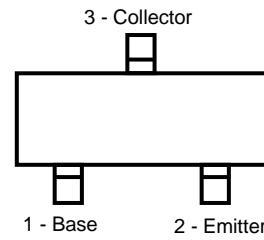


## Description

The **2SC3356** is designed for such applications as: DC/DC converters, supply line switching, battery charger, LCD backlighting, peripheral drivers, Driver in low supply voltage applications (e.g. lamps and LEDs) and inductive load driver (e.g. relays, buzzers and motors).



Top View

## Features

- Low Noise and High Gain
- High Power Gain

## Mechanical Characteristics

- Lead finish:100% matte Sn(Tin)
- Mounting position: Any
- Qualified max reflow temperature:260°C
- Device meets MSL 1 requirements
- Pure tin plating: 7 ~ 17  $\mu$ m
- Pin flatness: $\leq$ 3mil

## Structure

NPN epitaxial planar silicon transistor

## Electrical characteristics per line@25°C( unless otherwise specified)

| Parameter                           | Symbol        | Conditions                                         | Min. | Typ. | Max. | Units         |
|-------------------------------------|---------------|----------------------------------------------------|------|------|------|---------------|
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C=1.0\text{mA}, I_B=0$                          | 12   |      |      | V             |
| Collector-Base Breakdown Voltage    | $V_{(BR)CBO}$ | $I_C=100\text{uA}, I_E=0$                          | 20   |      |      | V             |
| Emitter -Base Breakdown Voltage     | $V_{(BR)EBO}$ | $I_E=100\text{uA}, I_C=0$                          | 2    |      |      | V             |
| Collector-Base Cutoff Current       | $I_{CBO}$     | $V_{CE}=15\text{V}$                                |      |      | 1    | $\mu\text{A}$ |
| Emitter-Base Cutoff Current         | $I_{EBO}$     | $V_{CE}=1\text{V}$                                 |      |      | 1    | $\mu\text{A}$ |
| DC Current Gain                     | $h_{FE}$      | $V_{CE}=10\text{V}, I_C=20\text{mA}$               | 130  |      | 180  |               |
| Gain Bandwidth Product              | $f_T$         | $V_{CE}=10\text{V}, I_C=20\text{mA}$               |      | 7    |      | GHz           |
| Feed-Back Capacitance               | $C_{re}$      | $V_{cb}=10\text{V}, I_E=0, f=1.0\text{MHz}$        |      | 0.55 | 1.0  | pF            |
| Noise Figure                        | NF            | $V_{ce}=10\text{V}, I_C=7\text{mA}, f=1\text{GHz}$ |      | 1.1  | 2.0  | dB            |

## Absolute maximum rating@25°C

| Parameter                    | Symbol     | Value       | Units |
|------------------------------|------------|-------------|-------|
| Collector to Base Voltage    | $BV_{CBO}$ | 20          | V     |
| Collector to Emitter Voltage | $BV_{CEO}$ | 12          | V     |
| Emitter to Base Voltage      | $BV_{EBO}$ | 2.5         | V     |
| Collector Current            | $I_C$      | 100         | mA    |
| Power Dissipation            | $P_D$      | 200         | mW    |
| Junction Temperature         | $T_J$      | 150         | °C    |
| Storage Temperature          | $T_{STG}$  | -55 to +150 | °C    |

