No. MLMCFE12000

PRODUCT SPECIFICATION

P/N: MCF0806 2G900-T

Type: MULTILAYER COMMON MODE CHOKE COILS

Soldering: Reflow only

Issue date: 3.Jul.2012

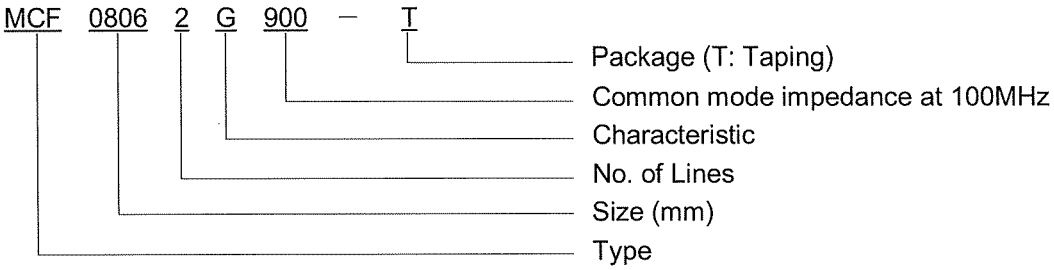
Applicable products to RoHS restriction

TAIYO YUDEN CO., LTD.

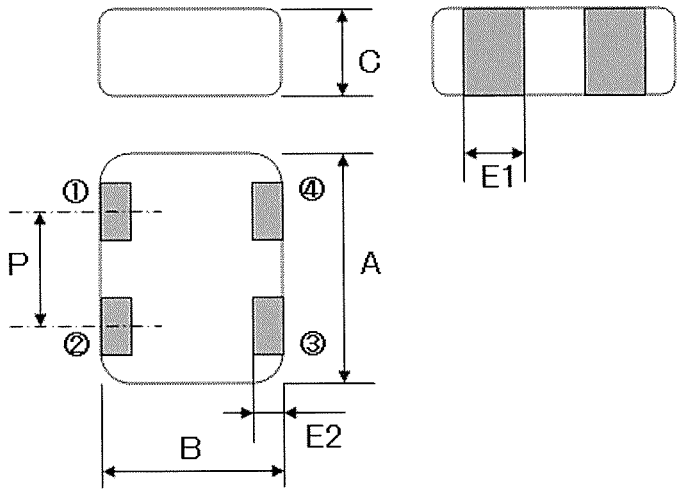
1. Scope

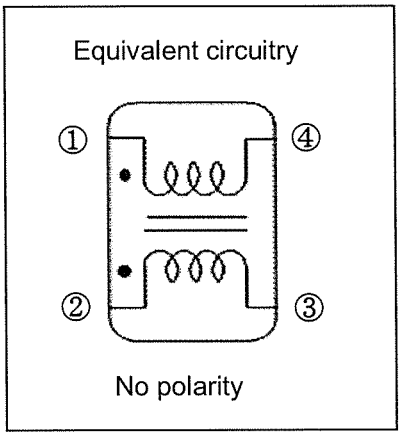
This specification applies to Multilayer Common Mode Choke Coil Taiyo Yuden Co., Ltd. delivers.
Its Application is limited for the High speed differential transmission line like as followings.
USB, LVDS, MIPI, MDDI, MHL, HDMI, DVI.
If used for another, please inquiry to Taiyo Yuden Co., Ltd.

