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# 2SC5866

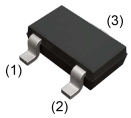
Medium power transistor (60V, 2A)

Datasheet

| Parameter | Value |
|---|---|
| $V_{CEO}$ | 60V |
| $I_C$ | 2A |

## ●Outline

TSMT3




SOT-346T

SC-96

## ●Features

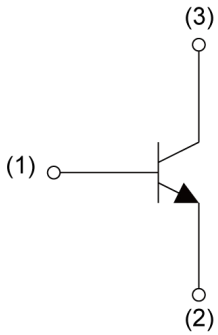
1)High speed switching.
($t_f$:Typ.:35ns at $I_C$=2A)

2)Low saturation voltage, typically
(Typ.:200mV at $I_C$=1.0A, $I_B$=100mA)

3)Storong discharge power for inductive load and capacitance load.

4)Complements the 2SA2094

## ●Inner circuit




(1) Base
(2) Emitter
(3) Collector

## ●Application

LOW FREQUENCY AMPLIFIER, HIGH SPEED SWITCHING

## ●Packaging specifications

| Part No. | Package | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|---|---|---|---|---|---|---|---|
| 2SC5866 | TSMT3 | 2928 | TL | 180 | 8 | 3000 | VL |

## ●Absolute maximum ratings ($T_a$ = 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 | $I_C$ | 2 | A |
| | $I_{CP}$ *1 | 4 | A |
| Power dissipation | $P_D$ *2 | 0.5 | W |
| Junction temperature | $T_j$ | 150 | ℃ |
| Range of storage temperature | $T_{stg}$ | -55 to +150 | ℃ |

## ●Electrical characteristics ($T_a$ = 25°C)

| Parameter | Symbol | Conditions | Values | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Collector-base breakdown voltage | $BV_{CBO}$ | $I_C$ = 100μA | 60 | - | - | V |
| Collector-emitter breakdown voltage | $BV_{CEO}$ | $I_C$ = 1mA | 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 | $V_{CE(sat)}$ | $I_C$ = 1.0A, $I_B$ = 100mA | - | 200 | 500 | mV |
| DC current gain | $h_{FE}$ | $V_{CE}$ = 2V, $I_C$ = 100mA | 120 | - | 390 | - |
| Transition frequency | $f_T$ *3 | $V_{CE}$ = 10V, $I_E$ = -100mA, f = 10MHz | - | 200 | - | MHz |
| Output capacitance | $C_{ob}$ | $V_{CB}$ = 10V, $I_E$ = 0A, f = 1MHz | - | 10 | - | pF |
| Turn-On time | $t_{on}$ *3 | $I_C$ = 2A, $I_{B1}$ = 200mA, $I_{B2}$ = -200mA, $V_{CC}$ ≃ 25V, $R_L$ = 12.5Ω See test circuit | - | 50 | - | ns |
| Storage time | $t_{stg}$ *3 | | - | 120 | - | ns |
| Fall time | $t_f$ *3 | | - | 35 | - | ns |

hFE values are calssified as follows :

| rank | Q | R | - | - | - |
|---|---|---|---|---|---|
| hFE | 120-270 | 180-390 | - | - | - |

*1 Pw=10ms

*2 Each terminal mounted on a reference land.

