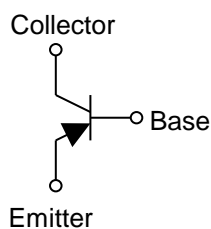


Parameter	Value
$V_{CEO}$	-60V
$I_C$	-5A

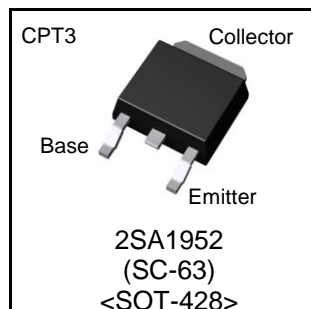
### ●Features

- 1) Suitable for Middle Power Driver
- 2) Complementary NPN Types : 2SC5103
- 3) Low  $V_{CE(sat)}$   
 $V_{CE(sat)} = -0.3V(\text{Max.}) (I_C/I_B = -3A / -0.15A)$   
 $V_{CE(sat)} = -0.5V(\text{Max.}) (I_C/I_B = -4A / -0.2A)$
- 4) Lead Free/RoHS Compliant.

### ●Inner circuit



### ●Outline



### ●Applications

Motor driver , LED driver  
Power supply

### ●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
2SA1952	CPT3	6595	TL	330	16	2,500	A1952

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

Parameter	Symbol	Values	Unit
Collector-base voltage	$V_{CBO}$	-100	V
Collector-emitter voltage	$V_{CEO}$	-60	V
Emitter-base voltage	$V_{EBO}$	-5	V
Collector current	DC	$I_C$	-5
	Pulsed	$I_{CP}$	-10
Power dissipation	$P_D^{*1}$	1	W
	$P_D^{*2}$	10	W
Junction temperature	$T_j$	150	°C
Range of storage temperature	$T_{stg}$	-55 to +150	°C

\*1 Mounted on a substrate

\*2  $T_C=25^\circ\text{C}$

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

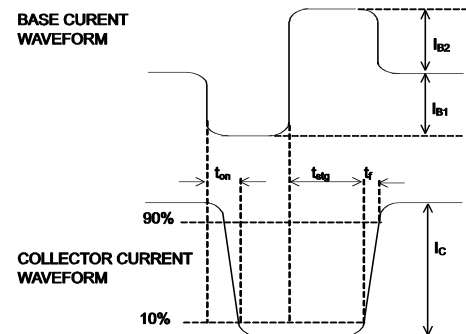
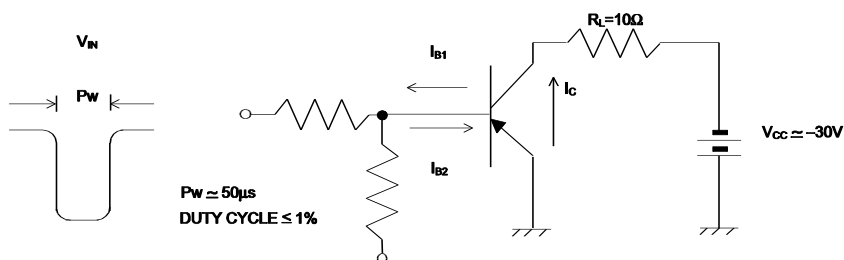
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	$BV_{CEO}$	$I_C = -1\text{mA}$	-60	-	-	V
Collector-base breakdown voltage	$BV_{CBO}$	$I_C = -50\mu\text{A}$	-100	-	-	V
Emitter-base breakdown voltage	$BV_{EBO}$	$I_E = -50\mu\text{A}$	-5	-	-	V
Collector cut-off current	$I_{CBO}$	$V_{CB} = -100\text{V}$	-	-	-10	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -5\text{V}$	-	-	-10	$\mu\text{A}$
Collector-emitter saturation voltage	$V_{CE(sat)}^{*1}$	$I_C = -3\text{A}, I_B = -0.15\text{A}$	-	-	-0.3	V
		$I_C = -4\text{A}, I_B = -0.2\text{A}$	-	-	-0.5	V
Base-emitter saturation voltage	$V_{BE(sat)}^{*1}$	$I_C = -3\text{A}, I_B = -0.15\text{A}$	-	-	-1.2	V
		$I_C = -4\text{A}, I_B = -0.2\text{A}$	-	-	-1.5	V
DC current gain	$h_{FE} 1^{*1}$	$V_{CE} = -2\text{V}, I_C = -1\text{A}$	120	-	270	-
	$h_{FE} 2^{*1}$	$V_{CE} = -2\text{V}, I_C = -3\text{A}$	40	-	-	-
Transition frequency	$f_T^{*1}$	$V_{CE} = -10\text{V}, I_E = 0.5\text{A}$ $f = 30\text{MHz}$	-	80	-	MHz
Output capacitance	$C_{ob}$	$V_{CB} = -10\text{V}, I_E = 0\text{A}$ $f = 1\text{MHz}$	-	130	-	pF
Turn-on time	$t_{on}^{*2}$	$I_C = -3\text{A}$ $I_{B1} = -0.15\text{A}$ $I_{B2} = 0.15\text{A}$ $V_{CC} \approx -30\text{V}$	-	-	0.3	$\mu\text{s}$
Storage time	$t_{stg}^{*2}$		-	-	1.5	$\mu\text{s}$
Fall time	$t_f^{*2}$		-	-	0.3	$\mu\text{s}$

