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**REVISIONS**

REV.	ECO NO.	DESCRIPTION OF UPDATE	APPROVED	DATE
-	RLSD	N/A	D. MILLER	05/87
A	1707	Per ECO	D. MILLER	07/89
B	2054	Per ECO	D. MILLER	12/90
C	3184	Per ECO	C. HEISELMAN	12/08/92
D	5227	Per ECO	C. HEISELMAN	07/10/96
E	6678	Per ECO	C. HEISELMAN	03/12/98
F	8184	Per ECO	C. HEISELMAN	04/07/00
G	10734	Per ECO	C. HEISELMAN	02/25/03
H	11715	Per ECO	C. HEISELMAN	07/11/04
I	16865	Add 5.1.8 flow down to subtier	C. HEISELMAN	01/21/10
J	17232	Add Condition E	C. HEISELMAN	04/20/10
K	20757	Add 5.1.9 Requirements for record retention	C. HEISELMAN	01/03/14
L	176066	Tie in Anaren Doc. #81000, general clarification, remove redundant information now located in 81000.	B. HAHN	02/27/15
M	191677	Add sample inspection of MIL-PRF-55365 tantalum caps	B. HAHN	01/13/17
N	194612	Add Condition B Delivery Conditions	J. DOUGLAS	03/24/17
P	205457	Add waffle pack specifications	B. HAHN	06/06/18
R	210023	Add packaging requirements and update document	<i>[Signature]</i>	<i>9/10/18</i>

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	<i>[Signature]</i> DRAFTING CHECK	DATE <b>8-30-18</b>		
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FINISH <b>N/A</b>	<i>[Signature]</i> QUALITY ASSURANCE	DATE <b>9/10/18</b>		
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**1.0 PURPOSE:**

The purpose of this document is to define the requirements for procurement of passive elements (resistors, resistor networks, thickfilm substrates, thinfilm substrates, inductors, transformers and capacitors) for use in devices. This document is used in conjunction with Anaren Doc. #81000.

**2.0 APPLICATION:**

This procedure shall apply to all passive elements as follows:

**2.1 Condition A** - Elements to be used in compliance with MIL-PRF-38534 Class H devices. Element evaluation shall be performed IAW MIL-PRF-38534 Class H and data provided with delivery.

For MIL-STD-981 inductors or transformers, Class B lot control applies, see Para. 5.1 for requirements.

**2.2 Condition B** - Elements intended to be used in full compliance with MIL-PRF-38534 Class H but element evaluation is the responsibility of the user. Vendor/mfg is responsible for 100% visual and electrical, Note 1.

For MIL-STD-981 inductors or transformers, Class B lot control applies, see Para. 5.2 for requirements.

For MIL-PRF-55365 tantalum capacitors, sample visual inspection is acceptable

**2.3 Condition C** - Elements to be used in devices which do not impose MIL-PRF-38534 element evaluation.

**2.4 Condition D** - Elements to be used in compliant MIL-PRF-38534 Class K devices. Element evaluation shall be performed IAW MIL-PRF-38534 Class K and data provided with delivery. Note 1.

For MIL-STD-981 inductors or transformers, Class S lot control applies, see Para. 5.4 for requirements.

For MIL-PRF-55365 tantalum capacitors, sample visual inspection is acceptable.

**2.5 Condition E** - Elements tested IAW the element drawing

***NOTE 1:** This evaluation is not required when the elements are acquired from the established reliability series of military specifications and the element meets or exceeds the evaluation requirements of this specification and is listed on the QPL.*

**3.0 DEFINITIONS:**

**3.1 Element** - A constituent of the device that contributes directly to its operation.

**3.2 Production Lot** - A production lot consists of a device type manufactured from the same basic raw materials on the same production line, processed under the same manufacturing techniques and controls using the same type of equipment. Each lot shall be assigned a unique identification that provides traceability to all processing steps.

**3.3 Inspection Lot**

**3.3.1** MIL-PRF-38534 Inspection Lot. An inspection lot shall consist of passive elements of a single circuit type submitted at one time for inspection to determine compliance with the applicable requirements and acceptable criteria.

