# 2SCR514R

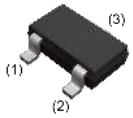
NPN 0.7A 80V Middle Power Transistor

Datasheet

| Parameter | Value |
|---|---|
| $V_{CEO}$ | 80V |
| $I_C$ | 0.7A |

## ●Outline

TSMT3

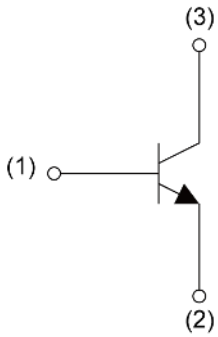



SOT-346T
SC-96

## ●Features

1)Suitable for Middle Power Driver
2)Complementary PNP Types:2SAR514R
1)Low saturation voltage, typically
$V_{CE(sat)}$=300mV(Max.)
($I_C$/ $I_B$=300mA/15mA)

## ●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 |
|---|---|---|---|---|---|---|---|
| 2SCR514R | TSMT3 | 2928 | TL | 180 | 8 | 3000 | ND |

## ●Absolute maximum ratings ($T_a$ = 25°C)

| Parameter | Symbol | Values | Unit |
|---|---|---|---|
| Collector-base voltage | $V_{CBO}$ | 80 | V |
| Collector-emitter voltage | $V_{CEO}$ | 80 | V |
| Emitter-base voltage | $V_{EBO}$ | 6 | V |
| Collector current | $I_C$ | 0.7 | A |
| | $I_{CP}$*1 | 1.4 | A |
| Power dissipation | $P_D$*2 | 0.5 | W |
| | $P_D$*3 | 1.0 | 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 | 80 | - | - | V |
| Collector-emitter breakdown voltage | $BV_{CEO}$ | $I_C$ = 1mA | 80 | - | - | V |
| Emitter-base breakdown voltage | $BV_{EBO}$ | $I_E$ = 100μA | 6 | - | - | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$ = 80V | - | - | 1.0 | μA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$ = 4V | - | - | 1.0 | μA |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$ = 300mA, $I_B$ = 15mA | - | 100 | 300 | mV |
| DC current gain | $h_{FE}$ | $V_{CE}$ = 3V, $I_C$ = 100mA | 120 | - | 390 | - |
| Transition frequency | $f_T$ | $V_{CE}$ = 10V, $I_E$ = -200mA, f = 100MHz | - | 320 | - | MHz |
| Output capacitance | $C_{ob}$ | $V_{CB}$ = 10V, $I_E$ = 0mA, f = 1MHz | - | 6 | - | pF |
| Turn-On time | $t_{on}$ | $I_C$ = 350mA, $I_{B1}$ = 35mA, $I_{B2}$ = -35mA, $V_{CC}$ ≃ 10V, $R_L$ = 27Ω See test circuit | - | 50 | - | ns |
| Storage time | $t_{stg}$ | | - | 650 | - | ns |
| Fall time | $t_f$ | | - | 100 | - | ns |

*1 $P_W$=10ms,Single Pulse

*2 Each terminal mounted on a reference land.

*3 Mounted on a ceramic board(40×40×0.7mm).

