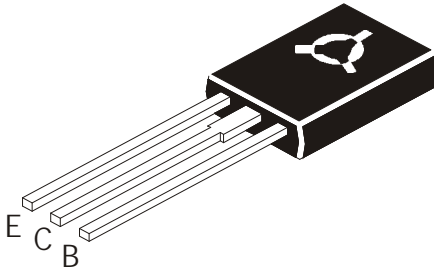


## NPN SILICON POWER TRANSISTOR

**CRD13003BC (9AC) (Tin Finish Part)**  
**LEAD FREE**



**TO-126**  
**Plastic Package**

### Applications

Suitable for Lighting, Switching Regulator and Motor Control

### ABSOLUTE MAXIMUM RATINGS

DESCRIPTION	SYMBOL	VALUE	UNIT
Collector Base Voltage	$V_{CBO}$	700	V
Collector Emitter (sus) Voltage	$V_{CEO}$	400	V
Emitter Base Voltage	$V_{EBO}$	9.0	V
Collector Current Continuous	$I_C$	1.5	A
Peak	$*I_{CM}$	3.0	A
Base Current Continuous	$I_B$	0.75	A
Peak	$*I_{BM}$	1.5	A
Emitter Current Continuous	$I_E$	2.25	A
Peak	$*I_{EM}$	4.5	A
Power Dissipation at $T_a=25^\circ\text{C}$	$P_D$	1.4	W
Derate Above $25^\circ\text{C}$		11.2	mW/ $^\circ\text{C}$
Power Dissipation at $T_c=25^\circ\text{C}$	$P_D$	45	W
Derate Above $25^\circ\text{C}$		360	mW/ $^\circ\text{C}$
Operating And Storage Junction Temperature Range	$T_j, T_{stg}$	- 65 to +150	$^\circ\text{C}$

### THERMAL RESISTANCE

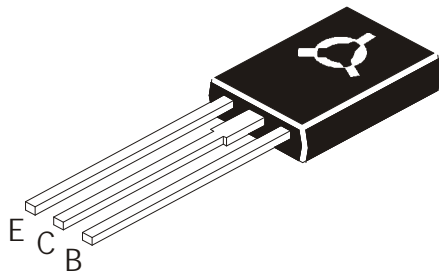
Junction to Case	$R_{th(j-c)}$	2.77	$^\circ\text{C}/\text{W}$
Junction to Ambient	$R_{th(j-a)}$	89	$^\circ\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purpose: 1/8" from Case for 5 Seconds	$T_L$	275	$^\circ\text{C}$

\*Pulse Test: Pulse Width=5ms, Duty Cycle=10%

CRD13003BC(9AC)Rev120705E

# NPN SILICON POWER TRANSISTOR

**CRD13003BC (9AC) (Tin Finish Part)**  
**LEAD FREE**



**TO-126**  
**Plastic Package**

## ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Base Voltage	V <sub>CBO</sub>	I <sub>C</sub> =1mA, I <sub>E</sub> =0	700	-	-	V
Collector Emitter (sus) Voltage	**V <sub>CEO (sus)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0	400	-	-	V
Collector Cut Off Current	I <sub>CBO</sub>	V <sub>CB</sub> =700V, I <sub>E</sub> =0	-	-	1.0	mA
		V <sub>CB</sub> =700V, I <sub>E</sub> =0, T <sub>c</sub> =100°C	-	-	5.0	mA
Emitter Cut Off Current	I <sub>EBO</sub>	V <sub>EB</sub> =9V, I <sub>C</sub> =0	-	-	1.0	mA
DC Current Gain	**h <sub>FE</sub>	I <sub>C</sub> =0.5A, V <sub>CE</sub> =5V	15	-	22	
		I <sub>C</sub> =2A, V <sub>CE</sub> =5V	4.0	-	25	
Collector Emitter Saturation Voltage	**V <sub>CE (sat)</sub>	I <sub>C</sub> =0.5A, I <sub>B</sub> =0.1A	-	-	0.5	V
		I <sub>C</sub> =1A, I <sub>B</sub> =0.25A	-	-	1.0	V
		I <sub>C</sub> =1.5A, I <sub>B</sub> =0.5A	-	-	2.5	V
		I <sub>C</sub> =1A, I <sub>B</sub> =0.25A, T <sub>c</sub> =100°C	-	-	1.0	V
Base Emitter Saturation Voltage	**V <sub>BE (sat)</sub>	I <sub>C</sub> =0.5A, I <sub>B</sub> =0.1A	-	-	1.0	V
		I <sub>C</sub> =1A, I <sub>B</sub> =0.25A	-	-	1.2	V
		I <sub>C</sub> =1A, I <sub>B</sub> =0.25A, T <sub>c</sub> =100°C	-	-	1.1	V

## DYNAMIC CHARACTERISTICS

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Current Gain Bandwidth Product	f <sub>T</sub>	I <sub>C</sub> =100mA, V <sub>CE</sub> =10V, f=1MHz	4.0	-	-	MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, f=0.1MHz	-	21	-	pF

