

N-CHANNEL SILICON FIELD-EFFECT TRANSISTORS

Symmetrical silicon n-channel junction FETs in plastic TO-92 envelopes. They are intended for applications such as analog switches, choppers, commutators etc.

Features

- High speed switching
- Interchangeability of drain and source connections
- Low $R_{DS\ on}$ at zero gate voltage

QUICK REFERENCE DATA

			J111	J112	J113	
Drain-source voltage	$\pm V_{DS}$	max.	40	40	40	V
Drain current $V_{DS} = 15\text{ V}; V_{GS} = 0$	I_{DSS}	min.	20	5	2	mA
Total power dissipation up to $T_{amb} = 50\text{ }^{\circ}\text{C}$	P_{tot}	max.	400	400	400	mW
Gate-source cut-off voltage $V_{DS} = 5\text{ V}; I_D = 1\text{ }\mu\text{A}$	$-V_{GS\ off}$	min. max.	3 10	1 5	0.5 3	V V
Drain-source on-state resistance $V_{DS} = 0.1\text{ V}; V_{GS} = 0$	$R_{DS\ on}$	max.	30	50	100	Ω

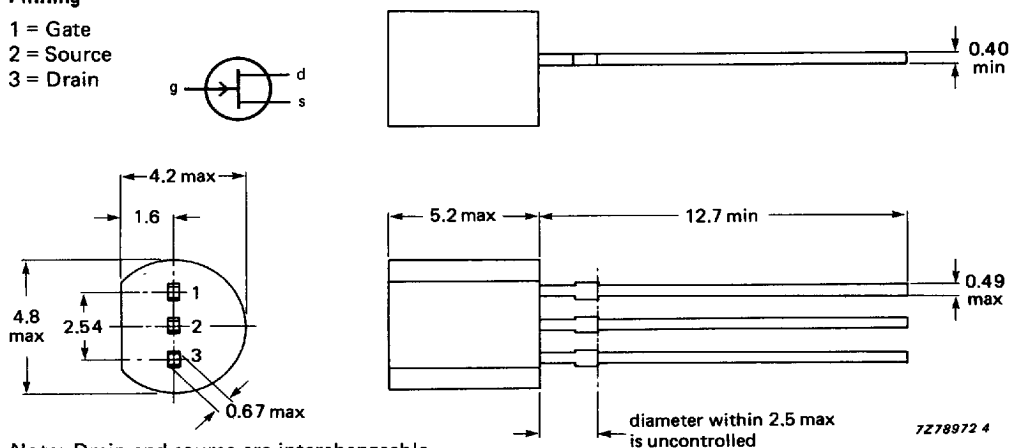
MECHANICAL DATA

Dimensions in mm

Fig.1 TO-92.

Pinning

- 1 = Gate
2 = Source
3 = Drain



RATINGS

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

Drain-source voltage	$\pm V_{DS}$	max.	40 V
Gate-source voltage	$-V_{GSO}$	max.	40 V
Gate-drain voltage	$-V_{GDO}$	max.	40 V
Gate forward current (DC)	I_G	max.	50 mA
Total power dissipation up to $T_{amb} = 50^\circ\text{C}$	P_{tot}	max.	400 mW
Storage temperature range	T_{stg}		-65 to $+150^\circ\text{C}$
Junction temperature	T_j	max.	150 $^\circ\text{C}$

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	250 K/W
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STATIC CHARACTERISTICS $T_j = 25^\circ\text{C}$ unless otherwise specified

			J111	J112	J113
Gate reverse current $-V_{GS} = 15\text{ V}; V_{DS} = 0$	$-I_{GSS}$	max.	1	1	1 nA
Drain cut-off current $V_{DS} = 5\text{ V}; -V_{GS} = 10\text{ V}$	$-I_{DSX}$	max.	1	1	1 nA
Drain saturation current $V_{DS} = 15\text{ V}; V_{GS} = 0$	I_{DSS}	min.	20	5	2 mA
Gate-source breakdown voltage $-I_G = 1\ \mu\text{A}; V_{DS} = 0$	$-V_{(BR)GSS}$	min.	40	40	40 V
Gate-source cut-off voltage $V_{DS} = 5\text{ V}; I_D = 1\ \mu\text{A}$	$-V_{GS\ off}$	min. max.	3 10	1 5	0.5 3 V
Drain-source on-state resistance $V_{DS} = 0.1\text{ V}; V_{GS} = 0$	$R_{DS\ on}$	max.	30	50	100 Ω

DYNAMIC CHARACTERISTICS

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

Input capacitance

$V_{DS} = 0; -V_{GS} = 10\text{ V}; f = 1\text{ MHz}$

$V_{DS} = -V_{GS} = 0; f = 1\text{ MHz}$

C_{is}	typ.	6 pF
C_{is}	typ.	22 pF
C_{is}	max.	28 pF

Feedback capacitance

$V_{DS} = 0; -V_{GS} = 10\text{ V}; f = 1\text{ MHz}$

C_{rs}	typ.	3 pF
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Switching times

test conditions

$V_{DD} = 10\text{ V}; V_{GS} = 0\text{ to }V_{GS\text{off}}$

$-V_{GS\text{off}} = 12\text{ V}; R_L = 750\ \Omega$ for J111

$-V_{GS\text{off}} = 7\text{ V}; R_L = 1550\ \Omega$ for J112

$-V_{GS\text{off}} = 5\text{ V}; R_L = 3150\ \Omega$ for J113

Rise time

t_r	typ.	6 ns
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Turn-on time

t_{on}	typ.	13 ns
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Fall time

t_f	typ.	15 ns
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Turn-off time

t_{off}	typ.	35 ns
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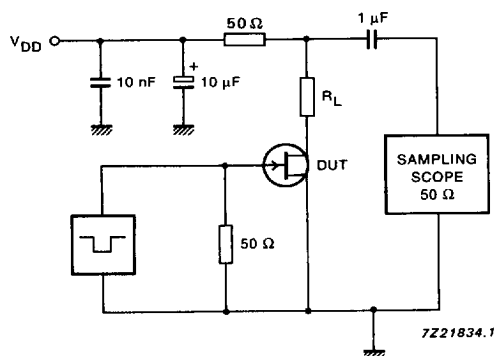


Fig.2 Switching times test circuit.

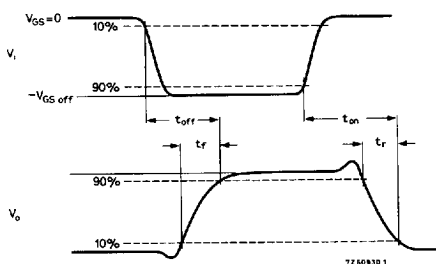


Fig.3 Input and output waveforms.