



# DATA SHEET

SEMICONDUCTOR

YS2N3904

## TRANSISTOR (NPN)

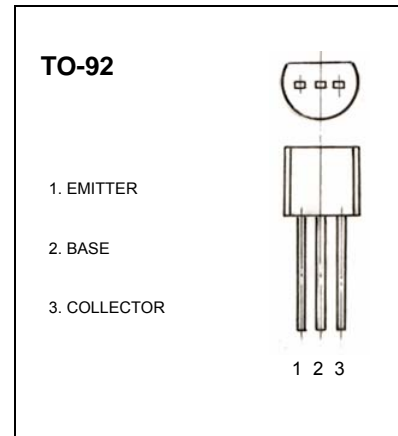


### FEATURE

- NPN silicon epitaxial planar transistor for switching and Amplifier applications
- As complementary type, the PNP transistor 2N3906 is Recommended
- This transistor is also available in the SOT-23 case with the type designation MMBT3904

### MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Value	Units
V <sub>CB0</sub>	Collector-Base Voltage	60	V
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>EBO</sub>	Emitter-Base Voltage	6	V
I <sub>C</sub>	Collector Current -Continuous	0.2	A
P <sub>C</sub>	Collector Power Dissipation	0.625	W
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55-150	°C



### ELECTRICAL CHARACTERISTICS (T<sub>amb</sub>=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0	60			V
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> = 1mA, I <sub>B</sub> =0	40			V
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> = 10μA, I <sub>C</sub> =0	6			V
Collector cut-off current	I <sub>CB0</sub>	V <sub>CB</sub> =60V, I <sub>E</sub> =0			0.1	μA
Collector cut-off current	I <sub>CEO</sub>	V <sub>CE</sub> = 40V, I <sub>B</sub> =0			0.1	μA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> = 5V, I <sub>C</sub> =0			0.1	μA
DC current gain	h <sub>FE1</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =10mA	100		400	
	h <sub>FE2</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =50mA	60			
	h <sub>FE3</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =100mA	30			
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =50mA, I <sub>B</sub> =5mA			0.3	V
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =50mA, I <sub>B</sub> =5mA			0.95	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =20V, I <sub>C</sub> =10mA, f=100MHz	300			MHz
Delay Time	t <sub>d</sub>	V <sub>CC</sub> =3V, V <sub>BE</sub> =0.5V,			35	ns
Rise Time	t <sub>r</sub>	I <sub>C</sub> =10mA, I <sub>B1</sub> =1mA			35	ns
Storage Time	t <sub>s</sub>	V <sub>CC</sub> =3V, I <sub>C</sub> =10mA			200	ns
Fall Time	t <sub>f</sub>	I <sub>B1</sub> =I <sub>B2</sub> =1mA			50	ns

