



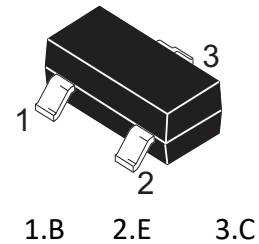
MMBT2222/MMBT2222A

NPN Silicon Epitaxial Planar Transistor

Features

SOT-23

- For switching and amplifier applications



Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Value	Unit
Collector Base Voltage	MMBT2222 MMBT2222A	V_{CBO}	60 75	V
Collector Emitter Voltage	MMBT2222 MMBT2222A	V_{CEO}	30 40	V
Emitter Base Voltage	MMBT2222 MMBT2222A	V_{EBO}	5 6	V
Collector Current		I_C	600	mA
Power Dissipation		P_{tot}	350	mW
Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STGg}	- 55 to + 150	°C

Characteristics (Ta=25°C)

Parameter		Symbol	Min.	Max.	Unit
DC Current Gain		h_{FE}	35	-	-
at $V_{CE} = 10\text{ V}$, $I_C = 0.1\text{ mA}$		h_{FE}	50	-	-
at $V_{CE} = 10\text{ V}$, $I_C = 1\text{ mA}$		h_{FE}	75	-	-
at $V_{CE} = 10\text{ V}$, $I_C = 10\text{ mA}$		h_{FE}	50	-	-
at $V_{CE} = 1\text{ V}$, $I_C = 150\text{ mA}$		h_{FE}	100	300	-
at $V_{CE} = 10\text{ V}$, $I_C = 150\text{ mA}$		h_{FE}	30	-	-
at $V_{CE} = 10\text{ V}$, $I_C = 500\text{ mA}$		h_{FE}	40	-	-
	MMBT2222 MMBT2222A				
Collector Base Cutoff Current		I_{CBO}	-	10	nA
at $V_{CB} = 50\text{ V}$	MMBT2222		-	10	
at $V_{CB} = 60\text{ V}$	MMBT2222A				
Emitter Base Cutoff Current		I_{EBO}	-	100	nA
at $V_{EB} = 3\text{ V}$					
Collector Base Breakdown Voltage		$V_{(BR)CBO}$	60	-	V
at $I_C = 10\text{ }\mu\text{A}$	MMBT2222 MMBT2222A		75	-	



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Collector Emitter Breakdown Voltage at $I_C = 10 \text{ mA}$	MMBT2222 MMBT2222A	$V_{(BR)CEO}$	30 40	- -	V
Emitter Base Breakdown Voltage at $I_E = 10 \mu\text{A}$	MMBT2222 MMBT2222A	$V_{(BR)EBO}$	5 6	- -	V
Collector Emitter Saturation Voltage at $I_C = 150 \text{ mA}$, $I_B = 15 \text{ mA}$ at $I_C = 500 \text{ mA}$, $I_B = 50 \text{ mA}$	MMBT2222 MMBT2222A MMBT2222 MMBT2222A	$V_{CE(sat)}$	- - - -	0.4 0.3 1.6 1	V
Base Emitter Saturation Voltage at $I_C = 150 \text{ mA}$, $I_B = 15 \text{ mA}$ at $I_C = 500 \text{ mA}$, $I_B = 50 \text{ mA}$	MMBT2222 MMBT2222A MMBT2222 MMBT2222A	$V_{BE(sat)}$	- 0.6 - -	1.3 1.2 2.6 2	V
Transition Frequency at $V_{CE} = 20 \text{ V}$, $-I_E = 20 \text{ mA}$, $f = 100 \text{ MHz}$		f_T	300	-	MHz
Collector Output Capacitance at $V_{CB} = 10 \text{ V}$, $f = 100 \text{ KHz}$		C_{ob}	-	8	pF
Delay Time at $V_{CC} = 30 \text{ V}$, $V_{BE(OFF)} = 0.5 \text{ V}$, $I_C = 150 \text{ mA}$, $I_{B1} = 15 \text{ mA}$		t_d	-	10	ns
Rise Time at $V_{CC} = 30 \text{ V}$, $V_{BE(OFF)} = 0.5 \text{ V}$, $I_C = 150 \text{ mA}$, $I_{B1} = 15 \text{ mA}$		t_r	-	25	ns
Storage Time at $V_{CC} = 30 \text{ V}$, $I_C = 150 \text{ mA}$, $I_{B1} = -I_{B2} = 15 \text{ mA}$		t_{stg}	-	225	ns
Fall Time at $V_{CC} = 30 \text{ V}$, $I_C = 150 \text{ mA}$, $I_{B1} = -I_{B2} = 15 \text{ mA}$		t_f	-	60	ns



