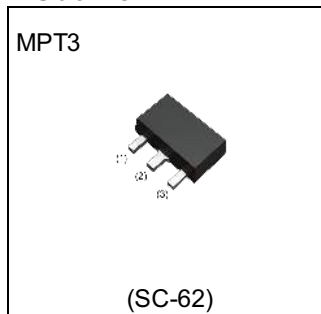


Parameter	Value
$V_{CEO}$	-30V
$I_C$	-1A

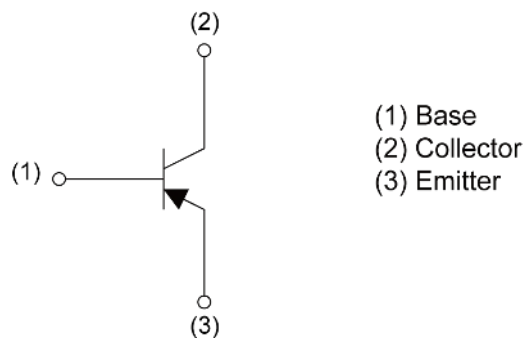
## ●Outline



## ●Features

- 1) Suitable for Middle Power Driver.
- 2) Complementary NPN Types : 2SCR293P5.
- 3) Low  $V_{CE(sat)}$   
 $V_{CE(sat)} = -350\text{mV (Max.)}$   
 $(I_C/I_B = -500\text{mA}/-25\text{mA})$

## ●Inner circuit



## ●Application

LOW FREQUENCY AMPLIFIER, DRIVER

## ●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
2SAR293P5	MPT3	6595	T100	330	16	1000	ML

**● Absolute maximum ratings** ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Values	Unit
Collector-base voltage	$V_{CBO}$	-30	V
Collector-emitter voltage	$V_{CEO}$	-30	V
Emitter-base voltage	$V_{EBO}$	-6	V
Collector current	$I_C$	-1	A
	$I_{CP}^{*1}$	-2	A
Power dissipation	$P_D^{*2}$	0.5	W
	$P_D^{*3}$	2.0	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Range of storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

**● Electrical characteristics** ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Collector-base breakdown voltage	$BV_{CBO}$	$I_C = -10\mu\text{A}$	-30	-	-	V
Collector-emitter breakdown voltage	$BV_{CEO}$	$I_C = -1\text{mA}$	-30	-	-	V
Emitter-base breakdown voltage	$BV_{EBO}$	$I_E = -10\mu\text{A}$	-6	-	-	V
Collector cut-off current	$I_{CBO}$	$V_{CB} = -30\text{V}$	-	-	-100	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -6\text{V}$	-	-	-100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}^{*4}$	$I_C = -500\text{mA}$ , $I_B = -25\text{mA}$	-	-150	-350	mV
DC current gain	$h_{FE}$	$V_{CE} = -2\text{V}$ , $I_C = -100\text{mA}$	270	-	680	-
Transition frequency	$f_T^{*4}$	$V_{CE} = -2\text{V}$ , $I_E = 100\text{mA}$ , $f = 100\text{MHz}$	-	320	-	MHz
Output capacitance	$C_{ob}$	$V_{CB} = -10\text{V}$ , $I_E = 0\text{A}$ , $f = 1\text{MHz}$	-	7	-	pF
Turn-On time	$t_{on}$	$I_C = -500\text{mA}$ , $I_{B1} = -25\text{mA}$ , $I_{B2} = 25\text{mA}$ , $V_{CC} \approx -5\text{V}$ , $R_L = 10\Omega$ See test circuit	-	60	-	ns
Storage time	$t_{stg}$		-	160	-	ns
Fall time	$t_f$		-	50	-	ns

\*1  $P_w=10\text{ms}$  Single Pulse

\*2 Each terminal mounted on a reference land.

\*3 Mounted on a ceramic board(40×40×0.7 mm) .

