**Product data sheet** 

## 1 Product profile

## 1.1 General description

NPN silicon RF transistor for high speed, low noise applications in a plastic, 4-pin dual-emitter SOT143B package.

The BFU550 is part of the BFU5 family of transistors, suitable for small signal to medium power applications up to 2 GHz.

#### 1.2 Features and benefits

- · Low noise, high breakdown RF transistor
- AEC-Q101 qualified
- Minimum noise figure (NF<sub>min</sub>) = 0.7 dB at 900 MHz
- · Maximum stable gain 21 dB at 900 MHz
- 11 GHz f<sub>T</sub> silicon technology

## 1.3 Applications

- Applications requiring high supply voltages and high breakdown voltages
- · Broadband amplifiers up to 2 GHz
- Low noise amplifiers for ISM applications
- · ISM band oscillators

### 1.4 Quick reference data

Table 1. Quick reference data

T<sub>amb</sub> = 25 °C unless otherwise specified

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
$V_{CB}$	collector-base voltage	open emitter		-	-	24	V
$V_{CE}$	collector-emitter voltage	open base		-	-	12	V
		shorted base		-	-	24	V
$V_{EB}$	emitter-base voltage	open collector		-	-	2	V
I <sub>C</sub>	collector current			-	15	50	mA
P <sub>tot</sub>	total power dissipation	T <sub>sp</sub> ≤ 87 °C	[1]	-	-	450	mW
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = 15 mA; V <sub>CE</sub> = 8 V		60	95	200	
C <sub>c</sub>	collector capacitance	V <sub>CB</sub> = 8 V; f = 1 MHz		-	0.72	-	pF
f <sub>T</sub>	transition frequency	I <sub>C</sub> = 25 mA; V <sub>CE</sub> = 8 V; f = 900 MHz		-	11	-	GHz



#### NPN wideband silicon RF transistor

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
G <sub>p(max)</sub>	maximum power gain	$I_C$ = 15 mA; $V_{CE}$ = 8 V; f = 900 MHz	[2]	-	21	-	dB
NF <sub>min</sub>	minimum noise figure	$I_C$ = 1 mA; $V_{CE}$ = 8 V; f = 900 MHz; $\Gamma_S$ = $\Gamma_{opt}$		-	0.7	-	dB
P <sub>L(1dB)</sub>	output power at 1 dB gain compression	$I_C$ = 25 mA; $V_{CE}$ = 8 V; $Z_S$ = $Z_L$ = 50 $\Omega$ ; f = 900 MHz		-	13.5	-	dBm

- $T_{sp}$  is the temperature at the solder point of the collector lead. If K > 1 then  $G_{p(max)}$  is the maximum power gain. If K < 1 then  $G_{p(max)}$  = MSG.

## **Pinning information**

Table 2. Discrete pinning

Simplified outline	Graphic symbol
4 3	]
	2—
1 2	3, 4 aaa-010459
	4 3

# **Ordering information**

**Table 3. Ordering information** 

· · · · · · · · · · · · · · · · · · ·								
Type number	Package							
	Name	Description	Version					
BFU550	-	plastic surface-mounted package; 4 leads	SOT143B					
OM7962	-	Customer evaluation kit for BFU520, BFU530 and BFU550 [1]	-					

- [1] The customer evaluation kit contains the following:
  - Unpopulated RF amplifier Printed-Circuit Board (PCB)
    - Unpopulated RF amplifier Printed-Circuit Board (PCB) with emitter degeneration
      - Four SMA connectors for fitting unpopulated Printed-Circuit Board (PCB)
        - BFU520, BFU530 and BFU550 samples
          - USB stick with data sheets, application notes, models, S-parameter and noise files

# **Marking**

Table 4 Marking

Table 4. Marking		
Type number	Marking	Description
BFU550 *TC		* = t : made in Malaysia
		* = w : made in China

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## NPN wideband silicon RF transistor

# 5 Design support

Table 5. Available design support

Download from the BFU550 product information page on <a href="http://www.nxp.com">http://www.nxp.com</a>.

Support item	Available	Remarks
Device models for Agilent EEsof EDA ADS	yes	Based on Mextram device model.
SPICE model	yes	Based on Gummel-Poon device model.
S-parameters	yes	
Noise parameters	yes	
Customer evaluation kit	yes	See Section 3 and Section 10.
Solder pattern	yes	
Application notes	yes	See <u>Section 10.1</u> and <u>Section 10.2</u> .