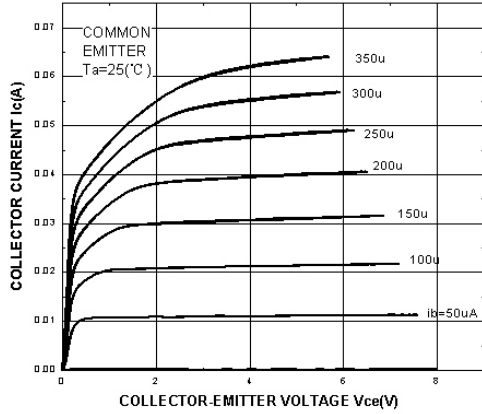
### CLASSIFICATION OF h<sub>FE1</sub>

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

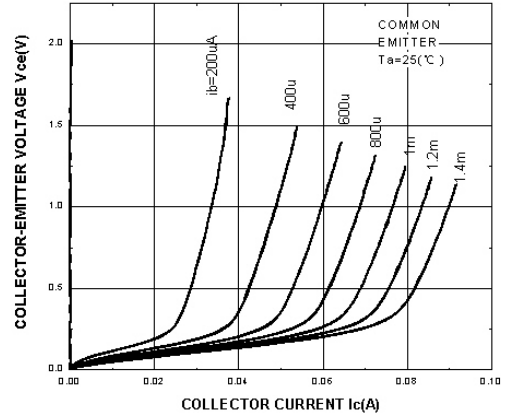
# DEVICE CHARACTERISTICS

## YS2N3904

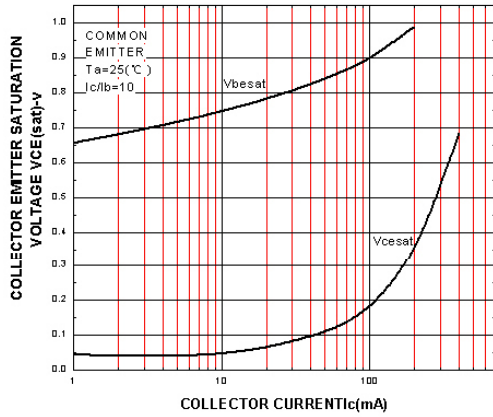
Ic-Vce



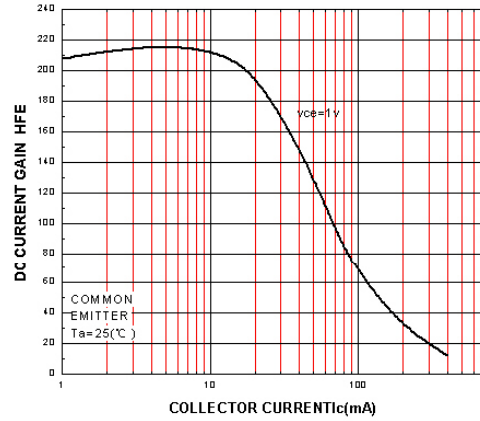
Vce-Ic



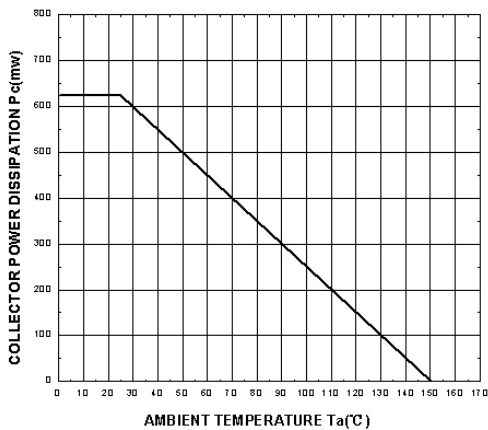
Vcesat-Ic  
Vbesat-Ic



hFE-Ic

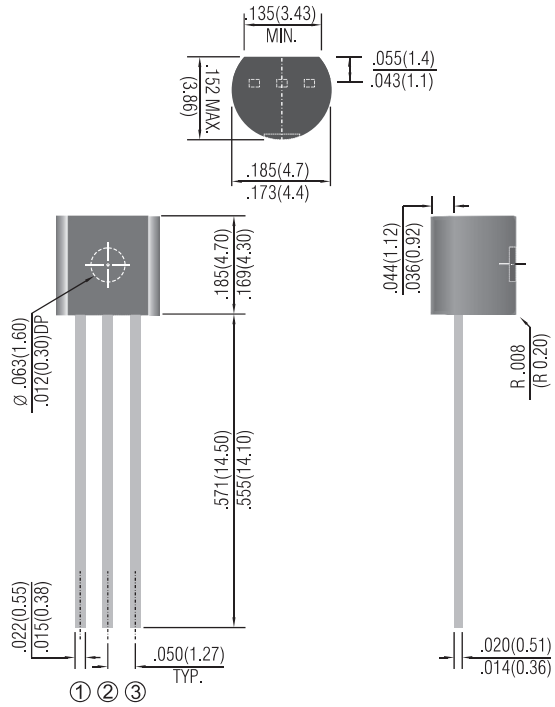


Pc-Ta



# PACKAGE OUTLINE & DIMENSIONS

## YS2N3904



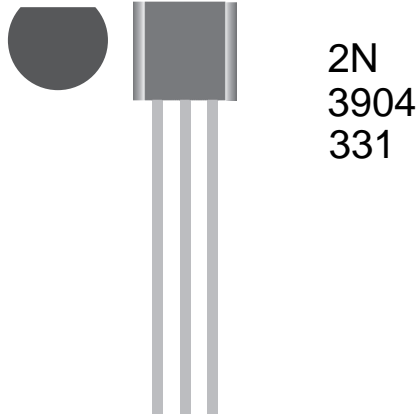


**亞昕科技股份有限公司**  
**Yea Shin Technology Co., Ltd.**

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TO-92 Marking Information

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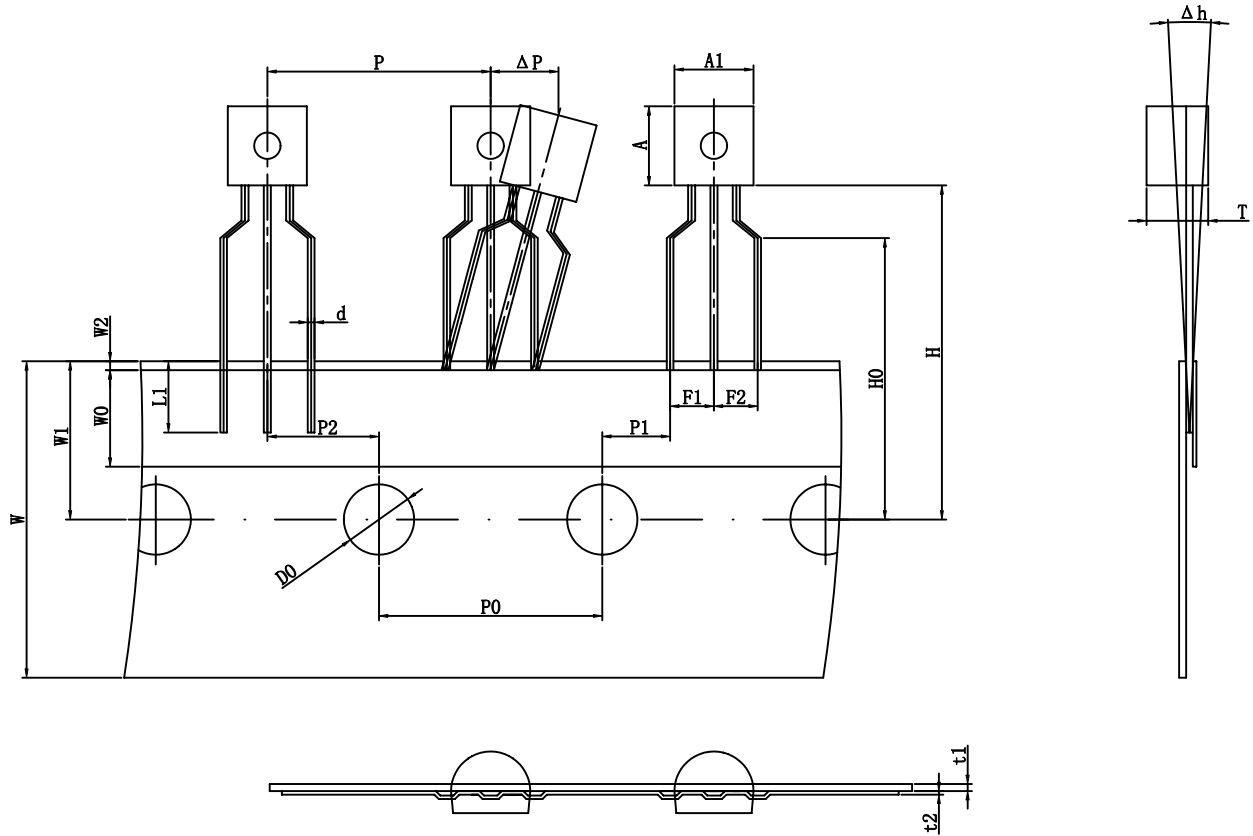


2N3904 : Device Code

331 : 產品識別碼



## TO-92 PACKAGE TAPEING DIMENSION



Item	Symbol	Value & Tolerance
Body width	A1	4.5 ± 0.1
Body height	A	4.5 ± 0.1
Body thickness	T	3.5 ± 0.1
Lead wire diameter	d	0.38 ± 0.02
Pitch of component	P	12.7 ± 0.3
Feed hole pitch	P0	12.7 ± 0.2
Hole center to component center	P2	6.35 ± 0.3
Lead to lead distance	F1,F2	2.5 ± 0.3
Component alignment, F-R	h	0 ± 1.0
Type width	W	18.0 + 1.0, - 0.5
Hole down tape width	W0	6.0 ± 0.5
Hole position	W1	9.0 ± 0.5
Hole down tape position	W2	1.0 MAX
Height of component from tape center	H	19.0 +2.0, -0
Lead wire clinch height	H0	16.0 ± 0.5
Lead wire(tape portion)	L1	2.5 MIN
Feed hole diameter	D0	4.0 ± 0.2
Taped Lead Thickness	t1	0.4 ± 0.05
Carrier Tape Thickness	t2	0.2 ± 0.05
Position of hole	P1	3.85 ± 0.3
Component alignment	P	0 ± 1.0

Unit : mm