Lumimax Optoelectronic Tech.

2N3906 TRANSISTOR(PNP)

Package TO-92

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)

Parameter	Symbol	Value	UNIT
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current -Continuous	I_C	-0.2	A
Collector Power Dissipation	P_C	0.625	W
Junction Temperature	T_J	150	°C
Junction and Storage Temperature	T_{stg}	-55~+150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

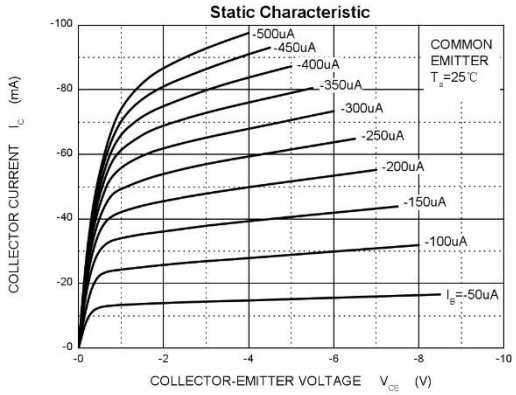
ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

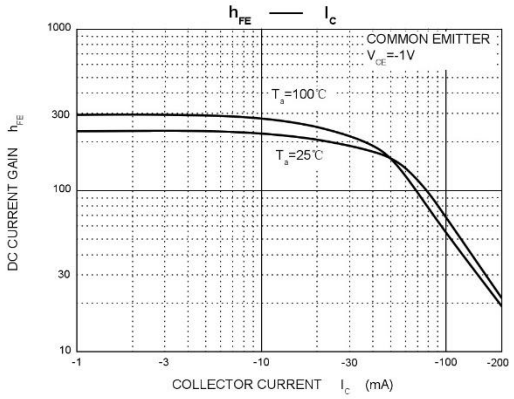
Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=-10μA, I_E=0	-40			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=-1mA, I_B=0	-40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=-10μA, I_C=0	-5			V
Collector cut-off current	I_{CBO}	V_{CB}=-40V, I_E=0			-0.1	μA
Collector cut-off current	I_{CEX}	V_{CE}=-30V, $V_{BE(OFF)}$=-3V			-50	nA
Emitter cut-off current	I_{EBO}	V_{EB}=-5V, I_C=0			-0.1	μA
DC current gain	$h_{FE(1)}$	V_{CE}=-1V, I_C=-10mA	100		400	
	$h_{FE(2)}$	V_{CE}=-1V, I_C=-50mA	60			
	$h_{FE(3)}$	V_{CE}=-1V, 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_{stg}	V_{CC}=-3V, I_C=-10mA,			225	ns
Fall time	T_F	I_{B1}=I_{B2}=-1mA			75	ns

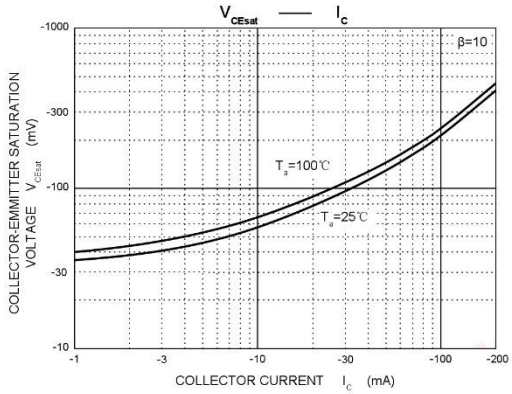
CLASSIFICATION OF h_{FE1}

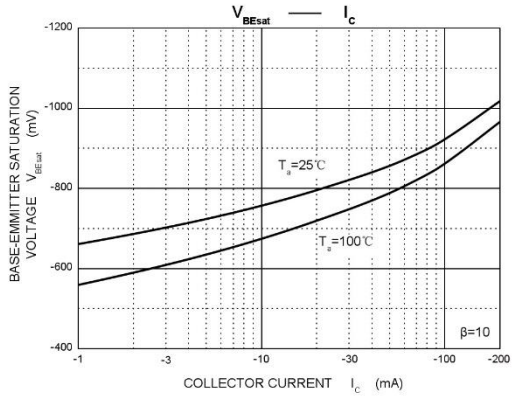
Rank	O	Y	G
Range	100-200	200-300	300-400

