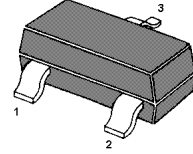


## MMBTA05

### NPN Silicon Epitaxial Planar Transistor

For switching and amplifier applications



1. Base 2. Emitter 3. Collector  
TO-236 Plastic Package

#### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Value	Unit
Collector Base Voltage	$V_{CBO}$	60	V
Collector Emitter Voltage	$V_{CEO}$	60	V
Emitter Base Voltage	$V_{EBO}$	4	V
Collector Current	$I_C$	500	mA
Power Dissipation	$P_{tot}$	350	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	- 65 to + 150	$^\circ\text{C}$

#### Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient <sup>1)</sup>	$R_{\theta JA}$	357	$^\circ\text{C/W}$

<sup>1)</sup> Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.

**Characteristics at  $T_a = 25\text{ }^\circ\text{C}$** 

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain				
at $V_{CE} = 1\text{ V}$ , $I_C = 10\text{ mA}$	$h_{FE}$	100	-	-
at $V_{CE} = 1\text{ V}$ , $I_C = 100\text{ mA}$	$h_{FE}$	100	-	-
Collector Base Cutoff Current at $V_{CB} = 60\text{ V}$	$I_{CBO}$	-	100	nA
Collector Emitter Cutoff Current at $V_{CE} = 60\text{ V}$	$I_{CES}$	-	100	nA
Collector Base Breakdown Voltage at $I_C = 100\text{ }\mu\text{A}$	$V_{(BR)CBO}$	60	-	V
Collector Emitter Breakdown Voltage at $I_C = 1\text{ mA}$	$V_{(BR)CEO}$	60	-	V
Emitter Base Breakdown Voltage at $I_E = 100\text{ }\mu\text{A}$	$V_{(BR)EBO}$	4	-	V
Collector Emitter Saturation Voltage at $I_C = 100\text{ mA}$ , $I_B = 10\text{ mA}$	$V_{CE(sat)}$	-	0.25	V
Base Emitter On Voltage at $V_{CE} = 1\text{ V}$ , $I_C = 100\text{ mA}$	$V_{BE(on)}$	-	1.2	V
Gain Bandwidth Product at $I_C = 10\text{ mA}$ , $V_{CE} = 2\text{ V}$ , $f = 100\text{ MHz}$	$f_T$	100	-	MHz

