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JAXA-QTS-2110  
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18 November 2005

TRANSFORMERS AND INDUNTORS,  
HIGH RELIABILITY, SPACE USE,  
GENERAL SPECIFICATION FOR

JAXA  
JAPAN AEROSPACE EXPLORATION AGENCY

This specification was originally written and established in the Japanese language. This specification has been translated into English for international users. Note that this document is a working document for international users and is not subject to configuration control by JAXA. Any discrepancies found in this document should be verified against the latest Japanese document before any significant decisions are made.

**Revision Record**

Rev.	Date	Revised Contents
A	18 Nov. 05	<ol style="list-style-type: none"><li>1) Reflected the revision of NASDA-HDB-4. NASDA-HDB-4 → JERG-0-035</li><li>2) Specified a provision to allow using specifications prepared by acquisition officers as a product specification.</li><li>3) For Appendix B, clarified the qualification coverage and added a check sheet.</li></ol>

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Inductors Low Frequency, Transformers Power, and Low Frequency			
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**TRANSFORMERS AND INDUCTORS,  
HIGH RELIABILITY, SPACE USE,  
GENERAL SPECIFICATION FOR**

1. GENERAL

1.1 Scope

This specification establishes the general requirements and quality assurance provisions for space use, high reliability, transformers and inductors (hereinafter referred to as "transformers/inductors ") used for electronic equipment installed on space systems. Assemblies consisting of transformers or inductors combined with other parts shall be excluded from application of this specification.

This specification complies with JAXA-QTS-2000 (Common Parts/Materials, Space Use, General Specification for) which was recently established to transition to the qualified manufacturing line system and replaces the following specifications.

- a) NASDA-QTS-39013C Inductors Low Frequency, Transformers Power, and Low Frequency, High Reliability, Space Use, General Specification For
- b) NASDA-QTS-1050 Transformers and Coils, High Reliability, Space Use, General Specification for

1.2 Terms and Definitions

The definitions for terms used herein are as specified in JAXA-QTS-2000, JIS C 5301 and JIS C 5310.

1.3 Classification

Transformers/inductors covered by this specification shall be classified as specified in Table 1.

**Table 1. Classification**

Type	Appendix	Previous specifications
Low frequency inductors and low frequency and power transformers	A	NASDA-QTS-39013C
Power transformers and power inductors (for manned missions)	B	NASDA-QTS-1050

1.4 Part Number

The part number shall be as specified in Appendix A, paragraph A.3.1.4 of JAXA-QTS-2000. Details shall be as specified in each appendix.

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<p>2. APPLICABLE DOCUMENTS</p>			
<p>2.1 Applicable Documents</p>			
<p>The documents listed below form a part of this specification. These documents are the latest issues available at the time of contract award or application.</p>			
<p>If it is necessary to designate an issue, the issue shall be specified in the detail specification.</p>			
a)	JAXA-QTS-2000	Common Parts/Materials, Space Use, General Specification for	
b)	JIS B 0205-1	ISO general purpose metric screw threads	
-- Part 1: Basic profile			
c)	JIS B 0205-2	ISO general purpose metric screw threads	
-- Part 2: General plan			
d)	JIS B 0205-3	ISO general purpose metric screw threads	
-- Part 3: Selected sizes for screws, bolts and nuts			
e)	JIS B 0205-4	ISO general purpose metric screw threads	
-- Part 4: Basic dimensions			
f)	JIS B 0209-1	ISO general purpose metric screw threads -- Tolerances --	
Part 1: Principles and basic data			
g)	JIS B 0209-2	ISO general purpose metric screw threads -- Tolerances --	
Part 2: Limits of sizes for general purpose external and			
internal screw threads -- Medium quality			
h)	JIS B 0209-3	ISO general purpose metric screw threads -- Tolerances --	
Part 3: Deviations for constructional screw threads			
i)	JIS C 3202	Enamelled winding wires	
j)	JIS C 5301	General rules of low frequency transformer for electronic	
equipment			
k)	JIS C 5310	Generic specification of transformers for electronic equipment	
l)	JIS C 6435	Testing methods for low frequency transformers and inductors	
m)	ASTM E 595	Standard Test Method for Total Mass Loss and Collected	
Volatile Condensable Materials from Outgassing in a			
Vacuum Environment			
n)	MIL-HDBK-454	General Guidelines for Electronic Equipment	
o)	MIL-STD-202	Test Method Standard, Electronic and Electrical	
Component Parts			
<p>2.2 Reference Documents</p>			
<p>The followings are reference documents of this specification.</p>			
a)	JERG-0-035	NASDA Parts Application Handbook	
b)	JIS C 5311	Testing methods of power transformers for electronic	
equipment			
c)	MIL-PRF-27	Transformers and Inductors (Audio, Power, and	
High-Power Pulse), General Specification for			
<p>2.3 Order of Precedence</p>			
<p>In the event of a conflict between the text of this specification and the applicable</p>			
documents, the following order of precedence shall apply.			
a)	Detail specification		

