

PNP Silicon High Voltage Transistors

Features

- AEC-Q101 Qualified
- High reliability
- High voltage (max. 300 V).
- Halogen and Antimony Free(HAF), RoHS compliant



1. Base 2. Emitter 3. Collector
SOT-23 Plastic Package

Applications

- For high voltage switching and amplifier
- Telephony
- Professional communication equipment

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

Parameter		Symbol	Value	Unit
Collector Base Voltage	MMBTA92A MMBTA93A	$-V_{CBO}$	300 200	V
Collector Emitter Voltage	MMBTA92A MMBTA93A	$-V_{CEO}$	300 200	V
Emitter Base Voltage		$-V_{EBO}$	5	V
Collector Current		$-I_C$	500	mA
Total Power Dissipation		P_{tot}	350	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	$R_{\theta JA}$	357 ¹⁾ 250 ²⁾	$^\circ\text{C/W}$

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

²⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.

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

Parameter		Symbol	Min.	Max.	Unit
DC Current Gain					
at $-V_{CE} = 10\text{ V}$, $-I_C = 1\text{ mA}$		h_{FE}	25	-	-
at $-V_{CE} = 10\text{ V}$, $-I_C = 10\text{ mA}$		h_{FE}	80	200	-
at $-V_{CE} = 10\text{ V}$, $-I_C = 30\text{ mA}$		h_{FE}	25	-	-
Collector Base Cutoff Current					
at $-V_{CB} = 200\text{ V}$	MMBTA92A	$-I_{CBO}$	-	250	nA
at $-V_{CB} = 160\text{ V}$	MMBTA93A	$-I_{CBO}$	-	250	
Emitter Base Cutoff Current					
at $-V_{EB} = 3\text{ V}$		$-I_{EBO}$	-	100	nA
Collector Base Breakdown Voltage					
at $-I_C = 100\text{ }\mu\text{A}$	MMBTA92A	$-V_{(BR)CBO}$	300	-	V
	MMBTA93A	$-V_{(BR)CBO}$	200	-	
Collector Emitter Breakdown Voltage					
at $-I_C = 1\text{ mA}$	MMBTA92A	$-V_{(BR)CEO}$	300	-	V
	MMBTA93A	$-V_{(BR)CEO}$	200	-	
Emitter Base Breakdown Voltage					
at $-I_E = 100\text{ }\mu\text{A}$		$-V_{(BR)EBO}$	5	-	V
Collector Emitter Saturation Voltage					
at $-I_C = 20\text{ mA}$, $-I_B = 2\text{ mA}$		$-V_{CE(sat)}$	-	0.5	V
Base Emitter Saturation Voltage					
at $-I_C = 20\text{ mA}$, $-I_B = 2\text{ mA}$		$-V_{BE(sat)}$	-	0.9	V
Current Gain Bandwidth Product					
at $-V_{CE} = 20\text{ V}$, $-I_C = 10\text{ mA}$, $f = 100\text{ MHz}$		f_T	50	-	MHz
Collector Output Capacitance					
at $-V_{CB} = 20\text{ V}$, $f = 1\text{ MHz}$	MMBTA92A	C_{ob}	-	6	pF
	MMBTA93A		-	8	

