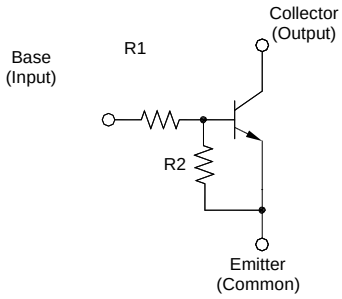
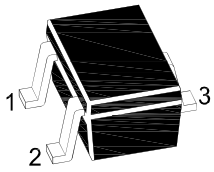
NPN Silicon Epitaxial Planar Transistor

for switching, interface circuit and drive circuit applications

Features

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





1.Base 2.Emitter 3.Collector
SOT-523 Plastic Package

Resistor Values

Type	R1 (K)	R2 (K)
MMBTRC416E	1	10
MMBTRC417E	2.2	2.2
MMBTRC418E	2.2	10
MMBTRC419E	4.7	10
MMBTRC420E	10	4.7
MMBTRC421E	47	10
MMBTRC422E	100	100

Absolute Maximum Ratings (T_a = 25 °C)

Parameter		Symbol	Value	Unit
Output Voltage		V_O	50	V
Input Voltage	MMBTRC416E	V_I	10, - 5	V
	MMBTRC417E		12, - 10	
	MMBTRC418E		12, - 5	
	MMBTRC419E		20, - 7	
	MMBTRC420E		30, - 10	
	MMBTRC421E		40, - 15	
	MMBTRC422E		40, - 10	
Output Current		I_O	100	mA
Total Power Dissipation		P_{tot}	100	mW
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	- 55 to + 150	°C

