

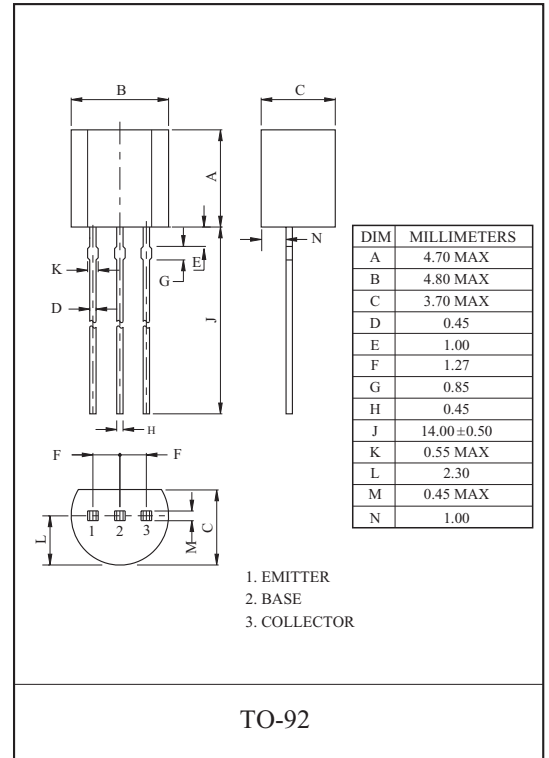
GENERAL PURPOSE APPLICATION.
SWITCHING APPLICATION.

FEATURES

- Low Leakage Current
: $I_{CEX} = -50\text{nA}(\text{Max.})$, $I_{BL} = -50\text{nA}(\text{Max.})$
@ $V_{CE} = -30\text{V}$, $V_{EB} = -3\text{V}$.
- Low Saturation Voltage
: $V_{CE(\text{sat})} = -0.4\text{V}(\text{Max.})$ @ $I_C = -50\text{mA}$, $I_B = -5\text{mA}$.
- Low Collector Output Capacitance
: $C_{ob} = 4.5\text{pF}(\text{Max.})$ @ $V_{CB} = 5\text{V}$.
- Complementary to 2N3904A.

MAXIMUM RATING (Ta=25 °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	Ta=25 °C	P_C	625	mW
	Tc=25 °C		1.5	W
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	-55 ~ 150	°C



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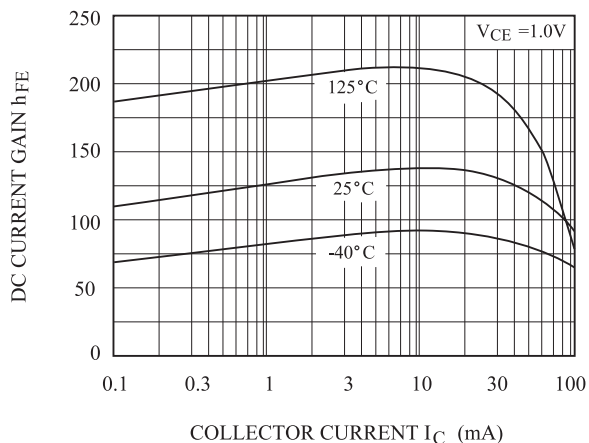
ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT		
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		
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	-	60			
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	k Ω		
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	$\mu\Omega$		
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	

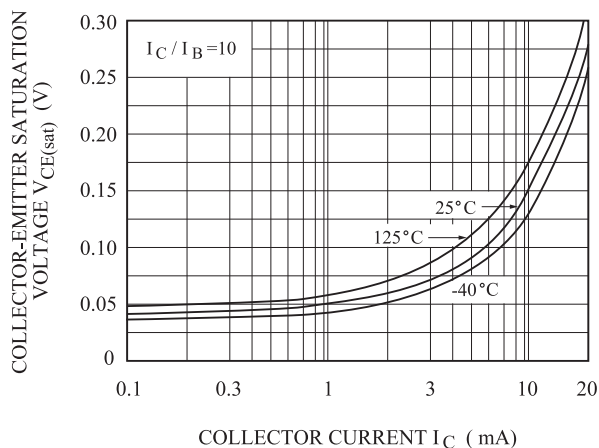
* Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

