

CW Power Transistor, 16W

30 - 400 MHz

PH0104-16

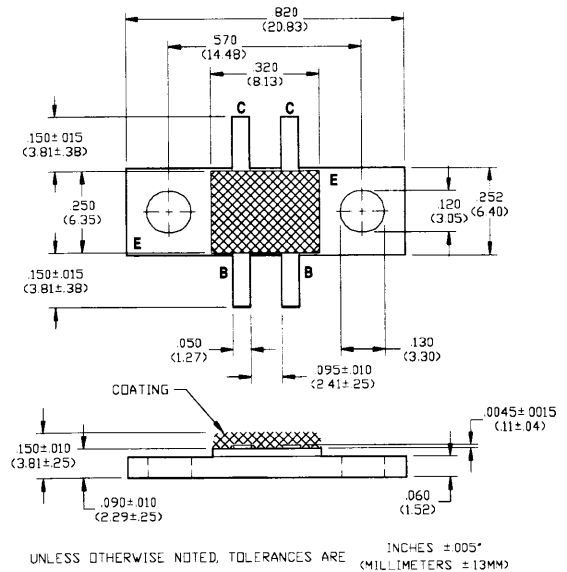
V2.00

Features

- NPN Silicon Power Transistor
- Common Emitter Configuration
- Class AB Broadband Operation
- 16 Watt PEP Output
- Diffused Emitter Ballasting Resistors
- Gold Metallization System
- Proven in Thousands of ARC-182 Airborne Radios

Absolute Maximum Ratings at 25°C

Parameter	Symbol	Rating	Units
Collector-Emitter Voltage	V_{CES}	65	V
Emitter-Base Voltage	V_{EBO}	4.0	V
Collector Current (Peak)	I_C	2	A
Power Dissipation	P_D	83	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-40 to +125	°C
Thermal Resistance	θ_{JC}	2.1	°C/W



Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	65	-	V	$I_C=5\text{ mA}$, $V_{BE}=0.0\text{ V}$
Base-Emitter Breakdown Voltage	BV_{EBO}	4.0	-	V	$I_B=2.5\text{ mA}$, $I_C=0.0\text{ A}$
Collector-Emitter Leakage Current	I_{CES}	-	1	mA	$V_{CE}=30\text{ V}$
DC Forward Current Gain	h_{FE}	20	80	-	$V_{CE}=5.0\text{ V}$, $I_C=500\text{ mA}$
Input Power	P_{IN}	-	2.0	W	$V_{CC}=27\text{ V}$, $I_{CO}=10\text{ mA}$, $P_{OUT}=16\text{ W}$, $F=400\text{ MHz}$
Power Gain	G_p	9.0	-	dB	$V_{CC}=27\text{ V}$, $I_{CO}=10\text{ mA}$, $P_{OUT}=16\text{ W}$, $F=400\text{ MHz}$
Collector Efficiency	η_C	40	-	%	$V_{CC}=27\text{ V}$, $I_{CO}=10\text{ mA}$, $P_{OUT}=16\text{ W}$, $F=400\text{ MHz}$
Input Return Loss	RL	9	-	dB	$V_{CC}=27\text{ V}$, $I_{CO}=10\text{ mA}$, $P_{OUT}=16\text{ W}$, $F=400\text{ MHz}$
Load Mismatch Tolerance	VSWR-T	-	3:1	-	$V_{CC}=27\text{ V}$, $I_{CO}=10\text{ mA}$, $P_{OUT}=16\text{ W}$, $F=400\text{ MHz}$

Specifications Subject to Change Without Notice.

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9-85

CW Power Transistor, 85W

30 - 400 MHz

PH0104-85

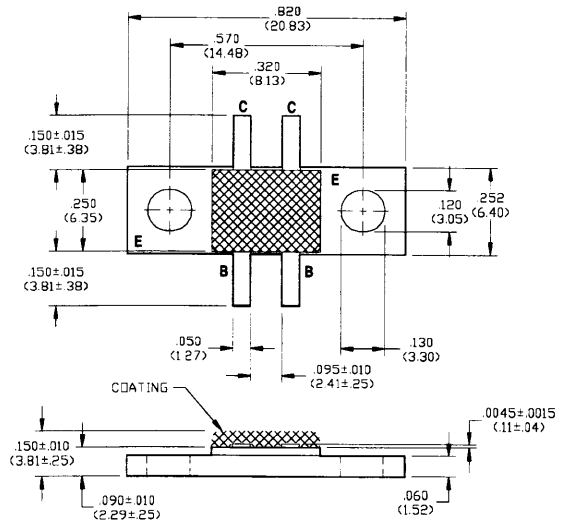
V2.00

Features

- NPN Silicon Power Transistor
- Common Emitter Configuration
- Class AB Broadband Operation
- 85 Watt PEP Output
- Diffused Emitter Ballasting Resistors
- Gold Metallization System
- Proven in Thousands of ARC-182 Airborne Radios

Absolute Maximum Ratings at 25°C

Parameter	Symbol	Rating	Units
Collector-Emitter Voltage	V_{CES}	65	V
Emitter-Base Voltage	V_{EBO}	4.0	V
Collector Current (Peak)	I_C	10	A
Power Dissipation	P_D	194	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-40 to +125	°C
Thermal Resistance	θ_{JC}	0.9	°C/W



UNLESS OTHERWISE NOTED, TOLERANCES ARE INCHES = ±0.005" (MILLIMETERS = ±0.13MM)

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	65	-	V	$I_C=10\text{ mA}, V_{BE}=0.0\text{ V}$
Base-Emitter Breakdown Voltage	BV_{EBO}	4.0	-	V	$I_B=10\text{ mA}, I_C=0.0\text{ A}$
Collector-Emitter Leakage Current	I_{CES}	-	4	mA	$V_{CE}=30\text{ V}$
DC Forward Current Gain	h_{FE}	20	80	-	$V_{CE}=5.0\text{ V}, I_C=2.0\text{ A}$
Input Power	P_{IN}	-	16	W	$V_{CC}=27\text{ V}, I_{CO}=50\text{ mA}, P_{OUT}=85\text{ W}, F=400\text{ MHz}$
Power Gain	G_P	7.3	-	dB	$V_{CC}=27\text{ V}, I_{CO}=50\text{ mA}, P_{OUT}=85\text{ W}, F=400\text{ MHz}$
Collector Efficiency	η_C	45	-	%	$V_{CC}=27\text{ V}, I_{CO}=50\text{ mA}, P_{OUT}=85\text{ W}, F=400\text{ MHz}$
Input Return Loss	RL	9	-	dB	$V_{CC}=27\text{ V}, I_{CO}=50\text{ mA}, P_{OUT}=85\text{ W}, F=400\text{ MHz}$
Load Mismatch Tolerance	VSWR-T	-	3:1	-	$V_{CC}=27\text{ V}, I_{CO}=50\text{ mA}, P_{OUT}=85\text{ W}, F=400\text{ MHz}$

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Wireless Bipolar Power Transistor, 4W 850 - 960 MHz

