

TO-92 Plastic-Encapsulate Transistors

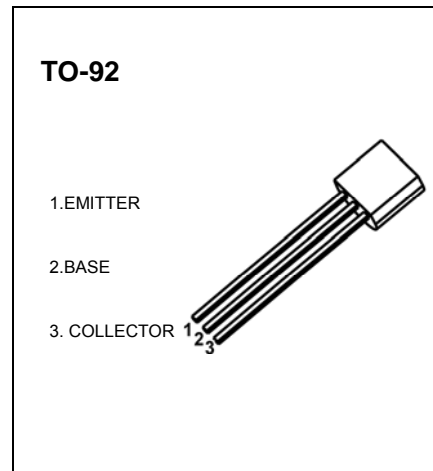
2N3906 TRANSISTOR (PNP)

FEATURE

- PNP silicon epitaxial planar transistor for switching and Amplifier applications
- As complementary type, the NPN transistor 2N3904 is Recommended
- This transistor is also available in the SOT-23 case with the type designation MMBT3906

MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V _{CB0}	Collector-Base Voltage	-40	V
V _{CE0}	Collector-Emitter Voltage	-40	V
V _{EB0}	Emitter-Base Voltage	-5	V
I _c	Collector Current -Continuous	-0.2	A
P _c	Collector Power Dissipation	0.625	W
T _J	Junction Temperature	150	°C
T _{stg}	Storage Temperature	-55~150	°C



