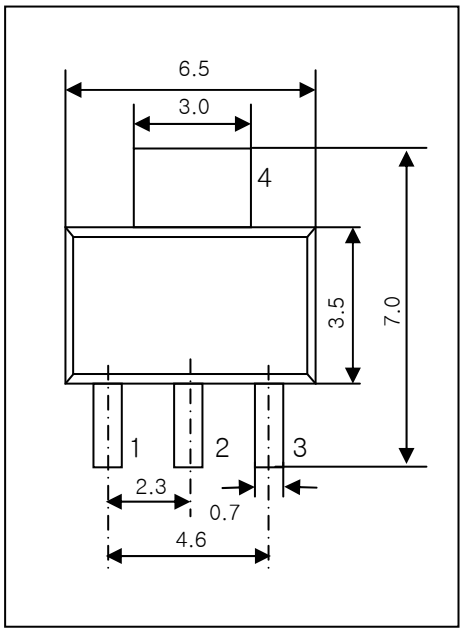
Specification	**THN6601B**

NPN SiGe RF TRANSISTOR

SOT223 **Unit in mm**



PIN CONFIGURATION

1. Emitter

2. Base

3. Emitter

4. Collector

☐ *Applications*

- UHF and VHF wide band amplifier

☐ *Features*

- High gain bandwidth product

  f_T = 7 GHz

- High power gain

  $|S_{21}|^2$ = 7 dB @ V_{CE} = 5 V, I_C = 100 mA, f = 1 GHz

- High power

  P_{OUT} = 32 dBm (1.5 W) @ V_{CE} = 6 V, I_{CQ} = 5 mA, f = 465 MHz

☐ *Absolute Maximum Ratings* (T_A = 25 ℃)

Parameter	Symbol	Ratings	Unit
Collector to Base Breakdown Voltage	BV_{CBO}	20	V
Collector to Emitter Breakdown Voltage	BV_{CEO}	12	V
Emitter to Base Breakdown Voltage	BV_{EBO}	3	V
Collector Current	I_C	500	mA
Total Power Dissipation	P_{tot}	1.5	W
Junction Temperature	T_j	150	℃
Storage Temperature	T_{stg}	-65 ~ 150	℃

☐ *Thermal Characteristics*

Symbol	Parameter	Condition	Value	Unit
R_{th} j-s	Thermal resistance from junction to soldering point	P_{tot} = 1.5 W; T_S = 60 ℃; note 1	55	K/W

Note 1. T_S is the temperature at the soldering point of the collector pin.

☐ *Electrical Characteristics* (T_A = 25 ℃)

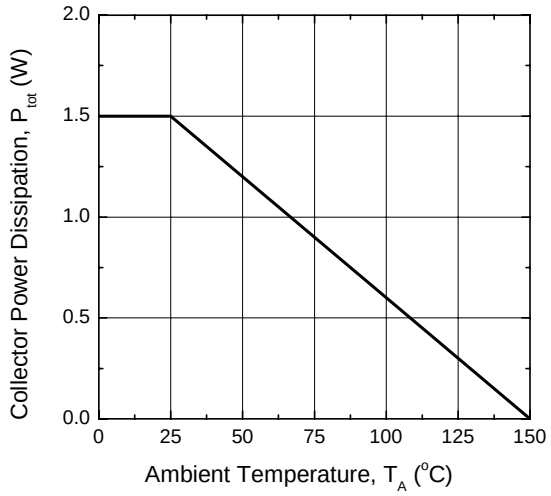
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector Cut-off Current	I_{CBO}	V_{CB} = 19 V, I_E = 0 mA			0.5	㎂
	I_{CEO}	V_{CE} = 12 V, I_B = 0 mA			10	㎂
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1.5 V, I_C = 0 mA			0.5	㎂
DC Current Gain	h_{FE}	V_{CE} = 5 V, I_C = 100 mA	50		300	
Gain Bandwidth Product	f_T	V_{CE} = 5 V, I_C = 100 mA	4	6		GHz
		V_{CE} = 7 V, I_C = 100 mA	5	7.0		GHz
Maximum Available Gain	MAG	V_{CE} = 5 V, I_C = 100 mA, f = 1 GHz	8	11		dB
		V_{CE} = 7 V, I_C = 100 mA, f = 1 GHz	9	12		dB
Insertion Power Gain	$\|S_{21}\|^2$	V_{CE} = 5 V, I_C = 100 mA, f = 1 GHz	5	7		dB
		V_{CE} = 7 V, I_C = 100 mA, f = 1 GHz	5	7		dB
Reverse Transfer Capacitance	C_{re}	V_{CB} = 6 V, I_E = 0 mA, f = 1 MHz		1.9		pF

