GSTMMBT3904WF

NPN General Purpose Transistor

Product Description

This device is designed as a general purpose amplifier and switch.

Features

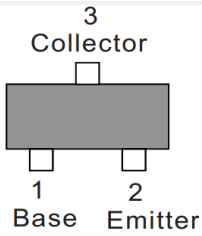
- Complementary to GSTMMBT3906
- Collector-Emitter Voltage V_{CEO} = 40V
- Collector Current I_C = 200mA
- RoHS Compliant and Halogen Free

Mechanical Data

- SOT-323 package design
- Epoxy meets UL 94 V-0 Flammability Rating

Packages & Pin Assignments

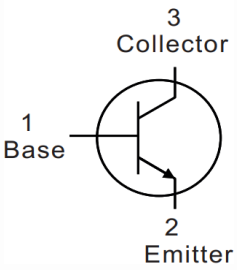
SOT-323



Top View

Pin	Description
1	Base
2	Emitter
3	Collector

Equivalent Circuit



Ordering and Marking Information

Ordering Information

Part Number	Package	h_{FE} Range	Marking Code	Quantity/Reel
GSTMMBT3904WF	SOT-323	100-300	K2N	3,000 PCS

GSTMMBT3904[1][2]

- **Product Code:** GSTMMBT3904
- **Package Code:** [1] is **W** for SOT-323
- **Green Level:** **F** for RoHS Compliant and Halogen Free

Marking Information

K2N

- **Product Code:** K2N

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

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

Electrical Characteristics (T_A=25°C unless otherwise specified)

Symbol	Description	Conditions	Min	Max	Unit
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C=10μA, I_E=0	60		V
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	I_C =1mA, I_B=0	40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E=10μA, I_C =0	5		V
I_{CBO}	Collector Cut-Off Current	V_{CB}=60V, I_E=0		60	nA
I_{CEX}	Collector Cut-Off Current	V_{CE}=30V, $V_{EB\ (off)}$=3V		50	nA
h_{FE}	DC Current Gain	V_{CE}=1V, I_C =100μA	40	-	-
		V_{CE}=1V, I_C =1mA	70	-	-
		V_{CE}=1V, I_C =10mA	100	300	-
		V_{CE}=1V, I_C =50mA	60	-	-
		V_{CE}=1V, I_C =100μA	40	-	-
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=10mA, I_B=1mA		0.25	V
		I_C=50mA, I_B=5mA		0.3	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C=10mA, I_B=1mA		0.85	V
		I_C=50mA, I_B=5mA		0.95	V
f_T	Current Gain-Bandwidth Product	V_{CE}=20V, I_C =10mA, f=100MHz	300		MHz
C_{ob}	Output Capacitance	V_{CB}=5V, I_E=0, f=1MHz		4	pF
C_{ib}	Input 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	Rise 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

