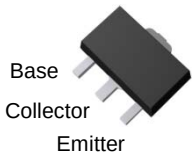
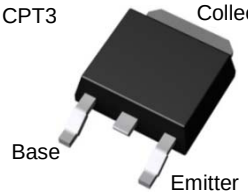
# 2SA2071 / 2SA2072

**PNP -3.0A -60V Middle Power Transistor**

Datasheet

| Parameter | Value |
|---|---|
| $V_{CEO}$ | −60V |
| $I_C$ | −3.0A |

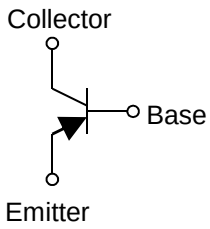
## ●Outline

| MPT3 | CPT3 |
|---|---|
|  |  |
| 2SA2071<br>(SC-62)<br><SOT-89> | 2SA2072<br>(SC-63)<br><SOT-428> |

## ●Features

1) Suitable for Middle Power Driver
2) Complementary NPN Types : 2SC5824 / 2SC5825
3) Low $V_{CE(sat)}$
   $V_{CE(sat)}$= −500mV Max. ($I_C/I_B$= −2A/ −0.2A)
4) Lead Free/RoHS Compliant.

## ●Inner circuit




## ●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 |
|---|---|---|---|---|---|---|---|
| 2SA2071 | MPT3 | 4540 | T100 | 180 | 12 | 1,000 | UN |
| 2SA2072 | CPT3 | 6595 | TL | 330 | 16 | 2,500 | A2072 |

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

| Parameter | | Symbol | Values | Unit |
|---|---|---|---|---|
| Collector-base voltage | | $V_{CBO}$ | −60 | V |
| Collector-emitter voltage | | $V_{CEO}$ | −60 | 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 | 2SA2071 | $P_D$ | 0.5 *2 | W |
| | | | 2 *3 | W |
| | 2SA2072 | | 1 *4 | W |
| | | | 10 *5 | W |
| Junction temperature | | $T_j$ | 150 | °C |
| Range of storage temperature | | $T_{stg}$ | −55 to +150 | °C |

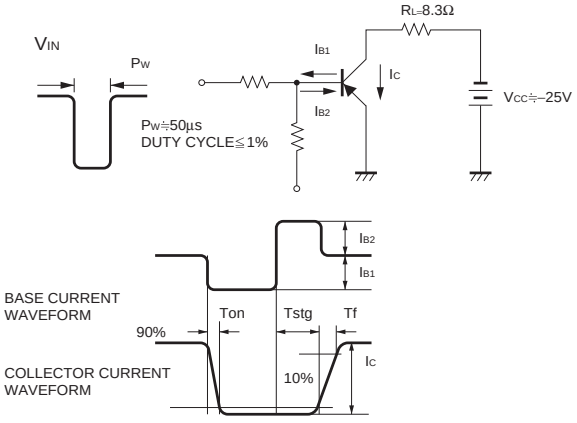
*1 Pw=100ms , single pulse *2 Each terminal mounted on a reference land
*3 Mounted on a ceramic board (40×40×0.7mm) *4 Mounted on a substrate *5 $T_C$=25°C

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

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-emitter breakdown voltage | $BV_{CEO}$ | $I_C$ = −1mA | −60 | - | - | V |
| Collector-base breakdown voltage | $BV_{CBO}$ | $I_C$ = −100μA | −60 | - | - | V |
| Emitter-base breakdown voltage | $BV_{EBO}$ | $I_E$ = −100μA | −6 | - | - | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$ = −40V | - | - | −1.0 | μA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$ = −4V | - | - | −1.0 | μA |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$ = −2A, $I_B$ = −0.2A | - | −0.20 | −0.50 | V |
| DC current gain | $h_{FE}$ | $V_{CE}$ = −2V, $I_C$ = −100mA | 120 | - | 270 | - |
| Transition frequency | $f_T$ | $V_{CE}$ = −10V, $I_E$ = 10mA f=10MHz | - | 180 | - | MHz |
| Output capacitance | $C_{ob}$ | $V_{CB}$ = −10V, $I_E$ = 0A f = 1MHz | - | 50 | - | pF |
| Turn-on time | $t_{on}$ *1 | $I_C$= −3A $I_{B1}$= −300mA $I_{B2}$=300mA $V_{CC}\simeq$ −25V | - | 20 | - | ns |
| Storage time | $t_{stg}$ *1 | | - | 150 | - | ns |
| Fall time | $t_f$ *1 | | - | 20 | - | ns |

