

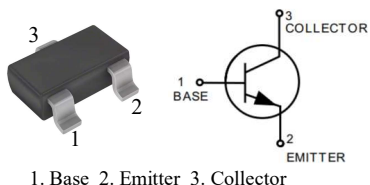


# MMBT2222ATH

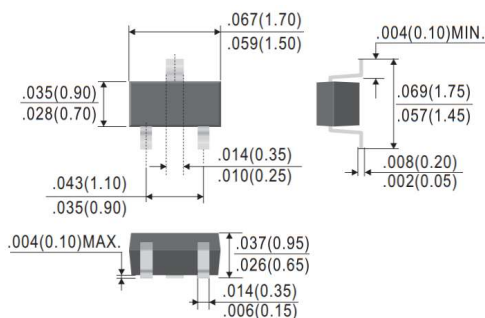
## NPN TRANSISTOR

### FEATURES

· Suffix "H" indicates Halogen-free parts, ex. MMBT2222ATH



### SOT-523



### Maximum Ratings ( $T_A=25\text{ }^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector Base Voltage	$V_{CBO}$	75	V
Collector Emitter Voltage	$V_{CEO}$	40	V
Emitter Base Voltage	$V_{EBO}$	6	V
Collector Current	$I_C$	600	mA
Power Dissipation	$P_D$	150	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	- 55 to + 150	$^\circ\text{C}$

### Electrical Characteristics ( $T_A=25\text{ }^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Min.	Max.	Unit
DC Current Gain	$I_C=0.1\text{mA}, V_{CE}=10\text{V}$	$h_{FE}$	35	-	-
	$I_C=1\text{mA}, V_{CE}=10\text{V}$		50	-	
	$I_C=10\text{mA}, V_{CE}=10\text{V}$		75	-	
	$I_C=150\text{mA}, V_{CE}=1\text{V}$		50	-	
	$I_C=150\text{mA}, V_{CE}=10\text{V}$		100	300	
	$I_C=500\text{mA}, V_{CE}=10\text{V}$		40	-	
Collector Base Breakdown Voltage	$I_C=10\mu\text{A}$	$V_{(BR)CBO}$	75	-	V
Collector Emitter Breakdown Voltage	$I_C=10\text{mA}$	$V_{(BR)CEO}$	40	-	V
Emitter Base Breakdown Voltage	$I_E=10\mu\text{A}$	$V_{(BR)EBO}$	6.0	-	V
Collector Base Cutoff Current	$V_{CB}=60\text{V}$	$I_{CBO}$	-	100	nA
Emitter Base Cutoff Current	$V_{EB}=3\text{V}$	$I_{EBO}$	-	100	nA
Collector Emitter Saturation Voltage	$I_C=150\text{mA}, I_B=15\text{mA}$	$V_{CE(sat)}$	-	0.3	V
	$I_C=500\text{mA}, I_B=50\text{mA}$		-	1.0	
Base Emitter Saturation Voltage	$I_C=150\text{mA}, I_B=15\text{mA}$	$V_{BE(sat)}$	0.6	1.2	V
	$I_C=500\text{mA}, I_B=50\text{mA}$		-	2.0	



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### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

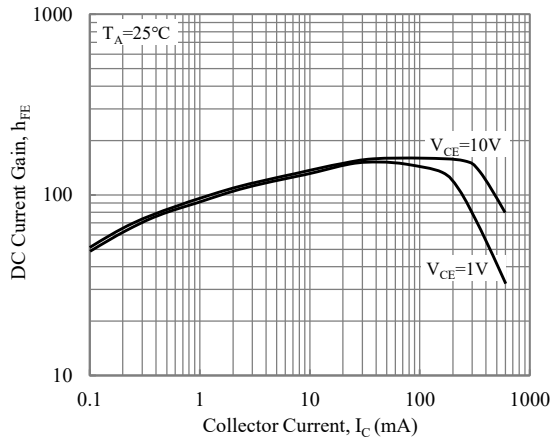
Parameter	Conditions	Symbol	Min.	Max.	Unit
Transition Frequency	$-I_E = 20\text{mA}$ , $V_{CE} = 20\text{V}$ , $f = 100\text{MHz}$	$f_T$	300	-	MHz
Collector Output Capacitance	$V_{CB} = 10\text{V}$ , $f = 100\text{KHz}$	$C_{ob}$	-	8	pF
Delay Time	$V_{CC} = 30\text{V}$ , $V_{BE(OFF)} = 0.5\text{V}$ , $I_C = 150\text{mA}$ , $I_{B1} = 15\text{mA}$	$t_d$	-	10	ns
Rise Time	$V_{CC} = 30\text{V}$ , $V_{BE(OFF)} = 0.5\text{V}$ , $I_C = 150\text{mA}$ , $I_{B1} = 15\text{mA}$	$t_r$	-	25	ns
Storage Time	$V_{CC} = 30\text{V}$ , $I_C = 150\text{mA}$ , $I_{B1} = -I_{B2} = 15\text{mA}$	$t_s$	-	225	ns
Fall Time	$V_{CC} = 30\text{V}$ , $I_C = 150\text{mA}$ , $I_{B1} = -I_{B2} = 15\text{mA}$	$t_f$	-	60	ns



