



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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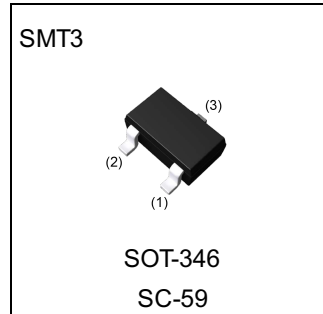
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| Parameter | Value |
|-----------|-------|
| V_{CEO} | 32V |
| I_C | 800mA |

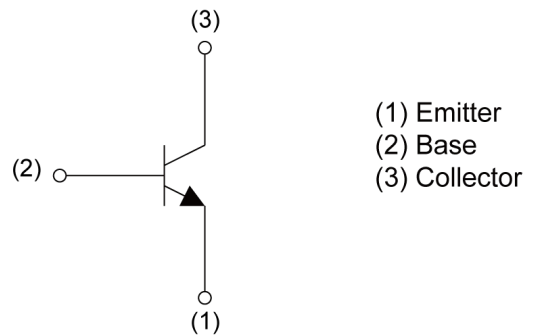
●Outline



●Features

- 1) Very low $V_{CE(sat)}$.
 $V_{CE(sat)}=0.1V(Typ.)$
 $(I_C/I_B=500mA/50mA)$
- 2) High current capacity in compact package.
- 3) Complements the 2SB1197K.

●Inner circuit



●Application

POWER AMPLIFIER

●Packaging specifications

| Part No. | Package | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|----------|---------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| 2SD1781K | SMT3 | 2928 | T146 | 180 | 8 | 3000 | AF |

● **Absolute maximum ratings** ($T_a = 25^\circ\text{C}$)

| Parameter | Symbol | Values | Unit |
|------------------------------|---------------|-------------|------------------|
| Collector-base voltage | V_{CBO} | 40 | V |
| Collector-emitter voltage | V_{CEO} | 32 | V |
| Emitter-base voltage | V_{EBO} | 5 | V |
| Collector current | I_C | 800 | mA |
| | I_{CP}^{*1} | 1.5 | A |
| Power dissipation | P_D^{*2} | 200 | mW |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Range of storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

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

| Parameter | Symbol | Conditions | Values | | | Unit |
|--------------------------------------|---------------|---|--------|------|------|------|
| | | | Min. | Typ. | Max. | |
| Collector-base breakdown voltage | BV_{CBO} | $I_C = 50\mu\text{A}$ | 40 | - | - | V |
| Collector-emitter breakdown voltage | BV_{CEO} | $I_C = 1\text{mA}$ | 32 | - | - | V |
| Emitter-base breakdown voltage | BV_{EBO} | $I_E = 50\mu\text{A}$ | 5 | - | - | V |
| Collector cut-off current | I_{CBO} | $V_{CB} = 20\text{V}$ | - | - | 500 | nA |
| Emitter cut-off current | I_{EBO} | $V_{EB} = 4\text{V}$ | - | - | 500 | nA |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 500\text{mA}, I_B = 50\text{mA}$ | - | 100 | 400 | mV |
| DC current gain | h_{FE} | $V_{CE} = 3\text{V}, I_C = 100\text{mA}$ | 120 | - | 390 | - |
| Transition frequency | f_T | $V_{CE} = 5\text{V}, I_E = -50\text{mA}, f = 100\text{MHz}$ | - | 150 | - | MHz |
| Output capacitance | C_{ob} | $V_{CB} = 10\text{V}, I_E = 0\text{A}, f = 1\text{MHz}$ | - | 15 | - | pF |

h_{FE} values are classified as follows :

| rank | Q | R | - | - | - |
|----------|---------|---------|---|---|---|
| h_{FE} | 120-270 | 180-390 | - | - | - |

*1 $P_w=100\text{ms}$ Single pulse

*2 Each terminal mounted on a reference land.