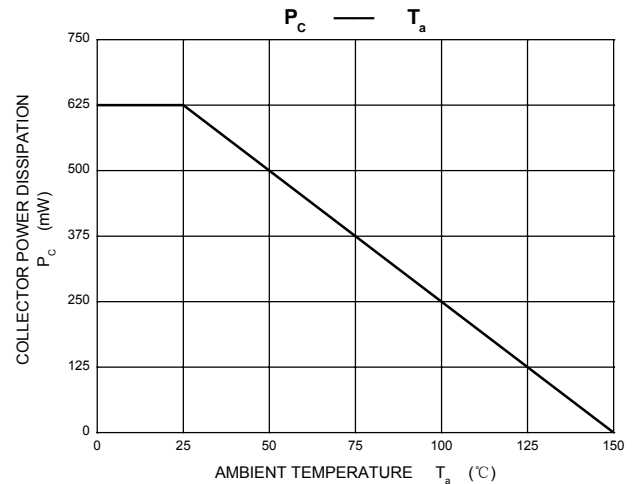
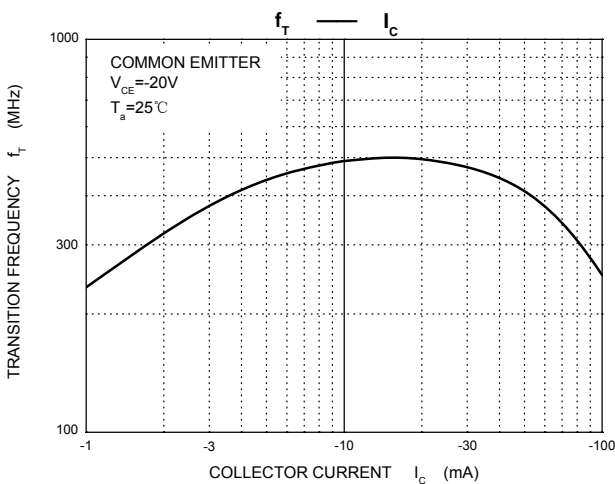
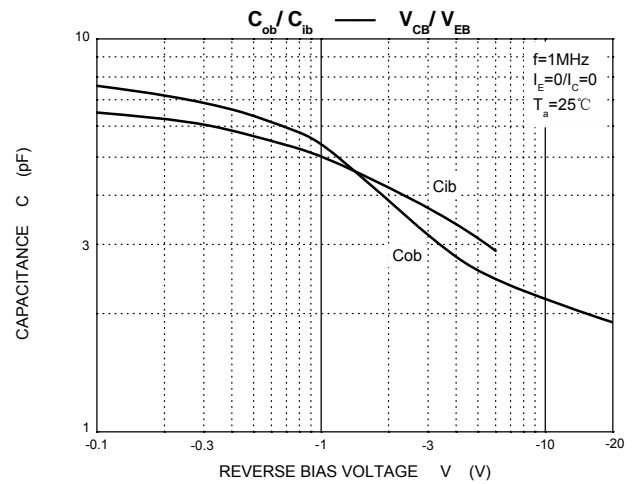
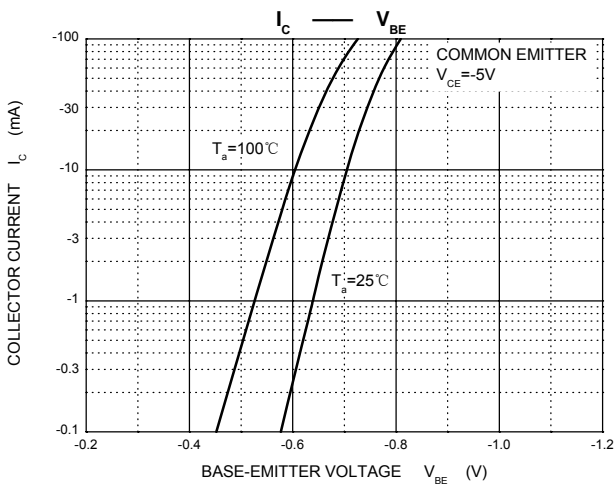
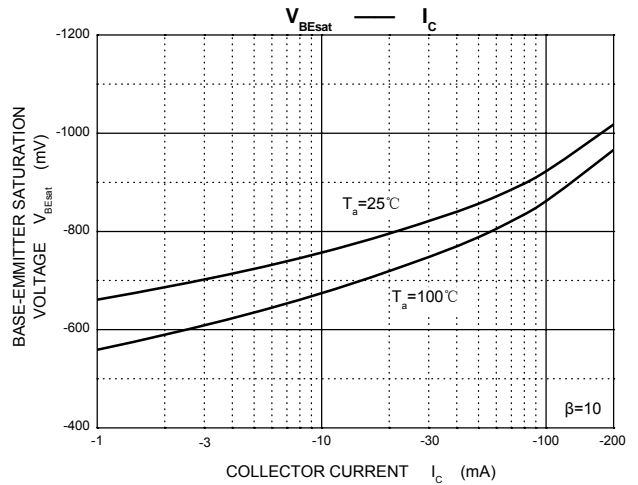
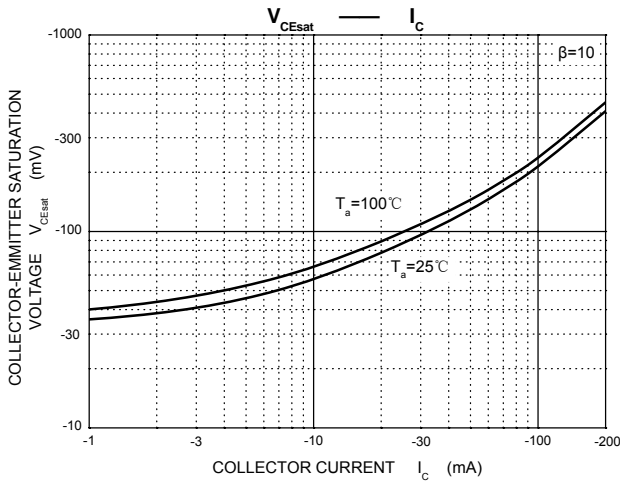
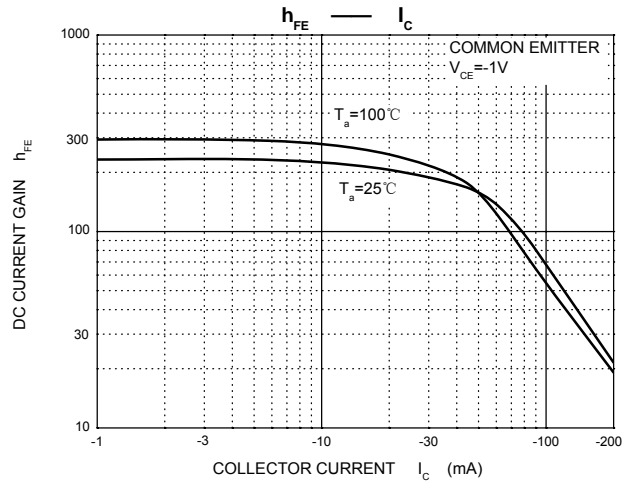
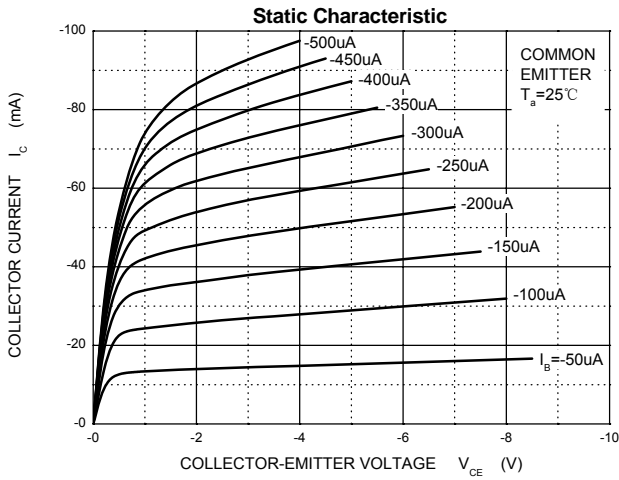
ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _c = -10μA, I _E =0	-40			V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _c = -1mA, I _B =0	-40			V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E = -10μA, I _c =0	-5			V
Collector cut-off current	I _{CBO}	V _{CB} = -40 V, I _E =0			-0.1	μA
Collector cut-off current	I _{CEx}	V _{CE} = -30 V, V _{BE(off)} = -3V			-50	nA
Emitter cut-off current	I _{EBO}	V _{EB} = -5 V, I _c =0			-0.1	μA
DC current gain	h _{FE1}	V _{CE} = -1 V, I _c = -10mA	100		400	
	h _{FE2}	V _{CE} = -1 V, I _c = -50mA	60			
	h _{FE3}	V _{CE} = -1 V, I _c = -100mA	30			
Collector-emitter saturation voltage	V _{CE(sat)}	I _c = -50mA, I _B = -5mA			-0.4	V
Base-emitter saturation voltage	V _{BE(sat)}	I _c = -50mA, I _B = -5mA			-0.95	V
Transition frequency	f _T	V _{CE} = -20V, I _c = -10mA f = 100MHz	250			MHz
Delay Time	t _d	V _{CC} = -3V, V _{BE} = -0.5V,			35	ns
Rise Time	t _r	I _c = -10mA, I _{B1} = -1mA			35	ns
Storage Time	t _s	V _{CC} = -3V, I _c = -10mA			225	ns
Fall Time	t _f	I _{B1} = I _{B2} = -1mA			75	ns