\*1 Plused

\*2 See switching time test circuit

**● $h_{FE}$  rank categories**

Rank	Q
$h_{FE}$	120 to 270



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

Fig.1 Ground Emitter Propagation Characteristics

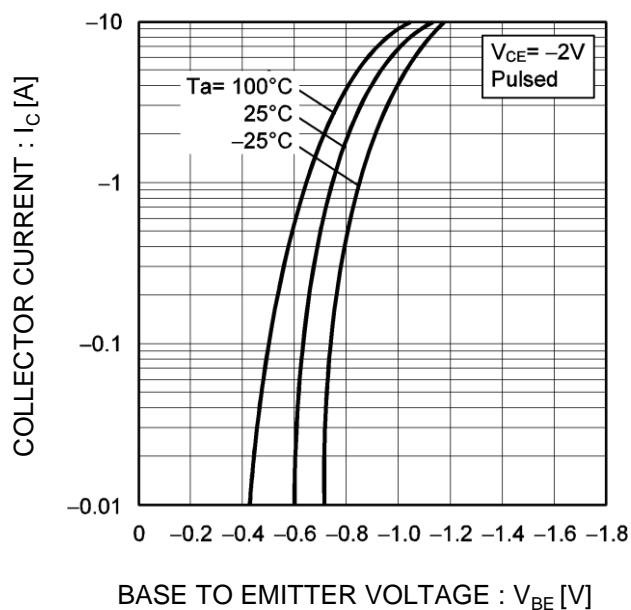


Fig.2 Typical Output Characteristics

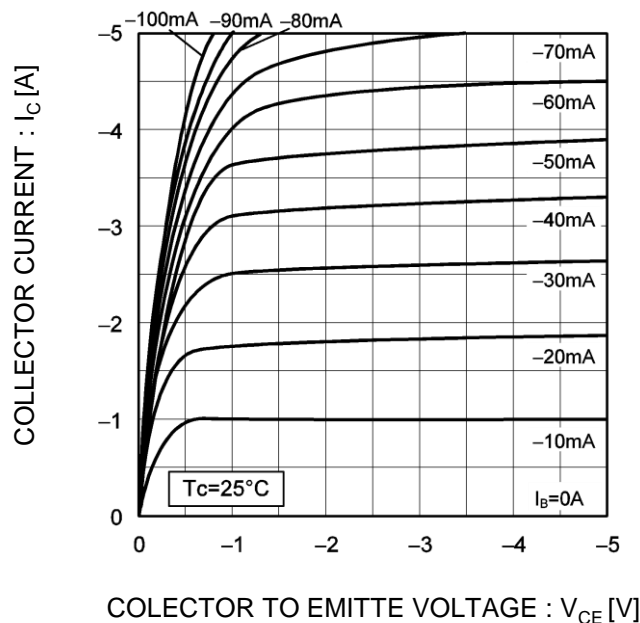


Fig.3 DC Current Gain vs. Collector Current (I)