*1 See switching time test circuit

## ●Switching time test circuit



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

Fig.1 Ground Emitter Propagation Characteristics

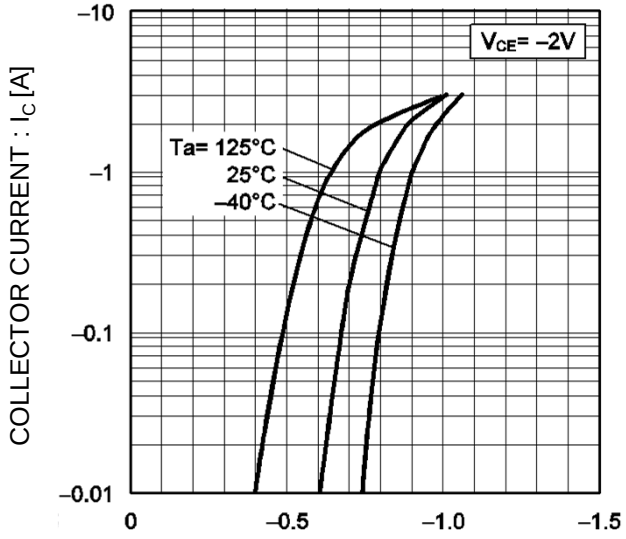



Fig.2 Typical Output Characteristics

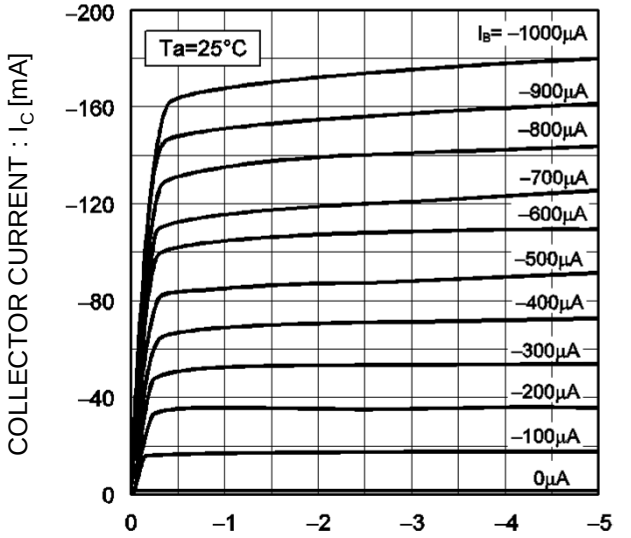



Fig.3 DC Current Gain vs. Collector Current(I)

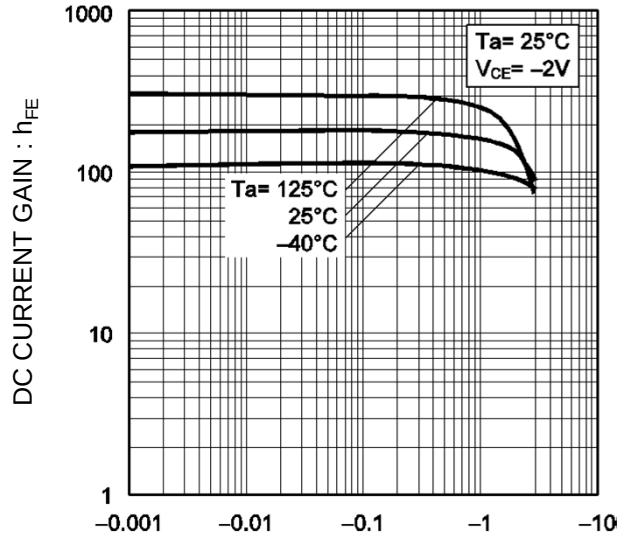
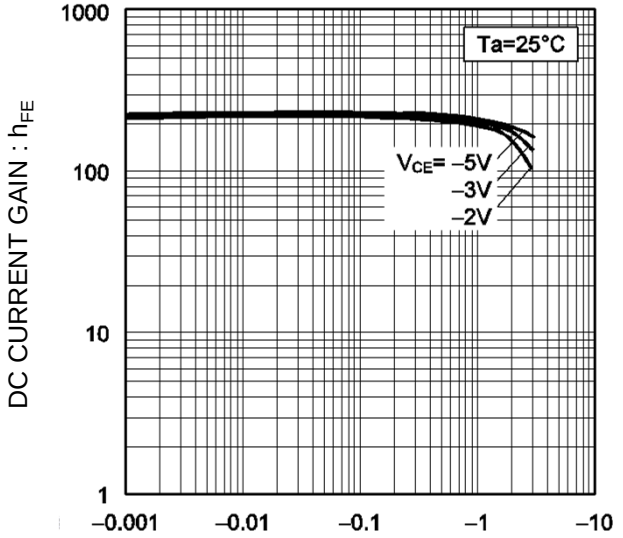