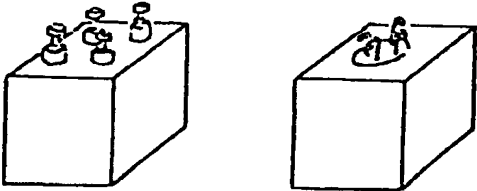
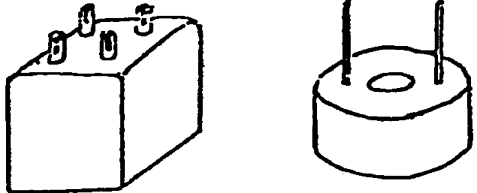
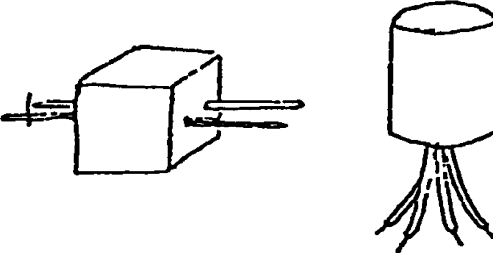
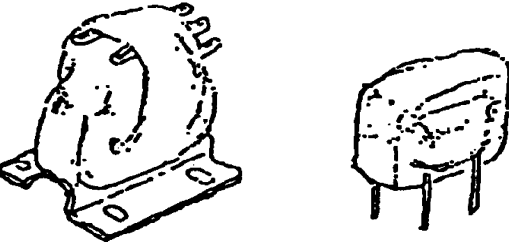
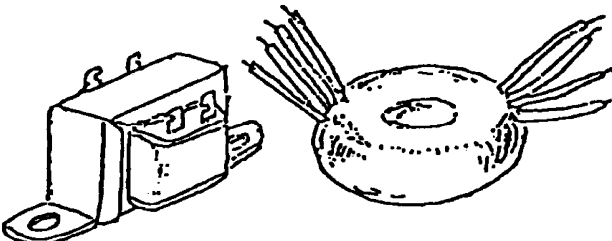
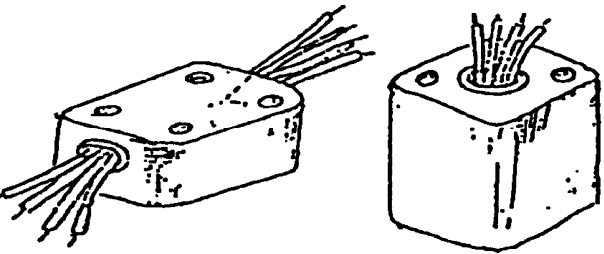
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<p>b) This specification c) JAXA-QTS-2000 d) Applicable documents of this specification (paragraph 2.1, except for JAXA-QTS-2000)</p> <p>2.4 Detail Specification</p> <p>Detailed requirements for the configuration and performance of transformers/inductors are specified in each detail specification and product specification. The detail specification shall be prepared and established by a manufacturer in accordance with Appendix A, Section A.4 of JAXA-QTS-2000. The detail specification shall also be registered with the Japan Aerospace Exploration Agency (hereinafter referred to as "JAXA").</p> <p>2.4.1 Detail Specification Number</p> <p>The detail specification number shall be indicated in the following form in accordance with Appendix A, paragraph A.2.2.2 of JAXA-QTS-2000.</p> <p>(Example)</p> <div style="text-align: center;"> <table border="0"> <tr> <td><u>JAXA-QTS-2110</u></td> <td>/</td> <td>A</td> <td>□□□</td> <td>A</td> </tr> <tr> <td> </td> <td></td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td>This specification number</td> <td></td> <td>Appendix letter</td> <td>Individual Identification</td> <td>Revision letter</td> </tr> </table> </div> <p>2.4.2 Revision Letter of Detail Specification</p> <p>A revision letter in the detail specification number shall be assigned in accordance with Appendix A, paragraph A.2.2.2.4 of JAXA-QTS-2000.</p> <p>2.4.3 Independency of Detail Specification</p> <p>The detail specification shall be a stand-alone document with a unique number defined in accordance with paragraph 2.4.1.</p> <p>2.4.4 Format of Detail Specification</p> <p>The detail specification format shall be in accordance with Appendix A, paragraph A.6, item b) of JAXA-QTS-2000, and shall specify each requirement in accordance with Appendix A, Section A.4 of JAXA-QTS-2000.</p> <p>2.4.5 Product Specification</p> <p>When specifying requirements for special applications within the qualification coverage defined in the detail specification, purchasers and/or certified manufacturers shall prepare a product specification in accordance with paragraph 6.3 and verify its compliance with the qualification coverage specified in paragraph 3.1.1. The product specification shall be readily available upon request from JAXA. Certified manufacturers shall attach a list of part numbers assigned to each product as a part of TRB status report in accordance with paragraph 3.3.5 of JAXA-QTS-2000.</p>				<u>JAXA-QTS-2110</u>	/	A	□□□	A						This specification number		Appendix letter	Individual Identification	Revision letter
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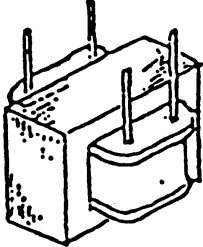
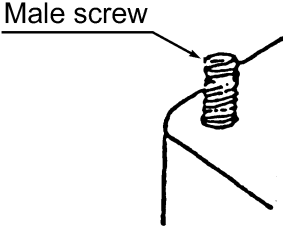
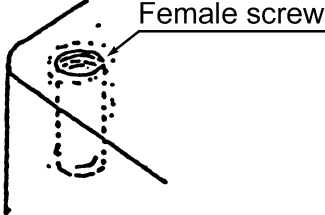
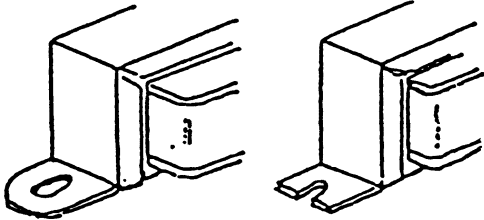
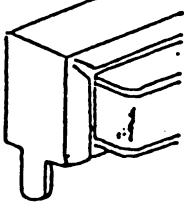
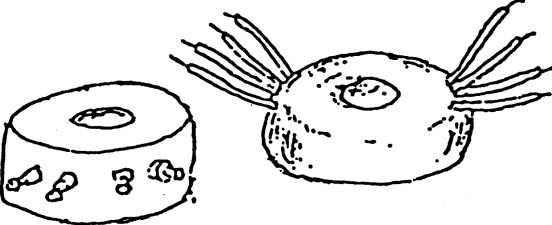
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<p>3. REQUIREMENTS</p> <p>3.1 Certification</p> <p>3.1.1 Qualification Coverage Qualification coverage shall be as specified in each appendix.</p> <p>3.1.2 Initial Qualification To acquire certification of the transformers/inductors in compliance with this specification, a manufacturer shall establish a quality assurance program in accordance with paragraph 3.2.1, perform the qualification tests specified in paragraph 4.4, and acquire a certification status from JAXA as specified in paragraph 3.4.1 of JAXA-QTS-2000. The manufacturer shall be listed on the Qualified Manufacturer List of the Japan Aerospace Exploration Agency (JAXA QML).</p> <p>3.1.3 Retention of Qualification To continue supplying transformers/inductors in accordance with this specification, a manufacturer must apply for QML certification retention in accordance with paragraph 3.4.2.1 of JAXA-QTS-2000 commencing between 30 and 60 days prior to the expiration date of the certification period (paragraph 3.1.4). If products were not shipped during the effective period of certification and a quality conformance inspection was not conducted, the manufacturer may apply for retention of certification without conducting the quality conformance inspection.</p> <p>3.1.4 Effective Period of Certification The effective period of certification granted in compliance with this specification shall be three years.</p> <p>3.1.5 Change of Qualification Coverage To change the qualification coverage, a manufacturer shall perform procedures for re-certification in accordance with paragraph 3.4.3 of JAXA-QTS-2000.</p> <p>3.2 Quality Assurance Program</p> <p>3.2.1 Establishment of a Quality Assurance Program To acquire certification status, a manufacturer shall be responsible for establishing a quality assurance program that satisfies the requirements specified in paragraph 3.3.1 of JAXA-QTS-2000 and this specification. The manufacturer shall generate a Quality Assurance Program Plan in accordance with paragraph 3.3.2 of JAXA-QTS-2000 and provide the plan to JAXA for review in accordance with paragraph 3.3.6 of JAXA-QTS-2000.</p> <p>3.2.2 TRB Formation To acquire a certification status in compliance with this specification, the manufacturer shall form and operate the Technical Review Board (TRB) in accordance with paragraph 3.3.5 of JAXA-QTS-2000.</p>			

