

# Radar Pulsed Power Transistor - 110 Watts, 1.20-1.40 GHz, 150μs Pulse, 10% Duty



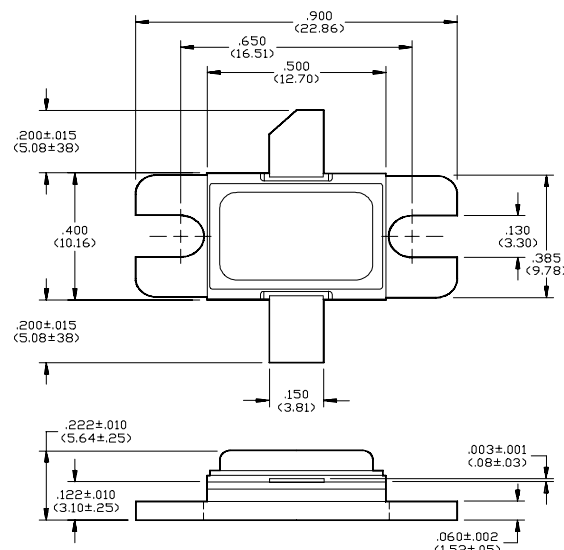
## Features

- 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

## Description

M/A-COM's PH1214-110M 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 PH1214-110M can produce 110 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 Drawing<sup>1</sup>

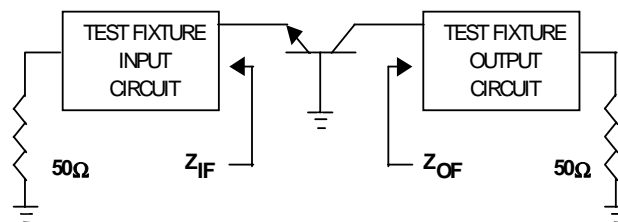


Notes: (unless otherwise specified)

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

## Broadband Test Fixture Impedance

f (GHz)	Z <sub>IF</sub> (Ω)	Z <sub>OF</sub> (Ω)
1.20	4.7 - j4.4	4.4 - j3.3
1.30	4.5 - j3.3	3.0 - j2.8
1.40	4.5 - j2.3	2.3 - j1.8



## Absolute Maximum Rating at 25°C

Parameter	Symbol	Rating	Units
Collector-Emitter Voltage	V <sub>CES</sub>	70	V
Emitter-Base Voltage	V <sub>EBO</sub>	3.0	V
Collector Current (Peak)	I <sub>C</sub>	10.5	A
Total Power Dissipation @ +25°C	P <sub>TOT</sub>	300	W
Storage Temperature	T <sub>stg</sub>	-65 to +200	°C
Junction Temperature	T <sub>j</sub>	200	°C

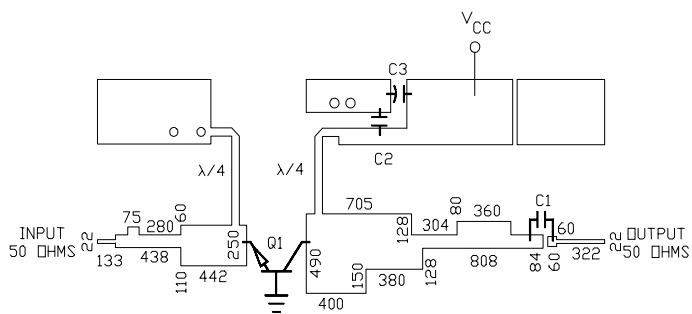
## Electrical Specifications at 25°C

Symbol	Parameter	Test Conditions	Min	Max	Units
BV <sub>CES</sub>	Collector-Emitter Breakdown	I <sub>C</sub> = 50 mA	70	-	V
I <sub>CES</sub>	Collector-Emitter Breakdown	V <sub>CE</sub> = 40 V	-	5.5	mA
R <sub>TH(JC)</sub>	Thermal Resistance	V <sub>CC</sub> = 40 V, P <sub>in</sub> = 20 W, f = 1.2, 1.3, 1.4 GHz	-	0.50	°C/W
P <sub>O</sub>	Output Power	V <sub>CC</sub> = 40 V, P <sub>in</sub> = 20 W, f = 1.2, 1.3, 1.4 GHz	110	-	W
G <sub>p</sub>	Power Gain	V <sub>CC</sub> = 40 V, P <sub>in</sub> = 20 W, f = 1.2, 1.3, 1.4 GHz	7.4	-	dB
η	Collector Efficiency	V <sub>CC</sub> = 40 V, P <sub>in</sub> = 20 W, f = 1.2, 1.3, 1.4 GHz	50	-	%
R <sub>L</sub>	Input Return Loss	V <sub>CC</sub> = 40 V, P <sub>in</sub> = 20 W, f = 1.2, 1.3, 1.4 GHz	9	-	dB
VSWR-T	Load Mismatch Tolerance	V <sub>CC</sub> = 40 V, P <sub>in</sub> = 20 W, f = 1.2, 1.3, 1.4 GHz	-	3:1	-
VSWR-S	Load Mismatch Stability	V <sub>CC</sub> = 40 V, P <sub>in</sub> = 20 W, f = 1.2, 1.3, 1.4 GHz	-	1.5:1	-

V2.00

### Test Fixture Electrical Schematic<sup>1</sup>

#### Top View



### Electrical Schematic Parts List

C1, C2	100 pF ATC size A
C3	50 uF 50 Volts
Q1	PH1214-110M
Board Type	Rogers 6010.5 .025" Thick, E <sub>R</sub> = 10.5



PH1214-110M

**Note:**

1. Dimensions are in mils.