

MMBTSA1235-AH

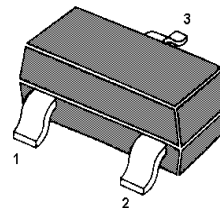
PNP Silicon Epitaxial Planar Transistor

for low frequency amplification applications

The transistor is subdivided into two groups E and F, according to its DC current gain.

Features

- AEC-Q101 Qualified
- Halogen and Antimony Free(HAF), RoHS compliant



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

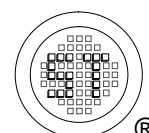
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Collector Base Voltage	$-V_{CBO}$	60	V
Collector Emitter Voltage	$-V_{CEO}$	50	V
Emitter Base Voltage	$-V_{EBO}$	6	V
Collector Current	$-I_C$	200	mA
Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 55 to + 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient ¹⁾	$R_{\theta JA}$	625	$^\circ\text{C/W}$

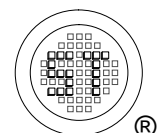
¹⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.



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

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $-V_{CE} = 6\text{ V}$, $-I_C = 1\text{ mA}$	Current Gain Group E F h_{FE} h_{FE} h_{FE}	150	-	300	-
		250	-	500	-
at $-V_{CE} = 6\text{ V}$, $-I_C = 0.1\text{ mA}$		90	-	-	-
Collector Base Cutoff Current at $-V_{CB} = 60\text{ V}$	$-I_{CBO}$	-	-	100	nA
Emitter Base Cutoff Current at $-V_{EB} = 6\text{ V}$	$-I_{EBO}$	-	-	100	nA
Collector Base Breakdown Voltage at $-I_C = 100\text{ }\mu\text{A}$	$-V_{(BR)CBO}$	60	-	-	V
Collector Emitter Breakdown Voltage at $-I_C = 100\text{ }\mu\text{A}$	$-V_{(BR)CEO}$	50	-	-	V
Emitter Base Breakdown Voltage at $-I_E = 100\text{ }\mu\text{A}$	$-V_{(BR)EBO}$	6	-	-	V
Collector Emitter Saturation Voltage at $-I_C = 100\text{ mA}$, $-I_B = 10\text{ mA}$	$-V_{CE(sat)}$	-	-	0.3	V
Base Emitter Saturation Voltage at $-I_C = 100\text{ mA}$, $-I_B = 10\text{ mA}$	$-V_{BE(sat)}$	-	-	1	V
Gain Bandwidth Product at $-V_{CE} = 6\text{ V}$, $-I_C = 10\text{ mA}$	f_T	-	200	-	MHz
Collector Output Capacitance at $-V_{CB} = 6\text{ V}$, $f = 1\text{ MHz}$	C_{ob}	-	4	-	pF



