BFT46
N-channel silicon FET

Product specification
December 1997
DESCRIPTION
Symmetrical n-channel silicon epitaxial planar junction field-effect transistor in a microminiature plastic envelope. The transistor is intended for low level general purpose amplifiers in thick and thin-film circuits.

PINNING
1 = drain
2 = source
3 = gate

Note: Drain and source are interchangeable.

Marking code
BFT46 = M3p

QUICK REFERENCE DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain-source voltage</td>
<td>±V_DS</td>
<td>max</td>
<td>25 V</td>
</tr>
<tr>
<td>Gate-source voltage (open drain)</td>
<td>-V_GSO</td>
<td>max</td>
<td>25 V</td>
</tr>
<tr>
<td>Total power dissipation up to T_amb = 40 °C</td>
<td>P_tot</td>
<td>max</td>
<td>250 mW</td>
</tr>
<tr>
<td>Drain current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V_DS = 10 V; V_GS = 0</td>
<td></td>
<td></td>
<td>&gt; 0.2 mA</td>
</tr>
<tr>
<td></td>
<td>I_DSS</td>
<td></td>
<td>&lt; 1.5 mA</td>
</tr>
<tr>
<td>Transfer admittance (common source)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I_D = 0.2 mA; V_DS = 10 V; f = 1 kHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equivalent noise voltage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V_DS = 10 V; I_D = 200 µA; B = 0.6 to 100 Hz</td>
<td>V_n</td>
<td></td>
<td>&lt; 0.5 µV</td>
</tr>
</tbody>
</table>
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RATINGS
Limiting values in accordance with the Absolute Maximum System (IEC 134)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain-source voltage</td>
<td>$\pm V_{DS}$</td>
<td>max. 25 V</td>
</tr>
<tr>
<td>Drain-gate voltage (open source)</td>
<td>$V_{DGO}$</td>
<td>max. 25 V</td>
</tr>
<tr>
<td>Gate-source voltage (open drain)</td>
<td>$-V_{GSO}$</td>
<td>max. 25 V</td>
</tr>
<tr>
<td>Drain current</td>
<td>$I_D$</td>
<td>max. 10 mA</td>
</tr>
<tr>
<td>Gate current</td>
<td>$I_G$</td>
<td>max. 5 mA</td>
</tr>
<tr>
<td>Total power dissipation up to $T_{amb}$</td>
<td>$P_{tot}$</td>
<td>max. 250 mW</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>$T_{stg}$</td>
<td>-65 to +150 °C</td>
</tr>
<tr>
<td>Junction temperature</td>
<td>$T_J$</td>
<td>max. 150 °C</td>
</tr>
</tbody>
</table>

THERMAL RESISTANCE
From junction to ambient

$R_{th,j-a} = 430$ K/W

Note
1. Mounted on a ceramic substrate of 8 mm x 10 mm x 0,7 mm.

CHARACTERISTICS
$T_J = 25$ °C unless otherwise specified

Gate cut-off current

$-V_{GS} = 10$ V; $V_{DS} = 0$$-I_{GSS} < 0.2$ nA

Drain current

$V_{DS} = 10$ V; $V_{GS} = 0$I_{DSS} < 1.5 mA

Gate-source voltage

$I_D = 50$ μA; $V_{DS} = 10$ V$-V_{GS} < 0.1$ V

Gate-source cut-off voltage

$I_D = 0.5$ nA; $V_{DS} = 10$ V$-V_{(P)GS} < 1.2$ V

$y$-parameters at $f = 1$ kHz;

$V_{DS} = 10$ V; $V_{GS} = 0$; $T_{amb} = 25$ °C

Transfer admittance $|y_{fs}| < 1.0$ mS

Output admittance $|y_{os}| < 10$ μS

$V_{DS} = 10$ V; $I_D = 200$ μA; $T_{amb} = 25$ °C

Transfer admittance $|y_{fs}| < 0.5$ mS

Output admittance $|y_{os}| < 5$ μS

Input capacitance at $f = 1$ MHz;

$V_{DS} = 10$ V; $V_{GS} = 0$; $T_{amb} = 25$ °C

$C_{ls} < 5$ pF

Feedback capacitance at $f = 1$ MHz;

$V_{DS} = 10$ V; $V_{GS} = 0$; $T_{amb} = 25$ °C

$C_{rs} < 1.5$ pF

Equivalent noise voltage

$V_{DS} = 10$ V; $I_D = 200$ μA; $T_{amb} = 25$ °C

$B = 0.6$ to 100 Hz

$V_n < 0.5$ μV
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**Fig. 2** Power derating curve.

**Fig. 3** Typical values. $V_{DS} = 10$ V; $T_J = 25 \, ^\circ$C.
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Fig. 4 Typical values. $V_{DS} = 10 \, \text{V}$.

Fig. 5 Correlation between $-V_{PGS}$ and $I_{DSS}$. $V_{DS} = 10 \, \text{V}; T_j = 25 \, ^\circ\text{C}$.

Fig. 6 $|y_{fs}|$ versus $I_D$. $V_{DS} = 10 \, \text{V}; f = 1 \, \text{kHz}; T_{amb} = 25 \, ^\circ\text{C}$.

Fig. 7 $|y_{os}|$ versus $I_D$. $V_{DS} = 10 \, \text{V}; f = 1 \, \text{kHz}; T_{amb} = 25 \, ^\circ\text{C}$.
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Fig. 8 $|y_{os}|$ versus $V_{DS}$. $I_D = 0.4\ mA$; $f = 1\ kHz$; $T_{amb} = 25\ ^\circ C$.

Fig. 9 Typical values. $V_{DS} = 10\ V$; $T_{amb} = 25\ ^\circ C$.

Fig. 10 Typical values. $V_{DS} = 10\ V$, $T_{amb} = 25\ ^\circ C$.

Fig. 11 $I_{GSS}$ versus $T_J$. $-V_{GSS} = 10\ V$; $V_{DS} = 0$. 
Fig. 12 $V_{DS} = 10 \, V$; $I_D = 0.2 \, mA$; $T_{amb} = 25 \, ^{\circ}C$.

Fig. 13 $V_{DS} = 10 \, V$; $I_D = 0.2 \, mA$; $T_{amb} = 25 \, ^{\circ}C$. 
**PACKAGE OUTLINE**

Plastic surface-mounted package; 3 leads  
SOT23

**DIMENSIONS (mm are the original dimensions)**

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<tr>
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<th>A</th>
<th>A₁ max.</th>
<th>b₀</th>
<th>c</th>
<th>D</th>
<th>E</th>
<th>e</th>
<th>e₁</th>
<th>Hₑ</th>
<th>Lₚ</th>
<th>Q</th>
<th>v</th>
<th>w</th>
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<td>0.1</td>
<td>0.48</td>
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<td>3.0</td>
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<td>0.95</td>
<td>2.5</td>
<td>0.45</td>
<td>0.55</td>
<td>0.2</td>
<td>0.1</td>
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**REFERENCES**

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<tr>
<th>OUTLINE VERSION</th>
<th>IEC</th>
<th>JEDEC</th>
<th>JEITA</th>
<th>EUROPEAN PROJECTION</th>
<th>ISSUE DATE</th>
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DATA SHEET STATUS

<table>
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<tr>
<th>DOCUMENT STATUS(1)</th>
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<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective data sheet</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<td>Preliminary data sheet</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Product data sheet</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
</tbody>
</table>

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**Contact information**

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