

# NPN Medium Power Transistor (Switching)

## UMT2222A / SST2222A / MMST2222A / PN2222A

### ●Features

- 1)  $BV_{CEO} > 40V$  ( $I_C=10mA$ )
- 2) Complements the UMT2907A / SST2907A / MMST2907A / PN2907A.

### ●Package, marking, and packaging specifications

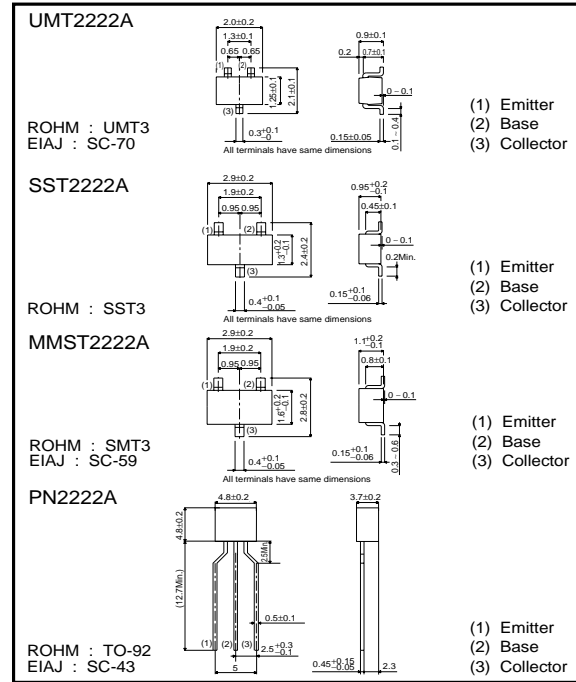
Part No.	UMT2222A	SST2222A	MMST2222A	PN2222A
Packaging type	UMT3	SST3	SMT3	TO-92
Marking	R1P	R1P	R1P	-
Code	T106	T116	T146	T93
Basic ordering unit (pieces)	3000	3000	3000	3000

### ●Absolute maximum ratings ( $T_a = 25^\circ C$ )

Parameter	Symbol	Limits	Unit	
Collector-base voltage	$V_{CB0}$	75	V	
Collector-emitter voltage	$V_{CE0}$	40	V	
Emitter-base voltage	$V_{EB0}$	6	V	
Collector current	$I_C$	0.6	A	
Collector power dissipation	$P_C$	UMT2222A, SST2222A, MMST2222A	0.2	W
		SST2222A	0.35	W *
		PN2222A	0.625	W
Junction temperature	$T_J$	150	$^\circ C$	
Storage temperature	$T_{stg}$	-55 ~ +150	$^\circ C$	

\* When mounted on a 7 x 5 x 0.6 mm ceramic board

### ●External dimensions (Units : mm)



### ●Electrical characteristics ( $T_a = 25^\circ C$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CB0}$	75	-	-	V	$I_C=10\mu A$
Collector-emitter breakdown voltage	$BV_{CE0}$	40	-	-	V	$I_C=10mA$
Emitter-base breakdown voltage	$BV_{EB0}$	6	-	-	V	$I_E=10\mu A$
Collector cutoff current	$I_{CB0}$	-	-	100	nA	$V_{CB}=60V$
Emitter cutoff current	$I_{EB0}$	-	-	100	nA	$V_{EB}=3V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.3	V	$I_C/I_B=150mA/15mA$
		-	-	1	V	$I_C/I_B=500mA/50mA$
Base-emitter saturation voltage	$V_{BE(sat)}$	0.6	-	1.2	V	$I_C/I_B=150mA/15mA$
		-	-	2	V	$I_C/I_B=500mA/50mA$
DC current transfer ratio	$h_{FE}$	35	-	-	-	$V_{CE}=10V, I_C=0.1mA$
		50	-	-	-	$V_{CE}=10V, I_C=1mA$
		75	-	-	-	$V_{CE}=10V, I_C=10mA$
		50	-	-	-	$V_{CE}=1V, I_C=150mA$
		100	-	300	-	$V_{CE}=10V, I_C=150mA$
		40	-	-	-	$V_{CE}=10V, I_C=500mA$
Transition frequency	$f_T$	300	-	-	MHz	$V_{CE}=20V, I_C=-20mA, f=100MHz$
Output capacitance	$C_{ob}$	-	-	8	pF	$V_{CB}=10V, f=100kHz$
Emitter input capacitance	$C_{ib}$	-	-	25	pF	$V_{EB}=0.5V, f=100kHz$
Delay time	$t_d$	-	-	10	ns	$V_{CC}=30V, V_{BE(OFF)}=0.5V, I_C=150mA, I_{B1}=15mA$
Rise time	$t_r$	-	-	25	ns	$V_{CC}=30V, V_{BE(OFF)}=0.5V, I_C=150mA, I_{B1}=15mA$
Storage time	$t_{stg}$	-	-	225	ns	$V_{CC}=30V, I_C=150mA, I_{B1}=-I_{B2}=15mA$
Fall time	$t_f$	-	-	60	ns	$V_{CC}=30V, I_C=150mA, I_{B1}=-I_{B2}=15mA$

