

# PNP General Purpose Transistor

## UMT3906/SST3906/MMST3906/2N3906

### ●Features

- 1)  $BV_{CEO} > -40V$  ( $I_C = -1mA$ )
- 2) Complements the T3904/SST3904/MMST3909/2N3904.
- 3) Low capacitance.

### ●Package, marking, and packaging specifications

Type	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°C)

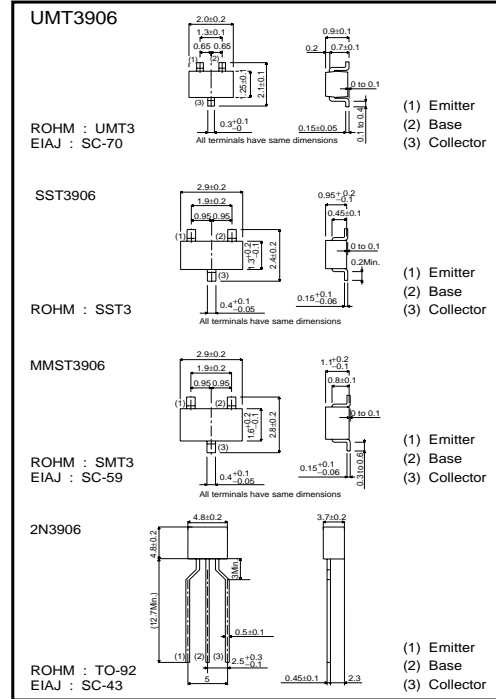
Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CBO}$	-40	V
Collector-emitter voltage	$V_{CEO}$	-40	V
Emitter-base voltage	$V_{EBO}$	-5	V
Collector current	$I_C$	-0.2	A
Collector Power dissipation	Pd	6.2	W
		0.35	W *
		0.3	W
Junction temperature	$T_J$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

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

### ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	-40	-	-	V	$I_C = -10\mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	-40	-	-	V	$I_C = -1mA$
Emitter-base breakdown voltage	$BV_{EBO}$	-5	-	-	V	$I_E = -10\mu A$
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	$I_C/I_E = -10mA/-1mA$
		-	-	-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	-	-	-	$V_{CE} = -1V, I_C = -0.1mA$
		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	$C_{ob}$	-	-	4.5	pF	$V_{CB} = -10V, f = 100kHz, I_E = 0A$
Emitter input capacitance	$C_{ib}$	-	-	10	pF	$V_{CB} = -0.5V, f = 100kHz, I_C = 0A$
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	$V_{CC} = -3V, I_C = -10mA, I_{B1} = -I_{B2} = -1mA$

### ●External dimensions (Unit : mm)



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●Electrical characteristics curves

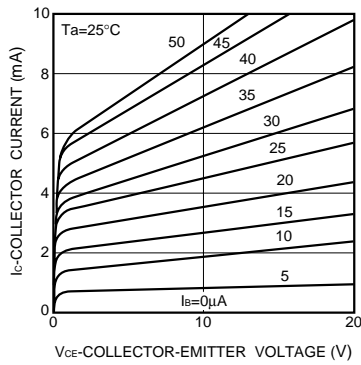


Fig.1 Grounded emitter output characteristics

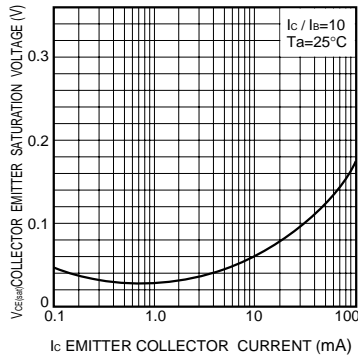


Fig.2 Collector-emitter saturation voltage vs. collector current

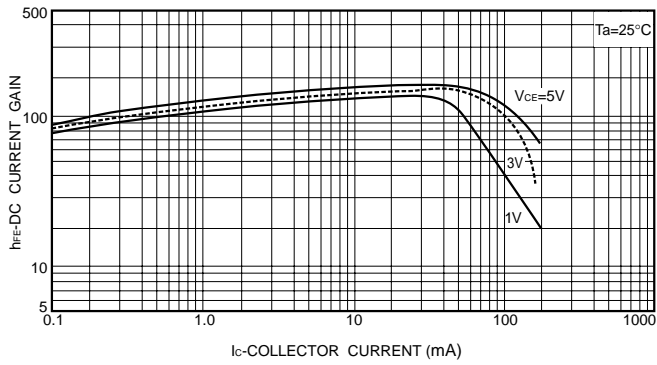


Fig.3 DC current gain vs. collector current ( I )

