SGS-THOMSON MICROELECTRONICS

S G S-THOMSON

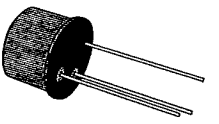
BFW16A BFW17A

CATV-MATV AMPLIFIERS

DESCRIPTION

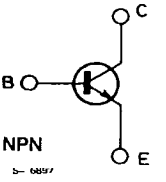
The BFW 16A and BFW 17A are multi-emitter silicon planar epitaxial NPN transistors in Jedec TO-39 metal case, with extremely good intermodulation properties and high power gain. They are primarily intended for final and driver stages in channel-and band-aerial amplifiers with high output power from 40 to 860 MHz.

Another possible application is as the final stage of the wide band vertical amplifier in high speed oscilloscopes.



TO-39

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage ($I_E = 0$)	40	V
V_{CER}	Collector-emitter Voltage ($R_{BE} \leq 50\ \Omega$)	40	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	25	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	3	V
I_C	Collector Current	150	mA
I_{CM}	Collector Peak Current	300	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 125$ °C	0.7 1.5	W W
T_{stg}, T_j	Storage and Junction Temperature	– 65 to 200	°C

THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	50	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	250	°C/W

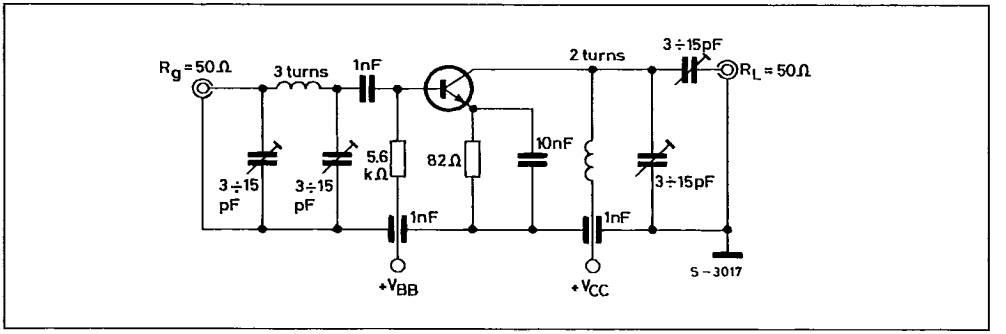
ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CB} = 20 V T_{amb} = 150 °C			20	µA
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage (I_C = 0)	I_E = 100 µA	3			V
V_{CEK}*/**	Collector-emitter Knee Voltage	I_C = 100 mA			0.75	V
h_{FE}*	DC Current Gain	I_C = 50 mA V_{CE} = 5 V I_C = 150 mA V_{CE} = 5 V	25 25			
f_T	Transition Frequency	I_C = 150 mA V_{CE} = 15 V f = 500 MHz for **BFW 16A** for **BFW 17A**		 1.2 1.1		 GHz GHz
C_{CBO}	Collector-base Capacitance	I_E = 0 V_{CB} = 15 V f = 1 MHz			4	pF
C_{re}	Reverse Capacitance	I_C = 10 mA V_{CE} = 15 V f = 1 MHz		1.7		pF
NF	Noise Figure (for **BFW 16A** only)	I_C = 30 mA V_{CE} = 15 V R_g = 75 Ω f = 200 MHz			6	dB
G_{pe}	Power Gain (not neutralized)	I_C = 70 mA V_{CE} = 18 V f = 200 MHz for **BFW 16A** and **BFW 17A** f = 800 MHz For **BFW 16A** only		 16 6.5		 dB dB
P_0	Output Power	I_C = 70 mA V_{CE} = 18 V Channel 9(1) for **BFW 16A** for **BFW 17A** Channel 62(2) For **BFW 16A** only	 130 70	 150 150 90		 mW mW mW

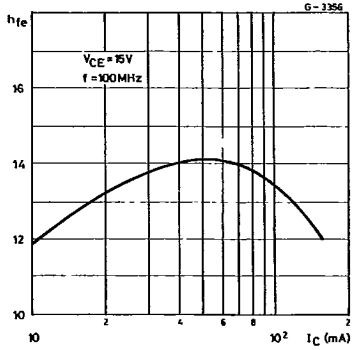
* Pulsed : pulse duration = 300 µs, duty cycle = 1 %.
** I_B = value for which I_C = 110 mA at V_{CE} = 1V.
(1) f_p = 202 MHz, f_q = 205 MHz, $f_{(2q-p)}$ = 208 MHz.
(2) f_p = 798 MHz, f_q = 802 MHz, $f_{(2q-p)}$ = 806 MHz.

TEST CIRCUIT

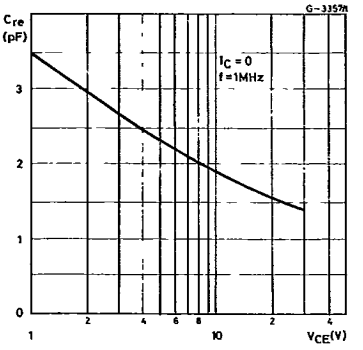
Test Circuit for Power Gain and Output Power Measurements (f = 200 MHz).



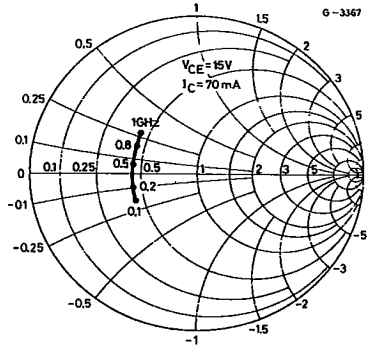
High Frequency Current Gain.



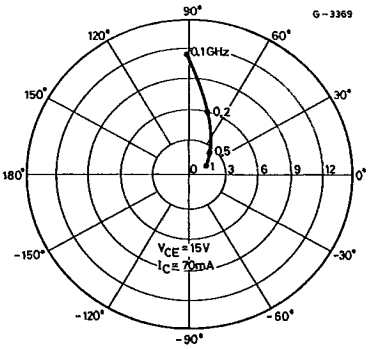
Reverse Capacitance.



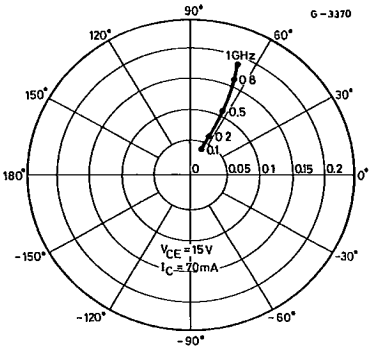
Input Impedance S_{11e} (normalized 50 Ω).



Forward Transfer Coefficient S_{21e}.



Reverse Transfer Coefficient S_{12e}.



Output Impedance S_{22e} (normalized 50 Ω).