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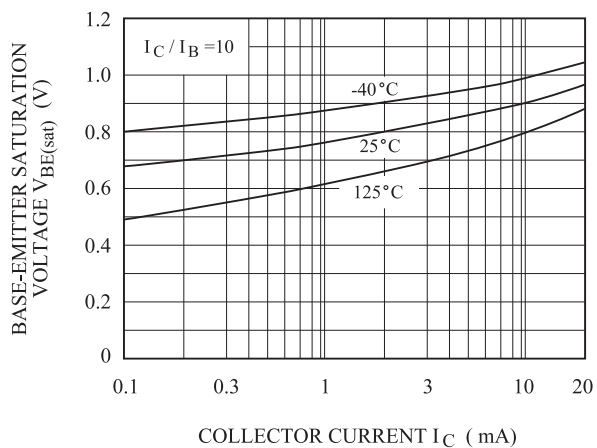
$h_{FE} - I_C$



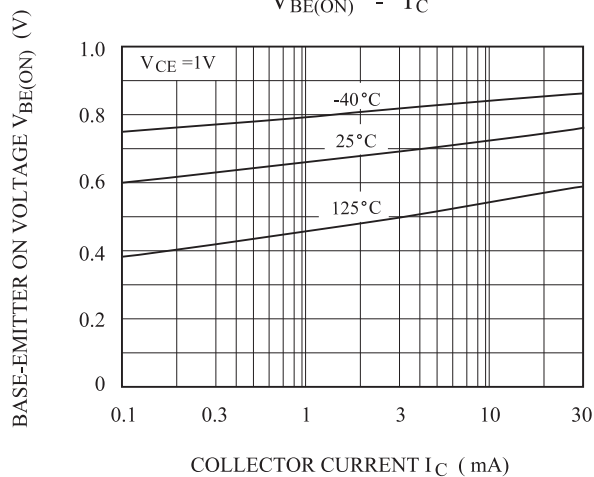
$V_{CE(sat)} - I_C$



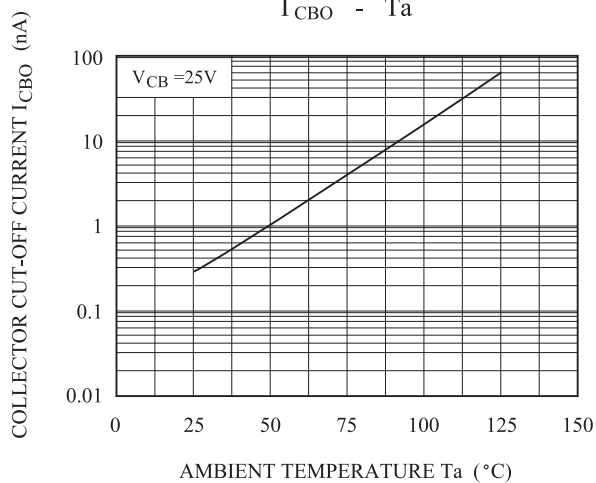
$V_{BE(sat)} - I_C$



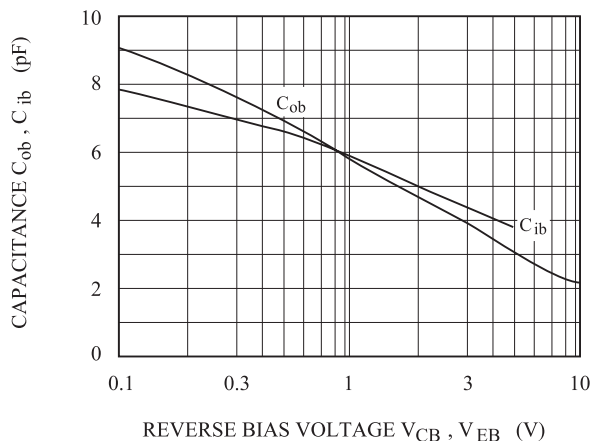
