

# BCP5510TA Datasheet

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DiGi Electronics Part Number	BCP5510TA-DG
Manufacturer	<a href="#">Diodes Incorporated</a>
Manufacturer Product Number	BCP5510TA
Description	TRANS NPN 60V 1A SOT223
Detailed Description	Bipolar (BJT) Transistor NPN 60 V 1 A 150MHz 2 W Surface Mount SOT-223-3



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## Purchase and inquiry

Manufacturer Product Number:

BCP5510TA

Series:

-

Transistor Type:

NPN

Voltage - Collector Emitter Breakdown (Max):

60 V

Current - Collector Cutoff (Max):

100nA (ICBO)

Power - Max:

2 W

Operating Temperature:

-55°C ~ 150°C (TJ)

Package / Case:

TO-261-4, TO-261AA

Base Product Number:

BCP5510

Manufacturer:

Diodes Incorporated

Product Status:

Active

Current - Collector (Ic) (Max):

1 A

Vce Saturation (Max) @ Ib, Ic:

500mV @ 50mA, 500mA

DC Current Gain (hFE) (Min) @ Ic, Vce:

63 @ 150mA, 2V

Frequency - Transition:

150MHz

Mounting Type:

Surface Mount

Supplier Device Package:

SOT-223-3

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0075

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



## Features

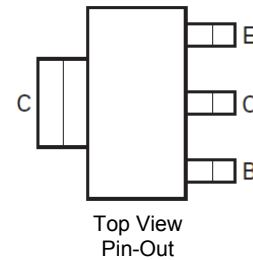
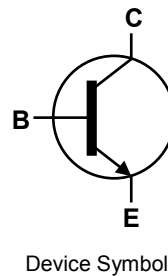
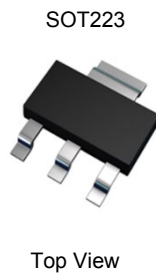
- $BV_{CE0} > 45V, 60V \text{ \& } 80V$
- $I_C = 1A$  High Continuous Collector Current
- $I_{CM} = 2A$  Peak Pulse Current
- 2W Power Dissipation
- Low Saturation Voltage  $V_{CE(sat)} < 500mV @ 0.5A$
- Gain Groups 10 and 16
- Complementary PNP Types: BCP51, 52 and 53
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen- and Antimony-Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 <sup>(e3)</sup>
- Weight: 0.112 grams (Approximate)

## Applications

- Medium Power Switching or Amplification Applications
- AF Driver and Output Stages

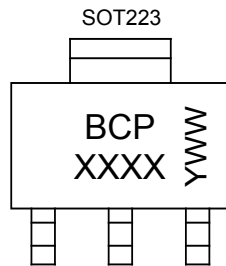


## Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BCP54TA	Standard	BCP 54	7	12	1,000
BCP5410TA	Standard	BCP 5410	7	12	1,000
BCP5416TA	Standard	BCP 5416	7	12	1,000
BCP55TA	Standard	BCP 55	7	12	1,000
BCP5510TA	Standard	BCP 5510	7	12	1,000
BCP5516TA	Standard	BCP 5516	7	12	1,000
BCP56TA	Standard	BCP 56	7	12	1,000
BCP5610TA	Standard	BCP 5610	7	12	1,000
BCP5616TA	Standard	BCP 5616	7	12	1,000
BCP5616TC	Standard	BCP 5616	13	12	4,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



BCP = Product Type Marking Code, Line 1  
 XXXX = Product Type Marking Code, Line 2 as follows:

BCP54 = 54	BCP55 = 55	BCP56 = 56
BCP5410 = 5410	BCP5510 = 5510	BCP5610 = 5610
BCP5416 = 5416	BCP5516 = 5516	BCP5616 = 5616

YWW = Date Code Marking  
 Y or Ȳ = Last Digit of Year (ex: 5= 2015)  
 WW or WW̄ = Week Code (01~53)

## Absolute Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	BCP54	BCP55	BCP56	Unit
Collector-Base Voltage	V <sub>CBO</sub>	45	60	100	V
Collector-Emitter Voltage	V <sub>CEO</sub>	45	60	80	V
Emitter-Base Voltage	V <sub>EBO</sub>	5			V
Continuous Collector Current	I <sub>C</sub>	1			A
Peak Pulse Collector Current (Single pulse)	I <sub>CM</sub>	2			
Continuous Base Current	I <sub>B</sub>	100			mA
Peak Pulse Base Current (Single pulse)	I <sub>BM</sub>	200			

## Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

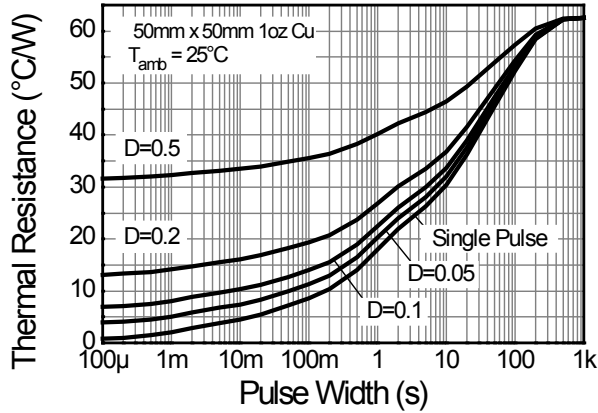
Characteristic	Symbol	Value	Unit
Power Dissipation	(Note 5) P <sub>D</sub>	2	W
Thermal Resistance, Junction to Ambient	(Note 5) R <sub>θJA</sub>	62	°C/W
Thermal Resistance, Junction to Leads	(Note 6) R <sub>θJL</sub>	19.4	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

## ESD Ratings (Note 7)

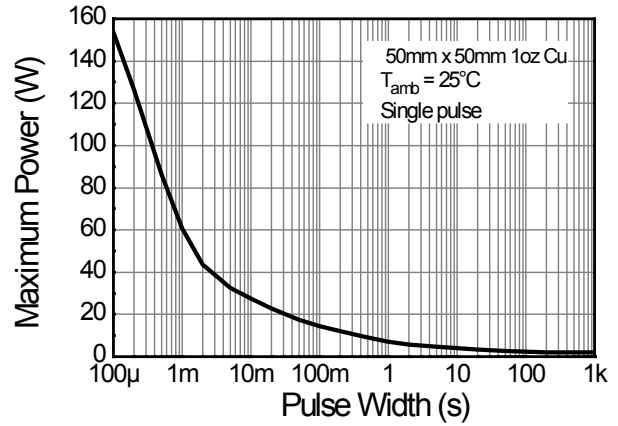
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the collector lead on 50mm x 50mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady-state.
  6. Thermal resistance from junction to solder-point (at the end of the collector lead).
  7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

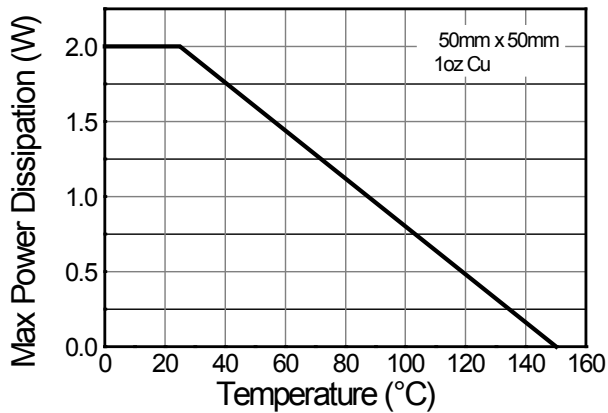
## Thermal Characteristics and Derating Information



