

NPN EPITAXIAL SILICON TRANSISTOR  
FOR HIGH-FREQUENCY LOW-NOISE AMPLIFICATION

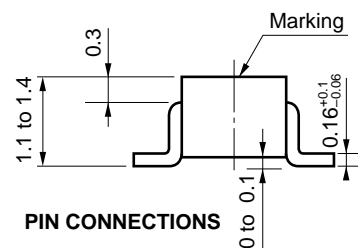
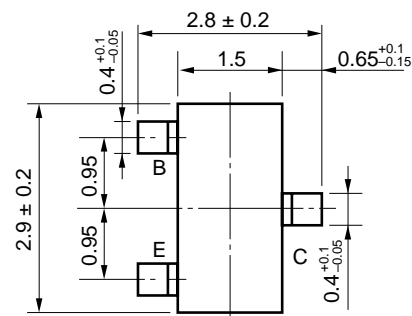
FEATURES

- Low-voltage, low-current, low-noise and high-gain  
 $NF = 3.0 \text{ dB TYP.}$  @  $V_{CE} = 1 \text{ V, } I_C = 250 \mu\text{A, } f = 1.0 \text{ GHz}$   
 $G_A = 3.5 \text{ dB TYP.}$  @  $V_{CE} = 1 \text{ V, } I_C = 250 \mu\text{A, } f = 1.0 \text{ GHz}$
- Ideal for battery drive of pagers, compact radio equipment, cordless phones, etc.
- Gold electrode gives high reliability.
- Mini mold package, ideal for hybrid ICs.

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25 \text{ }^\circ\text{C}$ )

PARAMETER	SYMBOL	RATING	UNIT
Collector to Base Voltage	$V_{CBO}$	15	V
Collector to Emitter Voltage	$V_{CEO}$	8	V
Emitter to Base Voltage	$V_{EBO}$	2	V
Collector Current	$I_C$	5	mA
Total Power Dissipation	$P_T$	50	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +150	$^\circ\text{C}$

PACKAGE DIMENSIONS (in mm)



PIN CONNECTIONS

- E: Emitter
  - B: Base
  - C: Collector
- Marking: R62

ELECTRICAL CHARACTERISTICS ( $T_A = 25 \text{ }^\circ\text{C}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 5 \text{ V, } I_E = 0$			0.1	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 1 \text{ V, } I_C = 0$			0.1	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 1 \text{ V, } I_C = 250 \mu\text{A, pulse}$	50	100	250	
Gain Bandwidth Product	$f_T$	$V_{CE} = 1 \text{ V, } I_C = 1 \text{ mA}$		4		GHz
Insertion Power Gain	$ S_{21e} ^2$	$V_{CE} = 1 \text{ V, } I_C = 1 \text{ mA, } f = 1 \text{ GHz}$	4.0	6.5		dB
Maximum Available Gain	MAG	$V_{CE} = 1 \text{ V, } I_C = 1 \text{ mA, } f = 1 \text{ GHz}$		12.5		dB
Noise Figure	NF	$V_{CE} = 1 \text{ V, } I_C = 250 \mu\text{A, } f = 1.0 \text{ GHz}$		3.0	4.5	dB
Associated Power Gain	$G_A$	$V_{CE} = 1 \text{ V, } I_C = 250 \mu\text{A, } f = 1.0 \text{ GHz}$		3.5		dB
Collector Capacitance	$C_{ob}^{Note}$	$V_{CB} = 1 \text{ V, } I_E = 0, f = 1.0 \text{ MHz}$		0.4	0.6	pF

