PNP General Purpose Transistor

UMT3906 / SST3906 / MMST3906 / 2N3906

●Features

1) BV_{CEO} > −40V (I_C = −1mA)
2) Complements the UMT3904 / SST3904 / MMST3904 / 2N3904.

●Package, marking and packaging specifications

Part No.	UMT3906	SST3906	MMST3906	2N3906
Packaging type	UMT3	SST3	SMT3	TO-92
Marking	R2A	R2A	R2A	—
Code	T106	T116	T146	T93
Basic ordering unit (pieces)	3000	3000	3000	3000

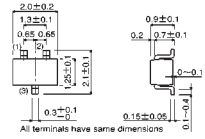
●Absolute maximum ratings (Ta=25℃)

Parameter		Symbol	Limits	Unit	
Collector-base voltage		V_{CBO}	−40	V	
Collector-emitter voltage		V_{CEO}	−40	V	
Emitter-base voltage		V_{EBO}	−5	V	
Collector current		I_C	−0.2	A	
Collector power dissipation	UMT3906	P_C	0.2	W	
	SST3906, MMST3906		0.3	W	*
	2N3906		0.625	W	
Junction temperature		Tj	150	℃	
Storage temperature		Tstg	−55~+150	℃	

* When mounted on a 7×5×0.6mm ceramic board.

●External dimensions (Units : mm)

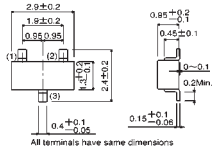
UMT3906



ROHM : UMT3
EIAJ : SC-70

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

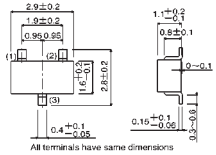
SST3906



ROHM : SST3

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

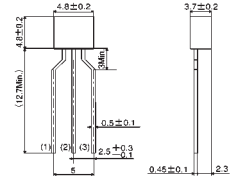
MMST3906



ROHM : SMT3
EIAJ : SC-59

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

2N3906



ROHM : TO-92
EIAJ : SC-43

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

● Electrical characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	−40	—	—	V	I_C = −10 μA
Collector-emitter breakdown voltage	BV_{CEO}	−40	—	—	V	I_C = −10mA
Emitter-base breakdown voltage	BV_{EBO}	−5	—	—	V	I_E = −10 μA
Collector cutoff current	I_{CES}	—	—	−50	nA	V_{CB} = −30V
Emitter cutoff current	I_{EBO}	—	—	−50	nA	V_{EB} = −3V
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	−0.25	V	I_C/I_B = −10mA/−1mA
		—	—	−0.4		I_C/I_B = −50mA/−5mA
Base-emitter saturation voltage	$V_{BE(sat)}$	0.65	—	−0.85	V	I_C/I_B = −10mA/−1mA
		—	—	−0.95		I_C/I_B = −50mA/−5mA
DC current transfer ratio	h_{FE}	60	—	—	—	V_{CE} = −1V , I_C = −0.1mA
		80	—	—		V_{CE} = −1V , I_C = −1mA
		100	—	300		V_{CE} = −1V , I_C = −10mA
		60	—	—		V_{CE} = −1V , I_C = −50mA
		30	—	—		V_{CE} = −1V , I_C = −100mA
Transition frequency	f_T	250	—	—	MHz	V_{CE} = −20V , I_E = 10mA, f=100MHz
Collector output capacitance	Cob	—	—	4.5	pF	V_{CB} = −10V , f=100kHz
Emitter input capacitance	Cib	—	—	10	pF	V_{EB} = −0.5V , f=100kHz
Delay time	td	—	—	35	ns	V_{CC} = −3V , $V_{BE(OFF)}$ = −0.5V , I_C = −10mA , I_{B1} = −1mA
Rise time	tr	—	—	35	ns	V_{CC} = −3V , $V_{BE(OFF)}$ = −0.5V , I_C = −10mA , I_{B1} = −1mA
Storage time	tstg	—	—	225	ns	V_{CC} = −3V , I_C = −10mA , I_{B1} = $-I_{B2}$ = −1mA
Fall time	tf	—	—	75	ns	V_{CC} = −3V , I_C = −10mA , I_{B1} = $-I_{B2}$ = −1mA

