

N-CHANNEL FETS

Silicon symmetrical n-channel junction field-effect transistors in TO-18 metal envelopes with the gate connected to the case. The transistors are intended for switching applications. The devices have the feature: low 'on' resistance at zero gate voltage.

QUICK REFERENCE DATA

Drain-source voltage	$\pm V_{DS}$	max.	40	V		
Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$	P_{tot}	max.	350	mW		
Drain current			BSV78	BSV79	BSV80	
$V_{DS} = 15\text{ V}; V_{GS} = 0$	I_{DSS}	>	50	20	10	mA
Gate-source cut-off voltage						
$I_D = 1\text{ nA}; V_{GS} = 15\text{ V}$	$-V_{(P)GS}$	>	3.75	2.0	1.0	V
		<	11	7.0	5.0	V
Drain-source resistance (on) at $f = 1\text{ kHz}$						
$I_D = 0; V_{GS} = 0$	$r_{ds\ on}$	<	25	40	60	Ω
Feedback capacitance at $f = 1\text{ MHz}$						
$V_{DS} = 0; -V_{GS} = 10\text{ V}$	C_{rs}	<	5	5	5	pF
Turn-on time	t_{on}	<	10	18	30	ns
Turn-off time	t_{off}	<	10	16	32	ns

MECHANICAL DATA

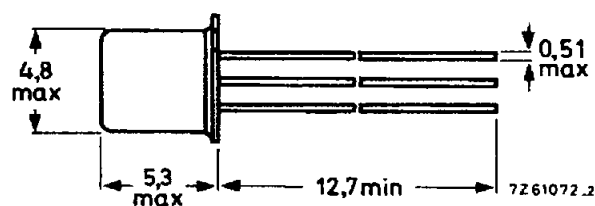
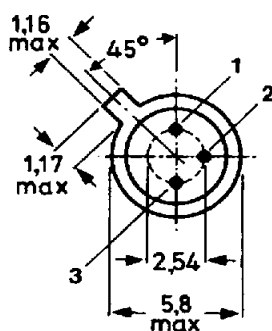
Dimensions in mm

Fig. 1 TO-18.

Gate connected to case

Pinning

- 1 = source
- 2 = drain
- 3 = gate



Note: Drain and source are interchangeable.

Accessories: 56246 (distance disc).

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-source voltage	$\pm V_{DS}$	max.	40 V
Drain-gate voltage (open source)	V_{DGO}	max.	40 V
Gate-source voltage (open drain)	$-V_{GSO}$	max.	40 V
Forward gate current	I_G	max.	50 mA
Total power dissipation up to $T_{amb} = 25\text{ }^\circ\text{C}$	P_{tot}	max.	350 mW
Storage temperature range	T_{stg}		-65 to + 175 $^\circ\text{C}$
Operating junction temperature	T_j	max.	175 $^\circ\text{C}$

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	430 K/W
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CHARACTERISTICS

$T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

Gate cut-off currents

$-V_{GS} = 20\text{ V}; V_{DS} = 0$	$-I_{GSS}$	<	0.25	nA
$-V_{GS} = 20\text{ V}; V_{DS} = 0; T_j = 150\text{ }^\circ\text{C}$	$-I_{GSS}$	<	0.5	μA

Drain cut-off current

$V_{DS} = 15\text{ V}; -V_{GS} = 12\text{ V}$	I_{DSX}	<	0.25	nA
$V_{DS} = 15\text{ V}; -V_{GS} = 12\text{ V}; T_j = 150\text{ }^\circ\text{C}$	I_{DSX}	<	0.5	μA

Drain current

			BSV78	BSV79	BSV80	
$V_{DS} = 15\text{ V}; V_{GS} = 0$	I_{DSS}	>	50	20	10	mA

Gate-source cut-off voltage

$I_D = 1\text{ nA}; V_{DS} = 15\text{ V}$	$-V_{(P)GS}$	>	3.75	2.0	1.0	V
		<	11	7.0	5.0	V

Gate-source voltage

$I_D = 1.5\text{ }\mu\text{A}; V_{DS} = 15\text{ V}$	$-V_{GS}$	>	3.5	1.75	0.75	V
		<	10	6.0	4.0	V

