

# BIPOLAR RF TRANSISTORS

## Class C 1030/1090 MHz

### Product Description

The WPTB64A1011AX is an application-specific transistor implemented using Northrop Grumman's Silicon Power Bipolar process and developed for short-pulse, high-power IFF applications. Ballasted emitters in 64 separate base cells on a 3.5 mil thick die help ensure low thermal resistance and good junction temperature uniformity for high reliability. This device is configured for common base operation and is tested at 800 ns pulse width with 1% duty cycle.

### Features

- Silicon Technology
- Refractory/Gold Metalization
- Single Stage Internal Matching
- Metal/Ceramic Hermetic Package
- Single Transistor Die Implementation

### Absolute Maximum Ratings

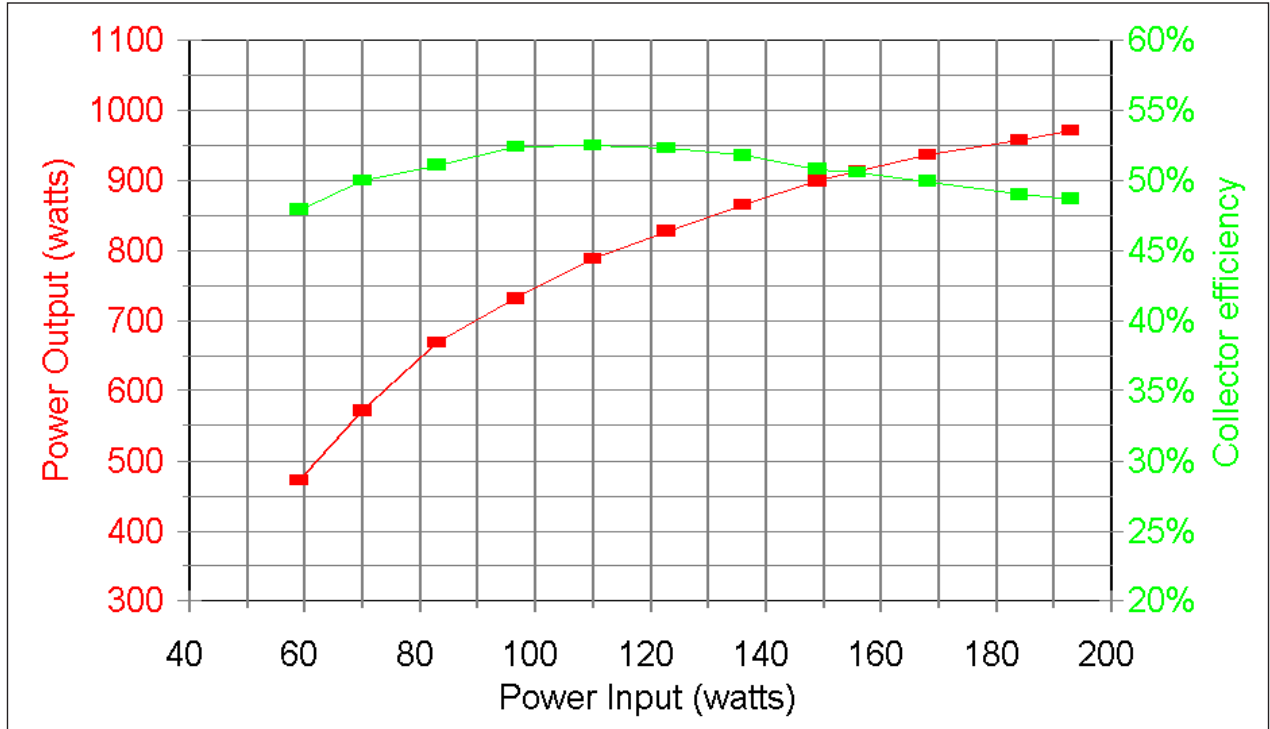
Storage Temperature..... -65° to 200° C  
 Operating Junction Temperature..... 200° C  
 Lead Temperature (Soldering 10 sec) ..... 300° C  
 Collector-Base Voltage..... 65V  
 Emitter-Base Voltage..... 3V  
 Peak Collector Current ..... 38A  
 Transient Thermal Resistance ..... 0.06° C/W

### Electrical Performance

Characteristic	Symbol	Min	Typical	Max	Units	Test Conditions
Collector Breakdown Voltage	$BV_{CES}$	65	75		Volts	$I = 50 \text{ mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	3	5		Volts	$I = 10 \text{ mA}$
Forward Current Transfer Ratio	$h_{FE}$	10	50	200		$V_{CE} = 5 \text{ V}, I_C = 500 \text{ mA}$
Common-Base Power Gain	G	6.8	7.2		dB	Note 1
Collector Efficiency	$\eta_C$		45		%	Note 1
Rise Time	$t_r$			90	ns	Note 1
Load Mismatch Tolerance	VSWR	3:1				Note 1
Overdrive Tolerance	OD	2			dB	Note 1

