

Notice for TAIYO YUDEN products

Please read this notice before using the TAIYO YUDEN products.

REMINDERS

- Product information in this catalog is as of October 2012. All of the contents specified herein are subject to change without notice due to technical improvements, etc. Therefore, please check for the latest information carefully before practical application or usage of the Products.

Please note that Taiyo Yuden Co., Ltd. shall not be responsible for any defects in products or equipment incorporating such products, which are caused under the conditions other than those specified in this catalog or individual specification.

- Please contact Taiyo Yuden Co., Ltd. for further details of product specifications as the individual specification is available.
- Please conduct validation and verification of products in actual condition of mounting and operating environment before commercial shipment of the equipment.

- All electronic components or functional modules listed in this catalog are developed, designed and intended for use in general electronics equipment.(for AV, office automation, household, office supply, information service, telecommunications, (such as mobile phone or PC) etc.). Before incorporating the components or devices into any equipment in the field such as transportation,(automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network (telephone exchange, base station) etc. which may have direct influence to harm or injure a human body, please contact Taiyo Yuden Co., Ltd. for more detail in advance. Do not incorporate the products into any equipment in fields such as aerospace, aviation, nuclear control, submarine system, military, etc. where higher safety and reliability are especially required.

In addition, even electronic components or functional modules that are used for the general electronic equipment, if the equipment or the electric circuit require high safety or reliability function or performances, a sufficient reliability evaluation check for safety shall be performed before commercial shipment and moreover, due consideration to install a protective circuit is strongly recommended at customer's design stage.

- The contents of this catalog are applicable to the products which are purchased from our sales offices or distributors (so called "TAIYO YUDEN' s official sales channel"). It is only applicable to the products purchased from any of TAIYO YUDEN' s official sales channel.

- Please note that Taiyo Yuden Co., Ltd. shall have no responsibility for any controversies or disputes that may occur in connection with a third party's intellectual property rights and other related rights arising from your usage of products in this catalog. Taiyo Yuden Co., Ltd. grants no license for such rights.

- Caution for export

Certain items in this catalog may require specific procedures for export according to "Foreign Exchange and Foreign Trade Control Law" of Japan, "U.S. Export Administration Regulations", and other applicable regulations. Should you have any question or inquiry on this matter, please contact our sales staff.

