

# 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

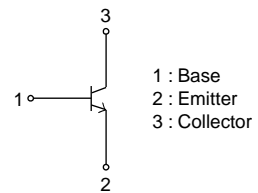
#### ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1, 2)

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

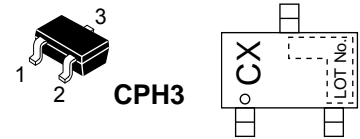
Note 1 : Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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.

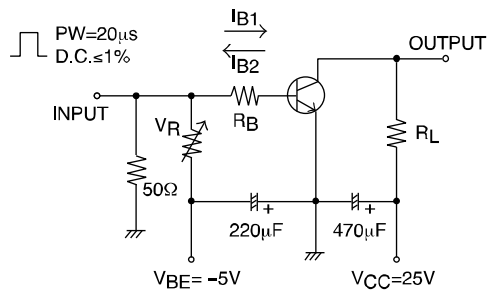
# 50C02CH

## 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	V <sub>EB</sub> =4V, I <sub>C</sub> =0A			100	nA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =10mA	300		800	
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =50mA		500		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, f=1MHz		2.8		pF
Collector to Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =100mA, I <sub>B</sub> =10mA		50	100	mV
Base to Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =100mA, I <sub>B</sub> =10mA		0.9	1.2	V
Collector to Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0A	60			V
Collector to Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA, R <sub>BE</sub> =∞	50			V
Emitter to Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =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

