

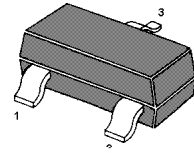
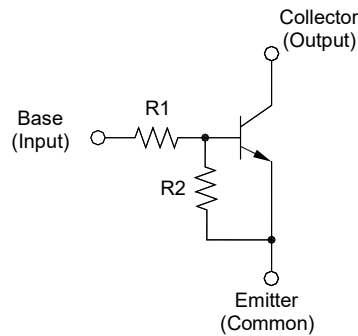
MMBTRC241S...MMBTRC246S

NPN Silicon Epitaxial Planar Transistors

For high current switching, interface circuit and driver circuit application.

Feature

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- High output current



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

Resistor Values

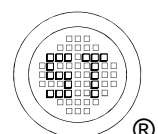
Type	R1 (KΩ)	R2 (KΩ)
MMBTRC241S	1	1
MMBTRC242S	2.2	2.2
MMBTRC243S	4.7	4.7
MMBTRC244S	10	10
MMBTRC245S	1	10
MMBTRC246S	2.2	10

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value	Unit
Output Voltage	V _o	50	V
Input Voltage	V _i	10, -10	V
		12, -10	
		20, -10	
		30, -10	
		10, -5	
		12, -6	
Output Current ¹⁾	I _o	800	mA
Total Power Dissipation	P _{tot}	200	mW
Thermal Resistance from Junction to Ambient ²⁾	R _{θJA}	625	°C/W
Junction Temperature	T _j	150	°C
Storage Temperature Range	T _{stg}	- 55 to + 150	°C

¹⁾ t_p = 1mS.

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

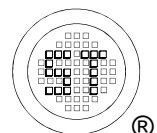


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Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_o = 5\text{ V}$, $I_o = 50\text{ mA}$	MMBTRC241S	33	-	-	-
	MMBTRC242S	39	-	-	-
	MMBTRC243S	47	-	-	-
	MMBTRC244S	56	-	-	-
	MMBTRC245S	56	-	-	-
	MMBTRC246S	56	-	-	-
Output Cutoff Current at $V_o = 30\text{ V}$	$I_{O(OFF)}$	-	-	10	μA
Input Current at $V_i = 5\text{ V}$	MMBTRC241S	-	-	7.2	mA
	MMBTRC242S	-	-	3.8	
	MMBTRC243S	-	-	1.8	
	MMBTRC244S	-	-	0.88	
	MMBTRC245S	-	-	7.2	
	MMBTRC246S	-	-	3.6	
Output Voltage at $I_o = 50\text{ mA}$, $I_i = 2.5\text{ mA}$	$V_{O(ON)}$	-	-	0.3	V
Input Voltage (ON) at $V_o = 0.3\text{ V}$, $I_o = 20\text{ mA}$	MMBTRC241S	-	-	3	V
	MMBTRC242S	-	-	3	
	MMBTRC243S	-	-	3	
	MMBTRC244S	-	-	3	
	MMBTRC245S	-	-	3	
	MMBTRC246S	-	-	2	
Input Voltage (OFF) at $V_o = 5\text{ V}$, $I_o = 0.1\text{ mA}$	MMBTRC241S~244S	$-V_{I(OFF)}$	0.5	-	V
	MMBTRC245S~246S		0.3	-	
Transition Frequency at $V_o = 10\text{ V}$, $I_o = 5\text{ mA}$, $f = 100\text{ MHz}$	$f_T^{1)}$	-	200	-	MHz

¹⁾ Characteristic of transistor only.



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Electrical Characteristics Curves

