REVISIONS (Δ DENOTES CHANGE)				
REV.	**DATE (YYYY/MM/DD)**	**RCN NO**	**DESCRIPTION OF CHANGE**	**UPDATED BY**
-	1985/09/30	---	RELEASE	D. MILLER
A	1985/04/17	---	Add sintering process	D. MILLER
B	1986/09/13	---	Update visual criteria	D. MILLER
C	1987/07/24	---	Add conditions	D. MILLER
D	1988/08/25	1487	Address Aegis, Airpax and Xeram comments and revise precedence (procurement then spec. control dwg)and add 0.050" minimum glass to metal seal surface dimension	D. MILLER
E	1991/02/06	2155	Update in accordance with MIL-H-38534	D. MILLER
F	1992/12/08	3174	Update IAW MIL-H-38534 Rev B	D. MILLER
G	1996/07/10	5227	MIL-H-38534 updated to MIL-PRF-38534	D. MILLER
H	2001/04/03	8978	Update address, require EV after screening, general clarifications	J. VANDEUSEN
I	2001/06/13	9175	Add internal glass menicus max climb	J. VANDEUSEN
J	2001/07/12	9242	Clarify max meniscus dimensions	J. VANDEUSEN
K	2004/07/11	11715	Update/clarification IAW ISO 9000-2000, AS9100	J. VANDEUSEN
L	2006/01/09	13088	Add bonding blocks and lugs to drawing. Clarification of document.	J. VANDEUSEN
M	2010/01/21	16865	Add 4.1.6 flow down to sub tier	J. VANDEUSEN
N	2012/05/18	19211	Update specifications	J. VANDEUSEN
O	2014/01/03	20757	Add 4.1.7 Requirements for record retention	J. VANDEUSEN
P	2015/02/27	176066	Tie in Anaren Doc. #81000, general clarification, remove redundant information now located in 81000.	J. VANDEUSEN
R	2018/06/08	201812	Update Table I	J. VANDEUSEN
T	2019/04/04	306233	Update package and lid EE supplier	J. VANDEUSEN
U	2021/01/21	309973	Update procurement specification formats, remove MIL-STD-981, Clarify EE data IAW MIL-PRF-38534 Rev L release.	J. VANDEUSEN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES -TOLERANCES- FRACTIONS DECIMALS ANGLES

DRAWN BY	DATE (YYYY/MM/DD)
D. MILLER	1985/09/30

DESIGNER N/A

ENGINEER DAN MALARIK

APPROVAL SIGNATURES ON FILE

THIRD ANGLE PROJECTION

TTM Technologies

PROCUREMENT SPECIFICATION FOR PACKAGES/COVERS

SIZE	CAGE CODE	DOC NO.	
A	31597	1014-0981	
SCALE	DOC CODE	REV	SHEET
N/A	N/A	U	1 OF 6

DOC TYPE N/A

1.0 PURPOSE:

This specification establishes the general requirements and quality provisions for procuring packages, lids, covers, baseplates, bonding blocks and lugs for use in hybrids/MCM's. This procurement specification is used in conjunction with Document #81000.

2.0 APPLICABLE DOCUMENTS:

2.1 The following documents of the issue 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.

Specifications:

Military

MIL-PRF-38534	Hybrid microcircuits, general specification for
MIL-DTL-45204	Gold Plating, Electrodeposited (was MIL-G-45204)
MIL-I-45208	Inspection system requirements
MIL-STD-883	Test methods and procedures for microelectronics
MIL-STD-45662 or ANSI/NCSL Z540-1, ISO10012-1/ISO10012-2	Calibration systems requirements
MIL-STD-202	Electronic component parts, Test methods
MIL-STD-1276	ASTM standards F-15

Standards

AMS-I-23011	Package material (was MIL-I-23011)
AMS-C-26074	Coatings, Electroless nickel (was MIL-C-26074)
AMS-QQ-N-290	Nickel Plating, Electrodeposited (was QQ-N-290)
JESD STD 9	Specification for Microelectronic Packages and Covers
ISO 9001	International Quality Standard
AS9100	Aerospace Standard

2.2 This procedure shall apply to all packages as follows:

2.2.1 Condition "A" - Packages to be used in "fully" compliant hybrid products as defined in MIL-PRF-38534. The package supplier shall perform package lot evaluation testing to all requirements in MIL-PRF-38534 Table C-VI Subgroups 1-6 or Table C-VIII (for ISP) Subgroups 1-8.

2.2.2 Condition "B" - Packages intended to be used in full compliance with MIL-PRF-38534 but package lot evaluation testing will be the responsibility of TTM. The package supplier shall perform package lot evaluation testing to all requirements in MIL-PRF-38534 Table C-VI Subgroups 1-2 or Table C-VIII (for ISP) Subgroups 1-2 while being capable of passing all subgroups.