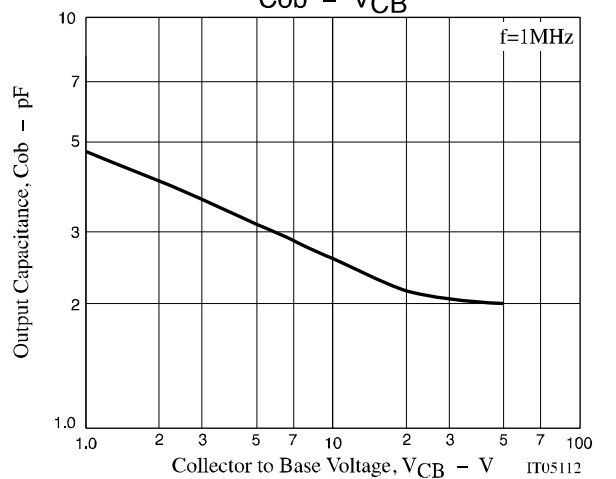
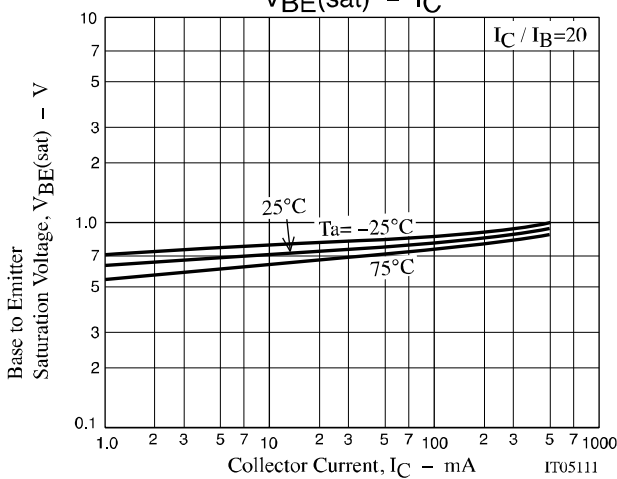
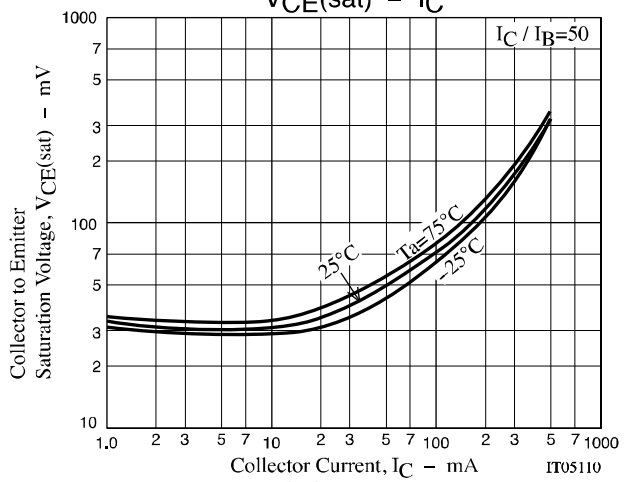
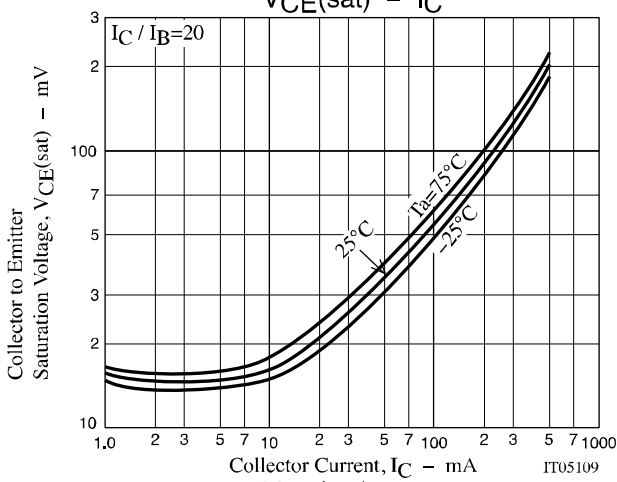
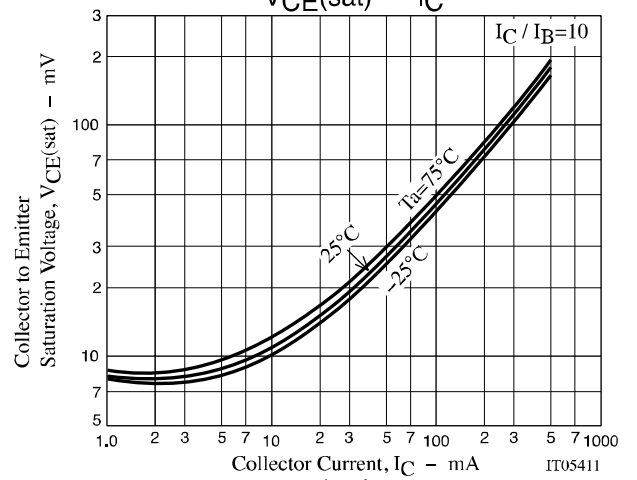
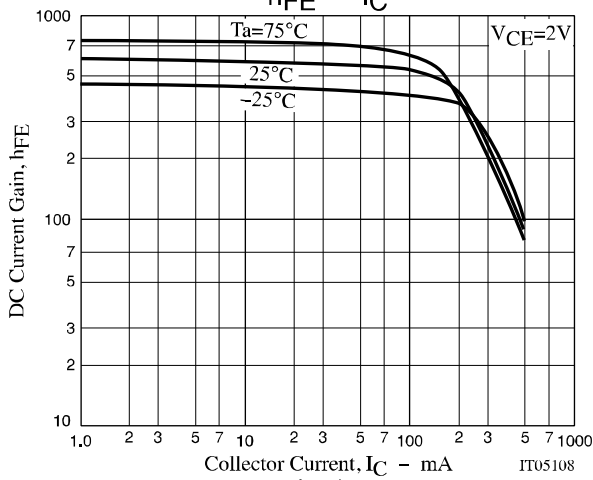
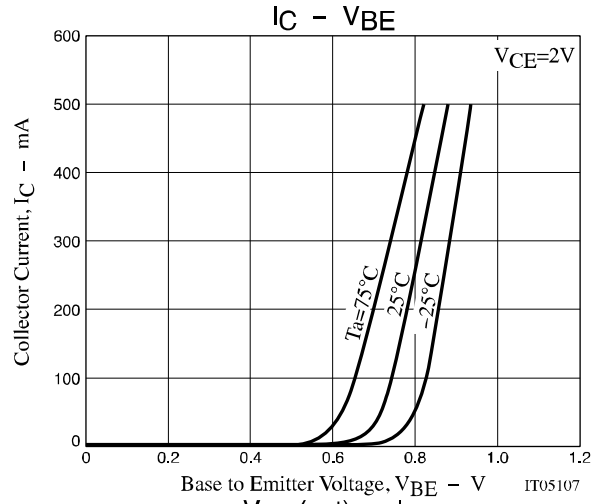
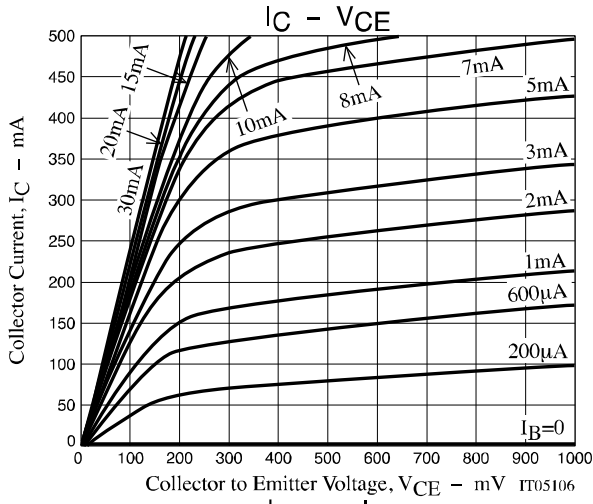
Note 3 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

