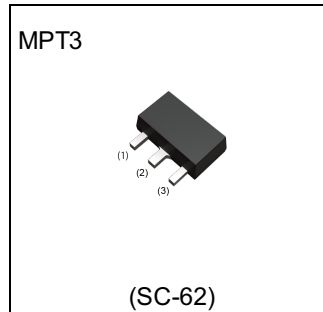


Parameter	Value
V_{CEO}	-30V
I_C	-1A

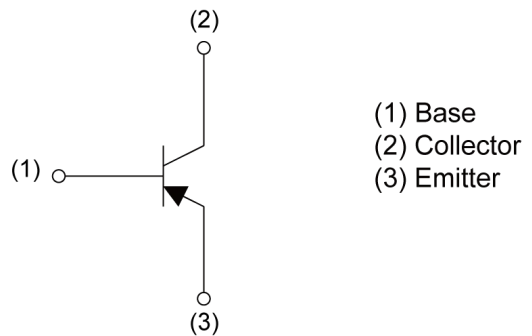
●Outline



●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}	$I_{\text{C}} = -10\mu\text{A}$	-30	-	-	V
Collector-emitter breakdown voltage	BV_{CEO}	$I_{\text{C}} = -1\text{mA}$	-30	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	$I_{\text{E}} = -10\mu\text{A}$	-6	-	-	V
Collector cut-off current	I_{CBO}	$V_{\text{CB}} = -30\text{V}$	-	-	-100	nA
Emitter cut-off current	I_{EBO}	$V_{\text{EB}} = -6\text{V}$	-	-	-100	nA
Collector-emitter saturation voltage	$V_{\text{CE(sat)}}^{*4}$	$I_{\text{C}} = -500\text{mA}$, $I_{\text{B}} = -25\text{mA}$	-	-150	-350	mV
DC current gain	h_{FE}	$V_{\text{CE}} = -2\text{V}$, $I_{\text{C}} = -100\text{mA}$	270	-	680	-
Transition frequency	f_{T}^{*4}	$V_{\text{CE}} = -2\text{V}$, $I_{\text{E}} = 100\text{mA}$, $f = 100\text{MHz}$	-	320	-	MHz
Output capacitance	C_{ob}	$V_{\text{CB}} = -10\text{V}$, $I_{\text{E}} = 0\text{A}$, $f = 1\text{MHz}$	-	7	-	pF
Turn-On time	t_{on}	$I_{\text{C}} = -500\text{mA}$, $I_{\text{B1}} = -25\text{mA}$,	-	60	-	ns
Storage time	t_{stg}	$I_{\text{B2}} = 25\text{mA}$, $V_{\text{CC}} \approx -5\text{V}$,	-	160	-	ns
Fall time	t_{f}	$R_{\text{L}} = 10\Omega$ See test circuit	-	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