# 6 Limiting values

### Table 6. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CB}$	collector-base voltage	open emitter	-	30	V
$V_{CE}$	collector-emitter voltage	open base	-	16	V
		shorted base	-	30	V
$V_{EB}$	emitter-base voltage	open collector	-	3	V
I <sub>C</sub>	collector current		-	80	mA
T <sub>stg</sub>	storage temperature		-65	+150	°C
V <sub>ESD</sub>	electrostatic discharge voltage	Human Body Model (HBM) According to JEDEC standard 22-A114E	-	±150	V
		Charged Device Model (CDM) According to JEDEC standard 22-C101B	-	±2	kV

# 7 Recommended operating conditions

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Syllibol	Faranietei	Conditions	141111	Typ	IVIAA	Offic
$V_{CB}$	collector-base voltage	open emitter	-	-	24	V
$V_{CE}$	collector-emitter voltage	open base	-	-	12	V
		shorted base	-	-	24	V
$V_{EB}$	emitter-base voltage	open collector	-	-	2	V
I <sub>C</sub>	collector current		-	-	50	mA
Pi	input power	Z <sub>S</sub> = 50 Ω	-	-	10	dBm
Tj	junction temperature		-40	-	+150	°C

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#### NPN wideband silicon RF transistor

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
P <sub>tot</sub>	total power dissipation	T <sub>sp</sub> ≤ 87 °C	[1]	-	-	450	mW

[1]  $T_{sp}$  is the temperature at the solder point of the collector lead.

## 8 Thermal characteristics

**Table 8. Thermal characteristics** 

Symbol	Parameter	Conditions		Тур	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[1]	140	K/W

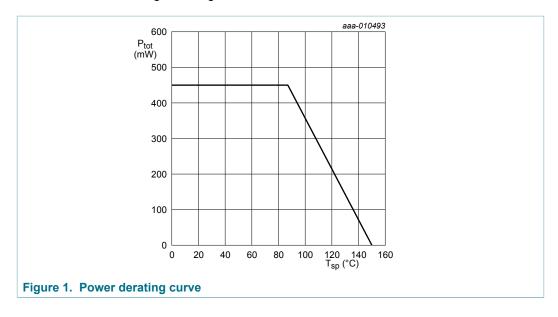
[1]  $T_{sp}$  is the temperature at the solder point of the collector lead.

 $T_{sp}$  has the following relation to the ambient temperature  $T_{amb}$ :

$$T_{sp} = T_{amb} + P \times R_{th(sp-a)}$$

With P being the power dissipation and  $R_{th(sp-a)}$  being the thermal resistance between the solder point and ambient.  $R_{th(sp-a)}$  is determined by the heat transfer properties in the application.

The heat transfer properties are set by the application board materials, the board layout and the environment e.g. housing.



## 9 Characteristics

#### **Table 9. Characteristics**

T<sub>amb</sub> = 25 °C unless otherwise specified

Symbol	Parameter	Conditions	ı	Min	Тур	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	I <sub>C</sub> = 100 nA; I <sub>E</sub> = 0 mA	2	24	-	-	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	I <sub>C</sub> = 150 nA; I <sub>B</sub> = 0 mA	•	12	-	-	V
I <sub>C</sub>	collector current		-	-	15	50	mA
I <sub>CBO</sub>	collector-base cut-off current	I <sub>E</sub> = 0 mA; V <sub>CB</sub> = 8 V	-	-	<1	-	nA

