BS170

Preferred Device

Small Signal MOSFET 500 mA, 60 V

N−Channel TO−92 (TO−226)

Features

- Pb−Free Package is Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain − Source Voltage	V_{DS}	60	Vdc
Gate−Source Voltage − Continuous − Non−repetitive ($t_p \leq 50\ \mu s$)	 V_{GS} V_{GSM}	 ±20 ±40	 Vdc Vpk
Drain Current (Note)	I_D	0.5	Adc
Total Device Dissipation @ $T_A = 25°C$	P_D	350	mW
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150	°C

1. The Power Dissipation of the package may result in a lower continuous drain current.

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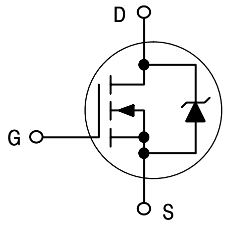
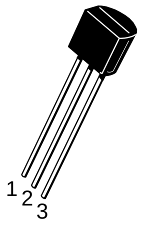
500 mA, 60 V
$R_{DS(on)} = 5\ \Omega$

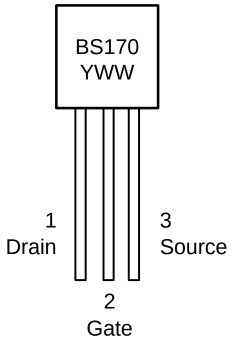
N−Channel





TO−92 (TO−226)
CASE 29
STYLE 30

MARKING DIAGRAM & PIN ASSIGNMENT



Y = Year
WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

Preferred devices are recommended choices for future use and best overall value.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Gate Reverse Current (V_{GS} = 15 Vdc, V_{DS} = 0)	I_{GSS}	−	0.01	10	nAdc
Drain−Source Breakdown Voltage (V_{GS} = 0, I_D = 100 μAdc)	$V_{(BR)DSS}$	60	90	−	Vdc
ON CHARACTERISTICS (Note 1)					
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 1.0 mAdc)	$V_{GS(Th)}$	0.8	2.0	3.0	Vdc
Static Drain−Source On Resistance (V_{GS} = 10 Vdc, I_D = 200 mAdc)	$r_{DS(on)}$	−	1.8	5.0	Ω
Drain Cutoff Current (V_{DS} = 25 Vdc, V_{GS} = 0 Vdc)	$I_{D(off)}$	−	−	0.5	μA
Forward Transconductance (V_{DS} = 10 Vdc, I_D = 250 mAdc)	g_{fs}	−	200	−	mmhos
SMALL−SIGNAL CHARACTERISTICS					
Input Capacitance (V_{DS} = 10 Vdc, V_{GS} = 0, f = 1.0 MHz)	C_{iss}	−	−	60	pF
SWITCHING CHARACTERISTICS					
Turn−On Time (I_D = 0.2 Adc) See Figure 1	t_{on}	−	4.0	10	ns
Turn−Off Time (I_D = 0.2 Adc) See Figure 1	t_{off}	−	4.0	10	ns

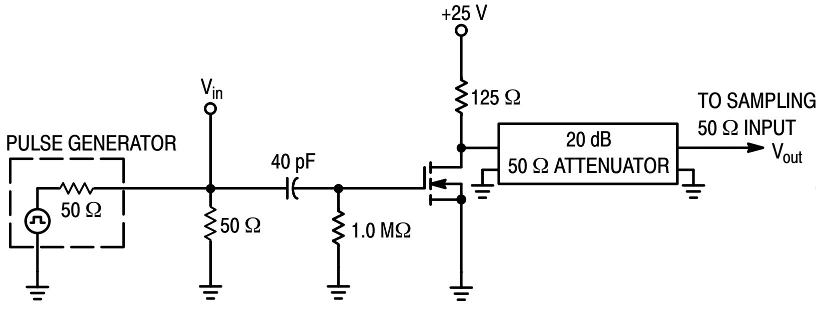
1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

ORDERING INFORMATION

Device	Package	Shipping†
BS170	TO−92 (TO−226)	1000 Unit / Box
BS170G	TO−92 (TO−226) (Pb−Free)	1000 Unit / Tubes
BS170RLRA	TO−92 (TO−226)	2000 Tape & Reel
BS170RLRM		2000 Tape & Ammo Box
BS170RLRP		2000 Tape & Ammo Box
BS170RL1		2000 Tape & Reel
BS170ZL1		2000 Tape & Ammo Box

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

RESISTIVE SWITCHING



(V_{in} Amplitude 10 Volts)