PH0810-4

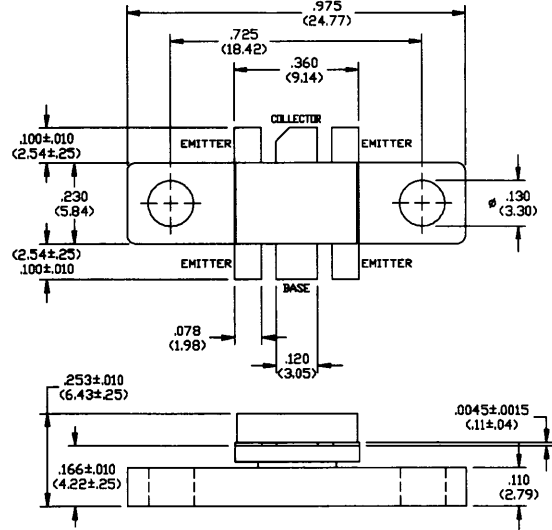
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Features

- NPN Silicon Microwave Power Transistor
- Designed for Linear Amplifier Applications
- Class AB: -30dBc Typ 3rd IMD at 4 Watts PEP
- Common Emitter Configuration
- Internal Input Impedance Matching
- Diffused Emitter Ballasting Resistors
- Gold Metallization System

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_{EBO}	3.0	V
Collector Current	I_C	0.7	A
Total Power Dissipation	P_{TOT}	19.5	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	7.5	°C/W



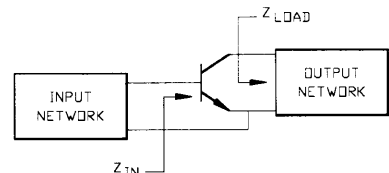
UNLESS OTHERWISE NOTED, TOLERANCES ARE INCHES ±.005" MILLIMETERS ±.13MM

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C=5$ mA
Collector-Emitter Leakage Current	I_{CES}	-	2.0	mA	$V_{CE}=24.0$ V
Collector-Emitter Breakdown Voltage	BV_{CEO}	22	-	V	$I_C=5$ mA
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	$I_E=2.5$ mA
DC Forward Current Gain	h_{FE}	15	120	-	$V_{CE}=5.0$ V, $I_C=0.1$ A
Power Gain	G_P	14	-	dB	$V_{CC}=24$ V, $I_{CO}=30$ mA, $P_{OUT}=4$ W, $F=900$ MHz
Collector Efficiency	η_C	45	-	%	$V_{CC}=24$ V, $I_{CO}=30$ mA, $P_{OUT}=4$ W, $F=900$ MHz
Input Return Loss	RL	10	-	dB	$V_{CC}=24$ V, $I_{CO}=30$ mA, $P_{OUT}=4$ W, $F=900$ MHz
Load Mismatch Tolerance	VSWR-T	-	10:1	-	$V_{CC}=24$ V, $I_{CO}=30$ mA, $P_{OUT}=4$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
3rd Order IMD	IMD ₃	-	-30	dBc	$V_{CC}=24$ V, $I_{CO}=30$ mA, $P_{OUT}=4$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz

Typical Optimum Device Impedances

F(MHz)	$Z_{IN}(\Omega)$	$Z_{LOAD}(\Omega)$
850	$3.0 + j3.5$	$10.6 + j15.9$
900	$4.0 + j2.4$	$11.2 + j16.9$
960	$3.0 + j1.0$	$11.3 + j17.5$



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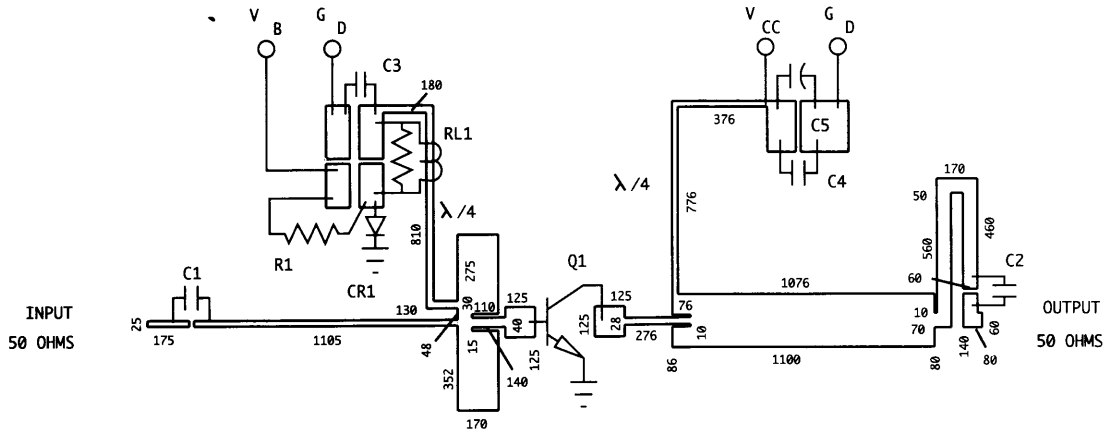
Typical S-Parameters

$V_{CC}=25\text{ V}, I_{CC}=200\text{ mA}$								
f(MHz)	S11		S21		S12		S22	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
50	0.771	-153.4	21.6	122.4	0.265	-102.1	0.016	20.3
150	0.868	-172.4	8.3	91.5	0.243	-134.1	0.016	11.2
250	0.871	-177.8	5.1	78.2	0.277	-135.4	0.017	2.7
350	0.868	179.3	3.9	67.2	0.302	-130.6	0.016	7.4
450	0.858	177.6	3.2	55.5	0.368	-124.1	0.018	-8.0
550	0.846	176.6	2.8	42.0	0.491	-118.9	0.019	-16.8
650	0.834	176.4	2.6	24.7	0.672	-118.9	0.020	-34.1
750	0.828	177.5	2.3	2.2	0.865	-126.1	0.016	-54.9
850	0.849	178.4	1.8	-23.8	1.0	-141.2	0.010	-89.4
950	0.882	177.6	1.2	-47.7	1.0	-153.6	0.009	-161.3
1050	0.905	175.6	0.817	-65.9	1.0	-165.1	0.009	132.8
1150	0.915	173.6	0.505	-78.5	0.869	-170.1	0.015	108.4
1250	0.918	171.8	0.306	-87.6	0.834	-174.6	0.018	93.5
1350	0.918	170.1	0.176	-92.9	0.79	-175.5	0.022	89.5
1450	0.917	168.1	0.087	-94.3	0.767	-175.2	0.027	83.6
1550	0.912	165.7	0.036	-76.9	0.793	-175.4	0.032	80.5

$V_{CC}=25\text{ V}, I_{CC}=300\text{ mA}$								
f(MHz)	S11		S21		S12		S22	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
50	0.777	-153.3	22.1	121.7	0.294	-105.2	0.014	17.9
150	0.868	-172.6	8.4	91.2	0.253	-142.9	0.017	18.9
250	0.870	-177.9	5.2	78.2	0.258	-137.9	0.015	7.8
350	0.865	179.2	3.9	67.2	0.309	-134.1	0.018	-1.0
450	0.856	177.4	3.2	55.4	0.362	-129.4	0.017	-3.4
550	0.844	176.5	2.9	42.1	0.485	-119.3	0.020	-14.3
650	0.829	176.4	2.6	24.7	0.680	-120.2	0.018	-33.4
750	0.824	177.5	2.3	1.7	0.887	-126.8	0.016	-49.4
850	0.847	178.5	1.9	-24.9	1.0	-141.2	0.009	-93.9
950	0.880	177.7	1.3	-48.8	1.0	-155.3	0.006	-165.9
1050	0.904	175.7	0.820	-66.6	0.968	-164.8	0.012	141.8
1150	0.914	173.6	0.508	-79.1	0.864	-170.6	0.015	115.1
1250	0.919	171.8	0.304	-87.4	0.828	-174.9	0.019	96.5
1350	0.917	170.0	0.178	-92.4	0.805	-176.5	0.022	86.2
1450	0.916	168.0	0.090	-93.3	0.769	-174.3	0.025	83.6
1550	0.912	165.7	0.032	-71.5	0.782	-177.6	0.032	78.5

Specifications Subject to Change Without Notice.

