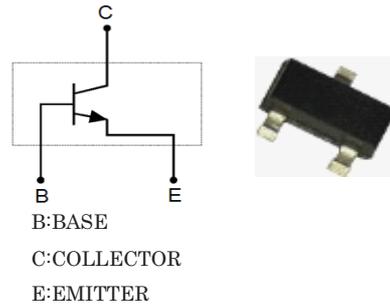


NPN General Purpose Amplifier

- ◇ Epoxy Meets UL 94 V-0 Flammability Rating
- ◇ Small Outline Surface Mount Package

Device Marking Code	
MMBT3904W	K2N

Equivalent Circuit



MAXIMUM RATINGS ($T_a = 25\text{ }^\circ\text{C}$)

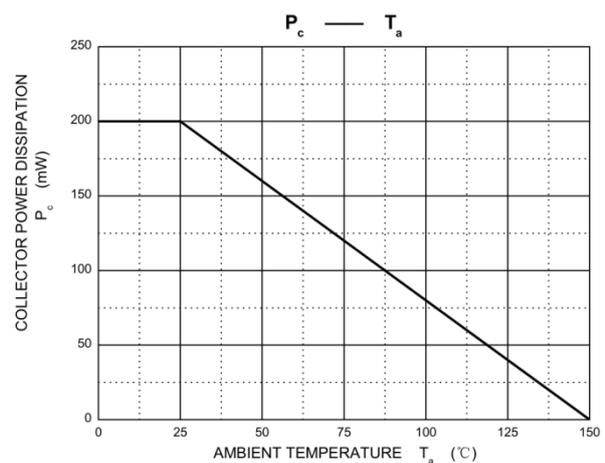
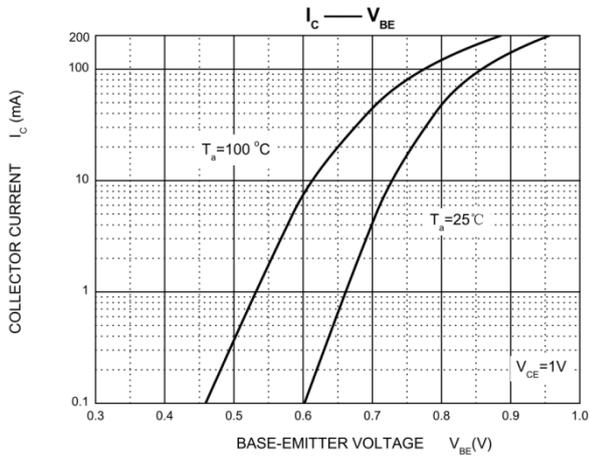
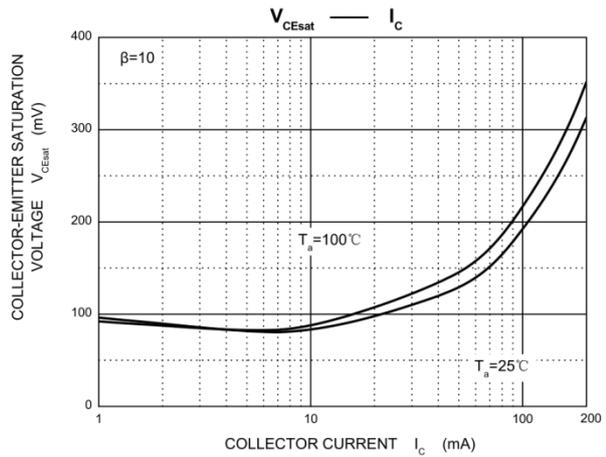
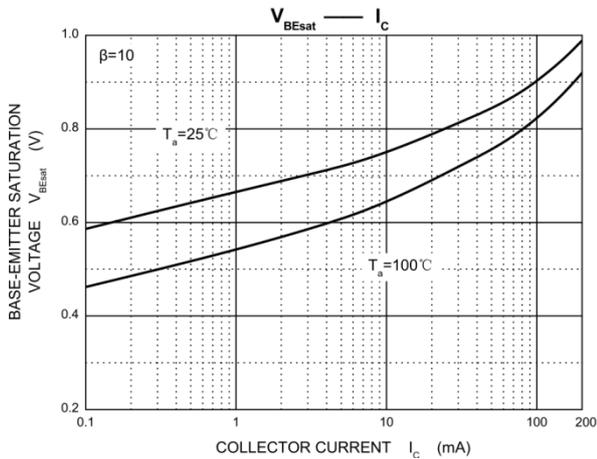
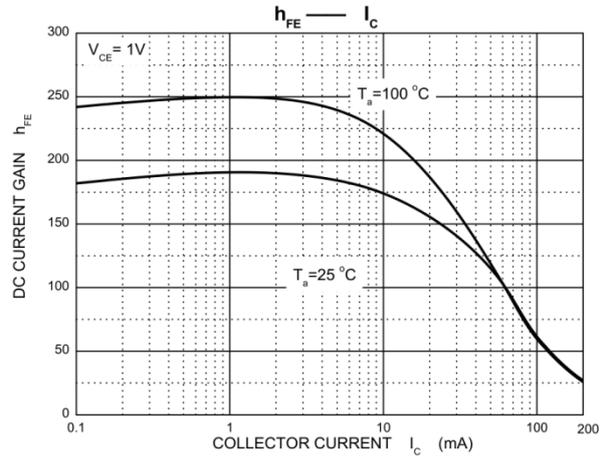
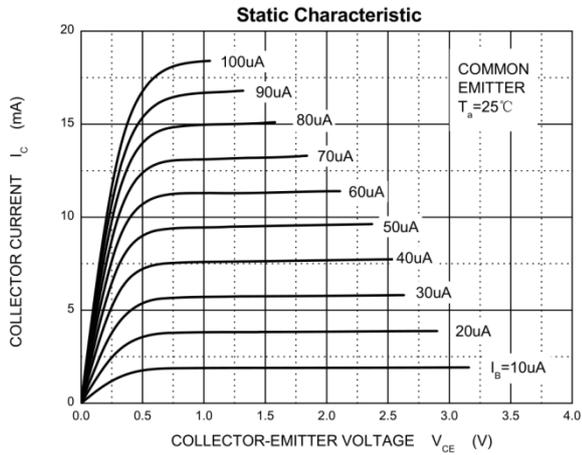
Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Power Dissipation	200	mA
P_C	Collector Power Dissipation	200	mW
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	625	$^\circ\text{C}/\text{W}$
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature	-55~+150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_a = 25\text{ }^\circ\text{C}$)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_{CBO}	Collector-Base Breakdown Voltage	$I_C=10\text{ }\mu\text{A}$, $I_E=0$	60			V
V_{CEO}	Collector-Emitter Breakdown Voltage	$I_C=1\text{mA}$, $I_B=0$	40			V
V_{EBO}	Emitter-Base Breakdown Voltage	$I_E=10\text{ }\mu\text{A}$, $I_C=0$	5			V
I_{CBO}	Collector Cut-Off Current	$V_{CB}=60\text{V}$, $I_E=0$			60	nA
I_{CEX}	Collector Cut-Off Current	$V_{CE}=30\text{V}$, $I_{BE(off)}=3\text{V}$			50	nA
h_{FE}	DC Current Gain	$V_{CE}=1\text{V}$, $I_C=100\text{ }\mu\text{A}$	40			
		$V_{CE}=1\text{V}$, $I_C=1\text{mA}$	70			
		$V_{CE}=1\text{V}$, $I_C=10\text{mA}$	100		300	
		$V_{CE}=1\text{V}$, $I_C=50\text{mA}$	60			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=10\text{mA}$, $I_B=1\text{mA}$			0.25	V
		$I_C=50\text{mA}$, $I_B=5\text{mA}$			0.3	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=10\text{mA}$, $I_B=1\text{mA}$			0.85	V
		$I_C=50\text{mA}$, $I_B=5\text{mA}$			0.95	V
f_T	Transition Frequency	$V_{CE}=20\text{V}$, $I_C=10\text{mA}$, $f=100\text{MHz}$	300			MHz

