



# MMBTA05-AU / MMBTA06-AU / MMBTA55-AU / MMBTA56-AU

## NPN AND PNP HIGH VOLTAGE TRANSISTOR

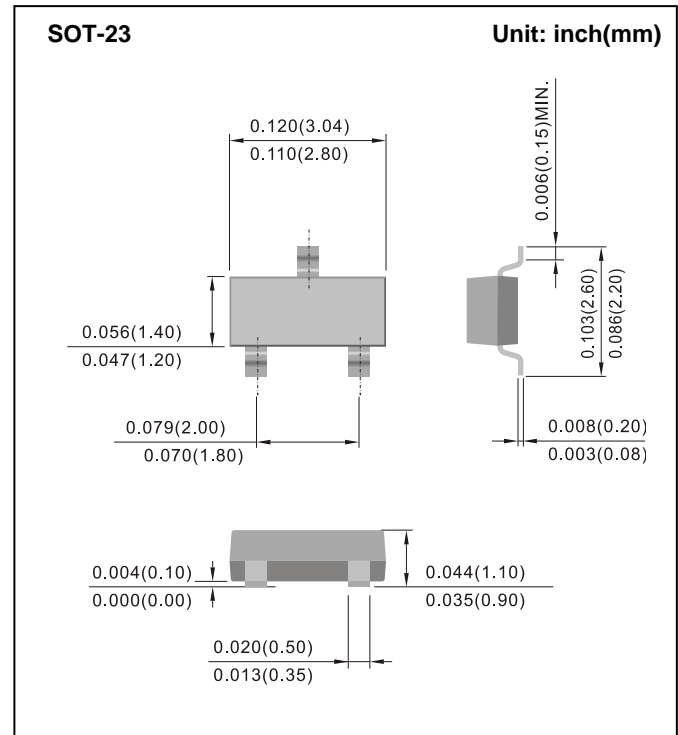
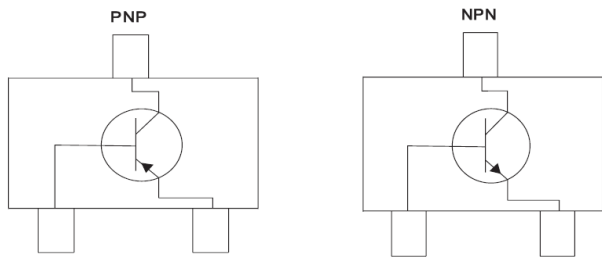
**Voltage** 60~80V **Power** 225mW

### Features

- NPN and PNP silicon, planar design
- Collector current  $I_C = 500\text{mA}$
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0003 ounces, 0.0084 grams



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

PARAMETER	SYMBOL	MMBTA05-AU	MMBTA55-AU	MMBTA06-AU	MMBTA56-AU	UNITS
Marking		B05	B55	B06	B56	
Collector-Emitter Voltage	$V_{CEO}$	60		80		V
Collector-Base Voltage	$V_{CBO}$	60		80		V
Emitter-Base Voltage	$V_{EBO}$	4				V
Collector Current-Continuous	$I_C$	500				mA
Circuit Figure		NPN	PNP	NPN	PNP	

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

CHARACTERISTIC	SYMBOL	MAX.	UNITS
Total device dissipation FR-4 board (Note 1) $T_A=25^\circ\text{C}$	$P_D$	225	mW
derate above $25^\circ\text{C}$		1.8	mW/ $^\circ\text{C}$
Typical thermal resistance	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total device dissipation alumina substrate (Note 2) $T_A=25^\circ\text{C}$	$P_D$	300	mW
derate above $25^\circ\text{C}$		2.4	mW/ $^\circ\text{C}$
Typical thermal resistance	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

Note : 1. FR-4=70 x 60 x 1mm.