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

Fig.1 Ground Emitter Propagation Characteristics

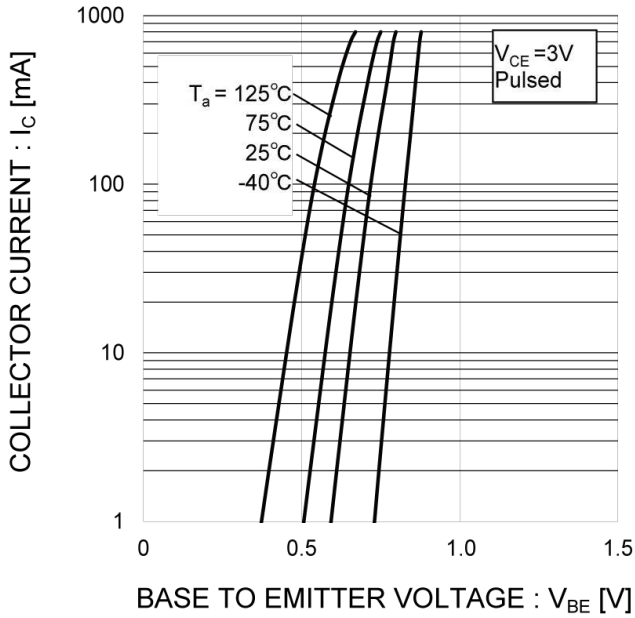


Fig.2 Typical Output Characteristics

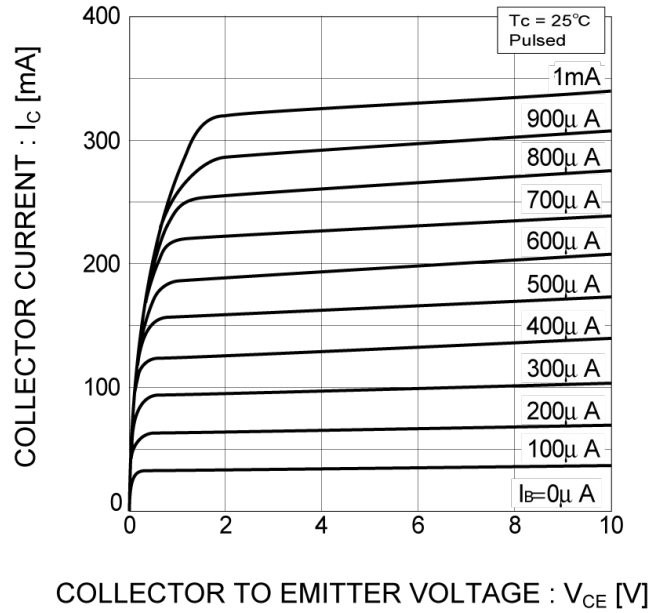


Fig.3 DC Current Gain vs. Collector Current (I)

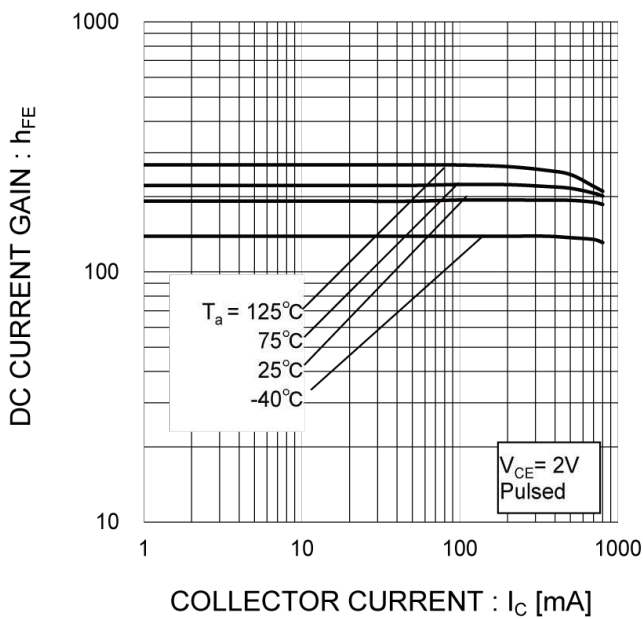
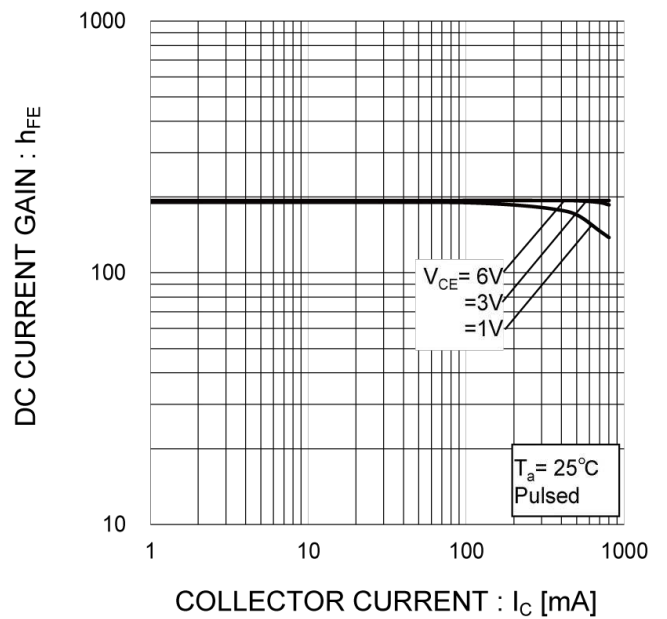


