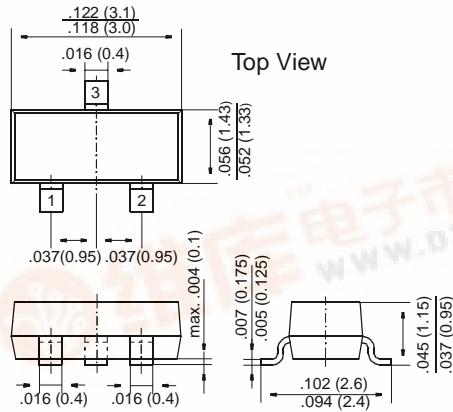


BS850

DMOS Transistors (P-Channel)

SOT-23



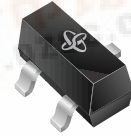
Dimensions in inches and (millimeters)

Pin configuration

1 = Gate, 2 = Source, 3 = Drain

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: SOT-23 Plastic Package

Weight: approx. 0.008 g

Marking

S50

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}	± 20	V
Drain Current (continuous)	$-I_D$	250	mA
Power Dissipation at $T_{SB} = 50\text{ °C}$	P_{tot}	0.310 ¹⁾	W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_S	-65 to +150	°C

¹⁾ Device on fiberglass substrate, see layout

Inverse Diode

	Symbol	Value	Unit
Max. Forward Current (continuous) at $T_{amb} = 25\text{ °C}$	I_F	0.3	A
Forward Voltage Drop (typ.) at $V_{GS} = 0, I_F = 0.12\text{ A}, T_j = 25\text{ °C}$	V_F	0.85	V

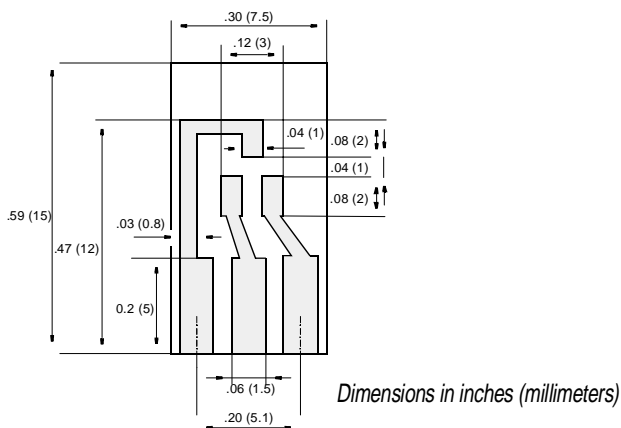
BS850

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	90	–	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	μA
Drain-Source ON Resistance at $-V_{GS} = 10 \text{ V}$, $-I_D = 200 \text{ mA}$	$R_{DS(ON)}$	–	3.5	5.0	Ω
Thermal Resistance Junction to Substrate Backside	R_{thSB}	–	–	320 ¹⁾	K/W
Thermal Resistance Junction to Ambient Air	R_{thJA}	–	–	450 ¹⁾	K/W
Forward Transconductance at $-V_{DS} = 10 \text{ V}$, $-I_D = 200 \text{ mA}$, $f = 1 \text{ MHz}$	g_m	–	200	–	mS
Input Capacitance at $-V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$	C_{iss}	–	60	–	pF
Switching Times at $-V_{GS} = 10 \text{ V}$, $-V_{DS} = 10 \text{ V}$, $R_D = 100 \Omega$					
Turn-On Time	t_{on}	–	5	–	ns
Turn-Off Time	t_{off}	–	25	–	ns