$V_{BE(ON)} - I_C$



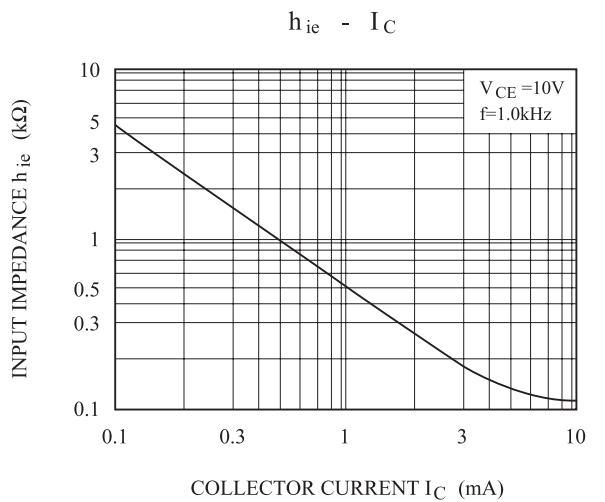
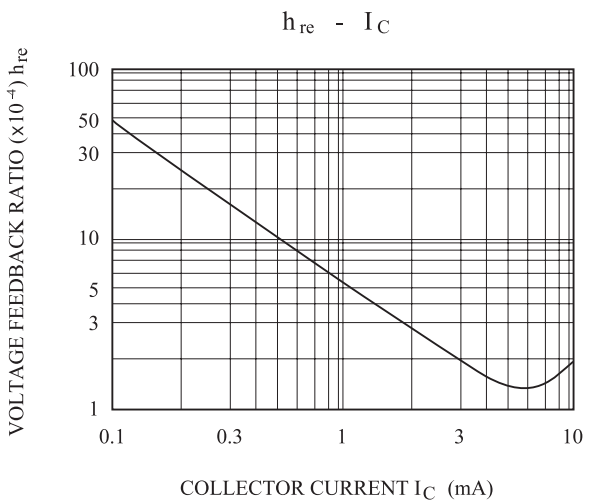
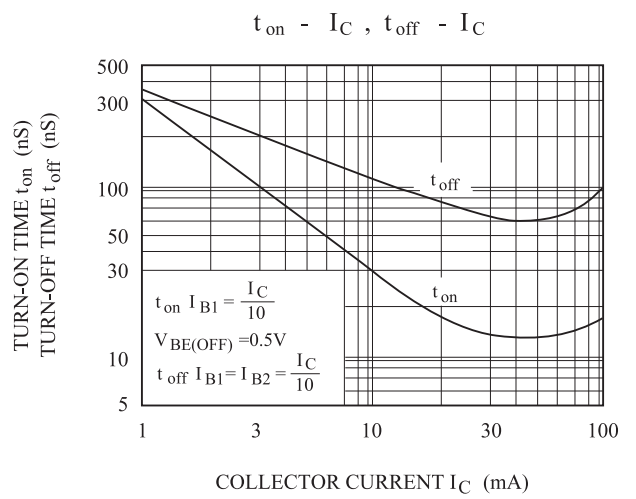
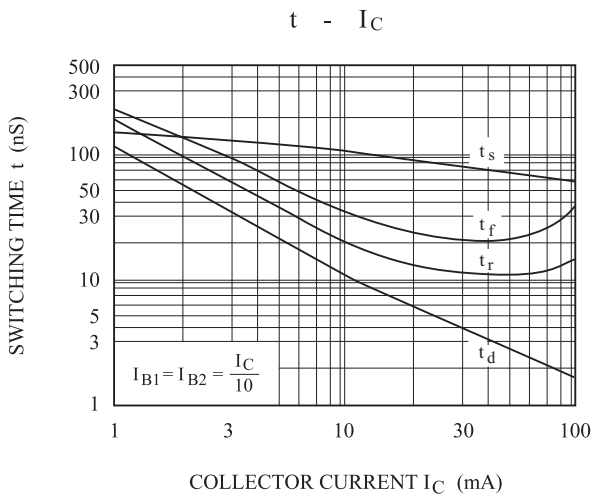
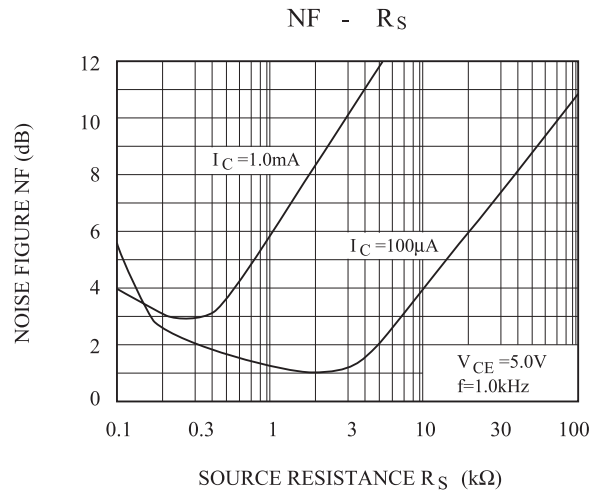
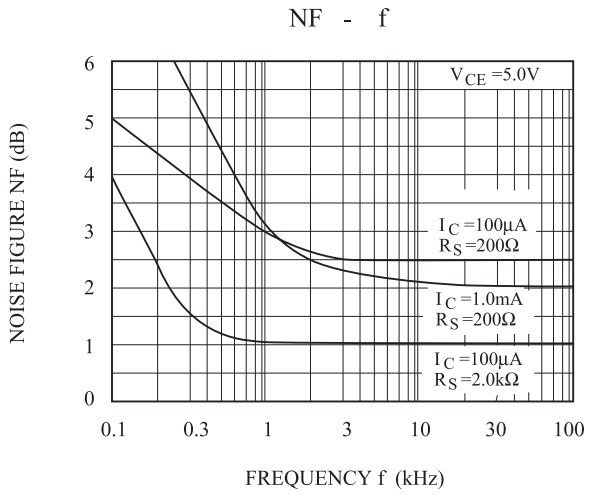
$I_{CBO} - T_a$



