



Radar Pulsed Power Transistor - 220 Watts, 1.20-1.40 GHz, 150μs Pulse, 10% Duty



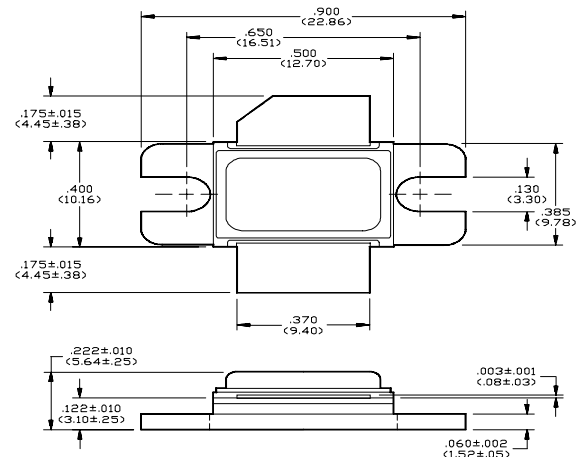
Features

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

Description

M/A-COM's PH1214-220M is a silicon bipolar NPN power transistor intended for use in L-band 1.2 - 1.4 GHz pulsed radars such as air traffic control and long-range weather radars. Designed for common-base, class C, broadband pulsed power applications, the PH1214-220M can produce 220 watts of output power with medium pulse length (150μs) at 10 percent duty cycle. The transistor is housed in a 2-lead rectangular metal-ceramic flange package, with internal input and output impedance matching networks. Diffused emitter ballast resistors and gold metalization assure ruggedness and long-term reliability.

Outline Drawing¹

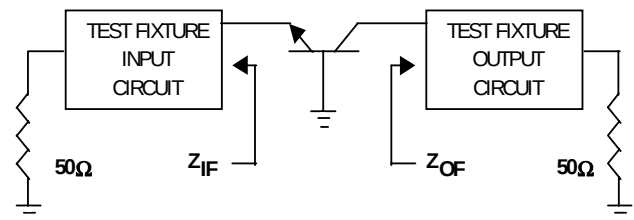


Notes: (unless otherwise specified)

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

Broadband Test Fixture Impedance

f (GHz)	Z _{IF} (Ω)	Z _{OF} (Ω)
1.20	3.3 - j2.7	2.0 - j1.5
1.30	3.4 - j2.1	1.9 - j1.6
1.40	3.6 - j1.3	1.7 - j1.4



Absolute Maximum Rating at 25°C

Parameter	Symbol	Rating	Units
Collector-Emitter Voltage	V _{CES}	70	V
Emitter-Base Voltage	V _{EBO}	3.0	V
Collector Current (Peak)	I _C	21.0	A
Total Power Dissipation @ +25°C	P _{TOT}	600	W
Storage Temperature	T _{stg}	-65 to +200	°C
Junction Temperature	T _j	200	°C

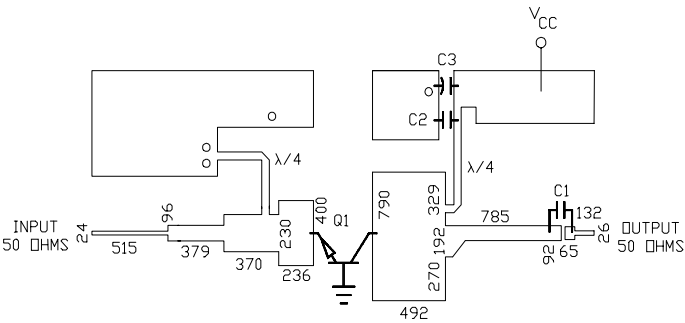
Electrical Specifications at 25°C

Symbol	Parameter	Test Conditions	Min	Max	Units
BV _{CES}	Collector-Emitter Breakdown	I _C = 100 mA	70	-	V
I _{CES}	Collector-Emitter Breakdown	V _{CE} = 40 V	-	10	mA
R _{TH(JC)}	Thermal Resistance	V _{CC} = 40 V, P _{in} = 40 W, f = 1.2, 1.3, 1.4 GHz	-	0.25	°C/W
P _O	Output Power	V _{CC} = 40 V, P _{in} = 40 W, f = 1.2, 1.3, 1.4 GHz	220	-	W
G _p	Power Gain	V _{CC} = 40 V, P _{in} = 40 W, f = 1.2, 1.3, 1.4 GHz	7.4	-	dB
η	Collector Efficiency	V _{CC} = 40 V, P _{in} = 40 W, f = 1.2, 1.3, 1.4 GHz	50	-	%
R _L	Input Return Loss	V _{CC} = 40 V, P _{in} = 40 W, f = 1.2, 1.3, 1.4 GHz	9	-	dB
VSWR-T	Load Mismatch Tolerance	V _{CC} = 40 V, P _{in} = 40 W, f = 1.2, 1.3, 1.4 GHz	-	3:1	-
VSWR-S	Load Mismatch Stability	V _{CC} = 40 V, P _{in} = 40 W, f = 1.2, 1.3, 1.4 GHz	-	1.5:1	-

V2.00

Test Fixture Electrical Schematic¹

Top View



Electrical Schematic Parts List

C1, C2	100 pF ATC size A
C3	50 uF 50 Volts
Q1	PH1214-220M
Board Type	Rogers 6010.5 .025" Thick, E _R = 10.5



PH1214-220M

Note:
1. Dimensions are in mils.