

EIA-417-A

EIA STANDARD

Crystal Outlines

EIA-417-A

(Revision of EIA-417)

APRIL 1991

ELECTRONIC INDUSTRIES ASSOCIATION
ENGINEERING DEPARTMENT



Documents

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(From Standards Proposal No. 2109, formulated under the cognizance of the EIA P-11 Committee on Piezoelectric Devices.)

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Crystal Outlines

1. SCOPE

This standard establishes the external dimensions of envelopes for the encapsulation of quartz resonators in their sealed or closed configuration. To the extent found feasible the outlines are arranged in "families", with all outlines within a family sharing a single major defining character. A family can consist of a single embodiment or of a substantial number. Provision is made for a family to grow as needs develop.

2. APPLICABLE DOCUMENTS

This standard is intended to be self-sufficient. A previous standard, RS-192A, contains a number of crystal outlines which have not been incorporated into the present document. RS-192A is, therefore, not obsoleted or supplanted by this standard. It will remain the repository of standards data on unsealed and gasket sealed plastic and ceramic bodied crystal plate holders. Where this standard and RS-192A cover the same outline, this standard will take precedence.

MIL-H-10056 is a specification of component parts of crystal envelopes some of which when closed satisfy outlines in this standard. Outlines are delineated on the slash sheets of MIL-C-3098 without conventional designation of outline, but with reference to MIL-H-10056 to realize the outline. These two referenced specifications are controlled by the designated agency of the United States government. Cross reference information with MIL-H-10056 given herein is for guidance only and must not be taken to be authoritative nor necessarily complete.

IEC Publication 122-3 standardizes crystal outlines on an international basis. Cross reference information with IEC Publication 122-3 given herein is for guidance only and must not be taken to be authoritative nor necessarily complete.

3. USE OF THE STANDARD

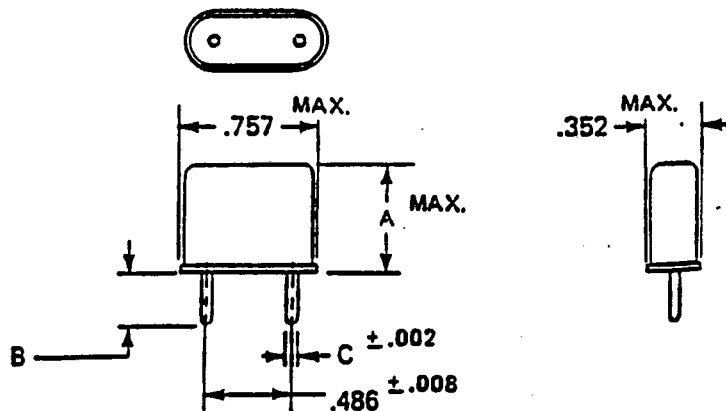
It is the intention that this document be offered by crystal manufacturers for use by their customers. The expected result is an increase in the use of existing standard outlines and a decrease in the demand for new configurations and variants.

Crystal outlines are grouped by size and configurations into families of similarity. The families are designated by a class symbol consisting of the letters CO followed by a serial number (thus CO-1, CO-2, etc.). Within a class of crystal outlines there will be many variations and certain constants.

The constants of any class are delineated on the drawing. The variations are listed in the table accompanying the drawing. The variations in any class pertain to the dimensions of leads and pins and to the height of the enclosure. An identifying number is assigned to each variant of leads and to each cover height. A complete part number consists of the class symbol, the pin number and the cover height number in sequence.

The following partial table is extracted from CO-6 for purposes of illustration.

PART NUMBER			TABLE IN INCHES		
Class	Pin	Can	A	B	C
CO-6	- 01 -	01	.575	.238 $\begin{smallmatrix} +.010 \\ -.015 \end{smallmatrix}$	.050
CO-6	- 02 -	01	.575	.500 Min.	.030
CO-6	- 01 -	02	.775	.238 $\begin{smallmatrix} +.010 \\ -.015 \end{smallmatrix}$	.050



In the example CO-6-01-01 and CO-6-02-01 would differ only in that the first has socketable pins while the second has short wire leads. CO-6-01-01 and CO-6-01-02 would be socketed identically but would be of different heights.

