MSK DWG. NO.	REV.	SHEET	SCALE	SIZE
1014-0981	M	1 OF 8	NTS	A

REVISIONS

REV.	ECO NO.	DESCRIPTION OF UPDATE	APPROVED	DATE
E	2155		C. HEISELMAN	02/91
F	3174		C. HEISELMAN	12/08/92
G	5227		C. HEISELMAN	07/10/96
H	8978		C. HEISELMAN	04/03/01
I	9175		C. HEISELMAN	06/13/01
J	9242		C. HEISELMAN	07/12/01
K	11715		C. HEISELMAN	07/11/04
L	13088		C. HEISELMAN	01/09/06
M	16865	Add 4.1.6 flow down to subtier		01/21/10

MSK

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DO NOT SCALE DRAWING	APPROVALS		FSCM NO.	M.S. KENNEDY CORPORATION LIVERPOOL, NEW YORK 13088	DOCUMENT CONTROL STAMP
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE FRACTIONS ± - DECIMALS ± - ANGLE ± - ± -	DRAFTER J. VANDEUSEN	DATE 01/11/10	51651	TITLE PROCUREMENT SPECIFICATION FOR PACKAGES/COVERS	
	DRAFTING CHECK	DATE 1/21/10			
MATERIAL N/A	ENGINEERING CHECK	DATE 1-21-10			
FINISH N/A	QUALITY ASSURANCE	DATE 1/21/10		MSK DWG. NO. 1014-0981 / REV. M / SHEET 1 OF 8	DEPARTMENT / COPY NO.

1.0 PURPOSE:

This specification establishes the general requirements and quality provisions for procuring packages, covers, bonding blocks and lugs, intended for use in fabricating hybrid microcircuits.

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-G-45204	Gold Plating, Electrodeposited
MIL-I-45208	Inspection system requirements
MIL-I-23011	Package material
MIL-C-26074	Coatings, Electroless nickel
QQ-N-290	Nickel Plating, Electrodeposited

Standards

MIL-STD-883	Test methods and procedures for microelectronics
MIL-STD-45662 or ANSI/NCSL Z540-1 or	Calibration systems requirements ISO10012-1/ISO10012-2
MIL-STD-202	Electronic component parts, Test methods
MIL-STD-1276	ASTM standards F-15
JEDEC STD9A	Metal package 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 manufacturer shall test to all requirements in subgroups 1-7 and shall be capable of passing subgroup 8 of Table I for each different lot of packages shipped to M.S. Kennedy.

2.2.2 **Condition "B"** - Packages intended to be used in full compliance with MIL-PRF-38534 but lot acceptance will be the responsibility of M.S. Kennedy. The package manufacturer shall test to the requirements of subgroups 1 and 7 of Table I and shall be capable of passing all subgroups (1-8) in Table I.

2.2.3 **Condition "C"** - Packages to be used on customer source control drawings or MSK standard product which does not impose MIL-PRF-38534. The package manufacturer shall test to the requirements of subgroups 1 and 7 of Table I to an AQL of 2.5% and shall be capable of passing all subgroups in Table I.

2.2.4 **Condition "D"** - Covers, Lids, Bonding Blocks and Lugs to be used in full compliance with MIL-PRF-38534 but lot acceptance will be the responsibility of M.S. Kennedy. The manufacturer shall test to the requirements of subgroups 1 and 7 and shall be capable of passing subgroup 6 of Table I. In addition, lugs shall be capable of passing solderability and lead integrity of Table I.

3.0 TERMS, DEFINITIONS AND SYMBOLS:

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

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

3.2 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 An inspection lot shall consist of homogeneous materials having the same configurations, manufactured using the same facilities, processes, materials and finish and plated together as one lot (if plating is applicable).

3.4 An index indicator 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 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 GENERAL:

4.1.1 The manufacturers of packages, covers, bonding blocks or lugs in compliance with this specification shall have production and test facilities which meet or exceed MIL-I-45208, ISO 9001 or AS9100 (or equivalent) and a calibration system that meets MIL-STD-45662/ANSI/NCSL Z540-1, ISO10012-1/ISO10012-2 or equivalent.

