



NPN SWITCHING TRANSISTOR

MMBT3904T

FEATURES

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



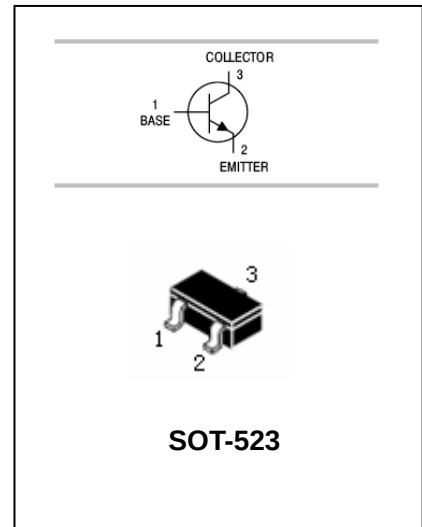
Lead-free

APPLICATIONS

- General switching and amplification.

ORDERING INFORMATION

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



MAXIMUM RATING @ $T_a=25^\circ\text{C}$ 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	$^\circ\text{C/W}$
T_{stg}	storage temperature range	-50 to +150	$^\circ\text{C}$
T_j	junction temperature	150	$^\circ\text{C}$



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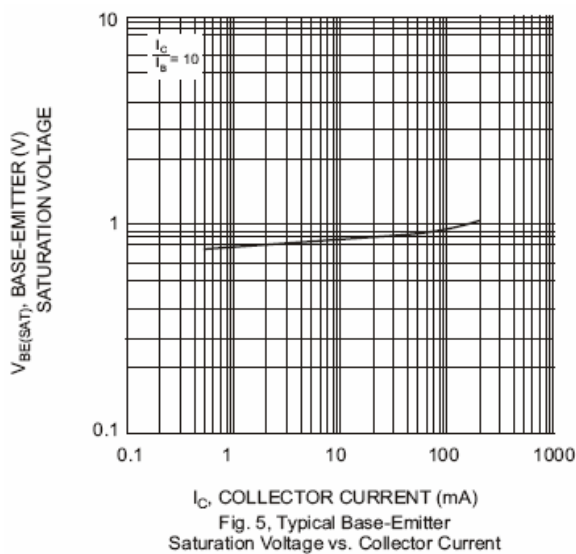
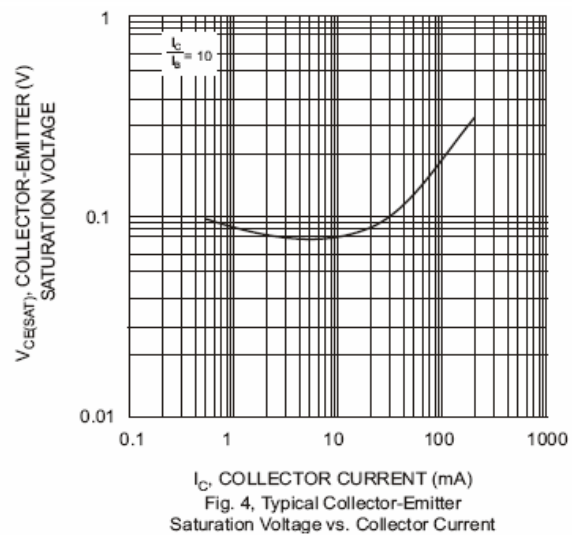
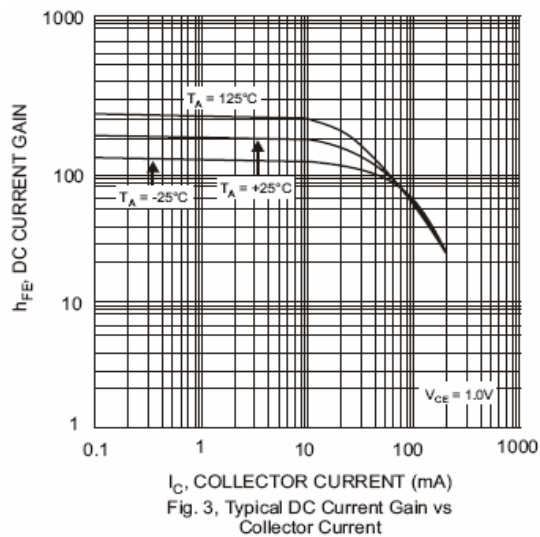
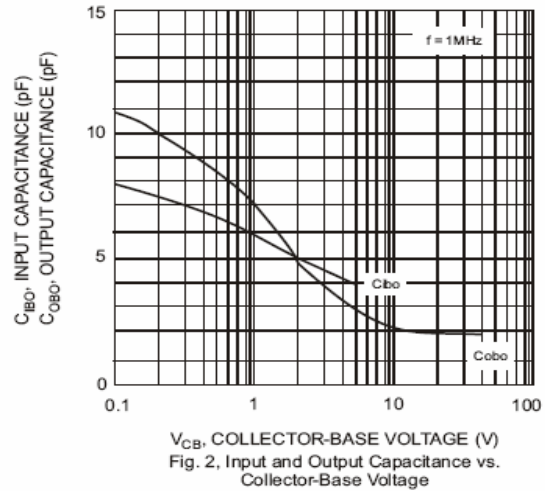
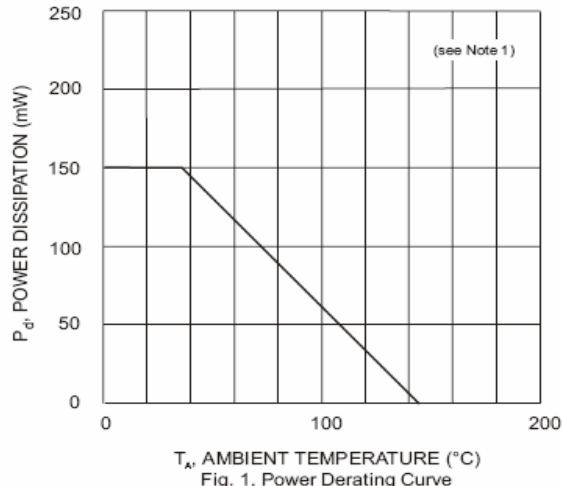
ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	Collector-base breakown voltage	$I_C=10\mu A, I_E=0$	60		
$V_{(BR)CEO}$	Collector- emitter breakown voltage	$I_C=1.0mA, I_B=0$	40		
$V_{(BR)BEO}$	Emitter-base breakown voltage	$I_E=10\mu A, I_C=0$	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	$I_C=100\mu A, V_{CE}=5V,$ $R_S=1k\Omega; f=1.0MHz$		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

