# IMZ4

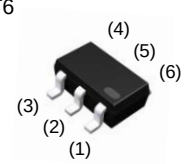
**PNP/NPN 500mA 32V Complex Medium Power Transistors** Datasheet

| Parameter | Tr1 |
|---|---|
| $V_{CEO}$ | 32V |
| $I_{C(MAX.)}$ | 500mA |

| Parameter | Tr2 |
|---|---|
| $V_{CEO}$ | −32V |
| $I_{C(MAX.)}$ | −500mA |

## ●Outline

SMT6

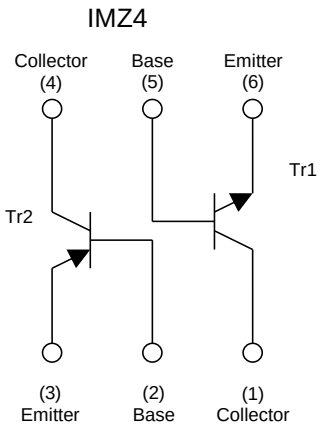



IMZ4
SOT-457 (SC-74)

## ●Features

1) Both a 2SA1036K chip and 2SC2411K chip in a SMT6 package.
2) Mounting possible with SMT3 automatic mounting machines.
3) Transistor elements are independent, eliminating interference.
4) Mounting cost and area can be cut in half.
5) Lead Free/RoHS Compliant.

## ●Inner circuit




## ●Application

Driver circuit

## ●Packaging specifications

| Part No. | Package | Package size (mm) | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit (pcs) | Marking |
|---|---|---|---|---|---|---|---|
| IMZ4 | SMT6 | 2928 | T108 | 180 | 8 | 3,000 | Z4 |


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

| Parameter | Symbol | Values | | Unit |
|---|---|---|---|---|
| | | Tr1 | Tr2 | |
| Collector-base voltage | $V_{CBO}$ | 40 | −40 | V |
| Collector-emitter voltage | $V_{CEO}$ | 32 | −32 | V |
| Emitter-base voltage | $V_{EBO}$ | 5 | −5 | V |
| Collector current | $I_C$ | 500 | −500 | mA |
| | $I_{CP}$ *1 | 1 | −1 | A |
| Collector Power dissipation | $P_D$ *2 | 300 (Total) *3 | | mW |
| Junction temperature | $T_j$ | 150 | | °C |
| Range of storage temperature | $T_{stg}$ | −55 to +150 | | °C |

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

<Tr1>

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $BV_{CBO}$ | $I_C$= 100μA | 40 | - | - | V |
| Collector-emitter breakdown voltage | $BV_{CEO}$ | $I_C$= 1mA | 32 | - | - | V |
| Emitter-base breakdown voltage | $BV_{EBO}$ | $I_E$= 100μA | 5 | - | - | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$ = 20V | - | - | 1.0 | μA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$ = 4V | - | - | 1.0 | μA |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$ / $I_B$= 500mA / 50mA | - | - | 0.6 | V |
| DC current gain | $h_{FE}$ | $V_{CE}$= 3V, $I_C$= 100mA | 180 | - | 390 | - |
| Transition frequency | $f_T$ | $V_{CE}$ = 5V, $I_E$ = −20mA, f = 100MHz | - | 250 | - | MHz |
| Output Capacitance | $C_{ob}$ | $V_{CB}$ = 10V, $I_E$ = 0A, f = 1MHz | - | 6.5 | - | pF |

<Tr2>

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $BV_{CBO}$ | $I_C$= −100μA | −40 | - | - | V |
| Collector-emitter breakdown voltage | $BV_{CEO}$ | $I_C$= −1mA | −40 | - | - | V |
| Emitter-base breakdown voltage | $BV_{EBO}$ | $I_C$= −100μA | −5 | - | - | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$ = 20V | - | - | −1.0 | μA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$ = 4V | - | - | −1.0 | μA |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$ / $I_B$= 500mA / 50mA | - | - | −0.6 | V |
| DC current gain | $h_{FE}$ | $V_{CE}$= 3V, $I_C$= 100mA | 180 | - | 390 | - |
| Transition frequency | $f_T$ | $V_{CE}$ = −5V, $I_E$ = 20mA, f = 100MHz | - | 200 | - | MHz |
| Output Capacitance | $C_{ob}$ | $V_{CB}$ = −10V, $I_E$ = 0A, f = 1MHz | - | 7 | - | pF |

*1 $P_W$=10ms. Single Pulse.

