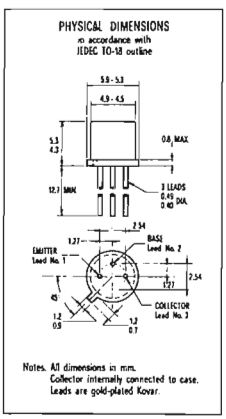
BFW 68

HIGH FREQUENCY AMPLIFIER

NPN DIFFUSED SILICON PLANAR EPITAXIAL TRANSISTOR

GENERAL DESCRIPTION - The BFW68 is an NPN Diffused Silicon Planar Transistor which has been designed for high frequency amplifier and oscillator applications.



ABSOLUTE MAXIMUM RATINGS (Note 1)

Maximum Temperatures

T_{STG}	Storage Temperature Range	-55°C to 200°C
T_J	Operating Junction Temperature	200°C
T_L	Lead Temperature (Soldering, 10 s time limit)	260°C

Maximum Power Dissipations (Notes 2 and 3)

P_D	Total Dissipation at 25°C Case Temperature	1.2 W
	at 25°C Ambient Temperature	0.36 W

Maximum Voltages (25°C free air temperature)

V_{CBO}	Collector to Base Voltage	50 V
V_{CEO}	Collector to Emitter Voltage (Note 4)	40 V
V_{EBO}	Emitter to Base Voltage	5 V

ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS	
h_{FE}	DC Current Gain (Note 5)	35	80			I_C = 100 μA	V_{CE} = 10 V
h_{FE}	DC Current Gain (Note 5)	45	120			I_C = 1 mA	V_{CE} = 10 V
h_{FE}	DC Current Gain (Note 5)	50	120			I_C = 10 mA	V_{CE} = 1 V
h_{FE}	DC Current Gain (Note 5)	40	105			I_C = 50 mA	V_{CE} = 10 V
V_{BEsat}	Base Saturation Voltage (Note 5)	0.75	0.85		V	I_C = 10 mA	I_B = 1 mA
V_{BEsat}	Base Saturation Voltage (Note 5)	0.86	1		V	I_C = 50 mA	I_B = 5 mA
V_{CEsot}	Collector Saturation Voltage (Note 5)	0.09	0.15		V	I_C = 10 mA	I_B = 1 mA
V_{CEsat}	Collector Saturation Voltage (Note 5)	0.2	0.4		V	I_C = 50 mA	I_B = 5 mA
I_{CBO}	Collector Reverse Current	0.1	10		nA	V_{CB} = 30 V	I_E = 0
I_{CBO} (125°C)	Collector Reverse Current	0.1	30		μA	V_{CB} = 30 V	I_E = 0
BV_{CBO}	Collector to Base Breakdown Voltage	50			V	I_C = 10 μA	I_E = 0
BV_{EBO}	Emitter to Base Breakdown Voltage	5			V	I_E = 10 μA	I_C = 0
LV_{CEO}	Collector to Emitter Sustaining Voltage (Notes 4 and 5)	40			V	I_C = 10 mA	I_B = 0

ELECTRICAL CHARACTERISTICS (25°C free oir temperature unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS	
h_{fe}	Small Signal Current Gain	40		200		I_C = 1 mA	V_{CE} = 5 V, f = 1 kHz
h_{ie}	Input Resistance			6	kΩ	I_C = 1 mA	V_{CE} = 5 V, f = 1 kHz
h_{oe}	Output Conductance			75	μmho	I_C = 1 mA	V_{CE} = 5 V, f = 1 kHz
h_{re}	Voltage Feedback Ratio			5	$\times 10^{-4}$	I_C = 1 mA	V_{CE} = 5 V, f = 1 kHz
h_{fe}	High Frequency Current Gain	2.5	4			I_C = 10 mA	V_{CE} = 15 V, f = 100 MHz
C_{TE}	Emitter Transition Capacitance		6	10	pF	I_C = 0	V_{EB} = 0.5 V
C_{obo}	Base-Collector Capacitance		3	4	pF	I_E = 0	V_{CB} = 10 V
NF	Noise Figure		5.8		dB	I_C = 1 mA, f = 100 MHz	V_{CE} = 5 V, R_S = 200 Ω
h_{fe}	Small Signal Current Gain	50		200		I_C = 5 mA	V_{CE} = 5 V, f = 1 kHz
h_{ie}	Input Resistance			2	kΩ	I_C = 5 mA	V_{CE} = 5 V, f = 1 kHz
h_{oe}	Output Conductance			125	μmho	I_C = 5 mA	V_{CE} = 5 V, f = 1 kHz
h_{re}	Voltage Feedback Ratio			5	$\times 10^{-4}$	I_C = 5 mA	V_{CE} = 5 V, f = 1 kHz
t_{on}	Turn On Time		30		ns	I_C = 50 mA	I_{B1} = 5 mA
t_{off}	Turn Off Time		240		ns	I_C = 50 mA	$I_{B1} = I_{B2}$ = 5 mA

NOTES:

(1) These ratings are limiting values obave which the serviceability of any individual semiconductor device may be impoired.

(2) These are steady stote limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

(3) These ratings give a maximum junction temperature of 200°C and junction-to-case thermal resistance of 146°C/W (derating factar af 6.9 mW/°C); junction-to-ambient thermal resistance of 486°C/W (derating factor of 2.06 mW/°C).

(4) This rating refers to a high-current point where collector-to-emitter voltage is lowest. Far more information send for SGS-AR 5.

(5) Measured under pulse conditians: pulse length = 300 μsec; duty cycle = 1%.