

# High voltage discharge, High speed switching, Low Noise (60V, 1A)

## 2SC5865

### ●Features

- 1) High speed switching. (  $T_f$  : Typ. : 50ns at  $I_C = 1.0A$  )
- 2) Low saturation voltage, typically.  
(Typ. : 200mV at  $I_C = 500mA$ ,  $I_B = 50mA$  )
- 3) Strong discharge power for inductive load and capacitance load.
- 4) Low Noise.
- 5) Complements the 2SA2092.

### ●Applications

High speed switching, Low noise

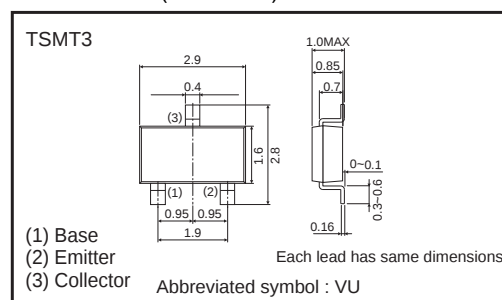
### ●Structure

NPN Silicon epitaxial planar transistor

### ●Packaging specifications

| Type    | Package                      | Taping |
|---------|------------------------------|--------|
|         | Code                         | TL     |
|         | Basic ordering unit (pieces) | 3000   |
| 2SC5865 |                              | ○      |

### ●Dimensions (Unit : mm)



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

| Parameter                    | Symbol    | Limits      | Unit  |
|------------------------------|-----------|-------------|-------|
| Collector-base voltage       | $V_{CB0}$ | 60          | V     |
| Collector-emitter voltage    | $V_{CE0}$ | 60          | V     |
| Emitter-base voltage         | $V_{EB0}$ | 6           | V     |
| Collector current            | $I_C$     | 1.0         | A     |
|                              | $I_{CP}$  | 2.0         | A *1  |
| Power dissipation            | $P_C$     | 500         | mW *2 |
| Junction temperature         | $T_j$     | 150         | °C    |
| Range of storage temperature | $T_{stg}$ | -55 to +150 | °C    |

\*1  $P_W = 10ms$

\*2 Each terminal mounted on a recommended land

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

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit          | Conditions                                                                                            |
|--------------------------------------|---------------|------|------|------|---------------|-------------------------------------------------------------------------------------------------------|
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | 60   | —    | —    | V             | $I_C=1\text{mA}$                                                                                      |
| Collector-base breakdown voltage     | $BV_{CBO}$    | 60   | —    | —    | V             | $I_C=100\mu\text{A}$                                                                                  |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | 6    | —    | —    | V             | $I_E=100\mu\text{A}$                                                                                  |
| Collector cut-off current            | $I_{CBO}$     | —    | —    | 1.0  | $\mu\text{A}$ | $V_{CB}=40\text{V}$                                                                                   |
| Emitter cut-off current              | $I_{EBO}$     | —    | —    | 1.0  | $\mu\text{A}$ | $V_{EB}=4\text{V}$                                                                                    |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —    | 200  | 500  | mV            | $I_C=500\text{mA}$ , $I_B=50\text{mA}$                                                                |
| DC current gain                      | $h_{FE}$      | 120  | —    | 390  | —             | $V_{CE}=2\text{V}$ , $I_C=100\text{mA}$                                                               |
| Transistor frequency                 | $f_T$         | —    | 250  | —    | MHz           | $V_{CE}=10\text{V}$ , $I_E=-100\text{mA}$ , $f=10\text{MHz}$ *1                                       |
| Collector output capacitance         | $C_{ob}$      | —    | 10   | —    | pF            | $V_{CB}=10\text{V}$ , $I_E=0\text{mA}$ , $f=1\text{MHz}$                                              |
| Turn-on time                         | $t_{on}$      | —    | 50   | —    | ns            | $I_C=1\text{A}$ ,<br>$I_{B1}=100\text{mA}$<br>$I_{B2}=-100\text{mA}$<br>$V_{CC}\approx 25\text{V}$ *2 |
| Storage time                         | $t_{stg}$     | —    | 130  | —    | ns            |                                                                                                       |
| Fall time                            | $t_f$         | —    | 50   | —    | ns            |                                                                                                       |