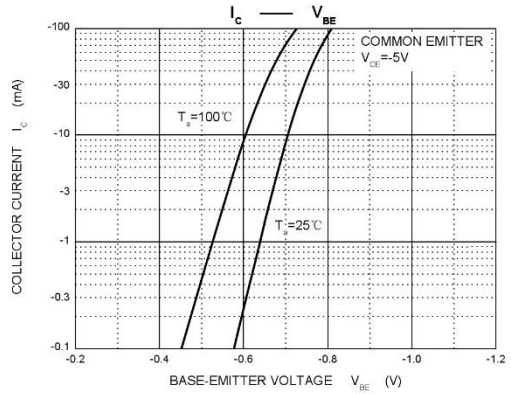
TYPICAL CHARACTERISTICS

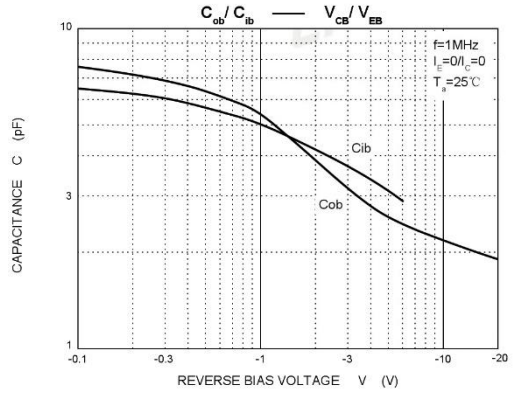


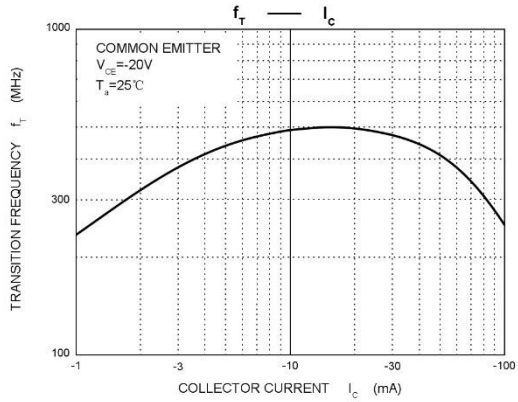


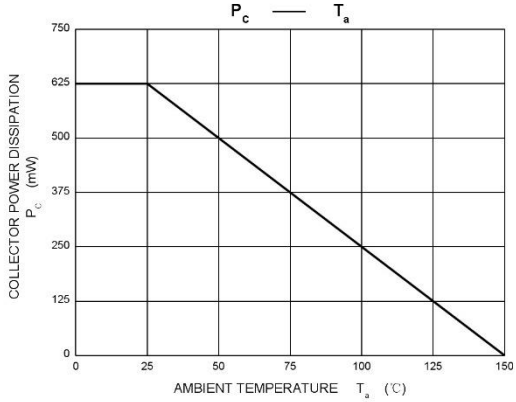




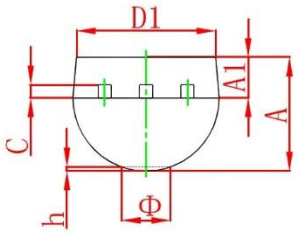


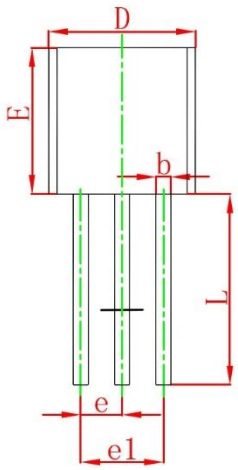






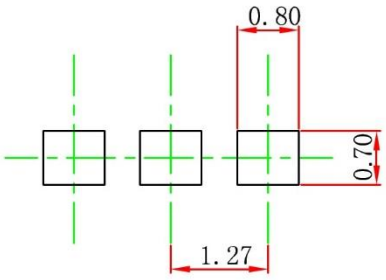
TO-92 Package Outline Dimensions