### Switching Time Test Circuit

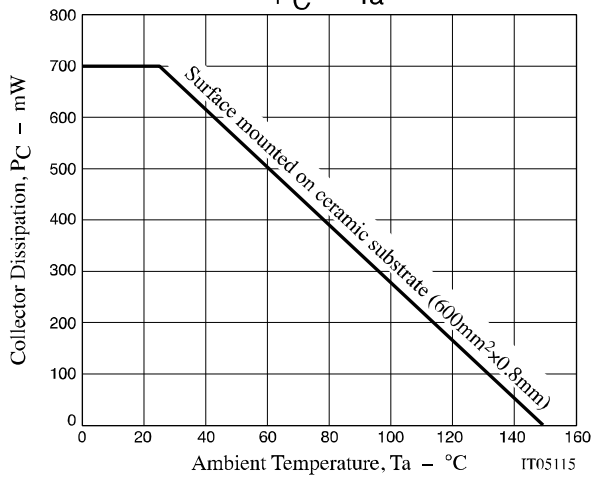
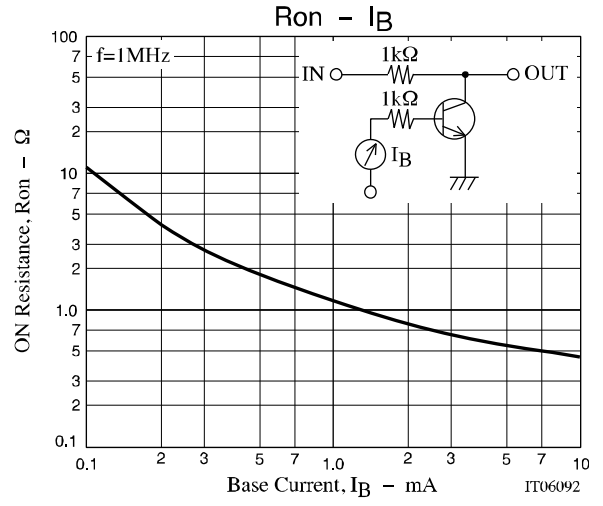
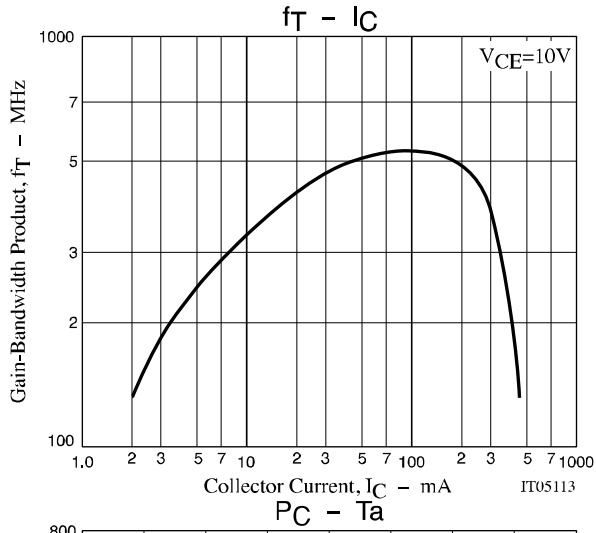


