

**NPN SiGe RF POWER TRANSISTOR**

**Applications**

- UHF and VHF wide band amplifier

**Features**

- High power gain

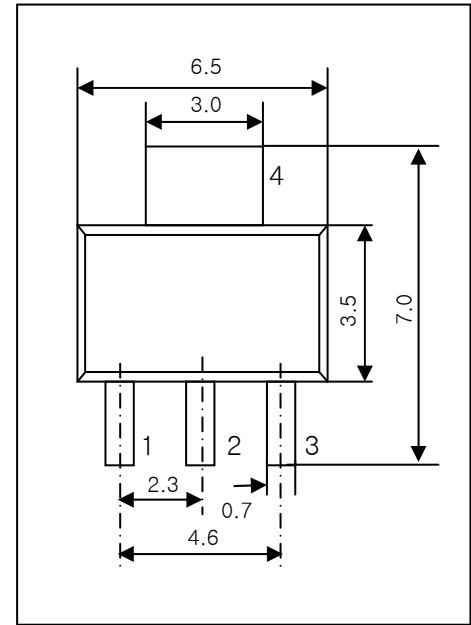
MAG = 15 dB @  $V_{CE} = 6\text{ V}$ ,  $I_C = 400\text{ mA}$ ,  $f = 465\text{ MHz}$

- 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 ( $T_A = 25\ ^\circ\text{C}$ )**

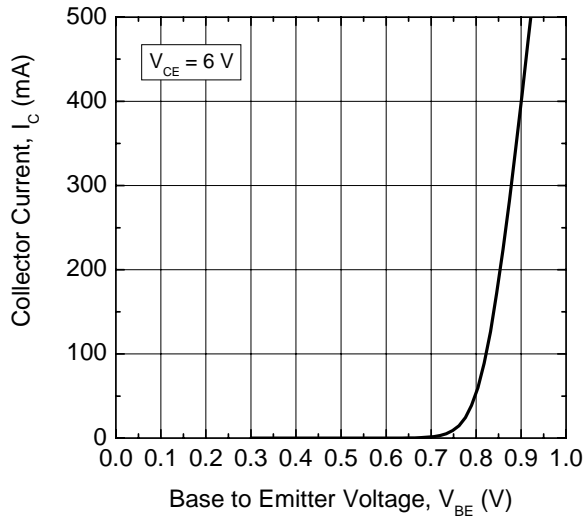
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 15\ \text{V}, I_E = 0\ \text{mA}$	-	-	1.0	$\mu\text{A}$
	$I_{CEO}$	$V_{CE} = 11\ \text{V}, I_B = 0\ \text{mA}$	-	-	5.0	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 1.0\ \text{V}, I_C = 0\ \text{mA}$	-	-	1.0	$\mu\text{A}$
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**

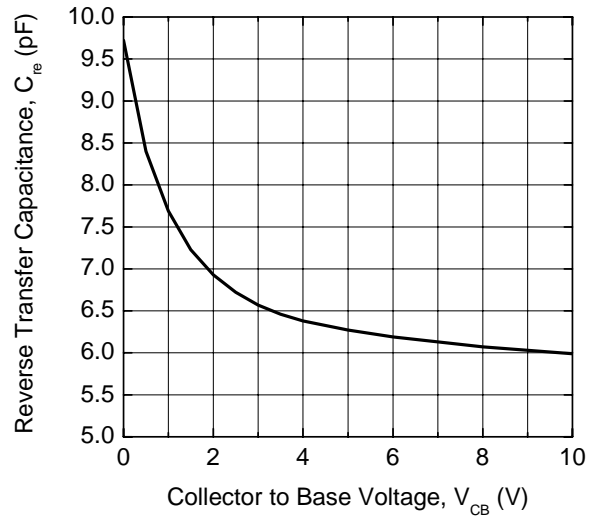
Marking	R6701	R6701·
$h_{FE}$ Value	40 - 200	170 - 300