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

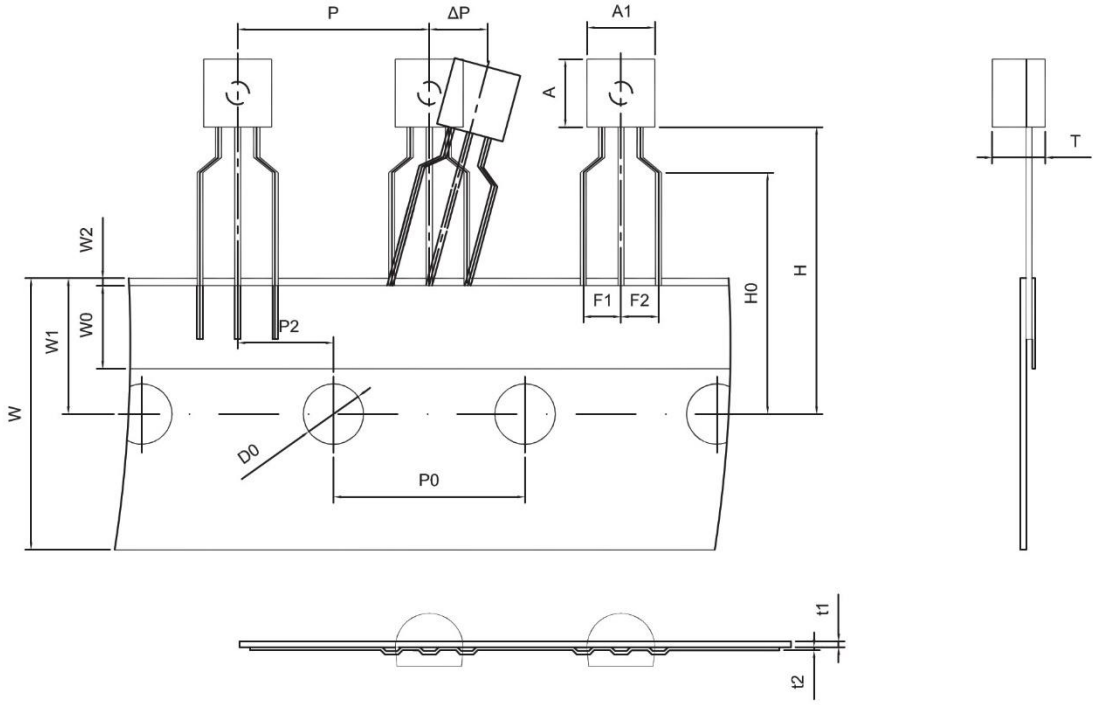
TO-92 Suggested Pad Layout



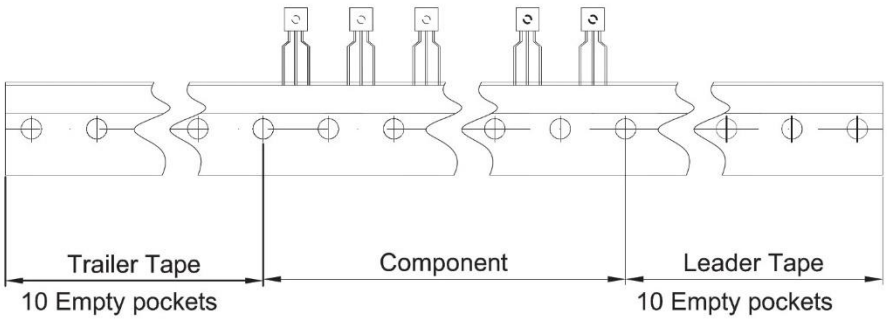
Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

TO-92 Tape and Reel

TO-92 PACKAGE TAPEING DIMENSION



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



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