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 2008. 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.
Should you have any question or inquiry on this matter, please contact our sales staff.

高速差動信号用コモンモードチョークコイル
COMMON MODE CHOKE COIL (SMD) FOR HIGH-SPEED DIFFERENTIAL SIGNAL

OPERATING TEMP.	−40〜+105℃

リフロー/REFLOW

特長　FEATURES

・高速差動信号であるHDMIなどにおいて、波形に影響を与えずにノイズ除去が可能な巻線構造のコモンモードチョークコイルです。
・当社の巻線技術を応用したことにより、1210サイズを実現しました。
・高速差動信号に対応できるように、特性インピーダンスを約100Ωに設計しています。
・カットオフ周波数は8GHzとなっており、高速差動信号に影響を与えません。

・Wire-wound Structured Type Common Mode Choke Coil Providing highly effective noise suppression characteristics without distorting the wave pattern of High-speed Differential Signal interface.
・Developed 1210 case-size by utilizing our wire-wound technologies
・Designing characteristic impedance as 100 ohm. Therefore, support a high-speed differential signal.
・Cut off frequency is 8GHz. No effect on the High-speed Differential Signal interface.

用途　APPLICATIONS

・液晶テレビ、Blue-ray、パソコンなどにおける高速差動信号の伝送ライン（HDMI、Serial-ATA、IEEE1394、LVDS、USB 2.0など）でのノイズ対策。
・小型の携帯機器における高速差動信号のノイズ対策。

・Radiated noise suppression in the High-speed Differential Signal interfaces [HDMI, Serial-ATA, IEEE1394, LVDS, and USB2.0] of LCD-TV, Blue-ray players, and PCs.
・Radiated noise suppression of the high-speed differential signal in a small portable device.

形名表記法　ORDERING CODE

1 形式

CM	コモンモードチョークコイル

2 外形寸法(L×W)［mm］

01	1.2×1.0mm

3 分類記号

H	HDMI規格対応

4 インピーダンス

900	90Ω　100MHzでのtyp. 値

5 梱包記号

T	テーピング品

C M 0 1 H 9 0 0 T
1 2 3 4 5

1 Type

CM	Common mode choke coil

2 External Dimensions(L×W)［mm］

01	1.2×1.0mm

3 Product classification code

H	HDMI standard correspondence

4 Impedance

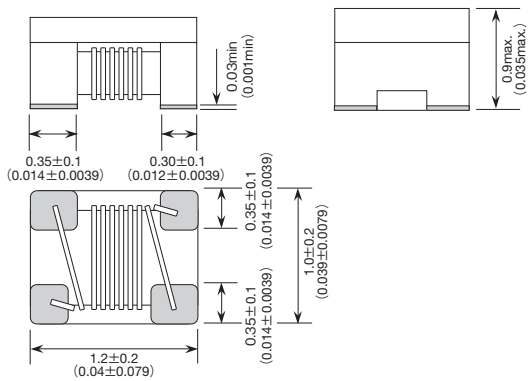
900	90Ω　typical at 100MHz

5 Packaging

T	Taping

外形寸法　EXTERNAL DIMENSIONS

●CM01H900T type



Unit : mm (inch)