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

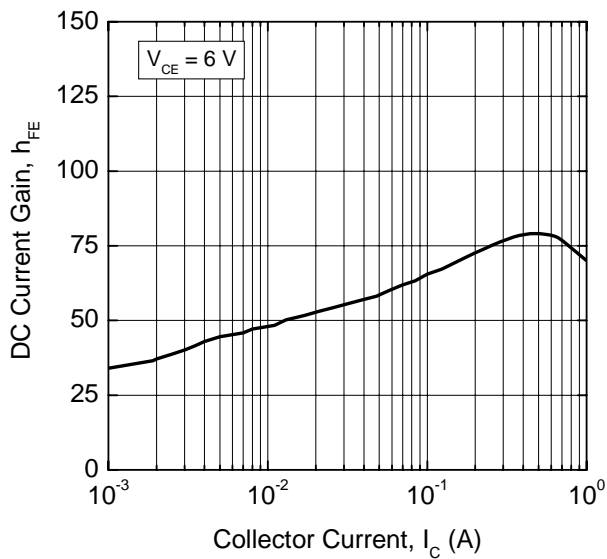
Collector Current vs. Base to Emitter Voltage



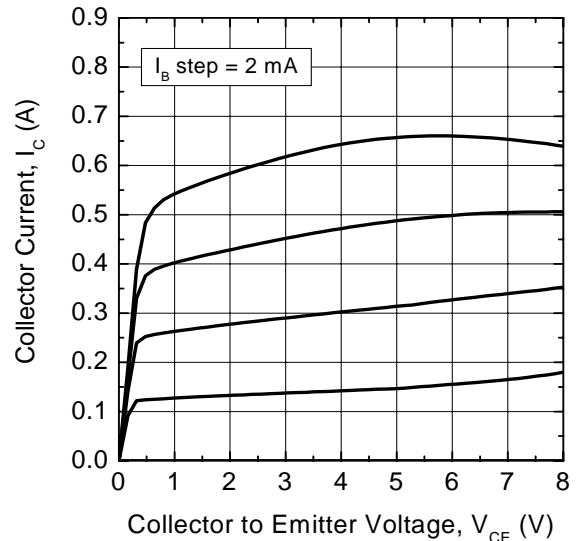
Reverse Transfer Capacitance vs. Collector to Base Voltage



DC Current Gain vs. Collector Current



Collector Current vs. Collector to Emitter Voltage

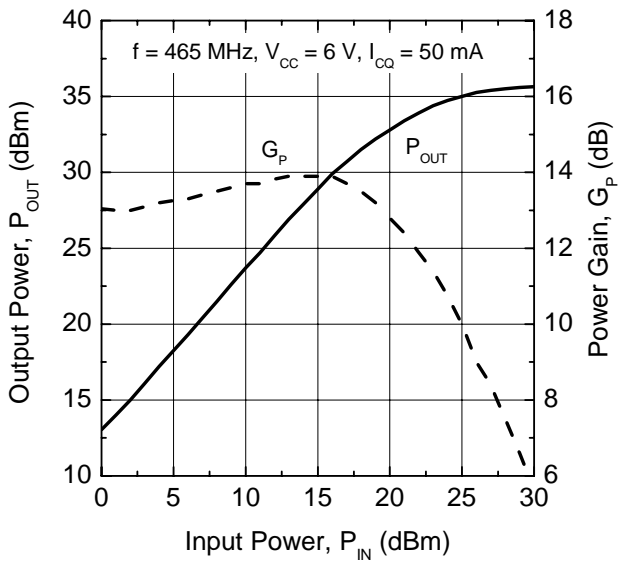


□ **Application Information**

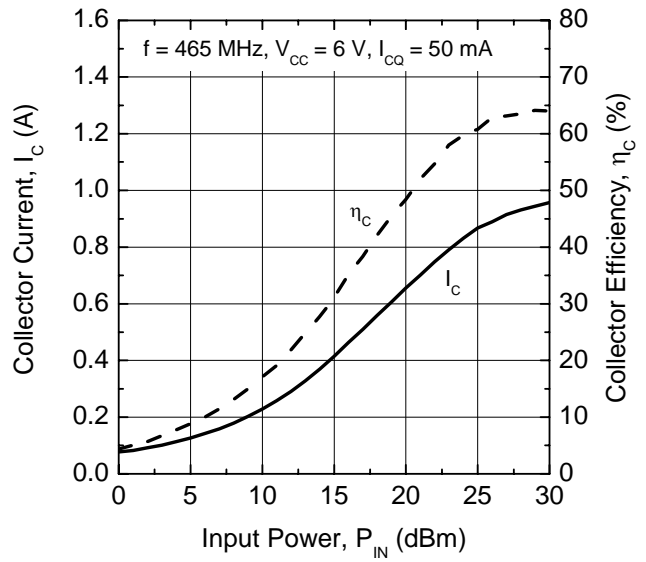
RF performance at  $T_S \leq 60 \text{ }^\circ\text{C}$  in common emitter configuration

