

# PNP General Purpose Transistor

UMT3906/SST3906/MMST3906/RXT3906/2N3906

● Features

- 1)  $BV_{CEO} < -40V$  ( $I_C = -1mA$ )
- 2) Complements the UMT3904/SST3904/MMST3904/RXT3904/PN3904.

● Package, marking and packaging specifications

Type	UMT3906	SST3906	MMST3906	RXT3906	2N3906
Package	UMT3	SST3	SMT3	MPT3	TO-92
Marking	R2A	R2A	R2A	AD*	—
Code	T106	T116	T146	T100	T93
Basic ordering unit (pieces)	3000	3000	3000	1000	3000

\* Indicates lot number.

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

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CB0}$	-40	V
Collector-emitter voltage	$V_{CE0}$	-40	V
Emitter-base voltage	$V_{EB0}$	-5	V
Collector current	$I_C$	-0.2	A
Collector power dissipation	UMT3906	0.2	W
	SST3906, MMST3906	0.3	
	RXT3906	0.5	
	2N3906	0.625	
Junction temperature	$T_J$	150	$^\circ C$
Storage temperature	$T_{stg}$	-55~150	$^\circ C$

● 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

RXT3906  
ROHM : MPT3  
EIAJ : SC-62  
(1) Base  
(2) Collector  
(3) Emitter

2N3906  
ROHM : TO-92  
EIAJ : SC-43  
(1) Base  
(2) Collector  
(3) Emitter

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CB0}$	-40	—	—	V	$I_C = -10 \mu A$
Collector-emitter breakdown voltage	$BV_{CE0}$	-40	—	—	V	$I_C = -10mA$
Emitter-base breakdown voltage	$BV_{EB0}$	-5	—	—	V	$I_E = -10 \mu A$
Collector cutoff current	$I_{CES}$	—	—	-50	nA	$V_{CE} = -30V$
Emitter cutoff current	$I_{EBO}$	—	—	-50	nA	$V_{EB} = -3V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	-0.25	V	$I_C/I_E = -10mA/-1mA$
		—	—	-0.4	V	$I_C/I_E = -50mA/-5mA$
Base-emitter saturation voltage	$V_{BE(sat)}$	0.65	—	-0.85	V	$I_C/I_E = -10mA/-1mA$
		—	—	-0.95	V	$I_C/I_E = -50mA/-5mA$
DC current transfer ratio	$h_{FE}$	60	—	—	—	$V_{CE} = -1V, I_C = -0.1mA$
		60	—	—	—	$V_{CE} = -1V, I_C = -1mA$
		100	—	300	—	$V_{CE} = -1V, I_C = -10mA$
		60	—	—	—	$V_{CE} = -1V, I_C = -60mA$
		30	—	—	—	$V_{CE} = -1V, I_C = -100mA$
Transition frequency	$f_T$	250	—	—	MHz	$V_{CE} = -20V, I_E = 10mA, f = 100MHz$
Output capacitance	$C_{ob}$	—	—	4.5	pF	$V_{CE} = -10V, f = 100KHz$
Emitter input capacitance	$C_{ib}$	—	—	10	pF	$V_{EB} = -0.5V, f = 100KHz$
Delay time	$t_d$	—	—	35	ns	$V_{CC} = -3V, V_{BE(OFF)} = -0.5V, I_C = -10mA, I_{B1} = -1mA$
Rise time	$t_r$	—	—	35	ns	$V_{CC} = -3V, V_{BE(OFF)} = -0.5V, I_C = -10mA, I_{B1} = -1mA$
Storage time	$t_{stg}$	—	—	225	ns	$V_{CC} = -3V, I_C = -10mA, I_{B1} = -I_{B2} = -1mA$
Fall time	$t_f$	—	—	75	ns	$V_{CC} = -3V, I_C = -10mA, I_{B1} = -I_{B2} = -1mA$

(SPEC-A38)

● Electrical characteristic curves

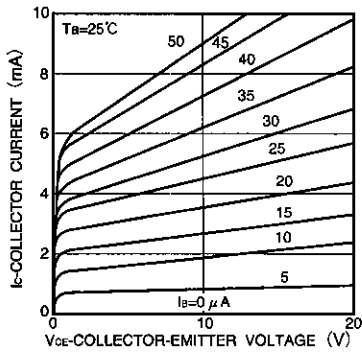


Fig.1 Grounded emitter output characteristics

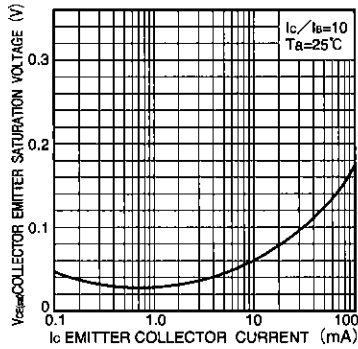


Fig.2 Collector-emitter saturation voltage vs. collector current

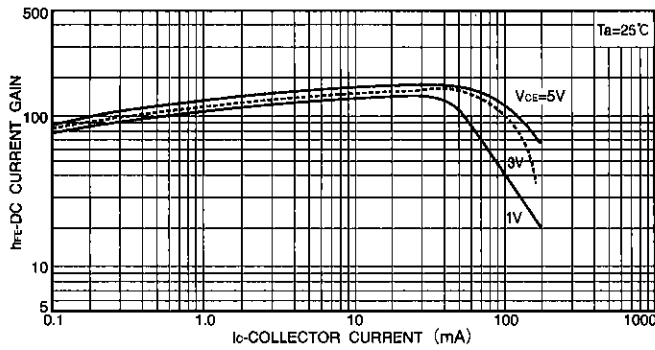


Fig.3 DC current gain vs. collector current (I)

