

# 50C02CH

## Bipolar Transistor 50V, 0.5A, Low VCE(sat), NPN Single



ON Semiconductor®

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### Features

- Large Current Capacitance
- Low Collector to Emitter Saturation Voltage (Resistance):  
RCE(sat) typ=175mΩ [IC=0.5A, IB=50mA]
- Ultrasmall Package Facilitates Miniaturization in End Products
- Small ON-Resistance (Ron)

### Typical Applications

- Low-Frequency Amplifier
- High Speed Switching
- Small Motor Drive
- Muting Circuit

### SPECIFICATIONS

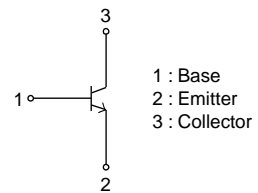
#### ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1, 2)

| Parameter                      | Symbol | Value       | Unit |
|--------------------------------|--------|-------------|------|
| Collector to Base Voltage      | VCBO   | 60          | V    |
| Collector to Emitter Voltage   | VCEO   | 50          | V    |
| Emitter to Base Voltage        | VEBO   | 5           | V    |
| Collector Current              | IC     | 500         | mA   |
| Collector Current (Pulse)      | ICP    | 1.0         | A    |
| Collector Dissipation (Note 2) | PC     | 700         | mW   |
| Junction Temperature           | TJ     | 150         | °C   |
| Storage Temperature            | Tstg   | -55 to +150 | °C   |

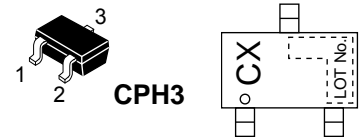
Note 1 : Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Note 2 : Surface mounted on ceramic substrate(600mm<sup>2</sup> × 0.8mm)

### ELECTRICAL CONNECTION



### MARKING



CPH3

### ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

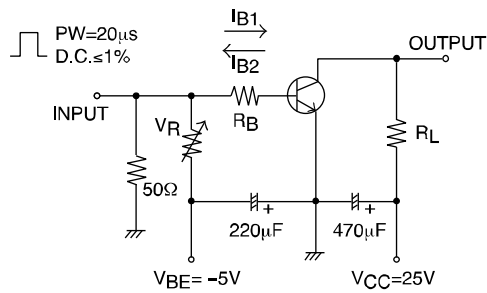
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## ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 3)

| Parameter                               | Symbol               | Conditions                               | Value |     |     | Unit |
|---|----------------------|--|-------|-----|-----|------|
|   |                      |  | min   | typ | max |      |
| Collector Cutoff Current                | ICBO                 | V <sub>CB</sub> =40V, I <sub>E</sub> =0A |       |     | 100 | nA   |
| Emitter Cutoff Current                  | IEBO                 | VEB=4V, IC=0A                            |       |     | 100 | nA   |
| DC Current Gain                         | hFE                  | V <sub>CE</sub> =2V, IC=10mA             | 300   |     | 800 |      |
| Gain-Bandwidth Product                  | f <sub>T</sub>       | V <sub>CE</sub> =10V, IC=50mA            |       | 500 |     | MHz  |
| Output Capacitance                      | Cob                  | V <sub>CB</sub> =10V, f=1MHz             |       | 2.8 |     | pF   |
| Collector to Emitter Saturation Voltage | V <sub>CE(sat)</sub> | IC=100mA, IB=10mA                        |       | 50  | 100 | mV   |
| Base to Emitter Saturation Voltage      | V <sub>BE(sat)</sub> | IC=100mA, IB=10mA                        |       | 0.9 | 1.2 | V    |
| Collector to Base Breakdown Voltage     | V(BR)CBO             | IC=10μA, IE=0A                           | 60    |     |     | V    |
| Collector to Emitter Breakdown Voltage  | V(BR)CEO             | IC=1mA, RBE=∞                            | 50    |     |     | V    |
| Emitter to Base Breakdown Voltage       | V(BR)EBO             | IE=10μA, IC=0A                           | 5     |     |     | V    |
| Turn-On Time                            | t <sub>on</sub>      | See specified Test Circuit               |       | 30  |     | ns   |
| Storage Time                            | t <sub>stg</sub>     |  |       | 340 |     | ns   |
| Fall Time                               | t <sub>f</sub>       |  |       | 55  |     | ns   |

