

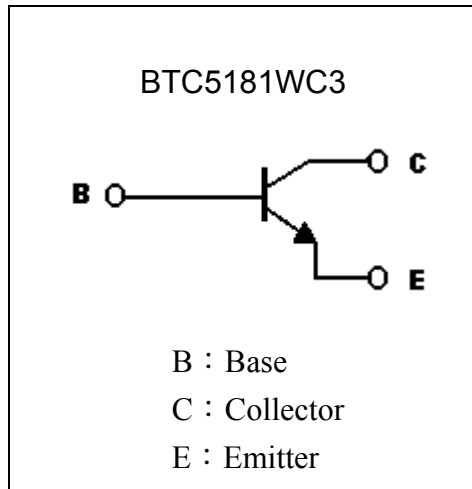
# High Frequency NPN Epitaxial Planar Transistor

## BTC5181WC3

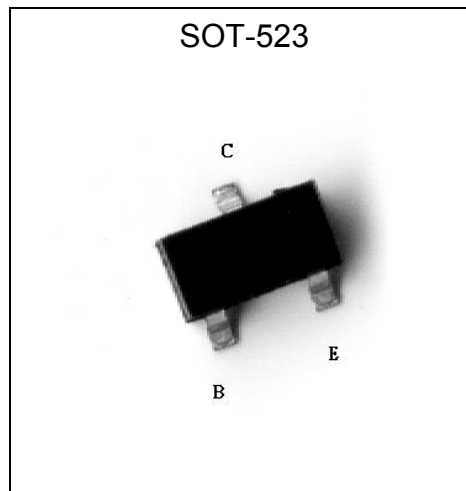
### Description

The BTC5181WC3 is a NPN Epitaxial Silicon Transistor designed for low noise microwave amplification application.

### Symbol



### Outline



### Features

- Low current consumption and high gain:  
 $|S_{21e}|^2 = 12\text{dB (typ.)}$  at  $V_{CE} = 2\text{ V}$ ,  $I_C = 7\text{ mA}$ ,  $f = 2\text{ GHz}$   
 $|S_{21e}|^2 = 11\text{dB (typ.)}$  at  $V_{CE} = 1\text{ V}$ ,  $I_C = 5\text{ mA}$ ,  $f = 2\text{ GHz}$
- Super mini-mold package

### Applications

- Low noise and high gain amplifiers & Oscillator buffer amplifiers

### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ )

Parameters	Symbol	Limits	Unit
Collector-Emitter Breakdown Voltage	$V_{CEO}$	3	V
Collector-Base Breakdown Voltage	$V_{CBO}$	5	V
Emitter-Base Breakdown Voltage	$V_{EBO}$	2	V
Collector Current	$I_C$	10	mA
Collector Power Dissipation	$P_d$	30	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65~+150	$^\circ\text{C}$