Fig.4 DC current gain vs. output current (II)



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

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

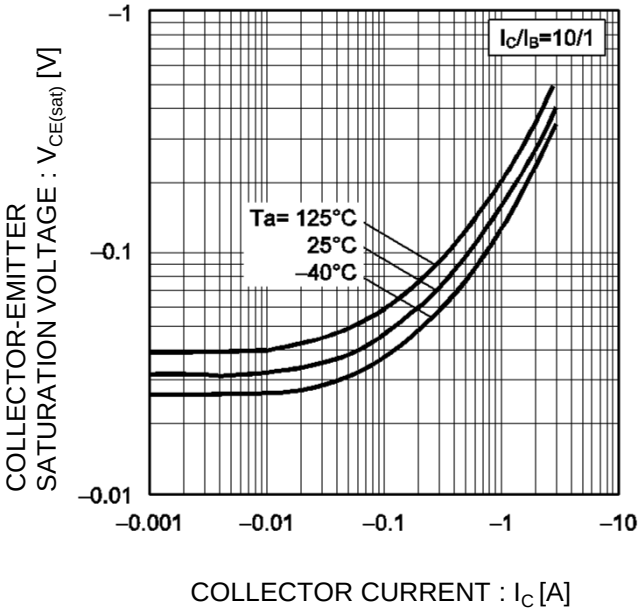



Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

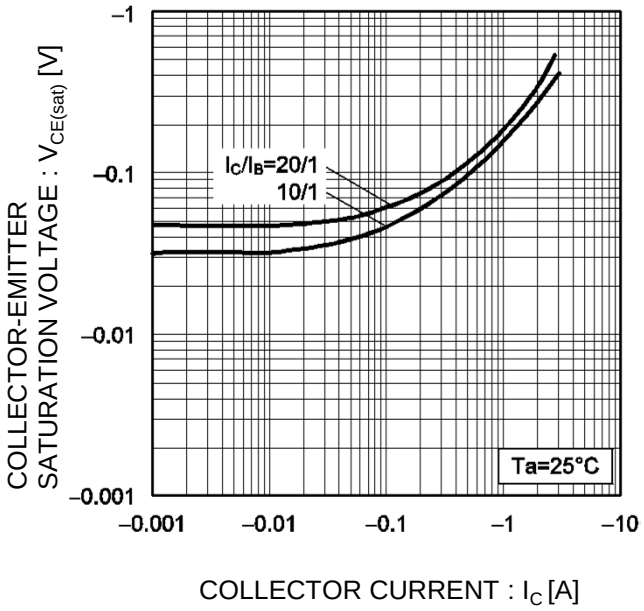



Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

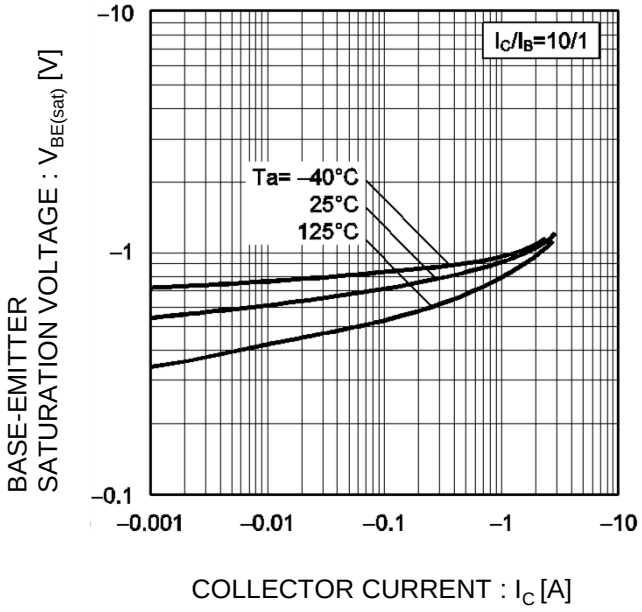
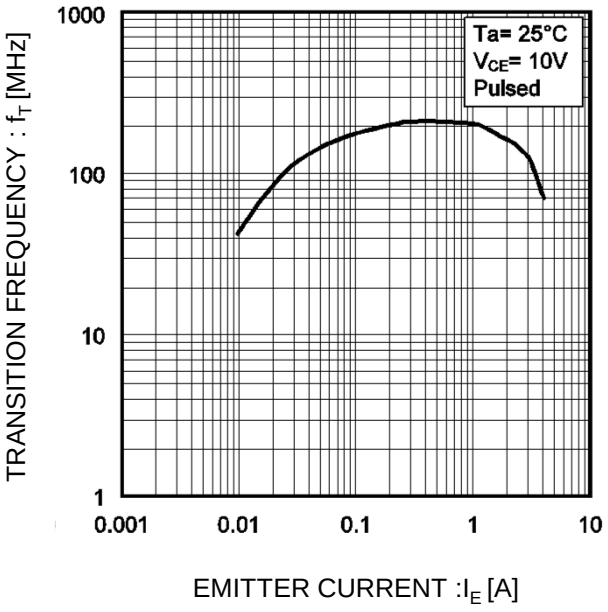



