

**Features**

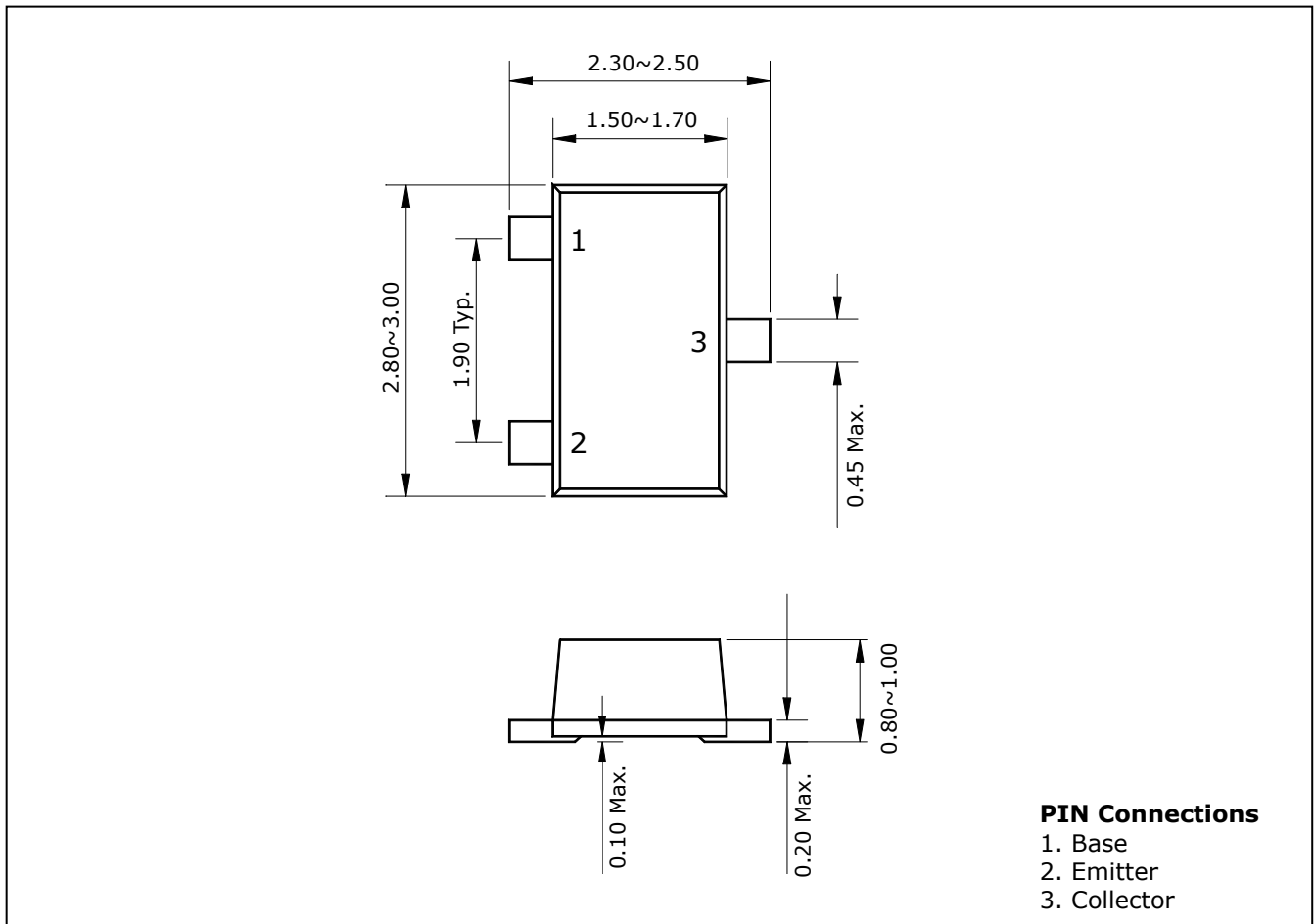
- Low saturation medium current application
- Extremely low collector saturation voltage
- Suitable for low voltage large current drivers
- High DC current gain and large current capability
- Low on resistance :  $R_{ON}=0.6\Omega(\text{Max.})$  ( $I_B=1\text{mA}$ )

