

N-CHANNEL SILICON FIELD-EFFECT TRANSISTORS

Symmetrical N-channel planar epitaxial junction field-effect transistors in a plastic TO-92 variant; intended for v.h.f. and u.h.f. applications.

QUICK REFERENCE DATA

Drain-source voltage	$\pm V_{DS}$	max.	30 V
Gate-source voltage (open drain)	$-V_{GS0}$	max.	30 V
Total power dissipation up to $T_{amb} = 75^\circ\text{C}$	P_{tot}	max.	300 mW
Drain current $V_{DS} = 15 \text{ V}; V_{GS} = 0$	I_{DSS}	BF256A	B
		> 3	6
		< 7	13
			11 mA
			18 mA
Feedback capacitance at $f = 1 \text{ MHz}$ $V_{DS} = 20 \text{ V}; -V_{GS} = 1 \text{ V}; T_{amb} = 25^\circ\text{C}$	C_{rs}	typ.	0,7 pF
Transfer admittance (common source) $V_{DS} = 15 \text{ V}; V_{GS} = 0; f = 1 \text{ kHz}; T_{amb} = 25^\circ\text{C}$	$ Y_{fs} $	>	4,5 mS
Power gain at $f = 800 \text{ MHz}$ $V_{DS} = 15 \text{ V}; R_S = 47 \Omega$	G_p	typ.	11 dB

MECHANICAL DATA

Dimensions in mm

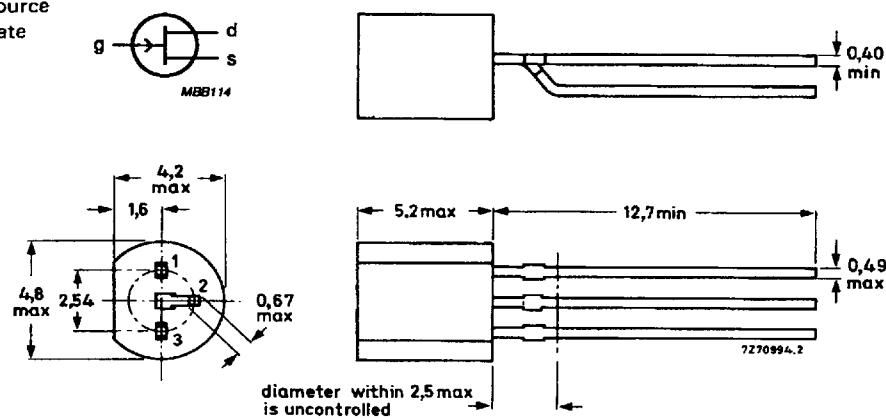
Fig. 1 TO-92 variant.

Pinning:

1 = drain

2 = source

3 = gate



Note: Drain and source are interchangeable

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RATINGS

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

Drain-source voltage	$\pm V_{DS}$	max.	30 V
Drain-gate voltage (open source)	V_{DGO}	max.	30 V
Gate-source voltage (open drain)	$-V_{GSO}$	max.	30 V
Gate current	I_G	max.	10 mA
Total power dissipation up to $T_{amb} = 75^\circ\text{C}$	P_{tot}	max.	300 mW
up to $T_{amb} = 90^\circ\text{C}$	P_{tot}	max.	300 mW 1)
Storage temperature	T_{stg}	—	—65 to + 150 °C
Junction temperature	T_j	max.	150 °C

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	250 K/W
From junction to ambient	$R_{th\ j-a}$	=	200 K/W 1)

CHARACTERISTICS $T_{amb} = 25^\circ\text{C}$ unless otherwise specified

Gate cut-off current

 $-V_{GS} = 20 \text{ V}; V_{DS} = 0$ $-I_{GSS}$ < 5 nA

Drain current 2)

 $V_{DS} = 15 \text{ V}; V_{GS} = 0$ I_{DSS}

BF256A	B	C
>	3	6
<	7	13
		18

 mA

Gate-source breakdown voltage

 $-I_G = 1 \mu\text{A}; V_{DS} = 0$ $-V_{(BR)GSS}$ > 30 V

Gate-source voltage

 $I_D = 200 \mu\text{A}; V_{DS} = 15 \text{ V}$ $-V_{GS}$ 3) 0,5 to 7,5 V

1) Transistor mounted on printed-circuit board, maximum lead length 3 mm, mounting pad for drain lead minimum 10 mm x 10 mm.