*2 Each terminal mounted on a reference footprint

*3 200mW per element must not be exceeded.


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

### <Tr1>

Fig.1 Ground Emitter Propagation Characteristics

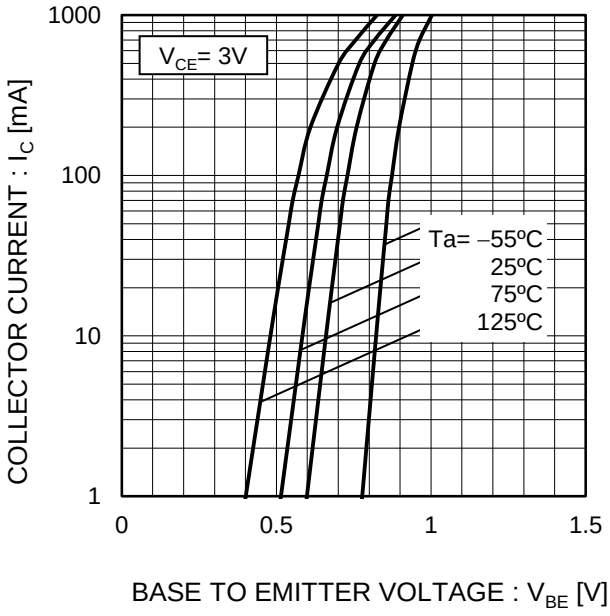



Fig.2 Typical Output Characteristics

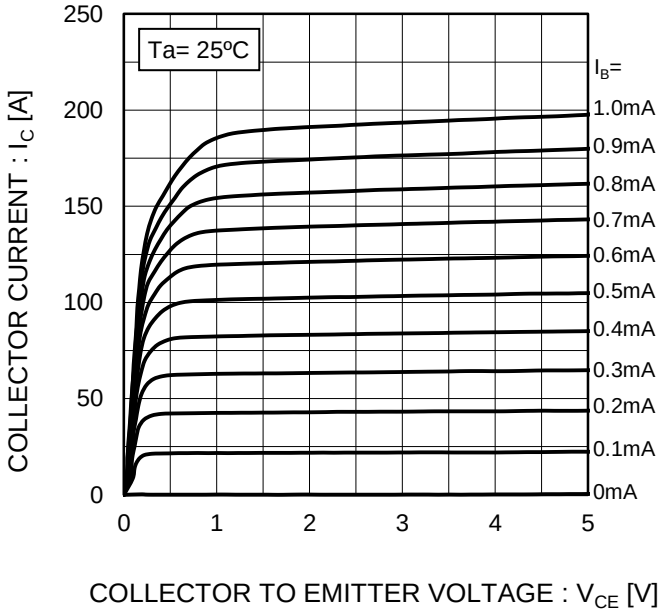



Fig.3 DC Current Gain vs. Collector Current (I)

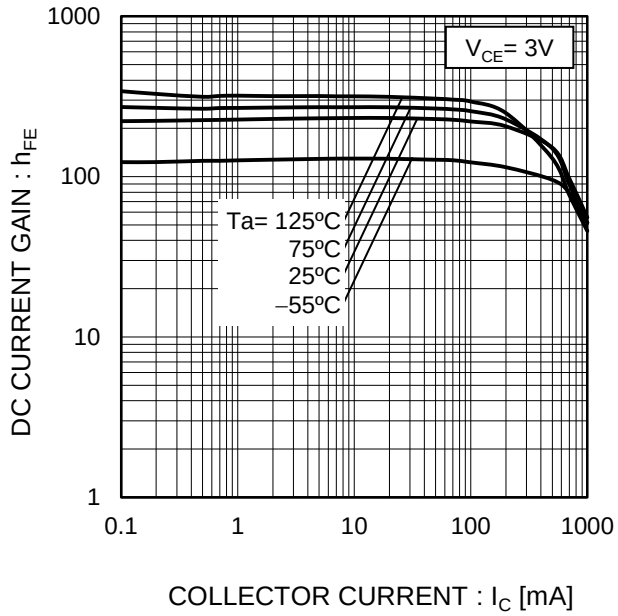
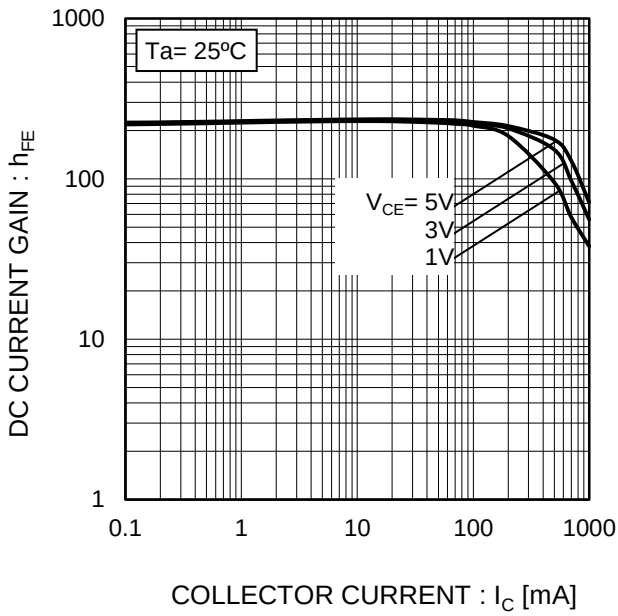