\*1 Non repetitive pulse

\*2 See switching characteristics measurement circuits

## ●hFE RANK

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

## ●Electrical characteristic curves

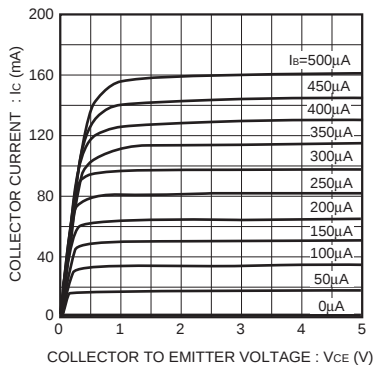


Fig.1 Typical output characteristics

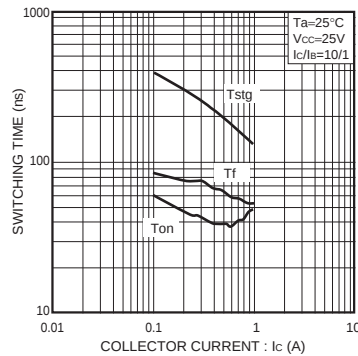
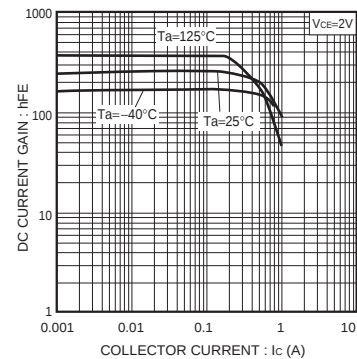
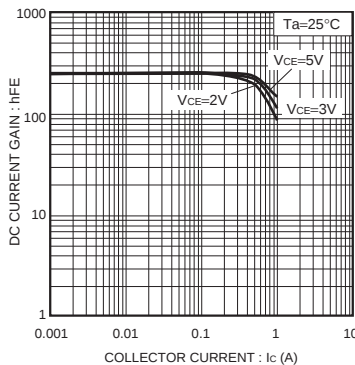
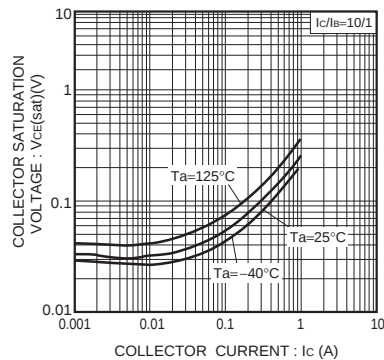
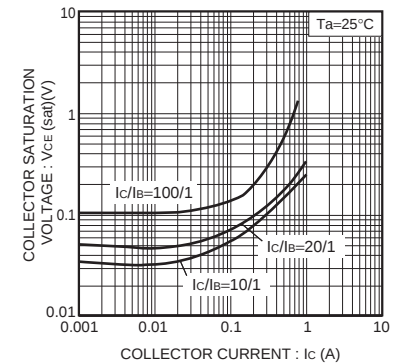


Fig.2 Switching Time

Fig.3 DC current gain  
vs. collector current ( I )Fig.4 DC current gain  
vs. collector current ( II )Fig.5 Collector-emitter saturation voltage  
vs. collector current ( I )Fig.6 Collector-emitter saturation voltage  
vs. collector current ( II )

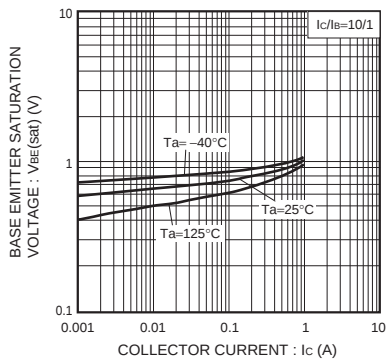


Fig.7 Base-emitter saturation voltage vs. collector current

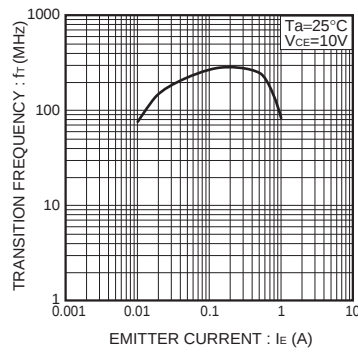


Fig.8 Transition frequency

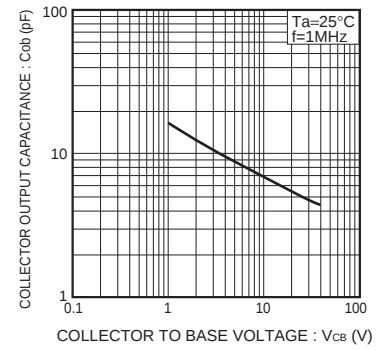


Fig.9 Collector output capacitance

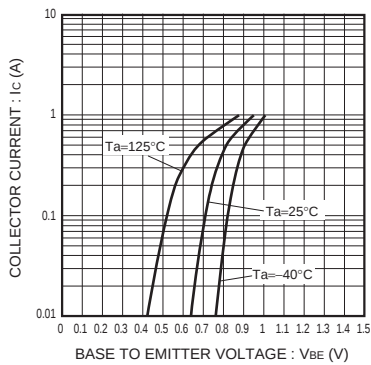
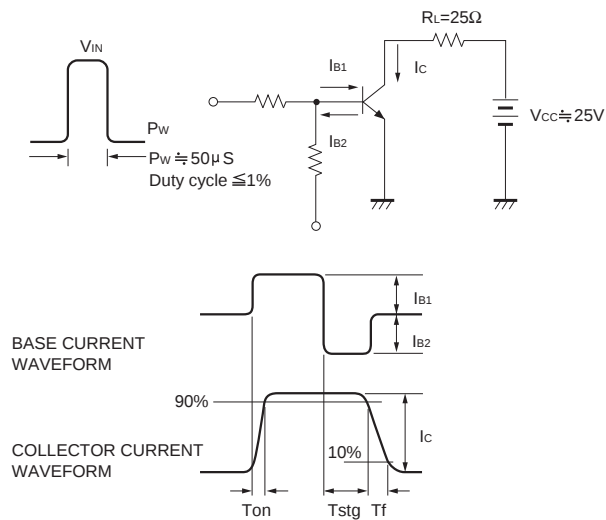


Fig.10 Ground emitter propagation characteristics

### ●Switching characteristics measurement circuits



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