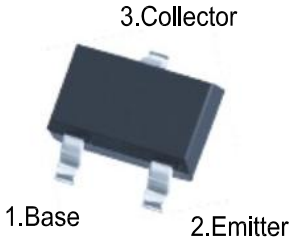
MMBT3904W

NPN Silicon Epitaxial Planar Transistor

Features

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process



SOT-323

Ordering Information:

Product	Package	Marking	Packing
MMBT3904W	SOT-323		3000PCS/Reel

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	60	V
Collector Emitter Voltage	V_{CEO}	40	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Total Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	- 55 to + 150	°C

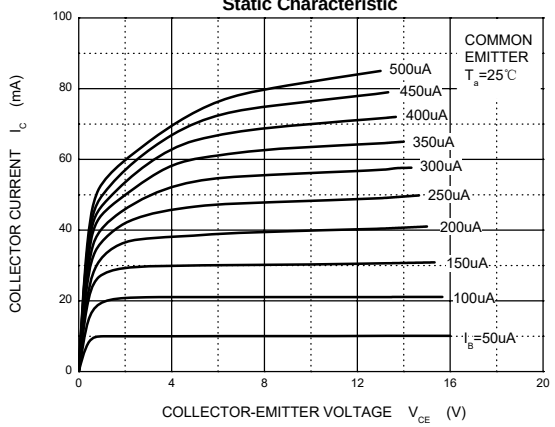
NPN Silicon Epitaxial Planar Transistor

Characteristics at T_a = 25 °C

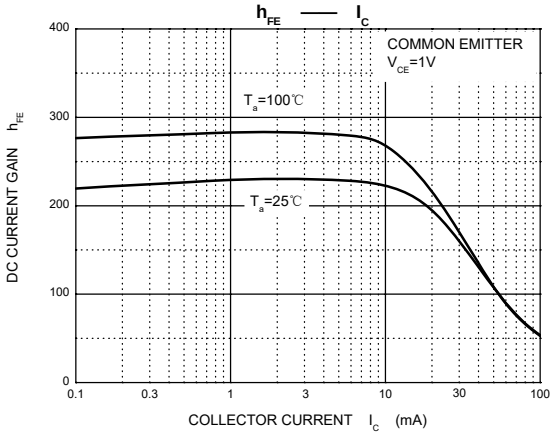
Parameter	Symbol	Min.	Max.	Unit
DC Current Gain at V_{CE} = 1 V, I_C = 0.1 mA at V_{CE} = 1 V, I_C = 1 mA at V_{CE} = 1 V, I_C = 10 mA at V_{CE} = 1 V, I_C = 50 mA at V_{CE} = 1 V, I_C = 100 mA	 h_{FE} h_{FE} h_{FE} h_{FE} h_{FE}	 40 70 100 60 30	 - - 300 - -	 - - - - -
Collector Emitter Cutoff Current at V_{CE} = 30 V	I_{CES}	-	50	nA
Emitter Base Cutoff Current at V_{EB} = 3 V	I_{EBO}	-	50	nA
Collector Base Breakdown Voltage at I_C = 10 µA	$V_{(BR)CBO}$	60	-	V
Collector Emitter Breakdown Voltage at I_C = 1 mA	$V_{(BR)CEO}$	40	-	V
Emitter Base Breakdown Voltage at I_E = 10 µA	$V_{(BR)EBO}$	6	-	V
Collector Emitter Saturation Voltage at I_C = 10 mA, I_B = 1 mA at I_C = 50 mA, I_B = 5 mA	$V_{CE(sat)}$	- -	0.2 0.3	V
Base Emitter Saturation Voltage at I_C = 10 mA, I_B = 1 mA at I_C = 50 mA, I_B = 5 mA	$V_{BE(sat)}$	0.65 -	0.85 0.95	V
Transition Frequency at V_{CE} = 20 V, $-I_E$ = 10 mA, f = 100 MHz	f_T	300	-	MHz
Collector Output Capacitance at V_{CB} = 10 V, f = 100 KHz	C_{ob}	-	4	pF
Delay Time at V_{CC} = 3 V, $V_{BE(OFF)}$ = 0.5 V, I_C = 10 mA, I_{B1} = 1 mA	t_d	-	35	ns
Rise Time at V_{CC} = 3 V, $V_{BE(OFF)}$ = 0.5 V, I_C = 10 mA, I_{B1} = 1 mA	t_r	-	35	ns
Storage Time at V_{CC} = 3 V, I_C = 10 mA, I_{B1} = $-I_{B2}$ = 1 mA	t_{stg}	-	200	ns
Fall Time at V_{CC} = 3 V, I_C = 10 mA, I_{B1} = $-I_{B2}$ = 1 mA	t_f	-	50	ns