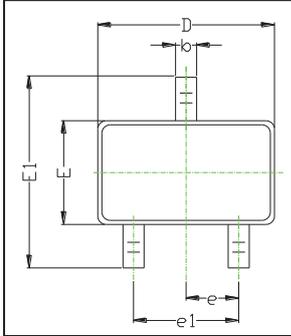
C_{ob}	Collector Output Capacitance	$V_{CB}=5V, I_E=0, f=1MHz$		4	pF
C_{ib}	Collector Output Capacitance	$V_{EB}=0.5V, I_E=0, f=1MHz$		8	pF
t_d	Delay time	$V_{CC}=3V, V_{BE(off)}=0.5V, I_C=10mA, I_{B1}=1mA$		35	nS
t_r	Delay time			35	nS
t_s	Storage time	$V_{CC}=3V, I_C=10mA, I_{B1}=I_{B2}=1mA$		225	nS
t_f	Fall time			75	nS

RATING AND CHARACTERISTICS CURVES (MMBT3904W)

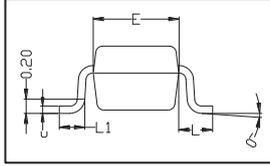


Package outline : SOT323

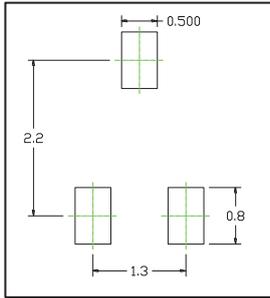
TOP VIEW



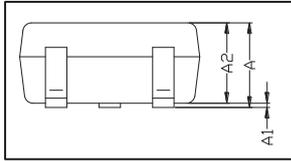
SIDE VIEW



SOLDERING PATTERN



FRONT VIEW



SYMBOL	DIMENSIONS IN MILLIMETER	
	MIN	MAX
A	0.900	1.000
A1	0.00	0.100
A2	0.900	1.000
b	0.200	0.400
c	0.080	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.650 TYP.	
e1	1.200	1.400
L	0.525 REF.	
L1	0.260	0.460
θ	0°	8°

Notice:

1. Lead plating: Pb free solder
2. Lead thickness includes solder plating
3. Lead frame: CAC-5
4. Other Tolerance: ± 0.05
6. Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions
5. Unit: mm

PACKAGING OF DIODE

REEL PACK

PACKAGE	PACKING CODE	REEL (EA)	COMPONENT SPACE(mm)	TAPE SPACE (mm)	REEL DIA (mm)	CARTON SIZE (mm)	EA PER CARTON	GROSS WEIGHT(Kg)
SOT-323	-T	3,000	---	---	178	390*205*310	120,000	5.29

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