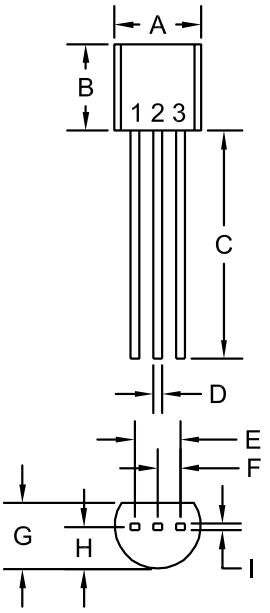
Package Details - TO-92

Mechanical Drawing



R1

DIMENSIONS				
	INCHES		MILLIMETERS	
SYMBOL	MIN	MAX	MIN	MAX
A (DIA)	0.175	0.205	4.45	5.21
B	0.170	0.210	4.32	5.33
C	0.500	-	12.70	-
D	0.016	0.022	0.41	0.56
E	0.100		2.54	
F	0.050		1.27	
G	0.125	0.165	3.18	4.19
H	0.080	0.105	2.03	2.67
I	0.015		0.38	

TO-92 (REV: R1)

LEAD CODE:

***SCR**

1) ANODE	or	1) CATHODE
2) GATE		2) GATE
3) CATHODE		3) ANODE

*** FET**

1) DRAIN		1) DRAIN
2) SOURCE		2) GATE
3) GATE		3) SOURCE
	or	
1) GATE		1) SOURCE
2) SOURCE		2) DRAIN
3) DRAIN		3) GATE

PUT
1) ANODE
2) GATE
3) CATHODE

TRIAC
1) MT1
2) GATE
3) MT2

*** TRANSISTOR**

1) EMITTER		1) EMITTER
2) BASE		2) COLLECTOR
3) COLLECTOR		3) BASE
	or	
1) COLLECTOR		1) BASE
2) BASE		2) EMITTER
3) EMITTER		3) COLLECTOR

* Note: See individual device datasheet for pinout information

Packing Code: D
D = White corrugated box with
black conductive coating
(surface resistivity of $<10^5$ ohms per square).

Standard Packing Quantity: 2.5K

Also available in the following lead form options
TO-92-SF, TO-92-ST, TO-92-ST1, TO-92-18F, TO-92-18R

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R0 (21-June 2004)

Package Details - TO-92 TR

Tape and Reel Specifications

1.0. Purpose:

This specification defines the tape and reel packaging requirements for TO-92 devices. Devices supplied to this specification are taped in accordance with Electronic Industries Association Standard EIA-468-B.

2.0 Requirements:

2.1 Tape and Reel Requirements: Devices to be taped and reeled in accordance with Figures 2 and 3.

2.2 Style Type: A suffix is added to part number to indicate Style Type. Example: CS92B TRE (CS92B taped and reeled in accordance with STYLE E). Note: STYLE E is preferred.

2.3 Packaging Base: Devices to be taped 2000 pieces per reel.

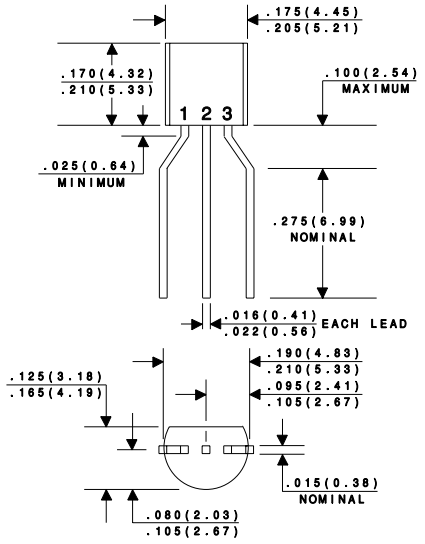

FIGURE 1. PHYSICAL DIMENSIONS
ALL DIMENSIONS IN INCHES (mm).

