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RESISTORS, FIXED, WIRE WOUND (POWER TYPE),
ESTABLISHED RELIABILITY,
SPACE USE,
NASDA STYLE RWS80, RWS81, RWS84, RWS89, RWS83
DETAIL SPECIFICATION FOR

Issued by Japan Aerospace Exploration Agency

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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Revision history

Rev.	Date	Description
NC	30 Oct. 1998	Original
A	29 May 2023	Header Deleted Issue date of the first edition (revision NC) at upper right corner of the page (specified at Revision history) Cover page Changed the corporate name from National Space Development Agency of Japan to the Japan Aerospace Exploration Agency. Revision history Newly Created. Paragraph 5, Table 4 Added a note ^(*) on Resistance to solvents.
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**RESISTORS, FIXED, WIRE WOUND (POWER TYPE),
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DETAIL SPECIFICATION FOR**

1. SCOPE

This specification establishes the detail requirements and quality assurance requirements for RWS80, 81, 84, 89 and 83 styles, established reliability, power type, wire wound, fixed resistors which are qualified for space use by the Japan Aerospace Exploration Agency.

2. PART NUMBER

The part number of resistors covered by this specification is as shown in Table 1.

TABLE 1. Part Number

Item	Applicable paragraph of NASDA-QTS-39007	Specification
Part number	1.3	Example: NASDA RWS80 S 49R9F A
Style	1.3.1	RWS80, RWS81, RWS84, RWS89, RWS83
Terminal type	1.3.2	S, W
Resistance	1.3.3	Example: 1000 = 100Ω (Identified by a four-digit number.)
Resistance tolerance	1.3.4	D (±0.5%), F (±1.0%), G (±2.0%), J (±5.0%)
Identification symbol	1.3.5	A

3. RATINGS

The ratings are as shown in Table 2.

TABLE 2. Ratings

Item	Requirement paragraph of NASDA-QTS-39007	Ratings										
Operating temperature range (°C)	3.5.2	-55 to +275										
Rated ambient temperature (°C)	3.5.3	25										
Derating curve	3.5.4	As specified in Figure 1.										
Style	—	—	RWS80		RWS81		RWS84		RWS89		RWS83	
Nominal resistance range (Ω)	3.5.1	Resistance tolerance symbol	D	F, G, J	D	F, G, J	D	F, G, J	D	F, G, J	D	F, G, J
		Minimum resistance	0.499	0.1	0.499	0.1	0.499	0.1	0.499	0.1	0.499	0.1
		Maximum resistance	(1)	1210		464		12400		3570		7000
(2)	360		200		3000		950		1800			
Power rating (W)	3.5.3	—	2		1		7		3		5	

Notes:

(1) Minimum wire diameter of 0.025mm

(2) Minimum wire diameter of 0.04mm

“Minimum wire diameter” means the minimum diameter of resistance wires which are used for manufacturing the resistors of the specified maximum resistance. For example, the resistance wire of 0.025mm diameter or larger shall be used for the resistors of 1.21k Ω resistance or less. The resistance wire of 0.04mm diameter or larger shall be used for the resistors of 360Ω or less.

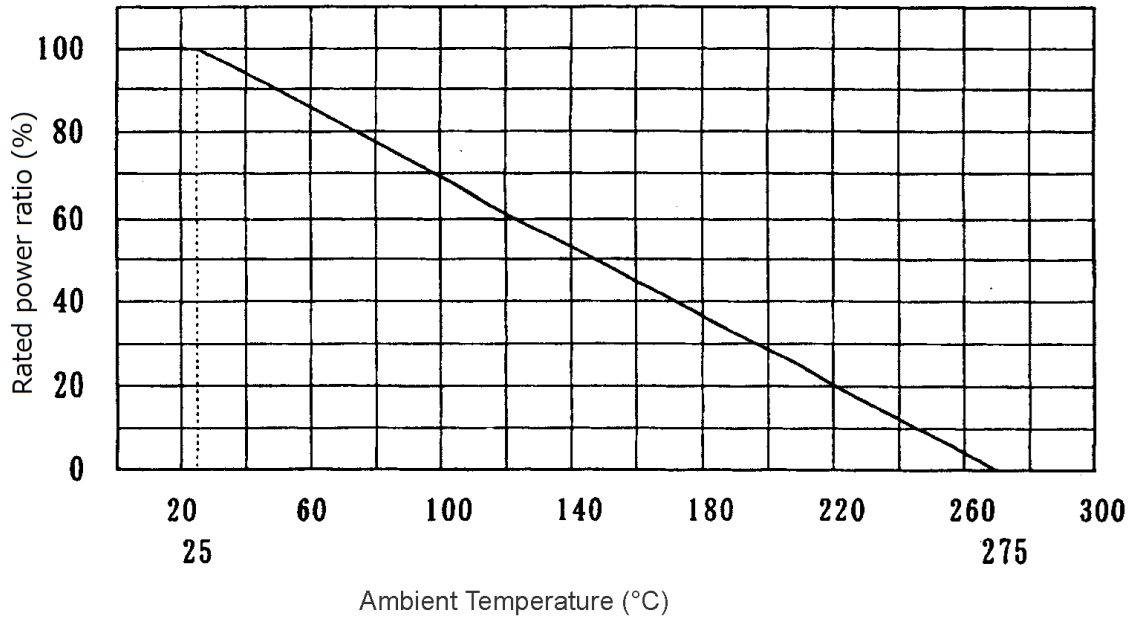


FIGURE 1. Load Derating Curve

4. PRODUCT INSPECTION

The visual, construction, physical dimensions and mass shall be in accordance with paragraph 3.4 of NASDA-QTS-39007, and Figure 2 and Table 3 of this specification.

Any construction other than that specified below may be accepted, provided that the dimension requirements shall be satisfied.

