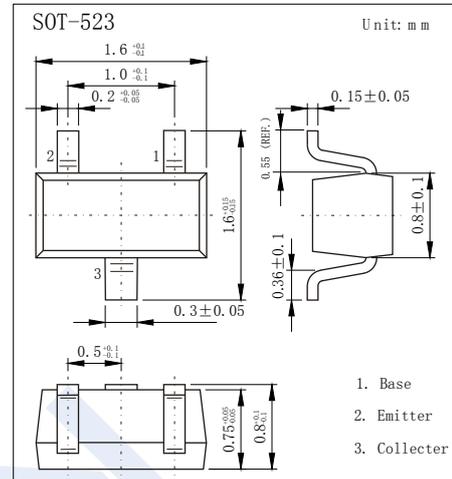


## NPN Transistors

## 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  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	$V_{CB0}$	$I_c = 100 \mu\text{A}$ , $I_E = 0$	60			V
Collector- emitter breakdown voltage	$V_{CEO}$	$I_c = 1 \text{ mA}$ , $I_B = 0$	40			
Emitter - base breakdown voltage	$V_{EBO}$	$I_E = 100 \mu\text{A}$ , $I_C = 0$	6			
Collector-base cut-off current	$I_{CBO}$	$V_{CB} = 60 \text{ V}$ , $I_E = 0$			100	nA
Collector cut-off current	$I_{CEX}$	$V_{CE} = 30 \text{ V}$ , $V_{EB(off)} = 3\text{V}$			50	
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 5 \text{ V}$ , $I_C = 0$			100	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10 \text{ mA}$ , $I_B = 1 \text{ mA}$			0.2	V
		$I_C = 50 \text{ mA}$ , $I_B = 5 \text{ mA}$			0.3	
Base - emitter saturation voltage	$V_{BE(sat)}$	$I_C = 10 \text{ mA}$ , $I_B = 1 \text{ mA}$	0.65		0.85	
		$I_C = 50 \text{ mA}$ , $I_B = 5 \text{ mA}$			0.95	
DC current gain	$h_{FE(1)}$	$V_{CE} = 10 \text{ V}$ , $I_C = 0.1 \text{ mA}$	40			
	$h_{FE(2)}$	$V_{CE} = 10 \text{ V}$ , $I_C = 1 \text{ mA}$	70			
	$h_{FE(3)}$	$V_{CE} = 10 \text{ V}$ , $I_C = 10 \text{ mA}$	100		300	
	$h_{FE(4)}$	$V_{CE} = 10 \text{ V}$ , $I_C = 50 \text{ mA}$	60			
Delay time	$t_d$	$V_{CC} = 3 \text{ V}$ , $V_{BE(off)} = -0.5 \text{ V}$			35	nS
Rise time	$t_r$	$I_C = 10 \text{ mA}$ , $I_{B1} = 1 \text{ mA}$			35	
Storage time	$t_s$	$V_{CC} = 3 \text{ V}$ , $I_C = 10 \text{ mA}$ , $I_{B1} = I_{B2} = 1 \text{ mA}$			200	
Fall time	$t_f$				50	
Collector output capacitance	$C_{ob}$	$V_{CB} = 5 \text{ V}$ , $I_E = 0$ , $f = 1 \text{ MHz}$			4	pF
Base input capacitance	$C_{ib}$	$V_{EB} = 0.5 \text{ V}$ , $I_C = 0$ , $f = 1 \text{ MHz}$			8	
Transition frequency	$f_T$	$V_{CE} = 20 \text{ V}$ , $I_C = 10 \text{ mA}$ , $f = 100 \text{ MHz}$	300			MHz

## ■ Marking

Marking	AM
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# NPN Transistors

## MMBT3904T (KMBT3904T)

### Typical Characteristics

