

# NPN small signal transistor

## MMSTA13

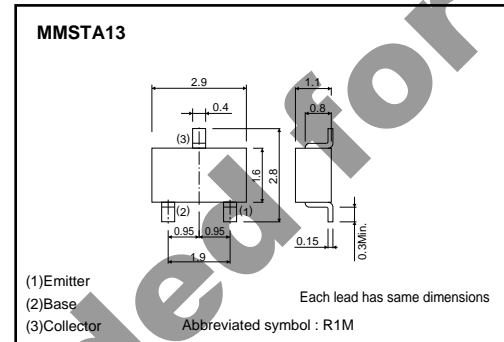
### ●Features

(1) High Current Gain.

### ●Packaging specifications

Type	Package	Taping
	Code	T146
	Basic ordering unit (pieces)	3000
MMSTA13		○

### ●Dimensions (Unit : mm)



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

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CBO}$	30	V
Collector-emitter voltage	$V_{CES}$	30	V
Emitter-base voltage	$V_{EBO}$	10	V
Collector current	$I_C$	0.3	A
		0.2	W
Collector power dissipation	$P_C$	0.35	W *
Junction temperature	$T_J$	150	°C
Storage temperature	$T_{stg}$	-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	$BV_{CES}$	30	-	-	V	$I_C = 100\mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	30	-	-	V	$I_C = 10\mu A$
Emitter-base breakdown voltage	$BV_{EBO}$	10	-	-	V	$I_E = 10\mu A$
Collector-base cutoff current	$I_{CBO}$	-	-	0.1	$\mu A$	$V_{CB} = 30V$
Emitter-base cutoff current	$I_{CEO}$	-	-	0.1	$\mu A$	$V_{EB} = 10V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	1.5	V	$I_C/I_E = 100mA / 100\mu A$
Base-emitter voltage	$V_{BE(on)}$	-	-	2.0	V	$V_{CE} = 5V, I_C = 100mA$ *
DC current transfer ratio	$h_{FE}$	5000	-	-	-	$V_{CE} = 5V, I_C = 10mA$
		10000	-	-	-	$V_{CE} = 5V, I_C = 100mA$ *
Transition frequency	$f_T$	125	-	-	MHz	$V_{CE} = 5V, I_E = -10mA, f = 100MHz$
Collector output capacitance	$C_{ob}$	-	5.4	-	pF	$V_{CB} = 10V, f = 100kHz, I_E = 0$

\* Pulsed

●Electrical characteristics curves

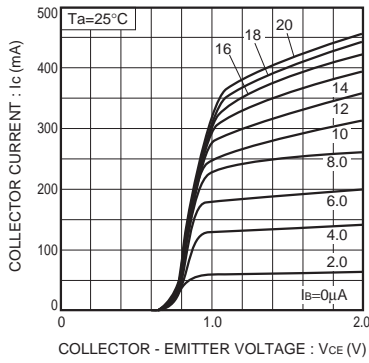


Fig.1 Typical output characteristics ( I )

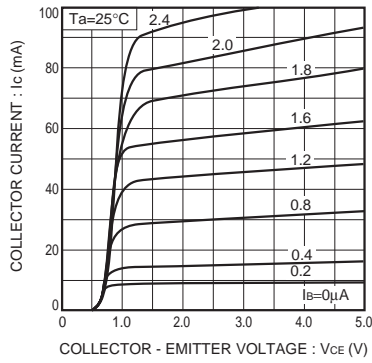


Fig.2 Typical output characteristics ( II )

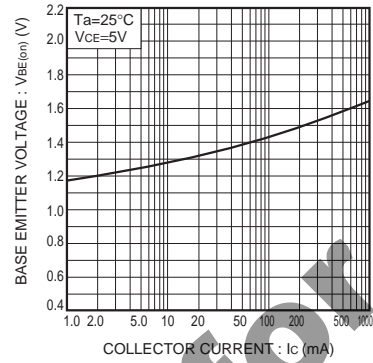


Fig.3 Base emitter 'ON' voltage vs. collector current

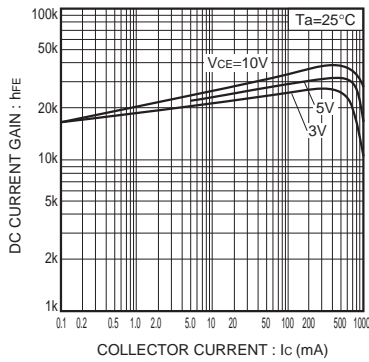


Fig.4 DC current gain vs. collector current ( I )

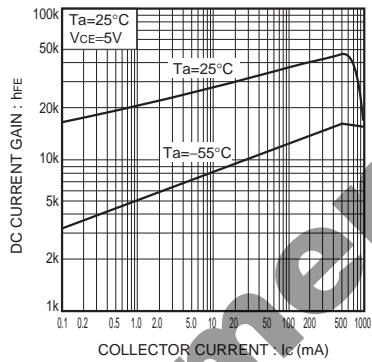


Fig.5 DC current gain vs. collector current ( II )

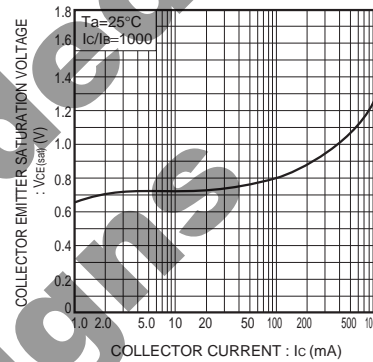


Fig.6 Collector emitter saturation voltage vs. collector current

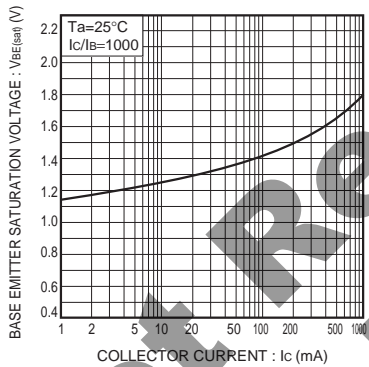


Fig.7 Base emitter saturation voltage vs. collector current

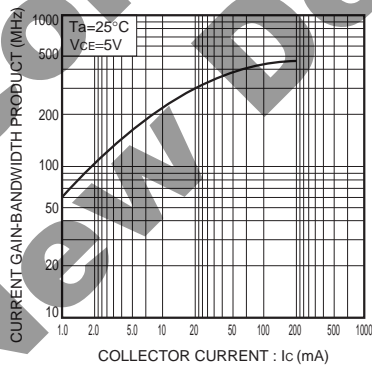


Fig.8 Current gain-bandwidth product vs. collector current

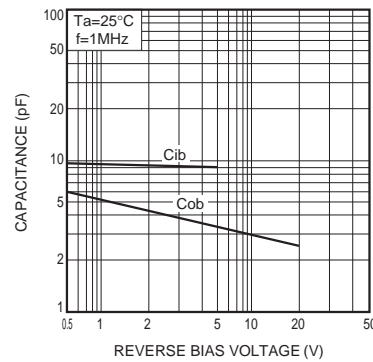


Fig.9 Capacitance vs. reverse bias voltage

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