

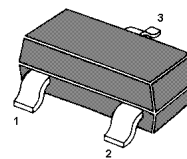
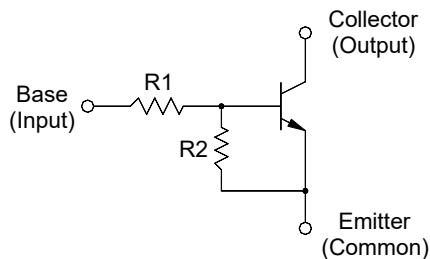
MMBTRC101SS...MMBTRC106SS-AH

NPN Silicon Epitaxial Planar Digital Transistor

for switching and interface circuit and drive circuit applications

Features

- AEC-Q101 is Qualified
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Halogen and Antimony Free(HAF), RoHS compliant



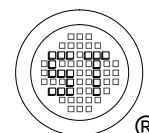
1. Base 2. Emitter 3. Collector
TO-236 Plastic Package

Resistor Values

Type	Marking Code	R1 (K Ω)	R2 (K Ω)
MMBTRC101SS	HP	4.7	4.7
MMBTRC102SS	HN	10	10
MMBTRC103SS	HR	22	22
MMBTRC104SS	HX	47	47
MMBTRC105SS	HY	2.2	47
MMBTRC106SS	HZ	4.7	47

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

Parameter		Symbol	Value	Unit
Output Voltage		V_o	50	V
Input Voltage	MMBTRC101SS	V_i	20, -10	V
	MMBTRC102SS		30, -10	
	MMBTRC103SS		40, -10	
	MMBTRC104SS		40, -10	
	MMBTRC105SS		12, -5	
	MMBTRC106SS		20, -5	
Output Current		I_o	100	mA
Total Power Dissipation		P_{tot}	200	mW
Junction Temperature		T_j	150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	- 55 to + 150	$^\circ\text{C}$

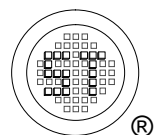


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Characteristics at $T_a = 25\text{ }^{\circ}\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_O = 5\text{ V}$, $I_O = 10\text{ mA}$	h_{FE}	30 50 70 80 80 80	- - - - - -	- - - - - -	- - - - - -
Output Cutoff Current at $V_O = 50\text{ V}$	$I_{O(OFF)}$	-	-	500	nA
Input Current at $V_I = 5\text{ V}$	I_I	- - - - - -	- - - - - -	1.8 0.88 0.36 0.18 3.6 1.8	mA
Output Voltage at $I_O = 10\text{ mA}$, $I_I = 0.5\text{ mA}$	$V_{O(ON)}$	-	-	0.3	V
Input Voltage (ON) at $V_O = 0.2\text{ V}$, $I_O = 5\text{ mA}$	$V_{I(ON)}$	- - - - - -	- - - - - -	2 2.4 3 5 1.1 1.3	V
Input Voltage (OFF) at $V_O = 5\text{ V}$, $I_O = 0.1\text{ mA}$	$V_{I(OFF)}$	1 0.5	- -	- -	V
Transition Frequency at $V_O = 10\text{ V}$, $I_O = 5\text{ mA}$	$f_T^{1)}$	-	200	-	MHz

¹⁾ Characteristic of transistor only.



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Electrical Characteristics Curves