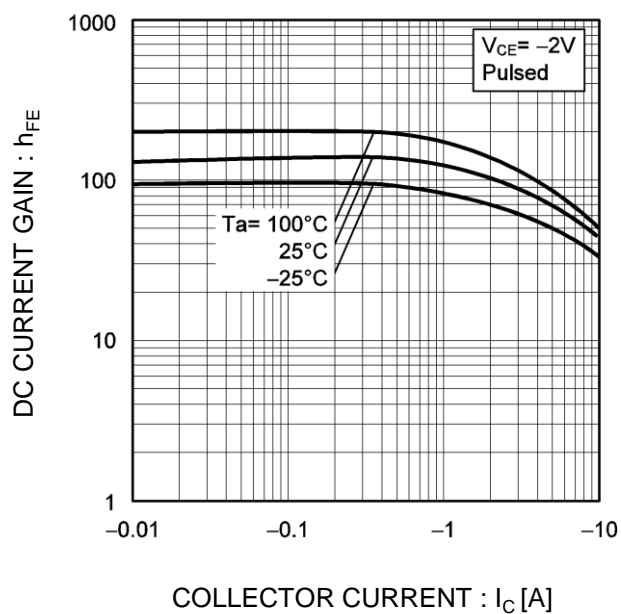
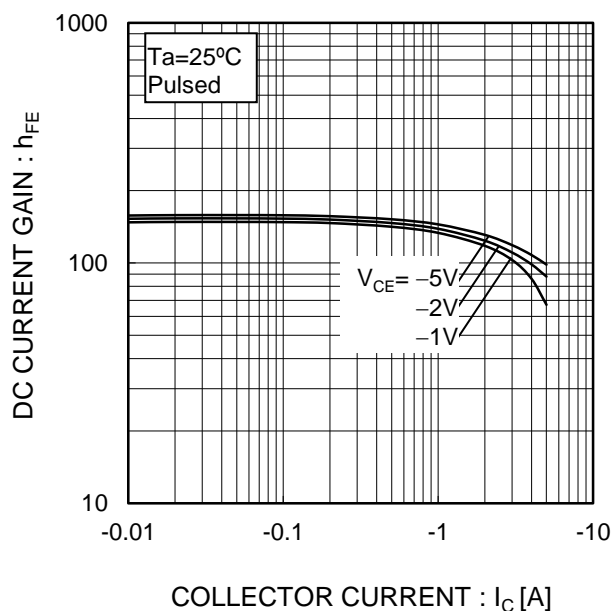


Fig.4 DC Current Gain vs. Collector Current (II)



●Electrical characteristic curves(Ta = 25°C)