Fig 1. Output Current vs. $V_{I(ON)}$

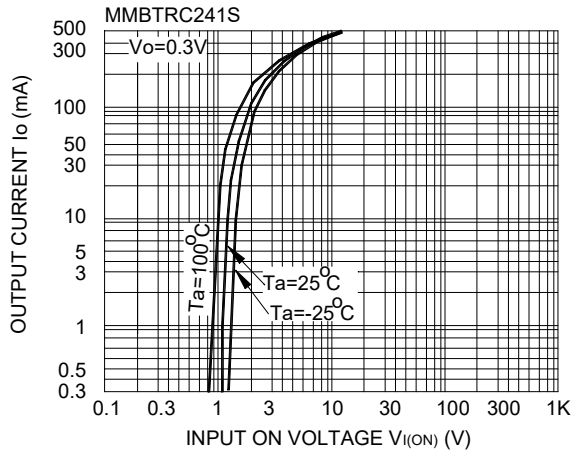


Fig 2. Output Current vs. $V_{I(ON)}$

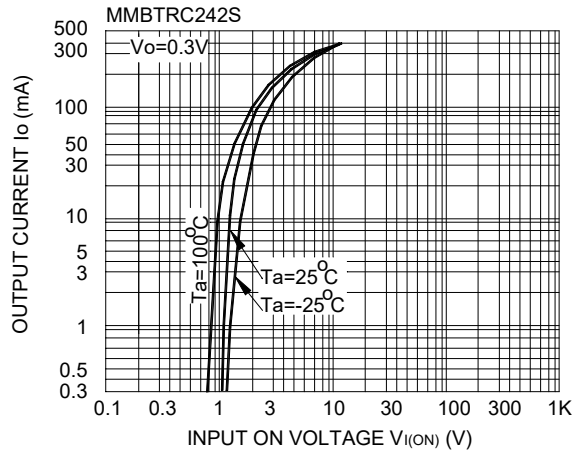


Fig 3. Output Current vs. $V_{I(OFF)}$

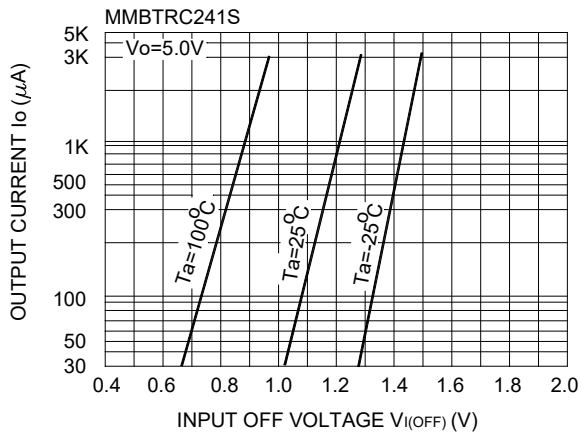


Fig 4. Output Current vs. $V_{I(OFF)}$

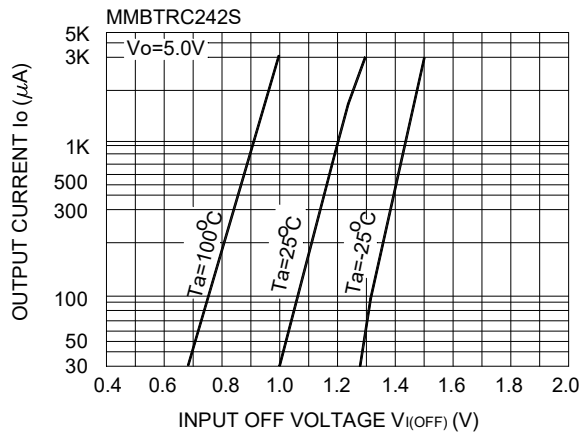


Fig 5. DC Current Gain vs. Output Current

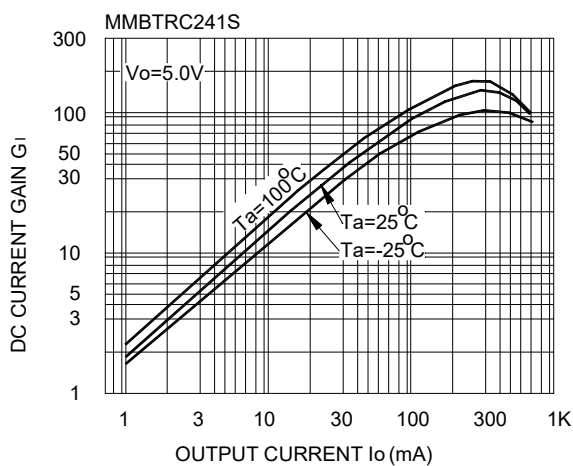
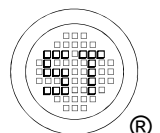
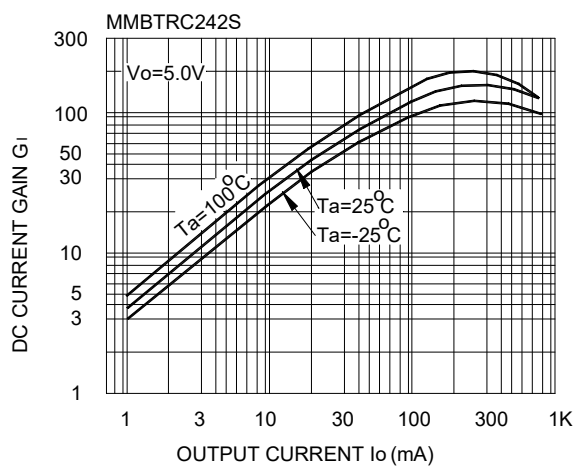


