General Purpose Transistor

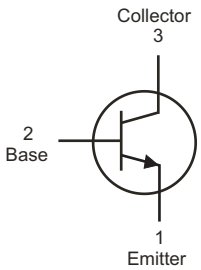
2N3904A-G (NPN)

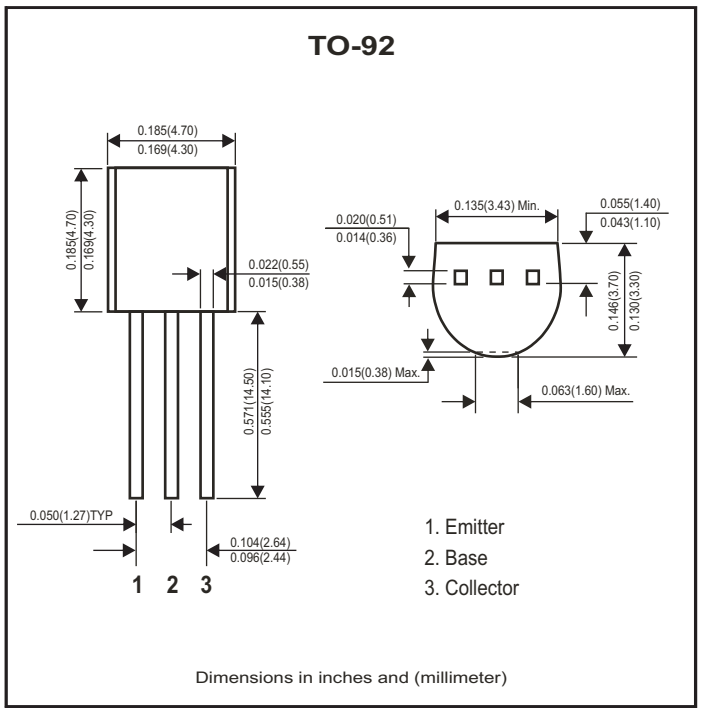
RoHS Device

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°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	°C
Storage temperature range	Tstg	-55~+150	°C

Electrical Characteristics (at T_A=25°C unless otherwise noted)

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

RATING AND CHARACTERISTIC CURVES (2N3904A-G)

Fig.1 - Static Characteristic

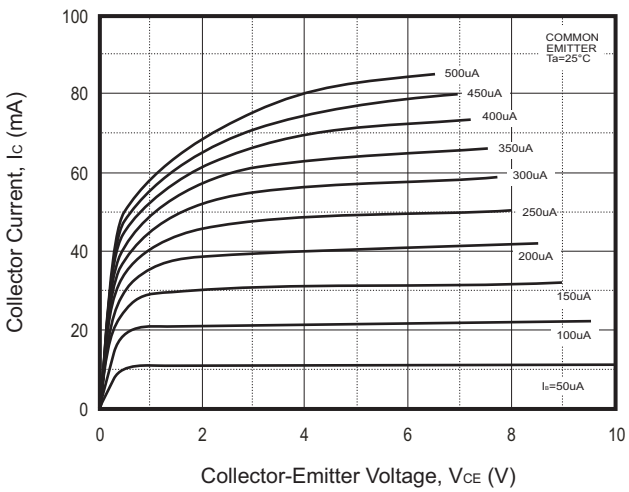
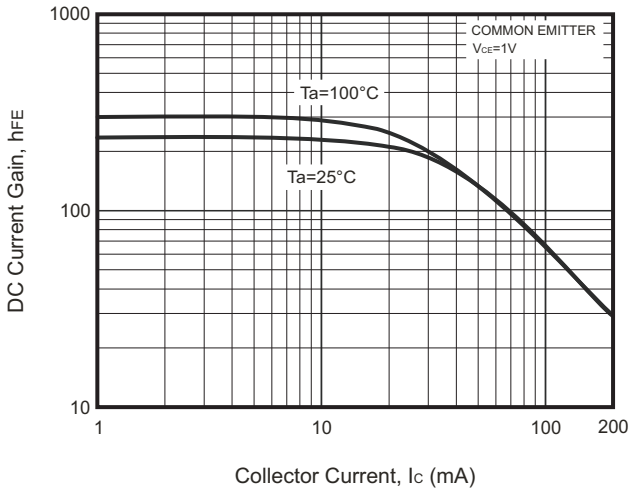