BALUN TRANSFORMERS



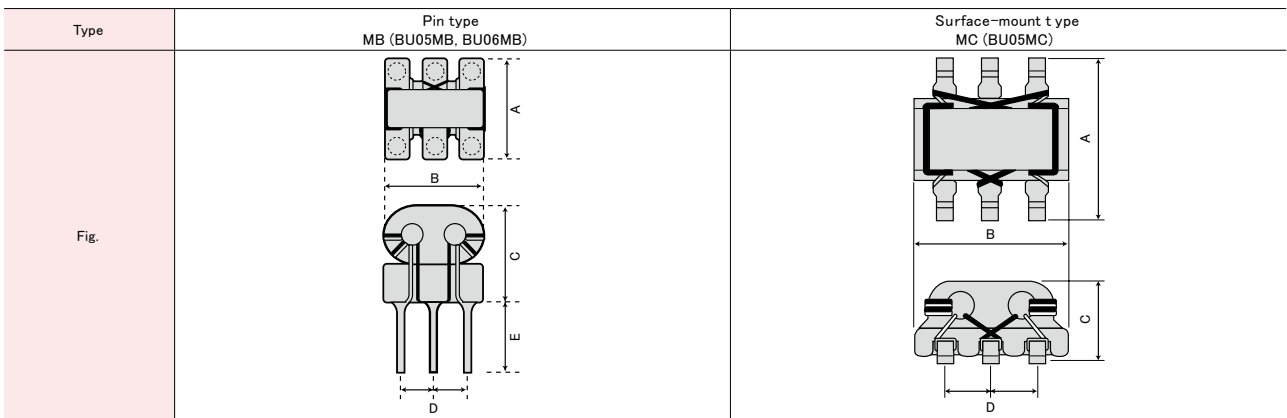
MB : WAVE MC : REFLOW

ORDERING CODE

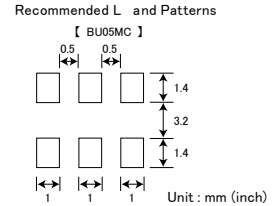
B U 0 5 M B Δ 0 1 Δ Δ ○

1 Type	2 Length of component [mm]	3 Shape	4 Product classification code	5 Packaging	6 Internal code
BU Balun transformer	05 5.0、5.3 06 6.0	MB pin type MC Surface-mount t type	example Δ01 Δ=Blank space	ΔT Tape & Reel ΔΔ Bulk (Only pin type) Δ=Blank space	Δ Standard product Δ=Blank space

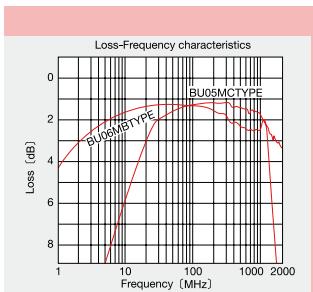
EXTERNAL DIMENSIONS /MINIMUM QUANTITY



Type	A	B	C	D	E	Minimum Quantity (pcs.)	
						Box	Taping
BU05MB	5.5 max. (0.217 max.)	5.5 max. (0.217 max.)	6.0 max. (0.236 max.)	1.75 ± 0.2 (0.069 ± 0.008)	3.5 (0.138)	200	—
BU06MB	8 max. (0.315 max.)	8 max. (0.315 max.)	8 max. (0.315 max.)	2.25 ± 0.2 pitch (0.089 ± 0.008)	3.5~5.0 (0.138 ± 0.197)	150	—
BU05MC	5.3 ± 0.5 (0.209 ± 0.020)	5.0 ± 0.3 (0.197 ± 0.012)	2.7 ± 0.2 (0.106 ± 0.008)	1.5 ± 0.2 pitch (0.059 ± 0.008)	—	—	2500

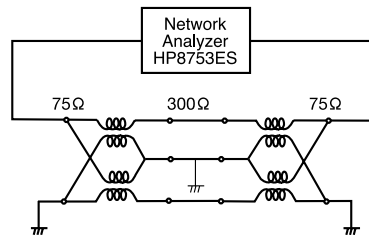


ELECTRICAL CHARACTERISTICS



The following chart shows typical ranges for operating characteristics. Please specify the following when ordering.

- ① loss
- ② standing wave ratio (VSWR)
- ③ operating frequency
- ④ specified test circuit