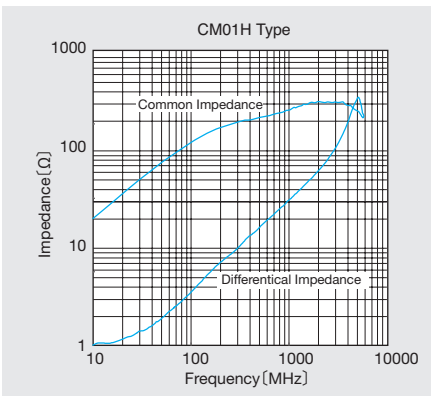
アイテム一覧　PART NUMBERS

CM01H TYPE

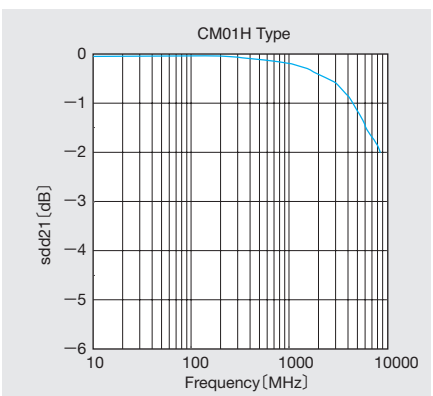
形名 Ordering	EHS	ライン数 No. of Lines	コモン インピーダンス Common Impedance [Ω] (at 100MHz)	直流抵抗 DC resistance [Ω]	定格電流 Rated current [mA]	定格電圧 Rated voltage [V] (D.C.)	絶縁抵抗 dielectric resistance [MΩ]	カットオフ周波数 Cut off frequency [GHz]	特性インピーダンス Characteristic impedance [Ω]
CM01H900T	RoHs	2	65min. (90 typ.)	0.5 max.	250 max.	20 max.	100 min.	8.0 typ.	100 typ.

特性図　ELECTRICAL CHARACTERISTICS

インピーダンス特性（代表例）　Impedance characteristics



伝送特性図(代表例)　Transmission characteristic



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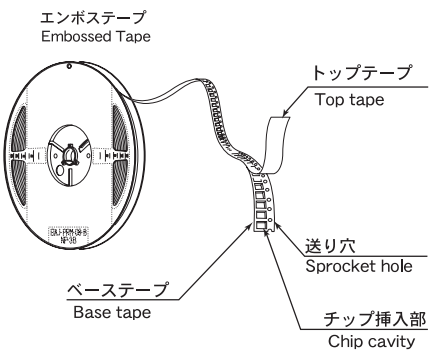
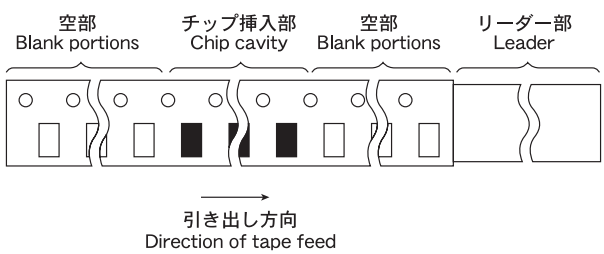
①最小受注単位数　Minimum Quantity

Type	最小受注単位数(pcs.) Minimum Quantity エンボステーピング Embossed tape
CM01H　[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テーピング材質　Tape Material



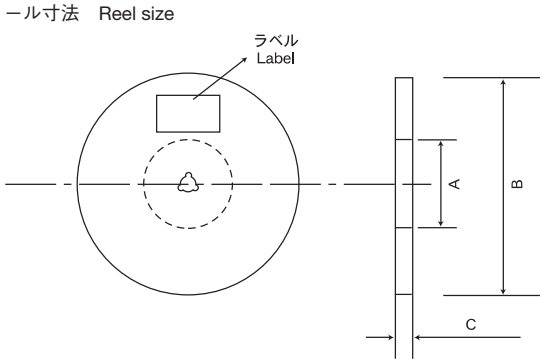
③リーダー部・空部　Leader and Blank Portion



Type	リーダー部 Leader	空部 (リーダー部側) Blank portions (Leader side)	空部 (チップ挿入部側) Blank portions (Chip cavity side)
CM01H	200～400 (7.87～15.75)	160～200 (6.30～7.87)	160(6.30)以上
CM04RC	150(5.89)	80 (3.14)	80 (3.14)
BU05MC	150(5.89)	80 (3.14)	80 (3.14)

Unit：mm (inch)

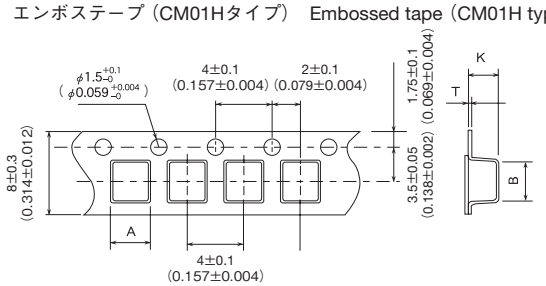
④リール寸法　Reel size



Type	A	B	C
CM01H	φ60+1/−0 (φ2.36+0.039/−0)	φ180+0/−3 (φ7.09+0/−0.118)	10.0±1.5 (0.394±0.059)
CM04RC	φ100±1 (φ3.94±0.039)	φ330±2 (φ12.99±0.079)	18±1.5 (0.709±0.059)
BU05MC	φ80±1 (φ3.15±0.039)	φ330±2 (φ12.99±0.079)	13.5±1 (0.53±0.039)

