NPN Medium Power Transistor (Switching)

UMT2222A/SST2222A/MMST2222A/RXT2222A/PN2222A

●Features

1) BV_{CEO} < 40V (I_C = 10mA)
2) Complements the UMT2907A/SST2907A/MMST2907A /RXT2907A/PN2907A.

●Package, marking and packaging specifications

Type	UMT2222A	SST2222A	MMST2222A	RXT2222A	PN2222A
Package	UMT3	SST3	SMT3	MPT3	TO-92
Marking	R1P	R1P	R1P	CB*	—
Code	T106	T116	T146	T100	T93
Basic ordering unit (pieces)	3000	3000	3000	1000	3000

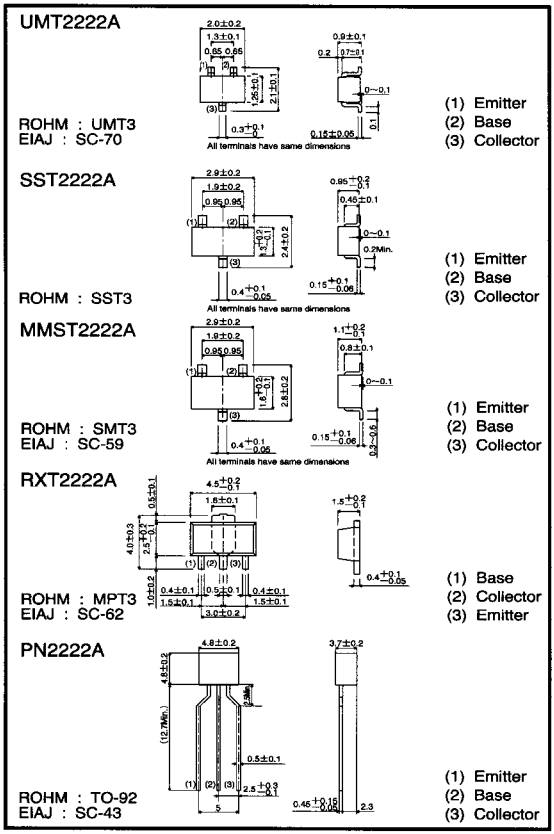
* Indicates lot number.

●Absolute maximum ratings (Ta=25℃)

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,SST2222AV, MMST2222A	P_C	0.2	W *
	SST2222A		0.35	
	RXT2222A		0.5	
	PN2222A		0.625	
Junction temperature		Tj	150	℃
Storage temperature		Tstg	−55~150	℃

* On 7 x 5 x 0.6 mm ceramic board

●External dimensions (Units : mm)



●Electrical characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	75	—	—	V	I_C=10 μA
Collector-emitter breakdown voltage	BV_{CEO}	40	—	—	V	I_C=10mA
Emitter-base breakdown voltage	BV_{EBO}	6	—	—	V	I_E=10 μA
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	fr	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

(SPEC-C31)

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●Electrical characteristic curves

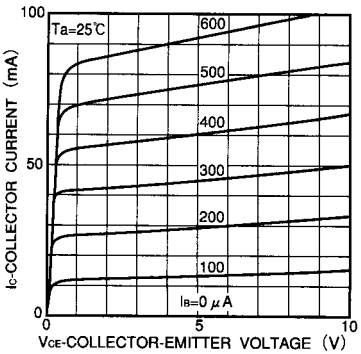

Fig.1 Grounded emitter output characteristics

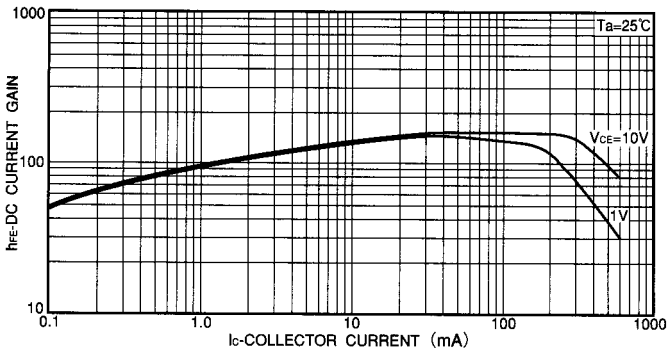

Fig.3 DC current gain vs. collector current (Ⅰ)

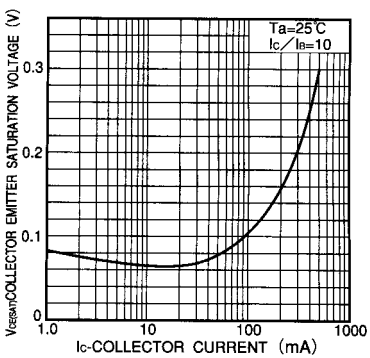

Fig.2 Collector-emitter saturation voltage vs. collector current

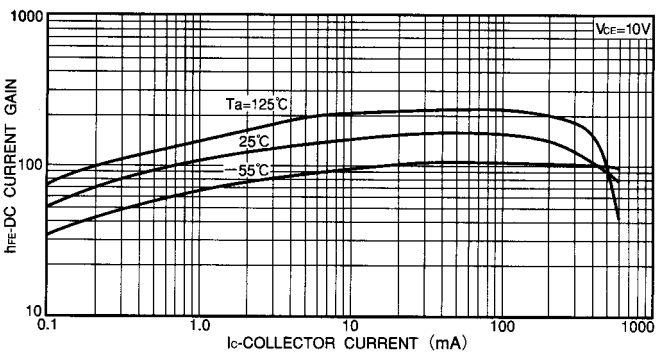

Fig.4 DC current gain vs. collector current (Ⅱ)

