

## 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 $T_{amb} = 75^\circ\text{C}$                                       | $P_{tot}$    | max. | 300 mW               |
| Junction temperature                                                                             | $T_j$        | max. | 150 $^\circ\text{C}$ |
| Drain current<br>$V_{DS} = 15\text{ V}; V_{GS} = 0$                                              | $I_{DSS}$    |      | 2 to 12 mA           |
| Transfer admittance (common source)<br>$V_{DS} = 15\text{ V}; V_{GS} = 0; f = 1\text{ kHz}$      | $ Y_{fs} $   | typ. | 3,5 mS               |
| Noise figure at $V_{DS} = 15\text{ V}; V_{GS} = 0$<br>$f = 1\text{ kHz}; R_G = 1\text{ M}\Omega$ | F            | <    | 2 dB                 |

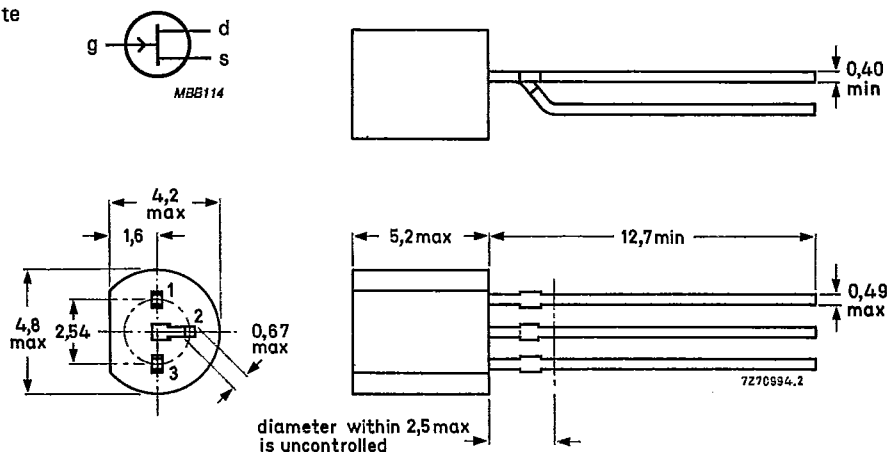
### MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92 variant.

Pinning:

- 1 = drain
- 2 = source
- 3 = gate



Note: Drain and source are interchangeable

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**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 $T_{amb} = 75\text{ }^{\circ}\text{C}$ | $P_{tot}$     | max. | 300         | mW                 |
| Storage temperature range                                            | $T_{stg}$     |      | -65 to +150 | $^{\circ}\text{C}$ |
| Junction temperature                                                 | $T_j$         | max. | 150         | $^{\circ}\text{C}$ |
| <b>THERMAL RESISTANCE</b>                                            |               |      |             |                    |
| From junction to ambient in free air                                 | $R_{th\ j-a}$ | =    | 250         | K/W                |

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N-channel silicon field-effect transistors

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# CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified

Gate cut-off current

$-V_{GS} = 20\text{ V}; V_{DS} = 0$

$-I_{GSS}$

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|--------|---|---|---|
| < 5    | 5 | 5 | 5 |

nA

Drain current

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

$I_{DSS}$

|       |     |     |      |
|-------|-----|-----|------|
| > 2,0 | 3,5 | 5,0 | 7,0  |
| < 4,5 | 6,5 | 8,0 | 12,0 |

mA

mA

Gate-source breakdown voltage

$-I_G = 1\text{ }\mu\text{A}; V_{DS} = 0$

$-V_{(BR)GSS}$

|      |    |    |    |
|------|----|----|----|
| > 30 | 30 | 30 | 30 |
|------|----|----|----|

V

Gate-source voltage

$I_D = 200\text{ }\mu\text{A}; V_{DS} = 15\text{ V}$

$-V_{GS}$

|       |     |     |     |
|-------|-----|-----|-----|
| > 0,4 | 0,4 | 0,4 | 0,4 |
|-------|-----|-----|-----|

