16.5 GHz Wideband NPN Chip – BFR391

Silicon NPN Planar RF Transistor in bare die form

Rev 1.3
15/02/19

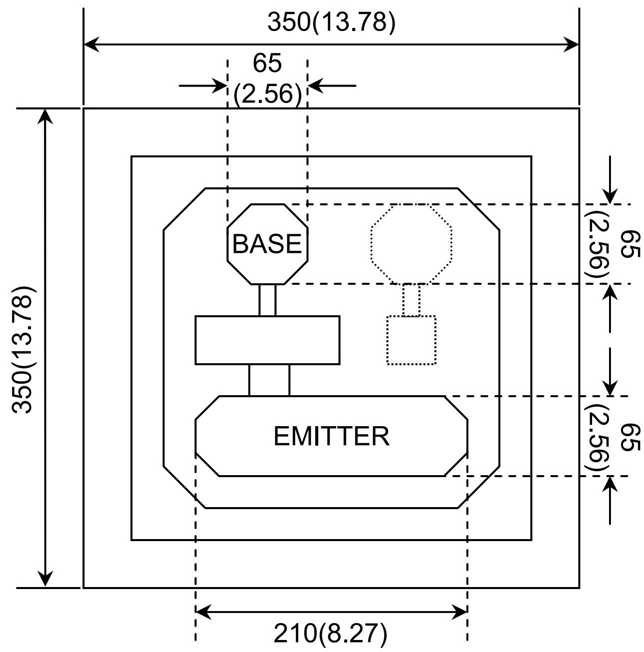
Description

NPN transistor in unencapsulated chip form. It is primarily intended for use in RF wideband amplifiers, such as in aerial amplifiers, radar systems, oscilloscopes, spectrum analyzers, etc. The transistor features low intermodulation distortion and high power gain; due to its very high transition frequency, it also has excellent wideband properties and low noise up to high frequencies.

Features:

- High Power Gain
- Low Noise
- Wide Transition Frequency

Die Dimensions in µm (mils)



CHIP BACKSIDE IS COLLECTOR

Ordering Information

The following part suffixes apply:

- No suffix - MIL-STD-750 /2072 Visual Inspection
- "**H**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-PRF-38534 Class H LAT
- "**K**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-PRF-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

www.siliconsupplies.com\quality\bare-die-lot-qualification

Supply Formats:

- Default – Die in Waffle Pack (400 per tray capacity)
- Sawn Wafer on Tape – By specific request
- Unsawn Wafer – By specific request
- With additional electrical selection – Specific request
- Sawn as pairs – Specific request
- Adjacent pair pick – Specific request

Mechanical Specification

Die Size (Unsawn)	350 x 350 13.78 x 13.78	µm mils
Base Pad Size	65 x 65 2.65 x 2.65	µm mils
Emitter Pad Size	210 x 65 8.27 x 65	µm mils
Die Thickness	150 (±20) 5.90 (±0.78)	µm mils
Top Metal Composition	Al 0.6µm	
Back Metal Composition	Au 0.6µm	

Absolute Maximum Ratings T_A = 25°C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
V_{CBO}	collector-base voltage	open emitter	-	15	V
V_{CEO}	collector-emitter voltage	open base	-	8	V
V_{EBO}	emitter-base voltage	open collector	-	2	V
I_C	DC collector current	-	-	150	mA
P_{tot}	total power dissipation	-	-	400	mW
T_{stg} ,T_J	storage & junction temperature	-	-65	150	ºC

Electrical Characteristics T_A = 25°C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	SYMBOL
I_{CBO}	collector cut-off current	I_E = 0 ; V_{CB} = 5V	-	-	100	nA
I_{EBO}	emitter cut-off current	I_C = 0 ; V_{EB} = 5V	-	-	100	nA
h_{FE}	DC current gain	I_C = 50mA;V_{CE} = 5V	60	-	150	
f_T	transition frequency	I_C = 50mA;V_{CE}= 5V; f = 1 GHz	13	16.5	-	GHz
G_P	power gain	I_C = 50mA;V_{CE}= 5V; f = 1 GHz	-	17.5	-	dB
NF	noise figure	I_C = 10mA; V_{CE} = 1V; f = 1 GHz	-	1.2	1.8	dB

