

# 2SC4691

## Silicon NPN epitaxial planer type

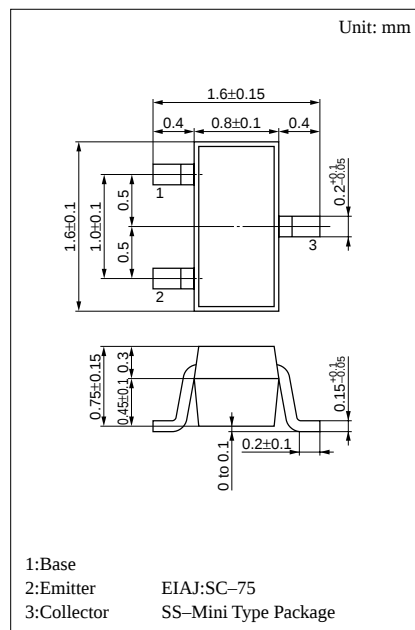
For high speed switching

### Features

- High-speed switching.
- Low collector to emitter saturation voltage  $V_{CE(sat)}$ .
- SS-Mini type package, allowing downsizing of the equipment and automatic insertion through the tape packing.

### Absolute Maximum Ratings (Ta=25°C)

| Parameter                    | Symbol    | Ratings    | Unit |
|------------------------------|-----------|------------|------|
| Collector to base voltage    | $V_{CBO}$ | 40         | V    |
| Collector to emitter voltage | $V_{CES}$ | 40         | V    |
| Emitter to base voltage      | $V_{EBO}$ | 5          | V    |
| Peak collector current       | $I_{CP}$  | 300        | mA   |
| Collector current            | $I_C$     | 100        | mA   |
| Collector power dissipation  | $P_C$     | 125        | mW   |
| Junction temperature         | $T_j$     | 125        | °C   |
| Storage temperature          | $T_{stg}$ | -55 ~ +125 | °C   |



Marking symbol : 2Y

### Electrical Characteristics (Ta=25°C)

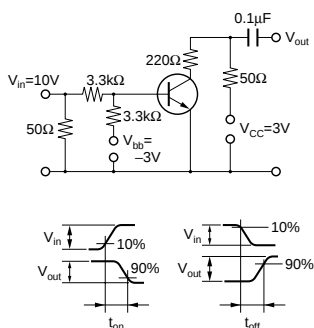
| Parameter                               | Symbol        | Conditions                              | min | typ  | max  | Unit    |
|-----------------------------------------|---------------|-----------------------------------------|-----|------|------|---------|
| Collector cutoff current                | $I_{CBO}$     | $V_{CB} = 15V, I_E = 0$                 |     |      | 0.1  | $\mu A$ |
| Emitter cutoff current                  | $I_{EBO}$     | $V_{EB} = 4V, I_C = 0$                  |     |      | 0.1  | $\mu A$ |
| Forward current transfer ratio          | $h_{FE}^*$    | $V_{CE} = 1V, I_C = 10mA$               | 60  |      | 200  |         |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 10mA, I_B = 1mA$                 |     | 0.17 | 0.25 | V       |
| Base to emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = 10mA, I_B = 1mA$                 |     |      | 1.0  | V       |
| Transition frequency                    | $f_T$         | $V_{CB} = 10V, I_E = -10mA, f = 200MHz$ |     | 450  |      | MHz     |
| Collector output capacitance            | $C_{ob}$      | $V_{CB} = 10V, I_E = 0, f = 1MHz$       |     | 2    | 6    | pF      |
| Turn-on time                            | $t_{on}$      | Refer to the measurment circuit         |     | 17   |      | ns      |
| Turn-off time                           | $t_{off}$     |                                         |     | 17   |      | ns      |
| Storage time                            | $t_{stg}$     |                                         |     | 10   |      | ns      |

