

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 2009. 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.
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COMMON MODE CHOKE COILS (FOR DC AND SIGNAL LINES) SMD TYPE



REFLOW

FEATURES

- Available in embossed tape and reel.
- Highly coupled coil construction ideal for common mode noise attenuation.

OPERATING TEMP.

- 25°C~105°C (Including self-generated heat)

ORDERING CODE

C M 0 4 R C 0 1 T ○

1 Type	2 Dimensions of Core (mm)	3 Shape	4 Product classification code	5 Packaging	6 Internal code
CM BU	04 05	RC MC	01~10	T	△
Common mode choke coils	3.5 5.0	Surface mount type		Taped products	Standard Products △=Blank space

EXTERNAL DIMENSIONS/MINIMUM QUANTITY

<p>BU05MC (2 Lines) type</p> <p>Minimum Quantity (pcs.) Embossed tape 2500</p>	<p>BU05MC (3 Lines) type</p> <p>Minimum Quantity (pcs.) Embossed tape 2500</p>	<p>CM04RC (2 Lines) type</p> <p>Minimum Quantity (pcs.) Embossed tape 1500</p>
<p>CM04RC (3 Lines) type</p> <p>Minimum Quantity (pcs.) Embossed tape 1000</p>	<p>CM04RC (3 Lines) type (Thin)</p> <p>Minimum Quantity (pcs.) Embossed tape 2500</p>	<p>CM04RC (4 Lines) type</p> <p>Minimum Quantity (pcs.) Embossed tape 1000</p>

The values without tolerance are for reference only.

Unit : mm (inch)

PART NUMBERS

CM04RC Type

Ordering code	EHS (Environmental Hazardous Substances)	No. of Lines	Impedance [Ω] (typical)	DC resistance [Ω] (max.)	Rated current [A] (max.)	Rated voltage [V] (D.C.)	Insulation resistance [MΩ] (min.)
CM04RC01T	RoHS	2	800 (at 100MHz)	0.06	1.5	50	100
CM04RC04T	RoHS		900 (at 20MHz)	0.1	1.3		
CM04RC07T	RoHS		500 (at 160MHz)	0.06	2.5		
CM04RC09T	RoHS		270 (at 200MHz)	0.03	3.0		
CM04RC10T	RoHS		100 (at 200MHz)	0.02	4.0		
CM04RC02T	RoHS	3	1000 (at 100MHz)	0.18	0.5	50	100
CM04RC08T (THIN)	RoHS		1000 (at 200MHz)	0.2	0.5		
CM04RC05T	RoHS	4	800 (at 100MHz)	0.2	0.5	50	100

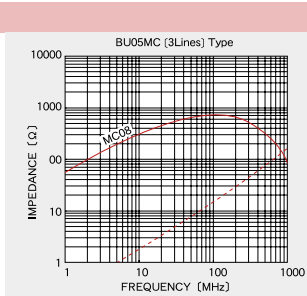
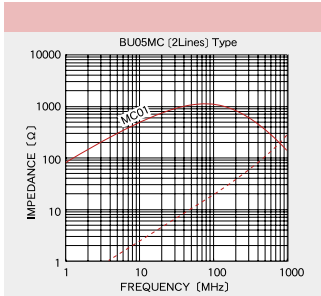
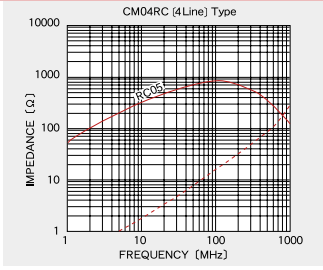
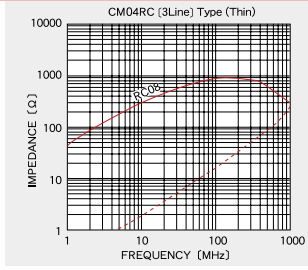
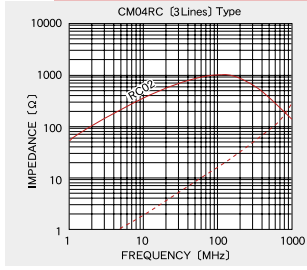
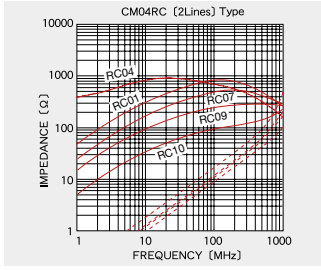
BU05MC Type