Electrical Characteristics Curves

Fig 1. Output Characteristics

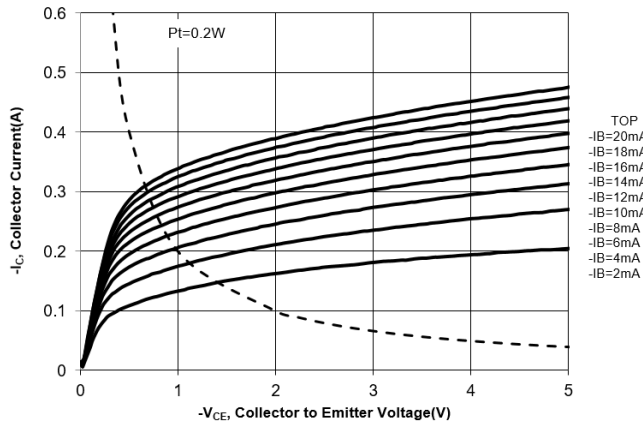


Fig 2. Output Characteristics

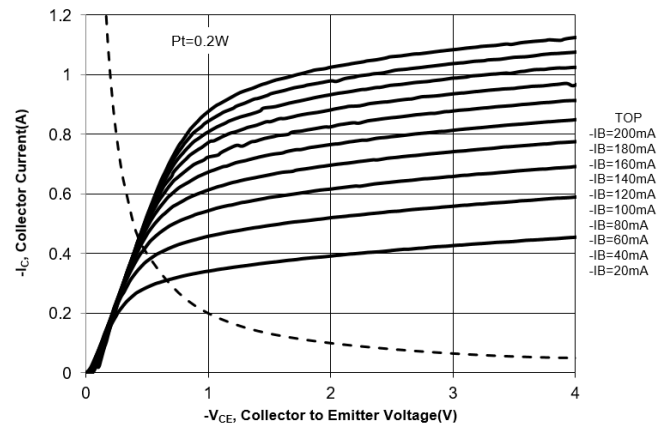


Fig 3. Collector Current vs. V_{BE}

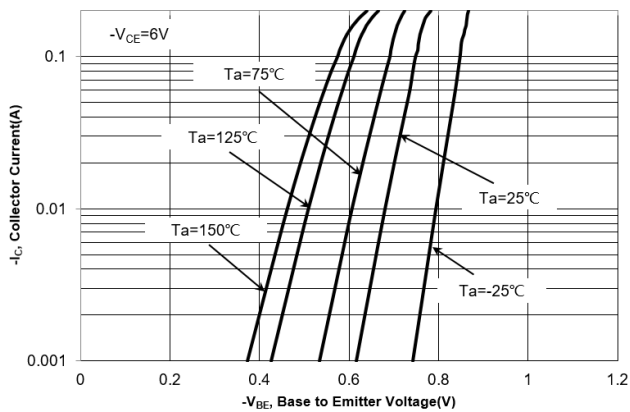
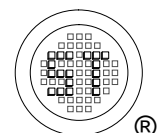
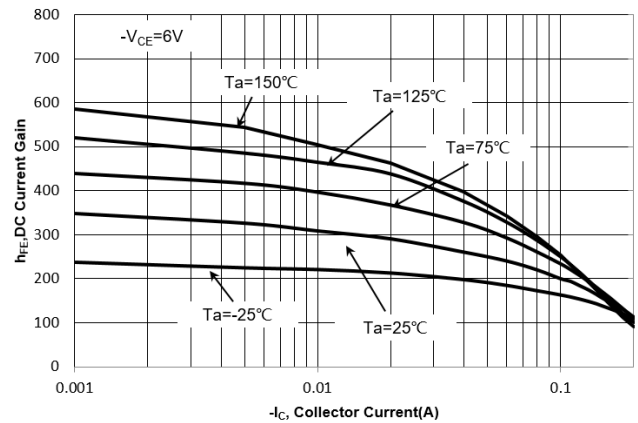


