

GENERAL PURPOSE APPLICATION.
SWITCHING APPLICATION.

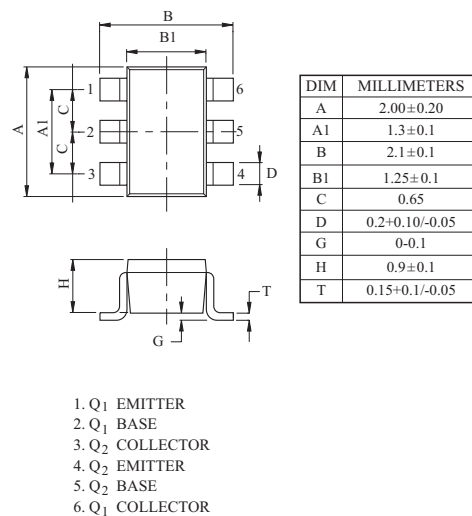
FEATURES

- Low Leakage Current
: $I_{CEX}=50\text{nA}(\text{Max.})$, $I_{BL}=50\text{nA}(\text{Max.})$
@ $V_{CE}=30\text{V}$, $V_{EB}=3\text{V}$.
- Excellent DC Current Gain Linearity.
- Low Saturation Voltage
: $V_{CE(\text{sat})}=0.3\text{V}(\text{Max.})$ @ $I_C=50\text{mA}$, $I_B=5\text{mA}$.
- Low Collector Output Capacitance
: $C_{ob}=4\text{pF}(\text{Max.})$ @ $V_{CB}=5\text{V}$.

MAXIMUM RATING (Ta=25 °C)

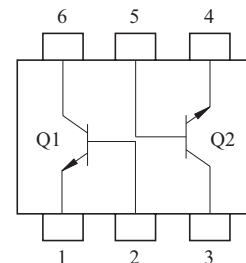
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Base Current	I_B	50	mA
Collector Power Dissipation	P_C^*	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	-55 ~ 150	°C

* Total Rating

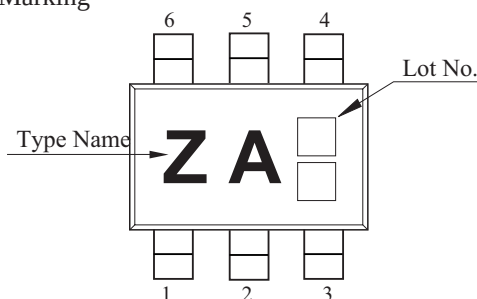


US6

EQUIVALENT CIRCUIT (TOP VIEW)

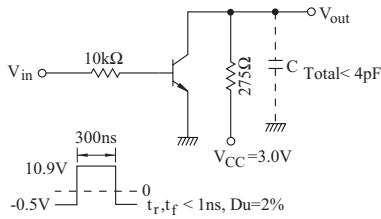
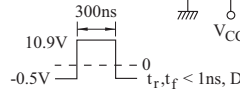
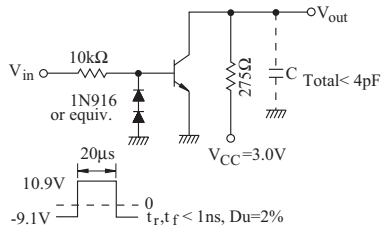
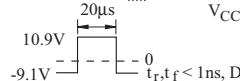


Marking



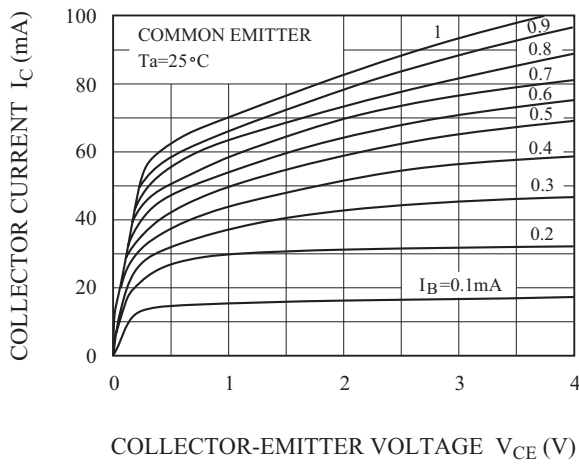
2N2904U

ELECTRICAL CHARACTERISTICS (Ta=25 °C)

