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

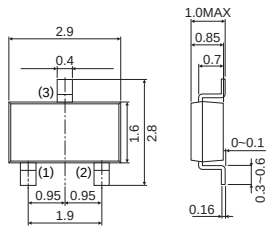
## 2SC5865

●**Features**

1) High speed switching. ( Tf : 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.

●**Dimensions** (Unit : mm)

TSMT3




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

Each lead has same dimensions

Abbreviated symbol : VU

●**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 | | ◯ |

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

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Collector-base voltage | $V_{CBO}$ | 60 | V |
| Collector-emitter voltage | $V_{CEO}$ | 60 | V |
| Emitter-base voltage | $V_{EBO}$ | 6 | V |
| Collector current | $I_C$ | 1.0 | A |
| | $I_{CP}$ | 2.0 | A *1 |
| Power dissipation | $P_C$ | 500 | mW *2 |
| Junction temperature | Tj | 150 | °C |
| Range of storage temperature | Tstg | −55 to +150 | °C |

*1 Pw=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 | $I_C$=1mA |
| Collector-base breakdown voltage | $BV_{CBO}$ | 60 | – | – | V | $I_C$=100μA |
| Emitter-base breakdown voltage | $BV_{EBO}$ | 6 | – | – | V | $I_E$=100μA |
| Collector cut-off current | $I_{CBO}$ | – | – | 1.0 | μA | $V_{CB}$=40V |
| Emitter cut-off current | $I_{EBO}$ | – | – | 1.0 | μA | $V_{EB}$=4V |
| Collector-emitter saturatioin voltage | $V_{CE(sat)}$ | – | 200 | 500 | mV | $I_C$=500mA, $I_B$=50mA |
| DC current gain | $h_{FE}$ | 120 | – | 390 | – | $V_{CE}$=2V, $I_C$=100mA |
| Transistor frequency | fT | – | 250 | – | MHz | $V_{CE}$=10V, $I_E$= −100mA, f=10MHz*1 |
| Collector output capacitance | Cob | – | 10 | – | pF | $V_{CB}$=10V, $I_E$=0mA, f=1MHz |
| Turn-on time | ton | – | 50 | – | ns | $I_C$=1A, $I_{B1}$=100mA $I_{B2}$= −100mA $V_{CC}$≒25V *2 |
| Storage time | tstg | – | 130 | – | ns | |
| Fall time | tf | – | 50 | – | ns | |

*1 Non repetitive pulse
*2 See switching characteristics measurement circuits

●**$h_{FE}$ RANK**

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

●**Electrical characteristics curves**

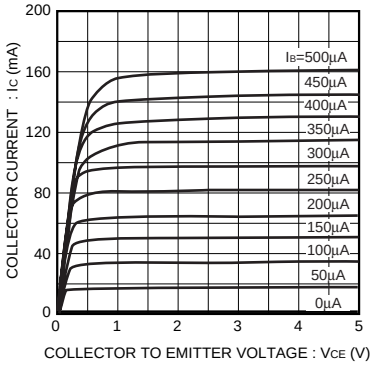



Fig.1 Typical output characteristics

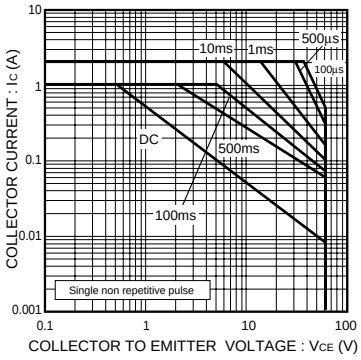



Fig.2 Safe operating area

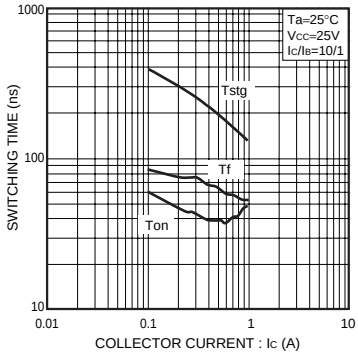



Fig.3 Switching Time

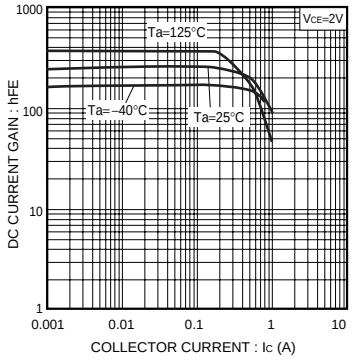



Fig.4 DC current gain
vs. collector current ( I )