Fig 4. DC Current Gain vs. Collector Current



Electrical Characteristics Curves

Fig 5. Power Dissipation vs. Ambient Temperature

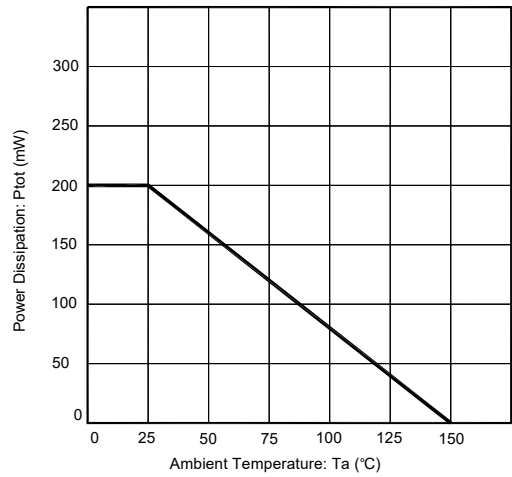


Fig 6. V_{BESAT} vs. Collector Current

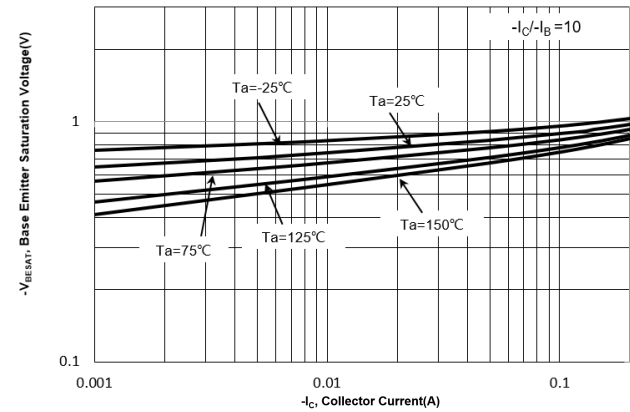


Fig 7. V_{CESAT} vs. Collector Current

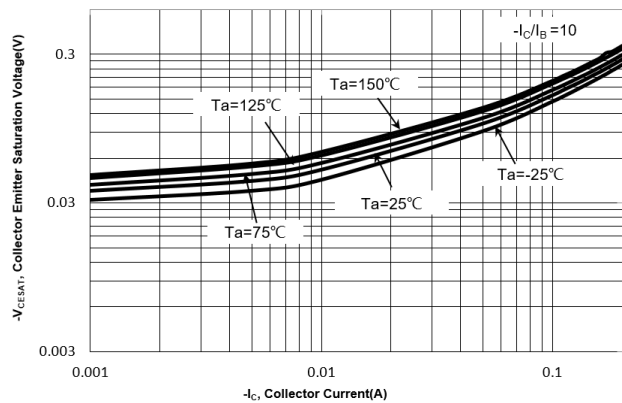
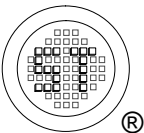
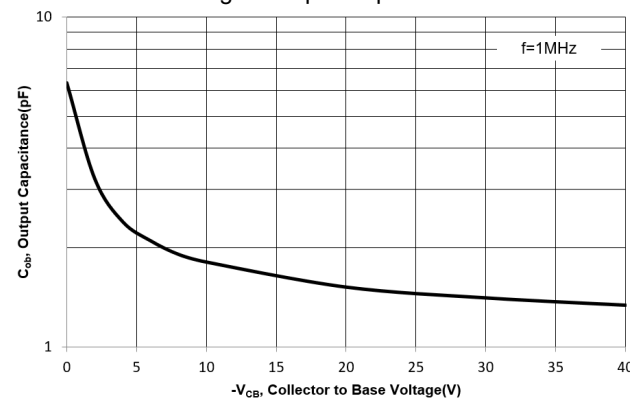


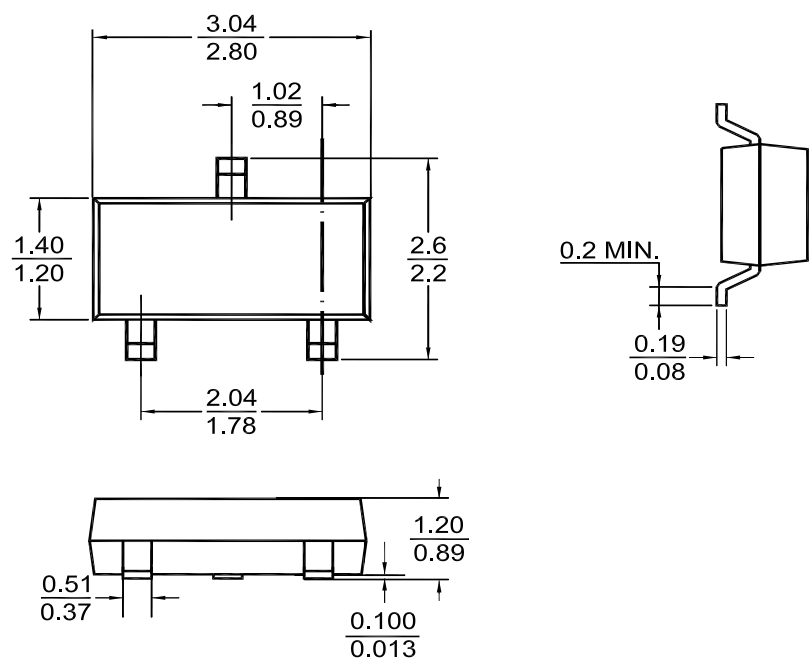
Fig 8. Output Capacitance



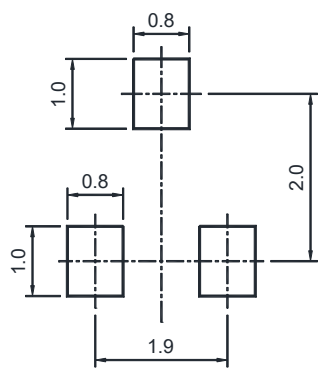
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Package Outline (Dimensions in mm)

TO-236



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

" ** " = Part No. (MMBTSA1235E/F = " 3E / 3F ")
" • " = HAF (Halogen and Antimony Free)
" YM " = Date Code Marking
" Y " = Year
" M " = Month
Font type: Arial