RF Test Fixture



ARTWORK DIMENSIONS IN MILS

PARTS LIST

C1 C2 C3	100 pF ATC SIZE A
C4	5000 pF ATC SIZE B
C5	50 uF 50 VOLTS
CR1	DIODE CATHODE MECHANICALLY ATTACHED TO FLANGE (HARRIS 1N4245)
Q1	PH0810-4
R1	5 OHMS 1/4 WATT
RL1	10T/NO. 22 AWG ON 3.1 OHM 1/4 WATT
BOARD TYPE	ROGERS 6010.5 .025" THICK, $\epsilon_R = 10.5$

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Wireless Bipolar Power Transistor, 15W

850 - 960 MHz

PH0810-15

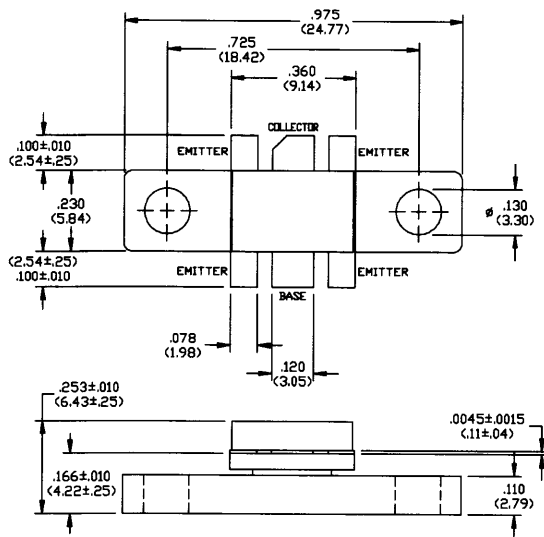
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Features

- Designed for Linear Amplifier Applications
- Class AB: -30dBc Typ 3rd IMD at 15 Watts PEP
- Common Emitter Configuration
- Internal Input Impedance Matching
- Diffused Emitter Ballasting Resistors

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_{EBO}	3.0	V
Collector Current	I_C	1.8	A
Total Power Dissipation	P_{TOT}	43	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	3.5	°C/W



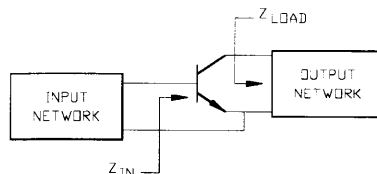
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Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C=15$ mA
Collector-Emitter Leakage Current	I_{CES}	-	2.0	mA	$V_{CE}=24.0$ V
Collector-Emitter Breakdown Voltage	BV_{CEO}	24	-	V	$I_C=40$ mA
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	$I_B=2.5$ mA
DC Forward Current Gain	h_{FE}	15	120	-	$V_{CE}=5.0$ V, $I_C=0.5$ A
Power Gain	G_P	12	-	dB	$V_{CC}=24$ V, $I_{CO}=100$ mA, $P_{OUT}=15$ W, $F=900$ MHz
Collector Efficiency	η_C	50	-	%	$V_{CC}=24$ V, $I_{CO}=100$ mA, $P_{OUT}=15$ W, $F=900$ MHz
Input Return Loss	RL	10	-	dB	$V_{CC}=24$ V, $I_{CO}=100$ mA, $P_{OUT}=15$ W, $F=900$ MHz
Load Mismatch Tolerance	VSWR-T	-	10:1	-	$V_{CC}=24$ V, $I_{CO}=100$ mA, $P_{OUT}=15$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
3rd Order IMD	IMD ₃	-	-30	dBc	$V_{CC}=24$ V, $I_{CO}=100$ mA, $P_{OUT}=15$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz

Typical Optimum Device Impedances

F(MHz)	$Z_{in}(\Omega)$	$Z_{LOAD}(\Omega)$
850	$2.5 + j3.6$	$4.3 + j2.6$
900	$2.9 + j2.4$	$4.4 + j3.4$
960	$1.5 + j2.0$	$4.3 + j3.9$



Specifications Subject to Change Without Notice.

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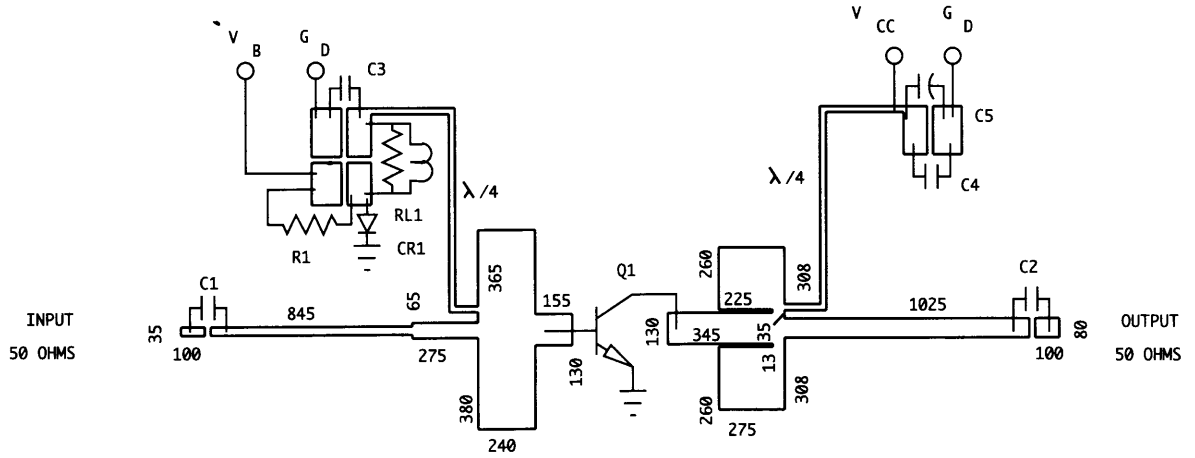
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RF Test Fixture



ARTWORK DIMENSIONS IN MILS

PARTS LIST

C1 C2 C3	100 pF ATC SIZE A
C4	5000 pF ATC SIZE B
C5	50 uF 50 VOLTS
CR1	DIODE CATHODE MECHANICALLY ATTACHED TO FLANGE (HARRIS 1N4245)
Q1	PH0810-15
R1	5 OHMS 1/4 WATT
RL1	10T/NO. 22 AWG ON 3.1 OHM 1/4 WATT
BOARD TYPE	ROGERS 6010.5 .025" THICK, $\epsilon_R = 10.5$

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Wireless Bipolar Power Transistor, 35W

