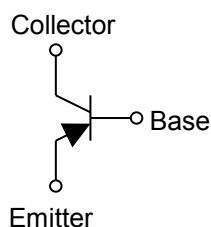


Parameter	Value
V_{CEO}	-50V
I_C	-3.0A

●Features

- 1) Suitable for Middle Power Driver
- 2) Complementary NPN Types : 2SCR533P / 2SCR533D
- 3) Low $V_{CE(sat)}$
 $V_{CE(sat)} = -0.4V$ Max. ($I_C/I_B = -1A/-50mA$)
- 4) Lead Free/RoHS Compliant.

●Inner circuit



●Outline

MPT3 Base Collector Emitter 2SAR533P (SC-62) <SOT-89>	CPT3 Collector Base Emitter 2SAR533D (SC-63) <SOT-428>
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●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
2SAR533P	MPT3	4540	T100	180	12	1,000	MM
2SAR533D	CPT3	6595	TL	330	16	2,500	AR533

●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Values	Unit
Collector-base voltage		V _{CBO}	−50	V
Collector-emitter voltage		V _{CEO}	−50	V
Emitter-base voltage		V _{EBO}	−6	V
Collector current	DC	I _C	−3.0	A
	Pulsed	I _{CP} ^{*1}	−6.0	A
Power dissipation	2SAR533P	P _D	0.5 ^{*2}	W
			2.0 ^{*3}	W
	2SAR533D		1.0 ^{*4}	W
			10 ^{*5}	W
Junction temperature		T _j	150	°C
Range of storage temperature		T _{stg}	−55 to +150	°C

*1 $P_w=10ms$, single pulse *2 Each terminal mounted on a reference land

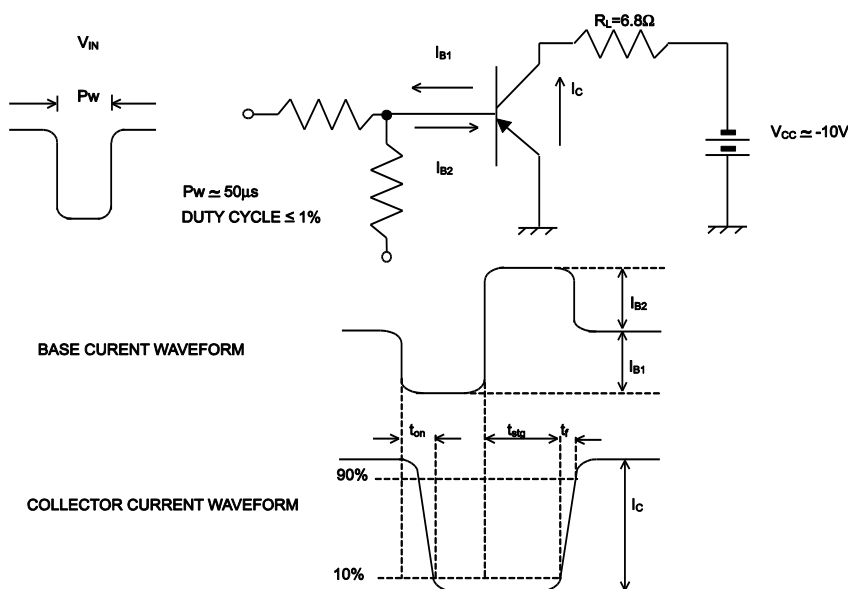
*3 Mounted on a ceramic board (40×40×0.7mm) *4 Mounted on a substrate *5 $T_C=25°C$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	BV_{CEO}	$I_C = -1\text{mA}$	-50	-	-	V
Collector-base breakdown voltage	BV_{CBO}	$I_C = -100\mu\text{A}$	-50	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	$I_E = -100\mu\text{A}$	-6	-	-	V
Collector cut-off current	I_{CBO}	$V_{CB} = -50\text{V}$	-	-	-1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = -4\text{V}$	-	-	-1	μA
Collector-emitter saturation voltage	$V_{CE(sat)}^{*1}$	$I_C = -1\text{A}, I_B = -50\text{mA}$	-	-0.20	-0.40	V
DC current gain	h_{FE}	$V_{CE} = -3\text{V}, I_C = -50\text{mA}$	180	-	450	-
Transition frequency	f_T	$V_{CE} = -10\text{V}, I_E = -500\text{mA}$ $f = 100\text{MHz}$	-	300	-	MHz
Output capacitance	C_{ob}	$V_{CB} = -10\text{V}, I_E = 0\text{A}$ $f = 1\text{MHz}$	-	24	-	pF
Turn-on time	t_{on}^{*2}	$I_C = -1.5\text{A}$ $I_{B1} = -150\text{mA}$ $I_{B2} = 150\text{mA}$ $V_{CC} \approx -10\text{V}$	-	45	-	ns
Storage time	t_{stg}^{*2}		-	250	-	ns
Fall time	t_f^{*2}		-	35	-	ns

