

MMBT3904W TRANSISTOR(NPN) SOT-323 Plastic-Encapsulate Transistors

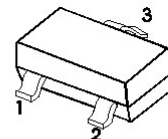
Features

- Complementary to MMBT3906W
- Power Dissipation of 200mW
- High Stability and High Reliability

Mechanical Data

- SOT-323 Small Outline Plastic Package
- Epoxy UL: 94V-0
- Mounting Position: Any

SOT-323



1. BASE
2. EMITTER
3. COLLECTOR

Marking: K2N

Maximum Ratings & Thermal Characteristics (Ratings at 25°C ambient temperature unless otherwise specified.)

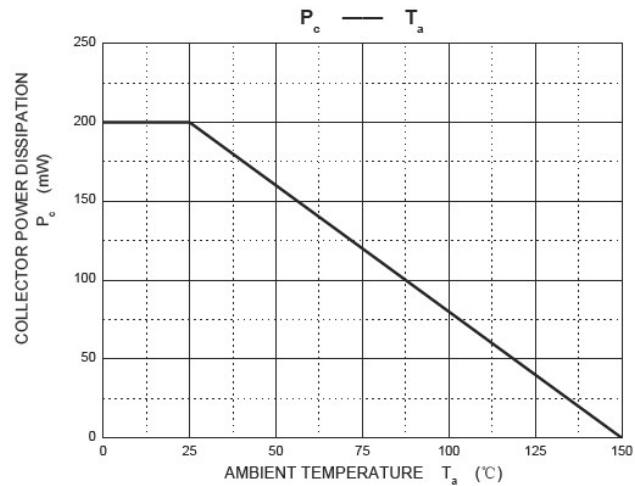
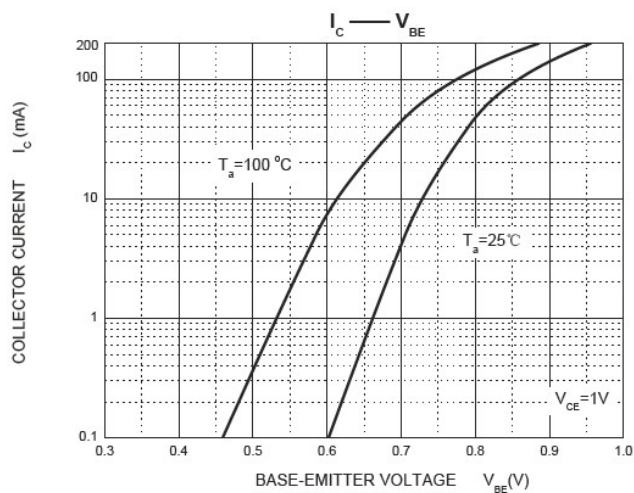
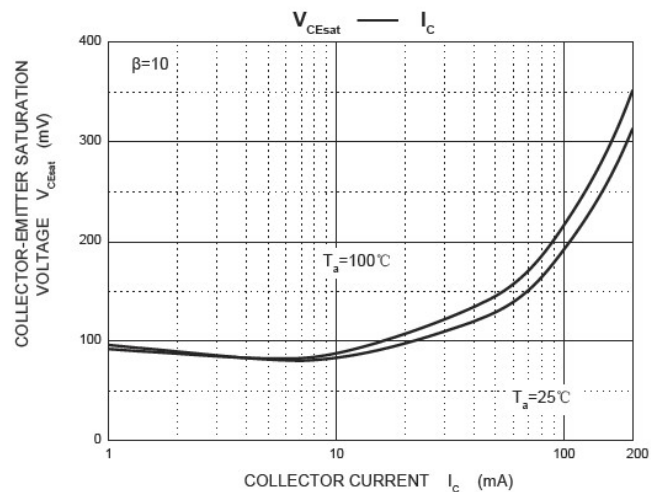
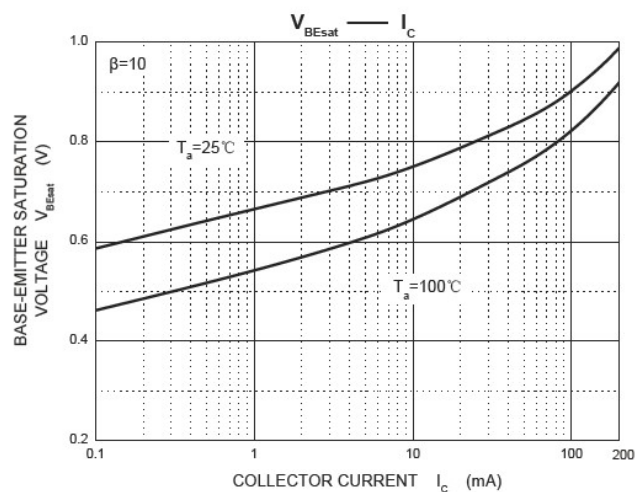
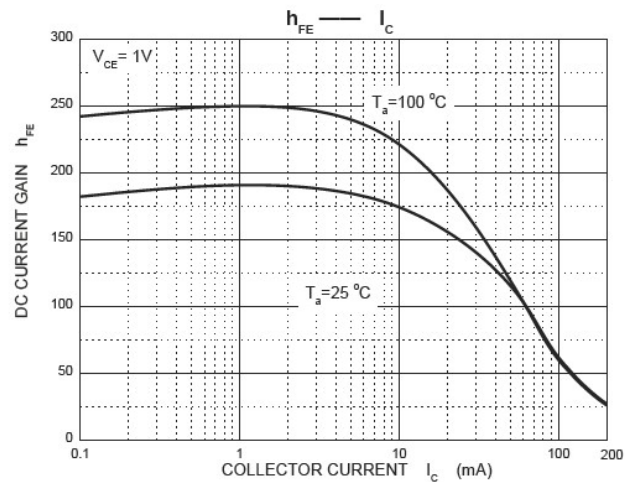
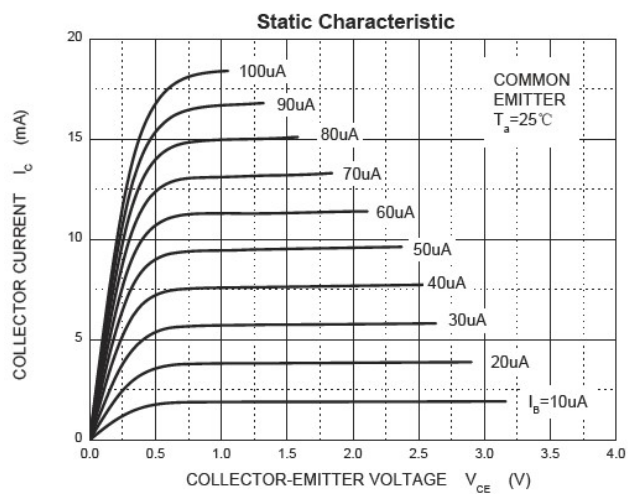
Parameters	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter -Base Voltage	V_{EBO}	6	V
Collector Current-Continuous	I_C	200	mA
Collector Power Dissipation	P_C	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-55-+150	°C
Thermal resistance From junction to ambient	$R_{\theta JA}$	625	°C/W

