

PH1516-10



Wireless Bipolar Power Transistor
10W, 1.45-1.60 GHz

M/A-COM Products
Released - Rev. 07.07

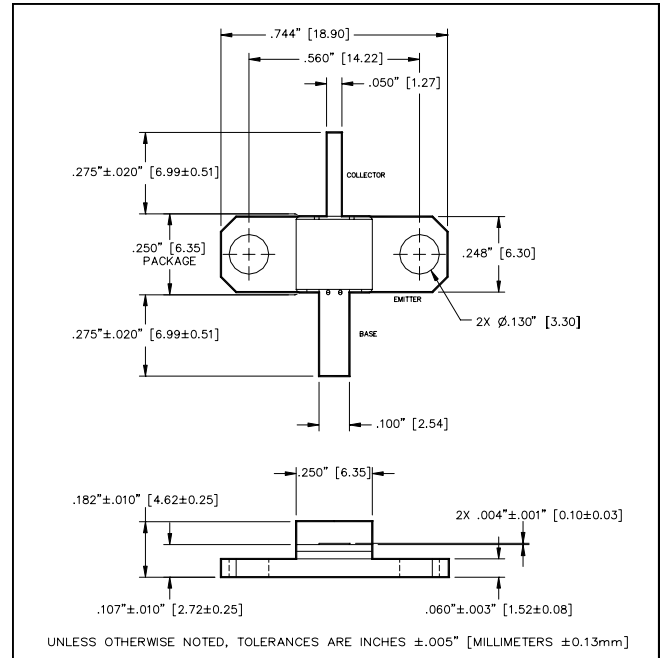
Features

- Designed for cellular base station applications
- Class AB: -33 dBc typ. 3rd IMD at 10 W PEP
- Class A: +49 dBm typ. 3rd order intercept point
- Common emitter configuration
- Internal input impedance matching
- Diffused emitter ballasting

ABSOLUTE MAXIMUM RATING 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	2.0	A
Total Power Dissipation	P_{TOT}	58	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to + 200	°C
Thermal Resistance	θ_{JC}	3.0	°C/W

Outline Drawing¹



Notes: (unless otherwise specified)

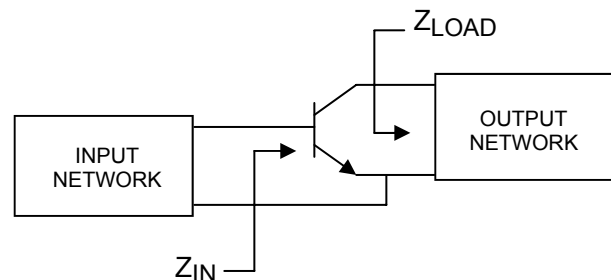
1. Tolerances are: inches ± .005" (millimeters ± 0.13mm)

