

Wireless Bipolar Power Transistor, 30W

1.6 - 1.7 GHz

PH1617-30

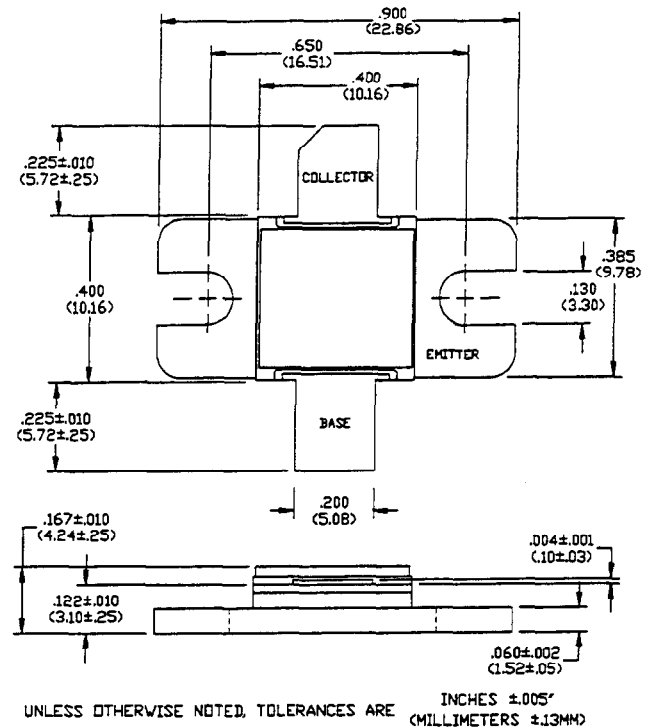
V2.00

Features

- Designed for Linear Amplifier Applications
- -30 dBc Typ 3rd IMD at 30 Watts PEP
- Common Emitter Class AB Operation
- Internal Input Impedance Matching
- Diffused Emitter Ballasting

Absolute Maximum Ratings at 25°C

Parameter	Symbol	Rating	Units
Collector-Base Voltage	V_{CBC}	60	V
Collector-Emitter Voltage	V_{CES}	60	V
Emitter-Base Voltage	V_{EB0}	3.0	V
Collector Current	I_C	10	A
Power Dissipation	P_D	109	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	1.6	°C/W