\*4 Pulsed

●Electrical characteristic curves( $T_a = 25^\circ\text{C}$ )

Fig.1 Grounded Emitter Propagation Characteristics

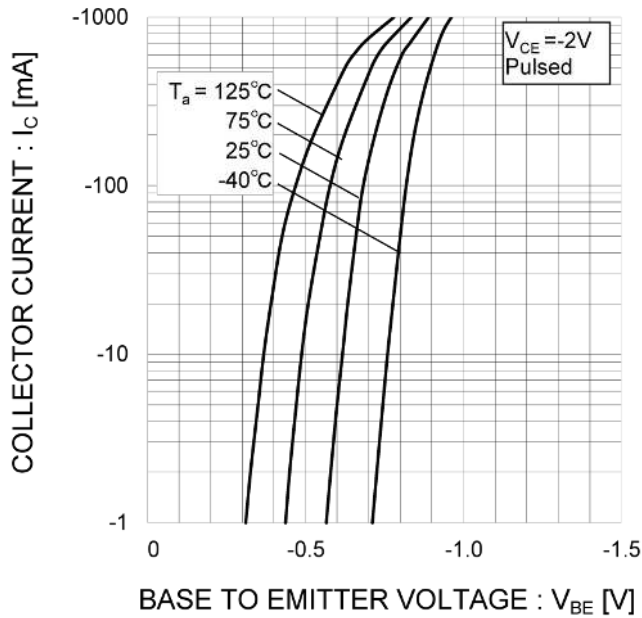


Fig.2 Typical Output Characteristics

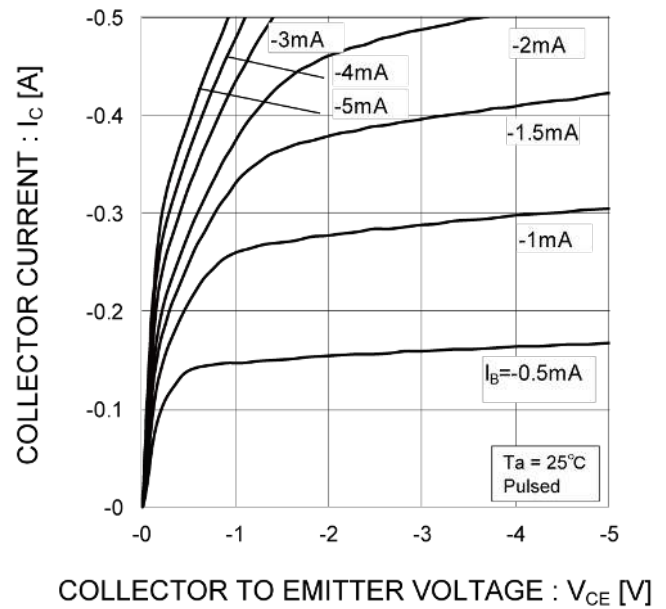


Fig.3 DC Current Gain vs. Collector Current(I)

