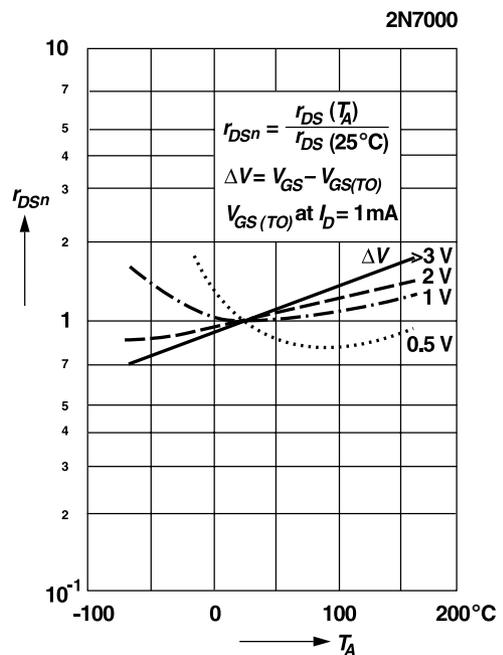
## Ratings and
Characteristic Curves (T_A = 25°C unless otherwise noted)

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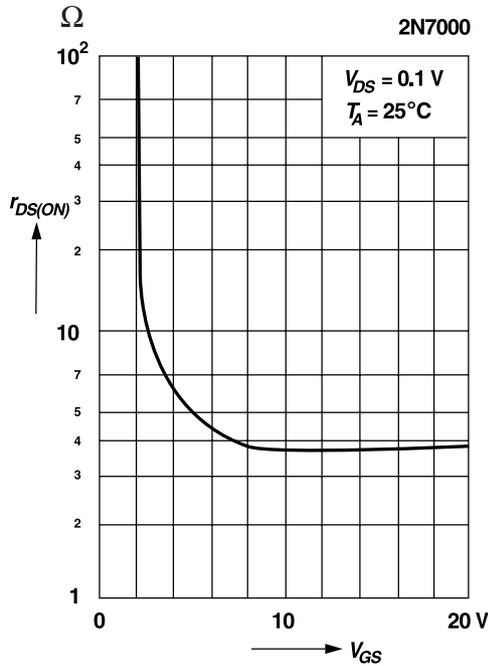
**Transconductance
versus gate-source voltage**

Pulse test width 80 ms; pulse duty factor 1%
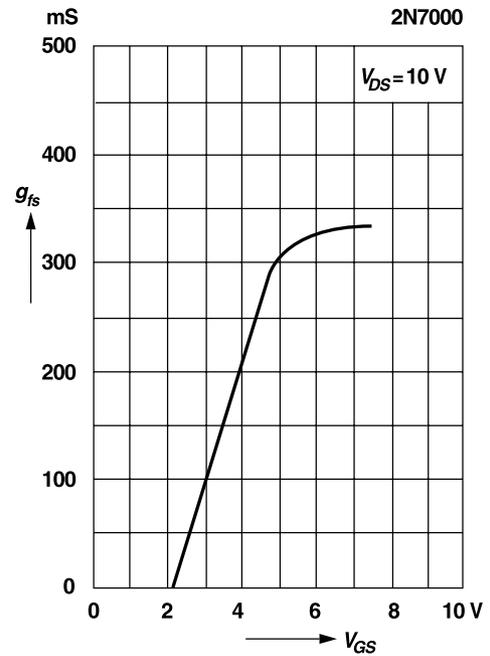
**Transconductance
versus drain current**

Pulse test width 80 ms; pulse duty factor 1%
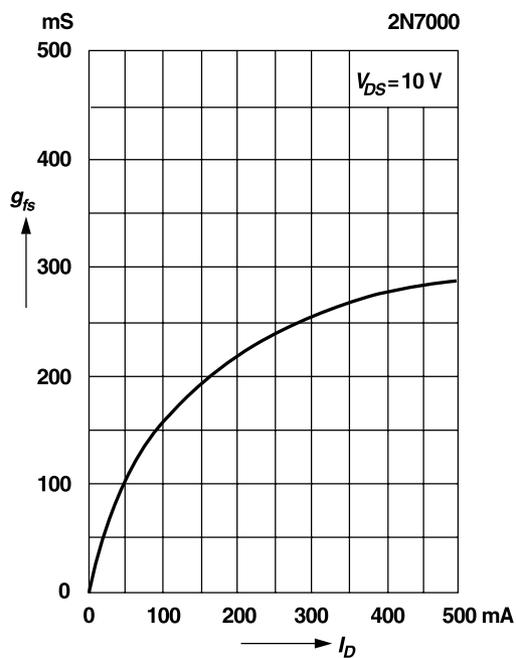
**Capacitance
versus drain-source voltage**