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 V; V_{GS} = 0	I_{DSS}	min.	20	5	2	mA
Total power dissipation up to T_{amb} = 50 °C	P_{tot}	max.	400	400	400	mW
Gate-source cut-off voltage V_{DS} = 5 V; I_D = 1 μA	$-V_{GS\ off}$	min. max.	3 10	1 5	0.5 3	V V
Drain-source on-state resistance V_{DS} = 0.1 V; V_{GS} = 0	$R_{DS\ on}$	max.	30	50	100	Ω

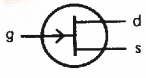
MECHANICAL DATA

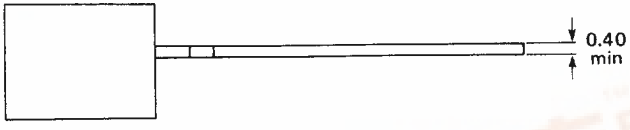
Dimensions in mm

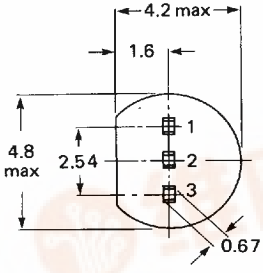
Fig.1 TO-92.

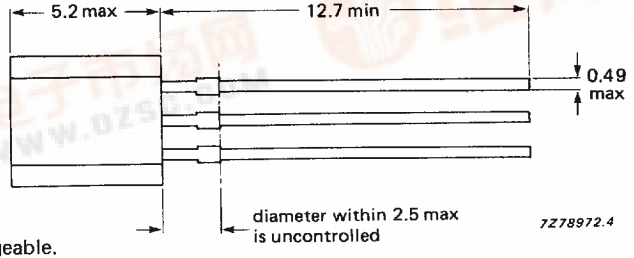
Pinning

1 = Gate
2 = Source
3 = Drain









Note: Drain and source are interchangeable.

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 °C	P_{tot}	max.	400	mW
Storage temperature range	T_{stg}		−65 to + 150	°C
Junction temperature	T_j	max.	150	°C

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j\text{-}a}$	=	250	K/W

STATIC CHARACTERISTICS

T_j = 25 °C unless otherwise specified

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

DYNAMIC CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Input capacitance			
V_{DS} = 0; $-V_{GS}$ = 10 V; f = 1 MHz	C_{is}	typ.	6 pF
V_{DS} = $-V_{GS}$ = 0; f = 1 MHz	C_{is}	typ.	22 pF
		max.	28 pF
Feedback capacitance			
V_{DS} = 0; $-V_{GS}$ = 10 V; f = 1 MHz	C_{rs}	typ.	3 pF
Switching times			
test conditions			
V_{DD} = 10 V; V_{GS} = 0 to V_{GSoff}			
$-V_{GS\ off}$ = 12 V; R_L = 750 Ω for J111			
$-V_{GS\ off}$ = 7 V; R_L = 1550 Ω for J112			
$-V_{GS\ off}$ = 5 V; R_L = 3150 Ω for J113			
Rise time	t_r	typ.	6 ns
Turn-on time	t_{on}	typ.	13 ns
Fall time	t_f	typ.	15 ns
Turn-off time	t_{off}	typ.	35 ns

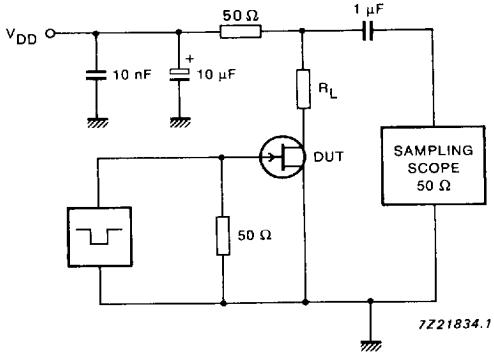


Fig.2 Switching times test circuit.

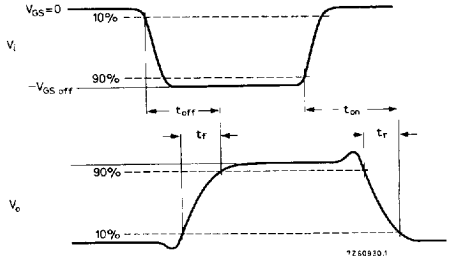


Fig.3 Input and output waveforms.