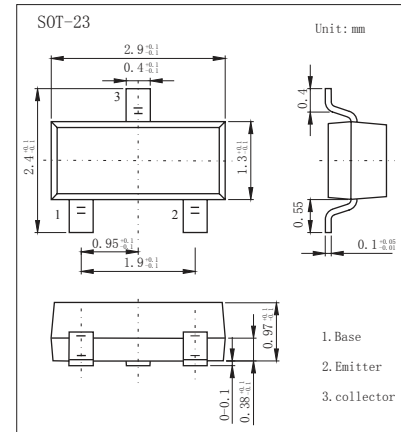


## NPN Transistors

## 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	$I_{CEX}$	$V_{CE}=30\text{V}, V_{EB(off)}=-3\text{V}$			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  $\leq 2.0\%$ .

### Mrarking

Marking	1P
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# NPN Transistors

## MMBT2222A (KMBT2222A)

■ Typical Characteristics

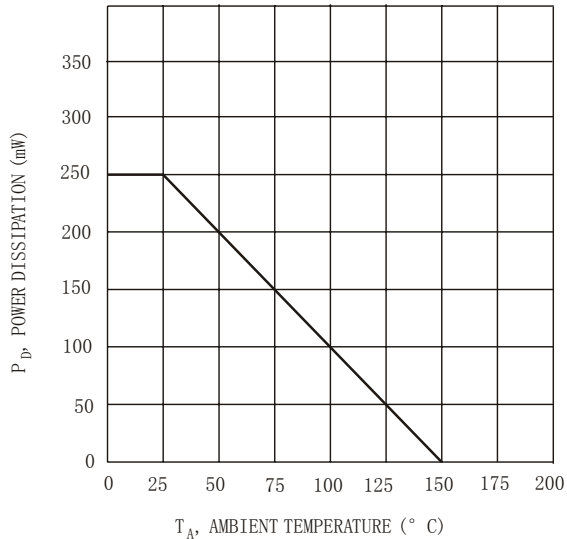


Fig. 1, Max Power Dissipation vs Ambient Temperature

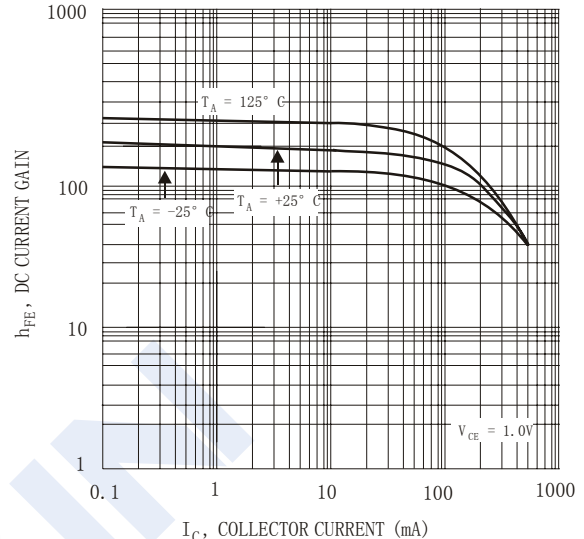


Fig. 2, Typical DC Current Gain vs Collector Current

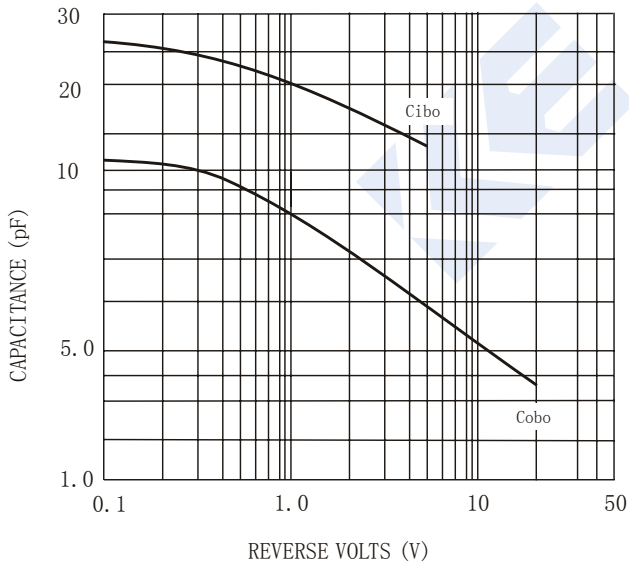


Fig. 3 Typical Capacitance

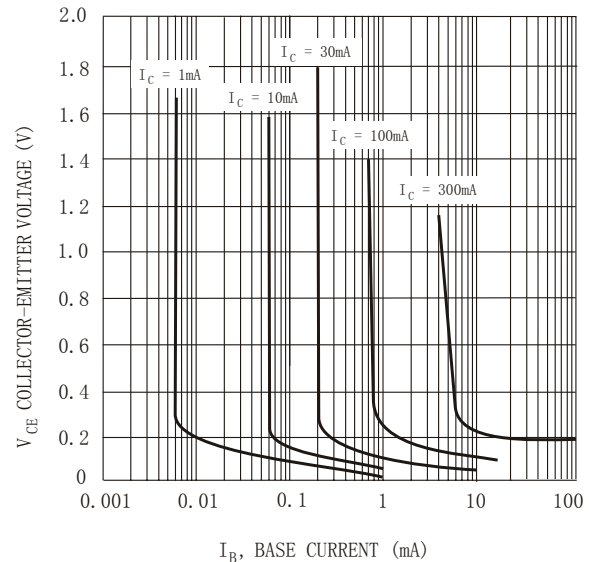


Fig. 4 Typical Collector Saturation Voltage