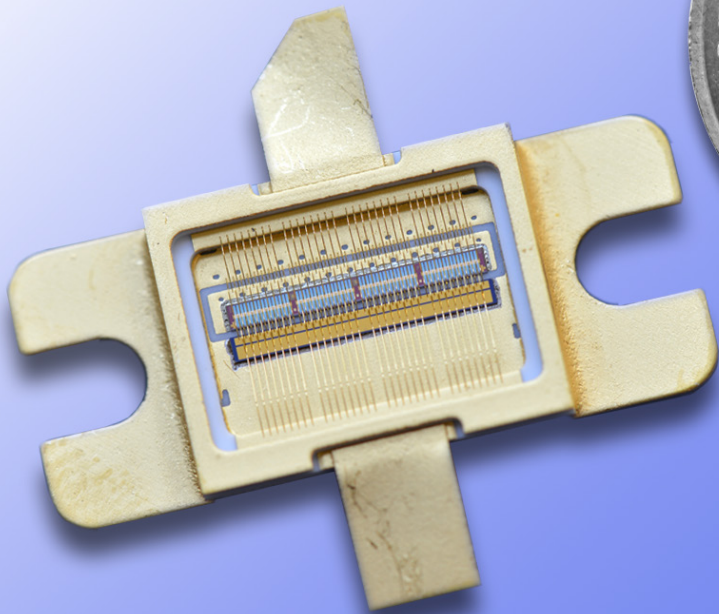
Note 1:  $V_{CC} = 52 \text{ Volts}$ , Pulse Width = 800 ns, Duty = 1%,  $P_{in} = 160 \text{ Watts}$ ,  $f_{rest} = 1030 \text{ MHz}$

## Typical Transfer Characteristics



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# BIPOLAR RF TRANSISTORS

CLASS C 960-1215 MHz

## Product Description

The WPTB32A0912Ax application-specific transistor uses the 3217 L-Band die which was developed for pulse radar systems. Optimal internal matching delivers high performance for applications such as the MIDS and JTIDS communication systems. Low thermal resistance and high efficiency couple to provide nearly imperceptible droop across the entire TDMA burst waveform at power levels of over 200 watts.

## Features

- Refractory/Gold Metalization
- Metal/Ceramic Hermetic Package
- Typical Power Out of 180 watts
- Two Stage Internal Matching
- Single Transistor Die Implementation

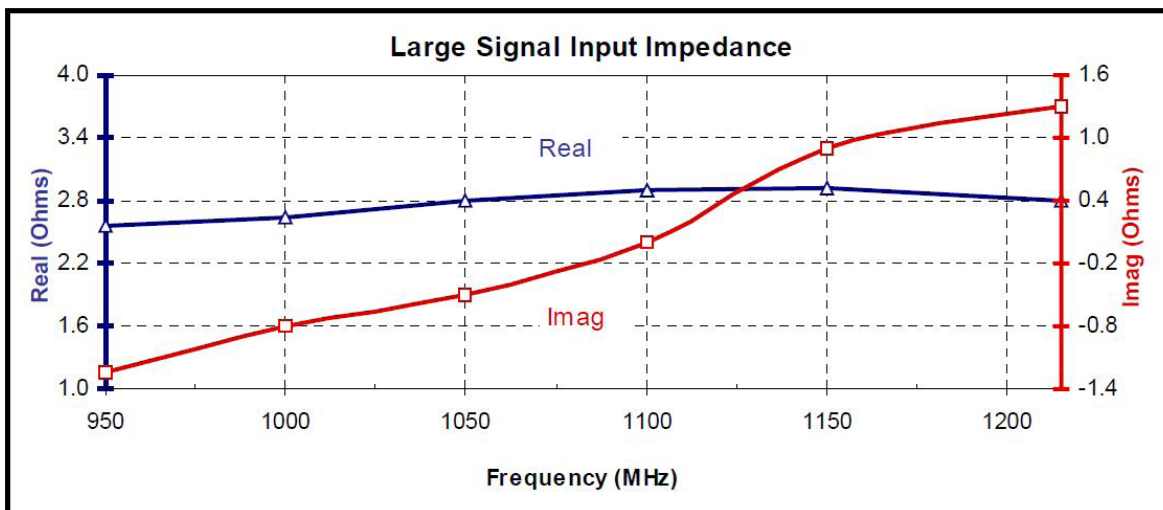
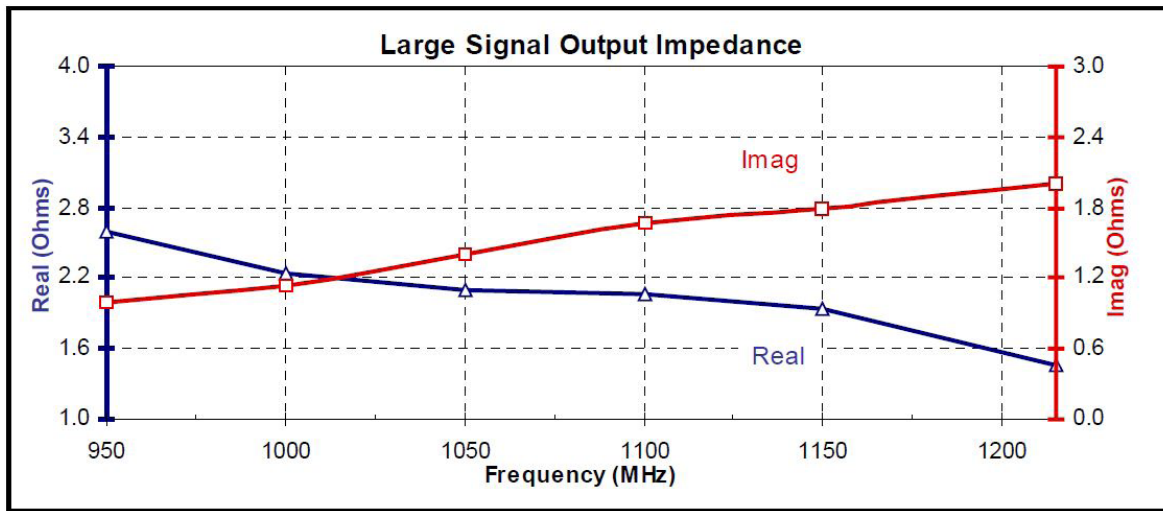
## Absolute Maximum Ratings

