

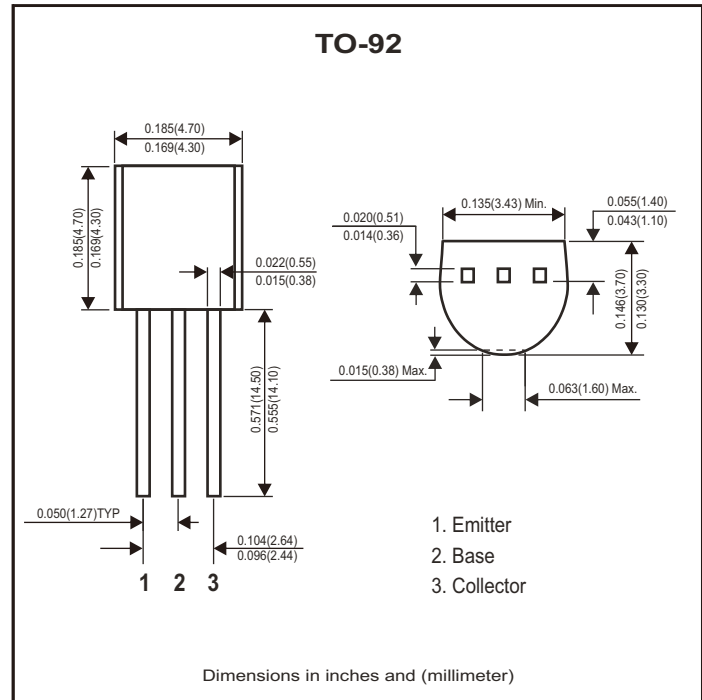
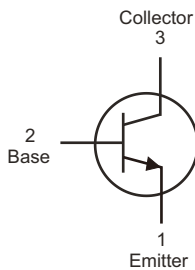
2N3904A-G (NPN) RoHS Device



Features

- NPN silicon epitaxial planar transistor for switching and amplifier application.
- As complementary type, the PNP transistor 2N3906A-G is recommended.

Circuit Diagram



Maximum Ratings (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	60	V
Collector-emitter voltage	V_{CEO}	40	V
Emitter-base voltage	V_{EBO}	6	V
Collector current - continuous	I_C	0.2	A
Collector power dissipation	P_C	0.625	W
Junction temperature	T_J	150	$^{\circ}\text{C}$
Storage temperature range	T_{stg}	-55~+150	$^{\circ}\text{C}$

Electrical Characteristics (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Collector-base breakdown voltage	$I_C=10\mu\text{A}$, $I_E=0$	$V_{(BR)CBO}$	60			V
Collector-emitter breakdown voltage	$I_C=1\text{mA}$, $I_B=0$	$V_{(BR)CEO}$	40			V
Emitter-base breakdown voltage	$I_E=10\mu\text{A}$, $I_C=0$	$V_{(BR)EBO}$	6			V
Collector-base cut-off current	$V_{CB}=60\text{V}$, $I_E=0$	I_{CBO}			0.1	μA
Collector-emitter cut-off current	$V_{CE}=40\text{V}$, $I_B=0$	I_{CEO}			0.1	μA
Emitter cut-off current	$V_{EB}=5\text{V}$, $I_C=0$	I_{EBO}			0.1	μA
DC current gain	$V_{CE}=1\text{V}$, $I_C=10\text{mA}$	$h_{FE(1)}$	200		300	
	$V_{CE}=1\text{V}$, $I_C=50\text{mA}$	$h_{FE(2)}$	60			
	$V_{CE}=1\text{V}$, $I_C=100\text{mA}$	$h_{FE(3)}$	30			
Collector-emitter saturation voltage	$I_C=50\text{mA}$, $I_B=5\text{mA}$	$V_{CE(sat)}$			0.3	V
Base-emitter saturation voltage	$I_C=50\text{mA}$, $I_B=5\text{mA}$	$V_{BE(sat)}$			0.95	V
Transition frequency	$V_{CE}=20\text{V}$, $I_C=10\text{mA}$, $f=100\text{MHz}$	f_r	300			MHz
Delay time	$V_{CC}=3\text{V}$, $V_{BE}=0.5\text{V}$	t_d			35	nS
Rise time	$I_C=10\text{mA}$, $I_{B1}=1\text{mA}$	t_r			35	nS
Storage time	$V_{CC}=3\text{V}$, $I_C=10\text{mA}$	t_s			200	nS
Fall time	$I_{B1}=I_{B2}=1\text{mA}$	t_f			50	nS

RATING AND CHARACTERISTIC CURVES (2N3904A-G)

