



SEMICONDUCTOR

MMBT2222/ALT1

Shandong Yiguang Electronic Joint stock Co., Ltd

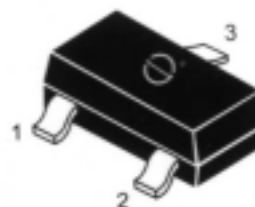
TECHNICAL DATA

NPN EPITAXIAL SILICON TRANSISTOR

GENERAL PURPOSE TRANSISTOR

- * Complement to MMBT2907/ALT1
- * Collector Dissipation: $P_c(\max)=225\text{mW}$

Package:SOT-23



ABSOLUTE MAXIMUM RATINGS at Ta=25

Characteristic	Symbol	Rating		Unit
		2222	2222A	
Collector-Base Voltage	Vcbo	60	75	V
Collector-Emitter Voltage	Vceo	30	40	V
Emitter-Base Voltage	Vebo	5	6	V
Collector Current	Ic	600		mA
Collector Dissipation Ta=25 *	P _D	225		mW
Junction Temperature	Tj	150		
Storage Temperature	Tstg	-55-150		

PIN:	1	2	3
STYLE			
NO.1	B	E	C

ELECTRICAL CHARACTERISTICS at Ta=25

Characteristic	Symbol	Min	Max	Unit	Test Conditions
Collector-Base Breakdown Voltage MMBT2222 MMBT2222A	BVcbo	60 75		V	Ic= 10uA Ie=0
Collector-Emitter Breakdown Voltage MMBT2222 MMBT2222A	BVceo	30 40		V	Ic= 10mA Ib=0
Emitter-Base Breakdown Voltage MMBT2222 MMBT2222A	BVebo	5 6		V	Ie= 10uA Ic=0
Emitter Cutoff Current MMBT2222A	Icex		10	nA	Vce=60V Veb=3V
Collect Cutoff Current MMBT2222 MMBT2222A	Icbo		10	nA	Vcb= 50V Ie=0 Vcb= 60V Ie=0
Collect Cutoff Current MMBT2222 MMBT2222A	Icbo		10	nA	Vcb=50VIe=0 Ta=125 Vcb=60VIe=0 Ta=125
Collect Cutoff Current MMBT2222A	Iebo		10	nA	Vcb=3V Ic=0
DC Current Gain	Hfe1	35			Vce=10VIc= 0.1mA
DC Current Gain	Hfe2	50			Vce= 10V Ic= 1mA
DC Current Gain	Hfe3	75			Vce=10V Ic= 10mA
DC Current Gain	Hfe4	100	300		Vce=10V Ic= 150mA
DC Current Gain	Hfe5	50			Vce= 1.0V Ic= 150mA
DC Current Gain MMBT2222 MMBT2222A	Hfe6	30 40			Vce=10V Ic= 500mA



SEMI CONDUCTOR

MMBT2222/ALT1

Shandong Yiguang Electronic Joint stock Co., Ltd

TECHNICAL DATA

NPN EPITAXIAL SILICON TRANSISTOR

ELECTRICAL CHARACTERISTICS at Ta=25 (cont inued)

Characteristic	Symbol	Min	Max	Unit	Test Conditions
Collector-Emitter Saturation Voltage MMBT2222 MMBT2222A	V _{ce(sat)}		0.4 0.3	V	I _c =150mA I _b = 15mA
Collector-Emitter Saturation Voltage MMBT2222 MMBT2222A	V _{ce(sat)}		1.6 1.0	V	I _c =500mA I _b = 50mA
Base-Emitter Saturation Voltage MMBT2222 MMBT2222A	V _{be(sat)}	0.6	1.3 1.2	V	I _c =150mA I _b = 15mA
Base-Emitter Saturation Voltage MMBT2222 MMBT2222A	V _{be(sat)}		2.6 2.0	V	I _c =500mA I _b = 50mA
Iutput Base Capacitance MMBT2222 MMBT2222A	C _{ibo}		30 25	PF	V _{EB} = 0.5 Vdc, I _C = 0, f = 1.0 MHz
Output Base Capacitance	C _{obo}		8	PF	V _{cb} =10V I _e =0 f=1MHz
Noise Figure	NF		10	dB	V _{ce} = 10V I _c = 0.1mA f=1KHz R _s =2KΩ
Current Gain-Bandwidth Product MMBT2222 MMBT2222A	f _T	250 300		MHz	V _{ce} = 20V I _c = 20mA f=100MHz