☐ *h_{FE} Classification*

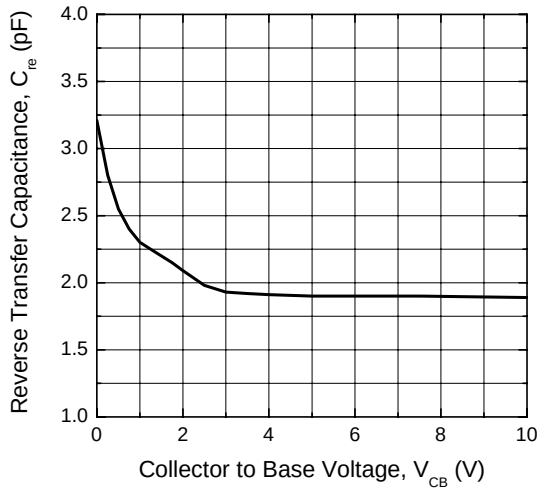
Marking	R1601	R1601·
h_{FE} Value	50 - 200	170 - 300

☐ *Typical Characteristics (T_A = 25 ℃, unless otherwise specified)*

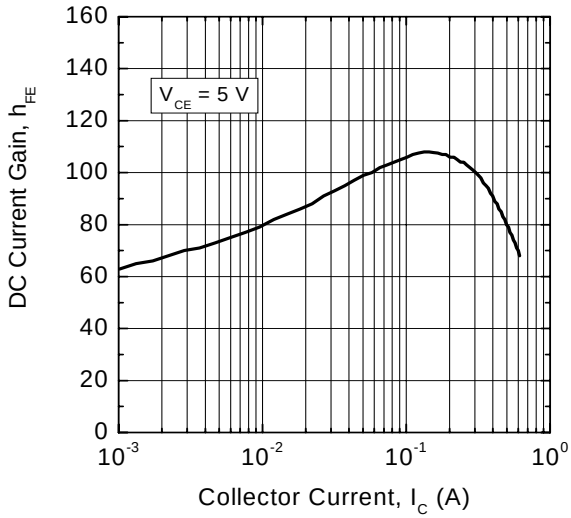
Power Dissipation vs. Ambient Temperature



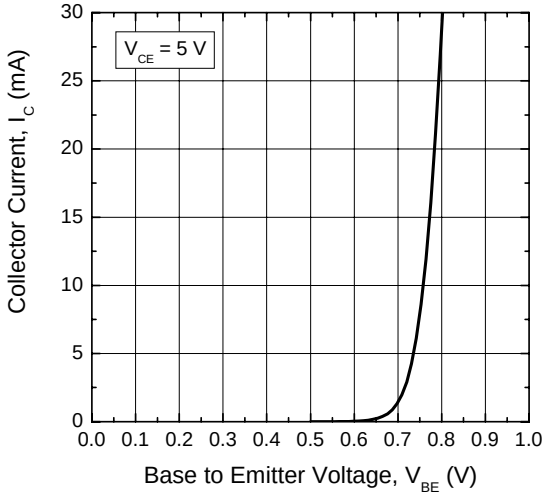
Reverse Transfer Capacitance vs. Collector to Base Voltage



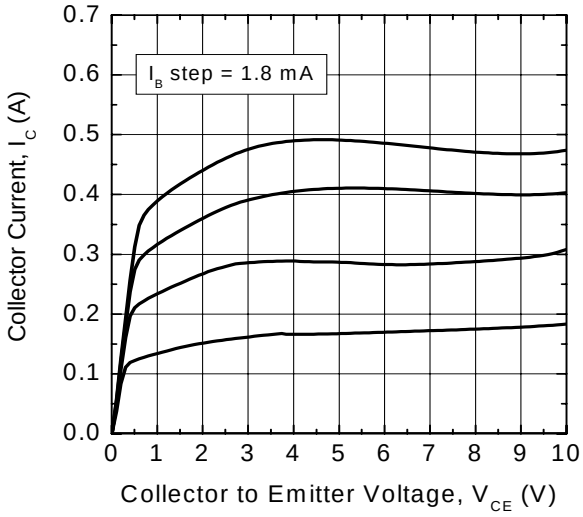
DC Current Gain vs. Collector Current



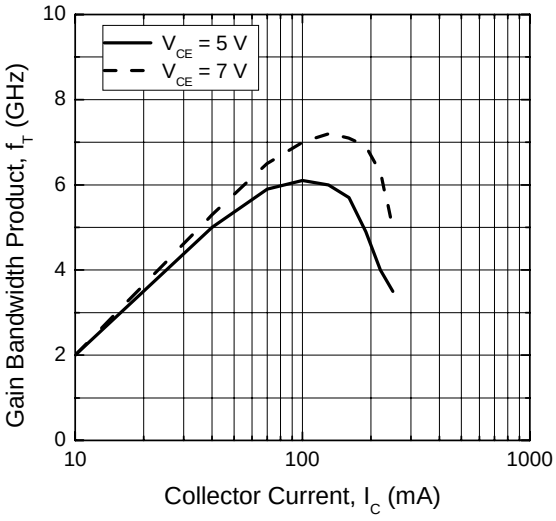
Collector Current vs. Base to Emitter Voltage



