

# NPN Medium Power Transistor (Switching)

## SST4401 / MMST4401 / 2N4401

### ●Features

- 1)  $BV_{CEO} > 40V$  ( $I_C = 1mA$ )
- 2) Complements the SST4403 / MMST4403 / PN4403.

### ●Package, marking, and packaging specifications

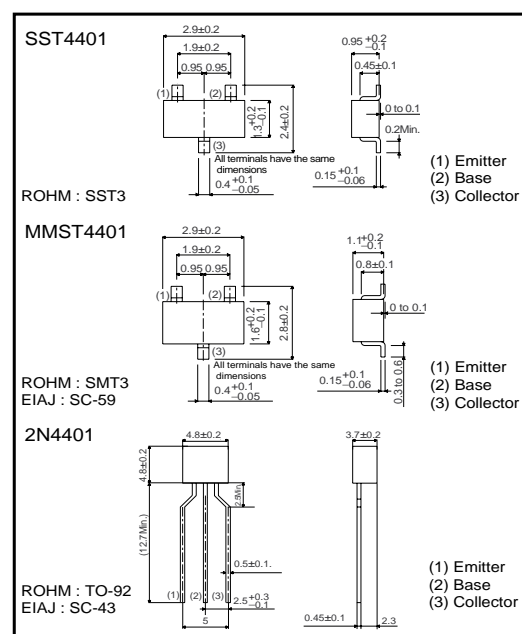
Part No.	SST4401	MMST4401	2N4401
Packaging type	SST3	SMT3	TO-92
Marking	R2X	R2X	-
Code	T116	T146	T93
Basic ordering unit (pieces)	3000	3000	3000

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

Parameter	Symbol	Limits	Unit	
Collector-base voltage	$V_{CBO}$	60	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	SST4401 MMST4401	$P_C$	0.2	W
			0.35	W
	2N4401		0.625	$^\circ C$
Junction temperature	$T_J$	150	$^\circ C$	
Storage temperature	$T_{stg}$	-55 to +150	$^\circ C$	

\* Mounted on a 7x5x0.6mm CERAMIC SUBSTRATE

### ●External dimensions (Unit : mm)



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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	60	-	-	V	$I_C = 100\mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	40	-	-	V	$I_C = 1mA$
Emitter-base breakdown voltage	$BV_{EBO}$	6	-	-	V	$I_E = 100\mu A$
Collector cutoff current	$I_{CBO}$	-	-	0.1	$\mu A$	$V_{CB} = 35V$
Emitter cutoff current	$I_{EBO}$	-	-	0.1	$\mu A$	$V_{EB} = 5V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.4	V	$I_C/I_E = 150mA/15mA$
		-	-	0.75	V	$I_C/I_E = 500mA/50mA$
Base-emitter saturation voltage	$V_{BE(sat)}$	-	-	0.95	V	$I_C/I_E = 150mA/15mA$
		-	-	1.2	V	$I_C/I_E = 500mA/50mA$
DC current transfer ratio	$h_{FE}$	20	-	-	-	$V_{CE} = 1V, I_C = 0.1mA$
		40	-	-	-	$V_{CE} = 1V, I_C = 1mA$
		80	-	-	-	$V_{CE} = 1V, I_C = 10mA$
		100	-	300	-	$V_{CE} = 1V, I_C = 150mA$
		40	-	-	-	$V_{CE} = 2V, I_C = 500mA$
Transition frequency	$f_T$	250	-	-	MHz	$V_{CE} = 10V, I_E = -20mA, f = 100MHz$
Collector output capacitance	$C_{ob}$	-	-	6.5	pF	$V_{CB} = 10V, f = 100kHz$
Emitter input capacitance	$C_{ib}$	-	-	30	pF	$V_{EB} = 0.5V, f = 100kHz$
Delay time	$t_d$	-	-	15	ns	$V_{CC} = 30V, V_{EB(OFF)} = 2V, I_C = 150mA, I_{B1} = 15mA$
Rise time	$t_r$	-	-	20	ns	$V_{CC} = 30V, V_{EB(OFF)} = 2V, I_C = 150mA, I_{B1} = 15mA$
Storage time	$t_{stg}$	-	-	225	ns	$V_{CC} = 30V, I_C = 150mA, I_{B1} = -I_{B2} = 15mA$
Fall time	$t_f$	-	-	30	ns	$V_{CC} = 30V, I_C = 150mA, I_{B1} = -I_{B2} = 15mA$