*3 Pulsed

## ●Electrical characteristic curves($T_a$ = 25°C)

Fig.1 Ground Emitter Propagation Characteristics

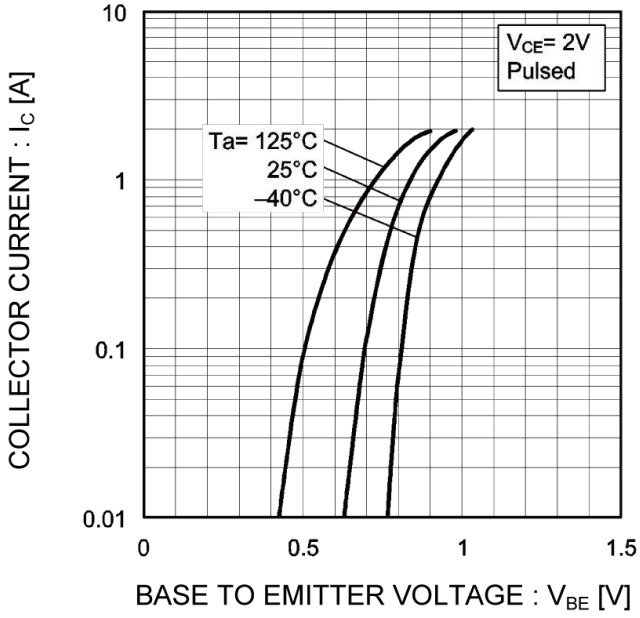



Fig.2 Typical Output Characteristics

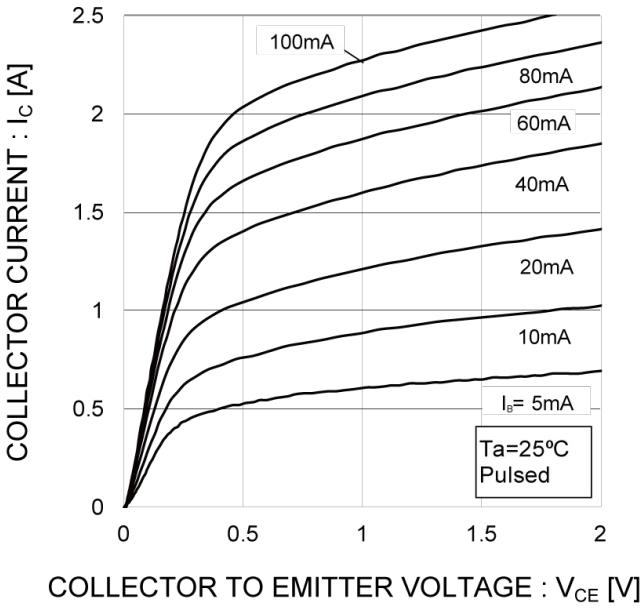



Fig.3 DC Current Gain vs. Collector Current (I)

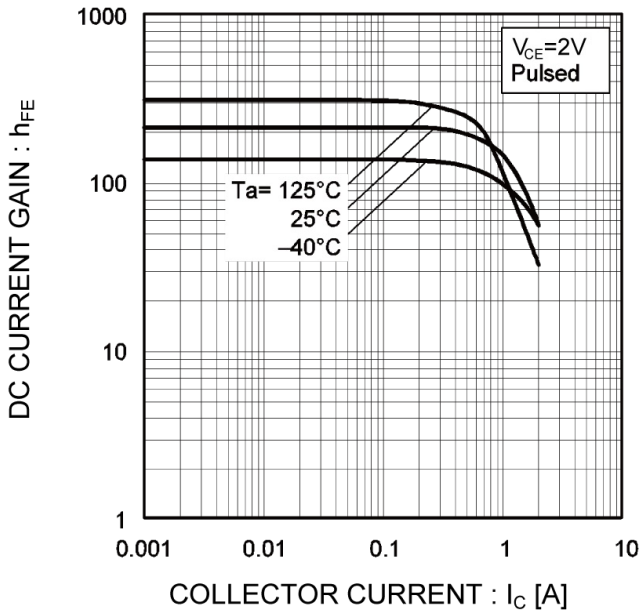
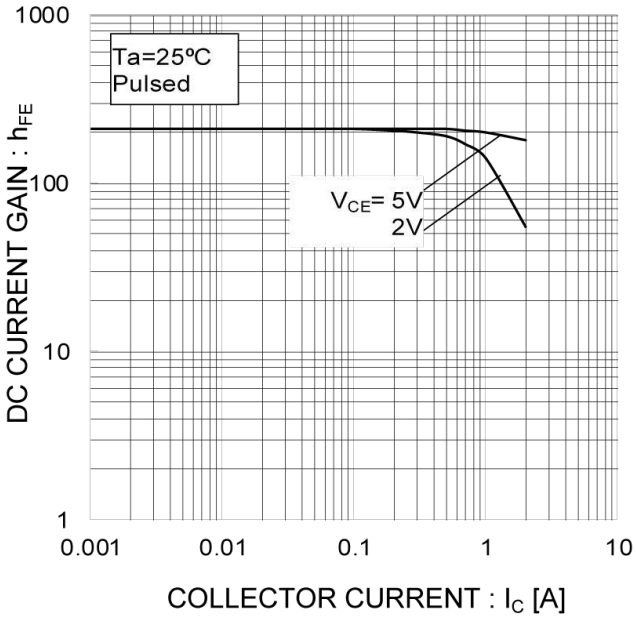