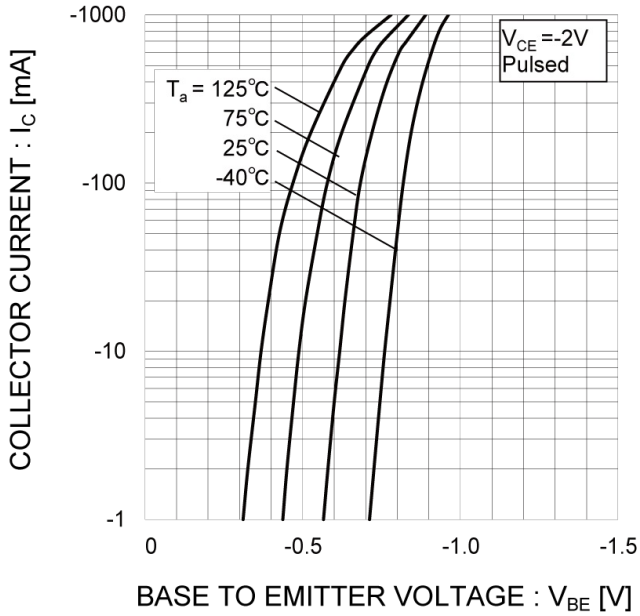


Fig.2 Typical Output Characteristics

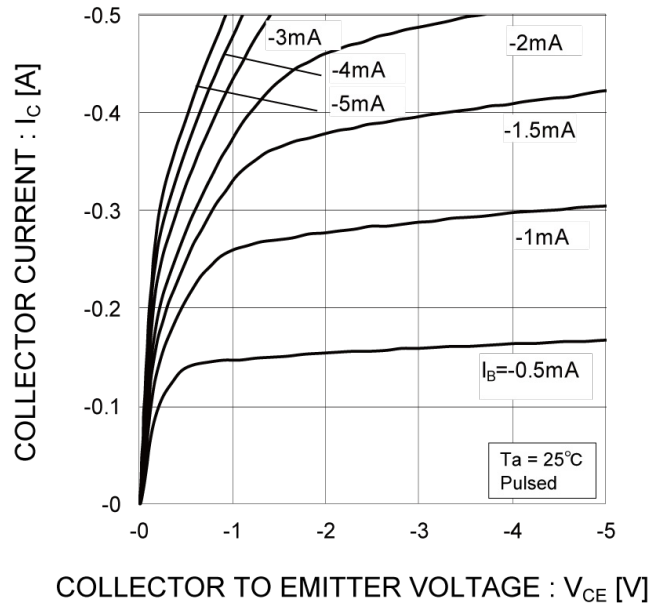


Fig.3 DC Current Gain vs. Collector Current(I)

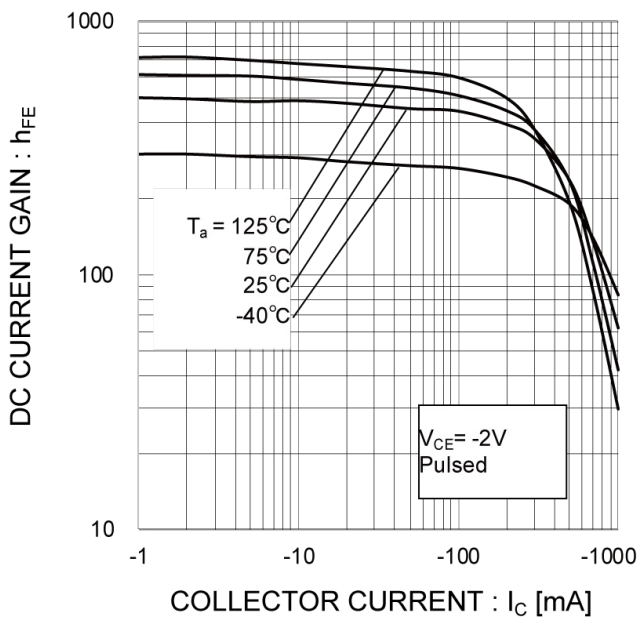
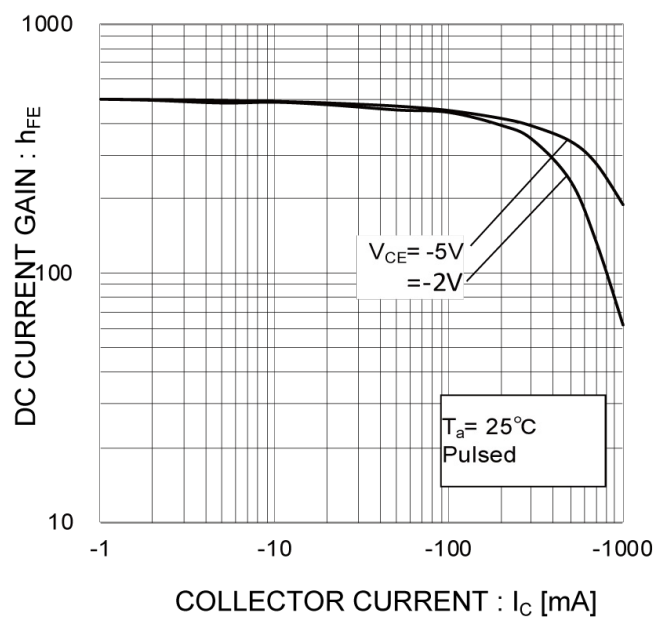


Fig.4 DC Current Gain vs. Collector Current(II)



