



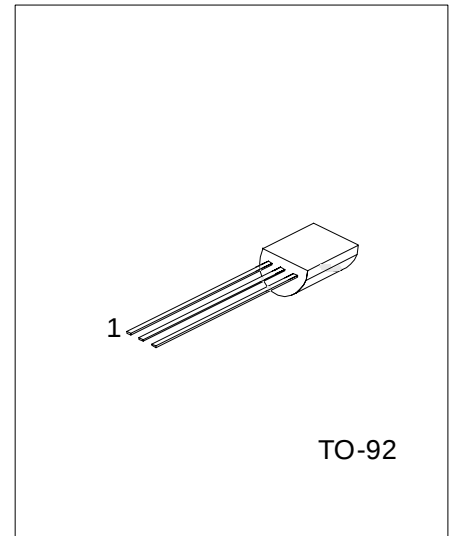
2N3904

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

■ ABSOLUTE MAXIMUM RATING (Ta=25 °C)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Collector Dissipation	P_C	625	mW
Junction Temperature	T_J	150	
Operating and Storage Temperature	T_{STG}	-55 ~ +150	

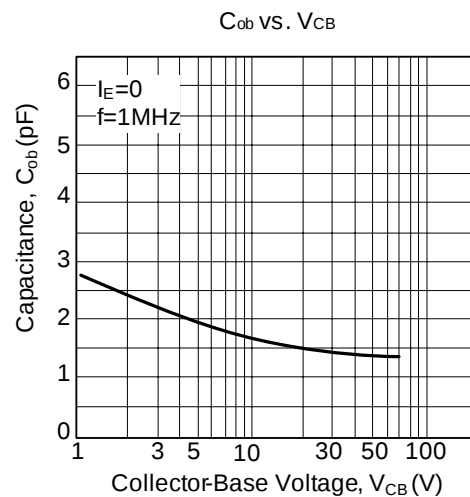
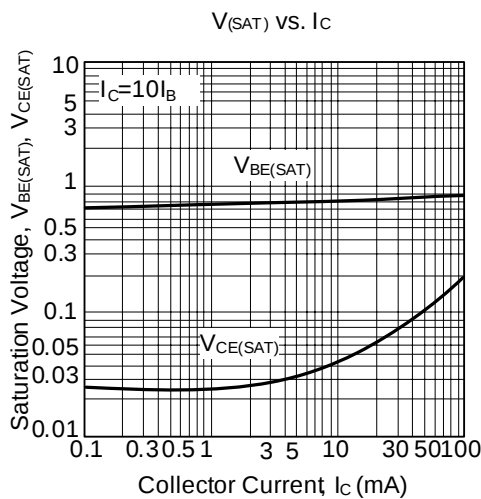
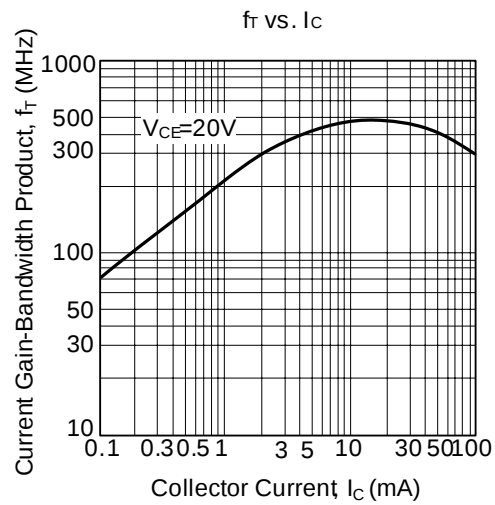
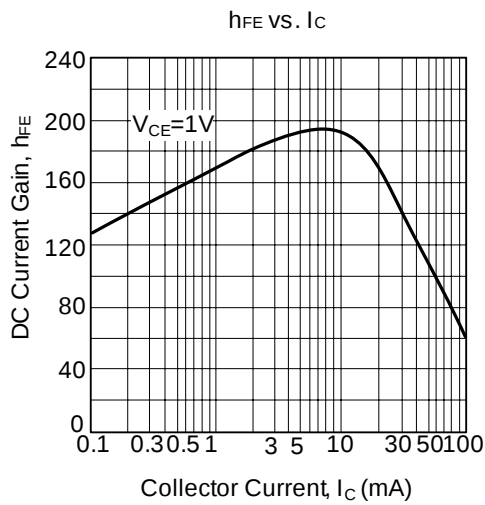
Note Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C=10\mu A, I_E=0$	60			V
Collector-Emitter Breakdown Voltage (note)	BV_{CEO}	$I_C=1mA, I_B=0$	40			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E=10\mu A, I_C=0$	6			V
Collector-Emitter Saturation Voltage (note)	$V_{CE(SAT)1}$	$I_C=10mA, I_B=1mA$			0.2	V
	$V_{CE(SAT)2}$	$I_C=50mA, I_B=5mA$			0.3	
Base-Emitter Saturation Voltage (note)	$V_{BE(SAT)1}$	$I_C=10mA, I_B=1mA$	0.65		0.85	V
	$V_{BE(SAT)2}$	$I_C=50mA, I_B=5mA$			0.95	
Collector Cut-off Current	I_{CBO}	$V_{CE}=30V, V_{EB}=3V$			50	nA
Base Cut-off Current	I_{BL}	$V_{CE}=30V, V_{EB}=3V$			50	nA
DC Current Gain (note)	h_{FE1}	$V_{CE}=1V, I_C=0.1mA$	40			
	h_{FE2}	$V_{CE}=1V, I_C=1mA$	70			
	h_{FE3}	$V_{CE}=1V, I_C=10mA$	100		300	
	h_{FE4}	$V_{CE}=1V, I_C=50mA$	60			
	h_{FE5}	$V_{CE}=1V, I_C=100mA$	30			
Current Gain Bandwidth Product	f_T	$V_{CE}=20V, I_C=10mA, f=100MHz$	300			MHz
Output Capacitance	C_{ob}	$V_{CB}=5V, I_E=0, f=1MHz$			4	pF
Turn on Time	t_{ON}	$V_{CC}=3V, V_{BE}=0.5V, I_C=10mA, I_B1=1mA$			70	ns
Turn off Time	t_{OFF}	$I_B1=1mA, I_B2=1mA$			250	ns

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

TYPICAL CHARACTERISTICS



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.