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Ratings And Characteristic Curves

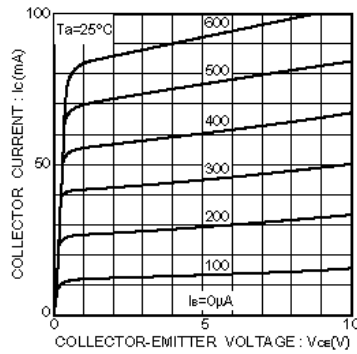


Fig.1 Grounded emitter output characteristics

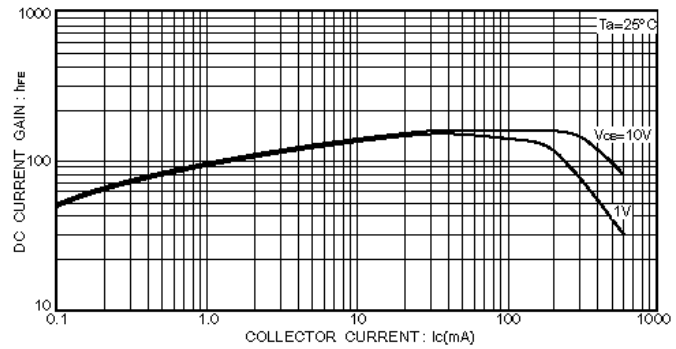


Fig.3 DC current gain vs. collector current(I)

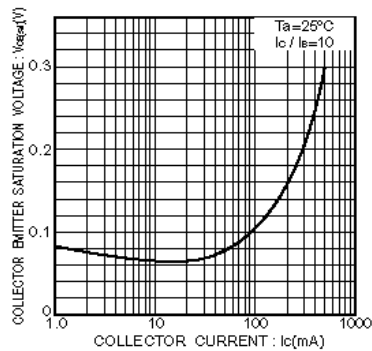


Fig.2 Collector-emitter saturation voltage vs. collector current

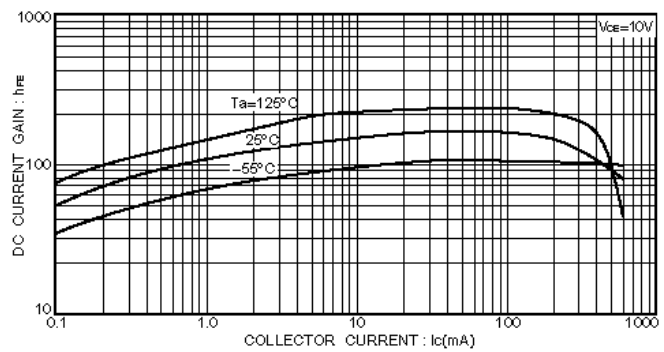


Fig.4 DC current gain vs. collector current(II)

