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

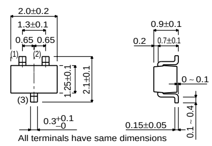
●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Collector-base voltage		V_{CBO}	75	V
Collector-emitter voltage		V_{CEO}	40	V
Emitter-base voltage		V_{EBO}	6	V
Collector current		I_C	0.6	A
Collector power dissipation	UMT2222A,SST2222A, MMST2222A	P_C	0.2	W
	SST2222A		0.35	W *
	PN2222A		0.625	W
Junction temperature		Tj	150	°C
Storage temperature		Tstg	−55 ~ +150	°C

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

●External dimensions (Units : mm)

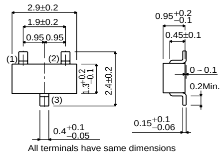
UMT2222A



ROHM : UMT3
EIAJ : SC-70

(1) Emitter
(2) Base
(3) Collector

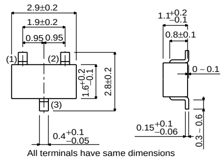
SST2222A



ROHM : SST3

(1) Emitter
(2) Base
(3) Collector

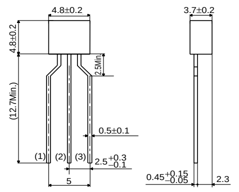
MMST2222A



ROHM : SMT3
EIAJ : SC-59

(1) Emitter
(2) Base
(3) Collector

PN2222A



ROHM : TO-92
EIAJ : SC-43

(1) Emitter
(2) Base
(3) Collector

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	75	–	–	V	I_C =10μA
Collector-emitter breakdown voltage	BV_{CEO}	40	–	–	V	I_C =10mA
Emitter-base breakdown voltage	BV_{EBO}	6	–	–	V	I_E =10μA
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_B =150mA/15mA
		–	–	1		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		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	Cob	–	–	8	pF	V_{CB} =10V , f =100kHz
Emitter input capacitance	Cib	–	–	25	pF	V_{EB} =0.5V , f =100kHz
Delay time	td	–	–	10	ns	V_{CC} =30V , $V_{BE(OFF)}$ =0.5V , I_C =150mA , I_{B1} =15mA
Rise time	tr	–	–	25	ns	V_{CC} =30V , $V_{BE(OFF)}$ =0.5V , I_C =150mA , I_{B1} =15mA
Storage time	tstg	–	–	225	ns	V_{CC} =30V , I_C =150mA , I_{B1} =−I_{B2} =15mA
Fall time	tf	–	–	60	ns	V_{CC} =30V , I_C =150mA , I_{B1} =−I_{B2} =15mA

●Electrical characteristic curves

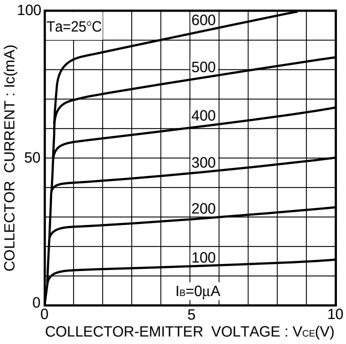


Fig.1 Grounded emitter output characteristics

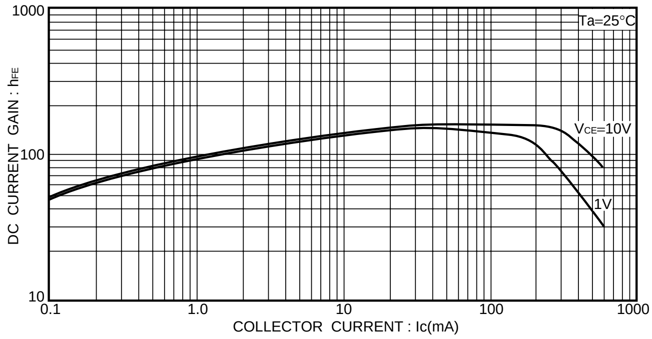


Fig.3 DC current gain vs. collector current(I)

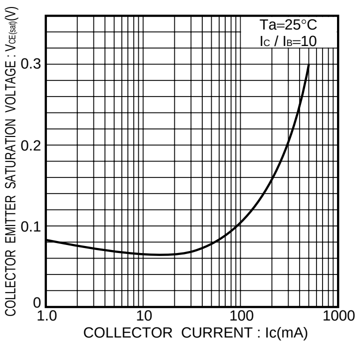


Fig.2 Collector-emitter saturation voltage vs. collector current

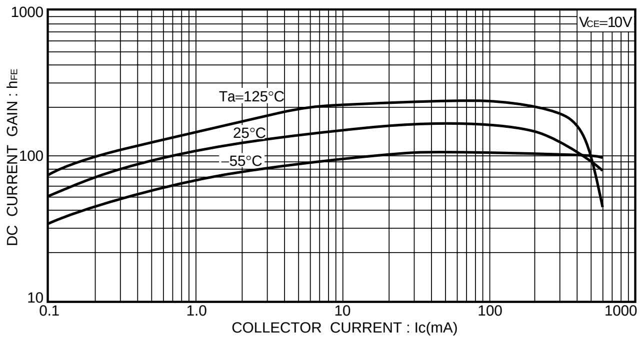


Fig.4 DC current gain vs. collector current(II)