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BALUN TRANSFORMERS

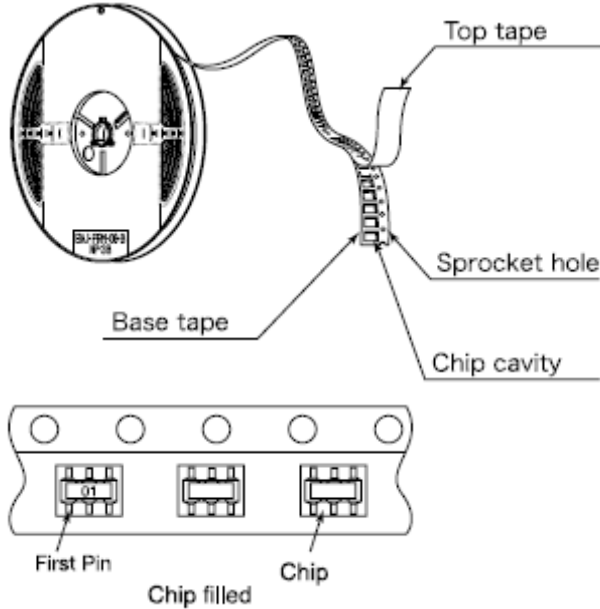
PACKAGING

① Minimum Quantity

Type	Minimum Quantity [pcs]	
	Box	Taping
BU05MC	—	2500
BU05MB	200	—
BU06MB	150	—

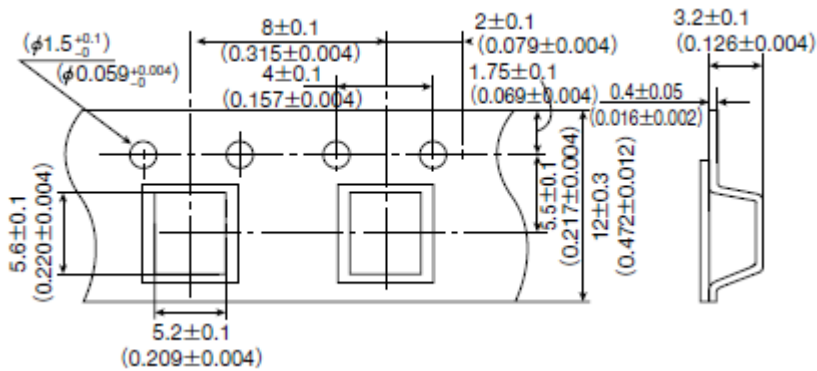
② Tape material

● Embossed Tape



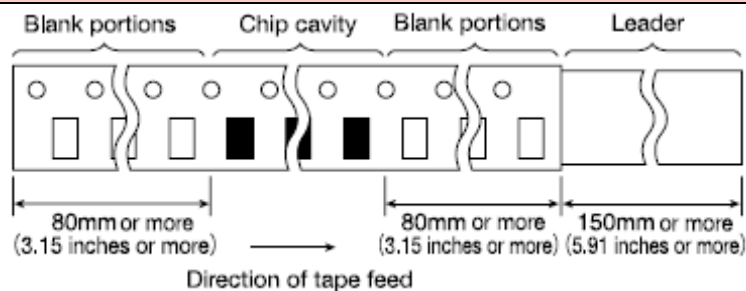
③ Taping dimensions

● Embossed tape 12mm wide (0.472 inches wide)



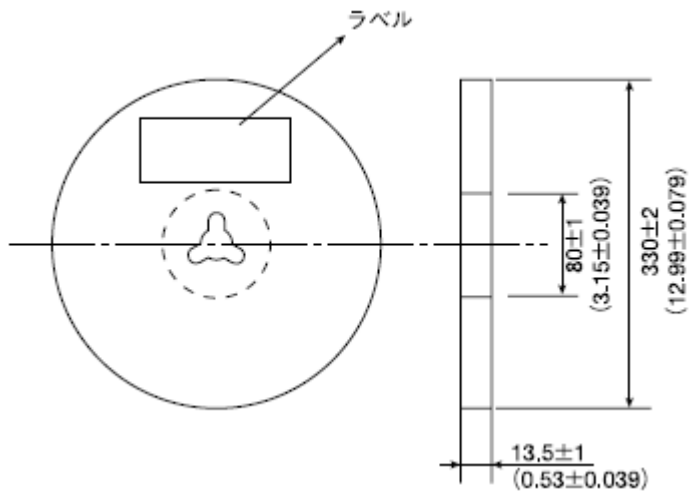
Unit: mm (inch)

④ Leader and Blank portion



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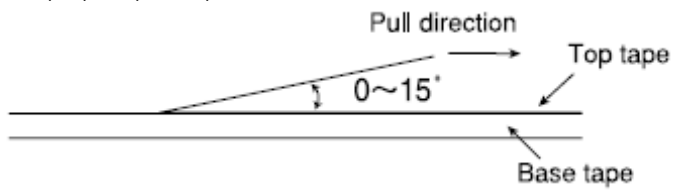
⑤ Reel size



Unit: mm (inch)

⑥ Top Tape Strength

The top tape requires a peel-off force of 0.1 to 0.7N in the direction of the arrow as illustrated below.



