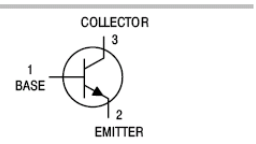
NPN SWITCHING TRANSISTOR MMBT3904T

FEATURES

- Epitaxial planar die construction.
- Complementary PNP type available (MMBT3906T).
- Collector Current Capability I_c=200mA.
- Collector-emitter Voltage V_{CEO}=40V.

Lead-free





SOT-523

APPLICATIONS

- General switching and amplification

ORDERING INFORMATION

Type No.	Marking	Package Code
MMBT3904T	1N	SOT-523

MAXIMUM RATING @ Ta=25℃ unless otherwise specified

SYMBOL	PARAMETER	MMBT3904T	UNIT
V_{CBO}	collector-base voltage	60	V
V_{CEO}	collector-emitter voltage	40	V
V_{EBO}	emitter-base voltage	6	V
I_C	collector current (DC)	200	mA
P_d	Power dissipation	150	mW
$R_{\theta JA}$	Thermal resistance, junction to Ambient	833	°C/W
T_{stg}	storage temperature range	-50 to +150	°C
T_j	junction temperature	150	°C

NPN SWITCHING TRANSISTOR MMBT3904T

ELECTRICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	Collector-base breakown voltage	I_C=10μA,I_E=0	60		
$V_{(BR)CEO}$	Collector- emitter breakown voltage	I_C=1.0mA,I_B=0	40		
$V_{(BR)BEO}$	Emitter-base breakown voltage	I_E=10μA,I_C=0	6		
I_{CBO}	Collector cut-off current	I_E=0,V_{CB}=30V		50	nA
I_{EBO}	Emitter cut-off current	I_C=0,V_{EB}=5V		50	nA
I_{CEX}	collector cut-off current	V_{CE}=30V,$V_{EB(OFF)}$=3.0V		50	nA
I_{BL}	Base cut-off current	V_{CE}=30V, $V_{EB(OFF)}$=3.0V		50	nA
h_{FE}	DC current gain	V_{CE}=1V,I_C=0.1mA V_{CE}=1V,I_C=1mA V_{CE}=1V,I_C=10mA V_{CE}=1V,I_C=50mA V_{CE}=1V,I_C=100mA	40 70 100 60 30	300	
$V_{CE（sat）}$	collector-emitter saturation voltage	I_C=10mA; I_B=1mA		200	mV
		I_C=50mA; I_B=5mA		300	mV
$V_{BE（sat）}$	base-emitter saturation voltage	I_C=10mA; I_B=1mA	650	850	mV
		I_C=50mA; I_B=5mA		950	mV
C_{obo}	Output capacitance	I_E=0,V_{CB}=5V,f=1MHz		4	pF
C_{ibo}	Input capacitance	I_C=0,V_{BE}=0.5V,f =1MHz		8	pF
f_T	transition frequency	I_C=10mA,V_{CE} =20V,f=100MHz	300		MHz
NF	noise figure	I_C=100μA,V_{CE} =5V, R_S =1kΩ;f =1.0MHz		5	dB
t_d	delay time	I_C=10mA,I_{B1}=1mA,$V_{BE(off)}$=-0.5V V_{CC}=3.0V	-	35	ns
t_r	rise time		-	35	ns
t_s	storage time	V_{CC}=3.0V, I_C=10mA	-	200	ns
t_f	fall time	I_{B1}=I_{B2}=1mA	-	50	ns