ELECTRICAL SPECIFICATIONS AT 25°C

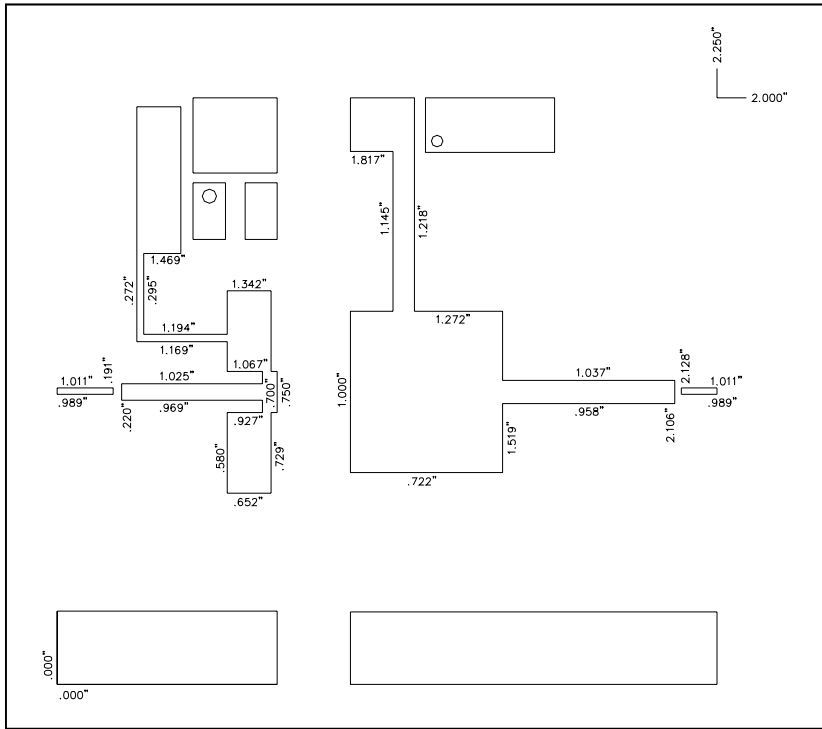
Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C = 20\text{mA}$
Collector-Emitter Leakage Current	I_{CES}	-	2.0	mA	$V_{CE} = 25\text{V}$
Collector-Base Breakdown Voltage	BV_{CEO}	20	-	V	$I_C = 20\text{mA}$
Collector-Base Breakdown Voltage	BV_{CER}	30	-	V	$I_C = 20\text{mA}, R_{BE}=220 \Omega$
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	$I_B = 20\text{mA}$
DC Forward Current Gain	h_{FE}	15	120	-	$V_{CE} = 5\text{V}, I_C = 1 \text{ A}$
Power Gain	G_P	10	-	dB	$V_{CC} = 25\text{V}, I_{CQ} = 100 \text{ mA}, P_{out} = 10 \text{ W}, F = 1.50\text{-}1.60 \text{ GHz}$
Collector Efficiency	η_C	40	-	%	$V_{CC} = 25\text{V}, I_{CQ} = 100 \text{ mA}, P_{out} = 10 \text{ W}, F = 1.50\text{-}1.60 \text{ GHz}$
Input Return Loss	RL	10	-	dB	$V_{CC} = 25\text{V}, I_{CQ} = 100 \text{ mA}, P_{out} = 10 \text{ W}, F = 1.50\text{-}1.60 \text{ GHz}$
Load Mismatch Tolerance	VSWR	-	3.0:1	-	$V_{CC} = 25\text{V}, I_{CQ} = 100 \text{ mA}, P_{out} = 10 \text{ W}, F = 1.50\text{-}1.60 \text{ GHz}$
3rd Order IMD	IMD_3	-	-30	dBc	$V_{CC} = 25\text{V}, I_{CQ} = 100 \text{ mA}, P_{out} = 10 \text{ W PEP } F = 1500 \text{ MHz}, \Delta F = 100\text{kHz}$

TYPICAL OPTIMUM DEVICE IMPEDANCES

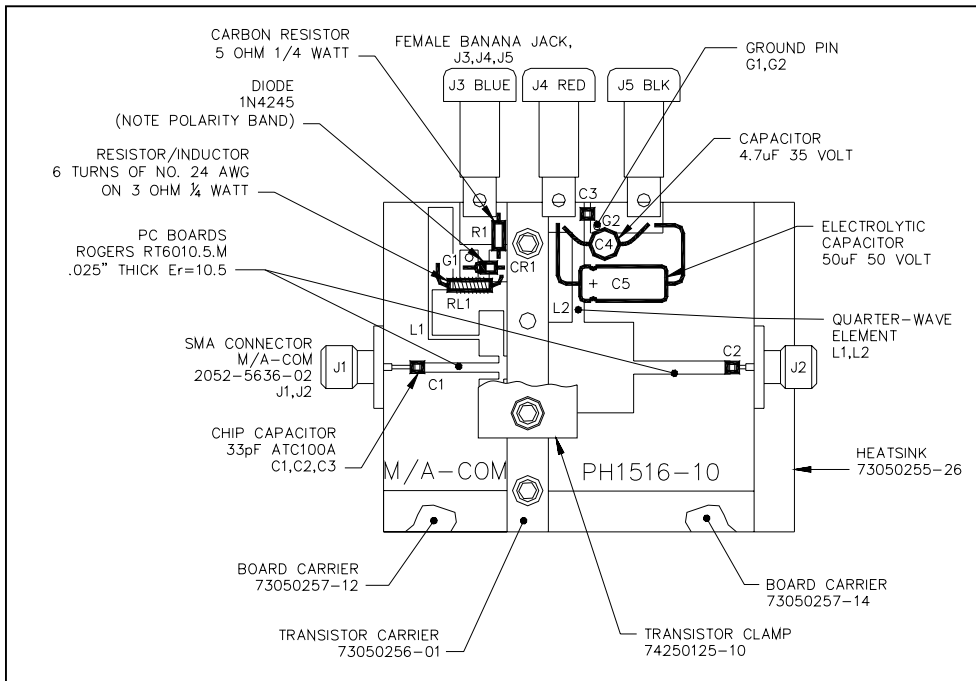
F (GHz)	$Z_{IN} (\Omega)$	$Z_{LOAD} (\Omega)$
1.50	1.4+j4.8	2.1-j0.3
1.55	2.0+j5.0	2.0-j0.4
1.60	2.5+j4.9	2.0-j0.5