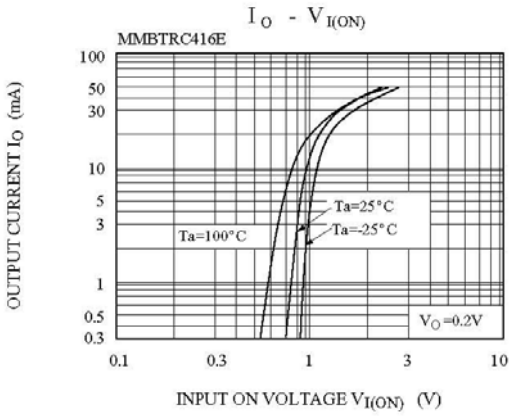
MMBTRC416E…MMBTRC422E

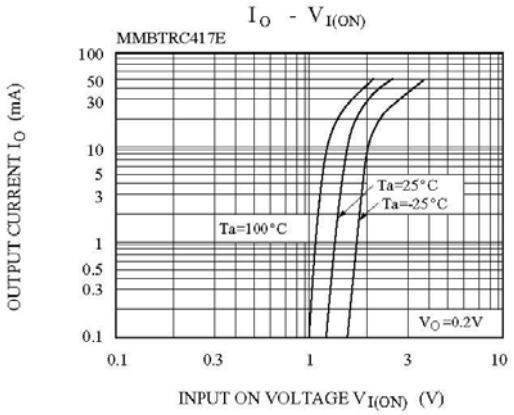
Characteristics at T_a = 25 °C

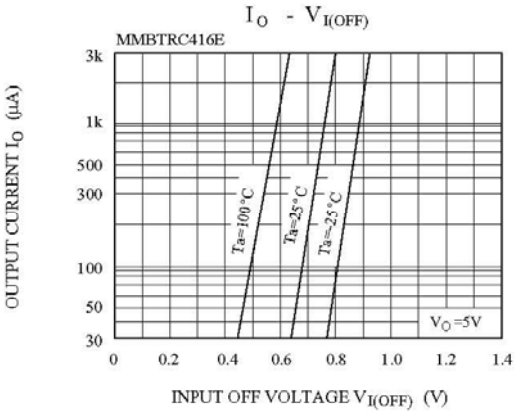
Parameter		Symbol	Min.	Typ.	Max.	Unit
DC Current Gain						
at V_O = 5 V, I_O = 5 mA	MMBTRC416E	G_I	33	-	-	-
at V_O = 5 V, I_O = 20 mA	MMBTRC417E		20	-	-	-
at V_O = 5 V, I_O = 10 mA	MMBTRC418E		33	-	-	-
at V_O = 5 V, I_O = 10 mA	MMBTRC419E		30	-	-	-
at V_O = 5 V, I_O = 10 mA	MMBTRC420E		24	-	-	-
at V_O = 5 V, I_O = 5 mA	MMBTRC421E		33	-	-	-
at V_O = 5 V, I_O = 5 mA	MMBTRC422E		62	-	-	-
Output Cutoff Current		$I_{O(OFF)}$	-	-	500	nA
at V_O = 50 V						
Input Current						
at V_I = 5 V	MMBTRC416E	I_I	-	-	7.2	mA
	MMBTRC417E		-	-	3.8	
	MMBTRC418E		-	-	3.8	
	MMBTRC419E		-	-	1.8	
	MMBTRC420E		-	-	0.88	
	MMBTRC421E		-	-	0.16	
	MMBTRC422E		-	-	0.15	
Output Voltage						
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC416E	$V_{O(ON)}$	-	-	0.3	V
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC417E		-	-	0.3	
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC418E		-	-	0.3	
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC419E		-	-	0.3	
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC420E		-	-	0.3	
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC421E		-	-	0.3	
at I_O = 5 mA, I_I = 0.25 mA	MMBTRC422E		-	-	0.3	
Input Voltage (ON)						
at V_O = 0.3 V, I_O = 20 mA	MMBTRC416E	$V_{I(ON)}$	-	-	3	V
at V_O = 0.3 V, I_O = 20 mA	MMBTRC417E		-	-	3	
at V_O = 0.3 V, I_O = 20 mA	MMBTRC418E		-	-	3	
at V_O = 0.3 V, I_O = 20 mA	MMBTRC419E		-	-	2.5	
at V_O = 0.3 V, I_O = 2 mA	MMBTRC420E		-	-	3	
at V_O = 0.3 V, I_O = 2 mA	MMBTRC421E		-	-	5	
at V_O = 0.3 V, I_O = 1 mA	MMBTRC422E		-	-	3	
Input Voltage (OFF)						
at V_{CC} = 5 V, I_O = 100 ìA	MMBTRC416E	$V_{I(OFF)}$	0.3	-	-	V
	MMBTRC417E		0.5	-	-	
	MMBTRC418E		0.3	-	-	
	MMBTRC419E		0.3	-	-	
	MMBTRC420E		0.8	-	-	
	MMBTRC421E		1	-	-	
	MMBTRC422E		0.5	-	-	
Transition Frequency		f_T [1)]	-	250	-	MHz
at V_O = 10 V, I_O = 5 mA						

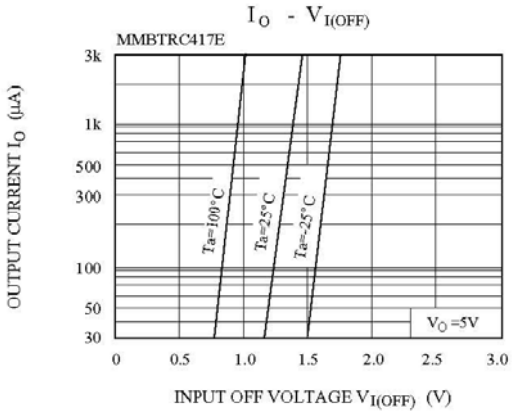
[1)] Characteristic of transistor only.

