

COMMON PARTS/MATERIALS, SPACE USE,
APPLICATION DATA SHEET FOR

Part Description	TRANSFORMERS AND INDUCTORS, POWER
Part Number and Type	NASDA 2110/A120-T000
Applicable Specification	JAXA-QTS-2110 JAXA-QTS-2110/A120

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Prepared and Established by Tamura Corporation

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This document is the English version of JAXA QTS/ADS which was originally written and authorized in Japanese and carefully translated into English for international users. If any question arises as to the context or detailed description, it is strongly recommended to verify against the latest official Japanese version.

The release date of the English version of this specification: February 10, 2023

Revision Log

Rev.	Date	Revised Contents				
NC	17 Feb. 2006	Original				
A	20 June 2012	<p>(1) Page 8: Outgassing Data of Materials Added the data for adhesive (which was erroneously omitted)</p> <p>(2) Page 3: Changed the contact due to reorganization.</p> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Before</td> <td style="text-align: center;">After</td> </tr> <tr> <td>Avio & Industrial Devices Business Unit Quality Assurance Group</td> <td>Electronic Components Business Sector Components Quality Assurance Group</td> </tr> </table> <p>(3) Page 3: Added paragraph 6 RELIABILITY</p> <p>(4) Page 3: Added an item in Paragraph 7.2 Instruction for Users: "Use insulation protection on terminals when the transformer is operated in reduced pressure environment."</p> <p>(5) Others: Pages 5 and 6: Added table numbers Page 5: Updated the test data in Table 1. (the data of Group A and B tests of Quality Conformance test was updated) Page 7: Added the table title of Table 3 "Evaluation Test Results (Electrical Characteristics)".</p>	Before	After	Avio & Industrial Devices Business Unit Quality Assurance Group	Electronic Components Business Sector Components Quality Assurance Group
Before	After					
Avio & Industrial Devices Business Unit Quality Assurance Group	Electronic Components Business Sector Components Quality Assurance Group					
B	8 Feb. 2018	<p>(1) Page 3: Changed contact in association with organization change Components Quality Assurance Group →Magnetic Business Unit, Production Management dept., Quality Assurance Group</p> <p>(2) Page 4: Added Manufacture line identification letter to the serial number in the marking; Added marking example; W: Wakayanagi Tamura Corporation, No letter added: Tamura corporation</p> <p>(3) Page 7, Table 3: Added the data for "sample made by Wakayanagi Tamura Corporation" to the parameter range.</p>				
C	22 Aug. 2022	<p>(1) Page 3, Paragraph 8: Changed contact division and telephone number in association with organization change.</p> <ul style="list-style-type: none"> • Production Management department → AVIO Department • +81-49-284-9152 → +81-50-3664-0489 				

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**COMMON PARTS AND MATERIALS, SPACE USE,
APPLICATION DATA SHEET FOR**

1. GENERAL

1.1 Scope

This Application Data Sheet details additional general information necessary for parts selection and/or equipment design that is not contained in JAXA-QML. Users are encouraged to look into other information sources for specific applications, and responsible for their decisions on part selection and usage.

1.2 Applicable Documents

- | | |
|------------------------|--|
| (1) JAXA-QTS-2000 | Common Parts/Materials, Space Use, General Specification for |
| (2) JAXA-QTS-2110 | Transformers and Inductors, High Reliability, Space Use, General Specification For |
| (3) JAXA-QTS-2110/A120 | NASDA 2110/A120 Type, Transformers and Inductors, Power, High Reliability, Space Use, Detail Specification For |

2. SUMMARY OF PRODUCTS

The transformer described in this data sheet is an open type high reliability product for electrical equipment to be installed on satellites and/or launch vehicles.

