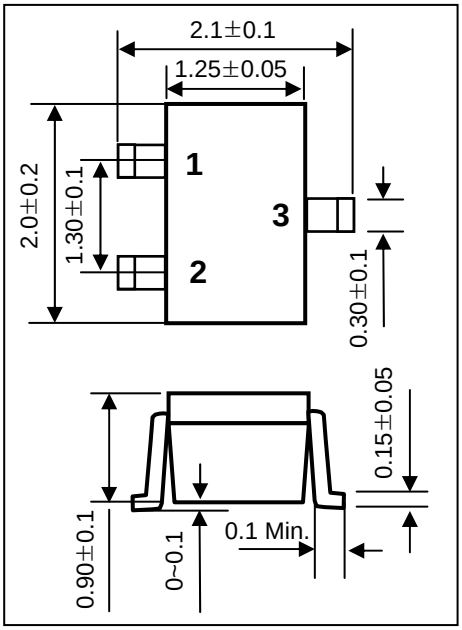
AUK Semiconductor

TBN6301 Series

Si NPN Transistor

SOT-323 **Unit in mm**



Pin Configuration

1. Base
2. Emitter
3. Collector

☐ *Applications*

- VHF and UHF wide band amplifier

☐ *Features*

- High gain bandwidth product

  f_T = 6 GHz at V_{CE} = 3 V, I_C = 10 mA

  f_T = 7.5 GHz at V_{CE} = 5 V, I_C = 20 mA

- High power gain

  $|S_{21}|^2$ = 9 dB at V_{CE} = 3 V, I_C = 10 mA, f = 1 GHz

- Low noise figure

  NF = 1.4 dB at V_{CE} = 3 V, I_C = 10 mA, f = 1 GHz

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

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	BV_{CBO}	20	V
Collector to Emitter Voltage	BV_{CEO}	8	V
Emitter to Base Voltage	BV_{EBO}	3	V
Collector Current	I_C	75	mA
Total Power Dissipation	P_{tot}	150	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} = 15 V, I_E = 0 mA			0.5	μA
	I_{CEO}	V_{CE} = 8 V, I_B = 0 mA			10	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 2 V, I_C = 0 mA			0.5	μA
DC Current Gain	h_{FE}	V_{CE} = 3 V, I_C = 10 mA	80		250	
Gain Bandwidth Product	f_T	V_{CE} = 3 V, I_C = 10 mA	5	6		GHz
		V_{CE} = 5 V, I_C = 20 mA	6	7.5		GHz
Insertion Power Gain	$\|S_{21}\|^2$	V_{CE} = 3 V, I_C = 10 mA, f = 1 GHz	7	9		dB
		V_{CE} = 5 V, I_C = 20 mA, f = 1 GHz	7	9.5		dB
Noise Figure	NF	V_{CE} = 3 V, I_C = 10 mA, f = 1 GHz		1.4	1.8	
Reverse Transfer Capacitance	C_{re}	V_{CB} = 3 V, I_E = 0 mA, f = 1 MHz		1.1		pF

☐ *h_{FE} Classification*

Marking	SB2	SB1
h_{FE} Value	80 - 160	125 - 250

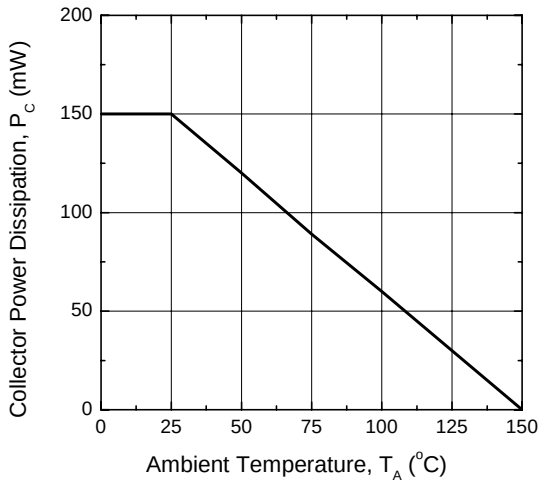
☐ *Available Package*

Unit in mm

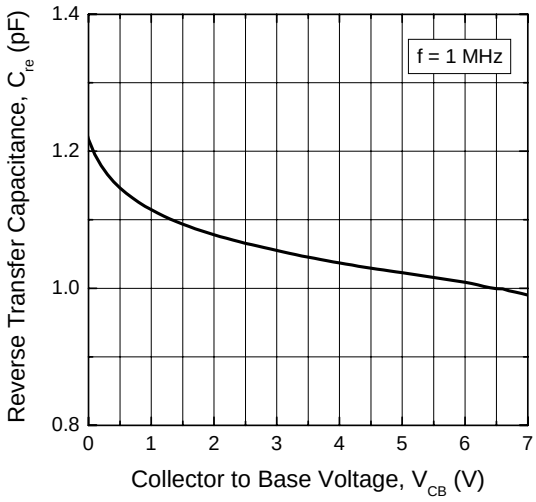
Product	Package	Dimension
TBN6301U	SOT-323	2.0 x 1.25, 1.0t
TBN6301E	SOT-523	1.6 x 0.8, 0.8t