SMD COMMON MODE CHOKE COILS FOR DC AND SIGNAL LINES, BALUN TRANSFORMERS

RELIABILITY DATA

1. Operating Temperature Range		
Specified Value	BU05MC	-25°C~+ 105°C
Test Method and Remarks	Including self-generated heat	
2. Storage Temperature Range		
Specified Value	BU05MC	-40°C~+ 85°C
Test Method and Remarks	-5 to +40°C in taped packaging	
3. Rated current		
Specified Value	BU05MC	Within the specified tolerance.
Test Method and Remarks	The maximum value of DC current within a specified rise of temperature individually.	
4. Impedance		
Specified Value	BU05MC	Within the specified tolerance.
Test Method and Remarks	Measuring equipment : HP 4291A or its equivalent Measuring frequency : Specified frequency	
5. DC Resistance		
Specified Value	BU05MC	Within the specified tolerance.
Test Method and Remarks	SMD transformer・Common mode choke coil : Measuring equipment : DC ohm meter	
6. Resistance to flexure of substrate		
Specified Value	BU05MC	Refer to the individual specification.
Test Method and Remarks	According to JIS C 0051	
		BU05MC
	Warp	3mm
	Pressing speed	0.5mm/sec.
	Duration	5±1sec.
7. Dielectric resistance : between wires		
Specified Value	BU05MC	100MΩ min.
Test Method and Remarks	Applied voltage : Ratd voltage Duration : 60 sec.	
8. Rated voltage		
Specified Value	BU05MC	Within the specification.
9. Withstanding voltage : between wires		
Specified Value	BU05MC	No abnormality.
Test Method and Remarks	Applied voltage : Regulation voltage, DC125V (BU05MC) Duration : 60 sec.	

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10. Resistance to vibration

Specified Value	BU05MC	Refer to the individual specification.
Test Method and Remarks	According to JIS C 0040 Directions : 2 hrs each in X, Y, and Z directions. Total : 6 hrs Frequency range : 10 to 55 to 10 Hz (1 min.) Amplitude : 1.5mm (Shall not exceed acceleration 196m/s ²) Mounting method : soldering onto printed board Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.	

11. Solderability

Specified Value	BU05MC	At least 75% of terminal electrode is covered by new solder.								
Test Method and Remarks	<table border="1"> <tr> <td></td> <td>BU05MC</td> </tr> <tr> <td>Solder temperature</td> <td>235±5°C</td> </tr> <tr> <td>Duration</td> <td>2±0.5sec.</td> </tr> <tr> <td>Immersion depth</td> <td>Up to 0.5mm from terminal root</td> </tr> </table>			BU05MC	Solder temperature	235±5°C	Duration	2±0.5sec.	Immersion depth	Up to 0.5mm from terminal root
	BU05MC									
Solder temperature	235±5°C									
Duration	2±0.5sec.									
Immersion depth	Up to 0.5mm from terminal root									

12. Resistance to solder Heat

Specified Value	BU05MC	Refer to the individual specification.																
Test Method and Remarks	<table border="1"> <tr> <td></td> <td>BU05MC</td> </tr> <tr> <td rowspan="3">Reflow soldering</td> <td>Preheating</td> <td>100 to 150°C 1 to 2min</td> </tr> <tr> <td>Peak</td> <td>230 to 240°C within 5sec. More than 200°C within 40sec.</td> </tr> <tr> <td>Number of reflow</td> <td>Within 2 times</td> </tr> <tr> <td rowspan="3">Manual soldering</td> <td>Solder temperature</td> <td>350±5°C</td> </tr> <tr> <td>Duration</td> <td>3±1sec.</td> </tr> <tr> <td>Recovery</td> <td>1 to 2hrs of recovery under the standard condition after the test.</td> </tr> </table>			BU05MC	Reflow soldering	Preheating	100 to 150°C 1 to 2min	Peak	230 to 240°C within 5sec. More than 200°C within 40sec.	Number of reflow	Within 2 times	Manual soldering	Solder temperature	350±5°C	Duration	3±1sec.	Recovery	1 to 2hrs of recovery under the standard condition after the test.
	BU05MC																	
Reflow soldering	Preheating	100 to 150°C 1 to 2min																
	Peak	230 to 240°C within 5sec. More than 200°C within 40sec.																
	Number of reflow	Within 2 times																
Manual soldering	Solder temperature	350±5°C																
	Duration	3±1sec.																
	Recovery	1 to 2hrs of recovery under the standard condition after the test.																