NPN Silicon Epitaxial Planar Transistor

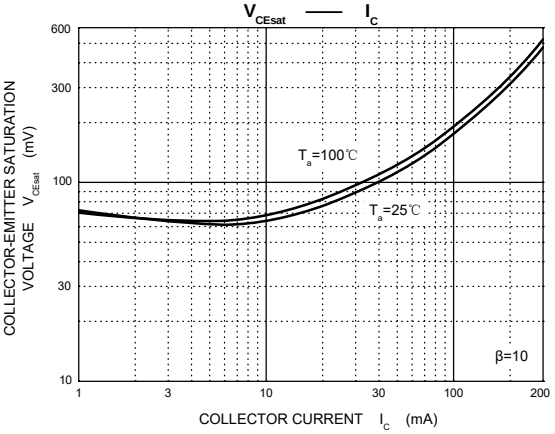
Static Characteristic



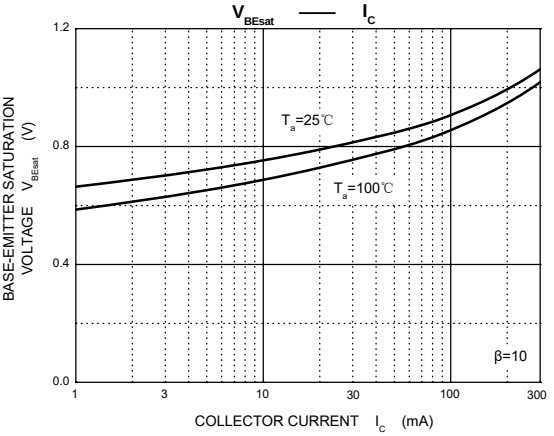
h_{FE} —— I_C



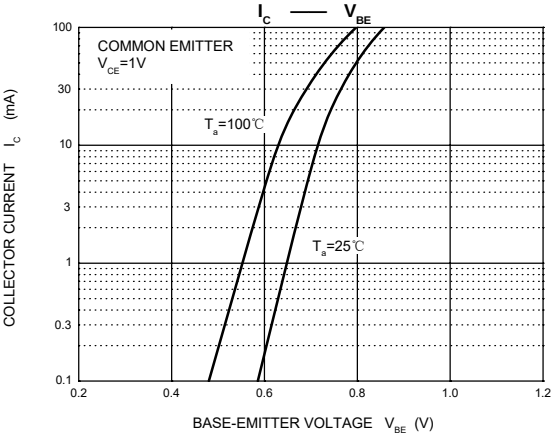
V_{CEsat} —— I_C



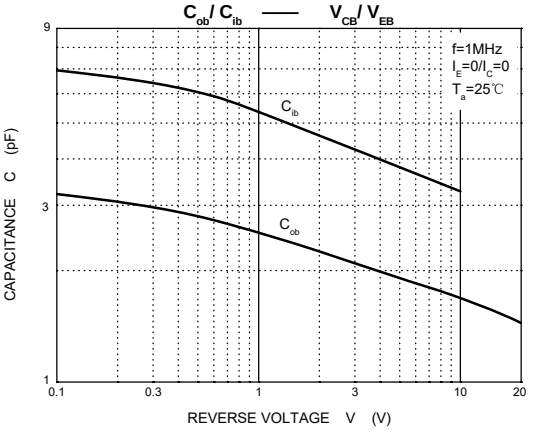
V_{BEsat} —— I_C