850 - 960 MHz

PH0810-35

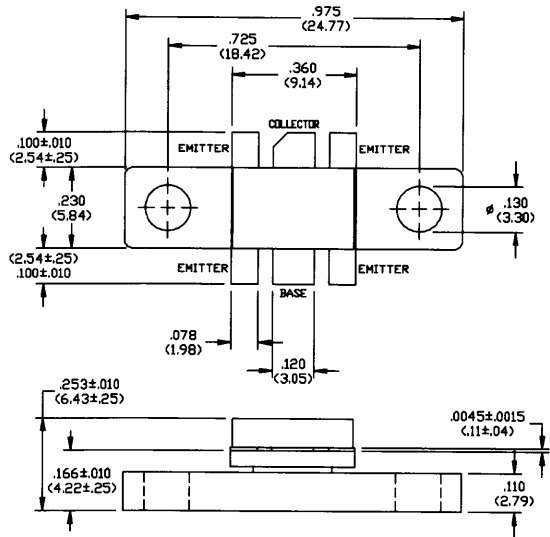
V2.00

Features

- Designed for Linear Amplifier Applications
- Class AB: -30dBc Typ 3rd IMD at 15 Watts PEP
- Class A: +53dBm Typ 3rd Order Intercept Point
- 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}	60	V
Collector-Emitter Voltage	V_{CES}	60	V
Emitter-Base Voltage	V_{EBO}	3.0	V
Collector Current	I_C	1.0	A
Total Power Dissipation	P_{TOT}	116	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	1.5	°C/W



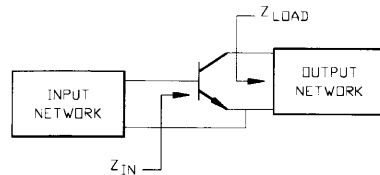
Electrical Characteristics at 25°C

UNLESS OTHERWISE NOTED, TOLERANCES ARE INCHES ±.005" (MILLIMETERS ±.13MM)

Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C=20$ mA
Collector-Emitter Leakage Current	I_{CES}	-	2.0	mA	$V_{CE}=24.0$ V
Collector-Emitter Breakdown Voltage	BV_{CEO}	24	-	V	$I_C=40$ mA
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	$I_B=20$ mA
DC Forward Current Gain	h_{FE}	15	120	-	$V_{CE}=5.0$ V, $I_C=1.0$ A
Power Gain	G_P	10	-	dB	$V_{CC}=24$ V, $I_{CO}=200$ mA, $P_{OUT}=35$ W, $F=900$ MHz
Collector Efficiency	η_C	55	-	%	$V_{CC}=24$ V, $I_{CO}=200$ mA, $P_{OUT}=35$ W, $F=900$ MHz
Input Return Loss	RL	10	-	dB	$V_{CC}=24$ V, $I_{CO}=200$ mA, $P_{OUT}=35$ W, $F=900$ MHz
Load Mismatch Tolerance	VSWR-T	-	3.0:1	-	$V_{CC}=24$ V, $I_{CO}=200$ mA, $P_{OUT}=35$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
3rd Order IMD	IMD_3	-	-30	dBc	$V_{CC}=24$ V, $I_{CO}=200$ mA, $P_{OUT}=35$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz

Typical Optimum Device Impedances

F(MHz)	$Z_{in}(\Omega)$	$Z_{LOAD}(\Omega)$
800	$1.0 + j3.7$	$2.1 + j0.9$
850	$1.3 + j4.0$	$1.6 + j0.7$
900	$1.9 + j4.3$	$1.6 + j0.4$
960	$3.0 + j2.7$	$1.7 + j0.1$



Specifications Subject to Change Without Notice.

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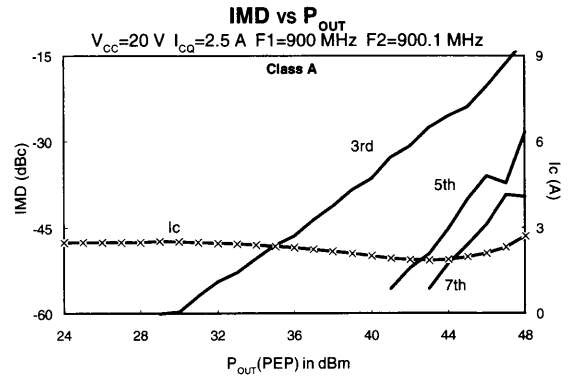
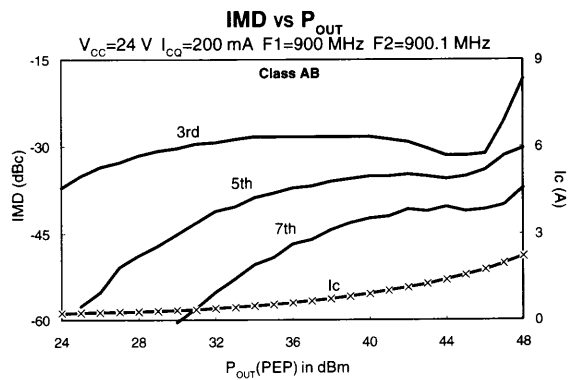
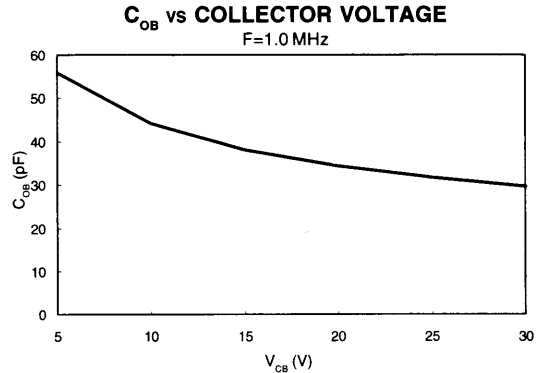
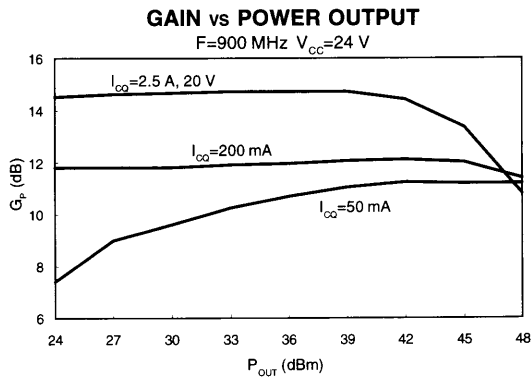
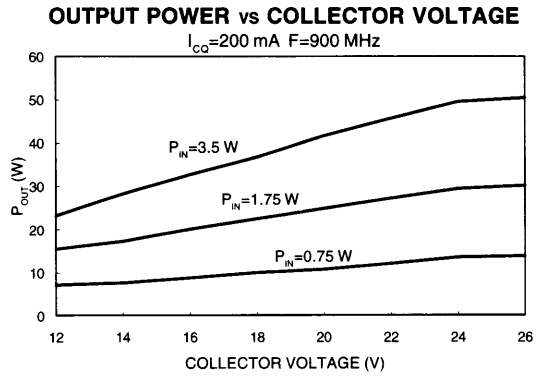
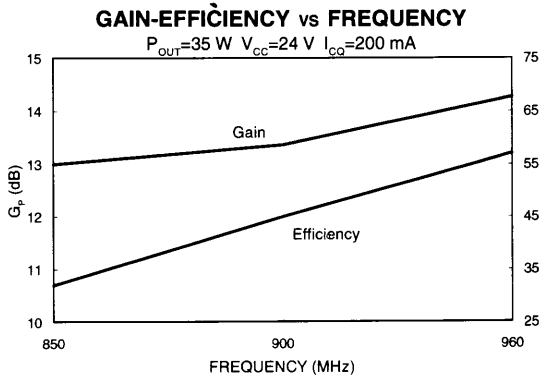
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Typical Broadband Performance Curves