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● Electrical characteristic curves

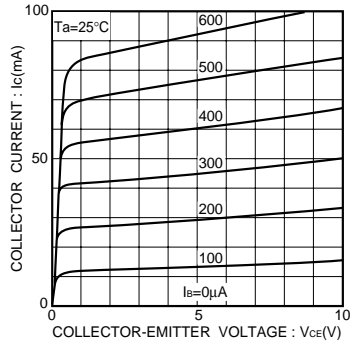


Fig.1 Grounded emitter output characteristics

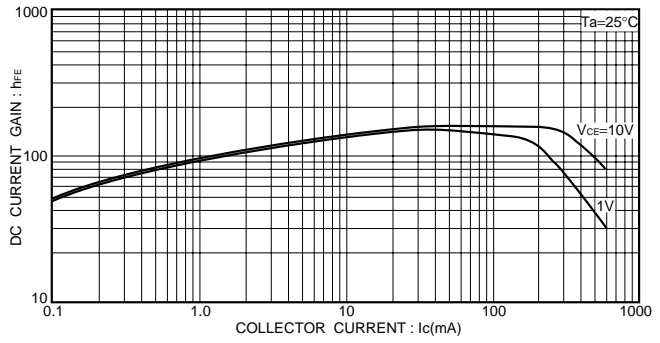


Fig.3 DC current gain vs. collector current(I)

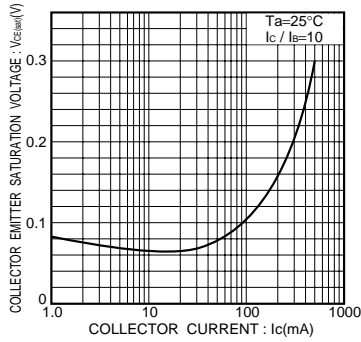


Fig.2 Collector-emitter saturation voltage vs. collector current

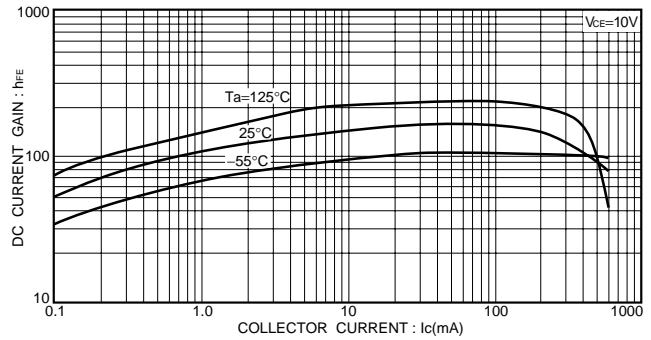


Fig.4 DC current gain vs. collector current(II)