2.2.3 Condition "C" - Packages to be used on devices which do not impose MIL-PRF-38534. The package supplier shall perform package lot evaluation testing to all requirements in MIL-PRF-38534 Table C-VI Subgroups 1-2 or Table C-VIII (for ISP) Subgroups 1-4 to an AQL of 2.5%.

2.2.4 Condition "D" - Covers, lids, baseplates, Bonding Blocks and Lugs to be used in full compliance with MIL-PRF-38534 but lot evaluation testing will be the responsibility of TTM. The supplier shall perform lot evaluation testing to all the requirements in MIL-PRF-38534 Table C-VI Subgroups 1-2 and be capable of passing Subgroup 6. In addition, lugs shall be capable of passing solderability and lead integrity.

3.0 DEFINITIONS:

For the purpose of this specification, the terms, definitions and symbols of JESD 9, MIL-PRF-38534, MIL-STD-883 and those contained herein shall apply and shall be used in the applicable documentation.

3.1 **Package** - The term "package" or "packages" in this specification shall be considered identical to cases, headers or housings.

3.2 **Production Lot** - A production lot shall consist of packages, covers, bonding blocks or lugs manufactured on the same production line(s) by means of the same production technique, material, control and design.

3.3 **Package Inspection Lot** - An inspection lot shall consist of homogeneous materials having the same configurations, manufactured using the same facilities, processes, materials (multiple material lots are acceptable) and plated within a 6 month time frame (if plating is applicable).

3.4 **Pin 1 Indicator** - An index indicator (ie. pin 1) for packages shall be any reference punch, mark, extended terminal, chamfer, tab, notch flat, groove, glass color change, etc., which identifies the first terminal lead position which may be used for sensing during automatic handling.

3.5 **Sintering** - The sintering process shall be the annealment of each package in a conventional furnace with a blended nitrogen/hydrogen environment with the requirement that a profile of the furnace be available for review.

4.0 REQUIREMENTS:

4.1 Item Requirements:

4.1.1 The individual item requirements for packages, covers, lids, baseplates, bonding blocks or lugs delivered under this specification shall be documented in the purchase documentation.

4.1.2 The operational temperature range shall be -65°C to +125°C. The processing temperature range should be -70°C to 400°C.

4.2 Design and Construction:

4.2.1 Package:

a. All hermetically produced packages supplied under this specification shall be capable of being hermetically sealed.

b. Packages manufactured using beryllium oxide are not recommended. In those circumstances where BeO, in any form, is being utilized, the shipping container shall be clearly identified so caution and safety measures may be implemented.

c. Ceramic packages shall be constructed using material specified on the drawing. Unless otherwise specified, chip-outs in the ceramic are acceptable but must conform to the dimensions appearing on the package drawing and meet JESD 9.

d. The manufacturer shall make available for review drawings which detail the package outline with material identified, acceptance test procedure, test equipment and technical data package on request.

e. Metal packages shall be constructed from material meeting the requirements of ASTM specification F-15, AMS-I-23011 (MIL-I-23011), Class 1, and/or MIL-STD-1276, Type K unless otherwise specified.

f. Finishes shall be in accordance with the drawing.

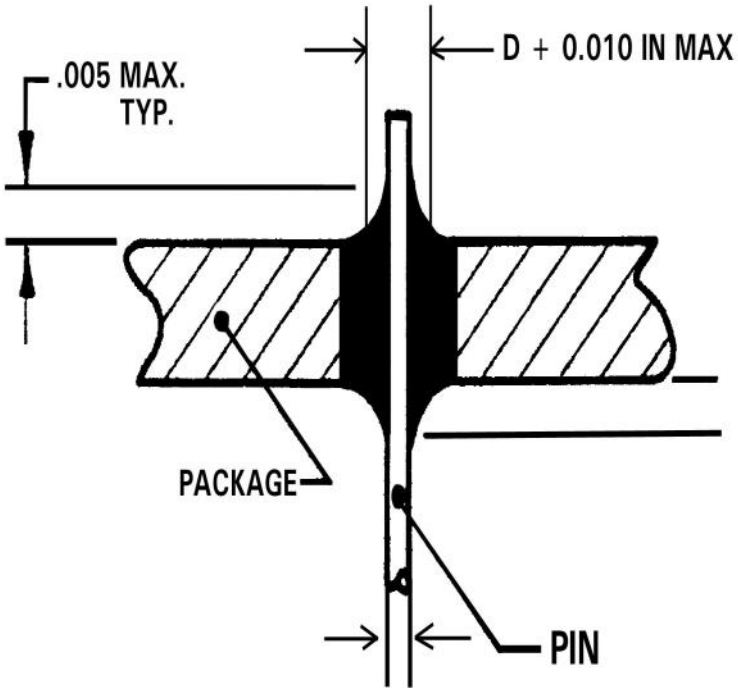
g. Flatpack packages fully compliant to MIL-PRF-38534 that are seam sealed, shall be required to have a minimum distance of 0.040 inches between the seal surface and the glass to metal seal. This dimension shall be specified on the package drawing.