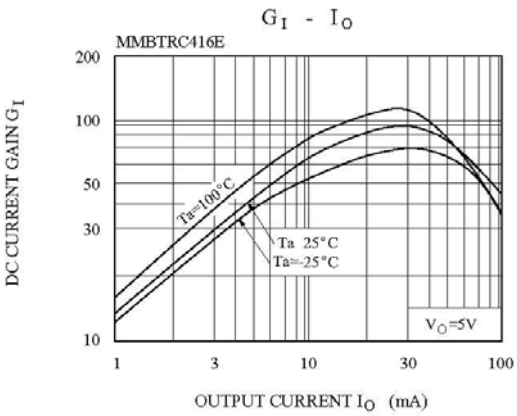
MMBTRC416E…MMBTRC422E

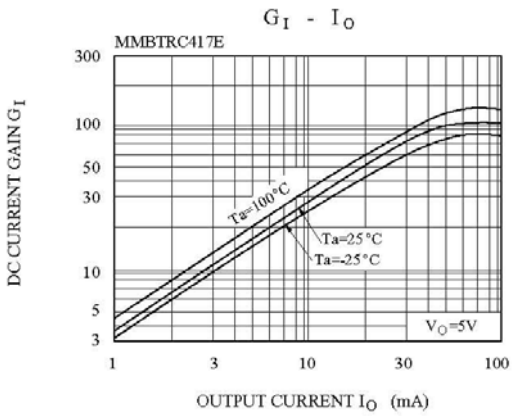












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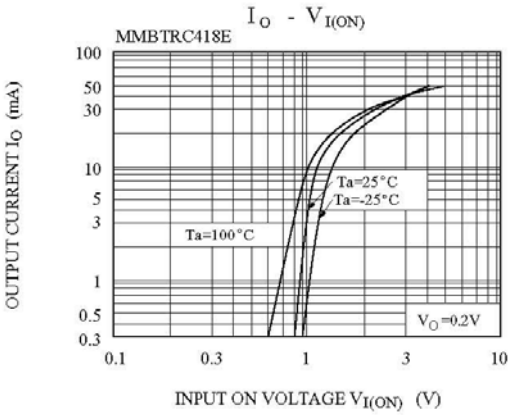