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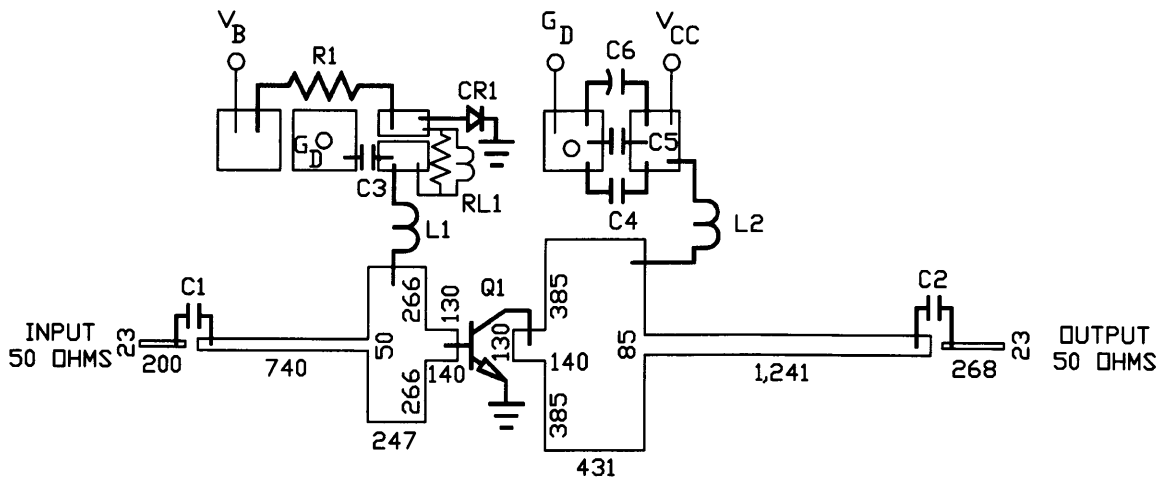
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RF Test Fixture



ARTWORK DIMENSIONS IN MILS

PARTS LIST

C1	C2	C3	C4	100 pF	ATC	SIZE B
C5				5000 pF		
C6				50 uF	50 VOLTS	
CR1				1N4245	DIODE	
L1	L2			10T/ND.	20 AWG ON 1/8" DIAMETER	
Q1				PH0810-35		
R1				5 OHMS	1/4 WATT	
RL1				10T/ND.	22 AWG ON 3.1 OHM 1/4 WATT	
BOARD TYPE				ROGERS 6010.5	.025" THICK, $E_R = 10.5$	

Specifications Subject to Change Without Notice.

9-94

M/A-COM, Inc.

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

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Wireless Bipolar Power Transistor, 60W 850 - 900 MHz

PH0810-60A

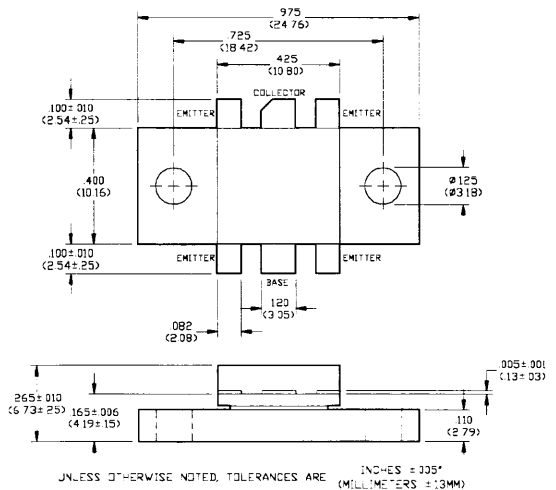
V2.00

Features

- Designed for Linear Amplifier Applications
- Class AB: -30 dBc Typ 3rd IMD at 60 Watts PEP
- Common Emitter Configuration
- Internal Input and Output 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_{EBO}	3.0	V
Collector Current	I_C	10	A
Total Power Dissipation	P_{TOT}	100	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	1.7	°C/W

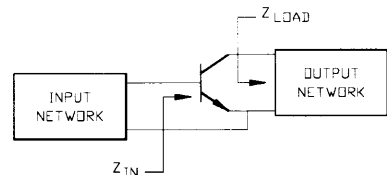


Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C=50$ mA
Collector-Emitter Leakage Current	I_{CES}	-	2.0	mA	$V_{CE}=26.0$ V
Collector-Emitter Breakdown Voltage	BV_{CEO}	24	-	V	$I_C=80$ mA
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	$I_B=50$ mA
DC Forward Current Gain	h_{FE}	15	120	-	$V_{CE}=5.0$ V, $I_C=1.0$ A
Power Gain	G_P	10	-	dB	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=60$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
Collector Efficiency	η_C	35	-	%	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=60$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
Input Return Loss	RL	10	-	dB	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=60$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
Load Mismatch Tolerance	VSWR-T	-	3:1	-	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=60$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
3rd Order IMD	IMD ₃	-	-28	dBc	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=60$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz

Typical Optimum Device Impedances

F(MHz)	$Z_{IN}(\Omega)$	$Z_{LOAD}(\Omega)$
850	$3.0 + j3.0$	$2.5 + j4.0$
875	$4.0 + j2.8$	$2.3 + j5.4$
900	$4.5 + j2.7$	$2.2 + j6.5$



Specifications Subject to Change Without Notice.

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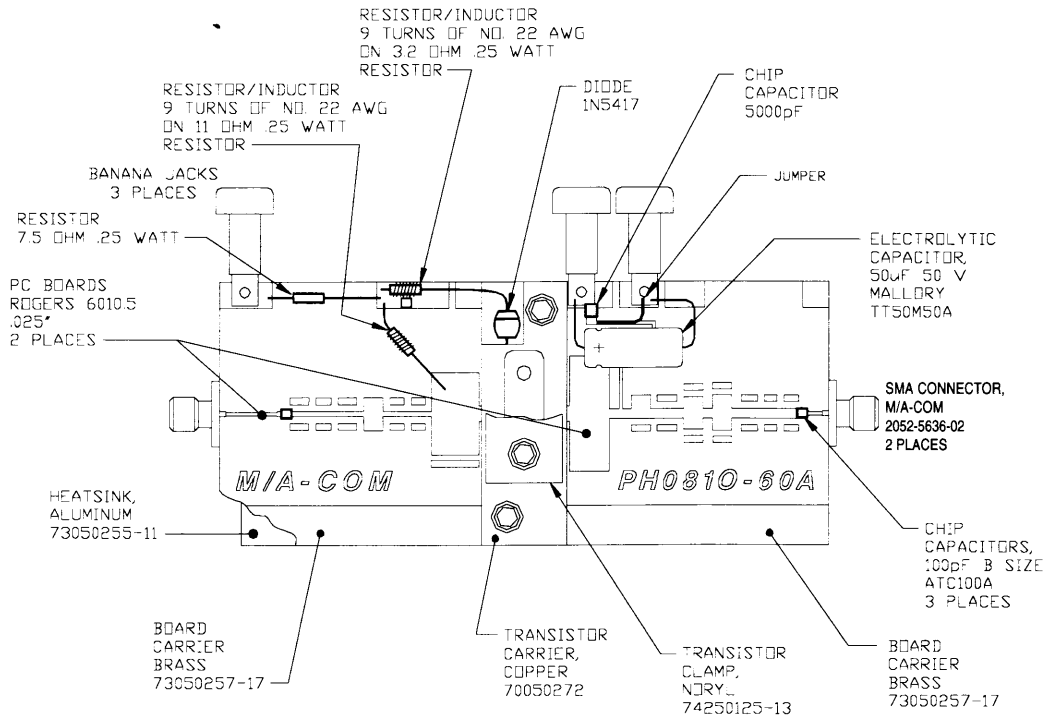
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Fax (800) 618-8883