**Electrical Characteristics Curves**

Fig. 1 Output Characteristics Curve

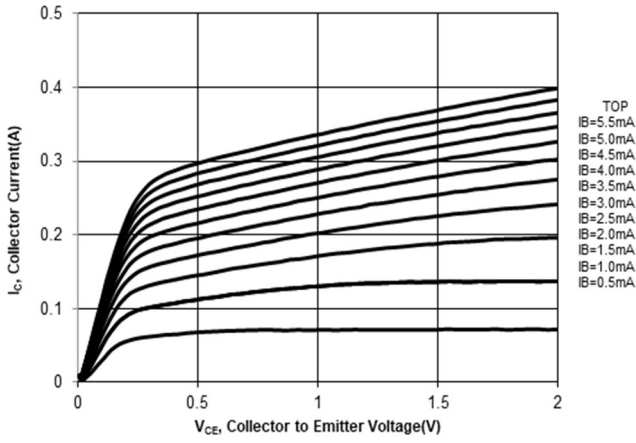


Fig. 2 Output Characteristics Curve

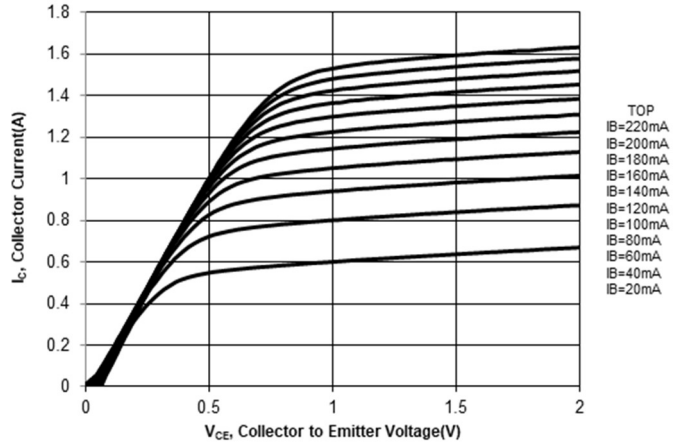


Fig. 3 Collector Current vs. Base-Emitter Voltage

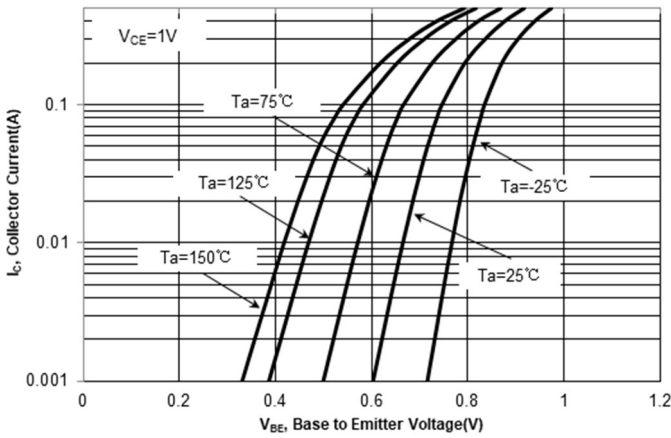
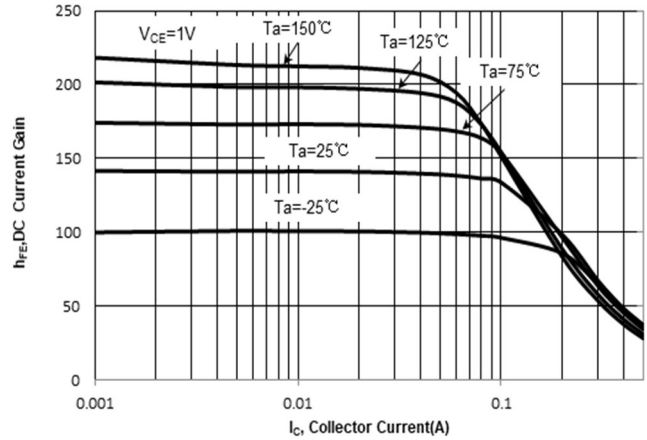


