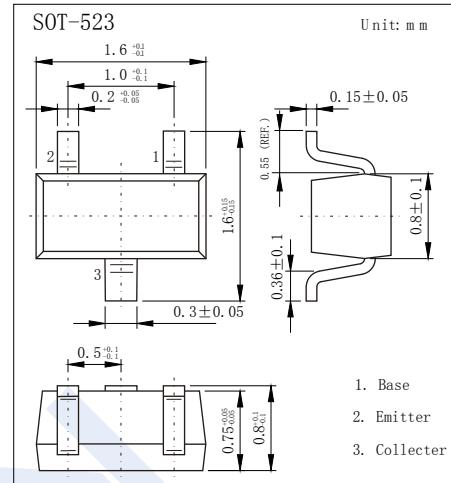


## NPN Transistors

### MMBT3904T (KMBT3904T)

#### ■ Features

- Small Package
- Complementary to MMBT3906T



#### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	$V_{CB0}$	60	V
Collector - Emitter Voltage	$V_{CE0}$	40	
Emitter - Base Voltage	$V_{EB0}$	6	
Collector Current - Continuous	$I_C$	200	mA
Collector Power Dissipation	$P_C$	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to 150	

## NPN Transistors

## MMBT3904T (KMBT3904T)

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V <sub>CBO</sub>	I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0	60			V
Collector- emitter breakdown voltage	V <sub>CEO</sub>	I <sub>C</sub> = 1 mA, I <sub>B</sub> = 0	40			
Emitter - base breakdown voltage	V <sub>EBO</sub>	I <sub>E</sub> = 100 μA, I <sub>C</sub> = 0	6			
Collector-base cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> = 60 V, I <sub>E</sub> = 0			100	nA
Collector cut-off current	I <sub>CEX</sub>	V <sub>CE</sub> = 30 V, V <sub>EB(off)</sub> =3V			50	
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> = 5V, I <sub>C</sub> =0			100	
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =10 mA, I <sub>B</sub> =1mA			0.2	V
		I <sub>C</sub> = 50 mA, I <sub>B</sub> = 5mA			0.3	
Base - emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =10 mA, I <sub>B</sub> =1mA	0.65		0.85	
		I <sub>C</sub> = 50 mA, I <sub>B</sub> = 5mA			0.95	
DC current gain	h <sub>FE(1)</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 0.1mA	40			
	h <sub>FE(2)</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 1mA	70			
	h <sub>FE(3)</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA	100		300	
	h <sub>FE(4)</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 50mA	60			
Delay time	t <sub>d</sub>	V <sub>CC</sub> =3V, V <sub>BE(off)</sub> =-0.5V			35	nS
Rise time	t <sub>r</sub>	I <sub>C</sub> =10mA, I <sub>B1</sub> =1mA			35	
Storage time	t <sub>s</sub>	V <sub>CC</sub> =3V, I <sub>C</sub> =10mA, I <sub>B1</sub> =I <sub>B2</sub> =1mA			200	
Fall time	t <sub>f</sub>				50	
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 5V, I <sub>E</sub> = 0, f=1MHz			4	pF
Base input capacitance	C <sub>ib</sub>	V <sub>EB</sub> =0.5V, I <sub>C</sub> =0, f=1MHz			8	
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> = 20V, I <sub>C</sub> = 10mA, f=100MHz	300			MHz

## ■ Marking

Marking	1N
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# NPN Transistors

## MMBT3904T (KMBT3904T)

■ Typical Characteristics