**Note** Measured using 3-pin bridge, with emitter pin connected to the bridge guard pin.

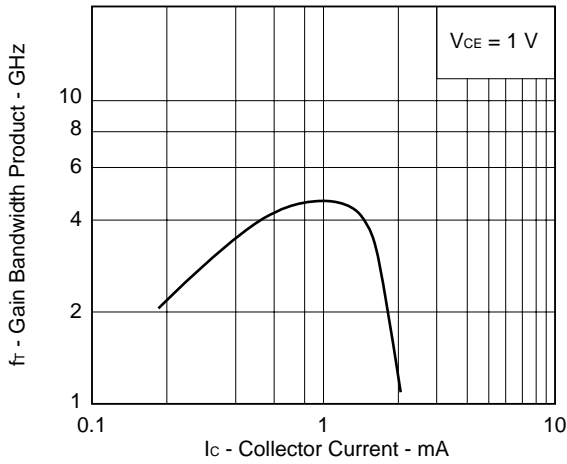
**hFE CLASSIFICATION**

RANK	K/P <sup>Note</sup>
Marking	R62
hFE	50 to 250

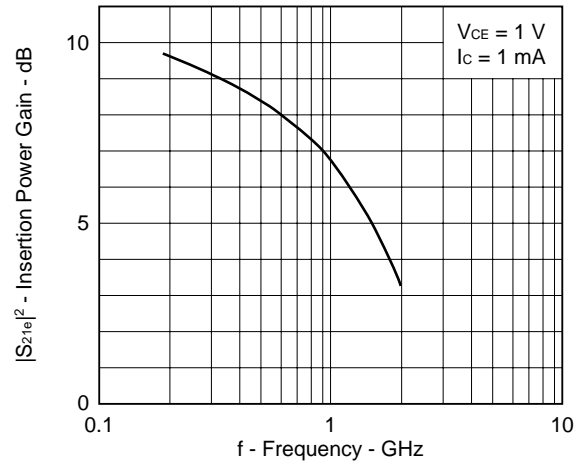
**Note** Existing rank classification/newly added rank

TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)

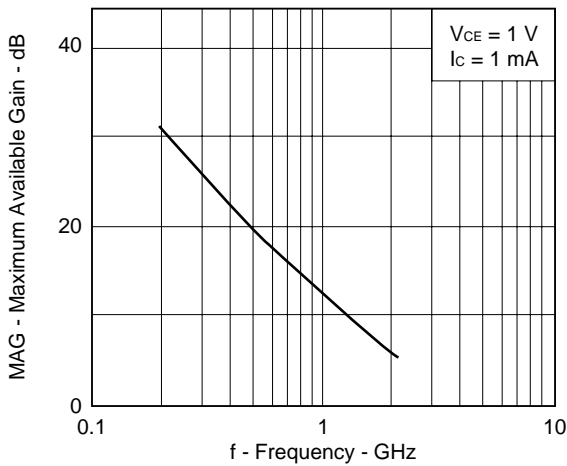
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



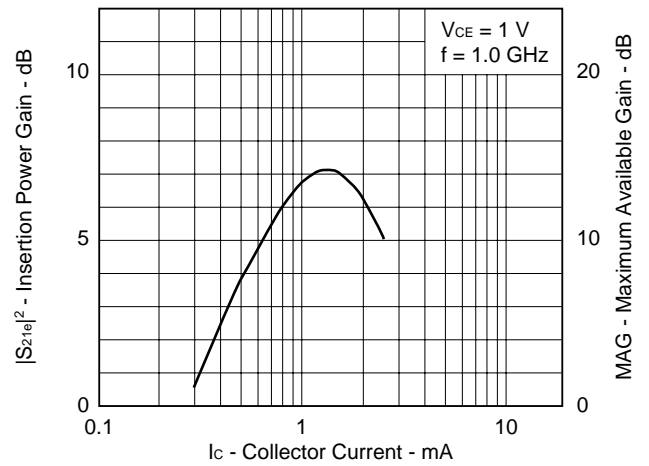
INSERTION POWER GAIN vs. FREQUENCY



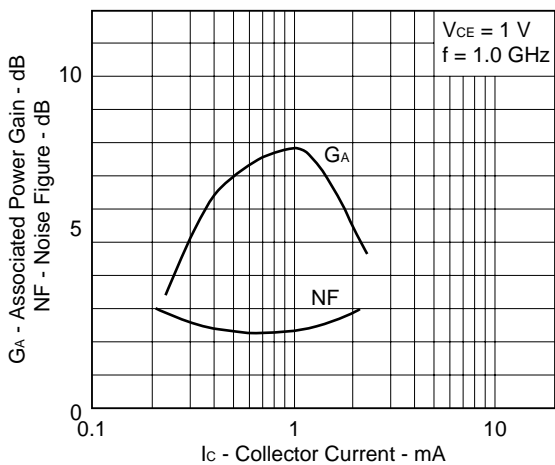
MAXIMUM AVAILABLE GAIN vs. FREQUENCY



INSERTION POWER GAIN vs. COLLECTOR CURRENT



NOISE FIGURE AND POWER GAIN AT OPTIMUM NF vs. COLLECTOR CURRENT





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Anti-radioactive design is not implemented in this product.