

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

Part Description	CONNECTORS, COAXIAL, RADIO FREQUENCY, HIGH RELIABILITY, SPACE USE RECEPTACLE JACK, STRAIGHT, 4-POINT ATTACHMENT RECEPTACLE JACK, STRAIGHT, 2-POINT ATTACHMENT
Part Number and Type	J2060 / HA41-33K0-* J2060 / HA42-33K0-*
Applicable Specification	JAXA-QTS-2060 JAXA-QTS-2060 Appendix H JAXA-QTS-2060/H402

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Prepared and Established by Waka Manufacturing Co., Ltd.

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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.

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Record of revisions

Rev.	Date	Description
NC	4 Mar. 2013	Original
A	19 Jun. 2014	Reflected the change of document by Waka Manufacturing Co., Ltd. Document No: JX013 (Rev. A)
B	28 Sept. 2016	Reflected the change of document by Waka Manufacturing Co., Ltd. Document No: JX013 (Rev. B)
C	21 Mar. 2025	Reflected the change of document by Waka Manufacturing Co., Ltd. Document No: JX013 (Rev. C)
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Revision history

Rev.	Date	Description
NC	4 Mar. 2013	Original
A	19 Jun. 2014	<p>Paragraph 6. Environmental Limit Added the evaluation result of the environmental limit test.</p> <p>Paragraph 7.2. Failure mode</p> <p>a) Open circuit Deleted the cause of open circuit (solder detachment) because it does not apply to this connector.</p> <p>b) Short circuit Clarified the cause of short circuit.</p>
B	28 Sept. 2016	<ul style="list-style-type: none"> <li>· Figure 3: <ul style="list-style-type: none"> <li>- Corrected dimension A in the figure. (error correction)</li> <li>- Changed Dimension B of ID numbers 33K0-41 and 33K0-42 from "4.10 to 4.17" to "4.05 to 4.17" (corrected errors)</li> <li>- Changed Dimension C of ID number 33K0-41 from "0.90 to 1.1" to "0.90 to 1.10" (error correction) to standardize the number of significant figure. (omission correction)</li> <li>- Changed the mass of ID number 33K0-02 from "2.7 to 2.8" to "2.6 to 2.8". (error correction)</li> </ul> </li> <li>· Figure 4: Corrected dimension A in the figure. (error correction)</li> <li>· Paragraph 4.1 b): Added the unit of insulation resistance (<math>\Omega</math>). (omission correction)</li> <li>· Paragraph 10.1 Contact Information: Changed the contact address, telephone/Fax numbers due to the head quarter relocation.</li> </ul>
C	21 Mar. 2025	<ul style="list-style-type: none"> <li>· Revised in accordance with the revised general specification JAXA-QTS-2060F.</li> <li>1) Changed terminology to align the standardized nomenclature for connectors and contacts. (for Japanese version only.)</li> <li>2) Item (d) of paragraph 4.1: Changed wording from "corona level" to "partial discharge."</li> <li>3) Items (a), (b), (c) and (e) of paragraph 4.2: Changed wording from "Insertion/removal force" to "connector mating and unmating force."</li> <li>4) Items (c) and (e) of paragraph 4.2: Changed wording from "coupling characteristics" to "contact insertion and removal characteristics."</li> <li>5) Items (a) and (b) of paragraph 4.3: Changed wording from "intermittent contact" to "electrical interruption."</li> <li>6) Item (c) of paragraph 4.2: Changed the criteria for contact insertion and removal characteristics. "0.277N {28.3gf} min." to "0.28N {28.5gf} min."</li> </ul>

Rev.	Date	Description
		<p>7) Item (d) of paragraph 4.2: Changed the criteria for center contact retention for the radial direction from "2.815N·cm {287.5gf}" to "2.82N·cm {287.6gf cm}."</p> <p>8) Table 6: Changed the applicable document for dielectric withstanding voltage from MIL-STD-1344 to EIA-364-20F due to the cancellation of MIL-STD-1344</p> <ul style="list-style-type: none"> <li>• Figure 3: Corrected to the dimensions to align with the drawings maintained by Waka Manufacturing Co., Ltd. <ul style="list-style-type: none"> <li>- Corrected the dimension "A" for ID numbers 33K0-01 and 33K0-02 from "5.60 to 6.40" to "5.80 to 6.20".</li> <li>- Corrected the dimension "A" for ID numbers 33K0-21 and 33K0-22 from "4.35 to 5.15" to "4.65 to 4.95".</li> <li>- Corrected the dimension "C" for ID numbers 33K0-21 and 33K0-22 from "3.05 to 3.30" to "3.07 to 3.27".</li> <li>- Corrected the dimension "C" for ID numbers 33K0-41 and 33K0-42 from "0.90 to 1.10" to "0.80 to 1.20".</li> </ul> </li> <li>• Figure 4: Corrected to the dimensions to align with the drawings maintained by Waka Manufacturing Co., Ltd. <ul style="list-style-type: none"> <li>- Corrected the dimension "E" for ID numbers 33K0-21 and 33K0-22 from "4.35 to 5.15" to "4.65 to 4.95".</li> <li>- Corrected the dimension "G" for ID numbers 33K0-21 and 33K0-22 from "3.05 to 3.30" to "3.07 to 3.27".</li> </ul> </li> <li>• Paragraph 3. USAGE Corrected wording errors in item c).</li> <li>• Items (c) and (e) of paragraph 4.1 Corrected errors.</li> <li>• Paragraph 8. STORAGE CONDITIONS Deleted the text of "Suppliers" since "Suppliers" is not defined in this data sheet. (for Japanese version only.)</li> <li>• Paragraph 9. NOTES Itemized and corrected editorial error.</li> <li>• Paragraph 10.1 Contact Information Added the missing town name.</li> </ul>