\* $h_{FE}$  Rank classification

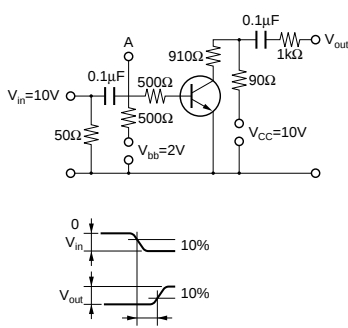
| Rank           | Q        | R        |
|----------------|----------|----------|
| $h_{FE}$       | 60 ~ 120 | 90 ~ 200 |
| Marking Symbol | 2YQ      | 2YR      |

# Switching time measurement circuit

## $t_{on}, t_{off}$ Test Circuit

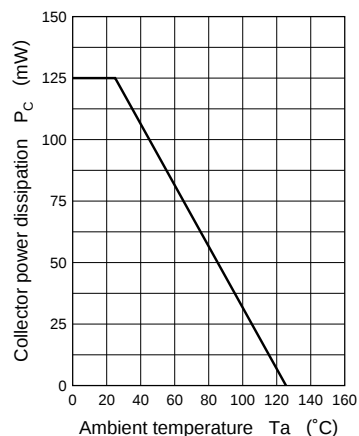


## $t_{stg}$ Test Circuit

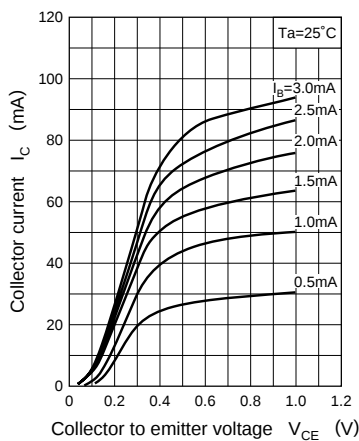


(Waveform at A)

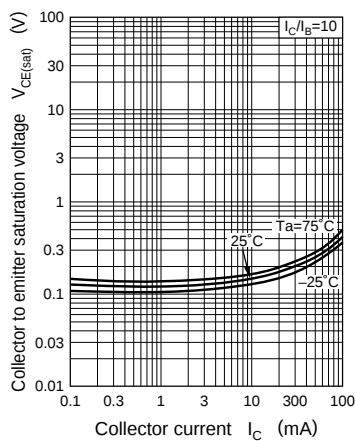
## $P_C - T_a$



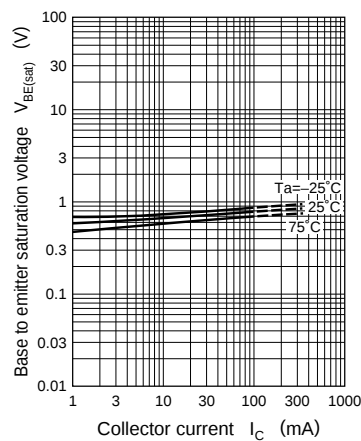
## $I_C - V_{CE}$



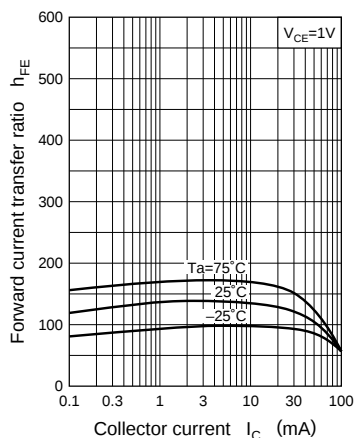
## $V_{CE(sat)} - I_C$



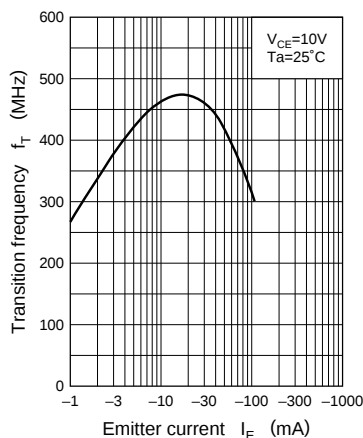
## $V_{BE(sat)} - I_C$



## $h_{FE} - I_C$



## $f_T - I_E$



## $C_{ob} - V_{CB}$

