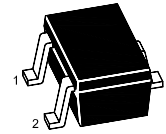


# MMBT2222W / MMBT2222AW

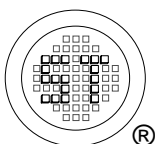
**NPN Silicon Epitaxial Planar Medium Power Transistor**  
for switching and amplifier applications



1.Base 2.Emitter 3.Collector  
SOT-323 Plastic Package

## Absolute Maximum Ratings ( $T_a = 25\text{ }^\circ\text{C}$ )

Parameter	Symbol	Value		Unit
		MMBT2222W	MMBT2222AW	
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		$^\circ\text{C}$
Storage Temperature Range	$T_S$	-55 to +150		$^\circ\text{C}$



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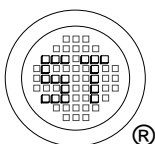


Dated : 15/03/2006

# MMBT2222W / MMBT2222AW

## Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain				
at $V_{CE} = 10\text{ V}$ , $I_C = 0.1\text{ mA}$	$h_{FE}$	35	-	-
at $V_{CE} = 10\text{ V}$ , $I_C = 1\text{ mA}$	$h_{FE}$	50	-	-
at $V_{CE} = 10\text{ V}$ , $I_C = 10\text{ mA}$	$h_{FE}$	75	-	-
at $V_{CE} = 1\text{ V}$ , $I_C = 150\text{ mA}$	$h_{FE}$	50	-	-
at $V_{CE} = 10\text{ V}$ , $I_C = 150\text{ mA}$	$h_{FE}$	100	300	-
at $V_{CE} = 10\text{ V}$ , $I_C = 500\text{ mA}$	$h_{FE}$	30	-	-
	MMBT2222W			
	MMBT2222AW			
Collector Base Voltage				
at $I_C = 10\text{ }\mu\text{A}$	$V_{CBO}$	60	-	V
	MMBT2222W	75	-	
	MMBT2222AW			
Collector Emitter Voltage				
at $I_C = 10\text{ mA}$	$V_{CEO}$	30	-	V
	MMBT2222W	40	-	
	MMBT2222AW			
Emitter Base Voltage				
at $I_E = 10\text{ }\mu\text{A}$	$V_{EBO}$	5	-	V
	MMBT2222W	6	-	
	MMBT2222AW			
Collector Base Cutoff Current				
at $V_{CB} = 50\text{ V}$	$I_{CBO}$	-	100	nA
at $V_{CB} = 60\text{ V}$		-	100	
	MMBT2222W			
	MMBT2222AW			
Emitter Base Cutoff Current				
at $V_{EB} = 3\text{ V}$	$I_{EBO}$	-	100	nA
	MMBT2222W			
	MMBT2222AW			
Collector Emitter Saturation Voltage				
at $I_C = 150\text{ mA}$ , $I_B = 15\text{ mA}$	$V_{CE(sat)}$	-	0.4	V
	MMBT2222W	-	0.3	
	MMBT2222AW	-	1.6	
at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$		-	1	
	MMBT2222W			
	MMBT2222AW			
Base Emitter Saturation Voltage				
at $I_C = 150\text{ mA}$ , $I_B = 15\text{ mA}$	$V_{BE(sat)}$	-	1.3	V
	MMBT2222W	0.6	1.2	
	MMBT2222AW	-	2.6	
at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$		-	2	
	MMBT2222W			
	MMBT2222AW			
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
Emitter Input Capacitance				
at $V_{EB} = 0.5\text{ V}$ , $f = 100\text{ KHz}$	$C_{ib}$	-	25	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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Certificate No. 05103