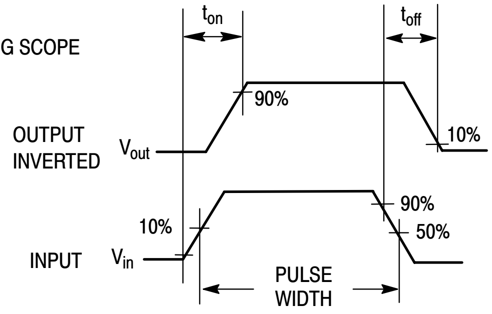
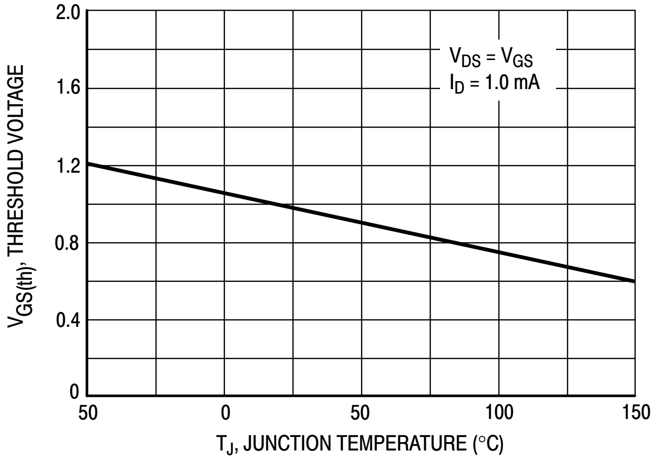


Figure 1. Switching Test Circuit

Figure 2. Switching Waveforms



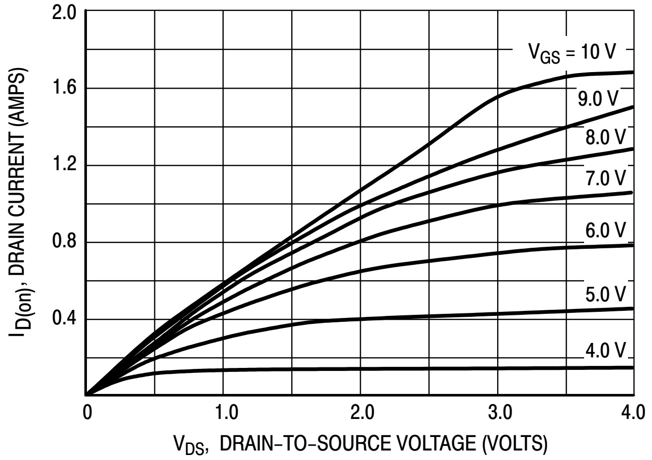
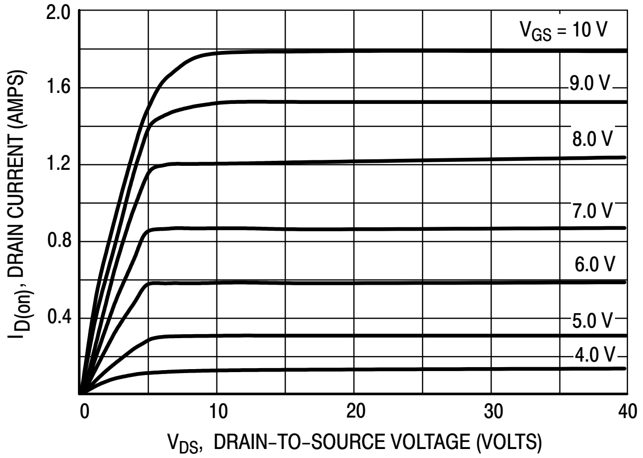


Figure 3. $V_{GS(th)}$ Normalized versus Temperature

Figure 4. On−Region Characteristics



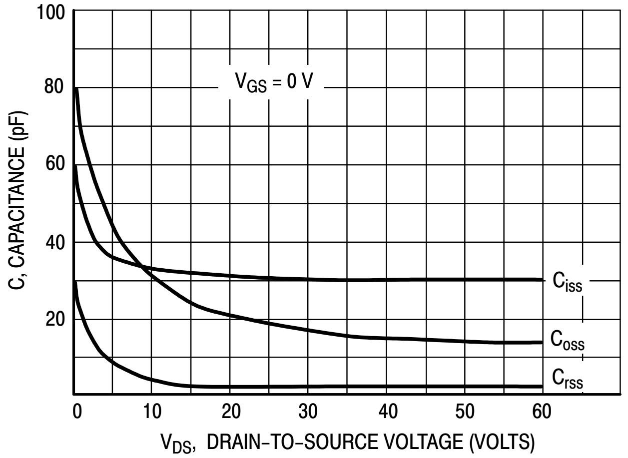
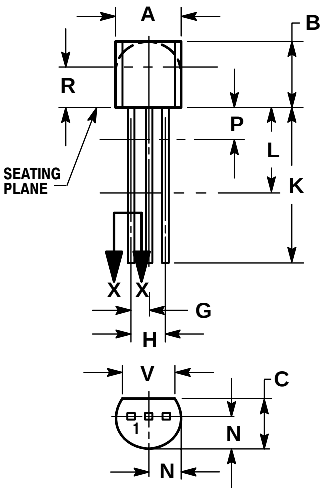


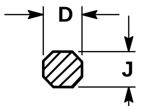
Figure 5. Output Characteristics

Figure 6. Capacitance versus Drain−To−Source Voltage

PACKAGE DIMENSIONS

TO−92 (TO−226)
CASE 29−11
ISSUE AL





SECTION X−X

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	−−−	12.70	−−−
L	0.250	−−−	6.35	−−−
N	0.080	0.105	2.04	2.66
P	−−−	0.100	−−−	2.54
R	0.115	−−−	2.93	−−−
V	0.135	−−−	3.43	−−−

STYLE 30:
PIN 1. DRAIN
2. GATE
3. SOURCE

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