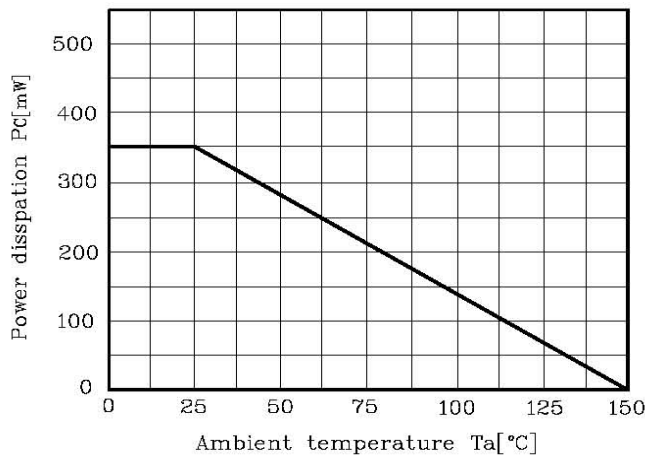


Fig.5 P_C - T_a

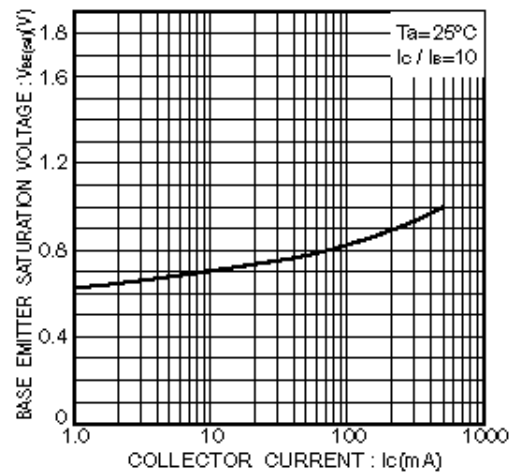


Fig.6 Base-emitter saturation voltage vs. collector current

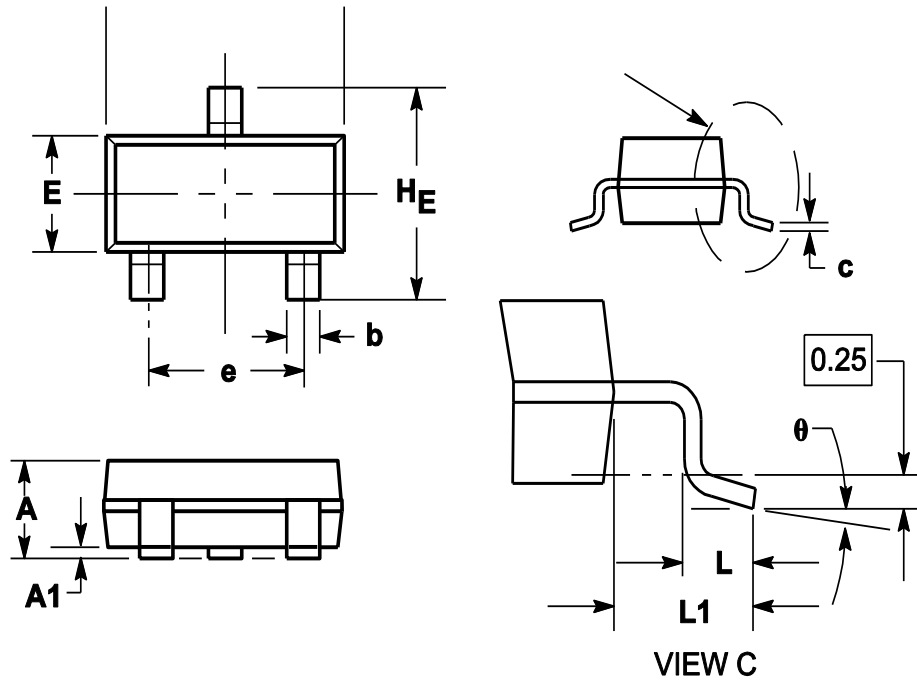


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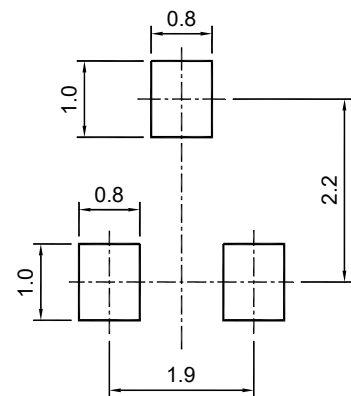
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Package Outline

SOT-23



Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.900	1.025	1.150
A1	0.000	0.050	0.100
b	0.300	0.400	0.500
c	0.080	0.115	0.150
D	2.800	2.900	3.000
E	1.200	1.300	1.400
HE	2.250	2.400	2.550
e	1.800	1.900	2.000
L1	0.550REF		
L	0.300		0.500
θ	0°		8°



SOT-23

Recommended soldering pad

Ordering information

Device	Package	Shipping
MMBT2222/MMBT2222A	SOT-23	3000/Tape&Reel(7inches)