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JEDEC STANDARD

Ceramic Package Specification for Microelectronic Packages

JESD27

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ELECTRONIC INDUSTRIES ASSOCIATION
ENGINEERING DEPARTMENT



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**CERAMIC PACKAGE SPECIFICATION
FOR
MICROELECTRONIC PACKAGES**

CONTENTS

<u>Section</u>	<u>Page</u>
1. SCOPE	1
2. GENERAL	1
3. REQUIREMENTS	2
3.1 General	2
3.2 Conflicting Requirements	2
3.3 Terms, Definitions, and Symbols	2
3.4 Classification of Requirements	3
3.5 Quality Assurance Program	3
3.6 Design and Construction	6
3.7 Workmanship	6
4. QUALITY ASSURANCE PROVISION	7
4.1 Responsibility for Tests and Inspections	7
5. PREPARATION FOR DELIVERY	7
5.1 Packaging and Packing	7
6. ORDERING DATA	8
6.1 General	8

JEDEC STANDARD No. 27

CONTENTS (continued)

<u>Section</u>	<u>Page</u>
7. VISUAL	8
7.1 General	8
7.2 Ceramic Defects	8
7.3 Contact Pads	12
7.4 Seal Area	14
7.5 Wire Bond	18
7.6 Die Attach	22
7.7 Braze Pads	25
7.8 Leads - Pins	28
APPENDIX A TERMS AND DEFINITIONS	40
APPENDIX B APPLICABLE INSPECTION AREAS BY PRODUCTS	41

**CERAMIC PACKAGE SPECIFICATION
FOR
MICROELECTRONIC PACKAGES**

(From JEDEC Council Ballot JCB-92-22, formulated under the cognizance of JC-13 Committee on Government Liaison.)

1. SCOPE

This JEDEC Standard establishes the general requirements and quality assurance provisions which can be specified and met in procuring microelectronic packages manufactured from ceramics.

This document details those minimum requirements necessary for ceramic packages.

2. GENERAL

The following documents of issues in effect on the date of invitation for bids or request for proposals shall form a part of this specification to the extent specified herein.

Applicable Documents

Naval Publications and Forms Center
5801 Tabor Avenue
Philadelphia, PA 19120

Military

MIL-M-38510 Microcircuits, General Specification for

Standards

MIL-STD-883 Test Methods and Procedures for Microelectronics

MIL-STD-45662 Calibration Systems Requirements

MIL-STD-1835 See Table II, page 5.

3. REQUIREMENTS

3.1 General

The manufacturers of ceramic microelectronic packages in compliance with this specification shall have and use production and test facilities and a quality and reliability assurance program adequate to assure successful compliance with provisions of this specification and the associated detail specification.

3.2 Conflicting Requirements

In the event of conflict between the requirements of this specification and other requirements, the following shall apply in order of precedence:

- (a) Package Drawing and Specification
- (b) This Specification
- (c) Other Documents Referenced in 2.

3.3 Terms, Definitions, and Symbols

3.3.1 Definition

The term package or packages in this specification shall be considered identical to cases, headers, parts or housings. Covers are included as part of this specification where applicable.

3.3.2 Terms, Definitions, and Symbols

For the purpose of the specification, the terms, definitions, and symbols of MIL-M-38510, MIL-STD-883, and those contained herein shall apply and shall be used in the applicable procurement documentation.

3.3.3 Production Lot

A production lot shall consist of packages manufactured on the same production line(s) by means of the same production technique(s) constituent material lots, control(s), and design(s).

3.3.4 Inspection Lot

An inspection lot shall consist of packages having the same configurations, manufactured using the same facilities, processes, materials, and finish plated as one lot (if plating is applicable). All packages shall be traceable to their original inspection lot.

3.3.5 Item Requirements

The individual item requirements for packages delivered under this specification shall be documented in the purchase documentation.

3.4 Classification of Requirements

The requirements of the packages are classified herein as follows:

- (a) Quality Assurance
- (b) Design and Construction
- (c) Workmanship

3.5 Quality Assurance Program

A quality assurance program shall be used that is adequate to assure successful compliance with provisions of this specification and associated detail specification and/or procurement documents.

3.5.1 Qualifications of Packages

Qualifications of packages shall consist of meeting the requirements of all ceramic package-related tests of Method 5008 or Method 5005 of MIL-STD-883, whichever is applicable, and the requirements of this specification.

3.5.2 Change of the Quality Assurance Program

After a manufacturer qualifies a package type he shall not implement any changes in product design, material, process, or control without concurrent change in the quality assurance program documentation.

3.5.3 Change of Qualified Product

The manufacturer shall notify the procuring activity prior to the implementation of any change of the product or quality assurance program which may affect performance, quality, reliability, or interchangeability.

3.5.4 Screening

All packages to be delivered or submitted for qualification or quality conformance in accordance with this specification shall have been subjected to and passed all criteria as required in Table 1 of this specification.

Table 1
Screening Tests

Examination or Test	MIL-STD-883 Method	Specific Conditions	Sample Size
1. Visual	2009	Appendices of this procedure	100%
	2017	3.1.3 As applicable	100% Note 1
2. Seal	1014		100%

NOTE 1: This applies to package elements (i.e., bottom of the cavity) that are designed to take the place of a substrate.

3.5.5 Quality Conformance Inspection.

Packages shall not be accepted or approved for delivery until the inspection lot has passed the quality conformance inspection required by Table 2.

3.5.6 Resubmitting Failed Lots

Resubmitting failed lots shall be in accordance with MIL-M-38510.

3.5.7 Traceability

All packages delivered shall be traceable to the inspection lot and shall be marked accordingly on the container.

Table 2
Quality Conformance Inspection

Examination or Test (Note 1)	MIL-STD-883 Test Method	Specific Conditions	Sample Size (Note 4)
1. Physical Dimensions	2016	Procurement Documentation	15 Pieces (0)
2. Plating Adhesion		MIL-M-38510 Microcircuit Finishes MIL-G-45204	For Destruct Test = 1 (0) For Non-Destruct Test = 5 (0)
3. (a) Thermal Shock (b) High Temperature (c) Lead Integrity (d) Seal	1011 1008 2004 2028 1014	C-15 cycles 1 hr @ 150°C B2 (lead fatigue) D (leadless chip carriers) (rigid leads) A4 unlidded packages	Note 2
4. Solderability	2003	Soldering temperature 245 +/- 5°C	Note 2 3(0) Note 3
5. Insulation Resistance	1003	100 Vdc 1 meg ohm	15 pcs (0) Note 2

NOTE 1: All tests except Visual, Seal, and Physical dimensions shall be considered destructive.

NOTE 2: Fifteen (15) leads minimum or all leads if less.

NOTE 3: Flux used shall be type R and steam aging time shall be 8 hours minimum.

NOTE 4: Samples shall be randomly selected from the inspection lot in accordance with Appendix B of MIL-M-38510.

3.6 Design and Construction

Package design and construction shall be in accordance with all of the requirements specified herein and in the purchase documentation.

NOTE: CAUTION

Packages utilizing beryllium oxide in any form should not be ground, sandblasted, machined or have other operations performed on them which produce beryllium oxide dust. Furthermore, beryllium oxide packages shall not be placed in acids that will produce fumes. Scrap beryllium oxide shall be disposed of in a manner consistent with the proper disposal of hazardous wastes.

3.6.1 Package

All packages supplied under this specification shall be capable of being hermetically sealed, as required by the detail specification.

3.6.2 Metals

External metal surfaces shall be corrosion-resistant or shall be plated or treated to resist corrosion. External leads shall meet the requirements specified in paragraph 3.6.3.

3.6.3 Lead Material and Finish

Lead material and finishes shall conform to MIL-M-38510.

3.7 Workmanship

Packages shall be manufactured, processed and tested in a careful manner, in accordance with good engineering practice, with the requirements of this specification, and with the production practices, workmanship instruction inspection and test procedures and training aids prepared by the manufacturer in fulfillment of the product assurance program of this specification.

4. QUALITY ASSURANCE PROVISION

4.1 Responsibility for Tests and Inspections

The manufacturer is responsible for the performance of all tests and inspection requirements as specified herein and in the purchase documentation. The manufacturer may use his own or other suitable facilities. The procuring activity reserves the right to witness or perform any of these tests and inspections set forth herein or in the purchase documentation and to audit the data resulting from the manufacturer's performance of these tests and inspections.

4.1.1 Inspection During Manufacture

The manufacturer shall establish and maintain inspection at appropriately located points in the manufacturing process to assure continuous control of quality of materials, subunits, and parts during fabrication and testing. This inspection shall be adequate to assure compliance with the procurement documentation and quality standards of the packages manufactured to this specification.

4.1.2 Inspection Records

The manufacturer shall maintain adequate records of all examinations, inspections and tests accomplished. Unless otherwise specified these records shall be maintained on file for a minimum of two years after product shipment.

5. PREPARATION FOR DELIVERY

5.1 Packaging and Packing

The package containers shall provide adequate protection from the contamination and physical damage encountered in normal handling and storage. No packaging or packing material that is used shall crumble, flake, or shred. Leads must be supported to prevent vibration and retain their shape and position. The cushioning material near or in contact with the packages shall not be fibrous in form which might cause leads to be caught and damaged upon removal.

6. ORDERING DATA

6.1 General

Purchase documentation should specify the following:

- (a) Part Number and Revision Status
- (b) Number and Revision Level of this Specification
- (c) Data to be Furnished

7. VISUAL

7.1 General

Visual criteria given herein may be used in conjunction with procurement activity specification in order to describe all requirements necessary for a specific package.

All visual inspection shall be performed at 7 - 10x magnification with verification and measurement at 30x +/-3x magnification.

Dimensions in this specification are in inches.

7.2 Ceramic Defects

7.2.1 Chips

Refer to Figure 1.

- (a) Reject for Cavity Edge chips exceeding 0.010 inch x 0.010 inch X 0.030 inch; no more than one chip per package side.
- (b) Reject for Cavity Corner chips greater than 0.010 inch X 0.010 inch X 0.010 inch; no more than two chips per cavity.
- (c) Reject for Outside Edge Chips greater than 0.030 inch X 0.030 inch X 0.100 inch; no more than one chip per package side.
- (d) Reject for Outside Cavity Corner chips greater than 0.030 inch X 0.030 inch X 0.030 inch; no more than two chips per part.

(e) Reject for a chip which undercuts a metallized area.

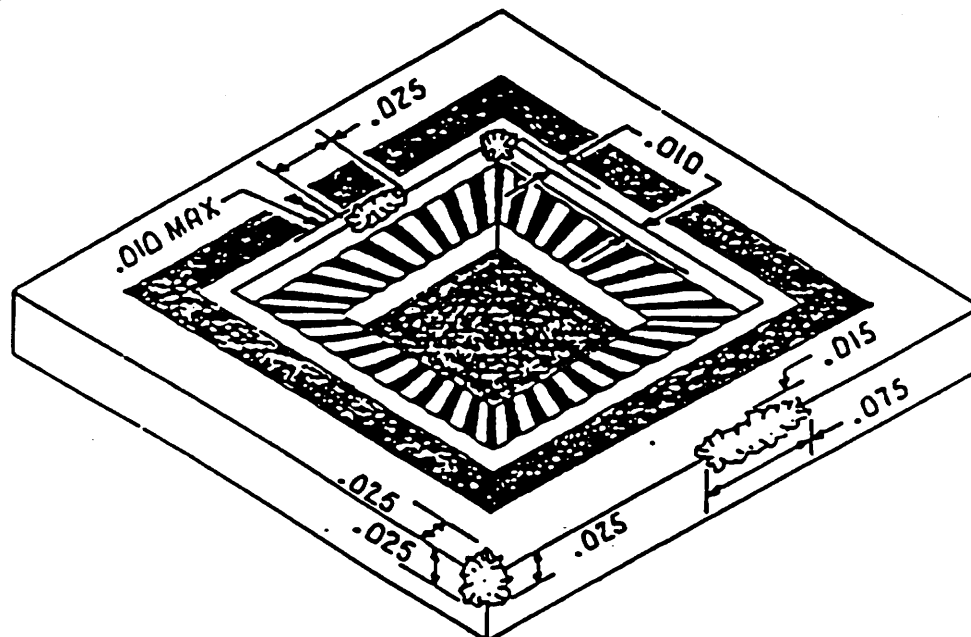


Figure 1
Ceramic Chips

7.2.2 Cracks

None allowed. Refer to Figure 2.

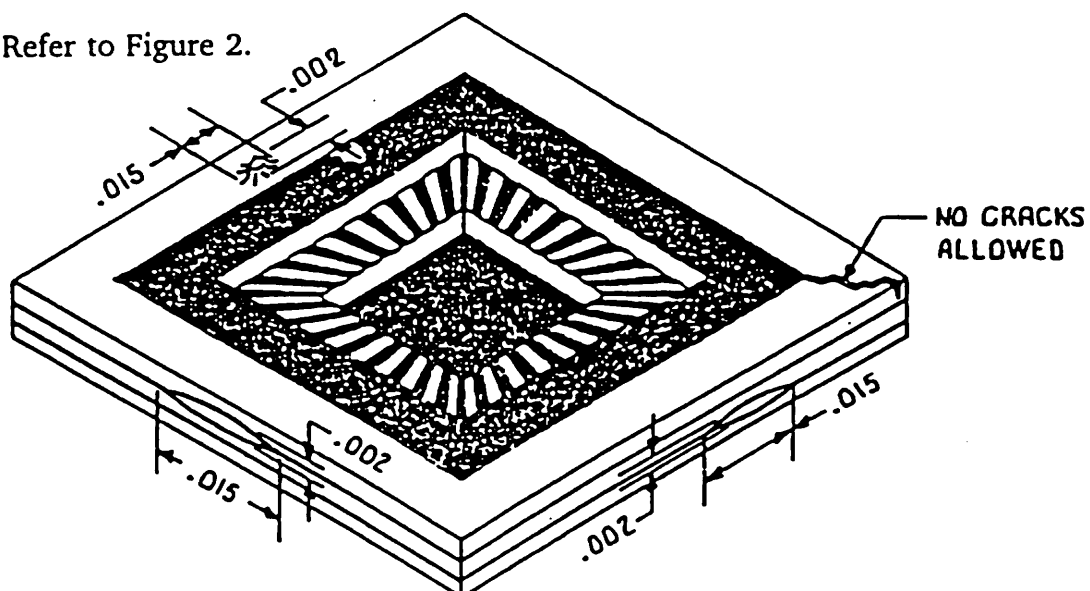


Figure 2
Ceramic Defects

7.2.3 Projections

Projections shall not exceed 0.002 inch height X 0.015 inch diameter. No more than one projection per surface or on each side. Refer to Figure 3.