**3.3.2** MIL-STD-981 Inspection Lot.

**3.3.2.1** Class B. An Inspection lot shall include completely assembled devices of the same grade, construction, class, family and electrical characteristics, manufactured under essentially the same conditions and having similar construction and materials. (Similar construction and materials shall be construed to include differences that will not affect test results.) Sample units shall be selected to be as much as practical, representative of the volt-ampere range of electrical values and physical dimensions included in the lot.

**3.3.2.2** Class S. An inspection lot shall consist of completely assembled devices of a single grade construction, class, family and part number from one procurement document. Each lot shall meet all the lot controls specified for Class S devices.

**3.4 Element Evaluation** - As applicable to this specification shall consist of passive elements evaluated IAW MIL-PRF-38534.

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**3.5 Environmentally controlled area:**

- 3.5.1 Class 8 per ISO 14644-1, -2 or Class 100,000 per MIL-STD-209.
- 3.5.2 Temperature - 25°C +3, -5°C
- 3.5.3 Positive pressure .01" water column or greater.
- 3.5.4 Humidity - RH 30 to 65%.
- 3.5.5 Element storage shall be in a nitrogen atmosphere dry box.

**4.0 REQUIREMENTS:**

**4.1 General:**

- 4.1.1 All material and processes used by vendor will be suitable for polymeric adhesive, soldering or eutectic die mounting where specified. Pad metallization shall be suitable for thermosonic, ultrasonic and thermocompression bonding of gold or aluminum wire and shall be capable of withstanding a pull test as specified per MIL-STD-883 Method 2011, where applicable to the element type.
- 4.1.2 All electrical test (100%) and visual inspection (100%) may be done at the element level provided rejects are identified and removed from the lot.

**4.2 Packaging Requirements:**

**4.2.1 Packaging:**

Refer to element packaging Table 1.

Elements shall be packaged to prevent damage during shipment and for automated assembly.

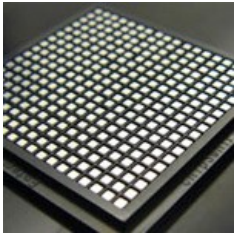

**4.2.2 Package Marking:**

The element part number, manufacturer's name, manufacturer's lot number and quantity shall appear on each waffle tray/gel pack. All samples and test data shall be identified by its device type, manufacturers name and manufacturer's lot number. Markings shall be sufficient for inspection lot traceability.

**4.2.3 Certificate of Compliance:**

As defined in document #81000.

**Element Packaging Requirements Table 1**

Element Type	Packaging Requirement			
Passive Elements (crystals, resistors, capacitors, inductors and transformers)	2" x 2" black conductive waffle tray with: - carrier well must be deep enough so that the die surface is below the top plane of the waffle tray - protective sheet or pad - secure lid (hinge or clamp)		OR 2" x 2" black conductive gel pack with vacuum release for auto pick and place capability: - secure lid (hinge or clamp)	
For elements which will not fit into a 2" x 2" waffle tray or gel pack	Elements shall be packaged in a manner that: 1. Physically restrained from vibration and mechanically isolated from shock that could cause physical damage or electrical degradation of the elements. 2. Sealed in an electrostatic bag.			

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**5.0 PROCEDURE:**

**5.1 Condition A:**

- 5.1.1** Element evaluation shall be performed by the supplier on each lot (production lot, inspection lot, etc.) IAW MIL-PRF-38534 for Class H elements.
- 5.1.2** The supplier shall have an accepted internal document for visual inspection to MIL-STD-883 Test Method 2032, or MIL-STD-981 as applicable to ensure compliance.
- 5.1.3** The supplier shall perform 100% visual test to an in-house control document in an environmentally controlled area and ensure compliance to all visual and mechanical specifications.
- 5.1.4**
  - a. For MIL-PRF-38534, the supplier shall perform 100% electrical testing at 25°C to ensure compliance with the manufacturer’s electrical data book and/or element Drawing.
  - b. For MIL-STD-981, the supplier shall perform 100% screening to Class B of MIL-STD-981 and 100% electrical testing at 25°C to ensure compliance to the manufacturer’s electrical data book and/or applicable element drawing.
  - c. Devices shall be capable of operating over full temperature range to minimum and maximum electrical data book specifications/element drawing. For specific applications, element characteristics may require testing over this temperature range and will be specified on the element drawing.
  - d. Documentation and test samples will be provided with each lot unless generic data is available.

