KODENSHI AUK

2N3904

NPN Silicon Transistor

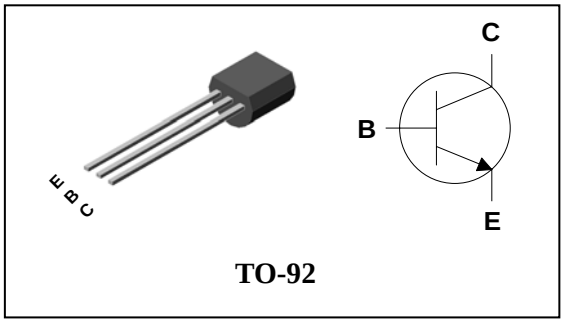
Descriptions

- General small signal application
- Switching application

Features

- Low collector saturation voltage
- Collector output capacitance
- Complementary pair with 2N3906

PIN Connection



TO-92

Ordering Information

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

Absolute maximum ratings

Ta=25°C

Characteristic	Symbol	Ratings	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 dissipation	P_C	625	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-Base breakdown voltage	BV_{CBO}	I_C=10μA, I_E=0	60	-	-	V
Collector-Emitter breakdown voltage	BV_{CEO}	I_C=1mA, I_B=0	40	-	-	V
Emitter-Base breakdown voltage	BV_{EBO}	I_E=10μA, I_C=0	6	-	-	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
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	pF
Delay time	t_d	V_{CC}=3V_{dc}, $V_{BE(off)}$=0.5V_{dc}. I_C=10mA_{dc}, I_{B1}=1mA_{dc}	-	-	35	ns
Rise time	t_r		-	-	35	ns
Storage time	t_s	V_{CC}=3V_{dc}, I_C=10mA_{dc}, I_{B1}=I_{B2}=1mA_{dc}	-	-	200	ns
Fall Time	t_f		-	-	50	ns

