

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 ($T_a = 25^\circ C$)

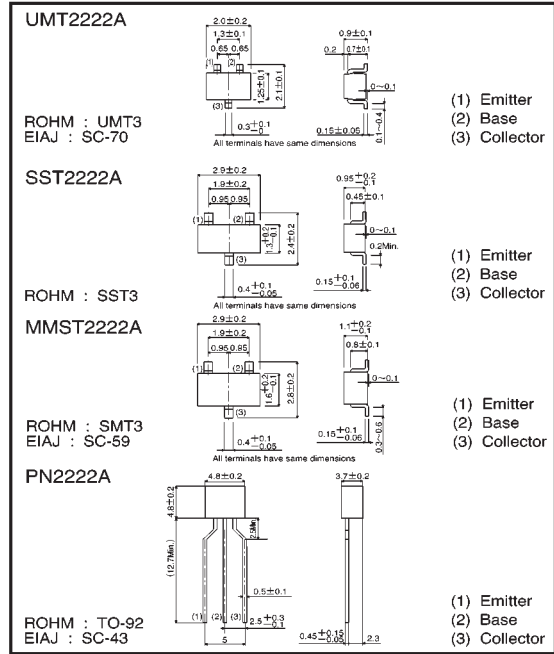
Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CB0}	75	V
Collector-emitter voltage	V_{CE0}	40	V
Emitter-base voltage	V_{EB0}	6	V
Collector current	I_C	0.6	A
Collector power dissipation	UMT2222A, SST2222A, MMST2222A	0.2	W
	SST2222A	0.35	W *
	PN2222A	0.625	W
Junction temperature	T_J	150	$^\circ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

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

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	75	—	—	V	$I_C = 10 \mu A$
Collector-emitter breakdown voltage	BV_{CEO}	40	—	—	V	$I_C = 10mA$
Emitter-base breakdown voltage	BV_{EBO}	6	—	—	V	$I_E = 10 \mu A$
Collector cutoff current	I_{CBO}	—	—	100	nA	$V_{CB} = 60V$
Emitter cutoff current	I_{EBO}	—	—	100	nA	$V_{EB} = 3V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	0.3	V	$I_C/I_E = 150mA/15mA$
		—	—	1		$I_C/I_E = 500mA/50mA$
Base-emitter saturation voltage	$V_{BE(sat)}$	0.6	—	1.2	V	$I_C/I_E = 150mA/15mA$
		—	—	2		$I_C/I_E = 500mA/50mA$
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	$V_{CC} = 30V, I_C = 150mA, I_{B1} = -I_{B2} = 15mA$

●External dimensions (Units : mm)



●Electrical characteristic curves

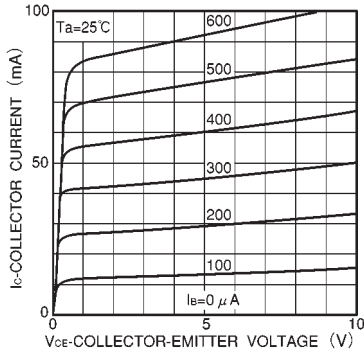


Fig.1 Grounded emitter output characteristics

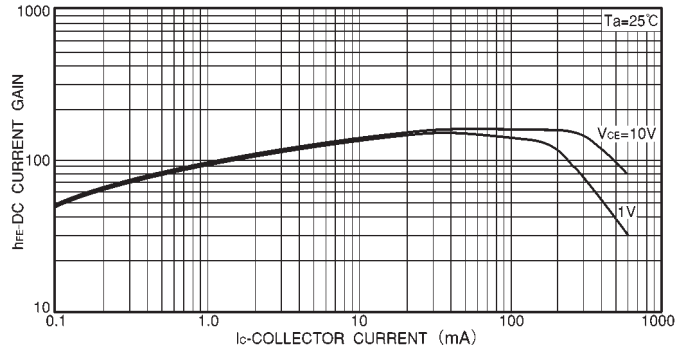


Fig.3 DC current gain vs. collector current (I)

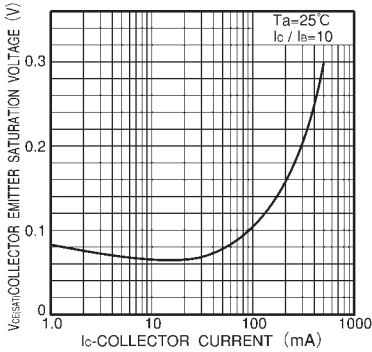


Fig.2 Collector-emitter saturation voltage vs. collector current

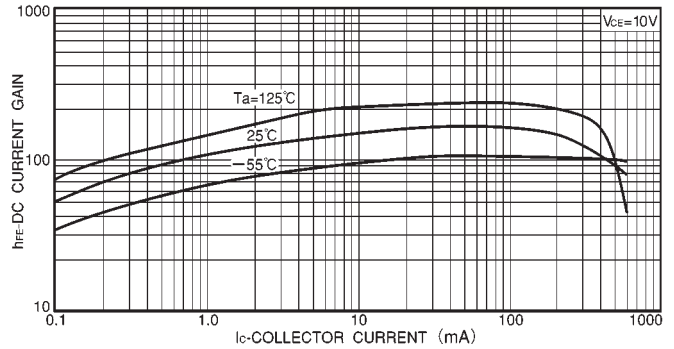


Fig.4 DC current gain vs. collector current (II)