SWITCHING CHARACTERISTICS

Characteristic	Symbol	Min	Max	Unit	Test Conditions
Delay Time	t _d		10	ns	(V _{CC} = 30 Vdc, V _{EB} (off) = - 0.5 Vdc
Rise Time	t _r		25	ns	I _C = 150 mAdc, I _{B1} = 15 mAdc)
Storage Time	t _s		225	ns	(V _{CC} = 30 Vdc, I _C = 150 mAdc
Fall Time	t _f		60	ns	I _{B1} = I _{B2} = 15 mAdc)

* Total Device Dissipation : FR=1x0.75x0.062in Board,Derate 25 .

Pulse Test : Pulse Width 300uS,Duty cycle 2%

DEVICE MARKING:

MMBT2222LT1=M1B

MMBT2222ALT1=1P



MMBT2222/ALT1

SWITCHING TIME EQUIVALENT TEST CIRCUITS

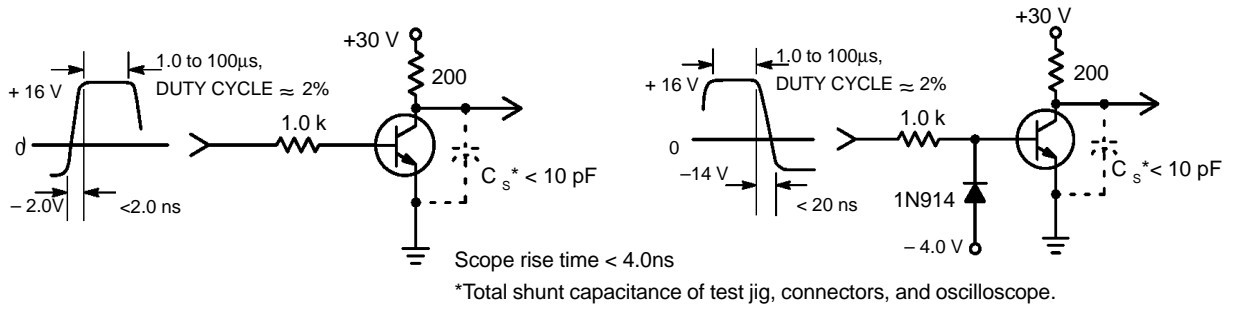


Figure 1. Turn-On Time

Figure 2. Turn-Off Time

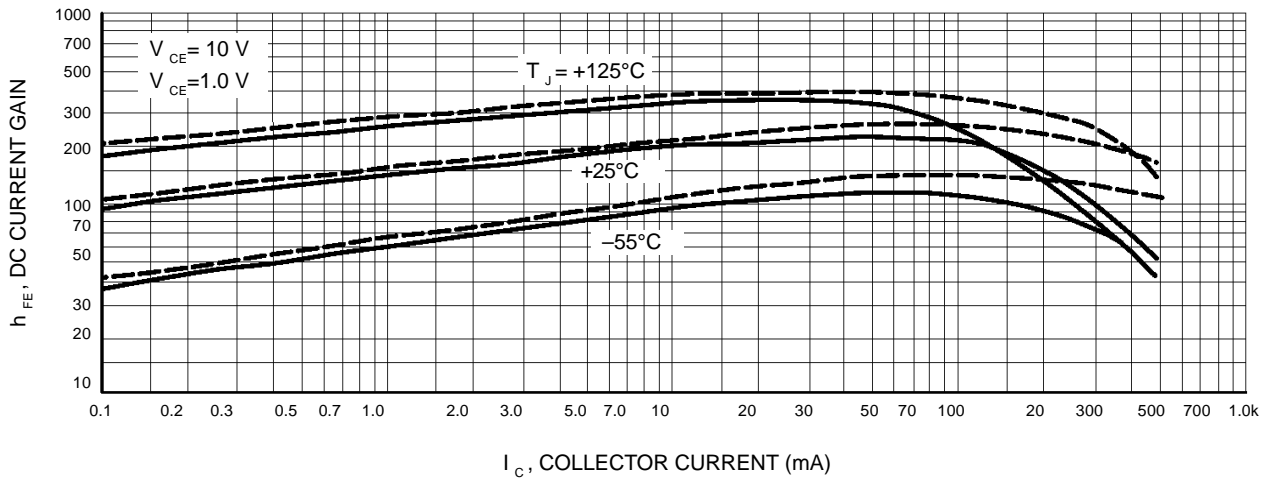


Figure 3. DC Current Gain

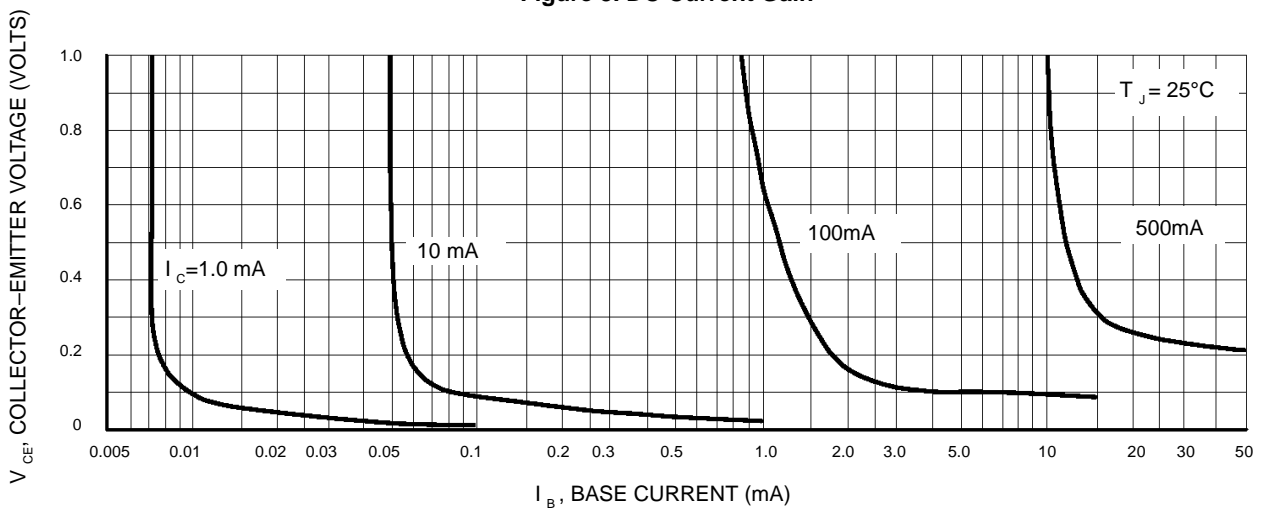
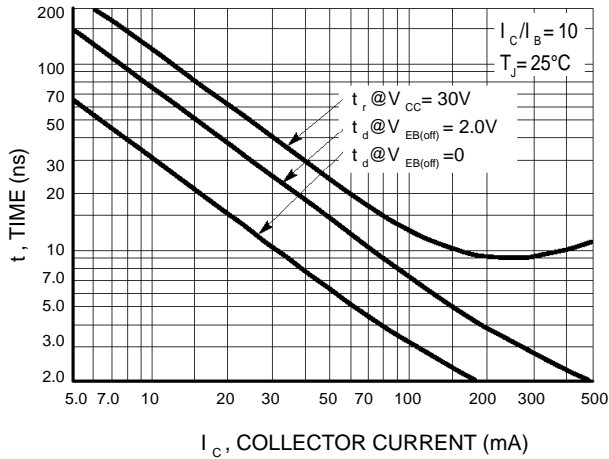