**Contents**

1.	GENERAL .....	1
1.1	Scope.....	1
1.2	Applicable Documents.....	1
2.	SUMMARY OF PRODUCTS.....	1
2.1	Outline.....	1
2.2	Structure of Part Number for Connectors .....	2
2.2.1	Part Number.....	2
2.3	External, Dimensions, Mass, and Marking.....	3
3.	USAGE.....	6
3.1	Rating .....	6
3.2	Dimensions for Mounting Hole .....	6
3.3	Selecting the Contact Plating .....	7
3.4	Precautions for Use.....	7
3.4.1	Handling.....	7
3.4.2	Mating and Unmating .....	7
4.	CHARACTERISTICS UNDER NORMAL OPERATING CONDITIONS .....	7
4.1	Electrical Performance .....	7
4.2	Mechanical Performance.....	9
4.3	Environmental Performance .....	10
4.4	Outgassing.....	12
4.5	Residual Magnetization .....	12
5.	CHARACTERISTICS UNDER VARIOUS OPERATING CONDITIONS.....	12
6.	ENVIRONMENTAL LIMIT .....	12
6.1	Dielectric Withstanding Voltage at Reduced Pressure.....	15
7.	RELIABILITY .....	15
7.1	Failure Rate .....	15
7.1.1	Calculation Conditions.....	15
7.1.2	Calculation Results .....	16
7.2	Failure Mode .....	16
8.	STORAGE CONDITIONS .....	16
9.	NOTES.....	16
10.	OTHERS.....	16
10.1	Contact Information.....	16

**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

JAXA-QTS-2060

Connectors, High Reliability, Space Use,  
General Specification for

JAXA-QTS-2060 Appendix H

Connectors, Coaxial, Radio Frequency

JAXA-QTS-2060/H402

Connectors, Coaxial, Radio Frequency, High  
Reliability, Space Use, Receptacle Jack, Straight,  
4-Point Attachment, Receptacle Jack, Straight,  
2-Point Attachment, Detail Specification For

2. SUMMARY OF PRODUCTS

2.1 Outline

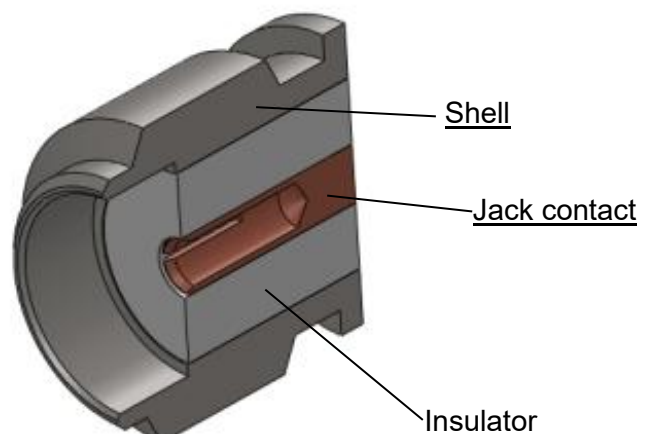
Connectors described in this data sheet are high reliability parts for electronic equipment to be installed on satellites and/or launch vehicles. They are coaxial radio frequency connectors which are generally referred to as SMA connectors.

Shells are round in shape and the mating parts contains the male connector with coupling nut and the female connector with an external thread to prevent mis-mating.

The contact of the connectors is a coaxial type only and the insulation is made out of Teflon which makes it a low insertion loss connector.

The connectors are interchangeable with ESA and MIL-certified connectors.

Cross-sectional view of the connector is shown in Figure 1.



Note: The screw section is not  
Included in this image.

**Figure 1. Cross-Sectional View of the Connector**

2.2 Structure of Part Number for Connectors

The structure of the part number for the connectors shall be in accordance with Appendix H of JAXA-QTS-2060 and is as follows.

2.2.1 Part Number

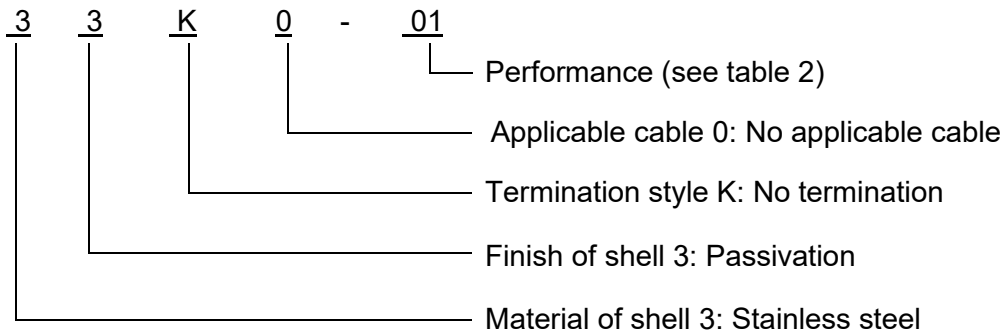
The part number of the connectors is assigned based on the series, configuration, identification number, contact type, and terminal style and the example is as follows.

Example J2060 / HA 41 - 33K0 - 01  
 Series Configuration Identification number  
 (HA:SMA) (See table1) (See paragraph 2.2.1.1)

**Table 1. Configuration**

1 <sup>st</sup> digit number	Connector type	2 <sup>nd</sup> digit number	Configuration/attachment
4	Receptacle jack	1	Straight 4-point attachment
		2	Straight 2-point attachment