4.1.2 The vendor shall notify M.S. Kennedy in writing of any Class I (major) change of product or process as defined in MIL-STD-480, MIL-PRF-38534 Configuration Control or equivalent document (ie. MIL-PRF-38534, MIL-PRF-19500, MIL-PRF-38535).

4.1.3 Certificate of compliance shall be signed by a responsible vendor official and shall be enclosed with each shipment with the following minimum information:

a. Device type
b. Suppliers' name and address
c. Manufacturer's name
d. Device quantity
e. Purchase order number
f. Applicable MSK drawing number and revision level
g. Lot number

4.1.4 The vendor shall have evidence of a working operator training and certification program. This program shall also include a written description of each process available to the operator.

4.1.5 M.S. Kennedy, MSK's Customer or Regulatory Agency reserves the right to review any vendor program, process and data to assure conformance to the requirements of this specification, the purchase order and the applicable MSK source control drawing.

4.1.6 The manufacturer shall flow down any applicable requirements to the sub-tier supplier.

4.2 CONFLICTING REQUIREMENTS:

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

4.2.1 Purchase order

4.2.2 Detail package specification/specification control drawing (SCD)

4.2.3 This drawing

4.2.4 Other documents referenced

4.3 ITEM REQUIREMENTS:

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

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

4.4 DESIGN AND CONSTRUCTION:

4.4.1 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 MSK SCD. A die (chip) recess in the header, in either or both sides, is acceptable but must conform to the dimensions appearing on the MSK source control drawing.

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, MIL-I-23011, Class 1, and/or MIL-STD-1276, Type K unless otherwise specified.

f. Finishes shall be in accordance with the MSK SCD.

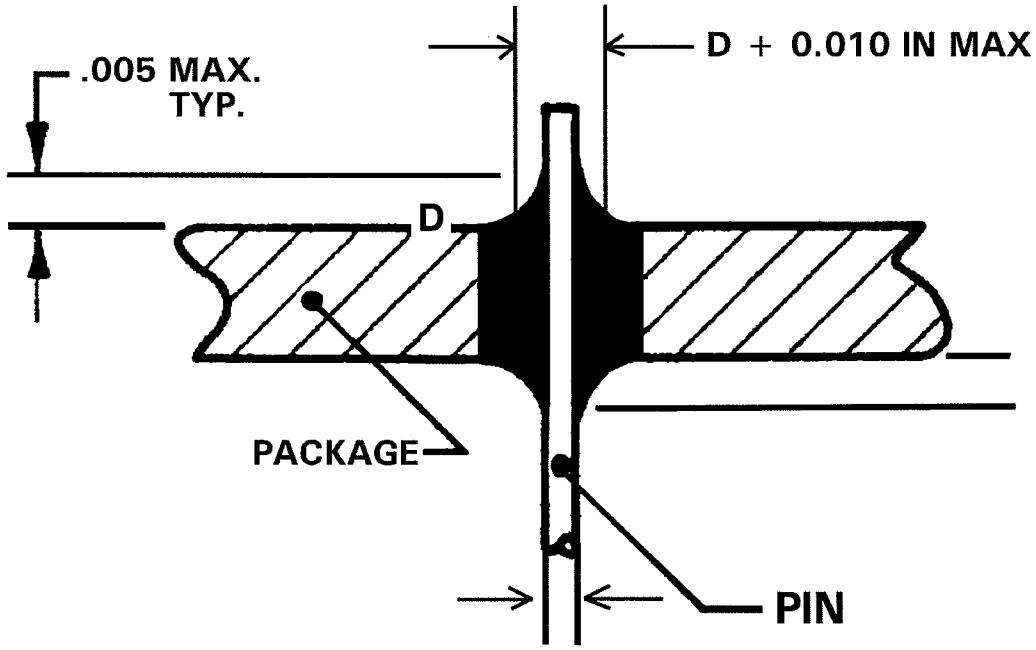
g. Flatpack packages fully compliant to MIL-PRF-38534 shall be required to have a minimum distance of 0.040 inches between the seal surface and the glass to metal seal. This dimension shall be specified on the specification control drawing.