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

Fig.1 Ground Emitter Propagation Characteristics

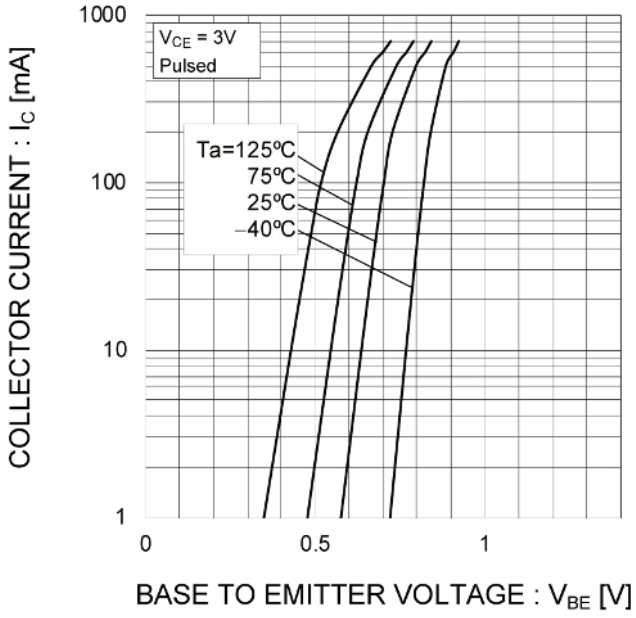



Fig.2 Typical Output Characteristics

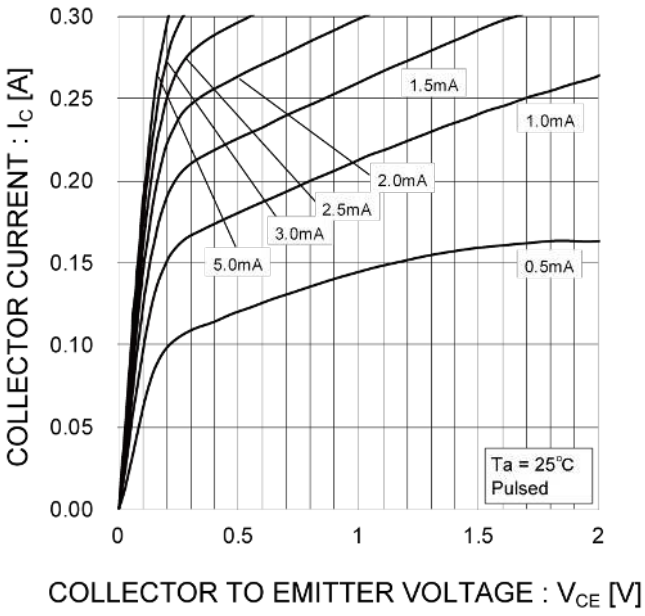



Fig.3 DC Current Gain vs. Collector Current (I)

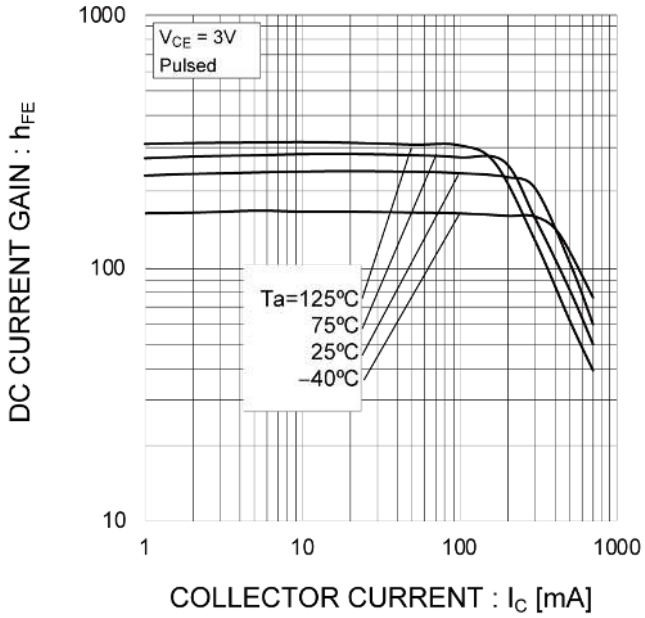
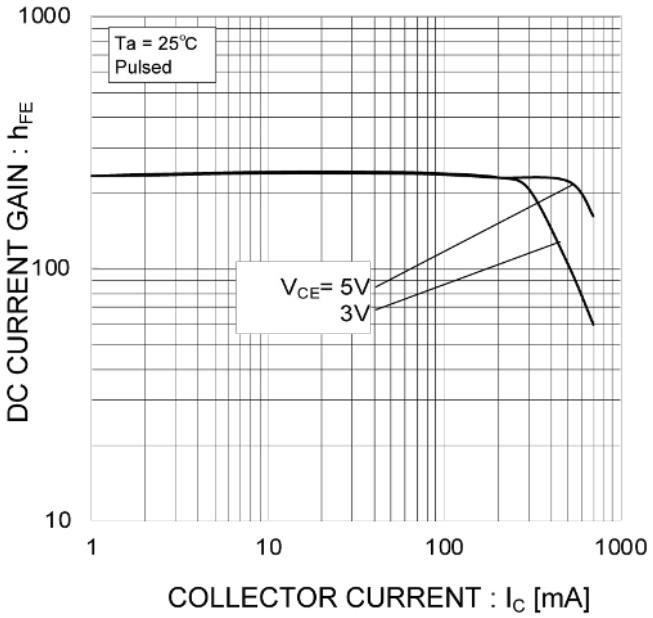