*1 Pulsed

*2 See switching time test circuit

●Switching time test circuit


●Electrical characteristic curves(Ta = 25°C)

Fig.1 Ground Emitter Propagation Characteristics

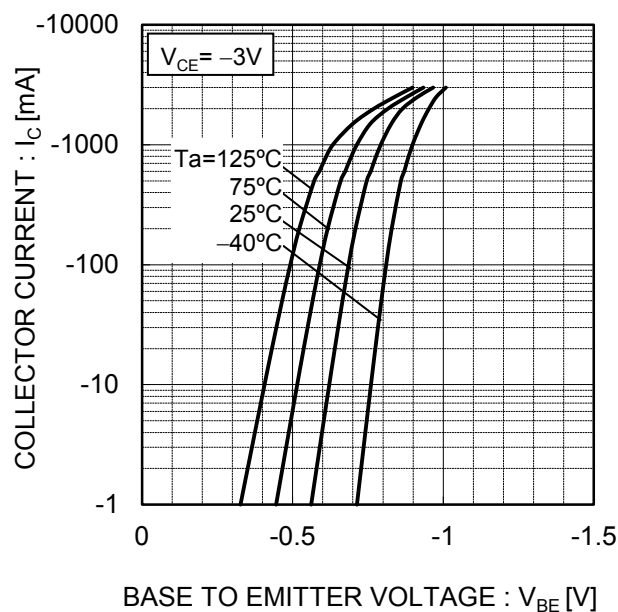


Fig.2 Typical Output Characteristics

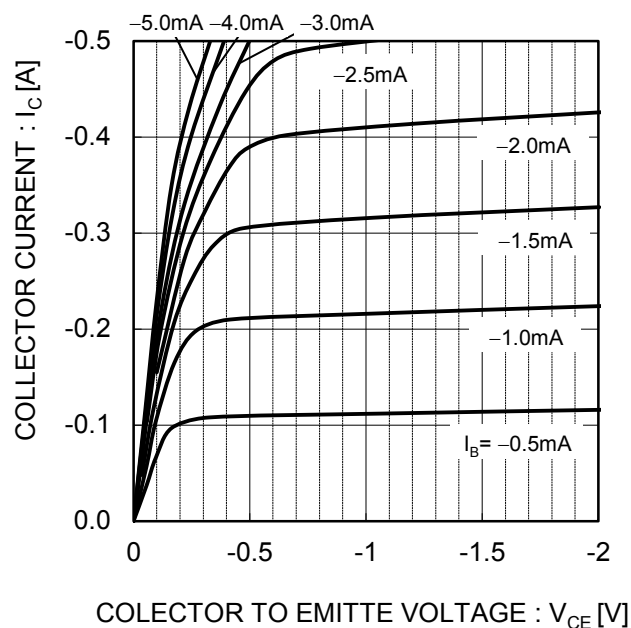


Fig.3 DC Current Gain vs. Collector Current(I)