Storage Temperature .....	-65° to 200° C
Operating Junction Temperature .....	200° C
Lead Temperature (Soldering 10 sec) .....	300° C
Collector-Base Voltage .....	80V
Emitter-Base Voltage .....	3V
Peak Collector Current .....	18A
Transient Thermal Resistance .....	0.35°C/W

# Electrical Performance

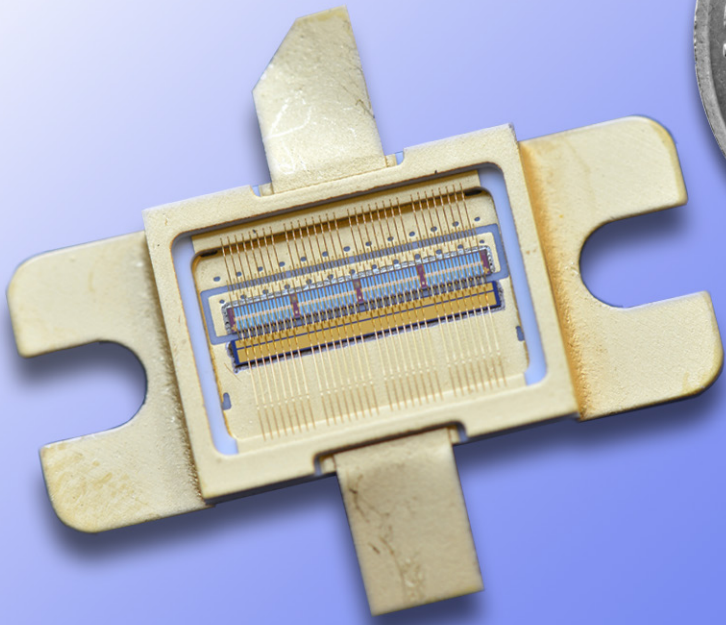
Characteristic	Symbol	Min	Typ	Max	Units	Test Conditions
Collector-Base Breakdown Voltage	$BV_{cbo}$	70	85		Volts	$I = 10 \text{ mA}$
Emitter-Base Breakdown Voltage	$BV_{ebo}$	3			Volts	$I = 10 \text{ mA}$
Forward Current Transfer Ratio	$H_{fe}$	20	45	80		$V_{ce} = 5 \text{ V}$ $I_c = 500 \text{ mA}$
Common Base Power Gain		7.2		8.5	dB	Note 1
Collector Efficiency		53			%	Note 2
Load Mismatch Tolerance		3:1			VSWR	Note 1
Frequency Band		1215		1400	MHz	

Note 1: Pulse format of 6.4  $\mu\text{s}$  ON, 6.6  $\mu\text{s}$  OFF for 3.3 ms, then OFF for 4.6 ms. Burst tests performed at  $P_{out} = 180 \text{ watts}$ .



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# BIPOLAR RF TRANSISTORS

CLASS C 1215-1400 MHz

### Product Description

The WPTB32A1214Ax is a high-power NPN transistor designed for pulsed radar applications. The 3217 L-Band die utilized in this device is capable of operating over a wide range of pulse widths, duty cycles and bandwidths. An application-specific design can easily be tailored to your requirements through minor changes in ballast resistor value and internal matching network values.