Fig.4 DC Current Gain vs. Collector Current (II)





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

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

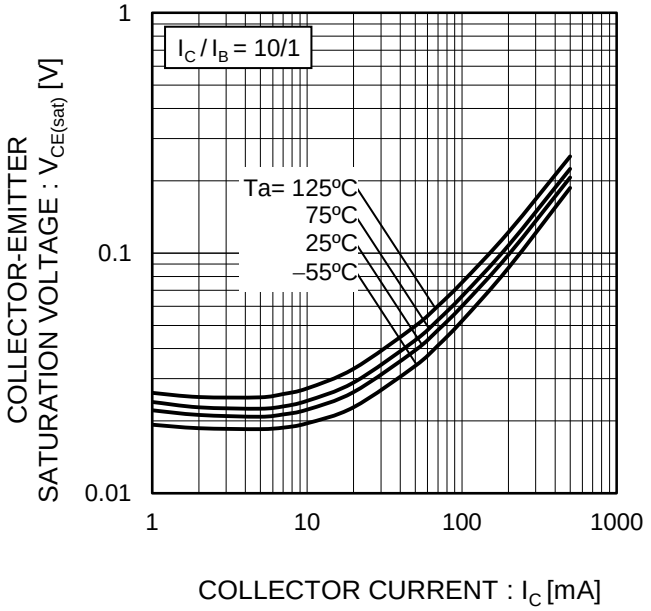



Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

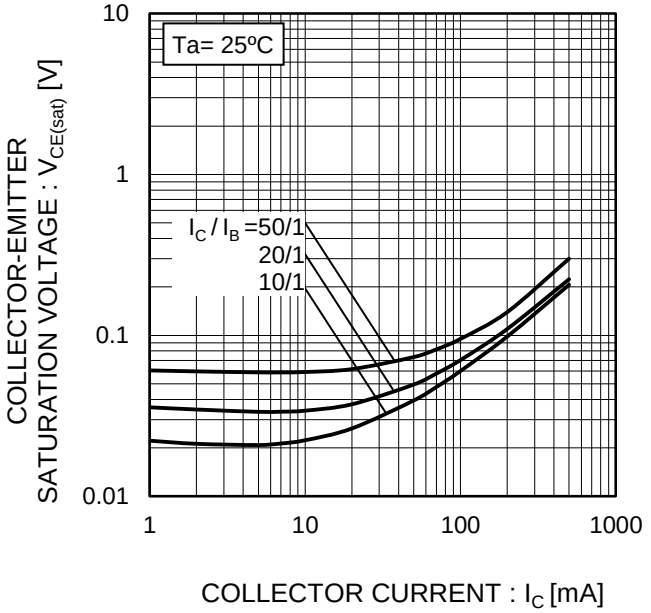



Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

