

#### FEATURES

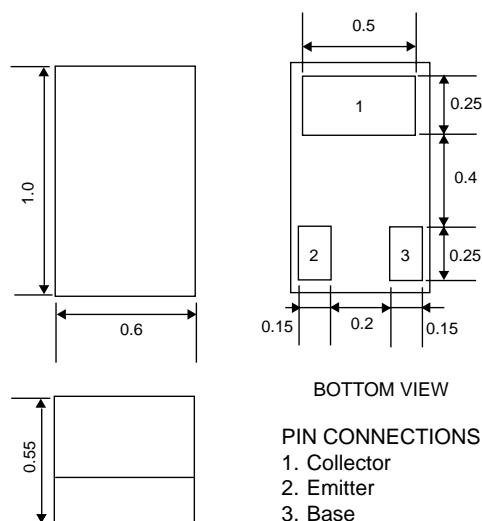
- **NEW MINIATURE M23 PACKAGE:**
  - World's smallest transistor package footprint — leads are completely underneath package body
  - Low profile/0.55 mm package height
  - Ceramic substrate for better RF performance
- **LOW NOISE FIGURE:**  
NF = 1.4 dB at 1 GHz
- **HIGH COLLECTOR CURRENT:**  
Ic MAX = 100 mA

#### DESCRIPTION

The NE856M23 transistor is designed for low cost amplifier and oscillator applications. Low noise figure, high gain and high current capability equate to wide dynamic range and excellent linearity. NEC's new low profile/ceramic substrate style "M23" package is ideal for today's portable wireless applications. The NE856 is also available in chip, Micro-x, and eight different low cost plastic surface mount package styles.

#### OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE M23



#### ELECTRICAL CHARACTERISTICS (TA = 25°C)

PART NUMBER EIAJ <sup>1</sup> REGISTERED NUMBER PACKAGE OUTLINE		NE856M23 2SC5649 M23			
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
f <sub>T</sub>	Gain Bandwidth at V <sub>CE</sub> = 3 V, I <sub>c</sub> = 7 mA, f = 1 GHz	GHz	3	4.5	
NF	Noise Figure at V <sub>CE</sub> = 3 V, I <sub>c</sub> = 7 mA, f = 1 GHz	dB		1.4	2.5
S <sub>21E</sub>   <sup>2</sup>	Insertion Power Gain at V <sub>CE</sub> = 3 V, I <sub>c</sub> = 7 mA, f = 1 GHz	dB	7	10.0	
h <sub>FE</sub> <sup>2</sup>	Forward Current Gain at V <sub>CE</sub> = 3 V, I <sub>c</sub> = 7 mA		80		145
I <sub>CBO</sub>	Collector Cutoff Current at V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0	μA			1
I <sub>EBO</sub>	Emitter Cutoff Current at V <sub>EB</sub> = 1 V, I <sub>C</sub> = 0	μA			1
CRE <sup>3</sup>	Feedback Capacitance at V <sub>CB</sub> = 3 V, I <sub>E</sub> = 0, f = 1 MHz	pF		0.7	1.5

Notes:

1. Electronic Industrial Association of Japan.
2. Pulsed measurement, pulse width ≤ 350 μs, duty cycle ≤ 2 %.
3. Capacitance is measured with emitter and case connected to the guard terminal at the bridge.

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>** (T<sub>A</sub> = 25°C)

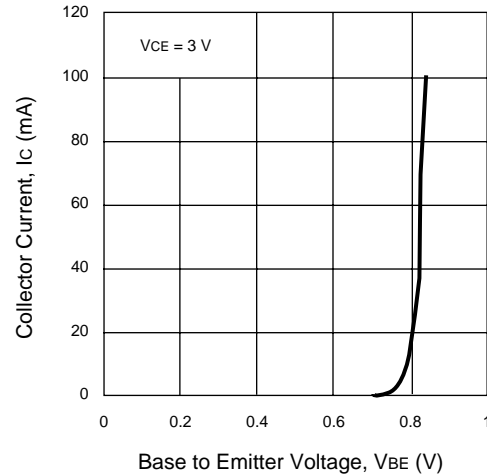
SYMBOLS	PARAMETERS	UNITS	RATINGS
V <sub>CBO</sub>	Collector to Base Voltage	V	20
V <sub>CEO</sub>	Collector to Emitter Voltage	V	12
V <sub>EB0</sub>	Emitter to Base Voltage	V	3
I <sub>C</sub>	Collector Current	mA	100
P <sub>T</sub>	Total Power Dissipation	mW	TBD
T <sub>J</sub>	Junction Temperature	°C	150
T <sub>STG</sub>	Storage Temperature	°C	-65 to +150

