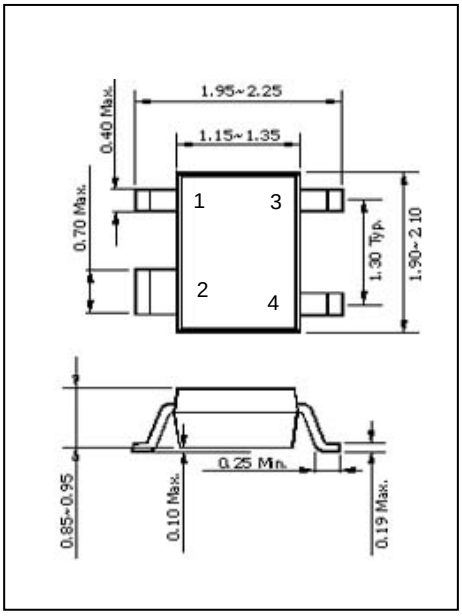
AUK Semiconductor

THN405Z

SiGe NPN Transistor

SOT-343 **Unit in mm**



☐ *Applications*

- Low noise amplifier, oscillator and buffer amplifier up to 3 GHz

☐ *Features*

- High gain bandwidth product

  f_T = 17 GHz at V_{CE} = 2 V, I_C = 10 mA

  f_T = 19 GHz at V_{CE} = 3 V, I_C = 15 mA

- High power gain

  $|S_{21}|^2$ = 15 dB at V_{CE} = 2 V, I_C = 5 mA, f = 1.8 GHz

  MAG = 20 dB at V_{CE} = 2 V, I_C = 5 mA, f = 1.8 GHz

- Low noise figure

  NF = 1.4 dB at V_{CE} = 2 V, I_C = 2 mA, f = 1.8 GHz

Pin Configuration

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

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

Parameter	Symbol	Ratings	Unit
Collector to Base Breakdown Voltage	BV_{CBO}	10	V
Collector to Emitter Breakdown Voltage	BV_{CEO}	4.5	V
Emitter to Base Breakdown Voltage	BV_{EBO}	1.5	V
Collector Current	I_C	25	mA
Total Power Dissipation	P_{tot}	75	mW
Operating Junction Temperature	T_j	150	℃
Storage Temperature	T_{stg}	-65 ~ 150	℃

Caution : **E**lectro **S**tatic **D**ischarge sensitive device

☐ *Electrical Characteristics* (T_A = 25 ℃)

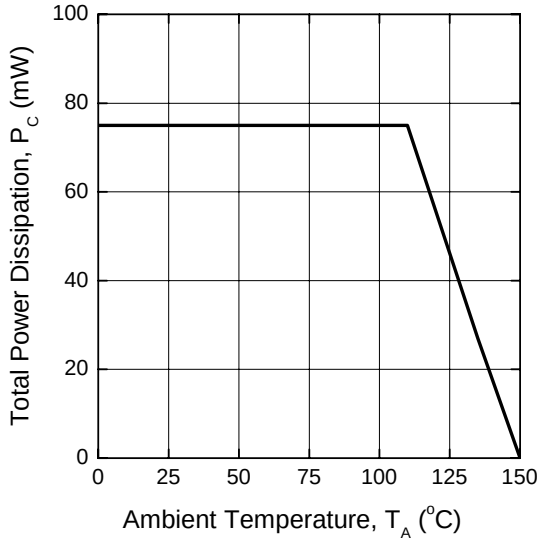
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector Cut-off Current	I_{CBO}	V_{CB} = 9 V, I_E = 0 mA	-	-	1.0	㎂
	I_{CEO}	V_{CE} = 3 V, I_B = 0 mA	-	-	1.0	㎂
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1 V, I_C = 0 mA	-	-	0.5	㎂
DC Current Gain	h_{FE}	V_{CE} = 3 V, I_C = 5 mA	50	-	260	
Gain Bandwidth Product	f_T	V_{CE} = 2 V, I_C = 10 mA	15	17	-	GHz
		V_{CE} = 3 V, I_C = 15 mA	16	19	-	GHz
Maximum Available Gain	MAG	V_{CE} = 2 V, I_C = 5 mA, f = 1.0 GHz	21	23	-	dB
		V_{CE} = 2 V, I_C = 5 mA, f = 1.8 GHz	18	20	-	dB
Insertion Power Gain	$\|S_{21}\|^2$	V_{CE} = 2 V, I_C = 5 mA, f = 1.0 GHz	16	18	-	dB
		V_{CE} = 2 V, I_C = 5 mA, f = 1.8 GHz	13	15	-	dB
Noise Figure	NF	V_{CE} = 2 V, I_C = 2 mA, f = 1.8 GHz	-	1.4	2.0	dB
Reverse Transfer Capacitance	C_{re}	V_{CB} = 2 V, I_E = 0 mA, f = 1 MHz	-	0.07	-	pF

