

NPN Transistors

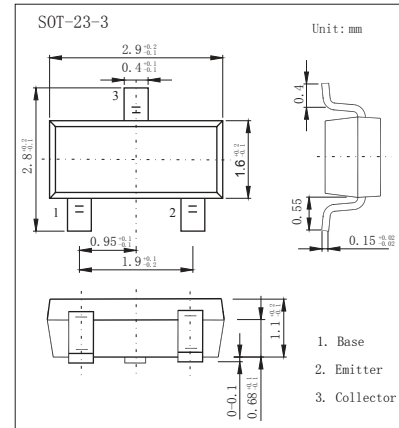
MMBT2222A (KMBT2222A)

■ Features

- Epitaxial planar die construction.
- Complementary PNP type available(MMBT2907A)

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

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CB0}	70	V
Collector - Emitter Voltage	V_{CE0}	40	
Emitter - Base Voltage	V_{EB0}	6	
Collector Current - Continuous	I_c	600	mA
Power Dissipation	P_D	250	mW
Thermal resistance from junction to ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 150	

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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_c = 100 \mu\text{A}, I_E = 0$	75			V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_c = 10 \text{ mA}, I_B = 0$	40			V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100 \mu\text{A}, I_C = 0$	6			V
Collector cutoff current	I_{CBO}	$V_{CB}=60\text{V}, I_E=0$			100	nA
Collector cut-off current	I_{CEX}	$V_{CE}=30\text{V}, V_{BE(off)}=-3\text{V}$			10	nA
Emitter cutoff current	I_{EBO}	$V_{EB}=3\text{V}, I_C=0$			100	nA
DC current gain	h_{FE}	$V_{CE}=10\text{V}, I_c=0.1\text{mA}$	40			
		$V_{CE}=10\text{V}, I_c=150\text{mA}$	100		300	
		$V_{CE}=10\text{V}, I_c=500\text{mA}$	42			
collector-emitter saturation voltage *	$V_{CE(sat)}$	$I_c = 150 \text{ mA}; I_B = 15 \text{ mA}$			0.3	V
		$I_c = 500 \text{ mA}; I_B = 50 \text{ mA}$			1	V
base-emitter saturation voltage *	$V_{BE(sat)}$	$I_c = 150 \text{ mA}; I_B = 15 \text{ mA}$	0.6		1.2	V
		$I_c = 500 \text{ mA}; I_B = 50 \text{ mA}$			2	V
Transition frequency	f_T	$I_c = 20 \text{ mA}; V_{CE} = 20 \text{ V}; f = 100 \text{ MHz}$	300			MHz
Delay time	t_d	$V_{CC}=30\text{V}, V_{BE(off)}=-0.5\text{V}, I_c=150\text{mA}, I_{B1}=15\text{mA}$			10	ns
Rise time	t_r				25	ns
Storage time	t_s				225	ns
Fall time	t_f				60	ns

* pulse test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

■ Marking

Marking	1P
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■ Typical Characteristics

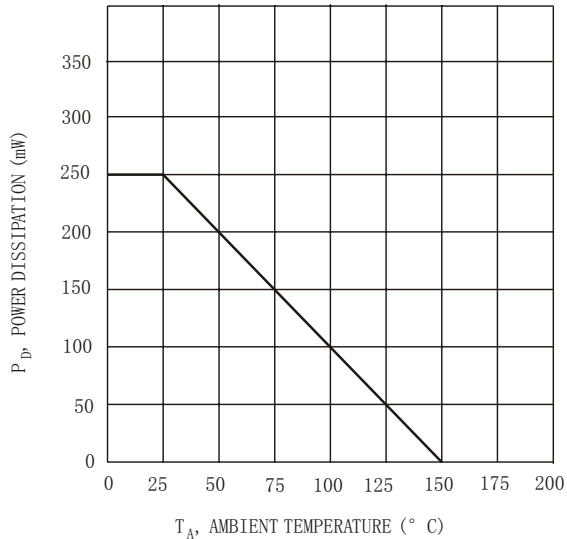


Fig. 1, Max Power Dissipation vs Ambient Temperature

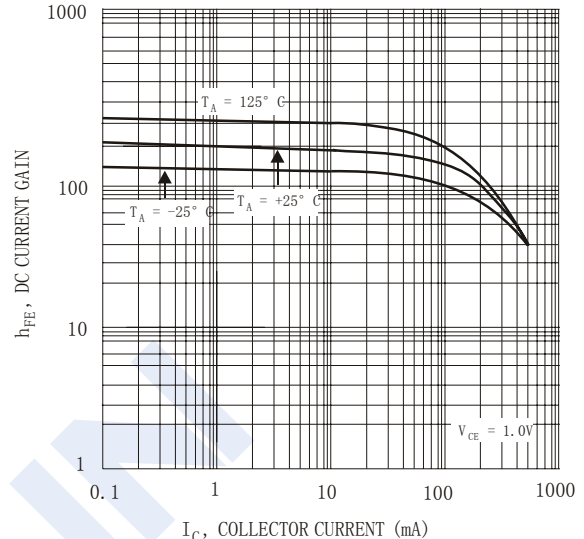


Fig. 2, Typical DC Current Gain vs Collector Current

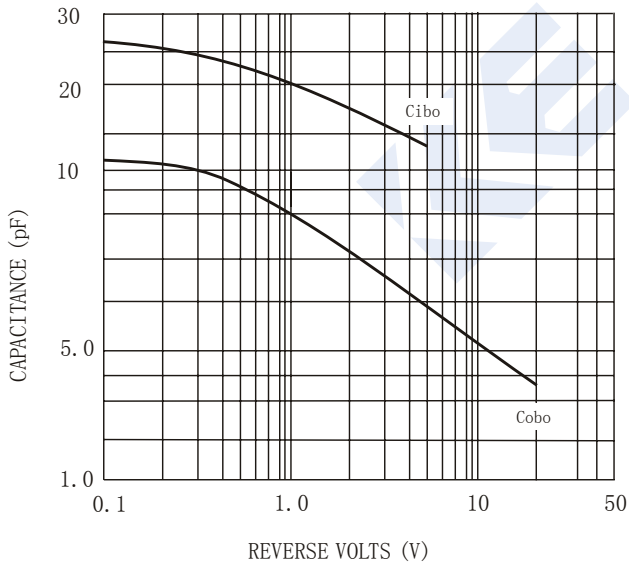


Fig. 3 Typical Capacitance

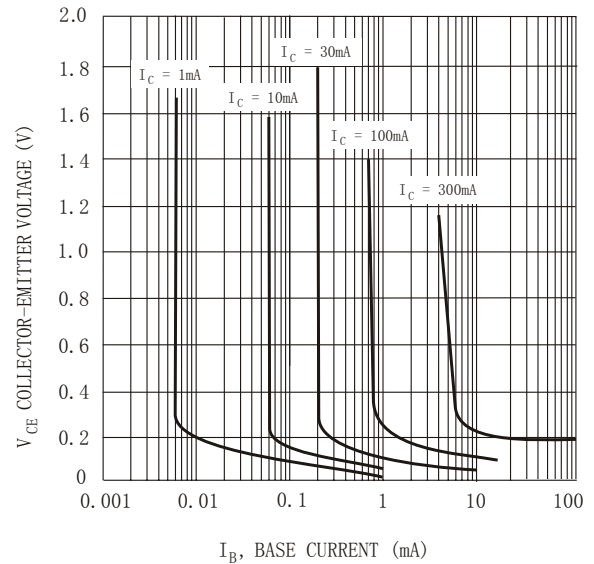


Fig. 4 Typical Collector Saturation Voltage