Asia/Pacific: Tel. +81 (03) 3226-1671
Fax +81 (03) 3226-1451

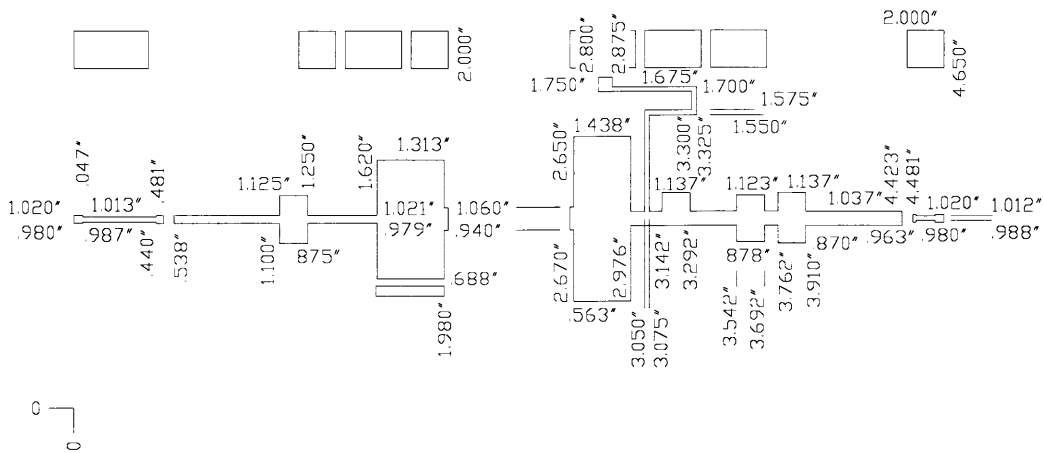
Europe: Tel. +44 (1344) 869 595
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9-95

RF Test Fixture



Test Fixture PC Board Dimensions



Specifications Subject to Change Without Notice.

Wireless Bipolar Power Transistor, 60W 900 - 960 MHz

PH0810-60B

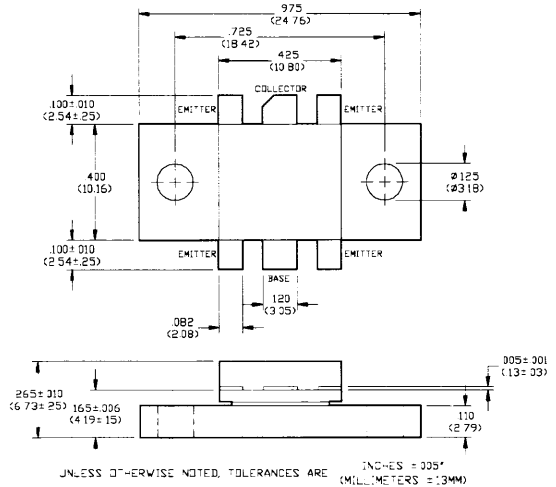
V2.00

Features

- Designed for Linear Amplifier Applications
- Class AB: -30 dBc Typ 3rd IMD at 60 Watts PEP
- Common Emitter Configuration
- Internal Input and Output 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_{EBO}	3.0	V
Collector Current	I_C	10	A
Total Power Dissipation	P_{TOT}	100	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	1.7	°C/W

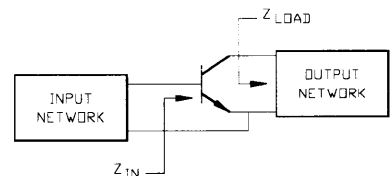


Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C=50$ mA
Collector-Emitter Leakage Current	I_{CES}	-	8.0	mA	$V_{CE}=26.0$ V
Collector-Emitter Breakdown Voltage	BV_{CEO}	24	-	V	$I_C=80$ mA
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	$I_B=50$ mA
DC Forward Current Gain	h_{FE}	15	120	-	$V_{CE}=5.0$ V, $I_C=1.0$ A
Power Gain	G_p	10	-	dB	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=60$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
Collector Efficiency	η_C	35	-	%	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=60$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
Input Return Loss	RL	10	-	dB	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=60$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
Load Mismatch Tolerance	VSWR-T	-	3:1	-	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=60$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
3rd Order IMD	IMD_3	-	-28	dBc	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=60$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz

Typical Optimum Device Impedances

F(MHz)	$Z_{IN}(\Omega)$	$Z_{LOAD}(\Omega)$
900	$1.5 + j1.8$	$2.8 - j1.1$
960	$1.5 + j1.3$	$2.2 - j1.3$



Specifications Subject to Change Without Notice.

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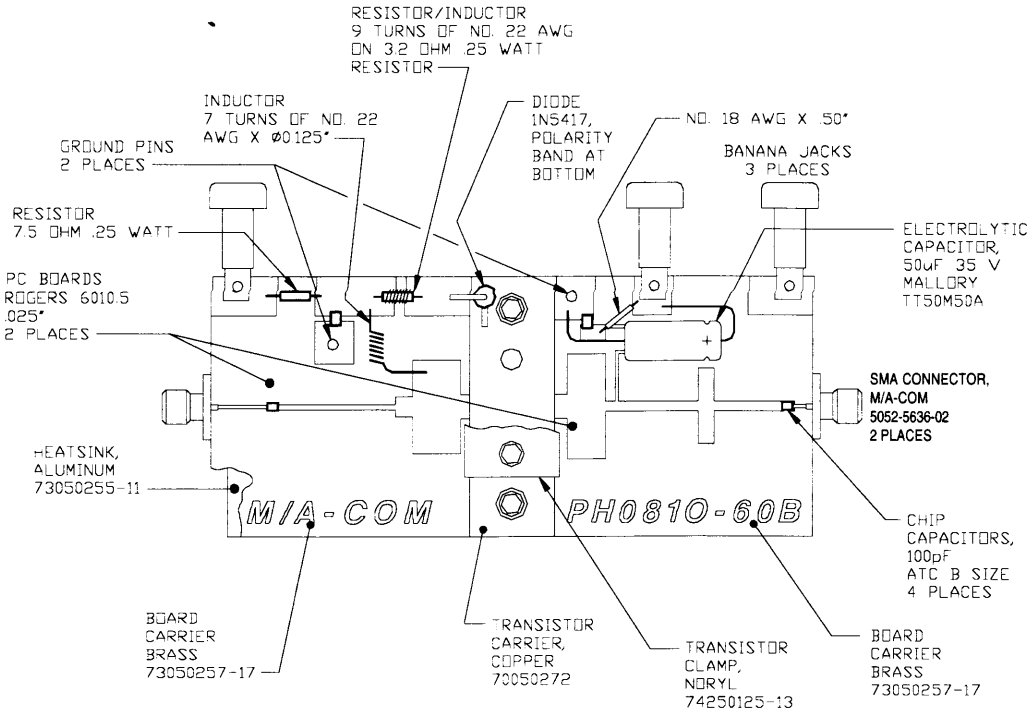
North America: Tel. (800) 366-2266
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Asia/Pacific: Tel. +81 (03) 3226-1671
Fax +81 (03) 3226-1451

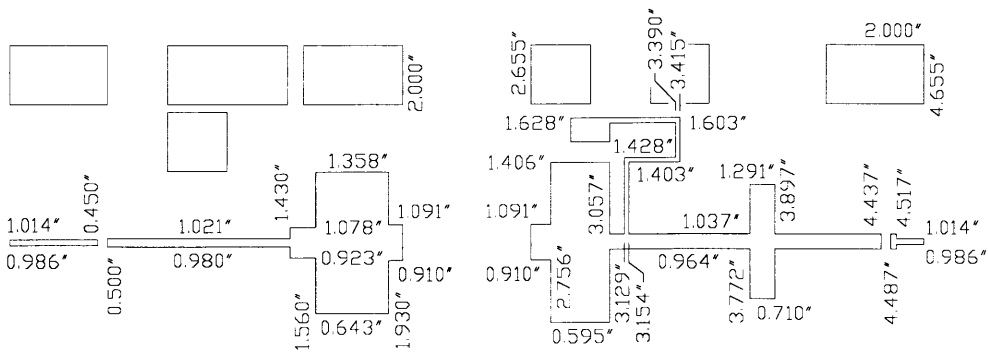
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9-97

RF Test Fixture



Test Fixture PC Board Dimensions



Specifications Subject to Change Without Notice.

