

# TRANSISTOR(PNP)

## PRODUCT SUMMARY

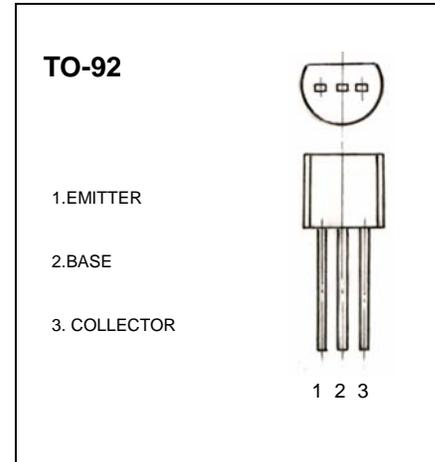
TO-92 Plastic-Encapsulate Transistors

## FEATURES

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<sub>A</sub>=25 °C unless otherwise noted)

Symbol	Parameter	Value	Units
V <sub>CB0</sub>	Collector-Base Voltage	-40	V
V <sub>CE0</sub>	Collector-Emitter Voltage	-40	V
V <sub>EB0</sub>	Emitter-Base Voltage	-5	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

(Tamb=25 °C unless otherwise specified)

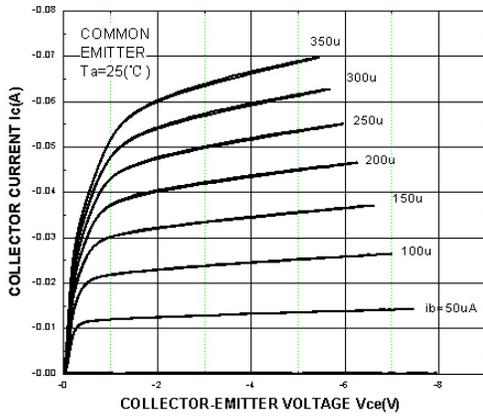
Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = -10\mu A, I_E = 0$	-40			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -1mA, I_B = 0$	-40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -10\mu A, I_C = 0$	-5			V
Collector cut-off current	$I_{CBO}$	$V_{CB} = -40V, I_E = 0$			-0.1	$\mu A$
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	$\mu A$
DC current gain	$h_{FE1}$	$V_{CE} = -1V, I_C = -10mA$	100		400	
	$h_{FE2}$	$V_{CE} = -1V, I_C = -50mA$	60			
	$h_{FE3}$	$V_{CE} = -1V, I_C = -100mA$	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	$t_d$	$V_{CC} = -3V, V_{BE} = -0.5V,$ $I_C = -10mA, I_{B1} = -1mA$			35	ns
Rise Time	$t_r$				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 $h_{FE1}$

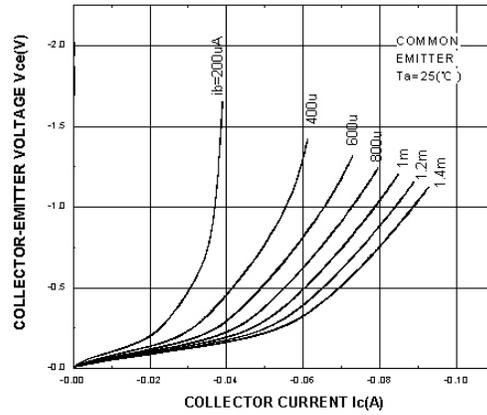
Rank	O	Y	G
Range	100-200	200-300	300-400

# TYPICAL CHARACTERISTICS

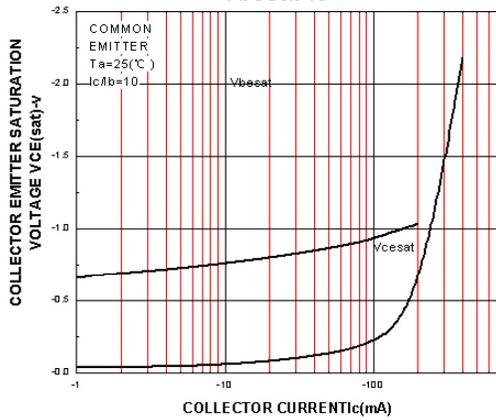
Ic-Vce



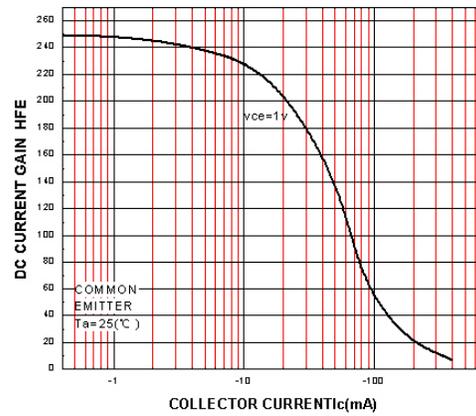
Vce-Ic



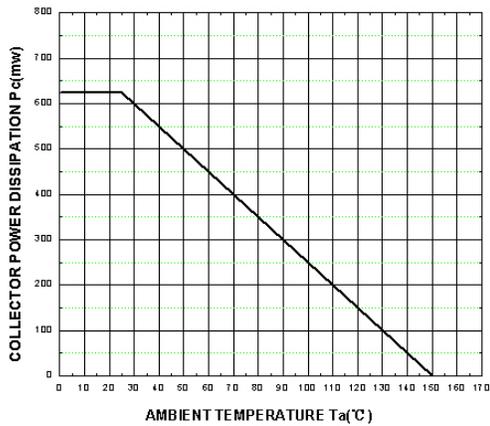
Vcesat-Ic  
Vbesat-Ic



hFE-Ic



Pc-Ta



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