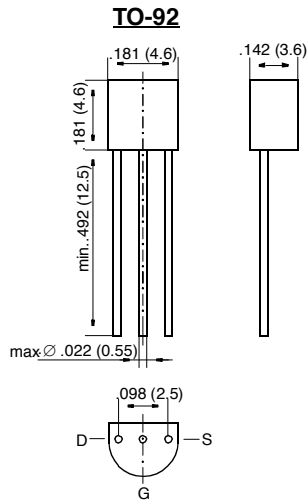


# BS170

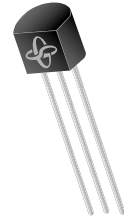
## DMOS Transistors (N-Channel)



Dimensions in inches and (millimeters)

### FEATURES

- ◆ High input impedance
- ◆ 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

On special request, this transistor is also manufactured in the pin configuration TO-18.

## 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 $T_{amb} = 25\text{ °C}$	$P_{tot}$	0.83 <sup>1)</sup>	W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_s$	-65 to +150	°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 $T_{amb} = 25\text{ °C}$	$I_F$	0.5	A
Forward Voltage Drop (typ.) at $V_{GS} = 0$ , $I_F = 0.5\text{ A}$ , $T_j = 25\text{ °C}$	$V_F$	0.85	V

# BS170

## ELECTRICAL CHARACTERISTICS

Ratings at 25 °C ambient temperature unless otherwise specified

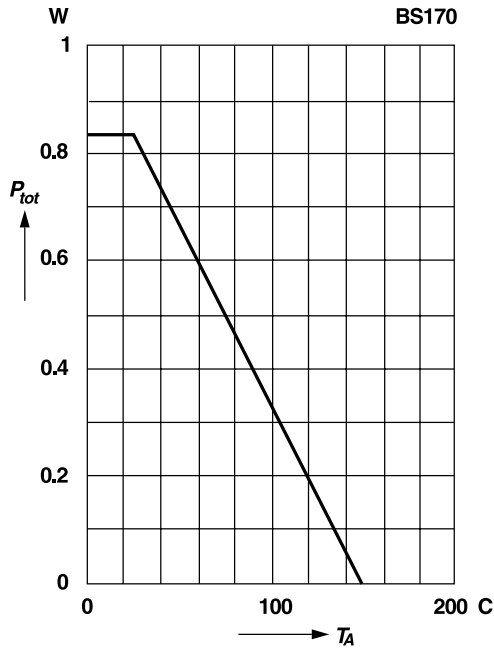
	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage at $I_D = 100\ \mu\text{A}$ , $V_{GS} = 0$	$V_{(BR)DSS}$	60	80	–	V
Gate Threshold Voltage at $V_{GS} = V_{DS}$ , $I_D = 1\ \text{mA}$	$V_{GS(th)}$	1.0	2	3.0	V
Gate-Body Leakage Current at $V_{GS} = 15\ \text{V}$ , $V_{DS} = 0$	$I_{GSS}$	–	–	10	nA
Drain Cutoff Current at $V_{DS} = 25\ \text{V}$ , $V_{GS} = 0$	$I_{DSS}$	–	–	0.5	$\mu\text{A}$
Drain-Source ON Resistance at $V_{GS} = 10\ \text{V}$ , $I_D = 0.2\ \text{A}$	$R_{DS(ON)}$	–	3.5	5.0	$\Omega$
Thermal Resistance Junction to Ambient Air	$R_{thJA}$	–	–	150 <sup>1)</sup>	K/W
Forward Transconductance at $V_{DS} = 10\ \text{V}$ , $I_D = 0.2\ \text{A}$ , $f = 1\ \text{MHz}$	$g_m$	–	200	–	mS
Input Capacitance at $V_{DS} = 10\ \text{V}$ , $V_{GS} = 0$ , $f = 1\ \text{MHz}$	$C_{iss}$	–	30	–	pF
Switching Times at $V_{GS} = 10\ \text{V}$ , $V_{DS} = 10\ \text{V}$ , $R_D = 100\ \Omega$ Turn-On Time Turn-Off Time	$t_{on}$ $t_{off}$	– –	5 15	– –	ns ns

