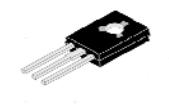
Continental Device India Pvt. Limited
An IATF 16949, ISO9001 and ISO 14001 Certified Company

NPN SILICON POWER TRANSISTOR C13003D



TO-126

TO-126 Leaded
Plastic Package
RoHS compliant

APPLICATIONS:

Suitable for Energy Saving Lamps and Electronic Ballast, High Frequency Switching Power Supply.

ABSOLUTE MAXIMUM RATINGS (Ta = 25 ℃ Unless otherwise specified)

PARAMETER		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	2.0	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	@ Ta=25 ºC	P_D	1.4	W
	Derate Above 25ºC		11.2	mW/°C
Power Dissipation	@ Ta=25 ºC	P_D	40	W
	Derate Above 25ºC		320	mW/°C
Operating And Storage Junction Temperature Range		T_j, T_{stg}	-65 to +150	°C

THERMAL RESISTANCE

Junction to Case	$R_{th\ (j-c)}$	3.12	°C/W
Junction to Ambient	$R_{th\ (j-a)}$	89	°C/W
Maximum Lead Temperature for Soldering Purpose: 1/8" from Case for 5 Seconds	T_L	275	°C

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

ELECTRICAL CHARACTERISTICS (T_A = 25°C; unless otherwise spec

PARAMETER	SYMBOL	TEST CONDITION	Value			Unit
			Min.	Typ.	Max.	
Collector Base Voltage	V_{CBO}	I_C=1mA, I_E=0	700	--	--	V
Collector Emitter (sus) Voltage	$V_{CEO(sus)}$ [1]	I_C=10mA, I_B=0	400	--	--	V
Collector Cut Off Current	I_{CBO}	V_{CB}=680V, I_E=0	--	--	1.0	mA
		V_{CB}=680V, I_E=0, T_c=100ºC	--	--	5.0	mA
Emitter Cut Off Current	I_{EBO}	V_{EB}=9V, I_C=0	--	--	1.0	mA
DC Current Gain	h_{FE} [1]	I_C=0.3A, V_{CE}=2V [2]	15	--	25	
		I_C=0.5A, V_{CE}=2V	8	--	30	
		I_C=1A, V_{CE}=2V	4		25	
Collector Emitter Saturation Voltage	$V_{CE\ (sat)}$ [1]	I_C=0.5A, I_B=0.1A	--	--	0.5	V
		I_C=1A, I_B=0.25A	--	--	1.0	V
		I_C=1.5A, I_B=0.5A	--	--	3.0	V
		I_C=1A, I_B=0.25A,Tc=100ºC	--	--	1.0	V
Base Emitter Saturation Voltage	$V_{BE\ (sat)}$ [1]	I_C=0.5A, I_B=0.1A	--	--	1.0	V
		I_C=1A, I_B=0.25A	--	--	1.2	V
		I_C=1A, I_B=0.25A,Tc=100ºC	--	--	1.1	V
DYNAMIC CHARACTERISTICS						
Current Gain Bandwidth Product	f_T	I_C=100mA, V_{CE}=10V, f=1MHz	4.0	--	--	MHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=0.1MHz	--	21	--	pF
SWITCHING TIME						
Delay Time	t_d	V_{CC}=125V, I_C=1A, I_{B1}=I_{B2}=0.2A, t_p=25µs, Duty Cycle=1%	--	--	0.1	µs
Rise Time	t_r		--	--	1.0	µs
Storage Time	t_s		--	--	4.0	µs
Fall Time	t_f		--	--	0.7	µs
Voltage Storage Time	t_{sv}	V_{Clamp}=300V, I_C=1A, I_{B1}=0.2A, $V_{BE(off)}$=5V, T_c=100ºC	--	--	4.00	µs
Crossover Time	t_C		--	--	0.75	µs
Fall Time	t_{fi}		--	0.15	--	µs

Note:

1. Pulse Test:- PW=300µs, Duty Cycle=2%
2. **h_{FE} 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.	**A**	**B**
	15-19	19-25