¹⁾ Device on fiberglass substrate, see layout



Layout for R_{thJA} test

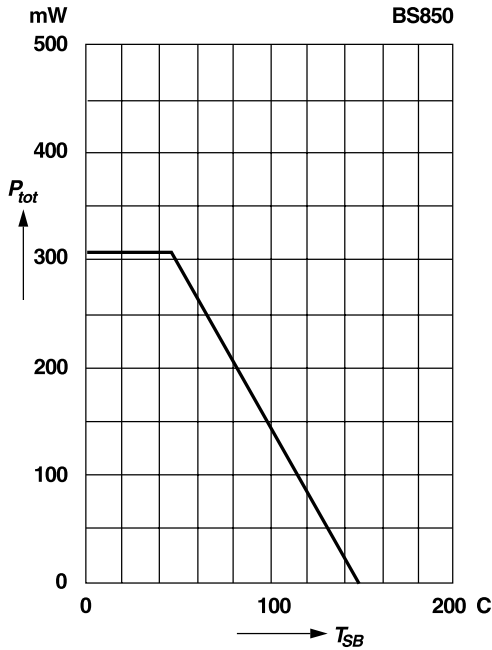
Thickness: Fiberglass 0.059 in (1.5 mm)

Copper leads 0.012 in (0.3 mm)

RATINGS AND CHARACTERISTIC CURVES BS850

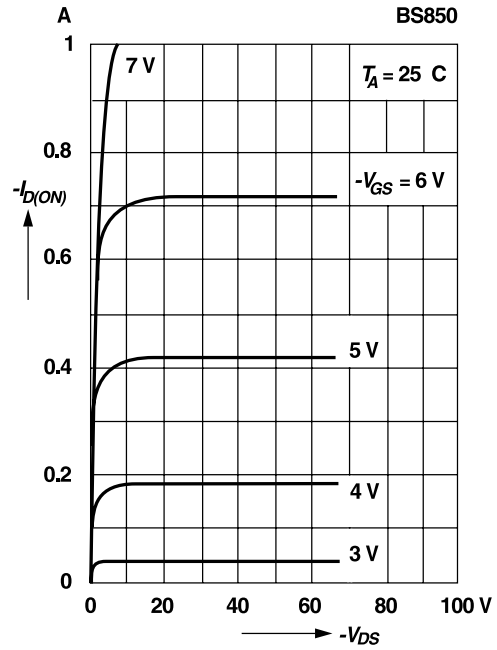
Admissible power dissipation versus temperature of substrate backside