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Package Details - TO-92 TR

Tape and Reel Specifications
(Continued)

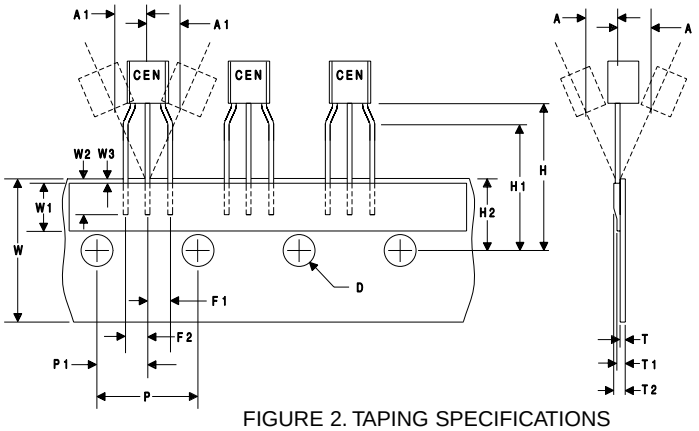


FIGURE 2. TAPING SPECIFICATIONS

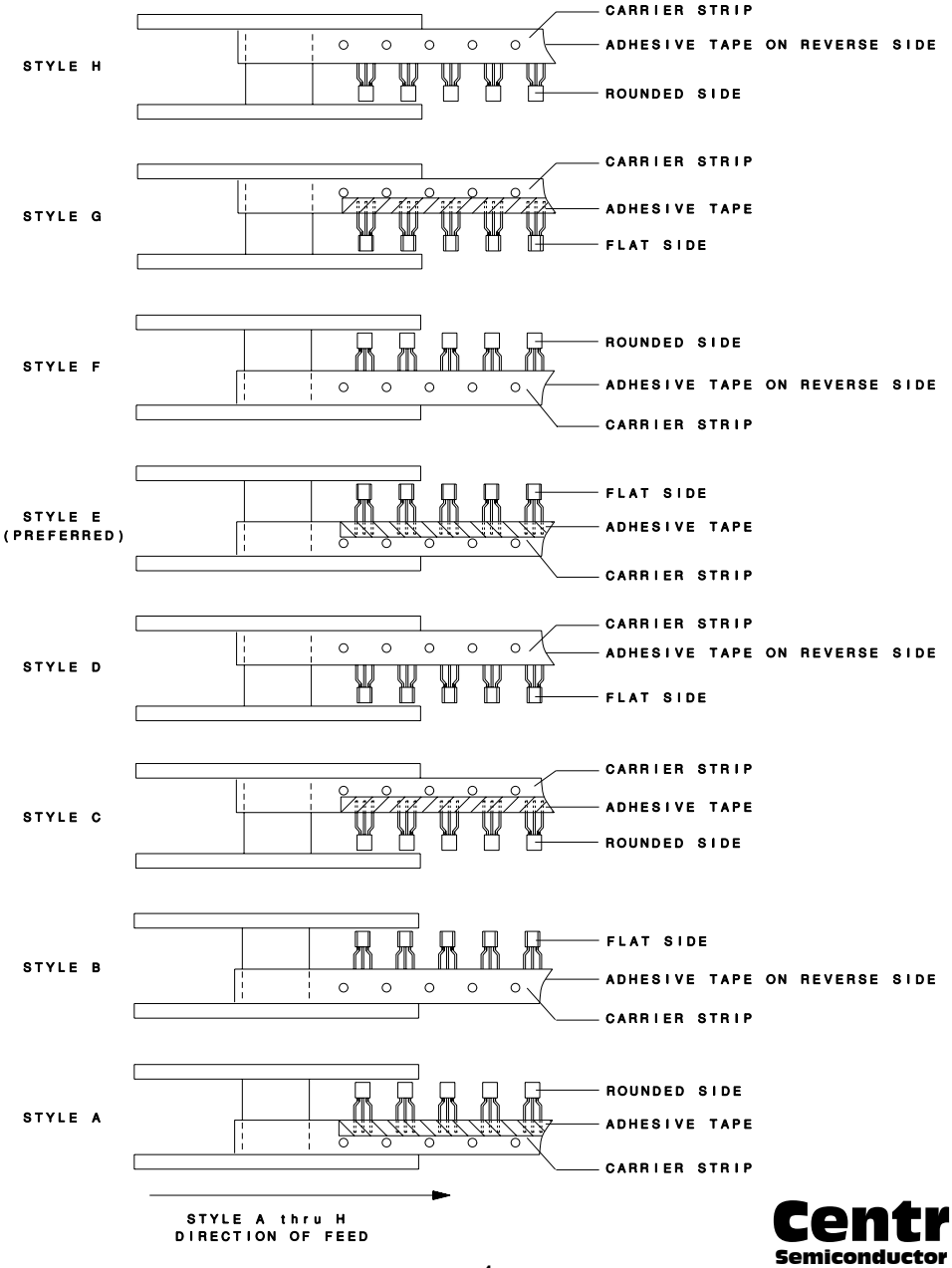
SYMBOL	DESCRIPTION	INCHES		MM		NOTE
		MIN	MAX	MIN	MAX	
A	FRONT TO REAR DEFLECTION	---	0.039	---	1.0	1
A1	LEFT TO RIGHT DEFLECTION	---	0.039	---	1.0	
D	FEED HOLE DIAMETER	0.15	0.17	3.8	4.2	
F1	COMPONENT LEAD PITCH	0.09	0.11	2.4	2.9	6
F2	COMPONENT LEAD PITCH	0.09	0.11	2.4	2.9	6
H	FEED HOLE TO BOTTOM OF COMPONENT	0.75	0.79	19.0	20.0	
H1	HEIGHT OF SEATING PLANE	0.61	0.65	15.5	16.5	2
H2	HEIGHT OF FEED HOLE LOCATION	0.33	0.37	8.5	9.5	7,8
P	FEED HOLE PITCH	0.49	0.51	12.5	12.9	3
P1	CENTER OF SEATING PLANE LOCATION	0.23	0.26	5.95	6.75	
T	CARRIER TAPE THICKNESS	0.015	0.027	0.38	0.68	4
T1	OVERALL TAPE THICKNESS	0.020	0.035	0.50	0.90	
T2	TOTAL TAPED PACKAGE THICKNESS	---	0.057	---	1.44	4
W	CARRIER TAPE WIDTH	0.69	0.75	17.5	19.0	
W1	ADHESIVE TAPE WIDTH	0.20	0.28	5.0	7.0	5
W2	LEAD ENCLOSURE	0.18	---	4.5	---	
W3	ADHESIVE TAPE POSITION	---	0.020	---	0.5	5