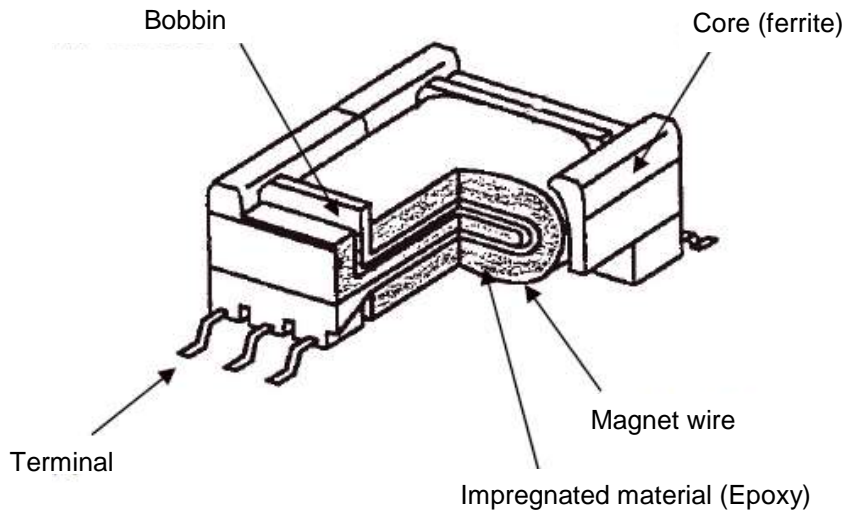
2.1 Externals, Dimensions and Mass

Externals, dimensions, mass and markings of the transformer are shown below.

Part number	Externals, dimensions and marking	Mass (nominal value)
NASDA 2110/A120-T000	See Figure 1	10.5g

2.2 Construction

The transformer is of an epoxy resin impregnated open type and composed of coils and EPC type ferrite core. The coils are made of magnet wires which are wound around a bobbin with gull-wing shaped terminal. The following figure shows internal structure.



3. USAGE

3.1 Rating

The ratings of transformers are as follows.

Part number	Rated power	Operating frequency	Operating ambient temperature (1)	Temperature rise (1)	Input voltage
NASDA2110/A120-T000	20VA	100kHz	-55°C to +85°C	20°C max.	30Vrms

Note (1) Operating ambient temperature + Temperature rise = Maximum operating temperature : Class R (105°C) as a maximum

3.2 Mounting Methods

It is recommended to mount the transformer as follows.

(1) The transformer shall be surface mounted on printed circuit board by both soldering the gull-wing terminals on the board and using epoxy adhesives on the coil body.

4. CHARACTERISTICS UNDER NORMAL OPERATING CONDITIONS

4.1 Electrical Characteristics

The transformer satisfied the electrical characteristics specified in the detail specification. Test results are shown in Tables 1 through 3.

4.2 Environmental Resistance

The transformer satisfied the environmental conditions specified in the detail specification. Test results are shown in Tables 1 through 3.

4.3 Outgassing

Outgassing data of organic materials used in the transformers is shown in Table 4.

5. HANDLING AND STORAGE CONDITIONS

(1) Caution shall be used not to give excess stress such as drop impact.

(2) It is advisable to store the transformer under the following conditions.

Items	Conditions
(1) Temperature	+0°C to +35°C
(2) Relative humidity	75%RH max.
(3) Pressure	86kPa to 106kPa
(4) Others	It is advisable to store where vibrations and shocks are minimal.

6. RELIABILITY

6.1 Possible Failure Mode

- Open circuit (breaking, bad connection)
- Short circuit (Insulation breakage, insulating film breakage)
- Low Inductance (iron core breakage, flexure, layer short)

7. PRECAUTIONS

7.1 Instructions for Purchaser

If purchaser's specification is included in the "qualification coverage" specified in the detail specification, JAXA-QTS-2110/A120, Paragraph 3.1, or if "qualification by similarity" specified in JAXA-QTS-2110, Appendix A (Paragraph A.3.1.1.1), is applicable, products can be provided as JAXA certified parts. In this case, the purchaser can specify requirements for specific applications in product specification (refer to JAXA-QTS-2110, Paragraph 6.3) for each procurement.

