

Wireless Bipolar Power Transistor, 30W 1.45 - 1.60 GHz

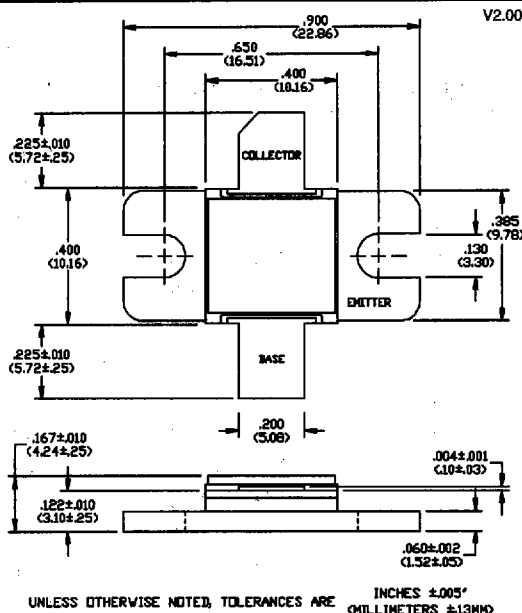
PH1516-30

Features

- Designed for Cellular Base Station Applications
- -30 dBc Typical 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_{CBO}	60	V
Collector-Emitter Voltage	V_{CES}	60	V
Emitter-Base Voltage	V_{EB0}	3.0	V
Collector Current	I_C	10	A
Total Power Dissipation	P_{TOT}	109	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	1.6	°C/W

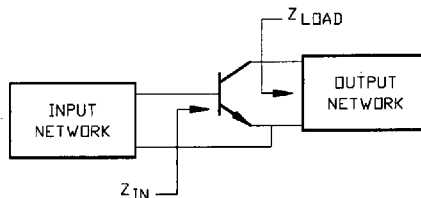


Electrical Characteristics at 25°C

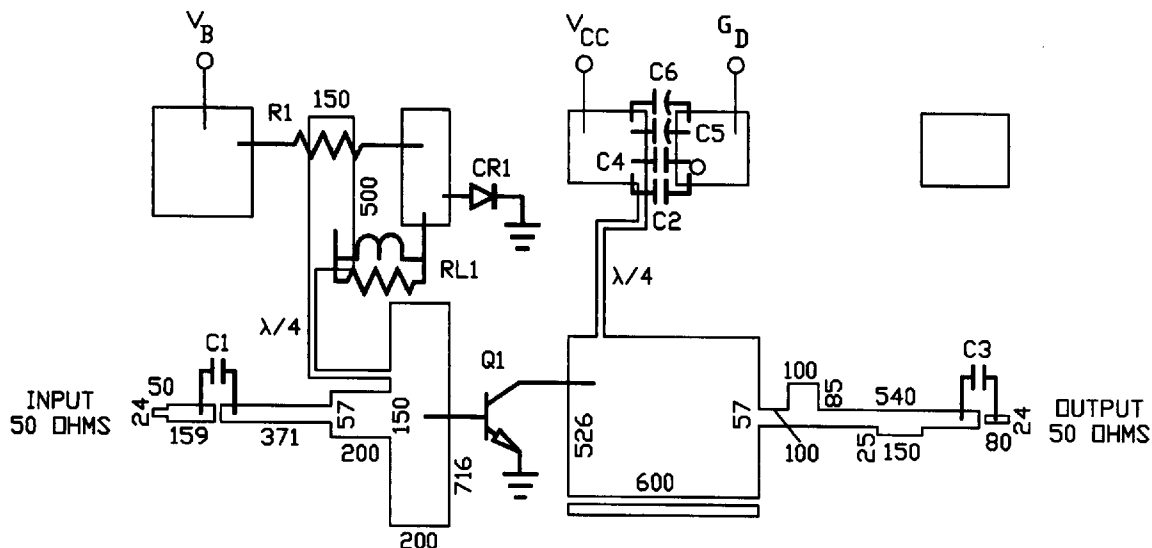
Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C=40$ mA
Collector-Emitter Leakage Current	I_{CES}	-	4.0	mA	$V_{CE}=25$ V
Collector-Emitter Breakdown Voltage	BV_{CEO}	20	-	V	$I_C=40$ mA
Collector-Emitter Breakdown Voltage	BV_{CER}	30	-	V	$I_C=40$ mA, $R_{BE}=220 \Omega$
Emitter-Base Breakdown Voltage	BV_{EB0}	3.0	-	V	$I_E=40$ 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, $I_{CQ}=200$ mA, $P_{OUT}=30$ W, $F=1.50 - 1.60$ GHz
Collector Efficiency	η_C	40	-	%	$V_{CC}=25$ V, $I_{CQ}=200$ mA, $P_{OUT}=30$ W, $F=1.50 - 1.60$ GHz
Input Return Loss	RL	10	-	dB	$V_{CC}=25$ V, $I_{CQ}=200$ mA, $P_{OUT}=30$ W, $F=1.50 - 1.60$ GHz
Load Mismatch Tolerance	VSWR	-	3.0:1	-	$V_{CC}=25$ V, $I_{CQ}=200$ mA, $P_{OUT}=30$ W, $F=1.50 - 1.60$ GHz
3rd Order IMD	IMD ₃	-	-28	dBc	$V_{CC}=25$ V, $I_{CQ}=200$ mA, $P_{OUT}=30$ W PEP $F=1500$ MHz, $\Delta F=100$ kHz