NOTES:
1) MAXIMUM ALIGNMENT DEVIATION BETWEEN LEADS NOT TO BE GREATER THAN 0.2mm.
2) AS ILLUSTRATED, THE CLEARANCE TO THE LEAD STANDOFF FORM SHALL BE DEFINED TO THE POINT OF RADIUS FOR THE STANDOFF FORM.
3) MAXIMUM CUMULATIVE VARIATION BETWEEN TAPE FEED HOLES SHALL NOT EXCEED 1.0mm IN 20 PITCHES.
4) OVERALL TAPED PACKAGE THICKNESS, INCLUDING COMPONENT LEADS AND TAPE SPLICES SHALL NOT EXCEED 1.44mm.
5) HOLDDOWN TAPE NOT TO EXTEND BEYOND THE EDGES OF CARRIER TAPE AND THERE SHALL BE NO EXPOSURE OF ADHESIVE.
6) NO MORE THAN 0.1% MISSING AND NO CONSECUTIVE MISSING COMPONENTS PER REEL IS PERMITTED.
7) A TAPE LEADER AND TRAILER, HAVING AT LEAST 3 SPROCKET HOLES IS REQUIRED.
8) NO MORE THAN 10 SPLICES PER REEL IS PERMITTED AND SPLICES SHALL NOT INTERFERE WITH SPROCKET FEED HOLES.