**Ordering Information**

| Type NO. | Marking | Package Code |
|----------|---------|--------------|
| STD123SF | 123     | SOT-23F      |

**Outline Dimensions**

unit : mm



## Absolute maximum ratings

(Ta=25°C)

| Characteristic            | Symbol    | Ratings | Unit |
|---------------------------|-----------|---------|------|
| Collector-Base voltage    | $V_{CBO}$ | 20      | V    |
| Collector-Emitter voltage | $V_{CEO}$ | 15      | V    |
| Emitter-Base voltage      | $V_{EBO}$ | 6.5     | V    |
| Collector current         | $I_C$     | 1       | A    |
| Collector dissipation     | $P_C^*$   | 350     | mW   |
| Junction temperature      | $T_j$     | 150     | °C   |
| Storage temperature       | $T_{stg}$ | -55~150 | °C   |

\* : Package mounted on 99.5% alumina 10×8×0.1mm

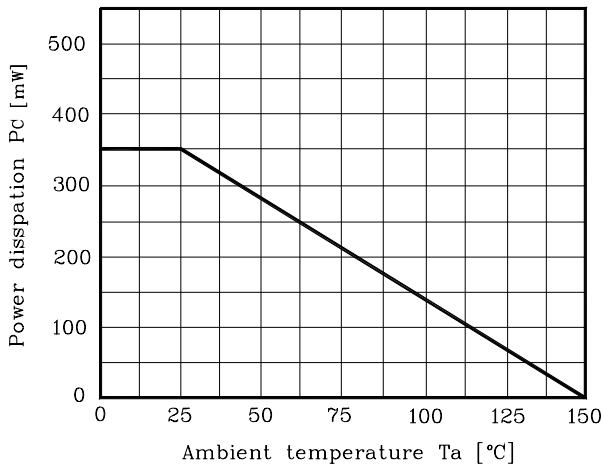
## Electrical Characteristics

(Ta=25°C)

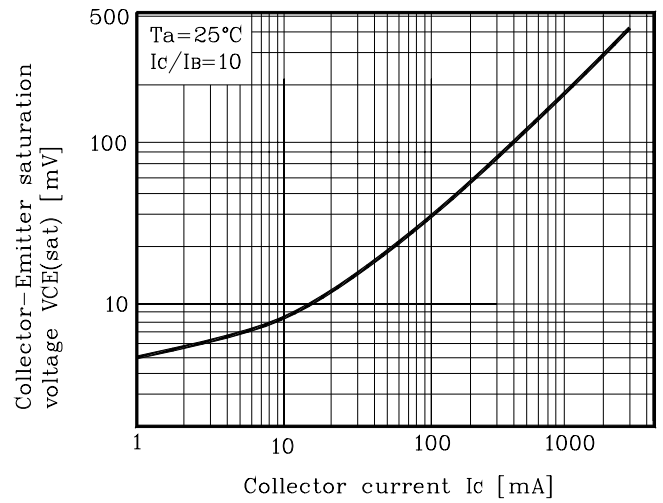
| Characteristic                       | Symbol        | Test Condition                 | Min. | Typ. | Max. | Unit     |
|--------------------------------------|---------------|--------------------------------|------|------|------|----------|
| Collector-Base breakdown voltage     | $BV_{CBO}$    | $I_C=50\mu A, I_E=0$           | 20   | -    | -    | V        |
| Collector-Emitter breakdown voltage  | $BV_{CEO}$    | $I_C=1mA, I_B=0$               | 15   | -    | -    | V        |
| Emitter-Base breakdown voltage       | $BV_{EBO}$    | $I_E=50\mu A, I_C=0$           | 6.5  | -    | -    | V        |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB}=20V, I_E=0$            | -    | -    | 0.1  | $\mu A$  |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB}=6V, I_C=0$             | -    | -    | 0.1  | $\mu A$  |
| DC current gain                      | $h_{FE}$      | $V_{CE}=1V, I_C=100mA$         | 150  | -    | -    | -        |
| Collector-Emitter saturation voltage | $V_{CE(sat)}$ | $I_C=500mA, I_B=50mA$          | -    | 0.1  | 0.3  | V        |
| Transistor frequency                 | $f_T$         | $V_{CE}=5V, I_C=50mA$          | -    | 260  | -    | MHz      |
| Collector output capacitance         | $C_{ob}$      | $V_{CB}=10V, I_E=0, f=1MHz$    | -    | 5    | -    | pF       |
| On resistance                        | $R_{ON}$      | $f=1KHz, I_B=1mA, V_{IN}=0.3V$ | -    | 0.6  | -    | $\Omega$ |

