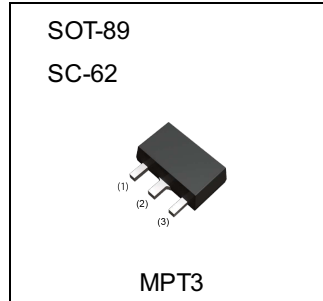


Parameter	Value
$V_{CEO}$	30V
$I_C$	5A

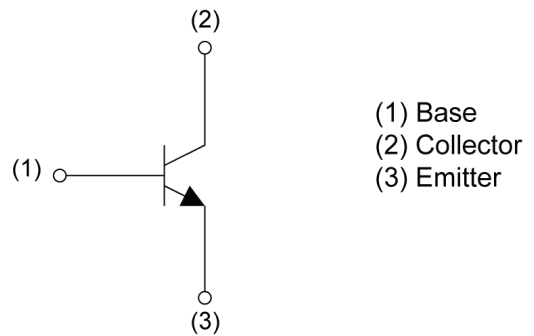
●Outline



●Features

- 1) Low saturation voltage, typically  
 $V_{CE(sat)}=400\text{mV}(\text{Max.})$   
 $(I_C/I_B=2\text{A}/100\text{mA})$
- 2) High speed switching

●Inner circuit



●Application

LOW FREQUENCY AMPLIFIER, HIGH SPEED SWITCHING

●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
2SCR542P	SOT-89 (MPT3)	4540	T100	180	12	1000	NQ

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

Parameter	Symbol	Values	Unit
Collector-base voltage	$V_{\text{CBO}}$	30	V
Collector-emitter voltage	$V_{\text{CEO}}$	30	V
Emitter-base voltage	$V_{\text{EBO}}$	6	V
Collector current	$I_{\text{C}}$	5	A
	$I_{\text{CP}}^{*1}$	10	A
Power dissipation	$P_{\text{D}}^{*2}$	0.5	W
	$P_{\text{D}}^{*3}$	2.0	W
Junction temperature	$T_{\text{j}}$	150	$^\circ\text{C}$
Range of storage temperature	$T_{\text{stg}}$	-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	$BV_{\text{CBO}}$	$I_{\text{C}} = 100\mu\text{A}$	30	-	-	V
Collector-emitter breakdown voltage	$BV_{\text{CEO}}$	$I_{\text{C}} = 1\text{mA}$	30	-	-	V
Emitter-base breakdown voltage	$BV_{\text{EBO}}$	$I_{\text{E}} = 100\mu\text{A}$	6	-	-	V
Collector cut-off current	$I_{\text{CBO}}$	$V_{\text{CB}} = 30\text{V}$	-	-	1.0	$\mu\text{A}$
Emitter cut-off current	$I_{\text{EBO}}$	$V_{\text{EB}} = 4\text{V}$	-	-	1.0	$\mu\text{A}$
Collector-emitter saturation voltage	$V_{\text{CE(sat)}}^{*4}$	$I_{\text{C}} = 2\text{A}, I_{\text{B}} = 100\text{mA}$	-	200	400	mV
DC current gain	$h_{\text{FE}}$	$V_{\text{CE}} = 2\text{V}, I_{\text{C}} = 500\text{mA}$	200	-	500	-
Transition frequency	$f_{\text{T}}^{*4}$	$V_{\text{CE}} = 10\text{V}, I_{\text{E}} = -100\text{mA},$ $f = 100\text{MHz}$	-	250	-	MHz
Output capacitance	$C_{\text{ob}}$	$V_{\text{CB}} = 10\text{V}, I_{\text{E}} = 0\text{A},$ $f = 1\text{MHz}$	-	25	-	pF
Turn-On time	$t_{\text{on}}$	$I_{\text{C}} = 2.5\text{A},$ $I_{\text{B1}} = 250\text{mA},$	-	40	-	ns
Storage time	$t_{\text{stg}}$	$I_{\text{B2}} = -250\text{mA},$ $V_{\text{CC}} \approx 10\text{V},$	-	320	-	ns
Fall time	$t_{\text{f}}$	$R_{\text{L}} = 3.9\Omega$ See test circuit	-	25	-	ns

\*1  $P_{\text{w}}=10\text{ms}$ , Single Pulse

\*2 Each terminal mounted on a reference land.