Package Details - TO-92 TR

Tape and Reel Specifications
(Continued)

FIGURE3. TAPING STYLE



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Package Details - TO-92 AP

Ammopack

Specifications

1.0. PURPOSE:

This specification defines the TO-92 Ammopack requirements. Devices supplied to this specification are taped in accordance with Electronic Industries Association Standard EIA-468-B.

2.0 REQUIREMENTS:

2.1 Tape Requirements: Devices to be taped in accordance with Figure 2.
2.2 Style Type: STYLE M (PREFERRED) or STYLE P (See Figures 3 and 4).
2.3 Ordering Info: Add suffix to part number to indicate Style Type .
Suffix APM For STYLE M (Equivalent to reel pack STYLE E).
Example: CS92B APM (CS92B SCR, Ammopack STYLE M).
or
Suffix APP For STYLE P (Equivalent to reel pack STYLE A).
Example: CS92B APP (CS92B SCR, Ammopack STYLE P).
2.4 Packaging Base: Devices to be taped 2000 pieces per Ammopack.

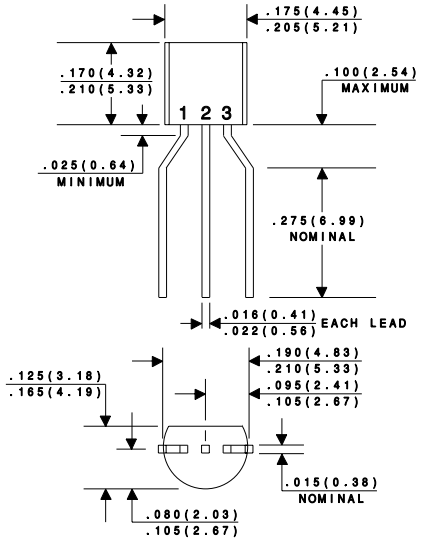


FIGURE 1. PHYSICAL DIMENSIONS
All Dimensions in Inches (mm)

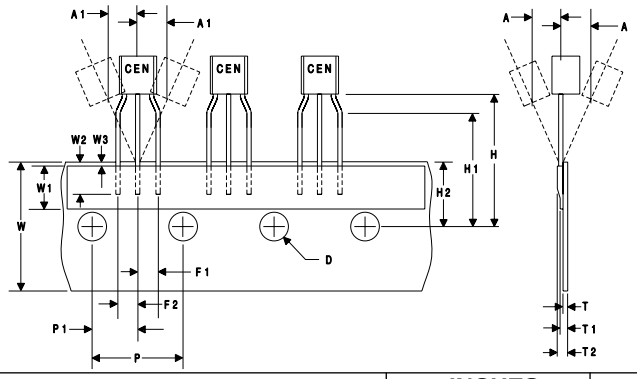
Package Details - TO-92 AP

TO-92 Ammopack

Specifications

(Continued)

FIGURE 2. (TAPING SPECIFICATIONS)



SYMBOL	DESCRIPTION	INCHES		MM		NOTE
		MIN	MAX	MIN	MAX	
A	FRONT TO REAR DEFLECTION	---	0.039	---	1.0	1
A1	LEFT TO RIGHT DEFLECTION	---	0.039	---	1.0	
D	FEED HOLE DIAMETER	0.15	0.17	3.8	4.2	
F1	COMPONENT LEAD PITCH	0.09	0.11	2.4	2.9	6
F2	COMPONENT LEAD PITCH	0.09	0.11	2.4	2.9	6
H	FEED HOLE TO BOTTOM OF COMPONENT	0.75	0.79	19.0	20.0	
H1	HEIGHT OF SEATING PLANE	0.61	0.65	15.5	16.5	2
H2	HEIGHT OF FEED HOLE LOCATION	0.33	0.37	8.5	9.5	7,8
P	FEED HOLE PITCH	0.49	0.51	12.5	12.9	3
P1	CENTER OF SEATING PLANE LOCATION	0.23	0.26	5.95	6.75	
T	CARRIER TAPE THICKNESS	0.015	0.027	0.38	0.68	4
T1	OVERALL TAPE THICKNESS	0.020	0.035	0.50	0.90	
T2	TOTAL TAPED PACKAGE THICKNESS	---	0.057	---	1.44	4
W	CARRIER TAPE WIDTH	0.69	0.75	17.5	19.0	
W1	ADHESIVE TAPE WIDTH	0.20	0.28	5.0	7.0	5
W2	LEAD ENCLOSURE	0.18	---	4.5	---	
W3	ADHESIVE TAPE POSITION	---	0.020	---	0.5	5