Device on fiberglass substrate, see layout



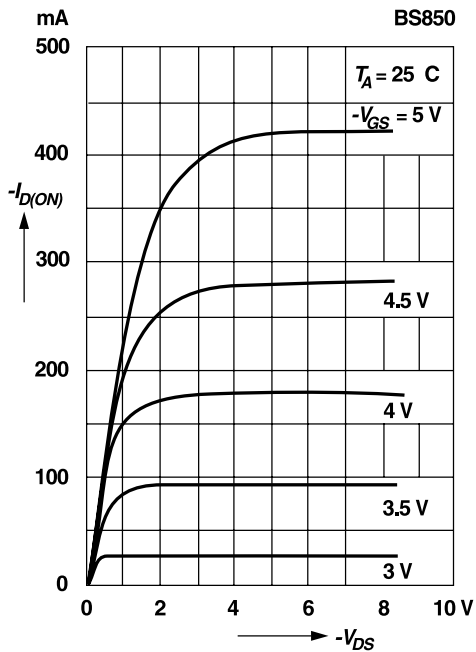
Output characteristics

Pulse test width 80 ms; pulse duty factor 1%

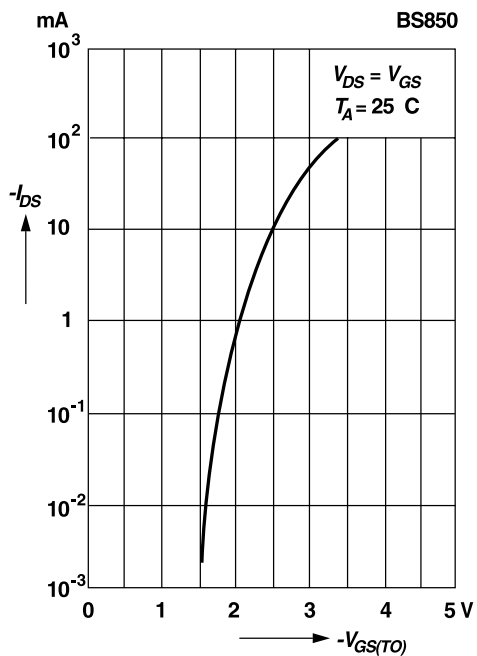


Saturation characteristics

Pulse test width 80 ms; pulse duty factor 1%



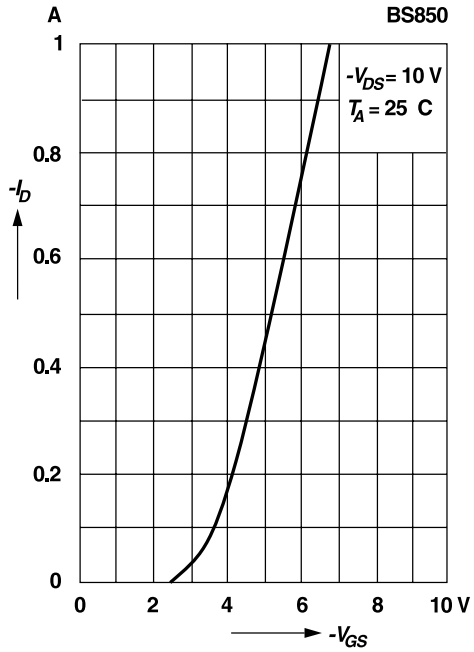
Drain-source current versus gate threshold voltage



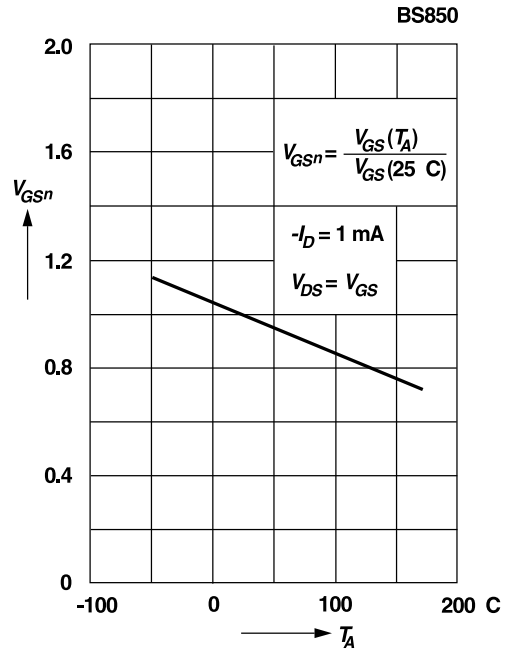
RATINGS AND CHARACTERISTIC CURVES BS850

Drain current versus gate-source voltage

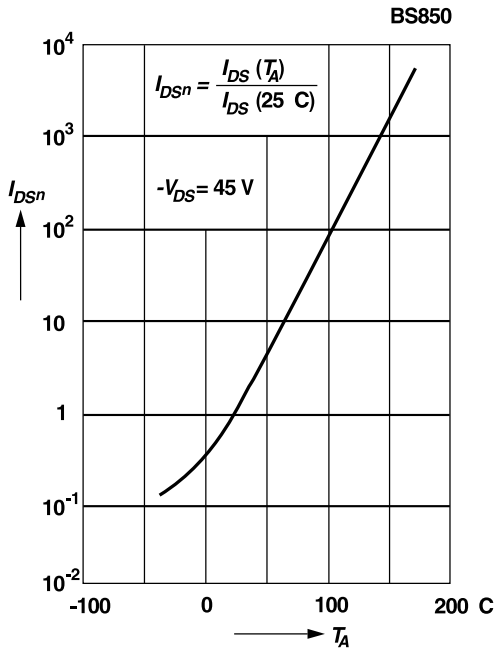
Pulse test width 80 ms; pulse duty factor 1%



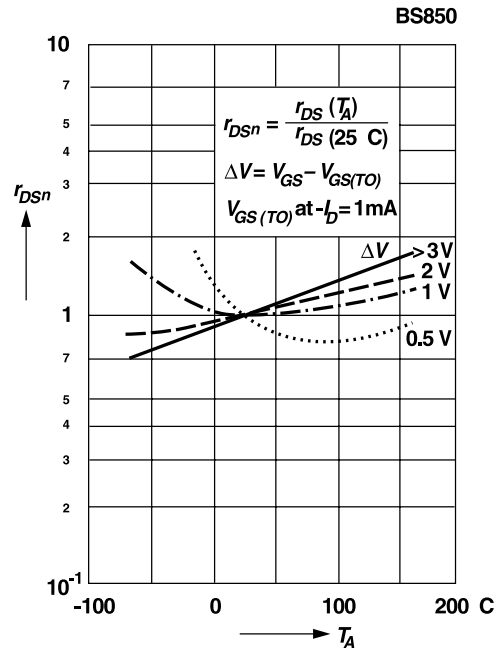
Normalized gate-source voltage versus temperature