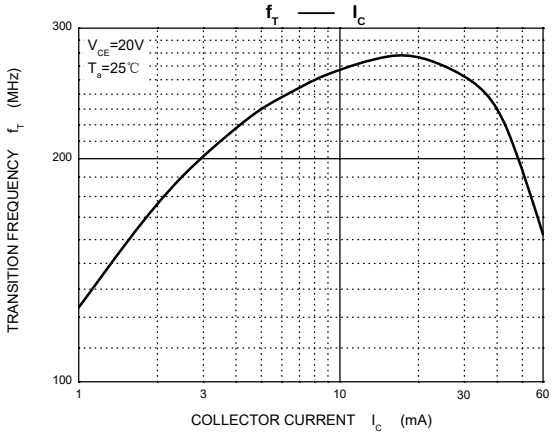
I_C —— V_{BE}



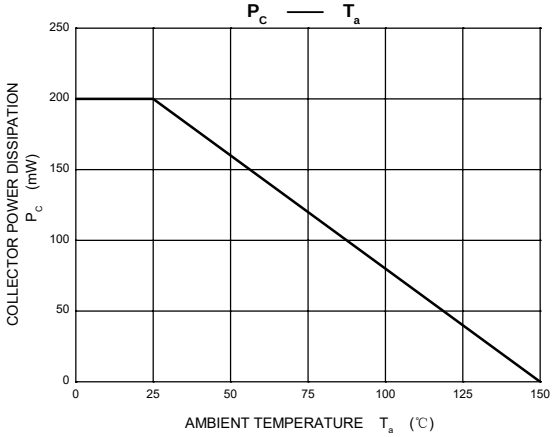
C_{ob} / C_{ib} —— V_{CB} / V_{EB}



f_T —— I_C

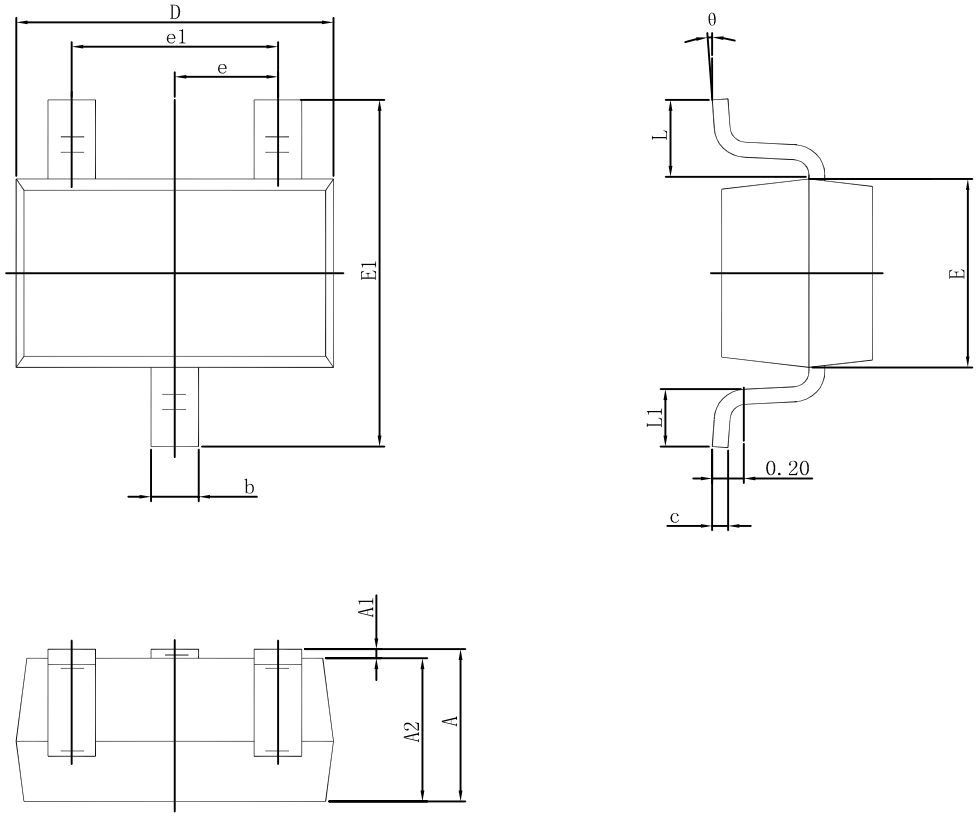


P_C —— T_a



NPN Silicon Epitaxial Planar Transistor

SOT-323 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°