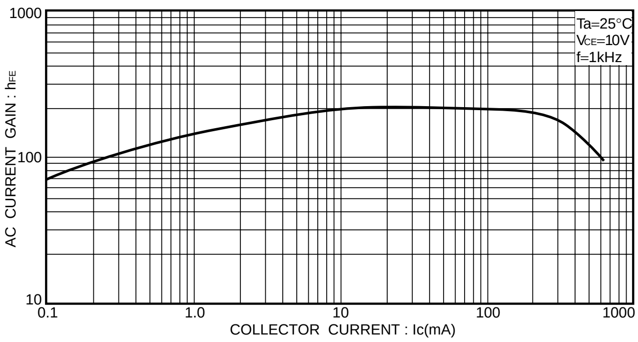


Fig.5 AC current gain vs. collector current

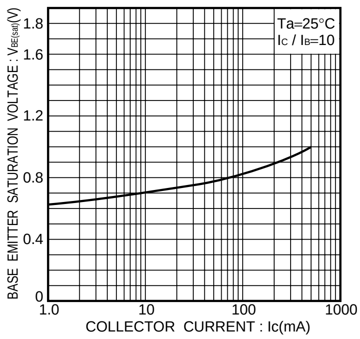


Fig.6 Base-emitter saturation voltage vs. collector current

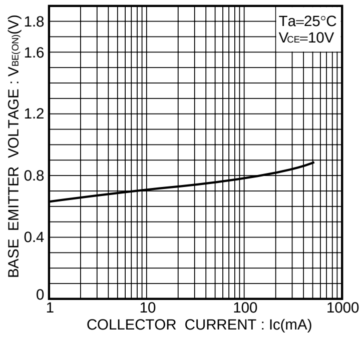


Fig.7 Grounded emitter propagation characteristics

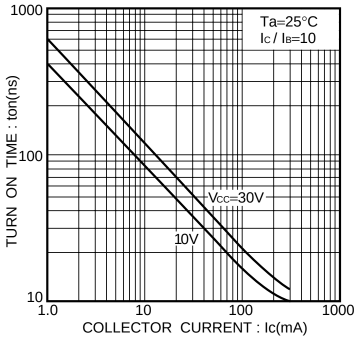


Fig.8 Turn-on time vs. collector current

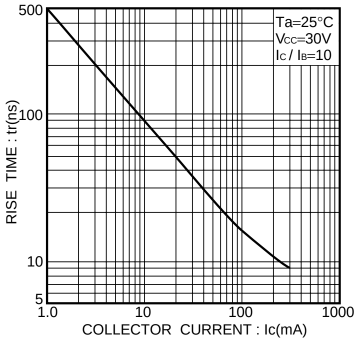


Fig.9 Rise time vs. collector current

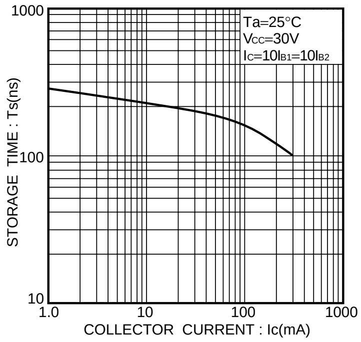


Fig.10 Storage time vs. collector current

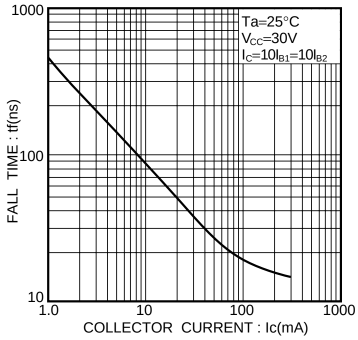


Fig.11 Fall time vs. collector current

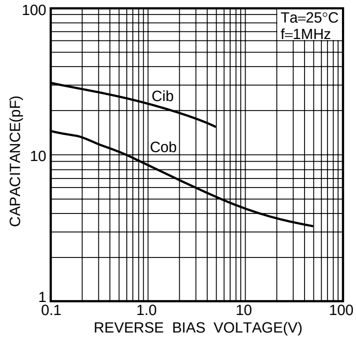


Fig.12 Input / output capacitance vs. voltage

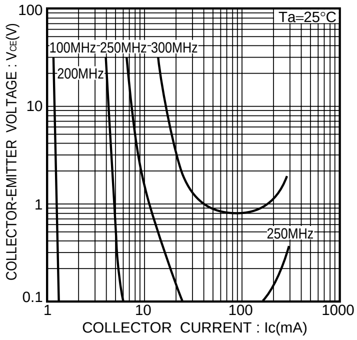


Fig.13 Gain bandwidth product

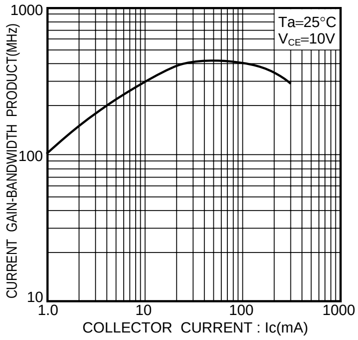


Fig.14 Gain bandwidth product vs. collector current