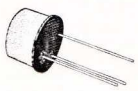
SGS-THOMSON MICROELECTRONICS

BFR18

HIGH-VOLTAGE, HIGH-CURRENT AMPLIFIER

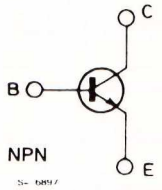
DESCRIPTION

The BFR18 is a silicon planar epitaxial NPN transistor in Jedec TO-18 metal case. This device is designed for amplifier applications over a wide range of voltage and current.



TO-18

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector–emitter Voltage (V_{BE} = 0)	85	V
V_{CEO}	Collector–emitter Voltage (I_B = 0)	55	V
V_{EBO}	Emitter–base Voltage (I_C = 0)	7	V
I_C	Collector Current	1	A
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C	0.5 1.8	W W
T_{stg}, T_j	Storage and Junction Temperature	– 55 to 200	°C

THERMAL DATA

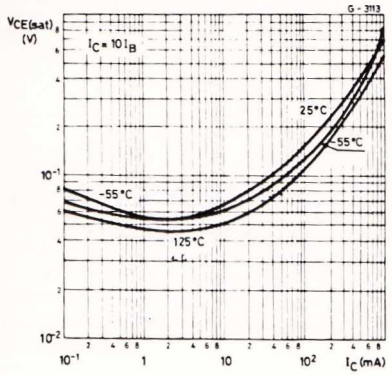
$R_{th\ j-case}$	Thermal Resistance Junction–case	Max	97	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction–ambient	Max	350	°C/W

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

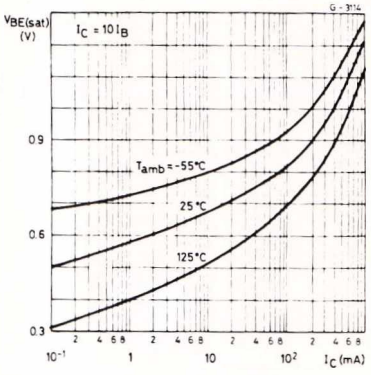
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current (V_{BE} = 0)	V_{CE} = 60 V V_{CE} = 60 V T_{amb} = 150 °C		0.2 0.2	10 10	nA µA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V		0.1	10	nA
$V_{(BR)\ CES}$	Collector–emitter Breakdown Voltage (V_{BE} = 0)	I_C = 100 µA	85			V
$V_{(BR)\ CEO}$*	Collector–emitter Breakdown Voltage (I_B = 0)	I_C = 30 mA	55			V
$V_{(BR)\ EBO}$	Emitter–base Breakdown Voltage (I_C = 0)	I_E = 100 µA	7			V
$V_{CE(sat)}$*	Collector–emitter Saturation Voltage	I_C = 150 mA I_B = 15 mA I_C = 500 mA I_B = 50 mA I_C = 1 A I_B = 0.1 A		0.13 0.3 0.65	0.25 1	V V V
V_{BE}*	Base–emitter Voltage	I_C = 10 mA V_{CE} = 1 V		0.66		V
$V_{BE(sat)}$*	Base–emitter Saturation Voltage	I_C = 150 mA I_B = 15 mA I_C = 500 mA I_B = 50 mA I_C = 1 A I_B = 0.1 A		0.85 1.1 1.35	1 1.6	V V V
h_{FE}*	DC Current Gain	I_C = 100 µA V_{CE} = 1 V I_C = 10 mA V_{CE} = 1 V I_C = 150 mA V_{CE} = 1 V I_C = 500 mA V_{CE} = 1 V I_C = 150 mA V_{CE} = 1 V T_{amb} = – 55 °C	30 70 60 30 15	75 120 90 45	 180 180	
h_{fe}	Small Signal Current Gain	I_C = 1 mA V_{CE} = 5 V f = 1 kHz		120		
f_T	Transition Frequency	I_C = 50 mA V_{CE} = 10 V f = 20 MHz	60	90		MHz
C_{EBO}	Emitter–base Capacitance	I_C = 0 V_{EB} = 0.5 V f = 1 MHz		50	80	pF
C_{CBO}	Collector–base Capacitance	I_E = 0 V_{CB} = 10 V f = 1 MHz		12	20	pF
NF	Noise Figure	I_C = 30 µA V_{CE} = 10 V R_g = 1 kΩ f = 1 kHz		2	8	dB
h_{ie}	Input Impedance	I_C = 1 mA V_{CE} = 5 V f = 1 kHz		2.2		kΩ
h_{re}	Reverse Voltage Ratio	I_C = 1 mA V_{CE} = 5 V f = 1 kHz		2.4×10^{-4}		
h_{oe}	Output Admitance	I_C = 1 mA V_{CE} = 5 V f = 1 kHz		8.5		µS

* Pulsed : pulse duration = 300µs, duty cycle = 1%.

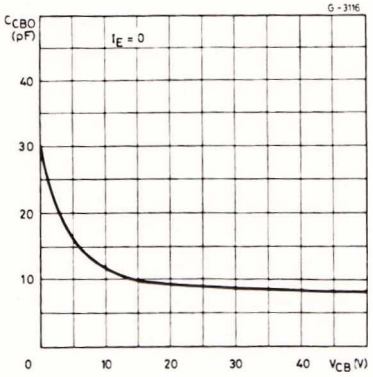
Collector-emitter Saturation Voltage.



Base-emitter Saturation Voltage.



Collector-base Capacitance.



High Frequency Current Gain.