(SPEC-A38)

●Electrical characteristic curves

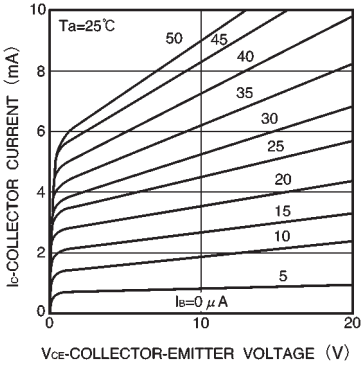


Fig.1 Grounded emitter output characteristics

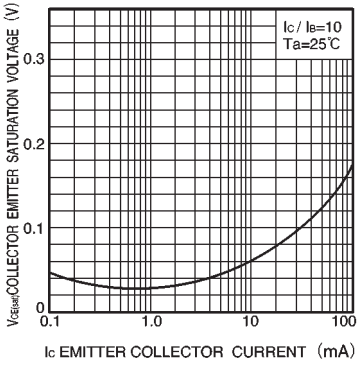


Fig.2 Collector-emitter saturation voltage vs. collector current

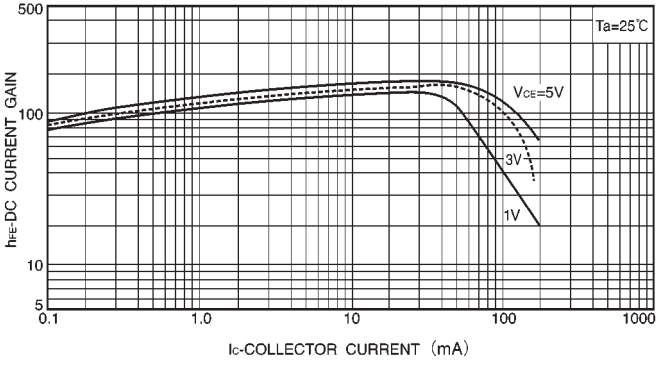


Fig.3 DC current gain vs.collector current (Ⅰ)

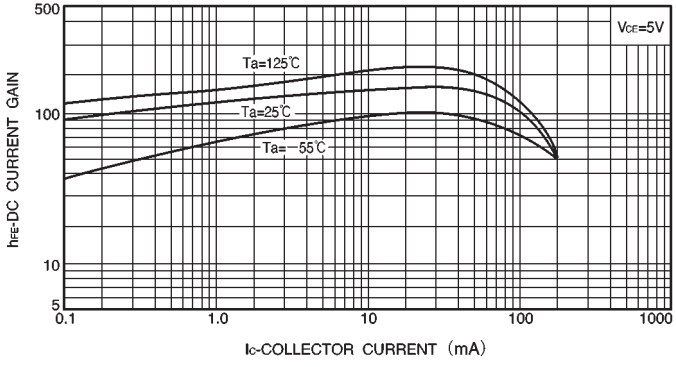


Fig.4 DC current gain vs. collector current (Ⅱ)