**Transient Thermal Impedance**



**Pulse Power Dissipation**

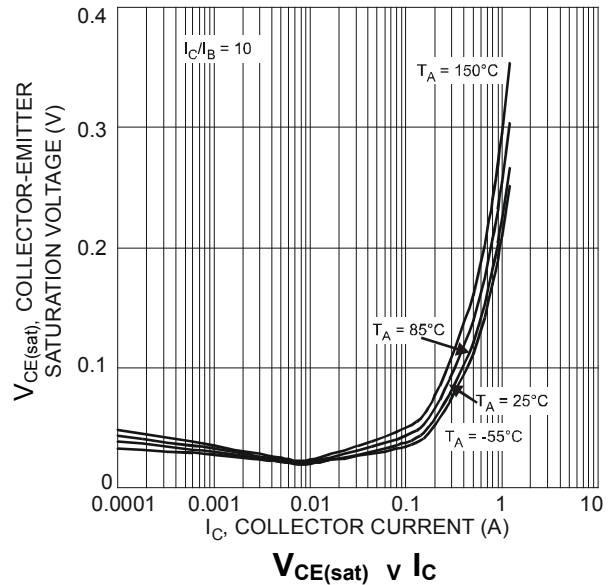
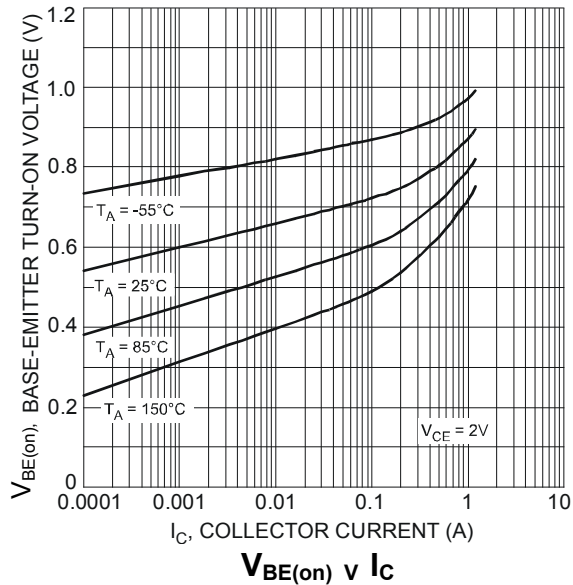
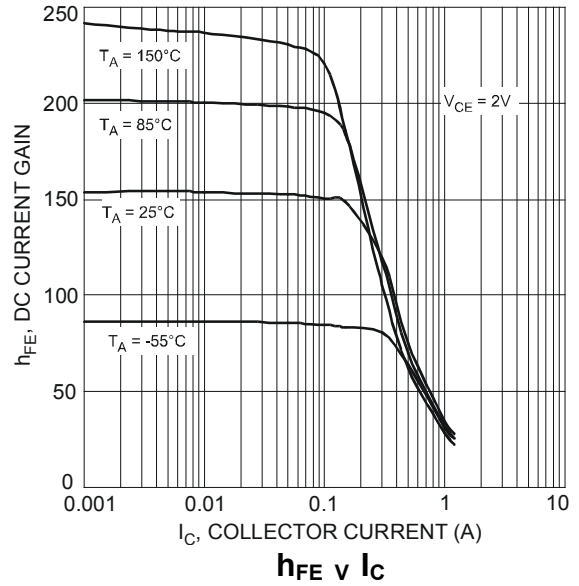
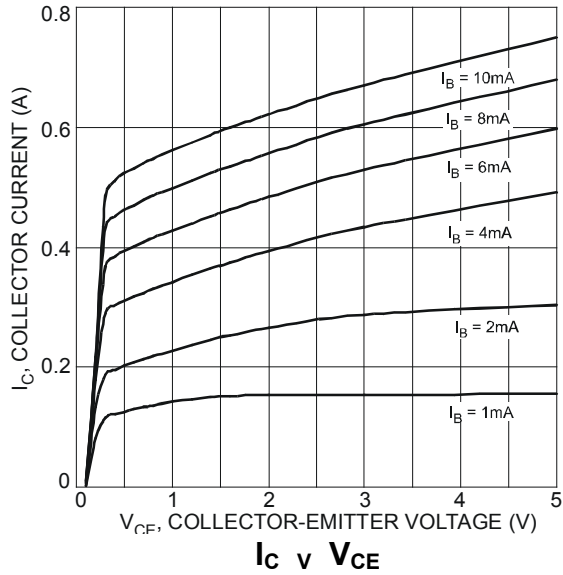


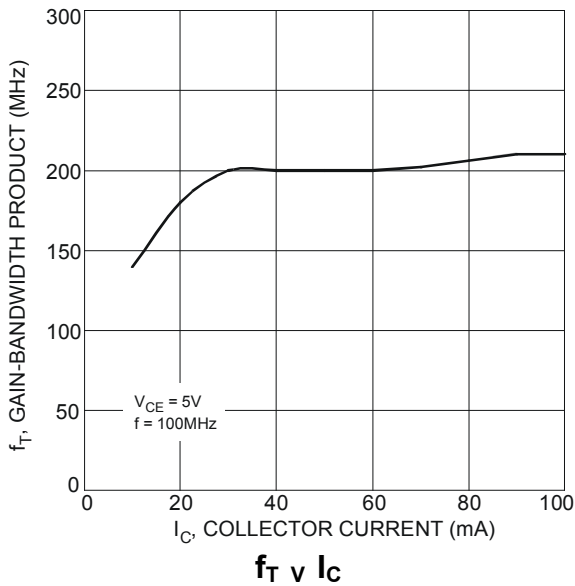
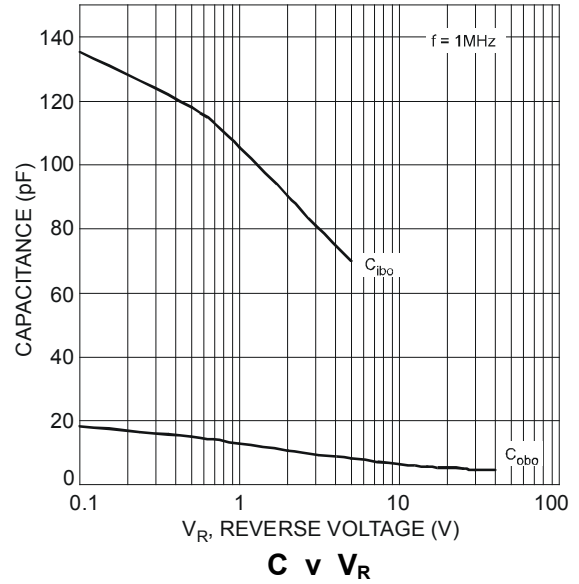
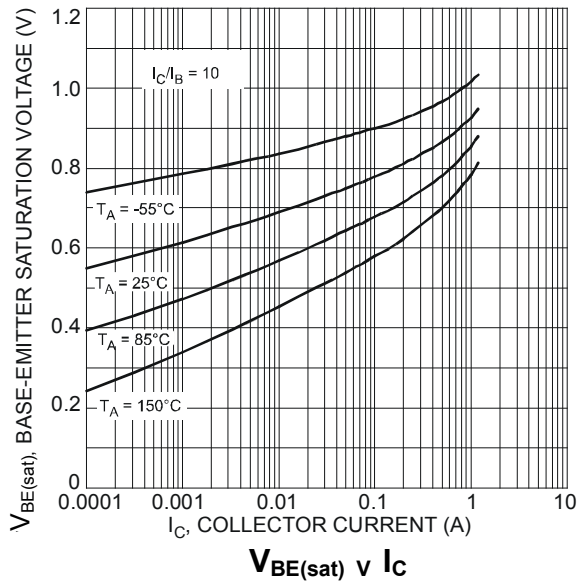
**Derating Curve**


**Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BCP54	$BV_{CBO}$	45	-	-	V	$I_C = 100\mu\text{A}$
	BCP55		60				
	BCP56		100				
Collector-Emitter Breakdown Voltage (Note 8)	BCP54	$BV_{CEO}$	45	-	-	V	$I_C = 10\text{mA}$
	BCP55		60				
	BCP56		80				
Emitter-Base Breakdown Voltage		$BV_{EBO}$	5	-	-	V	$I_E = 10\mu\text{A}$
Collector Cut-Off Current		$I_{CBO}$	-	-	0.1 20	$\mu\text{A}$	$V_{CB} = 30\text{V}$ $V_{CB} = 30\text{V}, T_A = +150^\circ\text{C}$
Emitter Cut-Off Current		$I_{EBO}$	-	-	20	nA	$V_{EB} = 4\text{V}$
DC Current Gain (Note 8)	All versions	$h_{FE}$	25	-	-	-	$I_C = 5\text{mA}, V_{CE} = 2\text{V}$ $I_C = 150\text{mA}, V_{CE} = 2\text{V}$ $I_C = 500\text{mA}, V_{CE} = 2\text{V}$
			40	-	250		
	10 gain grp		25	-	-		
	16 gain grp		63	-	160		
			100	-	250		$I_C = 150\text{mA}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 8)		$V_{CE(sat)}$	-	-	0.5	V	$I_C = 500\text{mA}, I_B = 50\text{mA}$
Base-Emitter Turn-On Voltage (Note 8)		$V_{BE(on)}$	-	-	1.0	V	$I_C = 500\text{mA}, V_{CE} = 2\text{V}$
Transition frequency		$f_T$	150	-	-	MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Output Capacitance		$C_{obo}$	-	-	25	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$

Note: 8. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

**Typical Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)


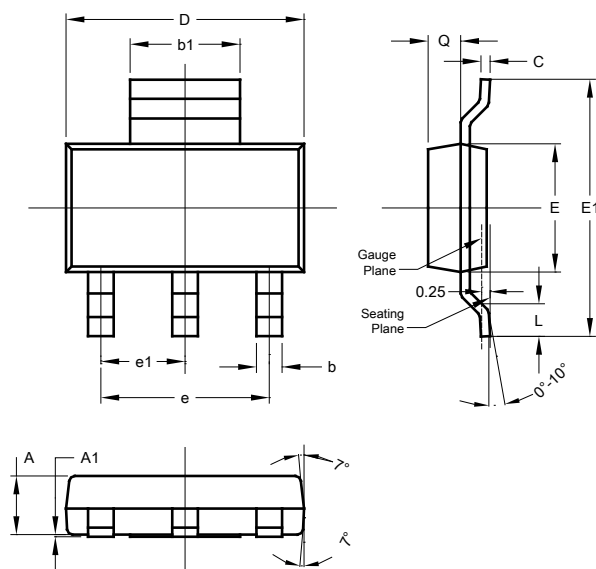
**Typical Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)




## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### SOT223

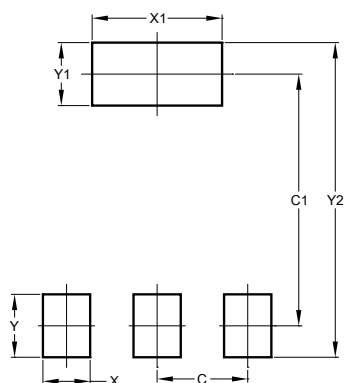


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### SOT223



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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