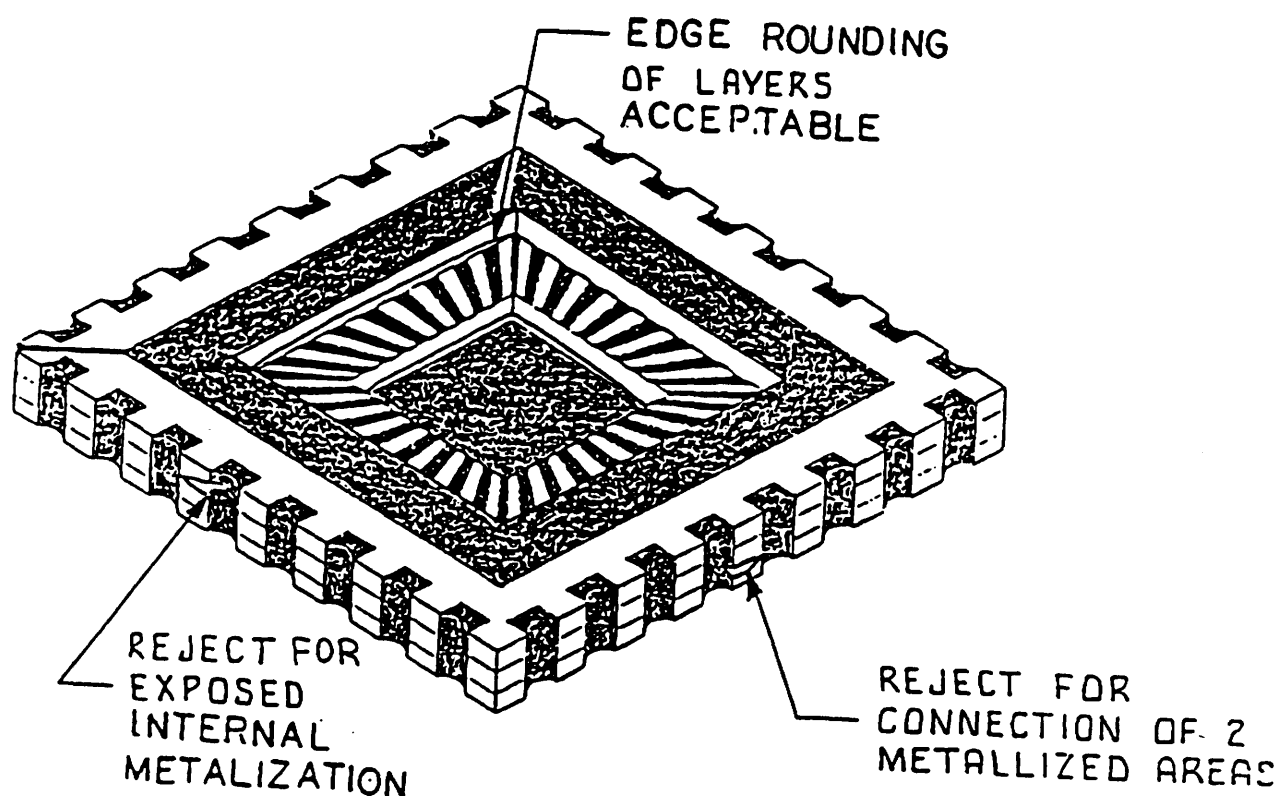


Figure 3
Delamination and Edge Rounding

7.2.4 Delamination

Refer to Figures 2 and 3.

- (a) Reject for delaminations greater than 0.002 inch X 0.015 inch on each side.
- (b) Reject for delamination which connects two metallized areas.
- (c) Reject for delamination which exposes internal metallizing.
- (d) Rounding at edge due to multilayer construction or slight layer misalignment is acceptable.

7.2.5 Fin/Burr

Refer to Figure 4.

- (a) Reject for fin/burr greater than 0.005 inch X 0.015; no more than one per side.
- (b) Reject for fin/burr which causes part to exceed maximum dimension.
- (c) Reject for fin/burr which is not firmly attached to package.

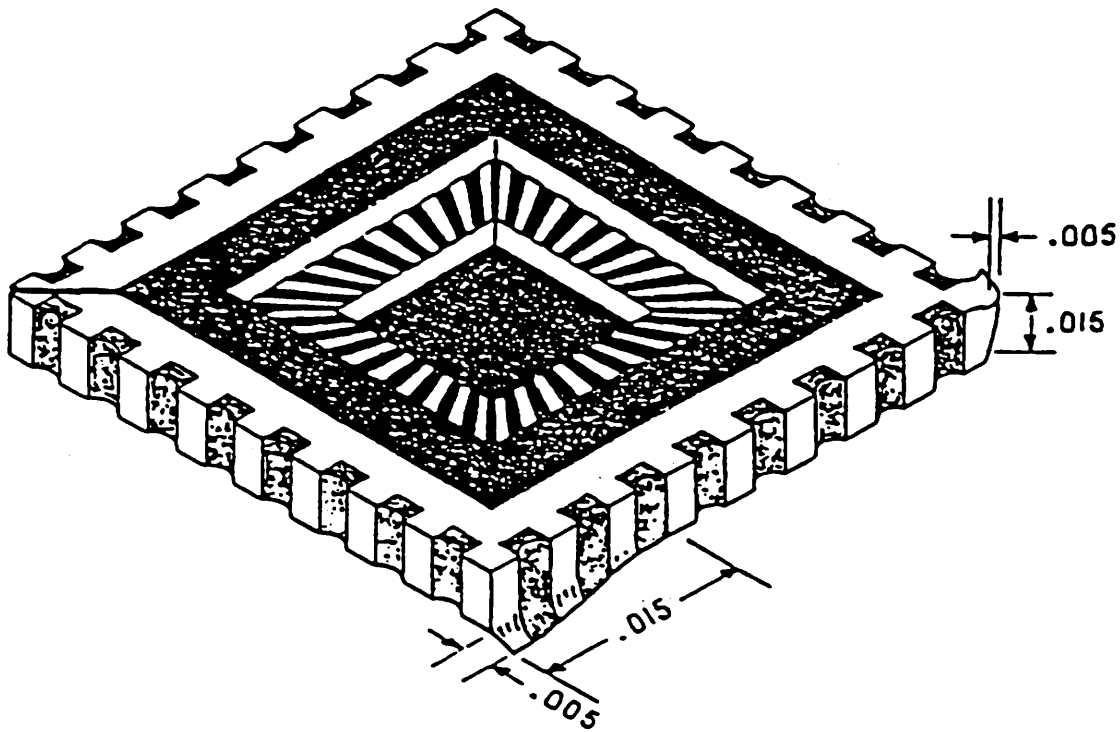


Figure 4
Ceramic Fins and Burrs

7.2.6 Pits/Pocks/Holes

- (a) Reject for pits/pocks/holes greater than 0.003 inch depth X 0.005 inch diameter.
- (b) Reject for pits/pocks/holes which expose internal metallizing.

7.3 Contact Pads

7.3.1 Metallization

Reject for any evidence of peeling, flaking or lifting metallization. Refer to Figure 5.

7.3.2 Projections

Refer to Figure 5. Reject for projections which exceed the following:

- (a) 0.002 inch height X 0.005 inch diameter.
- (b) Not fully plated and firmly attached.
- (c) More than five (5) projections per package side.
- (d) More than one (1) projection per pad.

7.3.3 Voids

Refer to Figure 5. Reject for voids which exceed the following:

- (a) Greater than 0.005 inch X 0.010 inch.
- (b) More than one (1) void per pad.
- (c) More than five (5) voids per side.

7.3.4 Pit/Depression

Reject for pits or depressions which exceed the following:

- (a) Greater than 0.002 inch depth X 0.005 inch diameter.
- (b) More than one (1) pit/depression per pad.
- (c) More than five (5) pits/depressions per side.

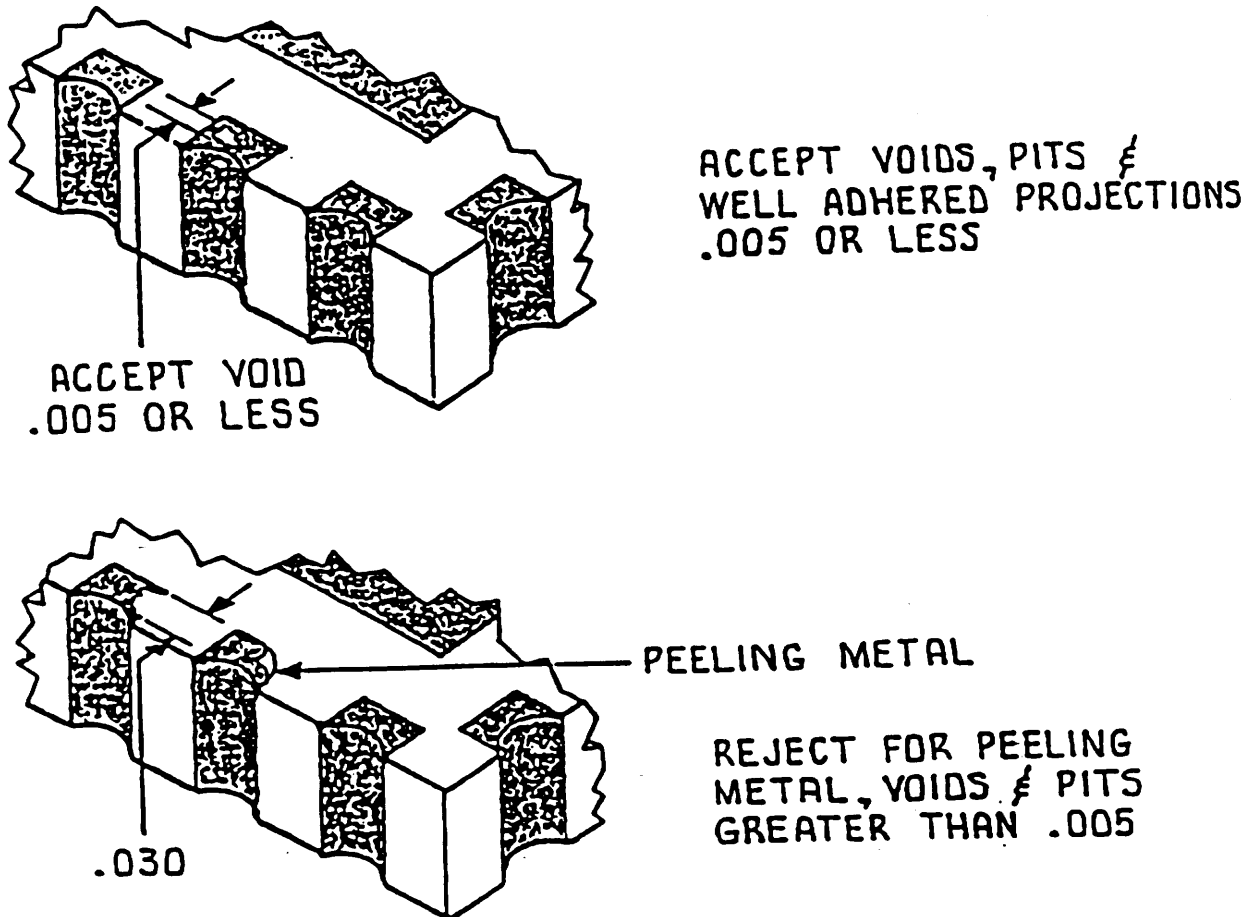


Figure 5
Contact Pad Defects

7.3.5 Smeared Metal and Isolation Gap

Refer to Figure 6.

- (a) Smeared metal and isolation gap rejects include parts which may exhibit bridged metallization or gold blush across the space between contact pads.
- (b) Reject for smeared metal which reduces the separation between contact pads to less than fifty percent (50%).
- (c) Reject for smeared metal which prohibits parts from meeting electrical requirements.

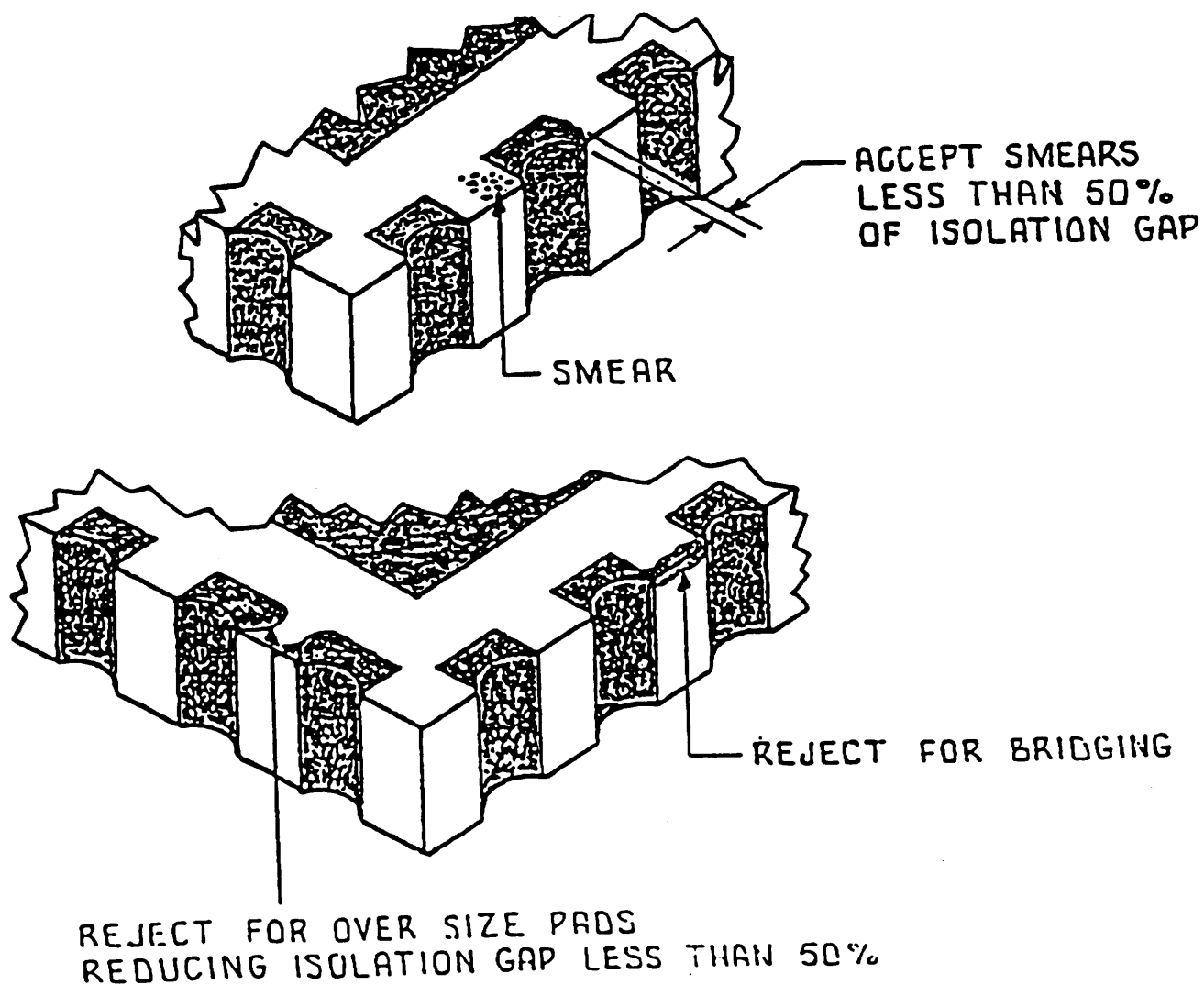


Figure 6
Contact Pad Smeared Metal

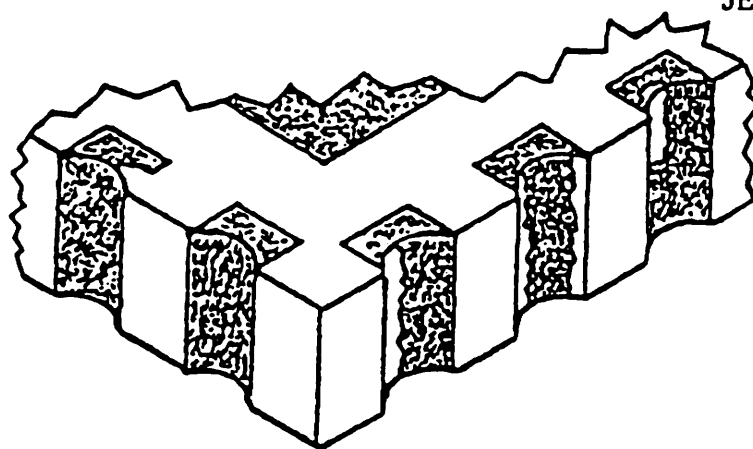
7.3.6 Visual Opens

All metal conductor paths must not be reduced by more than 50% of design width.
Refer to Figure 7.