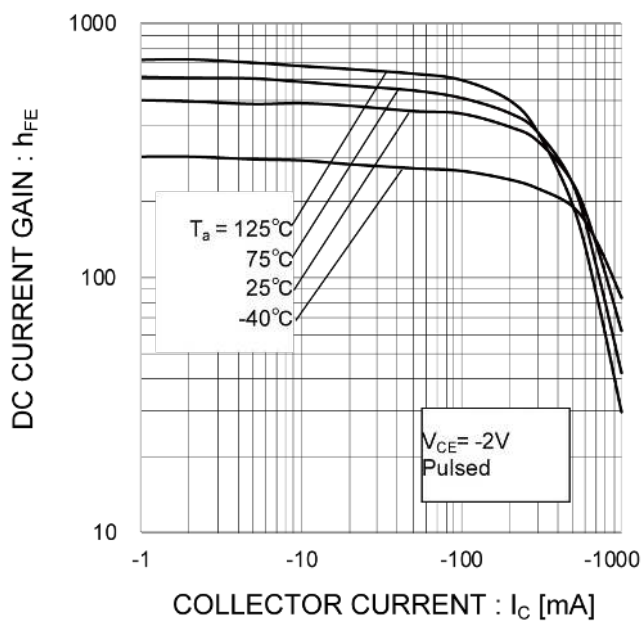
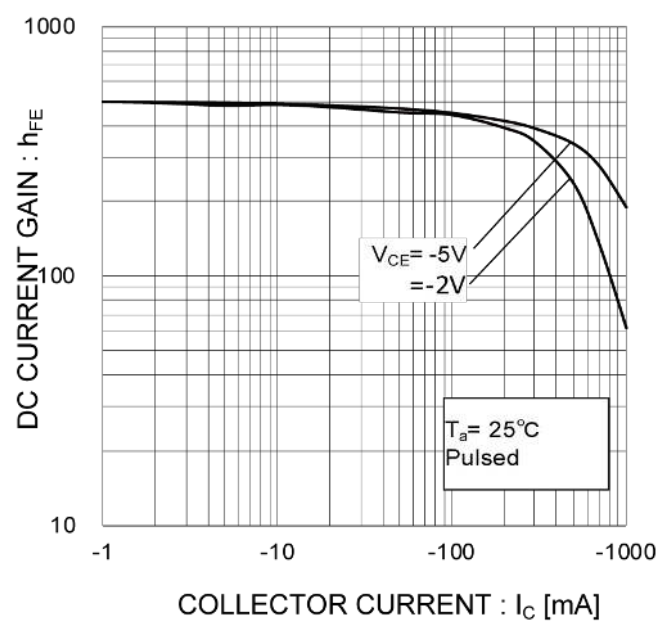


Fig.4 DC Current Gain vs. Collector Current(II)



●Electrical characteristic curves( $T_a = 25^\circ\text{C}$ )

Fig.5 Collector-Emitter Saturation  
Voltage vs. Collector Current(I)

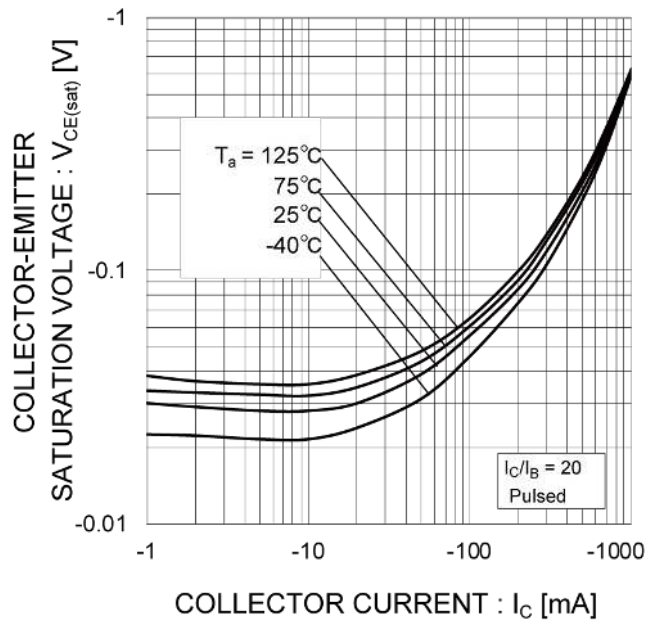


Fig.6 Collector-Emitter Saturation  
Voltage vs. Collector Current(II)