Fig 1. Output Current vs. Input On Voltage

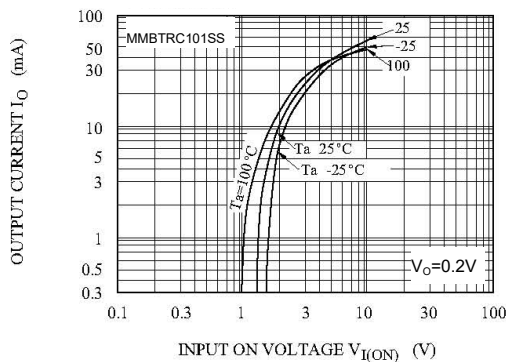


Fig 2. Output Current vs. Input On Voltage

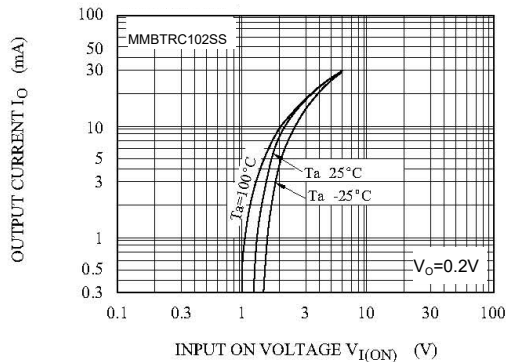


Fig 3. Output Current vs. Input On Voltage

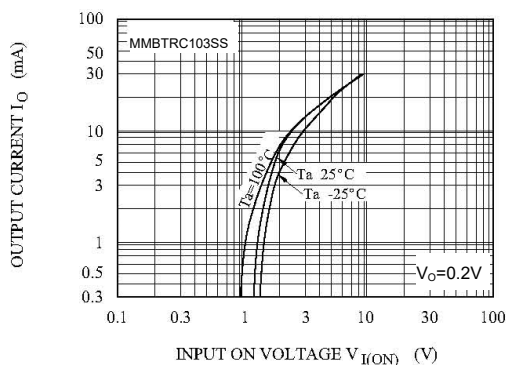


Fig 4. Output Current vs. Input On Voltage

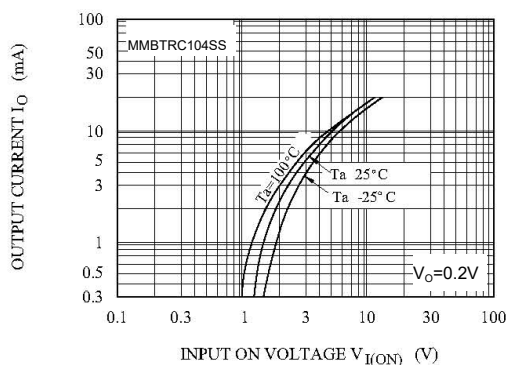


Fig 5. Output Current vs. Input On Voltage

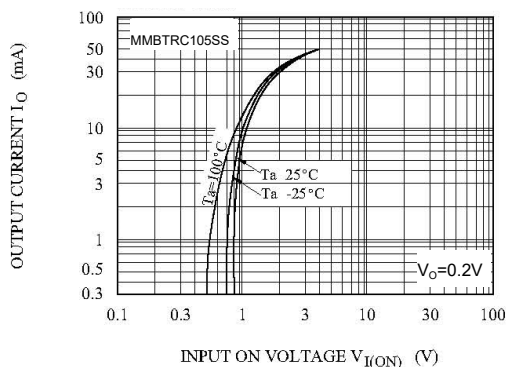
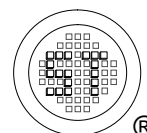
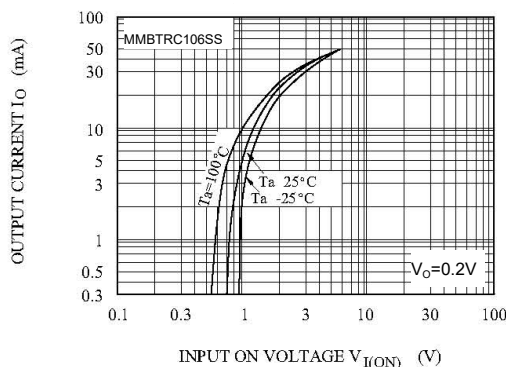


Fig 6. Output Current vs. Input On Voltage



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Electrical Characteristics Curves