Fig.4 DC Current Gain vs. Collector Current (II)



## ●Electrical characteristic curves($T_a$ = 25°C)

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

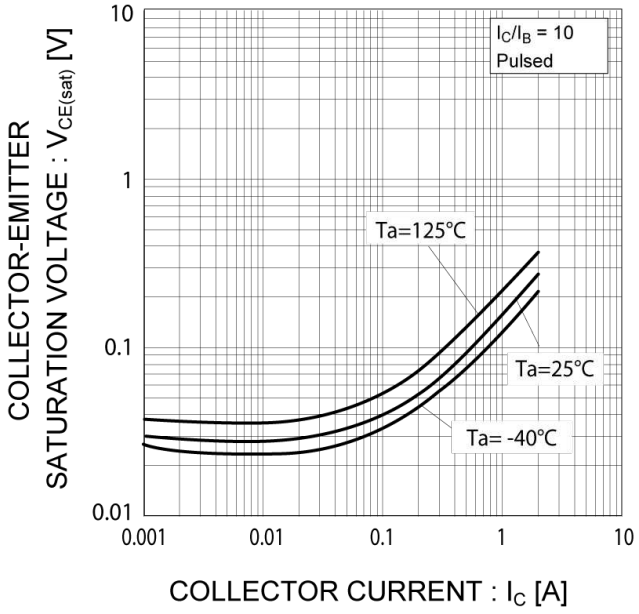



Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

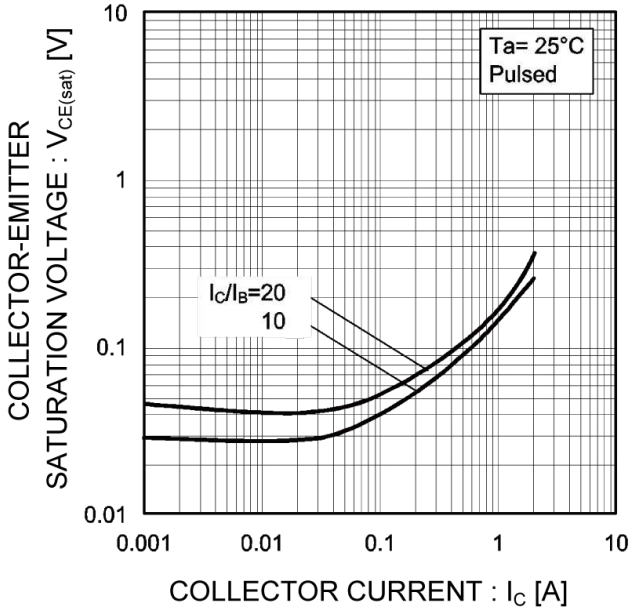



Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

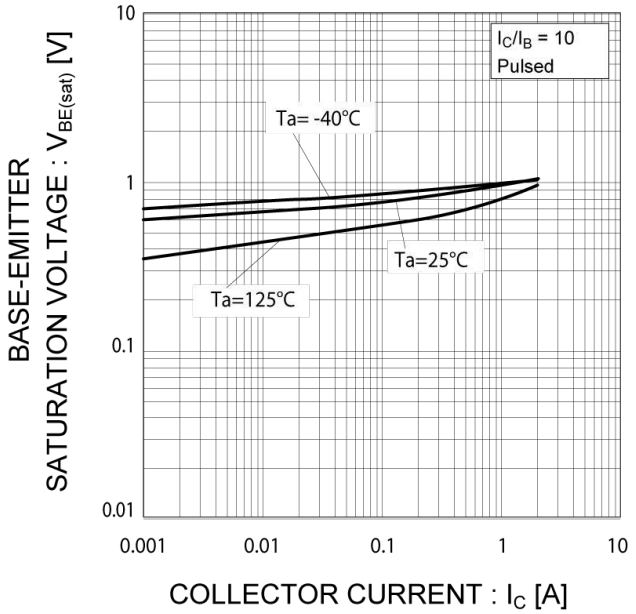
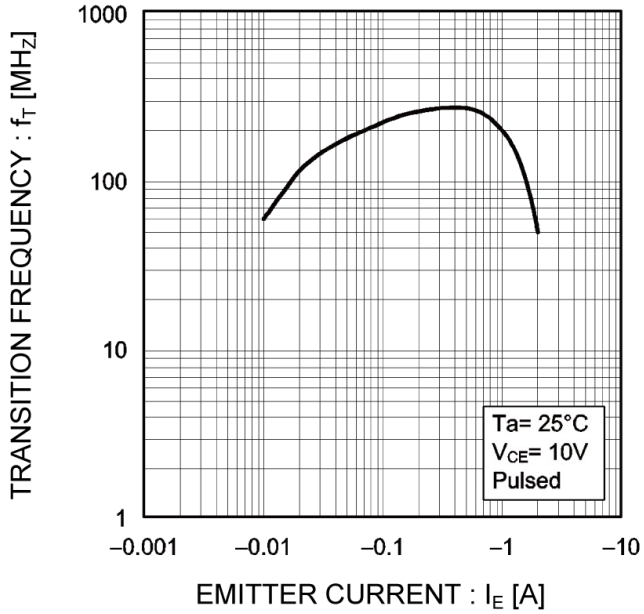