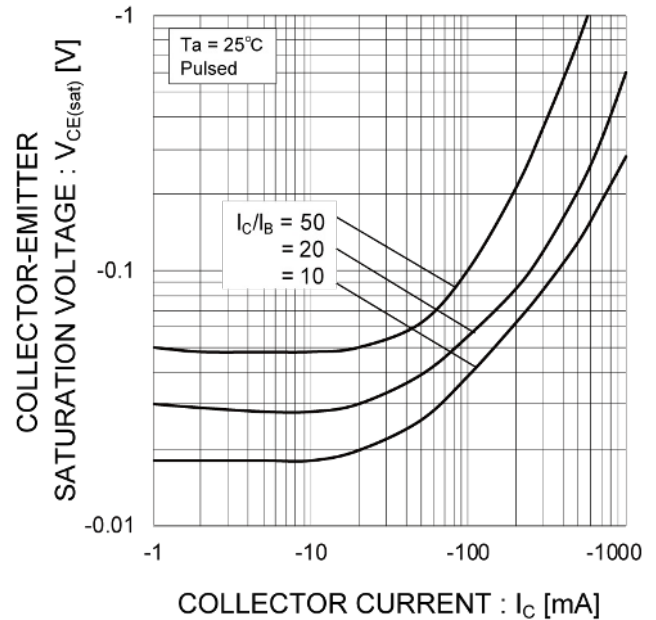


Fig.7 Base-Emitter Saturation Voltage  
vs. Collector Current

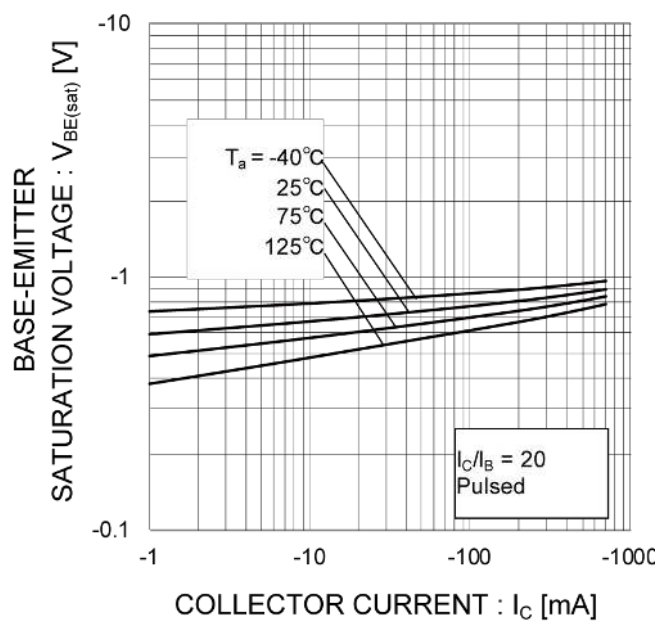
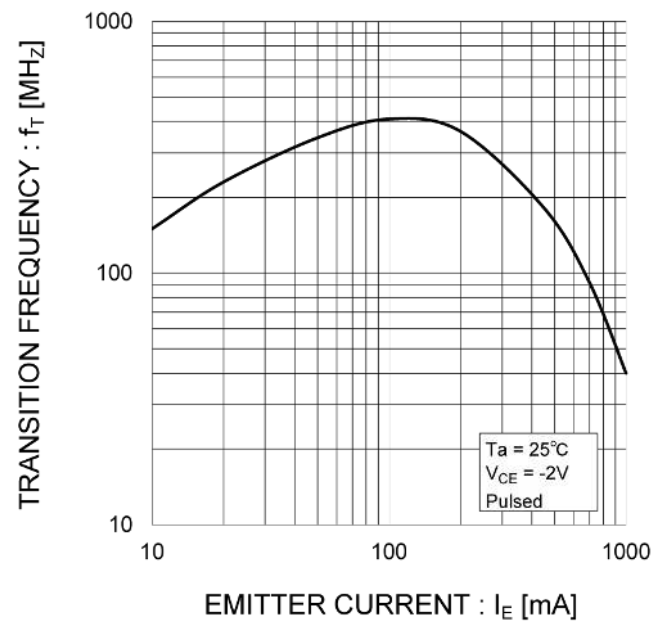


Fig.8 Gain Bandwidth Product  
vs. Emitter Current



# ●Electrical characteristic curves( $T_a = 25^\circ\text{C}$ )

Fig.9 Emitter input capacitance  
vs. Emitter-Base Voltage  
Collector output capacitance vs.  
Collector-Base Voltage