Normalized drain-source current versus temperature

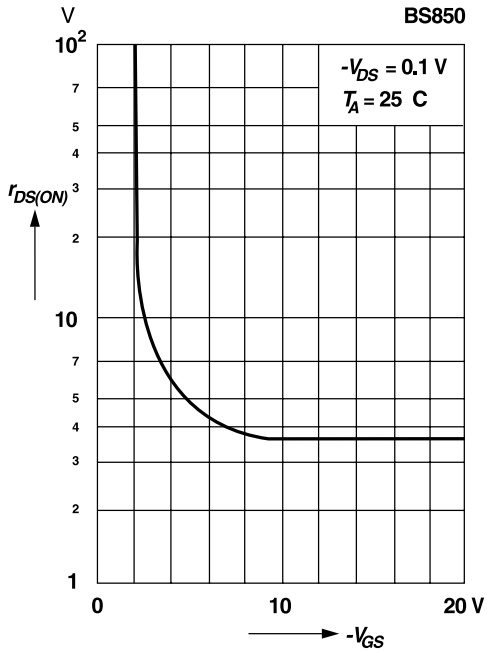


Normalized drain-source resistance versus temperature



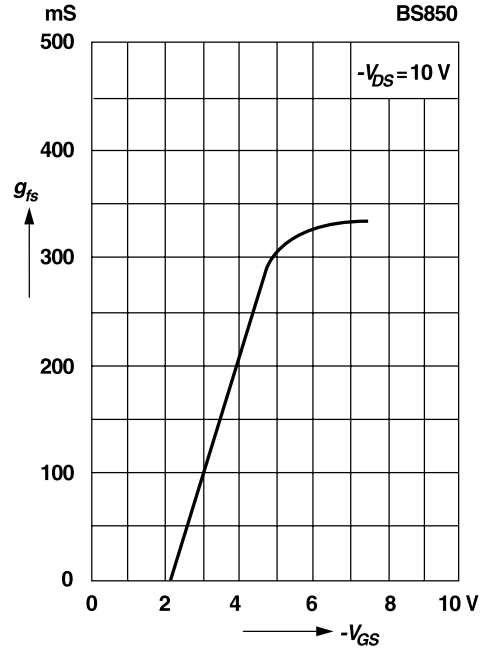
RATINGS AND CHARACTERISTIC CURVES BS850

Drain-source resistance versus gate-source voltage



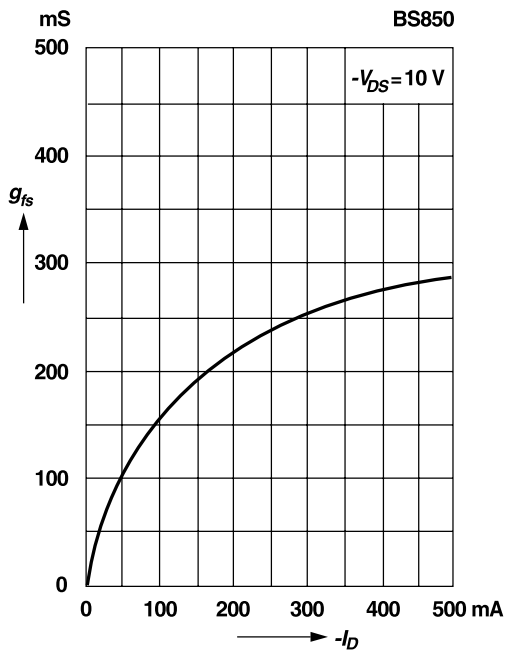
Transconductance versus gate-source voltage

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