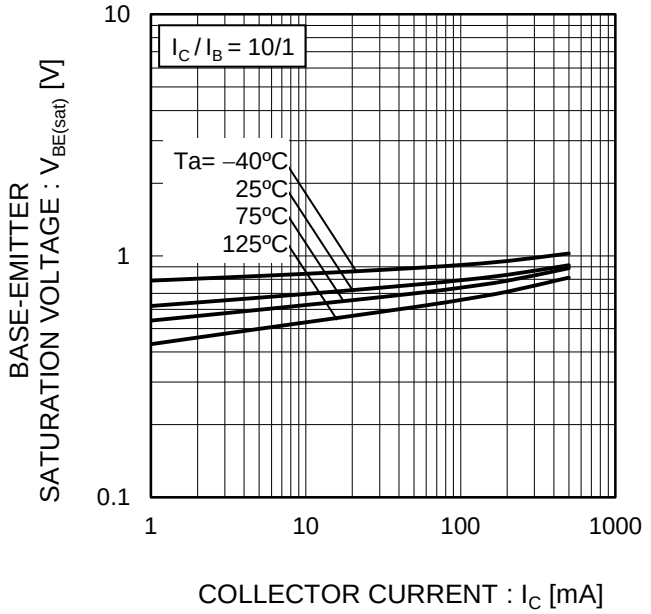
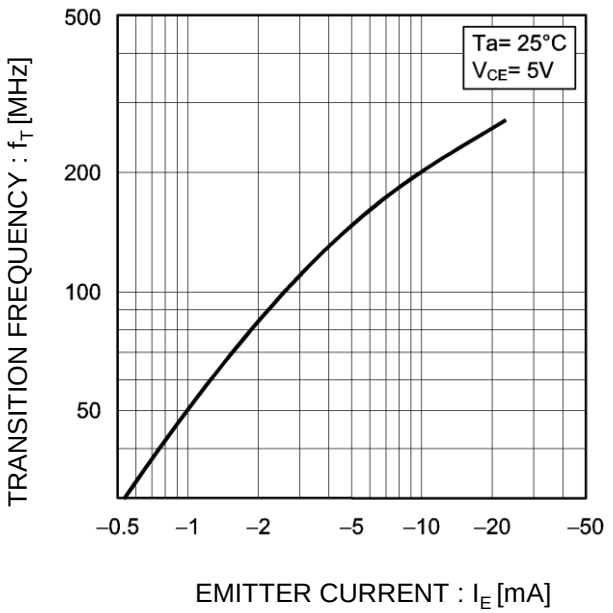



Fig.8 Gain Bandwidth Product vs. Emitter Current





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

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

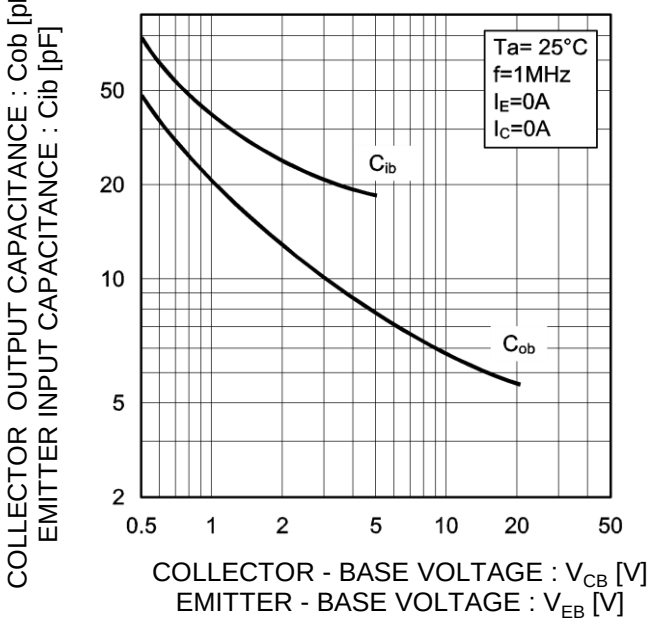
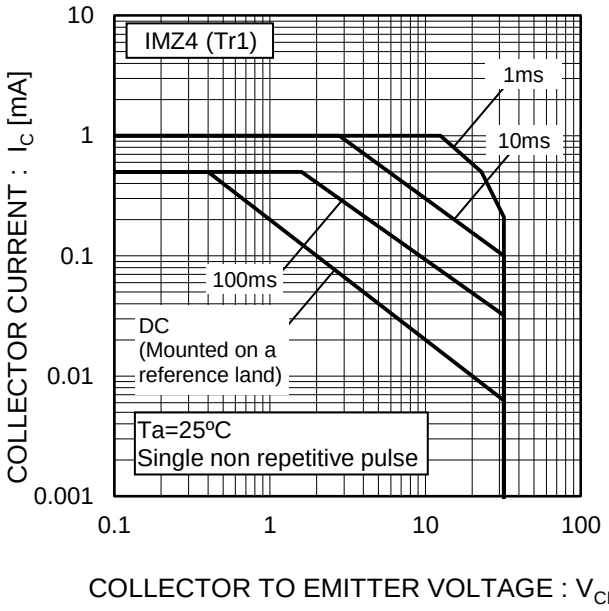