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3.3	Materials <p>Materials used for manufacturing transformers/inductors shall be as specified in this specification. If a specific material is not specified, a material which enables the transformers/inductors to satisfy the requirements of this specification shall be used and the material shall be specified in the document defining the manufacturing conditions of the quality assurance program including the attached documents from a material manufacturer or receiving inspection data at the time of purchase.</p>		
3.3.1	Outgassing <p>Organic materials used for transformers/inductors shall meet the following requirements when tested in accordance with ASTM E 595.</p> <ul style="list-style-type: none"><li>a) Total Mass Loss (TML): 1.0% or less</li><li>b) Collected Volatile Condensable Material (CVCM): 0.1% or less</li></ul>		
3.4	Design and Construction <p>The design and construction shall be in accordance with each appendix. The configurations, mounting constructions and terminal types shall be as specified in Tables 2 through 4, respectively. Detailed requirements shall be specified in the detail specification.</p>		
3.5	Externals, Dimension, Mass and Marking <p>The externals, dimensions, mass and markings of transformers/inductors shall be as specified in each appendix.</p>		
3.6	Workmanship <p>The workmanship of transformers/inductors shall be as specified in each appendix.</p>		
3.7	Rating <p>The ratings of transformers/inductors shall be as specified in each appendix.</p>		
3.8	Electrical Performance <p>Requirements for the electrical performance of transformers/inductors shall be in accordance with each appendix.</p>		
3.9	Mechanical Performance <p>Requirements for the mechanical performance of transformers/inductors shall be in accordance with each appendix.</p>		
3.10	Environmental Performance <p>Requirements for the environmental performance of transformers/inductors shall be in accordance with each appendix.</p>		
3.11	Durability Performance <p>Requirements for the durability performance of transformers/inductors shall be in accordance with each appendix.</p>		