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

\*4 Pulsed

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

Fig.1 Ground Emitter Propagation Characteristics

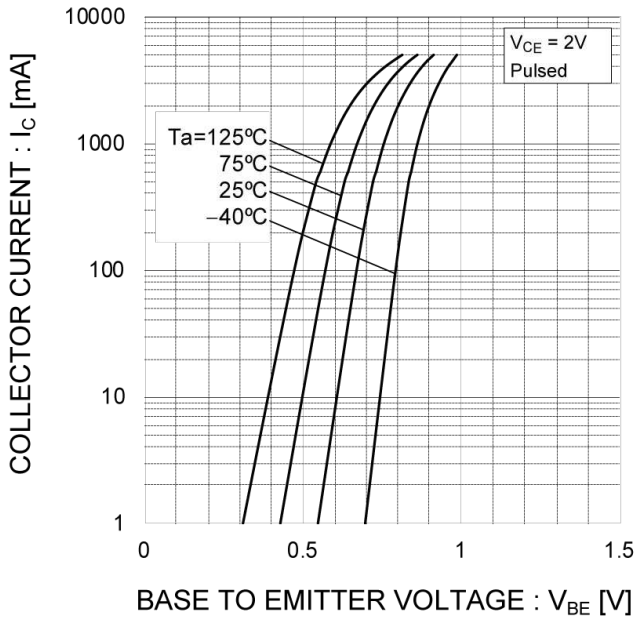


Fig.2 Typical Output Characteristics

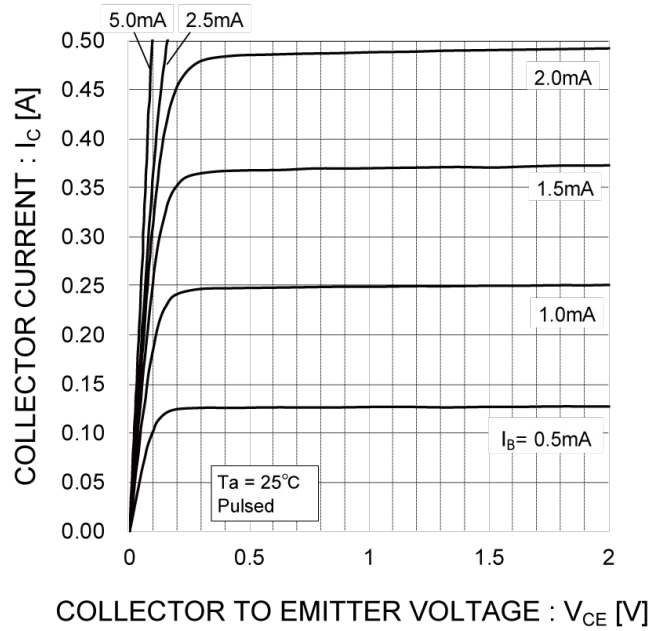


Fig.3 DC Current Gain vs. Collector Current (I)

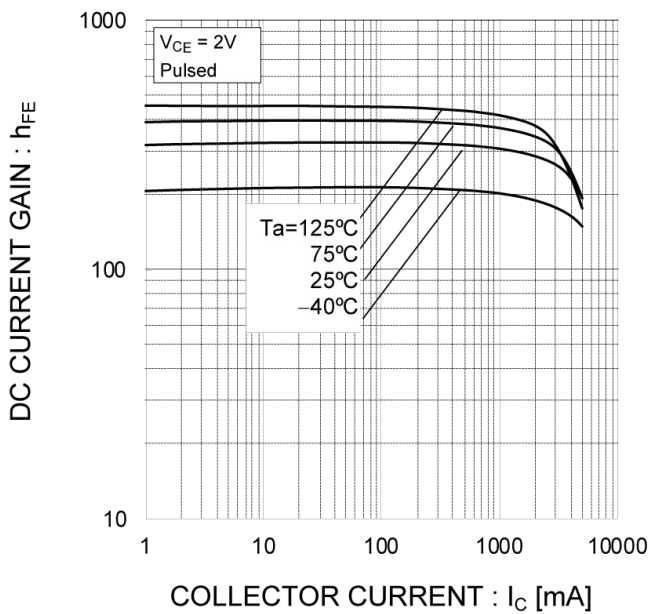
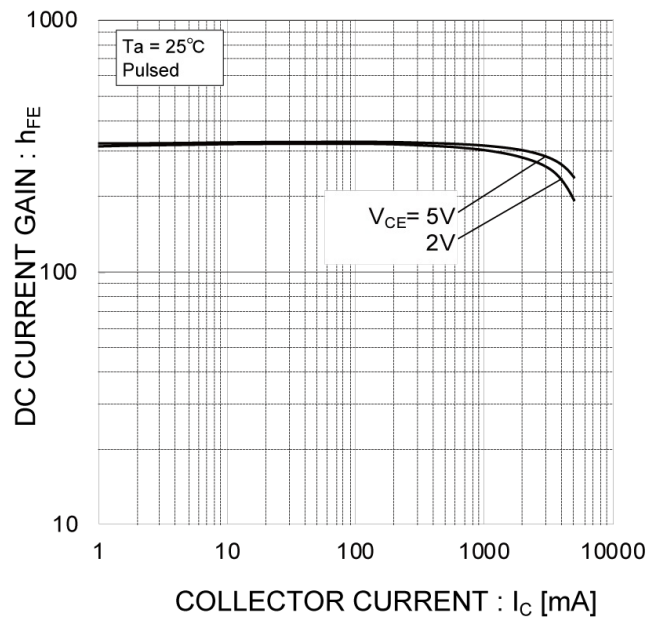