2) Measured under pulse conditions: $t_p = 300 \mu\text{s}$; $\delta \leq 0,02$.3) BF256B/1: $I_{DSS} = 6$ to 8 mA; $-V_{GS} = 1,4$ to 2,6 V.

γ -parameters (common source)

Transistor admittance at $f = 1$ kHz
 $V_{DS} = 15$ V; $V_{GS} = 0$

$|Y_{fs}|$ > typ. 4,5 mS 1)
 5 mS 1)

Output capacitance at $f = 1$ MHz
 $V_{DS} = 20$ V; $V_{GS} = 0$

C_{os} typ. 1,2 pF

Feedback capacitance at $f = 1$ MHz
 $V_{DS} = 20$ V; $-V_{GS} = 1$ V

C_{rs} typ. 0,7 pF

Cut-off frequency

$V_{DS} = 15$ V; $V_{GS} = 0$

f_{gfs} typ. 1 GHz 2)

Noise figure at $f = 800$ MHz

$V_{DS} = 10$ V; $R_S = 47 \Omega$

F typ. 7,5 dB

Power gain at $f = 800$ MHz

$V_{DS} = 15$ V; $R_S = 47 \Omega$

G_p typ. 11 dB

1) Measured under pulse conditions: $t_p = 300 \mu s$; $\delta \leq 0,02$.

2) The frequency at which g_{fs} is 0,7 of its value at 1 kHz.

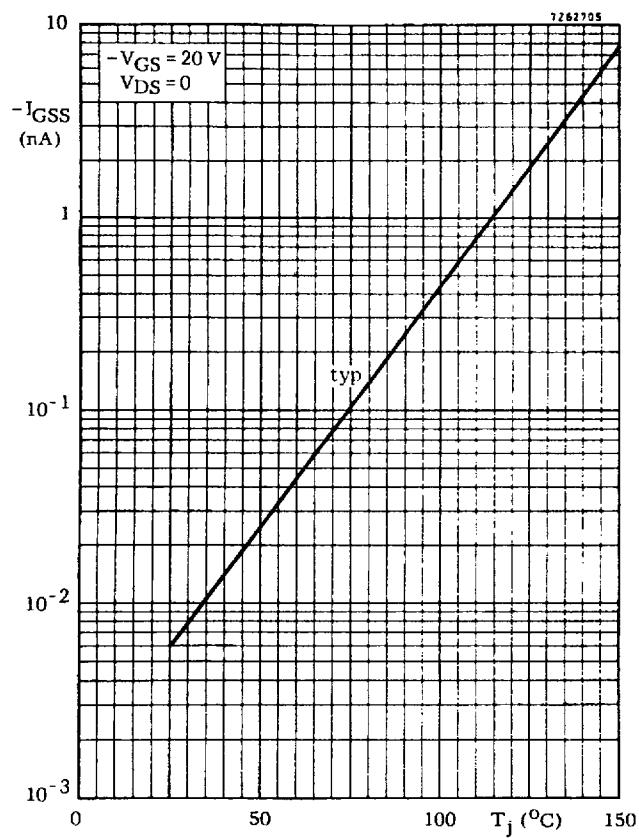


Fig. 2

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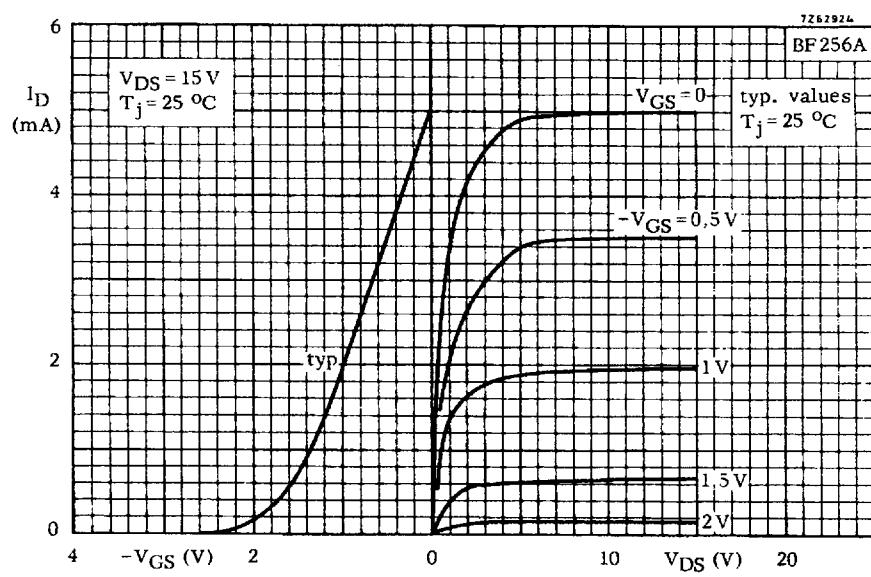