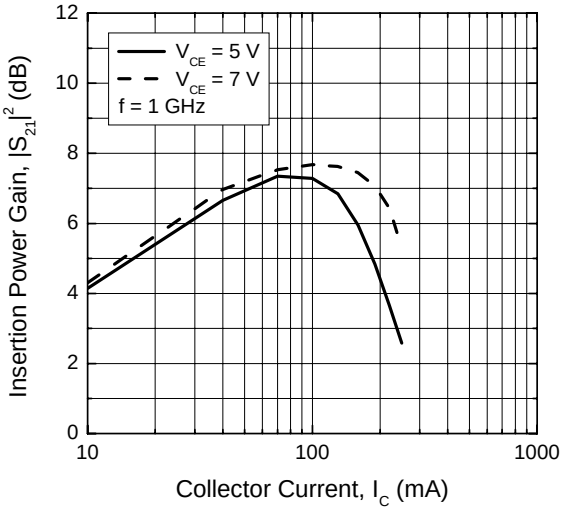
Collector Current vs. Collector to Emitter Voltage



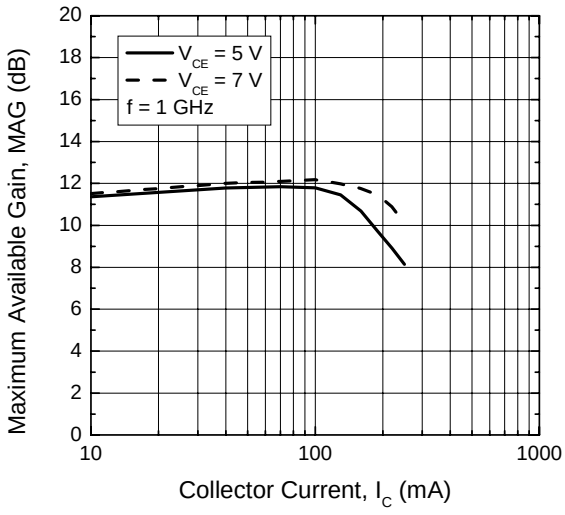
Gain Bandwidth Product vs. Collector Current



Insertion Power Gain vs. Collector Current



Maximum Available Gain vs. Collector Current

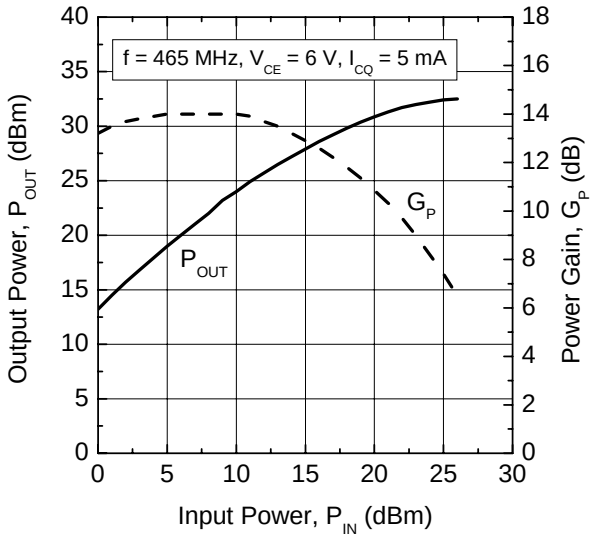


☐ *Application Information*

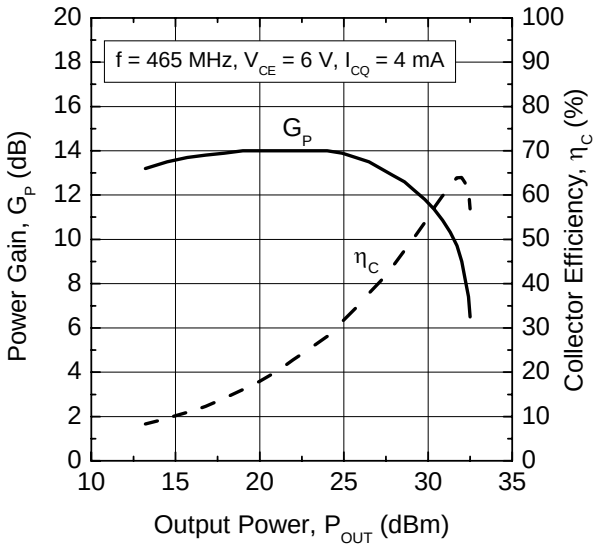
RF performance at $T_S \leq 60$ ℃ in common emitter configuration