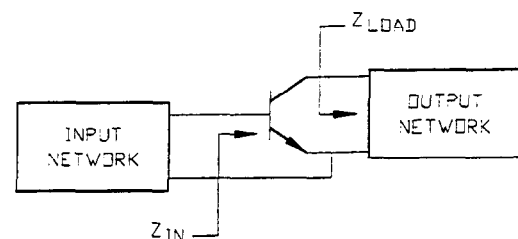


Electrical Characteristics at 25°C

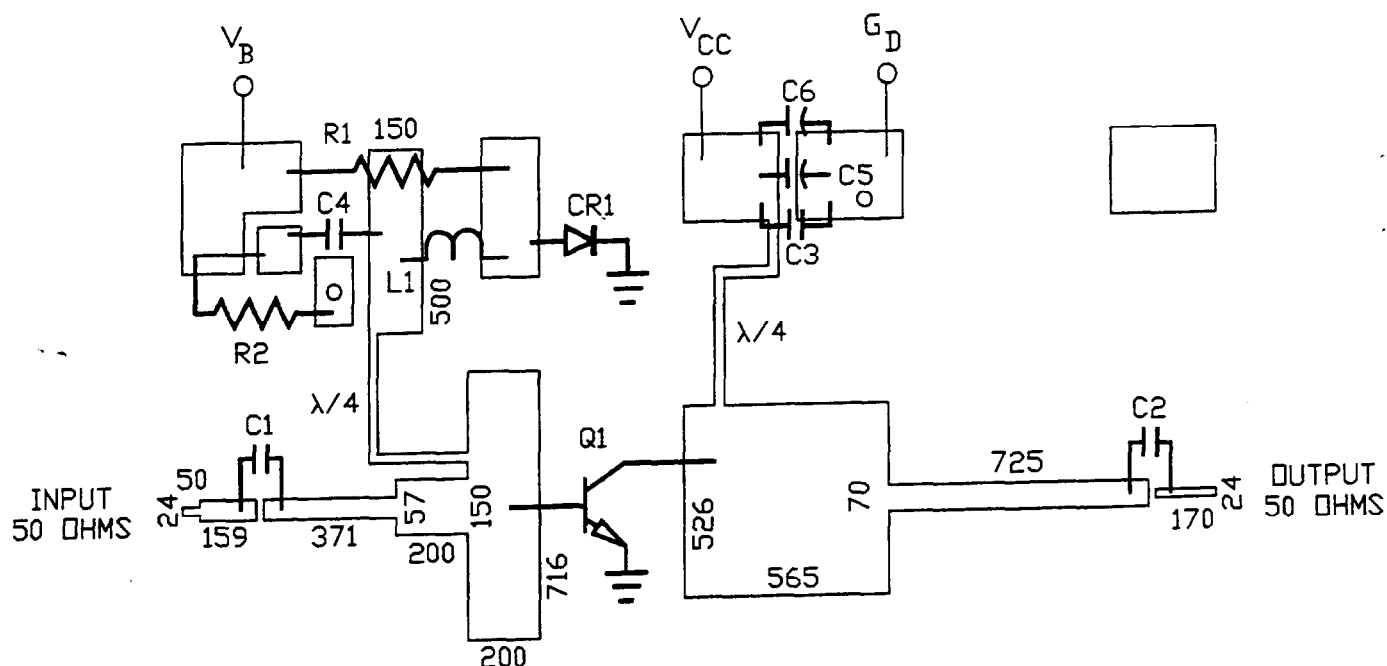
Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C=40$ mA
Collector-Emitter Leakage Current	I_{CES}	-	4.0	mA	$V_{CE}=25$ V
Collector-Emitter Breakdown Voltage	BV_{CEO}	20	-	V	$I_C=40$ mA
Collector-Emitter Breakdown Voltage	BV_{CER}	30	-	V	$I_C=40$ mA, $R_{BE}=220 \Omega$
Emitter-Base Breakdown Voltage	BV_{EB0}	3.0	-	V	$I_B=40$ mA
DC Forward Current Gain	h_{FE}	15	120	-	$V_{CE}=5$ V, $I_C=2$ A
Power Gain	G_p	10	-	dB	$V_{CC}=25$ V, $I_{C0}=200$ mA, $P_{OUT}=30$ W PEP, $F=1.6, 1.65, 1.70$ GHz
Collector Efficiency	η_C	40	-	%	$V_{CC}=25$ V, $I_{C0}=200$ mA, $P_{OUT}=30$ W PEP, $F=1.6, 1.65, 1.70$ GHz
Input Return Loss	RL	10	-	dB	$V_{CC}=25$ V, $I_{C0}=200$ mA, $P_{OUT}=30$ W PEP, $F=1.6, 1.65, 1.70$ GHz
Load Mismatch Tolerance	VSWR-T	-	3.0:1	-	$V_{CC}=25$ V, $I_{C0}=200$ mA, $P_{OUT}=30$ W PEP, $F=1.6, 1.65, 1.70$ GHz
3rd Order IMD	IMD ₃	-	-28	dBc	$V_{CC}=25$ V, $I_{C0}=20$ mA, $P_{OUT}=30$ W PEP, $F=1650$ MHz, $\Delta F=100$ kHz

Typical Optimum Device Impedances

F(GHz)	$Z_{IN}(\Omega)$	$Z_{LOAD}(\Omega)$
1.60	$2.1 + j4.9$	$1.3 - j0.7$
1.65	$3.1 + j3.8$	$1.2 - j0.8$
1.70	$2.1 + j3.5$	$1.2 - j0.9$