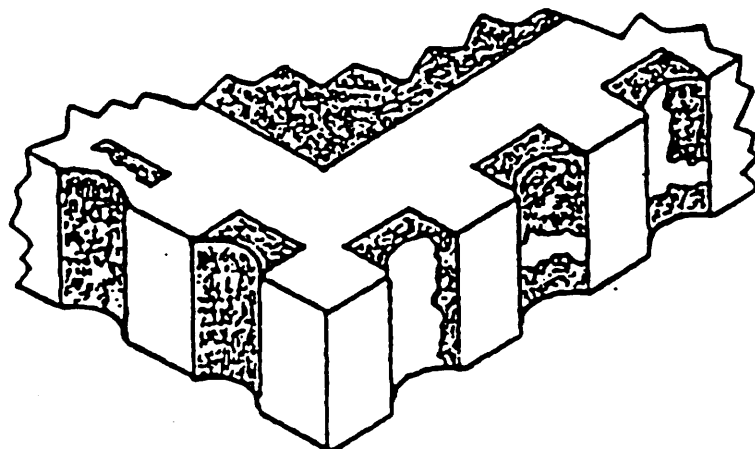
7.4 Seal Area

7.4.1 Peeling/Flaking/Lifting

None allowed. Refer to Figure 8.



ACCEPTABLE OPENS



REJECT FOR LESS THAN 50% CONNECTION

7.4.2 Projections

Refer to Figure 8.

- (a) Reject for projections greater than 0.001 inch height X 0.005 inch diameter.
- (b) Reject for projections which are not firmly attached.
- (c) Reject for parts which have more than three (3) projections per side.
- (d) Reject for projections closer than 0.001 inch to each other.
- (e) Reject parts where projection has reduced the width of the original seal area by more than 25%.

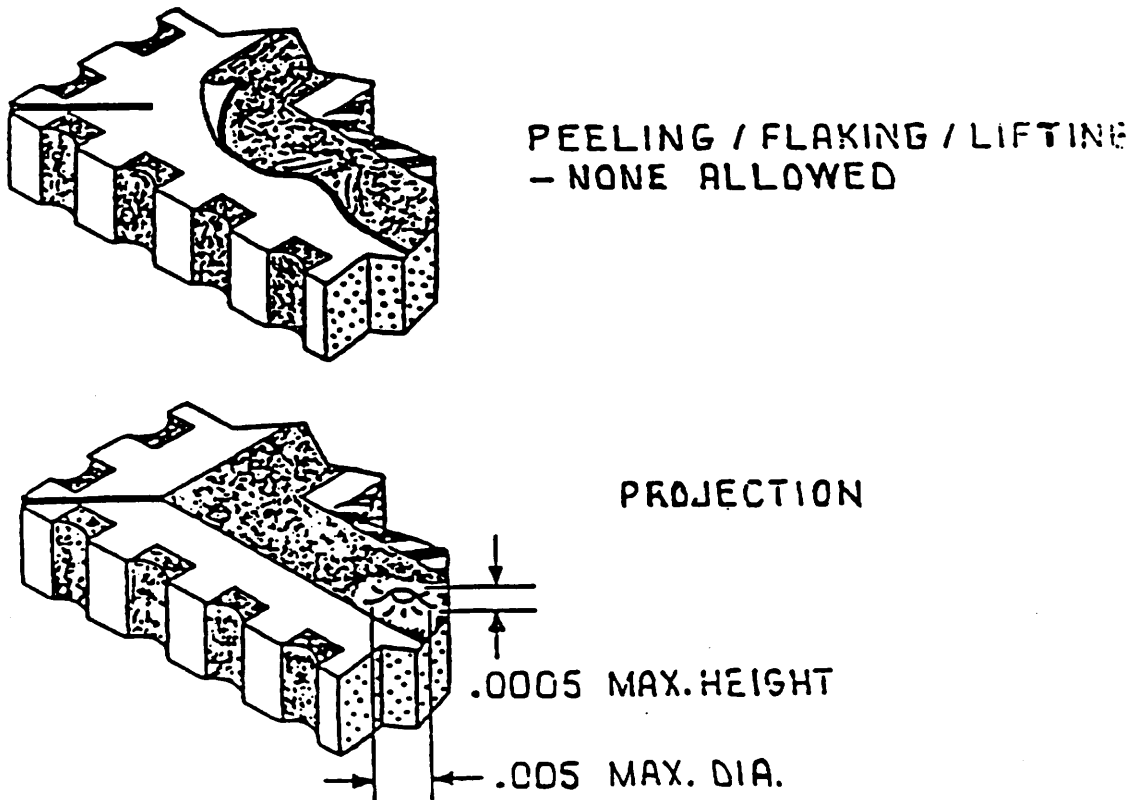


Figure 8
Seal Area Defects

7.4.3 Void

Refer to Figure 9.

- (a) Reject for voids which exceed 0.010 inch maximum diameter.
- (b) Reject parts with more than five (5) voids per side of seal area.
- (c) Reject for parts with voids closer than .100 inch to each other.
- (d) Reject for voids which reduce total seal area by more than 25%.

7.4.4 Pit

Refer to Figure 9.

- (a) Reject for pits greater than 0.002 inch depth X 0.005 inch diameter.
- (b) Reject parts which have more than five (5) pits per seal area side.
- (c) Reject for parts with pits than .100 inch to each other.
- (d) Reject for pits which reduce total seal area by more than 25%.

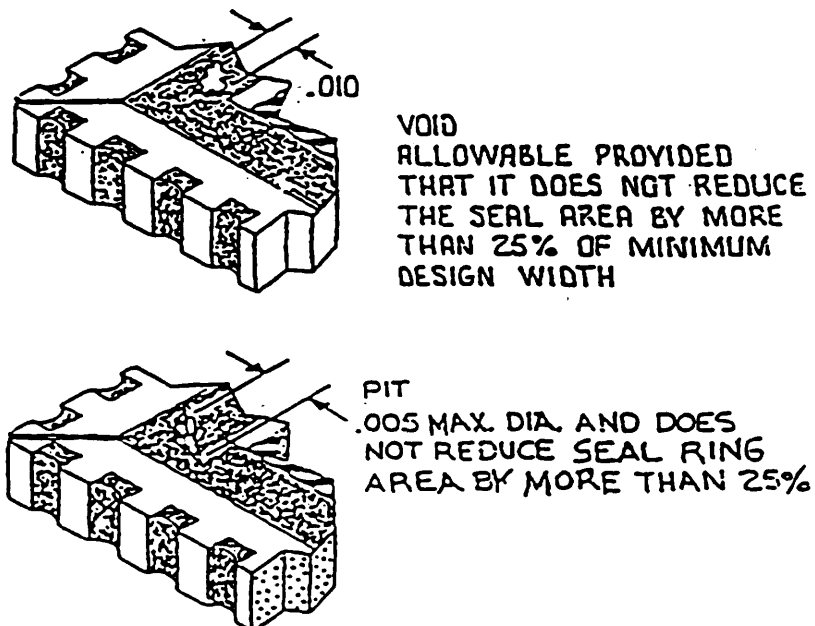
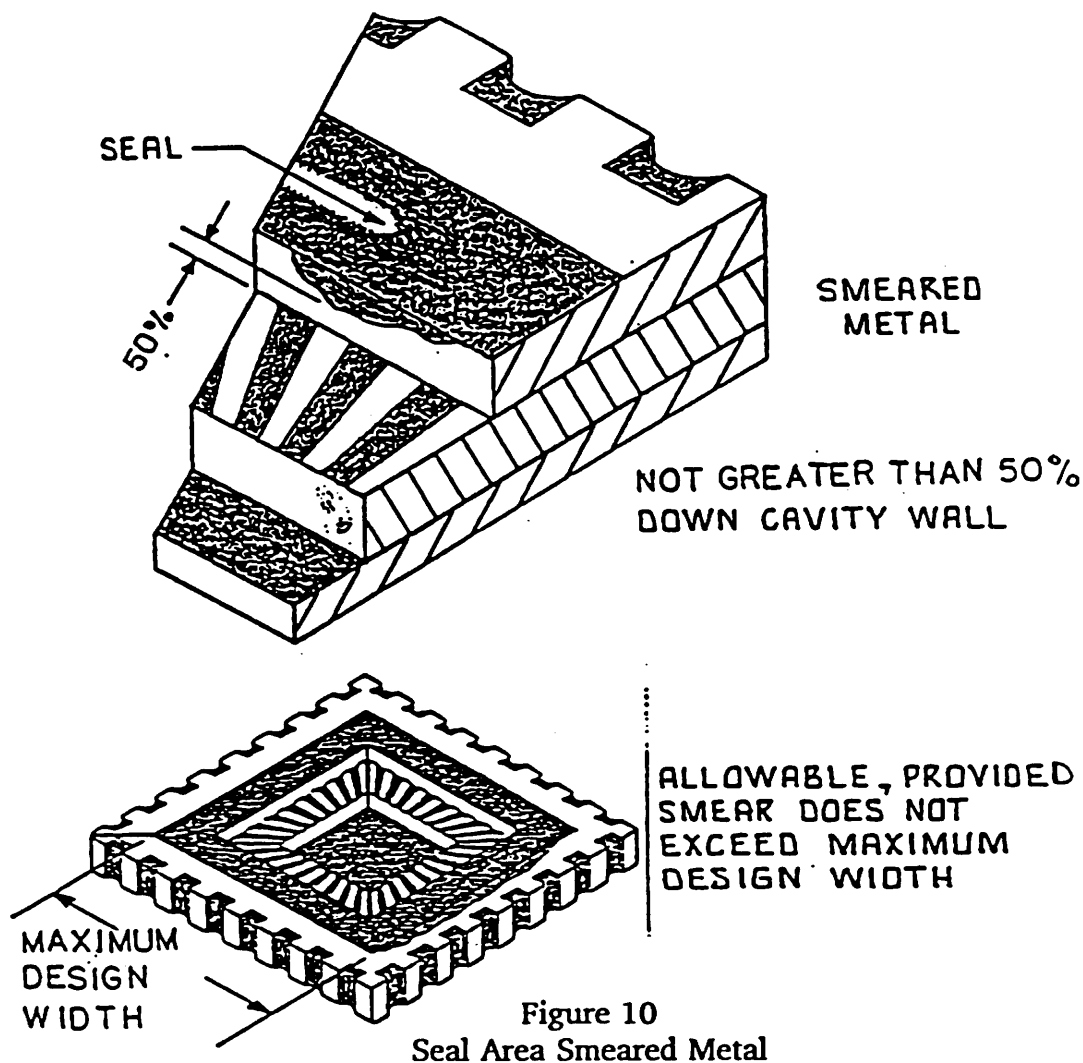


Figure 9
Seal Area Voids and Pits

7.4.5 Smeared Metal

Refer to Figure 10.

- (a) Reject for smeared metal which is smeared more than 50% down cavity wall.
- (b) Reject for smears which cause seal area to be larger than the maximum allowable dimension.



7.5 Wire Bond

For purposes of visual inspection, the Critical Wire Bond Area shall be defined as an area which is 0.015 inch length and is 80% the width of the designed wire bond finger width. This area is to be located no further back than 0.025 inch from the tip of the wire bond finger. The tip of any wire bond finger shall not be further back than 0.005 inch from the edge of the ceramic layer. Refer to Figure 11.

7.5.1 Metallization on Wire Bond Pad

Reject for any evidence of Peeling/Flaking/Lifting Metallization on wire bond pad.

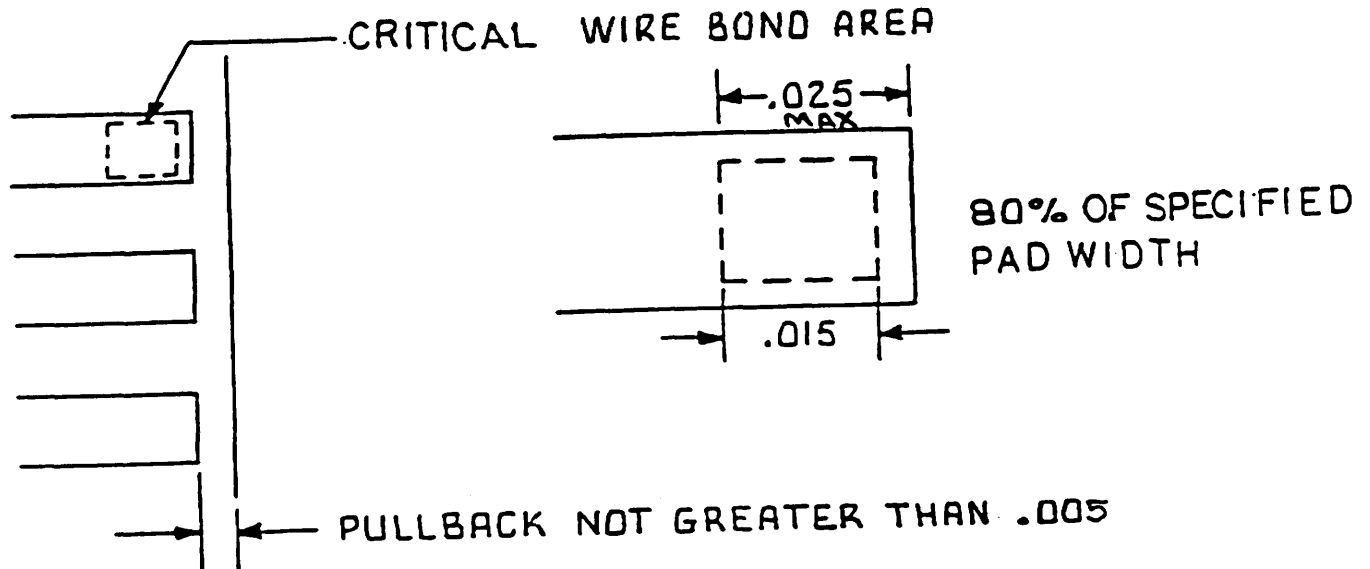


Figure 11
Critical Wire Bond Area and Pullback

7.5.2 Projection

- (a) Critical Wire Bond - none allowed.
- (b) Remaining Trace - No projections allowed greater than 0.002 inch height X 0.005 inch diameter. Must be well adhered and no more than five (5) projections per part.