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 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.

M.S. Kennedy prefers the glass to be below the internal base plane.



4.4.2 LEAD MATERIAL AND FINISHES:

a. Lead material shall conform to the MSK SCD.

b. Lead finish and surface treatment shall be as specified in the MSK SCD.

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.

4.4.3 Cover/Lid:

a. Cover/Lid material shall conform to the MSK SCD.

b. Cover/Lid finish shall conform to the MSK SCD.

4.4.4 Bonding Blocks:

a. Bonding Block material shall conform to the MSK SCD.

b. Bonding Block finish shall conform to the MSK SCD.

c. Bonding block shall be capable of being epoxy or solder attached based on SCD finish.

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

4.4.5 Lugs:

a. Lug material shall conform to the MSK SCD.

b. Lug finish shall conform to the MSK SCD

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 cracking of the plating finish.

4.5 PRODUCT ASSURANCE:

4.5.1 LOT ACCEPTANCE:

4.5.1.1 Lot acceptance shall consist of the test conditions specified in Paragraph 2.2. M.S. Kennedy 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 and environment screening. Implementation of these tests shall be based on history and application.

4.5.1.2 The manufacturer shall notify, in writing, the procuring activity (MSK) prior to the implementation of any change in product design, material, process on control which may affect performance, quality reliability or interchangeability.

TABLE I

Subgroup	MIL-STD-883 Reference	PKG	LID	BB	LUG	Operation	Condition	Sample
1	2016	X	X	X	X	Physical Dimensions		2.5% AQL
2	2003	X			X	Solderability	Solder Temp 245° ±5°C R type flux	3 devices all leads
3 /1	1011	X				Thermal Shock	-65°C to 150°C	3 (0)
	1008	X				Stabilization Bake	1 hr at 150°C	3 (0)
	2004	X			X	Lead Integrity	B2 (lead fatigue)	3 (0)
							D (leadless carriers)	
	1014	X				Seal	A4 unlidded cases 1 X 10	3 (0)
4	1003	X				Metal Package Isolation	600 Vdc, 100 nA max	3 (0)
5								
6	1009	X	X		X	Salt Atmosphere	A	5 (0)
7 /3	2009	X	X	X	X	External Visual		2.5% AQL
8 /1 /4	-					Device Seal	-	3 (0)
	1014					Seal Test	1×10^{-8}	3 (0)
	1010					Temperature Cycle	-65°C to 150°C, 10 cycles	3 (0)
	2001					Constant Acceleration	Y1 axis, 3000G	3 (0)
	2002					Mechanical Shock	Cond B, Y1 direction	3 (0)
	2007					Vibration Variable Frequency	Cond B	3 (0)
	1014					Seal Test	1×10^{-8}	3 (0)
	2003					Solderability	Solder Temp 245°C ±5°C RMA type flux	3 (0)
	1018					Internal Water Vapor	16-24 hour bake	3 (0)
/3	2009					External Visual		3 (0)

Note:

/1. Subgroups 3 and 8 shall be performed in sequence.

/2. Covers shall be capable of passing subgroup 6 and shall be tested to when specified on the purchase order.

/3. Packages shall also meet the visual requirements of JEDEC STD 9A.

/4. Packages shall be capable of passing Subgroup 8.

4.6 PREPARATION FOR DELIVERY:

4.6.1 PACKAGING:

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

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

4.6.2 DOCUMENTATION:

Certificate of compliance (to the purchase order and applicable documents) as specified in para 4.1.3.

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

4.6.3 MARKING:

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

- Part Number and Revision
- Identification by inspection lot (see para 3.3, this document) on the container and each box delivered.
- Quantity of packages in each shipping container.

5.0 QUALITY ASSURANCE PROVISIONS:

5.1 M.S. Kennedy 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 M.S. Kennedy reserves the right to review any vendors' program, process and data to assure conformance to the requirements of this specification, the purchase order and the applicable MSK SCD.

6.0 ACCEPT/REJECT CRITERIA:

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

6.2 Reject any material and separate it from the lot which fails the visual criteria.

6.3 Reject any lot which does not pass the lot acceptance test (ref 4.5.1).