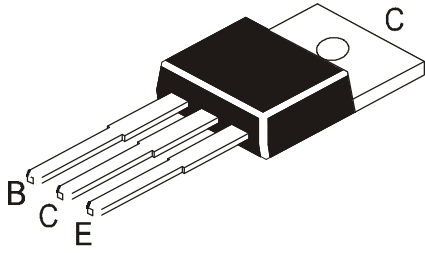


**NPN SILICON POWER TRANSISTOR**

**CD13005**



**TO-220  
Plastic Package**

**Applications**

**Suitable for Lighting, Switching Regulator and Motor Control**

**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	$I_C$	2.0	A
Peak (1)	$I_{CM}$	4.0	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 @ $T_a=25^\circ\text{C}$	$P_D$	1.4	W
Derate Above $25^\circ\text{C}$		11.2	mW/ $^\circ\text{C}$
Power Dissipation @ $T_c=25^\circ\text{C}$	$P_D$	60	W
Derate Above $25^\circ\text{C}$		480	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	$R_{th(j-c)}$	2.08	$^\circ\text{C/W}$
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%

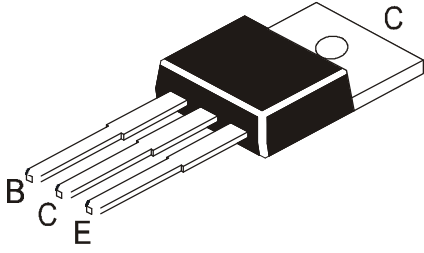
**ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$  unless specified otherwise)**

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	$I_{CBO}$	$V_{CB}=600\text{V}, I_E=0$ $V_{CB}=600\text{V}, I_E=0, T_c=100^\circ\text{C}$	-	-	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=300ms, Duty Cycle=2%

**NPN SILICON POWER TRANSISTOR**

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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	8	-	40	
		I <sub>C</sub> =2A, V <sub>CE</sub> =5V	4	-	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**

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>				4.0	μs
Fall Time	t <sub>f</sub>				0.7	μs

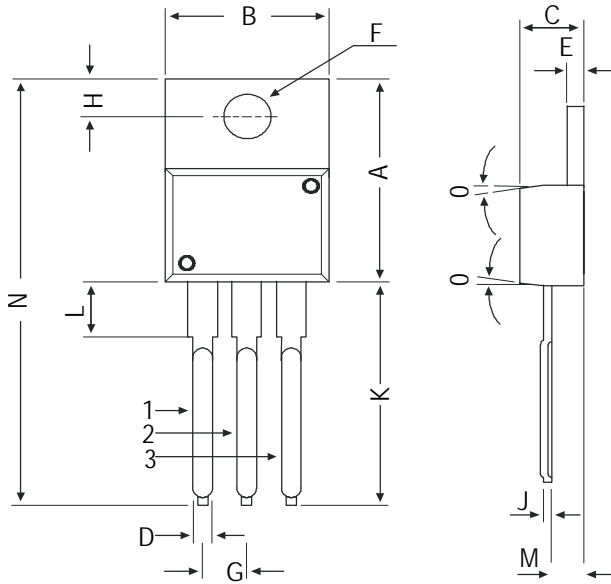
**\*\* h<sub>FE</sub> Classification:-**

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>
	13005A	13005B	13005C	13005E	13005F
	XY	XY	XY	XY	XY
<b>X= Year of Manufacturer Code</b>					
<b>Y= Month Code</b>					

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

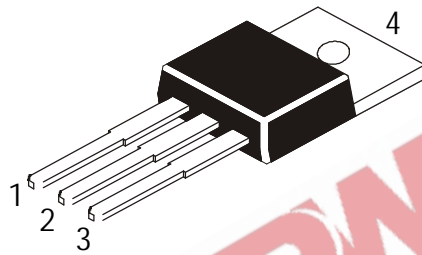
CD13005Rev\_3 260404E

TO-220 Plastic Package



DIM	MIN	MAX
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D	—	0.90
E	1.15	1.40
F	3.75	3.88
G	2.29	2.79
H	2.54	3.43
J	—	0.56
K	12.70	14.73
L	2.80	4.07
M	2.03	2.92
N	—	31.24
O	7 DEG	

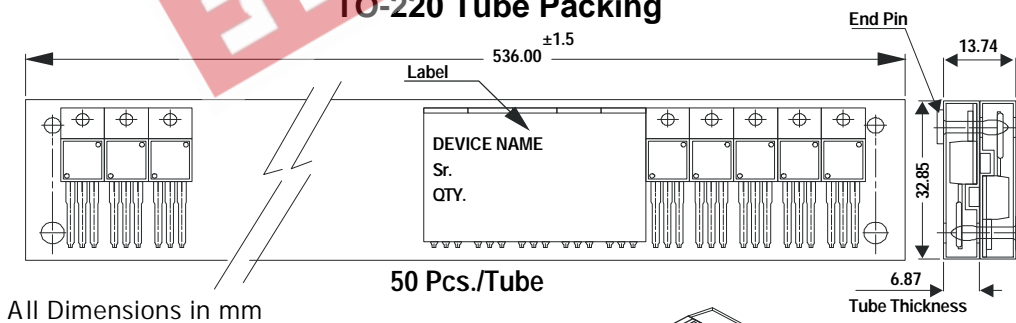
All dimensions in mm.



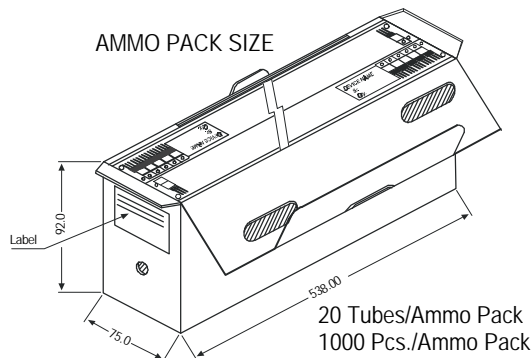
Pin Configuration

1. Base
2. Collector
3. Emitter
4. Collector

TO-220 Tube Packing



AMMO PACK SIZE



Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-220	200 pcs/polybag	396 gm/200 pcs	3" x 7.5" x 7.5"	1.0K	17" x 15" x 13.5"	16.0K	36 kgs
	50 pcs/tube	120 gm/50 pcs	3.5" x 3.7" x 21.5"	1.0K	19" x 19" x 19"	10.0K	29 kgs



### Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Discrete 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 is 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 Discrete 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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