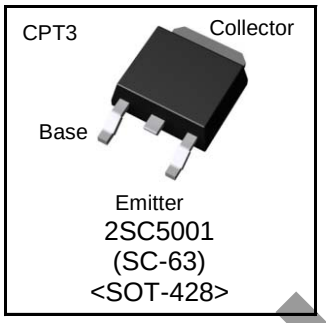
2SC5001

NPN 10A 20V Middle Power Transistor Datasheet

Parameter	Value
V_{CEO}	20V
I_C	10A

●Outline

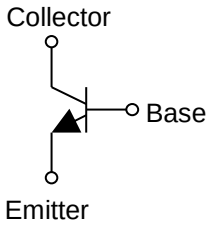


2SC5001
(SC-63)
<SOT-428>

●Features

1) Suitable for Middle Power Driver
2) Complementary PNP Types : 2SA1834
3) Low $V_{CE(sat)}$
   $V_{CE(sat)}$= 0.25V(Max.)
   (I_C/I_B= 4A/ 0.05A)
4) Large collector current : I_C= 10A (DC Max.)
5) Lead Free/RoHS Compliant.

●Inner circuit



●Applications

Motor driver , LED driver
Power supply , strobe

●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
2SC5001	CPT3	6595	TL	330	16	2,500	C5001

●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Values	Unit
Collector-base voltage		V_{CBO}	30	V
Collector-emitter voltage		V_{CEO}	20	V
Emitter-base voltage		V_{EBO}	6	V
Collector current	DC	I_C	10	A
	Pulsed	I_{CP} *1	15	A
Power dissipation		P_D *2	1	W
		P_D *3	10	W
Junction temperature		T_j	150	°C
Range of storage temperature		T_{stg}	−55 to +150	°C

*1 Pw=10ms , single pulse
*2 Mounted on a substrate
*3 Tc=25°C

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	BV_{CEO}	I_C = 1mA	20	-	-	V
Collector-base breakdown voltage	BV_{CBO}	I_C = 50μA	30	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	I_E = 50μA	6	-	-	V
Collector cut-off current	I_{CBO}	V_{CB} = 20V	-	-	1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 5V	-	-	1	μA
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 4A, I_B = 0.05A	-	0.13	0.25	V
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C = 4A, I_B = 0.05A	-	0.9	1.2	V
DC current gain	h_{FE} 1	V_{CE} = 2V, I_C = 0.5A	120	-	390	-
	h_{FE} 2	V_{CE} = 2V, I_C = 4A	82	-	-	-
Transition frequency	f_T	V_{CE} = 5V, I_E = -1.5A f=50MHz	-	150	-	MHz
Output capacitance	C_{ob}	V_{CB} = 10V, I_E = 0A f = 1MHz	-	220	-	pF

●h_{FE} rank categories

Rank	Q	R
h_{FE}	120 to 270	180 to 390

●**Electrical characteristic curves**(Ta = 25°C)

