



## NPN SWITCHING TRANSISTOR

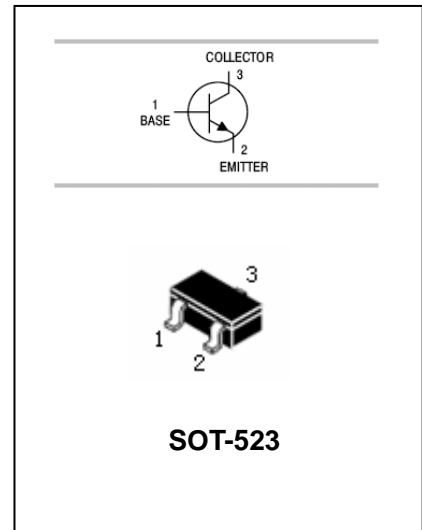
## MMBT2222AT

### FEATURES

- Epitaxial planar die construction.
- Complementary PNP type available (MMBT2907AT).
- Collector Current Capability  $I_c=600\text{mA}$ .
- Ultra-small surface mount package.



Lead-free



### APPLICATIONS

- General switching and amplification.

### ORDERING INFORMATION

Type No.	Marking	Package Code
MMBT2222AT	1P	SOT-523

### MAXIMUM RATING @ $T_a=25^\circ\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	MMBT3904T	UNIT
$V_{CBO}$	collector-base voltage	75	V
$V_{CEO}$	collector-emitter voltage	40	V
$V_{EBO}$	emitter-base voltage	6	V
$I_C$	collector current (DC)	600	mA
$P_d$	Power dissipation	150	mW
$R_{\theta JA}$	Thermal resistance, junction to Ambient	833	$^\circ\text{C}/\text{W}$
$T_{stg}$	storage temperature range	-55 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	$I_C=10\mu A, I_E=0$	75		
$V_{(BR)CEO}$	Collector- emitter breakown voltage	$I_C=10mA, I_B=0$	40		
$V_{(BR)BEO}$	Emitter-base breakown voltage	$I_E=10\mu A, I_C=0$	6		
$I_{CEX}$	collector cut-off current	$V_{CE}=60V, V_{EB(OFF)}=3.0V$		50	nA
$I_{BL}$	Base cut-off current	$V_{CE}=60V, V_{EB(OFF)}=3.0V$		50	nA
$h_{FE}$	DC current gain	$V_{CE}=10V, I_C=0.1mA$	35		
		$V_{CE}=10V, I_C=1mA$	50		
		$V_{CE}=10V, I_C=10mA$	75		
		$V_{CE}=10V, I_C=150mA$	100		
		$V_{CE}=10V, I_C=500mA$	40		
$V_{CE(sat)}$	collector-emitter saturation voltage	$I_C=150mA; I_B=15mA$		0.3	V
		$I_C=500mA; I_B=50mA$		1	V
$V_{BE(sat)}$	base-emitter saturation voltage	$I_C=150mA; I_B=15mA$		1.2	V
		$I_C=500mA; I_B=50mA$		2.0	V
$C_{obo}$	Output capacitance	$I_E=0, V_{CB}=10V, f=1MHz$		8	pF
$C_{ibo}$	Input capacitance	$I_C=0, V_{BE}=0.5V, f=1MHz$		30	pF
$f_T$	transition frequency	$I_C=20mA, V_{CE}=20V, f=100MHz$	300		MHz
NF	noise figure	$I_C=100\mu A, V_{CE}=10V, R_S=1k\Omega; f=1.0MHz$		4	dB
$t_d$	delay time	$I_C=150mA, I_{B1}=15mA, V_{BE(off)}=-0.5V, V_{CC}=30V$	-	10	ns
$t_r$	rise time		-	25	ns
$t_s$	storage time	$V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA$	-	225	ns
$t_f$	fall time		-	60	ns