### Features

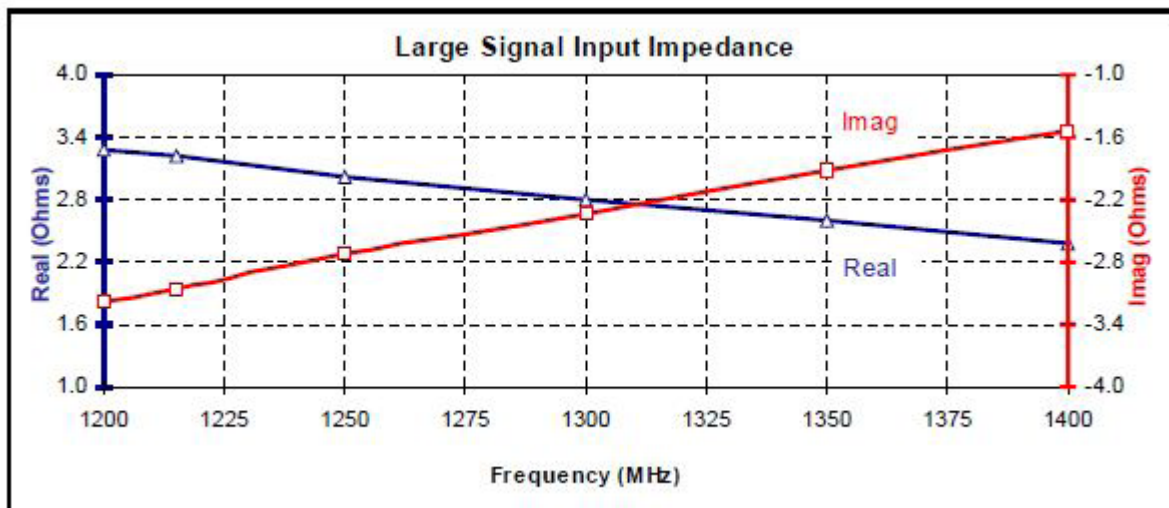
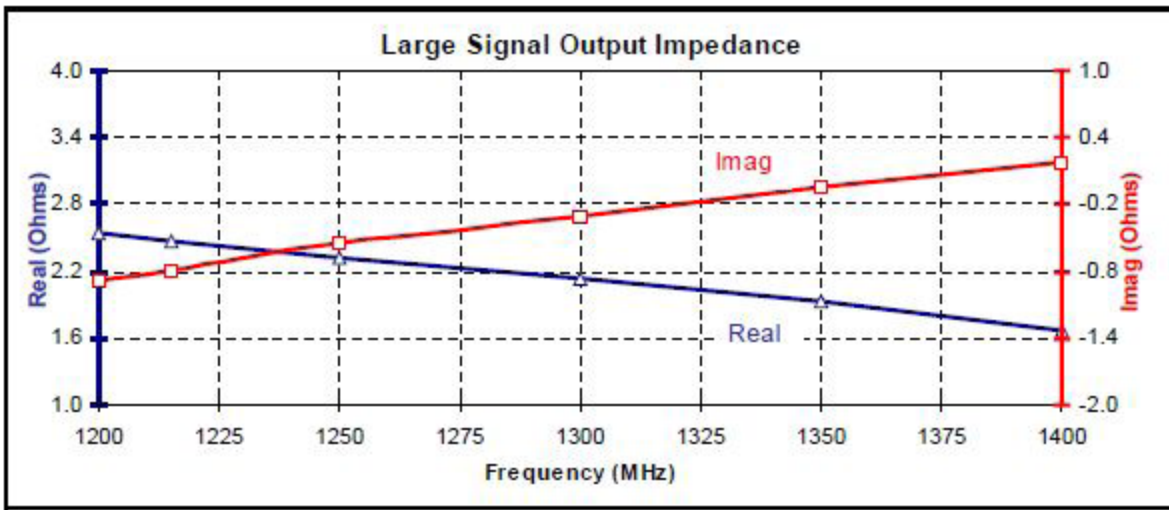
- Refractory/Gold Metalization
- Metal/Ceramic Hermetic Package
- Typical power out of 250 watts
- Two Stage Internal Matching
- Single Transistor Die Implementation