$C_{ob} - V_{CB}, C_{ib} - V_{EB}$

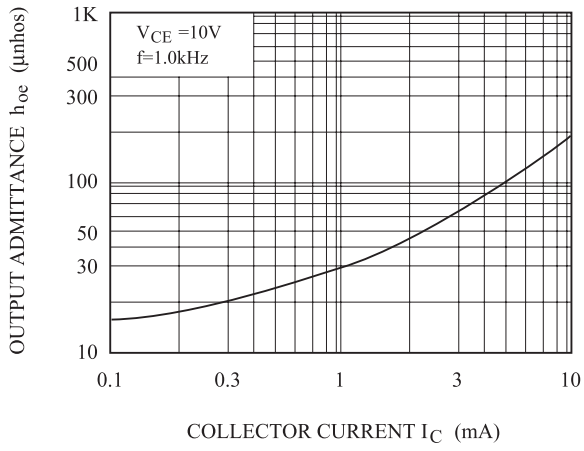


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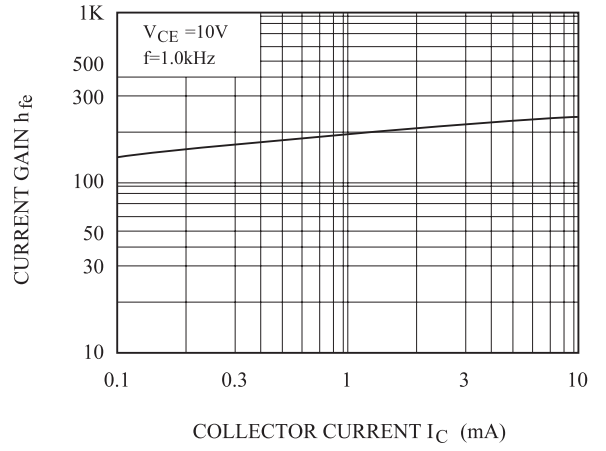


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$h_{oe} - I_C$



$h_{fe} - I_C$



$P_c - T_a$

