



TBN6501U

Si NPN Transistor

Applications

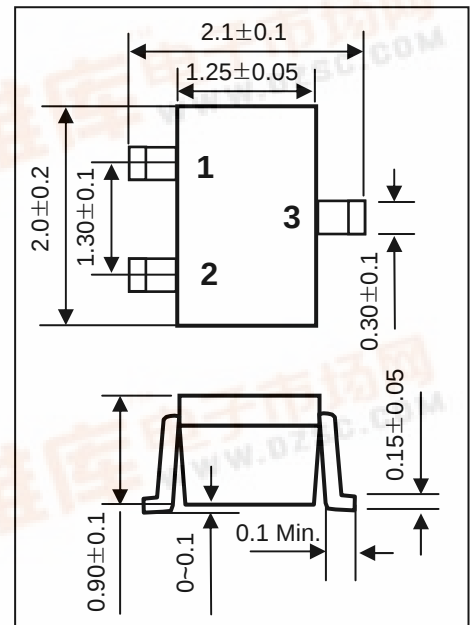
- Broadband amplifier application under 1GHz
- SAW filter driver in TV tuners

Features

- Gain bandwidth product
 - $f_T = 1.1 \text{ GHz}$ at $V_{CE} = 3 \text{ V}$, $I_C = 20 \text{ mA}$
 - $f_T = 1.5 \text{ GHz}$ at $V_{CE} = 5 \text{ V}$, $I_C = 30 \text{ mA}$
- Power gain
 - $|S_{21}|^2 = 3.0 \text{ dB}$ at $V_{CE} = 3 \text{ V}$, $I_C = 10 \text{ mA}$, $f = 1 \text{ GHz}$
- Noise figure
 - $NF = 1.8 \text{ dB}$ at $V_{CE} = 3 \text{ V}$, $I_C = 10 \text{ mA}$, $f = 1 \text{ GHz}$

SOT-323

Unit in mm



Pin Configuration

1. Base
2. Emitter
3. Collector

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

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	100	mA
Total Power Dissipation	P_{tot}	200	mW
Operating Junction Temperature	T_j	150	$^\circ \text{C}$
Storage Temperature	T_{stg}	-65 ~ 150	$^\circ \text{C}$