2. Alumina=0.4 x 0.3 x 0.024 in. 99.5 alumina.



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

PARAMETER	SYMBOL	MIN.	MAX.	UNITS	
<b>OFF Characteristics</b>					
Collector-Emitter Breakdown Voltage ( $I_C=1.0\text{mA}$ , $I_B=0$ )	MMBTA05-AU, MMBTA55-AU MMBAT06-AU, MMBTA56-AU	$V_{(BR)CEO}$	60 80	- -	V
Emitter-Base Breakdown Voltage ( $I_E=100\mu\text{A}$ , $I_C=0$ )		$V_{(BR)EBO}$	4	-	V
Collector Cutoff Current ( $V_{CE}=60\text{V}$ , $I_B=0$ )		$I_{CES}$	-	0.1	$\mu\text{A}$
Collector Cutoff Current ( $V_{CB}=60\text{V}$ , $I_E=0$ ) ( $V_{CB}=80\text{V}$ , $I_E=0$ )	MMBTA05-AU, MMBTA55-AU MMBAT06-AU, MMBTA56-AU	$I_{CBO}$	- -	0.1 0.1	$\mu\text{A}$
<b>ON characteristics</b>					
DC Current Gain ( $I_C=10\text{mA}$ , $V_{CE}=1\text{V}$ ) ( $I_C=100\text{mA}$ , $V_{CE}=1\text{V}$ )		$f_{FE}$	100 100	- -	-
Collector-Emitter Saturation Voltage ( $I_C=100\text{mA}$ , $I_B=10\text{mA}$ )		$V_{CE(SAT)}$	-	0.25	V
Base-Emitter On Voltage ( $I_C=100\text{mA}$ , $V_{CE}=1\text{V}$ )		$V_{BE(ON)}$	-	1.2	V
<b>Small-signal characteristics</b>					
Current-Gain-Bandwidth Product ( $I_C=10\text{mA}$ , $V_{CE}=2\text{V}$ , $f=100\text{MHz}$ )		$f_T$	100	-	MHz



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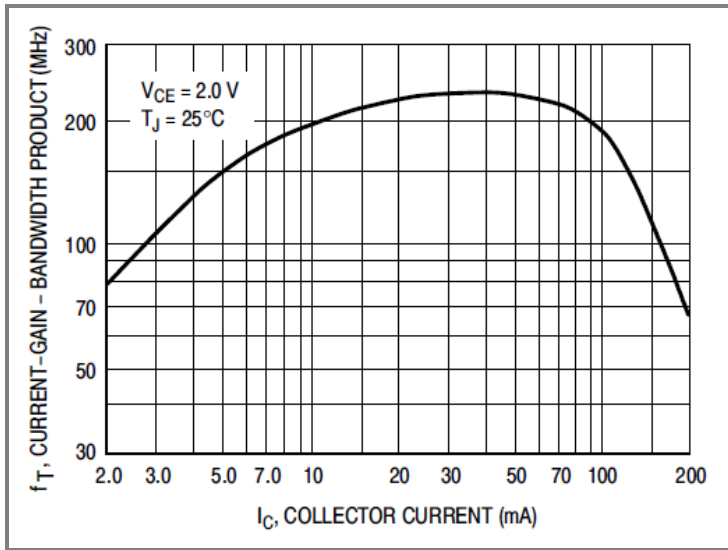