Fig. 3

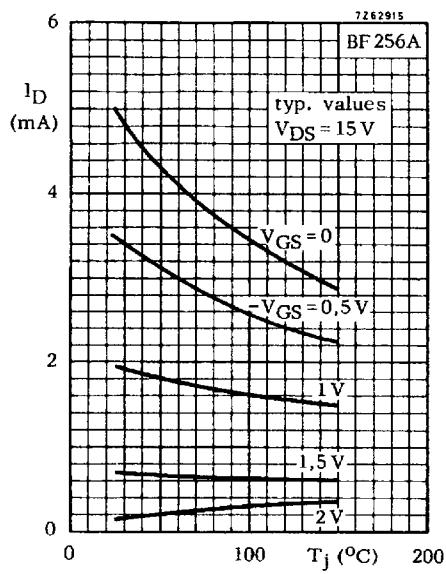
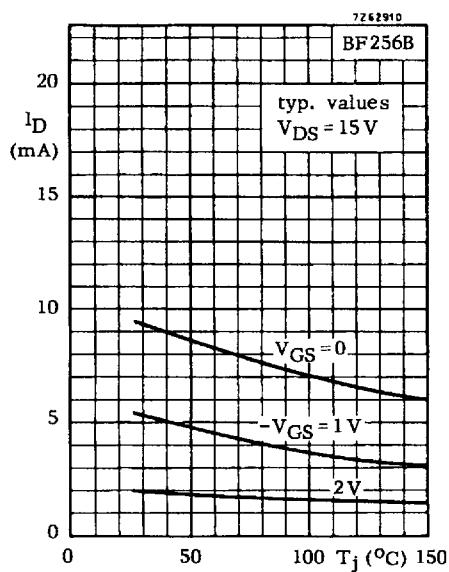
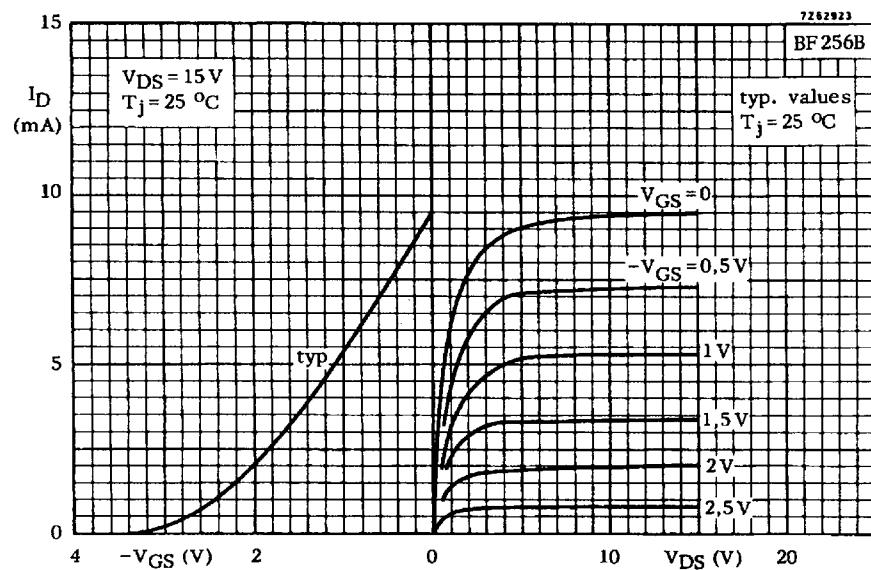