V

$I_D = 1,0\text{ mA}; V_{DS} = 15\text{ V}$

$-V_{GS}$

|       |   |   |   |
|-------|---|---|---|
| > 0,2 | — | — | — |
|-------|---|---|---|

V

|       |   |   |   |
|-------|---|---|---|
| < 1,2 | — | — | — |
|-------|---|---|---|

V

$I_D = 1,5\text{ mA}; V_{DS} = 15\text{ V}$

$-V_{GS}$

|     |     |   |   |
|-----|-----|---|---|
| > — | 0,4 | — | — |
|-----|-----|---|---|

V

|     |     |   |   |
|-----|-----|---|---|
| < — | 1,4 | — | — |
|-----|-----|---|---|

V

$I_D = 2,5\text{ mA}; V_{DS} = 15\text{ V}$

$-V_{GS}$

|     |   |     |   |
|-----|---|-----|---|
| > — | — | 0,5 | — |
|-----|---|-----|---|

V

|     |   |     |   |
|-----|---|-----|---|
| < — | — | 1,5 | — |
|-----|---|-----|---|

V

$I_D = 3,5\text{ mA}; V_{DS} = 15\text{ V}$

$-V_{GS}$

|     |   |   |     |
|-----|---|---|-----|
| > — | — | — | 0,6 |
|-----|---|---|-----|

V

|     |   |   |     |
|-----|---|---|-----|
| < — | — | — | 1,6 |
|-----|---|---|-----|

V

Gate-source cut-off voltage

$I_D = 10\text{ nA}; V_{DS} = 15\text{ V}$

$-V_{(P)GS}$

|       |     |     |     |
|-------|-----|-----|-----|
| > 0,5 | 0,5 | 0,5 | 0,5 |
|-------|-----|-----|-----|

V

y-parameters at  $T_{amb} = 25\text{ }^{\circ}\text{C}$

$V_{DS} = 15\text{ V}; V_{GS} = 0; f = 1\text{ kHz}$

Transfer admittance

$|y_{fs}|$

|       |     |     |     |
|-------|-----|-----|-----|
| > 2,5 | 3,0 | 3,5 | 4,0 |
|-------|-----|-----|-----|

mS

$V_{DS} = 15\text{ V}; -V_{GS} = 1\text{ V}; f = 1\text{ MHz}$

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  $f = 1\text{ kHz}; R_G = 1\text{ M}\Omega$

$V_{DS} = 15\text{ V}; V_{GS} = 0; T_{amb} = 25\text{ }^{\circ}\text{C}$

F

typ.

0,5

dB

< 2 dB

Equivalent noise voltage at  $T_{amb} = 25\text{ }^{\circ}\text{C}$

$V_{DS} = 15\text{ V}; V_{GS} = 0; f = 10\text{ Hz}$

$V_n/\sqrt{B}$

typ.

