# N-CHANNEL SILICON FIELD-EFFECT TRANSISTORS

Symmetrical N-channel planar epitaxial junction field-effect transistors in a plastic TO-92 variant; intended for hi-fi amplifiers and other audio-frequency equipment.

## QUICK REFERENCE DATA

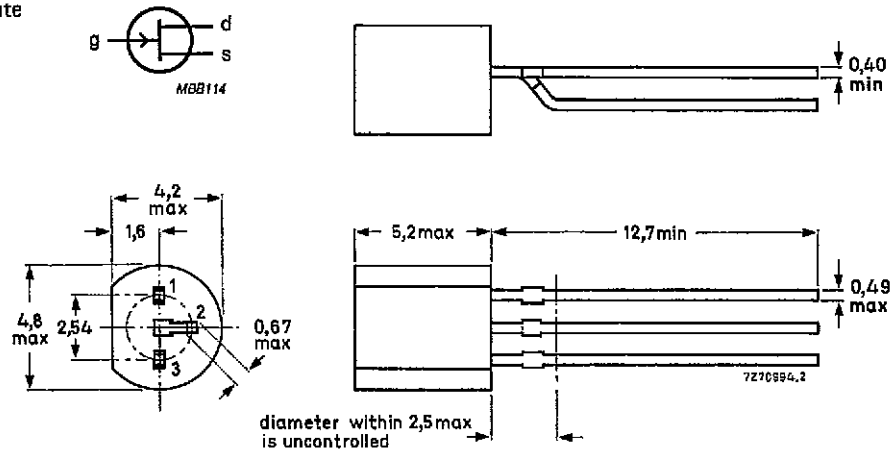
| | | | | |
|---|---|---|---|---|
| Drain-source voltage | $\pm V_{DS}$ | max. | 30 | V |
| Total power dissipation up to $T_{amb}$ = 75 °C | $P_{tot}$ | max. | 300 | mW |
| Junction temperature | $T_j$ | max. | 150 | °C |
| Drain current<br>$V_{DS}$ = 15 V; $V_{GS}$ = 0 | $I_{DSS}$ | | 2 to 12 | mA |
| Transfer admittance (common source)<br>$V_{DS}$ = 15 V; $V_{GS}$ = 0; f = 1 kHz | $\|y_{fs}\|$ | typ. | 3,5 | mS |
| Noise figure at $V_{DS}$ = 15 V; $V_{GS}$ = 0<br>f = 1 kHz; $R_G$ = 1 MΩ | F | < | 2 | dB |

## MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92 variant.

Pinning:
1 = drain
2 = source
3 = gate




Note: Drain and source are interchangeable

**RATINGS** Limiting values in accordance with the Absolute Maximum System (IEC134)

| | | | | |
|---|---|---|---|---|
| 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 °C | $P_{tot}$ | max. | 300 | 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 | $R_{th\ j-a}$ | = | 250 | K/W |