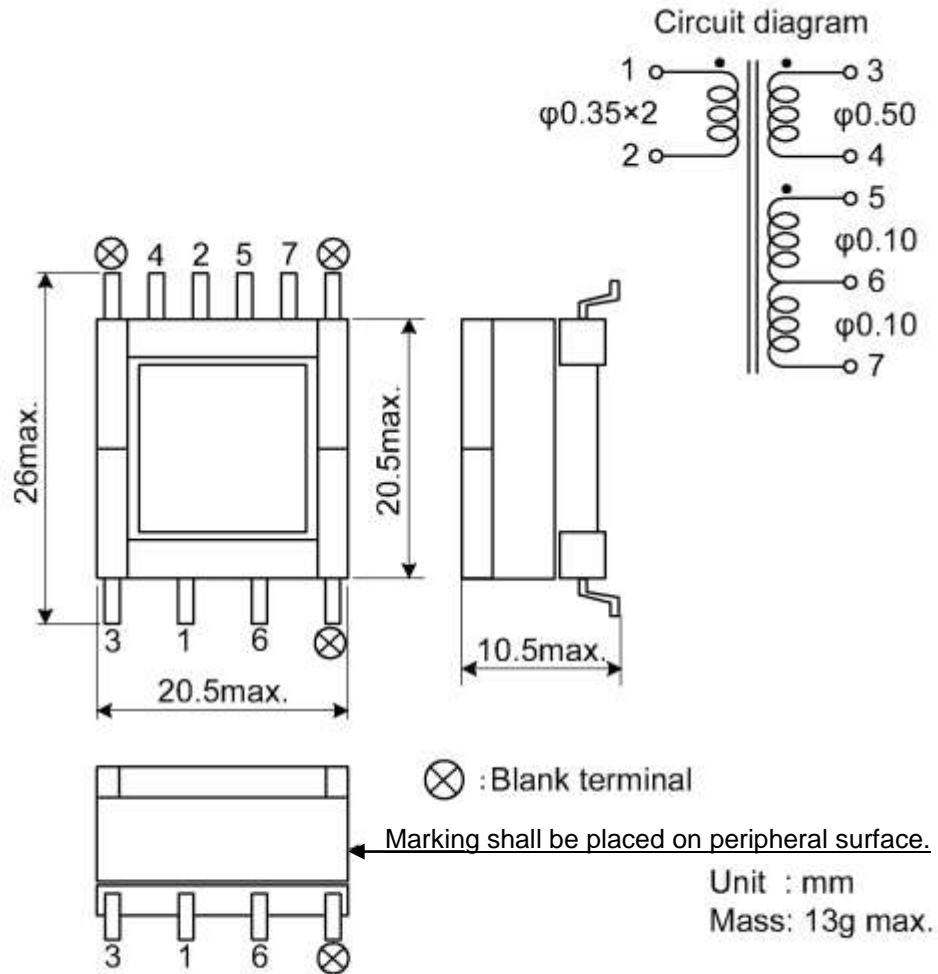
7.2 Instructions for User

- Apply sufficient amount of adhesive to the bonding surface.
- The acceptable adhesive is rigid epoxy adhesive.
- It is advisable to keep the operating frequency deviation within $\pm 5\%$ of the rated operating frequency.
- It is advisable to operate the transformer within the rated output power and direct current.
- Operate the transformer in the temperature class R (105°C) as a maximum.
- Use the transformer in consideration of its outgassing characteristics.
- Terminals shall be insulated when used under reduced-pressure environment.

8. OTHERS

Direct all inquiries about this data sheet to Tamura Corporation.