7.5.3 Void

- (a) Critical Wire Bond - none allowed.
- (b) Remaining Trace - No projections allowed greater than 0.002 inch height X 0.005 inch maximum diameter. No more than one (1) void per wire bond pad and must meet Visual Open criteria in 7.4.6. See Figure 12.
 - No more than one per trace.
 - Must not be greater than 50% of design width.

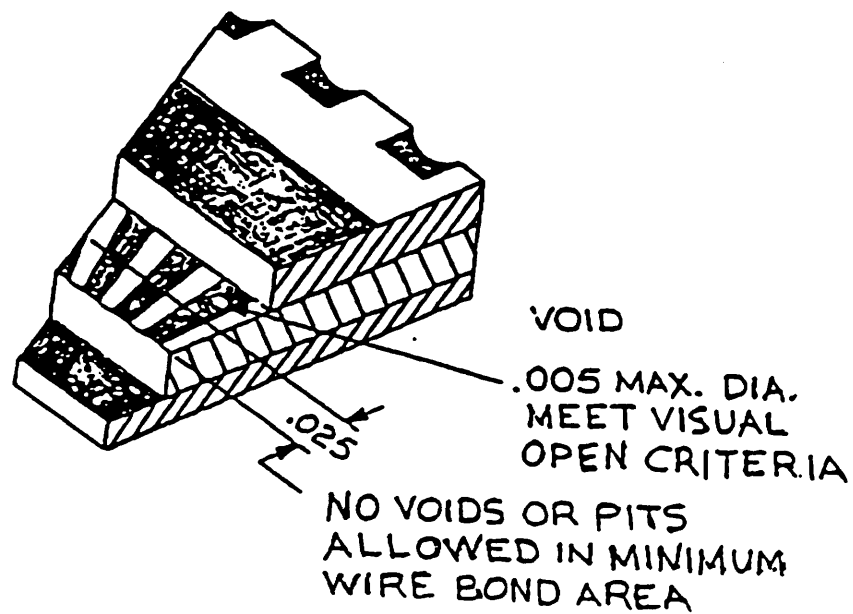


Figure 12
Wire Bond Pad Voids and Pits

7.5.4 Pit

Refer to Figure 13.

- (a) Critical Wire Bond Pad - None allowed.
- (b) Remaining Trace - No pits greater than 0.002 inch depth X 0.005 inch diameter and no more than one pit per trace.

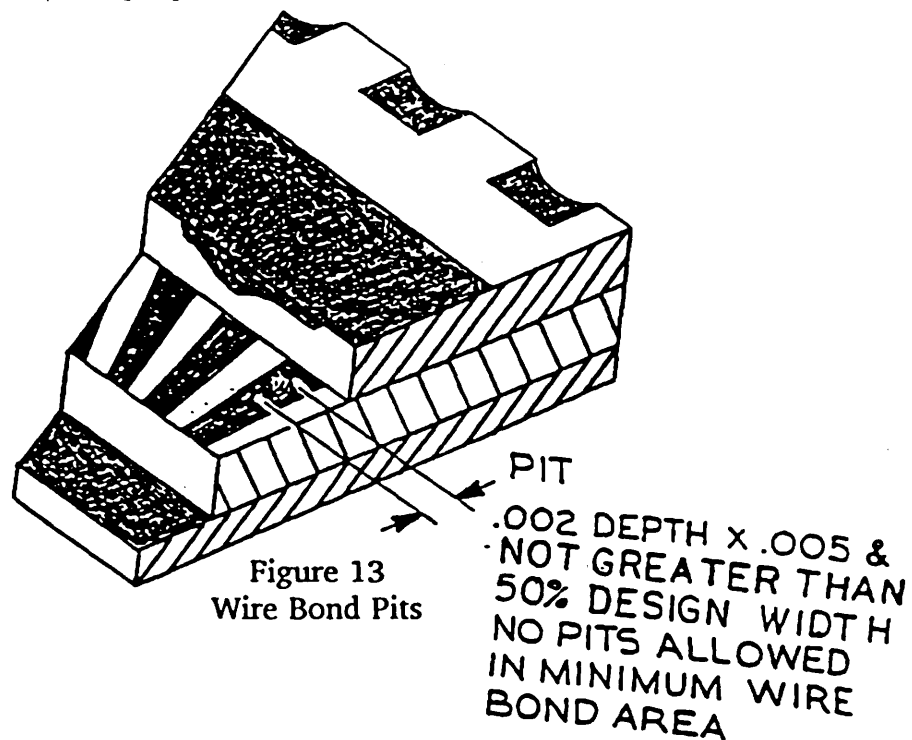


Figure 13
Wire Bond Pits

7.5.5 Smeared Metal/Isolation Gap

Refer to Figure 14.

Smeared metal allowed provided that electrical parameters are met and the smears are not greater than 50% of the designed spacing width.

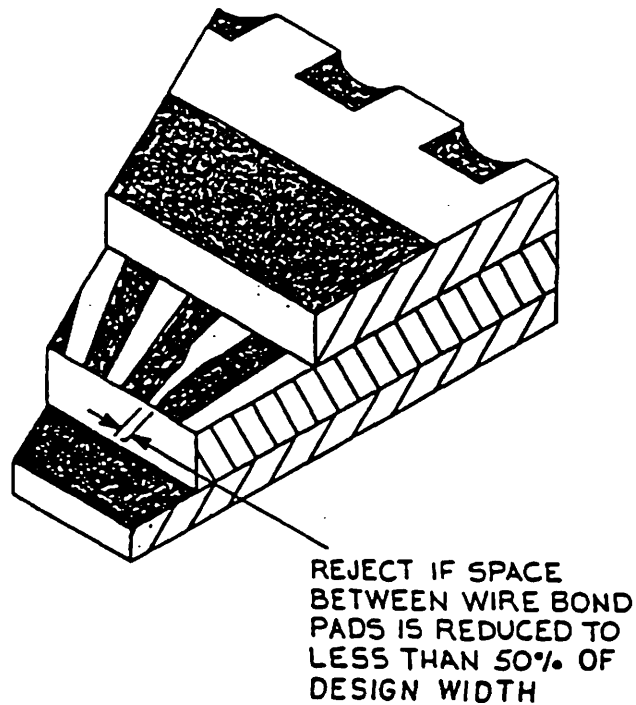


Figure 14
Wire Bond Smeared Metal

7.5.6 Visual Open

Refer to Figure 15.

- (a) Critical Wire Bond Pad - None allowed.
- (b) Remaining Trace - Visual opens must not reduce the width of the wire bond pad by more than 50% .

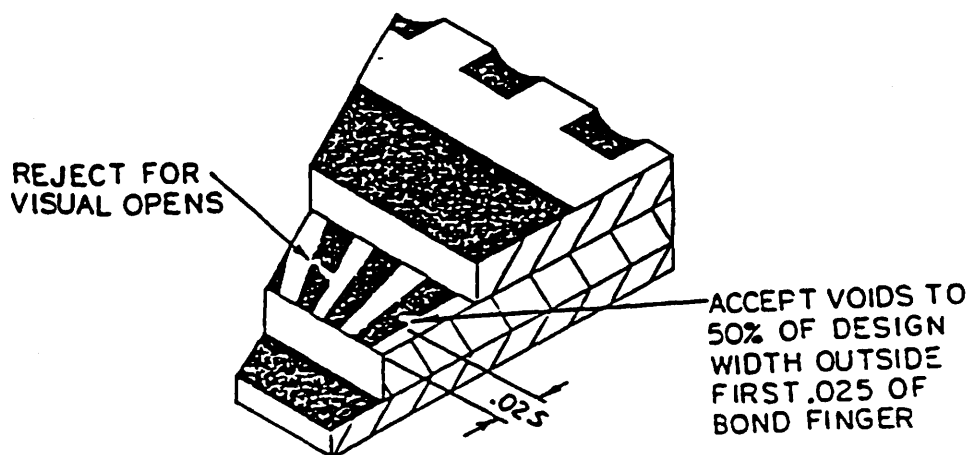


Figure 15
Wire Bond Pad Visual Opens

7.6 Die Attach

For purposes of visual inspection, the Critical Die Attach Area shall be defined as that area which is within a 0.020 inch perimeter from the die attach cavity wall. Refer to Figure 16.

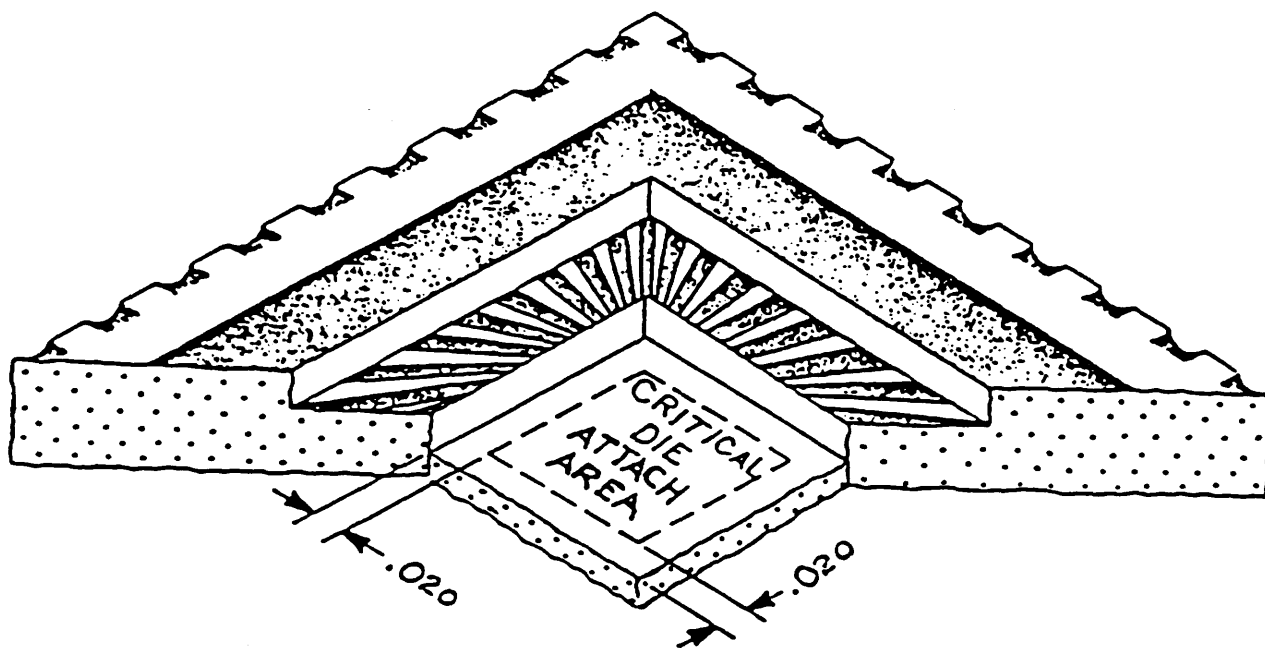


Figure 16
Critical Die Attach Area

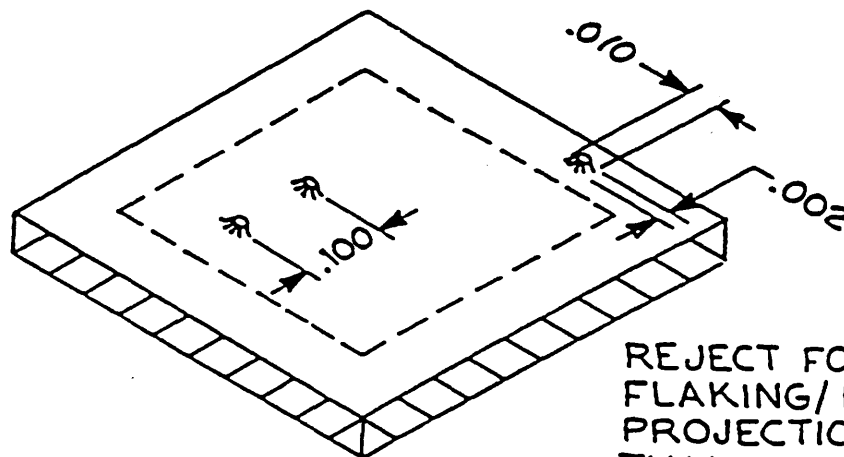
7.6.1 Metallization

No peeling, flaking, or lifting metallization allowed.

7.6.2 Projections

Refer to Figure 17.

- (a) Critical Die Attach Area - Reject for projections greater than 0.002 inch height X 0.005 inch diameter. These must be well adhered with no more than five (5) allowed and no closer than .100 inch to each other.
- (b) Perimeter - No projections greater than 0.002 inch height X 0.010 inch diameter and must be well adhered.



REJECT FOR PEELING/
FLAKING/ LIFTING AND/OR
PROJECTIONS CLOSER
THAN .100 IN CRITICAL
DIE ATTACH OR EXCEED
MAXIMUM ALLOWABLE
DIMENSIONS FOR EACH
DEFECT.

Figure 17
Die Attach Projections

7.6.3 Void

Refer to Figure 18.

- (a) Critical Die Attach Area - Reject for voids greater than 0.010 inch maximum diameter. No more than five (5) voids allowed. Reject for voids closer than .100 inch to another void.
- (b) Perimeter - No requirement.

7.6.4 Pit

- (a) Critical Die Attach Area - Reject for pits greater than 0.002 inch depth X 0.005 inch diameter. No more than five (5) pits allowed and not closer than .100 inch to another pit.
- (b) Perimeter - No requirement.

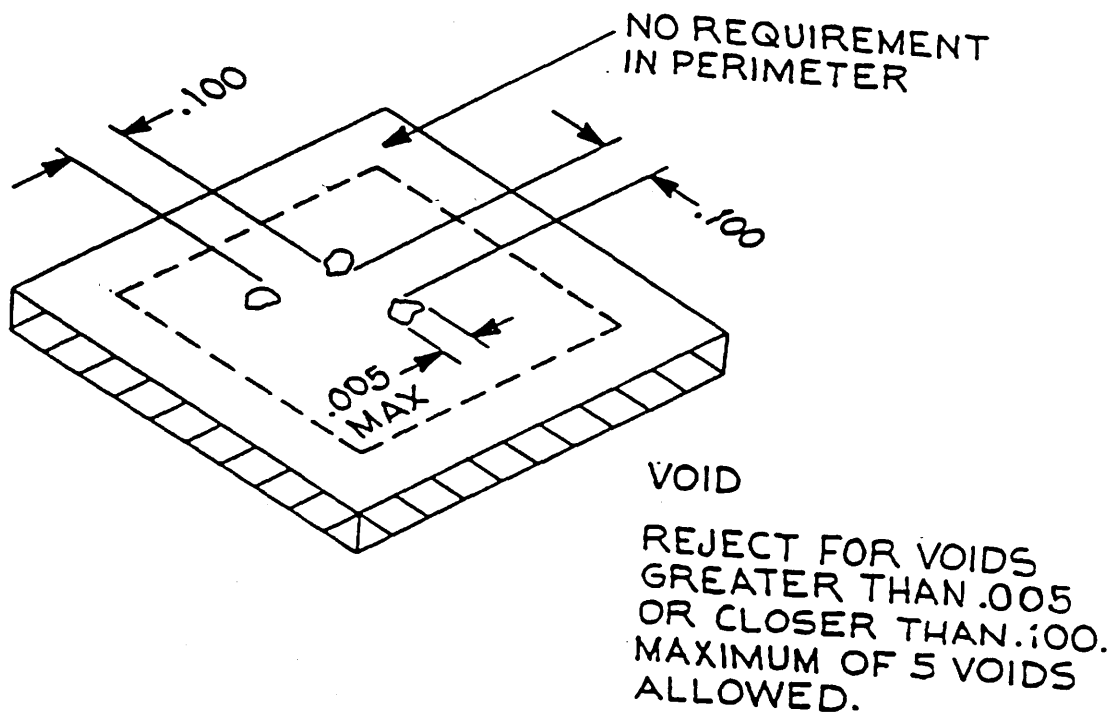


Figure 18
Die Attach Voids

7.6.5 Smeared Metal

Refer to Figure 19.