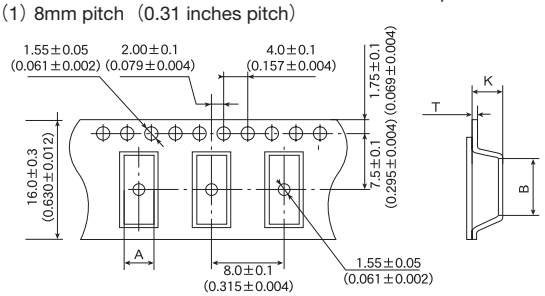
Unit：mm (inch)

エンボステープ (CM01Hタイプ)　Embossed tape (CM01H type)

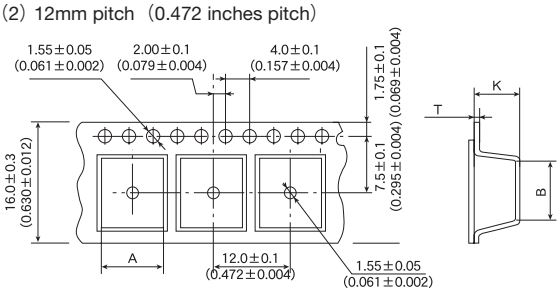


エンボステープ (CM04RCタイプ)　Embossed tape (CM04RC type)

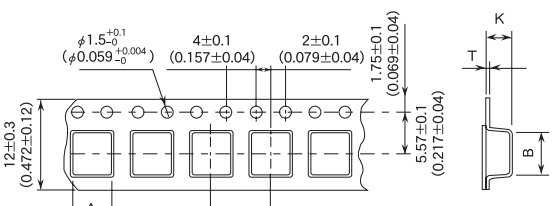
(1) 8mm pitch (0.31 inches pitch)



(2) 12mm pitch (0.472 inches pitch)



エンボステープ (BU05MCタイプ)　Embossed tape (BU05MC type)

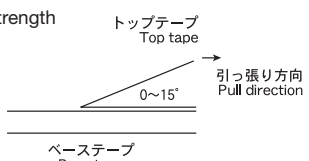


Unit：mm (inch)

Type	ライン数 Lines	挿入ピッチ Insertion pitch	チップ挿入部 Chip cavity		テープ厚み Tape thickness	
			A	B	K	T
CM01H	2	4.0±0.1	1.16±0.1	1.41±0.1	0.98±0.1	0.3max.
CM04RC	2	8.0±0.1	5.7±0.1	9.65±0.1	5.2max	0.4±0.05
	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
	4	12.0±0.1	10.3±0.1	10.3±0.1	5.0max	0.3±0.05
BU05MC	2 3	8.0±0.1	5.35±1.5	5.7±0.2	3.2±0.1	0.4±0.05

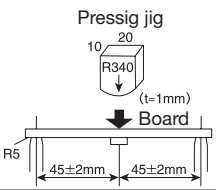
Unit：mm

⑥トップテープ強度　Top Tape Strength



●CM01H
トップテープのはがし力は、下図矢印方向にて0.1～1.0Nとなります。
The top tape requires a peel-off force of 0.1 to 1.0N in the direction of the arrow as illutrated below.

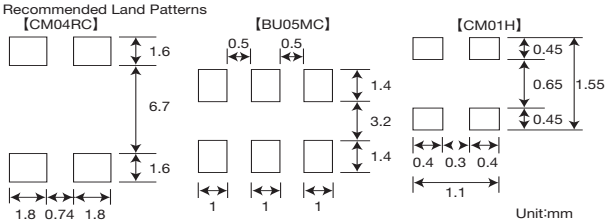
●CM04RC・BU05MC
トップテープのはがし力は、下図矢印方向にて0.1～0.7Nとなります。
The top tape requires a peel-off force of 0.1 to 0.7N in the direction of the arrow as illutrated below.