Fig.1 - Static Characteristic

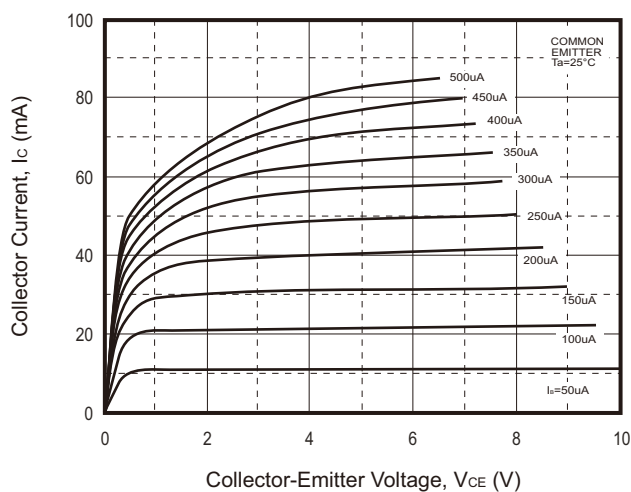
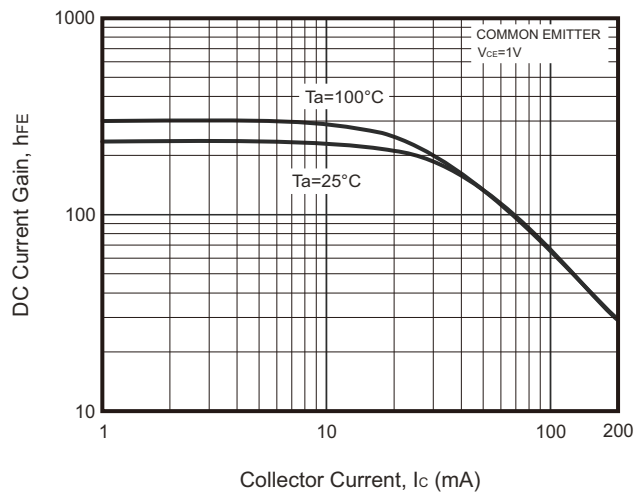


Fig.2 - h_{FE} — I_C



RATING AND CHARACTERISTIC CURVES (2N3904A-G)