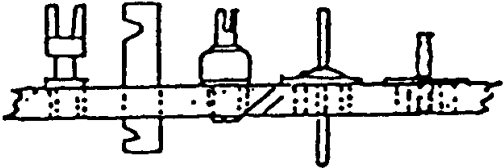
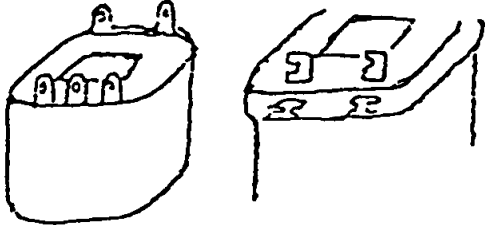
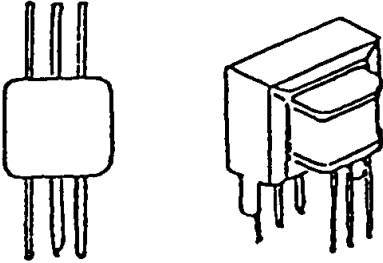
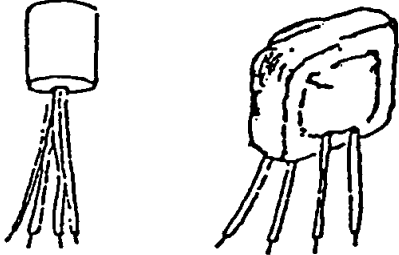
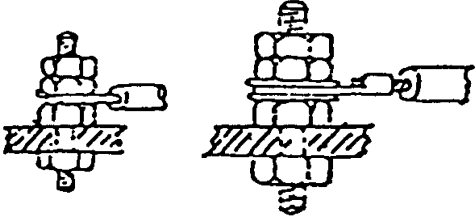
**Table 2. Configuration of Transformers/Inductors**

Grade	Configuration	Example	Remark
4	Metal case Sealed type		Glass or ceramic sealed terminal shall be used.
5	Synthetic resin case Filled type		-
5	Molded type Cast type		-
5	Coated type		-
6	Open type		-
7	Metal case, Semi-sealed type		-

**Table 3. Mounting Construction of Transformers/Inductors**

Mounting construction	Example	Remark
With leads or pin terminals		-
With studs	 <p>Male screw</p>	-
With screw holes	 <p>Female screw</p>	-
With holes on a mounting bracket	 <p>Round or slotted hole      Notch</p>	-
By a mounting bracket tab		-
By adhesion, screwing through a central mounting hole, or their combination		-

**Table 4. Terminal Construction of Transformers/Inductors**

Terminal type		Construction	Example
Soldered terminals	Solid wire lead	Contains a single wire (copper alloy wire etc.) to tie up terminals.	
	Rod	Metal rods, plates or tubes are embedded in an insulator, and wires are soldered to them (turret type or hook type, etc.).	
	Lug	Wires are soldered to lugs mounted to an insulator (tub type, or flat type, etc.).	
	Pin	Leads (copper alloy wire etc.) are extended and to be soldered to a printed wiring board.	
Insulating lead		Flexible insulated strand wires are pulled out outside the transformer or inductor for external connection (including direct wiring wire).	
Screw		Wires are clinched to an insulator with a screw clamp or an embedded screw.	
Others		Other than above.	—