●Electrical characteristic curves

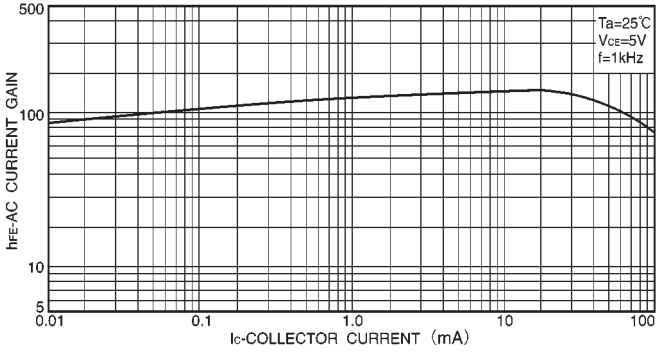


Fig.5 AC current gain vs. collector current

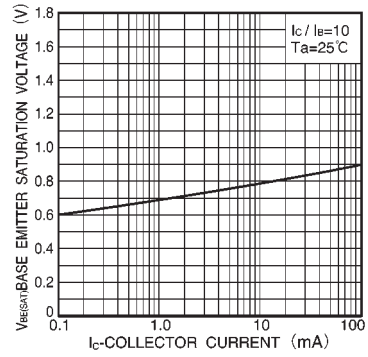


Fig.6 Base-emitter saturation voltage vs. collector current

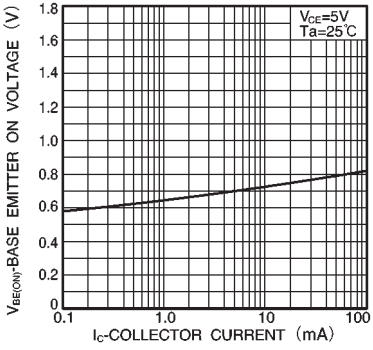


Fig.7 Grounded emitter propagation characteristics

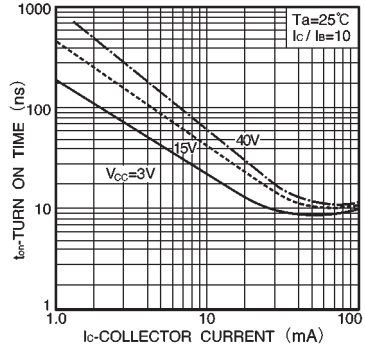


Fig.8 Turn-on time vs. collector current

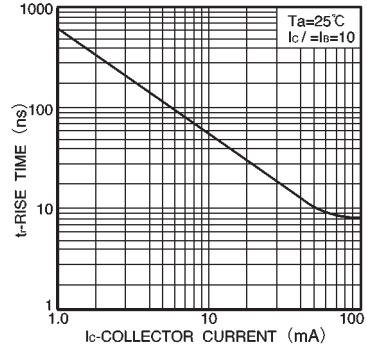


Fig.9 Rise time vs. collector current

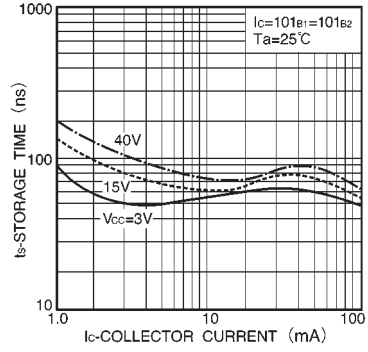


Fig.10 Storage time vs. collector current

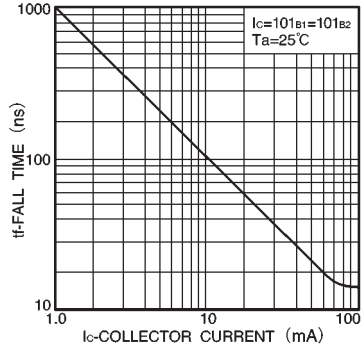


Fig.11 Fall time vs. collector current

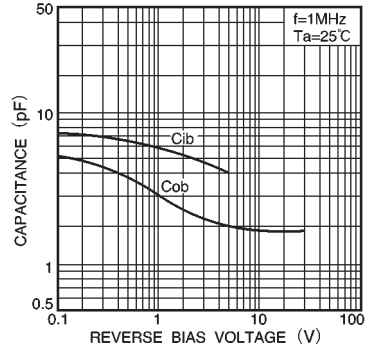