### Absolute Maximum Ratings

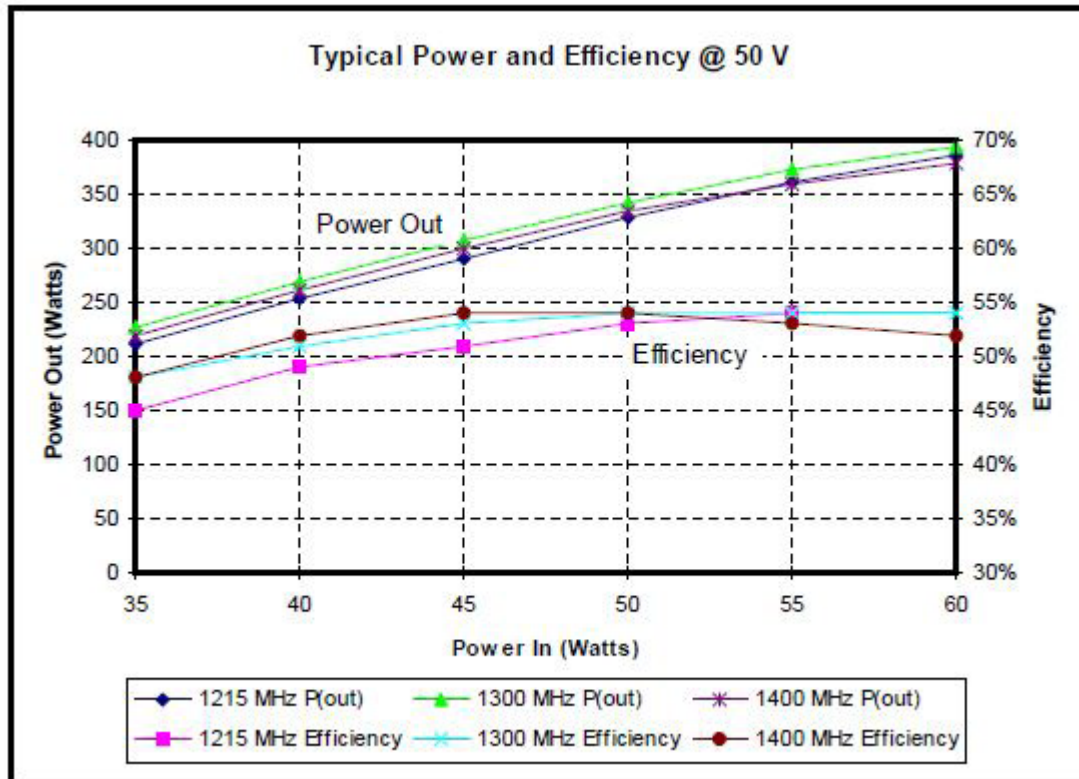
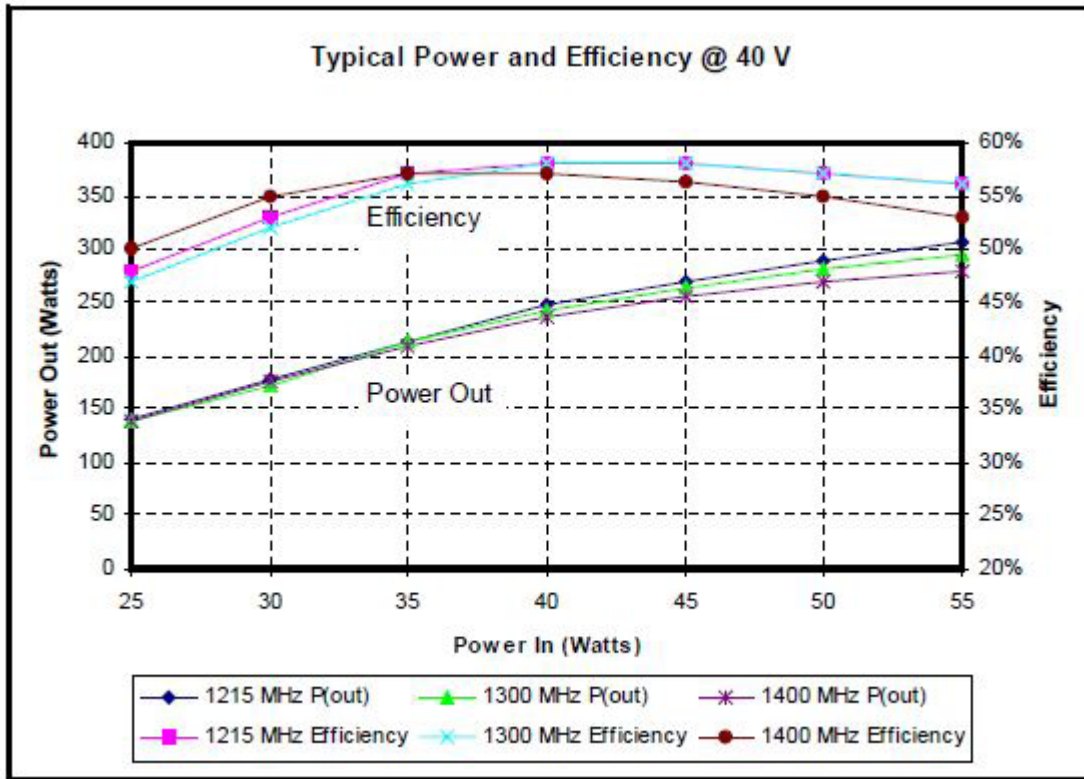
Storage Temperature .....	-65° to 200° C
Operating Junction Temperature .....	200° C
Lead Temperature (Soldering 10 sec) .....	300° C
Collector-Base Voltage .....	80V
Emitter-Base Voltage .....	3V
Peak Collector Current .....	18A
Transient Thermal Resistance .....	0.18°C/W