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

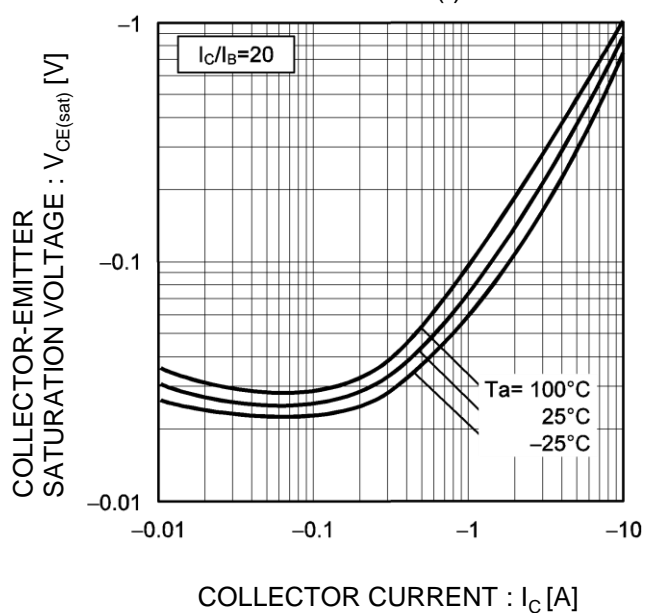


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

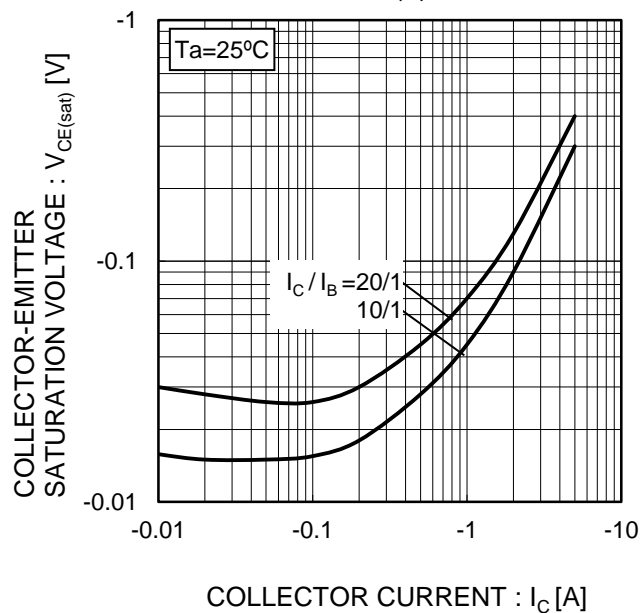


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

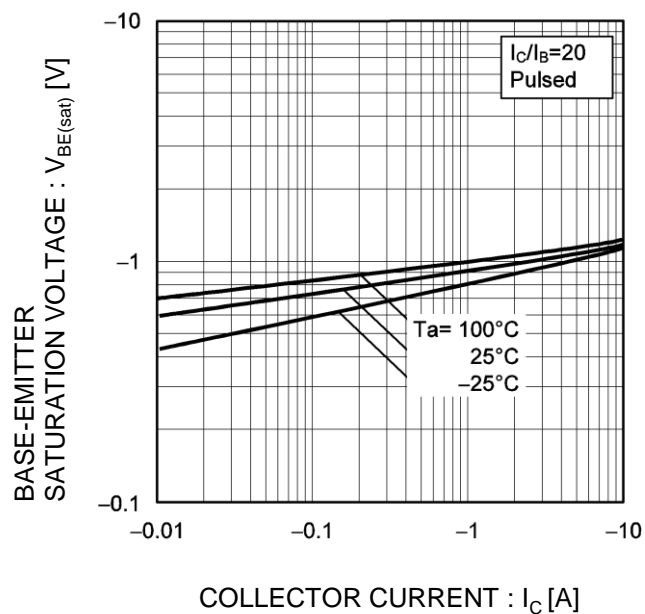
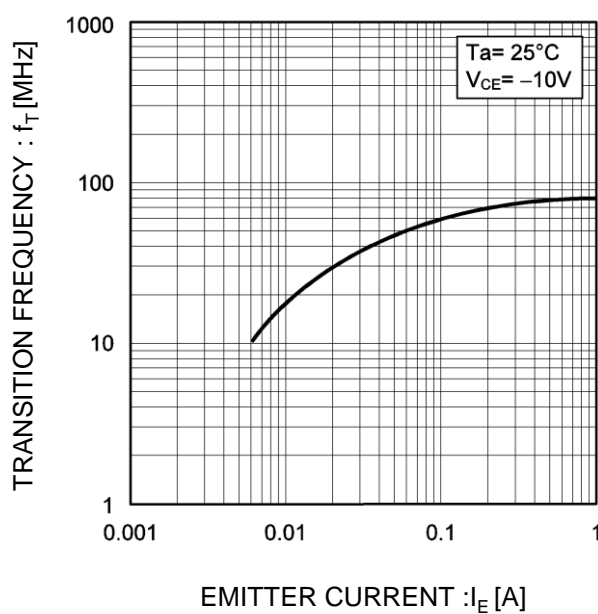


