

### Applications

- Power amplifier application
- High current switching application

#### Features

- $\bullet$  Low saturation voltage:  $V_{CE(sat)}{=}0.15V$  Typ. @  $I_{C}{=}1A,$   $I_{B}{=}50mA$
- Large collector current capacity: I<sub>C</sub>=2A
- Small and compact SMD type package
- Complementary pair with STA3250F

### **Ordering Information**

| Туре NO. | Marking | Package Code |  |  |
|----------|---------|--------------|--|--|
| STC4250F | HW2     | SOT-89       |  |  |

# **Outline Dimensions**

3.70~4.30 2.40~2.70 1.20 Max <u>1</u>.15 Typ. 3 4.40~4.70 1.87 Max 4 2 0.58 Max. 1 1.15 Typ. 0.48 Max. \_  $1.40 \sim 1.70$ **PIN Connections** 1. Base 2,4. Collector 0.46 Max. 0.10 Max. 3. Emitter

unit : mm

# **STC4250F**

## **Absolute Maximum Ratings**

| Absolute Maximum Ratings    |                  |         | [Ta=25℃] |
|-----------------------------|------------------|---------|----------|
| Characteristic              | Symbol           | Rating  | Unit     |
| Collector-base voltage      | V <sub>CBO</sub> | 50      | V        |
| Collector-emitter voltage   | V <sub>CEO</sub> | 50      | V        |
| Emitter-base voltage        | V <sub>EBO</sub> | 5       | V        |
| Collector current           | I <sub>C</sub>   | 2       | А        |
| Collector Dower discipation | P <sub>C</sub>   | 0.5     | W        |
| Collector Power dissipation | P <sub>C</sub> * | 1       | W        |
| Junction temperature        | TJ               | 150     | °C       |
| Storage temperature range   | T <sub>stg</sub> | -55~150 | °C       |

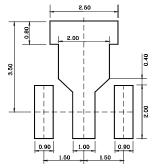
\* Device mounted on ceramic substrate (250mm<sup>2</sup> × 0.8t)

# **Electrical Characteristics**

| Electrical Characteristics           |              |                    |  |      |      |      | [Ta=25℃] |  |
|--------------------------------------|--------------|--------------------|--|------|------|------|----------|--|
| Characteristic                       |              | Symbol             | Test Condition                             | Min. | Тур. | Max. | Unit     |  |
| Collector-emitter breakdown voltage  |              | $BV_{CEO}$         | $I_C=10mA$ , $I_B=0$                       | 50   | -    | -    | V        |  |
| Collector cut-off current            |              | I <sub>CBO</sub>   | $V_{CB}$ =50V, $I_{E}$ =0                  | -    | -    | 0.1  | μA       |  |
| Emitter cut-off current              |              | $\mathbf{I}_{EBO}$ | $V_{EB} = 5V, I_{C} = 0$                   | -    | -    | 0.1  | μA       |  |
| DC current gain                      |              | h <sub>FE</sub>    | V <sub>CE</sub> =2V, I <sub>C</sub> =0.5A* | 120  | -    | 240  |          |  |
|                                      |              | h <sub>FE</sub>    | V <sub>CE</sub> =2V, I <sub>C</sub> =1.5A* | 40   | -    | -    |          |  |
| Collector-emitter saturation voltage |              | $V_{CE(sat)}$      | $I_{C}=1A, I_{B}=0.05A^{*}$                | -    | -    | 0.35 | V        |  |
| Base-emitter saturation voltage      |              | $V_{BE(sat)}$      | $I_{C}=1A, I_{B}=0.05A^{*}$                | -    | -    | 1.2  | V        |  |
| Transition frequency                 |              | f <sub>T</sub>     | $V_{CE}$ =2V, I <sub>C</sub> =50mA         | -    | 240  | -    | MHz      |  |
| Collector output capacitance         |              | C <sub>ob</sub>    | $V_{CB}$ =10V, $I_E$ =0, f=1MHz            | -    | 15   | -    | pF       |  |
| Switching<br>Time                    | Turn-on Time | t <sub>on</sub>    | $[si] = -lse = 50mA$ DUTY CYCLE $\leq 1%$  | -    | 100  | -    | nS       |  |
|                                      | Storage Time | t <sub>stg</sub>   |  | -    | 300  | -    |          |  |
|                                      | Fall Time    | t <sub>f</sub>     |  | -    | 50   | -    |          |  |

\*: Pulse test:  $t_P \leq 300 \mu s$ , Duty cycle  $\leq 2\%$ 

#### [Unit: mm] **\*** Recommend PCB solder land



# STC4250F

## **Electrical Characteristic Curves**



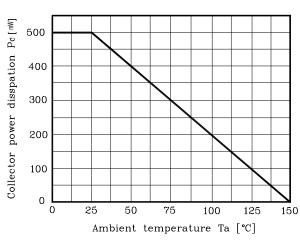
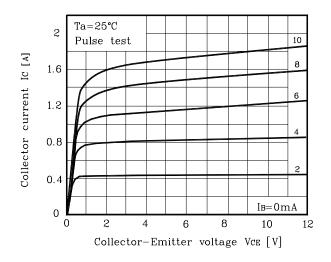
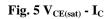


Fig. 3  $I_{C}\$ - $V_{CE}$ 





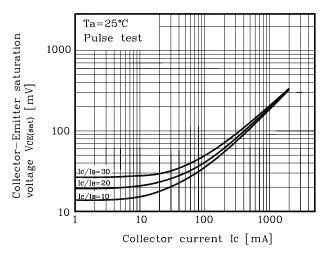


Fig. 2  $I_C\;$  -  $V_{BE}$ 

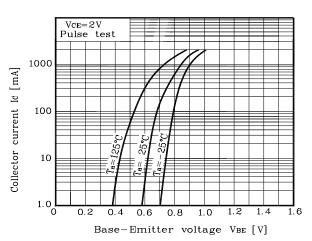
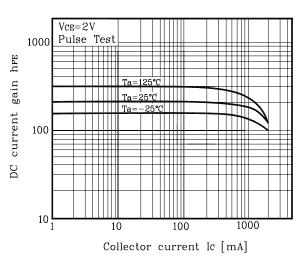
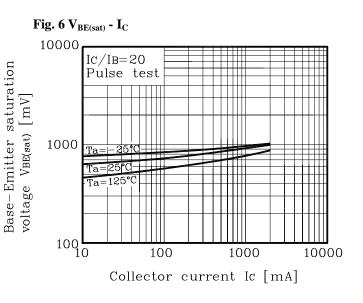


Fig. 4  $h_{FE}$  -  $I_C$ 





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## **Electrical Characteristic Curves**

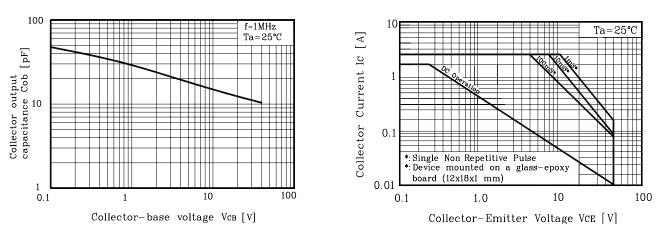


Fig. 8 Safe Operating Area

Fig. 7 C<sub>Ob</sub> - V<sub>CB</sub>

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