The principle employed in standardizing leads is to provide the socketed pin if it exists and solderable wire leads to allow point-to-point wiring, erect soldering into a board and soldering into a board with the unit laid down on the board, if all are feasible.

Where two outlines differ only in the number of leads or in the location of the same number of leads the outlines are assigned to different classes. These cases are noted in the cross reference information.

4. AMENDMENTS AND ADDITIONS

The procedures of the Electronic Industries Association require periodic review of all standards. It may occur that a new class, lead, or cover is required to be standardized in the intervening period. Standardization action is indicated when the second source or the third user of a given tooled configuration is identified. A person recognizing the need for addition to or amendment of this standard is invited to address a letter requesting this action to the Engineering Department of the Electronic Industries Association. Action on individual classes may be undertaken at any time, as necessary.

5. CROSS-REFERENCE CHART

(SS = Solder Seal CW = Cold Weld)
(GL = Glass RW = Resistance Weld)

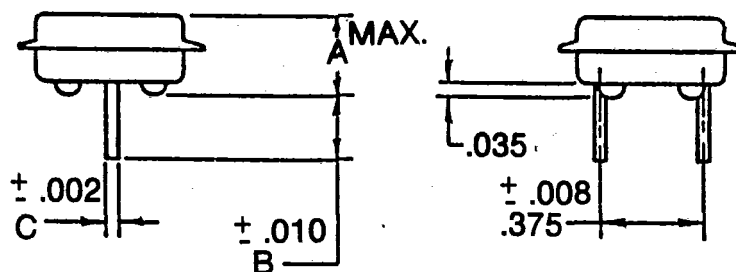
Class	Seal Type	Similar to MIL-H-10056
CO-1	CW	HC-39/U
CO-2	CW	HC-41/U
CO-3	CW	HC-38/U
CO-4	SS	HC-6/U & HC-33/U Slimline
CO-5	CW	HC-35/U 3 Leads
CO-6	SS	HC-6/U & HC-33/U & HC-13/U & HC-34/U
CO-7	CW	HC-40/U 4 Leads
CO-8	CW	HC-37/U 5 Leads
CO-9 (OBSOLETE)	SS	HC-11/U
CO-10 (OBSOLETE)	SS	HC-10/U
CO-11	SS	HC-33/U & HC-6/U & HC-34/U & HC-13/U 3 Leads
CO-12	SS	HC-32/U
CO-13	SS	HC-32/U 3 Leads
CO-14 (OBSOLETE)	SS	HC-6/U & HC-33/U & HC-13/U & HC-34/U 4 Leads
CO-15	SS	HC-6/U & HC-33/U Slimline 3 Leads
CO-16	CW	HC-47/U & HC-36/U
CO-17	CW	HC-43/U & HC-42/U
CO-18	SS	HC-18/U & HC-25/U
CO-19	CW	HC-46/U
CO-20	SS	HC-44/U
CO-21	CW	HC-45/U -1
CO-22	SS	HC-18/U Slimline
CO-23	SS	HC-18/U Slimline 3 Leads
CO-24 (OBSOLETE)	SS	
CO-25	CW	HC-47/U & HC-36/U 3 Leads
CO-26	GL	HC-26/U & HC-29/U
CO-27	GL	HC-27/U & HC-27/U With .030" Dia. Leads