Typical Characteristics T_A = 25°C unless otherwise stated

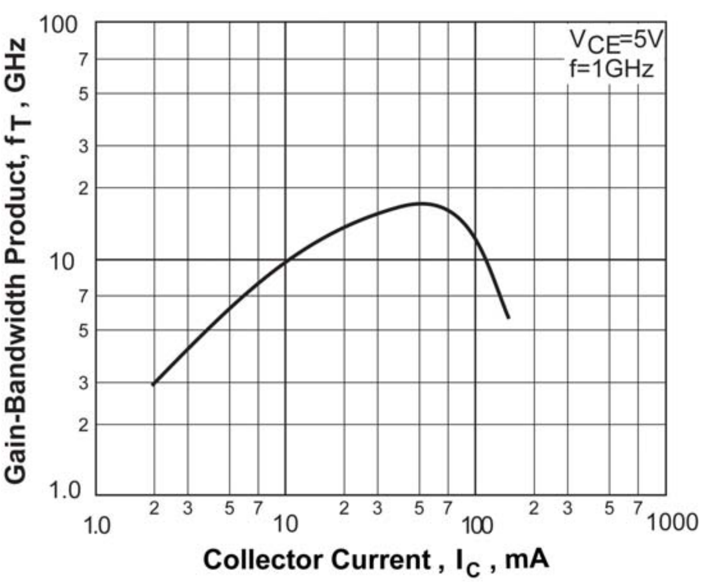


FIGURE 1. Transition Frequency versus Collector Current

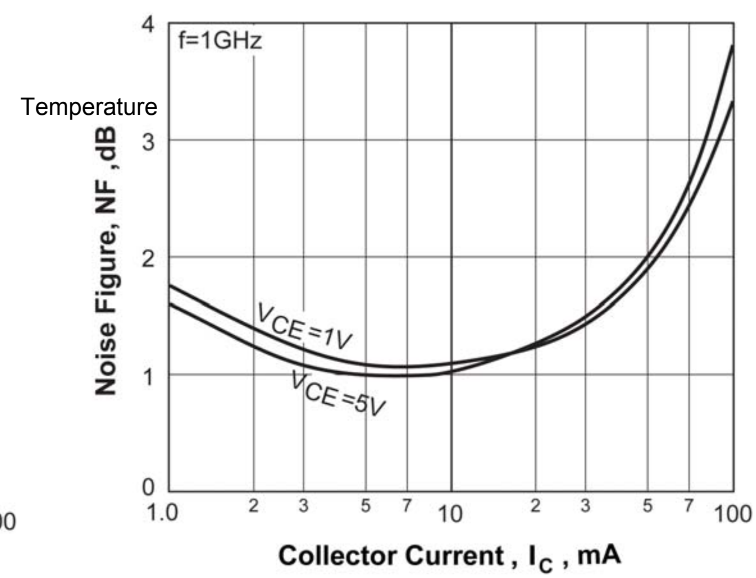


FIGURE 2. Noise Figure versus Collector Current

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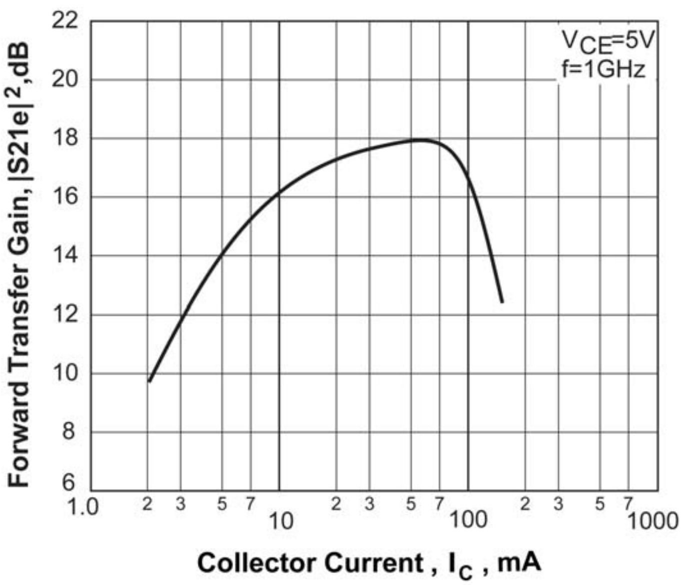

