

Preliminary Specification

THN6701B

NPN SiGe RF POWER TRANSISTOR

Applications

- UHF and VHF wide band amplifier

Features

- High power gain

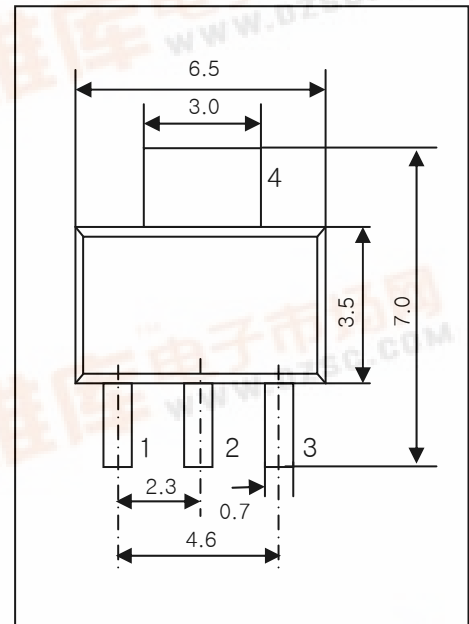
MAG = 15 dB @ $V_{CE} = 6\text{ V}$, $I_C = 400\text{ mA}$, $f = 465\text{ MHz}$

- High power

$P_{OUT} = 35\text{ dBm}(3\text{W})$ @ $V_{CE} = 6\text{ V}$, $I_{CQ} = 50\text{ mA}$, $f = 465\text{ MHz}$

SOT223

Unit in mm



PIN CONFIGURATION

- 1. Base
- 2. Emitter
- 3. Collector
- 4. Emitter

Absolute Maximum Ratings ($T_A = 25\text{ }^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit
Collector to Base Breakdown Voltage	BV_{CBO}	17	V
Collector to Emitter Breakdown Voltage	BV_{CEO}	12	V
Emitter to Base Breakdown Voltage	BV_{EBO}	1.5	V
Collector Current	I_C	1	A
Total Power Dissipation	P_{tot}	4.5	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 ~ 150	$^\circ\text{C}$



Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{th\ j-a}$	Thermal Resistance from Junction to Ambient	27	K/W

Electrical Characteristics ($T_A = 25\ ^\circ\text{C}$)

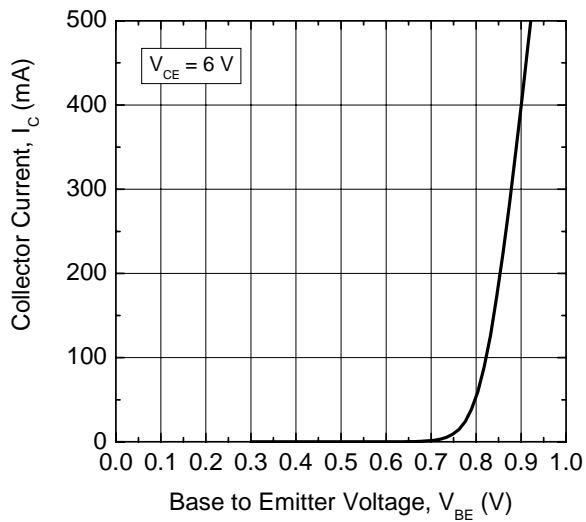
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector Cut-off Current	I_{CBO}	$V_{CB} = 15\ \text{V}, I_E = 0\ \text{mA}$	-	-	1.0	μA
	I_{CEO}	$V_{CE} = 11\ \text{V}, I_B = 0\ \text{mA}$	-	-	5.0	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 1.0\ \text{V}, I_C = 0\ \text{mA}$	-	-	1.0	μA
DC Current Gain	h_{FE}	$V_{CE} = 6\ \text{V}, I_C = 200\ \text{mA}$	40	-	300	
Reverse Transfer Capacitance	C_{re}	$V_{CB} = 6\ \text{V}, I_E = 0\ \text{mA}, f = 1\ \text{MHz}$	-	6.2	-	pF

h_{FE} Classification

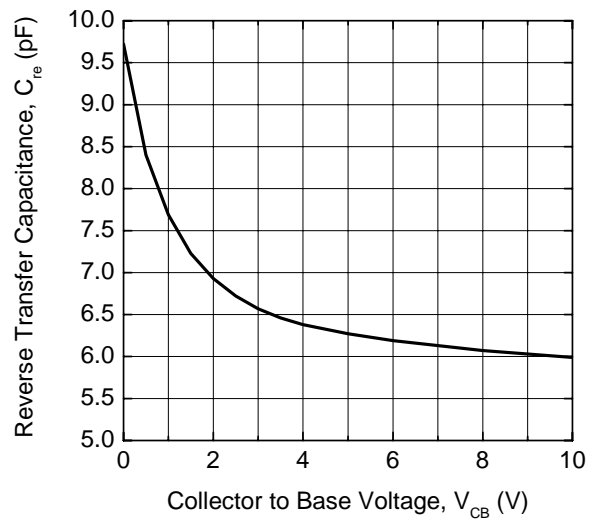
Marking	R6701	R6701'
h_{FE} Value	40 - 200	170 - 300