Fig.8 Gain Bandwidth Product vs. Emitter Current



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

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

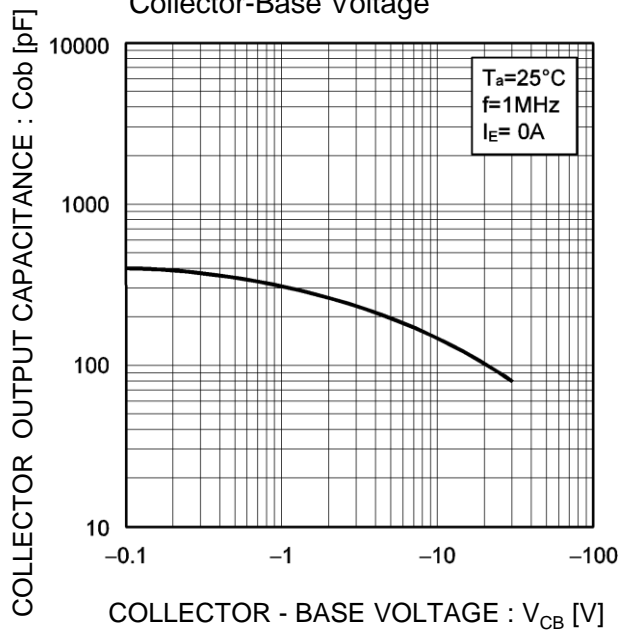
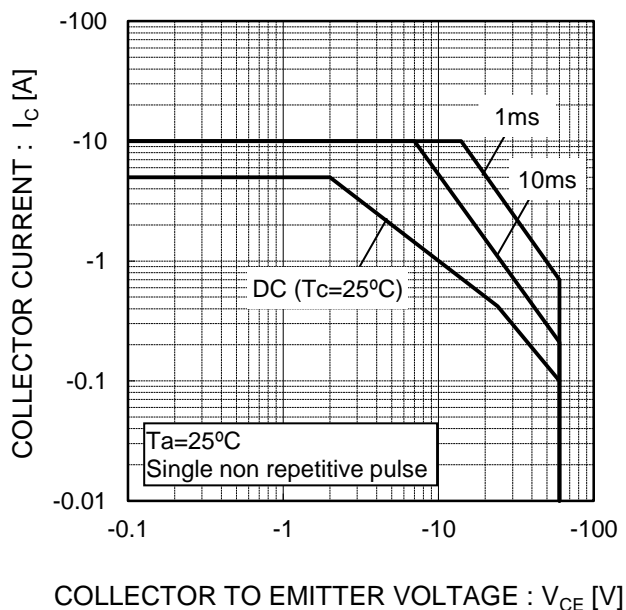
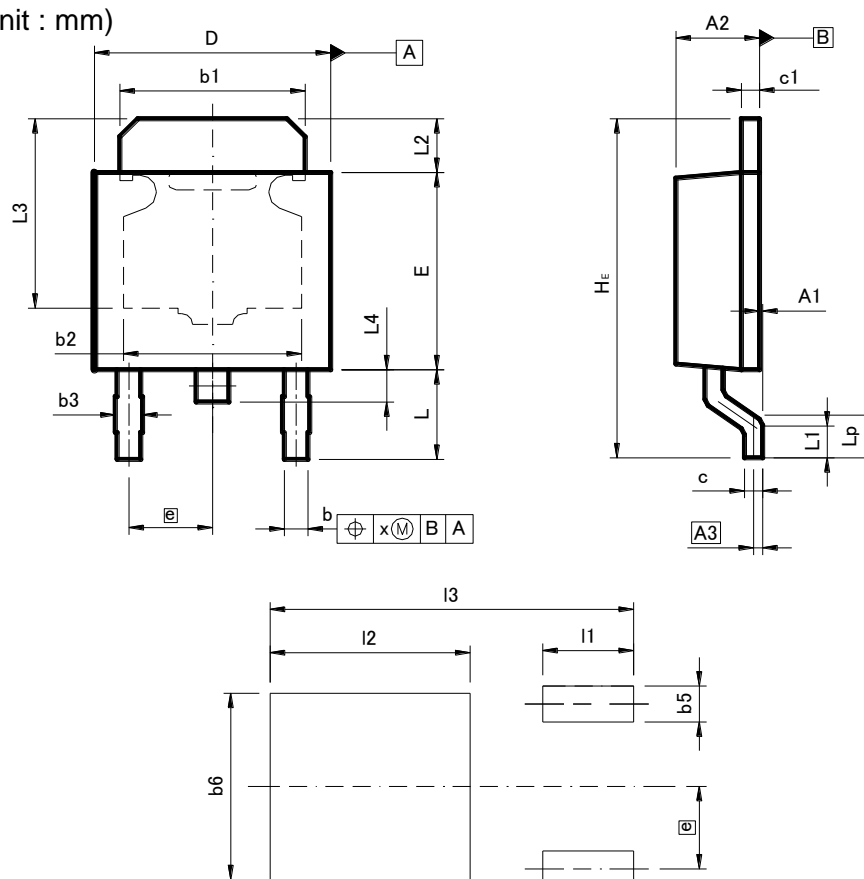


Fig.10 Safe Operating Area



## ●Dimensions (Unit : mm)

CPT3



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

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A1	0.00	0.15	0.000	0.006
A2	2.20	2.50	0.087	0.098
A3	0.25		0.010	
b	0.55	0.75	0.022	0.030
b1	5.00	5.30	0.197	0.209
b2	5.00		0.197	
b3	0.75		0.030	
c	0.40	0.60	0.016	0.024
c1	0.40	0.60	0.016	0.024
D	6.30	6.70	0.248	0.264
E	5.40	5.80	0.213	0.228
e	2.30		0.091	
HE	9.00	10.00	0.354	0.394
L	2.20	2.80	0.087	0.110
L1	0.80	1.40	0.031	0.055
L2	1.20	1.80	0.047	0.071
L3	5.30		0.209	
L4	0.90		0.035	
Lp	1.00	1.60	0.039	0.063
x	—	0.25	—	0.010

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b5	—	1.00	—	0.04
b6	—	5.20	—	0.205
l1	—	2.50	—	0.098
l2	—	5.50	—	0.217
l3	—	10.00	—	0.394

Dimension in mm / inches

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