2. Product Name Format



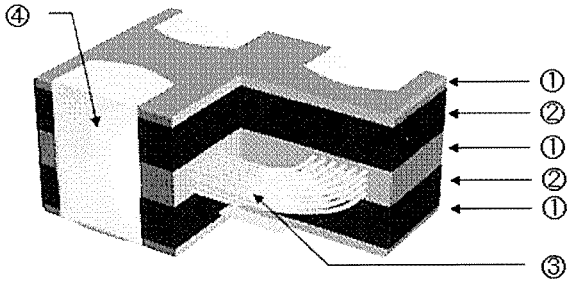
3. Size, Dimensions and Materials





TYPE	Dimensions					
	A	B	C	E1	E2	P
MCF0806	0.85±0.05	0.65±0.05	0.40±0.05	0.27±0.1	0.2+0.05/−0.1	0.5±0.1

Unit【mm】



	Name	Material
①	Body 1	Dielectric
②	Body 2	Ferrite
③	Internal Conductors	Ag
④	Terminal Electrodes	Sn / surface Ni / plating Ag / base

● During the parts manufacturing process, Ozone depleting substances (ODS) are not used.

※RoHS compliance

- This product conform to "RoHS compliance".
- "RoHS compliance" means that the product does not contain lead, cadmium, mercury, hexavalent chromium, PBB or PBDE referring to EU Directive 2002/95/EC, except other non-restricted substances or impurities which could not be technically removed at the refining process.

4. Marking

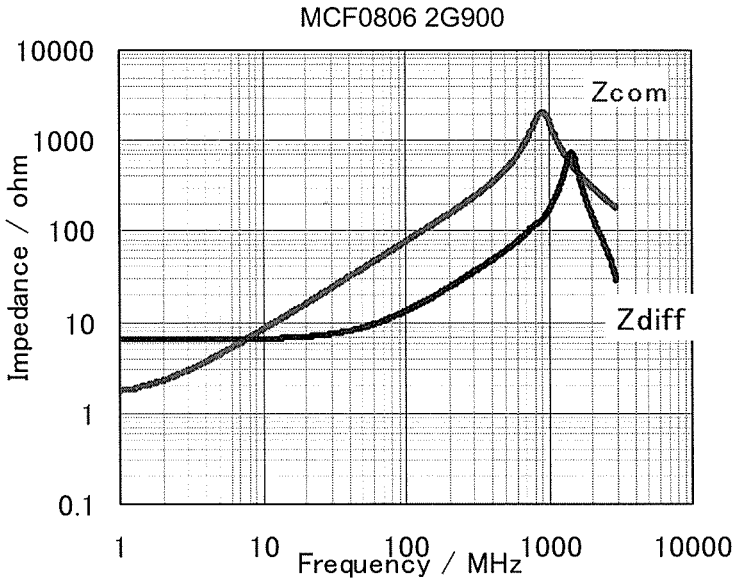
Description is omitted.

5. Part number and Characteristics

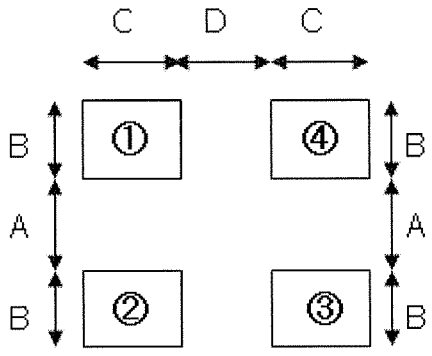
Range of operating temperature : -40℃ to +85℃

Ordering code	Commom mode Impedance (at 100MHz) 【Ω】	DC resistance 【Ω】	Rated current 【mA】	Rated voltage 【V】	Insulation resistance 【MΩ】
MCF0806 2G900-T	90±20%	6.5 max	100 max	5 max	100 min

Impedance characteristics (Typ.)



Recommended land dimension



A: 0.15 to 0.25
B: 0.25 to 0.35
C: 0.25 to 0.35
D: 0.25 to 0.35

Unit 【mm】

6. Specification

<table>
<tr><th>No.</th><th>Item</th><th>Specified Value</th><th>Testing method</th></tr>
<tr><td>6-1</td><td>Appearance and Dimensions</td><td>Appearance: No harmful defect for practical use.
Dimensions: Per Item 3.</td><td>Visual inspection and micro-meter.</td></tr>
<tr><td>6-2</td><td>Commom mode Impedance</td><td>Per Item 5.</td><td>Measuring points: Terminals ①to④ and ②to③ set into parallel.
Impedance measured at 100±1MHz.
Measuring equipment: HP4291Aor equivalent</td></tr>
<tr><td>6-3</td><td>DC resistance</td><td>Per Item 5.</td><td>Measuring points: ①to④ or ②to③</td></tr>
<tr><td>6-4</td><td>Insulation resistance</td><td>Per Item 5.</td><td>Measuring points: ①to② or ③to④
Measuring voltage: Rated voltage</td></tr>
<tr><td>6-5</td><td>Vibration</td><td>Per Table 1.

