

Alternate Solution for EOL Crystal Packages

Technical Paper

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CTS SOLUTION TO END-OF-LIFE CRYSTALS

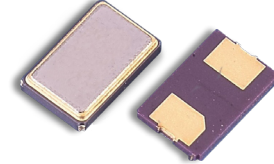
Legacy crystal products and packages can be hard to source, entering the end-of-life [EOL] threshold, or the last-time buy [LTB] date has passed. Two packages in this predicament are the 4-lead plastic small outline J-lead package [4-SOJ] and the 4-pad HC-49/US-SM metal can configuration. Finding a new form-fit replacement is nearly impossible; so many users face a costly re-design of their application board to accommodate a different package style. Before investing in a re-design project, CTS has an alternate solution for engineers to consider.



4-SOJ



HC-49/US-SM, 4-Pad



Model 435

The CTS solution is to place a Model 435 device across the existing attach pads that generate the electrical connections to the crystal resonator. See Drawing 1A/1B and 2A/2B. This alternate solution is a suitable short-term fix to manage current board inventory to keep production flowing until a long-term solution can be evaluated and implemented. Ultimately, CTS recommends that engineers rearrange their PC boards for a new package configuration with greater availability, potentially a lower cost, and a longer projected industry life cycle. Please contact CTS for recommendations.

4-SOJ PACKAGE

The drawings below show the new connections made by replacing the 4-SOJ device with Model 435. Also listed are common supplier model names for the 4-SOJ packages used in the industry.

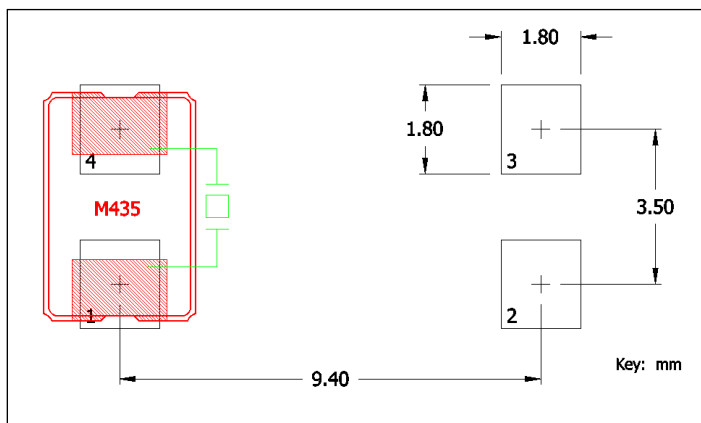


Figure 1a – Layout with Replacement M435

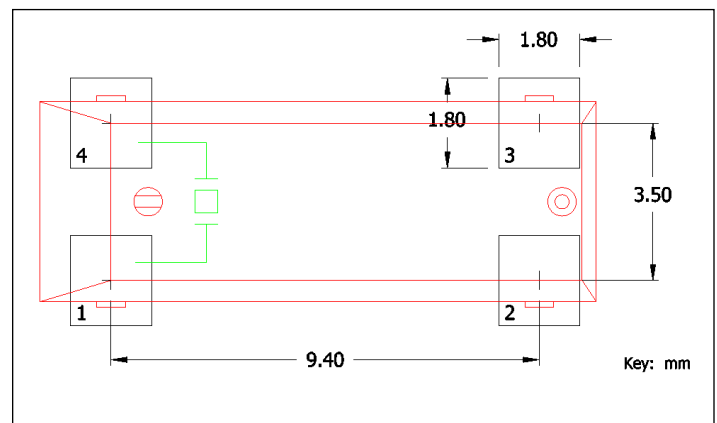


Figure 1b – Layout with Current 4-SOJ

Common Supplier Models

- Citizen – CM309, CM309B, CM309E, CM309S
- CTS – ATP-SM, VFSSMC-3
- Abracon – ABSM2
- ECS – ECX-3SX [7SX]
- Raltron – TT-SMDC

HC-49/US-SM

The drawings below show the new connections made by replacing the HC-49/US-SM device with Model 435. Also listed are common supplier model names for the HC-49/US-SM packages used in the industry.

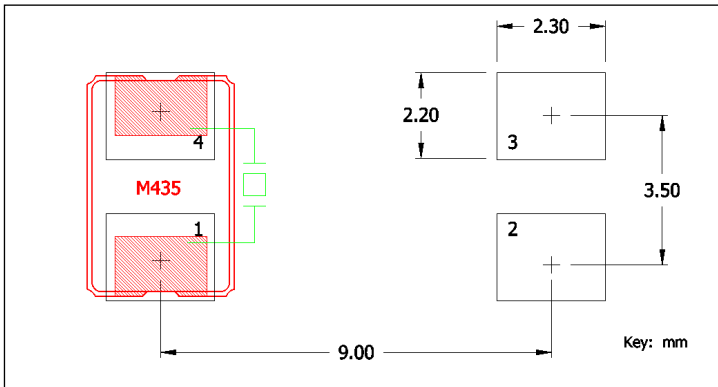


Figure 2a – M435 Replacement

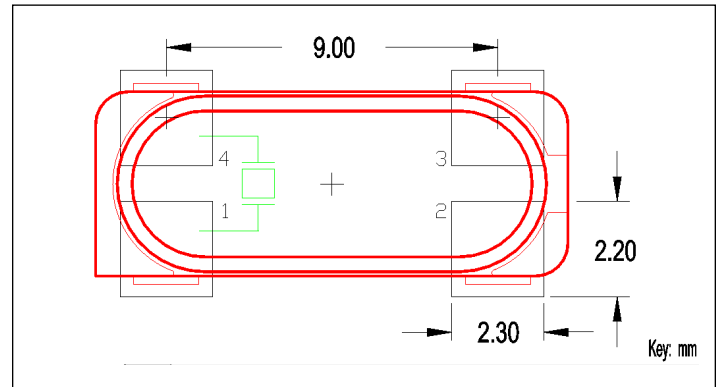


Figure 2b – HC-49/US-SM Current

Common Supplier Models

- CTS – ATSSM4P
- Abracon – ABSM3A, ABSM32A, ABSM33A, ABSM3B, ABSM32B, ABSM33B
- ECS – CSM-4AX [28AX]
- Raltron – AS-4PD

Layout Considerations for Model 435 Replacement

- Review M435 package compliance to existing PC board attach pad design
- Review solder stencil design for proper attach pad coverage and deposited amount
- May need to consider covering stencil openings for unused pads
- Review spacing design standards to adjacent components
- Adjust vision system pass/fail criteria for locations using M435 replacement environment

MODEL 435 PRODUCT REVIEW

Model	Package Size [mm]	Frequency [MHz]	Tolerance @ +25°C	Stability over Temperature	Operating Temperature Range
435	5.0 x 3.2 [2-pad]	7.6 – 156.25 Fund & 3rd OT	±10ppm ±15ppm ±20ppm ±25ppm ±30ppm	±10ppm ±15ppm ±20ppm ±25ppm ±30ppm ±50ppm	-20°C to +70°C -30°C to +85°C -40°C to +85°C -40°C to +105°C

https://www.ctscorp.com/connect_product_line/crystals/

ABOUT CTS

CTS (NYSE: CTS) is a leading designer and manufacturer of products that Sense, Connect, and Move. The company manufactures sensors, actuators, and electronic components in North America, Europe, and Asia. CTS provides solutions to OEMs in the aerospace, communications, defense, industrial, information technology, medical, and transportation markets. For more information on CTS Corporation and products, please visit www.ctscorp.com.

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