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

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

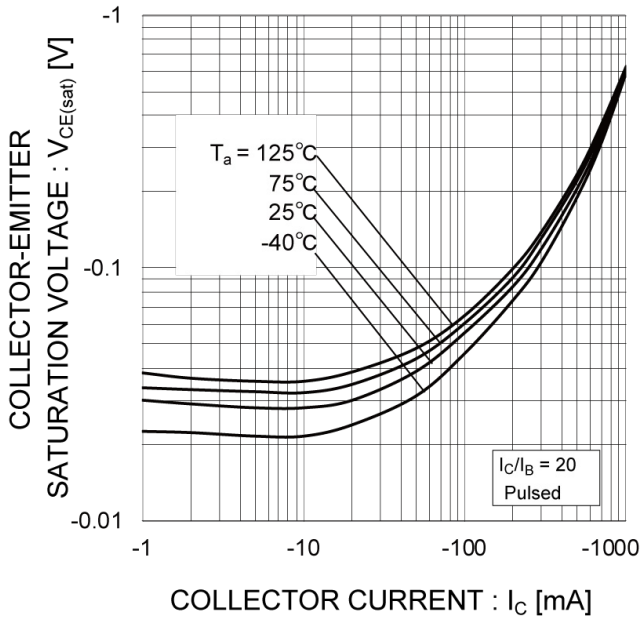


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current(II)

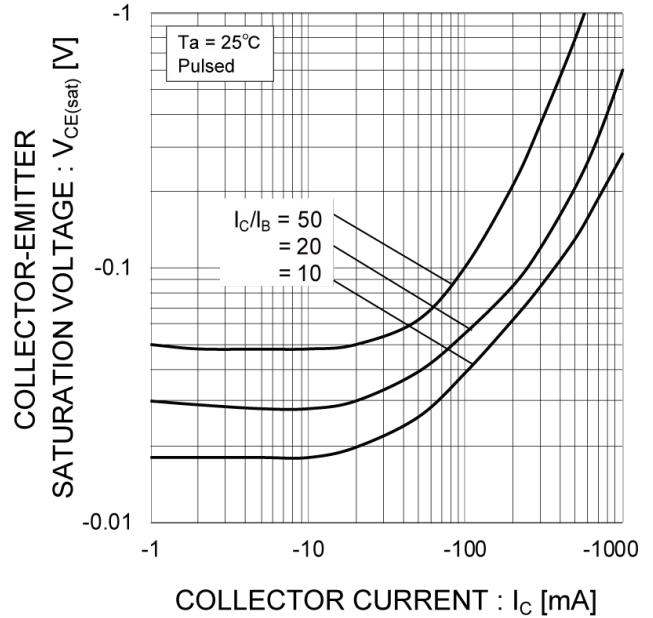


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

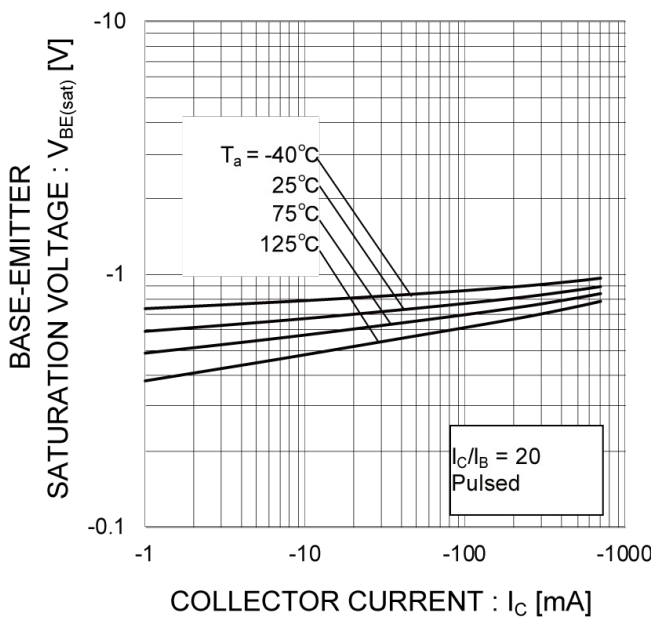
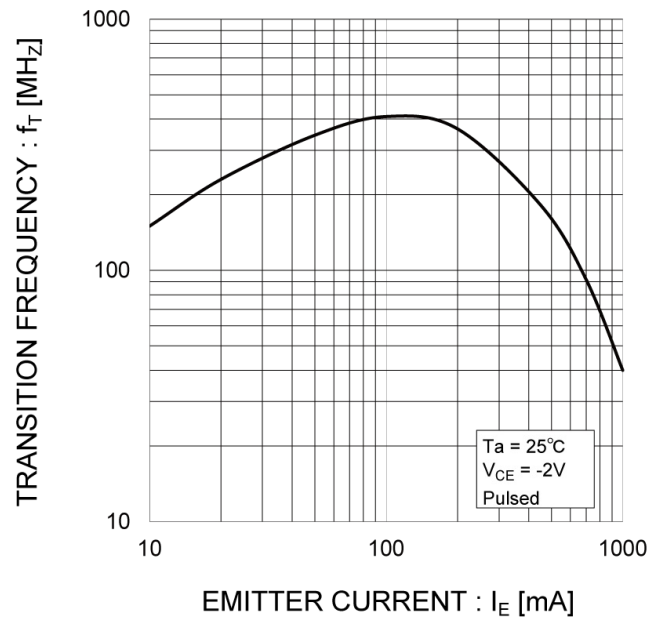


