7 GHz fT Wideband NPN Chip – 2SC3356

Silicon NPN Planar RF Transistor in bare die form

Rev 1.3
30/7/20

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. The device is a direct replacement for the obsolete NE85600 or NE85633 and is also functionally similar to BFR96. Closest available PNP complement is BFT92.

Features:

- High Power Gain
- Low Noise
- Wide Transition Frequency

Ordering Information

The following part suffixes apply:

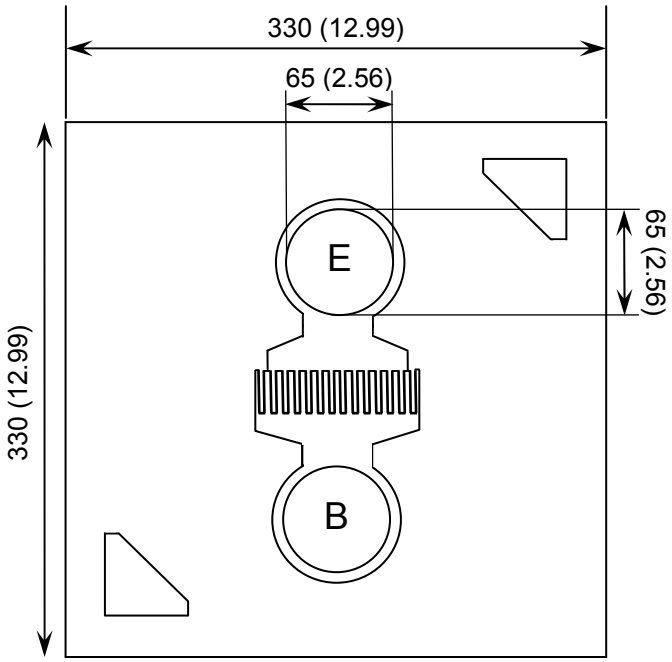
- No suffix - MIL-STD-750 /2072 Visual Inspection
- "**H**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-PRF-38534 Class H LAT
- "**K**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-PRF-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

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

Die Dimensions in µm (mils)



E = EMITTER, B = BASE
CHIP BACKSIDE IS COLLECTOR

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 or adjacent pair pick – Specific request

Mechanical Specification

Die Size (Unsawn)	330 x 330 12.99 x 12.99	µm mils
Base & Emitter Bond Pad Size	65 Ø 2.56 Ø	µm mils
Die Thickness	180 (±10) 7.09 (±0.39)	µm mils
Top Metal Composition	Al	
Back Metal Composition	Au 1µm	

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Absolute Maximum Ratings T_A = 25°C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
V_{CBO}	Collector-Base Voltage	Open Emitter	-	20	V
V_{CEO}	Collector-Emitter Voltage	Open Base	-	12	V
V_{EBO}	Emitter-Base Voltage	Open Collector	-	3	V
I_C	DC Collector Current	-	-	100	mA
P_{tot}	Total Power Dissipation	-	-	700	mW
T_{stg}	Storage Temperature	-	-65	150	ºC
T_J	Junction Temperature	-	-	175	ºC

Electrical Characteristics T_A = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	SYMBOL
I_{CBO}	Collector Cut-off Current	I_E = 0 ; V_{CB} = 10V	-	-	1	µA
I_{EBO}	Emitter Cut-off Current	I_C = 0 ; V_{EB} = 1V	-	-	1	µA
h_{FE}	DC Current Gain	I_C = 20mA;V_{CE} = 10V	50	185	300	-
f_T	Transition Frequency	I_C = 20mA;V_{CE}=10V	-	7	-	GHz
$\|S_{21e}\|^2$	Insertion Power Gain	I_C = 20mA;V_{CE} = 10V; f = 1 GHz	-	11.5	-	dB
NF	Noise Figure	I_C = 7mA; V_{CE} = 10V; f = 1 GHz	-	1.1	2	dB
C_{re}	Feedback Capacitance	I_E = 0;V_{CB}=10V f = 1MHz	-	-	1	pF
$R_{TH\ (J-C)}$	Thermal Resistance (Junction to Case)	Assembled in Micro-X Package	-	85	-	ºC/W

