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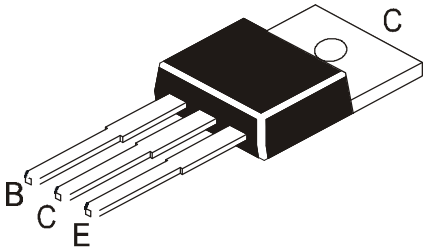
NPN SILICON POWER TRANSISTOR — CD13005



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 ºC	P_D	1.4	W
Derate Above 25ºC		11.2	mW/ ºC
Power Dissipation @ T_c=25 ºC	P_D	60	W
Derate Above 25ºC		480	mW/ ºC
Operating And Storage Junction Temperature Range	T_j, T_{stg}	- 65 to+150	ºC

THERMAL RESISTANCE

Junction to Case	$R_{th\ (j-c)}$	2.08	ºC/W
Junction to Ambient	$R_{th\ (j-a)}$	89	ºC/W
Maximum Lead Temperature for Soldering Purpose: 1/8" from Case for 5 Seconds	T_L	275	ºC

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

ELECTRICAL CHARACTERISTICS (T_a=25ºC unless specified otherwise)

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

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

CD13005Rev_3 260404E

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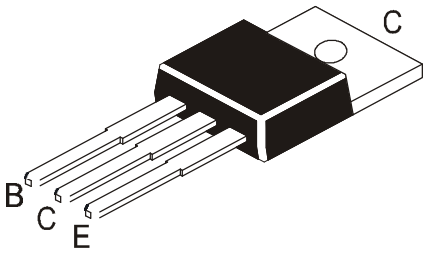

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ELECTRICAL CHARACTERISTICS (T_a=25ºC unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
DC Current Gain	*h_{FE}	**I_C=0.5A, V_{CE}=5V	8	-	40	
		I_C=2A, V_{CE}=5V	4	-	25	
Collector Emitter Saturation Voltage	*$V_{CE\ (sat)}$	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	-	-	2.5	V
		I_C=1A, I_B=0.25A,T_c=100ºC	-	-	1.0	V
Base Emitter Saturation Voltage	*$V_{BE\ (sat)}$	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,T_c=100ºC	-	-	1.1	V

DYNAMIC CHARACTERISTICS

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
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

Turn On Time	t_{on}	V_{CC}=125V, I_C=1A, I_{B1}=0.2A, I_{B2}=0.2A			1.1	µs
Storage Time	t_{stg}				4.0	µs
Fall Time	t_f				0.7	µs

**** 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	C	E	F
	11-16	15-19	18-22	21-25	24-30
MARKING	CD 13005A XY	CD 13005B XY	CD 13005C XY	CD 13005E XY	CD 13005F XY

X= Year of Manufacturer Code
Y= Month Code

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

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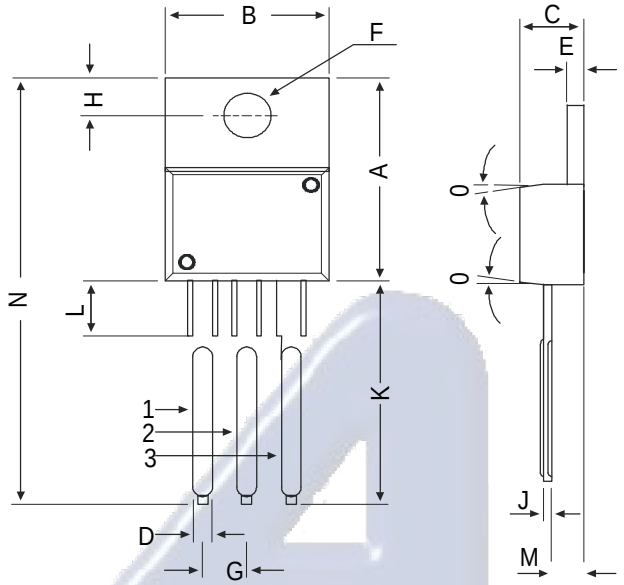
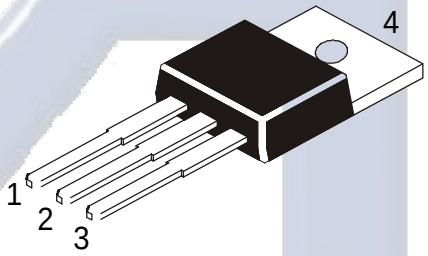


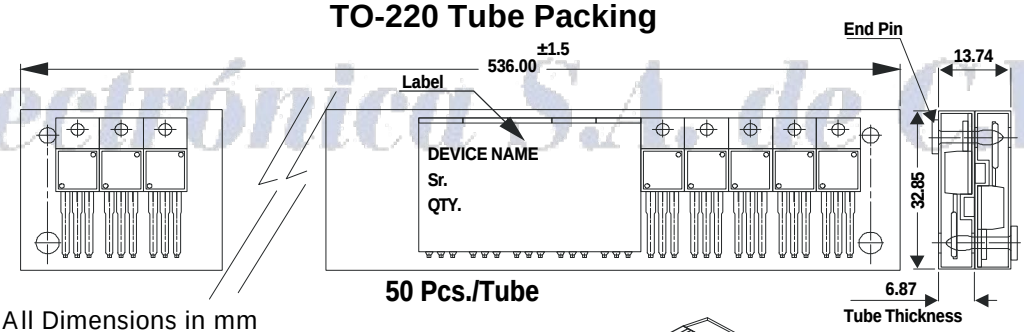
DIM	MIN	MAX
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D	—	0.90
E	1.15	1.40
F	3.75	3.88
G	2.29	2.79
H	2.54	3.43
J	—	0.56
K	12.70	14.73
L	2.80	4.07
M	2.03	2.92
N	—	31.24
O	7 DEG	

All diminsions in mm.



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

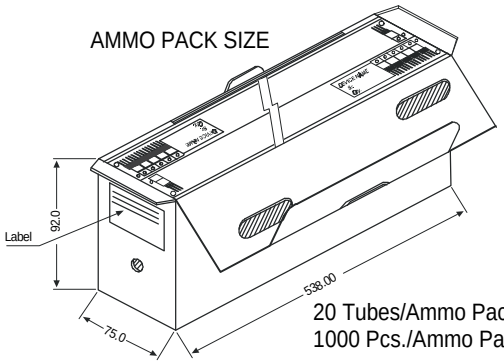
TO-220 Tube Packing



50 Pcs./Tube

All Dimensions in mm

AMMO PACK SIZE



20 Tubes/Ammo Pack
1000 Pcs./Ammo Pack

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 50 pcs/tube	396 gm/200 pcs 120 gm/50 pcs	3" x 7.5" x 7.5" 3.5" x 3.7" x 21.5"	1.0K 1.0K	17" x 15" x 13.5" 19" x 19" x 19"	16.0K 10.0K	36 kgs 29 kgs

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