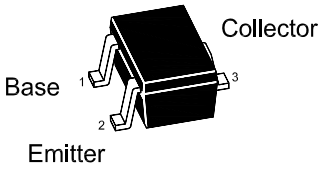
迈拓电子
MAITUO ELECTRONIC

MMBT2222E/AE NPN Silicon Epitaxial Planar Medium Power Transistor

for switching and amplifier applications



SOT-523

Marking :

MMBT2222E : M1B

MMBT2222AE :1P

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value		Unit
		MMBT2222E	MMBT2222AE	
Collector Base Voltage	V_{CBO}	60	75	V
Collector Emitter Voltage	V_{CEO}	30	40	V
Emitter Base Voltage	V_{EBO}	5	6	V
Collector Current	I_C	600		mA
Total Power Dissipation	P_{tot}	200		mW
Junction Temperature	T_j	150		°C
Storage Temperature Range	T_S	-55 to +150		°C

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Characteristics at T_a = 25 °C

Parameter		Symbol	Min.	Max.	Unit
DC Current Gain					
at V_{CE} = 10 V, I_C = 0.1 mA		h_{FE}	35	-	-
at V_{CE} = 10 V, I_C = 1 mA		h_{FE}	50	-	-
at V_{CE} = 10 V, I_C = 10 mA		h_{FE}	75	-	-
at V_{CE} = 1 V, I_C = 150 mA		h_{FE}	50	-	-
at V_{CE} = 10 V, I_C = 150 mA		h_{FE}	100	300	-
at V_{CE} = 10 V, I_C = 500 mA	MMBT2222E	h_{FE}	30	-	-
	MMBT2222AE	h_{FE}	40	-	-
Collector Base Voltage at I_C = 10 µA	MMBT2222E	V_{CBO}	60	-	V
	MMBT2222AE		75	-	
Collector Emitter Voltage at I_C = 10 mA	MMBT2222E	V_{CEO}	30	-	V
	MMBT2222AE		40	-	
Emitter Base Voltage at I_E = 10 µA	MMBT2222E	V_{EBO}	5	-	V
	MMBT2222AE		6	-	
Collector Base Cutoff Current at V_{CB} = 50 V	MMBT2222E	I_{CBO}	-	100	nA
at V_{CB} = 60 V	MMBT2222AE		-	100	
Emitter Base Cutoff Current at V_{EB} = 3 V		I_{EBO}	-	100	nA
Collector Emitter Saturation Voltage at I_C = 150 mA, I_B = 15 mA	MMBT2222E	$V_{CE(sat)}$	-	0.4	V
	MMBT2222AE		-	0.3	
at I_C = 500 mA, I_B = 50 mA	MMBT2222E		-	1.6	
	MMBT2222AE		-	1	
Base Emitter Saturation Voltage at I_C = 150 mA, I_B = 15 mA	MMBT2222E	$V_{BE(sat)}$	-	1.3	V
	MMBT2222AE		0.6	1.2	
at I_C = 500 mA, I_B = 50 mA	MMBT2222E		-	2.6	
	MMBT2222AE		-	2	
Transition Frequency at V_{CE} = 20 V, $-I_E$ = 20 mA, f = 100 MHz		f_T	300	-	MHz
Collector Output Capacitance at V_{CB} = 10 V, f = 100 KHz		C_{ob}	-	8	pF
Emitter Input Capacitance at V_{EB} = 0.5 V, f = 100 KHz		C_{ib}	-	25	pF
Delay Time at V_{CC} = 30 V, $V_{BE(OFF)}$ = 0.5 V, I_C = 150 mA, I_{B1} = 15 mA		td	-	10	ns
Rise Time at V_{CC} = 30 V, $V_{BE(OFF)}$ = 0.5 V, I_C = 150 mA, I_{B1} = 15 mA		tr	-	25	ns
Storage Time at V_{CC} = 30 V, I_C = 150 mA, I_{B1} = $-I_{B2}$ = 15 mA		tstg	-	225	ns
Fall Time at V_{CC} = 30 V, I_C = 150 mA, I_{B1} = $-I_{B2}$ = 15 mA		tf	-	60	ns