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TYPICAL CHARACTERISTICS @ $T_a=25^\circ\text{C}$ unless otherwise specified





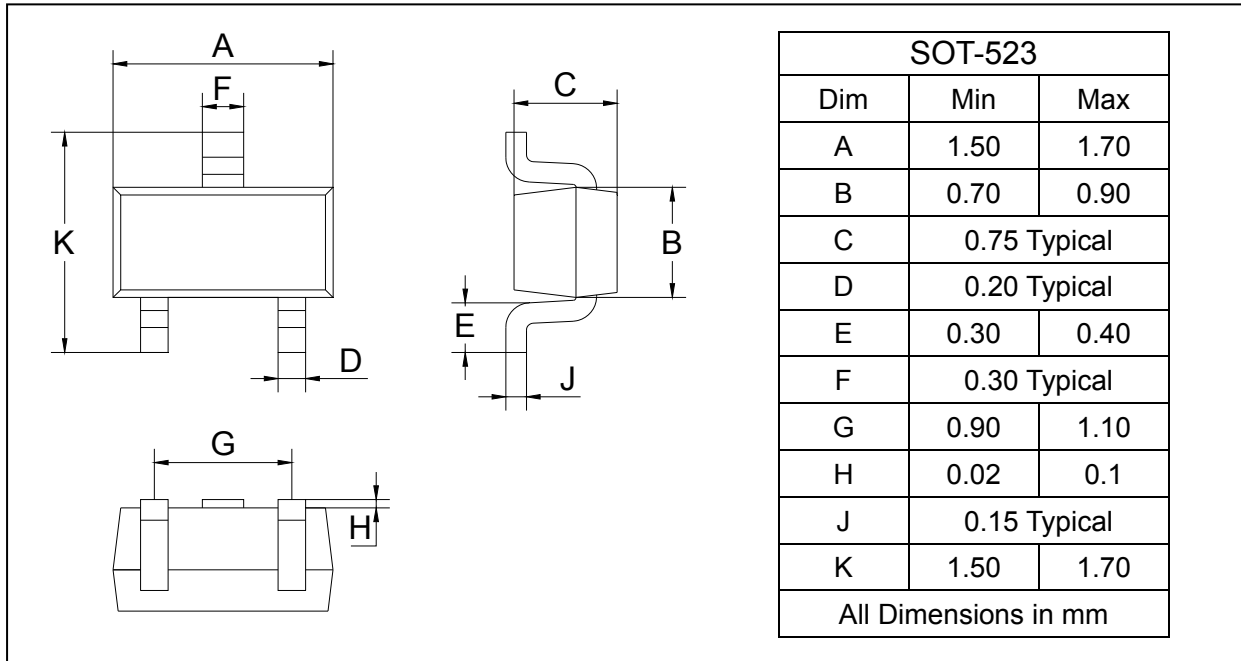
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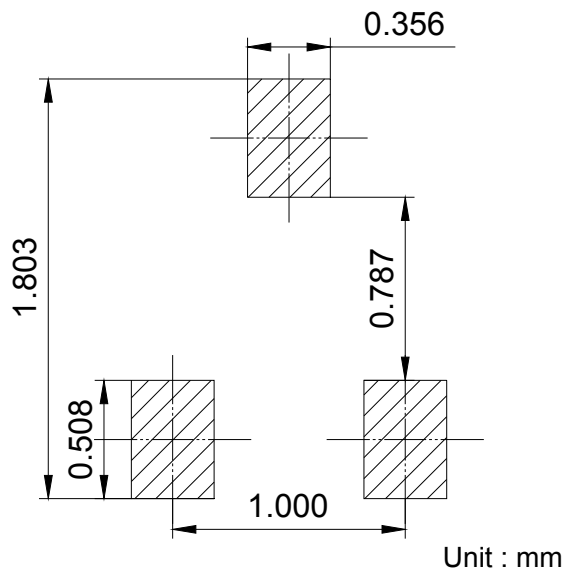
PACKAGE OUTLINE

Plastic surface mounted package

SOT-523



SOLDERING FOOTPRINT



PACKAGE INFORMATION

Device	Package	Shipping
MMBT3904T	SOT-523	3000/Tape&Reel