Fig. 4

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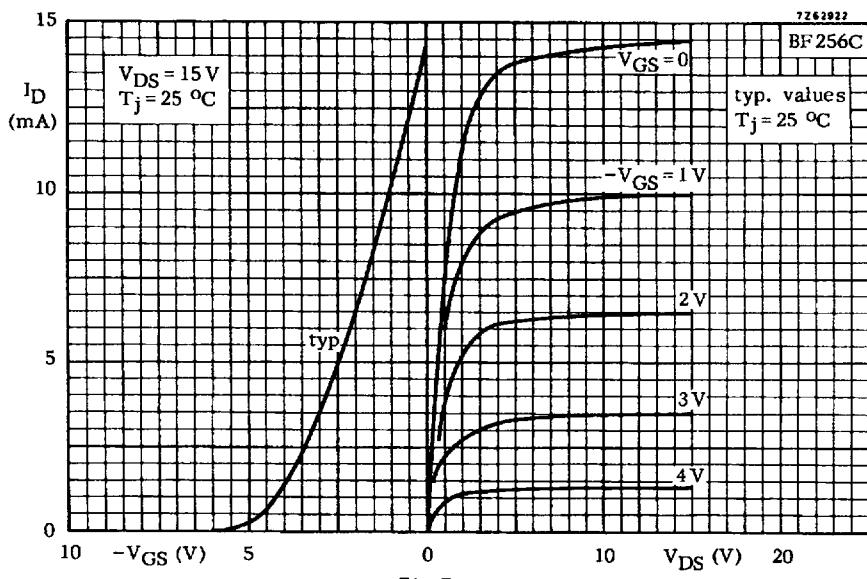


Fig. 7

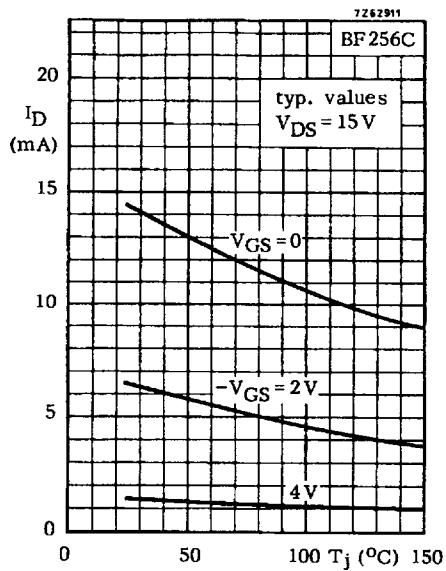


Fig. 8

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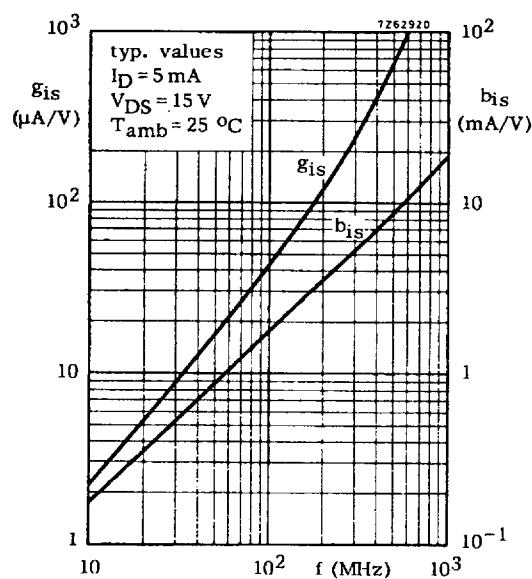


