AUK Semiconductor

2N3904N

NPN Silicon Transistor

Descriptions

- General small signal application
- Switching application

Features

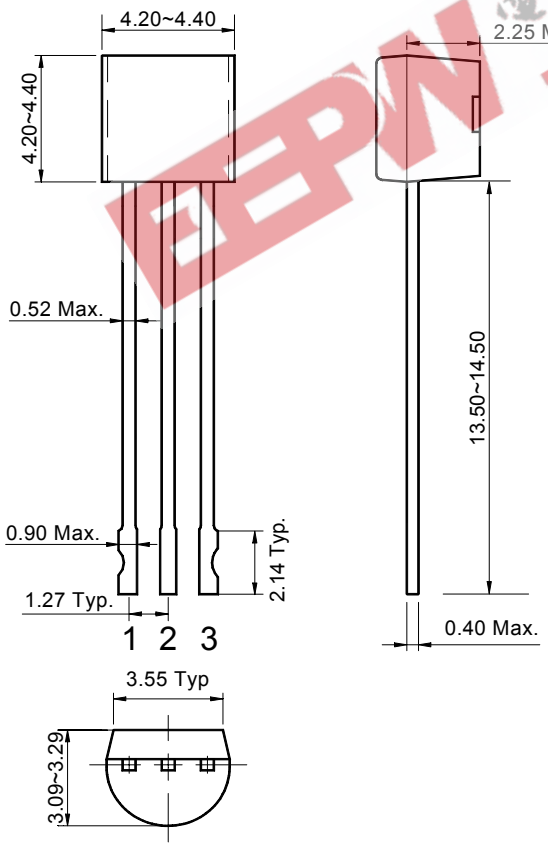
- Low collector saturation voltage : $V_{CE(sat)}$=0.3V(MAX.) @ I_C=50mA, I_B=5mA
- Low collector output capacitance : C_{ob} = 3pF(Typ.) @ V_{CB}=5V, I_E=0, f=1MHz
- Complementary pair with STA3906A

Ordering Information

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

Outline Dimensions

unit : mm



PIN Connections

1. Emitter
2. Base
3. Collector

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}	V_{CC}=3V, I_C=10mA, I_{B1}=I_{B2}=1mA	-	-	200	ns
Fall Time	t_f		-	-	50	ns

Electrical Characteristic Curves

Fig. 1 P_C - T_a

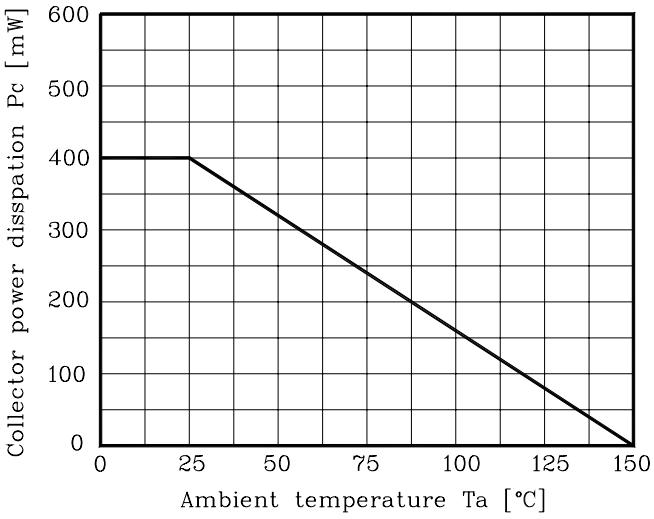


Fig. 2 h_{FE} - I_C

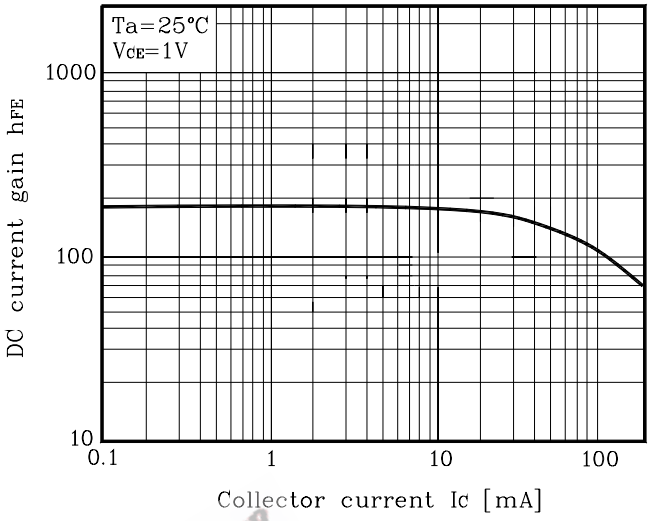


Fig. 3 $V_{CE(sat)}$ - I_C