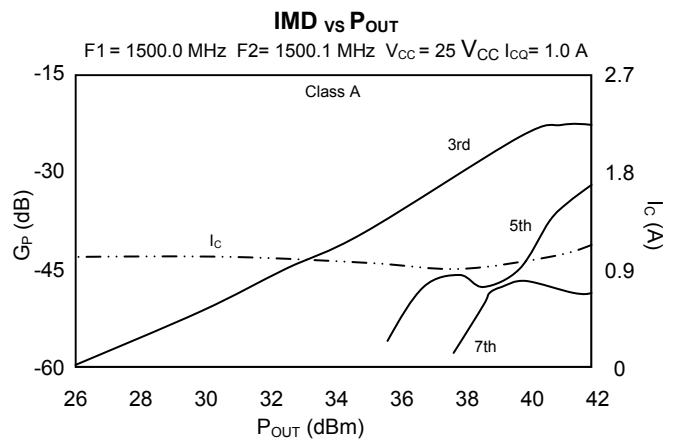
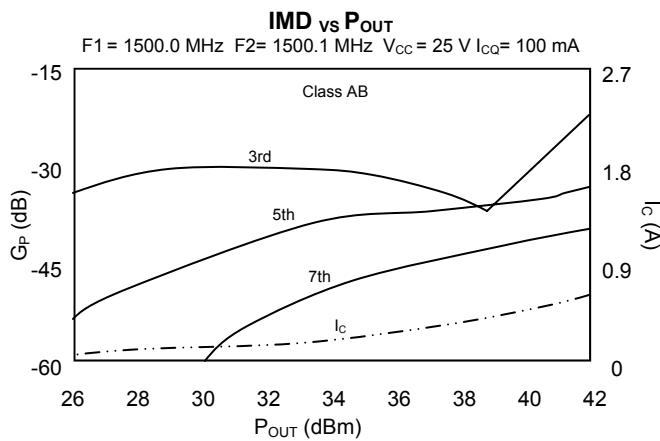
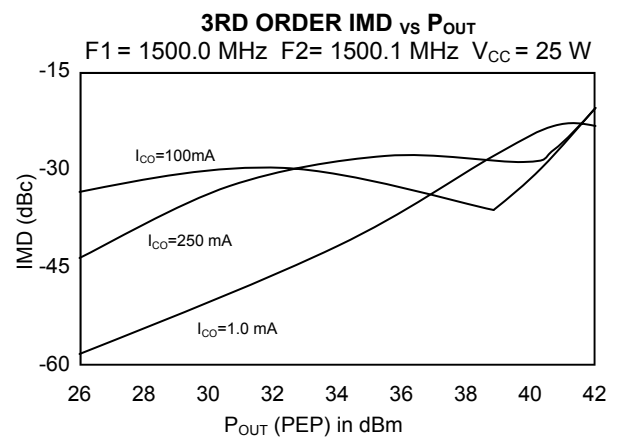
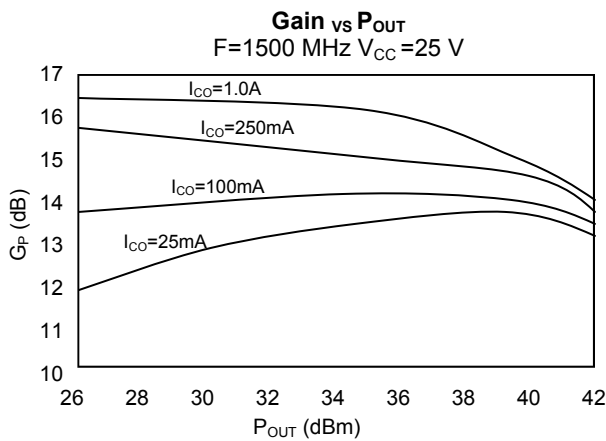
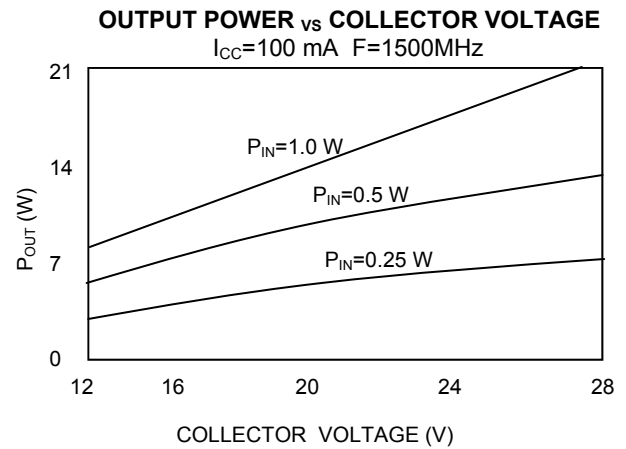
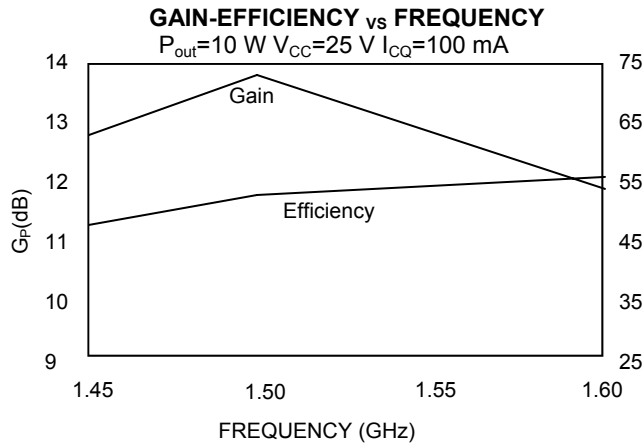
TEST FIXTURE CIRCUIT DIMENSIONS



