

NE680M03

OUTLINE DIMENSIONS (Units in mm)

- PACKAGE OUTLINE M03**
-
- Technical drawing of Package Outline M03. The top view shows a central rectangular area with a stylized 'H' logo. Dimensions include a total width of 1.2 ± 0.05 , a central width of 0.8 ± 0.1 , and a total height of 1.4 ± 0.1 . Specific features are labeled with numbers 1, 2, and 3. The bottom view shows a trapezoidal shape with a width of 0.59 ± 0.05 and a height of $0.15^{+0.1}_{-0.05}$.

The NE680M03 transistor is designed for low noise, high gain, and low cost applications. This high fr part is ideal for low voltage/low current applications. NEC's new low profile/flat lead style "M03" package is ideal for today's portable wireless applications. The NE680 is also available in chip, Micro-x, and six different low cost plastic surface mount package styles.

Note:

1. This dimension was changed effective 04/2000 from 1.4 mm to 1.2 mm. Products with "04" or a higher number indicated for month of manufacture in lot numbers have the new dimension.

1. Emitter
2. Base
3. Collector

Example of Lot No. Identification

0 6 xxxxxxxx

- In-company control code
- Month of manufacture
(Example: Jan. = 1, Feb. = 2, etc.
Oct. = X, Nov. = Y, Dec. = Z)
- Year of manufacture
(Last digit of year, 2000 = 0)

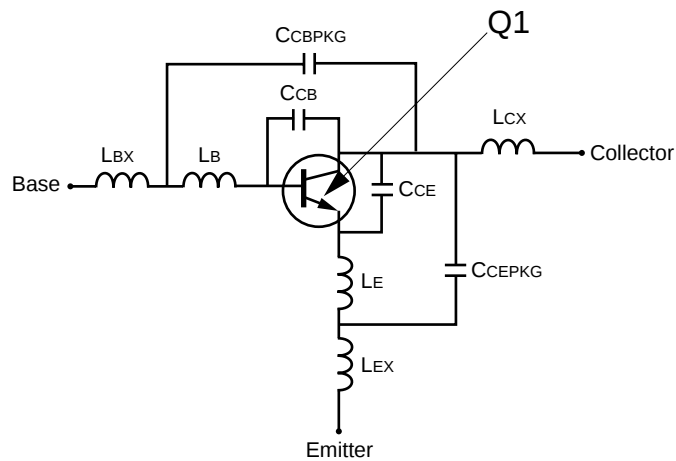
ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER EIAJ ¹ REGISTERED NUMBER PACKAGE OUTLINE		NE680M03 2SC5434 M03			
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
f _T	Gain Bandwidth at V _{CE} = 3 V, I _C = 5 mA, f = 2 GHz	GHz	5.5	8.0	
NF	Noise Figure at V _{CE} = 3 V, I _C = 6 mA, f = 2 GHz	dB		1.9	3.2
S _{21E} ²	Insertion Power Gain at V _{CE} = 3 V, I _C = 5 mA, f = 2 GHz	dB	5.5	7.5	
h _{FE} ²	Forward Current Gain at V _{CE} = 3 V, I _C = 5 mA		80		145
I _{CBO}	Collector Cutoff Current at V _{CB} = 10 V, I _E = 0	μA			1.0
I _{EBO}	Emitter Cutoff Current at V _{EB} = 1 V, I _C = 0	μA			1.0
C _{RE} ³	Feedback Capacitance at V _{CB} = 3 V, I _E = 0, f = 1 MHz	pF		0.3	0.7

1. Electronic Industrial Association of Japan.
2. Pulsed measurement, pulse width $\leq 350 \mu\text{s}$, duty cycle $\leq 2 \%$.
3. Capacitance is measured with emitter and case connected to the guard terminal at the bridge.