Fig.3 - $V_{CEsat} - I_c$

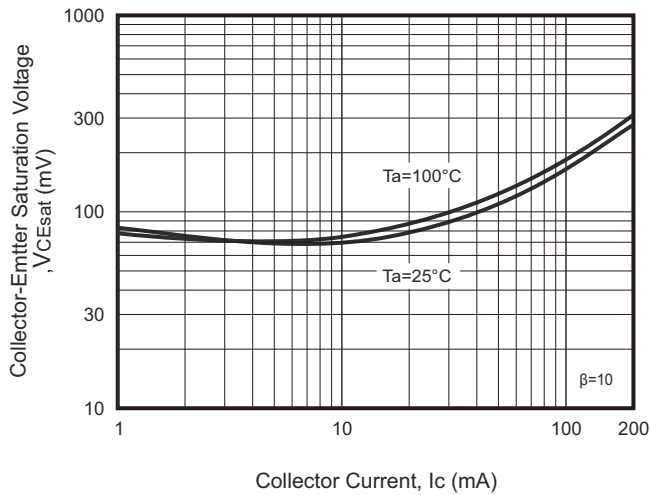


Fig.4 - $V_{BEsat} - I_c$

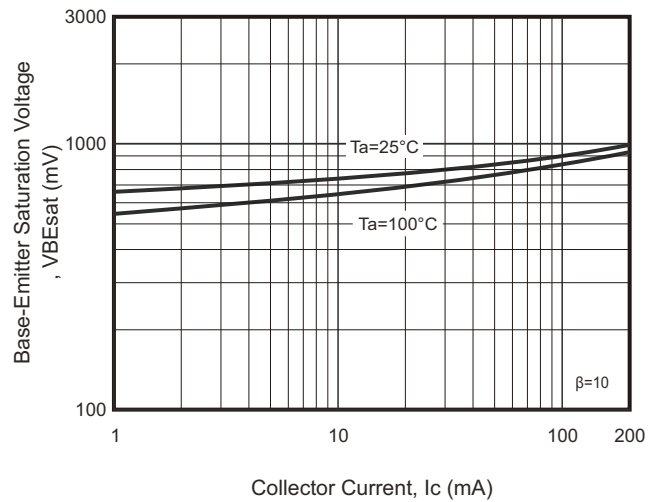


Fig.5 - $I_c - V_{BE}$

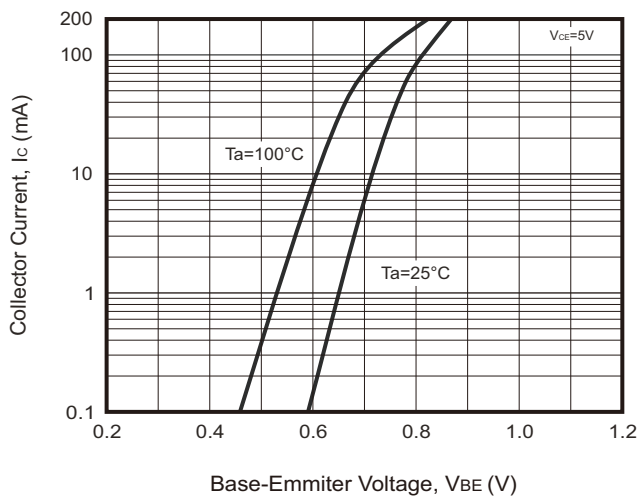


Fig.6 - $C_{ob}/C_{ib} - V_{CB}/V_{EB}$

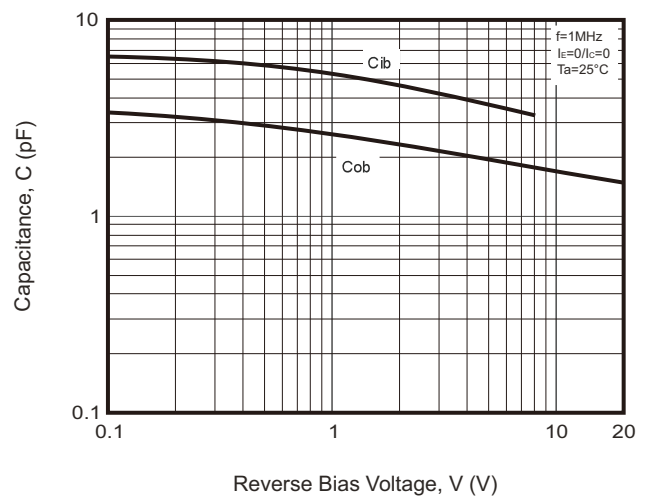


Fig.7 - $f_T - I_c$

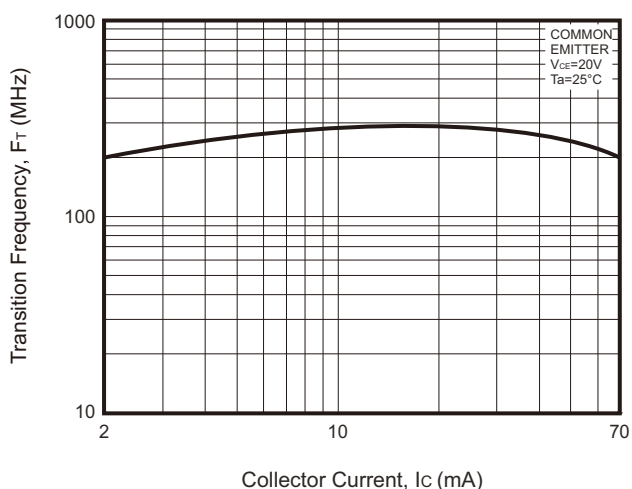
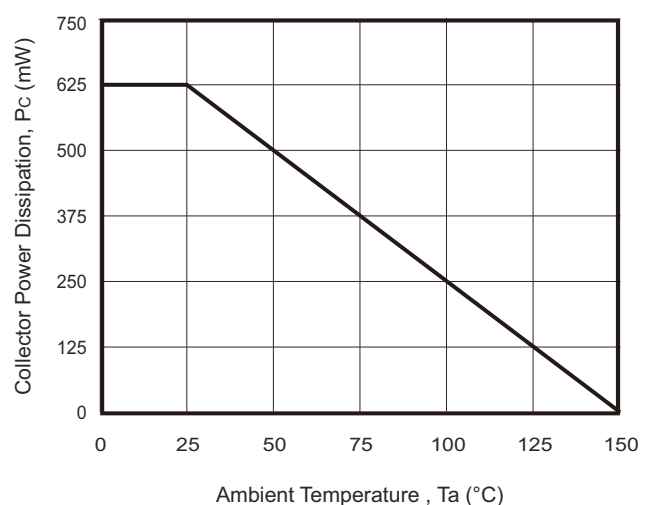


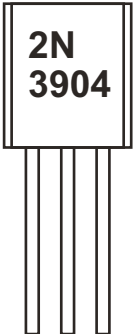
Fig.8 - $P_c - T_a$



Company reserves the right to improve product design , functions and reliability without notice.

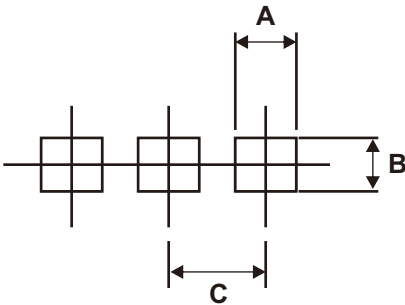
Marking Code

Part Number	Marking Code
2N3904A-G	2N3904



Suggested PAD Layout

SIZE	TO-92	
	(mm)	(inch)
A	0.80	0.031
B	0.70	0.028
C	1.27	0.050



Standard Packaging

Case Type	BULK PACK
	BAG (pcs)
TO-92	1,000