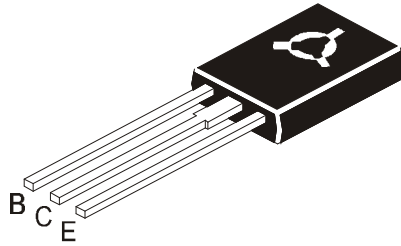


**NPN SILICON POWER TRANSISTOR**

**CD13003D**



**TO126  
Plastic Package**

**With Built - in Integrated Diode between Emitter & Collector**

**ABSOLUTE MAXIMUM RATINGS**

DESCRIPTION	SYMBOL	VALUE	UNIT
Collector Base Voltage	$V_{CBO}$	600	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 (1)	$I_{CM}$	3.0	A
Base Current Continuous	$I_B$	0.75	A
Peak (1)	$I_{BM}$	1.5	A
Emitter Current Continuous	$I_E$	2.25	A
Peak (1)	$I_{EM}$	4.5	A
Power Dissipation @ $T_a=25\text{ }^\circ\text{C}$	$P_D$	1.4	W
Derate Above $25\text{ }^\circ\text{C}$		11.2	mW/ $^\circ\text{C}$
Power Dissipation @ $T_c=25\text{ }^\circ\text{C}$	$P_D$	45	W
Derate Above $25\text{ }^\circ\text{C}$		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	$^\circ\text{C/W}$
Junction to Ambient	$R_{th(j-a)}$	89	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purpose: 1/8" from Case for 5 Seconds	$T_L$	275	$^\circ\text{C}$

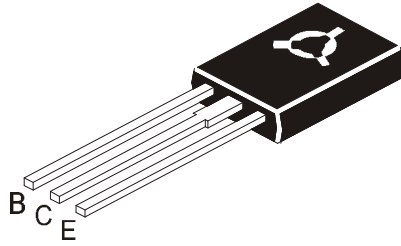
(1) Pulse Test: Pulse Width=5ms, Duty Cycle=10%

**ELECTRICAL CHARACTERISTICS ( $T_a=25\text{ }^\circ\text{C}$  unless specified otherwise)**

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Base Voltage	$V_{CBO}$	$I_C=1\text{mA}, I_E=0$	600			V
Collector Emitter (sus) Voltage	* $V_{CEO(sus)}$	$I_C=10\text{mA}, I_B=0$	400			V
Collector Cut Off Current	$I_{CBO}$	$V_{CB}=600\text{V}, I_E=0$ $V_{CB}=600\text{V}, I_E=0, T_c=100\text{ }^\circ\text{C}$			1.0 5.0	mA mA
Emitter Cut Off Current	$I_{EBO}$	$V_{EB}=9\text{V}, I_C=0$			1.0	mA

\*Pulse Test: PW=300 $\mu\text{s}$ , Duty Cycle=2%

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

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
DC Current Gain	*h <sub>FE</sub>	**I <sub>C</sub> =0.5A, V <sub>CE</sub> =5V	11		30	
		I <sub>C</sub> =1A, V <sub>CE</sub> =5V	5		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
Integrated Diode Forward Voltage	V <sub>FEC</sub>	I <sub>F</sub> =1A			2.0	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**

Turn On Time	t <sub>on</sub>	V <sub>CC</sub> =125V, I <sub>C</sub> =1A, I <sub>B1</sub> =0.2A, I <sub>B2</sub> =0.2A			1.1	μs
Storage Time	t <sub>stg</sub>		2.0		4.0	μs
Fall Time	t <sub>r</sub>				0.7	μs