Fig.4 DC Current Gain vs. Collector Current (II)



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

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

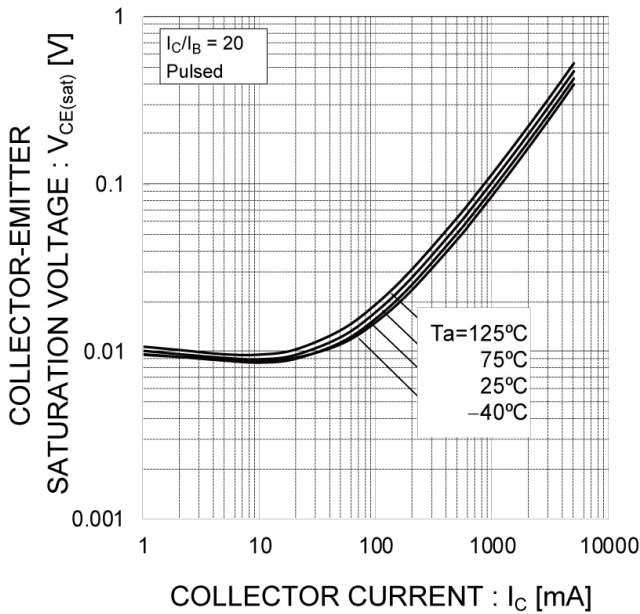


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

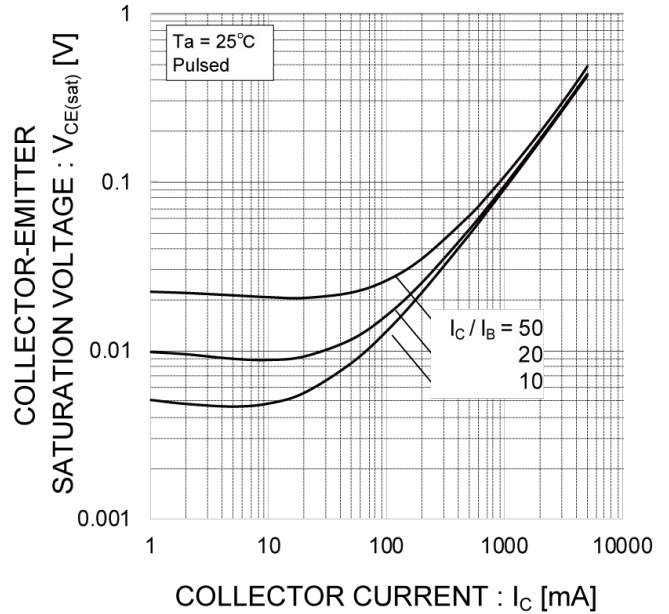


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