ISO 14001:2004  
Certificate No. 7116



ISO 9001:2000  
Certificate No. 0506088

Dated : 15/03/2006

# MMBT2222W / MMBT2222AW

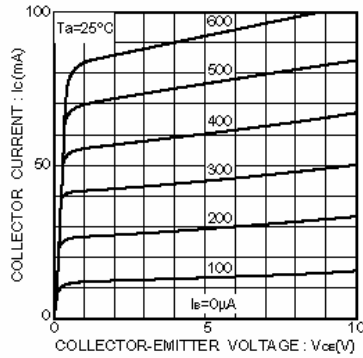


Fig.1 Grounded emitter output characteristics

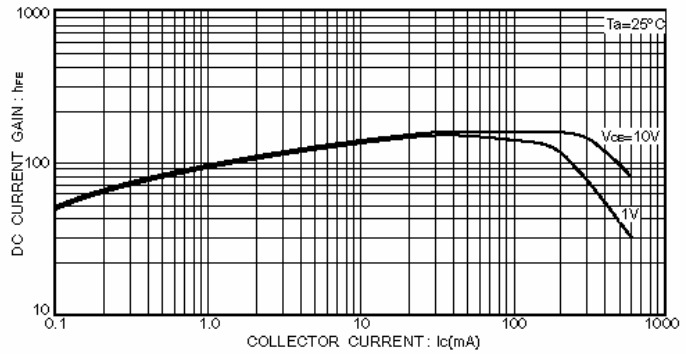


Fig.3 DC current gain vs. collector current(I)

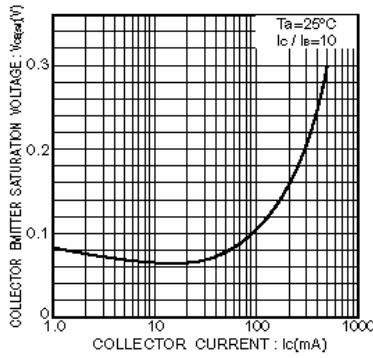


Fig.2 Collector-emitter saturation voltage vs. collector current

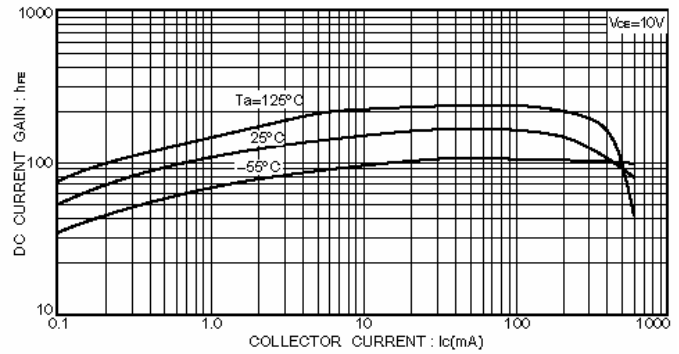


Fig.4 DC current gain vs. collector current(II)

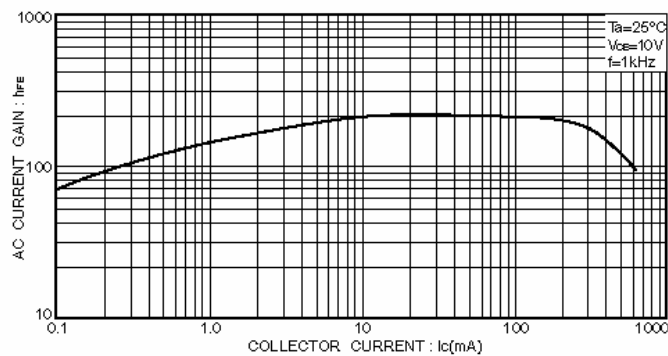


Fig.5 AC current gain vs. collector current

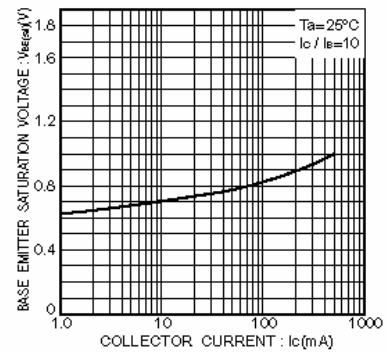
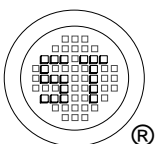