Fig.4 DC Current Gain vs. Collector Current (II)



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

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

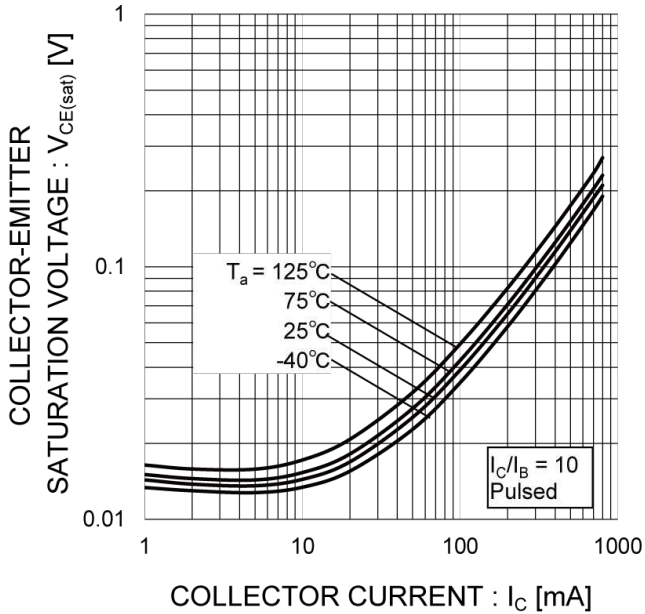


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

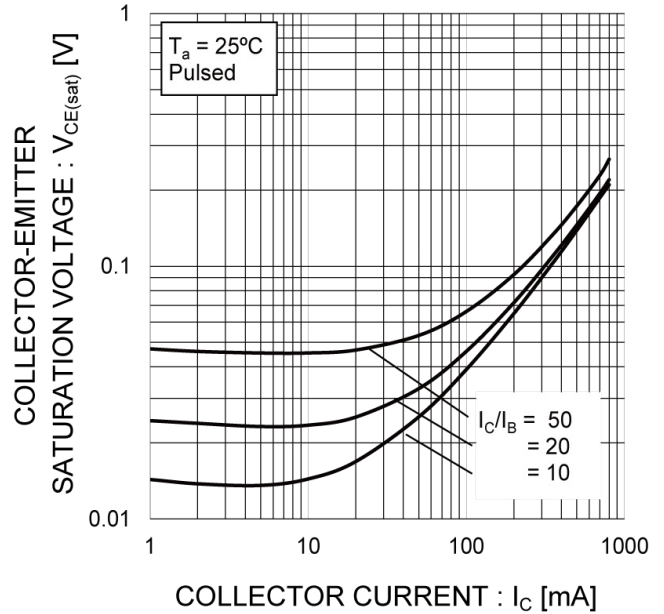


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