Item	Specifled Value			Test Method and Remarks
	CommonMode Choke Coils CM01H	CommonMode Choke Coils CM04RC	CommonMode Choke Coils BU05MC	
1.Operating Temperature Range	−40℃～+105℃	−25℃～+105℃		Including self-generated heat
2.Storage Temperature Range	−40℃～+85℃	−40℃～+85℃		−5 to +40℃ in taped packaging
3.Rated current	Within the specified tolerance.			The maximum DC value having temperature increase within specified temperature,as detailed in individual specification.
4.Impedance	Within the specified tolerance.			Measuring equipment : HP 4291A or its equivalent Measuring frequency : Specified frequency
5.Inductance	—	Within the specified tolerance.		
6.DC Resisitance	Within the specified tolerance.			SMD transformer・Commom mode choke coil : Measuring equipment : DC ohm meter
7.Resistance to flexure of substrate	Within the specified tolerance.	Refer to individual specification.		According to JIS C0051 CM01H: Warp 2mm; Pressing speed 0.5mm/sec.; Duration 5±1sec. CM04RC・BU05MC: Warp 3mm; Pressing speed 0.5mm/sec.; Duration 5±1sec. 
8.Dielectric resistance : between wires	100MΩ min.			Applied voltage : Rated voltage Duration : 60 sec.
9.Rated voltage	Within the specification.			
10.Withstanding voltage : between wires	No abnormality.			Applied voltage : Regulation voltage Duration : 60 sec.
11.Resistance to vibration	No abnormality observed in appearance	Refer to individual specification.		According to JIS C0040 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.
12.Solderability	At least 90% of terminal electrode is covered by new solder.	At least 75% of terminal electrode is covered by new solder.		CM01H: Solder temperature 245±5℃; Duration 3±1sec.; Immersion depth — CM04RC・BU05MC: Solder temperature 235±5℃; Duration 2±0.5sec.; Immersion depth Up to 0.5mm from terminal root
13.Resistance to solder Heat	Within the specified tolerance.	Refer to individual specification.		Reflow soldering — CM01H: Preheating: 150to180℃ 1to2min; Peak: 255±5℃ 5sec; More than 230℃ within 40 sec; Number of reflow: Within 2 times Reflow soldering — CM04RC・BU05MC: Preheating: 100to150℃ 1to2min; Peak: 230 to 240℃ within 5sec; More than 200℃ within 40sec; Number of reflow: Within 2 times Manual soldering — CM01H: — Manual soldering — CM04RC・BU05MC: Solder temperature: 350±5℃; Duration: 3±1sec; Recovery: 1to2hrs of recovery under the standardcondition after the test.

<table>
<tr><th rowspan="2">Item</th><th colspan="3">Specifled Value</th><th rowspan="2">Test Method and Remarks</th></tr>
<tr><th>CommonMode Choke Coils CM01H</th><th>CommonMode Choke Coils CM04RC</th><th>CommonMode Choke Coils BU05MC</th></tr>
<tr><td>14.Thermal shock</td><td>Within the specified tolerance.</td><td colspan="2">Refer to individual specification.</td><td>Accoding to JIS C0025
Conditions of 1 cycle
<table>
<tr><th rowspan="2">Step</th><th colspan="2">Temperature (℃)</th><th colspan="2">Time (min)</th></tr>
<tr><th>CM01H</th><th>CM04RC・BU05MC</th><th>CM01H</th><th>CM04RC・BU05MC</th></tr>
<tr><td>1</td><td>−40±3℃</td><td>−25±3℃</td><td colspan="2">30±3</td></tr>
<tr><td>2</td><td>Room Temp.</td><td>Room Temp.</td><td colspan="2">3</td></tr>
<tr><td>3</td><td>85±2℃</td><td>85±3℃</td><td colspan="2">30±3</td></tr>
<tr><td>4</td><td>Room Temp.</td><td>Room Temp.</td><td colspan="2">3</td></tr>
</table>
Number of cycle :
CM01H : 100 cycle
CM04RC・BU05MC : 10 cycle
Recovery : Recovery under the standard condition after removal from test chamber.
CM01H : Measuring it more than two hours and less than 48 hours.
CM04RC・BU05MC : Leave during 1〜2 hour.</td></tr>
<tr><td>15.Loading under damp heat</td><td>Within the specified tolerance.</td><td colspan="2">Refer to individual specification.</td><td>
<table>
<tr><th></th><th>CM01H</th><th>CM04RC・BU05MC</th></tr>
<tr><td>Temperature</td><td>60±2℃</td><td>40±3℃</td></tr>
<tr><td>Humidity</td><td colspan="2">90〜95%RH</td></tr>
<tr><td>Applied current</td><td colspan="2">Rated current</td></tr>
<tr><td>Duration</td><td colspan="2">1000±24hrs</td></tr>
</table>
Recovery : Recovery under the standard condition after removal from test chamber.
CM01H : Measuring it more than two hours and less than 48 hours.
CM04RC・BU05MC : Leave during 1〜2 hour.</td></tr>
<tr><td>16.High temperature life test</td><td>—</td><td colspan="2">Refer to individual specification.</td><td>
<table>
<tr><th></th><th>CM04RC・BU05MC</th></tr>
<tr><td>Temperature</td><td>85±3℃</td></tr>
<tr><td>Duration</td><td>1000±24hrs</td></tr>
</table>
Recovery : Recovery under the standard condition after removal from test chamber.
CM01H : Measuring it more than two hours and less than 48 hours.
CM04RC・BU05MC : Leave during 1〜2 hour.</td></tr>
<tr><td>17.Low Temperature life Test</td><td>Within the specified tolerance.</td><td colspan="2">Refer to individual specification.</td><td>
<table>
<tr><th></th><th>CM01H</th><th>CM04RC・BU05MC</th></tr>
<tr><td>Temperature</td><td>−40±2℃</td><td>−40±3℃</td></tr>
<tr><td>Applied current</td><td colspan="2">1000±24hrs</td></tr>
</table>
Recovery : Recovery under the standard condition after removal from test chamber.
CM01H : Measuring it more than two hours and less than 48 hours.
CM04RC・BU05MC : Leave during 1〜2 hour.</td></tr>
<tr><td>18.Loading at high temperature life test</td><td>Within the specified tolerance.</td><td colspan="2">—</td><td>
<table>
<tr><th></th><th>CM01H</th></tr>
<tr><td>Temperature</td><td>105±2℃</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.
CM01H : Measuring it more than two hours and less than 48 hours.
CM04RC・BU05MC : Leave during 1〜2 hour.</td></tr>
</table>