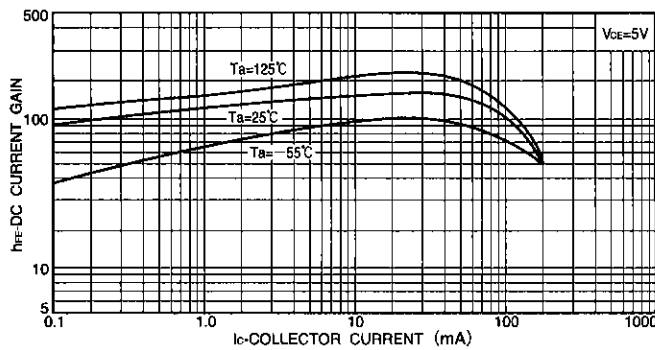


Fig.4 DC current gain vs. collector current (II)



USA & European specification models

● Electrical characteristic curves

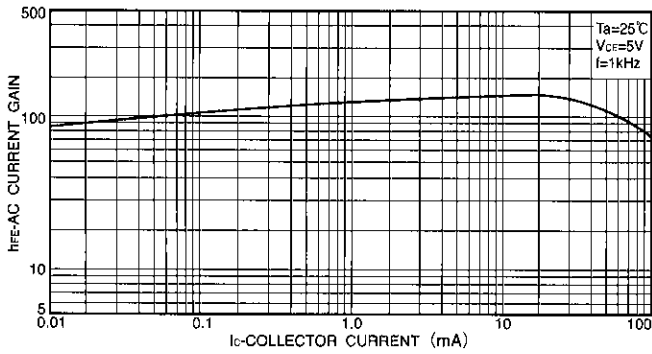


Fig.5 AC current gain vs. collector current

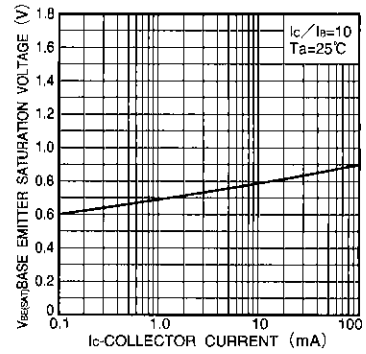


Fig.6 Base-emitter saturation voltage vs. collector current

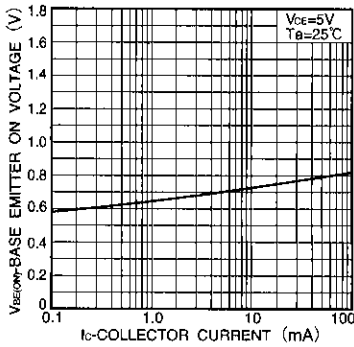


Fig.7 Grounded emitter propagation characteristics

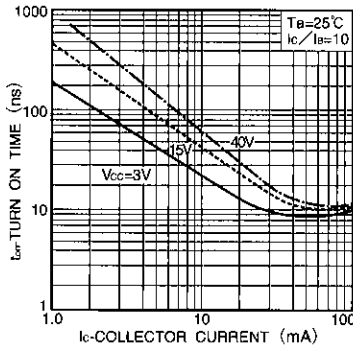


Fig.8 Turn-on time vs. collector current

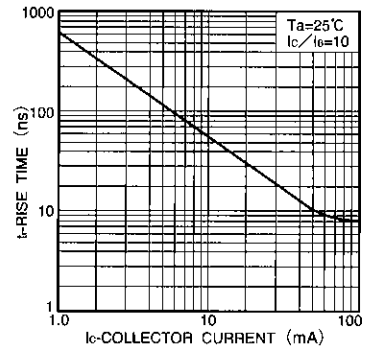


Fig.9 Rise time vs. collector current

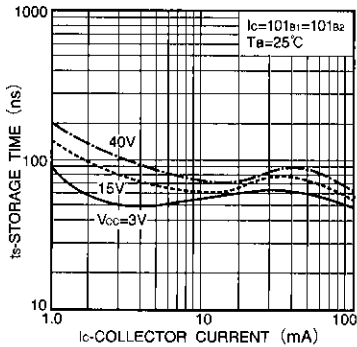


Fig.10 Storage time vs. collector current

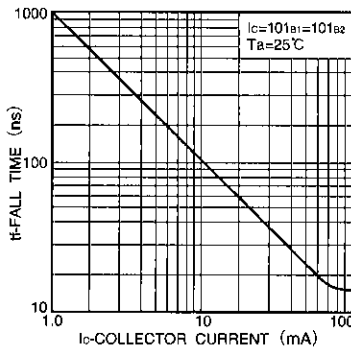


Fig.11 Fall time vs. collector current

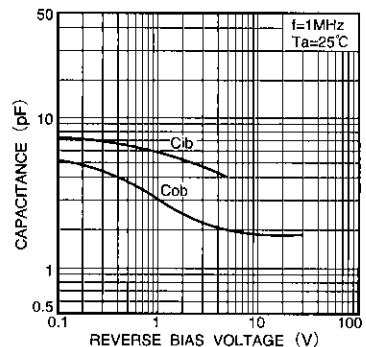