NONLINEAR MODEL

SCHEMATIC



BJT NONLINEAR MODEL PARAMETERS (1)

Parameters	Q1	Parameters	Q1
IS	5.98e-16	MJC	0.15
BF	179	XCJC	1
NF	1.04	CJS	0
VAF	17	VJS	0.75
IKF	0.02	MJS	0
ISE	1.0e-6	FC	0.5
NE	30	TF	8.7e-12
BR	16	XTF	20
NR	1.04	VTF	0.3
VAR	100	ITF	0.04
IKR	6.85e-3	PTF	120
ISC	1.5e-9	TR	0.635e-9
NC	20	EG	1.11
RE	0.50	XTB	0
RB	8.54	XTI	3
RBM	2	KF	0
IRB	4e-4	AF	1
RC	10		
CJE	0.358e-12		
VJE	0.86		
MJE	0.5		
CJC	0.162e-12		
VJC	0.52		

UNITS

Parameter	Units
time	seconds
capacitance	farads
inductance	henries
resistance	ohms
voltage	volts
current	amps

ADDITIONAL PARAMETERS

Parameters	680M03
CCB	0.08e-12
CCE	0.08e-12
LB	0.4e-9
LE	0.8e-9
CCBPKG	0.08e-12
CCEPKG	0.08e-12
LBX	0.12e-9
LCX	0.10e-9
LEX	0.12e-9

MODEL RANGE

Frequency: 0.1 to 3.0 GHz
Bias: VCE = 0.5 V to 6 V, IC = 0.5 mA to 15 mA
Date: 11/98

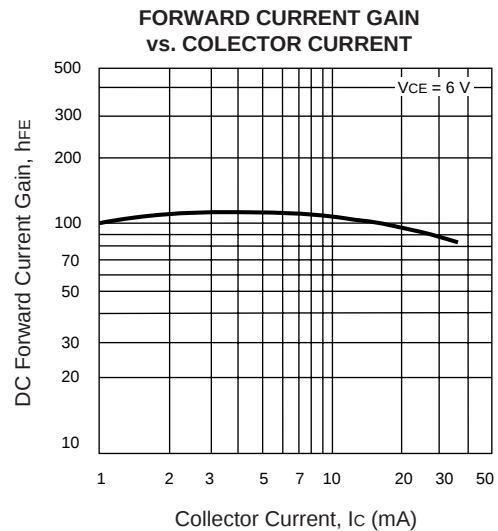
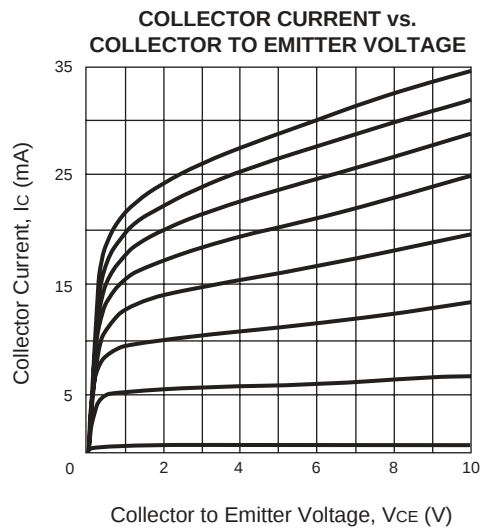
(1) Gummel-Poon Model

ABSOLUTE MAXIMUM RATINGS¹ ($T_A = 25^\circ\text{C}$)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CBO}	Collector to Base Voltage	V	20
V_{CEO}	Collector to Emitter Voltage	V	10
V_{EBO}	Emitter to Base Voltage	V	1.5
I_C	Collector Current	mA	35
P_T	Total Power Dissipation	mW	125
T_J	Junction Temperature	$^\circ\text{C}$	150
T_{STG}	Storage Temperature	$^\circ\text{C}$	-65 to +150

Note:

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

TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)

Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.



EXCLUSIVE NORTH AMERICAN AGENT FOR **NEC** RF, MICROWAVE & OPTOELECTRONIC SEMICONDUCTORS

CALIFORNIA EASTERN LABORATORIES • Headquarters • 4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • Telex 34-6393 • FAX (408) 988-0279

DATA SUBJECT TO CHANGE WITHOUT NOTICE

Internet: <http://WWW.CEL.COM>

06/10/2002