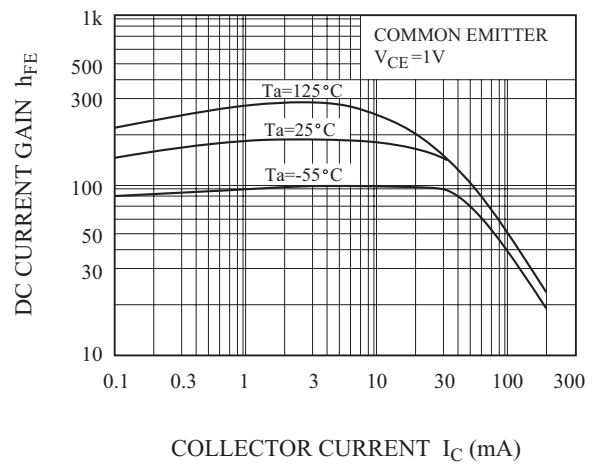
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I _{CEX}	V _{CE} =30V, V _{EB} =3V	-	-	50	nA
Base Cut-off Current		I _{BL}	V _{CE} =30V, V _{EB} =3V	-	-	50	nA
Collector-Base Breakdown Voltage		V _{(BR)CBO}	I _C =10μA, I _E =0	60	-	-	V
Collector-Emitter Breakdown Voltage *		V _{(BR)CEO}	I _C =1mA, I _B =0	40	-	-	V
Emitter-Base Breakdown Voltage		V _{(BR)EBO}	I _E =10μA, I _C =0	6.0	-	-	V
DC Current Gain	*	h _{FE} (1)	V _{CE} =1V, I _C =0.1mA	40	-	-	
		h _{FE} (2)	V _{CE} =1V, I _C =1mA	70	-	-	
		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	-	-	0.2	V
		V _{CE(sat)} 2	I _C =50mA, I _B =5mA	-	-	0.3	
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	300	-	-	MHz
Collector Output Capacitance		C _{ob}	V _{CB} =5V, I _E =0, f=1MHz	-	-	4.0	pF
Input Capacitance		C _{ib}	V _{BE} =0.5V, I _C =0, f=1MHz	-	-	8.0	pF
Input Impedance		h _{ie}	V _{CE} =10V, I _C =1mA, f=1kHz	1.0	-	10	k Ω
Voltage Feedback Ratio		h _{re}		0.5	-	8.0	x10 ⁻⁴
Small-Signal Current Gain		h _{fe}		100	-	400	
Collector Output Admittance		h _{oe}		1.0	-	40	μ Ω
Noise Figure		NF	V _{CE} =5V, I _C =0.1mA Rg=1k Ω,	-	-	5.0	dB
Switching Time	Delay Time	t _d		-	-	35	nS
	Rise Time	t _r		-	-	35	
	Storage Time	t _{stg}		-	-	200	
	Fall Time	t _f		-	-	50	

