

# NPN small signal transistor

## MMSTA13

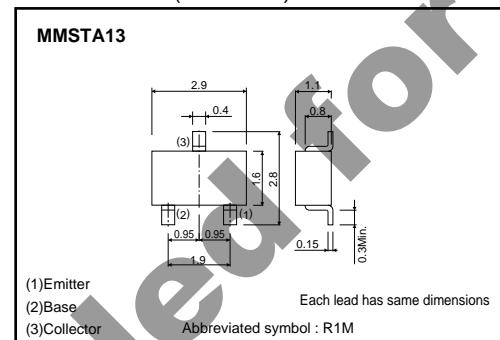
### ●Features

(1) High Current Gain.

### ●Packaging specifications

Type	Package	Taping
	Code	T146
MMSTA13		○

### ●Dimensions (Unit : mm)



### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CBO</sub>	30	V
Collector-emitter voltage	V <sub>CES</sub>	30	V
Emitter-base voltage	V <sub>EBO</sub>	10	V
Collector current	I <sub>C</sub>	0.3	A
Collector power dissipation	P <sub>C</sub>	0.2	W
		0.35	W *
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to 125	°C

\* Mounted on a 7×5×0.6 mm CERAMIC SUBSTRATE

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV <sub>CES</sub>	30	—	—	V	I <sub>C</sub> = 100μA
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	30	—	—	V	I <sub>C</sub> = 10μA
Emitter-base breakdown voltage	BV <sub>EBO</sub>	10	—	—	V	I <sub>E</sub> = 10μA
Collector-base cutoff current	I <sub>CBO</sub>	—	—	0.1	μA	V <sub>CB</sub> = 30V
Emitter-base cutoff current	I <sub>CEO</sub>	—	—	0.1	μA	V <sub>EB</sub> = 10V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	—	—	1.5	V	I <sub>C</sub> /I <sub>B</sub> = 100mA/ 100μA
Base-emitter voltage	V <sub>BE(on)</sub>	—	—	2.0	V	V <sub>CE</sub> = 5V, I <sub>C</sub> = 100mA *
DC current transfer ratio	h <sub>FE</sub>	5000	—	—	—	V <sub>CE</sub> = 5V, I <sub>C</sub> = 10mA
		10000	—	—	—	V <sub>CE</sub> = 5V, I <sub>C</sub> = 100mA *
Transition frequency	f <sub>T</sub>	125	—	—	MHz	V <sub>CE</sub> = 5V, I <sub>E</sub> = -10mA, f=100MHz
Collector output capacitance	C <sub>ob</sub>	—	5.4	—	pF	V <sub>CB</sub> = 10V, f=100kHz, I <sub>E</sub> = 0

\* Pulsed

● Electrical characteristics curves

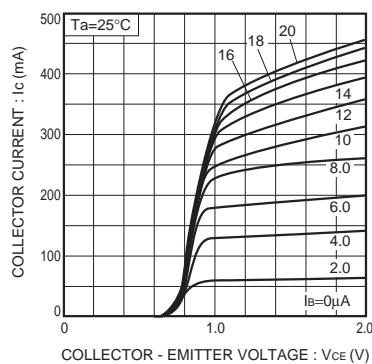


Fig.1 Typical output characteristics (I)

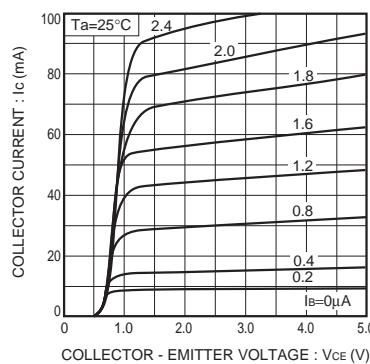


Fig.2 Typical output characteristics (II)

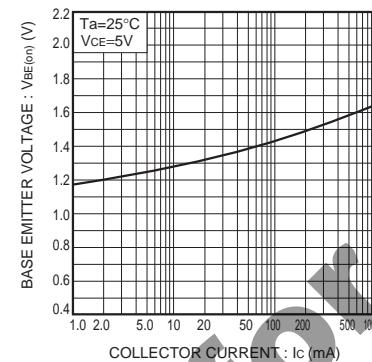


Fig.3 Base emitter 'ON' voltage vs. collector current

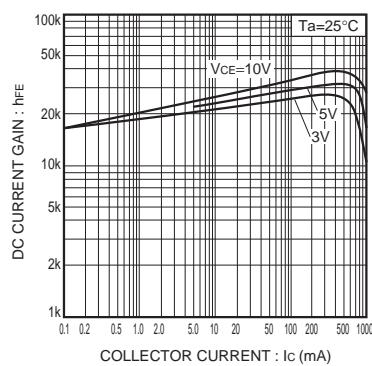


Fig.4 DC current gain vs. collector current (I)

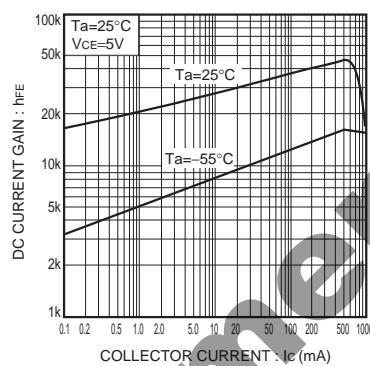


Fig.5 DC current gain vs. collector current (II)

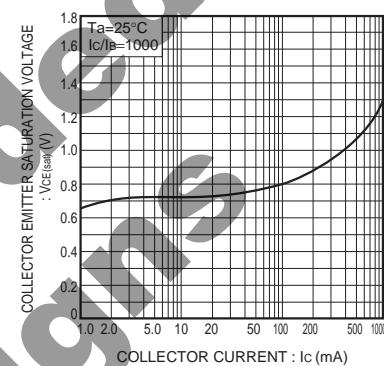


Fig.6 Collector emitter saturation voltage vs. collector current

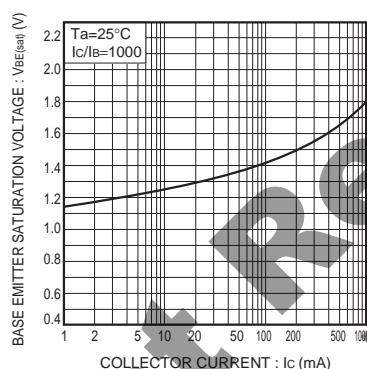


Fig.7 Base emitter saturation voltage vs. collector current

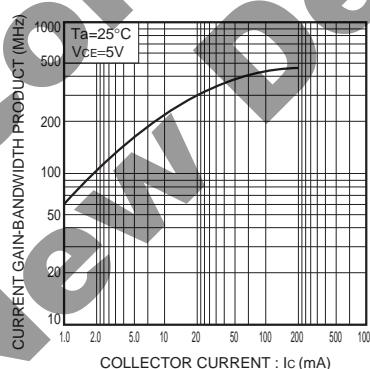


Fig.8 Current gain-bandwidth product vs. collector current

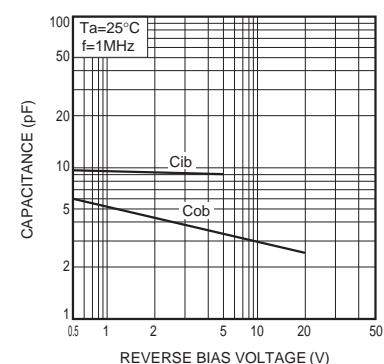


Fig.9 Capacitance vs. reverse bias voltage

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