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

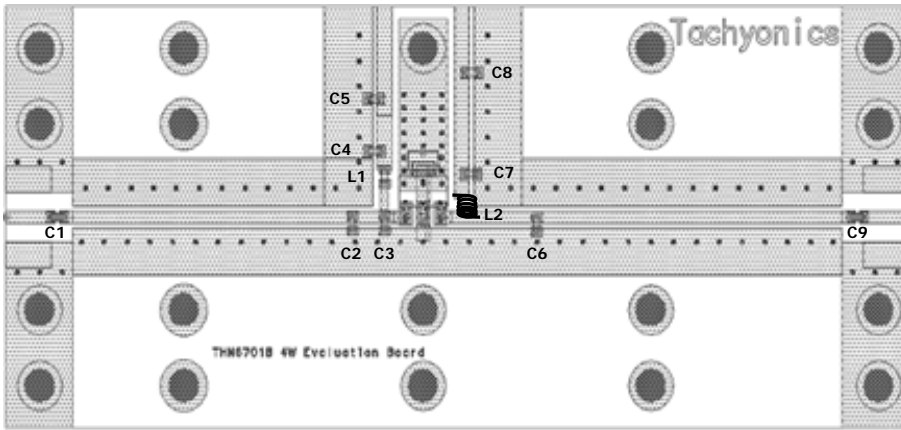
**Output Power or Power Gain vs. Input Power**



**Collector Current or Collector Efficiency vs. Input Power**



□ **Evaluation Board (for FRS at 465 MHz)**



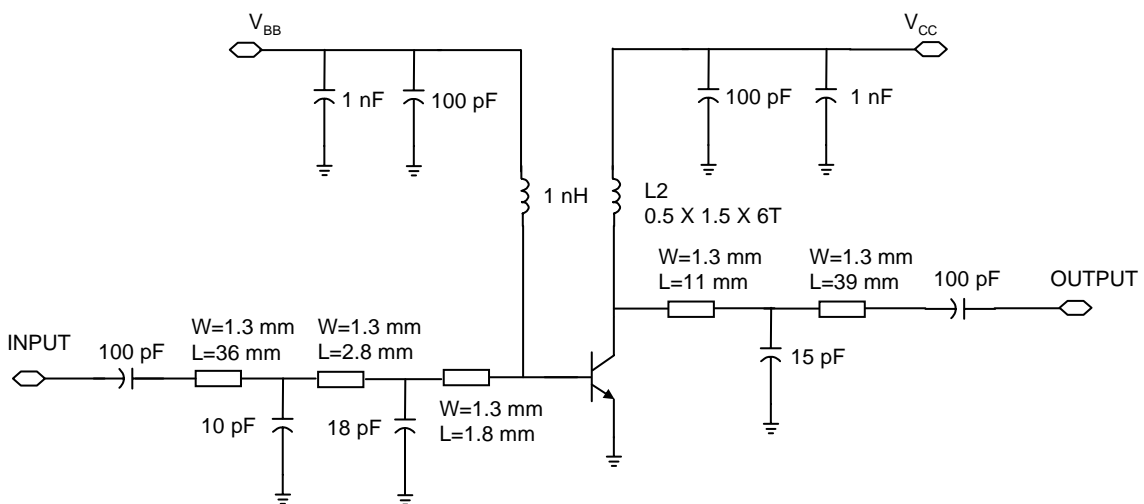
Part	Value
C1, C4 C7, C9	100 pF (1608, Murata)
C2	10 pF (1608, Murata)
C3	18 pF (1608, Murata)
C5, C8	1 nF (1608, Murata)
C6	15pF (1608, Murata)
L1	100 nH (1608, Murata)
L2	0.4 X 1.5 X 6T (Air Coil)

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

Evaluation board dimension = 119 x 50 mm<sup>2</sup>

Test condition: CW test, V<sub>CC</sub> = 6.0 V, I<sub>CQ</sub> = 50 mA, f = 465 MHz

□ **Test Circuit Schematic Diagram**



□ Package Dimensions