# Electrical Performance

Characteristic	Symbol	Min	Typ	Max	Units	Test Conditions
Collector-Base Breakdown Voltage	$BV_{cbo}$	70	85		Volts	$I = 10 \text{ mA}$
Emitter-Base Breakdown Voltage	$BV_{ebo}$	3			Volts	$I = 10 \text{ mA}$
Forward Current Transfer Ratio	$H_{fe}$	20	45	80		$V_{ce} = 5 \text{ V}$ $I_c = 500 \text{ mA}$
Common Base Power Gain		7.2		8.5	dB	$P_{in} = 42 \text{ W}$ $V_{cc} = 40 \text{ V}$ 150 ms 5% duty
Collector Efficiency		53			%	See above
Load Mismatch Tolerance		3:1			VSWR	
Frequency Band		1215		1400	MHz	

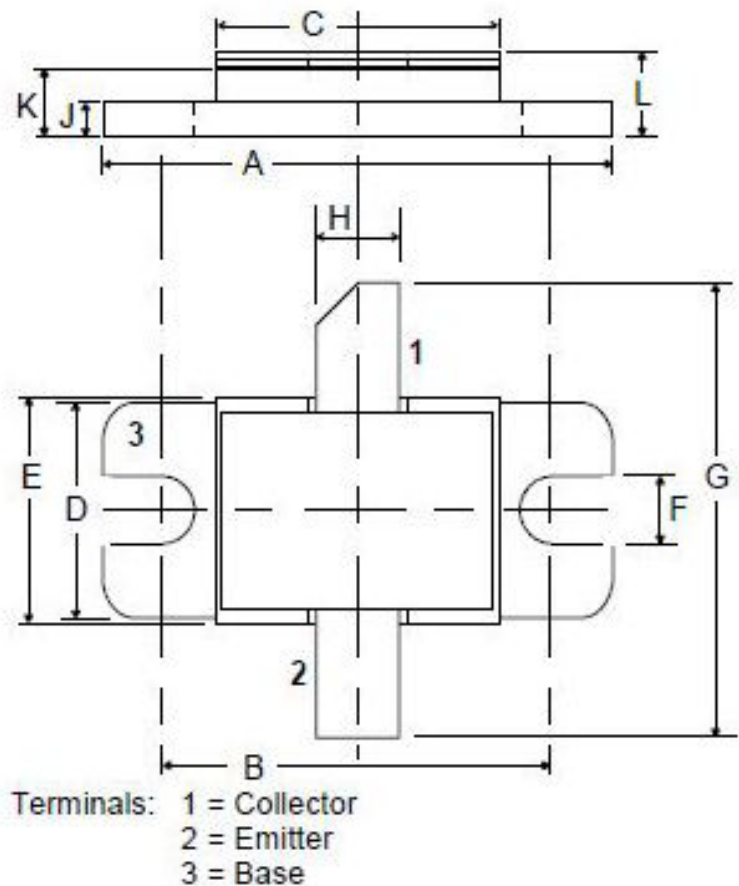


# Power Out and Efficiency

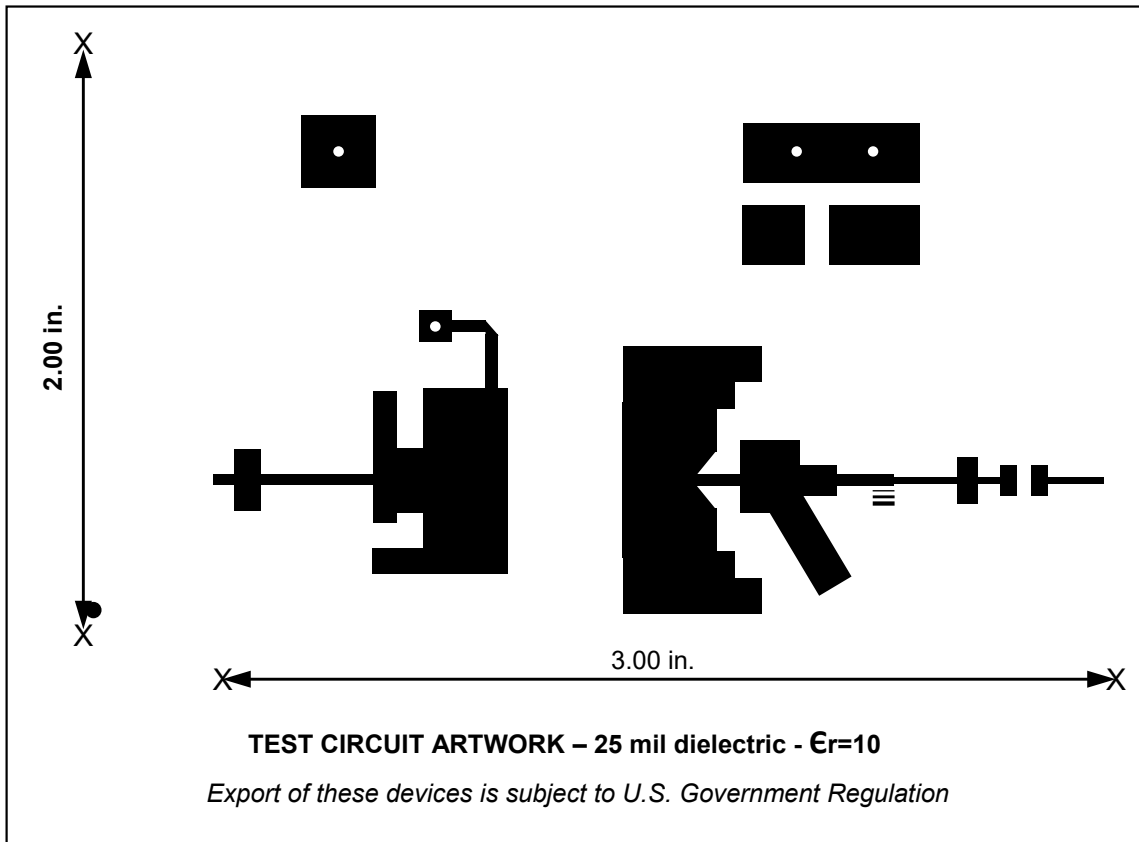


## Mechanical Data

Dimension	Inches		Millimeters	
	Min	Max	Min	Max
A	.890	.910	22.6	23.11
B	.695	.705	17.65	17.91
C	.495	.505	12.57	12.83
D	.380	.390	9.65	9.91