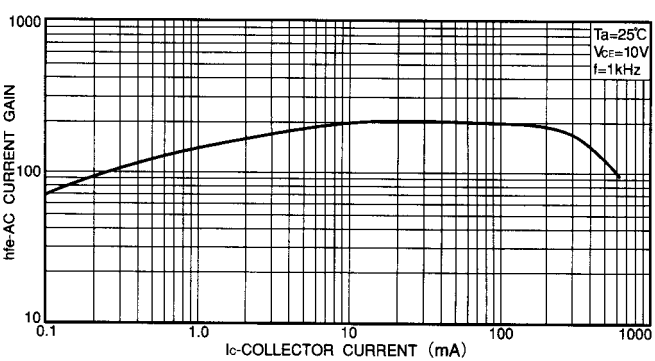

Fig.5 AC current gain vs. collector current

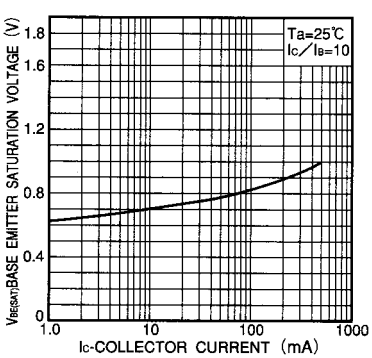

Fig.6 Base-emitter saturation voltage vs. collector current

●Electrical characteristic curves

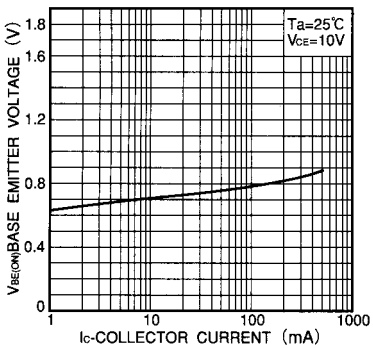

Fig.7 Grounded emitter propagation characteristics

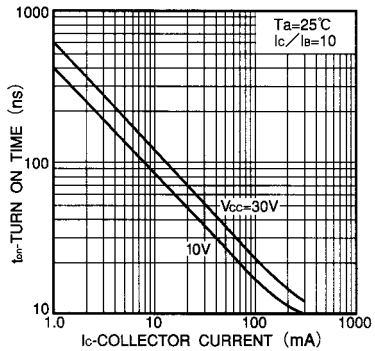

Fig.8 Turn-on time vs. collector current

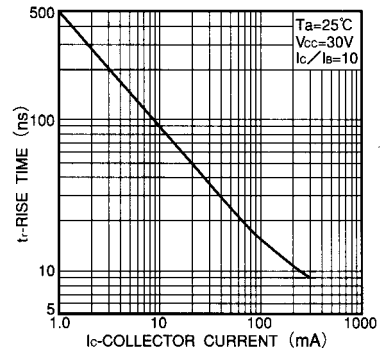

Fig.9 Rise time vs. collector current

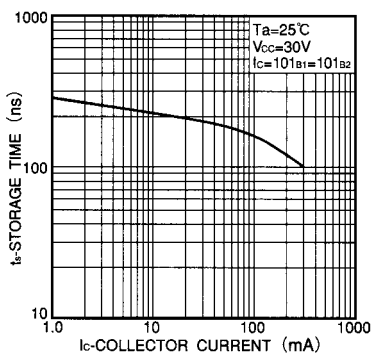

Fig.10 Storage time vs. collector current

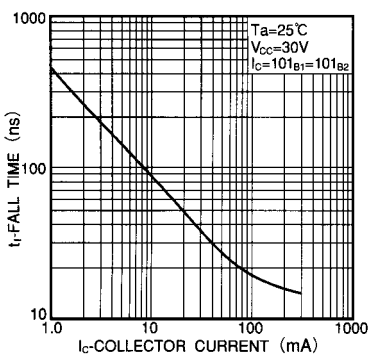

Fig.11 Fall time vs. collector current

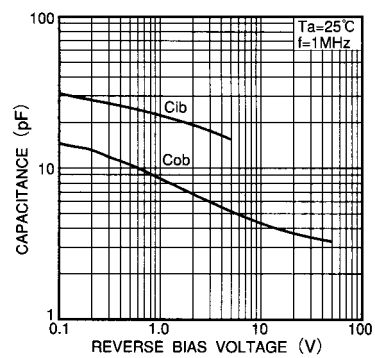

Fig.12 Input/output capacitance vs. voltage

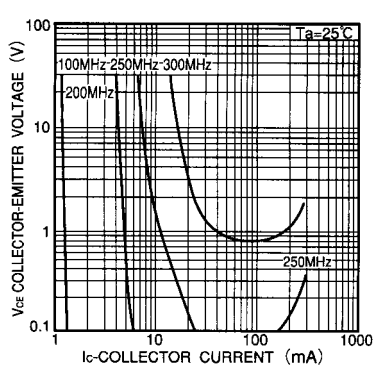

Fig.13 Gain bandwidth product

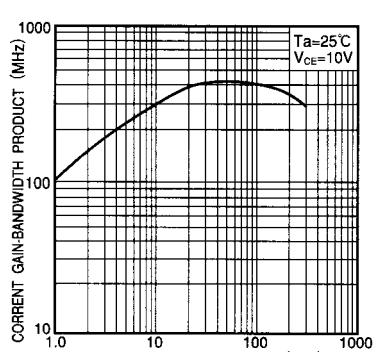

Fig.14 Gain bandwidth product vs. collector current