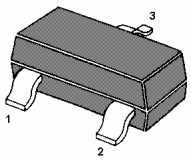
MMBT2222 / MMBT2222A

NPN Silicon Epitaxial Planar Medium Power Transistor
for switching and amplifier applications



1. Base 2. Emitter 3. Collector

SOT-23 Plastic Package

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value		Unit
		MMBT2222	MMBT2222A	
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

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	MMBT2222	h_{FE}	30	-	-
	MMBT2222A	h_{FE}	40	-	-
Collector Base Voltage					
at I_C = 10 µA	MMBT2222	V_{CBO}	60	-	V
	MMBT2222A		75	-	
Collector Emitter Voltage					
at I_C = 10 mA	MMBT2222	V_{CEO}	30	-	V
	MMBT2222A		40	-	
Emitter Base Voltage					
at I_E = 10 µA	MMBT2222	V_{EBO}	5	-	V
	MMBT2222A		6	-	
Collector Base Cutoff Current					
at V_{CB} = 50 V	MMBT2222	I_{CBO}	-	100	nA
at V_{CB} = 60 V	MMBT2222A		-	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	MMBT2222	$V_{CE(sat)}$	-	0.4	V
	MMBT2222A		-	0.3	
at I_C = 500 mA, I_B = 50 mA	MMBT2222		-	1.6	
	MMBT2222A		-	1	
Base Emitter Saturation Voltage					
at I_C = 150 mA, I_B = 15 mA	MMBT2222	$V_{BE(sat)}$	-	1.3	V
	MMBT2222A		0.6	1.2	
at I_C = 500 mA, I_B = 50 mA	MMBT2222		-	2.6	
	MMBT2222A		-	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

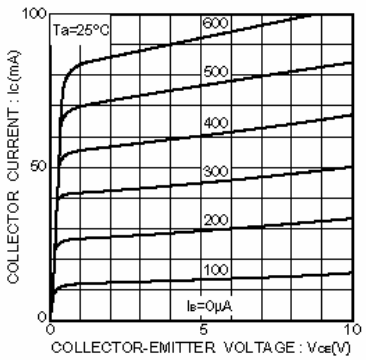


Fig.1 Grounded emitter output characteristics

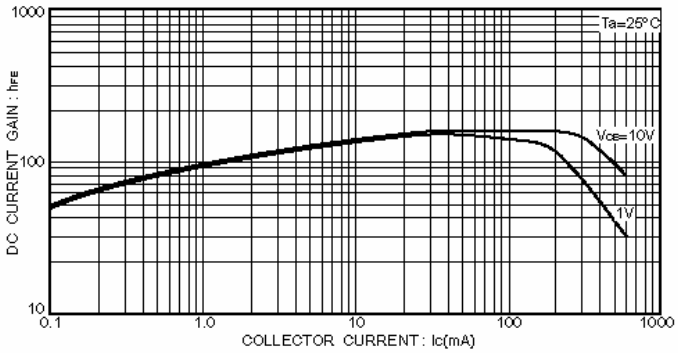


Fig.3 DC current gain vs. collector current(I)

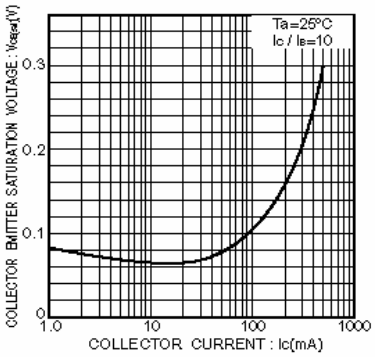


Fig.2 Collector-emitter saturation voltage vs. collector current

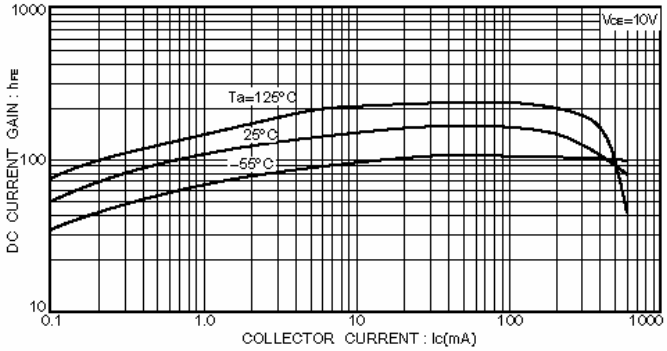


Fig.4 DC current gain vs. collector current(II)