CHARACTERISTIC CURVES

Fig 1: Ic-Vce plot

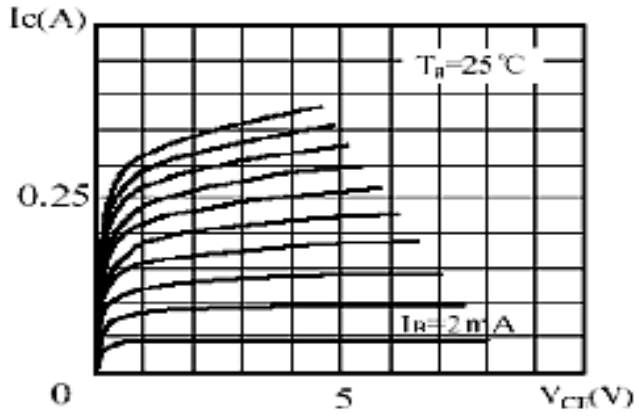


Fig 2: hfe-Ic plot

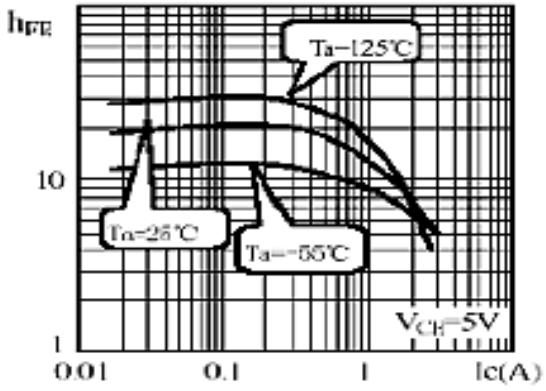


Fig 3: V_{ECSat}-Ic plot

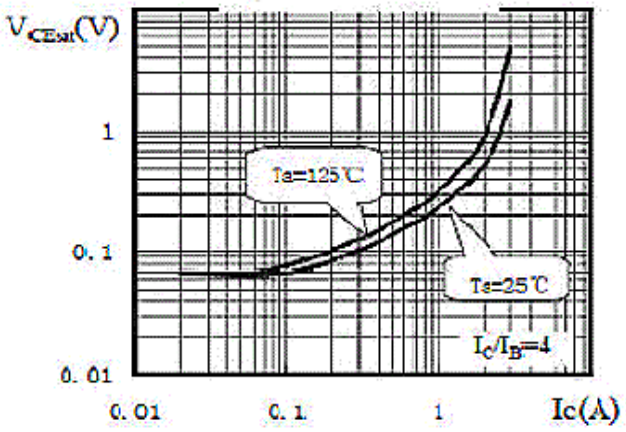


Fig 4. V_{BEsat}-Ic plot

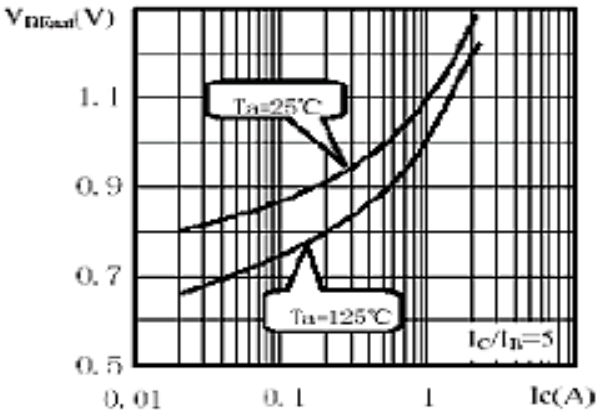


Fig 5: PC-T

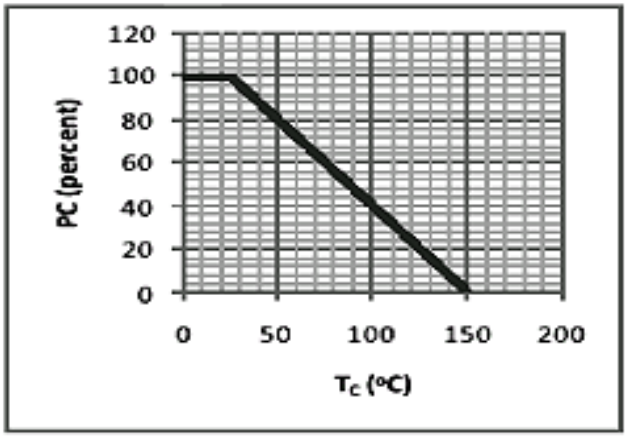
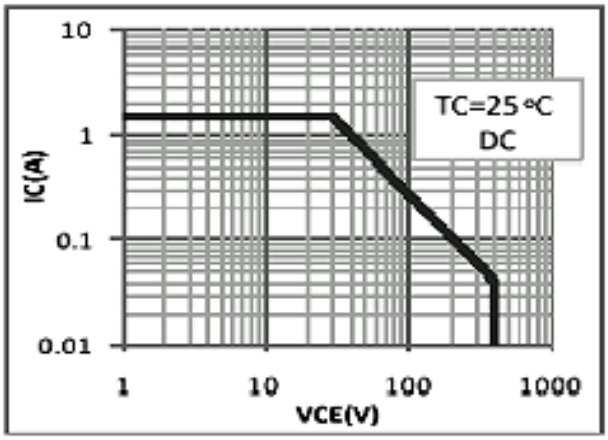