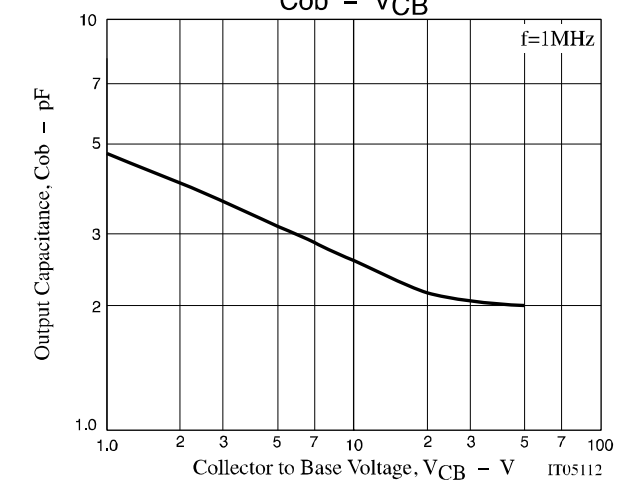
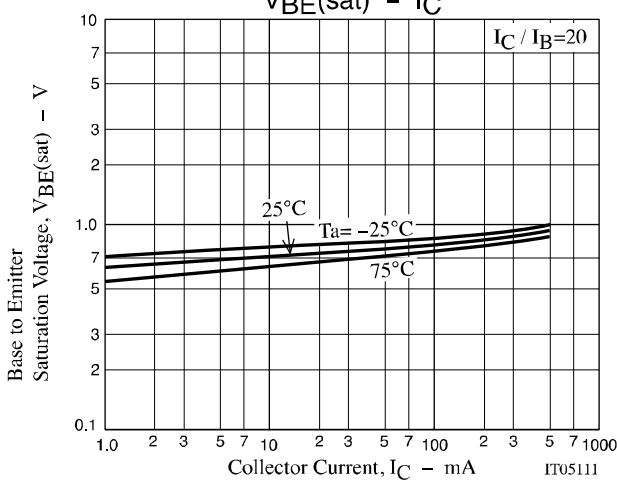
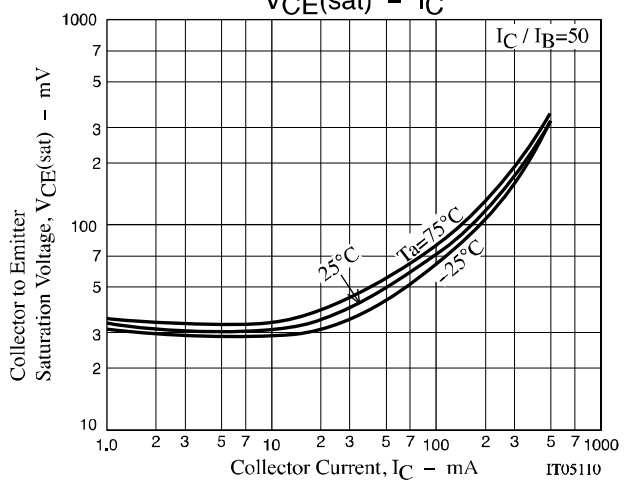
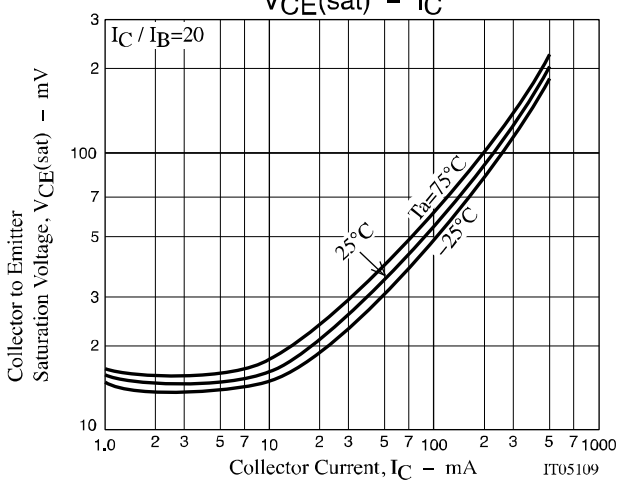
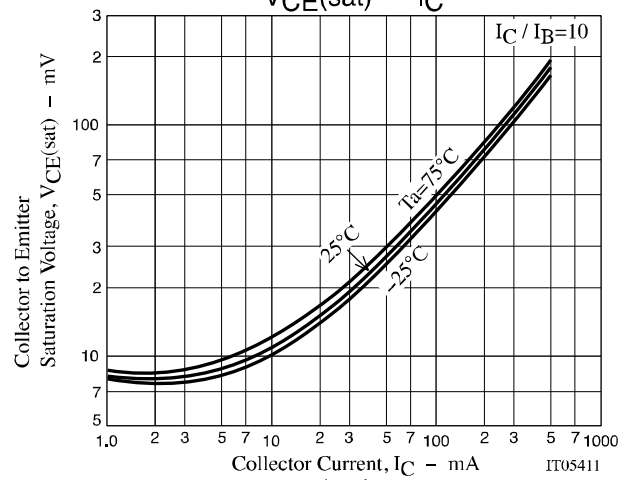