Table 1
<table><tr><td>Appearance</td><td>No remarkable Defect</td></tr><tr><td>Commom mode Impedance change rate</td><td>Within ±20%</td></tr><tr><td>Insulation resistance</td><td>100MΩmin</td></tr></table></td><td>Test sample shall be soldered to test board and the test shall be conducted under the conditions shown in Table 2.

Table 2
<table><tr><td>Vibration frequency range</td><td colspan="2">10Hz to 55Hz</td></tr><tr><td>Overall amplitude</td><td colspan="2">1.5mm</td></tr><tr><td>1cycle</td><td colspan="2">1min. (10→55→10Hz)</td></tr><tr><td rowspan="3">Time</td><td>X</td><td rowspan="3">2 hours each</td></tr><tr><td>Y</td></tr><tr><td>Z</td></tr></table></td></tr>
<tr><td>6-6</td><td>Solderability</td><td>More than 75% of terminal electrode shall be covered with fresh solder.</td><td>Test sample shall be immersed into molten solder under the conditions shown in Table 3 after immersed into flux.
After this, test samples shall be taken out and visually checked.
The speed for immersion and taking out shall be 25 mm/s.

Table 3 (Eutectic solder)
<table><tr><td>Solder temperature</td><td>230℃±5℃</td></tr><tr><td>Immersion time</td><td>4s±1s</td></tr></table>
Table 3 (Pb-free solder Sn/3.0Ag/0.5Cu)
<table><tr><td>Solder temperature</td><td>245℃±3℃</td></tr><tr><td>Immersion time</td><td>4s±1s</td></tr></table></td></tr>
</table>

6. Specification

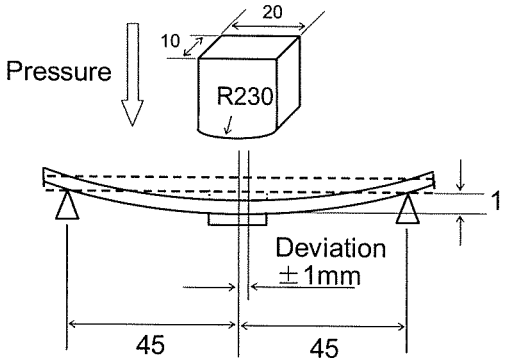
<table>
<tr><th>No.</th><th>Item</th><th>Specified Value</th><th>Testing method</th></tr>
<tr><td>6-7</td><td>Resistance to Soldering Heat</td><td>Per Table 1.</td><td>Test sample shall be immersed into molten solder after immersed into flux and preheated under the conditions shown in Table4 .
After this, test samples shall be taken out and measured after kept at room temperature for 2 to 3 hours. (Note 1)
The speed for immersion and taking out shall be 25 mm/s.

Table 4
<table><tr><td>Preheating</td><td>150℃, 3min.</td></tr><tr><td>Resistance to Soldering Heat</td><td>260℃±5℃</td></tr><tr><td>Immersion time</td><td>10s±0.5s</td></tr></table></td></tr>
<tr><td>6-8</td><td>Thermal Shock</td><td>Per Table 1.</td><td>Steps 1 to 4 shown in Table 5 as one cycle shall be repeated 5 times.
After the test, keep the test sample at a normal temperature with a normal humidity for 2 to 3 hours, then measurement shall be conducted. (Note 1)