Fig 6: Safe operating Area



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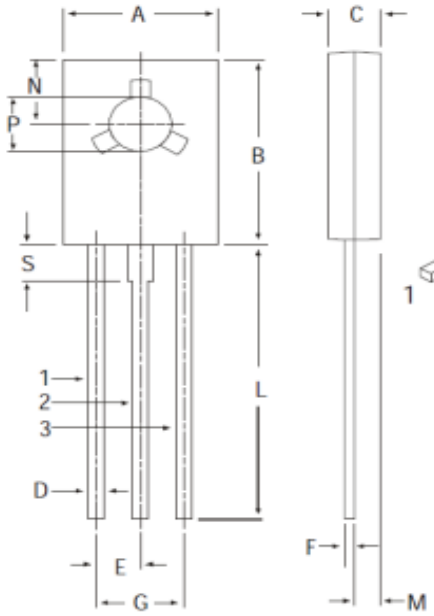
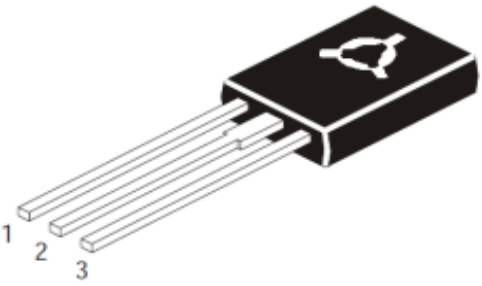
Package Details

TO-126 Leaded Plastic Package



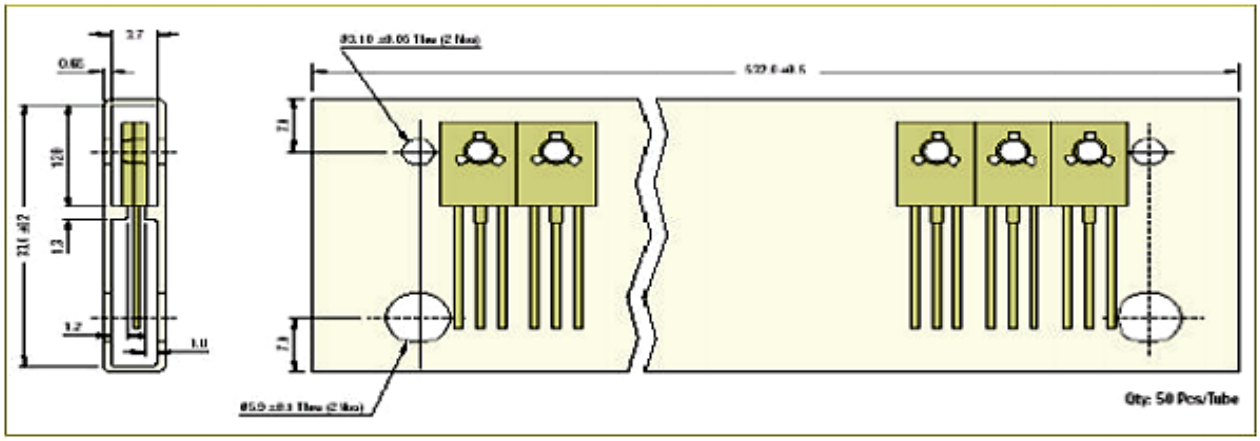


Pin Configuration
1. Base
2. Collector
3 Emitter

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 diminsions in mm.

TO-126 Packaging Tube



Package Specifications

1 & 4: Tape and Ammo Pack, 1 & 8: 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	48 x 38 x 22	15.6
	Tube	1,000 (50 pcs/tube)	1K	55 x 8 x 10	1.5	10K	55 x 35 x 27	16.3

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Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers.The product can be unconditionally shipped within this period. The period is defined as 2 years.
If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.
The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.
For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	**Time**	**Condition**
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH

Customer Notes

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 Coil'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).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.

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