Fig.10 Safe Operating Area




### <Tr2>

Fig.11 Ground Emitter Propagation Characteristics

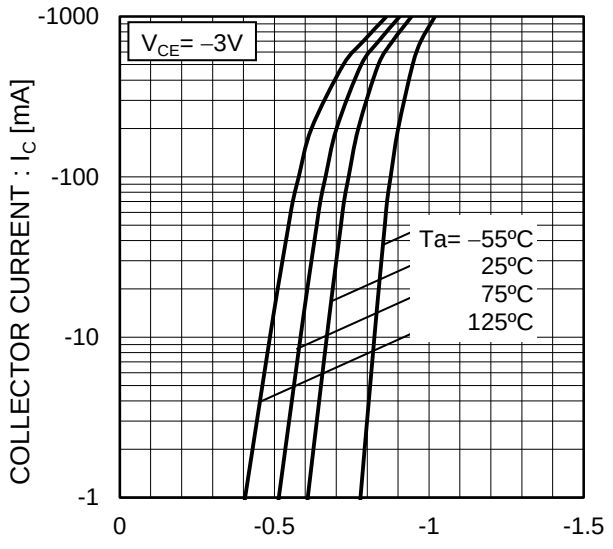
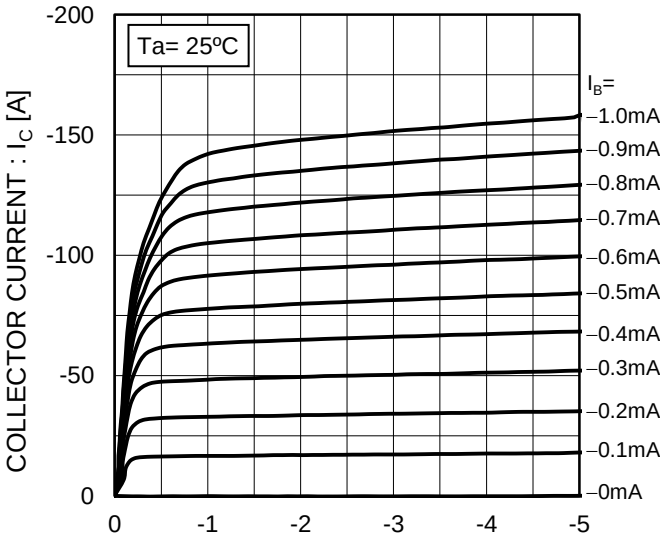



Fig.12 Typical Output Characteristics





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

Fig.13 DC Current Gain vs. Collector Current (I)

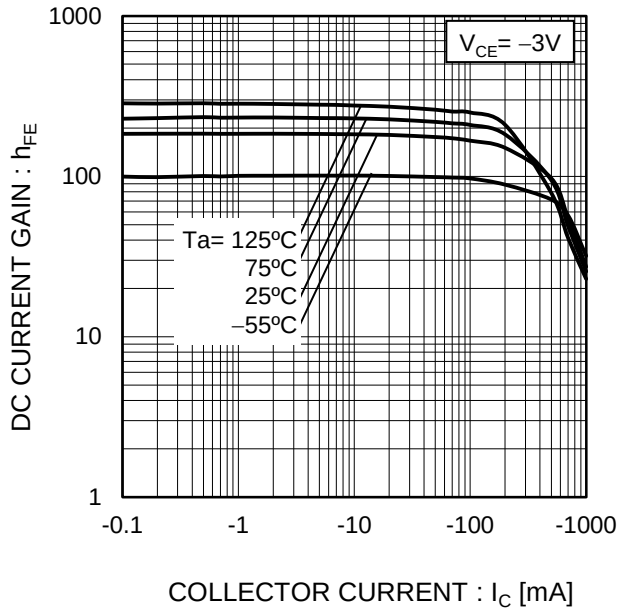



Fig.14 DC Current Gain vs. Collector Current (II)