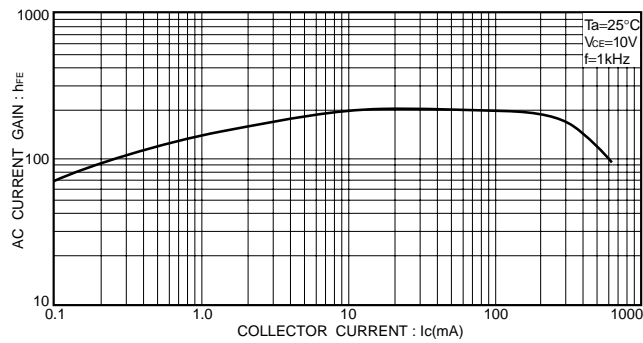


Fig.5 AC current gain vs. collector current

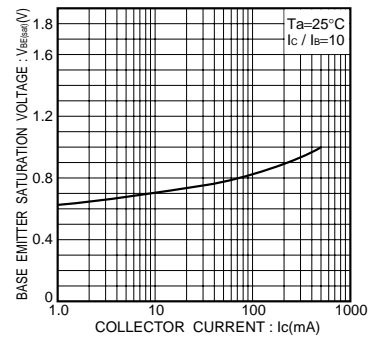


Fig.6 Base-emitter saturation voltage vs. collector current

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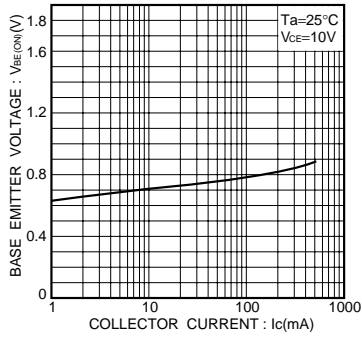


Fig.7 Grounded emitter propagation characteristics

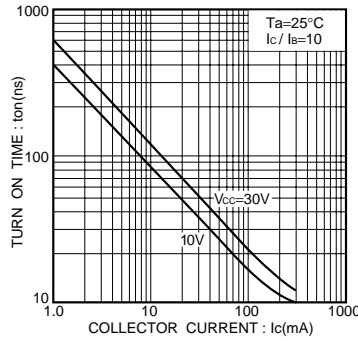


Fig.8 Turn-on time vs. collector current

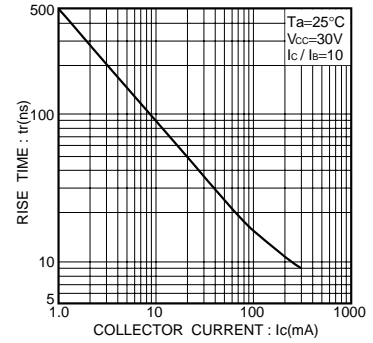


Fig.9 Rise time vs. collector current

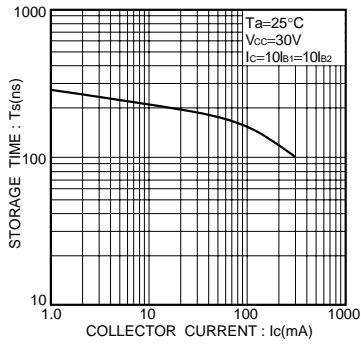


Fig.10 Storage time vs. collector current

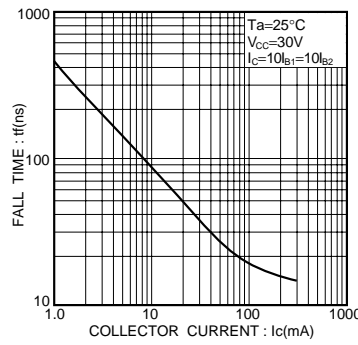


Fig.11 Fall time vs. collector current

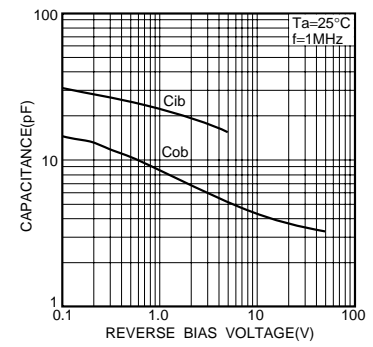


Fig.12 Input / output capacitance vs. voltage

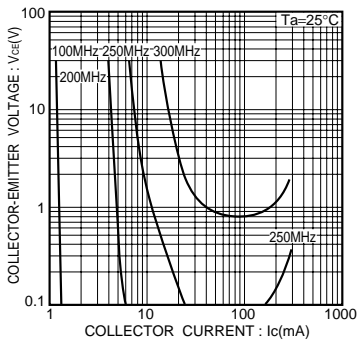


Fig.13 Gain bandwidth product

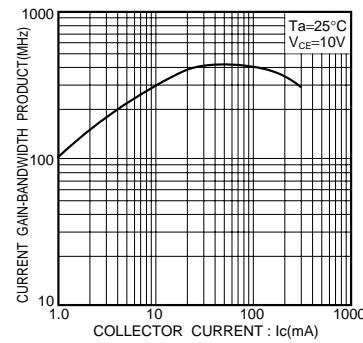


Fig.14 Gain bandwidth product vs. collector current