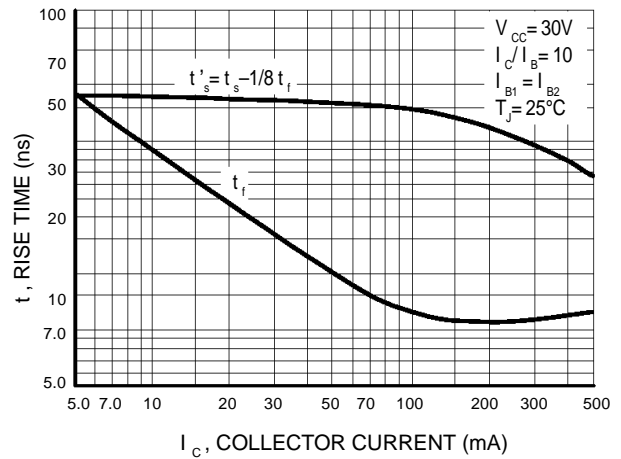
Figure 4. Collector Saturation Region



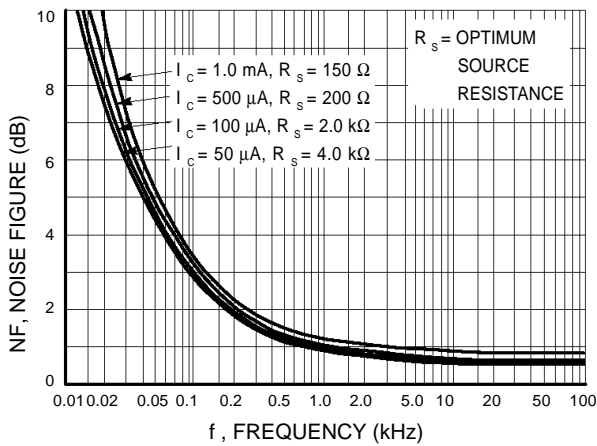
MMBT2222/ALT1



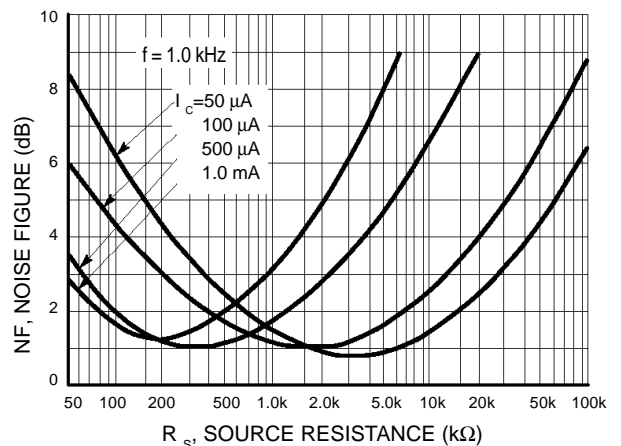
I_C , COLLECTOR CURRENT (mA)
Figure 5. Turn-On Time