2.2.1.1 Identification Number



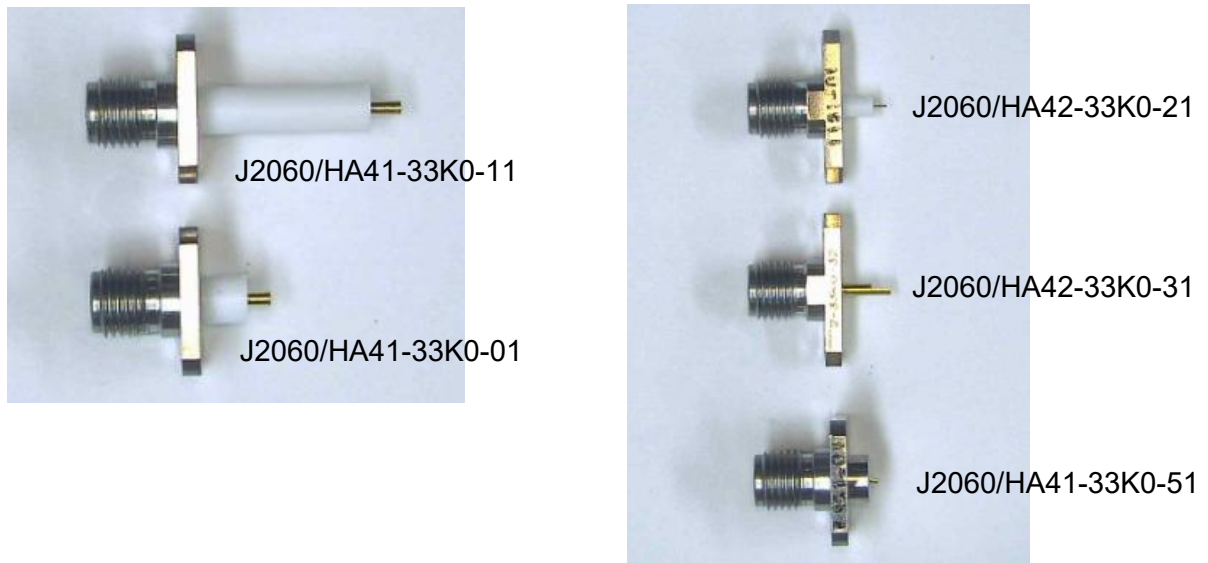
**Table 2. Performance**

Unit: mm

No.	Center contact surface finish				Terminal Shape
	Underplating		Surface finish		
	Metal	Thickness (μm)	Metal	Thickness (μm)	
01	Ni	2.0 min.	Au	2.0 min.	Terminal shape I (Figure 3)
11					Terminal shape I (Figures 3 and 4)
21					Terminal shape II (Figures 3 and 4)
31					Terminal shape III (Figures 3 and 4)
41					Terminal shape IV (Figure 3)
51					Terminal shape V (Figure 3)
02	Cu	2.5 min.	Au	2.5 min.	Terminal shape I (Figure 3)
12					Terminal shape I (Figures 3 and 4)
22					Terminal shape II (Figures 3 and 4)
32					Terminal shape III (Figures 3 and 4)
42					Terminal shape IV (Figure 3)
52					Terminal shape V (Figure 3)

2.3 External, Dimensions, Mass, and Marking

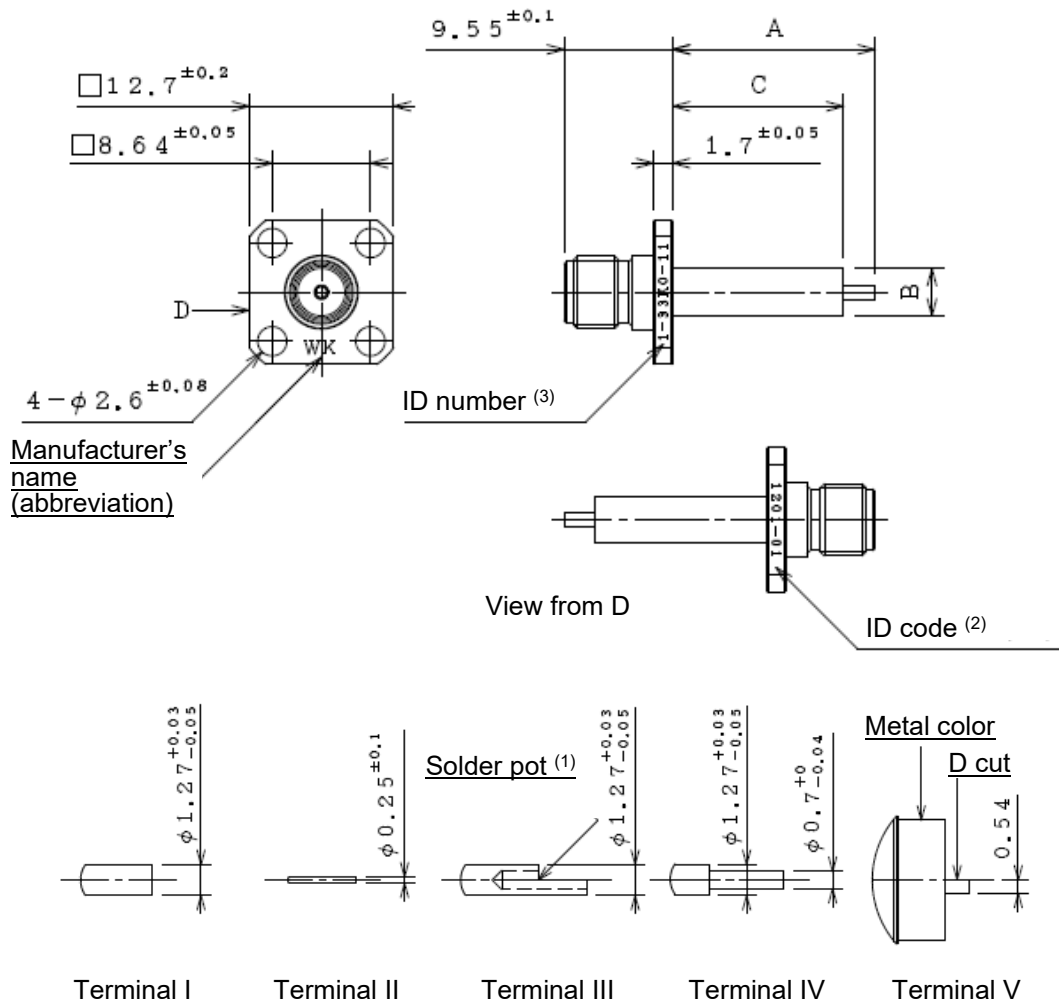
The external, dimensions, and marking shall be as specified in Figures 2 through 4.



**Figure 2. External Views of the Connectors**

JX-013

Unit: mm



ID number	A	B	C	Terminal shape	Surface treatment (center contact)	Mass (g)
33K0-01	6.0±0.2	4.1±0.1	4.0±0.2	I	Ni 2.0u Au 2.0u	2.6 to 2.8
33K0-11	17.87±0.4	4.1±0.1	15.0±0.4	I	Ni 2.0u Au 2.0u	3.1 to 3.3
33K0-21	4.75+0.2/-0.1	2.16±0.1	3.17±0.1	II	Ni 2.0u Au 2.0u	2.4 to 2.7
33K0-31	5.03±0.4	4.1±0.1	-0.20 to 0.05	III	Ni 2.0u Au 2.0u	2.5 to 2.7
33K0-41	5.5±0.4	4.12+0.05/-0.07	1.0±0.2	IV	Ni 2.0u Au 2.0u	2.4 to 2.7
33K0-51	3.0±0.4	4.94±0.1	2.0+0.05/-0	V	Ni 2.0u Au 2.0u	2.7 to 2.9
33K0-02	6.0±0.2	4.1±0.1	4.0±0.2	I	Cu 2.5u Au 2.5u	2.6 to 2.8
33K0-12	17.87±0.4	4.1±0.1	15.0±0.4	I	Cu 2.5u Au 2.5u	3.1 to 3.3
33K0-22	4.75+0.2/-0.1	2.16±0.1	3.17±0.1	II	Cu 2.5u Au 2.5u	2.4 to 2.7
33K0-32	5.03±0.4	4.1±0.1	-0.20 to 0.05	III	Cu 2.5u Au 2.5u	2.5 to 2.7
33K0-42	5.5±0.4	4.12+0.05/-0.07	1.0±0.2	IV	Cu 2.5u Au 2.5u	2.4 to 2.7
33K0-52	3.0±0.4	4.94±0.1	2.0+0.05/-0	V	Cu 2.5u Au 2.5u	2.7 to 2.9

Notes: (1) The solder cup hole shall be large enough for φ0.74 wire rod to be inserted a minimum of 2.24mm into the hole.