FIGURE 3. Insertion Power Gain versus Collector Current

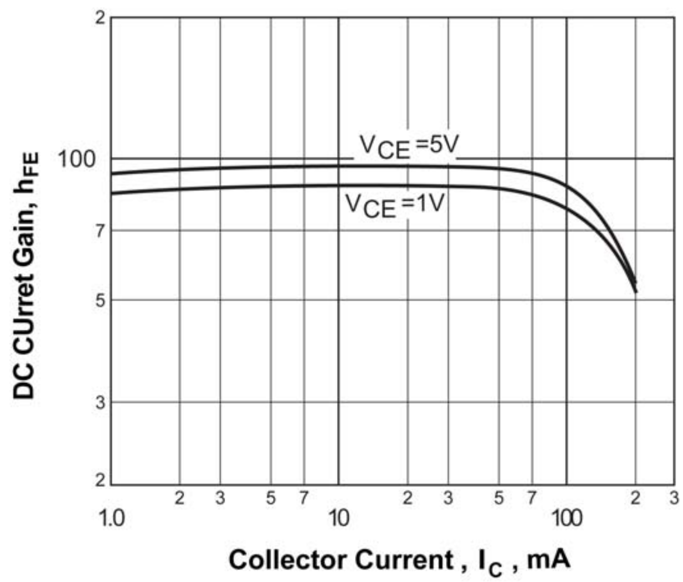

FIGURE 4. h_{FE} versus Collector Current

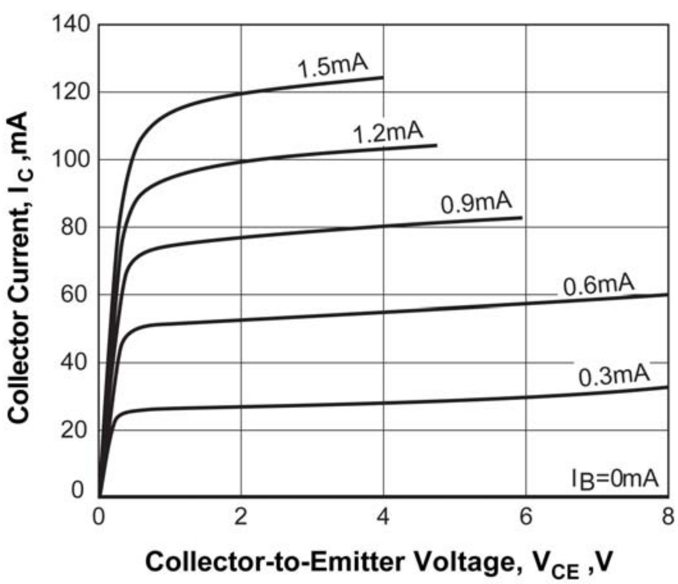

FIGURE 5. Collector Current versus Collector-to-Emitter Voltage

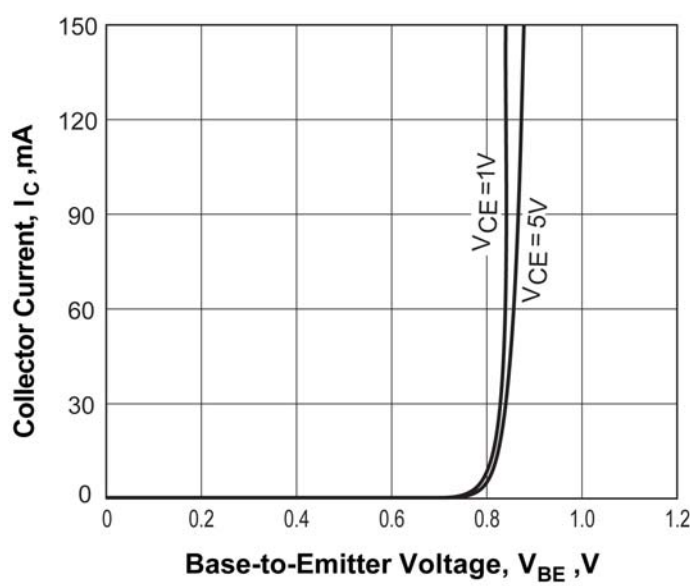

FIGURE 6. Collector Current versus Base-to-Emitter Voltage