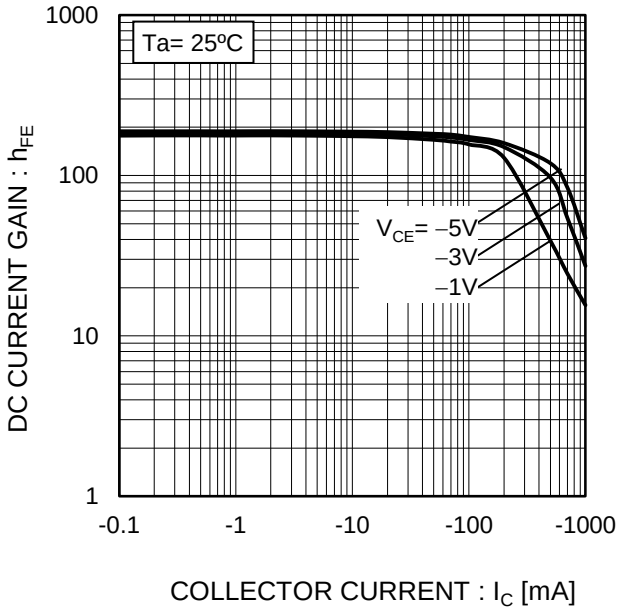



Fig.15 Collector-Emitter Saturation Voltage vs. Collector Current (I)

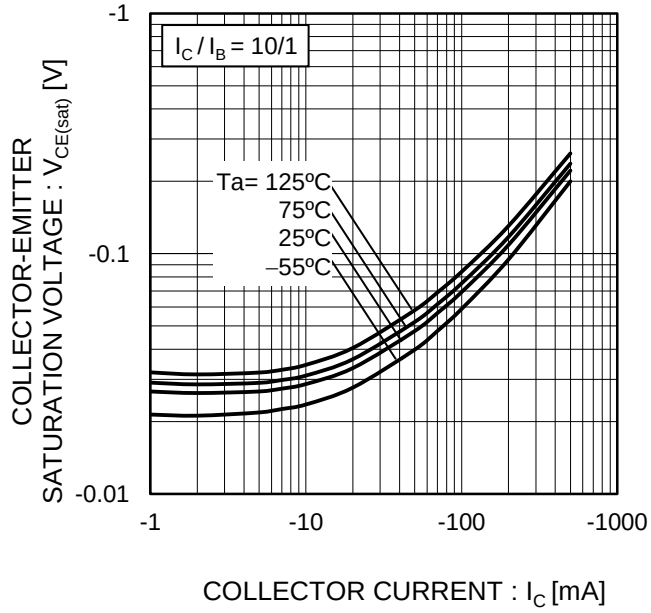
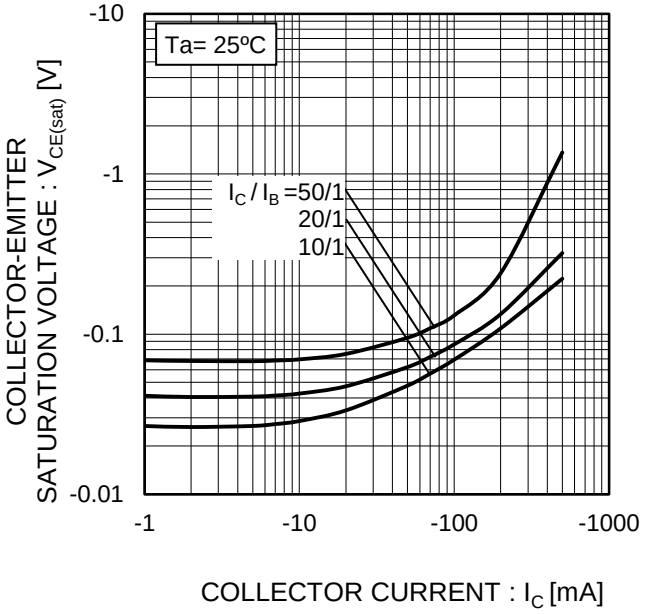



Fig.16 Collector-Emitter Saturation Voltage vs. Collector Current (II)