Fig. 9

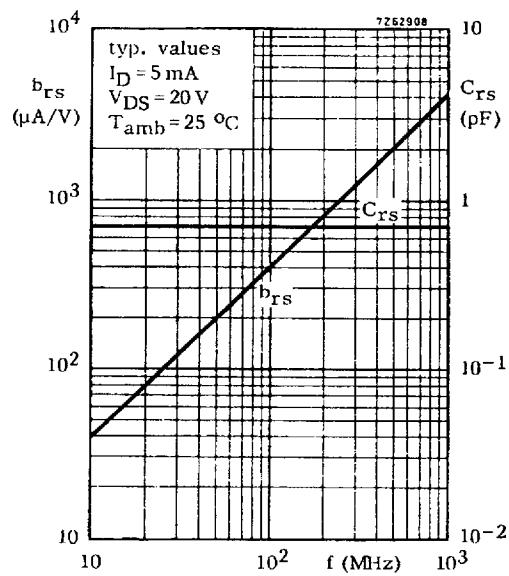


Fig. 10

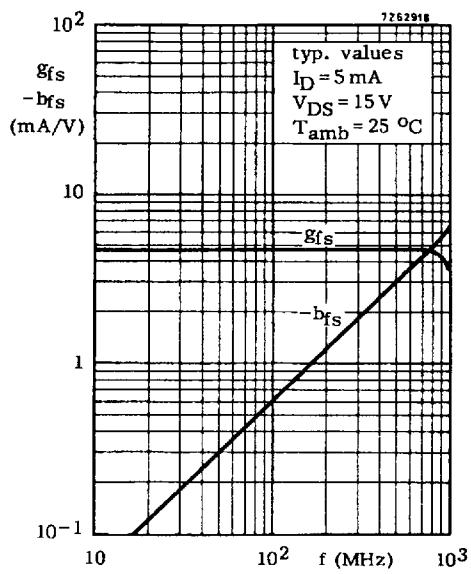


Fig. 11

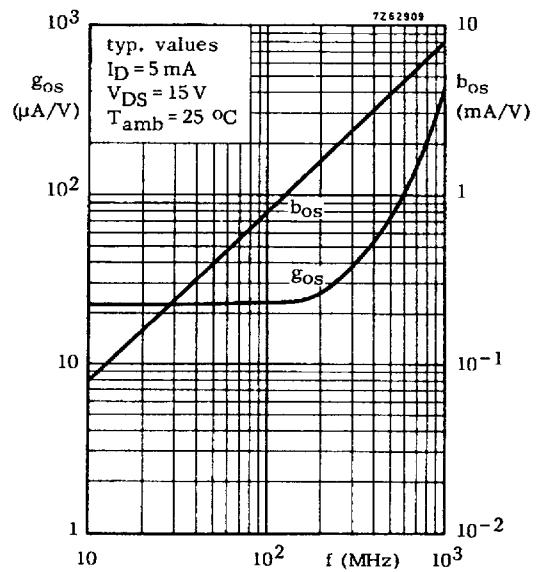


Fig. 12

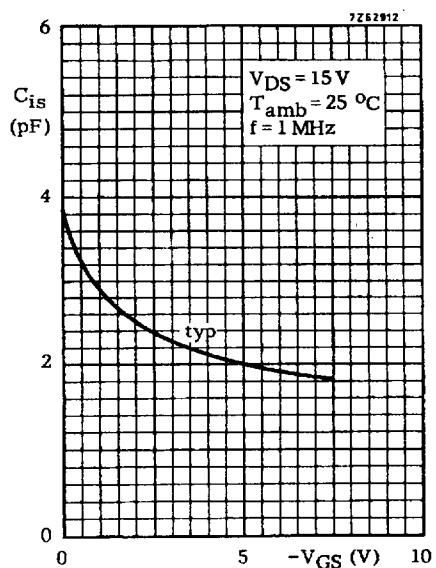


Fig. 13

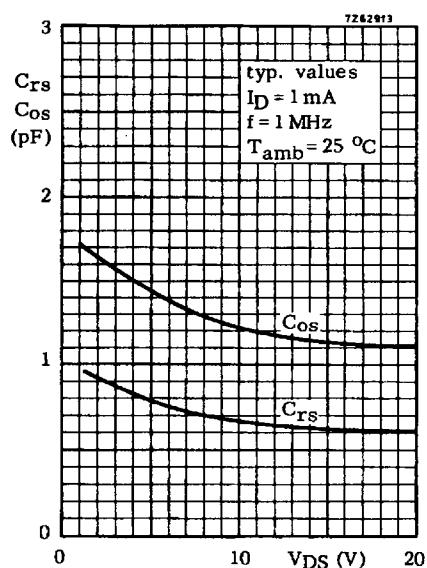