☐ h_{FE} *Classification*

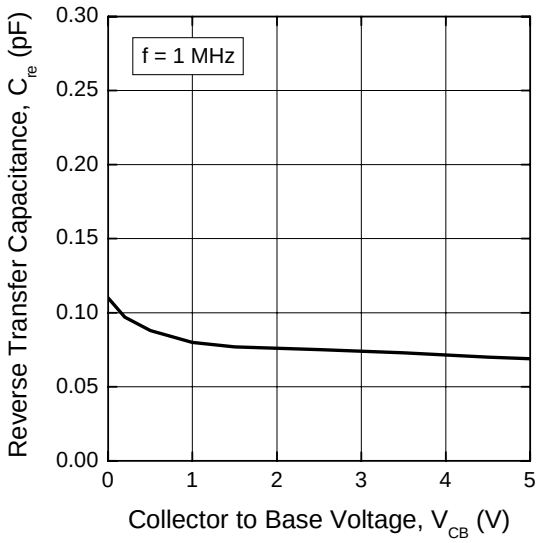
Marking	BF1	BF2
h_{FE} Value	50 - 150	130 - 260

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

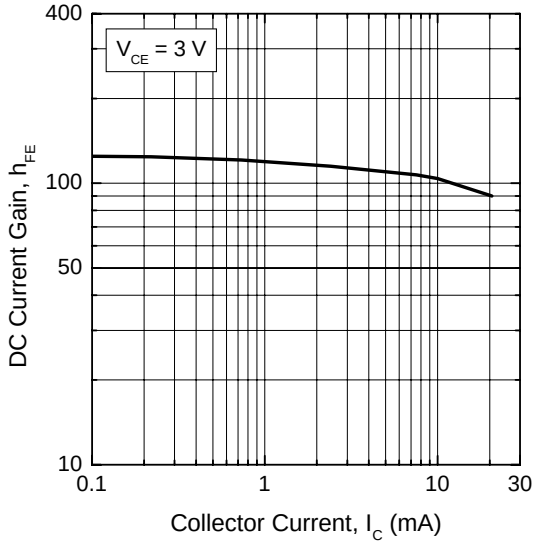
Power Dissipation vs. Ambient Temperature



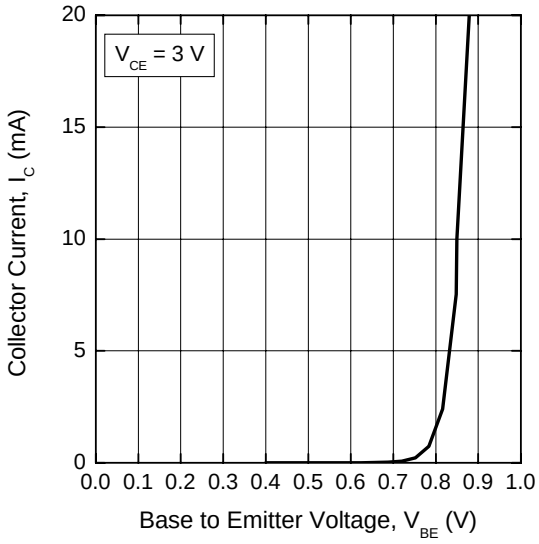
Collector to Base Capacitance vs. Collector to Base Voltage



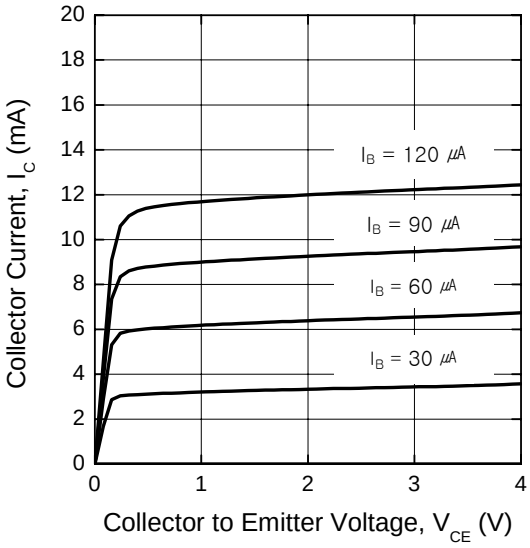
DC Current Gain vs. Collector Current



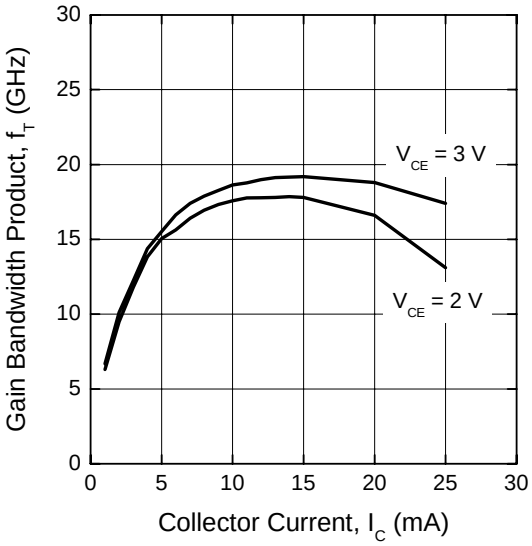
Collector Current vs. Base to Emitter Voltage