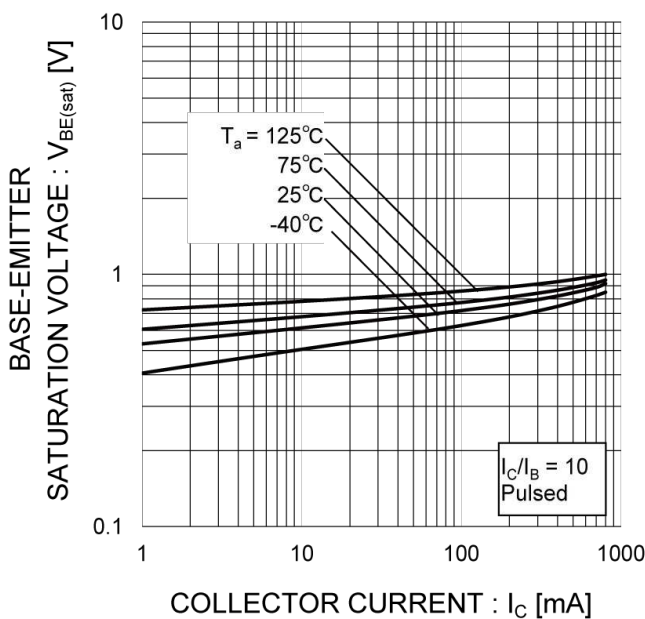
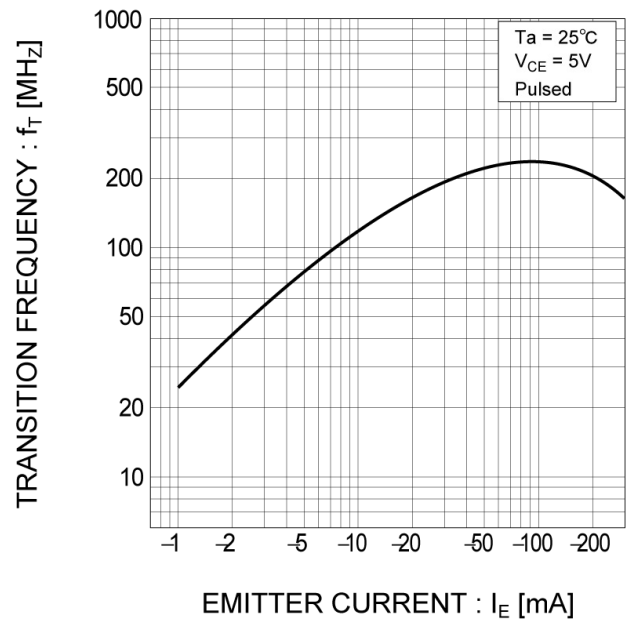


Fig.8 Gain Bandwidth Product vs. Emitter Current



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

Fig.9 Emitter Input Capacitance vs.
Emitter-Base Voltage
Collector Output Capacitance vs.
Collector-Base Voltage