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

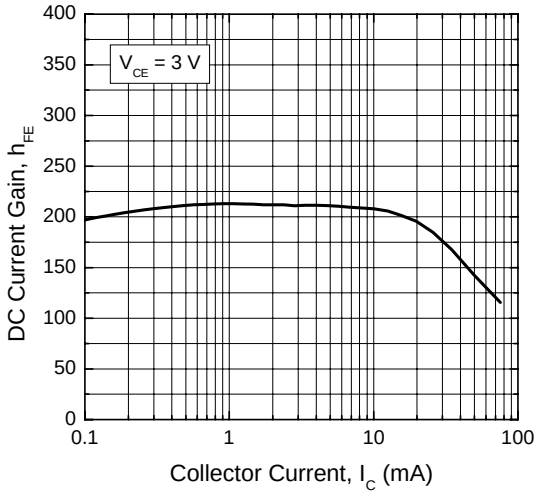
Power Dissipation vs. Ambient Temperature



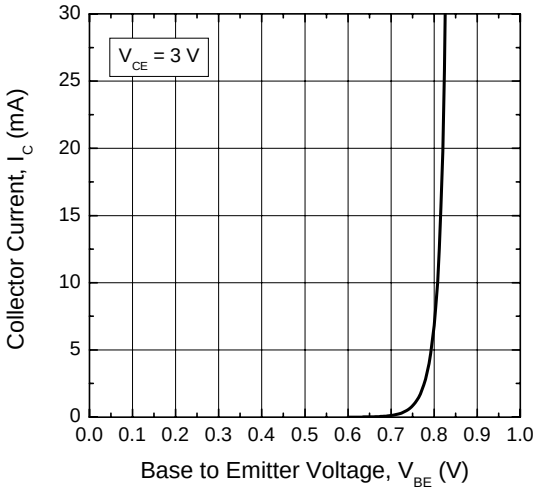
Reverse Transfer Capacitance vs. Collector to Base Voltage



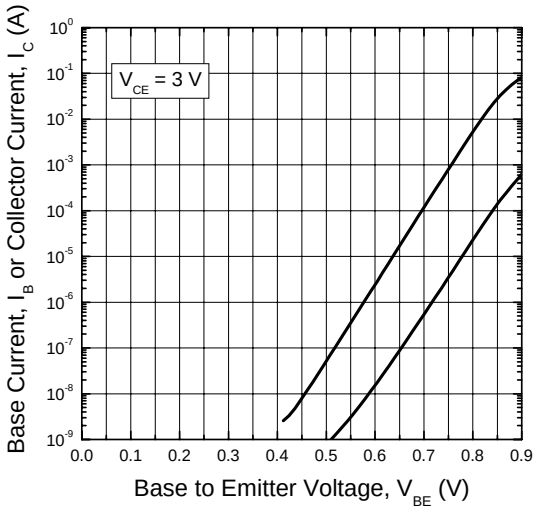
DC Current Gain vs. Collector Current



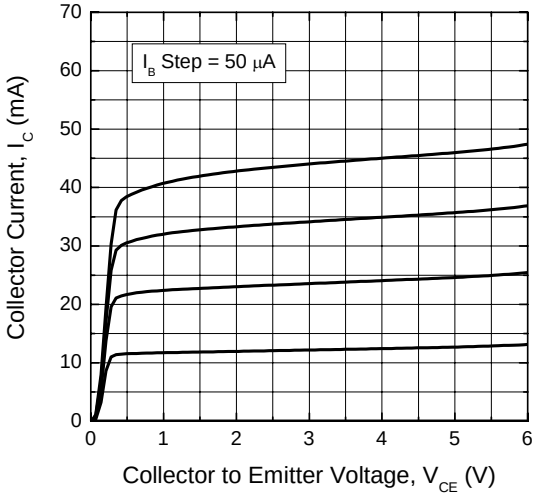
Collector Current vs. Base to Emitter Voltage