Fig. 4  $h_{FE,DC}$  Current Gain vs. Collector Current



Electrical Characteristics Curves

Fig. 5  $V_{BE(sat)}$  vs. Collector Current

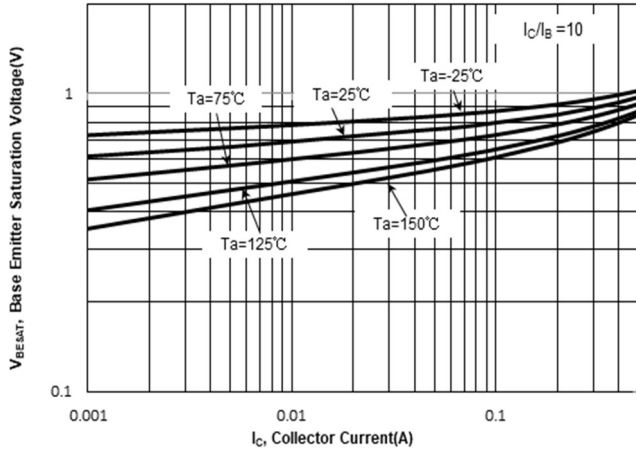


Fig. 6  $V_{CE(sat)}$  vs. Collector Current

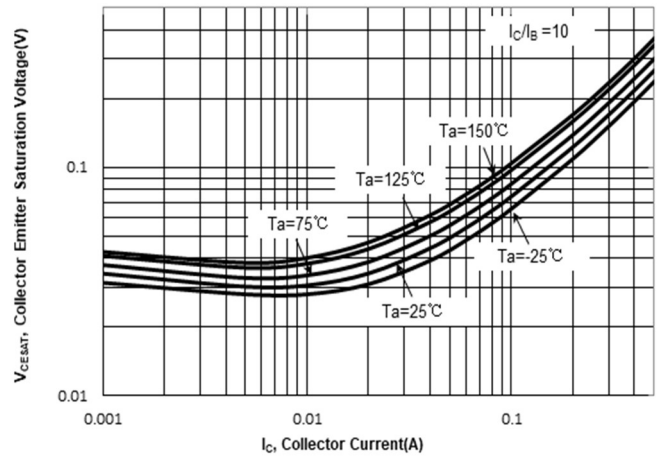


Fig. 7 Capacitance

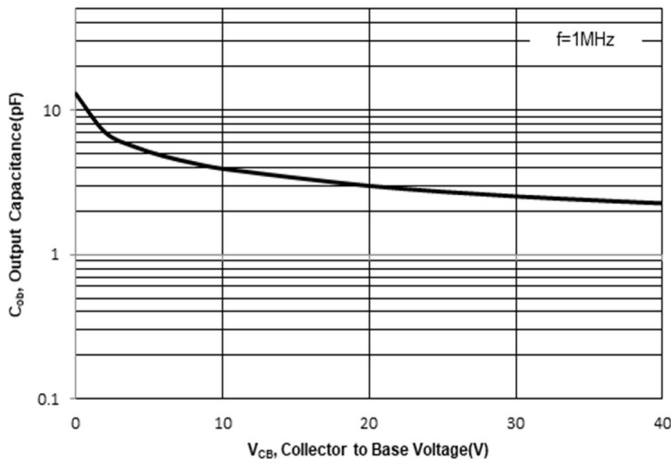


Fig. 8. Power Derating Curve

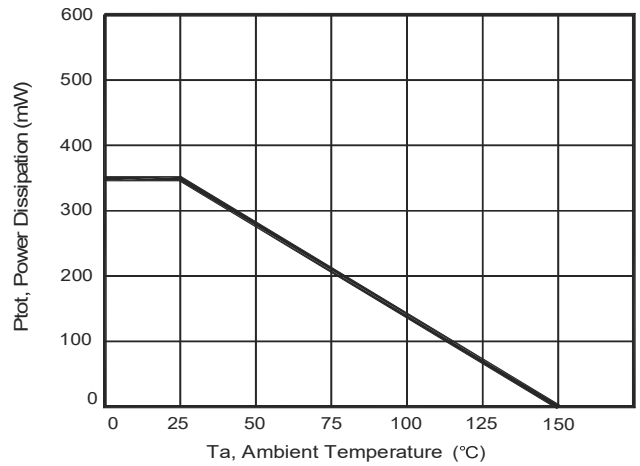
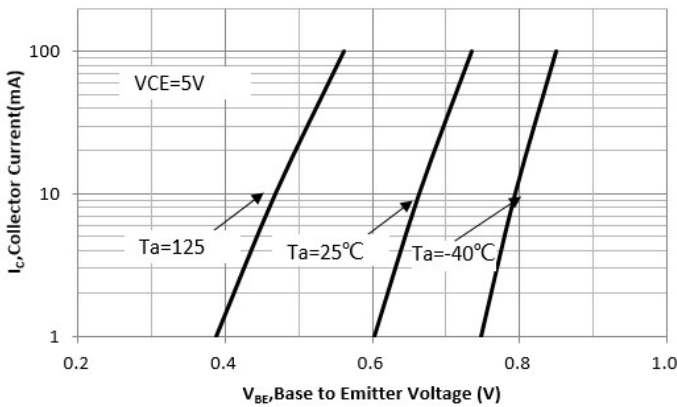
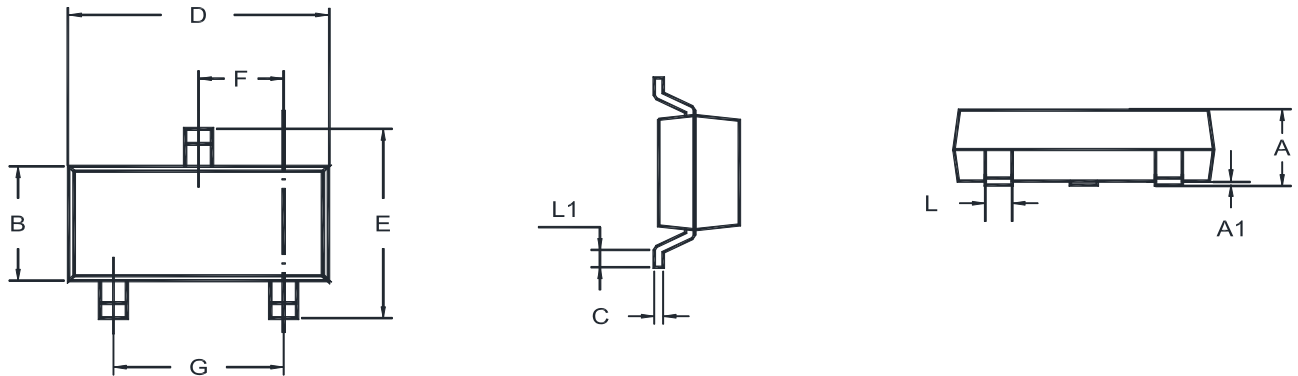


Fig. 9 Collector Current vs. Base-Emitter Voltage



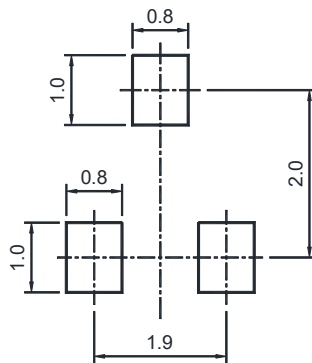
Package Outline (Dimensions in mm)

TO-236



Unit	A	A1	B	C	D	E	F	G	L	L1
mm	1.20	0.100	1.40	0.19	3.04	2.6	1.02	2.04	0.51	0.2
	0.89	0.013	1.20	0.08	2.80	2.2	0.89	1.78	0.37	MIN

Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
TO-236	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Marking information

- " 1GM " = Part No.
- "YM" = Date Code Marking
- "Y" = Year
- "M" = Month
- Font type: Arial

