MACOM
an AMP company

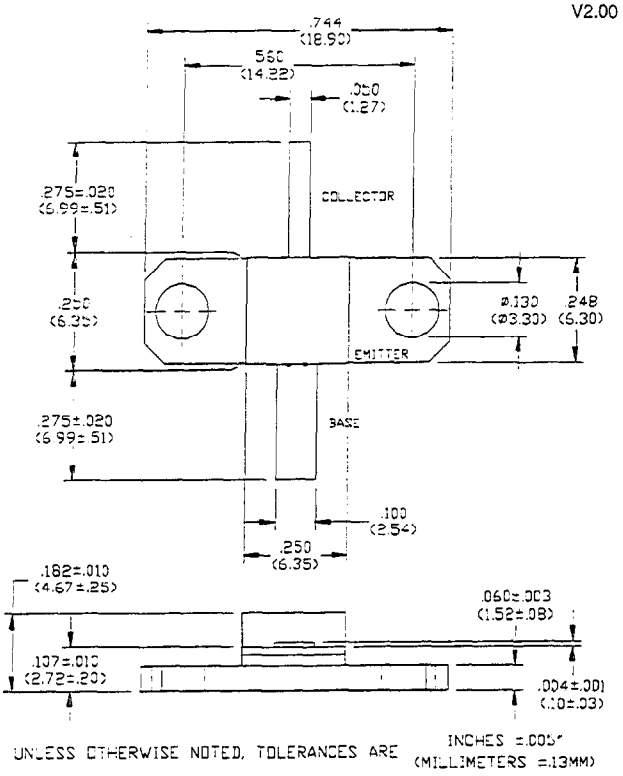
Wireless Bipolar Power Transistor, 10W
1.78 - 1.90 GHz

PH1819-10

V2.00

Features

- Designed for Cellular Base Station Applications
- -30 dBc Typ 3rd IMD at 10 Watts PEP
- Common Emitter Configuration
- Internal Input Impedance Matching
- Diffused Emitter Ballasting



Absolute Maximum Ratings at 25°C

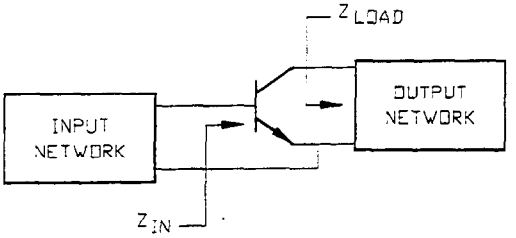
Parameter	Symbol	Rating	Units
Collector-Base Voltage	V_{CBO}	65	V
Collector-Emitter Voltage	V_{CES}	65	V
Emitter-Base Voltage	V_{EBO}	3.0	V
Collector Current	I_C	3.0	A
Power Dissipation	P_D	44	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	4.0	°C/W