Fig.4 DC Current Gain vs. Collector Current (II)



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

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

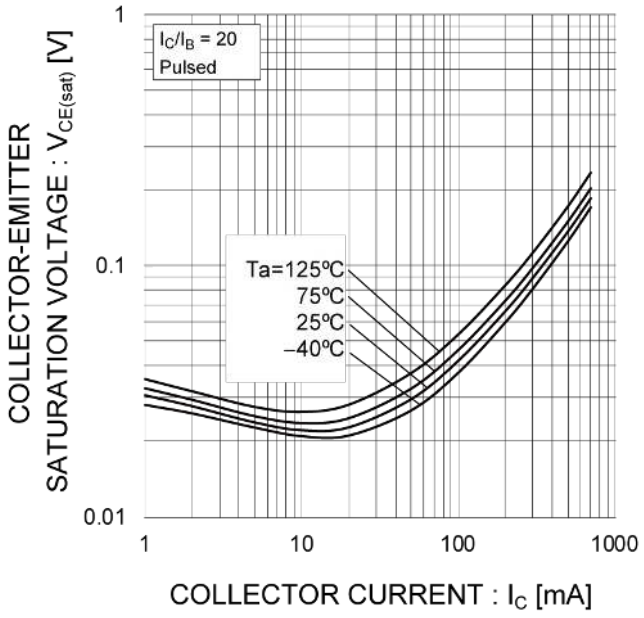



Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

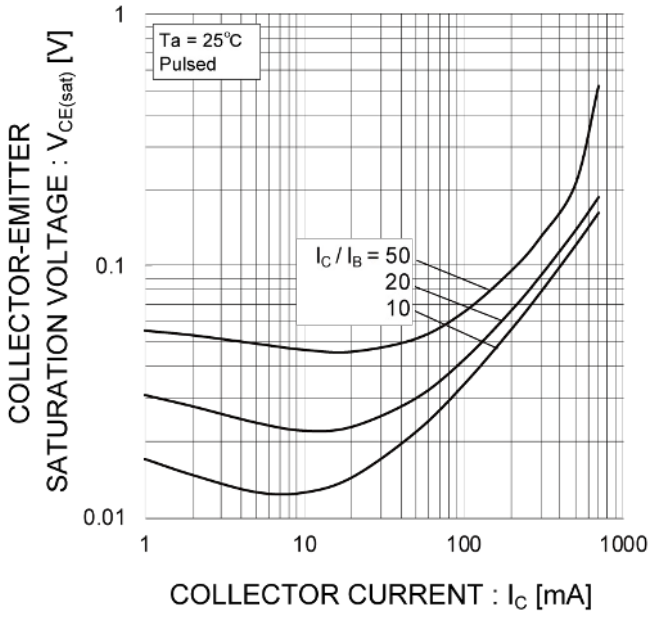



Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

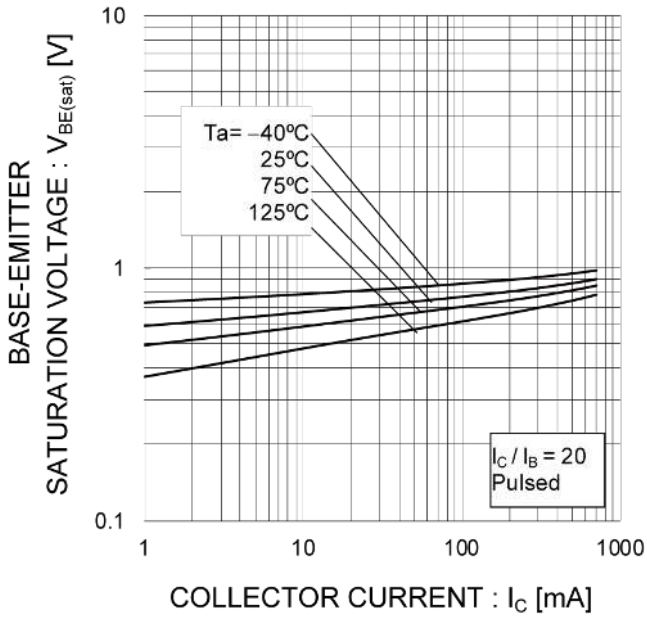
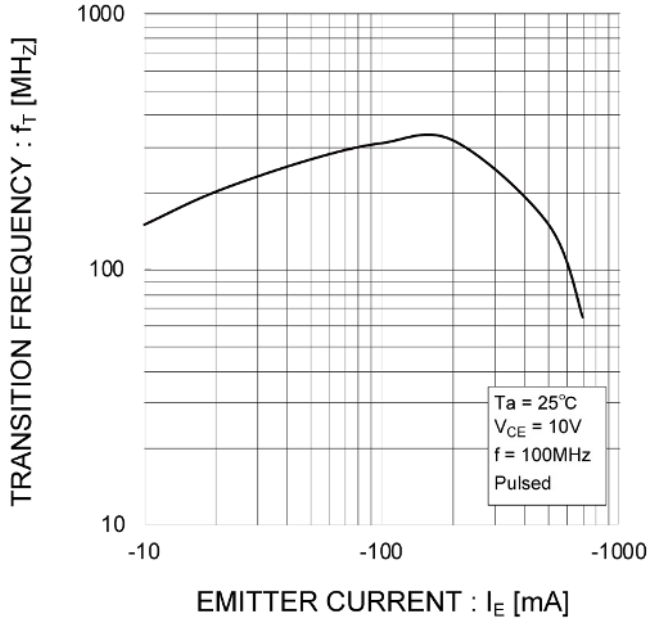