Fig.2 - h_{FE}— I_C



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

RATING AND CHARACTERISTIC CURVES (2N3904A-G)

Fig.3 - V_{CEsat} — I_C

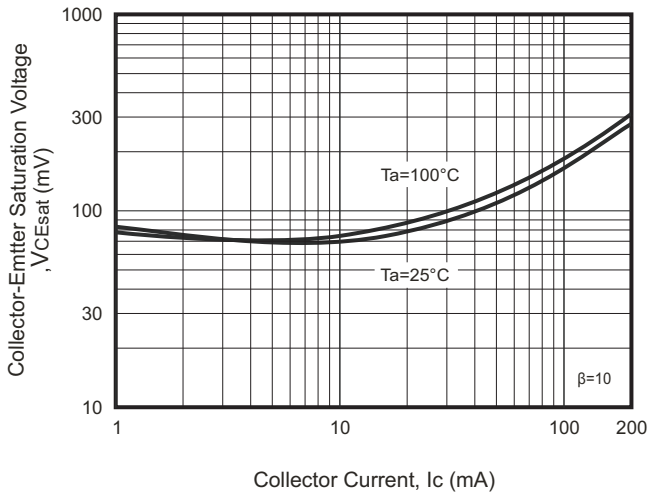


Fig.4 - V_{BEsat} — I_C

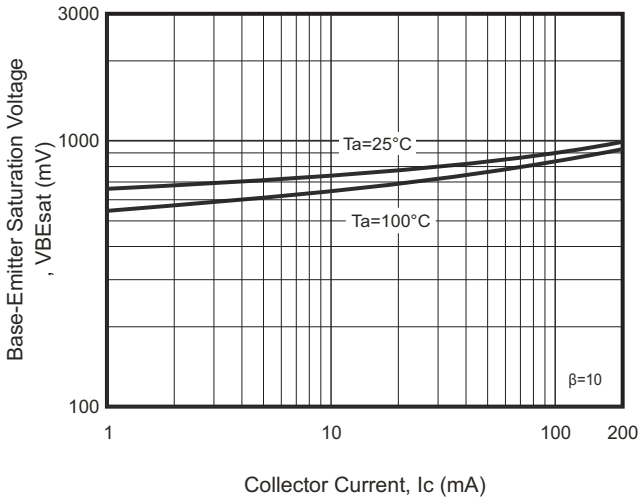


Fig.5 - I_C — V_{BE}

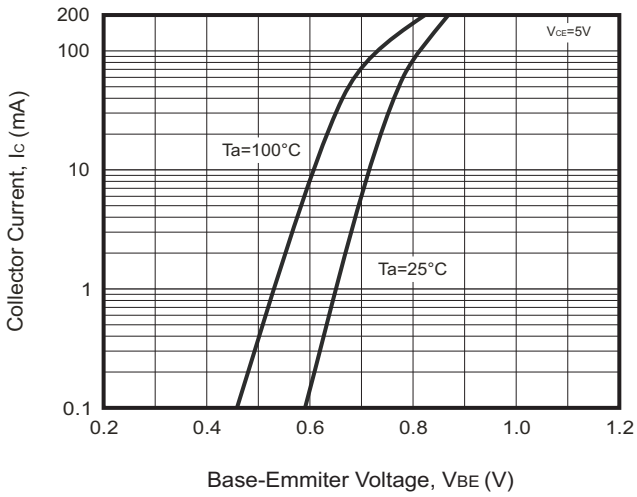


Fig.6 - C_{ob}/C_{ib} — V_{CB}/V_{EB}