Typical Characteristics

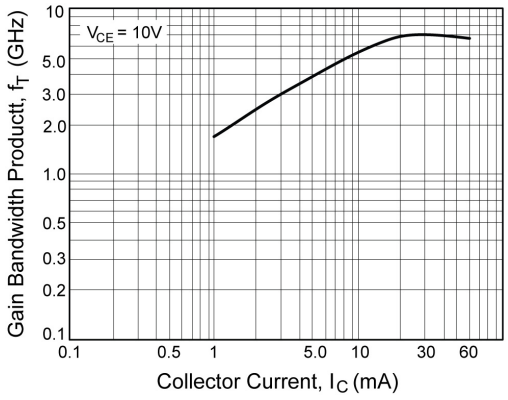

FIGURE 1. Gain Bandwidth Product versus Collector Current

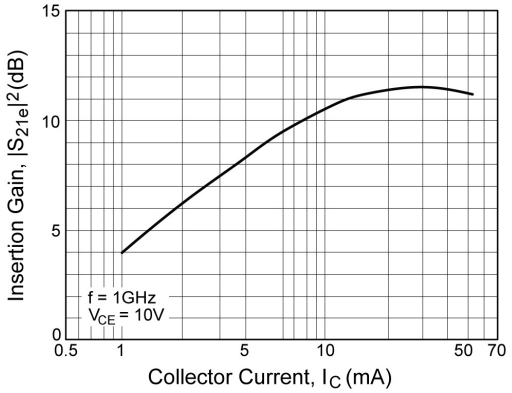

FIGURE 2. Insertion Power Gain versus Collector Current

Typical Characteristics continued

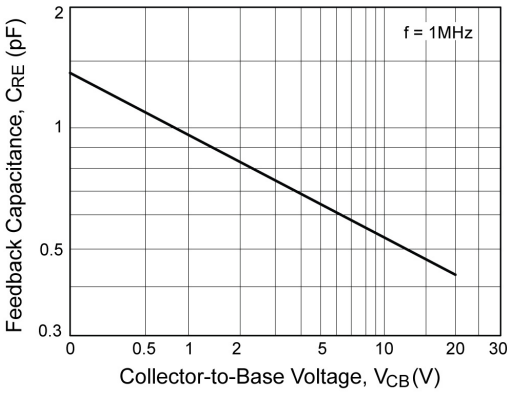

FIGURE 3. Feedback Capacitance versus Collector-Base Voltage

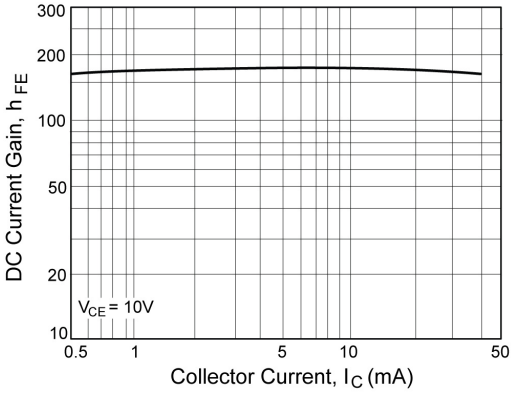

FIGURE 4. DC Current Gain versus Collector Current

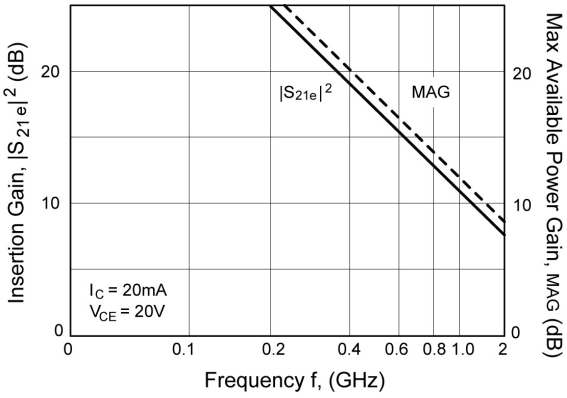

FIGURE 5. Insertion Power Gain, MAG versus Frequency

Bare Die & Micro-X Package simulation models available at Modelithics®