T-31-25

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.

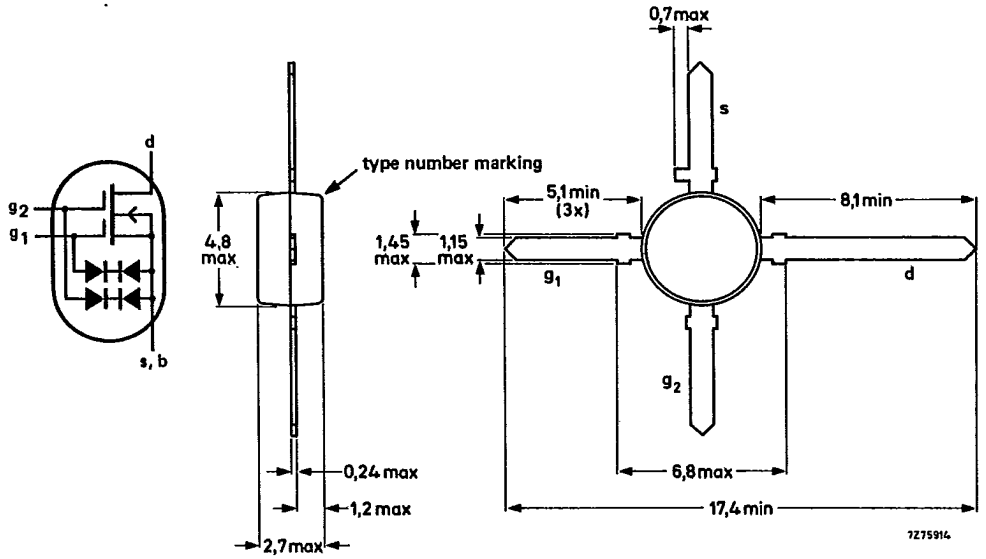
QUICK REFERENCE DATA

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

MECHANICAL DATA

Dimensions in mm

Fig. 1 SOT-103.



RATINGS

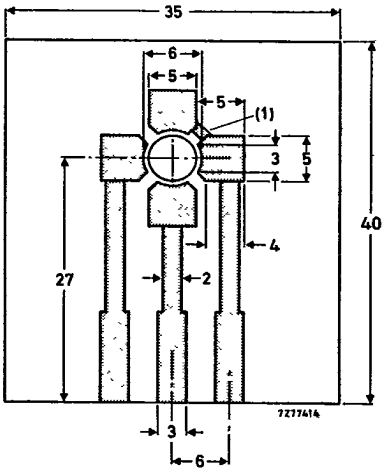
Limiting values in accordance with the Absolute Maximum System (IEC 134)

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 °C	P_{tot}	max.	225 mW
Storage temperature	T_{stg}		−65 to +150 °C
Junction temperature	T_j	max.	150 °C

THERMAL RESISTANCE

From junction to ambient in free air mounted on the printed-circuit board (see Fig. 2) $R_{th\ j-a}$ = 335 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.

Silicon n-channel dual gate MOS-FET

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STATIC CHARACTERISTICS

T_{amb} = 25 °C

Gate cut-off currents			
$\pm V_{G1-S}$ = 5 V; $V_{G2-S} = V_{DS}$ = 0	$\pm I_{G1-SS}$	<	50 nA
$\pm V_{G2-S}$ = 5 V; $V_{G1-S} = V_{DS}$ = 0	$\pm I_{G2-SS}$	<	50 nA
Gate-source breakdown voltages			
$\pm I_{G1-SS}$ = 10 mA; $V_{G2-S} = V_{DS}$ = 0	$\pm V_{(BR)G1-SS}$		6,0 to 20 V
$\pm I_{G2-SS}$ = 10 mA; $V_{G1-S} = V_{DS}$ = 0	$\pm V_{(BR)G2-SS}$		6,0 to 20 V
Drain current*			
V_{DS} = 15 V; V_{G1-S} = 0; + V_{G2-S} = 4 V	I_{DSS}		2 to 20 mA
Gate-source cut-off voltages			
I_D = 20 μA; V_{DS} = 15 V; + V_{G2-S} = 4 V	$-V_{(P)G1-S}$	<	2,5 V
I_D = 20 μA; V_{DS} = 15 V; V_{G1-S} = 0	$-V_{(P)G2-S}$	<	2,0 V

DYNAMIC CHARACTERISTICS

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

Transfer admittance at f = 1 kHz	$\lvert y_{fs} \rvert$	>	15 mS
		typ.	17 mS
Input capacitance at gate 1; f = 1 MHz	C_{ig1-s}	typ.	2,5 pF
		<	3,0 pF
Input capacitance at gate 2; f = 1 MHz	C_{ig2-s}	typ.	1,2 pF
Feedback capacitance at f = 1 MHz	C_{rs}	typ.	25 fF
		<	35 fF
Output capacitance at f = 1 MHz	C_{os}	typ.	1,0 pF
		<	1,3 pF
Noise figure at G_S = 2 mS; $B_S = B_S$ opt f = 200 MHz	F	typ.	1,5 dB
		<	2,8 dB
Power gain at G_S = 2 mS; $B_S = B_S$ opt G_L = 0,5 mS; $B_L = B_L$ opt; f = 200 MHz	G_p	typ.	25 dB

* Measured under pulse conditions.