



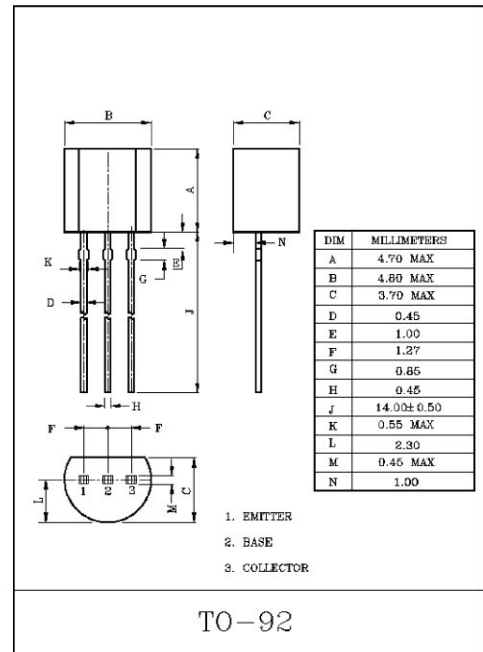
GENERAL PURPOSE APPLICATION.
SWITCHING APPLICATION.

FEATURES

- Low Leakage Current
: $I_{CEX} = -50\text{nA (Max.)}$, $I_{BL} = 50\text{nA (Max.)}$
@ $V_{CE} = -30\text{V}$, $V_{BE} = 3\text{V}$.
- Excellent DC Current Gain Linearity.
- Low Saturation Voltage
: $V_{CE(sat)} = -0.4\text{V (Max.)}$ @ $I_C = -50\text{mA}$, $I_B = -5\text{mA}$.
- Low Collector Output Capacitance
: $C_{ob} = 4.5\text{pF (Max.)}$ @ $V_{CB} = -5\text{V}$.
- Complementary to 2N3904.

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

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
Base Current	I_B	-50	mA
Collector Power Dissipation	P_C	$T_a = 25^\circ\text{C}$	625 mW
		$T_c = 25^\circ\text{C}$	1.5 W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 ~ 150	$^\circ\text{C}$





ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT			
Collector Cut-off Current	I_{CEX}	$V_{CE}=-30V, V_{BE}=3V$	-	-	-50	nA			
Base Cut-off Current	I_{BL}	$V_{CE}=-30V, V_{BE}=3V$	-	-	50	nA			
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=-10\mu A, I_E=0$	-40	-	-	V			
Collector-Emitter Breakdown Voltage *	$V_{(BR)CEO}$	$I_C=-1mA, I_B=0$	-40	-	-	V			
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=-10\mu A, I_C=0$	-5.0	-	-	V			
DC Current Gain *	$h_{FE}(1)$	$V_{CE}=-1V, I_C=-0.1mA$	60	-	-				
	$h_{FE}(2)$	$V_{CE}=-1V, I_C=-1mA$	80	-	-				
	$h_{FE}(3)$	$V_{CE}=-1V, I_C=-10mA$	100	-	300				
	$h_{FE}(4)$	$V_{CE}=-1V, I_C=-50mA$	60	-	-				
	$h_{FE}(5)$	$V_{CE}=-1V, I_C=-100mA$	30	-	-				
Collector-Emitter Saturation Voltage *	$V_{CE(sat)1}$	$I_C=-10mA, I_B=-1mA$	-	-	-0.25	V			
	$V_{CE(sat)2}$	$I_C=-50mA, I_B=-5mA$	-	-	-0.4				
Base-Emitter Saturation Voltage *	$V_{BE(sat)1}$	$I_C=-10mA, I_B=-1mA$	-0.65	-	-0.85	V			
	$V_{BE(sat)2}$	$I_C=-50mA, I_B=-5mA$	-	-	-0.95				
Transition Frequency	f_T	$V_{CE}=-20V, I_C=-10mA, f=100MHz$	250	-	-	MHz			
Collector Output Capacitance	C_{ob}	$V_{CB}=-5V, I_E=0, f=1MHz$	-	-	4.5	pF			
Input Capacitance	C_{ib}	$V_{BE}=-0.5V, I_C=0, f=1MHz$	-	-	10	pF			
Input Impedance	h_{ie}	$V_{CE}=-10V, I_C=-1mA, f=1kHz$	2.0	-	12	kΩ			
Voltage Feedback Ratio	h_{re}		1.0	-	10	$\times 10^{-4}$			
Small-Signal Current Gain	h_{fe}		100	-	400				
Collector Output Admittance	h_{oe}		3.0	-	60	μS			
Noise Figure	NF		$V_{CE}=-5V, I_C=-0.1mA$ $R_g=1k\Omega, f=10Hz \sim 15.7kHz$	-	-	4.0	dB		
Switching Time	Delay Time	t_d				-	-	35	nS
	Rise Time	t_r				-	-	35	
	Storage Time	t_{stg}				-	-	225	
	Fall Time	t_f				-	-	75	

Note : *Pulse Test : Pulse Width $\leq 300\mu S$, Duty Cycle $\leq 2.0\%$