Fig.12 Input/output capacitance vs. voltage

● Electrical characteristic curves

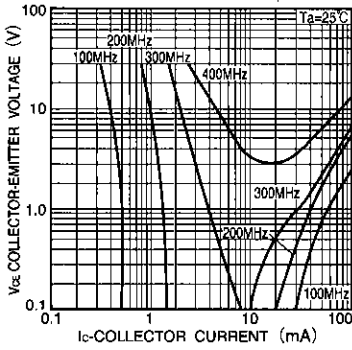


Fig. 13 Gain bandwidth product

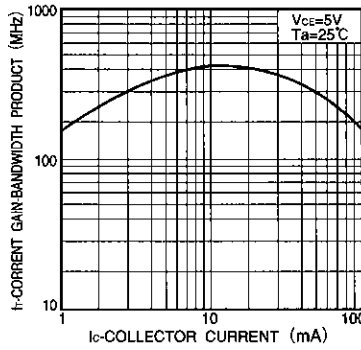


Fig. 14 Gain bandwidth product vs. collector current

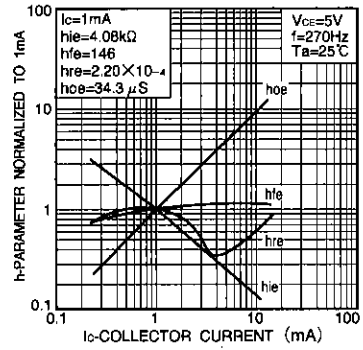


Fig. 15 h value vs. collector current

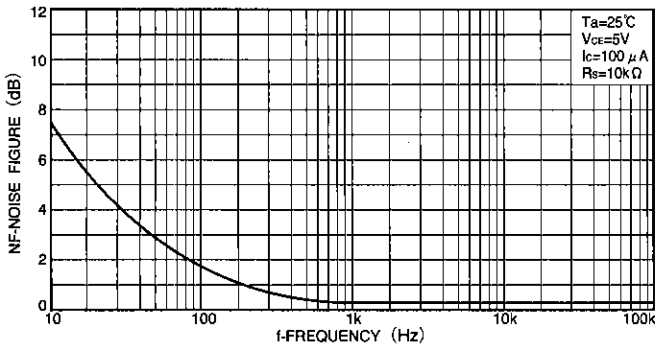


Fig. 16 Noise vs. collector current

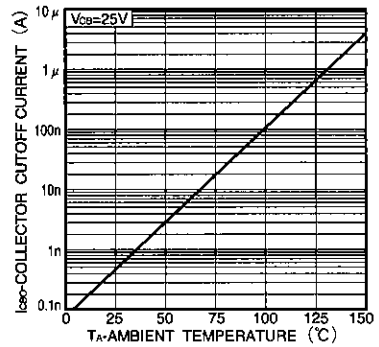


Fig. 17 Noise characteristics (I)

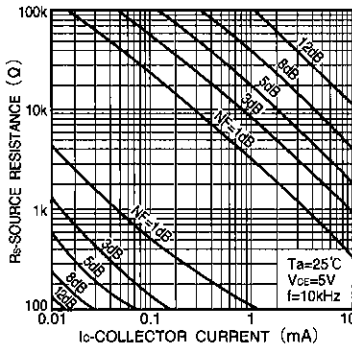


Fig. 18 Noise characteristics (II)

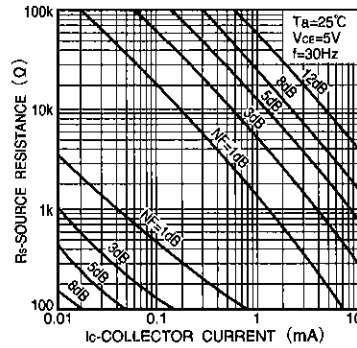


Fig. 19 Noise characteristics (III)

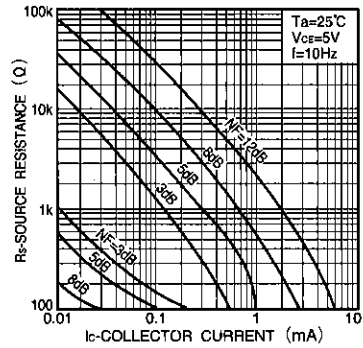


Fig. 20 Noise characteristics (IV)

USA & European specification models

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