Fig.8 Gain Bandwidth Product vs. Emitter Current



● 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

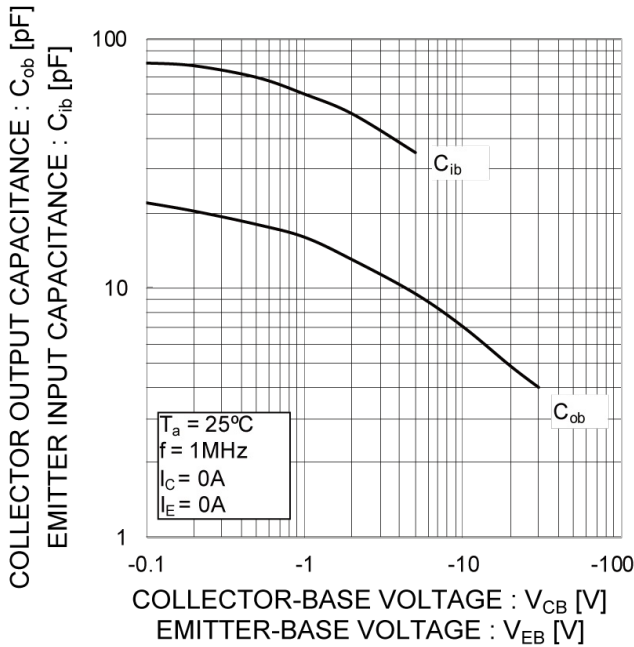
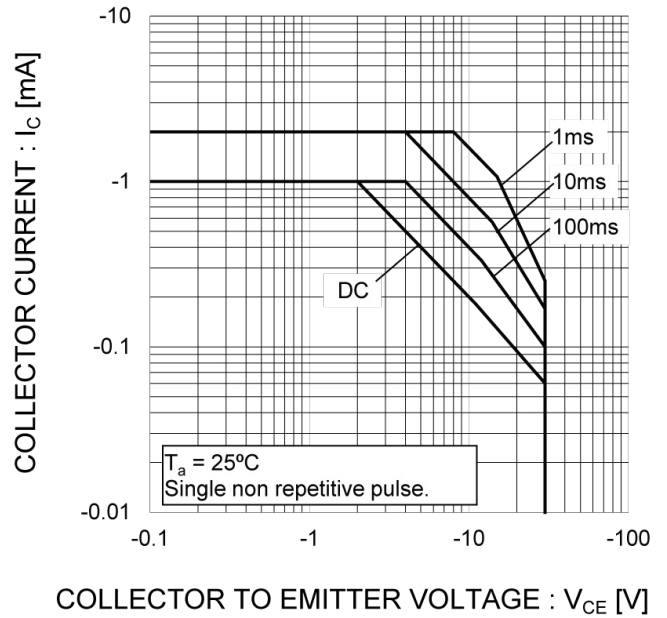
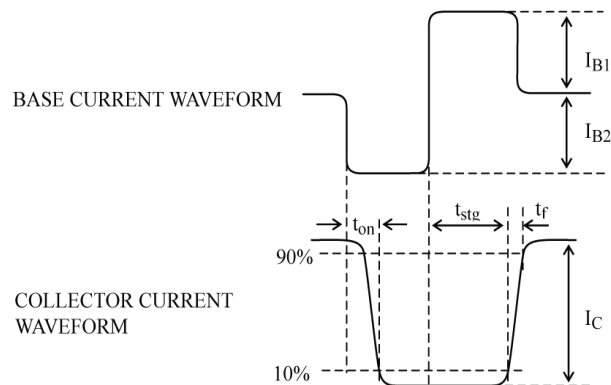
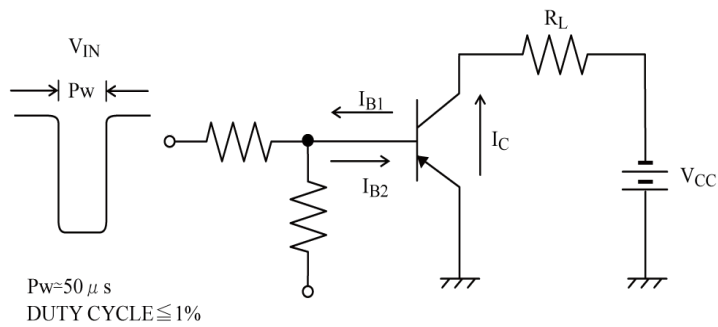