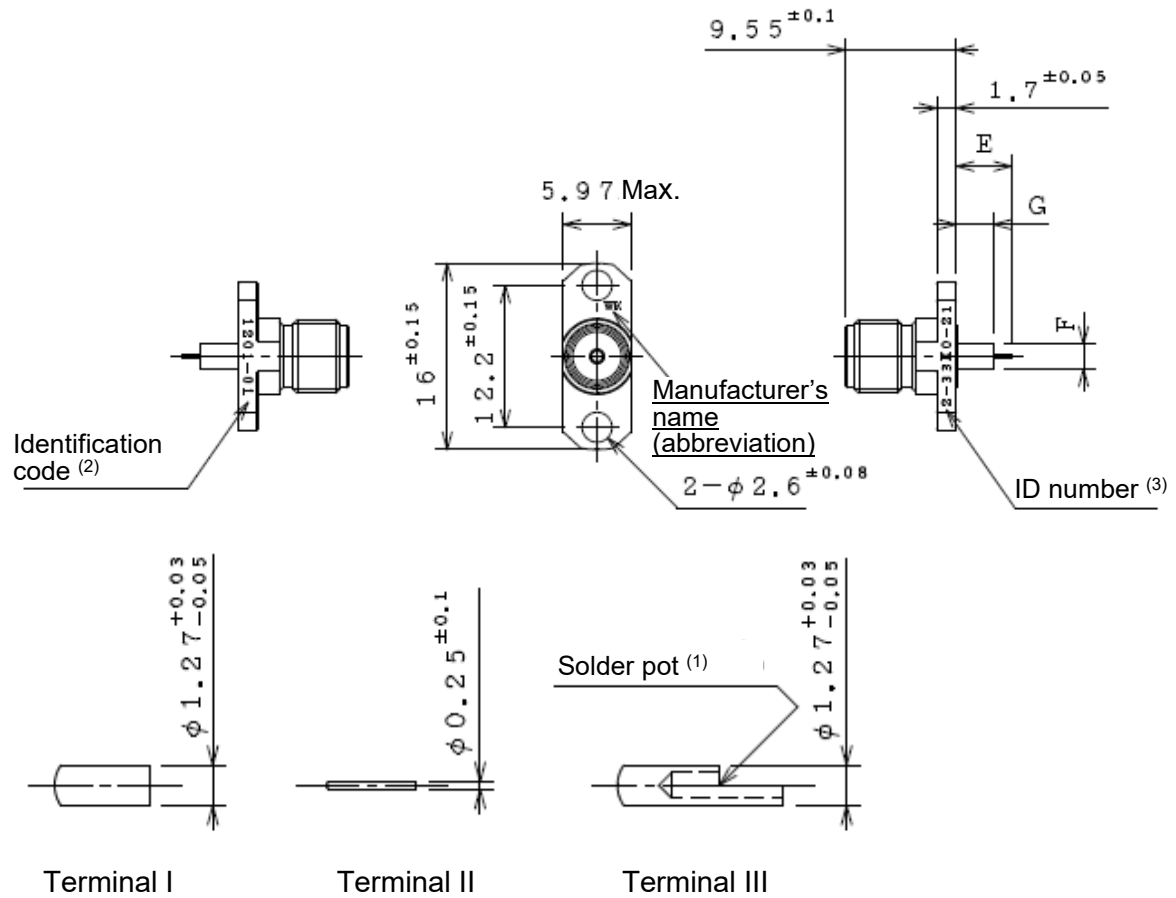
(2) The number identifying the connector configuration, attachment style and identification number shall be marked.

(3) Identification code shall be specified in Table 3.

**Figure 3. Externals, Dimensions, and Marking (4-Point Attachment Type)**

JX-013

Unit: mm



ID Number.	E	F	G	Terminal shape	Surface treatment (center contact)	Mass (g)
33K0-11	17.87±0.4	4.1±0.1	15.0±0.4	I	Ni 2.0u Au 2.0u	2.3 to 2.5
33K0-21	4.75+0.2/-0.1	2.16±0.1	3.17±0.1	II	Ni 2.0u Au 2.0u	1.7 to 1.9
33K0-31	5.03±0.4	4.1±0.1	-0.20 to 0.05	III	Ni 2.0u Au 2.0u	1.7 to 1.9
33K0-12	17.87±0.4	4.1±0.1	15.0±0.4	I	Cu 2.5u Au 2.5u	2.3 to 2.5
33K0-22	4.75+0.2/-0.1	2.16±0.1	3.17±0.1	II	Cu 2.5u Au 2.5u	1.7 to 1.9
33K0-32	5.03±0.4	4.1±0.1	-0.20 to 0.05	III	Cu 2.5u Au 2.5u	1.7 to 1.9

Notes: (1) The solder cup hole shall be large enough for Ø0.74 wire rod to be inserted a minimum of 2.24mm into the hole.

(2) The number identifying the connector configuration, attachment style and identification number shall be marked.

(3) Identification code shall be specified in Table 3.