Caution : Electro Static Discharge sensitive device

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

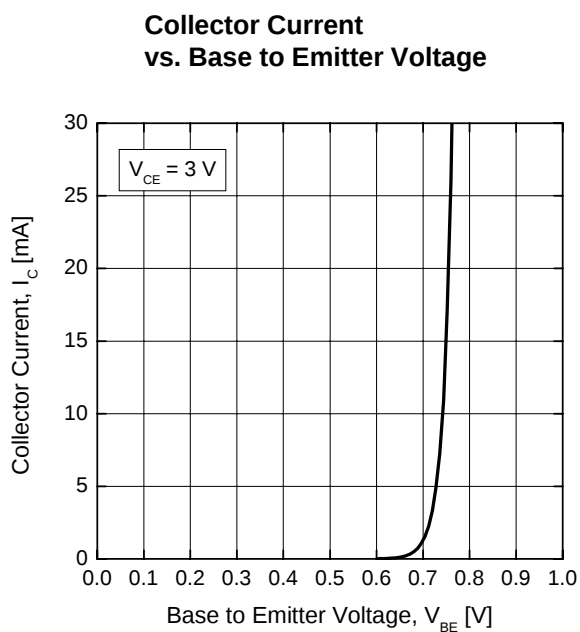
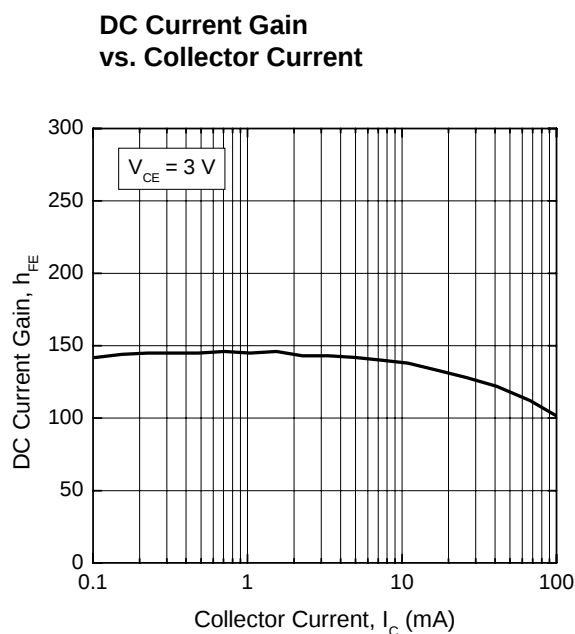
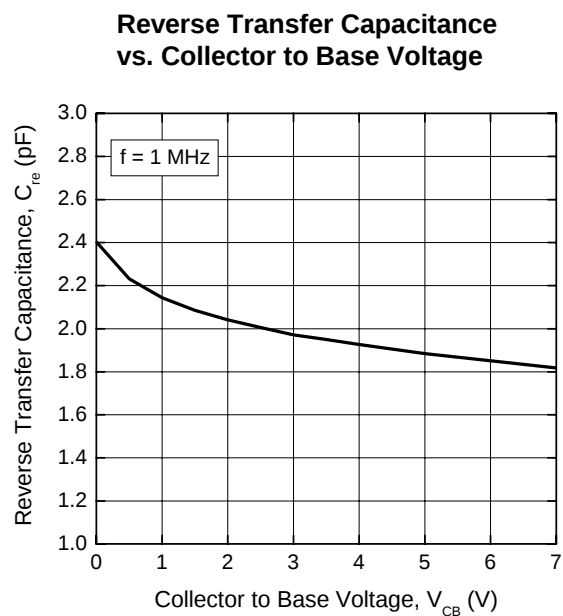
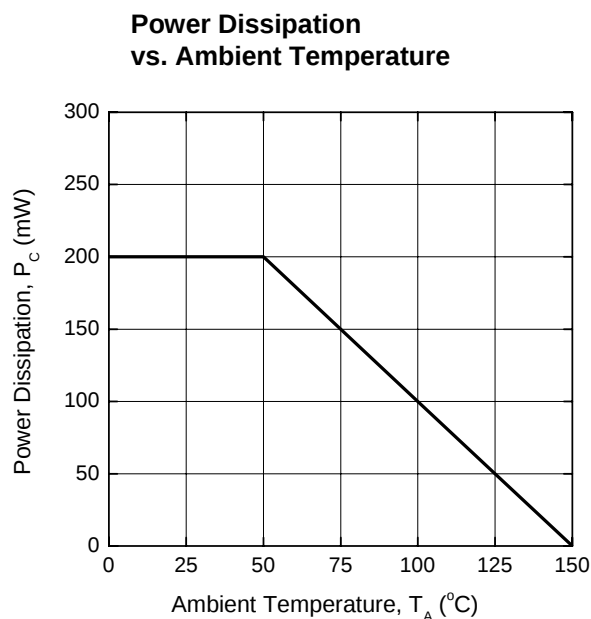
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector Cut-off Current	I_{CBO}	$V_{CB} = 15\text{ V}, I_E = 0\text{ mA}$	-	-	0.5	μA
	I_{CEO}	$V_{CE} = 8\text{ V}, I_B = 0\text{ mA}$	-	-	10	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 2\text{ V}, I_C = 0\text{ mA}$	-	-	0.5	μA
DC Current Gain	h_{FE}	$V_{CE} = 3\text{ V}, I_C = 10\text{ mA}$	50	-	250	
Gain Bandwidth Product	f_T	$V_{CE} = 3\text{ V}, I_C = 20\text{ mA}$	0.9	1.1	-	GHz
		$V_{CE} = 5\text{ V}, I_C = 30\text{ mA}$	1.3	1.5	-	GHz
Insertion Power Gain	$ S_{21} ^2$	$V_{CE} = 3\text{ V}, I_C = 20\text{ mA}, f = 1\text{ GHz}$	-	3.0	-	dB
		$V_{CE} = 5\text{ V}, I_C = 30\text{ mA}, f = 1\text{ GHz}$	-	4.0	-	dB
Noise Figure	NF	$V_{CE} = 3\text{ V}, I_C = 10\text{ mA}, f = 1\text{ GHz}$	-	1.8	-	
Reverse Transfer Capacitance	C_{re}	$V_{CB} = 3\text{ V}, I_E = 0\text{ mA}, f = 1\text{ MHz}$	-	2.0	-	pF