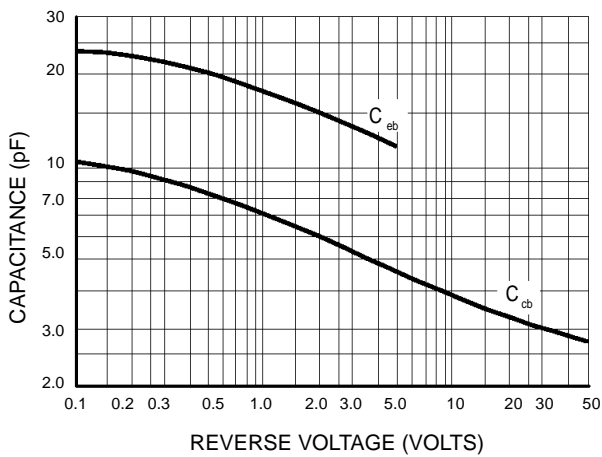
I_C , COLLECTOR CURRENT (mA)
Figure 6. Turn - Off Time



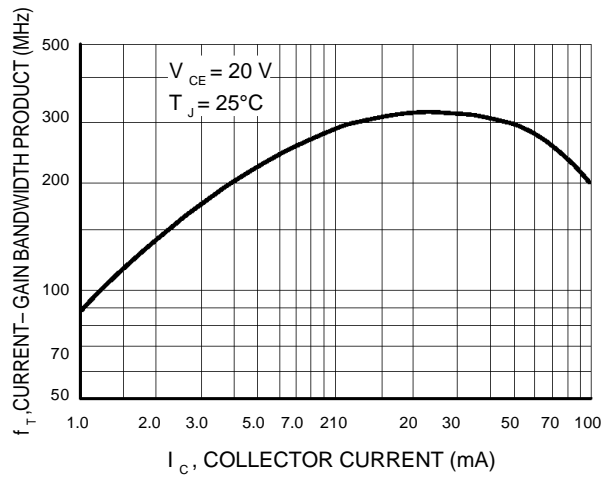
f, FREQUENCY (kHz)
Figure 7. Frequency Effects



R_s , SOURCE RESISTANCE (kΩ)
Figure 8. Source Resistance Effects



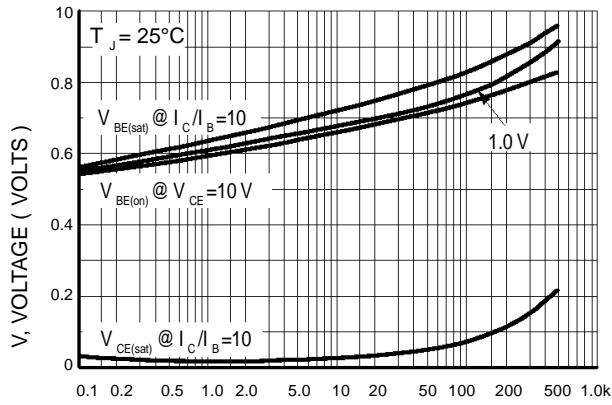
REVERSE VOLTAGE (VOLTS)
Figure 9. Capacitance



I_C , COLLECTOR CURRENT (mA)
Figure 10. Current-Gain Bandwidth Product

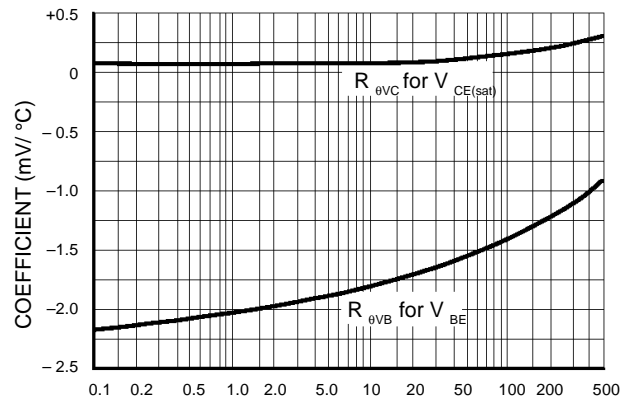


MMBT2222/ALT1



I_C , COLLECTOR CURRENT (mA)

Figure 11. "On" Voltages



I_C , COLLECTOR CURRENT (mA)

Figure 12. Temperature Coefficients