**Figure 4. Externals, Dimensions, and Marking (2-Point Attachment Type)**

**Table 3. Identification Code**

Example.: $\frac{13}{1}$ $\frac{12}{2}$ - $\frac{01}{3}$	
1	The last two digits of the number of the year
2	The two digits indicating the calendar week of the year
3	Production lot number (series)

3. USAGE

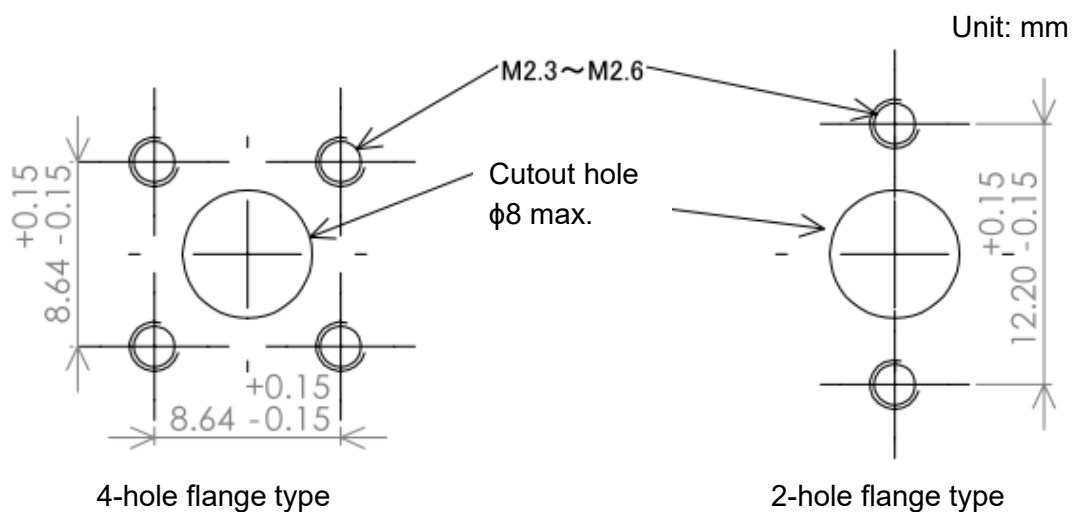
3.1 Rating

- a) Rated voltage 335Vrms (Barometric pressure)
- b) Nominal impedance 50Ω
- c) Operating Temperature Range -65 to +115°C

3.2 Dimensions for Mounting Hole

The connectors shall be mounted on the place where holes as shown in Figure 5 are drilled to align the drill holes of the connector. If several cutout holes need to be drilled, take a plenty of space between cutout holes considering the widths of the flanges for 4-hole and 2-hole being 12.7mm and 5.8mm, respectively.

The screws of size M2.3 to M2.6 shall be used for mounting the connectors, and the drill holes need to be drilled. Although the cutout holes of the connectors shall be based on the terminal configuration and mating connectors and decided by the users, the maximum hole size shall be 8mm considering the interference with the drill holes. Alternate the screwing; the screw shall not be tightened all at once but a few turns at a time and move to the other side (diagonal side in the case of 4-hole) of the mount and screw the other and back to the other side to screw all the way alternately little by little.



**Figure 5. Mounting Hole Dimensions**

### 3.3 Selecting the Contact Plating

The surface plating can be selected for the contact of the connectors. The contact with Ni underplating shall be connected by bonding, and with Cu underplating contact shall be connected by soldering. Make a choice according to the termination style. The detail about the surface finish shall be shown in Table 2.

### 3.4 Precautions for Use

#### 3.4.1 Handling

A clean gloves and/or finger cot shall be used for handling connectors and contacts after the package seal is opened. When a contact is tested individually for conductivity, the contact shall be inserted to the mated contact straight without applying the bending moment or rotation.

Take extra caution for handling these RF connectors because they are extremely delicate and fragile.

#### 3.4.2 Mating and Unmating

Mating or unmating of the connectors shall be performed gently in parallel with the mating axis. Mate or unmate the connectors without applying the bending moment or rotation.

Use the torque wrench for tightening the coupling nut. The recommended size and torque for the wrench shall be 5/16 (8mm), and 78.94 {8.05} to 112.88N·cm {11.5kgf·cm}, respectively.

## 4. CHARACTERISTICS UNDER NORMAL OPERATING CONDITIONS

The following test items of qualification test was performed and the results met the requirements specified in the applicable specification.

### 4.1 Electrical Performance

#### (a) Dielectric withstanding voltage

Test voltage: AC1000Vrms (Barometric pressure)

Test duration: One minute

Requirement: Connectors shall exhibit no evidence of short circuit.

#### (b) Insulation resistance

Test voltage: DC500V

Requirement: Insulation resistance shall be 5000MΩ as a minimum.

#### (c) Contact resistance

Measured section: Center contact

Requirement: Contact resistance shall be 3.0mΩ as a maximum before test and 4.0mΩ as a maximum after test.

(d) Partial discharge

Test voltage: 300Vrms (under reduced pressure: 4.4kPa {33mmHg} <sup>(1)</sup>)

Requirement: Corona shall not be occurred at test voltage (or 5pC or less)

Note: <sup>(1)</sup> After corona occurrence at normal pressure, pressure was reduced to the specified value.

(e) VSWR (Reference data)

VSWR is not required in the qualification test, however, the reference data is shown in Figure 6. The following graph shows the return loss and insertion loss obtained from the connector being connected back to back since the transmission characteristics for receptacle type alone can not be measured.

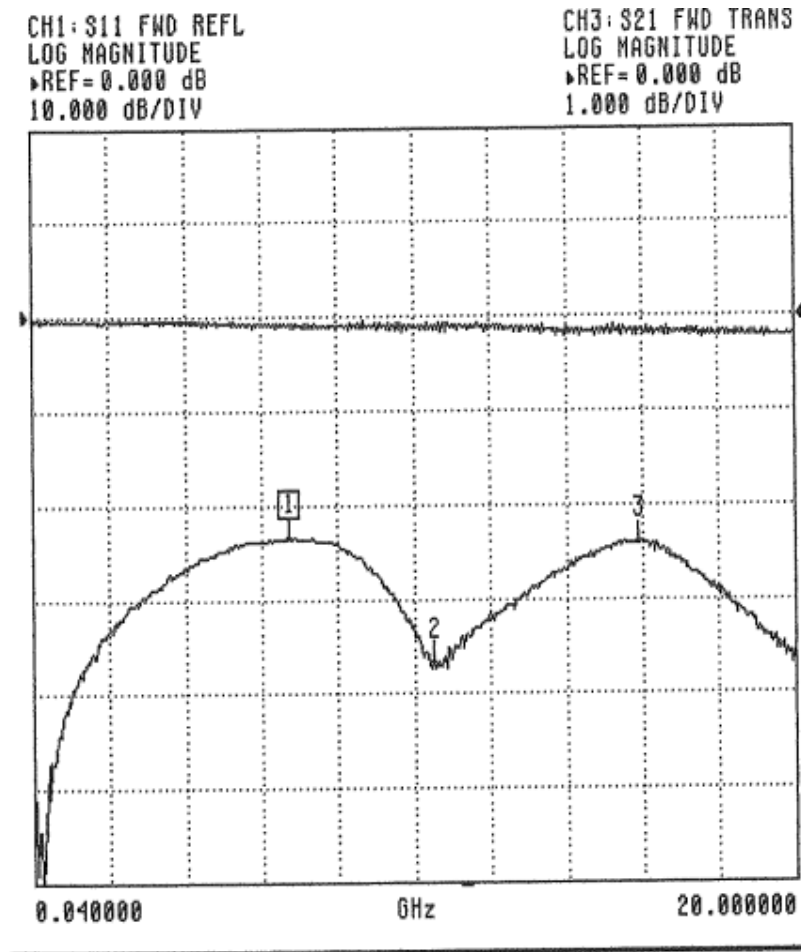


Figure 6. J2060/HA42-33K0-01 (Two receptacle types connected back to back)

