



M/A-COM

# Radar Pulsed Power Transistor - 80 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 PH1214-80M is a silicon bipolar NPN power transistor designed 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 PH1214-80M can produce 80 watts of output power with medium pulse length (150 µs) 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. Dissued emitter ballast resistors and gold metalization assure ruggedness and long-term reliability. In addition to L-band pulsed radars, this high performance power transistor can also be used in pulsed digital communications systems.

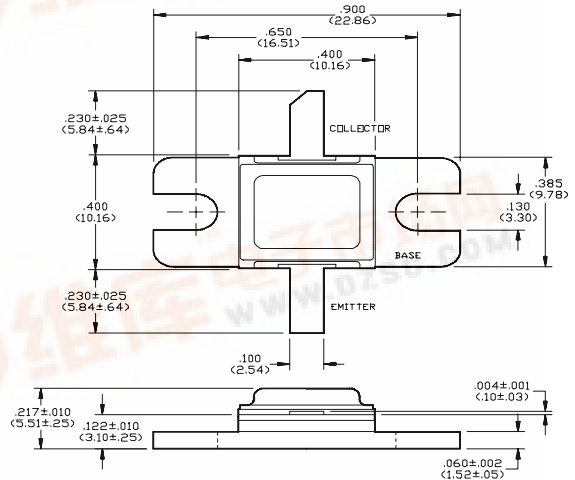
## Absolute Maximum Rating at 25°C

Parameter	Symbol	Rating	Units
Collector-Emitter Voltage	$V_{CES}$	70	V
Emitter-Base Voltage	$V_{EBO}$	3.0	V
Collector Current (Peak)	$I_C$	6.4	A
Total Power Dissipation @ +25°C	$P_{TOT}$	185	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	$I_C = 35 \text{ mA}$	70	-	V
$I_{CES}$	Collector-Emitter Breakdown	$V_{CE} = 40 \text{ V}$	-	3.5	mA
$R_{TH(JC)}$	Thermal Resistance	$V_{CC} = 40 \text{ V}, P_{in} = 13 \text{ W}, f = 1.2, 1.3, 1.4 \text{ GHz}$	-	0.80	°C/W
$P_O$	Output Power	$V_{CC} = 40 \text{ V}, P_{in} = 13 \text{ W}, f = 1.2, 1.3, 1.4 \text{ GHz}$	80	-	W
$G_p$	Power Gain	$V_{CC} = 40 \text{ V}, P_{in} = 13 \text{ W}, f = 1.2, 1.3, 1.4 \text{ GHz}$	7.5	-	dB
$\eta$	Collector Efficiency	$V_{CC} = 40 \text{ V}, P_{in} = 13 \text{ W}, f = 1.2, 1.3, 1.4 \text{ GHz}$	50	-	%
$R_L$	Input Return Loss	$V_{CC} = 40 \text{ V}, P_{in} = 13 \text{ W}, f = 1.2, 1.3, 1.4 \text{ GHz}$	9	-	dB
VSWR-T	Load Mismatch Tolerance	$V_{CC} = 40 \text{ V}, P_{in} = 13 \text{ W}, f = 1.2, 1.3, 1.4 \text{ GHz}$	-	3:1	-
VSWR-S	Load Mismatch Stability	$V_{CC} = 40 \text{ V}, P_{in} = 13 \text{ W}, f = 1.2, 1.3, 1.4 \text{ GHz}$	-	1.5:1	-

## Outline Drawing<sup>1</sup>

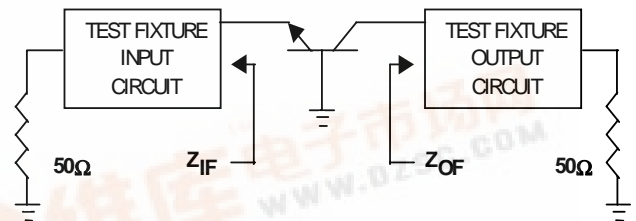


Notes: (unless otherwise specified)

1. Tolerances are: inches  $\pm .005''$  (millimeters  $\pm 0.13\text{mm}$ )

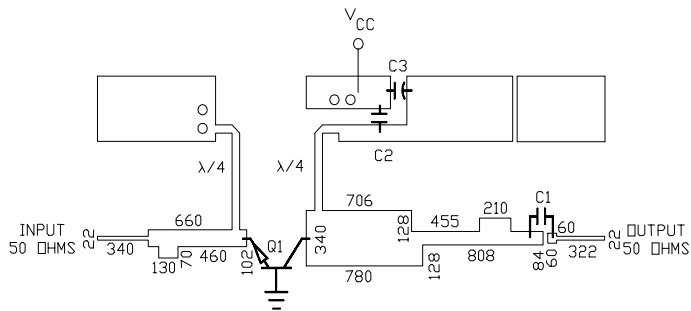
## Broadband Test Fixture Impedance

F (GHz)	$Z_{IF} (\Omega)$	$Z_{OF} (\Omega)$
1.20	9.4 - j4.5	7.0 - j2.8
1.30	8.3 - j2.8	4.5 - j3.2
1.40	7.9 - j1.3	3.0 - j2.1



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

#### Top View



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PH1214-80M

**Note:**

1. Dimensions are in mils.

### Electrical Schematic Parts List

C1, C2	100 pF ATC size A
C3	50 uF 50 Volts
Q1	PH1214-80M
Board Type	Rogers 6010.5 .025" Thick, E <sub>R</sub> = 10.5