NPN SILICON TRANSISTOR

NE685M23

FEATURES

• NEW MINIATURE M23 PACKAGE:

- World's smallest transistor package footprint leads are completely underneath package body
- Low profile/0.55 mm package height

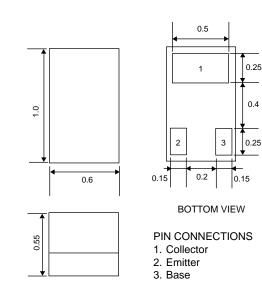
- Ceramic substrate for better RF performance
- HIGH GAIN BANDWIDTH PRODUCT: ft = 12 GHz
- LOW NOISE FIGURE: NF = 1.5 dB at 2 GHz

DESCRIPTION

The NE685M23 transistor is designed for low noise, high gain, and low cost requirements. This high fT part is well suited for very low voltage/low current designs for portable wireless communications and cellular radio applications. NEC's new low profile/ceramic substrate style "M23" package is ideal for today's portable wireless applications. The NE685 is also available in six different low cost plastic surface mount package styles.

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE M23



ELECTRICAL CHARACTERISTICS (TA = 25°C)

PART NUMBER EIAJ ¹ REGISTERED NUMBER PACKAGE OUTLINE			NE685M23 2SC5652 M23			
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	ТҮР	MAX	
fт	Gain Bandwidth at VcE = 3 V, Ic = 10 mA, f = 2 GHz	GHz		12		
NF	Noise Figure at Vce = 3 V, Ic = 10 mA, f = 2 GHz	dB		1.5	2.5	
S21E ²	Insertion Power Gain at VcE = 3 V, Ic = 7 mA, f = 2 GHz	dB	7	10		
hfe ²	Forward Current Gain at Vce = 3 V, Ic = 10 mA		75		145	
Ісво	Collector Cutoff Current at VCB = 5 V, IE = 0	μA			0.1	
Іево	Emitter Cutoff Current at VEB = 1 V, IC = 0	μΑ			0.1	
Cre ³	Feedback Capacitance at VcB = 3 V, IE = 0, f = 1 MHz	pF		0.4	0.7	

Notes:

1. Electronic Industrial Association of Japan.

2. Pulsed measurement, pulse width \leq 350 µs, duty cycle \leq 2 %.

3. Capacitance is measured with emitter and case connected to the guard terminal at the bridge.

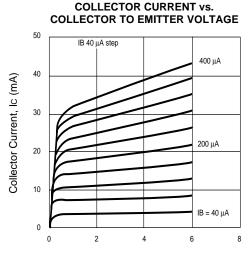
SYMBOLS	PARAMETERS	UNITS	RATINGS
Vсво	Collector to Base Voltage	V	9
VCEO	Collector to Emitter Voltage	V	5
Vebo	Emitter to Base Voltage	V	2
Ic	Collector Current	mA	30
Рт	Total Power Dissipation	mW	TBD
TJ	Junction Temperature	°C	150
Tstg	Storage Temperature	°C	-65 to +150

ABSOLUTE MAXIMUM RATINGS¹ (TA = 25°C)

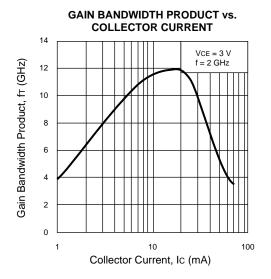
Note:

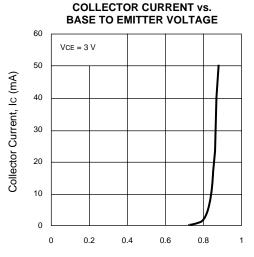
1. Operation in excess of any one of these parameters may result in permanent damage.

TYPICAL PERFORMANCE CURVES (TA = 25°C)



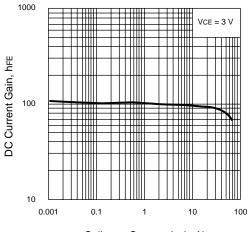
Collector to Emitter Voltage, VCE (V)





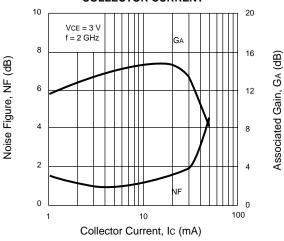
Base to Emitter Voltage, VCE (V)

DC CURRENT GAIN vs. COLLECTOR CURRENT



Collector Current, Ic (mA)

NOISE FIGURE/ASSOCIATED GAIN vs. COLLECTOR CURRENT



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