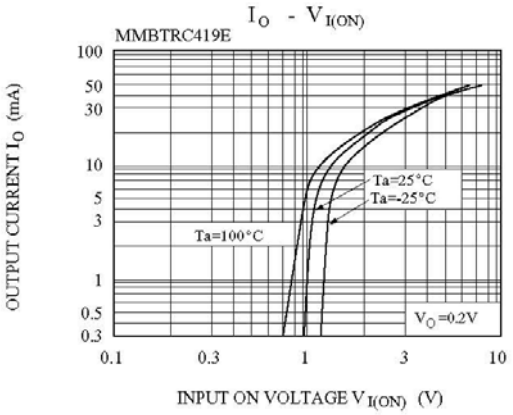

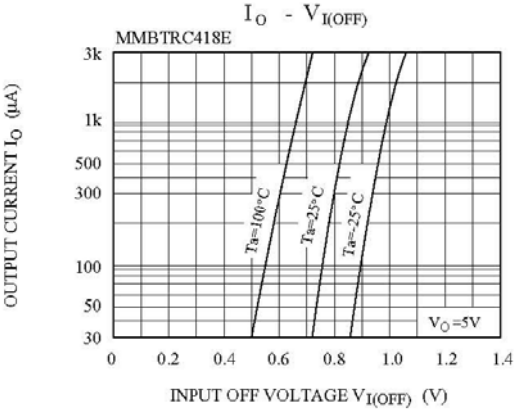

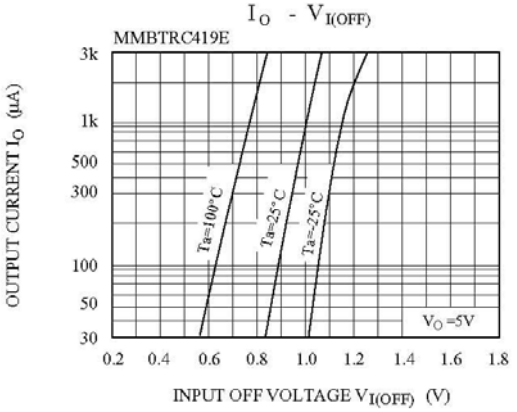

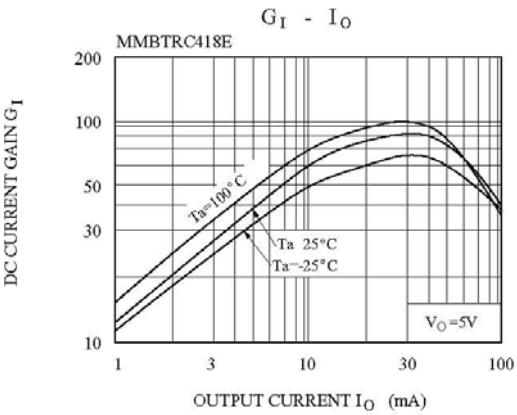

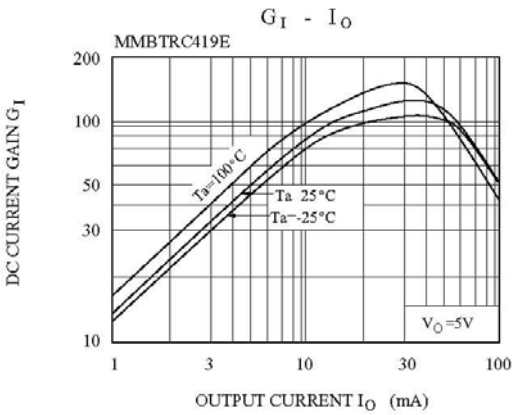

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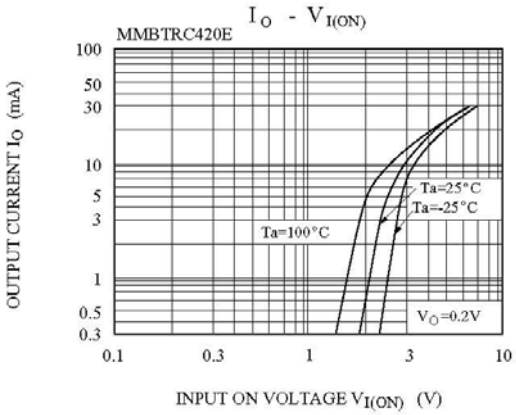

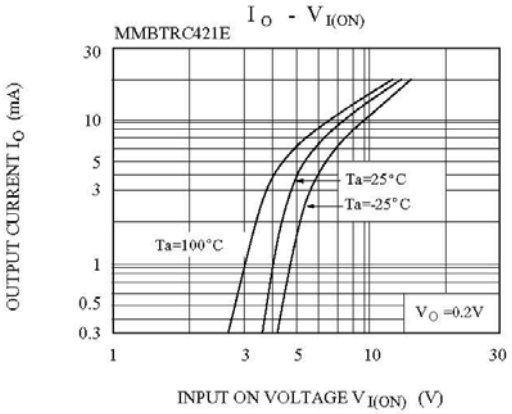

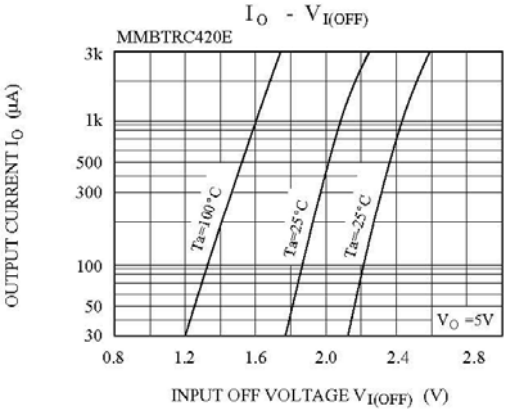

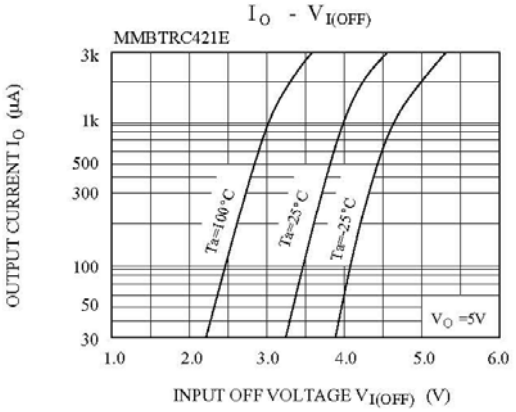

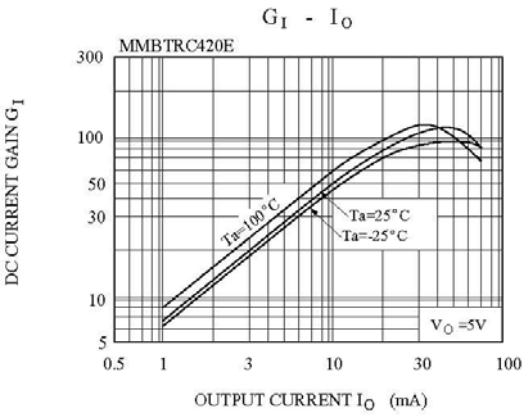

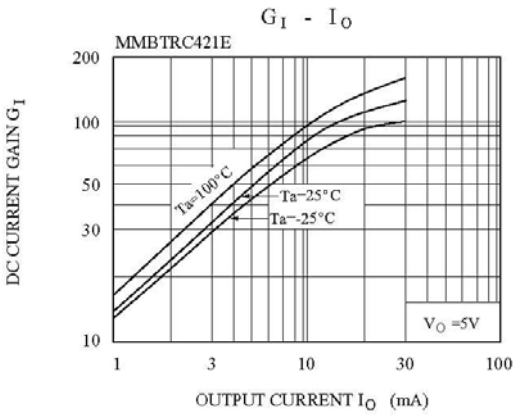

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