NOTES:
1) MAXIMUM ALIGNMENT DEVIATION BETWEEN LEADS NOT TO BE GREATER THAN 0.2mm.
2) AS ILLUSTRATED, THE CLEARANCE TO THE LEAD STANDOFF FORM SHALL BE DEFINED TO THE POINT OF RADIUS FOR THE STANDOFF FORM.
3) MAXIMUM CUMULATIVE VARIATION BETWEEN TAPE FEED HOLES SHALL NOT EXCEED 1.0mm IN 20 PITCHES.
4) OVERALL TAPED PACKAGE THICKNESS, INCLUDING COMPONENT LEADS AND TAPE SPLICES SHALL NOT EXCEED 1.44mm.
5) HOLDDOWN TAPE NOT TO EXTEND BEYOND THE EDGES OF CARRIER TAPE AND THERE SHALL BE NO EXPOSURE OF ADHESIVE.
6) NO MORE THAN 0.1% MISSING AND NO CONSECUTIVE MISSING COMPONENTS PER REEL IS PERMITTED.
7) A TAPE LEADER AND TRAILER, HAVING AT LEAST 3 SPROCKET HOLES IS REQUIRED.
8) NO MORE THAN 10 SPLICES PER REEL IS PERMITTED AND SPLICES SHALL NOT INTERFERE WITH SPROCKET FEED HOLES.

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Package Details - TO-92 AP

Ammopack

Specifications (Continued)

FIGURE 3. STYLE M (PREFERRED)

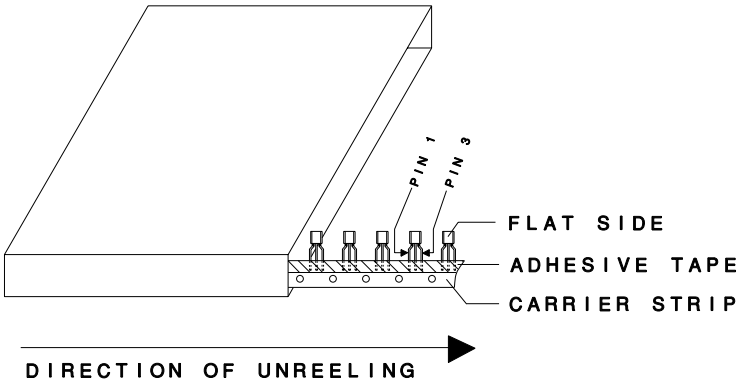
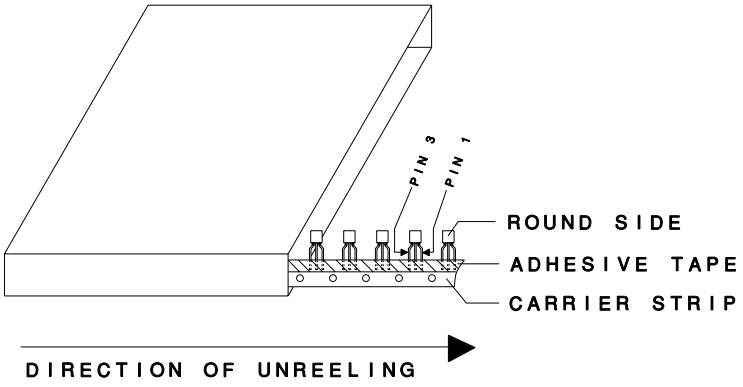


FIGURE 4. STYLE P



Note: The box is accessible from either side depending upon whether PIN 1 or PIN 3 is required at the leading edge.