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

Fig.17 Base-Emitter Saturation Voltage vs. Collector Current

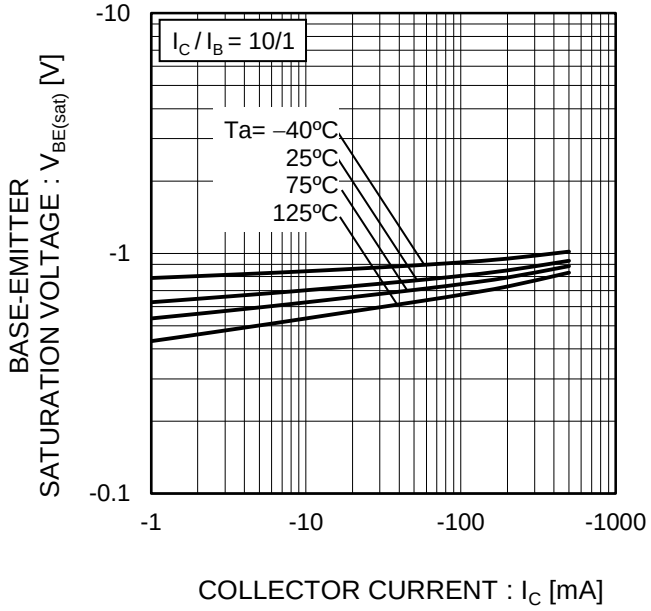



Fig.18 Gain Bandwidth Product vs. Emitter Current

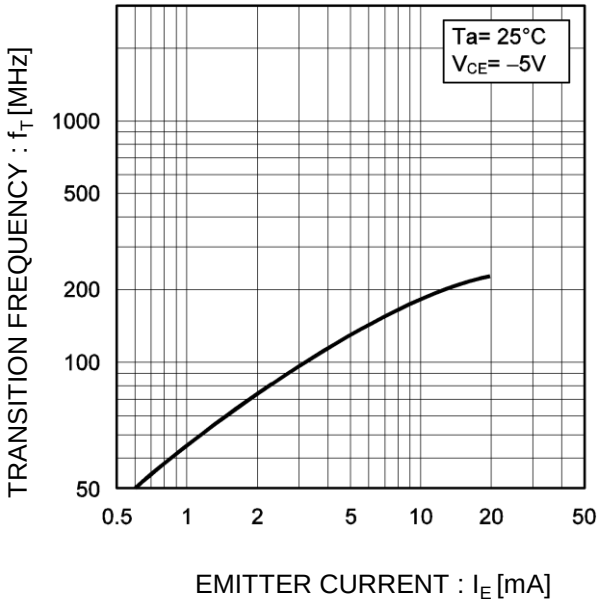



Fig.19 Emitter input capacitance vs. Emitter-Base Voltage
Collector output capacitance vs. Collector-Base Voltage

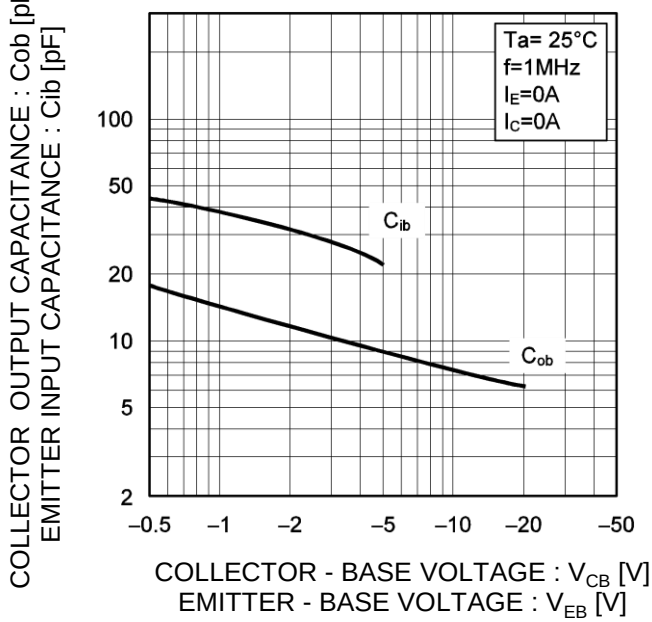
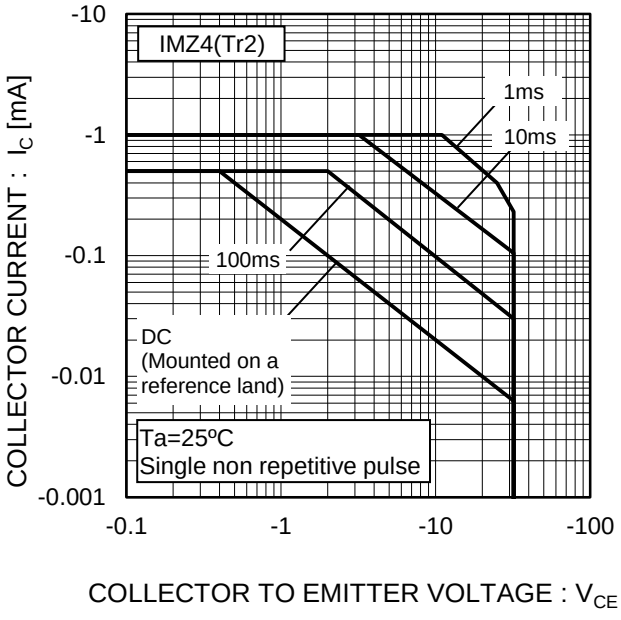