Table 5
<table><tr><th>Step</th><th>Temperature</th><th>Time</th></tr><tr><td>1</td><td>-40℃ ± $^{0}_{3}$ ℃</td><td>30min.±3min.</td></tr><tr><td>2</td><td>Normal temp</td><td>2min. to 3min.</td></tr><tr><td>3</td><td>+85℃ ± $^{3}_{0}$ ℃</td><td>30min.±3min.</td></tr><tr><td>4</td><td>Normal temp</td><td>2min. to 3min.</td></tr></table></td></tr>
<tr><td>6-9</td><td>Resistance to Humidity</td><td>Per Table 1.</td><td>Test board shall be kept in a thermo hygrostat at temperature of 40℃±2℃ and relative humidity of 90% to 95% for 500 +24/-0 hours.
After the test, keep the test sample at a normal temperature with a normal humidity for 2 to 3 hours, then measurement shall be conducted. (Note 1)</td></tr>
<tr><td>6-10</td><td>High Temperature Life Test</td><td>Per Table 1.</td><td>Test board shall be kept in an atmosphere with temperature of 85℃±2℃ for 500 +24/-0 hours.
After the test, keep the test sample at a normal temperature with a normal humidity for 2 to 3 hours, then measurement shall be conducted. (Note 1)</td></tr>
<tr><td>6-11</td><td>High Temperature Load Life Test</td><td>Per Table 1.</td><td>Test board shall be kept in a thermostatic oven with temperature of 85℃±2℃ for 500 +24/-0 hours while supplying ① to ④ and ②−③ with rated current.
After the test, keep the test sample at a normal temperature with a normal humidity for 2 to 3 hours, then measurement shall be conducted. (Note 1)</td></tr>
</table>

(Note 1) If a question is found in the result of measurement, another measurement shall be conducted after test samples shall be kept for 48±2 hours.

6. Specification

No.	Item	Specified Value	Testing method
6-12	Bending Strength	No mechanical damage.	Solder a test sample to the printed circuit board and apply a load in the arrow direction until amount of deflection reaches to 1mm.  Unit【mm】

6-13 Measuring Conditions

Temperature : Normal temperature (5℃ to 35℃)
Relative humidity : Normal humidity (45% to 85%)
Atmospheric pressure : Normal pressure (86kPa to 106kPa)
If a question arises, the measurement shall be conducted under the conditions given below.
Temperature : 20℃±2℃
Relative humidity : 60% to 70%
Atmospheric pressure : 86kPa to 106kPa