## Typical Characteristics

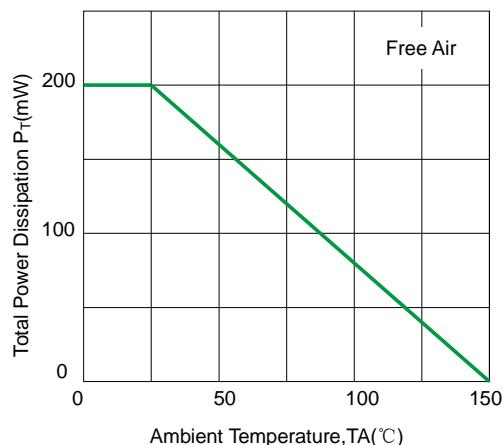


Fig 1. Total Power Dissipation VS Ambient Temperature

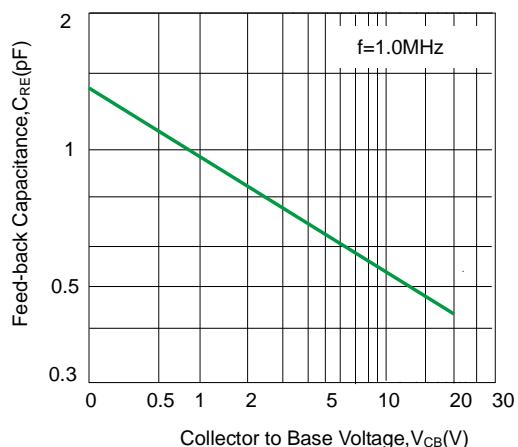


Fig 2. Feed-back Capacitance VS Collector to Base Voltage

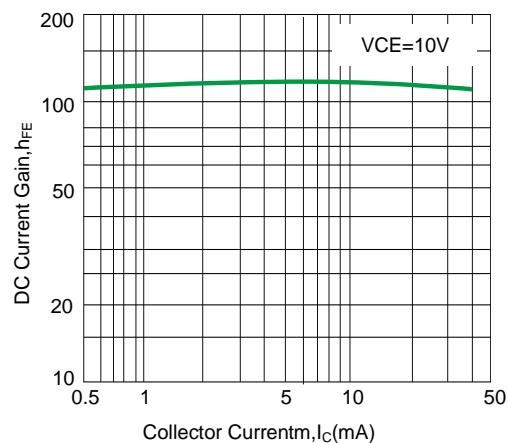


Fig 3. DC Current Gain VS Collector Current

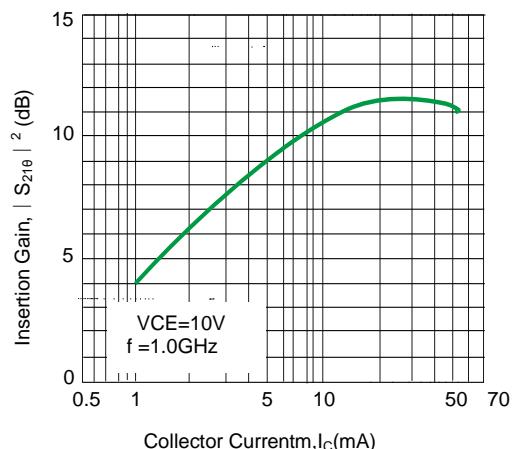