Electrical Characteristics Curves

Fig. 1 Output Characteristics Curve

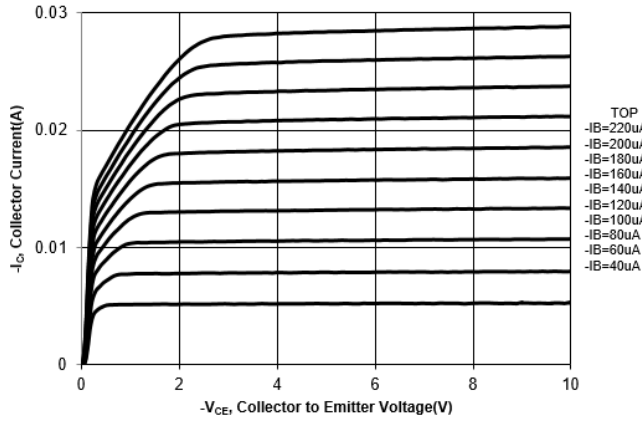


Fig. 2 Collector Current vs. Base to Emitter Voltage

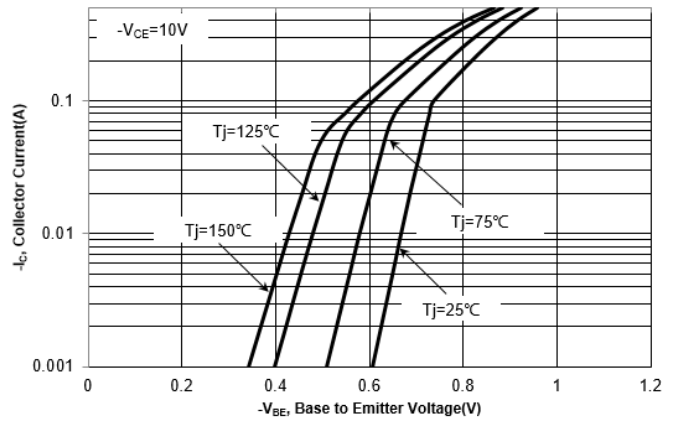


Fig. 3 DC Current Gain vs. Collector Current

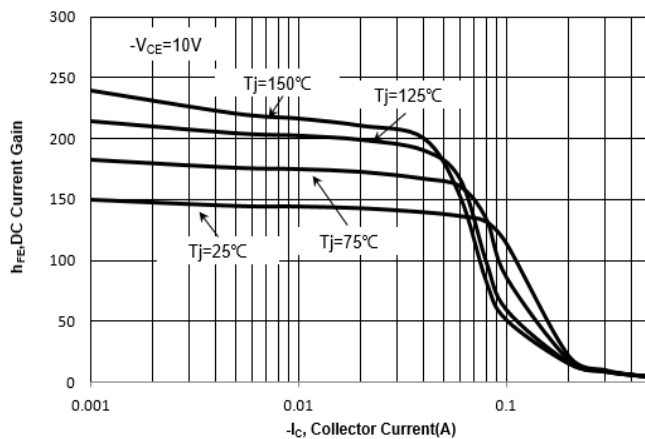
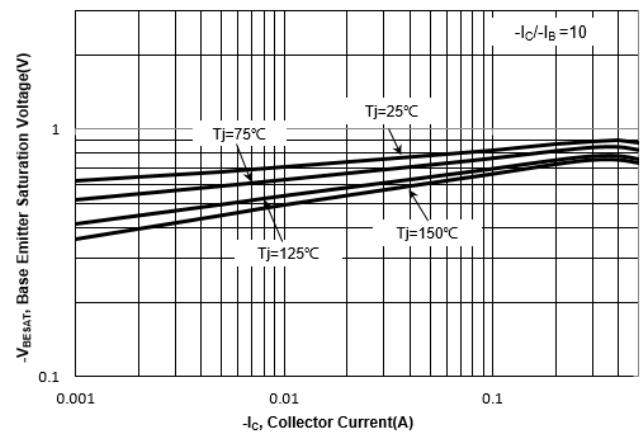