6-14 Solder for Test

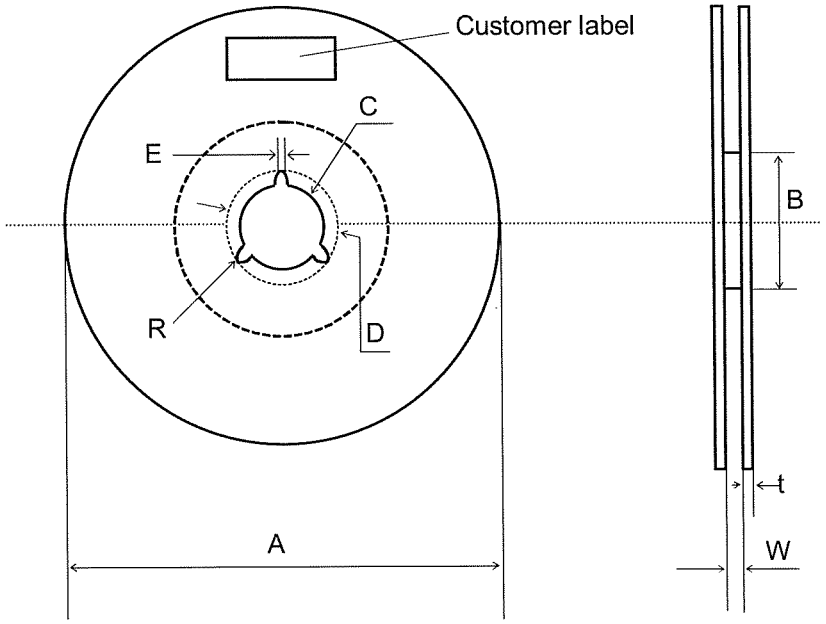
JIS－Z－3282 H63A or H60A

6-15 Flux for Test

Methanol (JIS K1501) solution containing rosin (JIS K5902) of 25 weight%

7. Taping Specifications

7-1 Marking and Dimensions of Reel



Customer label description

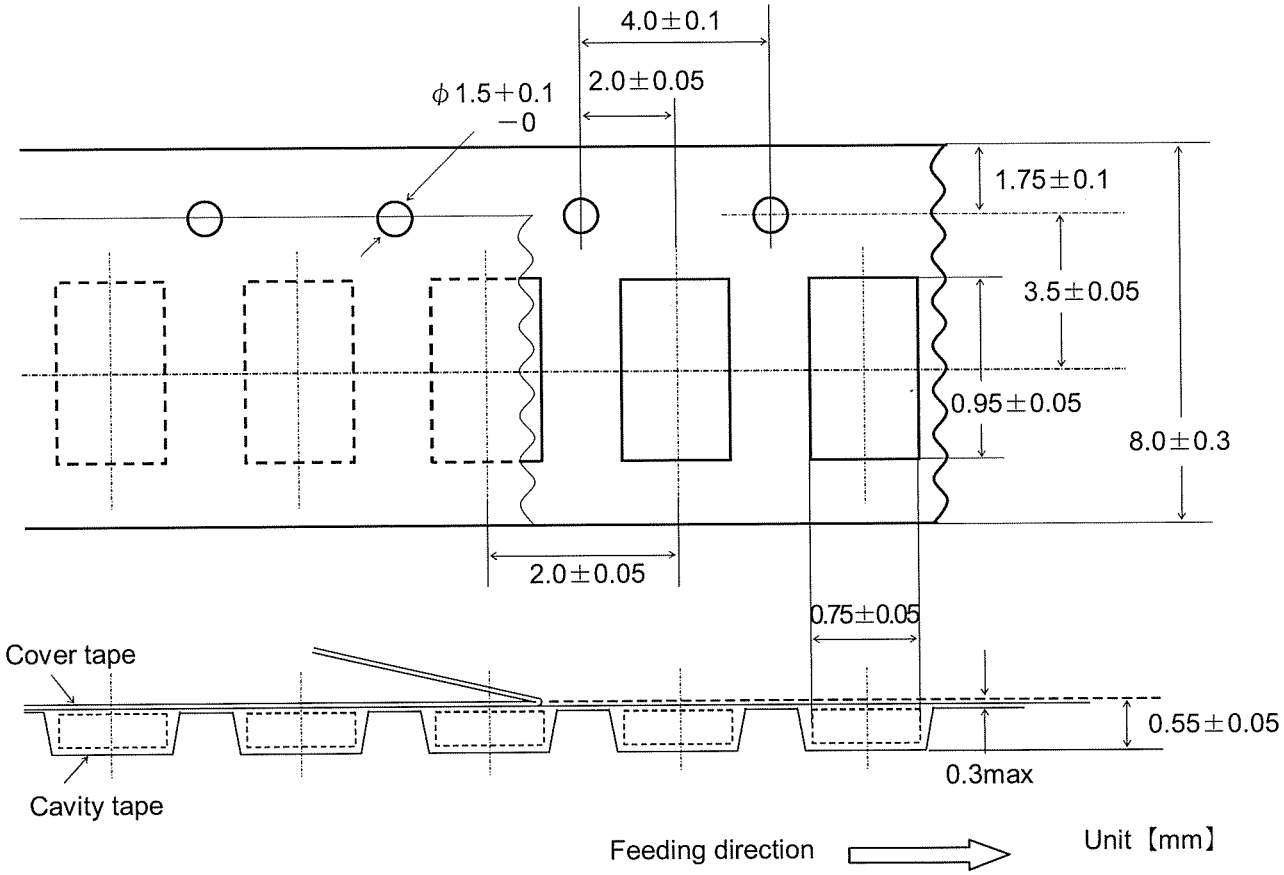
1. Manufacturer Name
2. Customer Parts No.
3. Our parts No.
4. Quantity
5. Control No.
   (Shipping Lot No.)
6. Manufacturing site
   (MADE IN ○○○)