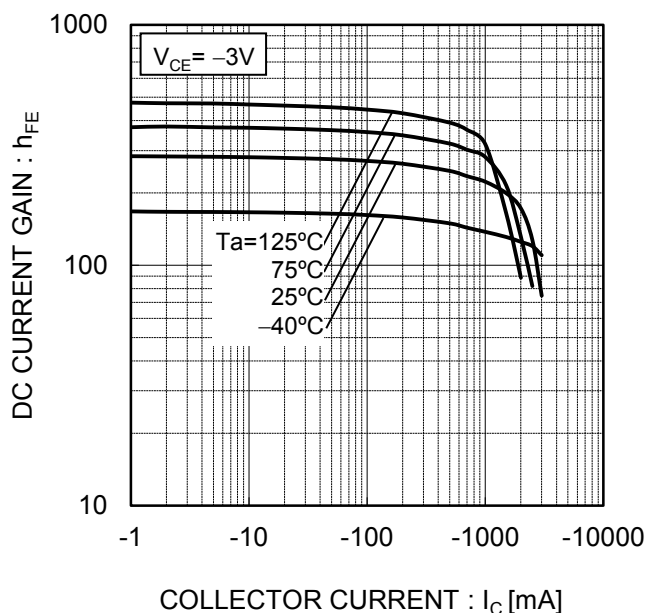
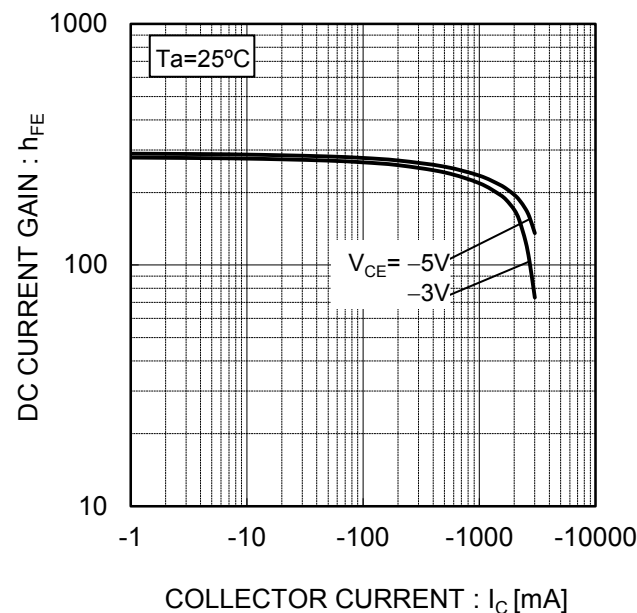


Fig.4 DC current gain vs. output current (II)



●Electrical characteristic curves(Ta = 25°C)