Fig. 14

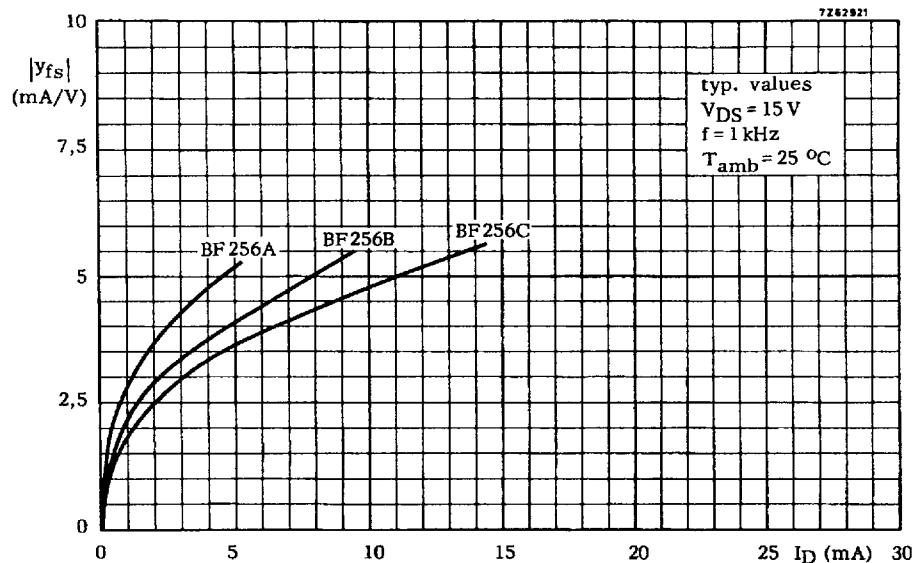


Fig. 15

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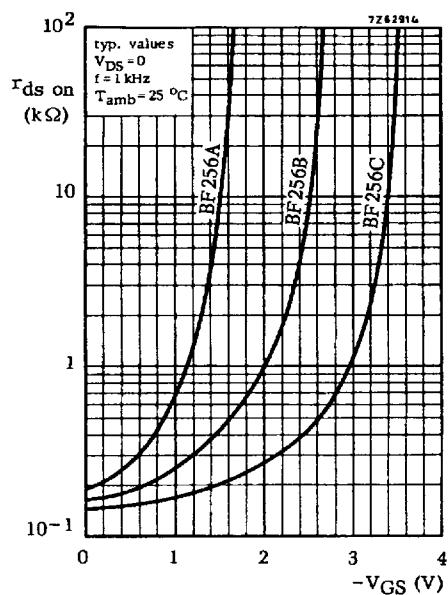


Fig. 16

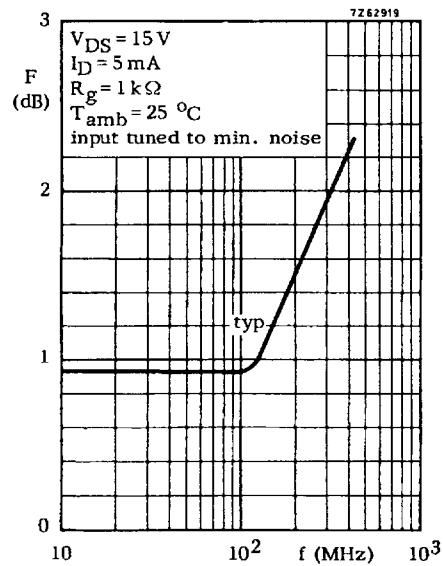


Fig. 17

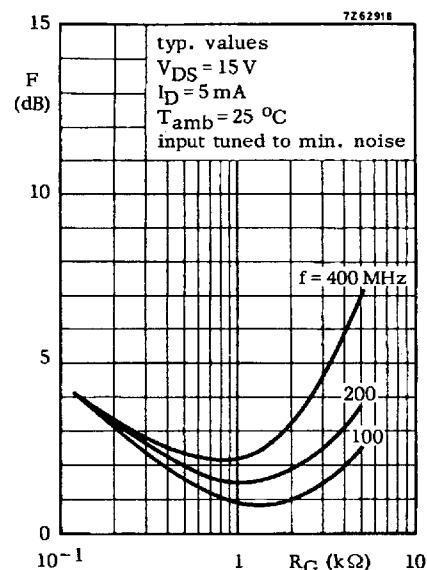


Fig. 18