

# DATA SHEET

**BF246A; BF246B; BF246C;  
BF247A; BF247B; BF247C**  
N-channel silicon junction  
field-effect transistors

Product specification  
Supersedes data of April 1995  
File under Discrete Semiconductors, SC07

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# N-channel silicon junction field-effect transistors

# BF246A; BF246B; BF246C; BF247A; BF247B; BF247C

### FEATURES

- Interchangeability of drain and source connections
- High  $I_{DSS}$  range
- Frequency up to 450 MHz.

### APPLICATIONS

- VHF and UHF amplifiers
- Mixers
- General purpose switching.

### DESCRIPTION

General purpose N-channel symmetrical silicon junction field-effect transistors in a plastic TO-92 variant package.

#### CAUTION

The device is supplied in an antistatic package. The gate-source input must be protected against static discharge during transport or handling.

### PINNING

PIN	SYMBOL	DESCRIPTION
<b>BF246A; BF246B; BF246C</b>		
1	d	drain
2	g	gate
3	s	source
<b>BF247A; BF247B; BF247C</b>		
1	d	drain
2	s	source
3	g	gate

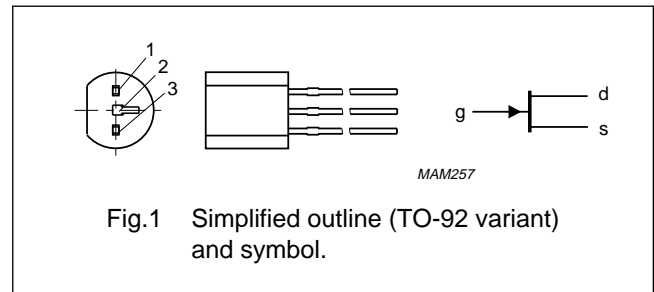


Fig.1 Simplified outline (TO-92 variant) and symbol.

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{DS}$	drain-source voltage		–	–	$\pm 25$	V
$V_{GSoff}$	gate-source cut-off voltage	$I_D = 10 \text{ nA}; V_{DS} = 15 \text{ V}$	–0.6	–	–14.5	V
$I_{DSS}$	drain current	$V_{DS} = 15 \text{ V}; V_{GS} = 0$				
	BF246A; BF247A		30	–	80	mA
	BF246B; BF247B		60	–	140	mA
	BF246C; BF247C		110	–	250	mA
$P_{tot}$	total power dissipation	up to $T_{amb} = 50 \text{ }^\circ\text{C}$	–	–	400	mW
$ y_{fs} $	forward transfer admittance	$I_D = 10 \text{ mA}; V_{DS} = 15 \text{ V}; f = 1 \text{ kHz}$	8	–	–	mS
$C_{rs}$	reverse transfer capacitance	$I_D = 10 \text{ mA}; V_{DS} = 15 \text{ V}; f = 1 \text{ MHz}$	–	3.5	–	pF
$T_j$	operating junction temperature		–	–	150	$^\circ\text{C}$

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### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DS}$	drain-source voltage		–	±25	V
$I_G$	gate current		–	10	mA
$P_{tot}$	total power dissipation	up to $T_{amb} = 50\text{ °C}$	–	400	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	operating junction temperature		–	150	°C

### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air	250	K/W

### STATIC CHARACTERISTICS

$T_{amb} = 25\text{ °C}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)GSS}$	gate-source breakdown voltage	$I_G = -1\ \mu\text{A}$ ; $V_{DS} = 0$	–25	–	–	V
$V_{GSoff}$	gate-source cut-off voltage	$I_D = 10\ \text{nA}$ ; $V_{DS} = 15\ \text{V}$	–0.6	–	–14.5	V
$V_{GS}$	gate-source voltage	$I_D = 200\ \mu\text{A}$ ; $V_{DS} = 15\ \text{V}$				
	BF246A; BF247A		–1.5	–	–4.0	V
	BF246B; BF247B		–3.0	–	–7.0	V
	BF246C; BF247C		–5.5	–	–12.0	V
$I_{DSS}$	drain current	$V_{GS} = 0$ ; $V_{DS} = 15\ \text{V}$ ; note 1				
	BF246A; BF247A		30	–	80	mA
	BF246B; BF247B		60	–	140	mA
	BF246C; BF247C		110	–	250	mA
$I_{GSS}$	gate leakage current	$V_{GS} = -15\ \text{V}$ ; $V_{DS} = 0$	–	–	–5	nA