Class	Seal Type	Similar to MIL-H-10056
CO-28	SS	HC-18/U 3 Leads
CO-29	CW	HC-43/U 3 Leads & HC-42/U 3 Leads
CO-30	SS	HC-44/U 3 Leads
CO-31	CW	HC-45/U -1 3 Leads
CO-32	CW	HC-35/U 2 Leads
CO-33	CW	HC-35/U 4 Leads
CO-34 (OBSOLETE)	CW	HC-35/U 8 Leads
CO-35	CW	HC-45/U -2 2 Leads
CO-36	CW	HC-45/U -2 3 Leads
CO-37	RW	HC-35/U RW 3 Leads
CO-38	RW	HC-37/U RW 5 Leads
CO-39	RW	HC-40/U RW 4 Leads
CO-40	RW	HC-45/U -2 RW
CO-41	RW	HC-49/U Slimline
CO-42	RW	HC-49/U & HC-50/U 3 Leads
CO-43	RW	HC-49/U & HC-50/U
CO-44	RW	HC-46/U RW
CO-45	RW	HC-46/U RW 3 Leads
CO-46	RW	HC-51/U & HC-48/U Slimline
CO-47	RW	HC-51/U & HC-48/U
CO-48	RW	HC-51/U & HC-48/U 3 Leads

CLASS CO-1

Diagram of a 6-pin D-sub connector. The dimensions are: .775 MAX. (width) and .775 MAX. (height).

INCH	MM
.035	.89
.375	9.53
.775	19.69

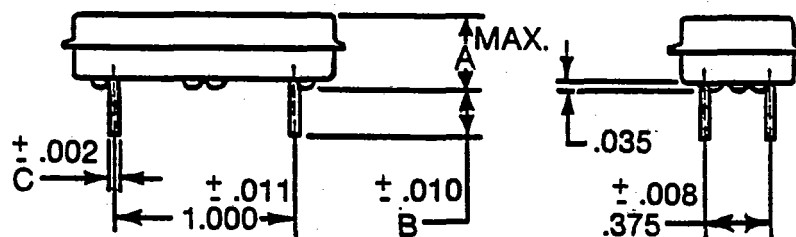
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NOTES:
CLOSURE METHOD - COLD WELD

CLASS CO-3

MAX.
2.100
MAX.
.750

INCH	MM
.035	.89
.375	9.53
.750	19.05
1.000	25.40
2.100	53.34

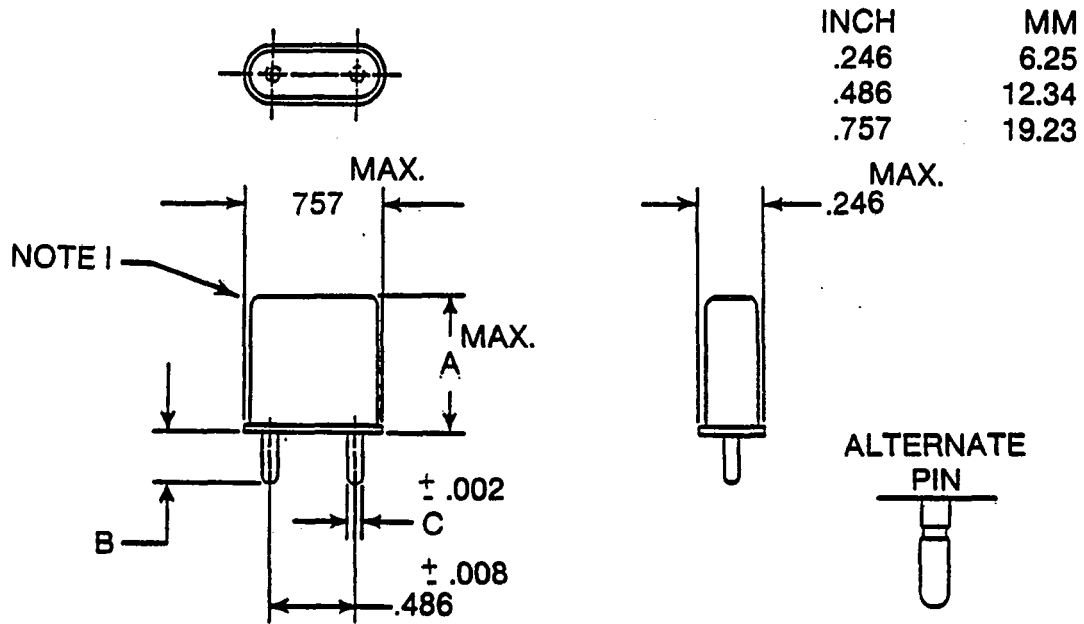
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1. CLOSURE METHOD - COLD WELD.