## CHARACTERISTICS

$T_j$ = 25 °C unless otherwise specified

| | | | BC264A | B | C | D | |
|---|---|---|---|---|---|---|---|
| Gate cut-off current | | | | | | | |
| $-V_{GS}$ = 20 V; $V_{DS}$ = 0 | $-I_{GSS}$ | < | 5 | 5 | 5 | 5 | nA |
| Drain current | | | | | | | |
| $V_{DS}$ = 15 V; $V_{GS}$ = 0 | $I_{DSS}$ | > | 2,0 | 3,5 | 5,0 | 7,0 | mA |
| | | < | 4,5 | 6,5 | 8,0 | 12,0 | mA |
| Gate-source breakdown voltage | | | | | | | |
| $-I_G$ = 1 µA; $V_{DS}$ = 0 | $-V_{(BR)GSS}$ | > | 30 | 30 | 30 | 30 | V |
| Gate-source voltage | | | | | | | |
| $I_D$ = 200 µA ; $V_{DS}$ = 15 V | $-V_{GS}$ | > | 0,4 | 0,4 | 0,4 | 0,4 | V |
| $I_D$ = 1,0 mA; $V_{DS}$ = 15 V | $-V_{GS}$ | > | 0,2 | – | – | – | V |
| | | < | 1,2 | – | – | – | V |
| $I_D$ = 1,5 mA; $V_{DS}$ = 15 V | $-V_{GS}$ | > | – | 0,4 | – | – | V |
| | | < | – | 1,4 | – | – | V |
| $I_D$ = 2,5 mA; $V_{DS}$ = 15 V | $-V_{GS}$ | > | – | – | 0,5 | – | V |
| | | < | – | – | 1,5 | – | V |
| $I_D$ = 3,5 mA; $V_{DS}$ = 15 V | $-V_{GS}$ | > | – | – | – | 0,6 | V |
| | | < | – | – | – | 1,6 | V |
| Gate-source cut-off voltage | | | | | | | |
| $I_D$ = 10 nA ; $V_{DS}$ = 15 V | $-V_{(P)GS}$ | > | 0,5 | 0,5 | 0,5 | 0,5 | V |
| y-parameters at $T_{amb}$ = 25 °C | | | | | | | |
| $V_{DS}$ = 15 V; $V_{GS}$ = 0; f = 1 kHz | | | | | | | |
| Transfer admittance | $\lvert y_{fs} \rvert$ | > | 2,5 | 3,0 | 3,5 | 4,0 | mS |
| $V_{DS}$ = 15 V; $-V_{GS}$ = 1 V; f = 1 MHz | | | | | | | |
| Input capacitance | $C_{is}$ | | typ. | 4,0 | | | pF |
| Feedback capacitance | $C_{rs}$ | | typ. | 1,2 | | | pF |
| Output capacitance | $C_{os}$ | | typ. | 1,6 | | | pF |
| Noise figure at f = 1 kHz; $R_G$ = 1 MΩ | | | | | | | |
| $V_{DS}$ = 15 V; $V_{GS}$ = 0; $T_{amb}$ = 25 °C | F | | typ. | 0,5 | | | dB |
| | | | < | 2 | | | dB |
| Equivalent noise voltage at $T_{amb}$ = 25 °C | | | | | | | |
| $V_{DS}$ = 15 V; $V_{GS}$ = 0; f = 10 Hz | $V_n/\sqrt{B}$ | | typ. | 40 | | | $nV/\sqrt{Hz}$ |