- (a) Reject for smeared metal greater than 50% of cavity wall.
- (b) Reject for smears which exceed maximum design dimension.

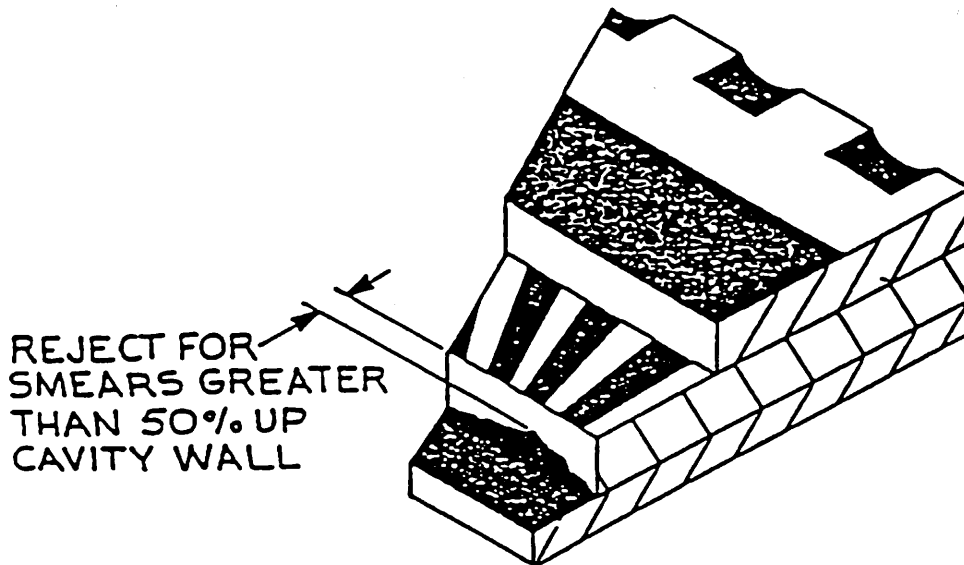


Figure 19
Die Attach Smeared Metal

7.7 Braze Pads

7.7.1 Metallization on Braze Pads

Reject for any evidence of peeling, lifting or flaking metallization on braze pads. Refer to Figure 20.

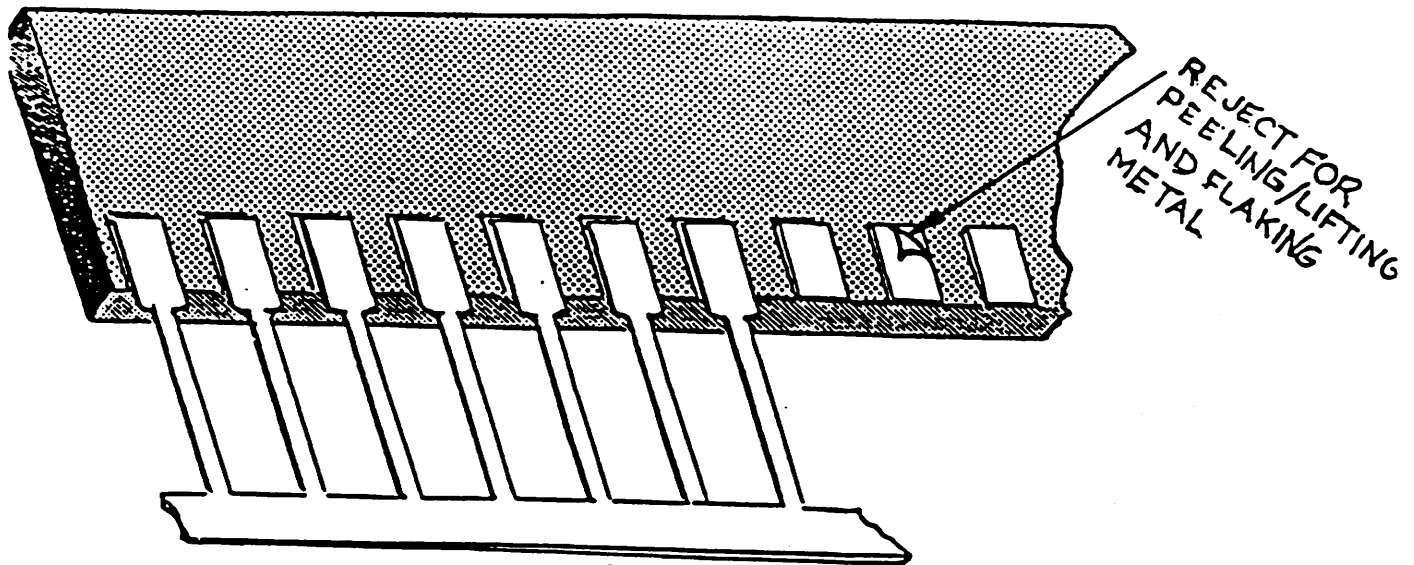


Figure 20
Braze Pad Peeling Metal

7.7.2 Projections

Reject for projections which exceed 0.002 inch height X 0.005 inch diameter. Reject for projections which are not firmly attached and/or uprooted. There must be no more than one (1) projection per pad and no more than 5 per side. Refer to Figure 21.

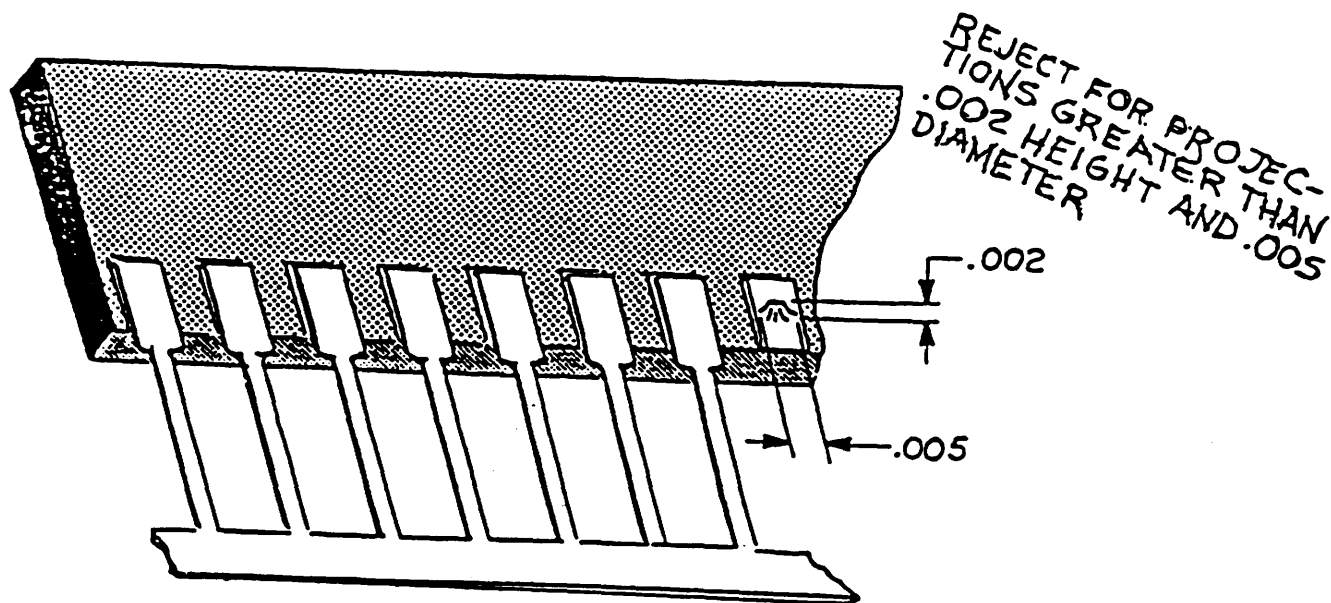


Figure 21
Braze Pad Projections

7.7.3 Voids

Refer to Figure 22. Voids in external metallizing shall be limited to:

- (a) No greater than 0.005 inch diameter.
- (b) Maximum occurrence of one (1) per pad.
- (c) No more than 5 per side.

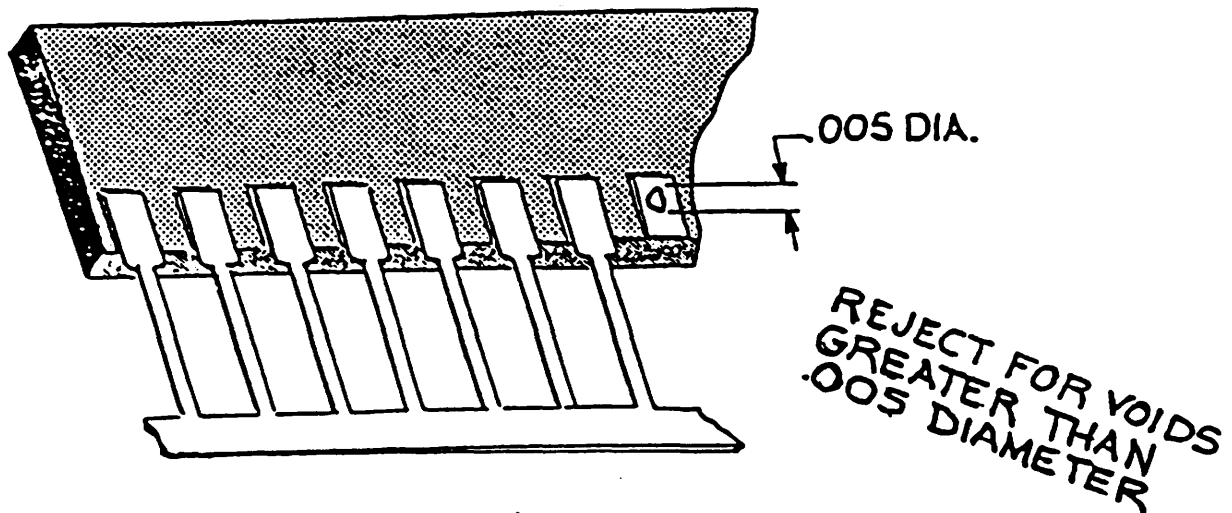


Figure 22
Braze Pad Voids

7.7.4 Pits

Reject for pitted braze pads which exceed the following:

- (a) Pits greater than 0.002 inch depth X 0.005 inch diameter.
- (b) More than one (1) pit per braze pad.
- (c) More than five (5) pits per side.

7.7.5 Smeared Metal and Isolation Gap

Refer to Figure 23.

- (a) Smeared Metal or Isolation Gap rejects shall include parts which exhibit bridging and gold blush between braze pads.
- (b) Smeared metal shall be allowed provided that isolation resistance requirements are met and that separation between pads is greater than 50% of design spacing.

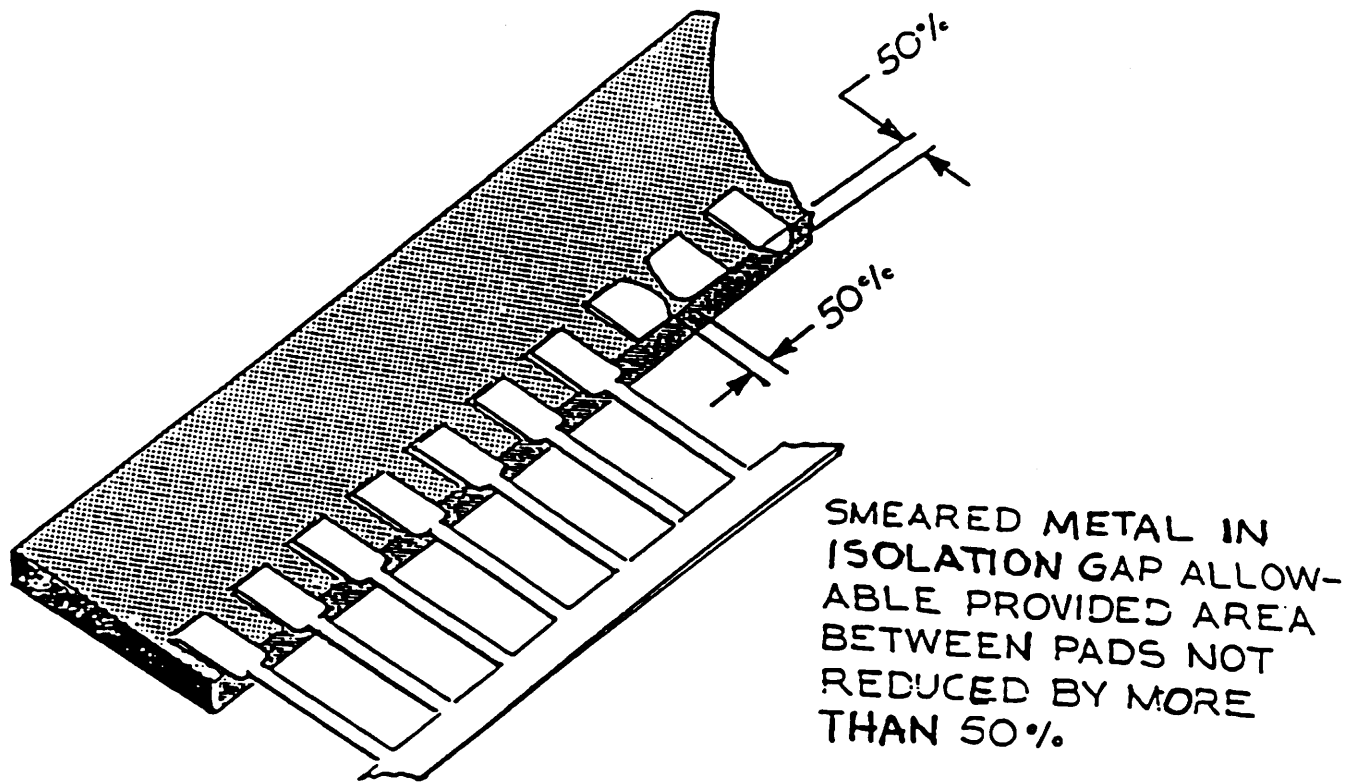


Figure 23
Braze Pad Smeared Metal

7.7.6 Visual Open

No braze pad visual opens allowed.