Fig 7. Output Current vs. Input off Voltage

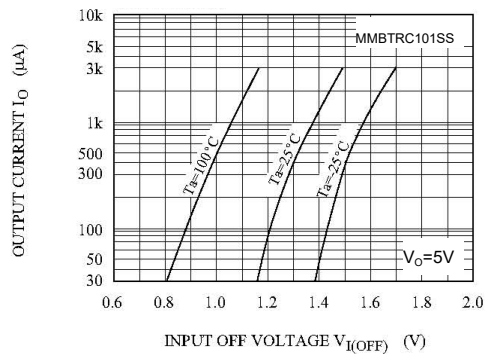


Fig 8. Output Current vs. Input off Voltage

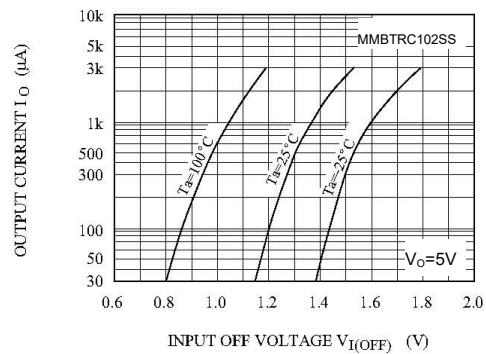


Fig 9. Output Current vs. Input off Voltage

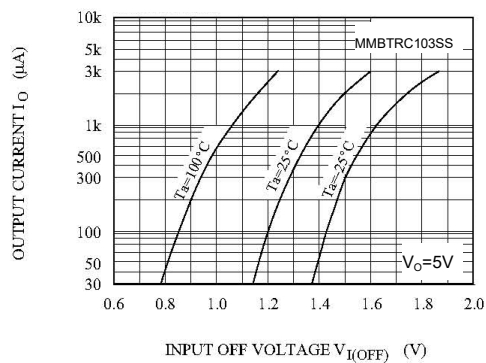


Fig 10. Output Current vs. Input off Voltage

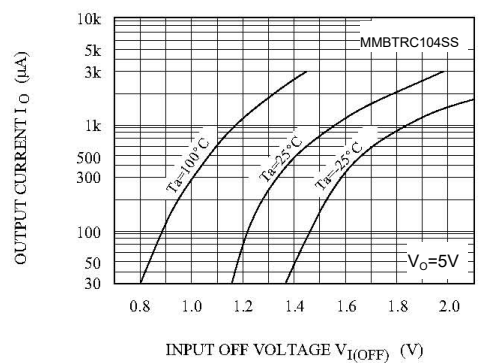


Fig 11. Output Current vs. Input off Voltage

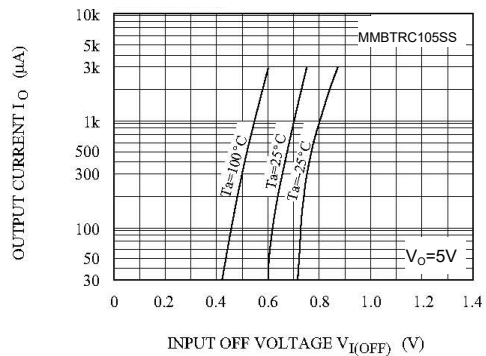
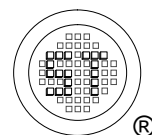
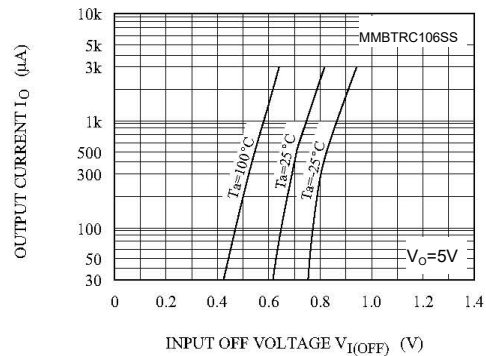


Fig 12. Output Current vs. Input off Voltage



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Electrical Characteristics Curves