Fig.8 Gain Bandwidth Product vs. Emitter Current



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

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

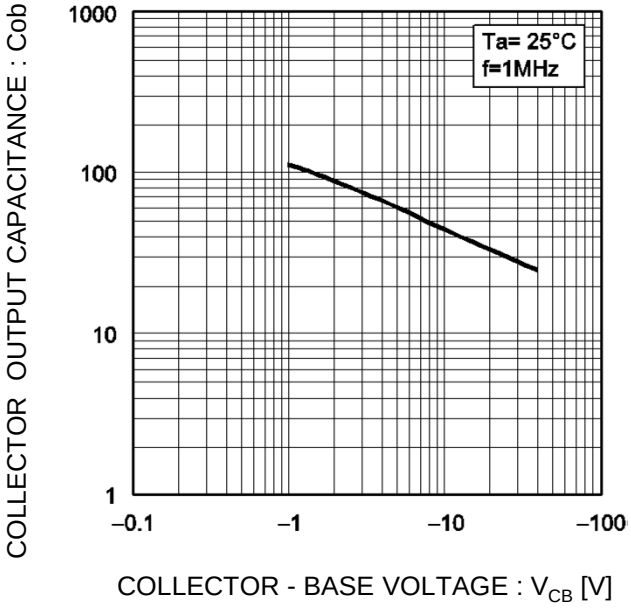



Fig.10 Safe Operating Area

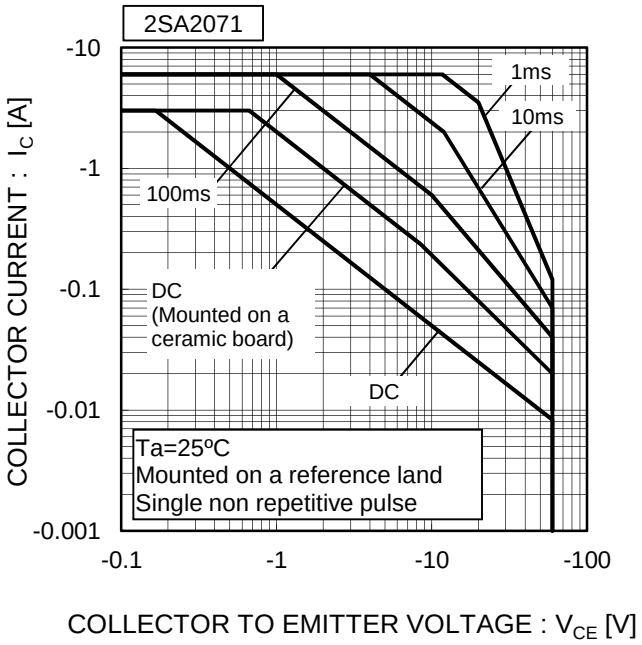
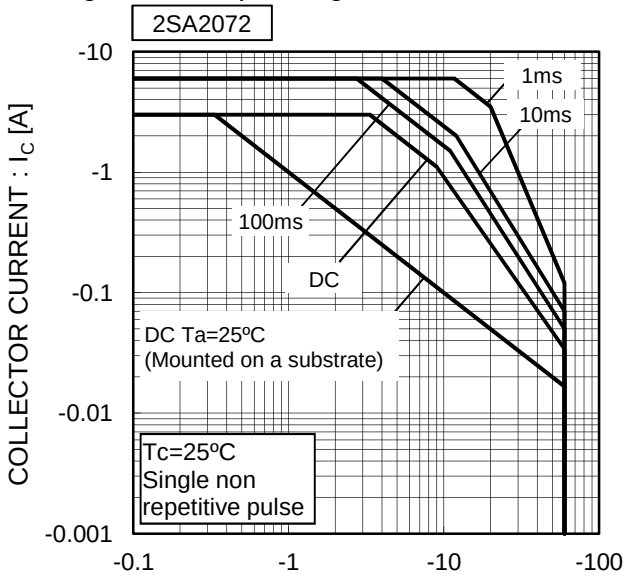
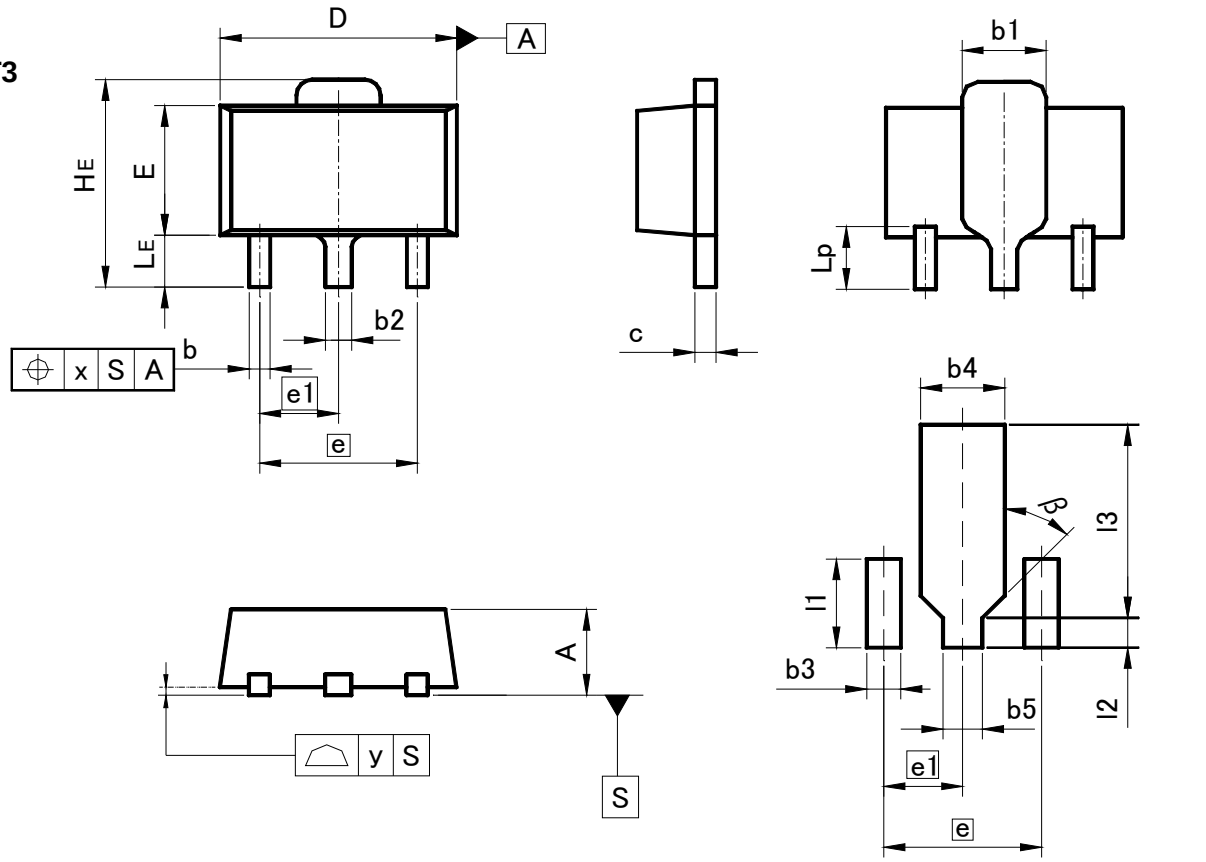