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<p>4. QUALITY ASSURANCE PROVISIONS</p> <p>4.1 General Requirements</p> <p>The manufacturer shall be responsible for implementing the quality assurance program as specified in paragraph 3.2 and operating the TRB.</p> <p>4.2 Classification of Test and Inspection</p> <p>The tests and inspections shall be classified into the following three categories in accordance with paragraph 4.3 of JAXA-QTS-2000.</p> <ul style="list-style-type: none"><li>a) In-process inspection</li><li>b) Qualification test</li><li>c) Quality conformance inspection</li></ul> <p>4.3 In-Process Inspection</p> <p>The manufacturer shall perform the in-process inspections during the manufacturing process to detect any failure which could seriously affect the reliability and quality of the products, assure the workmanship, and characterize properties which cannot be measured using the finished products. Some examples are shown below. The manufacturing flowchart in the quality assurance program plan shall define the inspection process.</p> <ul style="list-style-type: none"><li>a) Internal visual inspection of semi-finished products (non-destructive, 100% or sampled inspection)</li><li>b) Physical and chemical inspection of semi-finished products (destructive or non-destructive, 100% or sampled inspection)</li><li>c) Characterization of semi-finished products (non-destructive, 100% or sampled inspection)</li></ul> <p>4.4 Qualification Test</p> <p>4.4.1 Sample</p> <p>Samples shall be manufactured using the process and control specified in the quality assurance program and shall also typify the qualification coverage.</p> <p>4.4.2 Manufacturing Records</p> <p>The manufacturer, which intends to acquire certification status, shall archive material certification, receiving inspection data or test data of materials used, work records related to sample preparation and the in-process inspection data. These records shall be readily available upon request.</p> <p>4.4.3 Test Items and Sample Size</p> <p>Test items, test sequence and sample size of the qualification test shall be in accordance with each appendix.</p> <p>4.4.4 Criteria for Pass/Fail</p> <p>A failure of any test in the qualification tests specified in each appendix shall constitute failure of the qualification tests. If the failure mode of the defects is catastrophic such</p>			

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<p>as an open- or short-circuiting where the function of the transformers/inductors might be lost, the transformer and inductors fail the qualification test.</p>			
4.4.5	Disposition after Inspections		
<p>The samples used in the qualification test shall not be delivered. The products in the same inspection lot that have passed the qualification test may be delivered after passing the Group A inspection of the quality conformance inspection.</p>			
4.5	Quality Conformance Inspection		
4.5.1	Quality Conformance Inspection (Group A)		
<p>Group A inspections shall be performed at the time of production for all products.</p>			
4.5.1.1	Sample		
<p>Selection of test samples for Group A inspections lots shall be defined as a part of the manufacturing conditions in the quality assurance program.</p>			
4.5.1.2	Inspection Items and Sample Size		
<p>Inspection items, inspection sequence and sample size in the Group A inspection shall be as specified in each appendix.</p>			
4.5.1.3	Criteria for Pass/Fail		
<p>A failure of any test in Group A inspections specified in each appendix shall constitute failure of Group A of quality conformance inspections. If the failure mode of the defects is catastrophic such as an open- or short-circuiting where the function of the transformers/inductors might be lost, the transformers/inductors fail Group A inspections.</p>			
4.5.1.4	Disposition after Inspections		
<p>The lots rejected in Group A inspection shall not be delivered. Details shall be specified in each appendix.</p>			
4.5.2	Quality Conformance Inspection (Groups B and C)		
<p>Groups B and C inspections shall be performed in accordance with the following schedule.</p>			
<p>a) Group B inspection shall be performed on the first lot manufactured within the certification period.</p>			
<p>b) When retention of certification is granted, Group C inspection shall be performed prior to the restart of production when no products were manufactured within the previous certification period and no quality conformance inspection was performed.</p>			
4.5.2.1	Sample		
<p>Samples for Groups B and C inspection lots shall be taken from inspection lots that have passed Group A inspections.</p>			

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4.5.2.2	<p>Inspection Items and Sample Size</p> <p>Inspection items, inspection sequence and sample size of the Group B and C inspections shall be as specified in each appendix.</p>		
4.5.2.3	<p>Criteria for Pass/Fail</p> <p>A failure of any inspection specified in the Group B or C inspections shall constitute failure of the quality conformance inspection of each group.</p>		
4.5.2.4	<p>Disposition after Inspections</p> <p>The samples used for the Group B and C inspections shall not be delivered. If the samples fail in the Group B or C inspections, the manufacturer shall conduct a failure analysis on the defects and take corrective action. Delivery of the products shall be suspended until JAXA approves the corrective actions.</p>		
4.6	<p>Method for Test or Inspection</p>		
4.6.1	<p>Externals, Dimension, Mass, and Marking</p> <p>Test methods for externals, dimensions, mass, and marking of the transformers/inductors shall be as specified in each appendix.</p>		
4.6.2	<p>Workmanship</p> <p>Test methods regarding workmanship of the transformers/inductors shall be as specified in each appendix.</p>		
4.6.3	<p>Electrical Performance</p> <p>Test methods regarding the electrical performance of the transformers/inductors shall be as specified in each appendix.</p>		
4.6.4	<p>Mechanical Performance</p> <p>Test methods regarding the mechanical performance of the transformers/inductors shall be as specified in each appendix.</p>		
4.6.5	<p>Environmental Performance</p> <p>Test methods regarding the environmental performance of the transformers/inductors shall be as specified in each appendix.</p>		
4.6.6	<p>Durability Performance</p> <p>Test methods regarding the durability performance of the transformers/inductors shall be as specified in each appendix.</p>		
4.7	<p>Long-Term Storage</p>		
4.7.1	<p>Disposition of Lots Stored for a Long-Term at the Manufacturer's Site</p> <p>When products have been stored at the manufacturer's site for 24 months or longer after the Group A inspections of the quality conformance inspection, the manufacturer shall perform 100% inspection for test items specified in each appendix prior to delivery.</p>		