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●Electrical characteristic curves

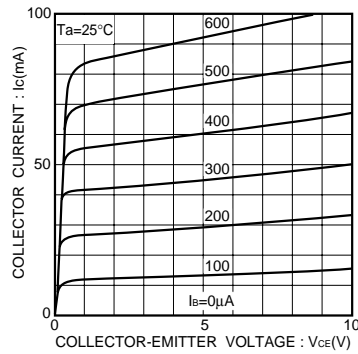


Fig.1 Grounded emitter output characteristics

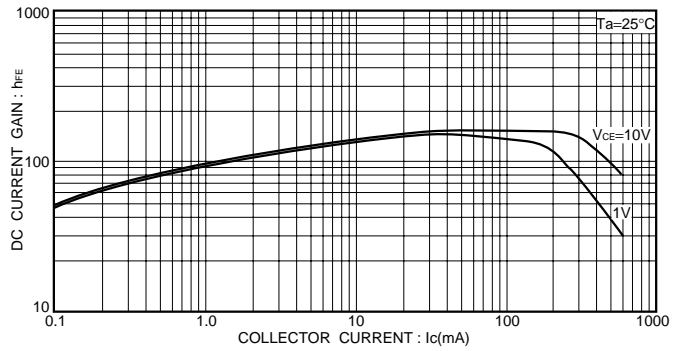


Fig.3 DC current gain vs. collector current(I)

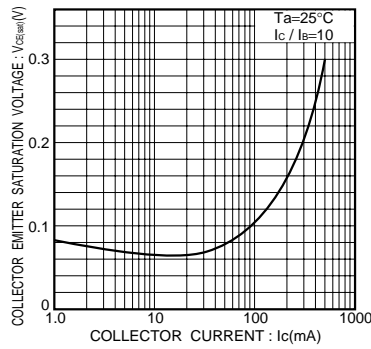


Fig.2 Collector-emitter saturation voltage vs. collector current

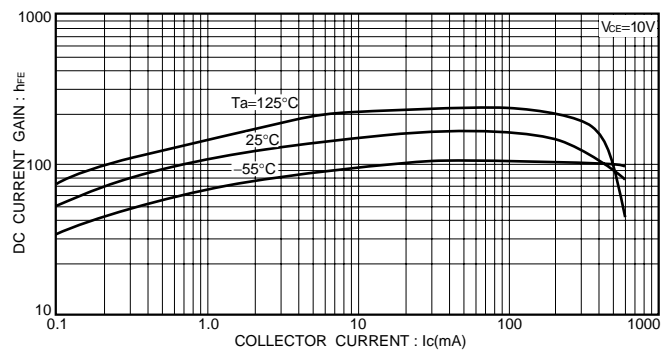


Fig.4 DC current gain vs. collector current(II)

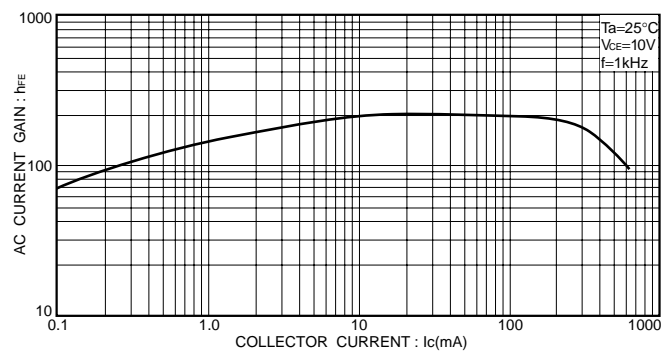


Fig.5 AC current gain vs. collector current

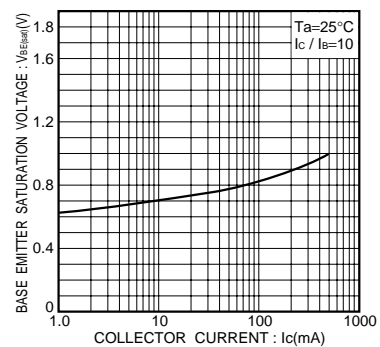


Fig.6 Base-emitter saturation voltage vs. collector current

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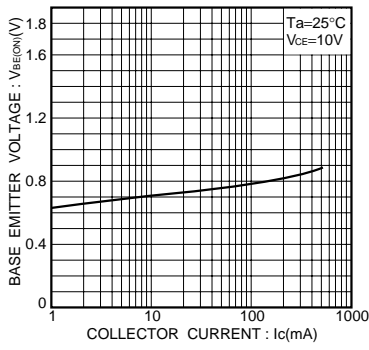