40

nV/ $\sqrt{\text{Hz}}$

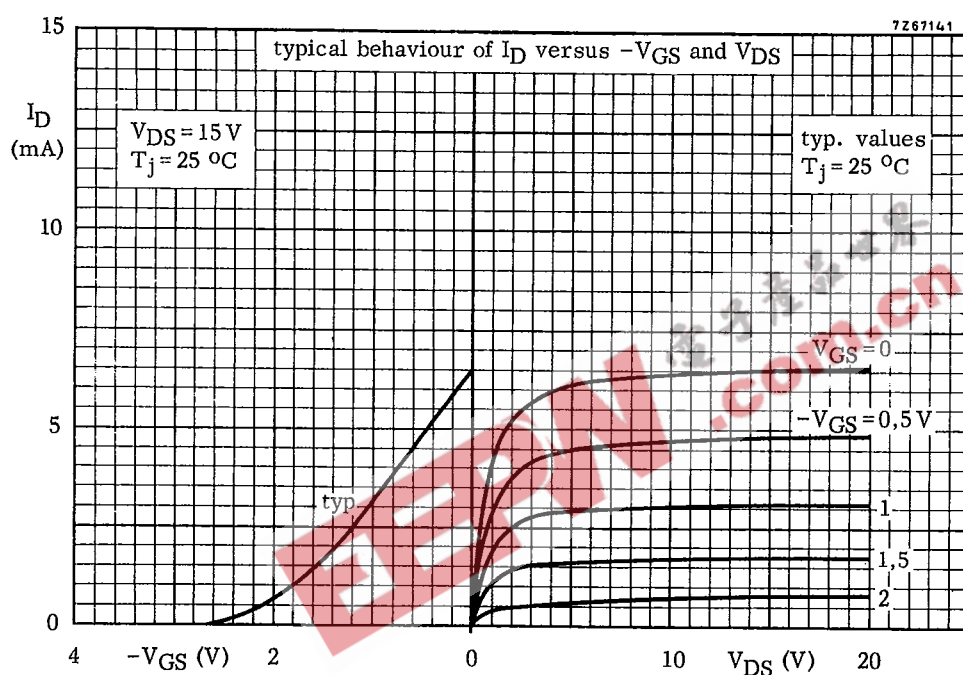


Fig. 2

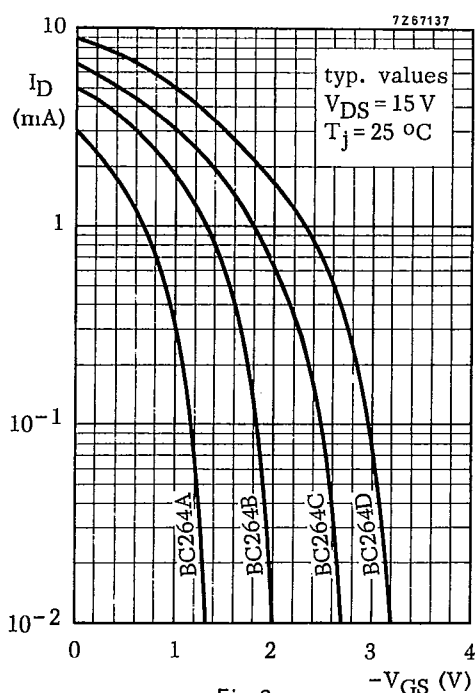


Fig. 3

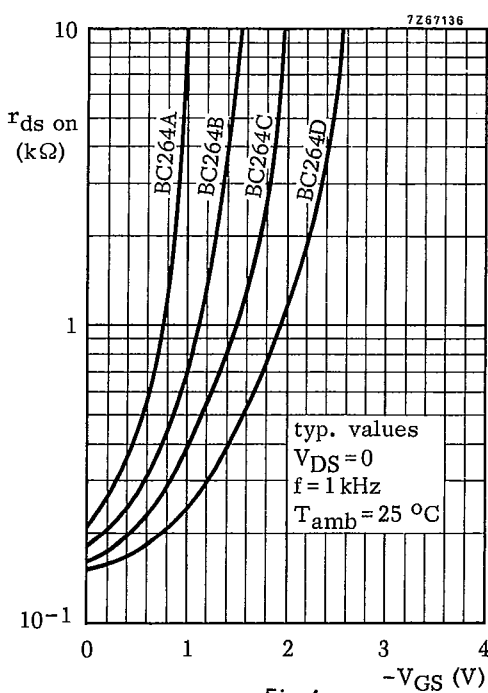