Code	ϕA	ϕB	ϕC	ϕD
Dimension	178±2.0	50 min	13±0.2	21±0.8

Code	E	W	t	R
Dimension	2.0±0.5	10±1.5	2.5 max	1.0

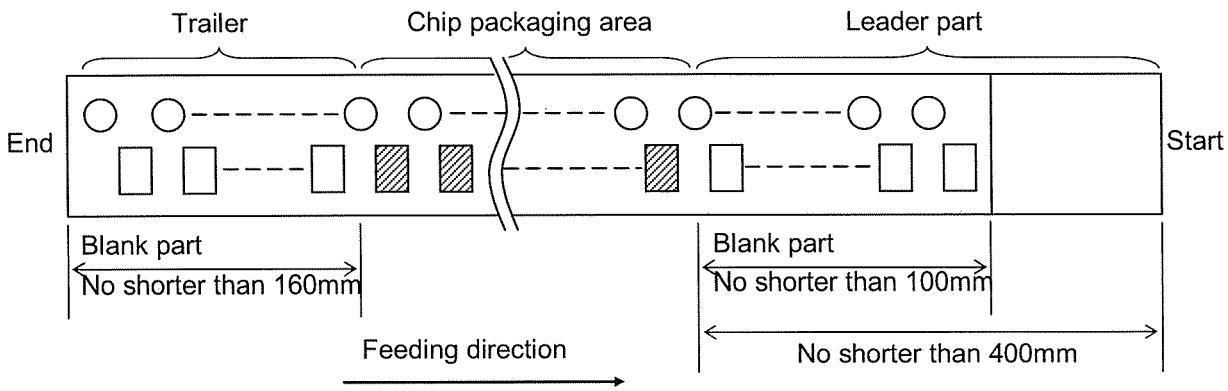
Unit【mm】

7-2 External Dimension of Plastics Tape

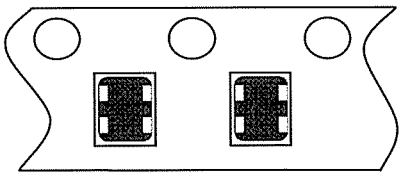


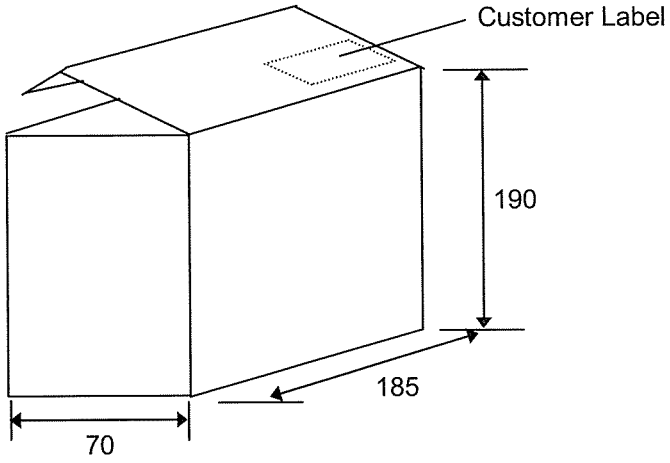
Unit【mm】

7-3 Packaging



Product direction





Customer label description

1. Manufacturer Name
2. Customer Parts No.
3. Our parts No.
4. Quantity
5. Control No.
   ※ (Shipping Lot No.)
6. Manufacturing site
   (MADE IN ○○○)

Unit [mm]
(The size is only for reference.)