Drain-source voltage (on)

$I_D = 20\text{ mA}; V_{GS} = 0$	V_{DSon}	<	500			mV
$I_D = 10\text{ mA}; V_{GS} = 0$	V_{DSon}	<		400		mV
$I_D = 5\text{ mA}; V_{GS} = 0$	V_{DSon}	<			325	mV

Drain-source resistance (on) at $f = 1\text{ kHz}$

$I_D = 0; V_{GS} = 0$	$r_{ds\text{ on}}$	<	25	40	60	Ω
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y parameters at $f = 1\text{ MHz}$ (common source)

$-V_{GS} = 10\text{ V}; V_{DS} = 0$						
Input capacitance	C_{is}	<	10	10	10	pF
Feedback capacitance	C_{rs}	<	5	5	5	pF

Switching times (see Fig. 2)

Turn-on time when switched from

- V_{GSoff} = 11 V to I_{Don} = 20 mA; V_{DD} = 10 V (BSV78)
- V_{GSoff} = 7 V to I_{Don} = 10 mA; V_{DD} = 10 V (BSV79)
- V_{GSoff} = 5 V to I_{Don} = 5 mA; V_{DD} = 10 V (BSV80)

- delay time
- rise time
- turn-on time

Turn-off time when switched from

- I_{Don} = 20 mA to -V_{GSMoff} = 11 V; V_{DD} = 10 V (BSV78)
- I_{Don} = 10 mA to -V_{GSMoff} = 7 V; V_{DD} = 10 V (BSV79)
- I_{Don} = 5 mA to -V_{GSMoff} = 5 V; V_{DD} = 10 V (BSV80)

- fall time
- storage time
- turn-off time

	BSV78	BSV79	BSV80
t _d	< 5	10	10 ns
t _r	< 5	8	20 ns
t _{on}	< 10	18	30 ns
t _f	< 6	11	24 ns
t _s	< 4	5	8 ns
t _{off}	< 10	16	32 ns

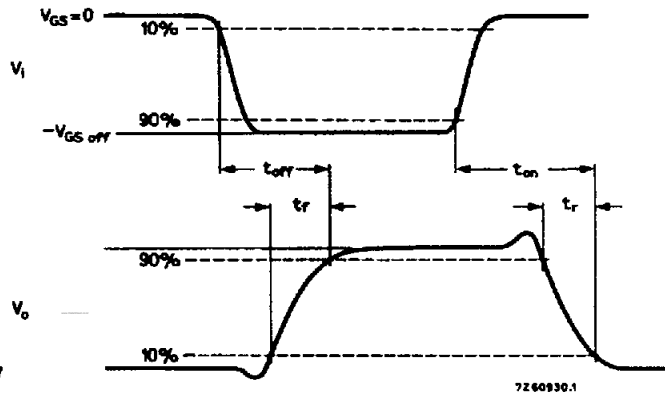
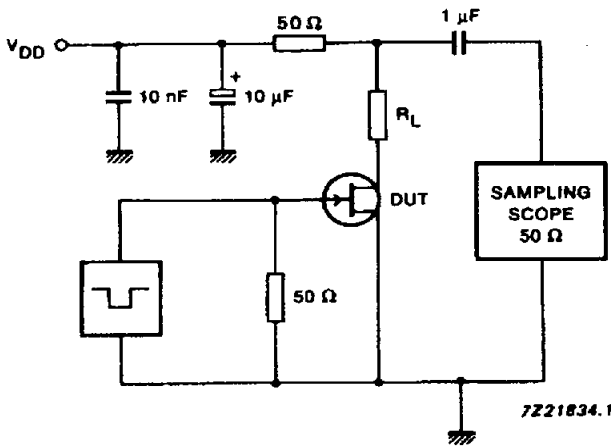


Fig. 2 Switching times test circuit and input and output waveforms.

	BSV78	BSV79	BSV80
R _L	= 424	909	1885 Ω

Pulse generator:

- R_i = 50 Ω
- t_r < 0.5 ns
- t_f < 5 ns

Oscilloscope:

- R_i = 50 Ω
- t_r < 1 ns
- t_f < 1 ns