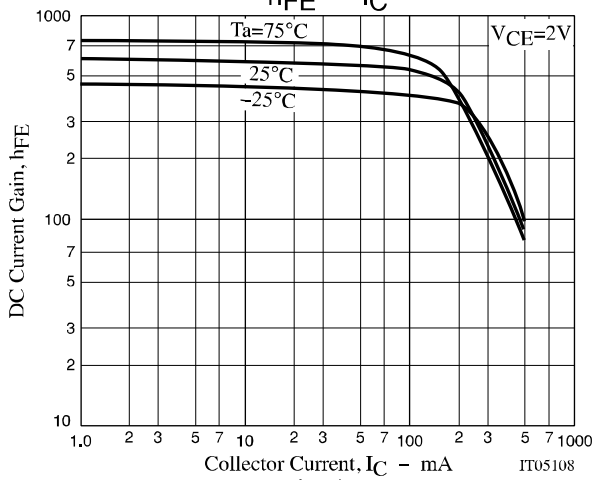
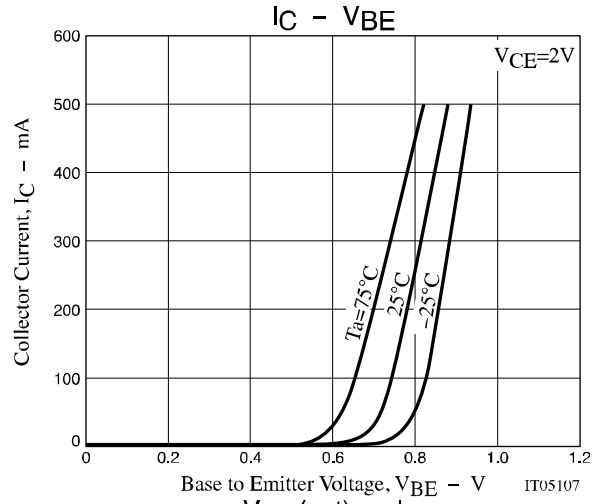
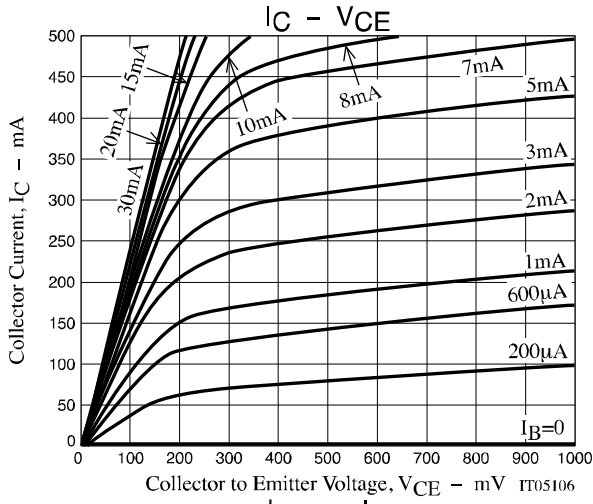
Note 3 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