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

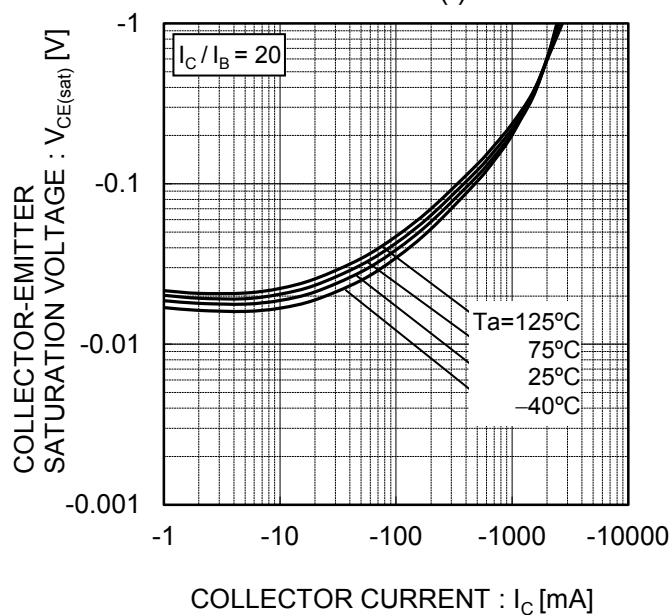


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

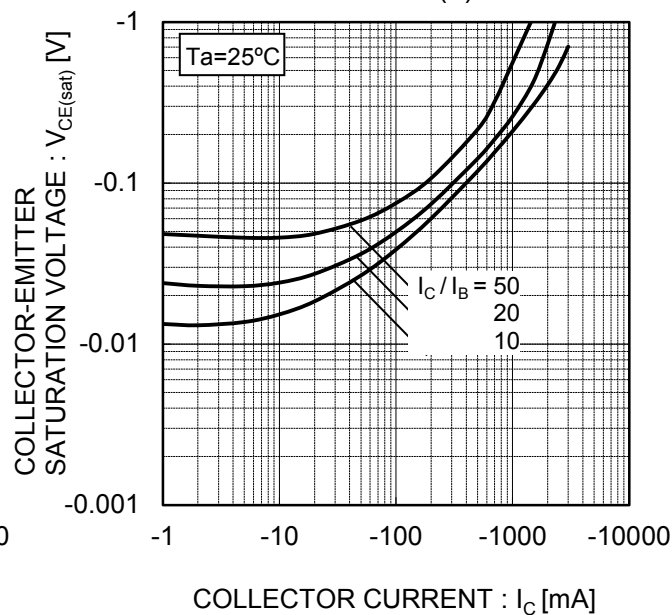


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

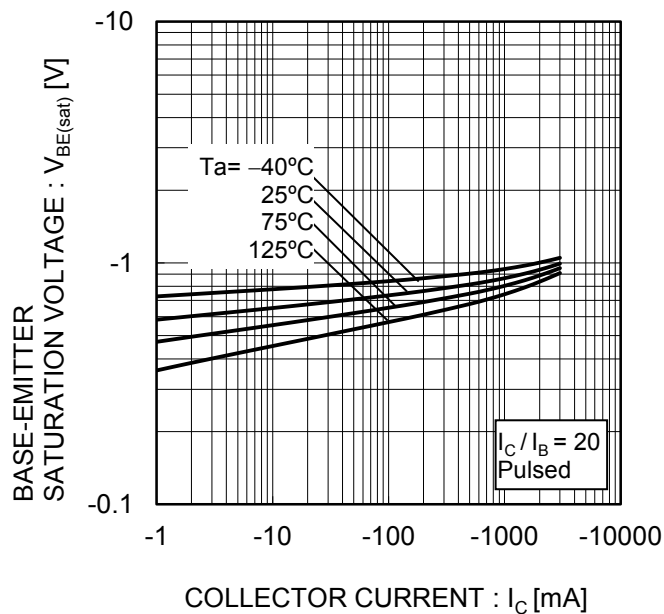
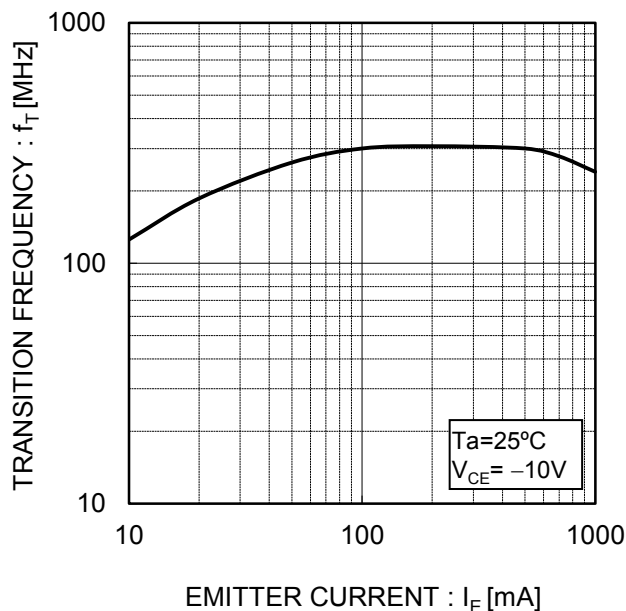


Fig.8 Gain Bandwidth Product vs. Emitter Current



●Electrical characteristic curves(Ta = 25°C)