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<p>Only the transformers/inductors which have passed such inspections can be shipped as products.</p>			
<p>4.7.2 Storage by Purchasers Instructions for storage by purchasers shall be as specified in the detail specification.</p>			
<p>4.8 Change to Tests and Inspections Any change in the in-process inspection and quality conformance inspection specified in this specification shall be made in accordance with paragraphs 4.4 and 6.1 of JAXA-QTS-2000.</p>			
<p>5. PREPARATION FOR DELIVERY Preparation for delivery shall be as follows and as specified in Section 5 of JAXA-QTS-2000.</p>			
<p>5.1 Packaging The transformers/inductors shall be appropriately packaged as high reliability parts at the time of delivery from the manufacturer to the purchaser. Package specifications shall be included in the quality assurance program.</p> <p>a) Individual packaging A group of transformers/inductors shall be individually packaged in a proper manner. The group shall contain a practical quantity of transformers/inductors such as 5, 10, or 20.</p> <p>b) Packaging Transformers/inductors shall be individually packaged with cushioning materials to protect the products. Additional requirements for packaging shall be specified in procurement documents, if necessary.</p>			
<p>5.2 Marking on Package Each shipping package shall have the following markings.</p> <p>a) Part name b) Part number (part number in this specification or that assigned by a purchaser) c) Applicable specification number d) Lot identification code e) Purchaser's name f) Manufacturer's name g) Quantity of packages h) Date of inspection i) Inspection result</p>			
<p>6. NOTES</p>			
<p>6.1 Notes for Manufacturer</p>			
<p>6.1.1 Preparation and Registration of Application Data Sheet The manufacturer shall prepare the Application Data Sheet in accordance with Appendix G of JAXA-QTS-2000 and register it with JAXA.</p>			
<p>6.2 Notes for Purchasers Refer to the Application Data Sheet for detailed data of the products and notes.</p>			

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<p data-bbox="177 232 810 264">6.2.1 Items to be Specified for Procurement</p> <p data-bbox="309 280 1453 353">To purchase transformers/inductors manufactured in accordance with this specification, the purchaser shall provide the following information.</p> <ul data-bbox="309 360 1390 555" style="list-style-type: none"><li data-bbox="309 360 1390 392">a) Part number (both specified in this specification and assigned by a purchaser)</li><li data-bbox="309 398 708 430">b) This specification number</li><li data-bbox="309 436 727 468">c) Detail specification number</li><li data-bbox="309 474 1382 506">d) Indication of test data or source inspection results to be submitted for delivery</li><li data-bbox="309 512 461 544">e) Others</li></ul> <p data-bbox="309 551 1461 745">For item e), requirements other than those defined in this specification may be specified by preparing a product specification (See paragraph 6.3.). However, if the requirements conflict with the existing requirements in this specification, the purchaser shall not request that the manufacturer indicate that the transformers/inductors comply with this specification.</p> <p data-bbox="177 790 695 822">6.3 Preparing Product Specification</p> <p data-bbox="277 837 1461 1070">A purchaser and/or manufacturer shall prepare a product specification to specify requirements for special applications. The format of product specification shall be in accordance with Format Example - 1. For description of paragraph 3 and subsequent paragraphs of the format example, a specification prepared by the purchaser may be used as the product specification provided that such specification covers the contents of product specification.</p>			

**Format Example - 1 (1/5)**

Established on: October 10, 2005

Manufacturer: XXXXXXXXXXXX

**PRODUCT SPECIFICATION  
NASDA 2110/A114 – T001 (to T003)**

	JAXA	Purchaser	Manufacturer
Part number	N2110/A114-T001	ABC123	114A001
(Control number)	N2110/A114-T002	(skip)	(skip)
	N2110/A114-T003	(skip)	(skip)

**1. Rating**

The rating shall be as shown in Table 1.