7.8 Leads - Pins

7.8.1 Metallization on Leads - Pins

There shall be no peeling, flaking, or lifting of metallization on leads or pins. Refer to Figure 24.

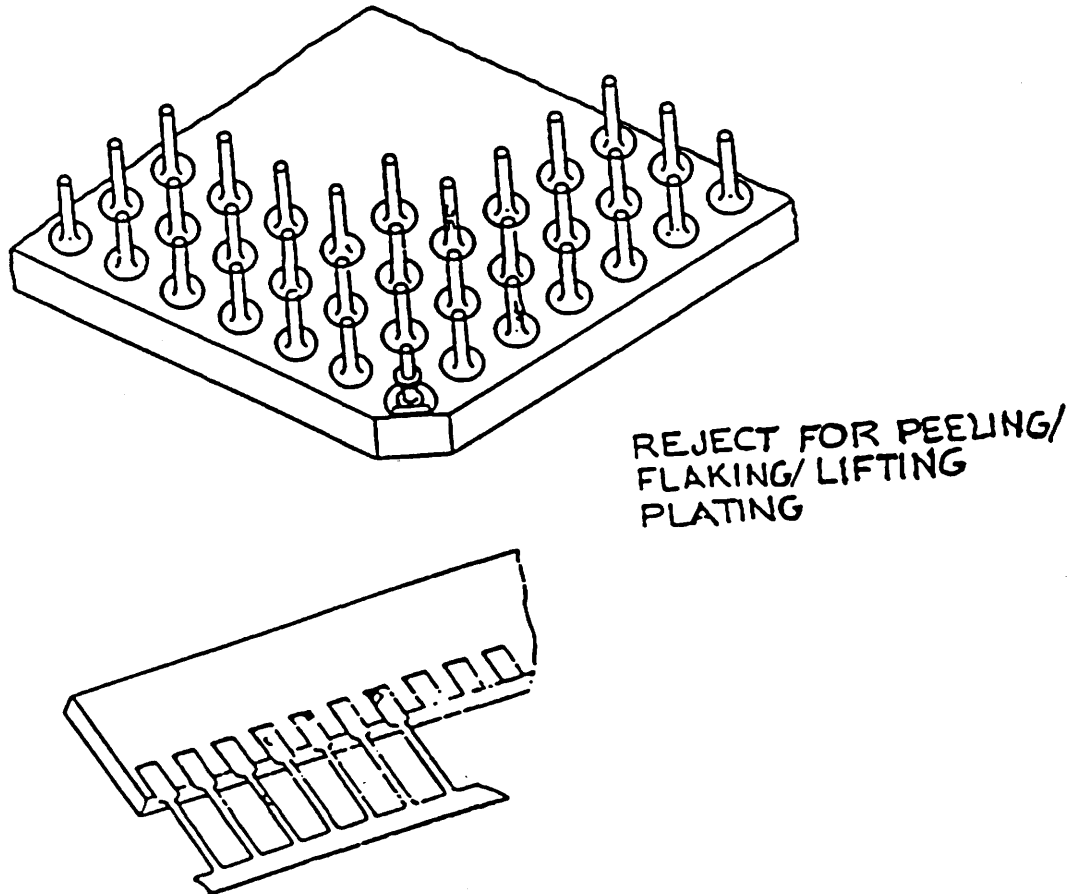


Figure 24
Leads - Pins Plating Defects

7.8.2 Void in Plating

All metallized areas shall be plated. The voids in the plating shall not exceed 0.005 inch maximum diameter and shall not be closer to another void more than .100 inch. Refer to Figure 25.

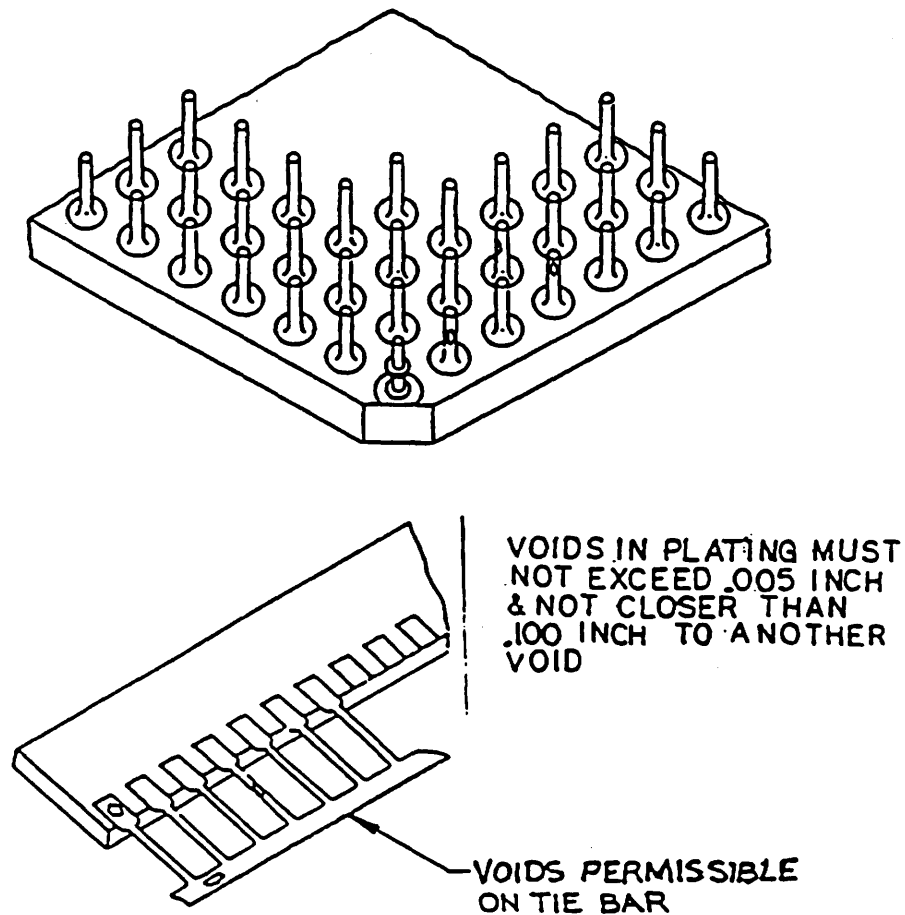


Figure 25
Plating Voids

7.8.3 Pit

Refer to Figure 26.

- (a) Pits shall not exceed 0.005 inch maximum diameter or 25% of lead surface whichever is smaller.
- (b) Reject for pits which exceed 0.003 inch depth or 25% of cross sectional area whichever is smaller.

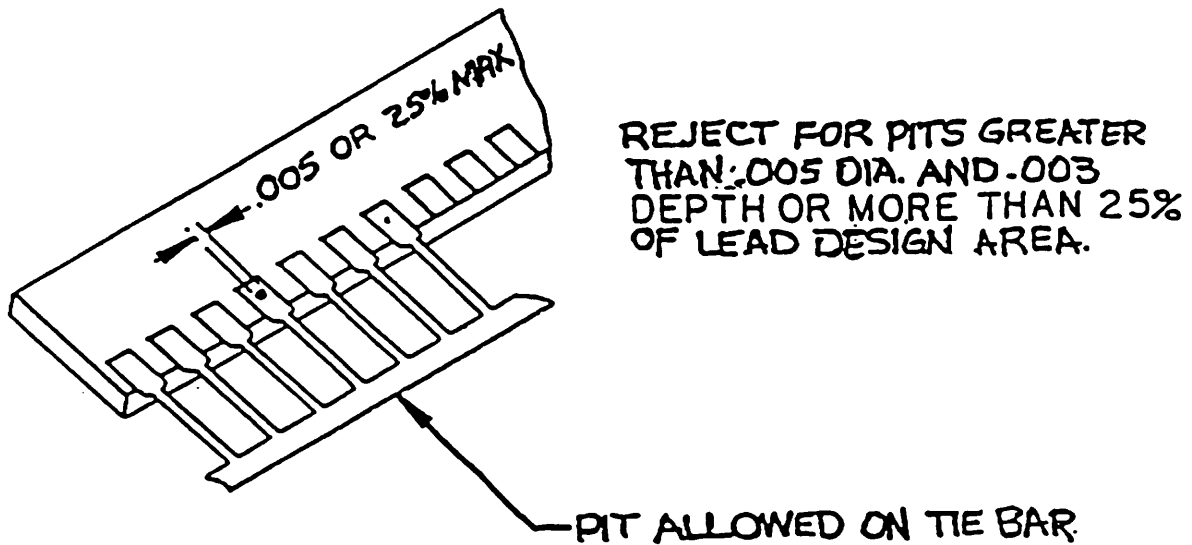


Figure 26
Lead/Pin Pits

7.8.4 Fin/Burr

Refer to Figure 27.

- (a) Reject for fin or burr which is greater than 0.002 inch X 0.050 inch length.
- (b) No fin or burr shall be acceptable if when measured with lead exceeds maximum dimension specified control drawing.
- (c) Reject for fins or burr which are not well adhered.

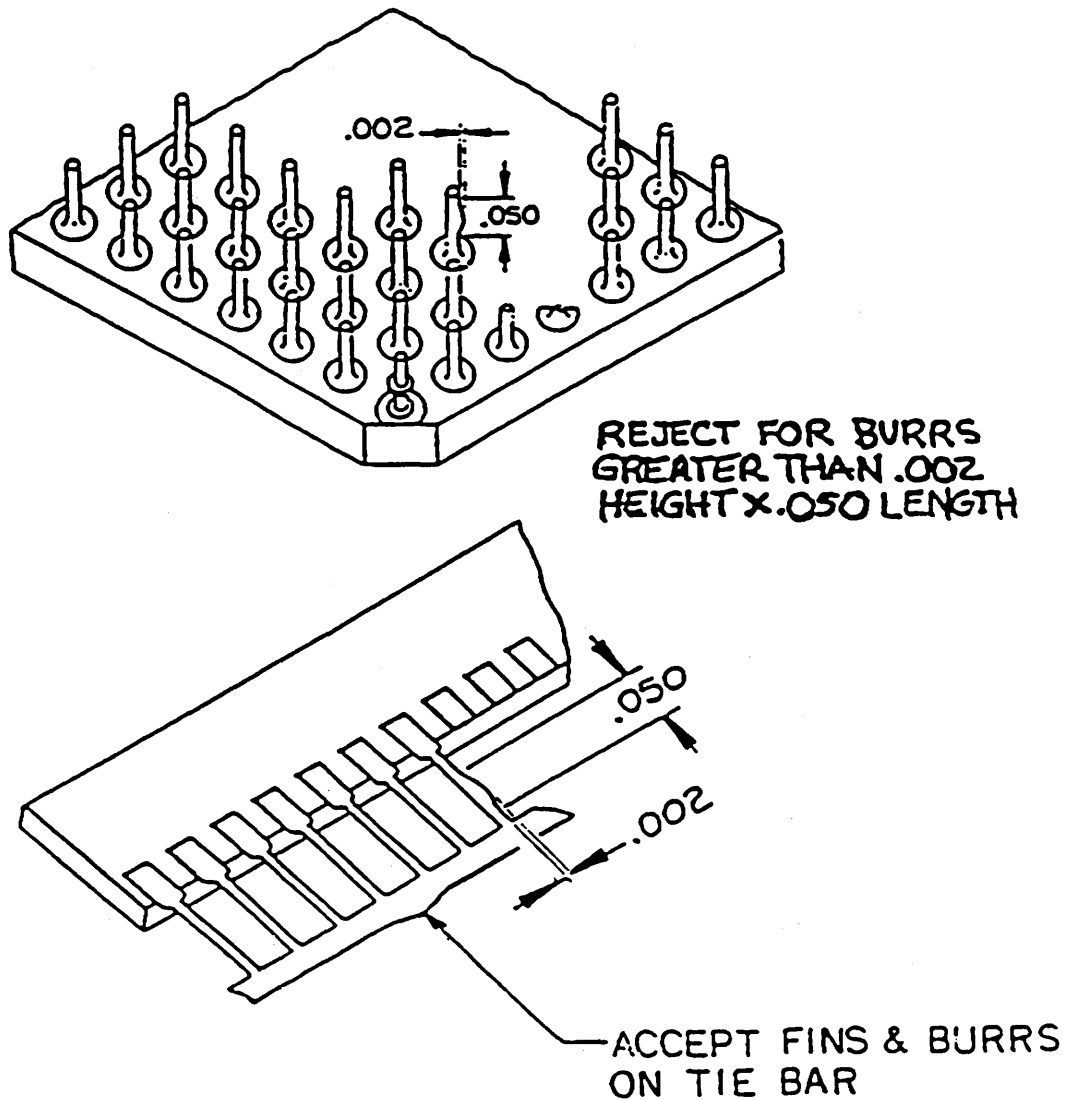


Figure 27
Lead/Pin Fins and Burrs

7.8.5 Underetched Leads/Pins

Refer to Figure 28.

- (a) Underetched areas shall not exceed 0.002 inch depth X 0.050 inch length.
- (b) When measured, lead shall not be less than minimum tolerance dimension specified on control drawing.

REJECT FOR UNDERETCH
CONDITION GREATER THAN
.002 DEPT X .050 LENGTH

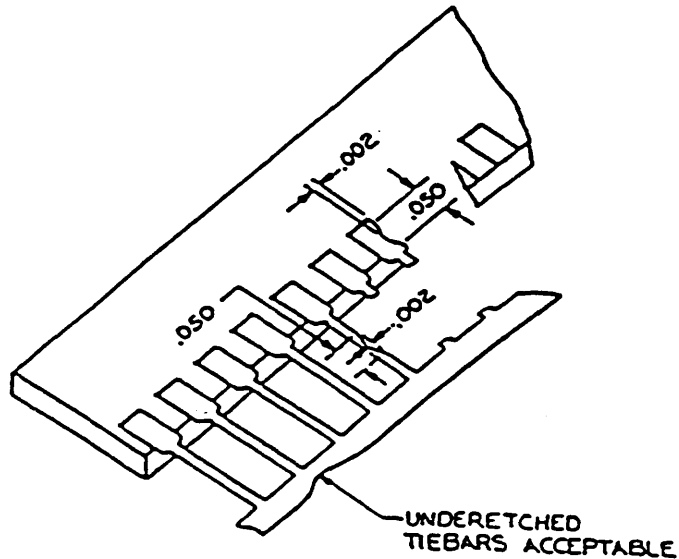
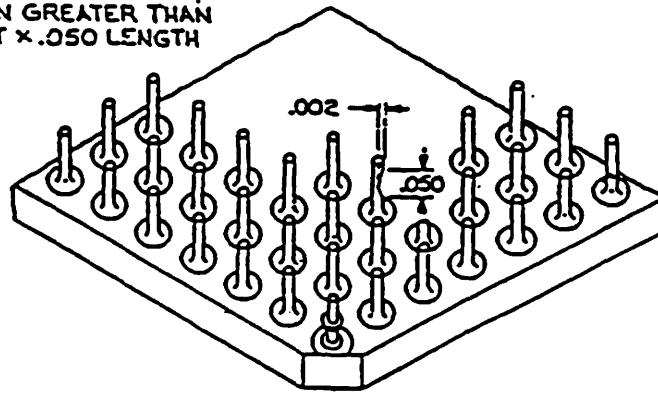


Figure 28
Underetched Leads/Pins

7.8.6 Damaged Leads/Pins

Refer to Figure 29.