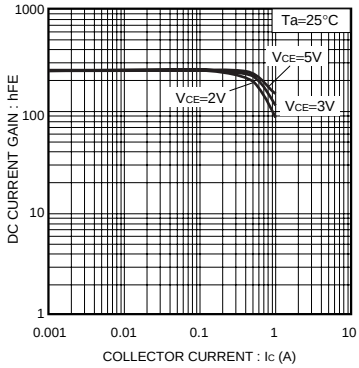



Fig.5 DC current gain
vs. collector current ( II )

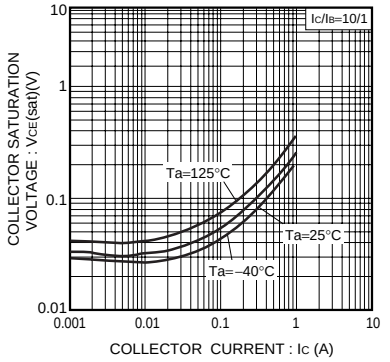



Fig.6 Collector-emitter saturation voltage
vs. collector current ( I )

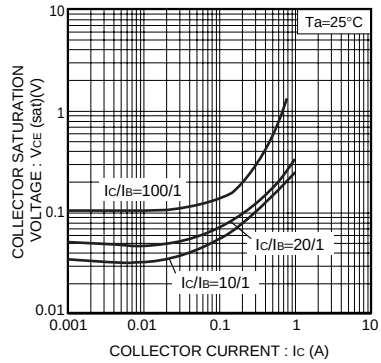



Fig.7 Collector-emitter saturation voltage
vs. collector current ( II )

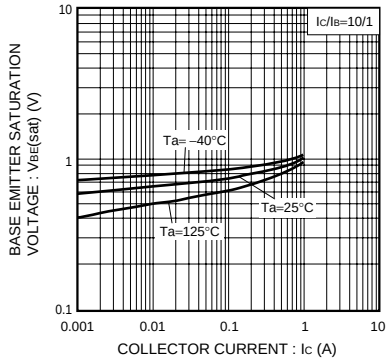



Fig.8 Base-emitter saturation voltage
vs. collector current

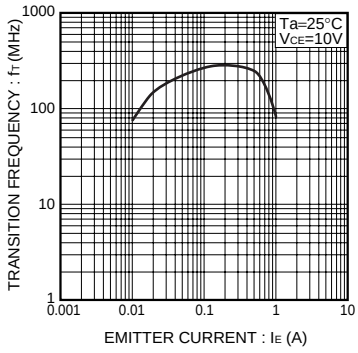



Fig.9 Transition frequency

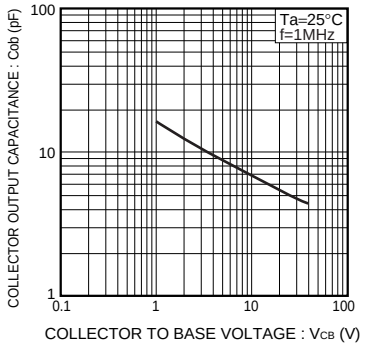



Fig.10 Collector output capacitance

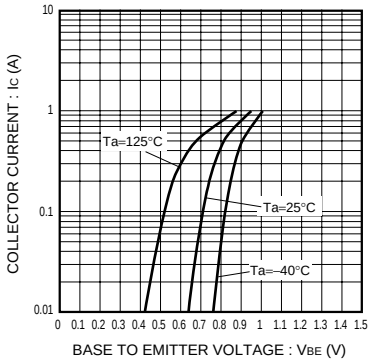
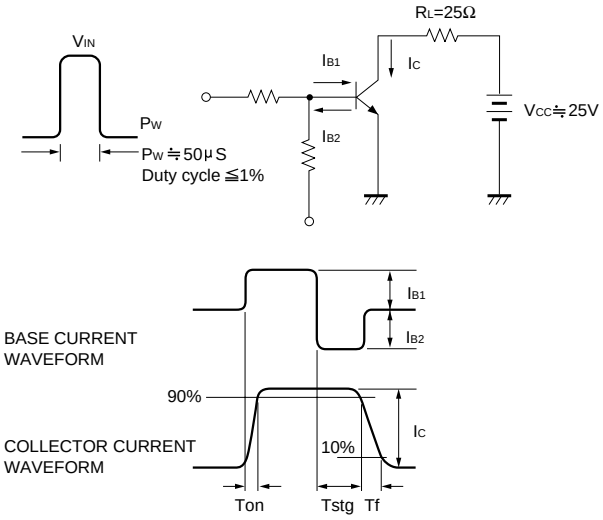



Fig.11 Ground emitter propagation characteristics

**●Switching characteristics measurement circuits**



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