E	.395	.405	10.03	10.29
F	.115	.125	2.92	3.18
G	.770	.830	19.55	21.08
H	.145	.155	3.68	3.94
J	.055	.065	1.39	1.65
K	.110	.130	2.79	3.30
L	.150	.215	3.81	5.46

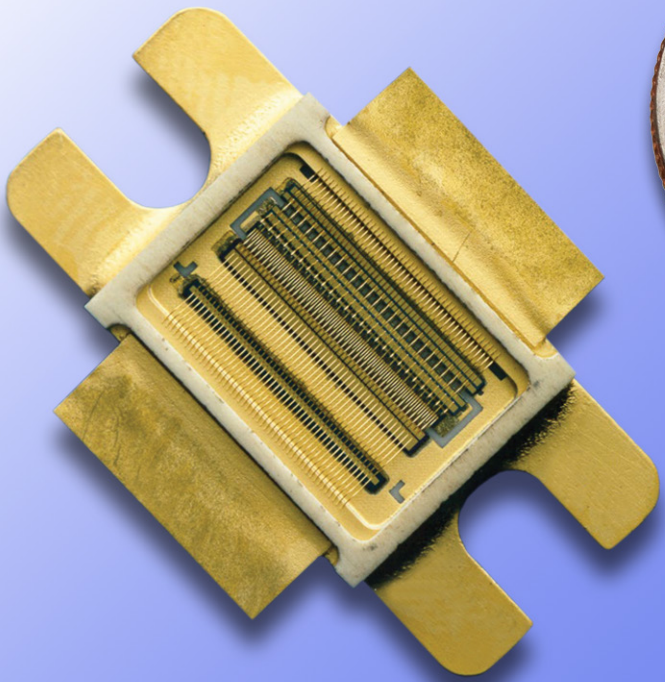






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# BIPOLAR RF TRANSISTORS

Class C 2.7-2.9 GHz

## Product Description

The WPTB48F2729Cx is an application specific transistor implemented using Northrop Grumman's SiGe Power Bipolar process and developed for pulsed radar systems. Optimal internal matching delivers high performance for Air Traffic Control applications with collector efficiencies approaching the values normally observed for L-Band devices operating at less than half the frequency. This device is configured for common base operation and is tested at 60  $\mu$ sec pulse width and 6% duty cycle.