Ordering code	EHS (Environmental Hazardous Substances)	No. of Lines	Impedance [Ω] (typical)	DC resistance [Ω] (max.)	Rated current [A] (max.)	Rated voltage [V] (D.C.)	Insulation resistance [MΩ] (min.)
BU05MC01T	RoHS	2	1000 (at 60MHz)	0.12	1	50	100
BU05MC08T	RoHS	3	700 (at 60MHz)	0.11	0.5		

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Impedance -vs- Frequency characteristics

(Measured by HP4291A)



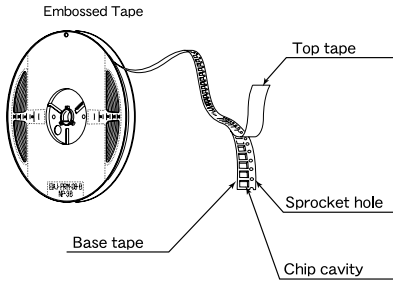
— Common mode
 - - - Normal mode

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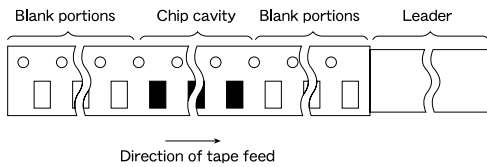
① Minimum Quantity

Type	Minimum Quantity (pcs.) Embossed tape
CM01 [2 Lines] type	3000
CM04RC [2 Lines] type	1500
CM04RC [3 Lines] type	1000
CM04RC [3 Lines] type (Thin)	2500
CM04RC [4 Lines] type	1000
BU05MC [2 Lines] type	2500
BU05MC [3 Lines] type	2500

② Tape Material



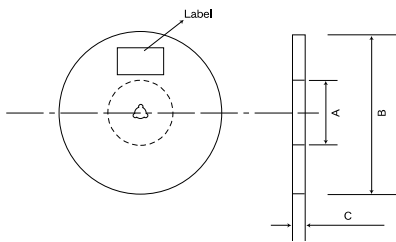
③ Leader and Blank Portion



Type	Leader	Blank portions (Leader side)	Blank portions (Chip cavity side)
CM01	200~400 (7.87~15.75)	160~200 (6.30~7.87)	160 (6.30) or more
CM04RC	150 (5.89)	80 (3.14)	80 (3.14)
BU05MC	150 (5.89)	80 (3.14)	80 (3.14)

Unit : mm (inch)

④ Reel size

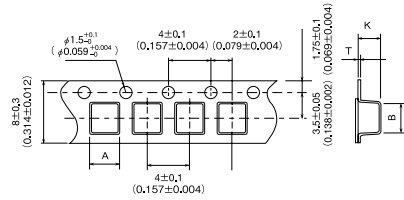


Type	A	B	C
CM01	$\phi 60+1/-0$ ($\phi 2.36+0.039/-0$)	$\phi 180+0/-3$ ($\phi 7.09+0/-0.118$)	10.0±1.5 (0.394±0.059)
CM04RC	$\phi 100\pm 1$ ($\phi 3.94\pm 0.039$)	$\phi 330\pm 2$ ($\phi 12.99\pm 0.079$)	18±1.5 (0.709±0.059)
BU05MC	$\phi 80\pm 1$ ($\phi 3.15\pm 0.039$)	$\phi 330\pm 2$ ($\phi 12.99\pm 0.079$)	13.5±1 (0.53±0.039)