NPN SWITCHING TRANSISTOR MMBT3904T

TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

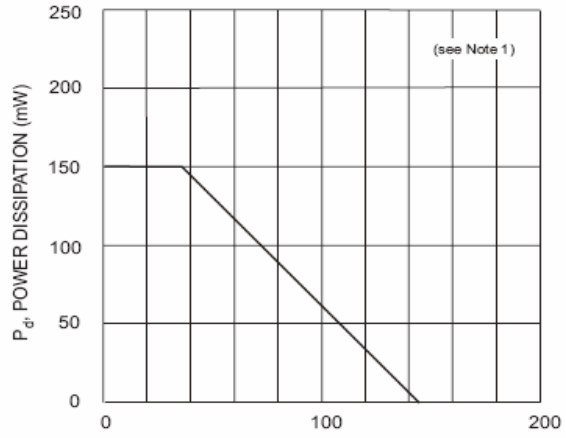


Fig. 1, Power Derating Curve

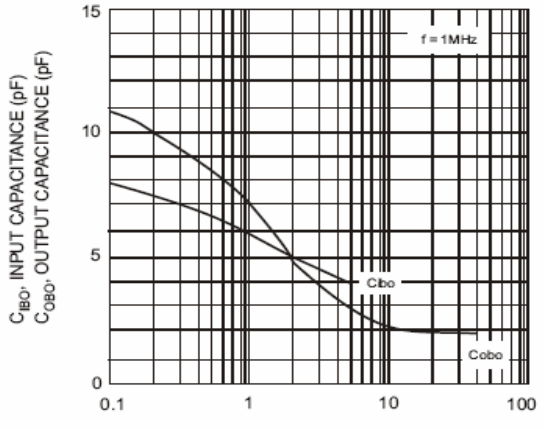


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

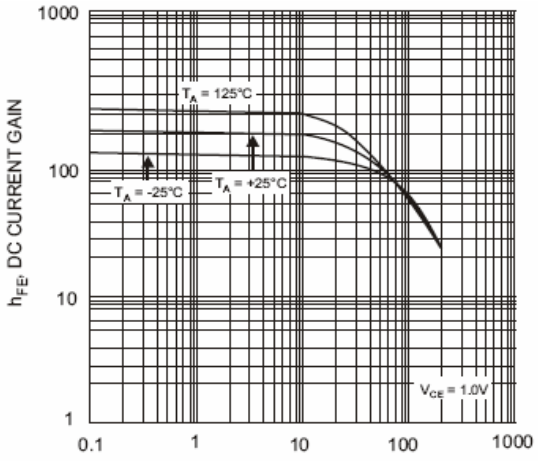


Fig. 3, Typical DC Current Gain vs Collector Current

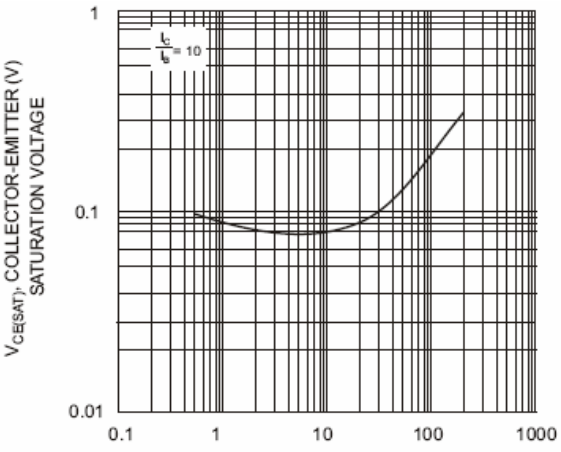


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

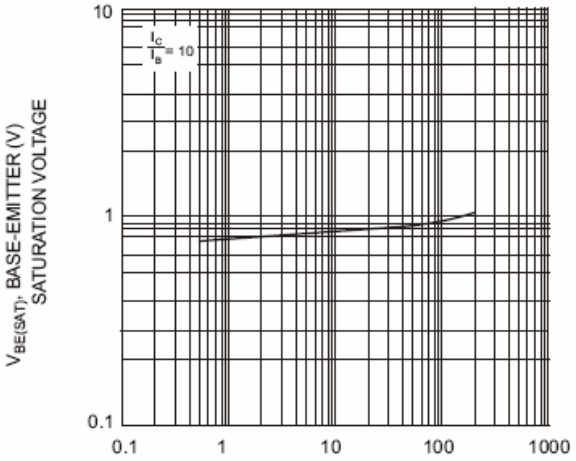
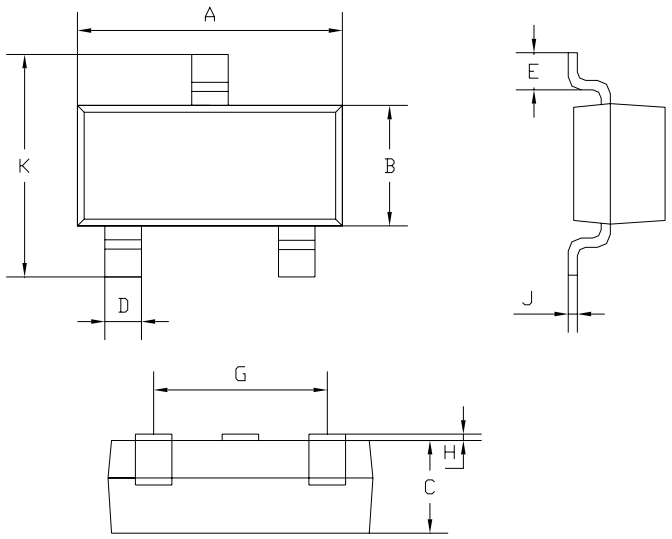


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current

NPN SWITCHING TRANSISTOR MMBT3904T

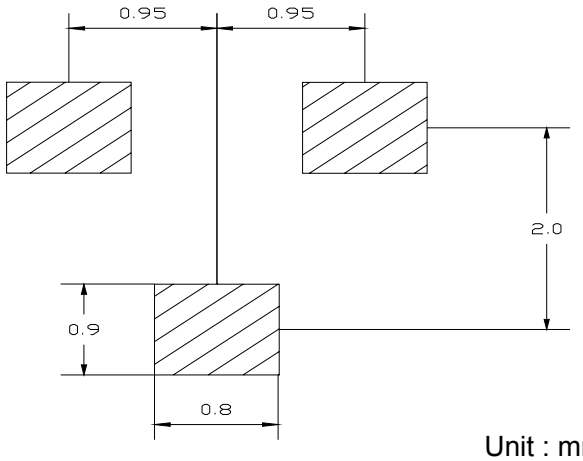
PACKAGE OUTLINE

Plastic surface mounted package SOT-23



SOT-23		
Dim	Min	Max
A	2.85	2.95
B	1.25	1.35
C	1.0Typical	
D	0.37	0.43
E	0.35	0.48
G	1.85	1.95
H	0.02	0.1
J	0.1Typical	
K	2.35	2.45
All Dimensions in mm		

SOLDERING FOOTPRINT



Unit : mm

PACKAGE INFORMATION

Device	Package	Shipping
MMBT3904	SOT-23	3000/Tape&Reel