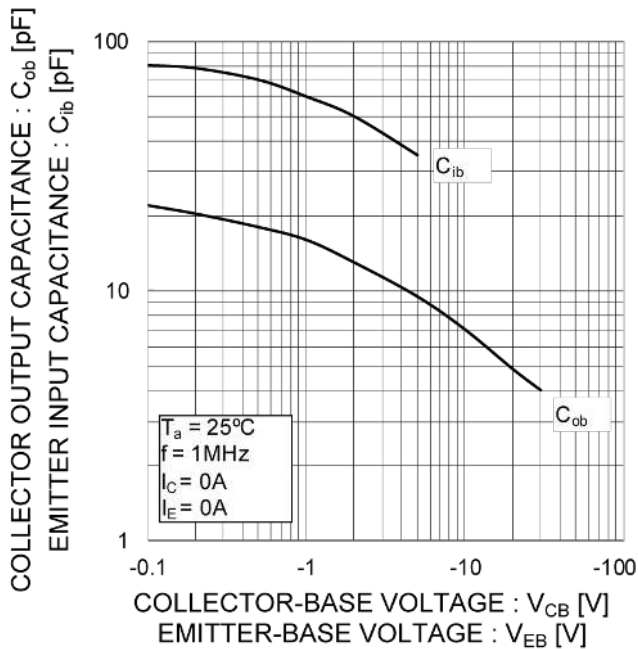
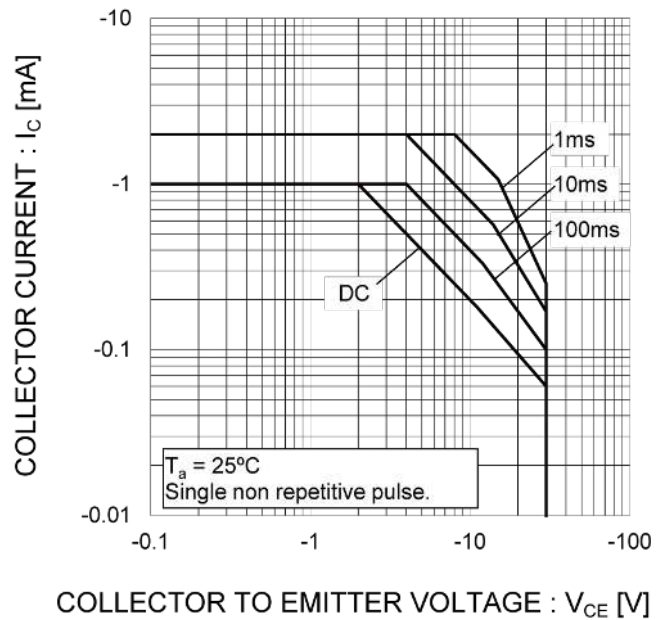
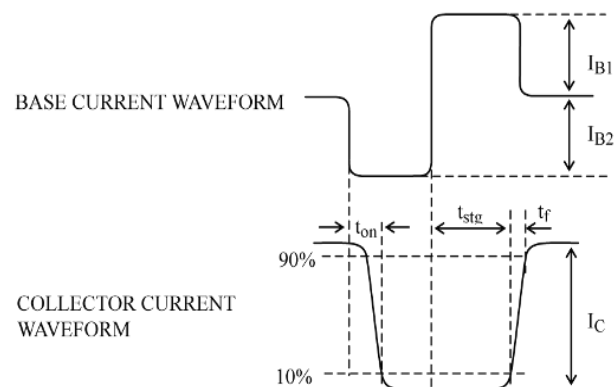
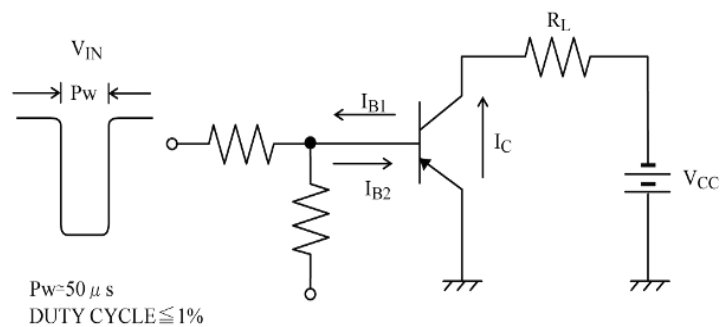