Fig.8 Gain Bandwidth Product vs. Emitter Current



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

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

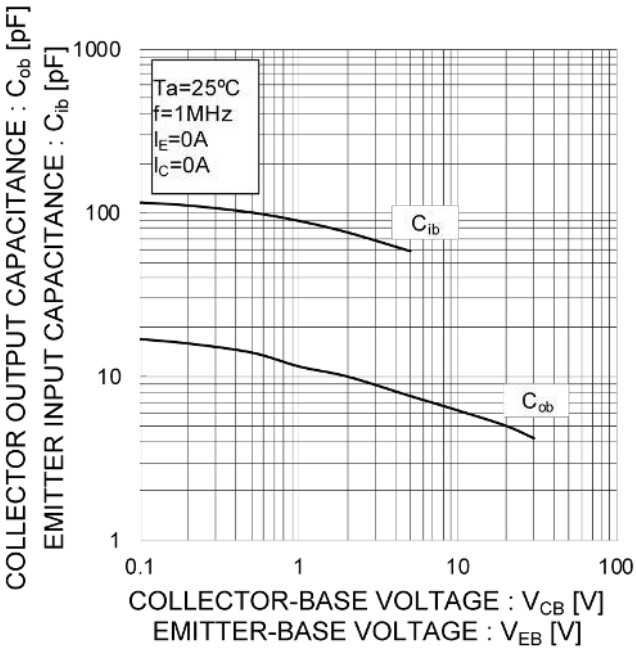
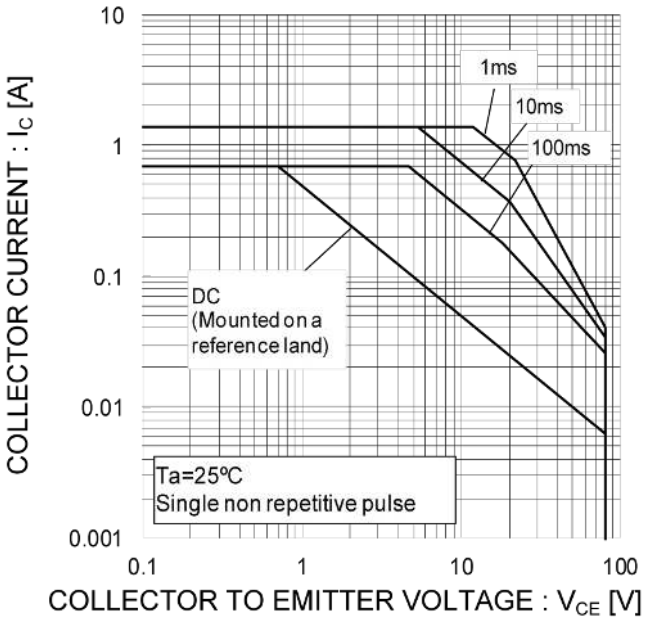
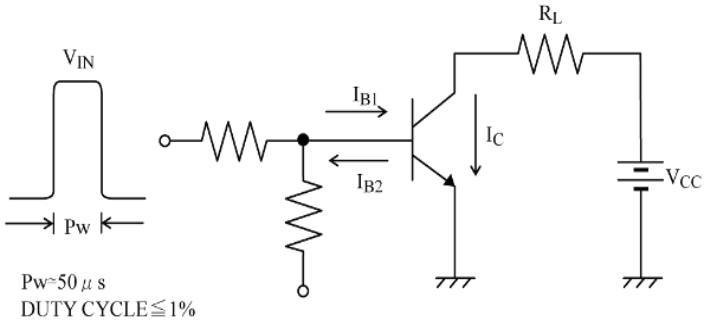
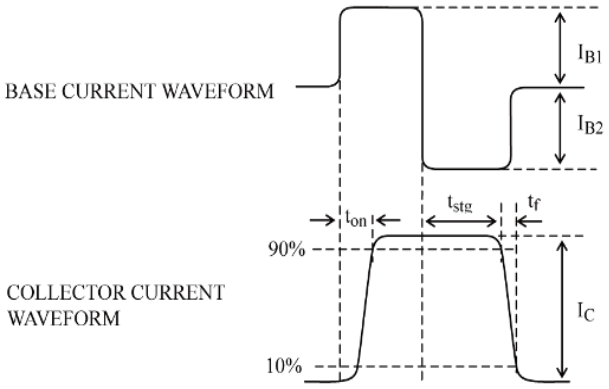



