SILICON N-CHANNEL DUAL GATE MOS-FET

Depletion type field-effect transistor in a plastic X-package with source and substrate interconnected, intended for VHF applications in television 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; + $V_{G2\text{-}S}$ = 4 V	$\lvert y_{fs} \rvert$	typ.	18 mS
Input capacitance at gate 1; f = 1 MHz I_D = 10 mA; V_{DS} = 15 V; + $V_{G2\text{-}S}$ = 4 V	$C_{ig1\text{-}s}$	typ. max.	2.5 pF 3.0 pF
Feedback capacitance at f = 1 MHz I_D = 10 mA; V_{DS} = 15 V; + $V_{G2\text{-}S}$ = 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; + $V_{G2\text{-}S}$ = 4 V; f = 200 MHz	F	typ.	1.0 dB

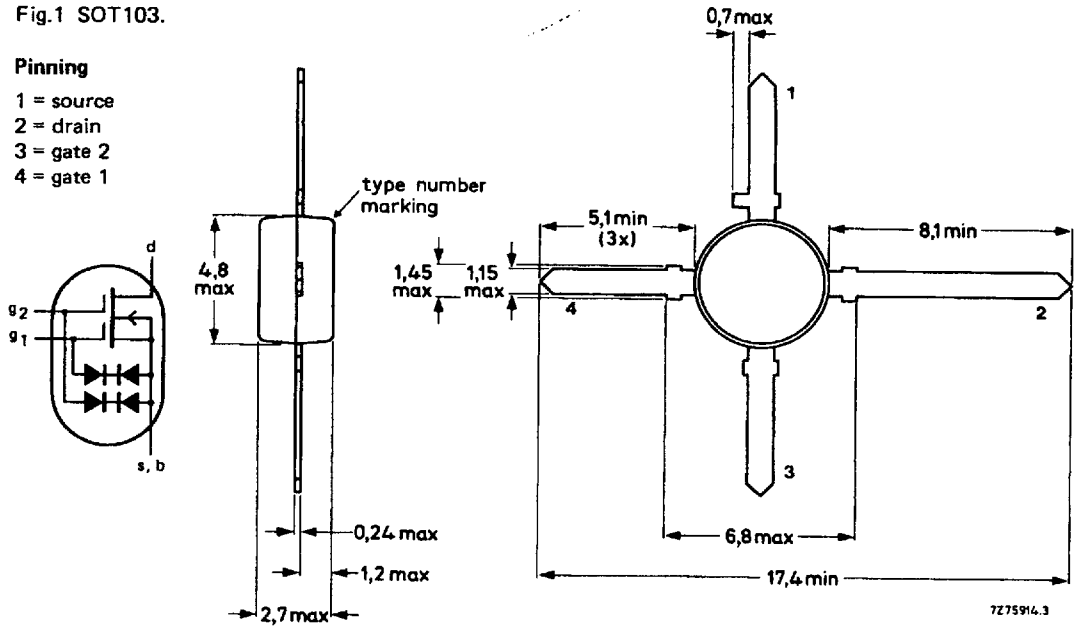
MECHANICAL DATA

Dimensions in mm

Fig.1 SOT103.

Pinning

1 = source
2 = drain
3 = gate 2
4 = gate 1



RATINGS

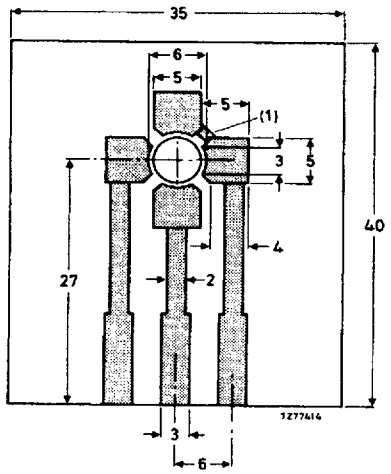
Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-source voltage	V_{DS}	max.	20 V
Drain-current (DC 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 range	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.