Fig.8 Gain Bandwidth Product vs. Emitter Current



## ●Electrical characteristic curves($T_a$ = 25°C)

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

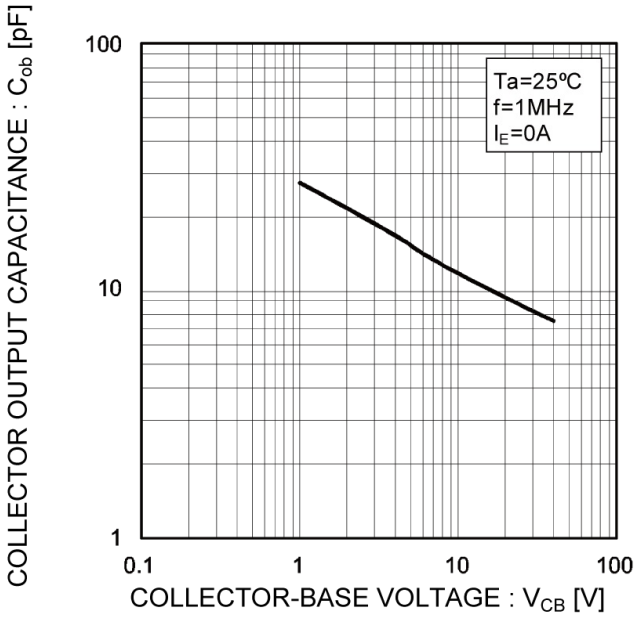
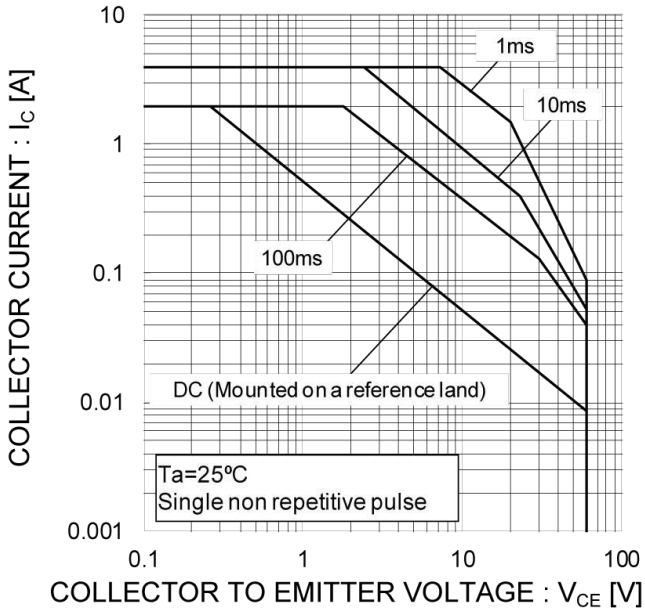
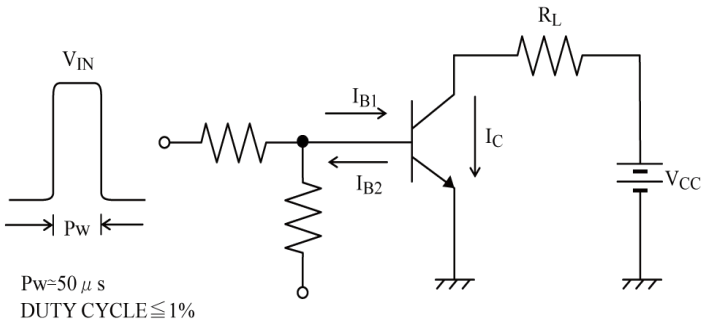
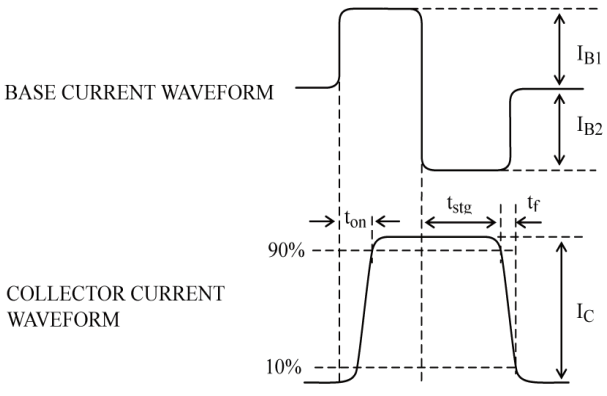