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

# RATINGS AND CHARACTERISTIC CURVES BS170

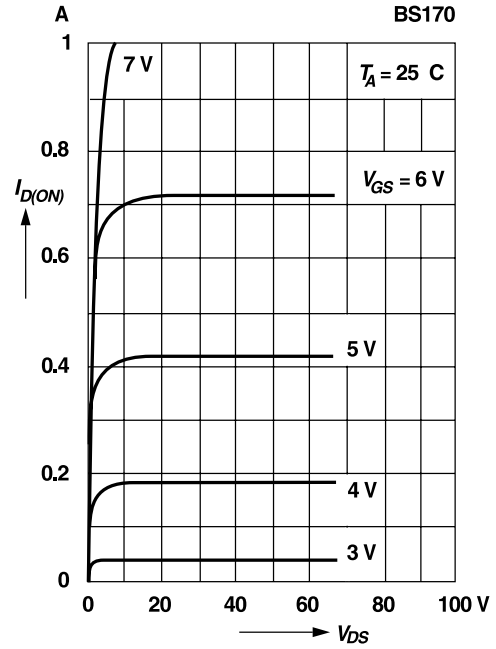
## Admissible power dissipation versus temperature

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



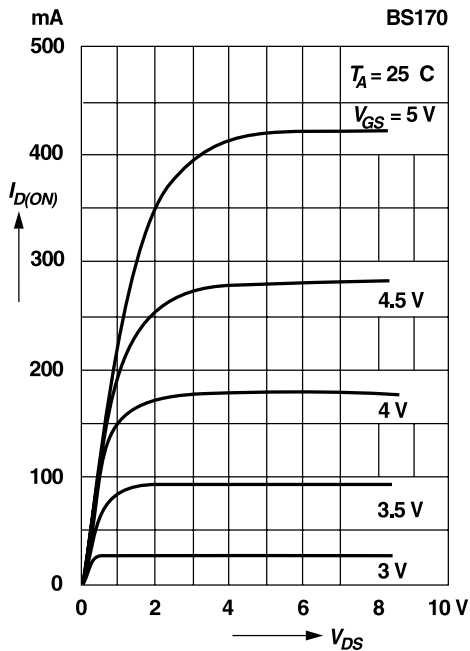
## Output characteristics

Pulse test width 80 ms; pulse duty factor 1%

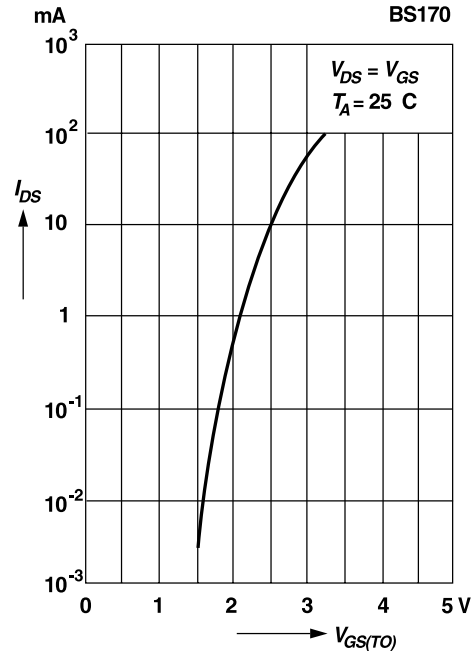


## Saturation characteristics

Pulse test width 80 ms; pulse duty factor 1%