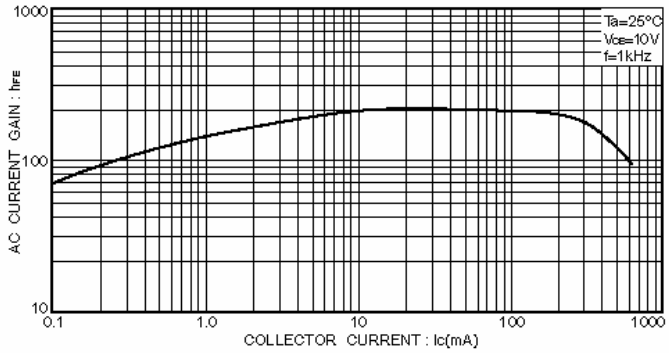


Fig.5 AC current gain vs. collector current

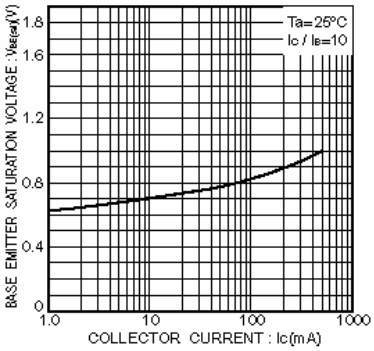


Fig.6 Base-emitter saturation voltage vs. collector current

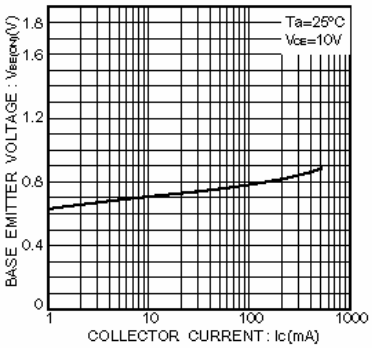


Fig.7 Grounded emitter propagation characteristics

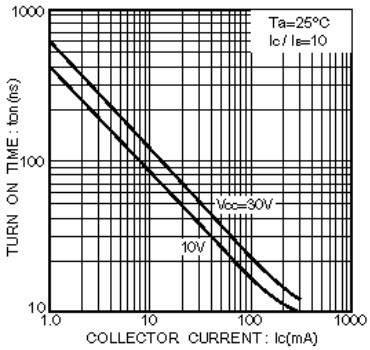


Fig.8 Turn-on time vs. collector current

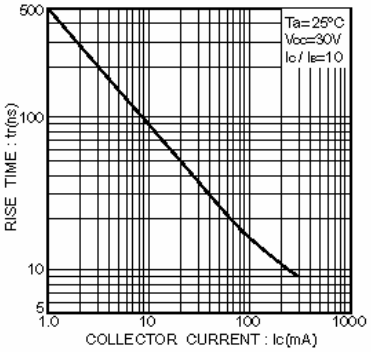


Fig.9 Rise time vs. collector current

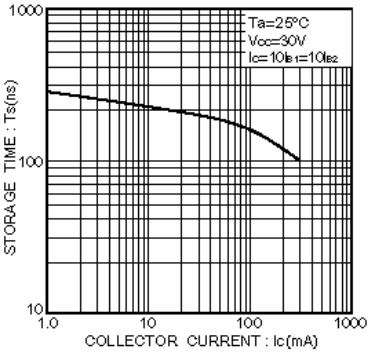


Fig.10 Storage time vs. collector current

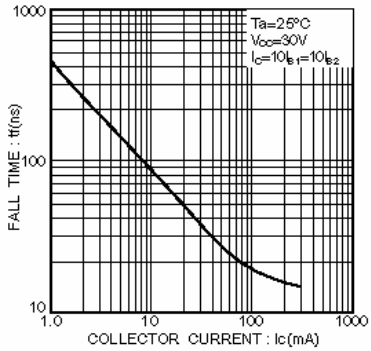


Fig.11 Fall time vs. collector current

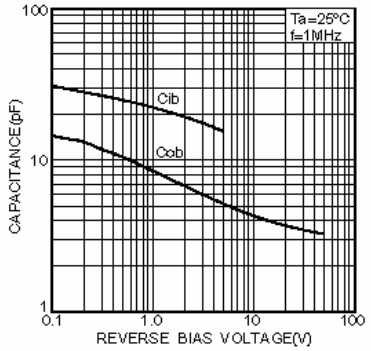


Fig.12 Input / output capacitance vs. voltage

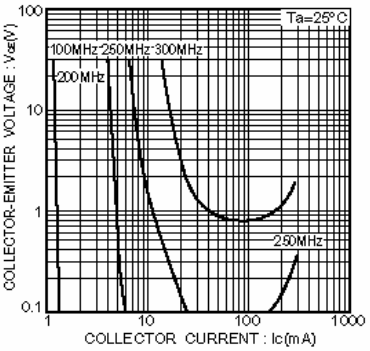


Fig.13 Gain bandwidth product

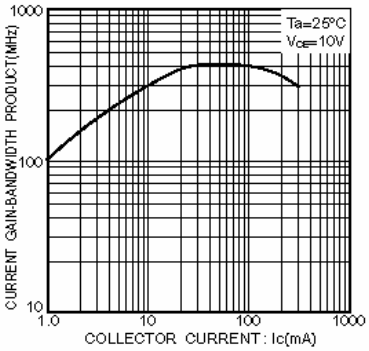


Fig.14 Gain bandwidth product vs. collector current