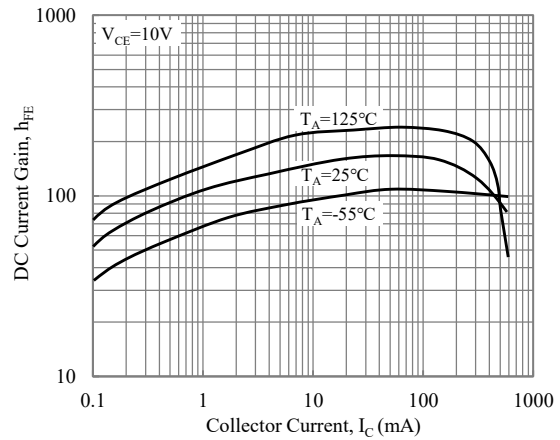
# MMBT2222ATH

## NPN TRANSISTOR

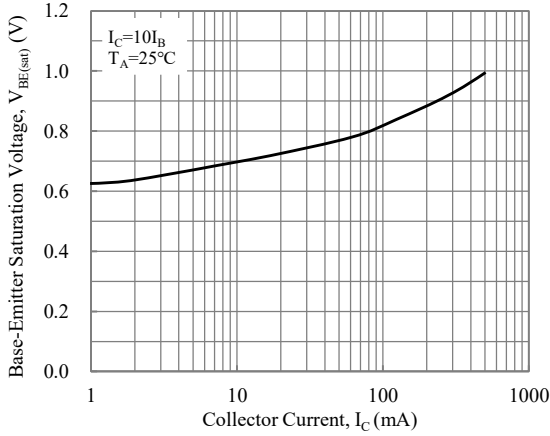
### RATINGS AND CHARACTERISTIC CURVES



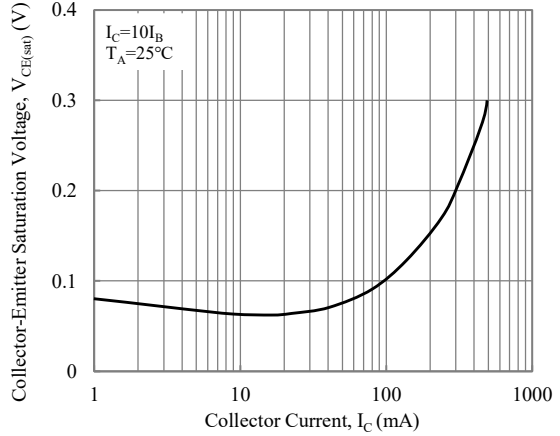
**Fig. 1 Current Gain vs Collector Current**



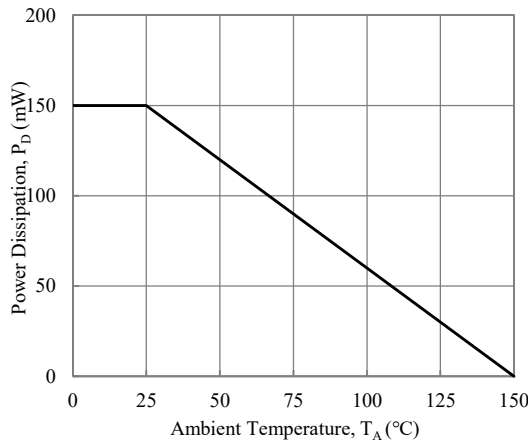
**Fig. 2 Current Gain vs Collector Current**



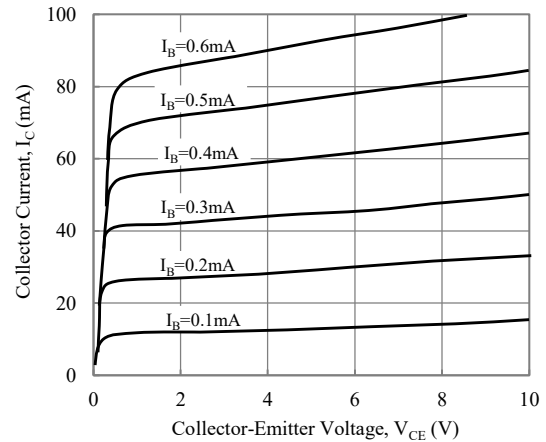
**Fig. 3 Base-Emitter Saturation Voltage vs Collector Current**