Fig.10 Safe Operating Area

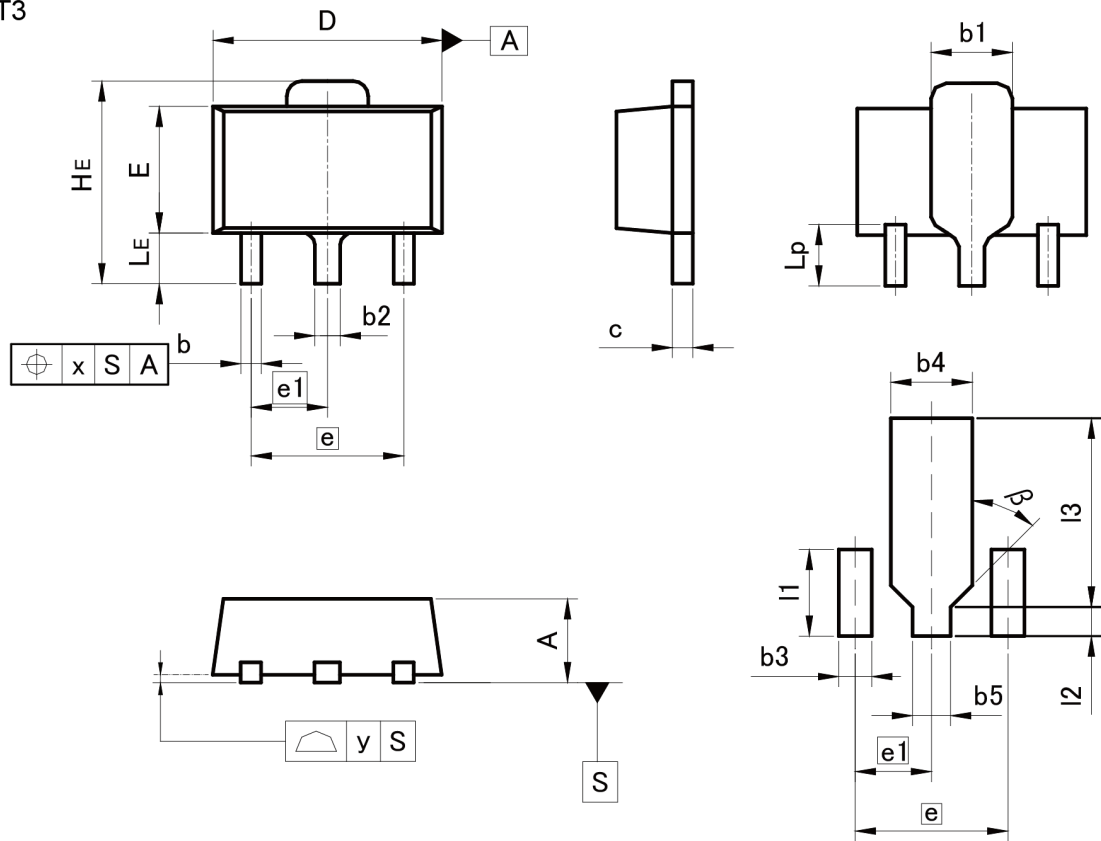


SWITCHING TIME TEST CIRCUIT



●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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