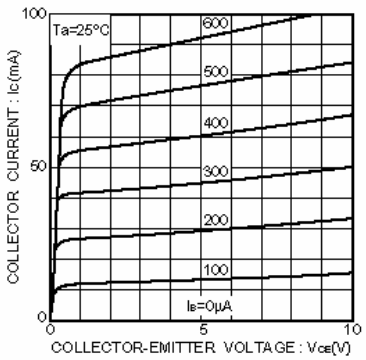

Fig.1 Grounded emitter output characteristics

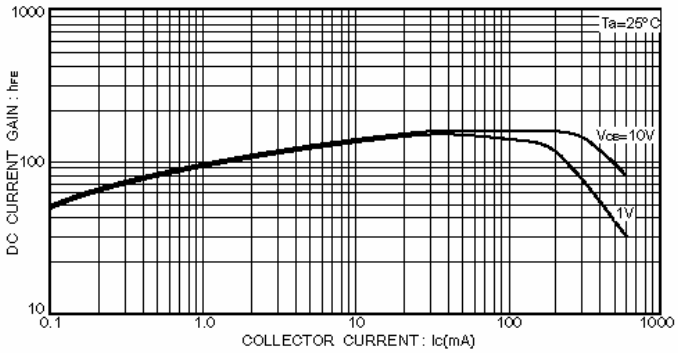

Fig.3 DC current gain vs. collector current(I)

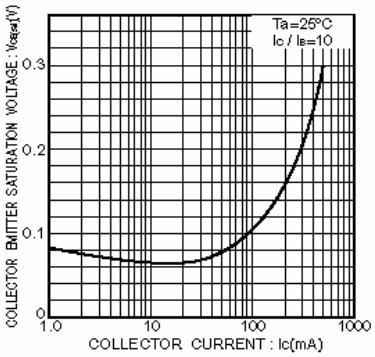

Fig.2 Collector-emitter saturation voltage vs. collector current

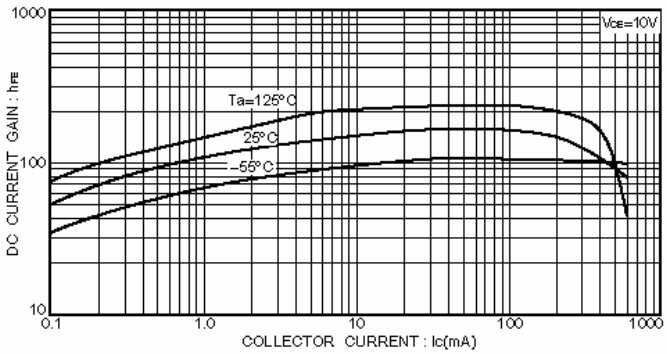

Fig.4 DC current gain vs. collector current(II)