Fig.10 Safe Operating Area



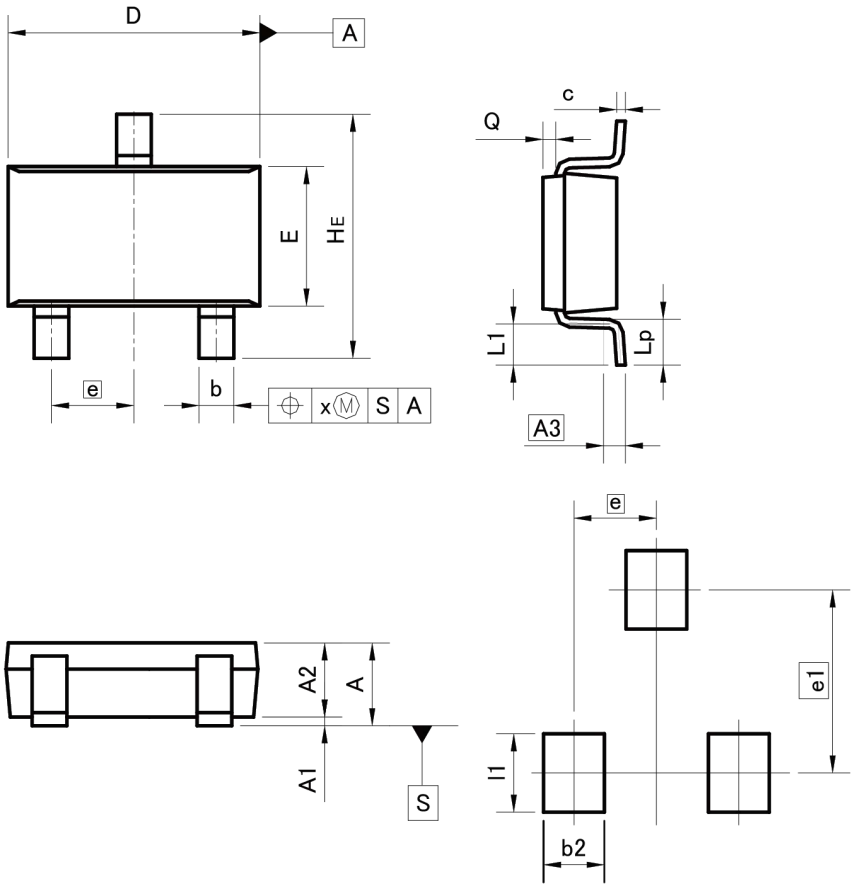

SWITCHING TIME TEST CIRCUIT



## ●Dimensions

TSMT3




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

| DIM | MILIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | – | 1.00 | – | 0.039 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A2 | 0.75 | 0.95 | 0.030 | 0.037 |
| A3 | 0.25 | | 0.010 | |
| b | 0.35 | 0.50 | 0.014 | 0.020 |
| c | 0.10 | 0.26 | 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 | 0.05 | 0.25 | 0.002 | 0.010 |
| x | – | 0.20 | – | 0.008 |

| DIM | MILIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| b2 | | 0.70 | – | 0.028 |
| e1 | 2.10 | | 0.083 | |
| l1 | – | 0.90 | – | 0.035 |

Dimension in mm/inches

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