## SWITCHING TIME

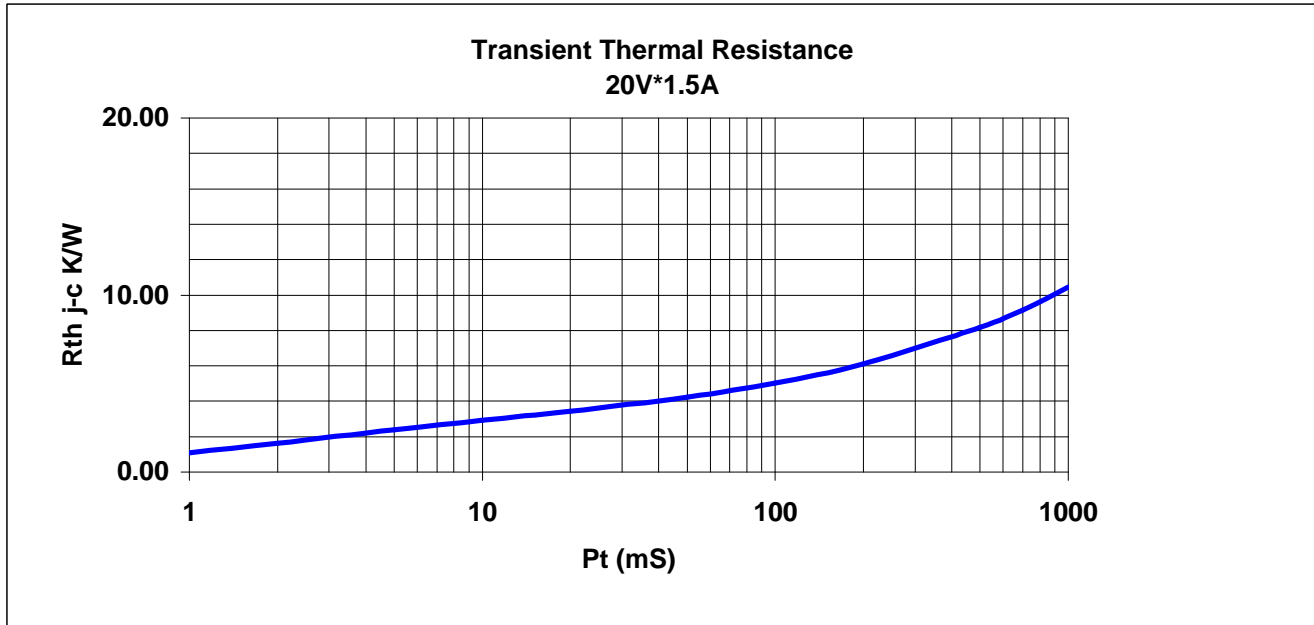
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Turn on Time	t <sub>on</sub>	V <sub>CC</sub> =125V	-	-	1.1	μs
Fall Time	t <sub>f</sub>	I <sub>B1</sub> =0.2A, I <sub>B2</sub> =0.2A	-	-	0.7	μs
Storage Time	t <sub>stg</sub>	I <sub>C</sub> =1A	-	-	4.0	μs

MARKING	For Lead Free Lead Finish	
	<b>C = CDIL Logo</b> <b>P = Plant Code, N for Delhi</b> <b>X = Year of Manufacturer</b> <b>YY = Week Code</b>	<b>CRD1</b> <b>3003</b> <b>BC</b> <b>PXYY</b>  <b>'T' stands for Tin finish leads</b>