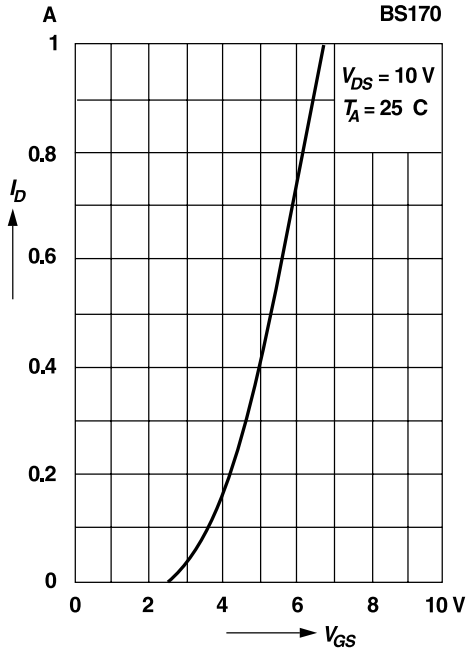
## Drain-source current versus gate threshold voltage



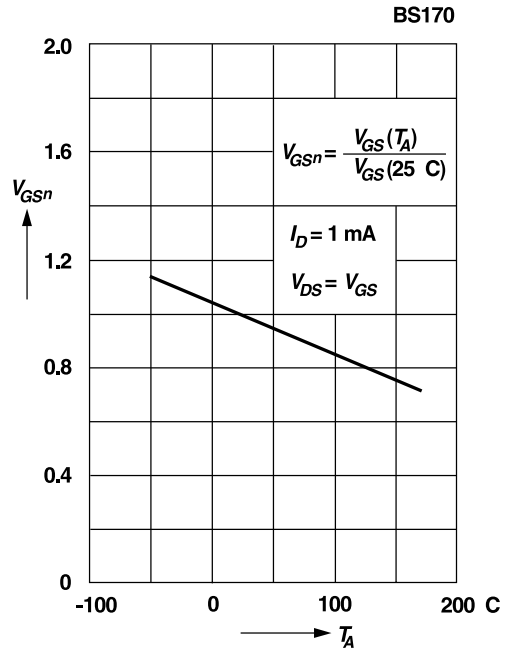
# RATINGS AND CHARACTERISTIC CURVES BS170

**Drain current  
versus gate-source voltage**

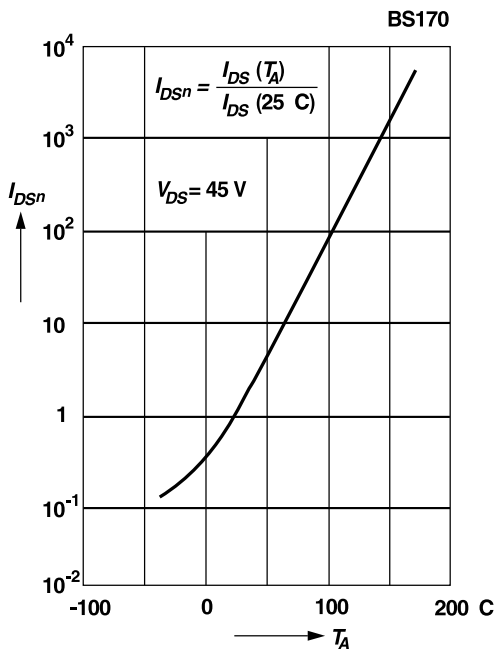
Pulse test width 80 ms; pulse duty factor 1%



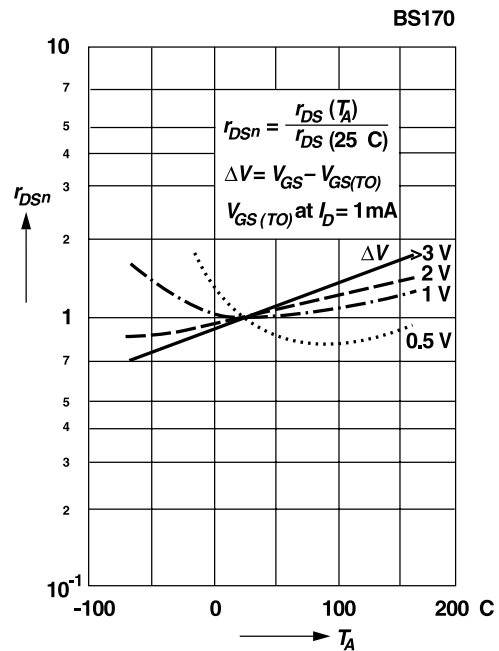
**Normalized gate-source voltage  
versus temperature**