## Electrical Characteristic Curves

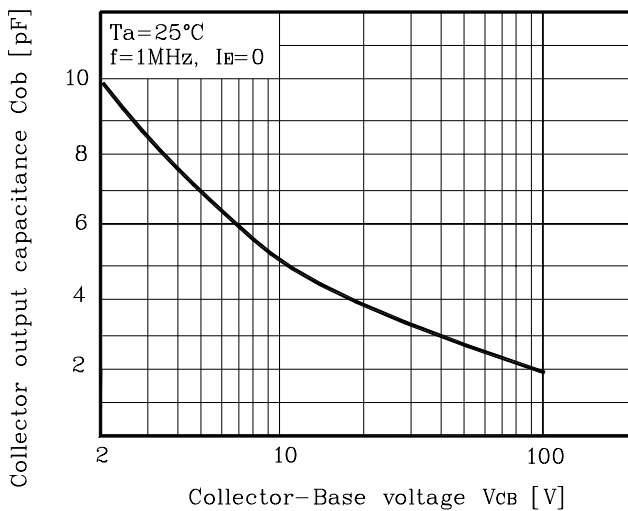
**Fig. 1**  $P_C - T_a$



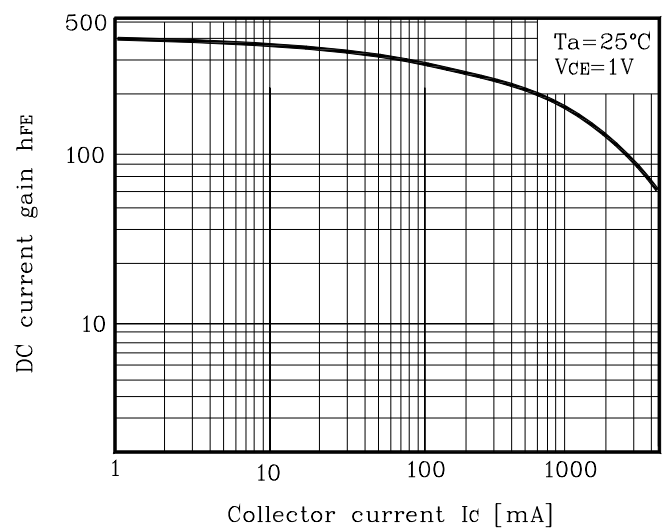
**Fig. 2**  $V_{CE(sat)} - I_C$



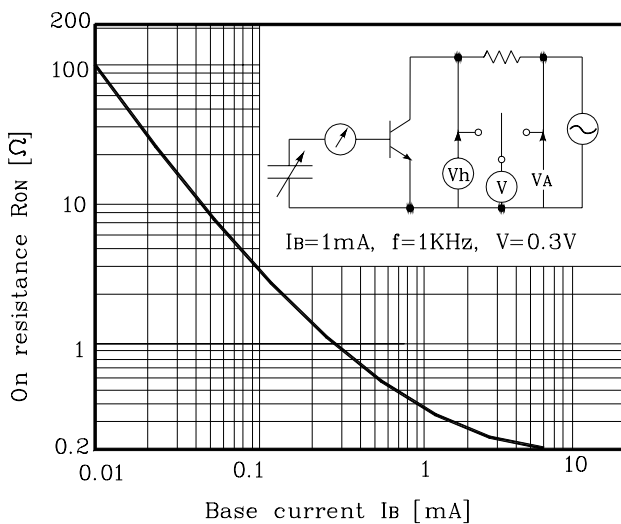
**Fig. 2**  $C_{ob} - V_{CB}$



**Fig. 4**  $h_{FE} - I_C$



**Fig. 5**  $R_{ON} - I_B$



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