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

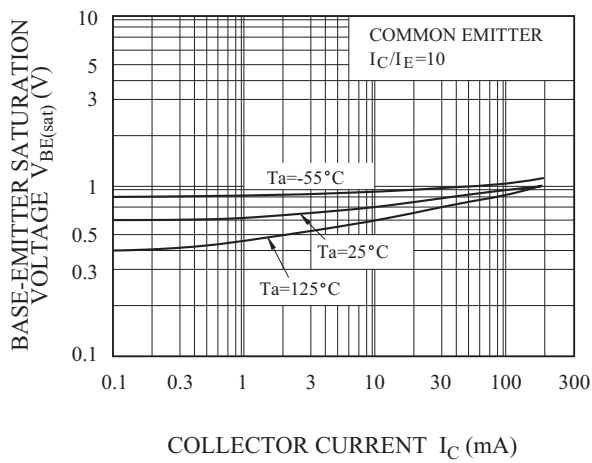
$I_C - V_{CE}$



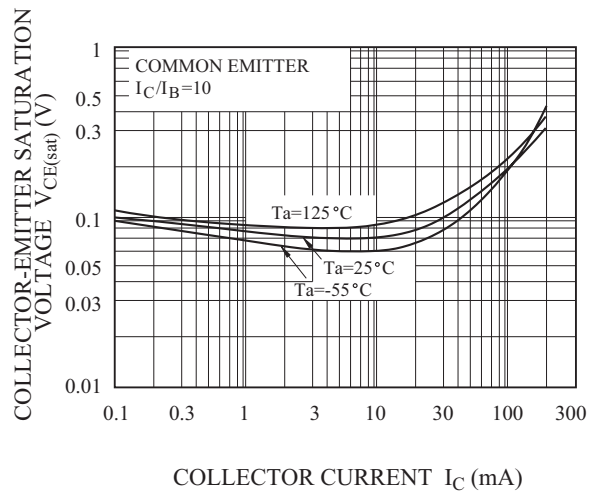
$h_{FE} - I_C$



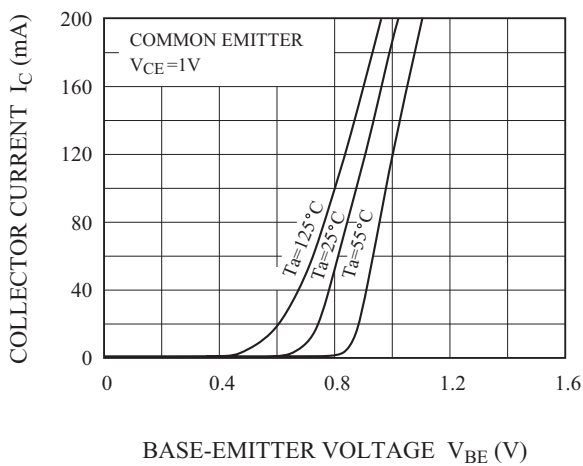
$V_{BE(sat)} - I_C$



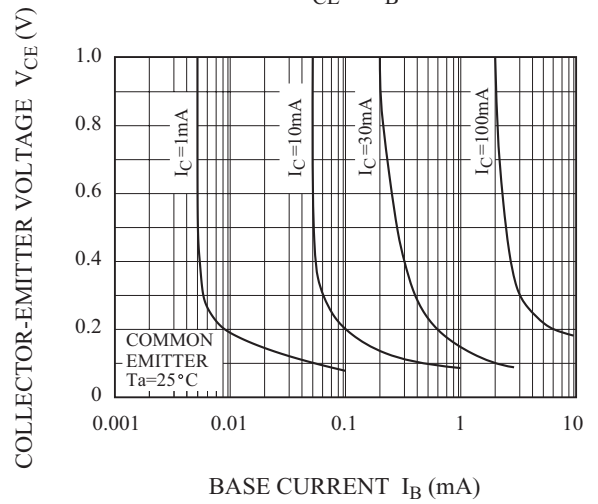
$V_{CE(sat)} - I_C$



$I_C - V_{BE}$

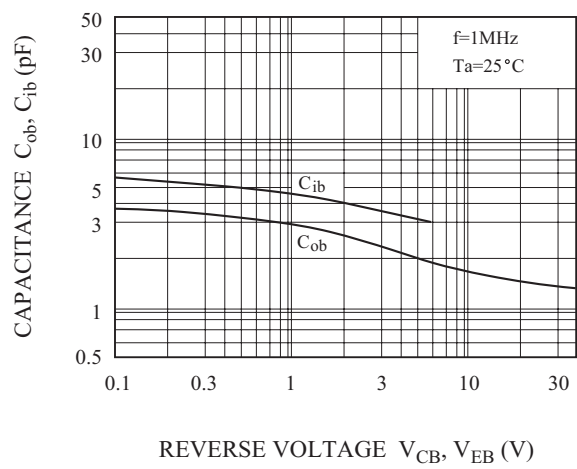


$V_{CE} - I_B$



2N2904U

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



$P_c - T_a$