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Symbol	Parameter	Conditions		Min	Тур	Max	Unit
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = 15 mA; V <sub>CE</sub> = 8 V		60	95	200	
C <sub>e</sub>	emitter capacitance	V <sub>EB</sub> = 0.5 V; f = 1 MHz		-	1.11	-	pF
C <sub>re</sub>	feedback capacitance	V <sub>CE</sub> = 8 V; f = 1 MHz		-	0.41	-	pF
C <sub>c</sub>	collector capacitance	V <sub>CB</sub> = 8 V; f = 1 MHz		-	0.72	-	pF
f <sub>T</sub>	transition frequency	I <sub>C</sub> = 25 mA; V <sub>CE</sub> = 8 V; f = 900 MHz		-	11	-	GHz
G <sub>p(max)</sub>	maximum power gain	f = 433 MHz; V <sub>CE</sub> = 8 V	[1]				
		I <sub>C</sub> = 1 mA		-	15	-	dB
		I <sub>C</sub> = 15 mA		-	25.5	-	dB
		I <sub>C</sub> = 25 mA		-	26.5	-	dB
		f = 900 MHz; V <sub>CE</sub> = 8 V	[1]				
		I <sub>C</sub> = 1 mA		-	12.5	-	dB
		I <sub>C</sub> = 15 mA		-	21	-	dB
		I <sub>C</sub> = 25 mA		-	21.5	-	dB
		f = 1800 MHz; V <sub>CE</sub> = 8 V	[1]				
		I <sub>C</sub> = 1 mA		-	10	-	dB
		I <sub>C</sub> = 15 mA		-	15	-	dB
		I <sub>C</sub> = 25 mA		-	15	-	dB
s <sub>21</sub>   <sup>2</sup>	insertion power gain	f = 433 MHz; V <sub>CE</sub> = 8 V					
		I <sub>C</sub> = 1 mA		-	10	-	dB
		I <sub>C</sub> = 15 mA		-	23	-	dB
		I <sub>C</sub> = 25 mA		-	23.5	-	dB
		f = 900 MHz; V <sub>CE</sub> = 8 V					
		I <sub>C</sub> = 1 mA		-	8	-	dB
		I <sub>C</sub> = 15 mA		-	17.5	-	dB
		I <sub>C</sub> = 25 mA		-	18	-	dB
		f = 1800 MHz; V <sub>CE</sub> = 8 V					
		I <sub>C</sub> = 1 mA		-	4.5	-	dB
		I <sub>C</sub> = 15 mA		-	11.5	-	dB
		I <sub>C</sub> = 25 mA		-	12	-	dB
NF <sub>min</sub>	minimum noise figure	f = 433 MHz; $V_{CE}$ = 8 V; $\Gamma_{S}$ = $\Gamma_{opt}$					
		I <sub>C</sub> = 1 mA		-	0.55	-	dB
		I <sub>C</sub> = 15 mA		-	0.9	-	dB
		I <sub>C</sub> = 25 mA		-	1.1	-	dB
		f = 900 MHz; $V_{CE}$ = 8 V; $\Gamma_{S}$ = $\Gamma_{opt}$					
		I <sub>C</sub> = 1 mA		-	0.7	-	dB
		I <sub>C</sub> = 15 mA		-	0.95	-	dB
		I <sub>C</sub> = 25 mA		-	1.2	-	dB

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## NPN wideband silicon RF transistor

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
		f = 1800 MHz; $V_{CE}$ = 8 V; $\Gamma_{S}$ = $\Gamma_{opt}$				
		I <sub>C</sub> = 1 mA	-	1	-	dB
		I <sub>C</sub> = 15 mA	-	1.1	-	dB
		I <sub>C</sub> = 25 mA	-	1.3	-	dB
G <sub>ass</sub>	associated gain	$f = 433 \text{ MHz}$ ; $V_{CE} = 8 \text{ V}$ ; $\Gamma_{S} = \Gamma_{opt}$				
		I <sub>C</sub> = 1 mA	-	22.5	-	dB
		I <sub>C</sub> = 15 mA	-	24.5	-	dB
		I <sub>C</sub> = 25 mA	-	25	-	dB
		f = 900 MHz; $V_{CE}$ = 8 V; $\Gamma_{S}$ = $\Gamma_{opt}$				
		I <sub>C</sub> = 1 mA	-	15	-	dB
		I <sub>C</sub> = 15 mA	-	19	-	dB
		I <sub>C</sub> = 25 mA	-	19	-	dB
		f = 1800 MHz; $V_{CE}$ = 8 V; $\Gamma_{S}$ = $\Gamma_{opt}$				
		I <sub>C</sub> = 1 mA	-	9.5	-	dB
		I <sub>C</sub> = 15 mA	-	13	-	dB
		I <sub>C</sub> = 25 mA	-	13.5	_	dB
P <sub>L(1dB)</sub>	output power at 1 dB gain compression	$f = 433$ MHz; $V_{CE} = 8$ V; $Z_{S} = Z_{L} = 50$ Ω				
		I <sub>C</sub> = 15 mA	-	9.5	_	dBm
		I <sub>C</sub> = 25 mA	-	13.5	_	dBm
		$f = 900 \text{ MHz}$ ; $V_{CE} = 8 \text{ V}$ ; $Z_S = Z_L = 50 \Omega$				
		I <sub>C</sub> = 15 mA	-	10	_	dBm
		I <sub>C</sub> = 25 mA	-	13.5	-	dBm
		$f = 1800 \text{ MHz}$ ; $V_{CE} = 8 \text{ V}$ ; $Z_{S} = Z_{L} = 50 \Omega$				
		I <sub>C</sub> = 15 mA	-	10	-	dBm
		I <sub>C</sub> = 25 mA	-	13	-	dBm
IP3 <sub>o</sub>	output third-order intercept point	$f_1$ = 433 MHz; $f_2$ = 434 MHz; $V_{CE}$ = 8 V; $Z_S$ = $Z_L$ = 50 $\Omega$				
		I <sub>C</sub> = 15 mA	-	19	-	dBm
		I <sub>C</sub> = 25 mA	-	23	-	dBm
		$f_1$ = 900 MHz; $f_2$ = 901 MHz; $V_{CE}$ = 8 V; $Z_S$ = $Z_L$ = 50 $\Omega$				
		I <sub>C</sub> = 15 mA	-	20	-	dBm
		I <sub>C</sub> = 25 mA	-	23	-	dBm
		$f_1$ = 1800 MHz; $f_2$ = 1801 MHz; $V_{CE}$ = 8 V; $Z_S$ = $Z_L$ = 50 $\Omega$				
		I <sub>C</sub> = 15 mA	-	19.5	-	dBm
		I <sub>C</sub> = 25 mA	-	23	_	dBm