Note on standard condition: "standard condition"
referred to herein is defined as follows:
5 to 35℃ 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℃ 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."

CM04RC,BU05MC,CM01H

Stages	Precautions	Technical considerations
1.Circuit Design	Operating environment, 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	Land pattern design 1.Please contact any of our offices for a land pattern, and refer to a recommended land pattern of specifications.	Surface Mounting ・Mounting and soldering conditions should be checked beforehand. ・Applicable soldering process to this products is reflow soldering only. ・Recommended Land Patterns 
3.Considerations for automatic placement	Adjustment of mounting machine 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.	1. When installing products, care should be taken not to apply distortion stress as it may deform the products.
4.Soldering	Reflow soldering 1.Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified. 2.This products is reflow soldering only. 3.SMD Inductors Please do not add any stress to a product until it returns in normal temperature after reflow soldering. Lead free soldering 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. 【CM04RC,BU05MC】 Recommended conditions for using a soldering iron: Put the soldering iron on the land-pattern. Soldering iron's temperature - Below 350 ℃ Duration - 3 seconds or less The soldering iron should not directly touch the inductor. 【CM01H】 Please do not recommended conditions for using a soldering iron.	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	Cleaning conditions 1.SMD Inductors Please contact any of our offices for a cleaning,	
6.Handling	Handling 1.Keep the product away from all magnets and magnetic objects. Breakaway PC boards (splitting along perforations) 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 1.Please do not give the product any excessive mechanical shocks. 2.SMD Inductors Please do not add any shock and power to a product in transportation. Pick-up pressure 1.SMD Inductors 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 1.SMD Inductors Please avoid accumulation of a packing box as much as possible.	1.There is a case that a characteristic varies with magnetic influence. 1.Planning pattern configurations and the position of products should be carefully performed to minimize stress. 1.There is a case to be damaged by a mechanical shock. 2.SMD Inductors There is a case to be broken by the handling in transportation. 1.SMD Inductors Damage and a characteristic can vary with an excessive shock or stress. 1.There is a case that transformation and a product of tape are damaged by accumulation of a packing box.
7.Storage conditions	Storage 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.. ・Recommended conditions Ambient temperature 0~40℃ Humidity Below 70% RH The ambient temperature must be kept below 30℃. 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. In case of storage over 6 months, solderability shall be checked before actual usage.	1.Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration oftaping/packaging materials may take place.