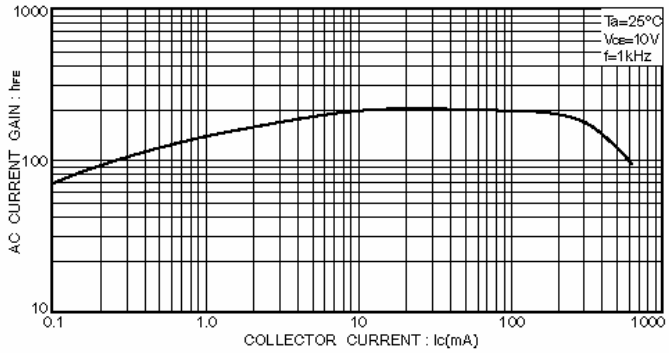

Fig.5 AC current gain vs. collector current

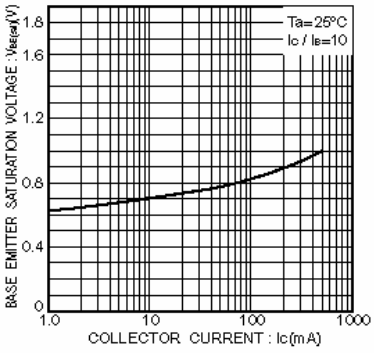

Fig.6 Base-emitter saturation voltage vs. collector current

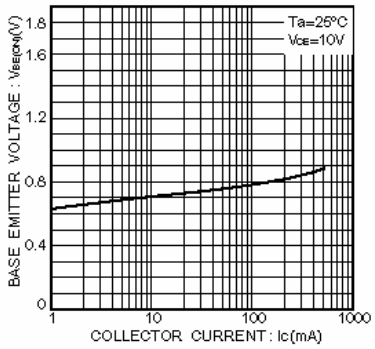

Fig.7 Grounded emitter propagation characteristics

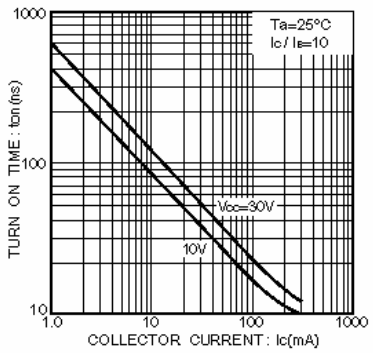

Fig.8 Turn-on time vs. collector current

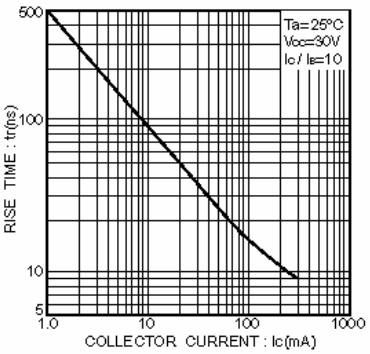

Fig.9 Rise time vs. collector current

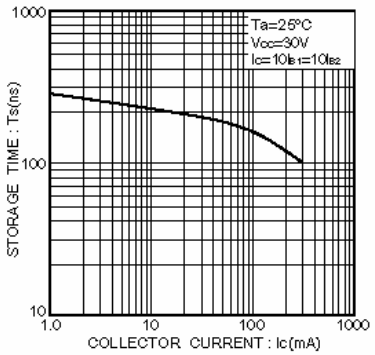

Fig.10 Storage time vs. collector current

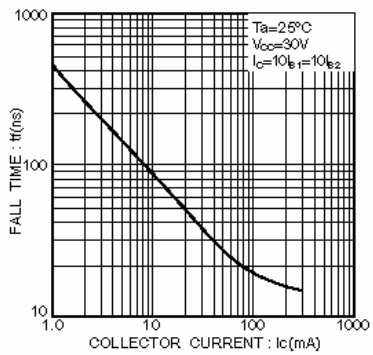

Fig.11 Fall time vs. collector current

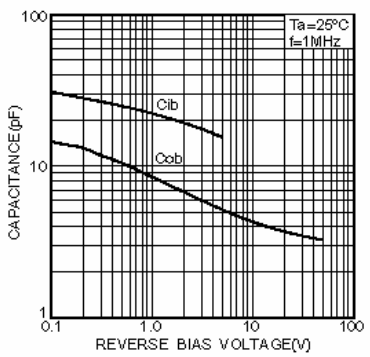

Fig.12 Input / output capacitance vs. voltage

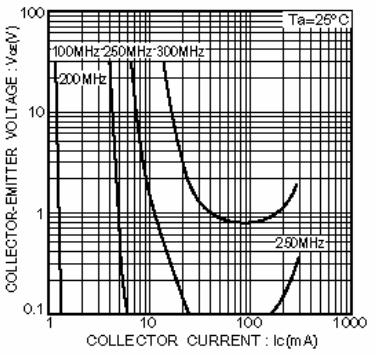

Fig.13 Gain bandwidth product

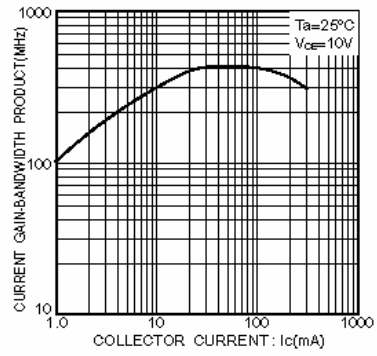

Fig.14 Gain bandwidth product vs. collector current

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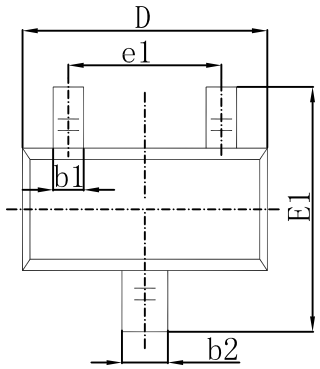
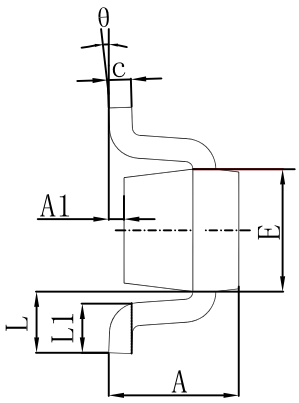
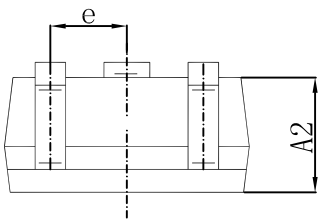
SOT-523 Package Outline Dimensions

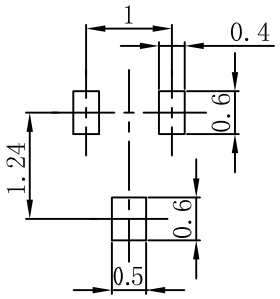






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

SOT-523 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.