This category may include bent leads/pins, incorrectly ground or scraped parts and poor workmanship which affects form, fit or function of parts. Minor bending allowed provided other areas of specification and control drawing configuration are met.

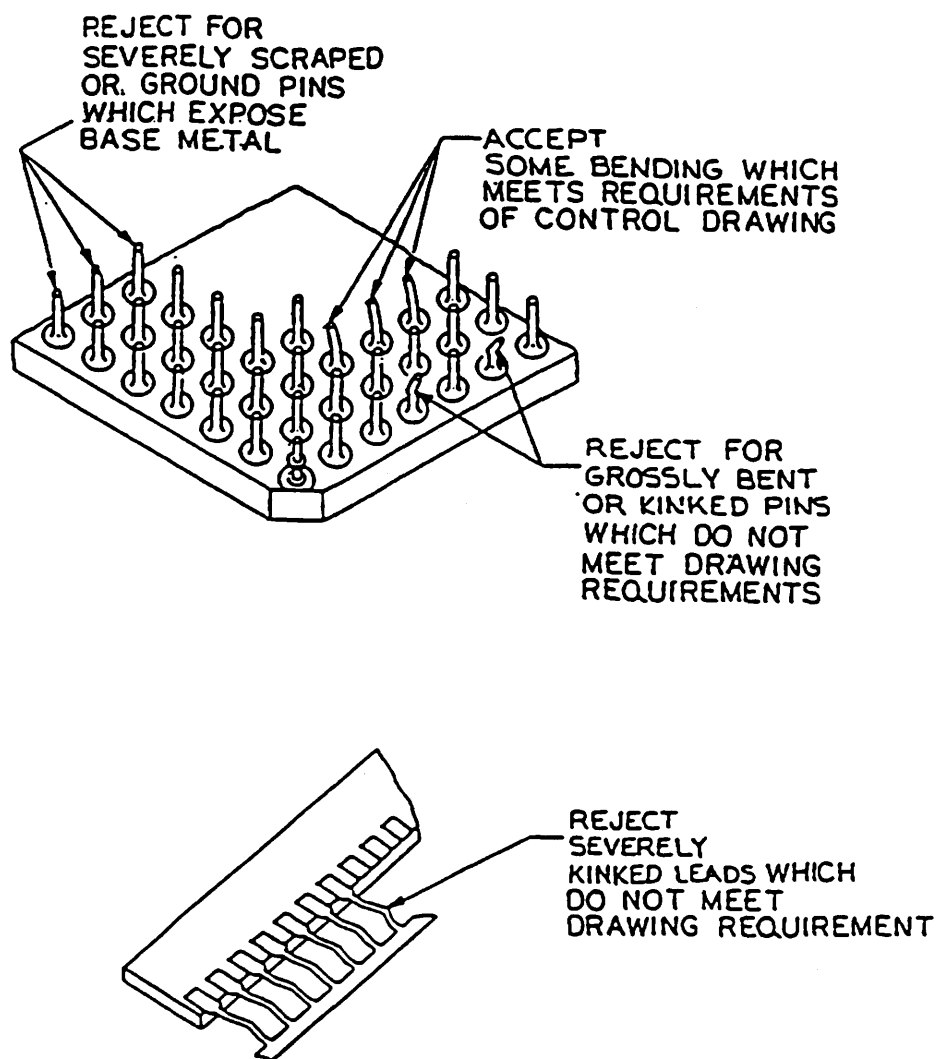


Figure 29
Damaged Leads/Pins

7.8.7 Lead/Pin Attachment

Lead/Pin Attachment inclusive of braze areas. Refer to Figures 30, 31, 32, 33, and 34.

- (a) All leads/pins must be well adhered and pass lead integrity testing in accordance with Table 2 and Method 2004.
- (b) Lead/Pin shall be positioned on braze pad as specified by product drawing.
- (c) Reject for pins which do not have a minimum of 50% braze fillet around head.
- (d) Reject for leads which do not have at least a minimum fillet of 50% on each side which is defect free.
- (e) There shall be no evidence of cracks in braze joint or lead/pin or missing metallization underneath.

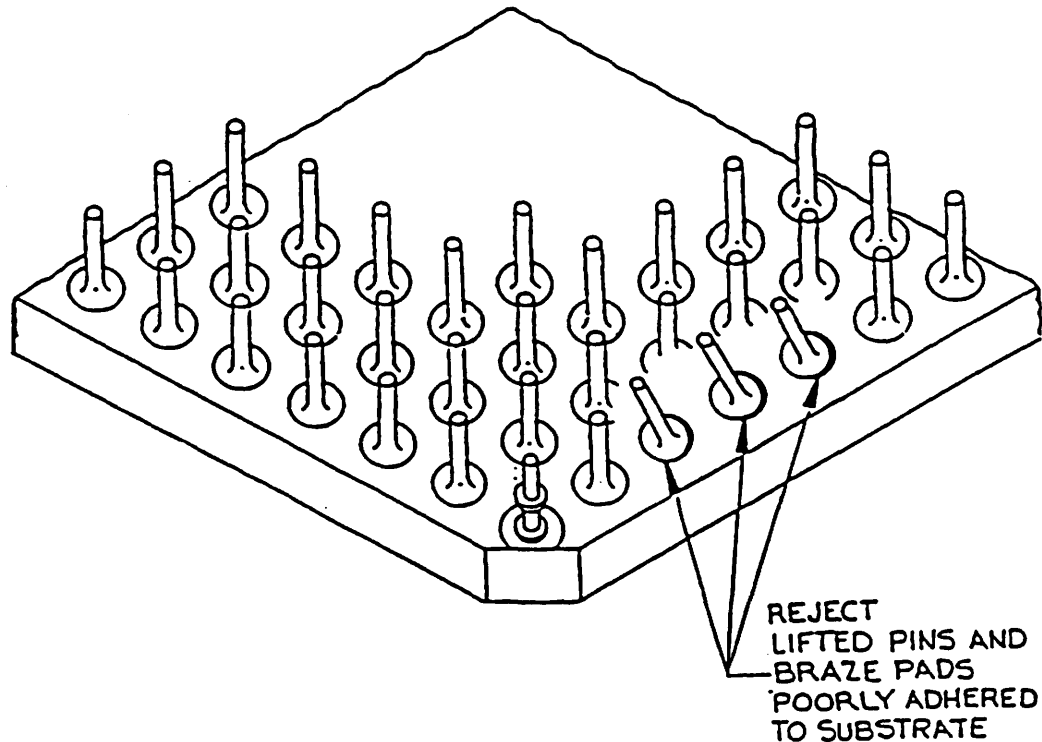
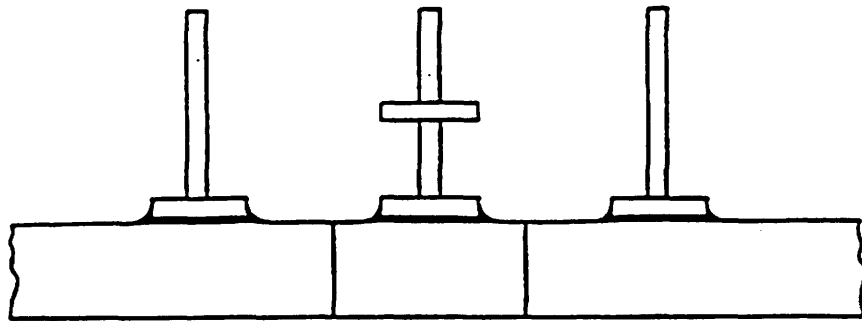
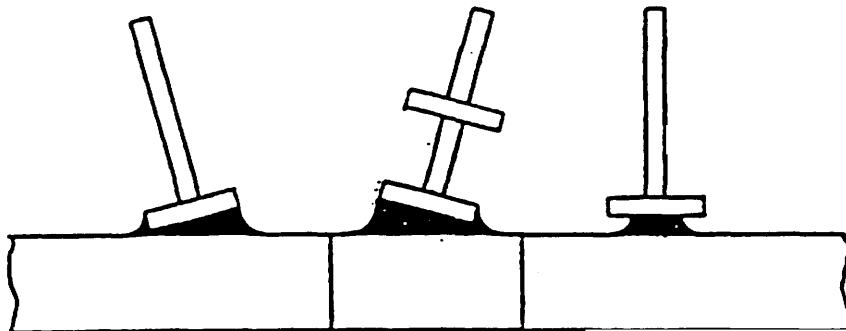


Figure 30
Lead/Pin Attachment



ACCEPTABLE

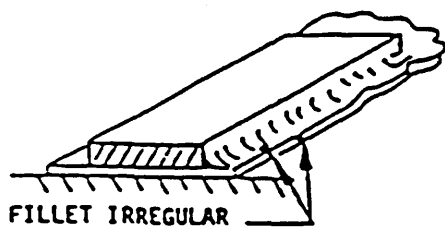
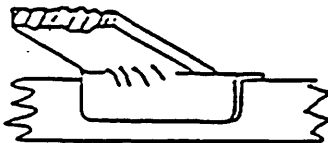
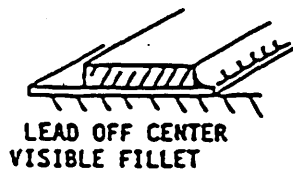
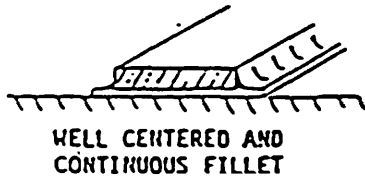


REJECTABLE

MUST NOT EXCEED MAXIMUM
ALLOWABLE DIMENSIONS AS
SPECIFIED ON PRODUCT
DRAWING

Figure 31
Stand-off and Pin Attachment

ACCEPTABLE BRAZE FILLETS



UNACCEPTABLE BRAZE FILLETS

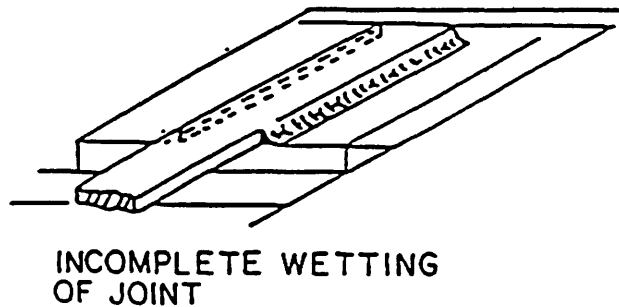
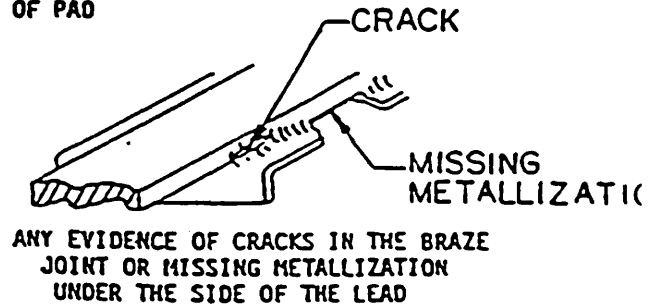
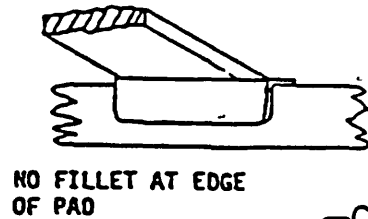
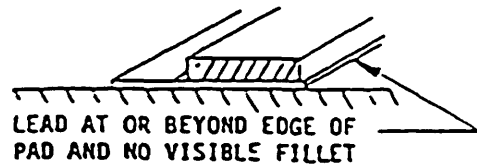