Fig 6. DC Current Gain vs. Output Current



MMBTRC241S...MMBTRC246S

Electrical Characteristics Curves

Fig 1. Output Current vs. $V_{I(ON)}$

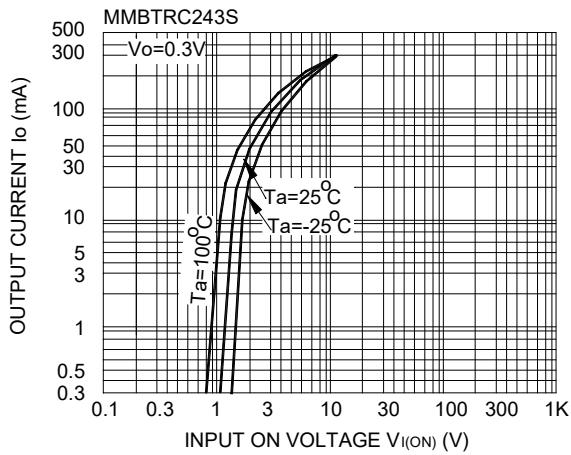


Fig 2. Output Current vs. $V_{I(ON)}$

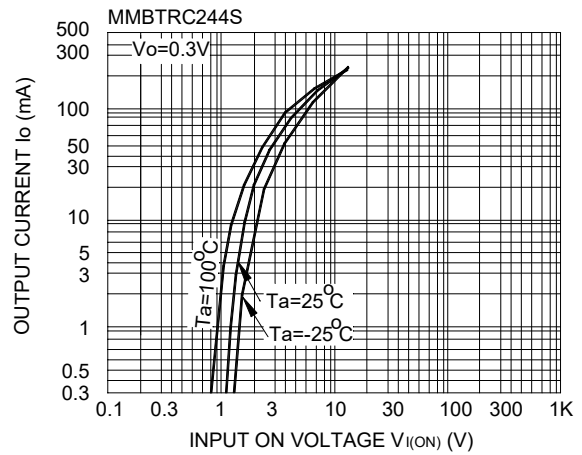


Fig 3. Output Current vs. $V_{I(OFF)}$

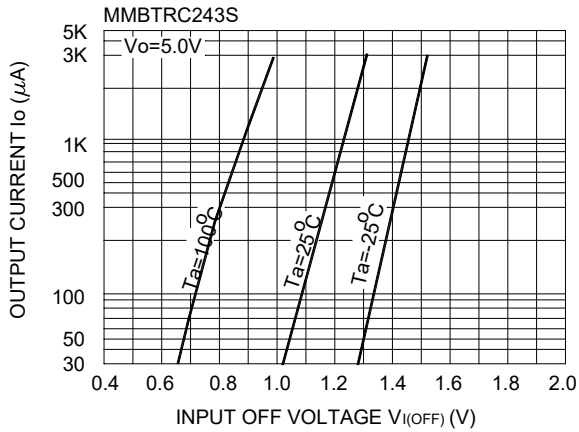


Fig 4. Output Current vs. $V_{I(OFF)}$

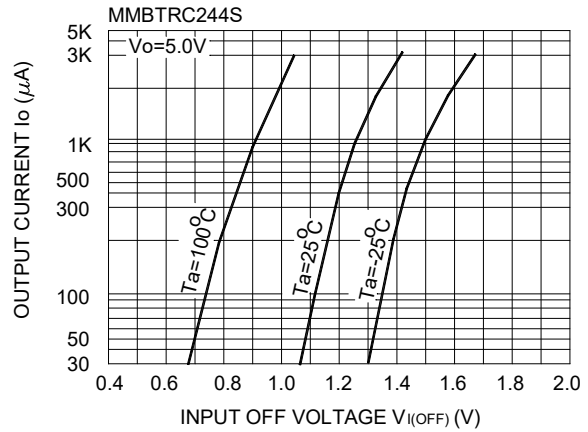