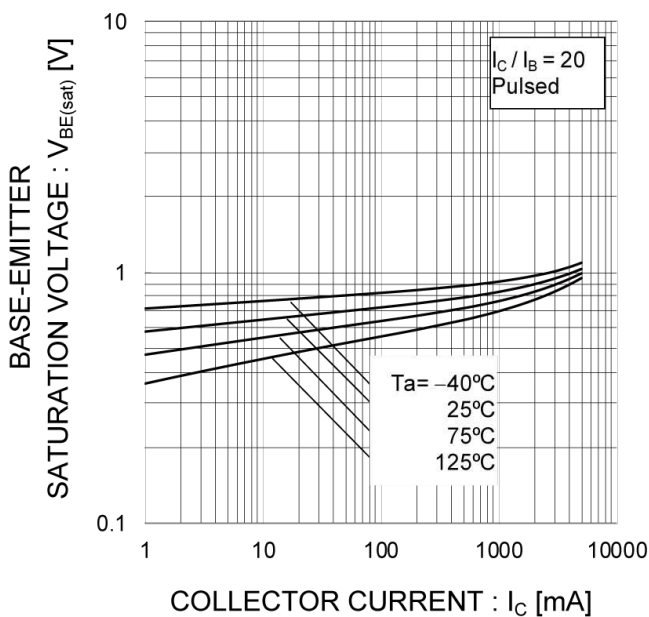
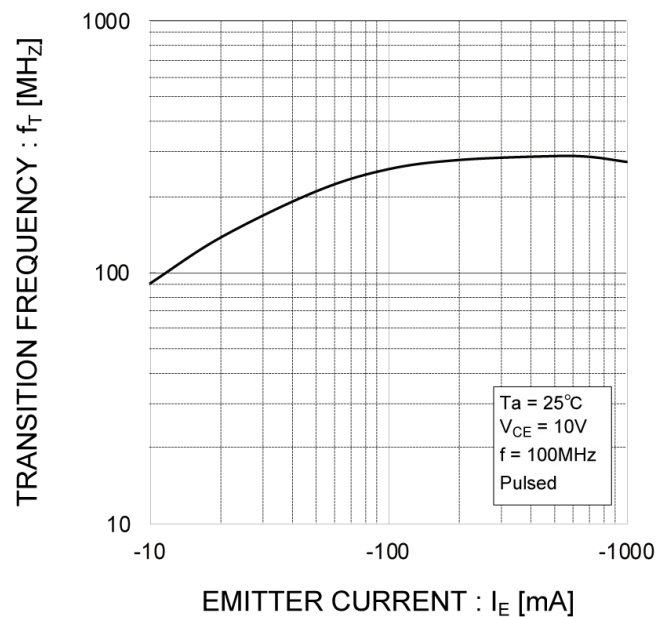


Fig.8 Gain Bandwidth Product vs. Emitter Current



● 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

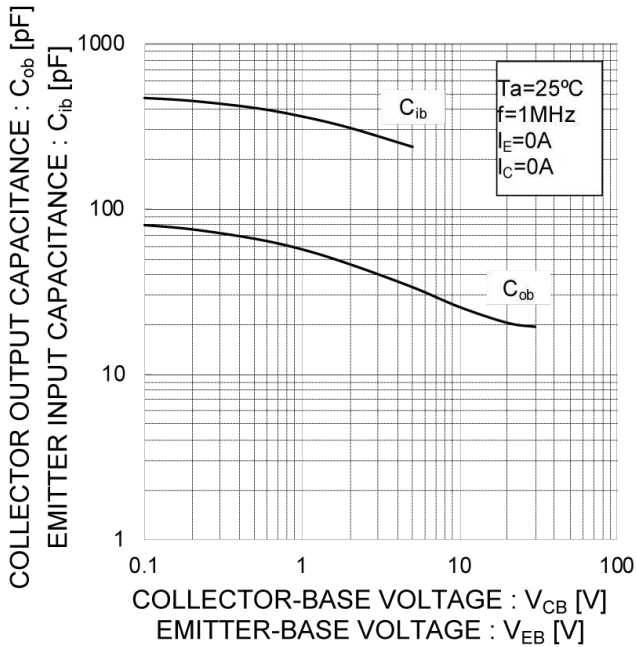
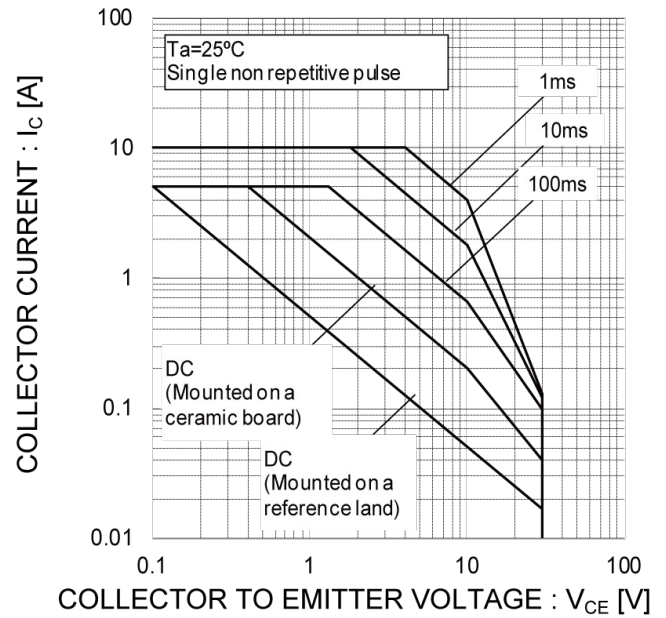
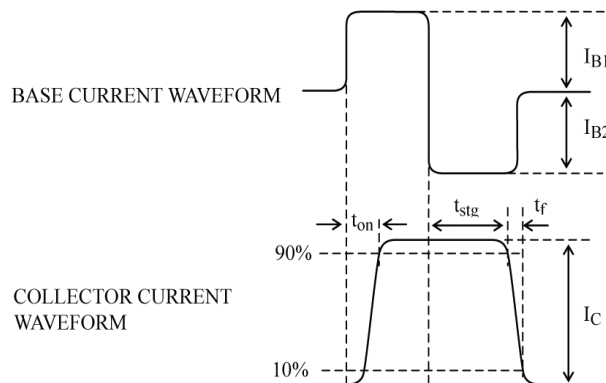
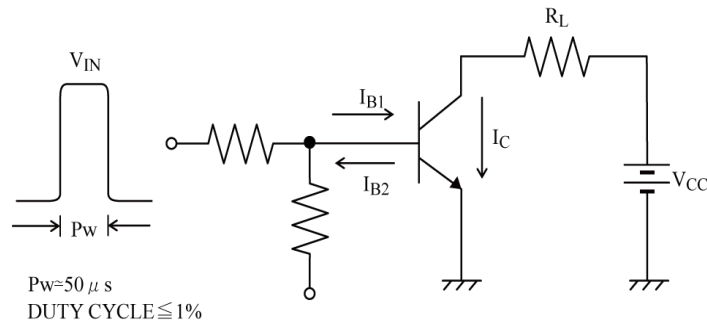