h. For Class K packages with leads glass isolated within 0.005 inch (0.13 mm) of the metal body shall have 600 Vdc applied between the case and leads not connected to the case. Packages which exhibit leakage greater than 10GΩ (100 nA) shall be rejected.

i. Package posts or bonding pads shall be suitable for the thermosonic, ultrasonic and/or thermocompression bonding of gold or aluminum wire and shall be capable of withstanding a wire pull test as specified in MIL-STD-883 method 2011.

j. For packages that have leads extending through the base of the package (ie. TO style packages, Dual In-Line Packages, Bathtub style packages) the internal glass meniscus shall be a maximum of .005 inches above the internal base plane with the maximum diameter of the meniscus above the base of the package shall be the pin diameter (Dimension D) plus 0.010 inches.

k. For packages built with purchased sub-assemblies, the plating data for each part will be retained by TTM suppliers and accessible upon request per Document #81000.



TTM prefers the glass to be below the internal base plane

4.2.2 Lead Material and Finishes:

a. Lead material shall conform to the package drawing.

b. Lead finish and surface treatment shall be as specified in the package drawing.

c. There shall be no kinks or bends in the leads within 0.050" from the package body, unless by design. Outside this area, gradual bends that can be straightened manually are acceptable.

4.2.3 Cover/Lid:

a. Cover/Lid material shall conform to the cover/lid drawing.

b. Cover/Lid finish shall conform to the cover/lid drawing.

c. Covers shall be capable of passing Salt Atmosphere and shall be tested to MIL-PRF-38534 Table C-VI Subgroup 6 when specified on the purchase order.

4.2.4 Bonding Blocks (BB):

a. Bonding Block material shall conform to the BB drawing.

b. Bonding Block finish shall conform to the BB drawing.

c. Bonding Block shall be capable of being epoxy or solder attached based on BB drawing finish.

d. Bonding Block shall not exhibit loose metal on the sides of the bonding block.

4.2.5 Lugs:

a. Lug material shall conform to the lug drawing.

b. Lug finish shall conform to the lug drawing

c. Lug foot shall meet the solderability requirements of MIL-STD-883 Test Method 2003.

d. Lug material and finish shall meet a 90° bend without peeling or blistering of the plating finish.

4.2.6 Baseplate:

a. Baseplate material shall conform to the baseplate drawing

b. Baseplate finish shall conform to the baseplate drawing

4.3 Product Assurance:

4.3.1 Lot Acceptance:

4.3.1.1 Lot acceptance shall consist of the applicable condition specified in Paragraph 2.2. TTM reserves the right to perform extraneous tests which may be necessary in evaluating the ability of the package, cover, bonding block or lug to withstand production processing, environment screening and qualification. Implementation of these tests shall be based on history and application.

4.3.2 First Article Inspection (FAI):

4.3.2.1 When specified on the purchase order, the supplier shall perform FAI in accordance with AS9102. The completed FAI report shall be submitted to TTM for review/approval.

4.4 Preparation for Delivery:

4.4.1 Packaging:

Packages, covers, baseplates and lugs should be individually packaged, physically restrained from vibration and mechanically isolated from shock that might cause damage.

Containers shall be suitably packaged for acceptance by common carrier for shipment, handling and storage without allowing damage to the material.

4.4.2 Documentation:

Certificate of compliance as defined in Document #81000.

Test data (as specified by the purchase order) as required.

4.4.3 Marking:

Package, lid, cover, baseplate, bonding block and lug containers shall be marked as follows:

- Part Number and Revision
- Identification by inspection or production lot on the container and each box delivered.
- Quantity of packages in each shipping container.

5.0 QUALITY ASSURANCE PROVISIONS:

5.1 TTM reserves the right to perform testing in accordance with para 2.0 and any failure of the material to meet the requirements of this document shall be cause for rejection of the shipment.

5.2 TTM reserves the right to review any supplier's program, process and data to assure conformance to the requirements of this specification, the purchase order and the applicable SCD.

6.0 ACCEPT/REJECT CRITERIA:

6.1 Accept all material lots which pass the applicable paragraphs of this procedure and the PO/TTM drawing.

6.2 Reject all material lots which fail the applicable paragraphs of this procedure and the PO/TTM drawing.

6.3 Reject any lot which does not pass the lot acceptance test (ref 4.3.1).

7.0 REFERENCE DOCUMENTS:

7.1 MIL-STD-883

7.2 MIL-PRF-38534

7.3 Purchase order

7.4 Element SCD

7.5 JESD 9

7.6 TTM supplier requirements for Quality, Design & Manufacturing, Document #81000