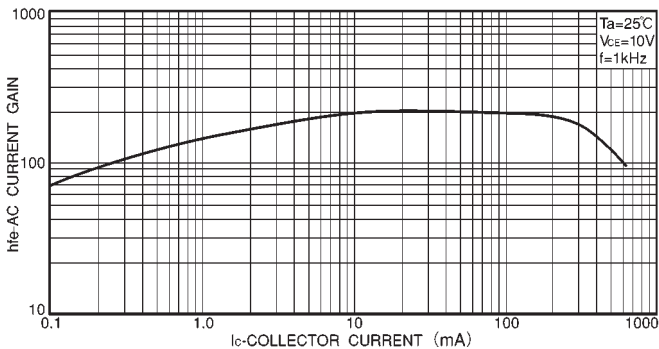


Fig.5 AC current gain vs. collector current

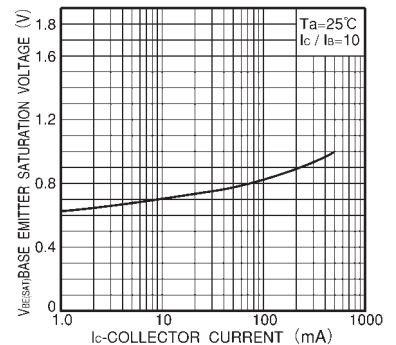


Fig.6 Base-emitter saturation voltage vs. collector current

● Electrical characteristic curves

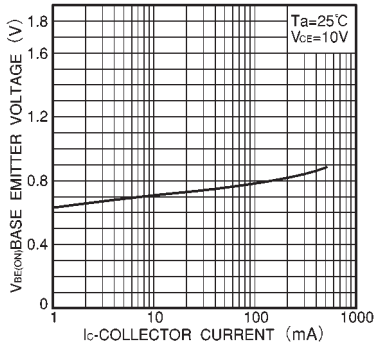


Fig.7 Grounded emitter propagation characteristics

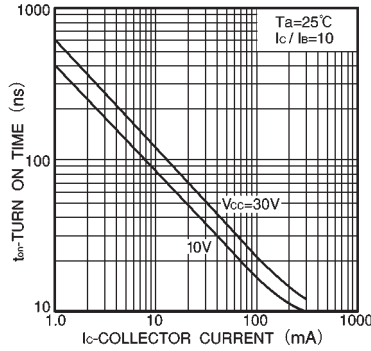


Fig.8 Turn-on time vs. collector current

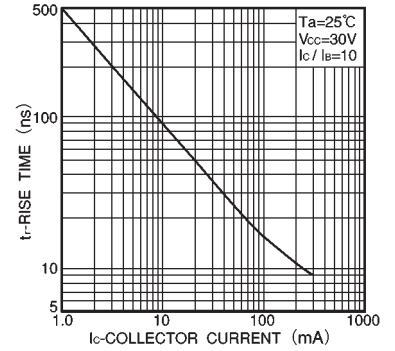


Fig.9 Rise time vs. collector current

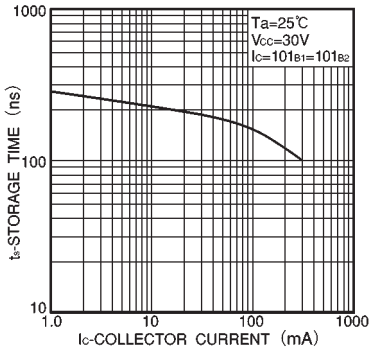


Fig.10 Storage time vs. collector current

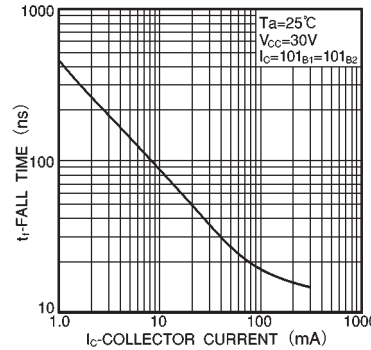


Fig.11 Fall time vs. collector current

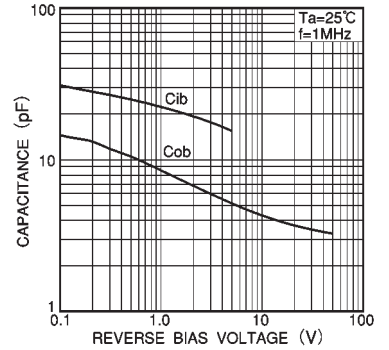


Fig.12 Input / output capacitance vs. voltage

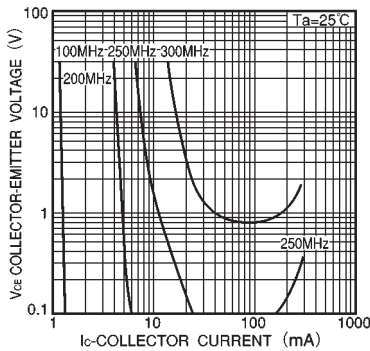


Fig.13 Gain bandwidth product

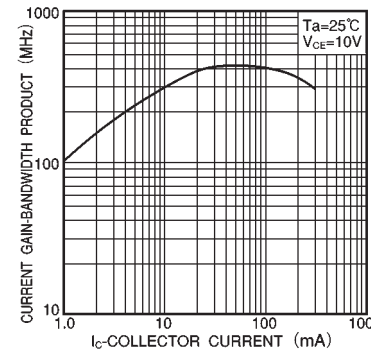


Fig.14 Gain bandwidth product vs. collector current