Fig.1 Current-Gain—Bandwidth Product

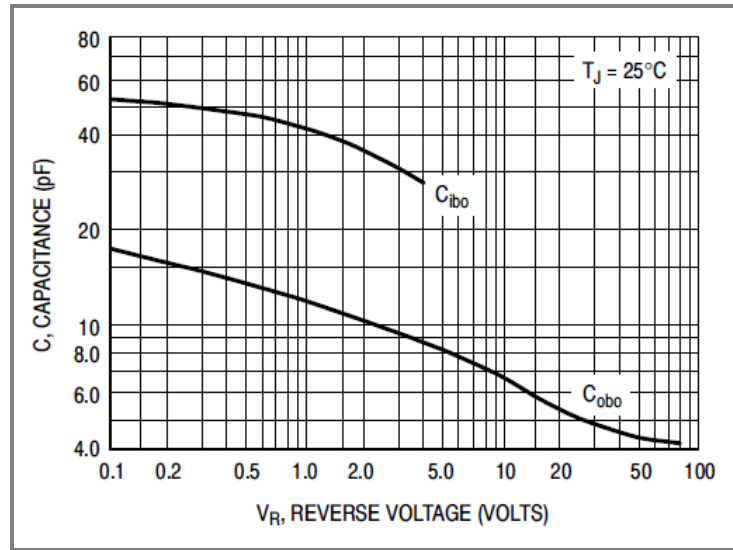


Fig.2 Capacitance

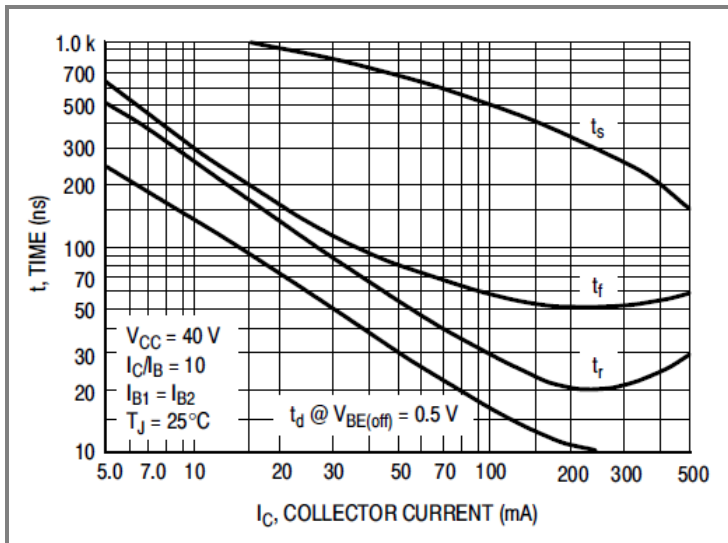


Fig.3 Switching Time

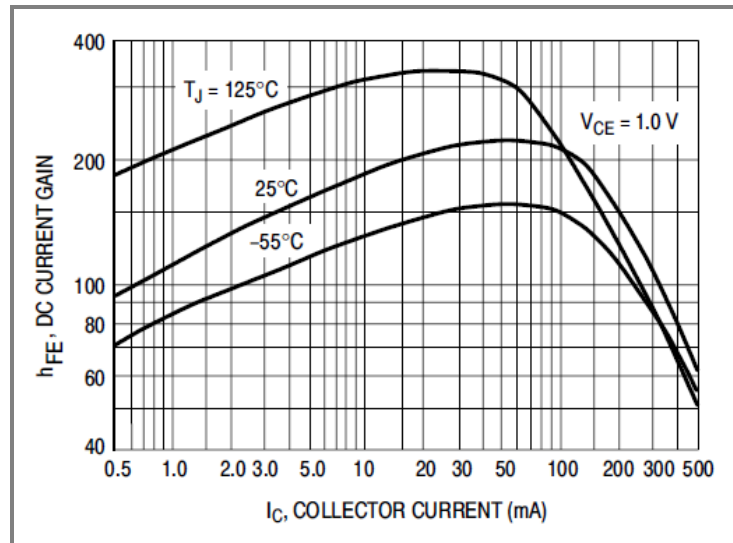


Fig.4 DC Current Gain

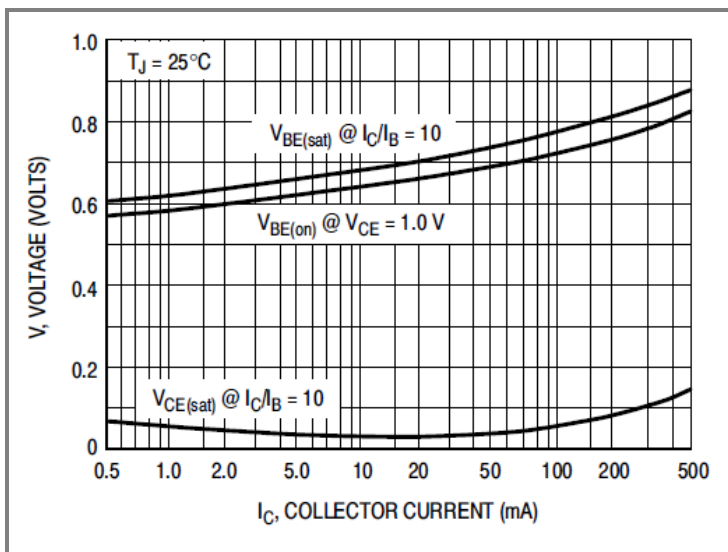


Fig.5 ON Voltages

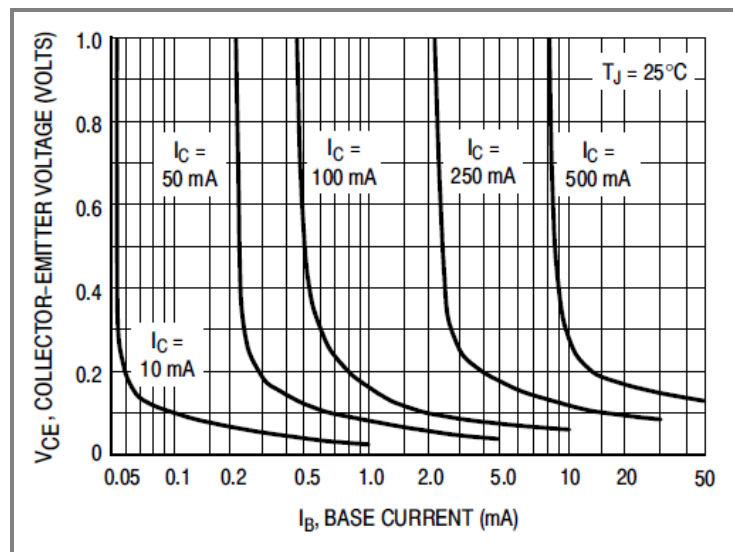


Fig.6 Collector Saturation Region



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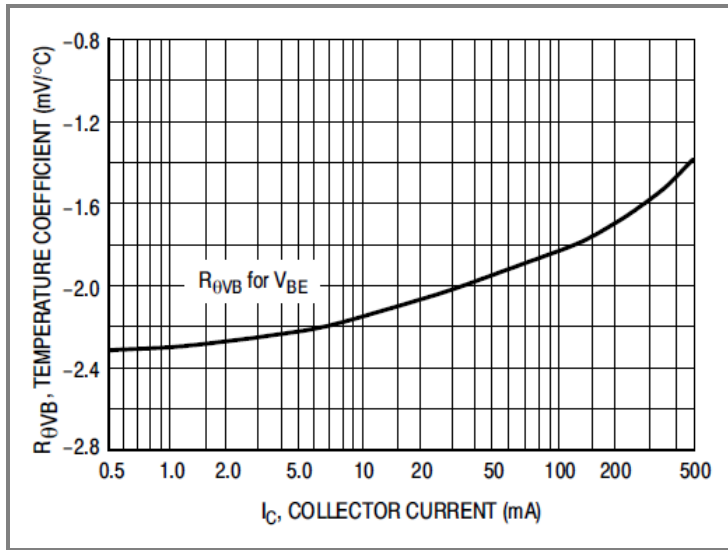