#### Note

1. Measured under pulse conditions:  $t_p = 300\ \mu\text{s}$ ;  $\delta \leq 0.02$ .

### DYNAMIC CHARACTERISTICS

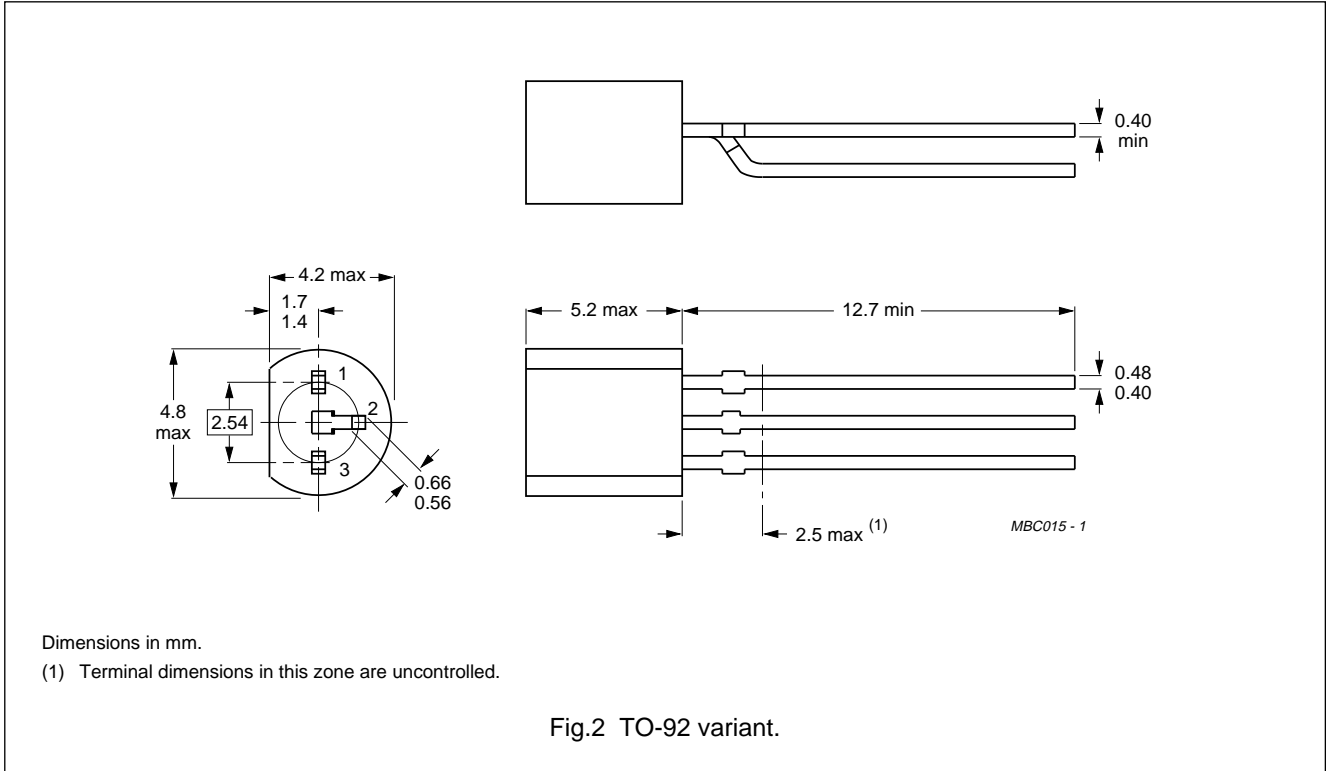
$T_{amb} = 25\text{ °C}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$C_{is}$	input capacitance	$I_D = 10\ \text{mA}$ ; $f = 1\ \text{MHz}$ ; $V_{DS} = 15\ \text{V}$	–	11	–	pF
$C_{rs}$	reverse transfer capacitance	$I_D = 10\ \text{mA}$ ; $f = 1\ \text{MHz}$ ; $V_{DS} = 15\ \text{V}$	–	3.5	–	pF
$C_{os}$	output capacitance	$I_D = 10\ \text{mA}$ ; $f = 1\ \text{MHz}$ ; $V_{DS} = 15\ \text{V}$	–	5	–	pF
$ y_{fs} $	forward transfer admittance	$I_D = 10\ \text{mA}$ ; $f = 1\ \text{kHz}$ ; $V_{DS} = 15\ \text{V}$	8	17	–	mS
$f_{gfs}$	cut-off frequency	$g_{fs} = 0.7$ of its value at 1 kHz; $V_{GS} = 0$	–	450	–	MHz

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PACKAGE OUTLINE



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## DEFINITIONS

<b>Data Sheet Status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

## LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.