

# Ceramic RF Devices for General Electronic Equipment for Consumer

## RELIABILITY DATA

### 1. Operating Temperature Range

Specified Value :  $-40 \sim +85^{\circ}\text{C}$

### 2. Storage Temperature Range

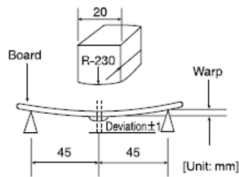
Specified Value :  $-40 \sim +85^{\circ}\text{C}$

Test Methods and Remarks : ※Note :  $-20$  to  $+40^{\circ}\text{C}$  in taped packaging

### 3. Resistance to Flexure of Substrate

Specified Value : No mechanical damage.

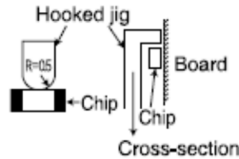
Test Methods and Remarks :  
 Warp : 2mm  
 Testing board : Glass epoxy-resin substrate  
 Thickness : 0.8mm



### 4. Adhesion of Electrode

Specified Value :  
 Characteristics : shall satisfy the electrical characteristics.  
 Appearance : No significant abnormality.

Test Methods and Remarks :  
 Applied force : 5N  
 Duration : 10 sec.



### 5. Solderability

Specified Value : 75% or more of immersed surface of terminal electrode shall be covered with fresh solder.

Test Methods and Remarks :  
 Solder temperature :  $240 \pm 5^{\circ}\text{C}$   
 Duration :  $3 \pm 1$  sec  
 Preconditioning : Immersion into flux.  
 Immersion and Removal speed : 25mm/sec.

### 6. Resistance to Solder Heat

Specified Value :  
 Characteristics : shall satisfy the electrical characteristics.  
 Appearance : No significant abnormality.

Test Methods and Remarks :  
 Preheating :  $150^{\circ}\text{C}$  for 2 min.  
 Solder temperature :  $260 \pm 5^{\circ}\text{C}$   
 Duration :  $5 \pm 0.5$  sec.  
 Preconditioning : Immersion into flux.  
 Immersion and Removal speed : 25mm/sec.  
 Recovery : 2 to 3hrs of recovery under the standard condition after the removal from test chamber.

### 7. Thermal Shock

▶ This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our specification. For details of each product (characteristics graph, reliability information, precautions for use, and so on), see our Web site (<http://www.ty-top.com/>).

Specified Value	Characteristics : shall satisfy the electrical characteristics. Appearance : No significant abnormality.															
Test Methods and Remarks	According to JIS C60068-2-14. Conditions for 1 cycle															
	<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Duration (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40±3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room Temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>85±2</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room Temperature</td> <td>Within 3</td> </tr> </tbody> </table>	Step	Temperature (°C)	Duration (min)	1	-40±3	30±3	2	Room Temperature	Within 3	3	85±2	30±3	4	Room Temperature	Within 3
	Step	Temperature (°C)	Duration (min)													
	1	-40±3	30±3													
	2	Room Temperature	Within 3													
3	85±2	30±3														
4	Room Temperature	Within 3														
Number of cycles : 100																
Mounting method : Soldering onto PC board. Recovery : 2 to 3hrs of recovery under the standard condition after the removal from test chamber.																

#### 8. Humidity (steady state)

Specified Value	Characteristics : shall satisfy the electrical characteristics. Appearance : No significant abnormality.
Test Methods and Remarks	Temperature : +85±2°C Humidity : 85±5%RH Duration : 1000 hrs Recovery : 2 to 3hrs of recovery under the standard condition after the removal from test chamber.

#### 9. High temperature life test

Specified Value	Characteristics : shall satisfy the electrical characteristics. Appearance : No significant abnormality.
Test Methods and Remarks	Temperature : +85±2°C Duration : 1000 hrs Recovery : 2 to 3hrs of recovery under the standard condition after the removal from test chamber.

#### 10. Low temperature life test

Specified Value	Characteristics : shall satisfy the electrical characteristics. Appearance : No significant abnormality.
Test Methods and Remarks	Temperature : -40±2°C Duration : 1000 hrs Recovery : 2 to 3hrs of recovery under the standard condition after the removal from test chamber.

Note on standard condition:

“standard condition” referred to herein is defined as follows :  
5 to 35°C of temperature, 45 to 85% relative humidity and 86 to 106kPa of air pressure.

When there are questions concerning measurement result :  
In order to provide correlation data, the test shall be conducted under condition of 20±2°C of temperature, 60 to 70% relative humidity and 86 to 106kPa of air pressure.

Unless otherwise specified, all the tests are conducted under the “standard condition”.