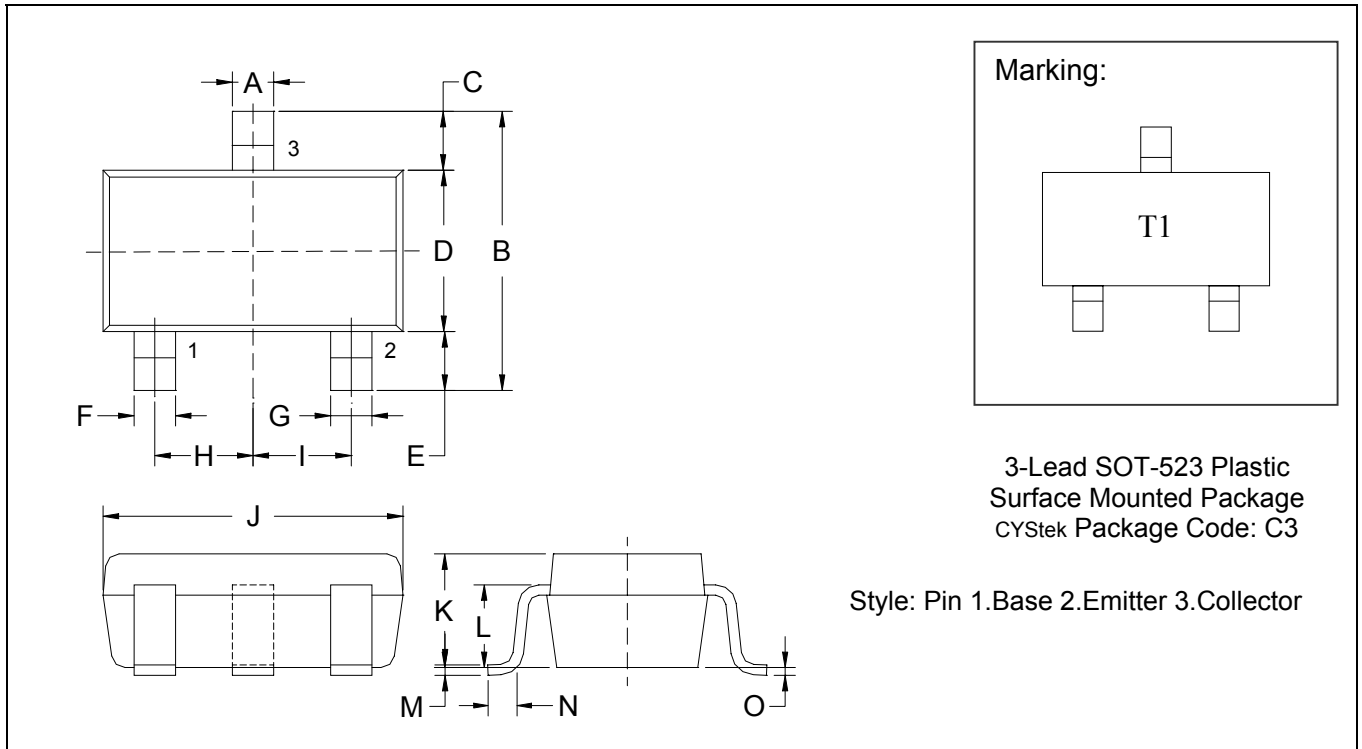


**Electrical Characteristics (TA=25°C)**

Parameters	Conditions	Symbol	Min	Typ.	Max	Unit
Collector Cutoff Current	$V_{CB}=3V, I_E=0$	$I_{CBO}$	-	-	100	nA
Emitter Cutoff Current	$V_{EB}=1V$	$I_{EBO}$	-	-	100	nA
DC Current Gain	$V_{CE}=2V, I_C=7mA$ (Note 1)	$h_{FE}$	70	-	140	-
Cutoff Frequency	$V_{CE}=2V, I_C=7mA, f=2GHz$	$f_T$	-	12	15.5	GHz
	$V_{CE}=1V, I_C=5mA, f=2GHz$		-	10	13	GHz
Noise Figure	$V_{CE}=2V, I_C=3mA, f=2GHz$	NF	-	1.5	2.0	dB
	$V_{CE}=1V, I_C=3mA, f=2GHz$		-	1.5	2.0	dB
Insertion Gain $ S_{21e} ^2$ in 50Ω system	$V_{CE}=2V, I_C=7mA, f=2GHz$	$ S_{21e} ^2$	10	12	-	dB
	$V_{CE}=1V, I_C=5mA, f=2GHz$		8.5	11	-	dB
Output Capacitance	$V_{CB}=2V, I_E=0, f=1MHz$	Cob	-	0.7	1.0	pF

Note 1: Pulse test: Pulse width ≤ 380μs, duty cycle ≤ 2%.

**SOT-523 Dimension**



\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0079	0.0157	0.20	0.40	I	*0.0197	-	*0.50	-
B	0.0591	0.0669	1.50	1.70	J	0.0610	0.0650	1.55	1.65
C	0.0118	0.0197	0.30	0.50	K	0.0276	0.0315	0.70	0.80
D	0.0295	0.0335	0.75	0.85	L	0.0224	0.0248	0.57	0.63
E	0.0118	0.0197	0.30	0.50	M	0.0020	0.0059	0.05	0.15
F	0.0039	0.0118	0.10	0.30	N	0.0039	0.0118	0.10	0.30
G	0.0039	0.0118	0.10	0.30	O	0	0.0031	0	0.08
H	*0.0197	-	*0.50	-					

**Notes:** 1.Controlling dimension: millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material:**

- Lead: 42 Alloy; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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