Typical Performance Characteristics

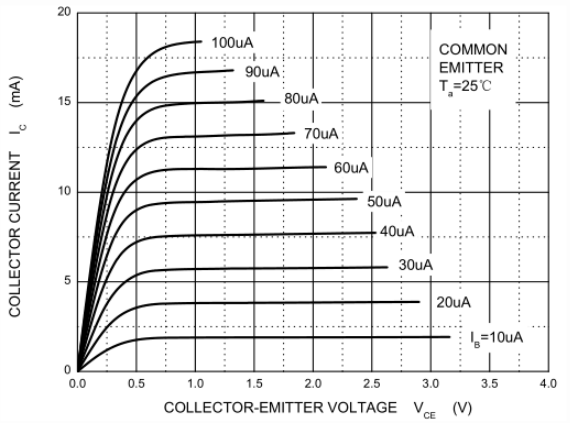


Figure 1. Static Characteristics

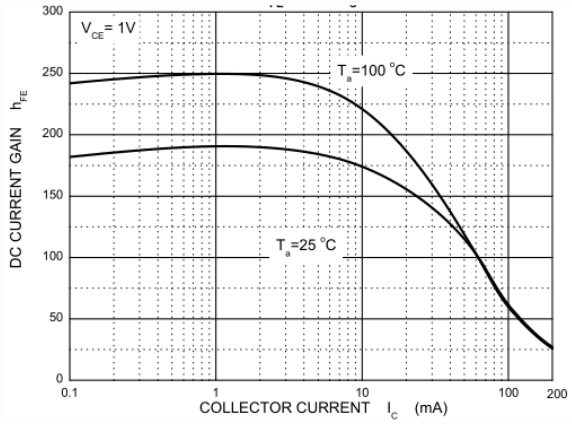


Figure 2. h_{FE} vs. Collector Current

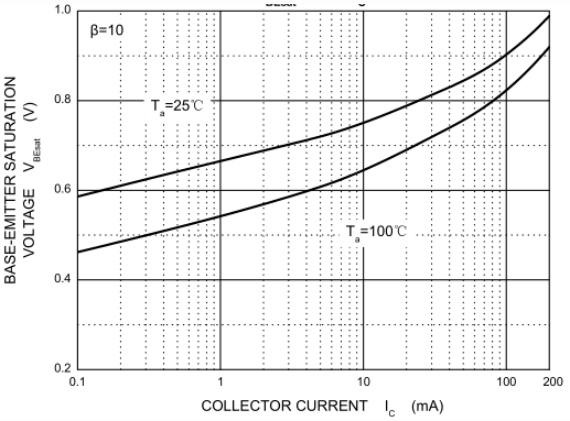


Figure 3. $V_{BE\ (sat)}$ vs. Collector Current

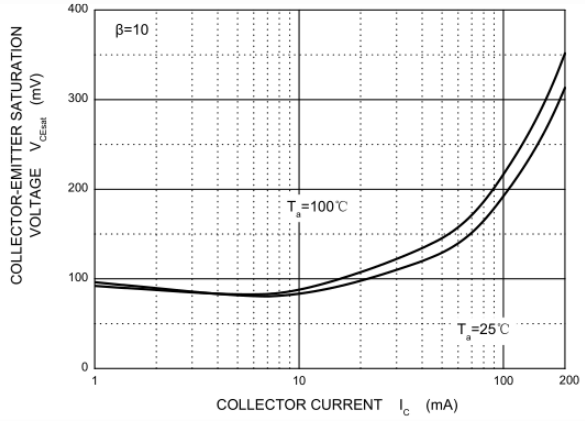


Figure 4. $V_{CE\ (sat)}$ vs. Collector Current

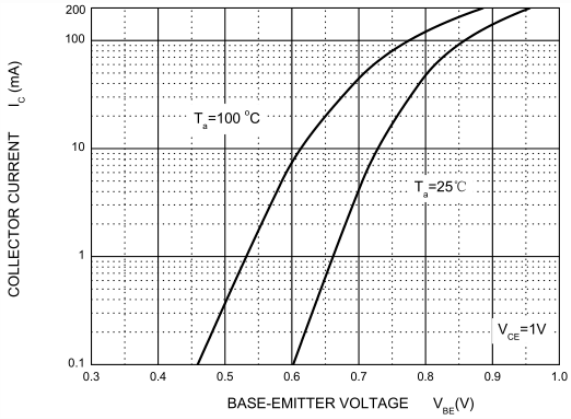


Figure 5. Collector Current vs. Base-Emitter Voltage

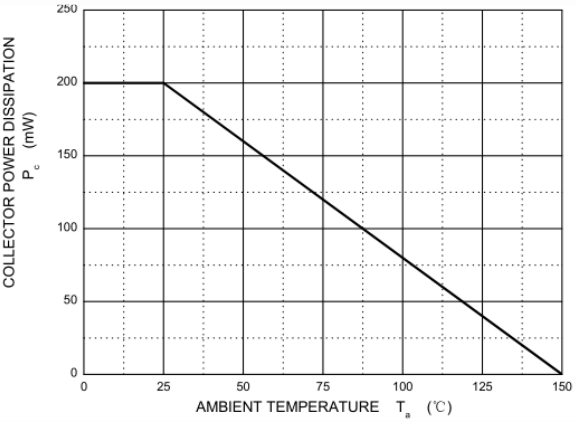
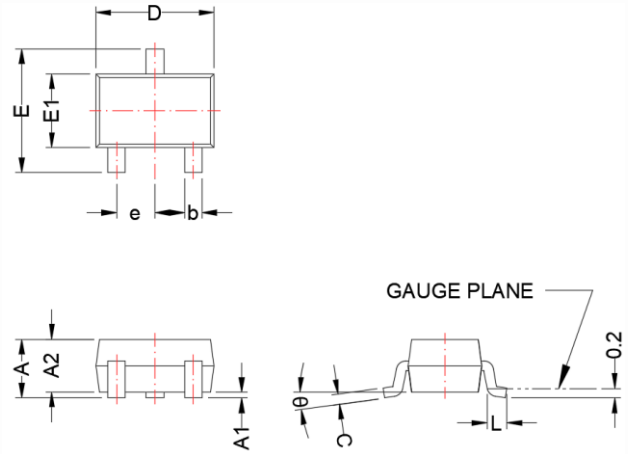


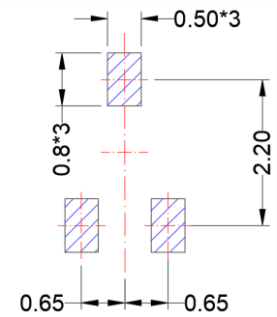
Figure 6. Power Dissipation vs. T_A

SOT-323

Package Dimension



Recommended Land Pattern



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.80	1.10	0.031	0.043
A1	0.00	0.10	0.000	0.004
A2	0.80	1.00	0.031	0.039
b	0.20	0.40	0.008	0.016
c	0.08	0.26	0.003	0.010
D	1.80	2.20	0.071	0.087
E	1.80	2.40	0.071	0.094
E1	1.15	1.35	0.045	0.053
e	0.65 BSC		0.026 BSC	
L	0.26	0.45	0.010	0.018
θ	0°	8°	0°	8°

NOTE:

Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.

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