Fig.1 Ground Emitter Propagation Characteristics

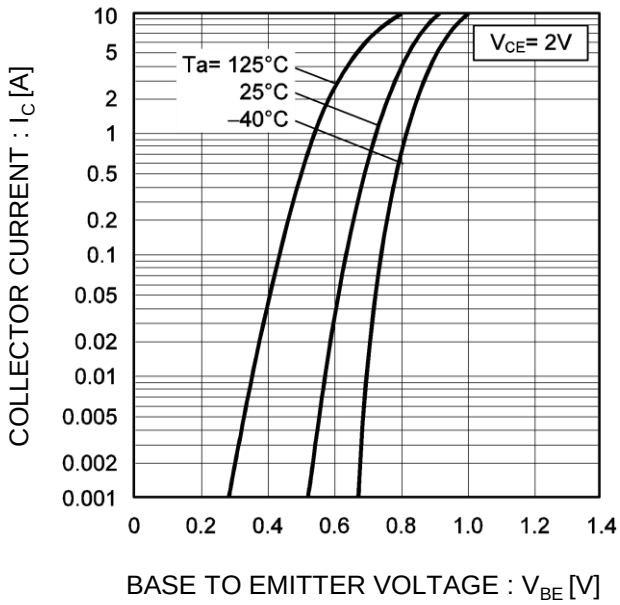


Fig.2 Typical Output Characteristics

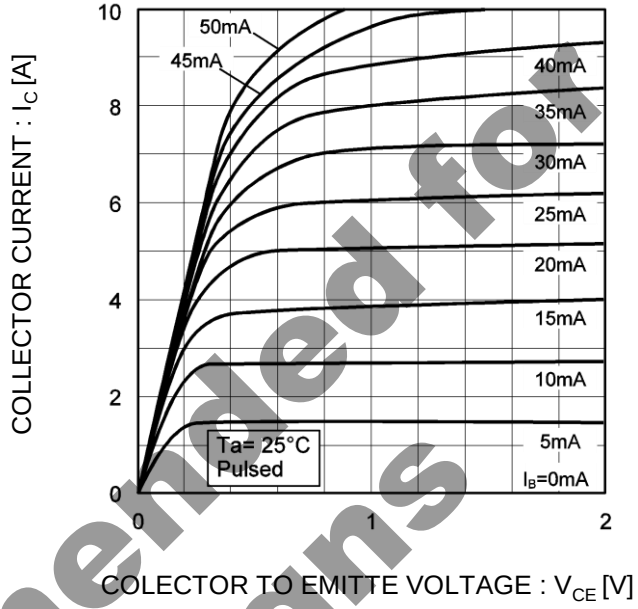


Fig.3 DC Current Gain vs. Collector Current(I)

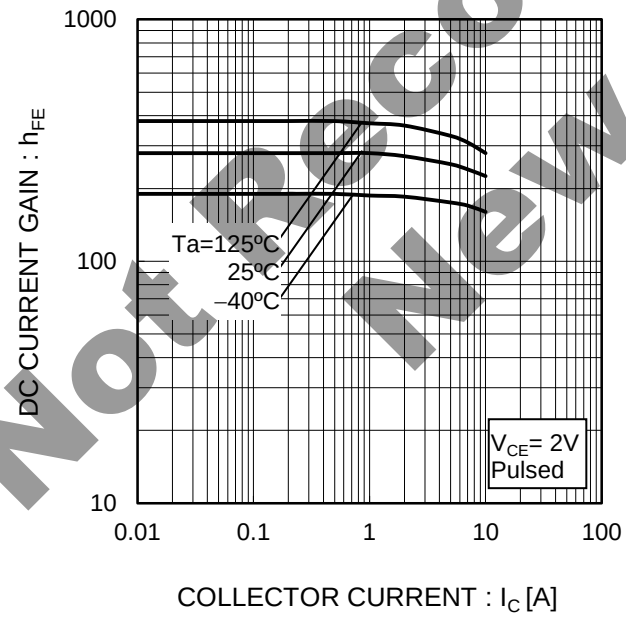
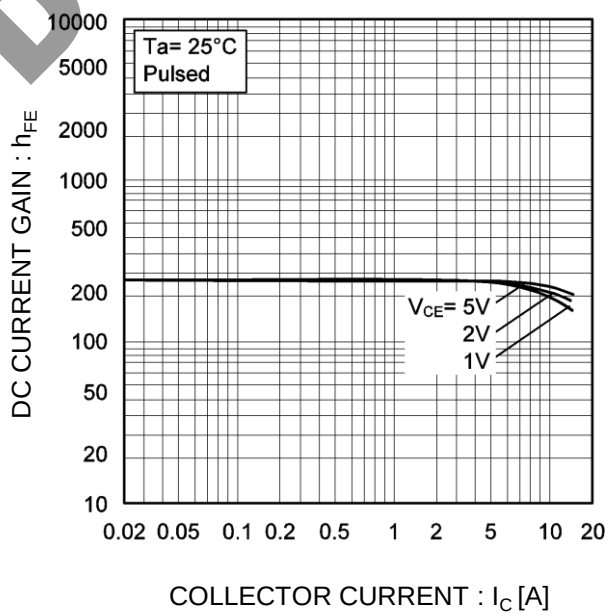


Fig.4 DC current gain vs. output current (II)



●**Electrical characteristic curves**(Ta = 25°C)