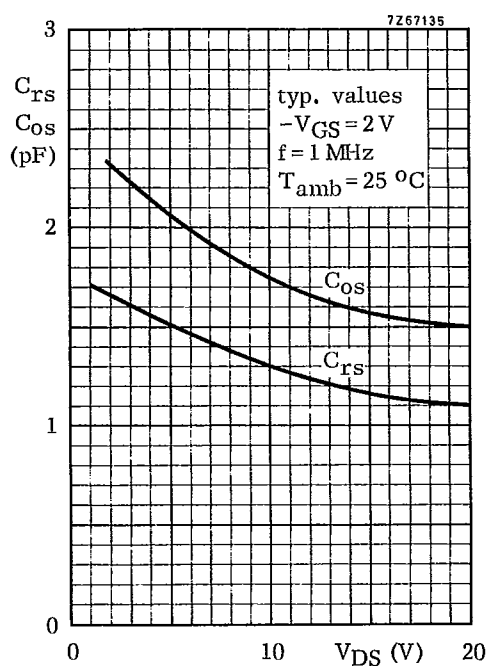
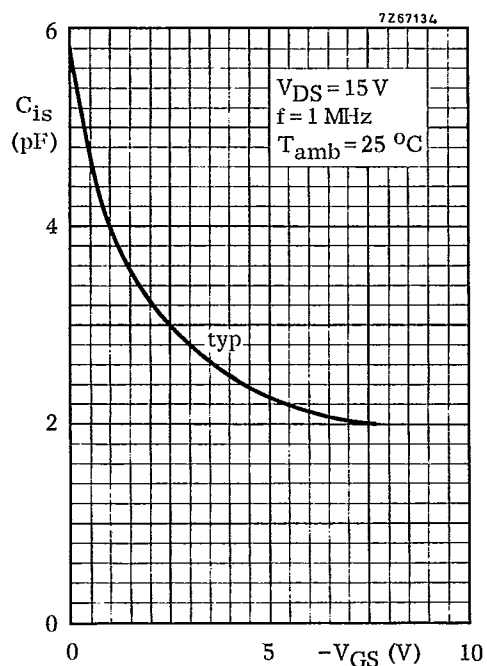
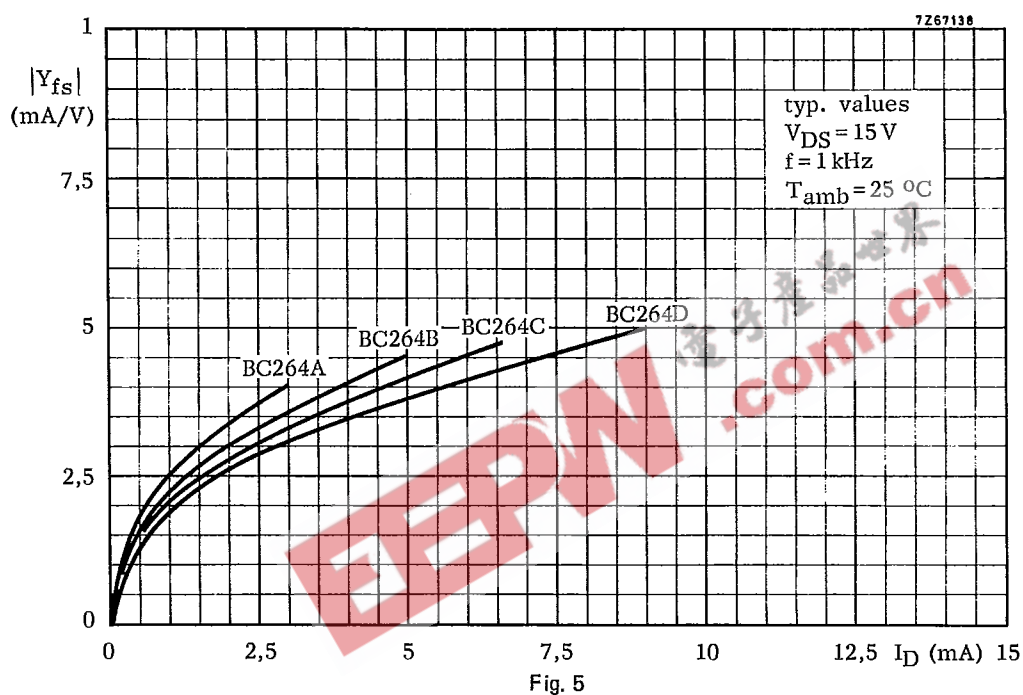


Fig. 4



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