**\*\* h<sub>FE</sub> Classification:-**

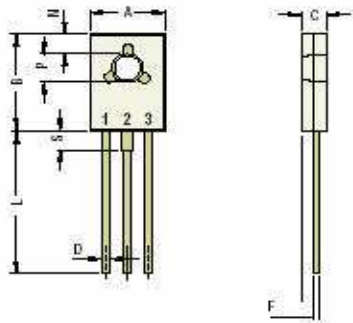
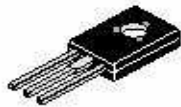
Note:- Product is pre selected in DC current gain (Groups A to F). CDIL reserves the right to ship any of the groups according to production availability.	<b>A</b>	<b>B</b>	<b>C</b>	<b>E</b>	<b>F</b>
	11-16	15-19	18-22	21-25	24-30
<b>MARKING</b>	<b>CD</b>	<b>CD</b>	<b>CD</b>	<b>CD</b>	<b>CD</b>
	13003DA XY	13003DB XY	13003DC XY	13003DE XY	13003DF XY
X = Year of Manufacturer Code					
Y = Month Code					

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

CD13003D Rev\_1 120310E

TO-126 (SOT-32) Plastic Package

**TO-126**  
Leaded Plastic  
Package

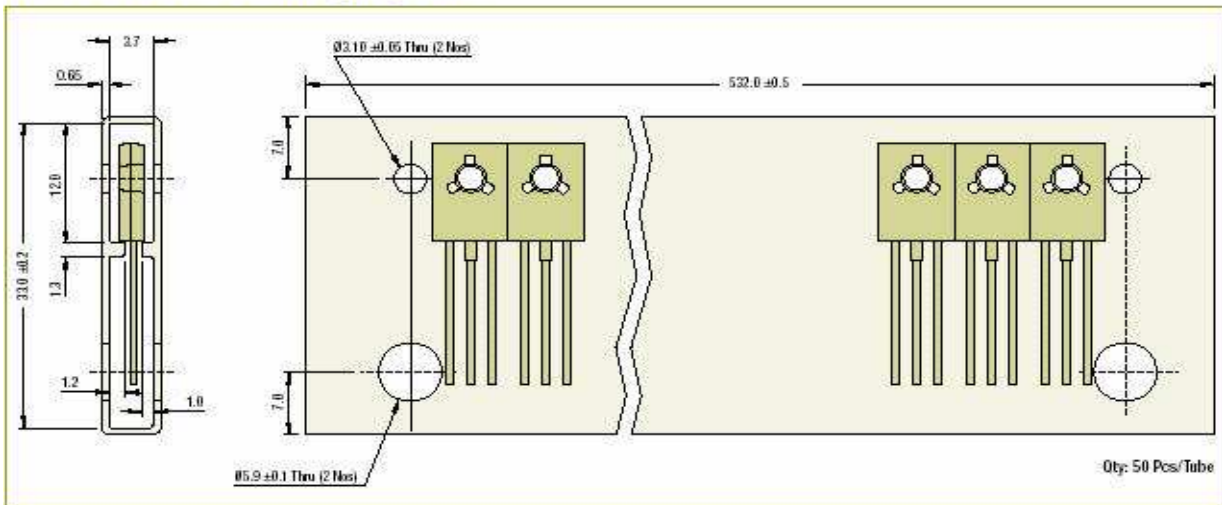


DIM	Min	Max	DIM	Min	Max
A	7.12	8.38	G	4.07	5.08
B	10.16	11.43	L	15.00	16.63
C	2.29	3.04	M	0.89	1.65
D	0.64	0.88	N	3.31	4.44
E	2.040	2.285	P	2.54	3.30
F	0.39	0.63	S	—	2.54

Pin Configurations

Pin 1: Base Pin 2: Collector Pin 3: Emitter

TO-126 Series Packaging Tube



**Packaging Specifications ...**

T & A: Tape and Ammo Pack; T & R: Tape and Reel; Bulk: Loose in Poly Bags; Tube: Tube and Carton; K: 1,000

Package / Case Type	Packaging Type	Std. Packing		Inner Carton		Outer Carton		
		Qty	Qty	Size L x W x H (cm)	Gross Weight (Kg)	Qty	Size L x W x H (cm)	Gross Weight (Kg)
TO-126	Bulk	2,000	2K	19 x 19 x 8	1.4	20K	46 x 38 x 22	15.6
	Tube	1,000 (50 pcstube)	1K	55 x 9 x 10	1.5	10K	55 x 35 x 27	16.3

**Component Disposal Instructions**

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

**Disclaimer**

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

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