\*\*Pulse Test:- PW=300ms, Duty Cycle=2%

CRD13003BC(9AC)Rev120705E

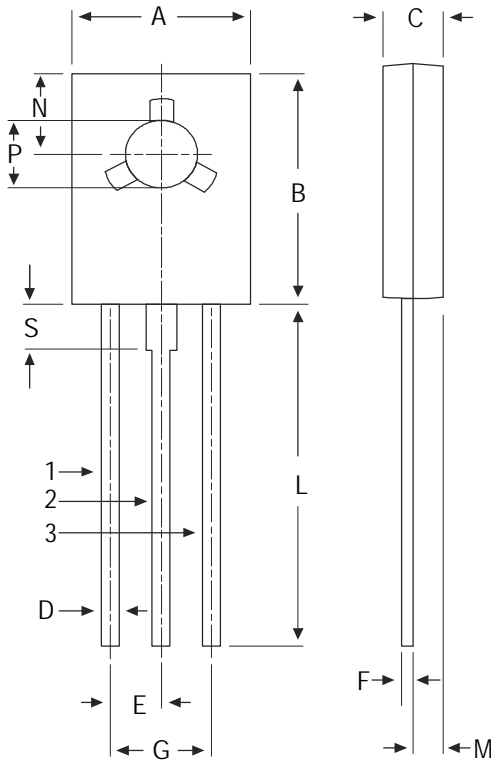
**CRD13003BC**



CRD13003BC(9AC)Rev120705E

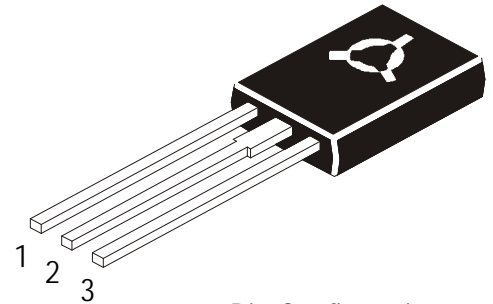
**TO-126**  
**Plastic Package**

**TO-126 (SOT-32) Plastic Package**



DIM	MIN	MAX
A	7.4	7.8
B	10.5	10.8
C	2.4	2.7
D	0.7	0.9
E	2.25 TYP.	
F	0.49	0.75
G	4.5 TYP.	
L	15.7 TYP.	
M	1.27 TYP.	
N	3.75 TYP.	
P	3.0	3.2
S	2.5 TYP.	

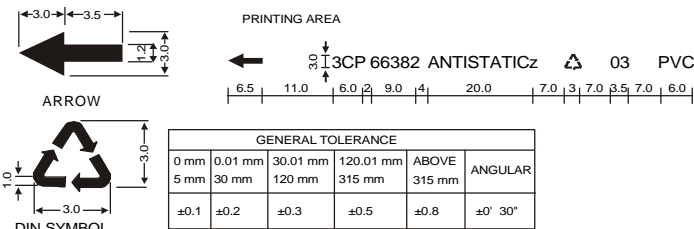
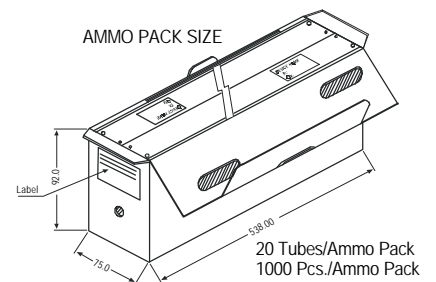
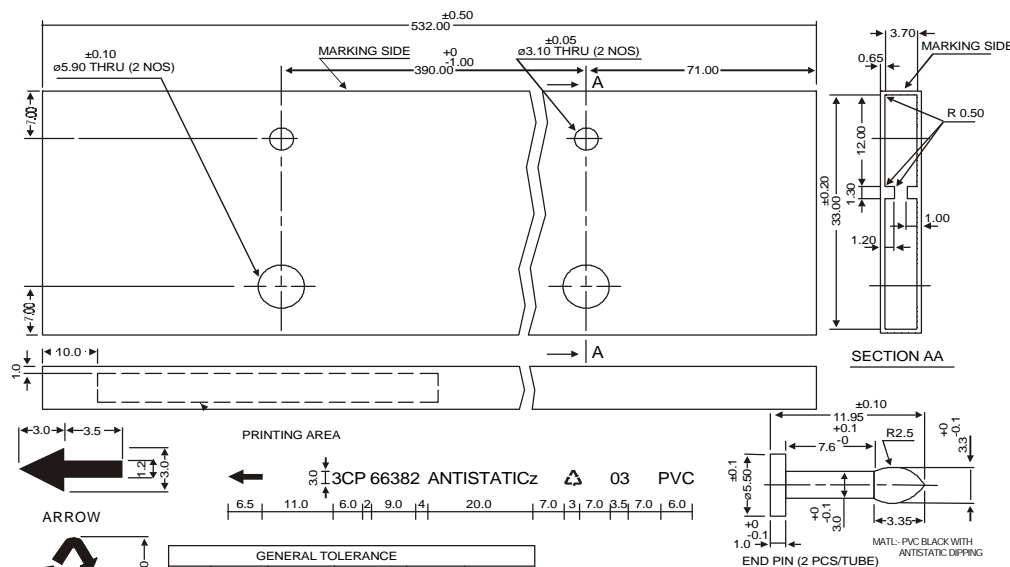
All dimensions in mm.



**Pin Configuration**

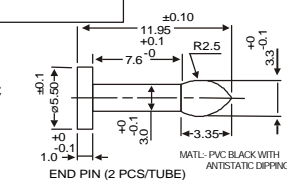
1. Emitter
2. Collector
3. Base

**TO-126 TUBE PACKING**



GENERAL TOLERANCE					
0 mm	0.01 mm	30.01 mm	120.01 mm	ABOVE 120.01 mm	ANGULAR
5 mm	30 mm	120 mm	315 mm	315 mm	
±0.1	±0.2	±0.3	±0.5	±0.8	±0° 30"

All dimensions in mm



- Notes:**
1. All print in black.
  2. All text in Helvetia medium font.

**Packing Detail**

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-126 Bulk	500 pcs/polybag	340 gm/500 pcs	3" x 7.5" x 7.5"	2K	17" x 15" x 13.5"	32K	31 kgs
TO-126 Tube	50 pcs/tube	73 gm/50 pcs	3" x 3.7" x 21.5"	1K	19" x 19" x 19"	10K	15 kgs

### **Disclaimer**

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