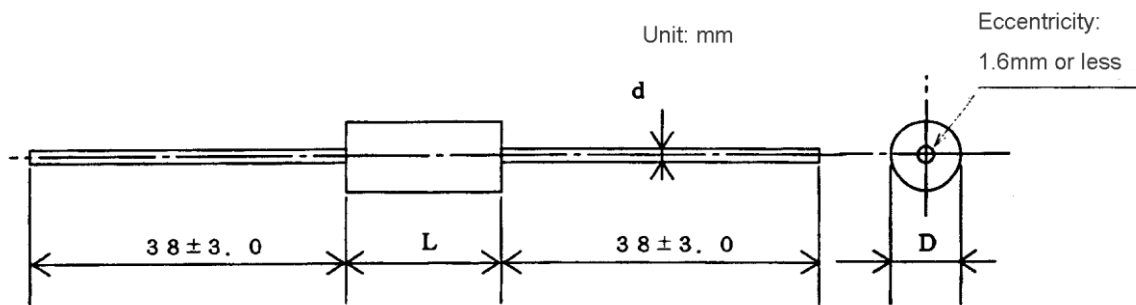


FIGURE 2. Construction and Dimensions

TABLE 3. Mass and Marking

Style		RWS80	RWS81	RWS84	RWS89	RWS83
Dimensions (mm)	D	2.4±0.8	2.2±0.5	7.9±0.8	4.8±0.8	6.5±0.8
	L	10.3±0.8	6.4±0.8	22.2±1.6	14.2±1.6	18.5±1.6
	d	0.65±0.05	0.5±0.05	1.0±0.05	0.8±0.05	1.0±0.05
Mass (g)		1 or less	0.35 or less	5 or less	3 or less	4 or less
Example of marking		XXX ⁽¹⁾ RWS80 49R9FS 9811 XXX ⁽²⁾	49R9 XXX ⁽¹⁾ F1 XXX ⁽²⁾	XXX ⁽¹⁾ RWS84 49R9FS 9811 XXX ⁽²⁾	XXX ⁽¹⁾ RWS89 49R9FS 9811 XXX ⁽²⁾	XXX ⁽¹⁾ RWS83 49R9FS 9811 XXX ⁽²⁾

Note (1): "XXX" – abbreviation of manufacturer name or trademark

Note (2): "XXX" – Identification symbol

5. PERFORMANCE

The performance shall comply with paragraph 3 of NASDA-QTS-39007 and Table 4 of this specification.

TABLE 4. Performance

No.	Item	Test Method Paragraph of NASDA-QTS-39007	Performance
1	Voltage aging	4.7.2	Allowable resistance change: $\pm(0.2\% + 0.05\Omega)$
2	Resistance	4.7.3	Within the specified resistance tolerance
3	Product inspection	4.7.4	As specified in Figure 2 and Table 3.
4	DPA	4.7.5	The conditions specified in the reliability assurance program shall be satisfied.
5	Solderability	4.7.6	At least 95% of the surface shall be covered with new solder.
6	Resistance to solvents	4.7.7 ^(*)	There shall be no abnormality of protective coating and marking.
7	Thermal shock (I)	4.7.8.1	Allowable resistance change: $\pm(0.2\% + 0.05\Omega)$
8	Thermal shock (II)	4.7.8.2	Allowable resistance change: $\pm(0.5\% + 0.05\Omega)$

TABLE 4. Performance (continued)

No.	Item	Test Method Paragraph of NASDA-QTS-39007	Performance	
			Resistance	ppm/°C
9	Resistance-temperature characteristic	4.7.9	0.1Ω or more and less than 0.499Ω	+650
			0.499Ω or more and less than 1Ω	+400
			1Ω or more and less than 10Ω	±50
			10Ω or more	±20
10	Low temperature storage	4.7.10	Allowable resistance change: ±(0.1% + 0.05Ω)	
11	Short time overload	4.7.11	Allowable resistance change: ±(0.2% + 0.05Ω)	
12	Dielectric withstanding voltage	4.7.12	Allowable resistance change: ±(0.1% + 0.05Ω) Leakage current: 500μA or less	
13	Insulation resistance	4.7.13	1000MΩ or more	
14	Moisture resistance	4.7.14	Moisture resistance Allowable resistance change: ±(0.2% + 0.05Ω)	
			Dielectric withstanding voltage Allowable resistance change: ±(0.1% + 0.05Ω)	
			Insulation resistance: 100M Ω or more	
15	Terminal strength	4.7.15	Allowable resistance change: ±(0.1% + 0.05Ω)	
16	Shock	4.7.16	Allowable resistance change: ±(0.1% + 0.05Ω)	
17	High frequency vibration	4.7.17.1	Allowable resistance change: ±(0.1% + 0.05Ω)	
18	Random vibration	4.7.17.2	Allowable resistance change: ±(0.1% + 0.05Ω)	
19	Life	4.7.18	Allowable resistance change	2000 hours: ±(0.5% + 0.05Ω)
				4000 hours: ±(0.1% + 0.05Ω)
20	Stability	4.7.19	Allowable resistance change: ±(0.5% + 0.05Ω)	

Note: (*) The solvent solutions used in this test shall exclude the following:

A mixture consisting of the following:

1. Forty-two parts by volume water, 1 megohm-cm minimum resistivity.
2. One part by volume of propylene glycol monomethyl ether (glycol ether PM, 1-methoxy-2-propanol).
3. One part by volume of monoethanolamine.

6. QUALITY ASSURANCE PROVISIONS

The quality assurance provisions shall be in accordance with paragraph 4 of NASDA-QTS-39007.

7. NOTES

Refer to the paragraph 6 of NASDA-QTS-39007 or application data sheet for notes on the resistors.