□ **Typical Characteristics ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified)**

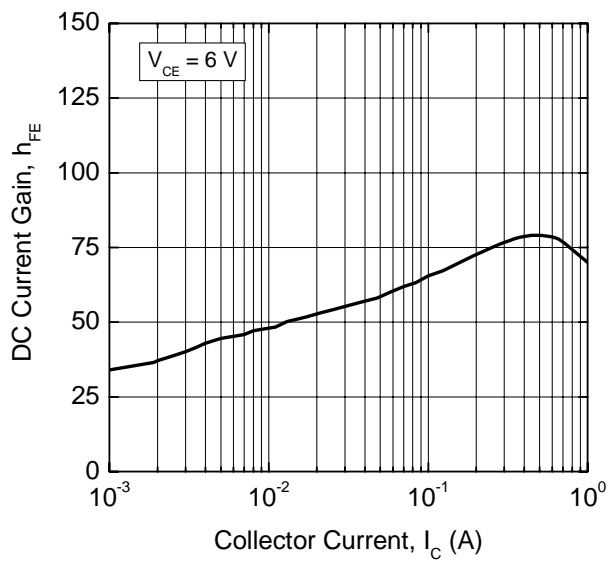
Collector Current vs. Base to Emitter Voltage



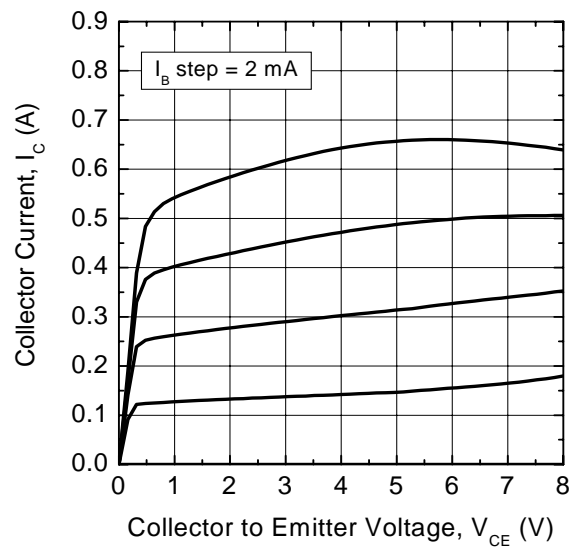
Reverse Transfer Capacitance vs. Collector to Base Voltage



DC Current Gain vs. Collector Current



Collector Current vs. Collector to Emitter Voltage

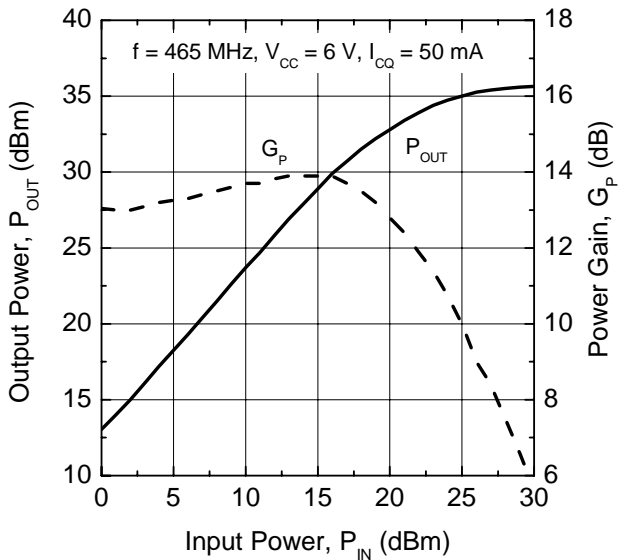


□ **Application Information**

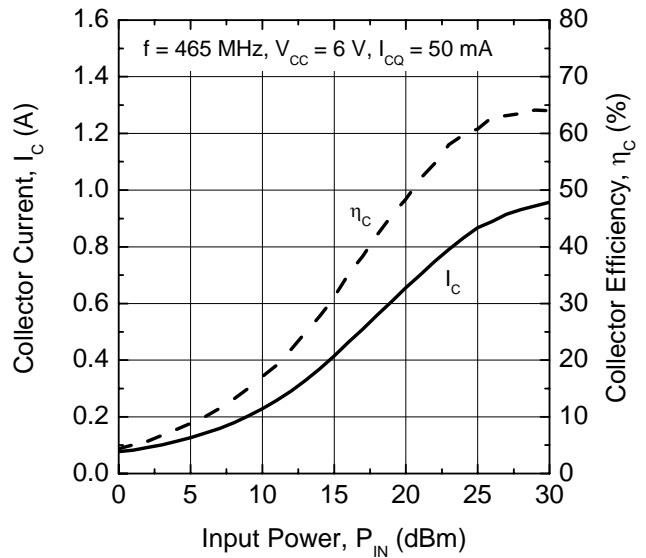
RF performance at $T_S \leq 60 \text{ }^\circ\text{C}$ in common emitter configuration

