

Transistors

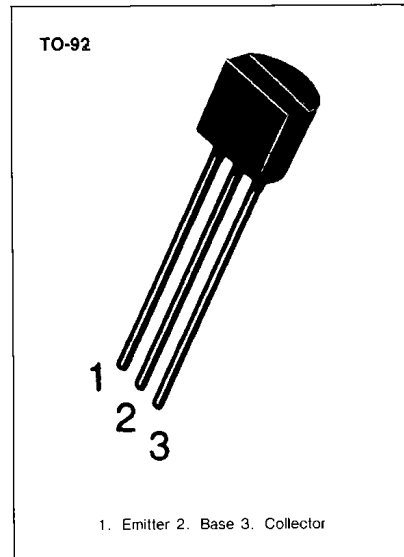
2N4400

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_{CB0}	60	V
Collector-Emitter Voltage	V_{CE0}	40	V
Emitter-Base Voltage	V_{EB0}	6	V
Collector Current	I_C	600	mA
Collector Dissipation	P_C	625	mW
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{stg}	-55 ~ 150	$^\circ C$



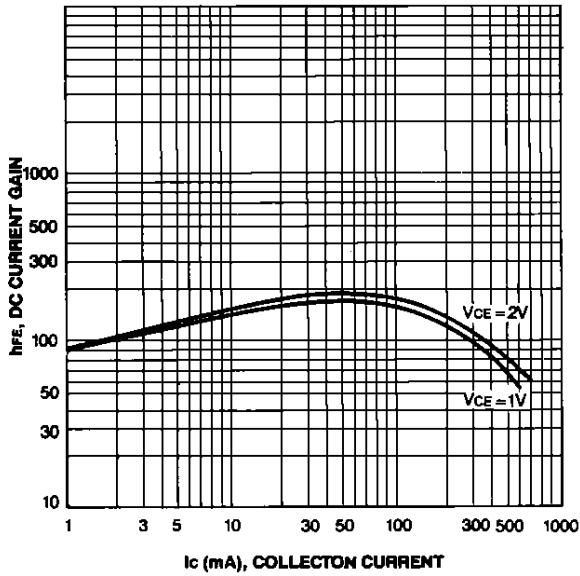
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ C$)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	BV_{CB0}	$I_C = 100\mu A, I_E = 0$	60			V
*Collector-Emitter Breakdown Voltage	BV_{CE0}	$I_C = 1mA, I_B = 0$	40			V
Emitter-Base Breakdown Voltage	BV_{EB0}	$I_E = 100\mu A, I_C = 0$	6			V
Collector Cut-off Current	I_{CEX}	$V_{CE} = 35V, V_{EB} = 0.4V$			100	nA
*DC Current Gain	h_{FE}	$V_{CE} = 1V, I_C = 0.1mA$ $V_{CE} = 1V, I_C = 1mA$ $V_{CE} = 1V, I_C = 10mA$ $V_{CE} = 1V, I_C = 150mA$ $V_{CE} = 2V, I_C = 500mA$	20		150	
*Collector-Emitter Saturation Voltage	$V_{CE} (\text{sat})$	$I_C = 150mA, I_B = 15mA$ $I_C = 50mA, I_B = 50mA$			0.4 0.75	V V
*Base-Emitter Saturation Voltage	$V_{BE} (\text{sat})$	$I_C = 150mA, I_B = 15mA$ $I_C = 500mA, I_B = 50mA$	0.75		0.95 1.2	V V
Output Capacitance	C_{CB}	$V_{CB} = 5V, I_E = 0$ $f = 100MHz$			6.5	pF
Current Gain Bandwidth Product	f_T	$V_{CE} = 10V, I_C = 20mA$ $f = 100MHz$	200			MHz
Turn On Time	t_{ON}	$V_{CC} = 30V, V_{BE} = 2V$ $I_C = 150mA, I_B = 15mA$			35	ns
Turn Off Time	t_{OFF}	$V_{CC} = 30V, I_C = 150mA$ $I_B = I_B = 15mA$			255	ns

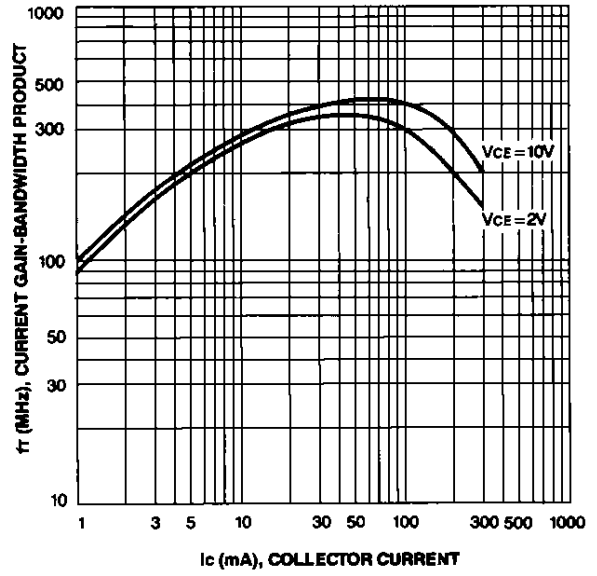
* Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$



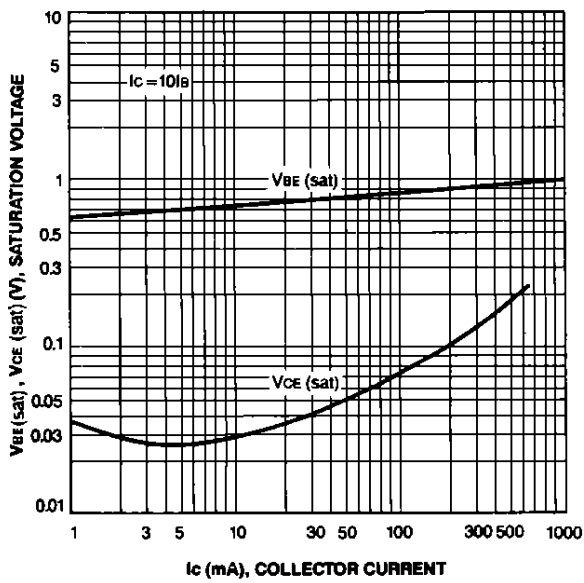
DC CURRENT GAIN



CURRENT GAIN-BANDWIDTH PRODUCT



**COLLECTOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE**



**COLLECTOR-BASE CAPACITANCE
OUTPUT CAPACITANCE**