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

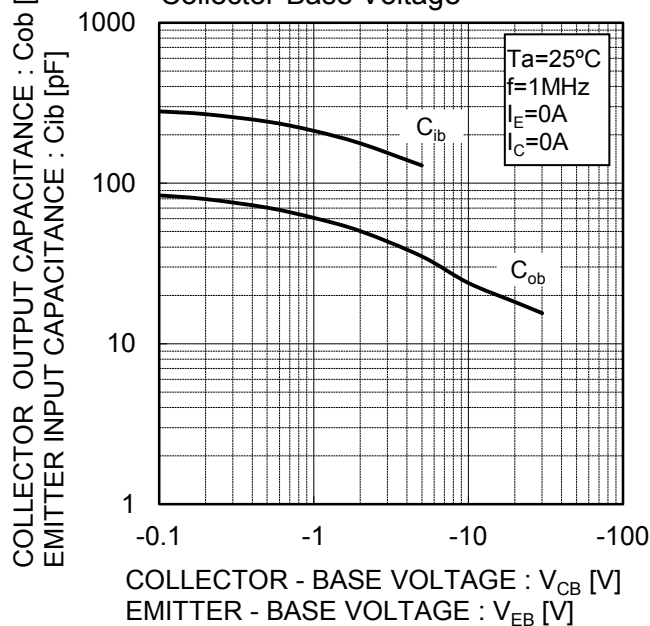


Fig.10 Safe Operating Area

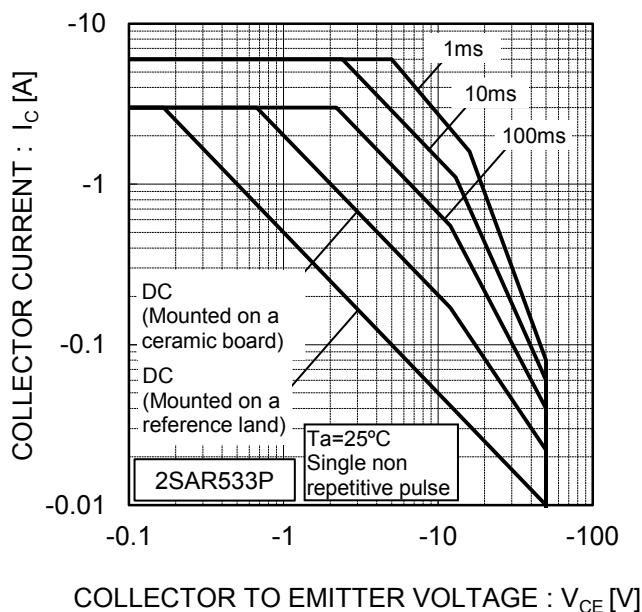
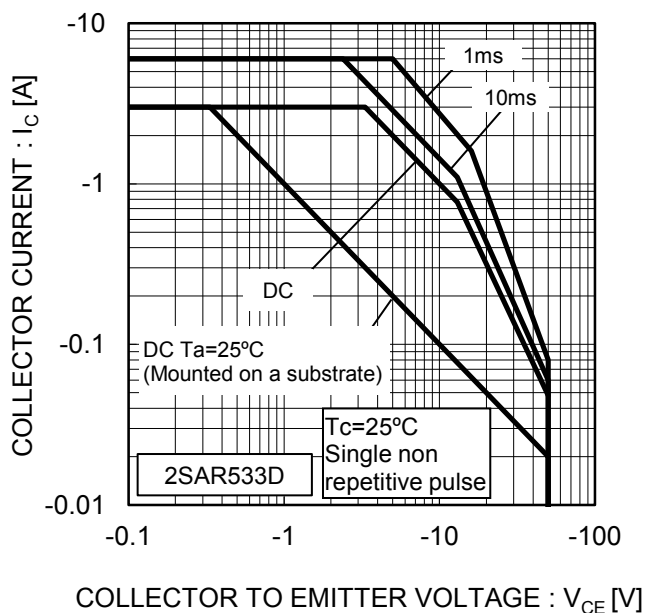
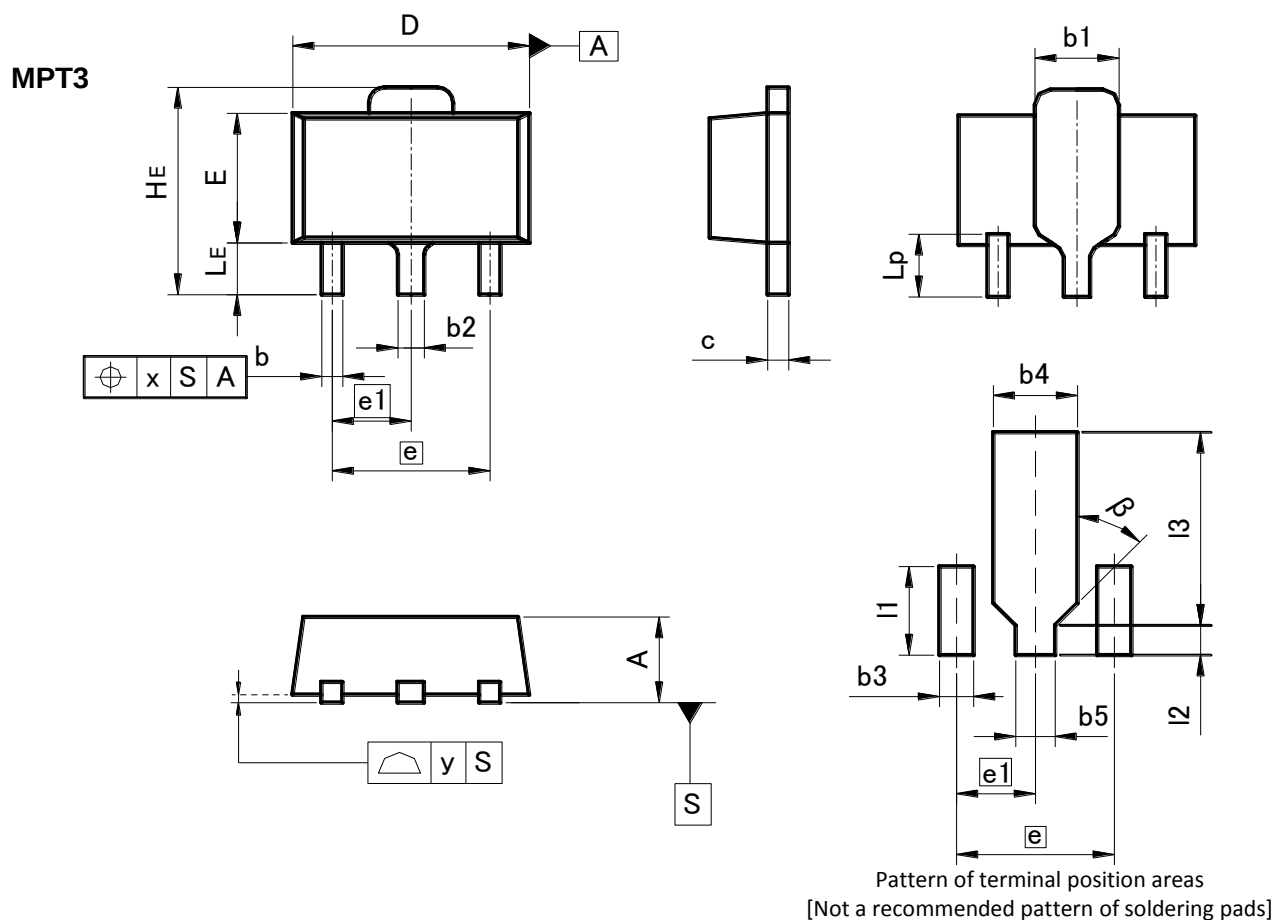