Fig.10 Safe Operating Area



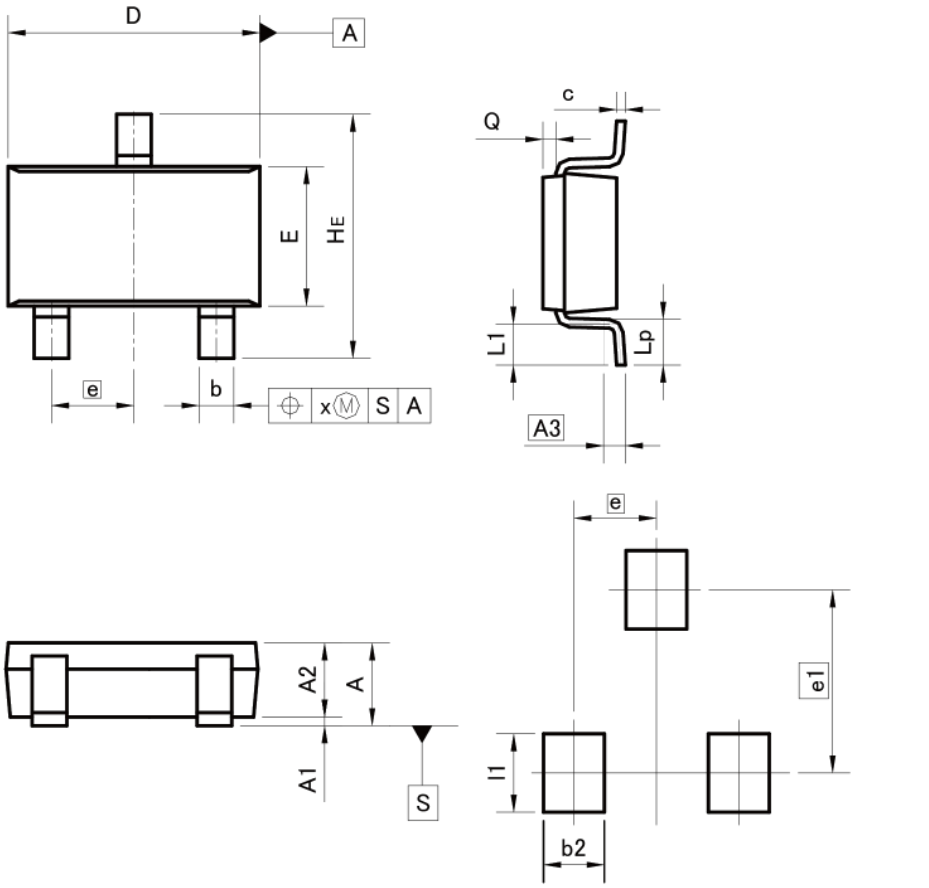

SWITCHING TIME TEST CIRCUIT



## ●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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