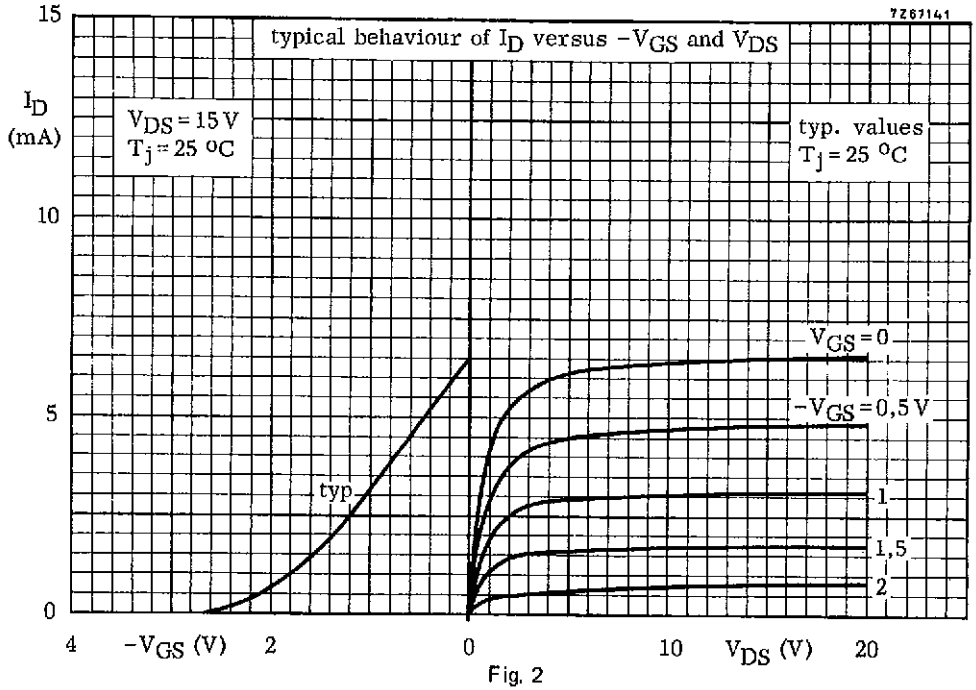



Fig. 2

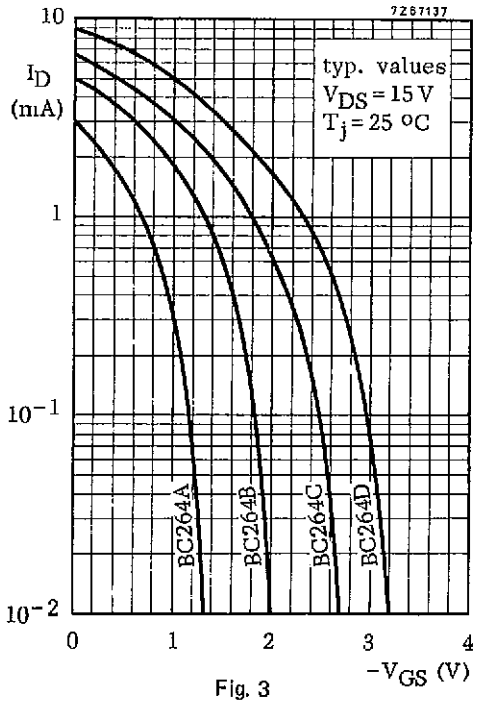



Fig. 3

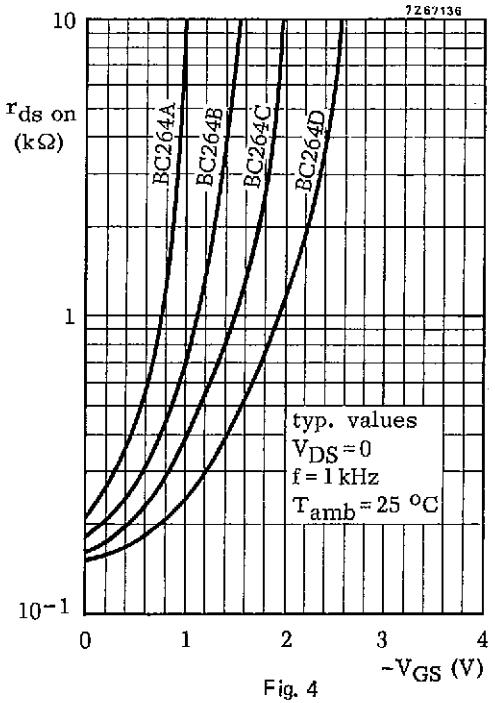



Fig. 4

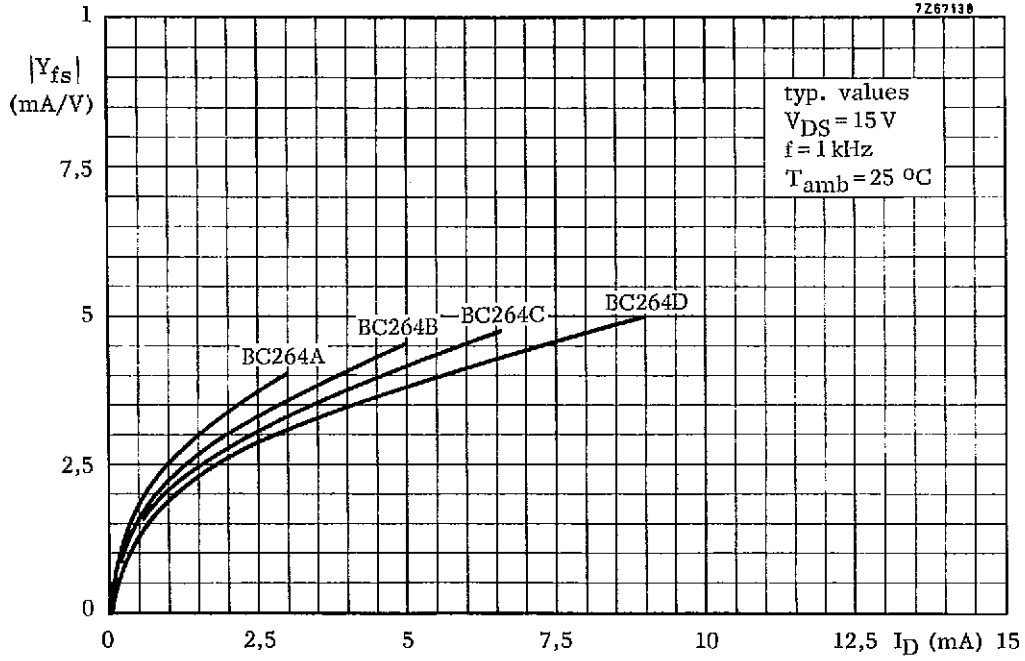



Fig. 5

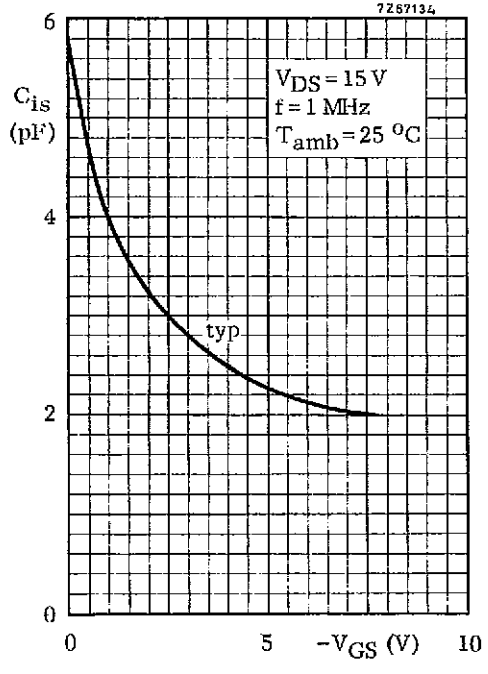