$$I_C = 20 I_{B1} = -20 I_{B2} = 200 \text{ mA}$$

# 50C02CH



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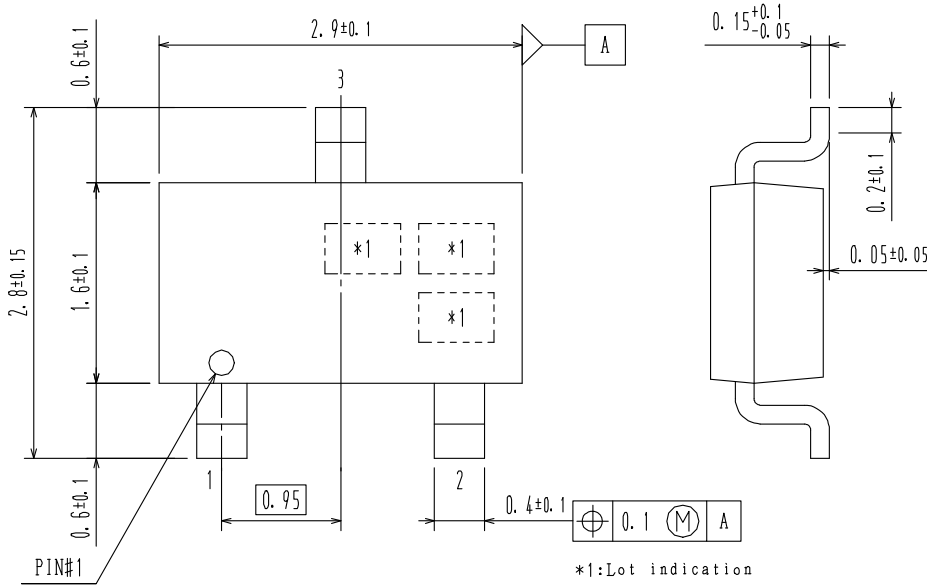


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## PACKAGE DIMENSIONS

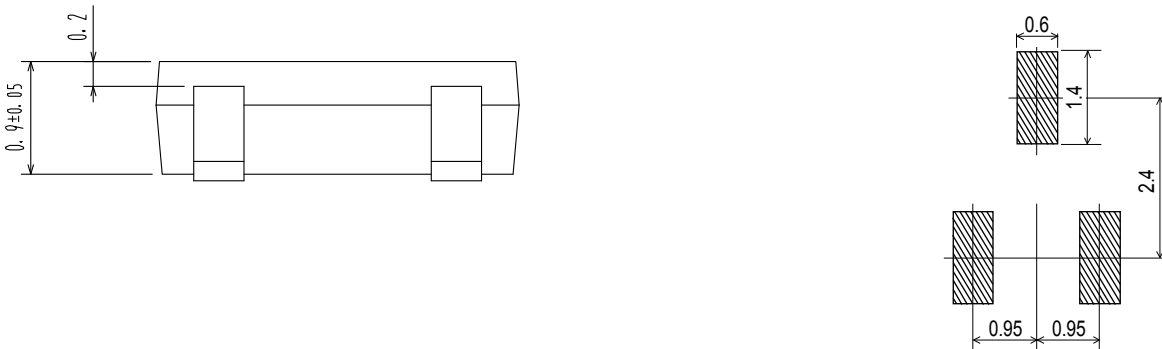
unit : mm

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 (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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