### Switching Time Test Circuit

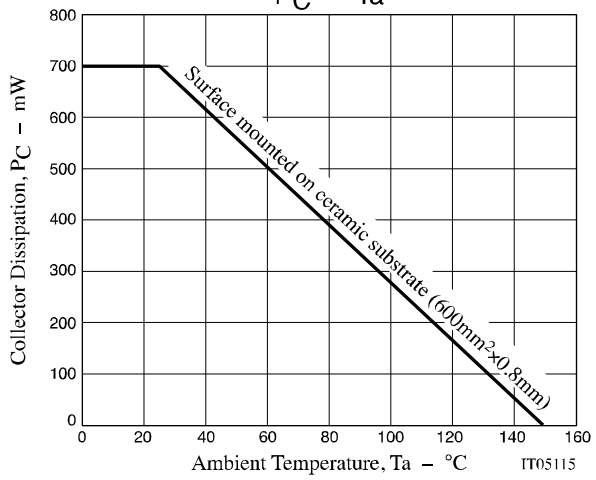
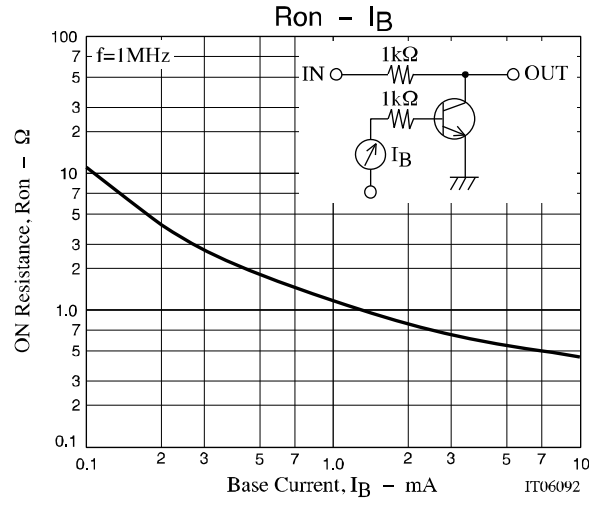
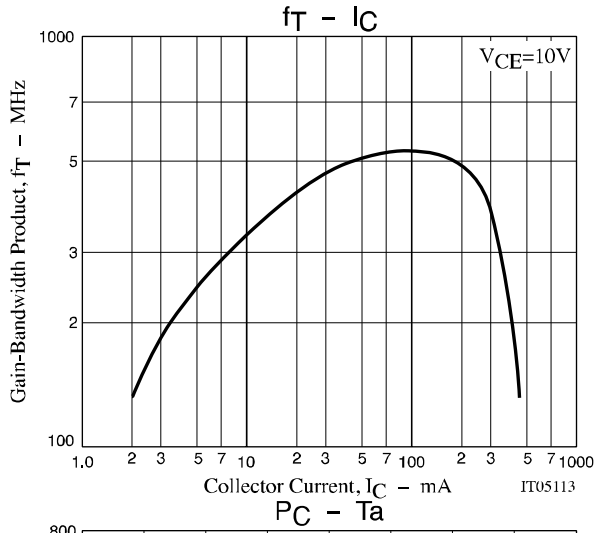