Fig.7 Grounded emitter propagation characteristics

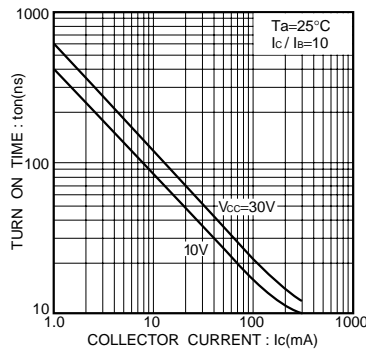


Fig.8 Turn-on time vs. collector current

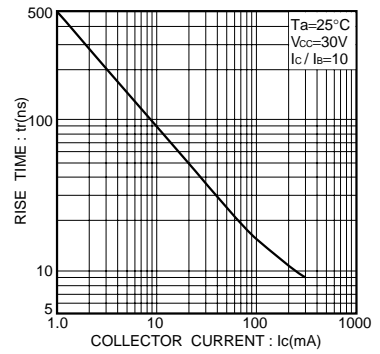


Fig.9 Rise time vs. collector current

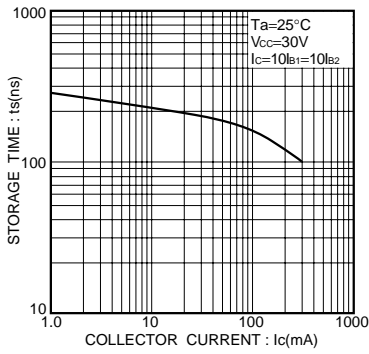


Fig.10 Storage time vs. collector current

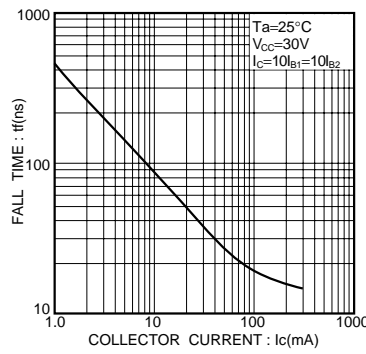


Fig.11 Fall time vs. collector current

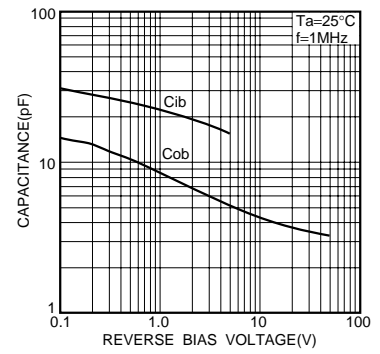


Fig.12 Input / output capacitance vs. voltage

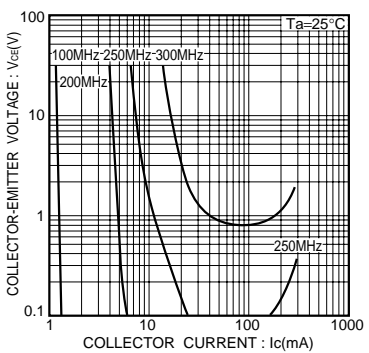


Fig.13 Gain bandwidth product

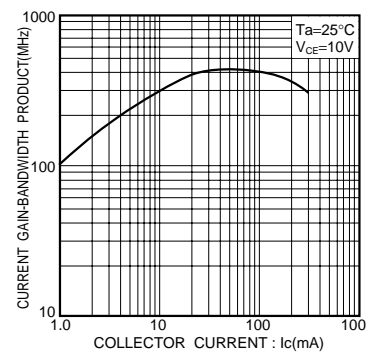


Fig.14 Gain bandwidth product vs. collector current

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