

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	$\pm V_{DS}$	40	V
Drain-Gate Voltage	V_{DG}	40	V
Gate-Source Voltage	V_{GS}	40	V
Forward Gate Current	$I_{G(f)}$	50	mA

THERMAL CHARACTERISTICS

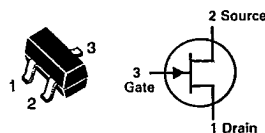
Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board,* $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225	mW
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate,** $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300	mW
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

*FR-5 = 1.0 x 0.75 x 0.062 in.

**Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

DEVICE MARKING

BSR56L = M4; BSR57L = M5; BSR58L = M6

BSR56L
thru
BSR58LCASE 318-03, STYLE 10
SOT-23 (TO-236AB)JFET
SWITCHING
TRANSISTORS

N-CHANNEL

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Gate-Source Breakdown Voltage ($I_G = 1.0 \mu\text{A}$, $V_{DS} = 0$)	$V_{(BR)GSS}$	40	—	Vdc
Gate-Reverse Current ($V_{DS} = 0 \text{ V}$, $V_{GS} = 20 \text{ V}$)	I_{GSS}	—	1.0	nA
Gate-Source Cutoff Voltage ($V_{DS} = 15 \text{ V}$, $I_D = 0.5 \text{ nA}$)	$V_{GS(off)}$	-4.0 -2.0 -0.8	-10 -6.0 -4.0	V

ON CHARACTERISTICS

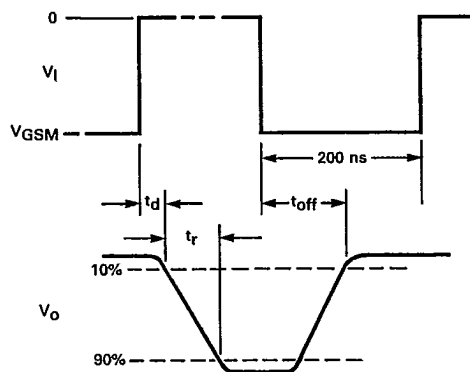
Zero-Gate Voltage Drain ($V_{DS} = 15 \text{ V}$, $V_{GS} = 0$)	BSR56L BSR57L BSR58L	I_{DSS}	50 20 8.0	— 100 80	mA
Drain-Source On Voltage ($I_D = 20 \text{ mA}$, $V_{GS} = 0$) ($I_D = 10 \text{ mA}$, $V_{GS} = 0$) ($I_D = 5.0 \text{ mA}$, $V_{GS} = 0$)	BSR56L BSR57L BSR58L	$V_{DS(on)}$	— — —	0.75 0.5 0.4	Vdc
Static Drain-Source On Resistance ($I_D = 0 \text{ mAdc}$, $V_{GS} = 0$, $f = 1.0 \text{ kHz}$)	BSR56L BSR57L BSR58L	$r_{DS(on)}$	— — —	25 40 60	Ohms

SWITCHING CHARACTERISTICS

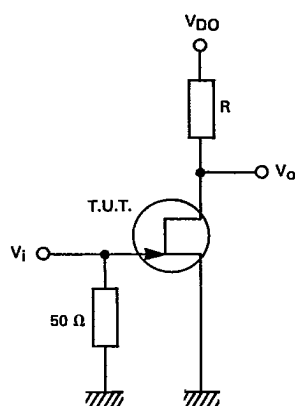
Delay Time: $V_{DD} = 10 \text{ V}$; $V_{GS} = 0$ ($V_{GSM} = 10 \text{ V}$, $I_D = 20 \text{ mA}$) ($V_{GSM} = 6.0 \text{ V}$, $I_D = 10 \text{ mA}$) ($V_{GSM} = 4.0 \text{ V}$, $I_D = 5.0 \text{ mA}$)	BSR56L BSR57L BSR58L	t_d	— — —	6.0 6.0 10	ns
Rise Time: $V_{DD} = 10 \text{ V}$; $V_{GS} = 0$ ($V_{GSM} = 10 \text{ V}$, $I_D = 20 \text{ mA}$) ($V_{GSM} = 6.0 \text{ V}$, $I_D = 10 \text{ mA}$) ($V_{GSM} = 4.0 \text{ V}$, $I_D = 5.0 \text{ mA}$)	BSR56L BSR57L BSR58L	t_r	— — —	3.0 4.0 10	ns
Turn-Off Time: $V_{DD} = 10 \text{ V}$; $V_{GS} = 0$ ($V_{GSM} = 10 \text{ V}$, $I_D = 20 \text{ mA}$) ($V_{GSM} = 6.0 \text{ V}$, $I_D = 10 \text{ mA}$) ($V_{GSM} = 4.0 \text{ V}$, $I_D = 5.0 \text{ mA}$)	BSR56L BSR57L BSR58L	t_{off}	— — —	25 50 100	ns

MOTOROLA SMALL-SIGNAL TRANSISTORS, FETs AND DIODES

T-35-25



SWITCHING TIMES WAVEFORMS



BSR56; R = 464 Ω
BSR57; R = 953 Ω
BSR58; R = 1910 Ω

Pulse Generator

$t_r = t_f \leq 1.0$ ns
 $\delta = 0.02$
 $Z_o = 50$ Ω

Oscilloscope

$t_r \leq 0.75$ ns
 $R_i \geq 1$ M Ω
 $C_i \leq 2.5$ pF

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