STATIC CHARACTERISTICS

T_j = 25 °C

Gate cut-off currents			
± V_{G1-S} = 5 V; V_{G2-S} = V_{DS} = 0	± I_{G1-SS}	max.	50 nA
± V_{G2-S} = 5 V; V_{G1-S} = V_{DS} = 0	± I_{G2-SS}	max.	50 nA
Gate-source breakdown voltages			
± I_{G1-SS} = 10 mA; V_{G2-S} = V_{DS} = 0	± $V_{(BR)G1-SS}$	6.0 to 20 V	
± I_{G2-SS} = 10 mA; V_{G1-S} = V_{DS} = 0	± $V_{(BR)G2-SS}$	6.0 to 20 V	
Drain current			
V_{DS} = 15 V; V_{G1-S} = 0; + V_{G2-S} = 4 V	I_{DSS}	4 to 20 mA	
Gate-source cut-off voltages			
I_D = 20 μA; V_{DS} = 15 V; + V_{G2-S} = 4 V	$-V_{(P)G1-S}$	max.	2.5 V
I_D = 20 μA; V_{DS} = 15 V; V_{G1-S} = 0	$-V_{(P)G2-S}$	max.	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	$\lvert y_{fs} \rvert$	min.	15 mS
		typ.	18 mS
Input capacitance at gate 1; f = 1 MHz	C_{ig1-s}	typ.	2.5 pF
		max.	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
Output capacitance at f = 1 MHz	C_{os}	typ.	1.0 pF
Noise figure at G_S = 2 mS ; B_S = B_S opt f = 200 MHz	F	typ.	1.0 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

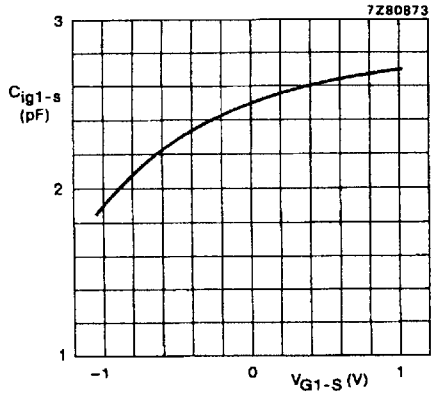


Fig. 3 V_{G2-S} = 4 V; V_{DS} = 15 V; f = 1 MHz; T_{amb} = 25 °C; typical values.

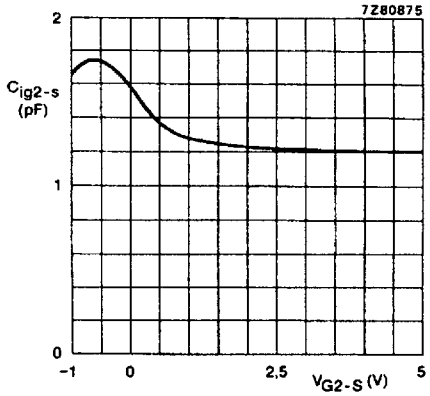


Fig. 4 V_{G1-S} = 0 V; V_{DS} = 15 V; f = 1 MHz; T_{amb} = 25 °C; typical values.

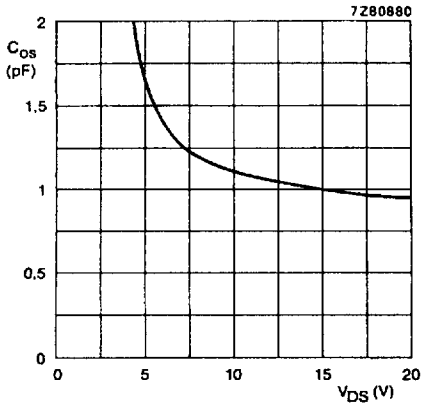


Fig. 5 V_{G2-S} = 4 V; I_D = 10 mA; f = 1 MHz; T_{amb} = 25 °C; typical values.

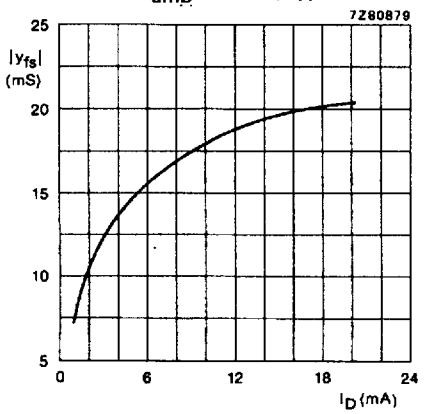


Fig. 6 V_{G2-S} = 4; V_{DS} = 15 V; f = 1 kHz; T_{amb} = 25 °C; typical values.