$$I_C=20I_{B1} = -20I_{B2}=200\text{mA}$$

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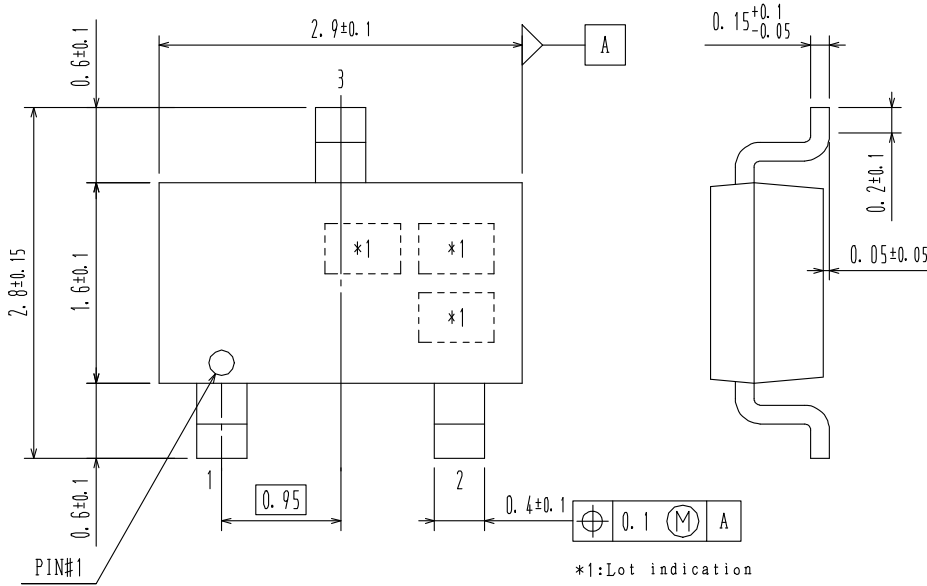


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## PACKAGE DIMENSIONS

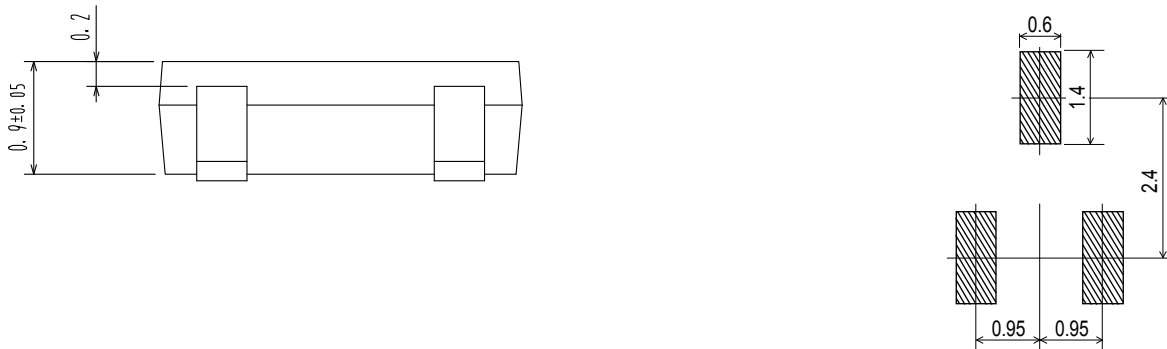
unit : mm

CPH3  
CASE 318BA  
ISSUE O



- 1 : Base
- 2 : Emitter
- 3 : Collector

### Recommended Soldering Footprint



## ORDERING INFORMATION

| Device       | Marking | Package           | Shipping (Qty / Packing) |
|--------------|---------|-------------------|--------------------------|
| 50C02CH-TL-E | CX      | CPH3<br>(Pb-Free) | 3,000 / Tape & Reel      |

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. [http://www.onsemi.com/pub\\_link/Collateral/BRD8011-D.PDF](http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF)

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