Fig. 6

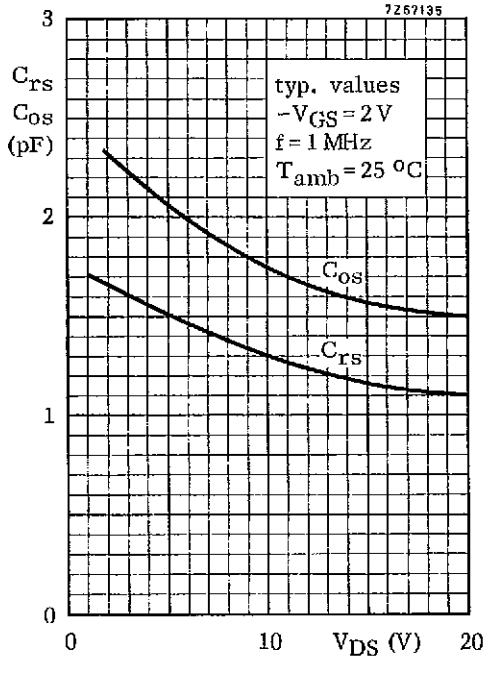



Fig. 7

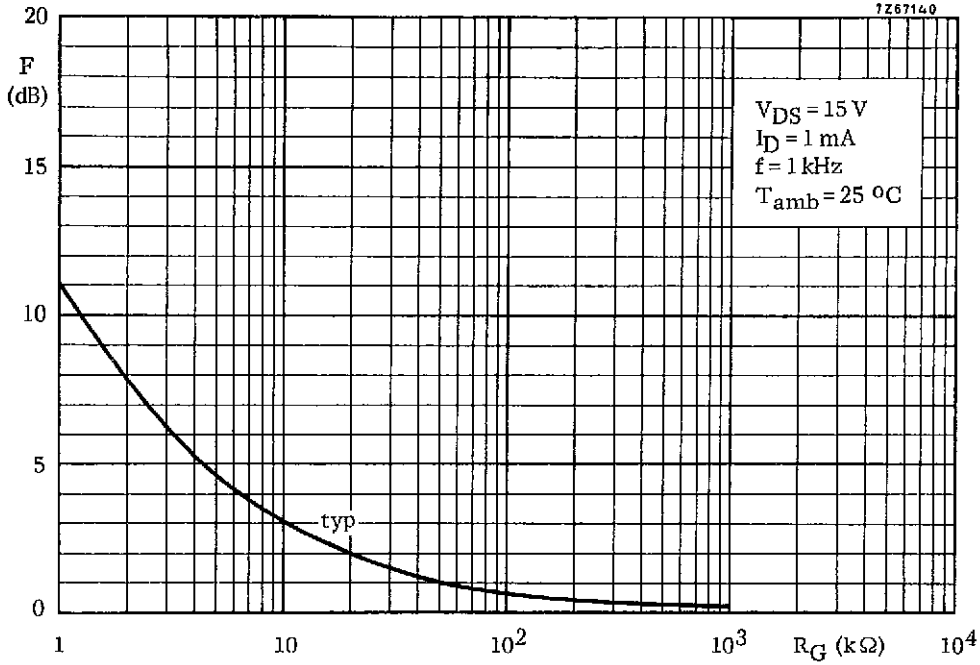

7Z67140
20
F
(dB)
15
10
5
0
$V_{DS}$ = 15 V
$I_D$ = 1 mA
f = 1 kHz
$T_{amb}$ = 25 °C
typ
1
10
$10^2$
$10^3$