<sup>[1]</sup> If K > 1 then  $G_{p(max)}$  is the maximum power gain. If K < 1 then  $G_{p(max)}$  = MSG.

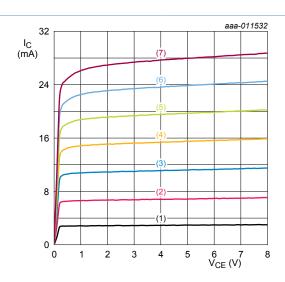
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**Product data sheet** 

Rev. 2.1 — 17 April 2019

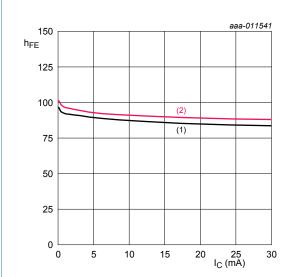
## 9.1 Graphs



 $T_{amb}$  = 25 °C.

- 1.  $I_B = 25 \mu A$
- 2.  $I_B = 75 \mu A$
- 3.  $I_B = 125 \mu A$
- 4.  $I_B = 175 \mu A$
- 5.  $I_B = 225 \mu A$
- 6.  $I_B = 275 \mu A$
- 7.  $I_B = 325 \mu A$

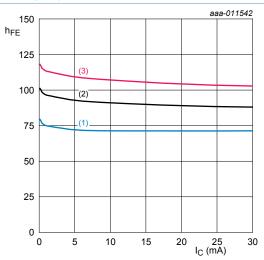
Figure 2. Collector current as a function of collector-emitter voltage; typical values



 $T_{amb}$  = 25 °C.

- 1.  $V_{CE} = 3.0 \text{ V}$
- 2.  $V_{CE} = 8.0 \text{ V}$

Figure 3. DC current gain as function of collector current; typical values

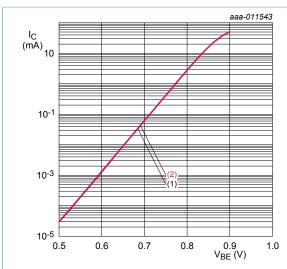


 $V_{CE}$  = 8 V.

- 1.  $T_{amb} = -40 \, ^{\circ}C$
- 2.  $T_{amb} = +25 \, ^{\circ}C$
- 3.  $T_{amb} = +125 \, ^{\circ}C$

Figure 4. DC current gain as function of collector current; typical values

### NPN wideband silicon RF transistor

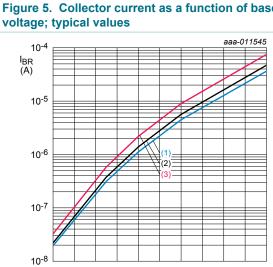


 $T_{amb}$  = 25 °C.

1.  $V_{CE} = 3.0 \text{ V}$ 

2.  $V_{CE} = 8.0 \text{ V}$ 

Figure 5. Collector current as a function of base-emitter



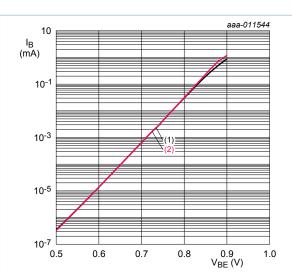
 $V_{CE}$  = 3 V.

1.  $T_{amb} = -40 \, ^{\circ}C$ 

2.  $T_{amb} = +25 \, ^{\circ}C$ 

3.  $T_{amb} = +125 \, ^{\circ}C$ 

Figure 7. Reverse base current as a function of emitterbase voltage; typical values

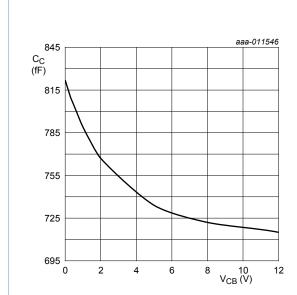


 $T_{amb}$  = 25 °C.