Figure 32
Lead Frame Attachment

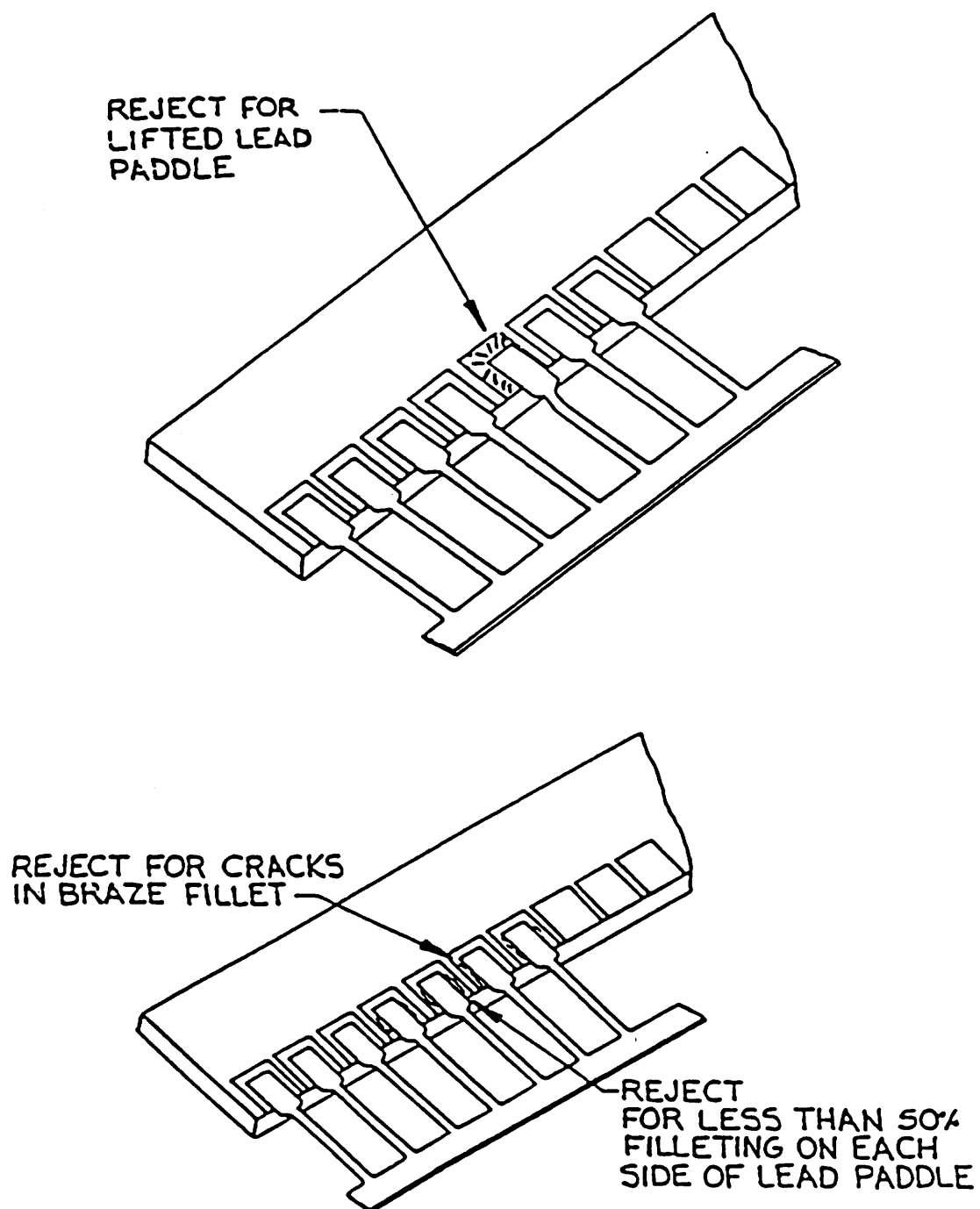


Figure 33
Lead Attachment Quality

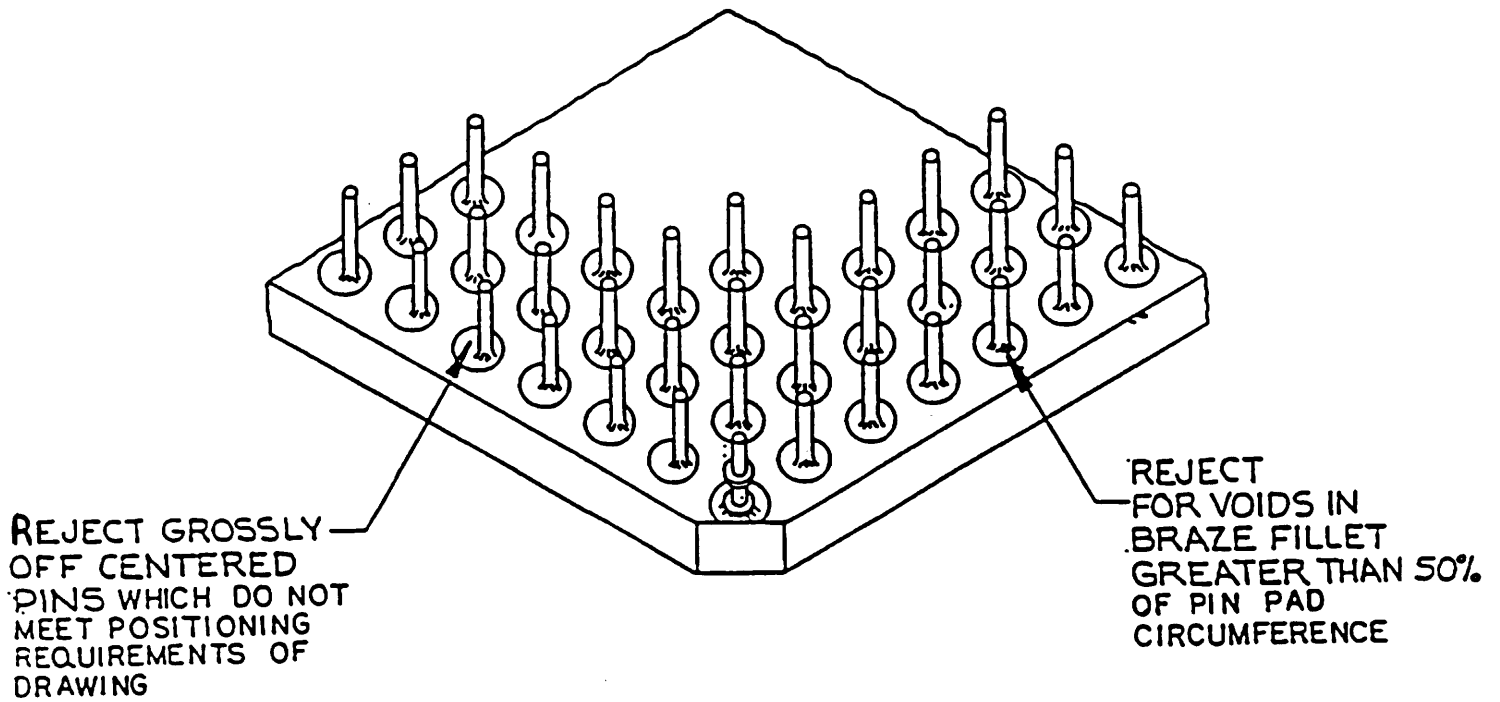


Figure 34
Pin Attachment Quality

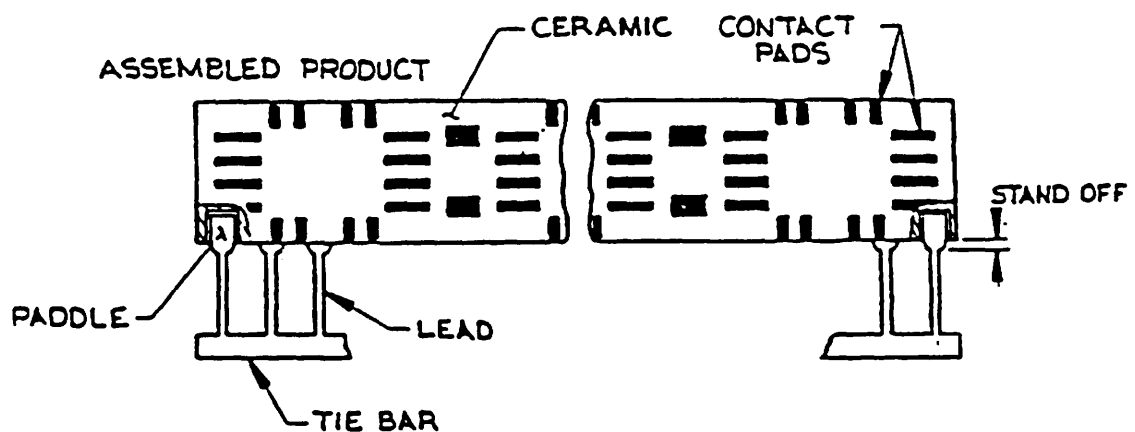
APPENDIX A
TERMS AND DEFINITIONS

Burr	A fragment of excess material or foreign particle adhering to a surface.
Chip	An area along an edge or corner where the material has broken off.
Crack	A line of fracture in the part without complete separation.
Discoloration	Coloration caused by residue left over from processing.
Fin	A fine feather edge protrusion occurring at an edge.
Hole	A depression in the surface, the bottom of which is not visible.
Pit	A shallow surface depression or crater.
Pock	A partially closed cavity on a surface
Projection	A raised portion of a surface indigenous with the parent material.
Foreign Material	Any adhering residue which is not of the piece part composition under inspection and which cannot be removed by a dry gas blow-off of 50 PSI and/or a suitable brush which will not scratch or damage the surface of the part.
Scrape	Removed or displaced material. Burnishes and rub marks where material is not displaced shall not be considered as scrapes. Tool marks in the base metal, uniformly covered by plated or deposited metal, shall not be considered to be pits or scrapes.
Etch Pits	A surface depression or crater caused by chemical milling (etching) through a defect in the photoresist pattern.
Visual Open	Any package component such as a wire bond finger, die attach pad, seal area, lead or pin which exhibits the complete absence of any plating.

APPENDIX B
APPLICABLE INSPECTION AREAS BY PRODUCTS

B1. SIP

Refer to Figure 35.



- CERAMIC •
- CONTACT PADS
- DIMENSIONS:
 - PART LENGTH • PART THICKNESS
 - PART WIDTH • LEADFRAME STAND OFF
 - LEADFRAME ALIGNMENT • CAMBER
- LEAD-PINS
- FUNCTIONALS:
 - PLATING THICKNESS • INSULATION RESISTANCE
 - SOLDERABILITY • CONDUCTOR RESISTANCE
 - LEAD BOND • CAPACITANCE

Figure 35
SIP Applicable Inspection Areas

B2. Special Leadless Multichip

Refer to Figure 36.

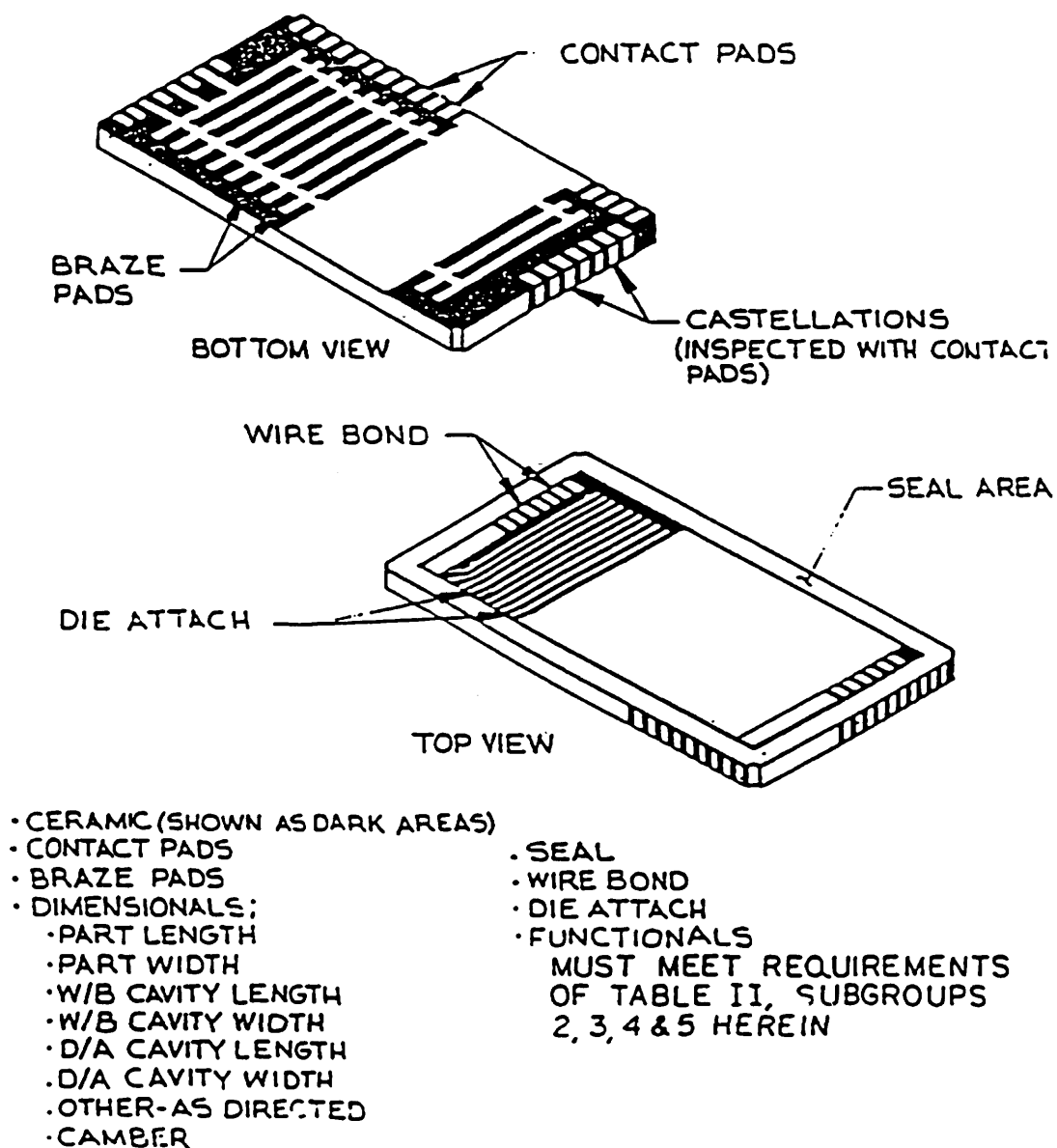


Figure 36
Special Leadless Multi-chip Package
Applicable Inspection Areas

B3. PGA

Refer to Figure 37.

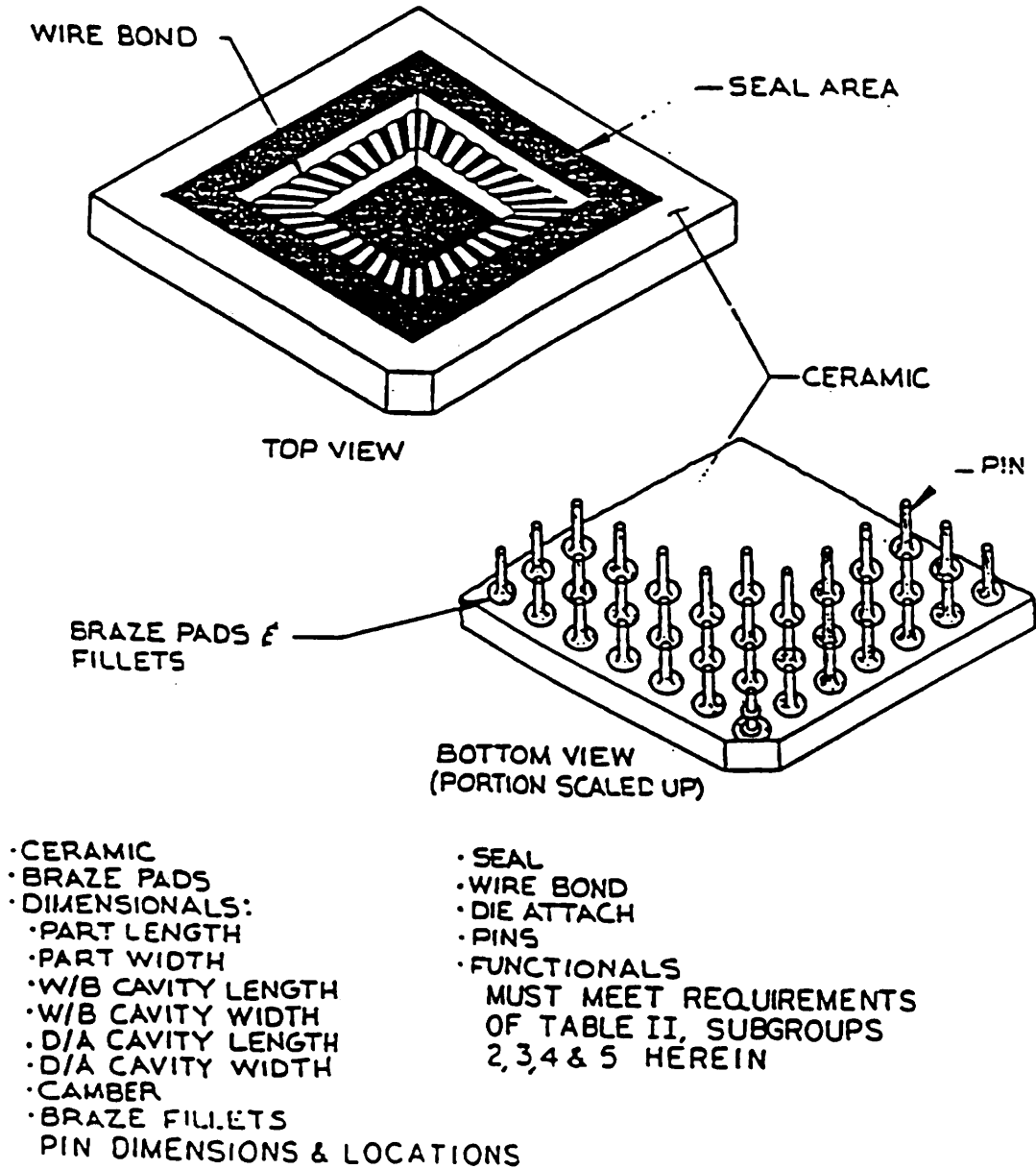


Figure 37
PGA Applicable Inspection Areas