□ **h_{FE} Classification**

Marking	SD2	SD1
h_{FE} Value	80 - 160	125 - 250

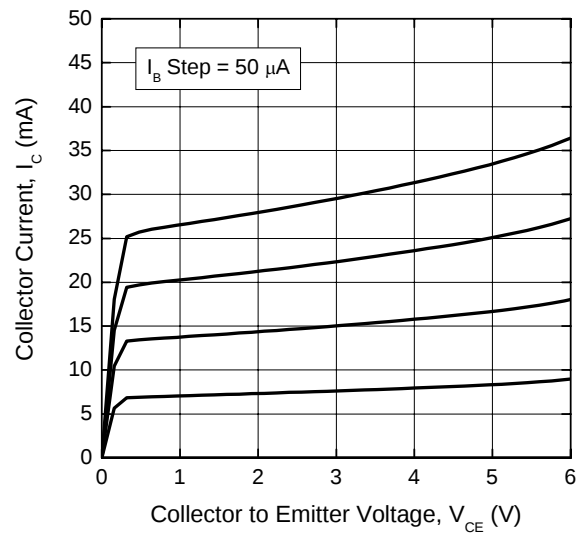
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□ **Typical Characteristics** ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

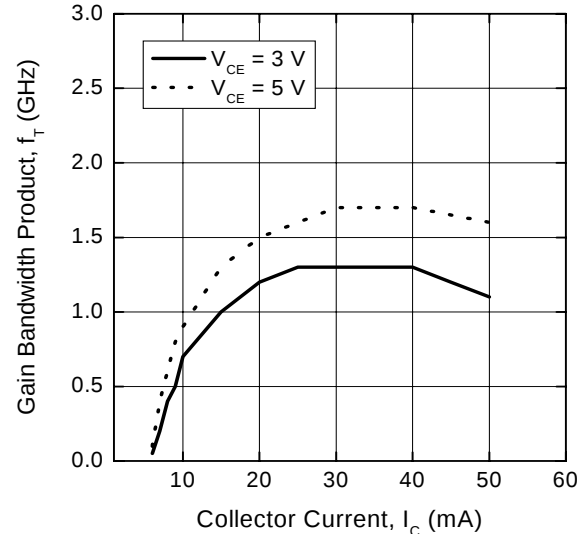


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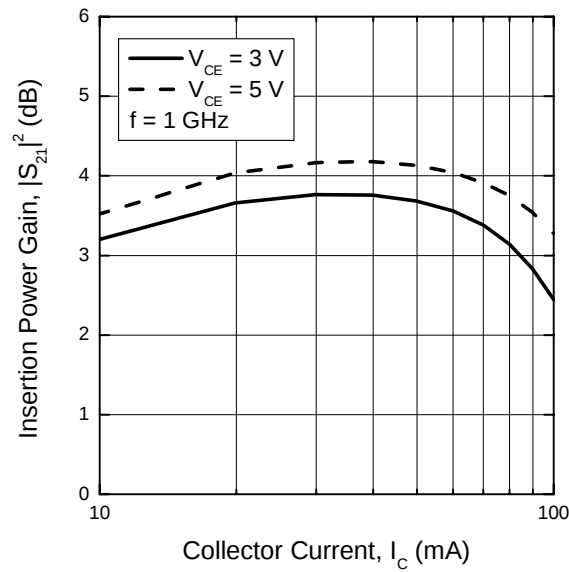
Collector Current
vs. Collector to Emitter Voltage



Gain Bandwidth Product
vs. Collector Current



Insertion Power Gain
vs. Collector Current



Maximum Available Gain
vs. Collector Current

