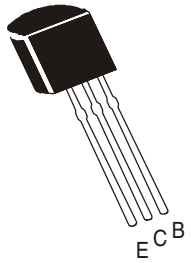
NPN SILICON PLANAR EPITAXIAL, HIGH VOLTAGE FAST SWITCHING POWER TRANSISTOR

CD13002
TCD13002 (Tin Lead Part)
LEAD FREE

TO-92
Plastic Package



Compact Fluorescent Lamps (CFLS)

ABSOLUTE MAXIMUM RATING (T_a =25ºC)

DESCRIPTION	SYMBOL	VALUE	UNIT
Collector Base Voltage	V_{CBO}	600	V
Collector Emitter Voltage	V_{CEO}	400	V
Emitter Base Voltage	V_{EBO}	9.0	V
Collector Current Continuous	I_C	1.0	A
Peak	I_{CM}	1.5	A
Power Dissipation	P_D	1.0	W
Operating and Storage Junction Temperature Range	T_j, T_{stg}	- 55 to +150	ºC

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 Voltage	V_{CEO}	I_C=1mA, I_B=0	400			V
Emitter Base Voltage	V_{EBO}	I_E=1mA, I_C=0	9.0			V
Collector Cut Off Current	I_{CBO}	V_{CB}=600V, I_E = 0			100	µA
Collector Cut Off Current	I_{CEO}	V_{CE}=400V, I_B = 0			50	µA
Emitter Cut Off Current	I_{EBO}	V_{EB}=9V, I_C=0			100	µA
DC Current Gain	h_{FE}	*V_{CE}=5V, I_C=0.1A	15		28	
		V_{CE}=5V, I_C=400mA	5.0		20	
Collector Emitter Saturation Voltage	$V_{CE\ (sat)}$	I_C=100mA, I_B=50mA	0.05		0.11	V
		I_C=230mA, I_B=50mA	0.12		0.24	V
Base Emitter Saturation Voltage	$V_{BE\ (sat)}$	I_C=100mA, I_B=50mA	0.82		0.88	V
Fall Time	t_f	I_C=0.11A			0.4	µs
Storage Time	t_s	I_C=0.1A, I_{B1}= I_{B2}=0.05A	0.07		0.9	µs
Transition Frequency	f_T	V_{CE}=10V, I_C=0.1A,f=1MHz	4.0			MHz

*h_{FE} Classification

Note:- Product is pre selected in DC current gain (Groups A to E). CDIL reserves the right to ship any of the groups according to production availability.	A 15-19	B 18-22	C 21-25	E 24-28
MARKING	CD 13002A XY	CD 13002B XY	CD 13002C XY	CD 13002E XY
	TCD 13002A XY	TCD 13002B XY	TCD 13002C XY	TCD 13002E XY
X = Year of Manufacturer Code Y = Month Code				

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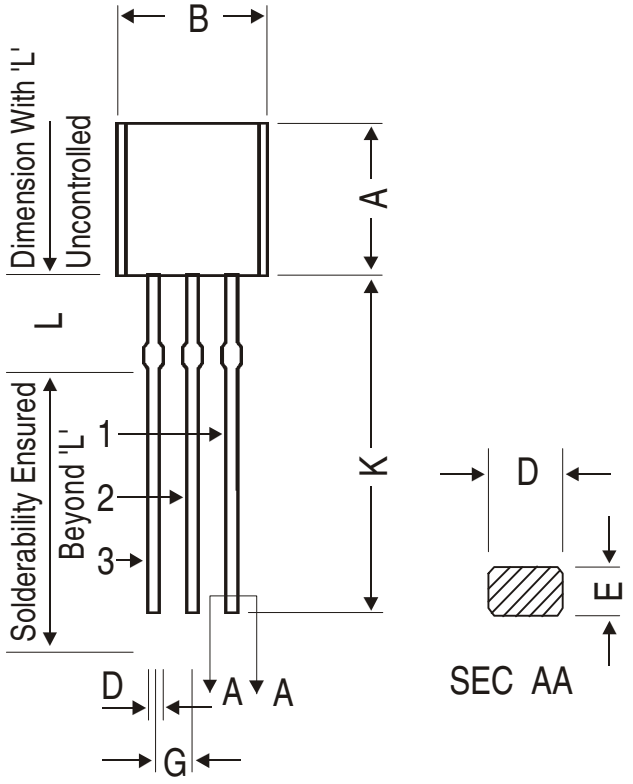
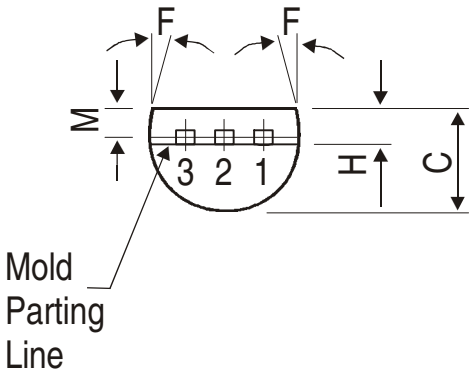
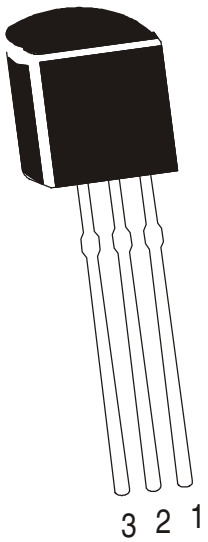
TO-92 Plastic Package



DIM	MIN.	MAX.
A	4.32	5.33
B	4.45	5.20
C	3.18	4.19
D	0.41	0.55
E	0.35	0.50
F	5 DEG	
G	1.14	1.40
H	1.20	1.40
K	12.70	—
L	1.982	2.082
M	1.03	1.20

All dimensions are in mm





PIN CONFIGURATION
1. BASE
2. COLLECTOR
3. EMITTER

The TO-92 Package, Tape and Ammo Pack Drawings are correct as on the date of issue/revision of this Data Sheet.