Note:

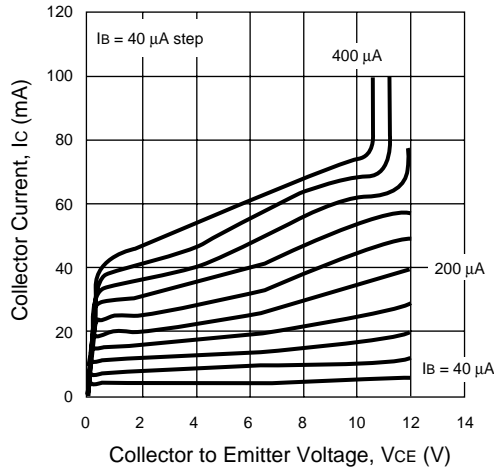
1. Operation in excess of any one of these parameters may result in permanent damage.

**TYPICAL PERFORMANCE CURVES** (T<sub>A</sub> = 25°C)

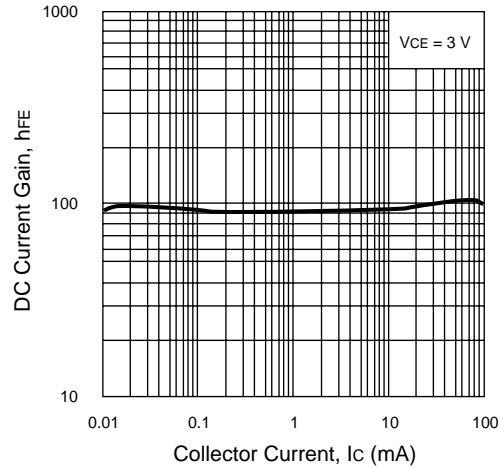
**COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE**



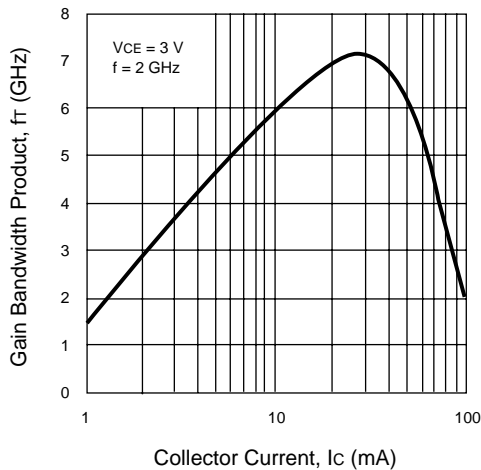
**COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE**



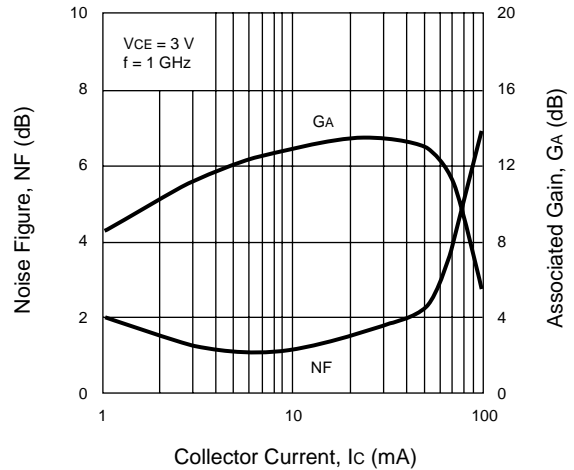
**DC CURRENT GAIN vs. COLLECTOR CURRENT**



**GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT**



**NOISE FIGURE/ASSOCIATED GAIN vs. COLLECTOR CURRENT**



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