・To attach labels means that all products are passed.

Control No.

We control our products by control number and shipping lot number is not marked on customer label.
Shipping lot number is marked on our control label.
Shipping lot number is traceable from our Control number marked on customer label.

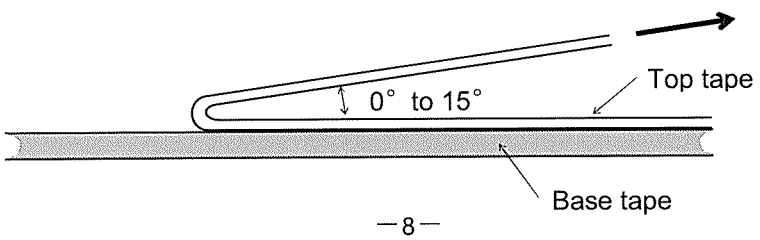
7-4 Quantity of taping package

TYPE	Thickness T	1 reel	1 carton box
MCF0806	0.40 mm	10,000 / reel	50,000 / 5 reels

7-5 The tensile strength of the tape is 5N or over.

7-6 Top tape strength

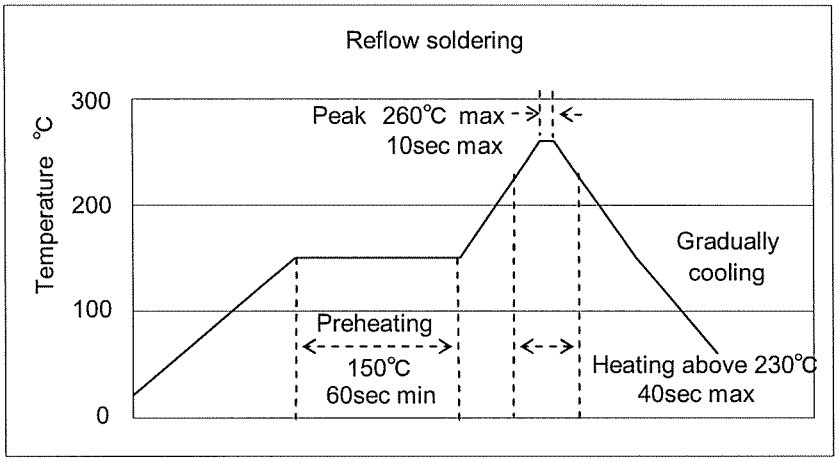
Top tape requires peeling strength of 0.1N to 0.7N in the arrow direction as shown below.



8.Cautions in Use

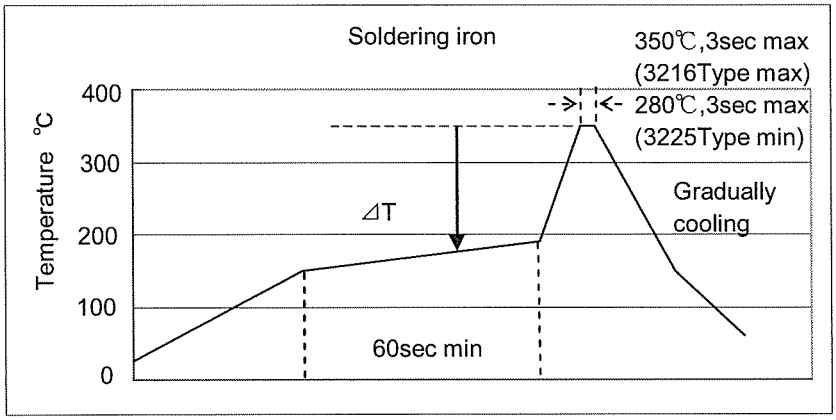
8-1 Cautions in Soldering Work

Recommended Soldering Profiles for Lead-free Solder Paste



※Components should be preheated to within **100 to 130**℃ from soldering temperature.