Electrical Characteristics (Ratings at 25°C ambient temperature unless otherwise specified).

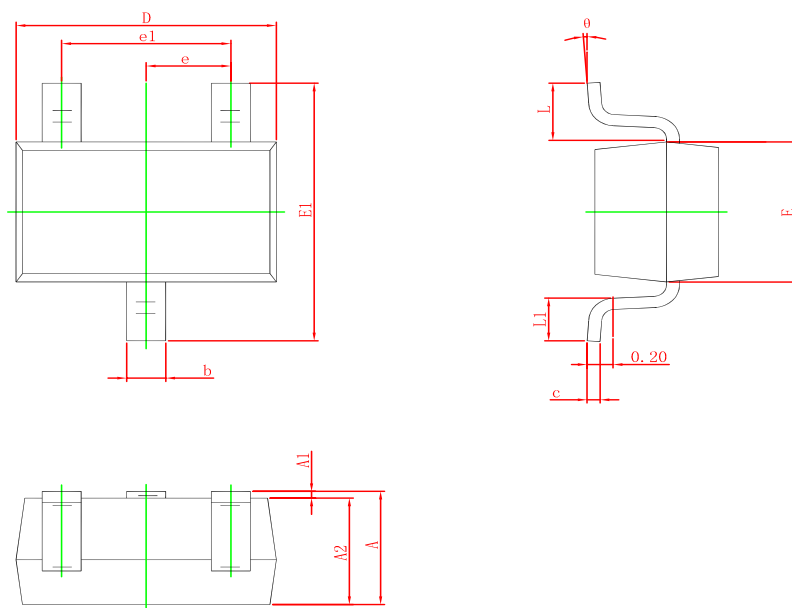
Parameter	Symbols	Test Condition	Limits		Unit
			Min	Max	
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1mA, I_B=0$	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	5		V
Collector cut-off current	I_{CEX}	$V_{CE}=30V, V_{EB(off)}=3V$		50	nA
Collector cut-off current	I_{CBO}	$V_{CB}=60V, I_E=0$		60	nA
DC current gain	$h_{FE(1)}$	$V_{CE}=1V, I_C=0.1mA$	40		
	$h_{FE(2)}$	$V_{CE}=1V, I_C=1mA$	70		
	$h_{FE(3)}$	$V_{CE}=1V, I_C=10mA$	100	300	
	$h_{FE(4)}$	$V_{CE}=1V, I_C=50mA$	60		
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=10mA, I_B=1mA$		0.25	V
		$I_C=50mA, I_B=5mA$		0.30	V
Base -emitter saturation voltage	$V_{BE(sat)}$	$I_C=10mA, I_B=1mA$		0.85	V
		$I_C=50mA, I_B=5mA$		0.95	V
Transition frequency	f_T	$V_{CE}=20V, I_C=10mA, f=100MHz$	300		MHz
Collector output capacitance	C_{ob}	$V_{CB}=5V, I_E=0, f=1MHz$		4	pF
	C_{ib}	$V_{EB}=5V, I_E=0, f=1MHz$		8	pF
Delay time	t_d	$V_{CC}=3V, V_{BE(off)}=-0.5V, I_C=10mA, I_{B1}=1mA$		35	nS
Rise time	t_r			35	nS
Storage time	t_s	$V_{CC}=3V, I_C=10mA, I_{B1}=I_{B2}=1mA$		225	nS
Fall time	t_f			75	nS

*Pulse test: pulse width $\leq$ 300us,duty cycle $\leq$ 2.0%

Typical characteristics



SOT-323 PACKAGE OUTLINE Plastic surface mounted package



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	0.800	1.000	0.031	0.039
b	0.200	0.400	0.008	0.016
c	0.050	0.150	0.002	0.006
D	1.900	2.200	0.075	0.087
E	1.150	1.350	0.045	0.053
E1	2.000	2.450	0.079	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°