Fig. 4 V_{BESAT} vs. Collector Current



Electrical Characteristics Curves

Fig. 5 V_{CESAT} vs. Collector Current

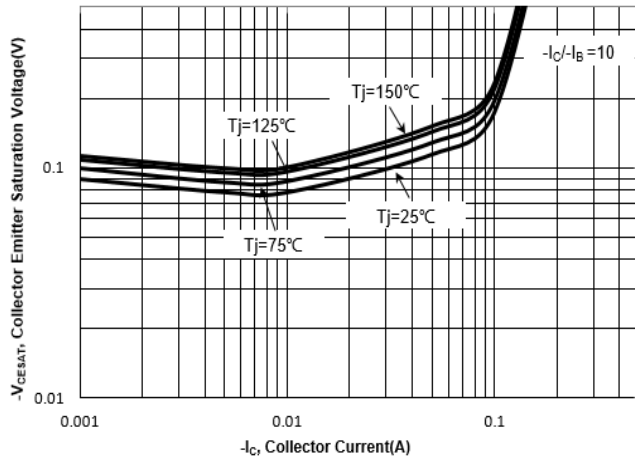


Fig. 6 Output Capacitance

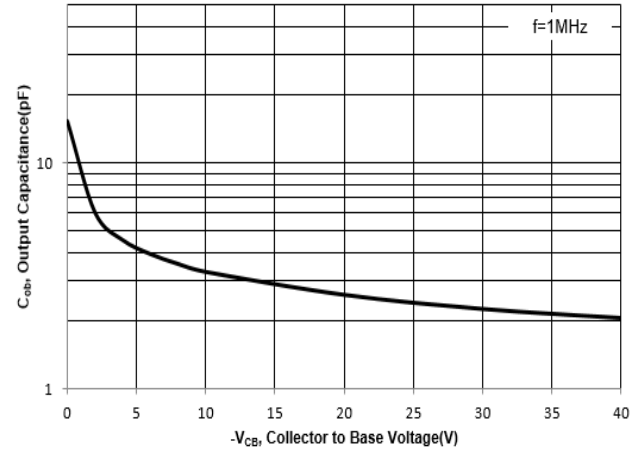
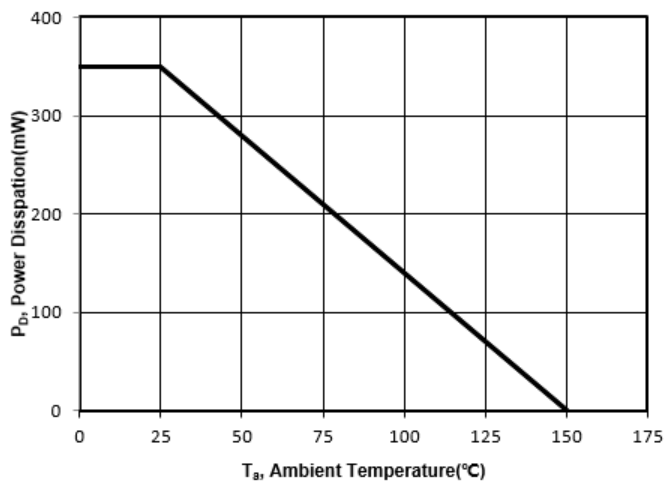
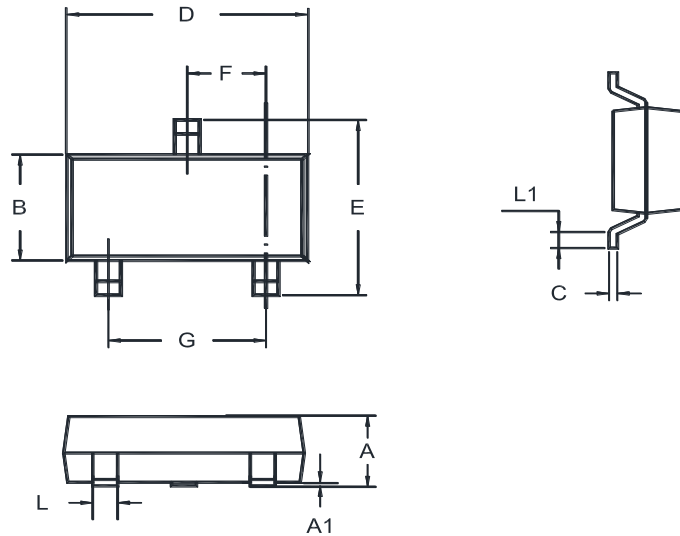


Fig. 7 Power Derating Curve



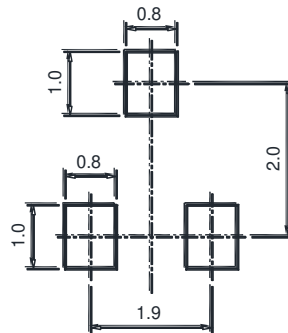
Package Outline (Dimensions in mm)

SOT-23



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

Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-23	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Marking information

" 2D " = Part No.
 " • " = HAF (Halogen and Antimony Free)
 "YM" = Date Code Marking
 "Y" = Year
 "M" = Month
 Font type: Arial