1.  $V_{CE} = 3.0 \text{ V}$ 

2.  $V_{CE} = 8.0 \text{ V}$ 

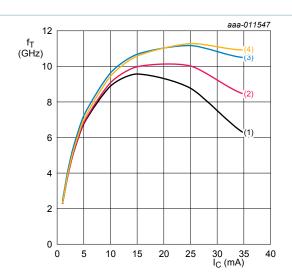
Figure 6. Base current as a function of base-emitter voltage; typical values



 $I_C = 0$  mA; f = 1 MHz;  $T_{amb} = 25$  °C.

Figure 8. Collector capacitance as a function of collector-base voltage; typical values

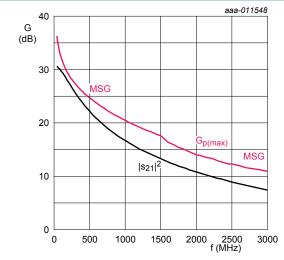
### NPN wideband silicon RF transistor



 $T_{amb}$  = 25 °C.

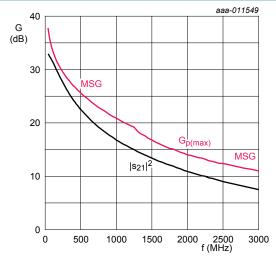
- 1.  $V_{CE} = 3.3 \text{ V}$
- 2.  $V_{CE} = 5.0 \text{ V}$
- 3.  $V_{CE} = 8.0 \text{ V}$
- 4. V<sub>CE</sub> = 12.0 V

### Figure 9. Transition frequency as a function of collector current; typical values



 $I_C$  = 15 mA;  $V_{CE}$  = 8 V;  $T_{amb}$  = 25 °C.

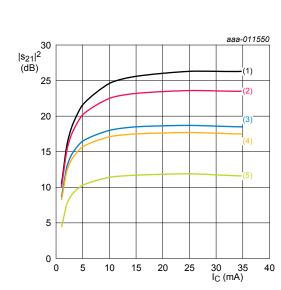
Figure 10. Gain as a function of frequency; typical values



 $I_C$  = 25 mA;  $V_{CE}$  = 8 V;  $T_{amb}$  = 25 °C.

Figure 11. Gain as a function of frequency; typical values

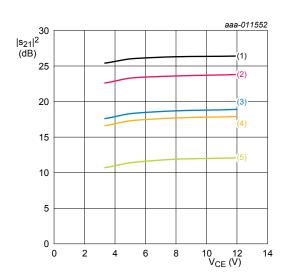
#### NPN wideband silicon RF transistor



 $V_{CE}$  = 8 V;  $T_{amb}$  = 25 °C.

- 1. f = 300 MHz
- 2. f = 433 MHz
- 3. f = 800 MHz
- 4. f = 900 MHz
- 5. f = 1800 MHz

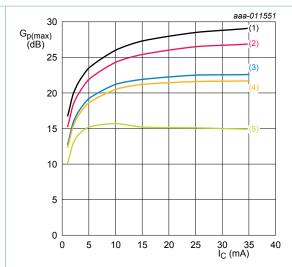
Figure 12. Insertion power gain as a function of collector current; typical values



 $I_C = 25 \text{ mA}$ ;  $T_{amb} = 25 ^{\circ}\text{C}$ .

- 1. f = 300 MHz
- 2. f = 433 MHz
- 3. f = 800 MHz
- 4. f = 900 MHz
- 5. f = 1800 MHz

Figure 14. Insertion power gain as a function of collector-emitter voltage; typical values

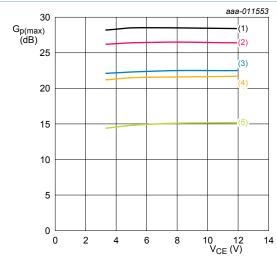


 $V_{CE} = 8 \text{ V}; T_{amb} = 25 ^{\circ}\text{C}.$ 

If K >1 then  $G_{p(max)}$  = maximum power gain. If K < 1 then  $G_{p(max)}$  = MSG.

- 1. f = 300 MHz
- 2. f = 433 MHz
- 3. f = 800 MHz
- 4. f = 900 MHz
- 5. f = 1800 MHz

Figure 13. Maximum power gain as a function of collector current; typical values



 $I_C$  = 25 mA;  $T_{amb}$  = 25 °C.

If K >1 then  $G_{p(max)}$  = maximum power gain. If K < 1 then  $G_{p(max)}$  = MSG.