Electrical Characteristics at 25°C

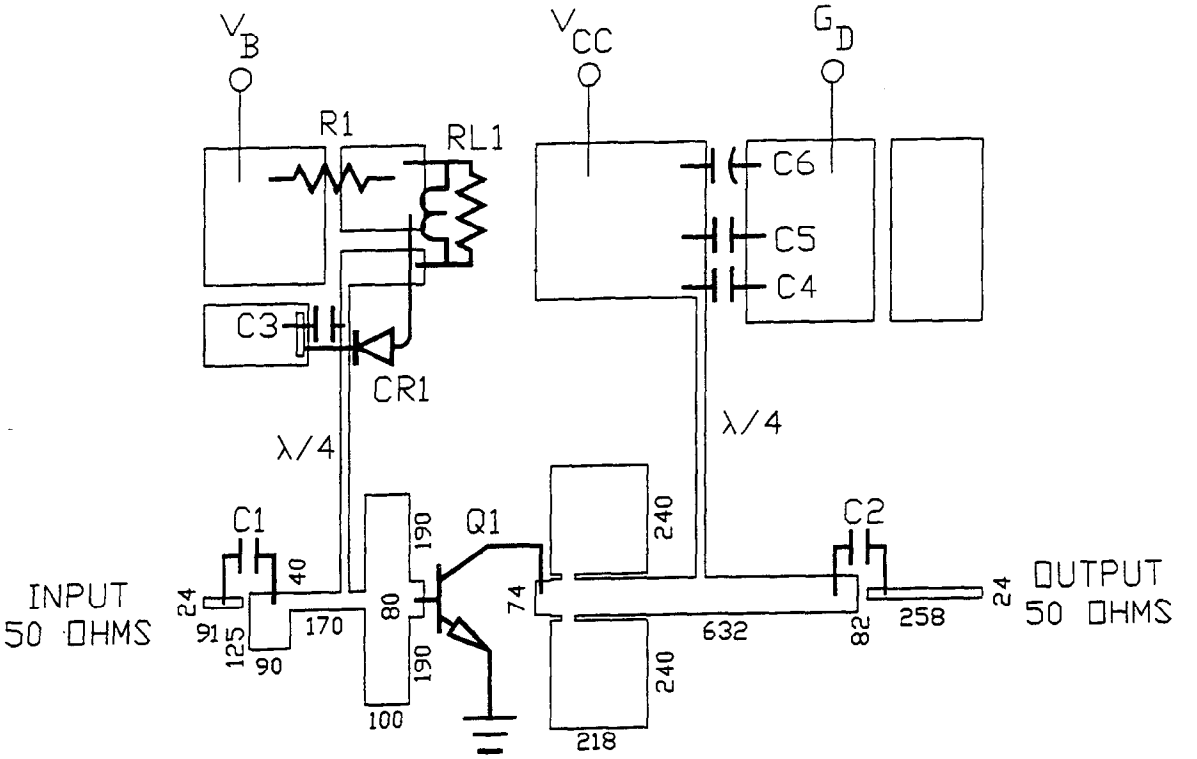
Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	65	-	V	I_C=10 mA
Collector-Emitter Leakage Current	I_{CES}	-	2.0	mA	V_{CE}=25 V
Collector-Emitter Breakdown Voltage	BV_{CEO}	20	-	V	I_C=10 mA
Collector-Emitter Breakdown Voltage	BV_{CER}	30	-	V	I_C=10 mA, R_{BE}=220Ω
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	I_B=10 mA
DC Forward Current Gain	h_{FE}	15	120	-	V_{CE}=5 V, I_C=250 mA
Power Gain	G_P	9.0	-	dB	V_{CC}=25 V, I_{CQ}=100 mA, P_{OUT}=10 W, F=1.78 - 1.90 GHz
Collector Efficiency	η_C	40	-	%	V_{CC}=25 V, I_{CQ}=100 mA, P_{OUT}=10 W, F=1.78 - 1.90 GHz
Input Return Loss	RL	10	-	dB	V_{CC}=25 V, I_{CQ}=100 mA, P_{OUT}=10 W, F=1.78 - 1.90 GHz
Load Mismatch Tolerance	VSWR	-	3.0:1	-	V_{CC}=25 V, I_{CQ}=100 mA, P_{OUT}=10 W, F=1.78 - 1.90 GHz
3rd Order IMD	IMD_3	-	-28	dBc	V_{CC}=25 V, I_{CQ}=100 mA, P_{OUT}=10 W PEP, F=1850 MHz, ΔF=100 kHz

Typical Optimum Device Impedances

F(GHz)	$Z_{IN}(\Omega)$	$Z_{LOAD}(\Omega)$
1.78	4.5 + j7.0	2.5 + j0.2
1.85	5.0 + j7.3	2.5 + j0
1.90	6.0 + j6.1	2.6 + 0.2



RF Test Fixture



ARTWORK DIMENSIONS IN MILS

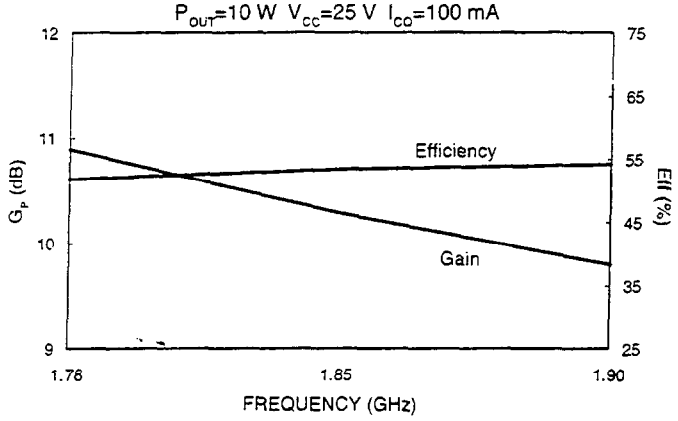
PARTS LIST

C1 C2 C3 C4	33 pF ATC SIZE A
C5	5000 pF
C6	50 uF 50 VOLTS
CR1	1N4245 DIODE
Q1	PH1819-10
R1	5.1 OHMS 1/4 WATT
RL1	6T/NO. 24 AWG ON 3 OHM 1/4 WATT
BOARD TYPE:	ROGERS 6010.5 .025" THICK, E_R = 10.5

