

P-CHANNEL SILICON FIELD-EFFECT TRANSISTORS

Silicon symmetrical p-channel junction FETs in a plastic TO-92 envelope and intended for application with analog switches, choppers, commutators etc.

A special feature is the interchangeability of the drain and source connections.

QUICK REFERENCE DATA

Drain-source voltage	$\pm V_{DS}$	max.	30	V			
Gate-source voltage	V_{GSO}	max.	30	V			
Gate current	$-I_G$	max.	50	mA			
Total power dissipation up to $T_{amb} = 50^\circ C$	P_{tot}	max.	400	mW			
Drain current $-V_{DS} = 15 V; V_{GS} = 0$	$-I_{DSS}$		J174	J175	J176	J177	
		min.	20	7	2	1.5	mA
		max.	135	70	35	20	mA
Drain-source ON-resistance $-V_{DS} = 0.1 V; V_{GS} = 0$	R_{DSon}	max.	85	125	250	300	Ω

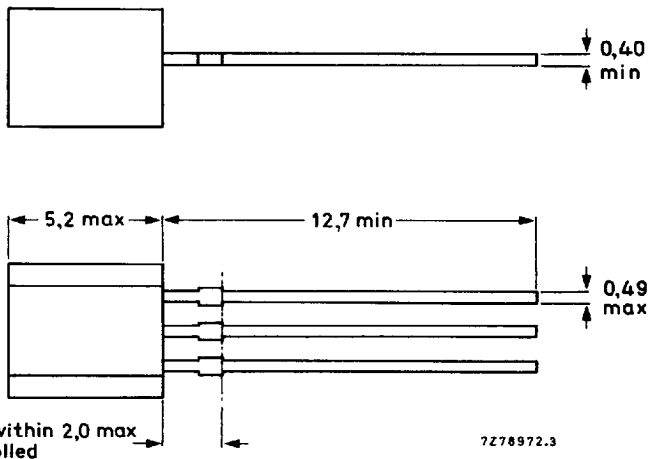
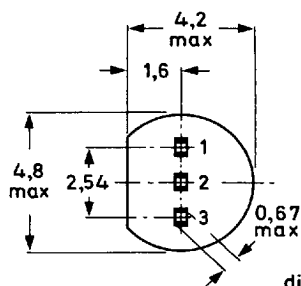
MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92.

Pinning:

- 1 = Source
- 2 = Gate
- 3 = Drain



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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.	30	V
Gate-source voltage	V_{GSO}	max.	30	V
Gate-drain voltage	V_{GDO}	max.	30	V
Gate current (DC)	$-I_G$	max.	50	mA
Total power dissipation up to $T_{amb} = 50^\circ C$	P_{tot}	max.	400	mW
Storage temperature range	T_{stg}		-65 to + 150	$^\circ C$
Junction temperature	T_j	max.	150	$^\circ C$

THERMAL RESISTANCE

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

$T_j = 25^\circ C$ unless otherwise specified

			J174	J175	J176	J177	
Gate cut-off current							
- $V_{GS} = 20\ V$; $V_{DS} = 0$	I_{GSS}	max.	1	1	1	1	nA
Drain cut-off current							
- $V_{DS} = 15\ V$; - $V_{GS} = 10\ V$	$-I_{DSX}$	max.	1	1	1	1	nA
Drain current							
- $V_{DS} = 15\ V$; $V_{GS} = 0$	$-I_{DSS}$	min.	20	7	2	1.5	mA
		max.	135	70	35	20	mA
Gate-source breakdown voltage							
$I_G = 1\ \mu A$; $V_{DS} = 0$	$V_{(BR)GSS}$	min.	30	30	30	30	V
Gate-source cut-off voltage							
$-I_D = 10\ nA$; $V_{DS} = -15\ V$	$V_{GS\ off}$	min.	5	3	1	0.8	V
		max.	10	6	4	2.25	V
Drain-source ON-resistance							
- $V_{DS} = 0.1\ V$; $V_{GS} = 0$	R_{DSon}	max.	85	125	250	300	Ω

DYNAMIC CHARACTERISTICS

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

Input capacitance, $f = 1\text{ MHz}$

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

$-V_{GS} = V_{DS} = 0$

C_{is}	typ.	8	pF
C_{is}	typ.	30	pF

Feedback capacitance, $f = 1\text{ MHz}$

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

C_{rs}	typ.	4	pF
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Switching times (see Fig. 2 + 3)

		J174	J175	J176	J177
Delay time	t_d	typ. 2	5	15	20 ns
Rise time	t_r	typ. 5	10	20	25 ns
Turn-on time	t_{on}	typ. 7	15	35	45 ns
Storage time	t_s	typ. 5	10	15	20 ns
Fall time	t_f	typ. 10	20	20	25 ns
Turn-off time	t_{off}	typ. 15	30	35	45 ns

Test conditions:

$-V_{DD}$	10	6	6	6 V
V_{GSoff}	12	8	6	3 V
R_L	560	1200	2000	2900 Ω
V_{GSon}	0	0	0	0 V

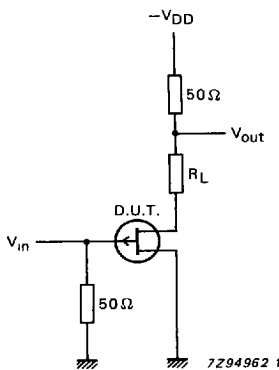


Fig. 2 Switching times test circuit.

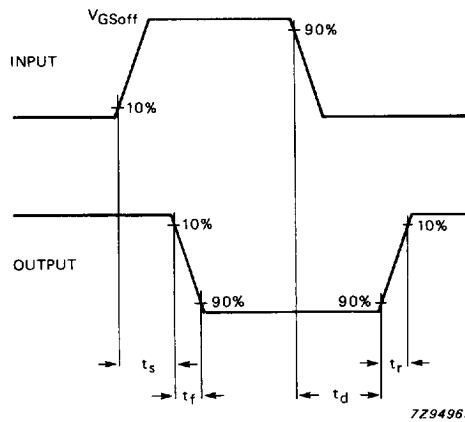


Fig. 3 Input and output waveforms;
 $t_d + t_r = t_{on}$
 $t_s + t_f = t_{off}$