

# Transistors

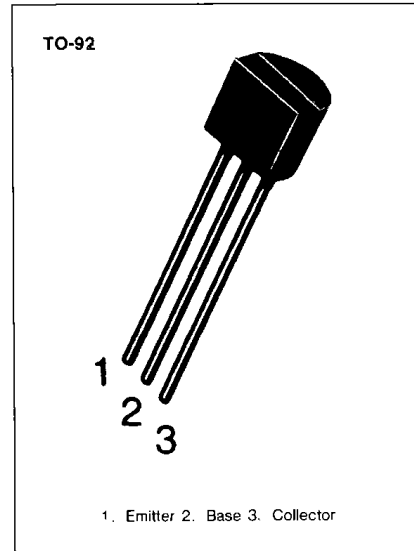
## 2N3905

### 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	$V_{CBO}$	-40	V
Collector-Emitter Voltage	$V_{CEO}$	-40	V
Emitter-Base Voltage	$V_{EBO}$	-5	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	$^\circ C$



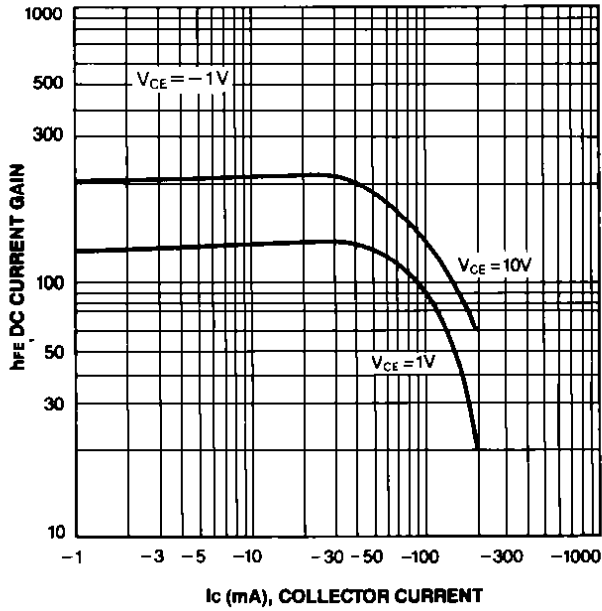
### ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ C$ )

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	$BV_{CBO}$	$I_C = -10\mu A, I_E = 0$	-40			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	$h_{FE}$	$V_{CE} = -1V, I_C = -0.1mA$	30			
		$V_{CE} = -1V, I_C = -1mA$	40			
		$V_{CE} = -1V, I_C = -10mA$	50		150	
		$V_{CE} = -1V, I_C = -50mA$	30			
		$V_{CE} = -1V, I_C = 100mA$	15			
*Collector-Emitter Saturation Voltage	$V_{CE} (\text{sat})$	$I_C = -10mA, I_B = -1mA$			-0.25	V
		$I_C = -50mA, I_B = -5mA$			-0.4	V
*Base-Emitter Saturation Voltage	$V_{BE} (\text{sat})$	$I_C = -10mA, I_B = -1mA$	-0.65		-0.85	V
		$I_C = -50mA, I_B = -5mA$			-0.95	V
Output Capacitance	$C_{OB}$	$V_{CB} = -5V, I_E = 0$ $f = 100KHz$			4.5	pF
Current Gain Bandwidth Product	$f_T$	$V_{CE} = -20V, I_C = -10mA$ $f = 100MHz$	200			MHz
Turn On Time	$t_{ON}$	$V_{CC} = -3V, V_{BE} = -0.5V$ $I_C = -10mA, I_{B1} = -1mA$			70	ns
Turn Off Time	$t_{OFF}$	$V_{CC} = -3V, I_C = -10mA$ $I_{B1} = I_{B2} = 1mA$			260	ns

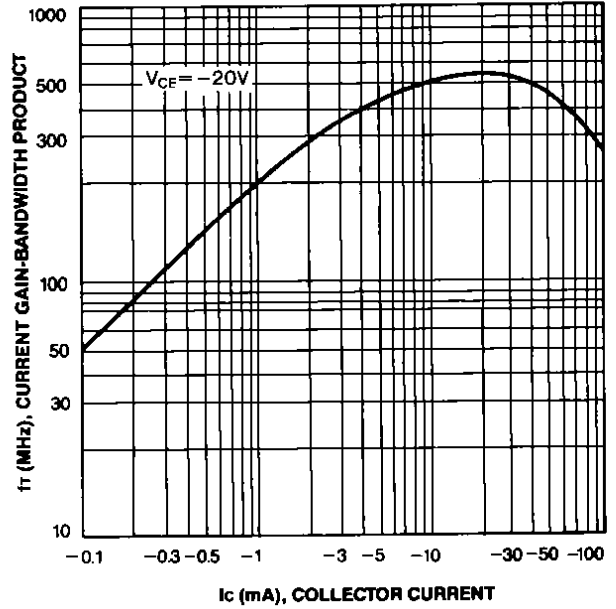
\*Pulse Test: Pulse Width  $\leq 300\mu s$ . Duty Cycle  $\leq 2\%$



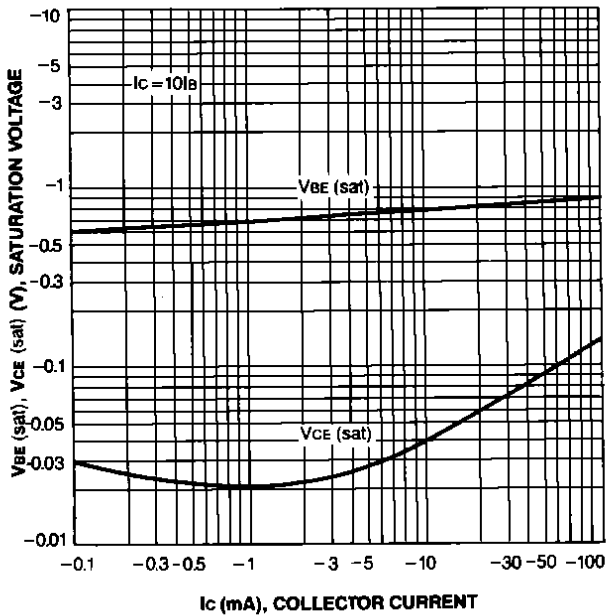
**DC CURRENT GAIN**



**CURRENT GAIN-BANDWIDTH PRODUCT**



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



**OUTPUT CAPACITANCE**