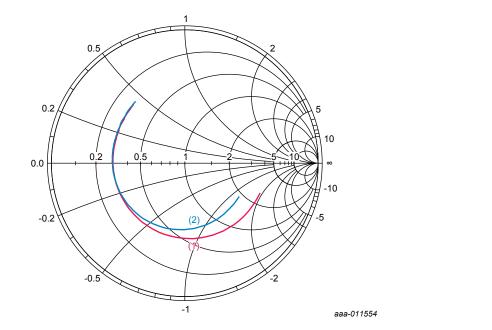
- 1. f = 300 MHz
- 2. f = 433 MHz
- 3. f = 800 MHz
- 4. f = 900 MHz
- 5. f = 1800 MHz

Figure 15. Maximum power gain as a function of collector-emitter voltage; typical values

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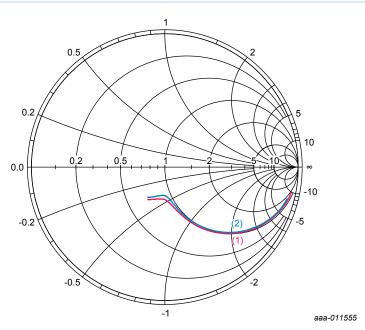
### NPN wideband silicon RF transistor



 $V_{CE}$  = 8 V; 40 MHz  $\leq$  f  $\leq$  3 GHz.

- 1.  $I_C = 15 \text{ mA}$
- 2.  $I_C = 25 \text{ mA}$

Figure 16. Input reflection coefficient (s<sub>11</sub>); typical values



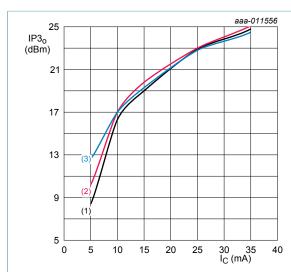
 $V_{CE}$  = 8 V; 40 MHz  $\leq$  f  $\leq$  3 GHz.

- 1.  $I_C = 15 \text{ mA}$
- 2.  $I_C = 25 \text{ mA}$

Figure 17. Output reflection coefficient  $(s_{22})$ ; typical values

BFU550

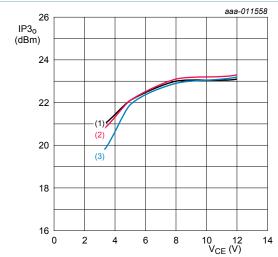
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$$V_{CE}$$
 = 8 V;  $T_{amb}$  = 25 °C.

- 1.  $f_1 = 433 \text{ MHz}$ ;  $f_2 = 434 \text{ MHz}$
- 2.  $f_1 = 900 \text{ MHz}$ ;  $f_2 = 901 \text{ MHz}$
- 3.  $f_1 = 1800 \text{ MHz}$ ;  $f_2 = 1801 \text{ MHz}$

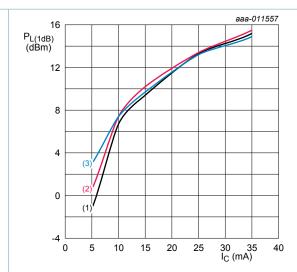
Figure 18. Output third-order intercept point as a function of collector current; typical values



 $I_C$  = 25 mA;  $T_{amb}$  = 25 °C.

- 1.  $f_1 = 433 \text{ MHz}$ ;  $f_2 = 434 \text{ MHz}$
- 2.  $f_1 = 900 \text{ MHz}$ ;  $f_2 = 901 \text{ MHz}$
- 3.  $f_1 = 1800 \text{ MHz}$ ;  $f_2 = 1801 \text{ MHz}$

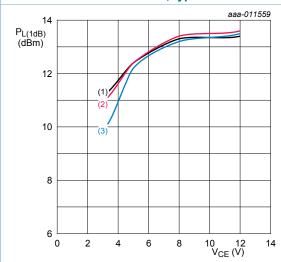
Figure 20. Output third-order intercept point as a function of collector-emitter voltage; typical values



 $V_{CE}$  = 8 V;  $T_{amb}$  = 25 °C.

- 1. f = 433 MHz
- 2. f = 900 MHz
- 3. f = 1800 MHz

Figure 19. Output power at 1 dB gain compression as a function of collector current; typical values

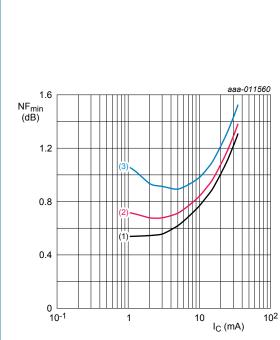


 $I_C$  = 25 mA;  $T_{amb}$  = 25 °C.