Typical Device Impedances

F(GHz)	$Z_{IN}(\Omega)$	$Z_{LOAD}(\Omega)$
1.45	$1.7 + j4.8$	$1.4 + j0.2$
1.50	$1.9 + j5.0$	$1.4 + j0.1$
1.60	$2.1 + j4.9$	$1.3 - j0.1$



RF Test Fixture



ARTWORK DIMENSIONS IN MILS

PARTS LIST

C1 C2 C3 33 pF ATC SIZE A
 C4 5000 pF
 C5 4.7 uF 63 VOLTS
 C6 50 uF 50 VOLTS
 CR1 1N4245 DIODE
 Q1 PH1516-30
 R1 5 OHMS 1/4 WATT
 RL1 6T/ND. 24 AWG DN 3 OHM 1/4 WATT
 BOARD TYPE: ROGERS 6010.5 25 THICK, $\epsilon_r = 10.5$

Specifications Subject to Change Without Notice.

M/A-COM, Inc.

North America: Tel. (800) 366-2266
Fax (800) 618-8883

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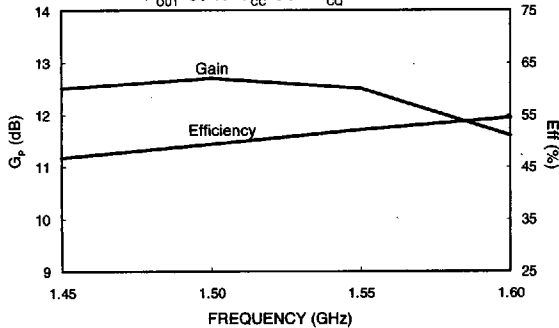
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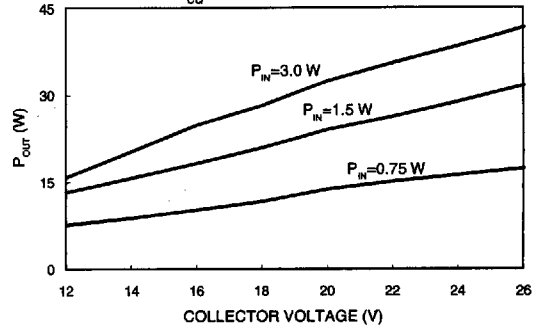
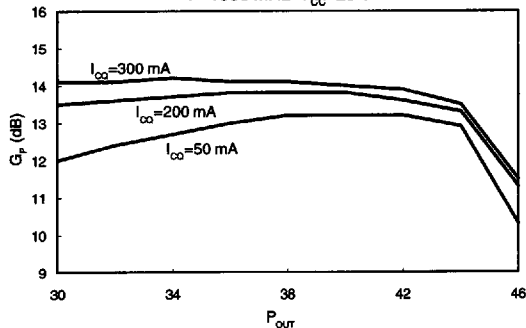
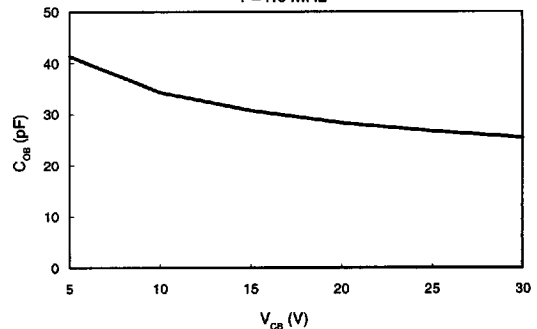
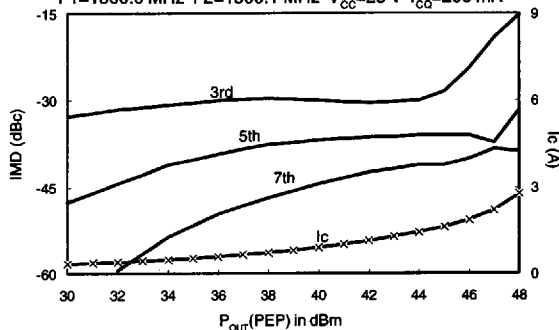
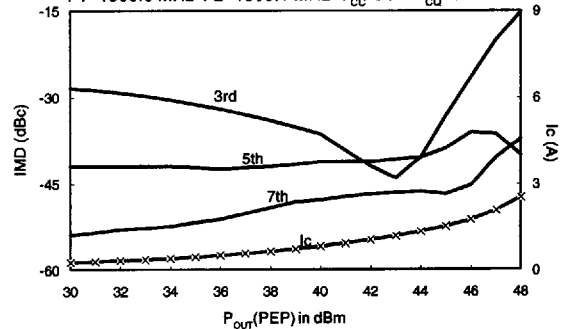
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Typical Broadband Performance Curves

GAIN-EFFICIENCY vs FREQUENCY

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

OUTPUT POWER vs COLLECTOR VOLTAGE

 $I_{CO}=200\text{ mA}$ $F=1500\text{ MHz}$ GAIN vs P_{OUT} $F=1500\text{ MHz}$ $V_{CC}=25\text{ V}$  C_{OB} vs COLLECTOR VOLTAGE $F=1.0\text{ MHz}$ IMD vs P_{OUT} $F1=1500.0\text{ MHz}$ $F2=1500.1\text{ MHz}$ $V_{CC}=25\text{ V}$ $I_{CO}=200\text{ mA}$ IMD vs P_{OUT} $F1=1500.0\text{ MHz}$ $F2=1500.1\text{ MHz}$ $V_{CC}=25\text{ V}$ $I_{CO}=50\text{ mA}$ 

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