RF Test Fixture

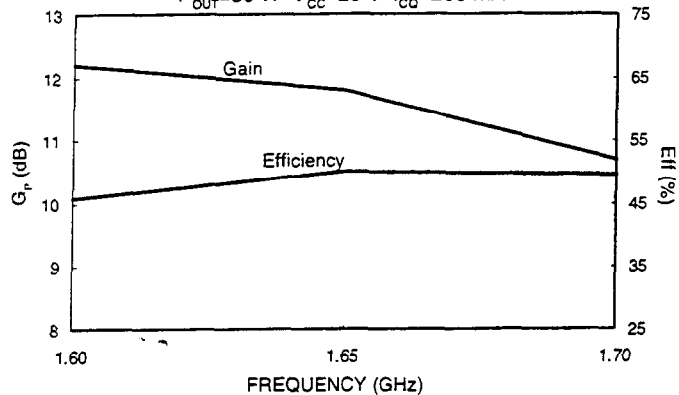


PARTS LIST

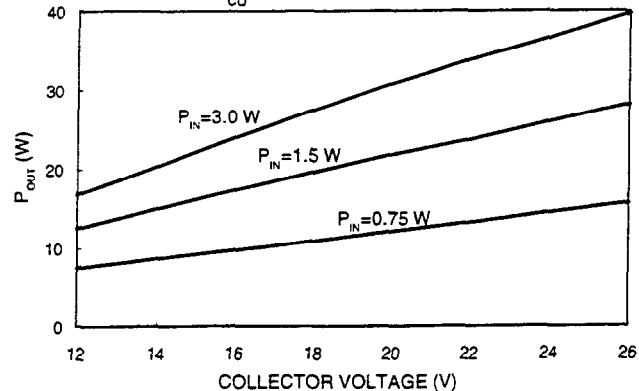
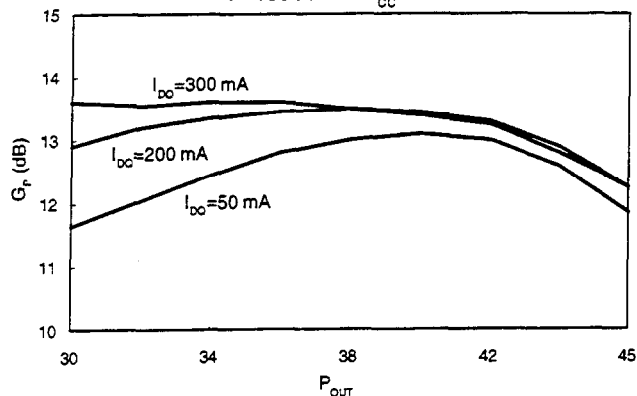
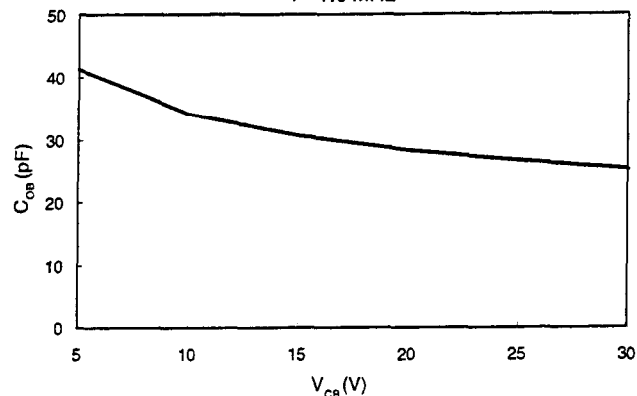
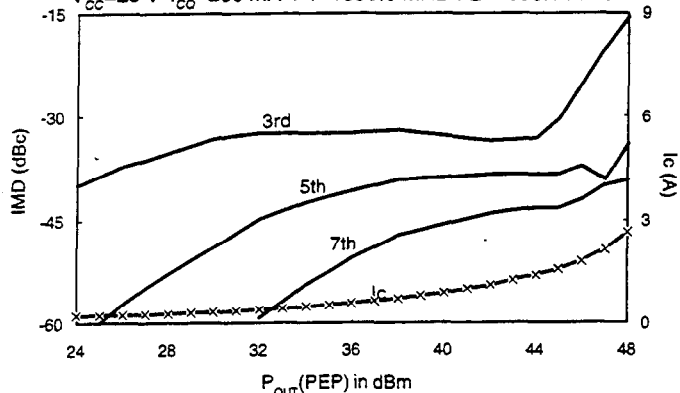
C1 C2 C3	33 pF ATC SIZE A
C4	6.8 μ F 35 VOLTS CHIP
C5	4.7 μ F 35 VOLTS CHIP
C6	50 μ F 50 VOLTS
CR1	1N4245 DIODE
Q1	PH1617-30
R1	5 Ω 1/4 WATT
R2	2.2 Ω 1/8 WATT CHIP
L1	10 T/NO. 24 AWG ON 1/8" DIAMETER
BOARD TYPE: ROGERS 6010.5 25 MILS THICK, $E_R = 10.5$	

Typical Broadband Performance Curves

GAIN-EFFICIENCY vs FREQUENCY

 $P_{OUT}=30\text{ W}$ $V_{CC}=25\text{ V}$ $I_{CO}=200\text{ mA}$ 

OUTPUT POWER vs COLLECTOR VOLTAGE

 $I_{CO}=200\text{ mA}$ $F=1650\text{ MHz}$ GAIN vs P_{OUT}
 $F=1650\text{ MHz}$ $V_{CC}=25\text{ V}$  C_{OB} vs COLLECTOR VOLTAGE $F=1.0\text{ MHz}$ IMD vs P_{OUT} $V_{CC}=25\text{ V}$ $I_{CO}=200\text{ mA}$ $F_1=1650.0\text{ MHz}$ $F_2=1650.1\text{ MHz}$ IMD vs P_{OUT} $V_{CC}=25\text{ V}$ $I_{CO}=50\text{ mA}$ $F_1=1650.0\text{ MHz}$ $F_2=1650.1\text{ MHz}$ 