Electrical Characteristic Curves

Fig. 1 P_C-T_a

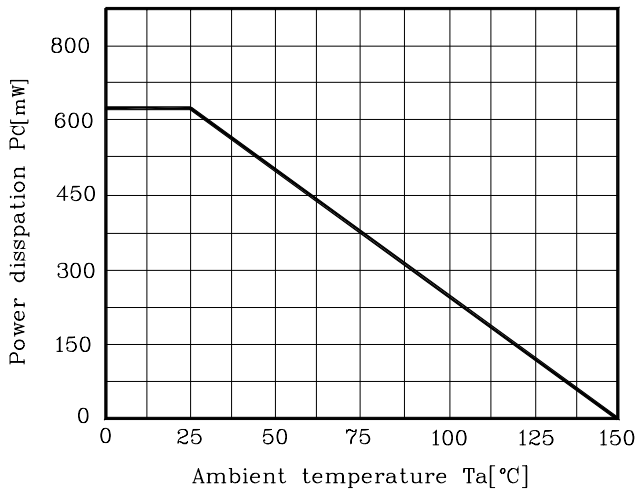


Fig. 2 h_{FE}-I_C

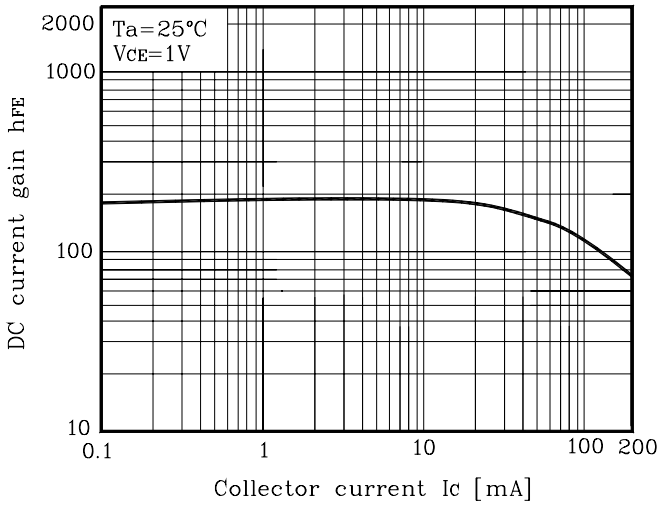
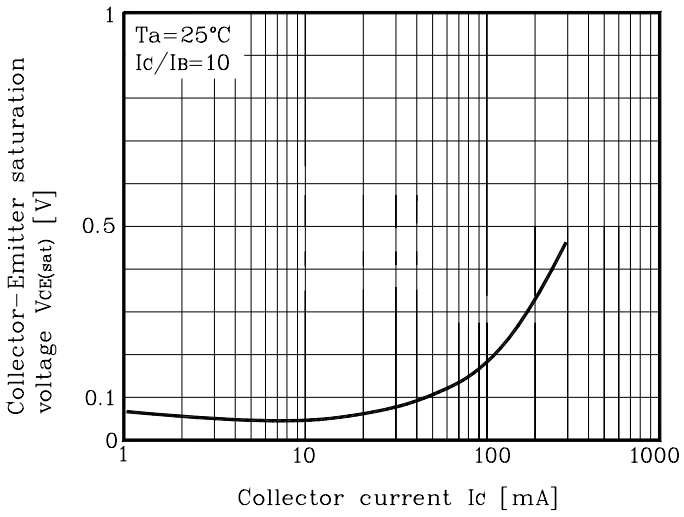
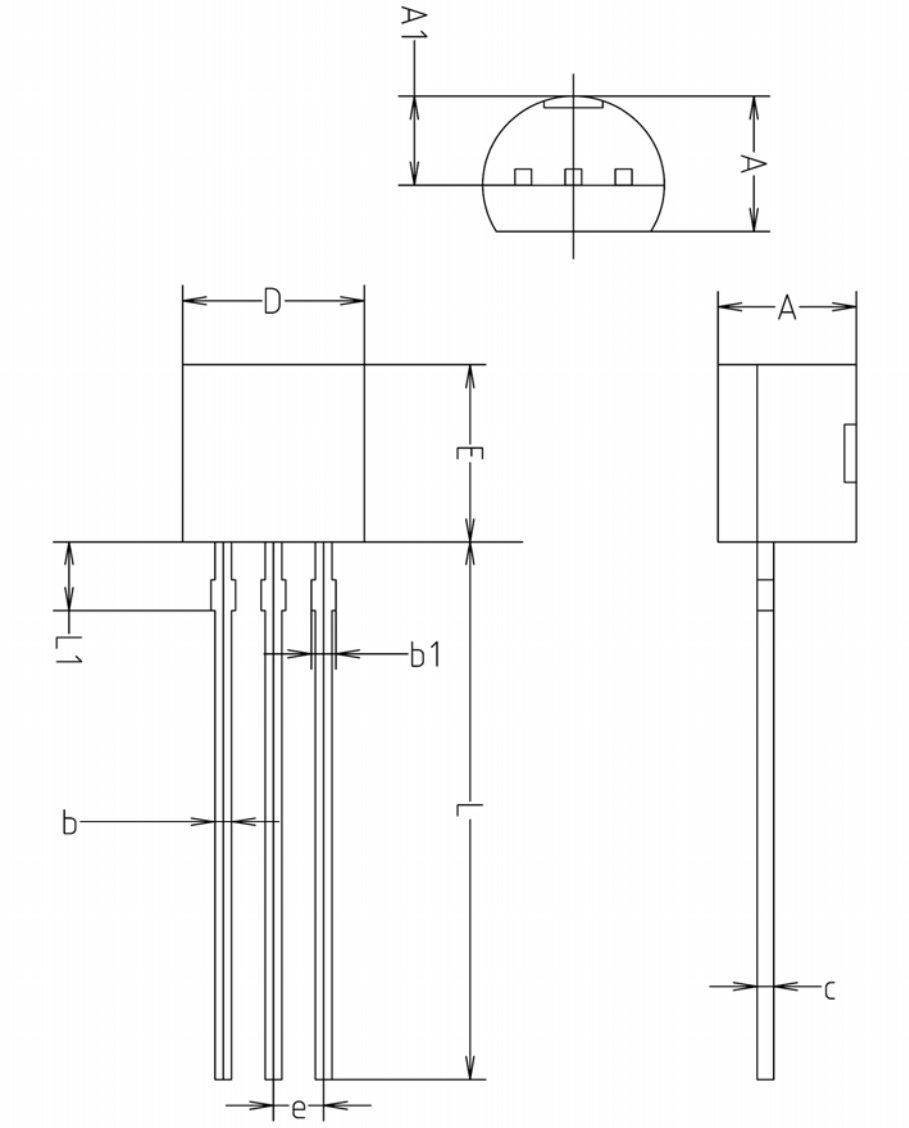


Fig. 3 $V_{CE(sat)}$-I_C



Outline Dimension



SYMBOL	MILLMETERS(mm)		
	MINIMUM	NOMINAL	MAXIMUM
A	3.40	3.50	3.66
A1	2.46	2.51	2.59
b	0.39	0.44	0.53
b1	0.39	–	0.63
c	0.35	0.42	0.47
D	4.48	4.60	4.70
E	4.48	4.60	4.70
e	1.17	1.27	1.37
L	13.70	14.00	14.77
L1	1.55	1.70	2.15

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