

# SILICON TRANSISTOR 2SC3604

## NPN EPITAXIAL SILICON TRANSISTOR FOR MICROWAVE LOW-NOISE AMPLIFICATION

The 2SC3604 is an NPN epitaxial transistor designed for low-noise amplification at 1.0 to 6.0 GHz. This transistor has low-noise and high-gain characteristics in a wide collector current region, and has a wide dynamic range.

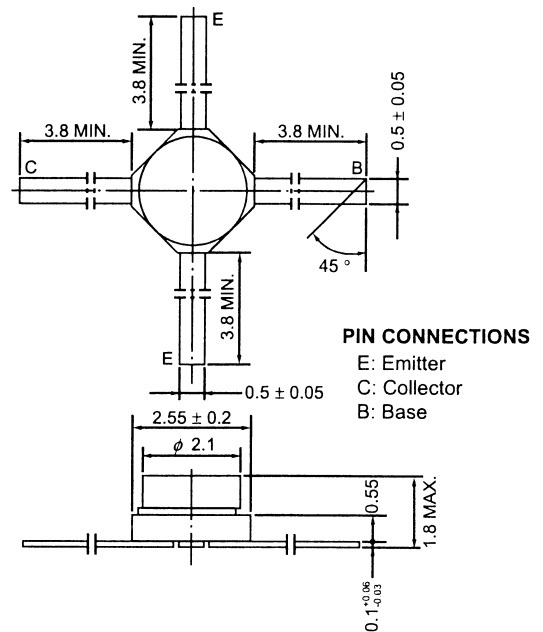
### FEATURES

- Low noise : NF = 1.6 dB TYP. @ f = 2.0 GHz
- High power gain :  $G_A = 12$  dB TYP. @ f = 2.0 GHz

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

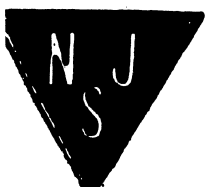
PARAMETER	SYMBOL	RATING	UNIT
Collector to Base Voltage	$V_{CBO}$	20	V
Collector to Emitter Voltage	$V_{CEO}$	10	V
Emitter to Base Voltage	$V_{EBO}$	1.5	V
Collector Current	$I_C$	65	mA
Total Power Dissipation	$P_T (T_C = 25^\circ\text{C})$	580	mW
Junction Temperature	$T_J$	200	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +150	$^\circ\text{C}$

### PACKAGE DIMENSIONS (in mm)



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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 10$ V, $I_E = 0$			1.0	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 1$ V, $I_C = 0$			1.0	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 8$ V, $I_C = 20$ mA Pulse	50	100	250	
Gain Bandwidth Product	$f_T$	$V_{CE} = 8$ V, $I_C = 20$ mA		8		GHz
Reverse Transfer Capacitance	$C_{re}$	$V_{CB} = 10$ V, $I_E = 0$ , $f = 1$ MHz		0.2	0.7	pF
Noise Figure	NF <sup>Note</sup>	$V_{CE} = 8$ V, $I_C = 7$ mA, $f = 2.0$ GHz		1.6	2.3	dB
Insertion Gain	$ S_{21e} ^2$	$V_{CE} = 8$ V, $I_C = 20$ mA, $f = 2.0$ GHz	9.0	11		dB
Maximum Available Gain	MAG	$V_{CE} = 8$ V, $I_C = 20$ mA, $f = 2.0$ GHz		13		dB
Power Gain	$G_A$	$V_{CE} = 8$ V, $I_C = 7$ mA, $f = 2.0$ GHz		12		dB

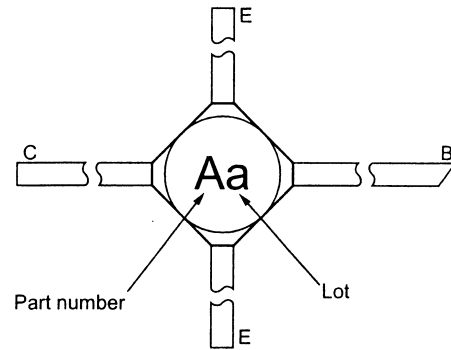


**MARKING**

Because the package of the micro X package transistor is too small to be marked, the following indication is employed.

**Part Number**

Part Number	Marking	Part Number	Marking
2SC2148	A	2SC3603	0
2SC2149	B	2SC3604	2
2SC2150	C	2SC3587	1
2SC2367	H		
2SC2585	K		
2SC1223	D		



**Lot**

Lot indication is colored as shown below.

The sequence black, brown, red, blue, and green, forms one cycle and this cycle is repeated.

Month \ Year	1988	1989	1990	1991	1992	1993	1994	1995	1996
1	j Black	v	h	t	f	r	d	p	b
2	k	w	i	u	g	s	e	q	c
3	l	x	j	v	h	t	f	r	d
4	m	y	k	w	i	u	g	s	e
5	n	z	l	x	j	v	h	t	f
6	o	a Brown	m	y	k	w	i	u	g
7	p	b	n	z	l	x	j	v	h
8	q	c	o	a Red	m	y	k	w	i
9	r	d	p	b	n	z	l	x	j
10	s	e	q	c	o	a Blue	m	y	k
11	t	f	r	d	p	b	n	z	l
12	u	g	s	e	q	c	o	a Green	m