Wireless Bipolar Power Transistor, 75W

850 - 960 MHz

PH0810-75

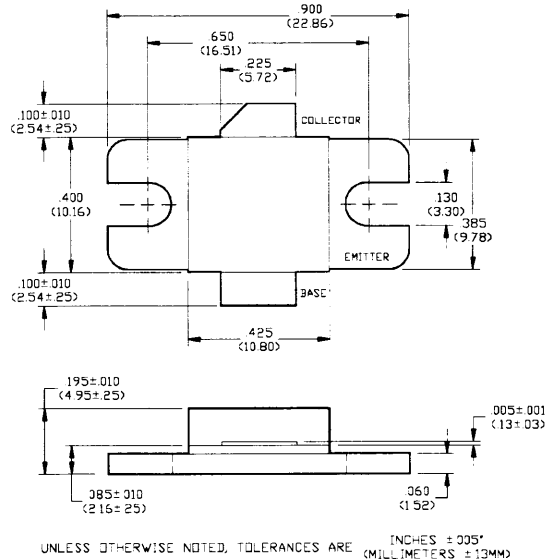
V2.00

Features

- Designed for Linear Amplifier Applications
- Class AB: -32 dBc Typ 3rd IMD at 75 Watts PEP
- Common Emitter Configuration
- Internal Input and Output 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_{EBO}	3.0	V
Collector Current	I_C	12	A
Total Power Dissipation	P_{TOT}	125	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	1.4	°C/W

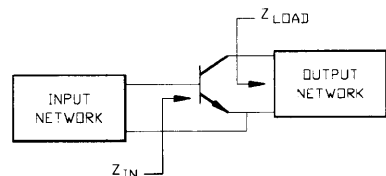


Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C=50$ mA
Collector-Emitter Leakage Current	I_{CES}	-	8.0	mA	$V_{CE}=26.0$ V
Collector-Emitter Breakdown Voltage	BV_{CEO}	24	-	V	$I_C=100$ mA
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	$I_B=50$ mA
DC Forward Current Gain	h_{FE}	15	120	-	$V_{CE}=5.0$ V, $I_C=1.0$ A
Power Gain	G_p	10	-	dB	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=75$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
Collector Efficiency	η_C	35	-	%	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=75$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
Input Return Loss	RL	10	-	dB	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=75$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
Load Mismatch Tolerance	VSWR-T	-	5.0:1	-	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=75$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz
3rd Order IMD	IMD ₃	-	-28	dBc	$V_{CC}=26$ V, $I_{CO}=150$ mA, $P_{OUT}=75$ W PEP, $F=900$ MHz, $\Delta F=100$ kHz

Typical Optimum Device Impedances

F (MHz)	$Z_{IN}(\Omega)$	$Z_{LOAD}(\Omega)$
850	$1.1 + j3.5$	$1.7 - j3.0$
900	$1.7 + j3.1$	$1.7 - j2.8$
960	$1.7 + j2.5$	$1.2 - j2.9$



Specifications Subject to Change Without Notice.

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9-99

Wireless Bipolar Power Transistor, 150W

850 - 960 MHz

PH0810-150

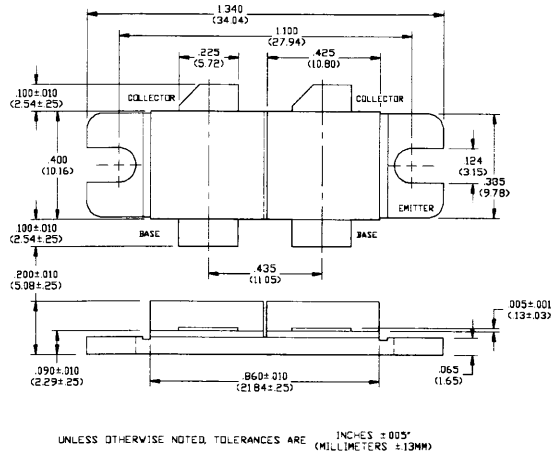
V2.01

Features

- Designed for Linear Amplifier Applications
- Class AB: -32 dBc Typ 3rd IMD at 150 Watts PEP
- Common Emitter Configuration
- Internal Input and Output 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_{EBO}	3.0	V
Collector Current	I_C	25	A
Total Power Dissipation	P_{TOT}	250	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	0.7	°C/W



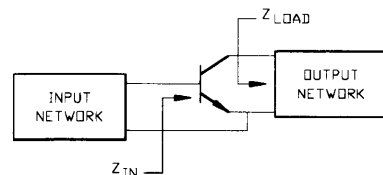
Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C=50 \text{ mA}^*$
Collector-Emitter Leakage Current	I_{CES}	-	10.0	mA	$V_{CE}=26.0 \text{ V}^*$
Collector-Emitter Breakdown Voltage	BV_{CEO}	24	-	V	$I_C=100 \text{ mA}^*$
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	$I_E=50 \text{ mA}^*$
DC Forward Current Gain	h_{FE}	15	120	-	$V_{CE}=5.0 \text{ V}, I_C=1.0 \text{ A}^*$
Power Gain	G_P	10	-	dB	$V_{CC}=26 \text{ V}, I_{CO}=300 \text{ mA}, P_{OUT}=150 \text{ W PEP}, F=900 \text{ MHz}, \Delta F=100 \text{ kHz}$
Collector Efficiency	η_C	35	-	%	$V_{CC}=26 \text{ V}, I_{CO}=300 \text{ mA}, P_{OUT}=150 \text{ W PEP}, F=900 \text{ MHz}, \Delta F=100 \text{ kHz}$
Input Return Loss	RL	10	-	dB	$V_{CC}=26 \text{ V}, I_{CO}=300 \text{ mA}, P_{OUT}=150 \text{ W PEP}, F=900 \text{ MHz}, \Delta F=100 \text{ kHz}$
Load Mismatch Tolerance	VSWR-T	-	5.0:1	-	$V_{CC}=26 \text{ V}, I_{CO}=300 \text{ mA}, P_{OUT}=150 \text{ W PEP}, F=900 \text{ MHz}, \Delta F=100 \text{ kHz}$
3rd Order IMD	IMD_3	-	-28	dBc	$V_{CC}=26 \text{ V}, I_{CO}=300 \text{ mA}, P_{OUT}=150 \text{ W PEP}, F=900 \text{ MHz}, \Delta F=100 \text{ kHz}$

* Per Side

Typical Optimum Device Impedances

F(MHz)	$Z_{IN}(\Omega)$	$Z_{LOAD}(\Omega)$
850	$2.2 + j6.0$	$3.3 - j5.4$
900	$3.5 + j5.6$	$3.4 - j5.0$
960	$3.6 + j4.0$	$2.3 - j5.2$



Specifications Subject to Change Without Notice.