Fig.10 Safe Operating Area

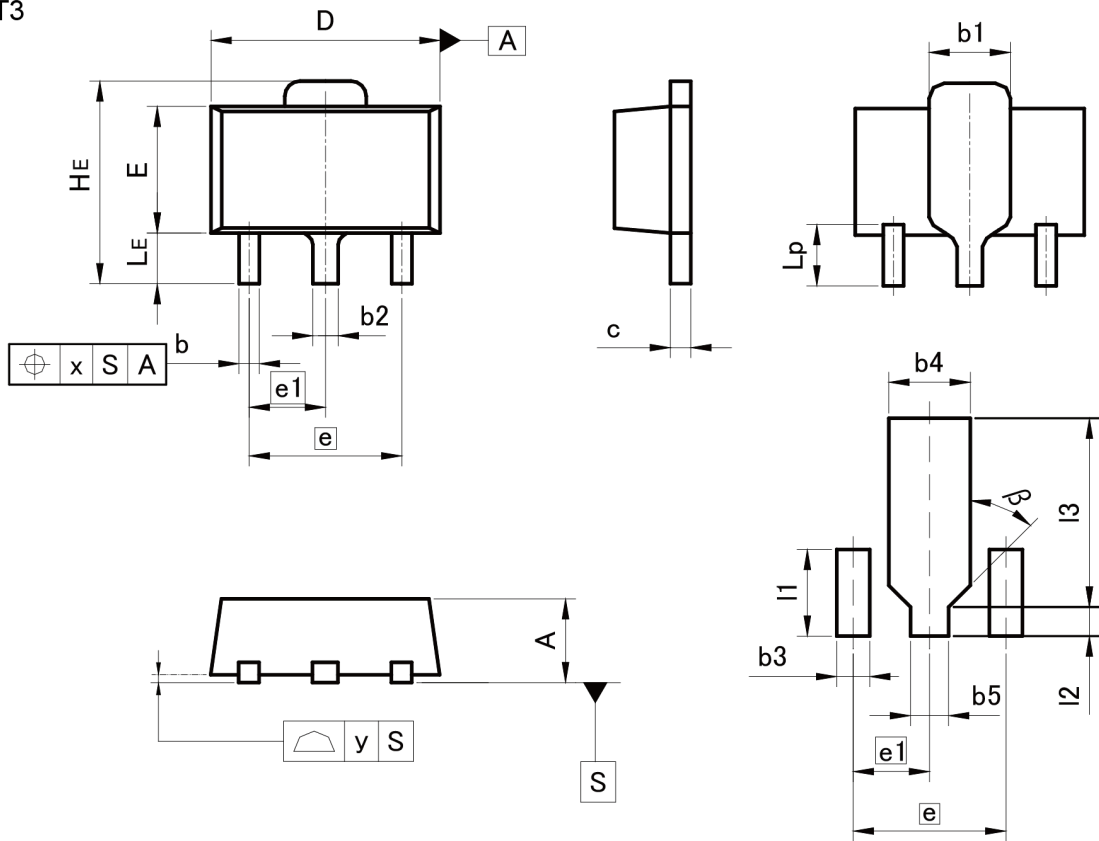


SWITCHING TIME TEST CIRCUIT



●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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