

2N3903

NPN EPITAXIAL SILICON TRANSISTOR

GENERAL PURPOSE TRANSISTOR

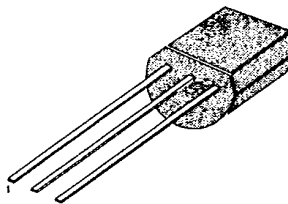
- Collector-Emitter Voltage: $V_{CE0}=40V$
- Collector Dissipation: $P_C(\text{max})=625mW$

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ C$)

Characteristic	Symbol	Rating	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	$^\circ C$
Storage Temperature	T_{stg}	-55 ~ 150	$^\circ C$

* Refer to 2N3904 for graphs

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1. Emitter 2. Base 3. Collector

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ELECTRICAL CHARACTERISTICS ($T_a=25^\circ C$)

Characteristic	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	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 Cut-off Current	I_{CEX}	$V_{CE}=30V, V_{EB}=3V$			50	nA
Base Cut-off Current	I_{BL}	$V_{CE}=30V, V_{EB}=3V$			50	nA
*DC Current Gain	h_{FE}	$I_C=0.1mA, V_{CE}=1V$	20			
		$I_C=1mA, V_{CE}=1V$	35			
		$I_C=10mA, V_{CE}=1V$	50		150	
		$I_C=50mA, V_{CE}=1V$	30			
		$I_C=100mA, V_{CE}=1V$	15			
*Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=10mA, I_B=1mA$			0.2	V
		$I_C=50mA, I_B=5mA$			0.3	V
*Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=10mA, I_B=1mA$	0.65		0.85	V
		$I_C=50mA, I_B=5mA$			0.95	V
Output Capacitance	C_{ob}	$V_{CB}=5V, I_E=0$ $f=1MHz$			4	pF
Current Gain Bandwidth Product	f_T	$I_C=10mA, V_{CE}=20V$ $f=100MHz$	250			MHz
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}	$V_{CC}=3V, I_C=1mA$ $I_B=I_{B2}=1mA$			225	ns

* Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$



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