#### 4.2 Mechanical Performance

(a) Connector Mating and Unmating Force

Requirement: The torque necessary to fully mate and unmate the connector shall not exceed 22.6N·cm {2.3kgf·cm}.

(b) Coupling Proof Torque

Test condition: Tighten the coupling nut with the torque of 169.7N·cm {17.30kgf·cm} and uncouple a minute later.

Requirement: The connection shall not be dislodged. At the completion of the test, the interface dimensions of the connector shall remain as specified in the detail specification and meet the requirement of connector mating and unmating force.

(c) Contact Insertion and Removal Characteristics

Test condition: After the completion of the contact insertion and removal three times with specified oversized pin, the connector shall be secured on the jig and tested for insertion and removal with specific test pin.

Requirement: The dimensions of the joint part shall be met as specified in the detail specification. For Connector mating and unmating force, the following conditions shall be met.

Force to mate: 13.3N {1.36kgf} as a maximum  
Force to unmate: 0.28N {28.5gf} as a minimum.

(d) Center Contact Retention

Test condition: A force in parallel with the axial direction of the center contact shall be applied from one direction with the following force and the internal contacted dimensions from both ends in the axial direction shall be measured. And then, test the connector by applying the force from the other direction. A torque meter shall be installed at the center contact and the following torque shall be applied to the connector to check that the connector will not be rotated.

Axial direction: 26.7N {2.72kgf}

Radial direction: 2.82N·cm {287.6gf·cm}

Requirement: The internal contacted dimensions shall meet the requirements specified in detail specification after applying the force from either axis or radial direction of the center contact.

(e) Durability

Test condition: 500 repetitions of mating and unmating actions (12 times/min. Max.)

Requirement: There shall not be any mechanical damage in the connector and the mating mechanism shall be able to operate mechanically. After the test, connector mating and unmating force and contact insertion and removal characteristics requirements shall be met.

(f) Solderability

Immersion Depth: Deeper than the size of the body and the contact joint parts of the connector

Requirement: 95% or more area of the immersed external dimensions of the connector shall be covered with solder.

4.3 Environmental Performance

(a) Vibration

High frequency vibration (294m/s<sup>2</sup> {30G} peak)

Sweep time and test duration: 10 to 2000Hz (20min. back and forth)

Direction and test cycle: 12 times for each direction perpendicular to x, y, and z axes.

Requirement: The connector shows no electrical interruption of 1μs or more, short or open circuit. There shall be no mechanical damage. After the test Contact resistance (center contact) requirement shall be met.

(b) Shock

Pulse waveform: Half sine

Peak acceleration rate: 2,942m/s<sup>2</sup> {300G}

Pulse duration: 3ms

Pulse velocity change: 5.61m/sec

Shock direction and test cycle: ±X, ±Y, and ±Z axes (3 times for each direction, total of 18 times)

Requirement: The connector shows no electrical interruption of 1μs or more, short or

JX-013

open circuit. There shall be no mechanical damage. After the test, Contact resistance (center contact) requirement shall be met.

(c) Thermal Shock

Temperature range: -65 to 200°C

Duration: 30min.

Number of cycle: 5 cycles

Requirement: There shall be no mechanical damage. After the test, dielectric withstanding voltage and contact resistance (center contact) requirements shall be met.

(d) Moisture Resistance

Temperature range: -10 to 65°C

Humidity range: 80 to 98%

Time of a cycle: 24 hours

Number of cycle: Five cycles for each cycles A and B shown in figure 7, total of 10 cycles.

Requirement: There shall be no mechanical damage. After the test, insulation resistance and dielectric withstanding voltage requirements shall be met.

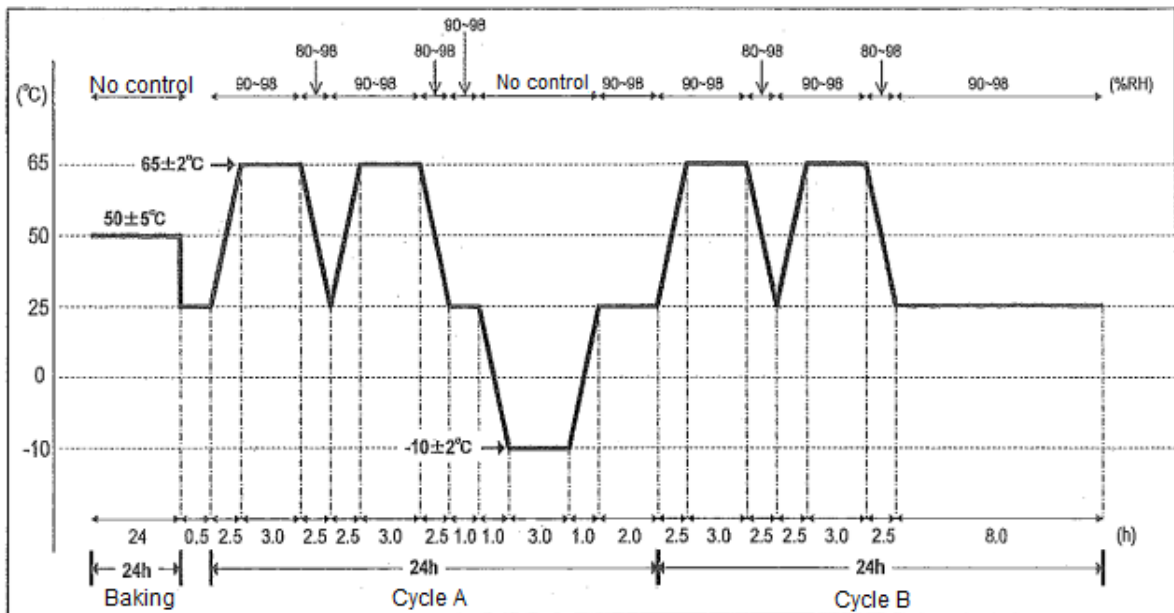


Figure 7. Type II, Moisture Test Cycle

(e) Salt Spray

Concentration: 5±1%

pH: 6.5 to 7.2

Temperature: 35±3°C

Test duration: 48 hours

Requirement: Bare metal shall not be exposed at the joint surface or internal surface. After the test, the requirement of connector mating and unmating force shall be met.

