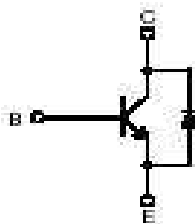
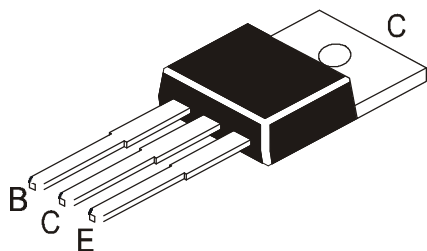


## NPN PLASTIC POWER TRANSISTOR

CDL13005D

TO-220  
Plastic Package



with Built in Diode

### ABSOLUTE MAXIMUM RATINGS

DESCRIPTION	SYMBOL	VALUE	UNIT
Collector Base Voltage	$V_{CBO}$	700	V
Collector Emitter Voltage	$V_{CEO}$	400	V
Emitter Base Voltage	$V_{EBO}$	9	V
Collector Current Continuous	$I_C$	4	A
Power Dissipation upto $T_a=25^\circ\text{C}$	$P_D$	2	W
Power Dissipation upto $T_c=25^\circ\text{C}$	$P_D$	75	W
Operating And Storage Junction Temperature Range	$T_j, T_{stg}$	- 55 to +150	$^\circ\text{C}$

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

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Cut Off Current	$I_{CBO}$	$V_{CB}=700\text{V}, I_E=0$			0.1	mA
Emitter Cut Off Current	$I_{EBO}$	$V_{EB}=9\text{V}, I_C=0$			0.1	mA
DC Current Gain	$*h_{FE}$	$I_C=1\text{A}, V_{CE}=5\text{V}$	10		50	
Ratio Between $h_{FE1}$ of Low Current and $h_{FE2}$ of High Current	$h_{FE1}/h_{FE2}$	$h_{FE1} I_C=5\text{mA}, V_{CE}=5\text{V}$ $h_{FE2} I_C=1\text{A}, V_{CE}=5\text{V}$	0.75			
Collector Emitter Saturation Voltage	$*V_{CE(sat)}$	$I_C=2\text{A}, I_B=0.5\text{A}$			0.6	V
Base Emitter Saturation Voltage	$*V_{BE(sat)}$	$I_C=2\text{A}, I_B=0.5\text{A}$			1.5	V
Transition Frequency	$f_T$	$V_{CE}=10\text{V}, I_C=500\text{mA}, f=1\text{MHz}$	5			MHz
Diode forward Voltage	$V_{FEC}$	$I_F=1\text{A}$			1.5	V
		$I_F=2\text{A}$			1.6	V

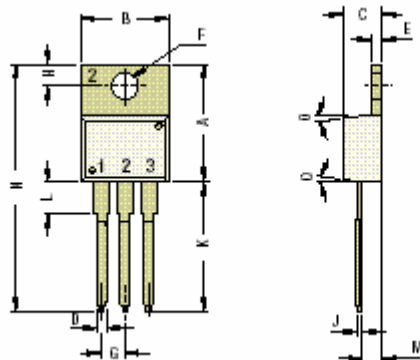
### Switching Time

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Fall Time	$t_f$	$I_C=2\text{A}, I_{B1}=-I_{B2}=0.4\text{A}$ $V_{CC}=120\text{V}$			0.8	$\mu\text{s}$
Storage Time	$t_s$				3.6	$\mu\text{s}$

$*h_{FE}$ Classification	A : 10 - 21	B : 20 - 31	C : 30 - 41	E : 40 - 50
Marking	CDL	CDL	CDL	CDL
Product is pre-selected in DC Current	13005D	13005D	13005D	13005D
Gain (Groups A to E). CDIL reserves the right to ship any of the group(s) to customers depending on production availability.	A XX	B XX	C XX	E XX
XX=date code				

\*Pulse Test  $t_p \leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

CDL13005DRev 270410E

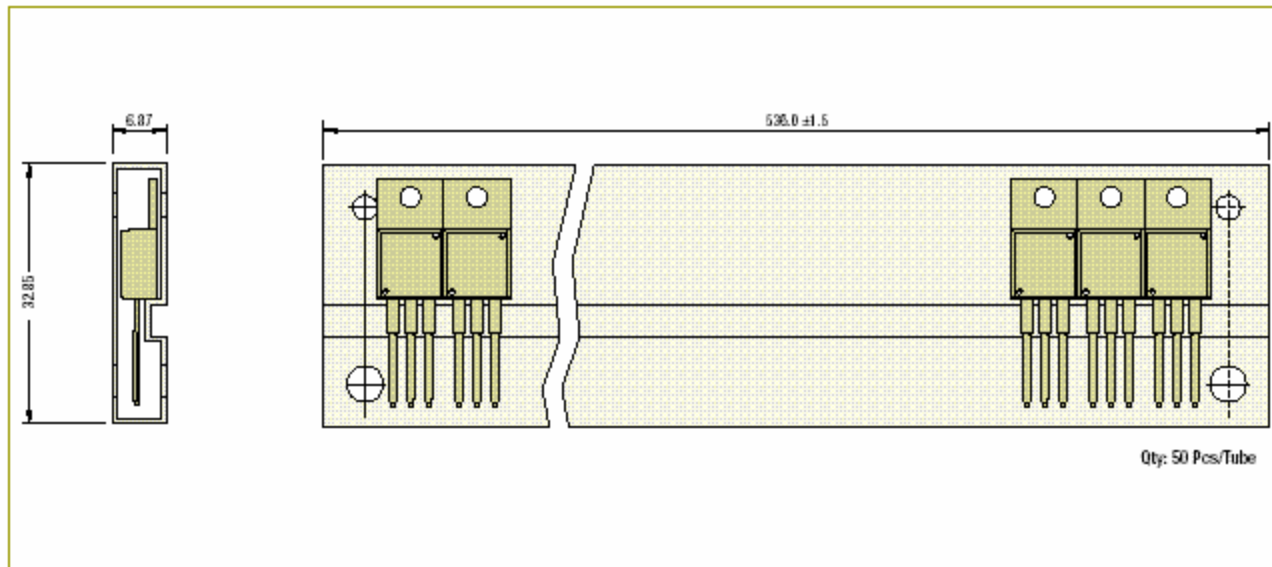
**TO-220**  
Leaded Plastic  
Package

DIM	Min	Max
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D	—	0.90
E	1.15	1.50
F	3.53	4.10
G	2.29	2.79