EIA STANDARD

CLASS CO-4

HOLDER OUTLINES AND PIN
CONNECTIONS FOR QUARTZ
CRYSTAL UNITS



PART NUMBER			TABLE IN INCHES			ALT. PIN AVAIL	TABLE IN MM		
CLASS	PIN	CAN	A	B	C		A	B	C
CO-4	01	01	.775	.238 $\pm .010$ - .015	.050	X	19.69	6.05	1.27
CO-4	02	01	.775	.500 Min.	.030		19.69	12.70	.76

NOTES:

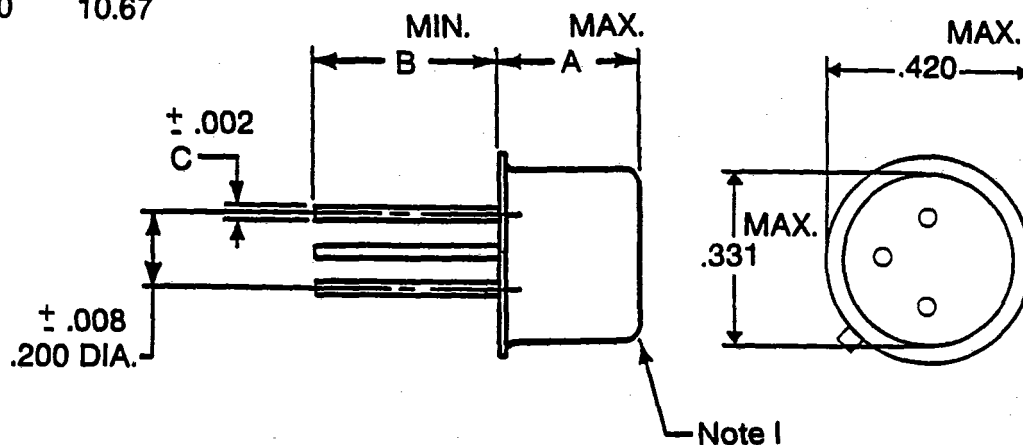
1. TO ALLOW FOR TAPER, MIN. DIMENSIONS AT THIS POINT ARE .187 X .711 (4.75 X 18.06 MM).
2. CLOSURE METHOD - SOLDER SEAL

EIA STANDARD

CLASS CO-5

HOLDER OUTLINES AND PIN
CONNECTIONS FOR QUARTZ
CRYSTAL UNITS

INCH	MM
.200	5.08
.331	8.41
.420	10.67



PART NUMBER			TABLE IN INCHES			ALT. PIN AVAIL	TABLE IN MM		
CLASS	PIN	CAN	A	B	C		A	B	C
CO-5	01	01	.265	.500	.018		6.73	12.70	.46
CO-5	01	02	1.000	.500	.018		25.40	12.70	.46
CO-5	01	03	1.550	.500	.018		39.37	12.70	.46

NOTES:

1. TO ALLOW FOR TAPER, MIN. DIMENSION AT THIS POINT IS .320 DIA. (8.13 MM DIA.).
2. CLOSURE METHOD - COLD WELD.

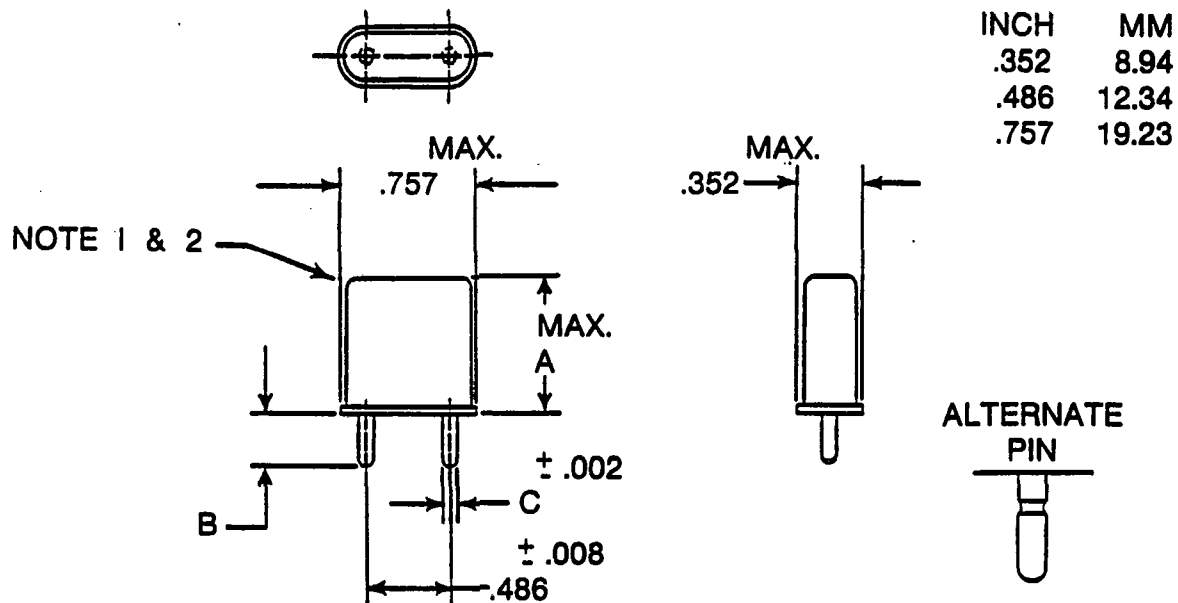


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EIA STANDARD

HOLDER OUTLINES AND PIN
CONNECTIONS FOR QUARTZ
CRYSTAL UNITS

CLASS CO-6


PART NUMBER			TABLE IN INCHES			ALT. PIN AVAIL	TABLE IN MM		
CLASS	PIN	CAN	A	B	C		A	B	C
CO-6	01	01	.575	.238 ^{+.010} _{-.015}	.050	X	14.61	6.05	1.27
CO-6	02	01	.575	.500 Min.	.030		14.61	12.70	.76
CO-6	01	02	.775	.238 ^{+.010} _{-.015}	.050	X	19.69	6.05	1.27
CO-6	02	02	.775	.500 Min.	.030		19.69	12.70	.76
CO-6	01	03	1.525	.238 ^{+.010} _{-.015}	.050	X	38.74	6.05	1.27
CO-6	02	03	1.525	.500 Min.	.030		38.74	12.70	.76
CO-6	01	04	2.025	.238 ^{+.010} _{-.015}	.050	X	51.44	6.05	1.27
CO-6	02	04	2.025	.500 Min.	.030		51.44	12.70	.76
CO-6	01	05	2.525	.238 ^{+.010} _{-.015}	.050	X	64.14	6.05	1.27
CO-6	02	05	2.525	.500 Min.	.030		64.14	12.70	.76

NOTES:

1. TO ALLOW FOR TAPER, MIN. DIMENSIONS AT THIS POINT ARE .285 X .711 (7.24 X 18.06 MM).
2. IF DIM. A IS OVER .765 MAX. MIN. DIMENSIONS AT THIS POINT ARE .259 X .707 (6.58 X 17.95 MM).
3. CLOSURE METHOD - SOLDER SEAL



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CLASS CO-7

HOLDER OUTLINES AND PIN CONNECTIONS FOR QUARTZ CRYSTAL UNITS

Technical drawing of a mechanical part, showing side and end views with dimensions and tolerances.