Manufacturer	Tamura Corporation Electronic Components Business Sector, Magnetic Business Unit, AVIO Department, Quality Assurance Group
Address	5-30, Chiyoda 5-chome, Sakado-city, Saitama 350-0214, Japan
Telephone	+81-50-3664-0489



1. Mass: 13g max.
2. Markings:
N2110/A120
Lot identification code
Serial number and manufacture line identification letter

(Marking example)

Serial number No. 1 W Manufacture line identification letter:
Letter "W": Wakayanagi Tamura Corporation
No letter added: Tamura Corporation

Trademark
Terminal identification

Figure 1. Externals, Dimensions and Markings

Table 1. Evaluation Test Results (Environmental Resistance and Electrical Characteristics)(Part 1)

Item no.	Test item	Test method ⁽¹⁾	Pass/Fail criteria	Test result (Parameter range)			
				Passed	Failed		
I	1	Thermal shock	A.4.4.6.3	No corrosions affecting electrical performance nor mechanical damages	Acceptable	3	0
II	2	Material, design, structure, externals, dimension, marking, workmanship	A.4.4.2 A.4.4.3	Markings, dimension, mass and structures shall be as specified in the detail specification.	Acceptable	3	0
	3	Electrical characteristics	A.4.4.4.1	Shown in Table 3.		3	0
	4	Withstanding voltage (ambient pressure)	A.4.4.4.2.1	No dielectric breakdown	Acceptable	3	0
	5	Withstanding voltage (reduced pressure)	A.4.4.4.2.2	No dielectric breakdown	Acceptable	3	0
	6	Interlayer withstanding voltage	A.4.4.4.3	No dielectric breakdown	Acceptable	3	0
	7	Insulation resistance	A.4.4.4.4	10,000MΩ min.	100,000MΩ min.	3	0
	8	Bacteria resistance	—	External materials shall be processed to prevent bacterial infestation.	Bacteria resistance material used		
III ⁽²⁾	9	Life	A.4.4.7.1	No mechanical or electrical damages	Acceptable	2	0
	10	Visual and mechanical inspection (post-test)	A.4.4.2.1	Markings, dimension, mass and structures shall be as specified in the detail specification	Acceptable	2	0
	11	Electrical characteristics	A.4.4.4.1	Shown in Table 3.		2	
IV	12	Resistance to soldering heat	A.4.4.5.3	No softening of insulating materials, no loosening of coil and terminals.	No softening of insulating materials, no loosening of coil and terminals.	3	0
	13	Terminal strength	A.4.4.5.1	No loosening, breakage or other mechanical damages to the terminals	Acceptable	3	0
	14	Temperature rise	A.4.4.4.6	20°C max.	7.0 to 8.9°C	3	0
	15	Vibration	A.4.4.6.1	No mechanical damages	Acceptable	3	0
	16	Shock	A.4.4.6.2	No mechanical damages	Acceptable	3	0
	17	Moisture resistance	A.4.4.6.5	No corrosions affecting electrical performance nor mechanical damages	Acceptable	3	0
	18	Overload	A.4.4.4.1.21	No corrosions affecting electrical performance nor mechanical damages	Acceptable	3	0
	19	Electrical characteristics	A.4.4.4.1	Shown in Table 3.		3	0
	20	Visual and mechanical inspection (post-test)	A.4.4.2.1	Markings, dimension, mass and structures shall be as specified in the detail specification	Acceptable	3	0
	21	DPA	A.4.4.3.1	No gap or cracks	Acceptable	3	0

Note ⁽¹⁾ Indicates paragraph number of JAXA-QTS-2110.

⁽²⁾ The evaluation test results in Group III consist of test data from NASDA-QTS-39013C.
The temperature at the 3rd step when the data were obtained was 95°C.

Table 2. Evaluation Test Results (Environmental Resistance and Electrical Characteristics) (Part2)