Fig 4. Insertion Gain VS Collector Current

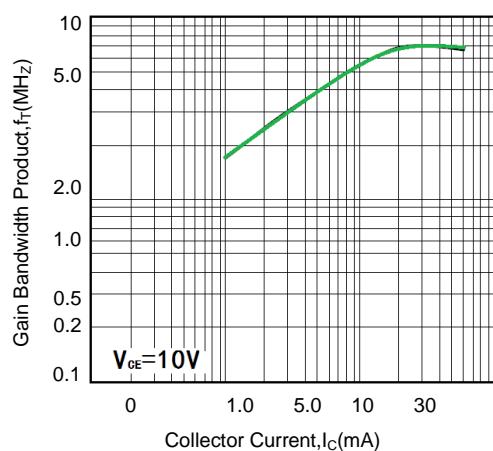


Fig 5.Gain Bandwidth Product VS Collector Current

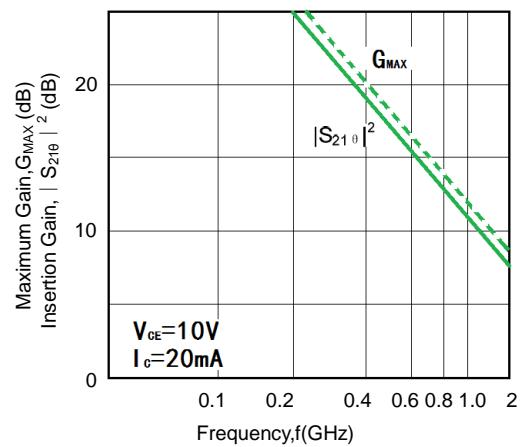


Fig 6.Insertion Gain.Maximum Gain VS Frequency

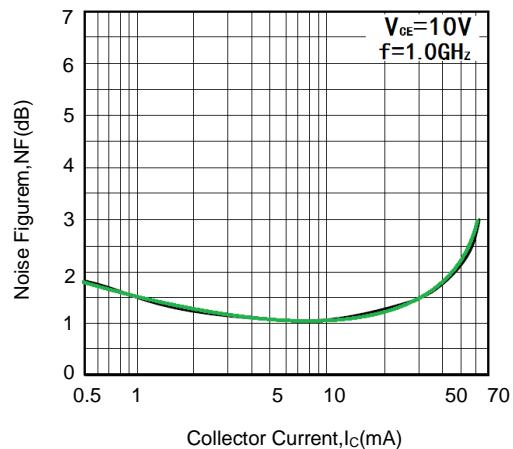


Fig 7.Noise Figure VS Collector Current

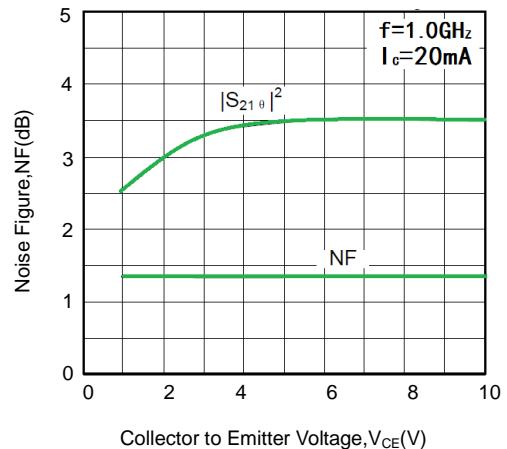
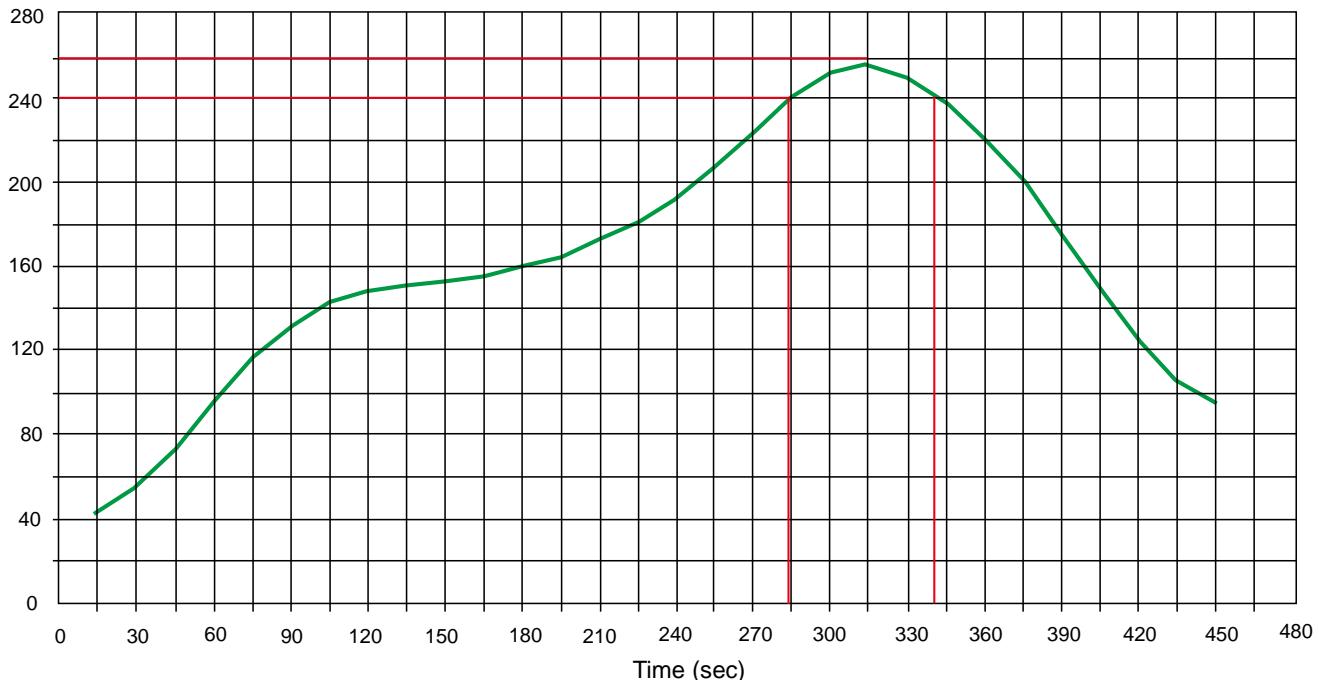