Fig.11 Safe Operating Area



●**Dimensions** (Unit : mm)

**MPT3**




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

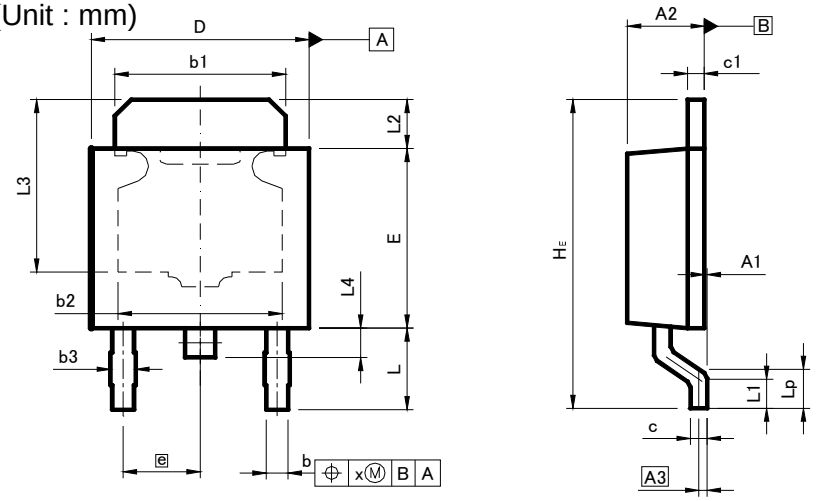
| DIM | MILIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 1.40 | 1.50 | 0.055 | 0.059 |
| b | 0.30 | 0.50 | 0.012 | 0.020 |
| b1 | 1.50 | 1.70 | 0.059 | 0.067 |
| b2 | 0.40 | 0.60 | 0.016 | 0.024 |
| c | 0.35 | 0.50 | 0.014 | 0.020 |
| D | 4.40 | 4.70 | 0.173 | 0.185 |
| 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 |

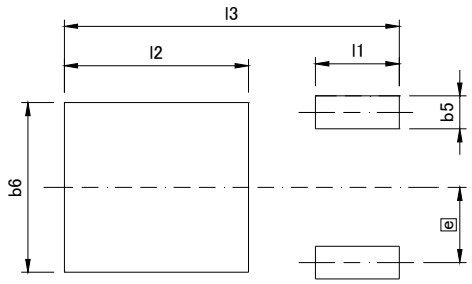
| DIM | MILIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| b3 | – | 0.65 | – | 0.026 |
| b4 | – | 1.70 | – | 0.067 |
| b5 | – | 0.75 | – | 0.030 |
| l1 | – | 1.71 | – | 0.067 |
| l2 | – | 0.58 | – | 0.023 |
| l3 | – | 3.72 | – | 0.146 |
| β | 45° | | 45° | |

Dimension in mm / inches

●**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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