Item no.	Test item	Test method ⁽¹⁾	Pass/Fail criteria	Test result (Parameter range)			
				Passed	Failed		
I	1	Thermal shock	A.4.4.6.3	No corrosions affecting electrical performance nor mechanical damages	Acceptable	8	0
	2	Winding continuity	A.4.4.4.7	All wires shall be free of open circuiting.	Acceptable	8	0
II	3	Material, design, structure, externals, dimension, marking, workmanship	A.4.4.2 A.4.4.3	Markings, dimension, mass and structures shall be as specified in the detail specification.	Acceptable	8	0
	4	Electrical characteristics	A.4.4.4.1	Shown in Table 3		8	0
	5	Withstanding voltage (ambient pressure)	A.4.4.4.2.1	No dielectric breakdown	Acceptable	8	8
	6	Withstanding voltage (reduced pressure)	A.4.4.4.2.2	No dielectric breakdown	Acceptable	8	0
	7	Interlayer withstanding voltage	A.4.4.4.3	No dielectric breakdown	Acceptable	8	0
	8	Insulation resistance	A.4.4.4.4	10,000MΩ min.	100,000MΩ min.	8	0
III	9	Solderability	A.4.4.5.2	The surface shall be covered with fresh solder. Defects such as pinholes shall not exceed the limit.	Acceptable	2	0
	10	Visual and mechanical inspection (post-test)	A.4.4.2.1	Markings, dimension, mass and structures shall be as specified in the detail specification.	Acceptable	2	0
	11	Electrical characteristics	A.4.4.4.1	Shown in Table 3		2	0
IV	12	Resistance to soldering heat	A.4.4.5.3	No softening of insulating materials, no loosening of coil and terminals.	Acceptable	6	0
	13	Electrical characteristics	A.4.4.4.1	Shown in Table 3		6	0
	14	Visual and mechanical inspection (post-test)	A.4.4.2.1	Markings, dimensions, mass and structures shall be as specified in the detail specification	Acceptable	6	0

Note ⁽¹⁾ Indicates section number of JAXA-QTS-2110.

Table 3. Evaluation Test Results (Electrical Characteristics)

NASDA2110/A120-T000

Item	Pass/Fail criteria	Parameter range	
		Tamura Corporation Sakado factory sample	Wakayanagi Tamura sample
Inductance	Between (1-2) 550μH min.	924 to 1048μH	940.8 to 1068.5μH
Transformer turns ratio	(3- 4) / (1-2) 0.700 ± 3% (5- 6) / (1-2) 3.00 ± 3% (5- 7) / (1-2) 5.90 ± 3%	-0.1 to 0.0% 0.3 to 0.41% 1.0 to 1.1%	-0.2 to 0.0% 0.1 to 0.3% 0.6 to 0.7%
DC resistance	Between (1 - 2) 0.12Ω max.	0.0860 to 0.0868Ω	0.0846 to 0.0856Ω
	Between (3 - 4) 0.08Ω max.	0.0600 to 0.0602Ω	0.0586 to 0.0589Ω
	Between (5 - 7) 18Ω max.	14.40 to 14.62Ω	14.36 to 14.43Ω
Polarity	Test points 1, 3 and 5 shall have the same polarity.	Acceptable	Acceptable
Dimensions	A (Length) 20.5mm max.	19.9 to 20.0mm	20.0mm
	B (Width) 20.5mm max.	20.1 to 20.2mm	19.8 to 19.9mm
	C (Height) 10.5mm max.	9.9 to 10.1mm	9.9mm
Volume	-	3.98 to 4.06cm ³	3.92 to 3.94cm ³
Mass	13g max.	10.4 to 10.5g	10.4 to 10.5g

Table 4. Outgassing Data

JAXA certified parts (NASDA2110/A120-T0000)		Outgassing Data of Materials				
No.	Category	Part Number	Material name	TML (%)	CVCM (%)	Mass (g) (Reference)
1	Bobbin	BEPC-19-1110GAFF	FR phenol	1.566	0.006	1.3
2	Wire	UEW (insulator)	Polyurethane	0.584	0.013	-
3	Insulating tape	650S	Polyimide/silicone adhesive	1.664	0.491	0.2
4	Adhesive	Aron alpha #201	α -Cyanoacrylate resin	14.310	0.120	0.001
5	Insulating tape	No. 1205	Polyimide/ acrylic adhesive	0.859	0.065	0.01
6	Adhesive	LOCTITE 325	Anaerobic adhesive	2.45	0.11	0.01
7	Impregnated material	No. 280	Epoxy	0.581	0.047	0.1
8	Ink	MARKEM7224 (white)	Epoxy	5.418	0.029	0.05
The outgassing data for the finished product				1.643	0.068	1.671