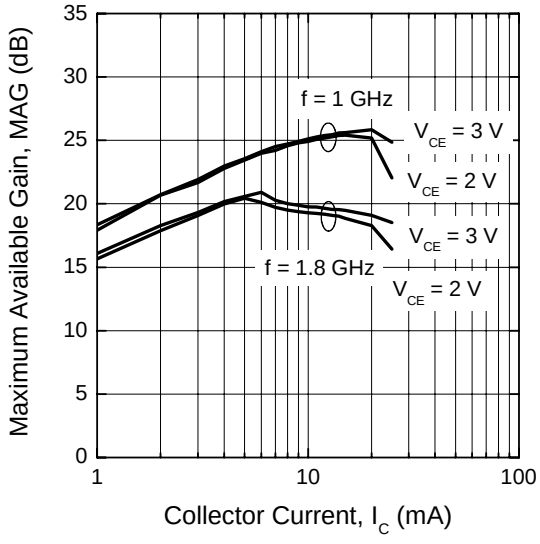
Collector Current vs. Collector to Emitter Voltage



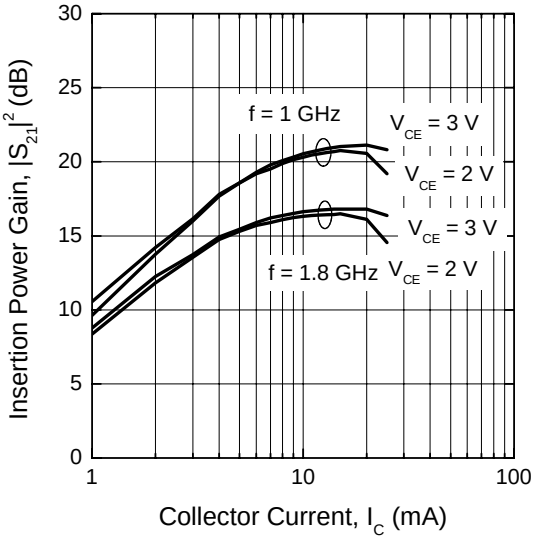
Gain Bandwidth Product vs. Collector Current



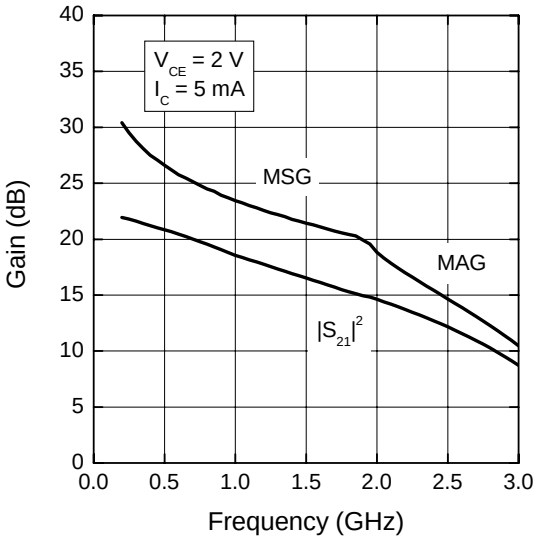
Maximum Available Gain vs. Collector Current

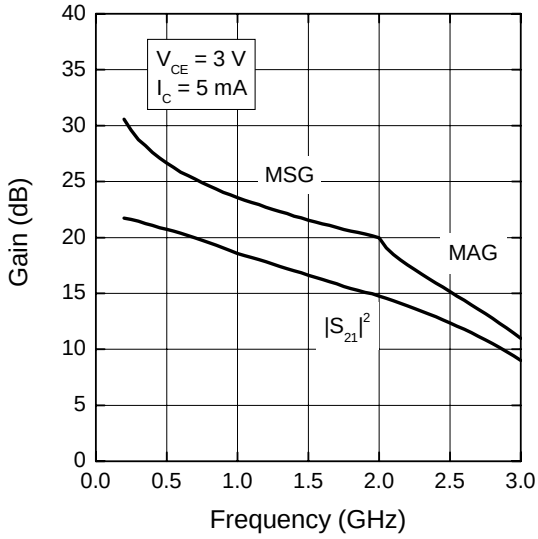


Insertion Power Gain vs. Collector Current



Power Gain
vs. Frequency





Noise Figure
vs. Collector Current

at V_{CE} = 2 V, I_C =parameters, Z_S = Z_{Sopt}