CLASSIFICATION OF h_{FE1}

Rank	O	Y	G
Range	100-200	200-300	300-400

Typical Characteristics

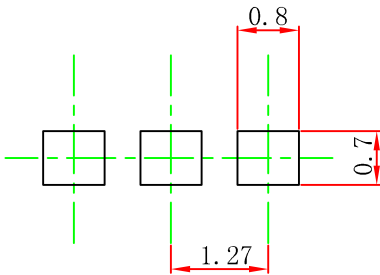


TO-92 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

TO-92 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

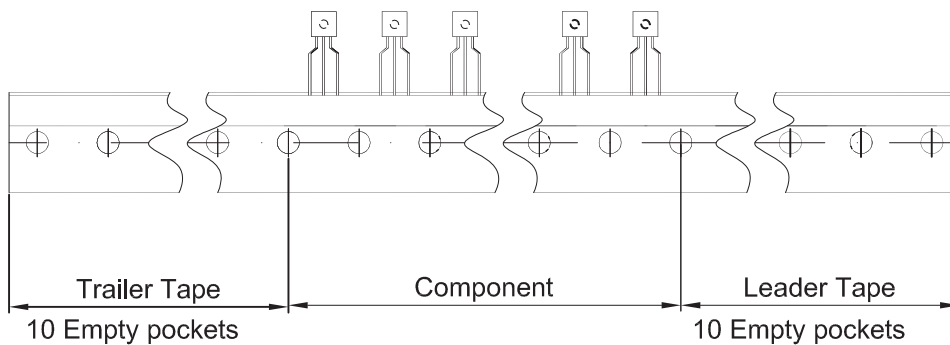
NOTICE

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TO-92 PACKAGE TAPEING DIMENSION



Dimiensions are in millimeter								
A1	A	T	P	P0	P2	F1	F2	W
4.5±0.2	4.5±0.2	3.5±0.2	12.7±0.3	12.7±0.2	6.35±0.3	2.5±0.3	2.5±0.3	18.0+1.0/-0.5
W0	W1	W2	H	H0	D0	t1	t2	ΔP
6.0±0.5	9.0±0.5	1.0 MAX.	19.0±1.0	16.0±0.5	4.0±0.2	0.4±0.05	0.2±0.05	0 ± 1.0



Package	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92	2000 pcs	333×162×43	20,000 pcs	350×340×250