Side View Dimensions:

- Overall length: 21.46
- Section C: $\pm .002$
- Section A: $\pm .008$
- Section B: .375 DIA.
- Section A: MAX.
- Section B: MAX.

End View Dimensions:

- Overall diameter: .850
- Inner diameter: .708
- Inner diameter: MAX.
- Inner diameter: 45°

Notes:

- NOTE 1

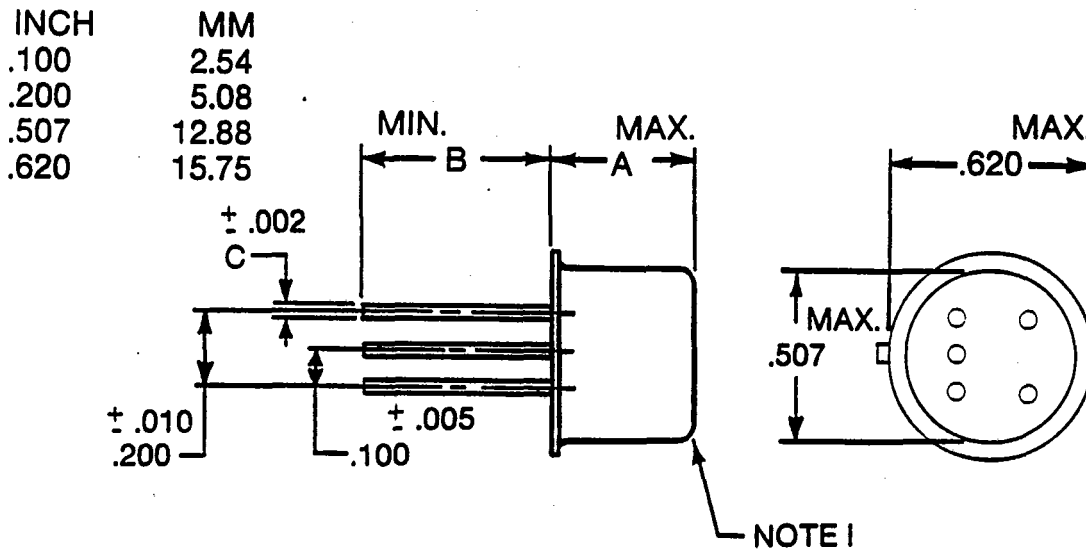
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2. TO ALLOW FOR TAPER, MIN. DIMENSION AT THIS POINT IS .697 DIA. (17.70 MM DIA.).
2. CLOSURE METHOD - COLD WELD.

EIA STANDARD

CLASS CO-8

HOLDER OUTLINES AND PIN
CONNECTIONS FOR QUARTZ
CRYSTAL UNITS



PART NUMBER			TABLE IN INCHES			ALT. PIN AVAIL	TABLE IN MM		
CLASS	PIN	CAN	A	B	C		A	B	C
CO-8	01	01	.265	.500	.018		6.73	12.70	.46
CO-8	02	01	.265	.281	.030		6.73	7.14	.76
CO-8	01	02	.600	.500	.018		15.24	12.70	.46
CO-8	02	02	.600	.281	.030		15.24	7.14	.76
CO-8	01	03	1.00	.500	.018		25.40	12.70	.46
CO-8	02	03	1.00	.281	.030		25.40	7.14	.76
CO-8	01	04	1.55	.500	.018		39.37	12.70	.46
CO-8	02	04	1.55	.281	.030		39.37	7.14	.76

NOTES:

1. TO ALLOW FOR TAPER, MIN. DIMENSION AT THIS POINT IS .498 DIA. (12.65 MM DIA.).
2. CLOSURE METHOD - COLD WELD.