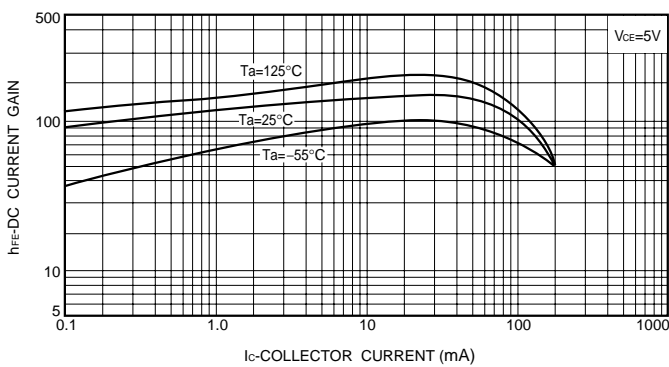


Fig.4 DC current gain vs. collector current ( II )

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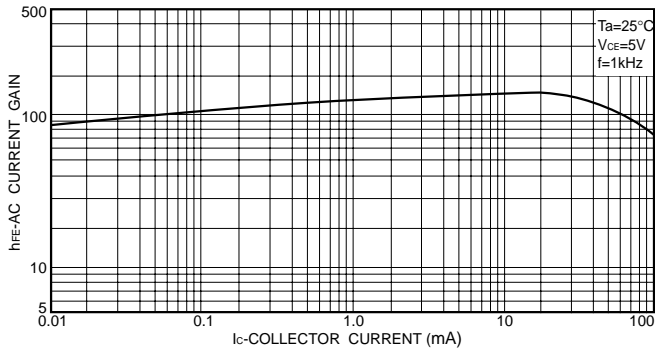