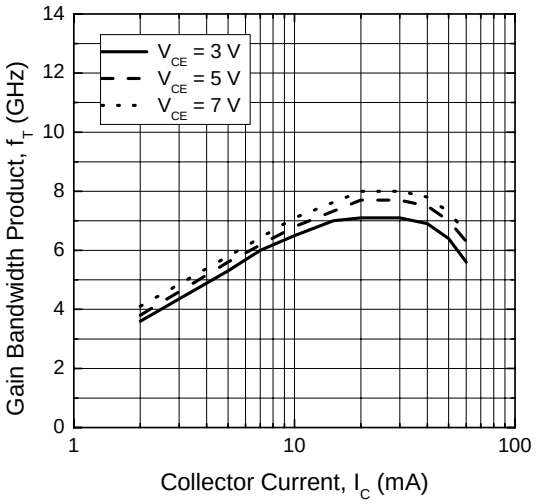
Base Current, Collector Current vs. Base to Emitter Voltage



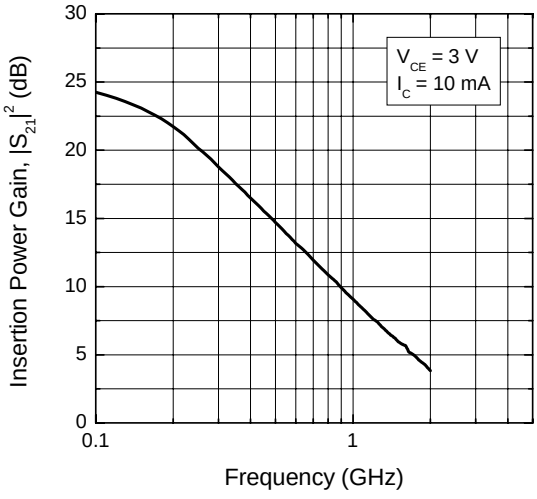
Collector Current vs. Collector to Emitter Voltage



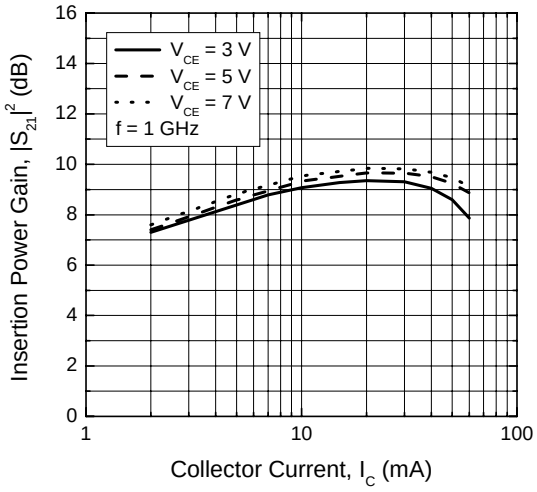
Gain Bandwidth Product vs. Collector Current



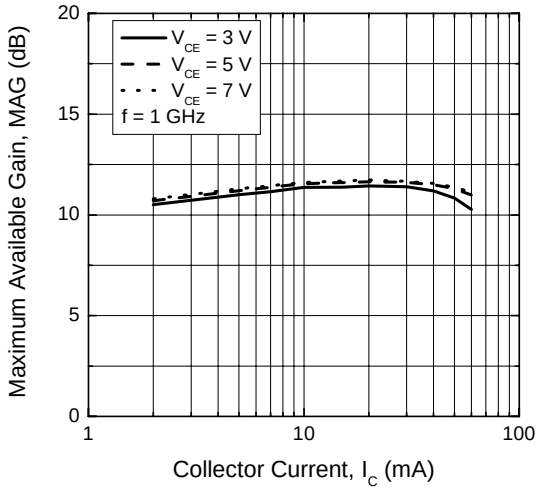
Insertion Power Gain vs. Frequency



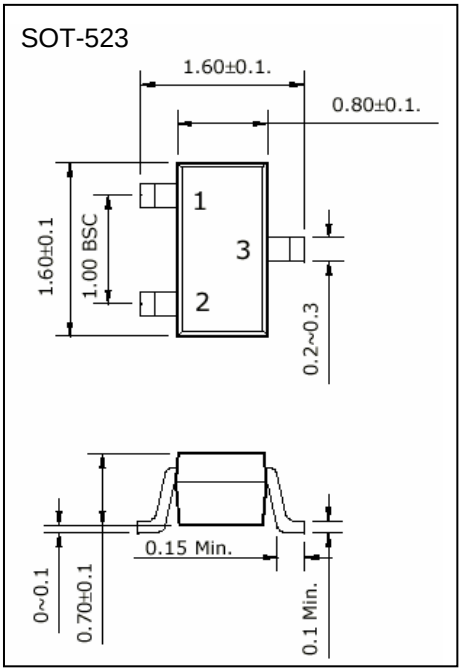
Insertion Power Gain vs. Collector Current



Maximum Available Gain vs. Collector Current



☐ Dimensions of TBN6301E in mm



Pin Configuration

Pin No.	Symbol	Description
1	B	Base
2	E	Emitter
3	C	Collector