

ENGINEERING PRACTICE STUDY

TITLE: LEAD REQUIREMENTS FOR MIL-PRF-49470

26 AUGUST 2014

PROJECT NUMBER 5910-2014-013

FINAL REPORT

Study conducted by John A. Bonitatibus
Electronics Engineer
Electronics Component Branch
DLA Land and Maritime-VAT

Prepared by:

//Signed//

John A. Bonitatibus
Electronics Engineer
Electronics Components Branch

Approved by:

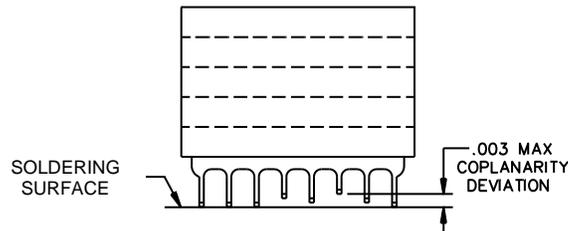
//Signed//

Michael A. Radecki
Chief
Electronics Components Branch

I. OBJECTIVE: An engineering practices study was conducted to gather information and comments regarding the addition of lead requirements to [MIL-PRF-49470](#).

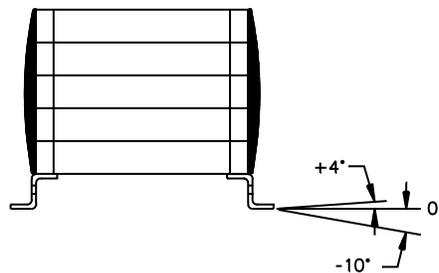
II. BACKGROUND: DLA Land and Maritime has learned that users of [MIL-PRF-49470](#) parts are rejecting units based on lead alignment tolerances that are not clearly defined in the specification; tolerances such as: coplanarity, foot angle, and seating plane. In order to meet the needs of the user base as well as protect the manufacturers, these tolerances should be specified and measurable. The G11 Component Parts Committee assigned task 12-206 to gather information regarding this issue. To that end, DLA Land and Maritime is considering adding the following requirements and clarifications to [MIL-PRF-49470](#):

Coplanarity



This proposed coplanarity requirement is intended for lead styles “L” and “J” to ensure that the lead bends are in one plane. The maximum deviation limit of .003 inches originates from [NASA STD 8739.2](#) (Workmanship Standard for Surface Mount Technology) (canceled).

Foot Angle

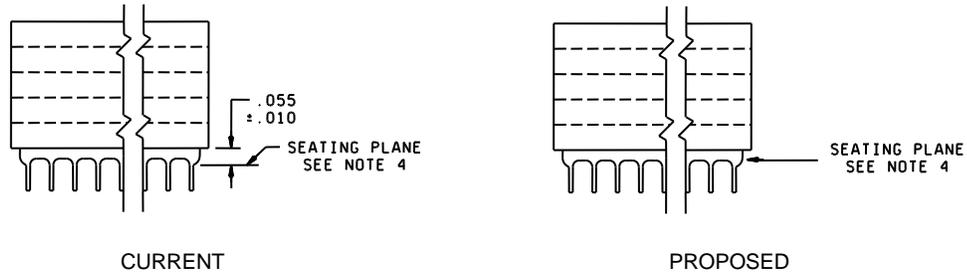


Note:

1. Foot angle shall be +4°, -10° from the plane formed by the bottom of the chip stack.

This proposed foot angle requirement is also intended for lead styles “L” and “J” to ensure that the lead bends are horizontal. A maximum deviation of +4°, -10° was suggested by a manufacturer.

Clarification to note 4 (MIL-PRF-49470/1 only)



MIL-PRF-49470/1E, figure 1, note 4 reads as follows:

Note 4: Lead frame configuration is shown as typical above the seating plane. A seating plane is only required for lead style N.

Because the configuration of the seating plane varies from manufacturer to manufacturer, consistent measurement is not always practical. The intent of the seating plane is to ensure that the part has a standoff height of .055 inches \pm .010 inches when mounted to a printed circuit board. Therefore, we are proposing the following wording:

Note 4: Lead frame configuration is shown as typical above the seating plane. The seating plane shall be configured to create a standoff height of .055 inches \pm .010 inches when the part is mounted to a printed circuit board. The standoff height shall be the distance between the PCB and the bottom of the chip stack. A seating plane is only required for lead style N.

III. RESULTS: Recipients of the study were asked to provide comments on the requirements and clarifications proposed herein and state if they feel these requirements should be included in MIL-PRF-49470.

Comments were received from several OEMs. They have experienced the issues referenced in this study and feel that adding the proposed requirements will be a benefit.

There were no objections to the proposals from any of the respondents, including several qualified manufacturers.

IV. CONCLUSIONS: The requirements and clarifications proposed in this study will help strengthen MIL-PRF-49470 and will be a benefit to users and manufacturers.

V. RECOMMENDATIONS: Revise MIL-PRF-49470/1 to add the requirements and clarifications proposed in this study.