Typical Broadband Performance Curves

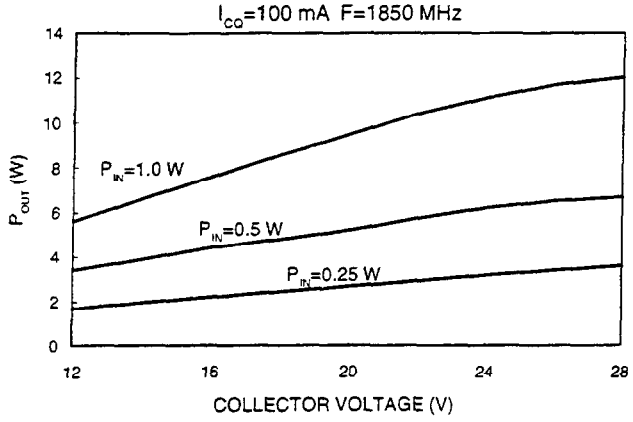
GAIN-EFFICIENCY vs FREQUENCY

P_{OUT}=10 W V_{CC}=25 V I_{CQ}=100 mA



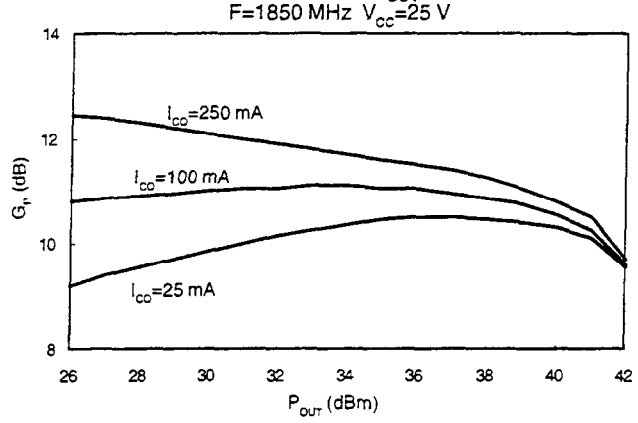
OUTPUT POWER vs COLLECTOR VOLTAGE

I_{CQ}=100 mA F=1850 MHz



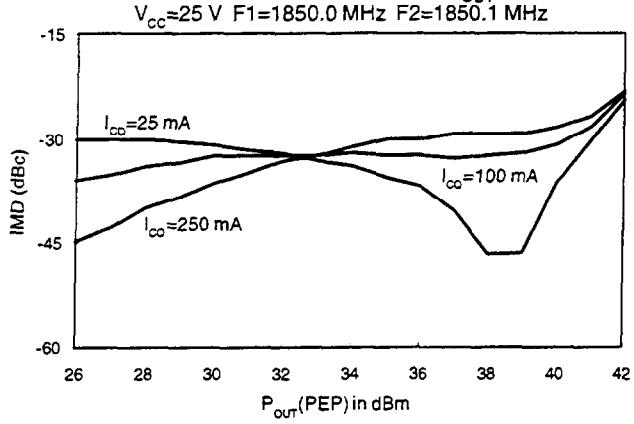
GAIN vs P_{OUT}

F=1850 MHz V_{CC}=25 V



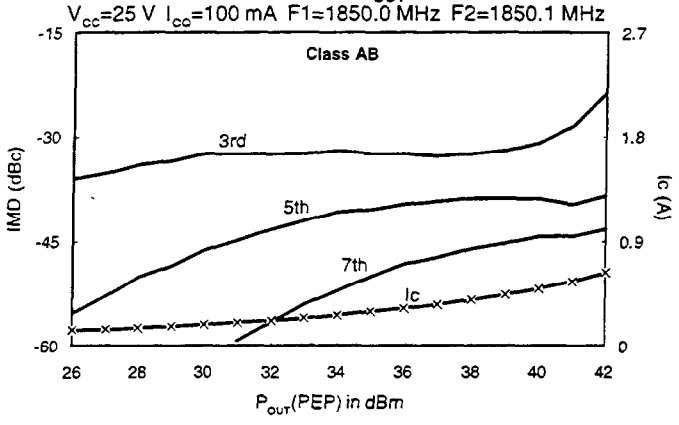
3RD ORDER IMD vs P_{OUT}

V_{CC}=25 V F1=1850.0 MHz F2=1850.1 MHz



IMD vs P_{OUT}

V_{CC}=25 V I_{CQ}=100 mA F1=1850.0 MHz F2=1850.1 MHz



IMD vs P_{OUT}

V_{CC}=25 V I_{CQ}=25 mA F1=1850.0 MHz F2=1850.1 MHz