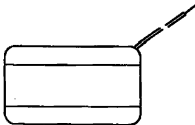
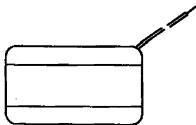
**Table 1. Rating**

Item	N2110/A114-T001	N2110/A114-T002	N2110/A114-T003
Operating ambient temperature	-55 to +100°C	(skip)	(skip)
Maximum operating temperature	+130°C		
Operating frequency	20kHz±10% (sine wave)		
Maximum operating voltage	175V		
Power voltage	50Vrms		
Output	253VA		

**Format Example - 1 (2/5)****2. Qualification Coverage**

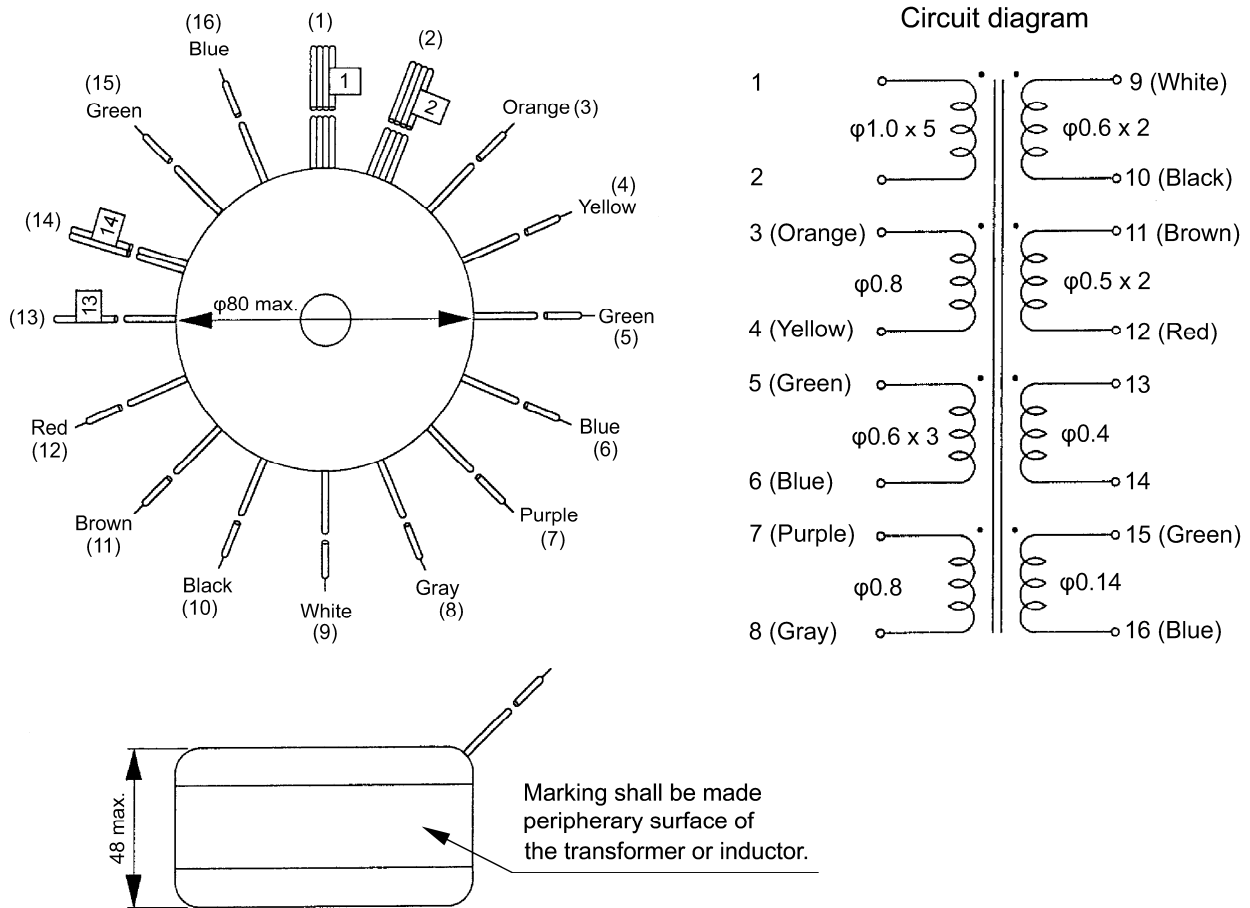
The qualification coverage shall be as shown in Table 2.