Fig.12 Input / output capacitance vs. voltage

●Electrical characteristic curves

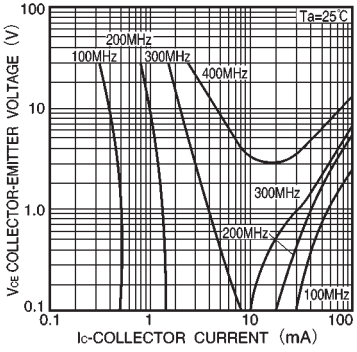


Fig.13 Gain bandwidth product

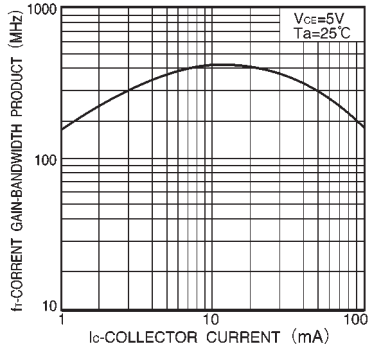


Fig.14 Gain bandwidth product vs. collector current

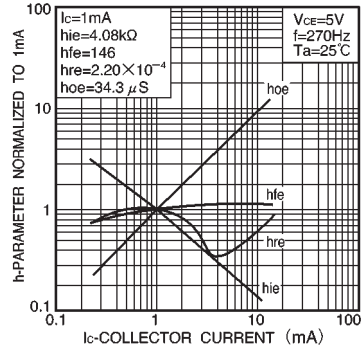


Fig.15 h parameter vs. collector current

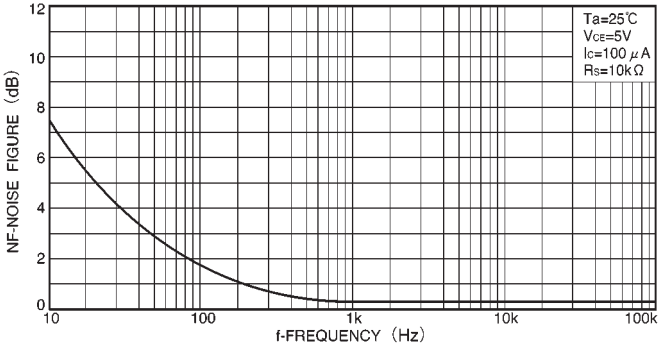


Fig.16 Noise vs. collector current

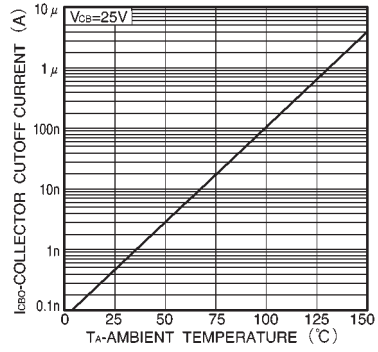


Fig.17 Noise characteristics (Ⅰ)

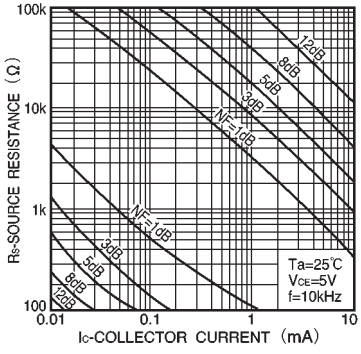


Fig.18 Noise characteristics (Ⅱ)

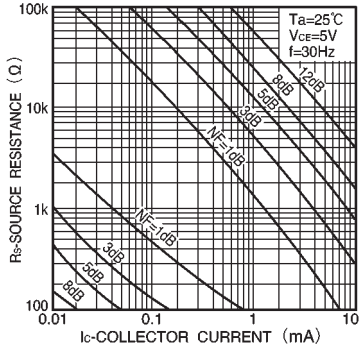


Fig.19 Noise characteristics (Ⅲ)

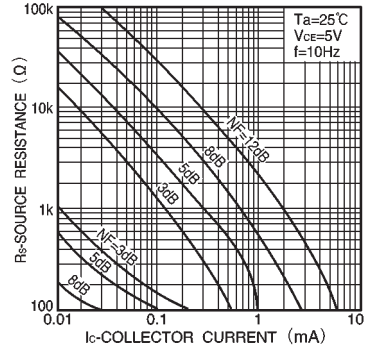


Fig.20 Noise characteristics (Ⅳ)