$R_G$ (kΩ)
$10^4$

Fig. 8

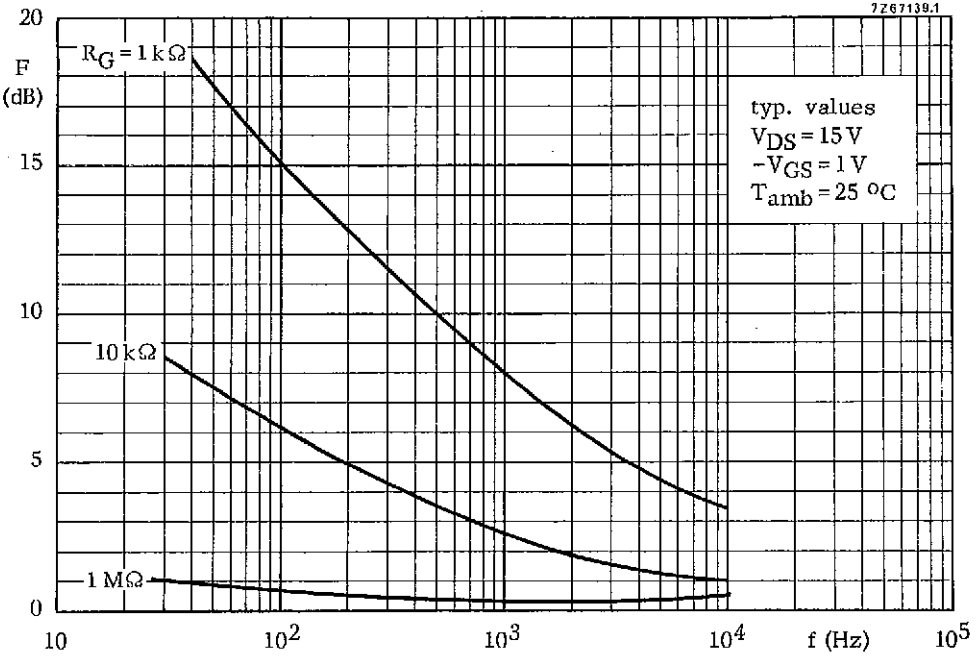

7Z67139.1
20
F
(dB)
15
10
5
0
$R_G$ = 1 kΩ
10 kΩ
1 MΩ
typ. values
$V_{DS}$ = 15 V
$-V_{GS}$ = 1 V
$T_{amb}$ = 25 °C
10
$10^2$
$10^3$
$10^4$
f (Hz)
$10^5$

Fig. 9