**5.1.5 Delivery Conditions:**

- 5.1.5.1** The supplier is responsible for ensuring that elements are packaged properly so as to avoid damage during shipment
- 5.1.5.2** Packaging shall be IAW section 4.2 Packaging Requirements
- 5.1.5.3** The type of element, name of manufacturer, quantity and lot number are to be clearly marked on each packing container. Markings shall be sufficient for element lot traceability.
- 5.1.5.4** Certificate of Compliance, as defined in Document #81000.
- 5.1.5.5** Required Documentation
  - a. Element Evaluation data
  - b. Test Data
- 5.1.5.6** Other Documentation - Evidence of the suppliers inspection performance shall be maintained at the suppliers facility. The evidence maintained should include the following:
  - a. Name of operation, specification number and revision of each process or test.
  - b. Part number, wafer lot number and manufacturer internal lot identification number (s).
  - c. Date (s) of test and operator identification.
  - d. Calibration control number and calibration due date of all test equipment.
  - e. Quantity tested and rejected for each process or test and actual quantity tested if sampled.
  - f. Specific major conditions of test that are verifiable by operator including times and temperatures.
  - g. For electrical test, test program number and revision.
  - h. Test data (ie electrical data, bond pull data).

**5.2 Condition B:**

- 5.2.1** The supplier shall have an accepted internal document for visual inspection to MIL-STD-883, Method 2032 or MIL-STD-981 as applicable to ensure compliance.
- 5.2.2** The supplier shall perform visual inspection 100% in an environmentally controlled area and ensure compliance to all mechanical specifications.

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- 5.2.3**
- a. For MIL-PRF-38534, the supplier shall perform electrical test at 25°C 100% to ensure compliance to the manufacturer’s electrical characteristics and/or element drawing.
  - b. For MIL-STD-981, the supplier shall perform 100% visual inspection and electrical testing to ensure compliance to the manufacturer’s electrical characteristics and/or element drawing. Screening in accordance with MIL-STD-981 is not required.
  - c. Devices shall be capable of operating over full temperature range to minimum and maximum electrical data book specifications element drawing. For specific applications, element characteristics may require testing over this temperature range and will be specified on the element drawing.

**5.2.4 Delivery Conditions**

- 5.2.4.1** The supplier is responsible for ensuring that elements are packaged properly so as to avoid damage during shipment
- 5.2.4.2** Packaging shall be IAW section 4.2 Packaging Requirements.
- 5.2.4.3** The type of element, name of manufacturer, quantity and lot number are to be clearly marked on each packing container. Markings shall be sufficient for element lot traceability.
- 5.2.4.4** Certificate of Compliance, as defined in Document #81000. The C of C shall state that the elements received 100% inspection and electrical testing.

**5.3 Condition C:**

**5.3.1** The supplier shall guarantee performance of the elements to conform to the electrical and mechanical specification in the applicable element drawing.

**5.3.2** Elements shall be capable of meeting the visual requirements of MIL-STD-883 Method 2032 and MIL-PRF-981 for magnetics.

**5.3.3 Delivery Conditions:**

- 5.3.3.1** The supplier is responsible for ensuring that elements are packaged properly so as to avoid damage during shipment.
- 5.3.3.2** Packaging shall be IAW section 4.2 Packaging Requirements.
- 5.3.3.3** The type of element, name of manufacturer, quantity and lot number are to be clearly marked on each packing container. Markings shall be sufficient for element lot traceability.
- 5.3.3.4** Certificate of Compliance, as defined in Document #81000.

**5.4 Condition D:**

**5.4.1** Element evaluation shall be performed by the supplier on each lot (production lot, inspection lot, etc.) IAW MIL-PRF-38534 for Class K elements.