※Assured to be reflow soldering for **2 times.**



※⊿T≦150℃（3216Type max），⊿T≦130℃（3225Type min）

※Preheating control: Boards and components should be preheated sufficiently with temperature over 150℃, and soldering should be conducted by soldering iron while temperature of boards and components keep sufficient temperature.

※The soldering iron should not directly touch the components.

※Assured to be soldering iron for **1 time.**

※It is recommended to use 20W soldering iron and the tip is 1ϕ or less.

Temperature in usage of Pb-free solder (Sn-3Ag-0.5Cu)

Case size	Soldering iron tip temp.	Preheating temp.
3216 type max.	≦350℃	≧150℃
3225 type min.	≦280℃	≧150℃

Note: The above profiles are the maximum allowable soldering condition, therefore these profiles are not always recommended.

8-2 Cautions in Handling for Mounting

- When installing a printed circuit board on the set after inductors are mounted, these inductors shall be free from a residual stress due to overall deflection of the printed circuit board or partial deflection resulting from tightening of screws.

8-3 Cautions in Handling

- Sets of tweezers made of non-magnetic material such as titanium shall be used.
- Soldering irons and measuring equipments shall be grounded.
- The electrodes of inductors or the conductive parts which conduct to these electrodes shall be protected from direct touch of bare hands or ambient metallic items (steel desk or the like).
- The inductors shall be kept away from the objects such as speakers, coils, etc. which generate a magnetic field.
- Note that the inductor should not be exposed to static electricity.

In case, an electric characteristic changes due to a departure from the above procedure notes, the inductor can be returned to its initial characteristic by heating the inductor to the temperature of 150℃ or more.

9. Cautions for storage

To maintain the solderability of terminal electrodes and to keep the packaging material in good condition, care must be taken to control temperature and humidity in the storage area.

Humidity should especially be kept as low as possible.

Recommended conditions

Ambient temperature	Below 30℃
Humidity	Below 70%RH

The ambient temperature must be kept below 40℃. Even under ideal storage conditions inductor electrode solderability decreases as time passes, so inductors should be used within 6 months from the time of delivery.

If exceeding the above period, please check solderability before using the inductors.

The packaging material should be kept where no chlorine or sulfur exists in the air.

10. Manufacturing site.

TAIYO YUDEN CO., LTD. / JAPAN

TAIYO YUDEN (PHILIPPINES) INC. / PHILIPPINES

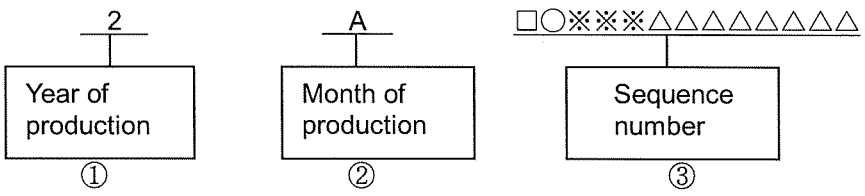
11. Others

Resin-coating:

- Coating/molding with resin may have negative effects on the inductor functions.
- When inductors are coated/molded with resin, please check effects on the inductors by analyzing them in actual applications prior to use.

Composition of the shipping lot number

(ex)



①Year of production (The last numeral of the Christian era. 201<u>2</u>year → 2)
②Month of production (It is due to the table below.)
③Sequence number is alphanumeric including space.

month	1	2	3	4	5	6	7	8	9	10	11	12
code	A	B	C	D	E	F	G	H	J	K	L	M

Operating conditions for guarantee of this product are as shown in the specification.
Please note that Taiyo Yuden Co., Ltd. shall not be responsible for a failure and/or abnormality which are caused by use under the conditions other than the aforesaid operating conditions.

- All electronic components listed in this specification 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.
- Please conduct validation and verification of products in actual condition of mounting and operating environment before commercial shipment of the equipment.
- The contents of this specification 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 specification. Taiyo Yuden Co., Ltd. grants no license for such rights.
- Caution for export
  Certain items in this specification 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.