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

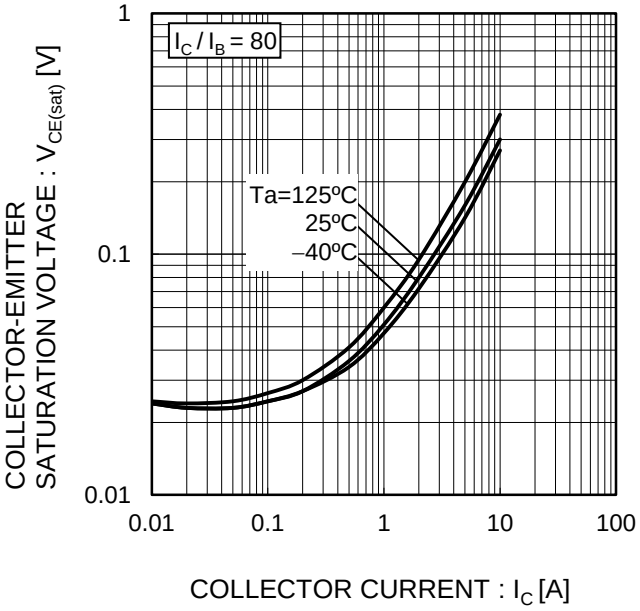


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

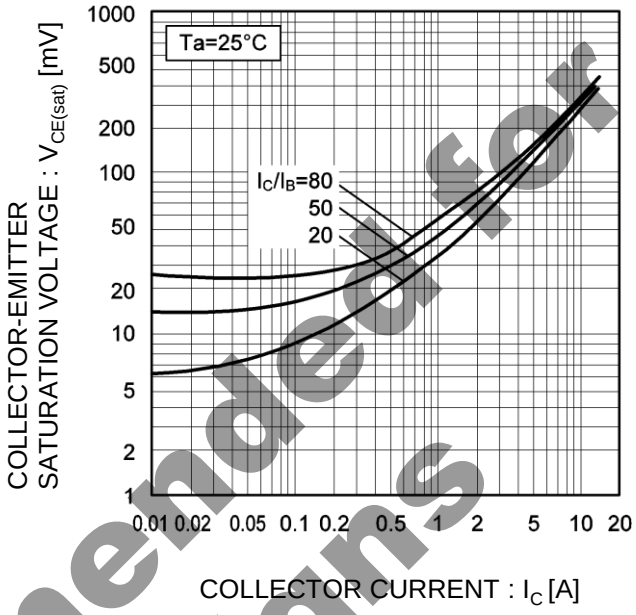


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

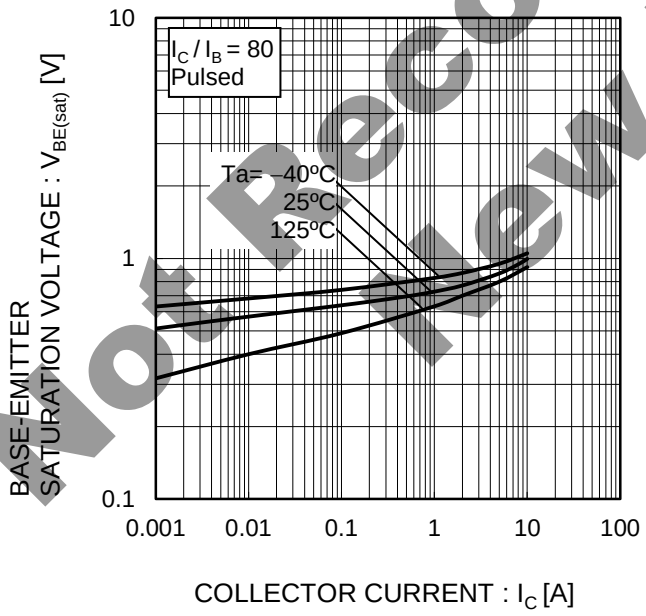
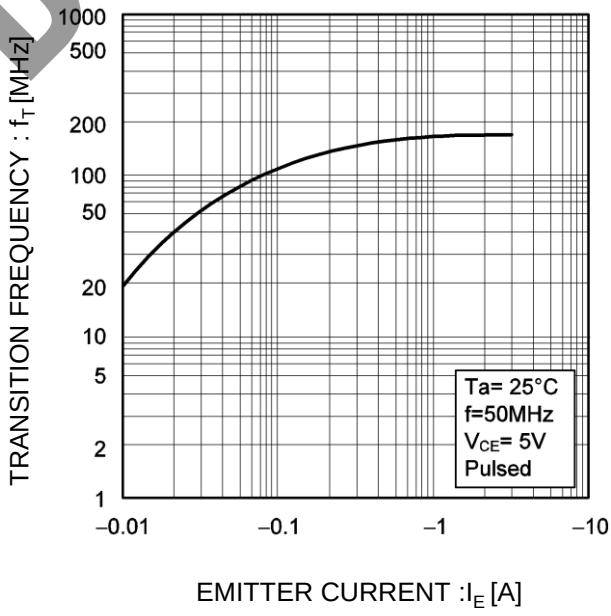


Fig.8 Gain Bandwidth Product vs. Emitter Current



●**Electrical characteristic curves**(Ta = 25°C)