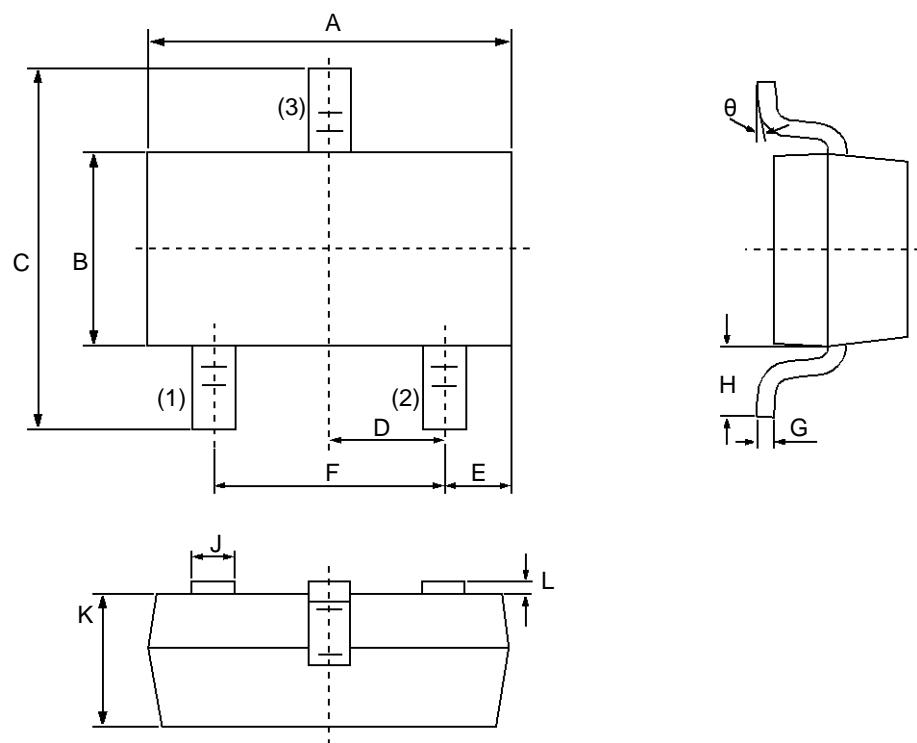
Fig 8.Noise Figure,Forward Insertion Gain VS Collector to Emitter Voltage

## Solder Reflow Recommendation

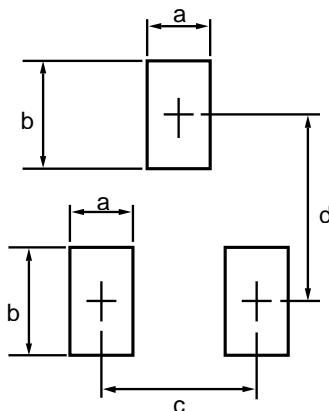
Peak Temp=257°C, Ramp Rate=0.802deg. °C/sec



## Product dimension(SOT-23)



| Dim | Millimeters |       | Inches |        |
|-----|-------------|-------|--------|--------|
|     | MIN         | MAX   | MIN    | MAX    |
| A   | 2.80        | 3.00  | 0.1102 | 0.1197 |
| B   | 1.20        | 1.40  | 0.0472 | 0.0551 |
| C   | 2.10        | 2.50  | 0.0830 | 0.0984 |
| D   | 0.89        | 1.02  | 0.0350 | 0.0401 |
| E   | 0.45        | 0.60  | 0.0177 | 0.0236 |
| F   | 1.78        | 2.04  | 0.0701 | 0.0807 |
| G   | 0.085       | 0.177 | 0.0034 | 0.0070 |
| H   | 0.45        | 0.60  | 0.0180 | 0.0236 |
| J   | 0.37        | 0.50  | 0.0150 | 0.0200 |
| K   | 0.89        | 1.11  | 0.0350 | 0.0440 |
| L   | 0.013       | 0.100 | 0.0005 | 0.0040 |
| θ   | 0°          | 10°   | 0°     | 10°    |



| Dim | Millimeters |      |
|-----|-------------|------|
|     | MIN         | MAX  |
| a   | --          | 0.7  |
| b   | --          | 1.2  |
| c   | --          | 2.04 |
| d   | --          | 2.2  |

### Ordering information

| Device  | Package          | Shipping           |
|---------|------------------|--------------------|
| 2SC3356 | SOT-23 (Pb-Free) | 3000 / Tape & Reel |

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