Material Composition Specification

TO-92 Case (Eutectic Die Attach)

Pb (lead)-free plating** 

Device average mass . . . . . **210 mg**

Fluctuation margin . . . . . **+/-10%**

Component	Material	Material		Substance	CAS No.	Substance		
		(%wt)	(mg)			(%wt)	(mg)	(ppm)
active device	doped Si	0.03%	0.072	Si	7440-21-3	0.03%	0.072	345
bond wire	gold	0.02%	0.032	Au	7440-57-5	0.02%	0.032	150
leadframe	Cu alloy w/ silver plating	43.76%	91.898	Cu	7440-50-8	43.64%	91.644	436,400
				Ag	7440-22-4	0.12%	0.254	1,210
encapsulation*	EMC	53.41%	112.159	silica	7631-86-9	38.51%	80.861	385,050
				epoxy resin	Proprietary	13.43%	28.205	134,310
				Sb_2O_3	1309-64-4	1.07%	2.249	10,710
				TBBA	79-94-7	0.27%	0.563	2,680
				carbon	1333-86-4	0.13%	0.281	1,340
	EMC GREEN	53.41%	112.159	silica	7631-86-9	39.5%	82.94	394,952
				epoxy resin	Proprietary	13.78%	28.93	137,764
				carbon	1333-86-4	0.13%	0.288	1,374
plating**	tin lead process	2.78%	5.838	Sn	7440-31-5	1.67%	3.507	16,700
				Pb	7439-92-1	1.11%	2.331	11,100
	100% tin process	2.78%	5.838	Sn	7440-31-5	2.78%	5.838	27,800

*EMC GREEN molding compound is Halogen-Free.
**Specify Lead-Free when ordering 100% tin (Pb-free) plating.

Disclaimer
The information provided in this Material Composition data sheet is, to our knowledge, correct. However, there is no guarantee to completeness or accuracy, as some information is derived from data sources outside the company.

Material Composition Specification

TO-92 Case (Solder Die Attach)

Pb (lead)-free plating** 

Device average mass . . . . . **210 mg**

Fluctuation margin . . . . . **+/-10%**

Component	Material	Material		Substance	CAS No.	Substance		
		(%wt)	(mg)			(%wt)	(mg)	(ppm)
active device	doped Si	0.03%	0.072	Si	7440-21-3	0.03%	0.072	345
bond wire	gold	0.02%	0.032	Au	7440-57-5	0.02%	0.032	150
leadframe	Cu alloy w/silver plating	43.76%	91.898	Cu	7440-50-8	43.64%	91.644	436,400
				Ag	7440-22-4	0.12%	0.254	1,210
die attach	solder	0.12%	0.25	Pb	7439-92-1	0.11%	0.233	1,110
				Sn	7440-31-5	0.01%	0.013	60
				Ag	7440-22-4	0.00%	0.006	30
encapsulation*	EMC	53.29%	111.908	silica	7631-86-9	38.42%	80.68	384,190
				epoxy resin	Proprietary	13.41%	28.162	134,105
				Sb_2O_3	1309-64-4	1.07%	2.237	10,650
				TBBA	79-94-7	0.26%	0.554	2,640
				carbon	1333-86-4	0.13%	0.275	1,310
	EMC GREEN	53.29%	111.908	silica	7631-86-9	39.40%	82.744	394,016
				epoxy resin	Proprietary	13.75%	28.882	137,535
				carbon	1333-86-4	0.13%	0.282	1,344
plating**	tin lead process	2.78%	5.838	Sn	7440-31-5	1.67%	3.507	16,700
				Pb	7439-92-1	1.11%	2.331	11,100
	100% tin process	2.78%	5.838	Sn	7440-31-5	2.78%	5.838	27,800

*EMC GREEN molding compound is Halogen-Free.
**Specify Lead-Free when ordering 100% tin (Pb-free) plating.

Disclaimer
The information provided in this Material Composition data sheet is, to our knowledge, correct. However, there is no guarantee to completeness or accuracy, as some information is derived from data sources outside the company.