- 1. f = 433 MHz
- 2. f = 900 MHz
- 3. f = 1800 MHz

Figure 21. Output power at 1 dB gain compression as a function of collector-emitter voltage; typical values

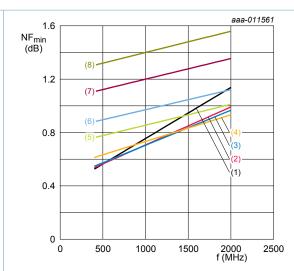
### NPN wideband silicon RF transistor



 $V_{CE}$  = 8 V;  $T_{amb}$  = 25 °C;  $\Gamma_{S}$  =  $\Gamma_{opt}$ .

- 1. f = 433 MHz
- 2. f = 900 MHz
- 3. f = 1800 MHz

Figure 22. Minimum noise figure as a function of collector current; typical values

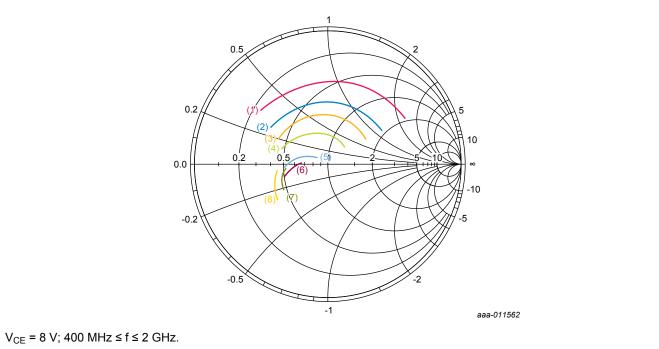


 $V_{CE}$  = 8 V;  $T_{amb}$  = 25 °C;  $\Gamma_{S}$  =  $\Gamma_{opt}$ .

- 1.  $I_C = 1 \text{ mA}$
- 2.  $I_C = 2 \text{ mA}$
- 3.  $I_C = 3 \text{ mA}$
- 4.  $I_C = 5 \text{ mA}$
- 5.  $I_C = 10 \text{ mA}$
- 6.  $I_C = 15 \text{ mA}$
- 7.  $I_C = 25 \text{ mA}$
- 8.  $I_C = 35 \text{ mA}$

Figure 23. Minimum noise figure as a function of frequency; typical values

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- 1.  $I_C = 1 \text{ mA}$
- 2.  $I_C = 2 \text{ mA}$
- 3.  $I_C = 3 \text{ mA}$
- 4.  $I_C = 5 \text{ mA}$
- 5.  $I_C = 10 \text{ mA}$
- 6.  $I_C = 15 \text{ mA}$
- 7.  $I_C = 25 \text{ mA}$
- 8.  $I_C = 35 \text{ mA}$

Figure 24. Optimum reflection coefficient ( $\Gamma_{opt}$ ); typical values

# 10 Application information

More information about the following application example can be found in the application notes. See Section 5 "Design support".

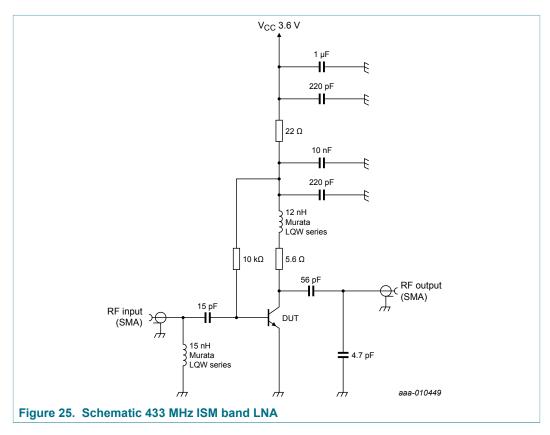
The following application example can be implemented using the evaluation kit. See <u>Section 3 "Ordering information"</u> for the order type number.

The following application example can be simulated using the simulation package. See Section 5 "Design support".

## 10.1 Application example: 433 ISM band LNA

433 ISM band LNA, optimized for low noise.

More detailed information of the application example can be found in the application note: *AN11431*.



Remark: fine tuning of components maybe required depending on PCB parasitics.