Fig.6 Base-emitter saturation voltage vs. collector current



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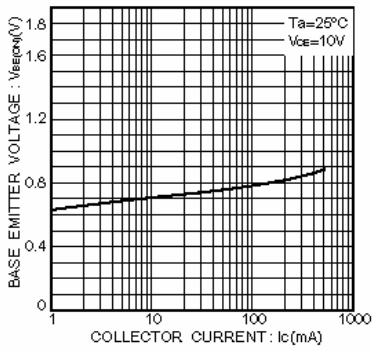


Fig.7 Grounded emitter propagation characteristics

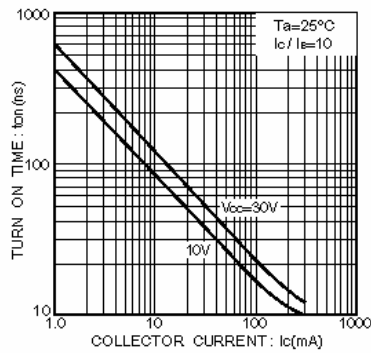


Fig.8 Turn-on time vs. collector current

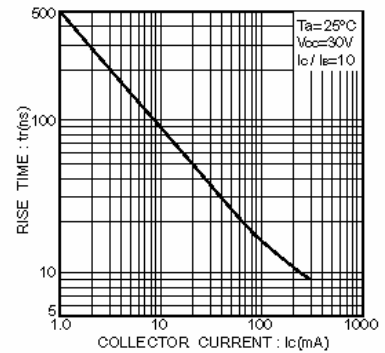


Fig.9 Rise time vs. collector current

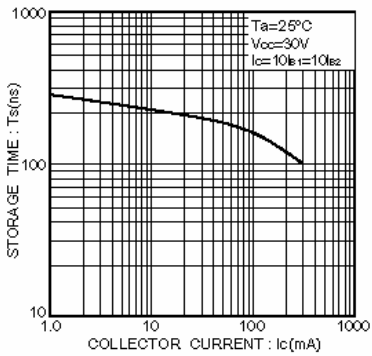


Fig.10 Storage time vs. collector current

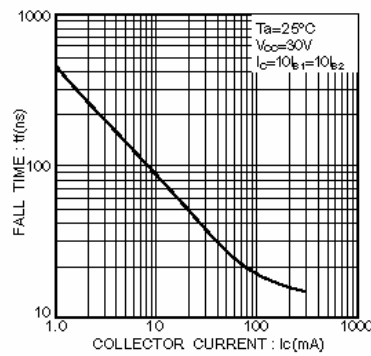


Fig.11 Fall time vs. collector current

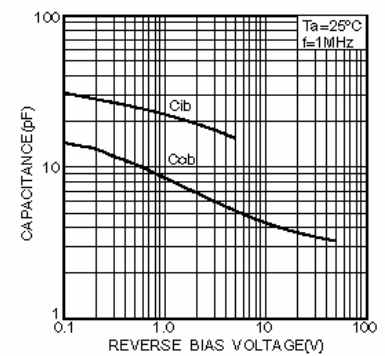


Fig.12 Input / output capacitance vs. voltage

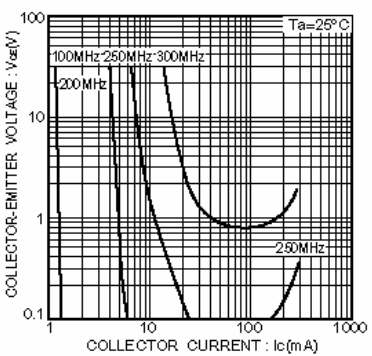


Fig.13 Gain bandwidth product

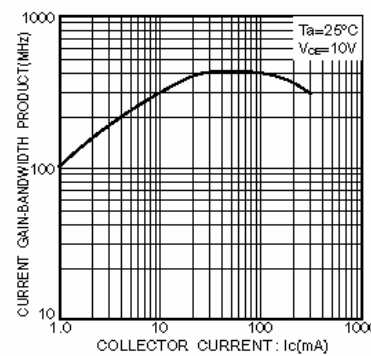
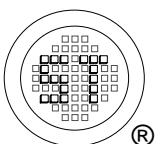


Fig.14 Gain bandwidth product vs. collector current



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