4.4 Outgassing

The outgassing test was conducted in accordance with ASTM E595 for organic materials used for the connectors. The results are shown in Table 4.

**Table 4. Outgassing Test Results**

Material	TML (%)	CVCM (%)
Insulation (Teflon)	0.004±0.000	0.000±0.000

Note: <sup>(1)</sup> The connectors contain no epoxy.

4.5 Residual Magnetization

The test results of residual magnetization measured with a gaussmeter shall be shown in Table 5.

**Table 5. Residual Magnetization Test Results**

Connector type	Average (nT)	Maximum (nT)	Minimum (nT)
Receptacle jack, Straight 4-point attachment	265	450	92
Receptacle jack, Straight 2-point attachment	516	667	322

5. CHARACTERISTICS UNDER VARIOUS OPERATING CONDITIONS

No data.

6. ENVIRONMENTAL LIMIT

The test conditions and test items for environmental limit test are shown in Tables 6 and 7. Each test result is specified in the tables indicated below.

- (1) External, dielectric withstanding voltage, instantaneous interruption Tables 8 and 10
- (2) Contact resistance Tables 9, Figures 8 and 9

**Table 6. Test Condition**

Gr.	Order	Test item	Test condition
I	1	Vibration (Random vibration)	MIL-STD-202 Test method 214 Test condition: (I) J rms value of acceleration: 37.80G 3 directions for 15min. each
	2	Shock	MIL-STD-202 Test method 213 Test condition: F (half-wave sinusoidal wave) · Gravitational acceleration: 1500G±20% · Pulse duration: 0.5ms±15% · Pulse speed variation: 4.68m/s±10% Total of 6 times (3 times each for “-” and “+” directions per direction) X 3 directions (Total vibration time: 18)
	3	Thermal shock	MIL-STD-202 Test method 107 Test condition: B-3 (The min. temp: -65°C <sub>-5</sub> <sup>+0</sup> to the max. temp. 165°C <sub>-5</sub> <sup>+0</sup> ) 1000cycle (Externals, contact resistance, and dielectric withstanding voltage are checked for each 100cycle)
II	1	Dielectric withstanding voltage (reduced pressure)	EIA-364-20F Voltage is applied by 100V increments (Check dielectric withstanding voltage under the reduced pressure of 4.4kPa)

Gr.	Order	Test item	Requirement	Sample size	Sample
I	1	Vibration (Random vibration)	As specified in paragraph H.3.8.2, Appendix H of JAXA-QTS-2060E. There shall be no loosening of parts.	5	J2060/HA42 -33K0-11
	2	Shock			
	3	Thermal shock			
II	1	Dielectric withstanding voltage (reduced pressure)	As specified in paragraph H.3.6.1, Appendix H of JAXA-QTS-2060E	5	

**Table 7. Measured Item**

	External	Contact resistance	Dielectric withstanding voltage	Instantaneous interrupt
Before test	□	□	□	
Vibration	●	●		○
Shock	●	●		○
Thermal shock	●	●	●	

Note:      □: Items to be measured before test  
              ○: Items to be measured during test  
              ●: Items to be measured after test

**Table 8 Externals, Dielectric Withstanding Voltage, and Instantaneous Interrupt**

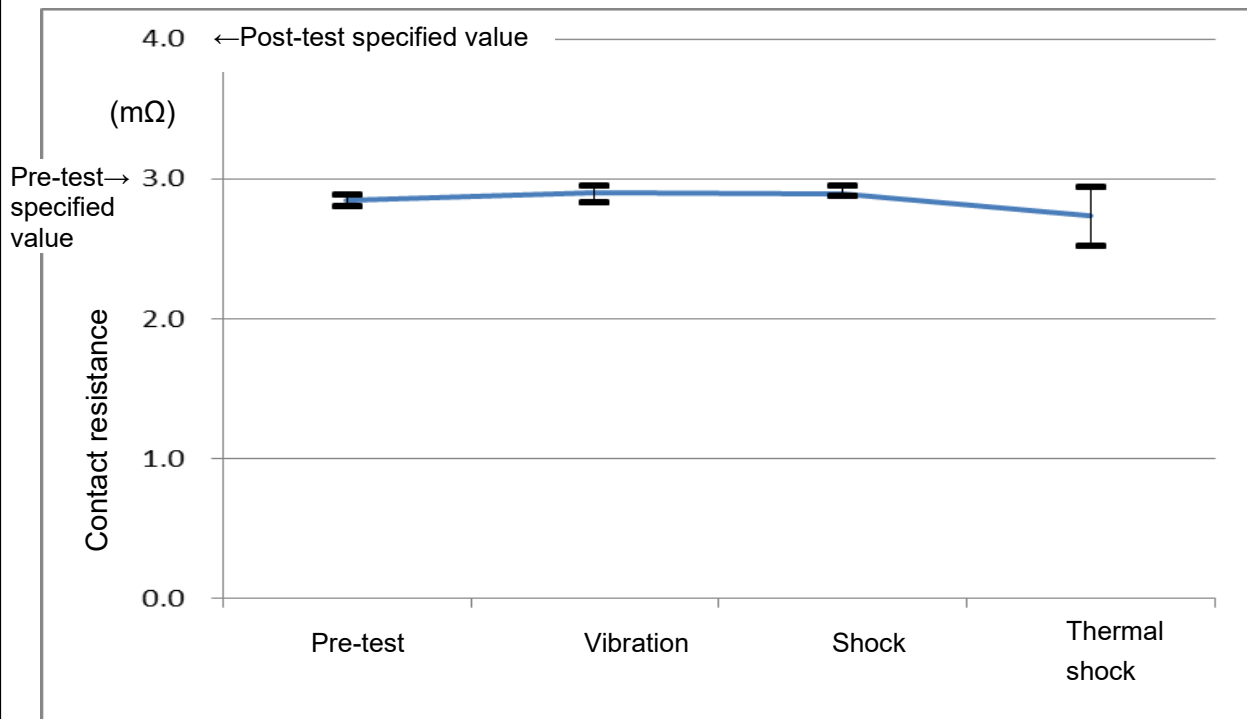
Part number	Item	Externals	Dielectric withstanding voltage	Instantaneous interrupt
J2060/HA42 -33K0-11	Pre-test	Good	Good	---
	Vibration	Good	---	Good
	Shock	Good	---	Good
	Thermal shock	Good	Good	---