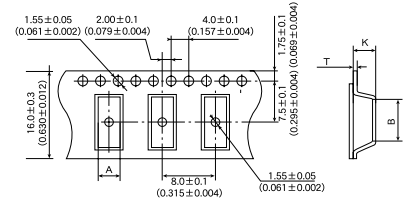
Unit : mm (inch)

⑤ Taping dimensions

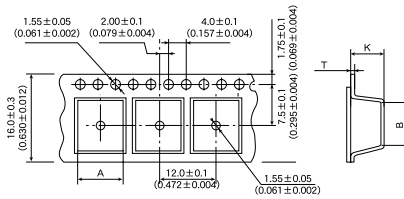
● Embossed tape (CM01 type)



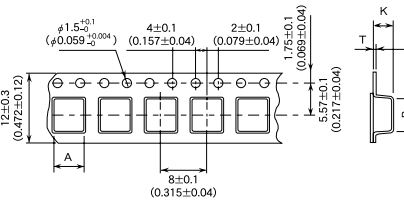
● Embossed tape (CM04RC type) 8mm pitch (0.31 inches pitch)



● Embossed tape (CM04RC type) 12mm pitch (0.472 inches pitch)



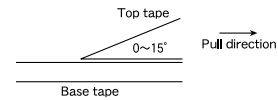
● Embossed tape (BU05MC type)



Type	Lines	Insertion pitch	Chip cavity		tape thickness	
			A	B	K	T
CM01	2	4.0±0.1	1.16±0.1	1.41±0.1	0.98±0.1	0.3max.
	2	8.0±0.1	5.7±0.1	9.65±0.1	5.2max	0.4±0.05
CM04RC	3	12.0±0.1	9.8±0.1	7.7±0.1	5.0max	0.38±0.05
	3 (THIN)	8.0±0.1	5.7±0.1	9.8±0.1	3.1max	0.4±0.05
BU05MC	4	12.0±0.1	10.3±0.1	10.3±0.1	5.0max	0.3±0.05
	2	8.0±0.1	5.35±1.5	5.7±0.2	3.2±0.1	0.4±0.05
	3					

Unit : mm (inch)

⑥ Top Tape Strength



● CM01

The top tape requires a peel-off force of 0.1 to 1.0N in the direction of the arrow as illustrated above.

● CM04RC, BU05MC

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

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RELIABILITY DATA

11. Solderability																														
CM01	At least 90% of terminal electrode is covered by new solder.																													
CM04RC																														
BU05MC	At least 75% of terminal electrode is covered by new solder.																													
【Test Method and Remarks】																														
	<table border="1"> <thead> <tr> <th></th> <th>CM01</th> <th>CM04RC・BU05MC</th> </tr> </thead> <tbody> <tr> <td>Solder temperature</td> <td>245±5°C</td> <td>235±5°C</td> </tr> <tr> <td>Duration</td> <td>3±1sec.</td> <td>2±0.5sec.</td> </tr> <tr> <td>Immersion depth</td> <td>—</td> <td>Up to 0.5mm from terminal root</td> </tr> </tbody> </table>		CM01	CM04RC・BU05MC	Solder temperature	245±5°C	235±5°C	Duration	3±1sec.	2±0.5sec.	Immersion depth	—	Up to 0.5mm from terminal root																	
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12. Resistance to solder Heat																														
CM01	Within the specified tolerance.																													
CM04RC																														
BU05MC	Refer to individual specification.																													
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13. Thermal shock																														
CM01	Within the specified tolerance.																													
CM04RC																														
BU05MC	Refer to individual specification.																													
【Test Method and Remarks】																														
Accoding to JIS C 0025																														
Conditions of 1 cycle																														
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2	Room Temp.	Room Temp.	3																											
3	85±2°C	85±3°C	30±3																											
4	Room Temp.	Room Temp.	3																											
Number of cycle : CM01 : 100 cycle CM04RC・BU05MC : 10 cycle																														
Recovery : Recovery under the standard condition after removal from test chamber.																														
CM01 : Measuring it more than two hours and less than 48 hours.																														
CM04RC・BU05MC : Leave during 1~2 hour.																														
14. Loading under damp heat																														
CM01	Within the specified tolerance.																													
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BU05MC	Refer to individual specification.																													
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BU05MC	Refer to individual specification.																													
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16. Low Temperature life Test																														
CM01	Within the specified tolerance.																													
CM04RC																														
BU05MC	Refer to individual specification.																													
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RELIABILITY DATA