**Normalized drain-source current  
versus temperature**

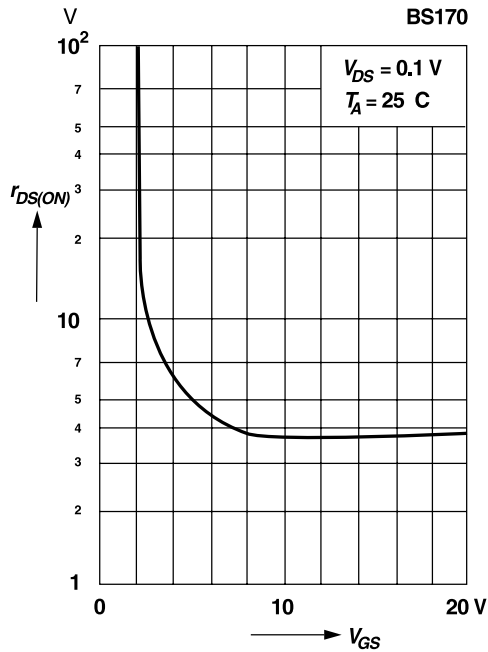


**Normalized drain-source resistance  
versus temperature**



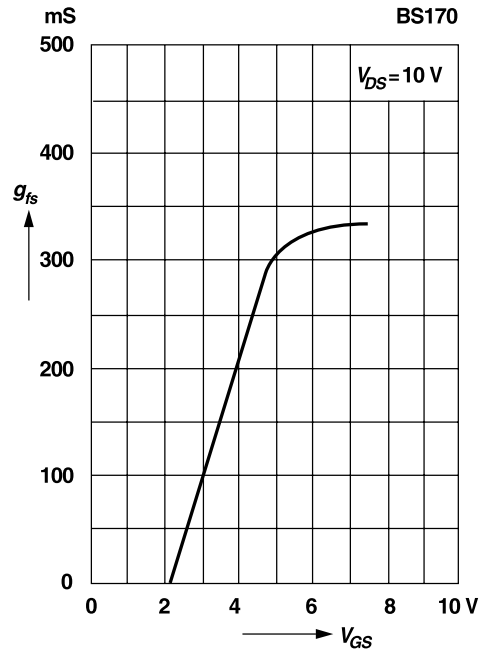
# RATINGS AND CHARACTERISTIC CURVES BS170

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



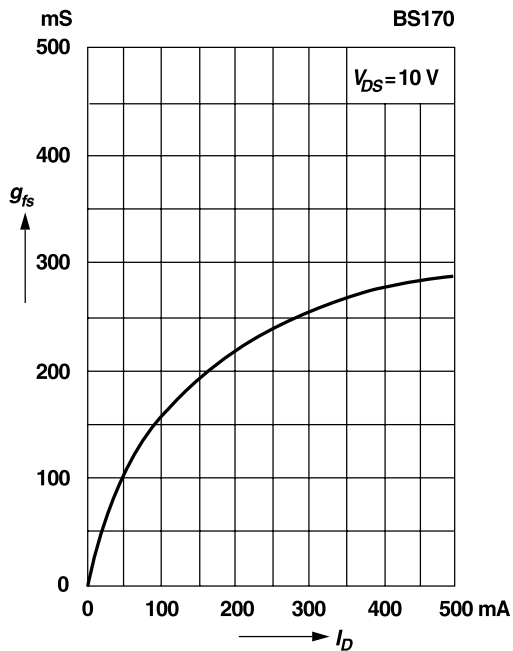
**Transconductance  
versus gate-source voltage**

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**