Table 10. Application performance data at 433 MHz

 $I_{CC} = 20 \text{ mA}; V_{CC} = 3.6 \text{ V}$ 

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
s <sub>21</sub>   <sup>2</sup>	insertion power gain		-	21	-	dB
NF	noise figure		-	1.3	-	dB
IP3 <sub>o</sub>	output third-order intercept point	$f_1 = 433.1 \text{ MHz}; f_2 = 433.2 \text{ MHz};$ $P_i = -30 \text{ dBm per carrier}$	-	19	-	dBm

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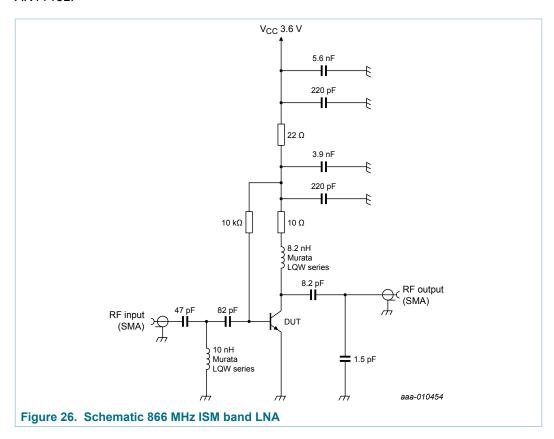
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### NPN wideband silicon RF transistor

## 10.2 Application example: 866 ISM band LNA

866 ISM band LNA, optimized for low noise.

More detailed information of the application example can be found in the application note: *AN11432*.



Remark: fine tuning of components maybe required depending on PCB parasitics.

Table 11. Application performance data at 866 MHz

 $I_{CC} = 20 \text{ mA}; V_{CC} = 3.6 \text{ V}$ 

Symbol	Parameter	Conditions	Mi	n	Тур	Max	Unit
$ s_{21} ^2$	insertion power gain		-		15	-	dB
NF	noise figure		-		1.4	-	dB
IP3 <sub>o</sub>	output third-order intercept point	$f_1 = 866.1 \text{ MHz}; f_2 = 866.2 \text{ MHz};$ $P_i = -30 \text{ dBm per carrier}$	-		19	-	dBm

# 11 Package outline

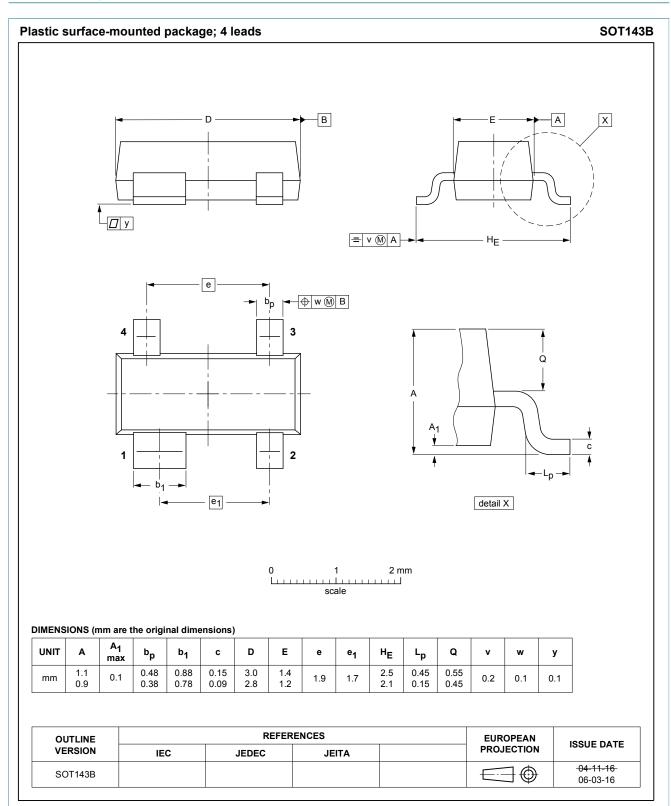


Figure 27. Package outline SOT143B

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### NPN wideband silicon RF transistor

# 12 Handling information

## **CAUTION**



This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices. Such precautions are described in the *ANSI/ESD S20.20*, *IEC/ST 61340-5*, *JESD625-A* or equivalent standards.

## 13 Abbreviations

#### Table 12. Abbreviations

Acronym	Description
AEC	automotive electronics council
ISM	industrial, scientific, and medical
LNA	low-noise amplifier
MSG	maximum stable gain
NPN	negative-positive-negative
SMA	SubMiniature version A

# 14 Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes		
BFU550 v.2.1	20190417	Product data sheet	-	BFU550 v.2		
modification	<ul> <li>Extended the description on the changes in Schematic 866 MHz ISM band LNA: Biasing on the schematic is adapted according to the EVB to do the RF/DC. Connection of 10 K resistor moved to the other side of the 82 pF capacitor</li> </ul>					
BFU550 v.2	20190408	Product data sheet	-	BFU550 v.1		
modification	Adapted Schematic 866 MHz ISM band LNA.					
BFU550 v.1	20140305	Product data sheet	-	-		

#### NPN wideband silicon RF transistor

# 15 Legal information

#### 15.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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