TEST FIXTURE ASSEMBLY



Typical Broadband Performance Curves



TYPICAL S-PARAMETERS

V _{CC} =25 V, I _{CQ} =1.0A								
F(MHz)	S11		S21		S12		S22	
	MAG	PHASE	MAG	PHASE	MAG	PHASE	MAG	PHASE
100	0.85	177.3	6.57	92.2	0.0066	6.74	0.73	-179.3
200	0.94	179.4	2.96	79.9	0.0073	4.33	0.73	-179.0
300	0.96	-179.4	1.95	75.5	0.0075	4.04	0.72	-178.8
400	0.97	-170.0	1.51	70.6	0.0077	0.91	0.72	-178.2
500	0.97	178.5	1.27	65.2	0.0081	-0.99	0.72	-177.6
600	0.97	178.1	1.12	59.5	0.0085	-2.6	0.73	-177.1
700	0.96	177.7	1.09	52.7	0.0088	-6.8	0.72	-176.1
800	0.97	178.0	0.93	39.5	0.0094	-12.0	0.73	-174.5
900	0.96	177.3	0.88	34.6	0.0093	-13.3	0.75	-173.4
1000	0.97	176.7	0.87	27.8	0.0102	-17.8	0.76	-172.3
1100	0.95	175.9	0.96	20.7	0.0126	-24.5	0.76	-170.1
1200	0.93	176.0	0.93	4.1	0.0118	-40.0	0.81	-169.0
1300	0.92	176.3	0.96	-9.2	0.0118	-51.4	0.86	-168.9
1400	0.91	176.9	0.98	-25.3	0.0120	-68.5	0.91	-169.8
1450	0.91	177.1	0.97	-34.4	0.0118	-79.3	0.94	-171.1
1500	0.91	177.6	0.95	-43.8	0.0117	-91.4	0.97	-172.7
1550	0.91	177.9	0.91	-53.8	0.0114	-104.9	0.98	-174.6
1600	0.92	178.1	0.87	-63.4	0.0107	-119.8	0.99	-176.7
1650	0.92	178.3	0.81	-72.7	0.0094	-135.3	0.99	-178.9
1700	0.9	178.1	0.74	-81.2	0.0094	-146.9	0.01	179.0
1750	0.94	178.0	0.67	-89.1	0.0084	-161.9	0.99	177.4
1800	0.95	177.6	0.61	-96.7	0.0080	-174.5	0.98	175.8
1850	0.95	177.1	0.55	-103.2	0.0079	-172.2	0.96	174.7
1900	0.95	176.7	0.49	-108.6	0.0077	-155.4	0.95	173.8
1950	0.96	176.1	0.44	-113.4	0.0071	145.8	0.94	173.1
2000	0.96	175.6	0.40	-117.3	0.0070	134.9	0.92	172.2
2100	0.96	174.3	0.34	-125.5	0.0081	123.6	0.97	171.0
2200	0.96	173.1	0.28	-133.5	0.0087	104.9	0.84	169.3
2300	0.96	171.1	0.23	-140.0	0.0092	89.0	0.88	168.7
2400	0.96	170.5	0.20	-144.5	0.0075	80.1	0.86	168.0