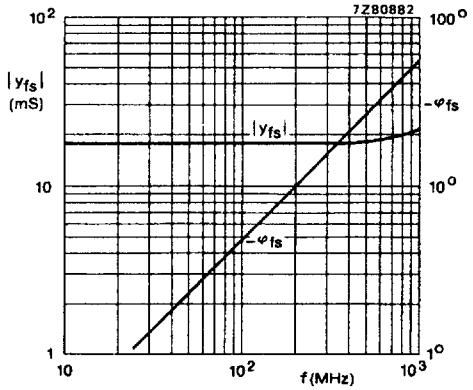


Fig. 7 V_{G2-S} = 4 V; V_{DS} = 15 V; I_D = 10 mA; T_{amb} = 25 °C; typical values.

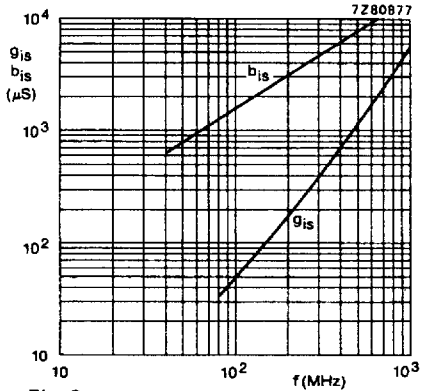


Fig. 8 V_{G2-S} = 4 V; V_{DS} = 15 V; I_D = 10 mA; T_{amb} = 25 °C; typical values.

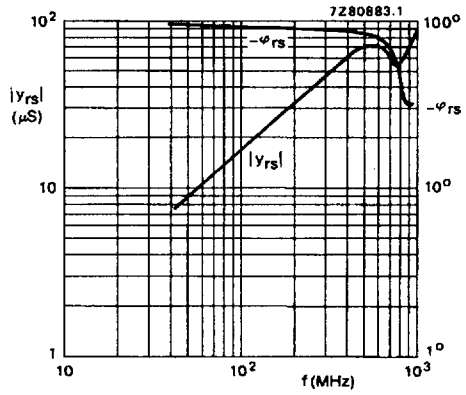


Fig. 9 $V_{G2\text{-}S}$ = 4 V; V_{DS} = 15 V; I_D = 10 mA; T_{amb} = 25 °C; typical values.

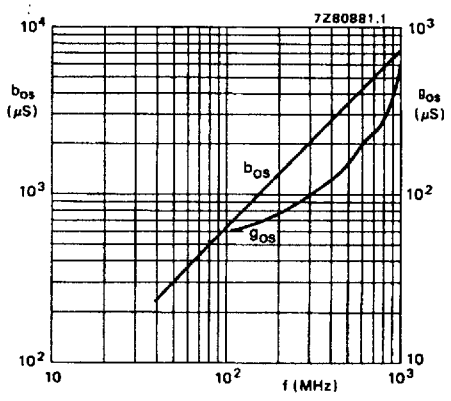


Fig. 10 $V_{G2\text{-}S}$ = 4 V; V_{DS} = 15 V; I_D = 10 mA; T_{amb} = 25 °C; typical values.

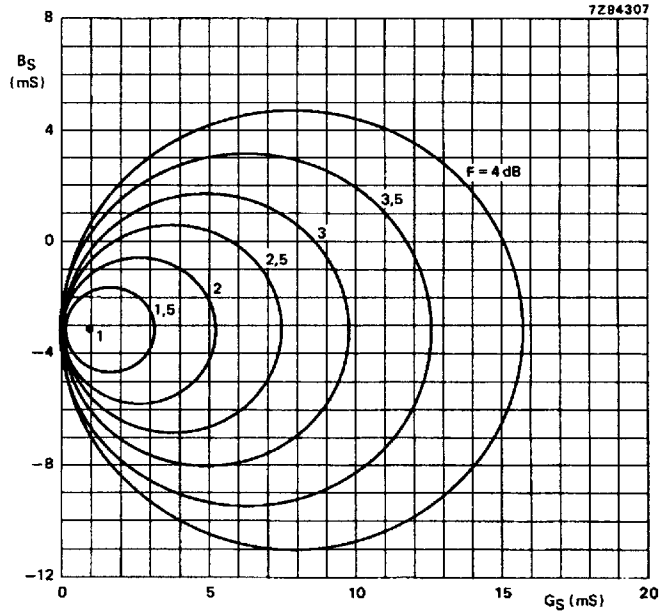


Fig. 11 $V_{G2\text{-}S}$ = 4 V; V_{DS} = 15 V; I_D = 10 mA; f = 200 MHz; T_{amb} = 25 °C; typical values.