17. Loading at high temperature life test

CM01	Within the specified tolerance.
CM04RC	—
BU05MC	—

【Test Method and Remarks】

CM01	
Temperature	105±2°C
Applied current	Rated current
Duration	1000±24hrs

Recovery : Recovery under the standard condition after removal from test chamber.
CM01 : Measuring it more than two hours and less than 48 hours.
CM04RC・BU05MC : Leave during 1~2 hour.

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."

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PRECAUTIONS

CM04RC, BU05MC, CM01

1. Circuit Design	
Precautions	<ul style="list-style-type: none"> ◆ Operating environment <ol style="list-style-type: none"> 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.
2. PCB Design	
Precautions	<ul style="list-style-type: none"> ◆ Land pattern design <ol style="list-style-type: none"> 1. Please contact any of our offices for a land pattern, and refer to a recommended land pattern of specifications.
Technical considerations	<ul style="list-style-type: none"> ◆ Land pattern design Surface Mounting <ul style="list-style-type: none"> • Mounting and soldering conditions should be checked beforehand. • Applicable soldering process to this products is reflow soldering only. • Recommended Land Patterns <p style="text-align: right;">Unit: mm</p>
3. Considerations for automatic placement	
Precautions	<ul style="list-style-type: none"> ◆ Adjustment of mounting machine <ol style="list-style-type: none"> 1. Excessive impact load should not be imposed on the products when mounting onto the PC boards. 2. Mounting and soldering conditions should be checked beforehand.
Technical considerations	<ul style="list-style-type: none"> ◆ Adjustment of mounting machine <ol style="list-style-type: none"> 1. When installing products, care should be taken not to apply distortion stress as it may deform the products.
4. Soldering	
Precautions	<ul style="list-style-type: none"> ◆ Reflow soldering <ol style="list-style-type: none"> 1. Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified. 2. This product is reflow soldering only. 3. Please do not add any stress to a product until it returns in normal temperature after reflow soldering. ◆ Lead free soldering <ol style="list-style-type: none"> 1. When using products with lead free soldering, we request to use them after confirming of adhesion, temperature of resistance to soldering heat, soldering etc sufficiently. ◆ Recommended conditions for using a soldering iron <ul style="list-style-type: none"> [CM04RC, BU05MC] <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. [CM01] <ul style="list-style-type: none"> • Please do not conduct an adjustment with a soldering iron because the wire would be broken due to its thinness.
Technical considerations	<ul style="list-style-type: none"> ◆ Reflow soldering <ol style="list-style-type: none"> 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.
5. Cleaning	
Precautions	<ul style="list-style-type: none"> ◆ Cleaning conditions <ol style="list-style-type: none"> 1. Please contact any of our offices for a cleaning.
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 into a ferrite core exposure part. ◆ 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. Planning pattern configurations and the position of products should be carefully performed to minimize stress. ◆ 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. Damage and a characteristic can vary with an excessive shock or stress. ◆ Packing <ol style="list-style-type: none"> 1. There is a case that transformation and a product of tape are damaged by accumulation of a packing box.
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, solderability of products electrodes may decrease as time passes. For this reason, product should be used within one year from the time of delivery.</p> <p>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.

* This catalog contains the typical specification only due to the limitation of space. When you consider 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/>) or CD catalogs.