Operation Mode	f (MHz)	V_{CE} (V)	P_{OUT} (dBm)	G_P (dB)	η_C (%)
CW, class-AB	465	6	35	≥ 10	60

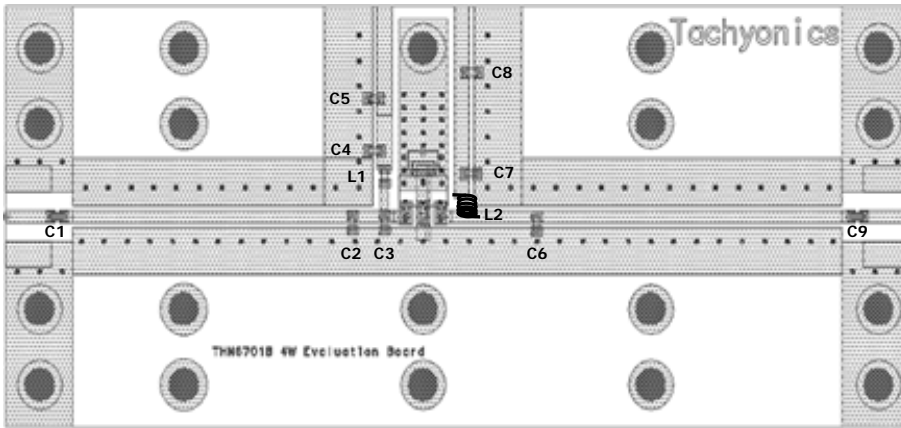
Output Power or Power Gain vs. Input Power



Collector Current or Collector Efficiency vs. Input Power



Evaluation Board (for FRS at 465 MHz)



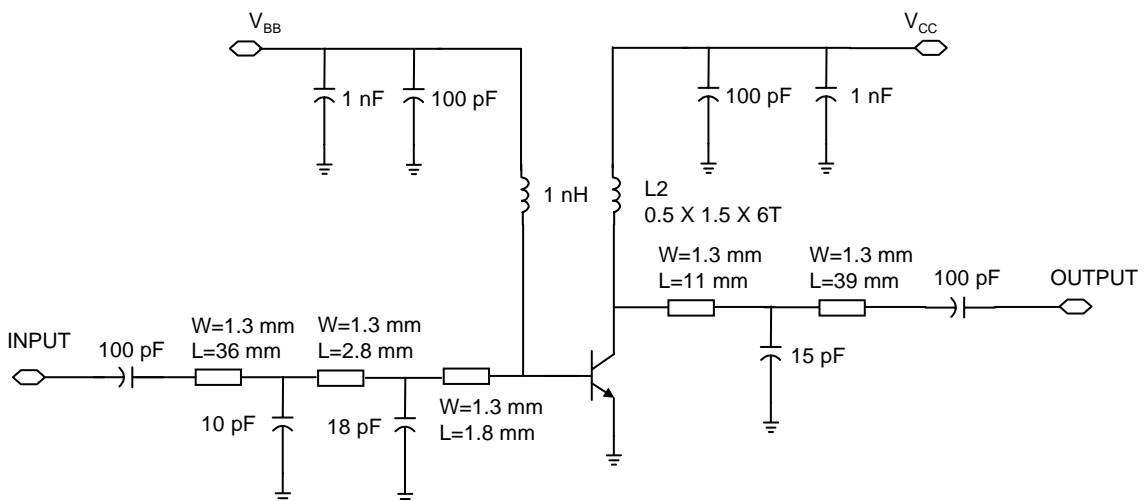
Part	Value
C1, C4 C7, C9	100 pF (1608, Murata)
C2	10 pF (1608, Murata)
C3	18 pF (1608, Murata)
C5, C8	1 nF (1608, Murata)
C6	15pF (1608, Murata)
L1	100 nH (1608, Murata)
L2	0.4 X 1.5 X 6T (Air Coil)

FR4 glass epoxy: dielectric constant = 4.5, thickness = 0.8 mm

Evaluation board dimension = 119 x 50 mm²

Test condition: CW test, V_{CC} = 6.0 V, I_{CQ} = 50 mA, f = 465 MHz

Test Circuit Schematic Diagram



□ Package Dimensions