Fig 13. DC Current Gain vs. Output Current

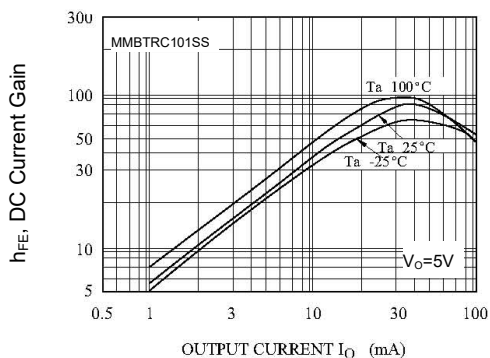


Fig 14. DC Current Gain vs. Output Current

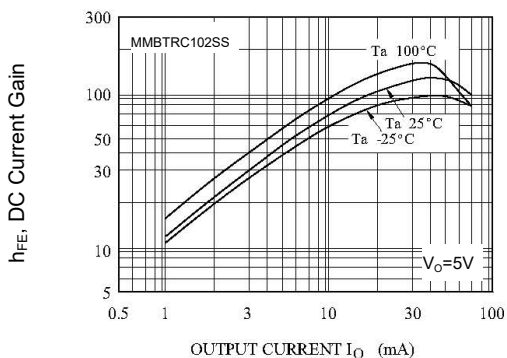


Fig 15. DC Current Gain vs. Output Current

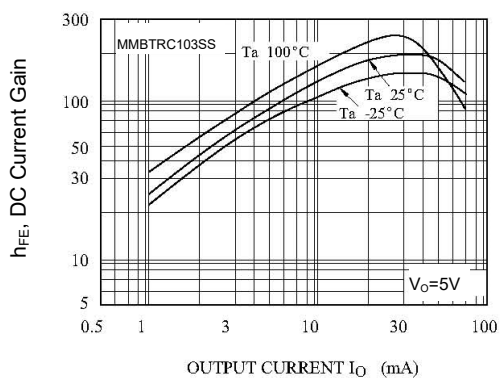


Fig 16. DC Current Gain vs. Output Current

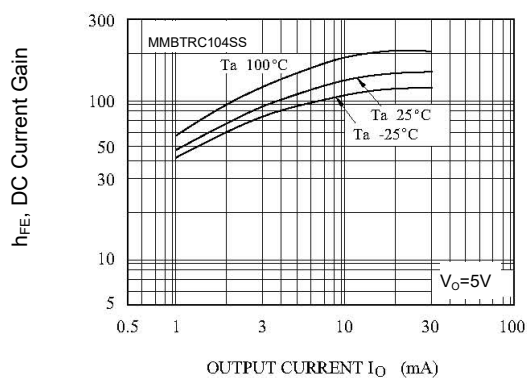


Fig 17. DC Current Gain vs. Output Current

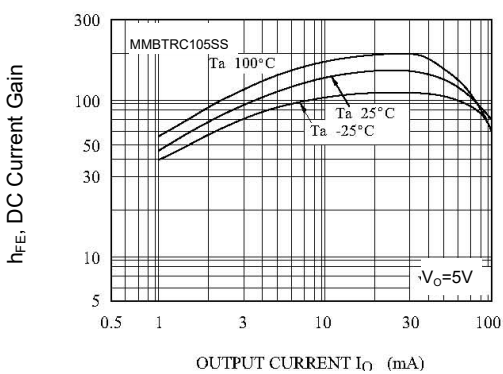


Fig 18. DC Current Gain vs. Output Current

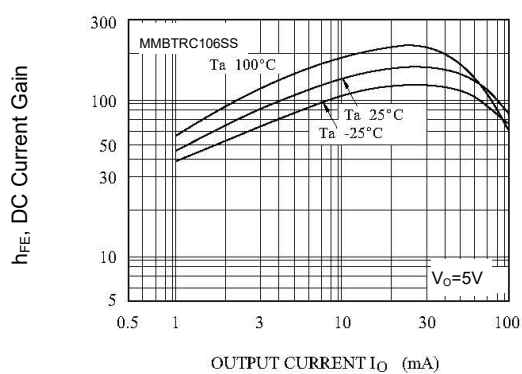
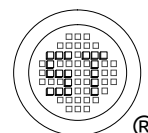
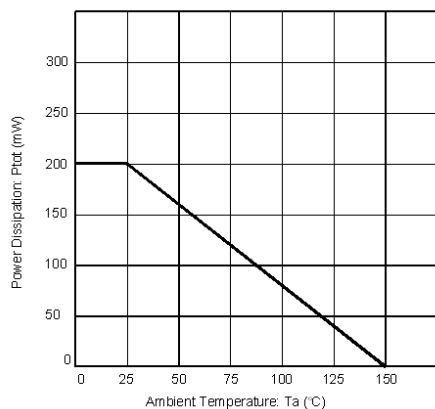


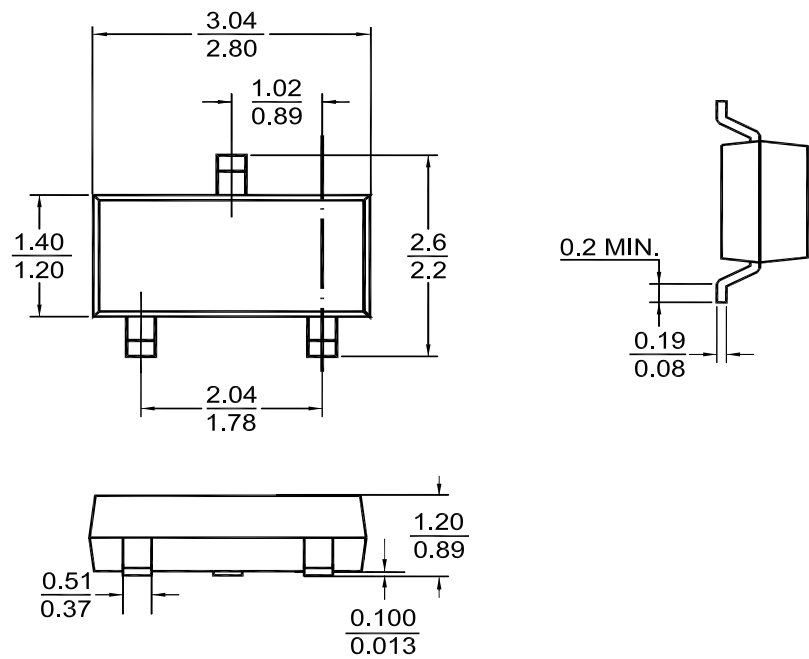
Fig 19. Power Derating Curve



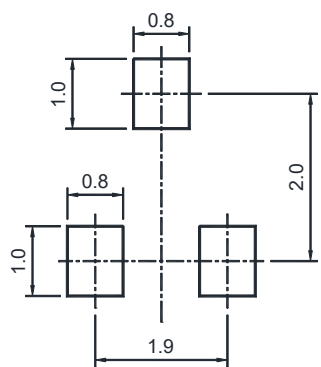
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Package Outline (Dimensions in mm)

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.
- " • " = HAF (Halogen and Antimony Free)
- "YM" = Date Code Marking
- "Y" = Year
- "M" = Month
- Font type: Arial