The currently valid dimensions and information, may please be confirmed from the TO-92 Drawing in the Packages and Packing Section of the Product Catalogue.

Packing Details

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/ Qty	Size	Qty	Size	Qty	Gr Wt
TO-92 Bulk	1K/polybag	200 gm/1K pcs	3" x 7.5" x 7.5"	5K	17" x 15" x 13.5"	80K	23 kgs
TO-92 T&A	2K/ammo box	645 gm/2K pcs	12.5" x 8" x 1.8"	2K	17" x 15" x 13.5"	32K	12.5 kgs

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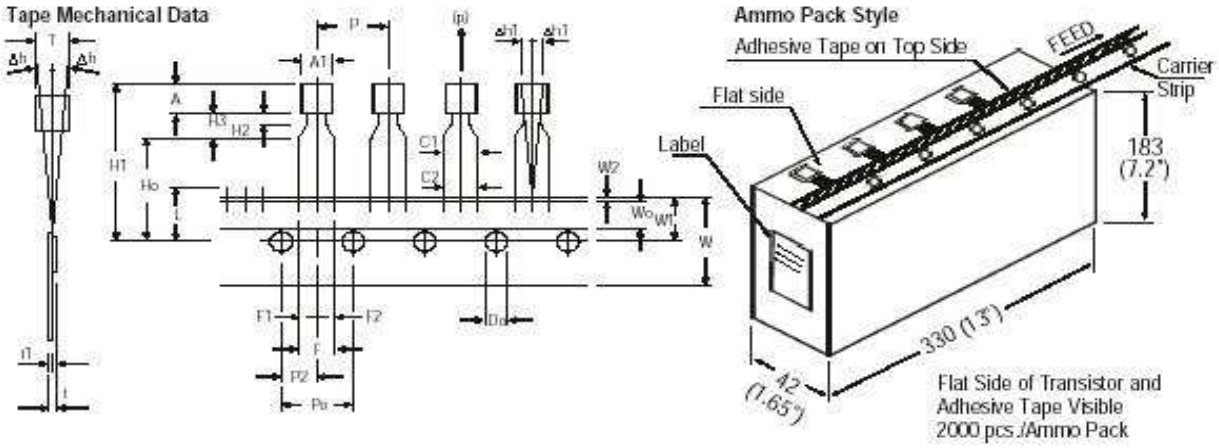
TO-92 Tape and Ammo Pack



All dimensions are in mm

ITEM	SYMBOL	SPECIFICATION			
		MIN.	NOM.	MAX.	TOL.
BODY WIDTH	A1	4.45		5.20	
BODY HEIGHT	A	4.32		5.33	
BODY THICKNESS	T	3.18		4.19	
PITCH OF COMPONENT	P		12.7		± 1.0
*1 FEED HOLE PITCH	Po		12.7		± 0.3
*2 FEED HOLE CENTRE TO COMPONENT CENTRE	P2		6.35		± 0.4
DISTANCE BETWEEN OUTER LEADS	F		5.08		+ 0.6 - 0.2
*3 COMPONENT ALIGNMENT SIDE VIEW	Δh		0	1.0	
*4 COMPONENT ALIGNMENT FRONT VIEW	Δh1		0	1.3	
TAPE WIDTH	W		18		± 0.5
HOLD-DOWN TAPE WIDTH	Wo		6		± 0.2
HOLE POSITION	W1		9		+ 0.7 - 0.5
HOLD-DOWN TAPE POSITION	W2	0.0		0.7	
LEAD WIRE CLINCH HEIGHT	Ho		16		± 0.5
COMPONENT HEIGHT	H1			24.0	
LENGTH OF SNIPPED LEADS	L			11.0	
FEED HOLE DIAMETER	Do		4		± 0.2
*5 TOTAL TAPE THICKNESS	t			1.2	
LEAD - TO - LEAD DISTANCE	F1, F2	2.40		2.70	- 0.1
STAND OFF	H2	0.45		1.45	
CLINCH HEIGHT	H3			3.0	
LEAD PARALLELISM	|C1 - C2|			0.22	
PULL - OUT FORCE	(p)	6N			

NOTES

1. Maximum alignment deviation between leads will not to be greater than 0.2mm.
2. Maximum non-cumulative variation between tape feed holes shall not exceed 1 mm in 20 pitches.
3. Holddown tape will not exceed beyond the edge(s) of carrier tape and there shall be no exposure of adhesive.
4. There will be no more than three (3) consecutive missing components in a tape.
5. A tape trailer, having at least three feed holes are provided after the last component in a tape.
6. Splices should not interfere with the sprocket feed holes.

REMARKS

*1 Cumulative pitch error 1.0 mm/20 pitch
*2 To be measured at bottom of clinch
*3 At top of body
*4 At top of body
*5 t1 0.3 – 0.6 mm

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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

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