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

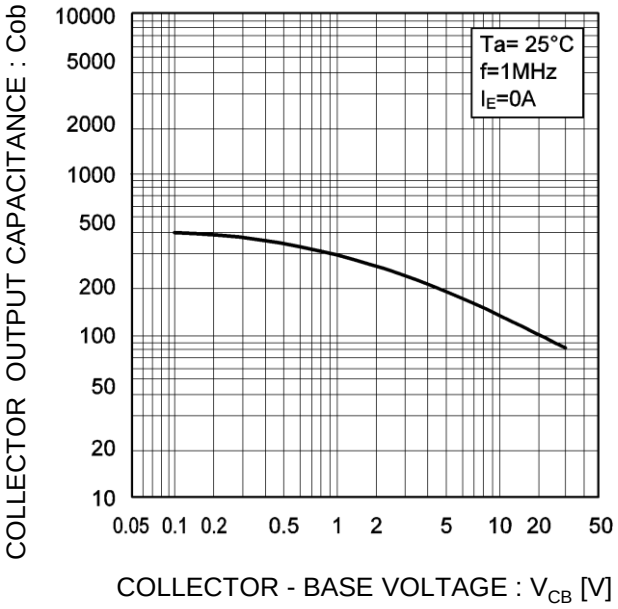
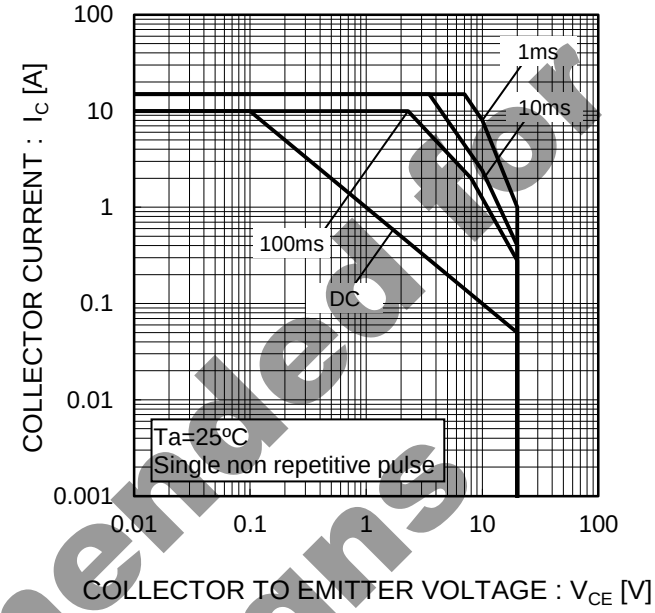
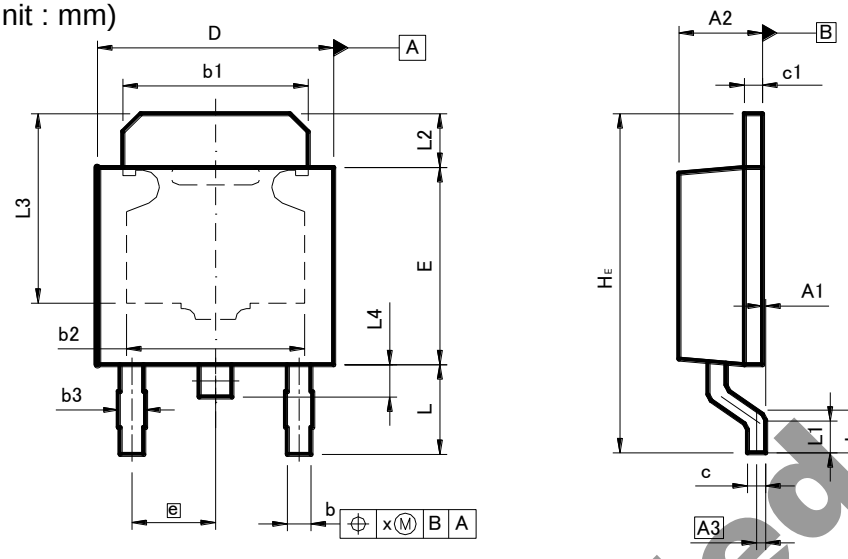


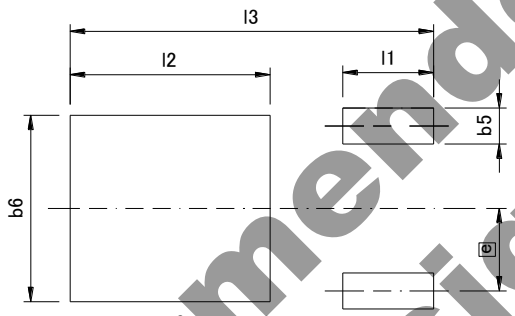
Fig.10 Safe Operating Area



●**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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