**Table 2. Qualification Coverage**

Qualification coverage by similarity including certified transformers/inductors		Description of individual transformer and inductor		
Detail specification no.: JAXA-QTS-2110/A114		Product specification: NASDA2110/A114-T0010 (to T003)		
Typical part no.: N2110/A114-T000		N2110/A114-T001	N2110/A114-T002	N2110/A114-T003
a)	Class (max. operating temperature)	S (130°C) max.	S (130°C)	(skip)
b)	External/internal mounding structure	Combination of adhesion and screwing	Combination of adhesion and screwing	
	External dimension (mm)	φ80 x 60 <sup>H</sup> max.	φ80 x 48 <sup>H</sup>	
	Total volume (cm <sup>3</sup> )	301.6 max.	241.2	
c)	Operating voltage	200V <sub>peak</sub> max.	175V <sub>peak</sub>	
	Insulation	Polyester equivalent or better	Polyester	
d)	Magnet wire diameter (mm)	φ0.14 min.	φ0.14	
	Coating material	Polyester equivalent or better	Polyester	
e)	Grade	6	6	
	Insulating, impregnating, and filling materials	Epoxy impregnation	Epoxy impregnation	
f)	Construction and material of terminal	PTFE lead: AWG28 min. Direct wiring wire: φ0.4mm min.	PTFE leads: AWG18, 20, 28 Direct wiring wire: φ1.0 x 5mm, φ0.4mm	
	Terminal strength	PTFE lead: 13.7N max. Direct wiring wire: 9.8N max.	PTFE lead wire: 13.7N Direct wiring wire: 9.8N	
g)	Shock	1,000G, 0.5ms, semi sine wave max.	840G, 0.6ms, semi sine wave	
	Vibration	High frequency: MIL-STD-202, test method 204, test condition D max. Random: MIL-STD-202, test method 214, test condition II-H max.	High frequency: MIL-STD-202, test method 204, test condition D Random: MIL-STD-202, test method 214, test condition II-H	
h)	Core material	MPP	MPP	
	Core shape	Toroidal	Toroidal	
i)	Dielectric withstanding voltage	AC500V	AC500V	
j)	Outline drawing			

**Format Example - 1 (3/5)****3. Product Inspection**

External, construction, dimensions, marking and mass shall be as shown in Figures 1, 2 and 3.



- Lead wire length: 100mm min.  
AWG 18 for terminals 5, 6  
AWG 20 for terminals 3, 4, 7, 8, 9, 10, 11, 12  
AWG 28 for terminals 15, 16  
Direct wiring wires of  $\phi 1.0\text{mm} \times 5$  for terminals 1, 2  
Direct wiring wires of  $\phi 0.4\text{mm}$  for terminals 13, 14  
Coating removed for length of approximately 10mm at end
- Mass: 900g max.

**Figure 1. External, Construction, Dimension, Marking and Mass (N2110/A114-T001)**

(Skip the rest)

**Format Example - 1 (4/5)**

## 4. Performance

The performance shall be as shown in Table 3.

**Table 3. Performance**

JAXA-QTS-2110, Appendix A		Performance		
Item	Paragraph no.	N2110/A114-T001	N2110/A114-T002	N2110/A114-T003
Electrical characteristics	A.3.7.1	As specified in Table 4.	As specified in Table 5.	As specified in Table 6.
Interlayer withstanding voltage	A.3.7.3	100kHz, sine wave of 100Vrms for 5±0.5s between (1-2)	(Skip)	(Skip)
Insulation resistance	A.3.7.4	a) 10,000MΩ		
Corona discharge	A.3.7.5	N/A		
Temperature rise	A.3.7.6	Up to 30°C (ambient temperature: 100°C)		
Solderability	A.3.8.2	N/A		
Resistance to soldering heat	A.3.8.3	N/A		
Seal	A.3.8.4	N/A		
Thermal shock	A.3.9.3	Test condition A-1 (temperature of 3rd step: 115°C)		
Immersion	A.3.9.4	N/A		
Flammability	A.3.9.6	N/A		
Resistance to solvents	A.3.9.7	N/A		
Life	A.3.10.1	Ambient temperature: 130°C – measured temperature rise		

**Format Example - 1 (5/5)**

## 5. Electrical Characteristic

The electrical characteristics shall be as shown in Tables 4, 5 and 6.

**Table 4. Electrical Characteristic (N2110/A114-T001)**

Item	Rating
Operating frequency	20kHz±10% (sine wave)
Power voltage	50Vrms
Winding ratio	$(3-4) / (1-2) = 2.533 \pm 3\%$ $(5-6) / (1-2) = 1.000 \pm 3\%$ $(7-8) / (1-2) = 2.533 \pm 3\%$ $(9-10) / (1-2) = 1.200 \pm 3\%$ $(11-12) / (1-2) = 1.200 \pm 3\%$ $(13-14) / (1-2) = 1.000 \pm 3\%$ $(15-16) / (1-2) = 0.800 \pm 4\%$
Inductance	(1-2) = 90μH min. at 10kHz, 0.1V, DC10A
DC resistance (at 20°C)	(1-2) = 0.03Ω max., (9-10) = 0.30Ω max (3-4) = 0.40Ω max., (11-12) = 0.35Ω max (5-6) = 0.20Ω max., (13-14) = 0.90Ω max (7-8) = 0.45Ω max., (15-16) = 5.00Ω max
Output	253VA
Polarity	Test points 1, 3, 5, 7, 9, 11, 13, and 15 shall have same polarity.
Test circuit	

(Skip the rest)