

SILICON N-CHANNEL DUAL GATE MOS-FET

Depletion type field-effect transistor in a plastic X-package with source and substrate interconnected, intended for v.h.f. applications in television tuners, especially in r.f. stages and mixer stages in S-channel tuners. The device is also suitable for use in professional communication equipment.

This MOS-FET tetrode is protected against excessive input voltage surges by integrated back-to-back diodes between gates and source.

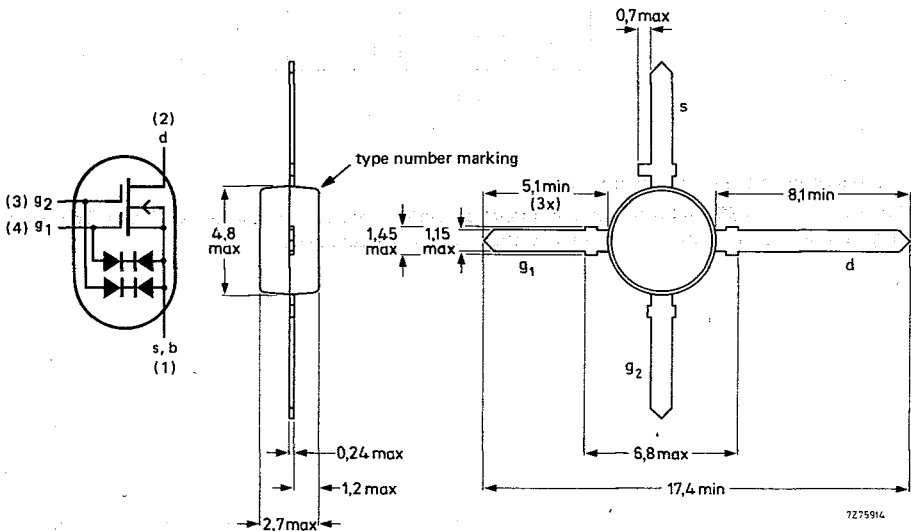
QUICK REFERENCE DATA

Drain-source voltage	V_{DS}	max.	20 V
Drain-current	I_D	max.	30 mA
Total power dissipation up to $T_{amb} = 75^\circ\text{C}$	P_{tot}	max.	225 mW
Junction temperature	T_j	max.	150 $^\circ\text{C}$
Transfer admittance at $f = 1\text{ kHz}$ $I_D = 10\text{ mA}$; $V_{DS} = 15\text{ V}$; $+V_{G2-S} = 4\text{ V}$	$ y_{fs} $	typ.	17 mS
Feedback capacitance at $f = 1\text{ MHz}$ $I_D = 10\text{ mA}$; $V_{DS} = 15\text{ V}$; $+V_{G2-S} = 4\text{ V}$	C_{rs}	typ.	25 fF
Noise figure at $G_S = 2\text{ mA/V}$ $I_D = 10\text{ mA}$; $V_{DS} = 15\text{ V}$; $+V_{G2-S} = 4\text{ V}$; $f = 200\text{ MHz}$	F	typ.	1,5 dB

MECHANICAL DATA

Dimensions in mm

Fig. 1 SOT-103.



RATINGS

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

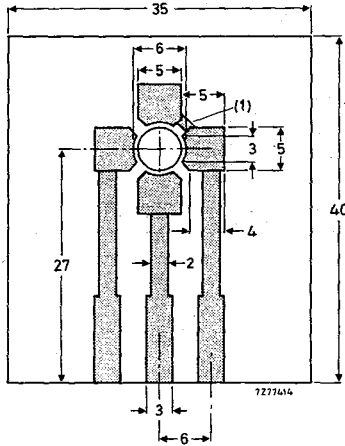
Drain-source voltage	V_{DS}	max.	20 V
Drain-current (d.c. or average)	I_D	max.	30 mA
Gate 1 - source current	$\pm I_{G1-S}$	max.	10 mA
Gate 2 - source current	$\pm I_{G2-S}$	max.	10 mA
Total power dissipation up to $T_{amb} = 75\text{ }^\circ\text{C}$	P_{tot}	max.	225 mW
Storage temperature	T_{stg}	-65 to +150	$^\circ\text{C}$
Junction temperature	T_j	max.	150 $^\circ\text{C}$

THERMAL RESISTANCE

From junction to ambient in free air
 mounted on the printed-circuit board (see Fig. 2)

$R_{th\ j-a} = 335\text{ K/W}$

Dimensions in mm



(1) Connection made by a strip or Cu wire.

Fig. 2 Single-sided 35 μm Cu-clad epoxy fibre-glass printed-circuit board, thickness 1,5 mm. Tracks are fully tin-lead plated. Board in horizontal position for R_{th} measurement.

STATIC CHARACTERISTICS

 $T_{amb} = 25^{\circ}\text{C}$

Gate cut-off currents

$\pm V_{G1-S} = 5\text{ V}; V_{G2-S} = V_{DS} = 0 \quad \pm I_{G1-SS} < 50\text{ nA}$

$\pm V_{G2-S} = 5\text{ V}; V_{G1-S} = V_{DS} = 0 \quad \pm I_{G2-SS} < 50\text{ nA}$

Gate-source breakdown voltages

$\pm I_{G1-SS} = 10\text{ mA}; V_{G2-S} = V_{DS} = 0 \quad \pm V_{(BR)G1-SS} 6,0\text{ to }20\text{ V}$

$\pm I_{G2-SS} = 10\text{ mA}; V_{G1-S} = V_{DS} = 0 \quad \pm V_{(BR)G2-SS} 6,0\text{ to }20\text{ V}$

Drain current*

$V_{DS} = 15\text{ V}; V_{G1-S} = 0; +V_{G2-S} = 4\text{ V} \quad I_{DSS} 2\text{ to }20\text{ mA}$

Gate-source cut-off voltages

$I_D = 20\text{ }\mu\text{A}; V_{DS} = 15\text{ V}; +V_{G2-S} = 4\text{ V} \quad -V_{(P)G1-S} < 2,5\text{ V}$

$I_D = 20\text{ }\mu\text{A}; V_{DS} = 15\text{ V}; V_{G1-S} = 0 \quad -V_{(P)G2-S} < 2,0\text{ V}$

DYNAMIC CHARACTERISTICS

Measuring conditions (common source); $I_D = 10\text{ mA}; V_{DS} = 15\text{ V}; +V_{G2-S} = 4\text{ V}; T_{amb} = 25^{\circ}\text{C}$

Transfer admittance at $f = 1\text{ kHz}$ $|y_{fs}| > 15\text{ mS}$
typ. 17 mS ←

Input capacitance at gate 1; $f = 1\text{ MHz}$ C_{ig1-s} typ. 2,5 pF
< 3,0 pF

Input capacitance at gate 2; $f = 1\text{ MHz}$ C_{ig2-s} typ. 1,2 pF

Feedback capacitance at $f = 1\text{ MHz}$ C_{rs} typ. 25 fF
< 35 fF

Output capacitance at $f = 1\text{ MHz}$ C_{os} typ. 1,0 pF
< 1,3 pF

Noise figure at $G_S = 2\text{ mS}$
 $f = 200\text{ MHz}$ F typ. 1,5 dB
< 2,8 dB ←

Power gain at $G_S = 2\text{ mS}$ G_p typ. 25 dB
 $G_L = 0,5\text{ mS}; f = 200\text{ MHz}$ ←

* Measured under pulse conditions.