13. Thermal shock

Specified Value	BU05MC	Refer to the individual specification.																		
Test Method and Remarks	According to JIS C 0025 Conditions of 1 cycle <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Time (min)</th> </tr> </thead> <tbody> <tr> <td></td> <td>BU05MC</td> <td>BU05MC</td> </tr> <tr> <td>1</td> <td>-25±3°C</td> <td>3±3</td> </tr> <tr> <td>2</td> <td>Room Temp.</td> <td>3</td> </tr> <tr> <td>3</td> <td>85±3°C</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room Temp.</td> <td>3</td> </tr> </tbody> </table> Number of cycle : BU05MC : 10 cycle Recovery : Recovery under the standard condition after removal from test chamber. BU05MC : Leave within 1 to 2 hours.		Step	Temperature (°C)	Time (min)		BU05MC	BU05MC	1	-25±3°C	3±3	2	Room Temp.	3	3	85±3°C	30±3	4	Room Temp.	3
Step	Temperature (°C)	Time (min)																		
	BU05MC	BU05MC																		
1	-25±3°C	3±3																		
2	Room Temp.	3																		
3	85±3°C	30±3																		
4	Room Temp.	3																		

14. Loading under damp heat

Specified Value	BU05MC	Refer to the individual specification.										
Test Method and Remarks	<table border="1"> <tr> <td></td> <td>BU05MC</td> </tr> <tr> <td>Temperature</td> <td>40±3°C</td> </tr> <tr> <td>Humidity</td> <td>90~95%RH</td> </tr> <tr> <td>Applied current</td> <td>Rated current</td> </tr> <tr> <td>Duration</td> <td>1000±24hrs</td> </tr> </table> Recovery : Recovery under the standard condition after removal from test chamber. BU05MC : Leave within 1 to 2 hours.			BU05MC	Temperature	40±3°C	Humidity	90~95%RH	Applied current	Rated current	Duration	1000±24hrs
	BU05MC											
Temperature	40±3°C											
Humidity	90~95%RH											
Applied current	Rated current											
Duration	1000±24hrs											

15. High temperature life test

Specified Value	BU05MC	Refer to the individual specification.						
Test Method and Remarks	<table border="1"> <tr> <td></td> <td>BU05MC</td> </tr> <tr> <td>Temperature</td> <td>85±3°C</td> </tr> <tr> <td>Duration</td> <td>1000±24hrs</td> </tr> </table> Recovery : Recovery under the standard condition after removal from test chamber. BU05MC : Leave within 1 to 2 hours.			BU05MC	Temperature	85±3°C	Duration	1000±24hrs
	BU05MC							
Temperature	85±3°C							
Duration	1000±24hrs							

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16. Low Temperature life Test		
Specified Value	BU05MC	Refer to the individual specification.
Test Method and Remarks		BU05MC
	Temperature	-40±3°C
	Applied current	1000±24hrs
Recovery : Recovery under the standard condition after removal from test chamber. BU05MC : Leave within 1 to 2 hours.		

17. Loading at high temperature life test		
Specified Value	BU05MC	—
Test Method and Remarks	Recovery : Recovery under the standard condition after removal from test chamber. BU05MC : Leave within 1 to 2 hours.	

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 results:

In order to provide correlation data, the test shall be conducted under condition of 20±2°C of temperature, 45 to 85% relative humidity and 86 to 106kPa of air pressure.

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

SMD COMMON MODE CHOKE COILS FOR DC AND SIGNAL LINES, BALUN TRANSFORMERS

PRECAUTIONS

1. Circuit Design

Precautions	<p>◆Operating environment</p> <p>1. The products described in this specification are intended for use in general electronic equipment, (office supply equipment, telecommunications systems, measuring equipment, and household equipment). They are not intended for use in mission-critical equipment or systems requiring special quality and high reliability (traffic systems, safety equipment, aerospace systems, nuclear control systems and medical equipment including life-support systems,) where product failure might result in loss of life, injury or damage. For such uses, contact TAIYO YUDEN Sales Department in advance.</p>
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2. PCB Design

Precautions	<p>◆Land pattern design</p> <p>1. Please contact any of our offices for a land pattern, and refer to a recommended land pattern of specifications.</p>
Technical considerations	<p>◆Land pattern design</p> <p>Surface Mounting</p> <ul style="list-style-type: none"> • Mounting and soldering conditions should be checked beforehand. • Applicable soldering process to these products is reflow soldering only. • Recommended Land Patterns <p style="text-align: center;">【BU05MC】</p> <p style="text-align: center;">Unit : mm</p>