Operation Mode	f (MHz)	V_{CE} (V)	P_{OUT} (dBm)	G_P (dB)	η_C (%)
CW, class-AB	465	6	30	≥ 11	56

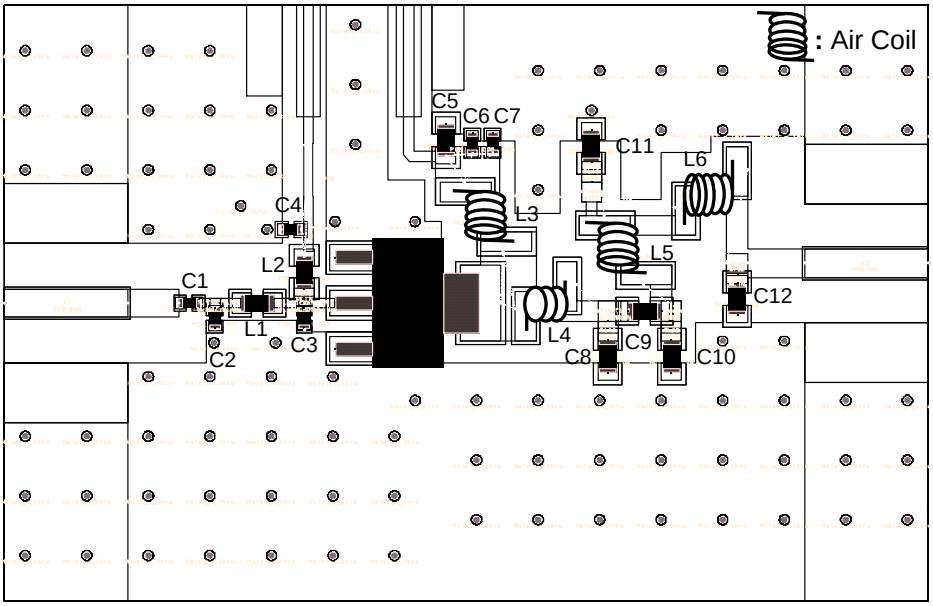
Output Power or Power Gain vs. Input Power



Power Gain or Collector Efficiency vs. Output Power



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

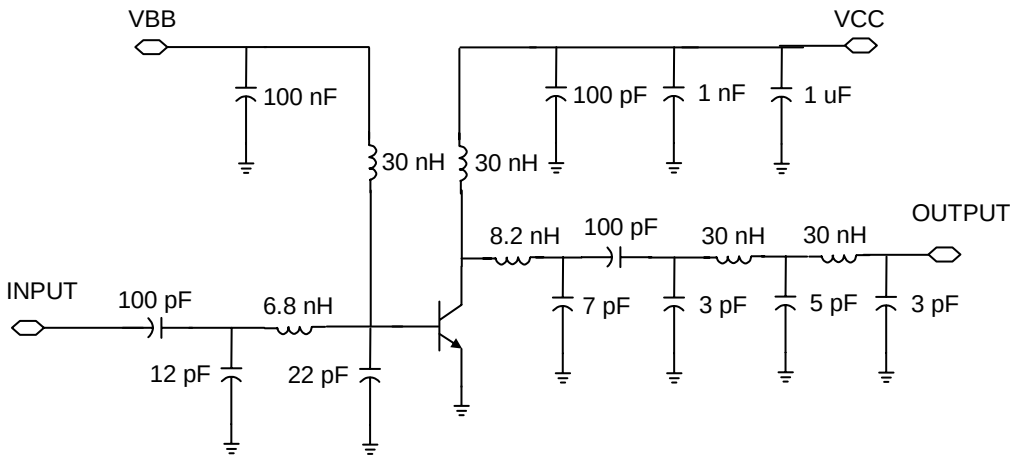


Part	Value
C1, C4, C5, C9	100 pF
C2	12 pF
C3	22 pF
C6	1 nF
C7	1 uF
C8	7 pF
C10, C12	3 pF
C11	5 pF
L1	6.8 nH
L2	100 nH
L3, L5, L6	30 nH
L4	8.2 nH

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

Evaluation board dimension = 45 x 30 mm^2

☐ *Test Circuit Schematic Diagram*



☐ Package Dimensions

Unit : mm