Fig 5. DC Current Gain vs. Output Current

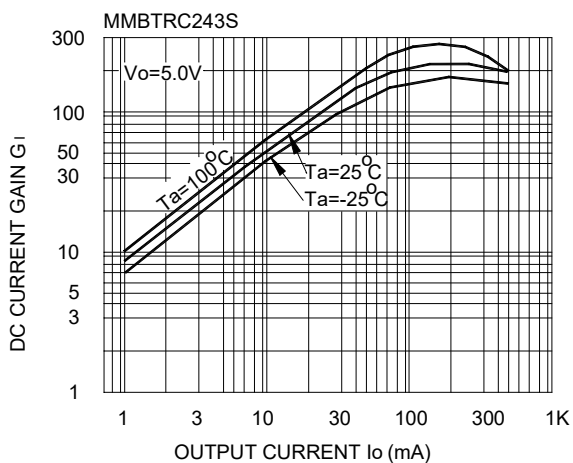
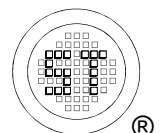
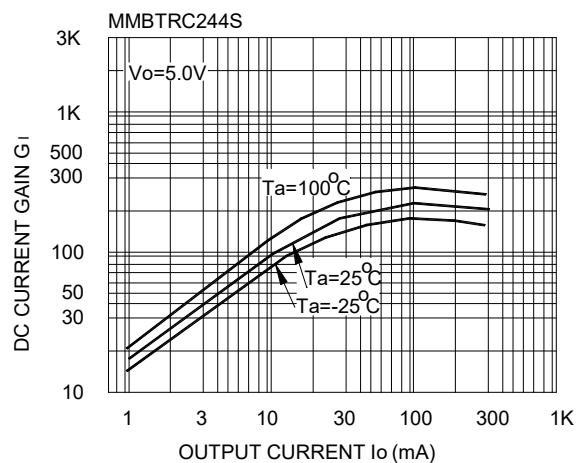
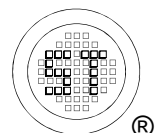
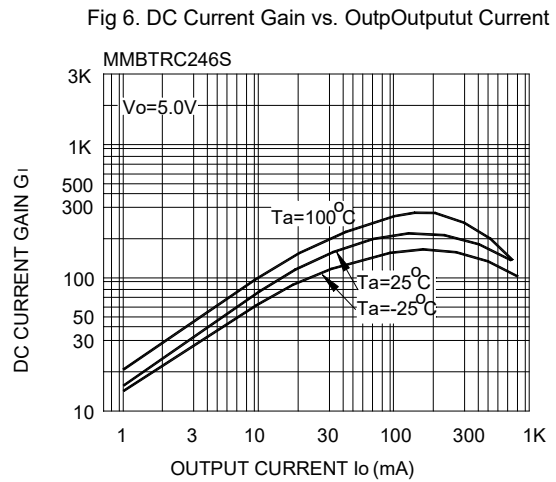
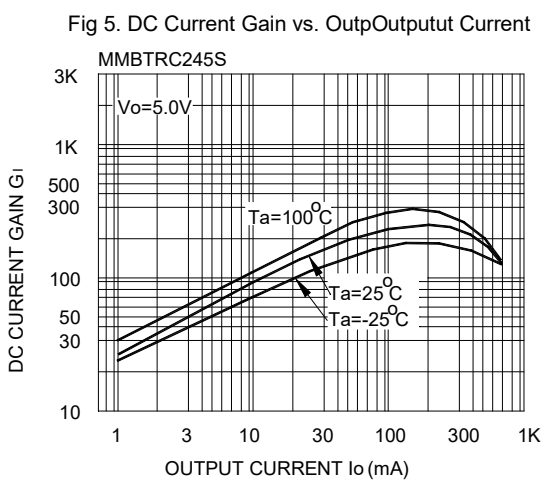
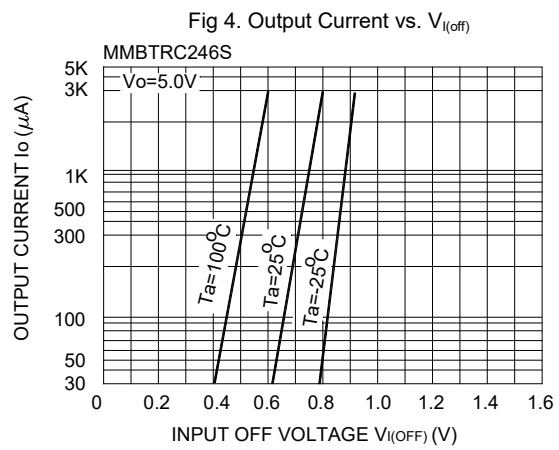
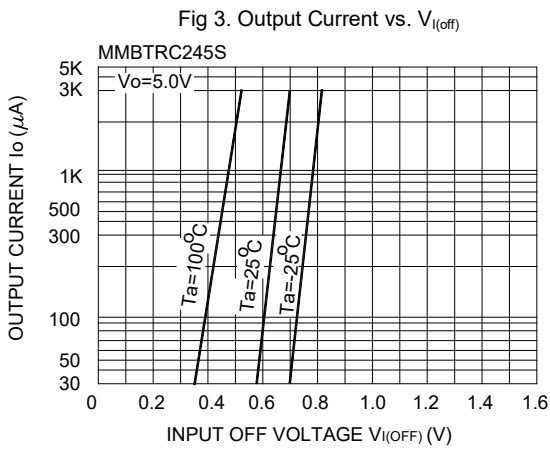
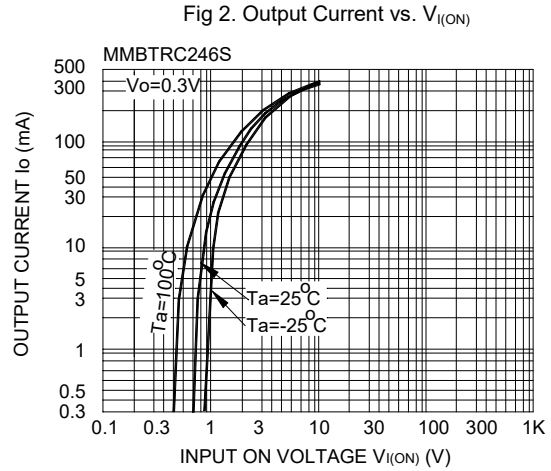
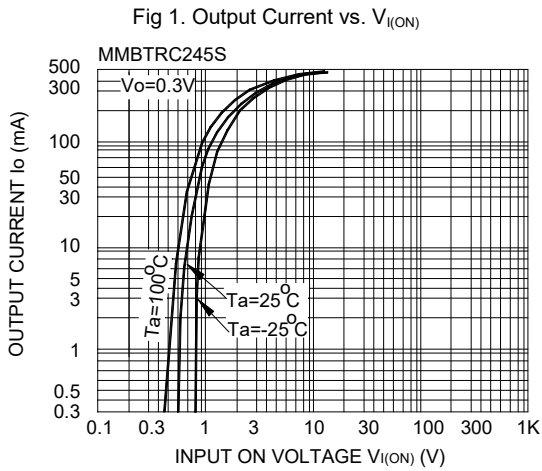