3. Considerations for automatic placement

Precautions	<p>◆Adjustment of mounting machine</p> <p>1. Excessive impact load should not be imposed on the products when mounting onto the PC boards.</p> <p>2. Mounting and soldering conditions should be checked beforehand.</p>
Technical considerations	<p>◆Adjustment of mounting machine</p> <p>1. When installing products, care should be taken not to apply distortion stress as it may deform the products.</p>

4. Soldering

Precautions	<p>◆Reflow soldering</p> <p>1. Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified.</p> <p>2. This product can be used reflow soldering only.</p> <p>3. Please do not add any stress to a product until it returns in normal temperature after reflow soldering.</p> <p>◆Lead free soldering</p> <p>1. When using products with lead free soldering, we request to use them after confirming adhesion, temperature of resistance to soldering heat, soldering etc sufficiently.</p> <p>◆Recommended conditions for using a soldering iron</p> <p>【BU05MC】</p> <ul style="list-style-type: none"> • Put the soldering iron on the land-pattern. • Soldering iron's temperature - Below 350°C • Duration - 3 seconds or less • The soldering iron should not directly touch the inductor.
Technical considerations	<p>◆Reflow soldering</p> <p>1. If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently degrade the reliability of the products.</p> <p>◆Recommended conditions for using a soldering iron</p> <p>If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently degrade the reliability of the products.</p>

5. Cleaning

Precautions	<p>◆Cleaning conditions</p> <p>1. Please contact any of our offices for a cleaning.</p>
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6. Handling	
Precautions	<ul style="list-style-type: none"> ◆ Handling <ol style="list-style-type: none"> 1. Keep the product away from all magnets and magnetic objects. ◆ Breakaway PC boards (splitting along perforations) <ol style="list-style-type: none"> 1. When splitting the PC board after mounting product, care should be taken not to give any stresses of deflection or twisting to the board. 2. Board separation should not be done manually, but by using the appropriate devices. ◆ Mechanical considerations <ol style="list-style-type: none"> 1. Please do not give the product any excessive mechanical shocks. 2. Please do not add any shock and power to a product in transportation. ◆ Pick-up pressure <ol style="list-style-type: none"> 1. Please do not push to add any pressure to a winding part. Please do not give any shock and push onto an exposed part of ferrite cores. ◆ Packing <ol style="list-style-type: none"> 1. Please avoid accumulation of a packing box as much as possible.
Technical considerations	<ul style="list-style-type: none"> ◆ Handling <ol style="list-style-type: none"> 1. There is a case that a characteristic varies with magnetic influence. ◆ Breakaway PC boards (splitting along perforations) <ol style="list-style-type: none"> 1. The position of the product on PCBs shall be carefully considered to minimize the stress caused from splitting of the PCBs. ◆ Mechanical considerations <ol style="list-style-type: none"> 1. There is a case to be damaged by a mechanical shock. 2. There is a case to be broken by the handling in transportation. ◆ Pick-up pressure <ol style="list-style-type: none"> 1. An excessive shock or stress may cause a damage to the product or a deterioration of a characteristic. ◆ Packing <ol style="list-style-type: none"> 1. If packing boxes are accumulated, that could cause a deformation on packing tapes or a damage on the products.
7. Storage conditions	
Precautions	<ul style="list-style-type: none"> ◆ Storage <ol style="list-style-type: none"> 1. To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled. <ul style="list-style-type: none"> • Recommended conditions <ul style="list-style-type: none"> Ambient temperature : 0~40°C, Humidity : Below 70% RH <p>The ambient temperature must be kept below 30°C. Even under ideal storage conditions, the solderability of electrodes may decrease gradually. For this reason, the products should be used within one year from the time of delivery. In case of storage over 6 months, solderability shall be checked before actual usage.</p>
Technical considerations	<ul style="list-style-type: none"> ◆ Storage <ol style="list-style-type: none"> 1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.