Fig.20 Safe Operating Area



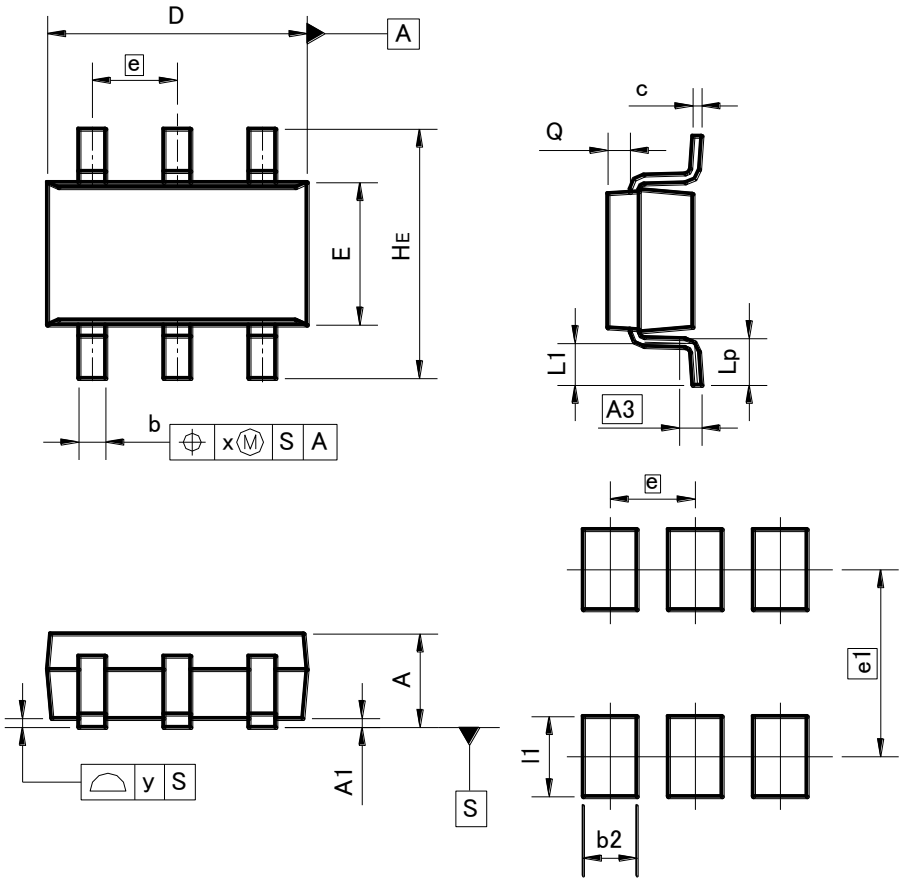


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## ●Dimensions (Unit : mm)

**SMT6**




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

| DIM | MILIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 1.00 | 1.30 | 0.039 | 0.051 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A3 | 0.25 | | 0.010 | |
| b | 0.25 | 0.40 | 0.010 | 0.016 |
| c | 0.09 | 0.25 | 0.004 | 0.010 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 1.50 | 1.80 | 0.059 | 0.071 |
| e | 0.95 | | 0.037 | |
| HE | 2.60 | 3.00 | 0.102 | 0.118 |
| L1 | 0.30 | 0.60 | 0.012 | 0.024 |
| Lp | 0.40 | 0.70 | 0.016 | 0.028 |
| Q | 0.20 | 0.30 | 0.008 | 0.012 |
| x | − | 0.20 | − | 0.008 |
| y | − | 0.10 | − | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| b2 | | 0.60 | − | 0.024 |
| e1 | 2.10 | | 0.083 | |
| l1 | − | 0.90 | − | 0.035 |

Dimension in mm / inches


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