## Features

- Silicon Germanium HBT Technology
- Refractory/Gold Metalization
- Two Stage Internal Matching
- Metal/Ceramic Hermetic Package
- Single Transistor Die Implementation

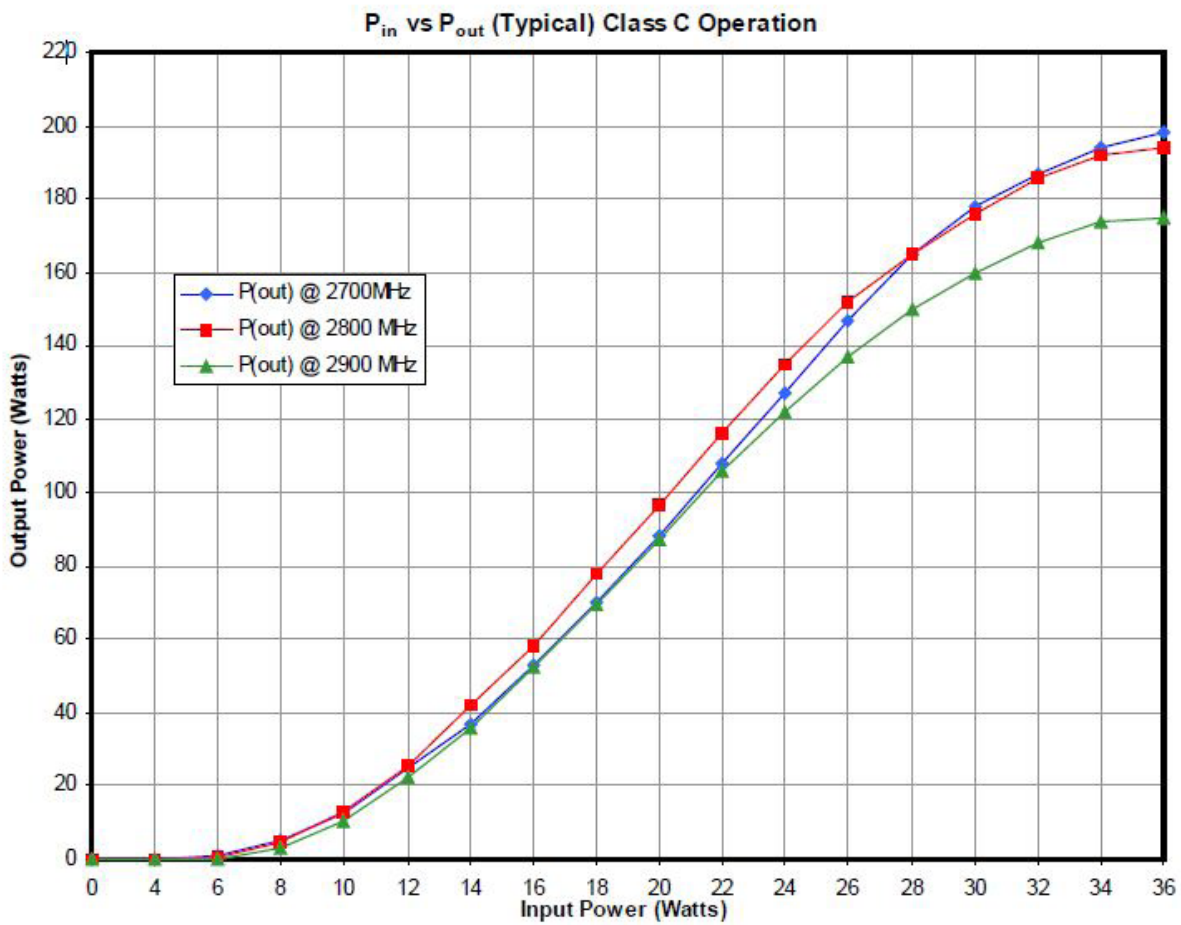
## Absolute Maximum Ratings

Storage Temperature .....	-65° to 200° C
Operating Junction Temperature .....	200° C
Lead Temperature (Soldering 10 sec) .....	300° C
Collector-Base Voltage .....	55V
Emitter-Base Voltage .....	3V
Peak Collector Current .....	14A
Transient Thermal Resistance .....	0.25°C/W

# Electrical Performance

Characteristic	Symbol	Min	Typ	Max	Units	Test Conditions
Collector-Base Breakdown Voltage	$BV_{cbo}$	55	60		Volts	$I = 10 \text{ mA}$
Emitter-Base Breakdown Voltage	$BV_{ebo}$	3	5		Volts	$I = 10 \text{ mA}$
Forward Current Transfer Ratio	$H_{fe}$	20	50	125		$V_{ce} = 5 \text{ V}$ $I_c = 500 \text{ mA}$
Common Base Power Gain		6.9	7.1	8	dB	Note 1
Collector Efficiency		40	46		%	Note 2
Load Mismatch Tolerance		2:1			VSWR	Note 1
Frequency Band		2.7		2.9	GHz	

Note 1:  $V_{cc} = 36 \text{ Volts}$ , Pulse Width = 60  $\mu\text{sec}$ , Duty = 6.33%,  $P_{in} = 28 \text{ Watts}$



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