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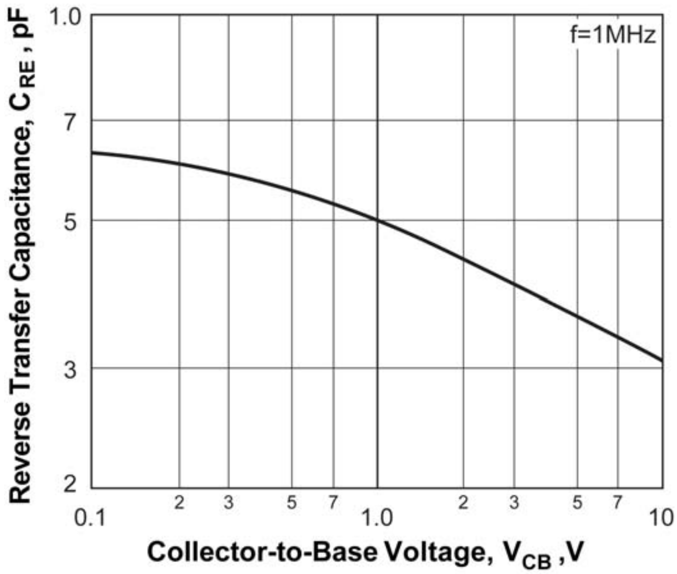

FIGURE 7. Reverse Transfer Capacitance

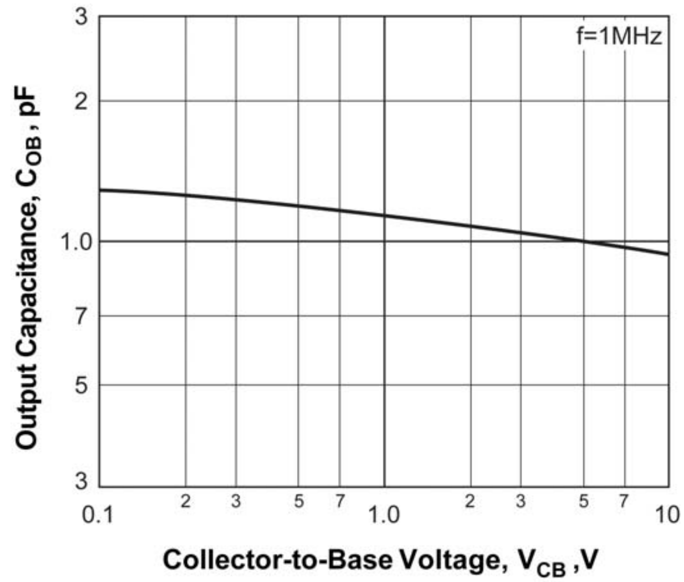

FIGURE 8. Output Capacitance

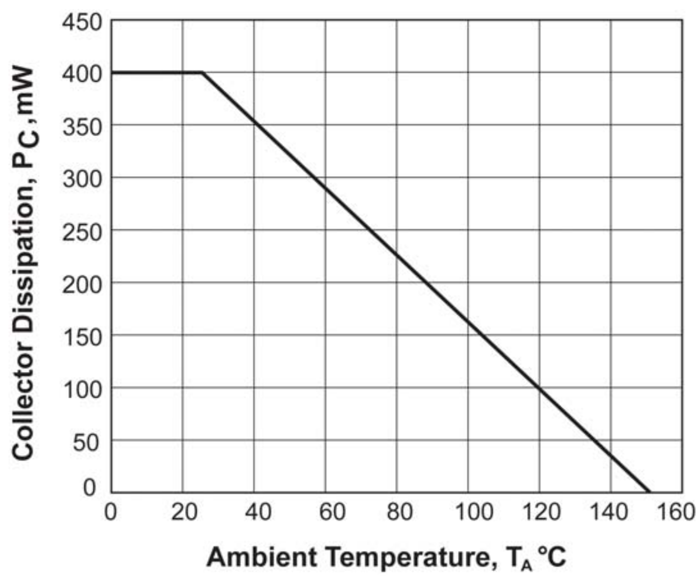

FIGURE 9. Power Dissipation versus Ambient Temperature