Fig.5 AC current gain vs. collector current

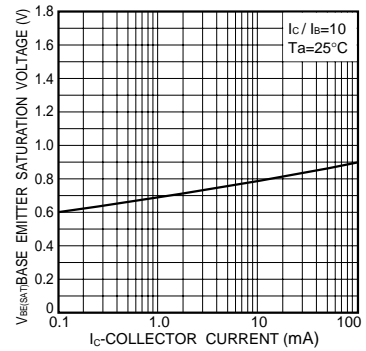


Fig.6 Base-emitter saturation voltage vs. collector current

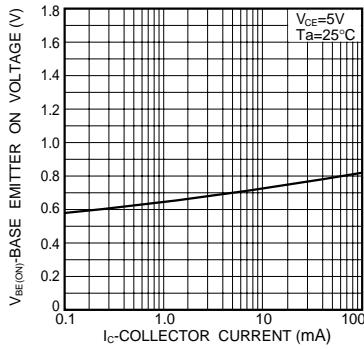


Fig.7 Grounded emitter propagation characteristics

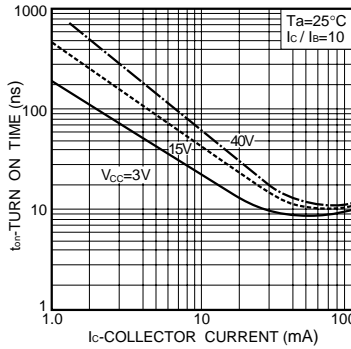


Fig.8 Turn-on time vs. collector current

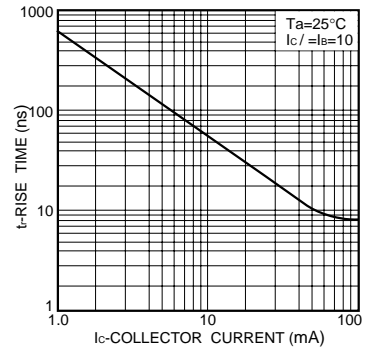


Fig.9 Rise time vs. collector current

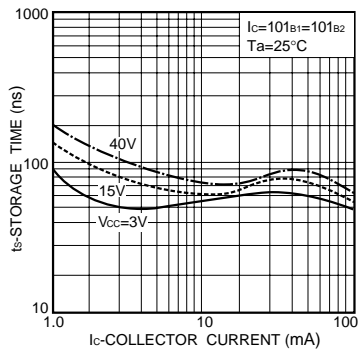


Fig.10 Storage time vs. collector current

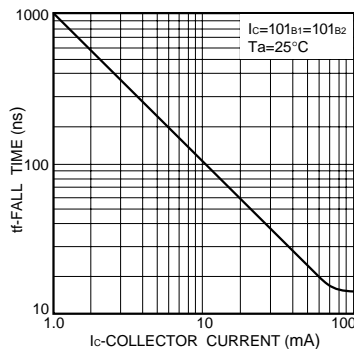


Fig.11 Fall time vs. collector current

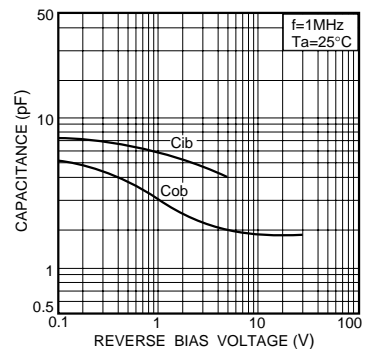


Fig.12 Input / output capacitance vs. voltage

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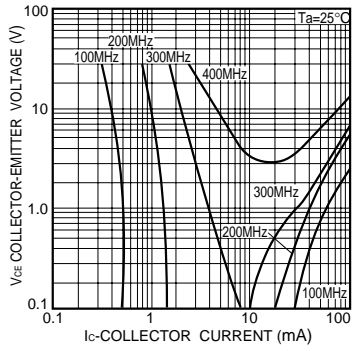


Fig.13 Gain bandwidth product

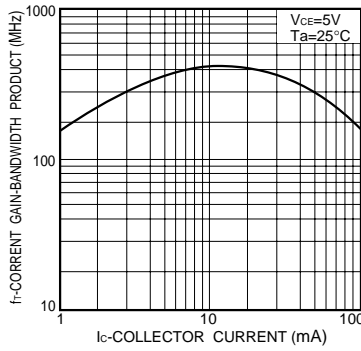


Fig.14 Gain bandwidth product vs. collector current

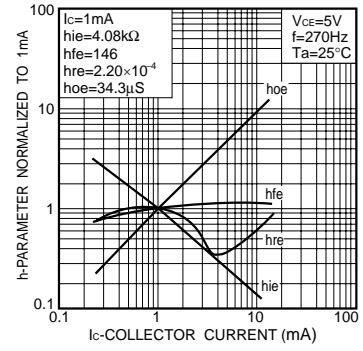


Fig.15 h parameter vs. collector current

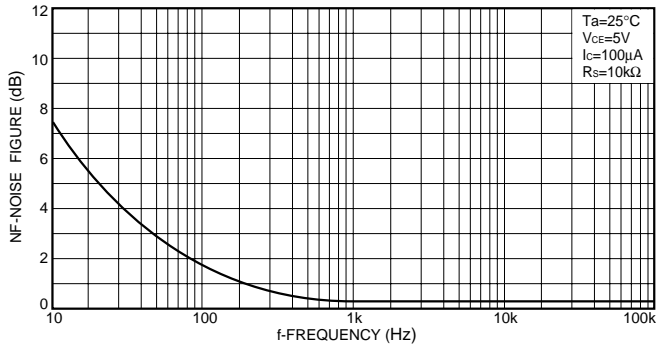


Fig.16 Noise vs. collector current

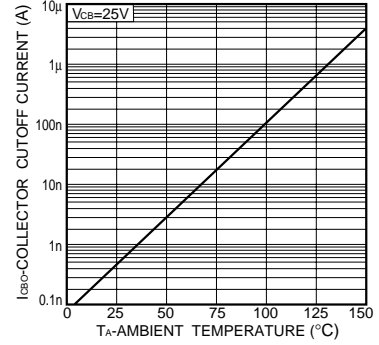


Fig.17 Noise characteristics (I)

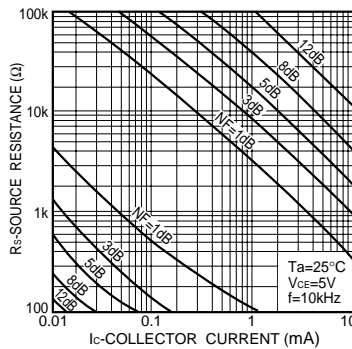


Fig.18 Noise characteristics (II)

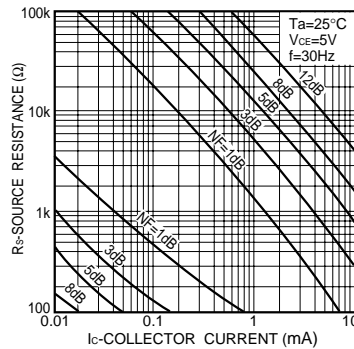


Fig.19 Noise characteristics (III)

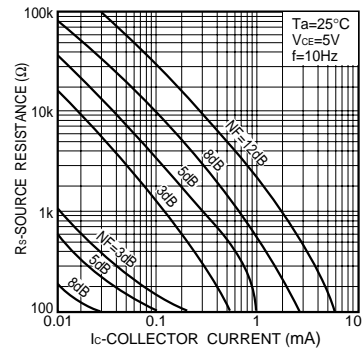


Fig.20 Noise characteristics (IV)

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