



# UNISONIC TECHNOLOGIES CO., LTD

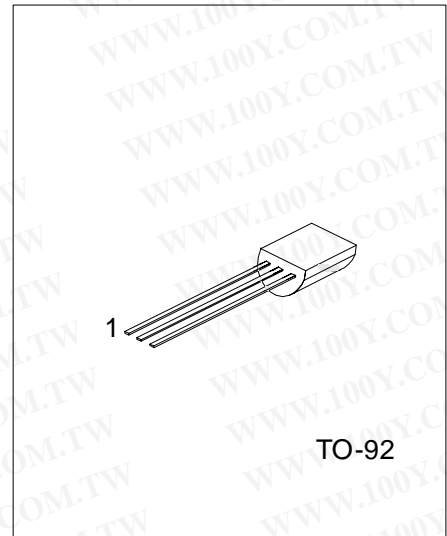
## 2N3904

## NPN SILICON TRANSISTOR

### NPN GENERAL PURPOSE AMPLIFIER

#### FEATURES

- \* Collector-Emitter Voltage:  $V_{CEO}=40V$
- \* Collector Dissipation:  $P_{C(MAX)}=625mW$
- \* Complementary to 2N3906



\*Pb-free plating product number: 2N3904L

#### ORDERING INFORMATION

Order Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
2N3904-T92-B	2N3904L-T92-B	TO-92	E	B	C	Tape Box
2N3904-T92-K	2N3904L-T92-K	TO-92	E	B	C	Bulk

2N3904L-T92-B 	(1)Packing Type	(1) B: Tape Box, K: Bulk
	(2)Package Type	(2) T92: TO-92
	(3)Lead Plating	(3) L: Lead Free Plating, Blank: Pb/Sn

勝特力材料 886-3-5753170  
 勝特力电子(上海) 86-21-54151736  
 勝特力电子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)

■ ABSOLUTE MAXIMUM RATING (Ta=25 )

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	V <sub>CBO</sub>	60	V
Collector-Emitter Voltage	V <sub>CEO</sub>	40	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Collector Current	I <sub>C</sub>	200	mA
Collector Dissipation	P <sub>C</sub>	625	mW
Junction Temperature	T <sub>J</sub>	150	
Operating and Storage Temperature	T <sub>STG</sub>	-55 ~ +150	

Note Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

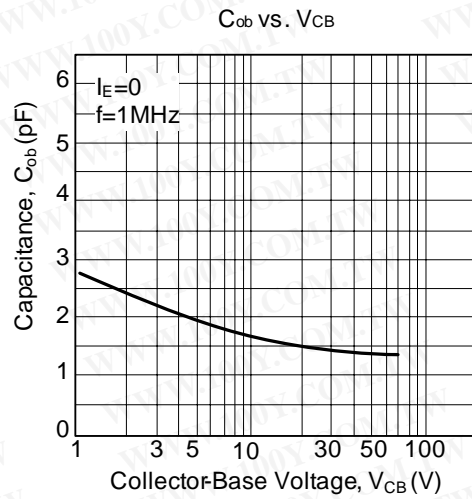
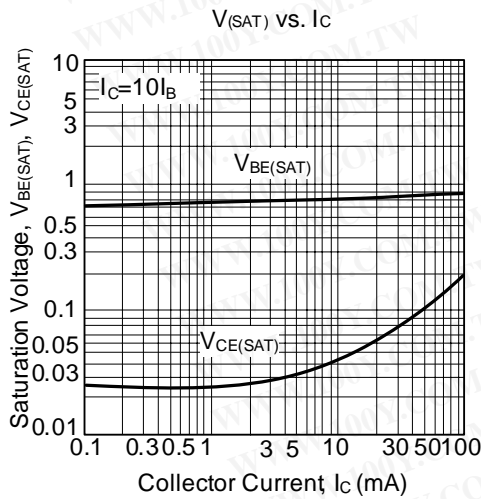
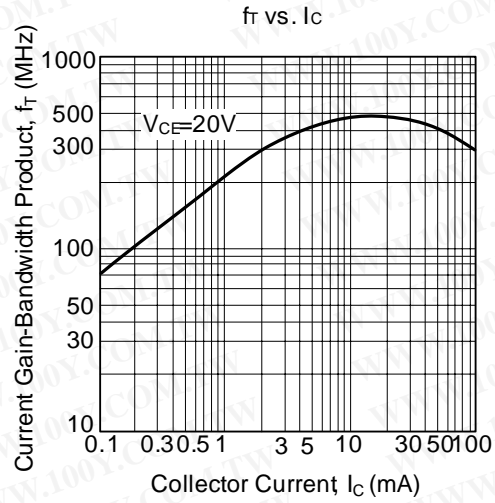
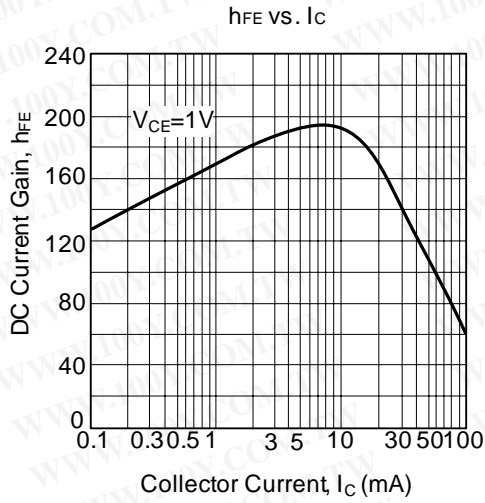
■ ELECTRICAL CHARACTERISTICS (Ta=25 , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0	60			V
Collector-Emitter Breakdown Voltage (note)	BV <sub>CEO</sub>	I <sub>C</sub> =1mA, I <sub>B</sub> =0	40			V
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =0	6			V
Collector-Emitter Saturation Voltage (note)	V <sub>CE(SAT)1</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =1mA			0.2	V
	V <sub>CE(SAT)2</sub>	I <sub>C</sub> =50mA, I <sub>B</sub> =5mA			0.3	
Base-Emitter Saturation Voltage (note)	V <sub>BE(SAT)1</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =1mA	0.65		0.85	V
	V <sub>BE(SAT)2</sub>	I <sub>C</sub> =50mA, I <sub>B</sub> =5mA			0.95	
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CE</sub> =30V, V <sub>EB</sub> =3V			50	nA
Base Cut-off Current	I <sub>BL</sub>	V <sub>CE</sub> =30V, V <sub>EB</sub> =3V			50	nA
DC Current Gain (note)	h <sub>FE1</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =0.1mA	40			
	h <sub>FE2</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =1mA	70			
	h <sub>FE3</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =10mA	100		300	
	h <sub>FE4</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =50mA	60			
	h <sub>FE5</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =100mA	30			
Current Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =20V, I <sub>C</sub> =10mA, f=100MHz	300			MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =5V, I <sub>E</sub> =0, f=1MHz			4	pF
Turn on Time	t <sub>ON</sub>	V <sub>CC</sub> =3V, V <sub>BE</sub> =0.5V, I <sub>C</sub> =10mA, I <sub>B1</sub> =1mA			70	ns
Turn off Time	t <sub>OFF</sub>	I <sub>B1</sub> =1mA, I <sub>B2</sub> =1mA			250	ns

Note: Pulse test: Pulse Width 300μs, Duty Cycle 2%

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### TYPICAL CHARACTERISTICS



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