**5.4.2** The supplier shall have an accepted internal document for visual inspection to MIL-STD-883, Method 2032, or MIL-STD-981 as applicable to ensure compliance.

**5.4.3** The supplier shall perform 100% visual test to an in-house control document in an environmentally controlled area and ensure compliance to all element mechanical specifications.

- 5.4.4**
  - a. For MIL-PRF-38534 the supplier shall perform 100% electrical testing at 25°C to ensure compliance with the manufacturer’s electrical data book and/or applicable element drawing.
  - b. For MIL-STD-981, the supplier shall perform 100% screening to Class S, 100% electrical testing and Group B lot acceptance testing IAW MIL-STD-981 for Class S inductors/transformers. The testing shall be performed by the supplier for each lot to ensure compliance with the manufacturer’s electrical data book and/or applicable element drawing.
  - c. Devices shall be capable of operating over full temperature range to minimum and maximum electrical data book specifications/element drawing. For specific applications, element characteristics may require testing over this temperature range and will be specified on the element drawing.
  - d. Documentation and test samples will be provided with each lot unless generic data is available.

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**5.4.5 Delivery Conditions:**

- 5.4.5.1** The supplier is responsible for ensuring that elements are packaged properly so as to avoid damage during shipment.
- 5.4.5.2** Packaging shall be IAW section 4.2 Packaging Requirements.
- 5.4.5.3** The type of element, name of manufacturer, quantity and lot number are to be clearly marked on each package container. Markings shall be sufficient for element lot traceability.
- 5.4.5.4** Certificate of Compliance, as defined in Document #81000.
- 5.4.5.5** Required Documentation
- a. Element Evaluation data
  - b. Test Data
- 5.4.5.6** Other Documentation - Evidence of the suppliers inspection performance shall be maintained at the suppliers facility. The evidence maintained should include the following:
- a. Name of title operation, specification number and revision of each process or test.
  - b. Identify part number, wafer lot number and manufacturer internal lot identification number (s).
  - c. Date (s) of test and operator identification.
  - d. Calibration control number and calibration due date of all test equipment.
  - e. Quantity tested and rejected for each process or test and actual quantity tested if sampled.
  - f. Specific major conditions of test that are verifiable by operator including times and temperatures.
  - g. For electrical test, test program number and revision.
  - h. Test data (ie electrical data, bond pull data).

**5.5 Condition E:**

- 5.5.1** The supplier shall guarantee performance of the elements to conform to the specification called out in the applicable element drawing.

**5.5.2 Delivery Conditions:**

- 5.5.2.1** The supplier is responsible for ensuring the elements are packaged properly so as to avoid damage during shipment.
- 5.5.2.2** Packaging shall be IAW section 4.2 Packaging Requirements.
- 5.5.2.3** The type of element, name of manufacturer, quantity and lot number are to be clearly marked on each packing container. Markings shall be sufficient for element lot traceability.
- 5.5.2.4** Certificate of Compliance as defined in Document #81000.

**6.0 QUALITY ASSURANCE PROVISIONS:**

- 6.1** Anaren reserves the right to perform testing in accordance with paragraph 2.0 and any failure of the material to meet the requirements of this document shall be cause for rejection of the shipment.
- 6.2** Anaren reserves the right to review any suppliers program, process and data to assure conformance to the requirements of this specification, purchase order and the applicable element drawings.

**7.0 ACCEPT/REJECT CRITERIA:**

- 7.1** Accept all lots which pass the applicable paragraphs of this procedure and the element drawing.
- 7.2** Reject any device(s) and separate it from the lot which fails an electrical parameter or visual criteria.
- 7.3** Reject any lot which does not pass element evaluation.

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**8.0 REFERENCE DOCUMENTS:**

- 8.1** MIL-STD-883
- 8.2** Element drawing
- 8.3** Anaren purchase order
- 8.4** MIL-STD-750
- 8.5** MIL-PRF-38534
- 8.6** ISO 14644-1, -2 or equivalent
- 8.7** Anaren supplier requirements for Quality, Design & Manufacturing, Document #81000

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