Fig.11 Safe Operating Area



●Dimensions (Unit : mm)



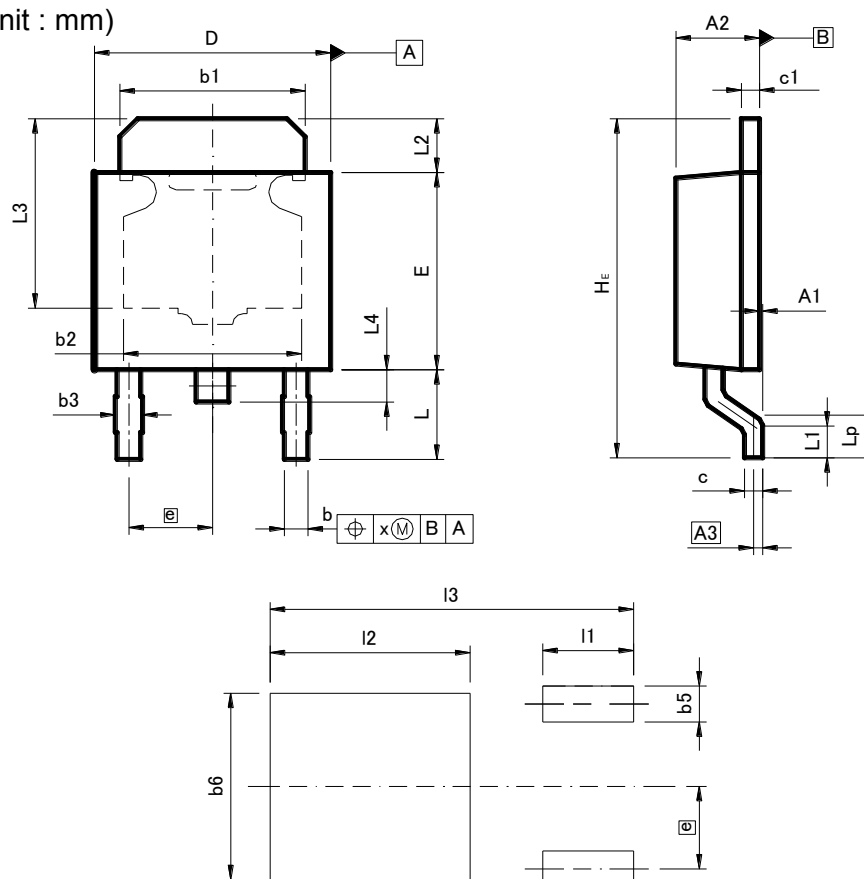
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.40	1.50	0.055	0.059
b	0.30	0.50	0.012	0.020
b1	1.50	1.70	0.059	0.067
b2	0.40	0.60	0.016	0.024
c	0.35	0.50	0.014	0.020
D	4.40	4.70	0.173	0.185
E	2.40	2.70	0.094	0.106
e	3.00		0.118	
e1	1.50		0.059	
HE	3.70	4.30	0.146	0.169
LE	0.80	1.20	0.031	0.047
Lp	1.01	1.41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

●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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