DIM	Min	Max
H	2.54	3.43
J	0.36	0.61
K	12.00	14.73
L	2.80	6.35
M	2.00	2.92
N	—	31.24
O	—	7°

Pin Configurations

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

**TO-220 Series Packaging Tube**

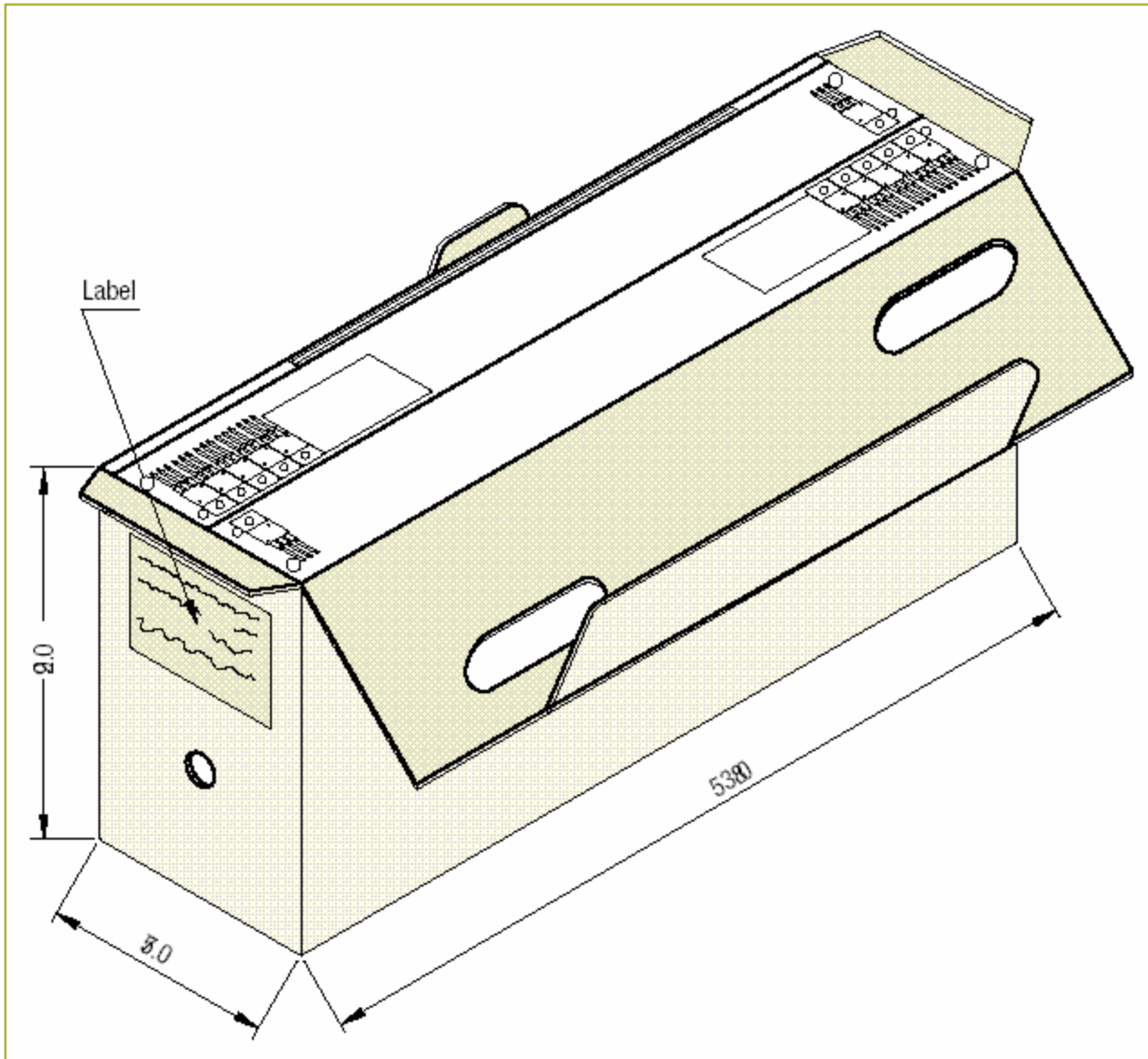
Packaging dimensions, tube dimensions and quantity/tube are approximate and subject to change.

**... Packaging Specifications**

T &amp; A: Tape and Ammo Pack; T &amp; 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)
... continued from previous page								
TO-220	Bulk	1,000	1K	19 x 19 x 8	2.0	10K	46 x 38 x 22	21.6
	Tube	1,000 (50 pcs/tube)	1K	55 x 8 x 10	2.8	10K	55 x 35 x 27	28.3

## Packaging for Tubes



Packaging dimensions/carton dimensions are approximate. Illustration shows packaging box for TO-220 Series.  
For dimensions of other tube packaging, please refer to Packaging Specifications page.

**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 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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