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

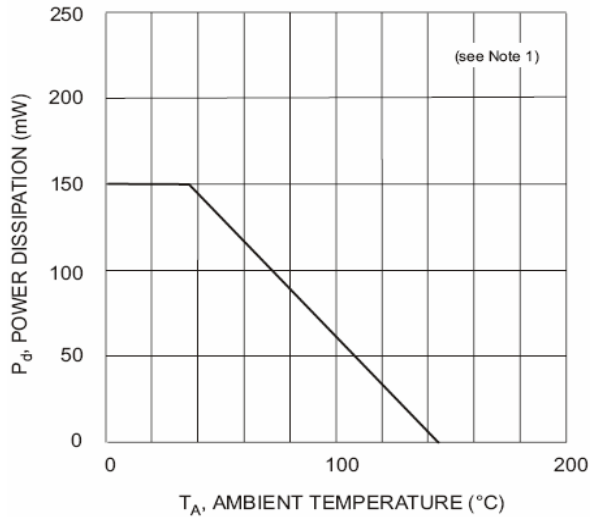


Fig. 1, Power Derating Curve

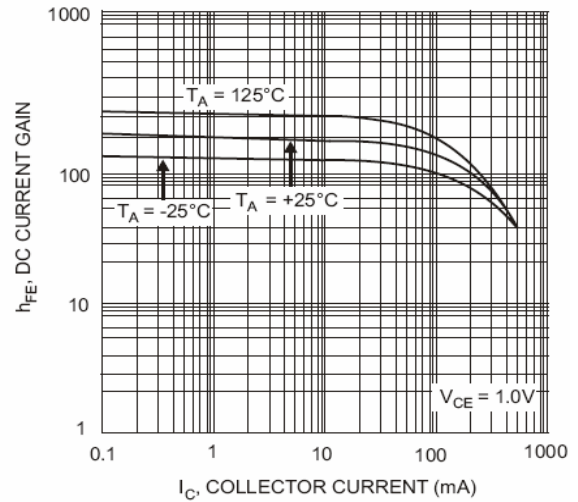


Fig. 2 Typical DC Current Gain vs. Collector Current

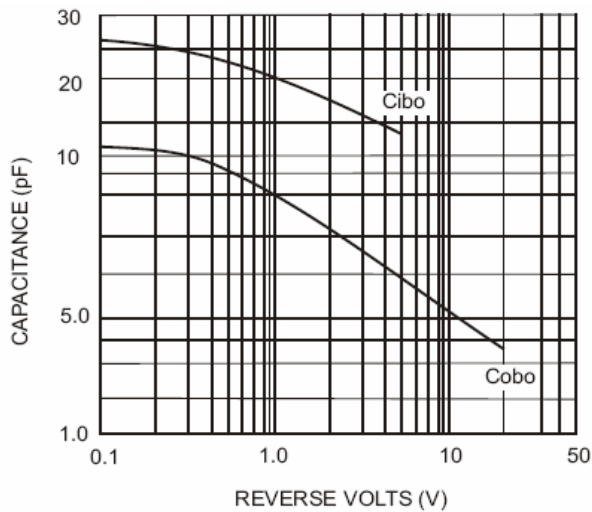


Fig. 3 Typical Capacitance

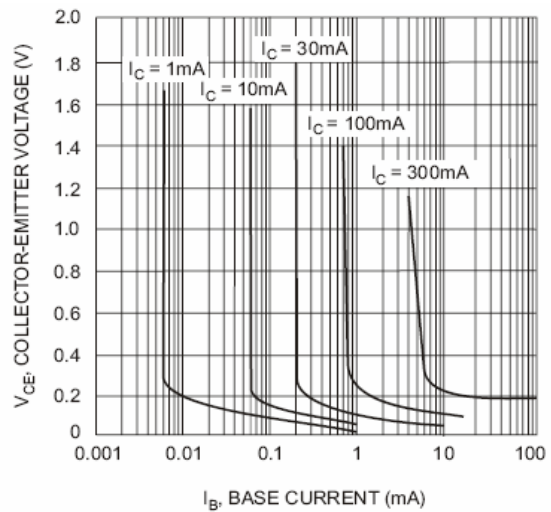


Fig. 4 Typical Collector Saturation Region

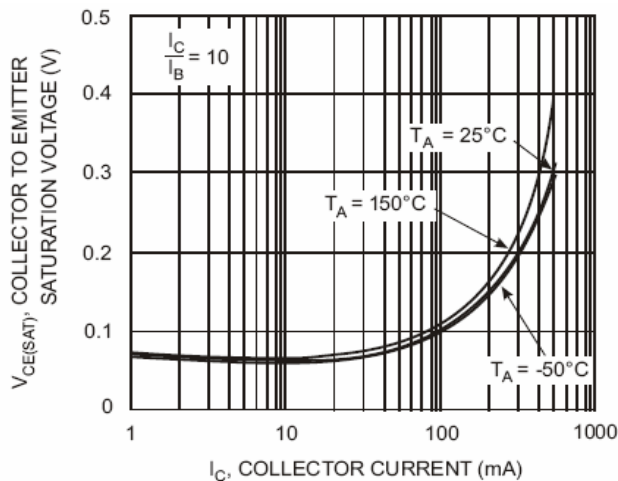


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

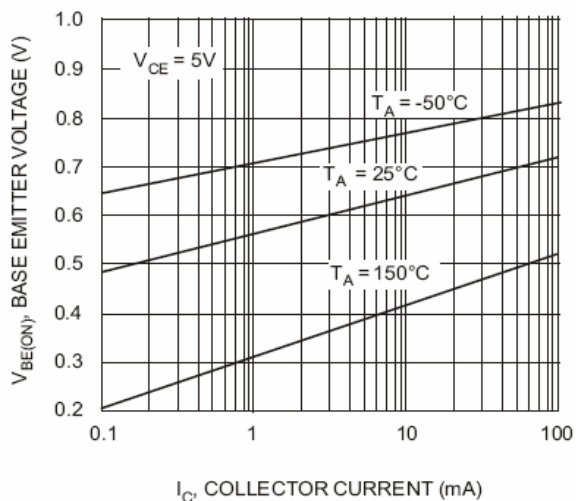


Fig. 6 Base Emitter Voltage vs. Collector Current



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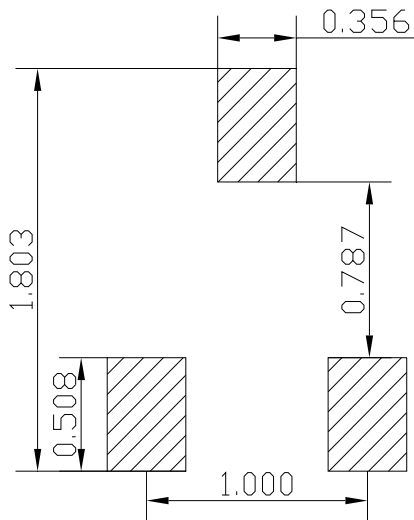
## PACKAGE OUTLINE

Plastic surface mounted package

SOT-523

SOT-523		
Dim	Min	Max
A	1.5	1.7
B	0.75	0.85
C	0.6	0.8
D	0.15	0.3
G	0.9	1.1
H	0.02	0.1
J	0.1 Typical	
K	1.45	1.75
All Dimensions in mm		

## SOLDERING FOOTPRINT



Unit : mm

## PACKAGE INFORMATION

Device	Package	Shipping
MMBT2222AT	SOT-523	3000/Tape&Reel