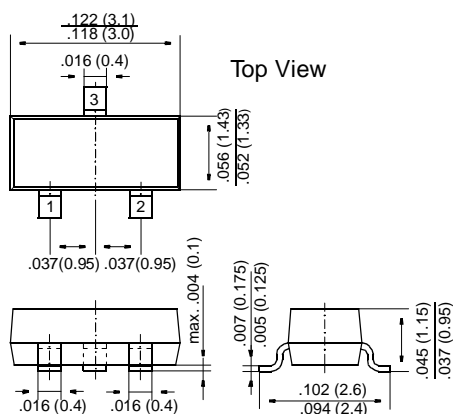


# BS809

## DMOS Transistors (N-Channel)

### SOT-23



Dimensions in inches and (millimeters)

Pin configuration

1 = Gate, 2 = Source, 3 = Drain

### 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:** SOT-23 Plastic Package

**Weight:** approx. 0.008 g

**Marking**

S09

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25 °C ambient temperature unless otherwise specified

	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	400	V
Drain-Gate Voltage	$V_{DGS}$	400	V
Gate-Source Voltage (pulsed)	$V_{GS}$	$\pm 20$	V
Drain Current (continuous) at $T_{SB} = 50\text{ }^{\circ}\text{C}$	$I_D$	100	mA
Power Dissipation at $T_{SB} = 50\text{ }^{\circ}\text{C}$	$P_{tot}$	310 <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> Device on fiberglass substrate, see layout

### Inverse Diode

	Symbol	Value	Unit
Max. Forward Current (continuous) at $T_{amb} = 25\text{ }^{\circ}\text{C}$	$I_F$	300	mA
Forward Voltage Drop (typ.) at $V_{GS} = 0$ , $I_F = 0.3\text{ A}$ , $T_j = 25\text{ }^{\circ}\text{C}$	$V_F$	1.0	V

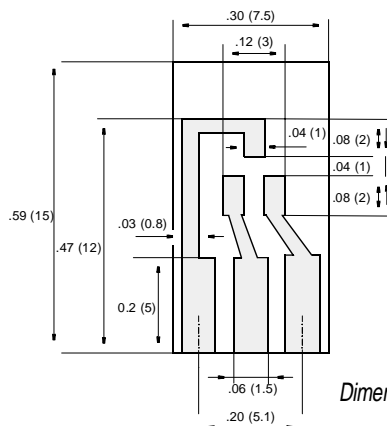
# BS809

## ELECTRICAL CHARACTERISTICS

Ratings at 25 °C ambient temperature unless otherwise specified

	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage at $I_D = 100 \mu\text{A}$ , $V_{GS} = 0 \text{ V}$	$V_{(BR)DSS}$	400	430	–	V
Gate-Body Leakage Current, Forward at $V_{GSF} = 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$	$I_{GSSF}$	–	–	100	nA
Gate-Body Leakage Current, Reverse at $V_{GSR} = 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$	$I_{GSSR}$	–	–	100	nA
Drain Cutoff Current at $V_{DS} = 400 \text{ V}$ , $V_{GS} = 0 \text{ V}$	$I_{DSS}$	–	–	500	nA
Gate-Source Threshold Voltage at $V_{GS} = V_{DS}$ , $I_D = 250 \mu\text{A}$	$V_{GS(th)}$	1	1.5	2.5	V
Drain-Source ON Resistance at $V_{GS} = 5 \text{ V}$ , $I_D = 100 \text{ mA}$	$R_{DS(on)}$	–	18	22	$\Omega$
Capacitances at $V_{DS} = 25 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 1 \text{ MHz}$ Input Capacitance Output Capacitance Feedback Capacitance	$C_{ISS}$ $C_{OSS}$ $C_{rS}$	– – –	80 20 10	– – –	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 50	– –	ns ns
Thermal Resistance Junction to Substrate Backside	$R_{thSB}$			320 <sup>1)</sup>	
Thermal Resistance Junction to Ambient Air	$R_{thJA}$	–	–	450 <sup>1)</sup>	K/W

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)

Dimensions in inches (millimeters)