Fig 6. DC Current Gain vs. Output Current



MMBTRC241S...MMBTRC246S

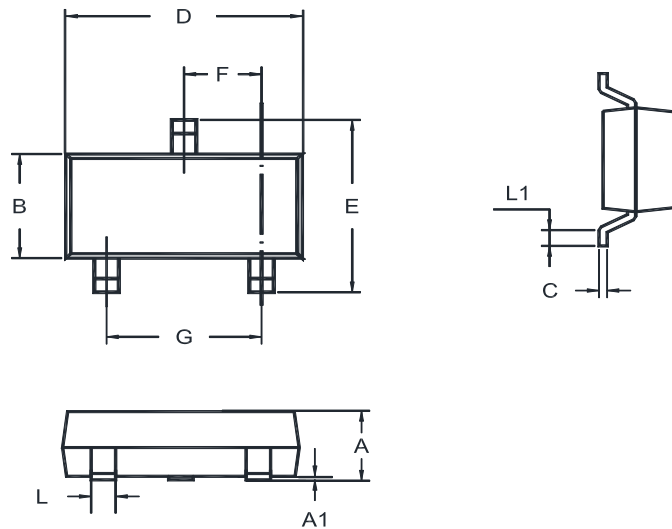
Electrical Characteristics Curves



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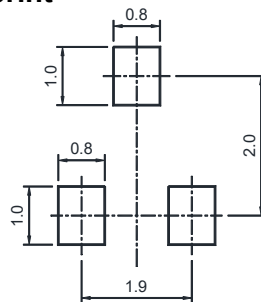
Package Outline (Dimensions in mm)

SOT-23



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	
SOT-23	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Marking information

Part No.	Marking Code	Part No.	Marking Code	Part No.	Marking Code
MMBTRC241S	NQ	MMBTRC243S	NS	MMBTRC245S	NU
MMBTRC242S	NR	MMBTRC244S	NT	MMBTRC246S	NV

" YM " = Date Code Marking

" Y " = Year

" M " = Month

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