



2N3904N

NPN Silicon Transistor

Descriptions

- General small signal application
- Switching application

Features

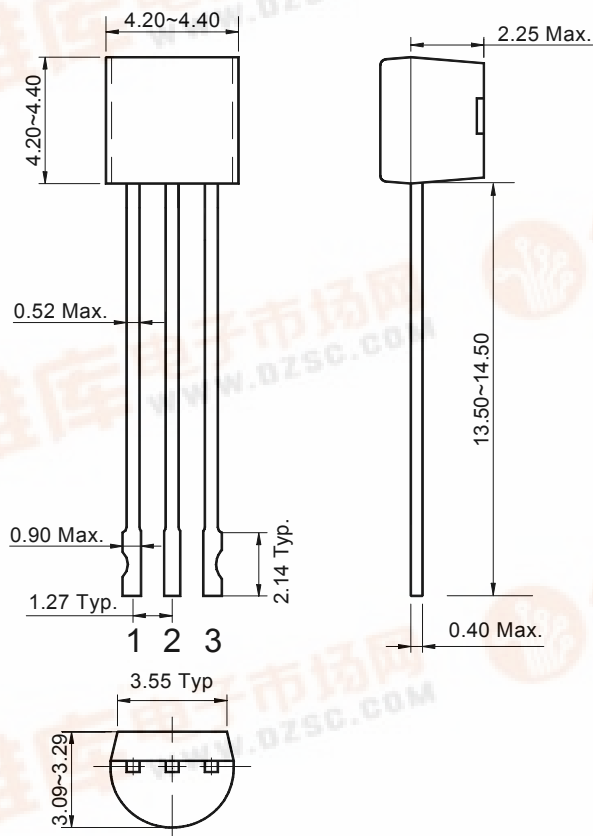
- Low collector saturation voltage : $V_{CE(sat)}=0.3V(MAX.)$ @ $I_C=50mA$, $I_B=5mA$
- Low collector output capacitance : $C_{ob} = 3pF(Typ.)$ @ $V_{CB}=5V$, $I_E=0$, $f=1MHz$
- Complementary pair with STA3906A

Ordering Information

Type NO.	Marking	Package Code
2N3904N	2N3904	TO-92N

Outline Dimensions

unit : mm



PIN Connections

1. Emitter
2. Base
3. Collector

2N3904N

Absolute Maximum Ratings

(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
Collector power dissipation	P_C	400	mW
Junction temperature	T_J	150	°C
Storage temperature range	T_{stg}	-55~150	°C

Electrical Characteristics

(Ta=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	BV_{CEO}	$I_C=1mA, I_B=0$	40	-	-	V
Collector cut-off current	I_{CEX}	$V_{CE}=30V, V_{EB}=3V$	-	-	50	nA
DC current gain	h_{FE}	$V_{CE}=1V, I_C=10mA$	100	-	300	-
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=50mA, I_B=5mA$	-	-	0.3	V
Base-emitter voltage	V_{BE}	$V_{CE}=1V, I_C=10mA$	-	0.75	1.0	V
Transition frequency	f_T	$V_{CE}=20V, I_C=10mA$	-	300	-	MHz
Collector output capacitance	C_{ob}	$V_{CB}=5V, I_E=0, f=1MHz$	-	3	-	pF
Turn on delay time	t_d	$V_{CC}=3V, V_{BE(off)}=0.5V,$ $I_C=10mA, I_{B1}=1mA$	-	-	35	ns
Rise time	t_r		-	-	35	ns
Storage time	t_{stg}		-	-	200	ns
Fall Time	t_f	$V_{CC}=3V, I_C=10mA,$ $I_{B1}=I_{B2}=1mA$	-	-	50	ns

Electrical Characteristic Curves

Fig. 1 $P_C - T_a$

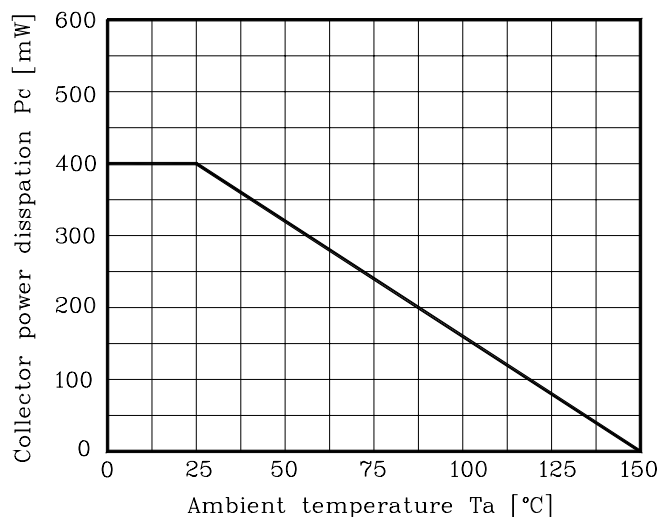


Fig. 2 $h_{FE} - I_C$

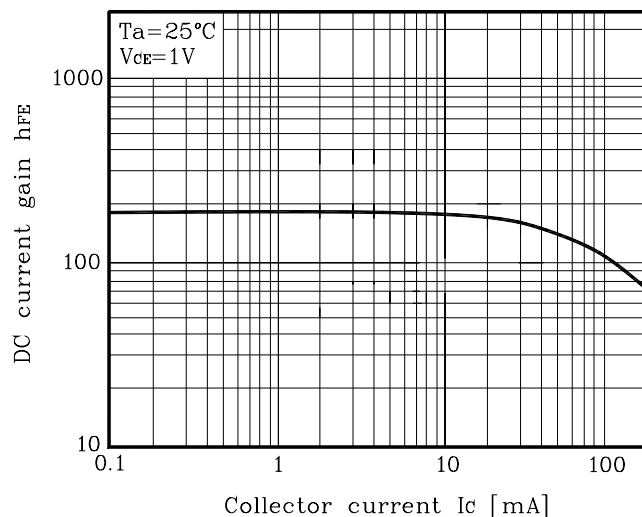
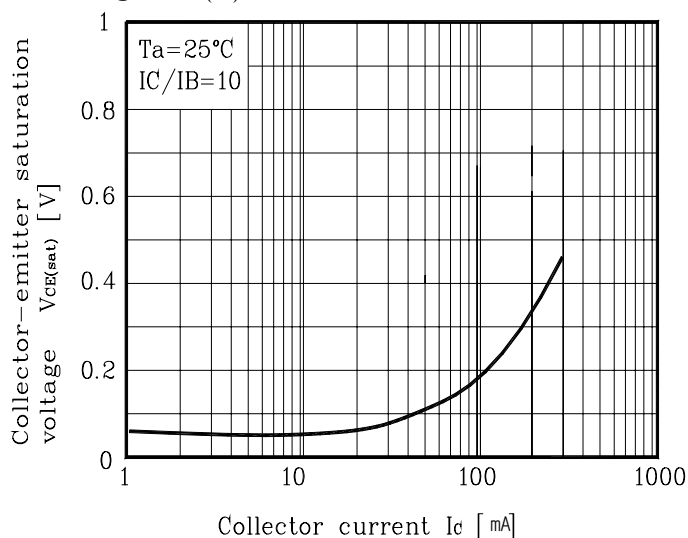


Fig. 3 $V_{CE(sat)} - I_C$



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