Fig.10 Safe Operating Area

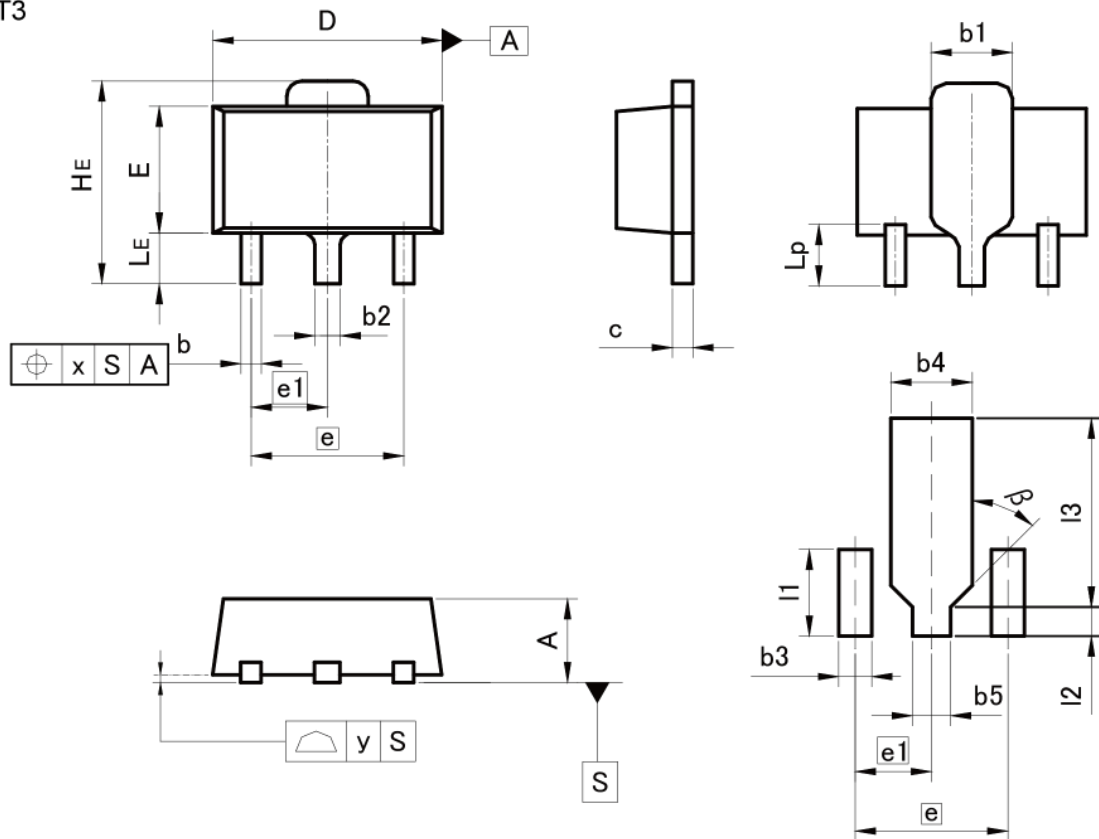


## SWITCHING TIME TEST CIRCUIT



# ●Dimensions

MPT3



Pattern of terminal position areas  
[Not a recommended pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.40	1.50	0.055	0.059
b	0.30	0.50	0.012	0.020
b1	1.50	1.70	0.059	0.067
b2	0.40	0.60	0.016	0.024
c	0.35	0.50	0.014	0.020
D	4.40	4.70	0.173	0.185
E	2.40	2.70	0.094	0.106
e	3.00		0.118	
e1	1.50		0.059	
HE	3.70	4.30	0.146	0.169
LE	0.80	1.20	0.031	0.047
Lp	1.01	1.41	0.040	0.056
x	—	0.15	—	0.006
y	—	0.10	—	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b3	—	0.65	—	0.026
b4	—	1.70	—	0.067
b5	—	0.75	—	0.030
l1	—	1.71	—	0.067
l2	—	0.58	—	0.023
l3	—	3.72	—	0.146
β	45°		45°	

Dimension in mm/inches

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