**Table 9. Contact Resistance**

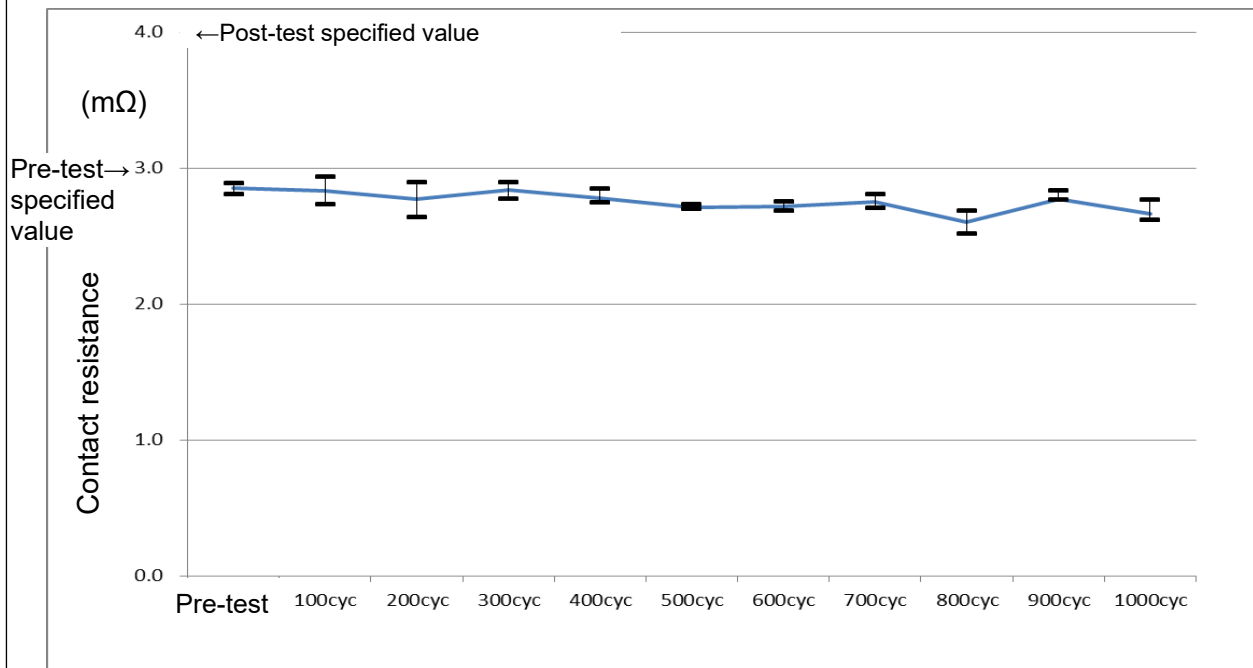
Part number	Item	Ave.	Max.	Min.	Std. deviate
J2060/HA42 -33K0-11	Pre-test	2.85	2.88	2.80	0.030
	Vibration	2.90	2.94	2.82	0.050
	Shock	2.89	2.94	2.87	0.029
	Thermal shock	2.74	2.93	2.51	0.086

(mΩ)

(n=5)



**Figure 8. Contact Resistance in Environmental Limit Test**



**Figure 9. Contact Resistance in Thermal Shock Test**

## 6.1 Dielectric Withstanding Voltage at Reduced Pressure

**Table 10. Dielectric Withstanding Voltage (Destructive Voltage) at Reduced Pressure**  
(Unit: Vrms)

Part number	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
J2060/HA42 -33K0-11	600	600	600	600	600

(n=5)

## 7. RELIABILITY

### 7.1 Failure Rate

The failure rate for the general products (estimate) in the market is shown below as a reference.

#### 7.1.1 Calculation Conditions

- a) Reliability level: 60%
- b) Number of defects reported by customers (r): 0
- c) Operating year: 2 years per each product  
 $T = (8 \text{ hours / day}) \times 300 \text{ days} \times 2 \text{ years} \times \text{Number of products}$ 
  - i) In 2005: 14181 pieces  $T1 = 68068800$
  - ii) In 2006: 17734 pieces  $T2 = 85123200$
  - iii) In 2007: 18484 pieces  $T3 = 88723200$
  - iv) In 2008: 17364 pieces  $T4 = 83347200$
  - v) In 2009: 13545 pieces  $T5 = 65016000$

vi) In 2010: 20987 pieces T6 = 100737600  
The total of operating time T = 491016000

#### 7.1.2 Calculation Results

$$\begin{aligned} \text{MTBF} &= T / 0.917 \text{ (when the number of failure } r = 0 \text{ according to JIS C 5003)} \\ &= 491016000 / 0.917 \\ &\approx 535459105.8 \end{aligned}$$

$$\begin{aligned} \text{Predicted failure rate: } \lambda &= 1 / \text{MTBF} \\ &= 1 / 535459105.8 \\ &\approx 1.87 \times 10^{-9} \\ &= 1.87 \text{ (fit)} \end{aligned}$$

#### 7.2 Failure Mode

The possible failure mode shall be as follows.

- a) Open-circuit  
Center contact breakdown
- b) Short-circuit  
Shavings etc. caused by the failed work on parts
- c) Characteristic degradation  
Plating trouble, contaminated insulation, damaged or loosened contact caused by twisting and rotating (improper instruction)

#### 8. STORAGE CONDITIONS

- a) The connectors are sealed in a bag to prevent any dust to get in during shipping. Do not open the sealed bag if not necessary. Re-seal the bag before storage if opened for receiving inspection or other needs.
- b) Store the connectors at an ambient temperature and humidity if possible.
- c) Minimize vibrations and shocks during shipping and storage.

#### 9. NOTES

When connecting or disconnecting, only rotate the coupling.  
Be careful not to rotate the shell or cable as this may damage the contacts.

#### 10. OTHERS

##### 10.1 Contact Information

Manufacturer: Waka Manufacturing Co., Ltd. Sales Department  
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