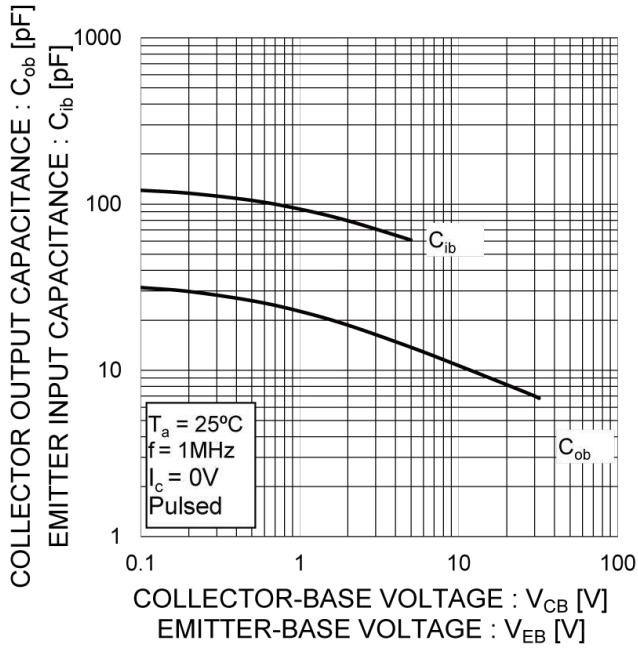
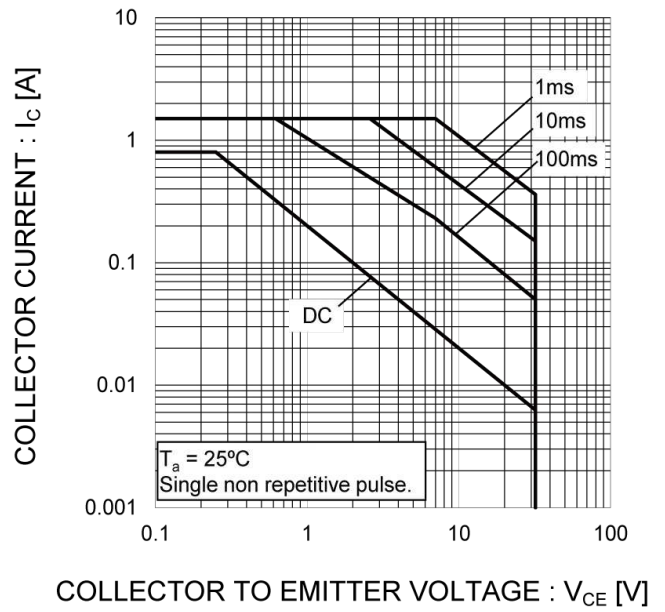
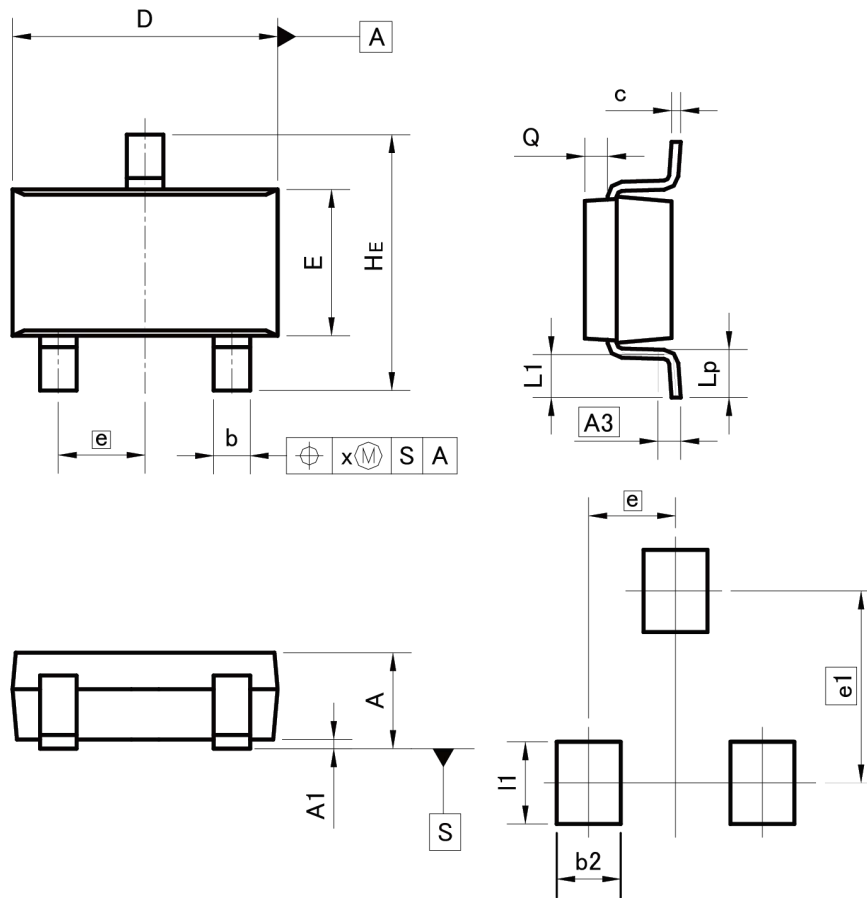


Fig.10 Safe Operating Area



●Dimensions

SMT3



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 | 0.35 | 0.50 | 0.014 | 0.020 |
| 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 | - | 0.10 | - | 0.004 |
| 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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