Fig.7 Base-Emitter Temperature Coefficient

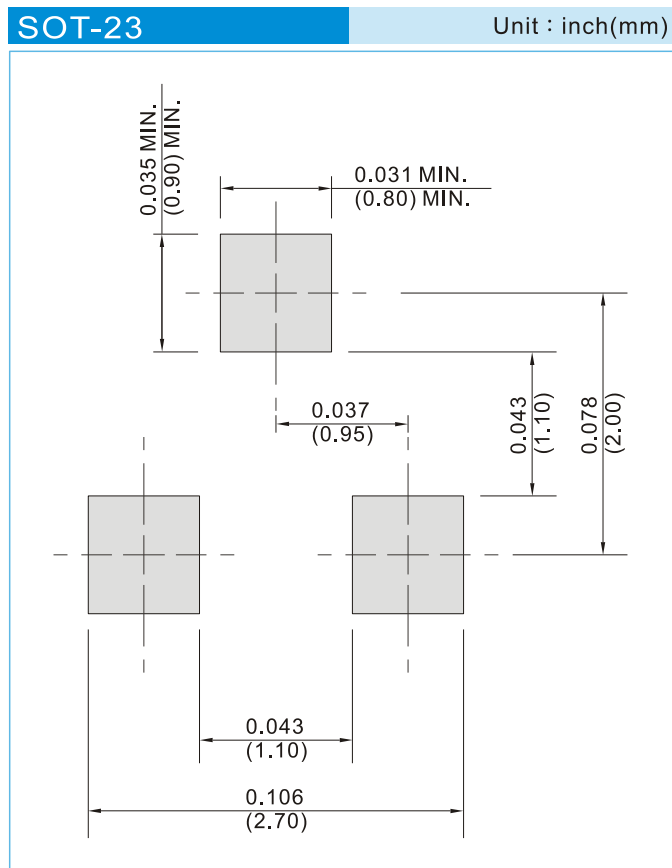


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## Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
MMBTA05-AU_R1_000A1	SOT-23	3K / 7" Reel	B05	Halogen Free
MMBTA05-AU_R2_000A1	SOT-23	12K / 13" Reel	B05	Halogen Free

## Mounting Pad Layout





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