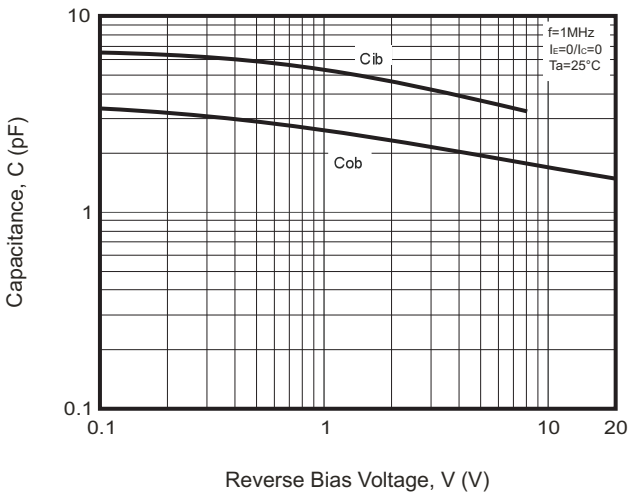


Fig.7 - f_T — I_C

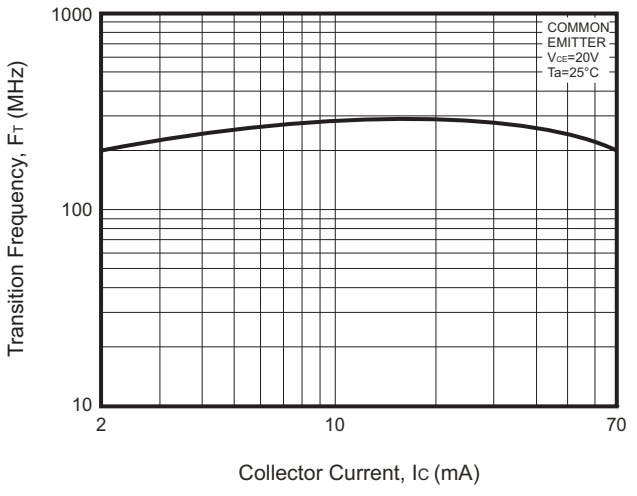
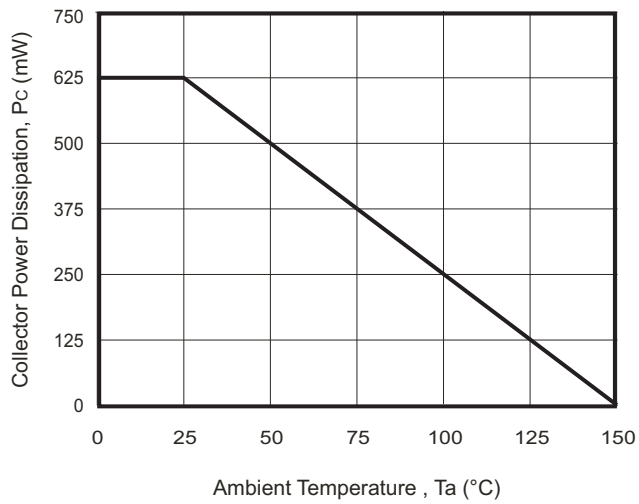


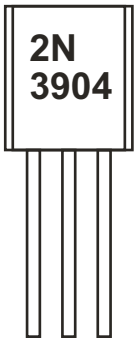
Fig.8 - P_C — Ta



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

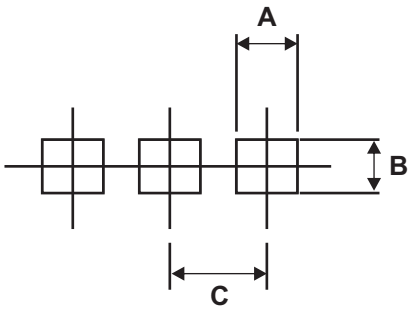
Marking Code

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)	BOX (pcs)
TO-92	1,000	10,000