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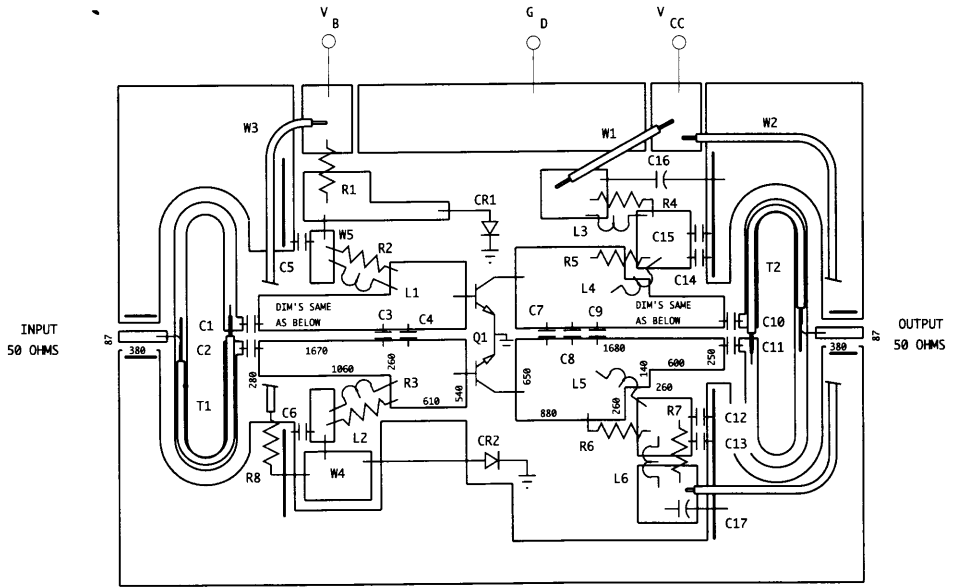
M/A-COM, Inc.

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RF Test Fixture



PARTS LIST

C9	.7pF 100 VDC CHIP ATC TYPE B
C7 C8	3.6pF 100 VDC CHIP ATC TYPE B
C4	6.2pF 100 VDC CHIP ATC TYPE B
C3	26pF 100 VDC CHIP ATC TYPE B
C1 C2 C10 C11	43pF 100 VDC CHIP ATC TYPE B
C5 C6 C12 C14	100pF 100 VDC CHIP ATC TYPE B
C13 C15	5000pF 100 VDC CHIP ATC TYPE B
C16 C17	50uF 50 VOLTS
CR1 CR2	DIODE JX5417
L3 L6	7 TURNS OF NO. 18 AWG ON .150" DIA
L1 L2	11 TURNS OF NO. 18 AWG ON .150" DIA
L4 L5	11 TURNS OF NO. 18 AWG ON .100" DIA
Q1	PH0810-150
R2 R3 R4 R7	.47 OHM .5 WATT
R1 R5 R6 R8	47 OHM 1 WATT
T1 T2	50 OHM SEMI RIGID COAX 2.20" X .088" OD
W1 W2 W3	NO. 16 AWG TEFLON WIRE
W4, W5	NO. 16 AWG JUMPER
BOARD MATERIAL	TEFLON GLASS, .031" THICK, Er = 2.54

Specifications Subject to Change Without Notice.

WA-COM, Inc.

9-101

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Linear Power Transistor, 40W

850 - 1450 MHz

PH0814-40

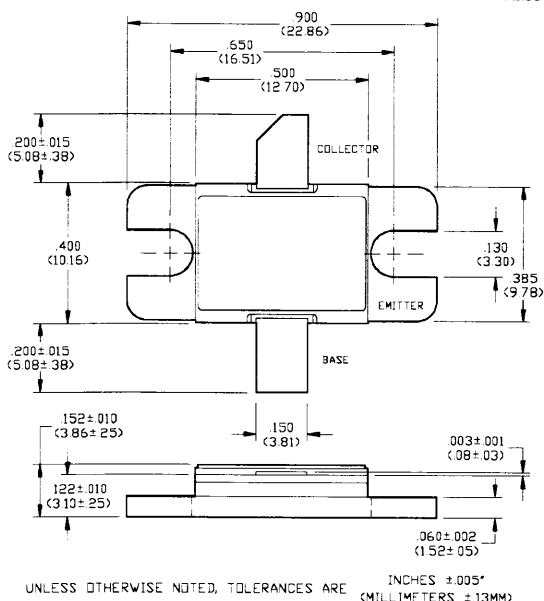
V2.00

Features

- NPN Silicon Microwave Power Transistor
- Common Emitter Configuration
- Broadband Class AB Operation
- Interdigitated Geometry
- Diffused Emitter Ballasting Resistors
- Gold Metalization System
- Internal Input and Output Impedance Matching
- Hermetic Metal/Ceramic Package

Absolute Maximum Ratings at 25°C

Parameter	Symbol	Rating	Units
Collector-Base Voltage	V_{CBO}	56	V
Collector-Emitter Voltage	V_{CES}	56	V
Emitter-Base Voltage	V_{EBO}	3.0	V
Collector Current (Peak)	I_C	5.6	A
Total Power Dissipation	P_{TOT}	175	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +200	°C
Thermal Resistance	θ_{JC}	1.0	°C/W



Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	56	-	V	$I_C=50$ mA
Collector-Emitter Leakage Current	I_{CES}	-	5.0	mA	$V_{CE}=28$ V
Collector-Base Breakdown Voltage	BV_{CBO}	56	-	V	$I_C=50$ mA
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	$I_B=10$ mA
DC Forward Current Gain	h_{FE}	15	100	-	$V_{CE}=5.0$ V, $I_C=0.5$ A
Input Power	P_{IN}	5.5	8.8	W	$V_{CC}=28$ V, $I_{CO}=12$ mA, $P_{OUT}=42$ W, $F=1450$ MHz
Collector Current	I_C	-	3.75	A	$V_{CC}=28$ V, $I_{CO}=12$ mA, $P_{OUT}=42$ W, $F=1450$ MHz
Input Return Loss	RL	10	-	dB	$V_{CC}=28$ V, $I_{CO}=12$ mA, $P_{OUT}=42$ W, $F=1450$ MHz
Saturated Output Power	P_{SAT}	50	-	W	$V_{CC}=28$ V, $I_{CO}=12$ mA, $F=1450$ MHz
Load Mismatch Tolerance	VSWR-T	-	3:1	-	$V_{CC}=28$ V, $I_{CO}=12$ mA, $P_{OUT}=42$ W, $F=1450$ MHz
Load Mismatch Tolerance	VSWR-T	-	1.5:1	-	$V_{CC}=28$ V, $I_{CO}=12$ mA, $P_{OUT}=42$ W, $F=850$ MHz

Typical Optimum Device Impedances

F(MHz)	$Z_{IN}(\Omega)$	$Z_{OF}(\Omega)$
850	2.0 - j3.6	3.0 - j4.9
950	2.4 - j2.5	2.3 - j3.1
1050	3.1 - j1.8	2.0 - j2.0
1150	3.5 - j1.9	1.8 - j1.4
1250	3.3 - j2.4	1.7 - j0.9
1350	2.5 - j2.4	1.4 - j0.5
1450	1.7 - j1.8	1.2 - j0.1

Specifications Subject to Change Without Notice.

