New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

BFW12
BFW13

# N-CHANNEL SILICON FETS

Symmetrical n-channel silicon planar epitaxial junction field-effect transistors in TO-72 metal envelopes with the shield lead connected to the case. The transistors are intended for battery powered equipment and other low current-low voltage applications.

## QUICK REFERENCE DATA

| | | | | | |
|---|---|---|---|---|---|
| Drain-source voltage | $\pm V_{DS}$ | max. | 30 | | V |
| Gate-source voltage (open drain) | $-V_{GSO}$ | max. | 30 | | V |
| Total power dissipation up to $T_{amb} = 110\ ^{o}C$ | $P_{tot}$ | max. | 150 | | mW |
| | | | BFW12 | BFW13 | |
| Drain current | | > | 1 | 0,2 | mA |
| $V_{DS} = 15$ V; $V_{GS} = 0$ | $I_{DSS}$ | < | 5 | 1,5 | mA |
| Gate-source cut-off voltage | | | | | |
| $I_D = 0,5$ nA; $V_{DS} = 15$ V | $-V_{(P)GS}$ | < | 2,5 | 1,2 | V |
| Feedback capacitance at f = 1 MHz | | | | | |
| $V_{DS} = 15$ V; $V_{GS} = 0$ | $C_{rs}$ | < | 0,80 | 0,80 | pF |
| Transfer admittance (common source) | | | | | |
| $V_{DS} = 15$ V; $I_D = 200\ \mu$A; f = 1 kHz | $\lvert y_{fs} \rvert$ | > | 0,5 | 0,5 | mS |
| Equivalent noise voltage | | | | | |
| $V_{DS} = 15$ V; $I_D = 200\ \mu$A | | | | | |
| B = 0,6 to 100 Hz | $V_n$ | < | 0,5 | 0,5 | $\mu$V |

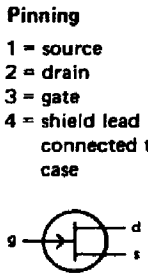
## MECHANICAL DATA

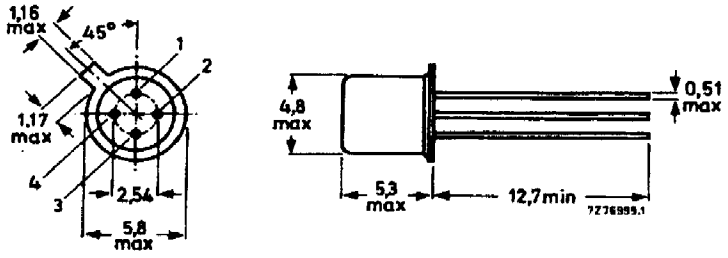
Dimensions in mm

Fig. 1 TO-72.

**Pinning**

1 = source
2 = drain
3 = gate
4 = shield lead connected to case




Note: Drain and source are interchangeable.

**CHARACTERISTICS** $T_j$ = 25 °C unless otherwise specified

| | | | BFW12 | BFW13 | |
|---|---|---|---|---|---|
| **Gate cut-off currents** | | | | | |
| $-V_{GS}$ = 10 V; $V_{DS}$ = 0 | $-I_{GSS}$ | < | 0.1 | 0.1 | nA |
| $-V_{GS}$ = 10 V; $V_{DS}$ = 0; $T_j$ = 150 °C | $-I_{GSS}$ | < | 0.1 | 0.1 | µA |
| Drain current [1]) | | | | | |
| $V_{DS}$ = 15 V; $V_{GS}$ = 0 | $I_{DSS}$ | > | 1 | 0.2 | mA |
| | | < | 5 | 1.5 | mA |
| Gate-source voltage | | | | | |
| $I_D$ = 50 µA; $V_{DS}$ = 15 V | $-V_{GS}$ | > | 0.5 | 0.1 | V |
| | | < | 2.0 | 1.0 | V |
| Gate-source cut-off voltage | | | | | |
| $I_D$ = 0.5 nA; $V_{DS}$ = 15 V | $-V_{(P)GS}$ | < | 2.5 | 1.2 | V |
| y parameters at f = 1 kHz; $T_{amb}$ = 25 °C | | | | | |
| $V_{DS}$ = 15 V; $V_{GS}$ = 0 | | | | | |
| Transfer admittance | $\|y_{fs}\|$ | > | 2.0 | 1.0 | mS |
| Output admittance | $\|y_{os}\|$ | < | 30 | 10 | µS |
| $V_{DS}$ = 15 V; $I_D$ = 500 µA | | | | | |
| Transfer admittance | $\|y_{fs}\|$ | > | 1.5 | – | mS |
| Output admittance | $\|y_{os}\|$ | < | 10 | – | µS |
| $V_{DS}$ = 15 V; $I_D$ = 200 µA | | | | | |
| Transfer admittance | $\|y_{fs}\|$ | > | 0.5 | 0.5 | mS |
| Output admittance | $\|y_{os}\|$ | < | 5 | 5 | µS |
| f = 1 MHz; $T_{amb}$ = 25 °C | | | | | |
| $V_{DS}$ = 15 V; $V_{GS}$ = 0 | | | | | |
| Input capacitance | $C_{iss}$ | < | 5 | 5 | pF |
| Feedback capacitance | $C_{rs}$ | < | 0.80 | 0.80 | pF |
| Equivalent noise voltage | | | | | |
| $V_{DS}$ = 15 V; $I_D$ = 200 µA; $T_{amb}$ = 25 °C<br>B = 0.6 to 100 Hz | $V_n$ | < | 0.5 | 0.5 | µV |

BFW12
BFW13

**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 |
| Drain current | $I_D$ | max. | 10 | mA |
| Gate current | $I_G$ | max. | 5 | mA |
| Total power dissipation up to $T_{amb}$ = 85 °C | $P_{tot}$ | max. | 150 | mW |
| Storage temperature range | $T_{stg}$ | −65 to + | 175 | °C |
| Junction temperature | $T_j$ | max. | 175 | °C |

**THERMAL RESISTANCE**

| | | | | |
|---|---|---|---|---|
| From junction to ambient | $R_{th\ j-a}$ | = | 590 | K/W |

**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 |
| Drain current | $I_D$ | max. | 10 | mA |
| Gate current | $I_G$ | max. | 5 | mA |
| Total power dissipation up to $T_{amb}$ = 85 °C | $P_{tot}$ | max. | 150 | mW |
| Storage temperature range | $T_{stg}$ | −65 to + | 175 | °C |
| Junction temperature | $T_j$ | max. | 175 | °C |

**THERMAL RESISTANCE**

| | | | | |
|---|---|---|---|---|
| From junction to ambient | $R_{th\ j\text{-}a}$ | = | 590 | K/W |