**Fig. 4 Collector-Emitter Saturation Voltage vs Collector Current**



**Fig. 5 Power Derating Curve**

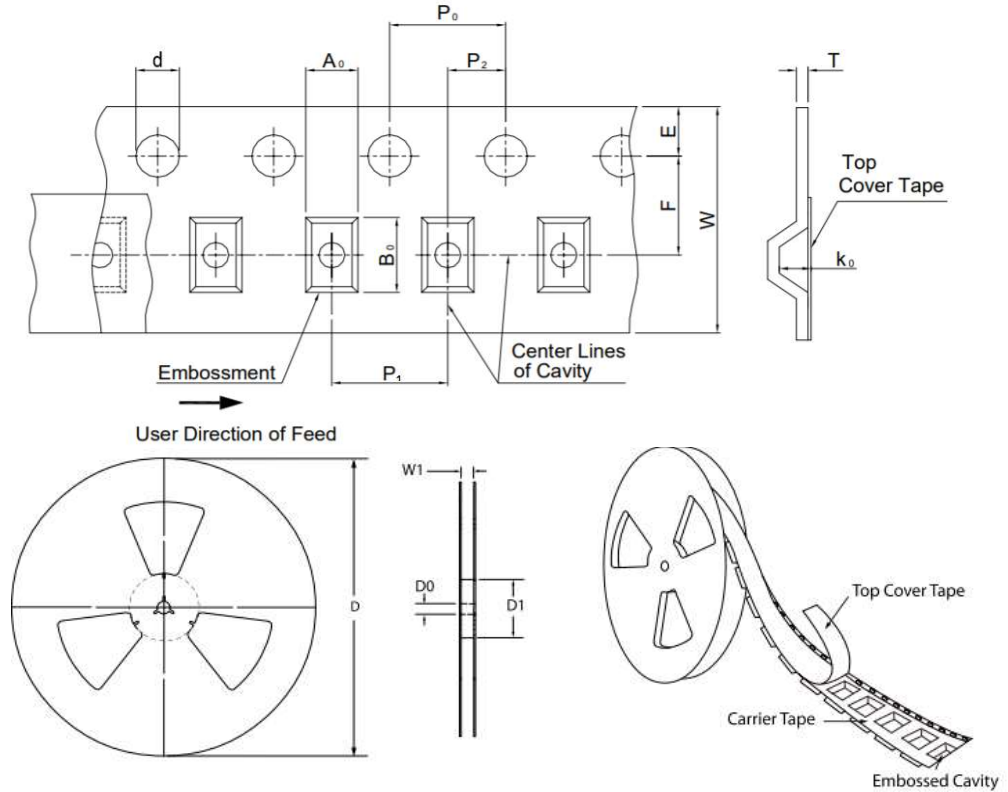


**Fig. 6 Output Characteristics**



# MMBT2222ATH NPN TRANSISTOR

## TAPE & REEL SPECIFICATION



Item	Symbol	SOT-523
Carrier width	A <sub>0</sub>	1.95 ± 0.10
Carrier length	B <sub>0</sub>	1.95 ± 0.10
Carrier depth	K <sub>0</sub>	1.10 ± 0.10
Sprocket hole	d	1.50 ± 0.10
Reel outside diameter	D	178.00 ± 2.00
Feed hole width	D <sub>0</sub>	13.00 ± 0.50
Reel inner diameter	D <sub>1</sub>	MIN. 50.00
Sprocket hole position	E	1.75 ± 0.10
Punch hole position	F	3.50 ± 0.10
Sprocket hole pitch	P <sub>0</sub>	4.00 ± 0.10
Punch hole pitch	P <sub>1</sub>	4.00 ± 0.10
Embossment center	P <sub>2</sub>	2.00 ± 0.10
Overall tape thickness	T	MAX. 0.60
Tape width	W	8.00 ± 0.30
Reel width	W <sub>1</sub>	MAX. 10.00

## ORDER INFORMATION

Package	Reel Size	Quantity
SOT-523	7"	4,000

## MARKING CODE

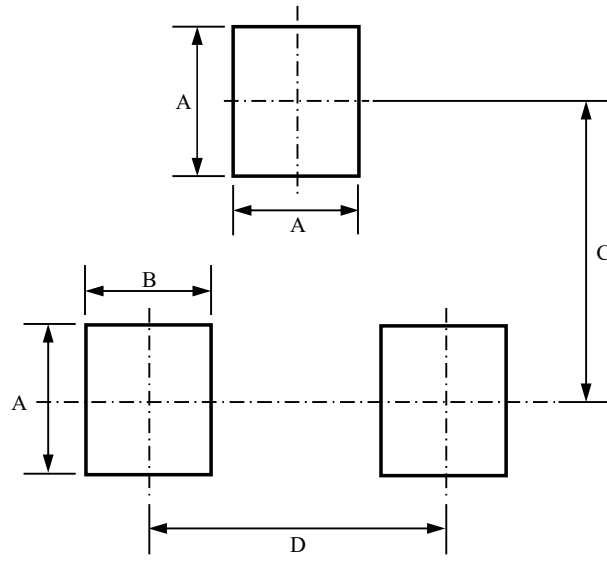
Part Number	Marking Code
MMBT2222ATH	1P



# MMBT2222ATH

## NPN TRANSISTOR

### SUGGESTED SOLDER PAD LAYOUT



Unit :mm

PACKAGE	A	B	C	D
SOT-523	0.70	0.6	1.30	1.00